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Nemo SX - Multifunction state module

Cat. N° : SXMC02

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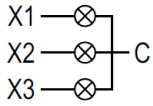
1. DESCRIPTION - USE

. Module dedicated to Nemo SX System.
. Enables to display a clear indication on the status of a circuit or of an associated modular device (MCBs, RCCBs, RCBOs...) and/or power devices (e.g. ACBs, MCCBs...) via voltage-free SPST-NO contacts.
- Type of information returned by the device:
  open, closed, tripped positions of a modular or power device, etc.
  LED behaviour
  other configurations (see § "Module configuration")

Symbol:



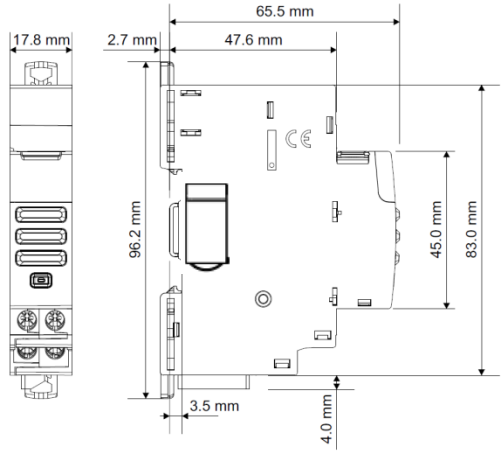
2. RANGE

. Cat. n° SXMC02: Universal State Module; 3 inputs from voltage-free SPST-NO contact with one common terminal.

Width:

. 1 module. 17,8 mm width.

3. OVERALL DIMENSIONS



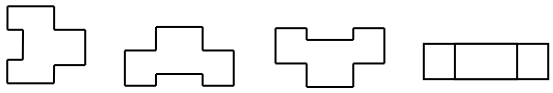
4. PREPARATION -CONNECTION

Fixing:

. On symmetric rail EN/IEC 60715 or DIN 35 rail

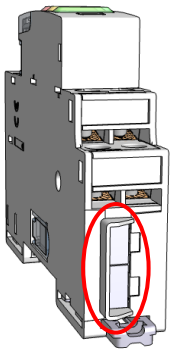
Operating positions:

. Vertical, Horizontal, Upside down, On the side

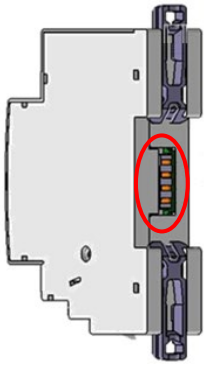


Power Supply:

. Mandatory in 12 VDC via the specific Power supply module Cat n° SXAA230
. Two ways:
  via specific communication patch cords (cat. nos SXAC250/500/1000) to connect at the downstream through dedicated ports



  via specific communication rails (cat. nos SXAR18/24/36) to connect at the rear through dedicated connectors



4. PREPARATION –CONNECTION *(continued)*

Terminals:
. Terminal depth: 8 mm.
. Stripping length: 8 mm

Screw head:
. Mixed, slotted and Pozidriv n° 1 (UNI7596 type Z1).

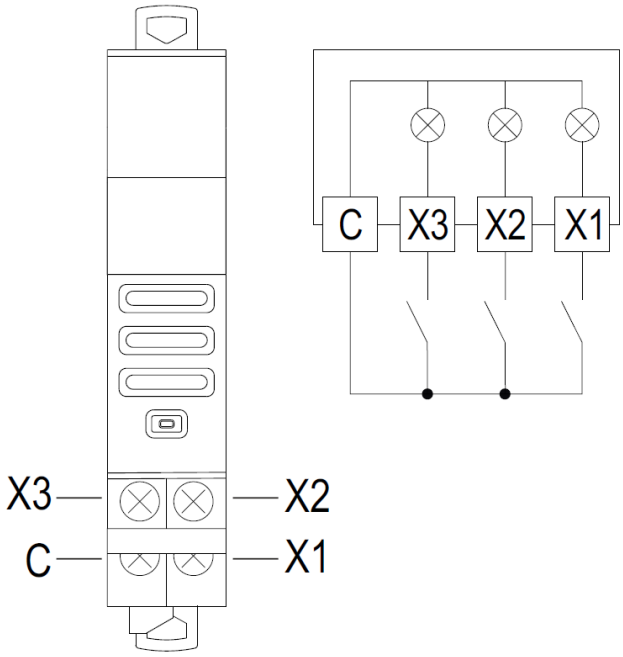
Recommended tightening torque:
. 1 Nm.

Recommended tools:
. For the terminals: Pozidriv n° 1 or flat screwdriver 4 mm.
. For fixing: flat screwdriver 5.5 mm (6 mm maximum).

Conductor type:

	Copper cable	
	Without ferrule	With ferrule
Rigid Cable	**1 x 0,5 mm² to 1,5 mm² 2 x 1,5 mm²**	-
Flexible Cable	**1 x 0,5 mm² to1,5 mm² 2 x 1,5 mm²**	**1 x 0,5 mm² to 1,5 mm² 2 x 1,5 mm²**

Wiring diagrams:



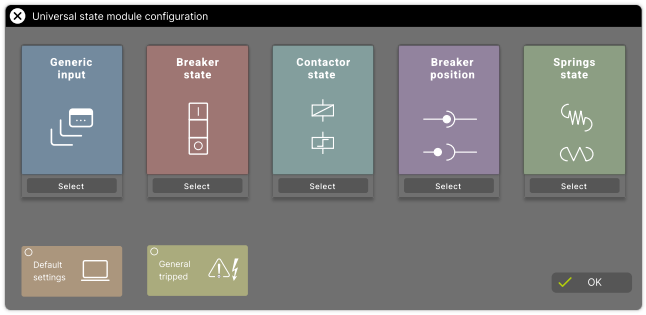
Inputs from voltage-free SPST NO contacts

4. PREPARATION –CONNECTION *(continued)*

Module configuration:
. Configuration is possible remotely, via EMS BTDIN Configuration software (**module firmware version ≥ 2.0.2** [production date ≥ 18W35] **& Configuration software ≥ 2.00.00**).

Configuration allows to set:
- information type
- LED behaviour

Possible configurations are listed as shown below.



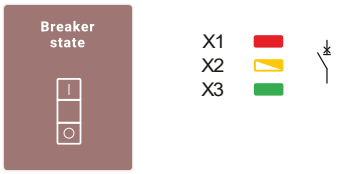
Note 1:

	Steady LED
	Blinking LED
	LED off

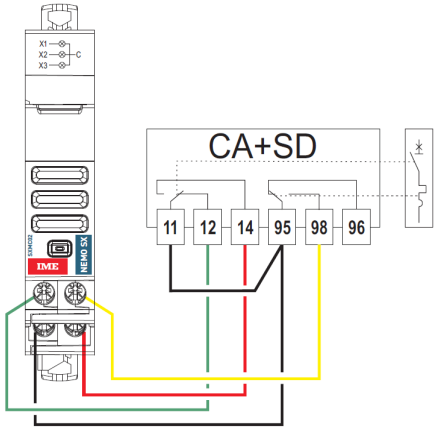
4. PREPARATION –CONNECTION *(continued)*

Connection with an associated device:

. Nemo SX multifunction state module must be configured remotely as shown:



Association with an electro-mechanical auxiliary contact + fault signalling switch.

