

Nemo SX - Multifunction Measuring module with Rogowski coils

Cat. Nos: SXMM63/SXMT63



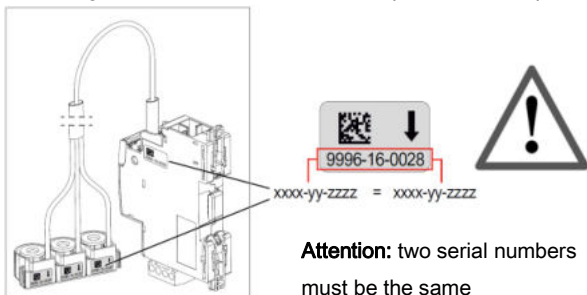
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1. DESCRIPTION - USE

. Module dedicated to Nemo SX System.
Multifunction Measuring module.
Measures the main electrical data of a single-phase or three-phase network.
The insertion is done by closed Rogowski coils.

2. RANGE

. Cat. n° SXMM63: Multifunction measuring module delivered with non interchangeable coil to measure a single-phase circuit up to 63A
. Cat. n° SXMT63: Multifunction measuring module delivered with non interchangeable coils to measure a three-phase circuit up to 63A



Width:

. 1 module. 17,8 mm width.

Rated current:

. Base current, Ib: 20 A (via external Rogowski sensor)
. Max. current, Imax: 63 A

Insertion rated voltages:

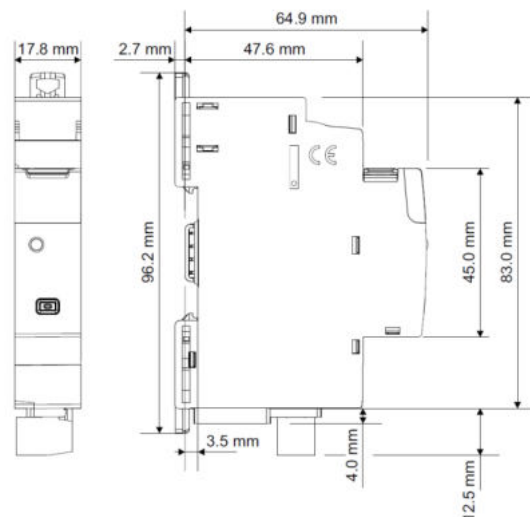
. Un: 110÷500 V~ (phase/phase)
. Un: 65÷290 V~ (phase/neutral)

Rated frequency:

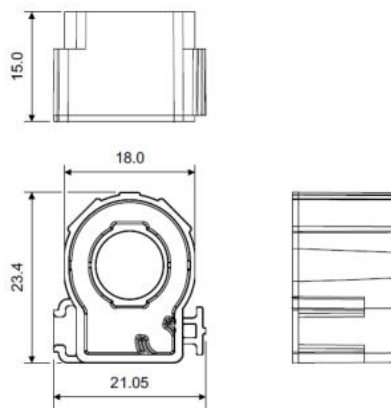
. fn: 50/60 Hz
. Admitted variation:
45 ÷ 55 Hz (fn 50 Hz)
55 ÷ 65 Hz (fn 60 Hz)

3. OVERALL DIMENSIONS

. SXMM63:
Module



Rogowski coil

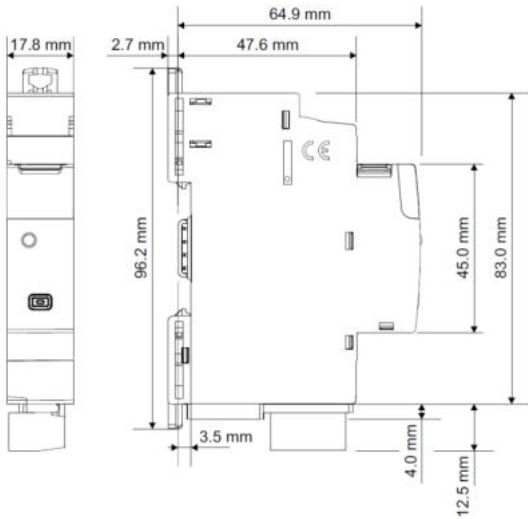


Nemo SX - Multifunction Measuring module with Rogowski coils

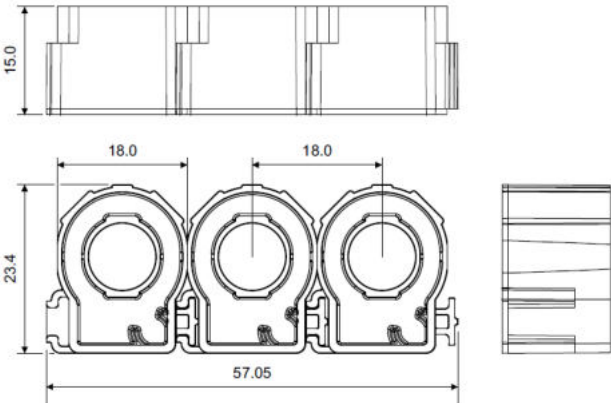
Cat. Nos: SXMM63/SXMT63

3. OVERALL DIMENSIONS (continued)

SXMT63:
Module



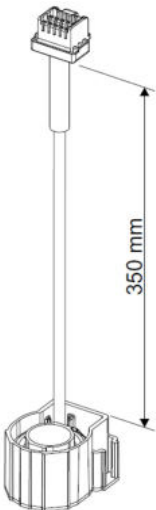
Rogowski coil



Note:

- . Pitch between two sensors is 18,0 mm
- . Sensors can be simply separated in order to be associated to modular devices 1,5 modules per pole width or to non-modular power devices (e.g. MCCB's)

Rogowski sensor(s) - Cable length



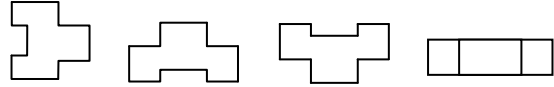
4. PREPARATION -CONNECTION

Fixing:

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

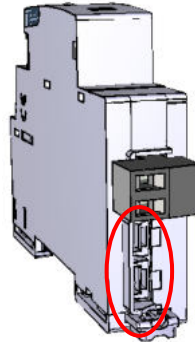
Operating positions:

- . Vertical, Horizontal, Upside down, On the side

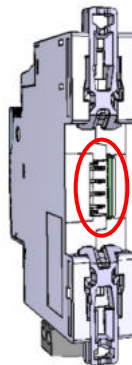


Power Supply:

- . Mandatory in 12 V d.c. 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 on dedicated ports



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



Voltage terminals:

- The removable black terminal is used to connect voltage(s)
- . Terminal depth: 8 mm.
- . Stripping length: 8 mm

Screw head:

- . Screw slotted.

