WAGO Power Supply Pro 2

1-phase; 24 VDC; 20 A; 480 W; Redundancy

2787-3147/000-030



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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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1 Provisions

This document applies to the following product:

2787-3147/000-030 (WAGO Pro 2 Power Supply)

Product detail page	www.wago.com/2787-3147/000-030

The product must only be installed and operated in accordance with the operating instructions. Knowledge of the operating instructions is required for proper use. You can find all documents and information on the detailed product page.

1.1 Intended Use

The product supplies electrical or electronic devices with DC voltage, such as industrial controllers or display, communication and measurement devices.

- The product is designed for use in dry indoor rooms.
- Operation of the products in industrial area is permitted.
- The product meets the EMC requirements for the residential, office and commercial area as well as small business, if the product used complies with the required emissions of interference (emission limits).
- Operation of the product in other application areas is only permitted when corresponding approvals and labeling are present.

Improper Use

Improper use of the product is not permitted. Improper use occurs especially in the following cases:

- Non-observance of the intended use
- Use without protective measures in an environment in which moisture, salt water, salt spray mist, dust, corrosive fumes, gases, direct sunlight or ionizing radiation can occur
- Use of the product in areas with special risk that require continuous fault-free operation and in which failure of or operation of the product can result in an imminent risk to life, limb or health or cause serious damage to property or the environment (such as the operation of nuclear power plants, weapons systems, aircraft and motor vehicles)

Warranty and Liability

The provisions of the latest WAGO General Terms and Conditions of Deliveries and Services (GTC) apply as well as the Software License Terms for Standard Software (SW-License) applicable to software products und software embedded in WAGO hardware products, both available at: www.wago.com.

In particular, the warranty is void if:

- The product is improperly used.
- The deficiency (hardware and software configurations) is due to special instructions.
- Modifications to the hardware or software have been made by the user or third parties that are not described in this documentation and that has contributed to the fault.

Individual agreements always have priority.

Obligations of Installers/Operators

The installers and operators bear responsibility for the safety of an installation or a system assembled with the product. The installer/operator is responsible for the proper installation and safety of the system. All laws, standards, guidelines, local regulations and accepted technology standards and practices applicable at the time of installation, and the instructions in the the products' Instructions for Use, must be complied with. In addition, the installment requirements for licensing must be observed. In the event of non-compliance, the product may not be operated within the scope of the approval.

The product is an open type device and is designed for installation in an additional enclosure.

1.2 Typographical Conventions

Number Notation

100	Decimals: Normal notation
0x64	Hexadecimals: C-notation
'100'	Binary: In single quotation marks
'0110.0100'	Nibbles separated by a period

Text Formatting

italic	Names of paths or files
bold	Menu items, entry or selection fields, emphasis
`Code`	Sections of program code
>	Selection of a menu point from a menu
"Value"	Value entries
[F5]	Identification of buttons or keys

Cross References / Links

	Cross references/links to a topic in a document
	Cross references / links to a separate document
	Cross references / links to a website
	Cross references / links to an email address

Sequence of Action

✓ This symbol identifies a precondition.

1. Action step
2. Action step

   ⇨ This symbol identifies an intermediate result.

⇨ This symbol identifies the result of an action.

- Individual action step

Lists

- Lists, first level

– Lists, second level

Figures

Figures in this documentation are for better understanding and may differ from the actual product design.

Warning Messages

⚠ DANGER

Type and source of hazard

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

- Action step to reduce risk

⚠ WARNING

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

- Action step to reduce risk

⚠ CAUTION

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- Action step to reduce risk

! NOTICE

Type and source of malfunction (property damage only)

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

- Action step to reduce risk

Information Notices

ⓘ Note

Information

Indicates information, clarifications, recommendations, referrals, etc.

2 Safety

2.1 General Safety Regulations

- This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user of the product. In addition, ensure that any supplement to this documentation is included, if necessary.
- The product must only be installed and put into operation by qualified electrical specialists per EN 50110-1/-2 and IEC 60364.
- Comply with the laws, standards, guidelines, local regulations and accepted technology standards and practices applicable at the time of installation.

2.2 Electrical Safety

- High voltage can cause electric shock or burns! Disconnect all power sources from the product before performing any installation, repair or maintenance.
- Make sure the product does not carry any voltage before starting work.

Power Supply

- Connecting impermissible current or frequency values may destroy the product.
- Provide suitable disconnect and overcurrent protection on the system side. The protection device must be located near the product where it can be operated. The **OFF** position must be clearly marked on the protection device.

Grounding/Protection/Fuses

- When handling the product, please ensure that environmental factors (personnel, work space and packaging) are properly equalized. Do not touch any conducting parts.
- Establish sufficient grounding. Make sure there is a flawless electrical connection between the DIN-rail and frame / additional enclosure.
- Protect the product with an appropriate overcurrent protection device.

Cables

- Always design the connection cables for the maximum anticipated current load.
- High currents and the inherent head generated by the product can cause additional heat generation at the clamping point. Plan for a correspondingly higher temperature range for the connecting cables, or reduce inherent heat by selecting larger conductor cross-sections.
- Only clamp one conductor to each connection terminal. If several conductors must be clamped, wire them using an upstream wiring assembly (e.g., WAGO Through Terminal Blocks).

2.3 Mechanical Safety

- Before startup, please check the product for any damage that may have occurred during shipping. Do not put the product into operation in the event of mechanical damage.
- Do not open the product housing.

- Use the cover cap to close the unused interface.
- The product is an open-type device and is designed for installation in an additional enclosure, which supplies the following safety aspects:
  - Restrict access to authorized personnel and may only be opened with tools.
  - Ensure the required pollution degree in the vicinity of the system.
  - Offer adequate protection against direct or indirect contact.
  - Offer adequate protection against UV irradiation.
  - Prevent fire from spreading outside of the enclosure.
  - Guarantee mechanical stability.

2.4 Thermal Safety

- The surface of the housing heats up during operation. Under special conditions (e.g., in the event of a fault or increased surrounding air temperature), touching the product may cause burns. Allow the product to cool down before touching it.
- The temperature inside the additional enclosure must not exceed the ambient temperature permitted for the mounted product.
- Cooling of the product must not be impaired. Ensure air can flow freely and that the minimum clearances from adjacent products/areas are maintained.

2.5 Indirect Safety

- Only use a dry or cloth or a clothed dampened with water to clean the product. Do not use cleaning agents, e.g., abrasive cleaners, alcohols or acetone.
- Clean tools and materials are imperative for handling the product.
- The product contains no parts that can be serviced by the user. Always have all service, maintenance and repair work performed by specialists authorized by WAGO.
- Replace any defective or damaged devices.
- Observe possible different technical specifications for mounting that does not correspond to the nominal mounting position.

3 Properties

3.1 Overview

The WAGO Power Supplies Pro 2 Redundancy Series 2787 are compact, switched mode Power supplies with a wide range of uses. The WAGO Power Supplies Pro 2 Redundancy have an integrated redundancy functionality and can be mounted on a DIN-rail.

The Power supplies can be configured directly via buttons on the product or via the integrated communication interface. For this purpose, the connection is established either via the WAGO USB communication cable or via an attached communication module. It is also possible to record and evaluate various output parameters via the WAGO Interface Configuration software, which is available separately.

The pluggable connection technology uses WAGO pluggable connectors. These allow pre-wiring for quicker installation, as well as quicker and easier product replacement.

The LEDs display various diagnostic messages (see Indicators [▶ 14]).

3.2 View



Figure 1: View

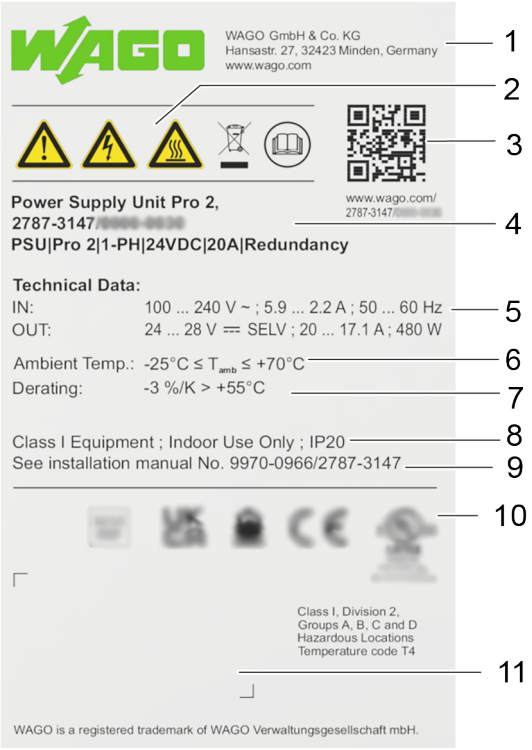
a	Ventilation openings	
b	Signal (X3)	Signal [▶ 13]
c	Output (X2)	Connectors [▶ 12]

d	Screw for overvoltage protection (output)	**Overvoltage protection [▶ 22]**
e	Optical status indication	**Indicators [▶ 14]**
f	Buttons	**Control Elements [▶ 14]**
g	Communication interface	**Communication interface [▶ 15]**
h	Type label	**Type label [▶ 11]**
i	Marker carrier	**Marker Carrier [▶ 65]**
j	Screw for overvoltage protection (input)	**Overvoltage protection [▶ 22]**
k	Input (X1)	**Connectors [▶ 12]**
l	Latch for mounting to/removal from DIN rail	

3.3 Product Identification

3.3.1 Type label

The product's type plate contains the following information:



1	Company logo and address	
2	Warning notice symbols	**Safety [▶ 8]**
3	QR link with link to website	
4	Product name and order number	
5	Input and output data	**Technical Data [▶ 15]**
6	Surrounding air temperature	**Environmental Requirements [▶ 19]**
7	Derating information	**Derating (Temperature-Dependent) [▶ 24]**
8	Additional technical data	**Technical Data [▶ 15]**
9	Information on the instruction leaflet	
10	Field for guidelines, approvals and standards	**Guidelines, approvals and standards [▶ 21]**
11	Label with product-specific information	**Product-specific information [▶ 12]**

3.3.2 Product-specific information

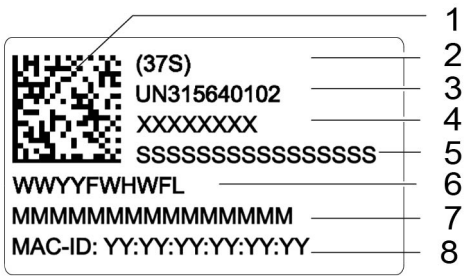


Figure 2: Product-specific information

1	2D data matrix code	Contains the information for positions 2 … 5
2	Key number	Fixed information (37S)
3	ID number per D-U-N-S®	Fixed information (WAGO Minden)
4	WAGO item number or internal SAP number	Product-specific
5	Consecutive number	Product-specific
6	Production date and revision	• Production date • Revision index (FC)
7	Internal manufacturer product number	Product-specific
8	Media Access Control Identifier	Product-specific

Table 1: Revision index structure

Software index	Hardware index	Boot loader index
FW	HW	FL

3.4 Connections

3.4.1 Connectors

Note the maximum permissible connection cross-sections of the power cables (see **Input [▶ 16]**).

Check the associated operating voltage before connecting the equipment (see **Technical Data [▶ 15]** or **Type label [▶ 11]**).

Additional information on the connection technology is provided in section .**Connection [▶ 33]**

3.4.1.1 Input

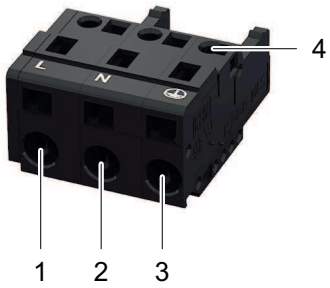


Figure 3: Input X1 Connection

1	Pin 1	Contact “L” for input voltage

2	Pin 2	Contact “N” for input voltage
3	Pin 3	Contact “PE” for input voltage
4	-	Test slot

Table 2: Details – Input Connection

Series	721 Series (see **Accessories [▶ 66]**)
Connection Technology	CAGE CLAMP

3.4.1.2 Output

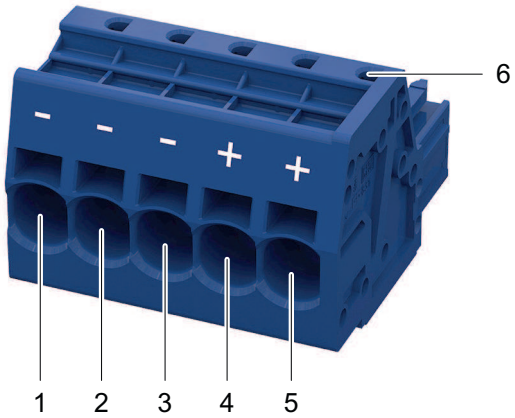


Figure 4: Output X2 Connection

1	Pin 1	Contact “−” for output voltage
2	Pin 2	Contact “−” for output voltage
3	Pin 3	Contact “−” for output voltage
4	Pin 4	Contact “+” for output voltage
5	Pin 5	Contact “+” for output voltage
6	-	Test slot

Table 3: Details – Output Connection

Series	831 Series (see **Accessories [▶ 66]**)
Connection Technology	Push-in CAGE CLAMP

3.4.2 Signal

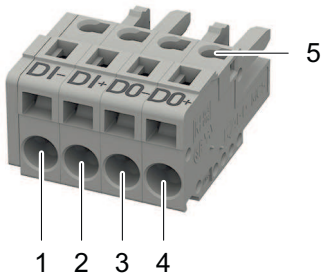


Figure 5: Signal X3 Connection

1	Pin 1	Contact "DI−" for input voltage
2	Pin 2	Contact "DI+" for input voltage
3	Pin 3	Contact "DO−" for output voltage
4	Pin 4	Contact "DO+" for output voltage

5	-	Test slot

Table 4: Details – Signal Connection

Series	721 Series (see Accessories [▶ 66])
Connection Technology	CAGE CLAMP

3.5 Indicators

The product has a visual status indicator. This indicator consists of five LEDs.

These LEDs indicate operating states and Diagnostics.

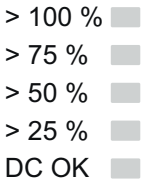


Figure 6: Optical Status Indicator

Table 5: Indication of Operating States – General

Indicator		Product is in Standby Mode	Latching Shutdown of Output [1]	Boost Output (Signaled for 5 s)
> 100 %		Off	Flashing (0.5 Hz)	Flashing (2 Hz)
> 75 %		Off	Off	Steady
> 50 %		Off	Off	Steady
> 25 %		Off	Off	Steady
DC OK		Flashing (0.5 Hz)	Off	Steady

[1] *In the event of overload or overtemperature, or if electronic circuit breaker trips*

Table 6: Indication of Operating States – Output Power

Indicator		DC OK / Output Power < 25 %	Output Power ≥ 25 % … < 50 %	Output Power ≥ 50 % … < 75 %	Output Power ≥ 75 % … < 100 %	Output Power ≥ 100 %
> 100 %		Off	Off	Off	Off	Steady
> 75 %		Off	Off	Off	Steady	Steady
> 50 %		Off	Off	Steady	Steady	Steady
> 25 %		Off	Steady	Steady	Steady	Steady
DC OK		Steady	Steady	Steady	Steady	Steady

3.6 Control Elements

This section describes the control elements.

3.6.1 Buttons

Two buttons are located on the front of the product. These buttons are labeled **+** and **–**. Among other functions, these two buttons are used to set or adjust the output voltage.



Figure 7: Control Elements

For a detailed description of how to use thus buttons to make settings, see Operation.

3.7 Communication interface

The communication interface is covered with a cap. Remove this cap to use the communication interface.

You can communicate with the product through the communication interface. The following options are available for this:

- Via the WAGO USB Communication Cable (see **Accessories [▶ 66]**)
- Via an attachable communication modulel (see **Accessories [▶ 66]**)

The WAGO USB Communication Cable is intended exclusively for parameterization and is not designed for continuous communication. Use a corresponding communication module for continuous communication!

