



# Introduction

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Greetings,

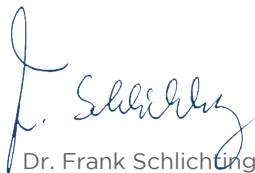
Monitoring has become essential for the solar industry and is almost always included for new solar PV plants. However, even just 10 years ago, professional monitoring systems were not frequently used and still today, many plant owners have not upgraded their systems.

There are a number of factors that could negatively influence the operation of a solar PV plant and could lead to a reduction in production or, in the worst case, to complete yield loss.

The Solar-Log® provides reliable around-the-clock monitoring for your plant. Underperformance is recognized right away and immediately reported before resulting in huge financial losses. Equipping an existing solar PV plant with Solar-Log® guarantees not only ideal plant monitoring, but also provides multiple functions for Smart Energy and feed-in management.

As of now, we are fit for the future with our Solar-Log WEB Enerest™ online portal. The new Solar-Log WEB Enerest™ portal makes customized PV monitoring within the function classes and plant sizes possible for installers, portal operators and end-users. The Solar-Log WEB Enerest™ packages offer ideal monitoring solutions at an attractive price-performance ratio.

Yours,



Dr. Frank Schliching, CEO

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# Introducing the Market Leader in PV Monitoring and Management

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## 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 265,000 plants and 1.47 million MPP trackers. In total, we monitor over 11.9 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 Enerest™.



## All-In-One solutions

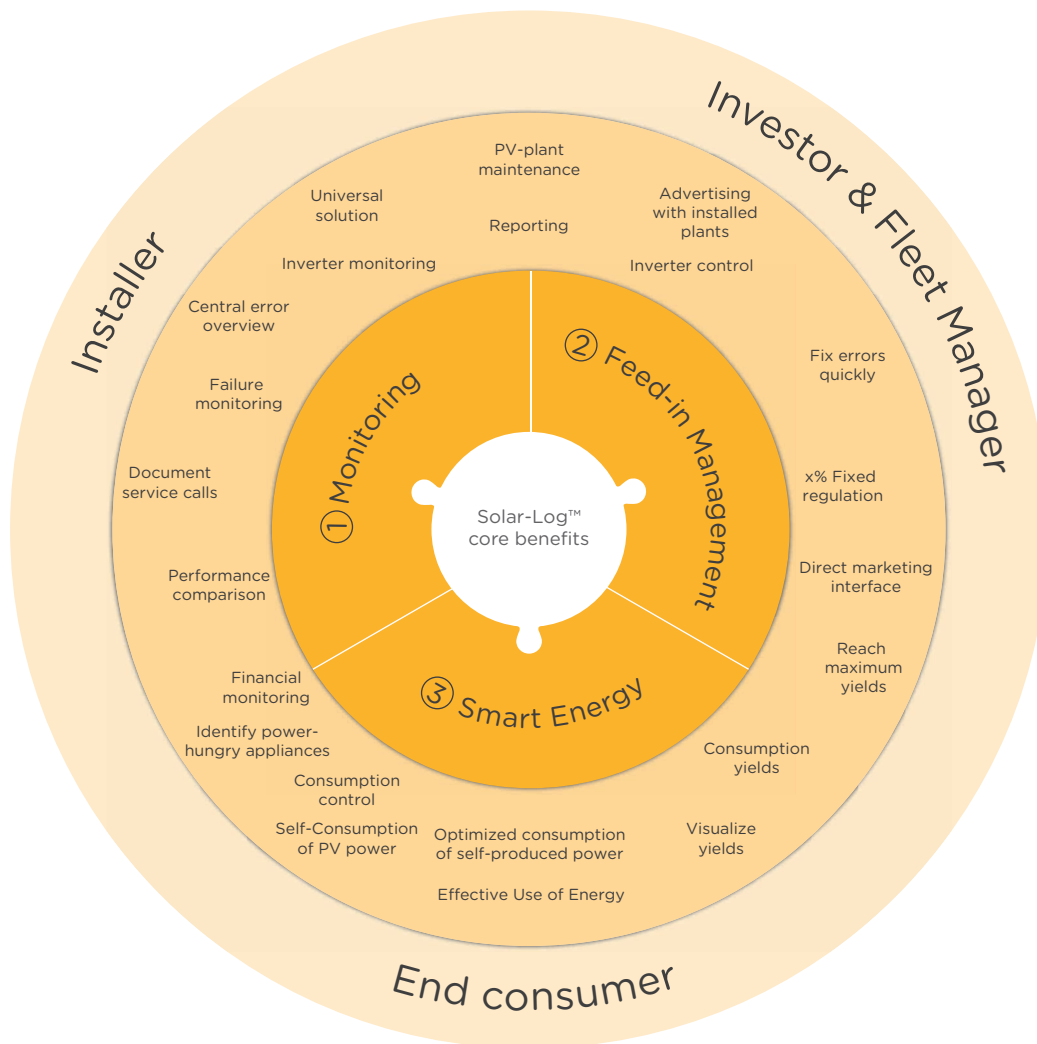
Unrivaled simplicity: Staying ahead of the competition with all-in-one solutions. Thanks to precise advanced technology for monitoring as well as for energy and feed-in management, the Solar-Log® offers the most efficient universal energy management system for solar PV plants. Its compatibility with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

## Unmatched security for banks and investors

Banks and investors often require financial guarantees on their solar 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®





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## Advantages and benefits for installers, portal operators and service providers

- 1 Information at a glance**

Monitor all PV plants from a single platform with the Solar-Log WEB Enerest™.
- 2 Considerable amount of time and money saved**

Remote monitoring and diagnostic tools significantly reduce on-site installation time and on-site maintenance costs. Remote configuration and troubleshooting means fewer truck rolls and more savings.
- 3 Compatible with all major inverters on the market**

This single monitoring system for all inverters allows plant operators to select the best inverter for their needs.
- 4 Wireless communication**

Cellular options and wireless communication tools allow Solar-Log® to be successful in even remote locations.