Recommended tightening torque:

- . 0,5 Nm.

Recommended tools:

- . For the terminals: flat screwdriver 3,5 mm.
- . For fixing: flat screwdriver 5.5 mm (6 mm maximum).

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. PREPARATION –CONNECTION (continued)

Connectable section:

. Copper cables.

Voltage measurement terminals

| | Without ferrule | With ferrule |
|----------------|---|---|
| Rigid Cable | 1 x 0,5 mm ² to 2,5 mm ² 2 x 1,5 mm ² | - |
| Flexible Cable | 1 x 0,5 mm ² to 2,5 mm ² 2 x 1,5 mm ² | 1 x 0,5 mm ² to 2,5 mm ² 2 x 1,5 mm ² |

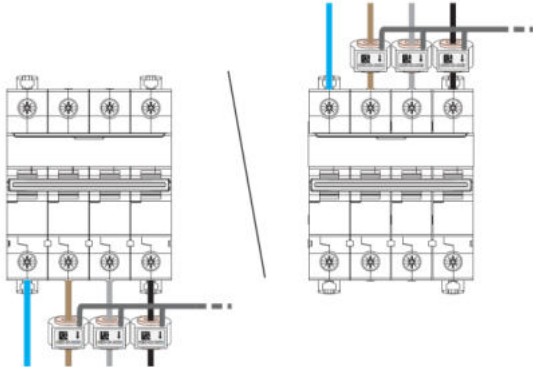
. Current Rogowski coil(s)

| | With internal plastic support | Without internal plastic support |
|----------------|---|---|
| Rigid Cable | 1 x 1,5 mm ² to 16 mm ² ø 4,8 mm | 1 x 1,5 mm ² to 25 mm ² ø 9,3 mm |
| Flexible Cable | 1 x 1,5 mm ² to 10 mm ² ø 4,8 mm | 1 x 1,5 mm ² to 16 mm ² ø 9,3 mm |

Wiring diagrams:

Note:

. Rogowski coils can be positioned both upstream or downstream the associated protection device of the measured line.



. Rogowski coils must be put in the correct direction of current flow (arrow drawing on the coil).

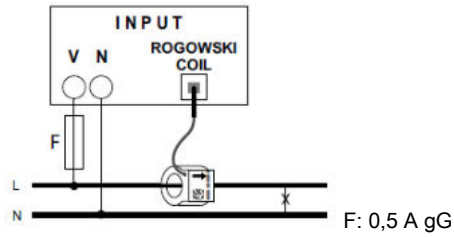
However, the direction of current flow can be, if necessary, changed via Nemo SX Configuration software or via Mini configuration module (cat. no SXV01).

4. PREPARATION –CONNECTION (continued)

Wiring diagrams (continued):

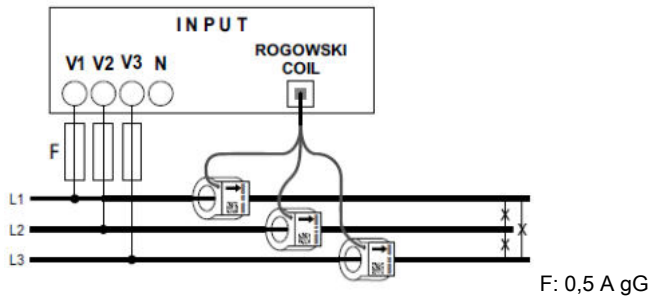
. SXMM63

single phase network (1N-1E):

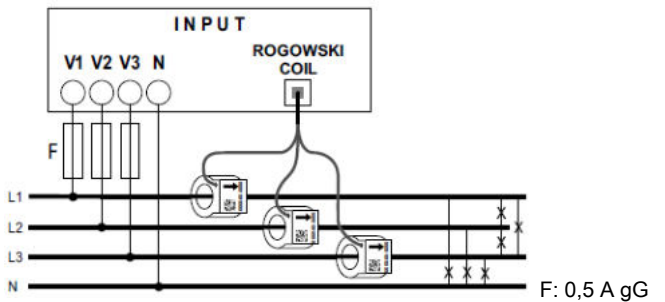


. SXMT63

3 wires three-phase network, 3 sensors (3-3E):

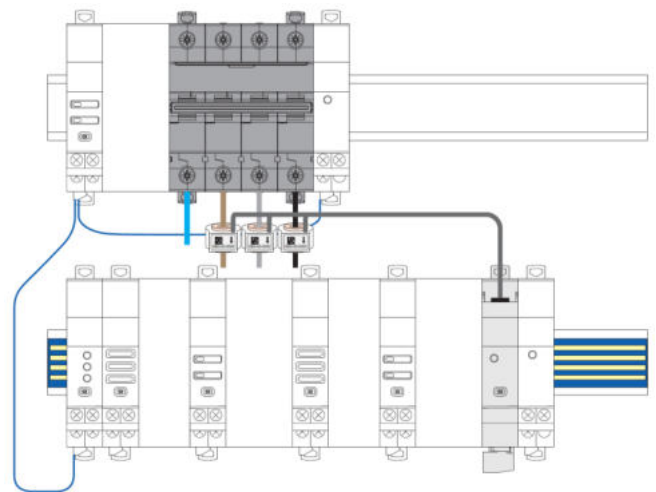


4 wires three-phase network, 3 sensors (3N-3E):



. Rogowski coil(s) cable length (see § Overall Dimensions) allow you to put Nemo SX Measure modules everywhere in the installation, within the limit of this length.

This is not mandatory to have them near to the associated protection device of the measured line.