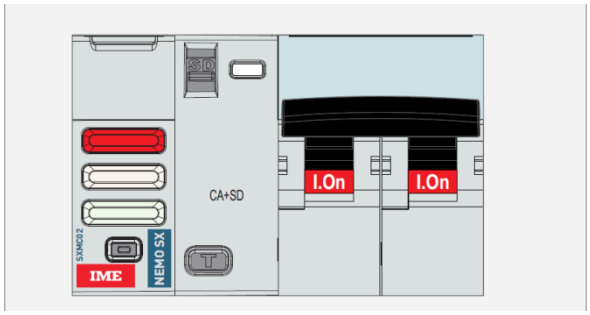


Note:

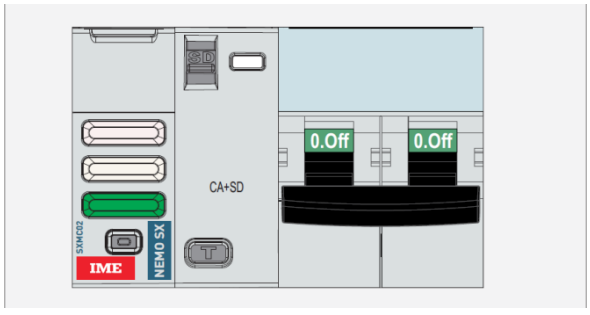
Open /Close / Tripped displayed information for a protection device.

With any kind of electrical protection device (modular or power) the displayed information must be done in accordance with the handle colour status, as shown below:

"I-ON" (red) = contacts closed



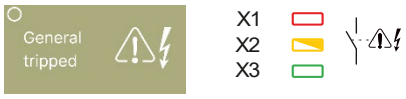
"O-OFF" (green) = contacts open



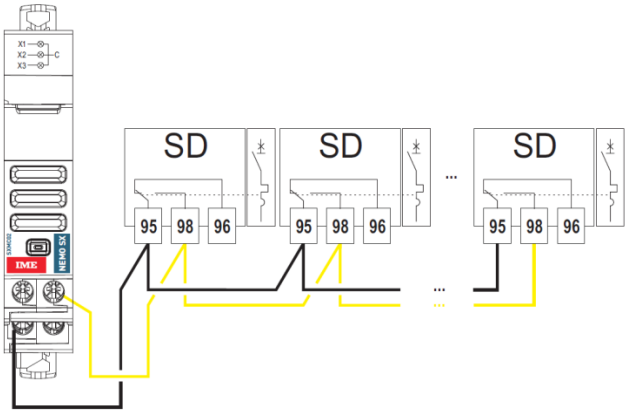
4. PREPARATION –CONNECTION *(continued)*

Connection with an associated device *(continued)*:

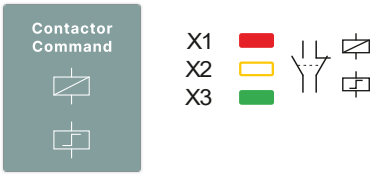
. Nemo SX multifunction state module must be configured remotely as shown:



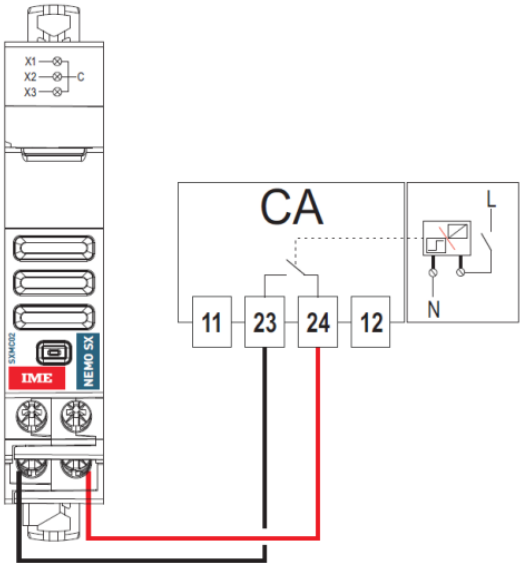
. Association with several electro-mechanical faults signalling auxiliaries.



. Nemo SX multifunction state module must be configured remotely as shown:



Association with an electro-mechanical Contactor or Latching relay auxiliary contact.



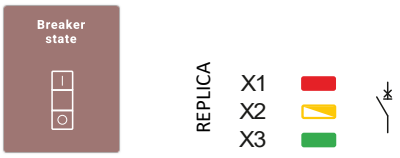
4. PREPARATION –CONNECTION *(continued)*

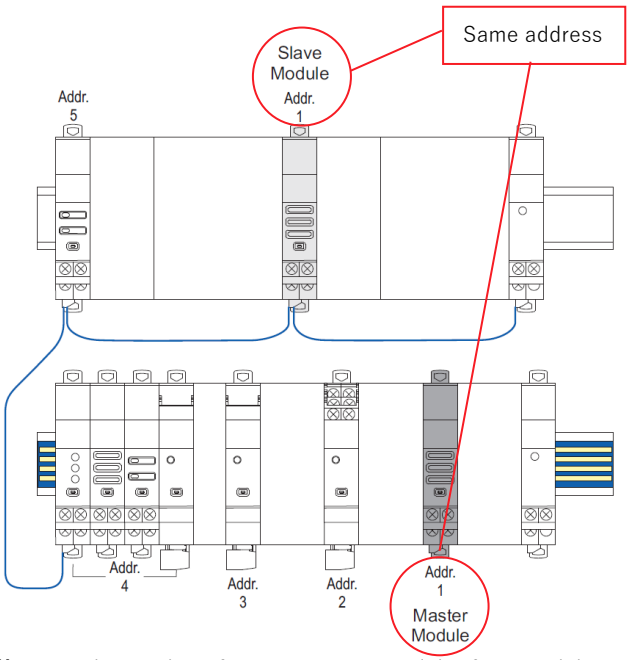
Module configuration *(continued)*:

Note 2:
REPLICA = Repeat function
. This configuration allows you to use a Nemo SX Multifunction state module (cat. no SXMC02) as Salve of another Nemo SX Multifunction state module (cat. no SXMC02) Master.
. REPLICA module receives via Nemo SX bus and repeats the signalisations of the master module trough 3 frontal led.
. No need to wire the terminals of the REPLICA module
. **REPLICA module must have the same address of the Master module**

. **Example**, Nemo SX Multifunction state module used as salve of another Nemo SX Multifunction state module

. Nemo SX multifunction state "REPLICA" module must be configured remotely as shown:





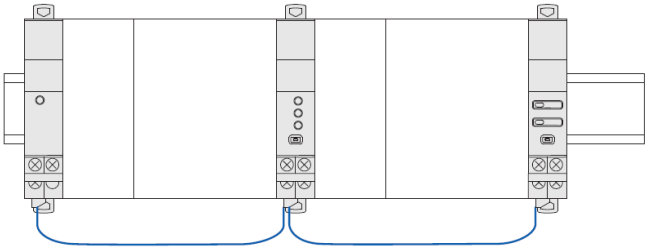
Note: to change the reference "Master module" for a module set as "REPLICA", it is sufficient assign to the "REPLICA" the address of the new "Master module".

