

Powador-proLOG



Operating instructions

Manual

Operating Instructions

Powador-proLOG

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1 About this documentation

The following notes guide you through all of the documentation. Additional documents are applicable in conjunction with these operating instructions.



1.1 Other applicable documents

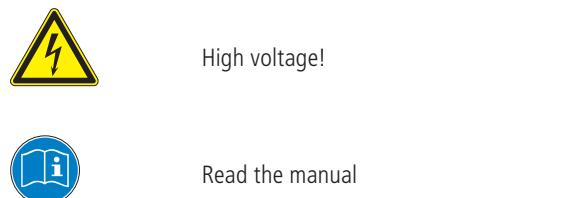
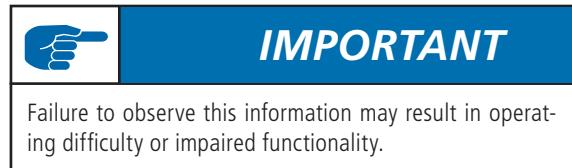
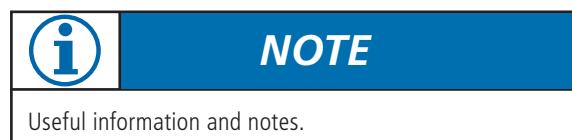
When installing the data logger, be sure to observe all assembly and installation instructions for components and other parts of the system. These instructions are delivered together with the respective components and other parts of the system.

1.2 Retention of documents

Pass these operating instructions on to the system operator. The system operator is to retain the documents. The instructions must be available whenever they are needed.

1.3 Symbols used in this document

When installing the data logger, observe the safety instructions included in these installation instructions.



1.4 CE marking

The CE marking is used to document that the Powador-proLOG data logger shown on the name plate fulfils the fundamental requirements of the following relevant directives:

- Directive relating to electromagnetic compatibility (Council Directive 2004/108/EC)
- Low voltage directive (Council Directive 2006/95/EC)

1.5 Name plate

The name plate showing the exact designation of the unit is located on the left side of the housing.

2 Safety Instructions and Regulations



DANGER

Danger due to lethal voltages.

Lethal voltages are present within the unit and on the power supply lines. Therefore, only authorised electricians may install and open the unit.

Standards and regulations

IEC 60364-7-712:2002:

Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems.

Technical rules

The installation must be suited to the on-site conditions and comply with local regulations and technical rules.

Accident prevention regulations

- The monitoring system for photovoltaic systems may only be connected by qualified specialists.
- Cables must be disconnected from all power sources before being connected to or disconnected from the system.
- Read the manual and familiarise yourself with the unit prior to operation
- Damaged units must be removed from operation immediately and inspected by a qualified specialist.
- The unit is to be opened by a qualified specialist only.
- The safety of the operator and the unit cannot be guaranteed if the operator does not adhere to the safety instructions.

ATTENTION

Risk of damage due to improper modifications.
Do not attempt to open or modify the data logger.

Transportation

The Powador-proLOG is subjected to extensive testing and inspections at our test facility. Only by doing so can we ensure the high quality of our products. Our data loggers leave our factory in proper electrical and mechanical condition. Special packaging ensures that materials are not damaged during transportation. However, damage may still occur during transport. The shipping company is responsible in such cases.

Thoroughly inspect the data logger upon delivery. Immediately notify the responsible shipping company if you discover any damage to the packaging which indicates that the data logger may have been damaged or if you discover any visible damage to the data logger.

If necessary, KACO new energy GmbH will assist you. Damage reports must be received by the shipping company in writing within six days following receipt of the goods.

When transporting the data logger, only the original packaging is to be used, as this ensures safe transport.

The proper and safe operation of this unit requires proper transportation, storage, assembly and installation, as well as careful operation and maintenance.

3 Notes on installation and operation

3.1 Intended use

The Powador-proLOG is used for system monitoring of a photovoltaic system.

It records the currents, voltages, temperatures, power and yields of every individual inverter, as well as the values of the externally connected sensors.

The Powador-proLOG is built according to the state of the art and recognised safety rules. Nevertheless, improper use may cause hazards for the operators or result in damage to the units.

Any other or additional use of the device is deemed improper. The manufacturer/supplier is not liable for damage caused by such use. Damage caused by improper use is at the sole risk of the operator.

Intended use also includes adherence to the operating instructions.

3.2 Factory warranty and liability

KACO new energy GmbH grants a warranty of two years on the Powador-proLOG starting from the date of shipment by KACO new energy GmbH.

During this time, KACO new energy GmbH guarantees the proper function of the units and to undertake repairs at the factory free of charge in the event of a defect for which we are responsible.

Contact your specialty dealer if your unit exhibits a defect or fault during the warranty period.

Warranty claims are excluded in the following cases:

- Use of the units in ways not intended
- Improper installation or installation that does not comply with standards
- Improper operation
- Operating the unit with defective protective equipment
- Unauthorised modifications to the units or repair attempts
- Influence of foreign objects or force majeure (lightning, overvoltage, severe weather, fire)
- Failure to observe the relevant safety regulations
- Transport damage

All warranty claims must be handled at the premises of KACO new energy GmbH. Where possible, the unit must be returned in its original or equivalent packaging. The costs for these services cannot be borne by KACO new energy GmbH.

KACO new energy GmbH will only perform warranty services if the defective unit is returned to KACO new energy GmbH

together with a copy of the invoice which was issued to the user by the dealer. The name plate on the unit must be fully legible. If these requirements are not fulfilled, KACO new energy GmbH reserves the right to deny warranty services.

3.3 Service

Starting with the product development phase, we place a great deal of importance on ensuring the quality and longevity of our data loggers.

However, in spite of all quality assurance measures, faults may occur in rare cases. In such cases, KACO new energy GmbH will provide you with the maximum possible support. KACO new energy GmbH will make every effort to remedy such faults in an expeditious manner and with a minimum of bureaucracy.

In such cases, please contact our service department directly.

Telephone: +49(0)7132-3818-680

e-Mail monitoring@kaco-newenergy.de

So that your enquiry can be dealt with more quickly, please always have the serial number (A) and hardware serial number (B) of your data logger to hand. Both numbers can be found on the name plate on the left-hand side of the housing (see figure below).



4 Technical Data

Electrical data	Powador-proLOG S	Powador-proLOG M	Powador-proLOG XL
Input levels			
AC power supply [V]	230	230	230
AC voltage range [V]	85 to 240	85 to 240	85 to 240
Rated frequency [Hz]	50	50	50
Frequency range [Hz]	47 to 63	47 to 63	47 to 63
230 V AC power input [W]	7.5	9	9
DC power supply [V]	24	24	24
DC voltage range [V]	21.6 to 26.4	21.6 to 26.4	21.6 to 26.4
24 V DC power input [W]	2.4	3.5	3.5
Output levels			
DC power supply [V]	24	24	24
DC voltage range [V]	23.5 to 24.5	23.5 to 24.5	23.5 to 24.5
Max. current consumption for sensors depending on modem variant			
Ethernet/DSL [mA]	230	230	230
ISDN modem [mA]	-	-	230
Analogue modem [mA]	190	-	190
GSM/GPRS modem [mA]	-	-	160
Mechanical data			
Display	LCD 2 x 16 characters	LCD 2 x 16 characters	LCD 2 x 16 characters
Controls	4 buttons for display	4 buttons for display	4 buttons for display
Display elements	4 LEDs	4 LEDs	4 LEDs
Interfaces	RS485, Ethernet, SO, Powador-go	RS485, Ethernet, SO, Powador-go	RS485, Ethernet, SO, Powador-go
Operating temperature [°C]	0 to +55	0 to +55	0 to +55
Storage temperature [°C]	-20 to +65	-20 to +65	-20 to +65
Protection rating	IP20	IP21	IP21
Mounting	Top hat rail & wall	Wall	Wall
H x W x D [mm]	160 x 110 x 63	217 x 220 x 87	217 x 220 x 87
Weight [g]	436	900	900

Connections	Powador-proLOG S	Powador-proLOG M	Powador-proLOG XL
Analogue inputs			
Number of	1	1	4
DC voltage measurement [V]	0 to 10 (max. 24)	0 to 10 (max. 24)	0 to 10 (max. 24)
DC current measurement [mA]	0 to 20 (max. 40/3 V)	0 to 20 (max. 40/3 V)	0 to 20 (max. 40/3 V)
Resistance measurement	PT1000	PT1000	PT1000
Measuring accuracy	1% of the end value (0.1 V/0.2 mA)	1% of the end value (0.1 V/0.2 mA)	1% of the end value (0.1 V/0.2 mA)
Digital inputs			
Number of	1	1	4
S0 pulse input (DC) [V]	Low: 0 to 7 High: 9 to 24	Low: 0 to 7 High: 9 to 24	Low: 0 to 7 High: 9 to 24
	<ul style="list-style-type: none"> – Powered exclusively by the unit's internal power supply – Can be configured as a status input – Potential-free contacts – S0 interface specification conforms to DIN 43864 		
Digital output			
Number of	1	1	1
S0 optocoupler (DC)	Max. 70 V/50 mA	Max. 70 V/50 mA	Max. 70 V/50 mA
Display elements	4 LEDs	4 LEDs	4 LEDs
Interfaces	<ul style="list-style-type: none"> – Can be configured as an alarm or pulse output – Observe the polarity 		
Communication			
Ethernet	100 MBit (RJ45)	100 MBit (RJ45)	100 MBit (RJ45)
Analogue modem (PSTN)*	1 (RJ12)	-	1 (RJ12)
ISDN modem*	-	-	1 (RJ12)
GSM/GPRS modem	-	-	SIM card slot Antenna (FME)

*Depending on Powador-proLOG variant

5 Installation

5.1 Determining the installation location

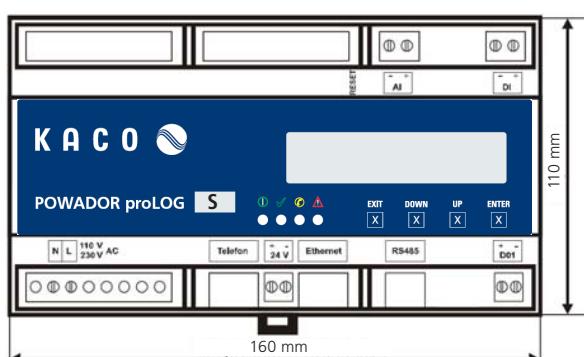
Install the Powador-proLOG near a telephone or Ethernet connection and a 230 V grid connection. To prevent damage to the Powador-proLOG or the building's electrical system, keep the following points in mind when you choose an installation location:

- The Powador-proLOG must not be installed outdoors or in damp areas. The unit must be protected from moisture and direct sunlight.
- The ambient temperature must be between 0°C and +55°C.
- There must not be any building installations (e.g. power, gas or water lines) around the drill holes.
- The Powador-proLOG should be placed on a level surface to prevent damage to the housing.

5.2 Installing the unit

5.2.1 Powador-proLOG S

The unit is suitable for mounting on a top hat rail (size 35 mm). To make it easy to attach the housing, use a clamping device to snap it onto (or release it from) the hat rail.



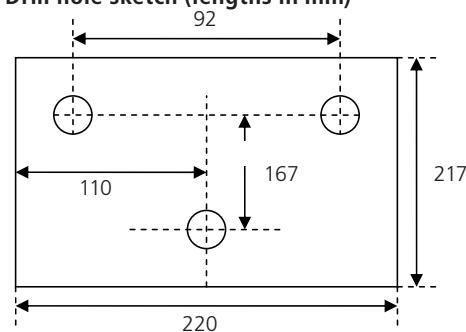
5.2.2 Powador-proLOG M / XL

The unit is suitable for wall mounting. Use the sketch below to mark the drill holes.

The distance between the screws on the mounting bracket and the wall should be approx. 3 mm.

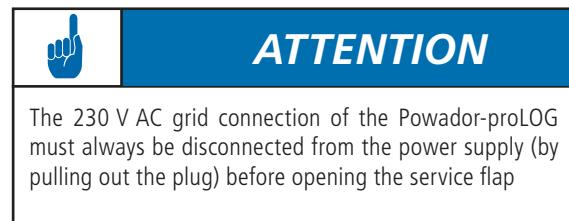
Hang the Powador-proLOG on the screw heads, and then pull down. Now secure the Powador-proLOG with a third screw in the lower part of the unit.

Drill hole sketch (lengths in mm)

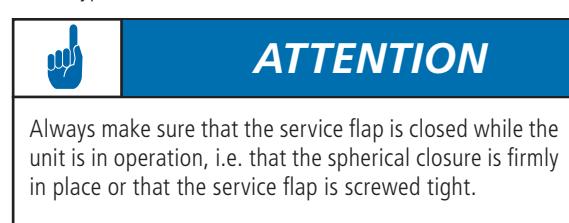


5.3 Service flap

The Powador-proLOG may only be operated when the service flap is closed. However, the service flap must be opened for the purpose of connecting the voltage supply, the network connection (Ethernet) or sensors.



There are two versions of the service flap: Spherical closure or screw-type closure



5.4 Connections



Powador-proLOG M/XL



Powador-proLOG S

5.4.1 Voltage supply

The Powador-proLOG is powered by an integrated power supply. The grid connection (230 V) should be protected by a separate fuse (e.g. B6A). The power supply provides 24 V, e.g. to power a solar sensor.



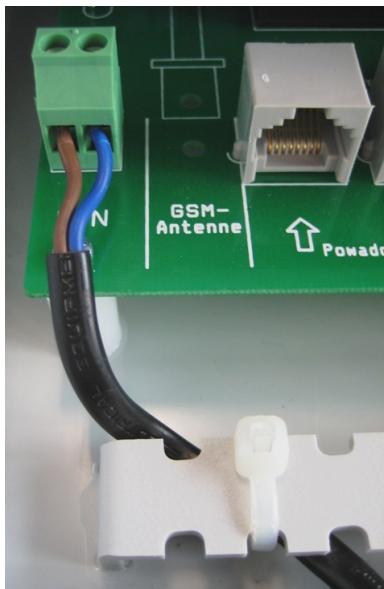
Powador-proLOG M/XL



Powador-proLOG S

Strain relief

When connecting the 230 V AC power cable (included in the scope of delivery), we recommend that you use a cable grip to attach it to the assembly rail inside the housing. The figure below shows an example cable grip design.

**5.4.2 GSM antenna (XL GSM/GPRS)**

Connect the GSM antenna supplied here. The connection is located to the far left, between the grid connection and the Powador-go RJ45 sockets.

**IMPORTANT**

For more information on the Powador-proLOG with GSM modem, see section 6.5 on page 22.

5.4.3 Powador-go (M / XL)

You can connect up to 100 current sensors (Powador-go) to the "Powador-go" RJ45 sockets. For example, you can use the current sensors to include inverters without RS485 in monitoring.

The current sensors are connected and supplied with power using patch cables. The ports are labelled "Powador go" (RJ45 sockets).

**ATTENTION**

The internal power supply can be used to supply power to a maximum of six current sensors.

**IMPORTANT**

When you have more than 32 bus devices, you need to use a repeater.

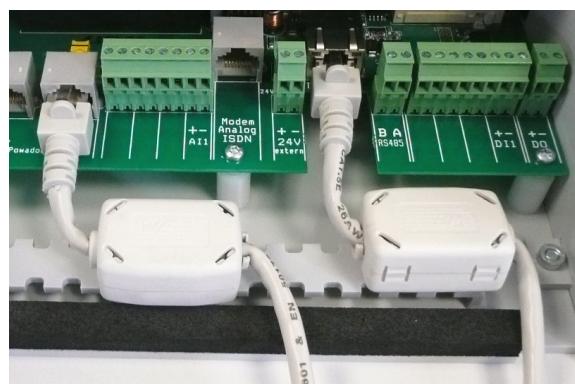
Installing the ferrite clips

To prevent possible communication faults caused by electromagnetic radiation, ferrite clips are included with the Powador-proLOG M. The installation process is shown in the two images below.

- Insert the patch cable (RS485) into the ferrite clip and close it.



- Connect the patch cable to the Powador-go port on the Powador-proLOG and attach the ferrite clip to the assembly rail (e.g. cable ties).



5.4.4 Analogue/ISDN modem (XL)

Depending on the unit type, the Powador-proLOG units are equipped with either an internal analogue or an internal ISDN modem. The cable connection is included in the scope of delivery.

- Before you install the unit, use a telephone to test the analogue/ISDN telephone connection in both directions (incoming and outgoing connections).
- Use the included cable to connect the unit to the TAE socket/NTBA.
- If you need to extend the cable, make sure that the contacts are secure and the polarity is correct..



Powador-proLOG XL



Powador-proLOG S (analogue only)

5.4.5 24 V supply



Powador-proLOG M/XL

Use this connection to power external sensors using the unit's internal power supply (max. 230 mA). The socket is located between the analogue/ISDN modem and the Ethernet interface.



Powador-proLOG S

5.4.6 Ethernet

All Powador-proLOG models are equipped with a network connection to connect the unit to an Ethernet network.