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4. PREPARATION –CONNECTION (continued)

Module configuration:

- . For these devices, following configurations are available:
 - SXMM63:
 - current versus
 - SXMT63:
 - current versus
 - insertion type (network with or without neutral conductor) [see § wiring diagrams]

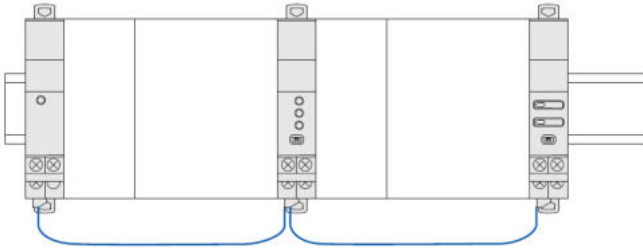
Configurations are made by Nemo SX configuration software or by the Nemo SX mini configurator module (cat no SXV01)

Data connection (Nemo SX modules inter-connection):

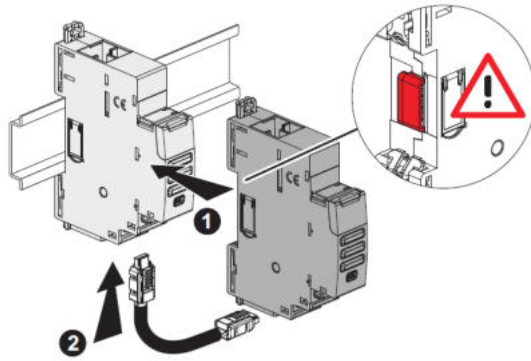
- . Via specific communication patch cords (cat. nos SXAC250/500/1000)



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 kept on.



4. PREPARATION –CONNECTION (continued)

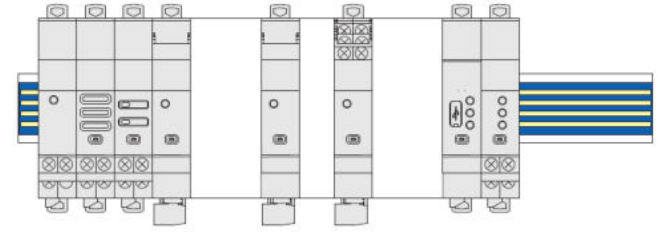
Data connection (Nemo SX modules inter-connection)

(continued):

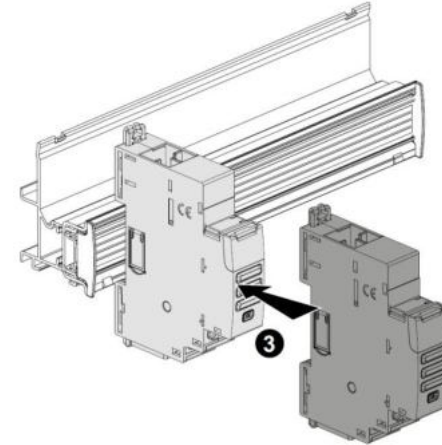
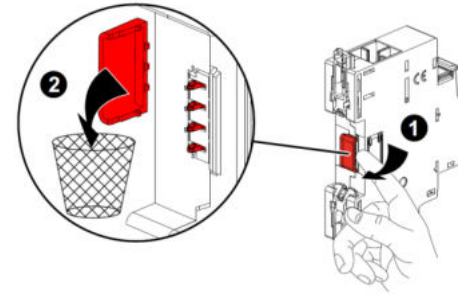
- . Via specific communication rails (cat. nos SXAR18/24/36).



. 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)

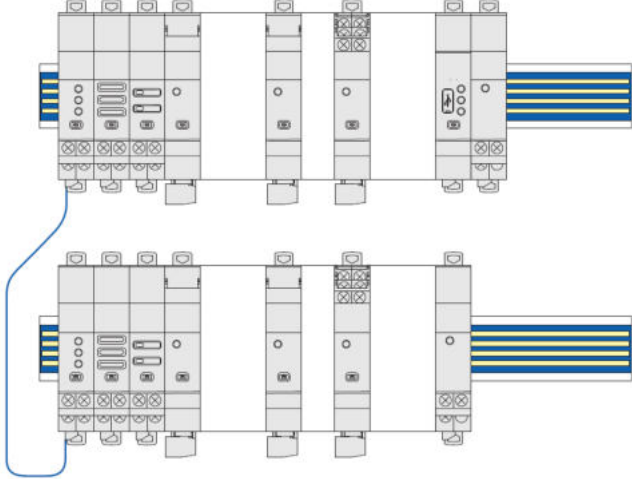
Data connection (Nemo SX modules inter-connection)

(continued):

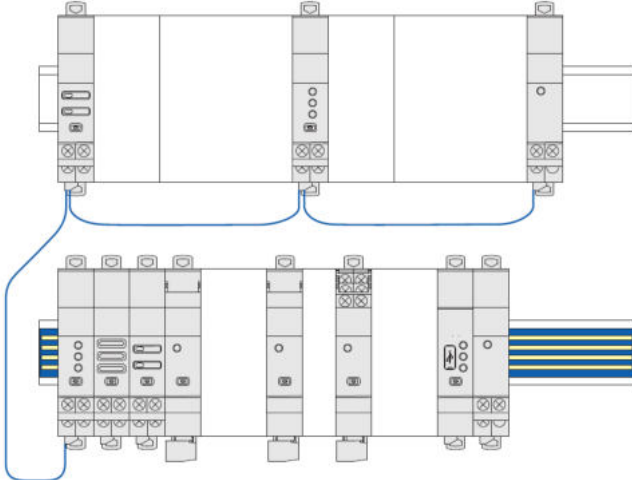
. Via a mix between specific communication patch cords and communication rails in order to create a link between several rows

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:

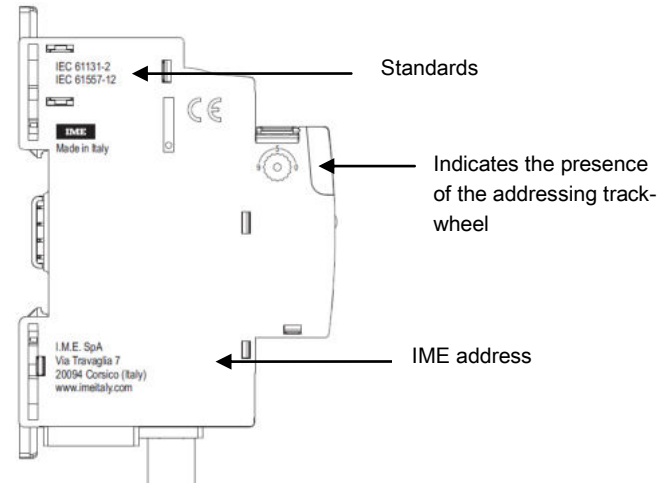
. By permanent ink pad printing (red line) and laser marking



