

Modular electrical terminal CPX

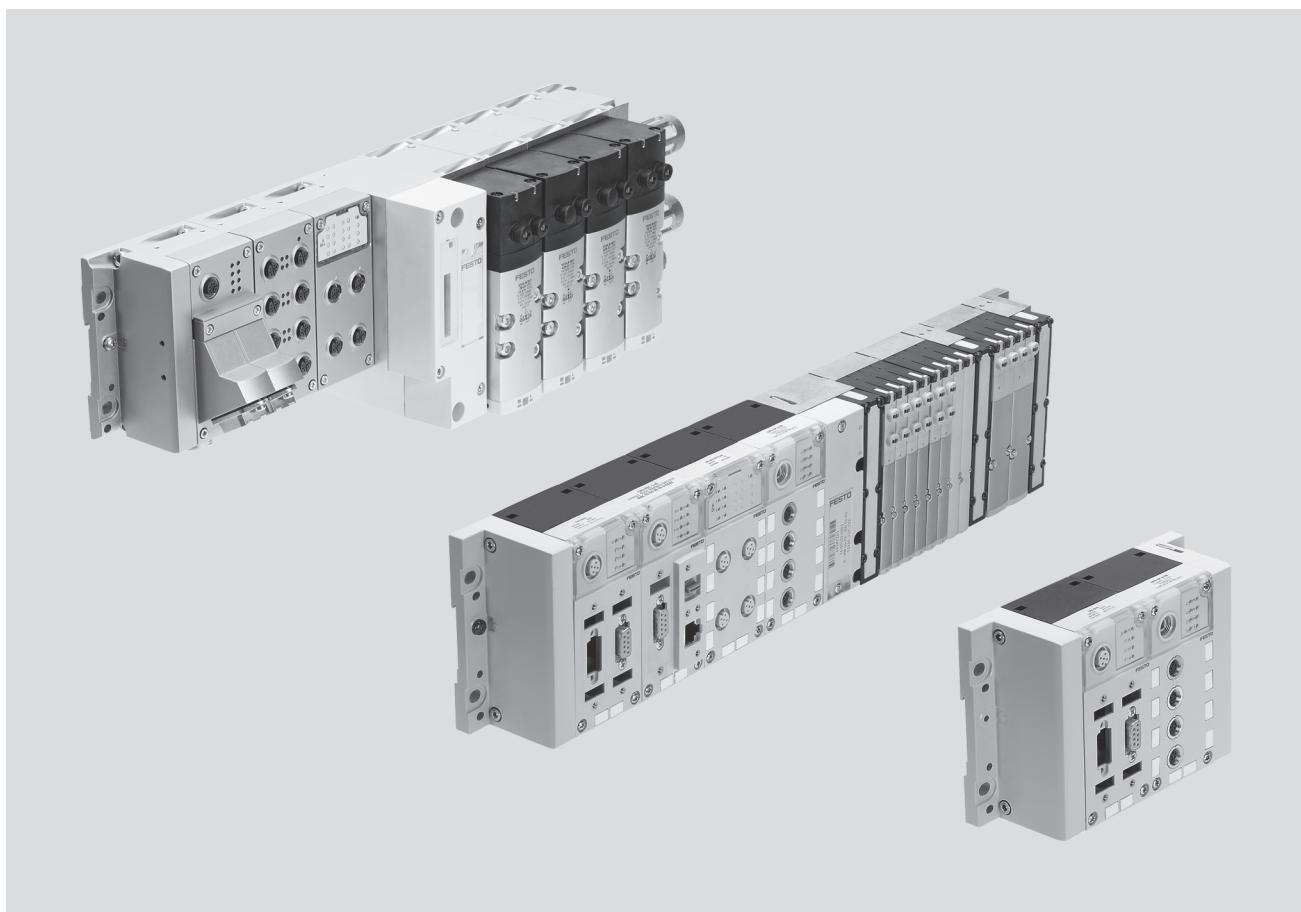
FESTO



Terminal CPX

Key features

FESTO



Key features

Installation concept

- Choice of several valve terminal types for different applications:
 - MPA-S
 - Type 32 MPA/MPA-F
 - MPA-L
- Economical from the smallest configuration up to the maximum number of modules
- Up to 9 electrical input/output modules plus bus nodes and pneumatic interface/electronic modules for valves
- Extensive range of functions and connection options for the electrical modules
- Choice of connection technology for technically and economically optimised connections
- Can be used as a dedicated remote I/O module

Electrical components

- High operating voltage tolerance ($\pm 25\%$)
- Choice of M18, 7/8" or AIDA push-pull connection for power supply
- Open to all fieldbus protocols and Ethernet
- Optional function and technology modules for preprocessing
- IT services and TCP/IP such as remote maintenance, remote diagnostics, web server, text message and e-mail alert
- Digital inputs and outputs, 4-/8-/16-way, optionally available with individual channel diagnostics
- Analogue inputs and outputs, 2-/4-way, optionally with HART protocol
- Pressure inputs
- Temperature inputs
- Controllers for pneumatic and electrical axes
- IP65 and IP67 or IP20

Assembly

- Wall or H-rail mounting, also on mobile systems
- Conversions/extensions are possible at any time, individual linking with CPX metal design
- Modular system offering a range of configuration options
- Fully assembled and tested unit
- Lower selection, ordering, assembly and commissioning costs thanks to the central CPX terminal
- Choice of pneumatic components for optimised control loop system design
- Decentralised, subordinate CPI installation system improves cycle times by up to 30%
- Safe and convenient earthing thanks to earthing plate

Operation

- Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules
- Suitable for direct machine mounting (IP65/IP67) or in a control cabinet with a terminal connection (IP20)
- Supports module and channel-oriented diagnostics
- Fieldbus/Ethernet remote diagnostics
- Innovative diagnostic support with integrated web server/web monitor or maintenance tool with USB adapter for PC
- Optimised commissioning thanks to parameterisable functions
- Reliability of service with connection blocks and modules that are quick to replace without changing the wiring

Terminal CPX

FESTO

Key features

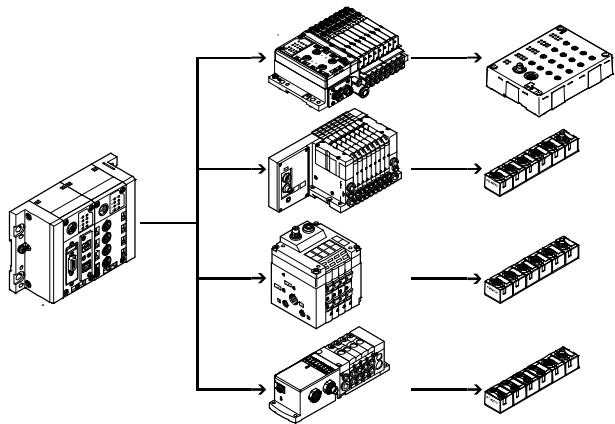
Pneumatic variants of the CPX terminal

The electrical CPX terminal is a modular peripheral system for valve terminals.

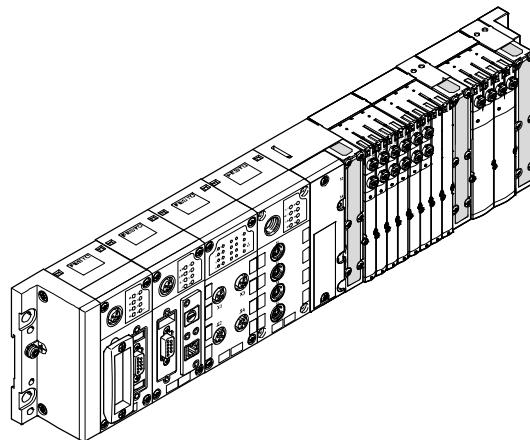
The system is specifically designed so that the valve terminal can be adapted to suit different applications.

The modular system design lets you configure the number of valves, inputs and additional outputs to suit the application.

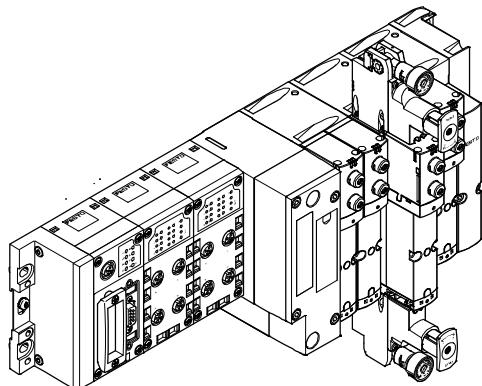
With valve terminal – decentralised



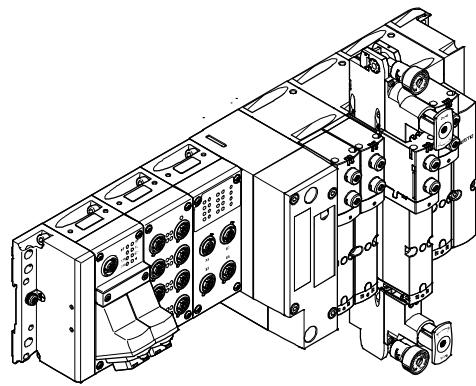
With valve terminal MPA-S – centralised



With valve terminal VTSA – centralised



In metal design with valve terminal VTSA – centralised



Terminal CPX

Key features

FESTO

Variants of the CPX terminal controller (with bus node, without preprocessing)

Bus node

Different bus nodes are used to integrate the terminal in the control systems of various manufacturers. The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems:

- PROFIBUS DP
- PROFINET
- INTERBUS

- DeviceNet
- CANopen
- CC-Link

Integration in universal networks based on Ethernet opens up new possibilities. Faster data transmission, real-time capability and above all additional IT services such

as file transfer, web server, web monitor as integrated website in the CPX terminal, text message/e-mail alerts, etc. open up a wide range of synergies.

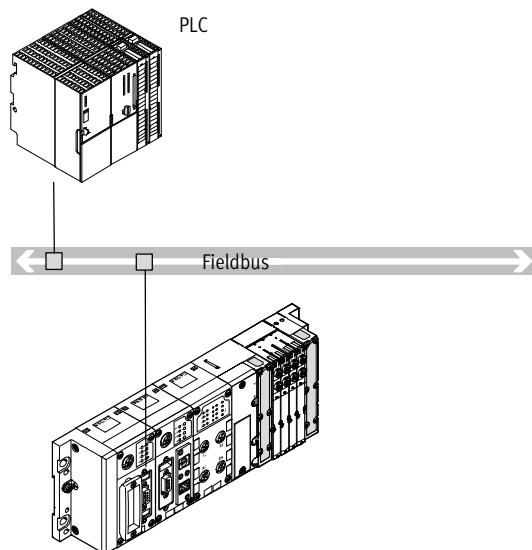
These include standardised and universal communication technology across all areas, including operating level, management level and field

level in the production environment, with protection to IP65, IP67.

The following protocols are supported:

- EtherNet/IP
- Modbus/TCP
- PROFINET
- POWERLINK
- EtherCAT
- Sercos III

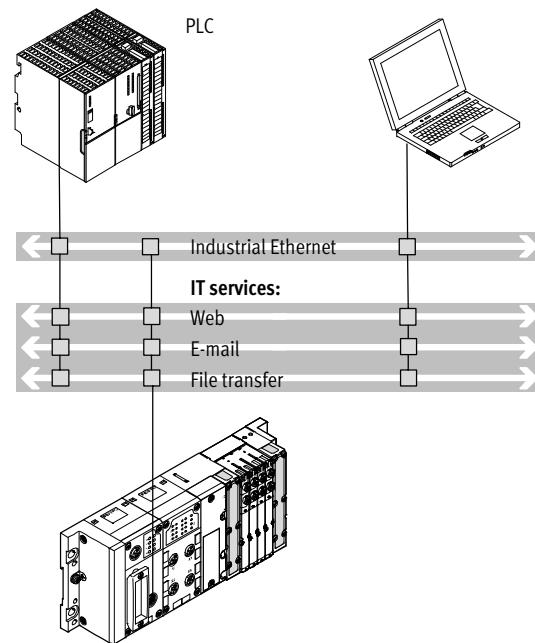
Bus node



- Communication with higher-order controller via fieldbus
- No preprocessing

- Fieldbus protocol dependent on CPX bus node used
- Up to 90 I/Os, depending on the bus node used

Industrial Ethernet bus node



- Connection to a higher-order controller directly via EtherNet/IP, Modbus/TCP, POWERLINK, EtherCAT or PROFINET

- No preprocessing
- Monitoring via Ethernet and web applications
- Up to 300 I/Os

Note

Every electrical connection can be combined with an appropriate number of I/O modules and/or pneumatic components, depending on its address capacity.

Likewise, every pneumatic variant of the CPX terminal can be operated with every electrical connection variant.

Terminal CPX

FESTO

Key features

Variants of the CPX terminal controller (with preprocessing in the control block)

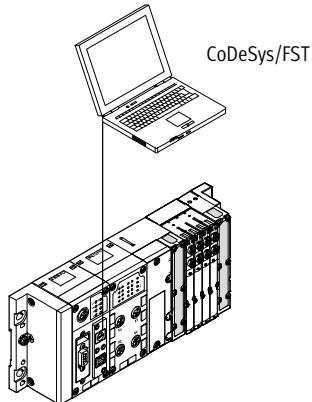
Control block

The optional Front End Controllers CPX-CEC enable access via Ethernet, in parallel with a bus node, as

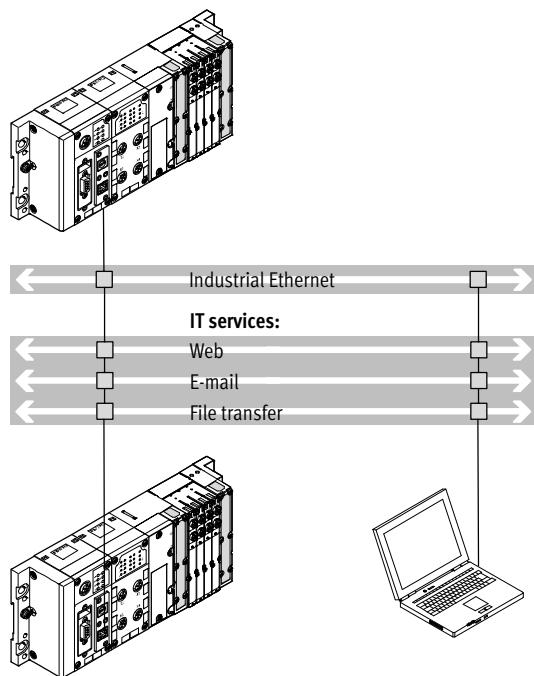
well as autonomous preprocessing. Access via Modbus/TCP and EasyIP is also possible.

Commissioning, programming and diagnostics using the Festo software tool FST 4.1 with hardware configurator.

With control block in stand-alone mode



With control block in Festo EasyIP mode



- Decentralised controller with direct machine mounting
- Interaction options via Front End Display
- Downloading of programs via Ethernet (or via the programming interface)
- Supports full expansion of all CPX peripherals
- More than 300 I/Os

- Beneficial application areas:
- Stand-alone individual workstations
 - Interlinked, stand-alone sub-systems
 - Automation using IT technology

- Fast preprocessing of the CPX peripherals in the control block
- Exchange of any data between the control blocks via EasyIP
- Remote diagnostics

- No higher-order controller is required
- More than 300 I/Os per CPX control block

Terminal CPX

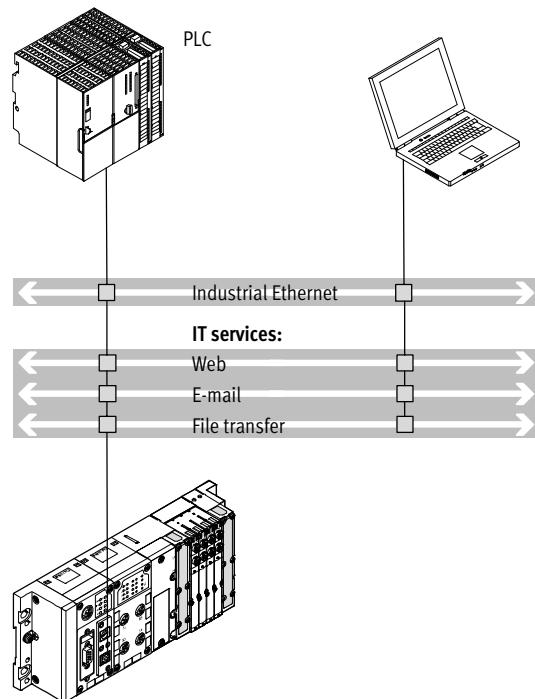
Key features

FESTO

Variants of the CPX terminal controller (with preprocessing in the control block)

With control block as remote controller on Ethernet

Remote controller on Ethernet as the preprocessing unit for decentralised, stand-alone subsystems using IT technology.

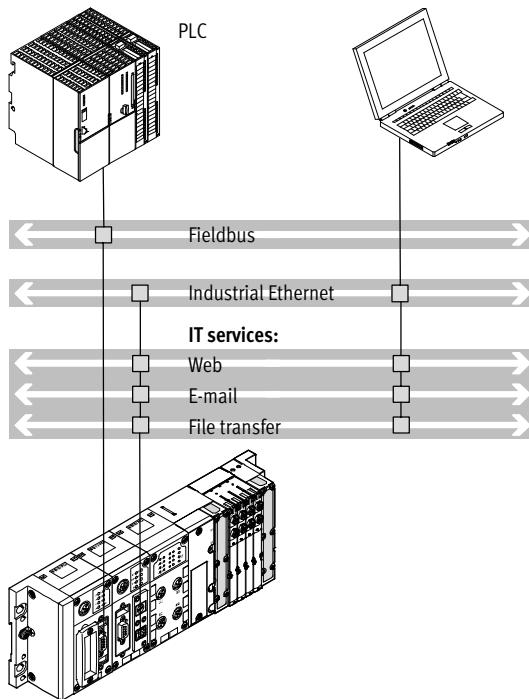


- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet and web applications

- Preprocessing of the CPX peripherals by CPX control block
- More than 300 I/Os

With control block as remote controller on the fieldbus

Fieldbus remote controller (combination with bus nodes for INTERBUS, PROFIBUS DP, PROFINET, CANopen, DeviceNet, CC-Link, POWERLINK, Sercos III or EtherCAT) as the preprocessing unit for decentralised, stand-alone subsystems.



- Fast preprocessing of the CPX peripherals in the control block
- Communication with higher-order controller via fieldbus
- Optional additional monitoring via Ethernet and web applications
- Downloading of programs via programming interface
- More than 300 I/Os, bus node is only used for communication with the higher-order PLC
- Two bus nodes for redundant communication configuration

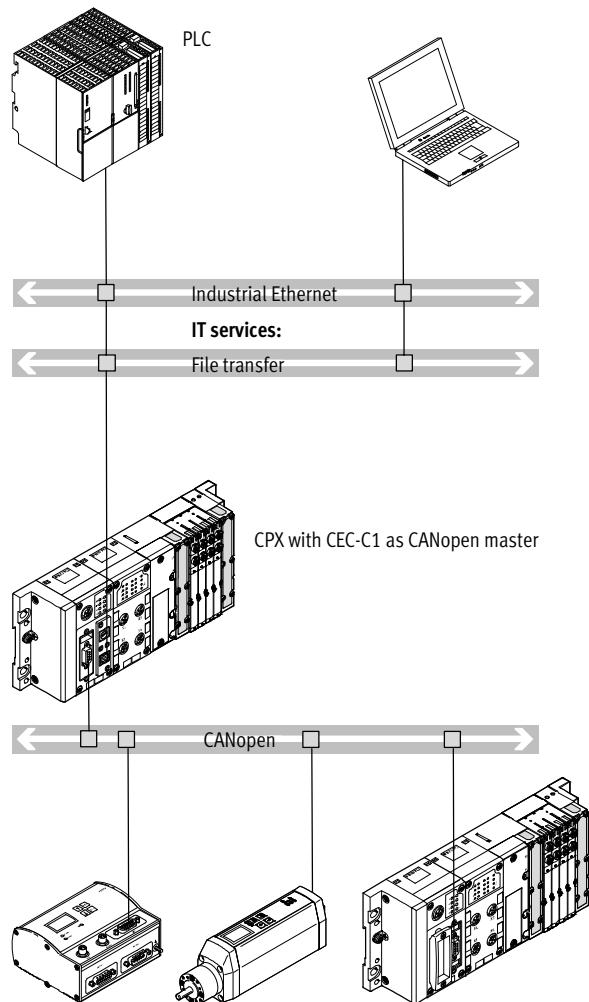
Terminal CPX

FESTO

Key features

Variants of the CPX terminal controller (with preprocessing in the control block)

With control block as CANopen fieldbus master



Properties:

- Connection to a higher-order controller via Ethernet, no further bus node is required
- Monitoring via Ethernet
- Preprocessing of the CPX peripherals by CPX control block
- More than 300 I/Os
- Up to 128 stations with repeater technology on CANopen

Operating modes:

- Remote controller on Ethernet
- Control block in Festo EasyIP mode

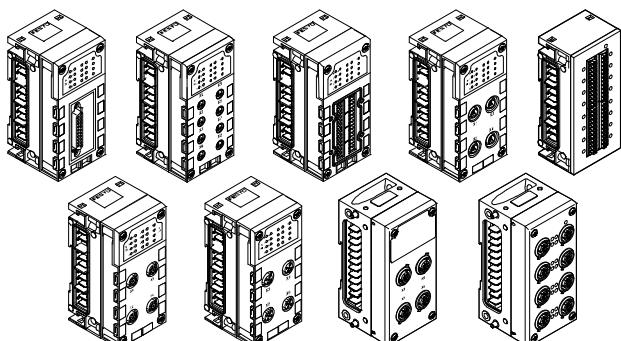
Terminal CPX

Key features

FESTO

Connection of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules



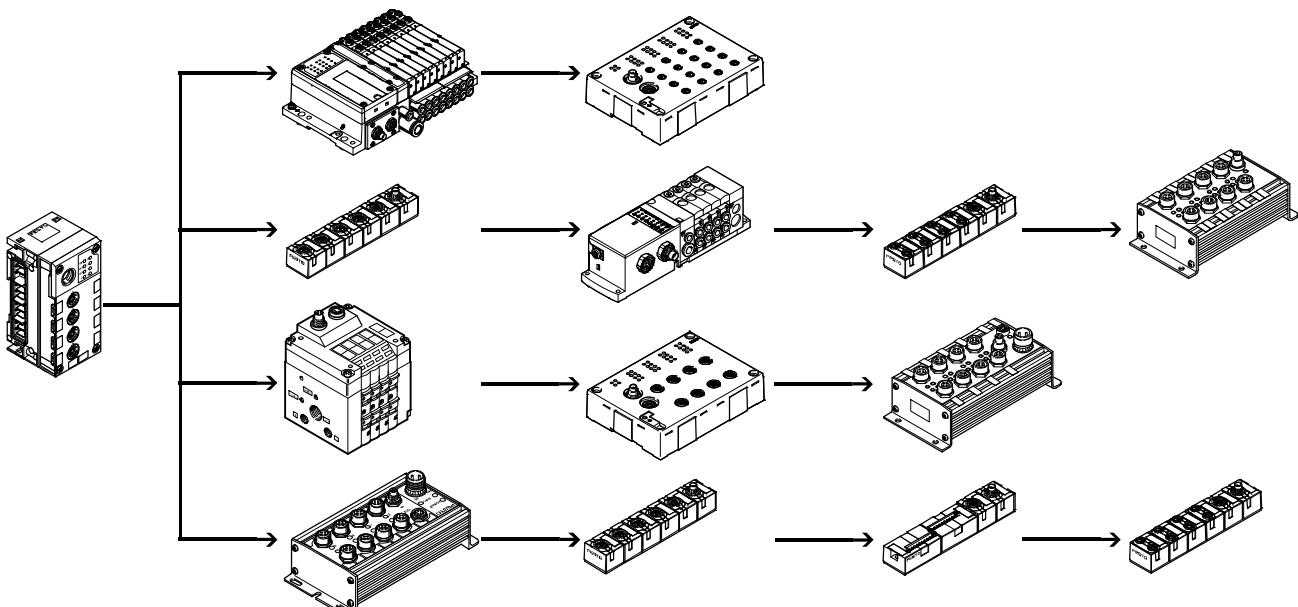
Electrical connection

The connection technology for sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – as appropriate to your standard or application. Plastic or metal connection blocks can be combined as required:

- Metal design
 - M12-5POL

- Plastic design:
 - M12-5POL
 - M12-5POL with quick lock and metal thread
 - M12-8POL
 - M8-3POL
 - M8-4POL
 - Sub-D
 - Harax®
 - CageClamp®
(with cover also to IP65, IP67)
 - Screw terminal / spring-loaded terminal

With CPX-CP interface



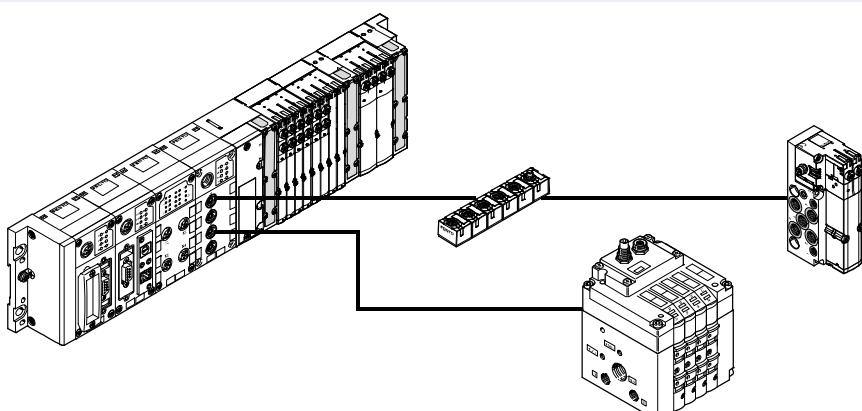
- Up to 4 strings per CP interface possible
- Up to 4 subordinate CP modules can be combined in one string

- Up to 32 I/Os can be connected per string
- Modules with M8, M12 and terminal connection

Several CP interface modules can be combined in one CPX terminal (depending on the controller used).

Combination of centralised CPX I/O modules and decentrally mounted I/O modules of the CPI installation system.

Combined centralised and decentralised electrical connection (valve terminal with CP interface/output module)

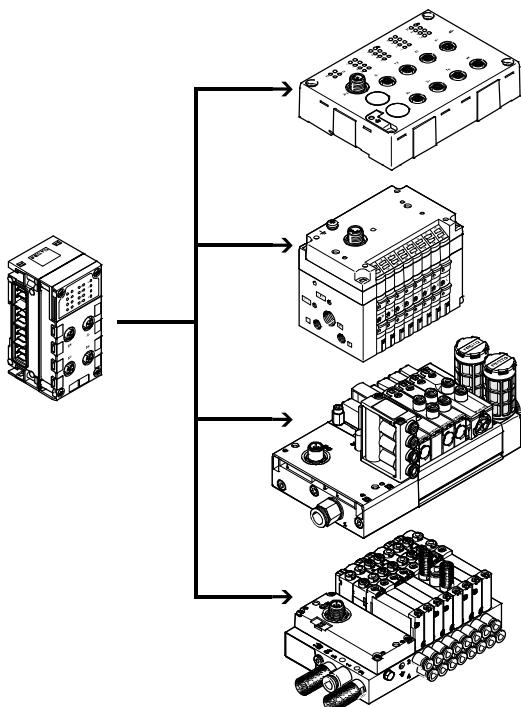


- Scalable to different requirements within a system
- One control interface in the system, reduces installation complexity with closely and widely spaced actuators
- Enables an optimum electrical and pneumatic control chain

Terminal CPX

Key features

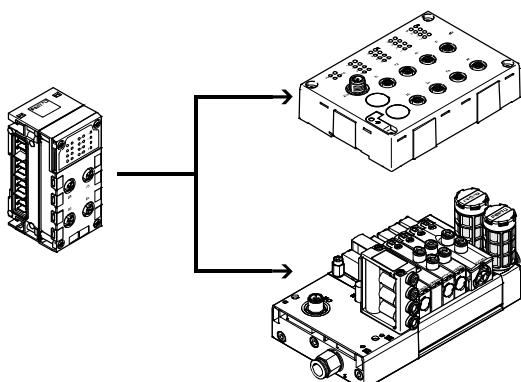
Connection of inputs and outputs to the CPX terminal with CPX-CTEL interface



- Up to 4 devices with individual electronic fuse protection per CPX-CTEL master
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m
- Input modules with 16 digital inputs (3-pin M8 and 5-pin M12 connection technology)
- Valve terminals with I-Port interface (up to 48 solenoid coils, different valve functions)

Several CPX-CTEL masters can be combined in one CPX terminal (depending on the controller used). Combination of central CPX I/O modules and decentrally mounted I/O modules with I-Port interface.

With CPX-CTEL-2 interface



- Up to 2 individual electronically protected IO-Link devices per CPX-CTEL-2 interface
- Max. 16-byte inputs/ 16-byte outputs per IO-Link device
- The maximum length of a string is 20 m

Several CPX-CTEL-2 interface modules can be combined on one CPX terminal (depending on the controller used). Combination of central CPX I/O modules and decentrally mounted I/O modules with IO-Link interface.

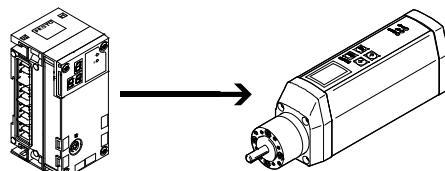
Terminal CPX

Key features

FESTO

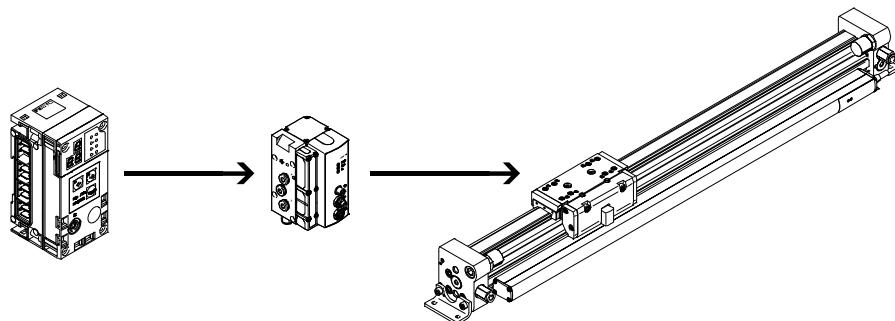
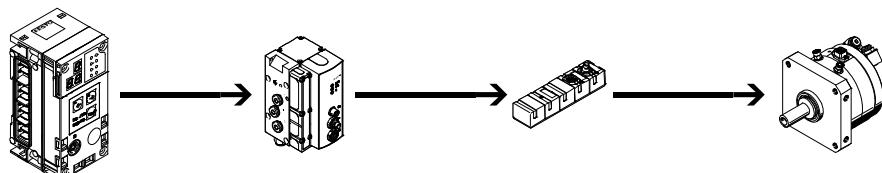
Connection of inputs and outputs to the CPX terminal

Electrical drives with CPX-CM-HPP axis interface



- Max. 4 individual electric axes, per CPX-CM-HPP
- No programming required
- Standardised communication with the drives via the Festo Handling and Positioning Profile (FHPP)
- The control component is independent of the bus node used

Pneumatic drives with CPX-CMAX/CMPX



CPX-CMAX

- Position and force control, directly actuated or selected from one of 64 configurable positioning profiles.
- Configurable record continuation enables simple functional sequences to be realised.
- The auto-identification function identifies each station with its device data on the controller.
- Actuation of a brake or clamping unit via the proportional directional control valve VPWP.
- Up to 7 modules (max. 7 axes) can be operated in parallel and independently of each other.
- Commissioning via the Festo configuration software FCT or via fieldbus.

CPX-CMPX

- Fast travel between the mechanical end stops of the cylinder, stopping gently and without impact in the end position.
- Fast commissioning via control panel, fieldbus or handheld unit.
- Improved downtime control.
- Actuation of a brake or clamping unit via the proportional directional control valve VPWP.
- Max. 9 end-position controllers can be actuated depending on the fieldbus.
- All system data can be read and written via the fieldbus, including the mid positions, for example.

Ordering

The CPX terminal with valve terminal is fully assembled according to your order specifications and individually tested. The finished valve terminal consists of the electrical peripherals including the desired actuation and the selected components of the VTSA (ISO), VTSA-F, MPA-S or MPA-L modules.

The CPX terminal with valve terminal is ordered using two separate order codes. One order code defines the electrical peripherals type CPX, while the other specifies the pneumatic components of the valve terminal.
The electrical peripherals type CPX can also be configured without a valve terminal and can be used on a fieldbus. For this order, only the order code for the electrical peripherals is required.

The order lists for the pneumatic components can be found on
➔ Internet: vtsa
(valve terminal VTSA)
➔ Internet: vtsa-f
(valve terminal VTSA-F)
➔ Internet: mpa-s
(valve terminal MPA-S)
➔ Internet: mpa-l
(valve terminal MPA-L)

The order lists for the CP/CPI components can be found on
➔ Internet: ctec
(CPI installation system)

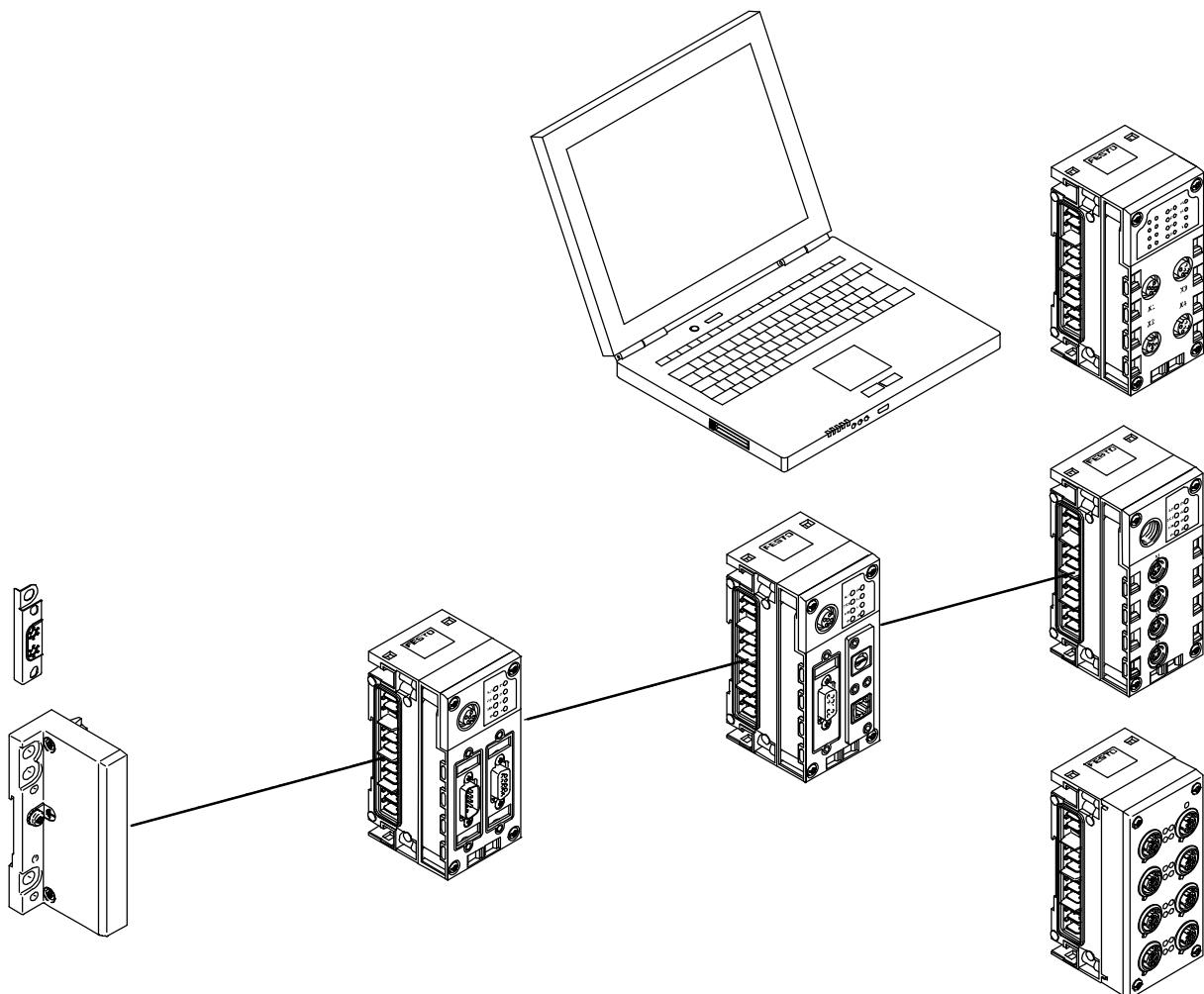
The order lists for the CTEU/CTEL components can be found on
➔ Internet: ctue
(I-Port interface/IO-Link)

Terminal CPX

Peripherals overview

FESTO

Complete overview of modules



End plate

- Mounting holes for wall mounting
- Functional earth connection
- Special earthing plate for safe and easy connection to the machine bed or H-rail
- External power supply for the entire system

Bus node

- Fieldbus/Industrial Ethernet connection using various types of connection technology
- Setting of fieldbus parameters via DIL switch
- Display of fieldbus and peripheral equipment status via LED
- PROFINET to AIDA standard in metal housing, fast start-up

Control block

- Pre-processing, stand-alone controller or remote unit CPX-CEC
- Connection via Ethernet TCP/IP or Sub-D programming interface
- Setting of operating modes via DIL switch and program selection via rotary switch
- CPX-CMX products for controlling axes

CP interface/CTEL interface

- Interfaces for decentralised installation systems, thus optimising the pneumatic control chains (short tubes/short cycle times)
- Actuator for I/O modules and valve terminals
- Power supply and bus interface via the same cable

Gateway

- Separate CPX combination
- Data capture for connected components
- Secure data transfer to a central storage location (cloud)

Web monitor

- Website integrated in the CPX terminal
- Dynamic status display
- Online diagnostics
- SMS/e-mail alert

Input/output modules

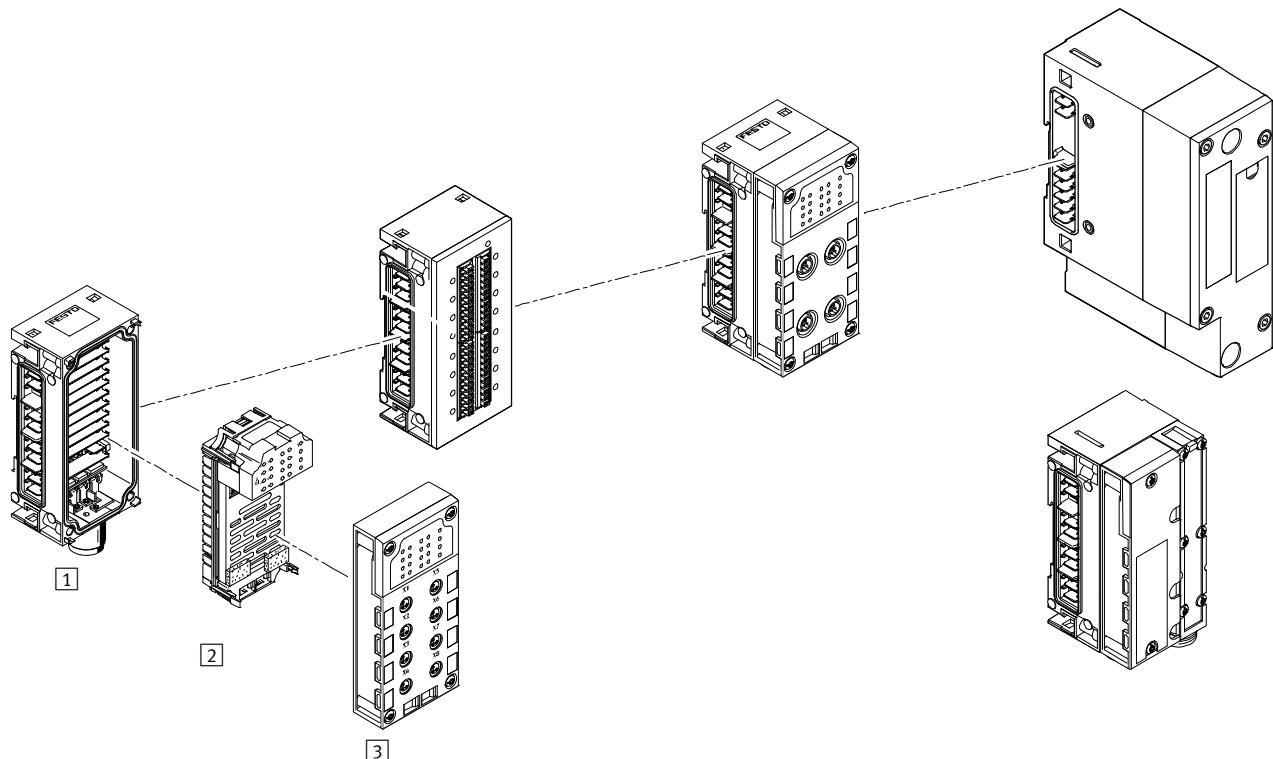
- Combination of
- Interlinking block
 - Electronics module
 - Connection block

Terminal CPX

FESTO

Peripherals overview

Complete overview of modules



Input/output modules

1 Interlinking block

- Internal linking of the power supply and serial communication
- External power supply for the entire system
- Additional power supply for outputs or valves
- Connection accessories for M18, 7/8" or AIDA push-pull
- Polymer design: linking with tie rods
- Metal design: individual linking with M6 screws, individually expandable

2 Electronics module

- Digital inputs for connecting the sensors
- Digital outputs for activating additional actuators
- Analogue inputs
- Temperature inputs (analogue)
- Analogue outputs
- PROFIsafe input module for safety-oriented sensor technology
- PROFIsafe shut-off module with two digital outputs for shutting off the supply voltage for valves

3 Connection block

- Choice of 8 connection technology variants
- Degree of protection IP65, IP67 or IP20
- Can be combined with the electronics modules
- M8/M12/Sub-D/quick connection accessories
- M8/M12/Sub-D, etc. connecting cables
- Modular system for M8/M12 connecting cables
- M12 connection technology for the metal design

Pneumatic interface

- Actuation of the solenoid coils
- MPA-S
- MPA-L
- VTSA/VTSA-F
- Actuation of pressure sensors
- Actuation of proportional pressure regulators

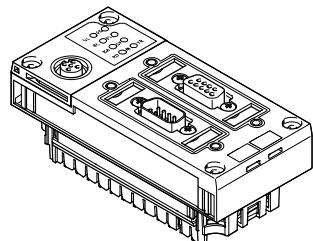
Terminal CPX

Peripherals overview

FESTO

Individual overview of modules

Bus node

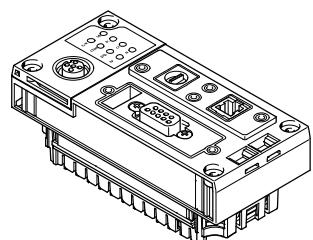


Bus node for
• PROFIBUS DP
• INTERBUS®
• DeviceNet®
• CANopen
• CC-Link®
• EtherNet/IP

- PROFINET
- POWERLINK
- EtherCAT®
- Sercos III

➔ Page 69

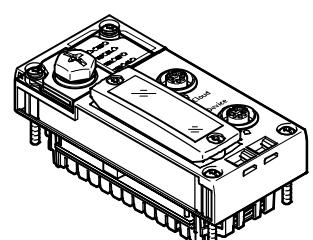
Control block



CPX-CEC
• Programming with CODESYS
• Ethernet interface
• Modbus®/TCP
• EasyIP
• CANopen Master

➔ Page 62

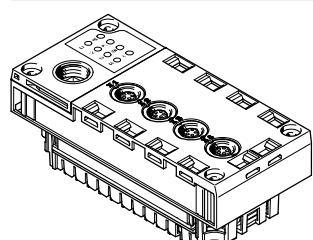
Gateway



CPX-IOT
• Continuous transfer of operating data from connected Festo components to a central storage location (cloud)
• Ethernet interface

➔ Page 57

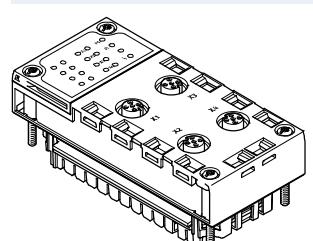
CP interface



Interface CPX-CP
• 4 CP strings
• Max. 4 modules per string
• 32I/32O per string
• CPI functionality

➔ Page 122

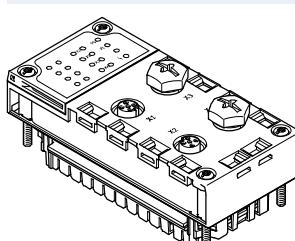
CTEL interface



➔ Page 127

Interface CPX-CTEL
• CTEL master
• Max. 4 devices with individual electronic fuse protection
• A maximum of 64 inputs/64 outputs per I-Port interface
• The maximum length of a string is 20 m

Electrical interface CPX-CTEL-2



➔ Page 133

Interface CPX-CTEL-2
• Master for IO-Link
• Max. 2 devices with individual electronic fuse protection
• Process data length of the inputs and outputs is limited to 16 bytes for inputs and 16 bytes for outputs per port
• The maximum length of a string is 20 m

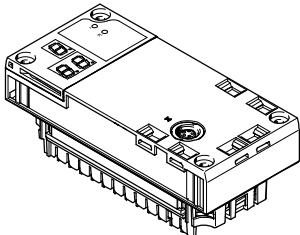
Terminal CPX

FESTO

Peripherals overview

Individual overview of modules

Modules for controlling electric drive units

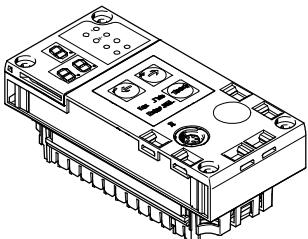


CPX-CM-HPP

- Axis interface
- CAN bus for up to 4 individual electric axes

→ Page 138

Modules for controlling pneumatic drive units



CPX-CMAX

- Axis controller
- Position and force control
- 64 configurable positioning records
- Auto-identification
- Control of a brake or clamping unit via the proportional directional control valve VPWP

CPX-CMPX

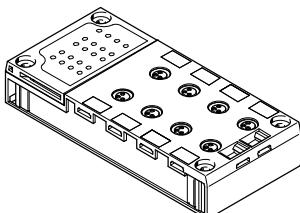
- End-position controller
- Fast travel between the mechanical end stops of the cylinder
- Smooth travel into the end position
- Improved standstill control
- Control of a brake via the proportional directional control valve VPWP

→ Page 141

CPX-CMIX

- Measuring module
- CAN input (Festo specification) for measuring signal
- Recording of the absolute position values or speed values of the connected drive

Polymer connection block



Direct machine mounting
(degree of protection IP65, IP67)

- M8-3POL
- M8-4POL
- M12-5POL
- M12-5POL quick lock, metal thread screened
- M12-8POL
- Sub-D
- Quick connector
- Spring-loaded terminal with cover

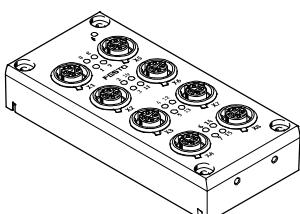
Protected fitting space
(degree of protection IP20)

- Spring-loaded terminal

Screening concept

- Optional screening plate for connection blocks with M12 connection technology

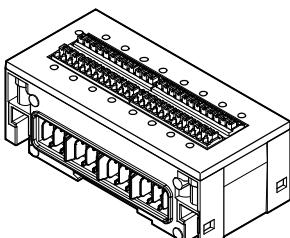
Metal connection block



Direct machine mounting
(degree of protection IP65, IP67)

- M12-5POL

Connection block including electronics module and interlinking block



Assembly in the control cabinet

(degree of protection IP20)

- Polymer connection block
- Spring-loaded terminal
- Digital input module with 16 inputs
- Digital I/O module with 8 inputs and 8 outputs

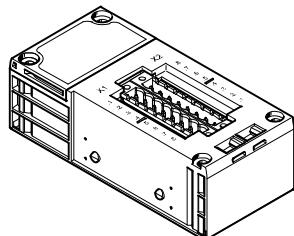
Terminal CPX

Peripherals overview

FESTO

Individual overview of modules

Connection block for NAMUR sensors and HART input/output module

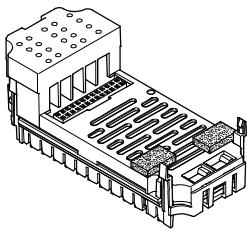


Direct machine mounting
(connection block to IP65)
• M12-4POL

Protected fitting space
(connection block to IP20)
• Screw terminal
• Spring-loaded terminal

Digital electronics module for inputs/outputs

➔ Page 150



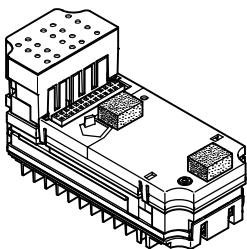
Digital inputs
• 4 digital inputs
• 8 digital inputs NPN
• 8 digital inputs PNP
• 8 digital inputs PNP with individual channel diagnostics
• 16 digital inputs
• 16 digital inputs with individual channel diagnostics

Digital outputs
• 4 digital outputs (1 A per channel, individual channel diagnostics)
• 8 digital outputs (0.5 A per channel, individual channel diagnostics)
• 8 digital outputs (2.1 A/50 W lamp load per channel pair, individual channel diagnostics)

Multi I/O modules
• 8 digital inputs and 8 digital outputs
• 2 digital inputs (counter channels, connection to various encoders) and 2 digital outputs (directly controlled by the input values)

Digital electronics module for NAMUR sensors

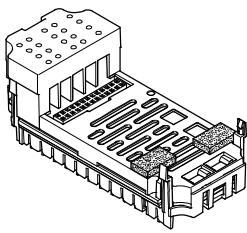
➔ Page 157



Digital inputs
• 8 digital inputs for NAMUR sensors or wired mechanical contacts

Analogue electronics module for inputs/outputs

➔ Page 194



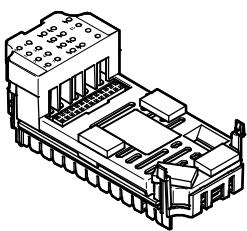
Analogue inputs
• 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
• 4 analogue inputs (1 ... 5 V, 0 ... 10 V, -5 ... +5 V, -10 ... +10 V, 0 ... 20 mA, 4 ... 20 mA, -20 ... +20 mA)
• 4 analogue inputs with HART protocol

Analogue temperature inputs
• 4 analogue inputs for temperature measurement (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000)
• 4 analogue inputs for temperature measurement (thermocoupler and PT1000 sensor for cold-junction compensation)

Analogue outputs
• 2 analogue outputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
• 4 analogue outputs with HART protocol

PROFIsafe input module

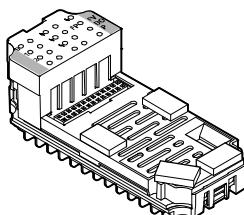
➔ Page 156



Digital inputs
• 8 digital inputs
• 11 function modes
• 5 independent clock outputs

PROFIsafe shut-off module

➔ Page 213



Digital outputs
• 2 digital outputs
• Supply voltage for valves can be shut off

Terminal CPX

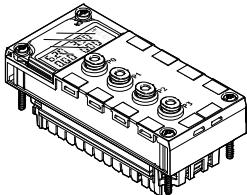
FESTO

Peripherals overview

Individual overview of modules

Analogue electronics module for pressure inputs

➔ Page 199

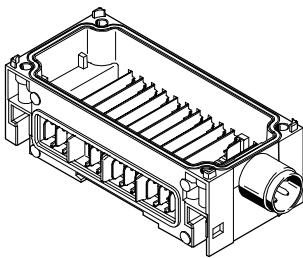


Analogue inputs

- 4 analogue pressure inputs
(0 ... 10 bar, -1 ... +1 bar)

Polymer interlinking block – Interlinking by means of tie rods

➔ Page 222



System linking

- Different voltages for supplying the modules
- Serial communication between the modules

In addition to system linking, power supply for the

- electronics plus sensors (16 A)
- valves plus actuators (16 A)

Additional power supply

In addition to system linking, power supply for the

- actuators (16 A per supply)

Power supply for the

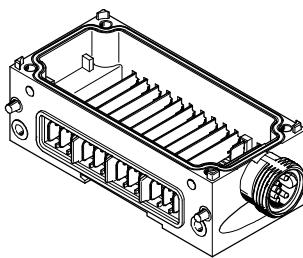
- valves (16 A per supply)

Expandability

- Can be expanded using an interlinking block with tie-rod extension CPX-ZA-1-E

Metal interlinking block – Individual linking

➔ Page 222



System linking

- Different voltages for supplying the modules
- Serial communication between the modules

In addition to system linking, power supply for the

- electronics plus sensors (16 A)
- valves plus actuators (16 A)

Additional power supply

In addition to system linking, power supply for the

- actuators (16 A per supply)

Power supply for the

- valves (16 A per supply)

Expandability

- Can be expanded as required by up to 10 interlinking blocks

- - Note

Polymer interlinking blocks (tie rods) and metal interlinking blocks (individual linking) cannot be combined due to their different interlinking systems.

- - Note

The 7/8" supply is subject to the following restrictions due to the available accessories:

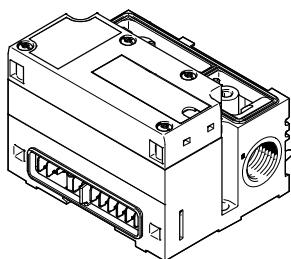
- 5-pin 8 A
- 4-pin 10 A

- - Note

The usage of appropriate interlinking blocks (CPX-...-VL) is required for use in ATEX environments as per the approval certificate (➔ page 49). The maximum supply is limited to 8 A for these modules.

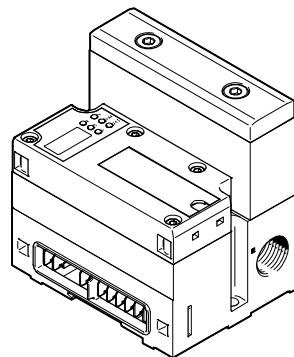
Terminal CPX

Peripherals overview



Valve terminal

- MPA1 (360 l/min)
- MPA2 (700 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- For CPX polymer design
- For CPX metal design
- Actuation of pressure sensors
- Proportional pressure regulators
- Pressure sensors
- Proportional pressure regulators



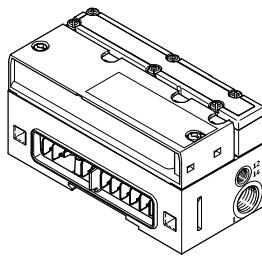
Valve terminal

- MPAF1 (360 l/min)
- MPAF2 (900 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- With integrated pressure sensor for channel 1
- For CPX polymer design
- For CPX metal design

Individual overview of modules

Pneumatic interface MPA-S

➔ Page 236

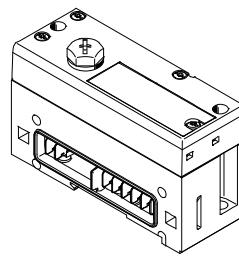


Valve terminal

- MPA1 (360 l/min)
- MPA14 (550 l/min)
- MPA2 (700 l/min)
- Up to 128 solenoid coils
- Up to 16 modules can be configured
- For CPX polymer design
- For CPX metal design
- Actuation of pressure sensors
- Proportional pressure regulators
- Pressure sensors
- Proportional pressure regulators

Pneumatic interface MPA-L

➔ Page 238

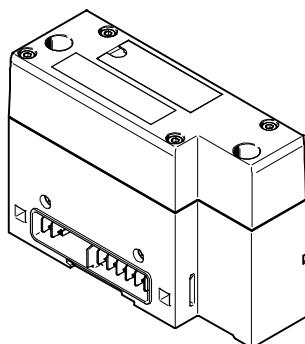


Valve terminal

- MPA1 (360 l/min)
- MPA14 (670 l/min)
- MPA2 (870 l/min)
- Up to 32 solenoid coils
- For CPX polymer design

Pneumatic interface VTSA/VTSA-F

➔ Page 199



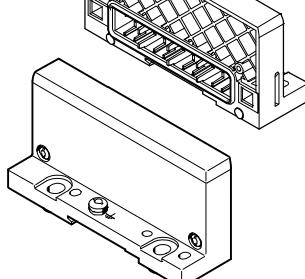
Valve terminal (valve flow rate by widths)

- 18 mm (700 l/min)
- 26 mm (1350 l/min)
- 42 mm (1300 l/min)
- 52 mm (2900 l/min)
- 65 mm (4000 l/min)
- Max. 32 valve positions/max. 32 solenoid coils
- For CPX polymer design
- For CPX metal design

End plate for polymer/metal design

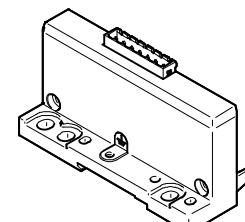
End plate

- Left-hand
- Right-hand (for use of the CPX terminal without valves)



End plate with system power supply

➔ Page 218



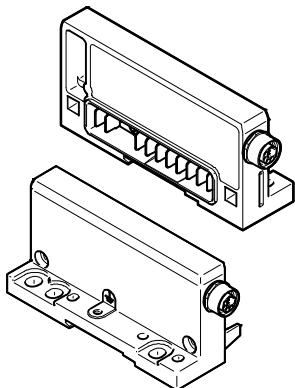
End plate

- Left-hand
- For polymer design
- Different voltages for supplying the CPX terminal

End plate with extension

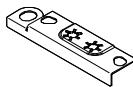
➔ Page 220

Earthing plate (for end plate for polymer design)



End plate

- Left-hand
- Right-hand
- Enables the CPX terminal to be separated into two interconnected units (series)
- Simplifies control cabinet installation
- For polymer or metal design



Earthing plate

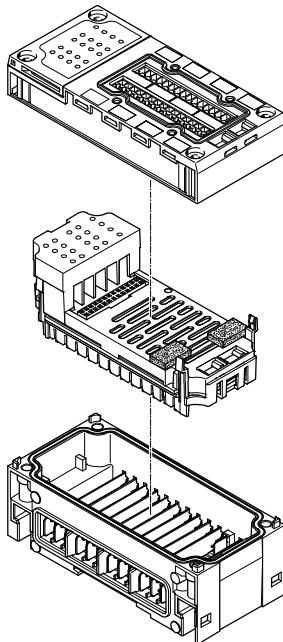
- For safe and easy connection to the machine bed or H-rail, suitable for right-hand and left-hand end plate
- Assembly and earthing in a single processing step, which means:
 - 50% time saving
 - No additional material required

Terminal CPX

Peripherals overview

FESTO

General basic data and guidelines



Max. 11 modules in total:

- One bus node and/or one control block, freely positionable
- Up to 9 additional input/output modules, freely positionable
- An additional pneumatic interface always positioned as the last module on the right-hand side
 - With VTSA, VTSA-F:
Fixed operating range, set using DIL switch
 - With MPA-S:
16 MPA modules can be configured
 - With MPA-L:
Fixed operating range, set using rotary switch

• Address capacity max. 512 inputs and 512 outputs, depending on bus node or control block

- One interlinking block with system power supply
- Multiple interlinking blocks with additional power supplies, always positioned to the right of the interlinking block with system power supply
- The connection blocks can, with just a few exceptions, be freely combined with the electronics modules for inputs/outputs, either in metal or polymer (→ table below)
- The electronics modules for inputs/outputs can be combined with various interlinking blocks

- Polymer interlinking blocks (tie rods) and metal interlinking blocks (individual linking) cannot be combined due to their different interlinking systems.

Terminal CPX

FESTO

Peripherals overview

Combinations of connection blocks and digital input modules		Digital electronics modules					
		CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE	CPX-P-8DE-N	CPX-F8DE-P
Connection blocks, polymer design							
CPX-AB-8-M8-3POL	■	■	■	■	-	-	-
CPX-AB-8-M8X2-4POL	-	-	-	-	-	-	-
CPX-P-AB-4XM12-4POL	-	-	-	-	■	-	-
CPX-AB-4-M12x2-5POL	■	■	■	■	-	-	-
CPX-AB-4-M12x2-5POL-R	■	■	■	■	-	-	-
CPX-AB-8-M12X2-5POL	-	-	-	-	-	-	-
CPX-AB-4-M12-8POL	-	-	-	-	-	-	-
CPX-AB-8-KL-4POL	■	■	■	■	-	-	■
CPX-P-AB-2XKL-8POL	-	-	-	-	■	-	-
CPX-AB-1-SUB-BU-25POL	■	■	■	■	-	-	-
CPX-AB-4-HAR-4POL	■	■	■	■	-	-	-
CPX-AB-ID-P	-	-	-	-	-	-	■
Connection blocks, metal design							
CPX-M-AB-4-M12X2-5POL	■	■	■	■	-	-	■
CPX-M-AB-4-M12X2-5POL-T	-	-	-	-	-	-	■
CPX-M-AB-8-M12X2-5POL	-	-	-	-	-	-	-

Combinations of connection blocks and digital input modules		Digital electronics modules		
		CPX-16DE	CPX-L-16DE	CPX-M-16DE-D
Connection blocks, polymer design				
CPX-AB-8-M8-3POL	-	-	-	-
CPX-AB-8-M8X2-4POL	■	-	-	-
CPX-P-AB-4XM12-4POL	-	-	-	-
CPX-AB-4-M12x2-5POL	-	-	-	-
CPX-AB-4-M12x2-5POL-R	-	-	-	-
CPX-AB-8-M12X2-5POL	-	-	-	■
CPX-AB-4-M12-8POL	-	-	-	-
CPX-AB-8-KL-4POL	■	-	-	-
CPX-P-AB-2XKL-8POL	-	-	-	-
CPX-AB-1-SUB-BU-25POL	■	-	-	-
CPX-AB-4-HAR-4POL	-	-	-	-
CPX-AB-ID-P	-	-	-	-
Connection blocks, metal design				
CPX-M-AB-4-M12X2-5POL	-	-	-	-
CPX-M-AB-4-M12X2-5POL-T	-	-	-	-
CPX-M-AB-8-M12X2-5POL	-	-	-	■

Terminal CPX

Peripherals overview

FESTO

Combinations of connection blocks and digital output modules/multi I/O modules		Digital electronics modules						
		CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-8DE-8DA	CPX-L-8DE-8DA	CPX-2ZE2DA	CPX-FVDA-P2
Connection blocks, polymer design								
CPX-AB-8-M8-3POL	■	■	-	-	-	-	-	-
CPX-AB-8-M8X2-4POL	■	■	■	-	-	-	-	-
CPX-P-AB-4XM12-4POL	-	-	-	-	-	-	-	-
CPX-AB-4-M12x2-5POL	■	■	-	-	-	-	-	-
CPX-AB-4-M12x2-5POL-R	■	■	■	-	-	-	-	-
CPX-AB-8-M12X2-5POL	-	-	-	-	-	-	-	-
CPX-AB-4-M12-8POL	-	-	-	■	-	-	-	-
CPX-AB-8-KL-4POL	■	■	■	■	-	-	-	■
CPX-P-AB-2XKL-8POL	-	-	-	-	-	-	-	-
CPX-AB-1-SUB-BU-25POL	■	■	■	■	-	-	-	-
CPX-AB-4-HAR-4POL	■	■	-	-	-	-	-	-
CPX-AB-ID-P	-	-	-	-	-	-	-	-
Connection blocks, metal design								
CPX-M-AB-4-M12X2-5POL	■	■	■	-	-	-	-	■
CPX-M-AB-4-M12X2-5POL-T	-	-	-	-	-	-	-	-
CPX-M-AB-8-M12X2-5POL	-	-	-	-	-	-	-	-

Combinations of connection blocks and analogue electronics modules for inputs/outputs		Analogue electronics modules							
		CPX-4AE-4AA-H	CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I	CPX-2AA-U-I	CPX-4AE-P	CPX-4AE-T	CPX-4AE-TC
Connection blocks, polymer design									
CPX-AB-8-M8-3POL	-	-	-	-	-	-	-	-	-
CPX-AB-8-M8X2-4POL	-	-	-	-	-	-	-	-	-
CPX-P-AB-4XM12-4POL	■	-	-	-	-	-	-	-	-
CPX-AB-4-M12x2-5POL	-	■	■	■	■	■	-	■	■
CPX-AB-4-M12x2-5POL-R	-	■	■	■	■	■	-	■	■
CPX-AB-8-M12X2-5POL	-	-	-	-	-	-	-	-	-
CPX-AB-4-M12-8POL	-	-	-	-	-	-	-	-	-
CPX-AB-8-KL-4POL	-	■	■	■	■	■	-	■	■
CPX-P-AB-2XKL-8POL	■	-	-	-	-	-	-	-	-
CPX-AB-1-SUB-BU-25POL	-	■	■	■	■	■	-	-	-
CPX-AB-4-HAR-4POL	-	-	-	-	-	-	-	■	-
CPX-AB-ID-P	-	-	-	-	-	-	-	-	-
Connection blocks, metal design									
CPX-M-AB-4-M12X2-5POL	-	■	■	■	■	■	-	■	■
CPX-M-AB-4-M12X2-5POL-T	-	-	-	-	-	-	-	-	-
CPX-M-AB-8-M12X2-5POL	-	-	-	-	-	-	-	-	-

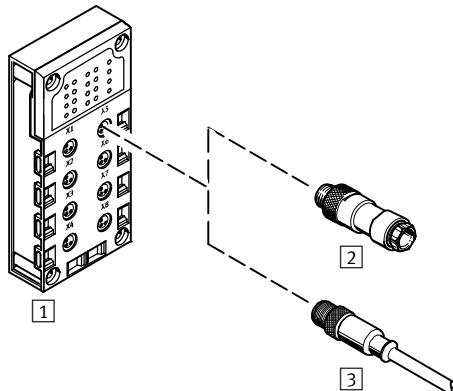
Terminal CPX

FESTO

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-8-M8-3POL with M8-3POL connection



- Compact for pre-assembled individual connection
- 8 sockets
- 3-pin design for connecting one channel per socket

- - Note

Festo delivers pre-assembled M8/M12 connecting cables (NEBU modular system) on request:

- Tailored to the application
- Perfect fit
- Easy to install

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-AB-8-M8-3POL	Socket, M8, 3-pin	[2] SEA-GS-M8 [2] SEA-3GS-M8-S [3] NEBU-...-M8G3 (modular system for choice of connecting cables)	Solder lugs Screw terminals Socket, M8, 3-pin Socket, M8, 4-pin Socket, M12, 5-pin Open cable end

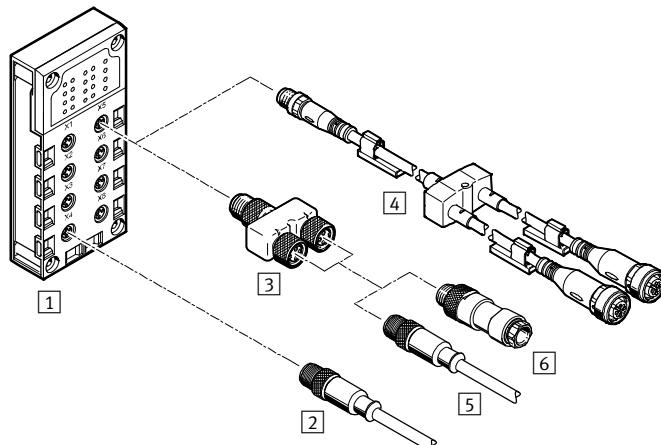
Terminal CPX

Key features – Electrical components

FESTO

Electrical connection – Connection block

CPX-AB-8-M8X2-4POL with M8-4POL connection



- Compact for pre-assembled individual connection
- 8 sockets
- 4-pin design for connection of 2 channels per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-AB-8-M8X2-4POL	Socket, M8, 4-pin	[2] NEBU-...-M8G4 (modular system for choice of connecting cables)	Socket, M8, 3-pin Socket, M8, 4-pin Socket, M12, 5-pin Open cable end	-	-
		[3] NEDY-L2R1-V1-M8G3-N-M8G4 (T adapter)	1x plug M8, 4-pin to 2x socket M8, 3-pin	[6] SEA-GS-M8 [6] SEA-3GS-M8-S [5] NEBU-...-M8G3 (modular system for choice of connecting cables)	Solder lugs Screw terminals Socket, M8, 3-pin Socket, M8, 4-pin Socket, M12, 5-pin Open cable end
		[4] NEDY-... (modular system for all types of sensor/actuator distributor)	2x socket, M8, 3-pin 2x socket, M8, 4-pin 2x socket, M12, 5-pin 2x socket, type A 2x socket, type B 2x socket, type C 2x socket, plug pattern H 2x socket, plug pattern ZB 2x socket, plug pattern ZC 2x open cable end	- - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - -

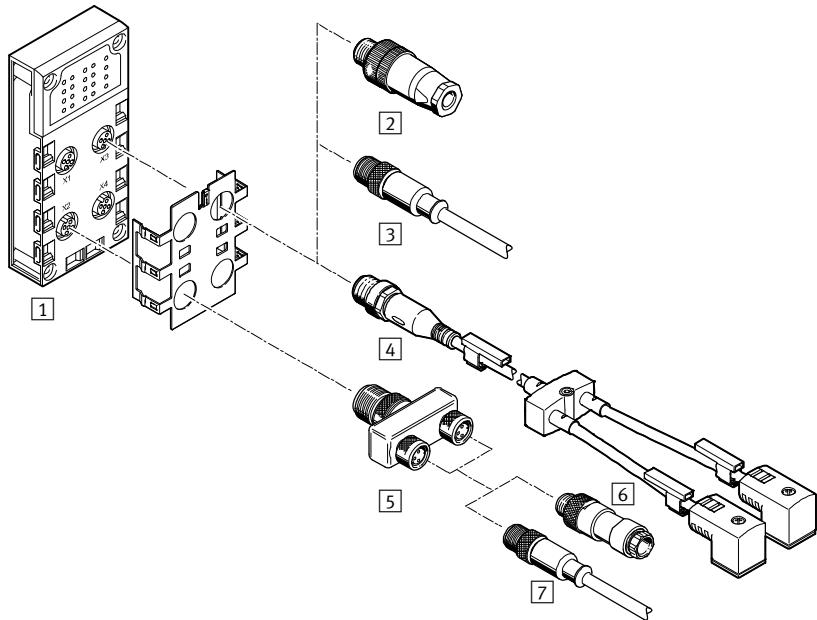
Terminal CPX

FESTO

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-4-M12x2-5POL and CPX-AB-4-M12x2-5POL-R with M12-5POL connection



- Suitable for self-assembly and sturdy with 2 channels per connection
- 4 sockets
- 5-pin design per connection
- Version ...-R with quick lock technology and metal thread for screening
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional cables with M8 connection.

Terminal CPX

Key features – Electrical components

FESTO

Combination of connection block and electrical connection technology

Combination of connection block and electrical connection technology					
Connection block	Connection technology	Plug/connecting cable	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-AB-4-M12x2-5POL CPX-AB-4-M12x2-5POL-R	Socket, M12, 5-pin	[2] SEA-GS-7 [2] SEA-4GS-7-2,5 [2] SEA-GS-9 [2] SEA-M12-5GS-PG7 [2] SEA-GS-11-DUO [2] SEA-5GS-11-DUO	Screw terminals Screw terminals Screw terminals Screw terminals Screw terminals, for two cables Screw terminals, for two cables	- - - - - -	- - - - - -
		[3] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin Socket, M12, 5-pin Open cable end	- - -	- - -
		[4] NEDY-... (modular system for all types of sensor/actuator distributor)	2x socket, M8, 3-pin 2x socket, M8, 4-pin 2x socket, M12, 5-pin 2x socket, type A 2x socket, type B 2x socket, type C 2x socket, plug pattern H 2x socket, plug pattern ZB 2x socket, plug pattern ZC 2x open cable end	- - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - -
		[5] NEDY- L2R1-V1-M8G3-N-M12G4 (T adapter)	Plug M12, 4-pin to 2x socket M8, 3-pin	[6] SEA-GS-M8 [6] SEA-3GS-M8-S [7] NEBU-...-M8G3 (modular system for choice of connecting cables)	Solder lugs Screw terminals Socket, M8, 3-pin Socket, M8, 4-pin Socket, M12, 5-pin Open cable end
		[5] NEDY- L2R1-V1-M12G5-N-M12G4 (T adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	[6] SEA-GS-7 [6] SEA-4GS-7-2,5 [6] SEA-GS-9 [6] SEA-M12-5GS-PG7 [6] SEA-GS-11-DUO [6] SEA-5GS-11-DUO [7] NEBU-...-M12G5 (modular system for choice of connecting cables)	Screw terminals Screw terminals Screw terminals Screw terminals Screw terminals, for two cables Screw terminals, for two cables Socket, M8, 4-pin Socket, M12, 5-pin Open cable end

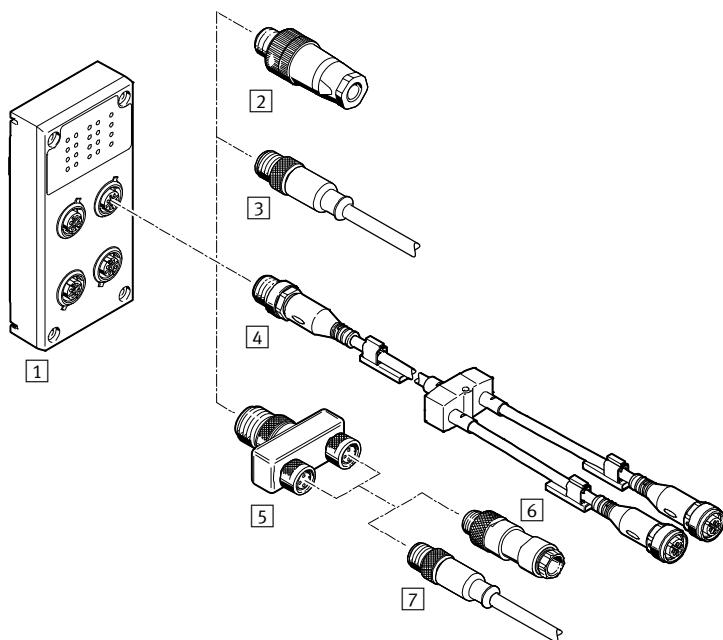
Terminal CPX

FESTO

Key features – Electrical components

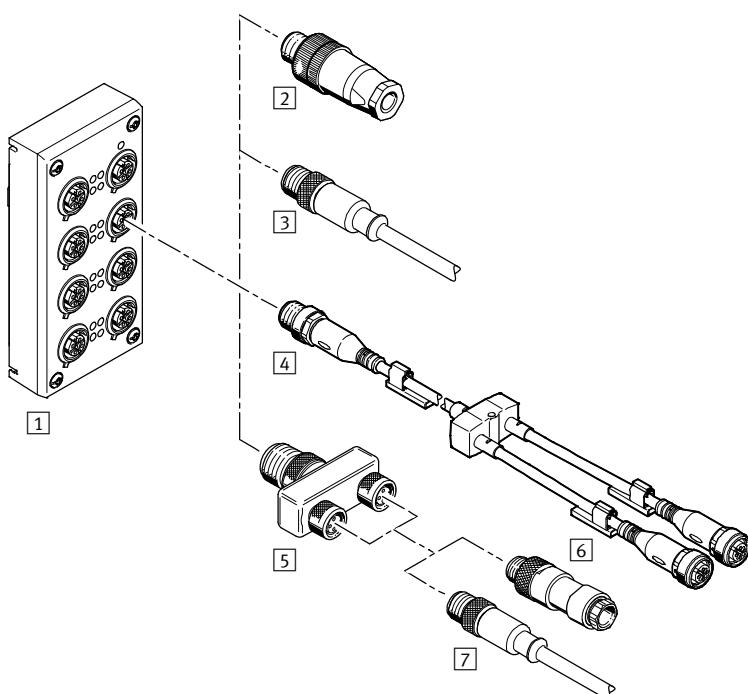
Electrical connection – Connection block (metal design)

CPX-M-AB-4-M12X2-5POL and CPX-M-AB-4-M12X2-5POL-T with M12-5POL connection



- Suitable for self-assembly and sturdy with 2 channels per connection
- 4 sockets
- 5-pin design per connection
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional cables with M8 connection.

CPX-M-AB-8-M12X2-5POL and CPX-AB-8-M12X2-5POL with M12-5POL connection



- Suitable for self-assembly and sturdy with 2 channels per connection
- 8 sockets
- 5-pin design per socket
- With two channels per connection, the corresponding input signals can be easily connected via a T-adapter and conventional connecting cables with M8 connection.

- - Note

Max. 4 T adapters (NEDY) can be mounted on a connection block.