## Advantages and benefits for plant owners and operators

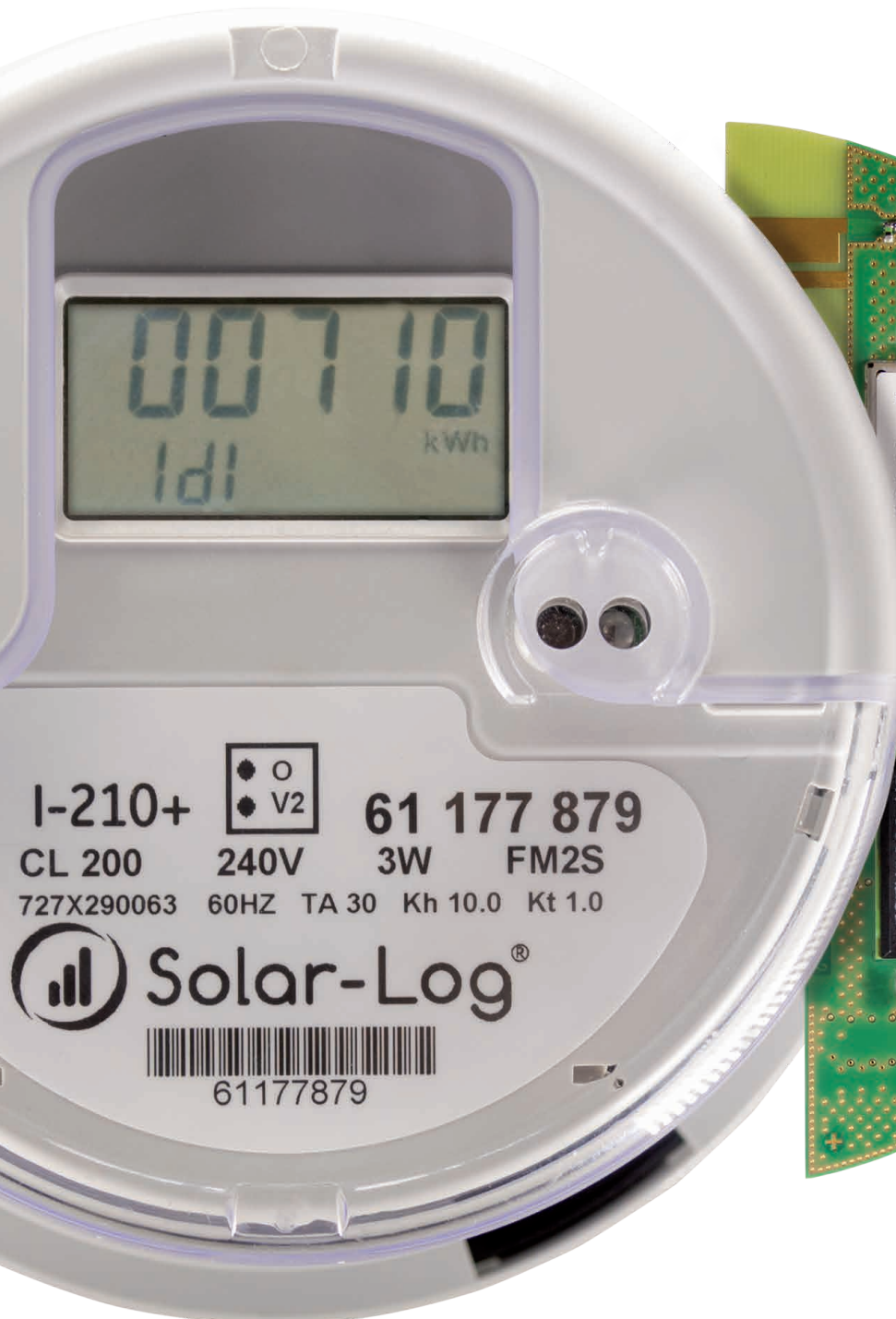
- 1 Investor & bank support**

Banks and investors demand assurances for their PV investments. Solar-Log® monitoring provides these guarantees by maximizing the PV plant's return on investment (ROI).
- 2 Higher efficiency**

Error messages are immediately transmitted online or to mobile devices to guarantee yield performance.
- 3 No PC expertise required**

Connecting the Solar-Log® to the network is simple and does not require installation of additional software.
- 4 Comprehensive, Automatic Reports**

Receive customizable weekly, monthly or yearly reports, the effortless way to stay informed.



00710 kWh  
Id1

I-210+  61 177 879  
CL 200 240V 3W FM2S  
727X290063 60HZ TA 30 Kh 10.0 Kt 1.0

 Solar-Log®



61177879



Telit UE910-EUD  
IMEI: 354678050286827  
CE1909  LOT: 4813  
Model: UE910-EUD  
Designed in Italy, Made in China

Solar-Log  
V2  
61177879

# 01

## Solar-Log<sup>®</sup> Hardware

### Solar-Log<sup>®</sup> device highlights

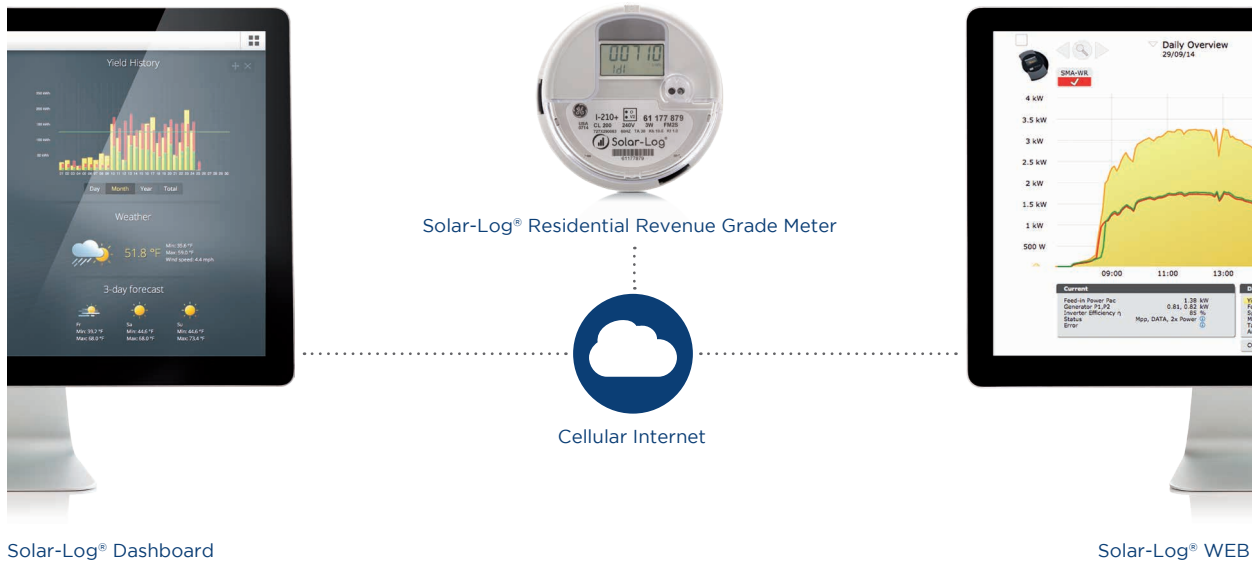
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Solar-Log<sup>®</sup> continues to introduce the most innovative PV monitoring solutions, this time by integrating its proven technology into Aclara's (formerly General Electric's) popular I-210+ Meter. The result is the Solar-Log<sup>®</sup> product family 350, 360, and 370, specially designed for the residential solar PV market and engineered for simple installation.

The new residential Solar-Log<sup>®</sup> product family evolved from the Solar-Log 300, 1200, and 2000 product line which has established its global leadership in monitoring and managing photovoltaic power plants.