To connect to a PC with the WAGO USB Communication Cable, perform the following steps:

1. Remove the cap.
2. Connect the USB connector of the WAGO USB Communication Cable to your PC.
3. Carefully insert the plug for the communication interface straight into the communication interface in such a way that the keying tab fits into the lower recess.
   ⇨ The plug is seated correctly once it has been inserted into the interface up to the stop. However, since the contours of the housing and plug differ, the plug does not sit completely flush with the surface of the housing.

You can now connect to your product with the WAGO Interface Configuration software and configure it (see **Configure Product [▶ 37]**).

3.8 Technical Data

3.8.1 Product

Table 7: Technical Data – Product

Property	Value
Width	70 mm
Height	130 mm
Depth	130 mm (from upper-edge of 35 rail)
Weight	1450 g
Degree of protection	IP20

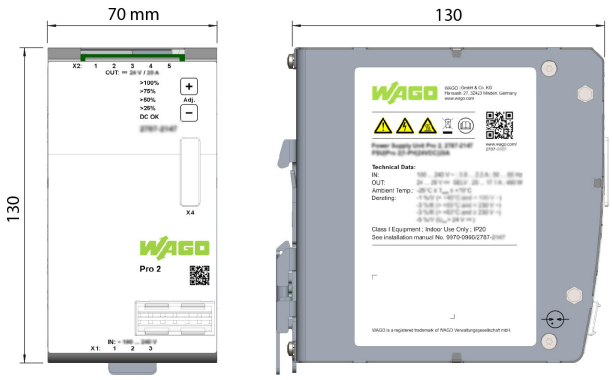


Figure 8: Dimensions

3.8.2 Input

Table 8: Technical Data – AC Input

Property		Value
Number of phases		1
Nominal input voltage		100 … 240 VAC
Input Voltage Range		90 … 264 VAC
		130 ... 240 VDC [1]
Input frequency		50 … 60 Hz
Grounding systems		TN, TT and IT networks
Input current (typ.) [2]	110 VAC	5.9 A
	230 VAC	2.2 A
Power factor (typ.) [2]	110 VAC	0.99
	230 VAC	0.97

[1] *For DC operation, external overcurrent protection must be provided!*
[2] *At nominal load*

Table 9: Technical Data – Mains Failure Buffering Time

Property		Value
Mains failure buffering time, typ. [1]	110 VAC	28 ms
	230 VAC	28 ms
Holding Time, typ. [1]	110 VAC	30 ms
	230 VAC	30 ms

[1] *At nominal load*

Table 10: Technical Data – Input Connection

Property		Value
Cross-section	Eindrähtig	0.08 … 2.5 mm² / 28 … 12 AWG
	Feindrähtig	0.08 … 2.5 mm² / 28 … 12 AWG
	Aderendhülse mit Kunststoffkragen	0.25 … 1.5 mm² / 20 … 16 AWG
	Aderendhülse ohne Kunststoffkragen	0.25 … 2.5 mm² / 20 … 14 AWG
Strip length		8 … 9 mm / 0.31 … 0.35 inch
Specifications of the conductors used		≥ +75°C / +167°F (ambient air temperature: ≤ +60°C / 140°F) ≥ +90°C / 194°F (ambient air temperature: > +60°C / 140°F)
Required tools (conductor termination)		Operating tool, with a partially insulated shaft, type 2 (see **Accessories [▶ 65]**)

3.8.3 Output

Table 11: Technical Data – Output

Property	Value
Nominal output voltage	24 VDC SELV [1]
Output voltage range	24 … 28 VDC SELV
Nominal output current	20 A (see **Derating [▶ 24]**)
Output current range	20 … 17.1 A
Output power [2]	480 W
PowerBoost	30 A (5 s)
TopBoost	120 A (15 ms)
Derating of output power	See **Derating [▶ 24]**
Line regulation [2]	< 0.02 %
Load regulation [3]	< 2.0 %
Residual ripple/noise [4]	< 70 mV
Overload Behavior [5] [6]	“Constant Current” Mode[1] “Constant Current with Latching Shutdown” Mode “Hiccup” Mode “Electronic Circuit Breaker” Mode “Latching Shutdown on Thermal Overload” Mode "PowerBoost" Mode "TopBoost" Mode

[1] Factory setting
[2] Nominal load, in range 90 … 264 VAC
[3] 10 % / 90 % load step
[4] 20 MHz bandwidth
*[5] See **Short Circuit and Overload Behavior [▶ 24]***
[6] Can be set via the WAGO Interface Configuration software
[7] See “Turn-on Time” Figure

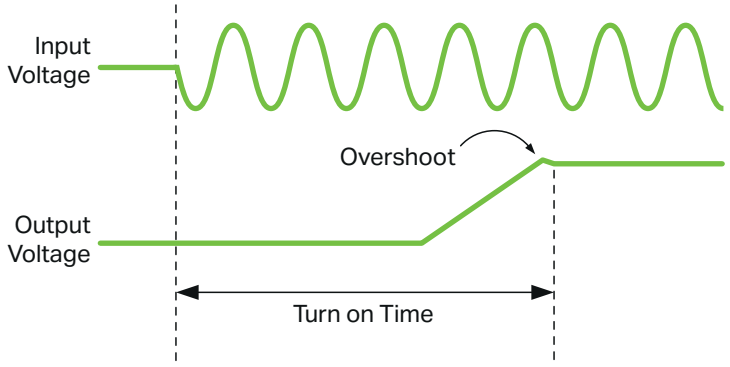


Figure 9: Turn-on time

Table 12: Technical Data – Output Connection

Property		Value
Cross-section	Solid	0.50 … 10 mm² / 20 … 8 AWG
	Fine-stranded	0.50 … 10 mm² / 20 … 8 AWG
	Insulated ferrule with plastic collar	0.50 … 6.0 mm²
	Ferrule without plastic collar	0.50 … 6.0 mm²
Strip length		13 … 15 mm / 0.51 … 0.59 inch
Specifications of the conductors used		≥ +75°C / +167°F (ambient air temperature: ≤ +60°C / 140°F) ≥ +90°C / 194°F (ambient air temperature: > +60°C / 140°F)

Property	Value
Required tools (conductor termination)	Operating tool, with a partially insulated shaft, type 3 (see Accessories [▶ 65])

3.8.4 Efficiency/Power Loss

Table 13: Technical Data – Efficiency/Power Loss

Property		Value
Efficiency, typ.[1]	110 VAC	93.9 %
	230 VAC	95.4 %
Power loss, typ.[1]	110 VAC	30.4 W
	230 VAC	23.3 W

[1] *At nominal load.*

3.8.5 Signal

Table 14: Technical Data – Signal (Input DI)

Property	Value
Signal type	24 VDC
Voltage range for signal (0)	−3 … +5 VDC
Voltage range for signal (1)	15 … 30 VDC
Input Current for signall (1) [1)]	4.5 mA
Isolationsspannung	see Security [▶ 20]

[1)] *at 24 VDC*

Table 15: Technical Data – Signal (Output DO)

Property	Value
Switch-on threshold, typ.	UOUT > USET × 0.93
Switch-off threshold, typ.	UOUT < USET × 0.87
Contact load, max.	50 mA
Voltage drop, typ.	< 100 mV (at 50 mA)
Contact voltage, max.	31.2 VDC
Polarity	Freely selectable
Series operation	Yes; a series connection of up to 10 signal contacts is permitted.
Implementation type	PhotoMOS
Isolation voltage	see Security [▶ 20]

Table 16: Technical Data – Signal Connection

Property		Value
Cross-section	Eindrähtig	0.08 … 2.5 mm² / 28 … 12 AWG
	Feindrähtig	0.08 … 2.5 mm² / 28 … 12 AWG
	Aderendhülse mit Kunststoffkragen	0.25 … 1.5 mm² / 20 … 16 AWG
	Aderendhülse ohne Kunststoffkragen	0.25 … 2.5 mm² / 20 … 14 AWG
Strip length		8 … 9 mm / 0.31 … 0.35 inch
Specifications of the conductors used		≥ +75°C / +167°F (ambient air temperature: ≤ +60°C / 140°F) ≥ +90°C / 194°F (ambient air temperature: > +60°C / 140°F)
Required tools (conductor termination)		Operating tool, with a partially insulated shaft, type 2 (see Accessories [▶ 65])

3.8.6 Communication

Table 17: Technical Data – Communication

Property	Value
Data timeliness of the communication interface	200 ms

3.8.7 MTBF/Lifespan

Table 18: Technical Data – MTBF/Lifespan

Property	At	Load	T_{amb}	Value
MTBF, typ. (SN 29500) (IEC 61709)	24 VDC SELV	100 %	25 °C	800000 h
	24 VDC SELV	100 %	40 °C	580000 h

3.8.8 Environmental Requirements

Table 19: Technical Data – Environmental Conditions

Property	Value
Ambient temperature, operation	−25 … +70 °C
Ambient temperature, restricted operation[1)]	−40 … −25 °C
Ambient temperature, storage	−40 … +85 °C
Derating (Temperature-Dependent)[2)]	−3 %/K (> +55 °C and < 230 VAC)
Derating (location-dependent) [2)]	−10.7 %/1000 m (> +50 °C; 3600 m or higher) −11.2 %/1000 m (> +55 °C; 2100 m or higher)
Derating (voltage-dependent) [2)]	−5 %/VDC
Relative humidity	5 … 96 % (no condensation permissible)
Elevation above sea level, max.	5000 m
Overvoltage category	III (≤ 2000 m) II (> 2000 m)
Vibration according to IEC 60068-2-6	5 … 150 Hz / 1g
Shock according to IEC 60068-2-27	15 g / 11 ms
Pollution degree according to IEC/EN 60664-1	2
Resistance to harmful gas [3)]	Resistant to flowing mixed gas per ISA S71.04, G3 Group A

[1)] Without mechanical actuation of buttons, female connectors etc., for example
[2)] See **Derating [▶ 24]**

3.8.9 Product Protection

Table 20: Technical Data – Product Safety

Property	Value
Internal input fuse [1)]	T 10 A / 250 VAC
Transient suppression at input	Yes, varistor
Overload protection at output	Electronic
Overvoltage protection at output, max. [2)]	32 VDC
Feedback voltage, max. [3)]	Yes, max. 32 VDC
Degree of protection	IP20
Ingress protection against foreign objects	> 4 mm
Overtemperature protection[4)]	Yes
Circuit breaker of the nominal current circuit [5)]	16 A (for USA/Canada: 15 A)

Property	Value

[1] Used only as an AC fuse. An external DC fuse must be used with DC supply.
[2] Internal limitation via a second control loop, deactivation of power supply, automatic restart.
[3] The voltage must not be exceeded due to power feedback.
[4] Configurable, see ***"Latching Shutdown on Thermal Overload" Mode [▶ 27]***
[5] The circuit breaker can be used for activation during installation. In this case, the circuit breaker must meet all the requirements on this shutdown device. If an additional switch is used, it must have the same electrical load capacity as the circuit breaker.

3.8.10 Security

Table 21: Technical Data – Safety

Property	Value
Input and output insulation, according to EN 61010-1; EN 61010-2-201	SELV/PELV
Protection class, with protective wire connection	I
Isolation voltage (input – output), ref. A [1]	3,51 kVAC
Isolation voltage (input – ground), ref. B [1]	2,2 kVAC
Isolation voltage (input – ground), ref. C [1]	500 VAC
Isolation voltage (output – digital input / output – digital output), ref. D [1]	500 VAC

[1] Type test (rise 5 s – stay 2 s – fall 5 s); see figure "Dielectric Strength"

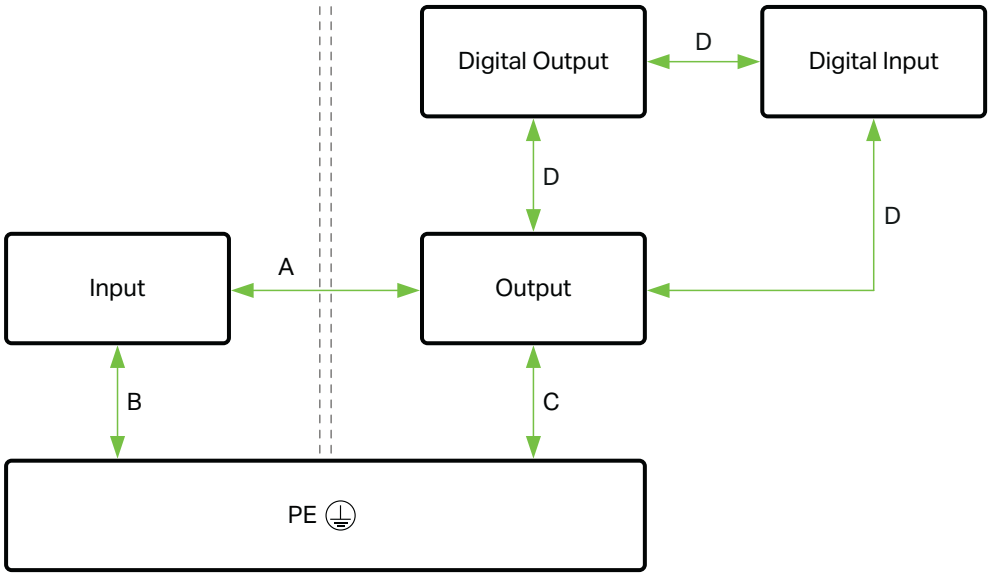


Figure 10: Dielectric Strength

4 Guidelines, approvals and standards

The applicable guidelines, approvals and standards for the product can be found on the product detail page at: **www.wago.com/2787-3147/000-030**.

5 Functions

The product has the following integrated functions:

Table 22: Functions

Function	Description
Redundancy	1 + 1 Redundancy without redundancy module; two power supplies with 10 A each are connected in parallel on the output side and supply a load of 10 A. n + 1 Redundancy increases utilization of the individual devices; three power supplies with 10 A each are connected in parallel at the output side and supply a load of 20 A. The integrated MOSFET functionality guarantees a simple design of a redundant power supply system.
TopBoost	Supplies up to 600 % more output current for 15 ms.
PowerBoost	Supplies up to 150 % of the output current for 5 s.
Recording and displaying measured values	Details see **Display Section: Measurements [▶ 56]**.
Recording and displaying time series of measured values	Details see **Display Section: Measurement Recording [▶ 58]**.
Configurable overload behavior	Details see **Dialog: Settings [▶ 42]**.
Configurable DI/DO interface	Details see **Dialog: Settings [▶ 42]**.
Configurable load management	Details see **Dialog: Settings [▶ 42]**.
Communication interdace	Allows connection via a WAGO USB Communication Cable (see **Communication interface [▶ 15]**) or via a communication module that is available as an option. The communication modules allow configuration and monitoring of the product via fieldbus systems.

5.1 Overvoltage protection

The product is protected against overvoltage. For insulation testing on your electrical equipment, this protection can be removed. The following test voltages apply:

Table 23: Test voltages on the input side

Overvoltage Protection	Test voltage
Input	> 600 VDC
	> 420 VAC

How to enable and disable overvoltage protection, see **Disable/Enable Input-Side Overvoltage Protection [▶ 62]**.

Table 24: Test voltages on the output side

Overvoltage Protection	Test voltage
Output	> 225 VDC
	> 175 VAC

How to enable and disable overvoltage protection, see **Disable/Enable Output-Side Overvoltage Protection [▶ 62]**.

For explicit information on maximum insulation voltages, see **Security [▶ 20]**.

6 Planning

6.1 EMC Installation

- **Compliance with EMC interference emission standards**
  To comply with EMC interference standards, the cable length of the DC output must not exceed 30 m.

6.2 Aids

You can obtain the WAGO Interface Configuration Software G2 FULL from **www.wago.com**.

6.3 Inrush Current

High inrush currents can occur if multiple products are supplied through the same circuit on the input side. In this case, it is advisable to switch the product on with a delay. The corresponding switch-on delay can be parameterized in the Dialogfenster: Einstellungen dialog in the “System” section of the WAGO Interface Configuration software.

The maximum number of products that can be operated in parallel on one circuit is given by the sum of the leakage currents. According to EN 62368-1, this sun must not exceed the maximum value of 3.5 mA.

6.4 Parallel Connection

In parallel operation, set the output voltage of the products that will be connected in parallel to precisely the same value, if possible. The resistance of the conductors between the power supply units and the load must be nearly identical. Only connect products of the same type in parallel.

