KACO new energy.

Powador-piccoLOG

Operating Manual

■ **English translation of German original**

Operating Manual

Powador-piccoLOG

Contents

1 General Notes

1.1 About this documentation

WARNING

Improper handling of the device can be hazardous

› You must read and understand the operating instructions before you can install and use the device safely.

Other applicable documents

During installation, 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.

Storing the documents

These instructions and other documents must be stored near the system and be available at all times.

1.2 Layout of Instructions

Symbols used


General hazard


Risk of fire or explosion


High voltage!


Risk of burns

Only ⚠ Authorised electrician authorised electricians may carry out tasks marked with this symbol.

1.3 Safety warnings symbols guide

DANGER

High risk

Failure to observe this warning will lead directly to serious bodily injury or death.

WARNING

Potential risk

Failure to observe this warning may lead to serious bodily injury or death.

CAUTION

Low-risk hazard

Failure to observe this warning will lead to minor or moderate bodily injury.

CAUTION

Risk of damage to property

Failure to observe this warning will lead to property damage.

Additional information symbols

NOTE

Useful information and notes

Country-specific function

Functions restricted to one or more countries are labelled with country codes in accordance with ISO 3166-1.

1.4 Instructions symbols guide

a) Single step instructions or instructions that can be carried out in any sequence:

Instructions

↻ Prerequisite(s) for the step(s) (optional)

☞ Carry out the next step.

☞ (Additional steps, if applicable)

» Result of the step(s) (optional)

b) Multi-step instructions that must be carried out in a fixed sequence:

Instructions

↻ Prerequisite(s) for the steps (optional)

1. Carry out the next step.
2. Carry out the next step.
3. (Additional steps, if applicable)

» Result of the steps (optional)

2 Safety

2.1 Proper use

PowerControl is a control system of various operating parameters (such as idle and active power, for instance) for use with photovoltaic plants.

The connections of this specific data logger and module should only be used with the permitted signals and signal strengths.

Only suitable for installation indoors. For installation in outdoor areas or dusty environments the device must be encased in a protective housing.

2.2 Protection features

- Do not open the device.
- Do not make any modifications to the device.
- Discontinue use of any damaged device and have them checked by an electrical specialist.
- Ensure local regulations are observed when using the device.
- The safety of the device and the operator are not guaranteed if the safety instructions are not followed.

3 Transportation and Delivery

3.1 Delivery

Every product leaves our factory in perfect electrical and mechanical condition. Unpack device and all accessories and check the contents are complete and intact.

- A damaged device must not be used.
- The device should only be transported in its original packaging. Protect the device against dust and moisture.

3.2 Scope of delivery

- Powador-piccoLOG
- Power supply DC 24 V, 0.83 A
- Micro USB cable
- Ethernet cable
- Ready-made RS485 cable
- Fixing materials (Philips screws, wall plugs)

3.3 Disclaimer

KACO new energy GmbH accepts no liability for damages that may arise from a failure to follow the instructions in the operating manual.

This shall apply in particular to damage that arises as a result of:

- Improper use of the product
- Mishandling of the product
- Incorrectly selected materials and tools
- Poor or unperformed maintenance and repair work

KACO new energy GmbH is not liable for events or occurrences beyond their control related to Powador-piccoLOG, such as

- the accuracy of an energy supplier's control commands,
  the non-implementation of forwarded control commands,
- hardware and/or software malfunctions caused by the operator,
- switching procedures carried out by the customer.
- Liability for any damages caused by such incidents and events is explicitly excluded.

4 Product Details

4.1 Functional Description

The Powador-piccoLOG is a data logger for small scale photovoltaic plants. It is also possible to send data to the Powador-web Public Portal. The data logger enables the implementation of simplified energy management.