# Wireless Residential Solar PV Monitoring

## Solar-Log® Residential Revenue Grade Meter - Highlights



## Highlights

- Simple plug & play socket meter installation, with no on-site configuration
- Certified Revenue Grade Metering (RGM) for automatic incentive reporting
- Compatible with any microinverters and string inverters (240 VAC single phase)
- Convenient online plant performance and power meter monitoring via Solar-Log WEB Enerest™
- Comprehensive Solar-Log® Dashboard for presenting plant performance via local or public display
- Plant performance visualization via iPhone (iOS) and Android apps
- Meteorological satellite data-based performance monitoring

## Optional

- Building load (self-consumption) monitoring
- Inverter direct monitoring
- Power management & onsite weather sensor
- Remote Disconnect



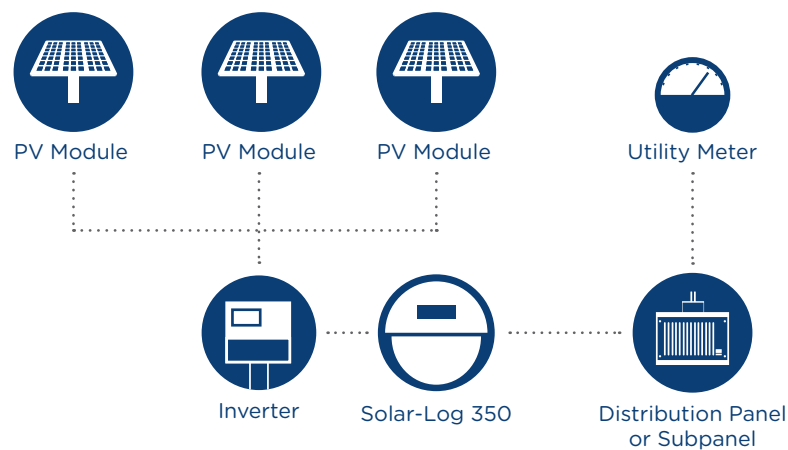
# Solar-Log 350

PV Production monitoring



Solar-Log 350

The Solar-Log 350 is a universal monitoring device that is compatible with all residential solar PV plants. This easy to install device does not require onsite configuration and includes a 5 year cellular data plan and Solar-Log WEB Enerest™ monitoring services.. The Solar-Log 350 guarantees maximized PV plant performance while providing revenue grade reporting.



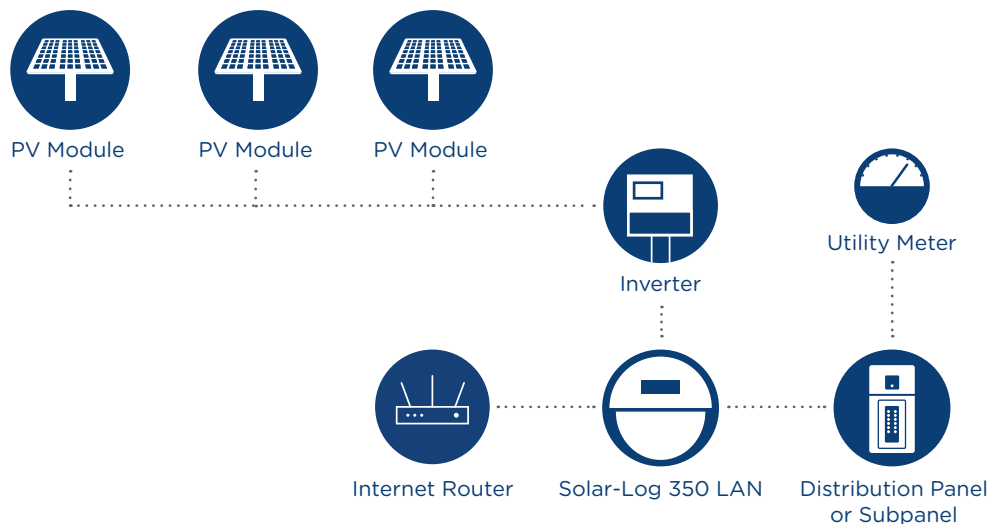
# Solar-Log 350 LAN

PV Production monitoring + LAN Connection



Solar-Log 350 LAN

The Solar-Log 350 LAN provides revenue grade metering for solar PV plants in locations where cell service is weak or unavailable. The LAN connection increases the number of times data is transferred per day, giving near real time visualization of plant data for system owners and installers. This plug and play socket meter is compatible with all residential solar PV plants, is compatible with all major inverter brands and comes with 5 years of Solar-Log WEB Enerest™ monitoring services.



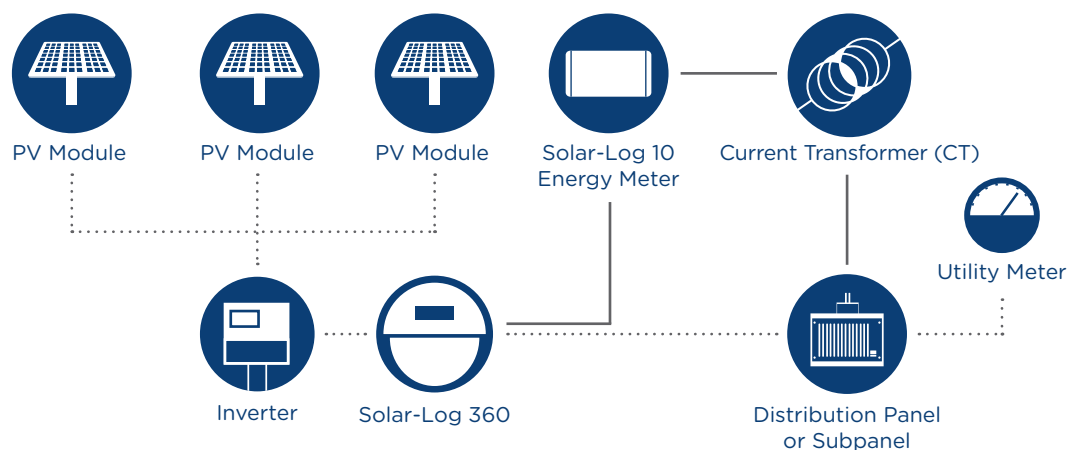
# Solar-Log 360

Production + Consumption monitoring



CTs - Current Transformers, Solar-Log 360 and Solar-Log 10 Energy Meter

The Solar-Log 360 is used for monitoring the total building-load. The included energy meter measures the power consumption directly at the main utility connection. It also allows plant owners to verify utility bills by automatically calculating the amount of consumed grid power. The Solar-Log 360 includes a 5 year cellular data plan, a 5 year Solar-Log WEB Enerest™ subscription and a 5 year warranty.



# Solar-Log 370

Production monitoring + connectivity

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The Solar-Log 370 is a universal monitoring device which provides revenue grade metering for automatic incentive reporting and is compatible with all single phase, residential solar PV plants up to 48kW.