Use external rail-mount terminal blocks when connecting in parallel. A parallel connection directly on the connectors on the secondary side of the product is not allowed.

For active load distribution, the “Active Droop” setting is enabled by default. This reduces the output voltage in the event of a load (by 300 mV from 0 A up to the nominal current). This smooth characteristic curve ensures better current sharing for parallel operation of power supplies. This setting can be enabled in the Dialog: Settings dialog in the “DC Output” section of the WAGO Interface Configuration software.

6.5 Insulation Testing

Before the electrical system is put into operation, insulation testing must be performed. You can find more detailed information in the following standards, for example:

- DIN VDE 0100-600 VDE 0100-600:2017-06 “Low-voltage electrical installations – Part 6: Verification”
- IEC 60364-6:2016 “Low voltage electrical installations – Part 6: Verification”

To protect the product against damage during this testing, it is necessary to disable the overvoltage protection. You can find additional information at Disable/Enable Input-Side Overvoltage Protection [▶ 62].

6.6 Derating

6.6.1 Derating (Temperature-Dependent)

Depending on the ambient temperature, it may be necessary to reduce the load.

Table 25: Derating (Temperature-Dependent)

Ambient Temperature	Derating
> +55 °C	−3 %/K (> +55 °C and < 230 VAC)
> +60 °C	−3 %/K (> +60 °C and ≥ 230 VAC)

Table 26: Derating (Temperature-Dependent)

Ambient Temperature	Derating
> +55 °C	−3 %/K (> +55 °C and < 230 VAC)

6.6.2 Derating (Location-Dependent)

Table 27: Derating (Location-Dependent)

Ambient Temperature	Derating
> +50 °C	−10.7 %/1000 m (> +50 °C; 3600 m or higher)
> +55 °C	−11.2 %/1000 m (> +55 °C; 2100 m or higher)

6.6.3 Derating (Voltage-Dependent)

Depending on the output voltage, it may be necessary to reduce the load.

Table 28: Derating (Voltage-Dependent)

Voltage Value	Derating
U_{OUT} > 24 VDC	−5 %/VDC

6.7 Short-Circuit and Overload Behavior

The product's output is electronically protected against overload and short circuits.

The following values apply to the description below:

- U_{OUT}: output voltage
- I_{OUT}: output current
- I_N: nominal output current
- I_{ECB}: trip current of the electronic circuit breaker
- t_{ECB}: trip delay of the electronic circuit breaker

You can find more information on the individual values in Technical Data [▶ 15].

6.7.1 "Constant Current" Mode

In this mode, the load current on the output is limited if the nominal output current is exceeded by a significant amount. The load current is limited to about 110 % of the nominal output current. This occurs for 20 seconds.

If the overload lasts longer, a 15-second pause occurs, during which the output voltage is switched off. The output voltage is then switched back on. If the overload is still present, the process starts again.

This mode is set by default.

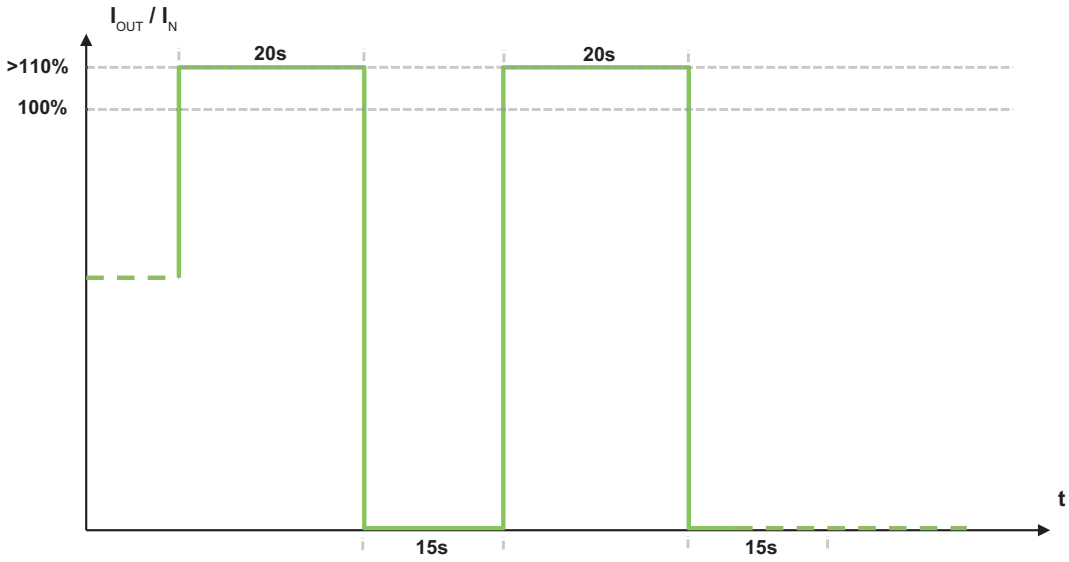


Figure 11: “Constant Current” Mode

6.7.2 “Constant Current with Latching Shutdown” Mode

In this mode, the load current on the output is limited if the nominal output current is exceeded by a significant amount. The load current is limited to about 110 % of the nominal output current. This occurs for 20 seconds.

If the overload lasts longer, the output is switched off. To switch the output back on, manual intervention is necessary. The following options are available for this:

- Communication interface
- Buttons
- Digital input

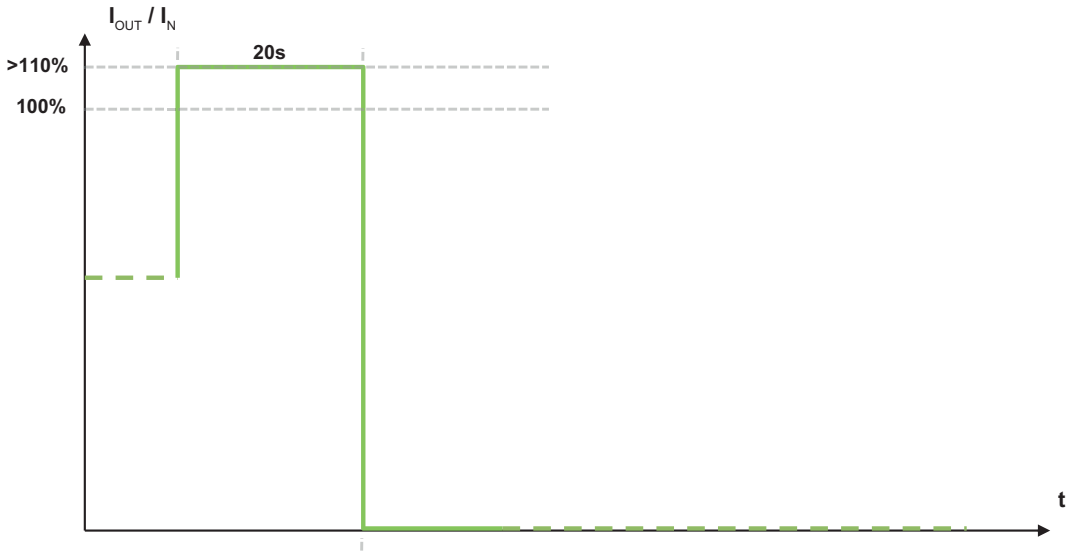


Figure 12: “Constant Current with Latching Shutdown” Mode

6.7.3 “Hiccup” Mode

In this mode, the output voltage is switched off if the nominal output current is exceeded by a significant amount. After a few milliseconds, the output voltage is switched back on to check whether the overload is still present. If the overload is still present, the output voltage is switched back off. This process repeats until the overload has been eliminated.

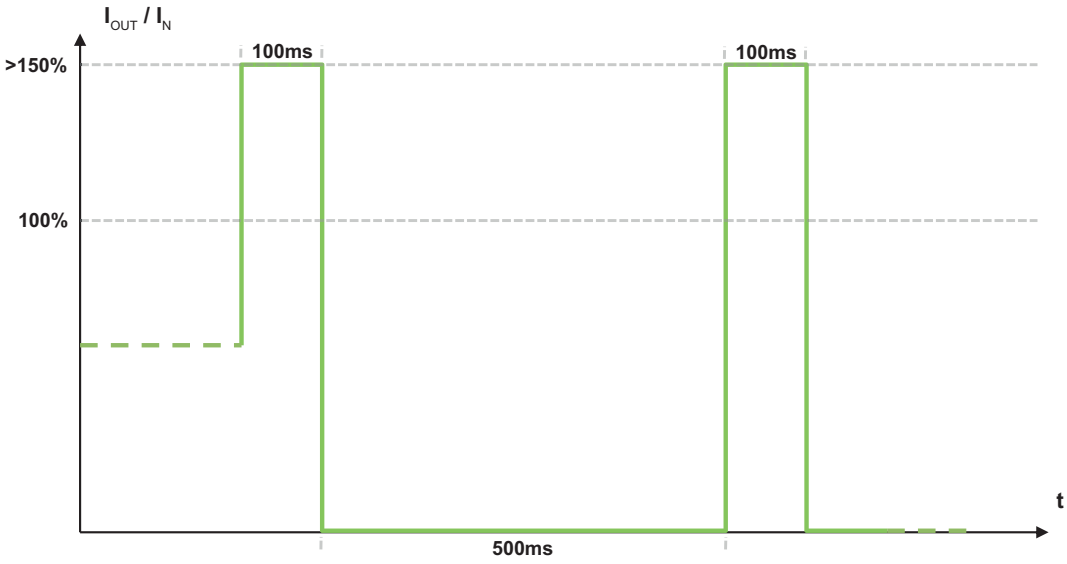


Figure 13: “Hiccup” Mode

6.7.4 “Electronic Circuit Breaker” Mode

In this mode, a specified trip current and trip delay can be set via the WAGO Interface Configuration software or a connected **communication module [▶ 65]**. If the output current exceeds the trip current setting, a specified amount of time elapses. If the output current is still higher than the trip current setting after the trip delay corresponding to the setting, the output is switched off. To switch the output back on, manual intervention is necessary. The following options are available for this:

- Communication interface
- Buttons
- Digital input

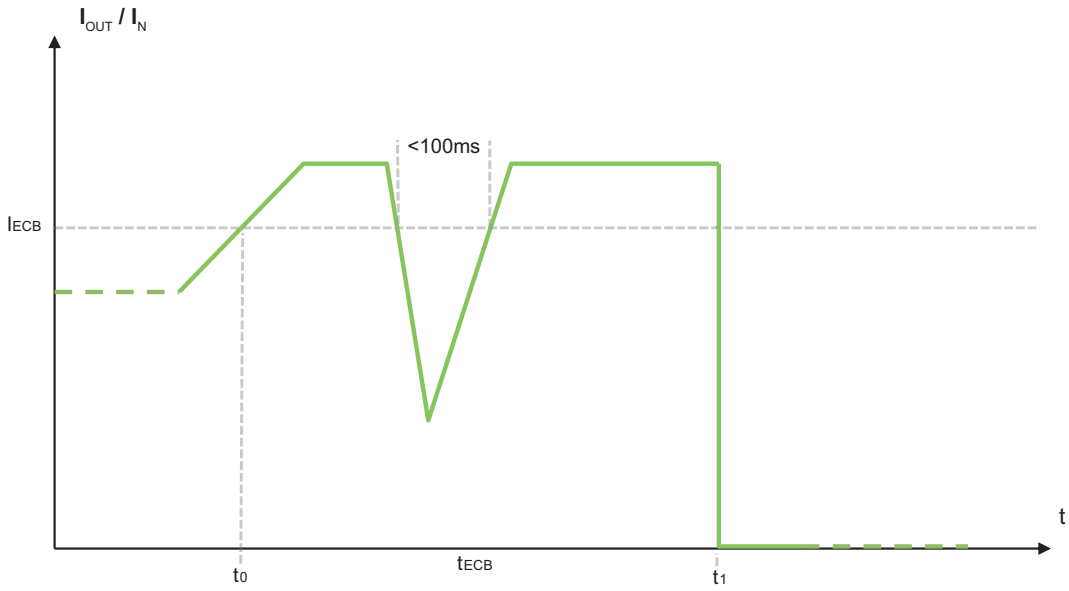


Figure 14: “Electronic Circuit Breaker” Mode

6.7.5 “Latching Shutdown on Thermal Overload” Mode

In this mode, the output voltage is switched off in the event of excessive internal device temperature. A corresponding “High Device Temperature” warning can, for example, be transmitted via the WAGO Interface Configuration software or passed to a higher-level controller via a connected **communication module [▶ 65]**. To switch the output back on, manual intervention is necessary. The following options are available for this:

- Communication interface
- Buttons
- Digital input

6.7.6 “PowerBoost” Mode

This mode can be used in combination with the following modes:

- **Modus „Konstantstrom“ [▶ 24]**
- **Modus „Konstantstrom mit speichender Abschaltung“ [▶ 25]**
- **Modus „Elektronischer Schutzschalter“ [▶ 26]**

In this mode, an output current of 150 % of the nominal output current is permitted for 5 seconds. The output is then switched off. The output then switches on automatically.

In combination with the **Modus „Konstantstrom“ [▶ 24]**, the “PowerBoost” mode is output again after each pause.

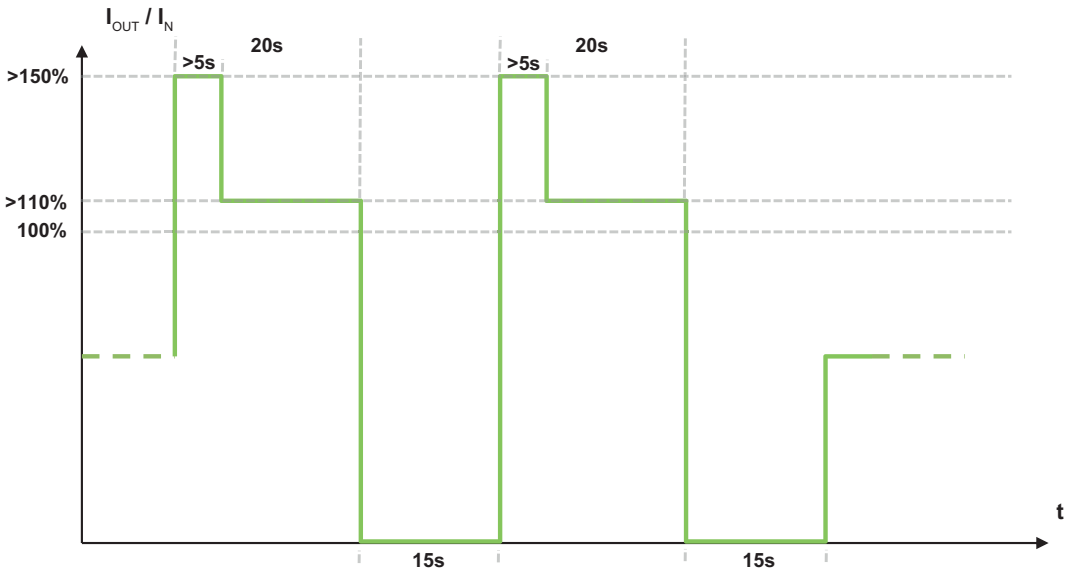


Figure 15: "PowerBoost" Mode in combination with "Constant Current" Mode

6.7.7 “TopBoost” Mode

In this mode, a current pulse of up to 600 % is output for up to 15 ms if the current output current exceeds the nominal output current by a significant amount. This overcurrent can be caused by a short circuit or a large overload in the secondary circuit, for example.

In some cases, the current pulse can trip an overcurrent protection device that is present in the connected circuit, such as a circuit breaker. This quickly ends the short circuit or high overload.

In selecting an appropriate overcurrent protection device, it is essential to pay attention to the following technical data to ensure reliable tripping:

- Trip characteristics
- Nominal value
- Safety factor for DC tripping

In addition, calculate the error loop impedance. The maximum current that can flow through the error loop (due to the impedance) must not be lower than trip current of the overcurrent protection device necessary to reliably trip it.

