XI/ON
Digital I/O-Modules
Supply Modules

MOELLER

Think future. Switch to green.

Warning!
Dangerous electrical voltage!

Before commencing the installation

- Disconnect the power supply of the device.

- Ensure that devices cannot be accidentally restarted.

- Verify isolation from the supply.

- Earth and short circuit.

- Cover or enclose neighbouring units that are live.

- Follow the engineering instructions (AWA) of the device concerned.

- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.

- Before installation and before touching the device ensure that you are free of electrostatic charge.

- The functional earth (FE) must be connected to the protective earth (PE) or to the potential equalisation. The system installer is responsible for implementing this connection.

- Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automation functions.

- Install automation devices and related operating elements in such a way that they are well protected against unintentional operation.

- Suitable safety hardware and software measures should be implemented for the I/O interface so that a line or wire breakage on the signal side does not result in undefined states in the automation devices.

- Ensure a reliable electrical isolation of the low voltage for the 24 volt supply. Only use power supply units complying with IEC 60364-4-41 (VDE 0100 Part 410) or HD 384.4.41 S2.

- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specifications, otherwise this may cause malfunction and dangerous operation.

- Emergency stop devices complying with IEC/EN 60204-1 must be effective in all operating modes of the automation devices. Unlatching the emergency-stop devices must not cause restart.

- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been installed with the housing closed. Desktop or portable units must only be operated and controlled in enclosed housings.

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Safety instructions

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- Measures should be taken to ensure the proper restart of programs interrupted after a voltage dip or failure. This should not cause dangerous operating states even for a short time. If necessary, emergency-stop devices should be implemented.

- Wherever faults in the automation system may cause damage to persons or property, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (for example, by means of separate limit switches, mechanical interlocks etc.).

Content

About this manual

Reading conventions

Symbols used in this manual have the following meanings:

	Attention!
	Warns of minor damage to property.

	Caution!
	Warns of major damage to property, and minor injuries.

	Warning!
	Warns of major damage to property, and death or major injuries.

→	Draws your attention to interesting tips and supplementary information

To make the document easy to use, you will find the chapter heading on the left of the header and the name of the current section on the right. This does not apply to the first page of a chapter and any empty pages at the end of a chapter.

List of revisions

Publication date	Page	Subject	New	Modi-fied	Delet ed
03/06	13	XI/ON ECO XNE-16D, figure 11, 12	✓		
	76	03/06 AWB2725-1533GB		✓	
	79	„XNE-16DI-24VDC-P"	✓		
	131	„Technical data"		✓	
	135	„XNE-16DO-24VDC-0.5A-P"	✓		
11/05	13	XI/ON ECO, figure 11	✓		
	14	XI/ON ECO, figure	✓		
	19	Column XI/ON ECO in table 3	✓		
	22	section "Description of the XI/ON-ECO modules"	✓		
	76	Value for $t_{rising\ edge}$: 100 µs		✓	
	131	Value **Current through supply terminal**: 10 mA		✓	
08/05	75	The XNE-8DI-24VDC-P module has been added	✓		
	130	The XNE-8DO-24VDC-P module has been added	✓		
	186	Examples for allocation of the process data to the terminals	✓		
	224	The properties for short-circuit proof outputs have been extended by one point	✓		

1 The XI/ON Station

Dimensions

Dimensions of electronics modules

Dimensions in mm (W × L × H)

Slice design	12.6 × 74.1	55.4
Block design	100.8 × 74.1	55.4

Dimensions of base modules

Dimensions in mm (W × L × H)

Slice design

2-/3-wire circuitry	12.6	117.6	49.9
4-wire circuitry	12.6	128.9	49.9
4 2-/3-wire circuitry	12.6	154.5	49.9

Block design

2-/3-wire circuitry	100.8	117.6	49.9
4-wire circuitry	100.8	128.9	49.9
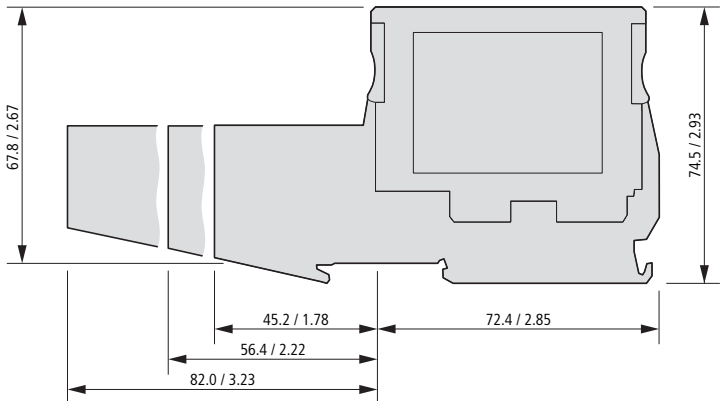
Figure 1: Side view of complete XI/ON module (with tension clamp connector)
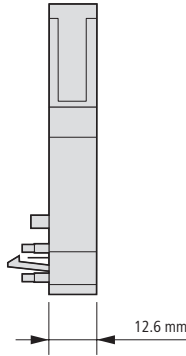
Figure 2:   Rear view of complete XI/ON module, slice design
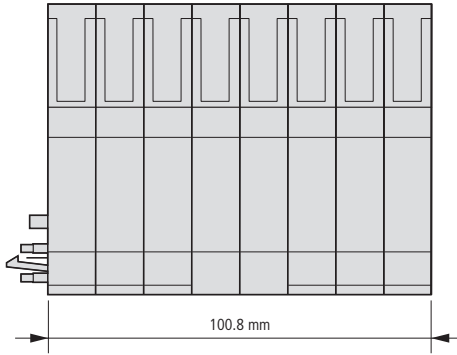
Figure 3:   Rear view of complete XI/ON module, block design
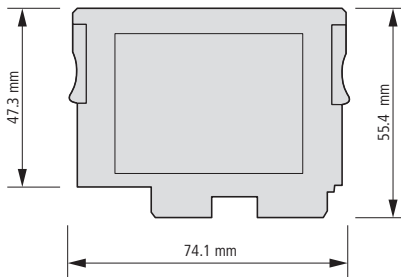
Figure 4:   Side view of electronics module

12.6 mm
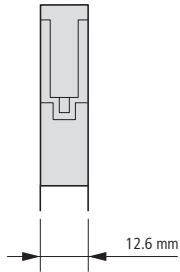
Figure 5:   Rear view of electronics module, slice design

100.8 mm
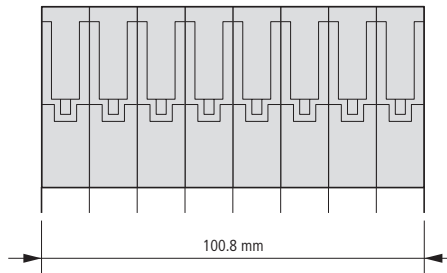
Figure 6:   Rear view of electronics module, block design

154.5 mm

128.9 mm

117.6 mm

4 x 2-/3-Leiter

4-Leiter

2-/3-Leiter

41.6 mm

49.9 mm
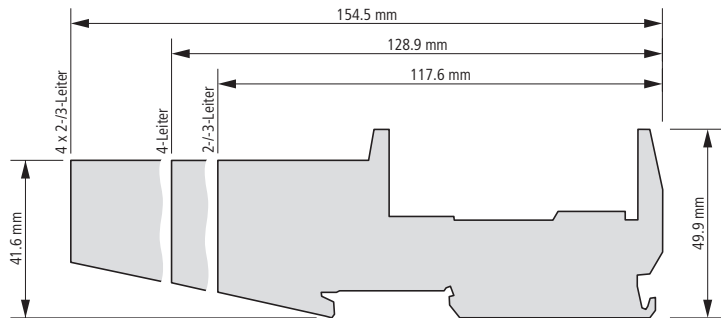
Figure 7:   Base module with tension clamp connector
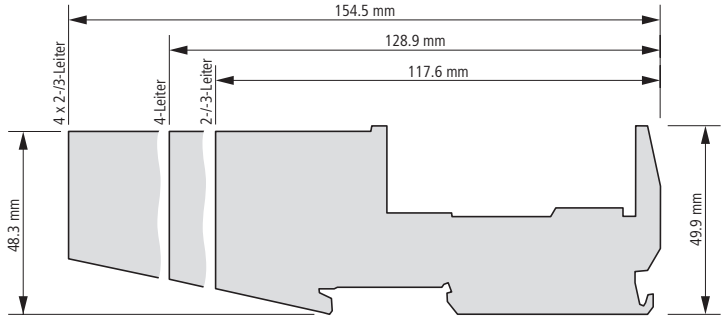
Figure 8: Base module with screw terminals
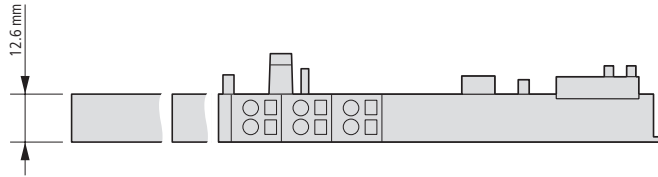
Figure 9: Plan view of base module, slice design
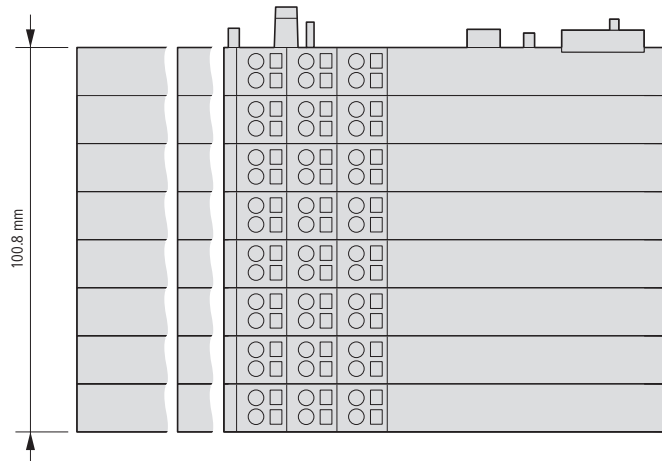
Figure 10: Plan view of base module, block design

Dimensions of ECO XNE modules
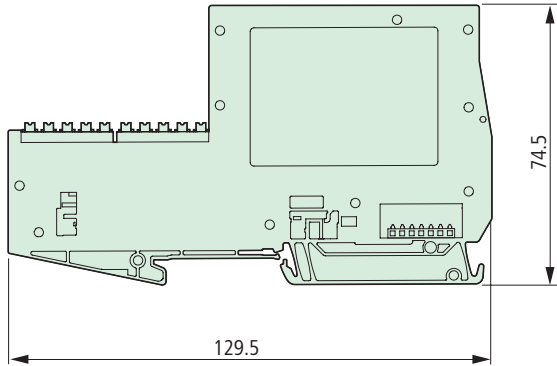
Figure 11: Side view of XI/ON ECO XNE-8D…- …
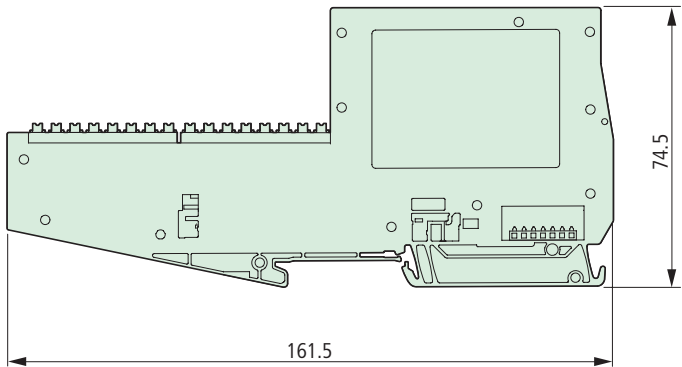
Figure 12: Side view of XI/ON ECO XNE-16D…- …
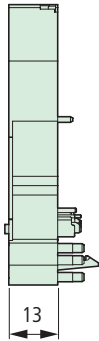
Front view of XI/ON ECO XNE-8D…-…

**Technical data for the
XI/ON station**

▽ **Attention!**
The auxiliary supply must meet the requirements for SELV
(= Safety Extra Low Voltage) as per IEC 60364-4-41.

Table 1:   Technical data for the XI/ON station

Designation	Value
Supply voltage/auxiliary supply	
Nominal value (provided for other modules)	24 V DC
Residual ripple	to EN 61131-2
Electrical isolation (U_L to U_{SYS}/ U_L to field bus/U_{SYS} to field bus)	Yes, via optocoupler
Environment/temperature	
Operating temperature, mounted horizontally	0 … +55 °C
Operating temperature, mounted vertically	0 … +55 °C
Storage temperature	-25 … +85 °C
Relative humidity as per EN 61131-2/EN 50178	5 … 95 % (indoor), Level RH-2, no condensation (storage at 45 °C, no functional test)
[2]XN enclosure rating for slice modules (possible heat dissipation)	1 W
XN-ECO enclosure rating[2] for slice modules (possible heat dissipation)	1.5 W
Enclosure rating for block modules (possible heat dissipation)	5 W

Designation	Value
Corrosive gases	
SO_2	10 ppm (rel. humidity < 75 %, no condensation)
H_2S	1.0 ppm (rel. humidity < 75 %, no condensation)
Vibration resistance	
10 … 57 Hz, constant amplitude 0.075 mm, 1 g	Yes
57 … 150 Hz, constant acceleration 1 g	Yes
Vibration type	Variable frequency runs at a rate of change of 1 octave/min
Vibration duration	20 variable frequency runs per coordinate axis
Shock resistance as per IEC 68-2-27	18 shocks, half-sine 15 g peak value/11 ms, for both +/- directions per spatial coordinate
Repeated shock resistance as per IEC 68-2-29	1000 shocks, half sine 25 g peak value/6 ms, for both +/- directions per spatial coordinate
Drop and topple	
Fall height (weight< 10 kg)	1.0 m
Fall height (weight 10 … 40 kg)	0.5 m
Test runs	7
Instrument with packaging, electronics boards electrically tested	

Designation	Value
Electromagnetic compatibility (EMC) as per EN 50082-2 (industrial)	
Static electricity as per EN 61000-4-2	
Air discharge (direct)	8 kV
Relay discharge (indirect)	4 kV
Electromagnetic HF fields as per EN 61000-4-3 and ENV 50204	10 V/m
Conducted interference, induced by HF fields as per EN 61000-4-6	10 V
Fast transients (burst) as per EN 61000-4-4	
Radiated interference as per EN 50081-2 (industrial)	to EN 55011 Class A[1], Group 1

1) Use in residential areas may lead to functional errors. Additional suppression measures are necessary!

2) XNE enclosures are one-piece enclosures. The module electronics and the connection level cannot be separated. XN enclosures are two-piece enclosures. The module electronics are located in a separate enclosure and must be inserted into a suitable base module. The vast majority of the electronics modules can be combined with two different base module types.

Table 2:   Approvals and tests for a XI/ON station

Designation	Value
Approvals	$C\epsilon$, $\circledR$, $\circledR$
Tests (EN 61131-2)	
Cold	DIN IEC 68-2-1, temperature -25 °C, Duration 96 h; device not in operation
Dry heat	DIN IEC 68-2-2, temperature +85 °C, Duration 96 h; device not in operation
Damp heat, cyclical	DIN IEC 68-2-30, temperature +55 °C, Duration 2 cycles of 12 h; device in operation
Temperature changes	DIN IEC 68-2-14, temperature 0 … +55 °C, Duration 2 cycles, temperature change per minute; device in operation
Operating life MTBF[1]	120000 h
Extraction/insertion cycles for electronics modules	20
Pollution level as per IEC 664 (EN 61131)	2
Degree of protection as per IEC 529	IP 20

1) The operational life of the relay modules is not given in hours. The relevant factor for the operational life of relay modules is the number of switching operations.
→ "Current and number of switching operations (operational life): AC15 – 250 V AC N/O contact", page 179

Technical data for the base modules

Table 3:   Technical data for the base modules

Designation	Base module	XI/ON ECO
Degree of protection	IP 20	IP 20
Stripped length	8 mm	8 mm
Max. cross-section at terminal	0.5 … 2.5 mm²	0.14 … 1.5 mm²
Conductors to be clamped		
"e" solid H 07V-U	0.5 … 2.5 mm²	0.25 … 1.5 mm²
"f" stranded H 07V-K	0.5 … 1.5 mm²	0.25 … 1.5 mm²
"f" with core-end ferrules to DIN 46228/1 (ferrules are crimped gas-tight)	0.5 … 1.5 mm²	0.25 …1.5 mm²
On AEH with plastic collars		
0.25 … 0.75 mm²"		
Finger test to IEC 947-1/1988	A1	A1
Rating data in accordance with VDE 0611 Part 1/8.92/IEC 947-7-1/1989		
Rated voltage	250 V	250 V
Rated current	17.5 A	17.5 A
Rated cross-section	1.5 mm²	1.5 mm²
Rated surge voltage	4 kV	4 kV
Pollution degree	2	2
Connection method in TOP direction	Tension spring connector or screw terminal	Tension spring connector

Designations of the base modules

XN-S3T-SBB: XI/ON
XN-S3T-SBB: **S**lice
XN-S3T-SBB: **3** connection rows
XN-S3T-SBB: **T**ension clamp
XN-S3T-SBB: **S**ingle Connectors
XN-S3T-SBB: **B**ridged Connectors
XN-S3T-SBB: **B**ridged Connectors
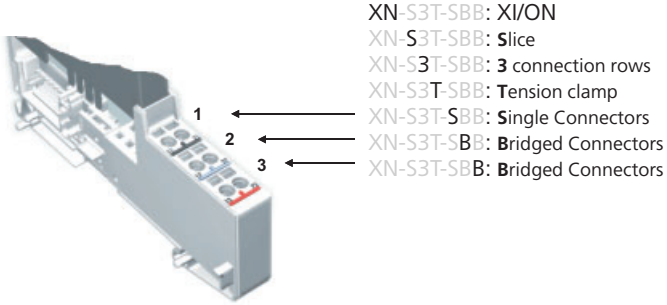
Figure 13: Example of a base module designation

Table 4: Abbreviations for base module designations

Identi-fier	Designation	Example
XN	Abbreviation for XI/ON	**XN**-B3S-SBB
B	Designation of base modules in block version (**Bloc**)	XN-**B**3S-SBB
S	Designation of base modules in slice version (**Slice**)	XN-**S**3T-SBB
P	Designation of base modules for feeding and bus refreshing modules (Power)	XN-**P**3T-SBB
3, 4, 6	Number of terminal rows.	XN-P**3**T-SBB
S	Designation of base modules with screw terminals (**Screw**)	XN-S3**S**-SBB
T	Designation of base modules with tension spring connector (**Tension Clamp**)	XN-S3**T**-SBB
x	Optionally **S** or **T** in the designation of base modules with screw or tension spring connections (**S**crew/**T**ension)	XN-S3**x**-SBB
S	Unlinked connections on the same connection level (level 1 in this case) in a base module, for connecting signals (**Single Connector**)	XN-S3T-**S**BB
B	Bridged connections on the same connection level in a base module, for voltage connections. (**Bridged Connector**)	XN-S3T-S**B**B
B	Supplement to the designation of base modules for bus refreshing modules that are used within an XI/ON station, but not for supplying the gateway. (Bus Refreshing)	XN-P4T-SBBC-**B**
C	Designation of a connection level that has a connection to a C-rail and can be used for a PE connection (only for specific base modules). (Cross Connection)	XN-S4T-SBB**C**
CJ	Base module for XN-2AI-THERMO-PI with integrated Pt1000 for cold junction compensation. (**Cold Junction Compensation**)	XN-S4T-SBBS-**CJ**

Description of the XI/ON-ECO modules

The XI/ON modules XNE-8DI-24VDC-P and XNE-8DO-24VDC-0.5A-P use direct push-in contacts different from XI/ON base modules which use spring-finger contacts. The handling with these direct push-in contacts is described in the following.

Insertion of the conductor

The conductor is simply pushed into the corresponding contact (⟶ figure 14).
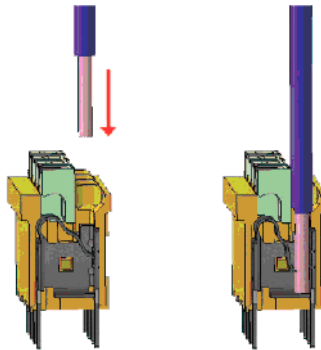
Figure 14: Insertion of the conductor

Removal of the conductor

The conductor can be removed from the corresponding
contact by pressing the release mechanism, e.g. with a screw
driver (→ figure 15).
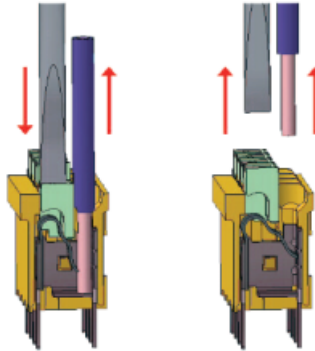
Figure 15: Removal of the conductor

→ The XI/ON-ECO modules can be easily combined with the
base modules using tension spring connection
engineering (XN-…**T**-…). A connection is not possible on
base modules using screw connection engineering
(XN-…**S**-…).
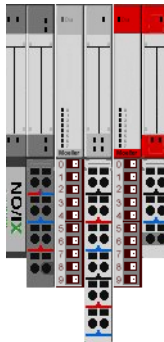
Figure 16: XI/ON-ECO modules combined with tension spring
contact modules

2 The supply modules

Bus refreshing modules   The bus refreshing modules provide:

- 5 V DC for the internal XI/ON module bus and the neighbouring gateway.
- 24 V DC (permissible range as per EN 61131-2) as the supply for the module electronics and the field. This 24 V DC supply voltage is distributed throughout the XI/ON station ($\longrightarrow$ "Internal connections in an XI/ON station", page 48) as a separate cable.

They are electrically isolated from the adjacent supply group on the left.

$\bigtriangledown$ **Attention!**
The first bus refreshing module in an XI/ON station must be fitted immediately to the right of the gateway (without an individual power supply), so that, in conjunction with a special base module ($\longrightarrow$ "Base module for XN-BR-24VDC-D (supplies a previous XI/ON gateway)", page 30), the 5 V DC supply voltage to the gateway is ensured.

The use of supply modules means that it is not necessary to make individual connections of the field and/or system supply voltage to each individual XI/ON I/O-module.

Depending on the application, potential groups can thus be formed by the planned use of supply modules. Supply modules are built in the slice form. They are completed by base modules with tension spring connectors or screw terminals. The ash-grey cover of the base modules for supply modules makes them stand out against the base modules for the XI/ON I/O-modules.

LED indicators
The error and diagnostics messages are provided by the indicator LEDs of the module. The corresponding diagnostics information is also transmitted to the gateway as diagnostics bits.

XN-BR-24VDC-D

Figure 17: Electronics module, bus refreshing module, with diagnostics
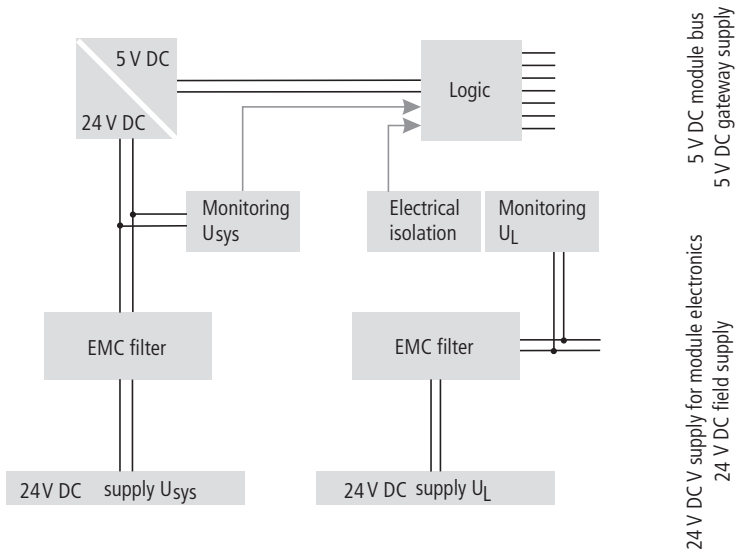
Figure 18: Block diagram

Technical data

Table 5:   XN-BR-24VDC-D

Designation	Value
Nominal voltages U_{Sys} and U_L	24 V DC
Supply U_{sys} (externally provided)	24 V DC (18 … 30 V DC)
Supply (internally converted): • Gateway supply • Module bus supply	5 V DC (4.7 … 5.3 V DC)
Supply U_L (externally provided and internally filtered): • Supply for module electronics • Field supply	24 V DC (18 … 30 V DC)
Ripple	< 5 %
Residual ripple, to	EN 61131-2
Maximum operating current I_{EI}	10 A
Mixumum system supply current I_{MB}	1.5 A

The diagnostics functions monitor the supply voltages that have to be provided by the user (system and field supplies) for undervoltage. They indicate any error through the **DIA** LED and send corresponding diagnostics information to the gateway.

