

SOLAR ELECTRIC

KOSTAL

PIKO Inverters – flexible, communicative and practical

Smart
connections.



KOSTAL competence – generating energy the smart way.

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KOSTAL family –
the story behind the success.100 years.



The KOSTAL group:
the success story of KOSTAL

- As an independent, family-run company, the KOSTAL group is specialised in the development of high-quality electronic and mechatronic solutions for a wide range of industrial and automobile applications.
- The company was founded in 1912 by Leopold Kostal in Lüdenscheid, Germany, and today employs about 13.300 staff in 37 locations in a total of 17 countries.
- The KOSTAL group has four business divisions: Automotive Electrical Systems, Industrial Electronics, Connectors and SOMA Test Technology.
- The KOSTAL group's partners include the world's leading automobile manufacturers and numerous major industrial companies.

KOSTAL Solar Electric:
a reliable partner for the long term

- The PIKO inverters are developed and produced in the Industrial Electronics division at the main site in Germany, and sales and technical service are handled by KOSTAL Solar Electric GmbH.
- International customers are also provided with on-site service via our branch offices in France, Italy, Spain and Greece.
- KOSTAL partnerships are oriented to the long term. This has always been and continues to be an essential element of our company culture.

Quality without compromise

- PIKO inverters are manufactured to the highest technological standards.
- All production processes are aligned to the zero-error philosophy of an automobile supplier.
- Strict quality controls, including a final test and inspection lasting several hours, form an integral part of the entire production process for the PIKO inverters.

PIKO Inverters from KOSTAL –
flexible, communicative and practical.

- The product range covers both single-phase and three-phase string inverters.
- From the 4,2 kW power class upwards, the PIKO inverters provide a symmetrical three-phase feed and thus prevent unbalanced loading of the network.
- The compact construction and low weight offer distinct advantages in terms of handling and installation.
- Thanks to their pre-configuration and certification, PIKO inverters are ready for immediate use in up to 30 European countries.
- The wide DC input voltage range offers numerous system configuration options and guarantees energy yields even in unfavourable light conditions.
- Up to three independent MPP trackers ensure maximum yields and flexibility in terms of system planning, in particular with varying roof orientations or inclinations.
- A data logger, web server and all relevant interfaces for system monitoring are integrated as standard features.
- Integrated active power control (100/60/30/0 %) and internal consumption control.

	PIKO 3.0 ¹	PIKO 3.6	PIKO 4.2	PIKO 5.5	PIKO 7.0	PIKO 8.3	PIKO 10.1
Input side (DC)							
Number of DC inputs / of MPP trackers	1 / 1	2 / 2	2 / 2	3 / 3	2 / 2		3 / 3
Recommended DC power	5 – 10 % above rated AC output ²						
Max. DC input voltage (open circuit voltage)	950 V						
Min. DC input voltage	180 V						
Max. DC input current	9 A	9 A / 13 A ³		9 A		12,5 A / 25 A ³	
Output side (AC)							
Number of feed-in phases	1		3				
AC grid voltage	1/N/PE, AC, 230 V		3/N/PE, AC, 230/400 V				
Max. AC output current	13,1 A	15,7 A	6,1 A	8 A	10,2 A	12 A	14,5 A
Rated AC output (cosφ = 1)	3.000 W	3.600 W (ES, PT 3.300 W)	4.200 W (UK 4.000 W, PT1 3.680 W, PT2 3.450 W)	5.500 W (ES, PT 5.000 W)	7.000 W (DK 6.000 W)	8.300 W	10.000 W
Apparent power (cosφ, adj)	3.000 VA	3.600 VA	4.200 VA	5.500 VA	7.000 VA	8.300 VA	10.000 VA
Max. efficiency	95,7 %	95,8 %	96,5 %	96,2 %	96,0 %	97,0 %	97,0 %
European-standard efficiency	95,0 %	95,1 %	95,4 %	95,7 %	95,3 %	96,3 %	96,4 %
Rated frequency	50 Hz						
Galvanic isolation	Transformerless						
Type of grid monitoring	According to the countries' certificates						
Operational conditions, ingress protection according to IEC 60529	interior + exterior, IP 55						
Ambient temperature	-20° ... 60° C						
Connection technology at input side	MC 4						
Connection technology at output side	Spring-loaded terminal strip						
Dimensions (WxDxH)	420 x 211 x 350 mm				520 x 230 x 450 mm		
Weight	19,8 kg	20 kg	20,5 kg	21,1 kg	33 kg		34 kg
Disconnection device	Integrated electronic circuit breaker						