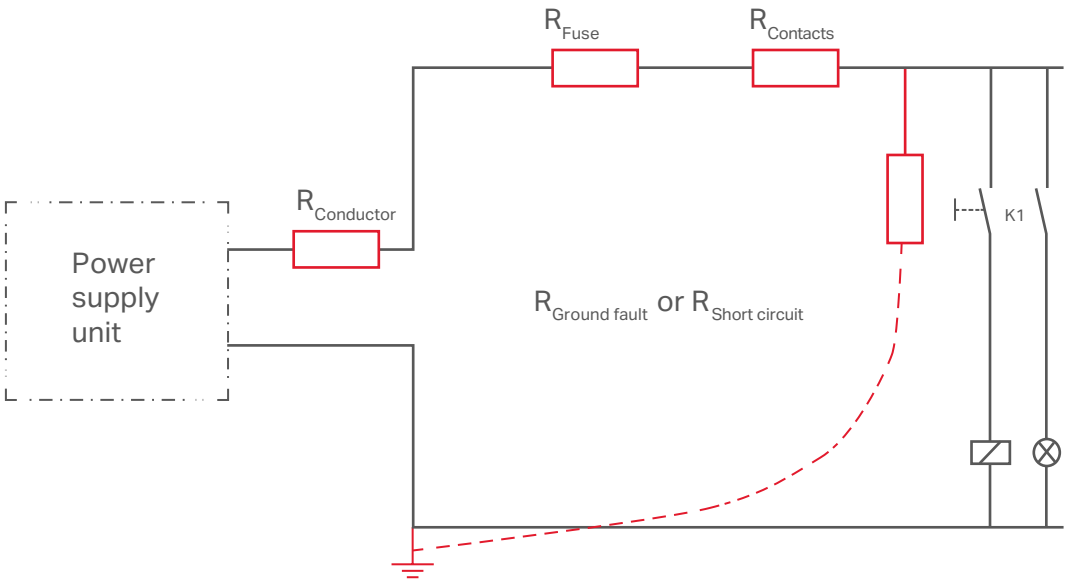


Figure 16: Loop Impedance

Note

Using the “PowerBoost” and “TopBoost” modes together

With firmware version 01.04.xx or higher, the “PowerBoost” and “TopBoost” modes can be used together. You can get a current firmware update from WAGO Technical Support.

7 Transport and Storage

The original packaging offers optimal protection during transport and storage.

- Store the product in suitable packaging, preferably the original packaging.
- Only transport the product in suitable containers/packaging.
- Make sure the product contacts are not contaminated or damaged during packing or unpacking.
- Observe the specified ambient climatic conditions for transport and storage.

8 Installation and Removal

NOTICE

Do not cover the ventilation openings!

Covered ventilation openings can lead to overheating of the product.

- Keep all ventilation openings clear!

The letters shown in parentheses refer to positions in figure “View” in View [▶ 10].

Mounting Positions

- Nominal mounting position: front side facing forwards, marking legible, bottom ventilation openings facing upwards and downwards
- Never operate the product directly next to other components!

Table 29: Minimum Clearances

Installation Clearances		Clearance
Passive adjacent device	Above/below	50 mm
(adjacent device does not generate heat)	On side	6 mm
Active adjacent device	Above/below	50 mm
(adjacent device generates additional heat; equivalent product under full load)	On side	12 mm

DIN-35 Rail

The DIN-rail is located in the center of the vertical axis (height) of the product (see Technical Data [▶ 15]).

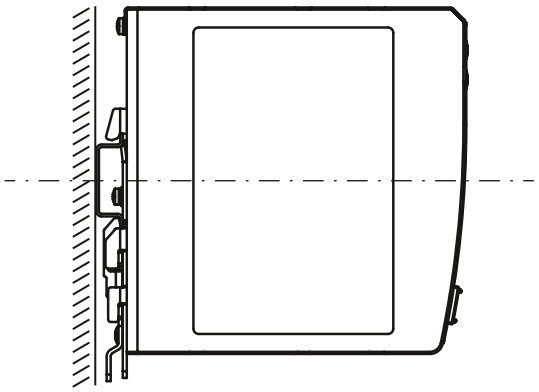


Figure 17: Position of the DIN Rail

The distances from the central axis of the DIN rail to the top and bottom are 65 mm.

Mounting on the DIN-Rail

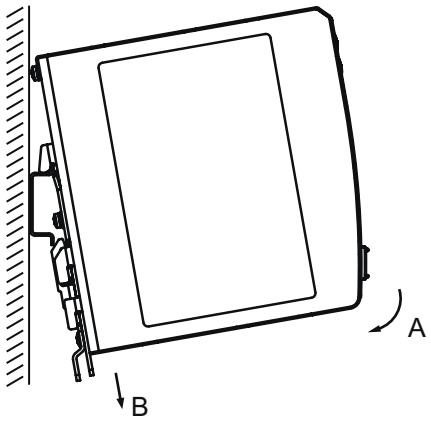


Figure 18: Mounting

Install the product as per EN 60715 by snapping it onto the DIN-35 rail (see figure “Mounting”):

1. Place the product, with the DIN-rail guide, on the top edge of the DIN-rail.
2. Press the product onto the DIN-rail [A] while simultaneously pulling on the latch (I) until it locks into place [B].
3. To ensure secure fastening on the DIN-rail, fit end stops on either side of the product (e.g., item no. **249-197**).

Removal from the DIN-Rail

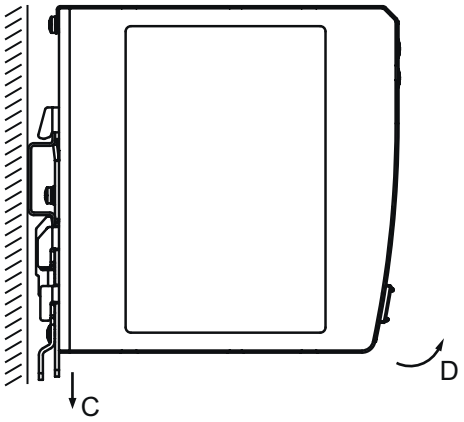


Figure 19: Removal

1. To remove (see figure “Removal”), pull the latch (I) down [C] using a screwdriver or an operating tool.
2. Pivot the product to remove it from the DIN-rail [D].

NOTICE

Avoid electrostatic discharge!

The products are equipped with electronic components that you may destroy by electrostatic discharge when you touch. Please observe the safety precautions against electrostatic discharge in accordance with EN 61340-5-1/-3. Pay attention while handling the products to good grounding of the environment (persons, job and packing).

9 Connection

Observe the maximum permissible cross-sections of the supply cables (see Technical Data [▶ 15]).

Check the associated operating voltage before connecting the equipment (see Type label [▶ 11]).

⚠ DANGER

Do not work on products while energized!

High voltage can cause electric shock or burns!

- Disconnect all power sources from the product before performing any installation, repair or maintenance.

9.1 Connecting Conductor to CAGE CLAMP®

WAGO CAGE CLAMP® connections are designed for solid, stranded or fine-stranded conductors.

ⓘ Note

Connect only one conductor per CAGE CLAMP® connection!

Only one conductor may be connected on each CAGE CLAMP® connection. Do not connect more than one conductor on one single connection.

If more than one conductor needs to be routed to one connection, connect them in an upcircuit wiring assembly – for example, using WAGO through terminal blocks.

Use an operating tool (see Accessories [▶ 66]) or a suitable screwdriver for connecting the conductors.

Perform the following steps to make the connection:

1. Insert the operating tool into the opening above the connector to open the CAGE CLAMP®.
   ⇨ When you hear a click, the CAGE CLAMP® connection is open.
2. Insert the conductor into the corresponding connection opening.
3. Remove the operating tool to close the CAGE CLAMP®.

⇨ The conductor is now securely clamped.

9.2 Push-In Termination

The connection for the output (see Output [▶ 17]) can also be wired directly. You do not need any tools for this.

The following conductors can be inserted directly:

- Fine-stranded conductors with ferrules and plastic collars for all permissible cross-sections

- Fine-stranded conductors with ferrules without plastic collars with a cross-section > 0.5 mm²/AWG 20
- Solid conductors with a cross-section > 0.5 mm²/AWG 20

10 Operation via Buttons

Using the **+** und **−** buttons on the front of the product, you can make the following settings:

Table 30: Operation via Buttons

Button [+]	Button [−]	Function
Switch product on or off		
Hold down simultaneously for 3 seconds		The product is switched on or off.
Set output voltage		
Press once	-	The output voltage increases in steps.
Press and hold	-	The output voltage increases continuously.
-	Press once	The output voltage is reduced in steps.
-	Press and hold	The output voltage is reduced continuously.
Reset product to factory settings		
Hold down simultaneously for 10 seconds		The product is reset to the factory settings.

During ongoing operation, you can set the output voltage and reset the product to the factory settings. These settings can be saved and then remain available when the product is switched off and back on.

11 Diagnostics via Indicators

The product has a visual status indicator. This indicator consists of five LEDs.

These LEDs indicate operating states and diagnostics.

Table 31: Display of Diagnostics – Warnings

Indicator		Output Voltage Too Low	Output Voltage Too High	Overload Threshold or Tripping Current of Electronic Circuit Breaker Exceeded
> 100 %		Flashing (2 Hz)	Flashing (2 Hz)	Flashing (2 Hz)
> 75 %		Off	Flashing (2 Hz)	Signaling of regular utilization
> 50 %		Off	Off	
> 25 %		Off	Off	
DC OK		Flashing (2 Hz)	Off	

Table 32: Diagnostic Indicators – Errors

Indicator		Short Circuit at Output	Overtemperature Shutdown [1)]	Internal Product Fault	Communication interface
> 100 %		Flashing (8 Hz)	Flashing (8 Hz)	Flashing (8 Hz)	Flashing (8 Hz)
> 75 %		Off	Steady	Flashing (8 Hz)	Off
> 50 %		Off	Off	Flashing (8 Hz)	Off
> 25 %		Off	Off	Flashing (8 Hz)	Off
DC OK		Off	Off	Flashing (8 Hz)	Steady

[1)] Automatic restart (factory setting)

12 Configuration

12.1 Requirements

12.1.1 System Requirements

The following system requirements must be met for the WAGO Interface Configuration software to be installed:

Minimum System Requirements

Table 33: Minimum System Requirements

Components	Requirements
Operating system	• Windows 7 (32- and 64-bit) • Windows 8 (32- and 64-bit) • Windows 8.1 (32- and 64-bit) • Windows 10 (32- and 64-bit)
Memory	2 GB
Free hard disk space	150 MB
Processor	1 GHz or higher, 32-bit (x86) or 64-bit (x64)
Screen resolution	800 × 600 pixels

Recommended System Requirements

Table 34: Recommended System Requirements

Components	Requirements
Operating system	Windows 10 (64-bit)
Memory	8 GB
Free hard disk space	250 MB
Processor	1 GHz or higher, 64-bit (x64)
Screen resolution	1920 × 1080 pixels

12.1.2 Install WAGO Interface Configuration Software

1. Open the **WAGO website**.
2. Download the **WAGO Interface Configuration software G2**.
3. Start the installation process by double-clicking the installation file. This requires administrator rights.
4. Choose whether to create a desktop icon and whether you want to launch the software immediately.

12.1.3 Configure Product

Configuring the product requires the WAGO Interface Configuration software to be installed (see **Install WAGO Interface Configuration Software [▶ 37]**).

You can use the software to configure the product either online or offline (see also: **Dialog: Settings [▶ 42]**).

The following requirements must be met before you can work online with the WAGO Interface Configuration software:

- The product must be connected to the computer on which the WAGO Interface Configuration software is installed.
- The product must be supplied with power.

The following description relates to the example of connecting the product to a computer via a WAGO USB communication cable.

12.2 First Steps

The following steps are based on the WAGO Interface Configuration software G2, Version 01.00.06.18 and Firmware Version 01.05.xx. If you have other versions, individual settings and functions may differ slightly from those illustrated or may not be available.

12.2.1 Starting the Software

To start the software, click the corresponding symbol on your desktop or open the software from the Windows Start menu.

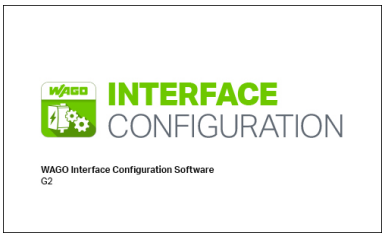


Figure 20: Software Start

After the software starts, a window opens showing the menu bar.

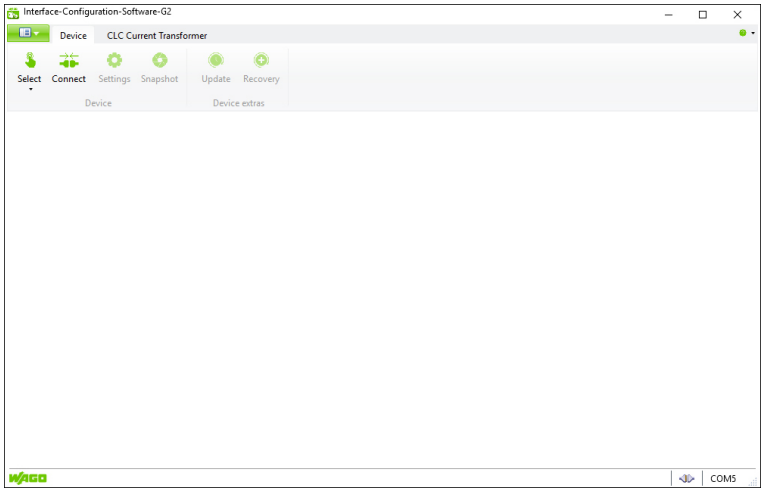


Figure 21: Start View

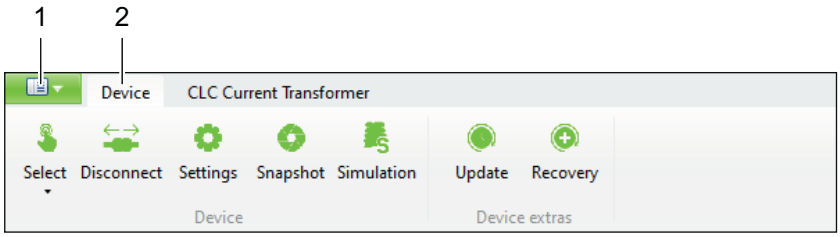


Figure 22: Start View – Tabs

Table 35: Legend for Figure “Start View – Tabs”

No.	Tab
1	Backstage
2	Device

To set up the product in the software for the first time, carry out the following steps on both tabs:

“Backstage” Tab

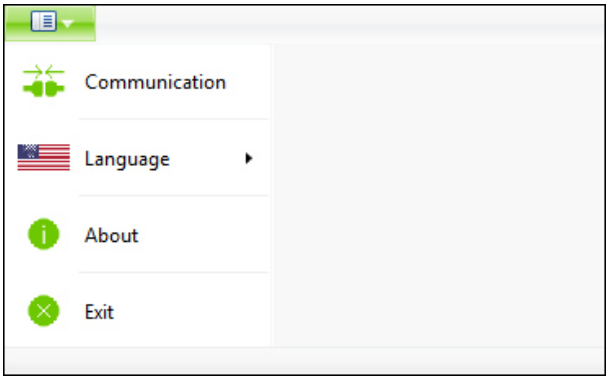


Figure 23: “Backstage” Tab

Table 36: “Backstage” Tab

Menu Item	Description
Communication	Selects the connection between the product and software.
Language	Selects the display language for the software.
Help	Opens the help for the software.
About	Displays information about the software (e.g., version).
Exit	Closes the software and the dialog.

On this tab, you can make the following settings:

1. Select the **Communication** menu item.
2. In the “Communication Settings” dialog, under **COM Port**, select the corresponding entry for your connection between the computer and the product (example: **WAGO USB service cable**).
3. Click **[Save]**.

