SIEMENS

SITOP power supplies

SITOP UPS1600 / UPS1100

Manual

SITOP UPS1600 10 A
6EP4134-3AB00-0AY0
6EP4134-3AB00-1AY0
6EP4134-3AB00-2AY0

SITOP UPS1600 20 A
6EP4136-3AB00-0AY0
6EP4136-3AB00-1AY0
6EP4136-3AB00-2AY0

SITOP UPS1600 40 A
6EP4137-3AB00-0AY0
6EP4137-3AB00-1AY0
6EP4137-3AB00-2AY0

SITOP UPS1100
Battery module 1.2 Ah
6EP4131-0GB00-0AY0
Battery module 2.5 Ah
6EP4132-0GB00-0AY0
Battery module 3.2 Ah
6EP4133-0GB00-0AY0
Battery module 5 Ah
6EP4133-0JB00-0AY0
Battery module 7 Ah
6EP4134-0GB00-0AY0
Battery module 12 Ah
6EP4135-0GB00-0AY0

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Overview

Description

The DC-UPS modules augment the SITOP 24 V power supply units for uninterruptible rated currents up to 40 A from the UPS1100 battery modules based on maintenance-free lead or LiFePo batteries. SITOP UPS1600 with its integrated electronics automatically detects the battery type that it charges with the optimum temperature-controlled charging characteristic curve. The intelligent battery management monitors all relevant data, also for parallel-connected battery modules. The Ethernet/PROFINET interface is used to output the battery status and various actual values, such as voltage and current. Thanks to the integrated web server, remote diagnosis is also possible.

The low profile SITOP UPS1600 DC-UPS module provides a dynamic overload behavior, for example, to switch on industrial PCs. The high charging current quickly restores the buffer readiness after a supply system failure. And for the deployment in stand-alone operation, the UPS can be activated from the battery for missing supply system voltage, e.g. to start the generators.

The key benefits of the product include:

- Compact SITOP UPS1600 24 V/10 A, 20 A and 40 A DC-UPS modules with digital inputs/outputs, optional with USB or two Ethernet/PROFINET interfaces

- SITOP UPS1100 24 V/1.2 Ah, 2.5 Ah, 3.2 Ah, 7 Ah and 12 Ah battery modules with maintenance-free lead-gel batteries or 5 Ah with LiFePo batteries and integrated electronics

- Intelligent battery management with automatic detection of the battery modules, and selection of the optimum temperature-controlled charging characteristic; monitoring of readiness for operation, aging and charge status.

- All diagnostic data and alarm messages are available via USB and Ethernet/PROFINET

- High dynamic overload capability: 3-fold rated current for 30 ms and 1.5-fold rated current for 5 seconds per minute

- High charging currents

- Start from battery modules for missing supply system voltage

- OPC UA server with encrypted interface

- Remote monitoring via the integrated web server

- SITOP UPS Manager (free software download) supports the configuration and monitoring for PC-based systems

- Completely integrated in TIA: user-friendly engineering in SIMATIC STEP 7 and SIMATIC STEP 7 in the TIA Portal, S7 function blocks for integration in the user programs and WinCC faceplates

Ordering data

The following device options are available:

SITOP UPS1600 uninterruptible power supply	
Type	Order number
Input 24 V DC Output 24 V DC / 10 A	6EP4134-3AB00-0AY0
Input 24 V DC Output 24 V DC / 10 A With USB interface	6EP4134-3AB00-1AY0
Input 24 V DC Output 24 V DC / 10 A With PROFINET (PN) interface	6EP4134-3AB00-2AY0
Input 24 V DC Output 24 V DC / 20 A	6EP4136-3AB00-0AY0
Input 24 V DC Output 24 V DC / 20 A With USB interface	6EP4136-3AB00-1AY0
Input 24 V DC Output 24 V DC / 20 A With PROFINET (PN) interface	6EP4136-3AB00-2AY0
Input 24 V DC, Output 24 V DC / 40 A	6EP4137-3AB00-0AY0
Input 24 V DC, Output 24 V DC / 40 A With USB interface	6EP4137-3AB00-1AY0
Input 24 V DC, Output 24 V DC / 40 A With PROFINET (PN) interface	6EP4137-3AB00-2AY0

SITOP UPS1100 battery module	
Type	Order number
Battery module 1.2 Ah (lead)	6EP4131-0GB00-0AY0
Battery module 2.5 Ah (pure lead)	6EP4132-0GB00-0AY0
Battery module 3.2 Ah (lead)	6EP4133-0GB00-0AY0
Battery module 5 Ah (LiFePO4)	6EP4133-0JB00-0AY0
Battery module 7 Ah (lead)	6EP4134-0GB00-0AY0
Battery module 12 Ah (lead)	6EP4135-0GB00-0AY0

Accessory for SITOP UPS1600	
Type	Order number
Device identification labels 20 mm × 7 mm, pastel turquoise	3RT1900-1SB20

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Safety instructions

<div style="text-align:right;font-size:2em">1</div>

> **⚠ WARNING**
>
> **Correct handling of the devices**
>
> When operating electrical devices, it is inevitable that certain components will carry dangerous voltages.
>
> Therefore, failure to handle the units properly can result in death or serious physical injury as well as extensive property damage.
>
> Only appropriately qualified personnel may work on or in the vicinity of this equipment.
>
> Perfect, safe, and reliable operation of this equipment is dependent on proper transportation, storage, installation and mounting.
>
> Before installation or maintenance work can begin, the system's main switch must be switched off and measures taken to prevent it being switched on again.
>
> If this instruction is not observed, touching live parts can result in death or serious injury.

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines, and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions only form one element of such a concept.

Customer is responsible to prevent unauthorized access to its plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent necessary and with appropriate security measures (e.g. use of firewalls and network segmentation) in place.

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit:
 http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under
 http://www.siemens.com/industrialsecurity.

Description, device design, dimension drawing

2

2.1 Device description

2.1.1 SITOP UPS1600

The SITOP UPS1600 10 A, 20 A and 40 A are built-in devices of the SITOP series for mounting on TH35-15/7.5 standard mounting rails (EN 60715). When installing the SITOP UPS1600 devices and SITOP UPS1100 battery modules, the relevant DIN/VDE regulations or country-specific regulations (e.g. VDE 0510 Teil 2 / EN 50272-2) must be carefully complied with.

See Section Installation (Page 203)

In combination with the SITOP UPS1100 battery modules, they are used to buffer the load current from the 24 V load power supplies of the SITOP series.
With their high dynamic overload capability up to the 300 % rated current for 30 ms or up to the 150 % rated current for 5 seconds per minute, they are suitable for applications with programmable logic controllers (PLCs) and industrial PCs, because they permit high switch-on currents even in buffer operation.

The input of the SITOP UPS1600 DC-UPS module must be connected with the output of the supplying 24 V DC power supply unit. The UPS1100 battery module is connected to the BAT terminals. The loads to be buffered are supplied via the output of the SITOP UPS1600 DC-UPS module with the voltage connected at the input.

The Energy Storage Link is new. This is an additional two-wire connection between the SITOP UPS1600 base device and the coded SITOP UPS1100 battery modules. Furthermore, the base device detects and manages as many as six battery modules and selects the optimum, temperature-controlled charging characteristic curve. The latter provides the basis for the long service life of the battery modules. The Energy Storage Link also monitors the operational readiness as well as the supply cables (wire breakage) and the charge state (voltage, current) of the rechargeable batteries.
The connection to the SITOP UPS1100 battery module is checked every 20 seconds (for voltage, reverse polarity protection). A test with a defined load of the lead or LiFePo batteries is also performed automatically every four hours (basic setting).
Battery modules of other type series and manufacturers can also be used, although with limited diagnostic functions, such as the display of the charging current or the end-of-charge voltage and without the possibility of temperature-controlled charging.

In the event of failure of the 24 V DC supply voltage or voltage dip below the set switch-in threshold, the loads are supplied by switching over to the battery module. Buffering is realized until the line supply returns or until the buffer time, set using the rotary coding switch, has expired. If the buffer time has been set to MAX, then shutdown is realized when the exhaustive discharge threshold is reached.

Using the output voltage interrupt function you can select as to whether the output voltage is interrupted once the set buffer time expires if, in the meantime, the input voltage returns (status when the device is delivered: the output voltage is not interrupted). For devices

without interface, the interruption lasts 5 s. For devices with interface, the interruption duration can be adjusted.

For devices with software release up to V2.0.1, this function is only available for devices with interface, as the output voltage is only interrupted after a shutdown signal is received.

For software version > V2.0.1, the interruption of the output voltage is independent of receiving a shutdown signal.

For the "Maximum buffer time" setting, the output voltage is only interrupted by the UPS Manager. In this case, the rotary coding switch "Connection threshold" must be set to REN.

Rotary switches can be used to set the battery module switch-in threshold and the buffer time. The charging current for the battery modules is set automatically, and can be changed using the interface (only for types -1AY0 and -2AY0), as well as via the signal connector.

Eight LEDs, two potential-free changeover contacts and one floating NO contact indicate the SITOP UPS1600 status.

The USB interface (only -1AY0) or PROFINET/Ethernet interface (only -2AY0) handles the communication to the PC/controllers.
For details, see Sections Connections and terminal designation (Page 20) and Operator controls (Page 25).

Operating data and diagnostic data can be transferred using two integrated Industrial Ethernet/PROFINET ports and visualized or further processed externally as an alternative to the proven USB connection. An integrated web server allows authorized users to export relevant data remotely via a web browser without requiring any additional software to be installed on the remote system. When delivered, the web server is not active (applies from version V2.1 and higher). Using the two rotary coding switches, the web server can be activated, and a temporary Internet address assigned, see SITOP UPS1600 (Page 25).
The free-of-charge SITOP UPS Manager, which runs on Windows XP and Windows 7 systems (32 and 64 bit), allows full access. This allows the overall DC-UPS installation to be configured and monitored easily using a PC. The software tool provides many possibilities for the visualization of operating and diagnostic information, such as in the form of alarm lists or easily understandable trend diagrams which, for example, provide a view of the chronological change of the charging current or load current of the DC-UPS at a glance.
The SITOP UPS1600 is fully integrated in Totally Integrated Automation (TIA), the Siemens open system architecture for integrated automation solutions. The engineering is performed in the TIA Portal and reduces to just a few clicks for the user. The UPS modules can be selected directly in the hardware catalog and transferred into the graphic network representation.
For applications without network connection, the SITOP UPS1600 is available in the variants with USB interface or digital inputs/outputs.
For stand-alone operation, the DC-UPS can be activated without input voltage from the battery, for example, to start a generator via a directly supplied controller. (see Chapter Jumper variants (Page 26))
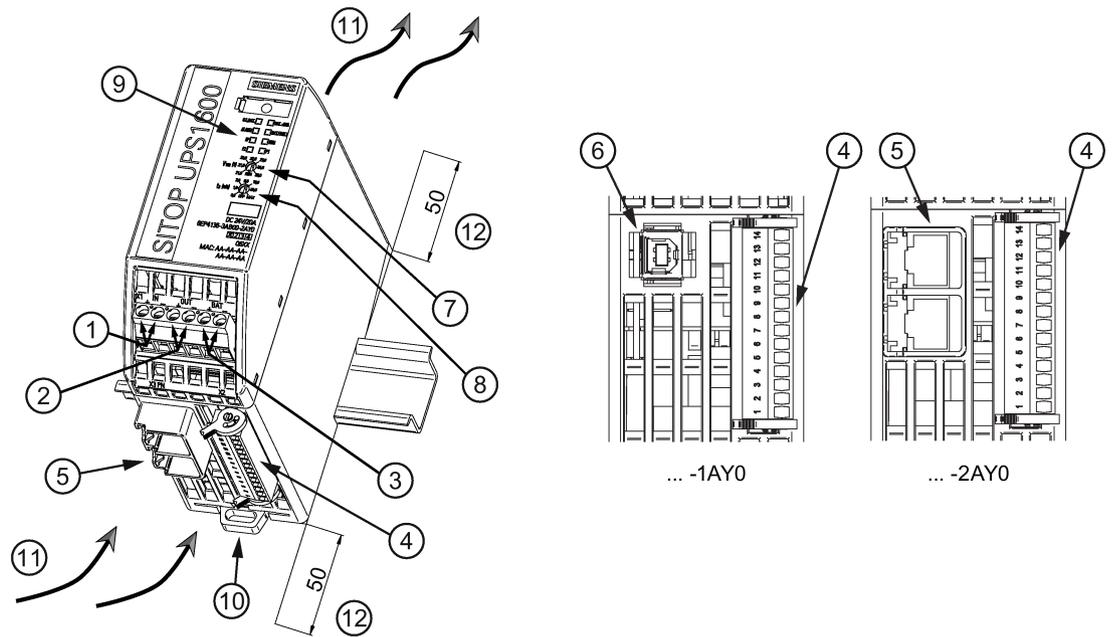
①   DC input X1

②   DC output X1

③   BAT X1

④   Signal connector X2

⑤   PROFINET (Ethernet) interface X3 (only for ... - 2AY0)

⑥   USB interface X3 (only for ... - 1AY0)

⑦   Rotary coding switch, switch-in threshold

⑧   Rotary coding switch, buffer time

⑨   Signaling (LEDs)

⑩   DIN rail slider

⑪   Convection

⑫   Clearance above/below

Figure 2-1   SITOP UPS1600 design (example 6EP4136-3AB00-2AY0)

2.1.2   SITOP UPS1100

The SITOP UPS1100 battery modules consist of a battery holder with two maintenance-free, closed lead or LiFePO batteries with terminals for the connection cables to the SITOP UPS1600 uninterruptible power supply. The UPS1100 contains a printed-circuit board for monitoring the battery functions and the communication with the SITOP UPS1600. A green LED lights continually to indicate that there is a communication connection to the SITOP UPS1600. The LED flashes when the batteries are being replaced or for faults and alarms.

Note

Battery module UPS1100 5 Ah with LiFePo batteries can only be used in conjunction with UPS1600 from software version V2.1.

Up to 6 SITOP UPS1100 of the same type can be connected in parallel with a SITOP UPS1600.

When replacing a battery, see Chapter Battery replacement (Page 208).
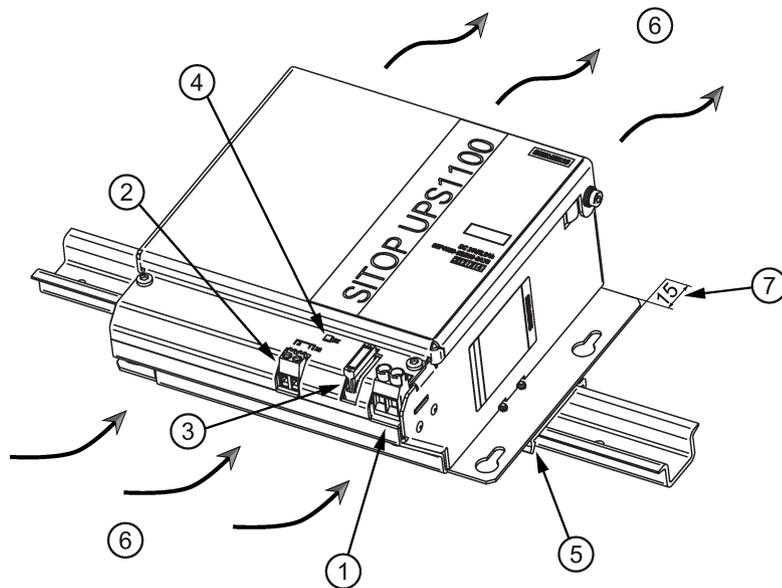
①   DC input X1
②   Signal terminal X2
③   Fuses F1/F2 (F2 only for 7 Ah and 12 Ah)
④   Signaling (LED)
⑤   Mounting rail holder (not for the 7 Ah and 12 Ah versions)
⑥   Natural convection
⑦   Clearance above

Figure 2-2   SITOP UPS1100 design (example 6EP4133-0GB00-0AY0)

Note

For the UPS1100, clearance is required above it in order to open the cover. Clearance below is not required for thermal reasons - however, space is required to feed in the cable.

2.2 Connections and terminal designation

2.2.1 SITOP UPS1600

2.2.1.1 Power terminals

The input terminals ① can be used to establish the connection to the supply voltage. The output terminals ② are used to connect to the supplied loads.

Cables must be used that are suitable for at least 90 °C (only for applications for UL508).

The UPS1100 battery modules are connected via BAT ③.

(see also Chapter Installation (Page 203))

Connections and terminal designations (see Figure 2-1 SITOP UPS1600 design (example 6EP4136-3AB00-2AY0) (Page 17))	
① DC input IN+, IN-	One screw terminal each
② DC output OUT+, OUT-	One screw terminal each
③ BAT+, BAT-	One screw terminal each
④ Signal connector	Connector with 14 screw terminals
⑤ PROFINET (Ethernet) connection	RJ45 plug-in contact (only for ...-2AY0)
⑥ USB connection	USB-B plug-in contact (only for...-1AY0)

	① + ② + ③	④	⑦ + ⑧
⊏▭▭	0,6 x 3,5	0,6 x 3,5	0,4 x 2,5
▬▭	1 x 0,2 - 6 mm^2 (90 °C)	1 x 0,2 - 1,5 mm^2	-
▬▨	1 x 0,2 - 4 mm^2 (90 °C)	1 x 0,2 - 1,5 mm^2	-
AWG	24 - 10	28 - 14	-
Nm	0,5 - 0,6 Nm	0,2 - 0,25 Nm	-
▭↔	8 mm	6 mm	-
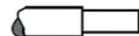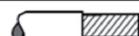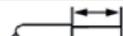
Figure 2-3　　Terminal data SITOP UPS1600 10 A, 20 A

	① + ② + ③	④	⑦ + ⑧
🖊	0,8 x 4,5	0,4 x 2,5	0,4 x 2,5
▬	1 x 0,5 - 16 mm^2	1 x 0,2 - 1,5 mm^2	-
▬	1 x 0,5 - 10 mm^2	1 x 0,2 - 1,5 mm^2	-
AWG	20 - 6	28 - 14	-
Nm	1,2 - 1,5 Nm	0,2 - 0,25 Nm	-
▬	11 mm	6 mm	-

Figure 2-4   Terminal data SITOP UPS1600 40 A

2.2.1.2   Signal terminal
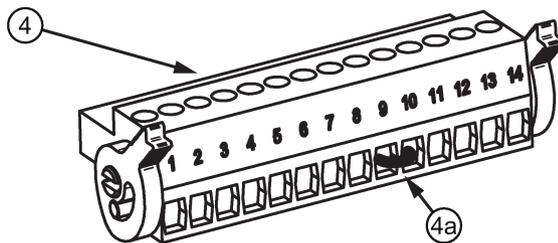
④   Signal connector

④a   Wire jumper

Figure 2-5   Signal connector
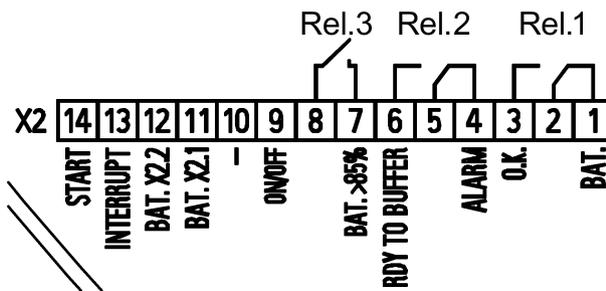
Figure 2-6   Signal connector connection schematic

Pin	Terminal designation	Function
1	BAT.	**24 V DC OK / BAT**
2	-	REL1 (changeover contact):
3	OK	Energized state: Normal operation Quiescent state: Buffer mode or off
4	ALARM	**Ready for buffer operation / alarm**
5	-	REL2 (changeover contact):
6	RDY TO BUFFER	Energized state: Buffer mode is possible Quiescent state: Not ready for buffering Cycle 0.25 Hz: Defective battery
7	BAT. > 85 %	**Battery > 85%**
8	-	REL3 (NO contact): Energized state: Buffering of the selected buffer time is possible, or charge state > 85 %
9	ON/OFF	On/Off (buffer operation permitted/prevented)
10	-	-
11	BAT. X2.1	Battery communication or charging current setting
12	BAT. X2.2	Battery supply or charging current setting
13	INTERRUPT	Interrupt (interruption of the output voltage)
14	START	Start from the battery

Relay contact: Contact rating, max. AC 30 V/0.5 A; DC 60 V/0.3 A; DC 30 V/1 A

The jumper (4a) (see Figure Signal connector (Page 21)) between pin 9 and 10 is necessary to operate the device in buffer mode.

Delivery state: Jumper between pin 9 and 10

2.2.1.3   USB port
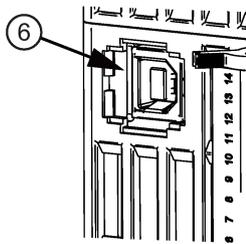
Figure 2-7   USB port

The USB interface (type B) ⑥ fully conforms to the USB 2.0 standard (12 MBd). Strain relief (see Section USB connector (Page 189)) is implemented using a defined cable/connector (Y-Con USB - Yamaichi).

2.2.1.4   PROFINET/Ethernet connection
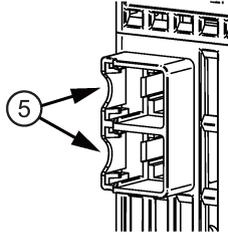
Figure 2-8   PROFINET/Ethernet connection

The Ethernet interface ⑤ corresponds to the standard full duplex up to 100 Mbit/s electrical (100BASE-TX) according to IEEE 802.3..

Properties of the Ethernet interface:

- Transfer rate 10/100 Mbit/s

- Two RJ45 sockets, i.e. integrated switch, for RJ45 connector

- Cable type 100Base-TX (CAT5)

- Auto negotiation

- Auto crossover communication via TCP/IP and PROFINET

The strain relief (see Section PROFINET/Ethernet connector (Page 190)) is implemented using a Siemens IE FastConnect RJ45.

The physics of the Ethernet interface is implemented so that PROFINET IO according to standards IEC 61158 and IEC 61784-2 is possible. For PROFINET, conformance class B must be maintained as a minimum.

The Ethernet/PROFINET interface permits:

- Configuration and monitoring using the SITOP UPS Manager

- Monitoring via the Web server

- Integration and communication of the DC-UPS with other automation components from Siemens and the open environment, e.g. IPC, PLC, HMI, OPC UA

- Firmware update of the device via UPS Manager, web server or STEP 7

2.2.2   SITOP UPS1100

2.2.2.1   Power terminals

Input terminals ① and signal terminal ② can be used to establish the connection to SITOP UPS1600. (also see Chapter Installation (Page 203)).

Connections and terminal designations (see Figure 2-2 SITOP UPS1100 design (example 6EP4133-0GB00-0AY0) (Page 18))	
① DC input +, -	One screw terminal each
② Signal terminal 1, 2	One screw terminal each

	①	②
🪛	0,6 x 3,5	0,6 x 3,5
	1 x 0,2 - 6 mm^2	1 x 0,14 - 4 mm^2
	1 x 0,2 - 4 mm^2	1 x 0,14 - 2,5 mm^2
AWG	24 - 10	22 - 12
Nm	0,5 Nm	0,5 - 0,7 Nm
	8 mm	6,5 mm
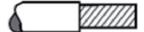
Figure 2-9   Terminal data for 6EP4131-0GB00-0AY0, 6EP4132-0GB00-0AY0, 6EP4133-0GB00 and 6EP4133-0JB00-0AY0

	①	②
🪛	1,0 x 5,5	0,6 x 3,5
	1 x 0,5 - 16 mm^2	1 x 0,14 - 4 mm^2
	1 x 0,5 - 16 mm^2	1 x 0,14 - 2,5 mm^2
AWG	26 - 6	22 - 12
Nm	1,2 - 1,5 Nm	0,5 - 0,7 Nm
	12 mm	6,5 mm
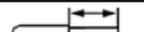
Figure 2-10   Terminal data for 6EP4134-0GB00-0AY0 and 6EP4135-0GB00-0AY0

2.3 Operator controls

2.3.1 SITOP UPS1600

2.3.1.1 Rotary coding switch, switch-in threshold

The switch-in threshold can be set using the rotary coding switch ⑦ on the device front between 21.0 V and 25.0 V (21 - 21.5 - 22 - 22.5 - 23 - 24 - 25 volt). The delivery state is 22.5 V

For devices with an interface (…-1AY0, …-2AY0), the coding switch has an additional REN position. If this is selected, the software settings (for the switch-in threshold and the backup time) apply rather than the hardware settings. In the switch position REN, the connection X2.13 (INTERRUPT - reset after buffer operation) of the signal terminal (see Section Signal terminal (Page 21)) has no effect.
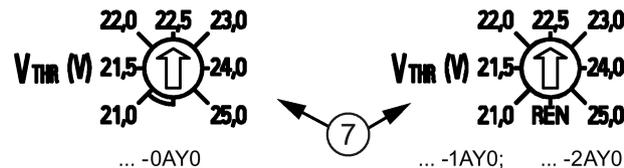
Figure 2-11   Rotary coding switch, switch-in threshold

Note

It is only permissible to operate the rotary switch using an insulated screwdriver.

For notes on actuating the rotary coding switch (screwdriver, torque), see Figure 2-3 Terminal data SITOP UPS1600 10 A, 20 A (Page 20).

2.3.1.2 Rotary coding switch, backup time

The buffer time is set using the rotary coding switch ⑧ on the device front between 30 seconds and MAX in steps of 0.5 minute (30 s), 1 minute, 2 minutes, 5 minutes, 10 minutes, 20 minutes and MAX. The MAX setting means that buffering is realized for as long as possible. The device only shuts down when the battery has discharged down to the stop buffering voltage (factory setting, 18.5 V). Delivery state is MAX

The rotary coding switch has an additional setting OFF (see following diagram). If this is selected and the additional threshold rotary coding switch is not set to REN, then buffering is deactivated.

If the buffer time is to be set using the software (only for devices with an interface (…-1AY0, …-2AY0)) (possible setting range, see Section Parameterizing SITOP UPS1600 (Page 77)), the rotary coding switch for the connection threshold must be set to REN (see Section Rotary coding switch, switch-in threshold (Page 25)).

Figure 2-12   Rotary coding switch, buffer time

Note

It is only permissible to operate the rotary switch using an insulated screwdriver.

For notes on actuating the rotary coding switch (screwdriver, torque), see Figure 2-3 Terminal data SITOP UPS1600 10 A, 20 A (Page 20)

2.3.1.3   Jumper variants

On/Off (pin 9)

The wire jumper on the signal connector ④ between pin 9 and pin 10 is used to enable/disable the buffer mode (see Figure 2-5 Signal connector (Page 21)).

Buffer operation is only possible if the ON/OFF wire jumper is connected. The ON/OFF wire jumper has priority over the position of the switch-in threshold rotary coding switch. Delivery state: Wire jumper is connected between pin 9 and 10

As a consequence, buffer operation can be enabled or prevented using a floating contact (e.g. a contact in the plant or system). The contact is switched instead of the ON/OFF wire jumper.

Note

The contact in the switched-on state must have a resistance of < 10 Ohm,
contact load must be a minimum of 15 V / 5 mA.

Note

The external circuit must meet the requirements relating to SELV circuits according to EN60950-1.

Changes are also effective in the buffer mode.

Table 2- 1   With interface (up to firmware release less than V1.20)

Rotary coding switch, buffer time	Rotary coding switch, connection threshold	Wire jumper ON/OFF with respect to -	Result
OFF	21 - 25	Yes	Buffering not permitted
0,5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time corresponding to the settings or maximum buffer time)
OFF, 0,5 - MAX	21 - 25	No	Buffering not permitted
OFF, 0,5 - MAX	REN	Not relevant	The software settings apply

Table 2- 2   With interface (from firmware release V1.20 up to V2.0.x)

Rotary coding switch, buffer time	Rotary coding switch, connection threshold	Wire jumper ON/OFF with respect to -	Result
OFF	21 - 25	Yes	Buffering not permitted
0,5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time corresponding to the settings or maximum buffer time)
OFF, 0,5 - MAX	21 - 25, REN	No	Buffering not permitted
OFF, 0,5 - MAX	REN	Yes	The software settings apply

Table 2- 3   With interface (from firmware release V2.1)

Rotary coding switch buffer time	Rotary coding switch switch-in threshold	Wire jumper ON/OFF with respect to -	Result
OFF	21 - 25	Yes	Buffering not permitted
0,5 - MAX	21 - 25	No	Buffering not permitted
0,5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time corresponding to the settings or maximum buffer time)
OFF, 0,5 - MAX	21 - 25 REN	No	Buffering not permitted

Rotary coding switch buffer time	Rotary coding switch switch-in threshold	Wire jumper ON/OFF with respect to -	Result
0,5 - MAX	REN	Yes	The software settings apply
OFF	REN	Not relevant	The web server can be activated, and a temporary Internet address assigned (precondition: IP address is 0.0.0.0 (when delivered))

Table 2- 4   Without interface

Rotary coding switch, buffer time	Rotary coding switch, connection threshold	Wire jumper ON/OFF with respect to -	Result
OFF	21 - 25	Yes	Buffering not permitted
OFF	21 - 25	No	Buffering not permitted
0,5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time corresponding to the settings or maximum buffer time)
0,5 - MAX	21 - 25	No	Buffering not permitted

Interruption of the output voltage (pin 13)

A wire jumper on the signal connector ④ between pin 13 and pin 10 is used to enable/disable the interruption of the output voltage, after the set buffer time expires, for the parameterized time (default value 5 seconds) when the line supply returns during the buffer time. The default value can only be changed for devices with USB or Ethernet/PROFINET interface.

To prevent data losses, PCs must be shut down in time before the buffer time ends. If the input voltage returns after the shutdown has already started, the SITOP UPS1600 terminates the buffer mode and transitions into normal operation. The PC will be shut down, however, it is not switched off. PCs, which do not have an on/off switch, can only be rebooted by switching off the power and switching on again. When the "Interrupt output voltage" jumper is inserted, the UPS generates this pulse.

Start from the battery (pin 14)

The start from the battery is initiated by connecting pin 14 to pin 10. This jumper must not provide a permanent connection, but must be controlled using a button. The input is designed so that a single lamp with a permissible supply voltage of between 12 and 30 V and 8 to 15 mA can be switched in series to the switching contact. If the button is actuated when the input voltage is not available, and if buffering is permitted, then the UPS goes into the buffer mode. The UPS1600 shuts down if, at the end of the selected buffer time, an input voltage is still not available.

The SITOP UPS1600 starts in normal operation if the input voltage is available.

This can occur if the UPS was remotely shut down via the interface.

Note

From UPS Manager Version V4.71.13 and UPS1600 Version V2.1.0, when starting from the battery, buffer operation is identified when powering up. After the set time "Shut down PC on power failure" the PC is correctly powered down and switched off. For earlier versions of the UPS Manager and the UPS1600 Version, when starting from the battery after the buffer time expires, the output of the UPS1600 is switched off without first having powered-down the PC.

Charge current setting (pin 10 / 11 / 12)

For uncoded batteries, the size of the charge current can be changed by placing jumpers between terminals X2.10 (-) and X2.11 or X2.12. These settings are only effective if the "Connection threshold" rotary coding switch is not set to REN.

Table 2- 5   Charge current

SITOP UPS1600 10 A	SITOP UPS1600 20 A and 40 A	Terminal X2.11	Terminal X2.12
0.3 A	0.8 A	open	open
0.8 A	1.75 A	open	connected with X2.10
Max.	Max.	connected with X2.10	open

Remark
The charge current can be automatically reduced if the charge current plus the load current at the UPS1600 results in an overload of the feeding power supply. The charge current can also be reduced if the ambient temperature of the UPS1600 is higher than 40 °C - or if the input voltage at the UPS1600 is less than 24 V.
Derating:
10 A: 3 A-->2 A
20 A: 4 A-->3 A
40 A: 5 A-->3 A

2.3.2   SITOP UPS1100

2.3.2.1   Buttons for battery replacement

For the SITOP UPS1100, below the cover there is a button ⑧ for battery replacement, see Battery replacement (Page 208)
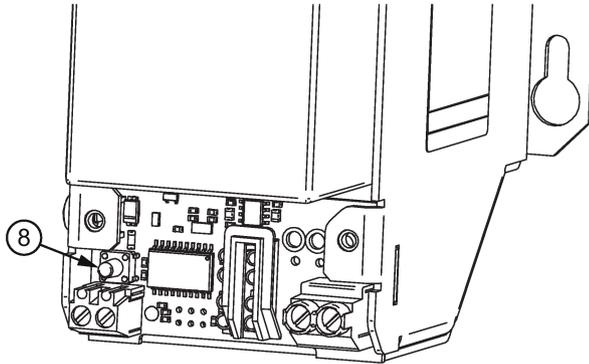
Figure 2-13   Buttons for battery replacement

2.4   Operating displays and signaling

2.4.1   SITOP UPS1600

2.4.1.1   LEDs

	6EP4134-3AB00- ...
	6EP4136-3AB00- ...
	6EP4137-3AB00- ...
Status display	LED 1: Operating mode DC-UPS LED 2: Charge state LED 3: Buffer readiness LED 4: Battery test LED 5: for PROFINET-specific diagnostic displays LED 6: for PROFINET-specific diagnostic displays LED 7: Connection status Ethernet port 1 LED 8: Connection status Ethernet port 2
• Remark	LEDs 5 to 8 are only active for... -2AY0

LEDs	Labeling, just the same as at the housing	Description
LED 1	O.K./BAT.	Operating mode DC-UPS
LED 2	BAT. > 85 %	Charge state
LED 3	ALARM	Ready for buffering
LED 4	BAT. FAULT	Battery test
LED 5	SF	for PROFINET-specific diagnostic displays
LED 6	RUN	for PROFINET-specific diagnostic displays
LED 7	P2	Connection status Ethernet port 1
LED 8	P1	Connection status Ethernet port 2

Figure 2-14   Operating displays

Legend:

○	LED off
●	LED lights up
✳ 0.5/3	LED flashes in the interval: 0.5 s on - 3 s off

LED 1 (O.K./BAT)

Signaling		6EP4134-3AB00- ... 6EP4136-3AB00- ... 6EP4137-3AB00- ...
○	Off	DC-UPS off
●	Red	DC-UPS defect (severe hardware fault)
✳	Flashing red (0.5/0.5)	Firmware update
✳	Flashing red (1/1)	Software corrupted
✳	Flashing yellow (0.5/0.5)	Critical temperature identified, overtemperature or overvoltage at the input
✳	Flashing yellow (0.5/3)	Buffer mode, output off
●	Yellow	Buffer mode, output on
✳	Flashing green (0.5/3)	DC-UPS OK, output off
●	Green	DC-UPS OK, output on

LED 2 (BAT>85 %)

Signaling		6EP4134-3AB00- ... 6EP4136-3AB00- ... 6EP4137-3AB00- ...
✳	Flashing green (0.5/0.5)	Firmware update
○	Off	Battery charge state <85 %
●	Green	Battery charge state >85 %

The LED and the relay contact (see Chapter Relay outputs (Page 34)) have two meanings:

1. If no other settings have been made, then the LED lights up after reaching a charge state greater than 85 %. The LED goes dark if the charge state falls below 85 %.

2. If an expected buffer current and a buffer time are set under the hardware configuration, then the LEDs and the relay contact serve as an indicator when buffering is possible with the two parameters – or is no longer possible.

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, for the evaluation, instead of the expected buffer current, the actually measured buffer current is used. As a consequence, the status of the LEDs and the relay can also change.

LED 3 (alarm)

Signaling		6EP4134-3AB00- ... 6EP4136-3AB00- ... 6EP4137-3AB00- ...
●	Red	Output off for 45 seconds because of overcurrent, overtemperature or buffer operation not possible
○	Off	Buffer operation possible

LED 4 (battery/BAT.Fault)

Signaling		6EP4134-3AB00- ... 6EP4136-3AB00- ... 6EP4137-3AB00- ...
○	Off	Battery O.K. or uncoded battery modules connected or buffer time rotary coding switch at position MAX
☀	Flashing yellow (0.5/0.5)	Battery outside the permitted temperature range
●	Red	Battery defective
●	Yellow	Selected buffer time cannot be attained

LED 5 and LED 6 (PROFINET LEDs)

Signaling				6EP4134-3AB00-2AY0 6EP4136-3AB00-2AY0 6EP4137-3AB00-2AY0
LED 5 (SF)		**LED 6 (RUN)**		
○	Off	○	Off	No connection to a PROFINET IO controller
○	Off	☀	Flashing green (0.5/0.5)	Configuration by the PROFINET IO controller
○	Off	●	Green	Application started successfully, module O.K.
●	Red	●	Green	Application started successfully, module not O.K.
☀	Flashing red (0,1/0,1)	●	Green	Application in progress, diagnosis can be called
☀	Flashing red (0.5/0.5)	☀	Flashing green (0.5/0.5)	Self-test running (flashing alternately every 3 s)
☀	Flashing red (0.5/0.5)	○	Off	DCP requires device identification (LED flashes for 3 seconds)
☀	Flashing red (0.5/0.5)	☀	Flashing green (0.5/0.5)	Firmware update

LEDs 5 and 6 are active only for ... -2AY0.

LED 7 (Ethernet LED / P2)

Signaling		6EP4134-3AB00-2AY0
		6EP4136-3AB00-2AY0
		6EP4137-3AB00-2AY0
○	Off	Device not connected with controller
●	Green	Device connected with controller, no activity
◑	Green/orange alternately	Device connected with controller, send/receive data (RX/TX)

LED 7 is active only for ... -2AY0

LED 8 (Ethernet LED / P1)

Signaling		6EP4134-3AB00-2AY0
		6EP4136-3AB00-2AY0
		6EP4137-3AB00-2AY0
○	Off	Device not connected with controller
●	Green	Device connected with controller, no activity
◑	Green/orange alternately	Device connected with controller, send/receive data (RX/TX)

LED 8 is active only for ... -2AY0

2.4.1.2   Relay outputs
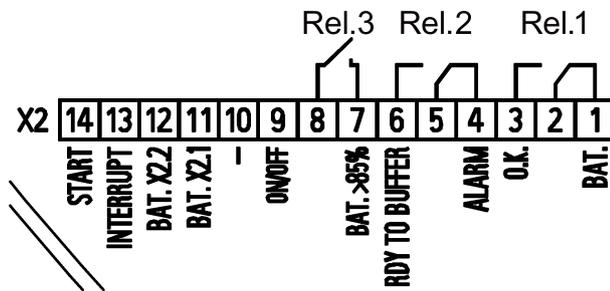
Figure 2-15   Signal connector connection schematic

REL1 (changeover contact):
Energized state: Normal operation (X2.2 - X2.3)
Deenergized state: Buffer mode or off

REL2 (changeover contact):
Energized state: Buffer operation is possible (X2.5 - X2.6)
Deenergized state: Not ready for buffering
Cycle 0.25 Hz: Battery defective or different – or more than 6 battery modules connected – or the selected buffer time is not reached.

REL3 (NO contact):
Energized state: Buffering of the selected buffer time is possible, or charge state > 85 %.

Contact rating:

30 V AC/0.5 A 60 V DC/0.3 A 30 V DC/1 A

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, for the evaluation, instead of the expected buffer current, the actually measured buffer current is used. As a consequence, the status of the LEDs and the relay can also change.

2.4.2 SITOP UPS1100

2.4.2.1 LEDs

	6EP4131-0GB00-0AY0 (1.2 Ah)
	6EP4132-0GB00-0AY0 (2.5 Ah)
	6EP4133-0GB00-0AY0 (3.2 Ah)
	6EP4133-0JB00-0AY0 (5 Ah)
	6EP4134-0GB00-0AY0 (7 Ah)
	6EP4135-0GB00-0AY0 (12 Ah)
Status display	LED battery
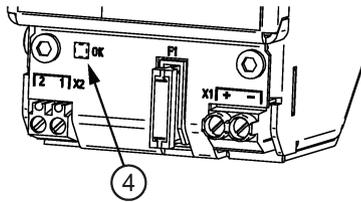
Figure 2-16   6EP4131-0GB00-0AY0 example

Table 2- 6   LED ④ battery

Signaling		6EP4131-0GB00-0AY0 (1.2 Ah)
		6EP4132-0GB00-0AY0 (2.5 Ah)
		6EP4133-0GB00-0AY0 (3.2 Ah)
		6EP4133-0JB00-0AY0 (5 Ah)
		6EP4134-0GB00-0AY0 (7 Ah)
		6EP4135-0GB00-0AY0 (12 Ah)
✳	Flashing green (0.5/0.5)	Error or alarm, battery replacement initiated
○	Off	Battery off, no communication
●	Green	Battery OK

2.5 Block diagram

2.5.1 SITOP UPS1600
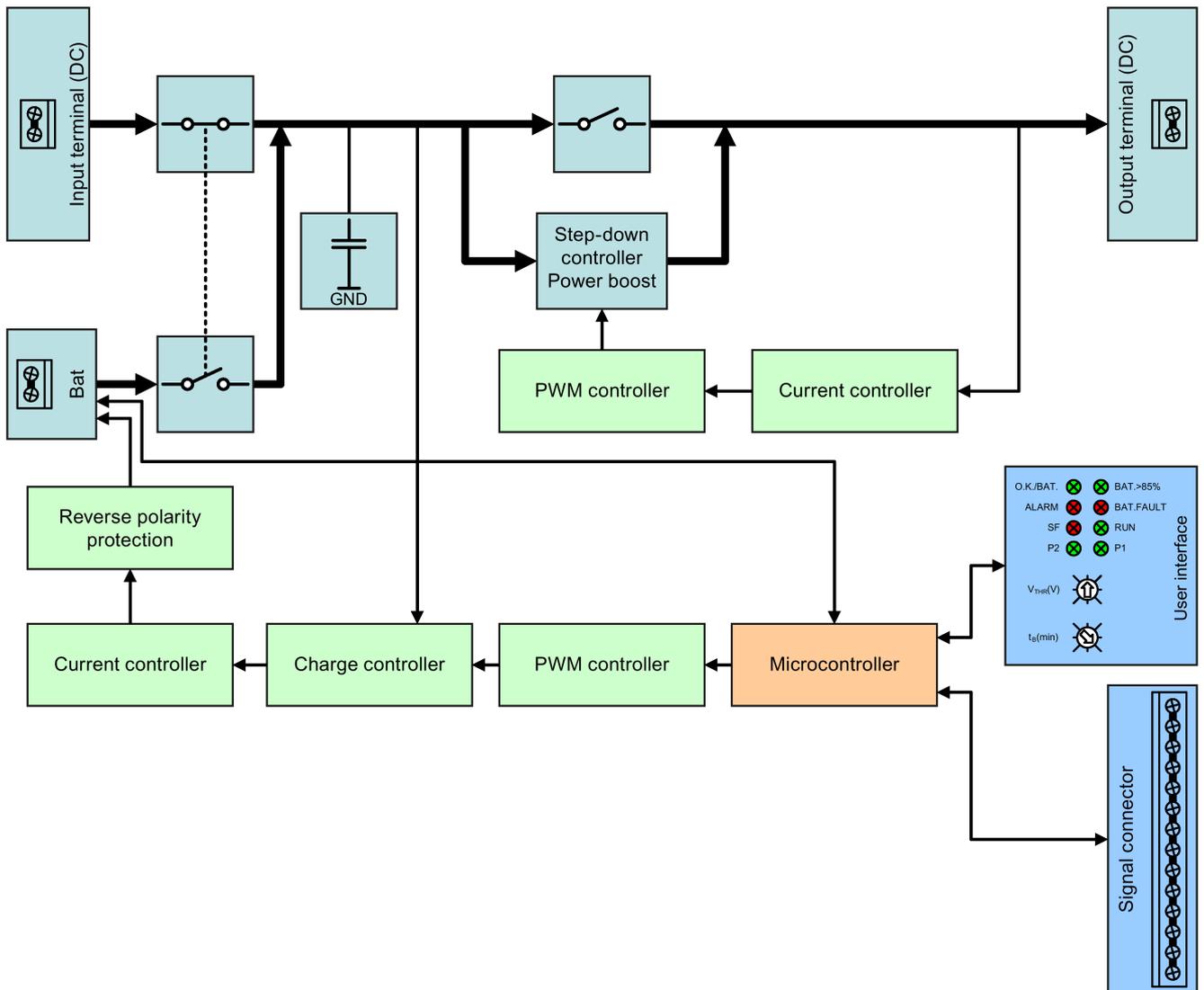
Figure 2-17 Block diagram SITOP UPS1600

2.5.2   SITOP UPS1100
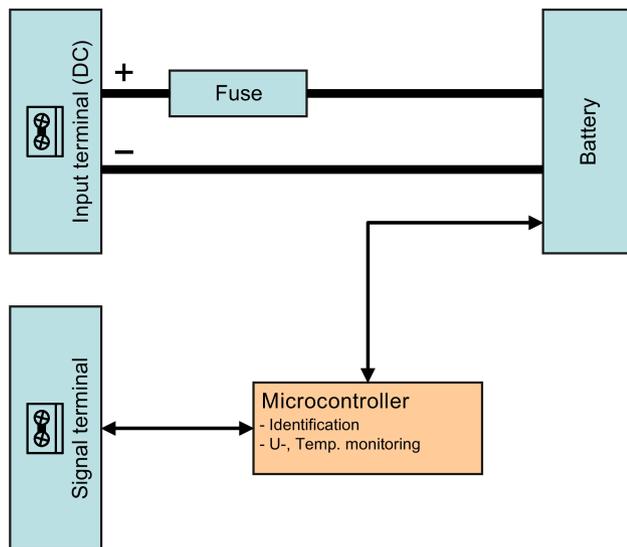
Figure 2-18   Block diagram SITOP UPS1100

2.6 Dimensions and weight

2.6.1 SITOP UPS1600
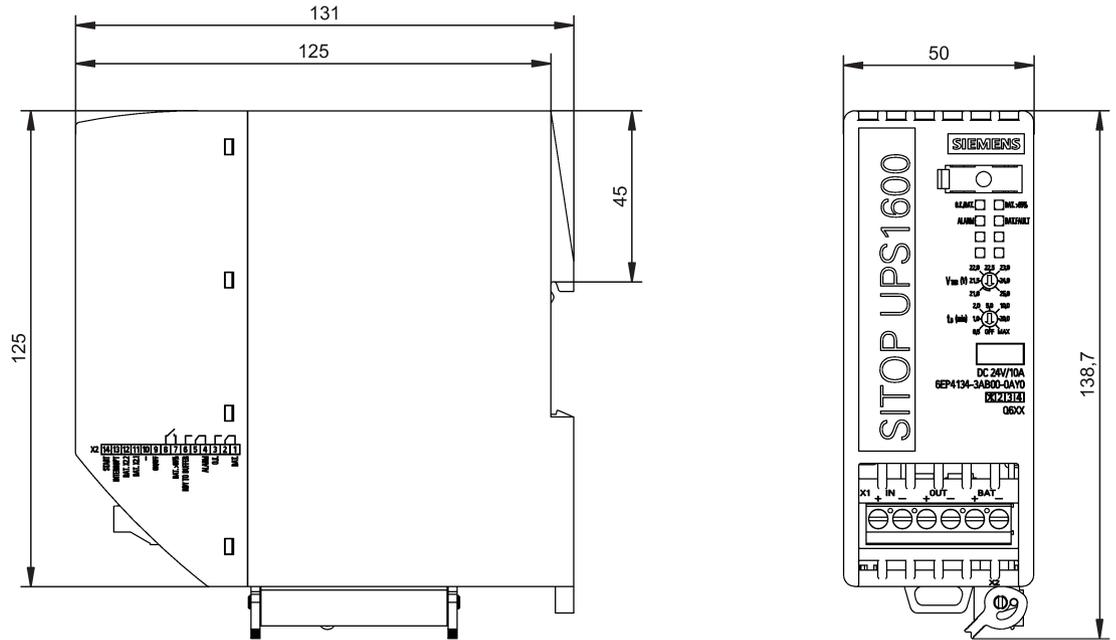
Figure 2-19   6EP4134-3AB00-0AY0, 6EP4134-3AB00-1AY0, 6EP4136-3AB00-0AY0,6EP4136-3AB00-1AY0 dimensioned drawing
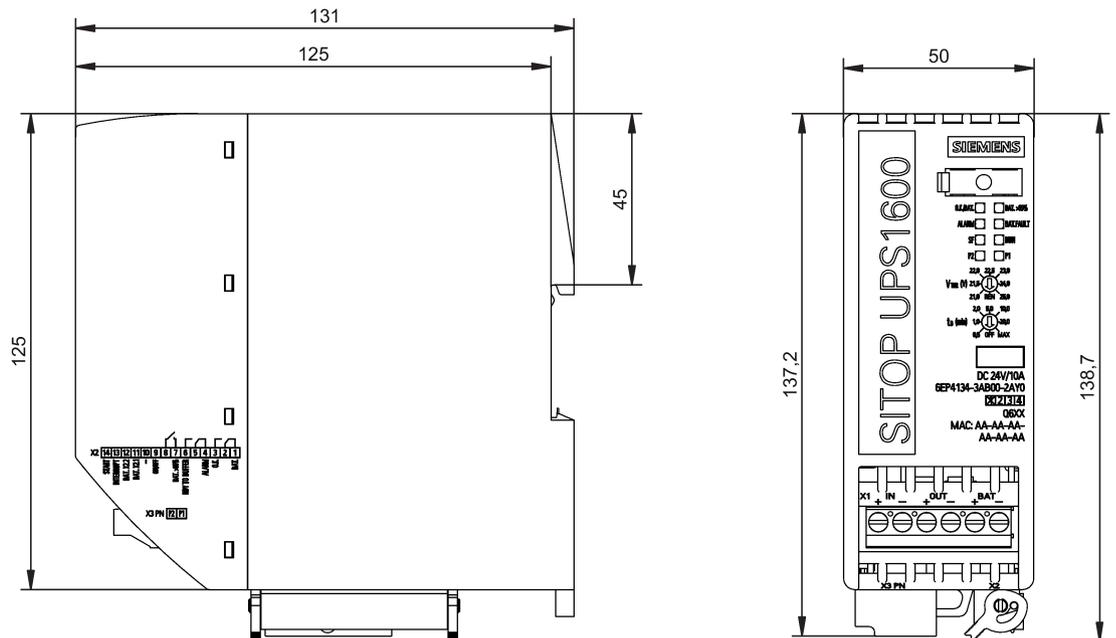
Figure 2-20   6EP4134-3AB00-2AY0, 6EP4136-3AB00-2AY0 dimensioned drawing
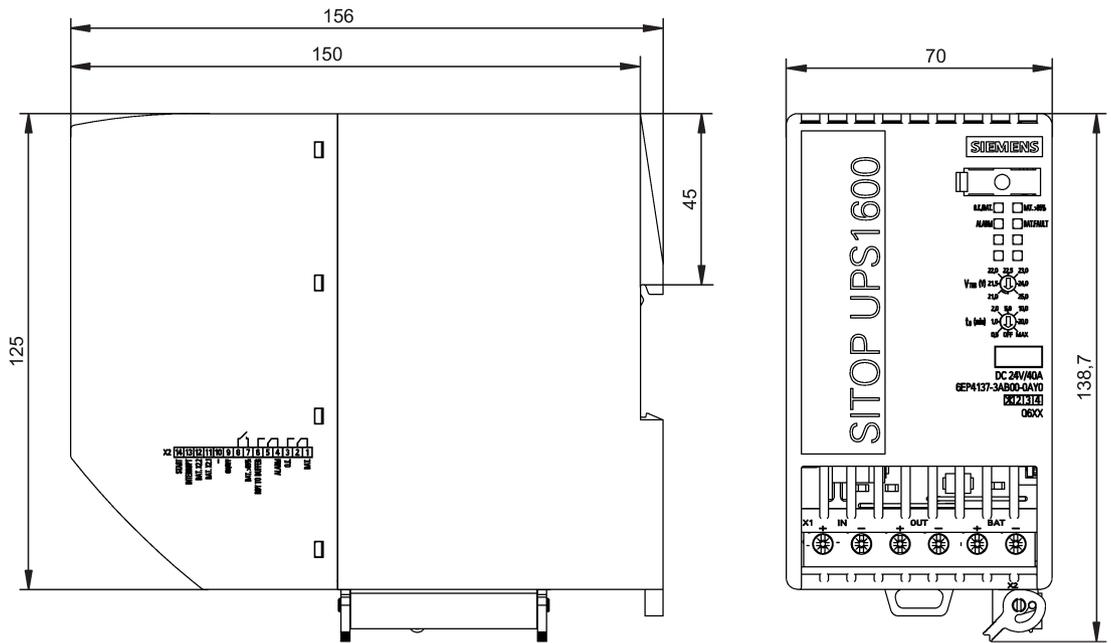
Figure 2-21   Dimension drawing 6EP4137-3AB00-0AY0, 6EP4137-3AB00-1AY0
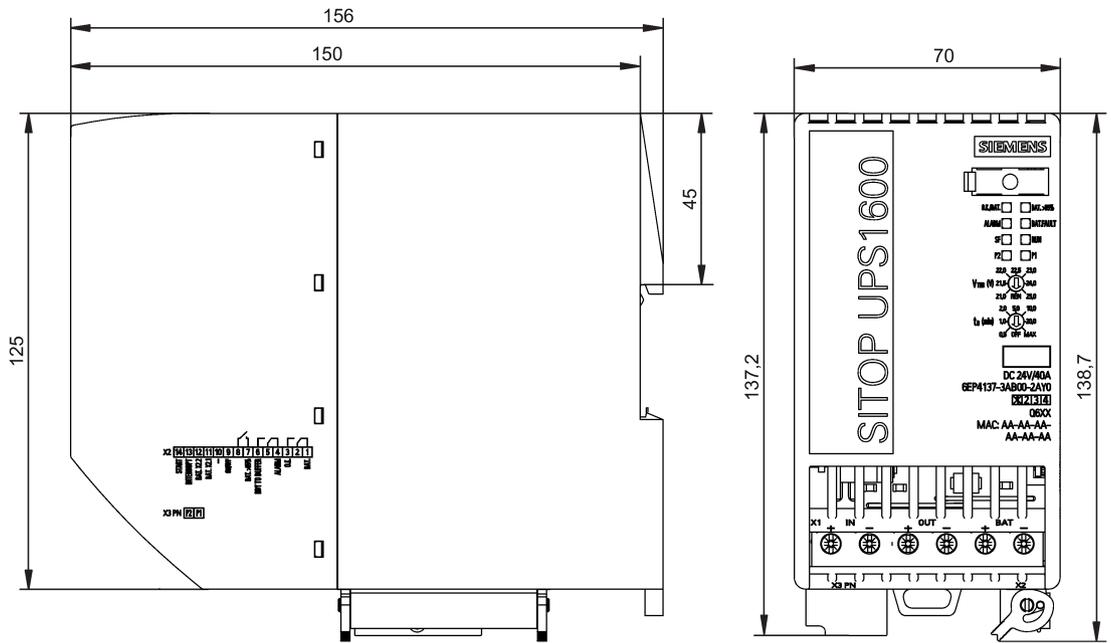
Figure 2-22   Dimension drawing 6EP4137-3AB00-2AY0

