SIEMENS

SITOP power supply

SITOP UPS1600 / UPS1100

Operating Instructions

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 UPS1100
battery module 1.2 Ah
6EP4131-0GB00-0AY0
battery module 3.2 Ah
6EP4133-0GB00-0AY0
battery module 7 Ah
6EP4134-0GB00-0AY0

05.2014
C98130-A7628-A1-4-7629

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.

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Overview

Description

The DC-UPS modules augment the SITOP 24 V power supply units for uninterruptible rated currents up to 20 A from the UPS1100 battery modules based on maintenance-free lead-gel accumulators. UPS1600 with its integrated electronics detects automatically the battery type that it charges with the optimum temperature-controlled loading 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 current values, such as voltage, current or residual capacity. Thanks to the integrated Web server, remote diagnosis is also possible.

The slim-line 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 and 20 A DC-UPS modules with digital inputs/outputs, optional with USB or two Ethernet/PROFINET interfaces
- SITOP UPS1100 24 V / 1.2 Ah, 3.2 Ah and 7 Ah battery modules with maintenance-free lead-gel accumulators and integrated electronics; intelligent battery management with automatic detection of the battery modules and selection of the optimum, temperature-controlled charging characteristic curve; monitoring of the operating readiness, accumulator supply cable, aging and charging state
- 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
- Remote monitoring with integrated Web server

- SITOP UPS Manager (free software download) supports the configuration and monitoring for PC-based systems
- Complete integration in TIA: User-friendly engineering in the TIA Portal, S7 function blocks for integration in user programs and WinCC faceplates

Ordering data

The following device options are available:

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

SITOP UPS1100 battery module	
Item	**Order number**
Battery module 1.2 Ah	6EP4131-0GB00-0AY0
Battery module 3.2 Ah	6EP4133-0GB00-0AY0
Battery module 7 Ah	6EP4134-0GB00-0AY0

Accessories	
Type	**Order number**
Device identification labels 20 mm × 7 mm, pastel turquoise	3RT1900-1SB20

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Safety information

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⚠ 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.

The relevant DIN/VDE regulations or country-specific specifications (e.g. VDE 0510 Part 2 / EN50272-2) must be observed for the storage, assembly and operation of the lead accumulators. It must be ensured that the battery location is suitably ventilated. Potential ignition sources must be separated by at least 50 cm.

Description, device design, dimension drawing 2

2.1 Device description

2.1.1 UPS1600

The UPS1600 10 A and 20 A are built-in devices of the SITOP series for installation on DIN EN 50022-35x15/7.5 standard mounting rails. The relevant DIN/VDE regulations or country-specific specifications (e.g. VDE 0510 Part 2 / EN 50272-2) must be observed for the installation of the UPS1600 devices and the UPS1100 battery modules.

See Section Installation (Page 107)

In combination with the SITOP UPS1100 battery modules, it is 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 3-fold rated current over 30 ms or up to the 1.5-fold rated current over 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 UPS1600 DC-UPS module must be connected with the output of the supplying 24 VDC power unit. The UPS1100 battery module is connected to the Bat terminals. The loads to be buffered are supplied via the output of the UPS1600 DC-UPS module with the voltage connected at the input.

The so-called Energy Storage Link, an additional two-wire connection between the SITOP UPS1600 base device and the coded SITOP UPS1100 battery modules, is new. 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 a long service life of the battery modules. Energy Storage Link also monitors the operational readiness as well as the supply cables (wire breakage), aging (service life) and the charging state (voltage, current, residual capacity) of the accumulators. The connection to the UPS1100 battery modules is checked every 20 seconds (for voltage and incorrect polarity protection). A test with a defined loading of the lead accumulators is also performed automatically every four hours.
Battery modules of other type series and manufacturers can also be deployed, 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 VDC supply voltage or voltage dip below the set switch-in threshold, the loads are supplied from the battery module that is kept full charged in parallel, ready for operation. The buffering is performed in accordance with the backup time set using the rotary coding switch or until the maximum backup time (shutdown after reaching the exhaustive discharge threshold).
There are two possibilities:
a.) Power restoration only after expiration of the backup time: On absence of the input voltage at the DC-UPS module, the battery immediately assumes the supply so that the Ua output voltage remains absolutely interruption-free until the end of the backup time.

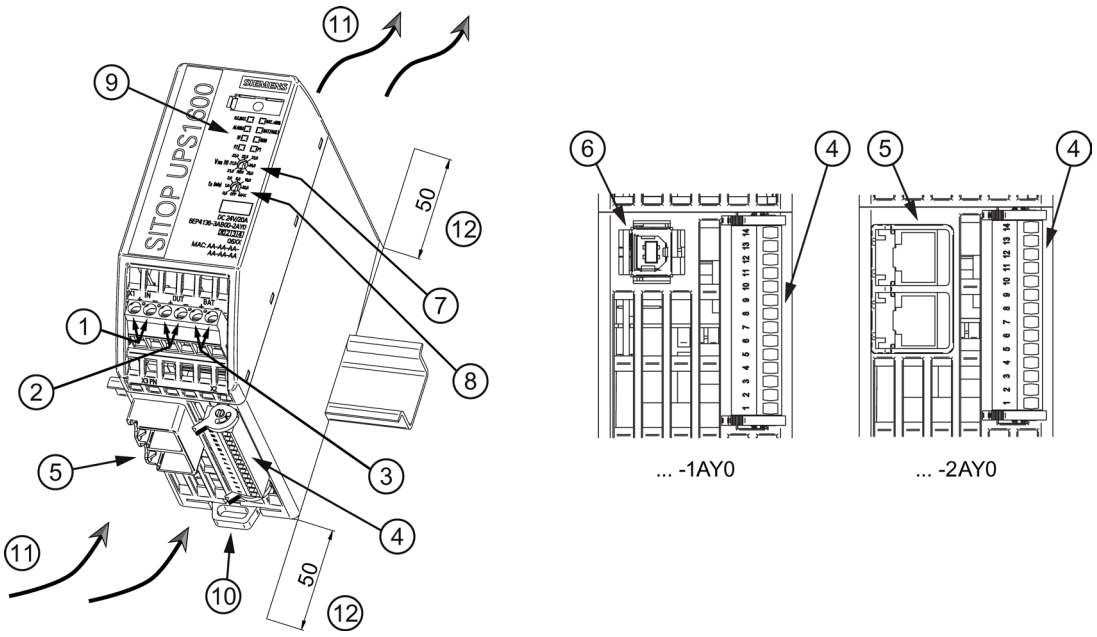
b.) Power restoration before expiration of the backup time: On absence of the input voltage at the DC-UPS module, the battery immediately assumes the supply so that the Ua output voltage remains absolutely interruption-free. If the "Interruption of the output voltage" setting is selected (see Chapter Jumper variants (Page 22)), the Ua output voltage is interrupted automatically for the parameterized time (default value 5 seconds) on supply system restoration during the parameterized backup time. The accumulator is already disconnected because the input voltage has already returned. If "Ua output interruption" is set, no interruption occurs because the input voltage has returned before expiration of the set backup time.

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

Eight LEDs, two potential-free changeover contacts and one NO contact indicate the 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 15) and Switches and buttons (Page 20).

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. The Web server is activated in the delivered state.
The free SITOP UPS Manager software tool available for Windows XP and Windows 7 systems (32- and 64-bit) provides 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 that, for example, provide a view of the chronological change of the charging voltage or load current of the DC-UPS.
The UPS Manager also detects when older SITOP DC-UPS modules (6EP1931-2xxxx) are deployed and displays them correctly.
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 in the graphical network representation accepted.
For applications without network connection, the SITOP UPS1600 is available in the variants with USB interface or digital inputs/outputs.
For stand-alone deployment, the DC-UPS can be activated without input voltage from the battery, for example, to start a generator via a directly supplied controller. (see Section Jumper variants (Page 22))



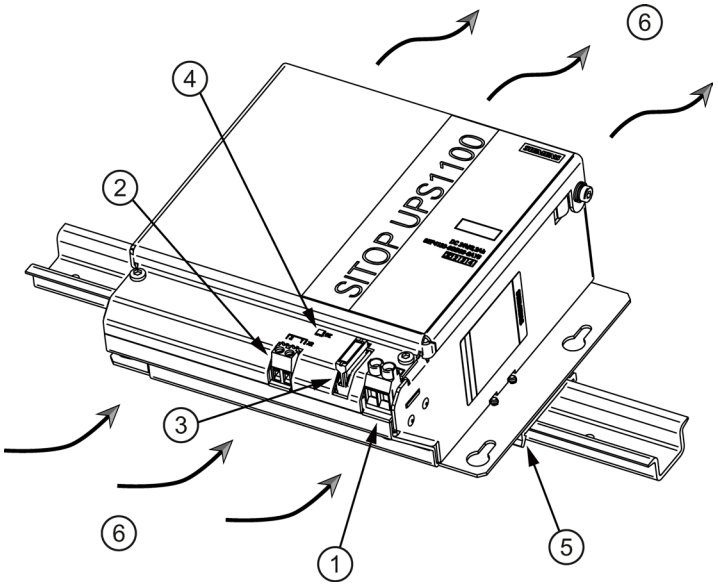
① DC input
② DC output
③ Bat
④ Signal connector
⑤ PROFINET (Ethernet) interface (only for ... - 2AY0)
⑥ USB interface (only for ... - 1AY0)
⑦ Rotary coding switch, switch-in threshold
⑧ Rotary coding switch, backup time
⑨ Signaling (LEDs)
⑩ DIN rail slider
⑪ Convection
⑫ Clearance above/below

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

2.1.2 UPS1100

The UPS1100 battery modules consist of a battery holder with two maintenance-free, closed lead-gel accumulators 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 UPS1600. A green LED lights continually to indicate that there is a communication connection to the UPS1600 or flashes during the accumulator replacement.

As many as six UPS1100 of the same type can be connected in parallel with a UPS1600. For an accumulator replacement, see Section Battery replacement (Page 112).



① DC input X1
② Signal terminal X2
③ Fuses F1/F2 (F2 only for 7 Ah)
④ Signaling (LED)
⑤ Top-hat mounting rail holder (not for the 7 Ah variant)
⑥ Natural convection

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

2.2 Connections and terminal designation

2.2.1 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.

The deployed cables must be suitable for temperatures of at least 90° C. (only for applications for UL508)

The UPS1100 battery modules are connected via BAT ③.

(see also Section Installation (Page 107))

Connections and terminal designations (see Figure 2-1 UPS1600 design (example 6EP4136-3AB00-2AY0) (Page 13))	
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 contact
⑥ USB connection	USB-B plug contact

	① + ② + ③	④	⑦ + ⑧
	SZS 0,6 x 3,5	SZS 0,6 x 3,5	SZS 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 UPS1600 terminal data

2.2.1.2 Signal terminal

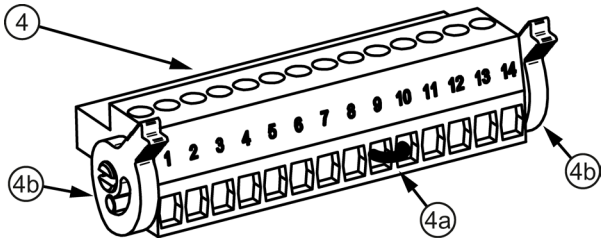


Figure 2-4 Signal connector

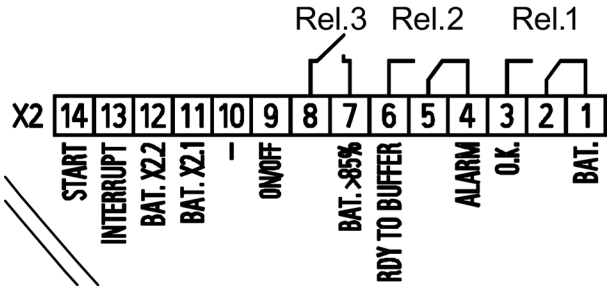


Figure 2-5 Signal connector connection schematic

Pin	Function
1	**24 VDC OK / Bat**
2	REL1 (changeover contact):
3	Energized state: Normal operation Quiescent state: Buffer mode or off
4	**Ready for buffer operation / alarm**
5	REL2 (changeover contact):
6	Energized state: Buffer mode is possible Quiescent state: Not ready for buffering Cycle 0.25 Hz: Defective battery
7	**Accumulator > 85%**
8	REL3 (NO contact): Energized state: Buffering of the selected buffer time is possible, or charge state >85%
9	On/Off
10	Weight
11	Accumulator communication
12	Accumulator supply
13	Interrupt (reset after buffer mode)
14	Start from the battery

Relay contact: Maximum contact loading 30 VDC / 1 A or 125 VAC / 0.5 A

The jumper (4a) (see Figure 2-4 Signal connector (Page 16)) 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

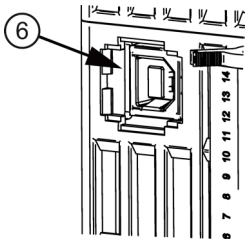


Figure 2-6 USB port

The USB interface (type B) ⑥ conforms fully to the USB 2.0 standard (12 MBd). Strain relief (see Section USB connector (Page 98)) is implemented using a defined cable/connector (Y-Con USB - Yamaichi company).

2.2.1.4 PROFINET/Ethernet connection

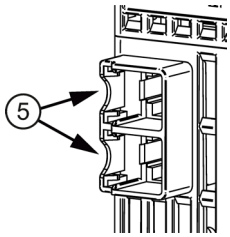


Figure 2-7 PROFINET/Ethernet connection

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

Properties of the Ethernet interface:

- Transmission 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 99)) is implemented using a Siemens IE FastConnect RJ45.

The physics of the Ethernet interface is implemented so that PROFINET IO is possible in accordance with the standards IEC 61158 and IEC 61784-2. 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
- Firmware update of the device via UPS Manager or STEP 7

2.2.2 UPS1100

2.2.2.1 Power terminals

The input terminals ① and the signal terminal ② can be used to establish the connection to the UPS1600 (see also Section Installation (Page 107))

Connections and terminal designations (see Figure 2-2 UPS1100 design (example 6EP4133-0GB00-0AY0) (Page 14))	
① DC input +, -	One screw terminal each
② Signal terminal 1, 2	One screw terminal each

	①	②
	SZS 0,6 x 3,5	SZS 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 2-8 Terminal data for 6EP4131-0GB00-0AY0 and 6EP4133-0GB00-0AY0

	①	②
	SZS 1,0 x 5,5	SZS 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 2-9 Terminal data for 6EP4134-0GB00-0AY0

2.3 Switches and buttons

2.3.1 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 position (REN, see the following figure). 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 16)) has no effect.

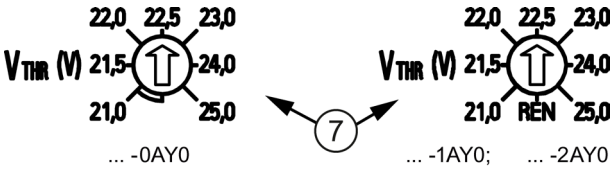


Figure 2-10 Rotary coding switch, switch-in threshold

Note

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

For notes on actuating the rotary coding switch (screwdriver, torque), see Figure 2-3 UPS1600 terminal data (Page 15).

2.3.1.2 Rotary coding switch, backup time

The backup time is set using the rotary coding switch ⑧ on the device front between 30 seconds and MAX (32767 seconds) in the steps 0.5 minute (30 seconds), 1 minute, 2 minutes, 5 minutes, 10 minutes, 20 minutes and MAX (32767 seconds). Delivery state is MAX

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

If the backup time is also set using the software (only for devices with an interface (…-1AY0, …-2AY0)) (possible setting range, see Section Parameterizing the UPS in STEP 7 V5 (Page 61)), the rotary coding switch for the switch-in threshold (see Section Rotary coding switch, switch-in threshold (Page 20)) must be set to REN.

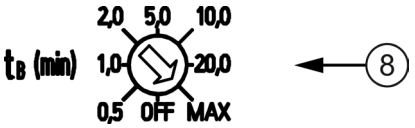


Figure 2-11 Rotary coding switch, backup time

Note

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

For notes on actuating the rotary coding switch (screwdriver, torque), see Figure 2-3 UPS1600 terminal data (Page 15).

2.3.1.3 Jumper variants

On/Off (pin 9)

The wire jumper on the signal connector ④ between pin 9 and pin 10 (see Figure 2-4 Signal connector (Page 16)) is used to enable/disable the buffer mode.

Buffer mode is only possible if the wire jumper ON/OFF is closed, or for UPS1600 devices with interface, also if the rotary coding switch connection threshold is at the "REN" position. From firmware release V1.20, the wire jumper ON/OFF has priority over the position of the connection threshold rotary coding switch.
As a consequence, it is possible to enable or disable buffer mode 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: For reasons relating to noise insensitivity, approximately in the range 5...10 mA, Umax = 15 VDC, SELV: Imax = 10 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 to ground	Result
OFF	21 - 25	Yes	Buffering not permitted
0.5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time in accordance with the settings or infinite 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 and higher)

Rotary coding switch, buffer time	Rotary coding switch, connection threshold	Wire jumper ON/OFF to ground	Result
OFF	21 - 25	Yes	Buffering not permitted
0.5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time in accordance with the settings or infinite 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 Without interface (all firmware releases)

Rotary coding switch, buffer time	Rotary coding switch, connection threshold	Wire jumper ON/OFF to ground	Result
OFF	21 - 25	Not relevant	Buffering not permitted
0.5 - MAX	21 - 25	Yes	Buffer mode permitted (buffer time in accordance with the settings or infinite buffer time)
0.5 - MAX	21 - 25	No	Buffering not permitted

Delivery state: Wire jumper between pin 9 and 10

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 for the parameterized time (default value 5 seconds) for supply system restoration during the buffer time.

To prevent data losses, the PCs must be shut down timely before the buffer time ends. If the input voltage returns after the shutdown has already started, buffer mode is ended and the UPS1600 goes 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.

For customers that use their own software, this pulse must be selected at the DC UPS module.

Note

This function is possible only in conjunction with the R signal (DC UPS Manager).

Start from the battery (pin 14)

The start from the battery is initiated by closing the contact pin 14 to ground (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 while pressing the button, the UPS1600 enters buffer mode, the set buffer time will be started. For example, if 5 minutes is set, the UPS1600 sets itself off after 5 minutes. If the input voltage returns during the buffer time, the UPS1600 switches to normal operation.

If the input voltage is available, the DC UPS starts in the normal operation.

If the UPS1600 is switched-off remotely via the interface (also possible when input voltage is available), start from the battery can be used to restart the UPS1600.

Charge current setting (pin 10 / 11 / 12)

For uncoded batteries, the size of the charge current can be changed by placing jumpers between the terminals X2.10 (ground) and X2.11 or X2.12.

Table 2- 4 Charge current

UPS1600 10 A	UPS1600 20 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

2.3.2 UPS1100

2.3.2.1 Buttons for battery replacement

For the UPS1100, a button ⑤ for the battery replacement is located under the cover.