“Device” Tab

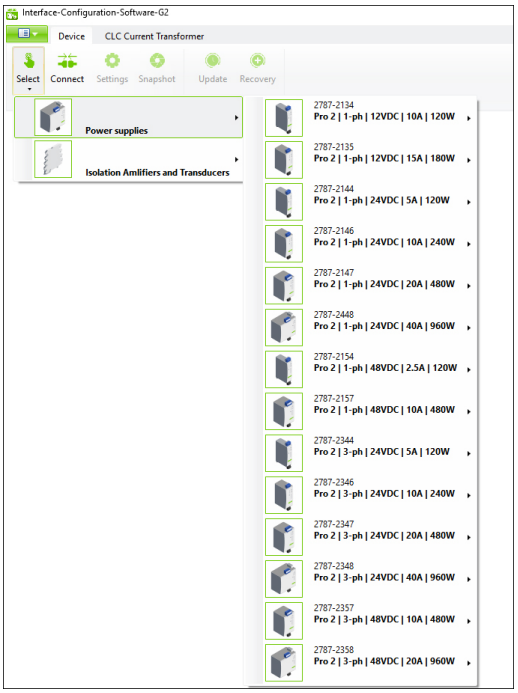


Figure 24: “Device” Tab – “Selection” Menu Item

Only two menu items are initially available on this tab:

Table 37: “Device” Tab

Menu Item	Description
Select	Selects the product to connect to the software.
Connect	Connects the selected product to the software.

The other menu items are not available until you have established the connection between your product and the software (see **Menu Bar [▶ 42]**). The **Settings** menu item is an exception; this menu item is available as soon as a product has been manually selected or automatically detected by the software (see the following steps).

The settings you have to make on this tab depend on whether you are configuring your product offline or online:

Offline Configuration

For offline configuration, make the following settings:

1. Select the **Select** menu item.
2. Select the product you are using.

   ⇨ Your product has been set up in the software.

You can now use the software to configure your product offline (see **Dialog: Settings [▶ 42]**).

Online Configuration

If your product is already connected to the computer online, you can immediately select the **Connect** menu item. The software automatically detects which product is connected.

Your product is connected to the software. You can now use the software to address, configure and evaluate your product.

12.3 Overview

Once the connection has been successfully established between the product and the software, additional sections appear in the software window.

The following figure provides an overview of all the sections:

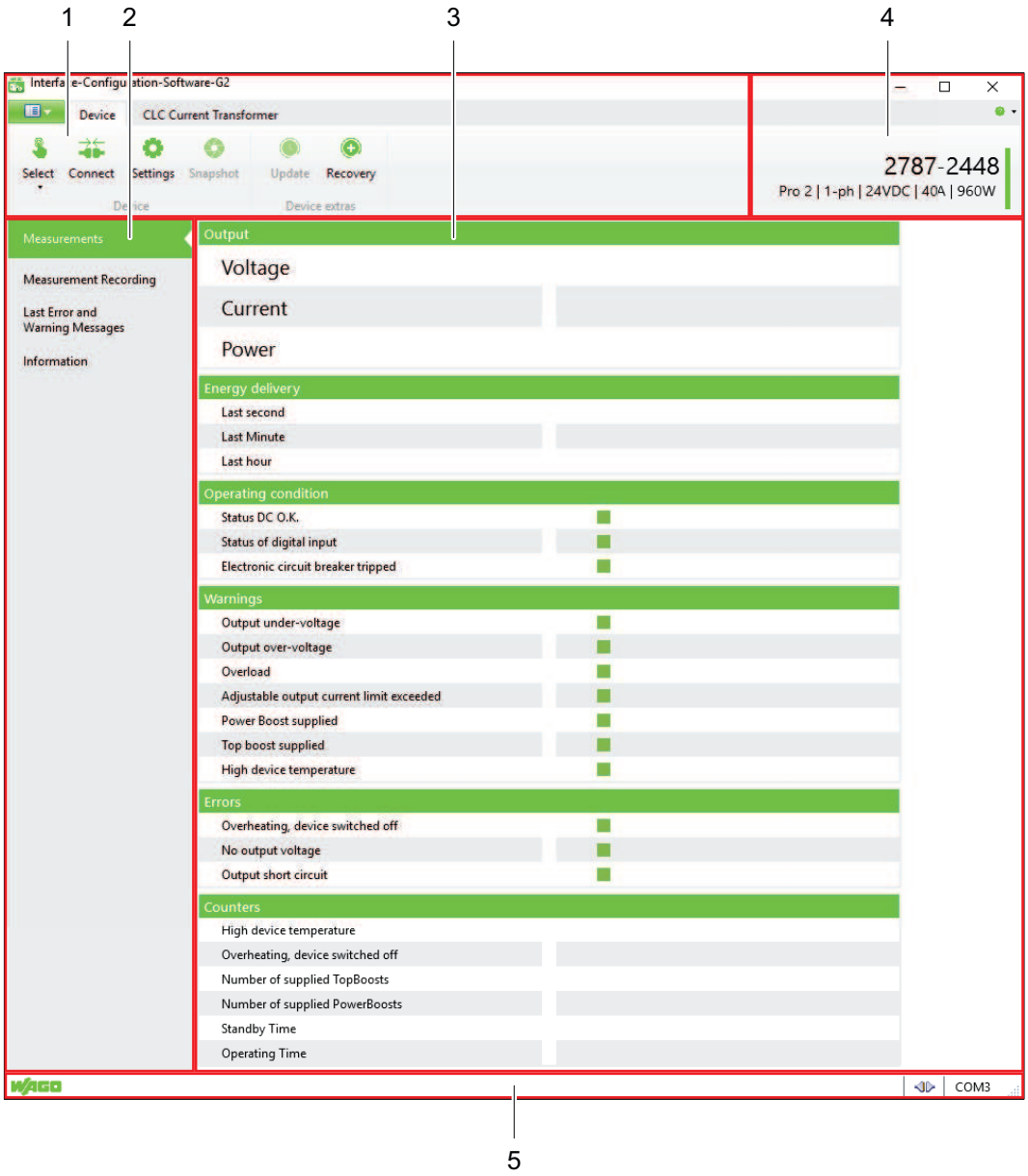


Figure 25: "Graphical User Interface" Overview

Table 38: Legend for the "Graphical User Interface" Overview

No.	Section	Description
1	Menu bar	The menu bar contains general software settings options. For more information, see **Menu Bar [▶ 42]**.
2	Main menu	In the main menu, you will find individual tabs that contain different display sections. For more information, see **Main Menu Introduction [▶ 55]**.
3	Display section	The Display section shows parameter settings and recorded time series in graphical form. For more information, see **Display Section Introduction [▶ 55]**.
4	Product information	This section contains information on the connected product.

No.	Section	Description
5	Footer	The footer indicates the status and interface of the active connection.

12.3.1 Menu Bar

The menu bar is divided into the “Backstage” and “Device” tabs (see also: Starting the Software [▶ 38]).

12.3.1.1 “Backstage” Tab

The settings options on the “Backstage” tab are described in Starting the Software [▶ 38].

12.3.1.2 “Device” Tab

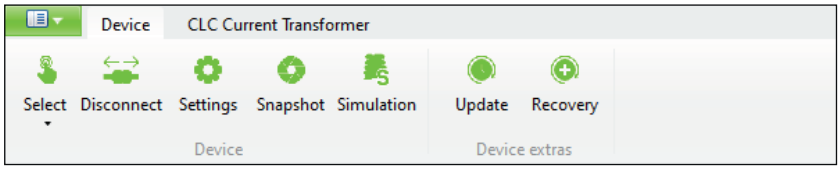


Figure 26: “Device” Tab

Table 39: “Device” Tab

Menu Item	Description
Select	Opens the product selection to select a new product (see also Starting the Software [▶ 38]).
Disconnect **Connect**	Connects/disconnects the connected product to/from the software
Settings	Opens the “Settings” dialog. The dialog is described in Dialog: Settings [▶ 42].
Snapshot	Creates a snapshot of all parameters and measured values, which can be stored as a CSV file.
Simulation	Opens the “Simulation” dialog. The dialog is described in Dialog: Simulation [▶ 52].
Update	Performs a firmware update on the product. You can get the current firmware update and corresponding compatibility information from WAGO Technical Support.
Restore	Restores any firmware version. This may be necessary if a current firmware update has failed and a connection to the connected product cannot be established.

12.3.1.2.1 Dialog: Settings

In this dialog, you can modify settings for the product. Two options are available:

- Online: With this option, the **[Save to Device]** button writes the settings directly to the product.
- Offline: With this option, the settings must be saved externally using the **[Export]** button. If a product is connected to the software later on, you can import these settings into the software with the **[Import]** button and then write them directly to the product with the **[Save to Device]** button.

The settings can be made in the following Sections:

- **DC output** (see DC output [▶ 44])
- **Signaling** (see Signaling [▶ 46])
- **System** (see System [▶ 48])
- **Password** (see Password [▶ 50])
- **Modbus** (see Modbus [▶ 51])

The buttons apply generally and are identical in all Sections.

Buttons

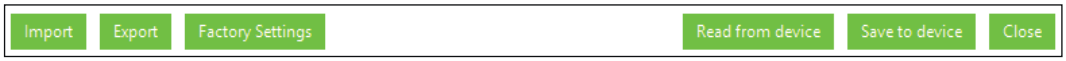


Figure 27: Dialog: Settings – Buttons

Changes that have been made but not yet saved are marked with the pencil symbol.

Table 40: Dialog: Settings – Buttons

Button	Description
[Import]	Imports previously saved settings, e.g., when a product is replaced or configuration is performed offline.
[Export]	Saves the new settings externally. The saved settings can be imported into a product that is configured offline, a replacement product or a product used in a similar way, for example.
[Factory Settings]	Resets all settings to the factory defaults.
[Read from Device]	Reads all saved settings from the connected product.
[Save to Device]	Writes all the settings that have been made to the connected product.
[Close]	Closes the dialog. Any settings that have not been saved are lost.

The individual Sections of the dialog are described below.

DC Output

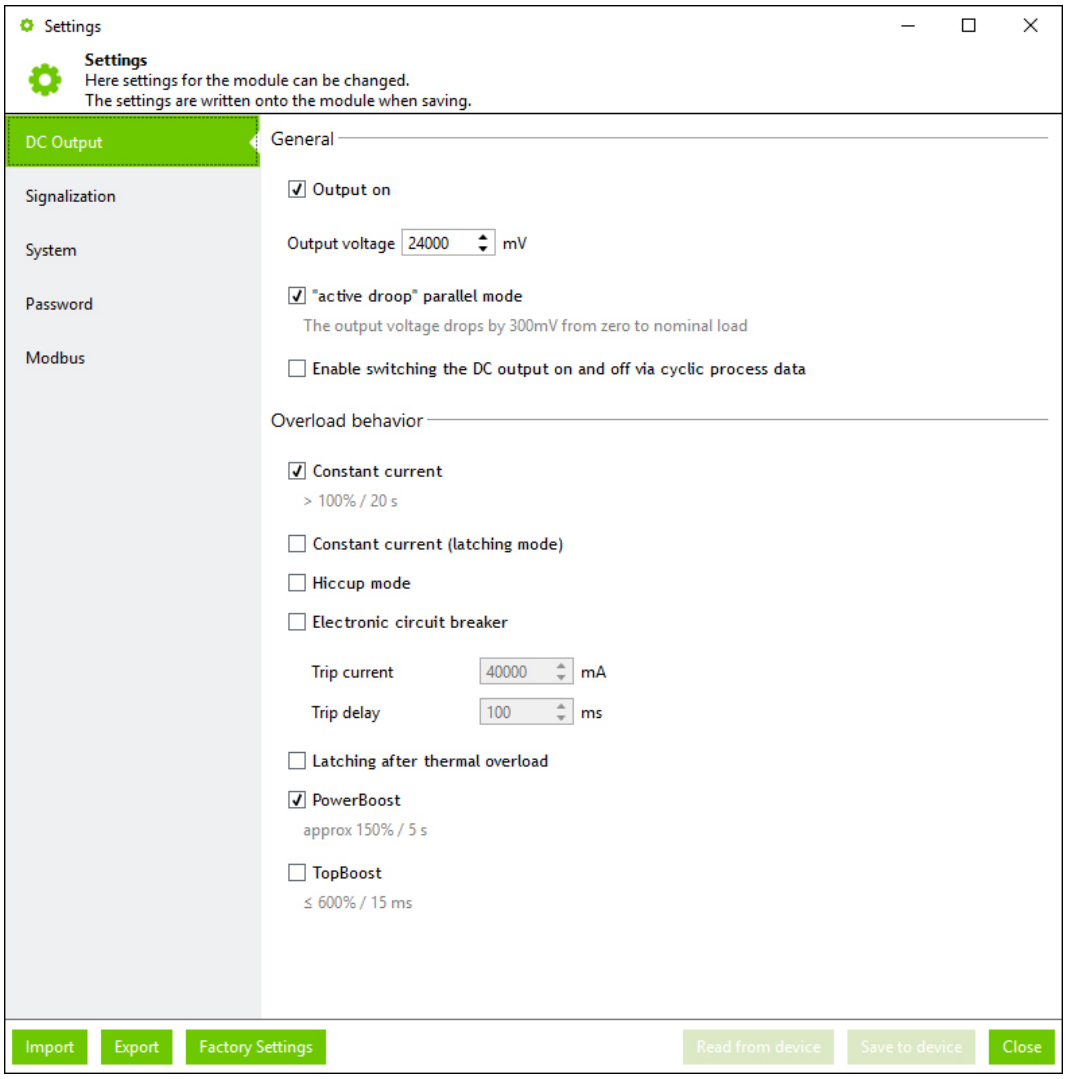


Figure 28: Dialog: Settings – DC Output

Table 41: Dialog: Settings – DC Output

Section	Parameter	Description
General	**Switch Output On**	If this checkbox is selected, the DC output is activated.
	Output Voltage	Here you can enter the output voltage (unit: mV) that is present when the output is active.
	“Active Droop” Parallel Switching Mode	If this checkbox is selected, the “Active Droop” parallel switching mode is active. In this mode, a smooth characteristic curve ensures better current sharing for parallel operation of power supplies.
	Enable Switch-On and Switch-Off of DC Output via Cyclic Process Data	If this checkbox is selected, the DC output can be switched on and off via cyclic process data.
Overload Behavior	**Constant Current**	If this checkbox is selected, the “Constant Current” overload behavior is enabled. You can find more detailed information in the Section **Constant Current [▶ 24]**.

Section	Parameter	Description
	Constant Current with Latching Shutdown	If this checkbox is selected, the “Constant Current with Latching Shutdown” overload behavior is enabled. You can find more detailed information in the Section **Constant Current with Latching Shutdown [▶ 25]**.
	Hiccup Mode	If this checkbox is selected, the “Hiccup Mode” overload behavior is enabled. You can find more information in the Section **Hiccup Mode [▶ 26]**.
	Electronic Circuit Breaker	If this checkbox is selected, the “Electronic Circuit Breaker” overload behavior is enabled. In the event of overload, the product works like an electronic circuit breaker and switches the energy off with a time delay. More information is available in the Section **Electronic Circuit Breaker [▶ 26]**.
	Trip Current	Here you can enter the trip current (unit: mA) for the “Electronic Circuit Breaker” overload behavior.
	Trip Delay	Here you can enter the trip delay (unit: ms) for the “Electronic Circuit Breaker” overload behavior.
	Latching Shutdown on Thermal Overload	If this checkbox is selected, the “Latching Shutdown on Thermal Overload” overload behavior is enabled. After an overtemperature event, the product no longer automatically switches the output back on as soon as it has cooled off. To switch the output back on, manual intervention is necessary. The following options are available for this: • Communication Interface • Buttons • Digital input More detailed information is available in Section **Latching Shutdown for Thermal Overload [▶ 27]**.
	PowerBoost	If this checkbox is selected, the “PowerBoost” overload behavior is enabled. The product offers up to 150% of the output power for 5 s. For more information, see **“PowerBoost” Mode [▶ 27]**.
	TopBoost	If this checkbox is selected, the “TopBoost” overload behavior is enabled. The product provides up to 600 % additional output current for 15 ms. For more information, see **“TopBoost” Mode [▶ 28]**.