Diagnostic messages

The module features the following diagnostics data:

Table 6:   Diagnostics through the LEDs

BR
24Vdc D
■ DIA
■ Vcc

■ Sys
■ U$_L$
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LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Fault in field supply U_L or system supply U_{sys}	Check the wiring of the system supply for the module bus and the field supply. Check that the voltages of the system supply and the field supply are within the permissible tolerances.
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed. Check the wiring of the system supply for the module bus.
	OFF	No fault indication or diagnostics	–
Vcc	Green	5 Vcc supply voltage for module bus is OK	–
	OFF	5 Vcc supply voltage for module bus has a fault	Check the voltage and the wiring for the system supply.
Sys	Green	System supply from external power supply is OK.	–
	OFF	System supply from external power supply has a fault.	Check the wiring of the system supply. Check the external power supply.
U$_L$	Green	Field supply from external power supply is OK.	–
	OFF	Field supply from external power supply has a fault.	Check the wiring of the field supply. Check the external power supply.

- Module bus voltage warnng
  Monitoring of the externally provided system supply
  voltage (U_{sys} = 24 V DC). The system supply is converted
  (24 V DC => 5 V).
- Field voltage missing
  Monitoring of the externally provided field supply voltage.
  U_L = 24 V DC

Base modules
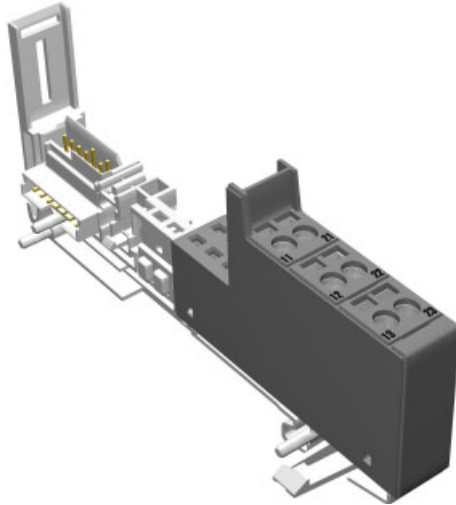
Figure 19: Base module for XN-BR-24VDC-D (supplies a previous XI/ON gateway)

Designation of base module with supply for the XI/ON gateway

with tension clamp connectors	XN-P3T-SBB XN-P4T-SBBC
With screw terminal	XN-P3S-SBB XN-P4S-SBBC
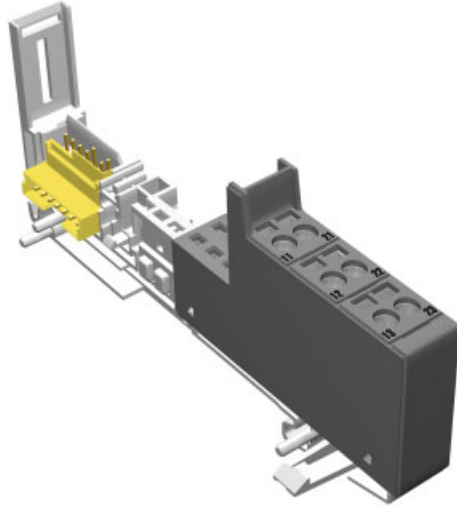
Figure 20: Base module for XN-BR-24VDC-D (does **not** supply a previous XI/ON gateway)

Designation of base module without supply for the XI/ON gateway

with tension clamp connectors	XN-P3T-SBB-B XN-P4T-SBBC-B
With screw terminal	XN-P3S-SBB-B XN-P4S-SBBC-B

Attention!
Only the base modules XN-P3x-SBB or XN-P4x-SBBC can be used to supply a gateway (without an integrated supply unit). The bus refreshing module is to be found immediately to the right of the gateway.

The base modules with or without gateway supply can be distinguished as follows.
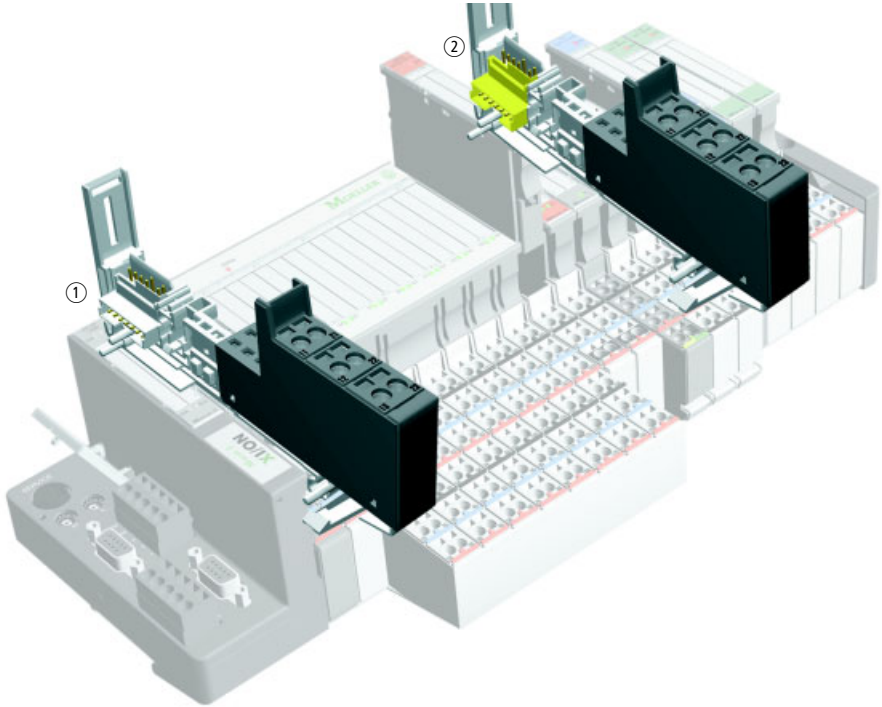
Figure 21: Assignment of the base modules

① Base module with gateway supply: light grey connection
② Base module without gateway supply: yellow connection

Connection diagrams

24 V DC
Module bus supply
+ = −

24 V DC
Field
supply
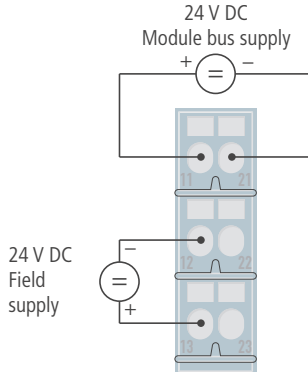
Figure 22: Connection diagram for
XN-P3x-SBB with gateway supply
XN-P3x-SBB-B without gateway supply

24 V DC
Module bus supply
+ = −

24 V DC
Field
supply

PE
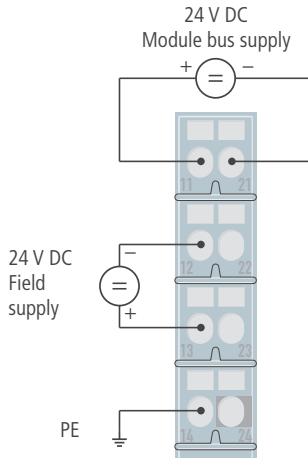
Figure 23: Connection diagram for
XN-P4x-SBBC with gateway supply
XN-P4x-SBBC-B without gateway supply

Power feed (Power Feeding modules)	The Power Feeding modules are used to supply the various XI/ON modules with the field voltage of 24 V DC or 120/230 V AC. They are used when different potential groups need to be set up within an XI/ON station, or in the event that the supply would otherwise be inadequate for the rated current requirements of the XI/ON modules. They are electrically isolated from the adjacent supply group on the left.

Warning!
Power feeding modules cannot be used to provide the 5 V DC supply for the XI/ON gateway.

The use of Power Feeding modules means that it is not necessary to provide a supply feed to each individual XI/ON module.

Power Feeding modules are built in the slice form. They are completed by base modules with tension spring connectors or screw terminals.

The ash-grey cover of the base modules for power feeding modules make them clearly distinguishable from the base modules for the XI/ON I/O modules.

LED indicators
The error and diagnostics messages are provided by the various LEDs on the module. The corresponding diagnostics information is transmitted to the gateway as diagnostics bits.

Module overview
XN-PF-24VDC-D
XN-PF-120/230VAC-D

XN-PF-24VDC-D

Figure 24: Electronics module: Power Feeding module, 24 V DC, with diagnostics
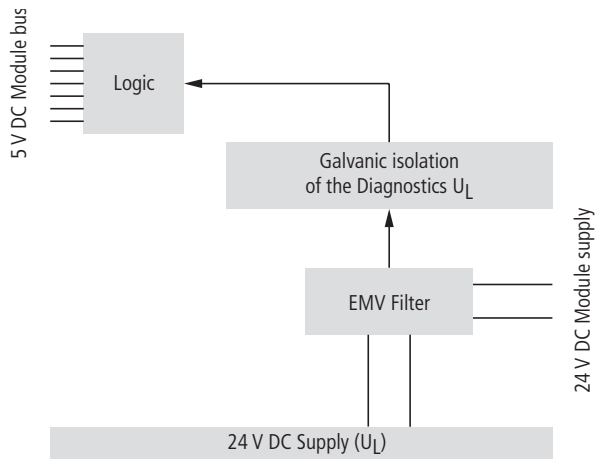
Figure 25: Block diagram

Technical data

Table 7:   XN-PF-24VDC-D

Designation	Value
Rated voltage	24 V DC (18 … 30 V DC)
Supply U_L • Supply for module electronics • Field supply	24 V DC (18 … 30 V DC)
Nominal current from module bus I_{MB} (maximum)	28 mA
Ripple	< 5 %
Residual ripple, to	EN 61131-2
Maximum operating current I_{EI}	10 A
Voltage disturbances, to	EN 61000-4-11/EN 61131-2

Diagnostic messages

The diagnostics functions monitor the field supply voltage provided by the user for undervoltage. They indicate any error through the **DIA** LED and send corresponding diagnostics information to the gateway.

Table 8:   Diagnostics through the LEDs

PF
24Vdc D
■ DIA

■ U_L
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LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	Check the wiring of the field supply. Check that the voltages of the field supply are within the permissible tolerances.
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
U_L	Green	Field supply from external power supply is OK.	–
	OFF	Field supply from external power supply has a fault.	Check the wiring of the field supply. Check the external power supply.

The module features the following diagnostics data:

• Field voltage missing
  Monitoring of the externally provided field supply voltage.
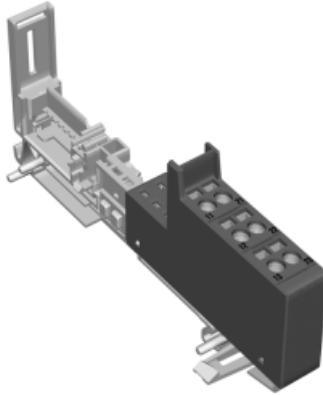
Base modules

Figure 26: Base module XN-P3T-SBB
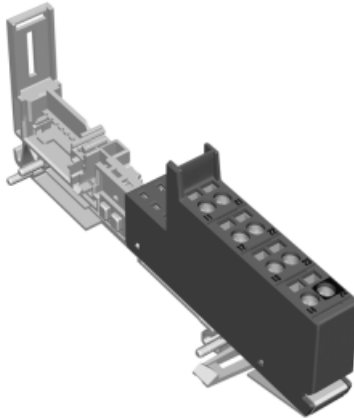
Figure 27: Base module XN-P4T-SBBC

Designation	
with tension clamp connectors	XN-P3T-SBB XN-P4T-SBBC
With screw terminal	XN-P3S-SBB XN-P4S-SBBC

Connection diagrams
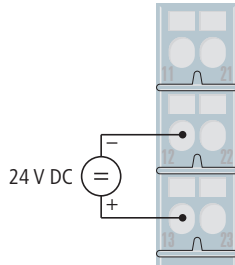
Figure 28: Connection diagram XN-P3x-SBB
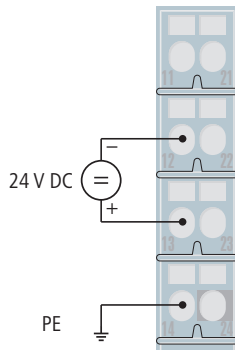
Figure 29: Connection diagram XN-P4x-SBBC

XN-PF-120/230VAC-D   The following modules must be supplied from a preceding
                          XN-PF-120/230VAC-D:

- XN-2DI-120/230VAC
- XN-2DO-120/230VAC-0,5A

> **Caution!**
> Relay modules must **not** be supplied from a preceding
> XN-PF-120/230VAC-D
> The nominal voltage at the supply terminals is 24 V DC ($\triangleq$
> coil voltage)!
> The relay modules can be externally loaded by up to
> 230 V AC ($\triangleq$ contact voltage).
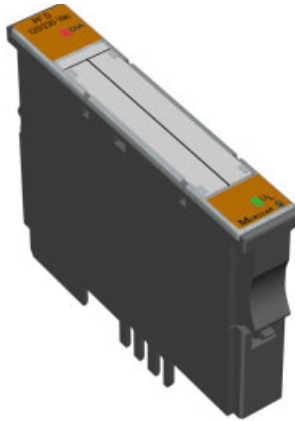
Figure 30: Electronics module: Power Feeding module,
            120/230 V AC, with diagnostics
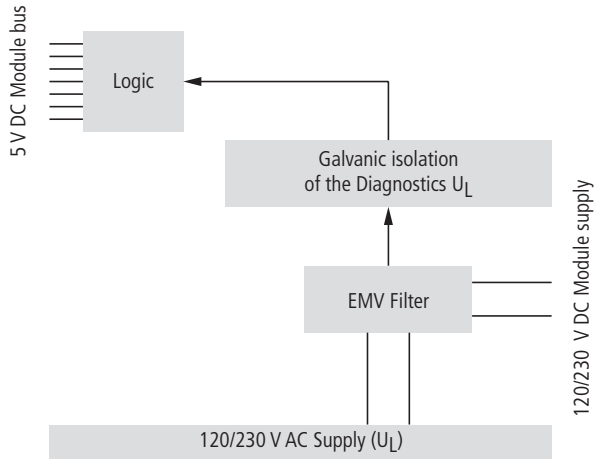
Figure 31: Block diagram

Technical data
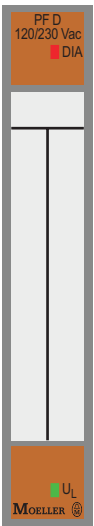
Table 9: XN-PF-120/230VAC-D

Designation	Value
Nominal voltage (permissible range as per EN 61131-2)	120 V AC (102 … 132 V AC) 230 V AC (195.5 … 253 V AC)
Supply U_L (permissible range as per EN 61131-2) • Supply for module electronics • Field supply	120 V AC (102 … 132 V AC) 230 V AC (195.5 … 253 V AC)
Nominal current from module bus I_{MB}	$\leqq$ 25 mA
Ripple	< 5 %
Residual ripple, to	EN 61131-2
Maximum operating current I_{EI}	10 A
Voltage disturbances, to	To EN 61000-4-11/EN 61131-2

Diagnostic messages

The diagnostics functions monitor the field supply voltage provided by the user for undervoltage. They indicate any error through the **DIA** LED and send corresponding diagnostics information to the gateway.

Table 10: Diagnostics through the LEDs

PF D
120/230 Vac
■ DIA

■ U$_L$
MOELLER ⊕

LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	Check the wiring of the field supply. Check that the voltages of the field supply are within the permissible tolerances.
	Red, blinking, 0.5 Hz and LED U$_L$ OFF	The field voltage in outside the permissible range. The permissible range for the field suply voltage: ➞ "Nominal voltage (permissible range as per EN 61131-2)", page 42	Check the wiring of the field supply. Check the external power supply or external supply feed.
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
U$_L$	Green	Field voltage is present from external feed	–
	OFF	Field voltage from external feed is missing	Check the wiring of the field supply. Check the external power supply or external supply feed.

The module features the following diagnostics data:

• Field voltage missing
Monitoring of the externally provided field supply voltage.
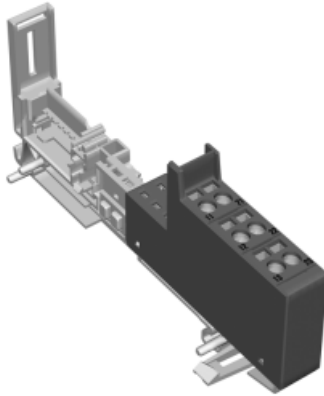
Base modules

Figure 32: Base module XN-P3T-SBB
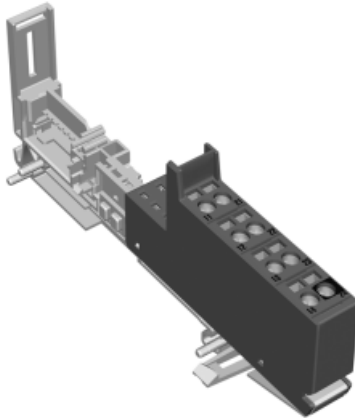
Figure 33: Base module XN-P4T-SBBC

Designation	
with tension clamp connectors	XN-P3T-SBB XN-P4T-SBBC
With screw terminal	XN-P3S-SBB XN-P4S-SBBC

Connection diagrams

Figure 34: Connection diagram XN-P3x-SBB

Figure 35: Connection diagram XN-P4x-SBBC

→ "Technical data for the base modules", page 19

Overview: Base modules for supply modules

Tension spring connector

Electronics modules	XN-S3T-SBB	XN-S3T-SBC	XN-S4T-SBBC	XN-S4T-SBBS	XN-S4T-SBCS	XN-S4T-SBBS-CJ	XN-S6T-SBBSBB	XN-B3T-SBB	XN-B3T-SBC	XN-B4T-SBBC	XN-P3T-SBB	XN-P3T-SBB-B	XN-P4T-SBBC	XN-P4T-SBBC-B
XN-BR-24VDC-D											●1)	●2)	●1)	●2)
XN-PF-24VDC-D											●		●	
XN-PF-120/230VAC-D											●		●	

1) Base modules for the gateway supply
2) Base module for bus refreshing within the stations

Screw terminals

Electronics modules Supply	XN-S3S-SBB	XN-S3S-SBC	XN-S4S-SBBC	XN-S4S-SBBS	XN-S4S-SBCS	XN-S4S-SBBS-CJ	XN-S6S-SBBSBB	XN-B3S-SBB	XN-B3S-SBC	XN-B4S-SBBC	XN-P3S-SBB	XN-P3S-SBB-B	XN-P4S-SBBC	XN-P4S-SBBC-B
XN-BR-24VDC-D											●1)	●2)	●1)	●2)
XN-PF-24VDC-D											●		●	
XN-PF-120/230VAC-D											●		●	

1) Base modules for the gateway supply
2) Base module for bus refreshing within the stations

Supply modules in a sample station

The following diagram shows various potential groups within an XI/ON station. The 24 V DC or 230 V AC voltage is fed in through the internal supply cable (——➤ "Internal connections in an XI/ON station", page 48):
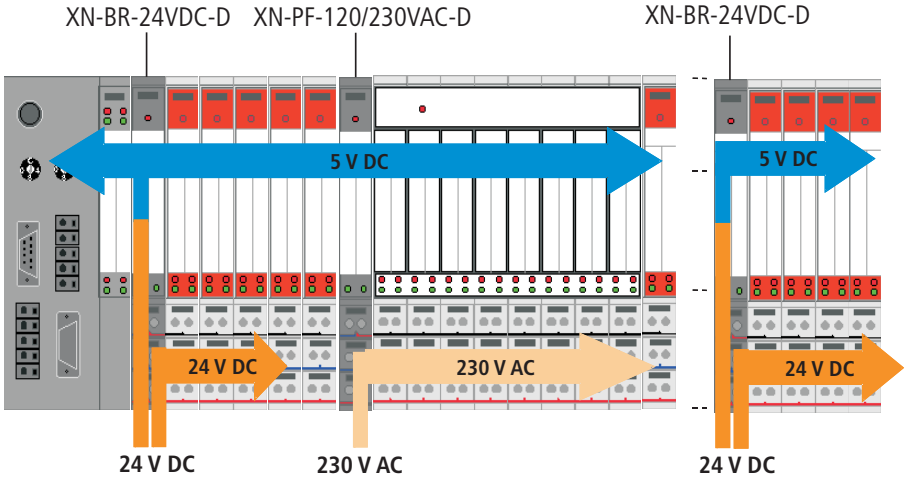
Basismodule
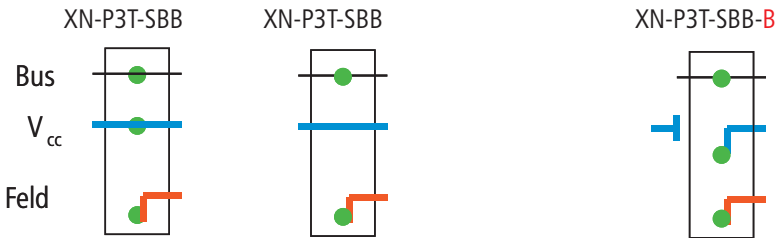
Figure 36: Potential groups in a sample station

Internal connections in an XI/ON station

The following diagram shows the internal data and supply cables for an XI/ON station:
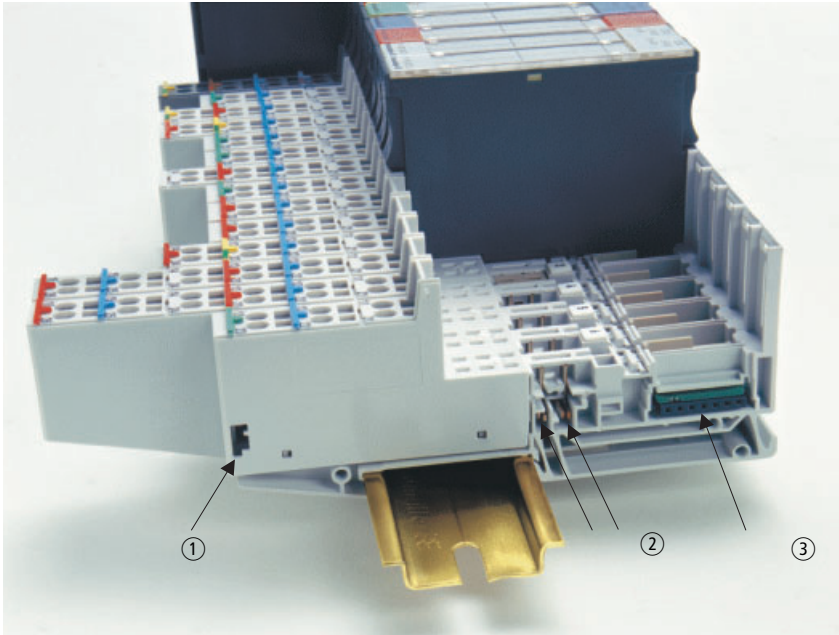
Figure 37: Internal connections in an XI/ON station

① This type of connection is known as a C-rail, and is led through all the base modules to the next supply module. All modules with a C in the designation have an electrical connection to the C-rail (e.g. XN-S4T-SB**C**S). The connections to the C-rail are marked by a black edge. The C-rail can be used as a protective earth (PE), or can have a maximum potential of 24 V.