Terminal CPX

Key features – Electrical components

FESTO

Combination of connection block and electrical connection technology					
Connection block	Connection technology	Plug/connecting cable	Connection technology	Plug/connecting cable	Connection technology
[1] CPX-M-AB-4-M12X2-5POL CPX-M-AB-8-M12X2-5POL CPX-AB-8-M12X2-5POL	Socket, M12, 5-pin	[2] SEA-GS-7 [2] SEA-4GS-7-2,5 [2] SEA-GS-9 [2] SEA-M12-5GS-PG7 [2] SEA-GS-11-DUO [2] SEA-5GS-11-DUO	Screw terminals Screw terminals Screw terminals Screw terminals Screw terminals, for two cables Screw terminals, for two cables	- - - - - -	- - - - - -
		[3] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 4-pin Socket, M12, 5-pin Open cable end	- - -	- - -
		[4] NEDY-... (modular system for all types of sensor/actuator distributor)	2x socket, M8, 3-pin 2x socket, M8, 4-pin 2x socket, M12, 5-pin 2x socket, type A 2x socket, type B 2x socket, type C 2x socket, plug pattern H 2x socket, plug pattern ZB 2x socket, plug pattern ZC 2x open cable end	- - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - -
		[5] NEDY- L2R1-V1-M8G3-N-M12G4 (T adapter)	Plug M12, 4-pin to 2x socket M8, 3-pin	[6] SEA-GS-M8 [6] SEA-3GS-M8-S	Solder lugs Screw terminals
		[5] NEDY- L2R1-V1-M12G5-N-M12G4 (T adapter)	Plug M12, 4-pin to 2x socket M12, 5-pin	[7] NEBU-...-M8G3 (modular system for choice of connecting cables) [6] SEA-GS-7 [6] SEA-4GS-7-2,5 [6] SEA-GS-9 [6] SEA-M12-5GS-PG7 [6] SEA-GS-11-DUO [6] SEA-5GS-11-DUO [7] NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket, M8, 3-pin Socket, M8, 4-pin Socket, M12, 5-pin Open cable end Screw terminals Screw terminals Screw terminals Screw terminals Screw terminals, for two cables Screw terminals, for two cables Socket, M8, 4-pin Socket, M12, 5-pin Open cable end

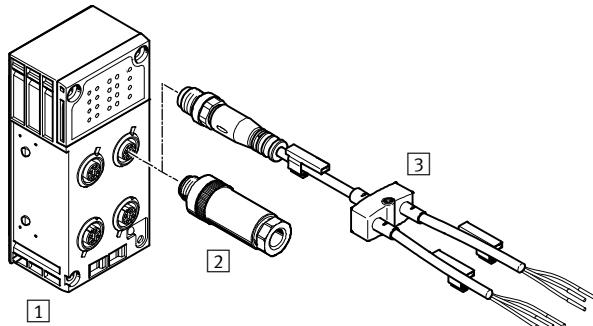
Terminal CPX

FESTO

Key features – Electrical components

Electrical connection – Connection block with M12, 4-pin connection

CPX-P-AB-4XM12-4POL



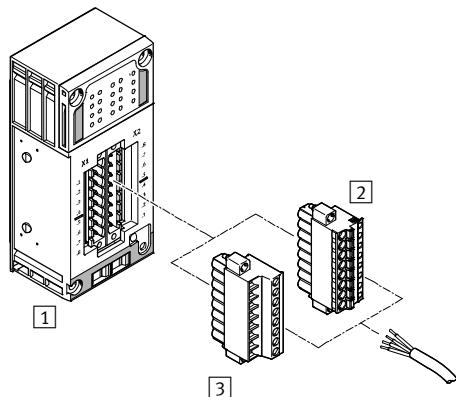
- Suitable for self-assembly and sturdy
- 4 sockets
- 4-pin design per connection

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-P-AB-4XM12-4POL	Socket, M12, 4-pin	[2] SEA-GS-HAR-4POL	Insulation displacement connector
		[2] SEA-4GS-7-2,5	Screw terminal
		[2] SEA-GS-7	Screw terminal
		[2] SEA-GS-9	Screw terminal
		[3] NEDY-...	2x open cable end (modular system for all types of sensor/actuator distributor)

Electrical connection – Connection block with clamping connector

CPX-P-AB-2XKL-8POL



- Quick connection technology for use in control cabinets
- Spring-loaded terminals or screw terminals
- Wire cross sections 0.2 ... 2.5 mm²

Combination of connection block and electrical connection technology

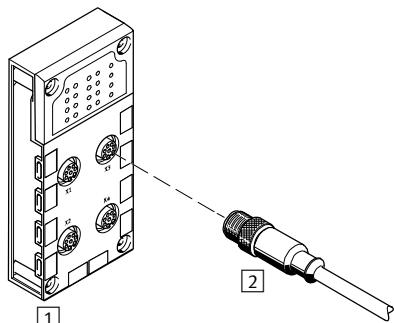
Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-P-AB-2XKL-8POL	Plug, 8-pin	[2] NECU-L3G8-C1	Spring-loaded terminals
		[3] NECU-L3G8-C2	Screw terminals

Terminal CPX

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-4-M12-8POL with M12-8POL connection

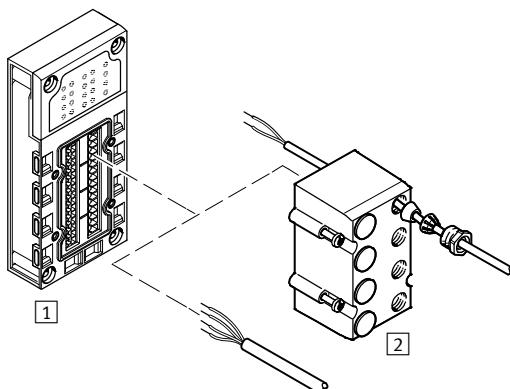


- Connection to cylinder/valve combinations with max. 3 inputs and 2 outputs
- 4 sockets
- 8-pin design per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
1 CPX-AB-4-M12-8POL	Socket, M12, 8-pin	2 KM12-8GD8GS-2-PU (pre-assembled connecting cable)	Socket, M12, 8-pin

CPX-AB-8-KL-4POL, CPX-2ZE2DA with spring-loaded terminal connection



- Quick connection technology for use in control cabinets
- 32 spring-loaded terminals
- 4 spring-loaded terminals per channel
- Wire cross sections Q05 ... 1.5 mm²
- Optional cover with fittings for IP65-, IP67 connection
 - 8 through-holes M9
 - 1 through-hole M16
 - Blanking plug
 - For I/O distributors, control desks or individual sensors/actuators

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
1 CPX-AB-8-KL-4POL CPX-2ZE2DA	Spring-loaded terminals, 32-pin	2 AK-8KL (cover)	–

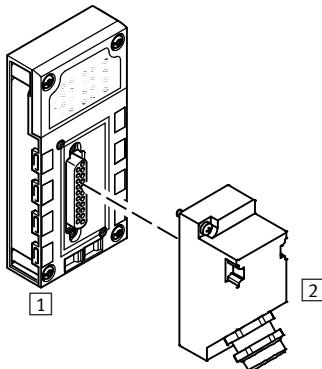
Terminal CPX

FESTO

Key features – Electrical components

Electrical connection – Connection block

CPX-AB-1-SUB-BU-25POL with Sub-D connection

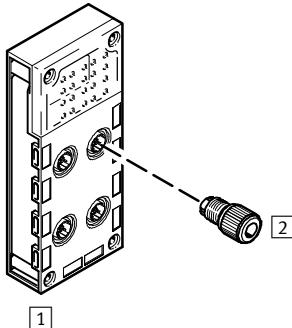


- Multi-pin connection for I/O distributor or control console
- One socket
- 25-pin design

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-AB-1-SUB-BU-25POL	Socket, Sub-D, 25-pin	[2] SD-SUB-D-ST25	Crimp contacts

CPX-AB-4-HAR-4POL with quick connector



- Sturdy quick connection technology for individual connections
- 4 sockets
- 4-pin design per socket

Combination of connection block and electrical connection technology

Connection block	Connection technology	Plug/connecting cable	Selectable connection technology
[1] CPX-AB-4-HAR-4POL	Socket, quick connector, 4-pin	[2] SEA-GS-HAR-4POL	Insulation displacement connectors

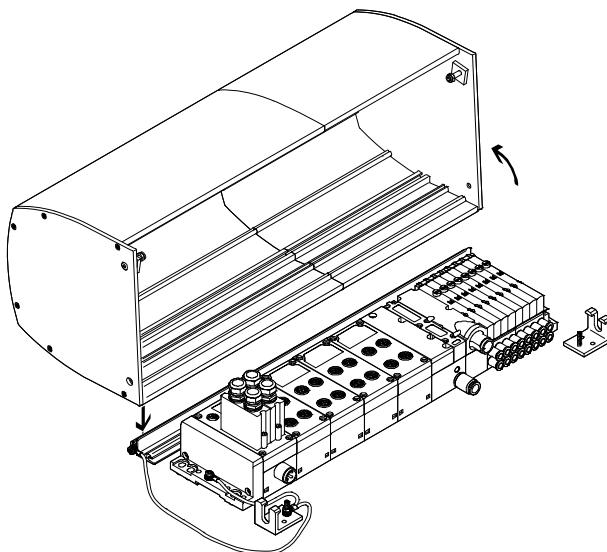
Terminal CPX

Key features – Assembly

FESTO

Hood

Description



→ Page 208

The CPX hood CAFC is a space- and cost-saving alternative to a control cabinet. It is designed as an extruded aluminium profile and is installed on a mounting plate.

The valve terminal (CPX with MPA-S or MPA-L) is well protected and is quick to install without the need for complex control cabinet through-feed for connecting cables and tubing.

The rail and the two mounting brackets are mounted on a base plate. The hood is attached to the retaining rail and secured with two screws. There is also a stand-by position (locking of the hood in the open position).

The hood is locked using two side screws (which meet the requirements for a special lock in compliance with ATEX).

The CPX hood can be ordered online using the valve terminal configurator.

Advantages of the CPX hood

- Impact protection (min. 7 J) for the modules underneath in combination with a suitable mounting plate provided by the user
- Protection against electrostatic discharge through the use of electrically conductive materials and the option of connecting an earth wire
- Protection against disconnection of live plugs (by securing the hood with at least one special lock to EN 60079-0, 9.2 and 20)
- UV protection for the underlying CPX and MPA modules

Points to note when using the CPX hood

- Only in combination with valve terminal MPA-S and MPA-L
- No bus nodes with push-pull connection (CPX-M-FB34, CPX-M-FB35, CPX-M-FB41)
- CPX power supply via angled plugs, no T plugs, no push-pull
- Electrical supply plate/additional power supply only possible with angled plug
- No MPA vertical stacking
- Use of larger fittings (for tubing O.D. larger than 12 mm) only possible with the angled design
- Ducted exhaust air only with elbow connector
- The permissible ambient temperature of the valve terminal is reduced by 5°C.

- Note

The CPX hood has no influence on the ATEX classification of the valve terminal or of the CPX terminal.

The CPX hood has no influence on the IP degree of protection of the valve terminal or of the CPX terminal.

The CPX hood does not protect against the effects of the weather in installations that are not in closed spaces.

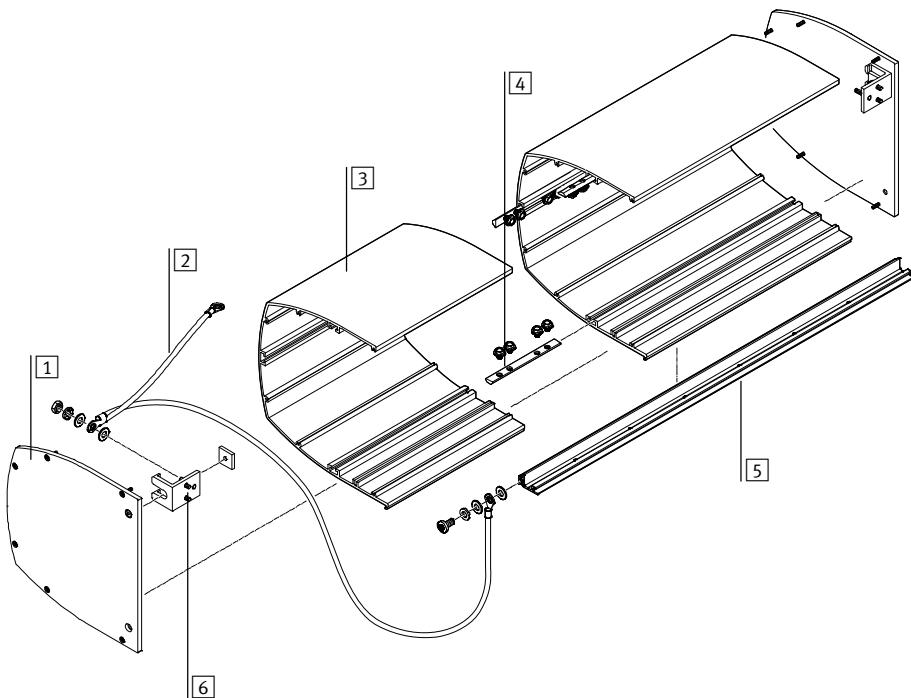
Terminal CPX

FESTO

Key features – Assembly

Hood

Assembly



Procedure:

- Assemble the rail and mounting bracket included in the mounting kit
- Attach the earthing cable
- Assemble the hood (if applicable, screw together several hood sections before attaching the side pieces)
- Attach and secure the hood

- [1] Side piece
- [2] Earthing cable
- [3] Hood section
- [4] Slot nut with screws, for joining the hood sections
- [5] Rail
- [6] Mounting bracket

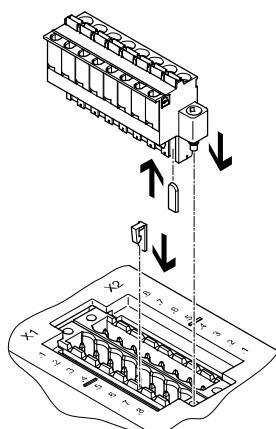
Technical data

Weight:

- Hood: approx. 500 g per 100 mm of length
- Mounting rail: approx. 550 g per 1000 mm of length
- Side pieces: approx. 500 g per side

- Ambient temperature $-5 \dots +50^{\circ}\text{C}$
- RoHS-compliant

Plug coding



The connection block CPX-P-AB-2XKL-8POL and the sockets NECU-L3G8 can be matched to one another using the coding elements CPX-P-KDS-AB-2XKL.

This reduces the possibility of the socket being plugged back into an incorrect slot after being disconnected from the CPX terminal (connection safeguard).

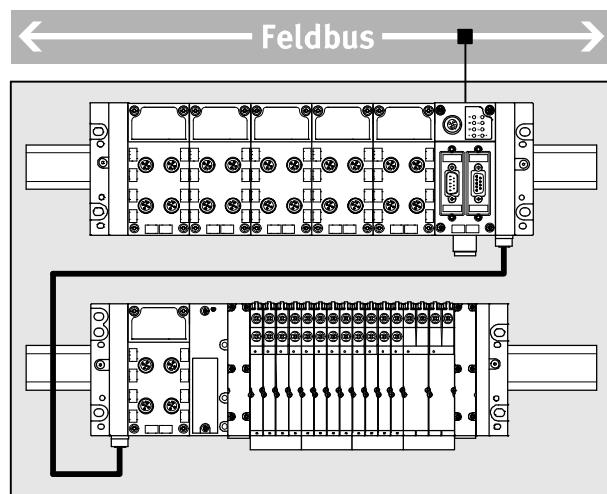
Terminal CPX

Key features – Assembly

FESTO

Extension

Functional principle



The extension enables the CPX terminal to be separated into or configured as two interconnected units (series).

The two parts are controlled by a common bus node or control block. An extensive CPX terminal can fit into limited installation spaces more easily as two compact units.

Applications:

- Installation in a control cabinet on two levels, one beneath the other
- Installation in two separate control cabinets
- Installation of part of the CPX terminal inside and part outside the control cabinet
- Spatial separation of electrics and pneumatics

Performance limits

- A maximum of 10 CPX modules are permitted in the first row
- A maximum of 8 CPX modules and a pneumatic interface are permitted in the second row

The number of CPX modules and solenoid coils is additionally limited by:

- the address space made available by the control block/bus node

- their address requirement
- their current consumption

Optimisation

The maximum possible performance or maximum number of modules can only be achieved if the following conditions are observed:

- The control block/bus node is installed in the first row, on the far right, on an interlinking block with system power supply

- The connecting cable between the first and second row is max. 2 m long

- An interlinking block with additional power supply for valves is situated in the second row

Configuration rules

The extension limits the power supply for the sensors and electronics for the CPX terminal as a whole as follows:

- First row max. 6 A
- Second row max. 2 A
- First and second row together, max. 6 A

If the 3 m connecting cable is used, the following restrictions apply:

- There can only be one CPX module in the second row
- An additional power supply for valves is required in order to connect a valve terminal

Positioning output modules in the second row requires a corresponding power supply in the second row:

- Install interlinking block with additional power supply for outputs in the second row to the left of the first output module

Terminal CPX

FESTO

Key features – Assembly

Extension – permissible CPX modules		Type code	First row	Second row
Control blocks	CPX-CEC		Permissible, at least one control block or bus node required	Not permissible
Bus nodes	CPX-FB CPX-M-FB		Permissible, at least one control block or bus node required	Not permissible
Gateway	CPX-IOT		Not permissible	Not permissible
Technology modules	CPX-CP CPX-CTEL CPX-CTEL-2 CPX-CM-HPP CPX-CMAX CPX-CMPX CPX-CMIX		Permissible	Not permissible
Input/output modules	CPX		Permissible	Permissible
PROFIsafe shut-off module	CPX-FVDA-P2		Not permissible	Not permissible
Interlinking block/end plate with system power supply	CPX-EPL-EV-S CPX-GE-EV-S CPX-M-GE-EV-S		Permissible, at least one interlinking block/end plate with system power supply required	Not permissible
Interlinking block with additional power supply	CPX-GE-EV-Z CPX-M-GE-EV-Z CPX-GE-EV-V		Permissible	Permissible
Interlinking block without power supply	CPX-GE-EV CPX-M-GE-EV		Permissible	Permissible
Pneumatic interface	VMPA-FB		Not permissible	Permissible
	VMPAL-EPL-CPX		Not permissible	Permissible
	VABA-S6-1		Not permissible	Permissible

Terminal CPX

Key features – Assembly

FESTO

Extension – maximum number of CPX modules/solenoid coils		
Special features of the design	First row	Second row
CPX terminal with valve terminal		
Connecting cable 3 m	10 CPX modules	<p>Valve terminal MPA-S with:</p> <ul style="list-style-type: none"> • Pneumatic interface for CPX metal interlinking module • Electrical supply plate VMPA-FB-SP directly after the pneumatic interface • Electronics modules with galvanic isolation • 128 solenoid coils (64 valve positions) <p>Valve terminal VTSA/VTSA-F with:</p> <ul style="list-style-type: none"> • 1 CPX module with interlinking block with additional power supply for valves • 32 solenoid coils (32 valve positions)
CPX terminal without valve terminal		
• Control block/bus node not in position on the far right of the first row	10 CPX modules	• 2 ... 5 CPX modules, depending on the control block/bus node used
• Control block/bus node in position on the far right of the first row	10 CPX modules	• 4 ... 8 CPX modules, depending on the control block/bus node used
CPX terminal with valve terminal MPA-S		
–	10 CPX modules	• 2 ... 5 CPX modules and manifold blocks MPA-S, depending on the control block/bus node used
• Electrical supply plates VMPA-FB-SP	10 CPX modules	• 2 ... 5 CPX modules, depending on the control block/bus node used
• Electronics modules with galvanic isolation		• Up to 128 solenoid coils (64 valve positions)
• Control block/bus node in position on the far right of the first row	10 CPX modules	• 4 ... 5 CPX modules and manifold blocks MPA-S, depending on the control block/bus node used
• CPX-FB11 or CPX-CEC not possible		
• CPX-FB13 or CPX-FB36	10 CPX modules	• 8 CPX modules and manifold blocks MPA-S
• Control block/bus node in position on the far right of the first row		
• Interlinking block with system power supply in position on the far right of the first row		
• CPX-FB13 or CPX-FB36	10 CPX modules	• 8 CPX modules and manifold blocks MPA-S
• Control block/bus node in position on the far right of the first row		
• Interlinking block with additional power supply for valves in second row		

Terminal CPX

FESTO

Key features – Assembly

Extension – maximum number of CPX modules/solenoid coils		
Special features of the design	First row	Second row
CPX terminal with valve terminal MPA-L		
–	10 CPX modules	<ul style="list-style-type: none">• 2 CPX modules (at least one CPX module required)• 16 solenoid coils (valve widths 10 mm and 14 mm) or 8 solenoid coils (valve width 20 mm)
• Interlinking block with additional power supply for valves in second row	10 CPX modules	<ul style="list-style-type: none">• 2 CPX modules (at least one CPX module required)• 32 solenoid coils (32 valve positions)
CPX terminal with valve terminal VTSA/VTSA-F		
–	10 CPX modules	<ul style="list-style-type: none">• 2 CPX modules• 12 solenoid coils (valve widths 18 mm, 26 mm and 42 mm) or 6 solenoid coils (valve widths 52 mm and 65 mm)
• Interlinking block with additional power supply for valves in second row	10 CPX modules	<ul style="list-style-type: none">• 2 CPX modules• 32 solenoid coils (32 valve positions)

Terminal CPX

Key features – Assembly

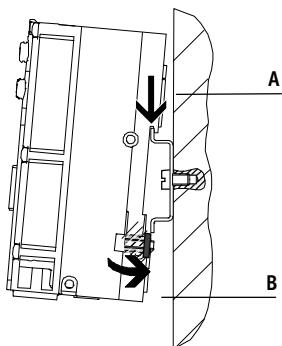
FESTO

Mounting options

Valve terminals with CPX terminal support different mounting options for direct machine mounting with a

high degree of protection and control cabinet installation.

H-rail mounting

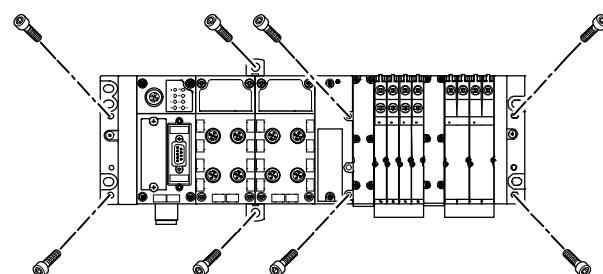


The H-rail mounting is part of the rear profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting kit. The CPX terminal is first hooked onto the H-rail (see arrow A).

It is then swivelled onto the H-rail and secured in place with the clamping element (see arrow B). The optional earthing plate enables a connection to be established to the machine potential/earth in one easy step.

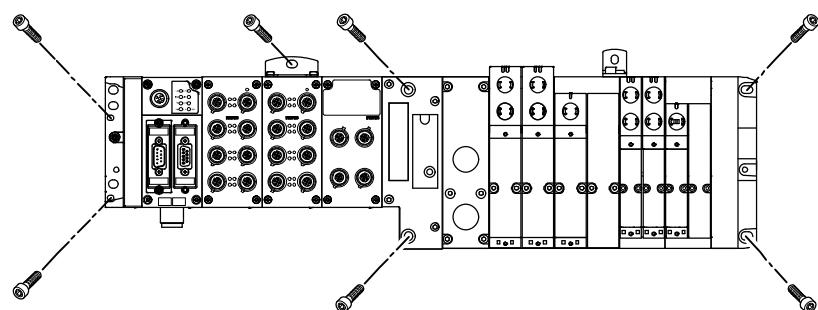
The following mounting kit is needed for H-rail mounting:
• CPX-CPA-BG-NRH
This facilitates mounting of the CPX terminal on H-rails to EN 60715. An additional mounting kit may be required for combination with valve terminals.

Wall mounting, polymer design



The end plates of the CPX terminal and valve terminal as well as the pneumatic interface include mounting holes for wall mounting. Additional mountings for the CPX terminal are available for longer valve terminals. These mountings differ depending on the design of the CPX terminal (polymer or metal).

Wall mounting, metal design



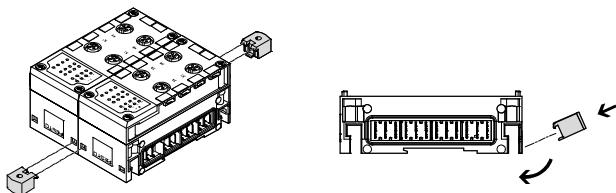
Terminal CPX

FESTO

Key features – Assembly

CPX terminal in polymer design

Additional mountings

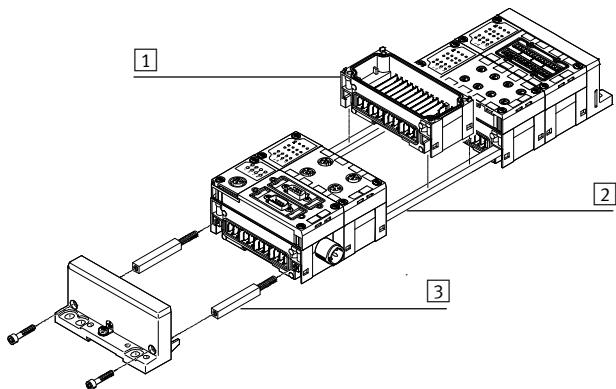


For longer valve terminals, there are additional mounting components for the CPX terminal that can be fitted between two modules.

Note

In the case of CPX terminals with 4 or more interlinking blocks, additional mountings of the type CPX-BG-RW must be used every 100 or 150 mm. These are supplied pre-assembled.

Interlinking with tie rods

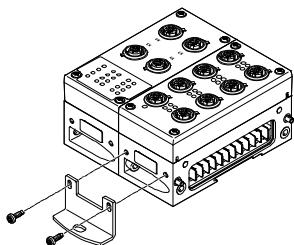


The CPX modules are mechanically connected using special tie rods [2]. Two screws in the end plates are all that are needed to assemble the entire unit. The tie rod ensures that the unit resists high mechanical loads and is therefore the mechanical backbone of the CPX terminal.

The open design enables interlinking blocks [1] to be replaced in the assembled state. The tie rod expansion kit [3] enables an extra module to be added to the CPX terminal.

CPX terminal in metal design

Additional mountings

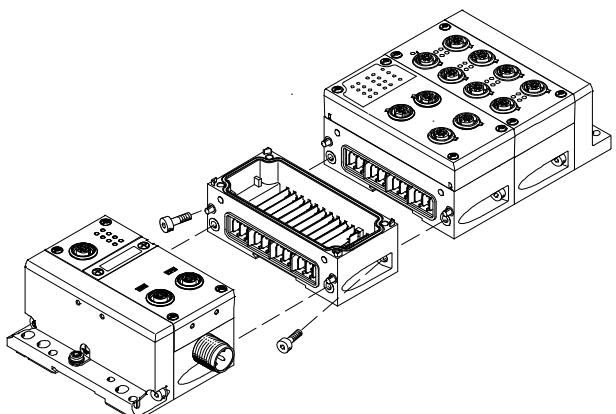


For longer valve terminals, there are additional mounting brackets for the CPX terminal that can be screwed onto the interlinking blocks. The mounting bracket CPX-M-BG-VT-2X enables a CPX terminal with valve terminal VTSA/VTSA-F to be mounted on a support system.

Note

In the case of CPX terminals with 4 or more interlinking blocks, additional mounting brackets of the type CPX-M-BG-RW must be used every 100 or 150 mm. These are supplied pre-assembled.

Linking with screws



The CPX modules are mechanically connected using an angled fitting. The CPX terminal can thus be expanded at any time.

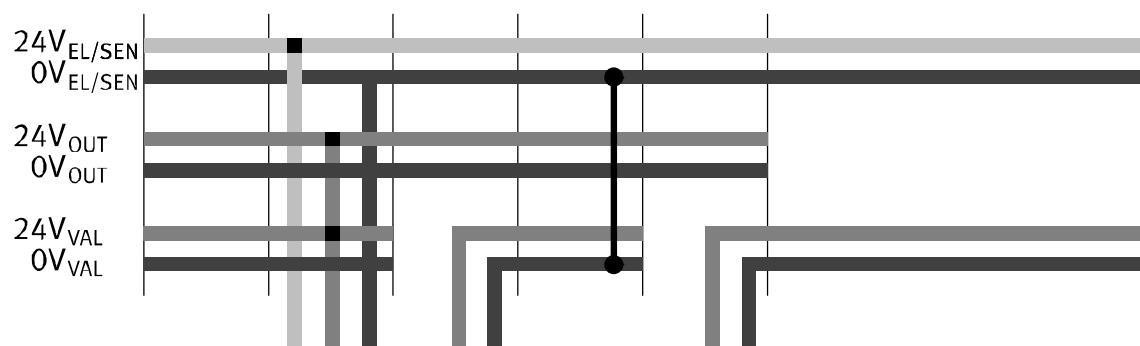
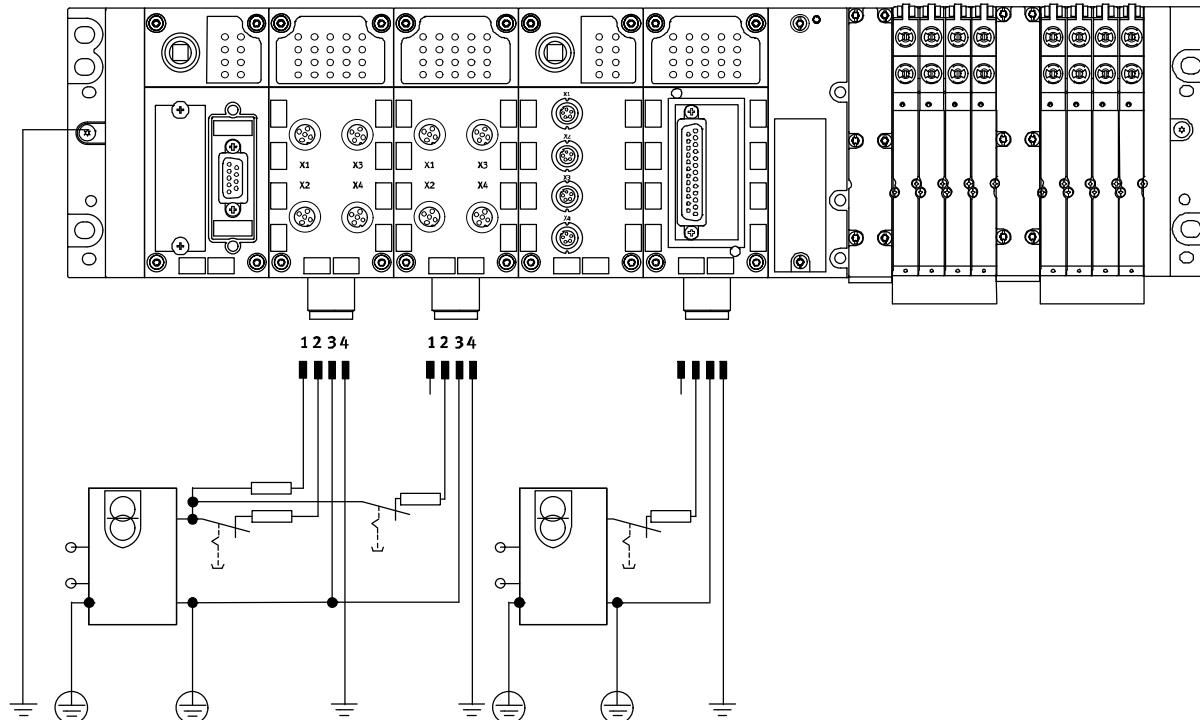
Terminal CPX

Key features – Power supply

FESTO

Power supply concept

General



The use of decentralised devices on the fieldbus – particularly with a high degree of protection for direct machine mounting – demands a flexible power supply concept. A valve

terminal with CPX is, in principle, supplied with all voltages via a single connection.

A distinction is made between the supply for
• Electronics plus sensors
• Valves plus actuators

Selectable connection technology:
• M18
• 7/8"
• AIDA push-pull

Interlinking blocks

Interlinking blocks represent the backbone of the CPX terminal with all supply lines. They provide the power supply for the modules used on them

as well as their bus connections. Many applications require the CPX terminal to be segmented into voltage zones. This applies in particular to the

separate disconnection of solenoid coils and outputs. The interlinking blocks provide either an easy-to-install central power

supply for the entire CPX terminal or galvanically isolated, all-pin disconnectable potential groups/voltage segments.

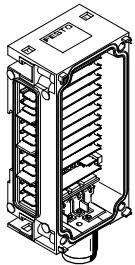
Terminal CPX

FESTO

Key features – Power supply

Interlinking blocks

With system power supply



- Polymer design
- CPX-GE-EV-S
 - CPX-GE-EV-S-7/8-4POL
 - CPX-GE-EV-S-7/8-5POL

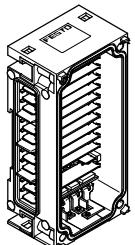
- Metal design
- CPX-M-GE-EV-S-7/8-CIP-4P
 - CPX-M-GE-EV-S-7/8-5POL
 - CPX-M-GE-EV-S-PP-5POL

- Connection technology
- M18 4-pin
 - 7/8" 4-pin
 - 7/8" 5-pin

- Connection technology
- 7/8" 4-pin
 - 7/8" 5-pin
 - AIDA push-pull, 5-pin

- Power supply
- For CPX terminal modules and connected sensors
 - For valves that are connected to the CPX terminal via a pneumatic interface
 - For actuators that are connected to the output modules of the CPX terminal

Without power supply

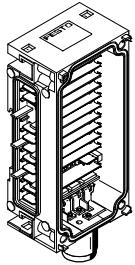


- Polymer design
- CPX-GE-EV

- Metal design
- CPX-M-GE-EV
 - CPX-M-GE-EV-FVO

-
-

With additional power supply for outputs



- Polymer design
- CPX-GE-EV-Z
 - CPX-GE-EV-Z-7/8-4POL
 - CPX-GE-EV-Z-7/8-5POL

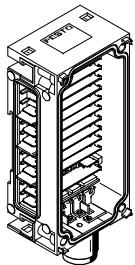
- Metal design
- CPX-M-GE-EV-Z-7/8-5POL
 - CPX-M-GE-EV-Z-PP-5POL

- Connection technology
- M18 4-pin
 - 7/8" 4-pin
 - 7/8" 5-pin

- Connection technology
- 7/8" 5-pin
 - AIDA push-pull, 5-pin

- Power supply
- For actuators that are connected to the output modules of the CPX terminal

With additional power supply for valves



- Polymer design
- CPX-GE-EV-V
 - CPX-GE-EV-V-7/8-4POL

- Connection technology
- M18 4-pin
 - 7/8" 4-pin

- Power supply
- For valves that are connected to the CPX terminal via a pneumatic interface

- - Note

For 7/8":
– Commercially available accessories are often limited to max. 8 A

- - Note

The valve terminal MPA-S has either a 7/8" 5-pin, 7/8" 4-pin, 3-pin M18 or 5-pin AIDA push-pull power supply for one or more valve voltage zones. Galvanically isolated, all pins disconnectable with voltage monitoring in the following MPA module.

- - Note

Suitable versions of the interlinking blocks with M18 and 7/8", 5-pin connection are available (CPX-GE-EV-...-VL and CPX-M-GE-EV-...-VL) for use in ATEX environments as per certification (→ page 49). The maximum current supply for these interlinking blocks is 8 A.

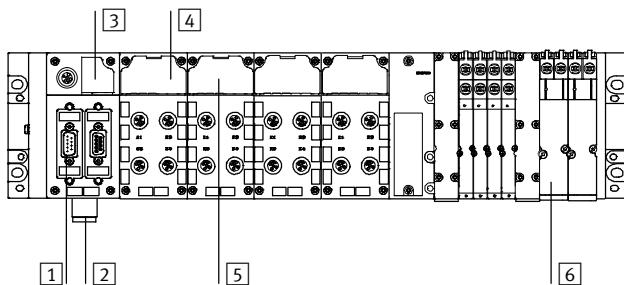
Terminal CPX

Key features – Diagnostics

FESTO

Diagnostics

System performance



Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants. A basic distinction is made between on-the-spot diagnostics using LEDs or diagnostic interface and diagnostics using a bus interface.

The CPX terminal supports on-the-spot diagnostics via a row of LEDs. This is separate from the connection area and therefore provides good visual access to status and diagnostic information.

1 Diagnostics via bus interface

2 Undervoltage monitoring

3 Diagnostic overview LED

– Fieldbus status

– CPX status

4 Status and diagnostic LED for module and I/O channels

5 Module and channel-specific

diagnostics

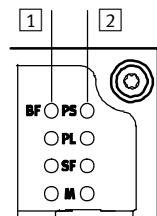
6 Valve-specific diagnostics for module and solenoid coils

7 MPA pressure sensor – integrated solution on the fieldbus

– Pre-assembled for channels 1, 3, 5 and external pressures

The diagnostic messages can be read out via the bus interface in the higher-order controller and visualised for the central recording and evaluation of error causes. This is done using the individual fieldbus-specific channels. CPX-CECs also offer the option of access via the integrated Ethernet interface (remote maintenance via PC/web applications).

Overview of LEDs on the bus node



1 Fieldbus-specific LEDs

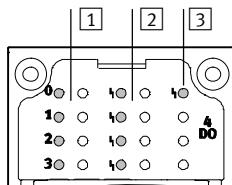
On each bus node, a maximum of 4 fieldbus-specific LEDs display the fieldbus communication status of the CPX terminal with the higher-order controller.

2 CPX-specific LEDs

A further 4 CPX-specific LEDs provide non-fieldbus-specific information about the status of the CPX terminal, for example

- System power
- Load power
- System fault
- Modification of parameters

Input/output module status and diagnostic LEDs



1 Status LEDs for the inputs and outputs

Each input and output channel is assigned a status LED.

2 Channel-oriented diagnostic LEDs

Depending on the module design, another diagnostic LED is available for each I/O channel.

3 Group diagnostic LEDs

An LED displays the group diagnostics for each module.

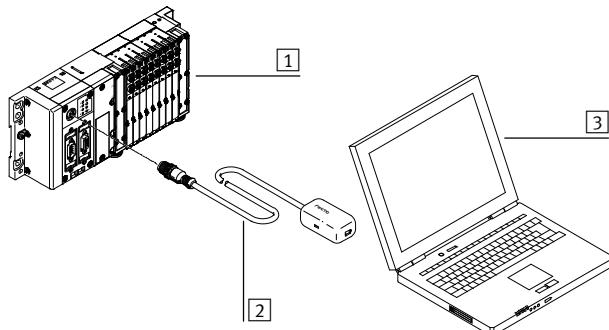
Terminal CPX

FESTO

Key features – Diagnostics

Diagnostics

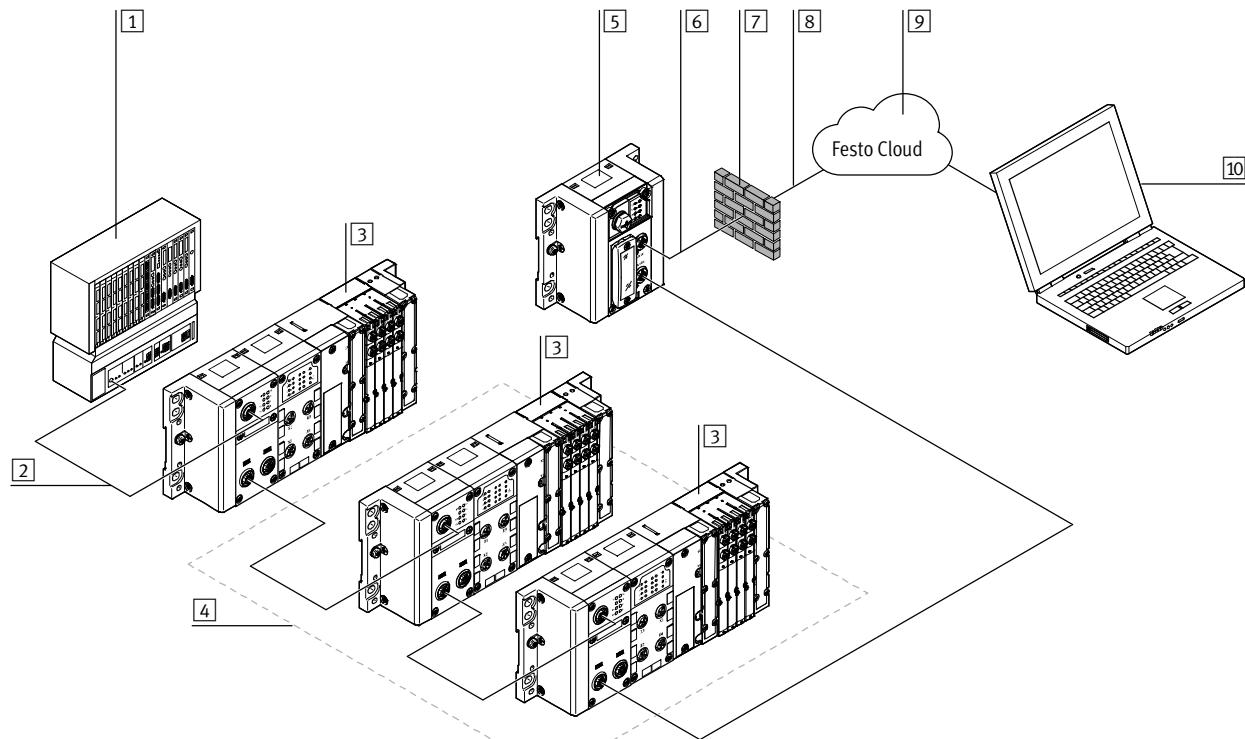
Display on a PC



- [1] CPX terminal with valve terminal
- [2] Adapter diagnostic interface to USB
- [3] Laptop/portable device with USB interface and installed FMT software

- Fault location and type
- Without programming
- Storing the configuration
- Preparing screenshots

Data capture via gateway



- [1] PLC to machine/system controller (no direct internet connection)
- [2] Bus system from the controller to the system parts (e.g. PROFINET)
- [3] Festo components with bus connection with serial linking

- [4] Components from which the CPX-IOT is collecting and transferring data
- [5] CPX-IOT gateway
- [6] Internet connection
- [7] Customer firewall or other security precautions

- [8] Transferring data to a central storage location (cloud) using secure protocols
- [9] Central storage location (cloud) provided by Festo

- [10] Simple decentralised evaluation of data using adapted programs (apps) for the components that are being monitored

Terminal CPX

Key features – Parameterisation

FESTO

Parameterisation

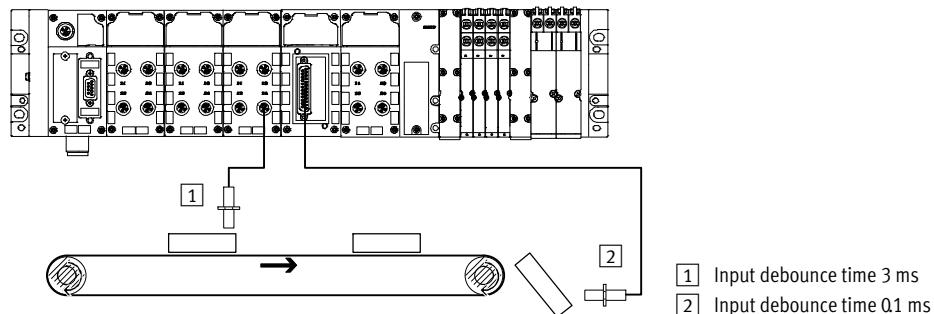
Changes to the application are often required during commissioning. The parameterisable characteristics of the CPX modules mean that functions can be very easily changed using configuration software. This reduces the

number of modules needed and, consequently, the amount of storage space required. It is therefore possible, for example, to reduce the switch-on debounce time for an input module – normally 3 ms –

to 0.1 ms on a "fast" input module for faster processes, or to set the response of a valve following a fieldbus interruption. Depending on the modules used, parameterisation can be performed

via the following interfaces:

- Ethernet
- Fieldbus
- Control block direct interface (programming interface)



Terminal CPX

FESTO

Key features – Addressing

Addressing

The various CPX modules occupy a different number of I/O addresses within the CPX system. The maximum address space for bus nodes depends on the performance of the fieldbus systems.

- Maximum system configuration:
- 1 bus node or control block
 - 9 I/O modules
 - 1 pneumatic interface (e.g. pneumatic interface MPA-S with up to 16 MPA manifold blocks)

The maximum system configuration can be limited in individual cases by exceeding the address space.



- Note
Please refer to the detailed description of the configuration/addressing rules in the technical data for CPX bus nodes.

Overview – Address space for CPX bus node and control block

	Protocol	Max. total		Max. digital		Max. analogue	
		Inputs	Outputs	Inputs	Outputs	Inputs	Outputs
CPX-CEC	<ul style="list-style-type: none"> • CODESYS Level 2 • TCP/IP • Easy IP • Modbus® TCP 	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB6	INTERBUS®	96 bits	96 bits	96 DI	96 DO	6 AI	6 AO
CPX-FB11	DeviceNet®	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB13	PROFIBUS	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB14	CANopen	256 bits	256 bits	64 DI (+ 64 DI)	64 DO (+ 64 DO)	8 AI (+ 8 AI)	8 AO (+ 8 AO)
CPX-M-FB21	INTERBUS® (FOC)	96 bits	96 bits	96 DI	96 DO	6 AI	6 AO
CPX-FB23-24	CC-Link®	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB33	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB34	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB35	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB36	EtherNet/IP	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB37	EtherCAT®	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB39	Sercos III	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-FB40	POWERLINK	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO
CPX-M-FB41	PROFINET RT	512 bits	512 bits	512 DI	512 DO	32 AI	18 AO



The bandwidth of the bus nodes can be restricted by the choice of module and the maximum number of modules.

CPX-FB6 (INTERBUS®) as example

	Digital inputs	Digital outputs	Notes
3x CPX-8DE	24	–	<ul style="list-style-type: none"> • The address space is occupied by 7 CPX I/O modules plus pneumatic interface • No additional modules can be configured
1x CPX-8DE-8DA	8	8	
2x CPX-2AE	64	–	
1x CPX-2AA	–	32	
3x VMPA1	–	24	
Allocated address space	96	96	

DI = Digital inputs (1 bit)

DO = Digital outputs (1 bit)

AO = Analogue outputs (16 bits)

AI = Analogue inputs (16 bits)

Terminal CPX

Key features – Addressing

FESTO

Overview – Allocated addresses for CPX modules		
	Inputs [bit]	Outputs [bit]
CPX-CP-4-FB	16, 32, 48, 64, 80, 96, 128 ¹⁾	16, 32, 48, 64, 80, 96, 128 ¹⁾
CPX-CTEL-4-M12-5POL	0, 64, 128, 192, 256 ¹⁾	0, 64, 128, 192, 256 ¹⁾
CPX-CTEL-2-M12-5POL-LK	64, 128, 192, 256 ¹⁾	64, 128, 192, 256 ¹⁾
CPX-CM-HPP	256	256
CPX-CMAX-C1-1	64	64
CPX-CMPX-C1-H1	48	48
CPX-CMIX-M1-1	48	48
CPX-4DE	4	–
CPX-8DE	8	–
CPX-8DE-D	8	–
CPX-8NDE	8	–
CPX-P-8DE-N	16	8
CPX-P-8DE-N (inputs configured as counter)	80	16
CPX-F8DE-P	48	56
CPX-16DE	16	–
CPX-M-16DE-D	16	–
CPX-L-16DE-16-KL-3POL	16	–
CPX-4DA	–	4
CPX-8DA	–	8
CPX-8DA-H	–	8
CPX-8DE-8DA	8	8
CPX-L-8DE-8DA-16-KL-3POL	8	8
CPX-2ZE2DA	96	96
CPX-4AE-4AA-H	0, 16, 32, 48, 64, 128, 144, 160, 176, 192 ¹⁾	0, 16, 32, 48, 64 ¹⁾
CPX-2AE-U-I	2 x 16	–
CPX-4AE-U-I	4 x 16	–
CPX-4AE-I	4 x 16	–
CPX-4AE-P-B2	4 x 16	–
CPX-4AE-P-D10	4 x 16	–
CPX-4AE-T	4 x 16	–
CPX-4AE-TC	4 x 16	–
CPX-2AA-U-I	–	2 x 16
CPX-FVDA-P2	48	48
VMPA1-FB-EMS-8	–	8
VMPA1-FB-EMG-8	–	8
VMPA2-FB-EMS-4	–	4
VMPA2-FB-EMG-4	–	4
VMPA1-FB-EMS-D2-8	–	8
VMPA1-FB-EMG-D2-8	–	8
VMPA2-FB-EMS-D2-4	–	4
VMPA2-FB-EMG-D2-4	–	4
VMPA-FB-PS-1	16	–
VMPA-FB-PS-3/5	16	–
VMPA-FB-PS-P1	16	–
VMPA-FB-EMG-P1	16	16
VMPAL-EPL-CPX	–	4, 8, 16, 24, 32 ¹⁾
VABA-S6-1-X1	–	8, 16, 24, 32 ¹⁾
VABA-S6-1-X2	–	8, 16, 24, 32 ¹⁾
VABA-S6-1-X2-D	8, 16, 24, 32 ¹⁾	8, 16, 24, 32 ¹⁾

1) Dependent on the DIL switch setting on the module

Terminal CPX

FESTO

Technical data

-  - Module width
50 mm



-  - Note

The data given here apply to the CPX system. If components that conform to lower values are used in the system, the specification for the entire system is reduced to the values of those components used.

Example

Protection class IP65/IP67 applies only to the fully assembled system with fitted plugs or covers (which must also conform to IP65/IP67). If components with a lower protection class are used, the protection level of the entire

system is reduced to the protection class of the component with the lowest protection level, for example CageClamp connection block with IP20 protection or MPA pneumatics with IP65 protection.

General technical data		
Module No.		197330
Max. no. of modules ¹⁾	Control block	1
	Bus node	1
	I/O modules/CP interface/CTEL interface/electrical interface CPX-CTEL-2/multi-axis interface	9
	Pneumatic interface	1
Max. address capacity	Inputs [byte]	64
	Outputs [byte]	64
Internal cycle time	[ms]	< 1
Configuration support	Fieldbus-specific	
LED displays	Bus node/control block/Gate-way	Up to 4 LEDs, bus-specific 4 LEDs, CPX-specific <ul style="list-style-type: none">• PS = Power system• PL = Power load• SF = System fault• M = Modify parameter/forcing active
	I/O modules	Min. one group diagnostic LED Channel-oriented status and diagnostic LED, depending on module
	Pneumatic interface	One group diagnostic LED Valve status LED on valve
Diagnostics	<ul style="list-style-type: none">• Channel and module-oriented diagnostics for inputs/outputs and valves• Detection of module undervoltage for the different voltage potential values• Storage of the last 40 errors with timestamp (asynchronous access)	

1) A maximum of 11 modules in total can be combined
(e.g. 1 control block + 9 I/O modules + 1 pneumatic interface, or 1 control block + 1 bus node + 8 I/O modules + 1 pneumatic interface)

Terminal CPX

Technical data

FESTO

General technical data		
Module No.	197330	
Parameterisation	Module-specific and entire system, for example: <ul style="list-style-type: none"> • Diagnostic behaviour • Condition monitoring • Profile of inputs • Fail-safe response of outputs and valves 	
Commissioning support	Forcing of inputs and outputs	
Protection class to EN 60529	IP65, IP67	
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Current supply	Interlinking block with system supply for electronics plus sensors actuators plus valves	[A] 16 (8/10 with 7/8" supply, 5-pin/4-pin) [A] 16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional power supply for actuators	[A] 16 (8/10 with 7/8" supply, 5-pin/4-pin)
	Additional power supply for valves	[A] 16 (10 with 7/8" supply, 4-pin)
Current consumption	Depending on system configuration	
Power failure bridging (bus electronics only)	[ms]	10
Power supply connection	M18, 4-pin 7/8", 5-pin 7/8", 4-pin AIDA push-pull, 5-pin	
Fuse concept	Per module with electronic fuses	
Tests	Vibration test to DIN IEC 68	• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
	Shock test to DIN IEC 68	• With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
PWIS classification	PWIS-free (free of paint-wetting impairment substances)	
Interference immunity	EN 61000-6-2 (industry)	
Interference emission	EN 61000-6-4 (industry)	
Isolation test for galvanically isolated circuits to IEC 1131 Part 2	[V DC]	500
Galvanic isolation of electrical voltages	[V DC]	80
Protection against direct and indirect contact	PELV (Protective Extra-Low Voltage)	
Materials	End plates: Die-cast aluminium	
Grid dimension	[mm]	50

Operating and environmental conditions		
Module No.	197330	
Ambient temperature	[°C] -5 ... +50	
Storage temperature	[°C] -20 ... +70	

Terminal CPX

FESTO

Technical data

Certifications – Maximum permissible values	
Module No.	197330
ATEX category gas	II 3G
Ex-ignition protection type gas	Ex nA IIC T4 X Gc
ATEX ambient temperature [°C]	-5 ≤ Ta ≤ +50
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX) To EU EMC Directive ¹⁾
Protection class to EN 60529	IP65, IP67
Certification	c UL us - Recognized (OL) C-Tick
Explosion protection certification outside the EU	EPL Gc (Ru)

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

 - Note	The values indicated represent the maximum performance limits that can be achieved with the fully assembled product. Depending on the individual components used, the value actually achieved for the overall product may be lower.	You can select e.g. the individual components required to achieve the ATEX category by choosing the corresponding features in the online	product configurator: → Internet:cpx
--	---	--	--

Weight [g]		
Control block	CEC	155.0
	CEC..V3	135.0
Bus node	FB6	125.0
	FB11	120.0
	FB13	115.0
	FB14	115.0
	FB21	1255.0
	FB23-24	115.0
	FB33	280.0
	FB34	280.0
	FB35	280.0
	FB36	125.0
	FB37	125.0
	FB39	125.0
	FB40	125.0
	FB41	280.0
Gateway	IOT	130.0
I/O module	CPX	38.0
	CPX-L	170.0
	NAMUR	100.0
	HART	77.4
Counter module	2ZE2DA	130.0
CP interface	CP	140.0
CTEL interface	CTEL	110.0
Electrical interface	CTEL-2	110.0
Axis interface	CM-HPP	140.0
Axis controller	CMAX	140.0
End-position controller	CMPX	140.0
Measuring module	CMIX	140.0

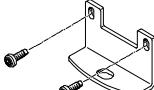
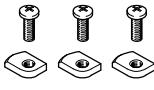
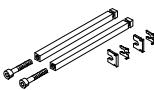
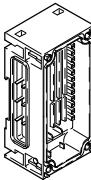
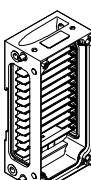
Connection block	Plastic	70.0
	Metal	175.0
Interlinking block, plastic	Without power supply	100.0
	With system supply	125.0
Interlinking block, metal	Without power supply	169.0
	With system supply, 7/8" 4-pin	228.0
	With system supply, 7/8" 5-pin	187.0
	With system supply, Push-pull	279.0
Tie rod	1-fold	19.0 ±2.5
	2-fold	32.5 ±2.5
	3-fold	46.0 ±2.5
	4-fold	59.5 ±2.5
	5-fold	73.0 ±2.5
	6-fold	86.5 ±2.5
	7-fold	100.0 ±2.5
	8-fold	113.5 ±2.5
	9-fold	127.0 ±2.5
	10-fold	140.5 ±2.5
End plate for plastic version	Left-hand	77.0
	Left-hand, with system supply	145.0
	Right-hand	70.0
End plate for metal version	Left-hand	113.0
	Right-hand	113.0
End plate with extension	Left-hand	190.0
	Right-hand	175.0
Pneumatic interface	MPA-S	238.4
	VTSA/VTSA-F	485.0

Terminal CPX

Accessories

FESTO

Ordering data – Accessories

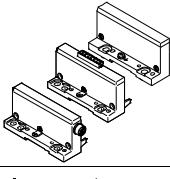
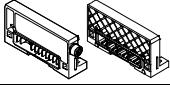
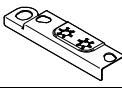
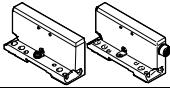
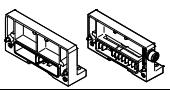
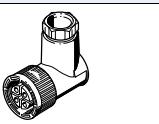
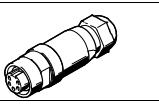
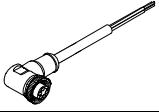
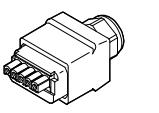
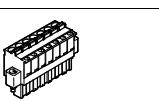
Designation		Part No.	Type
Mounting			
	Attachment for wall mounting (for long valve terminals, 10 pieces), design for plastic manifold sub-bases	529040	CPX-BG-RW-10x
	Attachment for wall mounting, design for metal manifold sub-bases	2 mounting brackets and 4 screws	550217 CPX-M-BG-RW-2X
		1 mounting bracket and 2 screws	2721419 CPX-M-BG-VT-2X
	Mounting for H-rail	CPX without pneumatic components	526032 CPX-CPA-BG-NRH
		CPX-VTSA	
		CPX-VTSA-F	
		CPX-MPA	
Tie rod			
	Tie rod CPX	Extension 1-fold	525418 CPX-ZA-1-E
		1-fold	195718 CPX-ZA-1
		2-fold	195720 CPX-ZA-2
		3-fold	195722 CPX-ZA-3
		4-fold	195724 CPX-ZA-4
		5-fold	195726 CPX-ZA-5
		6-fold	195728 CPX-ZA-6
		7-fold	195730 CPX-ZA-7
		8-fold	195732 CPX-ZA-8
		9-fold	195734 CPX-ZA-9
		10-fold	195736 CPX-ZA-10
Plastic interlinking block			
	Without power supply	-	195742 CPX-GE-EV
		M18	195746 CPX-GE-EV-S
	With system supply	M18, for ATEX environment	8022170 CPX-GE-EV-S-VL
		7/8" – 5-pin	541244 CPX-GE-EV-S-7/8-5POL
		7/8" – 5-pin, for ATEX environment	8022172 CPX-GE-EV-S-7/8-5POL-VL
		7/8" – 4-pin	541248 CPX-GE-EV-S-7/8-4POL
	With additional power supply for outputs	M18	195744 CPX-GE-EV-Z
		M18, for ATEX environment	8022166 CPX-GE-EV-Z-VL
		7/8" – 5-pin	541246 CPX-GE-EV-Z-7/8-5POL
		7/8" – 5-pin, for ATEX environment	8022173 CPX-GE-EV-Z-7/8-5POL-VL
	With additional power supply for valves	7/8" – 4-pin	541250 CPX-GE-EV-Z-7/8-4POL
		M18	533577 CPX-GE-EV-V
		M18, for ATEX environment	8022171 CPX-GE-EV-V-VL
		7/8" – 4-pin	541252 CPX-GE-EV-V-7/8-4POL
Metal interlinking block			
	Without power supply	-	550206 CPX-M-GE-EV
		Only for CPX-FVDA-P2	567806 CPX-M-GE-EV-FVO
	With system supply	7/8" – 5-pin	550208 CPX-M-GE-EV-S-7/8-5POL
		7/8" – 5-pin, for ATEX environment	8022165 CPX-M-GE-EV-S-7/8-5POL-VL
		7/8" – 4-pin	568956 CPX-M-GE-EV-S-7/8-CIP-4P
		Push-pull – 5-pin	563057 CPX-M-GE-EV-S-PP-5POL
	With additional power supply for outputs	7/8" – 5-pin	550210 CPX-M-GE-EV-Z-7/8-5POL
		7/8" – 5-pin, for ATEX environment	8022158 CPX-M-GE-EV-Z-7/8-5POL-VL
		Push-pull – 5-pin	563058 CPX-M-GE-EV-Z-PP-5POL

Terminal CPX

FESTO

Accessories

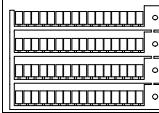
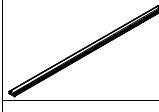
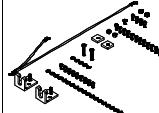
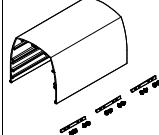
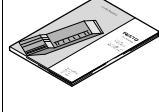
Ordering data – Accessories

Designation		Part No.	Type
Mounting accessories			
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	550218 CPX-DPT-30X32-S-4x
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	550219 CPX-M-M3x22-4x
		Bus node/metal connection block	550216 CPX-M-M3x22-S-4x
End plates for plastic version			
	End plate, left-hand	–	195716 CPX-EPL-EV
		With system supply	576315 CPX-EPL-EV-S
		With extension	576314 CPX-EPL-EV-X
	End plate, right-hand	–	195714 CPX-EPR-EV
		With extension	576313 CPX-EPR-EV-X
	Earthing element for right-hand/left-hand end plate	5 pieces	538892 CPX-EPFE-EV
End plates for metal version			
	End plate, left-hand	–	550212 CPX-M-EPL-EV
		With extension	576317 CPX-M-EPL-EV-X
	End plate, right-hand	–	550214 CPX-M-EPR-EV
		With extension	576316 CPX-M-EPR-EV-X
Power supply			
	Plug socket for mains connection M18x1, straight, 4-pin	For 1.5 mm ² For 2.5 mm ²	18493 NTSD-GD-9 18526 NTSD-GD-13,5
	Plug socket for mains connection M18x1, angled, 4-pin	For 1.5 mm ² For 2.5 mm ²	18527 NTSD-WD-9 533119 NTSD-WD-11
	Plug socket for mains connection 7/8", straight, 5-pin	0.25 ... 2.0 mm ²	543107 NECU-G78G5-C2
	Plug socket for mains connection 7/8", straight, 4-pin	0.25 ... 2.0 mm ²	543108 NECU-G78G4-C2
	Plug socket for mains connection 7/8", angled, 5-pin – open cable end, 5-wire	2 m	573855 NEBU-G78W5-K-2-N-LE5
	Power supply socket push-pull, connection pattern PP, fulfills requirements according to AIDA	5-pin	5195383 NECU-M-PPG5PP-C1-PN
	Straight plug, spring-loaded terminal, for end plate left-hand with system supply	7-pin	576319 NECU-L3G7-C1

Terminal CPX

Accessories

FESTO

Ordering data – Accessories		Part No.	Type
Designation			
Inscription labels			
	Inscription labels 6x10, 64 pieces, in frames	18576	IBS-6x10
Hood			
	Mounting rail for securing the cover	1,000 mm	572256 CAFC-X1-S
	Mounting kit for CPX cover		572257 CAFC-X1-BE
	Hood section for CPX terminal including mounting attachments for connecting several hood sections in series	200 mm	572258 CAFC-X1-GAL-200
		300 mm	572259 CAFC-X1-GAL-300
Manual			
	CPX System Manual	German	526445 P.BE-CPX-SYS-DE
		English	526446 P.BE-CPX-SYS-EN
		Spanish	526447 P.BE-CPX-SYS-ES
		French	526448 P.BE-CPX-SYS-FR
		Italian	526449 P.BE-CPX-SYS-IT

Terminal CPX

FESTO

Accessories

User manuals – General information

Comprehensive user manuals are vital for the fast and reliable use of fieldbus components.

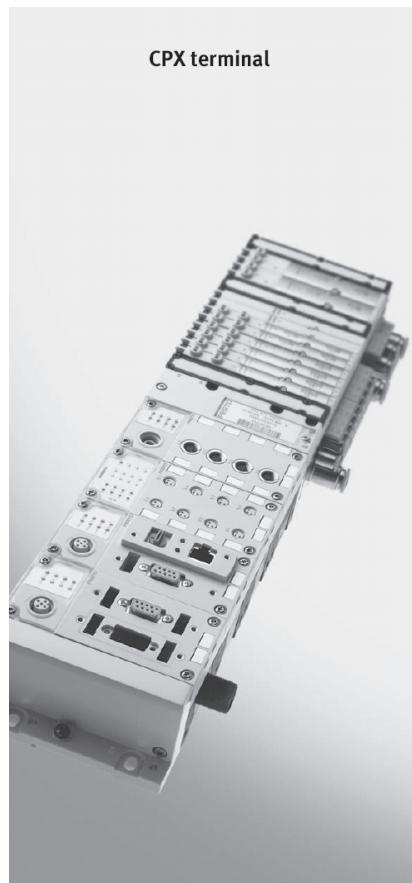
The manuals provided by Festo contain step-by-step instructions for using CPX terminals:

1. Installation
2. Commissioning and parameterisation
3. Diagnostics

Application-oriented explanations are provided for integration of the CPX terminal in the programming and configuration software of the various controller manufacturers. Use the order code to select the language you want. The manual for the configuration you have ordered is supplied automatically.

The documents can be quickly and easily downloaded from the Festo website.

→ www.festo.com



CPX terminal

FESTO

Electronics manual

System description

Installing and commissioning CPX terminals

Manual
526 446
en 0707c
[713 010]

Overview – User manuals

Type	Title	Description
Pneumatic components		
P.BE-VTSA-44-...	Valve terminals with VTSA and VTSA-F pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the VTSA and VTSA-F pneumatic components.
P.BE-MPA-...	Valve terminals with MPA-S pneumatics	Instructions on assembly, installation, commissioning and diagnostics of the MPA-S pneumatic components.
MPAL-VI-...	Valve terminals	Instructions on assembly, installation, commissioning and diagnostics of the MPA-L pneumatic components.

Terminal CPX

Accessories

FESTO

Overview – User manuals		
Type	Title	Description
Electronic components		
P.BE-CPX-SYS-...	System description, installation and commissioning	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles of parameterisation
P.BE-CPX-FVDA-P2-...	PROFIsafe shut-off module	Connection technology and instructions on mounting, installing and commissioning for the PROFIsafe shut-off module of the type CPX-FVDA-P2
P.BE-CPX-EA-...	CPX-EA modules, digital	Connection technology and assembly, installation and commissioning instructions for digital input and output modules of the type CPX-... as well as VTSA/VTSA-F and MPA-S/L pneumatic interface
P.BE-CPX-P-EA-...	Input module CPX-P-8DE-N	Connection technology and assembly, installation and commissioning instructions for digital input module for NAMUR sensors of the type CPX-P-8DE-N
P.BE-CPX-F8DE-P-...	Input module CPX-F8DE-P	Connection technology and assembly, installation and commissioning instructions for PROFIsafe input module of the type CPX-F8DE-P
P.BE-CPX-2ZE2DA-...	EA module CPX-2ZE2DA	Connection technology and instructions on mounting, installing and commissioning for the counter module of the type CPX-2ZE2DA
P.BE-CPX-AX-...	CPX-EA modules, analogue	Connection technology and assembly, installation and commissioning instructions for analogue input and output modules of the type CPX-... as well as pressure sensors and proportional pressure regulators.
P.BE-CPX-CP...	CPX CP interface	Instructions on assembly, installation, commissioning and diagnostics of the CP interface
P.BE-CPX-CTEL...	CPX CTEL interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX CTEL master
P.BE-CPX-CTEL-LK...	Electrical interface CPX-CTEL-2	Instructions on assembly, installation, commissioning and diagnostics of the electrical interface CPX for IO-Link
CPX-CM-HPP...	CPX axis interface	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis interface (CM-HPP)
P.BE-CPX-CMAX-SYS...	CPX axis controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX axis controller (CMAX)
P.BE-CPX-CMAX-CONTROL...	CPX axis controller	Information on controlling, diagnosing and parameterising the axis controller via the fieldbus
P.BE-CPX-CMPX-SYS...	CPX end-position controller	Instructions on assembly, installation, commissioning and diagnostics of the CPX end-position controller (CMPX)
P.BE-CPX-CMIX...	CPX measuring module	Instructions on assembly, installation, commissioning and diagnostics of the CPX measuring module (CMIX)
P.BE-CPX-FB... CPX-FB...	CPX bus node	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus nodes
P.BE-CPX-PNIO...	CPX bus node for PROFINET	Instructions on assembly, installation, commissioning and diagnostics of the relevant bus nodes
P.BE-CPX-CEC...	CPX CoDeSys controller (control block)	Instructions on assembly, installation, commissioning and diagnostics of the relevant control block

User manuals – GSD, EDS, etc.

Device description files and icons are used to explain the integration of the CPX terminal in the configuration software of the various controller manufacturers.

These can be downloaded quickly and easily from www.festo.com.

Terminal CPX

Technical data – Operator unit CPX-MMI-1

FESTO

-  - Width
81 mm

The operator unit is a small, convenient commissioning and service device for the CPX terminal. It provides data polling, configuration and diagnostic functions for CPX terminals. Its extremely flexible application range means that data can be read in or out at any location. IP65 compatibility makes it suitable for use in harsh industrial environments.



Application

Functions

- Advance commissioning through the monitoring/forcing of inputs and outputs without fieldbus master/PLC
- Test function for parameter settings, for example fail-safe of the outputs or switch-on delay of the inputs
- Plain-text diagnostics of module and channel-oriented errors
- Condition monitoring: preselection/loading of counters, activation of the channels to be monitored
- Display of the last 40 error occurrences with timestamp
- Identification of sporadic causes of errors through display of the diagnostic history
- Password protection

Connection

The operator unit is connected to the CPX bus nodes or control block, as appropriate, using a M12 connecting cable. The voltage for the operator unit is supplied by the CPX component

Communication

Once connected to the CPX terminal, the operator unit loads the available configuration for the I/O modules, valves, etc. This ensures the availability of up-to-date texts, messages, menus and displays. Status information, diagnostic messages and parameter bits are then exchanged during operation.

Assembly

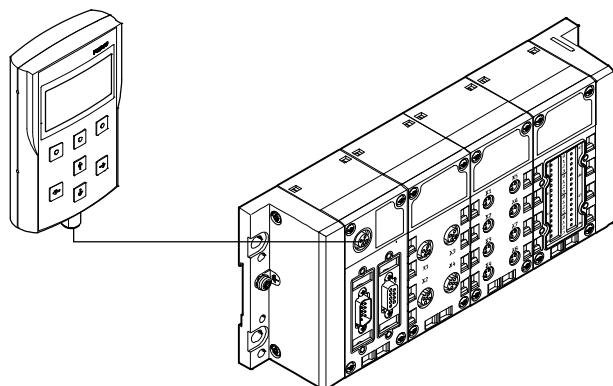
A mounting bracket for the operator unit offers the option of wall or H-rail mounting. The mounting bracket also has an option for temporary mounting using a hanging device.

Terminal CPX

Technical data – Operator unit CPX-MMI-1

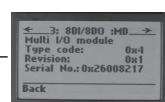
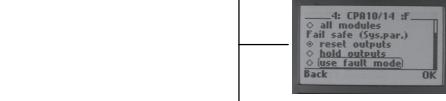
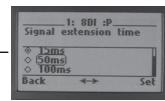
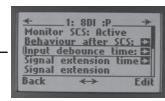
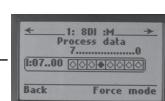
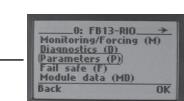
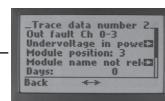
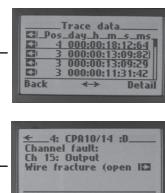
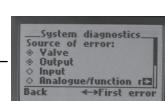
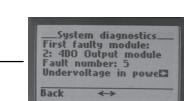
FESTO

Connection



The operator unit is connected to the CPX terminal using a pre-assembled connecting cable.

Function examples



System overview

- Overview of configured modules and current diagnostic messages

Diagnostics

- Fast access to the diagnostic history and the modules with diagnostic messaging
- Display of the last 40 diagnostic messages with timestamp
- Display of the current diagnostic message for a module

Commissioning

- Selection of module-specific data and parameters
- Display and modification of the current status of the inputs and outputs of a module
- Display and modification of the current settings for module-specific parameters

Setup

- Setting of access permission (password)
- Contrast setting of the display

Terminal CPX

FESTO

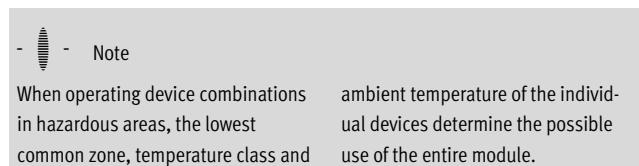
Technical data – Operator unit CPX-MMI-1

General technical data		CPX-MMI-1
Type		CPX-MMI-1
Data interface	[RS232]	RS232 interface, 57.6 kBaud, M12 socket, 4-pin
Display component		LCD graphical display with background illumination (128 x 64 pixels)
Control elements		7 keys: 4 arrow keys and 3 function keys, touch-sensitive keypad
Electromagnetic compatibility		Interference emission tested to DIN EN 61000-6-4, industry Interference immunity tested to DIN EN 61000-6-2, industry
Nominal operating voltage	[V DC]	24, supplied by the connected device
Operating voltage range	[V DC]	18 ... 30
Current consumption	[mA]	50 ... 60
Protection class to IEC 60529		IP65
Relative air humidity	[%]	90, non-condensing
Vibration resistance		Tested to DIN/IEC 68/EN 60068, Part 2-6 • With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
Shock resistance		Tested to DIN/IEC 68/EN 60068, Part 2-27 • With wall mounting: Severity level 2 • With H-rail mounting: Severity level 1
Materials		Reinforced PA
Dimensions (W x H x D)	[mm]	81 x 137 x 28
Weight	[g]	150

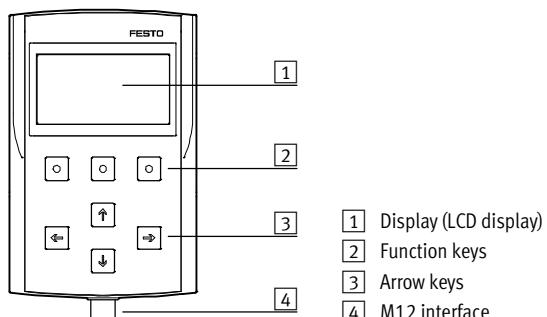
Operating and environmental conditions

Ambient temperature	[°C]	0 ... 50
CE mark (see declaration of conformity)		To EU EMC Directive ¹⁾ In accordance with EU Explosion Protection Directive (ATEX)
ATEX category	Gas	II 3 G
	Dust	II 3 D
EX-ignition protection type	Gas	Ex nA IIC T6 X Gc
	Dust	Ex tc IIIC T60°C X Dc IP65
ATEX ambient temperature	[°C]	-5 <= Ta <= +50

- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.



Connection and display components



- [1] Display (LCD display)
- [2] Function keys
- [3] Arrow keys
- [4] M12 interface

Terminal CPX

Accessories – Operator unit CPX-MMI-1

FESTO

Ordering data			
Designation		Part No.	Type
Operator unit			
	Provides data polling, configuration and diagnostic functions for CPX terminals	529043	CPX-MMI-1
Connecting cable			
	Connecting cable M12-M12, specially for CPX-MMI	1.5 m	529044 KV-M12-M12-1,5
		3.5 m	530901 KV-M12-M12-3,5
Mounting			
	Bracket	534705	CPX-MMI-1-H
	Mounting for H-rail	536689	CPX-MMI-1-NRH
User manual			
	User manual for operator unit CPX-MMI-1	German	534824 P.BE-CPX-MMI-1-DE
		English	534825 P.BE-CPX-MMI-1-EN
		French	534827 P.BE-CPX-MMI-1-FR
		Italian	534828 P.BE-CPX-MMI-1-IT
		Spanish	534826 P.BE-CPX-MMI-1-ES

Terminal CPX

FESTO

Technical data – CPX Maintenance Tool

Function

CPX Maintenance Tool (CPX-FMT) combines service software with a connecting adapter. The service software is a tool for the design, parameterisation and online diagnostics of the CPX terminal. The USB-to-M12 adapter features built-in galvanic isolation (between CPX and PC) and enables a PC to be connected to the diagnostic interface of the CPX terminal.

- Adapter
- Software on CD-ROM



Application

Only from Festo

The CPX-FMT software enables access to CPX valve terminals via Ethernet and the bus nodes EtherNet/IP (FB 36), Sercos III (FB 39) and PROFINET (FB 33, FB 34, FB 35, FB 41). The bus nodes or control block can be connected directly to the PC via a USB adapter from Festo.. Similar to the CPX-MMI, diagnostic data such

as the error trace or module diagnostics can be read out and parameters can be modified in plain text. In contrast to the CPX-MMI, the data can be used directly on a PC. There is an option, for example, to send screenshots of a configuration or the current error trace directly via e-mail. In addition, CPX configurations can also be saved

and archived directly as a CPX-FMT project. Undocumented changes can subsequently be identified using the online/offline comparison function. On-site tests such as the actuation of valves or the emulation of sensor feedback (in both cases called "forcing"), for example, can be

performed without an existing controller infrastructure. It must be noted that with both the CPX-FMT and the CPX-MMI, only local parameters on the CPX valve terminal can be changed and saved. The configuration of the networks or controller software cannot be influenced.

General technical data

Type	NEFC-M12G5-0.3-U1G5	
System requirements	PC	IBM-compatible
	Drive	CD-ROM
	Interfaces	USB port (specification USB 1.1 or higher)
	Operating system	Microsoft Windows 2000 or XP
Functional range	<ul style="list-style-type: none">• Configuration and parameterisation• Reading out of system, module, channel diagnostics and error trace• Saving of the configuration as a project• Integration of plug-ins/links to self-executing programs	
Scope of delivery	<ul style="list-style-type: none">• Adapter M12, 5-pin to mini USB socket• CD-ROM with installation program	
Type of mounting	Screw-in	
Electrical connection	Plug M12x1, 5-pin	
Adapter cable composition	4 x 0.34 mm ²	
Cable length	[m]	0.3
Protection class to EN 60529	IP20	
CE mark (see declaration of conformity)	To EU EMC Directive	
Ambient temperature	[°C]	-5 ... +50
Material	Housing	ABS
	Cable sheath	PUR
	Pin contact	Gold-plated brass
Note on materials	RoHS-compliant	

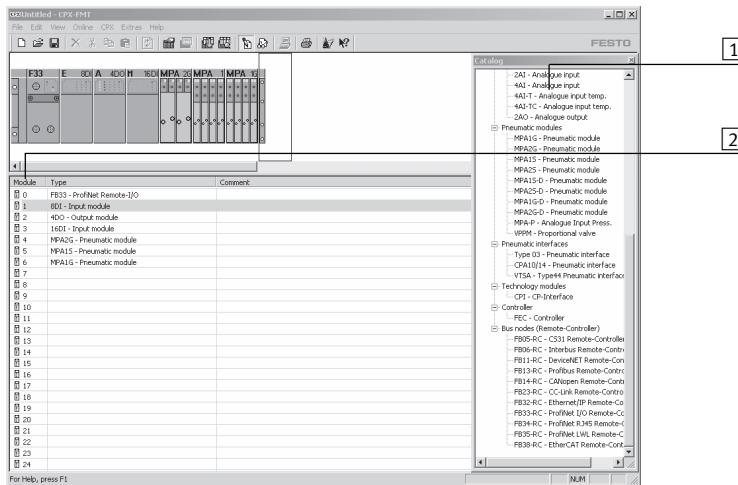
Terminal CPX

Technical data – CPX Maintenance Tool

FESTO

Display components

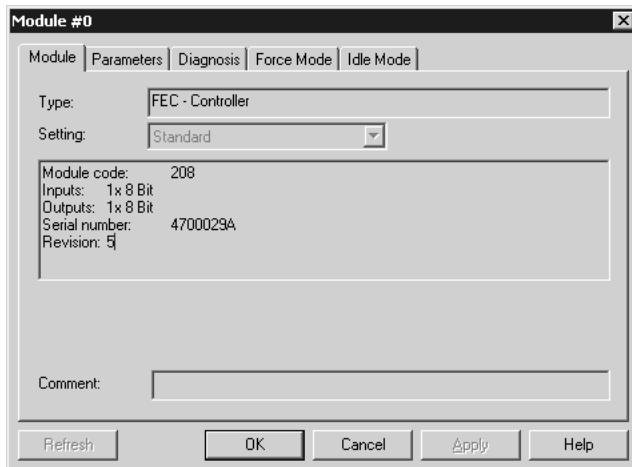
Creating a device configuration using the editor



The device configuration can be conveniently generated, parameterised and saved using the drag & drop feature. You can insert and move modules.

