



**KACO-display**

**Wireless Solar Monitoring System.**



**Operating Instructions  
KACO-display**

full of energy...



KACO-display provides high-technology monitoring of your valuable photovoltaic installation. It shows the desired output, actual output, and it sounds an alarm as soon as a disturbance occurs.

KACO-**display** consists of two parts: KACO-**adapter** (transmitter) and the display (receiver). KACO-**adapter** is capable of wireless data transmission to the display, thus saving laborious cable routing. In addition, it allows for use of several displays simultaneously in different locations.

Depending on the version of KACO-**display** all parts of the solar module can be monitored.

Data is processed in the display and shown in various display modes.

### Startup

- Install the KACO-**adapter** (transmitter)
- Switch on the KACO-**display**
- Adjust your settings on the KACO-**display**

### KACO-**adapter**

#### Inverter Set-up

Connect KACO-**adapter** to a blueplanet inverter by means of the enclosed data cable. Up to max. 4 blueplanet devices can be connected to KACO-**adapter**. 4 PS/2 receptacles are provided in the KACO-**adapter**, and a sub-D port (RS 232) interface is provided in the KACO inverter. The cable connected to KACO-**adapter** recognizes the inverter type being used.

Make sure that KACO-**adapter** is close to the solar inverters and plug it into a wall outlet. Please test the location in advance to ensure that the transmitter can operate free from disturbances (you can check this by testing the signals/messages received by KACO-**display**). A data cable is enclosed with each KACO-**display**.

If more than one inverter is to be connected to the monitoring system you will need the corresponding number of additional data cables.

### KACO-**display**

#### Settings

To access the Settings menu you must open the KACO-**display** as follows:

- Loosen the four stainless-steel screws located on each corner of the KACO-**display** cover plate by manually turning them left.
- Inside the device you will find three keys designated -, MENU, and +.
- Press the MENU key.
- Select the desired menu item by pressing - or +.
- Press the MENU key to access this menu item.
- Use the + and - keys to change a value as desired.
- To confirm a selected item or entered value, press the MENU key.

#### Overview of the Set menu:

Menu item	Options	Explanation	Default setting
Illumination	Always On Always Off 120 seconds Automatic	- The display is illuminated for 120 seconds after knocking on the display screen. - Time-dependent control (see explanation below)	120s
Display Automatic	On  Off	- Changes the display at certain intervals - Toggle function (possible at any time by knocking on the display)	Off
Inverter	blueplanet 2901xi  blueplanet 3601xi	- Inverter type - Only used to scale the display - Displays the daily curve of the	blueplanet 4500

		4 inverters	
Rated Power*		- Rated grid-feeding capacity of the complete installation in W	5000
Transmitter IDs	Transmitter IDs: KACO- <b>adapter</b> WR 0-9	- KACO- <b>adapter</b> for inverters	0
Location	North Central South	Choose your location from the state list below	Central
Time / Hour *	Hour Date AM / PM	AM/PM - Summer time / Winter time	
Change meter	Clear daily meter Clear total meter Change total meter		

**\*To ensure that the results are displayed correctly, it is vital that the time/hour, metering factor and rated power of your photovoltaic installation be entered correctly.**

<b>North</b>	WA, SD, MN, IA, WE, MI, VT, NY, NH, MA, RI, CT, ME, AK, OR, ID, MT, WY
<b>Central</b>	NJ, PA, DE, MD, VA, KY, IN, OK, AR, MO, KS, NE, CO, UT, NV, NM, NC, WV, OH, TN, IL, CA
<b>South</b>	TX, LA, MS, AL, GA, SC, FL, HI, AZ

The metering factor is printed on the grid-feeding meter.

The rated power is shown on the invoice of your installation. If necessary, your supplier will provide you with this information.

**Automatic display illumination**

If the automatic display illumination is activated KACO-**display** will switch the display illumination ON and OFF at the following times:

00:00 - 06:00 OFF
06:00 - 09:00 ON
09:00 - 17:00 OFF
17:00 - 00:00 ON

In general, you can enable the display illumination for 2 minutes by tapping the display screen. The brightness can be controlled with the rotary switch of the power supply. Please use the values of 7.5V, 9V or 12V.

KACO-**display** can now be mounted on the wall. To do this:

1. Drill through any of the pre-bored holes in the back of the plastic housing.
2. Fasten the KACO-**display** to the wall.
3. Close the housing again by securely re-fastening the four stainless-steel screws.

**Operation and displays**

Changing from one display to another is done easily by tapping the display screen. The illumination is automatically switched on for 2 minutes after each change.

To protect your data the recorded values are stored in a buffer memory. In this way, data will not be lost even in the event of a power failure. If any disturbances occur, KACO-**display** will send an alarm message.

The expected total yield will be calculated from the plant's indicated nominal capacity and the date. The calculation is based on a sunny day, i.e. the actual insolation on the respective day will not be taken into account.

The calculated nominal curve is drawn as a line, whereas the fed-in daily capacity is shown as a continuous area. This gives you a full overview of your PV installation's output at a glance.