② These connections provide the supply voltage U_L. The supply voltage U_L is used for the field supply, and also as a supply for the module electronics. The majority of XI/ON modules require this 24 V DC supply in addition to the 5 V DC module bus voltage.

③ This 7-core module bus connection includes the 5 V DC module bus voltage as well as the data cables.

3 Digital input modules

Digital input modules (DI) detect electrical High (**1**) and Low (**0**) levels through the connections on the base module, and transmit the corresponding digital value to the gateway, via the internal module bus.

The electronics on the module bus side of the digital input modules is electrically isolated from the field level by optocouplers. Polarity reversal protection is also provided.

Digital input modules are built in both slice and block designs. They are completed by base modules with tension spring connectors or screw terminals.

There are no parameter setting options for the digital input modules.

LED indicators
The channel status is indicated by the status LED. Error messages from the I/O level are made on a module basis, through the collective **DIA** indicator LED.

If the **DIA** LED is permanently red, this indicates that the module bus communication for the digital input module has failed.

Table 11: Module summary

	No. of channels	**Positive switching**
XN-2DI-24VDC-P	2	j
XN-2DI-24VDC-N	2	
XN-2DI-120/230VAC	2	-
XN-4DI-24VDC-P	4	j
XN-4DI-24VDC-N	4	
XN-16DI-24VDC-P	16	j
XN-32DI-24VDC-P	32	j

XN-2DI-24VDC-P

Figure 38: Electronics module, digital input module, 2DI, 24 V DC, positive switching
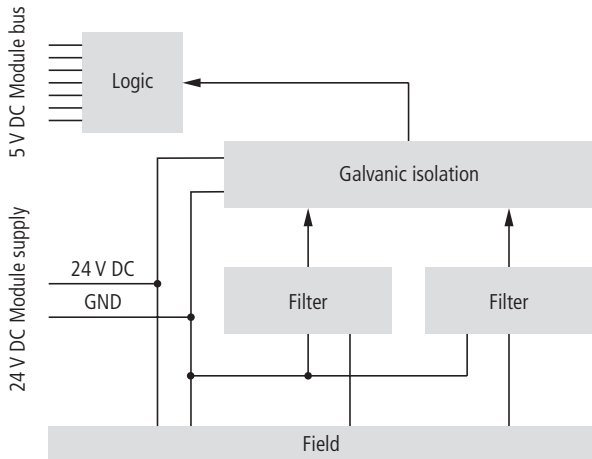
Figure 39: Block diagram

Technical data

Table 12: XN-2DI-24VDC-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply via supply terminal[2] (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA[1]
Number of channels	2
Input signal S	
Low level (range)	−30 V … +5 V
Current range for detection of a Low level	0 mA … 1.5 mA
High level (range)	11 V DC … 30 V DC
Current range for detection of a High level	2 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 200 µs
$t_{falling\ edge}$	< 200 µs

2-wire initiators (Bero®) with a permissible quiescent current of 1.5 mA can be connected.

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 13: Diagnostics through the LEDs

```
2DIp
24Vdc
 ■ DIA



11 ■ ■ 21

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```

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

Base modules

Figure 40: Base module XN-S3T-SBB
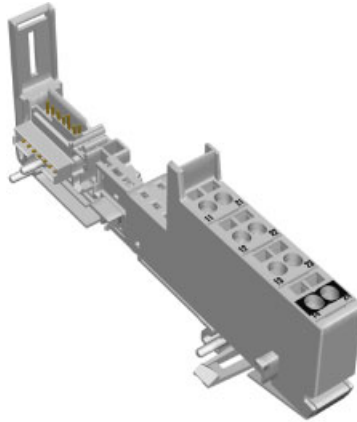
Figure 41: Base module XN-S4T-SBBC

Designation	
with tension clamp connectors	XN-S3T-SBB XN-S4T-SBBC
With screw terminal	XN-S3S-SBB XN-S4S-SBBC

Connection diagrams
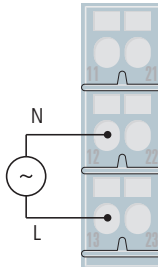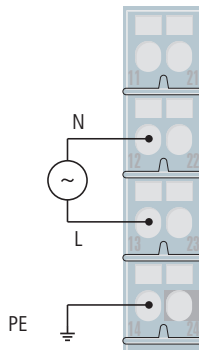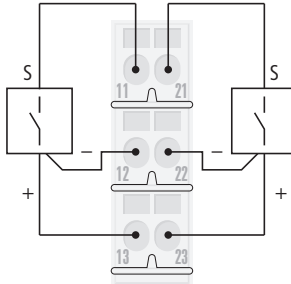

Figure 42: Connection diagram XN-S3x-SBB
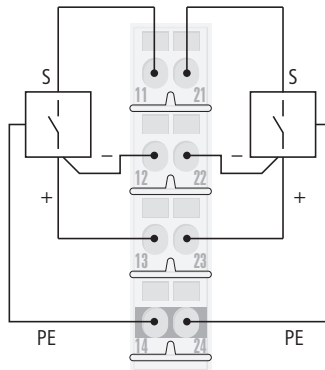
Figure 43: Connection diagram XN-S4x-SBBC

→ "Technical data for the base modules", page 19

XN-2DI-24VDC-N

Figure 44: Electronics module, digital input module, 2DI, 24 V DC, negative switching
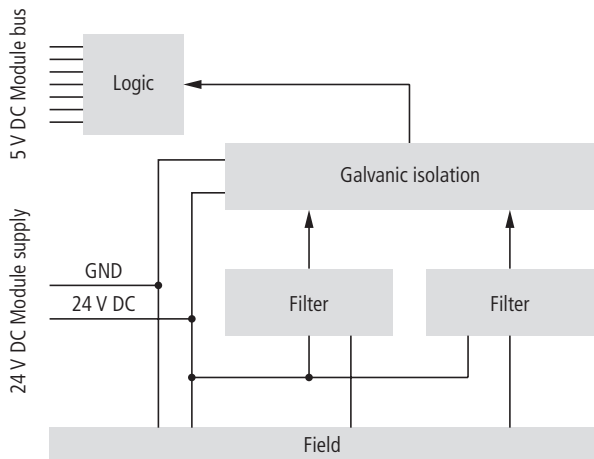
Figure 45: Block diagram

Technical data

Table 14: XN-2DI-24VDC-N

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA[1]
Number of channels	2
Input signal S	
Low level (range)	30 V … (U_L – 11 V)
Current range for detection of a Low level	0 mA … 1.7 mA
High level (range)	0 V … 5 V
Current range for detection of a High level	1.8 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 200 µs
$t_{falling\ edge}$	< 200 µs

2-wire initiators (Bero®) with a permissible quiescent current of 1.5 mA can be connected.

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
   The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 15:   Diagnostics through the LEDs

2DIn
24Vdc
■ DIA

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

11 ■ ■ 21

MOELLER ⓡ

Base modules

Figure 46: Base module XN-S3T-SBB
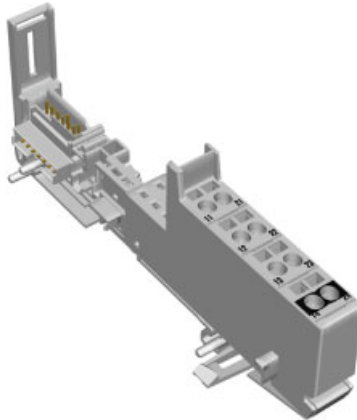
Figure 47: Base module XN-S4T-SBBC

Designation	
with tension clamp connectors	XN-S3T-SBB XN-S4T-SBBC
With screw terminal	XN-S3S-SBB XN-S4S-SBBC

Connection diagrams
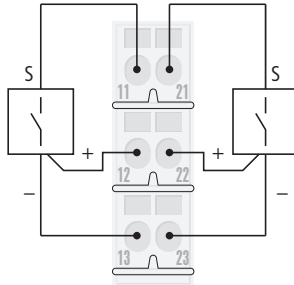
Figure 48: Connection diagram XN-S3x-SBB
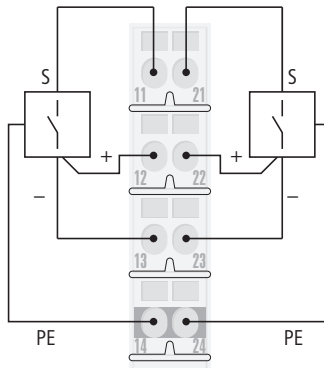
Figure 49: Connection diagram XN-S4x-SBBC

→ "Technical data for the base modules", page 19

XN-2DI-120/230VAC

Figure 50: Electronics module, digital input module, 2DI, 120/230 V AC
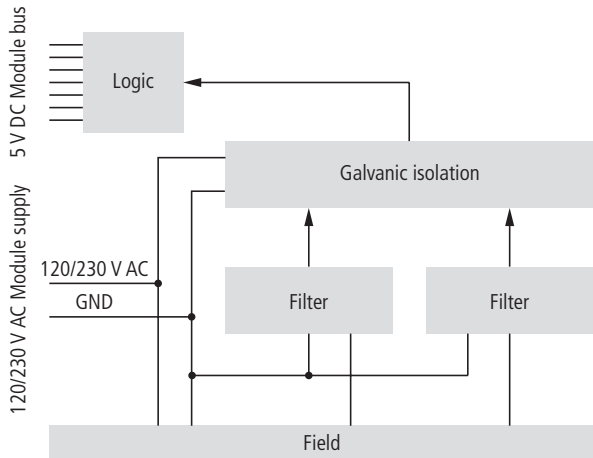
Figure 51: Block diagram

Technical data

Table 16: XN-2DI-120/230VAC

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L	120/230 V AC
Current through supply terminal (for supply to the module electronics/max.)	20 mA[1]
Number of channels	2
Input signal S	
Low level (range)	0 V AC … 20 V AC
Current range for detection of a Low level	0 mA … 1 mA
High level (range)	79 V AC … 265 V AC
Current range for detection of a High level	3 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 20 ms
$t_{falling\ edge}$	< 20 ms
Maximum permissible cable capacitance	141 nF at 79 V AC/50 Hz 23 nF at 265 V AC/50 Hz

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 17:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

2DIp
120/230Vac
DIA

11 21

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Base modules

Figure 52: Base module XN-S3T-SBB
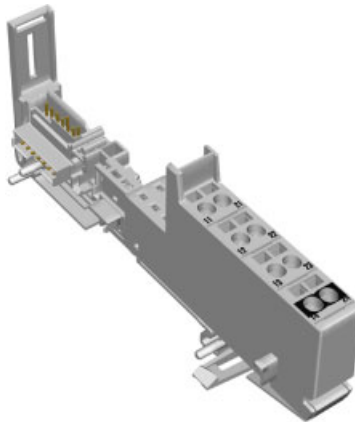
Figure 53: Base module XN-S4T-SBBC

Designation	
with tension clamp connectors	XN-S3T-SBB XN-S4T-SBBC
With screw terminal	XN-S3S-SBB XN-S4S-SBBC

Connection diagrams
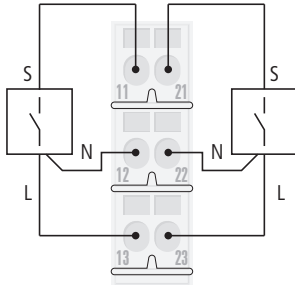
Figure 54: Connection diagram XN-S3x-SBB
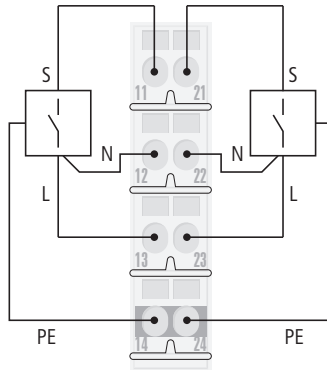
Figure 55: Connection diagram XN-S4x-SBBC

→ "Technical data for the base modules", page 19

XN-4DI-24VDC-P

Figure 56: Electronics module, digital input module, 4DI, 24 V DC, positive switching
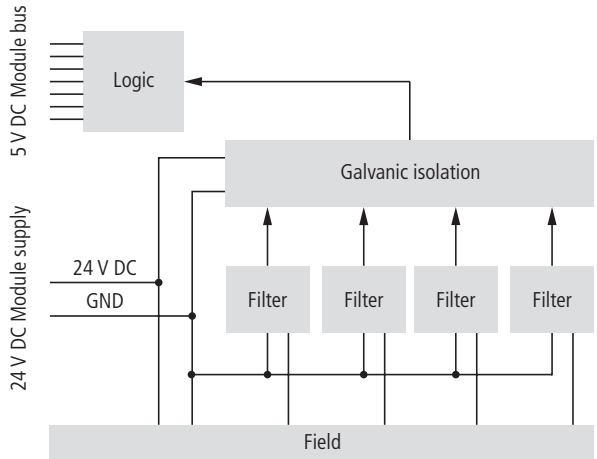
Figure 57: Block diagram

Technical data

Table 18: XN-4DI-24VDC-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	29 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	40 mA[1]
Number of channels	4
Input signal S	
Low level (range)	−30 V … +5 V
Current range for detection of a Low level	0 mA … 1.5 mA
High level (range)	15 V … 30 V
Current range for detection of a High level	2 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 200 μs
$t_{falling\ edge}$	< 200 μs

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
   The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 19:   Diagnostics through the LEDs

4DIp
24Vdc
■ DIA

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–
14	Green	Status of channel 3 = **1**	–
	OFF	Status of channel 3 = **0**	–
24	Green	Status of channel 4 = **1**	–
	OFF	Status of channel 4 = **0**	–

11 ■ ■ 21
14 ■ ■ 24
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Base modules

Figure 58: Base module XN-S4T-SBBS

Designation

with tension clamp connectors	XN-S4T-SBBS
With screw terminal	XN-S4S-SBBS
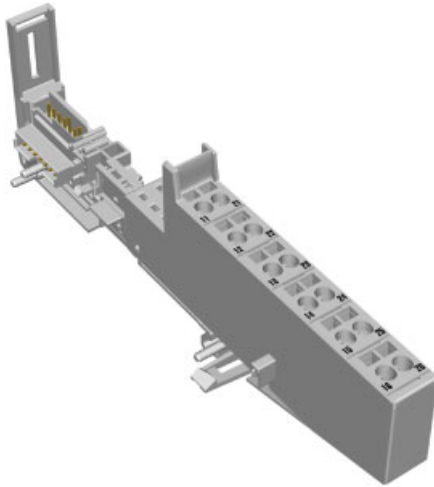
Figure 59: Base module XN-S6T-SBBSBB

Designation

with tension clamp connectors	XN-S6T-SBBSBB
With screw terminal	XN-S6S-SBBSBB

Connection diagrams
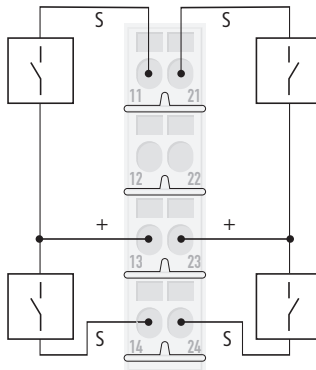
Figure 60: Connection diagram XN-S4x-SBBS
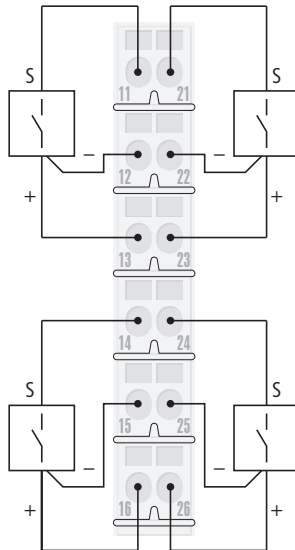
Figure 61: Connection diagram XN-S6x-SBBSBB

XN-4DI-24VDC-N

Figure 62: Electronics module, digital input module, 4DI, 24 V DC, negative switching
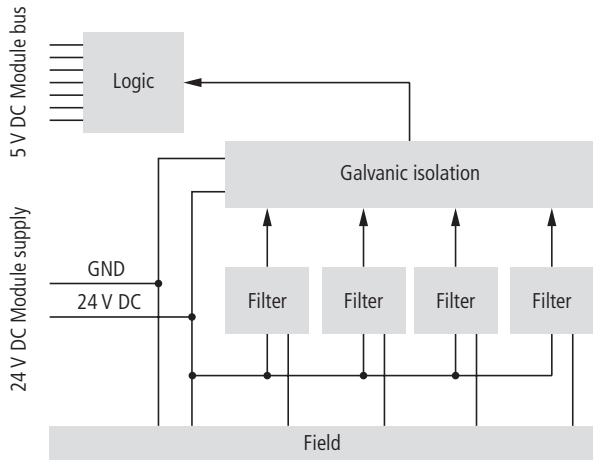
Figure 63: Block diagram

Technical data

Table 20: XN-4DI-24VDC-N

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	40 mA[1]
Number of channels	4
Input signal S	
Low level (range)	30 V … (U_L – 11 V)
Current range for detection of a Low level	0 mA … 1.2 mA
High level (range)	0 V … 5 V
Current range for detection of a High level	1.3 mA … 6 mA
Input delay	
$t_{rising\ edge}$	< 200 μs
$t_{falling\ edge}$	< 200 μs

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
   The overall current that is required for each module is given by the sum of all the individual currents.
2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 21: Diagnostics through the LEDs