4.2 Device overview

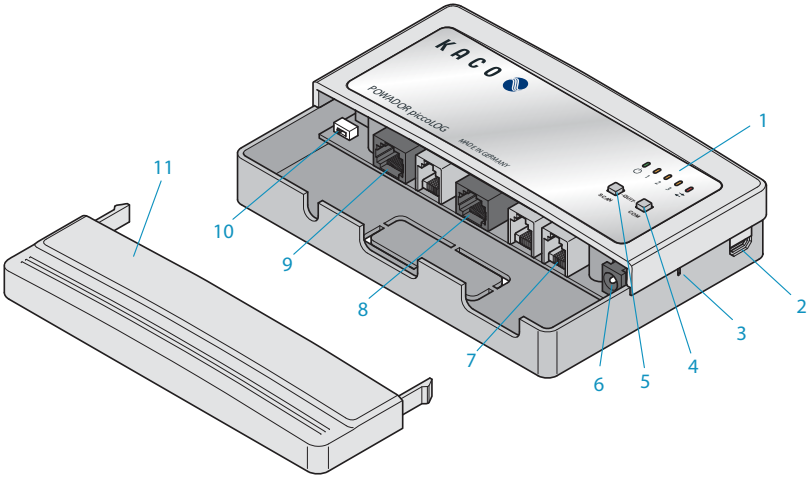


Figure 1: Device overview

1	LED indicators	7	RS485/422 for inverters (RJ12 jack)
2	Micro USB	8	Ethernet connection
3	"Reset" button	9	Port for ripple control receiver (RJ45 jack)
4	"COM" button	10	Power control switch
5	"SCAN" button	11	Protective cover
6	Power connection		

5 Installation and Start-up

5.1 Safety instructions for Installation and Start-Up

DANGER

Risk of fatal injury due to electric shock

Coming into contact with live components can result in electrical shock, burns or death.

- Installation should only be carried out by an electrician.
- Check the cable installation points.
- Do not drill into cables.

CAUTION

Overvoltage or incorrectly connected cables may cause property damage.

Overvoltage and voltage spikes may damage or destroy the device.

- Protect the power supply to prevent overvoltage.
- Only connect cables to the designated connection points.

5.2 Interface overview

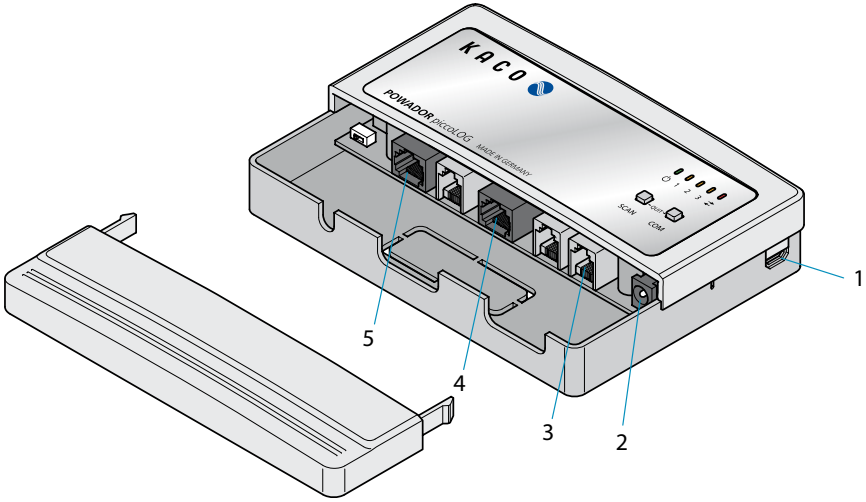


Figure 2: Interface overview

1	Micro-USB
2	Power connection
3	RS485/422 for inverters (RJ12 jack)
4	Ethernet port
5	Port for ripple control receiver (RJ45 jack)