4. PREPARATION –CONNECTION *(continued)*

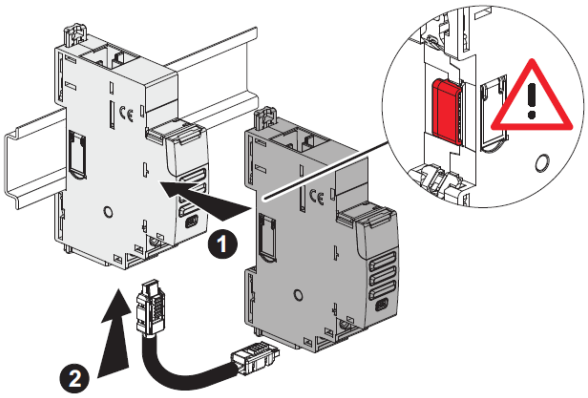
Data connection (Nemo SX modules inter-connection):

. Via specific communication patch cords (cat. nos SXAC250/ 500/1000)

Allow data transmission between the different Nemo SX modules. This type of connection is recommended when there are few Nemo SX modules, distributed all over the enclosure.



Implementing: with this configuration, the plastic protection cover of the backside communication ports on the Nemo SX module must be keep on.

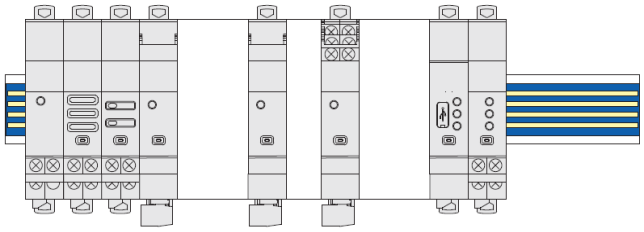


4. PREPARATION –CONNECTION *(continued)*

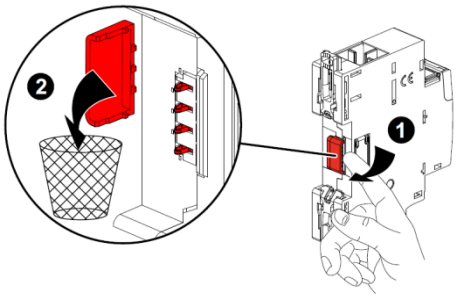
Data connection (Nemo SX modules inter-connection) *(continued)*:

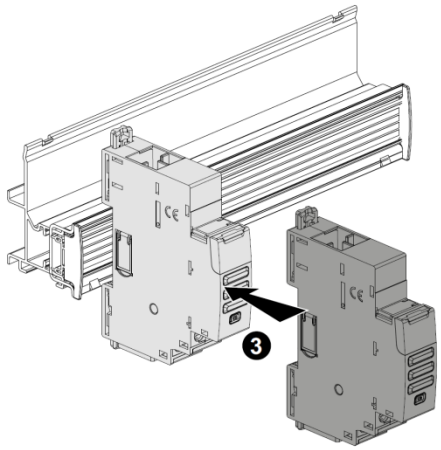
. Via specific communication rails (cat. nos SXAR18/24/36).

. Allow data transmission between the different Nemo SX modules.
This type of connection is recommended when there are several Nemo SX modules on the same DIN row.



Implementing: with this configuration, the plastic protection cover of the backside communication ports on the Nemo SX module must be removed.





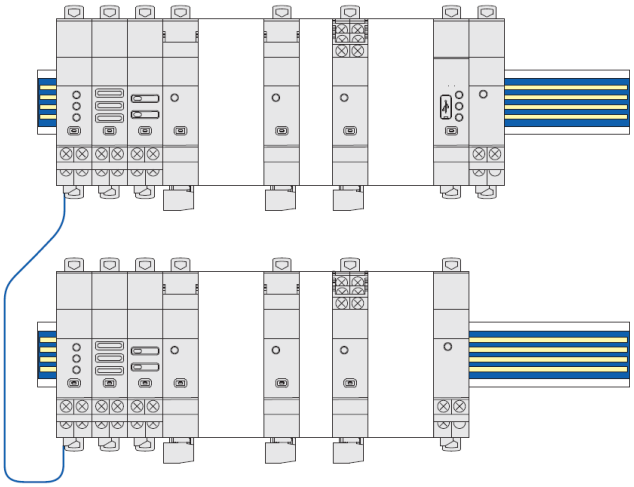
4. PREPARATION –CONNECTION *(continued)*

Data connection (Nemo SX modules inter-connection) *(continued)*:

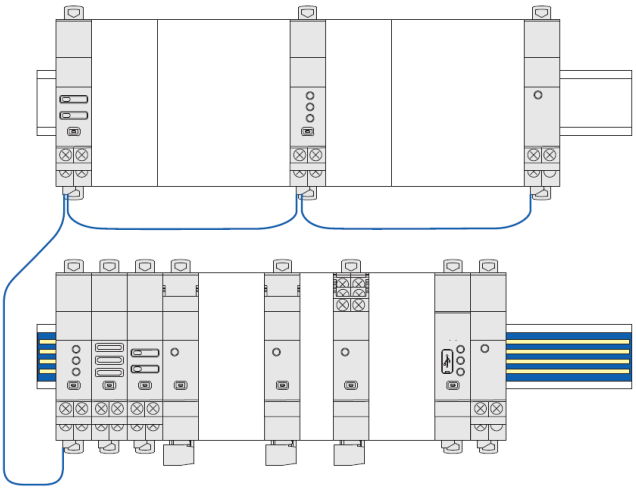
. Via a mix between specific communication patch cords and communication rails in order to create a link between several rows

Two situations:

- Individually connected with communication rails.
  The communication patch cord allows to connect two rows.



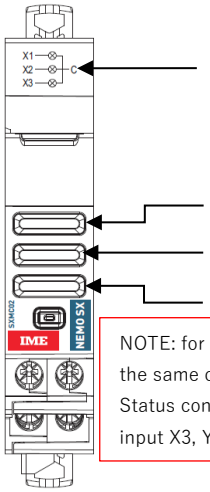
- Individually connected with communication patch cords & communication rail.
  The communication patch cords allow to connect Nemo SX module on a row and to connect two rows.