```
4DIn
24Vdc
   ■DIA




11 ■ ■ 21
14 ■ ■ 24
MOELLER ®
```

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–
14	Green	Status of channel 3 = **1**	–
	OFF	Status of channel 3 = **0**	–
24	Green	Status of channel 4 = **1**	–
	OFF	Status of channel 4 = **0**	–

Base modules
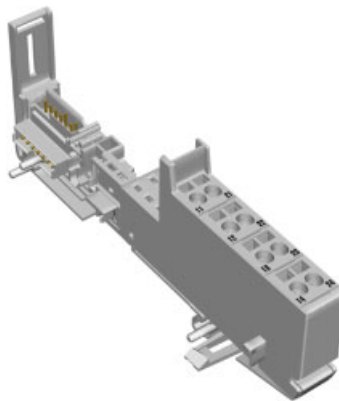
Figure 64: Base module XN-S4T-SBBS

Designation

with tension clamp connectors	XN-S4T-SBBS
With screw terminal	XN-S4S-SBBS
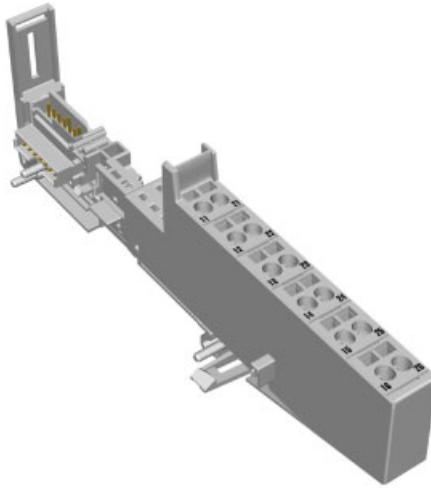
Figure 65: Base module XN-S6T-SBBSBB

Designation

| with tension clamp connectors	XN-S6T-SBBSBB
With screw terminal	XN-S6S-SBBSBB

Connection diagrams
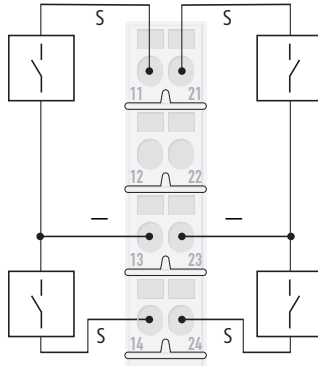
Figure 66: Connection diagram XN-S4x-SBBS
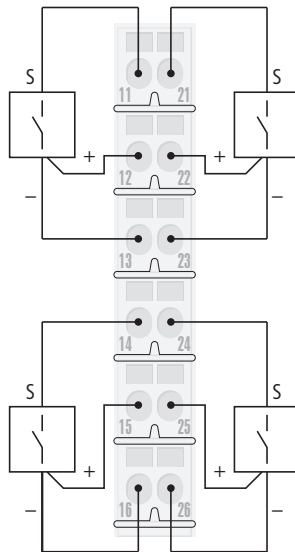
Figure 67: Connection diagram XN-S6x-SBBSBB

→ "Technical data for the base modules", page 19

XNE-8DI-24VDC-P

Figure 68: Digital input module, 8DI, electrically isolated, switching to + pole
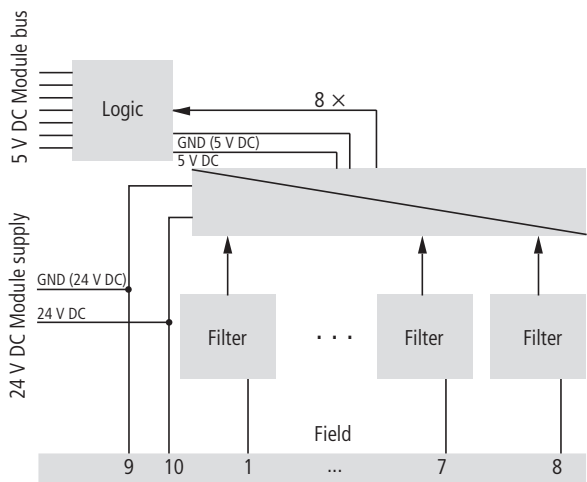
Figure 69: Block diagram

Technical data

Table 22: XNE-8DI-24VDC-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	15 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics – the inputs are switched off – maximum)	1.5 mA[1]
Input signal S	
Low level (range)	$-U_L$ … 5 V
Current range for detection of a Low level	–1 mA … 1.5 mA
High level (range)	11 V … U_L
Current range for detection of a High level	2 mA … 5 mA
Input delay	
$t_{rising\ edge}$	< 100 µs
$t_{falling\ edge}$	< 200 µs
Simultaneity factor	100 %
Insulation voltage (module bus to channels)	500 V_{eff}

1) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 23: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	–
1 … 8	Green	Status of channel: **1**	–
	OFF	Status of channel: **0**	–

8DIp
24Vdc
DIA

1
2
3
4
5
6
7
8

MOELLER

Connection diagram

Figure 70: Connection diagram XNE-8DI-24VDC-P
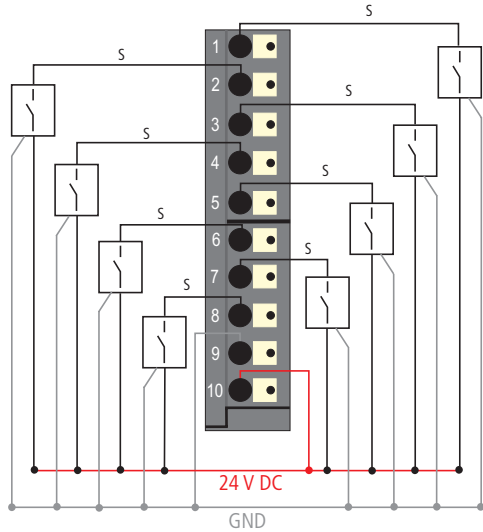
Figure 71: Connection diagram XNE-8DI-24VDC-P with power supply of the sensors

XNE-16DI-24VDC-P
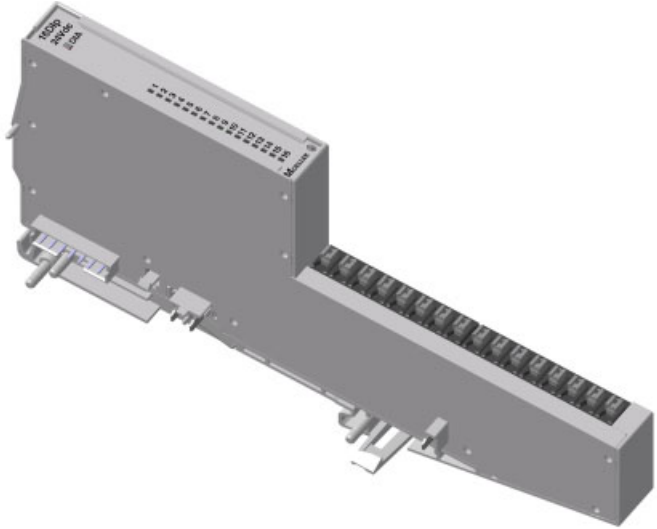
Figure 72:   Digital input module, 16DI, electrically isolated, switching to + pole
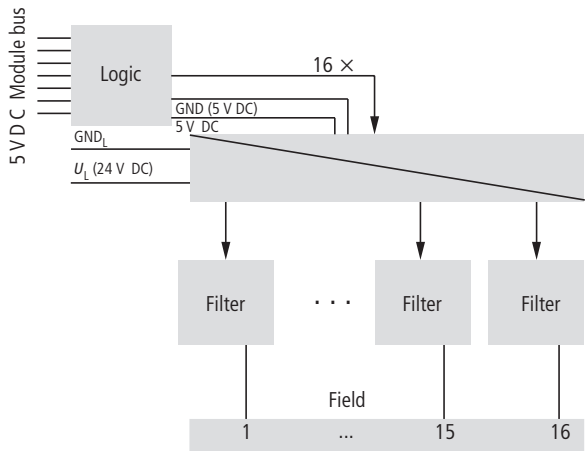
Figure 73:   Block diagram

Technical data

Table 24:   XNE-16DI-24VDC-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	15 mA
Module supply[2] via supply terminal (U_L)[1]	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics – the inputs are switched off – maximum)	3 mA[1]
Input signal S	
Low level (range)	$-U_L$ … 5 V
Current range for detection of a Low level	−1 mA … 1.5 mA
High level (range)	11 V … U_L
Current range for detection of a High level	2 mA … 5 mA
Input delay	
$t_{rising\ edge}$	< 150 µs
$t_{falling\ edge}$	< 300 µs
Simultaneity factor	100 %
Insulation voltage (module bus to channels)	500V_{eff}

1) The supply terminal (U_L) provides the current for the module electronics and for the initiators. The electrical connection for power supply of the switching elements U_L must be modular externally supplied.
The overall current that is required for each module is the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostics messages

Table 25: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 neighbouring electronics modules have been removed.
	OFF	No error message	–
1 … 16	Green	Status of channel: **1**	–
	OFF	Status of channel: **0**	–

16 Dlp
24 Vdc
DIA

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

MOELLER

Connection diagram
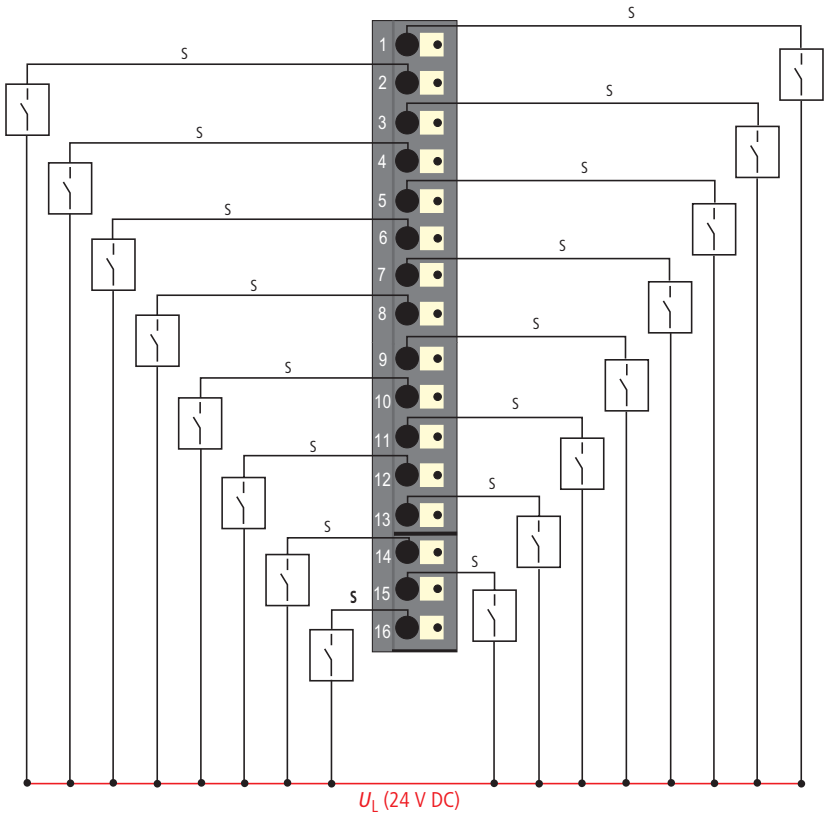
Figure 74:   Connection diagram XNE-16DI-24VDC-P
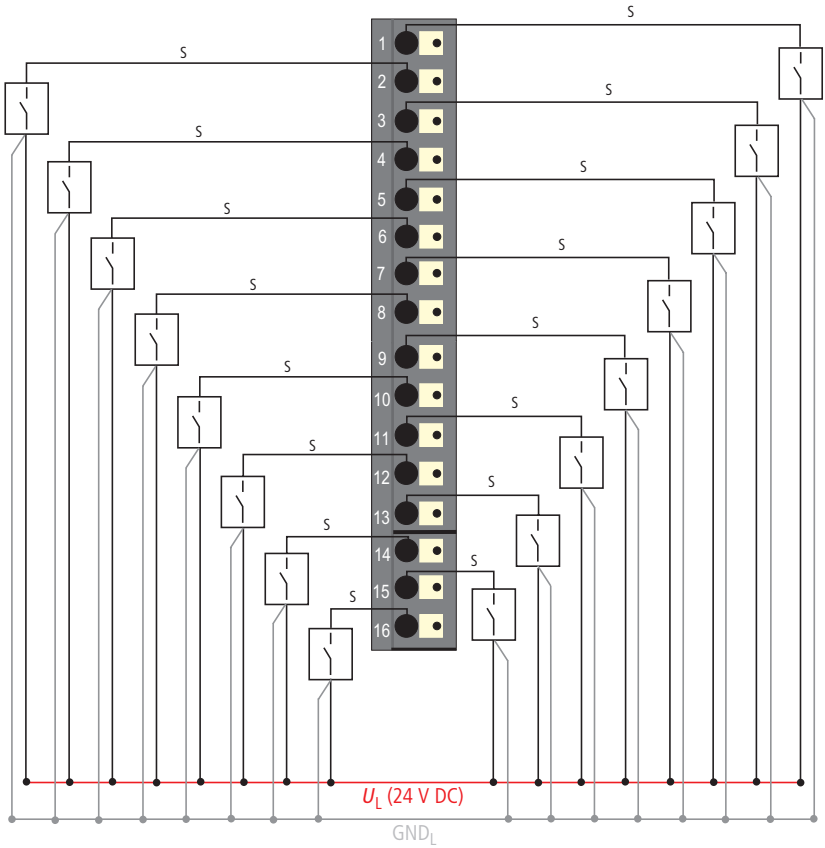
Figure 75: Connection diagram XNE-16DI-24VDC-P with power
supply of the sensors

XN-16DI-24VDC-P

Figure 76: Electronics module, digital input module, 16DI,
24 V DC, positive switching
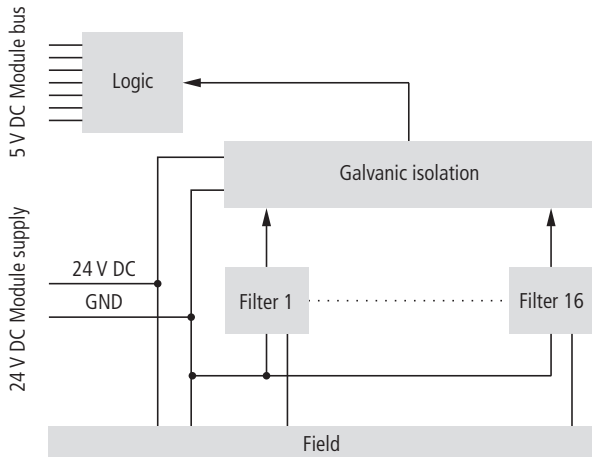
Figure 77: Block diagram

Technical data

Table 26: XN-16DI-24VDC-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	45 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	40 mA[1]
Number of channels	16
Input signal S	
Low level (range)	−30 V … +5 V
Current range for detection of a Low level	0 mA … 1.5 mA
High level (range)	15 V … 30 V
Current range for detection of a High level	2 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 200 µs
$t_{falling\ edge}$	< 200 µs

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
   The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 27: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

LED	Display	Meaning	Remedy
31	Green	Status of channel 3 = **1**	–
	OFF	Status of channel 3 = **0**	–
…			
161	Green	Status of channel 16 = **1**	–
	OFF	Status of channel 16 = **0**	–

Base modules
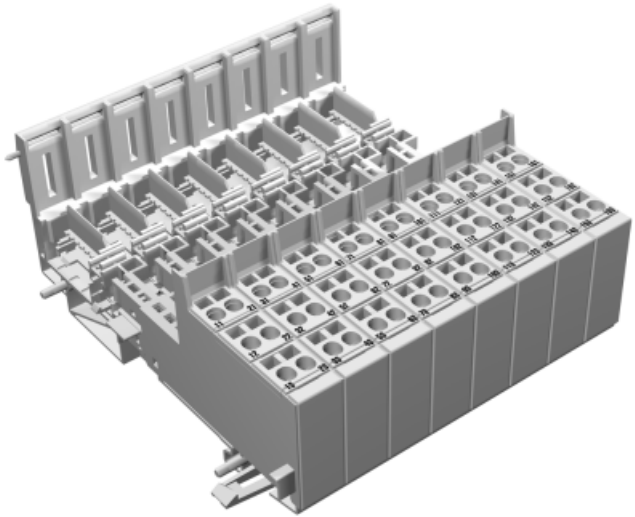
Figure 78: Base module XN-B3T-SBB
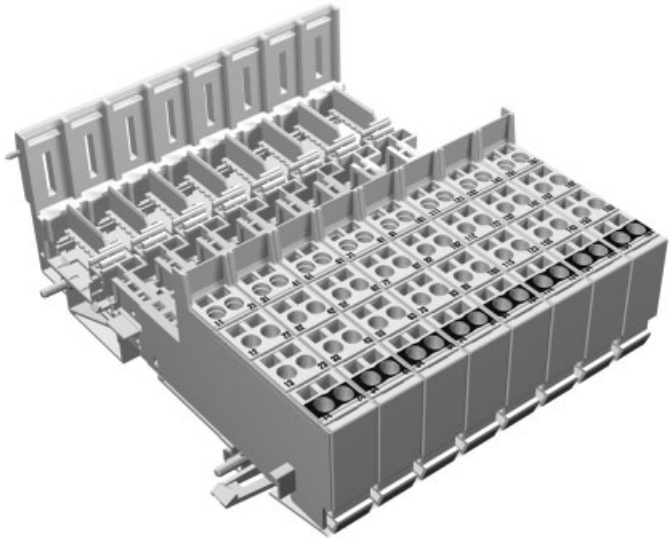
Figure 79: Base module XN-B4T-SBBC

Designation	
with tension clamp connectors	XN-B3T-SBB XN-B4T-SBBC
With screw terminal	XN-B3S-SBB XN-B4S-SBBC

Connection diagrams
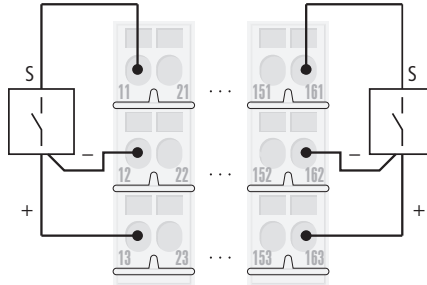
Figure 80: Connection diagram XN-B3x-SBB

Figure 81: Connection diagram XN-B4x-SBBC

→ "Technical data for the base modules", page 19

XN-32DI-24VDC-P

Figure 82: Digital input module, 32DI, 24 V DC, positive switching
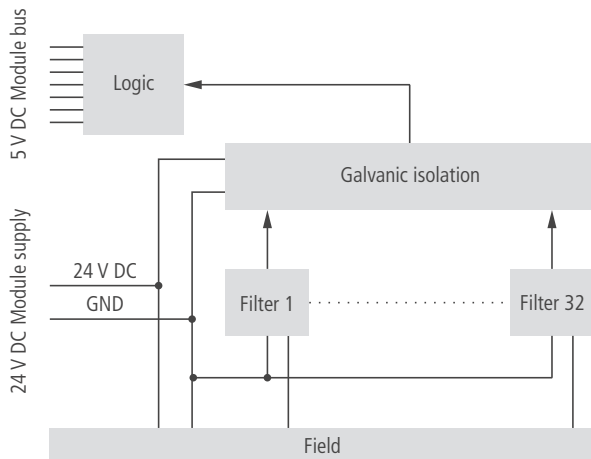
Figure 83: Block diagram

Technical data

Table 28:   XN-32DI-24VDC-P

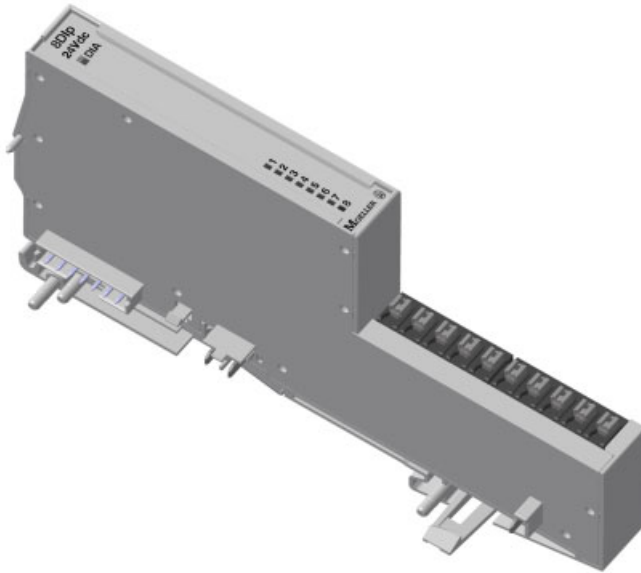| Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	30 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	30 mA[1]
Number of channels	32
Input signal S	
Low level (range)	-30 V … +5 V
Current range for detection of a Low level	0 mA … 1.5 mA
High level (range)	15 V … 30 V
Current range for detection of a High level	2 mA … 10 mA
Input delay	
$t_{rising\ edge}$	< 200 µs
$t_{falling\ edge}$	< 200 µs

1) The supply terminal (U_L) provides the current for the module electronics and for the sensors on the inputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 29: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
…			
161	Green	Status of channel 16 = **1**	–
	OFF	Status of channel 16 = **0**	–
14	Green	Status of channel 17 = **1**	–
	OFF	Status of channel 17 = **0**	–
…			
164	Green	Status of channel 32 = **1**	–
	OFF	Status of channel 32 = **0**	–

Base modules
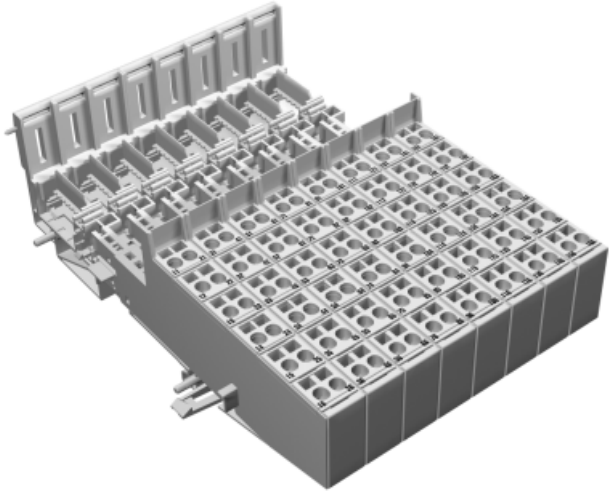
Figure 84: Base module XN-B6T-SBBSBB

Designation	
with tension clamp connectors	XN-B6T-SBBSBB
With screw terminal	XN-B6S-SBBSBB

Connection diagram
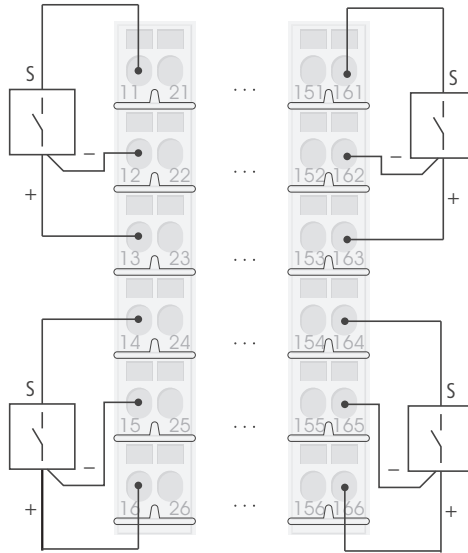
Figure 85: Connection diagram XN-B6x-SBBSBB

→ "Technical data for the base modules", page 19

**Overview: Base modules
for digital input modules**   **Tension spring connector**

Electronics modules Digital input	Base modules XN-S3T-SBB	XN-S3T-SBC	XN-S4T-SBBC	XN-S4T-SBBS	XN-S4T-SBCS	XN-S4T-SBBS-CJ	XN-S6T-SBBSBB	XN-S6T-SBCSBC	XN-B3T-SBB	XN-B3T-SBC	XN-B4T-SBBC	XN-B6T-SBBSBB	XN-P3T-SBB	XN-P3T-SBB-B	XN-P4T-SBBC	XN-P4T-SBBC-B
XN-2DI-24VDC-P	●		●													
XN-2DI-24VDC-N	●		●													
XN-2DI-120/230VAC-P	●		●													
XN-4DI-24VDC-P				●			●									
XN-4DI-24VDC-N				●			●									
XN-16DI-24VDC-P									●		●					
XN-32DI-24VDC-P												●				

Screw terminals

Electronics modules / Digital input	Base modules XN-S3S-SBB	XN-S3S-SBC	XN-S4S-SBBC	XN-S4S-SBBS	XN-S4S-SBCS	XN-S4S-SBBS-CJ	XN-S6S-SBBSBB	XN-S6S-SBCSBC	XN-B3S-SBB	XN-B3S-SBC	XN-B4S-SBBC	XN-B6S-SBBSBB	XN-P3S-SBB	XN-P3S-SBB-B	XN-P4S-SBBC	XN-P4S-SBBC-B
XN-2DI-24VDC-P	●		●													
XN-2DI-24VDC-N	●		●													
XN-2DI-120/230VAC	●		●													
XN-4DI-24VDC-P							●									
XN-4DI-24VDC-N							●									
XN-16DI-24VDC-P									●		●					
XN-32DI-24VDC-P												●				

4   Digital output modules

Digital output modules (DO) receive output values from the gateway via the internal module bus. The modules convert the values and output the corresponding Low (**0**) or High (**1**) values through the base module to the field level.

The outputs are implemented according to EN 61131-2.

The electronics on the module bus side of a digital output module is electrically isolated from the field level by optocouplers.

Digital output modules are built in both slice and block designs. They are completed by base modules with tension spring connectors or screw terminals.

There are no parameter setting options for the digital output modules.

LED indicators
The channel status is indicated by the status LED. Error messages from the I/O level are made on a module basis, through the collective **DIA** indicator LED. The corresponding diagnostics information is transmitted to the gateway as diagnostics bits.

If the **DIA** LED is permanently red, this indicates that the module bus communication for the digital output module has failed.

Attention!
External suppression components should be fitted when using inductive loads.

Table 30:   Module summary

	No. of channels	Positive switching	Output current, max.	Electrically isolated
XN-2DO-24VDC-0.5A-P	2	✓	0.5 A	✓
XN-2DO-24VDC-0.5A-N	2	–	0.5 A	✓
XN-2DO-24VDC-2A-P	2	✓	2A	✓
XN-4DO-24VDC-0.5A-P	4	✓	0.5 A	✓
XN-16DO-24VDC-0.5A-P	16	✓	0.5 A	✓
XN-32DO-24VDC-0.5A-P	32	✓	0.5 A	✓
XN-2DO-120/230VAC-0.5A	2	–	0.5 A	✓

XN-2DO-24VDC-0.5A-P

Figure 86: Digital output module, 2DO, 0.5 A, electrically isolated, positive switching
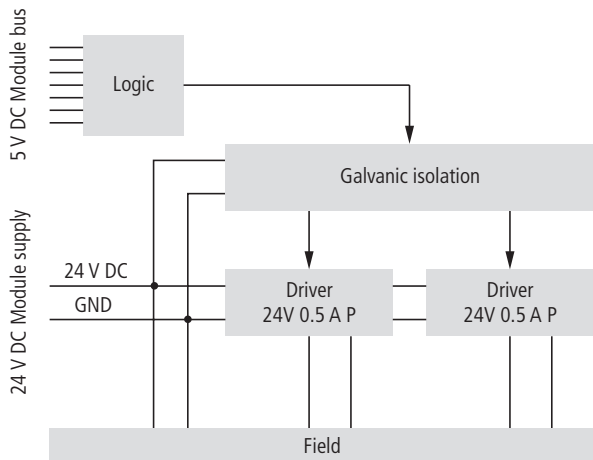
Figure 87: Block diagram

Technical data

Table 31: XN-2DO-24VDC-0.5A-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	32 mA
Module supply via supply terminal[2] (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA[1]
Outputs	
Number of channels	2
Output voltage (the output is switched on and loaded)	$U_L - 1$ V DC
Output current (to supply the actuators/the output is switched on)[2]	
Nominal value	0.5 A
Permissible value	< 0.6 A[1]
Simultaneity factor	100 %
Output delay for signal change and resistive load (48 Ω … 1kΩ)	
from Low to High level (typical)	100 µs
from High to Low level (typical)	100 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 3 W
Switching frequency	
Resistive load ($R_{LO} < 1$ kΩ)	< 5 kHz
Lamp load	10 Hz
Insulation voltage (fieldbus to channels)	500 V_{eff}

Designation	Value
short-circuit proof, to	EN 61131-2, $\longrightarrow$ page 224
protected, to	EN 61131-2, $\longrightarrow$ page 223
Restart after removal of a short-circuit	Automatic

1) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 32: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	–
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

The module features the following diagnostics data per channel:

• **Overcurrent** (short-circuit)

Base modules

Figure 88: Base module XN-S3T-SBC
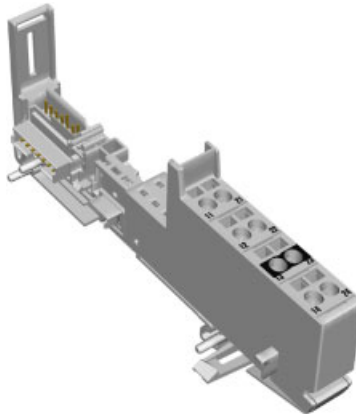
Figure 89: Base module XN-S4T-SBCS

| **Designation**	
with tension clamp connectors	XN-S3T-SBC XN-S4T-SBCS
With screw terminal	XN-S3S-SBC XN-S4S-SBCS

Connection diagrams
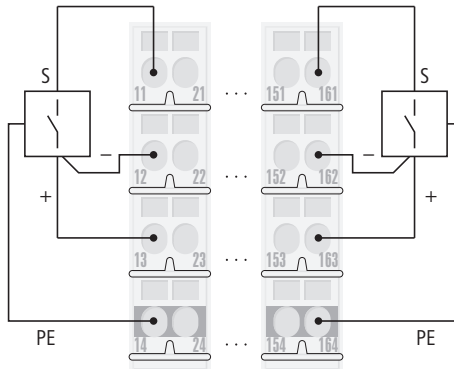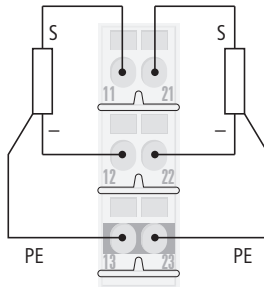

Figure 90: Connection diagram XN-S3x-SBC

Figure 91: Connection diagram XN-S4x-SBCS

→ "Technical data for the base modules", page 19

XN-2DO-24VDC-0.5A-N
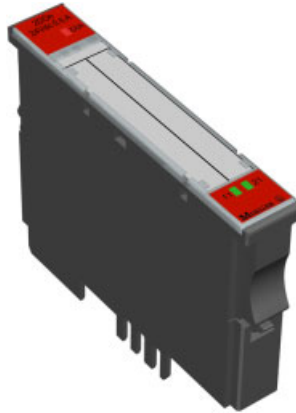
Figure 92: Digital output module, 2DO, 0.5 A, electrically isolated, negative switching
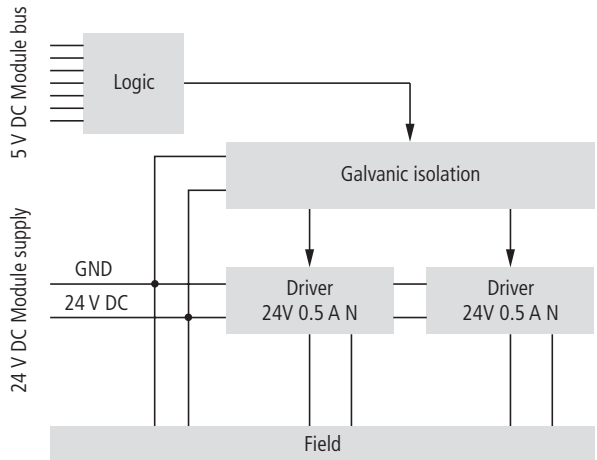
Figure 93: Block diagram

Technical data

Table 33:   XN-2DO-24VDC-0.5A-N

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	32 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA[1]
Outputs	
Number of channels	2
Output voltage Output voltage (the output is switched on and loaded)	U_L-1 V DC
Output current (to supply the actuators/the output is switched on)	
Nominal value	0.5 A
Permissible value	< 0.6 A[1]
Simultaneity factor	100 %
Output delay for signal change and resistive load (48 Ω … 1kΩ)	
from Low to High level (typical)	100 µs
from High to Low level (typical)	100 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 12 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 100 Hz
Inductive load	< 2 Hz
Lamp load	< 10 Hz

Designation	Value
Insulation voltage (fieldbus to channels)	500 V_{eff}
short-circuit proof, to	EN 61131-2, → page 224
Restart after removal of a short-circuit	Automatic

1) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 34: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	–
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

The module features the following diagnostics data per channel:

• **Overcurrent** (short-circuit)

2DOn
24Vdc 0.5 A
DIA

11 21

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Base modules

Figure 94: Base module XN-S3T-SBC
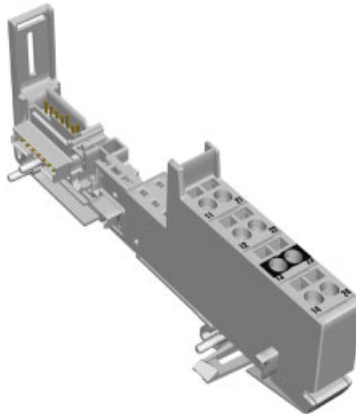
Figure 95: Base module XN-S4T-SBCS

Designation	
with tension clamp connectors	XN-S3T-SBC XN-S4T-SBCS
With screw terminal	XN-S3S-SBC XN-S4S-SBCS

Connection diagrams
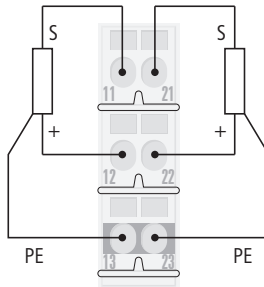
Figure 96: Connection diagram XN-S3x-SBC
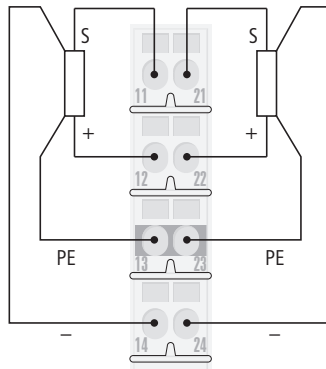
Figure 97: Connection diagram XN-S4x-SBCS

$\longrightarrow$ "Technical data for the base modules", page 19

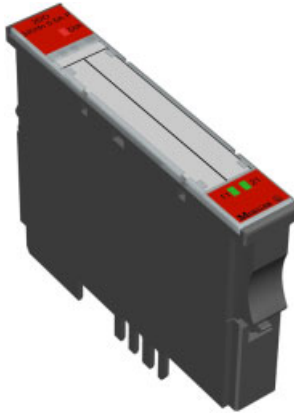**XN-2DO-24VDC-2A-P**
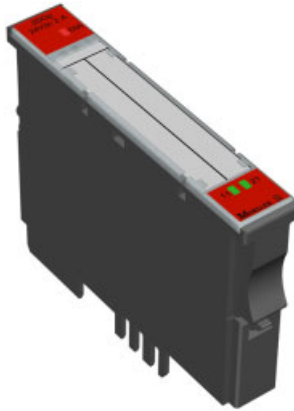
Figure 98: Digital output module, 2DO, 2 A, electrically isolated, positive switching
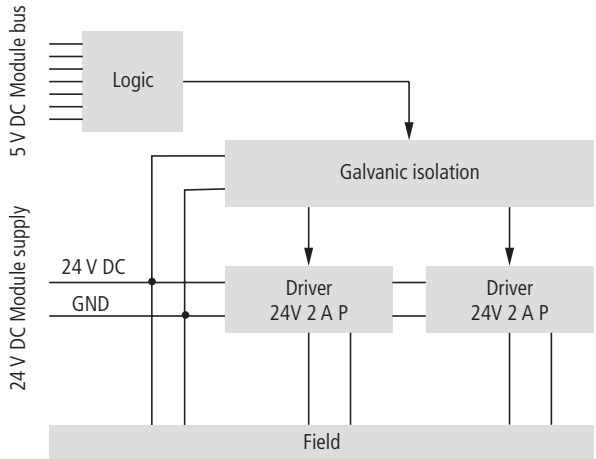
Figure 99: Block diagram

Technical data

Table 35: XN-2DO-24VDC-2A-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	33 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	50 mA[1]
Outputs	
Number of channels	2
Output voltage Output voltage (the output is switched on and loaded)	$U_L – 1$ V DC
Output current (to supply the actuators/the output is switched on)	
Nominal value	2A
Permissible value	< 2.4 A[1]
Value for inductive load (1.2 H)	< 1 A
Simultaneity factor	100 %
Output delay for signal change and resistive load (12 Ω … 1 kΩ)	
from Low to High level (typical)	100 µs
from High to Low level (typical)	100 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 12 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 6 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 5 kHz
Lamp load	10 Hz

Designation	Value
Insulation voltage (fieldbus to channels)	500 V$_{eff}$
protected, to	EN 61131-2, $\longrightarrow$ page 223
Restart after removal of a short-circuit	Automatic

1) The supply terminal (U$_L$) provides the current for the module electronics and for the consumers on the outputs.
   The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U$_L$).

Diagnostic messages

Table 36:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	–
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

2DOp
24Vdc 2 A
DIA

11   21

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The module features the following diagnostics data per channel:

• **Overcurrent** (short-circuit)

Base modules

Figure 100:Base module XN-S3T-SBC
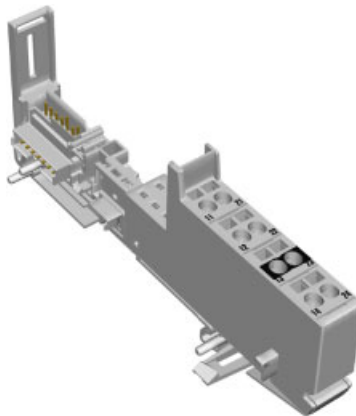
Figure 101:Base module XN-S4T-SBCS

Designation	
with tension clamp connectors	XN-S3T-SBC XN-S4T-SBCS
With screw terminal	XN-S3S-SBC XN-S4S-SBCS

Connection diagrams