	6EP4134-3AB00-0AY0	6EP4134-3AB00-1AY0	6EP4134-3AB00-2AY0
Dimensions (W × H × D) in mm	50 × 138.7 × 125	50 × 138.7 × 125	50 × 138.7 × 125
Weight	Approx. 0.38 kg	Approx. 0.4 kg	Approx. 0.45 kg

	6EP4136-3AB00-0AY0	6EP4136-3AB00-1AY0	6EP4136-3AB00-2AY0
Dimensions (W × H × D) in mm	50 × 138.7 × 125	50 × 138.7 × 125	50 × 138.7 × 125
Weight	Approx. 0.39 kg	Approx. 0.41 kg	Approx. 0.45 kg

	6EP4137-3AB00-0AY0	6EP4137-3AB00-1AY0	6EP4137-3AB00-2AY0
Dimensions (W × H × D) in mm	70 × 138.7 × 150	70 × 138.7 × 150	70 × 138.7 × 150
Weight	Approx. 0.65 kg	Approx. 0.65 kg	Approx. 0.7 kg

2.6.2   SITOP UPS1100
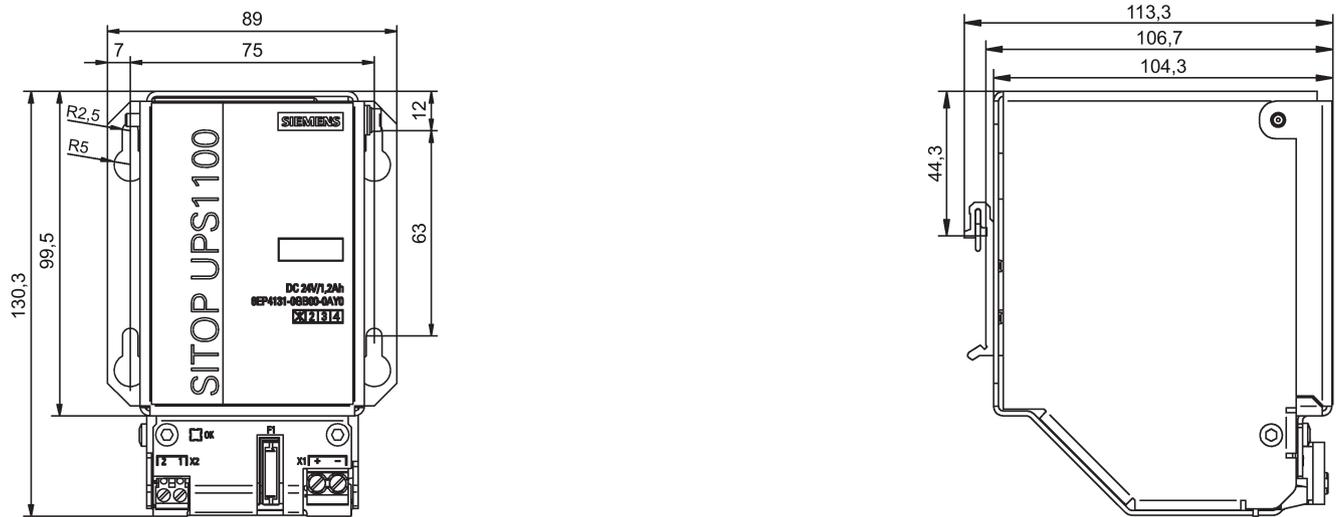
Figure 2-23   6EP4131-0GB00-0AY0 dimensioned drawing
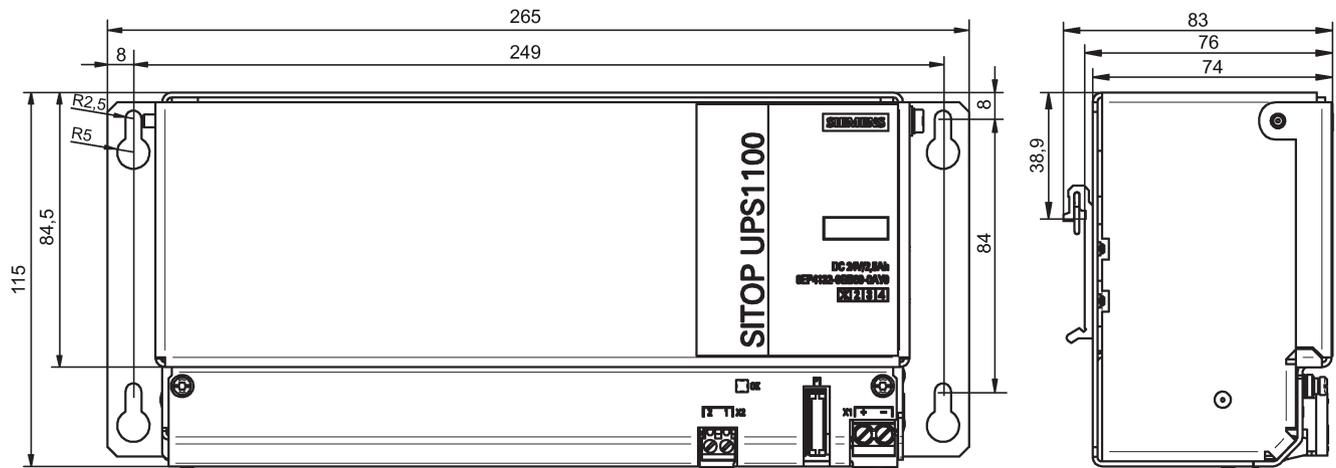
Figure 2-24   Dimension drawing 6EP4132-0GB00-0AY0
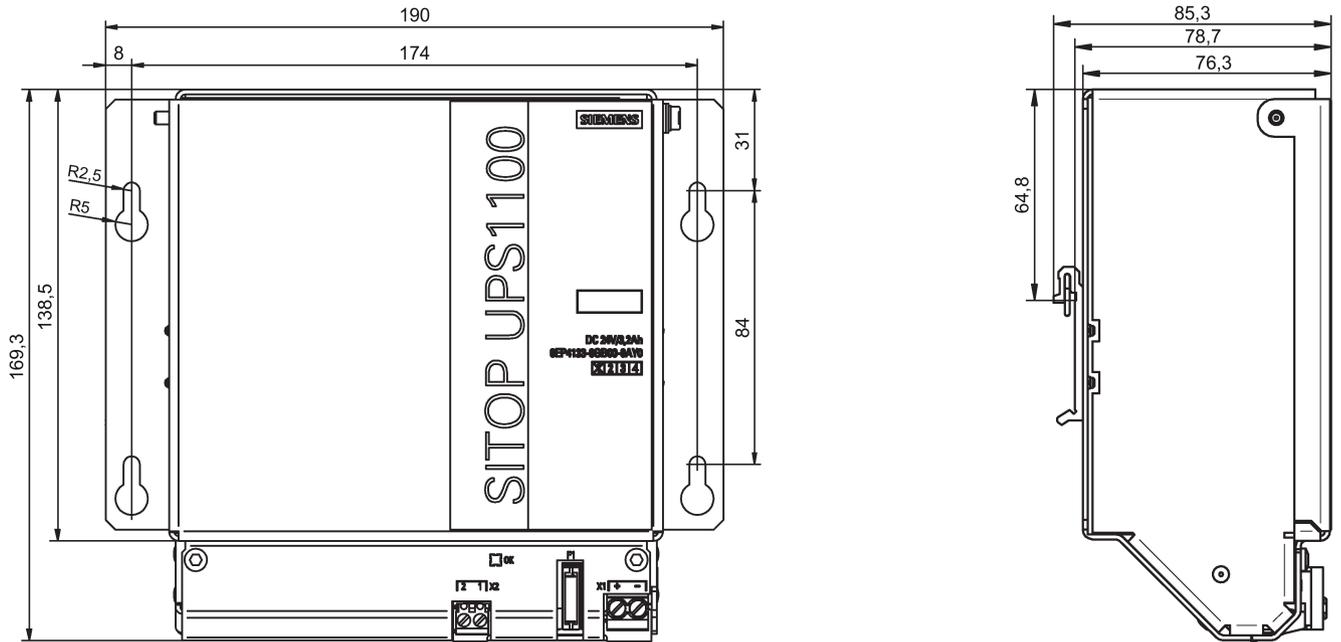
Figure 2-25   6EP4133-0GB00-0AY0 dimensioned drawing
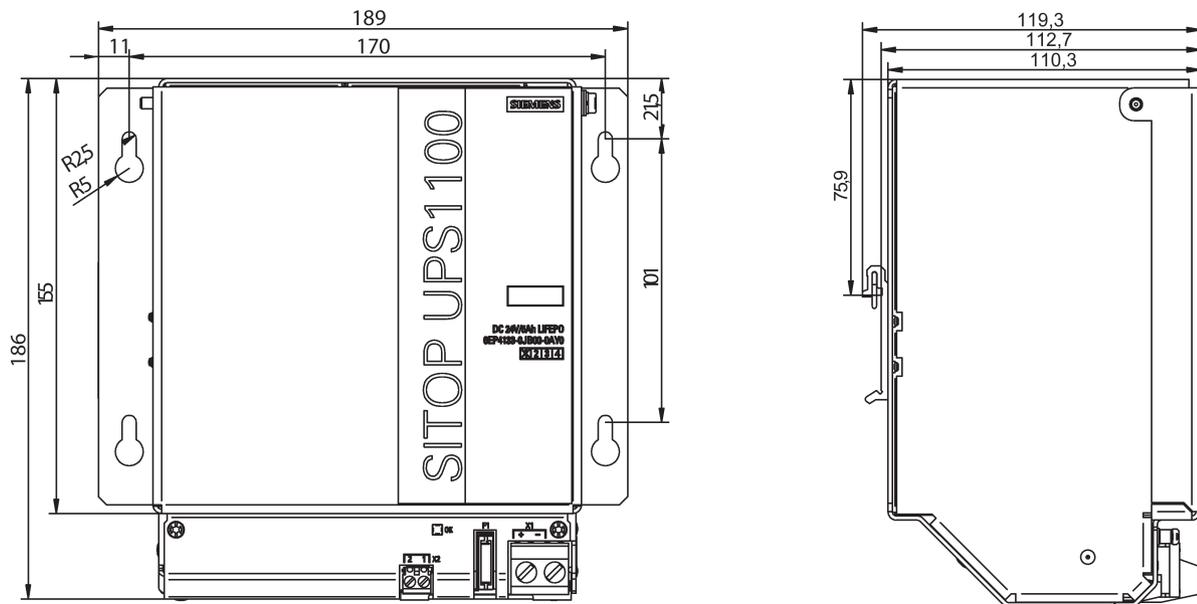
Figure 2-26   Dimension drawing 6EP4133-0JB00-0AY0
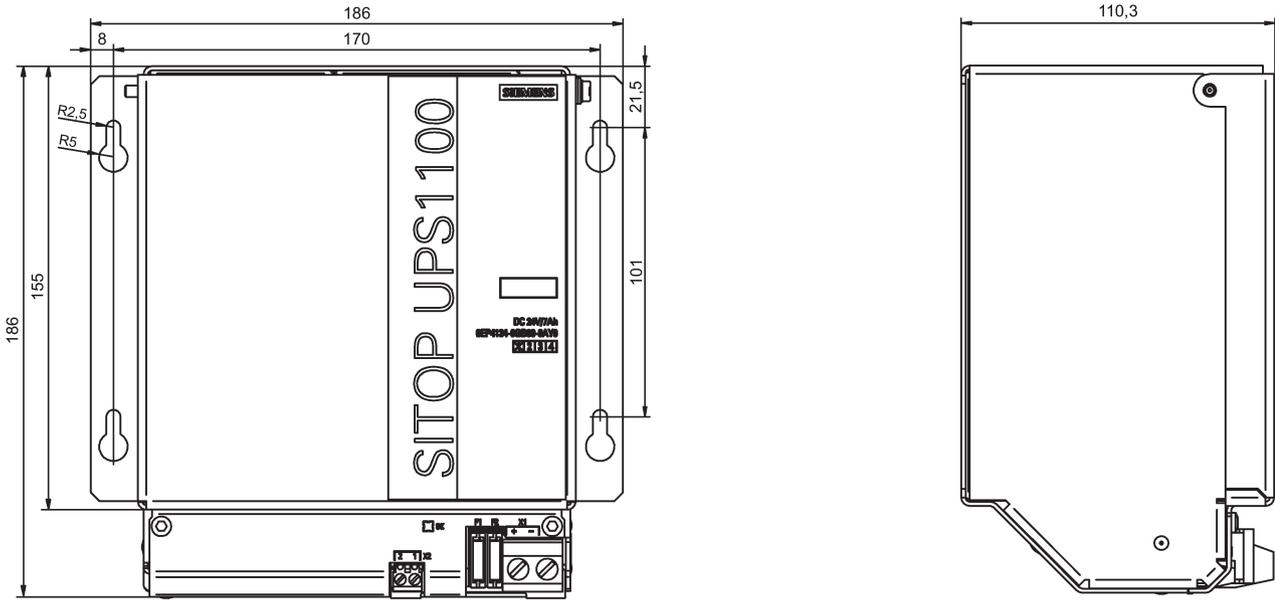
Figure 2-27   6EP4134-0GB00-0AY0 dimensioned drawing
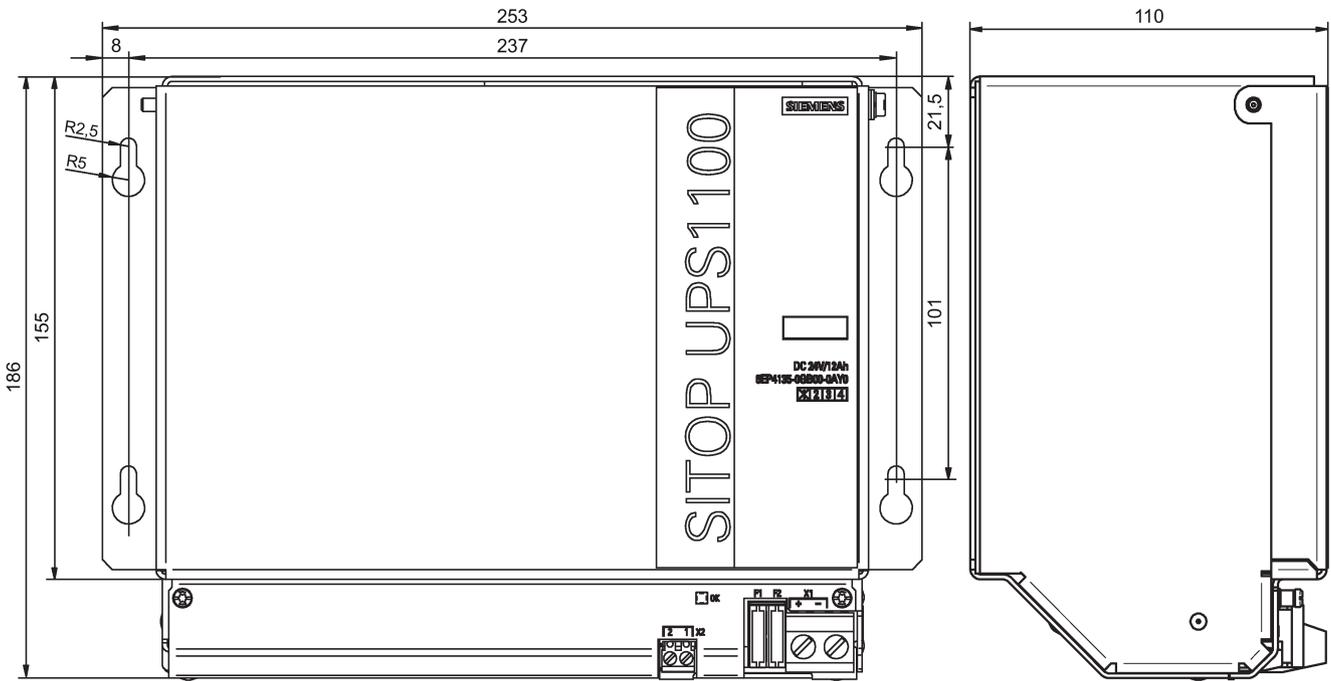
Figure 2-28   Dimension drawing 6EP4135-0GB00-0AY0

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4132-0GB00-0AY0 (2.5 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)
Dimensions (W × H × D) in mm	89 × 130.3 × 106.7	265 × 115 × 76	190 × 169.3 × 78.7
Weight	Approx. 1.9 kg	Approx. 3.7 kg	Approx. 3.8 kg

	6EP4133-0JB00-0AY0 (5 Ah)	6EP4134-0GB00-0AY0 (7 Ah)	6EP4135-0GB00-0AY0 (12 Ah)
Dimensions (W × H × D) in mm	189 × 185.5 × 112.7	186 × 186 × 110.3	253 × 186 × 110
Weight	Approx. 3.4 kg	Approx. 6.1 kg	Approx. 9.8 kg

Engineering and remote access

<div style="text-align: right; font-size: 3em;">3</div>

3.1 General

This section describes the software tools offered by Siemens that are compatible with SITOP UPS1600 . The software tools are introduced with their functions, the associated requirements and the operation. The software products are:

- SIMATIC STEP 7 in the TIA Portal
- SIMATIC STEP 7
- SITOP UPS Manager
- Web server
- OPC UA

Functions of the individual software products

- **SIMATIC STEP 7 in the TIA Portal**
  The SITOP UPS1600 can be used with STEP 7 in the TIA portal from version 12 with service pack 1 (SP1).
  From SW version V2.2, STEP 7 can be used in the TIA Portal from version 13 with service pack 1.
  After SITOP UPS1600 has been saved in the hardware catalog of STEP 7 in the TIA Portal , it can be integrated in the project, parameterized and diagnosed.

- **SIMATIC STEP 7**
  SITOP UPS1600 can be used with SIMATIC STEP 7 from Version 5.4.
  After SITOP UPS1600 has been integrated in the hardware catalog of STEP 7 it can be integrated in projects, parameterized and diagnosed.

- **SITOP UPS Manager**
  Using the SITOP UPS Manager , theSITOP UPS1600 can be parameterized. In addition, the protection of individual computers or computer networks can be determined by shutdown conditions after the failure of the supply voltage.

- **Web server**
  The web server is used to monitor the SITOP UPS1600. It operates independently of the UPS Manager and the PROFINET access.

Note

SIMATIC STEP 7 and the SITOP UPS Manager cannot simultaneously access the SITOP UPS1600.

3.2 Overview of application examples

At our support web site you can find the following application example to parameterize the SITOP UPS1600 uninterruptible power supply:

- "SITOP UPS1600: Graphic blocks and STEP 7 communication blocks" to integrate SITOP UPS1600 into an automation system : (https://support.industry.siemens.com/cs/ww/en/view/78817848)

3.3 SIMATIC STEP 7 in the TIA Portal

3.3.1 Introduction

The uninterruptible power supply SITOP UPS1600 can be used with SIMATIC STEP 7 in the TIA Portal from Version 12 with service pack 1 (SP1). From SW version V2.2, STEP 7 can be used in the TIA Portal from Version 13 with service pack 1.

In SIMATIC STEP 7 in the TIA Portal , the basic device SITOP UPS1600 and its battery modules SITOP UPS1100 can be integrated in projects, parameterized and diagnosed.

Note

If you wish to use SIMATIC STEP 7 V13 in the TIA Portal, then you must install the appropriate Hardware Support Package (HSP) or the appropriate generic station description file (GSD) in order to use the SITOP UPS1600 and the supplementary modules. This step is not required from SIMATIC STEP 7 V14 in the TIA Portal. Using SITOP UPS1600 with HSP is only possible from TIA Version V13; in TIA Version12, only using GSD.

You can find additional information at Installing the Hardware Support Package (HSP) (Page 50) or Installing the generic station description file (GSD) (Page 52).

Note

TIA and SITOP UPS Manager cannot simultaneously access SITOP UPS1600. The service of the SITOP UPS Managers may not run while the system is accessed via TIA.

3.3.2 Installing the Hardware Support Package (HSP)

Note

SIMATIC STEP 7 V13 service pack 1

The following step is only relevant for SIMATIC STEP 7 V13 with service pack 1 in the TIA Portal.

The HSP is available at our SITOP-homepage (http://www.siemens.com/sitop-ups1600) or directly at (https://support.industry.siemens.com/cs/ww/en/view/75854606).

Procedure

To install the Hardware Support Package, proceed as follows:

1. Start STEP 7 in the TIA Portal.

2. In the "Options" menu, click on "Support Packages".
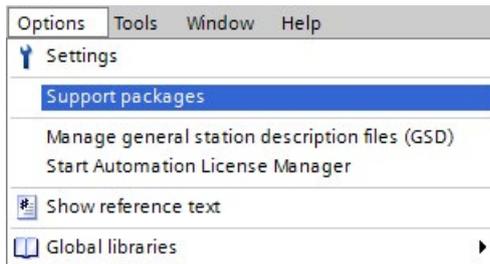
   Dialog "Detailed information" opens.

   All Support Packages from the directory that you specified as storage location for Support Packages in the settings are listed in a table.

3. You have the following possibilities to install the Hardware Support Package:

   – If the Support Package is already present on your computer or on the supplied DVD, you can add it to the list from the "Add from the file system".

   – If you want to add a Support Package from the "Service & Support" page in the Internet, download it with "Load from the Internet".
   You can then add it to the file system.

4. Select the support package that you want to install.

5. Click on "Install", and follow the instructions of the installation program. During the installation you will be prompted to close all TIA Portal instances.

6. Close all TIA Portal instances and click on "Continue".

7. After the Support Package has been installed, the TIA Portal is reinitialized by clicking on "Restart".

   The installed devices are imported into the module catalog and can then be integrated in the project.

   You can find the SITOP UPS1600 in the hardware catalog under "Power Supplies\SITOP UPS\UPS1600".

Note

You can find additional information on installing hardware support packages in the manual of your STEP 7 software.

3.3.3 Installing the generic station description file (GSD)

Note

SIMATIC STEP 7 V13

The following step is only relevant for SIMATIC STEP 7 V13 in the TIA Portal.

 The GSD is available at our SITOP-homepage (http://www.siemens.com/sitop-ups1600) or directly at (https://support.industry.siemens.com/cs/ww/en/view/75854605).

Preconditions

- You know where the GSD file is saved.

Procedure

To install the generic station description file, proceed as follows:

1. Download the GSD file from the Internet.

2. Start SIMATIC STEP 7 V13 in the TIA Portal.

3. In the project view, click in the menu "Options" on "Install general station description file (GSD)" or "Manage general station description file (GSD)".
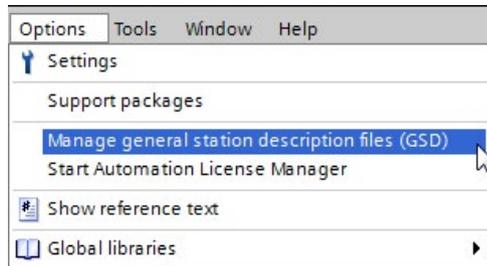
   The "Manage general station description file (GSD)" dialog is opened.

4. Select the source path under which you locally saved the GSD file that you downloaded.

5. Select the GSD file.

6. Click on "Install", and follow the instructions of the installation program.

The installed devices are imported into the module catalog and can then be integrated in the project. You can find the UPS1600 in the hardware catalog at "Other field devices\PROFINET IO\I/O\Siemens AG\UPS1600".

3.3.4 Inserting SITOP UPS1600 into a project

To be able to use the SITOP UPS1600, you must assign it as IO device to an IO controller (SIMATIC S7 control). Further, SITOP UPS1600 can be equipped in the project with one or several SITOP UPS1100 battery modules.

The main views used to configure the SITOP UPS1600 are the Network view and the Device view.

Note

Additional information on the Network view and Device view, as well as the Topology view is available in the manual for your STEP 7 software.

Preconditions

● The hardware support package or the general station description file of the SITOP UPS1600 has been installed.

● STEP 7 in the TIA Portal has been opened, and a project with an IO controller (SIMATIC S7 control) has been created.

Inserting SITOP UPS1600 from the hardware catalog

1. Open the network view.

2. Open the "Hardware catalog" task card.

3. **If you use the SITOP UPS1600 with the hardware support package:**
   In the "Catalog" palette, navigate to SITOP UPS1600 under Power Supplies\SITOP UPS\UPS1600.

4. **If you use the SITOP UPS1600 with the generic station description file:**
   In the "Catalog" palette, navigate to the SITOP UPS1600 under "Other devices\PROFINET IO\I/O\Siemens AG\UPS1600".

5. Select the required SITOP UPS1600 using a mouse click.
   In the "Information" area you can see information about the selected SITOP UPS1600, and if necessary change the preselected version.

6. Drag the SITOP UPS1600 and drop it into the Network view.
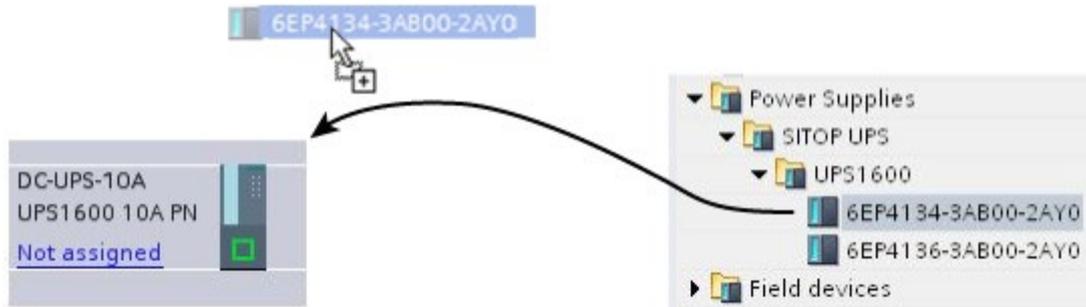
Alternatively, you can add the module to the Network view by double-clicking on the entry in the hardware catalog.

You have now inserted the SITOP UPS1600 into the project. The rectangle displayed in the network view symbolizes the SITOP UPS1600.

3.3.5 Assigning the SITOP UPS1600 to a controller

To be able to use the SITOP UPS1600 you must assign an IO controller as IO device.

1. Click in the network view on the blue lettering "Not assigned" at the left next to the symbol of the SITOP UPS1600.

A menu opens with the available controllers.
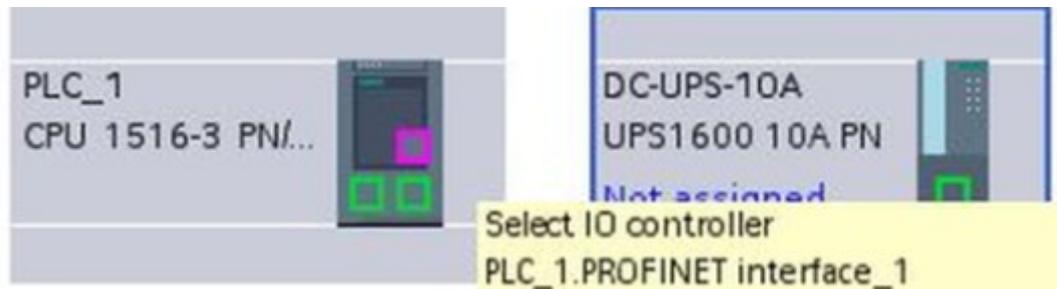
2. Select a controller in the menu.

3. Select the connection between the controller and SITOP UPS1600.
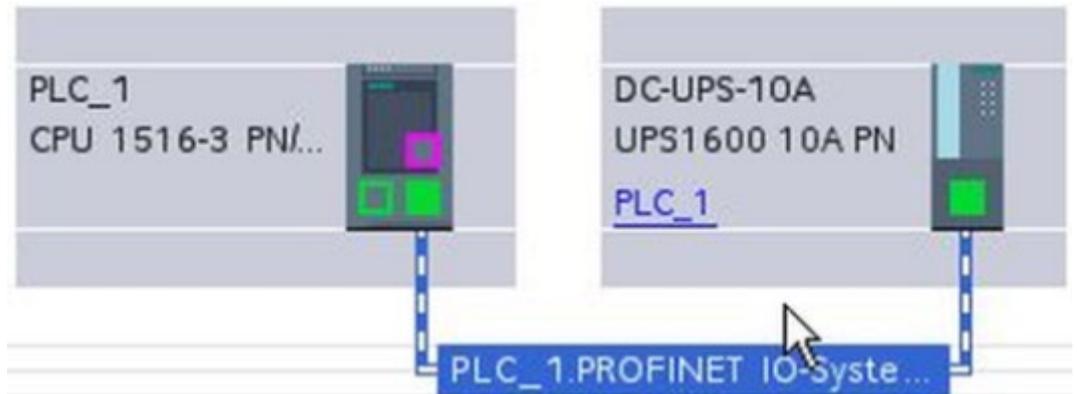
4. Make the required settings in the "Network data".

5. Double-click on SITOP UPS1600 to display it in the device view.

6. Select the PROFINET-interface.

7. Under "Ethernet addresses" in the inspector window enter the IP address of the SITOP UPS1600, which was already assigned in theTIA Portal.

   You have assigned a controller to the SITOP UPS1600.

3.3.6 Assigning a battery module SITOP UPS1100 to the basic device SITOP UPS1600

The basic functions of the uninterruptible power supply are available with all of the battery modules that are compatible with the SITOP UPS1600. The SITOP UPS1100 5 Ah LiFePo battery is first supported by the UPS1600 with SW version V2.1.
Additional functions are available with the SITOP UPS1100 battery module:

● Automatic detection of the battery module rated values

● Automatic management of up to six battery modules

● Temperature-controlled charging

● Battery fast test

● Diagnostics using the SITOP UPS Manager and the web server

Using an example, in the following steps, it is shown how the SITOP UPS1600 is assigned a SITOP UPS1100 battery module.

Note

Only SITOP UPS1100 battery modules of the same type can be inserted into the slots of a SITOP UPS1600.

The number of battery modules that can be configured is limited to six. The description is only applicable to devices that were linked to via the HSP.

Preconditions

- STEP 7 in the TIA Portal has been opened and a project has been created.

- A SITOP UPS1600 has been integrated in the project.

Procedure

The procedure is only applicable for devices integrated via HSP.
For GSD devices, values can be manually specified for a (third-party) battery module; however, it is not necessary to add a battery module to the configuration.

1. In the device view, select the SITOP UPS1600 basic device.

2. In the Hardware catalog , navigate to the SITOP UPS1100 battery module under Power Supplies\SITOP UPS\UPS1100.

3. Select the required battery module in the hardware catalog.
In the "Information" area you can see information about the expansion module, and when necessary you can change the preselected (default) version.

4. Drag the battery module and drop it into the Device view.
Alternatively, the battery module can be added by double-clicking on the entry in the hardware catalog.
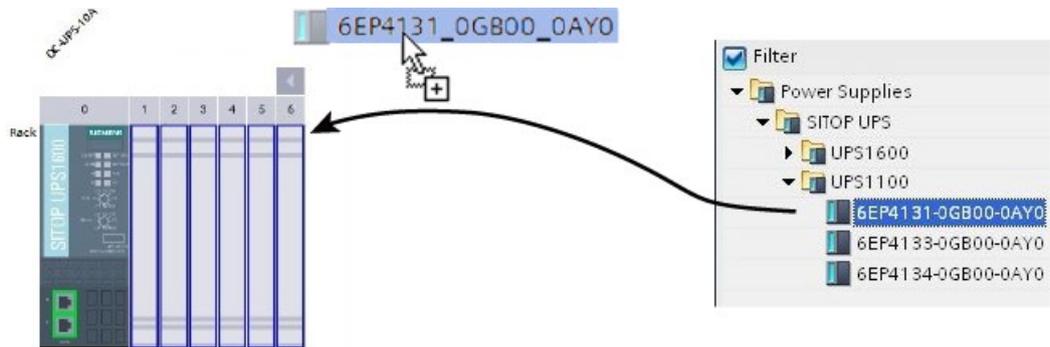
5. Drag the battery module and drop at the first free slot to the right next to the
   SITOP UPS1600.
   The battery module is inserted at the selected slot.
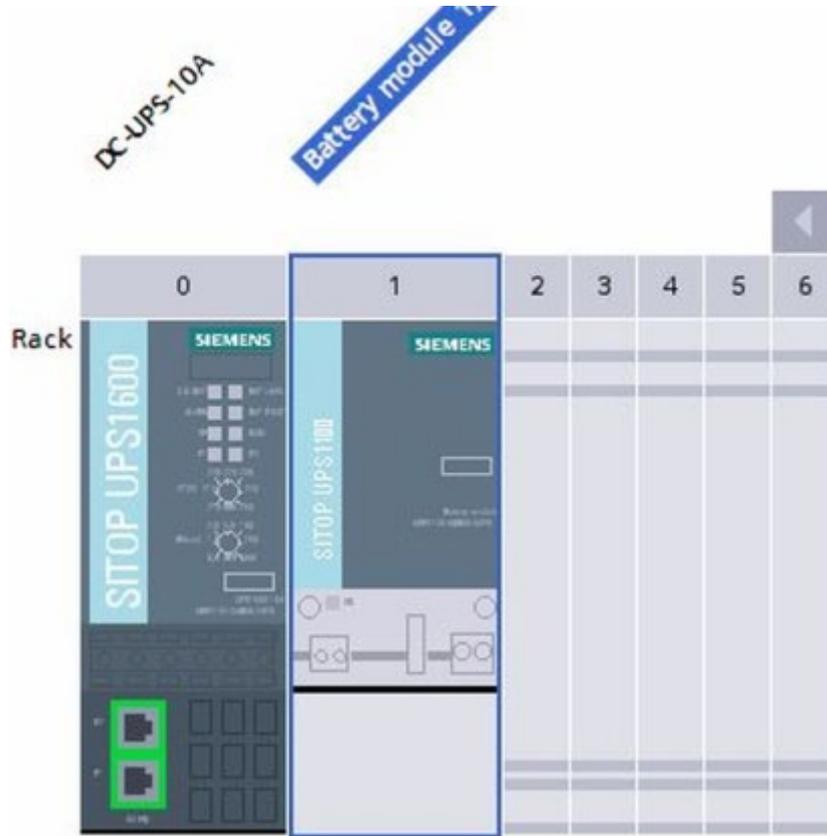
6. Save the hardware configuration.

   You have assigned a battery module to the basic device SITOP UPS1600.

How you change the number and type of SITOP UPS1100 battery modules used is
described under Parameterizing UPS1600 with STEP 7 in the TIA Portal (Page 58).

3.3.7 Parameterizing the UPS1600

The adjustable parameters of the SITOP UPS1600 can be found in STEP 7 in the TIA Portal in the inspector window under Properties when the appropriate device was selected.

For parameterization, in the area navigation, the settings under "Base Unit", "Energy storage" and "Webserver" are relevant.

Navigation area		Description
Profinet security	Profinet security	DCP write protection activated

Navigation area		Description
Base Unit	Buffering	All parameters, which involve the behavior of SITOP UPS1600 when buffering
	Signaling	Setting of the alarm signaling and the wait time for stable input voltage.
Energy storage	–	Parameters for the battery modules used
Web server	General information	Define as to whether the SITOP UPS1600 may be accessed via web server (yes / no)
		Activate web server on this module
		Enable automatic logoff
		Access with HTTPS only.
	Automatic update	Activate automatic update / Activation interval

Navigation area		Description
OPC UA server	OPC UA server activated	Here, activate the OPC UA server.
	Unencrypted access activated	You have the option of activating unencrypted access to the OPC UA server. However, this option is not recommended.
	OPC UA server port	Specify which port should be used.

Navigation area		Description
NTP client	NTP client activated	Here, activate the NTP client.
	NTP server address 1 … 4	Enter up to 4 addresses for an NTP server.

A detailed description of the individual parameters of the subgroups is contained in the associated section under Parameterizing the UPS in STEP 7 in the TIA Portal (Page 58).

The procedure is the same for all parameters. This section describes the general procedure to reach the configuration dialog, using as example the parameters for buffering. The individual parameters and their possible values are described in the following subsections.

Each parameter has a start value. A click on "Reset to initial values" resets all parameters of a subgroup to the associated start value.

Preconditions

- The SITOP UPS1600 was integrated in the opened project.

Proceed as follows

1. Select the SITOP UPS1600 in the Device view.

2. In the inspector window select "Properties > General > Device configuration".

   Entries for parameterization are provided in the navigation area.
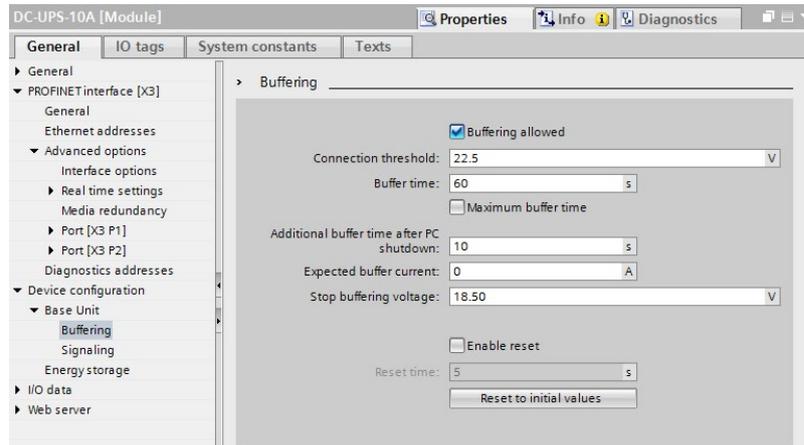
"Buffering" parameters

Parameter	Value range	Initial value
Buffering allowed	Yes / No	Yes
Connection threshold	21 - 25 V	22.5 V
Buffer time	1 - 32767 s	600 s
Maximum buffer time [1]	Yes / No	No
Additional buffer time after PC shutdown. [3]	1 - 300 s	60 s
Expected buffer current [1]	0 - 40 A	0 A
Stop buffering voltage	18 - 23 V	18.5 V
Enable reset	Yes / No	No
Reset time	1 - 120 s	5 s
Battery test interval [2]	1 - 65535 h	4 h

[1]   Parameter only available from SW version V2.0 and higher

[2]   Parameter only available from SW version V2.1 and higher

[3]   valid from V2.0.4 or V2.1

- **Buffering permitted**
  When the connection threshold is fallen below, selects whether the system is buffered or the output is shut down.

- **Switch-in threshold**
  Setting the switch-in threshold.

- **Buffer time**
  Length of time during which the system should be buffered by the SITOP UPS1600.

- **Maximum buffer time**

  The setting means that buffering is realized for as long as possible. The device only shuts down when the battery has discharged down to the defined stop buffering voltage. The value entered for the "Buffer time" parameter is not relevant in this case.

- **Additional buffer time after PC shutdown**
  Time during which the system should be buffered by the SITOP UPS1600 after the PC was shut down.

- **Expected buffer current**

  Load current, which is expected at the device output during buffer operation. Please adjust the correct application load current required. For current settings between 0 A and rated current, the display in the diagram "Remaining buffer time" is adapted.

  If a value of 0 A is entered, then for this parameter, the average value of the actual load current measured at the output over the last 10 min is assumed. The value of this parameter is used when calculating the remaining buffer time. The entered value may not exceed the rated device current.

  Note

  From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- **Stop buffering voltage**
  The voltage at which battery discharge is terminated. The stop buffering voltage defined for this type is always used for a coded battery (UPS1100).

- **Enable reset**
  If the value is set to "Yes" then the output voltage is interrupted after the selected buffer time expires if, in the meantime, the input voltage returns. This option is useful, when, for example, computer networks are protected by the UPS that can be activated by a reset when the power supply is restored. For buffer time "MAX", the output voltage is not interrupted.

- **Reset time**
  Here, you define the interrupt duration.

- **Battery test interval**

  The time interval between battery tests can be set using the parameter.

"Signaling" parameter

Parameter	Value range	Default setting
Downtime alarm	0 - 20,000 ms	100 ms
Wait time for stable input voltage	0.2 - 65 s	1.0 s

- **Downtime alarm**
  The time in which no alarm is issued to the system although it is buffered.

- **Wait time for a stable input voltage**
  Time where the input voltage must continually lie above the connection threshold so that buffering is exited and a transition is made into normal operation.

"Energy storage" parameter

The "energy storage" has two different areas that depend on the battery type being used. First select whether you are using a SITOP UPS1100 battery module or some other energy storage device.

Possible parameters when using a SITOP UPS1100 battery module

Parameter	Value range
Module	Drop-down menu with the SITOP UPS1100 battery modules saved by the HSP
Number of modules	0 - 6
Total capacity	0 - 72 Ah

- **Module**
  Type of SITOP UPS1100 battery module.

- **Number of modules**
  Number of installed modules.

- **Total capacity**
  Total capacity of the installed battery modules.

Possible parameters for the deployment of a different battery module

Parameter	Value range	Default setting
Total capacity	0.1 - 3,200 Ah	10 Ah
End-of-charge voltage	24 - 30 V	27.3 V
Charge current	0.001 - 3 or 4 or 5 A	0.3 A
Faulty battery voltage	1 - 18 V	6 V

- **Total capacity**
  Total capacity of the installed batteries.

- **End of charge voltage**
  Maximum voltage up to which the battery may be charged.