5. GENERAL CHARACTERISTICS

Front face marking:

. By permanent ink pad printing (red line) and laser marking



Electrical diagram

LED linked to the input X1

LED linked to the input X2

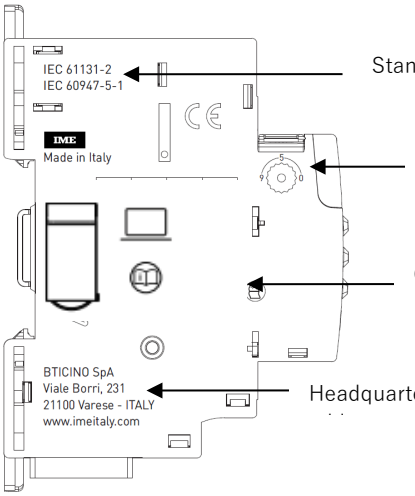
LED linked to the input X3

NOTE: for all configurations the inputs and the leds have the same correspondence as above, except for the Spring Status configuration where the Red led corresponds to input X3, Yellow led to input X1 and green led to input X2

Lateral side marking:

. By laser.

left side: Standard and programming information



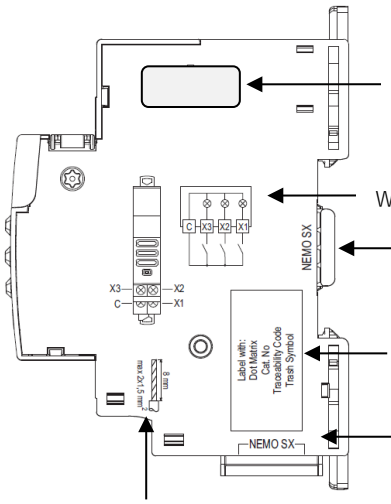
Standards

Indicates the presence of the addressing track-wheel

Configuration via PC

Headquarter

right side: cabling and traceability information



Label: to be removed from the module and

Wiring diagram

Data connection with communication rail

Traceability

Data connection with communication patch cords

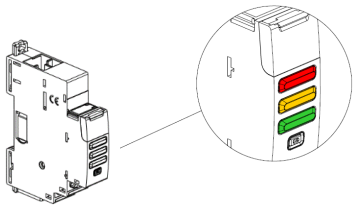
Cabling information

5. GENERAL CHARACTERISTICS *(continued)*

Signalling LEDs:

. Equipped with configurable signalling LEDs: red, yellow and green
(see § "Module configuration"):

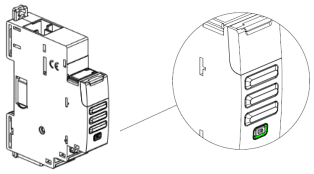
- LED turned on: indicates that the corresponding inputs is high (contact cabled between the common terminal "C" and the corresponding terminal "X1", "X2", or "X3" is closed)
- LED turned off: indicates that the corresponding inputs is low (contact cabled between the common terminal "C" and the corresponding terminal "X1", "X2", or "X3" is open)



. Technology: non-replaceable LED lamps
. Life time 100 000 hours without maintenance.
. The ergonomic design of the translucent plastic window allows a homogeneous projection of the light.

Multi-Functions button:

Front face button as several functions:



. Gives information about the operating state on the module
Possible states:

Colour	State	Meaning
red	Slow blinking	Error (e.g. addressing error)
	Fast blinking	No function
	Steady *(pressing the multifunction button longer than 10 sec.)*	Total reset [any firmware updates are preserved]
green	Slow blinking	System process is running. Wait until the Led turns steady
	Fast blinking *(pressing the multifunction button for 5 sec.)*	put in "Stand-by" the Nemo SX module (no remote action and communication available)
	Steady	System OK, connection is running
orange	Slow blinking	Creation of a link with "Link Functionality" procedure *(see next §)*
	Fast blinking	Device's firmware update in progress
	Steady	Start of FW update or active Link functionality (see next §)

5. GENERAL CHARACTERISTICS *(continued)*

Link Functionality:

. This function allows you to link two Nemo SX modules to create automatic actions that, once programmed, can run independently without a connection to a manager is needed.
The basic rule is the link between an event (circuit breaker that trip, a threshold exceeded, etc.) and an action accordingly (signalling, opening of a circuit by motorized control or contactor, etc.).

Possible associations are:

	Action module	
Event generator	Command: SXM0C1	State: SXMC02
Measure: SX3M63, SXMM63, SXMT63, SXMT125, SXMMT5, SXMR02, SXMR04, SXMR06, SXMR08	✓	✓ Only with the module configured remotely as shown: 
State: SXMC02	✓	✗ It's enough to configure the module (locally or remotely) as "REPLICA"

Note:
- association can only be of type 1 to 1 (1 event and 1 action).
- modules already associated cannot be used for other associations.
- all the configuring procedure will be done with the Configuration Software (available online for free). *[For more details refer to the Installation Manual of Nemo SX Configuration software]*

Modules compatible with "Link Functionality" feature: firmware versions and production date:

Cat n°	Firmware version	Production date indicated on the label sticked on the side of the module
SX3M63	all firmware versions	any production date
SXMM63	ver. ≥ 2.0.1	date ≥ 18W49
SXMT63	ver. ≥ 2.0.1	date ≥ 18W49
SXMT125	all firmware versions	any production date
SXMMT5	ver. ≥ 2.0.1	date ≥ 18W35
SXMR02	all firmware versions	any production date
SXMR04	all firmware versions	any production date
SXMR06	all firmware versions	any production date
SXMR08	all firmware versions	any production date
SXMC02	ver. ≥ 2.0.2	date ≥ 18W49
SXM0C1	ver. ≥ 3.0.2	date ≥ 18W39
SXV01	ver. ≥ 2.0.4	date ≥ 18W38
SXI485	ver. ≥ 3.0.8	date ≥ 18W31

5. GENERAL CHARACTERISTICS *(continued)*

Insulation voltage:
. Ui = 400 V

Impulse withstand voltage Uimp:
. Nemo SX ports / Input terminals:
wave 1,2 / 50 μs: 6 kV
alternate current 50 Hz / 1 min.: 3 kV

Pollution degree:
. 2 according to IEC/EN 60898-1.

Overvoltage category:
. III

Dielectric strength:
. 2500 V

Plastic material:
. Self-extinguishing polycarbonate.
. Heat and fire resistant according to IEC/EN 60695-2-12, glow-wire test at 960° C.
. Classification UL 94 / IECEN 60695-11-10: V1

Ambient operating temperature:
. Min. = -25° C. Max. = +70° C

Ambient storage temperature:
. Min. = -40° C. Max. = +70° C

Protection Index:
. Protection index of terminals against direct contacts: IP2X (IEC/EN 60529).
. Protection index of terminals against solid and liquid bodies (wired device): IP 20 (IEC/EN 60529).
. Protection index of the front face against solid and liquid bodies: IP 40 (IEC/EN 60529).
. Class II, front panel with faceplate.

Average weight per device:
. 0,055 kg.