Battery replacement, see Section Battery replacement (Page 112)

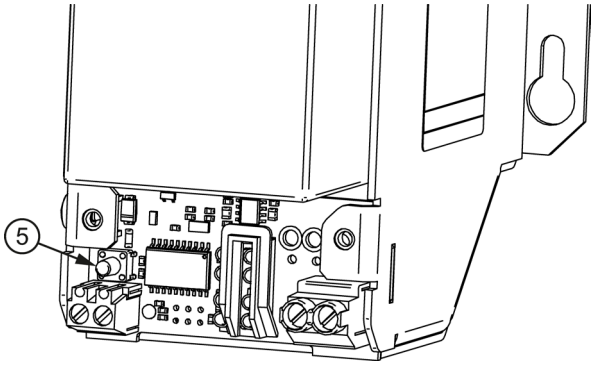


Figure 2-12 Buttons for battery replacement

2.4 Operating displays and signaling

2.4.1 UPS1600

2.4.1.1 LEDs

	6EP4134-3AB00-... **6EP4136-3AB00-...**
Status display	LED1: DC-UPS operating mode LED2: Charge state LED3: Ready for buffering LED4: Accumulator test LED5: Specific diagnostic displays for PROFINET LED6: Specific diagnostic displays for PROFINET LED7: Ethernet port 1 connection state LED8: Ethernet port 2 connection state LED 7 and 8 are active only for ... -2AY0

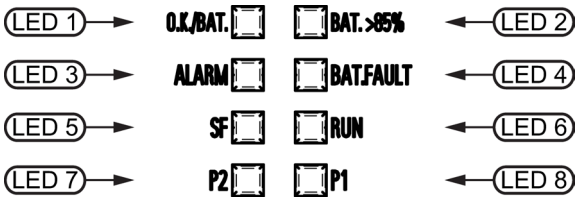


Figure 2-13 Operating displays

Legend:

○	LED off
●	LED lights up
✷ 0,5/3	LED flashes on in 0.5-second and off in 3-second intervals

LED 1 (OK/Bat)

Signaling		6EP4134-3AB00-... 6EP4136-3AB00-...
○	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 reached, overtemperature or overvoltage at the input
✷	Flashing yellow (0.5/3)	Buffer mode, output off
●	Yellow	Buffer mode
✷	Flashing green (0.5/3)	DC-UPS OK, output off
●	Green	DC-UPS OK

LED 2 (Bat. > 85%)

Signaling		6EP4134-3AB00-... 6EP4136-3AB00-...
✷	Flashing green (0.5/0.5)	Updating the firmware
○	Off	Battery charge state < 85%
●	Green	Battery charge state > 85%

LED 3 (alarm)

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

LED 4 (accumulator / bat. fault)

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

LED 5 and LED 6 (PROFINET LEDs)

Signaling				6EP4134-3AB00-2AY0 6EP4136-3AB00-2AY0
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 OK
●	Red	●	Green	Application started successfully, module not OK
✷	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 in progress (flashing alternately every 3 seconds)
✷	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)	Updating the firmware

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

LED 7 (Ethernet LED / P2)

Signaling		6EP4134-3AB00-2AY0 6EP4136-3AB00-2AY0
○	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
○	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

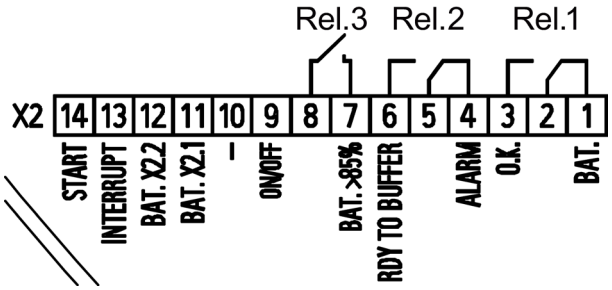


Figure 2-14 Signal connector connection schematic

REL1 (changeover contact):
Energized state: Normal operation
Quiescent state: Buffer mode or off

REL2 (changeover contact):
Energized state: Buffer operation is possible
Quiescent state: Not ready for buffering
Cycle 0.25 Hz: Accumulator defective or set backup time is not attained

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

2.4.2 UPS1100

2.4.2.1 LEDs

	6EP4131-0GB00-0AY0 (1.2 Ah) **6EP4133-0GB00-0AY0 (3.2 Ah)** **6EP4134-0GB00-0AY0 (7 Ah)**
Status display	LED battery

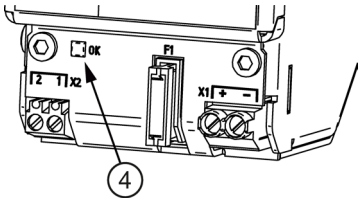


Figure 2-15 6EP4131-0GB00-0AY0 example

Table 2- 5 LED ④ battery

Signaling		**6EP4131-0GB00-0AY0 (1.2 Ah)** **6EP4133-0GB00-0AY0 (3.2 Ah)** **6EP4134-0GB00-0AY0 (7 Ah)**
✷	Flashing green (0.5/0.5)	Fault or alarm
○	Off	Battery off, no communication
●	Green	Battery OK

2.5 Block diagram

2.5.1 UPS1600

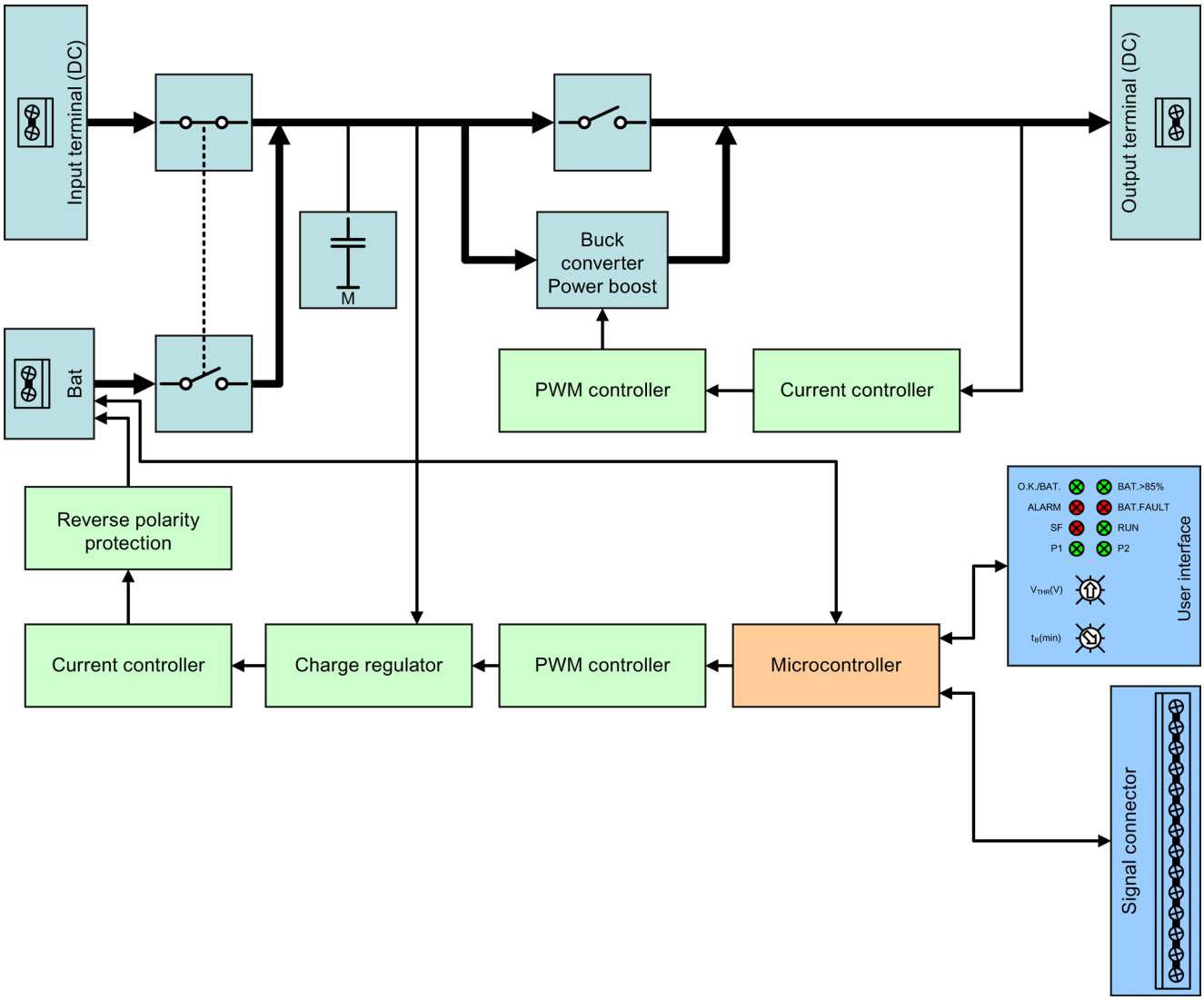


Figure 2-16 UPS1600 block diagram

2.5.2 UPS1100

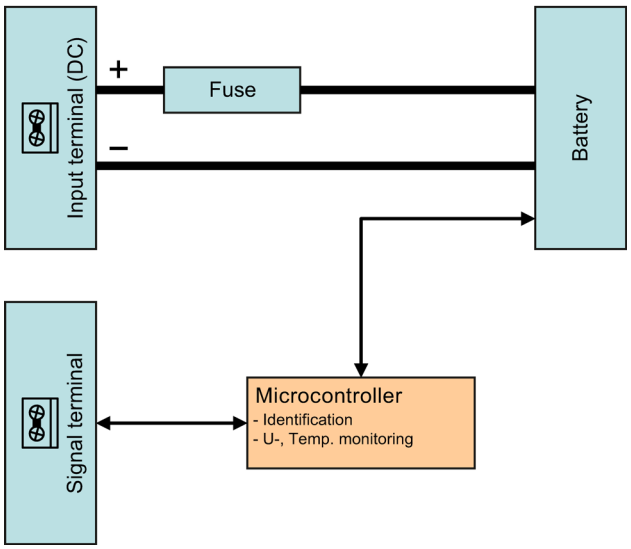


Figure 2-17 UPS1100 block diagram

2.6 Dimensions and weight

2.6.1 UPS1600

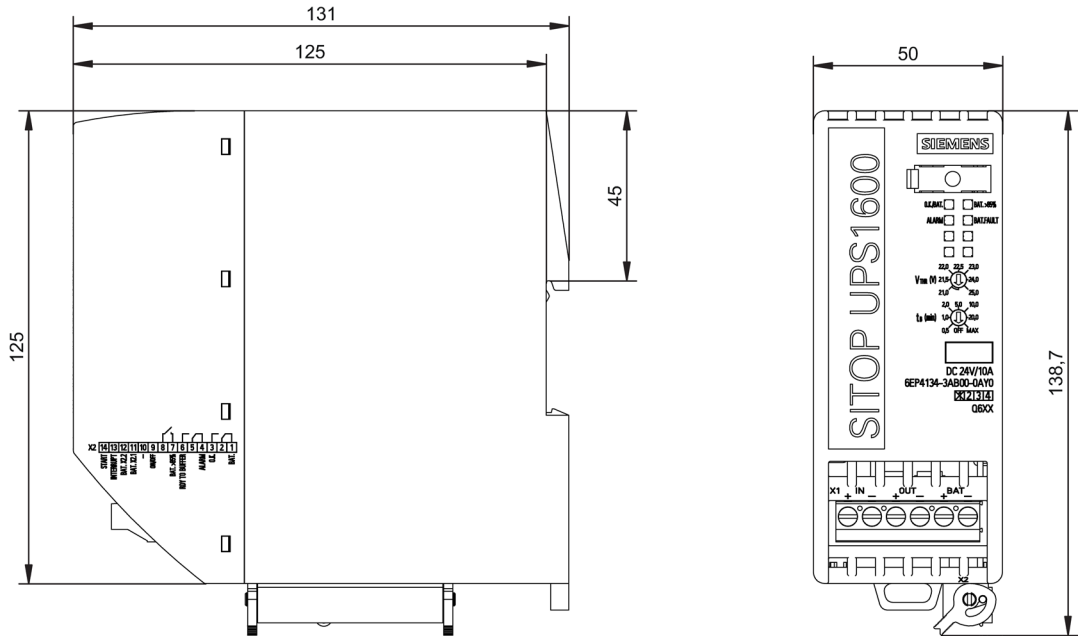


Figure 2-18 6EP4134-3AB00-0AY0, 6EP4134-3AB00-1AY0, 6EP4136-3AB00-0AY0,6EP4136-3AB00-1AY0 dimensioned drawing