- **Charge current**
  The battery is not charged with more than the selected charge current. The manufacturer's details for the permitted battery charge current must be observed. Further, the following, device-dependent values apply:

  – SITOP UPS1600 10 A: Maximum permissible charge current 3,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 2,000 mA

  – SITOP UPS1600 20 A: Maximum permissible charge current 4,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

  – SITOP UPS1600 40 A: Maximum permissible charge current 5,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

  Faulty battery voltage
  If the battery voltage undershoots this value, it is considered as being faulty by the SITOP UPS1600 and is not charged.

"Web server" parameters

Parameter	Value range	Default setting
Activate web server on this module	Yes / No	Yes (up to V2.0) No (from V2.1)
Permit access only with HTTPS	Yes / No	Yes
Log off automatically after 15 minutes	Yes / No	No
Update interval	0 / 5 s / 10 s / 20 s / 30 s / 60 s	30 s
Enable automatic update	Yes / No	No

Set here whether access to the UPS via web server is permitted.

- **Activate web server on this module**
  Define whether this device can be accessed via the web server.

- **Permit access only with HTTPS**
  Define whether access is only permissible via HTTPS.

- **Log off automatically after 15 minutes**
  You define whether a user should be automatically logged off after closing the web server.

- **Update interval**
  You define in which intervals the actual values are sent to the web server.

- **Enable automatic update**

  When you enable "Automatic update" then the actual values of the SITOP UPS1600 and connected supplementary modules are sent to the web server.

3.3.8 Loading the configuration (commissioning)

In the delivered state, the SITOP UPS1600 has not yet been assigned an IP address and the DHCP protocol is deactivated.

When the SITOP UPS1600 is first connected with a controller (SIMATIC S7- control system), it must be assigned a device name and an IP address by the controller. A new configuration can be loaded to the device using STEP 7 in the TIA Portal .

Identifying a SITOP UPS1600 in the network

From the STEP 7 in the TIA Portal , you can get the LED "SF" at the SITOP UPS1600 to flash. This means that you can clearly identify a module in the network, e.g. if several SITOP UPS1600 are installed in the network.

Preconditions

- The SITOP UPS1600 has been correctly connected and linked with the network.
- PG/PC with STEP 7 in the TIA Portal is connected with the network.

Proceed as follows

1. Open the "Online > Accessible nodes" menu.
2. As type of PG/PC interface, select "PN/IE".
3. Select the PG/PC interface connected with the system.
4. Select the connection with the subnet, in which the SITOP UPS1600 is located.
   All of the available SITOP UPS1600 devices in the selected subnet are displayed.
5. Select the required SITOP UPS1600.
6. Activate the "Flash LED" checkbox.

7. Check at which SITOP UPS1600 in the network the "SF" LED flashes.

By checking the flashing LEDs, you can uniquely identify all SITOP UPS1600 in a network. Note the device name and the IP address of the required SITOP UPS1600 in order to load a configuration.

Changing the device name of the SITOP UPS1600

1. In STEP 7 , in the tabular area of the Network view, select the "Network overview" table.
2. Overwrite the name in the "Device" column in the row of the PROFINET device involved.

You have changed the name of the SITOP UPS1600 device.

The name is adapted in the graphical area of the network view.

Changing the PROFINET device name of the SITOP UPS1600 via the properties of the PROFINET interface

You can change the PROFINET device name using the properties of the PROFINET interface.

1. In the Network or Device view of the Hardware and Network editor of STEP 7, select the PROFINET interface of a PROFINET device.

2. In the Inspector window navigate to "Ethernet addresses" in the "PROFINET" area.

3. Deactivate the "Generate automatically the PROFINET device name" checkbox.

4. Enter the new PROFINET device name in the appropriate field.
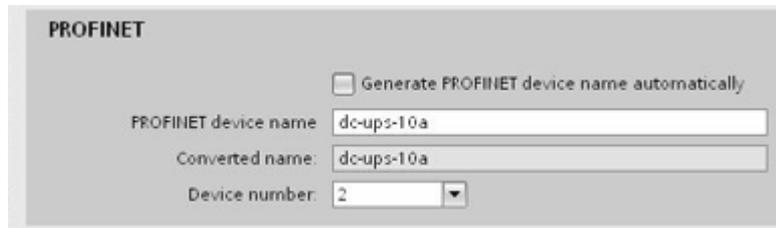
Changing the IP address of a SITOP UPS1600

1. In the Network or Device view of the hardware and network editor from STEP 7 in the TIA Portal , select the PROFINET interface of a PROFINET device.

2. In the Inspector window, navigate to "Ethernet addresses" in the "IP protocol" area.

3. Check whether the "Set IP address in the project" option is activated.

4. Enter the new IP address in the appropriate field.

Loading the configuration to the SITOP UPS1600

To commission the UPS, you must load the project data that you created offline into the connected SITOP UPS1600. This project data results from the configuration of the hardware, networks and connections in STEP 7.
Initially, the complete project data is loaded. Only the changes are loaded for subsequent load actions.

Preconditions

● The project data is consistent.

● The device name must be identical offline and online.

● The SITOP UPS1600 is accessible online.

● The SITOP UPS1600 is located in the PROFINET IO system of an IO controller.

● The PG/PC is connected to the same network to which the SITOP UPS1600 and the controller are connected. The interface of the PG/PC must be set to TCP/IP.

Note

Ensure that the article number of the SITOP UPS1600 configured offline matches the article number of the device connected online. The following response is obtained after loading the configuration into the device:

Offline configured device / Online connected device	UPS1600 10 A	UPS1600 20 A	UPS1600 40 A
UPS1600 10 A	Device status: OK Diagnostics status: OK	Device status: Fault Diagnostics status: Differences were identified (not accepted)	Device status: Fault Diagnostics status: Differences were identified (not accepted)
UPS1600 20 A	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: OK	Device status: Fault Diagnostics status: Differences were identified (not accepted)
UPS1600 40 A	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: OK

Figure 3-1   Online / offline

Procedure

1. In the "Project tree", right-click on the SITOP UPS1600 controller.
   The shortcut menu opens.
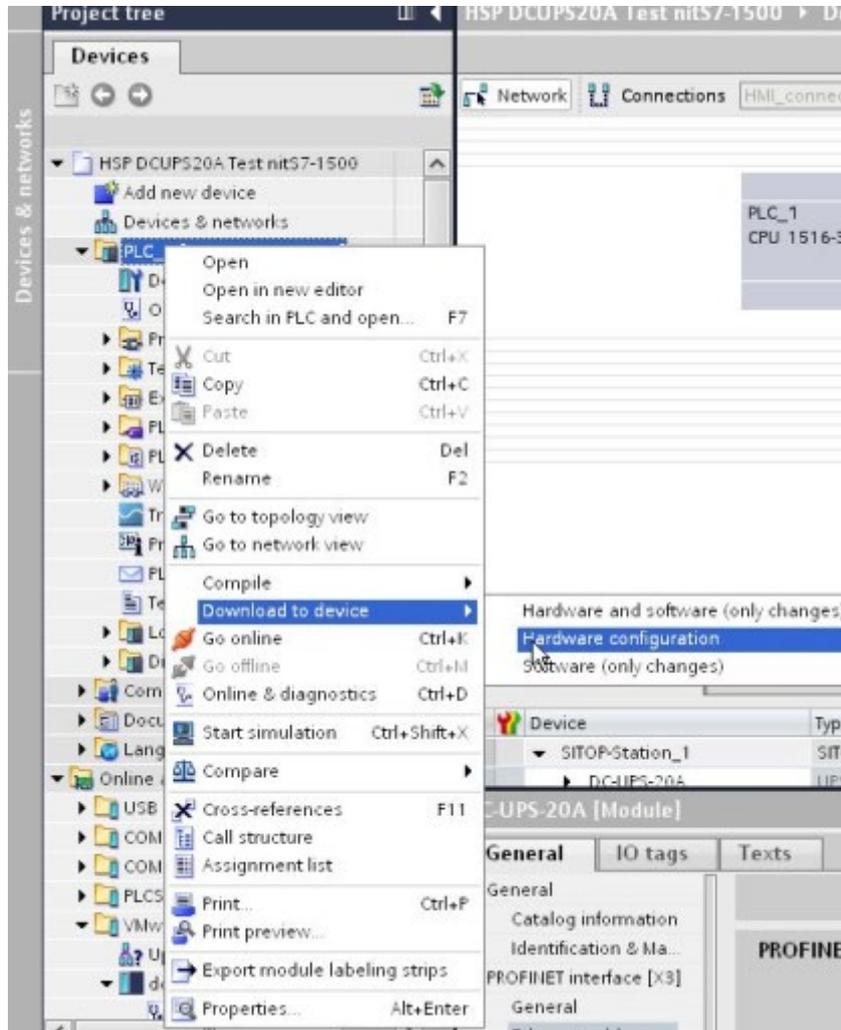
2. In the shortcut menu, in submenu "Download to device", select option "Hardware configuration".

   The project data are compiled. The "Load" button is activated as soon as loading is possible.

3. Click on "Load".

   Data is loaded. The "Result of the load operation" dialog window is then opened. In this dialog, you can check whether the load task was successful and select any further actions.

4. Click on the "Finish" button.

Result

The set parameters have been loaded to the SITOP UPS1600 via the controller.

3.3.9   Diagnostics

The following data can be retrieved using the online and diagnostics function:

Navigation area		Value
General	Module	Short designation
		Article number
		Hardware
		Firmware
	Module information	Device name
		Module name
		Plant designation
		Location ID
	Manufacturer information	Description of manufacturer
		Serial number
		Copyright entry
		Profile
		Profile details
PROFINET interface	Ethernet address / network connection	MAC address
	Ethernet address / IP parameter	IP address
		Subnet mask
		Default router
		IP settings
		IP setting time
	Ports	List of ports
Functions	Assign an IP address	MAC address
		IP address
		Subnet mask
		Router address
	Firmware update / UPS1600	Article number
		Firmware
		Name
		Rack
		Slot
		Firmware file
		Firmware version
		Suitable for modules with
		Status
		Activate firmware after update
	Assign name	PROFINET device name
		Type
	Reset to factory settings	MAC address
	IP address	

Navigation area		Value
	PROFINET device name	

Retrieve the online and diagnostics data of SITOP UPS1600

Proceed as follows to start the online and diagnostics view of the particular module:

Project tree:

1. Open the device folder of the SITOP UPS1600 in the Project tree. This is located (after the assignment to the control system) in the folder of the control system under "Distributed I/O " > [name of the PROFINET connection].

2. Double-click on "Online & diagnostics".

   Alternatively:

3. Select the device folder of the SITOP UPS1600 in the Project tree.

4. In the shortcut menu or in the "Online" main menu, select the "Online & diagnostics" .

Device view:

1. Open the device view of the device configuration.

2. Select the SITOP UPS1600.

3. In the shortcut menu or in the "Online" main menu, select the "Online & diagnostics" .

Network view:

1. Open the network view of the device configuration.

2. Select the SITOP UPS1600.

3. In the shortcut menu or in the "Online" main menu, select the "Online & diagnostics" .

4. Click on "Connect online".

   The information is displayed under "Diagnostics / General".

3.3.10 Firmware update

> ⚠ **WARNING**
>
> **The SITOP UPS1600 is reset while updating the firmware. For safety reasons, the output is switched off.**
>
> Ensure that no damage is caused to the plant or system.
>
> Ensure that the PG/PC and/or all switches, routers and gateways that are used have an independent power supply during the firmware update.

> ⚠ **WARNING**
>
> **Firmware update with UPS-Manager**
>
> If for the firmware update, the UPS Manager is used, please note that for a firmware update from version V2.1 to V2.2 or higher, then a UPS Manager with version V4.72 or higher must be used. This also applies to firmware updates from V2.2.0 to higher versions.

Note

Install the current version of the SITOP UPS Managers, before you start the firmware update. It is possible that an older version (less than V4.5X) of the SITOP UPS Managers does not support this firmware update. The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.com/sitop) or directly (https://support.industry.siemens.com/cs/ww/en/view/75854607).

Note

Do not switch-off the devices during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/en/79207181). Different firmware updates are offered depending on the amp rating of the SITOP UPS1600.

Note

Observe the compatibility of the firmware!

Other firmware updates are not compatible.

Determine the amp rating of your SITOP UPS1600 and download the appropriate firmware update.

Note

It is not possible to downgrade the device firmware to a release with a version number lower than the firmware installed in the device itself. Information on how to read out the firmware release from the device is provided in Section Diagnostics (Page 67).

Note

"Reset to Factory" function:

All configuration parameters are reset to the default setting; 0.0.0.0 is used for the IP address. A new IP address must then be assigned, as otherwise there is no connection to the UPS Manager or TIA Portal.

Preconditions

- The SITOP UPS1600 has been correctly connected and linked with the system.
- PG/PC with STEP 7 in the TIA Portal is connected with the system.
- Online connection is established.

Procedure

The firmware update consists of several files, which are combined in a zip file.

1. Download the firmware update.
2. Unpack the ZIP file into a temporary directory.
3. In the network view, select the components whose firmware is to be updated.
4. Change to the device view.
5. Click on "Go online".
6. In the shortcut menu of the SITOP UPS1600, select "Online & Diagnostics".
   The "Online access" menu opens.
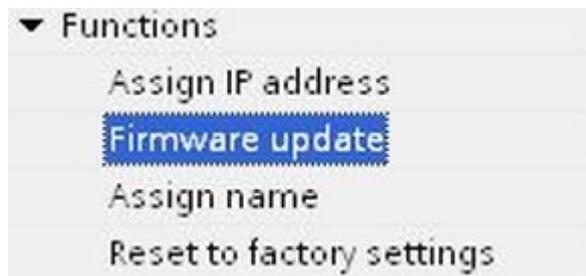
7. In the "Functions" folder, select the "Firmware update" group.
8. Click on the "Browse" button in the "Firmware loader" area to select the path to the directory with the unzipped files.
9. Select the appropriate file "*.upd". All SITOP UPS1600 are displayed in the table, for which an update is possible with the selected firmware file.
10. Click on the "Start update" button. If the selected file can be interpreted by the module, it will be loaded into the module. For version V2.1 - depending on the UPS1600 type - the firmware file is called "ups20a.upd", for example. If this requires changing the operating state of the CPU, you will be prompted to do this with dialogs.
11. Confirm the notes that are displayed.
   The firmware is sent from the controller to the component . While sending, LED 4 ("SF") and LED 6 ("RUN") flash at the SITOP UPS1600.

12. Confirm the message from the TIA Portal that the data was successfully sent by pressing "OK".
    The firmware is saved in the internal component memory. The following LEDs flash while saving:

    – LED 1 ("OK/Bat")

    – LED 2 (">85%")

    Note

    It can take several minutes to save the firmware in the component. Do not switch-off the devices.

    ---

13. The device is automatically restarted after the LEDs no longer flash.

    Note

    During the firmware update, if the power supply of the SITOP UPS1600, or PG/PC or intermediate switches, routers or gateways is interrupted, then under certain circumstances, a fallback firmware is activated. If the SITOP UPS1600 can then no longer be accessed remotely, you must assign the a new IP address, or under the menu item "Assign name" you must enter a new name in the field "PROFINET device names" (see the manual for the particular unit).

    ---

14. The firmware has been updated. Only now is it permissible to switch off the SITOP UPS1600.

Note

After updating the firmware, in the hardware configuration of your project, you must replace the SITOP UPS1600 involved by SITOP UPS1600 with the current firmware version. The configured configuration then matches the actual configuration again.

Note

For GSD, the SITOP UPS1600 must be deleted, and newly integrated; this means that parameters, addresses and names must be newly set - and it is also possible that a new GSD file must first be installed.

3.3.11   Restore factory settings

A reset to the factory settings deletes all configurations of the PROFINET interface saved in the SITOP UPS1600 and restores the factory settings. This affects, for example:

- IP address

- Device name

The parameter values for SITOP UPS1600 and the energy storage device are kept.

Proceed as follows to reset the SITOP UPS1600 factory settings:

1. Select SITOP UPS1600 in the Network view and change to the Device view.

2. Click on "Go online".

3. In the SITOP UPS1600 shortcut menu, select "Online & diagnostics".

4. In the "Functions" folder, select the "Reset to factory settings" group.

```
▶ Diagnostics
▼ Functions
      Assign IP address
   ▶ Firmware update
      Assign name
      Reset to factory settings
```
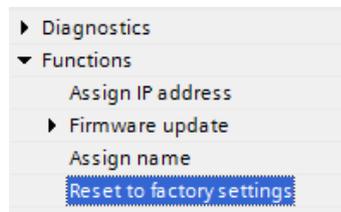
5. Click on the "Reset" button.

6. Respond to the confirmation prompt with "OK".

3.4 SIMATIC STEP 7

3.4.1 Introduction

The uninterruptible power supply SITOP UPS1600 can be used with SIMATIC STEP 7 from Version 5.4 and higher.

In SIMATIC STEP 7 , the basic device SITOP UPS1600 and its SITOP UPS1100 battery modules can be integrated in the project, parameterized and diagnosed.

Note

SIMATIC STEP 7 and the SITOP UPS Manager cannot simultaneously access the SITOP UPS1600. It is not permissible that the SITOP UPS Manager service runs while the system is being accessed via SIMATIC STEP 7.

3.4.2 Installing the generic station description file (GSD)

To use the SITOP UPS1600 and the SITOP UPS1100 battery modules in SIMATIC STEP 7, you must install the corresponding generic station description file (GSD). The GSD file is available at our SITOP-homepage (http://www.siemens.com/sitop-ups1600) or directly at (https://support.industry.siemens.com/cs/ww/en/view/75854605).

Preconditions

- SIMATIC STEP 7 has been opened and a project has been created.

- At least one station has been added.

- You know where the GSD data have been saved.

Procedure

1. Download the GSD file from the Internet.

2. Close all stations in HW Config.

3. Click on "Browse ...", and select the folder in which the GSD file is located.

4. Select the GSD file and click on "Install".

Note

If the file was not able to be installed, or if errors occurred during installation, then SIMATIC STEP 7 creates a report file. You can open this log file by clicking on the "Display log" button.

---

5. In the "Options" menu, click on "Update Catalog".

The installed devices are imported into the module catalog and can then be integrated in the project. You can find SITOP UPS1600 in the hardware catalog under "PROFINET IO\I/O\UPS1600".

3.4.3 Inserting SITOP UPS1600 into a project

To be able to use the SITOP UPS1600 it must be assigned as IO device to an IO controller (SIMATIC S7 control) .

Preconditions

- The GSD file of the SITOP UPS1600 has been correctly installed.
- SIMATIC STEP 7 has been opened, and a project with an IO controller (SIMATIC S7 control) has been created.

Creating a subnet

1. Open the Hardware view "HW Config".

2. Call the shortcut menu of line "PN-IO"

3. Select "Insert PROFINET IO system".
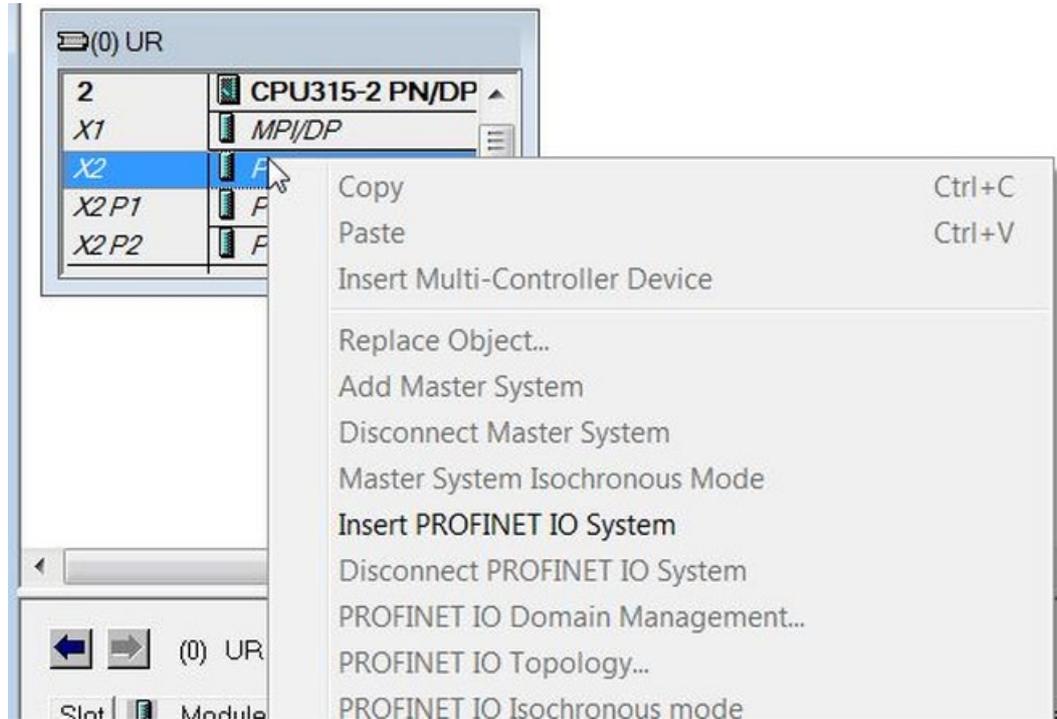
4. In dialog field "Properties - Ethernet interface PN-IO", select the "Parameters" tab.

5. Set the IP address of the PROFINET interface.

6. Create a new subnet.
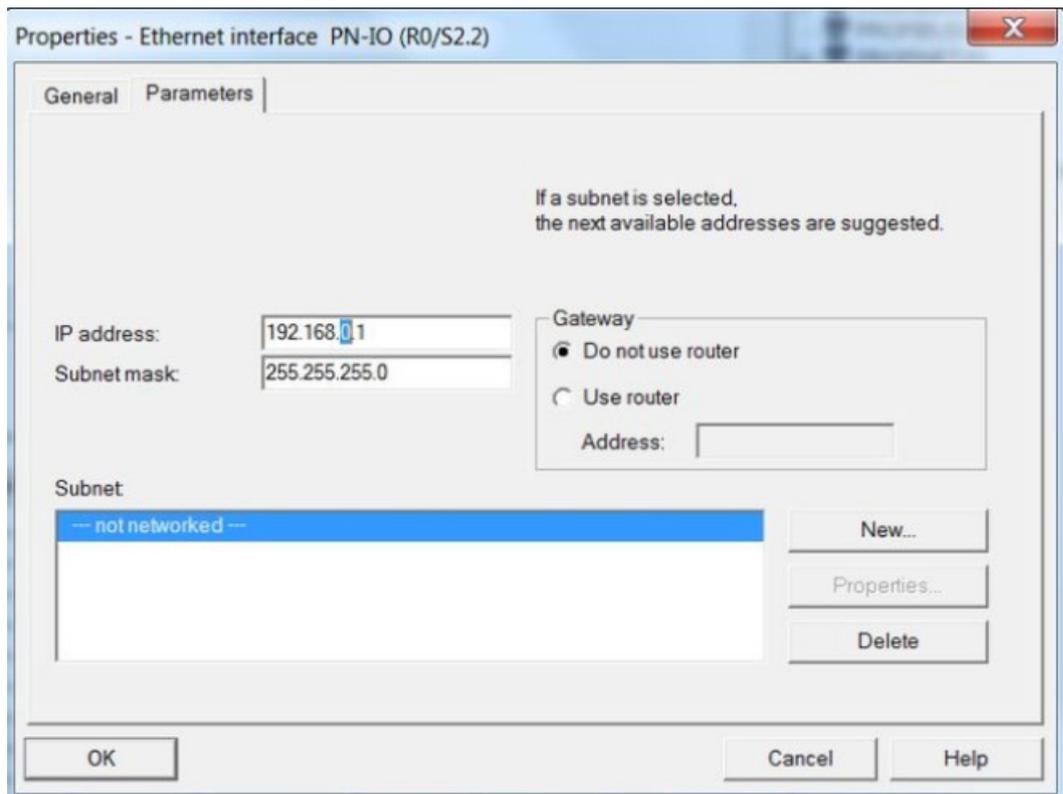
7. Confirm the properties of the new subnet.

8. Close the "Properties - Ethernet interface PN-IO" dialog box.

   The subnet is displayed as a horizontal line in the hardware view.
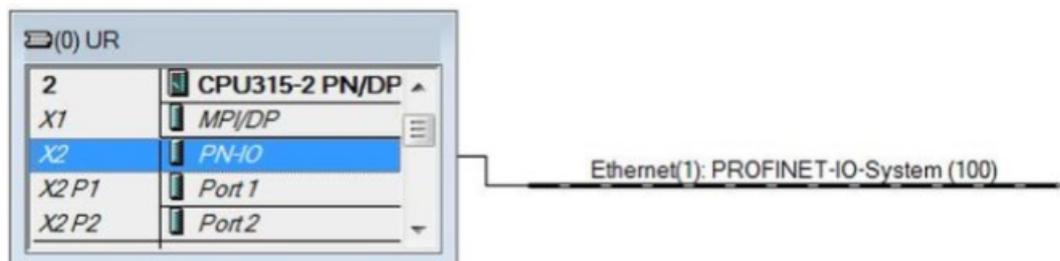
Inserting SITOP UPS1600 from the hardware catalog

1. Select the subnet.

2. Open the "Catalog" window using the "View > Catalog" menu command.

3. In the hardware catalog, navigate to the SITOP UPS1600 under "PROFINET IO \ I/O \ UPS1600".
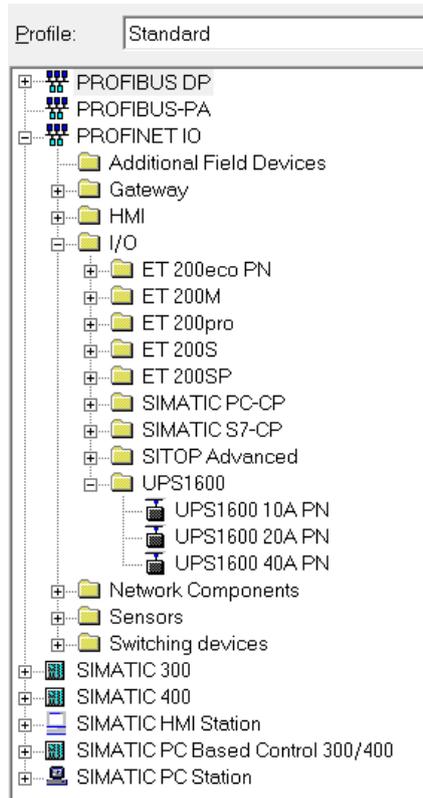
4. Click the desired SITOP UPS1600; keep the left mouse button pressed and drag the SITOP UPS1600 to the subnet.

5. Double-click on "SITOP UPS1600".

6. In the open dialog Device name, enter the device number and IP address in the Ethernet.

7. Save the hardware configuration.

You have now inserted the SITOP UPS1600 into the project. The rectangle displayed in the editor symbolizes the SITOP UPS1600.
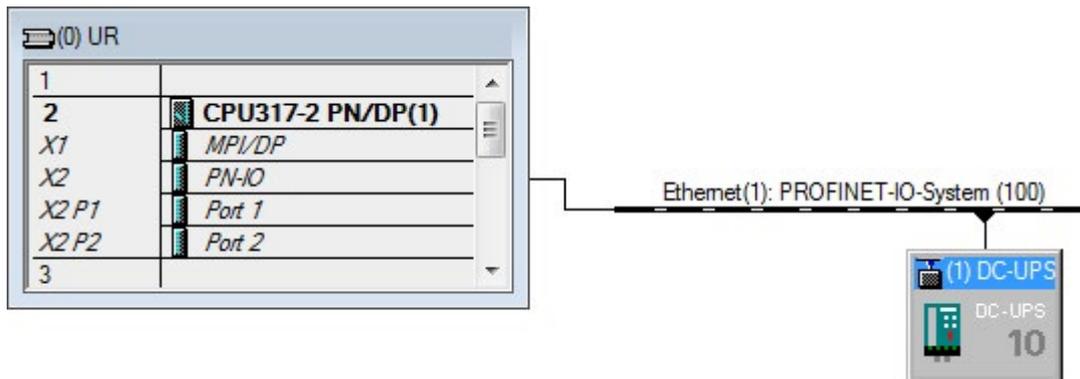
3.4.4 Parameter assignment

3.4.4.1 Parameters of the basic device and battery module

The adjustable parameters of the basic device SITOP UPS1600 and the SITOP UPS1100 battery modules are structured according to subgroups in SIMATIC STEP 7. These subgroups are shown in the table below.

Subgroup	Description
Buffer parameters	All parameters, which involve the behavior of SITOP UPS1600 when buffering.
Battery parameters	Parameterizing the battery being used.
Charging parameters	Parameters for the charging behavior: • End-of-charge voltage • Charge current
Reset parameters	Activate interruption of the output voltage for supply system restoration.
Buffering parameters	Load current that is expected at the device output during buffer operation.
Maintenance	R test - the battery state is determined by subjecting it to a load.
Identification	Definition of the location and contact data to be able to identify the SITOP UPS1600.
Web server	Definition as to whether the SITOP UPS1600 may be accessed via web server (yes / no).

A detailed description of the individual parameters of the subgroups is contained in the associated section under Parameterizing SITOP UPS1600 (Page 77).

3.4.4.2 Parameterizing SITOP UPS1600

The procedure is the same for all parameters. This section describes the general procedure to reach the configuration dialog. The individual parameters and their possible values are described in the following subsections.

Each parameter has a start value. A click on "Reset to initial values" resets all parameters of a subgroup to the associated start value.

Preconditions

● The SITOP UPS1600 has been integrated in the opened project and networked.

Proceed as follows

1. Open Network view "NetPro" ("Tools > Configure network").
The controller and the networked SITOP UPS1600 are displayed.

2. In the Network view click on SITOP UPS1600. The hardware configuration opens.

3. Double click in the hardware configuration on the SITOP UPS1600 entry in the station window for slot 0.1.

4. In the configuration dialog click on the "Parameters" tab.

5. Click the desired subgroup.
   The subgroup opens.
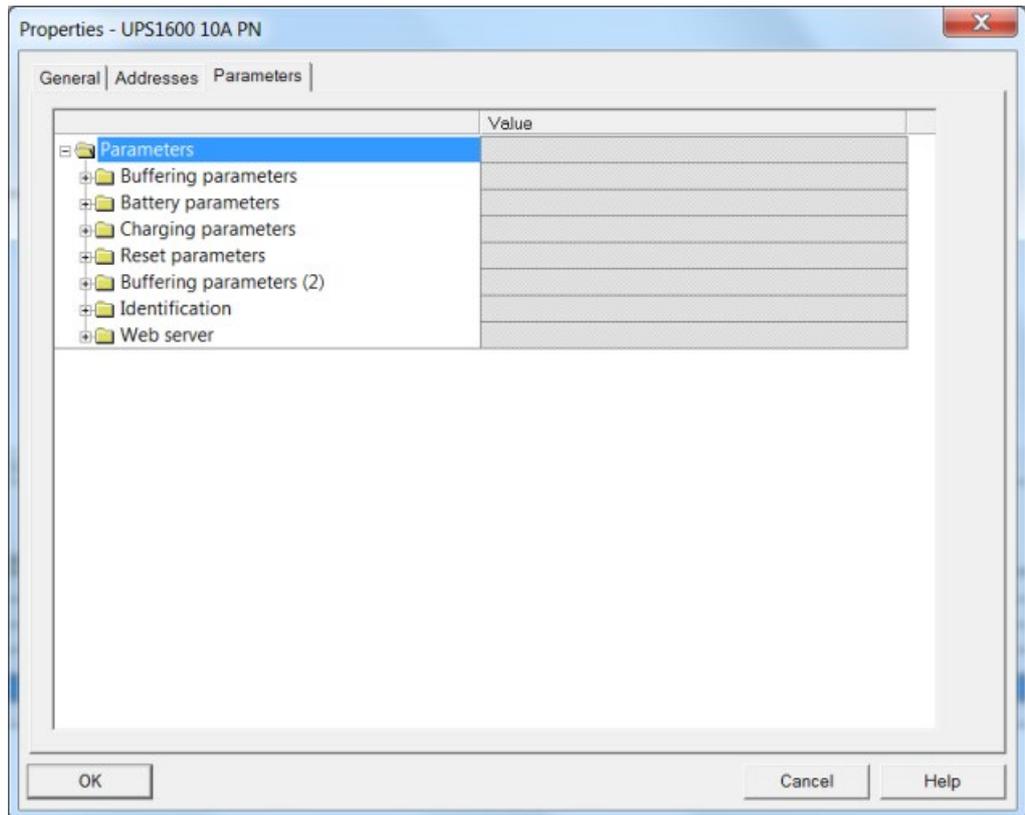
6. Enter the values.

7. Confirm your entry by clicking on "OK".

   The parameters are stored in the project.

Buffer parameters

Parameter	Value range	Default setting
Buffer time	1 … 32767 s	600 s
Additional buffer time after the PC was powered down[1]	1 … 300 s	60 s
Connection threshold	21 … 25 V	22.5 V
Stop buffering voltage	18 ... 23 V	18.5 V
Wait time for stable input voltage	200 … 65,000 ms	1000 ms
Downtime alarm	0 … 20.000 ms	125 ms
Buffering allowed	Yes / No	Yes
Enable reset after buffering	Yes / No	No

[1]   valid from V2.0.4 or V2.1

- **Buffer time**
  Time where the system is to be buffered by SITOP UPS1600. The "Buffering allowed" parameter is used to specify whether buffering should be performed. If a value of 32767 is entered, then the SITOP UPS1600 interprets this as MAX, and only shuts down the buffering when the stop buffering voltage is reached.

- **Additional backup time after the PC has been shutdown**
  The time to be buffered by the SITOP UPS1600 once the PC has been shut down.

- **Connection threshold**
  If the connection threshold value is fallen below, the SITOP UPS1600 starts buffering. If the value of the connection threshold is subsequently exceeded again, then the SITOP UPS1600 stops buffering.

- **Stop buffering voltage**
  The voltage at which battery discharge is terminated.

- **Wait time for a stable input voltage**
  Time where the input voltage must continually lie above the connection threshold so that buffering is exited and a transition is made into normal operation.

- **Downtime alarm**
  The time in which no alarm is issued to the system although it is buffered.

- **Buffering allowed**
  Select between buffers with the specified values or passive measurement of the power supply by the SITOP UPS1600.

- **Activate reset after buffering**
  If the value is set to "yes", then, in the meantime, if the input voltage returns after the buffer time has expired, the SITOP UPS1600 shuts down the output for the selected interrupt time.

Battery parameters

Parameter	Value range	Default setting
Faulty battery voltage	1 … 18 V	6 V
Battery capacity	0.1 … 3,200 Ah	10 Ah:
Ignore data of coded battery	Yes / No	No

- **Battery defective voltage**
  If the battery voltage undershoots this value, it is considered as being defective by the SITOP UPS1600 and is not charged.

- **Battery capacity**
  If no UPS1100 battery modules are being used: Enter the total capacity of the installed batteries.

- **Ignore data of coded battery**
  Set the value to "Yes" if you define the parameters for the UPS1100 yourself.

Charging parameters

Parameter	Value range	Default setting
End-of-charge voltage	24 … 30 V	26 V
Charge current	1 … 4,000 mA	800 mA

- **End-of-charge voltage**

  The end-of-charge voltage is the maximum voltage up to which the battery is charged.

- **Charge current**
  The battery is not charged with more than the selected charge current. The manufacturer's details for the permitted charge current of the battery must be observed.

Note

When UPS1100 battery modules are used, both parameters are automatically set, and do not have to be defined.

The following, device-dependent maximum values apply:

- SITOP UPS1600 10 A: Maximum permissible charge current 3,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 2,000 mA

- SITOP UPS1600 20 A: Maximum permissible charge current 4,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

- SITOP UPS1600 40 A: Maximum permissible charge current 5,000 mA
  Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

Reset parameters

Parameter	Value range	Default setting
Reset time	1 … 120 s	5 s

Here, you define the interrupt duration for the "Interrupt output voltage" function (reset after buffering)

Buffering parameters (2)

Parameter	Value range	Default setting
Expected buffer current	0 ... 40 A	0 A

Load current, which is expected at the device output during buffer operation. Please adjust the correct application load current required. For current settings between 0 A and rated current, the display in the diagram "Remaining buffer time" is adapted.

If a value of 0 A is entered, then for this parameter, the average value of the actual load current measured at the output over the last 10 min is assumed. The value of this parameter is used when calculating the remaining buffer time. The entered value may not exceed the rated device current.

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

Maintenance

Parameter	Value range	Default setting
R test interval	1 ... 65535 h	4 h

R test: The battery state is determined by subjecting it to a cyclic load.

Identification

Parameter	Value range
Contact	Free text
Location	Free text

- **Contact**
  Enter, for example, a contact address or the name of a staff member.

- **Location**
  Enter a description of the location that can be used to locate the SITOP UPS1600.

Web server

Parameter	Value range	Default setting
Activate web server on this module	Yes / No	No
Permit access only with HTTPS	Yes / No	Yes
Log off automatically after 15 minutes	Yes / No	No
Enable automatic update	Yes / No	Yes
Update interval	0 / 5 s / 10 s / 20 s / 30 s / 60 s	10 s

Set here whether access to the SITOP UPS1600 via web server is permitted.

- Activate web server on this module
  Define whether this device can be accessed via the web server.

- Permit access only with HTTPS
  Define whether access is only permissible via HTTPS.

- Log off automatically after 15 minutes
  You define whether a user should be automatically logged off after closing the web server.

- Update interval
  You define in which intervals the actual values are sent to the web server.

3.4.5 Loading the configuration to the SITOP UPS1600 (commissioning)

In the delivered state, the SITOP UPS1600 has not yet been assigned any IP address and the DHCP protocol is deactivated.

When the SITOP UPS1600 is first connected with an IO controller (SIMATIC S7 control system), it must be assigned a device name and an IP address by the IO controller. STEP 7 can be used to load a new configuration to the device.

Preconditions

- The SITOP UPS1600 has been correctly connected and linked with the system.

- PG/PC with SIMATIC STEP 7 is connected with the network.

Displaying accessible nodes

Note

If nodes can only be accessed via interposed switches or routers (with protocol conversion), they are not displayed in the list of the accessible nodes.

1. Click in menu "Target system" on "Display accessible nodes".

   The "Accessible nodes" window is opened with the following displays:

   – Station

   – SITOP UPS1600

The following table shows which information is displayed in the "Object name" column.

Accessible nodes	Object name	Description
S7-CPU, PC station	Name of the station	The "Details" view also shows the operating state, module type and, if available, information from the associated STEP 7 project (station name, CPU name, system identification).

Loading the IO controller for the first time

Once you have configured the SITOP UPS1600 and the station, you must load this configuration to the IO controller (SIMATIC S7 control system). This is the way that the IO controller is assigned its configured IP addresses.

Before loading, carry out a consistency test to check the configuration for duplicate addresses, identical names, etc.

Inform yourself whether the IO controller to be loaded can also be initially loaded via the PROFINET interface. If not, you must first load the hardware configuration via the MPI interface .

1. Select in the "Target system > Load" menu.

2. Select the module to be loaded.

3. In the "Select node address" dialog, if necessary, click the "Display" button to display the actual accessible modules (these include the IO controller to be loaded with its current IP address or its MAC address, if no IP address is yet available).

4. Select the IO controller to be loaded from the accessible modules.

   This module is displayed in the "Enter connection to target station" dialog box.

5. Start loading by clicking on the "OK" button.

   The IO controller is assigned the configured IP address.

Note

Ensure that the article number of the SITOP UPS1600 configured offline matches the article number of the device connected online.

The following response is obtained after loading the configuration into the device:

	UPS1600 10 A	UPS1600 20 A	UPS1600 40 A
UPS1600 10 A	Device status: OK Diagnostics status: OK	Device status: Fault Diagnostics status: Differences were identified (not accepted)	Device status: Fault Diagnostics status: Differences were identified (not accepted)
UPS1600 20 A	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: OK	Device status: Fault Diagnostics status: Differences were identified (not accepted)
UPS1600 40 A	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: Differences were identified (accepted)	Device status: OK Diagnostics status: OK

The upper-left header cell reads "Offline configured device" (above the diagonal) and "Online connected device" (below the diagonal).

Figure 3-2   Online / offline

Allocating the SITOP UPS1600 a device name (online)

In order that the configured IO controller can address the SITOP UPS1600, you must assign each individual IO device (including SITOP UPS1600) the configured device name.

For the procedure described below, the SITOP UPS1600 and the station for the PG/PC must be accessible online on the Ethernet.

1. Open HW Config.

2. In the "Target system > Ethernet" menu, click on "Assign device name".

3. In the "Assign device name" dialog, in the "Device name" field, select SITOP UPS1600.

4. In the "Available devices" select the SITOP UPS1600. Using the "Flash" button, you can flash the LED on the SITOP UPS1600 so that the device can be uniquely identified.

5. Click on the "Assign name" button.

After the name assignment, you can bring the IO controller into the RUN operating state.

When powering up, the IO controller distributes the configuration information to the SITOP UPS1600 and then goes into cyclic operation.

3.4.6 Diagnostics

The following data can be fetched using the Diagnostics function:

Group	Value
SITOP UPS1600 general	Article number
	Serial number

Fetching diagnostics data

You can use the "Station > Open online" menu command in "HW Config" to select the SITOP UPS1600 and view the diagnostics data.

3.4.7 Firmware update

> ⚠ **WARNING**
>
> **The SITOP UPS1600 is reset while updating the firmware. For safety reasons, the output is switched off.**
>
> Ensure that no damage is caused to the plant or system.
>
> Ensure that the PG/PC and/or all switches, routers and gateways that are used have an independent power supply during the firmware update.

> ⚠ **WARNING**
>
> **Firmware update with UPS-Manager**
>
> If for the firmware update, the UPS Manager is used, please note that for a firmware update from version V2.1 to V2.2 or higher, then a UPS Manager with version V4.72 or higher must be used. This also applies to firmware updates from V2.2.0 to higher versions.

Note

Install the current version of the SITOP UPS Managers, before you start the firmware update. It is possible that an older version (less than V4.5X) of the SITOP UPS Managers does not support this firmware update. The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.com/sitop) or directly (https://support.industry.siemens.com/cs/ww/en/view/75854607).

Note

Do not switch-off the devices during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/en/79207181). Different firmware updates are offered depending on the amp rating of the SITOP UPS1600.

Note

Observe the compatibility of the firmware!

Other firmware updates are not compatible.

Determine the amp rating of your SITOP UPS1600 and download the appropriate firmware update.

Note

It is not possible to downgrade the device firmware to a release with a version number lower than the firmware installed in the device itself. Information on how to read out the firmware release from the device is provided in Section Determining the firmware version (Page 132).

Note

"Reset to Factory" function:

All configuration parameters are reset to the default setting; 0.0.0.0 is used for the IP address. A new IP address must then be assigned, as otherwise there is no connection to the UPS Manager or TIA Portal.

See also

Diagnostics (Page 85)

Preconditions

- The SITOP UPS1600 has been correctly connected and linked with the PROFINET IO system.
- PG/PC with STEP 7 is connected with the network.

Procedure

The firmware update consists of several files, which are combined in a zip file.

1. Download the firmware update.

2. Unpack the ZIP file into a temporary directory.

3. Open the "Accessible nodes" window with the "Target system > Display accessible nodes" menu command.

Note

For an online connection via the "Accessible nodes" window, PG/PC and "Accessible nodes" must be connected to the same physical Ethernet subnet.

---

4. Select the "Target system > Update firmware" menu command.

5. Select the SITOP UPS1600 whose firmware is to be updated.

6. In the open "Update firmware" dialog, press the "Browse" button to select the path to the directory with the unzipped files.
   In this directory, select the corresponding "*.upd" file.

7. After you have selected a file, the information in the bottom fields of the "Update firmware" dialog box indicate the components for which the file is suitable and from which firmware version.

8. Click the "Run" button.

9. STEP 7 checks whether the selected file can be interpreted by the module; if the check is positive, then the file is loaded to the module.

10. If this requires changing the operating state of the IO controller, then you will be prompted to do this in the relevant dialog boxes.

11. The module then automatically updates the firmware.

Note

A separate connection is established to the CPU for the firmware update, if available. In this case, the task can be interrupted. If no resources are available for another connection, an existing connection will be used automatically. In this case, the task cannot be interrupted; the "Cancel" button in the transfer dialog is grayed-out and cannot be operated.

---

12. Confirm the notes that are displayed.
    The firmware is sent from the IO controller to the component, and saved in the internal component memory. The following LEDs flash while saving:

    – LED 1 ("OK/Bat")

    – LED 2 (">85%")

Note

It can take several minutes to save the firmware in the component. Do not switch-off the devices.

Note

During the firmware update, if the power supply of the SITOP UPS1600, or PG/PC or intermediate switches, routers or gateways is interrupted, then under certain circumstances, a fallback firmware is activated. If the SITOP UPS1600 can then no longer be accessed remotely, you must assign the SITOP UPS1600 a new IP address, or under the menu item "Assign name" you must enter a new name in the field "PROFINET device names" (see the manual for the particular device).

---

13. The SITOP UPS1600 automatically updates the firmware.

14. The firmware has been updated. Only now is it permissible to switch off the SITOP UPS1600.

15. Using STEP 7 (read out the diagnostics buffer of the IO controller), check whether SITOP UPS1600 successfully starts with the new firmware.

Note

After updating the firmware, in the hardware configuration of your project, you must replace the SITOP UPS1600 involved by the SITOP UPS1600 with the current firmware version. The configured configuration then matches the actual configuration again.

3.4.8 Restore factory settings

With STEP 7 Version 5.5, it is possible to restore the factory setting of modules using the "Target system -> Edit Ethernet node".

1. To select the MAC address of the SITOP UPS1600, which should be reset to the factory setting, click in dialog "Edit Ethernet node" on "Browse".

2. Click on the "Reset" button.

   This deletes the IP address and the device name from the module. The parameter values for SITOP UPS1600 and the energy storage device are kept.

3.5 Cyclic and acyclic data

The data communicated between SITOP UPS1600 and the PROFINET IO-Controller can be viewed in SIMATIC STEP 7 or SIMATIC STEP 7 in the TIA Portal. Here, a distinction is made between cyclic data (input/output data) and acyclic data (reading/writing data sets).

Input/output data

SITOP UPS1600 sends, in cyclic intervals (1 ms - 512 ms for IRT or 1 ms - 2048 ms for RT), data about the actual operating states to the PROFINET IO-Controller. You will find more information on this at Input and output data (Page 90).

Reading and writing data sets

Reading and writing data sets are sent acyclically from the SITOP UPS1600 to the PROFINET IO-Controller or from the PROFINET IO-Controller to the SITOP UPS1600. Additional information can be found at Reading and writing data sets (Page 91).

3.5.1 Input and output data

An overview of the input and output data, which is cyclically sent from the SITOP UPS1600 to the PROFINET IO controller is provided in the following tables.

Slot	Subslot	Data	Description	Data size
0	2	Input voltage	Input voltage is present: • 0: NOT OK • 255: OK	Unsigned8
		Buffer mode	Buffer mode: The load connected to the SITOP UPS1600 is supplied via the energy storage device connected to the SITOP UPS1600: • 0: inactive • 255: active	Unsigned8
		Ready for buffering	Ready for buffer operation as the energy storage device of the buffer component has been sufficiently charged. • 0: NOT OK • 255: OK	Unsigned8
		Charge sufficient	Charge level sufficient: When this flag is set, the required charge level has been achieved: • 0: NOT OK • 255: OK	Unsigned8

Slot	Subslot	Data	Description	Data size
		Battery change recommended	Battery replacement recommended: Battery capacity is insufficient to achieve the specified buffer time: • 0: no • 255: yes	Unsigned8
		Not used	-	Unsigned8
		Battery charge level	Battery charge level in %: • 0-100: 0-100% • 255: unknown battery	Unsigned8
		Battery connection maintenance from V2.1	Connection to the battery interrupted: Check the connection and fuse: • 0: no maintenance required • 255: maintenance required	Unsigned8

3.5.2 Reading and writing data sets

An overview of all data sets, which are communicated between the SITOP UPS1600 and the PROFINET IO-Controller is provided in the following table. Here, a distinction is made between the following data sets:

- **Reading data sets:** Data which is sent from the SITOP UPS1600 to the PROFINET IO-Controller .