Volume when packed:
. 0,21 dm^3.

Consumption:
. Values at 12 VDC

Configuration	W	mA
Stand-by	0,258	21,5
All led OFF	0,258	21,5
1 led ON	0,298	24,8
2 led ON	0,337	28,1
All led ON	0,376	31.4

6. SYSTEM ARCHITECTURES

The Nemo SX is a polyvalent system and, according to the needs of the customer, can be set up and/or used as “Stand-alone” or “Supervised” system. Based on this choice the configuration and addressing methods are different.

Four possible architectures are provided:

6.1 Stand-alone system

6.1.1 with local addressing (through the track wheel)

6.1.2 with remote addressing (through a computer)

6.2 Supervised (Computer Supervisory System)

6.2.1 with local addressing

6.2.2 with remote addressing

6.1 Stand-alone system

. **Stand-alone** = autonomous system. To be used by the end-user if it is not necessary to have a computer for the supervision outside the envelope. Everything can be managed on site.

6.1.1 Stand-alone system with local addressing (through the track wheel)

Local addressing advantages:

- No configuration software needed to set-up the installation
- **It is not necessary to use a computer to manage settings** (configurations, test, ...) and to use the system (visualize and be alerted, ...). Everything can be done through the Mini configuration module (local display, cat. no SXV01). *[Refer to the technical sheet dedicated to this module for details].*
- No communication Interfaces or gateways are required.
- Installation can be done without the intervention of a System Integrator

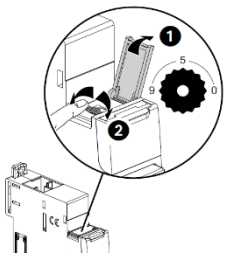
Programming procedure:

. For Nemo SX modules which need some mandatory through the Nemo SX configurator *(see § "Module configuration")*

Addressing procedure:

. For all Nemo SX modules: mandatory through the track wheel located on the top upper face of each Nemo SX modules

. Marked from 0 to 9 in order to locally define the Modbus address of the Nemo SX modules



Note for Measure Module “3x single phase”:
This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

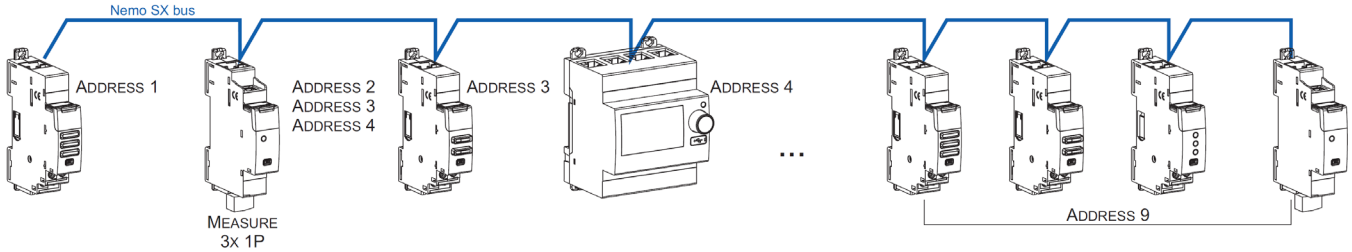
Consequences of the local addressing mode (through the track wheel):

. Each device of the system must be addressed.

. Addresses available: from 1 to 9

. Address 0 not permitted

. It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a multifunction signalling module (cat. no SXMC02), a multifunction control module (cat. no SXM0C1), a measuring module, and so on. In this way on the Nemo SX mini configuration module (local display) the grouped function will be displayed as a unique “device” with all grouped functions. *[Refer to the schemes hereunder]*



Note for the mini configuration module (local display)

. It is possible to assign it the same address as another Nemo SX through the programming menu of the device

. The mini configuration module can be placed everywhere in the Nemo SX bus

6. SYSTEM ARCHITECTURES

6.1 Stand-alone system *(continued)*

6.1.2 Stand-alone system with remote addressing (through a computer)

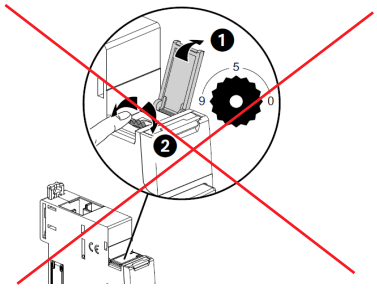
Remote addressing advantages:

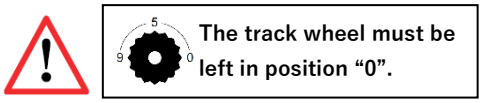
- Whole configuration (addresses and functions) can be set up through the Nemo SX Configuration software
- Configuration software available for free
- **Automatic detection of the Nemo SX modules** installed in the system (characteristics, functions, configuration…)
- **Increased settings possibilities: load shedding function**
- Increased addressing**: up to 30 Modbus addresses in a system**

Programming procedure:

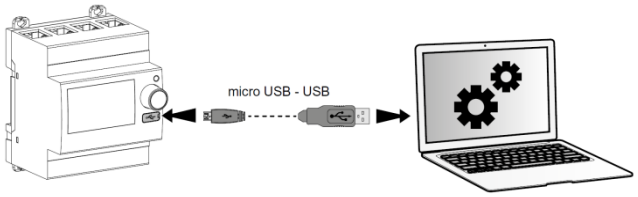
. For Nemo SX modules which need some: possible through the configuration software *(see § "Module configuration").*

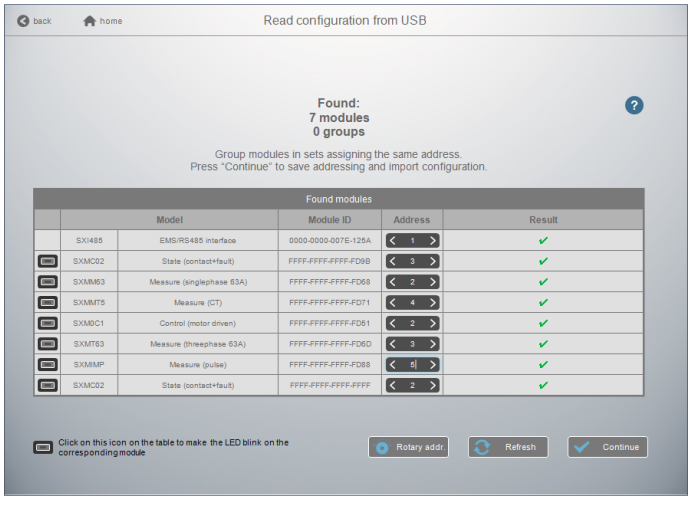
Addressing procedure:





. It is not necessary to assign an address via rotary; **The track wheel must be left in default position "0**".
. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)
. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the user assigns the remote address and all the characteristics to each module.
Note: it is mandatory to connect the computer to the Mini configuration module with a "type B" micro - USB cable. *[For more details, refer to the technical data sheet of the Mini configuration module Nemo SX]*