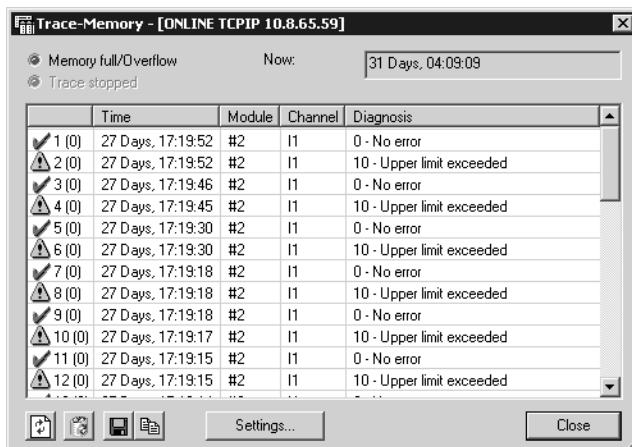
- 1 Module numbers from the graphic system overview
 - 2 Catalogue for selecting required modules

Module overview for a selected module



Displays important module data as well as the number of allocated inputs and outputs.

Diagnostic memory



Faults which occur during operation are entered in a diagnostic memory. The first or the last 40 entries are saved, as well as the respective time measured from the moment the power supply was switched on.

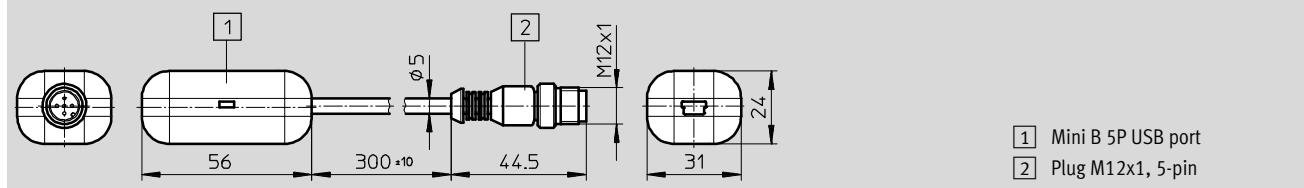
Terminal CPX

FESTO

Technical data – CPX Maintenance Tool

Dimensions

Adapter



Ordering data

Designation

Part No. Type

	CPX Maintenance Tool (CPX-FMT), software and USB-to-M12 adapter	547432 NEFC-M12G5-0.3-U1G5
--	---	----------------------------

Terminal CPX

Technical data – Control block CPX-CEC

FESTO



IT services:



The CODESYS controller is a modern control system for CPX terminals that enables programming with CODESYS to IEC 61131-3.

The power supply to and communication with other modules takes place via the interlinking block.

In addition to network connections, LEDs are also provided for the bus status, operating status of the PLC and CPX peripherals information, as are switching elements and a diagnostic interface for CPX-FMT.



Application

Bus connection

The CPX-CEC is a remote controller that can be connected to a master PLC via the fieldbus nodes of the CPX terminal or via Ethernet. At the same

time, it is possible to operate the CPX-CEC as a compact stand-alone controller directly on the machine.

Communication protocols

- Fieldbus via CPX fieldbus nodes
- Modbus/TCP
- EasyIP

Operating modes

- Stand-alone
- Remote controller, fieldbus
- Remote controller, Ethernet

Setting options

The CPX-CEC has the following interfaces for monitoring, programming and commissioning:

- For the CPX-FMT
- Ethernet interface for IT applications
- Remote diagnostics

The operating mode and fieldbus protocol are set using the DIL switch on the CPX-CEC.

The integrated web server offers a convenient means of querying data saved in the CPX-CEC.

Features

- Easy actuation of valve terminal configurations with MPA, VTSA
- Diagnostics with flexible monitoring options for pressure, flow rate, cylinder operating time, air consumption

- Actuation of decentralised installation systems on the basis of CPI actuation of applications in proportional pneumatics
- AS-Interface actuation via gateway

- Connection to all fieldbuses as a remote controller and for pre-processing
- Actuation of electric drives as individual axes via CANopen (CPX-CEC-C1/-M1)

- Early warnings and visualisation options
- Closed-loop pneumatic applications

Terminal CPX

FESTO

Technical data – Control block CPX-CEC

General technical data

Protocol		CODESYS Level 2 EasyIP Modbus TCP TCP/IP
Processing time		Approx. 200 µs/1 k instruction
Programming software		CODESYS provided by Festo
Programming language		To IEC 61131-3 Sequential function chart (SFC) Instruction list (IL) Function chart (FCH), additional continuous function chart (CFC) Ladder diagram (LD) Structured text (ST)
Programming	Operating language	German, English
	Support for file handling	Yes
Device-specific diagnostics		Diagnostic memory Channel and module-oriented diagnostics Undervoltage/short circuit of modules
LED displays	Bus-specific	TP: Link/traffic
	Product-specific	RUN: PLC status STOP: PLC status ERR: PLC runtime error PS: Electronics supply, sensor supply PL: Load supply SF: System fault M: Modify/forcing active
IP address setting		DHCP Via CODESYS Via MMI
Function blocks		CPX diagnostic status, copy CPX diagnostic trace, read CPX module diagnostics, etc.
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 55

Materials

Housing	Reinforced PA PC
Note on materials	RoHS-compliant

Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Storage temperature	[°C]	-20 ... +70
Relative air humidity	[%]	95, non-condensing
Corrosion resistance class CRC ¹⁾		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Electrical data

Nominal operating voltage	[V DC]	24
Load voltage	Nominal operating voltage With pneumatics type VTSA With pneumatics type MPA Without pneumatics	[V DC] 24 [V DC] 21.6 ... 26.4 [V DC] 18 ... 30 [V DC] 18 ... 30
Power failure buffering	[ms]	10
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 85
Degree of protection to EN 60529		IP65, IP67

Terminal CPX

Technical data – Control block CPX-CEC

FESTO

Technical data		CPX-CEC-C1	CPX-CEC-C1-V3	CPX-CEC-M1-V3
Type				
Additional functions	Motion functions for electric drives		SoftMotion functions for electric drives	
CPU data	Flash [MB]	32	32	32
	RAM [MB]	32	256	256
	Processor [MHz]	400	800	800
Control interface		CAN bus	CAN bus	CAN bus
Parameterisation		CODESYS V2.3	CODESYS V3	CODESYS V3
Configuration support		CODESYS V2.3	CODESYS V3	CODESYS V3
Program memory, user program	[MB]	4	16	16
Flags	CODESYS variable concept			
	Remanent data [kB]	30	28	28
	Global data memory [MB]	8	–	–
Control elements	DIL switch for CAN termination			
	Rotary switch for RUN/STOP			
Total number of axes		31	127	31
Ethernet	Number	1		
	Connection technology	RJ45 socket, 8-pin		
	Data transmission speed [Mbps]	10/100		
	Supported protocols	TCP/IP, EasylP, Modbus TCP		
Fieldbus interface	Number	1		
	Connection technology	Sub-D plug connector, 9-pin		
	Data transmission speed, can be set via software [kbps]	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000	125, 250, 500, 800, 1000
	Supported protocols	CAN bus		
	Galvanic isolation	Yes		

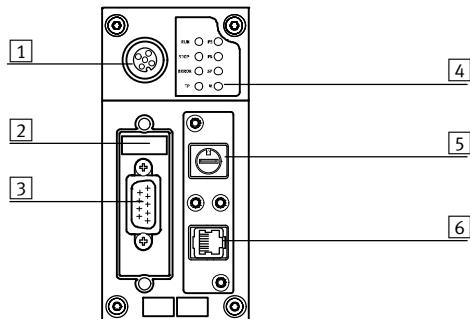
Technical data		CPX-CEC	CPX-CEC-S1-V3
Type			
CPU data	Flash [MB]	32	32
	RAM [MB]	32	256
	Processor [MHz]	400	800
Parameterisation	CODESYS V2.3		CODESYS V3
Configuration support	CODESYS V2.3		CODESYS V3
Additional functions	Diagnostic functions		
	RS232 communication function		
Program memory, user program	[MB]	4	16
Flags	CODESYS variable concept		CODESYS variable concept
	Remanent data [kB]	30	28
	Global data memory [MB]	8	–
Control elements	Rotary switch for RUN/STOP		
Ethernet	Number	1	
	Connection technology	RJ45 socket, 8-pin	
	Data transmission speed [Mbps]	10/100	
	Supported protocols	TCP/IP, EasylP, Modbus TCP	
Data interface	Number	1	
	Connection technology	Sub-D socket, 9-pin	
	Data transmission speed [kbps]	9.6 ... 230.4	
	Supported protocols	RS232 interface	
	Max. cable length [m]	–	30
	Galvanic isolation	Yes	

Terminal CPX

FESTO

Technical data – Control block CPX-CEC

Connection and display components CPX-CEC-C1/-M1



- [1] CPX-FMT connection
- [2] DIL switch
- [3] Fieldbus interface
(Sub-D plug connector, 9-pin)
- [4] Status LEDs, bus-specific and
product-specific
- [5] RUN/STOP rotary switch
- [6] Ethernet interface (RJ45 socket,
8-pin)

Pin allocation – CPX-CEC-C1/-M1

	Pin	Signal	Meaning
Fieldbus interface, Sub-D plug connector			
	1	n.c.	Not connected
	2	CAN_L	CAN low
	3	CAN_GND	CAN ground
	4	n.c.	Not connected
	5	CAN_SHLD	Connection to functional earth FE
	6	CAN_GND	CAN ground (optional) ¹⁾
	7	CAN_H	CAN high
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Screening	Plug connector housing must be connected to FE
Ethernet interface, RJ45 plug connector			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screening	Screening

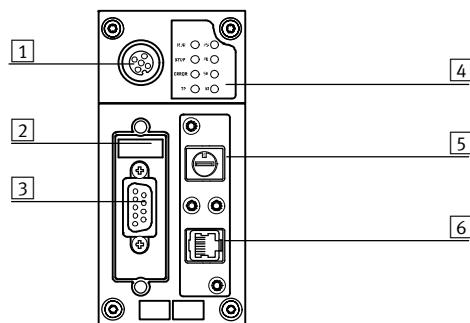
1) If a drive controller with external power supply is connected, CAN ground (optional), pin 6, on the CPX-CEC-C1/-M1 must not be used.

Terminal CPX

Technical data – Control block CPX-CEC

FESTO

Connection and display components CPX-CEC/CPX-CEC-S1-V3



- [1] CPX-FMT connection
- [2] DIL switch
- [3] RS232 interface
(Sub-D socket, 9-pin)
- [4] Status LEDs, bus-specific and product-specific
- [5] RUN/STOP rotary switch
- [6] Ethernet interface (RJ45 socket, 8-pin)

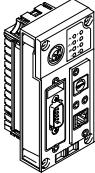
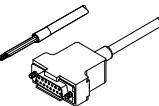
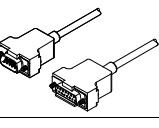
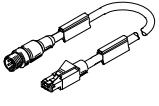
Pin allocation – CPX-CEC/CPX-CEC-S1-V3

	Pin	Signal	Meaning
RS232 interface, Sub-D socket			
	1	n.c.	Not connected
	2	RXD	Received data
	3	TXD	Transmitted data
	4	n.c.	Not connected
	5	GND	Data reference potential
	6	n.c.	Not connected
	7	n.c.	Not connected
	8	n.c.	Not connected
	9	n.c.	Not connected
	Screening	Screening	Connection to functional earth
Ethernet interface, RJ45 plug connector			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screening	Screening

Terminal CPX

FESTO

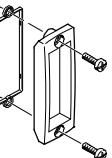
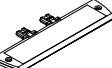
Accessories – Control block CPX-FEC

Ordering data				
Designation		Part No.	Type	
Control block				
	Motion functions for electric drives	CODESYS V2.3 CODESYS V3	155 g 135 g	567347 CPX-CEC-C1 3473128 CPX-CEC-C1-V3
	SoftMotion functions for electric drives	CODESYS V3	135 g	3472765 CPX-CEC-M1-V3
	RS232 communication function	CODESYS V2.3	155 g	567346 CPX-CEC
		CODESYS V3	135 g	3472425 CPX-CEC-S1-V3
Fieldbus interface				
	Sub-D plug connector, 9-pin, for CANopen			532219 FBS-SUB-9-BU-2x5POL-B
	Connecting cable for RS232 interface			539642 FEC-KBG7
	Connecting cable for RS232 interface			539643 FEC-KBG8
	Micro Style bus connection, 2xM12 for DeviceNet/CANopen			525632 FBA-2-M12-5POL
	Socket for Micro Style connection, M12			18324 FBSD-GD-9-5POL
	Plug connector for Micro Style connection, M12			175380 FBS-M12-5GS-PG9
	Open Style bus connection for 5-pin terminal strip for DeviceNet/CANopen			525634 FBA-1-SL-5POL
	Terminal strip for Open Style connection, 5-pin			525635 FBSD-KL-2x5POL
Ethernet interface				
	RJ45 plug connector	Protection class IP65, IP67		534494 FBS-RJ45-8-GS
	Cover for RJ45 connection	Protection class IP65, IP67		534496 AK-Rj45
	Straight plug, RJ45, 8-pin	Straight plug, M12x1, 4-pin, D-coded	Protection class IP20	8040451 NEBC-D12G4-ES-1-S-R3G4-ET 8040452 NEBC-D12G4-ES-3-S-R3G4-ET 8040453 NEBC-D12G4-ES-5-S-R3G4-ET 8040454 NEBC-D12G4-ES-10-S-R3G4-ET
	Straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	Protection class IP20	8040455 NEBC-R3G4-ES-1-S-R3G4-ET

Terminal CPX

Accessories – Control block CPX-FEC

FESTO

Ordering data		Part No.	Type
Designation			
Covers and attachments			
	Inspection cover, transparent, for Sub-D connection	533334	AK-SUB-9/15-B
	Inscription label holder for manifold block	536593	CPX-ST-1
User documentation			
	Manual for control block CPX-CEC	German	569121 P.BE-CPX-CEC-DE
		English	569122 P.BE-CPX-CEC-EN

Terminal CPX

Technical data – Bus node CPX-FB6

FESTO



Bus node for handling communication between the electrical CPX terminal and a higher-order master via INTERBUS.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The fieldbus communication status is displayed via four INTERBUS-specific LEDs.



Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket and a 9-pin Sub-D plug with a typical INTERBUS pin allocation.

The bus connector plugs (with IP65/IP67 protection from Festo or IP20 protection from other manufacturers) facilitate the connection of the incoming and outgoing bus cable.

The outgoing bus plug contains the typical INTERBUS RBST bridge for identification of the outgoing bus connection.

The Sub-D interfaces are designed for controlling network components with a fibre-optic cable connection.

INTERBUS implementation

The CPX-FB6 supports the INTERBUS protocol to EN 50254. In addition to synchronous I/O exchange, the optional PCP channel can be used for parameterisation and diagnostic functions.

The PCP channel provides access to advanced system information and assigns operation parameters while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 96 inputs and 96 outputs, the CPX-FB6 supports a large number of I/O module configurations, including pneumatic interface.

Note

If the PCP channel is used, the maximum number of possible process data bits is reduced by 16.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

Technical data – Bus node CPX-FB6

FESTO

General technical data		
Type	CPX-FB6	
Fieldbus interface	Sub-D, 9-pin, socket and pin	
Baud rate	[Mbit/s]	
Bus type	Remote bus	
Ident. code	1, 2 or 3 (configuration-specific) 243 (PCP-channel activated)	
Profile	12 (I/O device)	
PCP channel	Yes, 16 bit (optional via DIL switch)	
Configuration support	Icons for CMD software	
Max. no. of process data bits	Inputs [bit]	96
	Outputs [bit]	96
LED displays (bus-specific)	UL = Operating voltage for INTERBUS interface RC = Remotebus check BA = Bus active RD = Remotebus disable TR = Transmit/receive	
Device-specific diagnostics	Via peripherals error	
Parameterisation	<ul style="list-style-type: none"> Start-up parameterisation via user functions (CMD) Via PCP communication 	
Additional functions	<ul style="list-style-type: none"> Storage of the last 40 errors with timestamp (access via PCP) 8-bit system status in image table for inputs 2-byte inputs and 2-byte outputs, system diagnostics in image table 	
Control elements	DIL switch	
Operating voltage	Nominal value [V DC]	24 (reverse polarity protected)
	Permissible range [V DC]	18 ... 30
	Power failure buffering [ms]	10
Current consumption	[mA]	Typically 200
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	PA-reinforced PC	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 50
Weight	[g]	125



Note

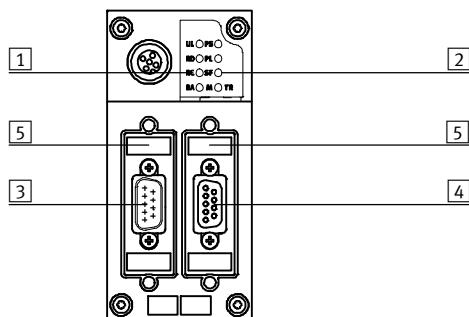
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

FESTO

Technical data – Bus node CPX-FB6

Connection and display components



- [1] INTERBUS-specific LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection, incoming (9-pin Sub-D plug)
- [4] Fieldbus connection, outgoing (9-pin Sub-D socket)
- [5] DIL switch

Pin allocation for the INTERBUS interface

Pin allocation for Sub-D	Pin	Signal	Designation	Pin	Pin allocation for M12
Incoming					
1	DO1	Data out	1		
2	DI1	Data in	3		
3	GND	Reference conductor/ground	5		
4	n.c.	Not connected	2		
5	n.c.	Not connected	4		
6	/DO1	Data out inverse			
7	/DI1	Data in inverse			
8	n.c.	Not connected			
9	n.c.	Not connected			
Hous-ing	Screened	Connection to FE (functional earth) via R/C combination	Hous-ing		
Outgoing					
1	DO2	Data out	1		
2	DI2	Data in	3		
3	GND	Reference conductor/ground	5		
4	n.c.	Not connected	2		
5	+5 V	Station detection ¹⁾	4		
6	/DO2	Data out inverse			
7	/DI2	Data in inverse			
8	n.c.	Not connected			
9	RBST	Station detection ¹⁾			
Hous-ing	Screened	Connection to FE (functional earth)	Hous-ing		

The incoming interface is galvanically isolated from the CPX peripherals. The plug housing is connected to the functional earth FE of the CPX terminal via an R/C combination.

1) The CPX terminal contains the protocol chip SUP1 3 OPC. This ensures automatic detection of additional connected INTERBUS stations. There is therefore no need for a bridge between pin 5 and pin 9.

Terminal CPX

Accessories – Bus node CPX-FB6

FESTO

Ordering data		Part No.	Type
Designation			
Bus node			
	INTERBUS bus node	195748	CPX-FB6
Bus connection			
	Sub-D plug	532218	FBS-SUB-9-BU-IB-B
	Incoming		
	Outgoing	532217	FBS-SUB-9-GS-IB-B
	Connection block M12 adapter (B-coded)	534505	CPX-AB-2-M12-RK-IB
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Inscription label holder for connection block	536593	CPX-ST-1
	Threaded sleeve, 4 pieces	533000	UNC4-40/M3x6
	Adapter from 5-pin M12 to mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5
User manual			
	User manual for bus node CPX-FB6	German	526433 P.BE-CPX-FB6-DE
		English	526434 P.BE-CPX-FB6-EN
		Spanish	526435 P.BE-CPX-FB6-ES
		French	526436 P.BE-CPX-FB6-FR
		Italian	526437 P.BE-CPX-FB6-IT

Terminal CPX

FESTO

Technical data – Bus node CPX-FB11



Bus node for handling communication between the electrical CPX terminal and a DeviceNet network.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The fieldbus communication status is displayed via the three DeviceNet-specific LEDs.



Application

Bus connection

The bus connection can be selected when ordering, either Micro Style as 2xM12 round connectors or OpenStyle as a terminal strip with IP20 protection.

Both connection types have the function of an integrated T-distributor with incoming and outgoing bus line.

DeviceNet implementation

The CPX-FB11 operates with the "Predefined Master/Slave Connection Set" as a "Group 2 Only Server". The polled I/O, change of state or synchronous method is used for the transmission of synchronous I/O data. The type of transmission can be selected in the network configuration.

The device diagnostics for all bus nodes CPX-FB11 is effectively gathered via strobed I/O and displayed in the input table of the controller. In addition to synchronous data transmission, asynchronous communication is supported through explicit messaging, which enables detailed device diagnostics and parameterisation.

A comprehensive EDS file supports the display of asynchronous data. It is also possible to display system information and assign parameters while the controller is running via the user program or the configuration software.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB11 supports any configuration of I/O modules, including pneumatic interface.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

Technical data – Bus node CPX-FB11

FESTO

General technical data		
Type	CPX-FB11	
Fieldbus interface	Either <ul style="list-style-type: none"> • Micro Style bus connection: 2xM12 with IP65, IP67 protection • Open Style bus connection: 5-pin terminal strip, IP20 	
Baud rate	[kbps]	
Addressing range	0 ... 63 Set using DIL switch	
Product	Type	Communication adapter (12 dec.)
	Code	4554 dec.
Communication types	Polled I/O, change of state/synchronous, strobed I/O and explicit messaging	
Configuration support	EDS file and bitmaps	
Max. address capacity	Inputs	[byte]
	Outputs	[byte]
LED displays (bus-specific)	MS = Module status NS = Network status IO = I/O status	
Device-specific diagnostics	Module and channel-oriented diagnostics by means of manufacturer-specific diagnostic object	
Parameterisation	<ul style="list-style-type: none"> • Module and system parameterisation via configuration interface in plain text (EDS) • Online in run or program mode 	
Additional functions	<ul style="list-style-type: none"> • Storage of the last 40 errors with timestamp (access via EDS) • 8-bit system status in image table for inputs • 2-byte inputs and 2-byte outputs, system diagnostics in image table 	
Control elements	DIL switch	
Operating voltage	Nominal value	[V DC]
	Permissible range	[V DC]
	Power failure buffering	[ms]
Current consumption	Typically 200	
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation	[°C]
	Storage/transport	[°C]
Materials	PA-reinforced PC	
Grid dimension	[mm]	
Dimensions (incl. interlinking block) W x L x H	[mm]	
Weight	[g]	



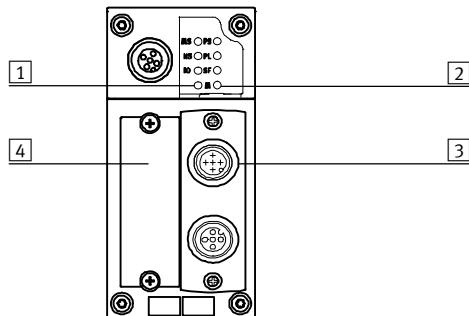
Note
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

FESTO

Technical data – Bus node CPX-FB11

Connection and display components



- [1] Bus-specific LEDs
- [2] CPX-specific status LEDs
- [3] Selectable fieldbus connection
Micro Style
Open Style
- [4] DIL switch cover

Pin allocation for the DeviceNet interface

Pin allocation	Pin	Signal-specific core colour ¹⁾	Signal	Designation
Sub-D plug				
	1	–	n.c.	Not connected
	2	Blue	CAN_L	Received/transmitted data low
	3	Black	0 V bus	0 V CAN interface
	4	–	n.c.	Not connected
	5	Blank	Screened	Connection to housing
	6	–	n.c.	Not connected
	7	White	CAN_H	Received/transmitted data high
	8	–	n.c.	Not connected
	9	Red	24 V DC bus	24 V DC supply for CAN interface

Micro Style bus connection (M12), incoming/outgoing

Incoming	1	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply for CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low
Outgoing	1	Blank	Screened	Connection to housing
	2	Red	24 V DC bus	24 V DC supply for CAN interface
	3	Black	0 V bus	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Blue	CAN_L	Received/transmitted data low

Open Style bus connection

	1	Black	0 V bus	0 V CAN interface
	2	Blue	CAN_L	Received/transmitted data low
	3	Blank	Screened	Connection to housing
	4	White	CAN_H	Received/transmitted data high
	5	Red	24 V DC bus	24 V DC supply for CAN interface

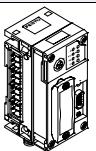
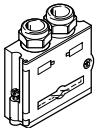
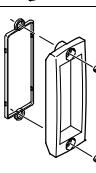
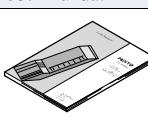
Bus connection 7/8"

	1	Black	Screened	Connection to housing
	2	Blue	24 V DC	24 V DC supply for CAN interface
	3	Blank	0 V	0 V CAN interface
	4	White	CAN_H	Received/transmitted data high
	5	Red	CAN_L	Received/transmitted data low

1) Typical for DeviceNet connecting cables

Terminal CPX

Accessories – Bus node CPX-FB11

Ordering data			
Designation		Part No.	Type
Bus node			
	DeviceNet bus node	526172	CPX-FB11
Bus connection			
	Sub-D plug	532219	FBS-SUB-9-BU-2x5POL-B
	Connection block, socket Sub-D 9-pin, plug 7/8", 5-pin	571052	CPX-AB-1-7/8-DN
	Micro Style bus connection, 2xM12	525632	FBA-2-M12-5POL
	Socket for MicroStyle connection, M12	18324	FBSD-GD-9-5POL
	Plug for Micro Style connection, M12	175380	FBS-M12-5GS-PG9
	Open Style bus connection for 5-pin terminal strip	525634	FBA-1-SL-5POL
	Terminal strip for Open Style connection, 5-pin	525635	FBSD-KL-2x5POL
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Inscription label holder for connection block	536593	CPX-ST-1
	Adapter from 5-pin M12 to mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5
User manual			
	User manual for bus node CPX-FB11	German	526421 P.BE-CPX-FB11-DE
		English	526422 P.BE-CPX-FB11-EN
		Spanish	526423 P.BE-CPX-FB11-ES
		French	526424 P.BE-CPX-FB11-FR
		Italian	526425 P.BE-CPX-FB11-IT

Terminal CPX

FESTO

Technical data – Bus node CPX-FB13



Bus node for handling communication between the electrical CPX terminal and a higher-order master via PROFIBUS DP.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The fieldbus communication status is displayed via the PROFIBUS-specific error LED.



Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical PROFIBUS allocation (to EN 50170).

The bus connector plug (with IP65/IP67 protection from Festo or IP20 protection from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

An active bus terminal can be connected using the DIL switch integrated in the plug.

The Sub-D interface is designed for controlling network components with a fibre-optic cable connection.

PROFIBUS DP implementation

The CPX-FB13 supports the PROFIBUS DP protocol to EN 50170 Volume 2 for synchronous I/O exchange, parameterisation and diagnostic functions (DPV0).

In addition to DPV0, asynchronous communication to the advanced specification DPV1 is supported. DPV1 provides asynchronous access to advanced system information and assigns operation parameters while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB13 supports any configuration of I/O modules, including pneumatic interface.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

Technical data – Bus node CPX-FB13

FESTO

General technical data		
Type	CPX-FB13	
Fieldbus interface	Sub-D socket, 9-pin (EN 50 170) Galvanically isolated 5 V	
Baud rate	[Mbit/s]	0.0096 ... 12
Addressing range	1 ... 125 Set using DIL switch	
Product range	4: Valves	
Ident. number	0x059E	
Communication types	DPV0: Synchronous communication DPV1: Asynchronous communication	
Configuration support	GSD file and bitmaps	
Max. address capacity	Inputs [byte]	64
	Outputs [byte]	64
LED displays (bus-specific)	BF: Bus fault	
Device-specific diagnostics	Identifier and channel-oriented diagnostics to EN 50170 (PROFIBUS standard)	
Parameterisation	<ul style="list-style-type: none">Start-up parameterisation via configuration interface in plain text (GSD)Asynchronous parameterisation via DPV1	
Additional functions	<ul style="list-style-type: none">Storage of the last 40 errors with timestamp (access via DPV1)8-bit system status in image table for inputs2-byte inputs and 2-byte outputs, system diagnostics in image table	
Control elements	DIL switch	
Operating voltage	Nominal value [V DC]	24
	Permissible range [V DC]	18 ... 30
	Power failure buffering [ms]	10
Current consumption	[mA]	Typically 200
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	PA-reinforced PC	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 50
Weight	[g]	115



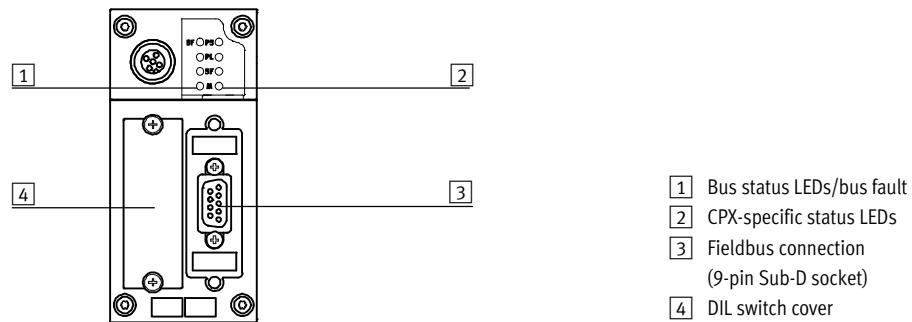
- Note
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

FESTO

Technical data – Bus node CPX-FB13

Connection and display components



- [1] Bus status LEDs/bus fault
- [2] CPX-specific status LEDs
- [3] Fieldbus connection
(9-pin Sub-D socket)
- [4] DIL switch cover

Pin allocation for PROFIBUS DP interface

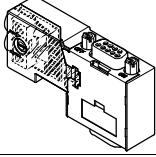
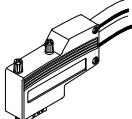
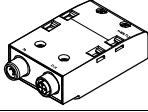
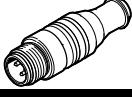
Pin allocation	Pin	Signal	Designation
Sub-D socket			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	RxD/TxD-P	Received/transmitted data P
	4	CNTR-P ¹⁾	Repeater control signal
	5	DGND	Data reference potential (M5V)
	6	VP	Supply voltage (P5V)
	7	n.c.	Not connected
	8	RxD/TxD-N	Received/transmitted data N
	9	n.c.	Not connected
	Housing	Screened	Connection to housing
Bus connection M12 adapter (B-coded)			
Incoming 	1	n.c.	Not connected
	2	RxD/TxD-N	Received/transmitted data N
	3	n.c.	Not connected
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Screened	Connection to FE (functional earth)
Outgoing 	1	VP	Supply voltage (P5V)
	2	RxD/TxD-N	Received/transmitted data N
	3	DGND	Data reference potential (M5V)
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Screened	Connection to FE (functional earth)

1) The repeater control signal CNTR-P is realised as a TTL signal.

Terminal CPX

Accessories – Bus node CPX-FB13

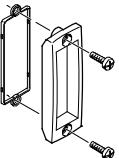
FESTO

Ordering data		Part No.	Type
Designation			
Bus node			
	PROFIBUS bus node	195740	CPX-FB13
Bus connection			
	Sub-D straight plug connector with terminating resistor and programming interface	574589	NECU-S1W9-C2-APB
	Sub-D plug, straight	532216	FBS-SUB-9-GS-DP-B
	Sub-D plug, angled	533780	FBS-SUB-9-WS-PB-K
	Bus connection M12 adapter (B-coded)	533118	FBA-2-M12-5POL-RK
	Connection block M12 adapter (B-coded)	541519	CPX-AB-2-M12-RK-DP
	Socket M12x1, 5-pin, straight, for self-assembly of a connecting cable for FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP	1067905	NECU-M-B12G5-C2-PB
	Plug M12x1, 5-pin, straight, for self-assembly of a connecting cable for FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP	1066354	NECU-M-S-B12G5-C2-PB
	Terminating resistor, M12, B-coded for PROFIBUS	1072128	CACR-S-B12G5-220-PB

Terminal CPX

FESTO

Accessories – Bus node CPX-FB13

Ordering data		Part No.	Type
Designation			
Bus connection			
	Inscription label holder for connection block M12	536593	CPX-ST-1
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Adapter from 5-pin M12 to mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5
User manual			
	User manual for bus node CPX-FB13	German	526427 P.BE-CPX-FB13-DE
		English	526428 P.BE-CPX-FB13-EN
		Spanish	526429 P.BE-CPX-FB13-ES
		French	526430 P.BE-CPX-FB13-FR
		Italian	526431 P.BE-CPX-FB13-IT

Terminal CPX

Technical data – Bus node CPX-FB14

FESTO



Bus node for handling communication between the electrical CPX terminal and a CANopen network master or CANopen network.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The different CANopen statuses and the fieldbus communication status are displayed via three additional LEDs.



Application

Bus connection

The bus connection is established via a 9-pin Sub-D plug (pin) as per the CAN in Automation (CiA) specification DS 102 with additional 24 V CAN transceiver supply (option as per DS 102).

The bus connector plug (with IP65/IP67 protection from Festo or IP20 protection from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

There are four contacts available for the four wires (CAN_L, CAN_H, 24 V, 0 V) of the incoming and outgoing bus cables.

CANopen implementation

The CPX-FB14 supports the CANopen protocol in accordance with the specifications DS 301 V4.01 and DS 401 V2.0.

Implementation is based on the CiA Pre-defined Connection Set.

There are four PDOs available for fast I/O data exchange.

Advanced system information can also be accessed by means of SDO communication. SDO communication also facilitates parameterisation before network startup or while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity, the CPX-FB14 supports a large number of I/O module configurations, including pneumatic interface.

By default, 8 byte digital inputs and 8 byte digital outputs can be addressed via PDO 1.

8 analogue input channels and 8 analogue output channels can be addressed via PDO 2 and 3. Status and diagnostic information can be evaluated via PDO 4.

Additional 8 byte digital inputs and outputs as well as 8 analogue input and output channels can be addressed via mapping.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8 byte outputs
- 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB14

General technical data		
Type	CPX-FB14	
Fieldbus interface	Sub-D pin, 9-pin (to DS 102) Bus interface galvanically isolated via optocoupler 24 V supply for CAN interface via bus	
Baud rate	[kbit/s]	
Addressing range	Node ID 1 ... 127 Set using DIL switch	
Product range	Digital inputs and outputs	
Communication profile	DS 301, V4.01	
Device profile	DS 401, V2.0	
Number	PDO	4 Tx/4 Rx
	SDO	1 server SDO
Configuration support	EDS file and bitmaps	
Max. address capacity	Inputs [byte]	16 digital, 16 analogue channels
	Outputs [byte]	16 digital, 16 analogue channels
LED displays (bus-specific)	MS = Module status NS = Network status IO = I/O status	
Device-specific diagnostics	Via emergency message Object 1001, 1002 and 1003	
Parameterisation	Via SDO	
Additional functions	<ul style="list-style-type: none"> • Storage of the last 40 errors with timestamp (access via SDO) • 8-bit system status via transmit PDO 4 (default) • 2-byte inputs and 2-byte outputs, system diagnostics via PDO 4 • Minimum boot-up • Variable PDO mapping • Emergency message • Node guarding • Heart beat 	
Control elements	DIL switch	
Operating voltage	Nominal value [V DC]	24
	Permissible range [V DC]	18 ... 30
	Power failure buffering [ms]	10
Current consumption	[mA]	Typically 200
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	PA-reinforced PC	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 50
Weight	[g]	115



Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Bus node CPX-FB14

FESTO

Connection and display components



Pin allocation for the CANopen interface

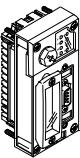
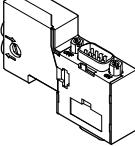
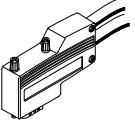
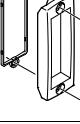
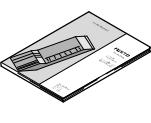
Pin allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	Received/transmitted data low
	3	CAN_GND	0 V CAN interface
	4	n.c.	Not connected
	5	CAN_Shld	Optional screened connection
	6	GND	Ground ¹⁾
	7	CAN_H	Received/transmitted data high
	8	n.c.	Not connected
	9	CAN_V+	24 V DC supply for CAN interface
	Housing	Screened	Connection to FE (functional earth)
Micro Style bus connection (M12)			
Incoming 	1	Screened	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply for CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Outgoing 			
Outgoing 	1	Screened	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply for CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Open Style bus connection			
	1	CAN_GND	0 V CAN interface
	2	CAN_L	Received/transmitted data low
	3	Screened	Connection to FE (functional earth)
	4	CAN_H	Received/transmitted data high
	5	CAN_V+	24 V DC supply for CAN interface

1) Connected internally via Pin 3

Terminal CPX

FESTO

Accessories – Bus node CPX-FB14

Ordering data		
Designation	Part No. Type	
Bus node		
	CANopen bus node 526174 CPX-FB14	
Bus connection		
	Sub-D socket for CANopen with terminating resistor and programming interface 574588 NECU-S1W9-C2-ACO	
	Sub-D plug 532219 FBS-SUB-9-BU-2x5POL-B	
	Sub-D plug, angled 533783 FBS-SUB-9-WS-CO-K	
	Connection block, Sub-D socket, 9-pin, plug 7/8", 5-pin 571052 CPX-AB-1-7/8-DN	
	Micro Style bus connection, 2xM12, 5-pin 525632 FBA-2-M12-5POL	
	Fieldbus socket for Micro Style connection, M12, 5-pin 18324 FBSD-GD-9-5POL	
	Plug for Micro Style connection, M12, 5-pin 175380 FBS-M12-5GS-PG9	
	Open Style bus connection 525634 FBA-1-SL-5POL	
	Terminal strip for Open Style connection, 5-pin 525635 FBSD-KL-2x5POL	
	Inspection cover, transparent 533334 AK-SUB-9/15-B	
	Inscription label holder for connection block 536593 CPX-ST-1	
	Adapter from 5-pin M12 to mini USB socket and controller software 547432 NEFC-M12G5-0.3-U1G5	
User manual		
	User manual for bus node CPX-FB14 German 526409 P.BE-CPX-FB14-DE English 526410 P.BE-CPX-FB14-EN Spanish 526411 P.BE-CPX-FB14-ES French 526412 P.BE-CPX-FB14-FR Italian 526413 P.BE-CPX-FB14-IT	

Terminal CPX

Technical data – Bus node CPX-M-FB21



Bus node for handling communication between the electrical terminal CPX and a higher-order master via INTERBUS.

The bus node processes communication with the I/O modules.

The status of the terminal CPX is displayed as a common message via 4 CPX-specific LEDs.

The fieldbus communication status is displayed via 6 INTERBUS-specific LEDs.



Application

Bus connection

The bus connection is established via a socket with INTERBUS Rugged Line connection technology and the associated plug, with fibre-optic cables used for the power supply to the valve terminal and data transmission.

The bus node is used as a remote I/O. It supports processing of max. 96 inputs and 96 outputs or max. 6 analogue I/O channels.

The I/O area is divided into:

- Digital I/O
- Analogue I/O

- System status/system diagnostics (optional)
- PCP channel (optional)

INTERBUS implementation

The CPX-M-FB21 support the INTERBUS protocol to EN 50254. In addition to cyclic I/O exchange, the optional PCP channel can be used for parameterisation and diagnostic functions.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

The PCP channel provides access to advanced system information and assigns operation parameters while the controller is running via the user program.

Note
If the PCP channel is used, the maximum number of possible process data bits is reduced by 16.

Special features in combination with CPX-FB21

- Remote Controller operating mode is not supported. A CPX-CEC cannot be used in combination with CPX-FB21 in a terminal CPX.

- Power is supplied via the fieldbus connection. It is therefore not possible to use an interlinking block with system supply within a terminal CPX with CPX-M-FB21.

- Only the valve terminals VTSA and VTSA-F with pneumatic interface VABA-S6-1-X2 can be selected as the pneumatic part.

Terminal CPX

FESTO

Technical data – Bus node CPX-M-FB21

General technical data		
Type	CPX-M-FB21	
Fieldbus interface	Rugged Line fibre-optic cable connection	
Baud rate	[Mbit/s]	
Bus type	Remote bus	
Max. address capacity	Inputs Outputs	[bit] [bit]
LED displays	INTERBUS-specific	BA = Bus active FO1 = Fibre-optic cable 1 FO2 = Fibre-optic cable 2 RC = Remotebus check RD = Remotebus disable UL = Operating voltage for INTERBUS interface
	CPX-specific	M = Parameterisation SF = System fault US1 = Electronics supply, sensor supply US2 = Load supply
Device-specific diagnostics	<ul style="list-style-type: none"> Diagnostic memory Channel and module-oriented diagnostics Module undervoltage 	
Parameterisation	<ul style="list-style-type: none"> Diagnostic behaviour Fail-safe response Forcing of channels Signal setup System parameters 	
Additional functions	<ul style="list-style-type: none"> Module and system parameterisation via operator units System status can be represented using process data Additional diagnostic interface for operator units 	
Operating elements	DIL switches	
Operating voltage	Nominal value Permissible range	[V DC] [V DC]
Intrinsic current consumption at nominal operating voltage	24 (polarity-safe) 18 ... 30	
Protection class to EN 60529	Typically 90	
Temperature range	Operation Storage/transport	[°C] [°C]
CE marking (see declaration of conformity)	-5 ... +50 -20 ... +70	
Housing materials	To EU EMC Directive	
Note on materials	Aluminium	
Grid dimension	RoHS-compliant	
Dimensions (incl. interlinking block) W x L x H	50	
Product weight	CPX-FB21	[g]
	1,255	



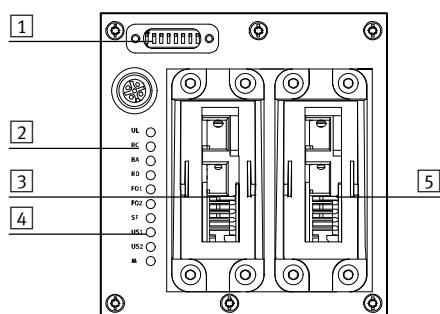
- Note
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Bus node CPX-M-FB21

FESTO

Connection and display components



- [1] DIL switch
- [2] INTERBUS-specific LEDs
- [3] Fieldbus connection, incoming
- [4] CPX-specific status LEDs
- [5] Fieldbus connection, outgoing

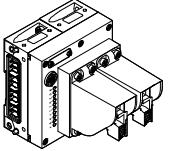
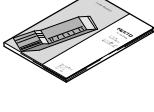
Pin allocation for INTERBUS interface

FOC pin allocation	Pin	Wire colour	Designation
Incoming			
	A	Black	Transmitted data
	B	Orange	Received data
	1	–	24 V supply for electronics and inputs
	2	–	0 V supply for electronics and inputs
	3	–	24 V supply for valves and outputs
	4	–	0 V supply for valves and outputs
	5	–	Functional earth
Outgoing			
	A	Orange	Transmitted data
	B	Black	Received data
	1	–	24 V supply for electronics and inputs
	2	–	0 V supply for electronics and inputs
	3	–	24 V supply for valves and outputs
	4	–	0 V supply for valves and outputs
	5	–	Functional earth

Terminal CPX

FESTO

Accessories – Bus node CPX-M-FB21

Ordering data		Part No.	Type
Designation			
Bus node			
			
	INTERBUS bus node, incoming and outgoing fieldbus connection	572221	CPX-M-FB21
Bus connection			
		572818	CPX-M-FB21-IB-RL
Manual			
		German	575107 P.BE-CPX-FB20/21-DE
		English	575108 P.BE-CPX-FB20/21-EN
		Spanish	575109 P.BE-CPX-FB20/21-ES
		French	575110 P.BE-CPX-FB20/21-FR
		Italian	575111 P.BE-CPX-FB20/21-IT

Terminal CPX

Technical data – Bus node CPX-FB23-24

FESTO

CC-Link

Bus node for handling communication between the electrical CPX terminal and a higher-order master for Control & Communication-Link (CC-Link) from Mitsubishi.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.

The fieldbus communication status is displayed via 4 CC-Link-specific LEDs.



Application

Bus connection

The bus connection can be selected when ordering and is established by means of a screw terminal with IP20

protection, a Sub-D plug with IP65/IP67 protection from Festo or IP20 protection from other

manufacturers.
Both connection types have the function of an integrated T-distributor and

thus support the connection of an incoming and outgoing bus cable.

CC-Link implementation

The CPX bus node CPX-FB23-24 optionally supports the CC-Link versions 2.0 (as function module F24) and 1.1. (as function module F23). These designations are also found in the system diagram for the CPX Maintenance Tool (CPX-FMT) from Festo.

Function module F24 corresponds to CC-Link version 2.0 and supports a maximum of four stations per slave, up to an address capacity 64 bytes of digital I/O and 64 bytes of analogue I/O each.
It is possible to optimise the configuration of the addressing in terms of either cycle time or station.

Function module F23 corresponds to CC-Link version 1.1 and supports a maximum of four stations per slave, up to an address capacity 32 bytes of digital I/O and 14 bytes of analogue I/O each.

The function module and option are set using the DIL switch on the CPX bus nodes.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place by interlinking of the CPX modules

and takes up the following address capacity in the CPX system:
• 8 byte outputs
• 8 byte inputs
The following address capacity

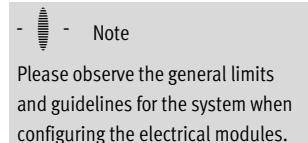
remains in the control block or CPX system for actuation of the peripherals:
• 56 byte inputs
• 56 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB23-24

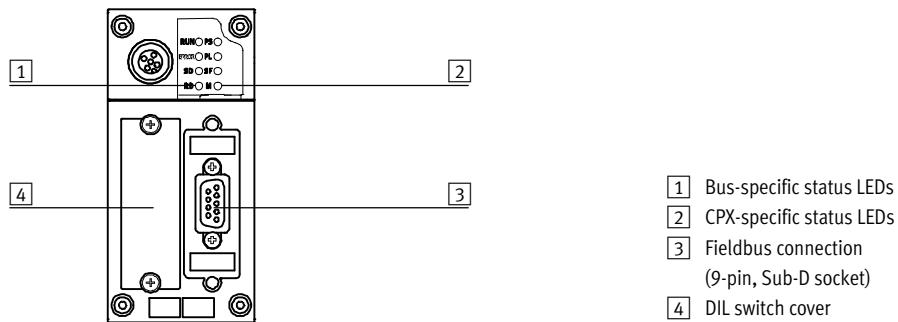
General technical data		CPX-FB23-24	
Type		CPX-FB23-24	
Fieldbus interface		Either • Sub-D socket, 9-pin • Sub-D plug, for self-assembly • Screw terminal strip, IP20	
Baud rates		[kbps]	
Protocol		CC-Link	
Max. address capacity, inputs	FB23	RWr	[byte]
		Rx	[byte]
	FB24	RWr	[byte]
		Rx	[byte]
Max. address capacity, outputs	FB23	RWw	[byte]
		Ry	[byte]
	FB24	RWw	[byte]
		Ry	[byte]
LED displays (bus-specific)		RUN = Communication status ERROR = Communication error SD = Send data RD = Receive data	
Device-specific diagnostics		<ul style="list-style-type: none"> Diagnostic memory Channel and module-oriented diagnostics Module undervoltage 	
Parameterisation		<ul style="list-style-type: none"> Diagnostic behaviour Fail-safe response Forcing of channels Signal setup System parameters 	
Additional functions		<ul style="list-style-type: none"> System status can be displayed using process data Additional diagnostic interface for operator units 	
Control elements		DIL switches	
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Current consumption		[mA]	
Protection class to EN 60529		IP65, IP67	
Temperature range	Operation	[°C]	-5 ... +50
	Storage/transport	[°C]	-20 ... +70
Materials		PA reinforced, PC	
Grid dimension		[mm]	
Dimensions (incl. interlinking block) W x L x H		[mm]	
Product weight		[g]	
		115	



Terminal CPX

Technical data – Bus node CPX-FB23-24

Connection and display components



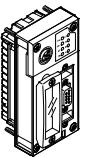
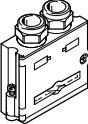
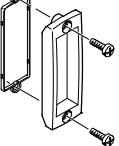
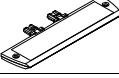
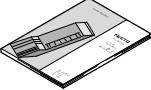
Pin allocation for the CC-Link interface

Pin allocation	Pin	Signal	Designation
Sub-D socket			
	1	n.c.	Not connected
	2	DA	Data A
	3	DG	Data reference potential
	4	n.c.	Not connected
	5	FE ¹⁾	Functional earth
	6	n.c.	Not connected
	7	DB	Data B
	8	n.c.	Not connected
	9	n.c.	Not connected
Screw terminal bus connection			
	1	FG	Functional earth/housing
	2	SLD	Screening
	3	DG	Data reference potential
	4	DB	Data B
	5	DA	Data A

Terminal CPX

FESTO

Accessories – Bus node CPX-FB23-24

Ordering data		Part No.	Type
Description			
Bus node			
	CC-Link bus node	526176	CPX-FB23-24
Bus connection			
	Sub-D plug	532220	FBS-SUB-9-GS-2x4POL-B
	Screw terminal bus connection	197962	FBA-1-KL-5POL
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Inscription label holder for connection block	536593	CPX-ST-1
	Adapter from 5-pin M12 to mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5
User documentation			
	User documentation for bus node CPX-FB23-24	German	526403 P.BE-CPX-FB23-24-DE
		English	526404 P.BE-CPX-FB23-24-EN
		Chinese	8026069 P.BE-CPX-FB23-24-ZH

Terminal CPX

Technical data – Bus node CPX-FB33

FESTO



Bus node for operating the CPX valve terminal on PROFINET.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The fieldbus communication status is displayed via three bus-specific LEDs.



Application

Bus connection

The bus connection is established via two M12 sockets, D-coded to IEC61076-2-101 with IP65, IP67 protection.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality

(cross-over and patch cables can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbit/s

PROFINET implementation

The CPX-FB33 supports the PROFINET protocol on the basis of the Ethernet standard and TCP/IP technology to IEEE802.3.

This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs

or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred. The Ethernet bandwidth is sufficient to transfer both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements, memory stick and a diagnostic interface. The purpose of the memory stick is to guarantee fast replacement of the bus node in the event of an error. PROFINET provides the user with

access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via CPX-FMT.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:
• 8 byte outputs
• 8 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:
• 56 byte inputs
• 56 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB33

General technical data		
Type	CPX-FB33	
Fieldbus interface	2x socket M12, D-coded, 4-pin	
Baud rate	[Mbit/s]	
Protocol	PROFINET RT PROFINET IRT	
Max. address capacity	Inputs Outputs	[byte] [byte]
LED displays	(bus-specific) (product-specific)	
	M/P	= Maintenance/PROFlenergy
	NF	= Network fault
	TP1	= Network active port 1
	TP2	= Network active port 2
	M	= Modify, parameterisation
	PL	= Load supply
	PS	= Electronic supply, sensor supply
	SF	= System fault
Device-specific diagnostics	<ul style="list-style-type: none"> • Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory 	
Configuration support	GSDML file	
Parameterisation	<ul style="list-style-type: none"> • System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels 	
Additional functions	<ul style="list-style-type: none"> • Start-up parameterisation in plain text via fieldbus • Fast startup (FSU) • Channel-oriented diagnostics via fieldbus • Asynchronous data access via fieldbus • System status can be represented using process data • Additional diagnostic interface for operator units • Asynchronous data access via Ethernet 	
Control elements	<ul style="list-style-type: none"> • DIL switch • Optional memory card 	
Operating voltage	Nominal value Permissible range	[V DC] [V DC]
		24 18 ... 30
Current consumption	[mA]	
Protection class to EN 60529	Typically 120	
Temperature range	Operation Storage/transport	[°C] [°C]
		- 5... +50 -20 ... +70
Materials	Housing	Die-cast aluminium
Grid dimension	[mm]	
Dimensions (incl. interlinking block) W x L x H	[mm]	
Weight	[g]	
280		



Please observe the general limits and guidelines for the system when configuring the electrical modules.



Always use screws appropriate to the interlinking block (metal or plastic):

- Self-tapping screws for plastic interlinking blocks

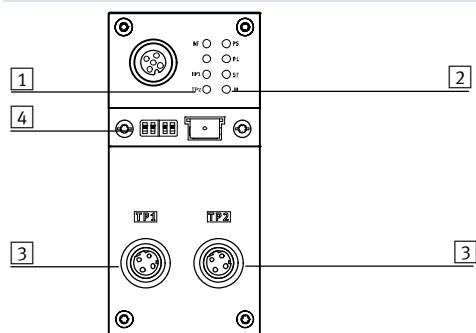
- Screws with metric thread for metal interlinking blocks

Terminal CPX

Technical data – Bus node CPX-FB33

FESTO

Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection
(4-pin socket M12, D-coded)
- [4] Transparent cover for DIL switch
and memory card

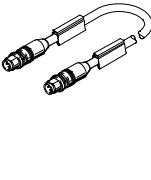
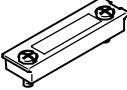
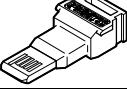
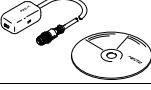
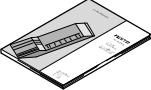
Pin allocation for the fieldbus interface

Pin allocation	Pin	Signal	Designation
M12 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing		Screened

Terminal CPX

FESTO

Accessories – Bus node CPX-FB33

Ordering data			Part No.	Type
Designation				
Bus node				
	PROFINET bus node		548755	CPX-FB33
Bus connection				
	Plug M12x1, 4-pin, D-coded		543109	NECU-M-S-D12G4-C2-ET
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	8040446 NEBC-D12G4-ES-0.5-S-D12G4-ET
			1 m	8040447 NEBC-D12G4-ES-1-S-D12G4-ET
			3 m	8040448 NEBC-D12G4-ES-3-S-D12G4-ET
			5 m	8040449 NEBC-D12G4-ES-5-S-D12G4-ET
			10 m	8040450 NEBC-D12G4-ES-10-S-D12G4-ET
		Straight plug, RJ45, 8-pin	1 m	8040451 NEBC-D12G4-ES-1-S-R3G4-ET
			3 m	8040452 NEBC-D12G4-ES-3-S-R3G4-ET
			5 m	8040453 NEBC-D12G4-ES-5-S-R3G4-ET
			10 m	8040454 NEBC-D12G4-ES-10-S-R3G4-ET
		Open end, 4-wire	5 m	8040456 NEBC-LE4-ES-5-D12G4-ET
	Transparent cover for DIL switch and memory card		548757	CPX-AK-P
	Memory card for PROFINET bus node, 2 MB		4798288	CPX-SK-3
	Cover cap for sealing unused bus connections (10 pieces)		165592	ISK-M12
	Screws for attaching an inscription label holder to the bus node (12 pieces)		550222	CPX-M-M2,5X8-12X
	Adapter from 5-pin M12 to mini USB socket and controller software		547432	NEFC-M12G5-0.3-U1G5
User manual				
	Electronics manual, CPX bus node, type CPX-FB33	German	548759	P.BE-CPX-PNIO-DE
		English	548760	P.BE-CPX-PNIO-EN
		Spanish	548761	P.BE-CPX-PNIO-ES
		French	548762	P.BE-CPX-PNIO-FR
		Italian	548763	P.BE-CPX-PNIO-IT

Terminal CPX

Technical data – Bus node CPX-M-FB34



Bus node for operating the CPX valve terminal on PROFINET.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via four CPX-specific LEDs.

The fieldbus communication status is displayed via three bus-specific LEDs.



Application

Bus connection

The bus connection is established via two RJ45 push-pull sockets to IEC61076-3-106 and IEC60603 with IP65, IP67 protection.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality

(cross-over and patch cables can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbit/s

PROFINET implementation

The CPX-M-FB34 supports the PROFINET protocol based on the Ethernet standard and the TCP/IP technology to IEEE802.3. This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs

or process equipment. In addition, non-real-time critical information such as diagnostic information, configuration information, etc. can be transferred. The Ethernet bandwidth is sufficient to transmit both data types (real-time and non-real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements, memory stick and a diagnostic interface. The purpose of the memory stick is to guarantee fast replacement of the bus node in the event of an error. PROFINET provides the user with

access to all peripherals, diagnostic data and parameter data of the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via CPX-FMT.

Special points in combination with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node is established

via the interlinking of the CPX modules and occupies an address capacity of the CPX system of:

- 8/16 byte outputs
- 8/16 byte inputs

The remaining address capacity of the control block or CPX system for actuating the peripherals is:

- 56/48 byte inputs
- 56/48 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-M-FB34

General technical data		
Type	CPX-M-FB34	
Fieldbus interface	2x RJ45 push-pull socket, AIDA	
Baud rate	[Mbit/s]	
Protocol	PROFINET RT PROFINET IRT	
Max. address capacity	Inputs Outputs	[byte] [byte]
LED displays	(bus-specific) (product-specific)	M/P = Maintenance/PROFlenergy NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2 M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics	<ul style="list-style-type: none"> • Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory 	
Configuration support	GSDML file	
Parameterisation	<ul style="list-style-type: none"> • System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels 	
Additional functions	<ul style="list-style-type: none"> • Start-up parameterisation in plain text via fieldbus • Fast startup (FSU) • Channel-oriented diagnostics via fieldbus • Asynchronous data access via fieldbus and via Ethernet • System status can be represented using process data • Additional diagnostic interface for operator units 	
Control elements	DIL switch, optional memory card	
Operating voltage	Nominal value Permissible range	[V DC] [V DC]
Intrinsic current consumption at nominal operating voltage	Typically 120 mA	
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation Storage/transport	[°C] [°C]
Material of housing	Die-cast aluminium	
Grid dimension	[mm]	
Dimensions (incl. interlinking block) W x L x H	50 x 107 x 80 mm	
Weight	280 g	

-  - Note
Please observe the general limits and guidelines for the system when configuring the electrical modules.

-  - Note
Always use screws appropriate to the interlinking block (metal or plastic):

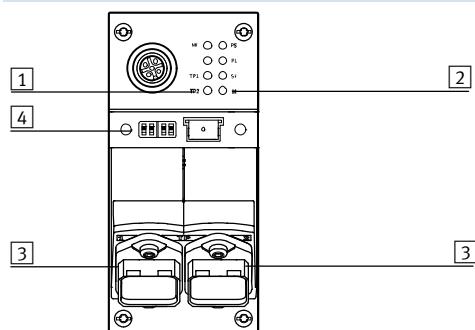
- Self-tapping screws for plastic interlinking blocks
- Screws with metric thread for metal interlinking blocks

Terminal CPX

Technical data – Bus node CPX-M-FB34

FESTO

Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection
(8-pin RJ45 socket)
- [4] DIL switch and memory card

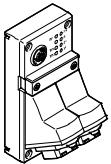
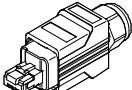
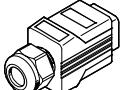
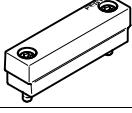
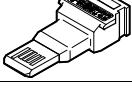
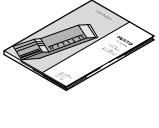
Pin allocation for the fieldbus interface

Pin allocation	Pin	Signal	Designation
RJ45 socket			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screened	Screened

Terminal CPX

FESTO

Accessories – Bus node CPX-M-FB34

Ordering data		Part No.	Type
Designation			
Bus node			
	PROFINET bus node	548751	CPX-M-FB34
Bus connection			
	RJ45 plug, 8-pin, push-pull	552000	FBS-RJ45-PP-GS
	Cover cap for bus connection	548753	CPX-M-AK-C
	Cover cap for bus connection	2873540	CPX-M-AK-D
	Cover for DIL switch and memory card	548754	CPX-M-AK-M
	Memory card for PROFINET bus node, 2 MB	4798288	CPX-SK-3
	Screws for attaching an inscription label holder to the bus node (12 pieces)	550222	CPX-M-M2,5X8-12X
	Adapter from 5-pin M12 to mini USB socket and controller software	547432	NEFC-M12G5-0,3-U1G5
User manual			
	Electronics manual, CPX bus node, type CPX-M-FB34	German	548759 P.BE-CPX-PNIO-DE
		English	548760 P.BE-CPX-PNIO-EN
		Spanish	548761 P.BE-CPX-PNIO-ES
		French	548762 P.BE-CPX-PNIO-FR
		Italian	548763 P.BE-CPX-PNIO-IT

Terminal CPX

Technical data – Bus node CPX-M-FB35/CPX-M-FB41

FESTO



Bus node for operating the CPX valve terminal on PROFINET.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.

The fieldbus communication status is displayed via three bus-specific LEDs.



Application

Bus connection

The bus connection is established via SCRI push-pull sockets to IEC61754-24 (fibre-optic cable, AIDA standard) with degree of protection to IP65, IP67.

The connections on the CPX-M-FB35 are equivalent 100BaseFX Ethernet ports that are brought together via an internal switch.

Fibre-optic cables made from plastic (POF, 980/1000 µm) are also suitable for transmission.

- Maximum segment length 50 m
- Transmission rate 100 Mbps
- Supports LLDP and SNMP

PROFINET implementation

The CPX-M-FB35/CPX-M-FB41 supports the PROFINET protocol based on the Ethernet standard and TCP/IP technology to IEEE802.3. This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or

process equipment. Furthermore, non real-time critical information such as diagnostic information, configuration information, etc. can be transferred. The Ethernet bandwidth is sufficient to transmit both data types (real-time and non real-time) in parallel.

The bus node features LEDs for bus status and CPX peripheral information as well as switch elements, memory stick and a diagnostic interface. The purpose of the memory stick is to guarantee fast replacement of the bus node in the event of an error. PROFINET provides the user with

access to all peripheral, diagnostic and parameter data for the CPX valve terminal. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, depending on the function, changed via CPX-FMT.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node takes place

by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-M-FB35/CPX-M-FB41

General technical data		CPX-M-FB35	CPX-M-FB41
Type			
Fieldbus interface		2x SCRJ push-pull socket, AIDA	
Baud rate	[Mbps]	100	
Protocol		PROFINET RT	PROFINET RT
		PROFINET IRT	–
Max. address capacity	Inputs [byte]	64	
	Outputs [byte]	64	
LED displays	(bus-specific)	M/P = Maintenance/PROFlenergy NF = Network fault TP1 = Network active port 1 TP2 = Network active port 2	NF = Network fault TP1 = Network active port 1
	(product-specific)	M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault	
Device-specific diagnostics		<ul style="list-style-type: none"> • Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory 	
Configuration support		GSDML file	
Parameterisation		<ul style="list-style-type: none"> • System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels 	
Additional functions		<ul style="list-style-type: none"> • Start-up parameterisation in plain text via fieldbus • Fast start-up (FSU) • Channel-oriented diagnostics via fieldbus • Acyclic data access via fieldbus and via Ethernet • System status can be displayed using process data • Additional diagnostic interface for operator unit 	
Control elements		DIL switch, optional memory card	
Operating voltage	Nominal value [V DC]	24	
	Permissible range [V DC]	18 ... 30	
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 150	Typically 125
Degree of protection to EN 60529		IP65, IP67	
Temperature range	Operation [°C]	– 5 ... +50	
	Storage/transport [°C]	–20 ... +70	
Housing material		Die-cast aluminium	
Note on materials		RoHS-compliant	
Grid dimension	[mm]	50	
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 80	
Product weight	[g]	280	



Please observe the general limits and guidelines for the system when configuring the electrical modules.



Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or polymer:

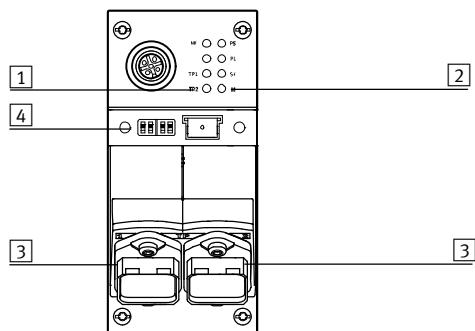
- Self-tapping screws for polymer interlinking blocks

- Screws with metric thread for metal interlinking blocks

Terminal CPX

Technical data – Bus node CPX-M-FB35/CPX-M-FB41

Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection (SCR) socket, 2-pin)
- [4] DIL switch and memory card

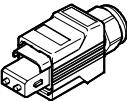
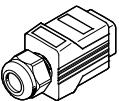
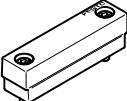
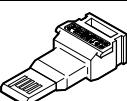
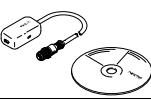
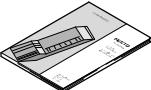
Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
SCR socket			
	1	TX	Outgoing
	2	RX	Incoming

Terminal CPX

FESTO

Accessories – Bus node CPX-M-FB35/CPX-M-FB41

Ordering data		Part No.	Type
Description			
Bus node			
	PROFINET bus node	2x SCRJ push-pull socket, AIDA	548749 CPX-M-FB35
		1x SCRJ push-pull socket, AIDA	3228960 CPX-M-FB41
Bus connection			
	SCRJ plug, 2-pin, push-pull		571017 FBS-SCRJ-PP-GS
	Cover cap for bus connection		548753 CPX-M-AK-C
	Cover cap for bus connection		2873540 CPX-M-AK-D
	Cover for DIL switch and memory card		548754 CPX-M-AK-M
	Memory card for PROFINET bus node, 2MB		4798288 CPX-SK-3
	Screws for attaching an inscription label to the bus node (12 pieces)		550222 CPX-M-M2,5X8-12X
	5-pin M12 adapter for mini USB socket and controller software		547432 NEFC-M12G5-0.3-U1G5
User documentation			
	Electronics manual, CPX bus node, type CPX-M-FB35/CPX-M-FB41	German	548759 P.BE-CPX-PNIO-DE
		English	548760 P.BE-CPX-PNIO-EN
		Spanish	548761 P.BE-CPX-PNIO-ES
		French	548762 P.BE-CPX-PNIO-FR
		Italian	548763 P.BE-CPX-PNIO-IT

Terminal CPX

Technical data – Bus node CPX-FB36



Bus node for handling communication between the electrical terminal CPX and the EtherNet/IP network.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the terminal CPX is displayed as a common message via 4 CPX-specific LEDs.



Application

Bus connection

The bus connection is established via an M12 plug, D-coded to IEC947-5-2 with IP65, IP67 protection.

EtherNet/IP is an open bus system based on the Ethernet standard and TCP/IP technology (IEEE802.3).

EtherNet/IP implementation

The CPX-FB36 supports the two operating modes: remote I/O and remote controller.
In remote I/O operating mode, all functions of the CPX valve terminal are

directly controlled by the EtherNet/IP master (host).
In addition to actuation via a bus system, it is possible to use IT technologies. An integrated web server

enables diagnostic data to be visualised via HTML. Various programs support direct access to the data of the device from the automation

network.
The EtherNet/IP node for CPX supports the transmission technology that conforms to DIN EN 50173/CAT 5.

Points to note in connection with CPX-CEC

When combining a bus node with a control block (CPX-CEC, in fieldbus remote controller operating mode), the connected I/Os or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC.
Communication between the control block and CPX bus node takes place via interlinking of the CPX modules

and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

 The following address capacity

remains in the control block or CPX system for actuation of the peripherals:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB36

General technical data		CPX-FB36
Type		CPX-FB36
Fieldbus interface		2x M12x1 socket, D-coded, 4-pin
Baud rates	[Mbit/s]	10/100
Protocol		EtherNet/IP Modbus TCP
Max. address capacity, inputs	[byte]	64
Max. address capacity, outputs	[byte]	64
LED displays (bus-specific)		MS = Module status NS = Network status TP1 = Network active port 1 TP2 = Network active port 2
Device-specific diagnostics		<ul style="list-style-type: none"> Module and channel-oriented diagnostics Module undervoltage Diagnostic memory
Configuration support		<ul style="list-style-type: none"> EDS file L5K export with CPX-FMT
Parameterisation		<ul style="list-style-type: none"> Diagnostic behaviour Fail-safe response Forcing of channels Idle mode characteristics Signal setup System parameters
Additional functions		<ul style="list-style-type: none"> EtherNet/IP Quickconnect Ring topology (DLR) Acyclic data access via "Explicit Message" and Ethernet Integrated switch IP addressing via DHCP, DIL switch or operator unit Channel-oriented diagnostics via fieldbus Start-up parameterisation in plain text via fieldbus System status can be represented using process data Additional diagnostic interface for operator units
Control elements		DIL switches
Operating voltage	Nominal value	[V DC] 24
	Permissible range	[V DC] 18 ... 30
Current consumption (at nominal voltage)		[mA] Typically 100
Protection class to EN 60529		IP65, IP67
Temperature range	Operation	[°C] -5 ... +50
	Storage/transport	[°C] -20 ... +70
Materials		PA reinforced
Note on materials		RoHS-compliant
Grid dimension		[mm] 50
Dimensions (incl. interlinking block) W x L x H		[mm] 50 x 107 x 50
Product weight		[g] 125



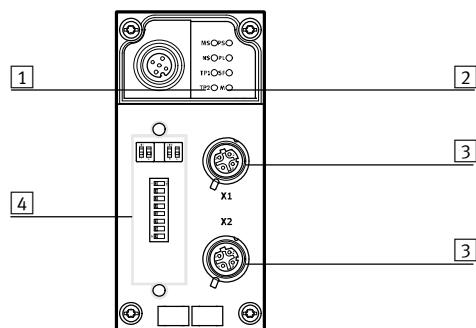
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Bus node CPX-FB36

FESTO

Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection (4-pin socket M12, D-coded)
- [4] Transparent DIL switch cover

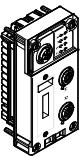
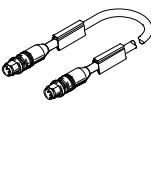
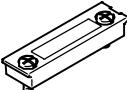
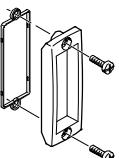
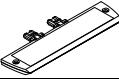
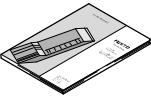
Pin allocation for the fieldbus interface

Pin allocation	Pin	Signal	Designation
M12 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Hous-ing	FE	Screening

Terminal CPX

FESTO

Accessories – Bus node CPX-FB36

Ordering data		Part No.	Type
Designation			
Bus node			
	EtherNet/IP bus node	1912451	CPX-FB36
Bus connection			
	Plug M12x1, 4-pin, D-coded	543109	NECU-M-S-D12G4-C2-ET
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m 8040446 NEBC-D12G4-ES-0.5-S-D12G4-ET 1 m 8040447 NEBC-D12G4-ES-1-S-D12G4-ET 3 m 8040448 NEBC-D12G4-ES-3-S-D12G4-ET 5 m 8040449 NEBC-D12G4-ES-5-S-D12G4-ET 10 m 8040450 NEBC-D12G4-ES-10-S-D12G4-ET
		Straight plug, RJ45, 8-pin	1 m 8040451 NEBC-D12G4-ES-1-S-R3G4-ET 3 m 8040452 NEBC-D12G4-ES-3-S-R3G4-ET 5 m 8040453 NEBC-D12G4-ES-5-S-R3G4-ET 10 m 8040454 NEBC-D12G4-ES-10-S-R3G4-ET
		Open end, 4-wire	5 m 8040456 NEBC-LE4-ES-5-D12G4-ET
	Transparent cover for DIL switch and memory card	548757	CPX-AK-P
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Inscription label holder for connection block	536593	CPX-ST-1
	5-pin M12 to mini USB socket adapter and controller software	547432	NEFC-M12G5-0.3-U1G5
Manual			
	Electronics manual, CPX bus node, type CPX-FB36	German 8024074 CPX-FB36-DE English 8024075 CPX-FB36-EN Spanish 8024076 CPX-FB36-ES French 8024077 CPX-FB36-FR Italian 8024078 CPX-FB36-IT Chinese 8024079 CPX-FB36-ZH	

Terminal CPX

Technical data – Bus node CPX-FB37

FESTO



Bus node for operating the CPX valve terminal on EtherCAT.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the terminal CPX is displayed as a common message via 4 CPX-specific LEDs.

The fieldbus communication status is displayed via 4 bus-specific LEDs.



Application

Bus connection

The bus connection is established via two M12x1 sockets, D-coded to IEC61076-2-101 with degree of protection to IP65, IP67.

Both connections are equivalent 100BaseTX Ethernet ports with integrated auto MDI functionality

(cross-over and patch cable can be used) that are brought together via an internal switch.

- Maximum segment length 100 m
- Transmission rate 100 Mbps

EtherCAT implementation

The CPX-FB37 supports the EtherCAT protocol based on the Ethernet standard and TCP/IP technology to IEEE802.3.

This guarantees a data exchange with a high data transmission rate, for example I/O data from sensors, actuators or robot controllers, PLCs or process equipment. Furthermore, non real-time critical information such as diagnostic information, configuration information, etc. can be transferred.

The data bandwidth is sufficient to transmit both data types (real-time and non-real-time) in parallel. The bus node features LEDs for bus status and CPX peripheral information as well as switch elements and a diagnostic interface. The bus node can be used as a remote I/O or remote controller. All information relevant to the CPX can be read out and, dependent on the function, changed via an FMT. The functions MDP (modular device

profile) and CoE (CAN over EtherCAT) enable easy access to parameters and diagnostic data via EtherCAT.

Specific EtherCAT functions:

- CoE (parameters and diagnostics or fail-safe mode): all module parameters can be set
- FoE (file over EtherCAT) makes it possible to download firmware easily

- EoE (Ethernet over EtherCAT): diagnostic data can be retrieved easily using a browser
- MDP (modular device profile): easy configuration using a module selection box
- Hot Connect, easy replacement of an EtherCAT CPX terminal
- DC (distributed clocks), time-synchronised data transmission

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node takes place

by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
- 8/16 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56/48 byte inputs
- 56/48 byte outputs

Terminal CPX

FESTO

Technical data - Bus node CPX-FB37

General technical data		
Type	CPX-FB37	
Fieldbus interface	2x M12x1 socket, 4-pin, D-coded	
Baud rates	[Mbps]	
Protocol		EtherCAT
Max. address capacity	Inputs Outputs	[byte] [byte]
LED displays	Bus-specific	Error = Communication error L/A1 = Network active port 1 L/A2 = Network active port 2 Run = Communication status
	Product-specific	M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics	<ul style="list-style-type: none"> • Channel and module-oriented diagnostics • Undervoltage of modules • Diagnostic memory 	
Configuration support	ESI file	
Parameterisation	<ul style="list-style-type: none"> • System parameters • Diagnostic behaviour • Signal setup • Fail-safe response • Forcing of channels 	
Additional functions	<ul style="list-style-type: none"> • System status can be displayed using process data • Additional diagnostic interface for operator units • Emergency message • Acyclic data access via fieldbus • Diagnostic object • Compatibility mode for the CPX-FB38 • Modular device profile (MDP) • Variable PDO mapping 	
Control elements	DIL switches	
Operating voltage	Nominal value Permissible range	[V DC] [V DC]
		24 18 ... 30
Current consumption	[mA]	
Degree of protection to EN 60529	Typically 100	
Temperature range	Operation Storage/transport	[°C] [°C]
		-5 ... +50 -20 ... +70
Materials	Housing	Reinforced PA
Note on materials	RoHS-compliant	
Grid dimension	[mm]	
Dimensions (incl. interlinking block) W x L x H	50 x 107 x 50	
Product weight	[g]	
	125	



Please observe the general limits and guidelines for the system when configuring the electrical modules.



Always use the correct screws for the interlinking block; this depends on whether the block is made of metal or polymer:

- Self-tapping screws for polymer interlinking blocks

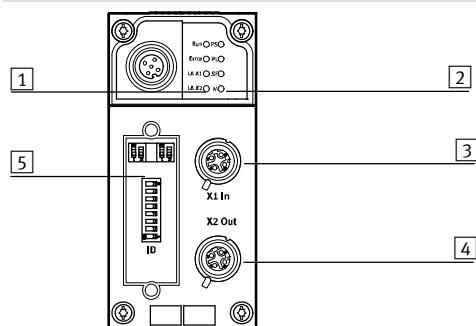
- Screws with metric thread for metal interlinking blocks

Terminal CPX

Technical data – Bus node CPX-FB37

FESTO

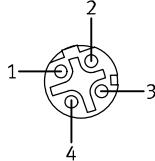
Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection, input
(M12x1 socket, 4-pin, D-coded)
- [4] Fieldbus connection, output
(M12x1 socket, 4-pin, D-coded)
- [5] DIL switch

Pin allocation for the fieldbus interface

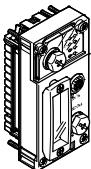
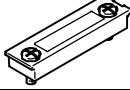
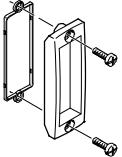
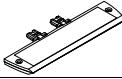
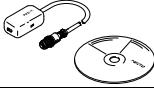
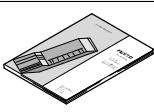
Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Housing	FE	Screening



Terminal CPX

FESTO

Accessories – Bus node CPX-FB37

Ordering data		Part No.	Type	
Description				
Bus node				
	EtherCAT bus node	2735960	CPX-FB37	
Bus connection				
	Plug connector M12x1, 4-pin, D-coded	543109	NECU-M-S-D12G4-C2-ET	
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m 1 m 3 m 5 m 10 m	8040446 NEBC-D12G4-ES-0.5-S-D12G4-ET 8040447 NEBC-D12G4-ES-1-S-D12G4-ET 8040448 NEBC-D12G4-ES-3-S-D12G4-ET 8040449 NEBC-D12G4-ES-5-S-D12G4-ET 8040450 NEBC-D12G4-ES-10-S-D12G4-ET
		Straight plug, RJ45, 8-pin	1 m 3 m 5 m 10 m	8040451 NEBC-D12G4-ES-1-S-R3G4-ET 8040452 NEBC-D12G4-ES-3-S-R3G4-ET 8040453 NEBC-D12G4-ES-5-S-R3G4-ET 8040454 NEBC-D12G4-ES-10-S-R3G4-ET
		Open end, 4-wire	5 m	8040456 NEBC-LE4-ES-5-D12G4-ET
	Transparent cover for DIL switch and memory card	548757	CPX-AK-P	
	Inspection cover, transparent	533334	AK-SUB-9/15-B	
	Cover cap for sealing unused bus connections (10 pieces)	165592	ISK-M12	
	Inscription label holder for connection block	536593	CPX-ST-1	
	5-pin M12 adapter for mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5	
User documentation				
	Electronics manual, CPX bus node, type CPX-FB37	German English Spanish French Italian Chinese	8029674 P.BE-CPX-FB37-DE 8029675 P.BE-CPX-FB37-EN 8029676 P.BE-CPX-FB37-ES 8029677 P.BE-CPX-FB37-FR 8029678 P.BE-CPX-FB37-IT 8029679 P.BE-CPX-FB37-ZH	

Terminal CPX

Technical data – Bus node CPX-FB39



Bus node for handling communication between the electrical CPX terminal and the Sercos III network.