¹ for the latest technical information on the new PIKO 3.0, see data sheet | ² depending on ambient temperature and solar radiation |

³ with parallel connection of two MPP trackers

PIKO Inverters – internationally deployable. Immediately.

PIKO inverters are preconfigured and certified for the majority of European countries. Country-specific network matching takes place automatically following activation of the appropriate country setting in the inverter.

- Further details:
- One PIKO for up to 30 countries
 - Simple country setting via DIP switch or display
 - Multilingual menu guidance

Pre-configuration and certification for the following countries:

Austria	Greece (islands), Cyprus (EU)	Portugal
Belgium	Greece (mainland)	Romania
Bosnia & Herzegovina	Italy	Serbia
Bulgaria	Latvia	Slovakia
Croatia	Lithuania	Slovenia
Czech Republic	Luxembourg	Spain
Denmark	Malta*	Sweden
Estonia	Montenegro	Switzerland
France	Netherlands	Turkey
Germany	Poland	United Kingdom*

* only for PIKO 3.0 | 3.6 | 4.2 | 5.5



PIKO Inverters – with a complete communication system. As standard.

The communication package integrated into all PIKO inverters enables monitoring of the PV system without the need for additional components.

- The package includes:
- Data logger
 - Web server
 - LAN interface
 - RS485 bus
 - S0 pulse input & output
 - Analog inputs for sensors and ripple control receivers (for active power control)

System monitoring is performed using PIKO Solar Portal, PIKO Master Control or via the integrated web server.



* Detailed information on the communication boards I and II is available on the next pages.

PIKO Inverters – the all-in-one communication board...

The communication board is the heart of the PIKO inverters. Thanks to its extensive functionality, in addition to providing a network and bus interface it also allows connection of a ripple control receiver, sensors, energy meters and all commonly available data transmission components. PIKO inverters: the all-in-one solution for the most demanding requirements.

