



Series SX102

Alphanumeric displays
with Profinet IO RT interface CC-A
Operating instructions

1 Contact

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2 Legal note

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3 Safety precautions



Bus errors may result in personal injury or material damage. Therefore it must be noted that the activation of the menu may cause a bus error.

Important information

Read these operating instructions before starting the unit. They provide you with important information on the use, safety and maintenance of the units. This helps you to protect yourself and prevent damage to the unit.



Information intended to help you to avoid death, bodily harm or considerable damage to property is highlighted by the warning triangle shown here; it is imperative that this information be properly heeded.

The operating instructions are intended for trained professional electricians familiar with the safety standards of electrical technology and industrial electronics.

Store these operating instructions in an appropriate place.

The manufacturer is not liable if the information in these operating instructions is not complied with.

Safety



Components inside the units are energized with electricity during operation. For this reason, mounting and maintenance work may only be performed by professionally-trained personnel while observing the corresponding safety regulations.

The repair and replacement of components and modules may only be carried out by the manufacturer for safety reasons and due to the required compliance with the documented unit properties.

The units do not have a power switch. They are operative as soon as the operating voltage is applied.

Intended use

The units are intended for use in industrial environments. They may only be operated within the limit values stipulated by the technical data.

When configuring, installing, maintaining and testing the units, the safety and accident-prevention regulations relevant to use in each individual case must be complied with.

Trouble-free, safe operation of the units requires proper transport, storage, installation, mounting and careful operation and maintenance of the units.

Mounting and installation

The attachment options for the units were conceived in such a way as to ensure safe, reliable mounting.



The user must ensure that the attachment hardware, the unit carrier and the anchoring at the unit carrier are sufficient to securely support the unit under the given surrounding conditions.

Sufficient space is to be kept clear around the units to ensure air circulation and to prevent the build-up of heat resulting from use.

Grounding

The devices are equipped with a ground connection for connection of the cable shielding to the functional ground (PE).

EMC measures

The devices comply with the EU Directive 2004/108/EC (EMC Directive) and provide the required interference immunity. Observe the following when connecting the operating voltage and data cables:

Use shielded data cables.

The data and operating voltage cables must be laid separately. They may not be laid together with heavy-current cables or other interference-producing cables.

The cable thickness must be properly assessed (DIN VDE 0100 Part 540).

The connection of the cable shielding to the functional ground (PE) must be as short and low-impedance as possible.

The cable shielding is to be connected at both cable ends. If equipotential bonding currents are expected due to the cable arrangement, electrical isolation is to be performed on one side. In this case, capacitive connection (approx. $0.1\mu\text{F}/600\text{ V AC}$) of the shielding on the isolated side must occur.

Disposal

Units or unit parts which are no longer needed are to be disposed of in accordance with the regulations in effect in your country.

4 Unit description

Model designation

This manual applies to units with the following model designation (x = the 'x's in the model designation indicate the size and design of the units).