Note for Measure Module "3x single phase":
This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

6. SYSTEM ARCHITECTURES

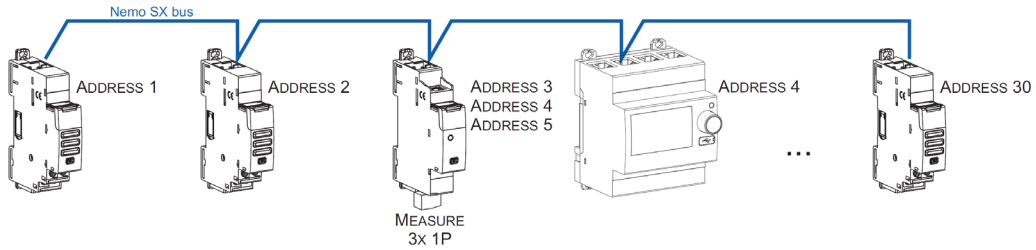
6.1 Stand-alone system *(continued)*:

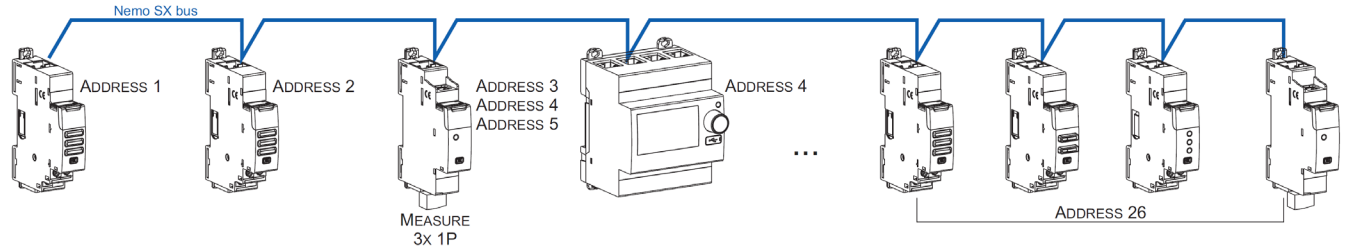
6.1.2 Stand-alone system with remote addressing (through a computer) *(continued)*:

Consequences for the system architecture:

- for 1 mini configuration module (cat. no SXV01)
  - up to **30 Nemo SX modules** (e.g. 30 devices grouped per functions with addresses from1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a multifunction signalling module (cat. no SXMC02), a multifunction control module (cat. no SXM0C1), a measuring module, and so on. In this way on the Nemo SX display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the schemes here under]*





Note for the mini configuration module (local display)

. It is possible to assign it the same address as another Nemo SX

. The mini configuration module can be placed everywhere in the Nemo SX bus

6.2 Supervised system (Computer Supervisory System)

. **Supervised system** = System to be used through a Computer Supervisory System to remotely read data from the Nemo SX devices and/or do operations on these devices (e.g. commands of a motor driven or contactor ...).

6.2.1 Supervised system-with local addressing (through the track wheel)

Local addressing advantages:

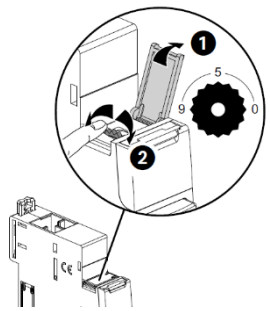
- No configuration software needed to set-up the installation
- Installation can be done without the intervention of a System Integrator

Programming procedure:

. For Nemo SX modules which need some mandatory through Nemo SX configurator *(see § "Module configuration")*

Addressing procedure:

. For all Nemo SX modules: mandatory through the track wheel located on the top upper face of each Nemo SX module



. Marked from 0 to 9 in order to locally define the Modbus address to Nemo SX modules

In this system the Modbus address of a Nemo SX Nemo SX module device or group of modules (several functions) is obtained considering the address of the interface Modbus/Nemo SX Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 → address of module n° 5 = Modbus address 15)

Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 12, Addresses of the module 12, 13, 14)

6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

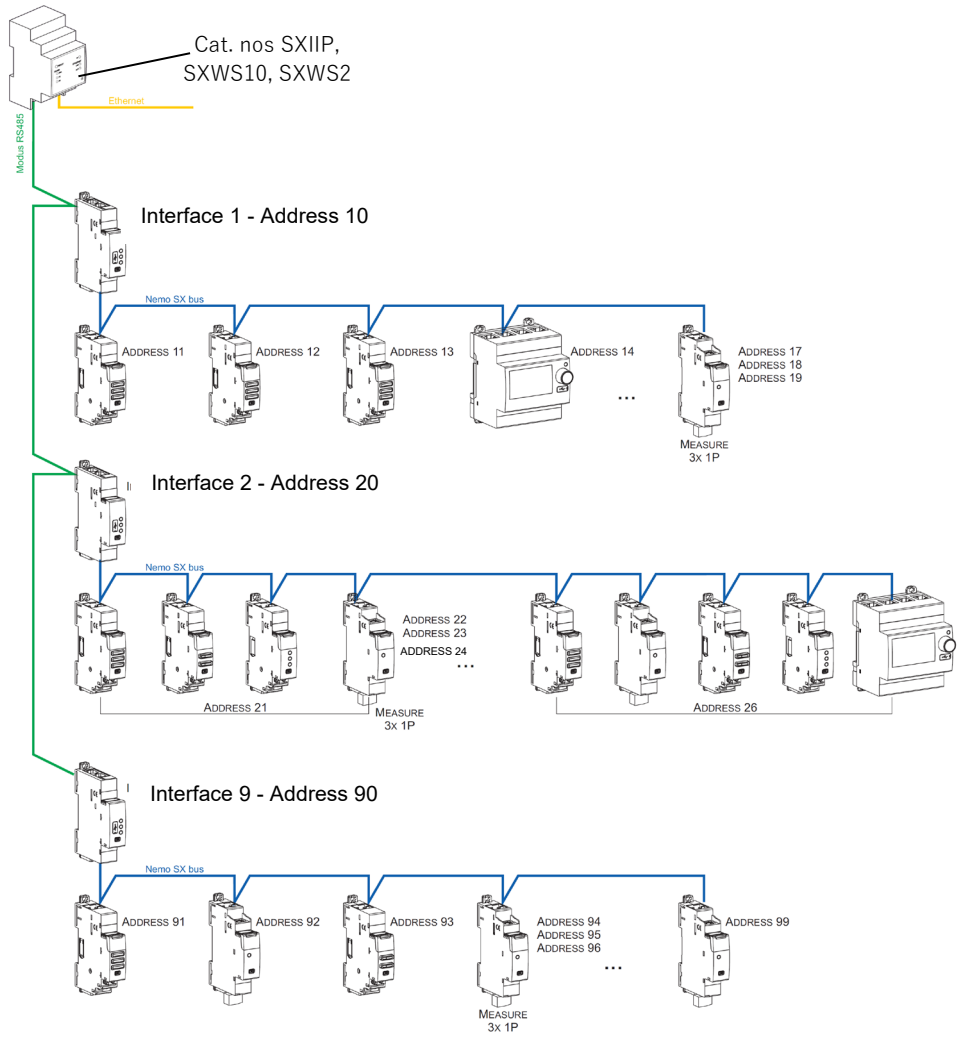
6.2.1 Supervised system-with local addressing (through the track wheel) *(continued)*