The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules.

The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.



Application

Bus connection

The bus connection is established via two M12x1 plug connectors, D-coded to IEC947-5-2 with degree of protection to IP65, IP67. The connections are equipped with automatic detection for the incoming and outgoing connection.

The Sercos III bus node can be used to connect the CPX valve terminal to the standardised Sercos III bus. Sercos II uses the Ethernet standard (IEEE802.3) and TCP/IP technology for communication in an industrial

environment.

Industry-compatible Sercos III devices enable data to be exchanged with a higher data transmission rate, such as data from sensors, actuators or controllers. You can also transmit

information that is not real-time critical, such as diagnostics or configuration information.

Web servers

In addition to activation via a bus system, it is possible to use IT

technologies. An integrated web server enables diagnostic data to be

visualised via HTML. Various programs support direct access to the device

data from the automation network.

Points to note in connection with CPX-CEC

The CPX-FB39 supports the operating modes remote I/O and remote controller. In remote I/O operating mode, all functions of the CPX valve terminal are directly controlled by the Sercos controller.

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block. In this case, the bus node only

provides the communication interface to the PLC. Communication between the control block and CPX bus node takes place by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8/16 byte outputs
 - 8/16 byte inputs
- The following address capacity remains in the control block or CPX system for activating the peripherals:
- 56/48 byte inputs
 - 56/48 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB39

General technical data		
Type	CPX-FB39	
Fieldbus interface	2x M12x1 socket, D-coded, 4-pin	
Baud rates	[Mbps]	
Protocol		Sercos III
Max. address capacity	Inputs	[byte] 64
	Outputs	[byte] 64
LED displays	Bus-specific	S = Sercos LED SD = Sercos sub-device LED TP1 = Network active port 1 TP2 = Network active port 2
	Product-specific	M = Modify, parameterisation PL = Load supply PS = Electronics supply, sensor supply SF = System fault
Device-specific diagnostics	<ul style="list-style-type: none"> Module and channel-oriented diagnostics Undervoltage of modules Diagnostic memory 	
Configuration support	SDDML file	
Parameterisation	<ul style="list-style-type: none"> Diagnostic behaviour Fallback output data Forcing of channels Signal setup System parameters 	
Additional functions	<ul style="list-style-type: none"> Ayclic and cyclic data access via Sercos IP addressing via Sercos parameters or operator unit Channel-oriented diagnostics via fieldbus Start-up parameterisation in plain text via fieldbus System status can be displayed using process data Additional diagnostic interface for operator units 	
Control elements	DIL switches	
Operating voltage	Nominal value	[V DC] 24
	Permissible range	[V DC] 18 ... 30
Current consumption (at nominal voltage)		[mA] Typically 100
Degree of protection to EN 60529	IP65, IP67	
Temperature range	Operation	[°C] - 5 ... +50
	Storage/transport	[°C] -20 ... +70
Materials	PA reinforced	
Note on materials	RoHS compliant	
Grid dimension	[mm] 50	
Dimensions (incl. interlinking block) W x L x H	[mm] 50 x 107 x 50	
Product weight	[g] 125	



Note

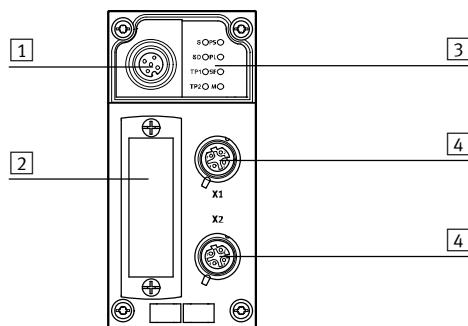
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Bus node CPX-FB39

FESTO

Connection and display components



- [1] Service interface for PC with CPX maintenance tool NEFC-M12G5-0.3-U1G5
- [2] Transparent DIL switch cover
- [3] Status LED, bus-specific and CPX-specific
- [4] Fieldbus connection (M12x1 socket, 4-pin, D-coded)

Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Hous-ing	FE	Screening

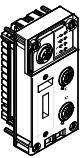
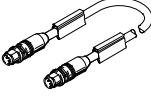
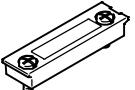
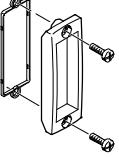
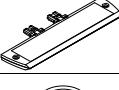
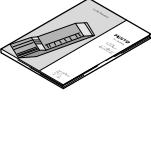
- - Note

The CPX-FB39 has the capability for automatic detection of transmit and receive cables (Auto-MDI/MDI-X Auto-Crossover). RD and TD signal pairs are automatically swapped if required.

Terminal CPX

FESTO

Accessories – Bus node CPX-FB39

Ordering data		Part No.	Type	
Description				
Bus node				
	Ethernet Sercos III bus node	2093101	CPX-FB39	
Bus connection				
	Plug connector M12x1, 4-pin, D-coded	543109	NECU-M-S-D12G4-C2-ET	
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m 1 m 3 m 5 m 10 m	8040446 NEBC-D12G4-ES-0.5-S-D12G4-ET 8040447 NEBC-D12G4-ES-1-S-D12G4-ET 8040448 NEBC-D12G4-ES-3-S-D12G4-ET 8040449 NEBC-D12G4-ES-5-S-D12G4-ET 8040450 NEBC-D12G4-ES-10-S-D12G4-ET
		Straight plug, RJ45, 8-pin	1 m 3 m 5 m 10 m	8040451 NEBC-D12G4-ES-1-S-R3G4-ET 8040452 NEBC-D12G4-ES-3-S-R3G4-ET 8040453 NEBC-D12G4-ES-5-S-R3G4-ET 8040454 NEBC-D12G4-ES-10-S-R3G4-ET
		Open end, 4-wire	5 m	8040456 NEBC-LE4-ES-5-D12G4-ET
	Transparent cover for DIL switch and memory card	548757	CPX-AK-P	
	Inspection cover, transparent	533334	AK-SUB-9/15-B	
	Cover cap for sealing unused bus connections (10 pieces)	165592	ISK-M12	
	Inscription label holder for connection block	536593	CPX-ST-1	
	5-pin M12 to mini USB socket adapter and controller software	547432	NEFC-M12G5-0.3-U1G5	
User Documentation				
	User Documentation for bus node CPX-FB39	German English Spanish French Italian Chinese	8028632 P.BE-CPX-FB39-DE 8028633 P.BE-CPX-FB39-EN 8028634 P.BE-CPX-FB39-ES 8028635 P.BE-CPX-FB39-FR 8028636 P.BE-CPX-FB39-IT 8028637 P.BE-CPX-FB39-ZH	

Terminal CPX

Technical data – Bus node CPX-FB40

FESTO



Bus node for handling communication between the electrical CPX terminal and the Ethernet POWERLINK network. The bus node is provided with system supply via the interlinking block and processes communication with the I/O modules. The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.



Application

Bus connection

The bus connection is established via an M12x1 plug connector, D-coded to IEC947-5-2 with degree of protection to IP65, IP67.

Ethernet POWERLINK uses the Ethernet standards and TCP/IP technology (IEEE802.3) for communication in an industrial environment and integrates all CANopen mechanisms. It includes all the key features of standard Ethernet, including

internode communication, hotplug capability and free selection of network topology. Ethernet POWERLINK fulfills the real-time requirements using a mix of timeslot and polling procedures. In other words, defined times are

reserved on the Ethernet lines exclusively for transferring real-time data. Only network participants which have previously been polled by the controller are able to transmit data during these timeslots.

Ethernet POWERLINK implementation

The CPX-FB40 supports the two operating modes: remote I/O and remote controller. In remote I/O operating mode, all functions of the CPX valve terminal are

directly controlled by the Ethernet POWERLINK master (host). In addition to activation via a bus system, it is possible to use IT technologies. An integrated web server enables

diagnostic data to be visualised via HTML. Various programs support direct access to the device data from the automation network.

The Ethernet POWERLINK node for CPX supports the transmission technology that conforms to DIN EN 50173/CAT 5 as an integrated interface.

Points to note in connection with CPX-CEC

When a bus node is combined with a control block (CPX-CEC, in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are controlled via the CPX control block.

In this case, the bus node only provides the communication interface to the PLC. Communication between the control block and CPX bus node takes place

by interlinking the CPX modules and takes up the following address capacity in the CPX system:

- 8 byte outputs
- 8 byte inputs

The following address capacity remains in the control block or CPX system for activating the peripherals:

- 56 byte inputs
- 56 byte outputs

Terminal CPX

FESTO

Technical data – Bus node CPX-FB40

General technical data		
Type	CPX-FB40	
Fieldbus interface	2x M12x1 socket, D-coded, 4-pin	
Baud rates	[Mbps]	
Protocol	Ethernet POWERLINK V2	
Max. address capacity	Inputs Outputs	[byte] [byte]
LED displays	Bus-specific Product-specific	64 64 BE = POWERLINK error BS = POWERLINK status L/A1 = Link/activity port 1 L/A2 = Link/activity port 2 M = Modify, parameterisation PL = Load supply PS = Electronic supply, sensor supply SF = System fault
Device-specific diagnostics	<ul style="list-style-type: none"> Module and channel-oriented diagnostics Undervoltage of modules Diagnostic memory 	
Configuration support	<ul style="list-style-type: none"> XDC file XDD file 	
Parameterisation	<ul style="list-style-type: none"> Diagnostic behaviour Fail-safe response Forcing of channels Signal setup System parameters 	
Additional functions	<ul style="list-style-type: none"> Ayclic data access via "SDO" and Ethernet Integrated hub IP addressing via DHCP, DIL switch or operator unit Channel-oriented diagnostics via fieldbus Start-up parameterisation in plain text via fieldbus System status can be displayed using process data Additional diagnostic interface for operator units 	
Control elements	DIL switches	
Operating voltage	Nominal value Permissible range Protection against incorrect polarity	[V DC] [V DC] For operating voltage
Current consumption (at nominal voltage)	[mA]	
Degree of protection to EN 60529	IP65, IP67	
Temperature range	Operation Storage/transport	[°C] [°C]
Materials	PA reinforced	
Note on materials	RoHS-compliant	
Grid dimension	[mm]	
Dimensions (incl. interlinking block) W x L x H	[mm]	
Product weight	[g]	125



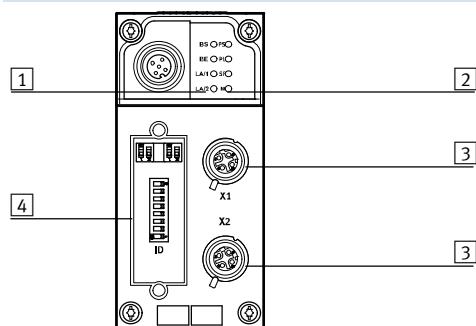
- Note
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Bus node CPX-FB40

FESTO

Connection and display components



- [1] Bus-specific status LEDs
- [2] CPX-specific status LEDs
- [3] Fieldbus connection (M12x1 socket, 4-pin, D-coded)
- [4] Transparent DIL switch cover

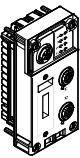
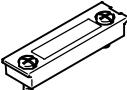
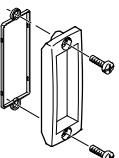
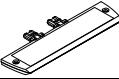
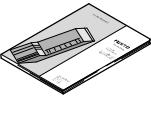
Pin allocation for the fieldbus interface

Terminal allocation	Pin	Signal	Designation
M12x1 socket, D-coded			
	1	TD+	Transmitted data+
	2	RD+	Received data+
	3	TD-	Transmitted data-
	4	RD-	Received data-
	Hous-ing	FE	Screening

Terminal CPX

FESTO

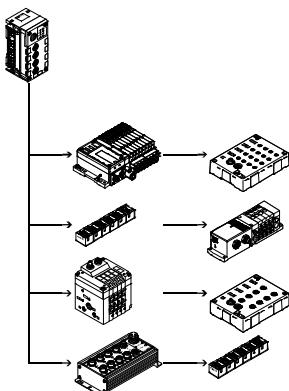
Accessories – Bus node CPX-FB40

Ordering data		Part No.	Type		
Description					
Bus node					
	Ethernet POWERLINK bus node	2474896	CPX-FB40		
Bus connection					
	M12x1 plug connector, 4-pin, D-coded	543109	NECU-M-S-D12G4-C2-ET		
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m 1 m 3 m 5 m 10 m	8040446 8040447 8040448 8040449 8040450	NEBC-D12G4-ES-0.5-S-D12G4-ET NEBC-D12G4-ES-1-S-D12G4-ET NEBC-D12G4-ES-3-S-D12G4-ET NEBC-D12G4-ES-5-S-D12G4-ET NEBC-D12G4-ES-10-S-D12G4-ET
		Straight plug, RJ45, 8-pin	1 m 3 m 5 m 10 m	8040451 8040452 8040453 8040454	NEBC-D12G4-ES-1-S-R3G4-ET NEBC-D12G4-ES-3-S-R3G4-ET NEBC-D12G4-ES-5-S-R3G4-ET NEBC-D12G4-ES-10-S-R3G4-ET
		Open end, 4-wire	5 m	8040456	NEBC-LE4-ES-5-D12G4-ET
	Transparent cover for DIL switch and memory card	548757	CPX-AK-P		
	Inspection cover, transparent	533334	AK-SUB-9/15-B		
	Inscription label holder for connection block	536593	CPX-ST-1		
	5-pin M12 adapter for mini USB socket and controller software	547432	NEFC-M12G5-0.3-U1G5		
User documentation					
	User documentation for bus node CPX-FB40	German English Spanish French Italian Chinese	8028650 P.BE-CPX-FB40-DE 8028651 P.BE-CPX-FB40-EN 8028652 P.BE-CPX-FB40-ES 8028653 P.BE-CPX-FB40-FR 8028654 P.BE-CPX-FB40-IT 8028655 P.BE-CPX-FB40-ZH		

Terminal CPX

Technical data – CPX-CP interface

FESTO



The CPX-CP electrical interface establishes the connection to CP modules of the CPI installation system via prefabricated connecting cables. The I/O data of the connected valve terminals with CP string extension and CP input and output modules are transferred to the connected CPX bus node and thus via fieldbus to the higher-order controller. This enables modular centralised and compact decentralised concepts to be established with one system.



Application

CP connection

As well as transmitting the communication data, the max. four CP strings of a CPX-CP interface also transmit the supply voltage to the connected sensors and the load supply to the valves (or outputs). Both circuits are

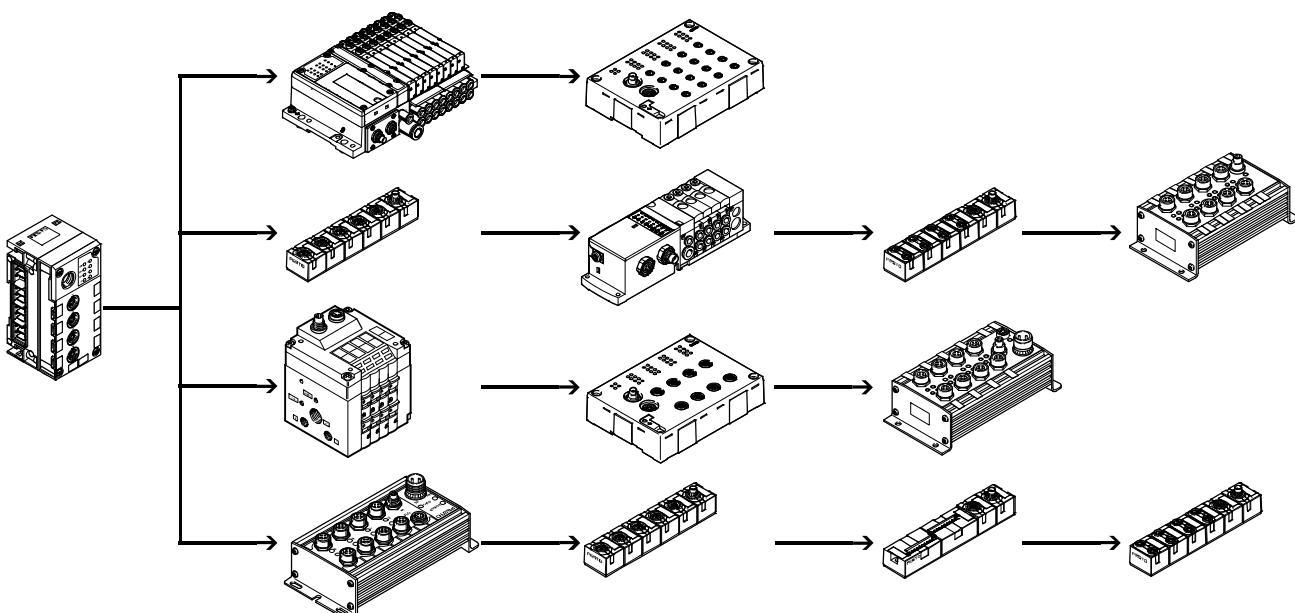
supplied separately with 24 V, but with a common reference potential. The valve terminals with CP string extension (or outputs) are supplied with voltage for the electronics and valves by the interlinking block.

The following combinations are made possible by the CP interface:

- Centralised analogue and digital inputs and outputs of the CPX terminal

- Decentralised digital inputs and outputs of the CP installation system
- Valve/valve terminals that can be connected both centrally and decentrally

Configuration example – CP interface with CP modules



Terminal CPX

Technical data – CPX-CP interface

FESTO

Implementation

The CPX-CP interface supports the CPI system:

- Max. 4 individual electronically protected CP strings
- Max. 4 CP modules per string
- Max. 32 inputs/32 outputs per string
- The maximum length of a string is 10 m. If the CP interface is positioned centrally, the CP system can cover an area of 20 m in diameter
- Modules with CPI functionality

The following CP module variants are available:

- Input modules with 8 or 16 digital inputs (connection technology M8, M12 and CageClamp)
- Output modules with 4 or 8 digital outputs (connection technology M12)
- Valve terminals with CP string extension (up to 32 solenoid coils, different valve functions)

CPI modules support the following functions:

- Module-oriented diagnostics
- Module/channel-oriented parameterisation
- Support for all functions by the CPX-FMT
- Module can be positioned anywhere within the string

Several CP interface modules can be combined in one CPX terminal, depending on the address capacity of the bus node.

Example:

- CPX-FB13 (512 I/O)
- Max. 4 CP interface modules (128 I/O each) possible



- Note

When arranging the CP modules it should be taken into consideration that CP input modules without CPI functionality should always be placed at the end of a string.

Configuration

The following rules apply for a string of a CPX-CP interface:

- Max. one output module or one valve terminal without CPI functionality
- Max. one output module without CPI functionality or one valve terminal with CP string extension
- Any number of CP modules with CPI functionality, up to the maximum limit of 4 modules and/or 32 inputs/32 outputs per string

Maximum extension:

- 4 input modules and 4 valve terminals/output modules without CPI functionality
- 16 CP modules with CPI functionality

The configuration of the strings with respect to the module type and position of the modules in the string is entered by activating the SAVE key in the CPX-CP interface and saved there remanently.

Saved data are retained even when the CP interface is isolated from the voltage supply.

The representation of the CP interface within a CPX terminal and thus at the fieldbus is dependent on the characteristics of the relevant fieldbus system. In addition to input and output addressing, this also applies to the representation of the diagnostics and parameterisation of the CP module and the characteristics of the CPI system.



- Note

The remanent saving of configuration data means that changes in the configuration or faulty modules are still displayed even after a voltage failure.

Terminal CPX

Technical data – CPX-CP interface

FESTO

General technical data		CPX-CP-4-FB
Type		CPX-CP-4-FB
Brief description		CP interface
Max. number of	CP strings	4
	CP modules per string	4
	Outputs per string	32
	Inputs per string	32
CP connection		M9 socket, 5-pin
Baud rate	[kbit/s]	1,000
Cycle time	CP modules without CPI functionality	[ms]
	CP modules with CPI functionality	[ms]
		4
		2
LED displays		L1 ... 4 = Status of the CP string 1 ... 4 PS = Electronic supply, sensor supply PL = Load supply RN = Status of the CP system SF = System fault
Device-specific diagnostics		Via bus node
Operating voltage	Nominal value	[V DC] 24 (reverse polarity protected)
	Permissible range	[V DC] 18 ... 30
	Power failure buffering	[ms] 20
Supply voltage of sensors		[V DC] 24 ±25% coming from bus node
Load voltage of actuators		[V DC] 24 ±10% coming from bus node
Current consumption	Without CP modules	[A] Max. 0.2
	Per CP string	[A] Max. 1.6
Protection class to EN 60529		IP65, IP67
Temperature range	Operation	[°C] -5 ... +50
	Storage/transport	[°C] -20 ... +70
Materials		PA
Grid dimension		[mm] 50
Dimensions (incl. interlinking block) W x L x H		[mm] 50 x 107 x 45
Weight	[g]	140



- Note

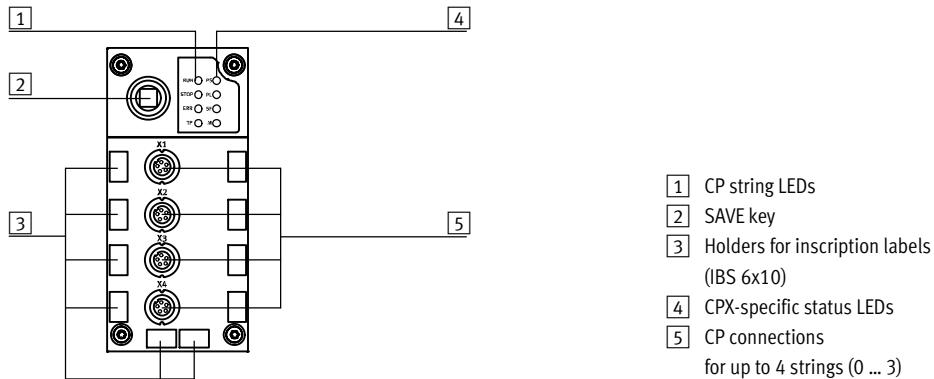
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Accessories CPX-CP interface

FESTO

Connection and display components



Power supply

	<p>The module combines the 0 V potential of the power supply for electronics and sensors with the 0 V potential of the power supply for valves.</p> <p>If all poles of the valves of a pneumatic interface connected to the right of the CP interface are to be switched off, an appropriate interlinking block with additional power supply must be used to the right of the CP interface.</p>
--	---

Terminal CPX

Accessories CPX-CP interface

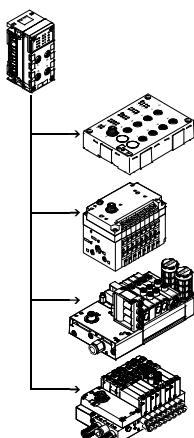
FESTO

Ordering data			
Designation		Part No.	Type
CP interface			
	Interface for max. 16 I/O modules and valve terminals of the CPI system	526705	CPX-CP-4-FB
Bus connection			
	Cover cap	M12	165592 ISK-M12
	Connecting cable, angled plug, angled socket	0.25 m	540327 KVI-CP-3-WS-WD-0,25
		0.5 m	540328 KVI-CP-3-WS-WD-0,5
		2 m	540329 KVI-CP-3-WS-WD-2
		5 m	540330 KVI-CP-3-WS-WD-5
		8 m	540331 KVI-CP-3-WS-WD-8
	Connecting cable, straight plug, straight socket	2 m	540332 KVI-CP-3-GS-GD-2
		5 m	540333 KVI-CP-3-GS-GD-5
		8 m	540334 KVI-CP-3-GS-GD-8
	Inscription label holder for connection block		536593 CPX-ST-1
User manual			
	User manual for CPX-CP interface	German	539293 P.BE-CPX-CP-DE
		English	539294 P.BE-CPX-CP-EN
		Spanish	539295 P.BE-CPX-CP-ES
		French	539296 P.BE-CPX-CP-FR
		Italian	539297 P.BE-CPX-CP-IT

Terminal CPX

FESTO

Technical data – Interface CPX-CTEL



The electrical interface CPX-CTEL master establishes the connection to modules with I-Port interface (device) from the CTEL/CTEU series. The I/O data from the connected devices is transferred to the connected CPX bus node and therefore transferred to the higher-level controller via fieldbus. A maximum of 4 devices can be connected to a CPX-CTEL master via appropriate M12- interfaces.



Application

I-Port interface

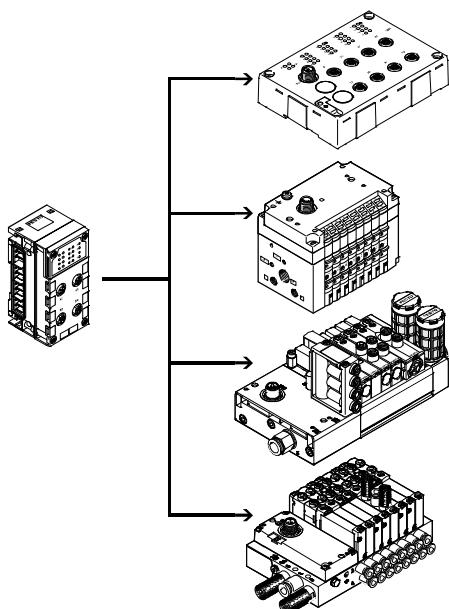
As well as transmitting the communication data, the I-Port interfaces of a CPX-CTEL master also transmit the power supply for the

connected sensors and the load supply for the valves (or outputs). Both circuits are supplied separately

with 24 V, with a separate reference potential. The connecting cables used must

meet the increased requirements resulting from their double function as a signal line and power supply cable.

Sample configuration – CPX-CTEL master with CTEL modules



The CPX-CTEL master provides four I-Port interfaces to which one device each can be connected. I-Port is an interface for exchanging serial data for connecting decentralised modules or valve terminals from Festo. The I-Port interface is based on IO-Link and is compatible with it in certain areas. The connection type corresponds to a star topology. In other words, only one module or valve terminal can be connected to each I-Port.

The restrictions compared to IO-Link include:

- Permanently set baud rate of 230.4 kbit/s
- SIO mode is not supported
- Max. 32 bytes of input data and 32 bytes of output data
- Only one dump of the master commands is used
- Configuration via IODD is not supported

Terminal CPX

Technical data – Interface CPX-CTEL

FESTO

Implementation

The CPX-CTEL master from Festo enables modules with an I-Port interface to be connected to a CPX system:

- Max. 4 devices with individual electronic fuse protection
- Max. 64 inputs/64 outputs per I-Port interface
- The maximum length of a string is 20 m

The following device variants are available:

- Input modules with 16 digital inputs (3-pin M8 and 5-pin M12 connection technology)
- Valve terminals with I-Port interface (up to 48 solenoid coils, different valve functions)

The decentralised arrangement of the modules and valve terminals with I-Port enables them to be mounted near the cylinders and actuators/sensors to be controlled. This allows the use of shorter air supply lines and sensor connecting cables or possibly smaller valves, which saves costs.

Several CPX-CTEL masters can be combined in one CPX terminal, depending on the address capacity of the bus node.
Example:

- CPX-FB13 (512 I/O)
- Max. 2 CPX-CTEL masters (256 I/O each) possible

Configuration

Setting

The precise number of I/O bytes made available is geared towards the requirements of the connected devices and the selected operating mode.

The operating mode and configuration presetting of the CPX-CTEL master can be defined by the user.

DIL switches are used for selecting the operating mode and making the setting for manual configuration. These DIL switches are not required during operation and are only accessible in unassembled condition.

Manual configuration

With manual configuration (tool change mode), the number of inputs and outputs in the process image of the CPX system or higher-level fieldbus can be manually defined via the DIL switches.

Automatic configuration

With automatic configuration, the I/O length for each I-Port is individually determined and this value is used to select the appropriate or next highest configuration presetting.

Power supply for I-Port devices

The CPX-CTEL master provides two separate power supplies for the connected devices:

- One for operating the device and the inputs connected to it
- One for outputs and valves connected to the device

The power supply for devices and inputs comes from the power supply for the electronics and sensors of the CPX terminal. The power supply for outputs and valves comes from the power supply

for the valves of the CPX terminal. The interlinking block with additional power supply enables a separate voltage supply for valves and outputs. This allows this supply voltage to be

switched off separately. In other words, the valves and outputs of the connected I-Port devices can be switched off separately without having to switch off the devices themselves.

Terminal CPX

FESTO

Technical data – Interface CPX-CTEL

General technical data		
Type	CPX-CTEL-4-M12-5POL	
Protocol	I-Port	
Max. address capacity	Outputs [bit]	256
	Inputs [bit]	256
I-Port connection	4x M12 socket, 5-pin, A-coded	
Number of I-Port interfaces	4	
Max. cable length	[m]	20
Internal cycle time	[ms]	1 per 8 bits of user data
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes, using an intermediate supply
LED displays	X1 ... 4 = Status of the I-Port interface 1 ... 4 PS = Electronics supply PL = Load supply -L- = Module fault	
Diagnostics	<ul style="list-style-type: none"> • Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage 	
Parameterisation	<ul style="list-style-type: none"> • Diagnostic behaviour • Failsafe per channel • Forces per channel • Idle mode per channel • Module parameters • Tool change mode 	
Additional functions	Tool change mode	
Operating elements	DIL switch	
Operating voltage	Nominal value [V DC]	24 (reverse polarity protected)
	Permissible range [V DC]	18 ... 30
	Power failure buffering [ms]	10
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 65
Max. power supply per channel	[A]	4x 1.6
Max. residual output current per channel	[A]	4x 1.6
Protection class to EN 60529	IP65, IP67	
Temperature range	Operating [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	PA reinforced, PC	
Note on materials	RoHS-compliant	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 55
Product weight	[g]	110



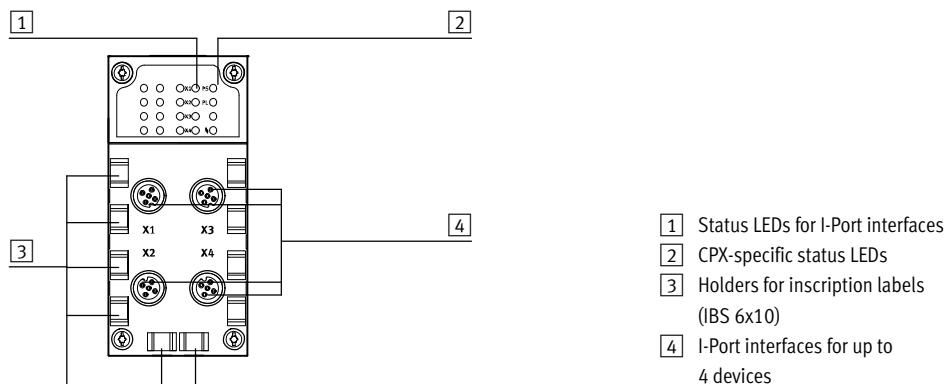
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

Technical data – Interface CPX-CTEL

FESTO

Connection and display components



Combinations of bus nodes/control blocks and interface CPX-CTEL

Bus node/control block	Part No.	Interface
		CPX-CTEL-4-M12-5POL
CPX-CEC-C1	567347	■
CPX-CEC-C1-V3	3473128	■
CPX-CEC-M1-V3	3472765	■
CPX-CEC	567346	■
CPX-CEC-S1-V3	3472425	■
CPX-FB11	526172	■
CPX-FB13	195740	■
CPX-FB14	526174	■
CPX-FB23-24	526176	■
CPX-FB33	548755	■
CPX-M-FB34	548751	■
CPX-M-FB35	548749	■
CPX-FB36	1912451	■
CPX-FB37	2735960	■
CPX-FB39	2093101	■
CPX-FB40	2474896	■
CPX-M-FB41	3228960	■

Pin allocation – I-Port interface

Pin allocation	Pin	Signal	Designation
	1	24 V _{SEN}	24 V DC supply voltage for electronics and inputs
	2	24 V _{VAL}	24 V DC load voltage supply for valves and outputs
	3	0 V _{SEN}	0 V DC supply voltage for electronics and sensors
	4	C/Q I-Port	Communication signal C/Q, data cable
	5	0 V _{VALVES}	0 V DC load voltage supply for valves and outputs

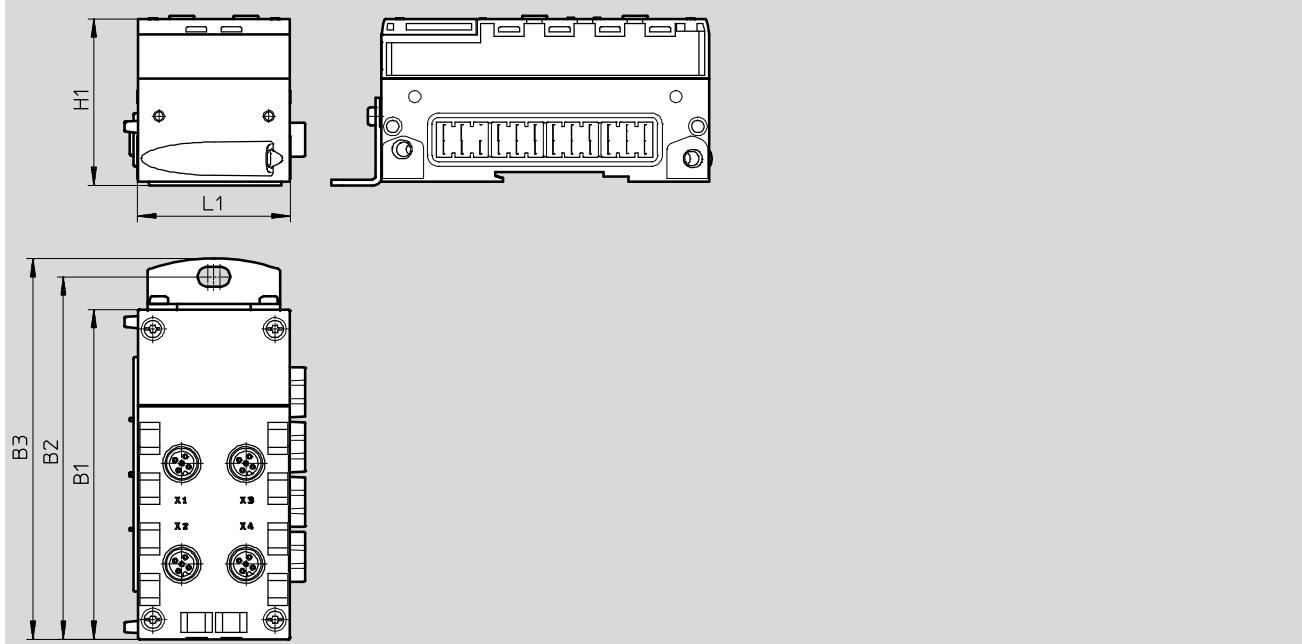
Terminal CPX

FESTO

Technical data – Interface CPX-CTEL

Dimensions

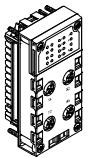
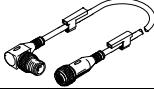
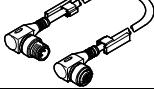
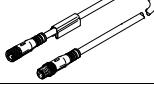
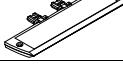
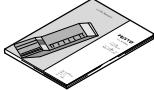
Download CAD data ➔ www.festo.com



Type	B1	B2	B3	H1	L1
CPX-CTEL-4-M12-5POL	108.1	118.9	124.9	55.1	50

Terminal CPX

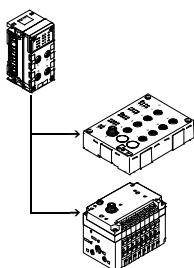
Accessories – Interface CPX-CTEL

Ordering data			
Designation		Part No.	Type
CPX-CTEL master			
	Interface for max. 4 I/O modules and valve terminals with I-Port interface (devices)	1577012	CPX-CTEL-4-M12-5POL
Bus connection			
	Cover cap	M12	165592 ISK-M12
	Connecting cable M12-M12, 5-pin • Straight socket • Angled plug	Cable characteristics: standard	0.5 m 8003617 NEBU-M12G5-K-0.5-M12W5 2 m 8003618 NEBU-M12G5-K-2-M12W5
	Connecting cable M12-M12, 5-pin • Angled socket • Angled plug	Cable characteristics: standard	0.5 m 570733 NEBU-M12W5-K-Q5-M12W5 2 m 570734 NEBU-M12W5-K-2-M12W5
	Connecting cable M12-M12, 5-pin • Straight socket • Staright plug	Cable characteristics: Suitable for chain link trunking	5 m 574321 NEBU-M12G5-E-5-Q8N-M12G5 7.5 m 574322 NEBU-M12G5-E-7.5-Q8N-M12G5 10 m 574323 NEBU-M12G5-E-10-Q8N-M12G5
	Inscription label holder for manifold block		536593 CPX-ST-1
Manual			
	Manual CPX-CTEL master	German	574600 P.BE-CPX-CTEL-DE
		English	574601 P.BE-CPX-CTEL-EN
		Spanish	574602 P.BE-CPX-CTEL-ES
		French	574603 P.BE-CPX-CTEL-FR
		Italian	574604 P.BE-CPX-CTEL-IT

Terminal CPX

FESTO

Technical data – Interface CPX-CTEL-2



The electrical interface CPX-CTEL-2... enables the connection of modules with IO-Link interface (IO-Link device) to the CPX terminal. The I/O data of the connected devices are transmitted to the connected CPX bus node and thus to the higher-order controller via fieldbus.

A maximum of two IO-Link devices can be connected to an electrical interface CPX-CTEL-2... via the corresponding M12 interfaces.



Application

IO-Link interface

The communication system IO-Link is used to exchange serial data from decentralised function modules (devices) at the field level. The electrical interface CPX-CTEL-2... provides two IO-Link interfaces to the outside, on each of which one device

can be connected.

The connection type corresponds to a star topology, which means that only one device can be connected to each port.

The address space that the module

makes available and assigns accordingly in the CPX system can be configured according to various presettings.

Selection of the operating mode and the setting for manual configuration

takes place via the DIL switches. These DIL switches are not required during continuous operation and are only accessible in the disassembled state.

Restrictions

The interfaces (ports) of electrical interface CPX-CTEL-2... support the connection of IO-Link devices with few limitations.

- The process data length of the inputs and outputs is limited to 16 bytes per port for inputs and outputs

- The driver strength on the C/Q line is limited to 250 mA

- SIO mode is not supported

Power supply for devices

The electrical interface CPX-CTEL-2... provides two separate power supplies for the connected devices:

- For the operation of the device and the inputs connected to it
- For the outputs and valves that are connected to the device

The power supply for the devices and the inputs is supplied by the power supply for the electronics and sensors of the CPX terminal. The power supply for the outputs and valves is supplied by the power supply

for the valves of the CPX terminal. The interlinking block with additional supply ensures a separate supply voltage for the valves and outputs. This means it is possible to disconnect this supply voltage

separately. The valves and outputs of the connected I-Port devices can therefore be disconnected separately without disconnecting the devices.

Terminal CPX

Technical data – Interface CPX-CTEL-2

FESTO

General technical data		
Type	CPX-CTEL-2-M12-5POL-LK	
Protocol	IO-Link, master version V 1.0	
Max. address capacity	Outputs [bit]	256
	Inputs [bit]	256
I-Port connection	2x socket M12, 5-pin, A-coded	
Number of IO-Link interfaces	2	
Max. cable length	[m]	20
Internal cycle time	[ms]	1 per 8 bits of user data
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes, using an intermediate supply
LED displays	X1 ... 2 = status of the IO-Link interface 1 ... 2 PS = Electronic supply PL = Load supply -L- = Module error	
Diagnostics	<ul style="list-style-type: none"> • Communication error • Module short circuit • Module-oriented diagnostics • Undervoltage 	
Parameterisation	<ul style="list-style-type: none"> • Diagnostic behaviour • Fail-safe mode per channel • Forcing per channel • Idle mode per channel • Module parameters 	
Additional functions	–	
Control elements	DIL switches	
Operating voltage	Nominal value [V DC]	24 (polarity-safe)
	Permissible range [V DC]	18 ... 30
	Power failure buffering [ms]	10
Intrinsic current consumption at nominal operating voltage [mA]	Typically 65	
Max. power supply per channel [A]	2 x 1.6	
Max. residual current of outputs per channel [A]	2x 1.6	
Degree of protection to EN 60529	IP65, IP67	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	PA reinforced, PC	
Note on materials	RoHS-compliant	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H [mm]	50 x 107 x 55	
Product weight	[g]	110



– Note

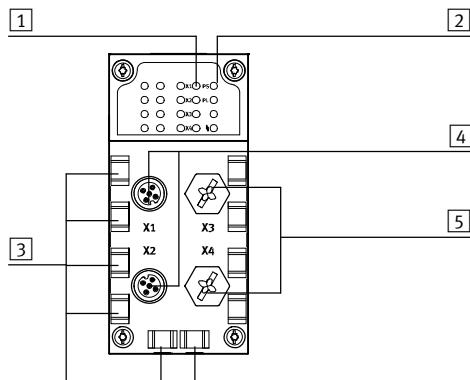
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Terminal CPX

FESTO

Technical data – Interface CPX-CTEL-2

Connection and display components

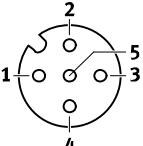


- [1] Status LEDs for I-Port interfaces
- [2] CPX-specific status LEDs
- [3] Holders for inscription labels (IBS 6x10)
- [4] IO-Link interfaces for up to 2 devices
- [5] Unoccupied connections

Combinations of bus nodes/control blocks and interface CPX-CTEL-2

Bus node/control block	Part No.	Interface
		CPX-CTEL-2-M12-5POL-LK
CPX-CEC-C1-V3	3473128	■
CPX-CEC-M1-V3	3472765	■
CPX-CEC-S1-V3	3472425	■
CPX-FB33	548755	■
CPX-M-FB34	548751	■
CPX-M-FB35	548749	■
CPX-FB36	1912451	■
CPX-FB39	2093101	■

Pin allocation of IO-Link interface

Pin allocation	Pin	Signal	Designation
	1	24 V _{SEN}	24 V DC supply voltage for electronics and inputs
	2	24 V _{VAL}	24 V DC load voltage supply for valves and outputs
	3	0 V _{SEN}	0 V DC supply voltage for electronics and sensors
	4	C/Q I-PORT	Communication signal C/Q, data cable
	5	0 V _{VALVES}	0 V DC load voltage supply for valves and outputs

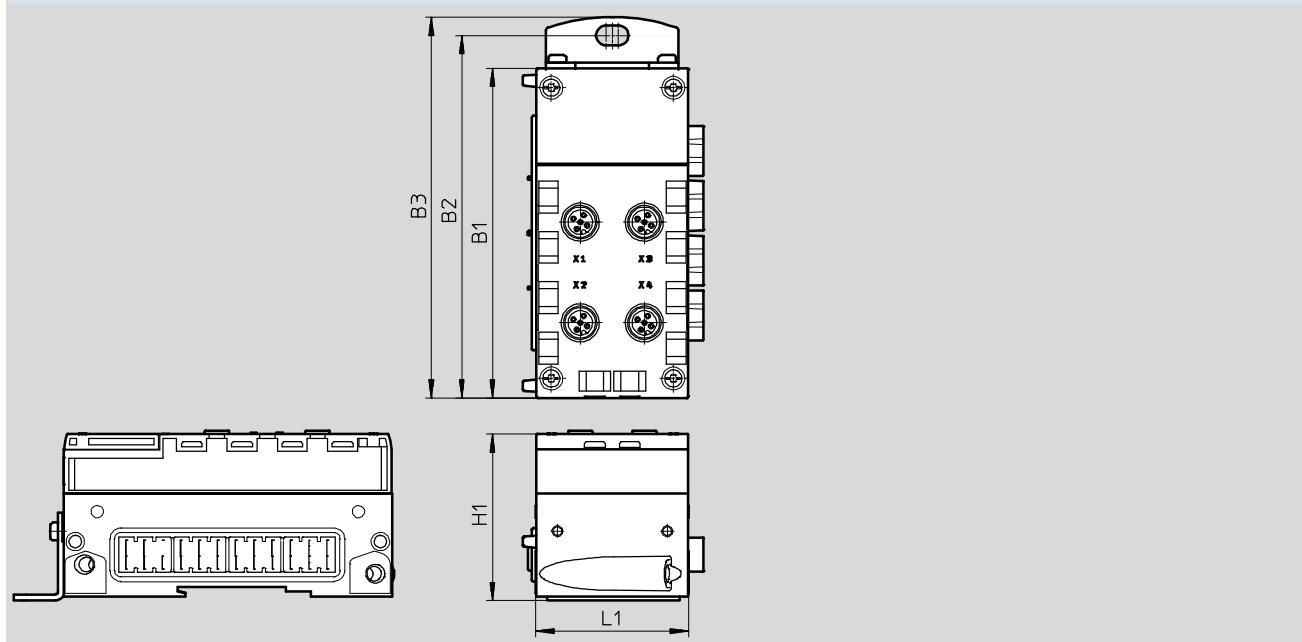
Terminal CPX

Technical data – Interface CPX-CTEL-2

FESTO

Dimensions

Download CAD data ➔ www.festo.com



Type	B1	B2	B3	H1	L1
CPX-CTEL-2-M12-5POL-LK	108.1	118.9	124.9	55.1	50

Terminal CPX

FESTO

Interface accessories CPX-CTEL-2

Ordering data		Part No.	Type
Designation			
CPX CTEL-Master, IO-Link			
	Interface for max. 2 I/O modules and valve terminals with IO-Link interface (devices)	2900543	CPX-CTEL-2-M12-5POL-LK
Bus connection			
	Cover cap	M12	165592 ISK-M12
	Connecting cable M12-M12, 5-pin • Straight socket • Angled plug	Cable characteristics: standard	0.5 m 8003617 NEBU-M12G5-K-0.5-M12W5
			2 m 8003618 NEBU-M12G5-K-2-M12W5
	Connecting cable M12-M12, 5-pin • Angled socket • Angled plug	Cable characteristics: standard	0.5 m 570733 NEBU-M12W5-K-0.5-M12W5
			2 m 570734 NEBU-M12W5-K-2-M12W5
	Connecting cable M12-M12, 5-pin • Straight socket • Staright plug	Cable characteristics: Suitable for chain link trunking	5 m 574321 NEBU-M12G5-E-5-Q8N-M12G5
			7.5 m 574322 NEBU-M12G5-E-7.5-Q8N-M12G5
			10 m 574323 NEBU-M12G5-E-10-Q8N-M12G5
	Inscription label holder for connection block		536593 CPX-ST-1
User documentation			
	User documentation for CPX CTEL-Master	German	8034115 P.BE-CPX-CTEL-LK-DE
		English	8034116 P.BE-CPX-CTEL-LK-EN
		Spanish	8034117 P.BE-CPX-CTEL-LK-ES
		French	8034118 P.BE-CPX-CTEL-LK-FR
		Italian	8034119 P.BE-CPX-CTEL-LK-IT
		Swedish	8034120 P.BE-CPX-CTEL-LK-ZH

Control block CPX-CM-HPP

Technical data

FESTO

The control block CPX-CM-HPP is a module in the CPX terminal for controlling electric drives.

The control component is independent of the bus node used. This means that Festo's electric drive technology is compatible with all industrial communication interfaces.

The control block does not need to be programmed.

- Max. 4 individual electric axes can be controlled via CAN bus
- No programming required
- Standardised communication with the drives via the Festo Handling and Positioning Profile (FHPP)
- Quick configuration and diagnostics via the operator unit CPX-FMT
- Simple, flexible and cost-effective

General technical data

Fieldbus interface	1x socket M9, 5-pin
Protocol	FHPP
Max. address volume for inputs	[byte] 32
Max. address volume for outputs	[byte] 32
LED display (product-specific)	Error: Error PL: Power supply
Device-specific diagnostics	Diagnostic memory Channel and module-oriented diagnostics Undervoltage/short circuit of modules
Parameterisation	Forcing of channels System parameters
Configuration support	Operator unit CPX-MMI
Total number of axes	4
Nominal operating voltage	[V DC] 24
Operating voltage range	[V DC] 18 ... 30
Power failure buffering	[ms] 10
Intrinsic current consumption at nominal operating voltage	[mA] Typically 80
Protection class to EN 60529 (plug connector plugged in)	IP65, IP67
Dimensions W x L x H (incl. interlinking block)	[mm] 50 x 107 x 55
Product weight (without interlinking block)	[g] 140
Materials	
Housing	PA, reinforced PC
Note on materials	RoHS-compliant

Technical data – Interfaces

Interface	
Control interface	CAN-Bus
Baud rate	[Mbps] 1

Operating and environmental conditions

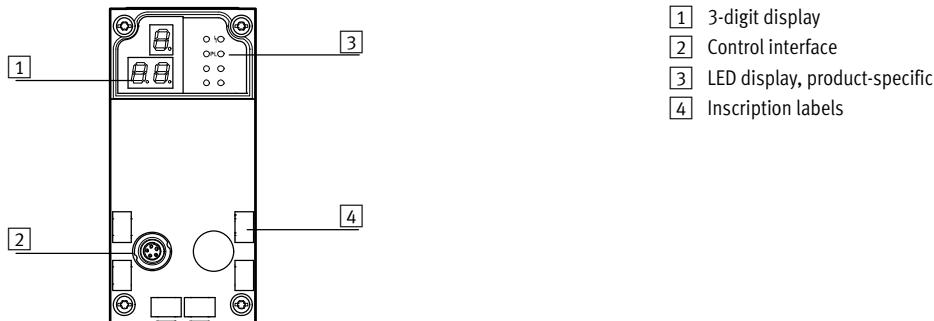
Ambient temperature	[°C]	-5 ... +50
Storage temperature	[°C]	-20 ... +70
CE mark (see declaration of conformity)		To EU Low Voltage Directive

Control block CPX-CM-HPP

FESTO

Technical data

Connection and display components



Pin allocation – Control interface

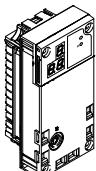
	Pin	Signal	Meaning
Socket M9, 5-pin			
1	n.c.	Not connected	
2	n.c.	Not connected	
3	CAN_GND	CAN ground	
4	CAN_H	CAN high	
5	CAN_L	CAN low	
Housing	Screened	Cable screen must be connected to functional earth (FE)	

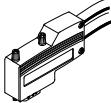
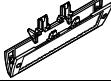
Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. no. of CPX-CM-HPP modules
CPX-CEC...	–	0
CPX-FB6	INTERBUS	0
CPX-FB11	DeviceNet	2
CPX-FB13	PROFIBUS	2
CPX-FB14	CANopen	1
CPX-M-FB21	INTERBUS	0
CPX-FB23-24	CC-Link	1 (function module F23) 0 (function module F24)
CPX-FB33	PROFINET RT, M12	2
CPX-M-FB34	PROFINET RT, RJ45	2
CPX-M-FB35	PROFINET RT, SCRJ	2
CPX-FB36	EtherNet/IP	2
CPX-FB37	EtherCAT	2
CPX-FB39	Sercos III	2
CPX-FB40	POWERLINK	2
CPX-M-FB41	PROFINET RT	2

Control block CPX-CM-HPP

Accessories

Ordering data		Part No.	Type
Designation			
Control block			
	Max. 4 individual electric axes can be controlled via CAN bus	562214	CPX-CM-HPP

Ordering data – Bus connection		Part No.	Type
Designation			
Connecting cable			
	Connecting cable	2 m	563711 NEBC-M9W5-K-2-N-LE3
		5 m	563712 NEBC-M9W5-K-5-N-LE3
	Plug for CAN bus interface, Sub-D, 9-pin, without terminating resistor	533783	FBS-SUB-9-WS-CO-K
Inscription label			
	Inscription label holder for manifold block	536593	CPX-ST-1
Documentation			
	Manual – Control block CPX-CM-HPP	German	568683 CPX-CM-HPP-DE
		English	568684 CPX-CM-HPP-EN

Axis controllers CPX-CMAX

FESTO

Technical data

The axis controller CPX-CMAX is intended exclusively for valve terminals CPX.



General technical data

Operating voltage

Operating voltage range	[V DC]	18 ... 30
Nominal operating voltage	[V DC]	24
Current consumption at nominal operating voltage	[mA]	200
Fuse protection (short circuit)		Electronic
Power failure bridging	[ms]	10

Load voltage

Load voltage range	[V DC]	20 ... 30
Nominal load voltage	[V DC]	24
Perm. load current	[A]	2.5
Fuse protection (short circuit)		Electronic

Number of axis strings

1

Axes per string

1

Length of connecting cable to axis

[m] ≤ 30

Max. no. of modules

7

Display

7-segment display

Assigned addresses	Outputs	[bit]	8x8
	Inputs	[bit]	8x8

Operating modes

Record Select mode

Direct mode

Controller types

Position control

Force control

Diagnostics

Module-orientated

Via local 7-segment display

Status display

Module status

Power Load

Display/Error Axis X

MC Axis X

Control interface

Data	CAN bus with Festo protocol
	Digital

Electrical connection	5-pin
	M9
	Socket

Materials: Housing	Reinforced PA
Note on materials	RoHS-compliant

Product weight	[g]	140
----------------	-----	-----

Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Axis controllers CPX-CMAX

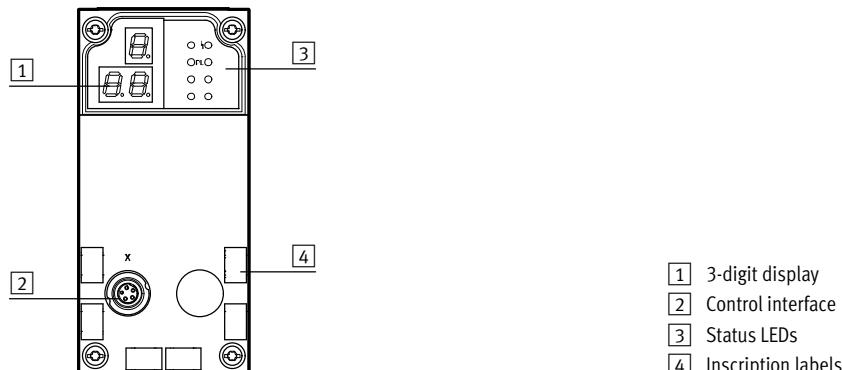
Technical data

FESTO

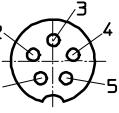
Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65

Connection and display components



Pin allocation – Control interface

	Pin	Signal	Designation
	1	+24 V	Nominal operating voltage
	2	+24 V	Load voltage
	3	0 V	Ground
	4	CAN_H	CAN high
	5	CAN_L	CAN low
	Housing	Screened	Cable screening

Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. no. of CMAX modules
CPX-CEC...	–	8
CPX-FB6	INTERBUS	1
CPX-FB11	DeviceNet ¹⁾	8
CPX-FB13	PROFIBUS ²⁾	8
CPX-FB14	CANopen	4
CPX-M-FB21	INTERBUS	1
CPX-FB23-24	CC-Link	4 (function module F23) 8 (function module F24)
CPX-FB33	PROFINET RT, M12	8
CPX-M-FB34	PROFINET RT, RJ45	8
CPX-M-FB35	PROFINET RT, SCRJ	8
CPX-FB36	EtherNet/IP	8
CPX-FB37	EtherCAT	8
CPX-FB39	Sercos III	8
CPX-FB40	POWERLINK	8
CPX-M-FB41	PROFINET RT	8

1) With Revision 20 (R20)

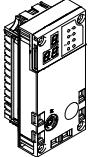
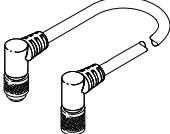
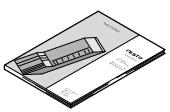
2) With Revision 23 (R23)

PROFIBUS®, DeviceNet®, CANopen®, INTERBUS®, CC-LINK®, EtherCAT®, PROFINET®, Sercos®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

Axis controllers CPX-CMAX

FESTO

Accessories

Ordering data		Brief description	Part No.	Type	
Axis controller					
	Order code in the CPX configurator: T21		548932	CPX-CMAX-C1-1	
Connecting cables					
	Connecting cable with angled plug and angled socket	0.25 m 0.5 m 2 m 5 m 8 m	540327 540328 540329 540330 540331	KVI-CP-3-WS-WD-0,25 KVI-CP-3-WS-WD-0,5 KVI-CP-3-WS-WD-2 KVI-CP-3-WS-WD-5 KVI-CP-3-WS-WD-8	
	Connecting cable with straight plug and straight socket	2 m 5 m 8 m	540332 540333 540334	KVI-CP-3-GS-GD-2 KVI-CP-3-GS-GD-5 KVI-CP-3-GS-GD-8	
		Connector for control cabinet through-feed		543252	KVI-CP-3-SSD
	Screws				
		For mounting on the metal interlinking block		550219	CPX-M-M3X22-4X
	Inscription labels				
		Inscription labels 6x10, in frames	64 pieces	18576	IBS-6X10
	User manual				
		Axis controller description CPX-CMAX ¹⁾	German English Spanish French Italian	559750 559751 559752 559753 559754	P.BE-CPX-CMAX-SYS-DE P.BE-CPX-CMAX-SYS-EN P.BE-CPX-CMAX-SYS-ES P.BE-CPX-CMAX-SYS-FR P.BE-CPX-CMAX-SYS-IT

1) User manual in paper form is not included in the scope of delivery.

End-position controllers CPX-CMPX

Technical data

The end-position controller CPX-CMPX is intended exclusively for use in valve terminals CPX.

FESTO



General technical data

Operating voltage

Operating voltage range	[V DC]	18 ... 30
Nominal operating voltage	[V DC]	24
Current consumption at nominal operating voltage	[mA]	80

Load voltage

Load voltage range	[V DC]	20 ... 30
Nominal load voltage	[V DC]	24
Perm. load current	[A]	2.5

Number of axes per module

1

Length of connecting cable to axis

[m]

≤ 30

Max. no. of modules

9

Display

7-segment display

Control elements

3 keys

Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8

Diagnostics

Module-orientated

Via local 7-segment display

Status display

Module status

Power Load

Control interface

Data	CAN bus with Festo protocol
	Digital

Electrical connection	5-pin
	M9
	Socket

Materials: Housing

Reinforced PA

Product weight

[g]

240

Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

End-position controllers CPX-CMPX

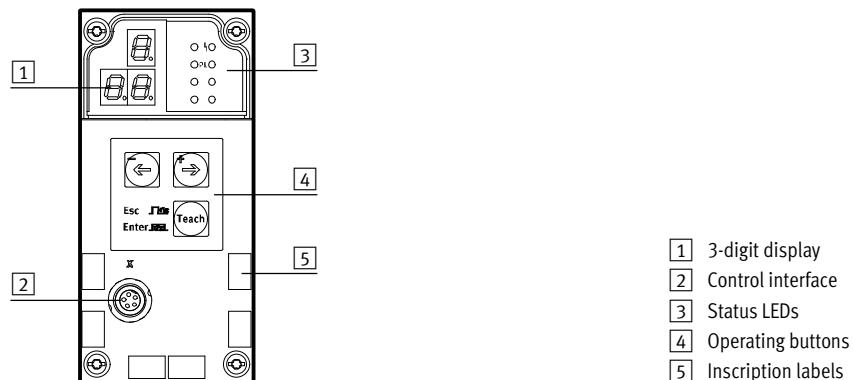
FESTO

Technical data

Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65
CE mark (see declaration of conformity)		To EU EMC Directive

Connection and display components



- [1] 3-digit display
- [2] Control interface
- [3] Status LEDs
- [4] Operating buttons
- [5] Inscription labels

Pin allocation – Control interface

Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Screened	Cable screening

Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. no. of CMPX modules
CPX-CEC...	–	9
CPX-FB6	INTERBUS	2
CPX-FB11	DeviceNet ¹⁾	9
CPX-FB13	PROFIBUS ²⁾	9
CPX-FB14	CANopen	5
CPX-M-FB21	INTERBUS	2
CPX-FB23-24	CC-Link	5 (function module F23) 9 (function module F24)
CPX-FB33	PROFINET RT, M12	9
CPX-M-FB34	PROFINET RT, RJ45	9
CPX-M-FB35	PROFINET RT, SCRJ	9
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-M-FB41	PROFINET RT	9

1) With Revision 20 (R20)

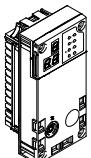
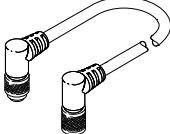
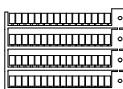
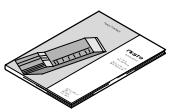
2) With Revision 23 (R23)

PROFIBUS®, DeviceNet®, CANopen®, INTERBUS®, CC-LINK®, EtherCAT®, PROFINET®, Sercos®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

End-position controllers CPX-CMPX

Accessories

FESTO

Ordering data		Brief description	Part No.	Type	
End-position controller					
	Order code in the CPX configurator: T20		548931	CPX-CMPX-C-1-H1	
Connecting cables					
	Connecting cable with angled plug and angled socket	0.25 m 0.5 m 2 m 5 m 8 m	540327 540328 540329 540330 540331	KVI-CP-3-WS-WD-0,25 KVI-CP-3-WS-WD-0,5 KVI-CP-3-WS-WD-2 KVI-CP-3-WS-WD-5 KVI-CP-3-WS-WD-8	
	Connecting cable with straight plug and straight socket	2 m 5 m 8 m	540332 540333 540334	KVI-CP-3-GS-GD-2 KVI-CP-3-GS-GD-5 KVI-CP-3-GS-GD-8	
		Connector for control cabinet through-feed		543252	KVI-CP-3-SSD
	Screws				
		For mounting on the metal interlinking block		550219	CPX-M-M3X22-4X
	Inscription labels				
		Inscription labels 6x10, in frames	64 pieces	18576	IBS-6X10
	User manual				
		End-position controller description CPX-CMPX ¹⁾	German English Spanish French Italian	555479 555480 555481 555482 555483	P.BE-CPX-CMPX-SYS-DE P.BE-CPX-CMPX-SYS-EN P.BE-CPX-CMPX-SYS-ES P.BE-CPX-CMPX-SYS-FR P.BE-CPX-CMPX-SYS-IT

1) User manual in paper form is not included in the scope of delivery.

Measuring modules CPX-CMIX

FESTO

Technical data

The measuring module CPX-CMIX is intended exclusively for use in valve terminals CPX.



General technical data

Operating voltage

Operating voltage range	[V DC]	18 ... 30
Nominal operating voltage	[V DC]	24
Current consumption at nominal operating voltage	[mA]	80
Protection against short circuit		Yes
Power failure bridging	[ms]	10

No. of axis strings

1

Axes per string

1

Length of connecting cable to axis

[m]

≤ 30

Max. no. of modules

9

Display

7-segment display

Assigned addresses

Outputs

[bit]

6x8

Inputs

[bit]

6x8

Diagnostics

Channel and module-oriented

Via local 7-segment display

Undervoltage of modules

Undervoltage of measuring system

Status display

Power Load

Error

Control interface

Data

CAN bus with Festo protocol

Digital

Electrical connection

5-pin

M9

Socket

Materials: Housing

Reinforced PA

Note on materials

RoHS-compliant

Product weight

[g]

140

Dimensions

Length

[mm]

107

Width

[mm]

50

Height

[mm]

55

Measuring modules CPX-CMIX

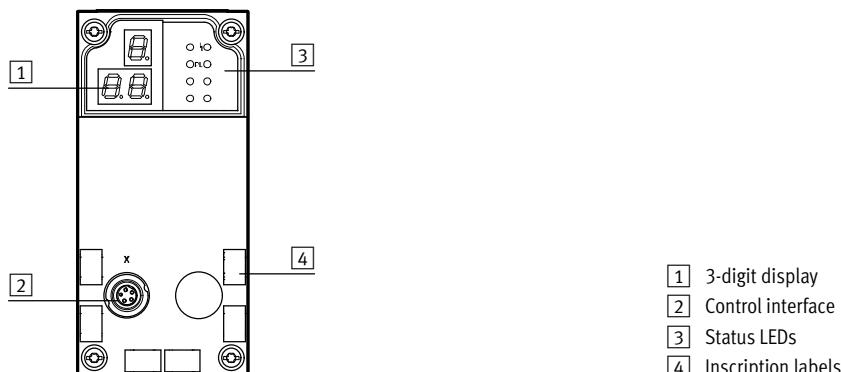
Technical data

FESTO

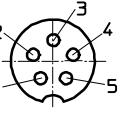
Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65

Connection and display components



Pin allocation – Control interface

	Pin	Signal	Designation
	1	+24 V	Nominal operating voltage
	2	+24 V	Load voltage
	3	0 V	Ground
	4	CAN_H	CAN high
	5	CAN_L	CAN low
	Housing	Screened	Cable screening

Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. no. of CMIX modules
CPX-CEC...	–	9
CPX-FB6	INTERBUS	2
CPX-FB11	DeviceNet ¹⁾	9
CPX-FB13	PROFIBUS ²⁾	9
CPX-FB14	CANopen	5
CPX-M-FB21	INTERBUS	2
CPX-FB23-24	CC-Link	5 (function module F23) 9 (function module F24)
CPX-FB33	PROFINET RT, M12	9
CPX-M-FB34	PROFINET RT, RJ45	9
CPX-M-FB35	PROFINET RT, SCRJ	9
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-M-FB41	PROFINET RT	9

1) With Revision 20 (R20)

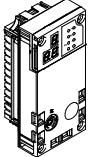
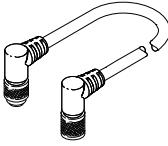
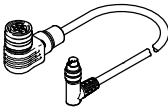
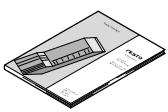
2) With Revision 23 (R23)

PROFIBUS®, DeviceNet®, CANopen®, INTERBUS®, CC-LINK®, EtherCAT®, PROFINET®, Sercos®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

Measuring modules CPX-CMIX

FESTO

Accessories

Ordering data		Brief description	Part No.	Type
Measuring module				
	Order code in the CPX configurator: T23		567417	CPX-CMIX-M1-1
Connecting cables				
	Connecting cable with angled plug and angled socket	0.25 m 0.5 m 2 m 5 m 8 m	540327 540328 540329 540330 540331	KVI-CP-3-WS-WD-0,25 KVI-CP-3-WS-WD-0,5 KVI-CP-3-WS-WD-2 KVI-CP-3-WS-WD-5 KVI-CP-3-WS-WD-8
	Connecting cable with straight plug and straight socket	2 m 5 m 8 m	540332 540333 540334	KVI-CP-3-GS-GD-2 KVI-CP-3-GS-GD-5 KVI-CP-3-GS-GD-8
	Connector for control cabinet through-feed		543252	KVI-CP-3-SSD
	For displacement encoder MME Connection between displacement encoder MME and measuring module CPX-CMIX	2 m	575898	NEBP-M16W6-K-2-M9W5
Screws				
	For mounting on the metal interlinking block		550219	CPX-M-M3X22-4X
Inscription labels				
	Inscription labels 6x10, in frames	64 pieces	18576	IBS-6X10
User manual				
	Measuring module description CPX-CMIX ¹⁾	German English Spanish French Italian	567053 567054 567055 567056 567057	P.BE-CPX-CMIX-DE P.BE-CPX-CMIX-EN P.BE-CPX-CMIX-ES P.BE-CPX-CMIX-FR P.BE-CPX-CMIX-IT

1) User manual in paper form is not included in the scope of delivery.

Terminal CPX

Technical data – Input module, digital

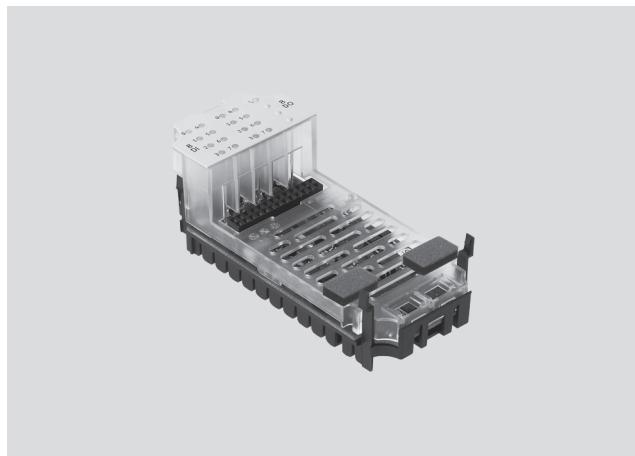
FESTO

Function

Digital input modules enable the connection of two-wire and three-wire sensors (proximity sensors, inductive or capacitive sensors, etc). Depending on the connection block selected, the module supports various connection concepts with different numbers of sockets (single or double allocation).

