Series SX202

Alphanumeric displays
with Profinet IO RT interface CC-A

Operating instructions

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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. 0.1µF/600 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, see chapter Technical data):

SX202-xx/03/0x-001/0B-CP and SX202-xx/05/0x-001/0B-CP

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.
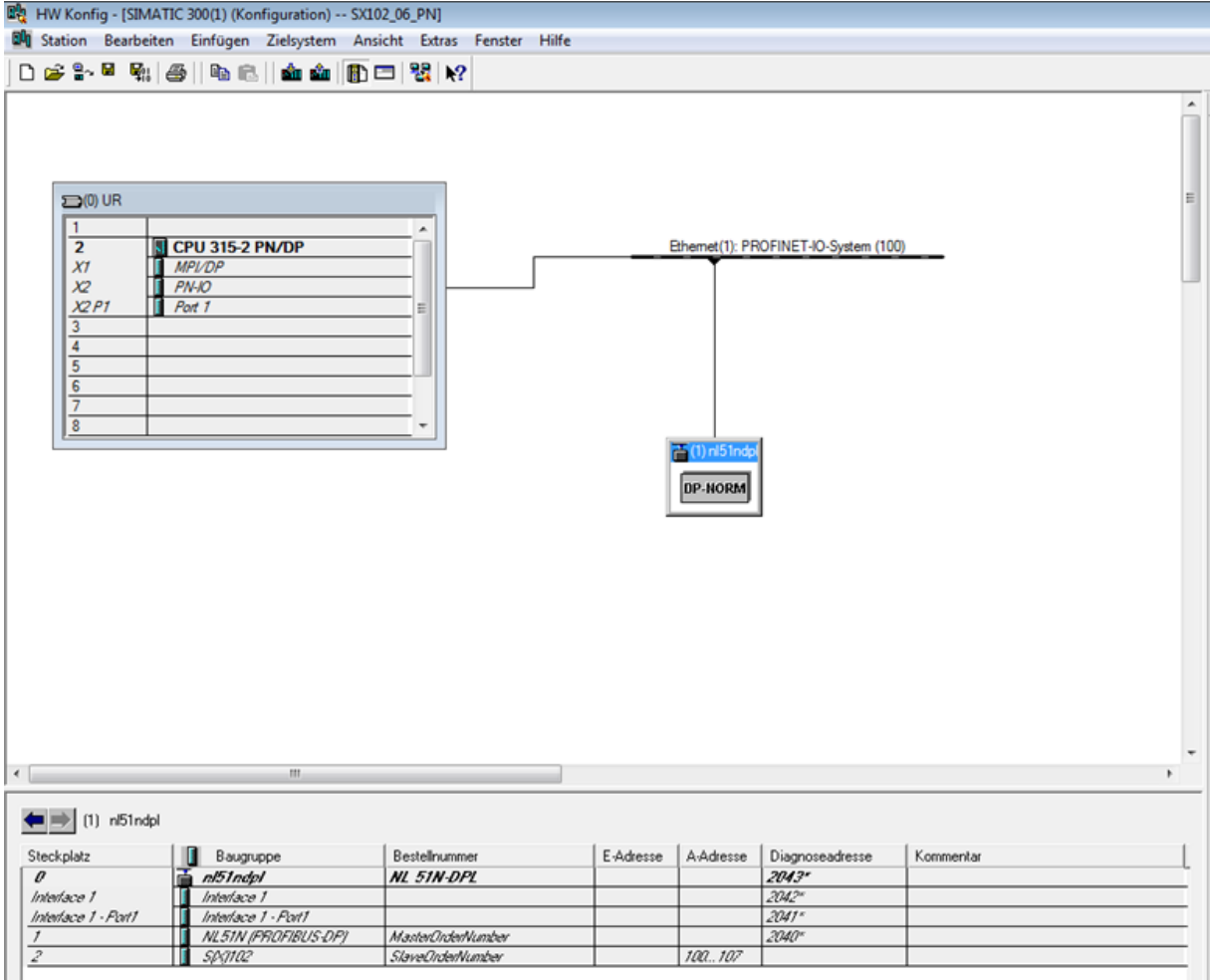
After installing the GSDML file the PROFINET IO-device named NL51NDPL which is located in the hardware catalog is added to an existing PROFINET IO-system.
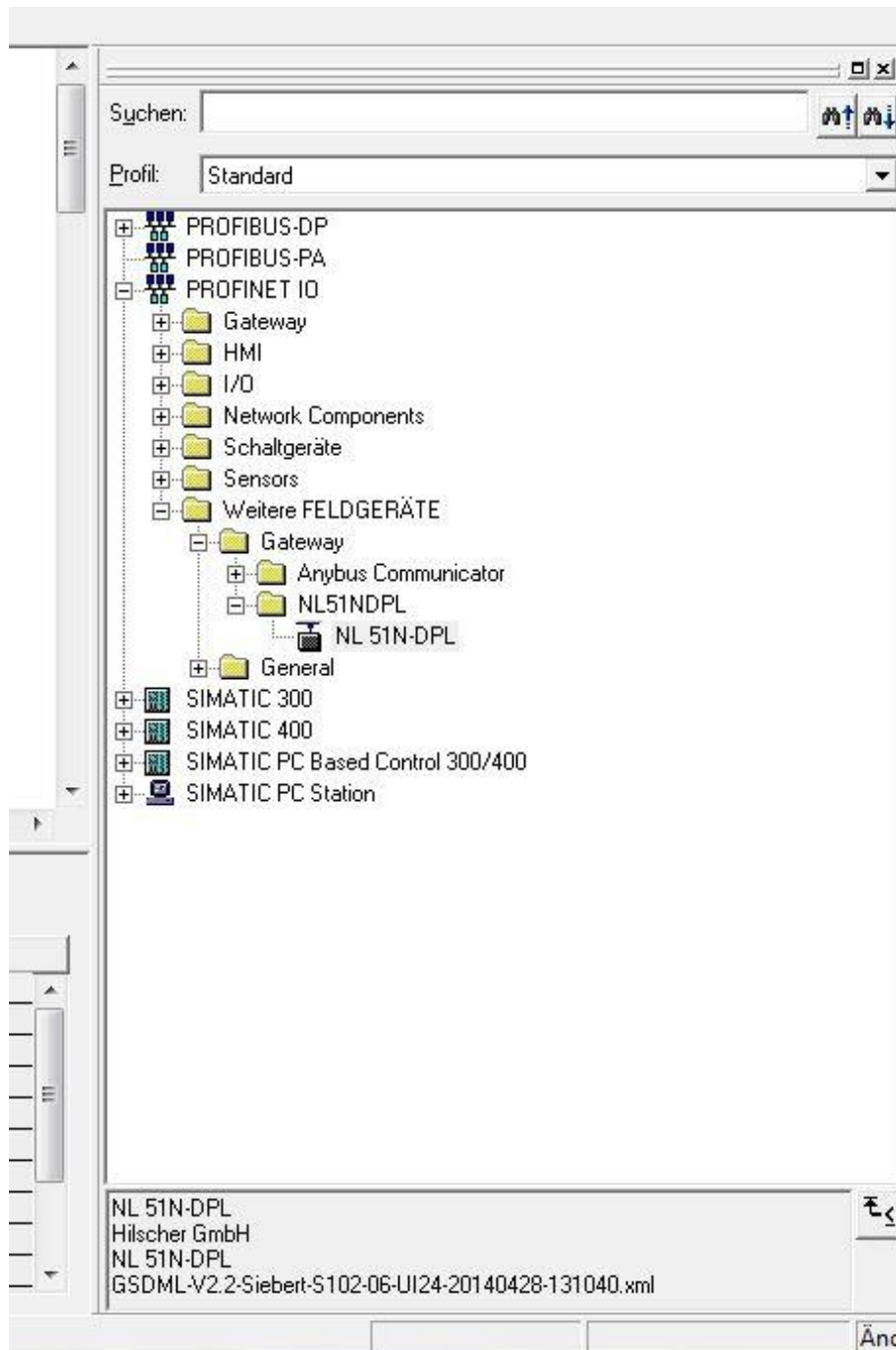
The output addresses of the device are defined.