Signalization

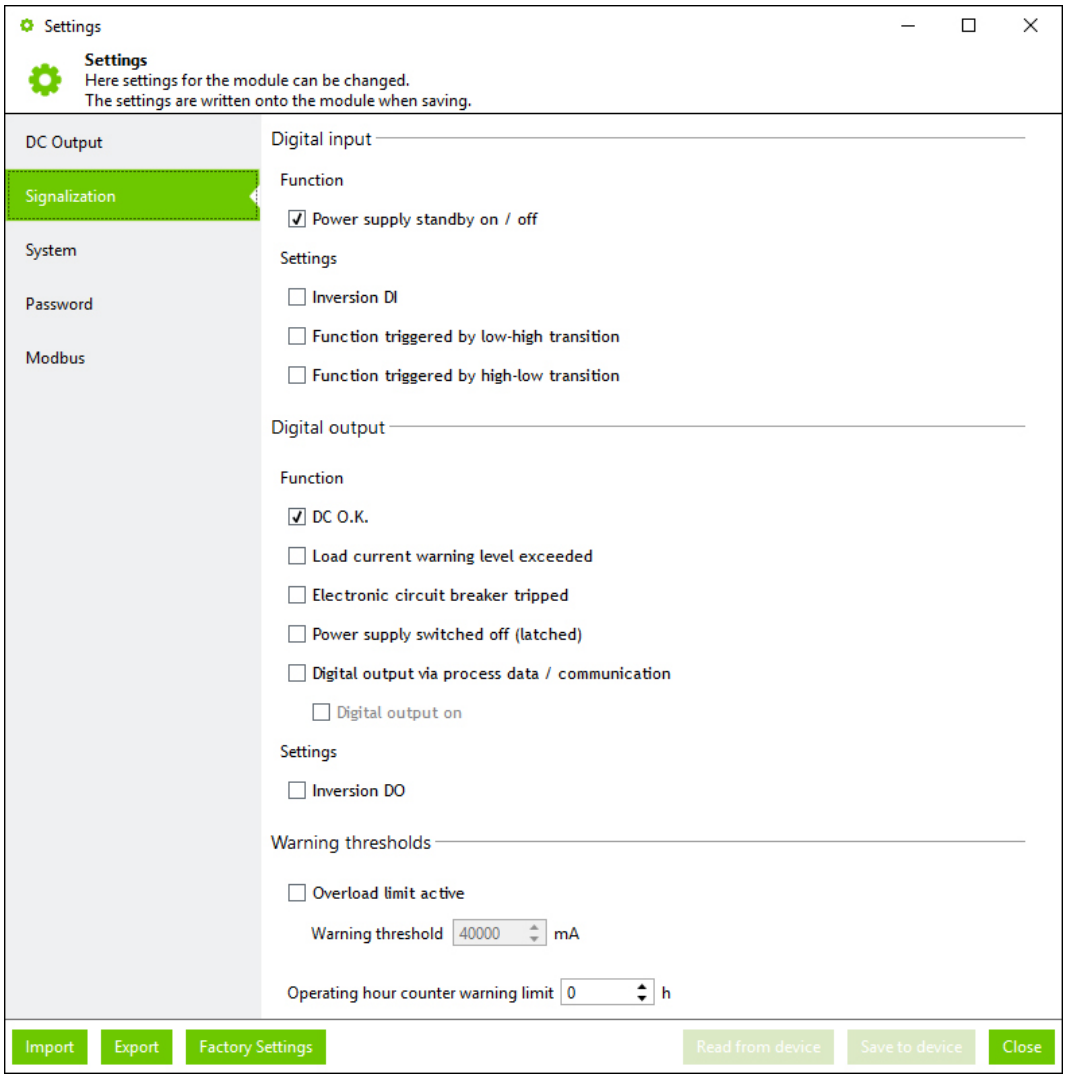


Figure 29: Dialog: Settings – Signalization

Table 42: Dialog: Settings – Signalization

Section	Parameters	Description
Digital input	**Power supply standby on/off**	If this checkbox is selected, the product can be switched on and off via the digital input.
	Inversion DI	If this checkbox is selected, the digital input is inverted.
	Function triggered by low-high transition	If this checkbox is selected, the digital input is activated in the event of an edge change from 0 to 1.
	Function triggered by high-low transition	If this checkbox is selected, the digital input is activated in the event of an edge change from 1 to 0.
Digital output	**DC O.K.** [1)]	If this checkbox is selected, the digital output is set if the DC output voltage is OK.
	Load current warning level exceeded [1)]	If this checkbox is selected, the digital output is set if the overload warning threshold is exceeded.
	Electronic circuit breaker tripped [1)]	If this checkbox is selected, the digital output is set if the electronic circuit breaker has tripped.
	Power supply switched off (latched) [1)]	If this checkbox is selected, the digital output is set if latching shutdown occurs.
	Digital output via process data/communication [1)]	If this checkbox is selected, the digital output can be controlled via the process data.

Section	Parameters	Description
	Digital output on	If this checkbox is selected, the digital output is switched on.
	Inversion DO	If this checkbox is selected, the digital output is inverted.
Warning thresholds	**Overload limit active**	If this checkbox is selected, a warning is triggered if the overload warning threshold is exceeded.
	Warning threshold	Here you can enter the value for current (unit: mA) at or above which a warning message is generated.
	Operating hour counter warning limit	You can enter after how many operating hours (unit: h) after which a warning message is generated.

[1] *These parameters are not mutually exclusive and can also be selected simultaneously.*

System

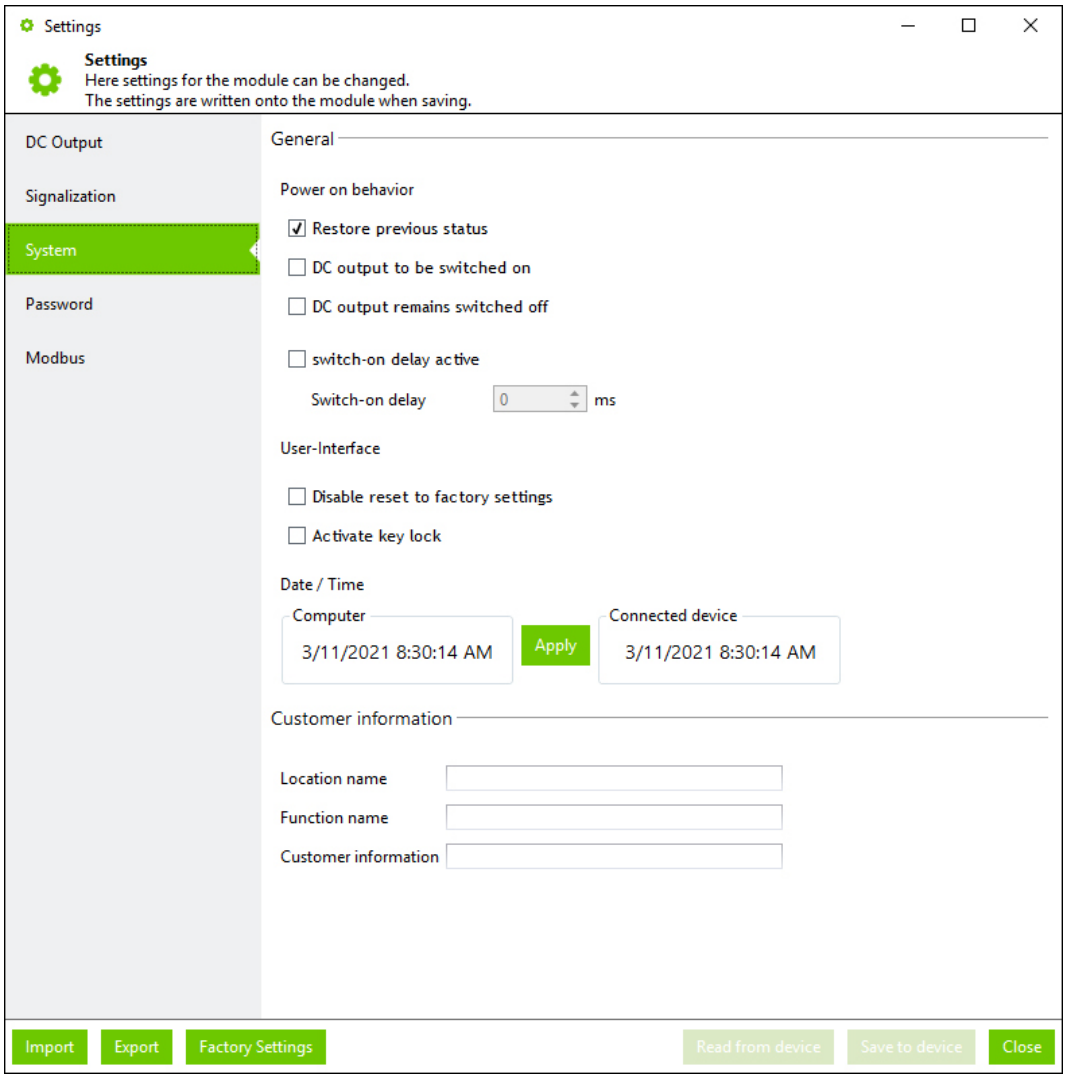


Figure 30: Dialog: Settings – System

Table 43: Dialog: Settings – System

Section	Parameters	Description
General	**Restore previous status** [1]	If this checkbox is selected, the previous state of the product is restored in the event of connection to the grid.
	DC output to be switched on [1]	If this checkbox is selected, the DC output is switched on in the event of connection to the grid.
	DC output remains switched off [1]	If this checkbox is selected, the DC output remains switched off in the event of connection to the grid.
	Switch-on delay active	If this checkbox is selected, an additional switch-on delay is enabled in the event of connection to the grid.
	Switch-on delay	Here you can enter the switch-on delay (unit: ms).
	Disable reset to factory settings	If this checkbox is selected, it is not longer possible to reset the product to the factory settings using the buttons.
	Activate key lock	If this checkbox is selected, a button lock feature is activated. No functions can be performed with the buttons. However, it is still possible to reset the product to the factory settings.

Section	Parameters	Description
	[Apply]	Here you can synchronize the internal time of the connected product with the system time of the PC.
Customer information	**Location name**	Here you can enter additional information on the product used. All the input fields can be freely edited. You can enter up to 32 characters into each input field.
	Function name	
	Customer information	

[1] *These parameters are mutually exclusive and can only be selected individually.*

Password

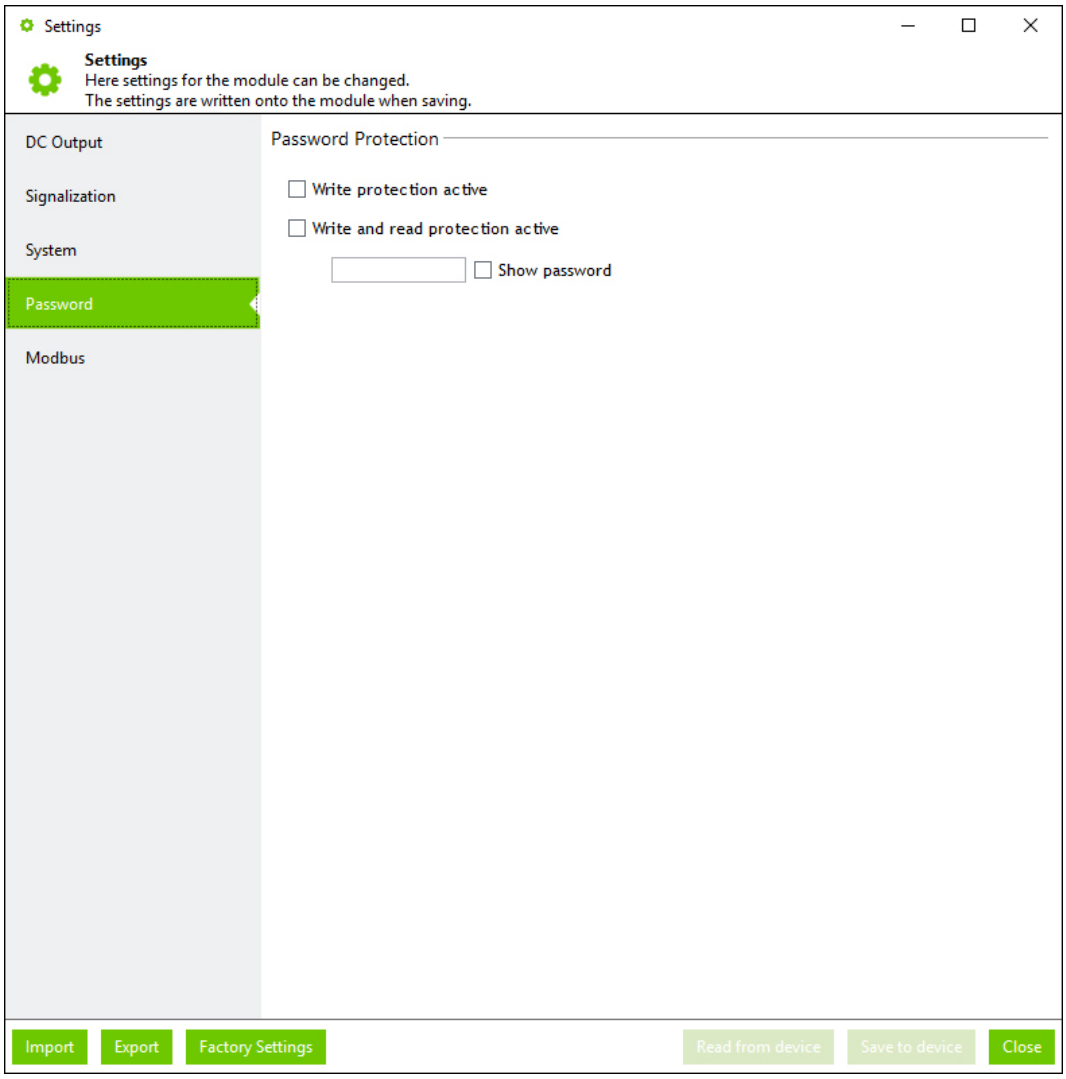


Figure 31: Dialog: Settings – Password

Table 44: Dialog: Settings – Password

Section	Parameters	Description
Password Protection	**Write protection active**	If this checkbox is selected, no parameters can be written to the product.
	Write and read protection active	If this checkbox is selected, no parameters can be written to the product or read from the product.
	Input field	You can enter the password here. The password can consist of at most eight characters (from the ASCII character set).
	Show password	If this checkbox is selected, the password entered is shown without encryption.

Modbus

This area contains specific parameters for the product.

The configured parameters are first transferred to the product. As soon as the Modbus RTU Communication Module is attached, the parameters are used here accordingly.

You can find more detailed information on Modbus RTU Communication Module in the respective 🕮 **Product Manual** and in **Accessories – Communication [▶ 65]**.