Applications

- Input modules for 24 V DC sensor supply voltage
- PNP or NPN logic
- Supports connection blocks with M12, M8, Sub-D, Harax and terminal connection
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection



General technical data

Type	CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
No. of inputs	4	8	8	8
Max. residual current of inputs per module	[A]	0.7	1	0.7
Fuse protection		Internal electronic fuse for each module	Internal electronic fuse for each module	Internal electronic fuse for each channel
Intrinsic current consumption at operating voltage	[mA]	Typically 15		
Operating voltage	Nominal value [V DC]	24		
	Permissible range [V DC]	18 ... 30		
Electrical isolation	Channel – channel	No		
	Channel – internal bus	No		
Switching level	Signal 0 [V DC]	≤ 5		≥ 11
	Signal 1 [V DC]	≥ 11		≤ 5
Input debounce time	[ms]	3 (Q1, 10, 20 parameterisable)		
Input characteristic curve		IEC 1131 Part 2		
Switching logic		Positive logic (PNP)		Negative logic (NPN)
LED displays	Group diagnostics	1	1	1
	Channel diagnostics	–	–	8
	Channel status	4	8	8
Diagnostics		Short circuit/overload per channel		
Parameterisation		• Module monitoring		
		• Behaviour after short circuit		
		• Input debounce time		
		• Signal stretching time		
Protection class to EN 60529		Depending on connection block		
Temperature range	Operation [°C]	-5 ... +50		
	Storage/transport [°C]	-20 ... +70		
Materials		Reinforced PA, PC		
Grid dimension	[mm]	50		
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50		
Weight	[g]	38		

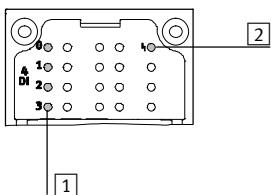
Terminal CPX

FESTO

Technical data – Input module, digital

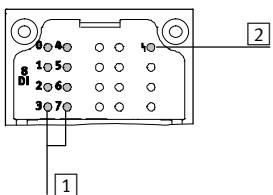
Connection and display components

CPX-4DE



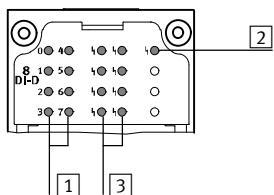
[1] Status LEDs (green)

CPX-8DE



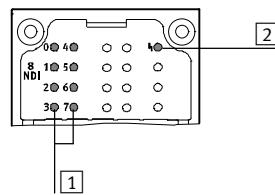
[1] Error LED (red, module error)

CPX-8DE-D



[1] Status LEDs (green)
[2] Error LED (red, module error)
[3] Channel-specific error LEDs (red)

CPX-8NDE



Allocation to inputs
→ Pin allocation for module

Connection block/digital input module combinations

Connection blocks	Part No.	Digital input modules			
		CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-8NDE
CPX-AB-8-M8-3POL	195706	■	■	■	■
CPX-AB-4-M12X2-5POL	195704	■	■	■	■
CPX-AB-4-M12X2-5POL-R	541254	■	■	■	■
CPX-AB-8-KL-4POL	195708	■	■	■	■
CPX-AB-1-SUB-BU-25POL	525676	■	■	■	■
CPX-AB-4-HAR-4POL	525636	■	■	■	■
CPX-M-AB-4-M12x2-5POL	549367	■	■	■	■

Pin allocation

Connection block inputs	CPX-4DE	CPX-8DE, CPX-8DE-D and CPX-8NDE		
CPX-AB-8-M8-3POL	 X1.1: 24 V _{SEN} X1.3: 0 V _{SEN} X1.4: Input x X2.1: 24 V _{SEN} X2.3: 0 V _{SEN} X2.4: Input x+1 X3.1: 24 V _{SEN} X3.3: 0 V _{SEN} X3.4: Input x+1 X4.1: 24 V _{SEN} X4.3: 0 V _{SEN} X4.4: n.c.	X5.1: 24 V _{SEN} X5.3: 0 V _{SEN} X5.4: Input x+2	X1.1: 24 V _{SEN} x X1.3: 0 V _{SEN} x X1.4: Input x	X5.1: 24 V _{SEN} x+4 X5.3: 0 V _{SEN} x+4 X5.4: Input x+4
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R ¹⁾ and CPX-M-AB-4-M12X2-5POL	 X1.1: 24 V _{SEN} X1.2: Input x+1 X1.3: 0 V _{SEN} X1.4: Input x X1.5: FE X2.1: 24 V _{SEN} X2.2: n.c. X2.3: 0 V _{SEN} X2.4: Input x+1 X2.5: FE	X3.1: 24 V _{SEN} X3.2: Input x+3 X3.3: 0 V _{SEN} X3.4: Input x+2 X3.5: FE	X1.1: 24 V _{SEN} x X1.2: Input x+1 X1.3: 0 V _{SEN} x X1.4: Input x X1.5: FE	X3.1: 24 V _{SEN} x+4 X3.2: Input x+5 X3.3: 0 V _{SEN} x+4 X3.4: Input x+4 X3.5: FE
	 X4.1: 24 V _{SEN} X4.2: n.c. X4.3: 0 V _{SEN} X4.4: Input x+3 X4.5: FE	X4.1: 24 V _{SEN} X4.2: n.c. X4.3: 0 V _{SEN} X4.4: Input x+3 X4.5: FE	X2.1: 24 V _{SEN} x+2 X2.2: Input x+3 X2.3: 0 V _{SEN} x+2 X2.4: Input x+2 X2.5: FE	X4.1: 24 V _{SEN} x+6 X4.2: Input x+7 X4.3: 0 V _{SEN} x+7 X4.4: Input x+6 X4.5: FE

1) Speedcon quick lock, screening additionally on metal thread

Terminal CPX

Technical data – Input module, digital

FESTO

| Pin allocation |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

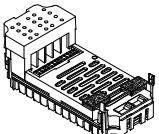
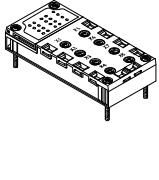
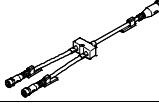
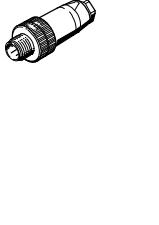
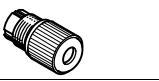
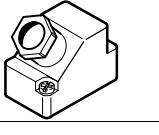
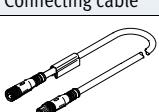
--

Connection block inputs
 | CPX-8DE, CPX-8DE-D and CPX-8NDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPX-AB-8-KL-4POL |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table> <tbody> <tr><td>X1.0:</td><td>24 V_{SEN}</td><td>X5.0:</td><td>24 V_{SEN}</td><td>X1.0:</td><td>24 V_{SEN} x</td><td>X5.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X1.1:</td><td>0 V_{SEN}</td><td>X5.1:</td><td>0 V_{SEN}</td><td>X1.1:</td><td>0 V_{SEN} x</td><td>X5.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X1.2:</td><td>Input x</td><td>X5.2:</td><td>Input x+2</td><td>X1.2:</td><td>Input x</td><td>X5.2:</td><td>Input x+4</td></tr> <tr><td>X1.3:</td><td>FE</td><td>X5.3:</td><td>FE</td><td>X1.3:</td><td>FE</td><td>X5.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td> <table> <tbody> <tr><td>1:</td><td>Input x</td><td>14:</td><td>Input x+2</td><td>1:</td><td>Input x</td><td>14:</td><td>Input x+4</td></tr> <tr><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+3</td><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+5</td></tr> <tr><td>3:</td><td>Input x+1</td><td>16:</td><td>Input x+3</td><td>3:</td><td>Input x+2</td><td>16:</td><td>Input x+6</td></tr> <tr><td>4:</td><td>n.c.</td><td>17:</td><td>n.c.</td><td>4:</td><td>Input x+3</td><td>17:</td><td>Input x+7</td></tr> <tr><td>5:</td><td>24 V_{SEN}</td><td>18:</td><td>24 V_{SEN}</td><td>5:</td><td>24 V_{SEN} x+1</td><td>18:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>6:</td><td>0 V_{SEN}</td><td>19:</td><td>24 V_{SEN}</td><td>6:</td><td>0 V_{SEN} x+1</td><td>19:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>7:</td><td>24 V_{SEN}</td><td>20:</td><td>24 V_{SEN}</td><td>7:</td><td>24 V_{SEN} x+3</td><td>20:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>8:</td><td>0 V_{SEN}</td><td>21:</td><td>24 V_{SEN}</td><td>8:</td><td>0 V_{SEN} x+3</td><td>21:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>9:</td><td>24 V_{SEN}</td><td>22:</td><td>0 V_{SEN}</td><td>9:</td><td>24 V_{SEN} x</td><td>22:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>10:</td><td>24 V_{SEN}</td><td>23:</td><td>0 V_{SEN}</td><td>10:</td><td>24 V_{SEN} x+2</td><td>23:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>11:</td><td>0 V_{SEN}</td><td>24:</td><td>0 V_{SEN}</td><td>11:</td><td>0 V_{SEN} x</td><td>24:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>12:</td><td>0 V_{SEN}</td><td>25:</td><td>FE</td><td>12:</td><td>0 V_{SEN} x+2</td><td>25:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td>Housing: FE</td><td>13:</td><td>FE</td><td></td><td>Housing: FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X3.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN}</td><td>X3.0:</td><td>24 V_{SEN} x+2</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X3.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN}</td><td>X3.1:</td><td>0 V_{SEN} x+2</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X3.2:</td><td>Input x+1</td><td>X7.2:</td><td>Input x+3</td><td>X3.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X4.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN}</td><td>X4.0:</td><td>24 V_{SEN} x+3</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X4.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN}</td><td>X4.1:</td><td>0 V_{SEN} x+3</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X4.2:</td><td>n.c.</td><td>X8.2:</td><td>n.c.</td><td>X4.2:</td><td>Input x+3</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X5.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN}</td><td>X5.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X5.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN}</td><td>X5.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X5.2:</td><td>Input x</td><td>X9.2:</td><td>Input x</td><td>X5.2:</td><td>Input x+4</td></tr> <tr><td>X5.3:</td><td>FE</td><td>X9.3:</td><td>FE</td><td>X5.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X6.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN}</td><td>X6.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X6.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN}</td><td>X6.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X6.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+1</td><td>X6.2:</td><td>Input x+5</td></tr> <tr><td>X6.3:</td><td>FE</td><td>X10.3:</td><td>FE</td><td>X6.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X7.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X7.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X7.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X7.3:</td><td>FE</td><td>X11.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X8.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X8.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X8.2:</td><td>n.c.</td><td>X12.2:</td><td>n.c.</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X8.3:</td><td>FE</td><td>X12.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X9.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X9.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X9.2:</td><td>Input x</td><td>X13.2:</td><td>Input x</td><td>X9.2:</td><td>Input x+4</td></tr> <tr><td>X9.3:</td><td>FE</td><td>X13.3:</td><td>FE</td><td>X9.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X10.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X10.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X10.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+5</td></tr> <tr><td>X10.3:</td><td>FE</td><td>X14.3:</td><td>FE</td><td>X10.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X11.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X11.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X11.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+6</td></tr> <tr><td>X11.3:</td><td>FE</td><td>X15.3:</td><td>FE</td><td>X11.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X12.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X12.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X12.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+3</td><td>X12.2:</td><td>Input x+7</td></tr> <tr><td>X12.3:</td><td>FE</td><td>X16.3:</td><td>FE</td><td>X12.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X13.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X13.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X13.2:</td><td>Input x</td><td>X17.2:</td><td>Input x</td><td>X13.2:</td><td>Input x+4</td></tr> <tr><td>X13.3:</td><td>FE</td><td>X17.3:</td><td>FE</td><td>X13.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X14.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X14.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X14.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+5</td></tr> <tr><td>X14.3:</td><td>FE</td><td>X18.3:</td><td>FE</td><td>X14.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X15.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X15.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X15.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+6</td></tr> <tr><td>X15.3:</td><td>FE</td><td>X19.3:</td><td>FE</td><td>X15.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X16.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X16.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X16.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+7</td></tr> <tr><td>X16.3:</td><td>FE</td><td>X20.3:</td><td>FE</td><td>X16.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X17.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X17.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X17.2:</td><td>Input x</td><td>X21.2:</td><td>Input x</td><td>X17.2:</td><td>Input x+4</td></tr> <tr><td>X17.3:</td><td>FE</td><td>X21.3:</td><td>FE</td><td>X17.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X18.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN}
x+5</td></tr> <tr><td>X18.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X18.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+5</td></tr> <tr><td>X18.3:</td><td>FE</td><td>X22.3:</td><td>FE</td><td>X18.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X19.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X19.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X19.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+6</td></tr> <tr><td>X19.3:</td><td>FE</td><td>X23.3:</td><td>FE</td><td>X19.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X20.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X20.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X20.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+7</td></tr> <tr><td>X20.3:</td><td>FE</td><td>X24.3:</td><td>FE</td><td>X20.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X21.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X21.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X21.2:</td><td>Input x</td><td>X25.2:</td><td>Input x</td><td>X21.2:</td><td>Input x+4</td></tr> <tr><td>X21.3:</td><td>FE</td><td>X25.3:</td><td>FE</td><td>X21.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X22.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X22.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X22.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+5</td></tr> <tr><td>X22.3:</td><td>FE</td><td>X26.3:</td><td>FE</td><td>X22.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X23.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X23.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X23.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+6</td></tr> <tr><td>X23.3:</td><td>FE</td><td>X27.3:</td><td>FE</td><td>X23.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X24.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X24.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X24.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+7</td></tr> <tr><td>X24.3:</td><td>FE</td><td>X28.3:</td><td>FE</td><td>X24.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X25.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X25.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X25.2:</td><td>Input x</td><td>X29.2:</td><td>Input x</td><td>X25.2:</td><td>Input x+4</td></tr> <tr><td>X25.3:</td><td>FE</td><td>X29.3:</td><td>FE</td><td>X25.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X26.0:</td><td>24 V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X26.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X26.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+5</td></tr> <tr><td>X26.3:</td><td>FE</td><td>X30.3:</td><td>FE</td><td>X26.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X27.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X27.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X27.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+6</td></tr> <tr><td>X27.3:</td><td>FE</td><td>X31.3:</td><td>FE</td><td>X27.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X28.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X28.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X28.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+7</td></tr> <tr><td>X28.3:</td><td>FE</td><td>X32.3:</td><td>FE</td><td>X28.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X29.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X29.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X29.2:</td><td>Input x</td><td>X33.2:</td><td>Input x</td><td>X29.2:</td><td>Input x+4</td></tr> <tr><td>X29.3:</td><td>FE</td><td>X33.3:</td><td>FE</td><td>X29.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X30.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24 V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X30.1:</td><td>0 V_{SEN}</td><td>X34.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X30.2:</td><td>Input x+1</td><td>X34.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+5</td></tr> <tr><td>X30.3:</td><td>FE</td><td>X34.3:</td><td>FE</td><td>X30.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X31.0:</td><td>24 V_{SEN}</td><td>X35.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X31.1:</td><td>0 V_{SEN}</td><td>X35.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X31.2:</td><td>Input x+2</td><td>X35.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+6</td></tr> <tr><td>X31.3:</td><td>FE</td><td>X35.3:</td><td>FE</td><td>X31.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X32.0:</td><td>24 V_{SEN}</td><td>X36.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X32.1:</td><td>0 V_{SEN}</td><td>X36.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X32.2:</td><td>Input x+3</td><td>X36.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+7</td></tr> <tr><td>X32.3:</td><td>FE</td><td>X36.3:</td><td>FE</td><td>X32.3:</td><td>FE</td></tr> </tbody> </table> </td><td> <table> <tbody> <tr><td>X33.0:</td><td>24 V_{SEN}</td><td>X37.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X33.1:</td><td>0 V_{SEN}</td><td>X37.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X33.2:</td><td>Input x</td><td>X37.2:</td><td>Input x</td><td>X33.2:</td><td>Input x+4</td></tr> <tr><td>X33.3:</td><td>FE</td><td>X37.3:</td><td>FE</td><td>X33.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X34.0:</td><td>24 V_{SEN}</td><td>X38.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X34.1:</td><td>0 V_{SEN}</td><td>X38.1:</td><td>0 V_{SEN}</td><</tr></tbody></table></td></tr></tbody></table> | X1.0: | 24 V _{SEN} | X5.0: | 24 V _{SEN} | X1.0: | 24 V _{SEN} x | X5.0: | 24 V _{SEN} x+4 | X1.1: | 0 V _{SEN} | X5.1: | 0 V _{SEN} | X1.1: | 0 V _{SEN} x | X5.1: | 0 V _{SEN} x+4 | X1.2: | Input x | X5.2: | Input x+2 | X1.2: | Input x | X5.2: | Input x+4 | X1.3: | FE | X5.3: | FE | X1.3: | FE | X5.3: | FE | | | | | | | | | | <table> <tbody> <tr><td>1:</td><td>Input x</td><td>14:</td><td>Input x+2</td><td>1:</td><td>Input x</td><td>14:</td><td>Input x+4</td></tr> <tr><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+3</td><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+5</td></tr> <tr><td>3:</td><td>Input x+1</td><td>16:</td><td>Input x+3</td><td>3:</td><td>Input x+2</td><td>16:</td><td>Input x+6</td></tr> <tr><td>4:</td><td>n.c.</td><td>17:</td><td>n.c.</td><td>4:</td><td>Input x+3</td><td>17:</td><td>Input x+7</td></tr> <tr><td>5:</td><td>24 V_{SEN}</td><td>18:</td><td>24 V_{SEN}</td><td>5:</td><td>24 V_{SEN} x+1</td><td>18:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>6:</td><td>0 V_{SEN}</td><td>19:</td><td>24 V_{SEN}</td><td>6:</td><td>0 V_{SEN} x+1</td><td>19:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>7:</td><td>24 V_{SEN}</td><td>20:</td><td>24 V_{SEN}</td><td>7:</td><td>24 V_{SEN} x+3</td><td>20:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>8:</td><td>0 V_{SEN}</td><td>21:</td><td>24 V_{SEN}</td><td>8:</td><td>0 V_{SEN} x+3</td><td>21:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>9:</td><td>24 V_{SEN}</td><td>22:</td><td>0 V_{SEN}</td><td>9:</td><td>24 V_{SEN} x</td><td>22:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>10:</td><td>24 V_{SEN}</td><td>23:</td><td>0 V_{SEN}</td><td>10:</td><td>24 V_{SEN} x+2</td><td>23:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>11:</td><td>0 V_{SEN}</td><td>24:</td><td>0 V_{SEN}</td><td>11:</td><td>0 V_{SEN} x</td><td>24:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>12:</td><td>0 V_{SEN}</td><td>25:</td><td>FE</td><td>12:</td><td>0 V_{SEN} x+2</td><td>25:</td><td>FE</td></tr>
<tr><td></td><td></td><td></td><td>Housing: FE</td><td>13:</td><td>FE</td><td></td><td>Housing: FE</td></tr> </tbody> </table> | 1: | Input x | 14: | Input x+2 | 1: | Input x | 14: | Input x+4 | 2: | Input x+1 | 15: | Input x+3 | 2: | Input x+1 | 15: | Input x+5 | 3: | Input x+1 | 16: | Input x+3 | 3: | Input x+2 | 16: | Input x+6 | 4: | n.c. | 17: | n.c. | 4: | Input x+3 | 17: | Input x+7 | 5: | 24 V _{SEN} | 18: | 24 V _{SEN} | 5: | 24 V _{SEN} x+1 | 18: | 24 V _{SEN} x+4 | 6: | 0 V _{SEN} | 19: | 24 V _{SEN} | 6: | 0 V _{SEN} x+1 | 19: | 24 V _{SEN} x+5 | 7: | 24 V _{SEN} | 20: | 24 V _{SEN} | 7: | 24 V _{SEN} x+3 | 20: | 24 V _{SEN} x+6 | 8: | 0 V _{SEN} | 21: | 24 V _{SEN} | 8: | 0 V _{SEN} x+3 | 21: | 24 V _{SEN} x+7 | 9: | 24 V _{SEN} | 22: | 0 V _{SEN} | 9: | 24 V _{SEN} x | 22: | 0 V _{SEN} x+2 and 3 | 10: | 24 V _{SEN} | 23: | 0 V _{SEN} | 10: | 24 V _{SEN} x+2 | 23: | 0 V _{SEN} x+2 and 3 | 11: | 0 V _{SEN} | 24: | 0 V _{SEN} | 11: | 0 V _{SEN} x | 24: | 0 V _{SEN} x+2 and 3 | 12: | 0 V _{SEN} | 25: | FE | 12: | 0 V _{SEN} x+2 | 25: | FE | | | | Housing: FE | 13: | FE | | Housing: FE | <table> <tbody> <tr><td>X3.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN}</td><td>X3.0:</td><td>24 V_{SEN} x+2</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X3.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN}</td><td>X3.1:</td><td>0 V_{SEN} x+2</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X3.2:</td><td>Input x+1</td><td>X7.2:</td><td>Input x+3</td><td>X3.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X4.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN}</td><td>X4.0:</td><td>24 V_{SEN} x+3</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X4.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN}</td><td>X4.1:</td><td>0 V_{SEN} x+3</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X4.2:</td><td>n.c.</td><td>X8.2:</td><td>n.c.</td><td>X4.2:</td><td>Input x+3</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> | X3.0: | 24 V _{SEN} | X7.0: | 24 V _{SEN} | X3.0: | 24 V _{SEN} x+2 | X7.0: | 24 V _{SEN} x+6 | X3.1: | 0 V _{SEN} | X7.1: | 0 V _{SEN} | X3.1: | 0 V _{SEN} x+2 | X7.1: | 0 V _{SEN} x+6 | X3.2: | Input x+1 | X7.2: | Input x+3 | X3.2: | Input x+2 | X7.2: | Input x+6 | X3.3: | FE | X7.3: | FE | X3.3: | FE | X7.3: | FE | | | | | | | | | X4.0: | 24 V _{SEN} | X8.0: | 24 V _{SEN} | X4.0: | 24 V _{SEN} x+3 | X8.0: | 24 V _{SEN} x+7 | X4.1: | 0 V _{SEN} | X8.1: | 0 V _{SEN} | X4.1: | 0 V _{SEN} x+3 | X8.1: | 0 V _{SEN} x+7 | X4.2: | n.c. | X8.2: | n.c. | X4.2: | Input x+3 | X8.2: | Input x+7 | X4.3: | FE | X8.3: | FE | X4.3: | FE | X8.3: | FE | <table> <tbody> <tr><td>X5.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN}</td><td>X5.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X5.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN}</td><td>X5.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X5.2:</td><td>Input x</td><td>X9.2:</td><td>Input x</td><td>X5.2:</td><td>Input x+4</td></tr> <tr><td>X5.3:</td><td>FE</td><td>X9.3:</td><td>FE</td><td>X5.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X6.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN}</td><td>X6.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X6.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN}</td><td>X6.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X6.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+1</td><td>X6.2:</td><td>Input x+5</td></tr> <tr><td>X6.3:</td><td>FE</td><td>X10.3:</td><td>FE</td><td>X6.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X7.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X7.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X7.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X7.3:</td><td>FE</td><td>X11.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X8.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X8.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X8.2:</td><td>n.c.</td><td>X12.2:</td><td>n.c.</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X8.3:</td><td>FE</td><td>X12.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> | X5.0: | 24 V _{SEN} | X9.0: | 24 V _{SEN} | X5.0: | 24 V _{SEN} x+4 | X5.1: | 0 V _{SEN} | X9.1: | 0 V _{SEN} | X5.1: | 0 V _{SEN} x+4 | X5.2: | Input x | X9.2: | Input x | X5.2: | Input x+4 | X5.3: | FE | X9.3: | FE | X5.3: | FE | | | | | | | X6.0: | 24 V _{SEN} | X10.0: | 24 V _{SEN} | X6.0: | 24 V _{SEN} x+5 | X6.1: | 0 V _{SEN} | X10.1: | 0 V _{SEN} | X6.1: | 0 V _{SEN} x+5 | X6.2: | Input x+1 | X10.2: | Input x+1 | X6.2: | Input x+5 | X6.3: | FE | X10.3: | FE | X6.3: | FE | | | | | | | X7.0: | 24 V _{SEN} | X11.0: | 24 V _{SEN} | X7.0: | 24 V _{SEN} x+6 | X7.1: | 0 V _{SEN} | X11.1: | 0 V _{SEN} | X7.1: | 0 V _{SEN} x+6 | X7.2:
 | Input x+2 | X11.2: | Input x+2 | X7.2: | Input x+6 | X7.3: | FE | X11.3: | FE | X7.3: | FE | | | | | | | X8.0: | 24 V _{SEN} | X12.0: | 24 V _{SEN} | X8.0: | 24 V _{SEN} x+7 | X8.1: | 0 V _{SEN} | X12.1: | 0 V _{SEN} | X8.1: | 0 V _{SEN} x+7 | X8.2: | n.c. | X12.2: | n.c. | X8.2: | Input x+7 | X8.3: | FE | X12.3: | FE | X8.3: | FE | <table> <tbody> <tr><td>X9.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X9.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X9.2:</td><td>Input x</td><td>X13.2:</td><td>Input x</td><td>X9.2:</td><td>Input x+4</td></tr> <tr><td>X9.3:</td><td>FE</td><td>X13.3:</td><td>FE</td><td>X9.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X10.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X10.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X10.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+5</td></tr> <tr><td>X10.3:</td><td>FE</td><td>X14.3:</td><td>FE</td><td>X10.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X11.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X11.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X11.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+6</td></tr> <tr><td>X11.3:</td><td>FE</td><td>X15.3:</td><td>FE</td><td>X11.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X12.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X12.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X12.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+3</td><td>X12.2:</td><td>Input x+7</td></tr> <tr><td>X12.3:</td><td>FE</td><td>X16.3:</td><td>FE</td><td>X12.3:</td><td>FE</td></tr> </tbody> </table> | X9.0: | 24 V _{SEN} | X13.0: | 24 V _{SEN} | X9.0: | 24 V _{SEN} x+4 | X9.1: | 0 V _{SEN} | X13.1: | 0 V _{SEN} | X9.1: | 0 V _{SEN} x+4 | X9.2: | Input x | X13.2: | Input x | X9.2: | Input x+4 | X9.3: | FE | X13.3: | FE | X9.3: | FE | | | | | | | X10.0: | 24 V _{SEN} | X14.0: | 24 V _{SEN} | X10.0: | 24 V _{SEN} x+5 | X10.1: | 0 V _{SEN} | X14.1: | 0 V _{SEN} | X10.1: | 0 V _{SEN} x+5 | X10.2: | Input x+1 | X14.2: | Input x+1 | X10.2: | Input x+5 | X10.3: | FE | X14.3: | FE | X10.3: | FE | | | | | | | X11.0: | 24 V _{SEN} | X15.0: | 24 V _{SEN} | X11.0: | 24 V _{SEN} x+6 | X11.1: | 0 V _{SEN} | X15.1: | 0 V _{SEN} | X11.1: | 0 V _{SEN} x+6 | X11.2: | Input x+2 | X15.2: | Input x+2 | X11.2: | Input x+6 | X11.3: | FE | X15.3: | FE | X11.3: | FE | | | | | | | X12.0: | 24 V _{SEN} | X16.0: | 24 V _{SEN} | X12.0: | 24 V _{SEN} x+7 | X12.1: | 0 V _{SEN} | X16.1: | 0 V _{SEN} | X12.1: | 0 V _{SEN} x+7 | X12.2: | Input x+3 | X16.2: | Input x+3 | X12.2: | Input x+7 | X12.3: | FE | X16.3: | FE | X12.3: | FE | <table> <tbody> <tr><td>X13.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X13.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X13.2:</td><td>Input x</td><td>X17.2:</td><td>Input x</td><td>X13.2:</td><td>Input x+4</td></tr> <tr><td>X13.3:</td><td>FE</td><td>X17.3:</td><td>FE</td><td>X13.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X14.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X14.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X14.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+5</td></tr> <tr><td>X14.3:</td><td>FE</td><td>X18.3:</td><td>FE</td><td>X14.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X15.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X15.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X15.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+6</td></tr> <tr><td>X15.3:</td><td>FE</td><td>X19.3:</td><td>FE</td><td>X15.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X16.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X16.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X16.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+7</td></tr> <tr><td>X16.3:</td><td>FE</td><td>X20.3:</td><td>FE</td><td>X16.3:</td><td>FE</td></tr> </tbody> </table> | X13.0: | 24 V _{SEN} | X17.0: | 24 V _{SEN} | X13.0: | 24 V _{SEN}
x+4 | X13.1: | 0 V _{SEN} | X17.1: | 0 V _{SEN} | X13.1: | 0 V _{SEN} x+4 | X13.2: | Input x | X17.2: | Input x | X13.2: | Input x+4 | X13.3: | FE | X17.3: | FE | X13.3: | FE | | | | | | | X14.0: | 24 V _{SEN} | X18.0: | 24 V _{SEN} | X14.0: | 24 V _{SEN} x+5 | X14.1: | 0 V _{SEN} | X18.1: | 0 V _{SEN} | X14.1: | 0 V _{SEN} x+5 | X14.2: | Input x+1 | X18.2: | Input x+1 | X14.2: | Input x+5 | X14.3: | FE | X18.3: | FE | X14.3: | FE | | | | | | | X15.0: | 24 V _{SEN} | X19.0: | 24 V _{SEN} | X15.0: | 24 V _{SEN} x+6 | X15.1: | 0 V _{SEN} | X19.1: | 0 V _{SEN} | X15.1: | 0 V _{SEN} x+6 | X15.2: | Input x+2 | X19.2: | Input x+2 | X15.2: | Input x+6 | X15.3: | FE | X19.3: | FE | X15.3: | FE | | | | | | | X16.0: | 24 V _{SEN} | X20.0: | 24 V _{SEN} | X16.0: | 24 V _{SEN} x+7 | X16.1: | 0 V _{SEN} | X20.1: | 0 V _{SEN} | X16.1: | 0 V _{SEN} x+7 | X16.2: | Input x+3 | X20.2: | Input x+3 | X16.2: | Input x+7 | X16.3: | FE | X20.3: | FE | X16.3: | FE | <table> <tbody> <tr><td>X17.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X17.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X17.2:</td><td>Input x</td><td>X21.2:</td><td>Input x</td><td>X17.2:</td><td>Input x+4</td></tr> <tr><td>X17.3:</td><td>FE</td><td>X21.3:</td><td>FE</td><td>X17.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X18.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X18.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X18.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+5</td></tr> <tr><td>X18.3:</td><td>FE</td><td>X22.3:</td><td>FE</td><td>X18.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X19.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X19.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X19.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+6</td></tr> <tr><td>X19.3:</td><td>FE</td><td>X23.3:</td><td>FE</td><td>X19.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X20.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X20.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X20.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+7</td></tr> <tr><td>X20.3:</td><td>FE</td><td>X24.3:</td><td>FE</td><td>X20.3:</td><td>FE</td></tr> </tbody> </table> | X17.0: | 24 V _{SEN} | X21.0: | 24 V _{SEN} | X17.0: | 24 V _{SEN} x+4 | X17.1: | 0 V _{SEN} | X21.1: | 0 V _{SEN} | X17.1: | 0 V _{SEN} x+4 | X17.2: | Input x | X21.2: | Input x | X17.2: | Input x+4 | X17.3: | FE | X21.3: | FE | X17.3: | FE | | | | | | | X18.0: | 24 V _{SEN} | X22.0: | 24 V _{SEN} | X18.0: | 24 V _{SEN} x+5 | X18.1: | 0 V _{SEN} | X22.1: | 0 V _{SEN} | X18.1: | 0 V _{SEN} x+5 | X18.2: | Input x+1 | X22.2: | Input x+1 | X18.2: | Input x+5 | X18.3: | FE | X22.3: | FE | X18.3: | FE | | | | | | | X19.0: | 24 V _{SEN} | X23.0: | 24 V _{SEN} | X19.0: | 24 V _{SEN} x+6 | X19.1: | 0 V _{SEN} | X23.1: | 0 V _{SEN} | X19.1: | 0 V _{SEN} x+6 | X19.2: | Input x+2 | X23.2: | Input x+2 | X19.2: | Input x+6 | X19.3: | FE | X23.3: | FE | X19.3: | FE | | | | | | | X20.0: | 24 V _{SEN} | X24.0: | 24 V _{SEN} | X20.0: | 24 V _{SEN} x+7 | X20.1: | 0 V _{SEN} | X24.1: | 0 V _{SEN} | X20.1: | 0 V _{SEN} x+7 | X20.2: | Input x+3 | X24.2: | Input x+3 | X20.2: | Input x+7 | X20.3: | FE | X24.3: | FE | X20.3: | FE | <table> <tbody> <tr><td>X21.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X21.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X21.2:</td><td>Input x</td><td>X25.2:</td><td>Input x</td><td>X21.2:</td><td>Input x+4</td></tr> <tr><td>X21.3:</td><td>FE</td><td>X25.3:</td><td>FE</td><td>X21.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X22.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X22.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X22.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+5</td></tr>
<tr><td>X22.3:</td><td>FE</td><td>X26.3:</td><td>FE</td><td>X22.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X23.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X23.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X23.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+6</td></tr> <tr><td>X23.3:</td><td>FE</td><td>X27.3:</td><td>FE</td><td>X23.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X24.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X24.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X24.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+7</td></tr> <tr><td>X24.3:</td><td>FE</td><td>X28.3:</td><td>FE</td><td>X24.3:</td><td>FE</td></tr> </tbody> </table> | X21.0: | 24 V _{SEN} | X25.0: | 24 V _{SEN} | X21.0: | 24 V _{SEN} x+4 | X21.1: | 0 V _{SEN} | X25.1: | 0 V _{SEN} | X21.1: | 0 V _{SEN} x+4 | X21.2: | Input x | X25.2: | Input x | X21.2: | Input x+4 | X21.3: | FE | X25.3: | FE | X21.3: | FE | | | | | | | X22.0: | 24 V _{SEN} | X26.0: | 24 V _{SEN} | X22.0: | 24 V _{SEN} x+5 | X22.1: | 0 V _{SEN} | X26.1: | 0 V _{SEN} | X22.1: | 0 V _{SEN} x+5 | X22.2: | Input x+1 | X26.2: | Input x+1 | X22.2: | Input x+5 | X22.3: | FE | X26.3: | FE | X22.3: | FE | | | | | | | X23.0: | 24 V _{SEN} | X27.0: | 24 V _{SEN} | X23.0: | 24 V _{SEN} x+6 | X23.1: | 0 V _{SEN} | X27.1: | 0 V _{SEN} | X23.1: | 0 V _{SEN} x+6 | X23.2: | Input x+2 | X27.2: | Input x+2 | X23.2: | Input x+6 | X23.3: | FE | X27.3: | FE | X23.3: | FE | | | | | | | X24.0: | 24 V _{SEN} | X28.0: | 24 V _{SEN} | X24.0: | 24 V _{SEN} x+7 | X24.1: | 0 V _{SEN} | X28.1: | 0 V _{SEN} | X24.1: | 0 V _{SEN} x+7 | X24.2: | Input x+3 | X28.2: | Input x+3 | X24.2: | Input x+7 | X24.3: | FE | X28.3: | FE | X24.3: | FE | <table> <tbody> <tr><td>X25.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X25.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X25.2:</td><td>Input x</td><td>X29.2:</td><td>Input x</td><td>X25.2:</td><td>Input x+4</td></tr> <tr><td>X25.3:</td><td>FE</td><td>X29.3:</td><td>FE</td><td>X25.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X26.0:</td><td>24 V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X26.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X26.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+5</td></tr> <tr><td>X26.3:</td><td>FE</td><td>X30.3:</td><td>FE</td><td>X26.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X27.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X27.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X27.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+6</td></tr> <tr><td>X27.3:</td><td>FE</td><td>X31.3:</td><td>FE</td><td>X27.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X28.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X28.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X28.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+7</td></tr> <tr><td>X28.3:</td><td>FE</td><td>X32.3:</td><td>FE</td><td>X28.3:</td><td>FE</td></tr> </tbody> </table> | X25.0: | 24 V _{SEN} | X29.0: | 24 V _{SEN} | X25.0: | 24 V _{SEN} x+4 | X25.1: | 0 V _{SEN} | X29.1: | 0 V _{SEN} | X25.1: | 0 V _{SEN} x+4 | X25.2: | Input x | X29.2: | Input x | X25.2: | Input x+4 | X25.3: | FE | X29.3: | FE | X25.3: | FE | | | | | | | X26.0: | 24 V _{SEN} | X30.0: | 24 V _{SEN} | X26.0: | 24 V _{SEN} x+5 | X26.1: | 0 V _{SEN} | X30.1: | 0 V _{SEN} | X26.1: | 0 V _{SEN} x+5 | X26.2: | Input x+1 | X30.2: | Input x+1 | X26.2: | Input x+5 | X26.3: | FE | X30.3: | FE | X26.3: | FE | | | | | | | X27.0: | 24 V _{SEN} | X31.0: | 24 V _{SEN} | X27.0: | 24 V _{SEN} x+6 | X27.1: | 0 V _{SEN} | X31.1: | 0 V _{SEN} | X27.1: | 0 V _{SEN} x+6 | X27.2: | Input x+2 | X31.2: | Input x+2 | X27.2: | Input x+6 | X27.3: | FE | X31.3: | FE | X27.3: | FE | | | | | | | X28.0: | 24 V _{SEN} | X32.0: | 24 V _{SEN} |
X28.0: | 24 V _{SEN} x+7 | X28.1: | 0 V _{SEN} | X32.1: | 0 V _{SEN} | X28.1: | 0 V _{SEN} x+7 | X28.2: | Input x+3 | X32.2: | Input x+3 | X28.2: | Input x+7 | X28.3: | FE | X32.3: | FE | X28.3: | FE | <table> <tbody> <tr><td>X29.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X29.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X29.2:</td><td>Input x</td><td>X33.2:</td><td>Input x</td><td>X29.2:</td><td>Input x+4</td></tr> <tr><td>X29.3:</td><td>FE</td><td>X33.3:</td><td>FE</td><td>X29.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X30.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24 V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X30.1:</td><td>0 V_{SEN}</td><td>X34.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X30.2:</td><td>Input x+1</td><td>X34.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+5</td></tr> <tr><td>X30.3:</td><td>FE</td><td>X34.3:</td><td>FE</td><td>X30.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X31.0:</td><td>24 V_{SEN}</td><td>X35.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X31.1:</td><td>0 V_{SEN}</td><td>X35.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X31.2:</td><td>Input x+2</td><td>X35.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+6</td></tr> <tr><td>X31.3:</td><td>FE</td><td>X35.3:</td><td>FE</td><td>X31.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X32.0:</td><td>24 V_{SEN}</td><td>X36.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X32.1:</td><td>0 V_{SEN}</td><td>X36.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X32.2:</td><td>Input x+3</td><td>X36.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+7</td></tr> <tr><td>X32.3:</td><td>FE</td><td>X36.3:</td><td>FE</td><td>X32.3:</td><td>FE</td></tr> </tbody> </table> | X29.0: | 24 V _{SEN} | X33.0: | 24 V _{SEN} | X29.0: | 24 V _{SEN} x+4 | X29.1: | 0 V _{SEN} | X33.1: | 0 V _{SEN} | X29.1: | 0 V _{SEN} x+4 | X29.2: | Input x | X33.2: | Input x | X29.2: | Input x+4 | X29.3: | FE | X33.3: | FE | X29.3: | FE | | | | | | | X30.0: | 24 V _{SEN} | X34.0: | 24 V _{SEN} | X30.0: | 24 V _{SEN} x+5 | X30.1: | 0 V _{SEN} | X34.1: | 0 V _{SEN} | X30.1: | 0 V _{SEN} x+5 | X30.2: | Input x+1 | X34.2: | Input x+1 | X30.2: | Input x+5 | X30.3: | FE | X34.3: | FE | X30.3: | FE | | | | | | | X31.0: | 24 V _{SEN} | X35.0: | 24 V _{SEN} | X31.0: | 24 V _{SEN} x+6 | X31.1: | 0 V _{SEN} | X35.1: | 0 V _{SEN} | X31.1: | 0 V _{SEN} x+6 | X31.2: | Input x+2 | X35.2: | Input x+2 | X31.2: | Input x+6 | X31.3: | FE | X35.3: | FE | X31.3: | FE | | | | | | | X32.0: | 24 V _{SEN} | X36.0: | 24 V _{SEN} | X32.0: | 24 V _{SEN} x+7 | X32.1: | 0 V _{SEN} | X36.1: | 0 V _{SEN} | X32.1: | 0 V _{SEN} x+7 | X32.2: | Input x+3 | X36.2: | Input x+3 | X32.2: | Input x+7 | X32.3: | FE | X36.3: | FE | X32.3: | FE | <table> <tbody> <tr><td>X33.0:</td><td>24 V_{SEN}</td><td>X37.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X33.1:</td><td>0 V_{SEN}</td><td>X37.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X33.2:</td><td>Input x</td><td>X37.2:</td><td>Input x</td><td>X33.2:</td><td>Input x+4</td></tr> <tr><td>X33.3:</td><td>FE</td><td>X37.3:</td><td>FE</td><td>X33.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X34.0:</td><td>24 V_{SEN}</td><td>X38.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X34.1:</td><td>0 V_{SEN}</td><td>X38.1:</td><td>0 V_{SEN}</td><</tr></tbody></table> | X33.0: | 24 V _{SEN} | X37.0: | 24 V _{SEN} | X33.0: | 24 V _{SEN} x+4 | X33.1: | 0 V _{SEN} | X37.1: | 0 V _{SEN} | X33.1: | 0 V _{SEN} x+4 | X33.2: | Input x | X37.2: | Input x | X33.2: | Input x+4 | X33.3: | FE | X37.3: | FE | X33.3: | FE | | | | | | | X34.0: | 24 V _{SEN} | X38.0: | 24 V _{SEN} | X34.0: | 24 V _{SEN} x+5 | X34.1: | 0 V _{SEN} | X38.1: | 0 V _{SEN} |
| X1.0: | 24 V _{SEN}
 | X5.0: | 24 V _{SEN} | X1.0: | 24 V _{SEN} x | X5.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X1.1: | 0 V _{SEN}
 | X5.1: | 0 V _{SEN} | X1.1: | 0 V _{SEN} x | X5.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X1.2: | Input x
 | X5.2: | Input x+2 | X1.2: | Input x | X5.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X1.3: | FE
 | X5.3: | FE | X1.3: | FE | X5.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table> <tbody> <tr><td>1:</td><td>Input x</td><td>14:</td><td>Input x+2</td><td>1:</td><td>Input x</td><td>14:</td><td>Input x+4</td></tr> <tr><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+3</td><td>2:</td><td>Input x+1</td><td>15:</td><td>Input x+5</td></tr> <tr><td>3:</td><td>Input x+1</td><td>16:</td><td>Input x+3</td><td>3:</td><td>Input x+2</td><td>16:</td><td>Input x+6</td></tr> <tr><td>4:</td><td>n.c.</td><td>17:</td><td>n.c.</td><td>4:</td><td>Input x+3</td><td>17:</td><td>Input x+7</td></tr> <tr><td>5:</td><td>24 V_{SEN}</td><td>18:</td><td>24 V_{SEN}</td><td>5:</td><td>24 V_{SEN} x+1</td><td>18:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>6:</td><td>0 V_{SEN}</td><td>19:</td><td>24 V_{SEN}</td><td>6:</td><td>0 V_{SEN} x+1</td><td>19:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>7:</td><td>24 V_{SEN}</td><td>20:</td><td>24 V_{SEN}</td><td>7:</td><td>24 V_{SEN} x+3</td><td>20:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>8:</td><td>0 V_{SEN}</td><td>21:</td><td>24 V_{SEN}</td><td>8:</td><td>0 V_{SEN} x+3</td><td>21:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>9:</td><td>24 V_{SEN}</td><td>22:</td><td>0 V_{SEN}</td><td>9:</td><td>24 V_{SEN} x</td><td>22:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>10:</td><td>24 V_{SEN}</td><td>23:</td><td>0 V_{SEN}</td><td>10:</td><td>24 V_{SEN} x+2</td><td>23:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>11:</td><td>0 V_{SEN}</td><td>24:</td><td>0 V_{SEN}</td><td>11:</td><td>0 V_{SEN} x</td><td>24:</td><td>0 V_{SEN} x+2 and 3</td></tr> <tr><td>12:</td><td>0 V_{SEN}</td><td>25:</td><td>FE</td><td>12:</td><td>0 V_{SEN} x+2</td><td>25:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td>Housing: FE</td><td>13:</td><td>FE</td><td></td><td>Housing: FE</td></tr> </tbody> </table>
 | 1: | Input x | 14: | Input x+2 | 1: | Input x | 14: | Input x+4 | 2: | Input x+1 | 15: | Input x+3 | 2: | Input x+1 | 15: | Input x+5 | 3: | Input x+1 | 16: | Input x+3 | 3: | Input x+2 | 16: | Input x+6 | 4: | n.c. | 17: | n.c. | 4: | Input x+3 | 17: | Input x+7 | 5: | 24 V _{SEN} | 18: | 24 V _{SEN} | 5: | 24 V _{SEN}
x+1 | 18: | 24 V _{SEN} x+4 | 6: | 0 V _{SEN} | 19: | 24 V _{SEN} | 6: | 0 V _{SEN} x+1 | 19: | 24 V _{SEN} x+5 | 7: | 24 V _{SEN} | 20: | 24 V _{SEN} | 7: | 24 V _{SEN} x+3 | 20: | 24 V _{SEN} x+6 | 8: | 0 V _{SEN} | 21: | 24 V _{SEN} | 8: | 0 V _{SEN} x+3 | 21: | 24 V _{SEN} x+7 | 9: | 24 V _{SEN} | 22: | 0 V _{SEN} | 9: | 24 V _{SEN} x | 22: | 0 V _{SEN} x+2 and 3 | 10: | 24 V _{SEN} | 23: | 0 V _{SEN} | 10: | 24 V _{SEN} x+2 | 23: | 0 V _{SEN} x+2 and 3 | 11: | 0 V _{SEN} | 24: | 0 V _{SEN} | 11: | 0 V _{SEN} x | 24: | 0 V _{SEN} x+2 and 3 | 12: | 0 V _{SEN} | 25: | FE | 12: | 0 V _{SEN} x+2 | 25: | FE | | | | Housing: FE | 13: | FE | | Housing: FE | <table> <tbody> <tr><td>X3.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN}</td><td>X3.0:</td><td>24 V_{SEN} x+2</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X3.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN}</td><td>X3.1:</td><td>0 V_{SEN} x+2</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X3.2:</td><td>Input x+1</td><td>X7.2:</td><td>Input x+3</td><td>X3.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X4.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN}</td><td>X4.0:</td><td>24 V_{SEN} x+3</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X4.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN}</td><td>X4.1:</td><td>0 V_{SEN} x+3</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X4.2:</td><td>n.c.</td><td>X8.2:</td><td>n.c.</td><td>X4.2:</td><td>Input x+3</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> | X3.0: | 24 V _{SEN} | X7.0: | 24 V _{SEN} | X3.0: | 24 V _{SEN} x+2 | X7.0: | 24 V _{SEN} x+6 | X3.1: | 0 V _{SEN} | X7.1: | 0 V _{SEN} | X3.1: | 0 V _{SEN} x+2 | X7.1: | 0 V _{SEN} x+6 | X3.2: | Input x+1 | X7.2: | Input x+3 | X3.2: | Input x+2 | X7.2: | Input x+6 | X3.3: | FE | X7.3: | FE | X3.3: | FE | X7.3: | FE | | | | | | | | | X4.0: | 24 V _{SEN} | X8.0: | 24 V _{SEN} | X4.0: | 24 V _{SEN} x+3 | X8.0: | 24 V _{SEN} x+7 | X4.1: | 0 V _{SEN} | X8.1: | 0 V _{SEN} | X4.1: | 0 V _{SEN} x+3 | X8.1: | 0 V _{SEN} x+7 | X4.2: | n.c. | X8.2: | n.c. | X4.2: | Input x+3 | X8.2: | Input x+7 | X4.3: | FE | X8.3: | FE | X4.3: | FE | X8.3: | FE | <table> <tbody> <tr><td>X5.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN}</td><td>X5.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X5.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN}</td><td>X5.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X5.2:</td><td>Input x</td><td>X9.2:</td><td>Input x</td><td>X5.2:</td><td>Input x+4</td></tr> <tr><td>X5.3:</td><td>FE</td><td>X9.3:</td><td>FE</td><td>X5.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X6.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN}</td><td>X6.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X6.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN}</td><td>X6.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X6.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+1</td><td>X6.2:</td><td>Input x+5</td></tr> <tr><td>X6.3:</td><td>FE</td><td>X10.3:</td><td>FE</td><td>X6.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X7.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN}</td><td>X7.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X7.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN}</td><td>X7.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X7.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+2</td><td>X7.2:</td><td>Input x+6</td></tr> <tr><td>X7.3:</td><td>FE</td><td>X11.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X8.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN}</td><td>X8.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X8.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN}</td><td>X8.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X8.2:</td><td>n.c.</td><td>X12.2:</td><td>n.c.</td><td>X8.2:</td><td>Input x+7</td></tr> <tr><td>X8.3:</td><td>FE</td><td>X12.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table> | X5.0: | 24 V _{SEN} | X9.0: | 24 V _{SEN} | X5.0: | 24 V _{SEN} x+4 | X5.1: | 0 V _{SEN} | X9.1: | 0 V _{SEN} | X5.1: | 0 V _{SEN} x+4 | X5.2: | Input x | X9.2: | Input x | X5.2: | Input x+4 | X5.3: | FE | X9.3: | FE | X5.3: | FE | | | | | | | X6.0: | 24 V _{SEN} | X10.0: | 24 V _{SEN} | X6.0: | 24 V _{SEN} x+5 | X6.1: | 0 V _{SEN} | X10.1: | 0 V _{SEN} | X6.1: | 0 V _{SEN} x+5
 | X6.2: | Input x+1 | X10.2: | Input x+1 | X6.2: | Input x+5 | X6.3: | FE | X10.3: | FE | X6.3: | FE | | | | | | | X7.0: | 24 V _{SEN} | X11.0: | 24 V _{SEN} | X7.0: | 24 V _{SEN} x+6 | X7.1: | 0 V _{SEN} | X11.1: | 0 V _{SEN} | X7.1: | 0 V _{SEN} x+6 | X7.2: | Input x+2 | X11.2: | Input x+2 | X7.2: | Input x+6 | X7.3: | FE | X11.3: | FE | X7.3: | FE | | | | | | | X8.0: | 24 V _{SEN} | X12.0: | 24 V _{SEN} | X8.0: | 24 V _{SEN} x+7 | X8.1: | 0 V _{SEN} | X12.1: | 0 V _{SEN} | X8.1: | 0 V _{SEN} x+7 | X8.2: | n.c. | X12.2: | n.c. | X8.2: | Input x+7 | X8.3: | FE | X12.3: | FE | X8.3: | FE | <table> <tbody> <tr><td>X9.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN}</td><td>X9.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X9.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN}</td><td>X9.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X9.2:</td><td>Input x</td><td>X13.2:</td><td>Input x</td><td>X9.2:</td><td>Input x+4</td></tr> <tr><td>X9.3:</td><td>FE</td><td>X13.3:</td><td>FE</td><td>X9.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X10.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN}</td><td>X10.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X10.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN}</td><td>X10.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X10.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+1</td><td>X10.2:</td><td>Input x+5</td></tr> <tr><td>X10.3:</td><td>FE</td><td>X14.3:</td><td>FE</td><td>X10.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X11.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN}</td><td>X11.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X11.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN}</td><td>X11.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X11.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+2</td><td>X11.2:</td><td>Input x+6</td></tr> <tr><td>X11.3:</td><td>FE</td><td>X15.3:</td><td>FE</td><td>X11.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X12.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN}</td><td>X12.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X12.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN}</td><td>X12.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X12.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+3</td><td>X12.2:</td><td>Input x+7</td></tr> <tr><td>X12.3:</td><td>FE</td><td>X16.3:</td><td>FE</td><td>X12.3:</td><td>FE</td></tr> </tbody> </table> | X9.0: | 24 V _{SEN} | X13.0: | 24 V _{SEN} | X9.0: | 24 V _{SEN} x+4 | X9.1: | 0 V _{SEN} | X13.1: | 0 V _{SEN} | X9.1: | 0 V _{SEN} x+4 | X9.2: | Input x | X13.2: | Input x | X9.2: | Input x+4 | X9.3: | FE | X13.3: | FE | X9.3: | FE | | | | | | | X10.0: | 24 V _{SEN} | X14.0: | 24 V _{SEN} | X10.0: | 24 V _{SEN} x+5 | X10.1: | 0 V _{SEN} | X14.1: | 0 V _{SEN} | X10.1: | 0 V _{SEN} x+5 | X10.2: | Input x+1 | X14.2: | Input x+1 | X10.2: | Input x+5 | X10.3: | FE | X14.3: | FE | X10.3: | FE | | | | | | | X11.0: | 24 V _{SEN} | X15.0: | 24 V _{SEN} | X11.0: | 24 V _{SEN} x+6 | X11.1: | 0 V _{SEN} | X15.1: | 0 V _{SEN} | X11.1: | 0 V _{SEN} x+6 | X11.2: | Input x+2 | X15.2: | Input x+2 | X11.2: | Input x+6 | X11.3: | FE | X15.3: | FE | X11.3: | FE | | | | | | | X12.0: | 24 V _{SEN} | X16.0: | 24 V _{SEN} | X12.0: | 24 V _{SEN} x+7 | X12.1: | 0 V _{SEN} | X16.1: | 0 V _{SEN} | X12.1: | 0 V _{SEN} x+7 | X12.2: | Input x+3 | X16.2: | Input x+3 | X12.2: | Input x+7 | X12.3: | FE | X16.3: | FE | X12.3: | FE | <table> <tbody> <tr><td>X13.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN}</td><td>X13.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X13.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN}</td><td>X13.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X13.2:</td><td>Input x</td><td>X17.2:</td><td>Input x</td><td>X13.2:</td><td>Input x+4</td></tr> <tr><td>X13.3:</td><td>FE</td><td>X17.3:</td><td>FE</td><td>X13.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X14.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN}</td><td>X14.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X14.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN}</td><td>X14.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X14.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+1</td><td>X14.2:</td><td>Input x+5</td></tr> <tr><td>X14.3:</td><td>FE</td><td>X18.3:</td><td>FE</td><td>X14.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X15.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN}</td><td>X15.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X15.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN}</td><td>X15.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X15.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+2</td><td>X15.2:</td><td>Input x+6</td></tr> <tr><td>X15.3:</td><td>FE</td><td>X19.3:</td><td>FE</td><td>X15.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X16.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN}</td><td>X16.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X16.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN}</td><td>X16.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X16.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+3</td><td>X16.2:</td><td>Input x+7</td></tr> <tr><td>X16.3:</td><td>FE</td><td>X20.3:</td><td>FE</td><td>X16.3:</td><td>FE</td></tr> </tbody> </table> | X13.0: | 24 V _{SEN} | X17.0: | 24 V _{SEN} | X13.0: | 24 V _{SEN} x+4 | X13.1: | 0 V _{SEN} | X17.1: | 0 V _{SEN} | X13.1: | 0 V _{SEN} x+4 | X13.2: | Input x | X17.2: | Input x | X13.2: | Input x+4 | X13.3: | FE | X17.3: | FE | X13.3: | FE | | | | | | | X14.0: | 24 V _{SEN} | X18.0: | 24 V _{SEN} | X14.0: | 24 V _{SEN} x+5 | X14.1: | 0 V _{SEN} | X18.1: | 0 V _{SEN} | X14.1: | 0 V _{SEN} x+5
 | X14.2: | Input x+1 | X18.2: | Input x+1 | X14.2: | Input x+5 | X14.3: | FE | X18.3: | FE | X14.3: | FE | | | | | | | X15.0: | 24 V _{SEN} | X19.0: | 24 V _{SEN} | X15.0: | 24 V _{SEN} x+6 | X15.1: | 0 V _{SEN} | X19.1: | 0 V _{SEN} | X15.1: | 0 V _{SEN} x+6 | X15.2: | Input x+2 | X19.2: | Input x+2 | X15.2: | Input x+6 | X15.3: | FE | X19.3: | FE | X15.3: | FE | | | | | | | X16.0: | 24 V _{SEN} | X20.0: | 24 V _{SEN} | X16.0: | 24 V _{SEN} x+7 | X16.1: | 0 V _{SEN} | X20.1: | 0 V _{SEN} | X16.1: | 0 V _{SEN} x+7 | X16.2: | Input x+3 | X20.2: | Input x+3 | X16.2: | Input x+7 | X16.3: | FE | X20.3: | FE | X16.3: | FE | <table> <tbody> <tr><td>X17.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN}</td><td>X17.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X17.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN}</td><td>X17.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X17.2:</td><td>Input x</td><td>X21.2:</td><td>Input x</td><td>X17.2:</td><td>Input x+4</td></tr> <tr><td>X17.3:</td><td>FE</td><td>X21.3:</td><td>FE</td><td>X17.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X18.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN}</td><td>X18.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X18.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN}</td><td>X18.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X18.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+1</td><td>X18.2:</td><td>Input x+5</td></tr> <tr><td>X18.3:</td><td>FE</td><td>X22.3:</td><td>FE</td><td>X18.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X19.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN}</td><td>X19.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X19.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN}</td><td>X19.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X19.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+2</td><td>X19.2:</td><td>Input x+6</td></tr> <tr><td>X19.3:</td><td>FE</td><td>X23.3:</td><td>FE</td><td>X19.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X20.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN}</td><td>X20.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X20.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN}</td><td>X20.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X20.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+3</td><td>X20.2:</td><td>Input x+7</td></tr> <tr><td>X20.3:</td><td>FE</td><td>X24.3:</td><td>FE</td><td>X20.3:</td><td>FE</td></tr> </tbody> </table> | X17.0: | 24 V _{SEN} | X21.0: | 24 V _{SEN} | X17.0: | 24 V _{SEN} x+4 | X17.1: | 0 V _{SEN} | X21.1: | 0 V _{SEN} | X17.1: | 0 V _{SEN} x+4 | X17.2: | Input x | X21.2: | Input x | X17.2: | Input x+4 | X17.3: | FE | X21.3: | FE | X17.3: | FE | | | | | | | X18.0: | 24 V _{SEN} | X22.0: | 24 V _{SEN} | X18.0: | 24 V _{SEN} x+5 | X18.1: | 0 V _{SEN} | X22.1: | 0 V _{SEN} | X18.1: | 0 V _{SEN} x+5 | X18.2: | Input x+1 | X22.2: | Input x+1 | X18.2: | Input x+5 | X18.3: | FE | X22.3: | FE | X18.3: | FE | | | | | | | X19.0: | 24 V _{SEN} | X23.0: | 24 V _{SEN} | X19.0: | 24 V _{SEN} x+6 | X19.1: | 0 V _{SEN} | X23.1: | 0 V _{SEN} | X19.1: | 0 V _{SEN} x+6 | X19.2: | Input x+2 | X23.2: | Input x+2 | X19.2: | Input x+6 | X19.3: | FE | X23.3: | FE | X19.3: | FE | | | | | | | X20.0: | 24 V _{SEN} | X24.0: | 24 V _{SEN} | X20.0: | 24 V _{SEN} x+7 | X20.1: | 0 V _{SEN} | X24.1: | 0 V _{SEN} | X20.1: | 0 V _{SEN} x+7 | X20.2: | Input x+3 | X24.2: | Input x+3 | X20.2: | Input x+7 | X20.3: | FE | X24.3: | FE | X20.3: | FE | <table> <tbody> <tr><td>X21.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN}</td><td>X21.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X21.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN}</td><td>X21.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X21.2:</td><td>Input x</td><td>X25.2:</td><td>Input x</td><td>X21.2:</td><td>Input x+4</td></tr> <tr><td>X21.3:</td><td>FE</td><td>X25.3:</td><td>FE</td><td>X21.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X22.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN}</td><td>X22.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X22.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN}</td><td>X22.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X22.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+1</td><td>X22.2:</td><td>Input x+5</td></tr> <tr><td>X22.3:</td><td>FE</td><td>X26.3:</td><td>FE</td><td>X22.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X23.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN}</td><td>X23.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X23.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN}</td><td>X23.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X23.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+2</td><td>X23.2:</td><td>Input x+6</td></tr> <tr><td>X23.3:</td><td>FE</td><td>X27.3:</td><td>FE</td><td>X23.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X24.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN}</td><td>X24.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X24.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN}</td><td>X24.1:</td><td>0 V_{SEN}
x+7</td></tr> <tr><td>X24.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+3</td><td>X24.2:</td><td>Input x+7</td></tr> <tr><td>X24.3:</td><td>FE</td><td>X28.3:</td><td>FE</td><td>X24.3:</td><td>FE</td></tr> </tbody> </table> | X21.0: | 24 V _{SEN} | X25.0: | 24 V _{SEN} | X21.0: | 24 V _{SEN} x+4 | X21.1: | 0 V _{SEN} | X25.1: | 0 V _{SEN} | X21.1: | 0 V _{SEN} x+4 | X21.2: | Input x | X25.2: | Input x | X21.2: | Input x+4 | X21.3: | FE | X25.3: | FE | X21.3: | FE | | | | | | | X22.0: | 24 V _{SEN} | X26.0: | 24 V _{SEN} | X22.0: | 24 V _{SEN} x+5 | X22.1: | 0 V _{SEN} | X26.1: | 0 V _{SEN} | X22.1: | 0 V _{SEN} x+5 | X22.2: | Input x+1 | X26.2: | Input x+1 | X22.2: | Input x+5 | X22.3: | FE | X26.3: | FE | X22.3: | FE | | | | | | | X23.0: | 24 V _{SEN} | X27.0: | 24 V _{SEN} | X23.0: | 24 V _{SEN} x+6 | X23.1: | 0 V _{SEN} | X27.1: | 0 V _{SEN} | X23.1: | 0 V _{SEN} x+6 | X23.2: | Input x+2 | X27.2: | Input x+2 | X23.2: | Input x+6 | X23.3: | FE | X27.3: | FE | X23.3: | FE | | | | | | | X24.0: | 24 V _{SEN} | X28.0: | 24 V _{SEN} | X24.0: | 24 V _{SEN} x+7 | X24.1: | 0 V _{SEN} | X28.1: | 0 V _{SEN} | X24.1: | 0 V _{SEN} x+7 | X24.2: | Input x+3 | X28.2: | Input x+3 | X24.2: | Input x+7 | X24.3: | FE | X28.3: | FE | X24.3: | FE | <table> <tbody> <tr><td>X25.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN}</td><td>X25.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X25.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN}</td><td>X25.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X25.2:</td><td>Input x</td><td>X29.2:</td><td>Input x</td><td>X25.2:</td><td>Input x+4</td></tr> <tr><td>X25.3:</td><td>FE</td><td>X29.3:</td><td>FE</td><td>X25.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X26.0:</td><td>24 V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN}</td><td>X26.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X26.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN}</td><td>X26.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X26.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+1</td><td>X26.2:</td><td>Input x+5</td></tr> <tr><td>X26.3:</td><td>FE</td><td>X30.3:</td><td>FE</td><td>X26.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X27.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN}</td><td>X27.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X27.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN}</td><td>X27.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X27.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+2</td><td>X27.2:</td><td>Input x+6</td></tr> <tr><td>X27.3:</td><td>FE</td><td>X31.3:</td><td>FE</td><td>X27.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X28.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN}</td><td>X28.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X28.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN}</td><td>X28.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X28.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+3</td><td>X28.2:</td><td>Input x+7</td></tr> <tr><td>X28.3:</td><td>FE</td><td>X32.3:</td><td>FE</td><td>X28.3:</td><td>FE</td></tr> </tbody> </table> | X25.0: | 24 V _{SEN} | X29.0: | 24 V _{SEN} | X25.0: | 24 V _{SEN} x+4 | X25.1: | 0 V _{SEN} | X29.1: | 0 V _{SEN} | X25.1: | 0 V _{SEN} x+4 | X25.2: | Input x | X29.2: | Input x | X25.2: | Input x+4 | X25.3: | FE | X29.3: | FE | X25.3: | FE | | | | | | | X26.0: | 24 V _{SEN} | X30.0: | 24 V _{SEN} | X26.0: | 24 V _{SEN} x+5 | X26.1: | 0 V _{SEN} | X30.1: | 0 V _{SEN} | X26.1: | 0 V _{SEN} x+5 | X26.2: | Input x+1 | X30.2: | Input x+1 | X26.2: | Input x+5 | X26.3: | FE | X30.3: | FE | X26.3: | FE | | | | | | | X27.0: | 24 V _{SEN} | X31.0: | 24 V _{SEN} | X27.0: | 24 V _{SEN} x+6 | X27.1: | 0 V _{SEN} | X31.1: | 0 V _{SEN} | X27.1: | 0 V _{SEN} x+6 | X27.2: | Input x+2 | X31.2: | Input x+2 | X27.2: | Input x+6 | X27.3: | FE | X31.3: | FE | X27.3: | FE | | | | | | | X28.0: | 24 V _{SEN} | X32.0: | 24 V _{SEN} | X28.0: | 24 V _{SEN} x+7 | X28.1: | 0 V _{SEN} | X32.1: | 0 V _{SEN} | X28.1: | 0 V _{SEN} x+7 | X28.2: | Input x+3 | X32.2: | Input x+3 | X28.2: | Input x+7 | X28.3: | FE | X32.3: | FE | X28.3: | FE | <table> <tbody> <tr><td>X29.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN}</td><td>X29.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X29.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN}</td><td>X29.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X29.2:</td><td>Input x</td><td>X33.2:</td><td>Input x</td><td>X29.2:</td><td>Input x+4</td></tr> <tr><td>X29.3:</td><td>FE</td><td>X33.3:</td><td>FE</td><td>X29.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X30.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24
V_{SEN}</td><td>X30.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X30.1:</td><td>0 V_{SEN}</td><td>X34.1:</td><td>0 V_{SEN}</td><td>X30.1:</td><td>0 V_{SEN} x+5</td></tr> <tr><td>X30.2:</td><td>Input x+1</td><td>X34.2:</td><td>Input x+1</td><td>X30.2:</td><td>Input x+5</td></tr> <tr><td>X30.3:</td><td>FE</td><td>X34.3:</td><td>FE</td><td>X30.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X31.0:</td><td>24 V_{SEN}</td><td>X35.0:</td><td>24 V_{SEN}</td><td>X31.0:</td><td>24 V_{SEN} x+6</td></tr> <tr><td>X31.1:</td><td>0 V_{SEN}</td><td>X35.1:</td><td>0 V_{SEN}</td><td>X31.1:</td><td>0 V_{SEN} x+6</td></tr> <tr><td>X31.2:</td><td>Input x+2</td><td>X35.2:</td><td>Input x+2</td><td>X31.2:</td><td>Input x+6</td></tr> <tr><td>X31.3:</td><td>FE</td><td>X35.3:</td><td>FE</td><td>X31.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X32.0:</td><td>24 V_{SEN}</td><td>X36.0:</td><td>24 V_{SEN}</td><td>X32.0:</td><td>24 V_{SEN} x+7</td></tr> <tr><td>X32.1:</td><td>0 V_{SEN}</td><td>X36.1:</td><td>0 V_{SEN}</td><td>X32.1:</td><td>0 V_{SEN} x+7</td></tr> <tr><td>X32.2:</td><td>Input x+3</td><td>X36.2:</td><td>Input x+3</td><td>X32.2:</td><td>Input x+7</td></tr> <tr><td>X32.3:</td><td>FE</td><td>X36.3:</td><td>FE</td><td>X32.3:</td><td>FE</td></tr> </tbody> </table> | X29.0: | 24 V _{SEN} | X33.0: | 24 V _{SEN} | X29.0: | 24 V _{SEN} x+4 | X29.1: | 0 V _{SEN} | X33.1: | 0 V _{SEN} | X29.1: | 0 V _{SEN} x+4 | X29.2: | Input x | X33.2: | Input x | X29.2: | Input x+4 | X29.3: | FE | X33.3: | FE | X29.3: | FE | | | | | | | X30.0: | 24 V _{SEN} | X34.0: | 24 V _{SEN} | X30.0: | 24 V _{SEN} x+5 | X30.1: | 0 V _{SEN} | X34.1: | 0 V _{SEN} | X30.1: | 0 V _{SEN} x+5 | X30.2: | Input x+1 | X34.2: | Input x+1 | X30.2: | Input x+5 | X30.3: | FE | X34.3: | FE | X30.3: | FE | | | | | | | X31.0: | 24 V _{SEN} | X35.0: | 24 V _{SEN} | X31.0: | 24 V _{SEN} x+6 | X31.1: | 0 V _{SEN} | X35.1: | 0 V _{SEN} | X31.1: | 0 V _{SEN} x+6 | X31.2: | Input x+2 | X35.2: | Input x+2 | X31.2: | Input x+6 | X31.3: | FE | X35.3: | FE | X31.3: | FE | | | | | | | X32.0: | 24 V _{SEN} | X36.0: | 24 V _{SEN} | X32.0: | 24 V _{SEN} x+7 | X32.1: | 0 V _{SEN} | X36.1: | 0 V _{SEN} | X32.1: | 0 V _{SEN} x+7 | X32.2: | Input x+3 | X36.2: | Input x+3 | X32.2: | Input x+7 | X32.3: | FE | X36.3: | FE | X32.3: | FE | <table> <tbody> <tr><td>X33.0:</td><td>24 V_{SEN}</td><td>X37.0:</td><td>24 V_{SEN}</td><td>X33.0:</td><td>24 V_{SEN} x+4</td></tr> <tr><td>X33.1:</td><td>0 V_{SEN}</td><td>X37.1:</td><td>0 V_{SEN}</td><td>X33.1:</td><td>0 V_{SEN} x+4</td></tr> <tr><td>X33.2:</td><td>Input x</td><td>X37.2:</td><td>Input x</td><td>X33.2:</td><td>Input x+4</td></tr> <tr><td>X33.3:</td><td>FE</td><td>X37.3:</td><td>FE</td><td>X33.3:</td><td>FE</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>X34.0:</td><td>24 V_{SEN}</td><td>X38.0:</td><td>24 V_{SEN}</td><td>X34.0:</td><td>24 V_{SEN} x+5</td></tr> <tr><td>X34.1:</td><td>0 V_{SEN}</td><td>X38.1:</td><td>0 V_{SEN}</td><</tr></tbody></table> | X33.0: | 24 V _{SEN} | X37.0: | 24 V _{SEN} | X33.0: | 24 V _{SEN} x+4 | X33.1: | 0 V _{SEN} | X37.1: | 0 V _{SEN} | X33.1: | 0 V _{SEN} x+4 | X33.2: | Input x | X37.2: | Input x | X33.2: | Input x+4 | X33.3: | FE | X37.3: | FE | X33.3: | FE | | | | | | | X34.0: | 24 V _{SEN} | X38.0: | 24 V _{SEN} | X34.0: | 24 V _{SEN} x+5 | X34.1: | 0 V _{SEN} | X38.1: | 0 V _{SEN} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1: | Input x
 | 14: | Input x+2 | 1: | Input x | 14: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2: | Input x+1
 | 15: | Input x+3 | 2: | Input x+1 | 15: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3: | Input x+1
 | 16: | Input x+3 | 3: | Input x+2 | 16: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4: | n.c.
 | 17: | n.c. | 4: | Input x+3 | 17: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5: | 24 V _{SEN}
 | 18: | 24 V _{SEN} | 5: | 24 V _{SEN} x+1 | 18: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6: | 0 V _{SEN}
 | 19: | 24 V _{SEN} | 6: | 0 V _{SEN} x+1 | 19: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7: | 24 V _{SEN}
 | 20: | 24 V _{SEN} | 7: | 24 V _{SEN} x+3 | 20: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8: | 0 V _{SEN}
 | 21: | 24 V _{SEN} | 8: | 0 V _{SEN} x+3 | 21: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9: | 24 V _{SEN}
 | 22: | 0 V _{SEN} | 9: | 24 V _{SEN} x | 22: | 0 V _{SEN} x+2 and 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10: | 24 V _{SEN}
 | 23: | 0 V _{SEN} | 10: | 24 V _{SEN} x+2 | 23: | 0 V _{SEN} x+2 and 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11: | 0 V _{SEN}
 | 24: | 0 V _{SEN} | 11: | 0 V _{SEN} x | 24: | 0 V _{SEN} x+2 and 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12: | 0 V _{SEN}
 | 25: | FE | 12: | 0 V _{SEN} x+2 | 25: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | Housing: FE | 13: | FE | | Housing: FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X3.0: | 24 V _{SEN}
 | X7.0: | 24 V _{SEN} | X3.0: | 24 V _{SEN} x+2 | X7.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X3.1: | 0 V _{SEN}
 | X7.1: | 0 V _{SEN} | X3.1: | 0 V _{SEN} x+2 | X7.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X3.2: | Input x+1
 | X7.2: | Input x+3 | X3.2: | Input x+2 | X7.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X3.3: | FE
 | X7.3: | FE | X3.3: | FE | X7.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X4.0: | 24 V _{SEN}
 | X8.0: | 24 V _{SEN} | X4.0: | 24 V _{SEN} x+3 | X8.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X4.1: | 0 V _{SEN}
 | X8.1: | 0 V _{SEN} | X4.1: | 0 V _{SEN} x+3 | X8.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X4.2: | n.c.
 | X8.2: | n.c. | X4.2: | Input x+3 | X8.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X4.3: | FE
 | X8.3: | FE | X4.3: | FE | X8.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X5.0: | 24 V _{SEN}
 | X9.0: | 24 V _{SEN} | X5.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X5.1: | 0 V _{SEN}
 | X9.1: | 0 V _{SEN} | X5.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X5.2: | Input x
 | X9.2: | Input x | X5.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X5.3: | FE
 | X9.3: | FE | X5.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X6.0: | 24 V _{SEN}
 | X10.0: | 24 V _{SEN} | X6.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X6.1: | 0 V _{SEN}
 | X10.1: | 0 V _{SEN} | X6.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X6.2: | Input x+1
 | X10.2: | Input x+1 | X6.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X6.3: | FE
 | X10.3: | FE | X6.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X7.0: | 24 V _{SEN}
 | X11.0: | 24 V _{SEN} | X7.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X7.1: | 0 V _{SEN}
 | X11.1: | 0 V _{SEN} | X7.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X7.2: | Input x+2
 | X11.2: | Input x+2 | X7.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X7.3: | FE
 | X11.3: | FE | X7.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X8.0: | 24 V _{SEN}
 | X12.0: | 24 V _{SEN} | X8.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X8.1: | 0 V _{SEN}
 | X12.1: | 0 V _{SEN} | X8.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X8.2: | n.c.
 | X12.2: | n.c. | X8.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X8.3: | FE
 | X12.3: | FE | X8.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X9.0: | 24 V _{SEN}
 | X13.0: | 24 V _{SEN} | X9.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X9.1: | 0 V _{SEN}
 | X13.1: | 0 V _{SEN} | X9.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X9.2: | Input x
 | X13.2: | Input x | X9.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X9.3: | FE
 | X13.3: | FE | X9.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X10.0: | 24 V _{SEN}
 | X14.0: | 24 V _{SEN} | X10.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X10.1: | 0 V _{SEN}
 | X14.1: | 0 V _{SEN} | X10.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X10.2: | Input x+1
 | X14.2: | Input x+1 | X10.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X10.3: | FE
 | X14.3: | FE | X10.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X11.0: | 24 V _{SEN}
 | X15.0: | 24 V _{SEN} | X11.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X11.1: | 0 V _{SEN}
 | X15.1: | 0 V _{SEN} | X11.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X11.2: | Input x+2
 | X15.2: | Input x+2 | X11.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X11.3: | FE
 | X15.3: | FE | X11.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X12.0: | 24 V _{SEN}
 | X16.0: | 24 V _{SEN} | X12.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X12.1: | 0 V _{SEN}
 | X16.1: | 0 V _{SEN} | X12.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X12.2: | Input x+3
 | X16.2: | Input x+3 | X12.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X12.3: | FE
 | X16.3: | FE | X12.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X13.0: | 24 V _{SEN}
 | X17.0: | 24 V _{SEN} | X13.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X13.1: | 0 V _{SEN}
 | X17.1: | 0 V _{SEN} | X13.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X13.2: | Input x
 | X17.2: | Input x | X13.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X13.3: | FE
 | X17.3: | FE | X13.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X14.0: | 24 V _{SEN}
 | X18.0: | 24 V _{SEN} | X14.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X14.1: | 0 V _{SEN}
 | X18.1: | 0 V _{SEN} | X14.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X14.2: | Input x+1
 | X18.2: | Input x+1 | X14.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X14.3: | FE
 | X18.3: | FE | X14.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X15.0: | 24 V _{SEN}
 | X19.0: | 24 V _{SEN} | X15.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X15.1: | 0 V _{SEN}
 | X19.1: | 0 V _{SEN} | X15.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X15.2: | Input x+2
 | X19.2: | Input x+2 | X15.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X15.3: | FE
 | X19.3: | FE | X15.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X16.0: | 24 V _{SEN}
 | X20.0: | 24 V _{SEN} | X16.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X16.1: | 0 V _{SEN}
 | X20.1: | 0 V _{SEN} | X16.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X16.2: | Input x+3
 | X20.2: | Input x+3 | X16.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X16.3: | FE
 | X20.3: | FE | X16.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X17.0: | 24 V _{SEN}
 | X21.0: | 24 V _{SEN} | X17.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X17.1: | 0 V _{SEN}
 | X21.1: | 0 V _{SEN} | X17.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X17.2: | Input x
 | X21.2: | Input x | X17.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X17.3: | FE
 | X21.3: | FE | X17.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X18.0: | 24 V _{SEN}
 | X22.0: | 24 V _{SEN} | X18.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X18.1: | 0 V _{SEN}
 | X22.1: | 0 V _{SEN} | X18.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X18.2: | Input x+1
 | X22.2: | Input x+1 | X18.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X18.3: | FE
 | X22.3: | FE | X18.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X19.0: | 24 V _{SEN}
 | X23.0: | 24 V _{SEN} | X19.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X19.1: | 0 V _{SEN}
 | X23.1: | 0 V _{SEN} | X19.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X19.2: | Input x+2
 | X23.2: | Input x+2 | X19.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X19.3: | FE
 | X23.3: | FE | X19.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X20.0: | 24 V _{SEN}
 | X24.0: | 24 V _{SEN} | X20.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X20.1: | 0 V _{SEN}
 | X24.1: | 0 V _{SEN} | X20.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X20.2: | Input x+3
 | X24.2: | Input x+3 | X20.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X20.3: | FE
 | X24.3: | FE | X20.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X21.0: | 24 V _{SEN}
 | X25.0: | 24 V _{SEN} | X21.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X21.1: | 0 V _{SEN}
 | X25.1: | 0 V _{SEN} | X21.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X21.2: | Input x
 | X25.2: | Input x | X21.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X21.3: | FE
 | X25.3: | FE | X21.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X22.0: | 24 V _{SEN}
 | X26.0: | 24 V _{SEN} | X22.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X22.1: | 0 V _{SEN}
 | X26.1: | 0 V _{SEN} | X22.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X22.2: | Input x+1
 | X26.2: | Input x+1 | X22.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X22.3: | FE
 | X26.3: | FE | X22.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X23.0: | 24 V _{SEN}
 | X27.0: | 24 V _{SEN} | X23.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X23.1: | 0 V _{SEN}
 | X27.1: | 0 V _{SEN} | X23.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X23.2: | Input x+2
 | X27.2: | Input x+2 | X23.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X23.3: | FE
 | X27.3: | FE | X23.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X24.0: | 24 V _{SEN}
 | X28.0: | 24 V _{SEN} | X24.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X24.1: | 0 V _{SEN}
 | X28.1: | 0 V _{SEN} | X24.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X24.2: | Input x+3
 | X28.2: | Input x+3 | X24.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X24.3: | FE
 | X28.3: | FE | X24.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X25.0: | 24 V _{SEN}
 | X29.0: | 24 V _{SEN} | X25.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X25.1: | 0 V _{SEN}
 | X29.1: | 0 V _{SEN} | X25.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X25.2: | Input x
 | X29.2: | Input x | X25.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X25.3: | FE
 | X29.3: | FE | X25.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X26.0: | 24 V _{SEN}
 | X30.0: | 24 V _{SEN} | X26.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X26.1: | 0 V _{SEN}
 | X30.1: | 0 V _{SEN} | X26.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X26.2: | Input x+1
 | X30.2: | Input x+1 | X26.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X26.3: | FE
 | X30.3: | FE | X26.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X27.0: | 24 V _{SEN}
 | X31.0: | 24 V _{SEN} | X27.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X27.1: | 0 V _{SEN}
 | X31.1: | 0 V _{SEN} | X27.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X27.2: | Input x+2
 | X31.2: | Input x+2 | X27.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X27.3: | FE
 | X31.3: | FE | X27.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X28.0: | 24 V _{SEN}
 | X32.0: | 24 V _{SEN} | X28.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X28.1: | 0 V _{SEN}
 | X32.1: | 0 V _{SEN} | X28.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X28.2: | Input x+3
 | X32.2: | Input x+3 | X28.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X28.3: | FE
 | X32.3: | FE | X28.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X29.0: | 24 V _{SEN}
 | X33.0: | 24 V _{SEN} | X29.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X29.1: | 0 V _{SEN}
 | X33.1: | 0 V _{SEN} | X29.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X29.2: | Input x
 | X33.2: | Input x | X29.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X29.3: | FE
 | X33.3: | FE | X29.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X30.0: | 24 V _{SEN}
 | X34.0: | 24 V _{SEN} | X30.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X30.1: | 0 V _{SEN}
 | X34.1: | 0 V _{SEN} | X30.1: | 0 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X30.2: | Input x+1
 | X34.2: | Input x+1 | X30.2: | Input x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X30.3: | FE
 | X34.3: | FE | X30.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X31.0: | 24 V _{SEN}
 | X35.0: | 24 V _{SEN} | X31.0: | 24 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X31.1: | 0 V _{SEN}
 | X35.1: | 0 V _{SEN} | X31.1: | 0 V _{SEN} x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X31.2: | Input x+2
 | X35.2: | Input x+2 | X31.2: | Input x+6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X31.3: | FE
 | X35.3: | FE | X31.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X32.0: | 24 V _{SEN}
 | X36.0: | 24 V _{SEN} | X32.0: | 24 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X32.1: | 0 V _{SEN}
 | X36.1: | 0 V _{SEN} | X32.1: | 0 V _{SEN} x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X32.2: | Input x+3
 | X36.2: | Input x+3 | X32.2: | Input x+7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X32.3: | FE
 | X36.3: | FE | X32.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X33.0: | 24 V _{SEN}
 | X37.0: | 24 V _{SEN} | X33.0: | 24 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X33.1: | 0 V _{SEN}
 | X37.1: | 0 V _{SEN} | X33.1: | 0 V _{SEN} x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X33.2: | Input x
 | X37.2: | Input x | X33.2: | Input x+4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X33.3: | FE
 | X37.3: | FE | X33.3: | FE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X34.0: | 24 V _{SEN}
 | X38.0: | 24 V _{SEN} | X34.0: | 24 V _{SEN} x+5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X34.1: | 0 V _{SEN}
 | X38.1: | 0 V _{SEN} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Terminal CPX

FESTO

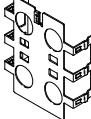
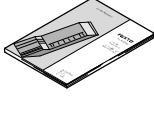
Accessories – Input module, digital

Ordering data				Part No.	Type
Designation					
Input module, digital					
	4 digital inputs, positive logic (PNP)		195752	CPX-4DE	
	8 digital inputs, positive logic (PNP)		195750	CPX-8DE	
	8 digital inputs, positive logic (PNP), advanced diagnostic function		541480	CPX-8DE-D	
	8 digital inputs, negative logic (NPN)		543813	CPX-8NDE	
Connection block					
	Plastic	8x socket, M8, 3-pin 4x socket, M12, 5-pin 4x socket, M12 with quick-lock technology, 5-pin Spring clip terminal, 32-pin 1x Sub-D socket, 25-pin 4x socket, quick connection, 4-pin	195706 195704 541254 195708 525676 525636	CPX-AB-8-M8-3POL CPX-AB-4-M12X2-5POL CPX-AB-4-M12X2-5POL-R CPX-AB-8-KL-4POL CPX-AB-1-SUB-BU-25POL CPX-AB-4-HAR-4POL	
	Metal	4x socket, M12, 5-pin	549367	CPX-M-AB-4-M12X2-5POL	
Distributor					
	Modular system for sensor/actuator distributor		-	NEDY-...	
				➔ Internet: nedy	
	Plug M12, 4-pin	2x socket M8, 3-pin 2x socket M12, 5-pin	8005311 8005310	NEDY-L2R1-V1-M8G3-N-M12G4 NEDY-L2R1-V1-M12G5-N-M12G4	
Plug					
	Plug	M8, 3-pin solderable screw-in M12, 4-pin, PG7 M12, PG7, 4-pin for cable Ø 2.5 mm M12, 4-pin, PG9 M12, 4 pin for 2 cables M12 for 2 cables, 5-pin M12, 5-pin	18696 192009 18666 192008 18778 18779 192010 175487	SEA-GS-M8 SEA-3GS-M8-S SEA-GS-7 SEA-4GS-7-2,5 SEA-GS-9 SEA-GS-11-DUO SEA-5GS-11-DUO SEA-M12-5GS-PG7	
	HARAX plug, 4-pin		525928	SEA-GS-HAR-4POL	
	Sub-D plug, 25-pin		527522	SD-SUB-D-ST25	
Connecting cable					
	Connecting cable M8-M8	0.5 m 1.0 m 2.5 m 5.0 m	541346 541347 541348 541349	NEBU-M8G3-K-0.5-M8G3 NEBU-M8G3-K-1-M8G3 NEBU-M8G3-K-2.5-M8G3 NEBU-M8G3-K-5-M8G3	
	Modular system for connecting cables		-	NEBU-... ➔ Internet: nebu	

Terminal CPX

Accessories – Input module, digital

FESTO

Ordering data		Part No.	Type
Designation			
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	538219	AK-8KL
	Fittings kit	538220	VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
User manual			
	User manual	German	526439 P.BE-CPX-EA-DE
		English	526440 P.BE-CPX-EA-EN
		Spanish	526441 P.BE-CPX-EA-ES
		French	526442 P.BE-CPX-EA-FR
		Italian	526443 P.BE-CPX-EA-IT

Terminal CPX

FESTO

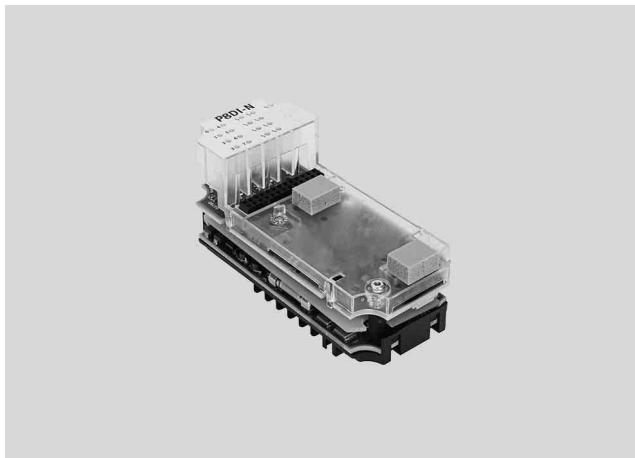
Technical data – Input module, digital, to NAMUR

Function

Digital input modules enable the connection of up to 8 NAMUR sensors (or wired mechanical contacts). In addition, the first 4 channels can alternatively be used as counters or for frequency measurement. M12 and terminal strip connection technology can be used.