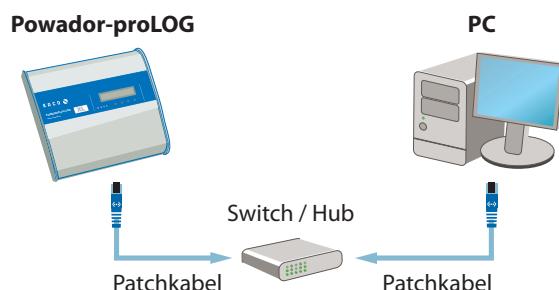
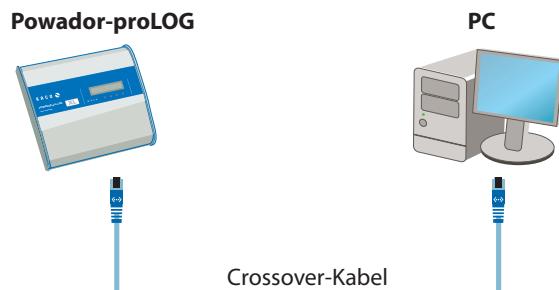
Powador-proLOG M/XL



Powador-proLOG S

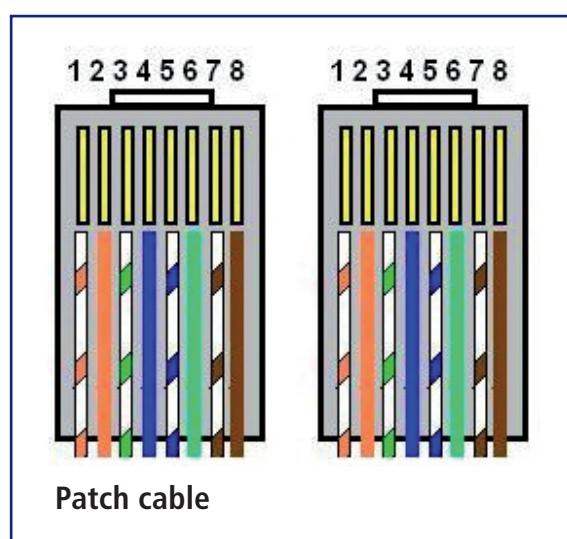
When installing the network cable, please note that a crossover cable (included in the scope of delivery) is required for direct communication between the Powador-proLOG unit and a PC. However, if you intend to set up a large network and

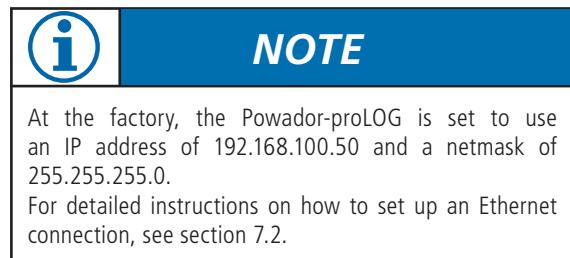
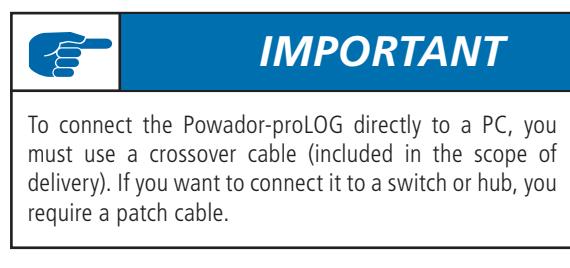
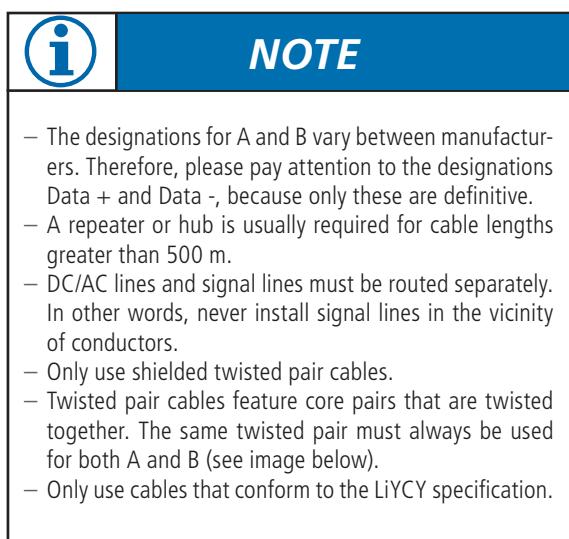
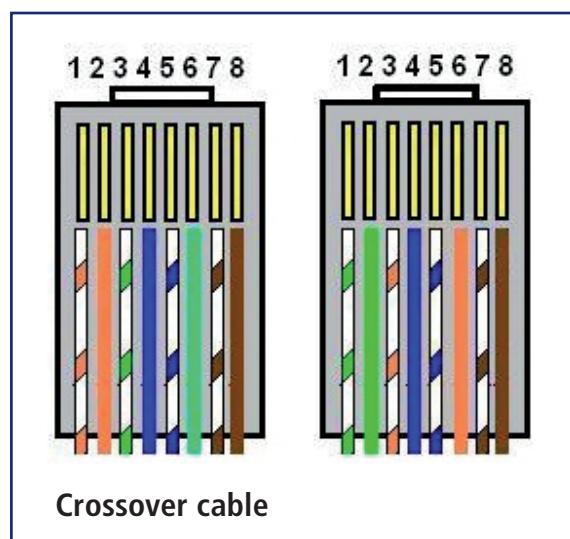
want to connect the Powador-proLOG unit to a PC or router via a switch or hub, you need to use a patch cable instead. The following figures illustrate the differences between the two Ethernet cables.



Difference between patch cable and crossover cable

To identify the cable type, simply hold both ends of the cable out in front of you. The RJ45 connector heads on the patch cables are identical. The connector heads on the crossover cables are different.



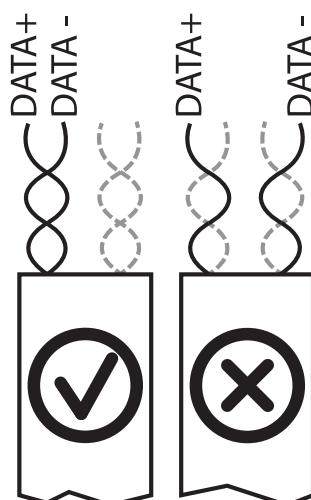


To prevent possible communication faults caused by electromagnetic radiation, ferrite clips are included with the Powador-proLOG M. The installation process is described in 5.4.3 Powador-go (M / XL).

5.4.7 RS485 connection

Use a shielded twisted pair cable to connect the unit to the RS485 bus (inverter <-> Powador-proLOG). The ports are labelled "A" and "B".

The maximum length of the RS485 bus is 1000 m. In practice, KACO new energy recommends keeping the length to 500 m. The last bus device must be terminated with a terminating resistor. The Powador-proLOG is already terminated at the factory. Each inverter is assigned a separate address (1 to 32).



RS485 bus: Assignment of twisted-pair wires

Powador-proLOG M / XL

Connect the RS485 bus to the A/B screw terminals.

Powador-proLOG S

A special cable with 6-pin connector is included in the scope of delivery for connecting the inverters via an RS485 bus. Plug the 6-pin connector into the Powador-proLOG S. Connect the inverters to the open cable ends. You only need the A and B wires.



Powador-proLOG M/XL



Powador-proLOG S



IMPORTANT

After you have connected the inverters and current sensors, make sure that the jumper switch is set to "Powador+Powador-go". If only inverters are connected, set the jumper switch to "Powador".



IMPORTANT

A maximum of 31 Powador inverters can be operated at the same time. The number of Powador 25/30/3300xi central inverters is restricted to a maximum of ten units, as each one occupies three addresses.

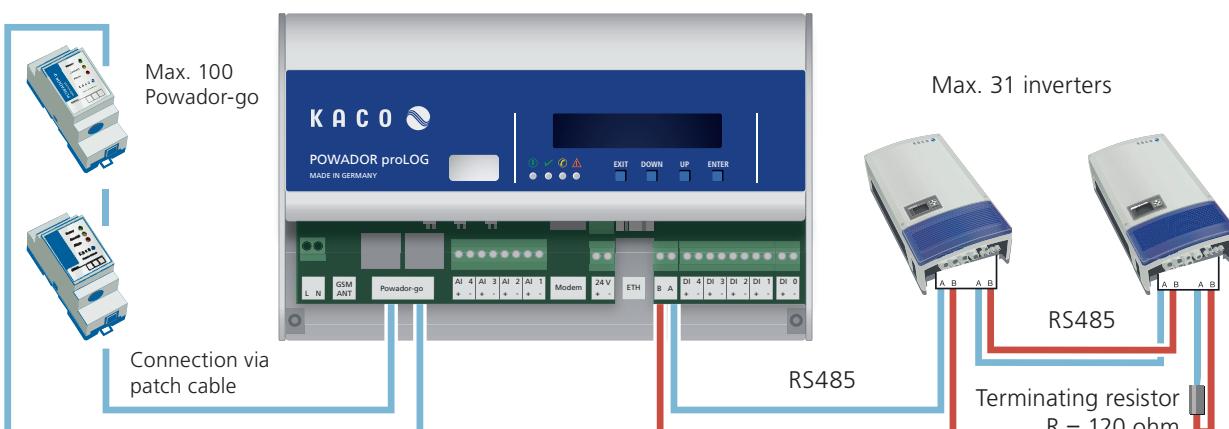
The Powador-proLOG S is limited to a maximum output of 50 kWp.



NOTE

Consult the relevant inverter manual for more information on connecting and addressing the individual inverters.

Schematic diagram for wiring inverters and current sensors



5.4.8 Digital output D0

The digital output can be used as an alarm output to control signalling devices or as a pulse output to connect a display.



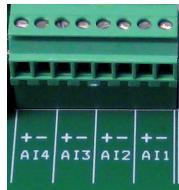
Powador-proLOG M/XL



Powador-proLOG S

5.4.9 Analogue/digital inputs

The unit is equipped with four (XL) or one (S, M) analogue input(s), which are designed for a voltage measurement of 0 to 10 V.



Powador-proLOG XL



Powador-proLOG S



ATTENTION

Incorrect polarity or using a voltage supply greater than 12 V can destroy the measuring input.



NOTE

To configure this function, connect to the Powador-proLOG and make the required settings via -> "Admin monitoring > Switching output" in your browser.



NOTE

The analogue inputs can be optionally converted for current measurement or resistance measurement. You do this in the configuration menu of the Powador-proLOG (Admin-Messung -> Admin measurement > Analogue channels).



ATTENTION

The output is designed as an optocoupler output (N/O contact) and must therefore be connected to an external voltage supply, if necessary. The maximum load is 50 mA.

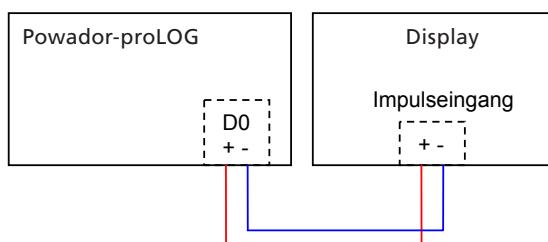


Powador-proLOG XL

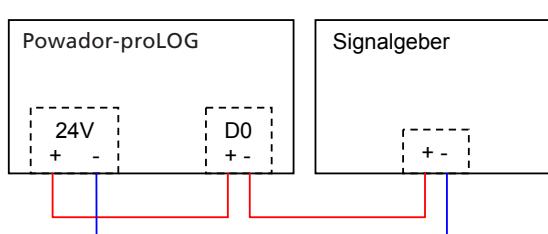


Powador-proLOG S

Connecting a display to D0



Connecting a signalling device to D0



ATTENTION

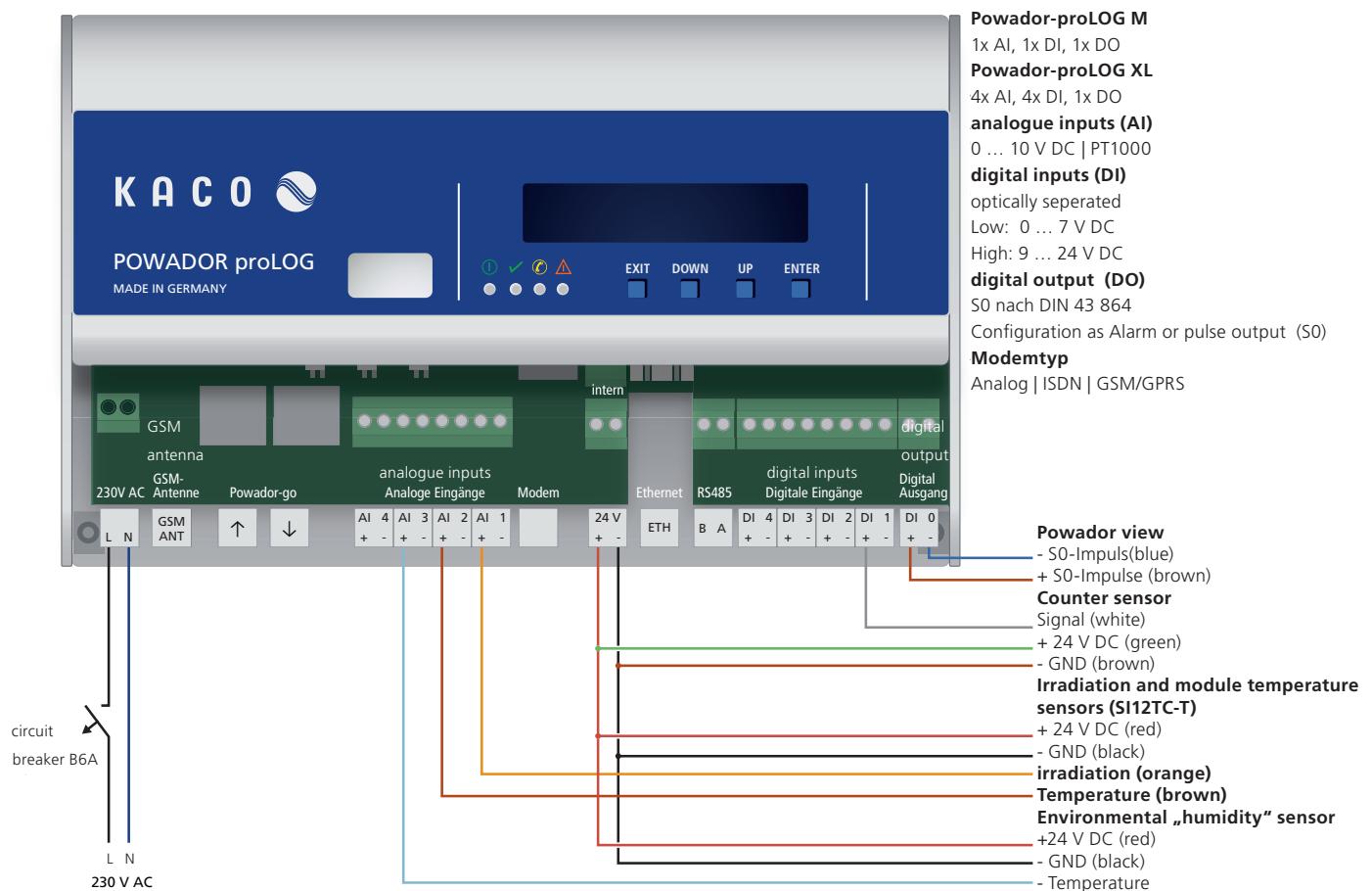
Incorrect polarity or using an external voltage supply greater than 24 V can destroy the measuring input. The 24-V supply is available starting at terminal DI+.



NOTE

The digital inputs can be optionally converted for status evaluation. This means that the Powador-proLOG can evaluate switching states 0 or 1 (N/C or N/O contact). This must be set up using the configuration files for the Powador-proLOG. Please contact the KACO new energy hotline.

Connecting sensors and energy counters to the Powador-proLOG S/M/XL

**NOTE**

Input AI1 is preconfigured for connection of a solar sensor.
Digital input DI1 is preconfigured for connection of a feed-in meter.

Recommended cables

Cable assemblies are provided with all sensors. In the case of the PT1000 ambient temperature sensor, we recommend using cables of the following type: LiYCY 2 x 2 x 0.5 mm². The maximum cable length of 100 m must not be exceeded.

5.5 KACO Power Control

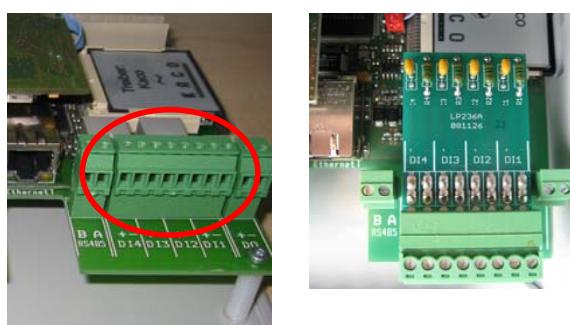
Since 1 January 2009 when the German Renewable Energies Act (EEG) was passed, PV systems in excess of 100 kW have been subject to remote-controlled power regulation. In principle, each individual unit in a network with other units can become a system of this size. Therefore, every Powador inverter supports power reduction.

KACO new energy achieves this power reduction function (KACO power control) by combining the Powador-proLOG XL unit with a radio ripple control receiver. These units enable the power supply company to reduce the power of the system as required. For this, the following levels are possible: 0%, 30%, 60% or 100% of the rated AC power of the inverter. When you specify 30 % or 60 %, the inverter limits the power to 30 % or 60 %. With a setting of 0 %, the inverter disconnects from the grid, and 100% is used for normal grid feed mode.

When the power supply company requests a reduction in the power, the Powador-proLOG receives the corresponding signal via the radio ripple control receiver. The Powador-proLOG then forwards the information to all connected inverters as a command via the RS485 interface. After a period of five minutes without any signal from the power supply company, the inverters return to normal operation.