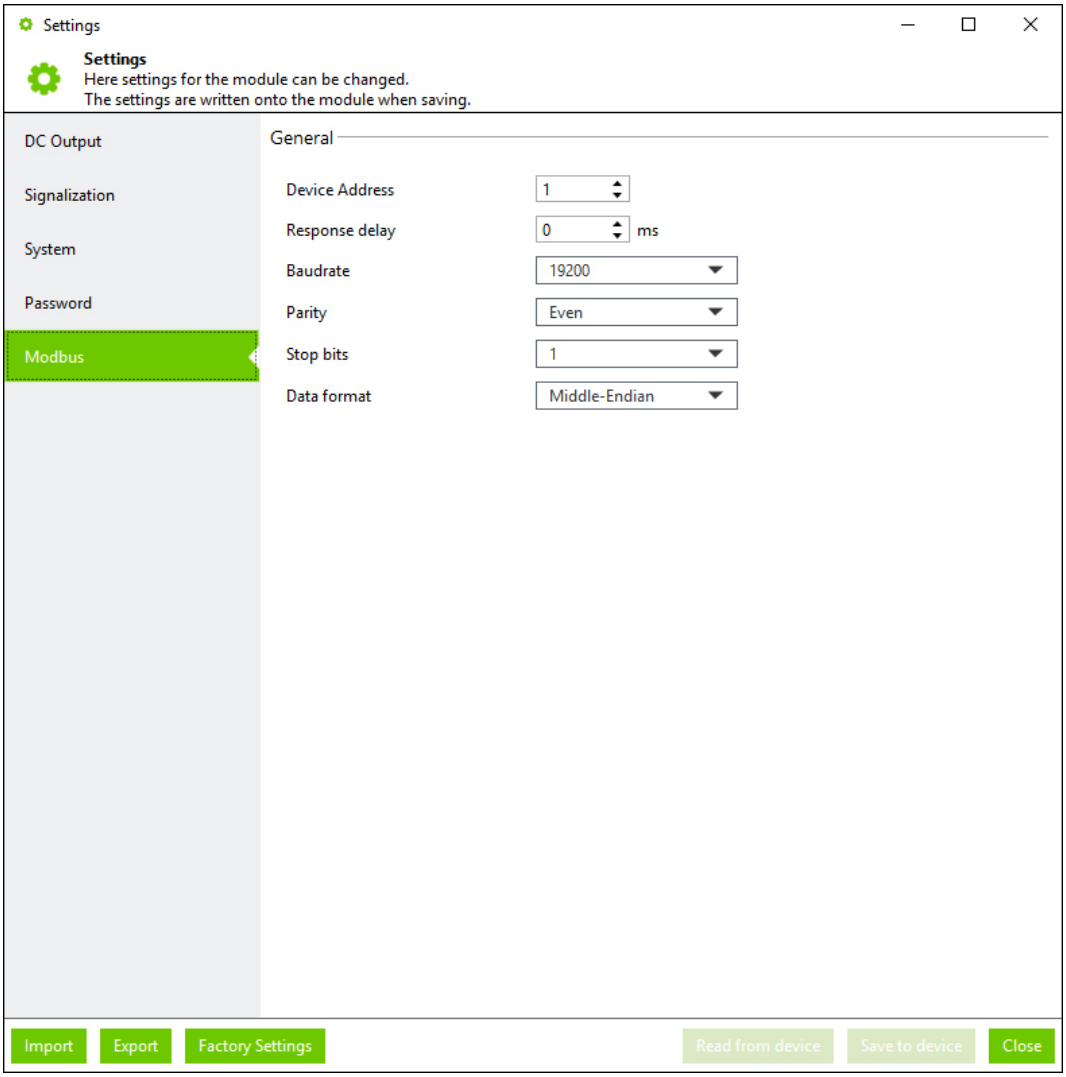


Figure 32: Dialog: Settings – Modbus

Table 45: Dialog: Settings – Modbus

Section	Parameter	Description
General	**Device Address**	The device address can be entered here.
	Response Delay	The response delay (unit: ms) can be entered here.
	Baud Rate	The baud rate can be selected here.
	Parity	The parity can be selected here.
	Stop Bits	The number of stop bits can be selected here.
	Data Format	The data format can be selected here:

12.3.1.2.2 Dialog: Simulation

In this dialog, you an adjust the individual setting options of the product on the software side. No available product is required. The individual setting options are used exclusively for simulation and test purposes and are not transferred to a connected product.

The simulation has the following advantages:

- **Get to know the full range of functions:**
  All existing operating states can be simulated.
- **Visual display of operating states, warnings and errors:**
  All operating states, warnings and errors can be displayed visually.
- **Identify the optimal setting options:**
  Optimal setting options for a specific load behavior can be identified.
- **View the register of communication models:**
  The specific registers and corresponding content of all existing Communication Modules can be viewed.

The dialog is made up of individual areas (“operation panels”) that differ depending on their function. The operation panels themselves have a function-specific structure and can be arranged as desired, highlighted in detail and shown or hidden.

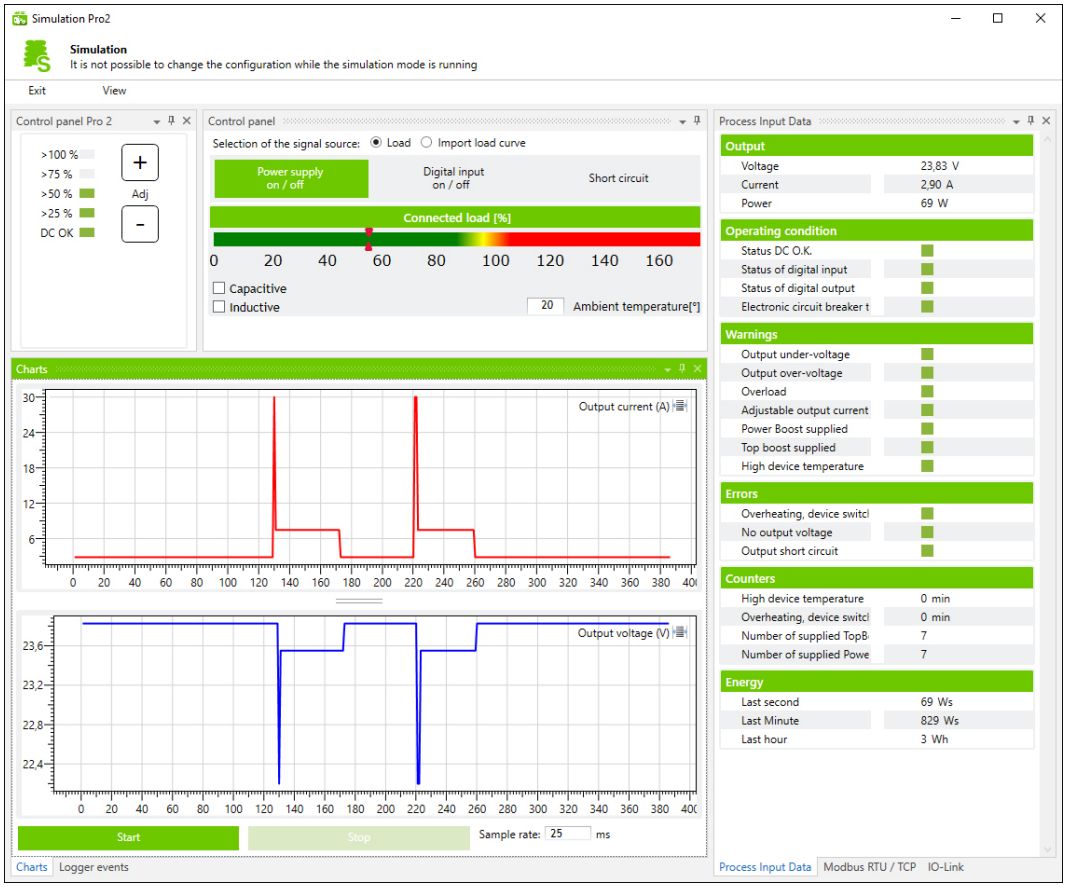
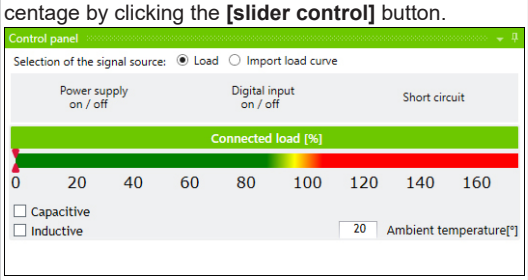


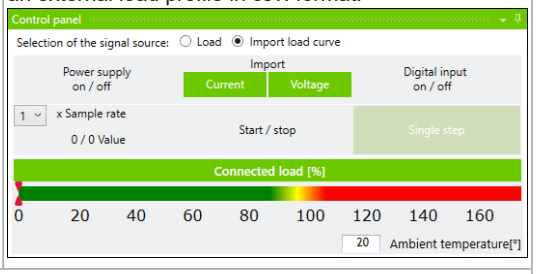
Figure 33: Dialog: Simulation

The dialog is explained below.

Table 46: Dialog: Simulation:

Section	Settings Option	Description
General Setting Options	**[Exit]**	Closes the dialog.

Section	Settings Option	Description
	[View]	Opens a dialog. You can select the individual operation panels to be displayed in the dialog.
Operation Panel Setting Options		Arranges the selected operation panel depending on the settings in the dialog.
		Hides the selected operation panel and anchors the operation panel as a tab on the outer edge of the dialog.
		Closes the selected operation panel.
“Pro 2 Operation Panel”	**Optical Status Indicator**	Displays the connected local [unit: %] You can set the percentage by clicking the **[slider control]** button in the operation panel.
	[Buttons]	You can set the output voltage. **[+]**: Increases the output voltage **[−]**: Decreases the output voltage You can enable the function by clicking the **[Power Supply ON/OFF]** button in the operation panel.
Operation Panel	The operation panel has two different views: • **“Load” view:** This view is displayed if the “Load” setting has been enabled in the **Signal Source Selection** operation panel. • **“Import load profile” view:** This view appears if the “Import load profile“ setting has been enabled in the **Signal Source Selection** operation panel. The different views are locked against each other and can only be selected individually. Individual setting options are also available in both views. These setting options are described in advance.	
	[Power Supply ON/OFF]	Switches the power supply on or off.
	[Digital Input ON/OFF]	Sets the digital input to “1” or resets the digital input to “0”.
	[Slider Control]	Sets the load percentage.
	Ambient Temperature	You can enter the ambient temperature. This function can be used to illustrate how the temperature-dependent load derating of works. **Example:** The yellow and red areas in the load display shift to the left if an ambient temperature in the range +55… +70 ° C is entered. In this way, the temperature-dependent derating is shown visually in the load display according to the ambient temperature.
	“Load” View	
	Signal Source Selection: Load	If the checkbox is selected, you can set the load percentage by clicking the **[slider control]** button. 
	The following specific settings options are available:	
	[Short circuit]	Generates a short circuit.

Section	Settings Option	Description
	Capacitive	If the checkbox is selected, the load has a capacitive component.
	Inductive	If the checkbox is selected, the load has an inductive component.
	“Import Load Profile” View	
	Signal Source Selection: Import Load Profile	If the checkbox is selected, you can import the load as an external load profile in csv. format. 
	The following specific settings options are available:	
	[Current]	You can import an existing load profile (current).
	[Voltage]	You can import an existing load profile (voltage).
	Sampling Rate	You can select the frequency with which the imported load profile should be scanned.
	[Start/Stop]	Starts and stops the imported load profile.
	[Step into]	Samples the imported load profile in single steps. Individual points can thus be examined more closely.
“Process Output Data” Operation Panel	–	Displays operating states, warnings and errors. General information on operating states, warnings and errors is explained in the Section **Display Section: Measurements [▶ 56]**.
“Modbus RTU/TCP” Operation Panel	–	Shows events and measured values from a plugged-in Modbus RTU Communication Module or a Modbus TCP Communication Module.
“IO-Link” Operation Panel	–	Shows events and measured values from a plugged-in IO-Link Communication Module.
“Diagrams” Operation Panel		Displays profiles of output voltage and output current. General information on the profiles of measured values is explained in the Section **Display Section: Measurement Recording [▶ 58]**.
	[Start]	Starts recording.
	[Stop]	Stops recording.
	Sampling Rate	You can enter the recording cycle for the measured values (unit: ms)
“Logger Events” Operation Panel	–	Displays the last accumulated error and warning messages. General information on accumulated error and warning messages is explained in the Section **Display Section: Last Error and Warning Messages [▶ 60]**.

12.3.2 Main Menu

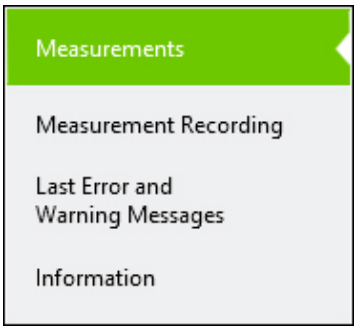


Figure 34: Main Menu

Menu Item	Description
Measured Values	Shows the current measured values and diagnostic messages. You can find the description in **Display Section: Measurements [▶ 56]**.
Measurement Recording	Shows a time sequence of up to three measured values. You can find the description in **Display Section: Measurement Recording [▶ 58]**.
Last Error Messages and Warnings	Shows the last accumulated error messages and warnings. You can find the description in **Display Section: Last Error and Warning Messages [▶ 60]**.
Information	Shows information about the connected product. You can find the description in **Display Section: Information [▶ 000]**.

12.3.3 Display Section

The Display section differs according to the menu item selected in the main menu.

12.3.3.1 Display Section: Measurements

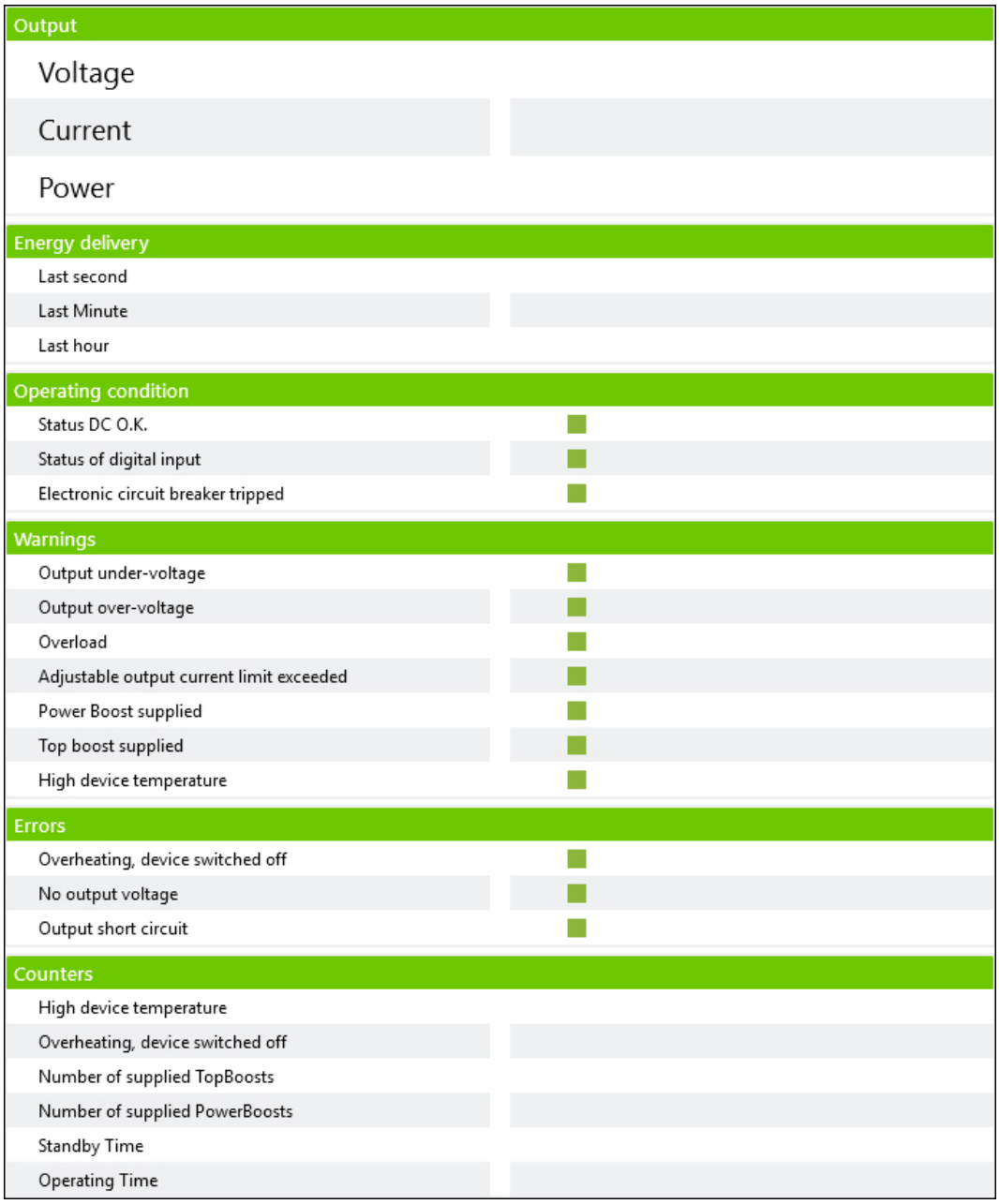


Figure 35: Display Section: "Measurements"

This Display section shows the current operating states, warnings and errors:

Table 47: Display Section: "Measurements"

Section	Indicator	Description
Output	**Output voltage**	This indicates the current output voltage (unit: V).
	Output current	This indicates the current output current (unit: A).
	Output power	This indicates the current output power (unit: W).
Energy delivery	**Last second**	This indicates the output energy supplied in the last second (unit: W·s).
	Last minute	This indicates the output energy supplied in the last minute (unit: W·s).
	Last hour	This indicates the output energy supplied in the last hour (unit: W·h).