5.3 Wall mounting

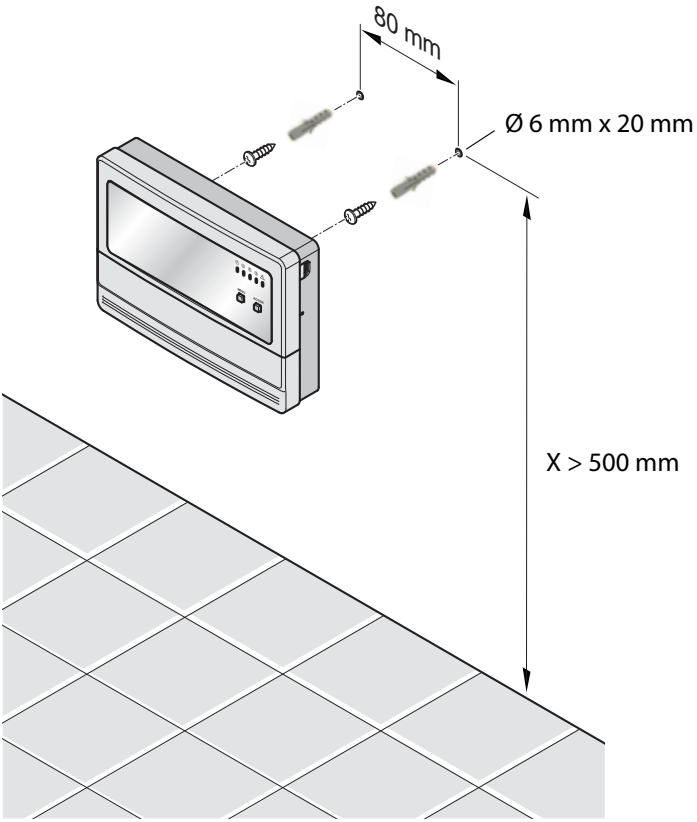


Figure 3: Wall mounting

Mounting the device on the wall:

- ☞ Drill holes.
- ☞ Insert wall plugs
- ☞ Screw the screws 5mm into the wall
- ☞ Slide device onto screws and ensure it is secure

5.4 Connecting the inverter

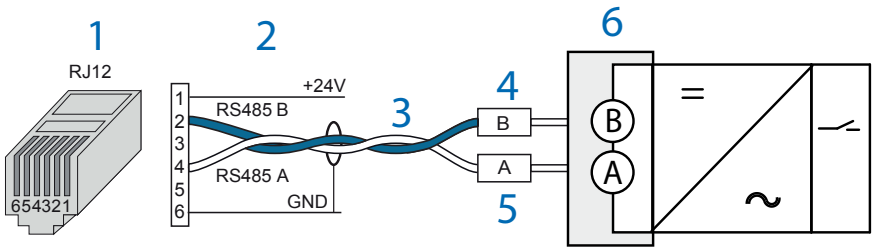


Figure 4: Connecting the inverter

1	RJ12 plug/ RS485	4	RS485 B / RS485- / -TR / T-
2	Signal name	5	RS485 A / RS485 + / +TR / T+
3	Bus cable (twisted and shielded wire pair) for the Powador-piccoLOG	6	Inverter

NOTE

See the inverter manual for details on bus configuration.

- To connect, use a ready-made connection cable or manufacture one according to the above pin configuration.
- We recommend the use of *UNITRONIC® Li2YCYv* (TP) cables, produced by "*LappKabel*", or equivalent. This cable is suitable for installation directly into the earth.

Bus configuration

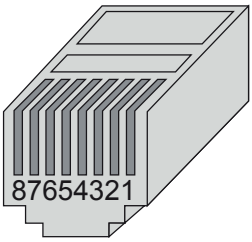
☞ Remove protective cover.

☞ Connect inverter with an RJ12 connection jack (see 5.2 "*Interface overview*").

» If there is no inverter already installed, the device will automatically search for an inverter once switched on.

» Perform a manual search with the software (see 5.9 "Powador-piccoLOG Device Manager").

5.5 Connect ripple control receiver (optional)



1 + 2	Reduction stage **0** ex works: 100 % power supply
3 + 4	Reduction stage **1** ex works: 60 % power supply
5 + 6	Reduction stage **2** ex works: 30 % power supply
7 + 8	Reduction stage **3** ex works: 0 % power supply
No signal	ex works: 70 % power supply
Invalid signal	ex works: 70 % power supply

Figure 5: Connect ripple control receiver

NOTE

To connect use a ready-made connection cable or a standard Ethernet cable.