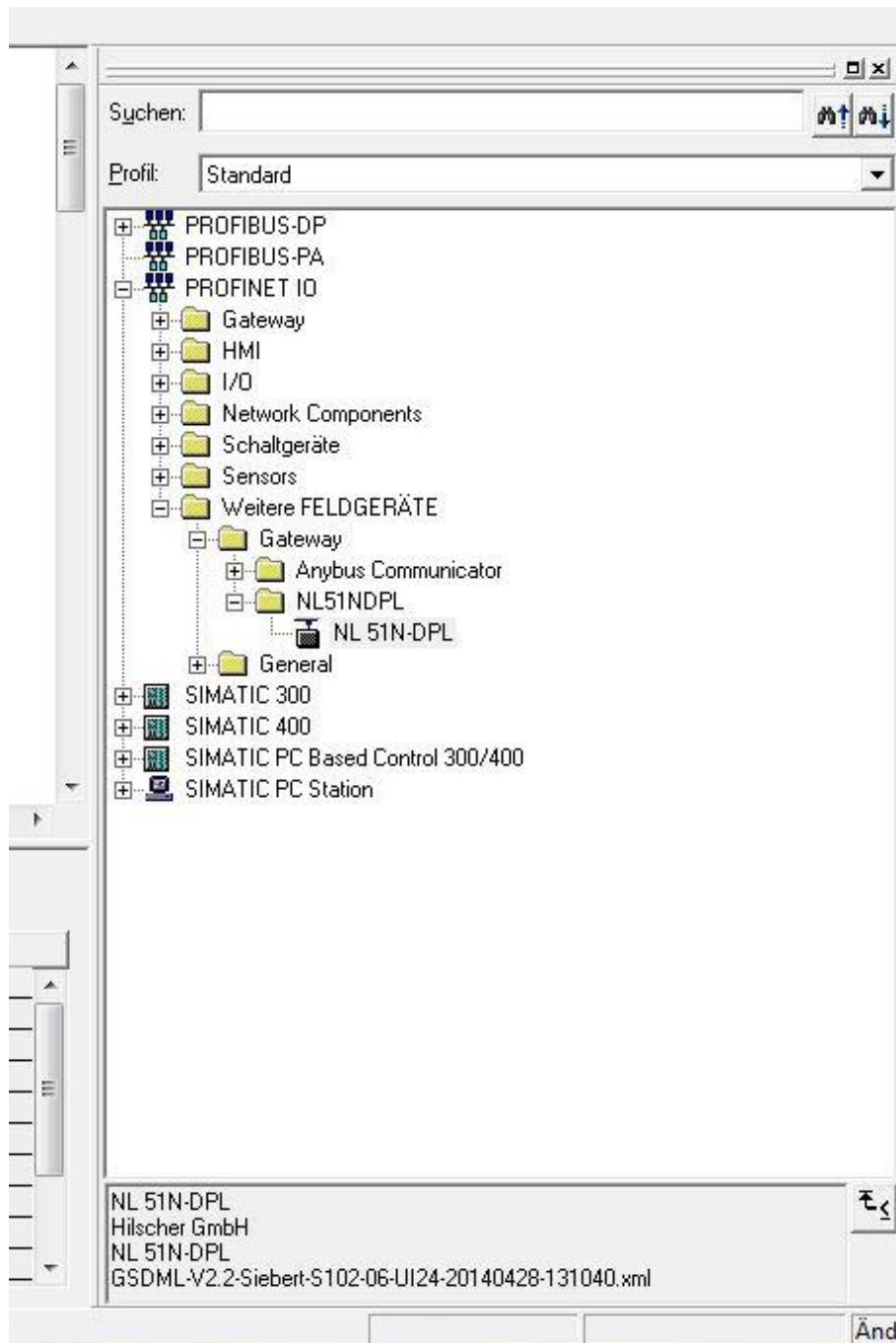
| | |
|----------------------------|-----------------------------------|
| SX102-06/18/0x-00x/0B-CP/x | character height 18 mm, 6 digits |
| SX102-08/18/0x-001/0B-CP/x | character height 18 mm, 8 digits |
| SX102-14/18/0x-001/0B-CP/x | character height 18 mm, 14 digits |
| SX102-x8/30/0x-001/0B-CP/x | character height 30 mm, 8 digits |