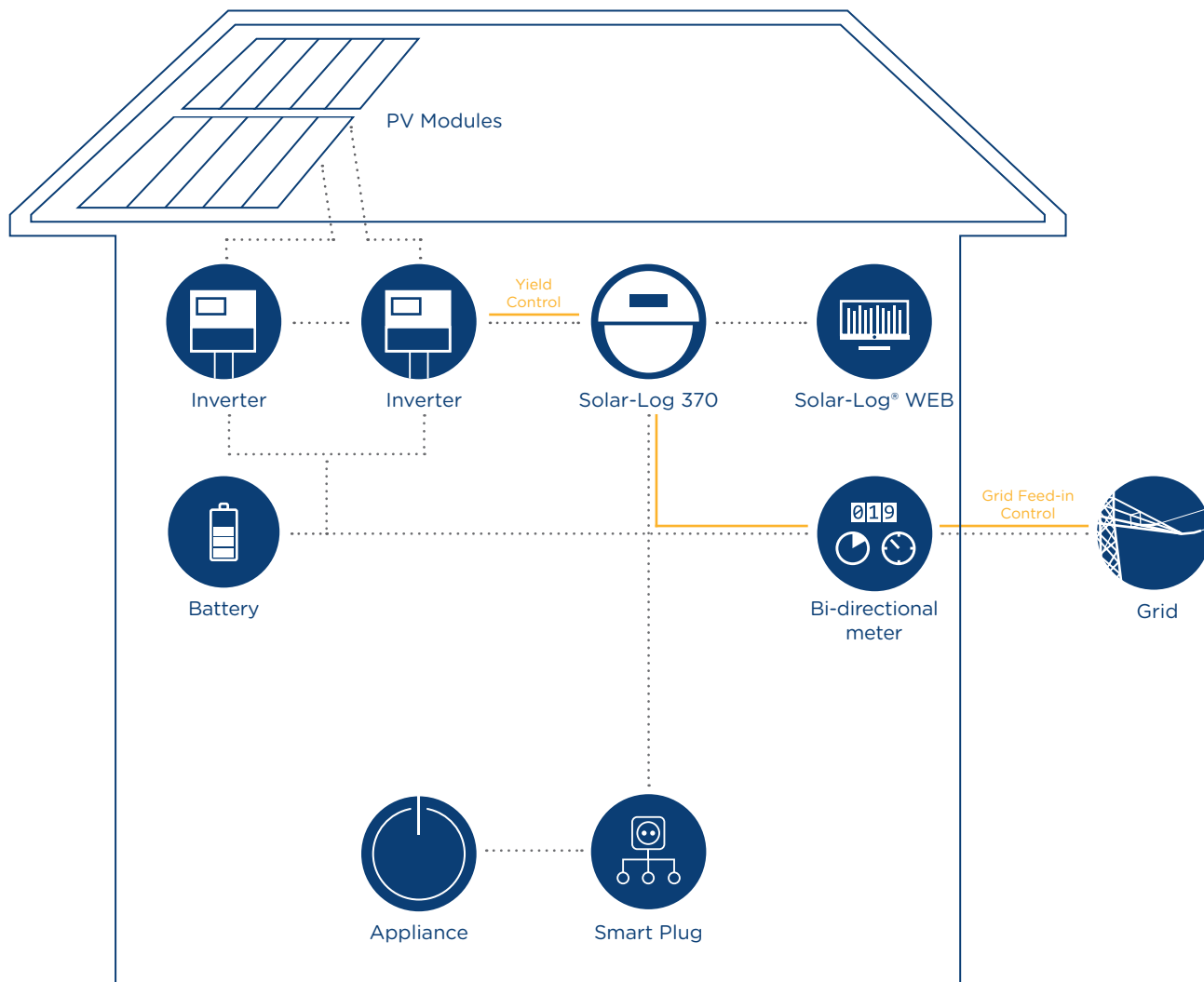
The Solar-Log 370 offers I/O ports for numerous connectivity options. An Ethernet port for LAN access and 2 x RS485 ports that provide access to inverters, batteries, weather sensors and consumption meters. Advanced features include inverter direct monitoring, power management, and remote disconnect.

The Solar-Log 370 includes a 5 year cellular data plan, a 5 year Solar-Log WEB Enerest™ subscription and a 5 year warranty.



## Power Management

The Solar-Log 370 is the complete, intelligent, residential solar PV plant monitoring and power management solution.



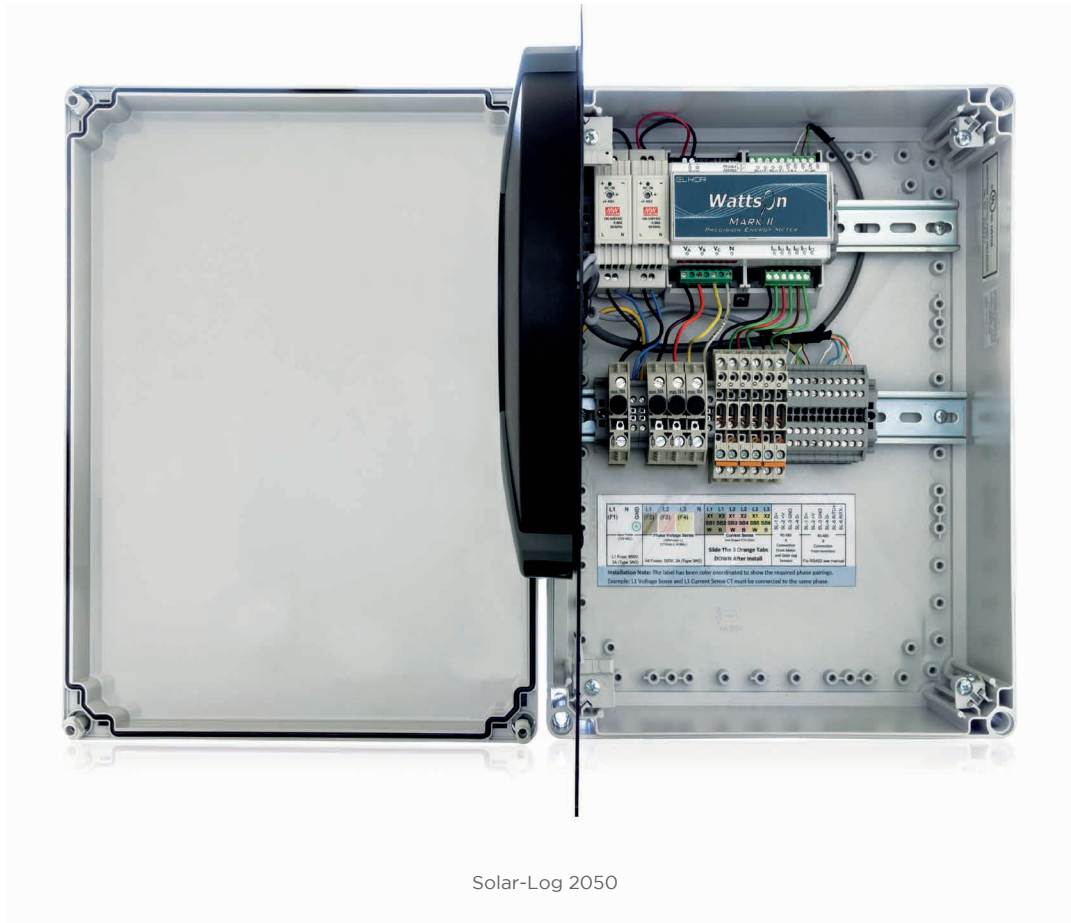
- Control inverter output to limit grid feed-in to meet local requirements.
- Optimize the use of PV power with networked smart plugs or relays to turn appliances on or off.
- Inverter direct monitoring for real-time error detection.
- Maximize PV plant performance by comparing yield to an on-site weather sensor, produced power from nearby plants, or satellite weather data in real time.
- Access all plant data for your entire fleet from anywhere in the world, 24/7 via the Solar-Log WEB Enerest™