- When using an Ethernet cable, cut off the connector at one end and manufacture the cable according to the above pin configuration.

Connect ripple control receiver

- ☞ Connect ripple control receiver with digital port (see5.2 "*Interface overview*").
- ☞ Activate PowerControl by turning the PowerControl switch (see 4.2 "Device overview") to the "*ON*" position (see also 7.3 "*PowerControl*"). Limited configuration options: Inverter scan not possible!
- ☞ Make adjustments using the software, if necessary.

5.6 Power connection

- ☞ Connect the accompanying power supply to the power socket (see 5.3 "*Interface overview*").
- ☞ Connect the power supply to the mains.
- ☞ Attach protective cover.

5.7 Configuring internet connection

5.7.1 Automatic configuration in networks with DHCP

NOTE

The router automatically assigns client's IP addresses when DHCP is activated on the network.

Automatic configuration

- ☞ Connect the device to the network via the Ethernet port using an Ethernet cable.
- » The device is allocated an IP address and is now configured.
- » The data logger does not have a web server and is not available via HTTP.

5.7.2 Manual configuration to the network without DHCP

Manual configuration

- ☞ Connect the device to the network via the Ethernet port using an Ethernet cable.
- ☞ Enter the network settings (IP address etc.) into the software.

5.8 Powador-web Public Portal

- ☞ Scan QR code onto the device using a smartphone and follow the instructions **or:**
- ☞ visit *www.powador.net/registration* and complete the registration form.
- ☞ Start the portal.

5.9 Powador-piccoLOG Device Manager software

NOTE

The installation sequence must be followed. Otherwise the device will not be properly recognised by the system.

- First install the software and the drivers, then connect to the PC.
- Following incorrect installation, install the device on the system afterwards (see 5.9.3 "*PC does not recognise the device*").

5.9.1 Install software

- ☞ Download software "*Powador-piccoLOG Devicemanager*" at "*www.kaco-newenergy.de/monitoring/piccolog*".
- ☞ Install software.

5.9.2 Connect the device to a PC

- ↻ Software is installed.
- ↻ Device is connected to the power supply.
- ☞ Connect the device to a PC using a USB cable.
- ☞ Device is recognised by PC.
- ☞ Start software.

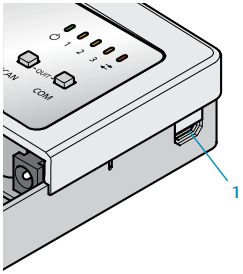


Figure 6: USB port (1)

5.9.3 PC does not recognise the device

The device has been connected to the PC before the software and drivers have been installed, and is not recognised by the PC. To fix this problem follow these steps.

Open Device Manager

1. Control Panel
2. System
3. Hardware
4. Device Manager

Installing/Reinstalling device drivers

1. Right-click on piccoLOG under "Other devices" (yellow question mark) .
2. Update drivers

» Hardware update wizard will open

3. Choose "No, not this time"
4. Choose "Automatically install software"
5. If an error message occurs, click on "Continue installation"

» Device should no longer appear under "Other devices"

6 Technical Data

General Information	
Power supply	DC 24 V
Power consumption	1.7 W (typical)
Bus connection	integrated (cannot be switched off)
Network	Ethernet connection (10/100 Mbit)
Communication	1 x RS485/RS422
	2 x RS232
	2 x pulse input according to DIN 43864 (ISO)
	4 x digital input for ripple control receiver
Frame size (W x H x D) in mm	152 x 107 x 37
Protection class	IP21
Weight	203 g
Ambient conditions	
Operating temperature	0 to 55 °C
Storage temperature	-20 to 65 °C
Cables and wires	
Cable types	
Bus cable	RS485/422, twisted and shielded Li2YCYv (TP) 2 x 2 x 0.5 mm²[1)]
Ethernet cable	Cat 5e / Cat 6 / Cat 7
RS232	J-Y(ST)Y 2 x 2 x 0.6 mm²
Power control	Cat 5e / Cat 6 / Cat 7
Maximum cable length permitted	
Bus cable	1200 m[2)3)]
Ethernet cable	100 m[3)]