Consequences of the local addressing mode (through the track wheel):

. Each device of the system must be addressed.
. Addresses available: from 1 to 9
. Address 0 not permitted

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a multifunction signalling module (cat. no SXMC02), a multifunction control module (cat. no SXM0C1), a measuring module, and so on. In this way on the Nemo SX display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme hereunder]*

Note: In this configuration the Modbus address of a Nemo SX module device or group of modules (several functions) is obtained considering the address of the interface Modbus/Nemo SX Interface as tenth and the address of a device or group of function as unit (e.g. Interface address 1 = 10 and device address = 5 → Modbus address = 15)



Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no SXIIP):
  - up to **81 Modbus address**
  - mandatory limit of max. **9 Modbus/Nemo SX interfaces or max. 1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for 1 Modbus/Nemo SX Interface (cat. no SXI485):
  - up to **30 Nemo SX modules** (ex. 30 devices grouped per functions with addresses from1 to 9)

Note: with local addressing, the Modbus/Nemo SX interface, does the automatic detection of modules (characteristics, functions, configuration...)

6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

6.2.2 Supervised system-with remote addressing (through a computer)

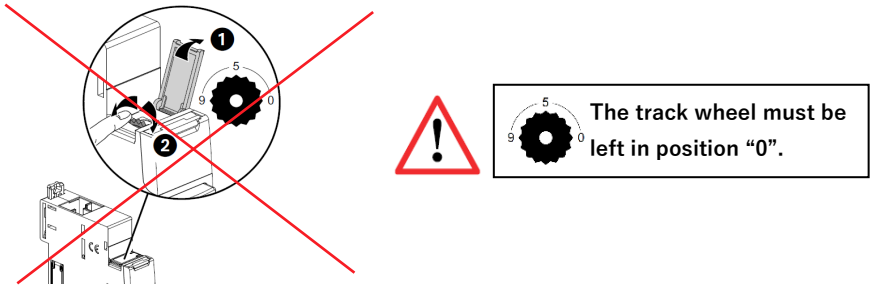
Remote addressing advantages:

- Whole ~~of~~ configuration (addresses and functions) can be done a remotely through the Nemo SX Configuration software
- Configuration software available for free
- **Automatic detection of the Nemo SX modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings possibilities: load shedding function**
- Increased addressing: **up to 32 Modbus/Nemo SX interfaces**
- Increased addressing**: up to 247 Modbus addresses in a system**

Programming procedure:

. For Nemo SX modules which need some: possible via the configuration software *(see § "Module configuration").*

Addressing procedure:

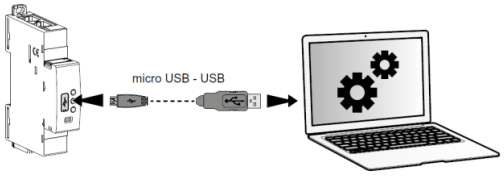


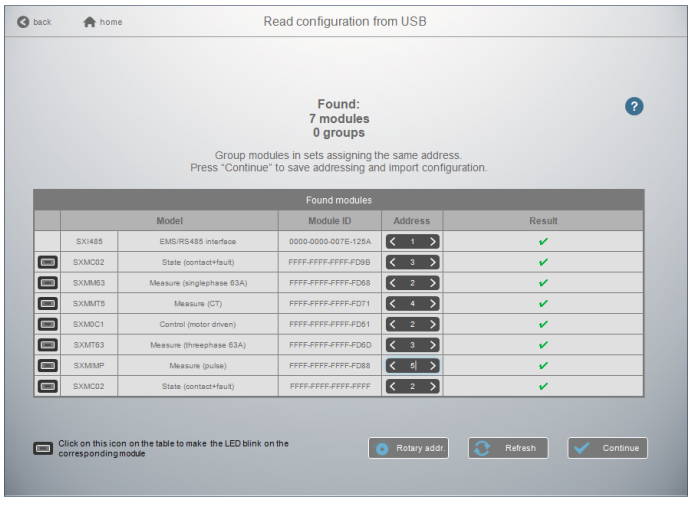
. It is not necessary to address the Nemo SX modules. **The track wheel must be left in default position "0".**

. All the addressing/configuring procedure will be done with the Configuration Software (available online for free)

. With remote addressing, the software does the automatic detection of modules installed in the system, but the supervision is not possible until the user assigns the remote address and all the characteristics to each module.

Note: it is mandatory to connect the computer to the different Modbus/Nemo SX interface with a "Type B" micro USB - USB cable (one interface at a time). *[For more details, refer to the technical sheet Modbus/Nemo SX interface]*





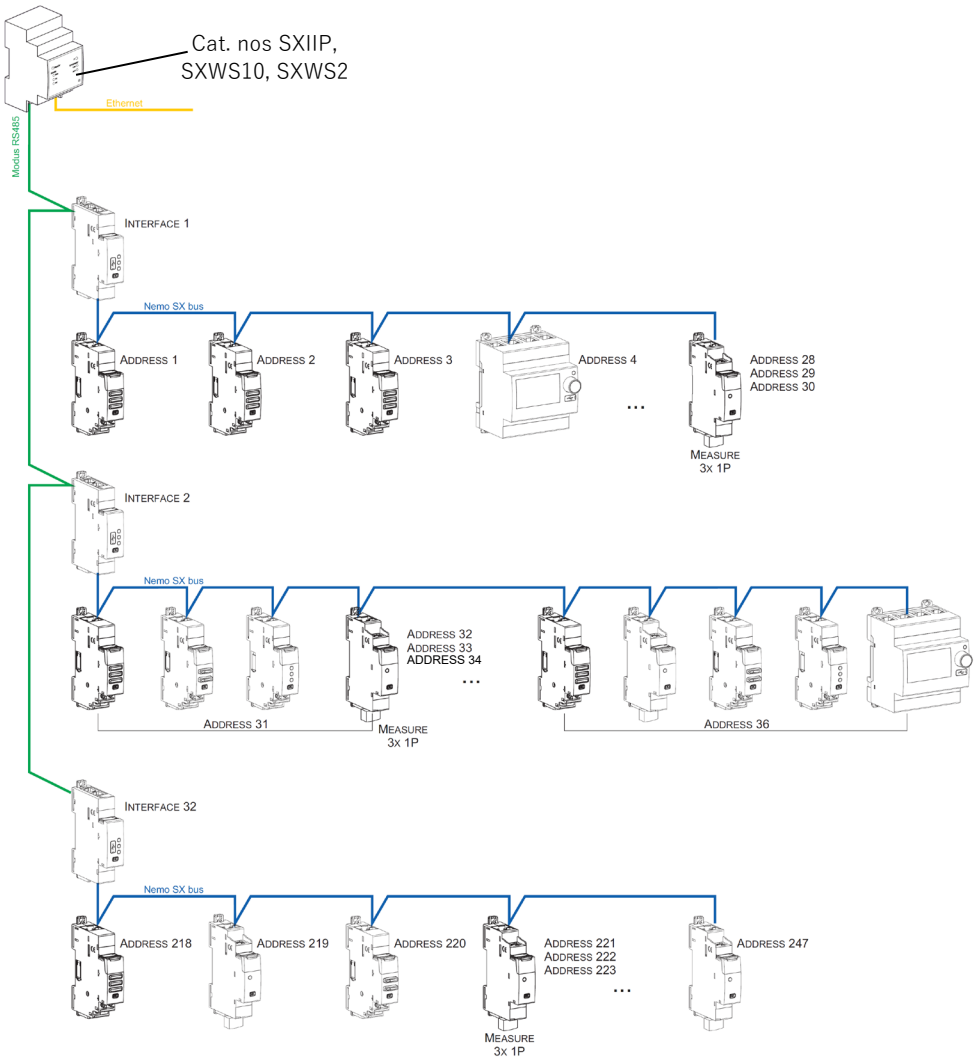
Note for Measure Module "3x single phase":