Translations:

Suchen	search
Profil	profile
Schaltgeräte	switching devices

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

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

Translations:
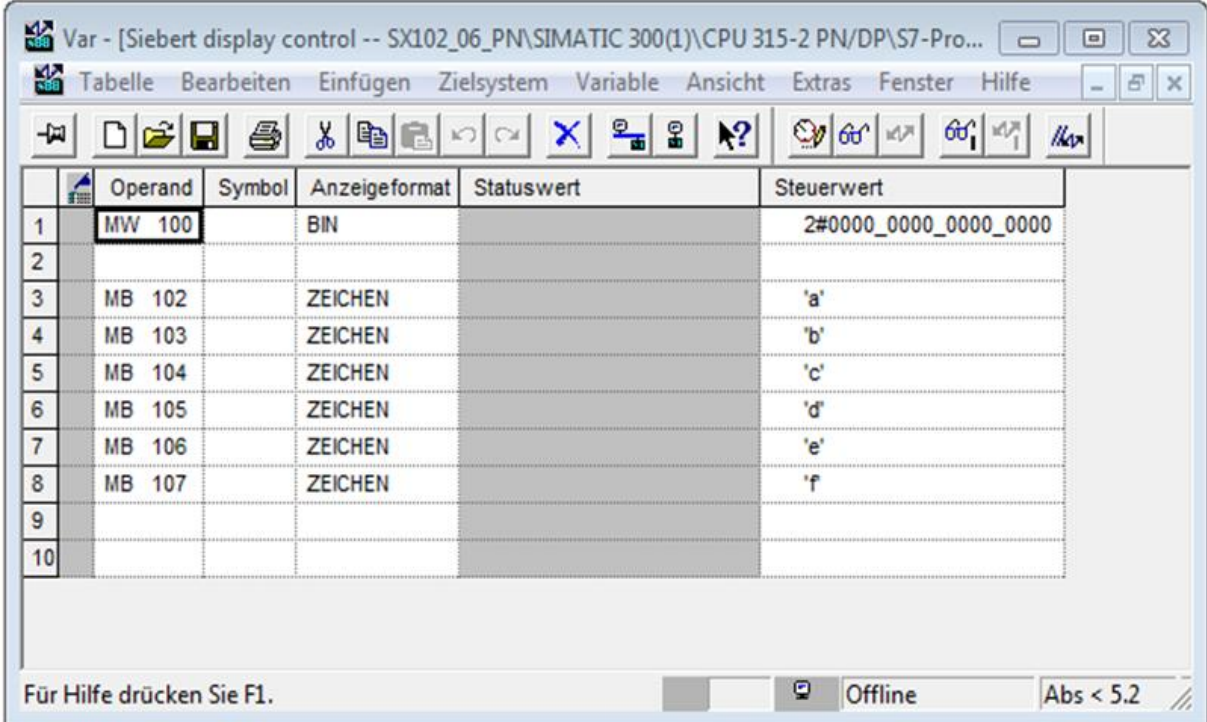
German	English
Gerätenamen vergeben	assign device name
Gerätename	device name
Gerätetyp	type of device
Vorhandene Geräte	existing devices
Name zuweisen	assign name
Teilnehmer-Blinktest	flash test participant
Dauer	duration
Sekunden	seconds
Blinken ein	flashing on
Aktualisieren	update
Exportieren	export
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

		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						

Für Hilfe drücken Sie F1.   Offline   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

Data format

The first four bytes (byte 0 to 3) 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

7	6	5	4					7	6	5	4	3	2	1	0
:	:	:	:					C24	C23	C22	C21	C20	C19	C18	C17

―――― Reserved ―――― (Byte 0 bits 3-0) ―――――― Flashing of single characters ――――――― (Byte 1)

(always set 0)   (0 = off, 1 = on)

- : : : 0 Normal brightness of the display
- : : : 1 Reduced brightness of the display
- : : 0 Flashing of the whole display off
- : : 1 Flashing of the whole display on
- : 0 Blanking of the whole display off
- : 1 Blanking of the whole display on (priority over flashing)
- 0 Display test off
- 1 Display test on (priority over flashing and blanking)

		Byte 2									Byte 3					
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

C16	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1

―――――――――――――― Flashing of single characters (0 = off, 1 = on) ――――――――――――――

The following bytes (starting from byte 4) contain the ASCII characters to be displayed. The number of these bytes depends on the digit numbers of the units:

Units with 4 digits (SX202-04/05/0x-001/0B-CP)

Byte:	4	5	6	7
Characters:	C4	C3	C2	C1

Units with 6 digits (SX202-06/05/0x-001/0B-CP)

Byte:	4	5	6	7	8	9
Characters:	C6	C5	C4	C3	C2	C1

Units with 8 digits (SX202-08/03/0x-001/0B-CP, SX202-08/05/0x-001/0B-CP)

Byte:	4	5	6	7	8	9	10	11
Characters:	C8	C7	C6	C5	C4	C3	C2	C1

Units with 12 digits (SX202-12/03/0x-001/0B-CP, SX202-12/05/0x-001/0B-CP)

Byte:	4	5	6	7	8	9	10	11	12	13	14	15
Characters:	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1

Units with 16 digits (SX202-16/03/0x-001/0B-CP, SX202-16/05/0x-001/0B-CP)

Byte:	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Characters:	C16	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1

Units with 20 digits (SX202-20/03/0x-001/0B-CP)

Byte:	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Characters:	C20	C19	C18	C17	C16	C15	C14	C13	C12	C11	C10	C9	C8	C7	C6	C5	C4	C3

Byte:	22	23
Characters:	C2	C1

Units with 24 digits (SX202-24/03/0x-001/0B-CP)

Byte:	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Characters:	C24	C23	C22	C21	C20	C19	C18	C17	C16	C15	C14	C13	C12	C11	C10	C9	C8	C7

Byte:	22	23	24	25	26	27
Characters:	C6	C5	C4	C3	C2	C1

6   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 bytes 1 to 3 (characters C24...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.

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	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	△
8	€	ü	é	ä	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	₨	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬	½	¼	¡	«	»
B	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	Ë
C	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
D	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
E	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	°	∙	·	√	ⁿ	²	■	

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

7   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*	F	- - -
		Display test at power-on	F	tESt
		Demo operation mode	F	PLAY
U	Save	Save parameters* (Set)	U	SEt
		Not saving parameters (Escape)	U	ESC
		Restore to factory settings (Default)	U	dEF

8   Status indicators

Error messages

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

Error $Err\,1$
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.

9 Technical data

Unit properties

LED display	SX202-xx/xx/0R-001/0B-CP	red
	SX202-xx/xx/0G-001/0B-CP	green
Character height	SX202-xx/03/0x-001/0B-CP	30 mm
	SX202-xx/05/0x-001/0B-CP	50 mm
Number of digits	SX202-04/xx/0x-001/0B-CP	4 digits
	SX202-06/xx/0x-001/0B-CP	6 digits
	SX202-08/xx/0x-001/0B-CP	8 digits
	SX202-12/xx/0x-001/0B-CP	12 digits
	SX202-16/xx/0x-001/0B-CP	16 digits
	SX202-20/xx/0x-001/0B-CP	20 digits
	SX202-24/xx/0x-001/0B-CP	24 digits
Power supply	24 V DC ±15 %, galvanically isolated, protected against reversed polarity	
Power consumption	SX202-08/03/0x-001/0B-CP	approx. 19 VA
	SX202-12/03/0x-001/0B-CP	approx. 27 VA
	SX202-16/03/0x-001/0B-CP	approx. 34 VA
	SX202-20/03/0x-001/0B-CP	approx. 40 VA
	SX202-24/03/0x-001/0B-CP	approx. 45 VA
	SX202-04/05/0x-001/0B-CP	approx. 17 VA
	SX202-06/05/0x-001/0B-CP	approx. 21 VA
	SX202-08/05/0x-001/0B-CP	approx. 26 VA
	SX202-12/05/0x-001/0B-CP	approx. 36 VA
	SX202-16/05/0x-001/0B-CP	approx. 44 VA
Connection	Profinet: RJ45 Buchse	
Supply voltage	Plug-in screw terminal strip	
Protection type	IP65 (front)	
Operating temperature	0…50°C	
Storage temperature	-20…70°C	
Humidity	max. 95 % (non condensing)	
Weight	SX202-08/03/0x-001/0B-CP	approx. 700 g
	SX202-12/03/0x-001/0B-CP	approx. 950 g
	SX202-16/03/0x-001/0B-CP	approx. 1200 g
	SX202-20/03/0x-001/0B-CP	approx. 1450 g
	SX202-24/03/0x-001/0B-CP	approx. 1700 g
	SX202-04/05/0x-001/0B-CP	approx. 900 g
	SX202-06/05/0x-001/0B-CP	approx. 1200 g
	SX202-08/05/0x-001/0B-CP	approx. 1450 g
	SX202-12/05/0x-001/0B-CP	approx. 2000 g
	SX202-16/05/0x-001/0B-CP	approx. 2600 g