Scope of application

- Input modules for 24 V DC sensor supply voltage
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection in each channel



General technical data

Type code	CPX-P-8DE-N	
No. of inputs	8	
Max. cable length	[m]	200
Input debounce time	[ms]	3 (0, 10, 20 parameterisable)
Fuse protection (short circuit)	Internal electronic fuse per channel	
Module current consumption (power supply for electronics)	[mA]	Typically 75
Nominal operating voltage	[V DC]	24 (reverse polarity protected)
Permissible voltage fluctuations	[%]	±25
Power failure buffering	[ms]	20
Residual ripple	[Vpp]	0.4
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes
Input characteristic curve	To EN 60947-5-6	
Switching level	To EN 60947-5-6	
LED indicators	Group diagnostics	1
	Channel diagnostics	8
	Channel status	8
Diagnostics	Wire break per channel Limit value violation per channel Parameterisation error Overload per channel	
Parameterisation	Data format Input debounce time per channel Input function per channel Replacement value in diagnostic case per channel Upper limit value per channel Signal extension time per channel Gate time per channel Monitoring of limit values per channel Monitoring of short circuit per channel Monitoring of wire break per channel Monitoring of parameters Lower limit value per channel Upper limit value per channel Counter configuration per channel	
Control components	DIL switch	
Additional functions	Frequency measurement Counter function	
Degree of protection to EN 60529	Depending on connection block	

Terminal CPX

Technical data – Input module, digital, to NAMUR

FESTO

General technical data

Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 70
Product weight	[g]	100

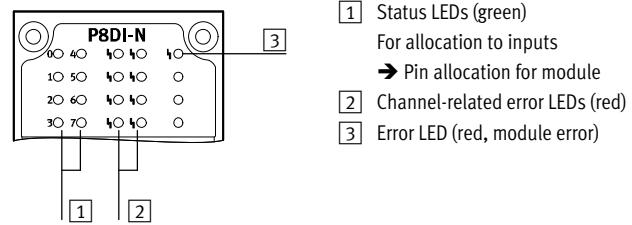
Materials

Housing	PA-reinforced PC
Note on materials	RoHS-compliant

Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Storage temperature	[°C]	-20 ... +70
Relative humidity	[%]	95, non-condensing

Connection and display components



Combinations of bus nodes/control blocks with digital input module

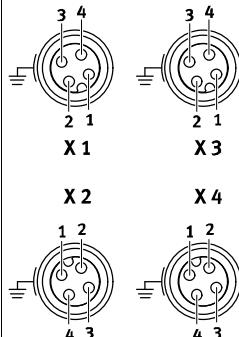
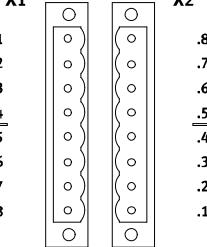
Bus node/control block	Part no.	Digital input module
		CPX-P-8DE-N
CPX-CEC-C1-V3	3473128	■
CPX-CEC-M1-V3	3472765	■
CPX-CEC-S1-V3	3472425	■
CPX-FB11	526172	■
CPX-FB13	195740	■
CPX-FB14	526174	■
CPX-FB33	548755	■
CPX-M-FB34	548751	■
CPX-M-FB35	548749	■
CPX-FB36	1912451	■
CPX-FB37	2735960	■

Combinations of connection block/digital input module

Connection blocks	Part no.	Digital input module
		CPX-P-8DE-N
CPX-P-AB-4XM12-4POL	565706	■
CPX-P-AB-2XKL-8POL	565704	■

Terminal CPX

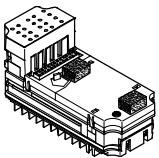
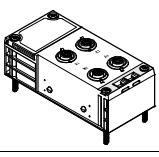
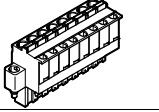
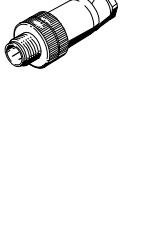
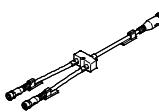
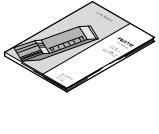
Technical data – Input module, digital, to NAMUR

Pin allocation		
Connection block inputs	CPX-P-8DE-N	
CPX-P-AB-4XM12-4POL		
	X1.1: BN+ [0] X1.2: BU- [0] X1.3: BN+ [1] X1.4: BU- [1]	X3.1: BN+ [4] X3.2: BU- [4] X3.3: BN+ [5] X3.4: BU- [5]
	X2.1: BN+ [2] X2.2: BU- [2] X2.3: BN+ [3] X2.4: BU- [3]	X4.1: BN+ [6] X4.2: BU- [6] X4.3: BN+ [7] X4.4: BU- [7]
CPX-P-AB-2XKL-8POL		
	X1.1: BN+ [0] X1.2: BU- [0] X1.3: BN+ [1] X1.4: BU- [1]	X2.1: BN+ [4] X2.2: BU- [4] X2.3: BN+ [5] X2.4: BU- [5]
	X1.5: BN+ [2] X1.6: BU- [2] X1.7: BN+ [3] X1.8: BU- [3]	X2.5: BN+ [6] X2.6: BU- [6] X2.7: BN+ [7] X2.8: BU- [7]
Combinations of interlinking block/digital input module		
Interlinking blocks	Part no.	Digital input module
		CPX-P-8DE-N
CPX-GE-EV-S	195746	–
CPX-GE-EV-S-VL	8022170	–
CPX-GE-EV-S-7/8-5POL	541244	–
CPX-GE-EV-S-7/8-5POL-VL	8022172	–
CPX-GE-EV-S-7/8-4POL	541248	–
CPX-M-GE-EV-S-7/8-5POL	550208	■
CPX-M-GE-EV-S-7/8-5POL-VL	8022165	■
CPX-M-GE-EV-S-7/8-CIP-4P	568956	–
CPX-M-GE-EV-S-PP-5POL	563057	–
CPX-GE-EV	195742	–
CPX-M-GE-EV	550206	■
CPX-GE-EV-Z	195744	–
CPX-GE-EV-Z-VL	8022166	–
CPX-GE-EV-Z-7/8-5POL	541246	–
CPX-GE-EV-Z-7/8-5POL-VL	8022173	–
CPX-GE-EV-Z-7/8-4POL	541250	–
CPX-M-GE-EV-Z-7/8-5POL	550210	■
CPX-M-GE-EV-Z-7/8-5POL-VL	8022158	■
CPX-M-GE-EV-Z-PP-5POL	563058	–
CPX-GE-EV-V	533577	–
CPX-GE-EV-V-VL	8022171	–
CPX-GE-EV-V-7/8-4POL	541252	–

Terminal CPX

Technical data – Input module, digital, to NAMUR

FESTO

Ordering data			
Designation		Part no.	Type code
Input module, digital, to NAMUR			
 8 digital inputs			
		565933	CPX-P-8DE-N
Connection block			
	Made of polymer	4x socket, M12, 4-pin	565706 CPX-P-AB-4XM12-4POL
		2x plug, 8-pin	565704 CPX-P-AB-2XKL-8POL
Plugs			
	Socket	8-pin	565712 NECU-L3G8-C1 565710 NECU-L3G8-C2
	Plug M12x1, 4-pin, straight, A-coded	Insulation displacement connector	525928 SEA-GS-HAR-4POL 192008 SEA-4GS-7-2,5 18666 SEA-GS-7 18778 SEA-GS-9
		Screw terminal	Connection cross section 0.25 ... 0.5 mm ² Permissible cable diameter 4 ... 6 mm Connection cross section 0.14 ... 0.5 mm ² Permissible cable diameter 6 ... 8 mm
Distributor			
	Modular system for all types of sensor/actuator distributors	-	NEDY-... ➔ Internet: nedy
Cover			
	Cover cap for closing off unused ports (10 pieces)	For M12 connections	165592 ISK-M12
Coding element			
	Ensures that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 pieces of each)	For NECU-L3G8	565713 CPX-P-KDS-AB-2XKL
User documentation			
	User documentation	German	575378 P.BE-CPX-P-EA-DE
		English	575379 P.BE-CPX-P-EA-EN
		Spanish	575380 P.BE-CPX-P-EA-ES
		French	575381 P.BE-CPX-P-EA-FR
		Italian	575382 P.BE-CPX-P-EA-IT
		Swedish	575383 P.BE-CPX-P-EA-SV

Terminal CPX

FESTO

Technical data – PROFIsafe input module

Function

The PROFIsafe input module has 8 input channels whose signal status is detected for safety-reasons, with the information transmitted to a suitable safety controller using the PROFIsafe safety protocol in combination with the appropriate fieldbus (PROFINET or PROFIBUS). This function is exclusively available for safety controllers using the PROFIsafe protocol, profile version 2.4.

Scope of application

- Input module for 24 V DC sensor supply voltage
- Supports connection blocks with M12 and terminal connection
- Module features can be parameterised
- Input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection



Description

Module-based passivation

While channel-by-channel passivation is disabled, the input module, in accordance with PROFIsafe specification, switches all informa-

tion in the input image to the safe status, even when there is only one channel error.

Channel-by-channel passivation

In the case of channel-by-channel passivation, when a channel error occurs, the input module switches the input information of the affected channel pair to 0, depending on the function mode.

- The input information for unaffected channel pairs does not change.
- The input module remains integrated.
- The input module indicates the current channel error status to the control unit via the input image.

Applications

The inputs on the PROFIsafe input module can be combined for multi-channel sensor applications. Every two inputs form a channel pair, which is set separately with one of 11 function modes.

The function mode has an influence on the evaluation of the input signals, and optionally on the generation of clock signals.

There are five independent clock outputs available for safe operation of passive sensors; the pulse patterns are used in some operating modes to detect crossovers in the signal paths.

The input module is designed to ensure that the input channels provide either secure data or no data at all, even when a fault is present in the system.

Range of applications

• Use as an input module for a higher-order safety controller. Several input modules can be used together and these monitor mutually independent sensors

• Use of multi-channel sensor applications with up to 8 secure inputs, which can be grouped and are suitable for configuration with the help of 11 different function modes

- Connection of different switches and sensors within the safety chain
- Output of an identifier coded by DIL switch in the connection block CPX-AB-ID-P

Note

The safety integrity level, Performance Level and category for the system as a whole correspond to that of the component in the safety chain with the lowest characteristic value.

Application examples

- Two-hand circuit for starting a function
- Emergency stop switch for incidents

- Operating mode selector switch with four positions
- Rotary indexing table

- Light curtain
- Acknowledge button with request

- End-position switches
- Protective door with two NO switches

Terminal CPX

Technical data – PROFlsafe input module

FESTO

General technical data		
Type	CPX-F8DE-P	
Number of inputs	8	
Safety function	Reliable detection and evaluation of input statuses	
Max. address capacity	Inputs [byte]	6
	Outputs [byte]	7
Max. cable length	[m]	200
Max. power supply	Per module [A]	3
Current consumption of module	[mA]	Typ. 35 (power supply for electronics)
Operating voltage	Nominal value [V DC]	24
	Permissible range [V DC]	20.4 ... 28.8
Voltage drop per channel	[V]	0.6
Residual ripple	[Vss]	2 within voltage range
Electrical isolation	Channel – channel	No
Input characteristic	To IEC 61131-2, type 2	
Switching logic	Inputs	PNP (positive switching)
Safety integrity level	As per EN62061	Reliable detection and evaluation of input statuses up to SIL CL3
	As per EN61508	Reliable detection and evaluation of input statuses up to SIL3
Performance Level	As per ISO13849	Reliable detection and evaluation of input statuses up to Cat 4 and PL e
Failure rate per hour (PFH)	1.0x 10 ⁻⁹	
Certificate issuing authority	01/205/5444.00/15	
LED displays	Group diagnostics	1
	Channel diagnostics	8
	Channel status	8
	Failsafe protocol active	1
Diagnostics	<ul style="list-style-type: none"> • Short circuit per channel • Undervoltage • Overvoltage • Excessive temperature • Crossover per channel • Wire break per channel • Communication • Process data error • Self test 	
Control elements	DIL switches	
Degree of protection to EN 60529	Depending on connection block	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 55

Terminal CPX

FESTO

Technical data – PROFIsafe input module

Materials

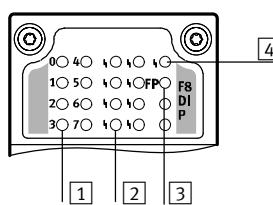
Note on materials	RoHS compliant
-------------------	----------------

Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Storage temperature	[°C]	-20 ... +70
CE marking (see declaration of conformity)		To EC Machinery Directive
Approval certificate		c UL us Recognised (OL)

Connection and display components

CPX-F8DE-P



- [1] Channel-related status LEDs (green):
- [3] Fail-safe protocol active (green)
- [2] Channel-related error LEDs (red)
- [4] Error LED (red, module error)

Combinations of bus nodes/control blocks with PROFIsafe input module

Bus node/control block	Part No.	PROFIsafe input module CPX-F8DE-P
CPX-FB13	195740	■
CPX-FB33	548755	■
CPX-M-FB34	548751	■
CPX-M-FB35	548749	■

- - Note

The PROFIsafe input module CPX-F8DE-P can only be interfaced as of software release 21 or release 30 (in the case of CPX-FB13).

Terminal CPX

FESTO

Technical data – PROFIsafe input module

Connection block/PROFIsafe input module combinations			
Connection blocks	Part No.	PROFIsafe input module	
			CPX-F8DE-P
CPX-M-AB-4-M12X2-5POL	549367		■
CPX-M-AB-4-M12X2-5POL-T	2639560		■
CPX-AB-8-KL-4POL	195708		■
CPX-AB-ID-P	2639571		■

Pin allocation		CPX-F8DE-P	
Connection block inputs		CPX-M-AB-4-M12X2-5POL	
CPX-M-AB-4-M12X2-5POL			
	X1.1: 24 VSEN X1.2: Input x+1 X1.3: 0 VSEN X1.4: Input x X1.5: FE		X3.1: 24 VSEN X3.2: Input x+5 X3.3: 0 VSEN X3.4: Input x+4 X3.5: FE
	X2.1: 24 VSEN X2.2: Input x+3 X2.3: 0 VSEN X2.4: Input x+2 X2.5: FE		X4.1: 24 VSEN X4.2: Input x+7 X4.3: 0 VSEN X4.4: Input x+6 X4.5: FE
CPX-M-AB-4-M12X2-5POL-T			
	X1-T.1: 24 VSEN x X1-T.2: Input x+1 X1-T.3: 0 VSEN X1-T.4: Input x X1-T.5: 24 VSEN x+1		X3-T.1: 24 VSEN x+4 X3-T.2: Input x+5 X3-T.3: 0 VSEN X3-T.4: Input x+4 X3-T.5: 24 VSEN x+5
	X2-T.1: 24 VSEN x+2 X2-T.2: Input x+3 X2-T.3: 0 VSEN X2-T.4: Input x+2 X2-T.5: 24 VSEN x+3		X4-T.1: 24 VSEN x+6 X4-T.2: Input x+7 X4-T.3: 0 VSEN X4-T.4: Input x+6 X4-T.5: 24 VSEN x+7
CPX-AB-8-KL-4POL			
	X1.0: 24 VSEN X1.1: 0 VSEN X1.2: Input x X1.3: FE		X5.0: 24 VSEN X5.1: 0 VSEN X5.2: Input x+4 X5.3: FE
	X2.0: 24 VSEN x X2.1: 24 VSEN x+1 X2.2: Input x+1 X2.3: FE		X6.0: 24 VSEN x+4 X6.1: 24 VSEN x+5 X6.2: Input x+5 X6.3: FE
	X3.0: 24 VSEN X3.1: 0 VSEN X3.2: Input x+2 X3.3: FE		X7.0: 24 VSEN X7.1: 0 VSEN X7.2: Input x+6 X7.3: FE
	X4.0: 24 VSEN x+2 X4.1: 24 VSEN x+3 X4.2: Input x+3 X4.3: FE		X8.0: 24 VSEN x+6 X8.1: 24 VSEN x+7 X8.2: Input x+7 X8.3: FE

Terminal CPX

FESTO

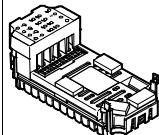
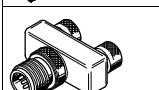
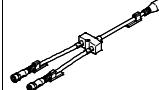
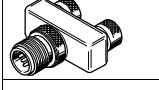
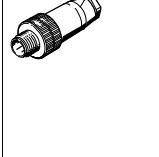
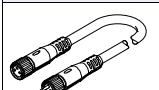
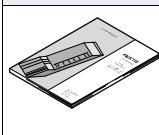
Technical data – PROFIsafe input module

Interlinking block/PROFIsafe input module combinations

Interlinking blocks	Part No.	PROFIsafe input module
		CPX-F8DE-P
CPX-GE-EV-S	195746	–
CPX-GE-EV-S-VL	8022170	–
CPX-GE-EV-S-7/8-4POL	541248	–
CPX-GE-EV-S-7/8-5POL	541244	–
CPX-GE-EV-S-7/8-5POL-VL	8022172	–
CPX-M-GE-EV-S-7/8-CIP-4P	568956	■
CPX-M-GE-EV-S-7/8-5POL	550208	■
CPX-M-GE-EV-S-7/8-5POL-VL	8022165	■
CPX-M-GE-EV-S-PP-5POL	563057	■
CPX-GE-EV	195742	–
CPX-M-GE-EV	550206	■
CPX-M-GE-EV-FVO	567806	–
CPX-GE-EV-Z	195744	–
CPX-GE-EV-Z-VL	8022166	–
CPX-GE-EV-Z-7/8-4POL	541250	–
CPX-GE-EV-Z-7/8-5POL	541246	–
CPX-GE-EV-Z-7/8-5POL-VL	8022173	–
CPX-M-GE-EV-Z-7/8-5POL	550210	■
CPX-M-GE-EV-Z-7/8-5POL-VL	8022158	■
CPX-M-GE-EV-Z-PP-5POL	563058	■
CPX-GE-EV-V	533577	–
CPX-GE-EV-V-VL	8022171	–
CPX-GE-EV-V-7/8-4POL	541252	–

Terminal CPX

Accessories – PROFIsafe input module

Ordering data		Description	Part No.	Type
PROFIsafe input module				
	8 digital inputs, positive logic (PNP), for reliable detection and evaluation of input statuses		2597424	CPX-F8DE-P
Connection block				
	Polymer	Spring-loaded terminal, 32-pin	195708	CPX-AB-8-KL-4POL
		8-way DIL switch	2639571	CPX-AB-ID-P
	Metal	4x socket M12, 5-pin	549367	CPX-M-AB-4-M12X2-5POL
		Unclocked sensor supply	2639560	CPX-M-AB-4-M12X2-5POL-T
Distributor				
	Modular system for sensor/actuator distributor		–	NEDY-... ➔ Internet: nedy
	Plug M12, 4-pin	2x socket M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4
Plug connector				
	Plug connector	M12, PG7	18666	SEA-GS-7
		M12, PG7, 4-pin for cable Ø 2.5mm	192008	SEA-4GS-7-2,5
		M12, PG9	18778	SEA-GS-9
		M12 for 2 cables	18779	SEA-GS-11-DUO
		M12 for 2 cables, 5-pin	192010	SEA-5GS-11-DUO
		M12, 5-pin	175487	SEA-M12-5GS-PG7
Connecting cable				
	Modular system for all types of connecting cable		–	NEBU-... ➔ Internet: nebu
User documentation				
	User documentation for PROFIsafe input module	German	8035496	P.BE-CPX-F8DE-P-DE
		English	8035497	P.BE-CPX-F8DE-P-EN
		Spanish	8035498	P.BE-CPX-F8DE-P-ES
		French	8035499	P.BE-CPX-F8DE-P-FR
		Italian	8035500	P.BE-CPX-F8DE-P-IT
		Chinese	8035501	P.BE-CPX-F8DE-P-ZH

Terminal CPX

FESTO

Technical data – Input module, digital, 16 inputs

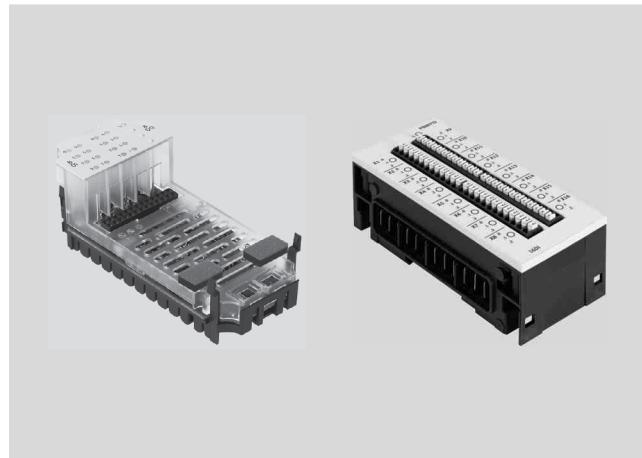
Function

Digital input modules enable the connection of two-wire and three-wire sensors (proximity sensors, inductive or capacitive sensors, etc.).

Depending on the connection block selected, the module supports various connection concepts with different numbers of sockets (single or double allocation).

Application

- Input modules for 24 V DC sensor supply voltage
- PNP logic
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection



General technical data

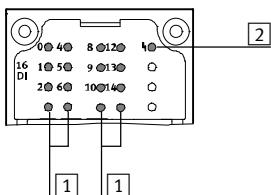
Type	CPX-16DE	CPX-M-16DE-D	CPX-L-16DE
Number of inputs	16	16	16
Max. residual current of inputs per module [A]	1.8	1.8	1.8
Intrinsic current consumption at operating voltage [mA]	Typically 15	Typically 34	Typically 15
Fuse protection	Internal electronic fuse per module	Internal electronic fuse per channel pair, additional safety fuse	Internal electronic fuse per module
Nominal operating voltage [V DC]	24	24	24
Operating voltage range [V DC]	18 ... 30	18 ... 30	18 ... 30
Electrical isolation	Channel – channel Channel – internal bus	No No	No No
Switching level	Signal 0 [V DC] Signal 1 [V DC]	≤ 5 ≥ 11	≤ 5 ≥ 11
Input debounce time [ms]	3 (0.1 ms, 10 ms, 20 ms parameterisable)		
Input characteristic	IEC 1131-T2	IEC 1131-T2	IEC 1131-T2, type 01
Switching logic	Positive logic (PNP)	Positive logic (PNP)	Positive logic (PNP)
LED displays	Group diagnostics Channel diagnostics Channel status	1 16 16	1 – 16
Diagnostics	Short circuit/overload per channel		
Parameterisation	<ul style="list-style-type: none"> Module monitoring Behaviour after short circuit Input debounce time Signal extension time 		
Protection class to EN 60529	Depending on connection block	Depending on connection block	IP20
Temperature range	Operation [°C] Storage/transport [°C]	-5 ... +50 -20 ... +70	-5 ... +50 -20 ... +70
Materials	Reinforced PA, PC		
Note on materials	–		
Grid dimension [mm]	50	50	50
Dimensions (incl. interlinking block and connection block) W x L x H [mm]	50 x 107 x 50		
Product weight [g]	38		
	Approx. 170		

Terminal CPX

Technical data – Input module, digital, 16 inputs

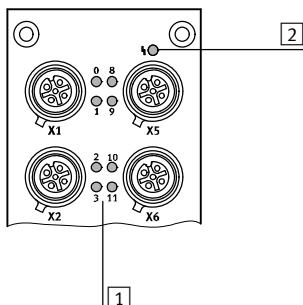
Connection and display components

CPX-16DE



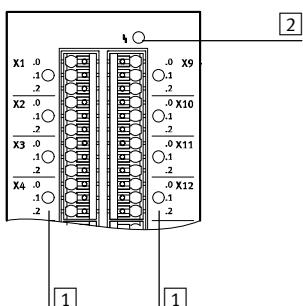
- [1] Status LEDs (green)
For allocation to inputs
→ pin allocation for module
- [2] Error LED (red, module error)

CPX-M-16DE-D



- [1] Common status LEDs (green)/error LEDs (red) for each input signal
- [2] Error LED (red, module error)

CPX-L-16DE



- [1] Status LEDs (green)
for each input signal
- [2] Error LED (red, module error)

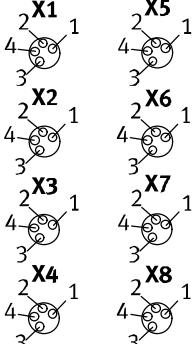
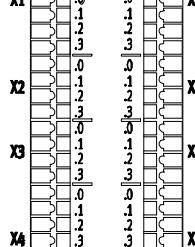
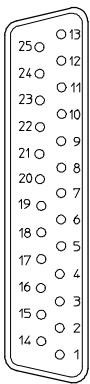
Connection block/digital input module combinations

Connection blocks	Part No.	Digital input modules		
		CPX-16DE	CPX-M-16DE-D	CPX-L-16DE
CPX-AB-8-M8X2-4POL	541256	■	–	–
CPX-AB-8-M12X2-5POL	3606900	–	■	–
CPX-AB-8-KL-4POL	195708	■	–	–
CPX-AB-1-SUB-BU-25POL	525676	■	–	–
CPX-M-AB-8-M12X2-5POL	549335	–	■	–

Terminal CPX

FESTO

Technical data – Input module, digital, 16 inputs

Pin allocation			
Connection block inputs		CPX-16DE	
CPX-AB-8-M8x2-4POL			
		X1.1: 24 V _{SEN} X1.2: Input x+1 X1.3: 0 V _{SEN} X1.4: Input x X2.1: 24 V _{SEN} X2.2: Input x+3 X2.3: 0 V _{SEN} X2.4: Input x+2 X3.1: 24 V _{SEN} X3.2: Input x+5 X3.3: 0 V _{SEN} X3.4: Input x+4 X4.1: 24 V _{SEN} X4.2: Input x+7 X4.3: 0 V _{SEN} X4.4: Input x+6	X5.1: 24 V _{SEN} X5.2: Input x+9 X5.3: 0 V _{SEN} X5.4: Input x+8 X6.1: 24 V _{SEN} X6.2: Input x+11 X6.3: 0 V _{SEN} X6.4: Input x+10 X7.1: 24 V _{SEN} X7.2: Input x+13 X7.3: 0 V _{SEN} X7.4: Input x+12 X8.1: 24 V _{SEN} X8.2: Input x+15 X8.3: 0 V _{SEN} X8.4: Input x+14
CPX-AB-8-KL-4POL			
		X1.0: Input x+8 X1.1: 24 V _{SEN} X1.2: Input x X1.3: FE X2.0: Input x+9 X2.1: 24 V _{SEN} X2.2: Input x+1 X2.3: FE X3.0: Input x+10 X3.1: 24 V _{SEN} X3.2: Input x+2 X3.3: FE X4.0: Input x+11 X4.1: 24 V _{SEN} X4.2: Input x+3 X4.3: FE	X5.0: Input x+12 X5.1: 0 V _{SEN} X5.2: Input x+4 X5.3: FE X6.0: Input x+13 X6.1: 0 V _{SEN} X6.2: Input x+5 X6.3: FE X7.0: Input x+14 X7.1: 0 V _{SEN} X7.2: Input x+6 X7.3: FE X8.0: Input x+15 X8.1: 0 V _{SEN} X8.2: Input x+7 X8.3: FE
CPX-AB-1-SUB-BU-25POL			
		1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: Input x+9 6: 24 V _{SEN} 7: Input x+11 8: 24 V _{SEN} 9: Input x+8 10: Input x+10 11: 24 V _{SEN} 12: 24 V _{SEN} 13: FE	14: Input x+4 15: Input x+5 16: Input x+6 17: Input x+7 18: Input x+12 19: Input x+13 20: Input x+14 21: Input x+15 22: 0 V _{SEN} 23: 0 V _{SEN} 24: 0 V _{SEN} 25: FE Housing: FE

Terminal CPX

Technical data – Input module, digital, 16 inputs

FESTO

Pin allocation		CPX-M-16DE-D	
Connection block inputs		CPX-M-AB-8-M12X2-5POL and CPX-AB-8-M12X2-5POL	
	X1	X1.1: 24 V _{Sx} X1.2: Input x+1 X1.3: 0 V _{Sx} X1.4: Input x X1.5: FE	X5.1: 24 V _{Sx+8} X5.2: Input x+9 X5.3: 0 V _{Sx+8} X5.4: Input x+8 X5.5: FE
	X2	X2.1: 24 V _{Sx+2} X2.2: Input x+3 X2.3: 0 V _{Sx+2} X2.4: Input x+2 X2.5: FE	X6.1: 24 V _{Sx+10} X6.2: Input x+11 X6.3: 0 V _{Sx+10} X6.4: Input x+10 X6.5: FE
	X3	X3.1: 24 V _{Sx+4} X3.2: Input x+5 X3.3: 0 V _{Sx+4} X3.4: Input x+4 X3.5: FE	X7.1: 24 V _{Sx+12} X7.2: Input x+13 X7.3: 0 V _{Sx+12} X7.4: Input x+12 X7.5: FE
	X4	X4.1: 24 V _{Sx+6} X4.2: Input x+7 X4.3: 0 V _{Sx+6} X4.4: Input x+6 X4.5: FE	X8.1: 24 V _{Sx+14} X8.2: Input x+15 X8.3: 0 V _{Sx+14} X8.4: Input x+14 X8.5: FE
	X5		
	X6		
	X7		
	X8		

Terminal CPX

FESTO

Technical data – Input module, digital, 16 inputs

Pin allocation		CPX-L-16DE
Connection block inputs		
X1 .0		X1.0: 24 V _{SEN}
.1		X1.1: Input x
.2		X1.2: 0 V _{SEN}
X2 .0		X2.0: 24 V _{SEN}
.1		X2.1: Input x+1
.2		X2.2: 0 V _{SEN}
X3 .0		X3.0: 24 V _{SEN}
.1		X3.1: Input x+2
.2		X3.2: 0 V _{SEN}
X4 .0		X4.0: 24 V _{SEN}
.1		X4.1: Input x+3
.2		X4.2: 0 V _{SEN}
X5 .0		X5.0: 24 V _{SEN}
.1		X5.1: Input x+4
.2		X5.2: 0 V _{SEN}
X6 .0		X6.0: 24 V _{SEN}
.1		X6.1: Input x+5
.2		X6.2: 0 V _{SEN}
X7 .0		X7.0: 24 V _{SEN}
.1		X7.1: Input x+6
.2		X7.2: 0 V _{SEN}
X8 .0		X8.0: 24 V _{SEN}
.1		X8.1: Input x+7
.2		X8.2: 0 V _{SEN}
	x9	X9.0: 24 V _{SEN}
	.1	X9.1: Input x+8
	.2	X9.2: 0 V _{SEN}
	x10	X10.0: 24 V _{SEN}
	.1	X10.1: Input x+9
	.2	X10.2: 0 V _{SEN}
	x11	X11.0: 24 V _{SEN}
	.1	X11.1: Input x+10
	.2	X11.2: 0 V _{SEN}
	x12	X12.0: 24 V _{SEN}
	.1	X12.1: Input x+11
	.2	X12.2: 0 V _{SEN}
	x13	X13.0: 24 V _{SEN}
	.1	X13.1: Input x+12
	.2	X13.2: 0 V _{SEN}
	x14	X14.0: 24 V _{SEN}
	.1	X14.1: Input x+13
	.2	X14.2: 0 V _{SEN}
	x15	X15.0: 24 V _{SEN}
	.1	X15.1: Input x+14
	.2	X15.2: 0 V _{SEN}
	x16	X16.0: 24 V _{SEN}
	.1	X16.1: Input x+15
	.2	X16.2: 0 V _{SEN}

Terminal CPX

Accessories – Input module, digital, 16 inputs

FESTO

Ordering data		Part No.	Type
Designation			
Input module, digital			
	16 digital inputs, internal electronic fuse per module	543815	CPX-16DE
	16 digital inputs, internal electronic fuse per channel pair, for CPX in metal	550202	CPX-M-16DE-D
	16 digital inputs, internal electronic fuse per module, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals	572606	CPX-L-16DE-16-KL-3POL
Connection block			
	Plastic	8x socket, M8, 4-pin	541256 CPX-AB-8-M8X2-4POL
		8x socket, M12, 5-pin	3606900 CPX-AB-8-M12X2-5POL
		Spring-loaded terminal, 32-pin	195708 CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin	525676 CPX-AB-1-SUB-BU-25POL
	Metal	8x socket, M12, 5-pin	549335 CPX-M-AB-8-M12X2-5POL
Distributor			
	Modular system for sensor/actuator distributor	–	NEDY-... ➔ Internet: nedy
	Plug M8, 4-pin	2x socket M8, 3-pin	8005312 NEDY-L2R1-V1-M8G3-N-M8G4
Plug			
	Plug, M8, 3-pin	Solderable	18696 SEA-GS-M8
		Screw-in	192009 SEA-3GS-M8-S
	Plug, Sub-D, 25-pin		527522 SD-SUB-D-ST25
Connecting cable			
	Connecting cable M8-M8	0.5 m	541346 NEBU-M8G3-K-0.5-M8G3
		1.0 m	541347 NEBU-M8G3-K-1-M8G3
		2.5 m	541348 NEBU-M8G3-K-2.5-M8G3
		5.0 m	541349 NEBU-M8G3-K-5-M8G3
	Modular system for connecting cables	–	NEBU-... ➔ Internet: nebu
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	538219	AK-8KL
		538220	VG-K-M9
Manual			
	Manual	German	526439 P.BE-CPX-EA-DE
		English	526440 P.BE-CPX-EA-EN
		Spanish	526441 P.BE-CPX-EA-ES
		French	526442 P.BE-CPX-EA-FR
		Italian	526443 P.BE-CPX-EA-IT

Terminal CPX

Technical data – Output module, digital

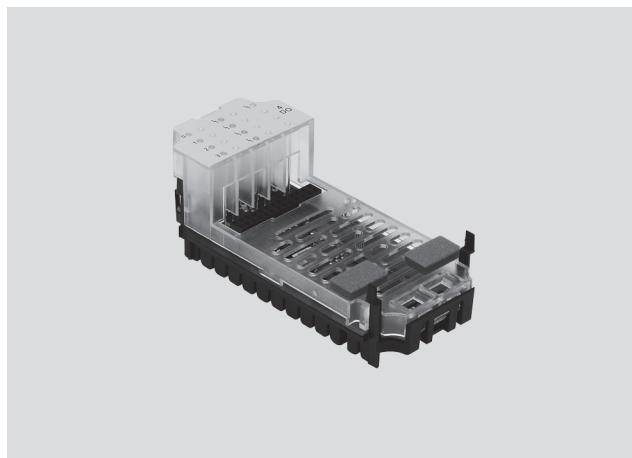
FESTO

Function

Digital outputs control actuators such as individual valves, hydraulic valves, heating controllers and many more. Separate circuits are created using an additional power supply. Parallel connection of the outputs of a module enables consuming devices to be controlled with up to 4 A.

Applications

- Output module for 24 V DC supply voltage
- PNP logic
- Module features can be parameterised
- The output module receives the voltage supply for the electronics and the outputs from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection in each channel



General technical data

Type	CPX-4DA	CPX-8DA	CPX-8DA-H		
No. of outputs	4	8	8		
Max. power supply	Per module [A]	4	8.4		
	Per channel [A]	1 (24 W lamp load, 4 channels can be connected in parallel)	2.1 (50 W lamp load), per channel pair		
Fuse protection (short circuit)	Internal electronic fuse for each channel				
Module current consumption (voltage supply for electronics) [mA]	Typically 16		Typically 34		
Operating voltage	Nominal value [V DC]	24			
	Permissible range [V DC]	18 ... 30			
Electrical isolation	Channel – channel	No			
	Channel – internal bus	Yes, using an intermediate supply			
Output characteristic curve	To IEC 1131-2				
Switching logic	Positive logic (PNP)				
LED displays	Group diagnostics	1	1		
	Channel diagnostics	4	8		
	Channel status	4	8		
Diagnostics	<ul style="list-style-type: none"> • Short circuit/overload, channel x • Undervoltage of outputs 				
Parameterisation	<ul style="list-style-type: none"> • Module monitoring • Behaviour after short circuit • Fail-safe channel x • Forcing channel x • Idle mode channel x 				
Protection class to EN 60529	Depending on connection block				
Temperature range	Operation [°C]	-5 ... +50			
	Storage/transport [°C]	-20 ... +70			
Materials	Reinforced PA, PC				
Grid dimension	[mm]	50			
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50			
Weight	[g]	38			

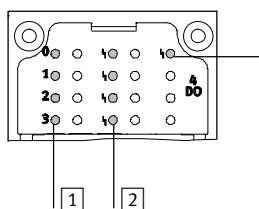
Terminal CPX

Technical data – Output module, digital

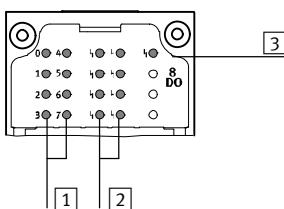
FESTO

Connection and display components

CPX-4DA



CPX-8DA



- [1] Status LEDs (yellow)
Allocation to outputs
→ Pin allocation for module
- [2] Channel-specific error LEDs (red)
- [3] Error LED (red, module error)

Connection block/digital output module combinations

Connection blocks	Part No.	Digital output module		
		CPX-4DA	CPX-8DA	CPX-8DA-H
CPX-AB-8-M8-3POL	195706	■	■	–
CPX-AB-8-M8X2-4POL	541256	■	■	■
CPX-AB-4-M12X2-5POL	195704	■	■	–
CPX-AB-4-M12X2-5POL-R	541254	■	■	■
CPX-AB-8-KL-4POL	195708	■	■	■
CPX-AB-1-SUB-BU-25POL	525676	■	■	■
CPX-AB-4-HAR-4POL	525636	■	■	–
CPX-M-AB-4-M12x2-5POL	549367	■	■	■

Pin allocation

Connection block outputs	CPX-4DA	CPX-8DA	
CPX-AB-8-M8-3POL			
X1 1 X5 1 3 4 3 4 X2 1 X6 1 3 4 3 4 X3 1 X7 1 3 4 3 4 X4 1 X8 1 3 4	X1.1: n.c. X1.3: 0 V _{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V _{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V _{OUT} X3.4: Output x+1 X4.1: n.c. X4.3: 0 V _{OUT} X4.4: n.c.	X5.1: n.c. X5.3: 0 V _{OUT} X5.4: Output x+2 X6.1: n.c. X6.3: 0 V _{OUT} X6.4: Output x+3 X7.1: n.c. X7.3: 0 V _{OUT} X7.4: Output x+3 X8.1: n.c. X8.3: 0 V _{OUT} X8.4: n.c.	X1.1: n.c. X1.3: 0 V _{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V _{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V _{OUT} X3.4: Output x+2 X4.1: n.c. X4.3: 0 V _{OUT} X4.4: Output x+3

Terminal CPX

FESTO

Technical data – Output module, digital

Pin allocation		Connection block outputs		CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-8-M8X2-4POL							
		X1.1: 0 V _{OUT} X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x	X5.1: 0 V _{OUT} X5.2: n.c. X5.3: 0 V _{OUT} X5.4: n.c.	X1.1: 0 V _{OUT} X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x	X5.1: 0 V _{OUT} X5.2: n.c. X5.3: 0 V _{OUT} X5.4: n.c.	X1.1: 0 V _{OUT} X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x	X5.1: 0 V _{OUT} X5.2: n.c. X5.3: 0 V _{OUT} X5.4: n.c.
		X2.1: 0 V _{OUT} X2.2: n.c. X2.3: 0 V _{OUT} X2.4: Output x+1	X6.1: 0 V _{OUT} X6.2: n.c. X6.3: 0 V _{OUT} X6.4: n.c.	X2.1: 0 V _{OUT} X2.2: Output x+3 X2.3: 0 V _{OUT} X2.4: Output x+2	X6.1: 0 V _{OUT} X6.2: n.c. X6.3: 0 V _{OUT} X6.4: Output x+2	X2.1: 0 V _{OUT} X2.2: n.c. X2.3: 0 V _{OUT} X2.4: Output x+3	X6.1: 0 V _{OUT} X6.2: n.c. X6.3: 0 V _{OUT} X6.4: n.c.
		X3.1: 0 V _{OUT} X3.2: Output x+3 X3.3: 0 V _{OUT} X3.4: Output x+2	X7.1: 0 V _{OUT} X7.2: n.c. X7.3: 0 V _{OUT} X7.4: n.c.	X3.1: 0 V _{OUT} X3.2: Output x+5 X3.3: 0 V _{OUT} X3.4: Output x+4	X7.1: 0 V _{OUT} X7.2: n.c. X7.3: 0 V _{OUT} X7.4: n.c.	X3.1: 0 V _{OUT} X3.2: Output x+5 X3.3: 0 V _{OUT} X3.4: Output x+4	X7.1: 0 V _{OUT} X7.2: n.c. X7.3: 0 V _{OUT} X7.4: n.c.
		X4.1: 0 V _{OUT} X4.2: n.c. X4.3: 0 V _{OUT} X4.4: Output x+3	X8.1: 0 V _{OUT} _{x+1} X8.2: n.c. X8.3: 0 V _{OUT} _{x+3} X8.4: n.c.	X4.1: 0 V _{OUT} X4.2: Output x+7 X4.3: 0 V _{OUT} X4.4: Output x+6	X8.1: 0 V _{OUT} X8.2: n.c. X8.3: 0 V _{OUT} X8.4: n.c.	X4.1: 0 V _{OUT} X4.2: Output x+7 X4.3: 0 V _{OUT} X4.4: Output x+6	X8.1: 0 V _{OUT} X8.2: n.c. X8.3: 0 V _{OUT} X8.4: n.c.
CPX-AB-4-M12X2-5POL¹⁾ and CPX-AB-4-M12X2-5POL-R²⁾							
		X1.1: n.c. X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x X1.5: FE	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V _{OUT} X3.4: Output x+2 X3.5: FE	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x X1.5: FE	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V _{OUT} X3.4: Output x+4 X3.5: FE	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x X1.5: FE	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V _{OUT} X3.4: Output x+4 X3.5: FE
		X2.1: n.c. X2.2: n.c. X2.3: 0 V _{OUT} X2.4: Output x+1 X2.5: FE	X4.1: n.c. X4.2: n.c. X4.3: 0 V _{OUT} X4.4: Output x+3 X4.5: FE	X2.1: n.c. X2.2: Output x+3 X2.3: 0 V _{OUT} X2.4: Output x+2 X2.5: FE	X4.1: n.c. X4.2: Output x+7 X4.3: 0 V _{OUT} X4.4: Output x+6 X4.5: FE	X2.1: n.c. X2.2: Output x+3 X2.3: 0 V _{OUT} X2.4: Output x+2 X2.5: FE	X4.1: n.c. X4.2: Output x+7 X4.3: 0 V _{OUT} X4.4: Output x+6 X4.5: FE
CPX-AB-8-KL-4POL							
		X1.0: n.c. X1.1: 0 V _{OUT} X1.2: Output x X1.3: FE	X5.0: n.c. X5.1: 0 V _{OUT} X5.2: Output x+2 X5.3: FE	X1.0: n.c. X1.1: 0 V _{OUT} X1.2: Output x X1.3: FE	X5.0: n.c. X5.1: 0 V _{OUT} X5.2: Output x+4 X5.3: FE	X1.0: n.c. X1.1: 0 V _{OUT} X1.2: Output x X1.3: FE	X5.0: n.c. X5.1: 0 V _{OUT} X5.2: Output x+4 X5.3: FE
		X2.0: n.c. X2.1: 0 V _{OUT} X2.2: Output x+1 X2.3: FE	X6.0: n.c. X6.1: 0 V _{OUT} X6.2: Output x+3 X6.3: FE	X2.0: n.c. X2.1: 0 V _{OUT} X2.2: Output x+1 X2.3: FE	X6.0: n.c. X6.1: 0 V _{OUT} X6.2: Output x+5 X6.3: FE	X2.0: n.c. X2.1: 0 V _{OUT} X2.2: Output x+1 X2.3: FE	X6.0: n.c. X6.1: 0 V _{OUT} X6.2: Output x+5 X6.3: FE
		X3.0: n.c. X3.1: 0 V _{OUT} X3.2: Output x+1 X3.3: FE	X7.0: n.c. X7.1: 0 V _{OUT} X7.2: Output x+3 X7.3: FE	X3.0: n.c. X3.1: 0 V _{OUT} X3.2: Output x+2 X3.3: FE	X7.0: n.c. X7.1: 0 V _{OUT} X7.2: Output x+2 X7.3: FE	X3.0: n.c. X3.1: 0 V _{OUT} X3.2: Output x+2 X3.3: FE	X7.0: n.c. X7.1: 0 V _{OUT} X7.2: Output x+6 X7.3: FE
		X4.0: n.c. X4.1: 0 V _{OUT} X4.2: n.c. X4.3: FE	X8.0: n.c. X8.1: 0 V _{OUT} X8.2: n.c. X8.3: FE	X4.0: n.c. X4.1: 0 V _{OUT} X4.2: Output x+3 X4.3: FE	X8.0: n.c. X8.1: 0 V _{OUT} X8.2: Output x+7 X8.3: FE	X4.0: n.c. X4.1: 0 V _{OUT} X4.2: Output x+3 X4.3: FE	X8.0: n.c. X8.1: 0 V _{OUT} X8.2: Output x+7 X8.3: FE

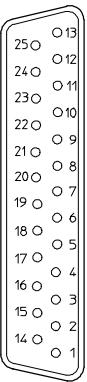
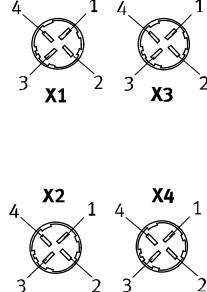
1) Not suitable for CPX-8DA-H.

- 2) Speedcon quick lock, screening additionally on metal thread

Terminal CPX

Technical data – Output module, digital

FESTO

Pin allocation				
Connection block outputs	CPX-4DA		CPX-8DA and CPX-8DA-H	
CPX-AB-1-SUB-BU-25POL				
	1: Output x 2: Output x+1 3: Output x+1 4: n.c. 5: n.c. 6: 0 V _{OUT} 7: n.c. 8: 0 V _{OUT} 9: n.c. 10: n.c. 11: 0 V _{OUT} 12: 0 V _{OUT} 13: FE	14: Output x+2 15: Output x+3 16: Output x+3 17: n.c. 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: n.c. 23: 0 V _{OUT} 24: 0 V _{OUT} 25: FE	1: Output x 2: Output x+1 3: Output x+2 4: Output x+3 5: n.c. 6: 0 V _{OUT} 7: n.c. 8: 0 V _{OUT} 9: n.c. 10: n.c. 11: 0 V _{OUT} 12: 0 V _{OUT} 13: FE	14: Output x+4 15: Output x+5 16: Output x+6 17: Output x+7 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: 0 V _{OUT} 23: 0 V _{OUT} 24: 0 V _{OUT} 25: FE
CPX-AB-4-HAR-4POL ¹⁾				
	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x X2.1: n.c. X2.2: n.c. X2.3: 0 V _{OUT} X2.4: Output x+1	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V _{OUT} X3.4: Output x+2 X4.1: n.c. X4.2: n.c. X4.3: 0 V _{OUT} X4.4: Output x+3	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V _{OUT} X1.4: Output x X2.1: n.c. X2.2: n.c. X2.3: 0 V _{OUT} X2.4: Output x+2	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V _{OUT} X3.4: Output x+4 X4.1: n.c. X4.2: Output x+7 X4.3: 0 V _{OUT} X4.4: Output x+6

1) Not suitable for CPX-8DA-H.

Terminal CPX

FESTO

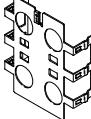
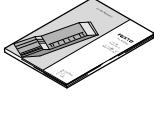
Accessories – Output module, digital

Ordering data			Part No.	Type	
Designation					
Output module, digital					
	4 digital outputs, power supply 1 A per channel		195754	CPX-4DA	
	8 digital outputs, power supply 0.5 A per channel		541482	CPX-8DA	
	8 digital outputs, power supply 2.1 A per channel pair		550204	CPX-8DA-H	
Connection block					
	Plastic	8x socket, M8, 3-pin 8x socket, M8, 4-pin 4x socket, M12, 5-pin 4x socket, M12 with quick-lock technology, 5-pin Spring clip terminal, 32-pin 1x Sub-D socket, 25-pin 4x socket, quick connection, 4-pin	195706 541256 195704 541254 195708 525676 525636	CPX-AB-8-M8-3POL CPX-AB-8-M8X2-4POL CPX-AB-4-M12X2-5POL CPX-AB-4-M12X2-5POL-R CPX-AB-8-KL-4POL CPX-AB-1-SUB-BU-25POL CPX-AB-4-HAR-4POL	
	Metal	4x socket, M12, 5-pin	549367	CPX-M-AB-4-M12X2-5POL	
Distributor					
	Modular system for sensor/actuator distributor		–	NEDY-... ➔ Internet: nedy	
	Plug M8, 4-pin	2x socket M8, 3-pin	8005312	NEDY-L2R1-V1-M8G3-N-M8G4	
	Plug M12, 4-pin	2x socket M8, 3-pin 2x socket M12, 5-pin	8005311 8005310	NEDY-L2R1-V1-M8G3-N-M12G4 NEDY-L2R1-V1-M12G5-N-M12G4	
Plug					
	Plug	M8, 3-pin M12, PG7 M12, PG7, 4-pin for cable Ø 2.5 mm M12, PG9 M12 for 2 cables M12 for 2 cables, 5-pin M12, 5-pin	Solderable Screw-in	18696 192009 18666 192008 18778 18779 192010 175487	SEA-GS-M8 SEA-3GS-M8-S SEA-GS-7 SEA-4GS-7-2,5 SEA-GS-9 SEA-GS-11-DUO SEA-5GS-11-DUO SEA-M12-5GS-PG7
	HARAX plug, 4-pin			525928	SEA-GS-HAR-4POL
	Sub-D plug, 25-pin			527522	SD-SUB-D-ST25
Connecting cable					
	Connecting cable M8-M8	0.5 m 1.0 m 2.5 m 5.0 m	541346 541347 541348 541349	NEBU-M8G3-K-0.5-M8G3 NEBU-M8G3-K-1-M8G3 NEBU-M8G3-K-2.5-M8G3 NEBU-M8G3-K-5-M8G3	
	Modular system for connecting cables		–	NEBU-... ➔ Internet: nebu	

Terminal CPX

Accessories – Output module, digital

FESTO

Ordering data		Part No.	Type
Designation			
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	538219	AK-8KL
	Fittings kit	538220	VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
User manual			
	User manual	German	526439 P.BE-CPX-EA-DE
		English	526440 P.BE-CPX-EA-EN
		Spanish	526441 P.BE-CPX-EA-ES
		French	526442 P.BE-CPX-EA-FR
		Italian	526443 P.BE-CPX-EA-IT

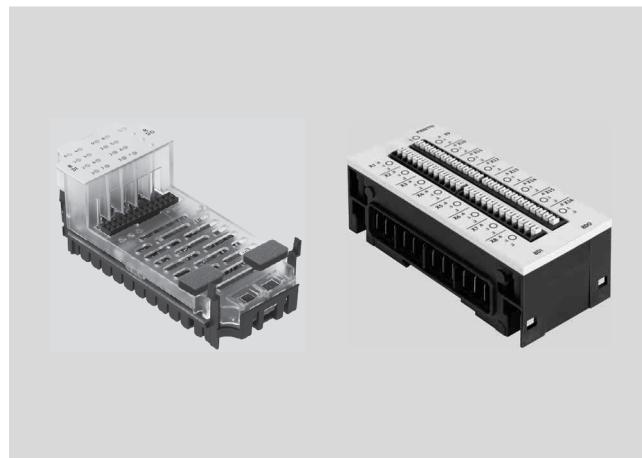
Terminal CPX

Technical data – Input/output module, digital

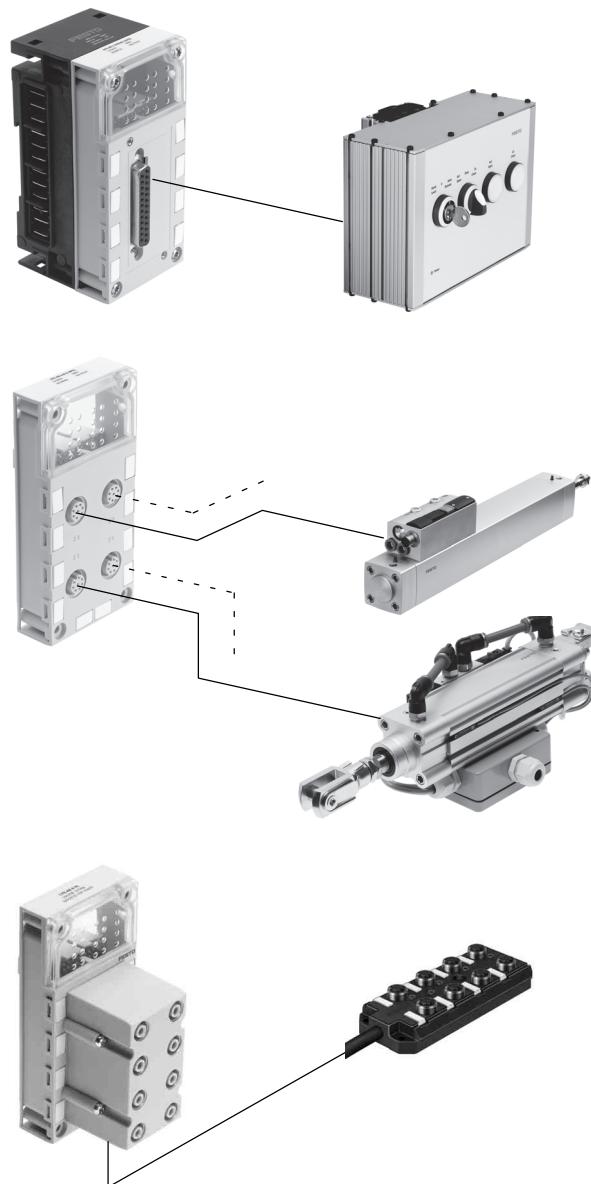
FESTO

Application

- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- As CPX-L with connection via spring-loaded terminals
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and the outputs from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection for the sensor power supply and integrated electronic fuse protection in each output channel



Function



The multi I/O module controls devices with a high number of inputs and outputs per connection point. Since the module supports Sub-D connection blocks, consoles with pushbuttons and lamps can be connected to the terminal CPX using a minimal amount of installation space.

Up to 8 inputs and 8 outputs can be connected to one connection point with high protection to IP65.

Since the module supports the M12 connection block (8-pin), up to 4 cylinder/valve combinations with integrated sensors can be connected. Each cylinder/valve combination is supported by 2 inputs and 2 outputs per connection. It is therefore possible to control max. 2 solenoid coils and record signals from 2 sensors with a pre-assembled connecting cable.

Two inputs on 2 connections are bridged to provide support for the diagnostic module of the cylinder/valve combination. This means that 3 inputs and 2 outputs are available at 2 connections.

As an alternative to the Sub-D and M12 connection block (8-pin) for installation with high protection to IP65, the terminal connection block produces an identical result for installation with IP20 protection – or with IP65/IP67 protection with additional cover.

Subordinate I/O modules with multi-pin plug connection (Sub-D plug or multi-pin connecting cable for self-assembly) support the cost-effective and space-saving integration of critical installation areas such as energy chains or upstream functions.

Terminal CPX

Technical data – Input/output module, digital

FESTO

General technical data		CPX-8DE-8DA	CPX-L-8DE-8DA
Type			
Number	Inputs	8	8
	Outputs	8	8
Max. power supply per module	Sensor supply [A]	0.7	1.8
	Outputs [A]	4	2
Max. power supply per channel	[A]	0.5 (12 W lamp load, channels 00 ... 003 can be connected in parallel to 04 ... 07)	0.25 (6 W lamp load)
Fuse protection (short circuit)		Internal electronic fuse per channel	
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 22	Typically 15
Operating voltage	Nominal value [V DC]	24	24
	Permissible range [V DC]	18 ... 30	18 ... 30
Electrical isolation, inputs	Channel – channel	No	No
	Channel – internal bus	No	No
Electrical isolation, outputs	Channel – channel	No	No
	Channel – internal bus	Yes, using an intermediate supply	No
Characteristic	Inputs	IEC 1131-T2	IEC 1131-T2, type 01
	Outputs	IEC 1131-T2	IEC 1131-T2
Switching level, inputs	Signal 0 [V DC]	≤ 5	≤ 5
	Signal 1 [V DC]	≥ 11	≥ 15
Input debounce time	[ms]	3 (0.1 ms, 10 ms, 20 ms parameterisable)	
Switching logic		Positive logic (PNP)	Positive logic (PNP)
LED displays	Group diagnostics	1	1
	Channel diagnostics	–	–
	Channel status	16	16
Diagnostics		<ul style="list-style-type: none"> • Short circuit/overload per channel • Undervoltage at outputs 	
Parameterisation		<ul style="list-style-type: none"> • Input debounce time • Failsafe per channel • Forces per channel • Idle mode per channel • Signal extension time • Module monitoring • Behaviour after short circuit 	
Protection class to EN 60529		Depending on connection block	IP20
Temperature range	Operation [°C]	-5 ... +50	-5 ... +50
	Storage/transport [°C]	-20 ... +70	-20 ... +70
Materials		Reinforced PA, PC	Reinforced PA
Note on materials		–	RoHS-compliant
Grid dimension	[mm]	50	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50	50 x 107 x 41
Product weight	[g]	38	Approx. 170

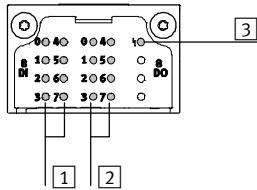
Terminal CPX

FESTO

Technical data – Input/output module, digital

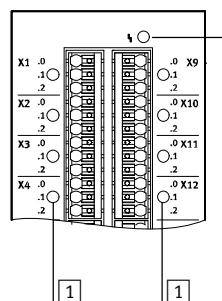
Connection and display components

CPX-8DE-8DA



- [1] Status LEDs (green)
For allocation to inputs
→ pin allocation for module
- [2] Status LEDs (yellow)
For allocation to outputs
→ pin allocation for module
- [3] Error LED (red)
(module error)

CPX-L-8DE-8DA



- [1] Status LEDs (green)
for each input signal
- [2] Error LED (red, module error)

Connection block/digital I/O module combinations

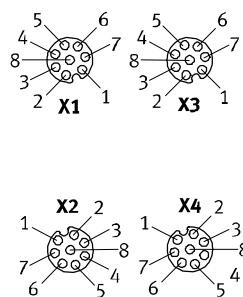
Connection blocks	Part No.	Digital I/O module	
		CPX-8DE-8DA	CPX-L-8DE-8DA
CPX-AB-4-M12-8POL	526178	■	–
CPX-AB-8-KL-4POL	195708	■	–
CPX-AB-1-SUB-BU-25POL	525676	■	–

Pin allocation

Connection block inputs/outputs

CPX-8DE-8DA

CPX-AB-4-M12-8POL



- | | |
|---------------------------|---------------------------|
| X1.1: 24 V _{SEN} | X3.1: 24 V _{SEN} |
| X1.2: Input x | X3.2: Input x+4 |
| X1.3: Input x+1 | X3.3: Input x+5 |
| X1.4: 0 V _{SEN} | X3.4: 0 V _{SEN} |
| X1.5: Output x | X3.5: Output x+4 |
| X1.6: Output x+1 | X3.6: Output x+5 |
| X1.7: Input x+4 | X3.7: n.c. |
| X1.8: 0 V _{OUT} | X3.8: 0 V _{OUT} |
-
- | | |
|---------------------------|---------------------------|
| X2.1: 24 V _{SEN} | X4.1: 24 V _{SEN} |
| X2.2: Input x+2 | X4.2: Input x+6 |
| X2.3: Input x+3 | X4.3: Input x+7 |
| X2.4: 0 V _{SEN} | X4.4: 0 V _{SEN} |
| X2.5: Output x+2 | X4.5: Output x+6 |
| X2.6: Output x+3 | X4.6: Output x+7 |
| X2.7: Input x+6 | X4.7: n.c. |
| X2.8: 0 V _{OUT} | X4.8: 0 V _{OUT} |

Terminal CPX

Technical data – Input/output module, digital

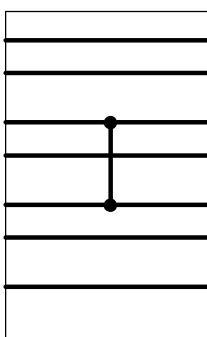
FESTO

Pin allocation			
Connection block inputs/outputs	CPX-8DE-8DA		
CPX-AB-8-KL-4POL			
	X1.0: 24 V _{SEN} X1.1: 0 V _{SEN} X1.2: Input x X1.3: FE	X5.0: Output x+4 X5.1: 0 V _{OUT} X5.2: Output x X5.3: FE	
	X2.0: Input x+4 X2.1: Input x+5 X2.2: Input x+1 X2.3: FE	X6.0: Output x+5 X6.1: 0 V _{OUT} X6.2: Output x+1 X6.3: FE	
	X3.0: 24 V _{SEN} X3.1: 0 V _{SEN} X3.2: Input x+2 X3.3: FE	X7.0: Output x+6 X7.1: 0 V _{OUT} X7.2: Output x+2 X7.3: FE	
	X4.0: Input x+6 X4.1: Input x+7 X4.2: Input x+3 X4.3: FE	X8.0: Output x+7 X8.1: 0 V _{OUT} X8.2: Output x+3 X8.3: FE	
CPX-AB-1-SUB-BU-25POL			
	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: Input x+4 6: Input x+5 7: Input x+6 8: Input x+7 9: 24 V _{SEN} 10: 24 V _{SEN} 11: 0 V _{SEN} 12: 0 V _{SEN} 13: FE	14: Output x 15: Output x+1 16: Output x+2 17: Output x+3 18: Output x+4 19: Output x+5 20: Output x+6 21: Output x+7 22: 0 V _{OUT} 23: 0 V _{OUT} 24: 0 V _{OUT} 25: FE Housing: FE	

Terminal CPX

FESTO

Technical data – Input/output module, digital

Pin allocation		
Connection block inputs	CPX-L-8DE-8DA	
X1 .0 .1 .2	X1.0: 24 V _{SEN} X1.1: Input x X1.2: 0 V _{SEN+out}	X9.0: 24 V _{SEN} X9.1: Output x X9.2: 0 V _{SEN+out}
X2 .0 .1 .2	X2.0: 24 V _{SEN} X2.1: Input x+1 X2.2: 0 V _{SEN+out}	X10.0: 24 V _{SEN} X10.1: Output x+1 X10.2: 0 V _{SEN+out}
X3 .0 .1 .2	X3.0: 24 V _{SEN} X3.1: Input x+2 X3.2: 0 V _{SEN+out}	X11.0: 24 V _{SEN} X11.1: Output x+2 X11.2: 0 V _{SEN+out}
X4 .0 .1 .2	X4.0: 24 V _{SEN} X4.1: Input x+3 X4.2: 0 V _{SEN+out}	X12.0: 24 V _{SEN} X12.1: Output x+3 X12.2: 0 V _{SEN+out}
X5 .0 .1 .2	X5.0: 24 V _{SEN} X5.1: Input x+4 X5.2: 0 V _{SEN+out}	X13.0: 24 V _{SEN} X13.1: Output x+4 X13.2: 0 V _{SEN+out}
X6 .0 .1 .2	X6.0: 24 V _{SEN} X6.1: Input x+5 X6.2: 0 V _{SEN+out}	X14.0: 24 V _{SEN} X14.1: Output x+5 X14.2: 0 V _{SEN+out}
X7 .0 .1 .2	X7.0: 24 V _{SEN} X7.1: Input x+6 X7.2: 0 V _{SEN+out}	X15.0: 24 V _{SEN} X15.1: Output x+6 X15.2: 0 V _{SEN+out}
X8 .0 .1 .2	X8.0: 24 V _{SEN} X8.1: Input x+7 X8.2: 0 V _{SEN+out}	X16.0: 24 V _{SEN} X16.1: Output x+7 X16.2: 0 V _{SEN+out}
Interlinking block	CPX-L-8DE-8DA	
 <p>0V_{Valves} 24V_{Valves}</p> <p>0V_{Output} 24V_{Output}</p> <p>0V_{El./Sen.} 24V_{El./Sen.}</p> <p>FE</p>	<p>The module combines the 0 V potential of the power supply for electronics and sensors with the 0 V potential of the power supply for outputs in the CPX interlinking module.</p>	<p>If all poles of the outputs of an output module connected to the right of the input/output module are to be switched off, an appropriate interlinking block with additional power supply for outputs must be used to the right of the input/output module.</p>

Terminal CPX

Accessories – Input/output module, digital

Ordering data		Part No.	Type
Designation			
Input/output module, digital			
	8 digital inputs, 8 digital outputs	526257	CPX-8DE-8DA
	8 digital inputs, 8 digital outputs, for CPX in plastic, including interlinking block and connection block with spring-loaded terminals	572607	CPX-L-8DE-8DA-16-KL-3POL
Connection block			
	Plastic	4x socket, M12, 8-pin	526178 CPX-AB-4-M12-8POL
		Spring-loaded terminal, 32-pin	195708 CPX-AB-8-KL-4POL
		1x socket, Sub-D, 25-pin	525676 CPX-AB-1-SUB-BU-25POL
Plug			
	Plug, Sub-D, 25-pin	527522	SD-SUB-D-ST25
Connecting cable			
	Connecting cable M12	525617	KM12-8GD8GS-2-PU
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67)	538219	AK-8KL
	- 8 cable through-feeds M9 - 1 cable through-feed for multi-pin plug	538220	VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
Manual			
	Manual	German	526439 P.BE-CPX-EA-DE
		English	526440 P.BE-CPX-EA-EN
		Spanish	526441 P.BE-CPX-EA-ES
		French	526442 P.BE-CPX-EA-FR
		Italian	526443 P.BE-CPX-EA-IT

Terminal CPX

Technical data – Counter module, digital

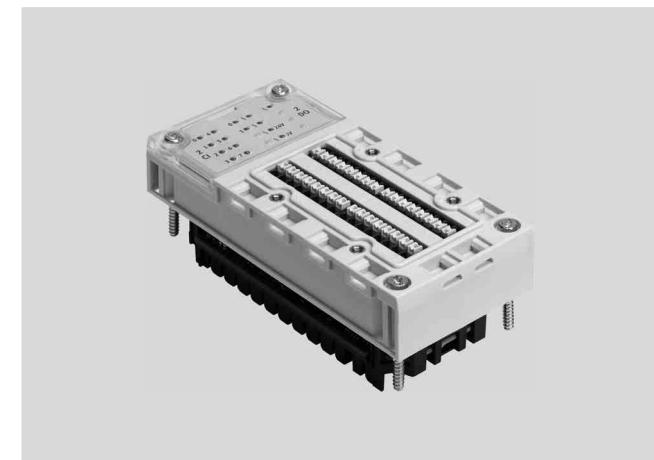
FESTO

Function

The counter module has two channels. Depending on the parameterisation, these can independently be used as counter inputs or as incremental value encoder inputs or SSI. The counter module additionally has one output per channel. The outputs can either be controlled by a counter channel or an incremental value encoder channel, i.e. through an event such as "Comparative value reached". Alternatively, outputs can also be controlled via process data.

Application

- Continuous counting
- One-off counting to count limit
- One-off counting to count limit, return to load value
- Periodic counting
- Measurement of frequencies
- Measurement of rotational speeds
- Measurement of duty cycle
- Measurement of position
- Measurement of speed
- Measurement with pulse generators
- Measurement with pulse generators and direction encoders
- Measurement with incremental encoders
- Measurement with SSI absolute encoders



Description

Applications

- | | | | |
|---|--|--|---|
| <ul style="list-style-type: none">• Recording travel and speed of a conveyor• Position and speed synchronisation of conveyors and pick & place applications• Counting goods e.g. in packaging installations | <ul style="list-style-type: none">• Systems for filling by weight and volume• Monitoring motor speeds• Measuring equipment for determining the position of axis systems (linear, rotational) | <ul style="list-style-type: none">• Control of fast-switching valves• Control of the opening time of a valve• Activation of semiconductor relays | <ul style="list-style-type: none">• Temperature monitoring and rotational speed control for drives• Change of direction in fast drives• Control of motors with pulse-width modulation (PWM) |
|---|--|--|---|

Supported devices

- | | | | |
|---|--|---|--|
| <ul style="list-style-type: none">• 5 V incremental encoder, single-ended or differential, with two 90° phase offset tracks | <ul style="list-style-type: none">• 24 V incremental encoder, single-ended, with two 90° phase offset tracks | <ul style="list-style-type: none">• 24 V pulse generator with or without direction level• 24 V direct current motors | <ul style="list-style-type: none">• Absolute encoder with SSI interface (13 bits to 25 bits) |
|---|--|---|--|

Terminal CPX

Technical data – Counter module, digital

FESTO

General technical data		
Type	CPX-2ZE2DA	
Number	Inputs	2
	Outputs	2
Max. power supply per module	Inputs [A]	2
	Outputs [A]	10
Max. power supply per channel	[A]	5 (adjustable, 20 W lamp load)
Max. cable length	[m]	30
Fuse protection (short circuit)	Internal electronic fuse per channel	
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 35
Operating voltage	Nominal value [V DC]	24
	Permissible range [V DC]	18 ... 30
Electrical isolation, inputs	Channel – channel	No
	Channel – internal bus	No
Electrical isolation, outputs	Channel – channel	No
	Channel – internal bus	Yes, using an intermediate supply
Characteristic curve	Inputs	To IEC 1131-2, Type 02
	Outputs	IEC 1131-T2
Switching level	Signal 0 [V DC]	≤ 5
	Signal 1 [V DC]	≥ 11
Input debounce time	[μs]	0.1 (0.2 μs, 0.4 μs, 0.8 μs, 1 μs, 2 μs, 4 μs, 8 μs, 10 μs, 50 μs, 100 μs, 500 μs, 1 ms, 3 ms, 10 ms, 20 ms parameterisable)
Switching logic	Inputs	Positive logic (PNP)
	Outputs	<ul style="list-style-type: none"> • Negative logic (NPN) • Positive logic (PNP) • Push-pull driver
LED displays	Group diagnostics	1
	Channel diagnostics	2
	Channel status	10
	Module diagnostics	2
Diagnostics	Operating mode-dependent diagnostics	
Parameterisation	<ul style="list-style-type: none"> • Switch-on/off delay • Frequency output • Speed measurement • Pulse output • Pulse train • Rotational speed measurement • Frequency measurement • Duty cycle measurement • Engine operating mode • Determination of position • Pulse width modulation • One-off counting • Continuous counting • Periodic counting 	
Protection class to EN 60529	IP65, IP67	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Certification	UL - Recognized (OL)	
Housing material information	Plastic	
Note on materials	RoHS-compliant	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50
Product weight	[g]	130

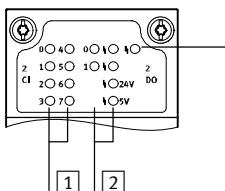
Terminal CPX

FESTO

Technical data – Counter module, digital

Connection and display components

CPX-2ZE2DA



- [1] Status LEDs (green)
For allocation to inputs
→ Pin allocation for module
- [2] Status LEDs (yellow, red)
For allocation to outputs
→ Pin allocation for module
- [3] Error LED (red)
(module error)

Pin allocation

Inputs/outputs	CPX-2ZE2DA																																				
X1 X2 X3 X4	.0 .1 .2 .3 .0 .1 .2 .3 .0 .1 .2 .3 .0 .1 .2 .3 .0 .1 .2 .3 .0 .1 .2 .3 .0 .1 .2 .3	<table><thead><tr><th>Channel 0</th><th>Channel 1</th></tr></thead><tbody><tr><td>X1.0: Input</td><td>X5.0: Input</td></tr><tr><td>X1.1: Input</td><td>X5.1: Input</td></tr><tr><td>X1.2: Input</td><td>X5.2: Input</td></tr><tr><td>X1.3: Input</td><td>X5.3: Input</td></tr><tr><td>X2.0: Input</td><td>X6.0: Input</td></tr><tr><td>X2.1: Input</td><td>X6.1: Input</td></tr><tr><td>X2.2: 5 V DC</td><td>X6.2: 5 V DC</td></tr><tr><td>X2.3: 0 V</td><td>X6.3: 0 V</td></tr><tr><td>X3.0: 24 V DC</td><td>X7.0: 24 V DC</td></tr><tr><td>X3.1: 0 V</td><td>X7.1: 0 V</td></tr><tr><td>X3.2: 24 V DC for digital input DI</td><td>X7.2: 24 V DC for digital input DI</td></tr><tr><td>X3.3: Digital input DI</td><td>X7.3: Digital input DI</td></tr><tr><td>X4.0: 0 V for digital input DI</td><td>X8.0: 0 V for digital input DI</td></tr><tr><td>X4.1: Digital output DO</td><td>X8.1: Digital output DO</td></tr><tr><td>X4.2: Reference potential for DO</td><td>X8.2: Reference potential for DO</td></tr><tr><td>X4.3: FE</td><td>X8.3: FE</td></tr></tbody></table>	Channel 0	Channel 1	X1.0: Input	X5.0: Input	X1.1: Input	X5.1: Input	X1.2: Input	X5.2: Input	X1.3: Input	X5.3: Input	X2.0: Input	X6.0: Input	X2.1: Input	X6.1: Input	X2.2: 5 V DC	X6.2: 5 V DC	X2.3: 0 V	X6.3: 0 V	X3.0: 24 V DC	X7.0: 24 V DC	X3.1: 0 V	X7.1: 0 V	X3.2: 24 V DC for digital input DI	X7.2: 24 V DC for digital input DI	X3.3: Digital input DI	X7.3: Digital input DI	X4.0: 0 V for digital input DI	X8.0: 0 V for digital input DI	X4.1: Digital output DO	X8.1: Digital output DO	X4.2: Reference potential for DO	X8.2: Reference potential for DO	X4.3: FE	X8.3: FE	
Channel 0	Channel 1																																				
X1.0: Input	X5.0: Input																																				
X1.1: Input	X5.1: Input																																				
X1.2: Input	X5.2: Input																																				
X1.3: Input	X5.3: Input																																				
X2.0: Input	X6.0: Input																																				
X2.1: Input	X6.1: Input																																				
X2.2: 5 V DC	X6.2: 5 V DC																																				
X2.3: 0 V	X6.3: 0 V																																				
X3.0: 24 V DC	X7.0: 24 V DC																																				
X3.1: 0 V	X7.1: 0 V																																				
X3.2: 24 V DC for digital input DI	X7.2: 24 V DC for digital input DI																																				
X3.3: Digital input DI	X7.3: Digital input DI																																				
X4.0: 0 V for digital input DI	X8.0: 0 V for digital input DI																																				
X4.1: Digital output DO	X8.1: Digital output DO																																				
X4.2: Reference potential for DO	X8.2: Reference potential for DO																																				
X4.3: FE	X8.3: FE																																				



The allocation and designation of inputs differs fundamentally depending on which type of encoder is connected. Appropriate allocation diagrams can be found in the user documentation for the counter module.

Terminal CPX

Accessories – Counter module, digital

Ordering data		Part No.	Type
Description			
Counter module, digital			
	2 digital inputs, 2 digital outputs	576046	CPX-2ZE2DA
Cover			
	Cover for CPX-2ZE2DA (IP65, IP67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	538219	AK-8KL
	Fittings kit	538220	VG-K-M9
Manual			
	Manual counter module CPX-2ZE2DA	German	8035733 P.BE-CPX-2ZE2DA-DE
		English	8035734 P.BE-CPX-2ZE2DA-EN
		Spanish	8035735 P.BE-CPX-2ZE2DA-ES
		French	8035736 P.BE-CPX-2ZE2DA-FR
		Italian	8035737 P.BE-CPX-2ZE2DA-IT
		Chinese	8035738 P.BE-CPX-2ZE2DA-ZH

Terminal CPX

FESTO

Technical data HART input/output module

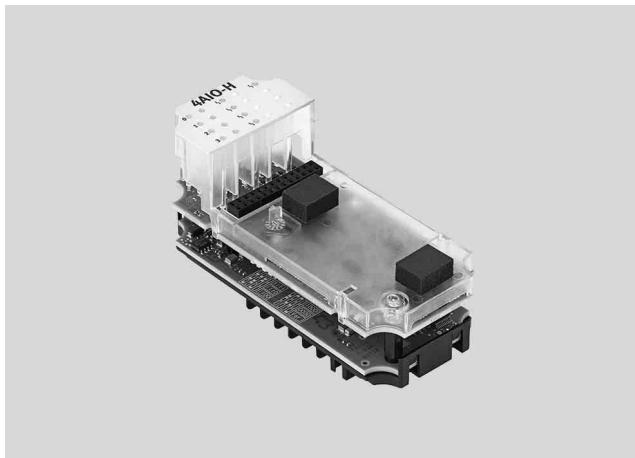
Function

The HART input/output module allows the connection of up to 4 sensors or actuators. The corresponding communication channel is made available for sensors or actuators that communicate using the HART protocol.

With the HART protocol, a conventional analogue 4 ... 20 mA current signal is modulated by a second frequency-modulated signal. Each of the 4 connections of the module can be configured as inputs or outputs.

Area of application

- Multi I/O module for 24 V DC supply voltage
- Supports connection blocks with M12 and terminal connection
- Module features can be parameterised
- The module receives the voltage supply for the electronics, outputs and the sensors from the interlinking block
- Module protection and diagnostics through integrated electronic fuse protection



General technical data

Type code	CPX-4AE-4AA-H		
Protocol	HART		
Number of selectable analogue inputs/outputs	4		
Sensor type	0 ... 20 mA	4 ... 20 mA	4 ... 20 mA with HART
Operating voltage	Nominal value [V DC]	24	
	Permissible range [V DC]	18 ... 30	
Power failure buffering	[ms]	10	
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 170	
Maximum short circuit current	[mA]	22	
Maximum open circuit voltage	[V]	28.8	
Minimum available sensor voltage	20.7 V DC at 20 mA		
Fuse protection (short circuit)	Internal electronic fuse per channel		
Reverse polarity protection	For all electrical connections		
Electrical isolation	Channel – channel	No	
	Channel – internal bus	Yes	
Signal range	0 ... 20 mA	4 ... 20 mA	4 ... 20 mA with HART
Data format	15 bits + prefix Scalable to 15 bits		
Maximum load	[Ω]	750	
Maximum input resistance	[Ω]	300	
Maximum cable length	[m]	500	
Basic error limit at 25 °C	[%]	±0.1	
Operating error limit related to the ambient temperature range	[%]	±0.3	
Repetition accuracy	0.05% at 20 °C		
LED indicators	Group diagnostics	1	
	Channel diagnostics	4	
	Channel status	4	
Control components	DIL switch		
Diagnostics	<ul style="list-style-type: none">• Wire break per channel• Limit violation per channel• Short circuit/overload per channel• Parameterisation error• Overflow/underflow• Limit violation to NE43 per channel		

Terminal CPX

Technical data – HART input/output module

FESTO

General technical data

Parameterisation	<ul style="list-style-type: none">• Data format• Failsafe per channel• Forcing per channel• Limit value monitoring per channel• Idle mode per channel• Measured value smoothing• Signal range per channel• Monitoring overflow/underflow• Monitoring to NE43, inputs• Monitoring wire break per channel• Wire break per channel• Limit value violation per channel• Short circuit/overload per channel• Parameterisation error• Overflow/underflow• Limit value violation to NE43 per channel• Number of HART repetitions• Hysteresis for limit values• HART variables (4 pieces)• Behaviour after short circuit/overload
Degree of protection to EN 60529	Depending on connection block

Technical data – Mechanical

Type of mounting	On interlinking block
Product weight	[g] 77.4
Grid dimension	[mm] 50
Dimensions (incl. interlinking block and connection block)	[mm] 50 x 107 x 70
W x L x H	

Materials

Housing	PA reinforced, PC
Note on materials	RoHS-compliant

Operating and environmental conditions

Ambient temperature	[°C] -5 ... +50
Storage temperature	[°C] -20 ... +70
Relative humidity	[%) 95, non-condensing
Corrosion resistance class CRC ¹⁾	1 (when installed)
CE marking (see declaration of conformity) ³⁾	To EU EMC Directive ²⁾

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. For dry indoor applications or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

3) Additional information www.festo.com/sp ➔ Certificates.