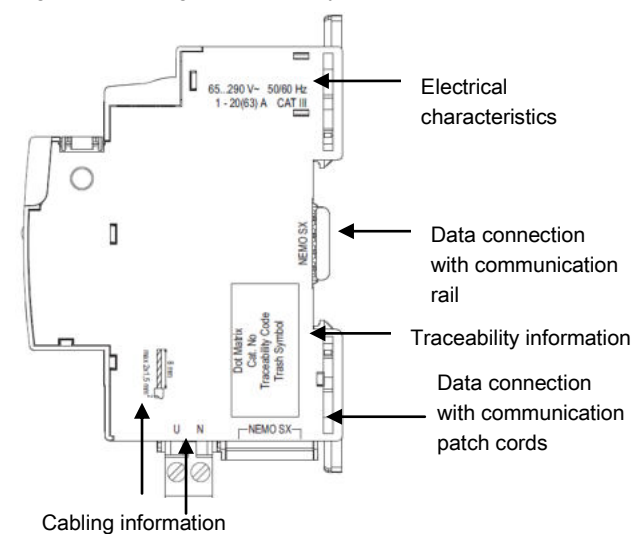
Lateral side marking:

. By laser.

left side: Standard and programming information



right side: cabling and traceability information



5. GENERAL CHARACTERISTICS (continued)

Voltage measurement terminal block marking:

. By permanent ink pad printing.

SXMM63

SXMT63

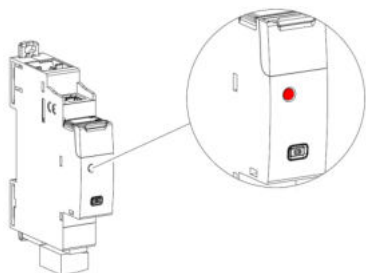


← Voltage(s) sequence

Measuring LED:

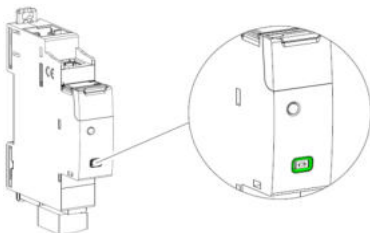
. The device is equipped with a measuring LED; it gives information that the device is counting an energy consumption:

- blinking red → 0,2 Wh per light pulse






Multi-Functions button:

. Front face button as several functions:



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

| Led color | State | Meaning |
|---|--|---|
|  red | Slow blinking | Error (e.g. addressing error) |
| | Fast blinking | No function |
| | Steady (pressing the multi function button longer than 20 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 multi function button for 10 sec.) | put in "Stand-by" the Nemo SX module (no remote action and communication available) |
| | Steady | System OK, connection is running |
|  orange | Slow blinking | No function |
| | Fast blinking | Device's firmware update in progress |
| | Steady | No function |

5. GENERAL CHARACTERISTICS (continued)

- . Current (accuracy 0,5):
phase: I₁, I₂, I₃;
neutral: I_N.
- . Voltage (accuracy 0,5):
phase/phase: U₁₂, U₂₃, U₃₁;
phase/neutral: V_{1N}, V_{2N}, V_{3N}.
- . Frequency (accuracy 0,1)
- . Power:
instantaneous active total power, phase (accuracy 0,5);
instantaneous reactive total power, phase (accuracy 2);
instantaneous apparent total power, phase (accuracy 0,5);
- . Power factor a (accuracy 1).
- . Energy:
total and partial active energy, positive and negative (accuracy 0,5);
total and partial reactive energy, positive and negative (accuracy 2).
- . THD (accuracy 5):
voltages THD: V₁, V₂, V₃ o U₁₂, U₂₃, U₃₁;
currents THD: I₁, I₂, I₃, I_N.
- . Harmonic analysis:
Voltages: odd harmonics up to 15th (in display and via communication RS485);
Currents: odd harmonics up to 15th (in display and via communication RS485);

Measuring sensors operating range:

- . Max Rogowski primary current: 63 A

Insulation voltage:

- . U_i = 400 V

Impulse withstand voltage U_{imp}:

- . Nemo SX ports / Voltages input terminals:
wave 1,2 / 50 μs: 6 kV
alternate current 50 Hz / 1 min.: 3 kV
- . Nemo SX ports / Current sensors input terminal:
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

5. GENERAL CHARACTERISTICS *(continued)*

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:

. Weight inclusive of measuring sensors

| | kg |
|--------|-------|
| SXMM63 | 0,068 |
| SXMT63 | 0,104 |

Volume when packed:

| | dm ³ |
|--------|-----------------|
| SXMM63 | 0,33 |
| SXMT63 | 0,33 |

Consumption:

. Values at 12 Vd.c.

| | W | mA |
|--------|-------|------|
| SXMM63 | 0,410 | 34,1 |
| SXMT63 | 0,419 | 34,8 |

5. GENERAL CHARACTERISTICS *(continued)*

Load shedding Function:

. Allows to automatically carry out load shedding in case of power demand when a circuit exceeds a threshold.