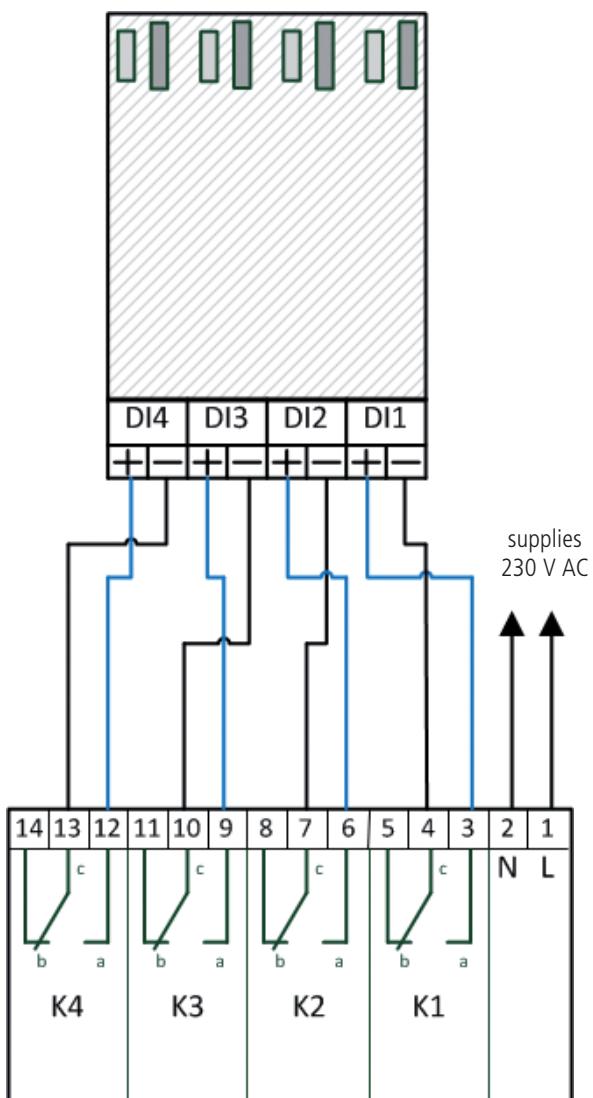
Connection

The radio ripple control receiver is connected to the Powador-proLOG XL, which is mandatory for the use of KACO power control. You do not have to make any changes to the inverter in order to use the KACO power control function, since it is integrated into the inverter as standard. It is activated and configured using the Powador-proLOG XL web server or the integrated display on the Powador-proLOG XL.



KACO Power-Control

Adapter board



Radio ripple control receiver

Relaiscontact



ATTENTION

To use the KACO power control function, you must insert the adapter board. This is included in the scope of delivery of each Powador-proLOG XL unit. In other words, you must remove the standard plug connector and insert the adapter board instead. Now connect the radio ripple control receiver to the adapter board.

5.6 Pin assignment



RJ45 socket

Left: Pin 1

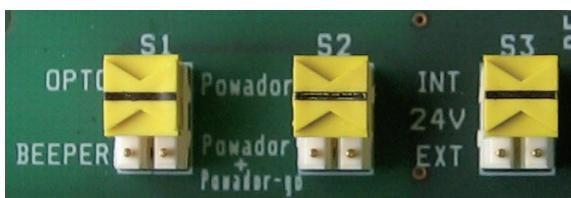
Right: Pin 8

PIN	Phone	ISDN
	Analog	
1		
2		
3		STA / (B2)
4	b= minus	SRA / (B1)
5	a= plus	SRB / (A1)
6		STB / (A2)
7		
8		

PIN	Ethernet	Function
	Name	
1	TPTX-	Transmit Data
2	TPTX+	Transmit Data
3	TPTX+	Transmit Data
4		
5		
6	TPTX-	Transmit Data
7		
8		

PIN	Powador-go	Function
	Name	
1	+12V...24V	supply
2	+12V...24V	supply
3	+12V...24V	alarm output
4	b= plus	data link
5	a= minus	data link
6	GND	alarm output
7	GND	supply
8	GND	supply

5.7 Jumper switch (M/XL only)



The Powador-proLOG M/XL has three jumper switches located on the circuit board. You can set the following operating modes:

OPTO <-> BEEPER

You can set the jumper to OPTO or BEEPER.

OPTO: Only the D0 output is activated.

BEEPER: The D0 output and the internal horn are activated.



NOTE

The BEEPER should only be active when the D0 output is used as an alarm output.

Powador <-> Powador+Powador-go

You can set the jumper to Powador or Powador+Powador-go. Powador: The RS485 signal is only present at the "B A RS485" terminal strip. Only the Powador inverters can be operated.



IMPORTANT

If only inverters are connected (without current sensors), make sure the jumper is set to "Powador". Otherwise, you cannot communicate with the inverters.

Powador+Powador-go:

The RS485 signal is present at the "B A RS485" terminal strip and at the "Powador-go" RJ45 sockets. The current sensors and the inverters can be operated together.



NOTE

The RS485 signal is internally bridged from the "RJ45" "Powador-go" socket to the "B A RS485" terminal strip using the "Powador+Powador-go" jumper setting.

24 V internal <-> 24 V external

You can set the jumper to INTERNAL or EXTERNAL. This jumper affects the front socket of the "24 V external" connection.

INTERNAL:

The Powador-go units draw their power from the internal power supply of the Powador-proLOG.

EXTERNAL:

An external voltage supply for the Powador-go units can be connected to the "24 V external" terminal strip.

Reset

Use the reset button to restart the Powador-proLOG.



6 Start-Up

6.1 Procedure



ATTENTION

Make sure that everything is properly connected (polarity) and that all inverters are addressed (RS485 address). For more information, see the inverter manual.

1. Switch on the Powador-proLOG
Connect the supply voltage to switch on the unit. After the supply voltage has been connected, the "Power" LED must remain lit.



NOTE

The system needs about two minutes to be completely initialised. This process is similar to starting up (booting) a PC. The completion of the boot phase is indicated by the status LED: The status LED is off during the boot phase and only starts to flash after it is completed.

2. Check the status LEDs
The status LED provides information about the unit's status after it has been started up:

Status LED is off -> System is starting up

Status LED is flashing steadily -> System is ready

3. This is the most important part of start-up. Once the system has started up (Power LED is lit/Status LED is flashing), you should connect to the Powador-proLOG with your computer to check whether all inverters are answering over the RS485 line and whether all connected sensors are providing data.
See section 7 ("Establishing a Connection") of this manual for information on how to connect to the Powador-proLOG with your computer.

6.2 Using the Powador-proLOG with Powador-web

1. You do not have to configure the data logger on site. You must ensure that the inverters and sensors have been connected correctly. Make sure that the telephone connection (analogue, ISDN) and the Internet connection (Ethernet) or SIM card (GSM/GPRS) are functioning correctly. It must be possible to access the data logger using a PC/laptop (assign IP address). In the case of network devices (Ethernet), you should also have the free TeamViewer software installed on your PC/laptop to ensure trouble-free service.
As soon as you have managed to meet these requirements, please contact the

KACO new energy monitoring service.

2. Once KACO new energy has confirmed that your data logger is communicating with the portal please send the completed application form to the monitoring service.
You can download the application form from our website: "www.kaco-newenergy.de".



NOTE

You can use what is known as the "posbox" function to test the connection to the Powador-web. To do this go to Admin monitoring » Network » Postbox).

6.3 Using the Powador-proLOG without Powador-web

1. Once you have successfully connected to the Powador-proLOG, you should configure the unit to meet your requirements (inverter, analogue/digital channels, alarm notification and data transmission).
2. You can use the "Installation Wizard") to configure and check the measured data of the Powador-proLOG. It will guide you through the installation process one step at a time.
You can also use the "Expert" page" to configure and check measured data.
For more information, see section 8 ("Menu Description").

6.4 Display menu and status LEDs

6.4.1 Meaning of the four status LEDs

"Power" LED

Remains lit: the unit is supplied with power
Is not lit: there is a fault in the voltage supply

"Status" LED

Is not lit: the system is just starting up (boot phase)
Flashing: the system loaded successfully (normal operation)

"Connect" LED

Is not lit: currently there is no connection via analogue modem, ISDN or GSM
Flashing: the connection to the remote station is being established

Remains lit: the connection was successfully established

"Alarm" LED

Is not lit: normal operation
Remains lit: the unit issues an alarm signal via alarm output D0 (provided it was appropriately configured)

6.4.2 Display menu

The integrated display allows you to make settings (e.g. IP address for the Powador-proLOG) or search for inverters during installation.

You can also query current measured values and stored energy yields while the unit is operating.

Navigating through the display menu:

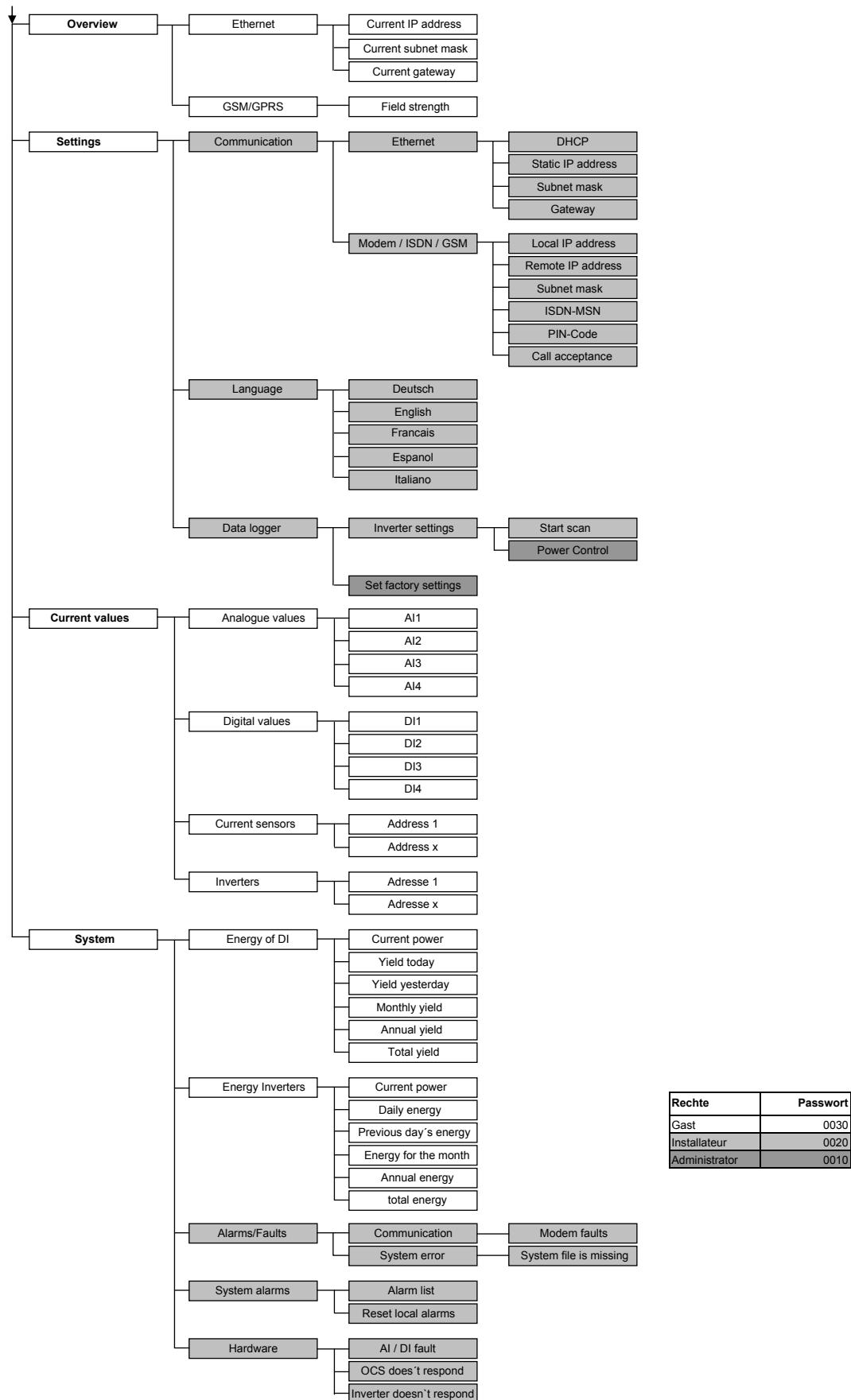
EXIT: - Cancel input
 - Go back one menu level

DOWN: - Select a menu item below this point
 - Lower the number

UP: - Select a menu item above this point
 - Increase the number

ENTER: - Confirm input
 - Go down one menu level
 - Go to the next menu level

6.4.3 Display menu structure: Description of the menu items



Description of the menu items:

Overview

You can see the current TCP/IP settings for your Ethernet connection here. For GSM/GPRS units, you can also query the field strength.

▲ Ethernet

- Current IP address: Shows the current IP address that is used in the LAN.
- Current subnet mask: Shows the current subnet mask that is used in the LAN.
- Current gateway: Shows the current gateway that is used in the LAN.

▲ GSM/GPRS

- Field strength: Indicates the field strength.

Settings

In the "Communication" section, you can make numerous communication settings, e.g. change IP addresses or set the PIN code for the GSM card. You can set the respective local language in the second section, which is the "Language" section. In the third section, which is the "Data logger" section, you can trigger an inverter scan and activate the power control function. You can also reset the data logger to its factory settings.

▲ Communication

- Ethernet
 - Boot protocol
 - none: No boot protocol is used.

DHCP (Dynamic Host Configuration Protocol):
A DHCP server assigns an IP address to the Powador-proLOG.

BOOTP (bootstrap protocol):
The BOOTP server assigns an IP address to the Powador-proLOG.

RARP (Reverse Address Resolution Protocol):
A RARP server assigns an IP address to the Powador-proLOG.

→ Static IP address:
The IP address that is used when no boot protocol was selected.

→ Subnet mask:
The subnet mask that is used when one was not assigned by the BOOTP/DHCP server.

→ Gateway:
The gateway that is used when one was not assigned by the BOOTP/DHCP server.

- Modem/ISDN/GSM
 - Local IP address:
The IP address that the Powador-proLOG has in the WAN.
 - Remote IP address:
The IP address that the caller must have on the WAN
 - Subnet mask:
The subnet mask in the WAN
 - MSN (ISDN only): MSN setting
 - PIN Code (GSM only): GSM pin setting

▲ Data logger

- Inverter settings
- Start scan: Use this option to search for inverters.
- Activate power control
- Set factory settings
Reset to factory settings.

Current values

The current measured values are displayed here. Various queries are possible, depending on which units are connected.

- ▲ Analogue values
Shows the analogue measured values.
- ▲ Digital values
Shows the digital measured values.
- ▲ Current sensors
Shows the measured values for the current sensors
- ▲ Inverters
Shows the current power of the individual inverters.

System

In the "Power/Energy" section, you can read the current total power and the energy that is fed in during various time periods. The "Alarms/Faults" section shows messages about faults detected in the system.

▲ Energy of DI

If at least one digital channel was selected to calculate the overall system power, the relevant measured value will be displayed in the following submenus.

- Current power
- Yield today
- Yield yesterday
- Monthly yield
- Annual yield
- Total yield

▲ Energy Inverters

If the inverters were selected to calculate the total system power and energy, the relevant measured value will be displayed in the following submenus.

- Current power
- Daily energy
- Previous day's energy
- Energy for the month
- Annual energy
- Total energy

▲ Alarms/Faults

- Communication
 - Modem fault

A fault occurred while establishing the modem connection
- System error:
 - System file is missing

A file that is needed by the system is missing.
- System alarms
 - Alarm list

A list of the system alarms that were triggered.
 - Reset local alarms

Reset the local alarm at D0.
- Hardware
 - AI/DI fault

Analogue/digital input fault
 - OCS does not respond

No reply from the current sensor
 - Inverter does not respond

No reply from the inverter

Factory settings:

Network:	IP address:	192.168.100.50
	Subnet mask:	255.255.255.0
Modem:	IP address:	192.168.200.1
	Remote IP address:	192.168.200.51
	Subnet mask:	255.255.255.255
	Analogue :Call acceptance active	
	ISDN:	MSN deleted
	GSM:	PIN code is 4321

6.5 Powador-proLOG XL with GSM/GPRS modem

6.5.1 General information

To ensure optimum operation of the Powador-proLOG, we recommend that you take advantage of the agreement that we offer. The costs for this agreement are passed on one to one.



IMPORTANT

If you use a different contract, KACO new energy will not be able to provide you with support due to recurring problems with the various network providers.

The alternatively used GSM/GPRS data card must have the following properties:

- You should be able to call the data card using an analogue modem. For this reason, the card's data telephone number is required. You usually receive another number for data traffic from your grid operator.
- You must be able to send e-mail (with attachments).
- The transfer rate is 9.6 kBit/s.
- The card does not require storage space.
- The data volume is approx. 100 kB per day, assuming the data is sent once per day by e-mail (without alarms).
- A CSD (Circuit Switched Data) data service must be activated.

6.5.2 Inserting a SIM card



ATTENTION

Be sure to ground yourself before touching any of the electronic components.

1. Open the housing

To insert the SIM card, first open the housing. To do so, remove the two housing screws on the front of the unit. The SIM card slot is located at the rear of the connection box on the top part of the modem.

2. Insert the SIM card

With the chip facing up, slide the SIM card into the holder. The card will lock automatically. To unlock it again, lightly push the SIM card forward.



3. Connect the antenna

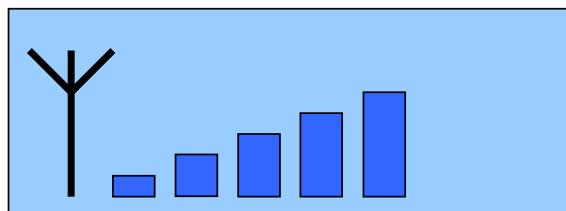


The antenna connection is located in the connection area, next to the 230 V grid connection. Connect the included antenna here.