This module is to be consider as 3 modules with 3 different Modbus Address. The module takes automatically the two addresses immediately following to the programmed one (e.g. Programmed address = 2, Addresses of the module 2, 3, 4)

6. SYSTEM ARCHITECTURES *(continued)*

6.2 Supervised system (Computer Supervisory System) *(continued)*

6.2.2 Supervised system-with remote addressing (through a computer) *(continued)*



Consequences for the system architecture:

- for 1 IP/Modbus gateway (cat. no SXIIP):
  - up to **247 Modbus address**
  - Because of Modbus: mandatory limit of max. **32 Modbus/Nemo SX interfaces** or max. **1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent) or max. **50 m of Category 6 cable** (FTP or UTP).
- for1 Modbus/Nemo SX Interface (cat. no SXI485):
  - up to **30 Nemo SX modules or grouped modules** (e.g. 30 devices grouped per functions with addresses from1 to 30)

It is possible to assign to several devices the same address with the purpose of grouping different functions, **because they are related to the same electrical circuit**. For example, it is possible to assign the same address to a multifunction signalling module (cat. no SXMC02), a multifunction control module (cat. no SXM0C1), a measuring module, and so on. In this way on the Nemo SX display or in a supervision system the grouped function will be displayed as a unique "device" with all grouped functions. *[Refer to the scheme up here]*

7. COMPLIANCE AND APPROVALS

Compliance to standards:

. Compliance with Directive on electromagnetic compatibility (EMC) n° 2014/30/EU
. Compliance with low voltage directive n° 2014/35/EU.
. Electromagnetic Compatibility:
IEC/EN 61131-2
IEC/EN 60947-5-1

Environment respect - Compliance with EU directives:

. Compliance with Directive 2011/65/EU as amended by Directive 2015/863 (RoHS 2) on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
. Compliance with REACH regulation (1907/2006): at the date of the publication of this document no element of the SVHC substance list (updated on 27/06/2018) is present in these products.
. WEEE directive (2012/19/EU): the sale of this product is subject to a contribution to eco-organisations in each country responsible for managing end-of-life products in the field of application of the European Waste Electronic and Electrical Equipment Directive.

Plastic materials:

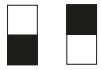
. Halogens-free plastic materials.
. Marking of parts according to ISO 11469 and ISO 1043.

Packaging:

. Design and manufacture of packaging compliant to decree 98-638 of the 20/07/98 and also to directive 94/62/CE.

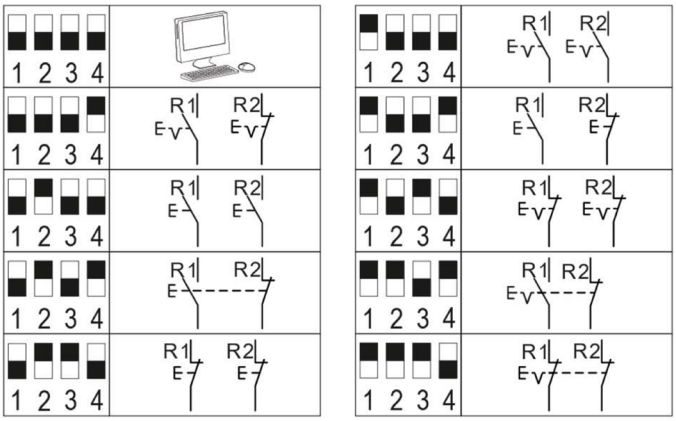
8. ANNEX: configuration with dip switch for the previous version

The black color indicates the position of the dip switch.

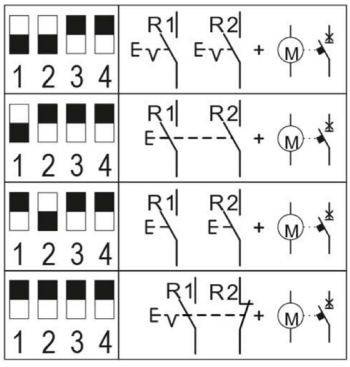


Universal control module

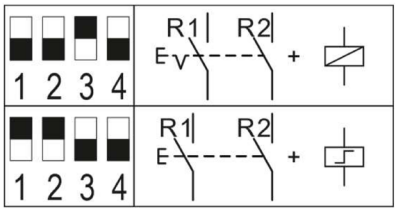
Generic outputs



Associated with Motor driven control

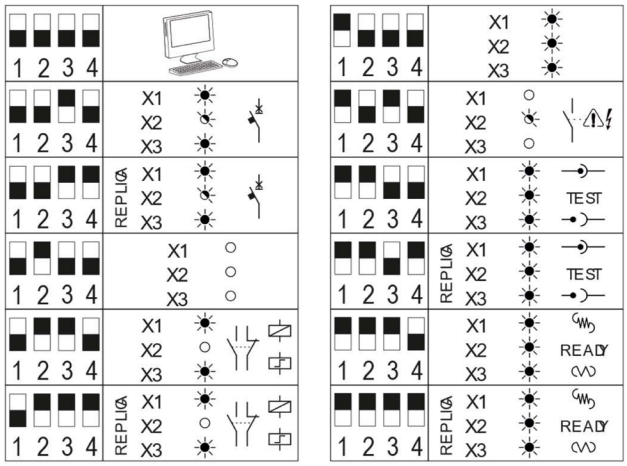


Associated with Latching relays or Contactors



8. ANNEX: configuration with dip switch for the previous version *(continued)*

Universal state module



State and control module for Latching relays and Contactors