5 Start-up

Start-up

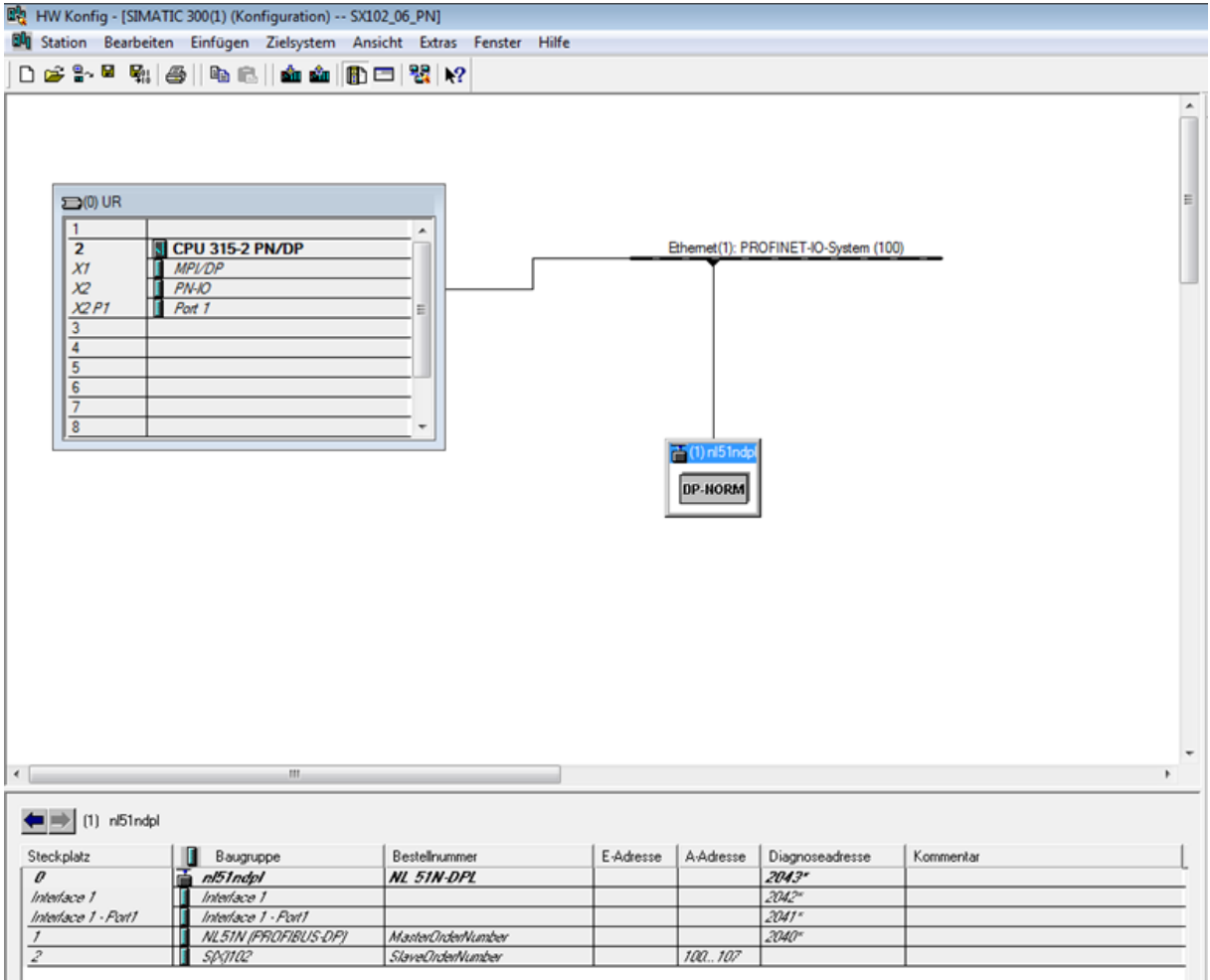
To locate the device in the hardware catalog of the engineering tool the GSDML file must be installed. The file is on the data carrier included in delivery.

After installing the GSDML file the Profinet IO-device named NL51NDPL which is located in the hardware catalog is added to an existing Profinet IO-system.



The output addresses of the device are defined.

Translations:
Suchen search
Profil profile
Schaltgeräte switching devices



The screenshot shows the HW Config interface for a SIMATIC 300(1) system. On the left, a rack configuration table is visible:

| Slot | Module |
|-------|-----------------|
| 1 | |
| 2 | CPU 315-2 PN/DP |
| X1 | MPI/DP |
| X2 | PN-IO |
| X2 P1 | Port 1 |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

The main workspace shows a network diagram with an Ethernet(1): PROFINET-IO-System (100) connected to a DP-NORM device (n151ndpl). Below the workspace, a detailed table for the DP-NORM device is shown:

| Steckplatz | Baugruppe | Bestellnummer | E-Adresse | A-Adresse | Diagnoseadresse | Kommentar |
|---------------------|---------------------|-------------------|-----------|-----------|-----------------|-----------|
| 0 | n151ndpl | NL 51N-DPL | | | 2043* | |
| Interface 1 | Interface 1 | | | | 2042* | |
| Interface 1 - Port1 | Interface 1 - Port1 | | | | 2041* | |
| 1 | NL51N (PROFIBUS-DP) | MasterOrderNumber | | | 2040* | |
| 2 | Sp1102 | SlaveOrderNumber | | 100...107 | | |

By assigning a name the device receives an IP address assigned by the controller and it is registered in the Engineering Tool. From this moment the display is manageable via the defined output addresses.