4. Start the Powador-proLOG

On delivery, the PIN number of the Powador-proLOG is 4321. The PIN numbers for the SIM card and the Powador-proLOG must be identical. If this is not the case, the card cannot be registered and will be blocked after a certain period. Use the display to check and/or change the PIN number for the Powador-proLOG.

Once the Powador-proLOG has successfully started, you can read the reception status on the display:



7 Establishing a Connection

7.1 Hardware and software requirements

If the Powador-proLOG has an internal analogue modem, you have to use an analogue modem for communication. If the Powador-proLOG has an internal ISDN modem, the PC also has to have an ISDN modem for communication. A table of the connections that are possible is contained in section 4.

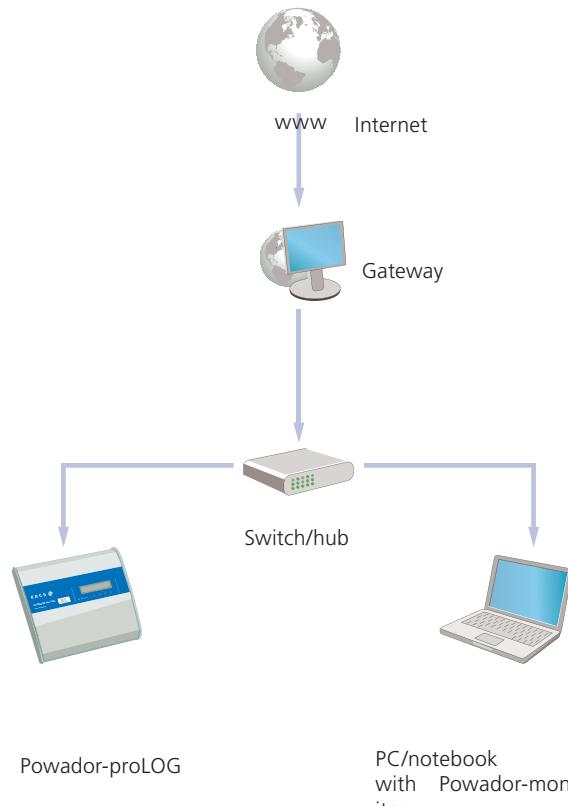
Hardware

Standard PC with modem (analogue or ISDN) for a Powador-proLOG with modem, or Ethernet network connection for a Powador-proLOG with Ethernet connection, and the possibility to send e-mail over the network.

Software

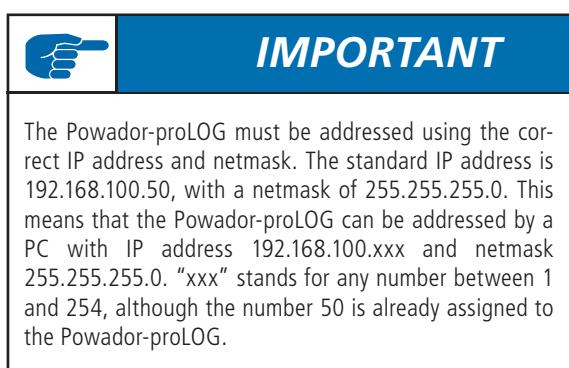
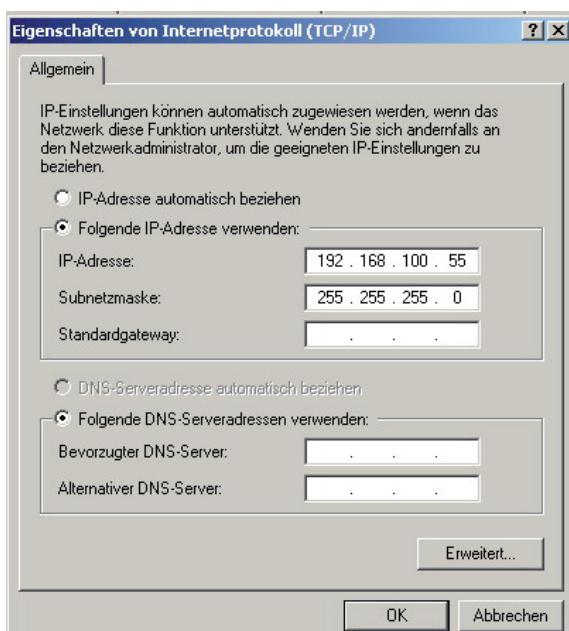
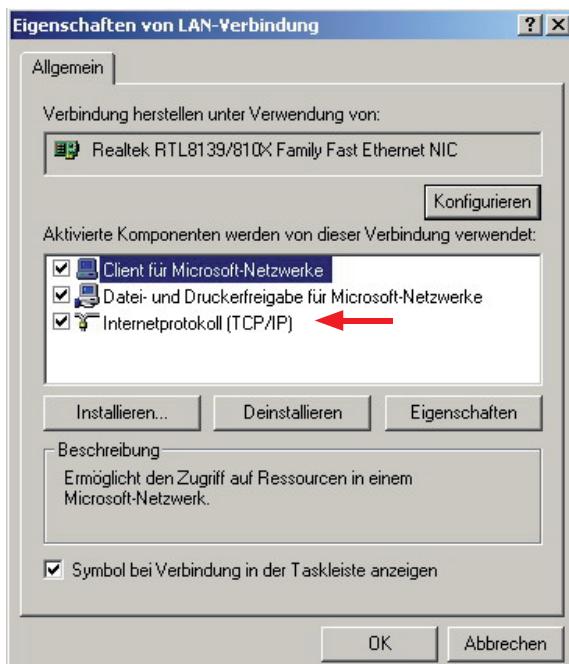
Internet browser: Internet Explorer 5.5/Netscape 6.1 (or later) with JavaScript activated.

7.2 Direct connection to a Powador-proLOG over a network (Ethernet)



The Powador-proLOG and the computer must be connected to the same network. The IP addresses and the netmask for the Powador-proLOG or computer must be in the same address space. As soon as these requirements have been met, you can use an Internet browser (e.g. Mozilla or Internet Explorer) to address the Powador-proLOG at its IP address.

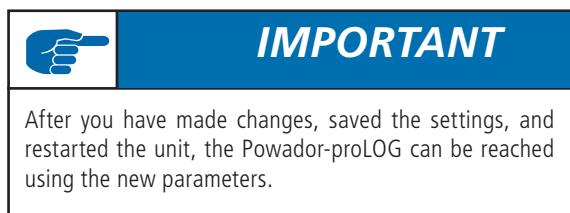
You can set the IP address in the "Network Connections" module in the Windows Control Panel.



Example:

IP address of the Powador-proLOG: 192.168.100.50
 IP address of the network card (computer): 192.168.100.55

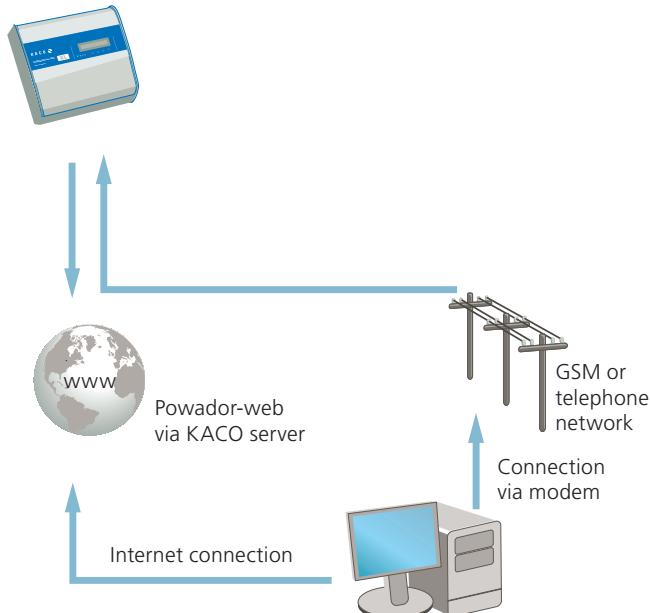
You can change the Powador-proLOG's settings for IP address, netmask and gateway via "Admin monitoring -> Network -> Settings"). Depending on your settings, the IP address may vary. In this case, enter the correct IP address in your browser instead of the standard address that is listed above.



7.3 Establishing a connection to a Powador-proLOG by modem

To connect to the Powador-proLOG from a PC, you have to set up a new dial-up connection. The instructions below are based on the example of Windows XP.

Powador-proLOG

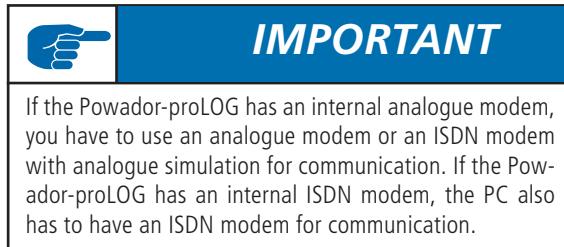


Windows XP

1. Step

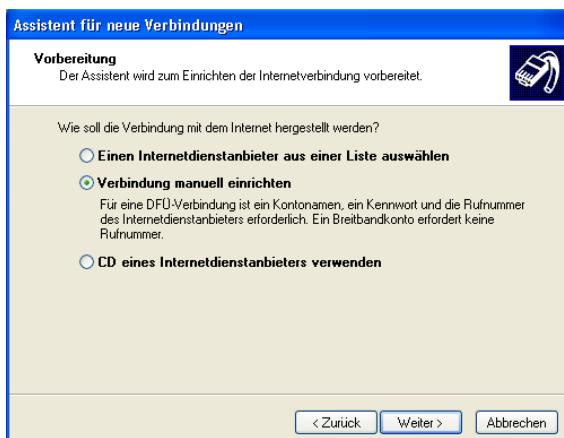
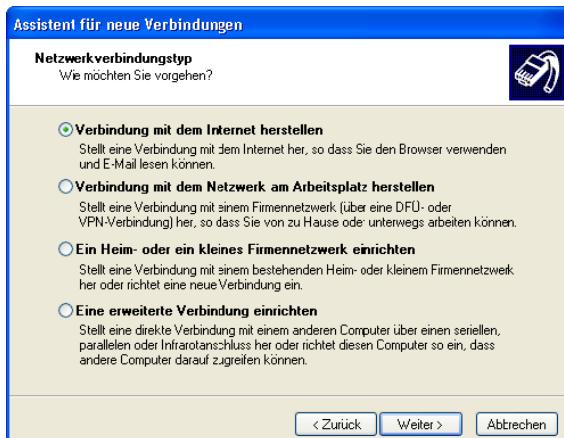
A suitable modem must already be connected to your PC and installed.

Access the "Network Connections" menu item by selecting "Start -> Settings -> Control Panel"). Now select the "New Connection Wizard".



2. Step

Select the "New Connection Wizard" and then click "Next". Now select the "Connect to the Internet" menu item. In the next window, select "Set up my connection manually". Select "Connect using a dial-up modem" in the following window.



Assistent für neue Verbindungen

Internetverbindung
Wie soll die Internetverbindung hergestellt werden?



Verbindung mit einem DFO-Modem herstellen
Stellt eine Verbindung mit einem Modem und über eine herkömmliche Telefonleitung oder eine ISDN-Telefonleitung her.

Verbindung über eine Breitbandverbindung herstellen, die Benutzername und Kennwort erfordert
Stellt eine Hochgeschwindigkeitsverbindung über ein DSL- oder Kabelmodem her. Internetdienstanbieter nennen diesen Verbindungstyp häufig PPPoE.

Verbindung über eine beständige aktive Breitbandverbindung herstellen
Stellt eine Hochgeschwindigkeitsverbindung über ein Kabelmodem oder eine DSL- oder LAN-Verbindung her. Diese Verbindung ist immer aktiv und erfordert keine Benutzeranmeldung.

< Zurück Weiter > Abbrechen

Assistent für neue Verbindungen

Zu wählende Rufnummer
Wie lautet die Rufnummer des Internetdienstanbieters?



Geben Sie die Rufnummer unten ein.

Rufnummer:
123456789

Sie müssen eventuell eine "1" bzw. eine Vorwahl oder beides einbeziehen. Wählen Sie die Rufnummer auf Ihrem Telefon, wenn Sie sich nicht sicher sind, ob diese zusätzlichen Nummern erforderlich sind. Die gewählte Nummer ist korrekt, wenn Sie bei dem Telefonanrufer einen Modenton hören.

< Zurück Weiter > Abbrechen

3. Step

Press the "Next" button to begin setting up your connection. First enter a name (of your choosing) which will be used later on to call up the connection. In the next window, enter the phone number for the Powador-proLOG.
In the window that follows, enter "admin" for both the user name and the password.

 **NOTE**

Check boxes 2 ("Make this the default Internet connection") and 3 ("Turn on Internet Connection Firewall for this connection") should be deactivated, because they could disrupt operation.
The following window is the final step in setting up the connection.

Assistent für neue Verbindungen

Internetkontoinformationen
Sie benötigen einen Kontonamen und ein Kennwort für die Anmeldung an Ihrem Internetkonto.



Geben Sie einen Kontonamen und ein Kennwort für den Internetdienstanbieter ein. Schreiben Sie diese Informationen auf und verwahren Sie sie an einem sicheren Ort. (Wenden Sie sich an den Internetdienstanbieter, wenn Sie den Kontonamen oder das Kennwort eines vorhandenen Kontos vergessen haben.)

Benutzername: MusterUser

Kennwort:

Kennwort bestätigen:

Diesen Kontonamen und Kennwort für die Internetverbindung aller Benutzer dieses Computers verwenden

Verbindung als Standardinternetverbindung verwenden

Internetverbindungsfirewall für diese Verbindung aktivieren

< Zurück Weiter > Abbrechen

Enter "admin" for both the user name and the password.

Assistent für neue Verbindungen

Verbindungsname
Wie lautet der Name des Internetdienstanbieters?



Geben den Namen des Internetdienstanbieters im folgenden Feld ein.

Name des Internetdienstanbieters
proLOG

Der hier eingegebene Name wird als Name für die zu erstellende Verbindung verwendet.

< Zurück Weiter > Abbrechen

Assistent für neue Verbindungen

Fertigstellen des Assistenten



Die erforderliche Schritte zum Erstellen der folgenden Verbindung wurden ordnungsgemäß durchgeführt:
proLOG

- Für alle Benutzer dieses Computers freigeben
- denselben Benutzernamen und dasselbe Kennwort für

Die Verbindung wird im Ordner "Netzwerkverbindungen" gespeichert.

Verknüpfung auf dem Desktop hinzufügen

Klicken Sie auf "Fertig stellen", um diese Verbindung zu erstellen und den Vorgang abzuschließen.

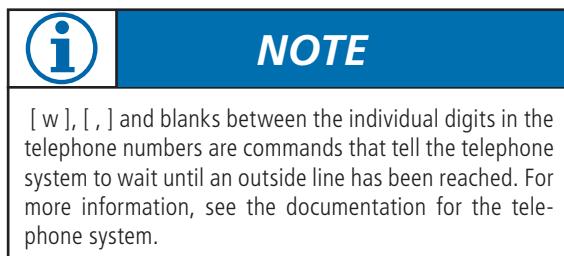
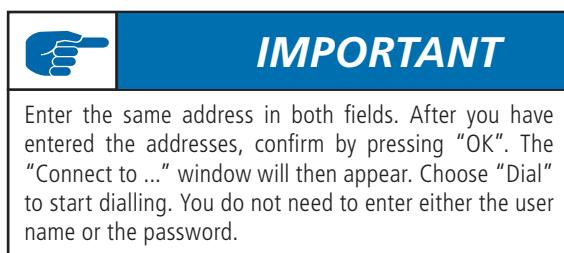
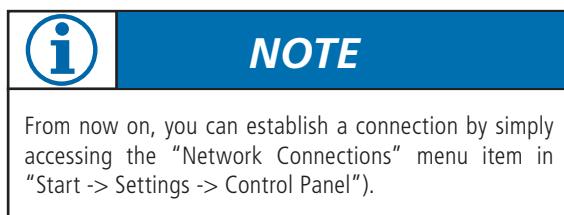
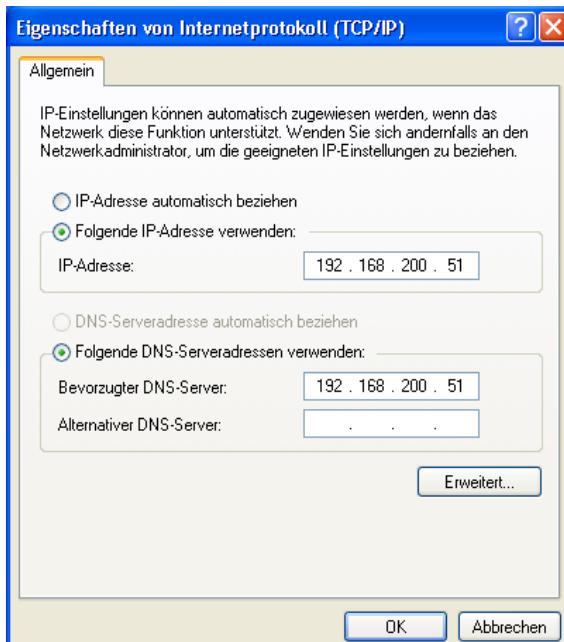
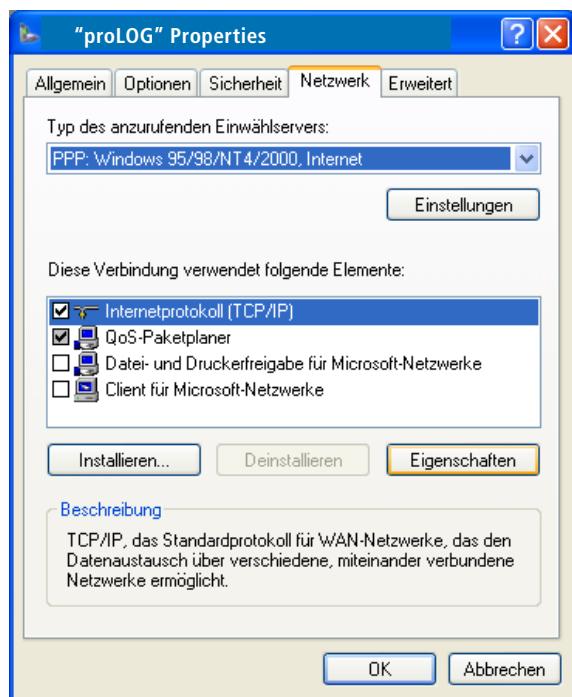
< Zurück Fertig stellen Abbrechen

 **NOTE**

When you enter the telephone number, remember to include any prefixes that may be required to dial out. The most common dial-out prefix is a preceding "0".