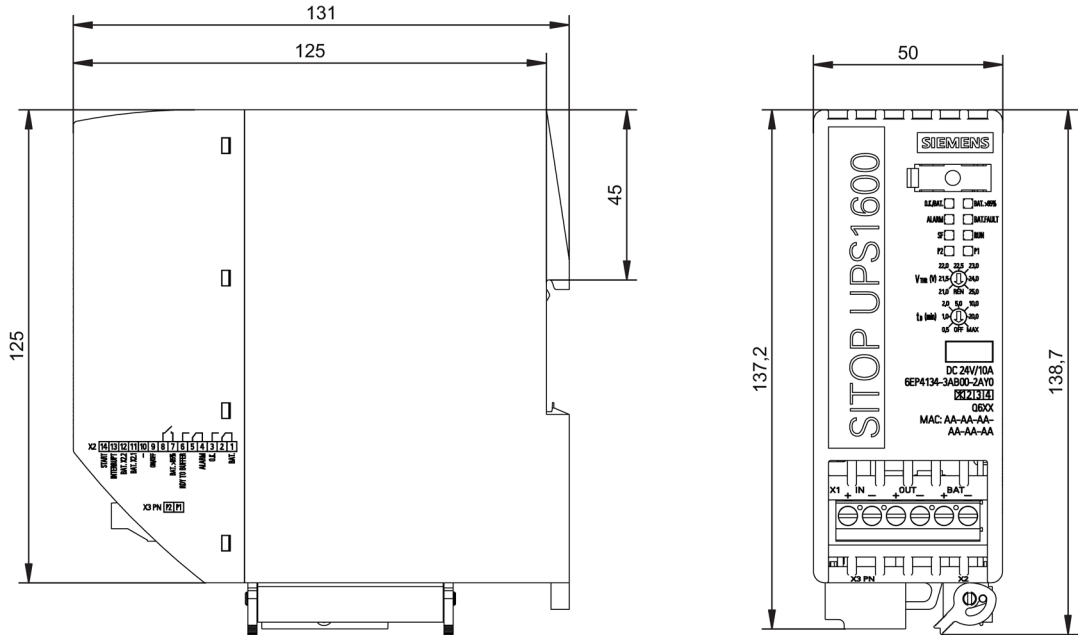


Figure 2-19 6EP4134-3AB00-2AY0, 6EP4136-3AB00-2AY0 dimensioned drawing

	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

2.6.2 UPS1100

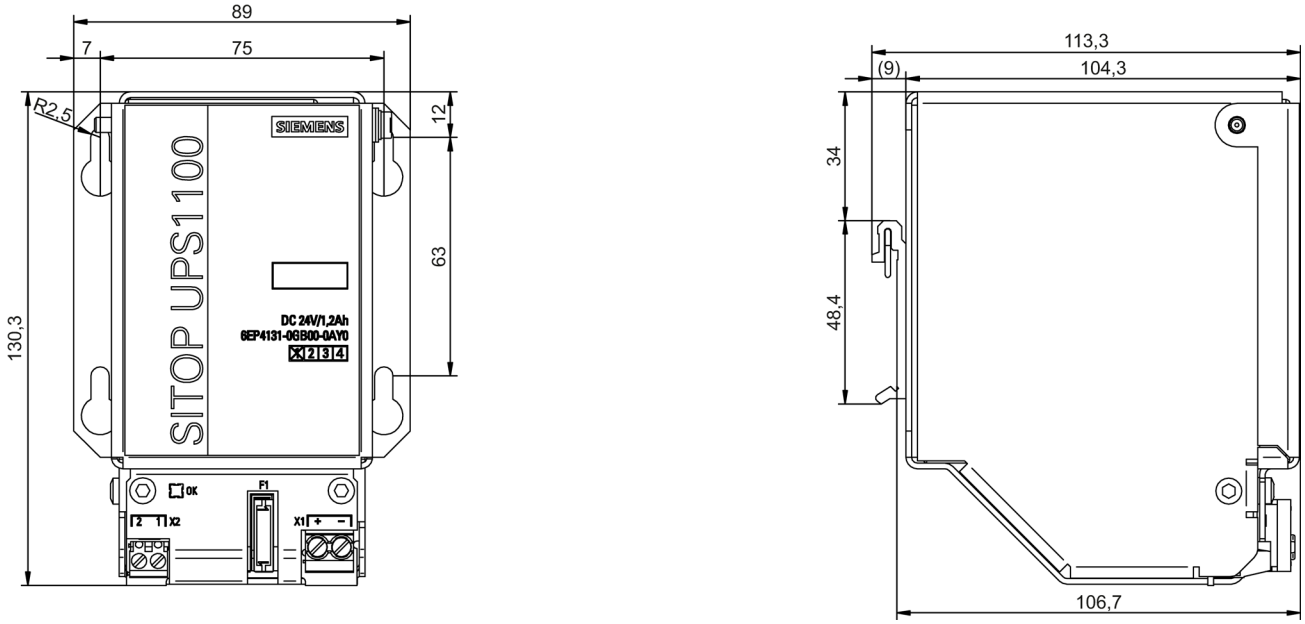


Figure 2-20 6EP4131-0GB00-0AY0 dimensioned drawing

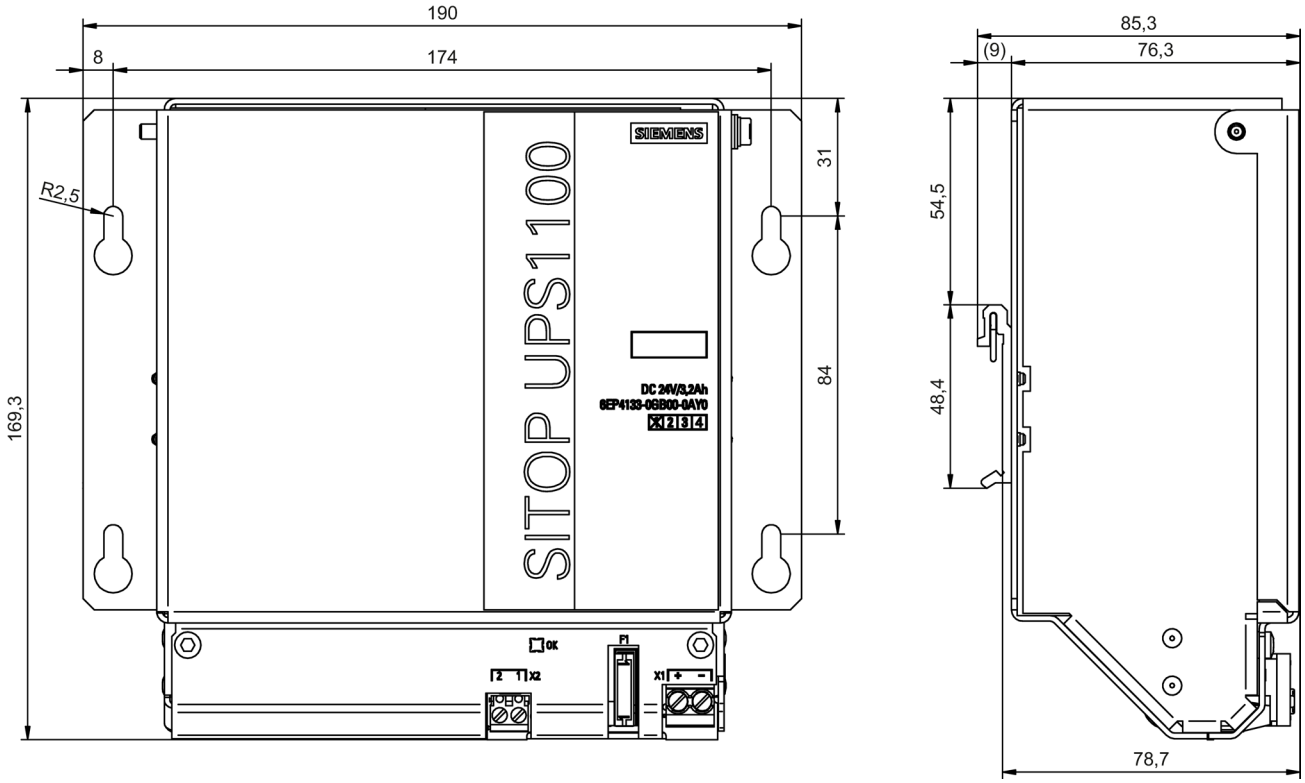


Figure 2-21 6EP4133-0GB00-0AY0 dimensioned drawing

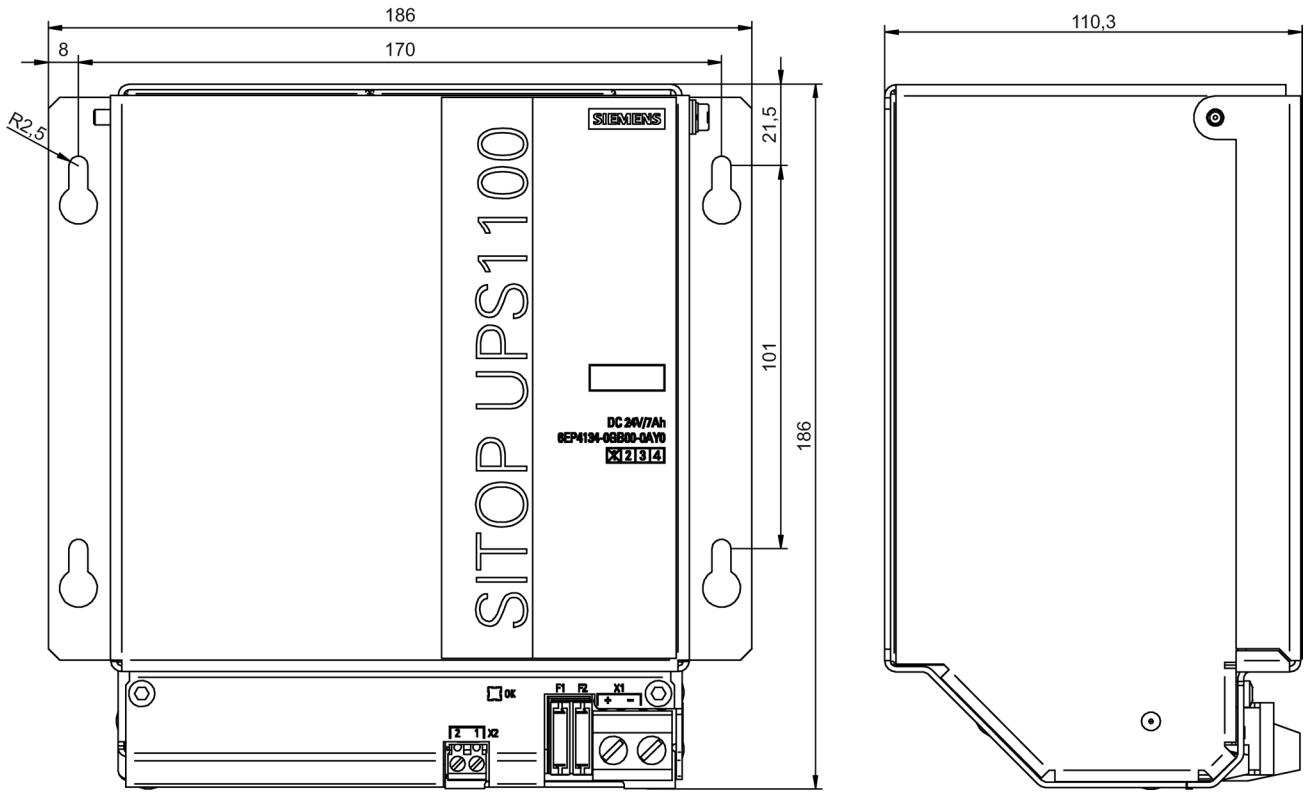


Figure 2-22 6EP4134-0GB00-0AY0 dimensioned drawing

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 Ah)
Dimensions (W × H × D) in mm	89 × 130 × 107	190 × 169 × 79	186 × 186 × 110
Weight	Approx. 1.9 kg	Approx. 3.8 kg	Approx. 6.1 kg

Engineering

3

3.1 General information

Contents of the "Engineering" section

This section describes those 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:

- STEP 7 in the TIA Portal from V12
- STEP 7 V5.4 or higher
- SITOP UPS Manager
- Web server

Functions of the individual software products

- **STEP 7 in the TIA Portal**
  The UPS1600 can be used with STEP 7 in the TIA Portal from Version 12 with service pack 1 (SP1).
  As the 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.
- **STEP 7 V5**
  The UPS1600 can be used with STEP 7 V5 from Version 5.4.
  As UPS1600 has been saved in the hardware catalog of STEP 7 V5 it can be integrated in the project, parameterized and diagnosed.
- **SITOP UPS Manager**
  UPS1600 can be parameterized with SITOP UPS Manager . 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 can be used to check the parameters and diagnose the UPS1600.

Note

SITOP UPS Manager and TIA cannot simultaneously access the UPS1600.

3.2 Alarm list

The help text provides further information about a pending alarm.
The Extended Error Type helps to interpret the alarms in self-programmed S7 function blocks.
The maintenance specifies the severity of the alarm:
MR = Maintenance Required
MD = Maintenance Demanded
F = Failure

Error Type	Extended Error Type	Maintenance	Alarm Text	Help Text
256	-	F	Device failure	Device failure
256	1	MR	Corrupt software	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 DC UPS.
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 DC UPS
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	DC UPS 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 DC UPS 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 DC UPS
256	16	MR	SW update is currently being executed	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.
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.

Error Type	Extended Error Type	Maintenance	Alarm Text	Help Text
256	22	MR	Wrong device ID	An attempt was made to update the software with an update file that is not suitable for the DC UPS.
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
257	-	F	Device diagnostics	Device diagnostics
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)	Internal device temperature close to the upper limit. Caution: The highest permitted temperature could be exceeded!
257	3	MD	Device temperature critical (too low)	Internal device temperature close to the lower limit. Device could leave the operating range.
257	4	F	High-resistance connection to battery	High-resistance connection to battery - check battery power cable
257	5	F	Connection to battery interrupted	Connection to battery interrupted - check connection and fuse
257	6	MD	Unknown battery	Data from the battery cannot be read correctly. Battery is defective or not supported by SIEMENS.
257	7	MR	Overcurrent	Output current of DC UPS 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	The PC shuts down
257	9	MR	DC UPS switched off	DC UPS switched off - buffer time exceeded or the PC has been shut down
257	10	MR	Output switched off	The DC UPS output was shut down as result of executing an instruction or an error situation (e.g. overtemperature, excessive output current).
257	11	MR	Output switched on	The DC UPS output was switched on again as result of executing an instruction or the correction of an error situation.
257	12	MR	Reset performed	Input voltage to DC UPS was OK again before the buffer time expired. Connected devices are reset by switching off the DC UPS outputs for the configured time.
257	13	MR	Reserve	
257	14	MR	Software update successful	Previous software update was successful - DC UPS is operational again.
257	15	MR	Input voltage is too high	Input voltage exceeds 30 V. DC UPS is not operational.
257	16	MD	Surplus battery	More than 6 batteries connected

Error Type	Extended Error Type	Maintenance	Alarm Text	Help Text
257	17	F	DC UPS parameters corrupt	DC UPS 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	19	MR	Reserve	
257	20	MR	Low voltage mode	Input voltage of DC UPS is too low. DC UPS is not operational.
257	21	MR	Buffering	Device is in buffer mode
257	22	MD	Communication with device failed	PROFINET connection available - DC UPS is defective
257	23	MR	Device powered up	Device powered up
257	24	F	Wrong battery polarity	Wrong battery polarity - check battery connections.
257	25	MD	Reserve	
257	26	MR	Insufficient charge level	The battery charge level is too low to guarantee the configured buffer time.
257	27	MR	Deep discharge battery	Battery is deep discharged - no buffering possible
258	-	F	Battery diagnostics	Battery diagnostics
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
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

3.3 STEP 7 in the TIA-Portal

The UPS1600 can be used with STEP 7 in the TIA Portal from version 12 with service pack 1 (SP1).

In STEP 7 in the TIA Portal the UPS1600 can be integrated, parameterized and diagnosed in projects.

Note

TIA and UPS Manager cannot simultaneously access the UPS. It is not permissible that UPS Managers service runs whileTIA is being accessed.

3.3.1 Installing the Hardware Support Package

To use the UPS1600, you must install the corresponding hardware support package (HSP) in the TIA-Portal . We make this HSP available to you on our SITOP homepage (http://www.siemens.de/sitop-usv) or directly under (http://support.automation.siemens.com/WW/view/de/75854606).

Procedure

To install the Hardware Support Package, proceed as follows:

1. Start STEP 7 in the TIA Portal as administrator.
2. Click in the menu "Tools" on "Support Packages".
   The "Detailed information" dialog 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, first 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.
6. Exit the TIA-Portal and then restart it.

Note

You can find additional information on installing hardware support packages in the STEP 7 manual in the TIA Portal.

3.3.2 Integrating UPS1600 into a project

To be able to use UPS1600, it must be assigned to an IO controller as an IO device. Further, UPS1600 can be equipped in the project with one or several UPS1100 battery modules.

The main views for the configuration of the UPS1600 are the network view and the device view.

Note

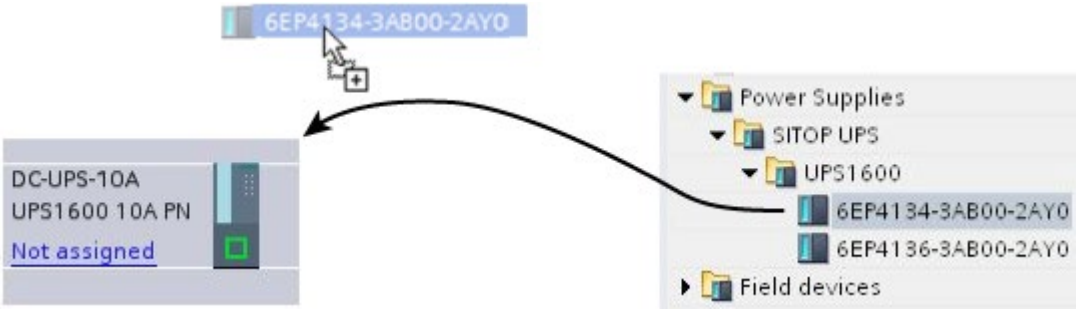
Additional information on the network view and device view as well as the topology view is provided in the STEP 7 manual in the TIA Portal.

Preconditions

- The hardware support package of UPS1600 has been correctly installed.
- STEP 7 in the TIA-Portal has been opened, and a project has been created with an IO controller .

Inserting UPS1600 from the hardware catalog

1. Open the network view.
2. Open the "Hardware catalog" task card.
3. In the "Catalog" palette navigate to the UPS1600 under Power supplies\SITOP UPS\UPS1600.
4. Select the required UPS1600 using a mouse click.
   In the "Information" area you can see information about the selected UPS1600.
5. Drag the UPS1600 and drop it into the Network view.



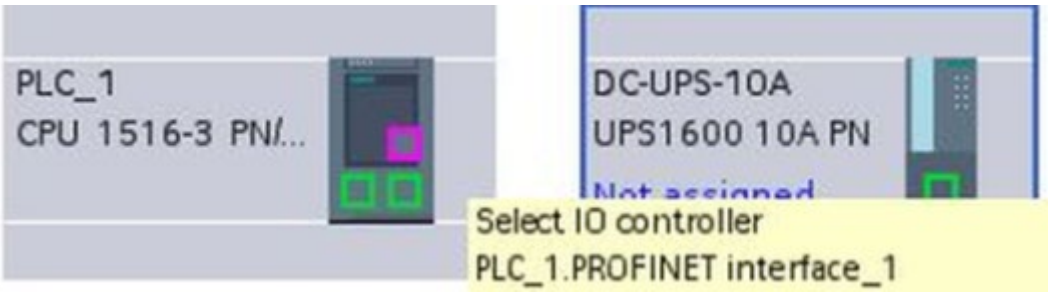
You have now placed the UPS1600 in the Network view. The rectangle displayed symbolizes the UPS1600.

Assigning the UPS1600 a controller

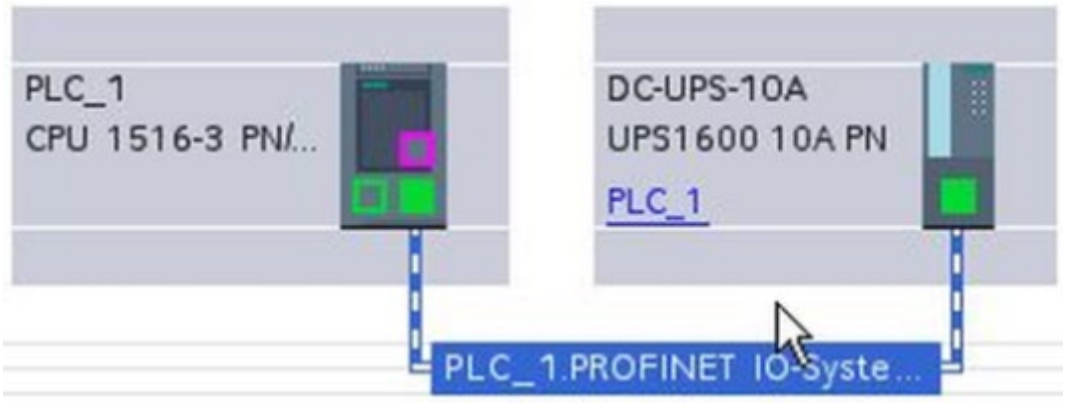
To be able to use UPS1600, it must be assigned to an IO controller as an IO device.

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

A menu opens with the available controllers.

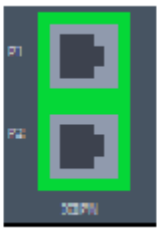


2. Select a controller in the menu.
3. Select the connection between the controller and UPS1600.



4. Make the required settings in the "Network data".
5. Double-click on 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 UPS1600, which was already assigned in the TIA-Portal .

You have assigned the UPS1600 a controller.

3.3.3 Assigning the UPS1600 battery modules

The basic functions of the uninterruptible power supply are available with all of the battery modules that are compatible with the UPS1600.
Additional functions are available with the UPS1100 battery module:

- Automatic detection of the battery module rated values
- Automatic management of up to 6 battery modules
- Temperature-controlled charging
- Battery fast test
- Diagnostics using SITOP UPS Manager and the web server

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

Note

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

The number of UPS1100 battery modules that can be configured is limited to 6.

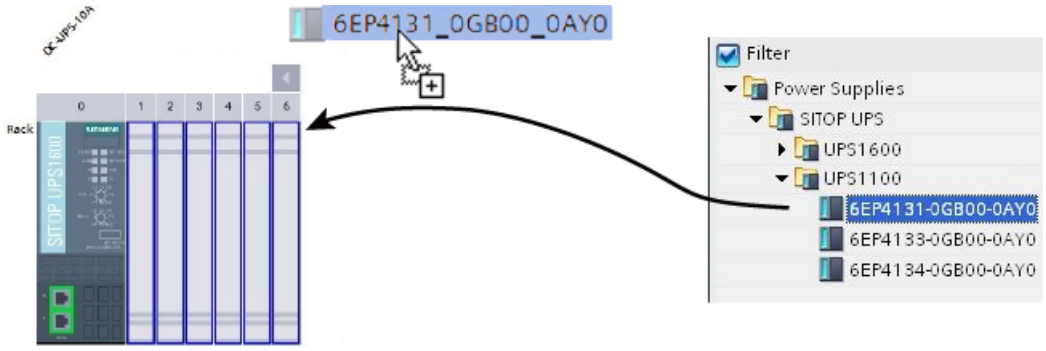
Preconditions

- STEP 7 in the TIA-Portal has been opened and a project has been created.
- A UPS1600 has been integrated in the project.

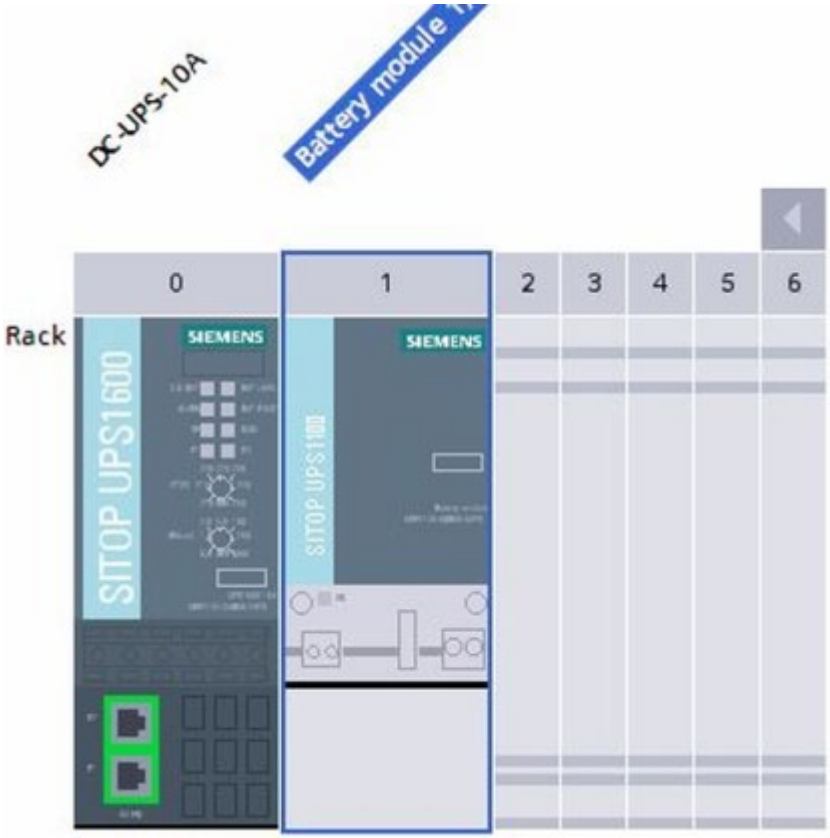
Procedure

1. In the device view, select the UPS1600.
2. In the Hardware catalog , navigate to the UPS1100 battery module under Power supplies\SITOP UPS\UPS1600.
3. Select the required UPS1100 battery module in the hardware catalog.

4. Drag the UPS1100 battery module and drop it into the Device view.
   Alternatively, the UPS1100 battery module can be added by double-clicking on the entry in the hardware catalog.



5. Drag the UPS1100 battery module and drop at the first free slot to the right next to the UPS1600.
   The UPS1100 battery module is inserted at the selected slot.



6. Save the hardware configuration.

Section Parameterizing UPS1600 with STEP 7 in the TIA Portal (Page 46) describes how you can change the number and type of UPS1100 battery module used.

3.3.4 UPS1600 and UPS1100 parameters in Step 7 in the TIA Portal

The adjustable parameters of the UPS1600 and the UPS1100 battery modules used can be found in STEP 7 in the TIA Portal in theInspector window under Properties if the corresponding device was selected. The "Basic device", "Energy storage" and "Web server" parameters are relevant. These tabs and their subgroups are shown in the table below.

Tab	Subgroup	Description
Basic unit	Buffering	All parameters that affect the behavior of the UPS for buffering.
	Signaling	Setting of the alarm signaling and the wait time for stable input voltage.
	Battery maintenance intervals	Maintenance interval for the deployed batteries.
Energy storage	–	Parameters for the deployed battery modules.
Web server	General information	Specification whether access to the UPS via Web server is permitted (yes/no).

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 46).

3.3.5 Parameterizing the UPS in STEP 7 in the TIA Portal

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.

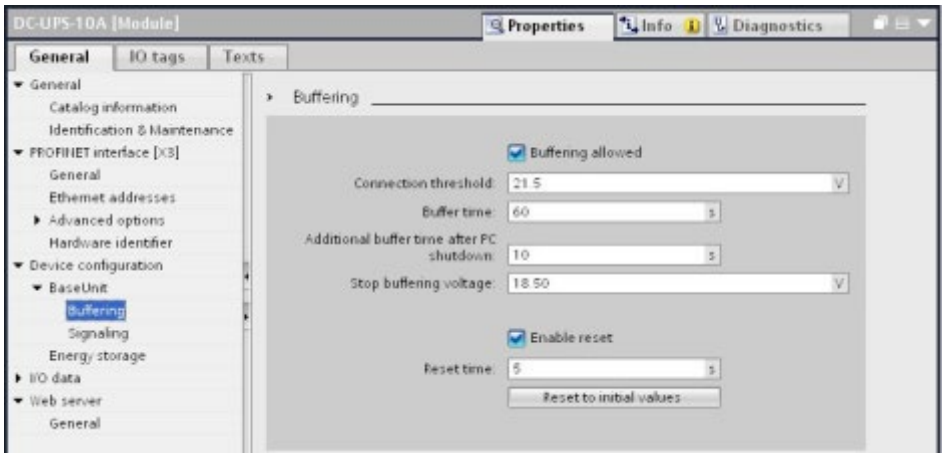
Each parameter has a start value. A click on "Reset to initial values" resets all parameters of a subgroup to the associated start value.