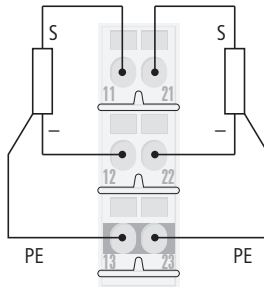
Figure 102:Connection diagram XN-S3x-SBC

Figure 103:Connection diagram XN-S4x-SBCS

→ "Technical data for the base modules", page 19

XN-2DO-120/230VAC-0.5A
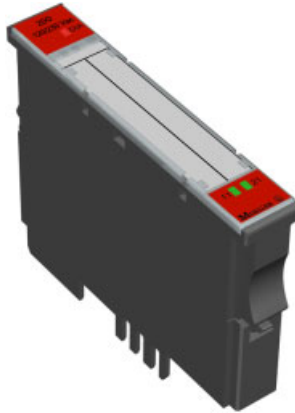
Figure 104: Digital output module, 2DO, 120/230 V AC
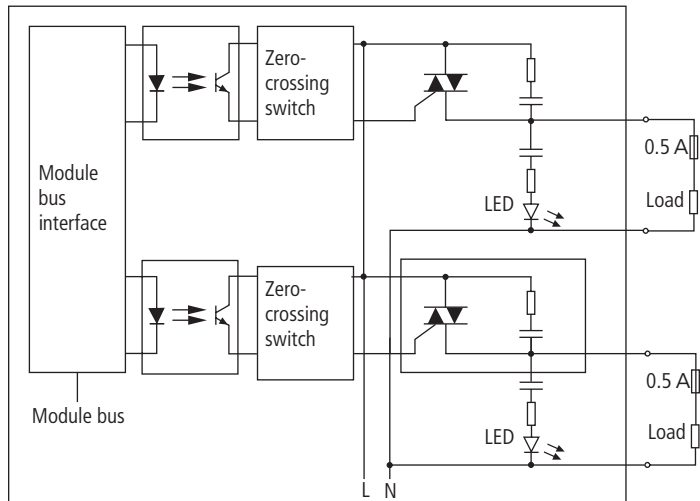
Figure 105: Circuit diagram XN-2DO-120/230VAC-0.5A

Technical data

Table 37: XN-2DO-120/230VAC-0.5A

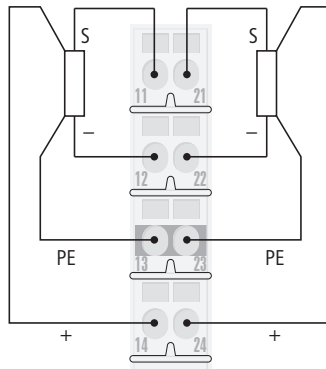| Designation	Value
Module supply[3] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	35 mA
Module supply[3] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L	120 … 230 VAC
Current through supply terminal (for supply to the module electronics/max.)	20 mA[2]
Frequency range	45 … 65 Hz
Outputs	
Number of channels	2
Implementation of the channels	Triac with zero-crossing switching
Voltage drop with channel switched on (max.)	2 V
Leakage current with channel switched on (max.)	1.5 mA
Leakage current with channel switched off (max.)	1.5 mA
Output current [2] (to supply the actuators/the output is switched on)	
Derating[1] at 40 °C	1 A (per channel 0.5 A)
Derating[1] at 50 °C	0.75 A (per channel 0.375 A)
Derating[1] at 55 °C	0.5 A (per channel 0.25 A)
Switch-on time	T/2 + 1 ms
Switch-off time	T/2 + 1 ms
Peak current (one period at 60 Hz)	8 A
Fusing (super-fast)	$\leqq$ 500 mA
Insulation voltage (fieldbus to channels)	500 V

1) Maximum load per channel. The outputs can be connected in parallel to increase the maximum output current.

2) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.

The overall current that is required for each module is given by the sum of all the individual currents.

3) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Leakage currents can produce a voltage at the output, even in the switched- off state. → figure page 117

Diagnostics messages
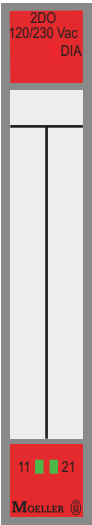
LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **ON**	–
	OFF	Status of channel 1 = **OFF**	–
21	Green	Status of channel 2 = **ON**	–
	OFF	Status of channel 2 = **OFF**	–

2DO
120/230 Vac
DIA

11   21

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Diagnostics data
None

Module parameters
None

⚠ The display elements are supplied from the field voltage (not from the module bus voltage). They will therefore only indicate the switching status correctly if this voltage is fully present on the Power Feeding module. ➔ figure 7

Base modules
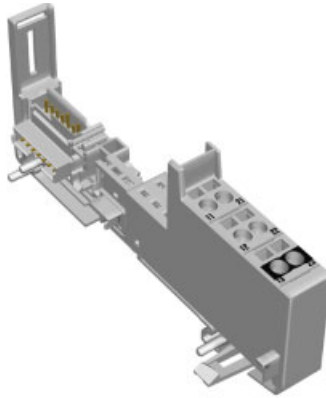
Figure 106: Base module XN-S3x-SBC
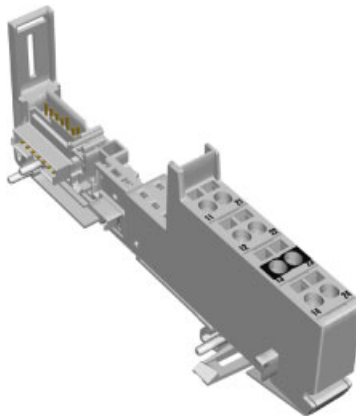
Figure 107: Base module XN-S4x-SBCS

Designation	
with tension spring connectors	XN-S3T-SBC XN-S4T-SBCS
with screw terminals	XN-S3S-SBC XN-S4S-SBCS

Connection diagrams
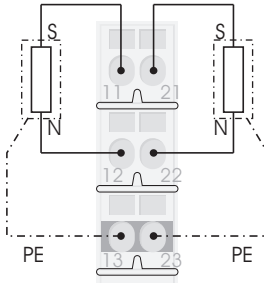
Figure 108: Connection diagram XN-S3x-SBC
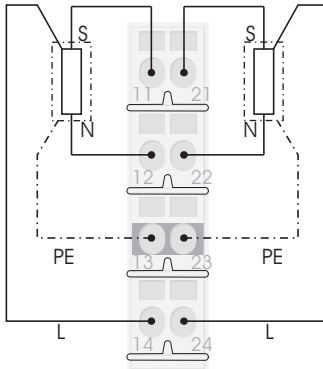
Figure 109: Connection diagram XN-S4x-SBCS

XN-4DO-24VDC-0.5A-P

Figure 110: Digital output module, 4DO, 0.5 A, electrically isolated, positive switching
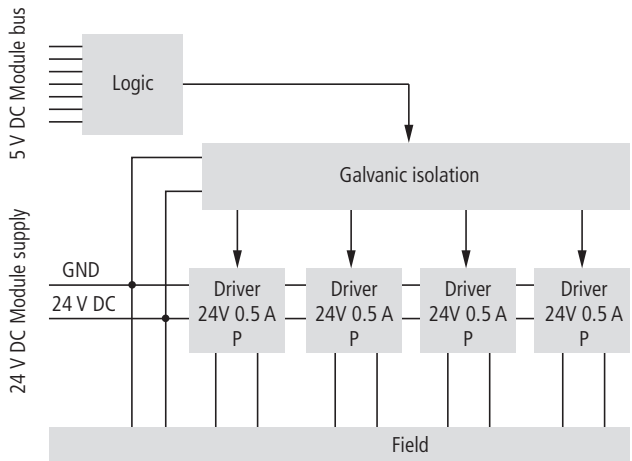
Figure 111: Block diagram

Technical data

Table 38: XN-4DO-24VDC-0.5A-P

Designation	Value
Module supply[3] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	30 mA
Module supply[3] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	25 mA[2]
Outputs	
Number of channels	4
Output voltage Output voltage (the output is switched on and loaded)	$U_L - 1$ V DC
Output current (to supply the actuators/the output is switched on)[1]	
Nominal value	0.5 A[2]
Permissible value for short-term overload (maximum 5 minutes)	1 A
Simultaneity factor	100 %
Output delay for signal change and resistive load (48 Ω … 1kΩ)	
from Low to High level (typical)	250 µs
from High to Low level (typical)	250 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 6 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 1 kHz
Inductive load	< 2 Hz
Lamp load	< 10 Hz

Designation	Value
Insulation voltage (fieldbus to channels)	500 V_{eff}
short-circuit proof, to	EN 61131-2, $\longrightarrow$ page 224
Restart after removal of a short-circuit	Automatic

1) The outputs can be connected in parallel to increase the maximum output current to up to 2 A.

2) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
The overall current that is required for each module is given by the sum of all the individual currents.

3) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 39: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red, blinking, 0.5 Hz	Diagnostics available	Remove the short-circuit on the corresponding channel.
	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	-
11	Green	Status of channel 1 = **1**	-
	OFF	Status of channel 1 = **0**	-
21	Green	Status of channel 2 = **1**	-
	OFF	Status of channel 2 = **0**	-
14	Green	Status of channel 3 = **1**	-
	OFF	Status of channel 3 = **0**	-
24	Green	Status of channel 4 = **1**	-
	OFF	Status of channel 4 = **0**	-

The module features the following diagnostics:

• **Overcurrent**

⚠️ **Attention!**
If overcurrent occurs, the overloaded channel must be switched off.

Base modules
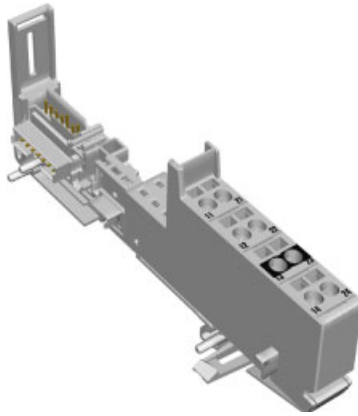
Figure 112: Base module XN-S4T-SBCS
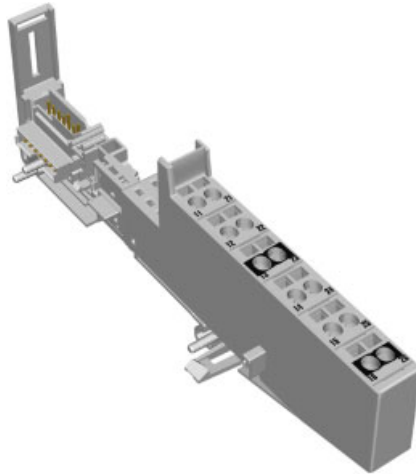
Figure 113: Base module XN-S6T-SBCSBC

Designation	
with tension clamp connectors	XN-S4T-SBCS XN-S6T-SBCSBC
With screw terminal	XN-S4S-SBCS XN-S6S-SBCSBC

Connection diagrams
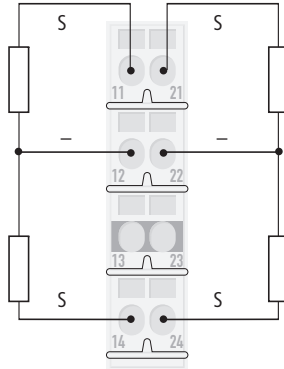
Figure 114: Connection diagram XN-S4x-SBCS
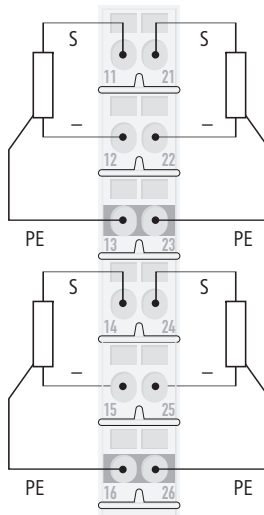
Figure 115: Connection diagram XN-S6x-SBCSBC

→ "Technical data for the base modules", page 19

XNE-8DO-24VDC-0.5A-P

Figure 116: Digital output module, 8DO, 0.5 A, electrically isolated, positive switching

Figure 117: Block diagram

Technical data

Table 40: XNE-8DO-24VDC-0.5A-P

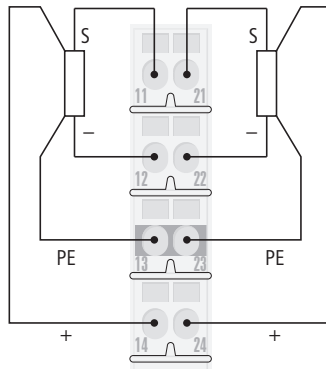| Designation	Value
Module supply[3] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	15 mA
Module supply[3] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics with inactive outputs/maximum)	3 mA[2]
Outputs	
Number of channels	8
Output voltage Output voltage (the output is switched on and loaded)	U_L-1 V DC
Output current (to supply the actuators/the output is switched on)[1]	
Nominal value	0.5 A[2]
Permissible value for short-term overload (maximum 5 minutes)	1 A
Simultaneity factor	100 %
Output delay for signal change and resistive load (48 Ω … 1kΩ)	
from Low to High level (typical)	300 µs
from High to Low level (typical)	300 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	to DC13 to IEC 60947-5-1
Lighting circuit R_{LL}	< 6 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 100 Hz
Inductive load	to DC13 to IEC 60947-5-1
Lamp load	< 10 Hz

Designation	Value
Insulation voltage (module bus to channels)	500 V_{eff}
Short-circuit proof (two parallel switched outputs also[1])	to EN 61131-2 $\longrightarrow$ page 224
Restart after removal of a short-circuit	Automatic

1) Two outputs can be connected in parallel to increase the maximum output current to 1 A.

2) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
   The overall current that is required for each module is given by the sum of all the individual currents.

3) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 41:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	-
1 … 8	Green	Status of channel: **1**	-
	OFF	Status of channel: **0**	-

8DOp
24Vdc0.5A
DIA

1
2
3
4
5
6
7
8

MOELLER

Connection diagram

Figure 118: Connection diagram for XNE-8DO-24VDC-0.5A-P

XNE-16DO-24VDC-0.5A-P
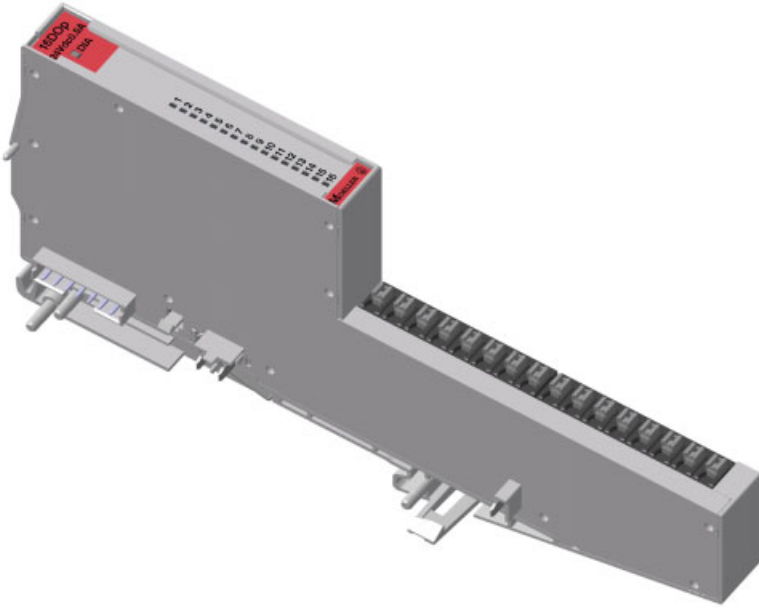
Figure 119:   Digital output module, 16DO, 0.5 A, electrically isolated, positive switching
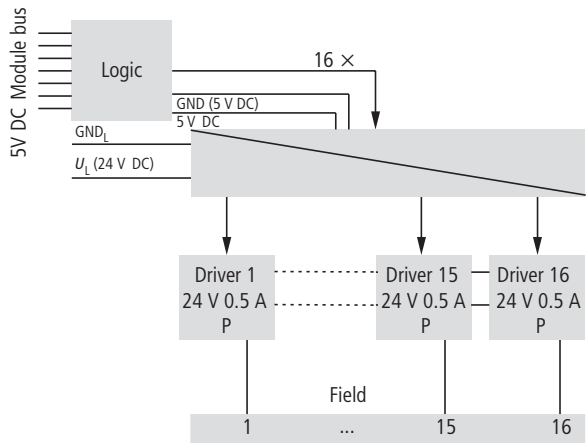
Figure 120:   Block diagram

Technical data

Table 42: XNE-16DO-24VDC-0.5A-P

Designation	Value
Module supply[3] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	25 mA
Module supply[3] via supply terminal (U_L)[2]	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics with inactive outputs/maximum)	3 mA[2]
Outputs	
No. of channels	16
Output voltage Output voltage (the output is switched on and loaded)	U_L-1 V DC
Output current (to supply the actuators/the output is switched on)	
Rated value[1]	0.5 A
Permissible value for short-term overload (maximum 5 minutes)	1A
Simultaneity factor	50 %
Total current over all outputs	max. 4 A[2]
Output delay for signal change and resistive load (48 Ω … 1 kΩ)	
from Low to High level (typical)	300 µs
from High to Low level (typical)	300 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	to DC13 to IEC 60947-5-1
Lighting circuit R_{LL}	< 6 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 100 Hz
Inductive load	to DC13 to IEC 60947-5-1

Designation	Value
Lamp load	< 10 Hz
Insulation voltage (module bus to channels)	$500V_{eff}$
Short-circuit proof (two parallel switched outputs also[1])	to EN 61131-2 → page 224
Restart after removal of a short-circuit	Automatic

1) Two outputs can be connected in parallel to increase the maximum output current to 1 A.

2) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs. The electrical connection for the switched loads to ground GND_L must be made modular external. The overall current that is required for each module is the sum of all the individual currents.

3) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostics messages

Table 43:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 neighbouring electronics modules have been removed.
	OFF	No error message	-
1 … 16	Green	Status of channel: **1**	-
	OFF	Status of channel: **0**	-

16 DO_p
24 Vdc 0.5 A
DIA

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

MOELLER

Connection diagram

Figure 121:   Connection diagram for XNE-16DO-24VDC-0.5A-P
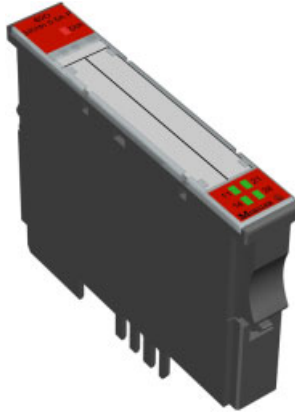
XN-16DO-24VDC-0.5A-P

Figure 122: Digital output module, 16DO, 0.5 A, electrically
isolated, positive switching
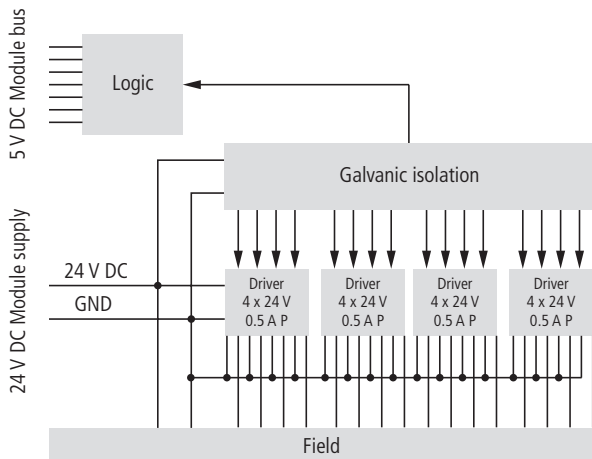
Figure 123: Block diagram

Technical data

Table 44: XN-16DO-24VDC-0.5A-P

Designation	Value
Module supply[2] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	120 mA
Module supply[2] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	30 mA[1]
Outputs	
Number of channels	16
Output voltage Output voltage (the output is switched on and loaded)	$U_L - 1$ V DC
Output current (to supply the actuators/the output is switched on)	
Nominal value	0.5 A
Permissible value	< 0.6 A[1]
Simultaneity factor	100 %
Output delay for signal change and resistive load	
from Low to High level (typical)	100 µs
from High to Low level (typical)	100 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 3 W

Designation	Value
Switching frequency	
Resistive load ($R_{LO} < 1$ kΩ)	< 100 Hz
Insulation voltage (fieldbus to channels)	500 V_{eff}
protected, to	EN 61131-2, $\longrightarrow$ page 223
Restart after removal of a short-circuit	Automatic

1) The supply terminal (U_L) provides the current for the module electronics and for the consumers on the outputs.
The overall current that is required for each module is given by the sum of all the individual currents.

2) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 45: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–
31	Green	Status of channel 3 = **1**	–
	OFF	Status of channel 3 = **0**	–
…			
161	Green	Status of channel 16 = **1**	–
	OFF	Status of channel 16 = **0**	–

The module features the following diagnostics data
(groupwise short-circuit detection):

• **Overcurrent** (short-circuit) channel 1-4/(short-circuit)
  channel 5-8/(short-circuit) channel 9-12/(short-circuit)
  channel 13-16

Base modules
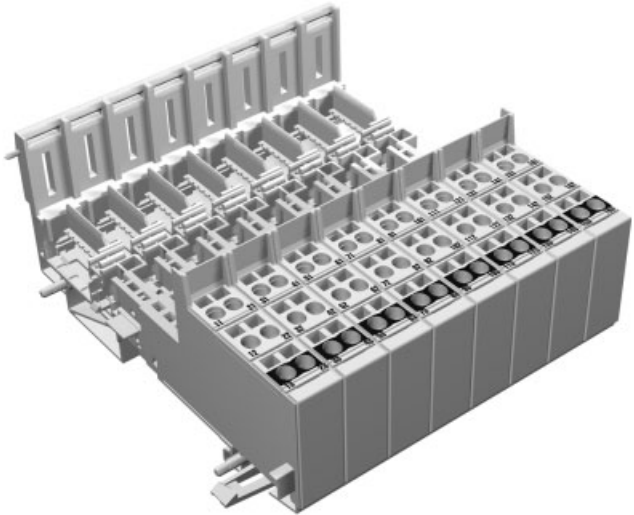
Figure 124: Base module XN-B3T-SBC

| Designation	
with tension clamp connectors	XN-B3T-SBC
With screw terminal	XN-B3S-SBC

Connection diagram
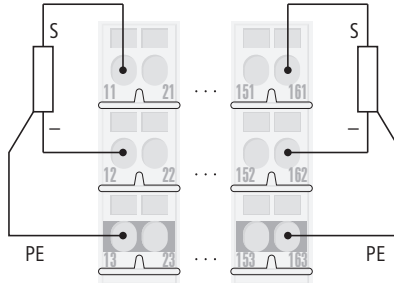
Figure 125: Connection diagram XN-B3x-SBC

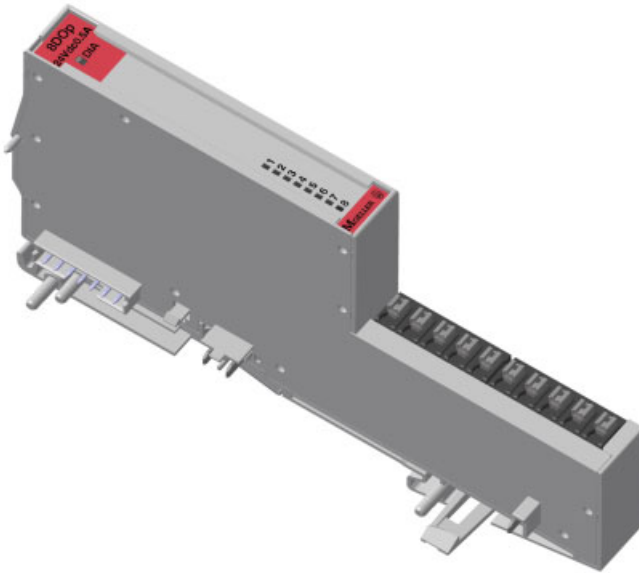→ "Technical data for the base modules", page 19

XN-32DO-24VDC-0.5A-P
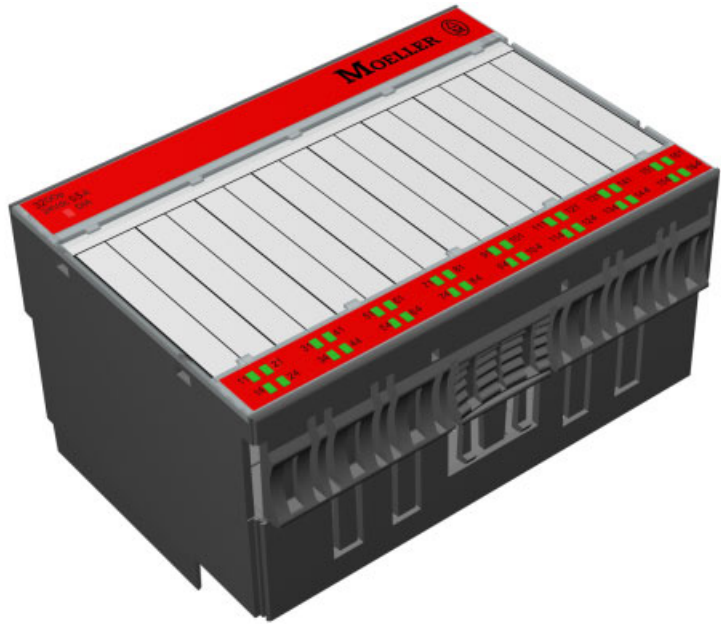
Figure 126: Digital output module, 32DO, 0.5 A, electrically isolated, positive switching
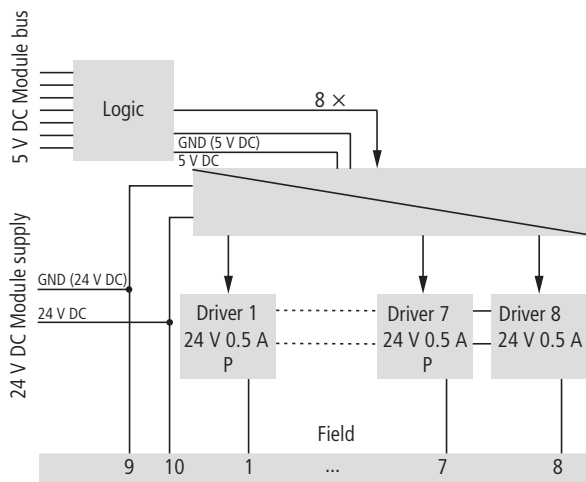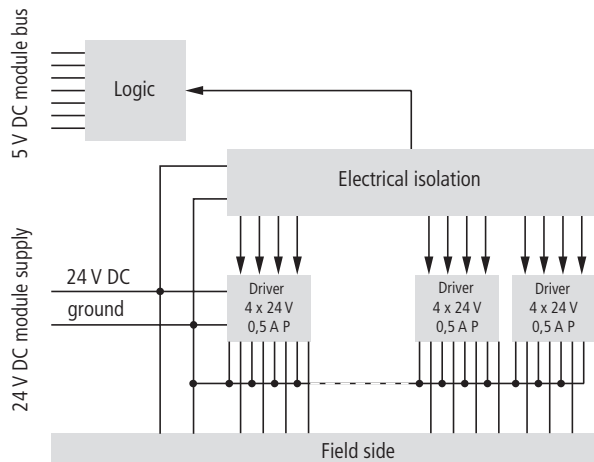

Figure 127: Block diagram

Technical data

Table 46: XN-32DO-24VDC-0.5A-P

Designation	Value
Module supply[3] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	30 mA
Module supply[3] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	50 mA
Outputs	
Number of channels	32
Output voltage Output voltage (the output is switched on and loaded)	$U_L - 1$ V DC
Output current (to supply the actuators/the output is switched on)[2]	
Nominal value	0.5 A
Permissible value	< 1 A
Permissible total current over all outputs[1]	10 A
Simultaneity factor[1]	100 %
Output delay for signal change and resistive load	
from Low to High level (typical)	300 µs
from High to Low level (typical)	300 µs
Resistive and inductive loads can be connected, as well as lighting circuits.	
Load resistance, resistive R_{LO}	> 48 Ω
Load resistance, inductive R_{LI}	< 1.2 H
Lighting circuit R_{LL}	< 6 W
Switching frequency	
Resistive load (R_{LO} < 1 kΩ)	< 100 Hz

Designation	Value
Insulation voltage (fieldbus to channels)	500 V$_{eff}$
short-circuit proof, to	EN 61131-2, ➞ page 224
Restart after removal of a short-circuit	Automatic

1) A maximum of 10 A can be provided by the module.
   The XN-BR-24VDC-D and the XN-PF-24VDC-D provide 10 A maximum.
   The number of outputs that can be switched simultaneously may therefore be less than 32.

2) Two outputs can be connected in parallel to increase the maximum output current to 1 A. The output will still be short-circuit proof as per EN 61131-2.

3) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U$_L$).

Diagnostic messages
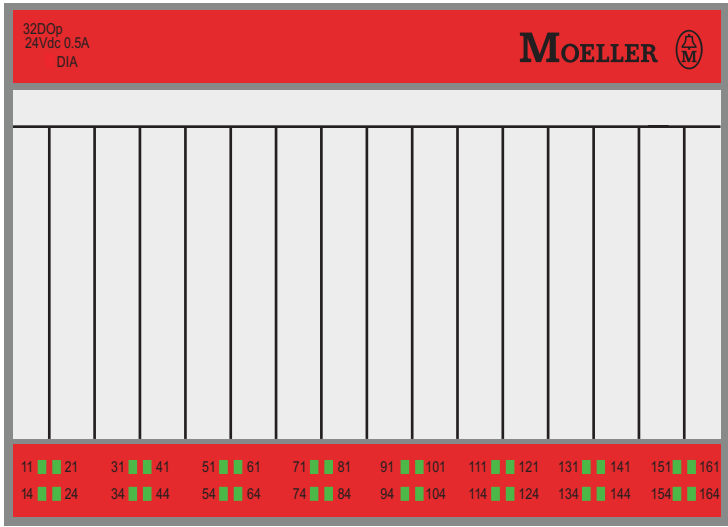
Table 47: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	Red, blinking	There is a short-circuit on at least one of the 32 channels. A diagnostics message will be transmitted.	Remove the short-circuit on the corresponding channel.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–
31	Green	Status of channel 3 = **1**	–
	OFF	Status of channel 3 = **0**	–
⋮			
164	Green	Status of channel 32 = **1**	–
	OFF	Status of channel 32 = **0**	–

The module features the following diagnostics data (groupwise short-circuit detection):

- Overcurrent K1,2,3 or 4
- Overcurrent K5,6,7 or 8
- Overcurrent K9,10,11 or 12
- Overcurrent K13,14,15 or 16
- Overcurrent K17,18,19 or 20
- Overcurrent K21,22,23 or 24
- Overcurrent K25,26,27 or 28
- Overcurrent K29,30,31 or 32

Base module
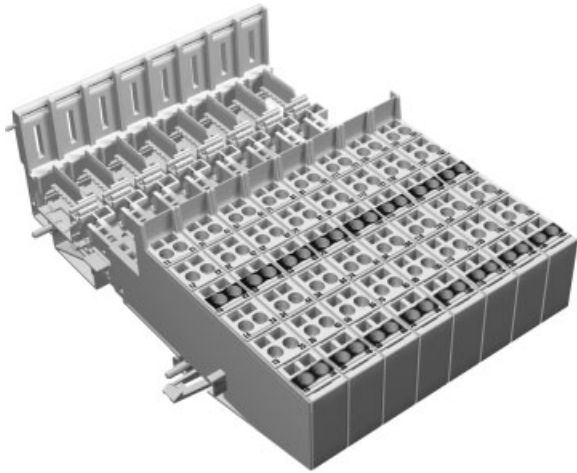
Figure 128: Base module XN-B6T-SBCSBC

Designation	
with tension clamp connectors	XN-B6T-SBCSBC
With screw terminal	XN-B6S-SBCSBC

Connection diagram
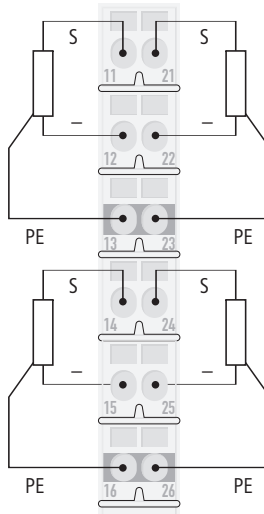
Figure 129: Connection diagram XN-B6x-SBCSBC

→ "Technical data for the base modules", page 19

Overview: Base modules for digital output modules — Tension spring connector