Translations:
Bearbeiten edit
Einfügen insert
Zielsystem target system
Ansicht view
Fenster window
Hilfe help
Steckplatz socket
Baugruppe module
Bestellnummer order no.
Diagnoseadresse diagnostic address
Kommentar comment

Gerätenamen vergeben

Gerätename: Gerätetyp:

Vorhandene Geräte:

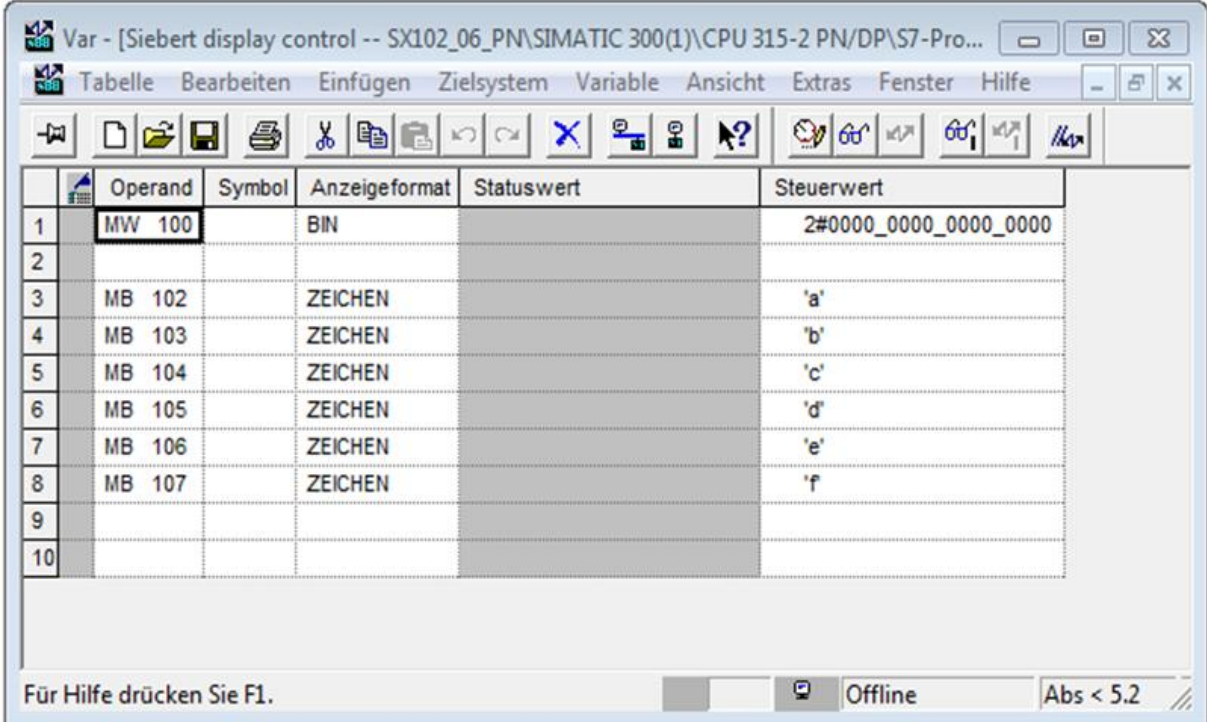
| IP-Adresse | MAC-Adresse | Gerätetyp | Gerätename |
|------------|-------------------|-----------|------------|
| --- | 00-02-A2-29-64-64 | NL51NDPL | nl51ndpl |

Teilnehmer-Blinktest
Dauer (Sekunden):

nur Geräte gleichen Typs anzeigen nur Geräte ohne Namen anzeigen

Changes of a value of the output bytes are shown on the display.