Preconditions

- The UPS1600 was integrated in the project that has been opened

Proceed as follows

1. Select the UPS1600.
2. In the Inspector window open tab "Properties/General"
   You see the possible subtabs for the parameterization.



Buffering parameters

Parameter	Value range	Default setting
Buffering allowed	Yes / No	Yes
Connection threshold	21 … 25 V	21.5 V
Buffer time	1 … 32767 s	60 s
Additional buffer time after PC shutdown	1 … 300 s	10 s
Stop buffering voltage	18 … 23 V	18.5 V
Activate interruption of the output voltage for supply system restoration	Yes / No	Yes
Interruption time	1 … 120 s	5 s

- **Buffering allowed**
  Select between buffers with the specified values or passive measurement of the power supply by the UPS.
- **Connection threshold**
  If the connection threshold value is undershot, the UPS starts buffering. If the value of the connection threshold is reached or undershot again later, the UPS stops buffering.
- **Buffer time**
  The time to be buffered by the UPS. The "Buffering allowed" parameter is used to specify whether buffering should be performed.
- **Additional buffer time after PC shutdown**
  Time, to be buffered by the UPS1600 after the PC has been shut down.
- **Stop buffering voltage**
  The voltage at which battery discharge is terminated.

- **Activate interruption of the output voltage for supply system restoration**
  If the value is set to "Yes", the system enters a reset after a supply system restoration during the buffering and switches the output off for a defined time (interruption time). 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.
- **Interruption time**
  The interruption time after which the power returns during buffer mode.

Signaling

Parameter	Value range	Default setting
Downtime alarm	0 … 20,000 ms	125 ms
Wait time for stable input voltage	0.005 … 65 s	0.5 s

- **Signaling delay for supply system failure**
  The time that a fault must be present before a response is made (buffering message).
- **Signaling delay for supply system restoration**
  The wait time until a stable input voltage is present.

Energy storage

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

Possible parameters when using a UPS1100 battery module

Parameter	Value range
Module	Drop-down menu with the UPS1100 battery modules saved by the HSP
Number of modules	0 … 6
Total capacity	0 … 42 Ah

- **Module**
  Type of UPS1100 battery module.
- **Number of modules**
  Number of the 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 … 4 A	0.8 A
Faulty battery voltage	1 … 18 V	6 V

- **Total 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 lowest permitted charge current applies.
  The following device-dependent maximum values also apply:
  - SITOP UPS1600 20A: Maximum permissible charge current 4000 mA
  - SITOP UPS1600 10A: Maximum permissible charge current 3000 mA
- **Faulty battery voltage**
  If the battery voltage undershoots this value, it is considered as being faulty by the UPS1600 and not charged.

Web server

Parameter	Value range	Default setting
Activate the Web server on this module	Yes / No	Yes

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

3.3.6 Configuring the UPS1600 in the system

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

When the UPS1600 is first connected with a controller, 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 UPS1600 in the system

By being able to flash the "SF" LED at the UPS1600 from the STEP 7 in the TIA Portal , a UPS1600 in the system can be uniquely identified, e.g. if a system has several UPS1600.

Preconditions

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

Proceed as follows

1. From the toolbar, 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 UPS1600 device is located.
   All of the available UPS1600 devices in the selected subnets are displayed.
5. Select the required UPS1600.
6. Activate the "Flash LED" checkbox.
7. Check at which UPS1600 in the system the "SF" LED flashes.

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

Changing the device name of the UPS1600

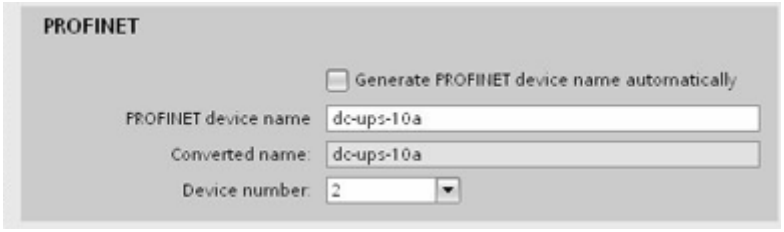
1. In STEP 7 in the TIA Portal in the tabular area of the Network view select tab "Network overview".
2. Overwrite the name in the "Device" column in the row of the PROFINET device involved.

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

Changing the device name of the UPS1600 using the properties of the PROFINET interface

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

1. Select the PROFINET interface of a PROFINET device in the Network or Device view of the Hardware and Network editor of STEP 7 in the TIA Portal.
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

1. Select the PROFINET interface of a PROFINET device in the Network or Device view of the Hardware and Network editor of STEP 7 in the TIA Portal.
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 UPS1600

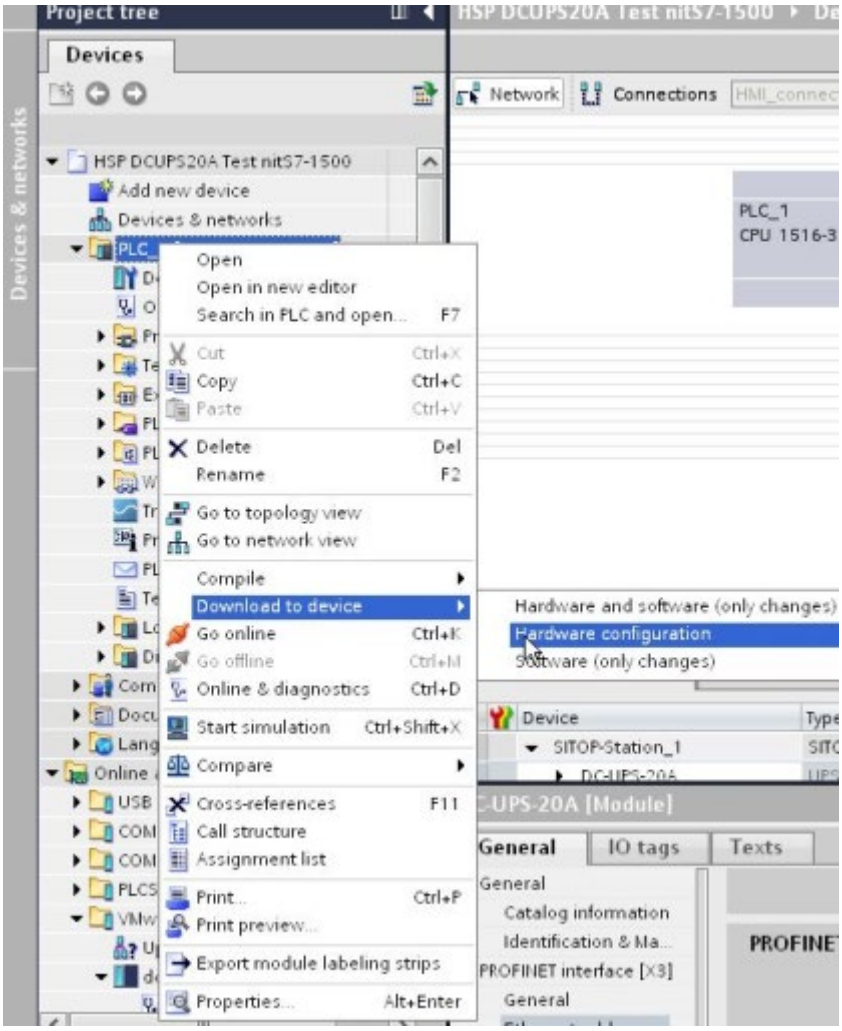
To commission the UPS, you must load the project data that you created offline into the connected UPS1600. This project data results from the configuration of the hardware, networks and connections in STEP 7 in the TIA Portal.
The complete project data is loaded for the initial loading. Only the changes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

Preconditions

- The project data is consistent.
- The device name must be identical offline and online.
- The UPS1600 is accessible online.
- The UPS1600 is located in the Profinet IO system of an IO controller.
- The PG/PC is connected to the same network to which the UPS1600 and the controller are connected. The interface of the PG/PC must be set to TCP/IP.

Procedure

1. Right-click the UPS1600 controller in the project tree.
   The context 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 the "Load" button.
   The project data are loaded. The "Load results" dialog 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 selected project data are loaded to the UPS1600 via the controller.

3.3.7 Diagnostics

The following data can be fetched using the Diagnostics function:

Group	Value
UPS1600 general	Order number
	Serial number
	Firmware
	Short designation
	Module information

Fetching diagnostics data

Proceed as follows to start the Online and diagnostics view of a module:

Project tree:

1. Open the device folder of the UPS1600 in the Project tree.
2. Double-click on "Online & diagnostics".

Or:

1. In the Project tree select the device folder of the UPS1600.
2. 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 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 UPS1600.
3. In the shortcut menu or in the "Online" main menu, select the "Online & diagnostics" .
4. Press the "Connect online" button.
   The information is displayed under Diagnostics/general.

3.3.8 Firmware update

WARNING

The UPS will be reset during the firmware update. For safety reasons, the output is switched off.

Ensure that no damage is caused to the system and that the PG/PC has a power supply independent of the UPS during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/de/79207181). Different firmware updates are offered depending on the amperage of the UPS.

Note

Observe the compatibility of the firmware!

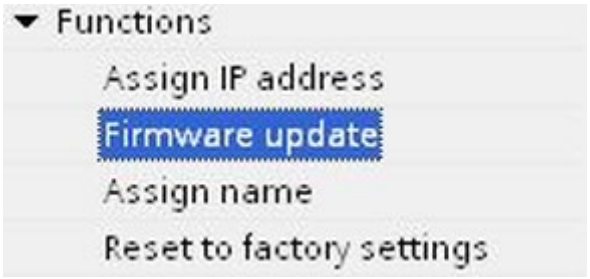
Determine the amperage of your UPS and download the appropriate firmware update. Other firmware updates are not compatible.

Preconditions

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

Procedure

1. Select the UPS1600 in the network view and switch to the device view.
2. In the shortcut menu of the UPS1600, select "Online & diagnostics".
   The "Online gateways" open.



3. In the "Functions" folder, select the "Firmware update" group.
4. Click on the "Browse" button in the "Firmware loader" area to select the path to the directory with the unzipped files.
5. Select the "dc_ups.upd" file. All UPS1600 are displayed in the table, for which an update is possible with the selected firmware file.

6. Click on the "Start update" button. If the selected file can be interpreted by the module, it will be loaded into the module. If this requires changing the operating state of the CPU, you will be prompted to do this with dialogs.
7. Confirm the notes that are displayed.
   The controller sends the firmware to the UPS1600. This is displayed by LED 5 (SF) and LED 6 (RUN) flashing at the UPS1600.
8. The TIA-Portal signals that the update was successful. Confirm this with OK.
9. After the controller has completely transferred the firmware to the UPS1600, LED 1 (OK/Bat) and LED 2 (>85%) start to flash at the UPS1600. The new firmware is now loaded to the UPS1600. This can take several minutes. LEDs 1, 2, 5 and 6 stop flashing.

   Note

   If a power failure occurs during the update, it is possible that a recovery firmware will be activated. In this case, the new IP address must be set.

10. The UPS1600 can now be switched off.

Note

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

The firmware update has been executed.

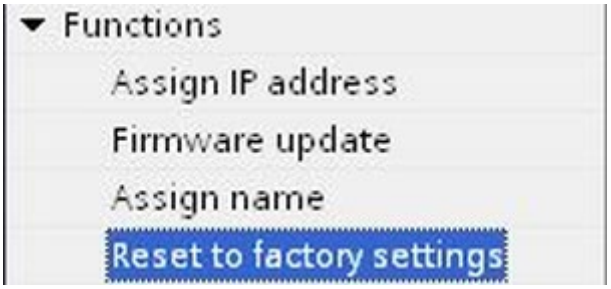
3.3.9 Restore factory settings

A reset to the factory settings deletes all hardware and software configurations stored in the UPS1600 and restores the factory settings. This affects, for example:

- IP address
- Device name
- Parameter values for UPS1600 and the energy store

Proceed as follows to restore the UPS1600 factory settings:

1. Select UPS1600 in the Network view and change to the Device view.
2. In the shortcut menu of the UPS1600, select "Reset to factory settings".



3. Activate the "Retain IP address" checkbox when you want to retain the IP address, or the "Delete IP address" checkbox, if you want to delete the IP address.
4. Click on the "Reset" button.
5. Respond to the confirmation prompt with "OK".

3.4 STEP 7 V5

UPS1600 can be used with STEP 7 V5 from Version 5.4 and higher.

In STEP 7 V5 , SITOP UPS1600 can be integrated in projects, parameterized and diagnosed.

Note

STEP 7 V5 and UPS Manager cannot simultaneously access the UPS. It is not permissible that UPS Manager service runs whileSTEP 7 V5 is being accessed.

3.4.1 Installing the generic station description file (GSD)

To use SITOP UPS1600 , in STEP 7 V5 , you must install the appropriate generic station description file (GSD). The GSD file is available on our SITOP home page (http://www.siemens.de/sitop-usv) or directly under (http://support.automation.siemens.com/WW/view/de/75854605).

Preconditions

- STEP 7 V5 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. Select the "Options > Install GSD files" menu command.
   The "Install GSD files" dialog opens.
4. Select the GSD file and click on the "Install" button.

   Note

   If the file could not be installed or a fault occurred during the installation, STEP 7 creates a log 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 the UPS1600 in the Hardware catalog , under "Further field devices / PROFINET IO > I/O".

3.4.2 Using UPS1600 in a project

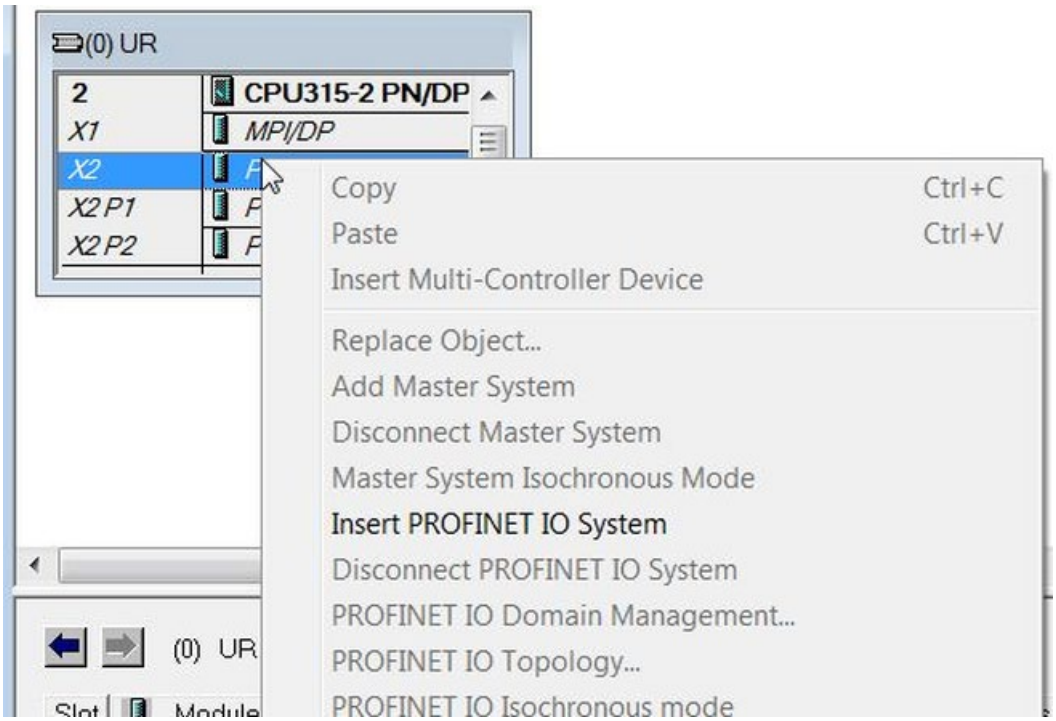
To be able to use UPS1600, it must be assigned to an IO controller as an IO device.

Preconditions

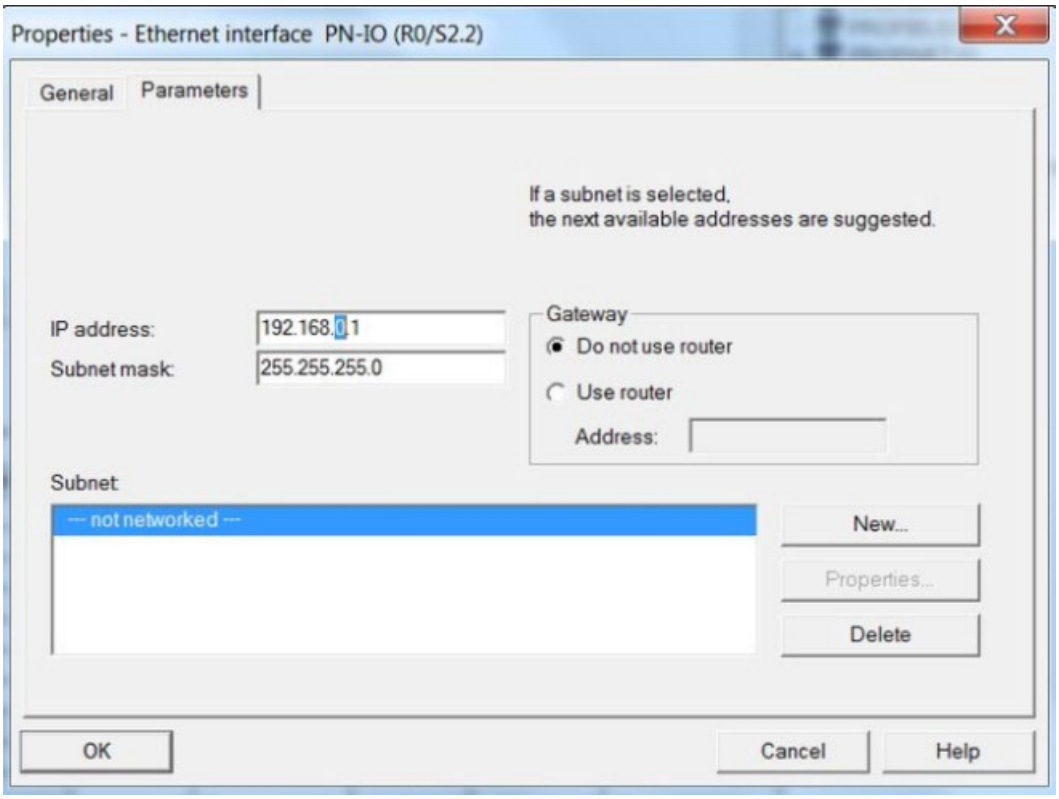
- The GSD file of the UPS1600 has been correctly installed.
- STEP 7 V5 has been opened, and a project with an IO controller has been created.

Creating a subnet

1. Open the Hardware view "HW Config".
2. Call the Shortcut menu of line "PN-IO", and select "Add PROFINET IO system".

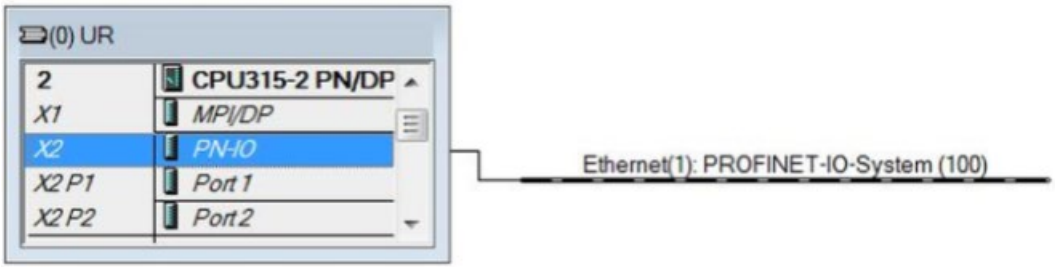


3. In dialog field "Properties - Ethernet interface PN-IO", select the "Parameter" tab, set the IP address of the PROFINET interface and create a new subnet.