Section	Indicator	Description
Operating condition	**Status DC OK**	Green LED: Status OK Red LED: There is a message
	Status of digital input	
	Electronic circuit breaker	
Warnings	**Output under-voltage**	Green LED: Status OK Red LED: There is a warning
	Output over-voltage	
	Overload	
	Configurable output current limit exceeded	
	PowerBoost supplied [1)]	
	TopBoost supplied [1)]	
	High device temperature	
Errors	**Overheating, device switched off**	Green LED: Status OK Red LED: Error present
	No output voltage	
	Output short circuit	
Counters	**High device temperature**	This shows how long the product has been operated at a high device temperature. The displayed value is the sum over the previous operating time (unit: h). The hours themselves are recorded and added up over the entire product life cycle.
	Overheating, device switched off	This shows how long the product switched off due to excess temperature. The displayed value is the sum over the previous operating time (unit: h). The hours themselves are recorded and added up over the entire product life cycle.
	Number of supplied Top-Boosts	The number of all Top Boosts generated is displayed here. The displayed value is the sum over the previous operating time.
	Number of supplied Power-Boosts	The number of all Power Boosts generated is displayed here. The displayed value is the sum over the previous operating time.
	Standby Time	The standby time of the product (unit: h) is displayed.
	Operating Time	The operating time of the product (unit: h) is displayed.

[1)] When PowerBoost or TopBoost is output, this is signaled for 5 s.

12.3.3.2 Display Section: Measurement Recording

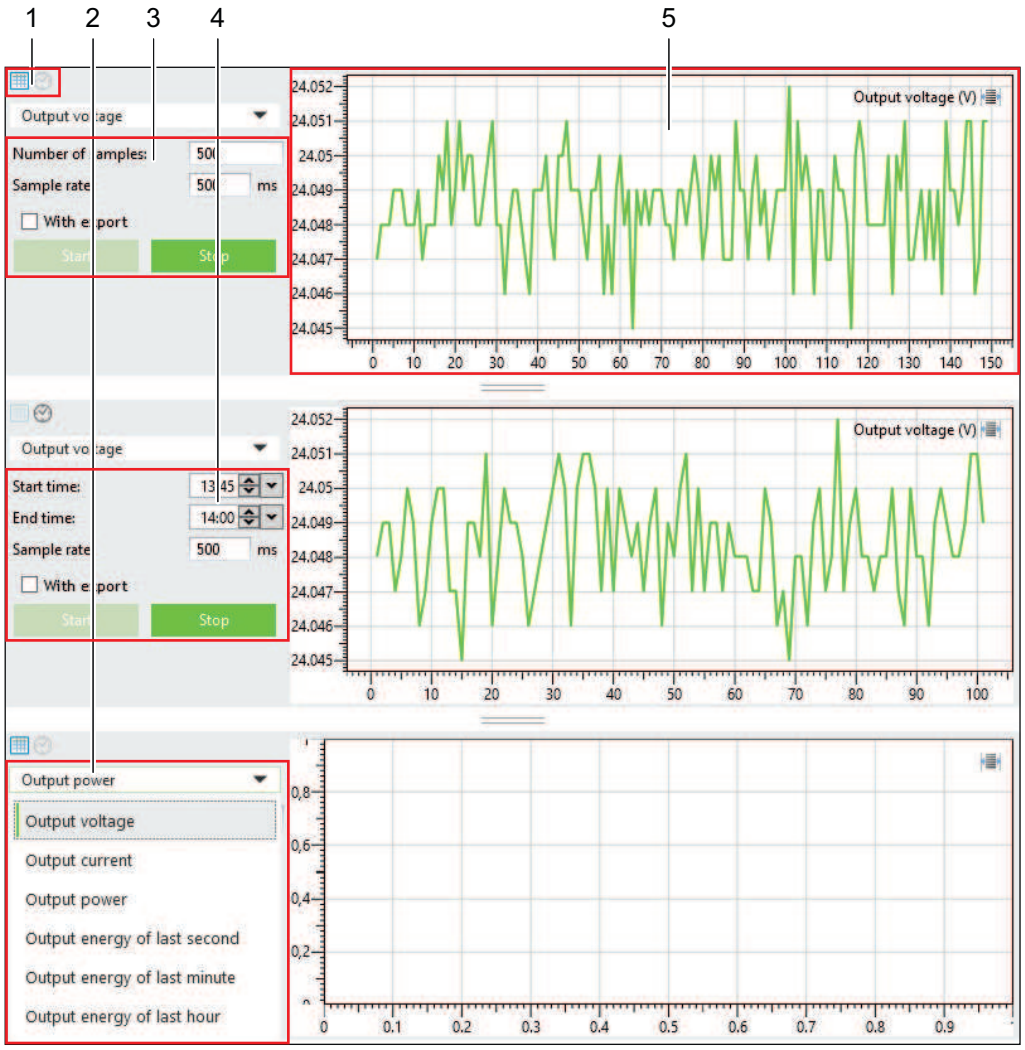


Figure 36: Display Section: "Measurement Recording"

This display section can represent the time series of up to three different measured values (measurement recordings).

You can make the following settings for each time series:

Table 48: Display Section: "Measurement Recording"

Pos.	Setting	Description
1	**Chart/Clock**	Here you can specify whether a specific number of values (**chart**) or measured values over a specific time period (**clock**) should be recorded. The corresponding input form changes accordingly: • Pos. 3 = input form for **chart** • Pos. 4 = input form for **clock**
2	**Measured Value Selection**	Here you can select the measured value to record.
3	**Number of samples**	Here you can enter the number of measured values to record (setting at pos. 1 = **chart**).
	Sample rate	Here you can enter the recording cycle for the measured values (unit: ms)

Pos.	Setting	Description
	With export	• Box checked: The recording is exported as a CSV file. • Box unchecked: The data is recorded only for online display and not saved.
	[Start]	Starts the recording (setting at pos. 1 = **chart**).
	[Stop]	Stops the recording before the specified number is reached (setting at pos. 1 = **chart**).
4	**Start time**	Here you can enter the time when recording should start (setting at pos. 1 = **clock**).
	End time	Here you can enter the time when recording should end (setting at pos. 1 = **clock**).
	Sample rate	Here you can enter the recording cycle for the measured values (unit: ms)
	With export	• Box checked: The recording is exported as a CSV file. • Box unchecked: The data is recorded only for online display and not saved.
	[Start]	Starts the recording (setting at pos. 1 = **chart**).
	[Stop]	Stops the recording before the specified number is reached (setting at pos. 1 = **chart**).
5	**–**	This shows the time series for the selected measured value.

12.3.3.3 Display Section: Last Error and Warning Messages

No.	Date	Time	WarningCode	ErrorCode
1	2021.03.10	13:02:12	Output under-voltage Adjustable output current limit exceeded Power Boost supplied	Output short circuit
2	2021.03.10	13:02:12	Output under-voltage Adjustable output current limit exceeded Power Boost supplied	
3	2021.03.10	13:02:12	Adjustable output current limit exceeded Power Boost supplied	
4	2021.03.10	13:02:12	Power Boost supplied	
5	2021.03.10	13:02:19		
6		00:00:43	Power Boost supplied	
7		00:00:45		
8	2021.03.10	13:02:06	Top boost supplied	
9	2021.03.10	13:02:06	Output under-voltage Overload Adjustable output current limit exceeded Top boost supplied	
10	2021.03.10	13:02:06	Output under-voltage Top boost supplied	
11	2021.03.10	13:02:06	Output under-voltage Adjustable output current limit exceeded Top boost supplied	Output short circuit
12	2021.03.10	13:02:06	Output under-voltage Adjustable output current limit exceeded Power Boost supplied Top boost supplied	Output short circuit
13	2021.03.10	13:02:06	Output under-voltage Adjustable output current limit exceeded Power Boost supplied Top boost supplied	No output voltage Output short circuit
14	2021.03.10	13:02:08	Output under-voltage Adjustable output current limit exceeded Power Boost supplied Top boost supplied	No output voltage
15	2021.03.10	13:02:08	Output under-voltage Adjustable output current limit exceeded Power Boost supplied Top boost supplied	No output voltage Output short circuit

Figure 37: Display Section: “Last Error and Warning Messages”

The last accumulated error messages and warnings are displayed in this display section:

Table 49: Display Section: “Last Error and Warning Messages”

Section	Description
No.	Consecutive number of the accumulated warning and error message.
Date	Date of the accumulated warning and error message.
Time	Time of the accumulated warning and error message.
Warning Code	Text of the accumulated warning.
Error Code	Text of the accumulated error message.

Up to 20 error messages and warnings are shown in the display section.

The display section is a so-called “ring memory”: If the display section is full, existing error messages and warnings are overwritten by accumulating error messages and warnings.

12.3.3.4 Display Section: Information

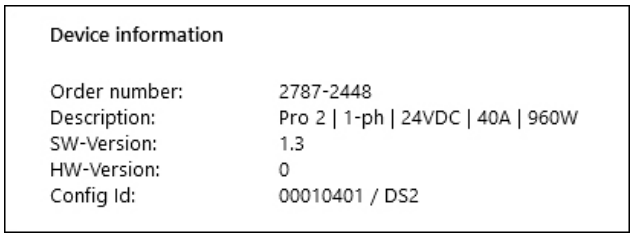


Figure 38: Example View

This display section shows information on the connect product.

Table 50: Display Section: "Information"

Indicator	Description
Order number:	This shows the order number of the product.
Description:	This shows the manufacturer's name for the product.
SW-Version	This shows the current release of the software version (firmware).
HW-Version:	This shows the current release of the hardware version.
Config ID:	This shows the configuration ID of the product.

13 Notes on Operation

13.1 Disable/Enable Overvoltage Protection

The product is protected against overvoltages; for more information, see Overvoltage Protection [▶ 22].

The letters shown in parentheses refer to positions in figure “View” in View [▶ 10].

13.1.1 Disable/Enable Input-Side Overvoltage Protection

Disable Overvoltage Protection

- Remove the screw (j) on the side of the product.

⇨ The overvoltage protection is disabled.

Enable Overvoltage Protection

- Screw in the screw (j) on the side of the product.

⇨ The overvoltage protection is enabled.

13.1.2 Disable/Enable Output-Side Overvoltage Protection

Disable Overvoltage Protection

- Remove the screw (d) on the side of the product.

⇨ The overvoltage protection is disabled.

Enable Overvoltage Protection

- Screw in the screw (d) on the side of the product.

⇨ The overvoltage protection is enabled.

14 Decommissioning

14.1 Disposal and Recycling



WEEE Mark

Electrical and electronic equipment may not be disposed of with household waste. This also applies to products without this mark.

Electrical and electronic equipment contain materials and substances that can be harmful to the environment and health. Electrical and electronic equipment must be disposed of properly after use. Environmentally friendly disposal benefits health, protects the environment from harmful substances in electrical and electronic equipment and enables sustainable and efficient use of resources.

- Observe the national and local regulations for the disposal of electrical and electronic equipment, lithium-ion batteries, lead–acid batteries and packaging.
- Clear any data stored on electrical and electronic equipment.
- Remove lithium-ion batteries, lead–acid batteries or memory cards that are added to the electrical and electronic equipment.
- Wear appropriate personal protective equipment when removing the lithium-ion batteries/lead–acid batteries.
- Dispose of the removed lithium-ion batteries/lead–acid batteries according to your local waste regulations (e. g. collection boxes at the retail or local collection points).
- Have electrical and electronic equipment sent to a local collection point.
- Dispose of all types of packaging to ensure a high level of recovery, reuse and recycling.
- Transport packages from the B2B area can be taken back free of charge via a return system in accordance with the Packaging Act. Please contact our service provider Interseroh directly. The corresponding certificate can be found at: **corporate-certificates**
- Throughout Europe, Directives 2006/66/EC, 94/62/EC and 2012/19/EU (WEEE) apply. National directives and laws may differ.

15 Appendix

15.1 Application Notes

The following figures provide examples of how the product can be connected as a load in three different grounding systems: TN, TT and IT.

15.1.1 AC Operation

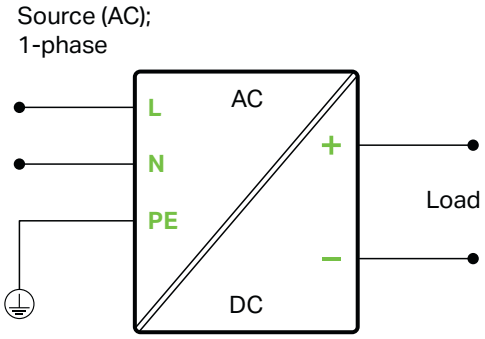


Figure 39: AC input

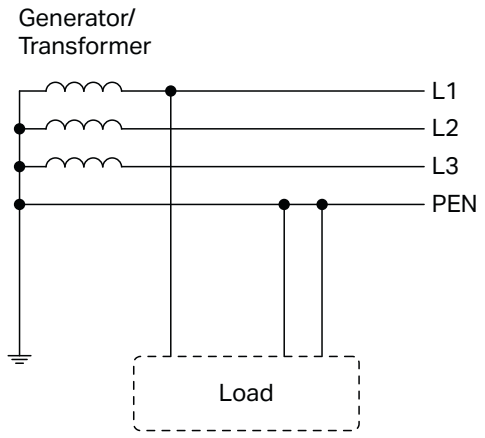


Figure 40: TN Network

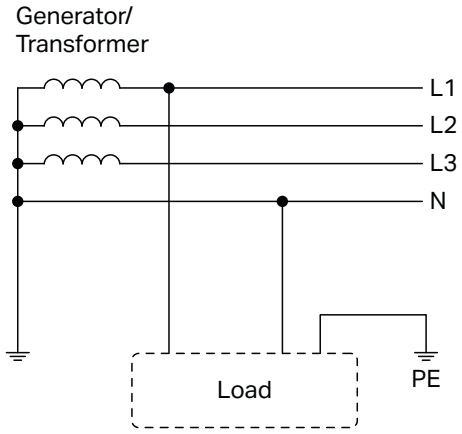


Figure 41: TT Network

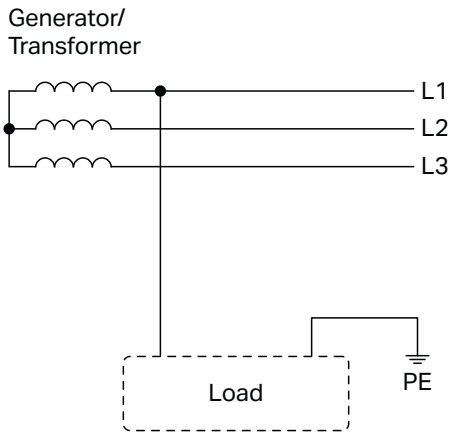


Figure 42: IT Network

15.2 Accessories

The following accessories are available for the product:

Accessories – Communication

Table 51: Accessories – Communication

Description	Name	Item Number
Attachable IO-Link Communication Module for the product	IO-Link Communication Module	2789-9080
Attachable Modbus RTU Communication Module for the product	Modbus RTU Communication Module	2789-9015
Attachable Modbus TCP Communication Module for the product	Modbus TCP Communication Module	2789-9052
Attachable EtherNet/IP Communication Module for the product	EtherNet/IP Communication Module	2789-9023
WAGO USB Communication Cable	2.5 m	750-923

Accessories – Tools

Table 52: Accessories – Tools

Description	Designation	Item Number
Operating tool, with partially insulated shaft	Type 2, blade 3.5 × 0.5 mm	0210-0720
Operating tool, with partially insulated shaft	Type 3, blade 5.5 × 0.8 mm	0210-0721

Accessories – Marking

Table 53: Accessories – Marking

Description	Item Number
Marker Carrier	2789-1233
Marking System	2009-0110
WMB Multi Marking System	2009-0115
	2009-0115/0000-0002

Accessories – Spare Parts

Table 54: Accessories – Spare Parts

Description	Item number
Female connector as spare part, input	0721-0203/0000-0004/0000-9540
Female connector as spare part, output	0831-3105/0000-0015/0000-9504
Female connector as spare part, signal	0721-0104/K000-0001

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