### Available Displays

#### 1. **PV installation's total daily yield curve & total grid-feeding capacity** Desired (nominal) curve

Date & Hour  
Daily yield & total yield  
Receiving level  
Alarm messages

#### 2. **Individual inverter grid-feeding capacity & total daily yield curve**

Desired (nominal) curve  
Date & Hour  
Daily yield & total yield  
Receiving level/intensity  
Alarm messages

#### 3. **Individual inverters current grid-feeding capacity & daily yield curves**

Hour  
Receiving level  
Alarm messages

#### 4. **Yesterday – daily yield sum & curve**

Desired (nominal) curve  
Date – preceding day  
Daily yield & total yield

#### 5. **Individual inverter values table**

Grid-feeding capacity  
Generator voltage  
Grid voltage  
Device temperature

#### 6. **Overview of alarms of the current day & preceding day (only if an alarm was triggered today or yesterday)**

Check plant/installation  
No data received

### Alarm messages

- In the event of faults an error message appears automatically at the lower left of the display in the form of a bell symbol.
- The alarm symbol will stop flashing if the user views and checks the list of alarms. The alarm symbol continues to be shown until the alarm list no longer includes an alarm – this is usually the case after two days (provided that no new alarm has been triggered).
- An antenna symbol is shown at the lower left of the display. To the right of this symbol the level of the received signal is shown in a bar graph. The symbol will flash if the reception of the signal is poor.

Instead of values, such as the grid-feeding capacity, etc., the following messages may also appear to indicate malfunctions or disturbances:

Alarm message	Description
Flashing line cursor	KACO- <b>adapter</b> is connected but the cable is not plugged in.
Line cursor	Received faulty value (very rare error)
Antenna symbol	No reception of a value for 2 minutes

## List of alarms

Alarm message	Description	Possible causes
Check plant/installation	Reply not received by all the connected inverters	This alarm will be triggered after approx. 3 minutes, if an inverter feeds more than 300W whereas another inverter feeds only 0W.
No data received	KACO <b>-display</b> does not receive any data from KACO <b>-adapter</b>	The wireless connection is interrupted. This message will be created after approx. 2 minutes. A warning sound will be returned if no connection is established for approx. 6 minutes.

We wish you success and the best solar yields with your KACO-display!

## Accessories (optional)

**KACO-relais** Radio-controlled relay, for extended transmission ranges between KACO-adapter and KACO-display. Max. 9 relays are possible. Due to the transmission capacity stipulated by law, it may be necessary to extend the transmission range by means of KACO -relais.

For further questions about accessories, contact your distributor.

## Technical data

### KACO-display

Included with delivery Display, adapter, operating instructions  
 Power supply Mains adapter 230 V AC, 12 V=  
 Measuring interval 8 minutes for the display of a curve  
 Date / Hour Integrated, adjustable via internal keys,  
 battery-buffer of clock: approx. 1 week  
 Power consumption 0.3 W - 3 W, depending on illumination intensity  
 Operating conditions -10°C to 50 °C, for dry rooms only  
 Dimensions 240 x 130 x 61 [mm]  
 Radio communication 433.92 MHz  
 RF approval EN 300 220, EN 301 489 & EN 60950  
 European Conformity CE Mark

### KACO -adapter Inverter Set

Included with delivery Transmitter for connection to max. 4 KACO blueplanet inverters; screwdrivers, operating instructions  
 Power supply 230 V AC  
 Power consumption 0.5 W – 0.75 W  
 Connections 4x PS/2 socket for connection to max. 4 blueplanet inverters via RS232  
 Transmitter range 5 - 30 m, depending on local conditions  
 Operating conditions 0°C to 55°C, for dry rooms only  
 Dimensions 110 x 65 x 60 [mm]

Technical specifications subject to change at any time and without notice.

## Guarantee and Service

Blueplanet grants a guarantee of two years on KACO-**display**, starting from the date of shipment from KACO. During this time, KACO Solar Inc. guarantees the proper function of the devices and free repair of issues that arise due to manufacturer defects.

Should your device show a defect or malfunction during the guarantee period, please contact your specialist dealer or, respectively, your installation expert, or notify KACO directly.

**Guarantee claims shall be excluded in the following cases:**

- Use of the device for other than the intended use (normal use).
- Improper use and installation that does not comply with the required standards
- Improper operation.
- Manipulation of the device or makeshift repairs by the customer
- Influence of foreign objects or Act of God  
(lightning, over voltage, storm, fire)
- Non-adherence to the relevant safety instructions (NEC codes, UL, etc.).
- Transport damage

All guarantee claims shall be handled at the premises of KACO Solar Inc. To this end, return transport should be sent, as far as possible, in the original or an equivalent packaging. Guarantee claims shall only be compensated by KACO if the damaged device is returned to KACO together with a copy of the invoice issued to the consumer by the specialist dealer. The model number on the device must be fully legible. In the event of noncompliance KACO reserves the right to deny guarantee services.

The warranty period for a replacement unit shall be six months from original shipping date.

**Service**

High quality and longevity of our products always have been of central importance for us. Our more than 60 years of experience in the field of development and production support this philosophy.

Despite all these quality-assuring measures, however, in very rare cases disturbances may occur. KACO Solar Inc. will offer a maximum of assistance if one of these cases should arise. KACO Solar Inc. will take every effort to remedy any defects quickly and without unnecessary bureaucracy. Please contact our service department directly – and someone will help you immediately.

**Our product line:**

PHOTOVOLTAIC INVERTERS  
FREQUENCY CONVERTERS  
DC / DC CONVERTERS  
CHARGING RECTIFIERS  
POWER SUPPLIES  
PROTECTED DC VOLTAGE SUPPLIES  
EMERGENCY POWER SYSTEMS  
USV - INSTALLATIONS

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