4. Confirm the properties of the new subnet and close the "Properties - Ethernet interface PN-IO" dialog box.

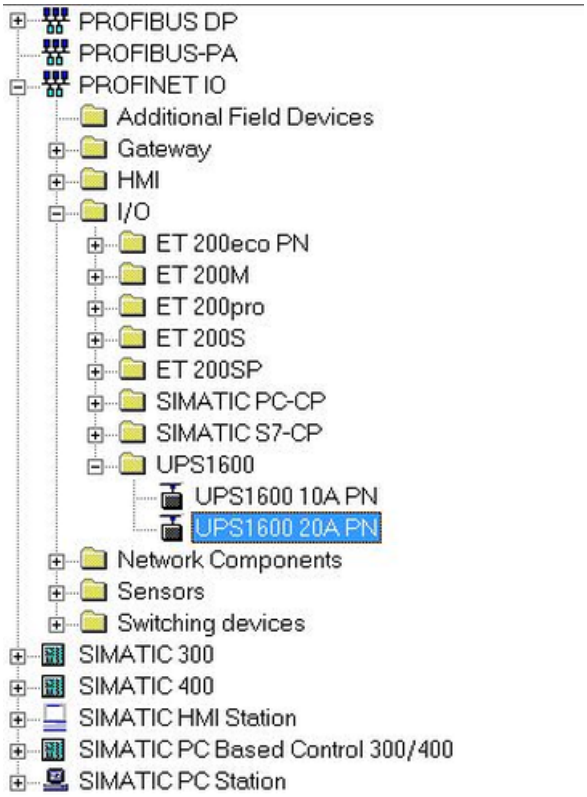
The subnet is displayed as a horizontal line in the hardware view.



Placing the UPS1600

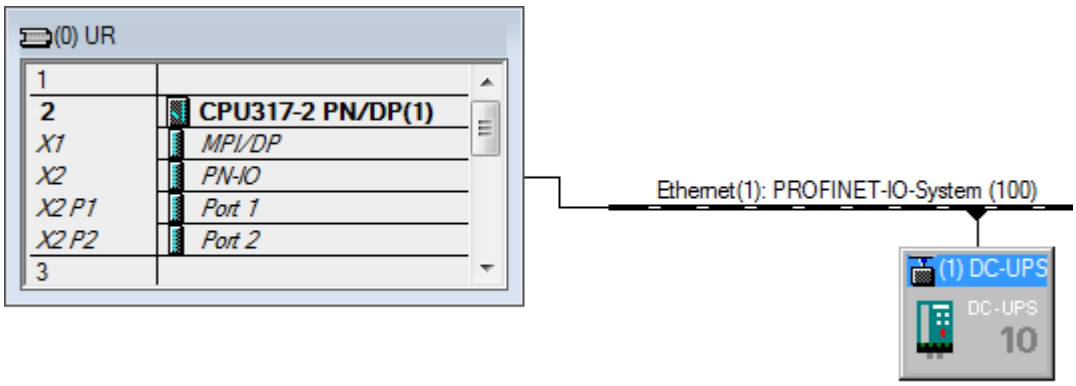
1. Select the subnet.
2. Open the "Catalog" window using the "View > Catalog" menu command.

3. In the hardware catalog, navigate to the UPS1600 under "PROFINET IO / I/O / UPS1600".



4. Click the desired UPS1600; keep the left mouse button pressed and drag the UPS1600 to the subnet.
5. Double-click on the UPS1600.
   You can now enter the device name, device number and IP address in the Ethernet.
6. Save the hardware configuration.

You have placed the UPS1600.



3.4.3 UPS parameters in STEP 7 V5

The configurable parameters of the UPS are subdivided into six subgroups in STEP 7 V5. These subgroups are shown in the table below.

Subgroup	Description
Buffer parameters	All parameters that affect the behavior of the UPS for buffering.
Battery parameters	Parameterization of the deployed battery.
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.
Identification	Specification of a location and contact details in order to identify the UPS.
Web server	Specification whether access to the UPS via Web server is permitted (yes/no).

A detailed description of the individual parameters of the subgroups is contained in the associated section under Parameterizing the UPS in STEP 7 V5 (Page 61).

3.4.4 Parameterizing the UPS in STEP 7 V5

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.

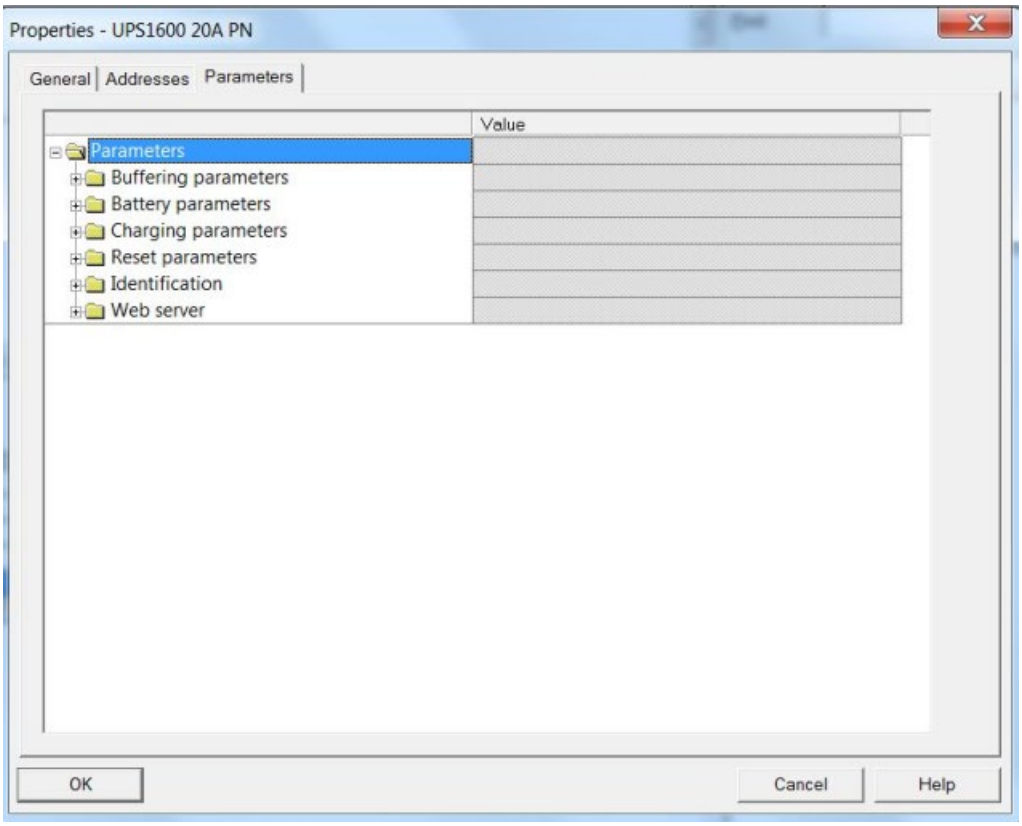
Preconditions

- The 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 UPS1600 are displayed.
2. Double-click in the network view on the UPS1600.
3. Open the hardware configuration.
   The hardware configuration opens.
4. In the hardware configuration , double-click on the entry of a UPS1600 in the station window.
5. In the configuration dialog click on the "Parameters" tab.

6. Click the desired subgroup.
   The subgroup opens.



7. Enter the values.
8. 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	60 s
Additional buffer time after PC shutdown	1 … 300 s	10 s
Connection threshold	21 … 25 V	21.5 V
Stop buffering voltage	18 … 23 V	18.5 V
Wait time for stable input voltage	5 … 65,000 ms	500 ms
Downtime alarm	0 … 20,000 ms	125 ms
Buffering allowed	Yes / No	Yes
Enable reset after buffering	Yes / No	Yes

- **Buffer time**
  The time to be buffered by the UPS. The "Buffering allowed" parameter is used to specify whether buffering should be performed.
- **Additional buffer time after PC shutdown**
  Time, to be buffered by the UPS1600 after the PC has been shut down.
- **Connection threshold**
  If the connection threshold value is undershot, the UPS starts buffering. If the value of the connection threshold is reached or undershot again later, the UPS stops buffering.
- **Stop buffering voltage**
  The voltage at which battery discharge is terminated.
- **Wait time for stable input voltage**
  The time in which no alarm is issued to the system although the connection threshold was undershot.
- **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 UPS.
- **Enable reset after buffering**
  If the value is set to "Yes", after the line supply returns during buffering, the system issues a reset – and switches the output off for a defined time. 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.

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

- **Faulty battery voltage**
  If the battery voltage undershoots this value, it is considered as being faulty by the UPS1600 and 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 no UPS1100 battery modules are being used.

Charging parameters

Parameter	Value range	Default setting
End-of-charge voltage	24 … 30 V	27.3 V
Charge current	1 … 4,000 mA	800 mA

- **End-of-charge voltage (0.01 V)**

  Note

  If UPS1100 battery modules are used, this value does not need to be specified.

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

- **Charge current (mA)**
  The battery is charged to the maximum with 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.

  Note

  If UPS1100 battery modules are being used, these values do not need to be specified.

  The following, device-dependent maximum values also apply:

  – SITOP UPS1600 20 A: Maximum permitted charge current 4,000 mA

  – SITOP UPS1600 10 A: Maximum permitted charge current 3,000 mA

Reset parameters

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

Specify the minimum interruption time for which the output voltage is switched off after the buffering.

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 UPS1600.

Web server

Parameter	Value range
Activating a Web server	Yes / No

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

3.4.5 Loading the configuration into the controller (commissioning)

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

When the UPS1600 is first connected with a controller, it is assigned a device name and an IP address by the controller. A new configuration can be loaded to the device using STEP 7 V5 .

Preconditions

- The UPS1600 has been correctly connected, and connected with the system.
- PG/PC with STEP 7 V5 is connected with the system.

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 the "Target system" menu on "Display accessible nodes"
   The "Accessible nodes" window is opened with the following displays:
   - The station
   - the 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).

Initially loading CPU as IO controller

Once you have configured the UPS1600 and the station, you must load this configuration into the CPU. In this way, the CPU (i.e. the IO controller) is assigned its configured IP addresses.

Before loading, you should perform a consistency test to check the configuration for duplicate addresses, identical names, etc.

Inform yourself whether the CPU to be loaded can also be initially loaded using 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 CPU to be loaded with its current IP address or its MAC address, if no IP address is yet available).
4. Select the CPU to be loaded from the accessible modules. This module is then displayed in the "Enter connection on the target station" dialog box.
5. Start loading by clicking on the "OK" button.
   The CPU (i.e. the IO controller) is allocated the configured IP address.

Allocating a UPS1600 a device name (online)

In order that the configured CPU can address the UPS1600, you must assign each individual IO device the configured device name.

For the procedure described below, the 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 UPS1600.
4. In the "Available devices" select the UPS1600. Using the "Flash" button, you can flash the LED on the UPS1600 so that the device can be uniquely identified.
5. Click on the "Assign name" button.

After the name assignment, you can place the CPU into the RUN operating state.

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

3.4.6 Diagnostics

The following data can be fetched using the Diagnostics function:

Group	Value
UPS1600 general	MLFB number
	Serial number

Fetching diagnostics data

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

3.4.7 Firmware update

⚠ WARNING

The UPS is reset while updating the firmware. For safety reasons, the output is switched off.

Ensure that no damage is caused to the system and that the PG/PC has a power supply independent of the UPS during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/de/79207181). Different firmware updates are offered depending on the amperage of the UPS.

Note

Observe the compatibility of the firmware!

Determine the amperage of your UPS and download the appropriate firmware update. Other firmware updates are not compatible.

Preconditions

- The UPS1600 has been correctly connected, and connected with the system.
- PG/PC with STEP 7 V5 is connected with the system.

Procedure

1. Download the firmware update.
   The firmware update consists of several files grouped in a ZIP file.
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. 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 "dc-ups.upd" file.
6. After you have selected a file, the information in the bottom boxes of the "Update firmware" dialog box indicate the modules for which the file is suitable and from which firmware version.
7. Click the "Run" button.
8. STEP 7 verifies that the selected file can be interpreted by the module and then downloads the file to the module.
9. If this requires changing the operating state of the CPU, you will be prompted to do this in the relevant dialog boxes.
10. The module then automatically updates the firmware.

    Note

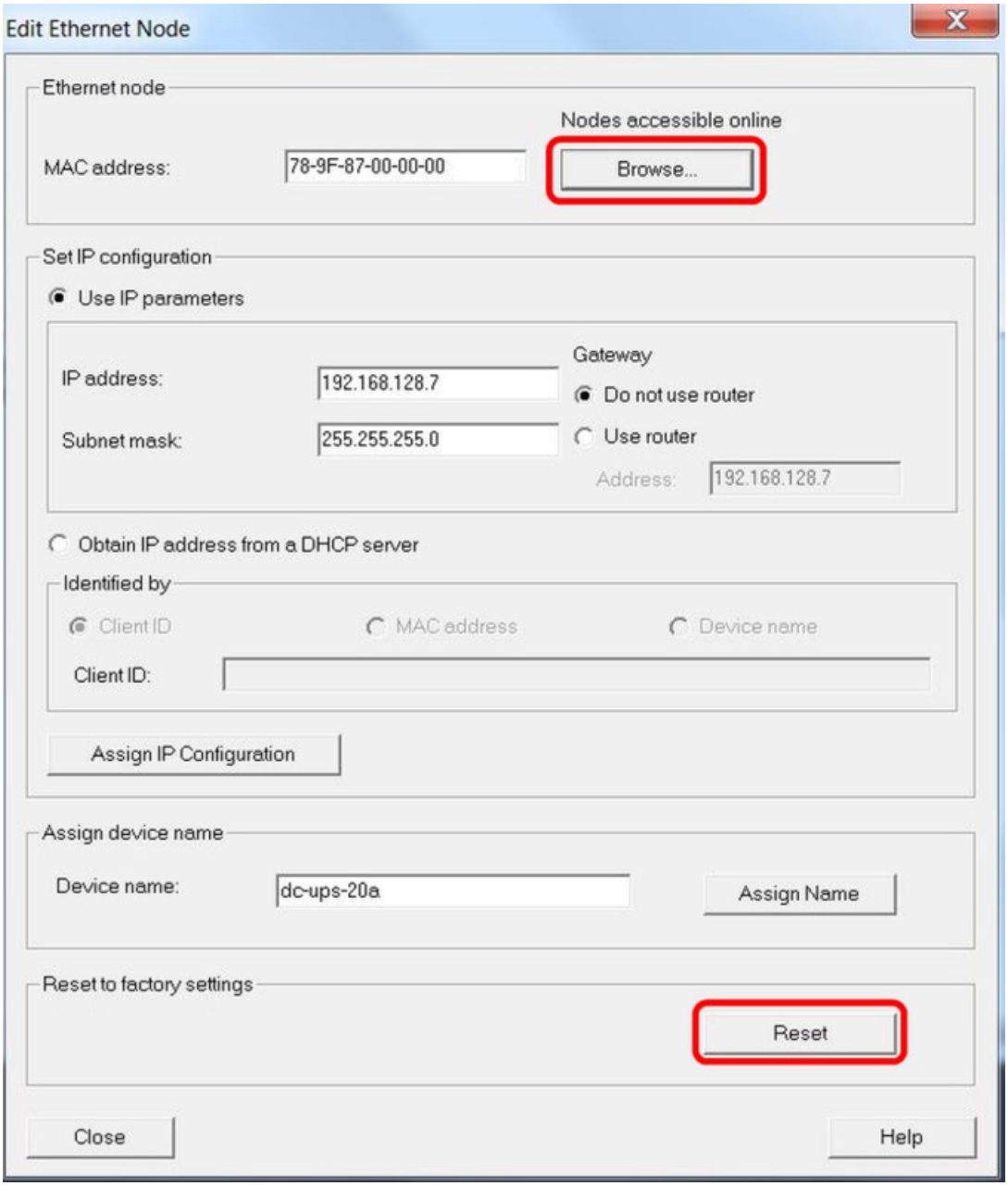
    A separate connection is established to the CPU for the firmware update, if available. In this case, the task can be interrupted. If no resources are available for another connection, an existing connection will be used automatically. In this case, the task cannot be interrupted; the "Cancel" button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

11. Use STEP 7 (read out the CPU diagnostics buffer) to verify that the module can start with the new firmware.

3.4.8 Restore factory settings

From STEP 7 V5.5, it is possible to restore the factory setting of modules using the "Target system -> Edit Ethernet nodes".

Click the "Browse" button in the "Edit Ethernet nodes" dialog to select the MAC address of the UPS1600 where the factory settings should be restored. Then click on the "Reset" button. This deletes the IP address and the device name from the module.



3.5 SITOP UPS Manager

Note

Ensure that only the UPS Manager accesses the UPS1600.

3.5.1 Functions of the SITOP UPS Manager

The main tasks that you can perform with the SITOP UPS Manager:

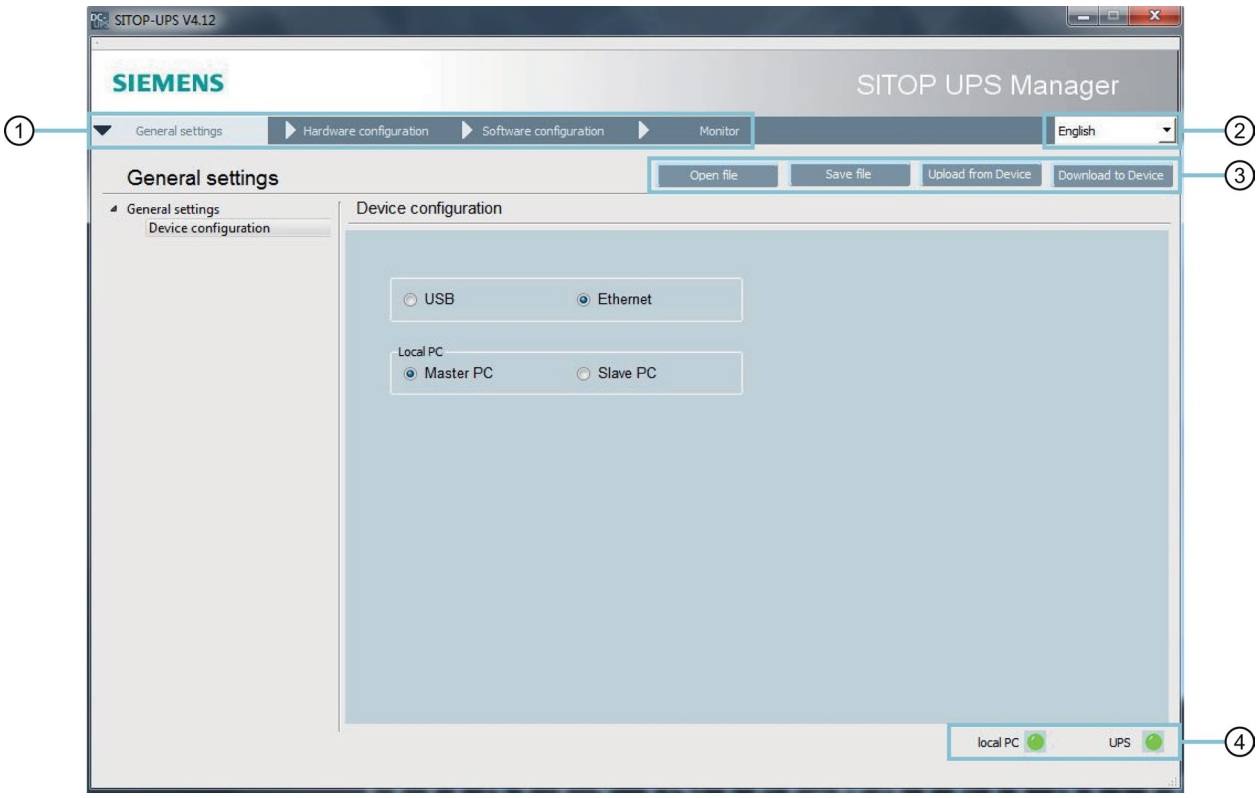
- Configuration of the SITOP UPS1600 uninterruptible power supply and the battery modules
- Protection of a computer or a computer network provided by the uninterruptible power supply with the master-slave operation
- Data backup by controlled shutdown, and
- Alarm-controlled starting of any applications (SMS, e-mail).

With the specification of further 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

3.5.2 The user interface of the SITOP UPS Manager



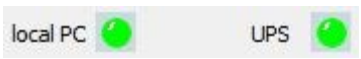
① Tab submenus
② Language selection
③ "Configurations" storage bar
④ Connection lamps

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.