Dimensions
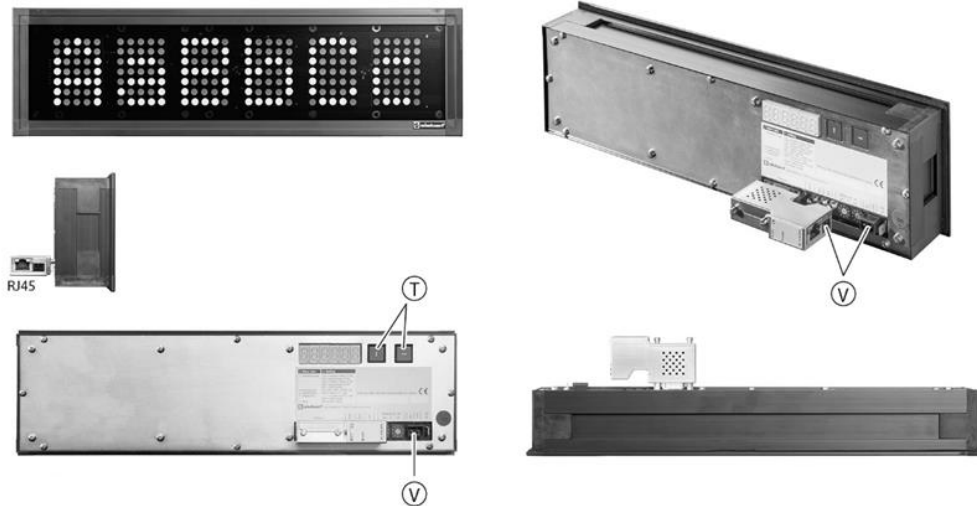
ⓣ   Menu buttons
ⓥ   Supply voltage
RJ45 Profinet interface

Character heigt 30mm

SX202-08/03/0x-001/0B-CP
Dimensions (W x H x D) 264 x 96 x 101 mm
Panel cut-out (W x H) 256 x 89 mm

SX202-12/03/0x-001/0B-CP
Dimensions (W x H x D) 384 x 96 x 101 mm
Panel cut-out (W x H) 376 x 89 mm

SX202-16/03/0x-001/0B-CP
Dimensions (W x H x D) 480 x 96 x 101 mm
Panel cut-out (W x H) 472 x 89 mm

SX202-20/03/0x-001/0B-CP
Dimensions (W x H x D) 600 x 96 x 101 mm
Panel cut-out (W x H) 592 x 89 mm

SX202-24/03/0x-001/0B-CP
Dimensions (W x H x D) 696 x 96 x 101 mm
Panel cut-out (W x H) 688 x 89 mm

Character height 50mm

SX202-04/05/0x-001/0B-CP
Dimensions (W x H x D) 240 x 96 x 101 mm
Panel cut-out (W x H) 232 x 89 mm

SX202-06/05/0x-001/0B-CP
Dimensions (W x H x D) 336 x 96 x 101 mm
Panel cut-out (W x H) 328 x 89 mm

SX202-08/05/0x-001/0B-CP
Dimensions (W x H x D) 432 x 96 x 101 mm
Panel cut-out (W x H) 424 x 89 mm

SX202-12/05/0x-001/0B-CP
Dimensions (W x H x D) 624 x 96 x 101 mm
Panel cut-out (W x H) 616 x 89 mm

SX202-16/05/0x-001/0B-CP
Dimensions (W x H x D) 816 x 96 x 101 mm
Panel cut-out (W x H) 808 x 89 mm