





Introduction

Dear Ladies and Gentlemen,

Photovoltaic is becoming increasingly important - throughout Europe and across the globe. Its share of the global energy mix is growing daily. The reason for this is that the constant availability of electric energy is playing an ever greater role and this availability is the minimum requirement for the acceptance of renewable sources of energy as energy sources. Consequently, storing energy is gaining importance.

This goes beyond just storing PV energy in a battery system and includes, for example, supplying heat pumps with PV power as a means of saving energy as heat. The Solar-Log™ coordinates the consumption of power by supplying the appropriate amount of PV power to the right place. It turns electrical appliances and devices on and off as needed. With this function, the Solar-Log™ is not just a data logger to monitor PV plants, but also an intelligent energy management system.

The international market continues to present new challenges for our Solar-Log™ as an energy management system. Feed-in management - and the different legal requirements for it - for example, is becoming a crucial aspect of the international market.

The Solar-Log™ provides solutions to these challenges.

Yours,

Frank Schlichting, CEO

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*In many countries, the designation "Speedwire" is a registered trademark of SMA Solar Technology AG.

Welcome to the market leader in PV Monitoring and Management

Quality



We provide our customers world-wide with state-of-the-art solar energy system solutions. We are the market leader when it comes to monitoring with over 236,000 plants and 990,000 inverters. In total, we monitor over 8 gigawatts and this number is increasing every day. Our recipe for success involves staying ahead of the market with new ideas and innovations for all of our Solar-Log™ models and our online portal Solar-Log™ WEB.



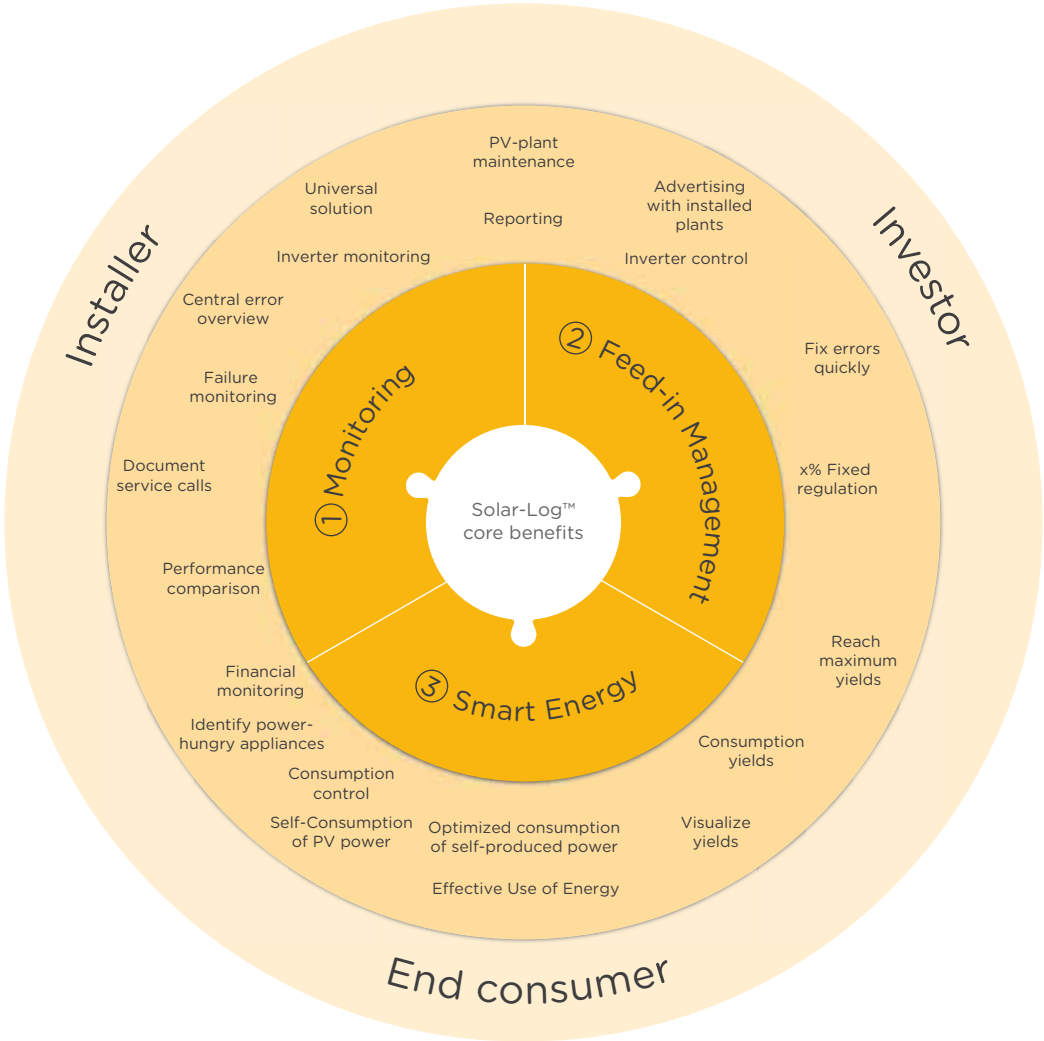
All-In-One solutions

Unrivaled simplicity: Staying ahead of the competition with all-in-one solutions. Thanks to precise advanced technology for monitoring as well as for energy and feed-in management, the Solar-Log™ offers the most efficient universal energy management system for photovoltaic plants. Its compatibility with inverters from all major manufacturers guarantees easy handling.

Unmatched security for banks

Banks and investors often require financial guarantees on their PV investments. With Solar-Log™ plant monitoring, we offer a system to reliably monitor the rate of return from the PV plant and to serve as a safeguard for PV investments.

The core benefits of the Solar-Log™



Visualization

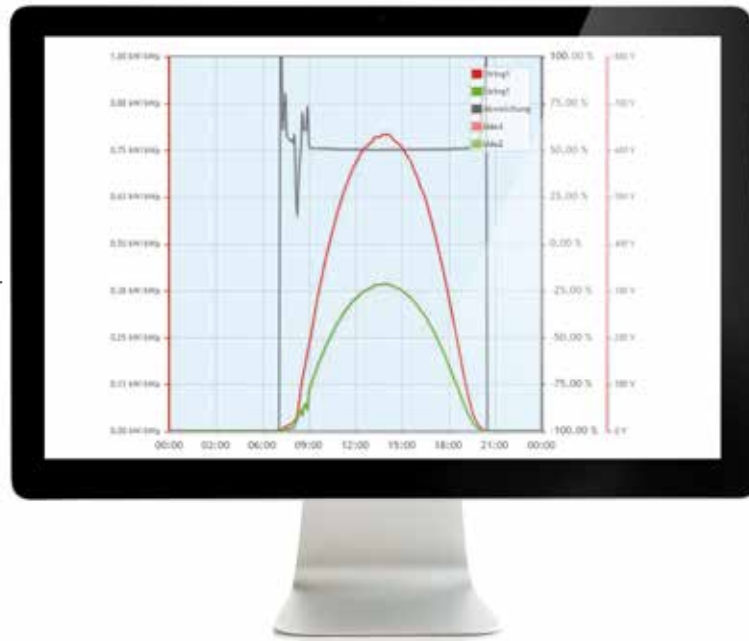
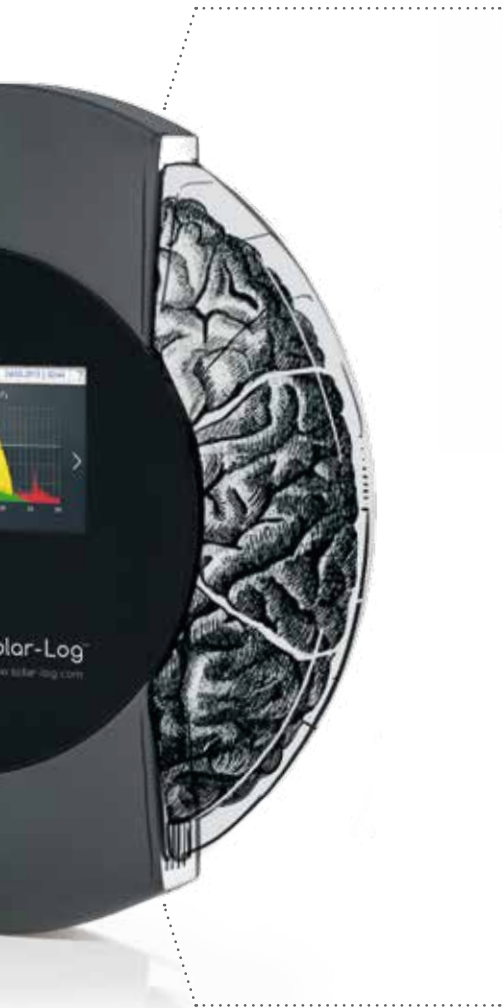


Daily graph: In the graph the current day is displayed as a curve graph. The values output (w) and yield (kWh) can be selected or deselected at any time from the graph key. The different values throughout the day can be displayed by moving the mouse along the curve.



LCD-Status-Display for notifications during installation and operation.

Diagnosis



MPP Tracker comparison: The gray line depicts the degree of deviation. The percentage of deviation can be read from the columns on the right. The columns on the left show the tracker's kW/kWp output.



Feed-in management - feed balance: The times when there was a grid feed and when electricity was purchased from the grid can be seen at a glance in this graph. Negative values indicate that electricity was purchased from the grid and positive values that there was grid feed.

Configuration



Feed-in management - active power: The power reduction can be defined and selected here, e.g. adjustable reduction with the calculation of self-consumption.



Devices - order: The order of the inverters can be defined in this menu and be adjusted as needed.



Top Features



Feed-in management - PM history: The Solar-Log™ PM+ records the reductions from the grid operators to the second. Solar Log™ WEB "Commercial Edition" offers the option to calculate the financial losses from these reductions and to create and send reports.



The new Dashboard view of the PV plant is displayed in the current values overview. The current consumption (as long as a consumption meter has been installed), the current production and grid feed are displayed in a tachometer format. In both graphs the current output from the individual inverters and the current total consumption from the consumption meters are recorded.

Advantages and benefits for installers, portal operators and service providers

- 1 Easily become more efficient**

No PC or Internet expertise is required to take advantage of the quick and simple installation with Easy Installation.
 - 2 The LCD displays show the operating status**

An LCD-Status-Display is included with all devices and provides comprehensive information on the installation and operating status.
 - 3 Greatly reduce the installation time and effort required for network set-up**

For wireless communication, all Solar-Log™ models are available with optional WiFi, Bluetooth and GPRS.
 - 4 Compatible with all major inverters on the market**

The single monitoring system for all inverters allows plant operators to select the best inverter for their needs.
 - 5 All information at a glance**

Centrally monitor all PV plants from a single platform with the Solar-Log™ WEB “Commercial Edition”.
 - 6 Saving a considerable amount of time and money**

Centrally monitor all PV plants from a single platform with the Solar-Log™ WEB “Commercial Edition”.
-

Advantages and benefits for plant operators

- 1 Unmatched security for banks**

Banks and investors require guarantees on their PV investments. Solar-Log™ monitoring helps to ensure a solid rate of return from the PV plant.
 - 2 Higher efficiency**

Error messages are immediately transmitted online or to mobile devices to guarantee yield certainty.
 - 3 Effective and quick monitoring**

The device can be intuitively and conveniently operated via the color TFT-Touch-Display directly from the device or remotely via the web browser.
 - 4 No PC expertise required**

No software needs to be installed to connect the Solar-Log™ to the network.
 - 5 Flawless and precise monitoring at an attractive price**

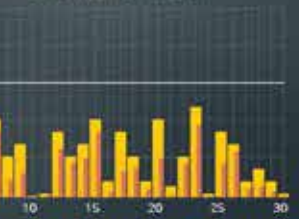
As the market leader, we produce larger quantities at the highest qualities and guarantee the best value for money.
 - 6 Optimize consumption of self-produced power and save money**

Optimized control and consumption of self-produced power with Solar-Log™. This optimization helps make rising electricity prices less frightening.
 - 7 Reliability, a reassuring feeling for decades to come**

The “Full-Service” contract offers plant operators comprehensive professional monitoring and maintenance.
-

Performance history 24.03.2013 | 02:44 ?

Performance Month



 Solar-Log™
www.solar-log.com

01

Solar-Log™ Hardware

Solar-Log™ device highlights

The Solar-Log™ is setting new international standards when it comes to monitoring and managing photovoltaic plants. Perfect and precise monitoring provides the basis for flawless operation, and intelligent controlling systems maximize the consumption of self-produced power in no time.

The Solar-Log™ fits into every house with its modern design. The Solar-Log 1200 and 2000 come with a TFT color touch screen to operate the device and to display yield graphics and plant data in a descriptive and easy-to-understand way. All Solar-Log™ devices come with a new LCD-Status-Display that provides comprehensive information on the installation and operating status.

Solar-Log 300, 1200 and 2000

Common features

Functions

Local monitoring

Local graphical reports via web browser.

LCD-Status-Display

Status display for installation and operations.

Smart Energy

Measurement and presentation of self-consumption control and visualization of individual appliances for the optimization of self-consumption.

Feed-in management

Reduction of feed-in power with a dynamic allowance for self-consumption.

Display Options

Solar-Log™ WEB

The Solar-Log™ WEB “Commercial Edition” online portal expands the monitoring functions of the Solar-Log™ and offers comprehensive reporting options in the form of graphs and tables via the Internet.

Solar-Log™ APP

You can access your data and graphical reports at any time from anywhere in the world with the free Solar-Log™ APP.

Solar-Log™ Dashboard

The Dashboard is a feature of the WEB “Commercial Edition” that displays all important information for a plant such as yields, CO₂ savings and plant performance.

Solarfox® large and external display

A large external display used in combination with the Solar-Log™ can visually present live data from a PV plant. You can also add personalized advertisements. Large external displays can be connected via the RS485 or S₀ interface.

Connections

Inverters

The Solar-Log™ is compatible with inverters from all major manufacturers.

Sensors RS485

The sensors measure solar irradiation, temperature and wind speed. They can even be combined with some inverters on an RS485 bus.

Meter S₀-In or RS485

The meter can record your consumption data or serve as an inverter and measure the power from incompatible inverters.

RS485 or S₀-Out

Connect a large external display to gain an additional overview of the data.

Solar-Log 300 USB connection and data export

A USB stick can be connected to manually install new firmwares with new functions or to transfer backups and other data.

Ripple Control Receiver

The signal to reduce active power is generally sent via a Ripple Control Receiver or remote control technology. Up to two Ripple Control Receivers can be connected to the Solar-Log™ PM+, one for power reduction and one for reactive power control.

Additional Functions

Cable cover

With its attractive design the cable cover for the Solar-Log™ offers the best possible mechanical protection for interfaces and cables.

Data security

The data volume from the Solar-Log™ can record for up to 20 years. The micro SD card is used to protect against any loss of data in the event of a power failure.

Maximum plant size 15 kWp

Optional Powermanagement

Dynamic LCD-Status-Display

Monitor, optimize and manage
the consumption of
self-produced power



Options	Standard	BT	WiFi	BT/WiFi	PM+	PM+/WiFi	GPRS	PM+/GPRS	Meter
	●	●	●	●	●	●	●	●	●

Solar-Log 300

For small domestic installations

Functions

Solar-Log™ Easy Installation

The inverter detection and the Internet logon start immediately. The installation status is shown on the LCD-Status-Display. The manual configuration of the Solar-Log™ can be performed via the WEB interface. Easy Installation is compatible with the Solar-Log™ WEB “Commercial Edition” and “Classic 2nd Edition”.

Self-consumption

Self-consumption can be measured and displayed as a graph with a power meter. A power meter with slightly less precision is already integrated into the Solar-Log 300 and 1200 Meter models. Only current transformers need to be connected for the measurements.

Connections

Inverters

The Solar-Log 300 can be connected to several SDS-supported inverters from a single manufacturer per interface with a maximum total power of 15 kWp.