The functions of the save bar ③ are used to load the configuration into or from the UPS1600 and open or save the configurations on a data medium.

The colored representations 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

3.5.3 Installation/uninstallation

The installation file for the SITOP UPS Manager is available at no charge on the SITOP home page (http://www.siemens.de/sitop-usv) or directly under (http://support.automation.siemens.com/WW/view/de/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 UPS1600, the computer must be connected with the 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 UPS Manager and batch files must not contain any blanks.

Installation steps

1. Close all applications before you start the installation.
2. Download the installation file under (http://support.automation.siemens.com/WW/view/de/75854607) and save it in a local directory.
3. Open the local directory.
4. Double-click on the "SetupSITOPUPSManager_" file.

5. Follow the installation instructions. Enter the requested information in the dialogs:
   - User interface language, German or English
   - Agreement declaration with the license conditions
   - Installation scope:
     Activate the options "Application" and "Driver".
   - Installation path:
     Accept the suggested path:
     C:\SITOPUPSManager.
     If you change the path, ensure that the path name does not contain any blanks.
   - Start menu folder
     Select the folder structure under which the SITOP UPS Manager should appear in the start menu.
6. Connect the UPS1600 with the computer via the Ethernet or USB interface.
7. Click "Finish" to complete the installation.

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 → SITOP UPS Manager → Uninstall".

3.5.4 Connection possibilities to the UPS1600

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

Depending on its type, the 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.

3.5.5 Establishing a connection via Ethernet

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

Configuring the 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-conform devices. You can download the Primary Setup Tool under (http://support.automation.siemens.com/WW/view/de/19440762).

Note

Additional information

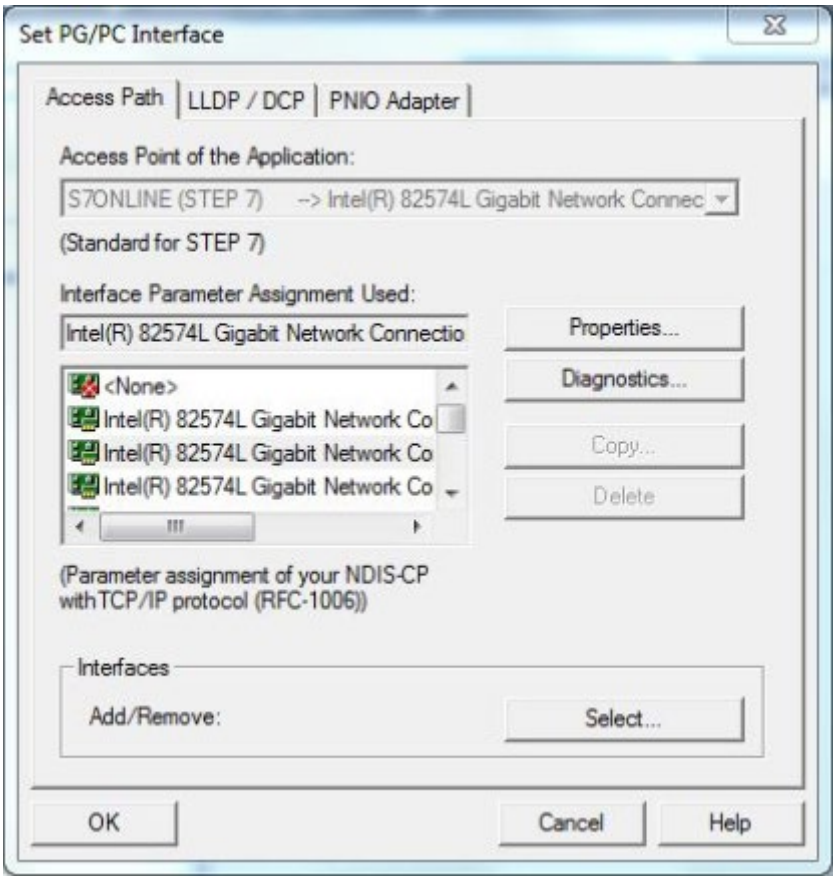
Additional information is contained in the Primary Setup Tool manual. This manual and further links can be found under (http://support.automation.siemens.com/WW/view/de/19440762).

Preconditions

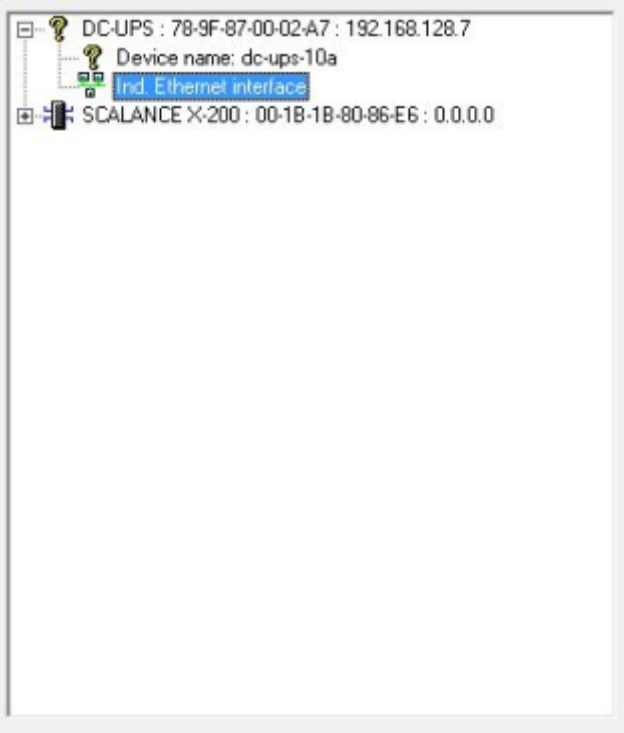
- The UPS1600 is connected with the client (PG/PC) via the Ethernet interface.
- The Primary Setup Tool is installed on the client.

Procedure

1. Start the Primary Setup Tool.
2. Select the "Settings > Select interface" menu command.
   The "Set PG/PC interface" dialog opens.

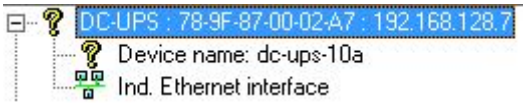


3. Select the interface with which the client is connected to the UPS1600.
   Close the "Set PG/PC interface" dialog by clicking on "OK".
4. Select the "Network > Browse" menu command.
   The UPS1600 is displayed in the tree view as "DC UPS:" with its MAC address and IP address.



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

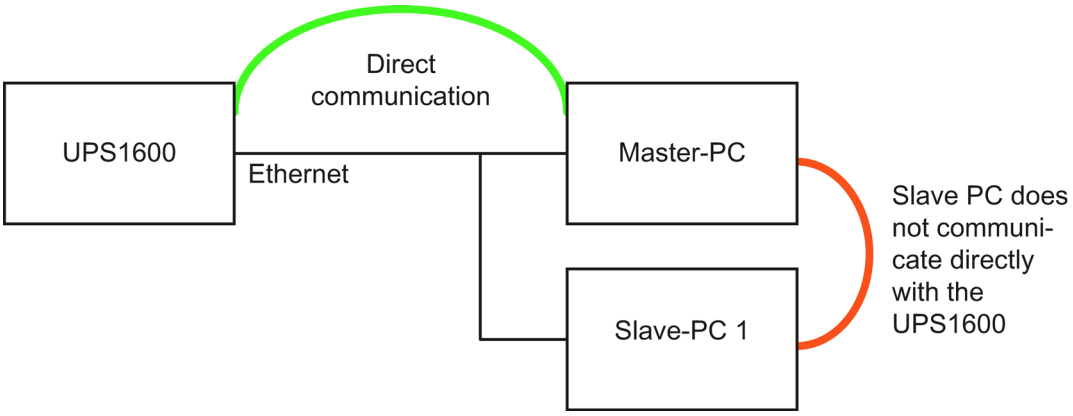
6. Configure the Ethernet interface as specified by the network administrator.
7. Select the UPS1600 in the tree view.
   Loading to the device is not possible while an interface is selected.



8. Select the " Module > Load" menu command 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 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 on the UPS1600 and operates as slave.
  Local computer = slave PC

The UPS1600, the master PC and the slave PC are on the same physical Ethernet in the master-slave configuration. Only the master PC communicates directly with the 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 client as master PC

1. Select "General settings > Device configuration".
2. Activate the "Ethernet" checkbox.
3. If you are prompted as to whether you want to restart the SITOP UPS Manager, confirm this with "Yes".
   SITOP UPS Manager is restarted.
4. Select "Hardware configuration > Ethernet configuration".

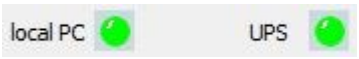
5. Enter the IP address of the master PC into the "IP address of the master PC when slave operation" field.

   Note

   The IP address of the master PC must also be specified on the master PC in the SITOP UPS Manager .

6. Enter the IP address of the UPS1600 into the "IP address of the UPS if in master mode" field.
7. If you are prompted as to whether you want to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.

The connection lamps light green; the connection as master PC to the UPS1600 has been established.



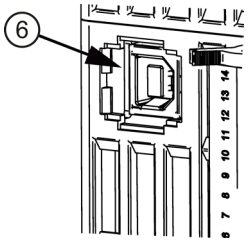
Configuring the client as slave PC

1. Select "General settings > Device configuration".
2. Activate the "Ethernet" checkbox and the "Slave PC" checkbox.
3. If you are prompted as to whether you want 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 into the "IP address of the master PC when slave operation" field.
6. If you are prompted whether you want to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.

The connection lamps light green; the connection as slave PC to the master PC has been established.

3.5.6 Establishing a connection via USB

1. Connect the UPS1600 using a USB cable with the client (PC/PG).



2. Select "General settings > Device configuration".
3. Activate the "USB" checkbox.
4. If you are prompted as to whether you want to restart the SITOP UPS Manager, confirm this with "Yes".
   The SITOP UPS Manager is restarted.
5. Check that the connection lamps light green.

The connection lamps light green; the connection to the UPS1600 via USB has been established.

3.5.7 Configuration in the SITOP UPS Manager

Once you have connected the 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. Enter the required configuration in the SITOP UPS Manager .
   Alternatively, you can load a saved configuration using the "Upload from device" command in the save bar "Configurations".
2. Click in the "Configurations save bar" on the "Download to device" button.

The configuration is loaded to the UPS1600.

3.5.8 General settings

Under "Software configuration > General settings", specify the maximum size of the log file in KB 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 kilobytes in the "Size of log file" dialog box.
3. Click on the "Browse" button and select a directory in which the log file should be saved. Confirm with "Select folder".

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

3.5.9 Configuring the UPS1600

You can use the SITOP UPS Manager to configure the UPS1600 and its energy storage, and subsequently load it into the device.

1. To do this, select "Hardware configuration > Base device" or "Hardware configuration > Energy storage".
2. Enter the desired values.
3. Click on the "Download to device" button

Configuration of the base device

The following parameters are available under "Hardware configuration > Base device":

Parameter	Value range	Default setting
Location-ID	Free text	–
Connection threshold	21 … 25 V	21.5 V
Buffer time	1 … 32,767 s	60 s
Shut down additional PC buffer time	1 … 300 s	10 s
Switch-off time after shutdown	1 … 300 s	5 s
Enable reset after buffering	Yes / No	Yes
Downtime alarm	0 … 20,000 ms	125 ms
Time of the pending input voltage	0.005 … 65 s	0.5 s

- Location ID: Details of the location identification where the UPS1600 is installed.
- Connection threshold: If the connection threshold value is fallen below, the UPSstarts buffering. If the value of the connection threshold is reached or undershot again later, the UPS stops buffering.

- Buffer time: The time to be buffered by the UPS.
- Additional buffer time after PC shutdown: The time in which the UPS1600 is buffered once the PC has been shut down.
- Switch-off time after shutdown: Time, in which the output voltage of the UPS1600 is switched off, although in the meantime the input voltage has returned. This function allows IPCs to automatically restart.
- Enable reset after buffering: If the value is set to "Yes", the system enters a reset after the end of the buffering. 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.
- Downtime alarm: The time in which no alarm is issued to the system although it is buffered.
- The time of the pending input voltage: The time in which no alarm is issued to the system although the connection threshold has been undershot.

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

If a different battery is used, activate the "Other battery" checkbox. Enter the rated values of the other battery. The following parameters are available under "Hardware configuration > Base device":

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.
- Battery defect voltage: If the battery voltage falls below this value, it will be considered as being defective by the UPS1600 and 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.

3.5.10 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.

The sending of alarms and notifications to the system or to users is also possible (SMS, e-mail).

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

- Supply voltage failure
- Restoration of the supply voltage
- State of the buffer readiness by the UPS:
  - General buffer readiness
  - Remaining buffer time
- State of the UPS battery:
  - Battery charge

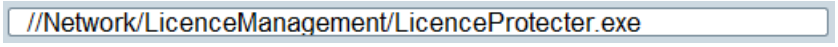
Storing an application

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, 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. To select an application, click on the "Browse" button.
   Select the required application from a directory.
   The application path is displayed.

4. To check whether the application will performed correctly, click the "Start" button.
5. Enter the time in seconds after which the application should be started.

Note

Only those applications that do not open any Windows screen can be started.

Behavior during buffer mode

Make the settings under "Software configuration > Buffer mode".

The following options are available:

- Start application on power failure
- Start application on power return
- Display SITOP UPS Manager on power failure
- Display SITOP UPS Manager on power return
- Shut down PC on power failure

Note

CAUTION: If the buffer time (see Section Configuring the UPS1600 (Page 80)) is set shorter than this time, the DC UPS switches off before the PC is shut down. The PC is then no longer protected.

Behavior for missing buffer readiness

Make the settings under "Software configuration > Buffer mode not possible".

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 is available again

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 when the battery replacement is completed
- Open the SITOP UPS Manager if battery replacement is recommended (from SITOP UPS Manager V4.12.5 and higher)
- Open the SITOP UPS Manager when the battery replacement is completed

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

Behavior depending on the remaining buffer time

Make the settings under "Software configuration > Remaining buffer time "Buffer mode not possible". Specify the minimum buffer time under "Hardware configuration > Base device" 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 when the desired buffer time can be achieved again
- Open the SITOP UPS Manager if the desired buffer time cannot be achieved
- Open the SITOP UPS Manager when the desired buffer time can be achieved again

Behavior for interrupted communication with the UPS1600

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

The following options are available:

- Start the application if the connection to the UPS1600 is interrupted
- Start the application when the connection to the UPS1600 exists again
- Open the SITOP UPS Manager when the connection to the UPS1600 exists again
- Open the SITOP UPS Manager if the connection to the UPS1600 is 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 Alarm list (Page 38)).

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

- Start the application if at least one system alarm is pending
- Start the application if no further system alarms are pending
- Open the SITOP UPS Manager if at least one system alarm is pending
- Open the SITOP UPS Manager if no further system alarms are pending

3.5.11 Display and visualization

The "Monitor" submenu shows information about the device data and parameters as well as the state of the power supply.

The following display options exist:

- Alarm monitoring: Pending alarms and alarm history
- Operating data: Device data and device parameters
- Trend charts:
  - Load current over time
  - Input voltage over time
  - Remaining buffer time
  - Battery temperature over time
  - Battery charge over time
  - Charge current over time

Displaying pending alarms

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

	Name	Time stamp	Help
1	Communication with battery fault (battery index: 1)	09.01.2014 13:58:38	Communication with formerly known battery is no longer possible - check communication
2	Communication with battery fault (battery index: 2)	09.01.2014 13:58:44	Communication with formerly known battery is no longer possible - check communication

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 "Monitor > Alarm history".
   The pending alarms are displayed in tabular form.

	Name	Time stamp	Alarm
1	Battery test	09.12.2013 01:20:50	Incoming
2	Battery test	09.12.2013 01:20:51	disappear
3	Battery test	09.12.2013 09:20:56	Incoming
4	Battery test	09.12.2013 09:20:59	disappear
5	no connection to DC-UPS	09.12.2013 09:36:02	Incoming
6	DC-UPS connected	09.12.2013 09:36:09	Incoming
7	Buffer mode not possible	09.12.2013 09:36:27	Incoming
8	Buffer mode not possible	09.12.2013 09:37:03	disappear
9	no connection to DC-UPS	09.12.2013 09:44:27	Incoming
10	Device powered up	09.12.2013 09:44:28	Incoming

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: Alarm type:
  - incoming: Occurrence of the alarm event
  - outgoing: Rectification of the alarm event

Data and parameters UPS1600

1. Select "Monitor > Operating data".
2. Find the data and parameters of the UPS1600 under "DC UPS Base Unit".

The following data are displayed:

- Order number
- Serial number
- Version number

The following parameters are displayed:

- Buffer mode
- Remaining buffer time
- Input voltage
- Load current
- Ready for buffering

Energy storage data and parameters

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

The following data are displayed:

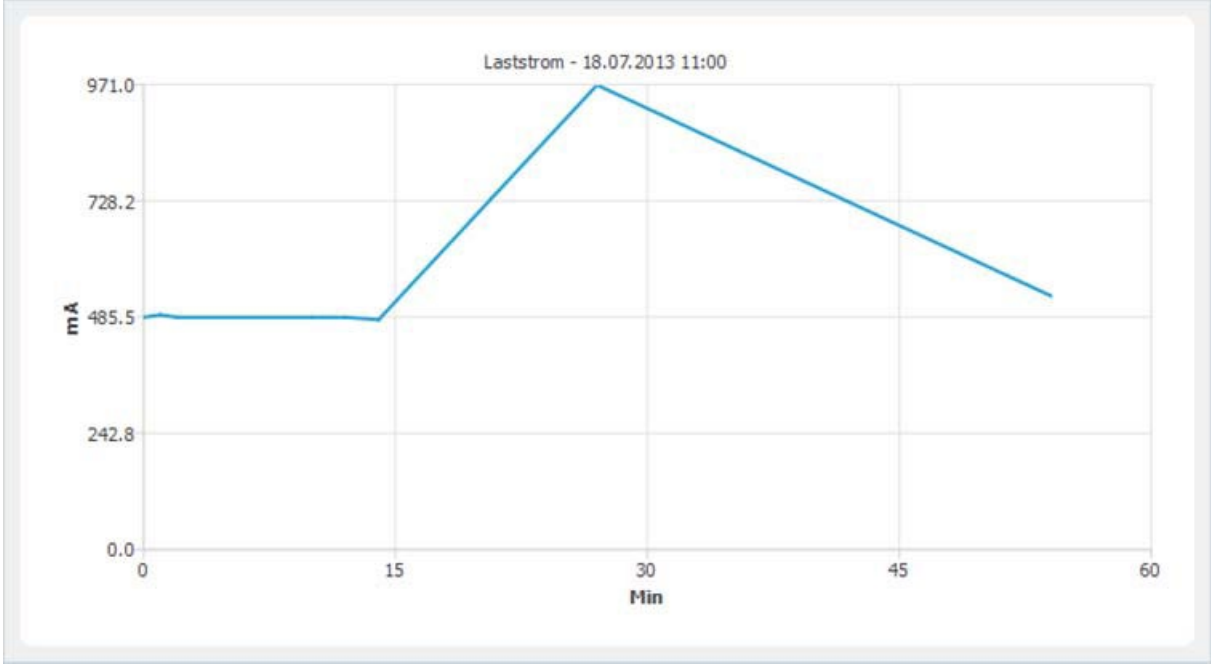
- Order number
- Serial number
- Version number

The following parameters are displayed:

- Battery capacity
- Battery charge level
- Battery temperature
- Charge current

Trend charts

You have the possibility of graphically displaying values about the power supply under "Monitor > Trend chart", for instance the load current over time:



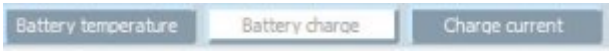
The following trend charts can be selected:

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

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

Procedure

1. Select "Monitor > Trend chart".
2. Select "DC UPS Base Unit" to display trend charts for values of the UPS1600
   or
   Select "Energy storage" to display trend charts of the energy storage values.
   3 charts are available under both points.
3. Click the appropriate button to display the required trend chart.



3.5.12 Firmware update

WARNING

The UPS is reset while updating the firmware. For safety reasons, the output is switched off.

Ensure that no damage is caused to the system and that the PG/PC has a power supply independent of the UPS during the firmware update.