Product comparison	Solar-Log 350	Solar-Log 350 LAN	Solar-Log 360	Solar-Log 370
ANSI C12.20 Power meter	●	●	●	●
+/-0.2% accuracy (RGM)	●	●	●	●
3G cellular modem	●	-	●	●
5 year cellular data plan service	●	-	●	●
5 year Solar-Log WEB Enerest™ service	●	●	●	●
5 year warranty	●	●	●	●
Production monitoring (all inverter types)	●	●	●	●
Consumption monitoring	-	-	●	Optional
Inverter Direct Monitoring	-	-	-	Optional
Weather sensor	-	-	-	Optional
Inverter Power Management	-	-	-	Optional
Remote Disconnect	Optional	Optional	Optional	Optional
I/O	3G Cellular Modem, AT&T 3 LEDs for Diagnostics	Ethernet 3 LEDs for Diagnostics	3G Cellular Modem, AT&T 3 LEDs for Diagnostics 1 x RS485 Solar-Log 10 Meter 2 x 100A CTs	3G Cellular Modem, AT&T 3 LEDs for Diagnostics Ethernet 1 x RS485 1 x RS485/RS422
Rating	240 V	240 V	240 V	240 V
Current Class	Class 200	Class 200	Class 200	Class 200
Frequency 60 Hz	60 Hz	60 Hz	60 Hz	60 Hz
Typical Accuracy	+/- 0.2%	+/- 0.2%	+/- 0.2%	+/- 0.2%
Phases	240 VAC single phase	240 VAC single phase	240 VAC single phase	240 VAC single phase
Socket Type	2S	2S	2S	2S
Starting Watts	< 5W	< 5W	< 5W	< 5W
Typical Watt Loss	0.7W	0.7W	0.7W	0.7W
Operational Temperature	-40°C - +85°C / -40°F - 185°F	-40°C - +85°C / -40°F - 185°F	-40°C - +85°C / -40°F - 185°F	-40°C - +85°C / -40°F - 185°F
Voltage	+/- 20%	+/- 20%	+/- 20%	+/- 20%
Display	5 character LCD	5 character LCD	5 character LCD	5 character LCD
Enclosure	NEMA 3 R Type	NEMA 3 R Type	NEMA 3 R Type	NEMA 3 R Type
Certifications	UL 2735, UL 61010-1	UL 61010-1	UL 2735, UL 61010-1	UL 2735, UL 61010-1
Weight	2 lbs	2 lbs	2 lbs 1 lb (Solar-Log 10)	2 lbs
Dimensions	7" x 7" x 5"	7" x 7" x 5"	7" x 7" x 5" 8" x 5" x 2.5" (Solar-Log 10)	7" x 7" x 5"

### Part number

Solar-Log 350	255850
Solar-Log 350 LAN	823210
Solar-Log 360	255851
Solar-Log 370	255852

## Solar-Log 2050



Solar-Log® Revenue Grade Metering with direct inverter monitoring provides the ultimate solution for measuring Solar PV plant performance. The Solar-Log 2050 includes a revenue grade meter with the option to add a Solar-Log® data logger. The Solar-Log® communicates with an RS485 or pulsing meter to deliver high accuracy metering required many plant owners, PPAs, and financing agreements for reporting, accounting, or billing purposes. The Solar-Log 2050 offers many customizable solutions to achieve the needs of fleet managers, solar PV installers, reporting agencies, utilities and end-users.

### Advantages of the Solar-Log 2050 Revenue Grade Meter

- Easy to install, maintain, and operate at a cost effective price-point for commercial and small-utility projects
- Meter solar PV Yield, building load, and sub-consumption
- Monitor net energy exporting in real time
- Collect inverter data including alarms and codes
- Control inverter production, power factor, and grid export
- Revenue grade accuracy for financial contracts (PPAs, etc.), incentive reporting, and Renewable Energy Credit (REC) monetization
- Export data over 3G cellular, or LAN connections

### Revenue Grade Meter Features

- ANSI C12.20 Class 0.2
- Better than +/- 0.2% accuracy with appropriate CTs (typical)
- Digital communications via RS485 (MODBUS RTU)
- 5 Amp version compatible with any standard 5A CT
- MCTA version available with mA current transducers
- Up to 32 inverters can be daisy chained to one Solar-Log®
- Supports single (split) phase, 3 phase service
- Cellular options available
- Optional interface for SCADA integration including DNP3 Protocol

### Monitoring features

- Inverter direct monitoring compatible with over 100 inverter brands
- Solar-Log WEB Enerest™ Fleet Management Tools - error codes, virtual irradiance (production forecasting), clustering (comparative production), alerts and logbook for monitoring and end user dashboard
- Solar-Log WEB Enerest™ the new app for our portal available for iOS and Android
- Solar-Log® Insight - commercial app for iOS (iPhone, iPad and Apple Watch) and Android

### Enclosure Features

- Prewired Solar-Log®, energy meter, power supply, fusing blocks, shorting blocks, RS485/422 ports, Ethernet port, and CTs as needed for fast installation
- Indoor/Outdoor, IP-67 (Environmental type 4X) rated when used with proper cable screws and when cable conduits are properly sealed
- Non-Fading enclosure made of polycarbonate and ABS plastic



## General data

Inverter connection options	Ethernet 1 x RS485, 2x RS485/RS422, 1 x CAN (1 inverter manufacturer per bus)
Max. plant size	2000 kWp - up to 3 inverter manufacturers
Max. cable length	Max. 1000 m <sup>1)</sup>
Central inverter SCB and SMB	●
String monitoring (depending on type of inverter / on tracking level)	●
Inverter failure, status of fault and power monitoring	●
Connection of sensors (irradiation / temp / wind)	● <sup>2)</sup>
E-mail and text message alarm	●
Connection to Solar-Log WEB Enerest™	●
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) 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.

## Technical Data

Voltage	600 V or 600/347 V 480 V or 480/277 V 208 V or 208/120 V 240 V or 240/120 V
Phases	Single (split) phase, Three Phase, 50 or 60 Hz
Power Supply	120 VAC, 277 VAC optional
Fused Input	x4 1A, 250V, or 3A, 500V
Temperature range	-40°C to +60°C
Certifications	ANSI C12.20 Class 0.2 meter
Accuracy	Better than 0.2% of reading (at 25°C, pf>=0.5)
Dimensions	11.81 x 15.75 x 5.12 inch
Weight	Standard Version 13lbs Cellular Version 22lbs
Material	Fiberglass reinforced polycarbonate
Color	Gray

# Solar-Log 300, 1200 and 2000

## Common features

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### Functions

#### Local monitoring

Local graphical reports via web browser.

#### LCD-Status-Display

Status display for installation and operations.

#### Smart Energy

Visualization of self-consumption, including individual appliances, with the option to control and optimize.

#### Feed-in management

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

### Display Options

#### Solar-Log WEB Enerest™

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

#### The new app for - Solar-Log WEB Enerest™

With its completely revised operating concept and modern design, the new app offers many new interactive features and graphics. The app is available for free from the app store.