4. Step

After you have finished setting up the connection, the "Connect to ..." window appears. First press the "Properties" button and then access the "Networking" tab in the following window. Place a check next to "Internet Protocol (TCP/IP)" and then click on "Properties". Activate the "Use the following IP address" and "Use the following DNS server addresses" options and then enter "192.168.200.51" in each of the address fields.



5. Step

Once the connection has been made, your browser (e.g. Netscape 6.1) opens, and the unit's IP address is entered in the address bar. The standard address is: <http://192.168.200.1>. Confirm this address to access the start page for the Powador-proLOG.

7.4 Powador-web

Powador-web is an Internet portal that allows for a comprehensive evaluation and visualisation of photovoltaic systems together with the Powador-proLOG. The password-protected portal provides you with secure and worldwide access to your system data.

As administrator, you can configure which data is displayed.

Highlights

- Professional remote monitoring
- Graphical presentation of measured values
- Compatible with all operating systems
- Automatic data transmission
- Comprehensive alarm parameters
- Alarm notification via e-mail, fax or SMS (text message)
- Summary of your systems for one farm
- KACO new energy configures portal and data logger based on the application form (which is available at www.kaco-newenergy.de).
- Low annual fee

Advantages of Powador-web

- Worldwide access to measured data
- Satellite data updated daily
- Basic data is the same for each user
- Updates are made centrally
- No installation necessary
- Extremely high level of data security and availability
- Hourly updates
- Custom alarm notification

The Powador-web Internet portal must be requested separately. Set-up and usage are subject to various costs. The application form is available for download from the KACO new energy website. To avoid your application being delayed, the application form must be completed in full. We have activated a sample system at

<http://www.kaco-newenergy.de>

so that you can familiarise yourself with what Powador-web can do. A link to "KACO Plant 3" in Neckarsulm is located on the right-hand side of the homepage. Because this system is accessible to everyone, it has a limited range of functions.

Once Powador-web has been completely set up and is ready to use, KACO new energy will send you the access data for your system.


IMPORTANT

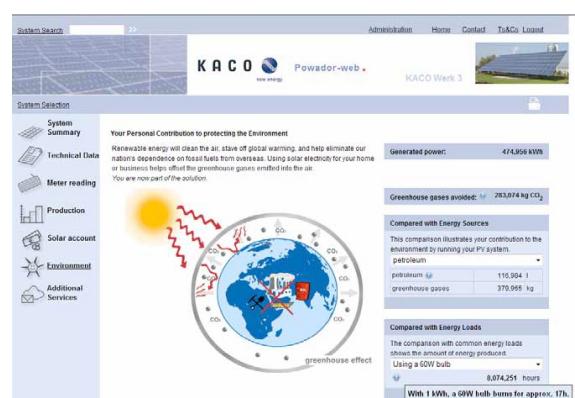
The "Java JIT compiler enabled" option must be activated (under "Tools -> Internet Options -> Advanced" in Internet Explorer). Also make sure that your browser and firewall allow pop-up windows from our "www.kaco-new-energy.de" page.



You can find the daily yield of your PV system under "Evaluation".



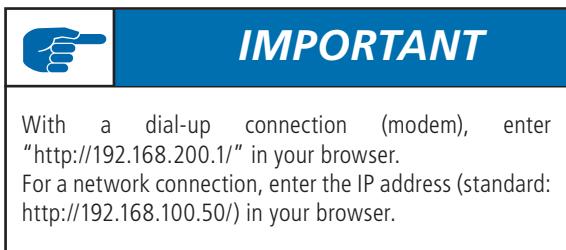
You can find a list of the total annual yield of your PV systems under "Solar account".



To find out what kind of difference you are making personally in the quest for an environmentally friendlier future, go to "Environment".

8 Menu Description

Once you have established a dial-up or network connection, you can access the menu structure for the Powador-proLOG in your browser.



The Powador-proLOG's Start Center is divided into two menu items:

- Installationsassistent (Installation Wizard)
- Profiseite (Expert Page)



The Installation Wizard has been designed to make it as easy as possible for the user to set up the data logger. The installation procedure comprises 14 steps. Help is provided for each step.

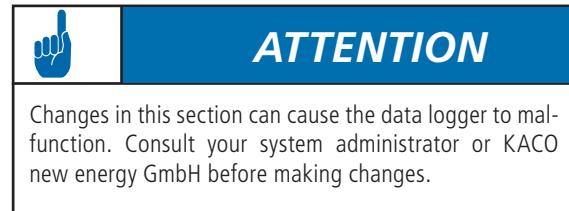
- 01 System time
- 02 System data
- 03 Contact data
- 04 Connections
- 05 Send data and alarms
- 06 Test connections
- 07 Measurement equipment: analogue
- 08 Measurement equipment: digital
- 09 Measurement equipment: inverter scan
- 10 Measurement equipment: energy comparison configuration
- 11 Test measurement equipment
- 12 Monitoring
- 13 Digital output
- 14 Final report

The expert page is intended for experienced users. The following menu items show the start page:

- 8.1 General
- 8.2 Online values
- 8.3 Status
- 8.4 Configuration

The following additional menu items can be accessed by the administrator:

- 8.5 Admin monitoring and
- 8.6 Admin measurement



8.1 General

The start page shows the most important information for the system.

Hardware:

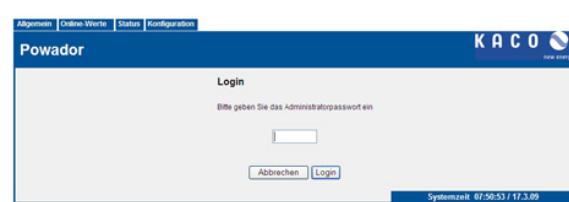
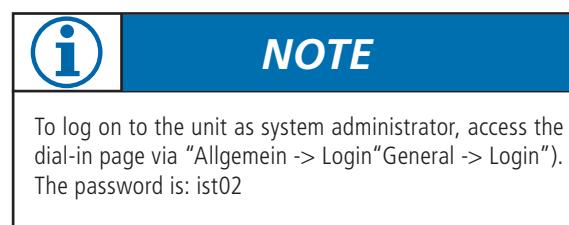
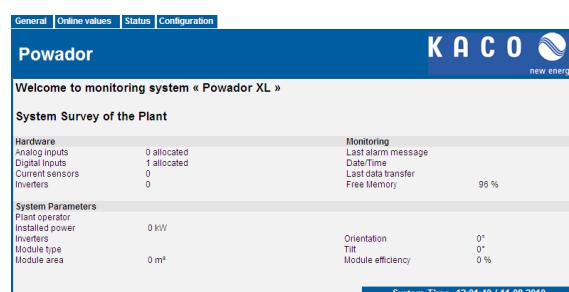
This section provides an overview of occupied channels and available bus devices.

Monitoring:

This section shows the last fault message that occurred, and when it occurred. The last data transmission is also shown. The field strength is indicated for GSM/GPRS units.

System parameters:

These entries provide information about the connected photovoltaic system.



HTML menu

General Information	Online values	Status	Configuration	Admin monitoring	Admin measurement
Logout	Analogue/digital	System messages	System data	Network »	Analogue Channels
Start page	Current sensors	Inverters	Standard contact	Contact addresses »	Digital Channels
	Powador-Argus		Date/time	Switching output	Extension Modules
	Inverter overview			System messages	Current sensors
	Inverter details			Inverters	Powador-Argus
	Active power/idle power control			Powador-Argus	Inverters
				Formulas »	Active power/idle power control »
				Status alarms »	Energy of digital inputs
				Website password	Energy of inverters
					Time synchronisation

8.2 Online values

This section shows various measured values from the sensors and counters that are connected to the analogue and digital inputs. If inverters are connected to the RS485 interface, you can also query the inverter values.

8.2.1 Analogue/digital

Online-Werte » Analog / Digital					
Summe ausgewählter Digitaleingänge					
Bezeichnung	Wert	Einheit	Bezeichnung	Wert	Einheit
Aktuelle Leistung	1.576	kW	Aktuelle Monatsenergie	3.930	kWh
Aktuelle Tagesenergie	0.117	kWh	Aktuelle Jahresenergie	3.930	kWh
Tagesenergie Vortag	0.000	kWh	Gesamtenergie	3.930	kWh

Example:

The system consists of two sub-systems, which have separate counters connected to the Powador-proLOG. To get the proper totals, activate the two sub-counters for consideration under "Admin measurement -> Energy of digital channels")

An overview of the system's overall energy production is provided here. You can define how this overall total is calculated in the > Admin measurement -> Energy of digital channels") section.

Details of the digital inputs:

Details Digitaleingänge								
Kanal	Bezeichnung	Aktuelle Leistung	Minimum	Maximum	Einheit	Zählerstand	Einheit	
1	Einspeisezähler	1.443	0.000	1.770	kW	95.562	kWh	
2	Verbrauchszähler	0.000	0.000	0.584	kW	30.324	kWh	

This section lists the measured values for each digital input.

Maximum:

The highest measured value for the current day

Current power:

The pulse constant is used to convert counter pulses to the corresponding power over a specified period of time. (Power displayed in kW.)

Counter reading:

This column shows the overall total for the measured pulses. You can calibrate this display with the actual value on the energy counter. (See the "Admin measurement -> Digital channels") menu item; displayed in kWh).

Minimum:

The lowest measured value for the current day

Details of the analogue inputs:

Details Analogeingänge					
Kanal	Bezeichnung	Wert	Minimum	Maximum	Einheit
1	Einstrahlung in Modulebene	322	96	478	W/m²
2	Temperatur Modul	13.8	5.7	13.7	°C
3	Umgebungstemperatur	8.1	4.7	8.3	°C

Analogue values are shown with channel number and designation. The following information is provided:

Minimum:

The lowest measured value for the current day

Value:

Current online value (updated every 10 seconds)

Maximum:

The highest measured value for the current day

8.2.2 Current sensors

If current sensors (Powador-go) are connected, the current measured values of the current sensors are shown here.

Online-Werte » Stromsensoren					
Aktualisieren	Adresse	Stromwert	Minimum	Maximum	Einheit
	0	1.64	0.00	4.11	A
	1	1.51	0.00	3.93	A
	2	1.57	0.00	4.11	A
	3	1.51	0.00	4.00	A
	4	1.57	0.00	4.04	A
	5	1.54	0.00	4.01	A
	6	1.53	0.00	3.99	A
	7	1.56	0.00	4.05	A
	8	1.55	0.00	3.99	A
	9	1.57	0.00	3.96	A
	10	1.61	0.00	4.06	A
	11	1.80	0.00	4.08	A
	12	1.86	0.03	4.18	A
	13	1.53	0.00	3.86	A

8.2.3 Inverter overview

If inverters are connected and properly addressed, current and accumulated measured values are shown here. Total yields are displayed in the "Total for all inverters" section. The "Overview of individual inverters") section lists all connected inverters, including address, unit status, current feed-in power and daily yield that was reached at the time of the query. Each inverter address is linked to the inverter details.

Online-Werte » Wechselrichter-Ubersicht						
Summe aller Wechselrichter		Bemerkung		Bemerkung		
Adresse	Leistung	Einheit	Tagsenergie	Wert	Einheit	
Aktuelle Leistung	9.388	kW		Aktuelle Monatsenergie	2524.281	kWh
Aktuelle Tagesenergie	6.678	kWh		Aktuelle Jahresenergie	10025.340	kWh
Tagesenergie Vorgag	176.478	kWh		Gesamtenergie	81020.813	kWh
Übersicht einzelner Wechselrichter						
Adresse	Leistung	Einheit	Tagsenergie	Wert	Einheit	
1	2990	W	2133	Wih		
1/1	1025	W	713	Wih		
1/2	978	W	717	Wih		
1/3	987	W	703	Wih		
2	2925	W	2096	Wih		
2/1	1011	W	709	Wih		
2/2	963	W	699	Wih		
2/3	952	W	688	Wih		
3	3215	W	2230	Wih		
3/1	1107	W	772	Wih		
3/2	1116	W	767	Wih		
3/3	992	W	691	Wih		
4	112	W	66	Wih		
5	188	W	145	Wih		
6	21	W	12	Wih		
7	9	W	2	Wih		
8	0	W	0	Wih		

Anmerkung: Die hervorgehobenen Werte werden alle 20s aktualisiert.

8.2.4 Inverter details

This section shows all of the inverter's measured values. You can only select one inverter at a time from the drop-down list.

Online-Werte » Wechselrichter-Details					
In der Auswahlliste können Sie die angeschlossenen Wechselrichter auswählen.					
Auswählen	Anzeige	Bemerkung	Kürzel	Wert	Einheit
3/1 Powador 3000n/1		Wechselrichter 3/1	S		
	Aktualisieren	Betriebsart / Status	U_DC_0	452.9	V
		Generatortension	L_DC_0	2.59	A
		Generatortstrom	P_DC_VR	1132	W
		Generatorerlösung	U_AC_0	229.5	V
		Netzspannung	I_AC_0	4.33	A
		Netzstrom	P_AC_VR	1018	W
		Leistung an Netz:	T_VR	12	°C
		Gerätetemperatur	E_DC_VR	772	Wih
		Tagesenergie			

8.3 Status

8.3.1 System messages

This menu item provides an overview of the possible alarm statuses.

The **measured value alarms** result from the criteria specified in "Admin monitoring -> Formulas -> Criteria 0-4". The status overview lists the following information:

- Designation:
The name that was defined in Formula -> Criterion") is shown here.
- Status:
Indicates whether the criterion is defined as active or inactive.
- Upper limit:
This shows the current upper limit value for the monitoring criterion.
- Actual value:
This shows the current actual value for the monitoring criterion.
- Lower limit:
This shows the current lower limit value for the monitoring criterion.
- Alarm counter:
This shows how often the criterion exceeded a limit value.
- Sending status:
Indicates whether there are currently alarm messages that are waiting to be sent.
- Information:
This shows when the last alarm occurred.

The system alarms relate to messages that are based on faults in the monitoring system.

- Designation:
The reason for the error message is shown here.
- Alarm type:
Information about the type of e-mail/fax alarm message.
- Alarm destination:
Shows which contact the error message was sent to.
- Alarm counter:
This shows how often the alarm was tripped.
- Sending status:
Indicates whether there are currently alarm messages that are waiting to be sent.
- Info Information:
This shows when the last alarm occurred.

The **Sending status of e-mails** status shows the system's current status. For example, if e-mails are waiting to be sent, "busy" is shown in the "sendstate" field. The normal status is "Ready to Send".

Status » Anlagenmeldungen							
Messwertalarme Bezeichnung	Status	Oberer Grenze	Ist-Wert	Untere Grenze	Alarmzähler	Versandstatus	Info
Vergleich Energie - Zeit E_Z_Pv2/E_Z_Pv1	inaktiv	0.00	0.00	0.00	0	-	
E_Z_Pv3/E_Z_Pv2	inaktiv	0.00	0.00	0.00	0	-	
E_Z_Pv4/E_Z_Pv2	inaktiv	0.00	0.00	0.00	0	-	

Anlagenalarme Bezeichnung	Alarmart	Alarmziel	Alarmzähler	Versandstatus	Info

Versandstatus der E-Mails						
Sendestatus:	Bereit zum Senden					
Folgende E-Mail wird im Moment versendet oder ist für den Versand vorgesehen:						

8.3.2 Inverters

The "Fault messages" section shows when the last alarm message occurred, including alarm destination and mode of communication). The "Brief information" section lists all connected inverters with their address and unit status.

Status » Wechselrichter						
Störungsmeldungen Bezeichnung	Alarmart	Alarmziel	Alarmzähler	Versandstatus	Info	
Kurzinfo						
Adresse	Status					
01	MPP-Regler, ständige Suchbewegung (4)					
01/1	MPP-Regler, ständige Suchbewegung (4)					
01/2	MPP-Regler, ständige Suchbewegung (4)					
01/3	MPP-Regler, ständige Suchbewegung (4)					
02	MPP-Regler, ständige Suchbewegung (4)					
02/1	MPP-Regler, ständige Suchbewegung (4)					
02/2	MPP-Regler, ständige Suchbewegung (4)					
02/3	MPP-Regler, ständige Suchbewegung (4)					
03	MPP-Regler, ständige Suchbewegung (4)					
03/1	MPP-Regler, ständige Suchbewegung (4)					
03/2	MPP-Regler, ständige Suchbewegung (4)					
03/3	MPP-Regler, ständige Suchbewegung (4)					
04	MPP-Regler, ohne Suchbewegung (5)					
05	MPP-Regler, ohne Suchbewegung (5)					
06	MPP-Regler, ohne Suchbewegung (5)					
07	MPP-Regler, ohne Suchbewegung (5)					
08	MPP-Regler, ohne Suchbewegung (5)					

8.4 Configuration

8.4.1 System data

System data is required at various times. In the Powador-proLOG, the information is used on the title page to provide a quick system overview. The system data is provided in the "Admin monitoring -> Formulas") section to define fault messages.