The files for updating the firmware (firmware updates) are available online under (http://support.automation.siemens.com/WW/view/de/79207181). Different firmware updates are offered depending on the amperage of the UPS.

Note

Observe the compatibility of the firmware!

Determine the amperage of your UPS and download the appropriate firmware update. Other firmware updates are not compatible.

Preconditions

- The UPS1600 is connected correctly and connected with the system.
- PG/PC with SITOP UPS Manager is connected with the system.

Procedure

1. Select "Monitor > Online functions".
2. Select "Firmware update".
3. To select the path to the directory with the unzipped files, click on the "Browse" button. In this directory, select the " dc_ups.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 UPS1600 by interrupting the UPS1600 power supply.
   Restore the power supply to the UPS1600.

The firmware update has been performed successfully.

3.6 Web server

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

3.6.1 Accessing the Web server

A Web browser is used for the access and operation.

The following Web browsers are suitable:

- Internet Explorer (version 8.x and 9.x)
- Mozilla Firefox (version 15.0.x)

Preconditions

- The computer with installed web browser is connected with the UPS1600 via Ethernet.
- The UPS1600 has an IP address that you know.
- The Web browser can display SVG graphics.

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:

1. Download the SVG update under (http://www.savarese.com/software/svgplugin).
2. Install the SVG update.
3. If required, restart your computer.

Access to the Web server

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 UPS1600 in the form http://ww.xx.yy.zz (input example: http://192.168.0.14).
3. Press the Enter key.
   The login page opens.
4. Enter the login information.
   Initial values:
   - User name: "Administrator"
   - Password: "admin"

Note

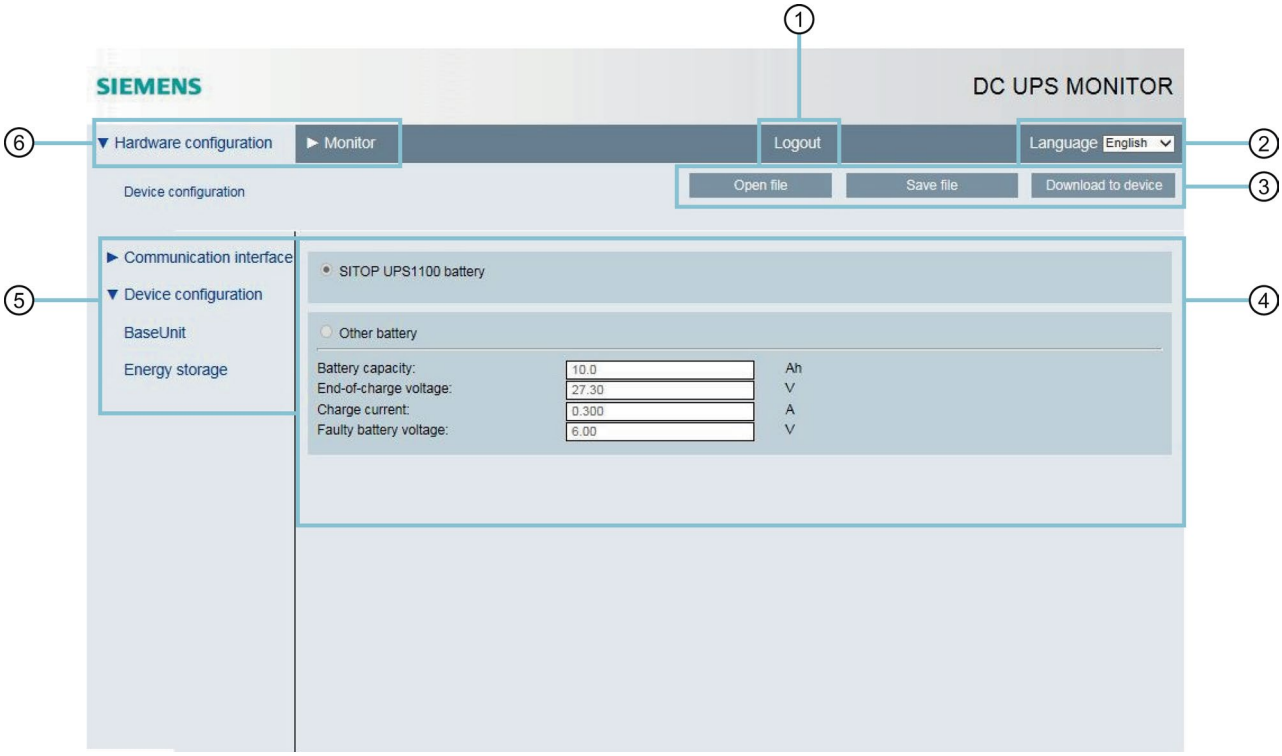
Change the password!!

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

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

Access is not possible if the web server has been deactivated via TIA or STEP 7.

3.6.2 The user interface of the Web server



① "Logout" button
② Language selection
③ "Configurations" save bar
④ Editor area
⑤ Navigation submenus
⑥ Menu selection

Menu selection ⑥ allows you to access the "HW configuration" and "Display" menus and their associated submenus. The functions of the menus are described in the following sections.

You access the submenus from the navigation submenus ⑤.

The associated settings possible in the selected submenu are made in the editor area ④.

The functions of the save bar ③ are used to load the configuration into the UPS1600 and open or save the configurations on a data medium.

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

Click the "Logout" ① button to logout from the current web server session. Access to the Web server is possible only after a new login.

If another controller (DC UPS Manager or an S7 controller) is simultaneously connected with the DC UPS, the web server is in the read-only mode. In this case, the function scope is restricted.

- No write access is possible; the parameter settings can only be read (input values shown gray)
- No firmware update is possible, the item is hidden

3.6.3 Functions of the Web server

The functions of the Web server are divided into the two menus.

Display

The following functions are available:

- View data of the UPS1600 (base device), see Viewing the UPS1600 (base device) data (Page 93)
- View the energy storage data, see Viewing the energy storage data (Page 93)
- Alarm monitoring (pending alarms, alarm history), see Alarm monitoring (Page 94)

HW configuration

The following functions are available:

- Configuration of the communications interface, see Configuring the communications interface (Page 95)

3.6.4 Viewing the UPS1600 (base device) data

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

The "Base unit" entry provides the following information:

- UPS1600 data:
  - Order number
  - Serial number
  - Version number
- Operating mode (normal or buffer mode)
- Ready for buffering
- Remaining buffer time
- Input voltage
- Load current

3.6.5 Viewing the energy storage data

1. Select the "Display" menu
2. Select the "Energy storage" entry under "Operating data" in the navigation.
3. Select the desired battery (example: battery 1) with a click.

The "Battery" entry provides the following information:

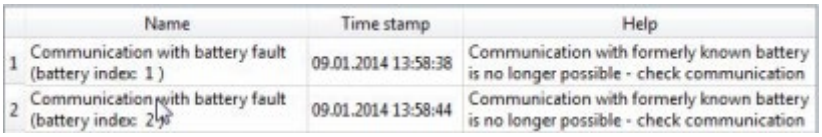
- Data of the battery module:
  - Order number
  - Serial number
  - Version number
- Capacity
- Battery charge
- Battery temperature
- Load current

3.6.6 Alarm monitoring

You can use the Web server to obtain information about pending alarms and the history of the alarms. Every alarm that concerns the UPS1600 and the connected battery modules is recorded. You can display pending alarms via "Pending alarms".

Displaying pending alarms

1. Select the "Display" menu
2. Select the "Pending alarms" entry under "Alarms" in the navigation.
   The pending alarms are displayed in tabular form.



	Name	Time stamp	Help
1	Communication with battery fault (battery index: 1)	09.01.2014 13:58:38	Communication with formerly known battery is no longer possible - check communication
2	Communication with battery fault (battery index: 2)	09.01.2014 13:58:44	Communication with formerly known battery is no longer possible - check communication

The individual columns contain the following information:

- Name: A descriptive name of the alarm
- Time: The time and date of the alarm event occurrence
- Help: Description of the alarm

Displaying the alarm history

1. Select the "Display" menu
2. Select the "Alarm history" entry under "Alarms" in the navigation.
   The alarm history is displayed in the tabular form.

	Name	Time stamp	Alarm
1	Battery test	09.12.2013 01:20:50	Incoming
2	Battery test	09.12.2013 01:20:51	disappear
3	Battery test	09.12.2013 09:20:56	Incoming
4	Battery test	09.12.2013 09:20:59	disappear
5	no connection to DC-UPS	09.12.2013 09:36:02	Incoming
6	DC-UPS connected	09.12.2013 09:36:09	Incoming
7	Buffer mode not possible	09.12.2013 09:36:27	Incoming
8	Buffer mode not possible	09.12.2013 09:37:03	disappear
9	no connection to DC-UPS	09.12.2013 09:44:27	Incoming
10	Device powered up	09.12.2013 09:44:28	Incoming

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: Alarm type:
  - 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 UPS1600 have been established.

Examples for further communications relationships are communication relationships via STEP 7 V5 or the SITOP UPS Manager.

3.6.7 Configuring the communications interface

Setting the password

1. Select the "Hardware configuration" menu.
2. In the navigation under "Communication interface", select the "LAN" entry.
3. In the fields in the "Password" area, enter the required password.
   Both entries must be identical.
4. Load the configuration into the UPS1600 by pressing the "Download to device" button.

Mounting/removal

4

4.1 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 snapped onto a standard mounting rail EN 60715 35×7.5/15 for mounting in a control cabinet.

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 4-1 Removal (example 6EP4136-3AB00-2AY0) (Page 97)) 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.

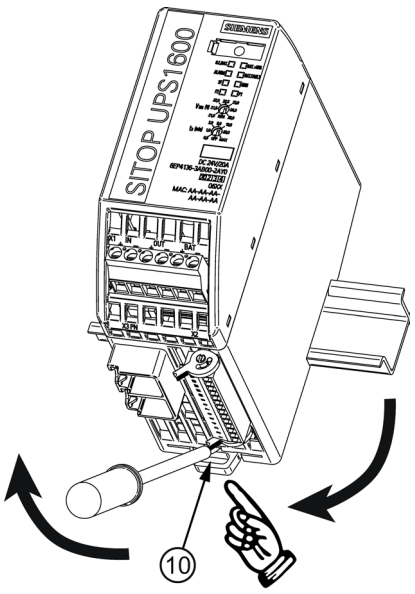


Figure 4-1 Removal (example 6EP4136-3AB00-2AY0)

4.1.1 Signal connector

Mounting

Push connector on socket ④ in the housing.

Removal

To remove the signal connector, press the release lever (4b) (see Figure 4-2 Mounting/removal: Signal connector (Page 98)) and then remove the connector.

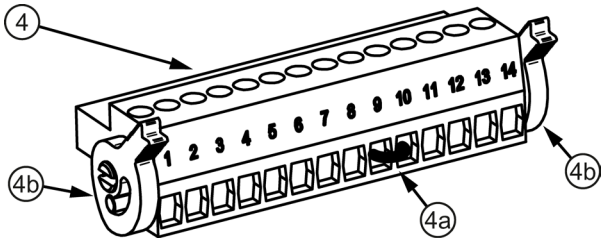


Figure 4-2 Mounting/removal: Signal connector

4.1.2 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 4-3 Mounting/removal: USB connector (Page 98)) and then remove the connector.

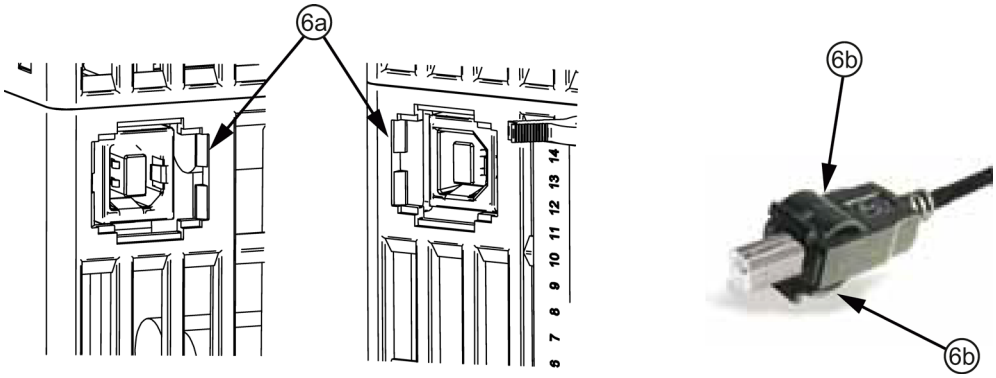


Figure 4-3 Mounting/removal: USB connector

4.1.3 PROFINET/Ethernet connector

For deployment in an explosion-endangered environment, 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 4-4 Mounting/removal: Ethernet (Page 99)) and then remove the connector.

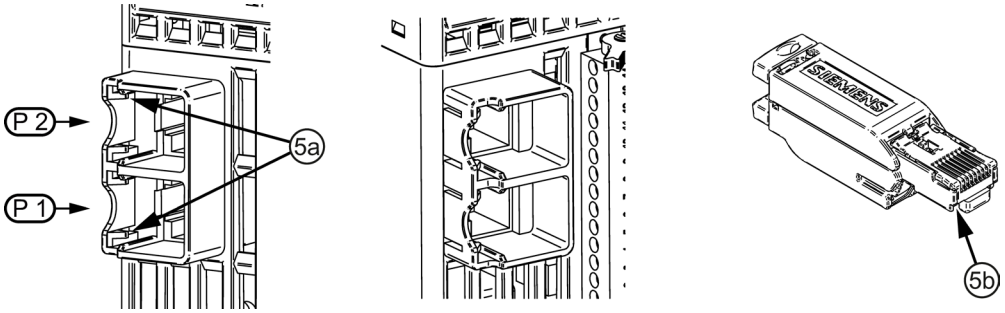


Figure 4-4 Mounting/removal: Ethernet

4.2 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.

The device is suitable for direct wall mounting.
The 6EP4131-0GB00-0AY0 (1.2 Ah) and 6EP4133-0GB00-0AY0 (3.2 Ah) devices can be snapped onto a standard mounting rail EN 60715 35×15, and the 6EP4131-0GB00-0AY0 (1.2 Ah) device can also be snapped onto a standard mounting rail EN 60715 35×7.5.

The lower part of the control cabinet or the coolest location in the control cabinet should be chosen as mounting location.

Mounting

For the drilled holes for the wall mounting, refer to the "Dimensions and weight" UPS1100 (Page 35) section.
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).

Removal

To remove the device, pull it forcibly downwards while removing it from the lower edge of the standard mounting rail (see Figure 4-5 Removal (example 6EP4133-0GB00-0AY0 (3,2 Ah)) (Page 101)). Then you can remove the device from the upper edge of the standard mounting rail.

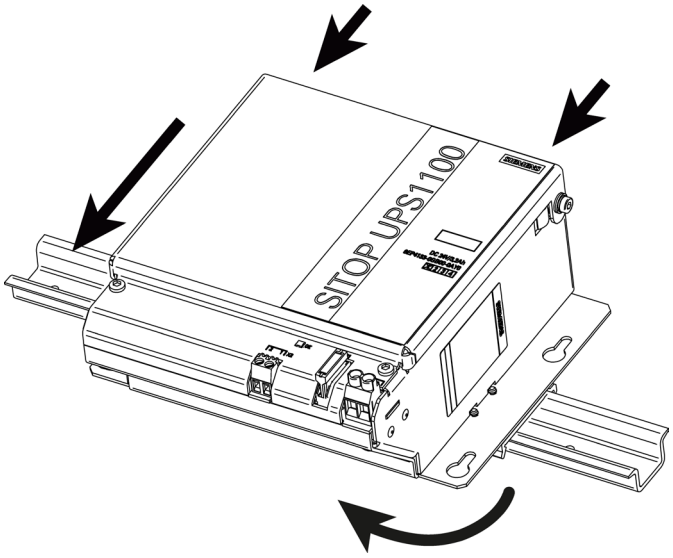


Figure 4-5 Removal (example 6EP4133-0GB00-0AY0 (3.2 Ah))

Mounting position, mounting clearances

5

5.1 UPS1600

5.1.1 Standard mounting position

The device is designed for mounting on standard EN 60715 35×7.5/15 mounting rails. The device must be mounted vertically to ensure proper cooling, and with the input terminals and output terminals at the bottom.

A clearance of at least 50 mm should be maintained above and below the device.

No space is required at the side.

Output current as a function of the ambient temperature

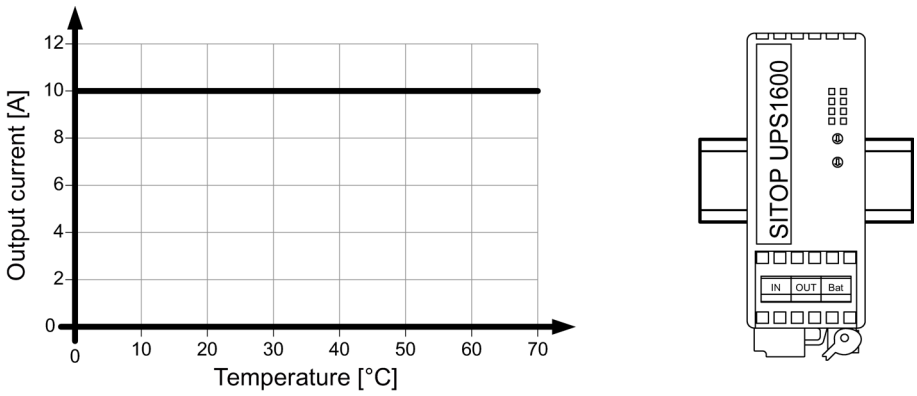


Figure 5-1 6EP4134-3AB00-... : Output current in the standard mounting position

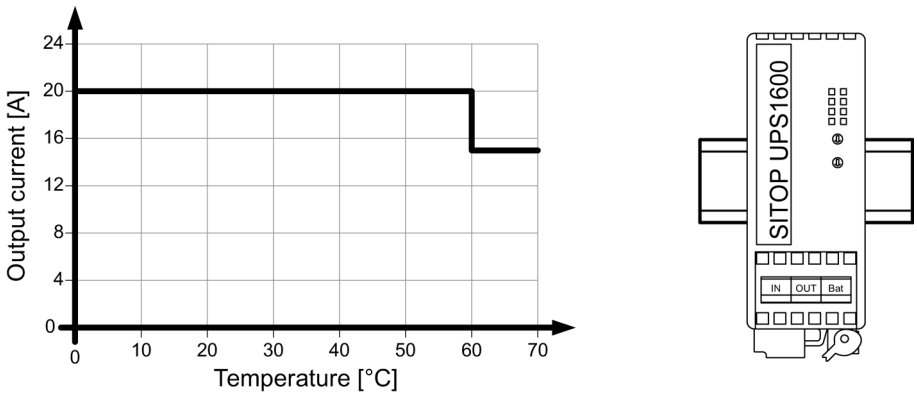


Figure 5-2 6EP4136-3AB00-... : Output current in the standard mounting position

5.1.2 Other mounting positions

Not released.

5.2 UPS1100

5.2.1 Standard mounting position

The device is suitable for the direct wall mounting. The 6EP4131-0GB00-0AY0 (1.2 Ah) and 6EP4133-0GB00-0AY0 (3.2 Ah) devices can be snapped onto a standard mounting rail EN 60715 35×15, and the 6EP4131-0GB00-0AY0 (1.2 Ah) device can also be snapped onto a standard mounting rail EN 60715 35×7.5. 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 input terminals and the output terminals are at the bottom to ensure correct cooling.

No clearance is required at the side.

5.2.2 Other mounting positions

Not released.