Electronics modules / Digital output	Base modules XN-S3T-SBB	XN-S3T-SBC	XN-S4T-SBBC	XN-S4T-SBBS	XN-S4T-SBCS	XN-S4T-SBBS-CJ	XN-S6T-SBBSBB	XN-S6T-SBCSBC	XN-B6T-SBCSBC	XN-B3T-SBB	XN-B3T-SBC	XN-B4T-SBBC	XN-B6T-SBBSBB	XN-P3T-SBB	XN-P3T-SBB-B	XN-P4T-SBBC	XN-P4T-SBBC-B
XN-2DO-24VDC-2.0A-P		●			●												
XN-2DO-24VDC-0.5A-P		●			●												
XN-2DO-24VDC-0.5A-N		●			●												
XN-4DO-24VDC-0.5A-P					●			●									
XN-16DO-24VDC-0.5A-P											●						
XN-32DO-24VDC-0.5A-P									●								
XN-2DO-120/230VAC-0.5A		●			●												

Screw terminals

Electronics modules	Base modules XN-S3S-SBB	XN-S3S-SBC	XN-S4S-SBBC	XN-S4S-SBBS	XN-S4S-SBCS	XN-S4S-SBBS-CJ	XN-S6S-SBBSBB	XN-S6S-SBCSBC	XN-B6S-SBCSBC	XN-B3S-SBB	XN-B3S-SBC	XN-B4S-SBBC	XN-B6S-SBBSBB	XN-P3S-SBB	XN-P3S-SBB-B	XN-P4S-SBBC	XN-P4S-SBBC-B
Digital output																	
XN-2DO-24VDC-2A-P	●				●												
XN-2DO-24VDC-0.5A-P	●				●												
XN-2DO-24VDC-0.5A-N	●				●												
XN-4DO-24VDC-0.5A-P					●			●									
XN-16DO-24VDC-0.5A-P											●						
XN-32DO-24VDC-0.5A-P									●								
XN-2DO-120/230VAC-0.5A	●				●												

5   Relay modules

The XI/ON relay modules (R) receive output values from the gateway via the internal module bus. The modules convert these values and transmit the appropriate switching states per channel to the field level via the base module.

Relay modules are suitable for solenoid valves, DC contactors, and signal lamps, in the nominal load voltage range 24 V DC/V AC … 230 V AC.

Relay modules are fitted with reverse polarity protection, and electrically isolated from the supply voltage.

Relay modules are built in the slice form. They are completed by base modules with tension spring connectors or screw terminals.

There are no parameter setting options for relay modules.

LED indicators
Error messages from the I/O level are made on a module basis, through the collective **DIA** indicator LED. The corresponding diagnostics information is transmitted to the gateway as diagnostics bits. If the **DIA** LED is permanently red, this indicates that the module bus communication has failed for the relay modules.

Load limit curve for resistive load
For 1000 switching actions, not continuous arc may occur that burns for more than > 10 ms.
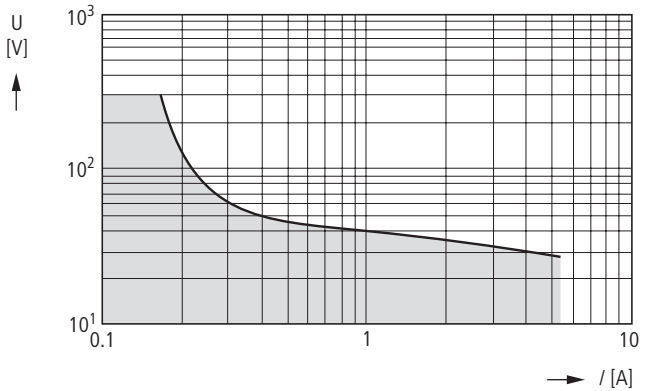
Figure 130: Definition of the load limit curve

→ When using relay modules, a standard module representation should be avoided as far as possible. Otherwise, if relay modules are swapped (changeover/N/C/N/O) a short-circuit could be caused that destroys the module.

▽ **Attention!**
External suppression components should be fitted when using inductive loads.

Module overview
- XN-2DO-R-NC
- XN-2DO-R-NO
- XN-2DO-R-CO

XN-2DO-R-NC

Figure 131: Relay module, 2 × N/C
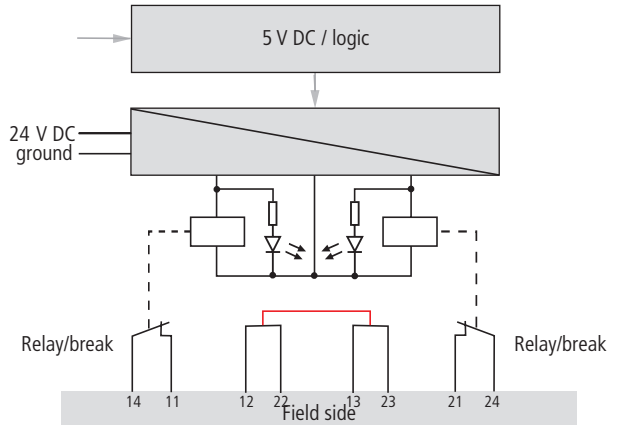
Figure 132: Block diagram XN-2DO-R-NC with the base module
XN-S4x-SBBS
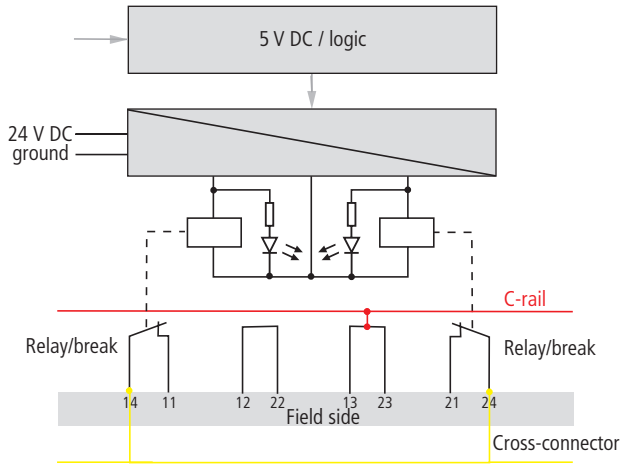
Figure 133: Block diagram XN-2DO-R-NC with the base module
XN-S4x-SBCS

Technical data

> **Attention!**
> The relay outputs must be protected by an external fuse
> (6A fast)!

Table 48: XN-2DO-R-NC

Designation	Value
Module supply[1] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[1] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA
Relay outputs	
Number of channels	2
Implementation of the channels	N/C
Contact type/material	$AgSnO_2$
Application category as per AC15/DC13	
Switching voltage (to supply the actuators)	
Nominal load voltage	230 V AC/30 V DC
Switching current (to supply the actuators)	
Current for DC (purely resistive)	Load limit curve:$\longrightarrow$ figure 130
Nominal current (DC13) 24 V DC	1 A
Nominal current (AC15) 250 V AC	1.5 A
Minimum load current ($\geqq$ 12 V DC)	100 mA
Switching frequency	
Resistive load	< 0.1 Hz
Inductive load	< 0.1 Hz
Lamp load	< 0.1 Hz

Designation	Value
Isolation	
Insulation voltage (relay output to relay output)	No
Insulation voltage (relay output to module bus)	1.5 kV$_{eff}$
Insulation voltage (relay output to field voltage)	1.5 kV$_{eff}$
Insulation voltage (module bus to field voltage)	500 V$_{eff}$

1) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U$_L$).

Diagnostic messages

Table 49:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No fault indication or diagnostics	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

2RO
NC
DIA

11   21

MOELLER

Base modules

Figure 134: Base module XN-S4T-SBBS
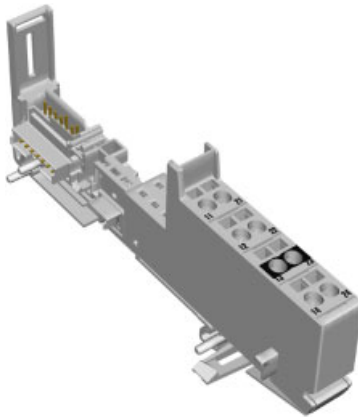
Figure 135: Base module XN-S4T-SBCS

Designation	
with tension clamp connectors	XN-S4T-SBBS XN-S4T-SBCS
With screw terminal	XN-S4S-SBBS XN-S4S-SBCS

Connection diagrams
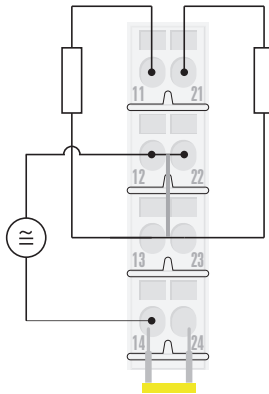
Figure 136: Connection diagram for XN-S4x-SBBS with externally applied supply and linked root (14/24). The contacts 12/22/13/23 are linked internally.
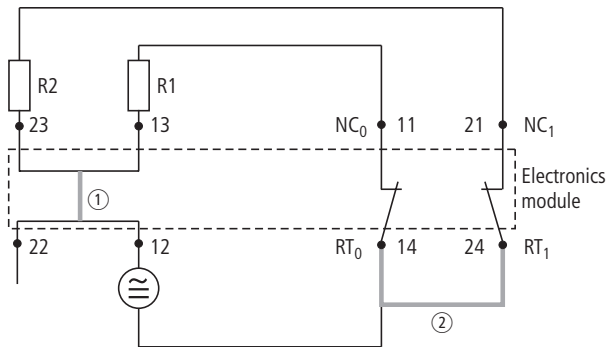
Figure 137: Module circuit diagram XN-S4x-SBBS

① Linked in the electronics

② Cross-connection via QVR to the base
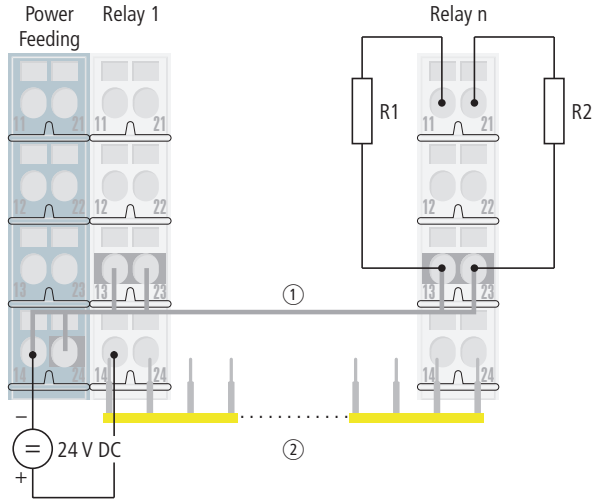
Figure 138: Connection diagram for XN-S4x-SBCS with supply via
C-rail and linked root.

① Supply via C-rail (-)

② Max. 8 relay modules (+)
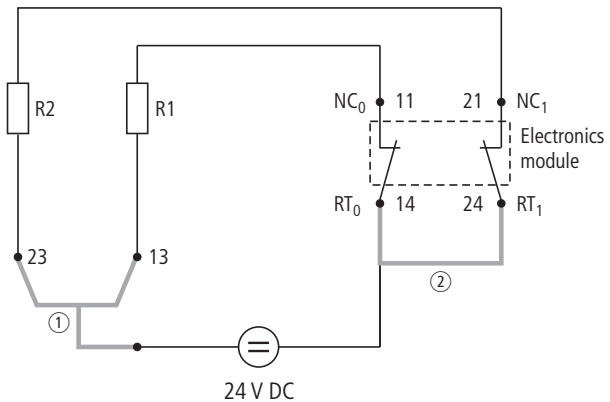
Figure 139: Module circuit diagram XN-S4x-SBCS

① C-rail

② Cross-connection via QVR to the base

Warning!
The C-rail must not have a potential above 24 V. Not 230 V!

→ The contact designations for the base module are not the relay contact designations as per DIN.

→ "Technical data for the base modules", page 19

XN-2DO-R-NO

Figure 140: Relay module, 2 × N/O
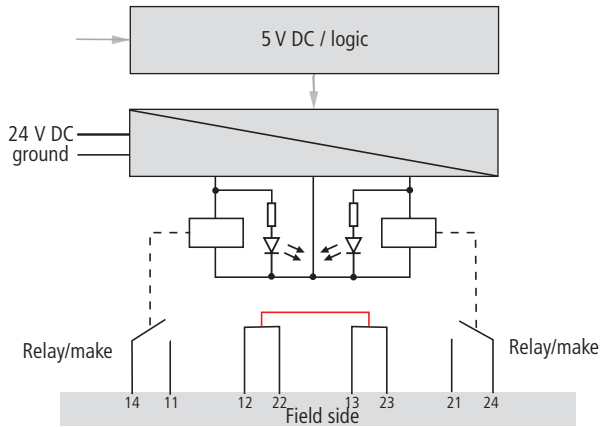
Figure 141: Block diagram XN-2DO-R-NO with the base module
XN-S4x-SBBS
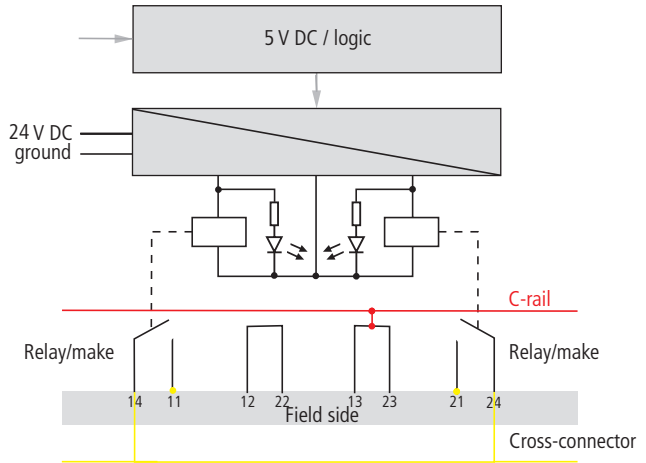
Figure 142: Block diagram XN-2DO-R-NO with the base module
XN-S4x-SBCS

Technical data

Table 50: XN-2DO-R-NO

Designation	Value
Module supply[1] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[1] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA
Relay outputs	
Number of channels	2
Implementation of the channels	N/O
Contact type/material	$AgSnO_2$
Application category as per AC15/DC13	
Switching voltage (to supply the actuators)	
Nominal load voltage	230 V AC/30 V DC
Switching current (to supply the actuators)	
Current for DC (purely resistive)	Load limit curve:⟶ figure 130
Nominal current (DC13) 24 V DC	1 A
Nominal current (AC15) 250 V AC	3 A
Minimum load current ($\geqq$ 12 V DC)	100 mA

Designation	Value
Current and number of switching operations (operational life): AC15 – 250 V AC	1 $\cdot$ 10^5 at 2 A
	2 $\cdot$ 10^5 at 1 A
	4 $\cdot$ 10^5 at 0.5 A
Current and number of switching operations (operational life): DC13 – 24 V DC	2 $\cdot$ 10^5 at 1 A
	> 5 $\cdot$ 10^5 at 0.5 A
Switching frequency	
Resistive load	< 0.1 Hz
Inductive load	< 0.1 Hz
Lamp load	< 0.1 Hz
Isolation	
Insulation voltage (relay output to relay output)	No
Insulation voltage (relay output to module bus)	1.5 kV$_{eff}$
Insulation voltage (relay output to field voltage cable)	1.5 kV$_{eff}$
Insulation voltage (module bus to field voltage cable)	500 V$_{eff}$

1) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U_L).

Diagnostic messages

Table 51:   Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

Base modules

Figure 143: Base module XN-S4T-SBBS
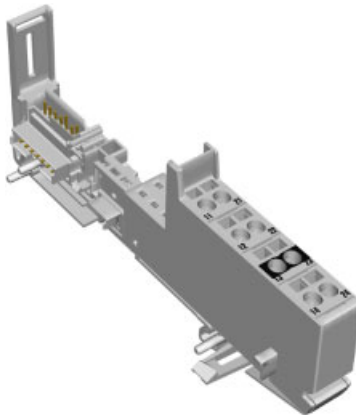
Figure 144: Base module XN-S4T-SBCS

Designation	
with tension clamp connectors	XN-S4T-SBBS XN-S4T-SBCS
With screw terminal	XN-S4S-SBBS XN-S4S-SBCS

Connection diagrams
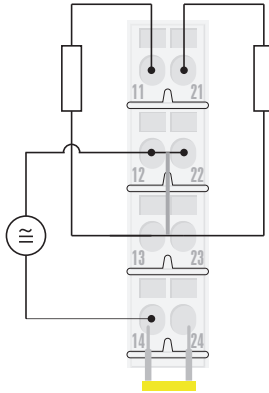
Figure 145: Connection diagram for XN-S4x-SBBS with externally applied supply and linked root
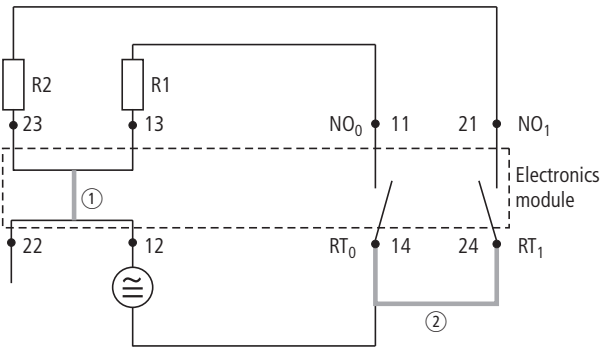
Figure 146: Module circuit diagram XN-S4x-SBBS

① Linked in the electronics
② Cross-connection via QVR to the base

Figure 147: Connection diagram for XN-S4x-SBCS with supply via C-rail and linked root

① Supply via C-rail
② Max. 8 relay modules

Figure 148: Module circuit diagram XN-S4x-SBCS

① C-rail
② Cross-connection via QVR to the base

Warning!
The C-rail must not have a potential above 24 V. Not 230 V!

The contact designations for the base module are not the relay contact designations as per DIN.

→ "Technical data for the base modules", page 19

XN-2DO-R-CO

Figure 149: Relay module, 2 x changeover
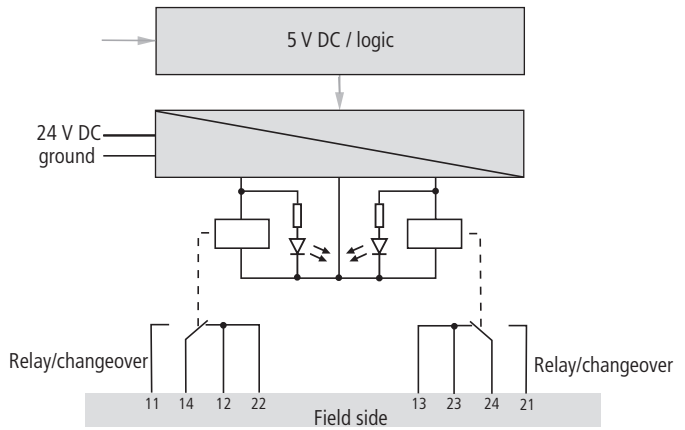
Figure 150: Block diagram XN-2DO-R-CO with the base module
XN-S4x-SBBS

Technical data

Table 52: XN-2DO-R-CO

Designation	Value
Module supply[1] through module bus voltage (5 V DC)	
Current from module bus I_{MB} (for supply to module electronics/max.)	28 mA
Module supply[1] via supply terminal (U_L)	
Nominal voltage through supply terminal U_L (range)	24 V DC (18 … 30 V DC)
Current through supply terminal (for supply to the module electronics/max.)	20 mA
Relay outputs	
Number of channels	2
Implementation of the channels	N/C
Contact type/material	$AgSnO_2$
Application category as per AC15/DC13	
Switching voltage (to supply the actuators)	
Nominal load voltage	230 V AC/30 V DC
Switching current (to supply the actuators)	
Current for DC (purely resistive)	Load limit curve: → figure 130
Nominal current (DC13) 24 V DC	1 A
Nominal current (AC15) 250 V AC for the N/O contact	3 A
Nominal current (AC15) 250 V AC for the N/C contact	1.5 A
Minimum load current ($\geqq$ 12 V DC)	100 mA

Designation	Value
Current and number of switching operations (operational life): AC15 – 250 V AC N/O contact	1×10^5 at 2 A
	2×10^5 at 1 A
	4×10^5 at 0.5 A
Current and number of switching operations (operational life): DC13 – 24 V DC/N/O contact	2×10^5 at 1 A
	$> 5 \times 10^5$ at 0.5 A
Switching frequency	
Resistive load	< 0.1 Hz
Inductive load	< 0.1 Hz
Lamp load	< 0.1 Hz
Isolation	
Insulation voltage (relay output to relay output)	No
Insulation voltage (relay output to module bus)	1.5 kV$_{eff}$
Insulation voltage (relay output to field voltage cable)	1.5 kV$_{eff}$
Insulation voltage (module bus to field voltage cable)	500 V$_{eff}$

1) A part of the electronics of the XI/ON module is supplied from the module bus voltage (5 V DC), the rest from the supply terminal (U$_L$).

Diagnostic messages

Table 53: Diagnostics through the LEDs

LED	Display	Meaning	Remedy
DIA	Red	Failure of module bus communication	Check whether more than 2 adjacent electronics modules have been removed.
	OFF	No error message	–
11	Green	Status of channel 1 = **1**	–
	OFF	Status of channel 1 = **0**	–
21	Green	Status of channel 2 = **1**	–
	OFF	Status of channel 2 = **0**	–

Base modules

Figure 151:Base module XN-S4T-SBBS

Designation	
with tension clamp connectors	XN-S4T-SBBS
With screw terminal	XN-S4S-SBBS

Connection diagrams
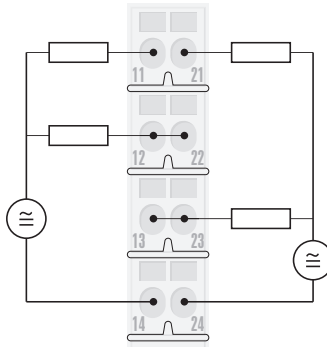
Figure 152: Connection diagram XN-S4x-SBBS
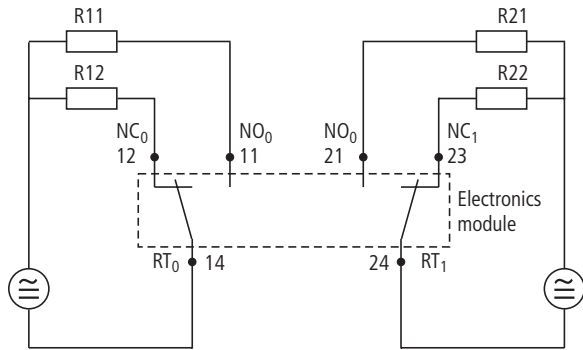
Figure 153: Module circuit diagram XN-S4x-SBBS

→ The contact designations for the base module do not correspond to the relay contact designations as per DIN.

Overview: Base modules for relay modules

Tension spring connector

Electronics modules

Relay modules	Base modules	XN-S3T-SBB	XN-S3T-SBC	XN-S4T-SBBC	XN-S4T-SBBS	XN-S4T-SBCS	XN-S4T-SBBS-CJ	XN-S6T-SBBSBB	XN-B3T-SBB	XN-B3T-SBC	XN-B4T-SBBC	XN-P3T-SBB	XN-P3T-SBB-B	XN-P4T-SBBC	XN-P4T-SBBC-B
XN-2DO-R-NC					●	●									
XN-2DO-R-NO					●	●									
XN-2DO-R-CO					●										

Screw terminals

Electronics modules

Relay modules	Base modules	XN-S3S-SBB	XN-S3S-SBC	XN-S4S-SBBC	XN-S4S-SBBS	XN-S4S-SBCS	XN-S4S-SBBS-CJ	XN-S6S-SBBSBB	XN-B3S-SBB	XN-B3S-SBC	XN-B4S-SBBC	XN-P3S-SBB	XN-P3S-SBB-B	XN-P4S-SBBC	XN-P4S-SBBC-B
XN-2DO-R-NC					●	●									
XN-2DO-R-NO					●	●									
XN-2DO-R-CO					●										

1) Base modules for the gateway supply

2) Base module for bus refreshing within the stations

6   Integration in PROFIBUS-DP

Process input data/Process output data

The process data are transmitted byte-wise (8-Bit) across the PROFIBUS. The digital module types have 1 bit of process data for each channel. This bit indicates the channel status (digital input) or fixes the channel status (digital output/relay).

The digital input modules only provide process input data.

The digital output modules and relay modules only receive process output data.

Process data from modules with a sum of 8 channels or less can be bundled together as 1 byte (8 bits). This reduces the total amount of process data. Bundling the process data in this way is known as **Packing**.

The packing of the modules is arranged by a software tool during the project engineering phase for the XI/ON station. A detailed description with corresponding examples can be found in the manual:

• XI/ON Gateway for PROFIBUS-DP
  XN-GW-1.5(12)MB(-S)
  XN-GWBR-PBDP

→   You can find the latest GSD files on the Moeller home page (http://www.moeller.net.) Here you will find the Support area for all the documents and files that are relevant to XI/ON.

Examples for allocation of the process data bits to the terminals

The assignment of the channels to the individual process data bits is generally in ascending order. The data can belong to various modules because of the option of bundling the data of 2 or 4-channel modules. The modules must not necesarily be located alongside one another. The least significant bits are invalid if not all 8 bits of a process data byte are filled out.

Example 1
The following overview of the process input data of two **packed** XN-4DI-24VDC-P modules and the corresponding terminal numbers of the connection level:

Table 54: Example of a terminal number/process input data assignment

Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Terminal numbers of Byte 0	24	14	21	11	24	14	21	11
	Second module XN-4DI-24VDC-P				First module XN-4DI-24VDC-P			

Example 2

The following overview of the process input data of a XN-32DI-24VDC-P module and the corresponding terminal numbers of the connection level:

Table 55: Example of a terminal number/process input data assignment

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Terminal numbers of Byte 0	81	71	61	51	41	31	21	11
Terminal numbers of Byte 1	161	151	141	131	124	114	101	91
Terminal numbers of Byte 2	84	74	64	54	44	34	24	14
Terminal numbers of Byte 3	164	154	144	134	124	114	104	94

Example 3

The following overview of the process output data of a XNE-8DO-24VDC-0.5A-P module and the corresponding terminal numbers of the connection level:

Table 56: Example of a terminal number/process input data assignment

Byte 0	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Terminal numbers of Byte 0	8	7	6	5	4	3	2	1

Diagnostics

The digital input modules do not provide diagnostics data.

The digital output modules and supply modules do provide diagnostics messages:

Module type	Diagnostics message	Position in diagnostics byte	Meaning
XN-2DO-24VDC-2.0A-P	**Overcurrent**	Bit 0	
XN-2DO-24VDC-0.5A-P			
XN-2DO-24VDC-0.5A-N			
XN16DO24VDC0.5A-P			
XN-4DO-24VDC-0.5A-P	ovrcurr/shrt-circ **(>=1 of K1-4)**	Bit 0	There is a short-circuit on at least one of channels 1 … 4.