Safety data

Shock resistance	Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27
Vibration resistance	Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6

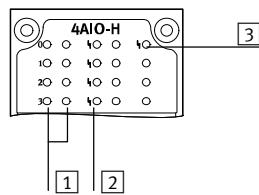
Terminal CPX

FESTO

Technical data – HART input/output module

Connection and display components

CPX-4EA-4AA-H



- [1] Status LEDs:
 - Inputs (green)
 - Outputs (yellow)
 - ➔ Pin allocation for module
- [2] Error LEDs (red)
 - Allocation to inputs/outputs
 - ➔ Pin allocation for module
- [3] Error LED (red)
(module error)

Combinations of bus nodes/control blocks with HART input/output module

Bus node/control block	Part no.	Protocol	Can be combined as of release	HART variables in process image only	Full HART functionality
CPX-FB11	526172	DeviceNet	25	■	–
CPX-FB13	195740	PROFIBUS	34	–	■
CPX-FB14	526174	CANopen	30	■	–
CPX-FB33	548755	PROFINET RT, M12	33	–	■
CPX-M-FB34	548751	PROFINET RT, RJ45	33	–	■
CPX-M-FB35	548749	PROFINET RT, SCRJ	33	–	■
CPX-FB36	1912451	EtherNet/IP	15	–	■
CPX-FB37	2735960	EtherCAT	7	■	–

Combinations of connection blocks with HART input/output module

Connection blocks	Part No.	HART input/output module
		CPX-4EA-4AA-H
CPX-P-AB-4XM12-4POL	565706	■
CPX-P-AB-2XKL-8POL	565704	■

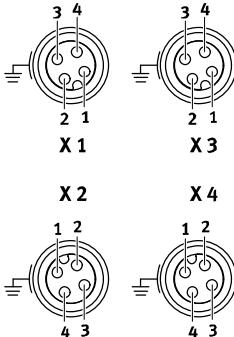
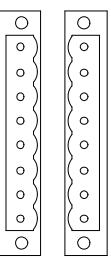
Combinations of connection blocks with interlinking block

Connection blocks	Part No.	Plastic interlinking block	Metal interlinking block
		CPX-GE...	CPX-M-GE...
CPX-P-AB-4XM12-4POL	565706	–	■
CPX-P-AB-2XKL-8POL	565704	■	■

Terminal CPX

Technical data – HART input/output module

FESTO

Pin allocation		CPX-4AE-4AA-H							
Connection block inputs/outputs		Inputs		Outputs					
CPX-P-AB-4XM12-4POL									
									
X1.1:	24 V _{SEN} x	X3.1:	24 V _{SEN} x+2	X1.1:	Output I0+				
X1.2:	0 V	X3.2:	0 V	X1.2:	0 V				
X1.3:	Input x	X3.3:	Input x+2	X1.3:	–				
X1.4:	0 V	X3.4:	0 V	X1.4:	0 V				
X2.1:	24 V _{SEN} x+1	X4.1:	24 V _{SEN} x+3	X2.1:	Output I1+				
X2.2:	0 V	X4.2:	0 V	X2.2:	0 V				
X2.3:	Input x+1	X4.3:	Input x+3	X2.3:	–				
X2.4:	0 V	X4.4:	0 V	X2.4:	0 V				
CPX-P-AB-2XKL-8POL									
X1 .1 .2 .3 <u>.4</u> .5 .6 .7 .8		X2 .8 .7 .6 .5 .4 .3 .2 .1	X1.1: 24 V _{SEN} x X1.2: 0 V X1.3: Input x X1.4: 0 V X1.5: 24 V _{SEN} x+1 X1.6: 0 V X1.7: Input x+1 X1.8: 0 V	X2.1: 24 V _{SEN} x+2 X2.2: 0 V X2.3: Input x+2 X2.4: 0 V X2.5: 24 V _{SEN} x+3 X2.6: 0 V X2.7: Input x+3 X2.8: 0 V	X1.1: Output I0+ X1.2: 0 V X1.3: – X1.4: 0 V X1.5: Output I1+ X1.6: 0 V X1.7: – X1.8: 0 V	X2.1: Output I2+ X2.2: 0 V X2.3: – X2.4: 0 V X2.5: Output I3+ X2.6: 0 V X2.7: – X2.8: 0 V			



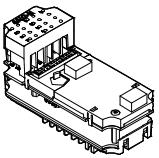
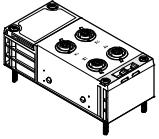
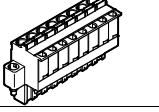
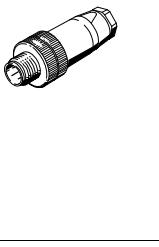
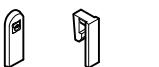
Note

In the case of mixed operation of inputs and outputs in one module, the connections are first assigned input signals and then output signals, in ascending order.

Terminal CPX

FESTO

Accessories – HART input/output module

Ordering data		Part No.	Type code
Designation			
HART input/output module			
	4 analogue inputs/outputs	8059847	CPX-4AE-4AA-H
Connection block			
	Plastic	4x socket, M12, 4-pin 2x plug, 8-pin	565706 CPX-P-AB-4XM12-4POL 565704 CPX-P-AB-2XKL-8POL
Connectors			
	8-pin socket	Spring-loaded terminal Screw terminal	565712 NECU-L3G8-C1 565710 NECU-L3G8-C2
	Plug M12x1, 4-pin, straight, A-coded	Insulation displacement connector Screw terminal	525928 SEA-GS-HAR-4POL 192008 SEA-4GS-7-2,5 18666 SEA-GS-7 18778 SEA-GS-9
Cover			
	Cover cap for sealing unused ports M12x1 (10 pieces)	165592 ISK-M12	
Coding element			
	Ensures that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 pieces of each)	For NECU-L3G8	565713 CPX-P-KDS-AB-2XKL

Terminal CPX

Technical data – Analogue module for inputs

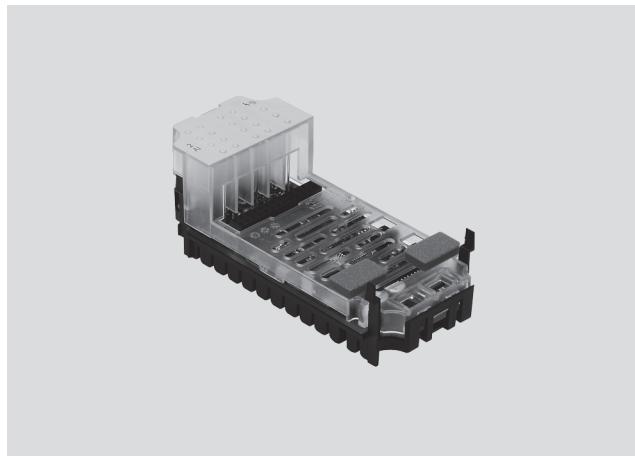
Function

Analogue modules control devices with a standardised analogue interface such as sensors for pressure, temperature, flow rate, filling level, etc.

The analogue module supports various connection concepts with different numbers of sockets or terminals as appropriate to the connection block selected.

Application

- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with Sub-D, terminal connection and M12 connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives the voltage supply for the electronics and the sensors from the interlinking block
- Analogue module protection and diagnostics through integrated electronic fuse protection



General technical data						
Type	CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I	
No. of analogue inputs	2		4		4	
Max. power supply per module [A]	0.7					
Fuse protection	Internal electronic fuse					
Current consumption from 24 V sensor supply (quiescent current) [mA]	Typically 50					
Current consumption from 24 V sensor supply (at full load) [A]	Max. 0.7					
Nominal operating voltage, load voltage [V DC]	24 ±2%					
Nominal operating voltage [V DC]	24					
Operating voltage range [V DC]	18 ... 30					
Signal range (parameterisable for each channel by means of DIL switch or software)	0 ... 10 V	0 ... 20 mA 4 ... 20 mA	1 ... 5 V 0 ... 10 V -5 ... +5 V -10 ... +10 V	0 ... 20 mA 4 ... 20 mA -20 ... +20 mA	0 ... 20 mA 4 ... 20 mA	
Operational error limit [%]	±0.5	-	±0.3	±0.3	±0.6	
Basic error limit (at 25 °C) [%]	±0.3	-	±0.2	±0.2	±0.5	
Repetition accuracy (at 25 °C) [%]	0.15	0.15	0.1	0.1	0.15	
Input resistance	100 kΩ	≤ 100 Ω	100 kΩ	≤ 100 Ω	≤ 100 Ω	
Max. permissible input voltage [V DC]	30	-	-30 ... +30	-	-	
Max. permissible input current [mA]	-	40	-	Internally limited to 60	40	
Conversion time per channel [μs]	Typically 150					
Cycle time (module) [ms]	≤ 4		≤ 0.5		≤ 10	
Data format	12 bit + prefix		15 bit + prefix		12 bit + prefix	
	Scalable to 15 bit		Scalable to 15 bit		Scalable to 15 bit	
Cable length [m]	Max. 30 (shielded)					

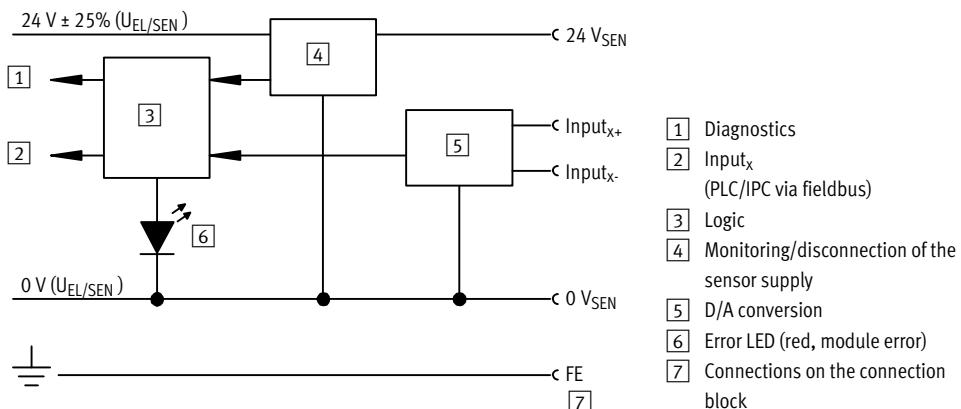
Terminal CPX

FESTO

Technical data – Analogue module for inputs

General technical data		CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I
Type				
Electrical isolation	Channel – channel	No		
	Channel – internal bus	Yes, with external sensor supply		
LED displays	Group diagnostics	1		
	Channel diagnostics	Via flashing frequency of group diagnostics	4	Via flashing frequency of group diagnostics
Diagnostics		Wire break per channel		
		Limit value violation per channel		
		Parameterisation error		
		Short circuit, input signal	Overload at input	Short circuit, input signal
		–	Overflow/underflow	–
		–	Short circuit in sensor supply	–
Parameterisation		Data format		
		Forces per channel		
		Limit value monitoring per channel		
		Measured value smoothing		
		Signal range per channel		
		Wire break monitoring per channel		
		Behaviour after short circuit		
		–	Behaviour after overload at input	–
		–	Sensor supply active	–
Protection class to EN 60529		Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials		Reinforced PA, PC		
Note on materials		–	RoHS-compliant	–
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Product weight		[g]	38	46
				38

Internal structure, basic representation



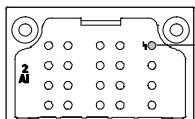
Terminal CPX

Technical data – Analogue module for inputs

FESTO

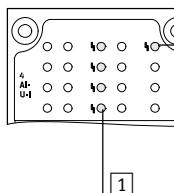
Connection and display components

CPX-2AE-U-I and CPX-4AE-I



[1] Error LED (red, module error)

CPX-4AE-U-I



[1] Error LED (red, module error)

[2] Channel-related error LEDs (red)

Connection block/analogue module combinations

Connection blocks	Part No.	Analogue module		
		CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I
CPX-AB-4-M12X2-5POL	195704	■	■	■
CPX-AB-4-M12X2-5POL-R	541254	■	■	■
CPX-AB-8-KL-4POL	195708	■	■	■
CPX-AB-1-SUB-BU-25POL	525676	■	■	■
CPX-M-AB-4-M12X2-5POL	549367	■	■	■

Pin allocation

Connection block inputs	CPX-2AE-U-I	CPX-4AE-U-I	CPX-4AE-I
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R ¹⁾ and CPX-M-AB-4-M12X2-5POL			
	X1.1: 24 VSEN X1.2: Input I0+ X1.3: 0 VSEN X1.4: Input I0- X1.5: FE ²⁾ X2.1: 24 VSEN X2.2: Input I0+ X2.3: 0 VSEN X2.4: Input I0- X2.5: FE ²⁾	X3.1: 24 VSEN X3.2: Input I1+ X3.3: 0 VSEN X3.4: Input I1- X3.5: FE ²⁾ X4.1: 24 VSEN X4.2: Input I1+ X4.3: 0 VSEN X4.4: Input I1- X4.5: FE ²⁾	X1.1: 24 VSEN X1.2: Input I0+ X1.3: 0 VSEN X1.4: Input I0- X1.5: FE ²⁾ X2.1: 24 VSEN X2.2: Input I1+ X2.3: 0 VSEN X2.4: Input I1- X2.5: FE ²⁾

CPX-AB-8-KL-4POL

X1	0 0 0 0 0 0 0 0 0 0	X5	X1.0: 24 VSEN X1.1: 0 VSEN X1.2: Input I0- X1.3: FE	X5.0: 24 VSEN X5.1: 0 VSEN X5.2: Input I1- X5.3: FE	X1.0: 24 VSEN X1.1: 0 VSEN X1.2: Input I0- X1.3: FE	X5.0: 24 VSEN X5.1: 0 VSEN X5.2: Input I1- X5.3: FE
X2	0 0 0 0 0 0 0 0 0 0	X6	X2.0: n.c. X2.1: n.c. X2.2: Input I0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Input I1+ X6.3: FE	X2.0: n.c. X2.1: n.c. X2.2: Input I0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Input I1+ X6.3: FE
X3	0 0 0 0 0 0 0 0 0 0	X7	X3.0: 24 VSEN X3.1: 0 VSEN X3.2: Input I0- X3.3: FE	X7.0: 24 VSEN X7.1: 0 VSEN X7.2: Input I1- X7.3: FE	X3.0: 24 VSEN X3.1: 0 VSEN X3.2: Input I0- X3.3: FE	X7.0: 24 VSEN X7.1: 0 VSEN X7.2: Input I1- X7.3: FE
X4	0 0 0 0 0 0 0 0 0 0	X8	X4.0: n.c. X4.1: n.c. X4.2: Input I0+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Input I1+ X8.3: FE	X4.0: n.c. X4.1: n.c. X4.2: Input I0+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Input I1+ X8.3: FE

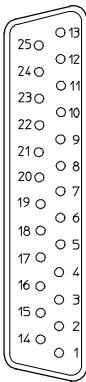
1) Speedcon quick lock, shield additionally on metal thread

2) FE/shield additionally on metal thread

Terminal CPX

FESTO

Technical data – Analogue module for inputs

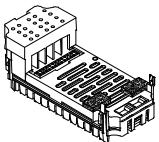
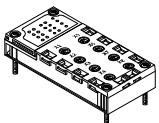
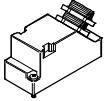
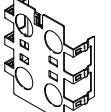
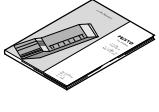
Pin allocation		CPX-2AE-U-I		CPX-4AE-U-I		CPX-4AE-I	
Connection block inputs							
CPX-AB-1-SUB-BU-25POL							
		1: Input U0– 2: Input U0+ 3: Input I0– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V _{SEN} 10: 24 V _{SEN} 11: 0 V _{SEN} 12: 0 V _{SEN} 13: Shield ¹⁾	14: Input U1– 15: Input U1+ 16: Input I1– 17: Input I1+ 18: 24 V _{SEN} 19: n.c. 20: 24 V _{SEN} 21: n.c. 22: 0 V _{SEN} 23: 0 V _{SEN} 24: 0 V _{SEN} 25: FE Housing: FE	1: Input 0– 2: Input 0+ 3: Input 1– 4: Input 1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V _{SEN} 10: 24 V _{SEN} 11: 0 V _{SEN} 12: 0 V _{SEN} 13: Shield ¹⁾	14: Input 2– 15: Input 2+ 16: Input 3– 17: Input 3+ 18: 24 V _{SEN} 19: n.c. 20: 24 V _{SEN} 21: n.c. 22: 0 V _{SEN} 23: 0 V _{SEN} 24: 0 V _{SEN} 25: FE Housing: FE	1: Input I0– 2: Input I0+ 3: Input I1– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V _{SEN} 10: 24 V _{SEN} 11: 0 V _{SEN} 12: 0 V _{SEN} 13: Shield ¹⁾	14: Input I2– 15: Input I2+ 16: Input I3– 17: Input I3+ 18: 24 V _{SEN} 19: n.c. 20: 24 V _{SEN} 21: n.c. 22: 0 V _{SEN} 23: 0 V _{SEN} 24: 0 V _{SEN} 25: FE Housing: FE

1) Connect shield to functional earth FE

Terminal CPX

Accessories – Analogue module for inputs

FESTO

Ordering data		Part No.	Type
Input module, analogue			
	2 analogue current or voltage inputs	526168	CPX-2AE-U-I
	4 analogue current or voltage inputs	573710	CPX-4AE-U-I
	4 analogue current inputs	541484	CPX-4AE-I
Connection block			
	Plastic	4x socket, M12, 5-pin	195704 CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin	541254 CPX-AB-4-M12X2-5POL-R
		Spring-loaded terminal, 32-pin	195708 CPX-AB-8-KL-4POL
	Metal	1x socket, Sub-D, 25-pin	525676 CPX-AB-1-SUB-BU-25POL
		4x socket, M12, 5-pin	549367 CPX-M-AB-4-M12X2-5POL
Plug			
	Plug, M12, 5 pin	175487	SEA-M12-5GS-PG7
	Plug, Sub-D, 25-pin	527522	SD-SUB-D-ST25
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67)		538219 AK-8KL
	<ul style="list-style-type: none"> - 8 cable through-feeds M9 - 1 cable through-feed for multi-pin plug 		538220 VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
Manual			
	Manual	German	526415 P.BE-CPX-AX-DE
English		526416 P.BE-CPX-AX-EN	
Spanish		526417 P.BE-CPX-AX-ES	
French		526418 P.BE-CPX-AX-FR	
Italian		526419 P.BE-CPX-AX-IT	

Terminal CPX

FESTO

Technical data – Analogue input module with pressure sensors

Function

The pressure input modules enable a maximum of four pressures to be processed. The internal measured value of the sensor (analogue value with 10 bit resolution) is converted into an internal numerical format as appropriate to the parameterisation and made available to the bus node as an image table. It is also possible to combine two channels into one differential pressure channel.

Applications

- Measuring range 0 ... 10 bar or -1 ... +1 bar
- Choice of units of measurement
- Processing of max. four pressures per module
- Pressure indication via LCD display
- Direct connection via QS4 push-in connectors
- Error message via CPX
- Channel-oriented diagnostics



General technical data

Type	CPX-4AE-P-B2	CPX-4AE-P-D10
No. of analogue inputs	4	
Pneumatic connection	QS-4	
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18...30
Intrinsic current consumption	[mA]	Typically 50
Measured variable		4x relative or 2x differential pressure measurement
Displayable units		<ul style="list-style-type: none"> • kPa • mbar • psi
Pressure measuring range	Starting value Final value	[bar] -1 0 [bar] 1 10
Internal cycle time	[ms]	5
Data format		<ul style="list-style-type: none"> • 15 bits + prefix • Binary representation in mbar, kPa, psi
LED displays		Group diagnostics
Diagnostics		<ul style="list-style-type: none"> • Limit value violation per channel • Parameterisation error • Sensor limit per channel
Parameterisation		<ul style="list-style-type: none"> • Diagnostic delay per channel • Hysteresis per module • Unit of measurement • Measured value smoothing per channel • Limit value monitoring per channel • Sensor limit per channel • Measurement of relative/differential pressure
Protection class to EN 60529		IP65, IP67
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C]	-5 ... 50
Storage temperature	[°C]	-20 ... 70
Temperature of medium	[°C]	0 ... 50
Note on materials		RoHS-compliant
Materials		Reinforced PA, PC
Grid dimension	[mm]	50
Dimensions (incl. interlinking block) W x L x H	[mm]	50 x 107 x 55
Weight	[g]	112



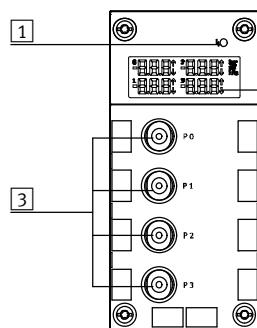
Extreme pneumatic conditions, for example high cycle frequency with large pressure amplitudes, can damage the sensors.

Terminal CPX

Accessories – Analogue input module with pressure sensors

FESTO

Connection and display components



- [1] Error LED (red, module error)
- [2] LCD display with permanent display of the four measured pressures, unit of measurement and if applicable limit value violation
- [3] QS connections

Ordering data

Designation	Part No.	Type															
Input module, analogue																	
	4 analogue pressure inputs, pressure range -1 ... +1 bar	560361 CPX-4AE-P-B2															
	4 analogue pressure inputs, pressure range 0 ... 10 bar	560362 CPX-4AE-P-D10															
Inscription labels																	
	Inscription labels 6x10, 64 pieces, in frames	18576 IBS-6x10															
User manual																	
	User manual	<table border="1"><tr><td>German</td><td>526415</td><td>P.BE-CPX-AX-DE</td></tr><tr><td>English</td><td>526416</td><td>P.BE-CPX-AX-EN</td></tr><tr><td>Spanish</td><td>526417</td><td>P.BE-CPX-AX-ES</td></tr><tr><td>French</td><td>526418</td><td>P.BE-CPX-AX-FR</td></tr><tr><td>Italian</td><td>526419</td><td>P.BE-CPX-AX-IT</td></tr></table>	German	526415	P.BE-CPX-AX-DE	English	526416	P.BE-CPX-AX-EN	Spanish	526417	P.BE-CPX-AX-ES	French	526418	P.BE-CPX-AX-FR	Italian	526419	P.BE-CPX-AX-IT
German	526415	P.BE-CPX-AX-DE															
English	526416	P.BE-CPX-AX-EN															
Spanish	526417	P.BE-CPX-AX-ES															
French	526418	P.BE-CPX-AX-FR															
Italian	526419	P.BE-CPX-AX-IT															

Terminal CPX

FESTO

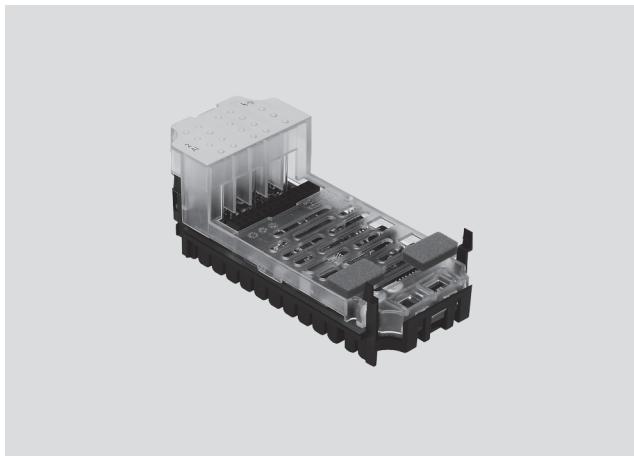
Technical data – Analogue module for temperature inputs

Function

The CPX-PT100 analogue input module with 4 channels for temperature measurement enables the connection of up to 4 temperature sensors of the type PT100-PT1000, Ni100-Ni1000, etc. The temperature module supports various connection concepts with different numbers of sockets or terminals as appropriate to the connection block selected.

Applications

- Temperature module for temperature sensors PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni500, Ni1000
- Supports connection blocks with M12, Harax and terminal connection
- Temperature module features can be parameterised
- 2-wire, 3-wire and 4-wire connection
- The temperature module is provided with voltage supply for the electronics and the sensors via the interlinking block
- Temperature module protection and diagnostics through integrated electronic fuse protection



General technical data

Type	CPX-4AE-T	
No. of analogue inputs	Temperature input	
Max. power supply per module	[A] 0.7	
Fuse protection	Internal electronic fuse for sensor supply	
Current consumption from 24 V sensor supply (quiescent current)	[mA] Typically 50	
Supply voltage of sensors	[V DC] 24 ±25%	
Sensor type (parameterisable for each channel by means of DIL switch)	PT100, PT200, PT500, PT1000 Ni100, Ni120, Ni500, Ni1000	
Temperature range	Pt standard Pt climatic Ni	[°C] -200 ... +850 [°C] -120 ... +130 [°C] -60 ... +180
Sensor connection technology	2-wire, 3-wire and 4-wire technology	
Resolution	15 bit + prefix	
Operating error limit relative to input range	[%] ±0.06	
Basic error limit (25 °C)	Standard Pt climatic	[K] ±0.6 [K] ±0.2
Temperature errors relative to input range	[%] ±0.001	
Linearity errors (no software scaling)	[%] ±0.02	
Repetition accuracy (at 25 °C)	[%] ±0.05	
Max. line resistance per wire	[Ω] 10	
Max. permissible input voltage	[V] ±30	
Cycle time (module)	[ms] ≤ 250	

Terminal CPX

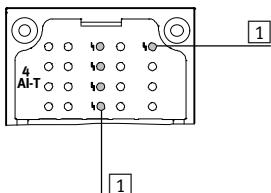
Technical data – Analogue module for temperature inputs

General technical data

Data format	15 bit + prefix, complement of two, binary notation in tenths of a degree	
Cable length	[m]	Max. 200 (screened)
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes
LED displays	Group diagnostics	1
	Channel diagnostics	4
Diagnostics	<ul style="list-style-type: none"> • Short circuit/overload, channel • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break 	
Parameterisation	<ul style="list-style-type: none"> • Unit of measurement and interference frequency suppression • Diagnostic message in the event of a wire break or short circuit • Limit monitoring per channel • Sensor connection technology • Sensor type/temperature coefficient, temperature range • Limit value per channel • Measured value smoothing 	
Protection class to EN 60529	Depending on connection block	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	Reinforced PA, PC	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50
Weight	[g]	38

Connection and display components

CPX-4AE-T



- [1] Error LED (red, module error)
- [2] Channel-specific error LEDs (red)

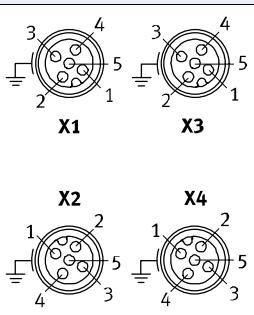
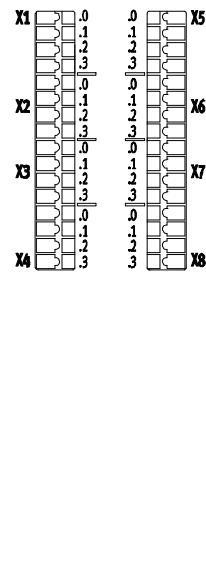
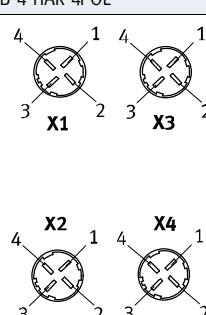
Connection block/analogue module combinations

Connection blocks	Part No.	Temperature module
		CPX-4AE-T
CPX-AB-4-M12X2-5POL	195704	■
CPX-AB-4-M12X2-5POL-R	541254	■
CPX-AB-8-KL-4POL	195708	■
CPX-AB-4-HAR-4POL	525636	■
CPX-M-AB-4-M12X2-5POL	549367	■

Terminal CPX

FESTO

Technical data – Analogue module for temperature inputs

Pin allocation																																							
Connection block inputs	CPX-4AE-T																																						
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R ¹⁾ and CPX-M-AB-4-M12X2-5POL																																							
	<table> <tbody> <tr><td>X1.1: Input I0+</td><td>X3.1: Input I2+</td></tr> <tr><td>X1.2: Input U0+</td><td>X3.2: Input U2+</td></tr> <tr><td>X1.3: Input I0-</td><td>X3.3: Input I2-</td></tr> <tr><td>X1.4: Input U0-</td><td>X3.4: Input U2-</td></tr> <tr><td>X1.5: FE²⁾</td><td>X3.5: FE²⁾</td></tr> <tr><td> </td><td> </td></tr> <tr><td>X2.1: Input I1+</td><td>X4.1: Input I3+</td></tr> <tr><td>X2.2: Input U1+</td><td>X4.2: Input U3+</td></tr> <tr><td>X2.3: Input I1-</td><td>X4.3: Input I3-</td></tr> <tr><td>X2.4: Input U1-</td><td>X4.4: Input U3-</td></tr> <tr><td>X2.5: FE²⁾</td><td>X4.5: FE²⁾</td></tr> </tbody> </table>	X1.1: Input I0+	X3.1: Input I2+	X1.2: Input U0+	X3.2: Input U2+	X1.3: Input I0-	X3.3: Input I2-	X1.4: Input U0-	X3.4: Input U2-	X1.5: FE ²⁾	X3.5: FE ²⁾			X2.1: Input I1+	X4.1: Input I3+	X2.2: Input U1+	X4.2: Input U3+	X2.3: Input I1-	X4.3: Input I3-	X2.4: Input U1-	X4.4: Input U3-	X2.5: FE ²⁾	X4.5: FE ²⁾																
X1.1: Input I0+	X3.1: Input I2+																																						
X1.2: Input U0+	X3.2: Input U2+																																						
X1.3: Input I0-	X3.3: Input I2-																																						
X1.4: Input U0-	X3.4: Input U2-																																						
X1.5: FE ²⁾	X3.5: FE ²⁾																																						
X2.1: Input I1+	X4.1: Input I3+																																						
X2.2: Input U1+	X4.2: Input U3+																																						
X2.3: Input I1-	X4.3: Input I3-																																						
X2.4: Input U1-	X4.4: Input U3-																																						
X2.5: FE ²⁾	X4.5: FE ²⁾																																						
CPX-AB-8-KL-4POL																																							
	<table> <tbody> <tr><td>X1.0: Input I0+</td><td>X5.0: Input I2+</td></tr> <tr><td>X1.1: Input I0-</td><td>X5.1: Input I2-</td></tr> <tr><td>X1.2: Input U0-</td><td>X5.2: Input U2-</td></tr> <tr><td>X1.3: FE</td><td>X5.3: FE</td></tr> <tr><td> </td><td> </td></tr> <tr><td>X2.0: n.c.</td><td>X6.0: n.c.</td></tr> <tr><td>X2.1: n.c.</td><td>X6.1: n.c.</td></tr> <tr><td>X2.2: Input U0+</td><td>X6.2: Input UI2+</td></tr> <tr><td>X2.3: FE</td><td>X6.3: FE</td></tr> <tr><td> </td><td> </td></tr> <tr><td>X3.0: Input I1+</td><td>X7.0: Input I3+</td></tr> <tr><td>X3.1: Input I1-</td><td>X7.1: Input I3-</td></tr> <tr><td>X3.2: Input U1-</td><td>X7.2: Input U3-</td></tr> <tr><td>X3.3: FE</td><td>X7.3: FE</td></tr> <tr><td> </td><td> </td></tr> <tr><td>X4.0: n.c.</td><td>X8.0: n.c.</td></tr> <tr><td>X4.1: n.c.</td><td>X8.1: n.c.</td></tr> <tr><td>X4.2: Input U1+</td><td>X8.2: Input U3+</td></tr> <tr><td>X4.3: FE</td><td>X8.3: FE</td></tr> </tbody> </table>	X1.0: Input I0+	X5.0: Input I2+	X1.1: Input I0-	X5.1: Input I2-	X1.2: Input U0-	X5.2: Input U2-	X1.3: FE	X5.3: FE			X2.0: n.c.	X6.0: n.c.	X2.1: n.c.	X6.1: n.c.	X2.2: Input U0+	X6.2: Input UI2+	X2.3: FE	X6.3: FE			X3.0: Input I1+	X7.0: Input I3+	X3.1: Input I1-	X7.1: Input I3-	X3.2: Input U1-	X7.2: Input U3-	X3.3: FE	X7.3: FE			X4.0: n.c.	X8.0: n.c.	X4.1: n.c.	X8.1: n.c.	X4.2: Input U1+	X8.2: Input U3+	X4.3: FE	X8.3: FE
X1.0: Input I0+	X5.0: Input I2+																																						
X1.1: Input I0-	X5.1: Input I2-																																						
X1.2: Input U0-	X5.2: Input U2-																																						
X1.3: FE	X5.3: FE																																						
X2.0: n.c.	X6.0: n.c.																																						
X2.1: n.c.	X6.1: n.c.																																						
X2.2: Input U0+	X6.2: Input UI2+																																						
X2.3: FE	X6.3: FE																																						
X3.0: Input I1+	X7.0: Input I3+																																						
X3.1: Input I1-	X7.1: Input I3-																																						
X3.2: Input U1-	X7.2: Input U3-																																						
X3.3: FE	X7.3: FE																																						
X4.0: n.c.	X8.0: n.c.																																						
X4.1: n.c.	X8.1: n.c.																																						
X4.2: Input U1+	X8.2: Input U3+																																						
X4.3: FE	X8.3: FE																																						
CPX-AB-4-HAR-4POL																																							
	<table> <tbody> <tr><td>X1.1: Input I0+</td><td>X3.1: Input I2+</td></tr> <tr><td>X1.2: Input U0+</td><td>X3.2: Input U2+</td></tr> <tr><td>X1.3: Input I0-</td><td>X3.3: Input I2-</td></tr> <tr><td>X1.4: Input U0-</td><td>X3.4: Input U2-</td></tr> <tr><td> </td><td> </td></tr> <tr><td>X2.1: Input I1+</td><td>X4.1: Input I3+</td></tr> <tr><td>X2.2: Input U1+</td><td>X4.2: Input U3+</td></tr> <tr><td>X2.3: Input I1-</td><td>X4.3: Input I3-</td></tr> <tr><td>X2.4: Input U1-</td><td>X4.4: Input U3-</td></tr> </tbody> </table>	X1.1: Input I0+	X3.1: Input I2+	X1.2: Input U0+	X3.2: Input U2+	X1.3: Input I0-	X3.3: Input I2-	X1.4: Input U0-	X3.4: Input U2-			X2.1: Input I1+	X4.1: Input I3+	X2.2: Input U1+	X4.2: Input U3+	X2.3: Input I1-	X4.3: Input I3-	X2.4: Input U1-	X4.4: Input U3-																				
X1.1: Input I0+	X3.1: Input I2+																																						
X1.2: Input U0+	X3.2: Input U2+																																						
X1.3: Input I0-	X3.3: Input I2-																																						
X1.4: Input U0-	X3.4: Input U2-																																						
X2.1: Input I1+	X4.1: Input I3+																																						
X2.2: Input U1+	X4.2: Input U3+																																						
X2.3: Input I1-	X4.3: Input I3-																																						
X2.4: Input U1-	X4.4: Input U3-																																						

1) Speedcon quick lock, screening additionally on metal thread

2) FE/screening additionally on metal thread

Terminal CPX

Accessories – Analogue module for temperature inputs

Ordering data				
Designation		Part No.	Type	
Input module, analogue				
	2 or 4 analogue temperature inputs	541486	CPX-4AE-T	
Connection block				
	Plastic	4x socket, M12, 5-pin	195704	CPX-AB-4-M12X2-5POL
	4x socket, M12 with quick-lock technology, 5-pin	541254	CPX-AB-4-M12X2-5POL-R	
	Spring clip terminal, 32-pin	195708	CPX-AB-8-KL-4POL	
	Metal	525636	CPX-AB-4-HAR-4POL	
	4x socket, M12, 5-pin	549367	CPX-M-AB-4-M12X2-5POL	
Plug				
	M12 plug, 5-pin	175487	SEA-M12-5GS-PG7	
	HARAX plug, 4-pin	525928	SEA-GS-HAR-4POL	
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65, IP67)	538219	AK-8KL	
	– 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug			
	Fittings kit	538220	VG-K-M9	
Screening plate				
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12	
User manual				
	User manual	German	526415	P.BE-CPX-AX-DE
		English	526416	P.BE-CPX-AX-EN
		Spanish	526417	P.BE-CPX-AX-ES
		French	526418	P.BE-CPX-AX-FR
		Italian	526419	P.BE-CPX-AX-IT

Terminal CPX

Technical data – Analogue module for thermocoupler

FESTO

Function

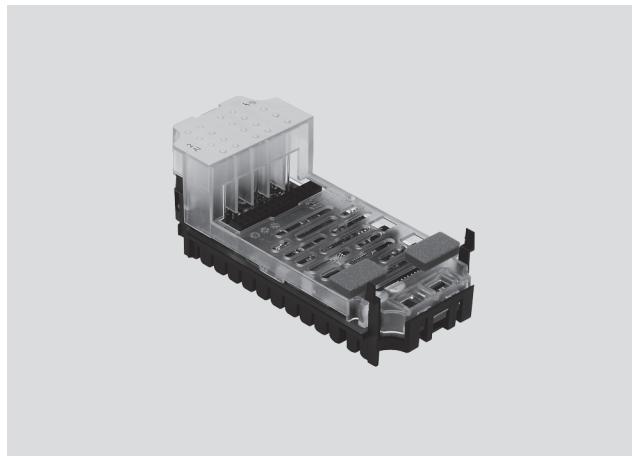
The CPX-4AE-TC analogue input module with four channels for temperature measurement enables up to four thermocoupler sensors to be connected.

The channels feature wire break and short circuit detection.

If no cold junction compensation sensor is being used, an internal theoretical value of 25 °C can be used (accuracy is impaired).

Applications

- Supports connection blocks with M12 and terminal connection
- Temperature module features can be parameterised
- 2-wire connection
- 2-wire connection for a PT1000 sensor for cold junction compensation
- The temperature module is provided with voltage supply for the electronics and the sensors via the interlinking block
- Temperature module protection and diagnostics through integrated electronic fuse protection



General technical data

Type	CPX-4AE-TC	
No. of analogue inputs	4	
Fuse protection (short circuit)	Internal electronic fuse for each channel	
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Sensor type (parameterisable for each channel by means of software)	<ul style="list-style-type: none">• Type B +400 ... +1,820 °C, 8 µV/°C• Type E -270 ... +900 °C, 60 µV/°C• Type J -200 ... +1,200 °C, 51 µV/°C• Type K -200 ... +1,370 °C, 40 µV/°C• Type N -200 ... +1,300 °C, 38 µV/°C• Type R 0 ... +1,760 °C, 12 µV/°C• Type S 0 ... +1,760 °C, 11 µV/°C• Type T -200 ... +400 °C, 40 µV/°C	
Sensor connection technology	2-wire technology	
Operating error limit relative to ambient temperature	[%]	Max. ±0.6
Basic error limit (at 25 °C)	[%]	Max. ±0.4
Repetition accuracy (at 25 °C)	[%]	±0.05
Max. line resistance per wire	[Ω]	10
Max. residual current per module	[mA]	30
Max. permissible input voltage	[V]	±30
Internal cycle time (module)	[ms]	250

Terminal CPX

Technical data – Analogue module for thermocoupler

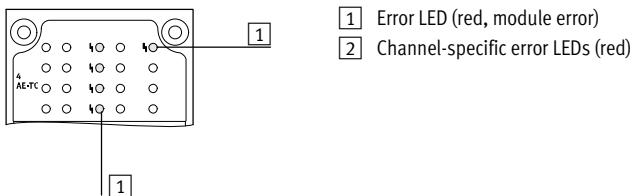
FESTO

General technical data

Data format	<ul style="list-style-type: none"> • 15 bit + prefix, complement of two • Binary notation in tenths of a degree 	
Cable length	[m]	Max. 50 (screened)
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes
LED displays	Group diagnostics	1
	Channel diagnostics	4
Diagnostics	<ul style="list-style-type: none"> • Parameterisation error • Wire break per channel • Limit value violation per channel 	
Parameterisation	<ul style="list-style-type: none"> • Wire break monitoring per channel • Unit of measurement • Cold junction compensation • Sensor type per channel • Limit value monitoring per channel • Measured value smoothing 	
Protection class to EN 60529	Depending on connection block	
Temperature range	Operation [°C]	-5 ... +50
	Storage/transport [°C]	-20 ... +70
Materials	Reinforced PA, PC	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50
Weight	[g]	38

Connection and display components

CPX-4AE-TC



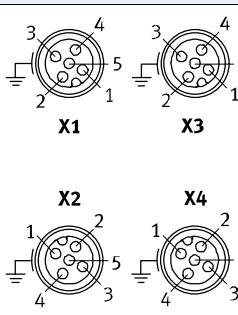
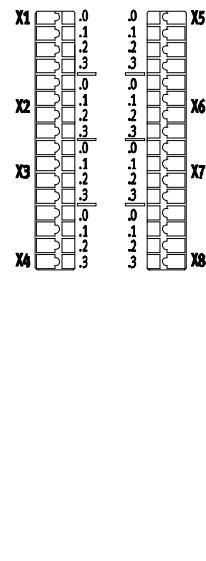
Connection block/analogue module combinations

Connection blocks	Part No.	Temperature module
		CPX-4AE-TC
CPX-AB-4-M12X2-5POL	195704	■
CPX-AB-4-M12X2-5POL-R	541254	■
CPX-AB-8-KL-4POL	195708	■
CPX-M-AB-4-M12x2-5POL	549367	■

Terminal CPX

FESTO

Technical data – Analogue module for thermocoupler

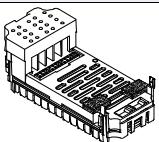
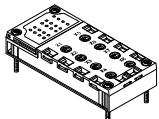
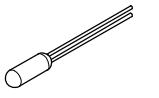
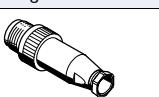
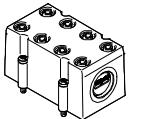
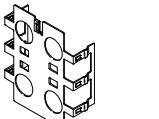
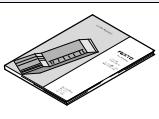
Pin allocation		
Connection block inputs	CPX-4AE-TC	
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R ¹⁾ and CPX-M-AB-4-M12X2-5POL		
	X1.1: Cold junction compensation 0+ X1.2: Input signal U0+ X1.3: Cold junction compensation 0- X1.4: Input signal U0- X1.5: FE ²⁾	X3.1: Cold junction compensation 2+ X3.2: Input signal U2+ X3.3: Cold junction compensation 2- X3.4: Input signal U2- X3.5: FE ²⁾
	X2.1: Cold junction compensation 1+ X2.2: Input signal U1+ X2.3: Cold junction compensation 1- X2.4: Input signal U1- X2.5: FE ²⁾	X4.1: Cold junction compensation 3+ X4.2: Input signal U3+ X4.3: Cold junction compensation 3- X4.4: Input signal U3- X4.5: FE ²⁾
CPX-AB-8-KL-4POL		
	X1.0: Cold junction compensation 0+ X1.1: Cold junction compensation 0- X1.2: Input signal U0- X1.3: FE	X5.0: Cold junction compensation 2+ X5.1: Cold junction compensation 2- X5.2: Input signal U2- X5.3: FE
	X2.0: n.c. X2.1: n.c. X2.2: Input signal U0+ X2.3: FE	X6.0: n.c. X6.1: n.c. X6.2: Input signal U2+ X6.3: FE
	X3.0: Cold junction compensation 1+ X3.1: Cold junction compensation 1- X3.2: Input signal U1- X3.3: FE	X7.0: Cold junction compensation 3+ X7.1: Cold junction compensation 3- X7.2: Input signal U3- X7.3: FE
	X4.0: n.c. X4.1: n.c. X4.2: Input signal U1+ X4.3: FE	X8.0: n.c. X8.1: n.c. X8.2: Input signal U3+ X8.3: FE

1) Speedcon quick lock, screening additionally on metal thread

2) FE/screening additionally on metal thread

Terminal CPX

Accessories – Analogue module for thermocoupler

Ordering data		Part No.	Type
Designation			
Input module, analogue			
	4 analogue temperature inputs, with 2-wire connection for a PT1000 sensor for cold junction compensation	553594	CPX-4AE-TC
Connection block			
	Plastic	4x socket, M12, 5-pin	195704 CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin	541254 CPX-AB-4-M12X2-5POL-R
		Spring clip terminal, 32-pin	195708 CPX-AB-8-KL-4POL
	Metal	4x socket, M12, 5-pin	549367 CPX-M-AB-4-M12X2-5POL
Cold junction compensation			
	PT1000 temperature sensor for cold junction compensation	553596	CPX-W-PT1000
Plug			
	M12 plug, 5-pin	175487	SEA-M12-5GS-PG7
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67)	538219	AK-8KL
	- 8 cable through-feeds M9 - 1 cable through-feed for multi-pin plug	538220	VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
User manual			
	User manual	German	526415 P.BE-CPX-AX-DE
		English	526416 P.BE-CPX-AX-EN
		Spanish	526417 P.BE-CPX-AX-ES
		French	526418 P.BE-CPX-AX-FR
		Italian	526419 P.BE-CPX-AX-IT

Terminal CPX

FESTO

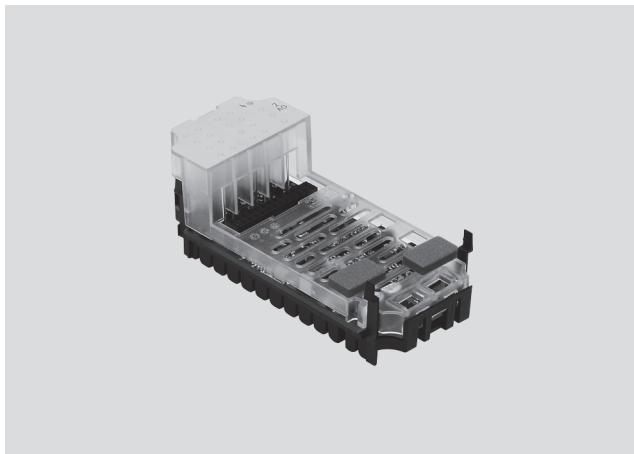
Technical data – Analogue module for outputs

Function

Analogue modules control devices with a standard analogue interface such as proportional valves, etc. The analogue module supports various connection concepts with different numbers of sockets or terminals as appropriate to the connection block selected.

Applications

- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without galvanic isolation possible
- The analogue module receives the voltage supply for the electronics and the actuators from the interlinking block
- Analogue module protection and diagnostics through integrated electronic fuse protection



General technical data

Type	CPX-2AA-U-I		
	Voltage output	Current output	
No. of analogue outputs	2		
Max. actuator supply per module	[A]	2.8	
Fuse protection		Internal electronic fuse for actuator supply	
Current consumption from 24 V sensor supply (at full load)	[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)	[A]	4 ... 10	
Supply voltage of actuators	[V DC]	24 ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)		0 ... 10 V DC	0 ... 20 mA 4 ... 20 mA
Resolution	[bit]	12	
No. of units		4,096	
Absolute accuracy	[%]	±0.6	
Linearity errors (no software scaling)	[%]	±0.1	
Repetition accuracy (at 25 °C)	[%]	0.05	
Encoder selection	Load resistance for ohmic load	[kΩ]	Min. 1
	Load resistance for capacitive load	[μF]	Max. 1
	Load resistance for inductive load	[mH]	–
	Short circuit protection analogue output		Yes
	Short circuit current analogue output	[mA]	Approx. 20
	Open circuit voltage	[V DC]	–
	Destruction limit against externally applied voltage	[V DC]	15
	Actuator connection		2 wires
Cycle time (module)	[ms]	≤ 4	

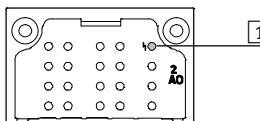
Terminal CPX

Technical data – Analogue module for outputs

General technical data		CPX-2AA-U-I	
Type		Voltage output	Current output
Response time	For ohmic load [ms]	0.1	0.1
	For capacitive load [ms]	0.7	–
	For inductive load [ms]	–	0.5
Data format		15 bit + prefix, linear scaling 12 bit right-justified 12 bit left-justified, S7 compatible 12 bit left-justified, S5 compatible	
Cable length	[m]	Max. 30 (screened)	
LED displays	Group diagnostics	1	
	Channel diagnostics	Yes, by means of flashing frequency of group diagnostics	
Diagnostics		<ul style="list-style-type: none"> • Short circuit/overload, actuator supply • Parameterisation error • Value falling below nominal range/full-scale value • Value exceeding nominal range/full-scale value • Wire break 	
Parameterisation		<ul style="list-style-type: none"> • Short circuit monitoring, actuator supply • Short circuit monitoring, analogue output • Behaviour after short circuit, actuator supply • Data format • Lower limit value/full-scale value • Upper limit value/full-scale value • Monitoring of value falling below nominal range/full-scale value • Monitoring of value exceeding nominal range/full-scale value • Wire break monitoring • Signal range 	
Protection class to EN 60529		Depending on connection block	
Temperature range	Operation [°C]	–5 ... +50	
	Storage/transport [°C]	–20 ... +70	
Materials		Reinforced PA, PC	
Grid dimension	[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 50	
Weight	[g]	38	

Connection and display components

CPX-2AA-U-I



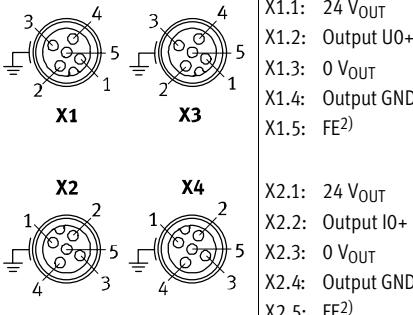
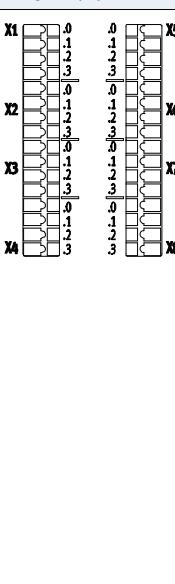
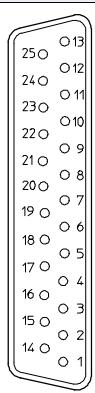
1 Error LED (red, module error)

Connection block/analogue module combinations		
Connection blocks	Part No.	Analogue module
CPX-AB-4-M12X2-5POL	195704	■
CPX-AB-4-M12X2-5POL-R	541254	■
CPX-AB-8-KL-4POL	195708	■
CPX-AB-1-SUB-BU-25POL	525676	■
CPX-M-AB-4-M12X2-5POL	549367	■

Terminal CPX

FESTO

Technical data – Analogue module for outputs

Pin allocation																																																																	
Connection block outputs	CPX-2AA-U-I																																																																
CPX-AB-4-M12X2-5POL, CPX-AB-4-M12X2-5POL-R ¹⁾ and CPX-M-AB-4-M12X2-5POL																																																																	
	<table> <tbody> <tr><td>X1.1:</td><td>24 V_{OUT}</td><td>X3.1:</td><td>24 V_{OUT}</td></tr> <tr><td>X1.2:</td><td>Output U0+</td><td>X3.2:</td><td>Output U1+</td></tr> <tr><td>X1.3:</td><td>0 V_{OUT}</td><td>X3.3:</td><td>0 V_{OUT}</td></tr> <tr><td>X1.4:</td><td>Output GND</td><td>X3.4:</td><td>Output GND</td></tr> <tr><td>X1.5:</td><td>FE²⁾</td><td>X3.5:</td><td>FE²⁾</td></tr> <tr><td>X2.1:</td><td>24 V_{OUT}</td><td>X4.1:</td><td>24 V_{OUT}</td></tr> <tr><td>X2.2:</td><td>Output I0+</td><td>X4.2:</td><td>Output I1+</td></tr> <tr><td>X2.3:</td><td>0 V_{OUT}</td><td>X4.3:</td><td>0 V_{OUT}</td></tr> <tr><td>X2.4:</td><td>Output GND</td><td>X4.4:</td><td>Output GND</td></tr> <tr><td>X2.5:</td><td>FE²⁾</td><td>X4.5:</td><td>FE²⁾</td></tr> </tbody> </table>	X1.1:	24 V _{OUT}	X3.1:	24 V _{OUT}	X1.2:	Output U0+	X3.2:	Output U1+	X1.3:	0 V _{OUT}	X3.3:	0 V _{OUT}	X1.4:	Output GND	X3.4:	Output GND	X1.5:	FE ²⁾	X3.5:	FE ²⁾	X2.1:	24 V _{OUT}	X4.1:	24 V _{OUT}	X2.2:	Output I0+	X4.2:	Output I1+	X2.3:	0 V _{OUT}	X4.3:	0 V _{OUT}	X2.4:	Output GND	X4.4:	Output GND	X2.5:	FE ²⁾	X4.5:	FE ²⁾																								
X1.1:	24 V _{OUT}	X3.1:	24 V _{OUT}																																																														
X1.2:	Output U0+	X3.2:	Output U1+																																																														
X1.3:	0 V _{OUT}	X3.3:	0 V _{OUT}																																																														
X1.4:	Output GND	X3.4:	Output GND																																																														
X1.5:	FE ²⁾	X3.5:	FE ²⁾																																																														
X2.1:	24 V _{OUT}	X4.1:	24 V _{OUT}																																																														
X2.2:	Output I0+	X4.2:	Output I1+																																																														
X2.3:	0 V _{OUT}	X4.3:	0 V _{OUT}																																																														
X2.4:	Output GND	X4.4:	Output GND																																																														
X2.5:	FE ²⁾	X4.5:	FE ²⁾																																																														
CPX-AB-8-KL-4POL																																																																	
	<table> <tbody> <tr><td>X1.0:</td><td>24 V_{OUT}</td><td>X5.0:</td><td>24 V_{OUT}</td></tr> <tr><td>X1.1:</td><td>0 V_{OUT}</td><td>X5.1:</td><td>0 V_{OUT}</td></tr> <tr><td>X1.2:</td><td>Output GND</td><td>X5.2:</td><td>Output GND</td></tr> <tr><td>X1.3:</td><td>FE</td><td>X5.3:</td><td>FE</td></tr> <tr><td>X2.0:</td><td>n.c.</td><td>X6.0:</td><td>n.c.</td></tr> <tr><td>X2.1:</td><td>n.c.</td><td>X6.1:</td><td>n.c.</td></tr> <tr><td>X2.2:</td><td>Output U0+</td><td>X6.2:</td><td>Output U1+</td></tr> <tr><td>X2.3:</td><td>FE</td><td>X6.3:</td><td>FE</td></tr> <tr><td>X3.0:</td><td>24 V_{OUT}</td><td>X7.0:</td><td>24 V_{OUT}</td></tr> <tr><td>X3.1:</td><td>0 V_{OUT}</td><td>X7.1:</td><td>0 V_{OUT}</td></tr> <tr><td>X3.2:</td><td>Output GDN</td><td>X7.2:</td><td>Output GND</td></tr> <tr><td>X3.3:</td><td>FE</td><td>X7.3:</td><td>FE</td></tr> <tr><td>X4.0:</td><td>n.c.</td><td>X8.0:</td><td>n.c.</td></tr> <tr><td>X4.1:</td><td>n.c.</td><td>X8.1:</td><td>n.c.</td></tr> <tr><td>X4.2:</td><td>Output I0+</td><td>X8.2:</td><td>Output I1+</td></tr> <tr><td>X4.3:</td><td>FE</td><td>X8.3:</td><td>FE</td></tr> </tbody> </table>	X1.0:	24 V _{OUT}	X5.0:	24 V _{OUT}	X1.1:	0 V _{OUT}	X5.1:	0 V _{OUT}	X1.2:	Output GND	X5.2:	Output GND	X1.3:	FE	X5.3:	FE	X2.0:	n.c.	X6.0:	n.c.	X2.1:	n.c.	X6.1:	n.c.	X2.2:	Output U0+	X6.2:	Output U1+	X2.3:	FE	X6.3:	FE	X3.0:	24 V _{OUT}	X7.0:	24 V _{OUT}	X3.1:	0 V _{OUT}	X7.1:	0 V _{OUT}	X3.2:	Output GDN	X7.2:	Output GND	X3.3:	FE	X7.3:	FE	X4.0:	n.c.	X8.0:	n.c.	X4.1:	n.c.	X8.1:	n.c.	X4.2:	Output I0+	X8.2:	Output I1+	X4.3:	FE	X8.3:	FE
X1.0:	24 V _{OUT}	X5.0:	24 V _{OUT}																																																														
X1.1:	0 V _{OUT}	X5.1:	0 V _{OUT}																																																														
X1.2:	Output GND	X5.2:	Output GND																																																														
X1.3:	FE	X5.3:	FE																																																														
X2.0:	n.c.	X6.0:	n.c.																																																														
X2.1:	n.c.	X6.1:	n.c.																																																														
X2.2:	Output U0+	X6.2:	Output U1+																																																														
X2.3:	FE	X6.3:	FE																																																														
X3.0:	24 V _{OUT}	X7.0:	24 V _{OUT}																																																														
X3.1:	0 V _{OUT}	X7.1:	0 V _{OUT}																																																														
X3.2:	Output GDN	X7.2:	Output GND																																																														
X3.3:	FE	X7.3:	FE																																																														
X4.0:	n.c.	X8.0:	n.c.																																																														
X4.1:	n.c.	X8.1:	n.c.																																																														
X4.2:	Output I0+	X8.2:	Output I1+																																																														
X4.3:	FE	X8.3:	FE																																																														
CPX-AB-1-SUB-BU-25POL																																																																	
	<table> <tbody> <tr><td>1:</td><td>Output GND</td><td>14:</td><td>Output GND</td></tr> <tr><td>2:</td><td>Output U0+</td><td>15:</td><td>Output U1+</td></tr> <tr><td>3:</td><td>Output GND</td><td>16:</td><td>Output GND</td></tr> <tr><td>4:</td><td>Output I0+</td><td>17:</td><td>Output I1+</td></tr> <tr><td>5:</td><td>n.c.</td><td>18:</td><td>24 V_{OUT}</td></tr> <tr><td>6:</td><td>n.c.</td><td>19:</td><td>n.c.</td></tr> <tr><td>7:</td><td>n.c.</td><td>20:</td><td>24 V_{OUT}</td></tr> <tr><td>8:</td><td>n.c.</td><td>21:</td><td>n.c.</td></tr> <tr><td>9:</td><td>24 V_{OUT}</td><td>22:</td><td>0 V_{OUT}</td></tr> <tr><td>10:</td><td>24 V_{OUT}</td><td>23:</td><td>0 V_{OUT}</td></tr> <tr><td>11:</td><td>0 V_{OUT}</td><td>24:</td><td>0 V_{OUT}</td></tr> <tr><td>12:</td><td>0 V_{OUT}</td><td>25:</td><td>FE</td></tr> <tr><td>13:</td><td>Screening³⁾</td><td colspan="2">Housing: FE</td></tr> </tbody> </table>	1:	Output GND	14:	Output GND	2:	Output U0+	15:	Output U1+	3:	Output GND	16:	Output GND	4:	Output I0+	17:	Output I1+	5:	n.c.	18:	24 V _{OUT}	6:	n.c.	19:	n.c.	7:	n.c.	20:	24 V _{OUT}	8:	n.c.	21:	n.c.	9:	24 V _{OUT}	22:	0 V _{OUT}	10:	24 V _{OUT}	23:	0 V _{OUT}	11:	0 V _{OUT}	24:	0 V _{OUT}	12:	0 V _{OUT}	25:	FE	13:	Screening ³⁾	Housing: FE													
1:	Output GND	14:	Output GND																																																														
2:	Output U0+	15:	Output U1+																																																														
3:	Output GND	16:	Output GND																																																														
4:	Output I0+	17:	Output I1+																																																														
5:	n.c.	18:	24 V _{OUT}																																																														
6:	n.c.	19:	n.c.																																																														
7:	n.c.	20:	24 V _{OUT}																																																														
8:	n.c.	21:	n.c.																																																														
9:	24 V _{OUT}	22:	0 V _{OUT}																																																														
10:	24 V _{OUT}	23:	0 V _{OUT}																																																														
11:	0 V _{OUT}	24:	0 V _{OUT}																																																														
12:	0 V _{OUT}	25:	FE																																																														
13:	Screening ³⁾	Housing: FE																																																															

1) Speedcon quick lock, screening additionally on metal thread

2) FE/screening additionally on metal thread

3) Connect screening to functional earth FE

Terminal CPX

Accessories – Analogue module for outputs

Ordering data			
Designation		Part No.	Type
Output module, analogue			
	2 analogue current or voltage outputs	526170	CPX-2AA-U-I
Connection block			
	Plastic	4x socket, M12, 5-pin	195704 CPX-AB-4-M12X2-5POL
		4x socket, M12 with quick-lock technology, 5-pin	541254 CPX-AB-4-M12X2-5POL-R
		Spring clip terminal, 32-pin	195708 CPX-AB-8-KL-4POL
		1x Sub-D socket, 25-pin	525676 CPX-AB-1-SUB-BU-25POL
	Metal	549367	CPX-M-AB-4-M12X2-5POL
Plug			
	M12 plug, 5-pin	175487	SEA-M12-5GS-PG7
	Sub-D plug, 25-pin	527522	SD-SUB-D-ST25
Connecting cable			
	Modular system for connecting cables	–	NEBU-... ➔ Internet: nebu
Cover			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67)	538219	AK-8KL
	– 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		
	Fittings kit	538220	VG-K-M9
Screening plate			
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
User manual			
	User manual	German	526415 P.BE-CPX-AX-DE
		English	526416 P.BE-CPX-AX-EN
		Spanish	526417 P.BE-CPX-AX-ES
		French	526418 P.BE-CPX-AX-FR
		Italian	526419 P.BE-CPX-AX-IT

Terminal CPX

Technical data – PROFIsafe shut-off module

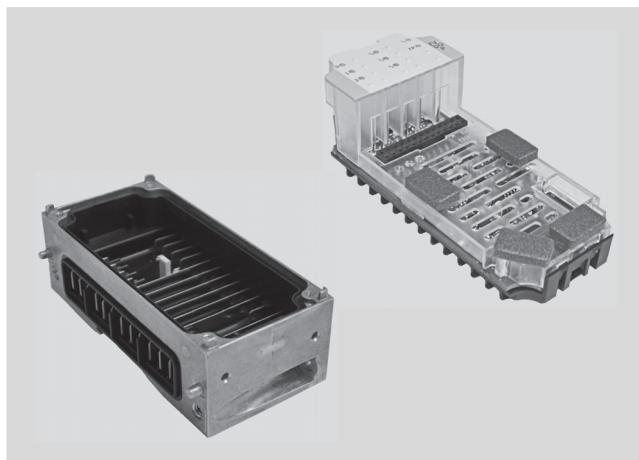
FESTO

Function

The PROFIsafe shut-off module interrupts the contact rails of the interlinking block for valves and outputs. The supply voltage for valves can be switched by the module within the CPX terminal and via a connection block to two consuming devices. Actuation takes place via the fieldbus node (PROFINET) of the CPX terminal.

Scope of application

- Output module for 24 V DC supply voltage
- Shut-off module for supply voltage for valves
- Can only be used with PROFINET or PROFIBUS bus node
- The shut-off module is supplied with voltage for the electronics and the outputs by the interlinking block
- The outputs are supplied from the power supply for valves (V_{Valves})



General technical data

Type	CPX-FVDA-P2	
Number of outputs	2	
Note on outputs	1 internal channel for shutting off the supply voltage for valves 2 external outputs	
Max. power supply	Per module	[A] 5
	Per channel	[A] 1.5
Fuse protection (short circuit)	Internal electronic fuse for each channel	
Current consumption of module	[mA]	Typ. 65 (power supply for valves)
	[mA]	Typ. 25 (power supply for electronics)
Operating voltage	Nominal value	[V DC] 24
	Permissible range	[V DC] 20.4 ... 28.8
Voltage drop per channel	[V]	0.6
Residual ripple	[Vss]	2 within voltage range
Load capacity to FE	[nF]	400
Max. response time to shut-off command	[ms]	23
Electrical isolation	Channel – channel	No
	Channel – internal bus	Yes, using an intermediate supply
Switching logic	Outputs	P-M switching
Safety integrity level	Safe shut off, SIL 3	
Performance level	Safe shut off/category 3, performance level e	
Failure rate per hour (PFH)	1.0×10^{-9}	
Certificate issuing authority	01/205/50294/13	
LED displays	Group diagnostics	1
	Channel diagnostics	3
	Channel status	3
	Failsafe protocol active	1
Diagnostics	<ul style="list-style-type: none"> • Short circuit/overload per channel • Undervoltage of valves • Cross circuit • Wire break per channel 	
Parameterisation	<ul style="list-style-type: none"> • Wire break monitoring per channel • Diagnostic behaviour 	
Protection class to EN 60529	Depending on connection block	
Materials	PA reinforced, PC	
Note on materials	RoHS-compliant	
Grid dimension	[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H	[mm]	50 x 107 x 55

Terminal CPX

Technical data – PROFIsafe shut-off module

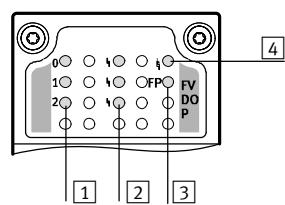
FESTO

Operating and environmental conditions

Ambient temperature	[°C]	-5 ... +50
Storage temperature	[°C]	-20 ... +70
CE mark (see declaration of conformity)	To EU Machinery Directive	
Certification	c UL us - Recognized (OL)	

Connection and display components

CPX-FVDA-P2



- [1] Status LEDs (yellow):
0: Supply voltage for valves
1: X1
2: X2
- [2] Channel-specific error LEDs (red)
- [3] Fail-safe protocol active (green)
- [4] Error LED (red, module error)

Combinations of bus nodes/control blocks and PROFIsafe shut-off module

Bus node/control block	Part No.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-FB13	195740	■
CPX-FB33	548755	■
CPX-M-FB34	548751	■
CPX-M-FB35	548749	■



Note

The PROFIsafe shut-off module CPX-FVDA-P2 can only be interfaced as of software release 21 or release 30 (CPX-FB13).

Terminal CPX

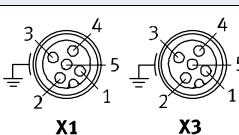
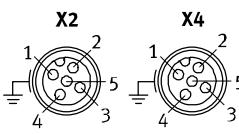
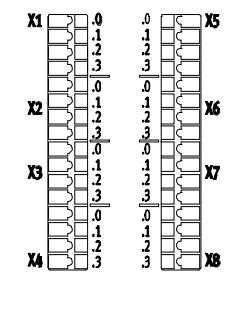
FESTO

Technical data – PROFIsafe shut-off module

Combinations of connection blocks and PROFIsafe shut-off module

Connection blocks	Part No.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-M-AB-4-M12X2-5POL	549367	■
CPX-AB-8-KL-4POL	195708	■

Pin allocation

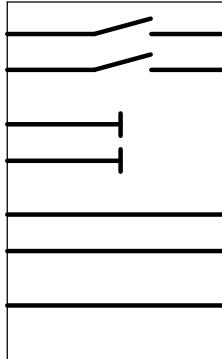
Connection block outputs	CPX-FVDA-P2
CPX-M-AB-4-M12X2-5POL	
	X1.1: 0 V _{OUT} 1 (cannot be shut off) X1.2: 24 V _{OUT} 1 (cannot be shut off) X1.3: 0 V _{OUT} 1 (can be shut off via fieldbus) X1.4: 24 V _{OUT} 1 (can be shut off via fieldbus) X1.5: FE (earth)
	X2.1: 0 V _{OUT} 2 (cannot be shut off) X2.2: 24 V _{OUT} 2 (cannot be shut off) X2.3: 0 V _{OUT} 2 (can be shut off via fieldbus) X2.4: 24 V _{OUT} 2 (can be shut off via fieldbus) X2.5: FE (earth)
CPX-AB-8-KL-4POL	
	X1.0: 0 V _{OUT} 1 (cannot be shut off) X1.1: 0 V _{OUT} 1 (can be shut off via fieldbus) X1.2: 24 V _{OUT} 1 (can be shut off via fieldbus) X1.3: FE (earth)
	X5.0: n.c. X5.1: n.c. X5.2: n.c. X5.3: n.c.
	X6.0: n.c. X6.1: n.c. X6.2: n.c. X6.3: n.c.
	X7.0: n.c. X7.1: n.c. X7.2: n.c. X7.3: n.c.
	X8.0: n.c. X8.1: n.c. X8.2: n.c. X8.3: n.c.

Terminal CPX

Technical data – PROFIsafe shut-off module

Combinations of interlinking blocks and PROFIsafe shut-off module		
Interlinking blocks	Part No.	PROFIsafe shut-off module
		CPX-FVDA-P2
CPX-GE-EV-S	195746	–
CPX-GE-EV-S-VL	8022170	–
CPX-GE-EV-S-7/8-4POL	541248	–
CPX-GE-EV-S-7/8-5POL	541244	–
CPX-GE-EV-S-7/8-5POL-VL	8022172	–
CPX-M-GE-EV-S-7/8-CIP-4P	568956	–
CPX-M-GE-EV-S-7/8-5POL	550208	–
CPX-M-GE-EV-S-7/8-5POL-VL	8022165	–
CPX-M-GE-EV-S-PP-5POL	563057	–
CPX-GE-EV	195742	–
CPX-M-GE-EV	550206	–
CPX-M-GE-EV-FVO	567806	■
CPX-GE-EV-Z	195744	–
CPX-GE-EV-Z-VL	8022166	–
CPX-GE-EV-Z-7/8-4POL	541250	–
CPX-GE-EV-Z-7/8-5POL	541246	–
CPX-GE-EV-Z-7/8-5POL-VL	8022173	–
CPX-M-GE-EV-Z-7/8-5POL	550210	–
CPX-M-GE-EV-Z-7/8-5POL-VL	8022158	–
CPX-M-GE-EV-Z-PP-5POL	563058	–
CPX-GE-EV-V	533577	–
CPX-GE-EV-V-VL	8022171	–
CPX-GE-EV-V-7/8-4POL	541252	–

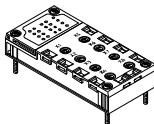
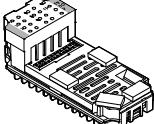
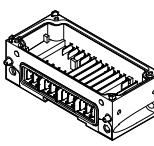
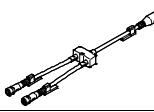
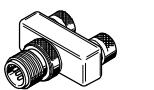
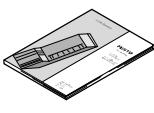
General technical data		
Type	CPX-M-GE-EV-FVO	
Nominal operating voltage	[V DC]	24
Acceptable current load (per contact/contact rail)	[A]	16
Protection class to EN 60529		Depending on connection block
Ambient temperature	[°C]	-5 ... +50
Material declaration		RoHS-compliant
Note on materials		Die-cast aluminium
Type of mounting		Angled fitting
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35
Product weight	[g]	170

Pin allocation		Pin	Allocation
Circuitry			
		–	–
	0V Valves	–	–
	24V Valves	–	–
	0V Output	–	–
	24V Output	–	–
	0V El./Sen.	–	–
	24V El./Sen.	–	–
	FE		

Terminal CPX

FESTO

Accessories – PROFlsafe shut-off module

Ordering data		Description	Part No.	Type
PROFlsafe shut-off module				
	Metal connection block	4x socket, M12, 5-pin	549367	CPX-M-AB-4-M12X2-5POL
	Plastic connection block	Spring-loaded terminal, 32-pin	195708	CPX-AB-8-KL-4POL
	Electronics module (can only be used with CPX-M-GE-EV-FVO)	PROFINET, PROFIBUS	1971599	CPX-FVDA-P2
	Metal interlinking block (only for CPX-FVDA-P2)		567806	CPX-M-GE-EV-FVO
Distributor				
	Modular system for sensor/actuator distributor		-	NEDY-... ➔ Internet: nedy
	Plug M12, 4-pin	2x socket M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4
Plug				
	Plug	M12, PG7	18666	SEA-GS-7
		M12, PG7, 4-pin for cable Ø 2.5 mm	192008	SEA-4GS-7-2,5
		M12, PG9	18778	SEA-GS-9
		M12 for 2 cables	18779	SEA-GS-11-DUO
		M12 for 2 cables, 5-pin	192010	SEA-5GS-11-DUO
		M12, 5-pin	175487	SEA-M12-5GS-PG7
Connecting cable				
	Modular system for connecting cables		-	NEBU-... ➔ Internet: nebu
Manual				
	Manual for PROFlsafe shut-off module	German	8022606	P.BE-CPX-FVDA-P2-DE
		English	8022607	P.BE-CPX-FVDA-P2-EN
		Spanish	8022608	P.BE-CPX-FVDA-P2-ES
		French	8022609	P.BE-CPX-FVDA-P2-FR
		Italian	8022610	P.BE-CPX-FVDA-P2-IT
		Chinese	8022611	P.BE-CPX-FVDA-P2-ZH

Terminal CPX

Technical data – End plate with system power supply

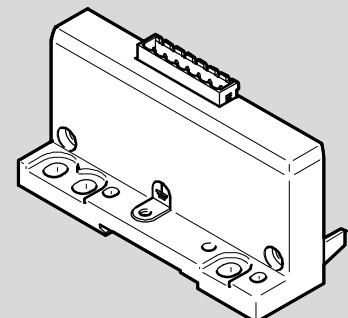
Function

End plates form the outer edge of the CPX terminal.
The earth connection and mounting holes for wall or H-rail mounting are located on the left end plate.

The end plate with system power supply has contact rails from which the other CPX components on the interlinking modules are supplied with power.

Application

- 24 V DC supply voltage for the electronics of the CPX terminal
- 24 V DC supply voltage for inputs
- 24 V DC supply voltage for valves
- 24 V DC supply voltage for outputs



General technical data

Electrical connection	Plug, 7-pin
Type of mounting	Tie rod
Power supply	System power supply
Maximum power supply [A]	12
Product weight [g]	145

Materials

Housing	Die-cast aluminium, painted
Note on materials	RoHS-compliant

Operating and environmental conditions

Approval certificate	cULus Recognized (OL)
----------------------	-----------------------

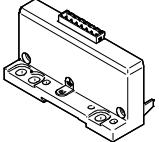
Pin allocation

Circuitry	Pin	Allocation
Plug, 7-pin		
0V 1	1	0 V power supply for valves
24V 2	2	24 V DC load voltage supply for valves
0V 3	3	0 V power supply for outputs
24V 4	4	24 V DC load voltage supply for outputs
0V 5	5	0 V power supply for electronics and sensors
24V 6	6	24 V DC power supply for electronics and sensors
FE 7	7	FE

Terminal CPX

FESTO

Accessories – End plate with system power supply

Ordering data		Part No.	Type
End plate with system power supply	 End plate for CPX terminal in plastic design	576315	CPX-EPL-EV-S
Terminal strip	 Plug, 7-pin, straight	Spring-loaded terminal	576319 NECU-L3G7-C1

Terminal CPX

Technical data – End plate with extension

Function

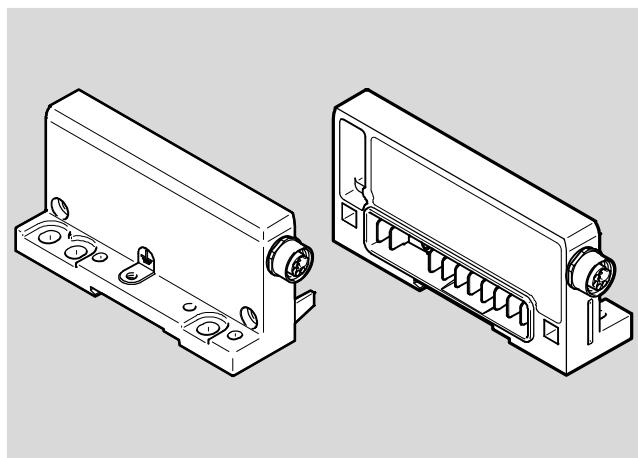
End plates form the outer edge of the CPX terminal.

The earth connection and mounting holes for wall or H-rail mounting are located on the left end plates.

The end plates with extension enable the CPX terminal to be separated into two interconnected terminals. Control is provided via a common bus node or control block.