- **Writing data sets:** Data which is sent from the PROFINET IO-Controller to the SITOP UPS1600.

Index	Slot	Subslot	Data set	Type	Description	Data size
0x0001	0	1	Buffering parameters	Reading / writing	Buffer parameters.	14 bytes
0x0002	0	1	Battery parameters	Reading / writing	Parameters of the connected battery modules	5 bytes
0x0003	0	1	Charging parameters	Reading / writing	Charge parameters of the connected battery modules	4 bytes
0x0004	0	1	Reset parameters	Reading / writing	Reset parameters.	1 byte
0x0005	0	1	Battery information parameters	Reading	Information about the connected battery modules SITOP UPS1100. This information is available via the link "Energy Storage".	1024 bytes
0x0006	0	1	Device information Parameters	Reading	Information about the SITOP UPS1600.	148 bytes
0x0007	0	1	Hardware settings parameters	Reading	Hardware settings of the SITOP UPS1600 (settings that were made at the front of the device).	8 bytes

Index	Slot	Subslot	Data set	Type	Description	Data size
0x0008	0	1	Buffering parameters from V2.0	Reading / writing	Buffer parameters of the SITOP UPS1600	2 bytes
0x0009	0	1	Maintenance parameters from V2.1	Reading / writing	Maintenance parameters of the SITOP UPS1600	2 bytes
0x0010	0	1	DC-UPS command	Writing	Sends special commands to the SITOP UPS1600	4 bytes
0x0010	0	1	Result of DC-UPS command	Reading	Response to the previously sent "DC-UPS command"	4 bytes
0x0011	0	1	Battery 1 information parameters	Reading	Information regarding the connected battery module 1 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0012	0	1	Battery 2 information parameters	Reading	Information regarding the connected battery module 2 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0013	0	1	Battery 3 information parameters	Reading	Information regarding the connected battery module 3 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0014	0	1	Battery 4 information parameters	Reading	Information regarding the connected battery module 4 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0015	0	1	Battery 5 information parameters	Reading	Information regarding the connected battery module 5 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0016	0	1	Battery 6 information parameters	Reading	Information regarding the connected battery module 6 SITOP UPS1100. This information is available via the link "Energy Storage".	68bytes (from V2.2)
0x0020	0	1	State information	Reading	Status information about SITOP UPS1600 and the connected battery modules SITOP UPS1100. Information about the SITOP UPS1100 battery modules is available via the link "Energy Storage".	64 bytes 70 bytes (from V2.1)
0x0040	0	1	Identification value parameters	Reading / writing	Device identification parameters.	80 bytes 108 bytes (from V2.1)
0x0041	0	1	Web server parameters	Reading / writing	Web server settings of the SITOP UPS1600.	1 byte 6 bytes (from V2.1)
0x0042	0	1	OPC UA server	Reading/ writing	OPC UA settings of the SITOP UPS1600.	4 bytes (from V2.2)
0x0043	0	1	NTP client parameters	Reading/ writing	Setting for connection to NTP servers	66 bytes (from V2.2)

Index	Slot	Subslot	Data set	Type	Description	Data size
0x0044	0	1	NTP client status parameters	Reading	Status NTP client	40 bytes (from V2.2)
0x0045	0	1	PROFINETSecurity	Reading/ writing	Setting for DCP write protection	2 bytes (from V2.2)

You can find detailed information about the individual data sets in Section Data sets (Page 93)

3.5.2.1 Data sets

In this section you can find detailed information about the individual data sets that are sent from the PROFINET IO-Controller to the SITOP UPS1600 - and which can be read from the SITOP UPS1600.

0x0001: Buffering parameters (reading/writing)

Data	Description	Data type
Buffer time [1 s]	Buffer time: After the selected buffer time has expired, the SITOP UPS1600 switches off the load output. The actual buffer time that can be achieved depends on the connected loads and energy storage devices.	Unsigned16
Buffer time 2 [1 s]	Additional buffer time after the PC was shut down. (only valid in conjunction with PC software SITOP UPS Manager)	Unsigned16
Buffer threshold [0.01 V]	Connection threshold: Switching voltage for buffering. Buffering is active below this value.	Unsigned16
Stop buffering voltage [0.01 V]	Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Input voltage OK time [1 ms]	Wait time for stable input voltage: Minimum time during which the input voltage during buffer operation must be available at the SITOP UPS1600 to exit buffer operation of the SITOP UPS1600 and to again supply the connected loads via the input voltage (normal operation).	Unsigned16
Downtime alarm [1 ms]	Downtime alarm: Alarm filter: An alarm is only sent if it is active for longer than the set time.	Unsigned16
Buffering allowed	Activate or deactivate buffer operation. The setting is only accepted in operating mode Remote Enable (REN) of the SITOP UPS1600.	Unsigned8
Enable reset after buffering	Enable reset after buffering: If, during buffer operation, the input voltage becomes available again, then the output is switched off for a selectable time in order to reset the connected devices.	Unsigned8

0x0002: Battery parameters (reading/writing)

Data	Description	Data type
Battery defect voltage [0.01 V]	Battery defect voltage: If the battery voltage falls below the set value, then the battery is identified to be defective.	Unsigned16
Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Ignore battery coding	Ignore data of the coded battery: When this parameter is set to "1", then data of the coded battery is ignored. Instead, data is taken from the parameterization ("Battery Parameters", "Charging Parameters").	Unsigned8

0x0003: Charging parameters (reading/writing)

Data	Description	Data type
End of charge voltage [0.01 V]	End of charge voltage: Battery voltage when charging changes to trickle charging. The connected energy storage device is then charged up to 100 %.	Unsigned16
Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16

0x0004: Reset parameters (reading/writing)

Data	Description	Data type
Reset time [1 s]	Reset time: Time during which the SITOP UPS1600 output is shutdown if the connected devices are reset.	Unsigned8

0x0005: Battery information parameters (reading)

Data	Description	Data type
Number of batteries	Number of connected battery modules. Here, only the SITOP UPS1100 battery modules (coded batteries) are counted.	Unsigned8
Fill byte(s)	-	3 x Unsigned8
Batt 1: Standby time [1 s]	Standby time	Unsigned32
Batt 1: Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32
Batt 1: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 1: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge over the lifetime of the SITOP UPS1600.	Unsigned32
Batt 1: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 1: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16

Data	Description	Data type
Batt 1: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Batt 1: Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 1: Battery type	Battery type	Unsigned8
Batt 1: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 1: Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8
Batt 1: Order number	Order number (Article number).	VisibleString(30)
Batt 1: Serial number	Serial number	VisibleString(30)
Batt 1: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 1: Version number	Version number	VisibleString(50)
Batt 2: Standby time [1 s]	Standby time	Unsigned32
Batt 2 Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32
Batt 2: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 2: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge over the lifetime of the SITOP UPS1600.	Unsigned32
Batt 2: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 2: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16
Batt 2: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Batt 2 Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 2: Battery type	Battery type	Unsigned8
Batt 2: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 12 Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8
Batt 2: Order number	Order number (Article number).	VisibleString(30)
Batt 2: Serial number	Serial number	VisibleString(30)
Batt 2: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 2: Version number	Version number	VisibleString(50)
Batt 3: Standby time [1 s]	Standby time	Unsigned32
Batt 3: Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32

Data	Description	Data type
Batt 3: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 3: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge within the service life of the SITOP UPS1600.	Unsigned32
Batt 3: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 3: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16
Batt 3: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Batt 3: Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 3: Battery type	Battery type	Unsigned8
Batt 3: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 3: Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8
Batt 3: Order number	Order number (Article number).	VisibleString(30)
Batt 3 Serial number	Serial number	VisibleString(30)
Batt 3: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 3: Version number	Version number	VisibleString(50)
Batt 4: Standby time [1 s]	Standby time	Unsigned32
Batt 4: Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32
Batt 4: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 4: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge over the lifetime of the SITOP UPS1600.	Unsigned32
Batt 4: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 4: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16
Batt 4: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Batt 4: Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 4: Battery type	Battery type	Unsigned8
Batt 4: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 4: Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8

Data	Description	Data type
Batt 4: Order number	Order number (Article number).	VisibleString(30)
Batt 4: Serial number	Serial number	VisibleString(30)
Batt 4: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 4: Version number	Version number	VisibleString(50)
Batt 5: Standby time [1 s]	Standby time	Unsigned32
Batt 5: Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32
Batt 5: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 5: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge within the service life of the SITOP UPS1600.	Unsigned32
Batt 5: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 5: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16
Batt 5: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the SITOP UPS1600.	Unsigned16
Batt 5: Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 5: Battery type	Battery type	Unsigned8
Batt 5: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 5: Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8
Batt 5: Order number	Order number (Article number).	VisibleString(30)
Batt 5: Serial number	Serial number	VisibleString(30)
Batt 5: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 5: Version number	Version number	VisibleString(50)
Batt 6: Standby time [1 s]	Standby time	Unsigned32
Batt 6 Buffer time [1 s]	Required buffer time, after which the SITOP UPS1600 shuts down in the buffer mode.	Unsigned32
Batt 6: Total charging current [1 mAh]	Total charge level (battery-specific data): Total charge within the service lifetime of the SITOP UPS1600.	Unsigned32
Batt 6: Total culled current [1 mAh]	Total charge level used (battery-specific data): Total discharge within the service life of the SITOP UPS1600.	Unsigned32
Batt 6: EOCV [0.01 V]	"End-of-charge voltage": Battery voltage when charging changes to trickle charging. The energy storage device is then charged up to 100 %.	Unsigned16
Batt 6: Charge current [1 mA]	Charge current: Current magnitude used to charge the connected battery modules during the constant charging process.	Unsigned16
Batt 6: Battery capacity [0.1 Ah]	Battery capacity: Total battery capacity of all energy storage devices connected to the 'SITOP UPS1600.	Unsigned16

Data	Description	Data type
Batt 6: Stop buffering voltage [0.01 V]	Stop buffering voltage: Buffer operation is exited if the battery voltage is below this value.	Unsigned16
Batt 6: Battery type	Battery type	Unsigned8
Batt 6: Minimal temperature [1 °C]	Lowest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Batt 6: Maximal temperature [1 °C]	Highest specified operating temperature of the battery module being used SITOP UPS1100.	Signed8
Fill byte(s)	-	3 x Unsigned8
Batt 6: Order number	Order number (Article number).	VisibleString(30)
Batt 6: Serial number	Serial number	VisibleString(30)
Batt 6: Manufacturing date	Manufacturing date	VisibleString(30)
Batt 6: Version number	Version number	VisibleString(50)

0x0006: Device information parameters (reading)

Data	Description	Data type
HW revision	Hardware version	Unsigned16
SW revision	Software release	Unsigned16
Boot loader version	Boot loader version	Unsigned16
Max output current [1 A]	Maximum output current	Unsigned8
Fill byte(s)	-	Unsigned8
MLFB/Order number	MLFB/order number (Article number)	VisibleString(30)
Serial number	Serial number	VisibleString(30)
Device name	Device name	VisibleString(30)
Version number	Version number	VisibleString(50)

0x0007: Hardware setting parameters (reading)

Data	Description	Data type
Buffer time [1 s]	Buffer time: After the selected buffer time has expired, the SITOP UPS1600 switches off the load output. The actual buffer time that can be achieved depends on the connected loads and energy storage devices.	Unsigned16
Buffer threshold [0.01 V]	Connection threshold: Switching voltage for buffering. Buffering is active below this value.	Unsigned16
Buffering allowed	Activate or deactivate buffer operation. The setting is only accepted in operating mode Remote Enable (REN) of the SITOP UPS1600.	Unsigned8
Enable reset	Enable reset: If, during buffer operation, the input voltage becomes available again, then the output of the SITOP UPS1600 is switched off for a selectable time in order to reset connected loads.	Unsigned8

Data	Description	Data type
Start from battery	Start from battery: Setting at the signal terminal for function "Start from battery".	Unsigned8
Selected battery profile	Profile of the selected battery: The battery charging behavior is set at the signal terminals. The setting is only used, if the SITOP UPS1600 is not in the "Remote Enable" (REN) mode	Unsigned8

0x0008: Buffering parameters (reading/writing)

Data	Description	Data type
Expected buffer current [0.1 Ah] from V2.0 and higher	Expected buffer current: Estimated average load current during buffer operation.	Unsigned16

0x0009: Maintenance parameters (reading/writing)

Data	Description	Data type
Resistor test interval [1 h] from V2.1	R test interval	Unsigned16

0x0010: DC-UPS command (writing)

Data	Description	Data type
CommandID	Remote reset: 8195	Unsigned16
Parameter 1	Not used	Unsigned8
Parameter 2	T_{off} : output voltage down time [s] >= V1.0	Unsigned8

Data	Description	Data type
CommandID	Remote reset 2: 8207	Unsigned16
Parameter 1	T_d: Waiting time after end of communication [s]	Unsigned8
Parameter 2	T_{off} : output voltage down time [s] >= V2.0.0	Unsigned8

Data	Description	Data type
CommandID	Output ON/OFF: 8200	Unsigned16
Parameter 1	0	Unsigned8
Parameter 2	0: output OFF 1: output ON	Unsigned8

Data	Description	Data type
CommandID	Reset to Factors-Values: 8209	Unsigned16
Parameter 1	Not used	Unsigned8
Parameter 2	Not used >= V2.1.0	Unsigned8

0x0010: Result of DC-UPS command (reading)

Data	Description	Data type
CommandID	CommandID (of the previously sent command)	Unsigned16
Parameter 1	0: OK > 0: Error	Unsigned16

0x0011: Battery 1 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 1 available	0 ... not available 1 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2

Data	Description	Data type
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0012: Battery 2 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 2 available	0 ... not available 2 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0013: Battery 3 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 3 available	0 ... not available 3 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0014 Battery 4 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 4 available	0 ... not available 4 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2

Data	Description	Data type
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0015: Battery 5 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 5 available	0 ... not available 5 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2

Data	Description	Data type
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0016: Battery 6 information parameters (reading)

Data	Description	Data type
Number of batteries	Number of batteries	Unsigned8 from V2.2
Battery 6 available	0 ... not available 6 ... available	Unsigned8 from V2.2
Minimal temperature	Minimal temperature	Signed8 from V2.2
Maximal temperature	Maximal temperature	Signed8 from V2.2
Standby time	Standby time	Unsigned32 from V2.2
Buffer time	Buffer time	Unsigned32 from V2.2
Total charging current	Total charging current	Unsigned32 from V2.2
Total culled current	Total culled current	Unsigned32 from V2.2
EOCV	End-of-charge voltage	Unsigned16 from V2.2
Charge current	Charge current	Unsigned16 from V2.2
Battery capacity	Battery capacity	Unsigned16 from V2.2

Data	Description	Data type
Stop buffering voltage	Stop buffering voltage	Unsigned16 from V2.2
Battery type	Battery type	Unsigned8 from V2.2
Order number	Order number	VisibleString(19) from V2.2
Serial number	Serial number	VisibleString(15) from V2.2
Manufacturing date	Manufacturing date	3 × Unsigned8 from V2.2
Version number	Version number	2 × Unsigned8 from V2.2

0x0020: State information (reading)

Data	Description	Data type
Remaining buffer time [1 s]	Probable remaining buffer time. The remaining buffer time is calculated based on the present battery charge and the average current over a 10 minute period.	Unsigned32
Total operating time [1 h]	Total operating time.	Unsigned32
Total calculated battery capacity [0.1 Ah]	Total calculated battery capacity	Unsigned16
Calculated battery 1 capacity [0.1 Ah]	Battery 1: Calculated battery capacity	Unsigned16
Calculated battery 2 capacity [0.1 Ah]	Battery 2: Calculated battery capacity	Unsigned16
Calculated battery 3 capacity [0.1 Ah]	Battery 3: Calculated battery capacity	Unsigned16
Calculated battery 4 capacity [0.1 Ah]	Battery 4: Calculated battery capacity	Unsigned16
Calculated battery 5 capacity [0.1 Ah]	Battery 5: Calculated battery capacity	Unsigned16
Calculated battery 6 capacity [0.1 Ah]	Battery 6: Calculated battery capacity	Unsigned16
Input voltage [0.01 V]	Input voltage: Measured rms value of the supply voltage at the input of the SITOP UPS1600.	Unsigned16
Input current [5 mA]	Current measured at the input of the SITOP UPS1600.	Unsigned16
Output voltage [0.01 V]	Voltage measured at the output of the SITOP UPS1600.	Unsigned16
Load current [5 mA]	Load current measured at the output of the SITOP UPS1600.	Unsigned16
Measured charge current [1 mA]	Measured battery charge current of the SITOP UPS1600.	Unsigned16
Battery voltage [0.01 V]	Measured battery voltage of the connected battery modules	Unsigned16
Output current [5 mA]	Load current measured at the output of the SITOP UPS1600.	Unsigned16
Charge voltage [0.01 V]	Voltage used to charge the batteries during the constant charging process.	Unsigned16
Fill byte(s)	-	3 x Unsigned8

Data	Description	Data type
Valid configuration	Valid configuration: Indicates whether the software parameters or the parameters at the rotary switches are used. The corresponding setting should be made at the rotary switch for the buffer threshold.	Unsigned8
Number of batteries	Number of connected battery modules. Here, only the SITOP UPS1100 battery modules (coded batteries) are counted.	Unsigned8
Fill byte(s)	-	7 x Unsigned8
Battery 1 change recommended	Battery 1: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 2 change recommended	Battery 2: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 3 change recommended	Battery 3: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 4 change recommended	Battery 4: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 5 change recommended	Battery 5: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 6 change recommended	Battery 6: Battery replacement recommended: The battery capacity is not sufficient for the defined buffer time.	Unsigned8
Battery 1 Connection Fault	Battery1: Connection fault	Unsigned8
Battery 2 Connection Fault	Battery 2: Connection fault	Unsigned8
Battery 3 Connection Fault	Battery 3: Connection fault	Unsigned8
Battery 4 Connection Fault	Battery 4: Connection fault	Unsigned8
Battery 5 Connection Fault	Battery 5: Connection fault	Unsigned8
Battery 6 Connection Fault	Battery 6: Connection fault	Unsigned8
Battery 1 temperature [1 °C]	Battery 1: Battery temperature	Integer8
Battery 2 temperature [1 °C]	Battery 2: Battery temperature	Integer8
Battery 3 temperature [1 °C]	Battery 3: Battery temperature	Integer8
Battery 4 temperature [1 °C]	Battery 4: Battery temperature	Integer8
Battery 5 temperature [1 °C]	Battery 5: Battery temperature	Integer8
Battery 6 temperature [1 °C]	Battery 6: Battery temperature	Integer8
Device temperature [1 °C]	Temperature in the housing	Integer8
LED pattern	Status of LEDs 1 to 4 for the SITOP UPS1600 [1]	Unsigned8

[1] Object structure LED pattern

7	6	5	4	3	2	1	0
Led 4		Led 3		Led 2		Led 1	
a	b	a	b	a	b	a	b

a	b	
0	0	Off
0	1	Red
1	0	Green
1	1	Yellow

0x0040: Identification value parameters (reading/writing)

Data	Description	Data type
Contact	Name of the contact person. You can change the name to suit your requirements (maximum 22 characters).	VisibleString(40) VisibleString(64) from V2.1
Location	Location designation: Indicates the unique location of the SITOP UPS1600 (max. 22 characters).	VisibleString(40) VisibleString(44) from V2.1

0x0041: Web server parameters (reading/writing)

Data	Description	Data type
WebserverEnabled	Enable/disable the web server of the SITOP UPS1600: • 0: disable • 255. enable	Unsigned8
AutoReloadEnabled from V2.1	Enable/disable automatic update: • 0: disable • 255. enable	Unsigned8
ReloadTime from V2.1	Update interval: • 0: Off • 5: 5s • 10: 10s • 20: 20s • 30: 30s • 60: 60s	Unsigned8
AutoLogout from V2.1	Enable/disable automatic logoff: • 0: disable • 255. enable When automatic logoff is activated, the logged on user ("Guest" or "Admin") is automatically logged off when the SITOP UPS1600 web server is inactive for 15 minutes.	Unsigned8
HttpAccessEnable from V2.1	Enable/disable HTTP access: • 0: disable • 255: enable	Unsigned8
Fill byte(s) from V2.1	-	Unsigned8

0x0042: OPC UA server (reading/writing)

Data	Description	Data type
OPCServerEnabled	Activate/deactivate the OPC UA interface of the SITOP UPS1600: • 0: disable • 255: enable	Unsigned8
OPCUnencrypdedAccessEnable	Activate/deactivate unencrypted access via the OPC UA interface of the SITOP UPS1600: • 0: disable • 255: enable	Unsigned8
OPCPort	Set port for OPC UA interface (1 to 65535)	Unsigned16

0x0043: NTP client parameters (reading/writing)

Data	Description	Data type
NTPServerEnabled	Activate/deactivate NTP server: • 0: disable • 255: enable	Unsigned8 from V2.2
Fill byte(s)	-	Unsigned8 from V2.2
NTPServer1	IP address of NTP server 1	Unsigned8 from V2.2
NTPServer2	IP address of NTP server 2	Unsigned8 from V2.2
NTPServer3	IP address of NTP server 3	Unsigned8 from V2.2
NTPServer4	IP address of NTP server 4	Unsigned8 from V2.2

0x0044: NTP client status parameters (reading)

Data	Description	Data type
Last synchronization time	Time that the last synchronization took place	VisibleString(20) from V2.2
Next synchronization time	Time of the next planned synchronization	VisibleString(20) from V2.2

0x0045: PROFINETSecurity (reading/writing)

Data	Description	Data type
DCPReadonlyIfConnected	Setting for DCP write protection	Unsigned8 from V2.2
Fill byte(s)	-	Unsigned8 from V2.2

3.6 SITOP UPS Manager

Note

Ensure that only the UPS Manager accesses the SITOP UPS1600.

Note

Install the current version of the SITOP UPS Manager so that you can use the full functional scope of the SITOP UPS1600.

The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.com/sitop-ups1600) or directly (https://support.industry.siemens.com/cs/ww/en/view/75854607).

3.6.1 Functions of the SITOP UPS Manager

You can fulfill the following tasks using the SITOP UPS Manager :

● Configuration of the SITOP UPS1600 uninterruptible power supply and the battery modules (see Chapter Configuring the SITOP UPS1600 (Page 119))

● Protect a computer or a computer network provided by the uninterruptible power supply with the master-slave technique

● Data backup by controlled shutdown

● Alarm-controlled starting of any application (SMS, e-mail)

New functions from V4.71:

● OPC UA server as non-proprietary software interface.

● Sitting IP address and name in the SITOP UPS1600.

● Identifying SITOP UPS1600 by flashing LED SF.

By specifying additional applications and alarms, you define a comprehensive protection of your computer or computer network.

The applications can be started depending on the following events:

● Supply voltage failure

● Restoration of the supply voltage

● State of the buffer readiness by the UPS:

   – General buffer readiness

   – Remaining buffer time

● Status of the UPS battery:

   – Battery replacement required

   – Battery charge

3.6.2   The user interface of the SITOP UPS Manager
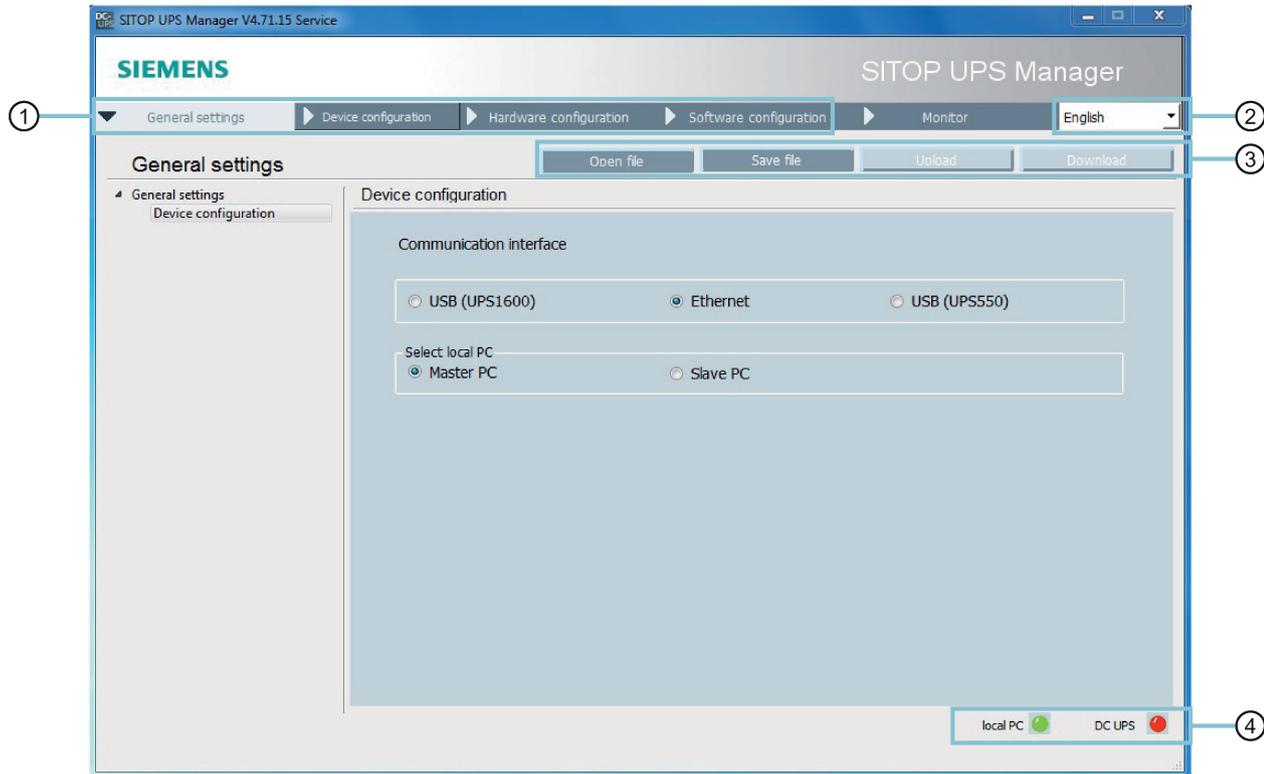
① Tabs for selecting the submenus
② Language selection
③ Save bar
④ Connection lamps

Use the tab ① to reach the individual submenus.

The language selection ② is used to select the user interface language of the SITOP UPS Manager. The German, English, French, Italian, Spanish, and Chinese languages are available.

You use the functions of the save bar ③ to load the configuration into or from the SITOP UPS1600 – and open or save the configurations to a data medium.

The colors of the connection lamps ④ indicate the status of the incoming and outgoing connection. Both lamps must light green.

Left-hand connection lamp: Connection status SITOP UPS Manager application - SITOP UPS Manager service
Right-hand connection lamp: Connection status SITOP UPS Manager service - SITOP UPS1600

3.6.3 Installation/uninstallation

The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.com/sitop-ups1600) or directly (https://support.industry.siemens.com/cs/ww/en/view/75854607).

Operational requirements

Operating systems

The Windows XP and Windows 7 (32 bit and 64 bit) operating systems are supported.

Ethernet or USB interface

To install and use the SITOP UPS Manager in conjunction with the SITOP UPS1600, the computer must be connected with the SITOP UPS1600 via Ethernet or USB port.

Windows user group

Users of the SITOP UPS Manager must be members of the Windows user group "power users".

Installation preconditions

Administration rights

You require administrator rights to install the SITOP UPS Manager.

Installation paths without blanks

Note

Paths must not contain any blanks!

The path names of the directories for SITOP UPS Manager and batch files must not contain any blanks.

Installation steps

Procedure when installing for the first time

1. Close all applications before you start the installation.

2. Double-click on the "Setup_SITOP-UPSManager_x.xx.x" file.

3. Follow the installation instructions. Enter the requested information in the dialogs:

   – Installer language, English or German

   – Agreement declaration with the license conditions

   – Installation scope:
   Activate option "USB driver" if your SITOP UPS1600 has a USB interface. You can select between application and service.

   – Installation path:
   Use the recommended target directory "C:\Program Files\x68\SITOPUPSManager" or select another one. If you select another target directory, please note that spaces are not permissible in the path name (to be taken into consideration up to version 4.61).

   – Start menu folder
   Select the folder structure under which the SITOP UPS Manager should appear in the start menu.

4. If you are using a SITOP UPS1600 with USB interface, then connect the SITOP UPS1600 to the computer using this interface.

5. Click "Finish" to complete the installation.

Procedure for an already existing installation

Note

The procedure described below is only necessary if a SITOP UPS Manager with version number less than 4.50 is to be installed. These steps are automatically executed for versions from V4.50 and higher.

---

1. Back up the file "dcups.ini", which is located in directory "ini" in the installation directory of the SITOP UPS Managers.

2. Carry out steps 1 to 5 of the procedure described above when installing for the first time.

3. Replace file "dcups.ini", which is located in directory "ini" in the installation directory of the SITOP UPS Managers, as a result of the file backed up in Step 1.

Result

After the successful installation, the SITOP "UPS Manager" is contained in the start menu under the selected start menu folder.

No further installations are required to operate the SITOP UPS Manager.

Uninstallation

The UPS Manager can be uninstalled using "Start → All programs → SITOPUPS Manager → Uninstall".

3.6.4 Options of establishing a connection to the SITOP UPS1600

Depending on the type, the SITOP UPS1600 provides either a USB interface or an Ethernet interface.

Depending on the type, the SITOP UPS1600 communicates via USB or Ethernet with the SITOP UPS Manager.

The SITOP UPS Manager supports the master-slave operation only for an existing Ethernet connection. This permits, for example, a controlled shutdown of the computers in the network by the applications started with the SITOP UPS Manager.

3.6.5 Establishing a connection via Ethernet

The SITOP UPS1600 requires an IP address for communication with the UPS Manager. This is assigned by the network administrator. Use the Primary Setup Tool to configure the SITOP SITOP UPS1600 interface.

Configuring the SITOP UPS1600 with the Primary Setup Tool

The Primary Setup Tool is a Siemens product that is free of charge, and which is used to identify and configure network-capable devices. You can download the Primary Setup Tool at (http://support.automation.siemens.com/WW/view/en/19440762).

From SW Version V2.1.0, the Primary Setup Tool is already integrated in the UPS Manager (from Version V4.71.x).

The following procedure is then required:

- "Device configuration" tab

- Select network adapter

- Device configuration → DC-UPS → Update list

Additional information is contained in the Primary Setup Tool manual. This manual and further links can be found at (http://support.automation.siemens.com/WW/view/en/19440762).

Preconditions

- The SITOP UPS1600 is connected with the client (PG/PC) via the Ethernet interface.

- The Primary Setup Tool is installed on the client.

- Firewall settings that are necessary:

  – Communication via 5000 is permitted.

  – Echo request (ping) is permitted.

Procedure

1. Start the Primary Setup Tool.

2. Select the "Settings > Select interface" menu command.
   The "Set PG/PC interface" dialog opens.
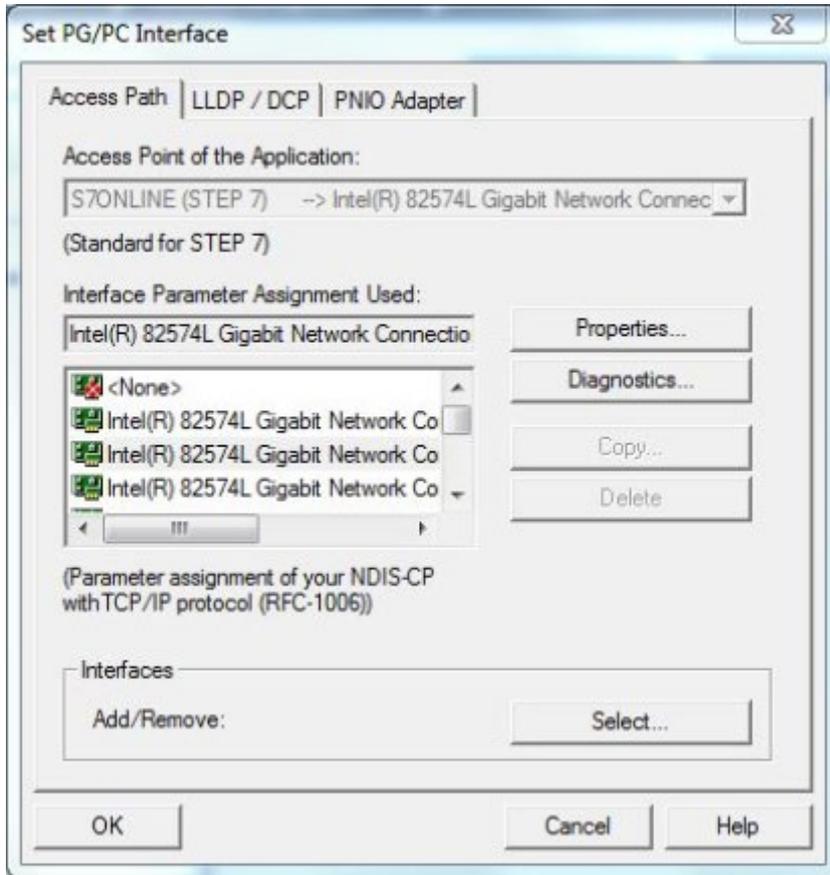
3. Select the interface with which the client is connected with the SITOP UPS1600.
   Click "OK" to close the "Set PG/PC interface" dialog.

4. Select the menu command "Network > Search".
   SITOP UPS1600 appears in the tree view as "DC-UPS :" with its MAC address and its IP address.

5. Open the SITOP UPS1600 entry and select "Ind. Ethernet interface".
   In the right-hand section, the configuration menu for the Ethernet interface of the SITOP UPS1600 opens.

6. Configure the Ethernet interface as specified by the network administrator.

7. Select the SITOP UPS1600 in the Tree view.

   Loading to the device is not possible while an interface is selected.
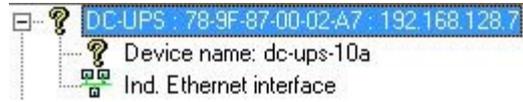
8. Select menu command "Module > Download", to load the configuration to the device.

   Alternatively, you can start loading using the "Load" button in the toolbar.

Configuring the connection in the SITOP UPS Manager

A basic setting is the configuration of the client (PC/PG) as master or slave. The consideration of possible application situations can help here:
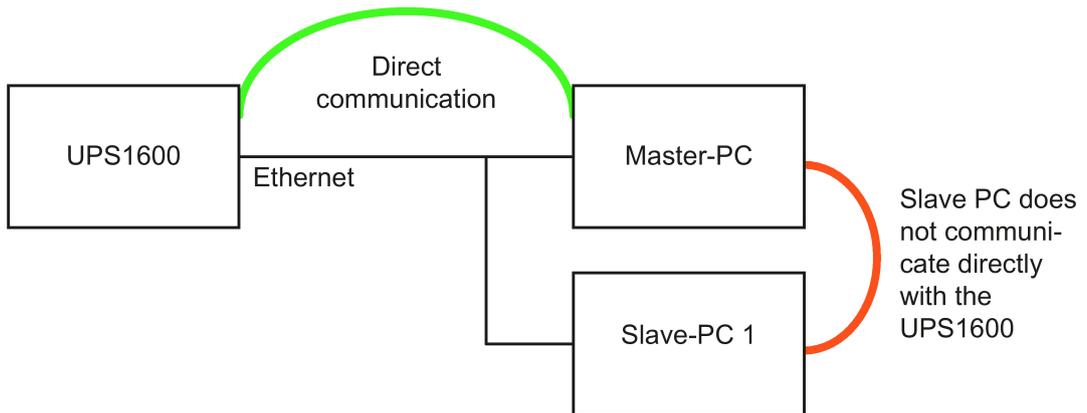
- The local computer is the only computer at the SITOP UPS1600.
  Local computer = master PC

- The local computer is one of several computers and performs the master function.
  Local computer = master PC

- The local computer is one of several computers at the SITOP UPS1600 and operates as slave.
  Local computer = slave PC

In the master-slave configuration, the SITOP UPS1600, the master PC and the slave PC are connected at the same physical Ethernet. Only the master PC communicates directly with the SITOP UPS1600. The slave PC receives the control signals from the SITOP UPS Manager of the master PC.

Note

Up to SITOP UPS Manager Version 4.12, the master PC can only manage 1 slave PC. From version 4.12.5 and higher, up to 8 slaves can be managed.

Configuring the local computer as master PC

1. Select "General settings > Device configuration".

2. Activate the "Ethernet" checkbox and the "Master-PC" checkbox.

3. If the message appears as to whether you wish to restart the SITOP UPS Manager, confirm this with "Yes".

   The SITOP UPS Manager is restarted.

4. Select "Hardware configuration > Ethernet configuration".

5. Enter the IP address of the master PC in the field "IP address of the master PC". A selection box is displayed next to field "IP address of the master PC", which lists all of the available IP addresses of the client (PC/PG). Selecting an IP address automatically inserts this address in field "IP address of the master PC".

Note

Also at the local computer, the IP address of the master PC must be specified in the SITOP UPS Manager if a master-slave configuration is to be used.

---

6. Enter the IP address of the SITOP UPS1600 in the "IP address of the DC-UPS" field.

7. If the message appears as to whether you wish to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.

The connection lamps light up green, the connection as master PC to the SITOP UPS1600 is established, if the (local) PC is connected as master PC to the SITOP UPS1600.

Configuring the client as slave PC

1. Select "General settings > Device configuration".

2. Activate the "Ethernet" checkbox and the "Slave PC" checkbox.

3. If the message appears as to whether you wish to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.

4. Select "Hardware configuration > Ethernet configuration".

5. Enter the IP address of the master PC in the field "IP address of the master PC".

6. If the message appears as to whether you wish to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.

The connection lamps light up green, the connection as slave PC to the master PC is established, if the (local) PC is connected as master PC to the SITOP UPS1600.

3.6.6 Establishing a connection via USB

1. Connect the SITOP UPS1600 using a USB cable with the client (PC/PG).
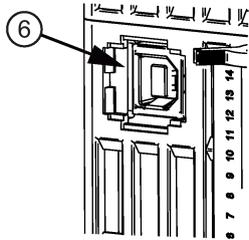
2. Select "General settings > Device configuration".

3. Activate the "USB (UPS1600)" checkbox.

4. If, in the lower area, a blue bar with the message "Configuration changed, restart application now." appears, click on the bar to restart the UPS. Clicking on "x" only minimizes the UPS Manager. You can maximize the UPS Manager again by clicking on the associated symbol in the task bar.
   The SITOP UPS Manager is restarted.

5. Check that the connection lamps light green.

   The connection lamps light green, the connection to the SITOP UPS1600 via USB has been established, if the (local) PC is connected as master PC to the SITOP UPS1600.

3.6.7 Configuration in the SITOP UPS Manager

Once you have connected the SITOP UPS1600 and the SITOP UPS Manager, you have the following configuration options:

- Create a new configuration.

- Load a configuration from a data medium or from a device.

- Change a configuration.

- Store a configuration on a data medium or load it into a device.

Procedure

1. Make the required hardware configuration in SITOP UPS Manager.

2. Click in the save bar "Configurations" on the "Download" button. The configuration is loaded to the SITOP UPS1600 .

3. Change the hardware configuration in the SITOP UPS Manager to address your specific requirements.

4. Click in the save bar "Configurations" on the "Download" button to transfer the configuration to the SITOP UPS1600. Click on "Save file", to save the configuration to a file. This means that you can restore the SITOP UPS1600 configuration at a later point in time – or transfer the configuration to other devices.

> **Note**
>
> When saving or loading a HW configuration, the entry in "Base unit > Location" is not accepted/changed.

3.6.7.1 General settings

Under "Software configuration > General settings", specify the maximum size of the log file in Kbytes and where it is saved.

From SITOP UPS Manager V4.12.5 and higher, under "Software configuration > General settings" you can also specify as to whether the window of the SITOP UPS Manager should always be in the foreground.

Log file

1. Select "Software configuration > General settings".

2. Enter the maximum file size in kbytes in the "Size of log file" dialog box.

3. Click on "Browse"

4. Select the directory in which the log file should be stored.

5. Confirm with "Select folder".

   The maximum size and the storage location of the log file has been saved.

3.6.7.2 Configuring the SITOP UPS1600

Using the SITOP UPS Manager, you can configure the SITOP UPS1600 and its energy storage device, and then load to the device (if it is an uncoded battery – for UPS1100, the values are automatically identified). To change the charge parameters switch-in threshold or buffer time, you must set the corresponding rotary coding switch to the "REN" position.

1. To do this, select "Hardware configuration > Base device" or "Hardware configuration > Energy storage".

2. Enter the desired values.

3. Click on "Download"

Configuring the basic device (base unit)

The following parameters are available under "Hardware configuration> Base unit".

Parameter	Value range	Default setting
Location	Free text	–
Connection threshold	21 - 25 V	22.5 V
Buffer time	1 - 32767 s	600 s
Maximum buffer time [1]	Yes / No	No

Parameter	Value range	Default setting
Additional buffer time after the PC was powered down [3]	1 - 300 s	60 s
Expected buffer current [1]	0 - 40 A	0 A
Reset time	1 - 120 s	5 s
Enable reset after buffering	Yes / No	No
Downtime alarm	0 - 20000 ms	100 ms
Wait time for stable input voltage	0.2 - 65 s	1.0 s
R test interval [2]	1 - 65535 h	4 h

[1] Parameter only available from V2.0.0 and higher

[2] Parameter only available from V2.1 and higher

[3] valid from V2.0.4 or V2.1

- Location: Details of the location identification where the SITOP UPS1600 is installed.

- Connection threshold: If the connection threshold value is fallen below, the SITOP UPS1600 starts buffering. If the value of the connection threshold is reached or undershot again later, the SITOP UPS1600 stops buffering.

- Buffer time: Length of time during which the system should be buffered by the SITOP UPS1600.

- Maximum buffer time: The MAX setting means that buffering is realized for as long as possible. The device only shuts down when the battery has discharged down to the defined stop buffering voltage. The value entered for the "Buffer time" parameter is not relevant in this case.

- Additional buffer time after PC shutdown: The time in which the system is buffered by the SITOP UPS1600 once the PC has been shut down.

- Expected buffer current: Load current, which is expected at the device output during buffer operation. Please adjust the correct application load current required. For current settings between 0 A and rated current, the display in the diagram "Remaining buffer time" is adapted. If a value of 0 A is entered, then for this parameter, the average value of the actual load current measured at the output over the last 10 min is assumed. The value of this parameter is used when calculating the remaining buffer time. The entered value may not exceed the rated device current.

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- Reset time: Time, in which the output voltage of the SITOP UPS1600 is switched off, although in the meantime the input voltage has returned. This function allows IPCs to automatically restart.

- Enable reset time after buffering: If the value is set to "Yes", the SITOP UPS1600 shuts down the output for the selected interrupt time if, in the meantime, the input voltage returns after the buffer time has expired. Using this function, after the SITOP UPS1600 has been powered down, an IPC can be switched on again, for example.

- Downtime alarm: The time in which no alarm is issued to the system although it is buffered.

- Wait time for stable input voltage: The time in which no alarm is issued to the system although the connection threshold has been undershot.

- R test interval: The time interval between battery tests can be set using the parameter.

To reset the parameters to their initial value, click the "Reset to initial values" button. All parameters for the base device will be reset to their initial value.

Configuring the energy storage

The characteristic values of a SITOP UPS1100 battery module are automatically read by the coding. If a SITOP UPS1100 battery module is used, activate the "SITOP UPS1100 battery" checkbox.

If you are using a different battery, activate the "Use third-party battery" checkbox. Enter the rated values of the other battery. The following parameters are available under "Hardware configuration> Energy storage".

Parameter	Value range
Battery capacity	0.1 - 3,200 Ah
End-of-charge voltage	24 - 30 V
Charge current	0.001 - 5 A
Faulty battery voltage	1 - 18 V

- Battery capacity: Total capacity of the installed batteries

- End-of-charge voltage: The charging completes when the selected end-of-charge voltage is reached.

- Charge current: The battery is not charged with more than the selected charge current. The manufacturer's details for the permitted charge current of the battery must be observed. If several batteries are connected, the smallest permitted charge current applies.

- Faulty battery voltage: If the battery voltage falls below this value, it will be considered as being defective by the SITOP UPS1600 and is not charged.

To reset the parameters to their initial value, click the "Reset to initial values" button. All parameters for the energy storage will be reset to their initial value.

3.6.8 Behavior of the SITOP UPS Manager

The monitoring of the uninterruptible power supply by the SITOP UPS Manager permits other applications to be started event driven.

In the event of a power failure, the SITOP UPS Manager can use the network to perform a controlled shutdown of the devices connected to the uninterruptible power supply in the specified order, or place them in a defined standby state.

Alarms and notifications can also be sent to the system or to users (SMS, e-mail).

The applications can be started depending on the following events and factors:

- Power failure

- Power return

- State of the buffer readiness by the SITOP UPS1600:

    - General buffer readiness

    - Remaining buffer time

- State of the SITOP UPS1600 battery:

    - Battery charge

    - for recommended battery replacement

- State of the communication interface:

    - Connection established/interrupted

- System alarm status

    - At least one alarm is active/no longer active

Storing an application

In the various submenus, you can store applications that will be started depending on the above-mentioned events and factors. Examples of such applications are:

- Batch scripts or runnable files, for example, to shut down a computer in the network.

- Applications that inform the user about the state of the power supply.

- Applications that protect licenses assigned to computers (floating licenses) from being lost because of power failure.

Procedure

1. Open the appropriate submenu under "Software configuration".

2. Activate the checkbox to start the application for the desired event.

3. Click on "Browse" to select an application.

4. Select the required application in a directory.

    The application path is displayed.

    //Network/LicenceManagement/LicenceProtecter.exe

5. To check whether the application will performed correctly, click the "Start" button.

6. Enter the time in minutes and seconds after which the application should be started.

Note

It is recommended that only applications without user interface – or those that automatically exit themselves without any manual intervention – are started.

Behavior during buffer mode

Make the settings under "Software configuration > Buffer operation" vor.

The following options are available:

- Start application on power failure.

- Start application after power return.

- Show SITOP UPS Manager on power failure.

- Show SITOP UPS Manager after power return.

- Shut down PC on power failure.

NOTICE

If the buffer time (see Section Configuring the SITOP UPS1600 (Page 119)) is set shorter than this time, the SITOP UPS1600 switches off before the PC has been shut down. The PC is then no longer protected. In master-slave operation, the time required to run down the master must be longer than the time required for the slave.