Inverter interface

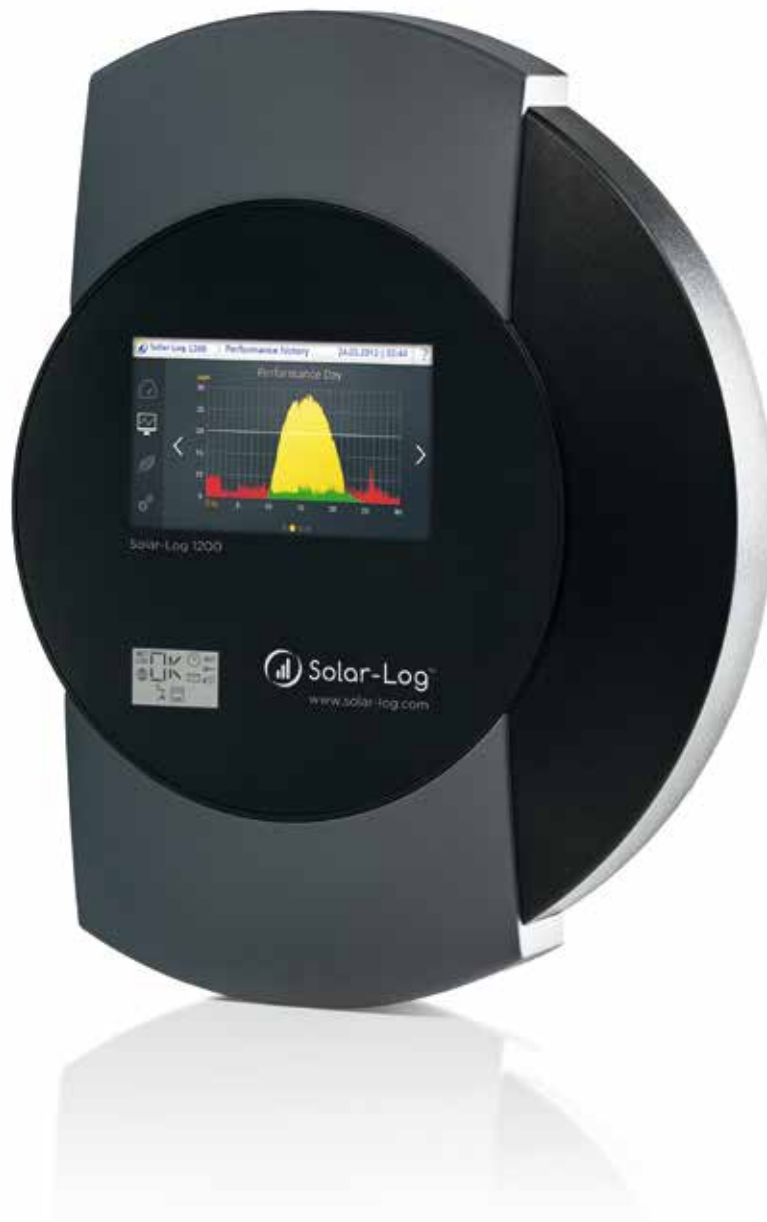
Inverters can be connected via an RS485/422 interface or an Ethernet connection. Additional inverters can be connected with the Bluetooth version.

Maximum plant size 100 kWp

Optional Powermanagement

Color TFT-Touch-Display and
LCD-Status-Display for displaying
graphics and operation

Possible to monitor, optimize
and manage the consumption
of self-produced power



Options	Standard	BT	WiFi	BT/WiFi	PM+	PM+/WiFi	GPRS	PM+/GPRS	Meter
	●	●	●	●	●	●	●	●	●

Solar-Log 1200

For small domestic installations and medium-sized plants

Functions

Solar-Log™ Easy Installation

The installation and initial setup is automatic. The inverter detection and the Internet logon start immediately. The installation status is shown on the LCD Display. The manual configuration of the Solar-Log™ can be performed via the WEB interface. Easy Installation is compatible with the Solar-Log™ WEB “Commercial Edition” and “Classic 2nd Edition”.

Self-consumption

Self-consumption can be measured and displayed as a graph with a power meter. A power meter with slightly less precision is already integrated into the Solar-Log 300 and 1200 Meter models. Only current transformers need to be connected for the measurements.

Display Options

TFT-Touch-Display and access to Solar-Log™

The Solar-Log™ can be operated from a computer with a web browser or directly via the device's TFT-Touch-Display. The graphical reports of yield data are visualized on the color TFT-Touch-Display and via the web browser. Remote access is possible with the Solar-Log™ WEB “Commercial Edition”.

Connections

Inverters

The Solar-Log 1200 can be connected to several SDS supported inverters from one manufacturer per interface with a maximum total power of 100 kWp.

Inverter interface

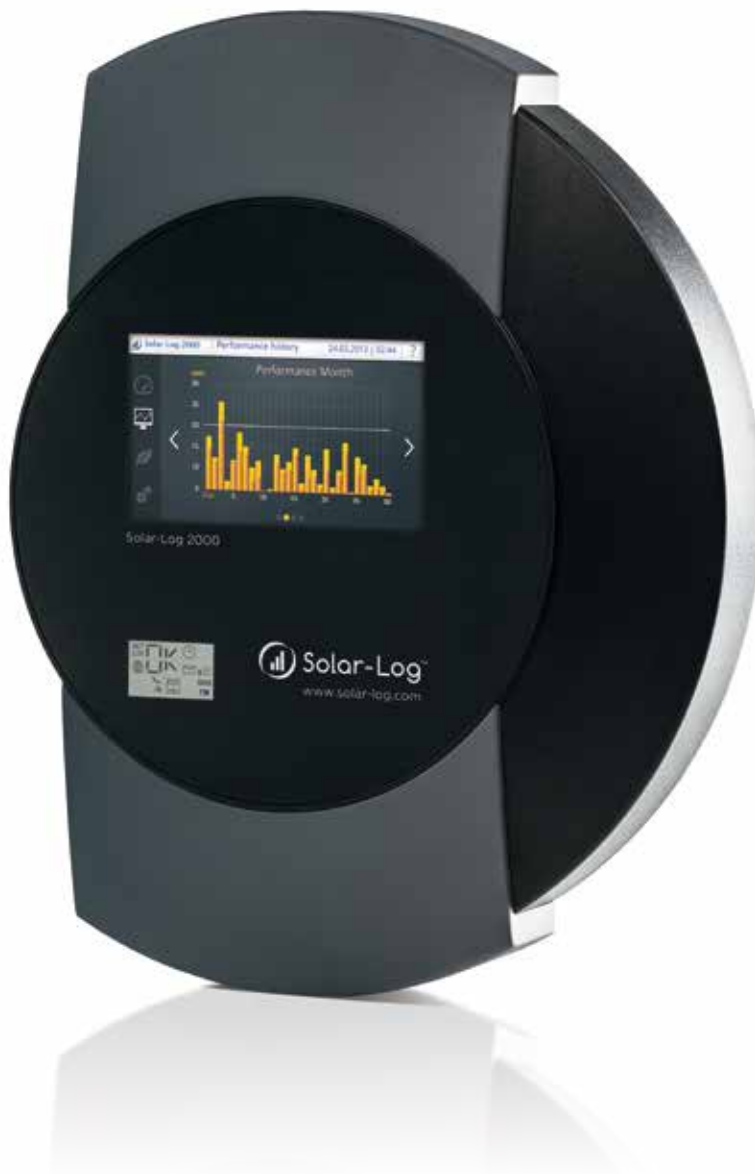
Inverters can be connected via an RS485/422 and RS485 interface or an Ethernet connection. Additional inverters can be connected with the Bluetooth version.

Maximum plant size 2000 kWp

Optional Powermanagement
and cos phi control

Color TFT-Touch-Display and
LCD-Status-Display for displaying
graphics and operation

Monitor central inverters and SCBs



Options	Standard	BT	WiFi	BT/WiFi	PM+	PM+/WiFi	GPRS	PM+/GPRS	Meter
	●	-	-	-	●	-	●	●	-

Solar-Log 2000

For solar power stations and large-scale PV plants

Functions

Self-consumption

The Solar-Log 2000 offers the option to measure the amount of self-produced power consumed and to present it graphically via the Solar-Log™ WEB “Commercial Edition”. An additional power meter serves as a consumption meter.

Solar-Log 2000 alarm function

This provides your plant with anti-theft protection and an external alarm against burglars and vandals.

Display Options

TFT-Touch-Display and access to Solar-Log™

The Solar-Log™ can be operated from a computer with a web browser or directly via the device's TFT-Touch-Display. The graphical reports of yield data are visualized on the color TFT-Touch-Display and via the web browser. Remote access is possible with the Solar-Log™ WEB “Commercial Edition”.

Connections

Inverters

The Solar-Log 2000 can be connected to several SDS supported inverters from one manufacturer per interface with a maximum total power of 2000 kWp.

Interfaces

The interfaces can be used to connect inverters (up to two different manufacturers) and accessories such as Utility Meter, Pyranometer and SCBs. The Solar-Log 2000 Standard and PM+ have two RS485/RS422 interfaces and one RS485 interface. The Solar-Log 2000 GPRS and PM+/GPRS have one RS485/RS422 and one RS485 interface.

Options

Solar-Log 2000 PM+ & Solar-Log™ Utility Meter

Combining the Solar-Log 2000 and Utility Meter simplifies implementation of the diverse requirements for powermanagement in Germany. The voltage-dependent reactive power control, Q(U) function, is accomplished by measuring the medium voltage with the Utility Meter. The combination of the Solar-Log 2000 and Utility Meter is also needed to send a confirmation of the current amount of feed-in power to the grid operator.

Solar-Log 2000 & PM-Package

For plants larger than 100 kWp, remote control of the reactive power supply and power limitations are required along with a confirmation of the current amount of feed-in power.

In practice, each grid operator stipulates its own signalization variant in the technical connection requirements (TAB). To fulfill the requirements from a particular grid operator, Solare Datensysteme offers a grid company specific PM-Package. This package includes hardware that is adjusted to a company's remote control technology and profile file.

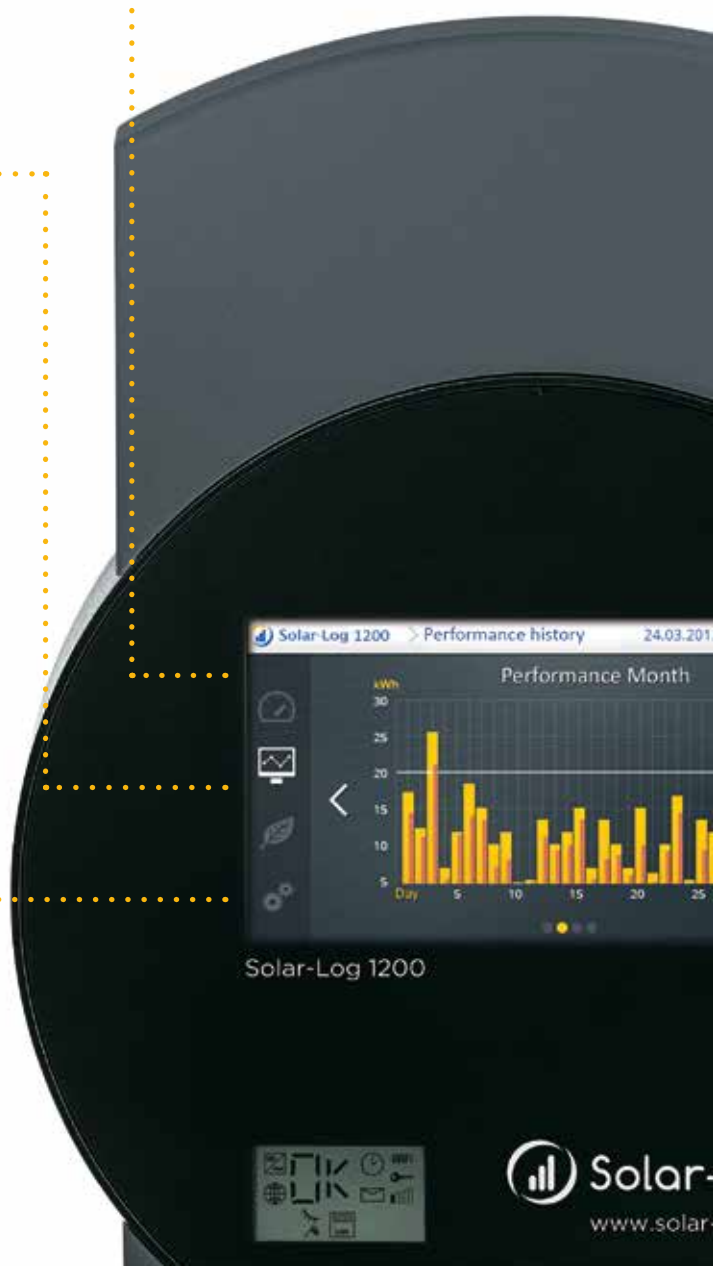
String Connection Box (SCB) or String Monitoring Box (SMB)

When used with the Solar-Log™ WEB “Commercial Edition” and either the SCB or SMB, the Solar-Log 2000 monitors every single string, ensuring the most complete and secure monitoring for large-scale PV plants with exact error identification and localization.



The generated output and the power consumption of the PV plant are displayed in the “Balance” section.

TFT-Touch-Display views in the Solar-Log 1200 and Solar-Log 2000



Product comparison

Solar-Log 300

Solar-Log 1200

Solar-Log 2000

Basis functions

Standard	●	●	●
PM+ ²⁾	●	●	●
PM+ / WiFi ²⁾	●	●	-
PM+ / GPRS ²⁾	●	●	● ⁴⁾
Bluetooth (BT) ²⁾	●	●	-
WiFi (Wireless Lan) ²⁾	●	●	-
Bluetooth (BT) / WiFi ²⁾	●	●	-
GPRS ²⁾	●	●	●
Solar-Log™ Meter (CT)	●	●	-
Central inverter SCB and SMB	-	-	●
Inverter connection options	Ethernet, Bluetooth ⁵⁾ 1 x RS485/RS422 (1 inverter manufacturer per bus)	Ethernet, Bluetooth ⁵⁾ 1 x RS485, 1 x RS485/RS422 (1 inverter manufacturer per bus)	Ethernet 1 x RS485, 2x RS485/RS422, 1 x CAN (1 inverter manufacturer per bus)
Max. plant size	15 kWp	100 kWp	2000 kWp
Max. cable length	Max. 1000 m ¹⁾	Max. 1000 m ¹⁾	Max. 1000 m ¹⁾

Plant monitoring

String monitoring / MPP Tracker (depending on type of inverter)	●	●	●
Monitoring of central inverters	-	-	●
SCB and SMB connections	-	-	●
Inverter failure, status of fault and power monitoring	●	●	●
Sensor system connection (irradiation / temp. / wind)	● ³⁾	● ³⁾	● ³⁾
E-mail and text message (SMS) alert	●	●	●
Alarm (local)	-	-	●
Yield forecast	●	●	●
Self-produced energy consumption: Digital electricity meter	●	●	●
Self-produced energy consumption: Managing external appliances	●	●	●

Feed-in management

Reduction to X percent (with the calculation of self-consumption)	● (+ Meter)	● (+ Meter)	● (+ Meter)
Remote controlled active and reactive power reductions (with the calculation of self-consumption)	PM+ (+ Meter)	PM+ (+ Meter)	PM+ (+ Meter)
Feed-in management with response signals	-	-	PM+, Utility Meter, PM-Package or Modbus TCP PM

Product comparison	Solar-Log 300	Solar-Log 1200	Solar-Log 2000	
Integrated web servers	●	●	●	Visualization
Graphic visualization – PC local and internet	●	●	●	
LCD-Status-Display	●	●	●	
Display on the unit	-	4.3" TFT color display	4.3" TFT color display	
Controls on the unit	-	Via touch display	Via touch display	
Large external display RS485 / S ₀ pulse	●	●	●	
HTTP data transfers to Solar-Log™ WEB for low data volumes	●	●	●	
FTP data transfer to third-party portals ⁶⁾	●	●	●	
Easy Installation	●	●	-	Installation
Network detection / DHCP	●	●	●	
Name resolution http://solar-log	●	●	●	
Ethernet network	●	●	●	Interfaces
USB flash drive	●	●	●	
Potential-free contact (relay)	-	●	●	
Alarm contact (anti-theft)	-	-	●	
Power supply voltage / device voltage /current consumption	115 V – 230 V / 12 V / 3 W			General data
Ambient temperature	-10 °C to +50 °C			
Housing/dimensions (w x h x d) in cm / Mounting /Protection level	Plastic / 22.5 x 28.5 x 4 / Wall-mounted / IP 20 (indoor use only)			
Connection to Solar-Log™ WEB "Commercial Edition"	●	●	●	
Weight ⁷⁾	710 g	800 g	810 g	
Multi-lingual (DE, EN, ES, FR, IT, NL, DK, TR, JP, CN)	●	●	●	
Memory, Micro-SD, 2 GB, endless data logging	●	●	●	
Warranty	5 years			

1) Depending on the inverter used, and the cable type (details can also vary from one type of device to another).

2) Other important information about Bluetooth and compatibility, Powermanagement, self-consumption and SCB and SMB inverters can be found on our website www.solar-log.com.