This is where you enter data about the operator, the system power, the module types, orientation, etc. You can also make settings related to error message sending, scanning rate, and so forth.

- System designation:
This entry appears on the start page and is included in all alarm messages.
- Operator:
For documentation purposes only.
- Installed power:
Used when calculating alarm criteria
- Module area:
Used when calculating alarm criteria
- Degree of efficiency of modules):
Used when calculating alarm criteria
- Degree of efficiency of inverters:
Used when calculating alarm criteria
- Number of sub-systems:

Used when calculating alarm criteria

- Storage interval:
Data compression every 300, 600, 900, 1800, 3600 seconds
- Orientation:
The system's orientation
- Angle of inclination:
The angle of inclination of the modules
- Module type:
Module data
- Inverter type:
e.g. Powador 5000xi
- E-mail contact for sending data:
Destination for sending measured data
- Data transmission: On/Off
- Dial-out prefix:
Number required to reach an outside line (depends on the telephone system)
- Tone or pulse dialling:
Dialling method setting
- Time-out (analogue modem):
Maximum time between two bell signals
- Language:
You can choose between German and English.
- Call acceptance: On/Off
You can limit call acceptance on the data logger to a specific time. More information can be found on the next page.
- Bell signals (analogue modem)):
Number of bell signals until the Powador-proLOG answers
- Contact for sending the daily file by fax:
The daily files can also be sent by fax at a specific time. Options: Inactive, Contacts 1-4), Standard contact.

Anlagenbezeichnung	KACO Werk 3
Betreiber	Kaco
Installierte Leistung	111.09 kW
Modulfläche (gesamt)	800.55 m²
Wirkungsgrad der Module	0 %
Wirkungsgrad der Wechselrichter	0 %
Anzahl der Teilanlagen	7
Speicherintervall	900 s
Orientierung	
Neigung	
Modultyp	
Wechselrichtertyp	
E-Mail-Kontakt für Datenversand	Datenbankserver
Datenversand	<input checked="" type="radio"/> Ein <input type="radio"/> Aus
Amtsholung	0.
Ton- oder Pulswahl	<input checked="" type="radio"/> Ton <input type="radio"/> Puls
Auszeit nach Klingelzeichen (nur analog. Modem)	8 s
Sprache	Deutsch
Rufannahme	<input checked="" type="radio"/> Ein <input type="radio"/> Aus
Klingelzeichen (nur analog. Modem)	1
Kontakt für den Versand der Tagesdatei per Fax	inaktiv
Uhrzeit für den Versand (0:00 bis 23:00)	0 : 05

Additional settings when call acceptance = "off"

- Start time for call acceptance:
Time that the unit begins answering
- Stop time for call acceptance:
Time that the unit stops answering
- Bell signals (analogue modem):
Number of bell signals until the Powador-proLOG answers
- Time for call acceptance after reset:
Time (in seconds) indicating how long the unit can be reached for after a restart

Rufannahme	<input type="radio"/> Ein <input checked="" type="radio"/> Aus
Startzeit Stunde Rufannahme (nur analog. Modem)	0 .00 Uhr
Stopzeit Stunde Rufannahme (nur analog. Modem)	0 .00 Uhr
Klingelzeichen bei Rufannahme (nur analog. Modem)	1
Zeitdauer Rufannahme nach Reset in s (nur analog. Modem)	600 s



8.4.2 Standard contact

The default setting for the Powador-proLOG is to have all alarm messages and measured value files sent to the address indicated in the "Standard contact" field. You can make changes to individual alarm criteria, system messages, and system parameters.

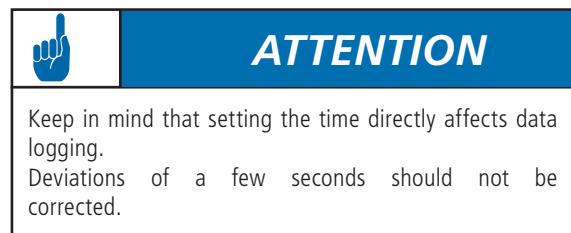
- Company/Person:
The company or person that is entered in this field is the name of the contact and is displayed in the selection boxes for addressing an alarm message.
- Street, postal code, telephone number, contact person:
For documentation purposes only.
- Mobile:
Mobile phone number for alarm notification by SMS (text message);
the mobile phone number may not contain formatting characters.
- Fax:
Fax number for alarm notification by fax;
the fax number may not contain formatting characters.
- E-mail:
E-mail address for alarm notification by e-mail (max. 40 characters)

Firma / Person	Kaco
Strasse	Werner Heisenberg Straße
PLZ	
Ort	Erlenbach
Mobiltelefon	
Ansprachpartner	Kachel, Daniel
Fax	
E-Mail	Daniel.Kachel@kaco-newenergy.de

Funktion des Standardkontakte:
In der Voreinstellung des Datenloggers werden alle Alarmmeldungen sowie die Messwertdaten an den Standardkontakt geschickt. Sie können diese Einstellung bei den einzelnen Alarmarten, Anlagemeldungen oder bei den Anlagenparametern ändern, sofern sie die Berechtigung haben.

8.4.3 Date/Time

This is where you set the time and date.



Konfiguration > Datum / Uhrzeit

Neues Datum (dd.mm.yj)	17 .3 .9
Neue Systemzeit (hh:mm:ss)	8 :55 :6
Abbrechen Speichern	

Bitte beachten Sie, dass die Einstellung der Uhrzeit direkte Auswirkungen auf die Datenprotokollierung hat. Abweichungen im Sekundenbereich sollten nicht korrigiert werden.



8.5 Admin monitoring

8.5.1 Network

The "Network" section is divided into four sub-sections.

1. Settings

The "Settings as PPP server" section pertains to the network settings for the Powador-proLOG's web server.

IP address of the server

IP address of the Powador-proLOG for dialling up by modem/ISDN/GSM (standard: 192.168.200.1). Netmask of the server:
Do not change.

IP address of the caller

Do not change. (Standard: 192.168.200.51)

Telephone number of the server

This telephone number is the number at which the Powador-proLOG can be reached. The number is used as the sender's number when sending an SMS (text message).

The LAN interface (Ethernet) settings pertain to the Powador-proLOG's local network settings.

Current IP address

The current IP address of the Powador-proLOG.

Boot protocol

You can choose between none, DHCP, BOOTP, and RARP. A description of the protocols is shown on page 10.

Static IP address

Indicates the desired IP address when no boot protocol is used.

Netmask

The subnet mask that is used if one has not been assigned by the BOOTP/DHCP server.

Gateway

The gateway that is used when one was not assigned by the BOOTP/DHCP server.

- DNS server

You can enter the DNS server in this field.

- DNS server

You can enter an alternate DNS server in this field.

The ISDN terminal adapter settings pertain to the Powador-proLOG's ISDN settings. To use the unit on an ISDN extension, enter the relevant connection number here.

MSN

Connection number for the ISDN extension, which is usually a phone number without prefix.

The settings for testing the reporting methods are used to test the Powador-proLOG's ability to make contact. The test can be conducted by e-mail, fax and SMS (text message).

Contact for the test

The contact for sending a test message. You can use the standard contact or specify one of the four contact addresses.

Place a check next to the relevant fields to activate the desired form of contact (E-mail, Fax, or Text message).

Admin-Überwachung » Netzwerk » Einstellungen

Einstellungen als PPP-Server	
Servername	
IP Adresse des Servers	192.168.200.1
Netzmaske des Servers	255.255.255.0
IP-Adresse des Anrufers	192.168.200.51
Telefonnummer des Servers	
Einstellungen LAN-Interface (Ethernet)	
Aktuelle IP-Adresse	192.168.106.9
Boot-Protokoll	Keines
Statistische IP Adresse	192.168.106.9
Netzmaske	255.255.0.0
Gateway	192.168.100.254
1. DNS-Server	
2. DNS-Server	
Einstellungen zum ISDN Terminaladapter	
MSN	
Überprüfung der Meldewege	
Kontakt für den Test	Kaco
E-Mail	<input type="checkbox"/>
Fax	<input type="checkbox"/>
SMS	<input type="checkbox"/>



IMPORTANT

Your changes are not applied until you press the "Save" button.

2. Internet

This section contains settings for the Internet access points (provider settings), which the Powador-proLOG uses to connect to the Internet. Enter the designation, access number, user name and password. The providers are listed under "Netzwerk -> E-Mail" ("Network -> E-mail").

Admin-Überwachung » Netzwerk » Internet			
Einstellungen der Internet-Zugangspunkte (Provider)	Bezeichnung	Einwahl-Nummer	Benutzername
1.	MSN	0192658	msn
2.	SBG 2006	03947311000	freesurf@hod
3.	Arcor GSM	08081809999	arcor
4.	freenet GSM	22243	freenet
5.			mobil



IMPORTANT

Your changes are not applied until you press the "Save" button.

3. E-mail

This section is where you make settings for sending e-mail messages.

The SMTP server (outbox) section includes settings for IP address and e-mail address. This information is needed for the Powador-proLOG to send e-mail messages.

- IP address of the server

The IP address for logging on to the e-mail server.

The IP address of our data processing centre is 213.179.128.176.

- E-Mail-Adresse des Powador-proLOG (E-mail address of the Powador-proLOG)

Enter a valid e-mail address here.

The e-mail address must include the relevant SMTP server. Standard e-mail address: sr@direct-data.de

- Collective e-mail address

KACO new energy provides a service for sending e-mail messages using a server in our data processing centre.

To use it, enter the address data@mail1.meteocontrol.de.

The e-mail messages will then be forwarded to the actual address.

The POP3 server (inbox) section includes settings for authentication, IP address, user name and password. Fill in these fields only if they are required by the e-mail account. The server in our data processing centre does not require them.

You can set the priority of the providers in the dialling services section. This means that the first provider listed will be dialled first. If no connection is made, the Powador-proLOG dials up the next provider.



IMPORTANT

Sending e-mail messages via the Ethernet interface: If you want to send e-mail messages through the local network (e.g. via DSL), make sure that no provider is selected in the list on the left side of the "dialling services" section.

Synchronisation with database server: Yes/No

When you use the "Powador-web" service, you have the option of having all alarm messages sent to both the receiving address and the portal. This means that the fault messages are also accessible in alarm management.



Admin-Überwachung > Netzwerk > E-Mail

SMTP-Server
IP-Adresse des SMTP-Servers: 213.179.128.176
E-Mail-Adresse des Powador: SN270037@direct-data.de
Sammel-E-Mail-Adresse: data@mail1.meteocontrol.de

POP3-Server
POP3-Authentifizierung benötigt:
IP-Adresse des POP3-Servers:
POP3-Benutzername:
POP3-Kennwort:

Einwahl-Dienste
 SBO 2006  Aufwärts  MSN Arcor GSM freenet GSM

- In der linken Liste befinden sich die Einwahldienste in Reihenfolge ihrer Verwendung. Ist ein Einwahldienst nicht erreichbar, wird der nächste Listenereintrag verwendet.
- In der rechten Liste befinden sich die zur Verfügung stehenden Einwahldienste.

Einstellungen zum Abgleich mit Datenbank
Kontakt für Datenabgleich: Datenbankserver
Abgleich mit Datenbank: Nein



IMPORTANT

Your changes are not applied until you press the "Save" button.

4. SMS

This section contains settings for sending SMS messages (text messages). Enter the numbers for the respective SMS servers here (T-Mobile, Vodafone, E-plus, O2).

Prefix(es))

SMS server prefix(es), separated by a semi-colon.

SMSC telephone number (analogue)

Phone number(s) of the server that is used for sending SMS messages.

SMSC telephone number (ISDN))

Phone number(s) of the server that is used for sending SMS messages.

Admin-Überwachung > Netzwerk > SMS

T-Mobile	Vorwahl(en)	0160.0170.0171.0175.01
	Telefonnummer SMSC (Analog)	0171251002
	Telefonnummer SMSC (ISDN)	01712521001
Vodafone	Vorwahl(en)	0162.0172.0173.0174.01
	Telefonnummer SMSC (Analog)	01722278025
	Telefonnummer SMSC (ISDN)	01722278000
E-Plus	Vorwahl(en)	0163.0177.0178.0155
	Telefonnummer SMSC (Analog)	01771167
	Telefonnummer SMSC (ISDN)	01771167
O2	Vorwahl(en)	0176.0179.0159
	Telefonnummer SMSC (Analog)	01797673425
	Telefonnummer SMSC (ISDN)	01797673425

8.5.2 Contact addresses

You can define up to four contacts in the "Contact addresses" section. These contacts are in addition to the standard contact and are alerted in the event of a fault. Fill in the fields in the same way you did for the standard contact address.

Admin-Überwachung > Kontaktadressen > Kontakt 4

Status	<input checked="" type="checkbox"/> aktiv
Firma / Person	Datenbankserver
Straße	<input type="text"/>
PLZ	<input type="text"/>
Ort	<input type="text"/>
Telefon	<input type="text"/>
Mobiltelefon	<input type="text"/>
Ansprechpartner	Datenbank, Server
Fax	<input type="text"/>
E-Mail	messdaten@mail1.meteocontrol.de

IMPORTANT

Your changes are not applied until you press the "Save" button.

8.5.3 Switching output

The settings in this section are used to configure the digital output. You can choose between inactive, alarm output and counter output.

When configured as a counter output for connecting a display, you need to enter a pulse constant. The pulse constant indicates how many pulses are emitted by the Powador-proLOG at D0 for one kWh of energy produced.

When configured as an alarm output for connecting an alarm, you can activate the various alarms in the "Set digital output" section in the lower part of the screen. You can clear the alarms in Admin monitoring -> System messages, Inverters and "Formulas"

Admin-Überwachung > Schaltausgang	
Einstellungen	<input type="radio"/> inaktiv <input type="radio"/> Alarmausgang <input type="radio"/> Zahlerausgang <input type="radio"/> Quelle digitaler Ausgang <input checked="" type="radio"/> Energie Digitalanfrage <input type="radio"/> Wechselrichterenergie ausgeben <input type="radio"/> Impulskonstante Digitalausgang <input type="text"/> Impulsesek/Wh
Installation testen	<input type="button" value="Test starten"/>
Admin-Überwachung > Schaltausgang	
Einstellungen	<input type="radio"/> inaktiv <input checked="" type="radio"/> Alarmausgang <input type="radio"/> Zahlerausgang <input type="radio"/> Installation testen <input type="button" value="Test starten"/>
Digitaler Ausgang setzen	<input type="checkbox"/> Aktive Alarmane <input type="checkbox"/> Stromausfall <input type="checkbox"/> Stromsensor ohne Rückmeldung <input type="checkbox"/> Systemdatei fehlt <input type="checkbox"/> Systemfehler <input type="checkbox"/> Emailversand gescheitert <input type="checkbox"/> Wechselrichteralarne <input type="checkbox"/> Wechselrichter ohne Rückmeldung <input type="checkbox"/> Energieabreitung <input type="checkbox"/> Anomaliedaten zu gross <input type="checkbox"/> Kriteriumalarne <input type="checkbox"/> Vergleich Energie - Zeit <input type="checkbox"/> Statusalarne

IMPORTANT

Your changes are not applied until you press the "Save" button.

8.5.4 System messages

System messages only pertain to information or faults in the monitoring system itself. You can make the following settings:

- Status
Set this criterion to inactive or active.
- Alarm type:
Used for logging on to or registering on the computer that was called.
- Alarm destination:
Indicates the contact that is notified when an alarm is triggered.
- Alarm counter:
Indicates how often the respective alarm has already occurred.
- Current information:
Indicates when the last alarm was triggered.
- Reset:
Use the "Reset counter" button to reset the alarm counter.

Admin-Überwachung > Anlagenmeldungen					
Bezeichnung	Status	Alarmart	Alarmziel	Alarmzähler	Aktuelle Informationen
Stormausfall	inaktiv	E-Mail	Kaco	0	<input type="button" value="Zähler zurücksetzen"/>
Stormsensor ohne Rückmeldung	inaktiv	E-Mail	Kaco	0	<input type="button" value="Zähler zurücksetzen"/>
Systemdatei fehlt	inaktiv	E-Mail	Kaco	0	<input type="button" value="Zähler zurücksetzen"/>
Systemehler	inaktiv	E-Mail	Kaco	0	<input type="button" value="Zähler zurücksetzen"/>
Emalversand gescheitert	inaktiv	SMS	Kaco	0	<input type="button" value="Zähler zurücksetzen"/>

8.5.5 Inverters

This section contains settings for inverter monitoring. Alarm notification is configured by indicating the alarm type (fax, e-mail, SMS) and the alarm destination (three contacts simultaneously).

- Anomaly file is too big.
This file is used to record the status changes of the inverters. The file is too big, because too many status changes were recorded.
An alarm message is triggered.
- Energy yield deviation:
Only works if the correct DC rated powers of the inverters have been entered.
- Inverter does not answer:
This alarm occurs when an inverter does not answer.
- Tolerance limit for energy comparison:
This setting pertains to the "Energy yield deviation" alarm type. The characteristic curves of the inverters must remain within this range. The alarm is activated when the upper or lower limit is exceeded.
- Time (hour) for checking whether the inverter responded to at least one protocol:
The inverter(s) must have responded to the Powador-proLOG at least once by the set time. Standard value: 13 (13:00).
- Number of winter days + 1 before an alarm is sent when a protocol has not been answered):
- Number of consecutive missing protocol answers before an alarm is sent):
- Pacmin [%] for last received protocol for detection of a failure).