Use the "upsshutdown.exe" program

After installing UPS-Managers (from version V4.71 and higher), file "upsshutdown.exe" is located under the following path:
C:\Users\Public\Documents\SitopUPSManager\commands\shutdown

In the settings for the UPS Manager under SW configuration, activate the following:

1. Activate "Switch off UPS after manual shutdown"under "General settings"
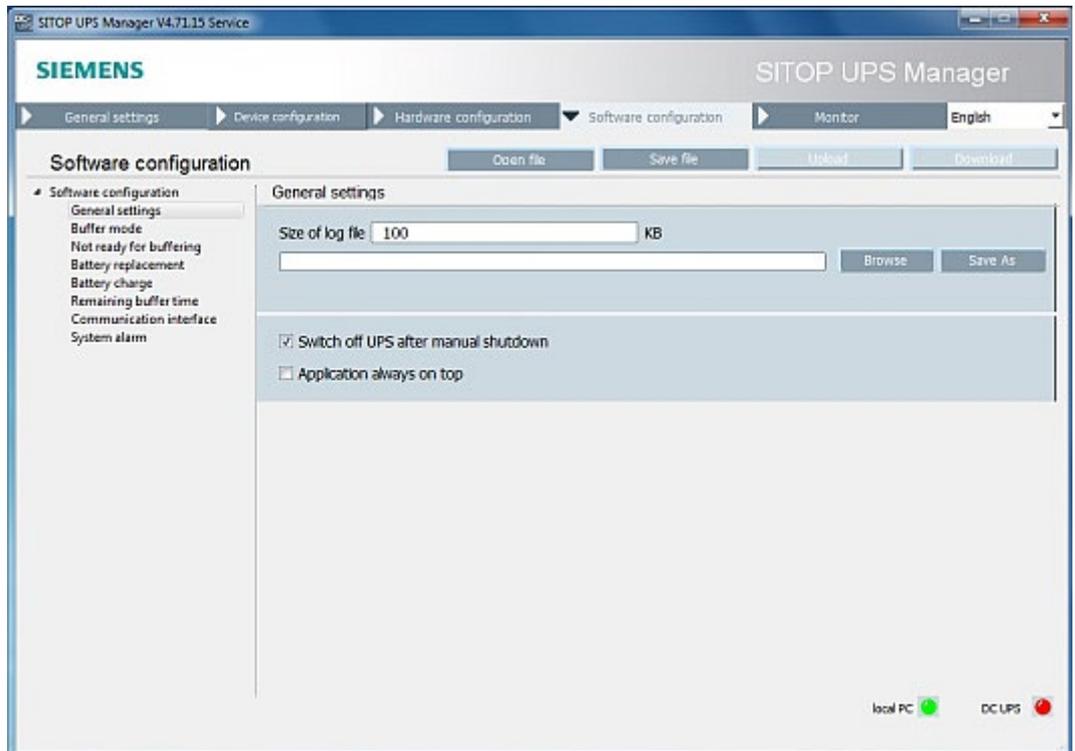
2. Under buffer operation, activate "Start application on power failure" and specify the path to your batch data, e.g. to
   C:\Users\Public\Documents\SitopUPSManager\commands\shutdown\runupsshutdown.bat. (adapt to the specific requirements)

3. Under buffer operation, deactivate "Shut down PC on power failure"
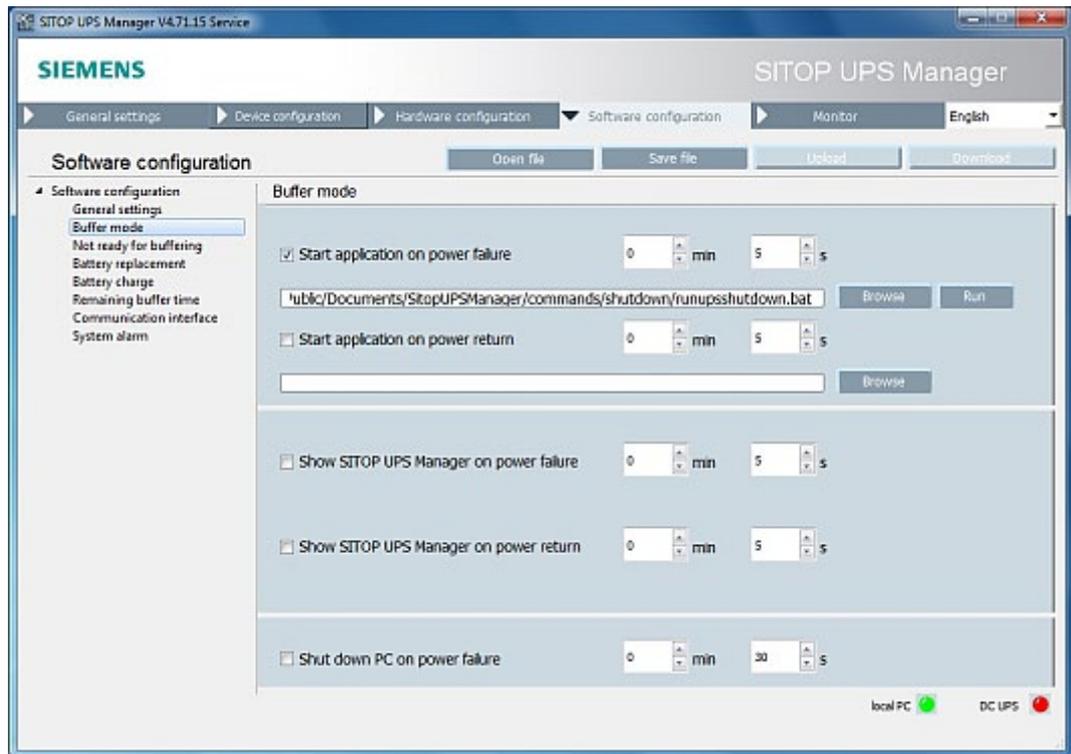
Description of the program arguments "upsshutdown.exe":

upsshutdown.exe -[c][r][s]
c: PC is shut down
s: S command is sent to the UPS. The UPS is shut down without any additional delay.
r: R command is sent to the UPS. After the PC has been shut down (no response to ping), the UPS shuts down after waiting for time "Additional buffer time after PC shutdown".

Example for runupsshutdown.bat:

```
@echo off
set var = C:\Users\Public\Documents\SitopUPSManager\commands\shutdown
echo "% var %" cd "% var %"
dir > info.txt
upsshutdown.exe -cr
```

Behavior for missing buffer readiness

Make the settings under "Software configuration > Not ready for buffering".

The following options are available:

- Start the application if buffer mode is not possible.
- Start the application when buffer readiness returns
- Open the SITOP UPS Manager if buffer mode is not possible
- Open the SITOP UPS Manager when buffer readiness returns.

Behavior when battery replacement required

Make the settings under "Software configuration > Battery replacement".

The following options are available:

- Start the application if battery replacement is recommended (from SITOP UPS Manager V4.12.5 and higher).
- Start the application once the battery has been replaced.
- Open the SITOP UPS Manager if battery replacement is recommended (from SITOP UPS Manager V4.12.5 and higher).
- Open the SITOP UPS Manager once the battery has been replaced.

Behavior depending on the battery charge

Make the settings under "Software configuration > Battery charge".

The following options are available:

- Start the application when the battery charge is > 85 % of the maximum.
- Start the application when the battery charge is < 85 % of the maximum.
- Open SITOP UPS Manager when the battery charge is > 85 % of the maximum.
- Open SITOP UPS Manager when the battery charge is < 85 % of the maximum.

Note

From UPS Manager Version V4.71, a percentage value of the battery charge can be programmed where an action should be initiated.

Behavior depending on the remaining buffer time

Make the settings under "Software configuration > Remaining buffer time". Specify the minimum buffer time under "Hardware configuration > Base Unit" in entry "Buffer time".

The following options exist in the "Remaining buffer time" submenu:

- Start the application if the desired buffer time cannot be achieved.
- Start the application if the desired buffer time can be achieved again.
- Display the SITOP UPS Manager if the desired buffer time cannot be achieved.
- Display the SITOP UPS Manager if the desired buffer time can be achieved again.

Response when communication to the SITOP UPS1600 is interrupted

Make the settings under "Software configuration > Communication interface".

The following options are available:

- Start the application if there is a connection to the SITOP UPS1600.
- Start the application if the connection to the SITOP UPS1600 is interrupted.

● Open the SITOP UPS Manager if there is a connection to the SITOP UPS1600.

● Open the SITOP UPS Manager if the connection to the SITOP UPS1600 was interrupted.

Behavior for pending system alarms

Make the settings under "Software configuration > System alarms". Reasons for a system alarm are contained in the alarms list (see Section Troubleshooting (Page 183)).

The following options exist in the "System alarms" submenu:

● Start the application if at least one system alarm is active.

● Start the application if no system alarm is active.

● Open the SITOP UPS Manager if at least one system alarm is active.

● Open the SITOP UPS Manager if no system alarm is active.

3.6.9 Display and visualization

The "Display" menu item shows information about the device data and parameters as well as the state of the power supply.

The following display options exist:

● Active alarms

● Alarm history

● Operating data: Data and parameters of the basic device and the energy storage device

● Trend charts:

  – Load current over time

  – Input voltage over time

  – Remaining buffer time over time

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

  – Battery temperature over time

  – Battery charge over time

  – Charge current over time

● Online functions:

  – Updating the firmware

Displaying pending alarms

1. Select "Display > Pending alarms".
   The pending alarms are displayed in a tabular form.

	Name	Time stamp	Help
1	Buffer mode not possible	20.10.2014 14:25:18	Buffer mode not possible - check settings, cabling, fuse, and battery voltages
2	Insufficient charge level	20.10.2014 14:20:43	The battery charge level is too low to guarantee the configured buffer time.

The individual columns contain the following information:

- Name: A descriptive name of the alarm

- Time: The time and date of the alarm arrival

- Help: Description of the alarm

Displaying the alarm history

1. Select "Display > Alarm history".
   The alarm history is displayed in a tabular form.

	Name	Time stamp	Alarm
1	Buffer mode not possible	20.10.2014 14:31:01	Outgoing
2	Connection to battery interrupted	20.10.2014 14:31:01	Outgoing
3	Battery defective (battery index: 1)	20.10.2014 14:31:06	Outgoing
4	Insufficient charge level	20.10.2014 14:31:20	Outgoing
5	Insufficient charge level	20.10.2014 14:31:39	Incoming
6	Buffering	20.10.2014 14:31:58	Incoming
7	Buffering	20.10.2014 14:32:04	Outgoing
8	Battery test	20.10.2014 14:32:08	Incoming
9	Battery test	20.10.2014 14:32:08	Outgoing

The individual columns contain the following information:

- Name: A descriptive name of the alarm

- Time: The time and date when the alarm comes and goes

- Alarm:

    – incoming: Occurrence of the alarm event

    – outgoing: Rectification of the alarm event

Data and parameters SITOP UPS1600

1. Select "Display > Operating data".

2. Under "Base Unit" you can find data and parameters of the SITOP UPS1600.

The following data are displayed:

- Order number

- Serial number

- SW version
- HW product version

The following parameters are displayed:

- Buffer mode
- Remaining buffer time

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- Input voltage
- Load current
- Ready for buffering

Energy storage data and parameters

1. Select "Display > Operating data".
2. The data and parameters of the energy storage device can be found under "Energy storage".

The following data are displayed:

- Order number
- Serial number
- SW version

The following parameters are displayed:

- Battery capacity
- Battery charge level
- Battery temperature
- Measured charge current

Trend charts

You have the possibility of graphically displaying values about the power supply under "Display> Trend chart", for instance the load current over time:
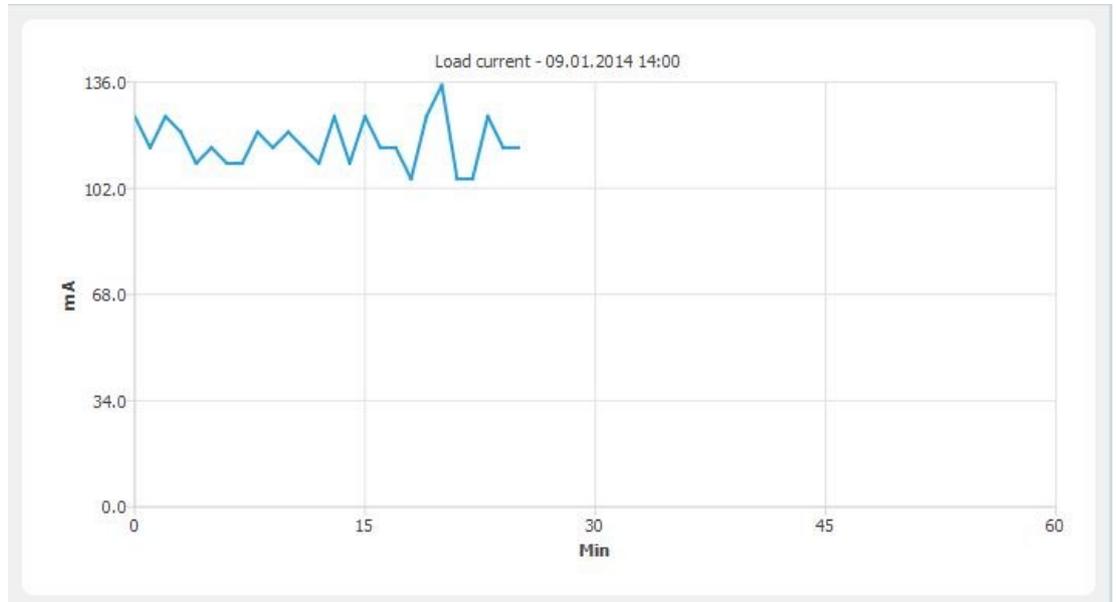
The following trend charts can be selected:

- Load current over time
- Input voltage over time
- Remaining buffer time

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- Battery temperature over time
- Battery charge over time
- Charge current over time

Procedure

1. Select "Display > Trend diagram".

2. Select "Base Unit" to display trend diagrams for SITOP UPS1600 values

   or

   select "Energy storage" to display trend diagrams for the energy storage device values.

   3 diagrams are available below both points.

3. Click the appropriate button to display the required trend diagram.

3.6.10 Determining the firmware version

The firmware version of the SITOP UPS1600 can be determined as follows using the UPS Manager:

Precondition

The SITOP UPS1600 is connected to your PC via USB.

Also possible for a connection via Ethernet with software version> V2.0 - and manager version > 4.60.1

Procedure

1. Start the UPS Manager.

2. Using the menu command "Display > Operating data > Base unit" the firmware version of the SITOP UPS1600 is displayed.
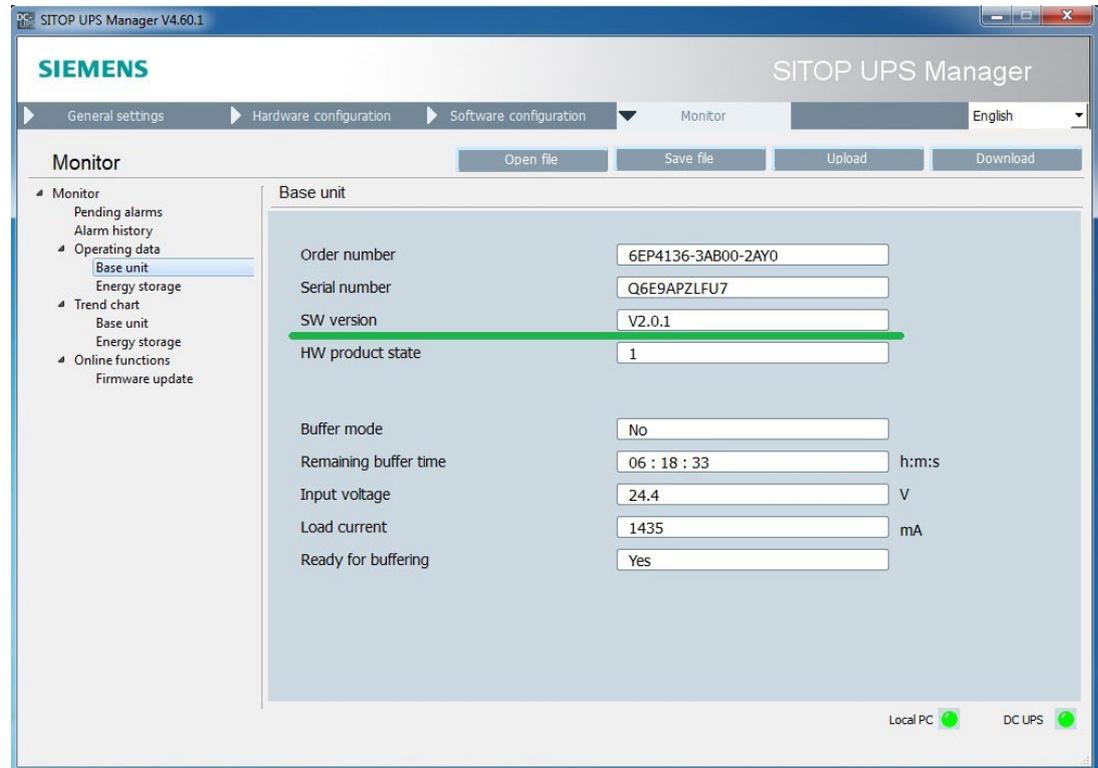
In the example shown, firmware version V2.0.1 is installed on the SITOP UPS1600.

3.6.11 Firmware update

⚠ WARNING
The SITOP UPS1600 is reset while updating the firmware. For safety reasons, the output is switched off.
Ensure that no damage is caused to the plant or system.
Ensure that the PG/PC and/or all switches, routers and gateways that are used have an independent power supply during the firmware update.

> ⚠ **WARNING**
>
> **Firmware update with UPS-Manager**
>
> If for the firmware update, the UPS Manager is used, please note that for a firmware update from version V2.1 to V2.2 or higher, then a UPS Manager with version V4.72 or higher must be used. This also applies to firmware updates from V2.2.0 to higher versions.

Note

Install the current version of the SITOP UPS Managers, before you start the firmware update. It is possible that an older version (less than V4.5X) of the SITOP UPS Managers does not support this firmware update. The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.com/sitop) or directly (https://support.industry.siemens.com/cs/ww/en/view/75854607).

Note

Do not switch-off the devices during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/en/79207181). Different firmware updates are offered depending on the amp rating of the SITOP UPS1600.

Note

Observe the compatibility of the firmware!

Other firmware updates are not compatible.

Determine the amp rating of your SITOP UPS1600 and download the appropriate firmware update.

Note

It is not possible to downgrade the device firmware to a release with a version number lower than the firmware installed in the device itself. Information on how to read out the firmware release from the device is provided in Section Determining the firmware version (Page 132).

Note

"Reset to Factory" function:

All configuration parameters are reset to the default setting; 0.0.0.0 is used for the IP address. A new IP address must then be assigned, as otherwise there is no connection to the UPS Manager or TIA Portal.

See also

Display and visualization (Page 128)

Preconditions

- The SITOP UPS1600 has been correctly connected and linked with the system.

- PG/PC with SITOP UPS Manager is connected with the system.

Procedure

1. Select "Display > Online functions".

2. Select "Update firmware".

3. To select the path to the directory with the unzipped files, click on the "Browse" button. In this directory, select the "ups10a.upd", "ups20a.upd" or "ups40a.upd" file.

4. Click on the "Start" button.
   The firmware is updated.

5. A message appears in the window area after the successful update.

6. Manually restart the SITOP UPS1600 by interrupting the SITOP UPS1600 power supply. Restore the power supply to the SITOP UPS1600.

   The firmware update has been performed successfully.

3.7　Web server

The web server is used to monitor the SITOP UPS1600. It operates independently of UPS Manager and PROFINET access.

New functions of the web server from V2.1 and higher:

- Write access

- User administration

- Access via https

3.7.1　Accessing the web server

A Web browser is used for the access and operation.

The following Web browsers are suitable:

- Internet Explorer V8 (on MS Windows XP)

- Internet Explorer V10 (on MS Windows 7)

- Internet Explorer V11 (on MS Windows 7)

- Mozilla Firefox from V40 (on MS Windows 7)

- Google Chrome from V44 (on MS Windows 7)

Preconditions

- The computer with installed web browser is connected with the SITOP UPS1600 via Ethernet.

- The Web browser can display SVG graphics. From version V2.1 and higher, it is no longer necessary that SVG graphics are supported.

  If your web browser cannot display SVG graphics, then "Please install the SVG viewer for a correct display" message appears on the start screen. To permit the correct display, perform the following steps:

  – Download the SVG update at (http://www.savarese.com/software/svgplugin).

  – Install the SVG update.

  – If required, restart your computer.

- The SITOP UPS1600 has an IP address that you know.

- Web server access is activated.

  The following sections explain how to activate access to the web server:

  – For SIMATIC STEP 7 in the TIA Portal at Parameterizing the UPS1600 (Page 58).

  – For SIMATIC STEP 7 at Parameter assignment (Page 77).

  – Users without SIMATIC STEP 7, must proceed as follows (for software version V2.1.1):

    Device in the state when supplied:

    1. Turn both rotary coding switches into the REN and OFF positions.
    2. Switch the device off and on again. Please wait approximately 1 minute as a new certificate is created due to the IP address change.
       The device can now be accessed via https://192.168.20.220.
    4. Login with name "admin" and password "admin".
    5. Under "HW Configuration -> General -> Web server -> Settings" the web server must be permanently activated. ("Activate web server on this module").
    6. Under "HW Configuration -> General -> Communication interface", IP address, subnet mask and router address can be set.
    7. To transfer changes to the device, the "Download to device" button must be pressed.
    8. Now turn the rotary coding switches to the required position and switch the device off and on again. Please wait approximately 1 minute as a new certificate is created due to the IP address change.
    The device can now be accessed at the new IP address.

    If the IP address was already changed, then the state when originally shipped must be restored. You can do this, for example, using the Primary Setup Tool and function "Reset" under "Module" - or using the PRONETA tool and function "Reset network parameters".

  – Users without SIMATIC STEP 7, must proceed as follows (from software version V2.1.2 and higher):

    1. Turn both rotary coding switches into the REN and OFF positions.
       The device is now accessible via https://192.168.20.220 (if the device was

previously in the state when originally shipped with IP address 0.0.0.0) – or using the already set IP address. Under certain circumstances you must wait approximately 1 minute because a new certificate must be created due to the IP address change.
3. Login with name "admin" and password "admin".
4. Under "HW Configuration -> General -> Web server -> Settings" the web server must be permanently activated. ("Activate web server on this module").
5. Under "HW Configuration -> General -> Communication interface", IP address, subnet mask and router address can be set.
6. To transfer changes to the device, the "Download to device" button must be pressed. Under certain circumstances you must wait approximately 1 minute because a new certificate must be created due to the IP address change.
7. Now turn the rotary coding switches to the required position.
The device can now be accessed at the previously set IP address or the new IP address.

Procedure

1. Connect the client (PG, PC) via the PROFINET interface with the CPU.

2. Open the web browser.
   In the address dialog box of the web browser, enter the IP address of the SITOP UPS1600 in the form http://ww.xx.yy.zz (input example: http://192.168.0.14).

The start page of SITOP UPS1600 is opened. You can navigate to further menus from the start page.

3.7.2 The web server user interface
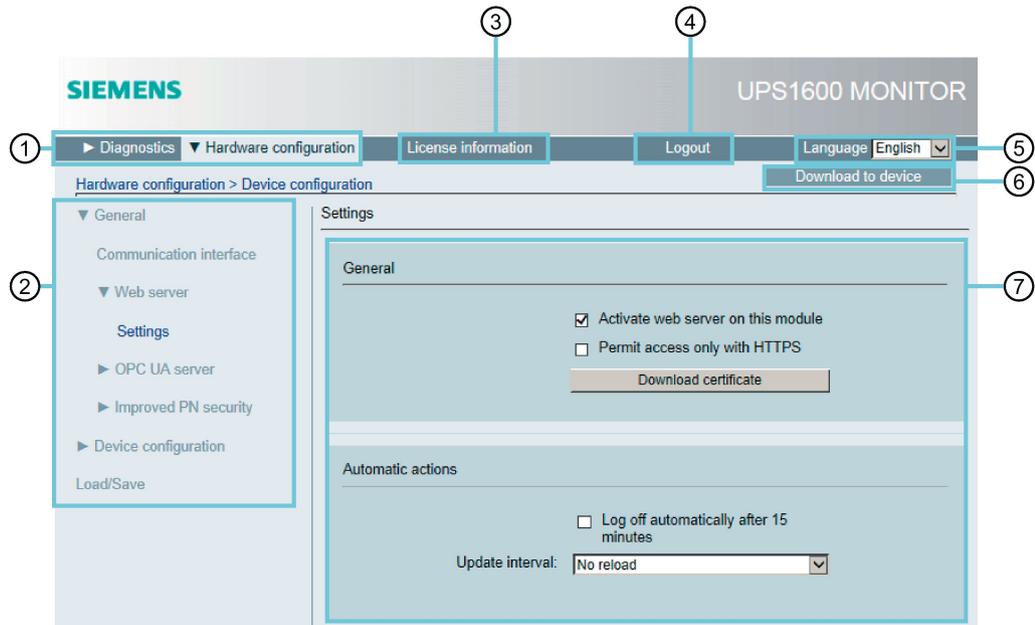
① Menu selection
② Navigation submenus
③ "License information" button
④ "Logout" button
⑤ Language selection
⑥ "Download to device" button
⑦ Editor area

The menu selection ① allows you to access menus "Diagnostics" and "HW configuration" and the various submenus. The functions of the menus are described in the following sections.

You access the submenus from the navigation submenus ②.

The associated settings possible in the selected submenu are made in the editor area ⑦.

You load the configuration to the devices by pressing button ⑥.

The language selection ⑤ is used to select the user interface language of the web server. The German, English, French, Italian, Spanish, and Chinese languages are available.

Click on the "Logout" ④ button to log out from the current web server session. The web server can only be accessed by logging in again.

You can download the license information of the UPS1600 system using the "License information" ③ button.

Grayed out menus

If the SITOP UPS1600 was assigned a SIMATIC S7 control as I/O device, or the SITOP UPS Manager is connected to the SITOP UPS1600, then the web server is in the read-only mode. The following applies in the read-only mode:

● No write access is possible; the parameter settings can only be read (input values shown in gray, valid for software version up to V2.0)

● Firmware cannot be updated, the item is hidden.

3.7.3 Functions of the web server

The functions of the web server are split up between the two menus "Diagnostics" and "HW Configuration".

Use the "Download to device" function to load changes that you have made to the device, see Loading the configuration (Page 141).

Diagnostics

You can find the following submenus here:

● Alarms:
For an overview of past and active alarms, see Alarm monitoring (Page 141).

● Operating data:
For an overview of the operating data, see View the data of the SITOP UPS1600 (basic device) (Page 143) and Viewing the energy storage data (Page 144)

● Online functions with the options:

– Firmware update

– Reset to factory setting

For the online functions, see Online functions (Page 145).

HW configuration

Here, in the following areas you can make changes:

● Configuring the PROFINET interface, see General (Page 146)

● Changing the web server settings, see Web server (Page 148)

● Configuring the OPC UA interface, see OPC UA server (Page 149).

● Making PN security settings, see Improved PN security (Page 151).

● Managing users, see User administration (Page 151).

● Configuring basic devices and energy storage devices, see Device configuration (Page 153)

You can save the configurations and load the existing configurations into the device, see Load / Save (Page 157).

3.7.4 Determining the firmware version

The firmware version of the SITOP UPS1600 can be determined as follows via Ethernet using the web server:

Using the menu command "Diagnostics > Operating data > Base unit" the firmware version of the SITOP UPS1600 is displayed.
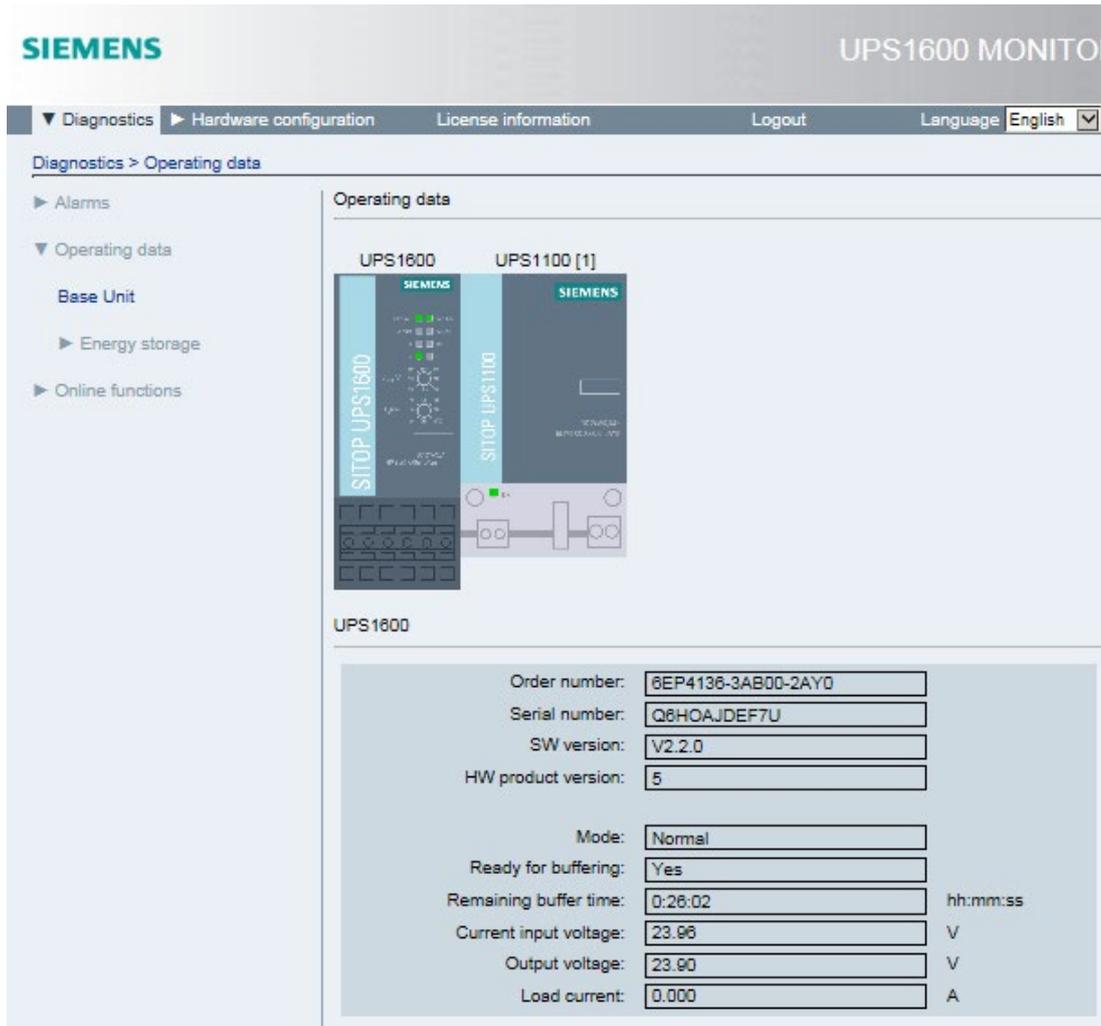
In the example shown, firmware version V2.2.0 is installed on the SITOP UPS1600.

3.7.5 Firmware update with web server

Precondition

- The SITOP UPS1600 has been correctly connected and linked with the system.
- PG/PC with the actual web browser is connected to the system and is logged on.

Note

Administrator rights for the web server are required in order to update the firmware.

Procedure

1. Select "Diagnostics > Online function > Firmware update"

2. Click on button "Select file". Select the appropriate update file.

3. Click on button "Run update".

   Firmware update starts.

   A message is displayed after the successful update.

4. Manually restart the SITOP UPS1600 by interrupting the SITOP UPS1600 power supply.

5. Reconnect the SITOP UPS1600 power supply.

The firmware update has been performed successfully.

3.7.6 Loading the configuration
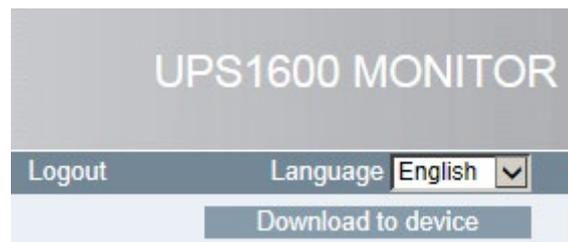
You can download the actual configuration from the web server directly to the device using the "Download to device" button.

Procedure for saving the configuration

1. Click on the "OK" button to load the configuration.

2. Acknowledge the confirmation prompt.

3.7.7 Diagnostics

3.7.7.1 Alarm monitoring

You can use the web server to obtain information about active alarms and the history of the alarms. Every alarm that concerns the SITOP UPS1600 and the connected battery modules is recorded. You can display active alarms using "Diagnostics > Alarms > Pending alarms".

Pending alarms

The currently pending system alarms are provided in this list.

Event	Date and time	Details on event
Buffer mode not possible	10.03.2017 07:37:26	Buffer mode not possible - check settings, cabling, fuse, and battery voltages
Deep discharge battery	10.03.2017 07:37:26	Battery is deep discharged - no buffering possible
Battery defective (battery index: 1)	10.03.2017 07:37:16	Battery defective - check fuse and battery voltages

Displaying the alarm history

1. Select menu "Diagnostics".

2. Select the "Alarm history" entry under "Alarms" in the navigation.

   The alarm history is displayed in a tabular form.

Event	Date and time	Incoming/outgoing
Insufficient charge level	10.03.2017 13:41:29	
New battery detected (battery index: 1)	10.03.2017 13:41:23	
Battery test	10.03.2017 13:41:23	
Battery test	10.03.2017 13:41:23	
Output switched on	10.03.2017 13:41:23	
Insufficient charge level	10.03.2017 13:41:23	

The individual columns contain the following information:

- Name: A descriptive name of the alarm

- Date and time: The time and date when the alarm comes and goes

- Incoming/outgoing:

  – incoming: Occurrence of the alarm event

  – outgoing: Rectification of the alarm event

Note

The alarm history is displayed only when no further communications relationships to the SITOP UPS1600 have been established.

Examples for further communications relationships are communication relationships via STEP 7 or the SITOP UPS Manager.

3.7.7.2 View the data of the SITOP UPS1600 (basic device)

1. Select menu "Diagnostics"

2. Select the "Base unit" entry under "Operating data" in the navigation.

Here, you can find the following information:

- Data of the SITOP UPS1600:

  - Order number

  - Serial number

  - SW version

  - HW product version

- Operating mode (normal or buffer mode)

- Ready for buffering

- Remaining buffer time

Note

From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- Current input voltage
- Output voltage
- Load current

3.7.7.3 Viewing the energy storage data
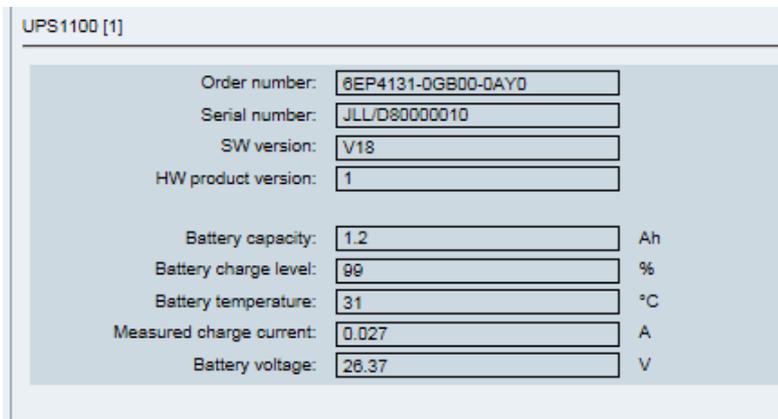
Figure 3-3   Diagnostics energy storage devices

1. Select menu "Diagnostics"
2. Select the "Energy storage" entry under "Operating data" in the navigation.

Here, you can find the following information about the connected energy storage devices:

- Order number
- Serial number
- SW version
- HW product version
- Battery charge level
- Battery temperature
- Measured charge current
- Battery voltage

3.7.7.4 Online functions

Firmware update

The firmware update process is described in detail in the "Firmware update readme", which is provided with the firmware update download package.

Follow the instructions provided there carefully. The files for updating the firmware are available online at: (https://support.industry.siemens.com/cs/ww/en/view/79207181)

Refer also to Section Firmware update with web server (Page 140).

Reset to factory settings

A reset to the factory settings deletes all hardware and software configurations stored in the SITOP UPS1600 and restores the factory settings.

This affects, for example:

- IP address

- Device name

- Parameter values for the SITOP UPS1600 and assigned supplementary modules.

- "Web server activated" setting. Web server is de-activated.

Procedure

1. Select menu "Diagnostics".

2. Select submenu "Online functions".

3. Select entry "Reset to factory setting".

4. In the editor area, click on "Reset to factory settings".

5. Acknowledge the confirmation prompt with "OK".

3.7.8 HW configuration

3.7.8.1 General

You have the following options under menu item "HW Configuration > General":

- Configuring the PROFINET interface

- Making settings for the web server

- Making settings for the OPC UA server

- Making settings for the NTP client

- Making settings for PROFINET security

- Managing users

PROFINET interface

You have the option of configuring the PROFINET interface regarding the following points:

- General I&M (identification & maintenance)
    - Defining the location ID
    - Defining the contact
    - Defining the device name
- Defining whether the IP address is dynamically assigned (activate DHCP) or whether it should be fixed.

Procedure

1. Select the "Hardware configuration" menu.

2. Select submenu "General".

3. Select the "Communication interface" entry.

4. In the editor area, under "Device name" enter the required device name.

5. To dynamically assign the IP address: Activate checkbox "Source IP address via DHCP".

6. To assign a fixed IP address: Activate checkbox "Fixed IP address" and enter the appropriate parameters in the editor area.

7. Load the data to the device, see Loading the configuration (Page 141).

3.7.8.2 Web server

Here, you can make general settings and define which actions should be automatically executed.

Settings
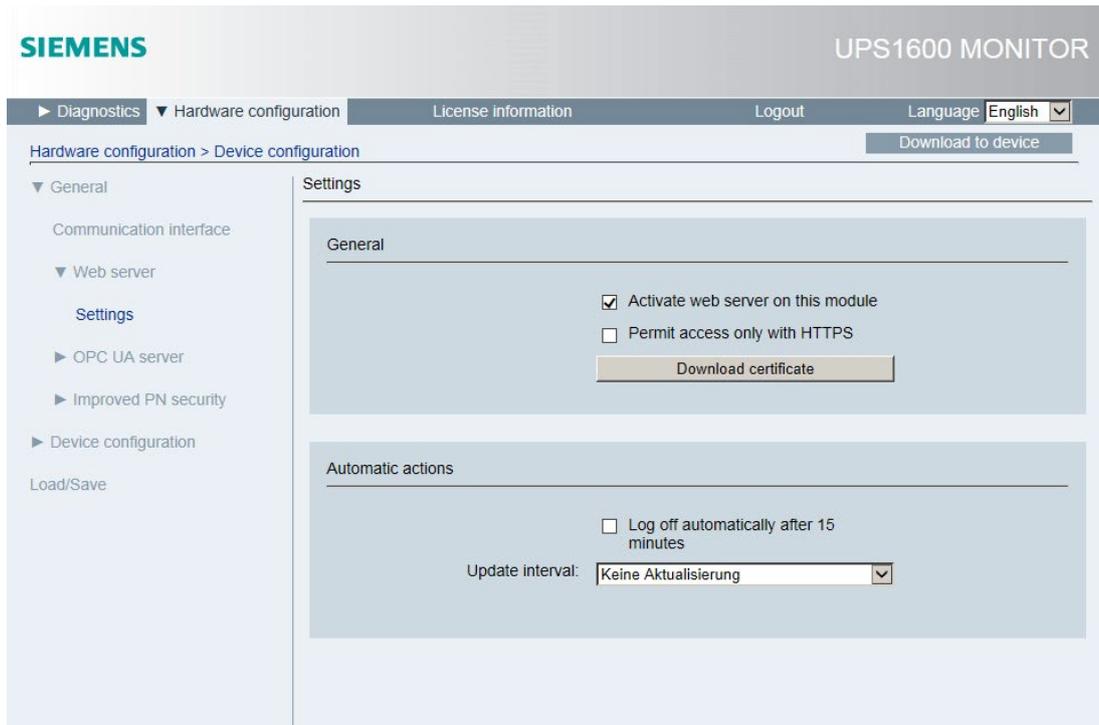
Parameters	Value range	Default setting
Activate web server on this module	Yes/no	No
Permit access only with HTTPS	Yes/no	Yes
Log off automatically after 15 minutes	Yes/no	No
Update interval	0 / 5 s / 10 s / 20 s / 30 s / 60 s	0 = no automatic up-date

● **Activate web server on this module**

Define as to whether the device may be accessed via the web server.

● **Permit access only with HTTPS**

Define whether access is only permissible via HTTPS.

- **Download certificate**

  You can download the certificate for encrypted connection via HTTPS by pressing the "Download certificate" button.

- **Log off automatically after 15 minutes**

  Define whether a user should be automatically logged off after closing the web server.

- **Update interval**

  Define the interval in which the actual values are sent to the web server.

3.7.8.3 OPC UA server

Here, you configure the OPC UA server.

Settings

General

- OPC UA server activated

  Define as to whether device can be accessed via the OPC UA interface. If the option is activated, then the SITOP PSU8600 acts as OPC UA server.

- Unencrypted access activated

  If the option is activated, then unencrypted access via the OPC UA client is possible. Activating the option is not recommended.

- OPC UA server port

  The preset port number is 4840. You can enter another port number.

3.7.8.4 NTP client

You configure the NTP client under "HW configuration > General > OPC UA server > Settings".
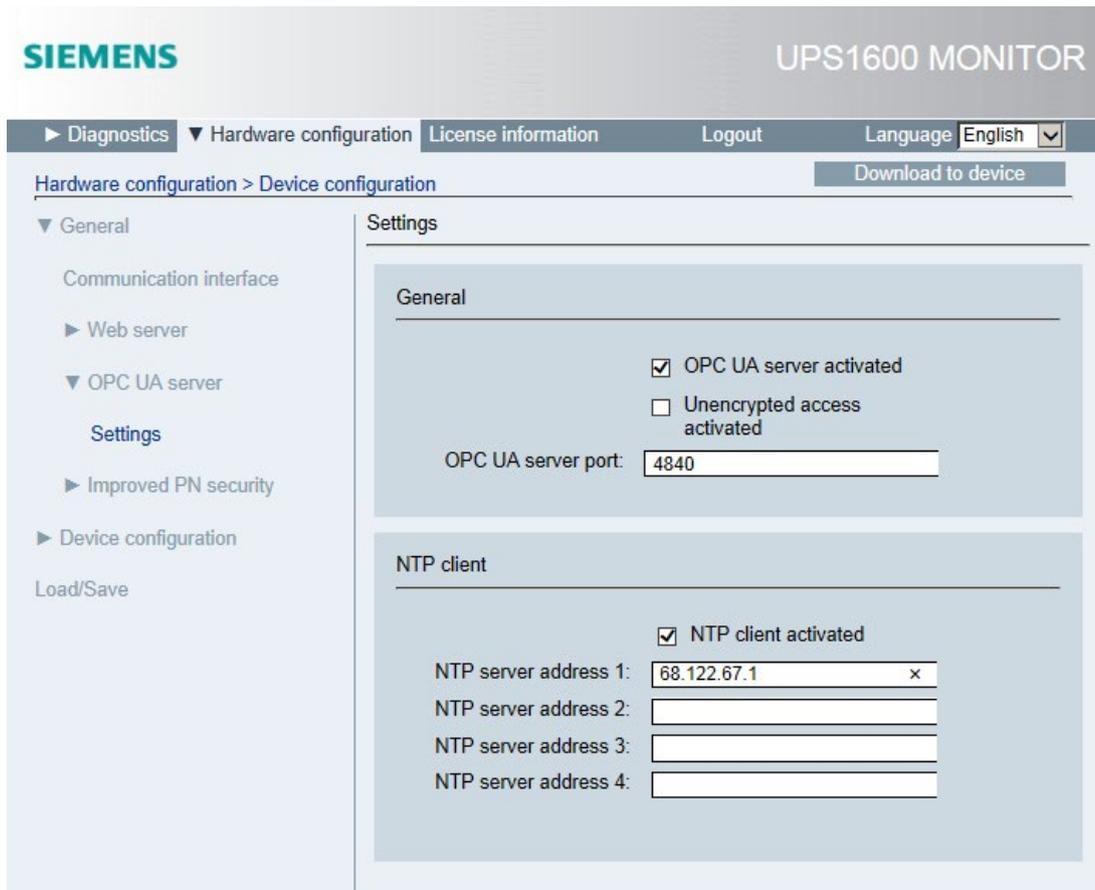
If the NTP client is activated, then the local time is synchronized with the specified time of the specified NTP server.

The NTP update interval is automatically and dynamically adapted between 64 seconds and 68 minutes 16 seconds.

The time of the last synchronization and the next scheduled synchronization are displayed.

- NTP client activated

    Here, activate the NTP client.

- NTP server address 1 … 4

    Enter up to 4 IP addresses of NTP servers.

3.7.8.5   Improved PN security

Settings
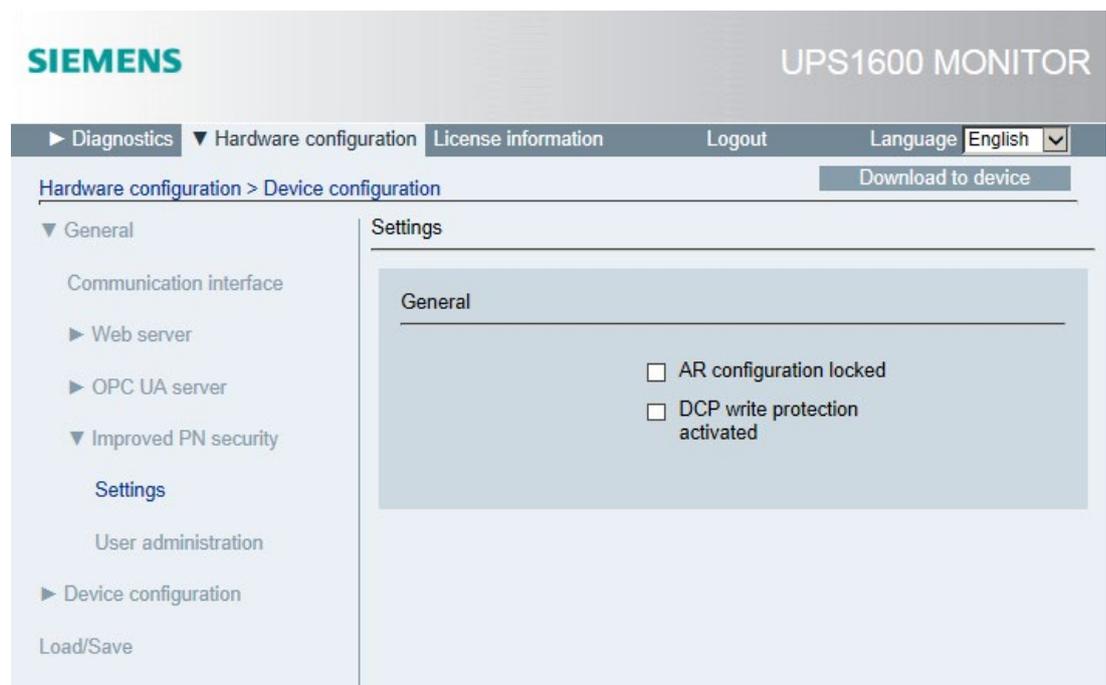
Activate these options in order to protect the system against changes initiated externally.

- AR configuration locked
- DCP write protection activated

3.7.8.6   User administration

You can access user administration under "HW configuration > General >Improved PN security > User administration ".

User administration

Here, you can change the administrator password and set up the system so that guests can access the system - and up to 14 additional user accounts with different authorization levels.
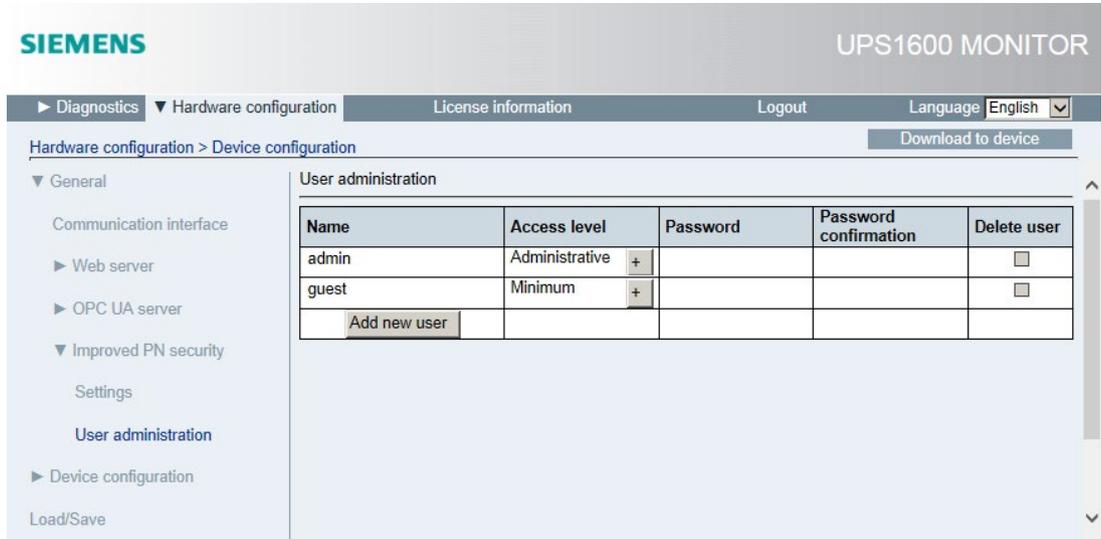
Procedure for changing the administrator password

Note

Users "admin" and "guest" are preset and cannot be deleted.