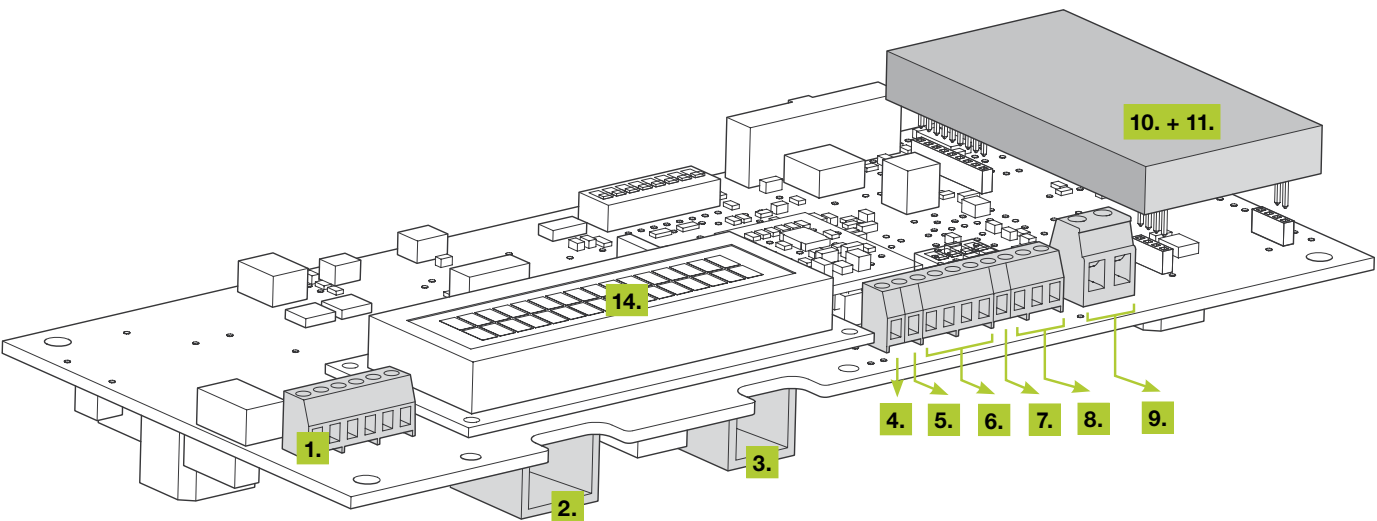


Communication boards I and II

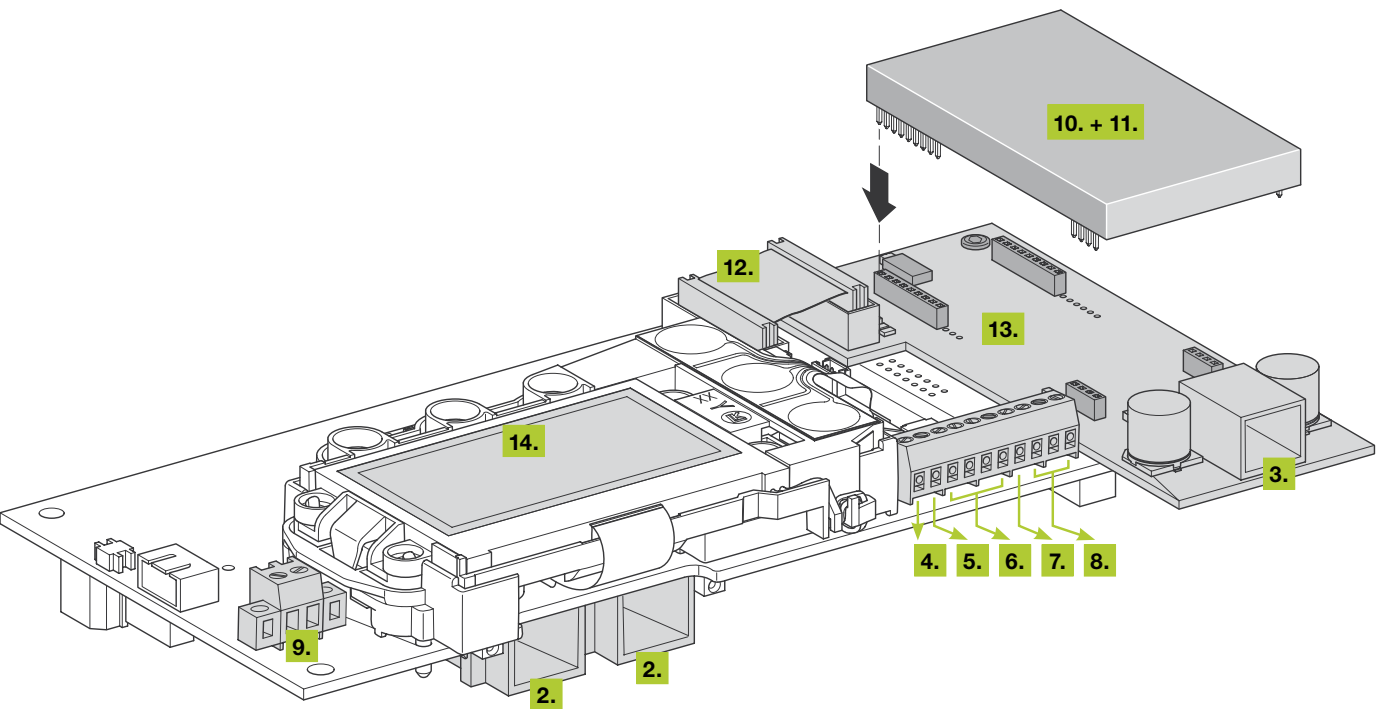
	Communication board I	Communication board II
1. Terminal block as an alternative to sockets 2 and 3	■ Analog telephone connection ■ Ethernet connection	-
2. RJ45 socket	■ LAN interface	■ 2 LAN interfaces, integrated switch for direct connection of multiple inverters
3. RJ11 socket	■ Analog telephone connection	-
4. Power supply for external sensors	■ 5 V output	■ 12 V output
5. Ground	■ For connections 4 + 6 + 7	-
6. 4 analog inputs	■ Sensors ■ Ripple control receiver for controlling power reduction	-
7. Impulse input	■ For connecting an energy meter; the data is stored in the integrated data logger	-
8. RS485 interface	■ Easy inverter connection ■ For connecting external displays and data loggers	-
9. Configurable switching output	■ S0 impulse output for connection of a display ■ Alarm contact ■ Control of internal consumption	-
10. Analog modem for remote data retrieval* (available as an option)	■ Data transfer to a solar portal ■ Enables remote dialling into the PIKO inverter for monitoring or service	-
11. GSM modem for remote data retrieval** (available as an option)	■ Data transfer to a solar portal ■ Enables remote dialling into the PIKO inverter for monitoring or service	-
12. Ribbon cable	-	■ included in the optional modem set
13. Modem adapter board	-	■ included in the optional modem set
14. Display	■ 2-line text display, single-button operation	■ Graphical display, 3-button operation