. Function is implementable using together following Nemo SX modules:

- Multifunction Control module (cat. no SXM0C1) with DIP-switches on 0000 position (see § "Module configuration")
- Measurement modules (cat. nos SXMM63, SXMT63, SXMMT5)

To set the different parameters it is necessary to use the Nemo SX Configuration software (available online for free)

. Procedure:

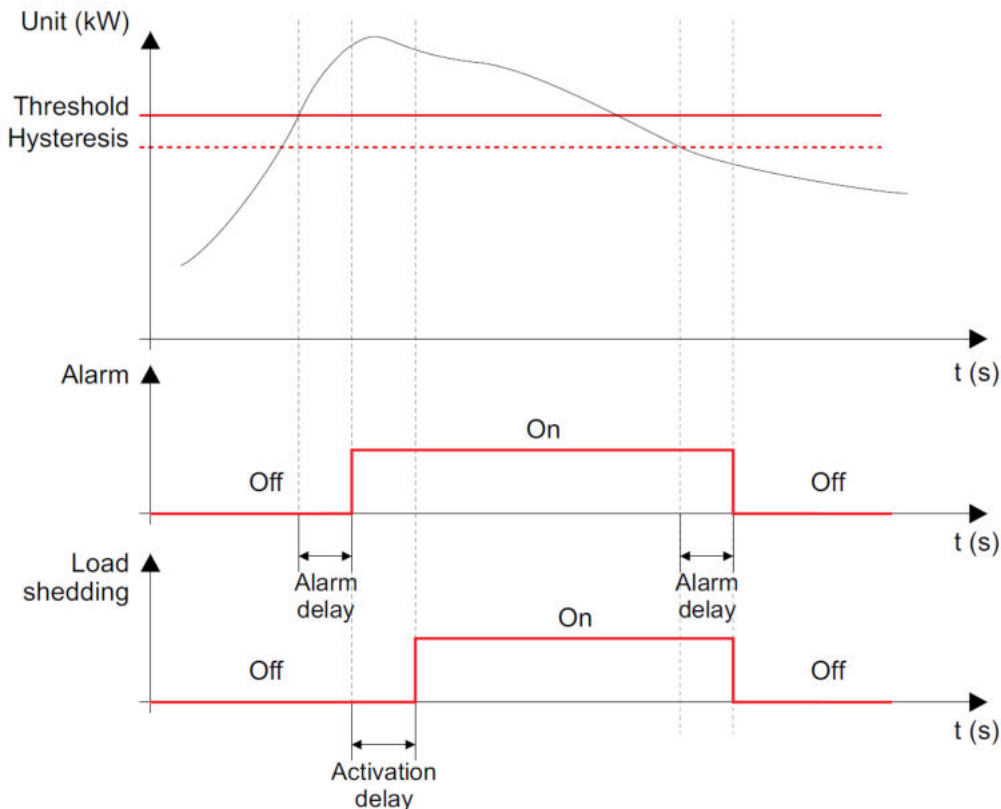
1. Assign the same address to the Nemo SX modules (Multifunction control and Measurement modules) which require to be linked
2. Connect a computer to the Modbus/Nemo SX interface or to the Mini configuration module (according to the system architecture type; see § "System architectures")
3. In the Nemo SX Configuration software pages adjust the parameters:

. In the dedicated page of the Measurement module:

- **Threshold:** value of Total active power (kW) above which procedure starts. *(default value 100 kW)*
- **Hysteresis:** value expressed in % of the threshold under which the alarm is over and the disconnected loads are restored. *(default value 5%)*
- **Alarm delay (s)** - *(default value 1s, min value 0 s, max. value 32767s):*
 during the activation of an alarm: is the waiting time between the threshold point and the alarm on the Nemo SX bus
 during the de-activation of an alarm: is the waiting time between the hysteresis point and the alarm is deactivation on the Nemo SX bus

. In the dedicated page of the Universal control module:

- **Relay normal state:** the rest position of the relay; normally open (NO) or normally closed (NC).
- **Relay activation:** impulsive or maintained
- **Relay activation time (s):** used for the impulsive work method; represents the time in which the relay remains in the working position *(default value 1s, max. value 32767s)*.
- **Activation delay (s):** waiting time between the alarm on the Nemo SX bus and the action done by the universal control module *(default value 0s, max. value 32767s)*.



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 manage on site.

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

Local addressing advantages:

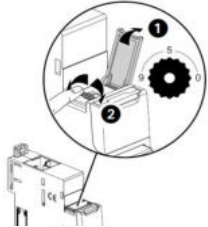
- No configuration software needed to set-up the installation
- **It is not necessary to use a computer to manage settings** (configurations, test, ...) and to use the system (visualize and be alerted, ...). Everything can be done through the Mini configuration module (local display, cat. no SXV01). [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 to lateral DIP-switch of each Nemo SX modules (see § "Module configuration" in the technical sheet of each device).

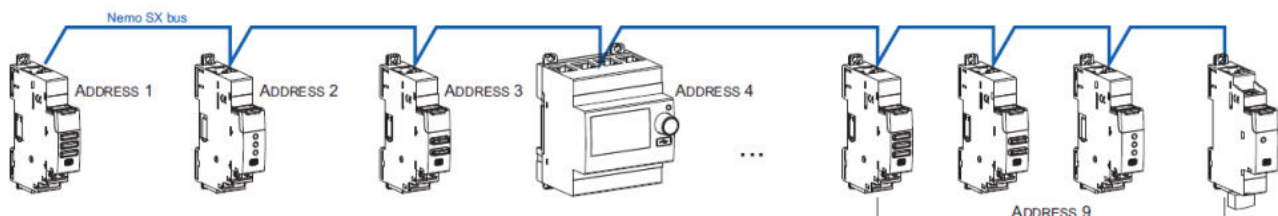
Addressing procedure:

. 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



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)

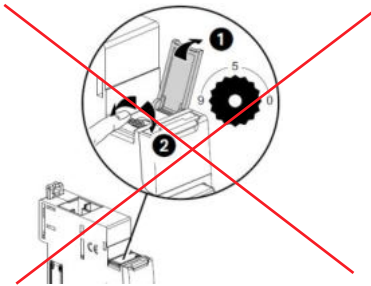
Remote addressing advantages:

- 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:

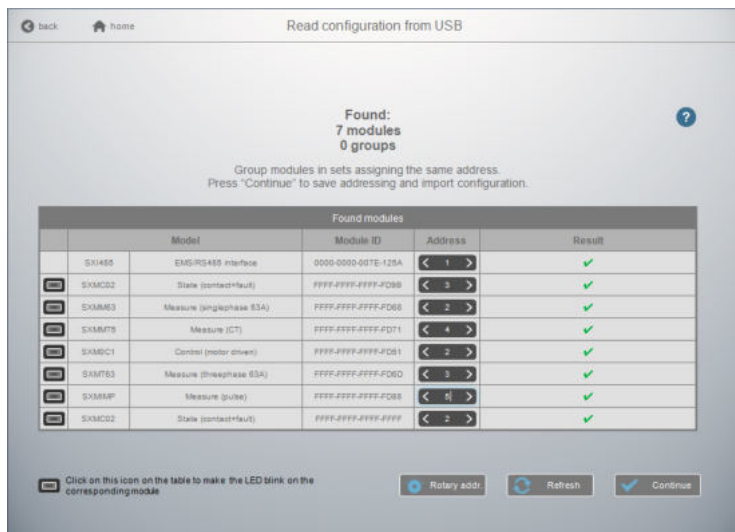
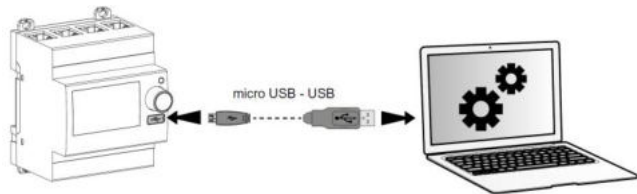
. For Nemo SX modules which need some: mandatory through to lateral DIP-switch of each Nemo SX modules *(see § "Module configuration" in the technical sheet of each device)*.

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 assign 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 - USB cable. *[For more details, refer to the technical sheet dedicated to this module].*



6. SYSTEM ARCHITECTURES

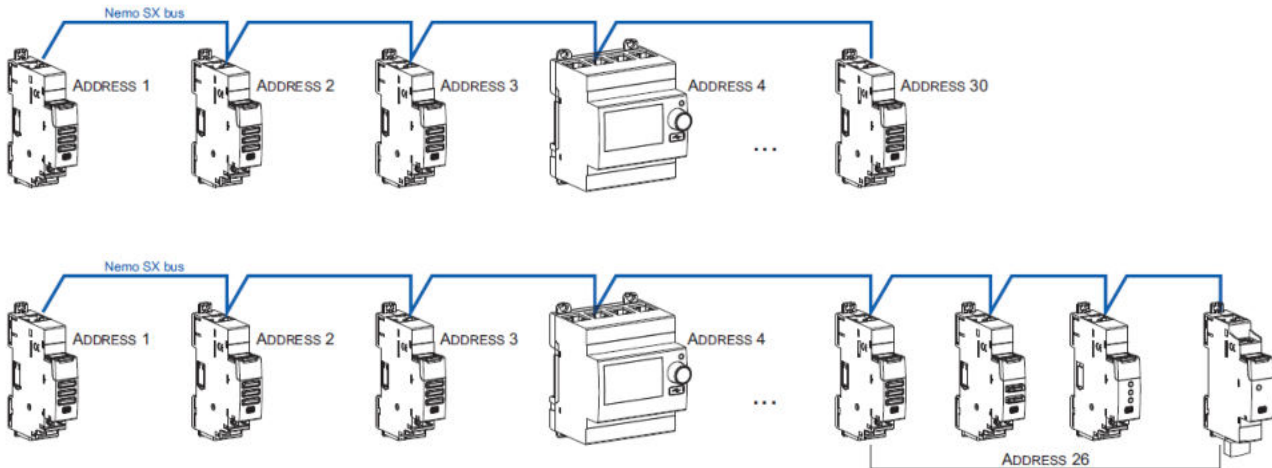
6.1 Stand-alone system (continued):

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)
 - o up to **30 Nemo SX modules** (eg. 30 devices grouped per functions with addresses from 1 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

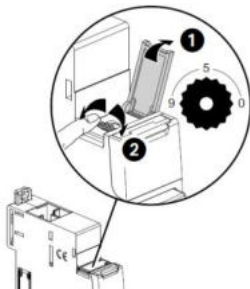
Programming procedure:

. For Nemo SX modules which need some: mandatory through to lateral DIP-switch of each Nemo SX modules (see § "Module configuration" in the technical sheet of each device).

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 to Nemo SX modules

In this system the Modbus address of an 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)



6. SYSTEM ARCHITECTURES *(continued)*

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

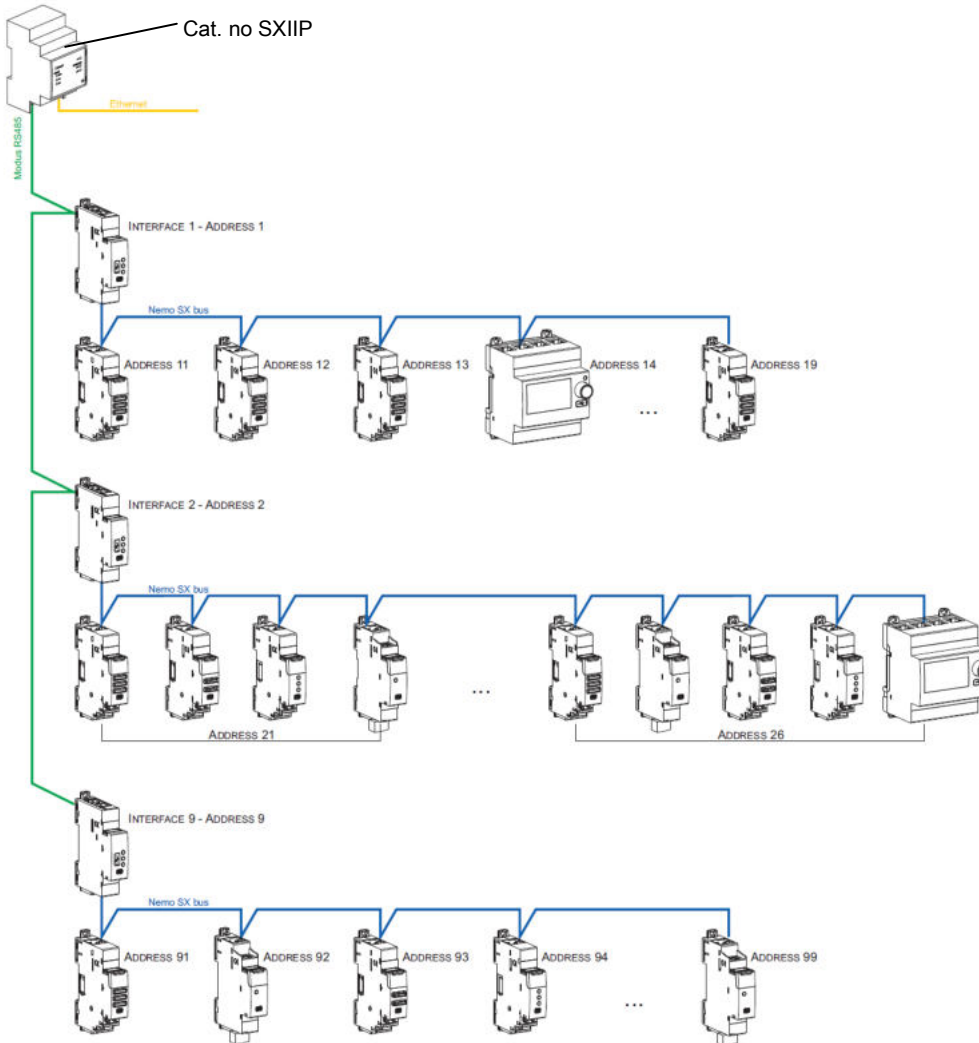
6.2.1 Supervised system-with local addressing (through the track wheel) *(continued)*