---

1. Select the "Hardware configuration" menu.

2. Select submenu "General > Improved PN security".

3. Select entry "User administration".

4. Enter the new password in the editor area, in line "admin" under "Password".

Note

The password must satisfy the following minimum requirements:

- min. 8 characters
- min. 1 uppercase letter
- min. 1 lowercase letter
- min. 1 digit
- min. 1 special character

The following characters are possible: ^[a-z0-9A-Z\\-_]+$

---

5. Enter the new password again under "Confirm password".

6. Load the data to the device, see Loading the configuration (Page 141).

> **Note**
>
> For security reasons, when installing for the first time, the default password should be changed. Further, it is recommended that passwords are regularly changed.

Procedure for setting up a guest access

1. Select the "Hardware configuration" menu.

2. Select submenu "General > Improved PN security".

3. Select entry "User administration".

4. Enter a password in the editor area under "guest" and select the individual access rights for guest access.

5. Enter the password again under "Confirm password".

6. Load the data to the device.

Procedure for setting up a user account

1. Select the "Hardware configuration" menu.

2. Select submenu "General > Improved PN security".

3. Select entry "User administration".

4. In the editor area, click on "Add new user" and in this line enter the name for the new user.

5. Select the individual access rights for the new user.

6. Enter a password for the new user - and repeat this to confirm the password.

7. Load the data to the device.

3.7.8.7 Device configuration

You set the parameters for basic devices and energy storage devices under menu item "HW Configuration > Device configuration".

Basic device configuration
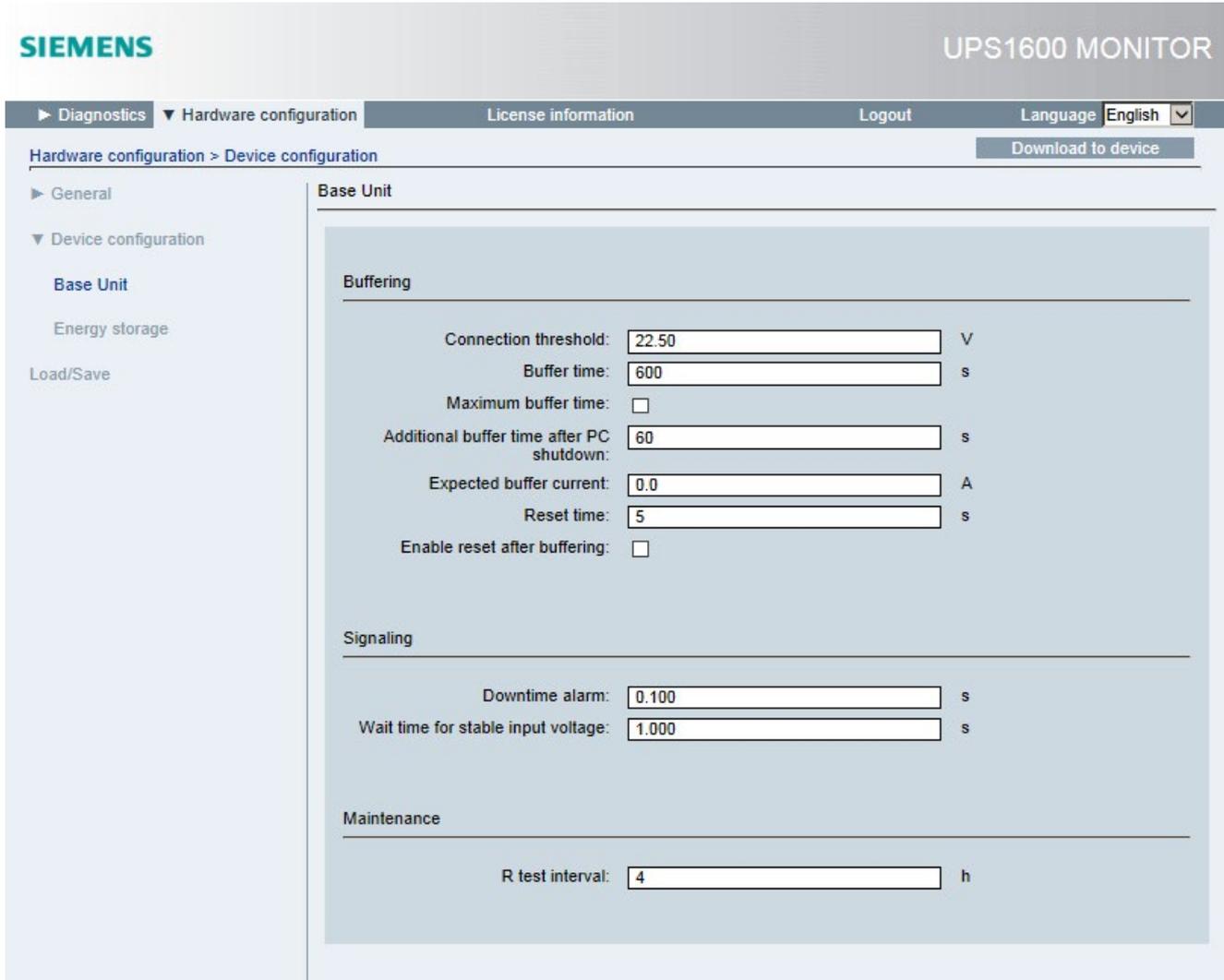
"Buffering" parameters

Parameter	Value range	Initial value
Connection threshold	21 - 25 V	22.5 V
Buffer time	1 - 32767 s	600 s
Maximum buffer time [1]	Yes / No	No
Additional buffer time after PC shutdown. [3]	1 - 300 s	60 s
Expected buffer current [1]	0 - 40 A	0 A
Reset time:		5 s
Enable reset after buffering	Yes / No	No

[1]   Parameter only available from SW version V2.0 and higher

[2]   Parameter only available from SW version V2.1 and higher

[3]   Valid from V2.0.4 or V2.1

- **Switch-in threshold**
  Setting the switch-in threshold.

- **Buffer time**
  Length of time during which the system should be buffered by the SITOP UPS1600.

- **Maximum buffer time**

  The setting means that buffering is realized for as long as possible. The device only shuts down when the battery has discharged down to the defined stop buffering voltage. The value entered for the "Buffer time" parameter is not relevant in this case.

- **Additional buffer time after PC shutdown**
  Time during which the system should be buffered by the SITOP UPS1600 after the PC was shut down.

- **Expected buffer current**

  Load current, which is expected at the device output during buffer operation. Please adjust the correct application load current required. For current settings between 0 A and rated current, the display in the diagram "Remaining buffer time" is adapted.

  If a value of 0 A is entered, then for this parameter, the average value of the actual load current measured at the output over the last 10 min is assumed. The value of this parameter is used when calculating the remaining buffer time. The entered value may not exceed the rated device current.

  Note

  From the instant in time when the SITOP UPS1600 is switched over into the buffer mode, to determine the expected buffer time, instead of the expected buffer current, the actually measured buffer current is used.

- **Enable reset after buffering**
  If the value is set to "Yes" then the output voltage is interrupted after the selected buffer time expires if, in the meantime, the input voltage returns. This option is useful, when, for example, computer networks are protected by the UPS that can be activated by a reset when the power supply is restored. For buffer time "MAX", the output voltage is not interrupted.

"Signaling" parameter

Parameter	Value range	Default setting
Downtime alarm	0 - 20,000 ms	100 ms
Wait time for stable input voltage	0.2 - 65 s	1 s

- **Downtime alarm**
  The time in which no alarm is issued to the system although it is buffered.

- **Wait time for a stable input voltage**
  Time where the input voltage must continually lie above the connection threshold so that buffering is exited and a transition is made into normal operation.

"Maintenance"

Parameter	Value range	Default setting
R test interval	1 … 65535 h	4 h

R test: The battery state is determined by subjecting it to a cyclic load.

Energy storage device configuration
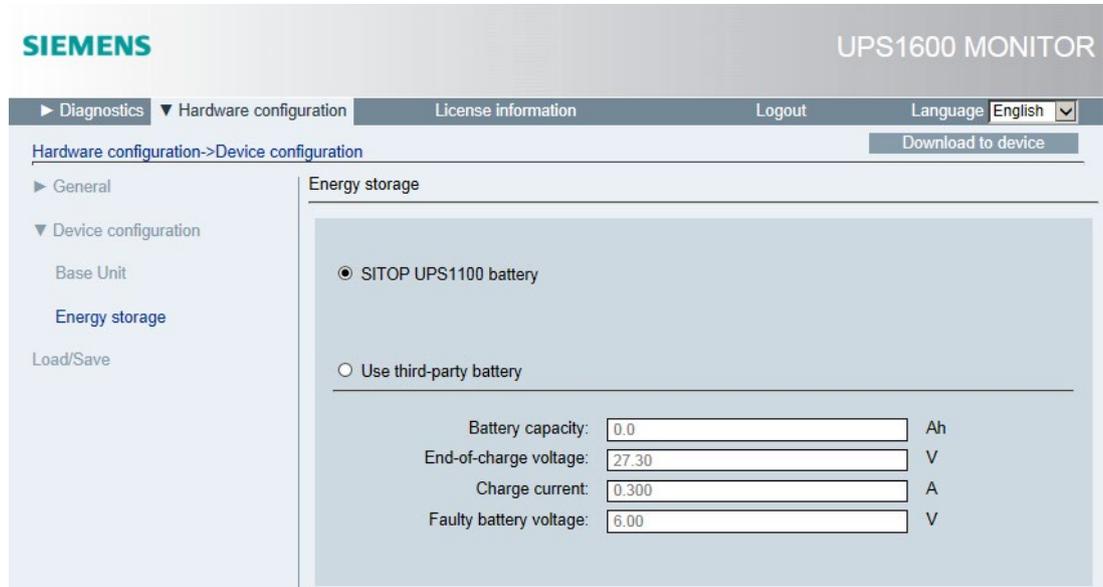
"Energy storage" has two different areas that depend on the battery type being used. First select whether you are using a SITOP UPS1100 battery module or some other energy storage.

Using a SITOP UPS1100 battery module

No additional parameterization.

Using a different battery module

Parameter	Value range	Default setting
Battery capacity	0.1 - 3,200 Ah	10 Ah
End-of-charge voltage	24 - 30 V	27.3 V
Charge current	0.001 - 3 or 4 or 5 A	0.3 A
Faulty battery voltage	1 - 18 V	6 V

- **Battery capacity**

  Total capacity of the installed batteries.

- **End-of-charge voltage**
  Maximum voltage up to which the battery may be charged.

- **Charge current**
  The battery is not charged with more than the selected charge current. The

manufacturer's details for the permitted battery charge current must be observed. Further, the following, device-dependent values apply:

– SITOP UPS1600 10 A: Maximum permissible charge current 3,000 mA
Derating for T_u > 40 °C or U_{in} < 24 V: 2,000 mA

– SITOP UPS1600 20 A: Maximum permissible charge current 4,000 mA
Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

– SITOP UPS1600 40 A: Maximum permissible charge current 5,000 mA
Derating for T_u > 40 °C or U_{in} < 24 V: 3,000 mA

Faulty battery voltage

If the battery voltage falls below this value, it is considered as being faulty by the SITOP UPS1600 and is not charged.

3.7.8.8 Load / Save

Configurations made in the web server can be saved as zip file. Saved configurations can be loaded back to the web server.
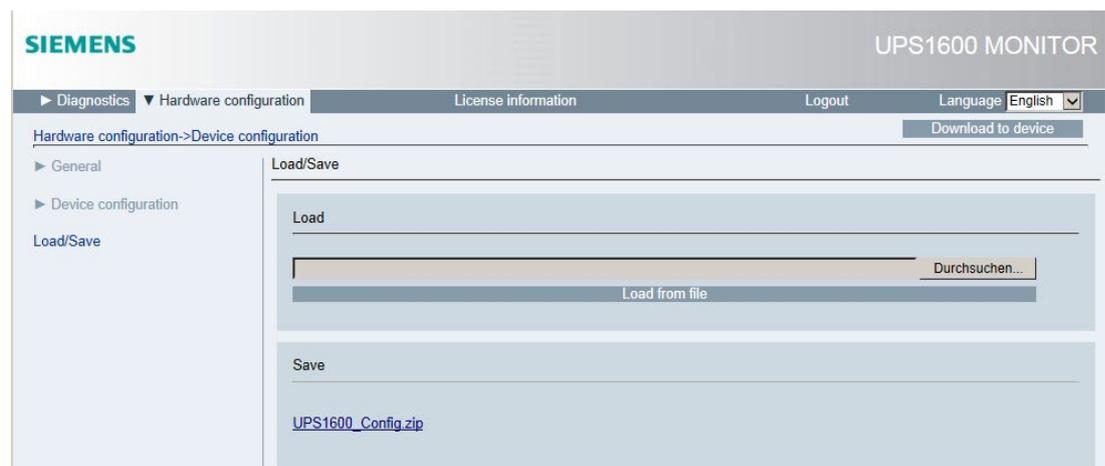
Procedure for saving the configuration

1. Select the "Hardware configuration" menu.

2. Select submenu "Load/Save".

3. The zip file now displayed can be saved as a file using the "Save target as" function of the shortcut menu (call by pressing the right-hand mouse key).

4. Enter a file name.

5. Click on "OK" to save the configuration as zip file.

Procedure for loading the configuration

1. Select the "Hardware configuration" menu.

2. Select submenu "Load/Save".

3. In the editor area, click on "Browse", and in the file dialog, select the path where the configuration file should be saved.

4. Click on the "OK" button to load the configuration.

3.8 OPC UA server

3.8.1 Introduction

OPC UA (Open Platform Communications - Unified Architecture) for non-proprietary communication in automation systems.

You can find information in the Internet at opcfoundation.org (https://opcfoundation.org/about/opc-technologies/opc-ua/).

3.8.2 Preconditions

Note

Example of an installation

Using "UaExpert" as example, this section describes how, using a client, you access SITOP UPS1600 data.

● UaExpert V1.4.4 is installed.

The OPC UA client for Microsoft Windows can be downloaded from the Internet site of Unified Automation:

https://www.unified-automation.com/downloads/opc-ua-clients.html (https://www.unified-automation.com/downloads/opc-ua-clients.html)

● Main module SITOP UPS1600 operates with firmware version v2.2.0 or higher.

● The IP address of SITOP UPS1600 is configured.

● The OPC UA server of the SITOP UPS1600 is activated.

Note

For OPC UA, every device is assigned a profile, which describes the capability of the particular device.

The OPC UA server of the SITOP UPS1600 corresponds to the "Micro Embedded Device Server" profile.

Note

Additional information on the OPC UA client is provided in the online documentation in menu "Help > UaExpert Manual".

3.8.3 Activating the OPC UA server via the SITOP UPS1600 web server

Start the web server of the SITOP UPS1600 in the MANUAL mode

Note

The MANUAL mode permits read access operations and restricted write access operations.

Preconditions:

- The settings of the SITOP UPS1600 correspond to the factory settings ("out-of-the-box").
- The SITOP UPS1600 web server is activated, see "Accessing the web server (Page 135)".
- The required IP address is already configured, see "Functions of the web server (Page 139)".

Changing the IP address

1. Navigate to "HW configuration > General > Communication interface".

2. Activate "Fixed IP address"

3. Under "Fixed IP address" enter the preferred IP address and the subnet mask.

4. Click on "Download to device".

Note

New IP address is immediately activated.

The connection to the web server is immediately interrupted.

5. Wait at least 2 minutes.

6. In the web browser, call the web server again by entering the new IP address.

7. On the web server homepage, select "Login".

8. As login, enter **admin** - and as password, also **admin**.

Note

For security reasons, the default password should be immediately changed. Further, it is recommended that passwords are regularly changed. The password must satisfy the following minimum requirements:

- min. 8 characters
- min. 1 uppercase letter
- min. 1 lowercase letter
- min. 1 digit
- min. 1 special character

The following characters are possible: ^[a-z0-9A-Z\\-_]+$

Activating the OPC-UA server and starting the web server for REMOTE operation

1. Navigate to "HW Configuration > General > OPC UA server > Settings".

2. Activate option "OPC UA server activated".

3. Click on "Download to device".

   The OPC UA server is activated.

3.8.4 Establishing a connection to the OPC UA server of the SITOP UPS1600

Note

The "Ua Expert" program is displayed in English.

---

1. Launch the "Ua Expert" program.

2. In the main menu, select "Server > Add".
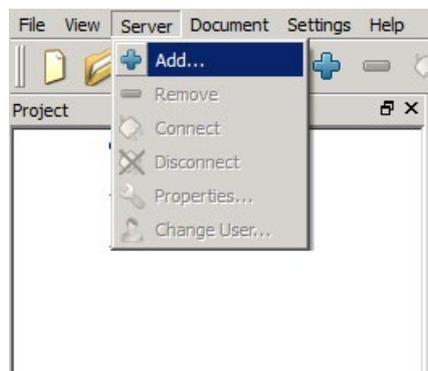
3. In the "Add Server" dialog box, click on "Double click to Add Server …".

4. In dialog "Enter Url", enter the protocol being used, the IP address of the SITOP UPS1600 and the number of ports.
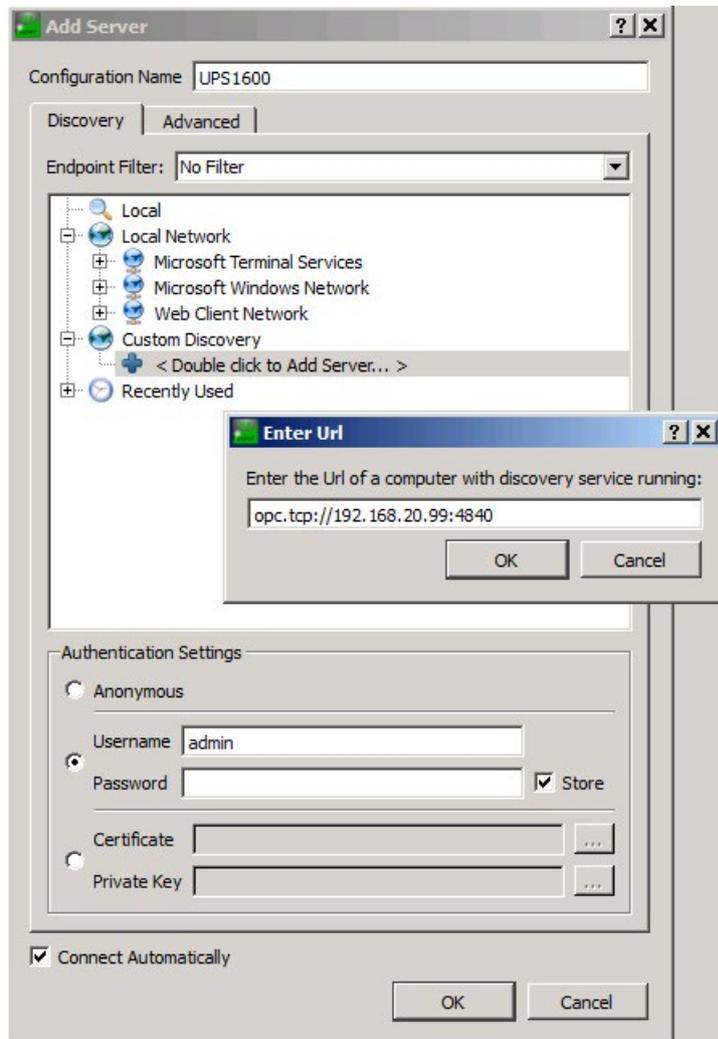
The preset port number for OPC UA is 4840.

Another port number can be set using the web server, PROFINET or OPC UA.

5. In dialog "Add Server" in area "Authentication Settings", enter the logon information for the SITOP UPS1600.

6. Click on the newly created server link "opc.tcp:\\…".

7. Select the connection type and enter the appropriate login data.

   For security reasons we recommend using an encrypted connection type (Basic128Rsa15 or Basic256).
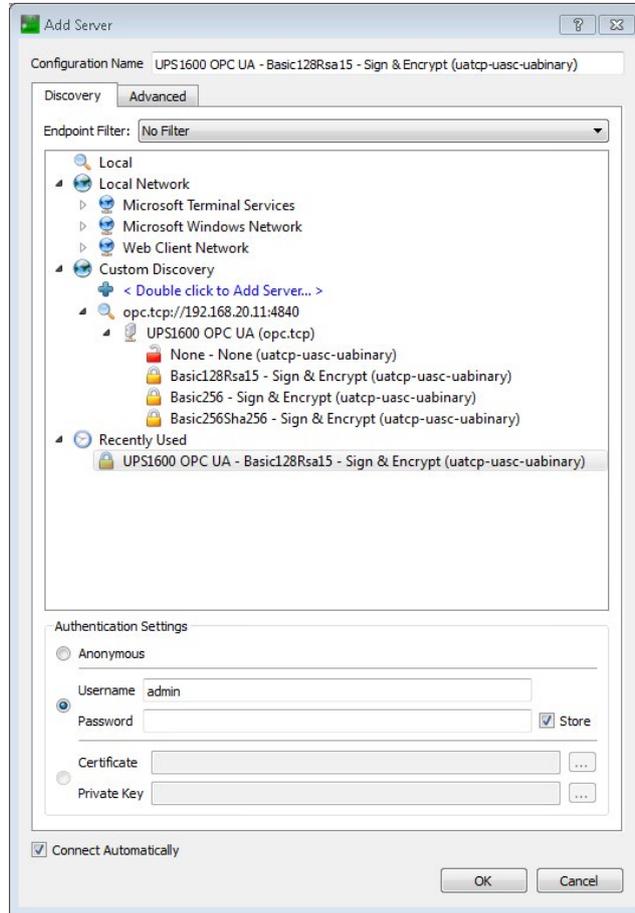
   Default Username: **admin**

   Default password: **admin**

8. Select SITOP UPS1600 in the project tree.

9. Click on symbol "Connect Server".
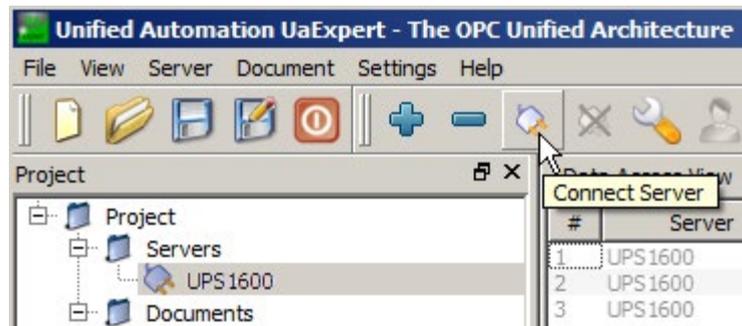
   In area "Address Space", the data objects available for the SITOP UPS1600 are shown in a tree structure.
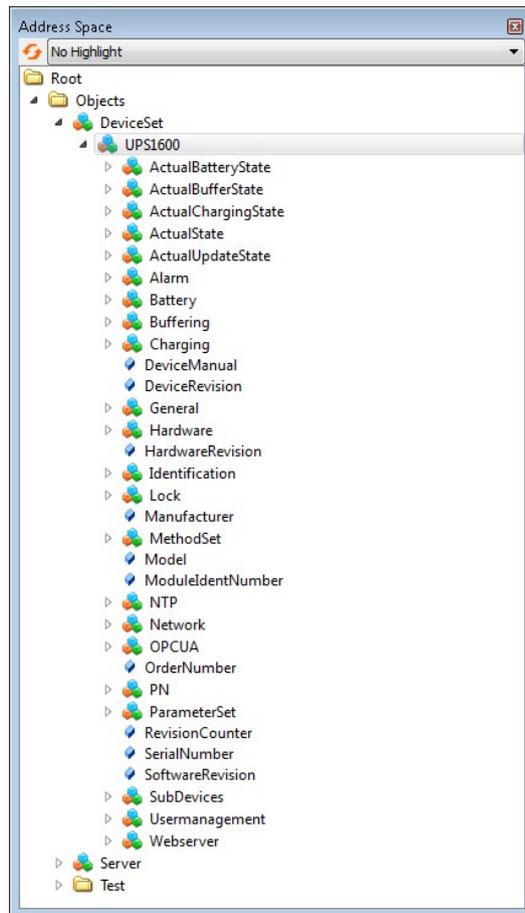
3.8.5 Working with the OPC UA client

3.8.5.1 Displaying SITOP UPS1600 parameters

Browse nodes - display parameters

Input and output data – as well as the operating states of the SITOP UPS1600 – are displayed in area "Address Space" in a tree-like structure as nodes. The properties of a marked node are displayed in area "Attributes".
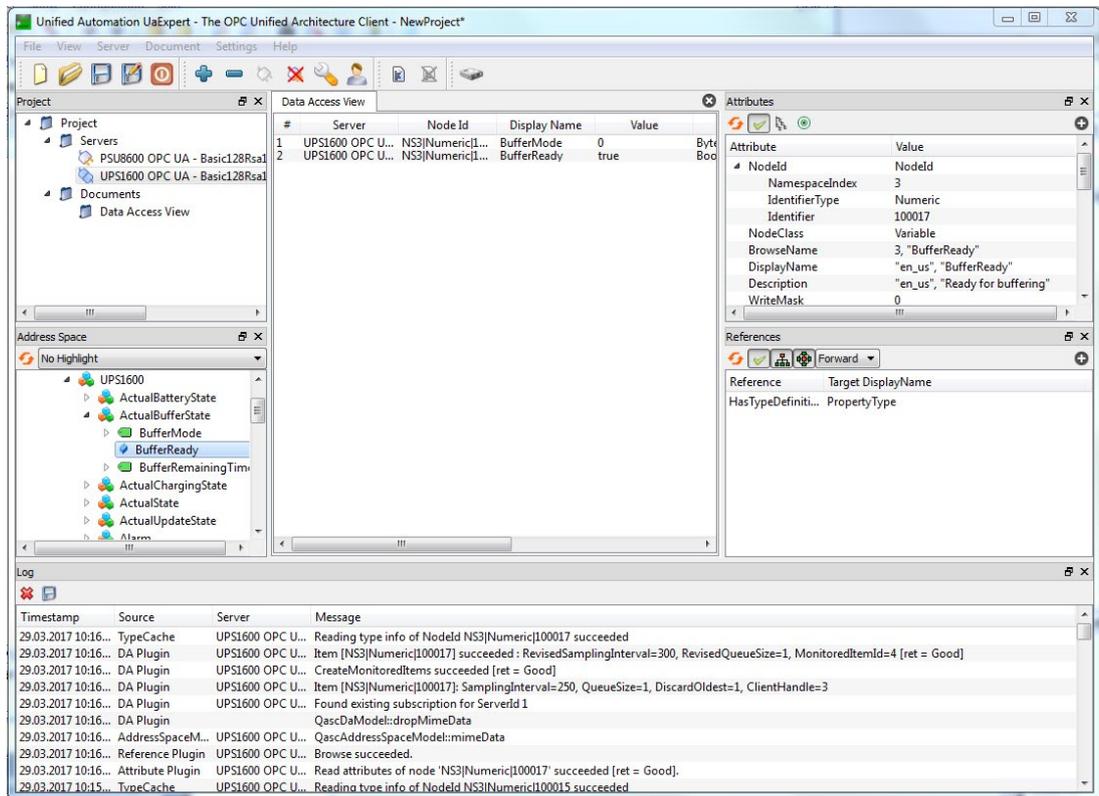
Subscribe to a node

The actual values of a subscribed node are permanently displayed in area "Data Access View".

To subscribe to a node, drag the appropriate node from area "Address Space" - and drop into area "Data Access View".
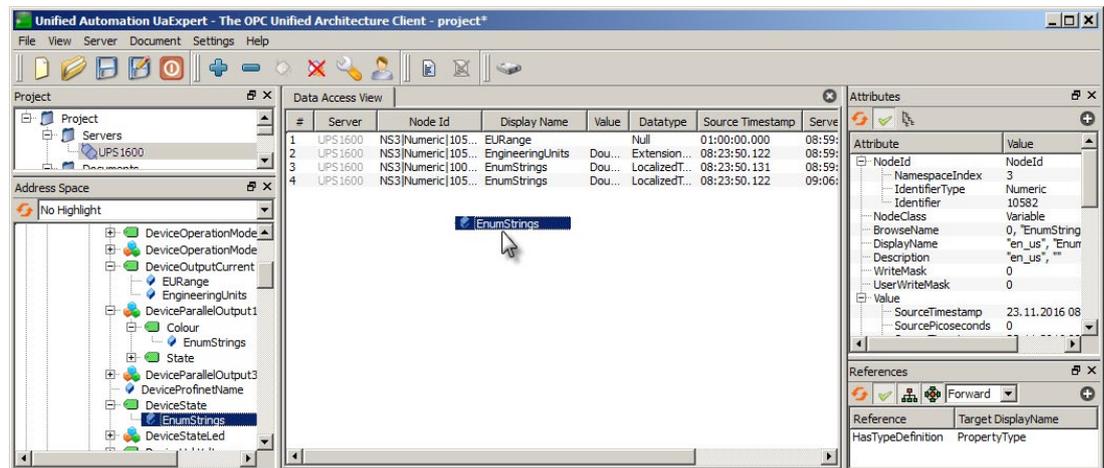
A subscription can only be made to nodes of NodeClass "Variable" .

3.8.5.2 Changing the value of a node

Write access operations to values are not permitted in order to avoid making undesirable changes.

Write access is made possible by calling method "InitLock". After 10 seconds, access is automatically blocked again.

Permitting write access

Note

Write access only for devices with PROFINET interface

Write access via OPC UA is not supported by devices with USB interface (... - 1AY0).

---

1. In the "Address Space" select <Root> → <Objects> → <DeviceSet> → <UPS1600> → <Lock> → <InitLock>.

2. Right click on method "InitLock" and in the shortcut menu, select "Call …".
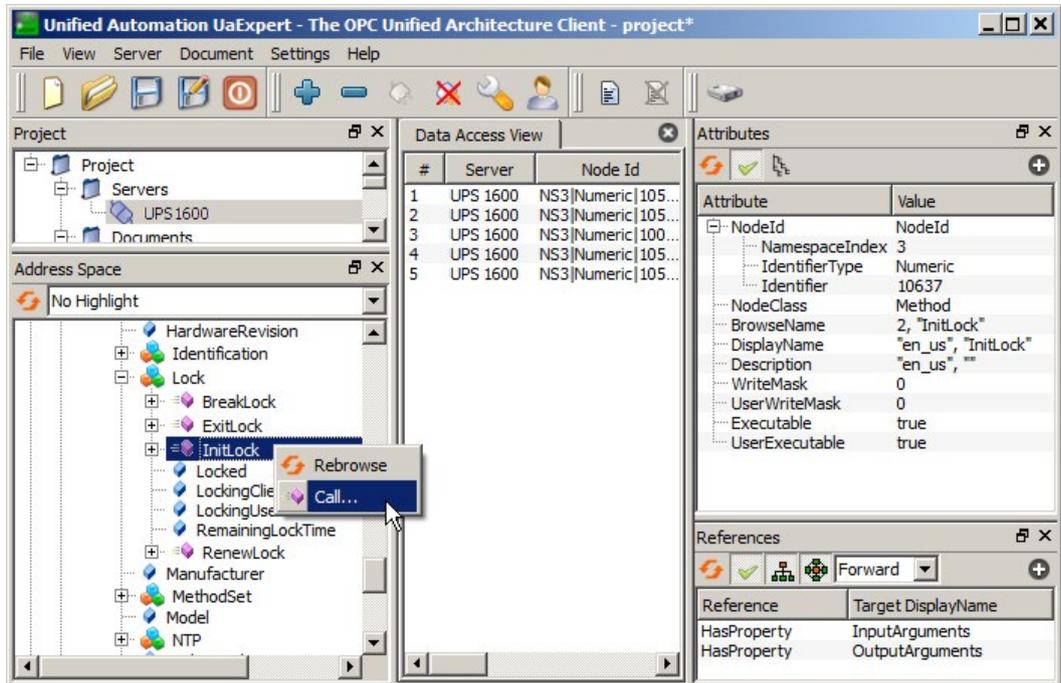
3. In the "Call InitLock" dialog box, click on "Call".
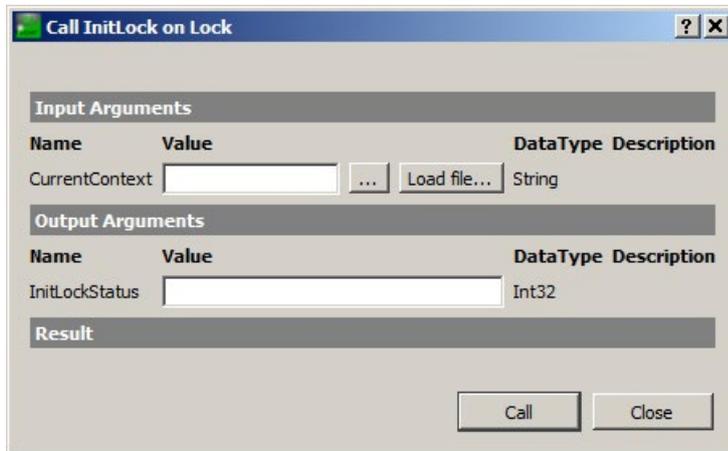
Figure 3-4   "Call InitLock on Lock" dialog

3.8.5.3 Calling a method

Calling a method from the "MethodSet"

The call is described using example "SynchronizeSystem".

Note

Methods are shown in the UA client with the symbol ⬦.

---

1. In "Address Space" select <Root> → <Objects> → <DeviceSet> → <UPS1600> → <MethodSet> → <SynchronizeSystem>.

2. Right click on method "SynchronizeSystem" and in the shortcut menu, select "Call …".
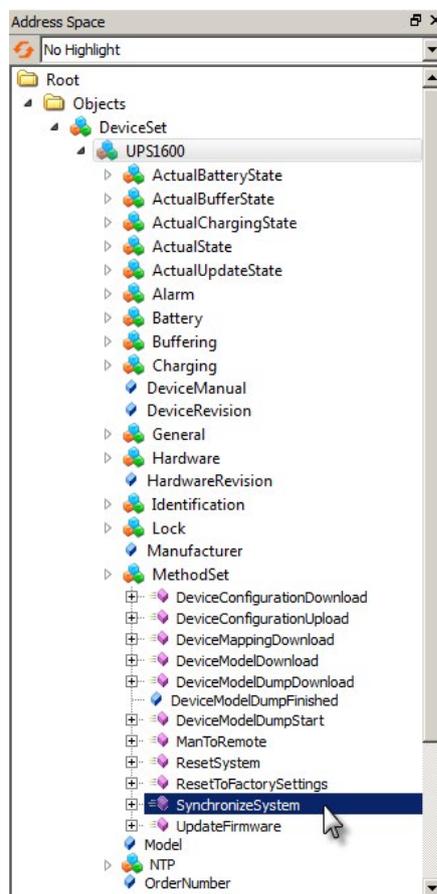
The result of the method call is displayed in a dialog.
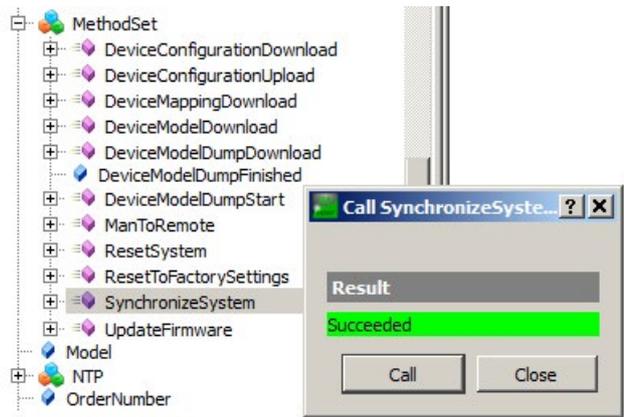
3.8.6 SITOP UPS1600 parameters in the OPC UA client

3.8.6.1 Introduction

The OPC UA client uses the following symbols:

Object

Object (supported modules)

Method

Variable with other attributes (EURange, EngineeringUnits, EnumStrings)

Variable

Information on the selected object is displayed in area "Attributes". Relationships to other objects are displayed in area "References".

A dialog is displayed when calling a method. "InputArguments" and "OutputArguments" can be entered here.

Values that can be changed (e.g. IP addresses or path data) can be directly edited in area "Attributes".

3.8.6.2 ActualBatteryState

Display name	Data type	Definition	Description
BatteryChange Recommended	Boolean	PropertyType	Battery capacity is insufficient to achieve the specified buffer time.
BatteryCharge	Byte	AnalogItemType	Battery charge level in percent
BatteryChargeVoltage	Float	AnalogItemType	Voltage used to charge battery during the constant charging phase.

Display name	Data type	Definition	Description
BatteryConnection Fault	Boolean	PropertyType	The connection to the battery has been interrupted or has a high impedance.
BatteryCount	Byte	PropertyType	Number of connected batteries. Only coded batteries are counted.
BatteryVoltage	Float	AnalogItemType	Current battery voltage

3.8.6.3 ActualBufferState

Display name	Data type	Definition	Description
BufferMode	Enumeration	MultiState DiscreteType	Indicates buffer mode
BufferReady	Boolean	PropertyType	Sufficient buffer readiness
BufferRemainingTime	UInt32	AnalogItemType	Estimated remaining buffer time. The remaining buffer time is calculated using the current battery charge level and average current over 10 minutes.

3.8.6.4 ActualChargingState

Display name	Data type	Definition	Description
ChargeMeasured Current	Float	AnalogItemType	Measured battery charge current
ChargeSufficient	Boolean	PropertyType	When this flag is set, the required charge level has been achieved

3.8.6.5 ActualState

Display name	Data type	Definition	Description
DeviceAlarmLed	Object	Sitop_1600_ LedType	Status of LED "Alarm"
DeviceBatteryFaultLed	Object	Sitop_1600_ LedType	Status of LED "BatteryFault"
DeviceBattery Over85Led	Object	Sitop_1600_ LedType	Status of LED "BatteryOver85"
DeviceCalculated Capacity	Float	AnalogItemType	Available battery capacity
DeviceCalculated Health	Byte	AnalogItemType	State of health (SoS) as percentage of the rated capacity
DeviceInputCurrent	Float	AnalogItemType	Measured input current of SITOP UPS1600
DeviceInputVoltage	Float	AnalogItemType	Input voltage
DeviceInputVoltageOK	Boolean	PropertyType	Input voltage has exceeded the configured threshold voltage. Connected devices are powered with the input supply.
DeviceLoadCurrent	Float	AnalogItemType	Measured output current of SITOP UPS1600

Display name	Data type	Definition	Description
DeviceMaxCurrent	Float	AnalogItemType	Maximum output current supported by the SITOP UPS1600
DeviceOutputCurrent	Float	AnalogItemType	Measured output current of SITOP UPS1600
DeviceOutputVoltage	Float	AnalogItemType	Maximum output voltage
DeviceP1LinkLed	Object	Sitop_1600_LedType	Status of LED "P1"
DeviceP2LinkLed	Object	Sitop_1600_LedType	Status of LED "P2"
DeviceRunLed	Object	Sitop_1600_LedType	Status of LED "RUN"
DeviceSFLed	Object	Sitop_1600_LedType	Status of LED "SF"
DeviceSWSettings Valid	Boolean	PropertyType	This object provides information about whether the SW parameters or the parameters at the rotary switches are used. The desired setting is selected on rotating switch for threshold voltage.
DeviceStateLed	Object	Sitop_1600_LedType	Status of LED "OK": Device status
DeviceTemperature	Sbyte	AnalogItemType	Device temperature
DeviceTotalOperating Time	UInt32	AnalogItemType	Battery-specific data: Total time for which battery was in buffer mode during its service life

3.8.6.6 ActualUpdateState

Display name	Data type	Definition	Description
UpdateProgress	Integer	PropertyType	Update progress
UpdateState	Enumeration	MultiState DiscreteType	Update status

3.8.6.7 Alarm

Display name	Data type	Definition	Description
AlarmBattery ConnectionBroken	Boolean	PropertyType	Connection to battery interrupted - check connection and fuse
AlarmBattery ConnectionHigh Resistive	Boolean	PropertyType	High-resistance connection to battery - check battery power cable
AlarmBatteryDeep Discharge	Boolean	PropertyType	Battery is deep discharged - no buffering possible
AlarmBatteryDeep DischargeNoCharging Possible	Boolean	PropertyType	Battery is deep discharged - replace battery
AlarmBatteryDefekt	Boolean	PropertyType	Battery defective - check fuse and battery voltages
AlarmBatterySOHTest	Boolean	PropertyType	Battery 'state of health' (SOH) tests are in progress

Display name	Data type	Definition	Description
AlarmBatteryTest	Boolean	PropertyType	Battery 'state of health' (SOH) tests are in progress. Output of SITOP UPS1600 is connected to the battery to detect the actual capacity of the battery.
AlarmBufferMode NotPossible	Boolean	PropertyType	Buffer mode not possible - check settings, cabling, fuse, and battery voltages
AlarmBuffer TimerReset	Boolean	PropertyType	PC is shutting down
AlarmBuffering	Boolean	PropertyType	Device is in buffer mode
AlarmCommunication ToDeviceFailed	Boolean	PropertyType	PROFINET connection available - SITOP UPS1600 is de-fective
AlarmDevice Failure	Boolean	PropertyType	Device failure
AlarmDevice Overtemperature	Boolean	PropertyType	Output and battery charging is switched off to prevent dam-age to the device.
AlarmDevice ParameterCorrupt	Boolean	PropertyType	SITOP UPS1600 parameters corrupt - try to update the software
AlarmDevice PoweredUp	Boolean	PropertyType	Device powered up
AlarmDevice TemperatureHigh	Boolean	PropertyType	Device temperature is very high! Provide cooling or turn off unnecessary consumers.
AlarmDevice TemperatureLow	Boolean	PropertyType	Device temperature is very low. Care for higher ambient temperature.
AlarmDevice TurnedOff	Boolean	PropertyType	SITOP UPS1600 off - buffer time exceeded or PC was shut down
AlarmFirmware UpdateOK	Boolean	PropertyType	Previous software update was successful - SITOP UPS1600 is operational again.
AlarmFuseBroken	Boolean	PropertyType	Fuse is defective.
AlarmInpu tVoltageHigh	Boolean	PropertyType	Input voltage exceeds 30 V. SITOP UPS1600 is not opera-tional.
Alarm InsufficientCharge	Boolean	PropertyType	Set buffer time can currently not be achieved due to low battery charge.
AlarmLow VoltageMode	Boolean	PropertyType	Input voltage of SITOP UPS1600 is too low. SITOP UPS1600 Buffer is not ready for buffering.
AlarmOutputTurnedOff	Boolean	PropertyType	Output of SITOP UPS1600 has been switched off due to the execution of a command or because an error situation has occurred (e.g. temperature or output current too high).
AlarmOutputTurnedOn	Boolean	PropertyType	Output of SITOP UPS1600 has been switched on again due to the execution of a command or because an error situation has been remedied.
AlarmOverCurrent	Boolean	PropertyType	Output current of SITOP UPS1600 is too high. Output will be switched off for 20s. The output will be switched on again after 20 s.
AlarmResetExecuted	Boolean	PropertyType	Input voltage to SITOP UPS1600 was OK again before the buffer time expired. Connected devices are reset by switch-ing off the SITOP UPS1600 outputs for the configured time.
AlarmSurplusBattery	Boolean	PropertyType	More than 6 batteries are connected. Connect only up to 6 batteries at the Energy Storage Link.

Display name	Data type	Definition	Description
AlarmUnknownBattery	Boolean	PropertyType	Data from the battery cannot be read correctly. Battery is defective or not supported by SIEMENS.
AlarmWrongBattery Configuration	Boolean	PropertyType	Different battery types connected. Only batteries of the same type can be operated together.
AlarmWrongBattery Polarity	Boolean	PropertyType	Wrong battery polarity - check battery connections.

3.8.6.8 Battery

Display name	Data type	Definition	Description
BatteryCapacity Setpoint	Float	AnalogItemType	Total battery capacity in Ah
BatteryDefectVoltage Setpoint	Float	AnalogItemType	If battery voltage is lower than this value, the battery is considered defective
BatteryIgnoreCoding Setpoint	Boolean	PropertyType	When this parameter is set to '1', data from the coded battery is ignored. The data is taken from the parameter assignment in this case.

3.8.6.9 Buffering

Display name	Data type	Definition	Description
BufferExpected CurrentSetpoint	Float	AnalogItemType	Estimated average output current during buffer mode
BufferThreshold Setpoint	Float	PropertyType	Trigger voltage for buffering - buffering is activated below this value
BufferTime2Setpoint	UInt16	AnalogItemType	Additional buffer time after PC shutdown (valid only in conjunction with SITOP UPS Manager)
BufferTimeSetpoint	UInt16	AnalogItemType	Desired buffering time before device switches off
BufferingEnableSetpoint	Boolean	PropertyType	Enable buffering
BufferingEndVoltage Setpoint	Float	AnalogItemType	When battery voltage is lower than this voltage, the battery charge is no longer sufficient. Buffering is stopped.
BufferingValid SupplyVoltage TimeSetpoint	Float	AnalogItemType	When the SITOP UPS1600 is in buffer mode, time for which the input voltage must be OK again before SITOP UPS1600 buffering is stopped and connected devices are operated again with input supply.

3.8.6.10   Charging

Display name	Data type	Definition	Description
ChargingCurrent Setpoint	Float	AnalogItemType	Charge current
ChargeEndVoltage Setpoint	Float	AnalogItemType	Battery voltage when charging changes to trickle charging. Battery is charged 100 %.

3.8.6.11   General

Display name	Data type	Definition	Description
AlarmInvalidSupply VoltageTimeSetpoint	Float	AnalogItemType	Alarm filter: an alarm is only sent if it is pending for longer than the configured time
DeviceOutputEnable Setpoint	Boolean	PropertyType	DeviceOutputEnableSetpoint
ResetEnableSetpoint	Boolean	PropertyType	When input voltage returns during buffering, the output is switched off for a configurable time in order to reset connected devices
ResetTimerSetpoint	Byte	AnalogItemType	Time for which the output of SITOP UPS1600 is switched off when connected devices are reset.
ResistorTestInterval Setpoint	Byte	AnalogItemType	Battery test interval

3.8.6.12   Hardware

Display name	Data type	Definition	Description
HardwareBattery ProfileClamp	Enumeration	MultiState DiscreteType	The charge characteristic for batteries on signal terminals is set. This setting is only applied if hardware settings are effective.
HardwareBuffer ThresholdSwitch	Enumeration	MultiState DiscreteType	Trigger voltage for buffering - buffering is activated below this value
HardwareBuffer TimeSwitch	Enumeration	MultiState DiscreteType	Desired buffering time before device switches off
HardwareBuffering EnableClamp	Boolean	PropertyType	Enable buffering
HardwareEnable ResetClamp	Boolean	PropertyType	When input voltage returns during buffering, the output is switched off for a configurable time in order to reset connected devices
HardwareStartFrom BatteryClamp	Boolean	PropertyType	Setting for 'Start from battery' on signal terminal

3.8.6.13 Identification

Display name	Data type	Definition	Description
IdentificationContact Setpoint	String[64]	PropertyType	Contact
IdentificationDevice NameSetpoint	String[32]	PropertyType	PROFINET device name
IdentificationLocation Setpoint	String[44]	PropertyType	Location ID

3.8.6.14 Lock

Display name	Data type	Definition	Description
BreakLock	Method	Method	
ExitLock	Method	Method	
InitLock	Method	Method	
Locked	Boolean	PropertyType	Locked
LockingClient	String[16]	PropertyType	LockingClient
LockingUser	Unsigned	PropertyType	LockingUser
RemainingLockTime	Duration	PropertyType	RemainingLockingTime
RenewLock	Method	Method	

3.8.6.15 MethodSet

Display name	Data type	Definition	Description
AddUser	Method	Method	Adds a user.
ChangeUserPassword	Method	Method	Changes a user password.
ClearAlarmHistory	Method	Method	Deletes the alarm history.
DeleteUser	Method	Method	Removes a user.
DownloadDevice Configuration	Method	Method	Downloads the device configuration.
RemoteReset	Method	Method	Executes a remote reset.
RemoteReset2	Method	Method	Executes a remote reset.
ResetSystem	Method	Method	Resets the system to the initial state.
ResetToFactory Settings	Method	Method	Reset to factory settings.
SetNetworkParameter	Method	Method	Sets the network parameters.
ShowAlarmHistory	Method	Method	Shows the alarm history.
ShowPending AlarmList	Method	Method	Shows the list of active alarms.
UpdateFirmware	Method	Method	Updates the firmware.
UploadAlarmHistory	Method	Method	Uploads the alarm history.
UploadCertificate	Method	Method	Uploads a certificate.