3) Using every inverter on the same bus is not always possible; please see the inverter database www.solar-log.com.

4) Solar-Log 2000 PM+ / GPRS Communication interface 1 x RS485, 1 x RS485/RS422 (1 inv. manufacturer per bus).

5) Bluetooth connection options only available with Bluetooth models.

6) It is possible to make a data transfer to third-party portals once per day via FTP - an additional license is required for more frequent transfers.

7) Weight of the standard version, deviations possible depending on the particular model.

Accessories

	Article number	Solar-Log 300	Solar-Log 1200	Solar-Log 2000
Smart Plugs	AllNet Standard 3.5 kW, measuring function	255879	●	●
	AllNet WLAN 1.8 kW, without measuring function	255616	●	●
	Gude 1100 / 1101, measuring function	www.gude.info	●	●
	Gude 1102 / 1103, without measuring function	www.gude.info	●	●
	Belkin WeMo Insight Switch, 16 A ³⁾ WLAN, measuring function	255841	●	●
Relays	Solar-Log™ Smart Relay Station, 1 x 16 A (1 x 3.5 kW)	255754	●	●
	Solar-Log™ Smart Relay Station, 3 x 16 A (3 x 3.5 kW)	255755		
	Smart Relay Box 8 Relays	255656	● ⁴⁾	●
	Gude Expert Net Control 2301 - 4x Relays Top-hat-rail mounting 230 V	www.gude.info	●	●
EGO Smart Heater	255840	●	●	
Meters	Inepro 1-phase, calibrated - S ₀ and RS485	255420	● S ₀ ⁴⁾	●
	Inepro 3-phase, calibrated - S ₀ and RS485	255421	● S ₀ ⁴⁾	●
	Iskra power meter, 1-phase - S ₀	255346	●	●
	Iskra power meter, 3-phase - S ₀	255347	●	●
	Solar-Log™ Utility Meter	255385	● ⁵⁾	● ⁵⁾
	Elkor WattsOn (USA)	-	●	●
	SMA Meter Connection Box	-	●	●
CTs	16 A sealed, 100 A sealed, 100 A open	See page 56	● (Meter)	● (Meter)
	Sensor Box Commercial ¹⁾	220060	●	●
Sensors	Sensor basic ¹⁾	255258	●	-
	Lufft UMB WS503	www.lufft.de	●	●
	RS485 Wireless Package	220058	●	●
Wireless	Directional radio antenna for the wireless package (std. 2.4 GHz antenna)	-	●	●
	GPRS external antenna	255329	● Solar-Log™ GPRS Version	● Solar-Log™ GPRS Version
Large plants	PM-Packages	grid company independent	-	●
	SCB / SMB	-	-	●
Misc.	PowerLine Package	255886	●	●
	Overvoltage Protection		255602	255601
	Special PiggyBack for SMA	220020	●	●
	Outdoor case	See page 89	●	●

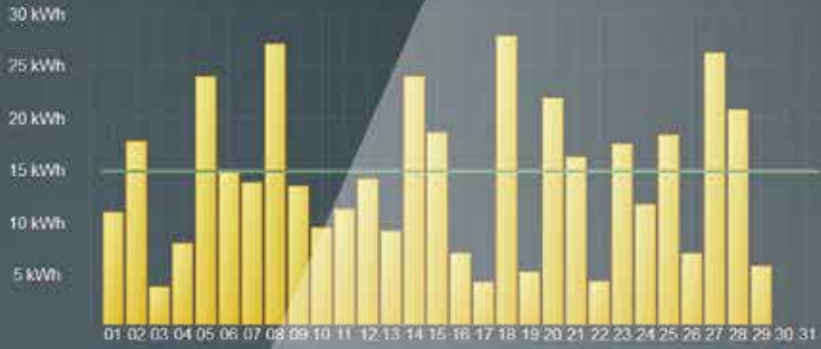
1) Can be connected to the same RS485 bus with some inverters; 2) separate RS485 interface always required - not with inverters on one port; 3) Independent of country version; 4) note that only one RS485 port is available; 5) only power meter, no reactive power, cos phi, etc.

Interface	Solar-Log 300	Solar-Log 1200	Solar-Log 2000		
RS485/RS422 - interface usage	RS485/RS422 - combined interface usage	RS485 - interface, RS485/RS422 - combined interface usage	RS485 A - interface, RS485/RS422 B, RS485/RS422 C* - combined interface usage	Inverter interfaces	
Inverter connection (Fronius / Sunville can be connected on an RS422 interface without an additional interface converter.)					
Connection of a Sensor basic to record environmental data (irradiance and module sensor)		Connection of a Sensor Box Commercial to record environmental data (irradiance, module and ambient temperature, wind sensor)			
RS485 - interface usage	Connection of meter for self-consumption according to IEC 60870				
Connection of the display panels produced by Schneider Displaytechnik, Rico or HvG					
Smart Relay Box connection for the management of consumption data					
	-	-	Connecting the Utility Meter and I/O Box for PM remote control technology		
CAN-bus	-	-	For the connection of Voltwerk inverters and other inverters with a CAN interface		
S ₀ pulse input - for optional recording and calculation of self-produced power consumption					
2x S ₀ -In / 1x S ₀ -Out	Second input to connect an additional power meter				Additional function interfaces
S ₀ pulse output to connect large external displays, pulse factor can be set to any value					
Relay	-	For external switch control, e.g. heat pumps			
Alarm	-	-	Connection for anti-theft protection via contact loop for external alarms via potential-free contact		
USB connection	To access data / Import firmware updates at plants				
PM+	For connection of a Ripple Control Receiver to regulate the plant				
Fulfills the EEG 2012 requirements (Germany)					
Solar-Log™ Meter (optional)	Current measurements via transformers (extra accessory) up to 2 x 3 phases or 6 single phases				
Network	Connection to the internet (Ethernet, fixed IP address or DHCP)			Net-work	
GPRS (optional)	Antenna connection and SIM card slot for Solar-Log™ with integrated GPRS				

* not with GPRS models

Article number	Solar-Log 300	Solar-Log 1200	Solar-Log 2000
Standard	255574	255591	255592
BT	255577	255585	-
WiFi	255576	255584	-
BT / WiFi	255578	255586	-
PM+	255579	255587	255594
PM+ / WiFi	255580	255588	-
GPRS	255575	255583	255593
PM+ / GPRS	255581	255589	255595
Solar-Log™ Meter (CT)	255582	255590	-

Yield History



Day **Month** Year Total

Weather



7.0 °C

Balingen,
Germany

Min: 3.0 °C
Max: 8.0 °C
Wind speed: 5.6 mph

3-day forecast



Th
Min: 6.0 °C
Max: 12.0 °C



Fr
Min: 7.0 °C
Max: 9.0 °C



Sa
Min: 8.0 °C
Max: 9.0 °C

02



Solar-Log™ Monitoring

The best way to present

Keeping everything in sight and under control: The Solar-Log™ WEB features concise presentation options that can be accessed from anywhere in the world via the internet. With this internet service, the plant yields, error messages and configuration data from the Solar-Log™ are transferred to our servers.

Solar-Log™ WEB comes in two versions, both of which are tailored to your needs. With the “Commercial Edition”, the plant owner can purchase a service contract from the installer. The owner does not have to worry about anything since the status messages are sent directly to the installer. This enables installers and service providers to react immediately by taking care of the problem remotely or by making a service call. The Solar-Log™ WEB “Commercial Edition” is also a central control element that allows installers to adjust settings and activate functions remotely. The plant owner has around-the-clock access to the yield and plant information. The “Classic 2nd Edition” offers basic plant monitoring functions. Private plant owners monitor their own plant and independently evaluate faults. There is the option to display, analyze and compare yields over a period of weeks, months or years.

Solar-Log™ WEB “Commercial Edition”

The “Full Service” option from the installer, portal operator and service provider: Installation, Monitoring, Maintenance.

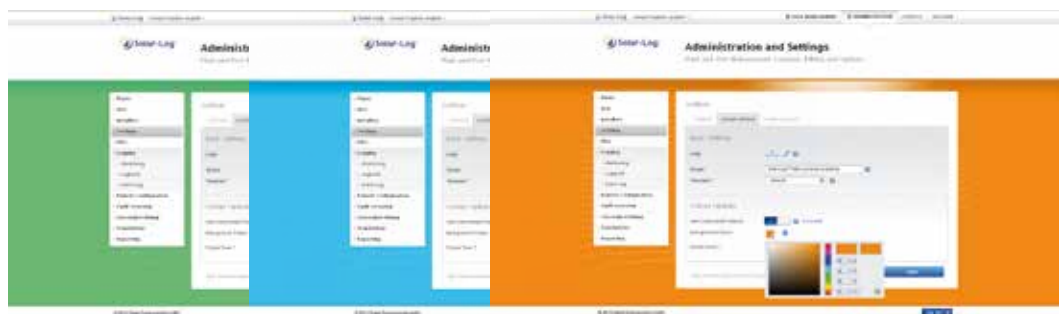
The Solar-Log™ WEB “Commercial Edition” has been developed for installers, portal operators and service providers. You can offer the plant owner a service contract to manage the PV plant remotely and to offer comprehensive professional monitoring. For the plant owner, this is the simplest and safest way since all of the installation and monitoring will be professionally and properly handled.

Professional remote maintenance

Without having to leave the office, the installer can react to error messages immediately by taking care of the problem remotely as well as access configuration settings. If needed, service calls can also be arranged immediately. At the same time, plant owners still have access to the yield and plant information.

Custom designed monitoring platform

The possibility to customize the design of your own platform is a huge service benefit for installers. A range of function modules are available that can be integrated as required at the touch of a button without expert knowledge. Pages individually designed with HTML can also be integrated. Precise color selection and HTML coding make it possible to customize the appearance to match the customer’s corporate design.



Template with different sample colors

Solar-Log™ WEB “Commercial Edition” advantages and benefits

1 Professional maintenance

The “Full-Service” maintenance concept offers plant operators ideal plant maintenance.

2 Effortless installation

Use the Solar-Log™ Easy Installation to quickly and easily integrate plants into the Solar-Log™ WEB “Commercial Edition”.

3 Efficient monitoring

Review the status of all monitored plants at a glance, ensuring quick and efficient monitoring.

4 Fast service restoration

Detect, analyze and remedy errors quickly with the diagnostic tools, saving time and money.

5 Simple administration

Manage and log all activities, events and appointments in the plant logbook.

6 Detailed reports

Keep plant operators informed with reliable and easy-to-read reports. Reports can also be generated automatically with minimal effort.

7 Concise presentation

In connection with the WEB “Commercial Edition”, the Solar-Log™ APP, Solar-Log™ Dashboard and Solarfox® can access plant data and offer various options to present the data.

8 Protection against data loss

Plant yields, error messages and configuration data are stored, secured and backed up on our server.

Power tools for installers, portal operators and service providers: Solar-Log™ WEB “Commercial Edition”

Simple integration of the PV plant and remote configuration

The set-up wizard guides you through the first steps to integrate the plants into Solar-Log™ WEB “Commercial Edition”. Once integrated, the Solar-Log™ settings can be conveniently accessed remotely via the Internet, greatly reducing the installation time and effort required on site.



With the Timeline Module, events such as the installation date, Solar-Log™ exchange, configuration modifications or the exchanging of inverters can be documented.

Always in the know with regular reports

A well-arranged yield report for every plant that is monitored by Solar-Log™ WEB “Commercial Edition” is available in a PDF or CSV format. If desired, the reports can be automatically generated on a weekly, monthly or yearly basis and sent to as many e-mail addresses as you want, the ideal option for installers and their customers to be reliably informed on a regular basis.

Documents are available when you need them

Documents for specific plants such as string plans, contracts or specifications can be uploaded to the portal and are accessible at all times by authorized users.

Benefits for the plant operator

When quality of service plays a big role, the WEB “Commercial Edition” is the perfect solution with the convenience it offers to plant owners. No in-depth technical knowledge is required, there is no need to invest time in monitoring and managing the plant. However, when there is a malfunction, you are informed immediately and offered possible solutions.



Central and concise plant monitoring, including a logbook and ticket system, reduces the daily check of all of the customer plants to a single task.



No basic fees, no long-term commitments

There are no annual basic fees to use the software, just a fee per plant. Every plant can be initially monitored for 30 days without obligation before plant specific charges arise. Hence, all Solar-Log™ fees can be correlated to the respective customers. On-site or online trainings are available to get the most out of all of the possibilities that the Solar-Log™ WEB “Commercial Edition” has to offer.

The perfect overview for installers, service providers and plant operators

A wide range of reporting and presentation options

The Solar-Log™ WEB “Commercial Edition” can process and analyze plant data in a graphic or numerical format in the form of daily, monthly and annual data reports. In addition, the yield line, input voltage, individual strings and inverters can be displayed. With the help of the Sensor Box Commercial, it is also possible to display environmental data and other benchmarks that aid plant monitoring.



Yield Overview: The yield overview allows several plants to be monitored at a glance.



Data overview: The overview option impressively displays the overall performance, the total yield or the amount of CO₂ emissions that have been avoided.



Plant overview: The informative plant overview with search options.



Year overview: Display of the power production and consumption.

Solar-Log™ WEB “Classic 2nd Edition”

Online monitoring for plant owners

The Solar-Log™ WEB “Classic 2nd Edition” has been developed for technically adept private plant owners. It offers all of the basic functions for monitoring and analyzing status messages. The yields and reports are presented as graphs. The “Classic 2nd Edition” can be used free of charge, in any country or region, with plants up to 30 kWp. There is an option to use for plants with more than 30 kWp for small fee.

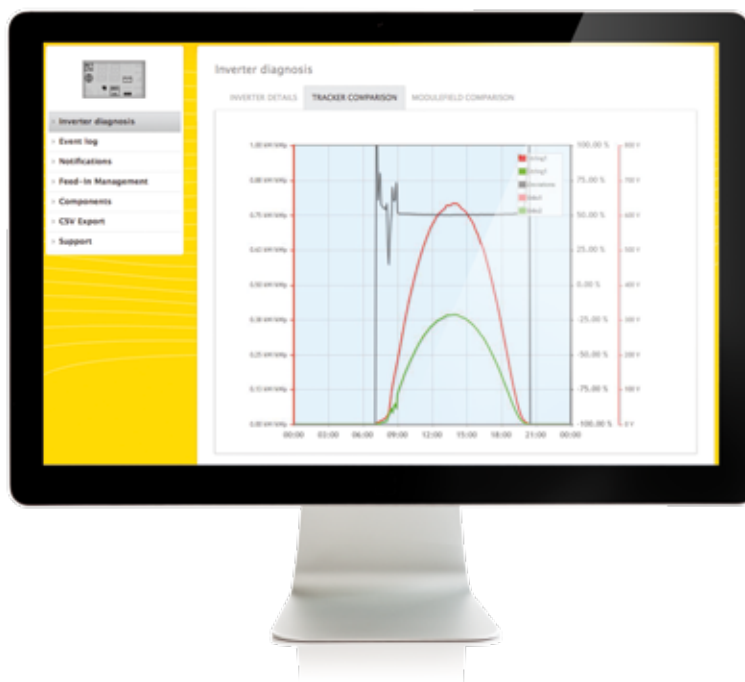


Daily overview with presentation of yield and consumption balance.

Comprehensive Solar-Log™ failure monitoring and power balancing

String monitoring

To ensure that the solar power plant runs efficiently without downtime, the power ratings of individual inverters are compared against one another. Here, the Solar-Log™ examines the data in terms of kWh / kWp (specific power) of the inverters. This means that different sized inverters can still be compared against one another. On multi-string tracking inverters, the Solar-Log™ can detect deviations right down to string level. The Solar-Log™ transmits details of these deviations either by e-mail or by text message (SMS).



MPP Tracker comparison: The gray line depicts the degree of deviation. The percentage of deviation can be read from the columns on the right. The columns on the left show the tracker's kW/kWp output.

Inverter status

The Solar-Log™ continuously records the status and fault codes of the inverters; you always have peace of mind that all connected inverters are working properly. Fault codes from each manufacturer are saved in the Solar-Log™ as well as on the Internet. In the event of a malfunction they are transmitted by e-mail.

Sensors

The following values can be displayed individually: irradiance W/m², module temperature C°, ambient temperature C° and wind speed m/s. The individual values at the top left of the graph key can be hidden and unhidden by clicking on them with the mouse. You can select and subsequently evaluate certain days with the date box.



Diagnostic tool

The diagnostic tool “Inverter Details” displays the measured values from the individual inverters. The graphic view can be customized by activating or deactivating any of the values.