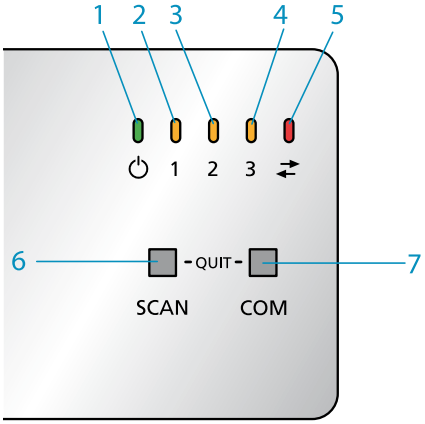
1) *We recommend the use of **UNITRONIC® Li2YCYv (TP)** cables, produced by **"Lapp Kabel"** or equivalent. This cable is suitable for installation directly into the earth.*

2) *The use of repeaters is required for longer cables.*

3) *Multiple cables of this length will require a hub.*

7 Operation

7.1 Overview of operating controls



1	"*Operating*" LED
2	"*Info Inverter 1*" LED
3	"*Info Inverter 2*" LED
4	"*Info Inverter 3*" LED
5	"*COM*" LED
6	"*SCAN*" button
7	"*COM*" button

Figure 7: Operation

7.2 LED indicators

LEDs	Off	Flashing	Illuminated
⏻	Data logger out of service	Data logger is currently in booting process	Data logger is ready for use
① ② ③	No inverter connected/ recognised	Inverter error discovered	Inverter recognised and no error
⇄	Last data packet has been successfully sent to the portal	Data packet is being sent to the Powador-web Portal	Data packet could not send to the Powador-web Portal

Example of LED display on device

7.3 Power control

There is a button in the connection area of the logger to turn the Power Control function on or off.

NOTE

When Power Control is activated configuration of the device is limited and a device scan is not possible.

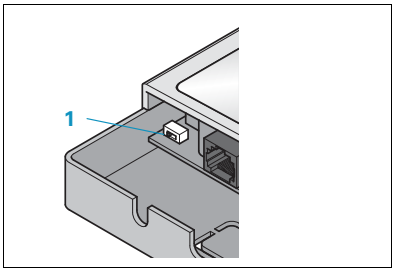


Figure 8: Flick Power Control switch

Activate Power Control

1. Open protective cover.
2. Turn Power Control switch left to the "*ON*" position.
3. Close protective cover.

Deactivate Power Control

1. Open protective cover.
2. Turn Power Control switch right to the "*OFF*" position.
3. Close protective cover.

NOTE

When Power Control is deactivated an automatic and manual inverter scan can be performed.

7.4 Factory settings

Audio alarm signal	active
No power signal from RSE	70 % of P_{Nenn}
Unexpected power signal from RSE	70 % of P_{Nenn}
Power reduction at level **0**	100 % of P_{Nenn}
Power reduction at level **1**	60 % of P_{Nenn}
Power reduction at level **2**	30 % of P_{Nenn}
Power reduction at level **3**	0 % of P_{Nenn}
DHCP	active

7.5 PC software mode

NOTE

As soon as the device is connected to the PC via the accompanying USB cable, the USB mode is automatically activated.

7.5.1 Firmware update

A Firmware update can be carried out using the Powador-piccoLOG Device Manager software.
During a Firmware update all five LEDs flash consecutively. Upon completion of the Firmware update the device will restart and re-connect with the software.

7.6 Restarting the device

The device can be restarted by pressing the "*RESET*" button.

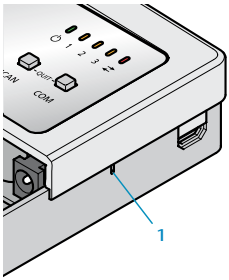


Figure 9: Press the "RESET (1)" button.

☞ Press "*RESET* (1)" button using a paper clip
» The device will restart.