Display name	Data type	Definition	Description
UploadDevice Configuration	Method	Method	Uploads the device configuration.
UploadLicence Information	Method	Method	Uploads license information.
UploadPendingAlarm List	Method	Method	Uploads the list of active alarms.

3.8.6.16 Network

Display name	Data type	Definition	Description
NetworkDHCPEnable	Boolean	PropertyType	DHCP enable
NetworkGateway	String[16]	PropertyType	Router address
NetworkIP	String[16]	PropertyType	IP address
NetworkSubnetmask	String[16]	PropertyType	Subnet mask

3.8.6.17 NTP

Display name	Data type	Definition	Description
NTPEnableSetpoint	Boolean	PropertyType	NTP client activated
NTPServer1Setpoint	String	PropertyType	NTP server address 1
NTPServer2Setpoint	String	PropertyType	NTP server address 2
NTPServer3Setpoint	String	PropertyType	NTP server address 3
NTPServer4Setpoint	String	PropertyType	NTP server address 4
NTPUpdateIntervall Setpoint	UInt32	AnalogItemType	

NTP client status

Display name	Data type	Definition	Description
NTPLastSynchronisa-tionTime [1]		PropertyType	Last synchronization instant
NTPNextSynchronisa-tionTime [1]		PropertyType	Next synchronization instant

[1] read only

3.8.6.18 OPC UA

Display name	Data type	Definition	Description
OPCUAServerEnable Setpoint	Boolean	PropertyType	OPC UA server activated
OPCUAServerPort Setpoint	Integer	PropertyType	OPC UA server port
OPCUAUnencrypted AccessEnable Setpoint	Boolean	PropertyType	Unencrypted access activated

3.8.6.19 ParameterSet

All variables of the SITOP UPS1600 are listed together under the "ParameterSet" node.

3.8.6.20 PROFINET

Display name	Data type	Definition	Description
PNARSetupLocked Setpoint	Boolean	PropertyType	AR configuration locked
PNDCPReadonly EnableSetpoint	Boolean	PropertyType	ODCP write protection activated

3.8.6.21 SubDevices

In folder "SupportedTypes", variables and methods are listed, which are available for the buffer modules.

SITOP UPS1100

ActualBufferState

Display name	Data type	Definition	Description
BufferTime	UInt32	AnalogItemType	Desired buffering time before device switches off
BufferingEndVoltage	Float	AnalogItemType	When battery voltage is lower than this voltage, the battery charge is no longer sufficient. Buffering is stopped.

ActualChargingState

Display name	Data type	Definition	Description
ChargeCurrent	Float	AnalogItemType	Actual charging current used to charge battery.
ChargeEndVoltage	Float	AnalogItemType	Battery voltage when charging changes to trickle charging. Battery is charged 100 %.
ChargeTotalCurrent	Float	AnalogItemType	Battery-specific data: Total charge to the battery during its service life

ActualState

Display name	Data type	Definition	Description
ModuleCalculated Capacity	Float	AnalogItemType	Available battery capacity
ModuleCalculated Health	Byte	AnalogItemType	State of health (SoS) as percentage of the rated capacity
ModuleCapacity	Float	AnalogItemType	Capacity
ModuleChange Recommended	Boolean	PropertyType	Battery capacity is insufficient to achieve the specified buffer time.
ModuleCompound	Enumeration	MultiState DiscreteType	Connected device
ModuleConnection Fault	Boolean	PropertyType	Connection to battery interrupted - check connection and fuse
ModuleManufactoring Date	Date	PropertyType	Manufacturing date of the battery modules.
ModuleMax Temperature	Sbyte	AnalogItemType	Maximum specified operating temperature of the battery.
ModuleMin Temperature	Sbyte	AnalogItemType	Minimum specified operating temperature of the battery.
ModuleStandbyTime	UInt32	AnalogItemType	Battery-specific data: Time for which battery was connected but no power was consumed.
ModuleStateLed	Object	Sitop_1600_ LedType	ModuleStateLed
ModuleTemperature	Sbyte	AnalogItemType	Battery temperature
ModuleTotalCulled Current	Float	AnalogItemType	Battery-specific data: Time for which battery was connected and power was consumed.

Alarm

Display name	Data type	Definition	Description
AlarmBatteryChange Canceled	Boolean	PropertyType	Battery replacement canceled - battery parameters are not reset
AlarmBatteryChange FInished	Boolean	PropertyType	Battery replacement finished - counters have been reset
AlarmBatteryChange Started	Boolean	PropertyType	Battery replacement started by user
AlarmBattery CommunicationFault	Boolean	PropertyType	Communication with formerly known battery is no longer possible - check communication

Display name	Data type	Definition	Description
AlarmBatteryDefect	Boolean	PropertyType	Battery defective - check fuse and battery voltages
AlarmBattery ParametersCorrupt	Boolean	PropertyType	Battery defective - replace battery
AlarmBattery TemperatureHigh	Boolean	PropertyType	Battery temperature too high - battery life will be shortened
AlarmBattery TemperatureLow	Boolean	PropertyType	Battery temperature too low - reduced output current
AlarmFuseBroken	Boolean	PropertyType	Fuse is defective.
AlarmNewBattery Detected	Boolean	PropertyType	A new battery was connected. The battery will be included in the calculation of the total capacity and the charge parameters.

Additional parameters

Display name	Data type	Definition	Description
DeviceManual	String	PropertyType	
HardwareRevision	String	PropertyType	Product state
Manufacturer	LocalizedText	PropertyType	
Model	LocalizedText	PropertyType	
OrderNumber	String[20]	PropertyType	Order number/MLFB
RevisionCounter	Int32	PropertyType	
SerialNumber	String[16]	PropertyType	Serial number
SlotId	UInt16	PropertyType	
SoftwareRevision	Integer	PropertyType	Software version/SWD
MaxModuleCount	Byte	PropertyType	

ParameterSet

 /

All variables of the SITOP UPS1100 buffer module are listed together under the "ParameterSet" node.

Display name	Data type	Definition	Description
AlarmBatteryChange Canceled	Boolean	PropertyType	Battery replacement canceled - battery parameters are not reset
AlarmBatteryChange FInished	Boolean	PropertyType	Battery replacement finished - counters have been reset
AlarmBatteryChange Started	Boolean	PropertyType	Battery replacement started by user
AlarmBattery CommunicationFault	Boolean	PropertyType	Communication with formerly known battery is no longer possible - check communication
AlarmBatteryDefect	Boolean	PropertyType	Battery defective - check fuse and battery voltages
AlarmBattery ParametersCorrupt	Boolean	PropertyType	Battery defective - replace battery
AlarmBattery TemperatureHigh	Boolean	PropertyType	Battery temperature too high - battery life will be shortened

Display name	Data type	Definition	Description
AlarmBattery TemperatureLow	Boolean	PropertyType	Battery temperature too low - reduced output current
AlarmFuseBroken	Boolean	PropertyType	Fuse is defective.
AlarmNewBattery Detected	Boolean	PropertyType	A new battery was connected. The battery will be included in the calculation of the total capacity and the charge pa- rameters.
BufferTime	UInt32	AnalogItemType	Desired buffering time before device switches off
BufferingEndVoltage	Float	AnalogItemType	When battery voltage is lower than this voltage, the battery charge is no longer sufficient. Buffering is stopped.
ChargeCurrent	Float	AnalogItemType	Actual charging current used to charge battery.
ChargeEndVoltage	Float	AnalogItemType	Battery voltage when charging changes to trickle charging. Battery is charged 100%.
ChargeTotalCurrent	Float	AnalogItemType	Battery-specific data: Total charge to the battery during its service life
ModuleCalculated Capacity	Float	AnalogItemType	Available battery capacity
ModuleCalculated Health	Byte	AnalogItemType	State of health (SoS) as percentage of the rated capacity
ModuleCapacity	Float	AnalogItemType	Capacity
ModuleChange Recommended	Boolean	PropertyType	Battery capacity is insufficient to achieve the specified buffer time.
ModuleCompound	Enumeration	MultiState DiscreteType	Connected device
ModuleConnection Fault	Boolean	PropertyType	Connection to battery interrupted - check connection and fuse
ModuleMax Temperature	Sbyte	AnalogItemType	Maximum specified operating temperature of the battery.
ModuleMin Temperature	Sbyte	AnalogItemType	Minimum specified operating temperature of the battery.
ModuleStandbyTime	UInt32	AnalogItemType	Battery-specific data: Time for which battery was connected but no power was consumed.
ModuleStateLed	Object	Sitop_1600_ LedType	ModuleStateLed
ModuleTemperature	Sbyte	AnalogItemType	Battery temperature
ModuleTotal CulledCurrent	Float	AnalogItemType	Battery-specific data: Time for which battery was connected and power was consumed.

3.8.6.22   UserManagement

Display name	Data type	Definition	Description
AddUser	Method	Method	Adds a user.
ChangeUserPassword	Method	Method	Changes the password for the user.
DeleteUser	Method	Method	Deletes the user.
UsermanagementUser 1 … 16	SitopUserType	SitopUserType	

Display name	Data type	Definition	Description
AccessLevel1Setpoint	Boolean	PropertyType	Can read data
AccessLevel2Setpoint	Boolean	PropertyType	Can read device configuration
AccessLevel3Setpoint	Boolean	PropertyType	Can write device configuration to device
AccessLevel4Setpoint	Boolean	PropertyType	Can read device settings
AccessLevel5Setpoint	Boolean	PropertyType	Can write device configuration to device
AccessLevel6Setpoint	Boolean	PropertyType	Can read alarm list
AccessLevel7Setpoint	Boolean	PropertyType	Can delete and save alarm list
AccessLevel8Setpoint	Boolean	PropertyType	Can change operating mode
AccessLevel9Setpoint	Boolean	PropertyType	Can perform firmware update
AccessLevel10Setpoint	Boolean	PropertyType	Can call special functions
AccessLevel11 Setpoint	Boolean	PropertyType	Can administer users
UserName	String[16]	PropertyType	User name [1 … 16]

3.8.6.23   Web server

Display name	Data type	Definition	Description
WebserverAutoLogout EnableSetpoint	Boolean	PropertyType	Log off automatically after 15 minutes
WebserverAutoReload EnableSetpoint	Boolean	PropertyType	Activate automatic update.
WebserverEnable Setpoint	Boolean	PropertyType	Activate web server on this module.
Webserver HttpAccessEnable Setpoint	Boolean	PropertyType	Permit access only with HTTPS
WebserverReload TimeSetpoint	Enumeration	MultiState DiscreteType	Update interval:

3.8.6.24   Additional

These nodes are listed at the first level in the object tree

Display name	Data type	Definition	Description
DeviceManual	String	PropertyType	Address (path in the file system or URL / web address) of the operating instructions for the device.
Hardware Revision	String	PropertyType	Revision status of the device hardware.
Manufacturer	LocalizedText	PropertyType	Name of the company that manufactured the device
Model	LocalizedText	PropertyType	
ModuleItemNumber	UInt32	PropertyType	
OrderNumber	String[20]	PropertyType	
RevisionCounter	Int32	PropertyType	Incremental counter that specifies how often the static data in the device was modified.

Display name	Data type	Definition	Description
SerialNumber	String	PropertyType	ID, which uniquely identifies the device for the device manufacturer
SoftwareRevision	String	PropertyType	Revision status of the device software.

3.8.7 OPC UA performance

OPC UA provides the option of collectively transferring modified actual values in the form of a subscription. The minimum pole interval of such a subscription is 100 ms. A maximum of 150 data nodes can be simultaneously monitored, independent of whether these data nodes are assigned one or various subscriptions.

OPC UA does not support any type of realtime communication, neither for actual values (read data) nor for setpoints (written data). As a consequence, it is not possible to specify an update/refresh rate or a maximum data flow rate.

3.8.8 Recommissioning after a basic device has been replaced - or after restoring the factory settings

If, for service reasons it is necessary to replace the basic device - or store the factory settings, then please observe the following notes:

1. Brand new basic devices or basic devices, where the factory settings have been restored, have no IP address. However, this is generally necessary so that the device can be accessed using OPC UA. Proceed as described in Chapter General (Page 146), Section "communication interface" to assign the device a certain IP address.

2. The configuration must be loaded to the device. This can be done in the following ways:

● Proceed as described in Chapter Load / Save (Page 157) to load a valid configuration into the device (previously saved via web server).

● Load a valid configuration to the device via OPC UA. Ensure that the necessary user account is available in the device for access via OPC UA. The latter can be created using a web server, see Chapter Web server (Page 148).

Troubleshooting

<div style="text-align: right; font-size: 3em;">4</div>

You can obtain additional information on an active alarm from the help text.
The extended error type is used to interpret alarms in S7 function blocks that you have programmed yourself.

The severity indicates the severity of the alarm:

- D = diagnostics
- MD = Maintenance Demanded
- MR = Maintenance Required
- F = Failure (module has failed)

Error Type	Extended Error Type	Severity	Alarm Text	Help Text
256	1	F	Software corrupted	Software is corrupt - try to update the software
256	2	MR	Wrong checksum	Internal error: Communication disrupted
256	3	MR	Parameter corrupt	Attempting to write to an unknown or read-only object.
256	4	MR	Unknown parameter	Attempting to set a parameter that is not known by UPS1600.
256	5	MR	Wrong message length	Internal error: Communication disrupted
256	6	MR	Wrong parameter	Parameter value is not within the specified range
256	7	MR	Command not accepted	An incorrect command was sent to the UPS1600
256	8	MR	Communication error: Wrong length field	Syntax error in command
256	9	MR	Wrong request	Error in sent message: Unknown request sent.
256	10	MR	Cannot write to object	Attempting to write a parameter that is "read-only"
256	11	MR	Object pending	UPS1600 cannot provide data for the requested object.
256	12	MR	Battery not available	Attempting to access a battery that is not available. Either the battery with the requested number was never connected or communication with this battery was interrupted.
256	13	MR	EEPROM write error	Saving UPS1600 parameters failed. Device is defective.
256	14	MR	Unknown alarm	Internal error: Wrong parameter at execution of test command.
256	15	MR	Command outside range	An incorrect command was sent to the UPS1600
256	16	MR	Software update is being performed	The command sent cannot be executed as long as the program is running.
256	17	MR	No software update	Cannot execute the sent command because no software update has been started.
256	18	MR	Wrong battery number	Attempting to retrieve data about a battery which does not exist or is not connected.
256	19	MR	Wrong address	Wrong Flash address in software update - software update file is corrupt.

Error Type	Ex- tended Error Type	Severity	Alarm Text	Help Text
256	20	MR	Write error	Cannot write to Flash - hardware may be defective
256	21	MR	Read error	Unable to read EEPROM. Device is defective.
256	22	MR	Wrong device ID	An attempt was made to update the software with an update file that is not suitable for the UPS1600.
256	23	MR	Corrupt data record	Error during software update - try to update the software again
256	24	MR	Wrong update	An attempt was made to update the software with an invalid update file. The update file is probably too old.
256	25	MR	Too much data	An entry in the software update cannot contain more than 32 bytes of reference data.
256	26	F	Device failure	Device failure
256	27	F	No boot loader available	No boot loader available
257	1	MD	Buffer mode is not possible	Buffer mode is not possible - check settings, cabling, fuse, and battery voltages
257	2	MD	Device temperature critical (too high)	Device temperature is very high! Ensure adequate cooling or disconnect unnecessary loads.
257	3	MD	Device temperature critical (too low)	Device temperature is very low! Ensure a higher ambient tem- perature.
257	4	F	High-resistance connection to battery	High-resistance connection to battery - check battery power cable
257	5	F	Connection to battery inter- rupted	Connection to battery interrupted - check connection and fuse
257	6	MD	Unknown battery	Data from the battery cannot be read correctly. Battery is de- fective or not supported by SIEMENS.
257	7	MR	Overcurrent	Output current of UPS1600 is too high. Output will be switched off for 20s. The output will be switched on again after 20s.
257	8	MR	Reset buffer timer	PC is shutting down
257	9	MR	UPS1600 off	UPS1600 off - buffer time exceeded or PC was shut down
257	10	MR	Output switched off	The UPS1600 output was shut down as result of executing an instruction or an error situation (e.g. overtemperature, exces- sive output current).
257	11	MR	Output switched on	The UPS1600 output was switched on again as result of exe- cuting an instruction or the correction of an error situation.
257	12	MR	Reset executed	Input voltage at UPS1600 was OK again before the buffer time expired. Connected devices are reset by switching off the UPS1600 outputs for the configured time.
257	13	MR	Battery test	A cyclic battery test will be performed Remark: For firmware versions from V2.2 - and for versions V2.0.× from version V2.0.5, the alarm is deactivated.
257	14	MR	Software update successful	Previous software update was successful - UPS1600 is opera- tional again.
257	15	MR	Input voltage is too high	Input voltage exceeds 30 V. UPS1600 is not operational.
257	16	MD	Surplus battery	More than 6 batteries are connected. Connect a maximum of 6 batteries to the Energy Storage Link.

Error Type	Extended Error Type	Severity	Alarm Text	Help Text
257	17	F	UPS1600 parameters corrupt	UPS1600-parameters corrupt - try to update the software.
257	18	F	Device overtemperature	Output and battery charging is switched off to prevent damage to the device.
257	20	MR	Low voltage mode	Input voltage of UPS1600 is too low. UPS1600 is not ready for buffering.
257	21	MR	Buffering	Device is in the buffer mode.
257	22	MR	Communication with device failed	PROFINET connection available - UPS1600 is defective
257	23	MR	Device powered up	Device powered up
257	24	F	Wrong battery polarity	Wrong battery polarity - check battery connections.
257	26	MR	Insufficient charge level	Set buffer time can currently not be achieved due to low battery charge.
257	27	MR	Deep discharge battery	Battery is deep discharged - no buffering possible
258	1	F	Battery defective (battery index: {1:d})	Battery defective - check the fuse and the battery voltages
258	2	F	Deep discharge battery, no charging possible (battery index: {1:d}).	Battery is deep discharged - replace battery
258	3	MD	Battery temperature high (battery index: {1:d})	Battery temperature too high - battery life will be shortened
258	4	MD	Battery temperature low (battery index: {1:d}).	Battery temperature too low - reduced output current
258	5	F	Communication with battery fault (battery index: {1:d})	Communication with formerly known battery is no longer possible - check communication
258	6	MR	New battery detected (battery index: {1:d})	A new battery was connected. The battery will be included in the calculation of the total capacity and the charge parameters.
258	7	F	Wrong battery configuration (battery index: {1:d})	Different battery types connected. Only batteries of the same type can be operated together.
258	8	MD	Battery parameters corrupt (battery index: {1:d}).	Battery defective - replace battery Remark: Alarm is deactivated.
258	9	MR	Battery replacement started (battery index: {1:d})	Battery replacement started by user
258	10	MR	Battery replacement finished (battery index: {1:d})	Battery replacement finished - counters have been reset
258	11	MD	Battery replacement canceled (battery index: {1:d})	Battery replacement canceled - battery parameters are not reset
258	12	F	Fuse is defective (battery index: {1:d})	Fuse is defective.

4.1 Hardware fault

For an internally identified software or hardware fault/error, the following response occurs:

• LED 1 (O.K./BAT.) lights up red
• LED 2/3/4 are dark
• Alarm 13 (Device failure) is sent
• UPS1600 output shuts down

Response from V2.0.4 or V2.1 and higher:
The output is only shut down for a software error (internal software error, software update not completed, software checksum is incorrect).

Mounting/removing

<div style="text-align: right; font-size: 3em;">5</div>

5.1 SITOP UPS1600

> **⚠ WARNING**
>
> **Installing the device in a housing or a control cabinet**
>
> The SITOP UPS1600s are built-in units. They must be installed in a housing or control cabinet where only qualified personnel have access.

The device can be mounted in a control cabinet on standard TH35×7.5/15 mounting rails (according to EN 60715).

> **⚠ WARNING**
>
> **Use in hazardous zones**
>
> If the device is to be used in a hazardous zone (II 3G Ex nA nC IIC T4 Gc) it must be installed in a distribution box with degree of protection IP54 or higher. This distribution box must comply with the requirements of EN 60079-15.

Mounting

To mount the device, position it with the mounting rail guide at the upper edge of the standard mounting rail and press down to lock it into place. If this is too difficult, press slider ⑩ at the same time, as described under "Removal".

Removal

To remove, carefully open the slider ⑩ using a screwdriver or by hand (see Figure 5-1 Removal (example 6EP4136-3AB00-2AY0) (Page 188)) and disengage the device at the bottom edge of the standard mounting rail. Then you can remove the device from the upper edge of the standard mounting rail.
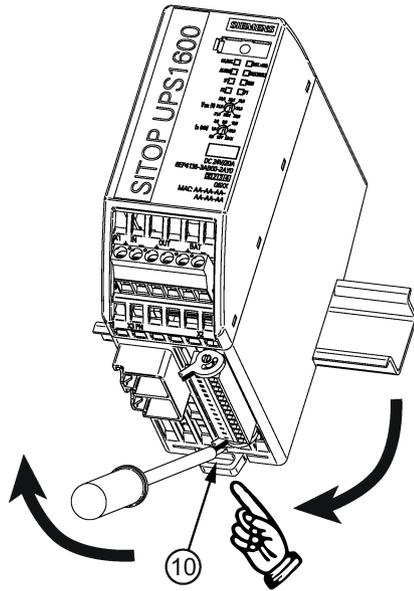
Figure 5-1   Removal (example 6EP4136-3AB00-2AY0)

5.1.1   Signal connector

Mounting

Push connector on socket ④ in the housing.

Removal

To remove the signal connector, press the release lever (4b) (see Figure 5-2 Mounting/removal: Signal connector (Page 188)) and then remove the connector.
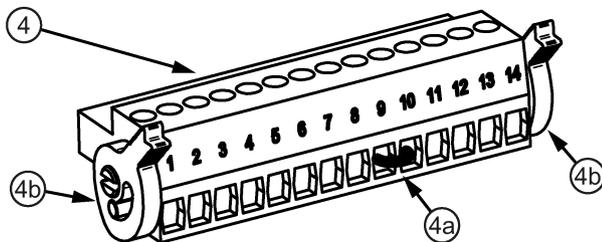
Figure 5-2   Mounting/removal: Signal connector

5.1.2   USB connector

For deployment in an explosion-endangered environment, a USB connector with strain relief must be used.

Mounting

Push the connector onto the socket in the housing until the strain relief (6b) snaps into the housing (6a).

Removal

To remove the USB connector, press to release the strain relief (6b) (see Figure 5-3 Mounting/removal: USB connector (Page 189)) and then remove the connector.
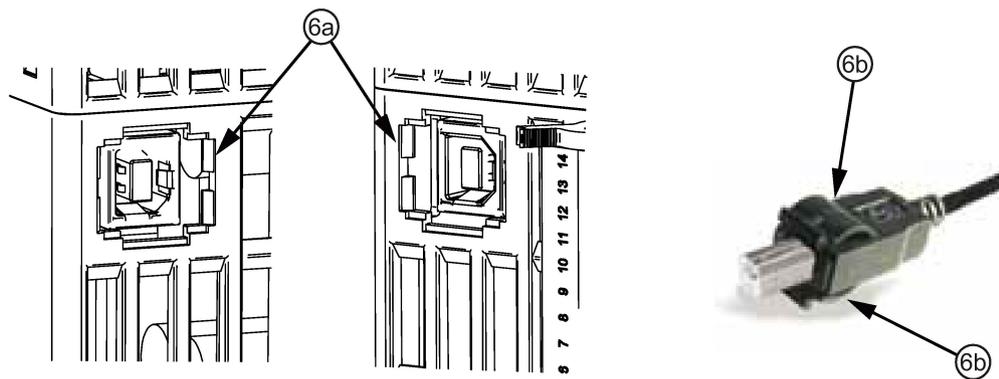
Figure 5-3   Mounting/removal: USB connector

5.1.3 PROFINET/Ethernet connector

For use in a hazardous zone, a PROFINET/Ethernet connector with strain relief must be used.

Mounting

Push the connector onto the socket in the housing until the strain relief (5b) snaps into the housing (5a).

Removal

To remove the PROFINET/Ethernet connector, press to release the strain relief (5b) (see Figure 5-4 Mounting/removal: Ethernet (Page 190)) and then remove the connector.
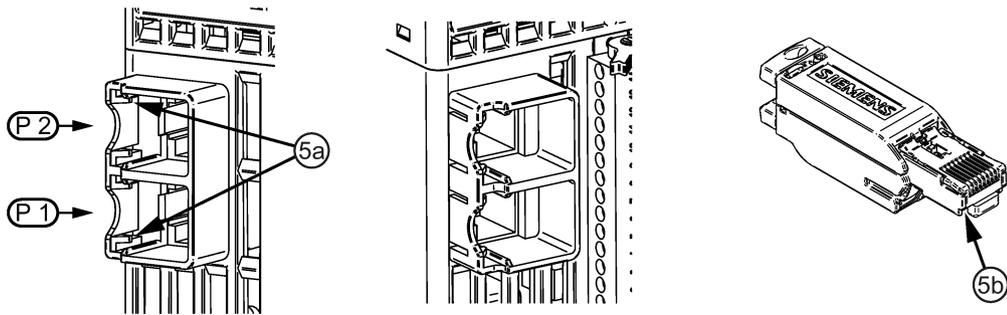
Figure 5-4   Mounting/removal: Ethernet

5.2 SITOP UPS1100

⚠ WARNING

Mounting the device in a housing or a control cabinet

The SITOP UPS1100 battery modules are built-in units. They must be mounted in a housing or control cabinet where only qualified personnel have access.

All devices are suitable for direct wall mounting.
Devices 6EP4131-0GB00-0AY0 (1.2 Ah), 6EP4132-0GB00-0AY0 (2.5 Ah), 6EP4133-0GB00-0AY0 (3.2 Ah) and 6EP4133-0JB00-0AY0 (5 Ah) can also be snapped onto a standard mounting rail TH35×15 (EN 60715), and device 6EP4131-0GB00-0AY0 (1.2 Ah) also onto a standard mounting rail TH35×7.5 (EN 60715).

The lower part of the control cabinet or the coolest location in the control cabinet should be chosen as mounting location.

⚠ WARNING

Use in hazardous zones

When the device is installed in a hazardous zone (II 3G nA IIC T4 Gc), **not permissible for 6EP4133-0JB00-0AY0 (5 Ah)**, then this must be installed in a distribution box with degree of protection IP54 or higher. This distribution box must comply with the requirements of EN 60079-15.

Mounting

See Chapter Dimensions and weight for the holes for wall mounting SITOP UPS1100 (Page 42).

To mount the device on a standard mounting rail, place it with the standard mounting rail guide at the upper edge of the standard mounting rail and snap it in downwards. If this is too difficult, push the device downwards while pressing on the rail as described for "Removal".

Note

The fuses should be inserted in the fuse holder only when commissioning the device (charged batteries).

Note

The lead acid batteries are fully charged when the device is delivered. The LiFePo battery (5 Ah) is only charged up to a maximum of 30 % of the nominal charge (to comply with transport regulations).

Removal

To remove the device, pull it forcibly downwards while removing it from the lower edge of the standard mounting rail (see Figure 5-5 Removal (example 6EP4133-0GB00-0AY0 (3,2 Ah))

(Page 192)). Then you can remove the device from the upper edge of the standard mounting rail.
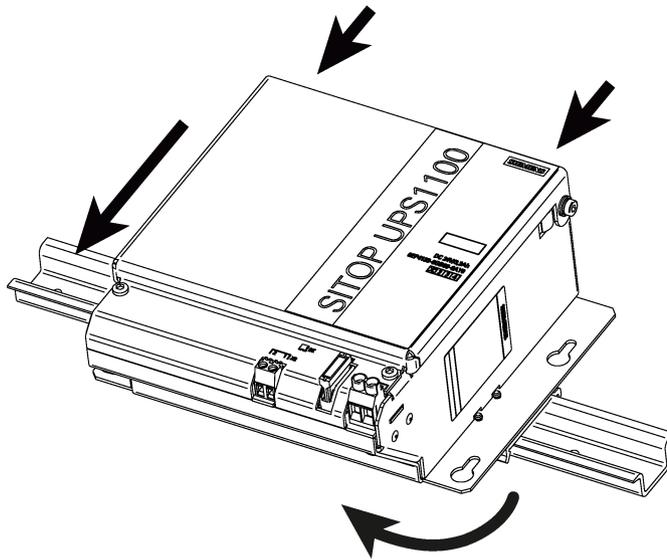
Figure 5-5   Removal (example 6EP4133-0GB00-0AY0 (3,2 Ah))

Mounting position, mounting clearances

6

6.1 SITOP UPS1600

6.1.1 Standard mounting position

The device is mounted on standard mounting rails EN 60715 35×7.5/15. The device must be mounted vertically in such a way that the input terminals and the output terminals are at the bottom to ensure correct cooling.

A clearance of at least 50 mm should be maintained above and below the device.

No clearance is required at the side.

Output current as a function of the ambient temperature
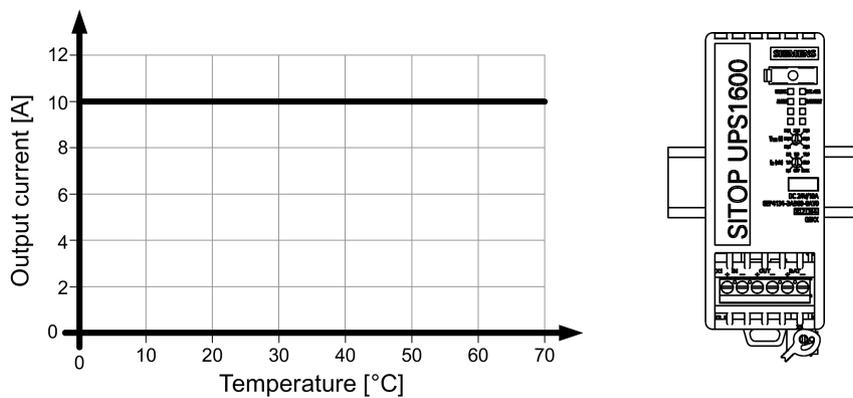
Figure 6-1   6EP4134-3AB00-... Output current in the standard mounting position
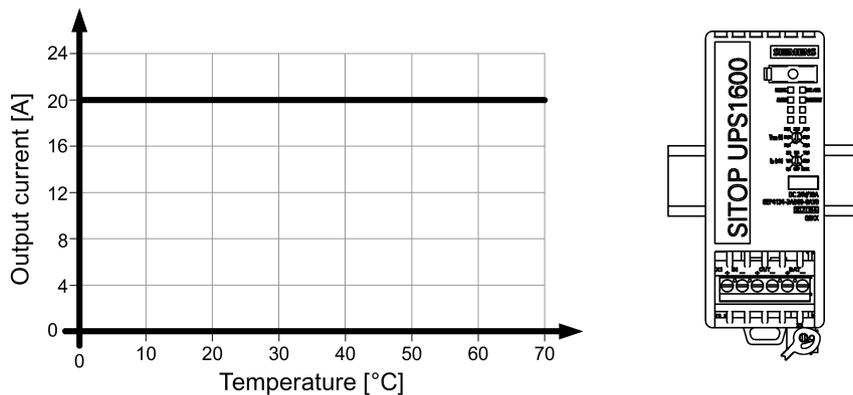
Figure 6-2   6EP4136-3AB00-... Output current in the standard mounting position
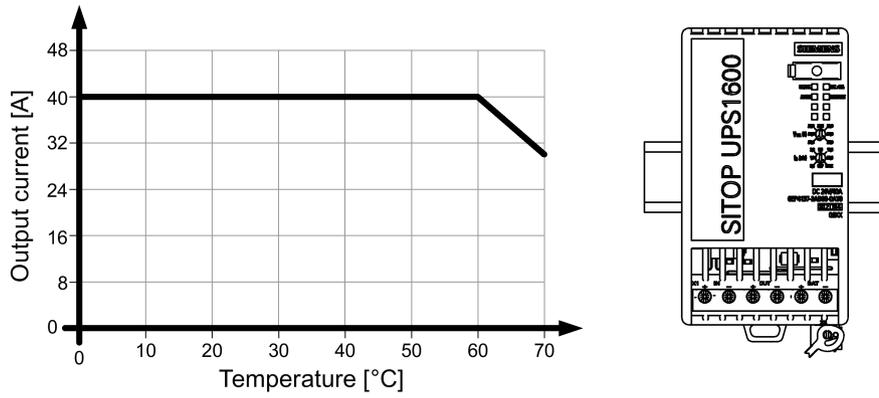
Figure 6-3   6EP4137-3AB00-... Output current in the standard mounting position

6.1.2 Other mounting positions

For mounting positions that deviate from the standard mounting position, derating factors (reduction of the output power or the permissible ambient temperature) must be observed in accordance with the following diagrams.

Note

In the case of mounting positions that deviate from the standard mounting position, reduced mechanical resistance of the devices against vibration and shock must be expected.

Particularly when installing on a vertically fastened standard mounting rail, additional measures may be required, e.g. to prevent the device from slipping on the standard mounting rail.

6.1.2.1 6EP4134-3AB00-...
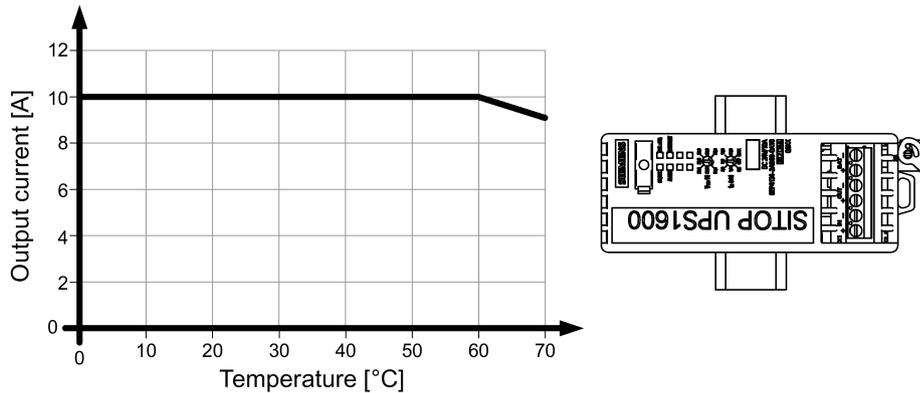
Figure 6-4   6EP4134-3AB00-... Mounting position 1
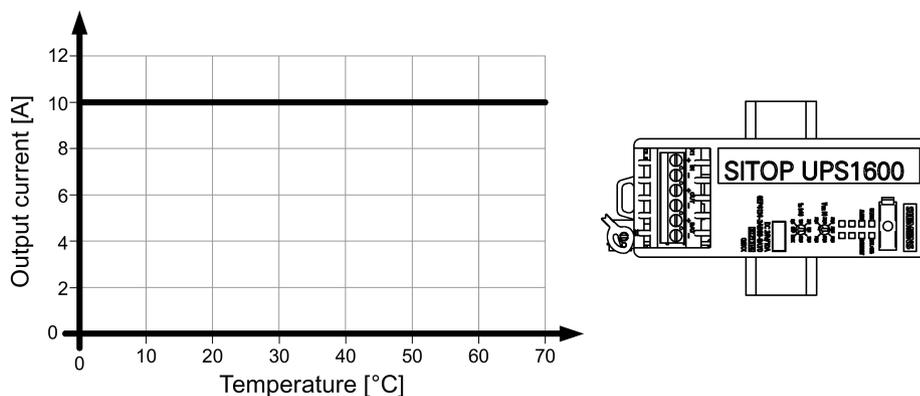
Figure 6-5   6EP4134-3AB00-... Mounting position 2
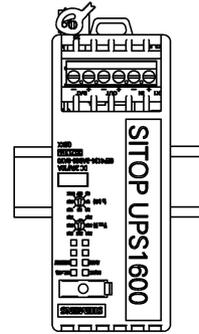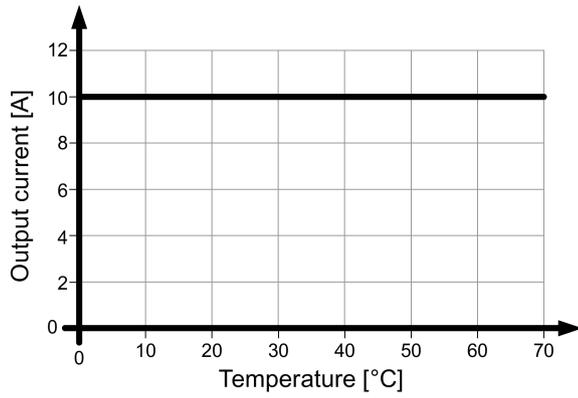
Figure 6-6   6EP4134-3AB00-... Mounting position 3
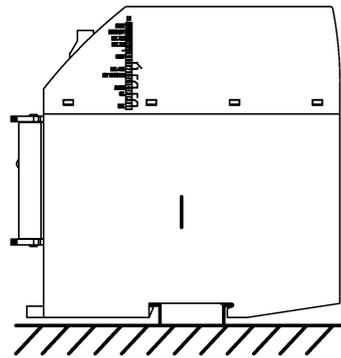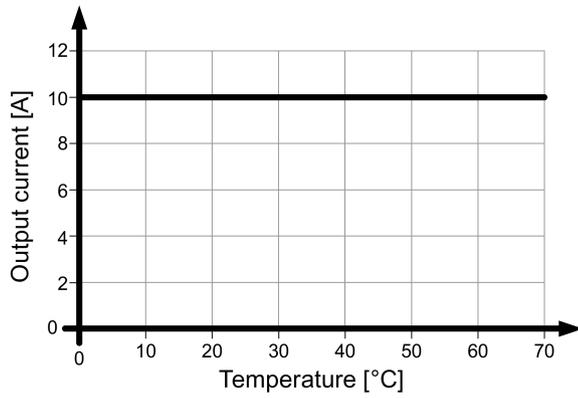
Figure 6-7   6EP4134-3AB00-... Mounting position 4
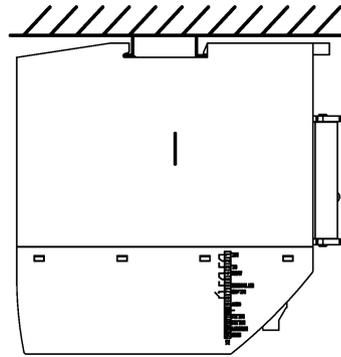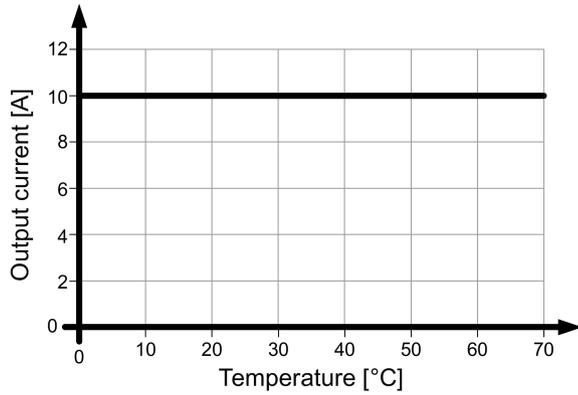
Figure 6-8   6EP4134-3AB00-... Mounting position 5

6.1.2.2 6EP4136-3AB00-...
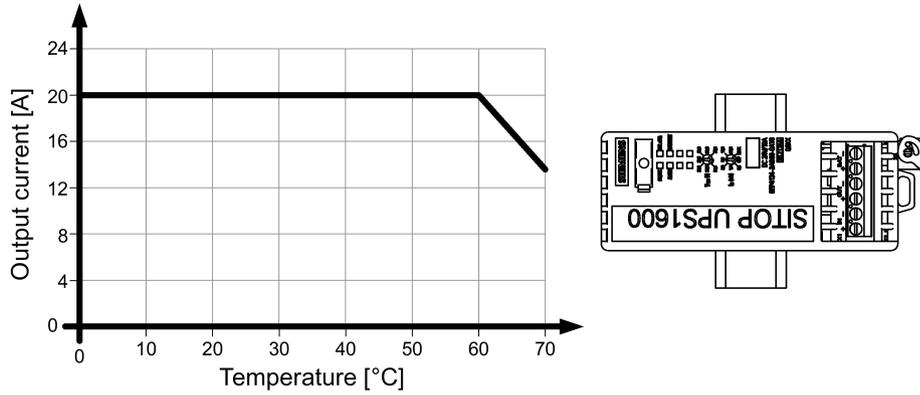
Figure 6-9   6EP4136-3AB00-... Mounting position 1
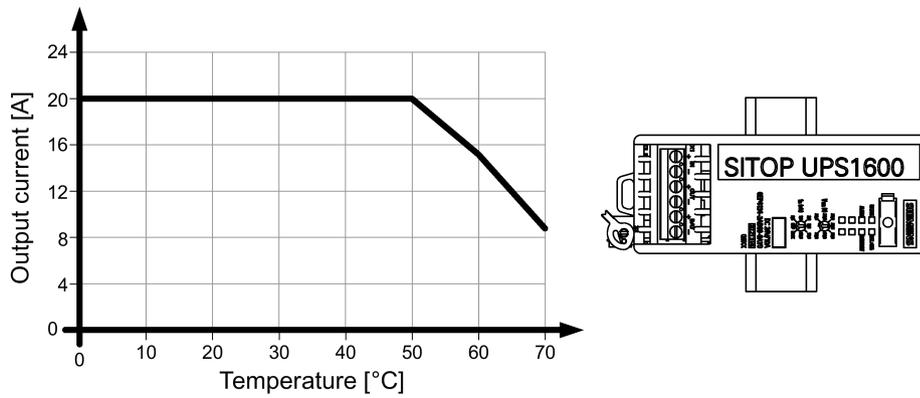
Figure 6-10   6EP4136-3AB00-... Mounting position 2
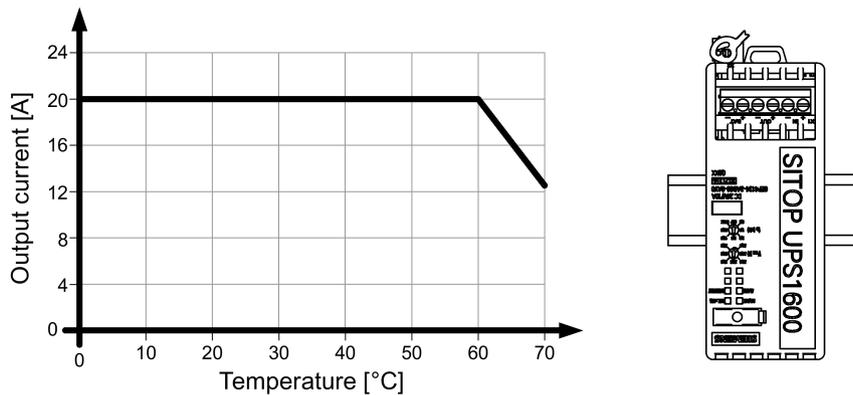
Figure 6-11   6EP4136-3AB00-... Mounting position 3
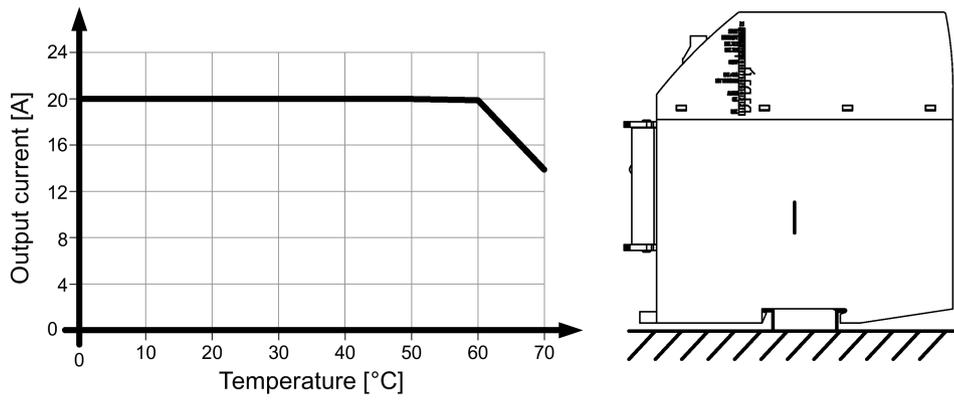
Figure 6-12   6EP4136-3AB00-... Mounting position 4
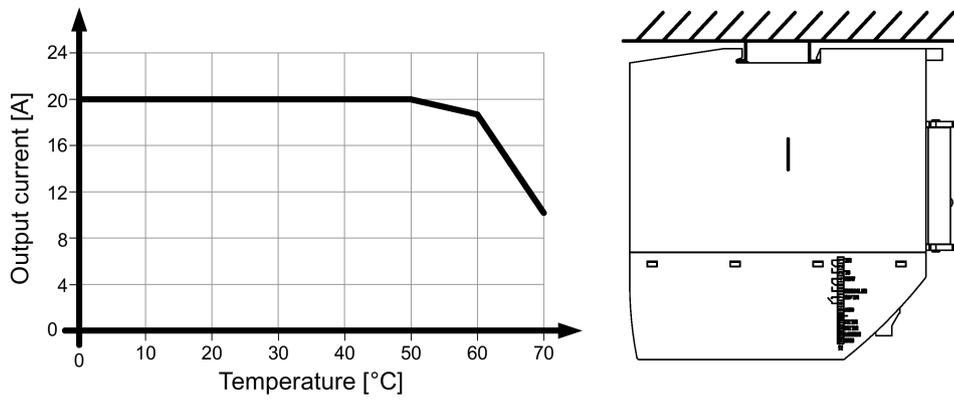
Figure 6-13   6EP4136-3AB00-... Mounting position 5

6.1.2.3   6EP4137-3AB00-...
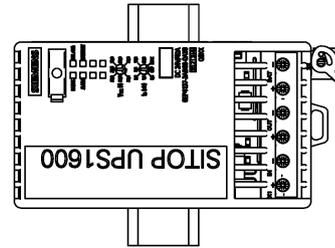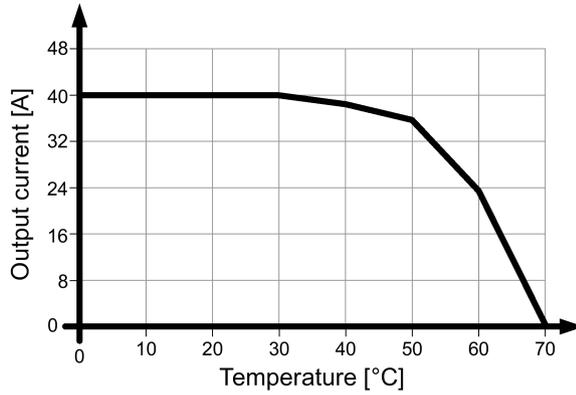
Figure 6-14   6EP4137-3AB00-... Mounting position 1
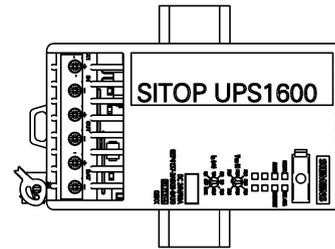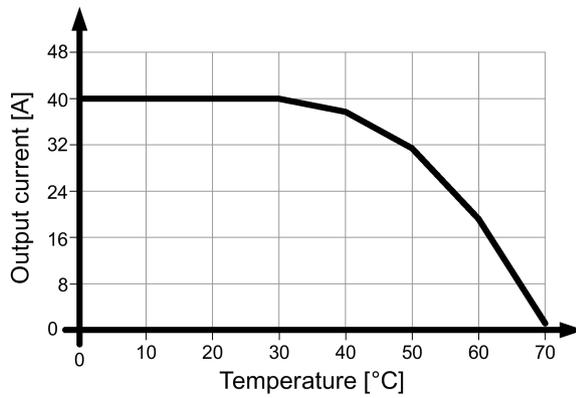
Figure 6-15   6EP4137-3AB00-... Mounting position 2
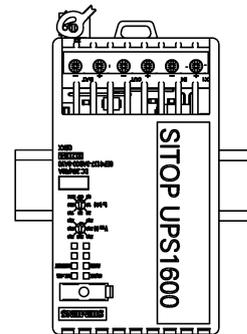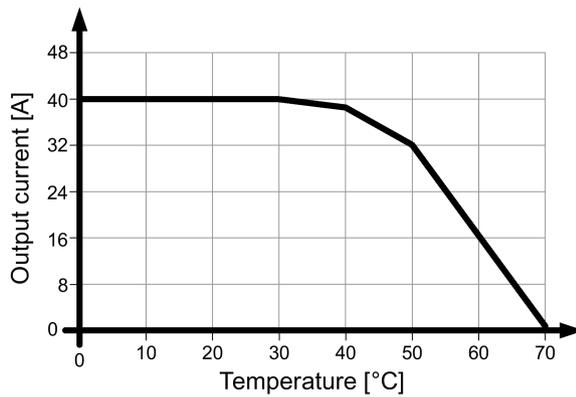
Figure 6-16   6EP4137-3AB00-... Mounting position 3
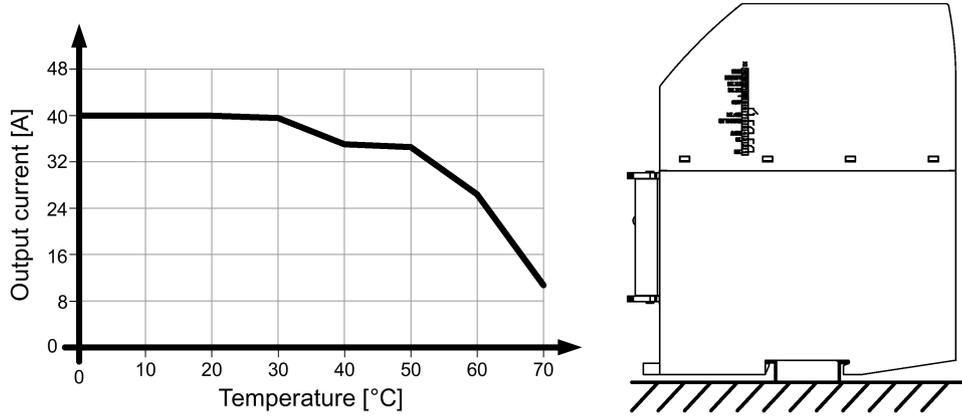
Figure 6-17   6EP4137-3AB00-... Mounting position 4
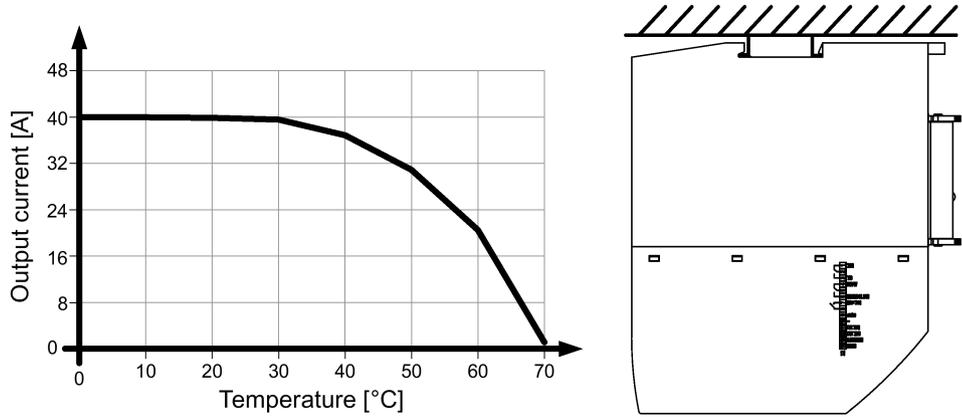
Figure 6-18   6EP4137-3AB00-... Mounting position 5

6.2 SITOP UPS1100

6.2.1 Standard mounting position

The device is suitable for the direct wall mounting. Devices 6EP4131-0GB00-0AY0 (1.2 Ah), 6EP4132-0GB00-0AY0 (2.5 Ah), 6EP4133-0GB00-0AY0 (3.2 Ah) and 6EP4133-0JB00-0AY0 (5 Ah) can also be snapped onto a standard mounting rail TH35×15 (EN 60715), and device 6EP4131-0GB00-0AY0 (1.2 Ah), also onto a standard mounting rail TH35×7.5 (EN 60715). It should also be mounted at the coolest point in the control cabinet (e.g. in the lower part of the control cabinet). The device must be mounted vertically in such a way that the terminals are at the bottom.