All information at a glance

Present your photovoltaic plant's performance data in a unique way with customized style. The Dashboard delivers a concise presentation of yields, CO₂ savings and performance. As an alternative, we also offer large external Solarfox® displays and the newly developed Solar-Log™ APP for mobile access.

Solar-Log™ Dashboard

The Dashboard provides customers a dynamic display of all of the important plant information, such as yield, CO₂ savings and performance. The display can be set up by selecting up to any four of the following elements: Current Production, Yield History, Earnings, Weather, Plant Information and Environmental Contribution. The Data Overview module makes it possible to even display the total yield data from several plants in one Dashboard. The Image and Text module allows you to add your own content to the Dashboard.



Solar-Log™ Dashboard – displaying PV plant performance at a glance. Remote access is possible with the WEB “Commercial Edition”.

Dashboard Slideshow

The new Slideshow mode allows you to select whether Dashboard modes are displayed at the same time or one after another. The graphs are automatically scaled to the entire Dashboard size available for the slide show. Regardless of whether they are used in the office, in public facilities, on a large display in an entrance hall or on tablet PCs or smartphones, the Dashboard Slide Show offers an impressive presentation of the current data. The Dashboard can also be configured for several Solar-Logs - the values from up to ten data loggers are compiled in one Dashboard. Most of the Dashboard views can present data from an unlimited number of devices.



Dashboard view: Presentation of the total overview.



Dashboard view: Presentation of the yield history.



Dashboard view: Presentation of the environmental contributions.



Dashboard view: Presentation of the current weather data.



For the visual presentation of a plant, any TV can be connected to the Dashboard with a simple Android HDMI stick.

Solar-Log™ APP

The Solar-Log™ APP allows you to always have your plant data with you. Current and past data is represented in the form of daily, monthly, annual and total overviews. Additionally, the CO₂ savings from the plant, power consumption and self-consumption are displayed. The values from the subconsumers are displayed in a concise overview as a pie chart. Intuitive finger gestures (swipes) enable you to quickly navigate between different time periods. The APP saves all of the data in an internal cache so that once loaded it can also display yields – even when no Internet connection is available.



Several different PV plants can be monitored by the Solar-Log™ and visualized with this APP.



Supported plants include any that are accessible via the Solar-Log™ WEB “Commercial Edition” and “Classic 2nd Edition” Internet websites.

The Solar-Log™ APP is available for both iOS (e.g. iPhone, iPad, ...) and Android devices (e.g. Samsung Galaxy S3, Samsung Galaxy Tab 2, ...). The APP is available from the iTunes Store for iOS devices and from Google Play Store for Android devices free of charge.

Solarfox® large external displays

Solarfox® large external displays visualize the performance data from photovoltaic plants in a highly visible way. All of the Solar-Log™ devices can be visualized regardless of their locations (Internet connection LAN / WiFi is sufficient). One display can be used for several plants or Solar-Log™ modules to provide vivid illustrations for visitors and customers. The data such as CO₂ savings or self-consumption can be displayed as a slideshow. All the content can be changed online at any time via a web browser, and also with just a few clicks you can add your own images, text logos or websites.



Available modules

Indoor: Solarfox® SF-300 24" (61 cm) to 55" (140 cm)

Outdoor: Solarfox® SF-400 32" (81 cm) to 42" (107 cm)



The German Federal Office of Economics and Export Control BAFA offers a 2,400 € funding program for displays in public buildings in Germany (100% financing available with no down payment). For more information visit: www.solar-fox.de/foerderung.

For further information and orders:

Solarfox® Solar Display Systems

SOLEDOS GmbH

Tel.: +49 60 58 – 91 638-0

E-mail: info@solar-fox.de

www.solar-fox.de

solarfox®
SOLAR DISPLAY SYSTEMS

Product comparison Solar-Log™ WEB

“Classic 2nd Edition”

“Commercial Edition”

	“Classic 2nd Edition”	“Commercial Edition”
Plant monitored by	Plant owner	Installer / Portal Operator / Service Provider
Annual fees	With costs, up to 30 kWp* free	With costs
Plant registration	Online: solar-log.com/classic2	Online: Portal operator
Yields per kWp (specific yields)	●	●
Event log (error/status messages from the inverters)	●	●
Data sheet with the essential information and plant image	●	●
Performance comparison of the individual inverters and strings	●	●
Data and fault messages via e-mail	●	●
Compatible with Solar-Log™ APP for iOS and Android	●	●
Compatible with Solarfox® large external display	●	●
Standard transfer intervals: 30 min, 1 h, 2 h, 4 h, 8 h, daily	Only standard	Standard plus every 10 or 15 min
Number of e-mail addresses for performance / fault messages	2	4 addresses per category
Simple configuration - with Easy Installation	●	●
Centralized and concise monitoring of several plants at a glance	-	●
Remote configuration of the Solar-Log™	-	●
Plant log book with ticket system and task assignment	-	●
Central plant data administration (location, owner, inverter, information and module data)	-	●
User administration and individual access rights	-	●
Yield overview with specific yields from all plants / inverters	-	●
Timeline (protocol of all configuration changes)	-	●
Page layout with precise color selection and customized logo	-	●
Custom page design due to flexible Content Management System (CMS)	-	●
Application as platform for promotional activities and customer relationship	-	●
Configuration wizard to design the web pages	-	●
Easily customized contact form	-	●
Additional language options	Only the server language	●

Product comparison Solar-Log™ WEB

“Classic 2nd Edition”

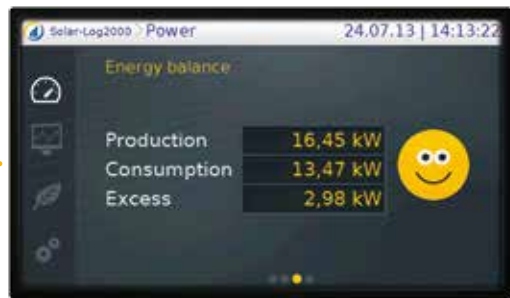
“Commercial Edition”

	“Classic 2nd Edition”	“Commercial Edition”
Dashboard with performance, yield, environmental contribution, weather forecast, plant information and plant earnings	-	●
Visualization of a 70% Feed-in Reduction	●	●
Visualization of a Powermanagement Reduction	-	●
Display all current data (total yield, total output, CO ₂ emission)	-	●
Integration of current data (total yield, total power output, CO ₂ emissions and much more) into one's own texts	-	●
Display all plant locations on a map	-	●
Overview of the reference plant with search options	-	●
Graphical arrangement of up to 10 Solar-Logs	-	●
Performance Ratio graphic (only when sensors are attached)	-	●
String Connection Box graphic	-	●
User-defined automatic yield report (CSV, PDF) via e-mail or FTP	-	●
Powermanagement report with a calculation of yield losses (only when sensors are attached)	-	●
Report on self-produced power consumption and balance	-	●
Sensor value report	-	●
Performance ratio evaluation	-	●
Annual overview compared to several years	-	●
Report on documented faults and service calls	-	●
Yield report at the inverter level	-	●
Simple integration or migration of plants from Classic 1st / 2nd Edition	-	●
Compatible with SMA Sunny WebBox (limited functionality)	-	●
On request, customized Corporate Identity template	-	With costs
On request, domain name of your choice (de / eu / com)	-	With costs
Available languages	DE, EN, FR, IT, ES, NL	DE, EN, FR, IT, ES, NL, CN, JP

Displaying module

*) Country-dependent

Changes & additions subject to change without notice.



03



Smart Energy

Efficient power management

Feed-in tariffs are being reduced. Tax incentives and subsidies are being removed. And energy prices continue to rise.

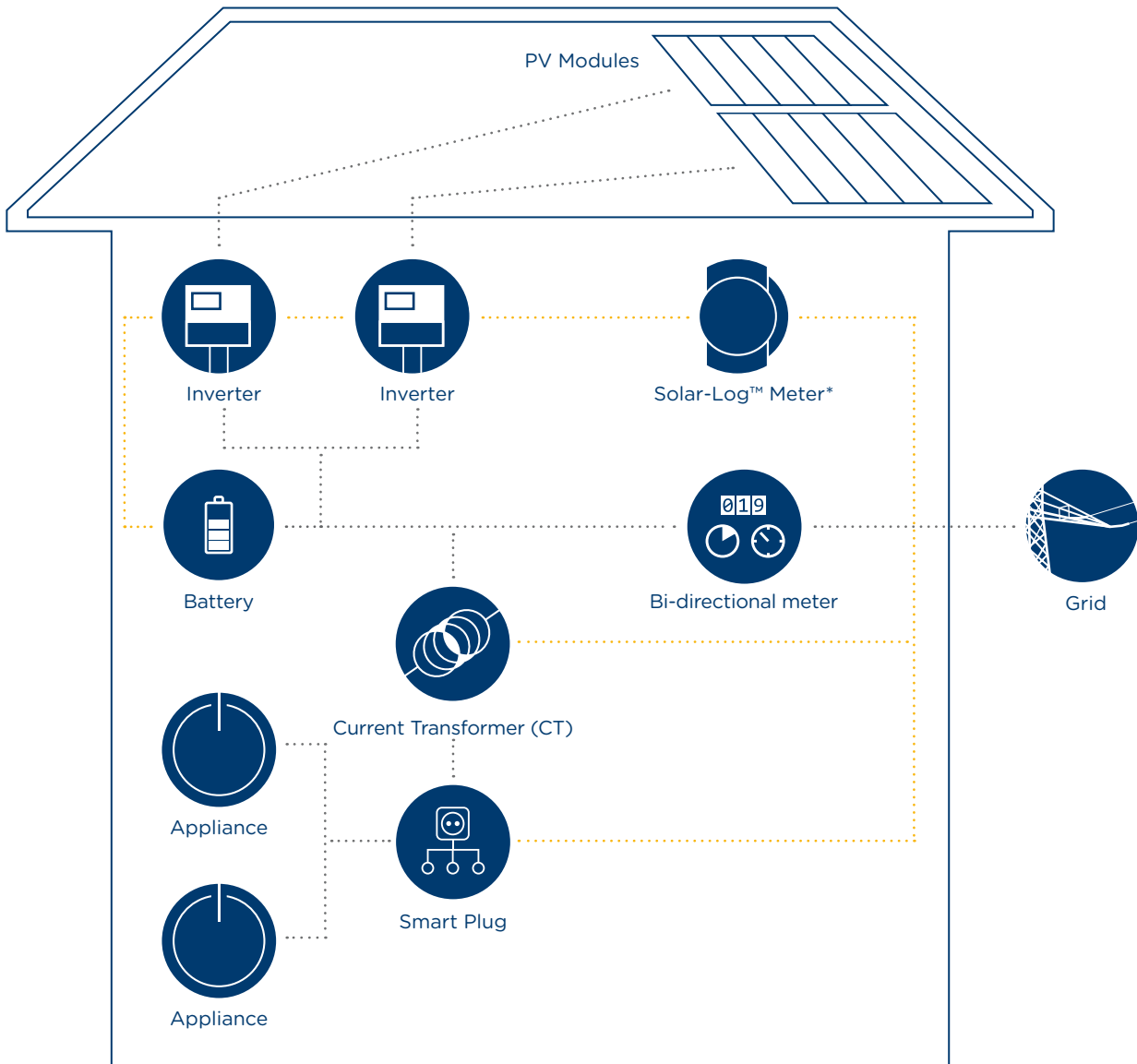
As a consequence, the constantly increasing energy needs make the storage and optimized consumption of self-produced power essential.

Storing energy in battery systems and saving energy as heat with the help of heat pumps are two possible solutions.

The Solar-Log™ is setting international standards not just for the monitoring but also for the energy management of photovoltaic plants. The Solar-Log™ distinguishes itself from competing systems with its intelligent control for energy and feed-in management and its monitoring of PV plants, as well as with its visualization and reporting options for plant data.

Smart Energy with Solar-Log™

The intelligent energy management system



*Please refer to your local regulations to see if using measuring transducers to record the total consumption for regulated grid feed is allowed.

Clever control of self-produced power

All Solar-Log™ devices offer the option to precisely control appliances via the Solar-Log™. Additional options to control appliances include networked “smart plugs” and the integrated relays such as Solar-Log™ Smart Relay Stations on the Solar-Log 300, 1200 and 2000.

Consumption of self-produced power can be automatically controlled and optimized with a Solar-Log™ Meter, Solar-Log™ CTs and an additional consumption meter.

You can operate Solar-Log 1200 and Solar-Log 2000 devices directly. The graphical reports of a PV plant's yield and consumption data are visualized on the color TFT display.



Graph of the daily consumption from the connected appliances.

Small appliances such as freezers and laundry dryers can also be monitored and controlled via “smart plugs.” Smart plugs fit on top of existing electrical outlets and measure the power consumption of the device connected to the outlet and send this data to the Solar-Log™. As a result, every individual smart plug can be displayed in the graphic with the total consumption. This helps you to easily identify power-hungry appliances.

Visualization of self-produced power consumption



Solar-Log™ is the intelligent energy management system for photovoltaic plants. The self-consumption is displayed, presented and efficiently controlled. The generated output and the consumption of the PV plant are displayed in the “Balance” section.



The break-even point is calculated with the help of plant yields and of nominal values based on the yield forecast. It indicates the point when the investment is making a profit.

Battery storage monitoring

Visualization of the battery's charging capacity

Battery storage systems can store PV energy when there is a surplus and make it available for self-consumption. Due to this function, these systems play an essential role in optimizing the consumption of self-produced power.

The Solar-Log™ displays the capacity of a battery storage system as a time diagram. A forecast line is created and a trend is displayed with the help of the charging capacity values. This allows decreasing battery capacity to be visually detected.

Visualization of self-consumption

The battery storage acts either as a generator or a power-consuming appliance in the balance view and is displayed accordingly.



Daily overview: The battery system is charged when there is a surplus of PV power at the plant (light green) and is used when there is not enough PV power to cover consumption needs, preventing the need to purchase electricity from the grid.

Logic control and consumption control

More solar energy for one's own household or company

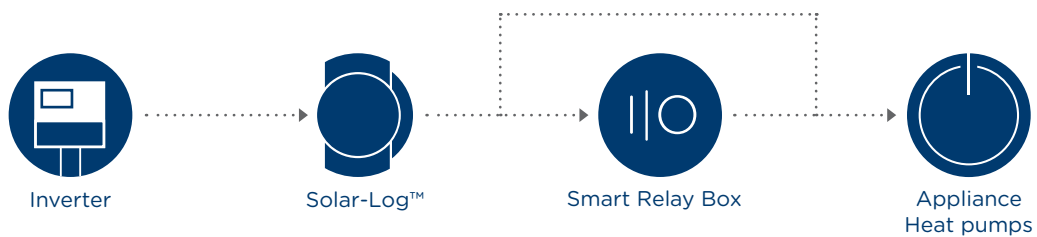
Special controlling and monitoring technology is required for the efficient use of energy. The Solar-Log™ offers an innovative solution for this: the concise visualization and the option to configure different usage profiles make it possible to optimize power consumption by controlling heat pumps and other electrical appliances.



For this, electrical appliances and devices, such as heating pumps and rods, are turned on and off based on pre-defined threshold values.

Effective use of heat pumps for energy storage

The combination of photovoltaic and heat pumps offers another potential way to optimize the consumption of self-produced power. The basic idea is to use surplus PV power to run the heat pumps. The Solar-Log™ coordinates the consumption and appropriate supply of PV power. It controls the power-consuming appliances and heat pumps. It controls the power-consuming appliances and heat pumps.



The Solar-Log™ Smart Relay Box is well suited to connect the Solar-Log™ and heat pump since different thresholds can be identified by the relay contacts. Some manufacturers' heat pumps can even be connected to the Solar-Log™ Energy Management System via their protocol. For heat pumps with a blocking contact, the internal relays of the Solar-Log 1200 and 2000 are also well suited for the control.

A building can be used as a buffer storage when using IDM heat pumps. The switching options of the heat pumps can be optimized with the integrated Solar-Log™ weather forecast. The target temperature in the rooms is then maintained by the heat pumps depending on the selected comfort mode and by taking the weather data into account.

Solar-Log™ and EGO Smart Heater - Intelligent Heating with PV Power



Thanks to the combination of the Solar-Log™ and the EGO Smart Heater, surplus PV power can be used to heat water which can also be used later when stored in combination storage tanks. The heating elements are activated to operate at different levels from 500 to 3500 watts depending on the amount of surplus power. This offers an enormous savings potential, especially in the summer and in transitional periods when there is a high amount of surplus PV power. No fossil fuels are needed by the water heater boiler with this technology. The Solar-Log™ web interface offers a quick and simple way to configure the settings for the heating elements.