#### Solar-Log® Dashboard

The Dashboard is a feature of the Solar-Log WEB Enerest™ L and XL that displays all important information for a plant such as yields, CO<sub>2</sub> savings and plant performance.

## Connections

### Inverters

The Solar-Log® is compatible with inverters from most major manufacturers.

### Weather Sensors

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

### Meter S<sub>0</sub>-In or RS485

The meter can record your consumption data or serve as an inverter and measure the power from incompatible inverters. In addition, batteries can be visualized via meters.

### RS485 or S<sub>0</sub>-Out

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

### Solar-Log™ 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.

### Ethernet / Speedwire\*

The Solar-Log™ models can be connected to compatible inverters with an Ethernet connection. SMA inverters can be connected directly to a regular network infrastructure with SMA's own Speedwire protocol. The SMA inverter only has to be connected to an Ethernet switch or router.

## 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.

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

Maximum plant size 15 kWp

Optional Power Management

Dynamic LCD-Status-Display

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



Options	Standard	PM+	Meter
	●	●	●
Part number	255574	255579	255582

# Solar-Log 300

For small domestic installations

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## Functions

### Solar-Log® Easy Installation

The inverter detection and the Internet log on 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 Enerest™.

### Smart Energy

Self-consumption can be measured and displayed as a graph with an energy meter. Smart Energy logics activate and deactivate individual appliances depending on the amount of available energy.

## Connections

### Inverters

A maximum of 100 inverters (just one manufacturer per bus), maximum plant size 15 kWp.

### Inverter interface

Inverters can be connected via an RS485/422 interface or an Ethernet connection.

Maximum plant size 100 kWp

Optional Power Management

Color Touchscreen and LCD-Status-Display for displaying graphics and operation

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



Options	Standard	PM+	Meter
	●	●	●
Part number	255591	255587	255590

# Solar-Log 1200

For small domestic installations and medium-sized plants

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## Functions

### Solar-Log® Easy Installation

The installation and initial setup is automatic. The inverter detection and the Internet log on 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 Enerest™.

### Smart Energy

Self-consumption can be measured and displayed as a graph with an energy meter. Smart Energy logics activate and deactivate individual appliances depending on the amount available energy.

## Display Options

### Color Touchscreen and access to Solar-Log®

The Solar-Log™ can be operated from a computer with a web browser or directly via the device's color touchscreen. The graphical reports of yield data are visualized on the color touchscreen and via the web browser. Remote configuration of the Solar-Log® parameters is possible with Solar-Log WEB Enerest™ XL.

## Connections

### Inverters

A maximum of 100 inverters (just one manufacturer per bus), maximum plant size 100 kWp.

### Inverter interface

Inverters can be connected via an RS485/422 and an RS485 interface or an Ethernet connection.



Maximum plant size 2 MW

Optional Power Management  
and cos phi control

Color touch screen and LCD-  
Status-Display for displaying graphics  
and operation

Central inverter



Options	Standard	PM+	Meter
	●	●	-
Part number	255592	255594	-

# Solar-Log 2000

For commercial and small-scale utility plants

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## 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 Enerest™. 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

### Color Touchscreen and access to Solar-Log®

The Solar-Log™ can be operated from a computer with a web browser or directly via the device's color touchscreen. The graphical reports of yield data are visualized on the color touchscreen and via the web browser. Remote configuration of the Solar-Log® parameters is possible with Solar-Log WEB Enerest™.

## Connections

### Inverters

A maximum of 100 inverters (just one manufacturer per bus), maximum plant size 2 MW.

### Interfaces

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

## Options

### Solar-Log 2000 PM+ & Solar-Log® Meter

Combining the Solar-Log 2000 with an additional meter simplifies implementation of varying feed-in limitations throughout the world. 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+ & PM-Package

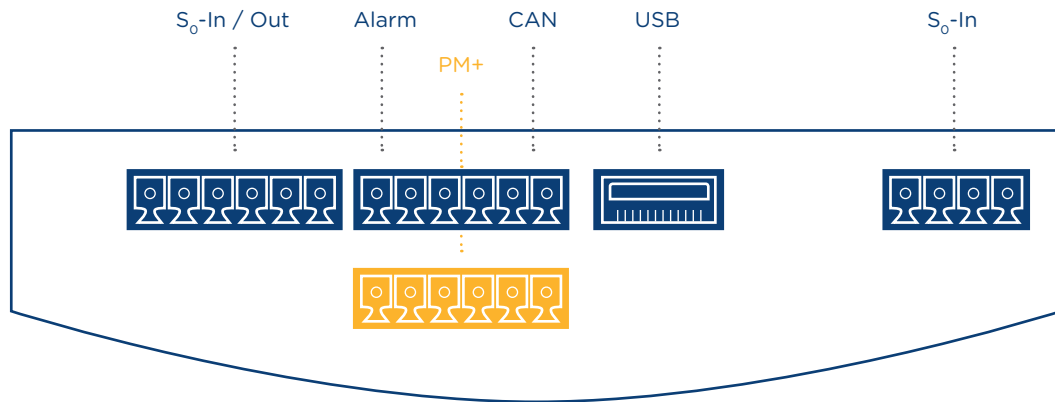
For plants larger than 100 kWp, remote control of the reactive power supply and power limitations are required along with a confirmation of the current amount of feed-in power.

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.

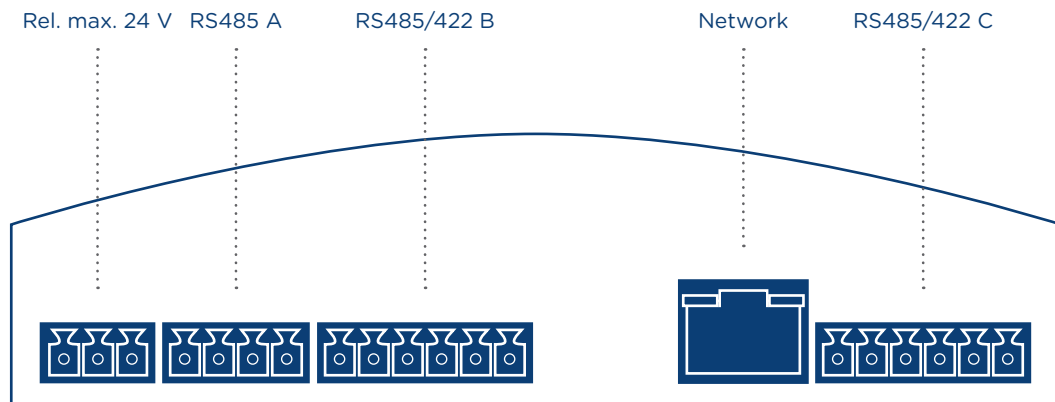


**Feed-in management - feed balance:** The times when there was a grid feed and when electricity was purchased from the grid can be seen at a glance in this graph. Negative values indicate that electricity was purchased from the grid and positive values that there was grid feed.