No clearance is required at the side.

6.2.2 Other mounting positions

Note

In the case of mounting positions that deviate from the standard mounting position, reduced mechanical resistance of the devices against vibration and shock must be expected.

Particularly when installing on a vertically fastened standard mounting rail, additional measures may be required, e.g. to prevent the device from slipping on the rail.

All mounting positions have been released, except the following:
For UPS1100 1.2 Ah: Mounting position (2) (see the following diagram)
all other UPS1100: Mounting position (5) (see the following diagram)

Mounting position (2) Mounting position (5)
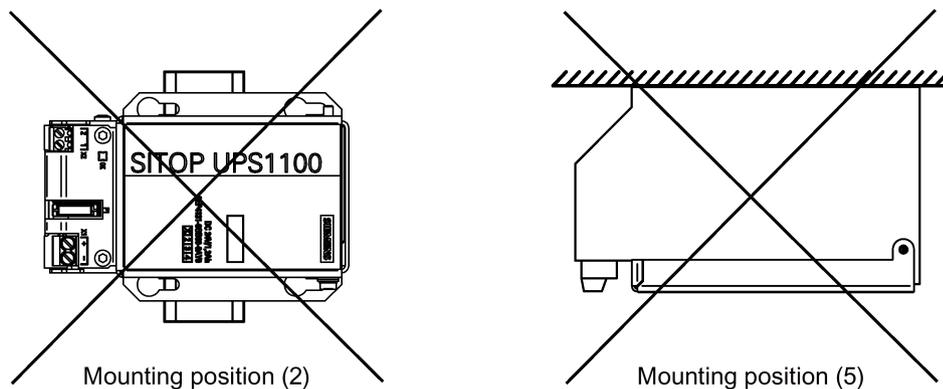
Figure 6-19   Mounting positions forbidden for the UPS1100

6.3 Altitude derating

Output current as a function of the altitude derating
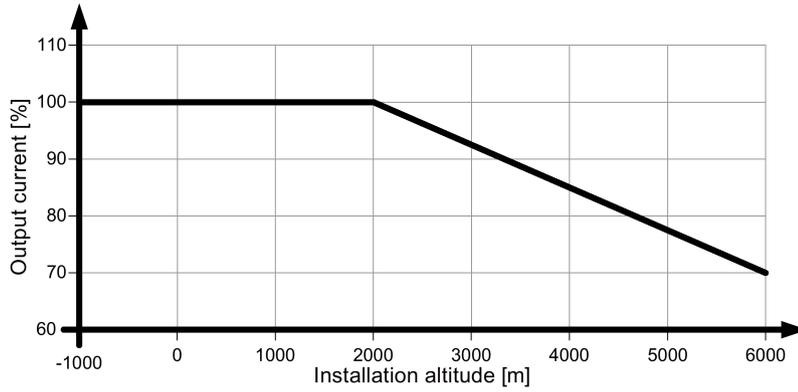
Figure 6-20   Altitude derating

Details see chapter Environmental conditions (Page 225)

Note

Only applies to the UPS1600. For UPS1100 (with the exception of UPS1100 2.5 Ah) operation at altitudes of 4000 m above sea level is not permissible.

Installation 7

Note

When installing the devices, the relevant country-specific regulations must be complied with.

The 24 V supply voltage must be SELV in accordance with EN60950-1 and EN50178.

Only qualified personnel are allowed to install the device/system and set it into operation.

It is not permissible that the connections are attached or detached in operation.

Note

for SITOP UPS1100

It is recommended that the batteries are only stored fully charged.

The lead acid batteries are fully charged when the device is delivered. The LiFePo battery (5 Ah) is only supplied charged up to a maximum of 30 % of the nominal charge (to comply with transport regulations).

The self-discharge rate of the batteries is approx. 3%/month for a temperature of 20° C. This value is temperature dependent and becomes more unfavorable for an increasing temperature, and more favorable for a decreasing temperature.

The fuses should only be inserted in the fuse holder when commissioning the device.

When storing UPS1100 battery modules and completely cabled/wired systems (with UPS1600 and fuse inserted in the UPS1100), it should be taken into account that an additional discharge current of 300 µA flows.

SITOP UPS1100 1.2 Ah is only recommended in conjunction with SITOP UPS1600 10 A.

SITOP UPS1100 2.5 Ah, 3.2 Ah and 5 Ah are only recommended in conjunction with SITOP UPS1600 10 A and 20 A.

When using battery modules without Energy Storage Link, it must be ensured that the selected batteries match the data of the UPS1600 (static and dynamic load current, charge current).
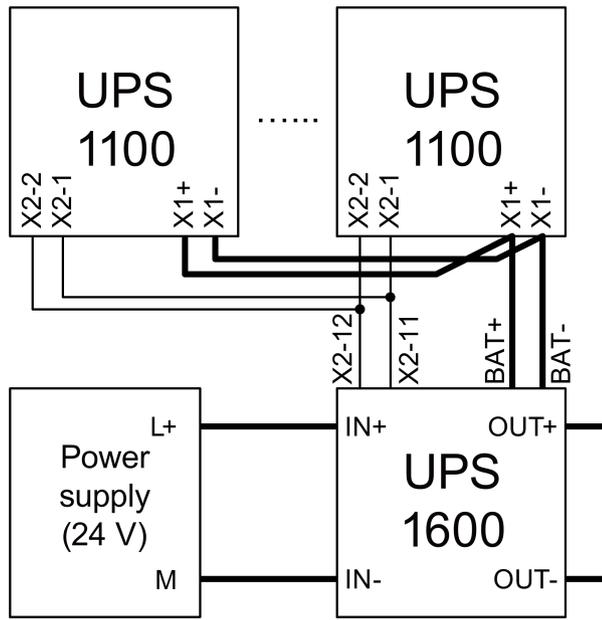
Figure 7-1   Wiring

7.1 Connecting the SITOP UPS1600 at its input

SITOP UPS1600 is designed to be connected to a 24 V DC supply. The 24 V supply voltage must be SELV in accordance with EN60950-1 and EN50178.
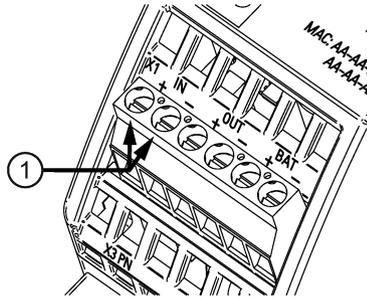
Figure 7-2   Input side connection

The 24 V power supply is connected at the "IN+", and "IN-" ① terminals (see Figure Input side connection (Page 205)).

Cables must be used that are suitable for at least 90 °C (only for applications for UL508).

7.2 Connecting the SITOP UPS1600 at its output

The output of the SITOP UPS1600 is no-load, overload and short-circuit proof. If an overload occurs, the electronic current limiting function limits the output current to a maximum value (see Section Technical data (Page 211)).
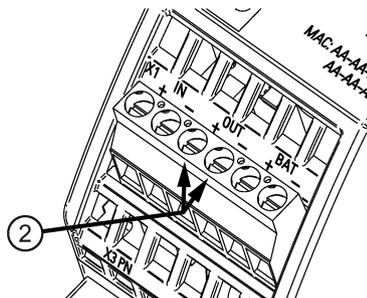
Figure 7-3   Output-side connection

The output voltage is connected at the "OUT+" and "OUT−" ② terminals (see Figure Output-side connection (Page 205)). Ensure that the output cables are dimensioned correctly for the maximum output current rms value and fused accordingly.

The deployed cables must be suitable for temperatures of at least 90° C. (only for applications for UL508)

7.3 Connecting the BAT SITOP UPS1600
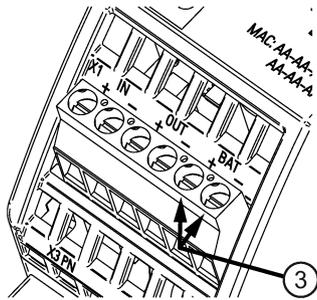
Figure 7-4   BAT connection

The "BAT+" and "BAT-" ③ connections (see Figure BAT connection (Page 206)) are used to connect the SITOP UPS1600 with one or more SITOP UPS1100 battery modules. Ensure that the cables are dimensioned correctly for the maximum output current rms value of the SITOP UPS1600.

For wiring, see Figure Wiring (Page 204).

Cables must be used that are suitable for at least 90 °C (only for applications for UL508).

Maximum cable length 3 m

7.4 USB interface

Maximum USB cable length 5 m

7.5 PROFINET/Ethernet connection

Maximum length of the PROFINET/Ethernet cable 100 m (90 m BASIC- Link plus 2 x 5 m CHANNEL- Link)

7.6 SITOP UPS1100 connections
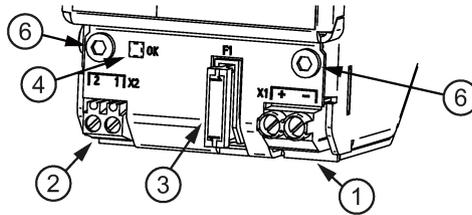
Connections 1.2 Ah/2.5 Ah/3.2 Ah/5 Ah
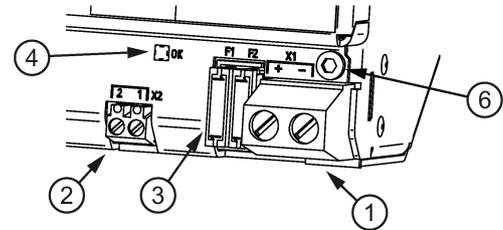
Connections 7/12 Ah

Connection X1 ①

The connections "X1+" and "X1-" are used to transfer power between the SITOP UPS1600 and the SITOP UPS1100.

1. Ensure that the cables are dimensioned corresponding to the fuses in the SITOP UPS1100 and the impedances between SITOP UPS1600 and SITOP UPS1100 are the same.

2. Only connect charged batteries with one another.

Connection X2 ②

Connections "X2-1" and "X2-2" serve to transfer data between SITOP UPS1600 and SITOP UPS1100 (see Figure Wiring (Page 204)).

When several battery modules are used, note the following:

● Up to 6 battery modules of the same type can be connected together in parallel.

● If different battery modules are connected in parallel, the relay REL2 is energized and de-energized at regular intervals (battery defective). No calculations with regard to charge and remaining buffer time are performed. The battery modules are not charged, but buffering is possible.

● If more than 6 battery modules are connected in parallel, the relay REL2 is energized and de-energized at regular intervals (battery defective). No calculations with regard to charge and remaining buffer time are performed. Charging and buffering, however, is possible.

7.7 Maintenance

7.7.1 Battery

SITOP UPS1100 devices contain 2 maintenance-free batteries.

Device type	Battery type
6EP4131-0GB00-0AY0 (1.2 Ah)	YUASA NP1,2-12
6EP4132-0GB00-0AY0 (2.5 Ah)	Hawker Energy CYCLON 0810-0075 2.5-12
6EP4133-0GB00-0AY0 (3.2 Ah)	YUASA NP3,2-12 or B.B.Battery BP3,6-12
6EP4133-0JB00-0AY0 (5 Ah)	NEC ALM12V7s
6EP4134-0GB00-0AY0 (7 Ah)	YUASA NP7-12 or B.B.Battery BP7-12
6EP4135-0GB00-0AY0 (12 Ah)	YUASA NP12-12 or B.B.Battery BP12-12

When replacing the batteries, always use batteries with the same batch number (approximately the same charge state).

The rechargeable batteries must be disposed of, discharged according to the applicable regulations.

When storing, installing and operating the buffer batteries, the regulations of VDE 0510 Part 2 / EN 50272-2 or the applicable national regulations must be observed.

The self-discharge rate of the batteries is approx. 3%/month for a temperature of 20° C. This value is temperature dependent and becomes more unfavorable for an increasing temperature, and more favorable for a decreasing temperature.

7.7.2 Battery replacement

See Figure 7-5 Maintenance (Page 209) and Figure 7-6 Wiring schematic (Page 209)

1. Remove the screws ⑨ using a Torx T10 screwdriver.

2. Open the cover.

3. Press button ⑧ for at least 2 s.

   LED ④ flashes

4. Remove fuse ③

5. Replace the batteries.

6. Press the button for at least 2 s

   LED ④ stops flashing and lights continuously.

7. Insert the fuse.

8. Close the cover (screw).

Pressing the button resets the following functions:

- Operating hours counter
- Buffer time counter
- Summed charge current
- Summed load current
- Calculated capacity

Note

Replace the battery only in normal operation, not in backup operation.

Figure 7-5   Maintenance

6EP4131-0GB00-0AY0 1,2 Ah   6EP4132-0GB00-0AY0 2,5 Ah   6EP4133-0JB00-0AY0 5 Ah
6EP4133-0GB00-0AY0 3,2 Ah   6EP4134-0GB00-0AY0 7 Ah
                                                                 6EP4135-0GB00-0AY0 12 Ah
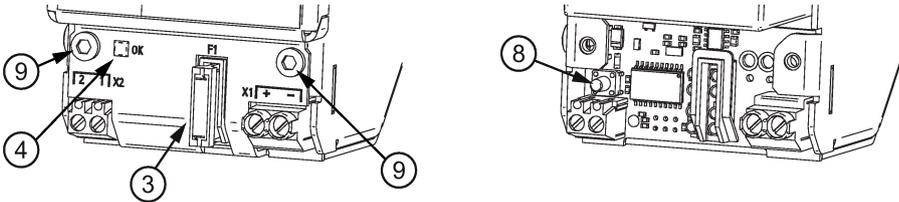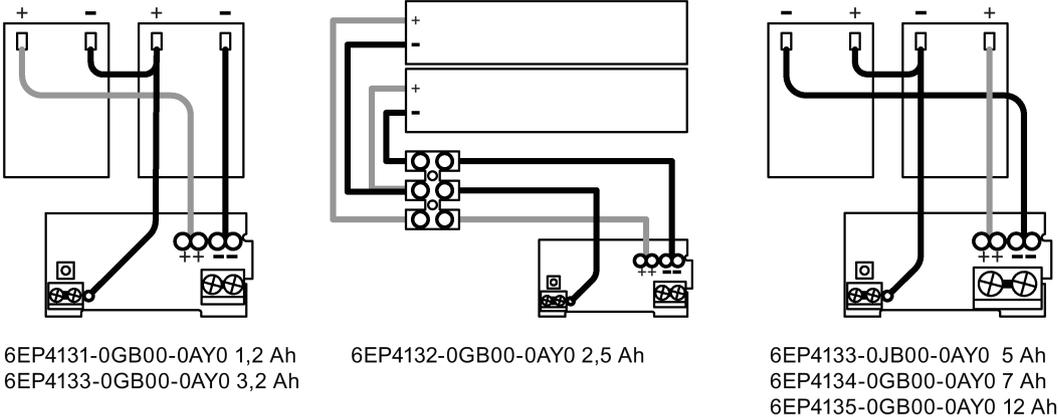
Figure 7-6   Wiring schematic

Technical data

<div align="right">8</div>

> **Note**
>
> Technical data apply for a rated input voltage, rated load and 25 °C ambient temperature if nothing else is specified.

8.1 Input data

8.1.1 SITOP UPS1600

	6EP4134-3AB00- ... (10 A)	6EP4136-3AB00- ... (20 A)	6EP4137-3AB00- ... (40 A)
Input voltage $U_{in\ rated}$/range	24 V DC/21 - 29 V		
Connection threshold for buffering	22.5 V DC ± 3 % (factory setting), setting range: 21 V DC, 21.5 V DC, 22 V DC, 22.5 V DC, 23 V DC, 24 V DC, 25 V DC or via software.		
• Remark	The connection (switch-in) threshold must be at least 0.5 V lower than the input voltage (measured at the input terminal under load).		
	After reaching the minimum input voltage at the DC UPS module, the module cannot buffer for a maximum of 1.5 seconds.		
Input current $I_{in\ rated}$	Approx. 14 A at the maximum charge current (3 A)	Approx. 25 A at the maximum charge current (4 A)	Approx. 46 A at the maximum charge current (5 A)
Reverse polarity protection	Yes		

8.1.2 SITOP UPS1100

Charge current

- The charge current is limited by the maximum permissible charge current of the UPS1600 (see Chapter SITOP UPS1600 (Page 213))

- When a battery module is connected, the charge current is max. 0.3C A.

- For several battery modules connected in parallel, the max. charge current is 0.3C A multiplied by the number of batteries connected in parallel.

Recommended end-of-charge voltage (standby use), dependent on the battery temperature

	6EP4131-0GB00- ... (1.2 Ah) 6EP4133-0GB00- ... (3.2 Ah) 6EP4134-0GB00- ... (7 Ah) 6EP4135-0GB00- ... (12 Ah)	6EP4132-0GB00- ... (2.5 Ah)	6EP4133-0JB00- ... (5 Ah)
At -10 °C	-	29.0 V	29.28 V
At 0 °C	-	28.6 V	29.52 V
At 10 °C	27.8 V	28.3 V	29.16 V
At 20 °C	27.3 V	27.9 V	28.8 V
At 30 °C	26.8 V	27.5 V	28.8 V
At 40 °C	26.6 V	27.2 V	28.8 V
At 50 °C	-	26.8 V	27.8 V
At 60 °C	-	26.4 V	-

Note

Battery module UPS1100 5 Ah with LiFePo batteries can only be used in conjunction with UPS1600 from software version V2.1 and higher.

See also

SITOP UPS1600 (Page 213)

Output data (Page 213)

8.2 Output data

8.2.1 SITOP UPS1600

	6EP4134-3AB00- ... (10 A)	6EP4136-3AB00- ... (20 A)	6EP4137-3AB00- ... (40 A)
Output voltage for normal operation	Input voltage U_{in} approx. - 0.2 V		
Output voltage for buffer mode	27 V DC (no-load); 24 V (50 % rated battery current); 22 V (100 % rated battery current); 18.5 V (deep discharge protection)		
Power-up characteristics	Start delay < 1 s Typical voltage increase: < 60 ms		
Output +BAT/-BAT for normal operation	I-U charging characteristic (initially fast charge current, then charge retention).		
• Remark	For one connected battery module the max. charge current is 0.3C A, for several battery modules connected in parallel, the charge current is 0.3C A multiplied by the number of batteries connected in parallel, however, limited by the maximum permissible charge current of the UPS1600.		
End-of-charge voltage	Automatic temperature-controlled setting with the SITOP UPS1100 battery modules		
Output current – rated value	10 A	20 A	40 A
Power boost for 30 ms	30 A	60 A	120 A
Extra power for 5 s/min	15 A	30 A	60 A
• Remark	When using the UPS1100 5 Ah, Extra Power is permissible for 1 s/min.		
Charge current	Max. 3 A Automatic setting for UPS1100; otherwise 0.3 A, 0.8 A or 3 A can be selected (by software or jumper (see Table 2-5 Charge current (Page 29)))	Max. 4 A Automatic setting for UPS1100; otherwise 0.8 A, 1.75 A, 4 A can be selected (by software or jumper (see Table 2-5 Charge current (Page 29)))	Max. 5 A Automatic setting for UPS1100; otherwise 0.8 A, 1.75 A, 4 A can be selected (by software or jumper (see Table 2-5 Charge current (Page 29)))
• Remark	The charge current can be automatically reduced if the charge current plus the load current at the UPS1600 results in an overload of the feeding power supply. The charge current can also be reduced if the ambient temperature of the UPS1600 is higher than 40 °C - or if the input voltage at the UPS1600 is less than 24 V. Derating: 10 A: 3 A→2 A 20 A: 4 A→3 A 40 A: 5 A→3 A		

8.2.2   SITOP UPS1100

	6EP4131-0GB00-... (1.2 Ah)	6EP4132-0GB00-... (2.5 Ah)	6EP4133-0GB00-... (3.2 Ah)	6EP4133-0JB00-... (5 Ah)	6EP4134-0GB00-... (7 Ah)	6EP4135-0GB00-... (12 Ah)
Output voltage rated value	24 V DC					
Rated voltage range	22 - 27 V DC	22 - 27 V DC	22 - 27 V DC	22 - 28.8 V DC	22 - 27 V DC	22 - 27 V DC
Output current rated value	10 A	20 A	20 A	20 A	40 A	40 A
Power boost for 30 ms	30 A	60 A	60 A	60 A	120 A	120 A
Extra Power for 5 s/min	15 A	30 A	30 A	-	60 A	60 A
Extra Power for 1 s/min	-	-	-	30 A	-	-
Battery fuse (pluggable)	15 A / 32 V	25 A / 32 V	25 A / 32 V	25 A/32 V	2 × 25 A/32 V	2 × 25 A/32 V

Remark:

The lead acid batteries are fully charged when the device is delivered. The LiFePo battery (5 Ah) is only supplied charged up to a maximum of 30 % of the nominal charge (to comply with transport regulations).

8.3 Backup times

Output current	6EP4131-0GB00-... (1.2 Ah)	6EP4132-0GB00-... (2.5 Ah)	6EP4133-0GB00-... (3.2 Ah)	6EP4133-0JB00-... (5 Ah)	6EP4134-0GB00-... (7 Ah)	6EP4135-0GB00-... (12 Ah)
1 A	34 minutes	1.7 h	2.5 h	5.2 h	5.4 h	10.3 h
2 A	11 minutes	54.6 minutes	1 h	2.5 h	2.6 h	4.8 h
3 A	9 minutes	32.9 minutes	39 minutes	1.7 h	1.6 h	3 h
4 A	6 min	20.6 minutes	27 minutes	1.25 h	1.2 h	2.3 h
6 A	3.5 minutes	14.3 minutes	17.5 minutes	50.6 minutes	41 minutes	1.4 h
8 A	2 minutes	10.5 minutes	12 minutes	37.8 minutes	28 minutes	1 h
10 A	1 minute	7.2 minutes	9 minutes	30.2 minutes	22 minutes	48.6 minutes
12 A	-	6 minutes	7 minutes	25.1 minutes	17 minutes	40.3 minutes
14 A	-	4.5 minutes	5 minutes	21.6 minutes	15 minutes	33.6 minutes
16 A	-	4.1 minutes	4 minutes	18.8 minutes	12.5 minutes	26 minutes
20 A	-	2.9 minutes	1 minute	12.9 minutes	9 minutes	19.6 minutes
30 A	-	-	-	-	4.6 min	12.1 min
40 A	-	--	-	-	2.8 min	8.5 min

8.4 Efficiency

Table 8- 1   SITOP UPS1600

	6EP4134-3AB00-0AY0 (10 A) 6EP4134-3AB00-1AY0 (10 A)	6EP4134-3AB00-2AY0 (10 A)
Efficiency at $U_{in\ rated}$, $I_{out\ rated}$, approx.	97.5 %	97.3 %
Power loss at $U_{in\ rated}$, $I_{out\ rated}$, approx.	6 W	7 W

	6EP4136-3AB00-0AY0 (20 A) 6EP4136-3AB00-1AY0 (20 A)	6EP4136-3AB00-2AY0 (20 A)
Efficiency at $U_{in\ rated}$, $I_{out\ rated}$, approx.	97.7 %	97.5 %
Power loss at $U_{in\ rated}$, $I_{out\ rated}$, approx.	10 W	11 W

	6EP4137-3AB00-0AY0 (40 A) 6EP4137-3AB00-1AY0 (40 A)	6EP4137-3AB00-2AY0 (40 A)
Efficiency at $U_{in\ rated}$, $I_{out\ rated}$, approx.	98.5 %	98.3 %
Power loss at $U_{in\ rated}$, $I_{out\ rated}$, approx.	15 W	17 W

8.5 Protection and monitoring

Table 8- 2   SITOP UPS1600

	6EP4134-3AB00- ... (10 A)	6EP4136-3AB00- ... (20 A)	6EP4137-3AB00- ... (40 A)
Current limitation Typ.	30 A	60 A	120 A
• Remark	Power boost with 300 % $I_{out\ rated}$ for typ. 30 ms	Power boost with 300 % $I_{out\ rated}$ for typ. 30 ms	Power boost with 300 % $I_{out\ rated}$ for typ. 30 ms
Short-circuit protection	Shutdown after 30 ms		
Reverse polarity protection	With respect to the input voltage U_{in} and with respect to batteries		
Overload/short-circuit indicator	Yes, restart in normal operation		

Table 8- 3   SITOP UPS1100

	6EP4131-0GB00-... (1.2 Ah)	6EP4132-0GB00-... (2.5 Ah)	6EP4133-0GB00-... (3.2 Ah)	6EP4133-0JB00-... (5 Ah)	6EP4134-0GB00-... (7 Ah)	6EP4135-0GB00-... (12 Ah)
Short-circuit protection	Yes, fuse					
Reverse polarity protection	Yes					

8.6 MTBF

	6EP4134-3AB00- ... (10 A) 6EP4136-3AB00- ... (20 A) 6EP4137-3AB00- ... (40 A)
Mean Time Between Failures	SN29500: > 320000 h at 40 °C, rated load, 24h operation

8.7 Mechanical system

8.7.1 SITOP UPS1600

Table 8- 4   SITOP UPS1600 10 A / 20 A

	6EP4134-3AB00- ... (10 A)			6EP4136-3AB00- ... (20 A)		
	... -0AY0	... -1AY0	... -2AY0	... -0AY0	... -1AY0	... -2AY0
Connection system	Screw-type terminal					
Connections / DC input	IN+, IN-: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)					
Connections / DC output	OUT+, OUT-: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)					
Connections / BAT	BAT+, BAT-: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)					
Connections / signal con-nector	X2 (1 - 14): 1 screw terminal each for 0.2 - 1.5 mm² solid/finely stranded					
Width of the housing	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm
Height of the housing	138.7 mm	138.7 mm	138.7 mm	138.7 mm	138.7 mm	138.7 mm
Depth of the housing	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Installation width	50 mm	50 mm	50 mm	50 mm	50 mm	50 mm
Mounting height	238.7 mm	238.7 mm	238.7 mm	238.7 mm	238.7 mm	238.7 mm
Weight, approx.	0.38 kg	0.4 kg	0.44 kg	0.39 kg	0.41 kg	0.45 kg
Product feature / of the housing / housing that can be lined up next to one another	Yes					
Type of mounting / wall mounting	No					
Type of mounting / rail mounting	Yes					
Type of mounting / S7-300 rail mounting	No					
Mounting	Can be snapped onto standard TH35x7,5/15 mounting rails (EN 60715)					

Table 8- 5   SITOP UPS1600 40 A

	6EP4137-3AB00- ... (40 A)		
	... -0AY0	... -1AY0	... -2AY0
Connection system	Screw-type terminal		
Connections / DC input	IN+, IN-: 1 screw terminal each for 0.5 - 16 (4) mm² solid (finely stranded)		
Connections / DC output	OUT+, OUT-: 1 screw terminal each for 0.5 - 16 (4) mm² solid (finely stranded)		
Connections / BAT	BAT+, BAT-: 1 screw terminal each for 0.5 - 16 (4) mm² solid (finely stranded)		

	6EP4137-3AB00- ... (40 A)		
	... -0AY0	... -1AY0	... -2AY0
Connections / signal connector	X2 (1 - 14): 1 screw terminal each for 0.2 - 1.5 mm² solid/finely stranded		
Width of the housing	70 mm	70 mm	70 mm
Height of the housing	138.7 mm	138.7 mm	138.7 mm
Depth of the housing	150 mm	150 mm	150 mm
Installation width	70 mm	70 mm	70 mm
Mounting height	238.7 mm	238.7 mm	238.7 mm
Weight, approx.	0.65 Kg	0.65 Kg	0.7 kg
Product feature / of the housing / housing that can be lined up next to one another	Yes		
Type of mounting / wall mounting	No		
Type of mounting / rail mounting	Yes		
Type of mounting / S7-300 rail mounting	No		
Mounting	Can be snapped onto standard TH35x7,5/15 mounting rails (EN 60715)		

8.7.2 SITOP UPS1100

Table 8- 6   SITOP UPS1100 1.2 Ah / 2.5 Ah / 3.2 Ah

	6EP4131-0GB00- ... (1.2 Ah)	6EP4132-0GB00- ... (2.5 Ah)	6EP4133-0GB00- ... (3.2 Ah)
Connection system	Screw-type terminal		
Connections / DC input	X1-1, X1-2: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)		
Connections / signal terminal	X2-1, X2-2: 1 screw terminal each for 0.14 - 4 (2.5) mm² solid (finely stranded)		
Width of the housing	89 mm	265 mm	190 mm
Height of the housing	130.3 mm	115 mm	169.3 mm
Depth of the housing	106.7 mm	76 mm	78.7 mm
Installation width	89 mm	265 mm	190 mm
Mounting height	145.3 mm	130 mm	184.3 mm
Weight, approx.	1.9 kg	3.7 kg	3.8 kg
Product feature / of the housing / housing that can be lined up next to one another	Yes		
Type of mounting / wall mounting	Yes		

	6EP4131-0GB00- ... (1.2 Ah)	6EP4132-0GB00- ... (2.5 Ah)	6EP4133-0GB00- ... (3.2 Ah)
Type of mounting / rail mounting	Yes		
Type of mounting / S7-300 rail mounting	No		
Mounting	Wall mounting, can be snapped onto standard TH35x7,5/15 mounting rails (EN 60715)	Wall mounting, can be snapped onto standard TH35x15 mounting rails (EN 60715)	

Table 8- 7   SITOP UPS1100 7 Ah / 12 Ah

	6EP4133-0JB00- ... (5 Ah)	6EP4134-0GB00- ... (7 Ah)	6EP4135-0GB00- ... (12 Ah)
Connection system	Screw-type terminal	Screw-type terminal	
Connections / DC input	X1-1, X1-2: 1 screw terminal each for 0.2 - 6 (4) mm² solid (finely stranded)	X1-1, X1-2: 1 screw terminal each for 0.2 - 16 mm² solid/finely stranded	
Connections / signal terminal	X2-1, X2-2: 1 screw terminal each for 0.14 - 4 (2.5) mm² solid (finely stranded)	X2-1, X2-2: 1 screw terminal each for 0.14 - 4 (2.5) mm² solid (finely stranded)	
Width of the housing	189 mm	186 mm	253 mm
Height of the housing	186 mm	186 mm	186 mm
Depth of the housing	112.7 mm	110.3 mm	110 mm
Installation width	189 mm	186 mm	253 mm
Mounting height	201 mm	201 mm	201 mm
Weight, approx.	3.4 kg	6.1 kg	9.3 kg
Product feature / of the housing / housing that can be lined up next to one another	Yes		
Type of mounting / wall mounting	Yes		
Type of mounting / rail mounting	Yes		
Type of mounting / S7-300 rail mounting	No		
Mounting	Wall mounting, can be snapped onto standard TH35x15 mounting rails (EN 60715)	Wall mounting	

8.8 Dimension drawing

see Section Dimensions and weight (Page 39)

CAD data that can be downloaded from the Internet:

6EP4134-3AB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00813)

6EP4134-3AB00-1AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00816)

6EP4134-3AB00-2AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00819)

6EP4136-3AB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00810)

6EP4136-3AB00-1AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00807)

6EP4136-3AB00-2AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00804)

6EP4137-3AB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01019)

6EP4137-3AB00-1AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01022)

6EP4137-3AB00-2AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01025)

6EP4131-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00829)

6EP4132-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01013)

6EP4133-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00832)

6EP4134-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00835)

6EP4135-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01016)

6EP4133-0JB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01105)

Safety, approvals, EMC

<div style="text-align: right; font-size: 3em;">9</div>

9.1 Safety

	6EP4134-3AB00- ..., 6EP4136-3AB00- ..., 6EP4137-3AB00- ... 6EP4131-0GB00- ..., 6EP4132-0GB00- ..., 6EP4133-0GB00- ..., 6EP4134-0GB00- ..., 6EP4135-0GB00- ..., 6EP4133-0JB00- ...
Protection class	Class III
Degree of protection (EN 60529)	IP20
Test voltage	See Table 9-1 Test voltage (Page 222)

9.2 Test voltage
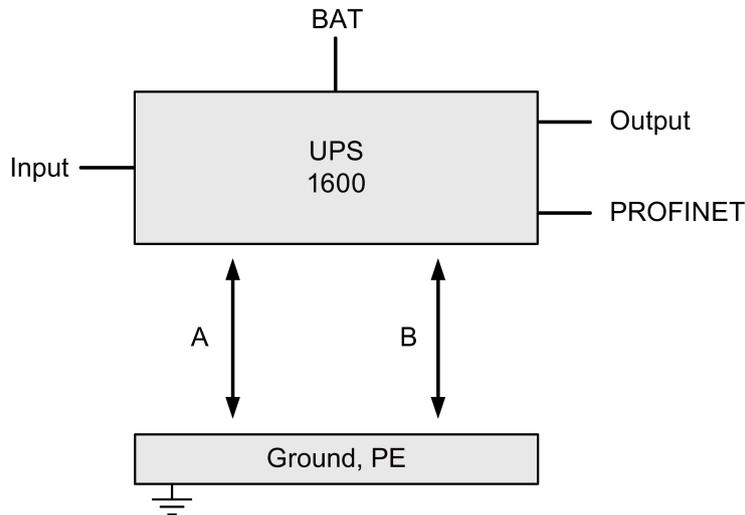
Figure 9-1   Test voltage diagram

Only applicable for UPS1600 with PROFINET (-2AY0).

Only the manufacturer can perform the type test and production test; users can also perform the field test.

Preconditions for performing the field test:

Test (A)

● Connect the input, output, BAT and signaling contact with one another and measure with respect to PE

Test (B)

● Connect all PROFINET cables and measure with respect to PE (input, output, BAT signal connector and PE are connected with each other)

Table 9- 1   Test voltage

	Test time	Input, output, BAT ↔ PE (A)	PROFINET ↔ PE (B)
Type test	60 s	700 VDC	2200 VDC
	60 s	500 VAC	1500 VAC
Production test	1 s	200 VDC	
	1 s	140 VAC	
Field test	1 s	200 VDC	2200 VDC
	1 s	140 VAC	1500 VAC

Remark:

Tripping current for DC measurement: 0 mA

Tripping current for AC measurement: <100 mA

9.3   Approvals

	6EP4134-3AB00- ... 6EP4136-3AB00- ... 6EP4137-3AB00- ...	6EP4131-0GB00-0AY0 6EP4132-0GB00-0AY0 6EP4133-0GB00-0AY0 6EP4133-0JB00-0AY0 6EP4134-0GB00-0AY0 6EP4135-0GB00-0AY0
CE marking	Yes, (2004/108/EG)	Yes, (2004/108/EG and 2006/66/EG)
UL/cUL approval	cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627
Explosion protection	EPS 13 ATEX 1 607 X IECEx EPS 14.0063X II 3G Ex nA nC IIC T4 Gc; cCSAus HazLoc Class I, Div 2, Group A,B,C,D T4; cULus HazLoc Class I, Div 2, Group A,B,C,D T4	EPS 13 ATEX 1 607 X IECEx EPS 14.0063X II 3G Ex nA IIC T4 Gc; cCSAus HazLoc Class I, Div 2, Group A,B,C,D T4; cURus HazLoc Class I, Div 2, Group A,B,C,D T4 6EP4133-0JB00-0AY0: No explosion protection certification
CB certification	Yes, (IEC 60950-1)	Yes, (IEC 60950-1)
Marine approvals	GL	GL

9.4   EMC

		6EP4134-3AB00- ... (10 A) 6EP4136-3AB00- ... (20 A) 6EP4137-3AB00- ... (40 A) 6EP4131-0GB00-0AY0 (1.2 Ah) 6EP4132-0GB00-0AY0 (2.5 Ah) 6EP4133-0GB00-0AY0 (3.2 Ah) 6EP4134-0GB00-0AY0 (7 Ah) 6EP4135-0GB00-0AY0 (12 Ah)	6EP4133-0JB00-0AY0 (5 Ah)
Electrostatic discharge	EN 61000-4-2	6 kV contact, 8 kV air	5 kV contact, 8 kV air
Electromagnetic fields	EN 61000-4-3	80 - 1000 MHz 10 V/m 1400 - 2000 MHz 10 V/m 2000 - 2700 MHz 10 V/m 895 - 905 MHz and 1.89 GHz 10 V/m	
High-speed transient disturbance variables (burst)	EN 61000-4-4	2 kV at DC input/output	
Surge voltages	EN 61000-4-5	500 V symmetrical/unsymmetrical at the DC input/output, 1 kV un-symmetrical at signal connections	

		6EP4134-3AB00- ... (10 A)	6EP4133-0JB00-0AY0
		6EP4136-3AB00- ... (20 A)	(5 Ah)
		6EP4137-3AB00- ... (40 A)	
		6EP4131-0GB00-0AY0 (1.2 Ah)	
		6EP4132-0GB00-0AY0 (2.5 Ah)	
		6EP4133-0GB00-0AY0 (3.2 Ah)	
		6EP4134-0GB00-0AY0 (7 Ah)	
		6EP4135-0GB00-0AY0 (12 Ah)	
High-frequency fields	EN 61000-4-6	10 V; 0.15 - 80 MHz	
Magnetic fields	EN 61000-4-8	Not applicable	
Emitted interference	EN 55022	Class B	
Generic standards	EN 61000-6-2	Immunity for industrial environments	
	EN 61000-6-3	Emission for residential areas	

Environmental conditions

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Table 10- 1   UPS1600

	6EP4134-3AB00- ... (10 A)	6EP4136-3AB00- ... (20 A)	6EP4137-3AB00- ... (40 A)
Ambient temperature	-25 ... 70 °C for natural convection (self convection)	-25 ... 60 °C for natural convection (self convection)	-25 ... 60 °C for natural convection (self convection)
		15 A (derating) at 60° ... 70° C	30 A (derating) at 60° ... 70° C
	Tested according to: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-78 humid heat, constant • EN 60068-2-14 temperature change		
	Remark: The service life of the UPS1100 battery modules (decrease to 50 % of the original capacity) depends on the battery temperature, at approximately 20 °C: 4 years, 30 °C: 2 years, 40 °C: 1 year		
Transport and storage temperature	-40 ... 85 °C		
	Tests (packed for shipping) according to: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-30 humid heat, cyclic		
Humidity class	Climatic class 3K3 according to EN 60721, 5 - 95 % no condensation		
Degree of pollution	2		
Mechanical stress in operation	Tested according to: • EN 60068-2-6 Vibration, test Fc: 3.5 mm deflection in the range 5 – 9 Hz 1 g acceleration in the range 9 – 150 Hz • EN 60068-2-27 shock, test Ea: acceleration 150 m/s^2 , test duration 11 ms		
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide		
Air pressure	Operation: • 1080 - 795 hPa (-1000 - 2000 m) • For operation at altitudes of 2000 m up to 6000 m above sea level: output must be derated by -7.5 % / 1000 m or the ambient temperature must be reduced by 5 K / 1000 m see Figure 6-20 Altitude derating (Page 202) Storage: • 1080 - 660 hPa (-1000 - 3500 m)		

Table 10- 2   UPS1100

	6EP4131-0GB00-0AY0 (1.2 Ah) 6EP4133-0GB00-0AY0 (3.2 Ah) 6EP4134-0GB00-0AY0 (7 Ah) 6EP4135-0GB00-0AY0 (12 Ah)	6EP4132-0GB00-0AY0 (2.5 Ah)	6EP4133-0JB00-0AY0 (5 Ah)
Ambient temperature	0 ... 40 °C for natural convection (self convection) 1.2 / 3.2 / 7 Ah: From product version 3: -15 ... 50 °C for natural convection (self convection) 12 Ah: From product version 2: -15 ... 50 °C for natural convection (self convection)	-20 ... 60 °C for natural convection (self convection)	-20 ... 50 °C for natural convection (self convection)
	Tested according to: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-78 humid heat, constant • EN 60068-2-14 temperature change		
	Remark: The service life of the UPS1100 battery modules (decrease to 50 % of the original capacity) depends on the battery temperature, at approximately 20 °C: 4 years, 30 °C: 2 years, 40 °C: 1 year		
Transport and storage temperature	-20 ... 50 °C	-40 ... 60 °C	-40 ... 60 °C
	Tests (packed for shipping) according to: • EN 60068-2-1 cold • EN 60068-2-2 dry heat • EN 60068-2-30 humid heat, cyclic		
Humidity class	Climatic class 3K3 according to EN 60721, 5 - 95 % no condensation		
Degree of pollution	2		

Mechanical stressing in operation	Tested according to:
	
	• EN 60068-2-6 Vibration, test Fc:
	  3.5 mm deflection in the range 5 – 9 Hz
	  1 g acceleration in the range 9 – 150 Hz
	
	• EN 60068-2-27 shock, test Ea:
	  acceleration 150 m/s^2 , test duration 11 ms		

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4132-0GB00-0AY0 (2.5 Ah)	6EP4133-0JB00-0AY0 (5 Ah)
	6EP4133-0GB00-0AY0 (3.2 Ah)		
	6EP4134-0GB00-0AY0 (7 Ah)		
	6EP4135-0GB00-0AY0 (12 Ah)		
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide		
Air pressure	Operation: • 1080 - 795 hPa (-1000 - 2000 m) • Operation at altitudes of 4000 m above sea level and higher is not permissible (exception, 2.5 Ah). • Operation at installation altitudes of 2000 - 6000 m above sea level: output power derating of -7.5 % / 1000 m - or reduction of the ambient temperature by 5 K / 1000 m see Figure 6-20 Altitude derating (Page 202) Storage: • 1080 - 660 hPa (-1000 - 3500 m)		

Environment

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The devices are in conformance with RoHS.

As a rule, only non-silicon precipitating materials are used.

Disposal guidelines

Packaging and packaging aids can and should always be recycled. The product itself may not be disposed of as domestic refuse.

Note

The rechargeable batteries must be disposed of, discharged according to the applicable regulations.

Service & Support

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Technical support

Technical support for all IA/DT products can be accessed through the following communication channels:

- Telephone: + 49 (0) 911 895 7222

- Internet:
  Online support request form (http://www.siemens.de/automation/support-request)

Technical documentation on the Internet

Operating instructions and manuals for SITOP are available in the Internet:
Operating instructions/manuals (http://www.siemens.com/sitop/manuals)

SITOP power supply homepage

General news about our power supplies is available in the Internet at the SITOP home page:
SITOP (http://www.siemens.com/sitop)

Information material

SITOP information can be downloaded from the Internet:
Information and download center (http://www.siemens.com/sitop-infomaterial)

CAx data

2D/3D data and circuit diagram macros can be downloaded from the Internet:
Siemens image database (http://www.siemens.com/sitop-cax)

Request all CAx data via the CAx download manager:
CAx shopping cart (http://www.siemens.com/cax)

SITOP Selection Tool

Simply and quickly select the optimum the power supply or DC-UPS:
SITOP Selection Tool (http://www.siemens.com/sitop-selection-tool)

Online catalog and ordering system

The online catalog and the online ordering system are available through the Industry Mall homepage:
Industry Mall (http://www.siemens.com/industrymall/de)

Contact persons

If you have any questions regarding the use of our products, then contact the Siemens contact person in your regional Siemens sales office.

You can find these addresses as follows:

- On the Internet (http://www.automation.siemens.com/partner)
- In Catalog CA 01