Even more advantages for plant owners:

- Frost protection function: when water temperature drops below 4°C, the heating elements start to heat the water at 500 watts to prevent the boiler from freezing (breakdown of the primary heater)
- More efficient heating capacity compared to solar thermal energy at lower outside temperatures
- Once the target water temperature has been achieved, the PV power can be used by other appliances
- Quick and simple installation
- Easy to add to existing PV plants
- No time-consuming heat-exchanger and pipes for the thermal transport

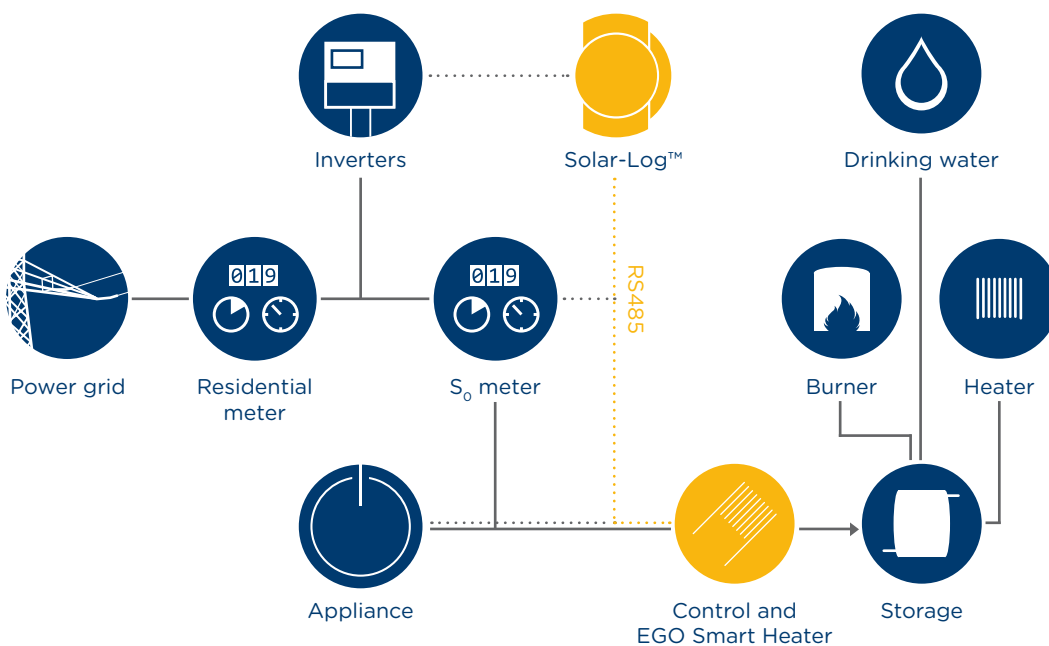
Article number

EGO Smart Heater for Solar-Log™

255840

Technical Data

Compatible with Solar-Log™ series:	Solar-Log ^{200, 500, 1000} and Solar-Log 300, 1200 and 2000 with firmware version 3.2.0 or higher (a free RS485 connection is also required)
Ambient temperature	0°C to +45°C
Heating capacity	adjustable operating level from 0 - 3500 watts in 500 watt steps
Heating temperature	adjustable to a max. of 80° C
Power frequency	50 Hz
Protection level	IP54 DIN EN 60529
Environmental type	for indoor use only
Maximum operating altitude	3000 meters above sea level
Input voltage	1N/PE AC 230 V
Protection class	I
Overvoltage category	II
Power supply	230 V / 16 A
Switching voltage	max. 265 V AC
Power connection	Separate power cables with current ratings of more than 16A are required for the screw-in heating elements.
Connection	via its own RS485 interface
Mounting threads	1.5 inch B / 38.1 mm
Width across flats	60 mm
Material / material quality	stainless steel / 1.4301
Unheated length	95 mm
Immersion depth	450 mm
Safety standards	DIN EN 60335-1 - Safety of Household and Similar Electrical Appliances DIN EN 60730-1/9 - Thermostats



Solar-Log™ Meter

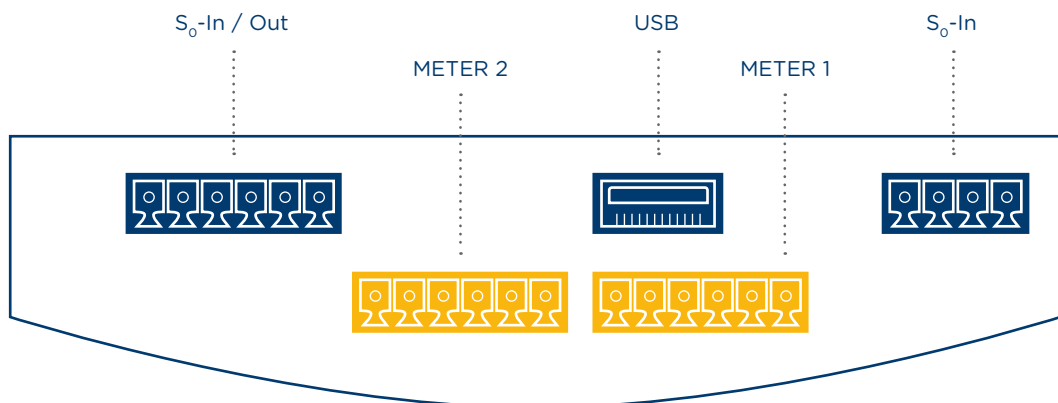
Metering power in a simple and effective way

The Solar-Log™ Meter provides detailed measurements for AC power, as well as for consumption and PV production. It has an integrated interface to connect up to six current transformers (CTs). This allows up to six single-phase outputs to be connected, measured and visualized, or for example two 3-phase outputs. The phases only have to pass through the sensors. Current transformers with an opening mechanism even permit an installation without opening the circuit.



With this, the Solar-Log 300 and 1200 fulfill the requirements for an energy management system with one single device: PV production measurements as well as self-consumption measurements and management. The Solar-Log™ Meter provides a comprehensive system with great benefits and minimal installation time.

Variable power reduction cannot be implemented by the Solar-Log™ Meter in connection with Solar-Log™ CTs. The Solar-Log™ requires an additional power meter connected to the S_0 or RS485 interface for variable power reduction.



The connection panel of the Solar-Log™:
Connections for up to two 3-phase transformers / CTs

Article number

Solar-Log 300, 1200 Meter	See page 29
Solar-Log™ CT 16 A	255639
Solar-Log™ CT 100 A-c	255640
Solar-Log™ CT 100 A-o	255638

Solar-Log™ Current Transformers (CTs)

Current transformers (CTs) are used to record the measured values and send the values to the Solar-Log™ Meter. The data from the connected appliances can be displayed accordingly in a daily consumption graph or table.



Inverters	Power	Status
WE 3	89 W	4-MPP
WE 4	89 W	4-MPP
WE 5	89 W	4-MPP
WE 6	89 W	4-MPP
WE 7	88 W	4-MPP
WE 1	829 W	MPP
WE 2	829 W	MPP
WE 3	829 W	MPP
WE 4	828 W	MPP
WE 5	828 W	MPP
WE 6	828 W	MPP
WE 7	828 W	MPP
WE 8	828 W	MPP
WE 9	828 W	MPP
WE 10	828 W	MPP
Consumption meter	Power	Status
Total Consumption Meter	4000 W	Power
Sensor	Irradiation	Status
S 8	1 W/m²	Offline

Daily consumption tables from the connected appliances.



Technical data

	Solar-Log™ CT 16 A	Solar-Log™ CT 100 A-c	Solar-Log™ CT 100 A-o
	Sealed transformer 80:1	Sealed transformer 500:1	Open transformer (folding mechanism) 500:1
Primary measurement	16 A		100 A
Secondary output	200 mA / max. 6.7 V		
Accuracy	±4% between 1 A - 16 A		±4% between 1 A - 100 A
Diameter / outer Dimension	4.32 cm	5.33 cm	5.18 x 5.43 cm
Depth	1.91 cm	1.91 cm	1.64 cm
Opening	0.7 cm	1.86 cm	1.86 cm
Cable length	3 m (it can be extended up to 30 m with 0.75 mm² cable)		

Feed-In Management

CONTROL STATE FEED-BALANCE PN-HISTORY

Control state



Power reduction

Reduction type:
Target power output (%):

	RS485-A	Total
Generator power (kW)	15.00	15.00
Maximum AC power (kW)	13.00	13.00
Allowed power (kW)	9.00	9.00
Consumption (kW)	0.00	0.00
Control value AC power (kW)	8.97	---
Current power output (kW)	8.69	8.69
Control value power (% AC)	69.00	---
Current power output (% AC)	66.88	66.88
Feed-in power (% DC)	57.96 1	57.96 1

Reactive power control

Reactive control type:
Cos(Phi):
Reactive power (VAR):

04



Feed-in Management

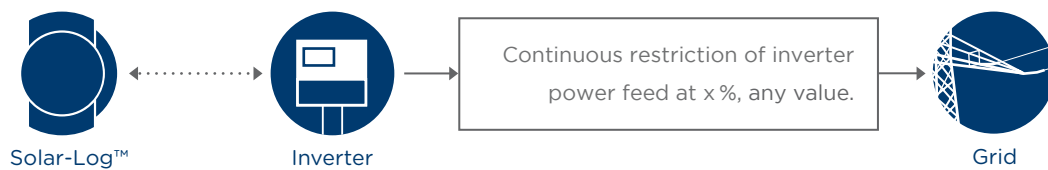
Individual solutions for international requirements

Power grids were originally built to distribute energy from a central source to the individual consumers. The increasing amount of PV power installed has changed this requirement. Ancillary services are already required in some countries to improve the stability of the grid. These services require the grid operators to be able to control the output and regulate the amount of reactive power from the PV plants.

Feed-in Management

Individual solutions for international requirements

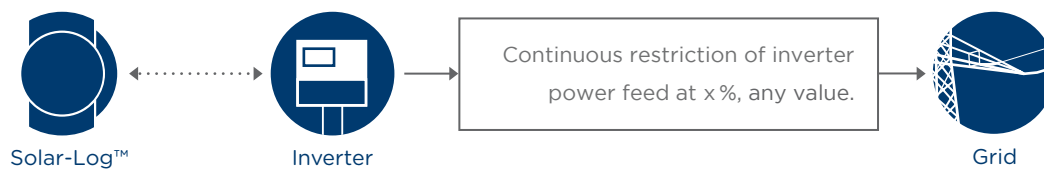
There will be new requirements for grid stability in all countries that have a certain amount of power produced from decentralized sources to stabilize the power grid on days with limited sunshine and on days with an abundance of sunshine. Such requirements are already in place in countries such as Germany, Italy, the Czech Republic, the United Kingdom and Switzerland. The Solar-Log™ models cover a wide range of requirements for powermanagement and provide a solution for every plant size.



Limited feed-in power

1. x % fixed regulation

With the fixed reduction, the inverter's power feed is limited to a set percentage (x%) of the module's output. The Solar-Log™ adjusts the inverter to the set percentage (x%) to limit the maximum yield accordingly.

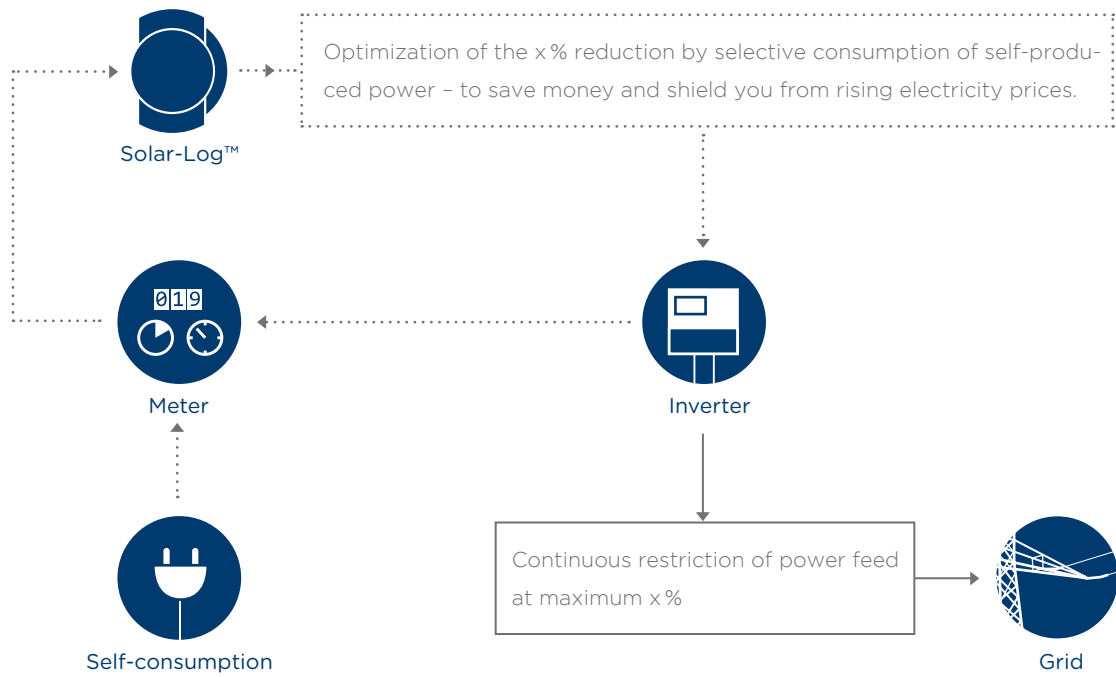


2. Remote controlled with the calculation of self-consumption

This function offers an innovative solution to largely minimize losses that result from a feed-in cap imposed by grid operators or other regulations. The feed-in cap can also be nearly 0%. In this case, the generated power is used solely for self-consumption. To carry out this function, only current consumption needs to be measured. The Solar-Log™ calculates the amount of private consumption and the current amount of power being produced by the inverters. If the difference between the current production and consumption (feed-in) exceeds e.g. 70% of the module's power output, the inverters are regulated accordingly. The entire output of the PV plant is available with the corresponding amount of self-consumption. The Smart Energy functions and the corresponding switches allow appliances to be selectively activated to increase the percentage of self-consumption. This function can also be configured for other x% values.



An additional external meter is needed to implement this function.



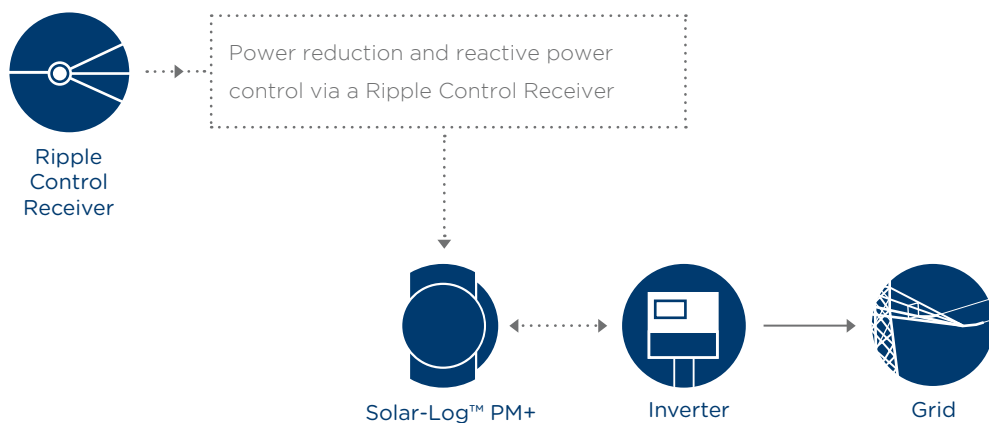
Example:

A plant with 4 kWp may only feed 50% into the grid and has to be limited to a maximum output of 2 kW. If an appliance, such as a stove, that uses 0.5 kW is turned on, the inverter could also convert 2.5 kW into AC power. Only 2 kW is then delivered to the feeding point.



Simplified feed-in management

With simplified feed-in management, the signals to reduce active power are generally sent via a Ripple Control Receiver. The Solar-Log™ PM+ product line comes with an additional interface for potential-free contacts. Up to two ripple control receivers can be connected to this interface, one for power reduction and one for reactive power control.



Simple feed-in management can also implement the “remote controlled with the calculation of self-consumption” function. To carry out this function, the Solar-Log™ only needs a special power meter to measure the current consumption in the house.