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 an 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):
 - o up to **81 Modbus address**
 - o mandatory limit of max. **9 Modbus/Nemo SX interfaces** or max. **1000 m of Modbus cable** (cable Belden 9842, Belden 3106A or equivalent).
- for 1 Modbus/Nemo SX Interface (cat. no SXI485):
 - o up to **30 Nemo SX modules** (ex. 30 devices grouped per functions with addresses from 1 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:

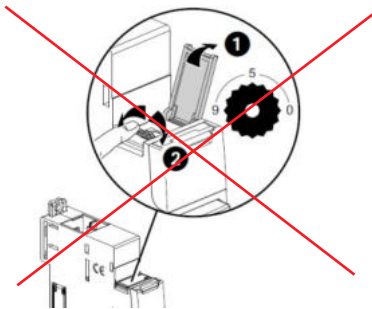
- Whole ef configuration (addresses and functions) can be done a remotely through the Nemo SX Configuration software
- Configuration software available for free
- **Automatic detection of the Nemo SX modules** installed in the system (characteristics, functions, configuration...)
- **Increased settings 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: mandatory through to lateral DIP-switch of each Nemo SX modules *(see § "Module configuration" in the technical sheet of each device)*.

Note: via the configuration software it is possible to assign all the functions and characteristics of each Nemo SX module

Addressing procedure:

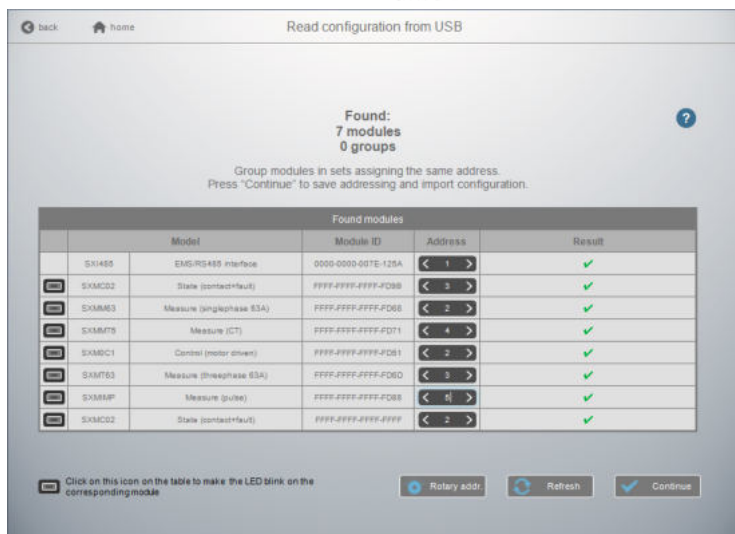
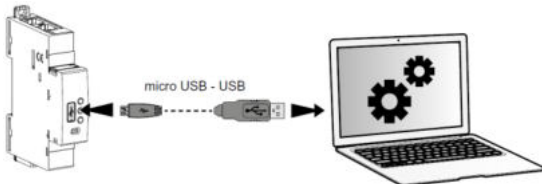


. It is not necessary to address the Nemo SX modules. The track wheel must be left in default position "0".

. A 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 assign the remote address and all the characteristics to each module.

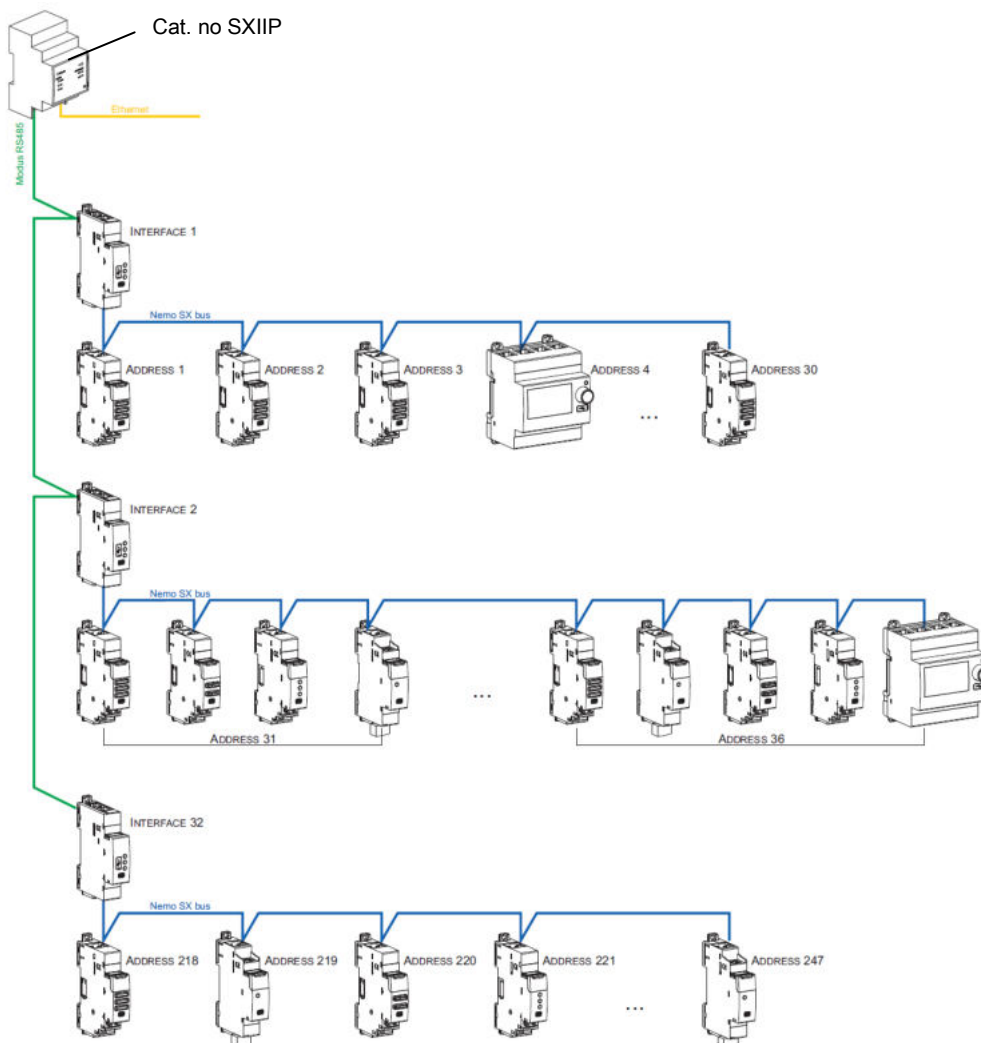
Note: it is mandatory to connect the computer to the different Modbus/Nemo SX interface with a "Type B" micro USB - USB cable (one interface at a time). *[For more details, refer to the technical sheet dedicated to this module].*