# Solar-Log 2000 PM+ Interfaces



Top



Bottom

Product comparison		Solar-Log 300	Solar-Log 1200	Solar-Log 2000
Basic functions	Standard	●	●	●
	PM+ <sup>2)</sup>	●	●	●
	Solar-Log® Meter (CT)	●	●	-
	Central inverter SCB and SMB	-	-	●
	Inverter connection options	Ethernet 1xRS485/RS422 (1 inverter manufacturer per bus, max. total of 100 INV)	Ethernet, 1xRS485, 1xRS485/RS422 (1 inverter manufacturer per bus, max. total of 100 INV / device)	Ethernet, 1xRS485, 2xRS485/RS422, 1xCAN (1 inverter manufacturer per bus, max. total of 100 INV / device)
	Max. plant size	15 kWp	100 kWp	2000 kWp
	Max. cable length	Max. 1000 m <sup>1)</sup>	Max. 1000 m <sup>1)</sup>	Max. 1000 m <sup>1)</sup>
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)	● <sup>3)</sup>	● <sup>3)</sup>	● <sup>3)</sup>
	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 and without the calculation of self-consumption)	●	●	●
	Limit of X percent (with adjustable fixed reduction)	●	●	●
	Remote controlled active and reactive power reductions (with the calculation of self-consumption)	PM+	PM+	PM+
	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" color touch screen display	4.3" color touch screen display	
Controls on the unit	-	Via touch display	Via touch display	
Large external display RS485 / S <sub>0</sub> pulse	●	●	●	
HTTP data transfers to Solar-Log® WEB for low data volumes	●	●	●	
FTP data transfer to third-party portals <sup>5)</sup>	●	●	●	
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 Enerest™	●	●	●	
Weight <sup>6)</sup>	710 g	800 g	810 g	
Multi-lingual (DE, EN, ES, FR, IT, 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 compatibility, Power management and self-consumption and SCB and SMB inverters can be found on our website [www.solar-log-america.com](http://www.solar-log-america.com).

3) Using every inverter on the same bus is not always possible; please see the inverter database [www.solar-log-america.com](http://www.solar-log-america.com).

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

5) 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.

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

Accessories		Part 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 <sup>3)</sup> WLAN, measuring function	255841	●	●	●
Relays	Solar-Log® Smart Relay Station, 3 x 16 A (3 x 3.5 kW)	255755			
	Solar-Log® Smart Relay Box 8 Relays	255656	● <sup>4)</sup>	●	●
	Gude Expert Net Control 2301 - 4x Relays Top-hat-rail mounting 230 V	www.gude.info	●	●	●
Meters	EGO Smart Heater	255840	●	●	●
	Solar-Log® Pro 380 Mod three-phase A.C. current meter	255913	● S <sub>0</sub> <sup>4)</sup>	●	●
	Iskra power meter, 1-phase - S <sub>0</sub>	255346	●	●	●
	Iskra power meter, 3-phase - S <sub>0</sub>	255347	●	●	●
	Solar-Log® Utility Meter	255385	● <sup>5)</sup>	● <sup>5)</sup>	●
	Elkor WattsOn (USA)	-	●	●	●
	SMA Meter Connection Box	-	●	●	●
CTs	16 A sealed, 100 A sealed, 100 A open	See page 59	● (Meter)	● (Meter)	●
	Sensor Box Professional Plus <sup>1)</sup>	220060	●	●	●
Wireless Sensors	Sensor Basic <sup>1)</sup>	255895	●	●	-
	Lufft UMB WS503	www.lufft.de	●	●	●
	RS485 Wireless Package	220058	●	●	●
	Directional radio antenna for the wireless package (std. 2.4 GHz antenna)	-	●	●	●
	PM-Packages	grid company independent	-	-	●
Large plants	SCB / SMB	-	-	-	●
	PowerLine Package	255886	●	●	●
Misc.	Overvoltage Protection		255602	255601	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 connection (Fronius / Sunville can be connected on an RS422 interface without an additional interface converter)		
	Connection to a Sensor basic irradiance and module temperature sensor	Connection to a Sensor Box Professional Plus to record environmental data such as temperature, irradiance, wind speed and ambient temperature*	
		Sensor Box Professional	
RS485 – interface usage	Meter connection, numerous options		
	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 <sub>0</sub> pulse input – for optional recording and calculation of self-produced power consumption		
2x S <sub>0</sub> -In / 1x S <sub>0</sub> -Out	Second input to connect an additional power meter		
	S <sub>0</sub> 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)		

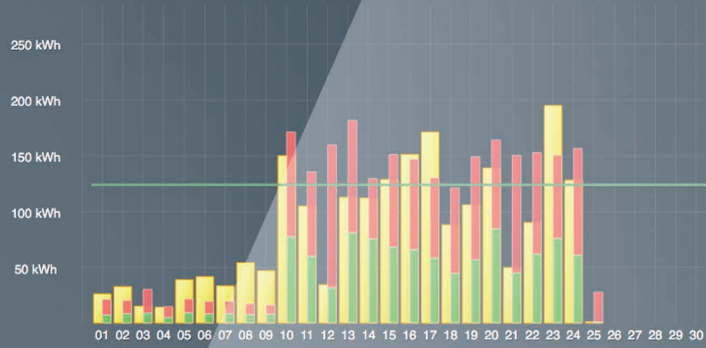
Inverter interfaces

Additional function interfaces

\* not with GPRS models

Part number	Solar-Log 300	Solar-Log 1200	Solar-Log 2000
Standard	255574	255591	255592
PM+	255579	255587	255594
Solar-Log® Meter (CT)	255582	255590	-

## Yield History



Day **Month** Year Total

## Weather



51.8 °F

Min: 35.6 °F  
Max: 59.0 °F  
Wind speed: 4.4 mph

## 3-day forecast



Fr  
Min: 39.2 °F  
Max: 68.0 °F



Sa  
Min: 44.6 °F  
Max: 68.0 °F



Su  
Min: 44.6 °F  
Max: 73.4 °F

# 02

## Solar-Log WEB Enerest™

### Superior Presentation

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The new name Solar-Log WEB Enerest™ emphasizes the continued forward-thinking development of our online portal solution. It is a combination of robust, proven technology and cutting-edge innovation.

The Solar-Log WEB Enerest™ provides installers and service providers a tool for centralized control. This allows them to offer plant owners optimal plant monitoring and concise presentation options. The newest features create the perfect fit for plant owners and provides banks and investors reliable protection and professional monitoring for solar investments.

Solar-Log WEB Enerest™ features reliable reporting functions and concise presentation options that can be accessed online.

Plant yield, error messages and configuration data are saved on SDS servers, to prevent data loss.