Managing large plants

The power grid management for photovoltaic plants in the medium voltage network

Large plants often have advanced requirements. In addition to the stipulations on controlling PV plants, the information on the actual amount of feed-in power may need to be provided. Communication with grid operators here is usually carried out with remote control technology such as telecontrol systems. This technology makes bi-directional communication possible. The signals are transmitted between the telecontrol system and Solar-Log 2000 PM+ via I/O Box(es) with the PM-Package. Depending on which value has to be transmitted to the grid operator, a measurement of transformer voltage and current with the Solar-Log™ Utility Meter is required.

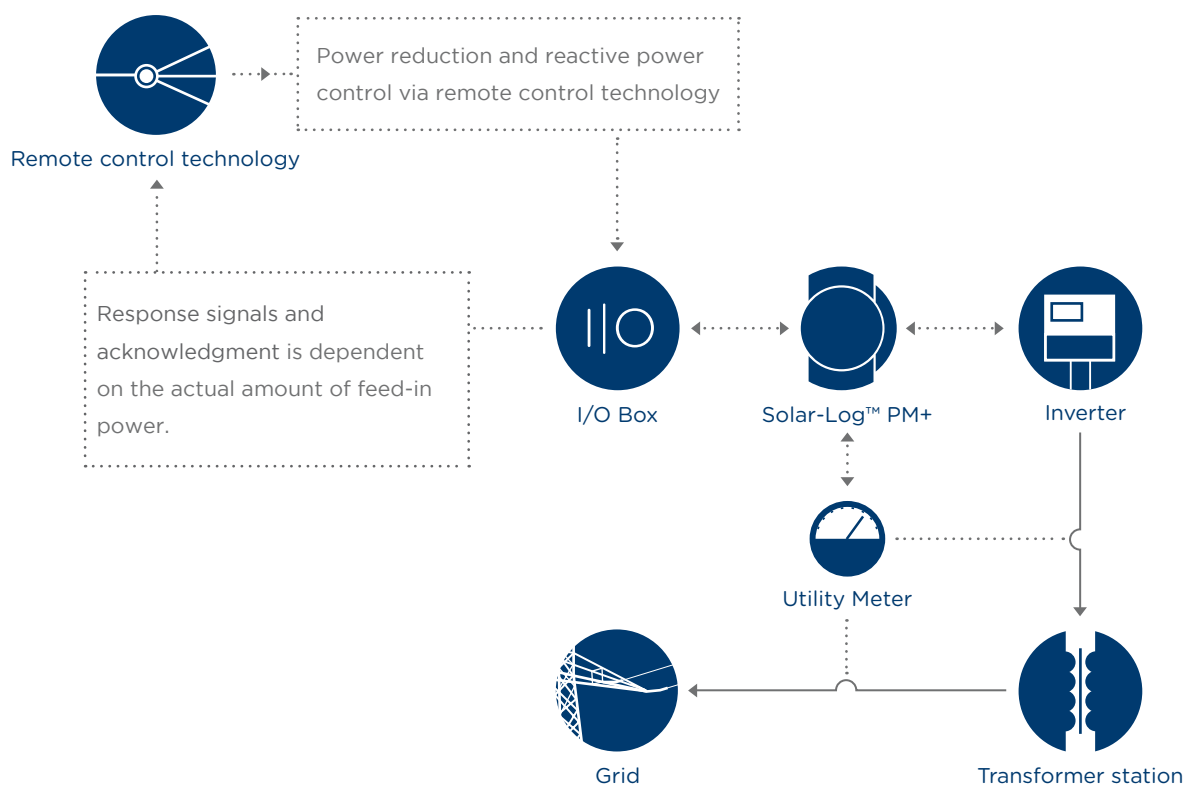
Controlling active power and regulating reactive power represents a serious technical challenge. Grid operators rely on various concepts here. The Solar-Log™ Utility Meter is used to control voltage-dependent reactive power via the Q(U) function and reactive power at the feeding point. Other functions such as the fixed value cos phi shift factor or performance-related cos phi functions can be implemented without additional measurements.



Operator interface for installing PM profiles.

Feed-in management

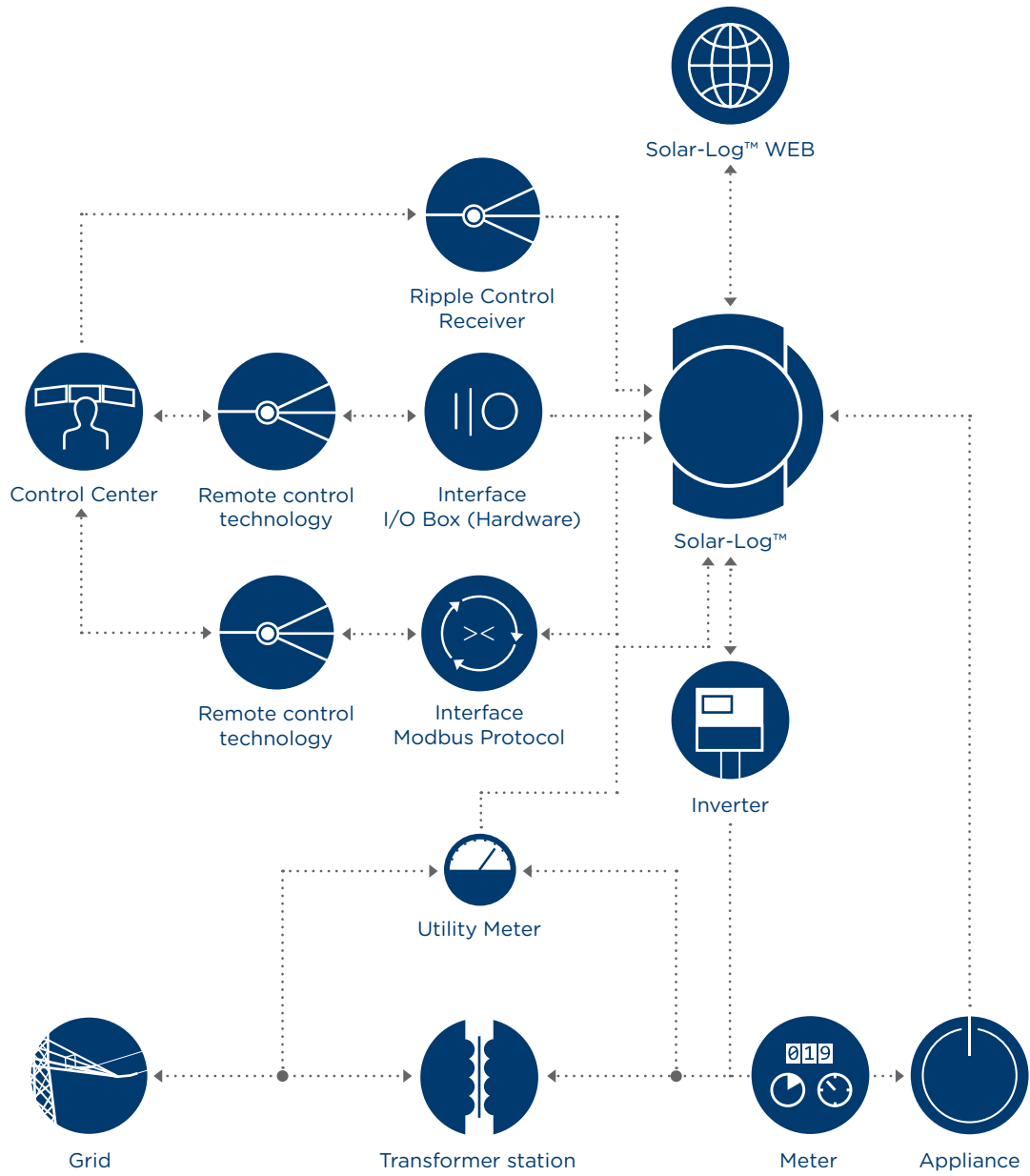
Feed-in management is becoming a more common requirement for large plants. In contrast to simple feed-in management, a response signal with the actual amount of feed-in power is also required. That is why most grid operators deploy remote control technology with different command and response signals. The Solar-Log™ I/O Box can receive and send the wide range of signals from various grid operators. This function is only available with the Solar-Log 2000 PM+. When used with the Utility Meter, measured values such as reactive power, voltage and currents are reported back.



Modbus TCP PM interface

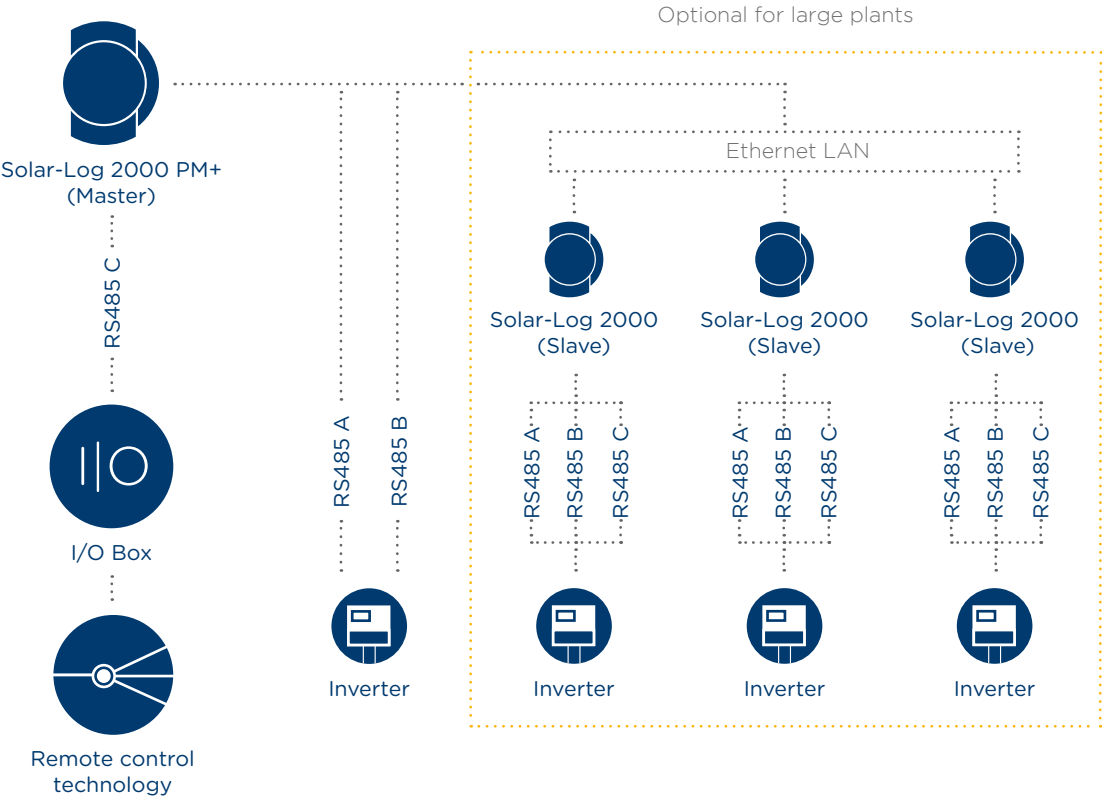
A direct connection to telecontrol systems from select manufacturers is possible with the Solar-Log™ via the TCP-based Modbus protocol. With this set up, the command signals and response signals between the remote control technology and the Solar-Log 2000 PM+ are relayed back and forth without potential-free and analog interfaces. Telecontrol protocols such as IEC 60870-C can be implemented when direct linking is used.

Several ways to transfer commands and responses between the Solar-Log™ and grid control center



Feed-in management with Solar-Log™ networks

Solar-Log 2000 data loggers are linked together via Ethernet to implement feed-in management at plants in the megawatt range. This linking over the network allows the control signals from Ripple Control Receivers to be interchanged.



The grid operator’s signals are received by the Solar-Log 2000 PM+ (master) and distributed to the connected inverters via the Solar-Log 2000 (slaves). The master can be connected to up to nine slaves in this setup. Linking the Solar-Logs together over the network helps to implement complex requirements (several plant parts, feeding points and inverters from several manufacturers).

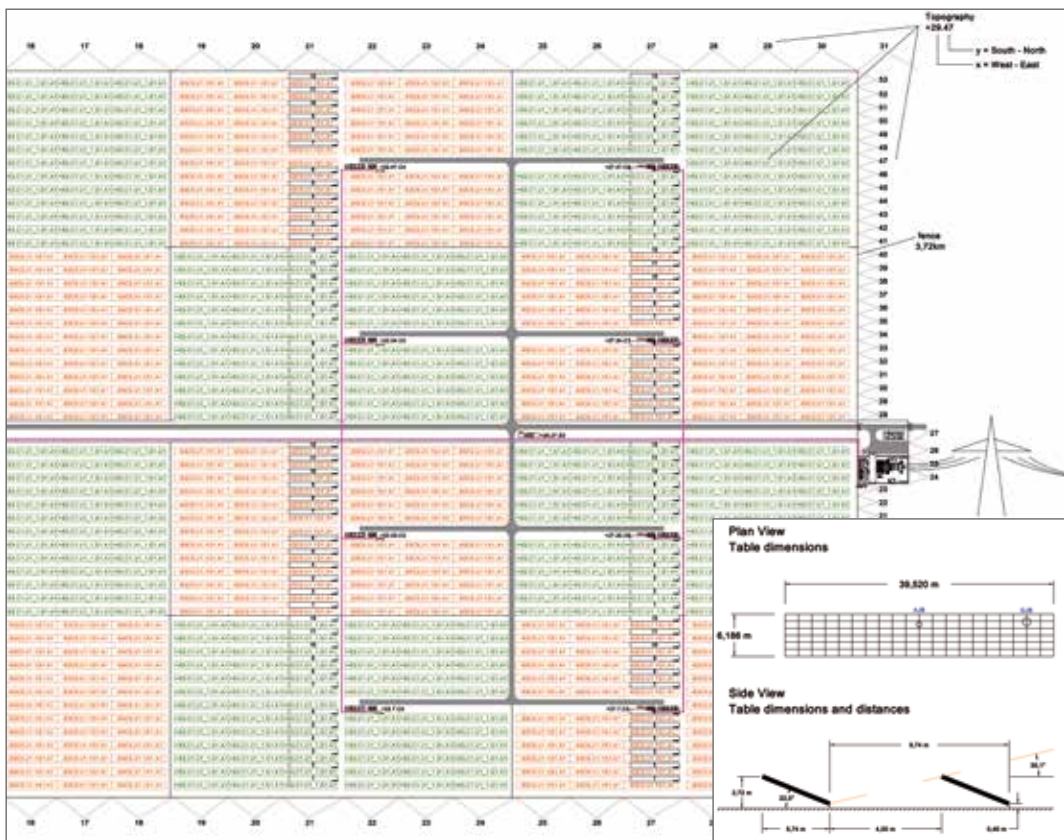
Solar-Log™ functions for feed-in management

	Solar-Log 300/1200/2000	Solar-Log 300 PM+/1200 PM+	Solar-Log 2000 PM+
Active power	Reduction to X percent with or without the calculation of self-consumption ¹⁾	●	● ²⁾
	Remote controlled reduction with or without the calculation of self-consumption ¹⁾	-	● ²⁾
Reactive power	Fixed value cos phi shift factor	●	●
	Fixed reactive power in VAR	●	●
	Variable cos phi shift factor over characteristic curve P/Pn	●	●
	Remote controlled fixed value cos phi shift factor	-	●
	Variable reactive power via characteristic curve Q(U) (only with Utility Meter voltage measurement)	-	●
	Remote controlled switch between fixed and characteristic curve P/Pn	-	-
	Remote controlled switch between fixed and characteristic curve Q(U)	-	-
	Controlled shift factor at the feeding point (only with Utility Meter voltage measurement)	-	-
	Connection for two Ripple Control Receivers	-	●
Interfaces	PM-Packages Flexible interface for remote control technology Inputs: max. 4 analog and 9 digital Outputs: max. 3 analog and 10 digital	-	●
	Modbus TCP interface for a direct connection to remote control technology	-	●
	Solar-Log™ Master-Slave network	-	●

1) Only with additional meter.