Application

- Separation of long CPX terminals into two shorter units
- Adaptation for installation in a control cabinet



General technical data

Type	CPX-EP...	CPX-M-EP...
Type of mounting	Tie rod	Angled fitting
Maximum power supply [A]	6	6

Materials

Type	CPX-EP...	CPX-M-EP...
Housing	Die-cast aluminium, painted	Die-cast aluminium
Note on materials	RoHS-compliant	RoHS-compliant

Operating and environmental conditions

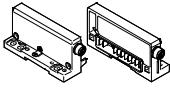
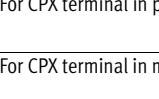
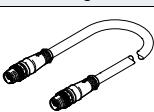
Approval certificate	cULus Recognized (OL)
----------------------	-----------------------

Terminal CPX

FESTO

Technical data – End plate with extension

Pin allocation – End plate with extension				
Circuitry	Pin	Allocation	Pin	Circuitry
Right-hand end plate (first row)	Round plug, 8-pin			Left-hand end plate (second row)
0V _{Valves}	M12			0V _{Valves}
24V _{Valves}	1	0 V DC supply voltage for electronics and sensors	1	24V _{Valves}
0V _{Output}	2	0 V DC load voltage supply for valves	2	0V _{Output}
24V _{Output}	3	24 V DC load voltage supply for valves	3	24V _{Output}
0V _{El./Sen.}	4	24 V DC supply voltage for electronics and sensors	4	0V _{El./Sen.}
24V _{El./Sen.}	5	Bus signal	5	24V _{El./Sen.}
FE	6	Bus signal	6	FE
	7	Bus signal	7	
	8	Bus signal	8	
Housing	FE		Housing	
	2		3	
	0V	24V	0V	24V
	M12	4	1	3
	24V	0V	24V	0V

Ordering data				
		Weight [g]	Part No.	Type
End plate with extension				
	For CPX terminal in plastic design	First row, right-hand end plate	190	576313 CPX-EPR-EV-X
		Second row, left-hand end plate	175	576314 CPX-EPL-EV-X
	For CPX terminal in metal design	First row, right-hand end plate	190	576316 CPX-M-EPR-EV-X
		Second row, left-hand end plate	175	576317 CPX-M-EPL-EV-X
Connecting cable				
	8-pin	0.25 m	564189 NEBC-F12G8-KH-0.25-N-S-F12G8	
		0.5 m	564190 NEBC-F12G8-KH-0.5-N-S-F12G8	
		1 m	564191 NEBC-F12G8-KH-1-N-S-F12G8	
		1.5 m	564192 NEBC-F12G8-KH-1.5-N-S-F12G8	
		2 m	576015 NEBC-F12G8-KH-2-N-S-F12G8	
		3 m	576636 NEBC-F12G8-KH-3-N-S-F12G8	

Terminal CPX

Technical data – Interlinking block with system supply

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with current.

Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- 24 V DC supply voltage for electronics of the CPX terminal
- 24 V DC supply voltage for inputs
- 24 V DC supply voltage for valves
- 24 V DC supply voltage for outputs



General technical data

Nominal operating voltage	[V DC]	24
Protection class to EN 60529		Depending on connection block
Ambient temperature	[°C]	-5 ... +50
Note on materials		RoHS-compliant
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35

Technical data – Plastic interlinking blocks

Type	CPX-GE-EV-S				
		-VL	-7/8-4POL	-7/8-5POL	-7/8-5POL-VL
Electrical connection	M18	M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Current supply	Sensors and electronics [A]	Max. 16	Max. 8	Max. 10	Max. 8
	Valves and outputs [A]	Max. 16	Max. 8	Max. 10	Max. 8
Materials	PA, reinforced				
Product weight	[g]	125			

Technical data – Metal interlinking blocks

Type	CPX-M-GE-EV-S			
	-7/8-CIP-4P	-7/8-5POL	-7/8-5POL-VL	-PP-5POL
Electrical connection	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin	AIDA push-pull, 5-pin
Current supply	Sensors and electronics [A]	Max. 10	Max. 8	Max. 16
	Valves and outputs [A]	Max. 10	Max. 8	Max. 16
Materials	Die-cast aluminium			
Product weight	[g]	187	187	279



Note the following points about the interlinking block

CPX-M-GE-EV-S-7/8-CIP-4P:

- Must be mounted as the first module to the right of the left-hand end plate

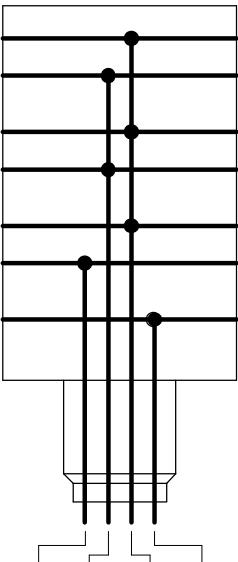
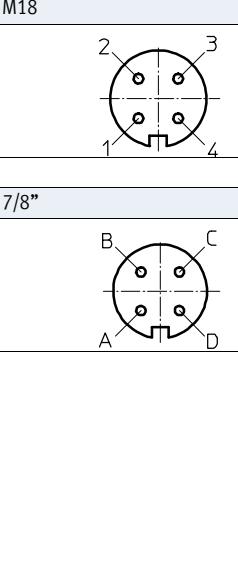
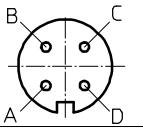
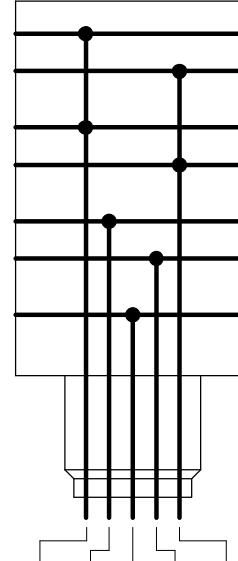
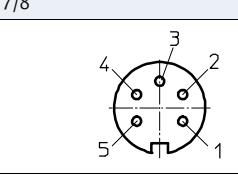
- Only permitted as an interlinking block to a bus node
- The functional earth (FE) must be connected via the left-hand end plate

Terminal CPX

FESTO

Technical data – Interlinking block with system supply

Pin allocation – Plastic interlinking blocks

Circuitry		Pin	Allocation
Round connector, 4-pin			
		M18	
		1	24 V DC supply voltage for electronics and sensors
		2	24 V DC load voltage supply for valves and outputs
		3	0 V
		4	FE
		7/8"	
			
		A	24 V DC supply voltage for electronics and sensors
		B	24 V DC load voltage supply for valves and outputs
		C	FE
		D	0 V
Round connector, 5-pin			
		7/8"	
		1	0 V valves and outputs
		2	0 V electronics and sensors
		3	FE
		4	24 V DC supply voltage for electronics and sensors
		5	24 V DC load voltage supply for valves and outputs

Terminal CPX

Technical data – Interlinking block with system supply

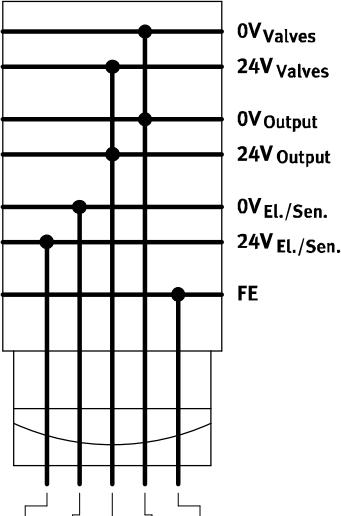
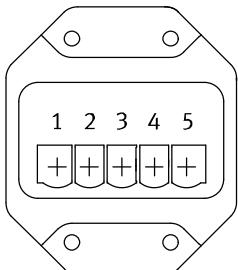
FESTO

Pin allocation – Metal interlinking blocks		Circuitry	Pin	Allocation
Round connector, 5-pin				
		7/8"		
			1 2 3 4 5	0 V valves and outputs 0 V electronics and sensors FE 24 V DC supply voltage for electronics and sensors 24 V DC load voltage supply for valves and outputs
			1 2 3 4 5	0 V valves and outputs 0 V electronics and sensors FE 24 V DC supply voltage for electronics and sensors 24 V DC load voltage supply for valves and outputs
Round connector, 4-pin				
		7/8"		
			A B C D	24 V DC supply voltage for electronics and sensors 24 V DC load voltage supply for valves and outputs 0 V DC supply voltage for electronics and sensors 0 V DC load voltage supply for valves and outputs
				- Note The functional earth (FE) must be connected via the left-hand end plate

Terminal CPX

FESTO

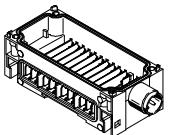
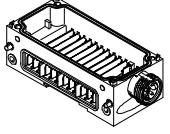
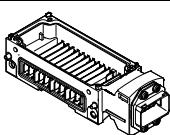
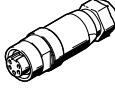
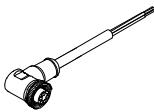
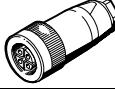
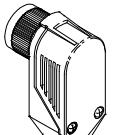
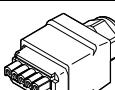
Technical data – Interlinking block with system supply

Pin allocation – Metal interlinking blocks		Pin	Allocation																				
Circuitry																							
Push-pull plug, 5-pin																							
			Plug pattern to PROFINET specification																				
 <table border="1" data-bbox="166 977 468 1044"> <tr> <td>PP</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>24V</td> <td>0V</td> <td>24V</td> <td>0V</td> <td>FE</td> <td></td> </tr> </table>	PP	1	2	3	4	5	24V	0V	24V	0V	FE		 <table border="1" data-bbox="928 460 1437 774"> <tr> <td>1</td> <td>24 V DC supply voltage for electronics and sensors</td> </tr> <tr> <td>2</td> <td>0 V electronics and sensors</td> </tr> <tr> <td>3</td> <td>24 V DC load voltage supply for valves and outputs</td> </tr> <tr> <td>4</td> <td>0 V valves and outputs</td> </tr> <tr> <td>5</td> <td>FE</td> </tr> </table>	1	24 V DC supply voltage for electronics and sensors	2	0 V electronics and sensors	3	24 V DC load voltage supply for valves and outputs	4	0 V valves and outputs	5	FE
PP	1	2	3	4	5																		
24V	0V	24V	0V	FE																			
1	24 V DC supply voltage for electronics and sensors																						
2	0 V electronics and sensors																						
3	24 V DC load voltage supply for valves and outputs																						
4	0 V valves and outputs																						
5	FE																						

Terminal CPX

Accessories – Interlinking block with system supply

FESTO

Ordering data				Part No.	Type
Designation					
Interlinking block with system supply					
	Connection M18, plastic interlinking block	4-pin	–	195746	CPX-GE-EV-S
	For ATEX environment		–	8022170	CPX-GE-EV-S-VL
	Connection 7/8", plastic interlinking block	4-pin	–	541248	CPX-GE-EV-S-7/8-4POL
	Connection 7/8", metal interlinking block	5-pin	–	541244	CPX-GE-EV-S-7/8-5POL
		4-pin	–	8022172	CPX-GE-EV-S-7/8-5POL-VL
	Connection push-pull plug (AIDA), metal interlinking block	5-pin	–	568956	CPX-M-GE-EV-S-7/8-CIP-4P
			–	550208	CPX-M-GE-EV-S-7/8-5POL
			For ATEX environment	8022165	CPX-M-GE-EV-S-7/8-5POL-VL
7/8" connection sockets					
	Power supply socket	5-pin	–	543107	NECU-G78G5-C2
			4-pin	543108	NECU-G78G4-C2
	Angled socket, 5-pin – Open cable end, 5-wire	2 m	–	573855	NEBU-G78W5-K-2-N-LE5
M18 connection sockets					
	Straight socket, screw terminal	4-pin	PG9	18493	NTSD-GD-9
		4-pin	PG13.5	18526	NTSD-GD-13,5
	Angled socket, screw terminal	4-pin	PG9	18527	NTSD-WD-9
	Angled socket, screw terminal	4-pin	PG11	533119	NTSD-WD-11
Power supply socket push-pull					
	Socket, spring-loaded terminal, connection pattern PP, fulfils requirements according to AIDA	5-pin	–	5195383	NECU-M-PPG5PP-C1-PN

Terminal CPX

FESTO

Accessories – Interlinking block with system supply

Ordering data		Part No.	Type
Designation			
Mounting accessories			
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	550218 CPX-DPT-30X32-S-4x
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	550219 CPX-M-M3x22-4x
		Bus node/metal connection block	550216 CPX-M-M3x22-S-4x

Terminal CPX

Technical data – Interlinking block

FESTO

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with current.

Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- All voltages are fed through to the next module by means of an interlinking system.
- The connected electronics module for inputs/outputs or bus node taps off the required voltage.



General technical data

Type	CPX-GE-EV	CPX-M-GE-EV
Electrical connection	–	–
Nominal operating voltage [V DC]	24	24
Acceptable current load (per contact/contact rail) [A]	16	8
Protection class to EN 60529	Depending on connection block	
Ambient temperature [°C]	–5 ... +50	
Note on materials	RoHS-compliant	
Materials	Reinforced PA	Aluminium
Grid dimension [mm]	50	
Dimensions W x L x H [mm]	50 x 107 x 35	
Weight [g]	108	169

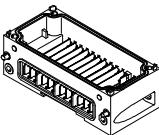
Pin allocation

Circuitry		Pin	Allocation
		–	–
		–	–
		–	–
		–	–
0V _{Valves}			
24V _{Valves}			
0V _{Output}			
24V _{Output}			
0V _{El./Sen.}			
24V _{El./Sen.}			
FE			

Terminal CPX

FESTO

Accessories – Interlinking block

Ordering data		Part No.	Type
Designation			
Interlinking block without supply			
	Plastic interlinking block	195742	CPX-GE-EV
	Metal interlinking block	550206	CPX-M-GE-EV
Mounting accessories			
	Screws for mounting the bus node/connection block on a plastic interlinking block	550218	CPX-DPT-30X32-S-4x
	Screws for mounting the bus node/connection block on a metal interlinking block	550219	CPX-M-M3x22-4x
		550216	CPX-M-M3x22-S-4x

Terminal CPX

Technical data – Interlinking block with additional power supply for outputs

Function

Interlinking blocks ensure the electrical supply of all other CPX modules.

They have contact rails, from which the other CPX components on the interlinking modules are supplied with current.

Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- 24 V DC supply voltage for outputs



General technical data

Nominal operating voltage	[V DC]	24
Protection class to EN 60529		Depending on connection block
Ambient temperature	[°C]	-5 ... +50
Note on materials		RoHS-compliant
Grid dimension	[mm]	50
Dimensions W x L x H	[mm]	50 x 107 x 35

Technical data – Plastic interlinking blocks

Type	CPX-GE-EV-Z				
		-VL	-7/8-4POL	-7/8-5POL	-7/8-5POL-VL
Electrical connection	M18	M18	7/8", 4-pin	7/8", 5-pin	7/8", 5-pin
Current supply	Outputs [A]	Max. 16	Max. 8	Max. 10	Max. 8
Materials		PA reinforced			
Product weight	[g]	125			

Technical data – Metal interlinking blocks

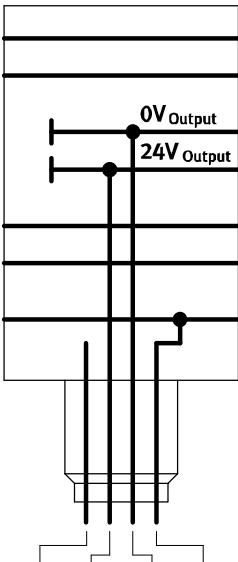
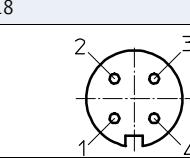
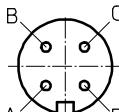
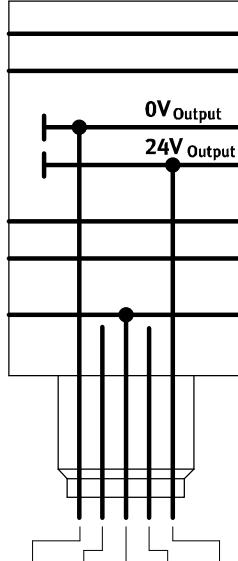
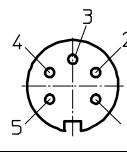
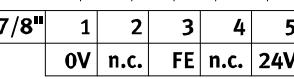
Type	CPX-M-GE-EV-Z		
	-7/8-5POL	-7/8-5POL-VL	-PP-5POL
Electrical connection	7/8", 5-pin	7/8", 5-pin	AIDA push-pull, 5-pin
Current supply	Outputs [A]	Max. 8	Max. 8
Materials		Die-cast aluminium	
Product weight	[g]	187	187
		279	

Terminal CPX

FESTO

Technical data – Interlinking block with additional power supply for outputs

Pin allocation – Plastic interlinking blocks

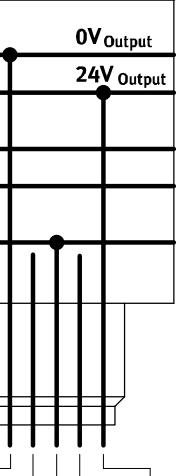
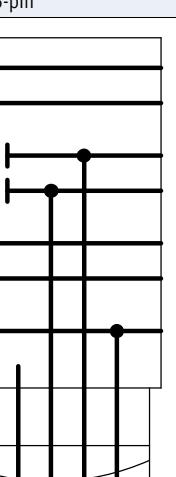
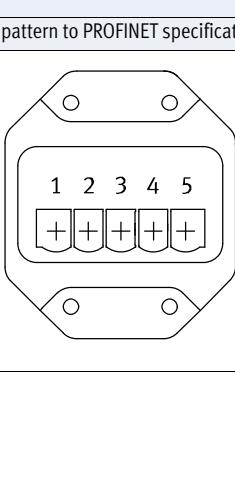
Circuitry		Pin	Allocation		
Round connector, 4-pin					
	M18				
		1	n.c.		
0V Valves	2	24 V DC load voltage supply for outputs			
24V Valves	3	0 V			
0V Output	4	FE			
24V Output					
0V EL./Sen.					
24V EL./Sen.					
FE					
	7/8"				
		A	n.c.		
	B	24 V DC load voltage supply for outputs			
	C	FE			
	D	0V			
Round connector, 5-pin					
	7/8"				
		1	0 V outputs		
0V Valves	2	n.c.			
24V Valves	3	FE			
0V Output	4	n.c.			
24V Output	5	24 V DC load voltage supply for outputs			
0V EL./Sen.					
24V EL./Sen.					
FE					
	7/8"				
	0V	n.c.	FE	n.c.	24V

Terminal CPX

FESTO

Technical data – Interlinking block with additional power supply for outputs

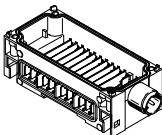
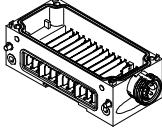
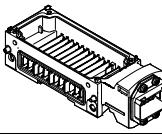
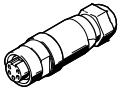
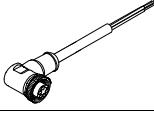
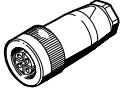
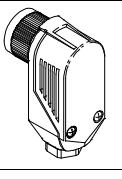
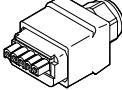
Pin allocation – Metal interlinking blocks

Circuitry		Pin	Allocation		
Round connector, 5-pin					
					
7/8"	1	2	3		
	0V	n.c.	FE		
	24V		n.c.		
			24V		
7/8"					
Push-pull plug, 5-pin					
					
PP	1	2	3		
	n.c.	n.c.	24V		
			0V		
			FE		
Plug pattern to PROFINET specification					
					
PP	1	2	3	4	5
	n.c.	n.c.	24V	0V	FE

Terminal CPX

FESTO

Accessories – Interlinking block with additional power supply for outputs

Ordering data				
Designation		Part No.	Type	
Interlinking block with additional power supply for outputs				
	Connection M18, plastic interlinking block	4-pin	–	195744 CPX-GE-EV-Z
	For ATEX environment		–	8022166 CPX-GE-EV-Z-VL
	Connection 7/8", plastic interlinking block	4-pin	–	541250 CPX-GE-EV-Z-7/8-4POL
		5-pin	–	541246 CPX-GE-EV-Z-7/8-5POL
	Connection 7/8", metal interlinking block	5-pin	–	8022173 CPX-GE-EV-Z-7/8-5POL-VL
	Connection push-pull plug (AIDA), metal interlinking block	5-pin	–	550210 CPX-M-GE-EV-Z-7/8-5POL
			For ATEX environment	8022158 CPX-M-GE-EV-Z-7/8-5POL-VL
7/8" connection sockets				
	Power supply socket	5-pin	–	543107 NECU-G78G5-C2
		4-pin	–	543108 NECU-G78G4-C2
	Angled socket, 5-pin – Open cable end, 5-wire	2 m	–	573855 NEBU-G78W5-K-2-N-LE5
M18 connection sockets				
	Straight socket, screw terminal	4-pin	PG9	18493 NTSD-GD-9
			PG13.5	18526 NTSD-GD-13,5
	Angled socket, screw terminal	4-pin	PG9	18527 NTSD-WD-9
	Angled socket, screw terminal	4-pin	PG11	533119 NTSD-WD-11
Power supply socket push-pull				
	Socket, spring-loaded terminal, connection pattern PP, fulfils requirements according to AIDA	5-pin	–	5195383 NECU-M-PPG5PP-C1-PN
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block	Bus node/metal connection block	550218	CPX-DPT-30X32-S-4X
	Screws for mounting the bus node/connection block on a metal interlinking block	Bus node/plastic connection block	550219	CPX-M-M3x22-4x
		Bus node/metal connection block	550216	CPX-M-M3x22-S-4x

Terminal CPX

Technical data – Interlinking block with additional power supply for valves

Function

Interlinking blocks ensure the electrical supply of all other CPX modules. They have contact rails, from which the other CPX components on the interlinking modules are supplied with current. Internal division of the power supply makes it possible to switch off specific areas of the sensors and actuators individually.

Applications

- 24 V DC supply voltage for valves



General technical data

Type	CPX-GE-EV-V	CPX-GE-EV-V-VL	CPX-GE-EV-V-7/8-4POL
Electrical connection	M18	7/8", 4-pin	
Nominal operating voltage	[V DC]	24	
Acceptable current load (per contact/contact rail)	[A]	16	8
Protection class to EN 60529		Depending on connection block	10
Ambient temperature	[°C]	-5 ... +50	
Note on materials		RoHS-compliant	
Materials		Reinforced PA	
Grid dimension	[mm]	50	
Dimensions W x L x H	[mm]	50 x 107 x 35	
Weight	[g]	125	

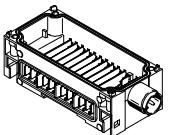
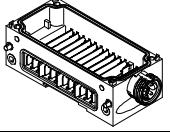
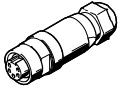
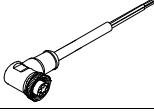
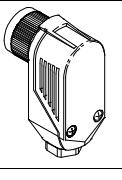
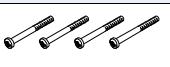
Pin allocation – Plastic interlinking blocks

Circuitry		Pin	Allocation
Round connector, 4-pin			
	M18		
		1	n.c.
		2	24 V DC load voltage supply for valves
		3	0 V
		4	FE
7/8"			
		A	n.c.
		B	24 V DC load voltage supply for valves
		C	FE
		D	0V

Terminal CPX

FESTO

Accessories – Interlinking block with additional power supply for valves

Ordering data				
Designation		Part No.	Type	
Interlinking block with additional power supply for valves				
	Connection M18, plastic interlinking block	4-pin	–	533577 CPX-GE-EV-V
	For ATEX environment		–	8022171 CPX-GE-EV-V-VL
	Connection 7/8", plastic interlinking block	4-pin	–	541252 CPX-GE-EV-V-7/8-4POL
7/8" connection sockets				
	Power supply socket	5-pin		543107 NECU-G78G5-C2
		4-pin		543108 NECU-G78G4-C2
	Angled socket, 5-pin – Open cable end, 5-wire	2 m		573855 NEBU-G78W5-K-2-N-LE5
M18 connection sockets				
	Straight socket, screw terminal	4-pin	PG9	18493 NTSD-GD-9
		4-pin	PG13.5	18526 NTSD-GD-13,5
	Angled socket, screw terminal	4-pin	PG9	18527 NTSD-WD-9
	Angled socket, screw terminal	4-pin	PG11	533119 NTSD-WD-11
Mounting accessories				
	Screws for mounting the bus node/connection block on a plastic interlinking block		Bus node/metal connection block	550218 CPX-DPT-30X32-S-4X

Terminal CPX

Technical data – Pneumatic interface VMPA-FB

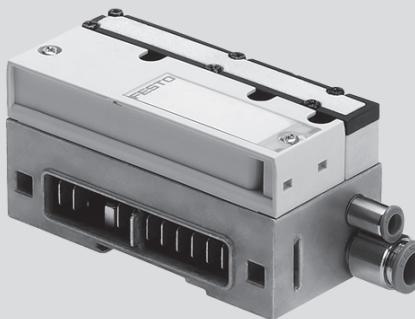
Function

The pneumatic interface VMPA-FB establishes the electromechanical connection between the CPX terminal and the valve terminal MPA-S.

The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA-S via the integrated CPX bus. The bus signal for activation of the solenoid coils is converted in the electronics module for max. 8 coils. From a technical point of view, the individual MPA pneumatic modules each represent a separate electrical module with digital outputs. Valves, which are galvanically isolated, can be supplied with power via the interlinking block CPX-GE-EV-V.

Applications

- Interface to the valve terminal MPA-S
- Max. 128 solenoid coils
- Features of the electronics module of the valve terminal MPA-S can be parameterised, for example status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe), individual channel diagnostics can be activated, condition monitoring can be activated individually for each valve
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electronics modules of the valve terminal MPA-S
- Electronics modules of the valve terminal MPA-S:
 - Undervoltage of valves
 - Short circuit of valves
 - Open load of valves
 - Counter preset reached in condition monitoring



General technical data

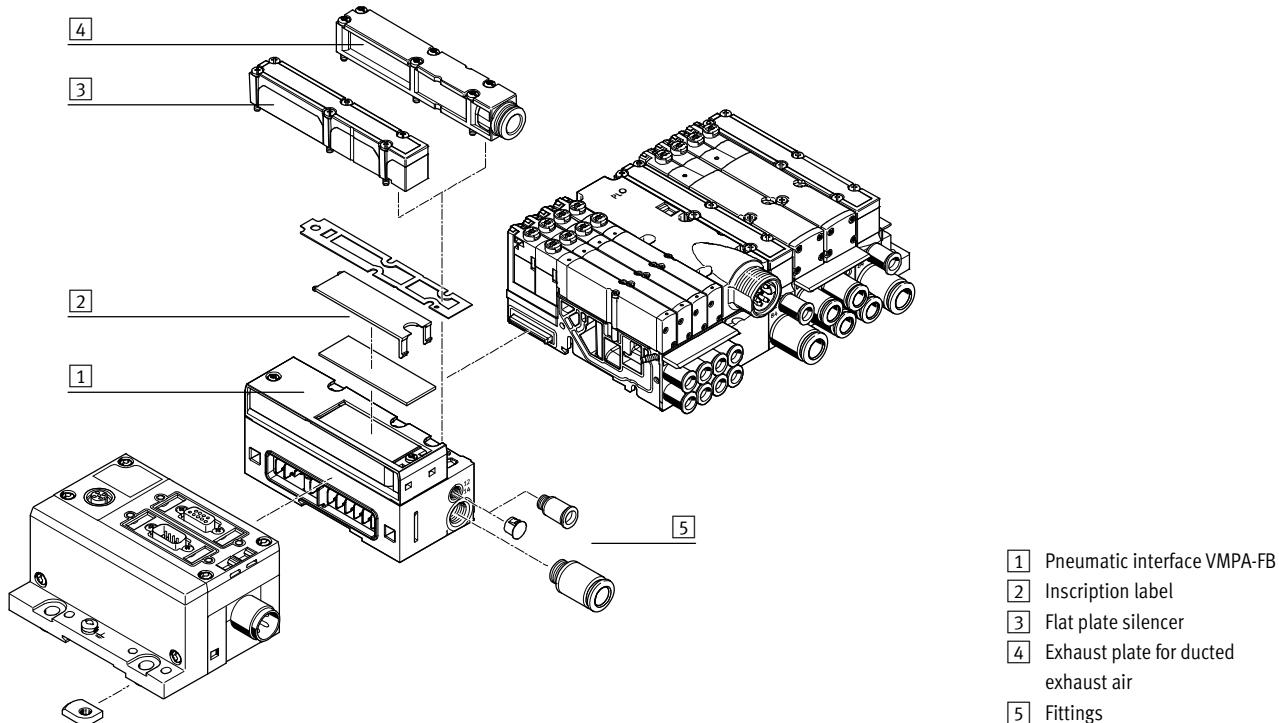
Type	VMPA-FB-EPL-G	VMPA-FB-EPL-E
No. of solenoid coils	128	
Pilot air supply	Internal	External
Pilot air connection 12/14	–	M7
Pneumatic connection 1	G1/4	G1/4
Operating pressure	[bar]	3 ... 8
Pilot pressure	[bar]	3 ... 8
Nominal operating voltage	[V DC]	24
Protection class to EN 60529		IP65
Ambient temperature	[°C]	-5 ... +50
Materials	Cover Housing	PA Die-cast aluminium
Weight	[g]	Approx. 320

Terminal CPX

FESTO

Accessories – Pneumatic interface VMPA-FB

Overview – Pneumatic interface VMPA-FB



Ordering data

Designation	Part No.	Type
Pneumatic interface for CPX plastic interlinking module		
	533370	VMPA-FB-EPL-G
Ducted exhaust air, internal pilot air	533369	VMPA-FB-EPL-E
Flat plate silencer, internal pilot air	533372	VMPA-FB-EPL-GU
Flat plate silencer, external pilot air	533371	VMPA-FB-EPL-EU
Pneumatic interface for CPX metal interlinking module		
	552286	VMPA-FB-EPLM-G
Ducted exhaust air, internal pilot air	552285	VMPA-FB-EPLM-E
Flat plate silencer, internal pilot air	552288	VMPA-FB-EPLM-GU
Flat plate silencer, external pilot air	552287	VMPA-FB-EPLM-EU
Exhaust plate		
	533375	VMPA-AP
For ducted exhaust air, with 10 mm push-in connector	541629	VMPA-AP-3/8
	533374	VMPA-APU
Flat plate silencer		

Terminal CPX

Technical data – Pneumatic interface VMPAL

Function

The pneumatic interface VMPAL establishes the electromechanical connection between the terminal CPX and the valve terminal MPA-L.

The bus signal for actuating the solenoid coils is converted in the pneumatic interface for the entire valve terminal.

The interlinking within the valve terminal is identical with the interlinking with multi-pin plug connections.

Application

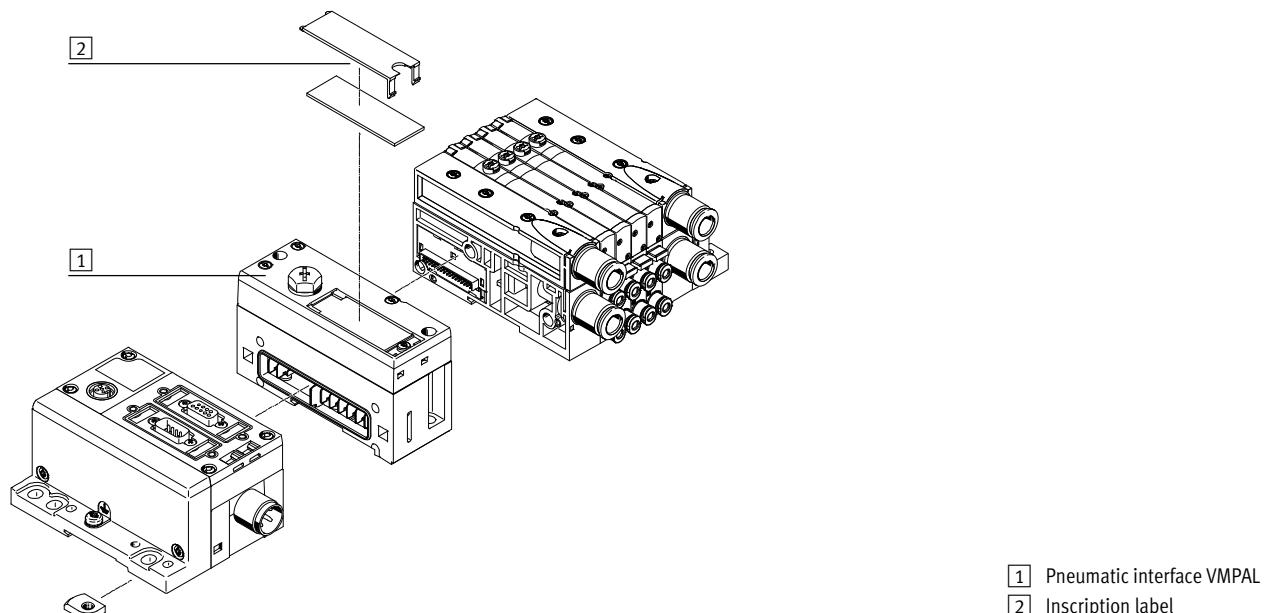
- Actuation of the valve terminal MPA-L
- Max. 32 solenoid coils
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electric modules of the valve terminal MPA-L



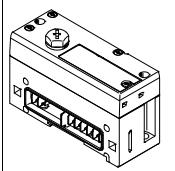
General technical data

Type	VMPAL-EPL-CPX	
Number of solenoid coils	32	
Operating pressure	[bar]	-0.9 ... 10
Pilot pressure	[bar]	3 ... 8
Nominal operating voltage	[V DC]	24
Protection class to EN 60529	IP67	
Ambient temperature	[°C]	-5 ... +50
Note on materials	RoHS-compliant	

Overview – Pneumatic interface VMPAL



Ordering data

Designation	Part No.	Type
 Pneumatic interface for CPX plastic interlinking module	570783	VMPAL-EPL-CPX

Terminal CPX

FESTO

Technical data – Pneumatic interface VTSA/VTSA-F

Function

The pneumatic interface VTSA provides the electromechanical connection between the terminal CPX and valve terminal VTSA/VTSA-F.

A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected to the fieldbus using the input modules of the terminal CPX.

Different circuits for valves and electrical outputs are implemented using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Application

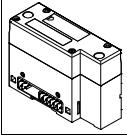
- Interface to the valve terminal VTSA and VTSA-F
- Max. 32 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Properties of the pneumatic interface can be parameterised, e.g. status of the solenoid coil when fieldbus communication is interrupted (failsafe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves



General technical data

Number of solenoid coils	32	
Electrical actuation	Fieldbus	
Electrical connection	Via CPX	
Diagnostics	Undervoltage at valves	
Parameterisation	<ul style="list-style-type: none">• Failsafe per channel• Forces per channel• Idle mode per channel• Module monitoring	
LED displays	<ul style="list-style-type: none">• 1 Group diagnostics• Channel status (on each valve)	
Fuse protection (short circuit)	Internal electronic fuse per valve output	
Electrical isolation channel – internal bus	Yes, when using an additional power supply for the valves	
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	21.6 ... 26.4
Intrinsic current consumption at nominal operating voltage	Electronic components Valves	[mA] [mA] Typically 15 Typically 50
Max. power supply per channel	[A]	0.2
Max. residual current per module	[A]	4
Protection class	<ul style="list-style-type: none">• IP65 (to EN 60529)• NEMA 4	
Ambient temperature	[°C]	-5 ... +50
Materials	Housing	Die-cast aluminium
	Bearing and end cap	PA
Note on materials	RoHS-compliant	
Product weight	[g]	590

Ordering data

Designation	Part No.	Type
 For plastic interlinking block	543416	VABA-S6-1-X1
For metal interlinking block	550663	VABA-S6-1-X2
	573613	VABA-S6-1-X2-D

Terminal CPX

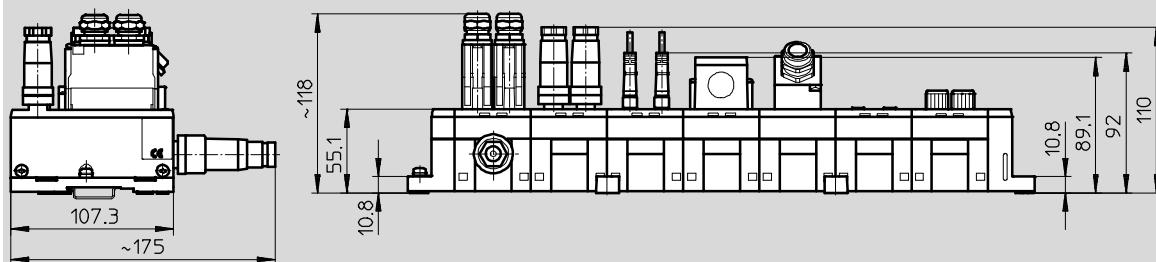
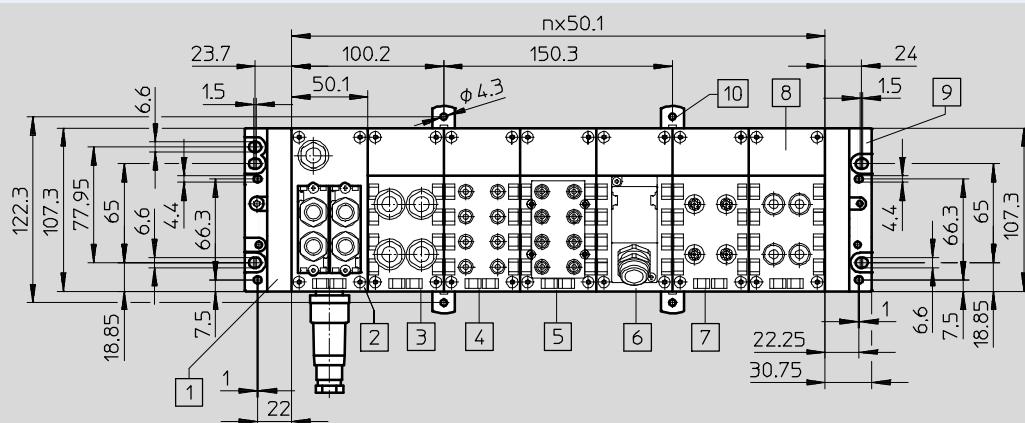
Technical data

FESTO

Dimensions – Plastic interlinking module

With bus nodes and connection blocks

Download CAD data → www.festo.com



- [1] Left-hand end plate
(earthing plate optional)
- [2] Bus nodes
- [3] Connection block
CPX-AB-4-M12-8POL
- [4] Connection block
CPX-AB-8-M8-3POL

- [5] Connection block
CPX-AB-8-KL-4POL
- [6] Connection block
CPX-AB-1-SUB-BU-25POL
- [7] Connection block
CPX-AB-4-HAR-4POL
- [8] Connection block
CPX-AB-4-M12x2-5POL
- [9] Right-hand end plate
- [10] Mounting clip for wall
mounting (required every
2 ... 3 connection blocks)

n Number of bus nodes and
connection blocks for CPX

Terminal CPX

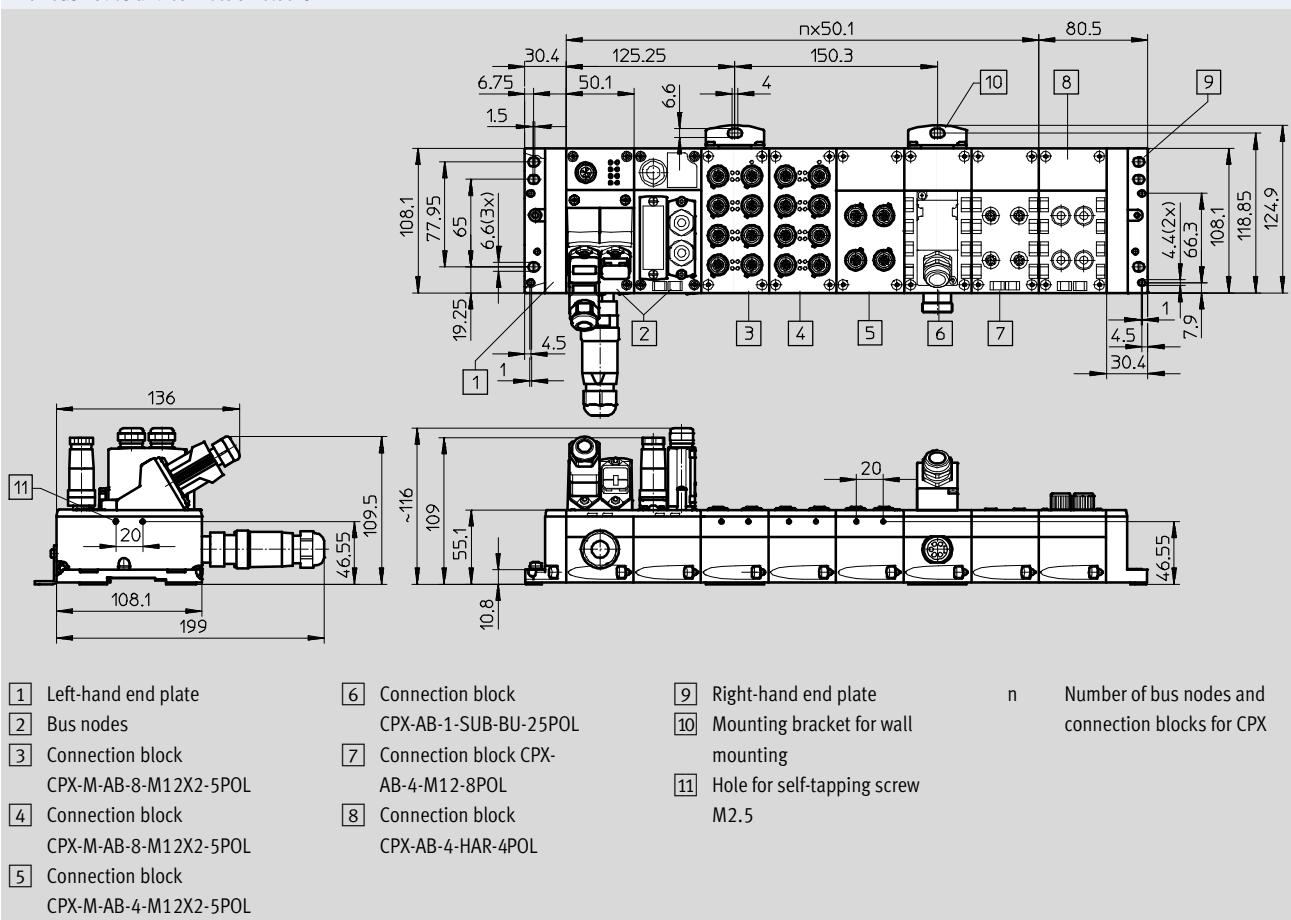
FESTO

Technical data

Dimensions – Metal interlinking block

With bus nodes and connection blocks

Download CAD data ➔ www.festo.com



Terminal CPX

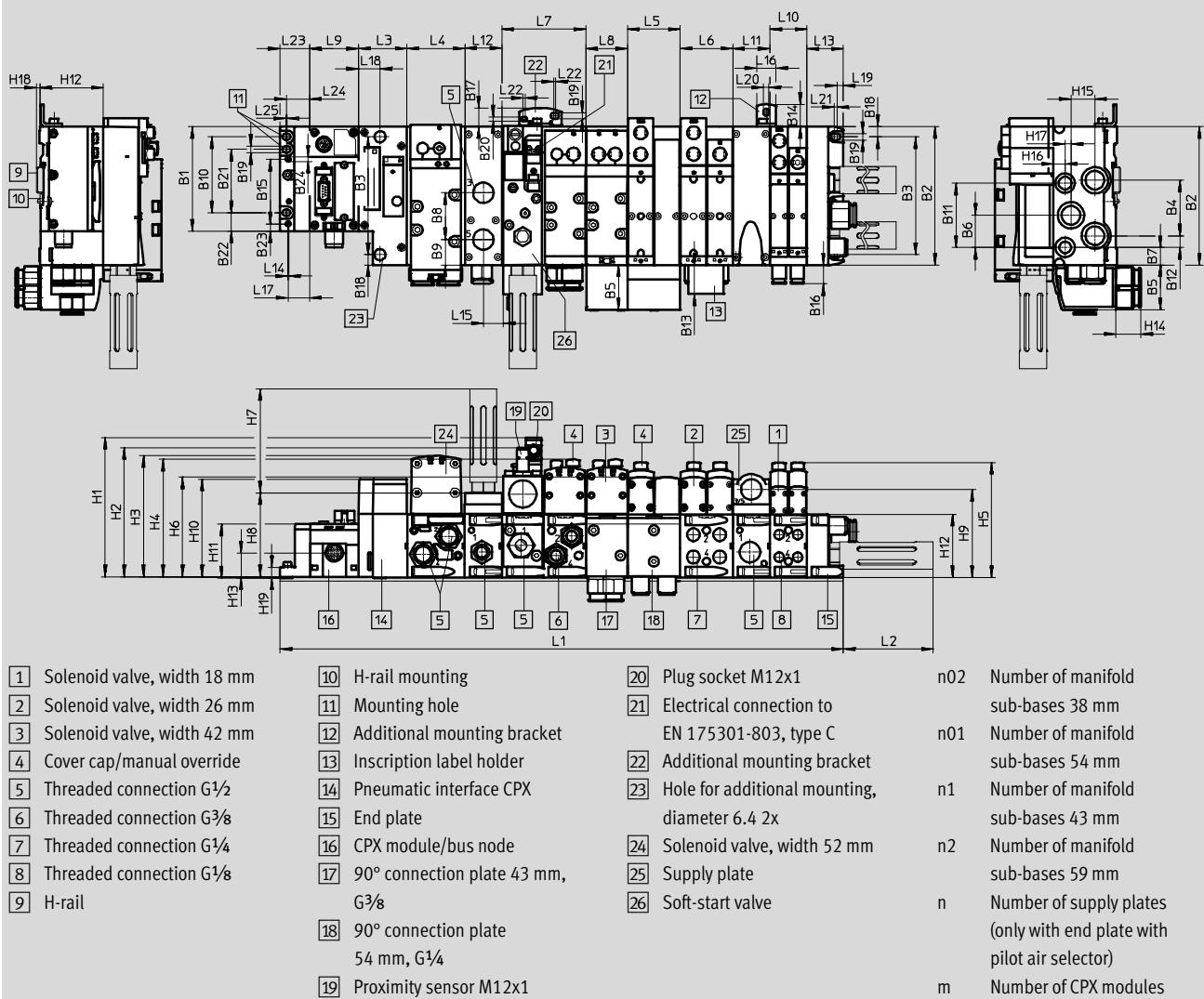
Technical data

FESTO

Dimensions

With bus nodes and valve terminal VTSA

Download CAD data → www.festo.com



Dim.	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B16	B18	B19	B20	B21	B22	B23	B24
[mm]	107.3	142	121	57	46	33	18	48	26	78	66	12	29.6	23	19.5	10.5	6.6	4.5	65	18.9	7.5	4.4

Dim.	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22
[mm]	92.4	50	n2x59	n01x54	54	n1x43	43	mx201	n02x38	nx38	38	37.3	1	20.5	20	22	22	6.3	5.5	3	2

Dim.	L23	L24	L25	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19
[mm]	30.4	23.7	1.5	143.9	133.3	125	121.3	118.2	103	106.8	87	90.3	101.4	55.1	65	25.8	25.7	24.5	12	6	3.5	10.8

Width	L1
18 mm	$30.4 + m \times 50.1 + 50 + n02 \times 38 + n \times 38 + 37.3$
26 mm	$30.4 + m \times 50.1 + 50 + n01 \times 54 + n \times 38 + 37.3$
42 mm	$30.4 + m \times 50.1 + 50 + n1 \times 43 + n \times 38 + 37.3$
52 mm	$30.4 + m \times 50.1 + 50 + n2 \times 59 + n \times 38 + 37.3$
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	$30.4 + m \times 50.1 + 50 + n02 \times 38 + n01 \times 54 + n1 \times 43 + n2 \times 59 + n \times 38 + 37.3$

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

Terminal CPX

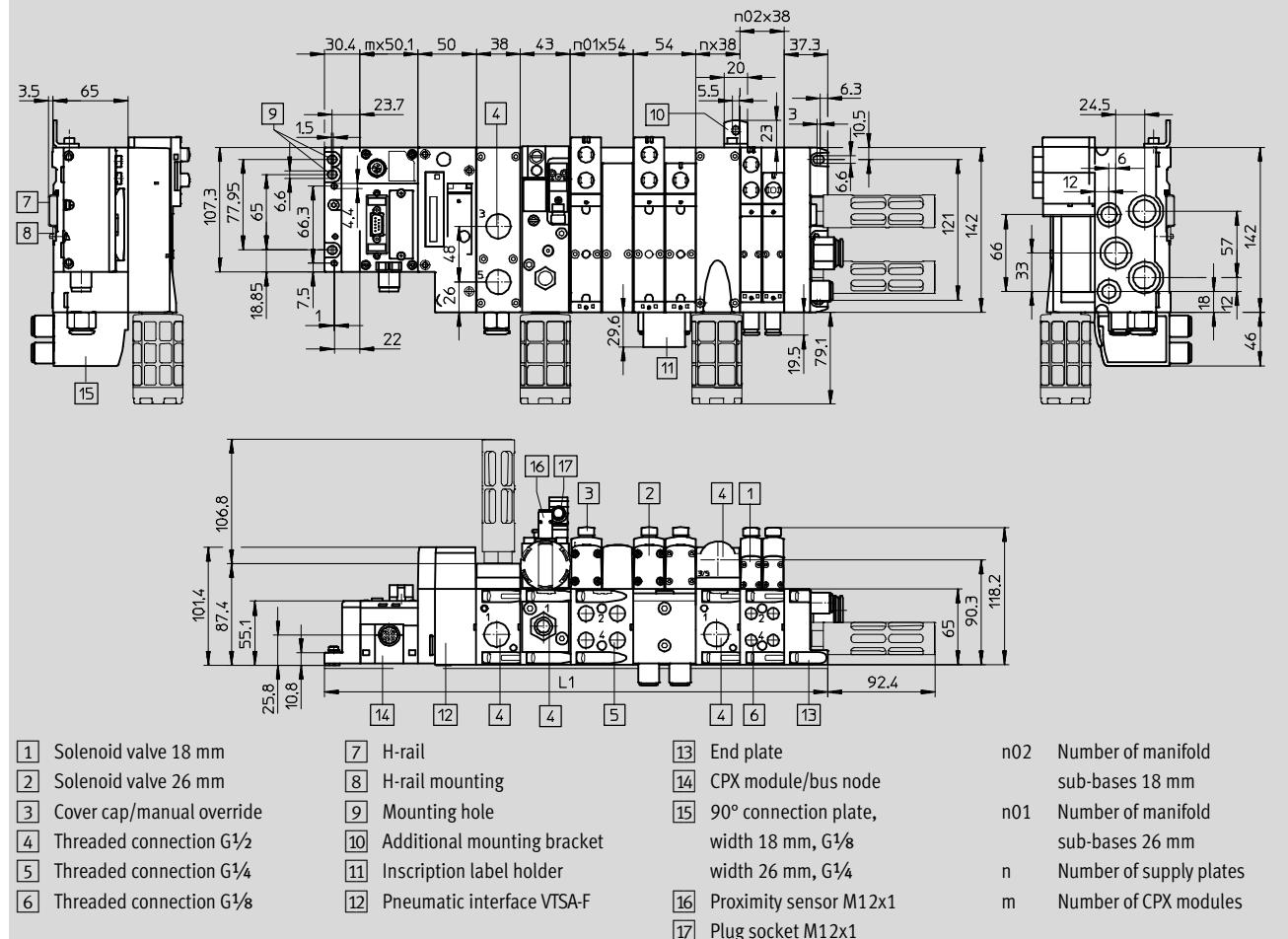
FESTO

Technical data

Dimensions

With bus nodes and valve terminal VTSA-F

Download CAD data ➔ www.festo.com



Width	L1
18 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n x 38 + 37.3
26 mm	30.4 + m x 50.1 + 50 + n01 x 54 + n x 38 + 37.3
Mixture of 18 mm and 26 mm	30.4 m x 50.1 + 50 + n02 x 38 + n01 x 54 + n x 38 + 37.3

Terminal CPX

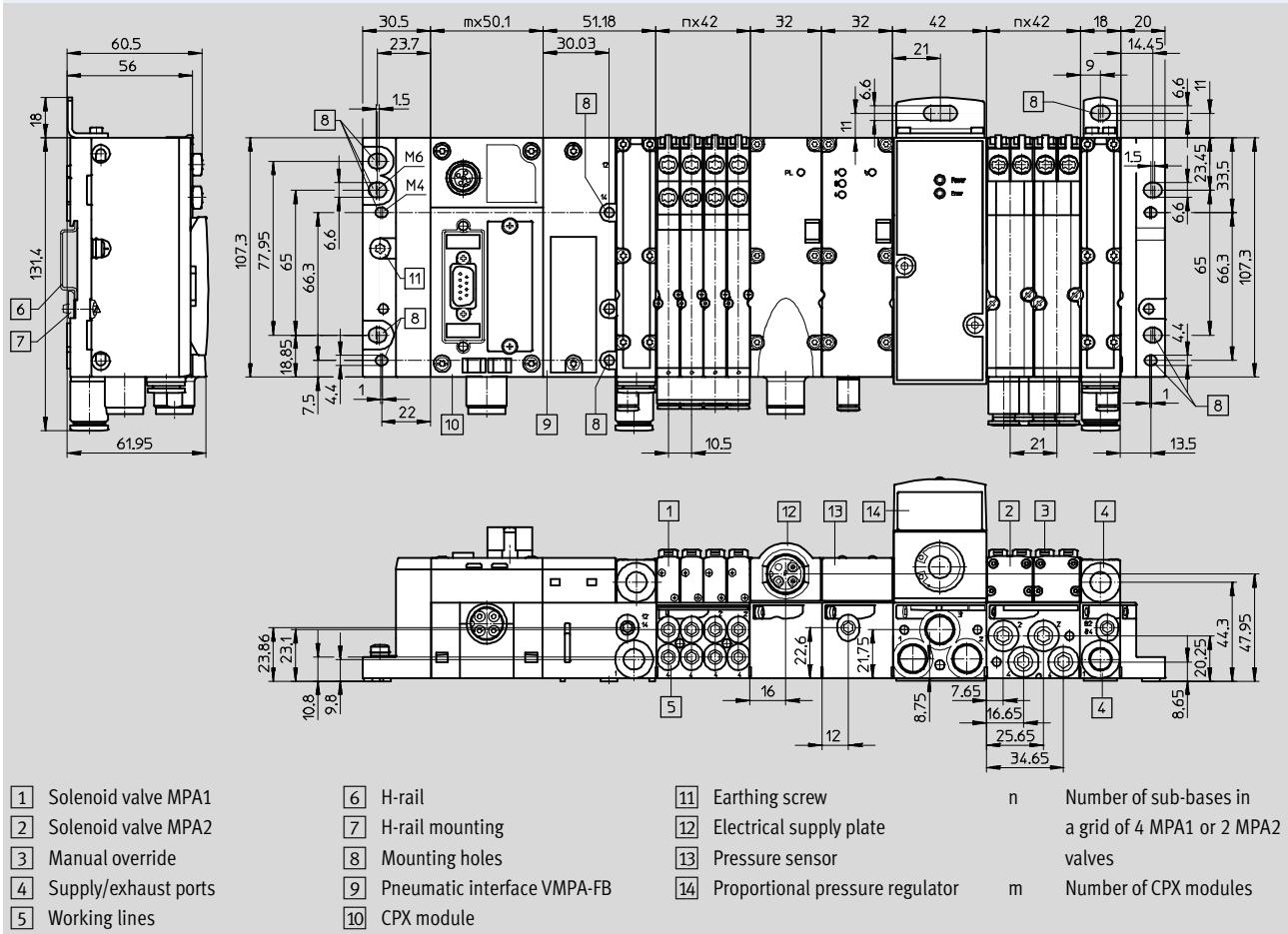
Technical data

FESTO

Dimensions

With bus nodes and valve terminal MPA-S

Download CAD data → www.festo.com



Terminal CPX

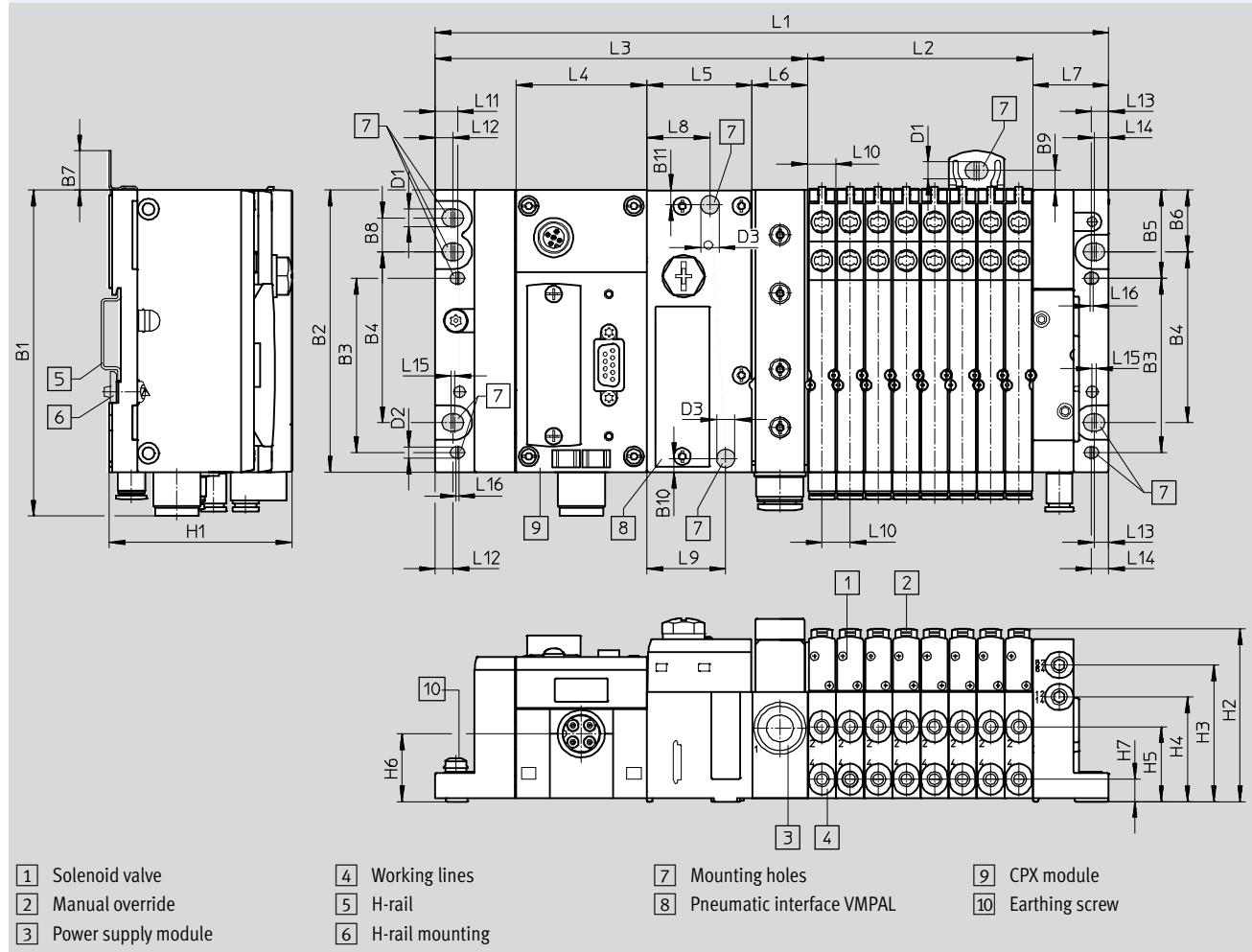
FESTO

Technical data

Dimensions

With bus node and valve terminal MPA-L

Download CAD data ➔ www.festo.com



Type	L1 ¹⁾	L2 ¹⁾	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	D1	D2	D3
MPA-L	170.9 + n x 10.70	n x 10.70	142.1	50	40.1	21.2	28.8	24	30	10.7	8.5	6.8	5.6	6.5	6.6	4.4	7

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	H1	H2	H3	H4	H5	H6	H7
MPA-L	124	107.3	66.3	65	33.5	23.5	15	13	7.5	5.3	5.5	69.6	65.7	52	39.8	28.5	25.8	8.5

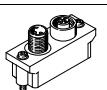
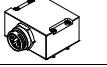
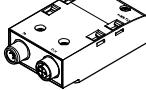
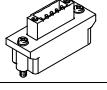
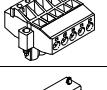
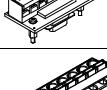
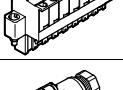
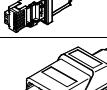
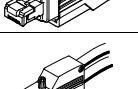
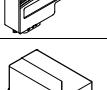
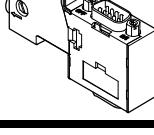
1) n = Number of sub-bases/valve positions

Terminal CPX

Accessories

FESTO

Ordering data – Accessories

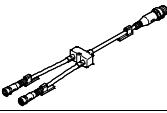
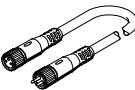
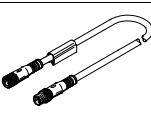
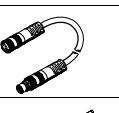
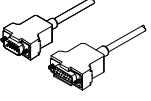
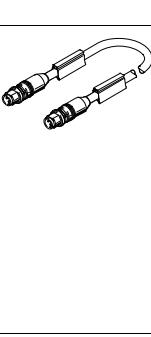
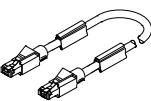
Designation			Part No.	Type code
Connectors and accessories				
	Sub-D plug for INTERBUS	Incoming	532218	FBS-SUB-9-BU-IB-B
		Outgoing	532217	FBS-SUB-9-GS-IB-B
	Sub-D plug for DeviceNet/CANopen		532219	FBS-SUB-9-BU-2x5POL-B
	Sub-D plug for PROFIBUS DP		532216	FBS-SUB-9-GS-DP-B
	Sub-D plug for CC-Link		532220	FBS-SUB-9-GS-2x4POL-B
	Sub-D plug		534497	FBS-SUB-9-GS-1x9POL-B
	Bus connection M12 adapter (B-coded) for PROFIBUS DP		533118	FBA-2-M12-5POL-RK
	Micro style bus connection, 2xM12 for DeviceNet/CANopen		525632	FBA-2-M12-5POL
	For micro style connection, M12	Socket	18324	FBSD-GD-9-5POL
		Plug	175380	FBS-M12-5GS-PG9
	M12x1 bus connection, 4-pin (D-coded) for Ethernet		543109	NECU-M-S-D12G4-C2-ET
	For FBA-2-M12-5POL-RK and CPX-AB-2-M12-RK-DP, M12x1, 5-pin, straight	Socket	1067905	NECU-M-B12G5-C2-PB
		Plug	1066354	NECU-M-S-B12G5-C2-PB
	Plug M12x1, 4-pin, straight, A-coded	Insulation displacement connect.	525928	SEA-GS-HAR-4POL
		Screw terminal	192008	SEA-4GS-7-2,5
			18666	SEA-GS-7
			18778	SEA-GS-9
	Connection block, 9-pin Sub-D socket, 5-pin 7/8" plug for DeviceNet		571052	CPX-AB-1-7/8-DN
	Connection block M12 adapter (B-coded)		541519	CPX-AB-2-M12-RK-DP
			534505	CPX-AB-2-M12-RK-IB
	Open style bus connection for 5-pin terminal strip for DeviceNet/CANopen		525634	FBA-1-SL-5POL
	Terminal strip for open style connection, 5-pin		525635	FBSD-KL-2x5POL
	Screw terminal bus connection for CC-Link		197962	FBA-1-KL-5POL
	8-pin socket	Spring-loaded terminal	565712	NECU-L3G8-C1
		Screw terminal	565710	NECU-L3G8-C2
	RJ45/plug		534494	FBS-RJ45-8-GS
	RJ45 plug, 8-pin, push-pull		552000	FBS-RJ45-PP-GS
			571017	FBS-SCRJ-PP-GS
	Plug for CAN bus interface, electric axes Sub-D, 9-pin, without terminating resistor		533783	FBS-SUB-9-WS-CO-K
	Sub-D socket with terminating resistor and programming interface	For CANopen	574588	NECU-S1W9-C2-ACO
	Sub-D plug, straight, with terminating resistor and programming interface	For PROFIBUS	574589	NECU-S1W9-C2-APP

Terminal CPX

FESTO

Accessories

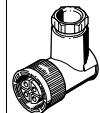
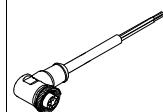
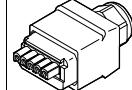
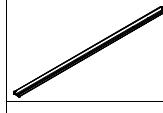
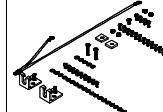
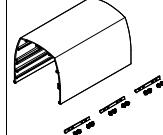
Ordering data – Accessories

Designation				Part No.	Type code
Distributors					
	Modular system for all types of sensor/actuator distributors			–	NEDY-... ➔ Internet: nedy
	Push-in T-connector	1x plug M8, 4-pin	2x socket M8, 3-pin	8005312	NEDY-L2R1-V1-M8G3-N-M8G4
		1x plug M12, 4-pin	2x socket M8, 3-pin	8005311	NEDY-L2R1-V1-M8G3-N-M12G4
			2x socket, M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4
Connecting cables					
	Modular system for any connecting cable			–	NEBU-... ➔ Internet: nebu
	Connecting cable M8-M8, Straight plug/straight socket	0.5 m	541346	NEBU-M8G3-K-0.5-M8G3	
		1.0 m	541347	NEBU-M8G3-K-1-M8G3	
		2.5 m	541348	NEBU-M8G3-K-2.5-M8G3	
		5.0 m	541349	NEBU-M8G3-K-5-M8G3	
	Connecting cable M12-M12, 5-pin, Straight plug/straight socket	1.5 m	529044	KV-M12-M12-1,5	
		3.5 m	530901	KV-M12-M12-3,5	
		5 m	574321	NEBU-M12G5-E-5-Q8N-M12G5	
	Connecting cable for CPX-CTEL, M12-M12, 5-pin, straight plug/straight socket	7.5 m	574322	NEBU-M12G5-E-7.5-Q8N-M12G5	
		10 m	574323	NEBU-M12G5-E-10-Q8N-M12G5	
		2.0 m	525617	KM12-8GD8GS-2-PU	
	Connecting cable M9, 5-pin, angled plug/open cable end 3-pin	2 m	563711	NEBC-M9W5-K-2-N-LE3	
		5 m	563712	NEBC-M9W5-K-5-N-LE3	
	Connecting cable M9, angled plug/angled socket	0.25 m	540327	KVI-CP-3-WS-WD-0,25	
		0.5 m	540328	KVI-CP-3-WS-WD-0,5	
		2 m	540329	KVI-CP-3-WS-WD-2	
		5 m	540330	KVI-CP-3-WS-WD-5	
		8 m	540331	KVI-CP-3-WS-WD-8	
	Connecting cable M9, straight plug/straight socket	2 m	540332	KVI-CP-3-GS-GD-2	
		5 m	540333	KVI-CP-3-GS-GD-5	
		8 m	540334	KVI-CP-3-GS-GD-8	
	Programming cable, sub-D socket, 9-pin	Sub-D plug, 9-pin	3 m	151915	KDI-PPA-3-BU9
		Open end, 3-wire	5 m	539642	FEC-KBG7
		Sub-D plug, 9-pin	2.5 m	539643	FEC-KBG8
	Connecting cable, straight plug, M12x1, 4-pin, D-coded	Straight plug, M12x1, 4-pin, D-coded	0.5 m	8040446	NEBC-D12G4-ES-0.5-S-D12G4-ET
			1 m	8040447	NEBC-D12G4-ES-1-S-D12G4-ET
			3 m	8040448	NEBC-D12G4-ES-3-S-D12G4-ET
			5 m	8040449	NEBC-D12G4-ES-5-S-D12G4-ET
			10 m	8040450	NEBC-D12G4-ES-10-S-D12G4-ET
	Straight plug, RJ45, 8-pin	1 m	8040451	NEBC-D12G4-ES-1-S-R3G4-ET	
		3 m	8040452	NEBC-D12G4-ES-3-S-R3G4-ET	
		5 m	8040453	NEBC-D12G4-ES-5-S-R3G4-ET	
		10 m	8040454	NEBC-D12G4-ES-10-S-R3G4-ET	
	Open end, 4-wire	5 m	8040456	NEBC-LE4-ES-5-D12G4-ET	
	Connecting cable, straight plug, RJ45, 8-pin	Straight plug, RJ45, 8-pin	1 m	8040455	NEBC-R3G4-ES-1-S-R3G4-ET

Terminal CPX

Accessories

FESTO

Ordering data – Accessories		Part No.	Type code
Designation			
Connectors and accessories – Power supply			
	Plug socket for mains connection M18, straight	For 1.5 mm ²	18493 NTSD-GD-9
		For 2.5 mm ²	18526 NTSD-GD-13,5
	Plug socket for mains connection M18, angled	For 1.5 mm ²	18527 NTSD-WD-9
		For 2.5 mm ²	533119 NTSD-WD-11
	Power supply socket, straight	7/8" connection, 5-pin	543107 NECU-G78G5-C2
		7/8" connection, 4-pin	543108 NECU-G78G4-C2
	7/8" power supply socket, 5-pin, angled socket/open cable end, 5-wire	2 m	573855 NEBU-G78W5-K-2-N-LE5
	Push-pull power supply socket, connection pattern PP, fulfils requirements to AIDA	5-pin	5195383 NECU-M-PPG5PP-C1-PN
	Straight plug, spring-loaded terminal, for left-hand end plate with system supply	7-pin	576319 NECU-L3G7-C1
Hood			
	Mounting rail for attaching the hood	1000 mm	572256 CAFC-X1-S
	Mounting kit for CPX hood		572257 CAFC-X1-BE
	Hood section for CPX terminal including mounting attachments for connecting several hood sections in series	200 mm	572258 CAFC-X1-GAL-200
		300 mm	572259 CAFC-X1-GAL-300
Screws			
	Screws for mounting the bus node/connection block on the polymer interlinking block	Bus node/metal connection block	550218 CPX-DPT-30X32-S-4X
	Screws for mounting the bus node/connection block on the metal interlinking block	Bus node/polymer connection block	550219 CPX-M-M3x22-4x
		Bus node/metal connection block	550216 CPX-M-M3x22-S-4x
	Screws for mounting an inscription label on the bus node (CPX-FB33, CPX-M-FB34, CPX-M-FB35)	12 pieces	550222 CPX-M-M2,5X8-12X

Terminal CPX

FESTO

Accessories

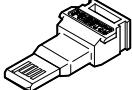
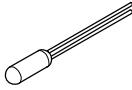
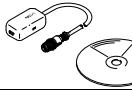
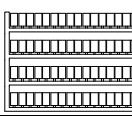
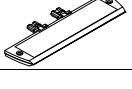
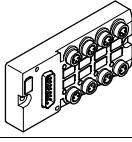
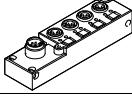
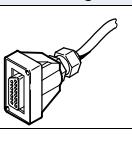
Ordering data – Accessories

Designation		Part No.	Type code
Mounting			
	Attachment for wall mounting (for long valve terminals, 10 pieces)	Version for polymer interlinking plates	529040 CPX-BG-RW-10x
	Attachment for wall mounting, version for metal interlinking plates	2 mounting brackets, 4 screws	550217 CPX-M-BG-RW-2X
		1 mounting bracket, 2 screws	2721419 CPX-M-BG-VT-2X
Coverings and attachments			
	Cover for CPX-AB-8-KL-4POL (IP65, IP67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug	538219	AK-8KL
	Fittings kit	538220	VG-K-M9
	Screening plate for M12 connections	526184	CPX-AB-S-4-M12
	Earthing element (5 pieces), for right-hand/left-hand end plate (polymer interlinking blocks)	538892	CPX-EPFE-EV
	Inspection cover, transparent	533334	AK-SUB-9/15-B
	Transparent cover for DIL switch and memory card	548757	CPX-AK-P
	Cover for DIL switch and memory card	548754	CPX-M-AK-M
	Cover plate for covering the DIL switches on CPX-M-FB21	572818	CPX-M-FB21-IB-RL
	Cover for RJ45 connection	534496	AK-RJ45
	Cover for RJ45 push-pull connection	548753	CPX-M-AK-C
	Cover cap for bus connection	2873540	CPX-M-AK-D
	Cover cap for closing off unused ports (10 pieces)	For M8 connections	177672 ISK-M8
		For M12 connections	165592 ISK-M12
	Coding element, so that a coded socket NECU-L3G8 can only be inserted in the matching coded connection block CPX-P-AB-2XKL (96 pieces of each)	For NECU-L3G8	565713 CPX-P-KDS-AB-2XKL

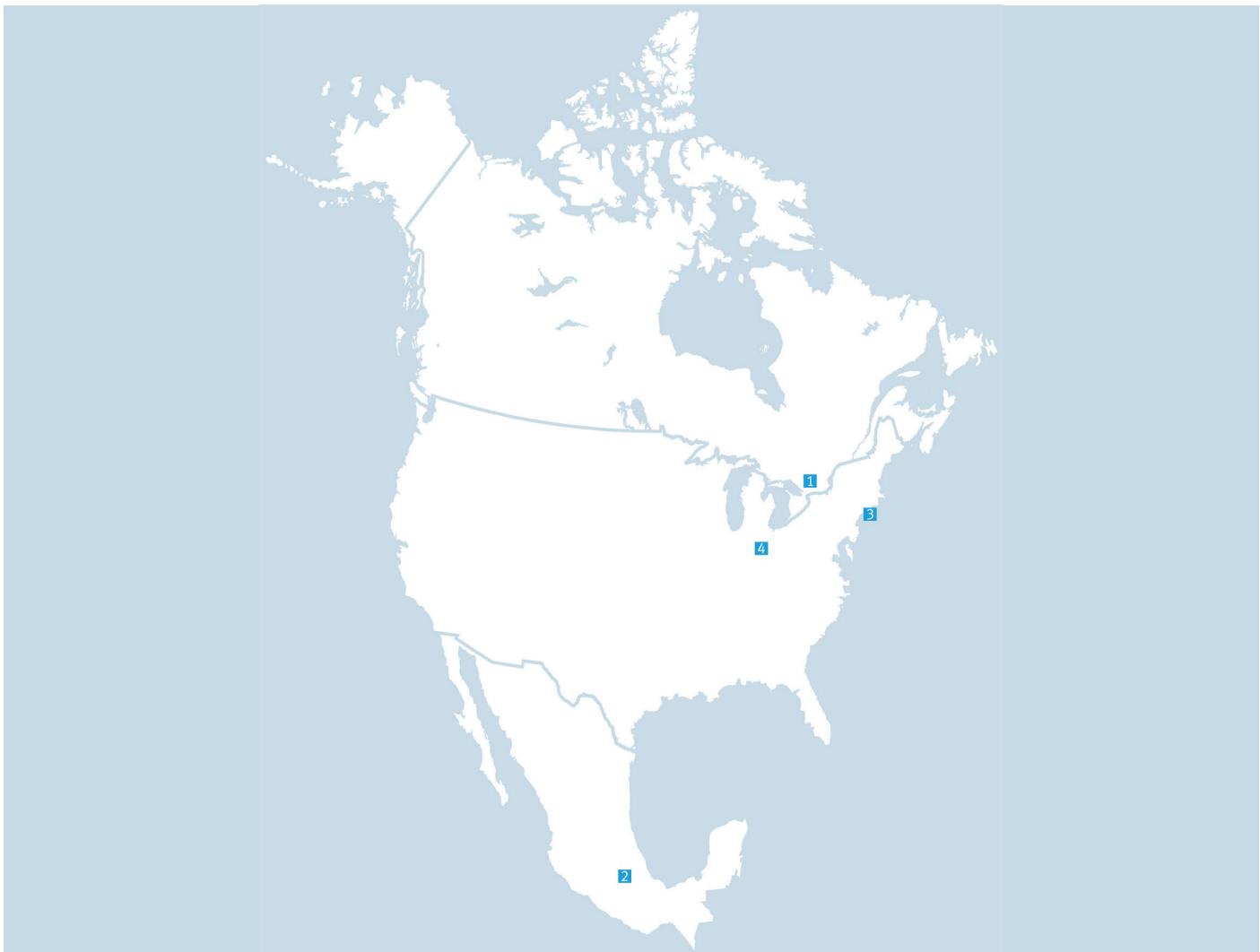
Terminal CPX

Accessories

FESTO

Ordering data – Accessories		Part No.	Type code
Designation			
Function elements			
	Memory card for PROFINET bus node (CPX-FB33, CPX-M-FB34, CPX-M-FB35), 2MB	4798288	CPX-SK-3
	Terminating resistor, M12, B-coded for PROFIBUS	1072128	CACR-S-B12G5-220-PB
	PT1000 temperature sensor for cold junction compensation	553596	CPX-W-PT1000
	Adapter, 5-pin M12 to mini USB socket, and controller software	547432	NEFC-M12G5-0.3-U1G5
Inscription labels			
	Inscription labels 6x10 mm, 64 pieces, in frames	18576	IBS-6x10
	Inscription label holder for connection block	536593	CPX-ST-1
Multi-pin plug distributors			
	Sub-D plug, 15-pin	8x socket M8, 3-pin	177669 MPV-E/A08-M8
		12x socket M8, 3-pin	177670 MPV-E/A12-M8
	Plug M12, 8 pin	4x socket, M8, 3-pin	574586 NEDU-L4R1-M8G3L-M12G8
		6x socket, M8, 3-pin	574587 NEDU-L6R1-M8G3L-M12G8
Connecting cable for multi-pin plug distributor			
	Sub-D socket, 15-pin, open cable end, 15-wire	5 m	177673 KMPV-SUB-D-15-5
		10 m	177674 KMPV-SUB-D-15-10
	Angled socket, M12, 8-pin, open cable end, 8-wire	Length 2 m	542256 NEBU-M12W8-K-2-N-LE8
		Length 5 m	542257 NEBU-M12W8-K-5-N-LE8
		Length 10 m	570007 NEBU-M12W8-K-10-N-LE8
	Straight socket, M12, 8-pin, open cable end, 8-wire	Length 2 m	525616 SIM-M12-8GD-2-PU
		Length 5 m	525618 SIM-M12-8GD-5-PU
		Length 10 m	570008 SIM-M12-8GD-10-PU

Festo - Your Partner in Automation



1 Festo Inc.

5300 Explorer Drive
Mississauga, ON L4W 5G4
Canada

Festo Customer Interaction Center

Tel: 1 877 463 3786
Fax: 1 877 393 3786
Email: customer.service.ca@festo.com

2 Festo Pneumatic

Av. Ceylán 3,
Col. Tequesquínáhuac
54020 Tlalnepantla,
Estado de México

Multinational Contact Center

01 800 337 8669
ventas.mexico@festo.com

3 Festo Corporation

1377 Motor Parkway
Suite 310
Islandia, NY 11749

Festo Customer Interaction Center

1 800 993 3786
1 800 963 3786
customer.service.us@festo.com

4 Regional Service Center

7777 Columbia Road
Mason, OH 45040

Connect with us



www.festo.com/socialmedia



www.festo.com