5.3 Altitude derating

Output current as a function of the altitude derating

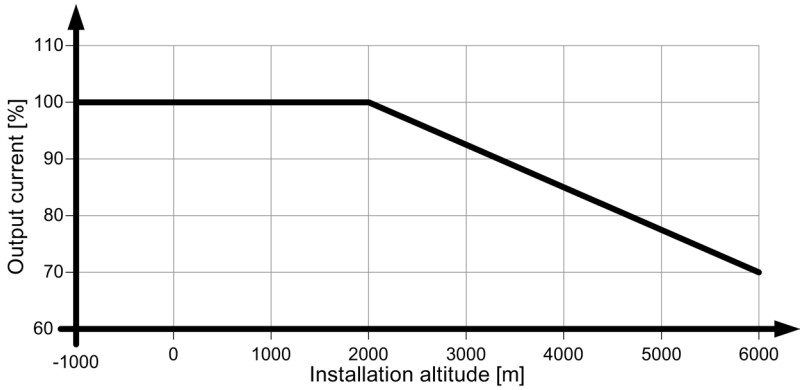


Figure 5-3 Altitude derating

Details see chapter Ambient conditions (Page 123)

Installation

6

Note

For installation of the devices, the relevant country-specific regulations must be observed.

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.

The connections must not be attached or detached during operation.

Note

For UPS1100

The self-discharge rate of the rechargeable batteries is approx. 3%/month for a temperature of 20° C. This value is temperature dependent, and for an increasing temperature, becomes more unfavorable and for a decreasing temperature, more favorable.

The fuses should only be inserted in the fuse holder when commissioning the device.

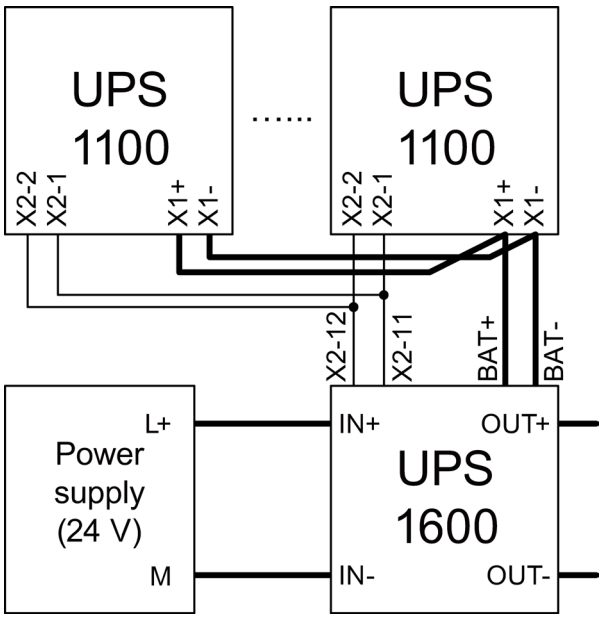


Figure 6-1 Wiring

6.1 UPS1600 input side connection

The UPS1600s are designed for connection to a 24 VDC power system. The 24 V supply voltage must be SELV in accordance with EN60950-1 and EN50178.

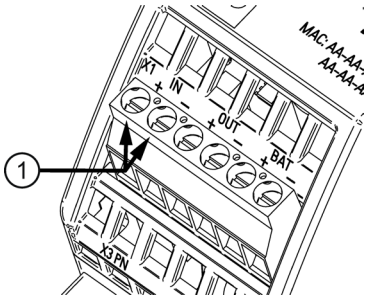


Figure 6-2 Input side connection

The 24 V power supply is connected at the "IN+", and "IN-" ① terminals (see Figure 6-2 Input side connection (Page 108)).

The deployed cables must be suitable for temperatures of at least 90° C. (only for applications for UL508)

Maximum cable length 3 m

6.2 UPS1600 output side connection

The output of the 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 113))

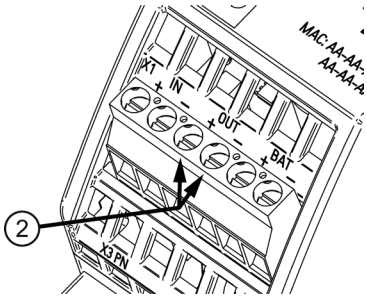


Figure 6-3 Output-side connection

The output voltage is connected at the "OUT+" and "OUT–" ② terminals (see Figure 6-3 Output-side connection (Page 108)). 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)

6.3 Connecting the BAT UPS1600

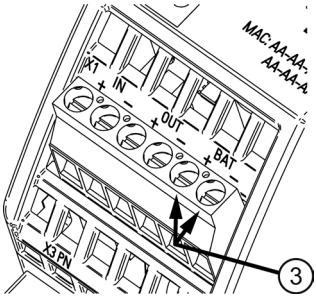


Figure 6-4 BAT connection

The "BAT+" and "BAT-" ③ connections (see Figure 6-4 BAT connection (Page 109)) are used to connect the UPS1600 with one or more UPS1100 battery modules. Ensure that the cables are dimensioned correctly for the maximum output current rms value of the UPS1600.

For wiring, see Figure 6-1 Wiring (Page 107).

The deployed cables must be suitable for temperatures of at least 90° C. (only for applications for UL508)

Maximum cable length 3 m

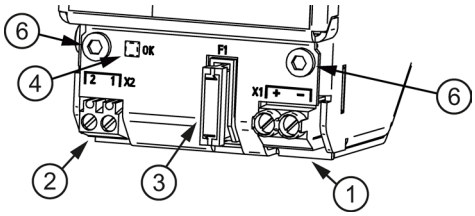
6.4 USB interface

Maximum USB cable length 5 m

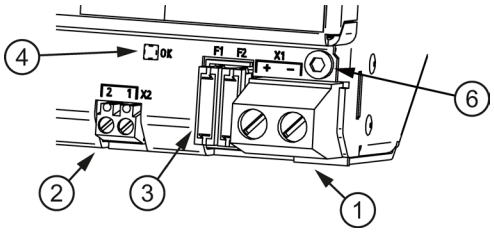
6.5 PROFINET/Ethernet connection

Maximum length of the PROFINET/Ethernet cable 100 m (90 m BASIC- Link plus 2 x 5 m CHANNEL- Link)

6.6 UPS1100 connections



Connections 1.2/3.2 Ah



Connections 7 Ah

Connection X1 ①

The connections "X1+" and "X1-" are used to transfer power between the UPS1600 with UPS1100. Ensure that the cables are dimensioned corresponding to the fuses in the UPS1100 and the impedances between UPS1600 and UPS1100 are identical. Only connect charged batteries with one another.

Connection X2 ②

The "X2-1" and "X2-2" connections are used to exchange data between the UPS1600 and UPS1100. (see Figure 6-1 Wiring (Page 107))

When several battery modules are used, note the following:

- As many as six battery modules of the same type can be connected together in parallel.
- If different battery modules are connected in parallel, relay 2 flashes (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 six battery modules are connected in parallel, relay 2 flashes (battery defective). No calculations with regard to charge and remaining buffer time are performed. Charging and buffering, however, is possible.

6.7 Maintenance

6.7.1 Battery

The UPS1100 devices contain two maintenance-free lead-gel batteries.

Device type	Battery type
6EP4131-0GB00-0AY0 (1.2 Ah)	YUASA NP1.2-12
6EP4133-0GB00-0AY0 (3.2 Ah)	YUASA NP3.2-12 or B.B.Battery BP3.6-12
6EP4134-0GB00-0AY0 (7 Ah)	YUASA NP7-12 or B.B.Battery BP7-12

When replacing the rechargeable 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 rechargeable batteries is approx. 3%/month for a temperature of 20° C. This value is temperature dependent, and for an increasing temperature, becomes more unfavorable and for a decreasing temperature, more favorable.

6.7.2 Battery replacement

See Figure 6-5 Maintenance (Page 112) and Figure 6-6 Wiring schematic (Page 112)

- Remove the screws ⑥ with a Torx T10 screwdriver and open the cover
- Press the button ⑤ for at least two seconds (LED ④ flashes)
- Remove the fuse ③
- Replace the battery
- Press the button for at least two seconds (LED ④ stops flashing and lights continuously)
- Insert the fuse
- Close the cover (screw)

Pressing the button resets the following functions:
Operating hours counter, backup time counter, accumulated charging current, accumulated load current, calculated capacity

Note

Replace the battery only in normal operation, not in backup operation.

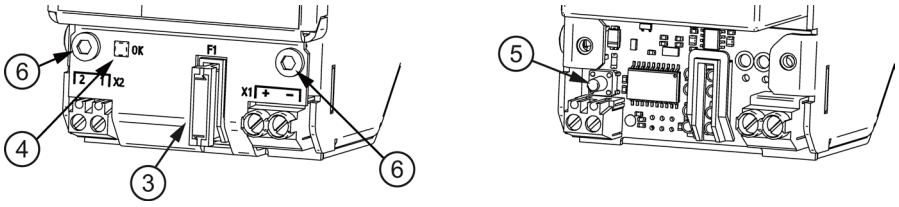
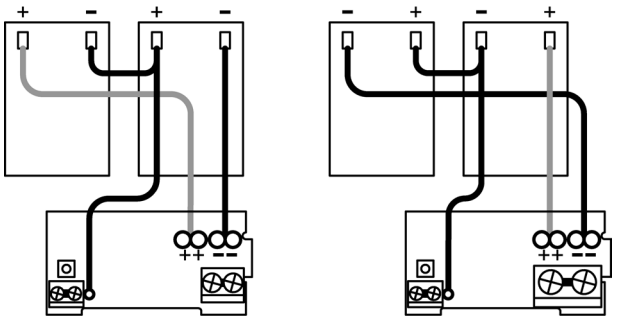


Figure 6-5 Maintenance



6EP4131-0GB00-0AY0 1,2Ah
6EP4133-0GB00-0AY0 3,2Ah

6EP4134-0GB00-0AY0 7Ah

Figure 6-6 Wiring schematic

Technical data

7

Note

Technical data is applicable for a rated input voltage, rated load and +25° C ambient temperature (if nothing else is specified).

7.1 Input

7.1.1 UPS1600

	6EP4134-3AB00-... (10 A)	6EP4136-3AB00-... (20 A)
Input voltage Ui rated / range	24 VDC (21 ... 29 V)	
Connection threshold for buffering • Remark	22.5 VDC ± 3% (factory setting), setting range: 21 VDC , 21.5 VDC , 22 VDC, 22.5 VDC, 23 VDC, 24 VDC, 25 VDC or via software. The connection threshold must be at least 0.5 V lower than the input voltage. After reaching the minimum input voltage at the DC UPS module, the module cannot buffer for a maximum of 1.5 seconds.	
Input current Ii rated	Approximately 14 A for the max. charge current (3 A)	Approximately 25 A for the max. charge current (4 A)
Reverse polarity protection	Yes	

7.1.2 UPS1100

Charging current: Maximum 0.3 CA for a connected battery module; maximum 0.4 CA is permitted for several parallel connected battery modules.

7.2 Output

7.2.1 UPS1600

	6EP4134-3AB00-... (10 A)	6EP4136-3AB00-... (20 A)
Output voltage with normal operation	Input voltage Ui minus approximately 0.2 V	
Output voltage for buffer mode	27 VDC (no-load); 24 V (50% battery rated current); 22 V (100% battery rated current); 18.5 V (exhaustive discharge protection)	
Power-up characteristics	Startup 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	Maximum 0.3 CA for a connected battery module; maximum 0.4 for several parallel connected battery modules.	
End-of-charge voltage	Automatic temperature-controlled setting with SITOP UPS1100 battery modules.	
Output current – rated value	10 A	20 A
• Power boost for 30 ms	30 A	60 A
• Extra power for 5 s/min	15 A	30 A
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 2-4 Charge current (Page 24)))	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 2-4 Charge current (Page 24)))

7.2.2 UPS1100

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 Ah)
Output voltage rated value	24 VDC, 22...27.0 VDC (no-load)		
Output current rated value	10 A	20 A	40 A
Battery fuse (plug-in)	15 A / 32 V	25 A / 32 V	2x25 A / 32 V

7.3 Backup times

Output current	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 Ah)
1 A	34 minutes	2.5 h	5.4 h
2 A	11 minutes	1 h	2.6 h
3 A	9 minutes	39 minutes	1.6 h
4 A	6 minutes	27 minutes	1.2 h
6 A	3.5 minutes	17.5 minutes	41 minutes
8 A	2 minutes	12 minutes	28 minutes
10 A	1 minute	9 minutes	22 minutes
12 A	-	7 minutes	17 minutes
14 A	-	5 minutes	15 minutes
16 A	-	4 minutes	12.5 minutes
20 A	-	1 minute	9 minutes

7.4 Efficiency

Table 7- 1 UPS1600

	6EP4134-3AB00-0AY0 (10 A) 6EP4134-3AB00-1AY0 (10 A)	6EP4134-3AB00-2AY0 (10 A)
Efficiency at Ua rated, Ia rated, approx.	97.5 %	97.3 %
Power loss at Ua rated, Ia rated, approx.	6 W	7 W

	6EP4136-3AB00-0AY0 (20 A) 6EP4136-3AB00-1AY0 (20 A)	6EP4136-3AB00-2AY0 (20 A)
Efficiency at Ua rated, Ia rated, approx.	97.7 %	97.5 %
Power loss at Ua rated, Ia rated, approx.	10 W	11 W

7.5 Protection and monitoring

Table 7- 2 UPS1600

	6EP4134-3AB00-... (10 A)			6EP4136-3AB00-... (20 A)		
	...-0AY0	...-1AY0	...-2AY0	...-0AY0	...-1AY0	...-2AY0
Current limitation Typ.	30 A			60 A		
• Remark	Power boost with 300% Ia rated for typ. 30 ms			Power boost with 300% Ia rated for typ. 30 ms		
Short-circuit protection	Yes, device will be switched off after five seconds (extra power)					
Reverse polarity protection	Against input voltage Ua and against batteries					
Overload/short-circuit indicator	Yes, restart in normal operation					

Table 7- 3 UPS1100

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 Ah)
Short-circuit protection	Yes, fuse		
Reverse polarity protection	Yes		

7.6 MTBF

	6EP4134-3AB00-0AY0 (10 A) 6EP4134-3AB00-1AY0 (10 A) 6EP4134-3AB00-2AY0 (10 A) 6EP4136-3AB00-0AY0 (20 A) 6EP4136-3AB00-1AY0 (20 A) 6EP4136-3AB00-2AY0 (20 A)
Mean Time Between Failures	SN29500: >350,000 hours at 40° C, rated load, 24-h operation

7.7 Mechanical system

Table 7- 4 UPS1600

	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 connector	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 / panel mounting	No					
Type of mounting / rail mounting	Yes					
Type of mounting / S7-300 rail mounting	No					
Mounting	Can be snapped onto standard EN 60715 35x7,5/15 mounting rails					

Table 7- 5 UPS1100

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 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)		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)		
Width of the housing	89 mm	190 mm	186 mm
Height of the housing	130 mm	169 mm	186 mm
Depth of the housing	107 mm	79 mm	110 mm

	6EP4131-0GB00-0AY0 (1.2 Ah)	6EP4133-0GB00-0AY0 (3.2 Ah)	6EP4134-0GB00-0AY0 (7 Ah)
Installation width	89 mm	190 mm	186 mm
Mounting height	130 mm	169 mm	186 mm
Weight, approx.	1.9 kg	3.8 kg	6.1 kg
Product feature of the housing / housing that can be lined up next to one another	Yes		
Type of mounting / panel mounting	Yes		
Type of mounting / rail mounting	Yes		No
Type of mounting / S7-300 rail mounting	No		
Mounting	Wall mounting, can be snapped onto standard EN 60715 35x7,5/15 mounting rails	Wall mounting, can be snapped onto standard EN 60715 35x15 mounting rails	Wall mounting

7.8 Dimension drawing

See chapter Dimensions and weight (Page 33)

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)

6EP4131-0GB00-0AY0
(http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00829)

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)

Safety, approvals, EMC

8

8.1 Safety

	6EP4134-3AB00-..., 6EP4136-3AB00-... 6EP4131-0GB00-0AY0, 6EP4133-0GB00-0AY0, 6EP4134-0GB00-0AY0
Protection class	Class III
Degree of protection (EN 60529)	IP20
Test voltage	See Table 8-1 Test voltage (Page 120)

8.2 Test voltage

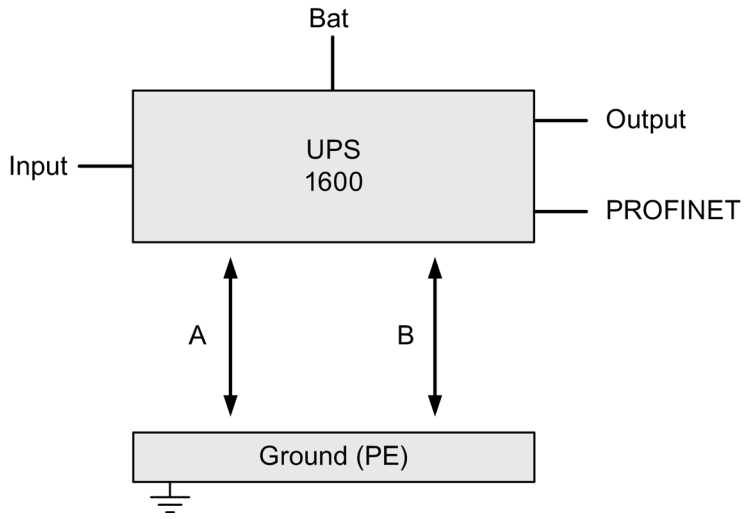


Figure 8-1 Test voltage diagram

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 can be connected with each other)

Table 8- 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	2200 VDC
	1 s	140 VAC	1500 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

8.3 Approvals

	6EP4134-3AB00-... **6EP4136-3AB00-...**	**6EP4131-0GB00-0AY0** **6EP4133-0GB00-0AY0** **6EP4134-0GB00-0AY0**
CE marking	Yes, (2004/108/EG and 2006/95/EG)	Yes, (2004/108/EG and 2006/95/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

8.4 EMC

		6EP4134-3AB00-... (10 A) **6EP4136-3AB00-... (20 A)** **6EP4131-0GB00-0AY0 (1.2 Ah)** **6EP4133-0GB00-0AY0 (3.2 Ah)** **6EP4134-0GB00-0AY0 (7 Ah)**
Electrostatic discharge	EN 61000-4-2	6 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/asymmetrical on DC-2 kV at DC input/output cables
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

Ambient conditions

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	6EP4134-3AB00-... (10 A)	6EP4136-3AB00-... (20 A)	6EP4131-0GB00-0AY0 (1.2 Ah) 6EP4133-0GB00-0AY0 (3.2 Ah) 6EP4134-0GB00-0AY0 (7 Ah)
Ambient temperature	-25 ... +70° C with natural convection	-25 ... +60° C with natural convection 15 A (derating) at 60° ... 70° C	0 ... +40° C with natural 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		
	Note: The service life of the UPS1100 battery modules (reduce to 50% of the original capacity) depends on the battery temperature, for approximately +20° C: 4 years, +30° C: 2 years, +40° C: 1 year		
Transport and storage temperature	-40 ... +85° C		-20 ... +50° 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, without condensation		
Degree of pollution	2		
Mechanical stressing during 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		

	6EP4134-3AB00-... (10 A)	6EP4136-3AB00-... (20 A)	6EP4131-0GB00-0AY0 (1.2 Ah) 6EP4133-0GB00-0AY0 (3.2 Ah) 6EP4134-0GB00-0AY0 (7 Ah)
Damaging gases	Tested according to: • EN 60068-2-42 sulfur dioxide • EN 60068-2-43 hydrogen sulfide		
Atmospheric 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 5-3 Altitude derating (Page 106) • Overvoltage category: III up to 2000 m (EN 50178) II from 2000 m up to 6000 m (EN 50178) 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.

Service & Support

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Technical support

Technical support for all IA/DT products can be accessed through the following communication channels:

- Phone: + 49 (0) 911 895 7222
- E-Mail (mailto:support.automation@siemens.com)
- 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.de/sitop/manuals)

SITOP power supply homepage

General news about our power supplies is available in the Internet at the SITOP homepage:
SITOP (http://www.siemens.de/sitop)

Information material

SITOP information can be downloaded from the Internet:
Information and download center (http://www.siemens.de/sitop-infomaterial)

CAx data

2D/3D data and circuit diagram macros can be downloaded from the Internet:
Siemens image database (http://www.siemens.de/sitop-cax)

Request all CAx data via the CAx download manager:
CAx shopping cart (http://www.siemens.de/cax)

SITOP Selection Tool

Simply and quickly select the optimum the power supply or DC-UPS:
SITOP Selection Tool (http://www.siemens.de/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.siemens.de/automation/partner)
- In Catalog CA 01