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):
 - o up to **247 Modbus address**
 - o 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).
- for 1 Modbus/Nemo SX Interface (cat. no SXI485):
 - o up to **30 Nemo SX modules or grouped modules** (e.g. 30 devices grouped per functions with addresses from 1 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:
 - emission according IEC/EN 61326-1, class B
 - immunity according IEC/EN 61326-1.
- . Active energy accuracy class: 0,5 (E_a, IEC/EN 61557-12).
- . Reactive energy accuracy class: 1 (E_r, IEC/EN 61557-12).

Conformity table to IEC 61557-12 Edition 1 (08/2007)

| Performance measuring and monitoring devices (PMD) characteristics | | |
|--|----------------------|-------------------------------------|
| Type of characteristic | Specification values | Other complementary characteristics |
| Power quality assessment function | - | - |
| Classification of PMD | DD | - |
| Temperature | K55 | - |
| Humidity + Altitude | Standard conditions | - |
| Active power and Active energy function performance class | 0,5 | - |

7. COMPLIANCE AND APPROVALS (continued)

Conformity table to IEC 61557-12 Edition 1 (08/2007) (continued)

| Function symbols | Function performance class according to IEC 61557-12 | Measuring range | Other complementary characteristics |
|-------------------------------------|--|--|-------------------------------------|
| P | 0,5 | 1,0 ÷ 63 A | - |
| Q _A , Q _V | 2 | 1,0 ÷ 63 A | - |
| S _A , S _V | 0,5 | 1,0 ÷ 63 A | - |
| E _a | 0,5 | 0 ÷ 2147483,648 MWh | 1,0 ÷ 63 A |
| E _{rA} , E _{rV} | 2 | 0 ÷ 2147483,648 MWh | 1,0 ÷ 63 A |
| E _{apA} , E _{apV} | - | - | - |
| f | ± 0,01 Hz | 45 ÷ 65 Hz | - |
| I | 0,5 | 1,0 ÷ 63A | - |
| I _N , I _{Nc} | 2 | 1,0 ÷ 63 A | - |
| U | 0,5 | 65 ÷ 290 V (Ph/N) 110 ÷ 500 V (Ph/Ph) | - |
| P _{FA} , P _{FV} | 1 | 0,5 ind ÷ 0,8 cap | - |
| P _{st} , P _{It} | - | - | - |
| U _{dip} | - | - | - |
| U _{swi} | - | - | - |
| U _{tr} | - | - | - |
| U _{Int} | - | - | - |
| U _{nba} | 0.5 | - | - |
| U _{nb} | - | - | - |
| U _h | 5 | 65 ÷ 290 V (Ph/N) 110 ÷ 500 V (Ph/Ph) | - |
| THD _u | - | 65 ÷ 290 V (Ph/N) 110 ÷ 500 V (Ph/Ph) | - |
| THD-R _u | 5 | - | - |
| I _h | 5 | 1,0 ÷ 63 A | - |
| THD _i | - | 1,0 ÷ 63 A | - |
| THD-R _i | 5 | - | - |
| Msv | - | - | - |

7. COMPLIANCE AND APPROVALS *(continued)*

Conformity table to IEC 61557-12 Edition 1 (08/2007) *(continued)*

| Characteristics of "Power quality assessment functions" | | | |
|---|--|--|-------------------------------------|
| Function symbols | Function performance class according to IEC 61557-12 | Measuring range | Other complementary characteristics |
| f | ± 0,01 Hz | 45 ÷ 65 Hz | - |
| I | 0,5 | 1,0 ÷ 63A | - |
| I _N , I _{Nc} | 0,5 | 1,0 ÷ 63 A | - |
| U | 0,5 | 65 ÷ 290 V (Ph/N) 110 ÷ 500 V (Ph/Ph) | - |
| U _{dip} | - | - | - |
| U _{swf} | - | - | - |
| U _{tr} | - | - | - |
| U _{int} | - | - | - |
| U _{nba} | 0,5 | - | - |
| U _{nb} | - | - | - |
| U _h | 5 | 65 ÷ 290 V (Ph/N) 110 ÷ 500 V (Ph/Ph) | - |
| I _h | 5 | 1,0 ÷ 63 A | - |
| Msv | - | - | - |

Environment respect – Compliance with EU directives:

- . Compliance with Directive 2011/65/EU known as "RoHS 2" on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- . Compliance with REACH regulation: at the date of the publication of this document no substance from the candidate list is present in these products.

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.

Environmental profile :

- . PEP document available