| Translations: | |
|-----------------------------------|------------------------------------|
| Gerätenamen vergeben | assign device name |
| Gerätename | device name |
| Gerätetyp | type of device |
| Vorhandene Geräte | existing devices |
| Name zuweisen | assign name |
| Teilnehmer-Blinktest | flash test participant |
| Dauer | duration |
| Sekunden | seconds |
| Blinken ein | flashing on |
| Aktualisieren | update |
| Exportieren | export |
| Schließen | close |
| Hilfe | help |
| nur Geräte gleichen Typs anzeigen | only show devices of the same kind |
| nur Geräte ohne Namen anzeigen | only show devices without name |



The screenshot shows a software window titled 'Var - [Siebert display control -- SX102_06_PN\SIMATIC 300(1)\CPU 315-2 PN/DP\S7-Pro...'. The window contains a menu bar with 'Tabelle', 'Bearbeiten', 'Einfügen', 'Zielsystem', 'Variable', 'Ansicht', 'Extras', 'Fenster', and 'Hilfe'. Below the menu is a toolbar with various icons. The main area displays a table with the following data:

| | Operand | Symbol | Anzeigeformat | Statuswert | Steuerwert |
|----|---------|--------|---------------|------------|-----------------------|
| 1 | MW 100 | | BIN | | 2#0000_0000_0000_0000 |
| 2 | | | | | |
| 3 | MB 102 | | ZEICHEN | | 'a' |
| 4 | MB 103 | | ZEICHEN | | 'b' |
| 5 | MB 104 | | ZEICHEN | | 'c' |
| 6 | MB 105 | | ZEICHEN | | 'd' |
| 7 | MB 106 | | ZEICHEN | | 'e' |
| 8 | MB 107 | | ZEICHEN | | 'f' |
| 9 | | | | | |
| 10 | | | | | |

At the bottom of the window, there is a status bar with the text 'Für Hilfe drücken Sie F1.', a status indicator 'Offline', and 'Abs < 5.2'.

The output byte AW 100 (MW 100) is used for formatting of the display (see data formats).

Translations:

| | |
|--------------------------|-------------------|
| Tabelle | table |
| Bearbeiten | edit |
| Einfügen | insert |
| Zielsystem | target system |
| Variable | variable |
| Ansicht | view |
| Fenster | window |
| Hilfe | help |
| Anzeigeformat | display format |
| Statuswert | status value |
| Steuerwert | control value |
| Zeichen | character |
| Für Hilfe drücken Sie F1 | for help click F1 |

6 Data format ASCII

Data format ASCII

The first two bytes (byte 0 and 1) contain the formatting of the characters to be shown.

| Byte 0 | | | | | | | | Byte 1 | | | | | | | |
|--------|---|---|---|-----|---|-----|---|--------|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| : | : | : | : | C12 | C11 | C10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | 0 | Normal brightness | | | | | | | | | | |
| : | : | : | : | 1 | Reduced brightness | | | | | | | | | | |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | 0 | Flashing off | | | | | | | | | | |
| : | : | : | : | 1 | Flashing on | | | | | | | | | | |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | 0 | Blanking off | | | | | | | | | | |
| : | : | : | : | 1 | Blanking on | | | | | | | | | | |
| : | : | : | : | | | | | | | | | | | | |
| : | : | : | : | 0 | Display test off | | | | | | | | | | |
| : | : | : | : | 1 | Display test on (Priority over flashing and blanking) | | | | | | | | | | |

- Flashing of single characters -(0 = aus, 1 = ein)

The following bytes (starting from byte 2) contain the ASCII characters to be displayed. The number of these bytes depends on the digit numbers of the units.

Units with 6 digits (SX102-x6/18/0x-00x/0B-K0)

| Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 |
|--------------|--------------|--------------|--------------|--------------|--------------|
| Character C6 | Character C5 | Character C4 | Character C3 | Character C2 | Character C1 |

Units with 8 digits (SX102-08/18/0x-01x/0B-K0. SX102-08/30/0x001/0B-K0))

| Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 |
|--------------|--------------|--------------|--------------|--------------|--------------|
| Character C8 | Character C7 | Character C6 | Character C5 | Character C4 | Character C3 |

| Byte 8 | Byte 9 |
|--------------|--------------|
| Character C2 | Character C1 |