XN-32DO-24VDC-0.5A-P	ovrcurr/shrt-circ (>=1 of K1-4)	Bit 0	There is a short-circuit on at least one channel in the group of 4.
	ovrcurr/shrt-circ (>=1 of K5-8)	Bit1	
	ovrcurr/shrt-circ (>=1 of K9-12)	-bit2	
	ovrcurr/shrt-circ (>=1 of K13-16)	Bit3	
	ovrcurr/shrt-circ (>=1 of K17-20)	Bit4	
	ovrcurr/shrt-circ (>=1 of K21-24)	Bit5	
	ovrcurr/shrt-circ (>=1 of K25-28)	Bit6	
	ovrcurr/shrt-circ (>=1 of K29-32)	Bit 7	

The XN-2DO-120/230VAC-0.5A and the XNE-8DO-24VDC-0.5A-P do not provide diagnostics data.

Parameters

There are no settable parameters for the digital input modules and output modules, or the relay modules.

However. please note that all the modules that appear in the **Standard module representation** during the project engineering planning with a software tool will occupy one parameter byte.

This parameter byte contains the number of other parameter bytes for the modules.

In the case of the digital input modules and output modules, or the relay modules, the value of the parameter byte is always 00_{hex}.

Furthermore, please note that the response of the digital outputs in a fault condition (change of module, wrong module replaced, fieldbus error) can be defined through gateway parameters.

The description of these gateway parameters can be found in the manual:

• XI/ON Gateway for PROFIBUS-DP
  XN-GW-1.5(12)MB(-S)
  XN-GWBR-PBDP

7 Integration in CANopen

Process input data/
Process output data
The digital module types have 1 bit of process data for each channel. This bit indicates the channel status (digital input) or fixes the channel status (digital output/relay).

The digital input modules only provide process input data.

The digital output modules and relay modules only receive process output data.

Objects, which can be defined by the Device Profile for I/O-Devices CiA DS-401, can be used to display the channel values as groups of 32, 16, 8 bits or as a single display of the values.

→ You can find the latest EDS files on the Moeller homepage (http://www.moeller.net). Here you will find the Support area for all the documents and files that are relevant to XI/ON.

Objects for reading the process input data

Overview

The objects indicate the process input values for each digital input channel in an XI/ON station.

The user has the option of choosing between 4 diferent formats for the representation of the values:

- Only one channel is displayed per Sub-index (Objects 6020_{hex}, 6021_{hex} and 6022_{hex})
- 8 channels are displayed per Sub-index (Object 6000_{hex}).
- 16 channels are displayed per Sub-index (Object 6100_{hex}).
- 32 channels are displayed per Sub-index (Object 6120_{hex}).

Table 57: Objects for the process input data

Index (hex)	Page	Name
6000_{hex}	➞ page 193	Read Input 8 Bit
6020_{hex}	➞ page 194	Read Input Bit (1 … 128)
6021_{hex}	➞ page 194	Read Input Bit (129 … 256)
6022_{hex}	➞ page 194	Read Input Bit (257 … 288)
6100_{hex}	➞ page 195	Read Input 16 Bit
6120_{hex}	➞ page 195	Read Input 32 Bit

6000$_{hex}$ Read Input 8 Bit

The object presents the values for the digital input modules in 8-bit groups.

A total of 36 groups (each 8-bit) can be displayed (288 digital input channels).

A PDO-Mapping of this object is always made automatically as a default for the first 8 sub-indices. This corresponds to 64 digital input channels.

If more than 64 input channels are present, then the **PDO-Mapping** must be carried out by the user.

Table 58: Object 6000$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Read Input 8 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ ... 24$_{hex}$	Unsigned8
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ ... 24$_{hex}$	ro
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ ... 24$_{hex}$	No

6020$_{hex}$ Read Input Bit (1 … 128)

6021$_{hex}$ Read Input Bit (129 … 256)

6022$_{hex}$ Read Input Bit (257 … 288)

The objects are a bit-wise representation of the values of the digital input modules. Each Sub-index for these objects is a Boolean value.

A total of 128 bits can be represented (128 digital input channels).

If more than 128 input channels are present, then Object 6021$_{hex}$ is used.

If more than 256 input channels are present, then Object 6022$_{hex}$ is used.

Since the number of digital input channels in a station is limited to 288, it is not possible to make use of the complete range of the array in Object 6022$_{hex}$.

Table 59: Object 6020$_{hex}$, 6021$_{hex}$, 6022$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Read Input Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 80$_{hex}$	Boolean
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 80$_{hex}$	ro
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 80$_{hex}$	No

6100$_{hex}$Read Input 16 Bit

The object presents the values for the digital input modules in 16-bit groups.

A total of 18 groups (each 16-bit) can be displayed (288 digital input channels).

Table 60:   Object 6100$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Read Input 16 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 12$_{hex}$	Unsigned16
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 12$_{hex}$	ro
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 12$_{hex}$	No

6120$_{hex}$Read Input 32 Bit

The object presents the values for the digital input modules in 32-bit groups.

A total of 9 groups (each 32-bit) can be displayed (288 digital input channels).

Table 61:   Object 6120$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Read Input Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 09$_{hex}$	Unsigned32
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 09$_{hex}$	ro
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 09$_{hex}$	No

Objects for writing the process output data

Overview

The objects indicate the process output values for each digital output channel in an XI/ON station.

The user has the option of choosing between 4 diferent formats for the representation of the values:

- Only one output channel is displayed per Sub-index (Objects 6020$_{hex}$, 6021$_{hex}$ and 6022$_{hex}$).
- 8 output channel values are displayed per Sub-index (Object 6000$_{hex}$).
- 16 output channel values are displayed per Sub-index (Object 6100$_{hex}$).
- 32 output channel values are displayed per Sub-index (Object 6120$_{hex}$).

Table 62: Objects for the process output data

Index (hex)	Page	Name
6200$_{hex}$	→ page 198	Write Output 8 Bit
6220$_{hex}$	→ page 199	Write Output Bit (1 … 128)
6221$_{hex}$	→ page 199	Write Output Bit (129 … 256)
6222$_{hex}$	→ page 199	Write Output Bit (257 … 288)
6300$_{hex}$	→ page 200	Write Output 16 Bit
6320$_{hex}$	→ page 200	Write Output 32 Bit

6200$_{hex}$ Write Output 8 Bit

The object presents the values for the digital output modules in 8-bit groups.

A total of 36 groups (each 8-bit) can be defined (288 digital output channels).

A PDO-Mapping of this object is always made automatically as a default for the first 8 sub-indices. This corresponds to 64 digital output channels.

If more than 64 output channels are present, then the **PDO-Mapping** must be carried out by the user.

Table 63: Object 6200$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Write Output 8 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ ... 24$_{hex}$	Unsigned8
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ ... 24$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ ... 24$_{hex}$	00$_{hex}$

6220$_{hex}$ Write Output Bit (1 … 128)

6221$_{hex}$ Write Output Bit (129 … 256)

6222$_{hex}$ Write Output Bit (257 … 288)

The objects are a bit-wise representation of the values of the digital output modules. Each Sub-index for these objects is a Boolean value.

A total of 128 bits can be represented (128 digital output channels).

If more than 128 output channels are present, then Object 6221$_{hex}$ is used.

If more than 256 output channels are present, then Object 6222$_{hex}$ is used.

Since the number of digital input channels in a station is limited to 288, it is not possible to make use of the complete range of the array in Object 6222$_{hex}$.

Table 64:   Object 6220$_{hex}$, 6221$_{hex}$, 6222$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Write Output Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 80$_{hex}$	Boolean
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 80$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 80$_{hex}$	0

6300$_{hex}$Write Output 16 Bit

The object presents the values for the digital output modules in 16-bit groups.

A total of 18 groups (each 16-bit) can be defined (288 digital output channels).

Table 65: Object 6300$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Write Output 16 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 12$_{hex}$	Unsigned16
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 12$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 12$_{hex}$	0000$_{hex}$

6320$_{hex}$Write Output 32 Bit

The object presents the values for the digital output modules in 32-bit groups.

A total of 9 groups (each 32-bit) can be defined (288 digital output channels).

Table 66:   Object 6320$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Write Output Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 09$_{hex}$	Unsigned32
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 09$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 09$_{hex}$	00000000$_{hex}$

Objects for the substitute output value in the event of an error

Overview

The objects define the substitute value and the substitute-value mode for each individual digital output channel of an XI/ON station. The substitute value is used in the event of a communication error or other unrecoverable error.

These values can not be saved in the digital output modules, since this type of module does not have an EEPROM memory. If the bus-master or the gateway is replaced, the values will have to be updated.

The user can choose between 4 different formats for the substitute-value settings of all the digital output values in the station concerned:

- Only one channel is set up per Sub-index. The substitute-value mode is then set with the Objects 6250_{hex}, 6251_{hex} and 6252_{hex}. The substitute value is set with Objects 6260_{hex}, 6261_{hex} and 6262_{hex}.
- 8 channels are set up per Sub-index. The substitute-value mode is then set with the Object 6206_{hex}. The substitute value is set with Object 6207_{hex}
- 16 channels are set up per Sub-index. The substitute-value mode is then set with the Object 6306_{hex}. The substitute value is set with Object 6307_{hex}
- 32 channels are set up per Sub-index. The substitute-value mode is then set with the Object 6326_{hex}. The substitute value is set with Object 6327_{hex}

The settings are updated regardless of the format (Object) that has been selected.

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**Objects for the substitute
output value in the event of an
error**

Table 67: Objects for the substitute value and the substitute-
value mode

Index (hex)	Page	Name
6206$_{hex}$	→ page 204	Error Mode Output 8 Bit
6207$_{hex}$	→ page 205	Error State Output 8 Bit
6250$_{hex}$	→ page 206	Error Mode Output Bit (1 … 128)
6251$_{hex}$	→ page 206	Error Mode Output Bit (129 … 256)
6252$_{hex}$	→ page 206	Error Mode Output Bit (257 … 288)
6260$_{hex}$	→ page 208	Error State Output Bit (1 … 128)
6261$_{hex}$	→ page 208	Error State Output Bit (129 … 256)
6262$_{hex}$	→ page 208	Error State Output Bit (257 … 288)
6306$_{hex}$	→ page 210	Error Mode Output 16 Bit
6307$_{hex}$	→ page 211	Error State Output 16Bit
6326$_{hex}$	→ page 212	Error Mode Output 32 Bit
6327$_{hex}$	→ page 213	Error State Output 32Bit

6206$_{hex}$ Error Mode Output 8 Bit

The object defines values in 8-bit groups. A total of 36 groups (each 8-bit) can be defined (288 digital output channels).

It defines (for each digital output channel) whether or not the output should take on a substitute value in the event of an error. The rule is:

0   The output maintains its value if an error occurs.

1   The output is set to a substitute value if an error occurs.

The substitute values for the digital output channels are defined by the Error State Output Object (e.g. 6207$_{hex}$).

Table 68:   Object 6206$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error Mode Output 8 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 24$_{hex}$	Unsigned8
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 24$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 24$_{hex}$	FF$_{hex}$

6207~hex~ Error State Output 8 Bit

The object defines values in 8-bit groups. A total of 36 groups (each 8-bit) can be defined (288 digital output channels).

The substitute value is defined for each digital output channel. The substitute values will only be used in the event of an error if a **1** is entered in an Error Mode Output Object (e.g. 6206~hex~) for the particular output channel.

Substitute values:

0   The output will be switched off if an error occurs.

1   The output will be switched on if an error occurs.

Table 69:   Object 6207~hex~ description

Feature	Sub-index	Description/Value
Name		Error State Output 8 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00~hex~	Unsigned8
	Sub-index 01~hex~ … 24~hex~	Unsigned8
Access	Sub-index 00~hex~	ro
	Sub-index 01~hex~ … 24~hex~	rw
Default value, XI/ON	Sub-index 00~hex~	No
	Sub-index 01~hex~ … 24~hex~	00~hex~

6250$_{hex}$ Error Mode Output Bit (1 … 128)

6251$_{hex}$ Error Mode Output Bit (129 … 256)

6252$_{hex}$ Error Mode Output Bit (257 … 288)

The objects defined the values bit-wise. Each Sub-index for these objects is a Boolean value.

A total of 128 bits can be represented (128 digital output channels).

If more than 128 output channels are present, then Object 6251$_{hex}$ is used.

If more than 256 output channels are present, then Object 6252$_{hex}$ is used.

Since the number of digital input channels in a station is limited to 288, it is not possible to make use of the complete range of the array in Object 6522$_{hex}$.

It is possible to define, for each digital output channel, whether or not the output should take on a substitute value in the event of an error. The rule is:

0   The output maintains its value if an error occurs.

1   The output is set to a substitute value if an error occurs.

The substitute values for the digital output channels are defined by the Error State Output Objects (e.g. 6260$_{hex}$, 6261$_{hex}$ und 6262$_{hex}$) definiert.

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**Objects for the substitute
output value in the event of an
error**

Table 70:   Object 6250_{hex}, 6251_{hex}, 6252_{hex} description

Feature	Sub-index	Description/Value
Name		Error Mode Output Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00_{hex}	Unsigned8
	Sub-index 01_{hex} … 80_{hex}	Boolean
Access	Sub-index 00_{hex}	ro
	Sub-index 01_{hex} … 80_{hex}	rw