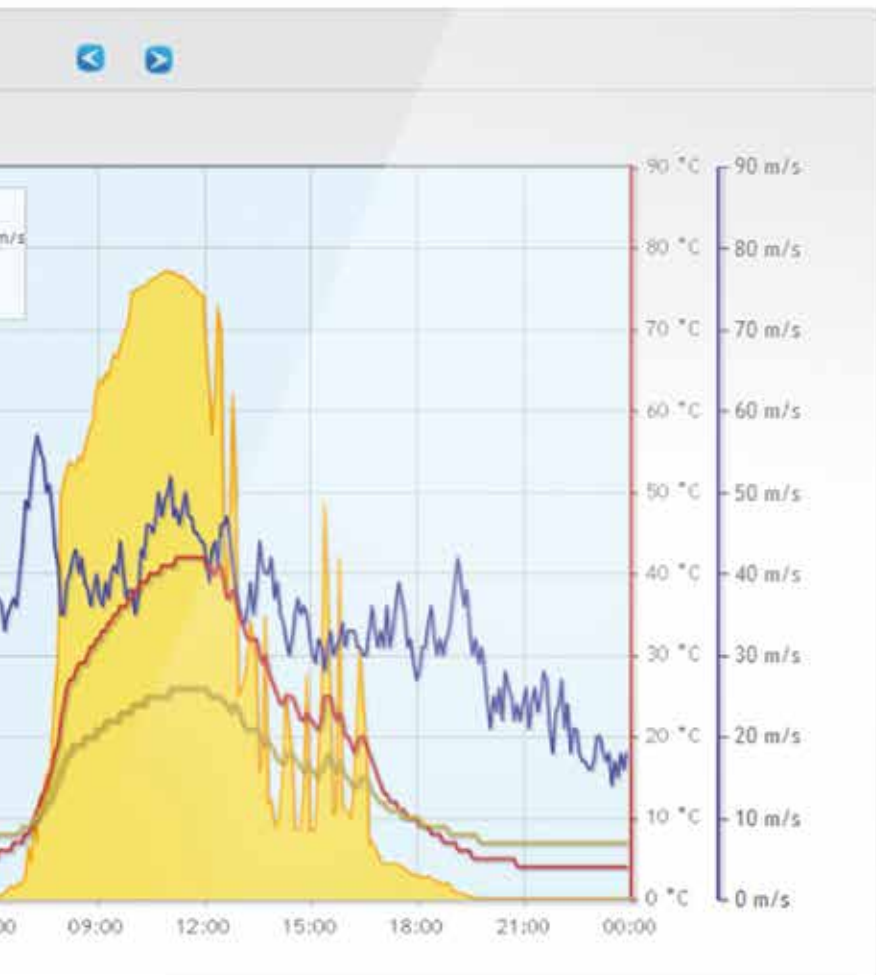
2) Allocation of self-consumption is not possible when using PM-Packages or Modbus TCP interface at the same time.

Solar-Log™ project planning for large PV plants



Technical data

Actual Plant Power	18 x 2.610 MWp DC = 46.98 MWp
Module Type	PV Modules
Average Peak Module Power	250 W
Total Number of Modules	18 x 9,000 = 162,000
Modules per String	20
Module Arrangement	8 Horizontal
Inverter Type	Central inverter
Total Number of Inverter units	18
Total Area	72.4 ha
Boundary Length	3,615 m



05

Solar-Log™ Accessories

Challenging requirements require sophisticated products

A number of accessories are available for the Solar-Log 300, 1200 and 2000 to offer extra protection, new functions and / or improved performance. From overvoltage protection to connecting diverse inverters or sensors, we can meet all your needs. Installers, dealers and service providers can offer their customers complete solutions with high-quality products.

Networked Smart Plugs

Optimizing the consumption of self-produced power

External appliances can be turned on and controlled by the Solar-Log 300, 1200 and 2000 via smart plugs. To optimize the consumption of self-produced power automatically, a total power consumption meter is required as well as a networked smart plug. A maximum of 10 networked smart plugs can be controlled.



Technical data	AllNet Standard 3.5 kW	AllNet WLAN 1.8 kW	Belkin WeMo Insight Switch
Maximum load	1600 - 3680 watts	1840 watts	3680 watts
Maximum current	16 A	8 A	16 A
Control	TCP / IP	TCP / IP	WLAN 2.4 Ghz
Status	On / Off	On / Off	On / Off
Function	Switch / Metering Consumption Recording	Switch	Switch / Metering Consumption Recording
Connector	C (Europlug), F (Schuko plug)	C (Europlug), F (Schuko plug)	B (Nema 5-15, 2 pole), C (Europlug), F (CEE 7/4 Schuko plug), I (AS/NZS 3112)
Dimensions (w x h x d) in mm, weight	68 x 40 x 125, 200 g	68 x 60 x 128, 200 g	130 x 160 x 100
Warranty	2 years	2 years	2 years

Solar-Log™ Smart Relay Box

The Solar-Log™ Smart Relay Box comes with 8 relay outputs. The outputs allow devices to be switched on directly or also to be adjusted in different levels according to the PV production. Only one free RS485 connection needs to be defined.



Technical data

Outputs	8 relays (30 V / 1 A to 230 V / 250 mA), 4 of which are alternating relays
Rated operating voltage	10 - 24 V
Warranty	1 year

Solar-Log™ Smart Relay Station

The potential-free relays of the Solar-Log™ Smart Relay Station are suited for the control of motors and pumps as well as ventilation, drying and air-conditioning systems – appliances with variable power consumption rates. The Solar-Log™ receives a response with the consumption values from each individual relay.



The communication between the Solar-Log™ Smart Relay Station and the Solar-Log™ takes place via a network interface RJ45 (TCP/IP).

The Solar-Log™ Smart Relay Station offers additional connection options, 3 x 3.5 kW. With the Solar-Log™ up to 10 appliances can be controlled, i.e. 3 x 3 plus one appliance.

Technical data	1 x 3.5 kW	3 x 3.5 kW
Maximum load	1 x 3680 W	3 x 3680 W
Relay outputs	1 individual potential-free switch output	3 individual potential-free switch outputs
Switching voltage	230 V AC, 16 A / 24 V DC	230 V AC, 16 A / 24 V DC
Consumption measurement	Per switch channel	Per switch channel
Power supply	12 V power supply	12 V power supply
Control	TCP/IP, button on the device	TCP/IP, button on the device
Warranty	2 years	2 years

Article number

AllNet Networked Smart Plugs standard 3.5 kW	255879
AllNet Networked Smart Plugs WLAN 1.8 kW	255616
Belkin WeMo Insight Switch	255841
Solar-Log™ Smart Relay Box	255656
Solar-Log™ Smart Relay Station 1 x 16 A (1 x 3.5 kW)	255754
Solar-Log™ Smart Relay Station 3 x 16 A (3 x 3.5 kW)	255755

Power Meters

Power measurements

A power meter relays the measured amount of power to the Solar-Log™ for analysis. If you wish to consume the self-produced power from a PV plant, the meter serves as a consumption meter, displaying a comparison of the power produced and consumed. The meter can be configured to operate with the Solar-Log™ in three different modes:

1. Measuring power consumption for the optimal utilization of self-produced power.
2. Measuring the total amount of power that has been fed into the grid.
3. Measuring the power production from inverters that are not directly supported by Solar-Log™.



Technical data	Inepro calibrated, 1-phase, S ₀ and RS485	Inepro calibrated, 3-phase, S ₀ and RS485	Iskra uncalibrated, 1-phase, S ₀	Iskra uncalibrated, 3-phase, S ₀
Connections	RS485 Interface / Cable length up to 500m		6-pin S ₀ -In / Out connector / max. cable length 10 m	
Direct connection	100 A	100 A	80 A	65 A
Voltage U _n	230 V / 400 V	3 x 230 V / 400 V	230 V -20% - +15%	3 x 230 V / 400 V -20% - +15%
Measuring range	< 1 mA - 100 A	< 1 mA - 100 A	4 mA - 80 A	4 mA - 65 A
Self-consumption	< 2 W	< 2 W per phase	< 8 W	< 0,85 W
Start-up current	< 1 mA	< 1 mA	4 mA	4 mA
Power frequency	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
Dimensions (w x h x d) in mm	76 x 130 x 65	126 x 130 x 65	36.5 x 100.5 x 65	53.6 x 84.3 x 65.1
Wire diameter	2.5 - 16 mm ²	2.5 - 16 mm ²	2.5 - 10 mm ²	2.5 - 16 mm ²
Protection level	IP51	IP51	IP20	IP20
LCD display	7-digit LCD (5.2)	7-digit LCD (5.2)	7-digit LCD	6+1 digit, 100 Wh resolution
S ₀ pulse	1600 p / kWh	400 p / kWh	1000 p / kWh	500 p / kWh
Misc.	Class 1 according to EN50470-1	-	2 counters: 1x total, 1x resetable	no LCD display
	Class 1 according to EN50470-3 MID, RS485* and S ₀		Class 1 EN 62053-21 and EN 62052-11	
Warranty	2 years	2 years	1 year	1 year

* Only one meter possible per RS485 Bus.

PowerLine Package

Alternative to the network cable

The PowerLine Package is a problem-free alternative for transmitting data between the Solar-Log™ and the PC or the router without having to run extra cable when WiFi reception is poor or an Ethernet connection is problematic. An integrated electrical socket enables the Solar-Log™, multiple sockets or other terminal devices to be connected directly to the adapter. An integrated mains filter optimizes the transmission capacity even more. In public areas, a Kensington lock provides for efficient anti-theft protection.



Technical data

Transmission speed	up to 500 Mbit/s
Integrated electrical socket	Schuko - Type F (CEE 7/4)
Encryption	128 Bit AES
Device connection	1 x Ethernet RJ45
Power consumption	4.4 W (max.), 0.5 W in standby mode
Output power for integrated bus	16 A
Power supply	196 - 250 V AC / 50 HZ
Temperature (storage, operating)	-25° C to 70° C, 0° C to 40° C
Ambient conditions	10 - 90% humidity (non-condensing)
Range	up to 300 m
Registrations	CE compliant in accordance with the technical requirements of all EU countries + (CH, NO)
Dimensions (w x h x d) in mm, weight	188.5 x 231 x 78.5, 850 g
Warranty	3 years

Article number

Iskra uncalibrated 1-phase, S ₀	255346
Iskra uncalibrated 3-phase, S ₀	255347
Inepro calibrated 1-phase, S ₀ and RS485	255420
Inepro calibrated 3-phase, S ₀ and RS485	255421
devolo dLAN - PowerLine Starter Kit (500 AVpro+) with integrated electrical socket	255886

Solar-Log™ PM-Packages

Grid operators employ a wide range of signals that are required for feed-in management and that are used to send commands and the response signals. The Solar-Log™ PM-Package is a single system to implement the various requirements with minimum effort. The PM-Package consists of I/O Boxes and PM profiles. The I/O Boxes are a flexible gateway between remote control technology and the Solar-Log 2000. The input and output signals from the I/O Boxes are defined by the PM profile according to the grid operator requirement.

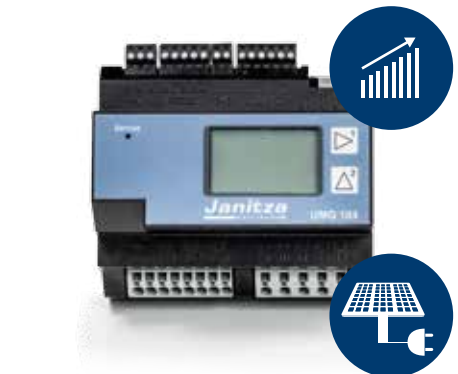


Technical data

Inputs	Up to 4 analog and up to 9 digital
Outputs	Up to 3 analog and up to 10 digital
Rated operating voltage	10 - 24 VDC

Solar-Log™ Utility Meter

The Solar-Log™ Utility Meter is a universal metering device. It can be integrated in both low- and medium-voltage networks (via a transformer) and is needed for various tasks. In addition to voltage-dependent reactive power control Q(U), it is also used for reactive power control at the feeding point and to record the data that is needed to send signals to the grid operator. It is also suited as a consumption meter for heavy loads.



Technical data

Voltage measurement	17 V - 520 V L-L, 4 inputs
Current measurement	Max. 5 A
Interface	RS485
Rated operating voltage	135 - 340 VDC voltage supply
Mounting	Top hat rails, 95 - 240 VAC / 135 - 340 VDC voltage supply

Article number

Solar-Log™ Utility Meter	255385
Measuring unit for cos phi control in conjunction with the network voltage	
Solar-Log™ PM-Packages	on request*
Consist of an I/O Box with a grid operator specific PM+ profile	

*The operator specific PM+ profile needs to be ordered.

Solar-Log™ String Monitoring Box (SMB)

String monitoring at large plants offers the best way to prevent failures. The Solar-Log™ String Monitoring Box, in combination with the Solar-Log 2000 and the Solar-Log™ WEB “Commercial Edition”, provides the optimal solution when upgrading to string monitoring. The Solar-Log™ SMB is employed if the SCB which is already present only links the strings but does not monitor them.

The Solar-Log™ SMB is a two-part monitoring system that consists of:



Solar-Log™ SMB-C

Control Unit for the communication with the Solar-Log™ including measuring unit for 16 strings.

Solar-Log™ SMB-M

Measuring unit for 16 strings.

The Solar-Log™ SMB-M always has to be connected to a Solar-Log™ SMB-C. That is why every plant has to have at least one Solar-Log™ SMB-C. That means a maximum of 16 strings can be monitored from the Solar-Log™ SMB-C, with an additional 16 strings from each attached Solar-Log™ SMB-M (maximum 3 SMB-M per SMB-C). This results in a total of 64 strings that can be monitored. Up to 31 Solar-Log™ SMB-Cs can be connected to a Solar-Log™ RS485 interface and in total 60 SMB-Cs and SMB-Ms can be connected together. Note that the Solar-Log™ SMB can only be used with the Solar-Log™ WEB “Commercial Edition” and needs a 24 V power supply.

Product comparison	Solar-Log™ SMB-C	Solar-Log™ SMB-M
Measuring number of strings		2 x 8 Strings
Measuring range per string		0 – 20 A, < 1% tolerance
Diameter for the cables		10 mm
Temperature range		-20 °C to +70 °C
Protection Class		IP65
Dimensions in mm		300 x 400 x 200
Power supply	23 VDC – 30 VDC	Via Solar-Log™ SMB-C
Power consumption	Max. 800 mA	Via Solar-Log™ SMB-C
Warranty	1 year	1 year

Article number

Solar-Log™ SMB-C	255427
Solar-Log™ SMB-M	255428

Ready-to-connect String Connection Box (SCB)

The optimum solution to every customer's needs

The DC output of the individual strings operates in parallel and connects to the central inverter, measuring the power output per string as long as the transmitted SCM measured values allow for a precise performance monitoring at the string level.

The SCB from Weidmüller in combination with a Solar-Log 2000 and the Solar-Log™ WEB "Commercial Edition" offers an ideal protection and monitoring system. The currents of the individual strings are compared to one another for fault identification and localization. Impairments causing reduced yields are immediately detected and can be corrected.



Product details

The SCB from Weidmüller provides complete solutions that meet the most diverse requirements. The boxes are available with 16 or 24 strings and the models are available with an internal or external power supply. A circuit breaker, surge protection and DC and AC fuses ensure safe and trouble-free operation of the plant. Fiberglass reinforced plastic cases help to withstand severe weather conditions to ensure trouble-free outdoor operations.

Technical data

Solar-Log™ SCB 16 W DC, SCB 16 W AC
Solar-Log™ SCB 24 W DC, SCB 24 W AC

Number of DC inputs	16 strings, 24 strings	Inputs
Input (+)(-)	0,75 mm ² - 25 mm ²	
Input DC cables entrance through	IP67, Ø: 5 - 10 mm	
Fuse form factor	10 x 38 mm	
Fuse link rated current (In)	15 A	
Auxiliary AC power cable	0.5 - 6 mm ²	
AC Input Wire diameter	IP67, Ø: 6 - 12 mm	
Number of DC outputs	1	Outputs
DC output	(≤ 240 mm ²), M10	
DC output cables exit through	M32 CG, IP67, Ø: 18 - 25 mm	
EIA RS485 cables	(0.5 - 4 mm ²)	Enclosure
Enclosure dimensions (H x W x D)	847 x 636 x 300 mm	
Material	fiberglass reinforced polyester (FRP)	
Operating ambient temperature range	-20 °C to +50 °C	
Intended installation location	protected outdoors	
Degree of protection (according to IEC 60529)	IP65	Characteristics
Rated DC voltage (Un)	1000 V	
Rated DC current per input (Inc)	9.0 A at 50 °C ambient	
Surge protection DC ports	Type II, I _{max} = 40 kA, U _p = 4.0/4.0 kV	
Surge protection AC ports	Type II, I _{max} = 40 kA, U _p = 1.5 kV	Monitoring
Surge protection RS485 ports	I _{max} = 10 kA, U _p = 15 V, no aux. contact	
Monitoring system	Transclenic	
Monitoring system powered by	85 264 Vac input / 4 W PSU	
Input current monitoring	+/- 1% error	
System voltage monitoring	yes, 1% error	
Internal temperature monitoring	yes, -20 °C to 70 °C	
Switch disconnecter monitoring	yes (closed / open)	
Conformity with norms	IEC 61439 2 ed2.0 / EN 61439 2:2011	Warranty
Warranty	1 year	

Article number

Solar-Log™ SCB 16 W DC	255882
Solar-Log™ SCB 16 W AC	255883
Solar-Log™ SCB 24 W DC	255884
Solar-Log™ SCB 24 W AC	255885

Solar-Log 300, 1200 and 2000 GPRS

The alternative to a permanent internet connection

The Solar-Log 300, 1200 and 2000 GPRS come with an integrated GPRS modem and an antenna with a magnetic base and two meters of cable. The SIM card holder is mounted inside of the device to protect it against theft. Please note that when using master/slave configuration with the Solar-Log 2000, each Solar-Log 2000 slave (maximum of nine) inside the network requires its own SIM card otherwise, a GPRS router has to be used.