Units with 14 digits (SX102-14/18/0x-001/0B-K0)

| Byte 2 | Byte 3 | Byte 4 | Byte 5 | Byte 6 | Byte 7 |
|---------------|---------------|---------------|---------------|---------------|--------------|
| Character C14 | Character C13 | Character C12 | Character C11 | Character C10 | Character C9 |

| Byte 8 | Byte 9 | Byte 10 | Byte 11 | Byte 12 | Byte 13 |
|--------------|--------------|--------------|--------------|--------------|--------------|
| Character C8 | Character C7 | Character C6 | Character C5 | Character C4 | Character C3 |

| Byte 14 | Byte 15 |
|--------------|--------------|
| Character C2 | Character C1 |

7 Control

Flashing

If in byte 0 bit 5 is set, the whole display will flash. With ASCII data format also individual characters may flash. For this purpose, the corresponding bits in byte 1 (characters C6...C1) are to be set. Flashing of the total display has priority over the flashing of individual characters.

Blanking

If in byte 0 bit 6 is set, the display will be blank. Blanking has priority over flashing.

Brightness control

If in byte 0 bit 4 is set, the brightness of the display will be reduced.

Display test

In menu item F, you can set whether a display test is to be performed after the operating voltage is applied.

The display test can also be activated via the PROFINET interface by setting bit 7 in byte 0.

The display test has priority over flashing and blanking.

Demo operation mode

If the setting *PLAY* is selected in menu item F, random characters are displayed. In this case, it is impossible to control the unit.

Power-on reset

After switching on the operating voltage, minus signs are displayed to signalize that the unit is ready for operation. If a display test has been preselected in menu item F, it runs beforehand.

8 Character set

Character set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4 | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5 | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6 | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7 | ~ | q | r | s | t | u | v | w | x | y | z | { | | } | ~ |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| B |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| D |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| E |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| F |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

The characters 00_h to 1F_h are shown as dotted lines.

9 Parameterization



Bus errors may result in personal injury or material damage. Therefore it must be noted that activating the menu during the operation of devices on the PROFINET can cause a bus error.

Menu operation

To start the menu, press both menu buttons simultaneously (approx. 1 sec.) until the first menu item appears in the menu display. It is now possible to navigate in the menu as follows:

| | |
|--------------------------|---|
| Next menu items forward | Press key [↕] long |
| Page menu items forward | Shortly press key [↕] |
| Previous menu item | Double-click on key [↕] |
| Page menu items backward | Double-click on key [↕] and keep it pressed |
| Next setting | Shortly press key [↔] |
| Page settings forward | Press key [↔] long |
| Previous setting | Double-click on key [↔] |
| Page setting backward | Double-click on key [↔] and keep it pressed |

To exit the menu shortly press the key [↕] in menu item U. Depending on the setting in menu item U the settings made are either saved (set) or not saved (escape) or the factory settings are reset (default).

Canceling the menu without saving the settings made is possible by pressing both menu buttons simultaneously (approx. 1 sec.). It will occur automatically if 60 seconds pass without a menu button being pressed.

Once the menu is closed, the device behaves in the same manner as when the operating voltage was applied.

Control of the display is not possible in menu mode.

The menu is shown in the following menu table. The default settings are marked with *. Individual menu items or settings can be suppressed depending on unit version or setting in another menu item.

Menu table

| Menu item | | Settings | Display |
|------------------|--------------|---------------------------------------|---------------------|
| F | Display test | No display test at power-on* | <i>F</i> --- |
| | | Display test at power-on | <i>F</i> <i>BBB</i> |
| | | Demo operation mode | <i>F</i> <i>PLY</i> |
| U | Save | Save parameters* (Set) | <i>U</i> <i>SEt</i> |
| | | Not saving parameters (Escape) | <i>U</i> <i>ESC</i> |
| | | Restore to factory settings (Default) | <i>U</i> <i>dEF</i> |

10 Status indicators

Error messages

If the unit detects an error, *Err n* will be displayed. *n* signifies the kind of error.

| | |
|---------------|------------------------|
| Error | <i>Err 1</i> |
| Kind of error | Parameterization error |

The operation mode set in the master is not corresponding to that set in the menu.

Solution: Select the same operation mode in the menu which has been set in the master.