8.5.6 Formulas

This section includes settings for defining the various criteria for monitoring the system. You can define the following parameters in the Settings section:

- Designation:
Enter the name of the criterion here.
- Status:
Set this criterion to inactive or active.
- Time:
Analysis on an interval/daily basis
- Alarm destination:
Indicates the contact that is notified when an alarm is triggered.
- Message type:
Indicates the type of message (e-mail/fax).
- Delay:
Indicates how many intervals/days there are to wait before a message is issued when the criterion is in an alarm condition.
- Number of triggered alarms:
Indicates the number of alarms that have been registered.
- Reset counter:
Use this option to reset the counter (for alarms that have already occurred) to zero.

The **formula settings** are defined using reverse Polish notation. An example showing how to set a criterion is provided in section 8 ("Configuration Example").

8.5.7 Status alarms

This section is used to evaluate analogue and digital inputs and send alarms accordingly. There are 15 status alarms. You can define the following parameters in the **Settings** section:

- Status:
Set this criterion to inactive or active.
- Designation:
Enter the name of the criterion here.
- Alarm destination:
Indicates the contact that is notified when an alarm is triggered.
- Message type:
Indicates the type of message (e-mail/fax).
- Delay:
Indicates how many seconds there are to wait before a message is issued when the status alarm is in an alarm condition.
- Reactivation of the alarm after reset:
Specifies the time interval after which the alarm is reactivated, in case the measured value for this time interval is below the defined limit value.
- Number of triggered alarms:
Indicates the number of alarms that have been registered.

The **formula setting** function includes the following functions:

- Analogue:
If a specified limit value is exceeded, a message is sent to the contact data defined in the settings (for example: measurement for channel 1 \geq the limit value of 8.0 V).

– Status:

The message is sent if (for example) status channel 1 no longer corresponds to the defined low/high fault level.

Formeleinstellung

– Pulse counter:

If a specified limit value is exceeded, a message is sent to the contact data defined in the settings (for example: counter 1 \leq the limit value of 1.0 kW).

Formeleinstellung

8.6 Admin measurement

8.6.1 Analogue channels

- Type:
Select the type of sensor to be measured.
You can choose between voltage, current and resistance measurement.
- Status:
Set this channel to inactive or active. Measured values are logged in data files according to status.
- Channel/Measured value designation:
Indicates the name of the channel. This designation is used in the online display of measured values.
- Code:
Indicates the channel's code designation. This designation is used in the data files. If possible, use one of the codes in the predefined list (see section 9: "List of Code Designations") so that it is easier to synchronise with the Internet database.
- Unit:
Specifies the unit for the measured values. This designation is used in the online display of measured values.
- Slope:
The slope is used to convert the measured input voltage to physical values.
- Offset:
The offset is entered as a physical value.

Admin-Messung > Analogkanäle

Kanal	Typ	Status	Bezeichnung	Kürzel	Einheit	Anzahl Kommasstellen	Steigung	Offset
1	Spannungseingang	aktiv	Einstrahlung in Modulalebene	O_M0	W/m²	0	120	0
2	Spannungseingang	aktiv	Temperatur Modul	T_M0	°C	1	10.869	-20
3	Spannungseingang	aktiv	Umgebungstemperatur	T_U0	°C	1	10	-60
4	Spannungseingang	aktiv	Temperatur Modul (PT100)	T_M1	°C	1	15	-60

8.6.2 Digital channels

- Status:
Set the channel to inactive or active. Measured values are logged in data files according to status.
- Channel/Measured value designation:
Indicates the name of the channel. This designation is used in the online display of measured values.
- Code:
Indicates the channel's code designation. This designation is used in the data files. If possible, use one of the codes in the predefined list (see section 9: "List of Code Designations") so that it is easier to synchronise with the Internet database.
- Unit:
Specifies the unit for the measured values. This designation is used in the online display of measured values.
- Number of decimal places:
Specifies the number of decimal places for the online display and for archiving in the data files.
- Pulse constant:
The pulse constant is used to convert the measured pulses to physical quantities. The constant is specified in pulses/kWh.
- Power interval:
Defines the time period for calculating the current power from the pulses. The time is defined in seconds (depends on the pulse frequency).
- Counter reading:
Current value for the energy measurement. You can also manually enter the value here.

Admin-Messung > Digitalkanäle								
Kanal	Status	Beschriftung	Kanal	Erweitert	Anzahl Kommastellen	Impulskonstante	Intervall für aktuelle Leistung	Zählerstand
1 (Messwert)	aktiv	Zähler EVU	E_Z_EVU	kWh	3	1000 imp./kWh	60 s	0,00000 kWh
2 (Messwert)	aktiv	Zähler Teilanlage 1	E_Z_PV1	kWh	3	96 imp./kWh	60 s	0,00000 kWh
3 (Messwert)	aktiv	Zähler Teilanlage 2	E_Z_PV2	kWh	3	76 imp./kWh	60 s	0,00000 kWh
4 (Messwert)	inaktiv				0	0,000000 imp./kWh	0 s	0,00000 kWh

8.6.3 Extension modules

You can use up to eight add-on modules to increase the number of inputs on the Powador-proLOG. In this case, the Powador-proLOG communicates with the extension modules over the local Ethernet network.

 **ATTENTION**

- Only in connection with the Powador-proLOG M and XL (Ethernet interface).
- Detailed instructions are included with the extension modules.

Admin-Messung > Erweiterungsmodul						
Abfrageintervall		Bezeichnung		IP-Adresse	Port	Gerätetyp
<small>Anmerkung: Das Abfrageintervall bestimmt, wie häufig der Datenlogger die Erweiterungsmodule ausliest.</small>						
1	inaktiv				0	io_441
2	inaktiv				0	io_441
3	inaktiv				0	io_441
4	inaktiv				0	io_441
5	inaktiv				0	io_441
6	inaktiv				0	io_001
7	inaktiv				0	io_441
8	inaktiv				0	io_441

8.6.4 Current sensors

Use this section to add or delete sensors. To do so, enter the bus address in the field and then press the "Add" or "Delete" button.

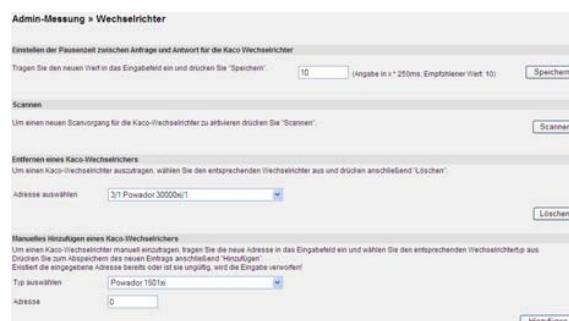
Once you have finished making changes, press "Apply" to use the new address list.



You can change the address of a sensor in the "Program a sensor" section. Since duplicate addresses are not allowed on a data logger, you can change the sensor addresses here. The rest of the options must be supported by the current sensors. You should therefore consult with KACO new energy before using these settings (or let KACO new energy make the settings for you).

8.6.5 Inverters

If inverters are connected, you can use this section for administration, e.g. to add or delete inverters from the system.



8.6.6 Energy of digital channels

This page pertains to the "Online values -> Analogue/Digital" section: As the administrator, you can correct the energy values that are displayed there.

You can also specify which channels should be included in the total in the "Digital inputs considered in the total" section.



8.6.7 Energy of inverters

If inverters are connected, you can use this section to correct the energy values displayed in "Online values -> Inverter overview".

The total will then automatically take all connected inverters into account, so that there is nothing to select here.



Bezeichnung	Wert	Einheit	Bezeichnung	Wert	Einheit
Tagesenergie Vorgag	176.470	kWh	Aktuelle Jahresenergie	10025.340	kWh
Aktuelle Montanenergie	2524.281	kWh	Gesamtenergie	81020.813	kWh

Anmerkung: Überschreiben Sie zur Korrektur von Energiewerten die eingegebenen Werte. Klicken Sie anschließend auf "Speichern".

8.6.8 Time synchronisation

Use this menu item to synchronise the system time on the Powador-proLOG.

– No synchronisation:

The system time must be manually set in "Configuration -> Date/Time".

– Internet synchronisation:

This function is only used in conjunction with Powador-web.

– Network synchronisation:

The Powador-proLOG synchronises the time via the gateway of the local network. The gateway must support the time server function.

Admin-Messung » Zeitsynchronisation



Keine Synchronisation
Internet-Synchronisation
Netzwerk-Synchronisation

Aktuelle Zeitzone: 1

IP-Adresse des Netzwerk-Zeitservers: 132.163.4.102

Portnummer des Netzwerk-Zeitservers: 37

Aktuelle Zeitzone: 1

Uhrzeit, zu der die Netzwerk-Zeitsynchronisation erfolgen soll: 2 : 20

8.6.9 Active power and idle power control (XL)

The remote-controlled active power and idle power control function can only be used with a Powador-proLOG XL. Select "Admin measurement » Active power and idle power control") to access all the settings for the remote-controlled function.

a) Configuration

You can use the "Configuration" menu item to activate the KACO power control function (active power control) and configure the relevant Powador-proLOG as a master or slave.



ATTENTION

Only the Powador-proLOG XL unit that has been defined as the master is able to forward active power and idle power control commands from the connected radio ripple control receiver to the slave data loggers. All slaves must also be Powador-proLOG XL units.

Admin-Messung » Wirk-/ Blindleistungsregelung » Konfiguration

PowerControl ist nicht aktiviert

Konfiguration

Aktivierung PowerControl aktiv inaktiv

Der als Master aktivierte proLOG gibt die Signale zur Wirk-/ Blindleistungsregelung an alle 16 Slave konfigurierten proLOG weiter (max. 20 proLOG als Slave bei aktiver Adressliste). Nur beim Master werden Einstellungen zur Wirk-/ Blindleistungsregelung angewandt und nur der Master ist in der Lage die Signale zur Wirk-/ Blindleistungsregelung zu senden.

Priorität proLOG Master Slave

Drücken Sie Speichern um die aktuellen Einstellungen zu übernehmen.

Speichern

b) Control

You can use the "Control" menu item to configure a wide variety of control methods. Depending on what you select, the page will change accordingly and display the relevant settings. Help is also provided for each of the procedures.



Please choose a reactive power control method:

Reactive power with radio ripple control terminal
 Power factor cosφ with radio ripple control terminal
 Fix reactive power in % of Pn
 Variable power factor cosφ(P) on the basis of the characteristic curve
 Variable reactive power Q(U) on the basis of the characteristic curve

In the lower screen, you can set the values for the KACO power control function, the idle power (as a percentage of the system's rated power) or the cosine phi for control via a radio ripple control receiver.

Powador proLOG XL

level	Digital input	Wirkleistung	Blindleistung	cosφ	Erregung
	DI4 DI3 DI2 DI1				
0	■ ■ ■ ■	100 %	0.0 %	1.000	kapazitiv ▾
1	■ ■ ■ ■	100 %	0.0 %	1.000	kapazitiv ▾
2	■ ■ ■ ■	60 %	0.0 %	1.000	kapazitiv ▾
3	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
4	■ ■ ■ ■	30 %	0.0 %	1.000	induktiv ▾
5	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
6	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
7	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
8	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
9	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
10	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
11	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
12	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
13	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
14	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾
15	■ ■ ■ ■	0 %	0.0 %	1.000	kapazitiv ▾

c) Address list

You can use the "Address list" menu item to enter the IP addresses of the slave units. The master Powador-proLOG XL unit forwards the digital signal of the radio ripple control receiver via Ethernet to all the slaves entered. This means that up to 20 slaves can be managed using just one master.

d) Online values

You can find the current status of the active power and idle power control function under "Online values » Active power and idle power control"

Allgemein | Online-Werte | Status | Konfiguration | Admin-Uberwachung | Admin-Messung

Powador

K A C O 
new energy.

Online-Werte » Wirk-/ Blindleistungsregelung

aktuelle Werte

Digitaleingang	DI4	DI3	DI2	DI1	Aktuelle Leistungsvorgabe	Aktuelle cosφ Vorgabe
	■	■	■	■	60 %	keine

Anmerkung: Die Werte werden alle 10s aktualisiert.

Systemzeit 14:57:33 / 18.09.2011

9 Configuration Example

9.1 Analogue channels

9.1.1 Voltage input

The rule for converting the measured computation value to a physical value is as follows:

$$[\text{Physical value}] = [\text{IV}] \times [\text{Gradient}] + [\text{Offset}]$$

$$[\text{IV}] = \text{Instantaneous channel value}$$

$$[\text{Gradient}] = \left(\frac{\text{Physical full-scale value}}{\text{Channel full-scale value}} \right)$$

$$[\text{Offset}] = \text{Physical measured value}$$

Legend:

[MW]: current measured value at the channel input in [V].
 [Measuring scale final value]: for a voltage input of 10 volts.

Example 1:

A sensor is to be connected to an analogue channel using a sensor constant of $10 \text{ V} = 1500 \text{ W/m}^2$. The measurement range final value of the input is 10 V.

The slope is calculated as follows:

$$[\text{Gradient}] = \frac{1500 \text{ W/m}^2}{10} = 150$$

If the channel does not show an offset during calibration, you can use 0 for the offset. Assuming the channel has an offset of $+15 \text{ W/m}^2$ (for example) during calibration, set the channel as follows:

$$\text{Offset} = -15 \text{ W/m}^2$$

Example 2:

A PT100 is to be connected to a channel using a voltage transformer. The voltage transformer supplies an output voltage of 10 V at $+100^\circ\text{C}$ and an output voltage of 0 V at -50°C . This results in a physical measurement range final value of 150°C . The slope is calculated as follows:

$$[\text{Gradient}] = \frac{150 \text{ }^\circ\text{C}}{10} = 15$$

Since the temperature is to be measured down to -50°C , the result is an offset of:

$$[\text{Offset}] = -50 \text{ }^\circ\text{C}$$

9.1.2 Current input

The rule for converting the measured computation value to a physical value is as follows:

$$[\text{Physical value}] = [\text{IV}] \times [\text{Gradient}] + [\text{Offset}]$$

$$[\text{IV}] = \text{Instantaneous channel value}$$

$$[\text{Gradient}] = \left(\frac{\text{Physical full-scale value}}{\text{Channel full-scale value}} \right)$$

$$[\text{Offset}] = \text{Physical measured value}$$

Legend:

[MW]: Current measured value at the channel input in [mV].
 [Measuring scale final value]: for a current input of 20 mA.

9.2 Digital inputs

The following equation is used to convert to a physical quantity:

$$\text{Physical measured value} = \frac{\sum \text{pulses}}{\text{Meter constant}}$$

Example: A counter provides 6000 pulses/kWh and is to be connected to a digital input. This counter constant is directly entered as a value in the Pulse constant (pulses/kWh) field, which means that the online display shows the values as energy [kWh]. To display the current power, you have to enter a value (e.g. 60) in the Interval for current power (s) field. This means that the pulses are added up over a period of 60 seconds and converted to an average power for this interval period.

9.3 Alarm criterion

An example should help you to achieve simple and effective system monitoring with the unit.

Example:

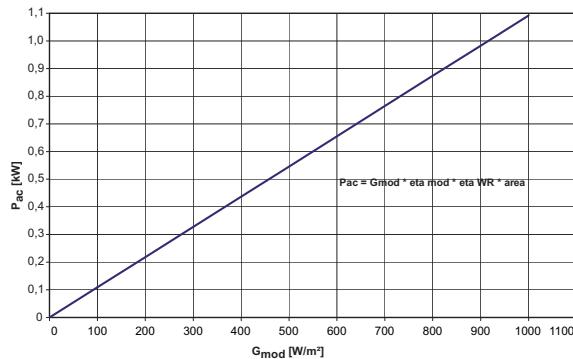
A photovoltaic system is equipped with a solar sensor for measuring irradiance in the module level and a generation counter with pulse output. These quantities are to be used to define limits for reporting a defect in the system by means of a "malfunction call".

9.3.1 Basic principle of monitoring

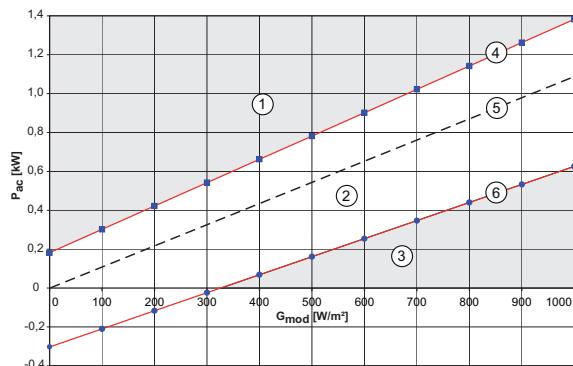
A relationship between irradiance and generated energy is used for the physical basis. Ideally, this means that:

$$[\text{generated power}] = [\text{irradiance} * \text{area of module} * \eta_{\text{module}} * \eta_{\text{inverter}}]$$

For PV modules with a degree of efficiency of 12%, an inverter degree of efficiency of 91%, and a module area of 10 m², the idealised relationship can be displayed as follows:



In reality, this relationship is not exactly linear across the entire range (lower irradiance => lower degree of efficiency). Therefore, a solution must be found for a working fault message criterion. For this purpose, a range is "stretched" so that measured values can move. This requires two linear equations that define the upper and lower limits of the "plausible" range:



In order to allow the maximum amount of flexibility in selecting the range, two different slopes can be defined. The displacement of the linear slopes by tHigh and tLow is specified as an absolute quantity (e.g. 0.2 kW).