7.7 Resetting the device

7.7.1 Reset on factory settings

NOTE

All collected data will be deleted during the reset. The data collected and stored in the Portal will not be affected by this.

- Back up all data with the *Powador-piccoLOG Device Manager* software prior to the reset.

Resetting device to the factory settings

1. Press and hold the "*COM*" button.
2. Restart the device. Then disconnect the device briefly from the network or press the "*RESET*"
   button (see 7.7 "*Gerät neu starten*")
» After approximately 10 seconds the device will begin to be reset, the "*COM*" LED will flash and the "STATUS" and "INFO" LEDs will flash consecutively.
3. Release "*COM*" button.
» Once the reset is complete, the LEDs will stop flashing and the device will restart.

7.7.2 Reset to basic firmware

In the event that it is not possible to change the firmware (after a failed firmware update, for example), there is still the possibility to switch back to the basic firmware and install a specific firmware.

NOTE

All collected data will be deleted during the reset. The data collected and stored in the Portal will not be affected by this.

- Back up all data with the *Powador-piccoLOG Device Manager* software prior to the reset.

Activate basic firmware

1. Press and hold "*SCAN*" and "*COM*" together.
2. Restart the device, then disconnect the device briefly from the network or press the "*RESET*" button (see 7.7 "Restarting the device").
3. After approximately 10 seconds the device will be reset, the "OPERATING" LED will be illuminated and the "STATUS" and "INFO" LEDs will flash consecutively.
4. Release "*SCAN*" button.
» Once the reset is complete, the LEDs will stop flashing and the device will restart with the basic firmware.

8 Error messages

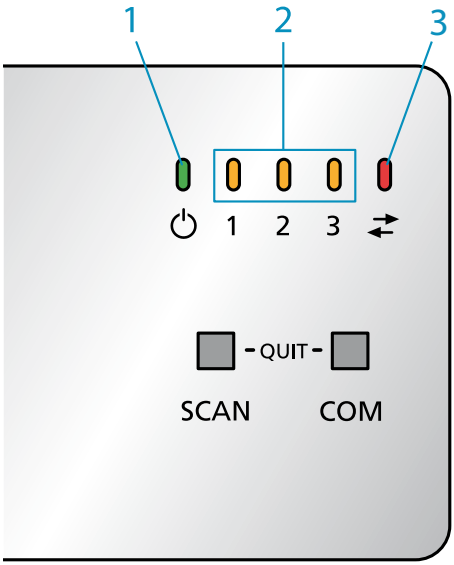


Figure 10: Error messages

1	"*Operating*" LED
2	"*Inverter*" LED
3	"*COM*" LED

Errors are indicated by the flashing the "*Operating*" LED and the "*Info*" LED. In addition, an audio signal from the "*Audible alarm*" is activated.

8.1 Troubleshooting

NOTE

Should it not be possible to fix the error using the help table below, please contact the KACO new energy GmbH service team.

LEDs	Off	Flashing	Illuminated
Operation	Check the mains supply	----	----
WR 1 **WR 2** **WR 3**	Check wiring/ IP address	Read status message from the device manager and inform an electrician	----
COM	----	----	Check internet connection or network settings

8.2 Acknowledging errors

There are two ways in which to acknowledge errors.

Firstly:

☞ Confirm error by briefly pressing the "*SCAN*" or "*COM*" buttons.

» The audio signal is now deactivated until the next error occurs, the LED signals will remain active for longer.

NOTE

Inform your technician so that the error can be fixed.

Secondly:

☞ Fix error.

» An audio signal sounds. The error is acknowledged.

» Afterwards a test is carried out that queries all possible errors, in order to report any connected errors that remain.

NOTE

In order to prevent any recurring alarm notifications, the error can be acknowledged in the above manner in the interim between recognising and repairing the error.

9 Environmental Protection and Waste Disposal

Old and out of use devices are to be disposed of according to the national and regional regulations for environmental protection and recovery of raw materials.

Electronic components must not be disposed of with domestic waste.

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