Technical data

GSM bands	Quad-band GSM / GPRS
GSM power rating	GSM 800 / 850 Power Class 4 - 33 dBm +/- 2 dBm GSM 1800 / 1900 Power Class 1 - 30 dBm +/- dBm
Data transfers	Class 10, max. 85.6 kbps
Package contents	2 m magnetic foot antenna
Connection	SMA antenna connection

GPRS external antenna

Improved data connection with GPRS

This antenna improves signal strength in response to poor GPRS reception and is suitable for outdoor wall mounting.



Technical data

Frequency	GSM 900: 880 - 960 MHz / GSM 1800: 1710 - 1880 MHz
Impedance	50 Ohm
Polarization	Vertical
Gain / power	0 dB / max. 10 W
Dimensions (w x h x d) in mm, Weight	155 x 370 x 36 (Ø 16 mm), 420 g
Temperature range / type of protection	-40 °C to +80 °C, IP 66
Cabel length / connection	4950 + 100 mm, FME Female or SMA

Solar-Log™ WiFi

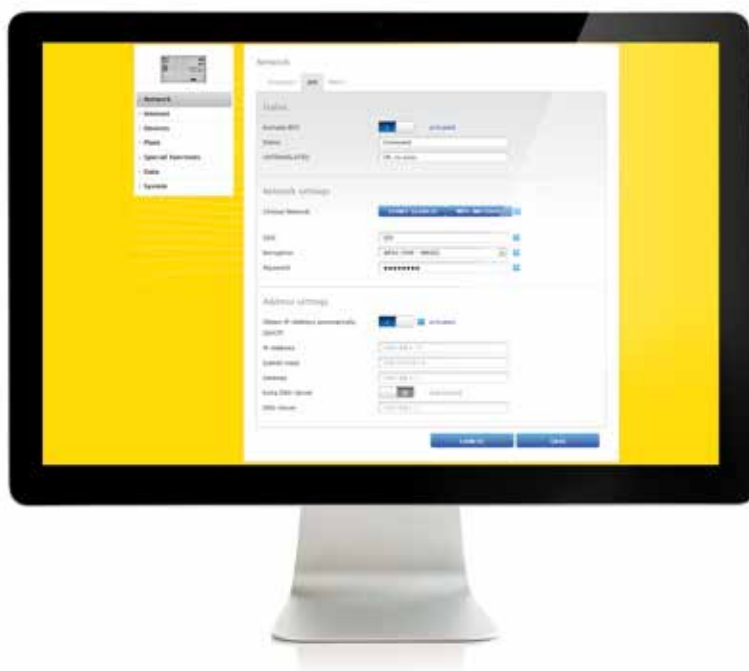
Wireless internet connection

The Solar-Log 300 and 1200 WiFi can easily connect to existing WiFi infrastructure. The signal strength is displayed via the web interface and on the device's LCD-Status-Display. The Solar-Log™ WiFi does not need an extra cable, eliminating additional costs for installation and hardware.



Technical data

WiFi (WLAN modes)	802.11b and 802.11g
Max. output transmission power	802.11b: +20 dB / 802.11g: +17 dB
Max. input level	-10 dB
Frequency	2.412 - 2.472 channel 1 - 13 / 2.484 channel 14
Encryption	WEP 128 and 64 Bit, WPA, WPA 2



Detailed WiFi information is provided via the web interface.

Article number

Solar-Log 300, 1200 and 2000 GPRS, Solar-Log 300, 1200 and 2000 PM+ / GPRS	See page 29
Antenna extension GPRS modem, internal / external area, 5m, internal modem	255326
Antenna extension GPRS modem, internal / external area, 10m, internal modem	255327
Antenna extension GPRS modem, internal / external area, 15m, internal modem	255328
GPRS Antenna for greater wireless coverage, internal modem	255329
Solar-Log 300, 1200 WiFi, Solar-Log 300, 1200 BT / WiFi, Solar-Log 300, 1200 PM+ / WiFi	See page 29

Sensor Box Commercial

Irradiation sensor specifically designed for commercial plants

Sensors measure the precise deviations between the potential power production and the current power production and deliver key statistical values in regard to the quality of the whole plant. Once a deviation is detected, an error message is sent. The most important element in the Sensor Box Commercial is the irradiance sensor. This delivers a reference value for solar radiation and enables conclusions to be drawn about possible power generation problems. Due to the built-in internal module temperature sensor, it is easy to analyze reductions in performance and use this data to find the cause of the fault. Up to nine Sensor Boxes Commercial can be connected. The irradiance sensor is equipped with a high-quality monocrystalline cell that is rugged and specifically designed for long-term use in outdoor locations. It is possible to use some RS485 inverters on the same bus.



Technical data

Solar cell, laminated inside glass	Mono crystalline silicon (5 cm x 3.3 cm)
Dimensions (w x h x d) in cm, housing	8.5 x 14.5 x 4.0, powder-coated aluminium housing, IP65
Temperature range	-40 °C to +90 °C
Power supply	Via RS485 data cable from Solar-Log™ (10 - 28 V _{DC})
Measuring range radiation strength	0 to max. 1,400 W/m ²
Tolerance	Irradiance sensor: +/-5 %
Scheduled	Not scheduled
Installation	On module assembly rails. Not necessary to open up the sensor.
Connecting cables	4 pin, 3 m, UV and weather-resistant
Ambient temperature sensor	PT1000 measuring range: -40 °C to +85 °C
Wind sensor	Cup anemometer measuring range: 0-40 m/s, gusts 60 m/s
Warranty	2 years

Article number

Sensor Box Commercial, including irradiance sensor and module temperature sensor	220060
Wind sensor for connection to the Sensor Box Commercial; including a 5 m connection cable	220061
Ambient temperature sensor for connection to the Sensor Box Commercial, including a 3 m connection cable	220062

Sensor Box Commercial accessories

Ambient temperature and wind sensors

The optional ambient temperature sensor (PT1000) delivers additional information about power generation. One problem that could arise and contribute to decreased yields is that the combination of cold temperatures and sunshine causes a buildup of ice. Such problems are easily detected when a sensor is being used. In addition to this, wind speeds can be tracked with a wind sensor and identified much better as possible causes for breakdowns, power reductions or power losses.



Daily overview with wind sensor (blue), module temperature (red), ambient temperature (green) and yield curve (yellow).

Sensor basic

Irradiance sensor specifically designed for residential systems

The Sensor basic delivers the irradiance values as well as the module temperature. Compared to the Sensor Box Commercial, the measurements from the Sensor basic are 3% more precise. It is not possible to connect wind and ambient temperature sensors. It is possible to use the sensor on the same bus with some RS485 inverters. A maximum of one Sensor basic can be connected on the RS485 bus.



Technical data

Solar cell	Amorphous thin layer silicon cell (3.5 cm x 3.5 cm)
Dimensions (w x h x d) in mm, housing	99 x 64 x 36, Polycarbonate, UV stabilized IP65
Temperature range	-25 °C to +75 °C
Power supply	Via RS485 data cable from Solar-Log™ 10-28 VDC
Measuring range, radiation strength	0 to 1,400 W/m ²
Tolerance	Irradiance sensor: +/- 8 %
Scheduled	Not scheduled
Termination	Terminated
Installation	On module mounting rails. Not necessary to open up the sensor.
Connecting cables	4-pin, 3 m, UV and weather-resistant
Warranty	1 year

Weather station with a Pyranometer

Precise measurements of irradiance

The Weather Station provides data on air pressure, wind direction and speed and humidity measurement results for the local prevailing overall irradiance. The data is collected by the integrated CMP 3 Pyranometer. Measuring the local irradiance provides information on the influence of weather conditions on the PV plant's performance. The data from the Pyranometer is used in the Solar-Log™ WEB "Commercial Edition".



Measurement	Measuring Range	Measuring Method
Pyranometer	1,400 W/m ² ; spectral range (50%): 300 – 2800 nm	Kipp & Zonen CMP3
Ambient temperature	-50 °C – +60 °C	NTC
Humidity	0 – 100 %	Capacitive
Air pressure	300 – 1,200 hPa	MEMS capacitive
Wind direction	0 – 359.9 °	Ultrasound
Wind speed	0 – 60 m/s	Ultrasound

Technical data

Power supply	24 Vdc +/- 10 %
Power consumption	20 VA at 24 V
Connection	RS485
Protection class	IP65
Dimensions in mm	Diameter: 150, Height: 332, Weight: 1.5 kg

Article number

Sensor basic including irradiance sensor and module temperature sensor	255258
Pyranometer with weather sensors	on request

Solar-Log™ RS485 Wireless Package

Connecting inverters wirelessly

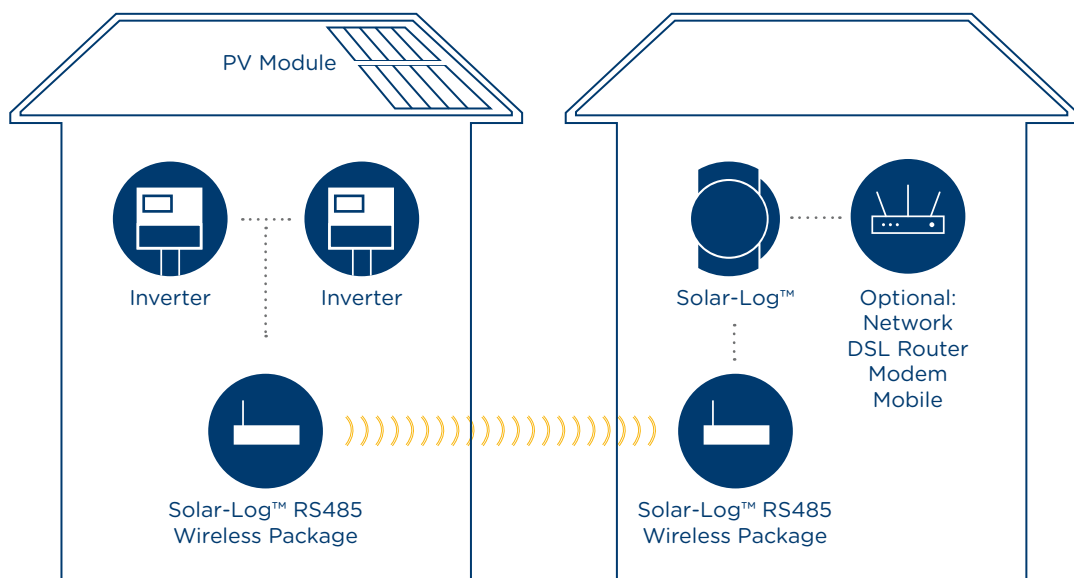
The Solar-Log™ RS485 Wireless Package makes it possible to connect to inverters even in places where cable connections are difficult. Radio modules are always deployed in pairs. When used in conjunction with the external and directional radio antenna, connections can be made at larger distances. The test function helps you to find the optimal mounting location.

When placing an order, the name of the inverter manufacturer is required in order to pre-configure the Wireless Packages. Not all inverters can be used with the Wireless Package. Please check the inverter database for the inverter compatibility (<http://www.solar-log.com/en/service-support/supported-inverters.html>).



Technical data

Range inside buildings	Up to 80 m (up to three concrete walls)
Range over open field	Up to 500 m, with directional radio antenna up to 800 m
Protection class, approval	IP 20, only suitable for internal use, CE standard
Power supply/performance	7 – 18 V, 1 watt
Frequency	2.4 Ghz
Temperature range	0 ° – 70 °C
Dimensions per piece (w x h x d) in mm, Weight	70 x 140 x 30, 200 g
Antenna	Dipole antenna, 2.1 dBi amplification



Solar-Log™ Bluetooth (BT)

Bluetooth module for wireless connections

The Solar-Log™ BT can easily connect to all SMA Bluetooth inverters without having to open the inverters. It is possible to have mixed mode operations for the inverters via Bluetooth, the RS485 interface SMA Speedwire* or Ethnernet. A major advantage of using the SMA network connection is that it is possible to have large distances between the Solar-Log™ and the inverters since every inverter operates as a signal repeater. A maximum of seven SMA Bluetooth inverters can be connected to the Solar-Log 300 and 1200 BT, and the maximum distance between two inverters depends on the surroundings, e.g. 50 meters is typical for open spaces.



Speedwire*

Alternative connection for SMA inverters

All Solar-Log™ modules have the option to connect to SMA inverters via SMA's Speedwire* protocol. All you need is a standard network infrastructure. Most new SMA inverters come with an integrated Speedwire* interface by default. The only step required is to connect the inverter to the same Ethernet switch or router as the Solar-Log™. Only standard network cables are needed for the connection.

Article number

Solar-Log 300, 1200 BT	See page 29
Solar-Log 300, 1200 BT / WiFi	See page 29
Solar-Log™ X24 RS485 Wireless Package (2 units) Please specify type of inverter for pre-configuration.	220058

*In many countries, the designation "Speedwire" is a registered trademark of SMA Solar Technology AG.

Overvoltage protection

Greater security thanks to optimal protection

The overvoltage protection device for the Solar-Log™ offers protection against power surges which could result from removing inverter communication cables from the logger while the inverter operates as well as from lightning strikes in the vicinity.

This device protection has been specially developed for retrofitting the RS485/422 interface of the Solar-Log™. It is easy to install in just a few quick steps. Failures due to power surges are minimized. Please note that it is not possible to have the overvoltage protection with the Solar-Log 2000 for the RS485-C interfaces.



Technical data

Nominal operating voltage	5 V
Maximum operating voltage	$6 V_{DC}; 4,25 V_{AC}$
Maximum operating current	500 mA
DC resistance in operation	2.7 Ohm
Line-ground capacitance	$< = 5 \text{ nF}$
Protection level core - core, max.	8 V
Protection level line - ground, max.	90 VDC (1kV / microS)
Impulse protection level line - ground	$< = 450 \text{ V}$
Nominal discharge current (1 kV/QS)	10 kA
Overvoltage protection class	Class 3
Dimensions (w x h x d) in mm	52 x 88 x 14

Article number

Extended cover and overvoltage protection for Solar-Log 300	255602
Extended cover and overvoltage protection for Solar-Log 1200 and 2000 (only RS485 + RS485 / 422 A)	255601
Solar-Log™ Installation Housing IP 65 version 1 for outdoor use including two power connections, mounting plate	255422
Solar-Log™ Installation Housing IP 65 version 2 for outdoor use including two power connections, mounting plate including transparent cover	220063
Transparent cover for Installation Housing IP 65 (version 1)	255435
Hinges (two units) for the Installation Housing	220072

Solar-Log™ Installation Housing for outdoor use

Protection against dust and moisture

The Solar-Log™ provides reliable protection to ensure safe operation under all weather conditions with protection against dust and moisture. The housing is available in two versions. The Housing can be equipped with a data logger and additional accessories such as the RS485 Mobile Wireless Package. In addition to the Solar-Log™ socket, a second socket is included.



Technical data	Version 1	Version 2
Installation Housing	The housing material is made of polycarbonate and ABS plastic.	
	For quick and easy installation of the Solar-Log™, the holes on the mounting wall have been pre-drilled.	
	There is space in the box for additional accessories.	
Mounting	4 PG connections are available for the grid power network and other connections.	5 PG connections are available for the grid power network and other connections.
	To mount the data logger properly, please remove the mounting plate from the installation and then mount the Solar-Log™ device. Then screw the mounting plate back on.	
Standard color for the enclosure	Hinges can be ordered to help open the cover easily.	
Surface	Gray / RAL 7035	
Protection class	The Installation Housing is non-fading.	
Dimensions (w x h x d) in mm, Weight in kg	IP 65 when used with the proper cable screws and when the cable conduits are properly sealed.	
Warranty	400 x 300 x 130, 3.53	600 x 300 x 130, 5.25
	2 years	2 years

Solar-Log™ compatibility:



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Subject to change without notice