Default value, XI/ON	Sub-index 00_{hex}	No
	Sub-index 01_{hex} … 80_{hex}	1

6260$_{hex}$ Error State Output Bit (1 … 128)

6261$_{hex}$ Error State Output Bit (129 … 256)

6262$_{hex}$ Error State Output Bit (257 … 288)

The objects defined the values bit-wise. Each Sub-index for these objects is a Boolean value.

A total of 128 bits can be represented (128 digital output channels).

If more than 128 output channels are present, then Object 6261$_{hex}$ is used.

If more than 256 output channels are present, then Object 6262$_{hex}$ is used.

Since the number of digital input channels in a station is limited to 288, it is not possible to make use of the complete range of the array in Object 6262$_{hex}$.

The substitute value is defined for each digital output channel. The substitute values will only be used in the event of an error if a 1 is entered in an Error Mode Output Object (e.g. 6250$_{hex,}$ 6251$_{hex\ a}$nd 6251$_{hex}$) for the particular output channel.

Substitute values:

0   The output will be switched off if an error occurs.

1   The output will be switched on if an error occurs.

Table 71:   Object 6260$_{hex}$, 6261$_{hex}$, 6262$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error State Output Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 80$_{hex}$	Boolean
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 80$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 80$_{hex}$	0

6306$_{hex}$ Error Mode Output 16 Bit

The object defines values in 16-bit groups. A total of 18 groups (each 16-bit) can be defined (288 digital output channels).

It is possible to define, for each digital output channel, whether or not the output should take on a substitute value in the event of an error. The rule is:

0   The output maintains its value if an error occurs.

1   The output is set to a substitute value if an error occurs.

The substitute values for the digital output channels are defined by an Error State Output Object (e.g. 6307$_{hex}$).

Table 72: Object 6306$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error Mode Output 16 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 12$_{hex}$	Unsigned16
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 12$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 12$_{hex}$	FFFF$_{hex}$

6307$_{hex}$ Error State Output 16 Bit

The object defines values in 16-bit groups. A total of 18 groups (each 16-bit) can be defined (288 digital output channels).

The substitute value is defined for each digital output channel. The substitute values will only be used in the event of an error if a 1 is entered in an Error Mode Output Object (e.g. 6306$_{hex}$) for the particular output channel.

Substitute values:

0   The output will be switched off if an error occurs.

1   The output will be switched on if an error occurs.

Table 73:   Object 6307$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error State Output 16Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 12$_{hex}$	Unsigned16
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 12$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 12$_{hex}$	0000$_{hex}$

6326$_{hex}$ Error Mode Output 32 Bit

The object defines values in 32-bit groups. A total of 9 groups (each 32-bit) can be defined (288 digital output channels).

It is possible to define, for each digital output channel, whether or not the output should take on a substitute value in the event of an error. The rule is:

0	The output maintains its value if an error occurs.
1	The output is set to a substitute value if an error occurs.

The substitute values for the digital output channels are defined by an Error State Output Object (e.g. 6327$_{hex}$).

Table 74:   Object 6326$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error Mode Output 32 Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 09$_{hex}$	Unsigned32
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 09$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 09$_{hex}$	FFFFFFFF$_{hex}$

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**Objects for the substitute
output value in the event of an
error**

6327$_{hex}$ Error State Output 32 Bit

The object defines values in 32-bit groups. A total of
9 groups (each 32-bit) can be defined (288 digital output
channels).

The substitute value is defined for each digital output
channel. The substitute values will only be used in the event
of an error if a 1 is entered in an Error Mode Output Object
(e.g. 6326$_{hex}$) for the particular output channel.

Substitute values:

0   The output will be switched off if an error occurs.

1   The output will be switched on if an error occurs.

Table 75: Object 6327$_{hex}$ description

Feature	Sub-index	Description/Value
Name		Error State Output 32Bit
Object Code		ARRAY
PDO Mapping		Yes
Data type	Sub-index 00$_{hex}$	Unsigned8
	Sub-index 01$_{hex}$ … 09$_{hex}$	Unsigned32
Access	Sub-index 00$_{hex}$	ro
	Sub-index 01$_{hex}$ … 09$_{hex}$	rw
Default value, XI/ON	Sub-index 00$_{hex}$	No
	Sub-index 01$_{hex}$ … 09$_{hex}$	00000000$_{hex}$

Emergencies

The following CANopen Emergencies can be triggered by an XI/ON module of type **Digital Output module**:

Designation	Meaning	Byte 0/1 Error Code	Byte 2 Error Register	Byte 3 Extra info	Byte 4 Additional information
Output current too high	Output current is too high	2310_{hex}	Bit1 (current fault)	Module number	Channel numbers for the 2-channel modules

Bytes 5, 6, 7 of the Emergency frame are unused and are therefore always 0.

8   Integration in DeviceNet

Digital Input Module Class (VSC104)

This class contains all the information and parameters for digital input modules.

Table 76:   Class Instance

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
100	64_{hex}	CLASS REVISION	G	UINT	Contains the revision number of this class (Maj. Rel. * 1000 + Min. Rel.).
101	65_{hex}	MAX INSTANCE	G	USINT	Contains the number of the highest instance of an object created at this level in the class hierarchy.
102	66_{hex}	# OF INSTANCES	G	USINT	Contains the number of object instances created at this class level.
103	67_{hex}	MAX CLASS ATTR	G	USINT	Contains the number of the last class attribute implemented.

Table 77: Object Instances

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
100	64hex	MAX OBJECT ATTR	G	USINT	Contains the number of the last object attribute implemented.
101	65hex	MODULE PRESENT	G	BOOL	FALSE: XI/ON module is not inserted, vacant base module TRUE: XI/ON module is plugged in
102	66hex	TERMINAL SLOT NUMBER	G	USINT	The slot number of the base module (base module to the right of the gateway = No. 1) belonging to the module. Corresponds to the relevant instance number within the TERMINAL SLOT CLASS.
103	67hex	MODULE ID	G	DWORD	Contains the module ID.
104	68hex	MODULE ORDER NUMBER	G	UDINT	Contains the order no. of the module, e.g. 225000.
105	69hex	MODULE ORDER NAME	G	SHORT_ STRING	Contains the module name, e.g. XN-4DI-P.
106	6Ahex	MODULE REVISION	G	USINT	Contains the revision number of the module.

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
107	6B$_{hex}$	MODULE TYPE ID	G	ENUM USINT	Provides information about the module type: 0 (00$_{hex}$) unknown module type 1 (01$_{hex}$) digital I/O-module 17 (11$_{hex}$) analog module I/O-voltage 18 (12$_{hex}$) analog module I/O-current 19 (13$_{hex}$) analog module Pt-temperature 20 (14$_{hex}$) analog module thermo-temperature 33 (21$_{hex}$) 16-bit counter module 34 (22$_{hex}$) 32-bit counter module 40 (28$_{hex}$) SSI-module 49 (31$_{hex}$) Motor-starter module as direct or reversing starter 50 (32$_{hex}$) Electronic motor starter 65 (41$_{hex}$) RS232 module 66 (42$_{hex}$) RS485/422 module 67 (43$_{hex}$) TTY-module
108	6C$_{hex}$	MODULE COMMAND INTERFACE	G/S	ARRAY	The control interface for the XI/ON module. ARRAY OF: BYTE: control byte sequence
109	6D$_{hex}$	MODULE RESPONSE INTERFACE	G	ARRAY	Message interface for the XI/ON module. ARRAY OF: BYTE: message byte sequence
110	6E$_{hex}$	PRODUCED DATA SIZE	G	UINT	Contains the information about the amount of Produced Data for the module.
111	6F$_{hex}$	PRODUCED DATA	G	DWORD	Contains the input data for the module. DWORD: Bit-wise assignment, depending on the module specification.
112	70$_{hex}$	DIAG SIZE	G	UINT	Contains the information about the amount of Diagnostics Data for the module.

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
113	71_{hex}	DIAG	G	DWORD	Contains the diagnostics information for the module. The digital XI/ON-I modules do not provide diagnostics data. DWORD: Bit-wise assignment, depending on the module specification.
114	72_{hex}	PARAM SIZE	G	UINT	Contains information about the scope of module parameters. The digital XI/ON I/O-modules do not have any settable parameters.
115	73_{hex}	PARAMS	G/S	DWORD	Contains the parameters for the module. DWORD: Bit-wise assignment, depending on the module specification. Since the digital XI/ON I/O-modules have no settable parameters, this attribute is not used.
116	74_{hex}	MODULE REGISTERED INDEX	G	ENUM USINT	Contains the index number found in all module lists.

Digital Output Module Class (VSC105)

This class contains all the information and parameters for digital output modules.

Table 78:   Class Instance

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
100	64_{hex}	CLASS REVISION	G	UINT	
101	65_{hex}	MAX INSTANCE	G	USINT	Contains the number of the highest instance of an object created at this level in the class hierarchy.
102	66_{hex}	# OF INSTANCES	G	USINT	Contains the number of object instances created at this class level.
103	67_{hex}	MAX CLASS ATTR	G	USINT	Contains the number of the last class attribute implemented.

Table 79:   Object Instances

Attribute no.		Attribute name	Access	Type	Description
Dec	**hex**				
100	64$_{hex}$	MAX OBJECT ATTR	G	USINT	Contains the number of the last object attribute implemented.
101	65$_{hex}$	MODULE PRESENT	G	BOOL	FALSE: XI/ON module is not inserted, vacant base module TRUE: XI/ON module is plugged in
102	66$_{hex}$	TERMINAL SLOT NUMBER	G	USINT	The slot number of the base module (base module to the right of the gateway = No. 1) belonging to the module. Corresponds to the relevant instance number within the TERMINAL SLOT CLASS.
103	67$_{hex}$	MODULE ID	G	DWORD	Contains the module ID.
104	68$_{hex}$	MODULE ORDER NUMBER	G	UDINT	Contains the order no. of the module, e.g. 225000.
105	69$_{hex}$	MODULE ORDER NAME	G	SHORT_ STRING	Contains the module names, e.g. XN2DO-24VDC-0.5A-P.
106	6A$_{hex}$	MODULE REVISION	G	USINT	Contains the revision number of the module.

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
107	6B$_{hex}$	MODULE TYPE ID	G	ENUM USINT	Provides information about the module type: 0 (00$_{hex}$) unknown module type 1 (01$_{hex}$) digital I/O-module 17 (11$_{hex}$) analog module I/O-voltage 18 (12$_{hex}$) analog module I/O-current 19 (13$_{hex}$) analog module Pt-temperature 20 (14$_{hex}$) analog module thermo-temperature 33 (21$_{hex}$) 16-bit counter module 34 (22$_{hex}$) 32-bit counter module 40 (28$_{hex}$) SSI-module 49 (31$_{hex}$) Motor-starter module as direct or reversing starter 50 (32$_{hex}$) Electronic motor starter 65 (41$_{hex}$) RS232 module 66 (42$_{hex}$) RS485/422 module 67 (43$_{hex}$) TTY-module
108	6C$_{hex}$	MODULE COMMAND INTERFACE	G/S	ARRAY	The control interface for the XI/ON module. ARRAY OF: BYTE: control byte sequence
109	6D$_{hex}$	MODULE RESPONSE INTERFACE	G	ARRAY	Message interface for the XI/ON module. ARRAY OF: BYTE: message byte sequence
110	6E$_{hex}$	CONSUMED DATA SIZE	G	UINT	Contains the information about the amount of Consumed Data for the module.
111	6F$_{hex}$	CONSUMED DATA	G/S	DWORD	Contains the output data for the module. DWORD: Bit-wise assignment, depending on the module specification.
112	70$_{hex}$	DIAG SIZE	G	UINT	Contains the information about the amount of Diagnostics Data for the module.

Attribute no.		Attribute name	Access	Type	Description
Dec	hex				
113	71_{hex}	DIAG	G	DWORD	Contains the diagnostics information for the module. DWORD: Bit-wise assignment, depending on the module specification.
114	72_{hex}	PARAM SIZE	G	UINT	Contains information about the scope of module parameters. The digital XI/ON I/O-modules do not have any settable parameters.
115	73_{hex}	PARAMS	G/S	DWORD	Contains the parameters for the module. DWORD: Bit-wise assignment, depending on the module specification. Since the digital XI/ON I/O-modules have no settable parameters, this attribute is not used.
116	74_{hex}	MODULE REGISTERED INDEX	G	ENUM USINT	Contains the index number found in all module lists.

Appendix

Definitions

Protected outputs as per EN 61131-2)

For outputs that the manufacturer has specified as **protected**, the following applies:

- The output must be able to withstand the load and/or the corresponding protection device must protect the output for all continuous output currents that exceed 110 % of the rated value;
- After the reset or replacement of the protective device, the PLC system must return to normal operation;
- Additional restart features can be selected from the 3 following types:
  - Protected output with automatic restart: a protected output that automatically restarts operation as soon as the overload is no longer present;
  - Protected output with controlled restart: a protected output that is restarted as a response to specific signals (e.g. by remote control);
  - Protected output with manual restart: a protected output that is restarted by manual action (the protection can be ensured by means of fuses, electronic lock-outs etc.).

Note: Lengthy operation in overload conditions may result in a reduction of the operational life of the module.

The protected outputs do not necessarily provide protection for the external wiring. The user is responsible for providing the means necessary to achieve such protection.

Short-circuit proof outputs (as per EN 61131-2)

For outputs that the manufacturer has specified as **short-circuit proof**, the following applies:

- For all output currents above the maximum current $I_{e\,max.}$ and up to $2 \times$ the rated current I_e, the output must function and withstand a temporary overload. Such temporary overload situations must be defined by the manufacturer.
- The protective device must be activated for all forseeable output currents greater than $20 \times$ the rated value. After a rest or replacement of the protective device, the PLC must once more function normally.
- For output currents in the range from $2 \ldots 20 \times I_e$ or for temporary overloads above the limits given by the manufacturer (see Item 1 above), a repair or replacement of the module may be required.
- During an overload of $2\,I_e$ for a duration of 5 minutes no danger of fire or electrical shock may result. Directly after every overload the highest temperature increase of the I/O insulation may not exceed the values stated in 4.4.2.