Bus error message

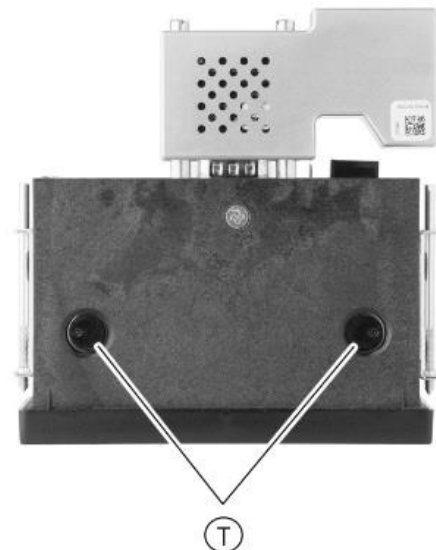
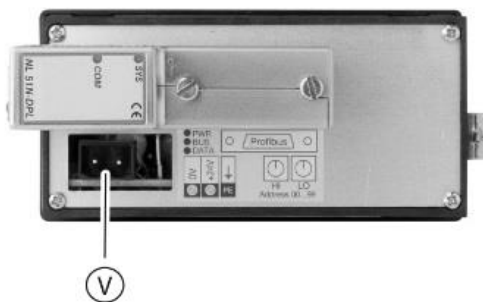
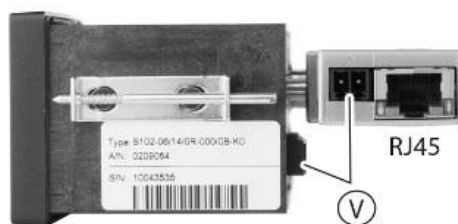
In case of a bus error a minus sign appears in the display.

11 Technical data

Unit properties

| | | |
|-------------------------|---|---------------|
| LED display | SX102-xx/xx/0R-00x/0B-CP | red |
| | SX102-xx/xx/0G-00x/0B-CP | green |
| Character height | SX102-xx/18/0x-00x/0B-CP | 18 mm |
| | SX102-08/30/0x-001/0B-CP | 30 mm |
| Number of digits | SX102-06/18/0x-00x/0B-CP | 6 digits |
| | SX102-08/xx/0x-001/0B-CP | 8 digits |
| | SX102-14/xx/0x-001/0B-CP | 14 digits |
| Power supply | 24 V DC \pm 15 %, galvanically isolated, protected against reverse polarity | |
| Power consumption | SX102-06/18/0x-00x/0B-CP | approx. 9 VA |
| | SX102-08/18/0x-001/0B-CP | approx. 9 VA |
| | SX102-14/18/0x-001/0B-CP | approx. 13 VA |
| | SX102-08/30/0x-001/0B-CP | approx. 13 VA |
| Connection | Profinet: RJ45 socket | |
| Supply voltage | Plug-in screw terminal strip | |
| Protection type (front) | SX102-06/18/0x-000/0B-CP | IP40 |
| | SX102-xx/xx/0x-001/0B-CP | IP65 |
| Operating temperature | 0...50 °C | |
| Storage temperature | -20...70 °C | |
| Humidity | max. 95 % (non condensing) | |
| Weight | SX102-06/14/0x-00x/0B-CP | approx. 210 g |
| | SX102-08/14/0x-001/0B-CP | approx. 340 g |
| | SX102-14/18/0x-001/0B-CP | approx. 540 g |
| | SX102-08/30/0x-001/0B-CP | approx. 540 g |

Dimensions



- Ⓧ Menu buttons
- Ⓥ Power supply voltage
- RJ45 Profinet interface

SX102-06/18/0x-00x/0B-CP/x

Dimensions (W x H x D) 96 x 48 x 102 mm
 Panel cut-out (W x H) 92 x 45 mm

SX102-0 /18/0x-001/0B-CP/x

Dimensions (W x H x D) 144 x 72 x 97 mm
 Panel cut-out (W x H) 136 x 66 mm

SX102-14/18/0x-001/0B-CP/x

Dimensions (W x H x D) 240 x 72 x 97 mm
 Panel cut-out (W x H) 233 x 66 mm

SX102-08/30/0x-001/0B-CP/x

Dimensions (W x H x D) 240 x 72 x 97 mm
 Panel cut-out (W x H) 233 x 66 mm