* Requires a separate telephone connection | ** Requires a SIM card with a data tariff

...for maximum functionality. Guaranteed.



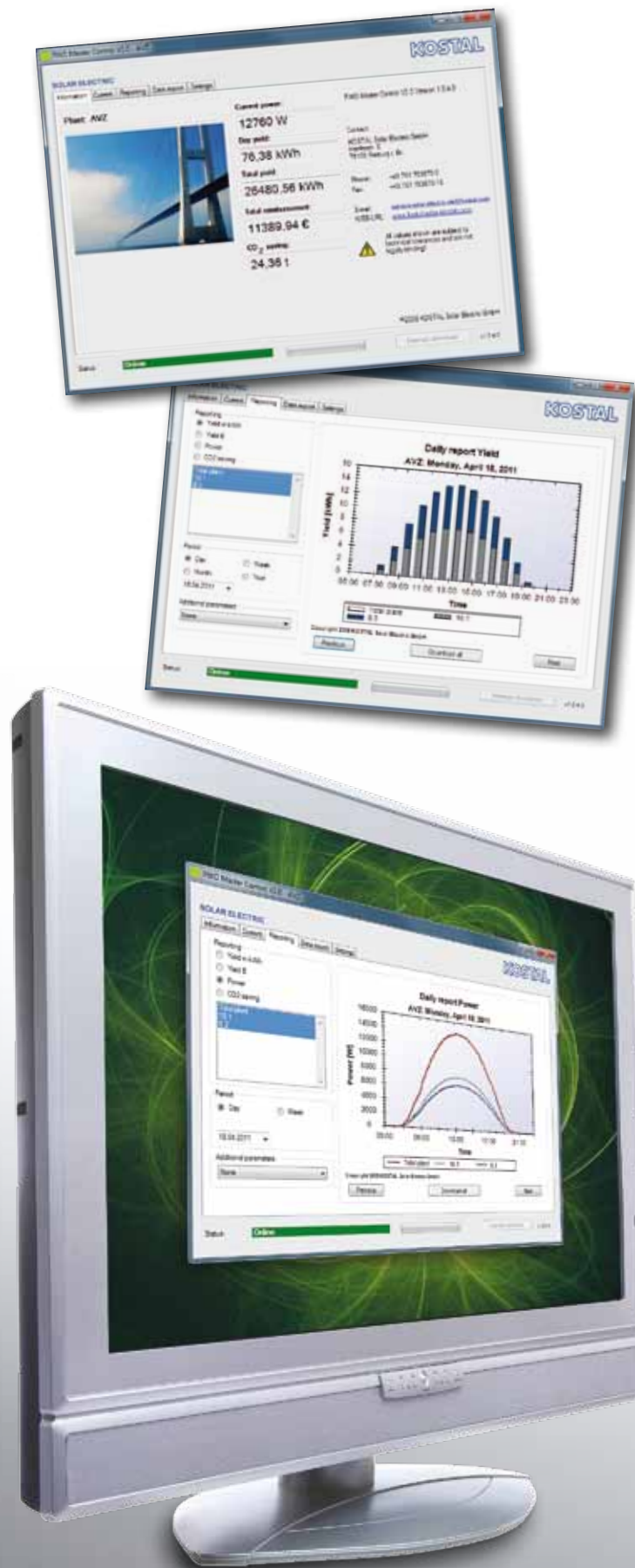
Communication board I



Communication board II

PIKO Inverters – reliable monitoring ...

... online, at any time. Worldwide.



Integrated web server: fast and direct monitoring

The key operating data can be displayed using the integrated web server which is also used to make all inverter settings.

The most important display and configuration functions are:

- Display of the current performance data and the daily and total yields
- An information page for checking sensors and modems
- Downloading of the historical log data
- Inverter configuration settings (e.g. portal access, IP address, internal consumption, active power control)

PIKO Master Control: monitoring made easy

PIKO Master Control makes it easy to process the PIKO inverter's yield and operating data. The software can be downloaded for free from the KOSTAL Solar Electric website*.

- PIKO Master Control enables:
- Graphical display of current and historical data
 - Data export

* www.kostal-solar-electric.com



PIKO Solar Portal: online monitoring, round the clock, anywhere in the world

The PIKO Solar Portal allows you to monitor the operation of your PIKO inverters via the Internet. You can register with the PIKO Solar Portal for free via the KOSTAL Solar Electric website*.

The functions provided include:

- Worldwide access to the portal via the Internet
- Graphical display of the performance and yield data
- E-mail notifications in the case of malfunctions
- Data export
- Sensor analysis
- Display of possible active power reduction by the network operator
- Storage of the log data

PIKO Master Control and PIKO Solar Portal are also suitable for use with PV systems consisting of multiple inverters, and thanks to the multilingual menu guidance can also be used internationally.

* www.kostal-solar-electric.com



PIKO Inverters – guaranteed service. Individually.

Each PIKO inverter is a quality product, manufactured in Europe within the KOSTAL group, and subjected to the same strict quality standards as e.g. our products for the automotive industry. Comprehensive warranty and after-sales services are provided for all PIKO inverters.



Service hotline with guaranteed assistance.



Personal contact with our customers for all issues.



KOSTAL Seminars can be booked online with a few clicks of the mouse.

Take Service literally. Call us!

Partnership for us means teamwork, solidarity and above all personal contact with our customers. Our service staff are available to deal with all pre-sales and post-sales issues by telephone, for example:

- General technical advice and assistance
- Support during planning of your system with the aid of the PIKOplan configuration software
- Customisation of the network parameters with the aid of the PARAKO software
- Assistance during system commissioning
- Support for system analysis
- Advice and assistance during configuration of the system monitoring
- Warranty issues

You can contact our Service Hotline on +49 761 47744-222 (Mo-Fr from 08:00 - 17:00, local time in Germany) or by e-mail to service-solar@kostal.com.

Security, guaranteed!

Within the first two years after purchase you can extend the warranty for your PIKO inverters from 5 years to either 10 or 20 years.

Services covered by the warranty:

- Replacement service
- Flat-rate replacement charge for specialist dealers

Services outside the warranty:

- Preferential price for replacement devices on return of the repairable defective device
- 2-year warranty for the replacement device

KOSTAL Seminars

In the Seminars our comprehensive know-how is passed on professionally, and specialist knowledge is exchanged interactively between the participants and the KOSTAL seminar instructors. Our offer includes various training sessions focusing on technology and sales, also in cooperation with TÜV Rheinland. Detailed information on our seminars is available at www.kostal-solar-electric.com/seminars.