The equations for the linear slopes can now be written as follows:

Lower limit:

$$Y < m_{\text{lower}} \otimes X \otimes t_{\text{lower}}$$

$$P_{\text{ac}} < m_{\text{lower}} (G_{\text{Module}} \otimes A_{\text{Arry}} \otimes \eta_{\text{PV}} \otimes \eta_{\text{INV}}) \otimes (t_{\text{lower}} \otimes P_{\text{nom}})$$

Upper limit:

$$Y > m_{\text{upper}} \otimes X \otimes t_{\text{upper}}$$

$$P_{\text{ac}} > m_{\text{upper}} (G_{\text{Module}} \otimes A_{\text{Arry}} \otimes \eta_{\text{PV}} \otimes \eta_{\text{INV}}) \otimes (t_{\text{upper}} \otimes P_{\text{nom}})$$

where: mlow = 0.85 tlow = - 0.25

mhigh = 1.1 thigh = 0.15

9.3.2 Setting parameters for the measuring device

Settings are made in: Admin monitoring -> Formulas -> Criterion x")

First make the basic settings for this alarm criterion.

- Designation: "Power by irradiance"
- Status: "Active"
- Time: "Interval"
- Alarm destination: "Standard contact"
- Message type: E-mail
- Delay: "8"

(This sets a measuring interval of 15 minutes and an alarm delay of two hours)

 **ATTENTION**

To send an alarm message, you have to specify the contact for the alarm destination in "Admin monitoring -> Contact addresses -> Contact x").

The formula entries are then as follows:

Y Generation for photovoltaic system (dig_0)

m (lower limit) 0.85

m (upper limit) 1.1

x Irradiance of module

(ana_0); System area; *eta PV; *eta inverter; *

c (lower limit) 200

c (upper limit) 200

9.4 Programming criteria using the example of an inverter comparison

In this comparison, the daily energy of inverter 4 is compared with that of inverter 5, and an alarm is triggered if there is an energy yield deviation. Different inverter types can be compared with one another. Enter a name for the criterion and activate it in the settings. You can then choose whether the criterion is calculated with each recording interval, or once a day.

The code for the daily energy of the respective inverter is entered in the **x** and **y** fields in the formula settings section (here: EWR_3, EWR_4). The reason the addresses are shifted is because the addresses in the proLOG start with "0" (daily energy from inverter 5 → EWR_4). This value is then divided by the respective installed generator power. This means that values from different inverters can also be compared with one another (here: EWR_3 has 5.6 kW and EWR_4 has 4.8 kW of module power installed). The upper and lower limits are set in the **c** fields. Set the slope for the valid range in the **m** fields. You can usually leave the slope as is.

Allgemein | Online-Werte | Status | Konfiguration | Admin-Überwachung | Admin-Messung

Admin-Überwachung > Formeln > Kriterium 3

Einstellungen		aktueller Status
Bezeichnung	Vergleich WR4<->WR5	obere Grenze: Ist-Wert: untere Grenze: Info: Alarmzähler 0
Status	aktiv	
Zeitpunkt	Tag	
Alarmziel	Solarstrom Schwaben Sebert	
Meldungstyp	Email	
Verzögerung	1 (1 - 255)	
Anzahl Alarne	0	

Formeleinstellungen		verfügbare Messwerte
Basis: $y = m * x + c$		Intervall (Int = 900 s) installierte Leistung (A_Ar) Anlagenfläche (A_Ar) Anzahl der Teilanlaege (Anz_Teile) Tageszeit in Minuten (Min) Summe der Tagesenergie (Summe) Tagesenergie von V1 (V1) Tagesenergie von V2 (V2) Tagesenergie von V3 (V3) Tagesenergie von V4 (V4)
y	EWR_3:5.6;/	+ - * / Verkn.
m (untere Grenze)	0.96	
m (obere Grenze)	1.04	
x	EWR_4:4.8;/	
c (untere Grenze)	-0.05	
c (obere Grenze)	0.05	

Anm.: Die Formel sind in der Umgekehrten polnischen Notation (upn) anzugeben. Bsp: a;b;+

9.5 List of code designations

Measured values	Powador-proLOG	Unit
Feed-in meter	E_Z_EVU	kWh
Counter for sub-system 1	E_Z_PV1	kWh
Counter for sub-system 2	E_Z_PV2	kWh
Counter for sub-system 3	E_Z_PV3	kWh
Irradiance in module level 0	G_M0	W/m ²
Irradiance in module level, part 1	G_M1	W/m ²
Irradiance in module level, part 2	G_M2	W/m ²
Irradiance in module level, part 3	G_M3	W/m ²
Irradiance in horizontal level	G_H0	W/m ²
Module temperature	T_M0	°C
Module temperature, part 1	T_M1	°C
Module temperature, part 2	T_M2	°C
Ambient temperature	T_U0	°C
Ambient temperature 1	T_U1	°C
Collector temperature	T_K0	°C
Collector temperature, part 1	T_K1	°C
Direct current	I_DC_0	A
Direct current of sub-system 1	I_DC_1	A
Direct current of sub-system 2	I_DC_2	A
Direct current of sub-system 3	I_DC_3	A
DC voltage	U_DC_0	V
DC voltage of sub-system 1	U_DC_1	V
DC voltage of sub-system 2	U_DC_2	V
DC voltage of sub-system 3	U_DC_3	V
Alternating current	I_AC_0	A
Alternating current of sub-system 1	I_AC_1	A
Alternating current of sub-system 2	I_AC_2	A
Alternating current of sub-system 3	I_AC_3	A
AC voltage	U_AC_0	V
AC voltage of sub-system 1	U_AC_1	V
AC voltage of sub-system 2	U_AC_2	V
AC voltage of sub-system 3	U_AC_3	V
<hr/>		
Wind speed	W_V0	m/s
Wind direction	W_R0	°
Humidity	F_L0	%
Heat quantity of collector	WM_K0	kWh
Heat quantity of heating	WM_H0	kWh
Heat quantity of CHP	WM_BHKW0	kWh

10 Update

KACO new energy cannot assume any liability or repair costs for damage resulting from a failure to observe these instructions. Please do not make changes to any directories or files other than the ones described.

10.1 Update with card reader

10.1.1 General information

A Compact Flash (CF) card is built into the Powador-proLOG. The entire operating system for the Powador-proLOG and all the system files are stored on this card. You will find the card slot on the right-hand side of the housing.



DANGER

Before starting the update, make sure to disconnect the power plug for the data logger. The Powador-proLOG must be switched off when removing the card from the data logger.

10.1.2 Instructions

To perform the update, you will need a Powador-proLOG, a card reader for CF cards, a PC or laptop and the new software (which you can obtain via the monitoring service).



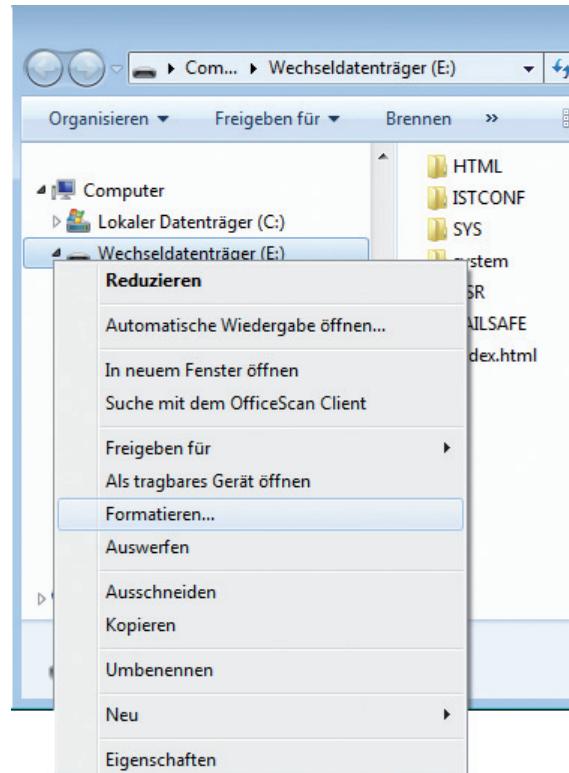
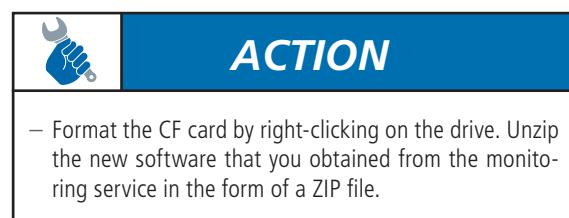
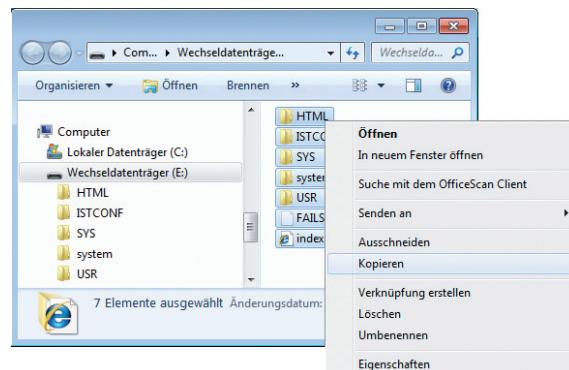
NOTE

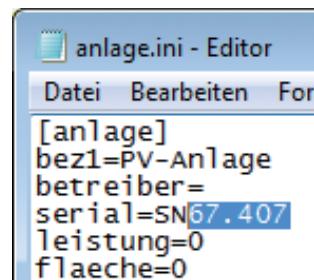
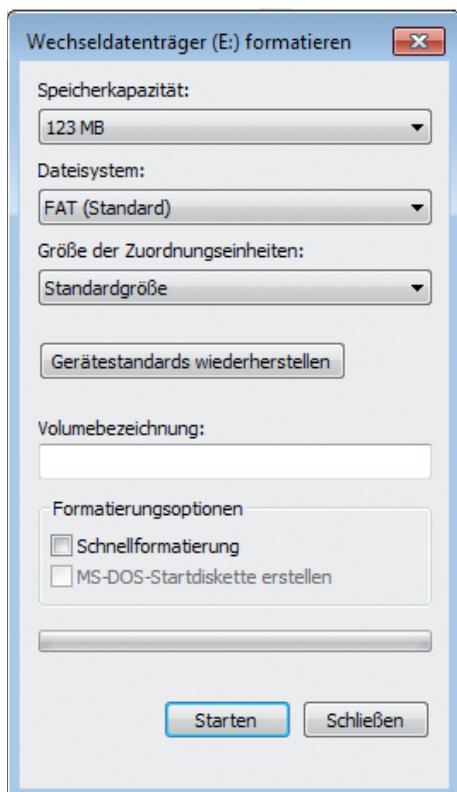
After the update, the unit will need to be reconfigured using the installation wizard.



ACTION

- Remove the protective cover from the card slot and take out the CF card.
- Insert the CF card into the reader and connect the reader to the PC/laptop.
- Start Windows Explorer and open the card reader drive.
- Create a backup copy by saving the CF card files to a folder of your choice on the PC/laptop.





 **ACTION**

- Copy the unzipped files to the CF card. It is recommended that you save the “data” folder from your backup copy onto the CF card. This will ensure that you have all the daily files on the Powador-proLOG.
- Open the file “anlage.ini” (which you can find in path “ISTCONF\ANLAGE”) and enter the serial number of your data logger.

 **ACTION**

- Insert the CF card again (with the KACO new energy logo at the top) and switch on the unit. The start process is complete when the status LED starts to flash. The new software is installed.
- Now run the installation wizard in order to reconfigure the data logger.

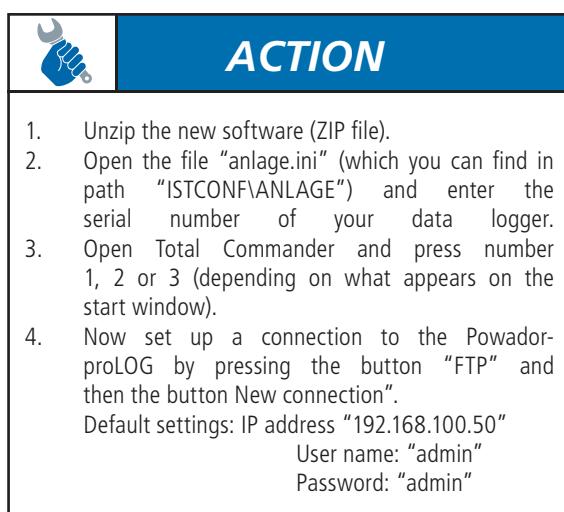
10.2 Update via FTP

10.2.1 General information

These instructions are based on the example of Total Commander software. Total Commander is a shareware file manager. However, you can also apply the information in these instructions to other FTP programs.

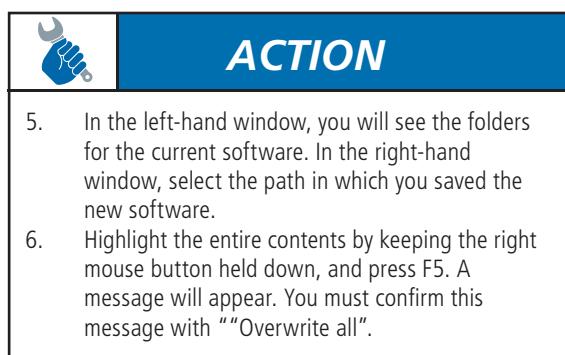
10.2.2 Instructions

To perform the update, you will need a Powador-proLOG, a PC or laptop and the new software (which you can obtain via the monitoring service).



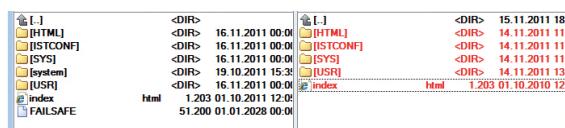
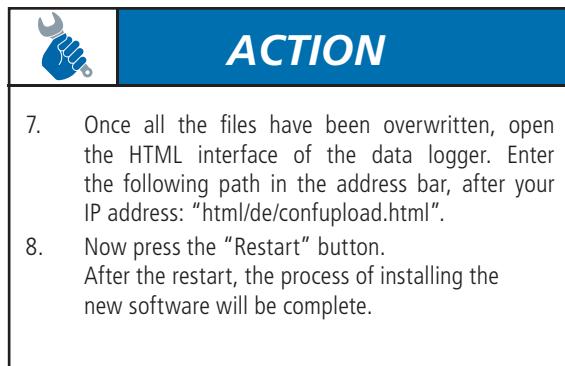
ACTION

1. Unzip the new software (ZIP file).
2. Open the file "anlage.ini" (which you can find in path "ISTCONF\ANLAGE") and enter the serial number of your data logger.
3. Open Total Commander and press number 1, 2 or 3 (depending on what appears on the start window).
4. Now set up a connection to the Powador-proLOG by pressing the button "FTP" and then the button New connection".
Default settings: IP address "192.168.100.50"
User name: "admin"
Password: "admin"



ACTION

5. In the left-hand window, you will see the folders for the current software. In the right-hand window, select the path in which you saved the new software.
6. Highlight the entire contents by keeping the right mouse button held down, and press F5. A message will appear. You must confirm this message with "Overwrite all".

ACTION

7. Once all the files have been overwritten, open the HTML interface of the data logger. Enter the following path in the address bar, after your IP address: "html/de/confupload.html".
8. Now press the "Restart" button.
After the restart, the process of installing the new software will be complete.



Powador

Loadable Application Images

Hardware serial number
3006912909008

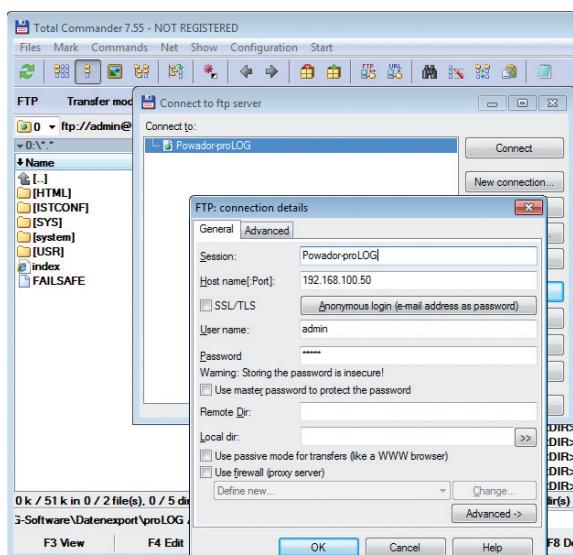
File name
kaco223_242_174.js2

Action
Laden

Version (VR/USR/OS)
2.23 / 2.42 / 1.74

Restart

System Time: 17:04:25 / 30.10.2011



Total Commander 7.55 - NOT REGISTERED

Files Mark Commands Net Show Configuration Start

FTP Transfer mode

FTP Connect to ftp server

Connect to:
Powador-proLOG

FTP: connection details

General Advanced

Session: Powador-proLOG

Host name[Port]: 192.168.100.50

SSL/TLS

User name: admin

Password: *****

Warning: Storing the password is insecure!

Use master password to protect the password

Remote Dir:

Local dir:

Use passive mode for transfers (like a WWW browser)

Use firewall (proxy server)

Define new... Change... Advanced ->

OK Cancel Help

0 k / 51 k in 0 / 2 file(s), 0 / 5 di
3-Software\Dateneport\proLOG

F3 View F4 Edit F8 De



ACTION

9. Now run the installation wizard in order to reconfigure the data logger.

The text and figures reflect the current technical state at the time of printing. Subject to technical changes. Errors and omissions excepted.



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