PIKO Inverters – with arc detection. For better protection.

PIKO inverters with arc detection* offer a comprehensive solution for protecting your building and PV system against damage.

Dangerous arcing can occur in various places in a PV system. Even a loose connector or a bad contact can result in arcing and ultimately in damage to the system and its environment.

Arc detection: for increased protection and safety

The arc detector of the PIKO inverter detects arcs in the individual strings as they are formed. It analyses resonance patterns and establishes whether an arc is present or not. As soon as a hazard of this kind is identified, the detector immediately disconnects the PIKO inverter from the network, ensuring safe operation of the PV system.

* PIKO 7.0 | 8.3 | 10.1: available also with arc detection



Arc detection for increased safety.



PIKO Inverters – optimally equipped with ...

With the PIKO Data Communicator: the essentials always at your fingertip

With the PIKO Data Communicator you can relax and monitor the yields of your PV system on a digital picture frame.

The PIKO Data Communicator is a set consisting of a Data Collector (1) and a Data Stick (2). The Data Collector collects the data from the PIKO inverters and transmits this data to the Data Stick. The Data Stick is connected via a USB interface to a digital picture frame (3) that displays all of the key data of your PV system.

Features:

- Can be connected to digital picture frames* with a USB interface and a slideshow function
- Simple installation
- Performance/yield of the PV system per day/month/year
- CO₂ savings per day/month/year
- Sensor data (ambient temperature, module temperature, solar irradiation)
- Wireless data transfer (30 m within buildings, 300 m outdoors with no obstructions)
- Up to 10 PIKO inverters can be connected
- 6 languages available (DE, EN, FR, ES, IT, GR)

* Digital picture frames are not included in the package. A list of compatible picture frames is available at www.kostal-solar-electric.com



...intelligent accessories. Across the board.



PIKO Sensor for comparing actual and target values.

PIKO Sensor: for measuring temperature and irradiation

The PIKO Sensor enables comparison of the actual irradiation and temperature conditions with the performance data of the PV system. The PIKO Sensor* measures the following values:

- Irradiation
- Ambient temperature
- Module temperature

A particularly convenient feature: The measured values can be visualised via a solar portal (e.g. PIKO Solar Portal) and the PIKO Master Control software.

* PIKO Sensor for communication board I, from the 3rd quarter of 2012 also for communication board II



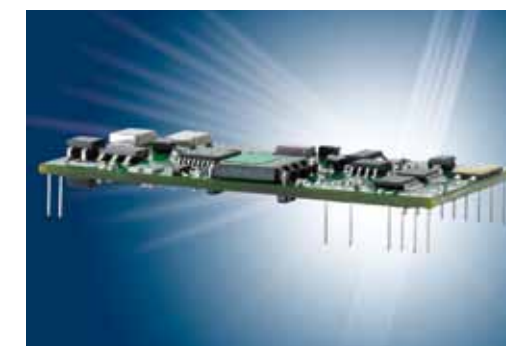
KOSTAL GSM modem: Online via the mobile phone network.

KOSTAL Modems: online via the mobile phone network or a dial-up connection

The KOSTAL GSM modem enables connection of PIKO inverters to the Internet via the mobile phone network¹; the KOSTAL analog modem via a dial-up connection².

For both modem types:

- The connection can be used for transferring data to a solar portal (e.g. PIKO Solar Portal) or for dialling in to the PV system.
- With a KOSTAL modem, PV systems with up to 20 inverters can be connected to the Internet³.



KOSTAL analog modem: Online via a dial-up connection.

Scope of delivery for the GSM modem: KOSTAL GSM modem, external GSM antenna, modem adapter board, cable (3 m, extendible)

Scope of delivery for the analog modem: KOSTAL analog modem, modem adapter board, RJ11 telephone cable (3 m)

¹ with a data SIM card and a volume tariff, not included

² requires a separate telephone connection

³ in the case of the GSM modem this depends on the strength of the GSM signal



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