# Solar-Log WEB Enerest™ XL

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

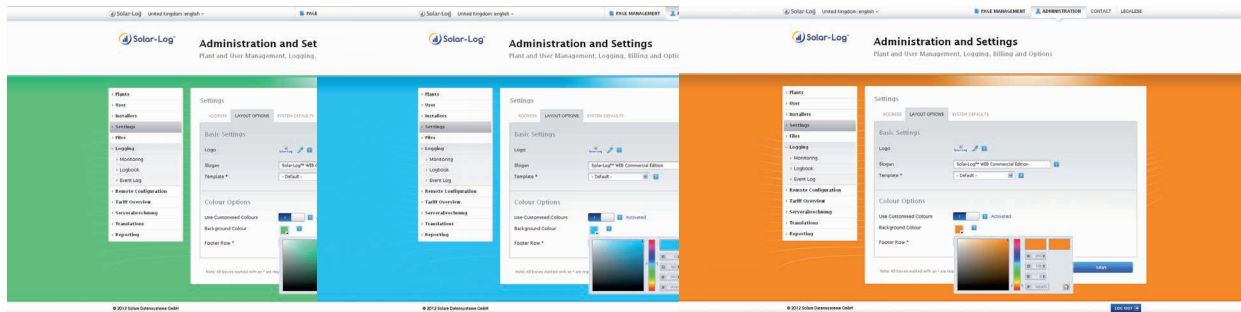
Installers and service providers can offer plant owners service contracts tailored to their individual needs and projects, centrally managing the plant in real time with remote access. This allows for advanced and professional plant monitoring. The Internet portal also serves as reliable protection and professional monitoring for PV investments.

## Professional remote maintenance

The Solar-Log WEB Enerest™ XL sends automatic alerts directly to the installer or portal operator, enabling them to react immediately and solve the problem remotely or through a service call. Installers and portal operator can also adjust settings and activate functions remotely.

## Customization of your own monitoring platform

The possibility to customize your own monitoring platform is an additional service benefit. A range of available function modules can be easily integrated as desired at the touch of a button. Pages designed with HTML can also be integrated. Specific color selection makes it possible to customize the appearance to match the customer’s corporate design.



Template with different sample colors

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## Solar-Log WEB Enerest™ XL advantages and benefits

- 1 Professional maintenance**

The “Full Service” maintenance concept offers plant operators remote and comprehensive professional plant maintenance.
  - 2 Easy Installation**

Integrate plants quickly and easily into Solar-Log WEB Enerest™ with Solar-Log® Easy Installation.
  - 3 Efficient monitoring**

Quickly and efficiently review the status of all monitored plants at a glance.
  - 4 Fast service**

Detect, analyze, and remedy errors quickly with the diagnostic tools.
  - 5 Effortless**

Manage and log all activities, events and appointments in the plant logbook.
  - 6 Detailed reports**

Update plant operators with reliable and easy-to-read reports. Optionally, reports can be set up to be generated automatically with minimal effort.
  - 7 Concise presentation**

In connection with the Solar-Log WEB Enerest™ L and XL, Solar-Log™ Dashboard and Solar-Log™ Insight can access plant data and offer various options to present the data. The app is compatible with all PV plants that are connected to the Solar-Log WEB Enerest™ portal.
  - 8 Protection against data loss**

Plant yields, error messages, and configuration data are secured, stored, and displayed.
-

## Power tools for installers, portal operators and service providers: Solar-Log WEB Enerest™

### Simple integration of the PV plant and remote configuration

PV plants are easy to set up in the Solar-Log WEB Enerest™ web portal. Pages can be automatically generated for the initial set up of every Solar-Log®. Once integrated, the Solar-Log® settings can be conveniently accessed remotely via the internet, thus greatly reducing the installation time and effort required on-site.

### Central and dynamic plant monitoring

Solar-Log WEB Enerest™ XL offers portal operators the option to centrally monitor all of the plants at the same time. Plant problems such as inverter failures or abnormal performance deviations are listed in order of importance and relevance. For example, the plant with the highest number of errors is listed first. This enables not only the daily centralized monitoring of a large number of plants, but also supports a straightforward troubleshooting process.

### Smart management of plant restoration with the plant logbook function

The plant logbook is available with Solar-Log WEB Enerest™ XL and includes the option of an integrated ticket system to log and manage service calls. Service team members can be centrally assigned to service calls and appointments. A list of all of the relevant details, comments, and current service status can be entered into and viewed in the logbook.

### Stay updated with regular reports

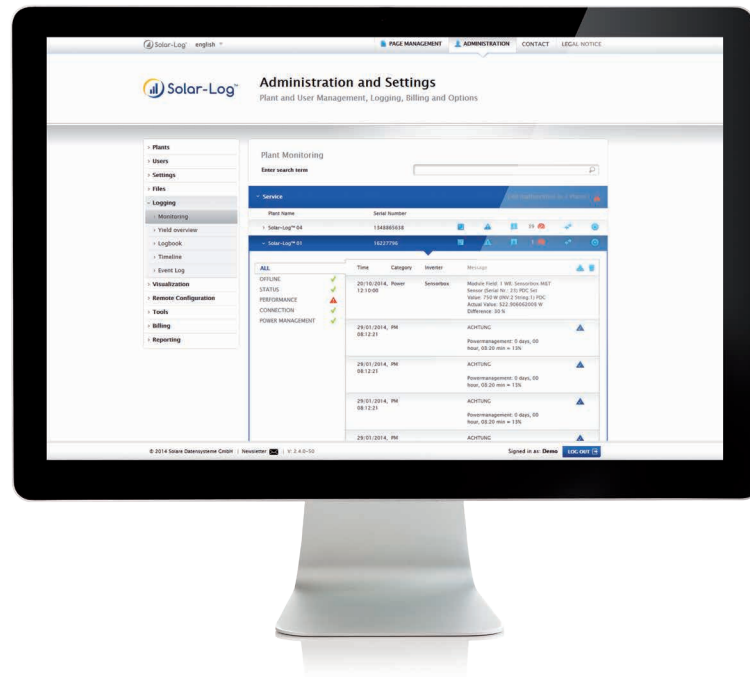
Concise yield reports can be created for every plant monitored with Solar-Log WEB Enerest™ XL. For example, in the Report section, energy balance reports can be automatically generated and sent to any recipient on a daily, weekly, monthly and yearly basis as a PDF or CSV file - the ideal option for installers and service providers to keep their customers informed on a regular basis.

### Documents are available when you need them

Upload plant specific documents such as string plans, contracts, or specifications to your portal so they are readily available when you need them. Keep them secure by defining authorized users.

### Benefits for the plant operator

The Solar-Log WEB Enerest™ XL is a perfect match for those who place particular importance on service quality. It is the most convenient solution for plant owners. No in-depth technical knowledge is required nor is there any need to invest time in managing and monitoring plants. In case of malfunctions, the installer or service provider can intervene immediately, as needed, to offer appropriate and professional 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 additional fees, no long-term commitments

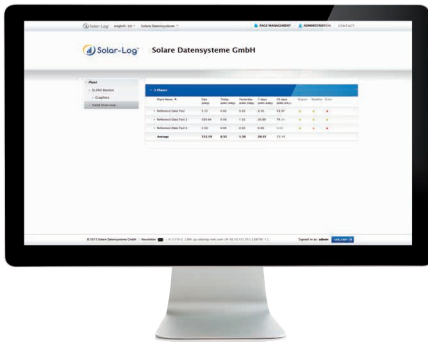
Every plant can be initially monitored for 30 days without obligation before plant specific charges arise. All charged fees can be linked to every individual plant owner. Online trainings are available to get the most out of all of the options that the Solar-Log WEB Enerest™ has to offer.



# The complete overview for installers, service providers and plant operators

## A wide range of reporting and presentation options

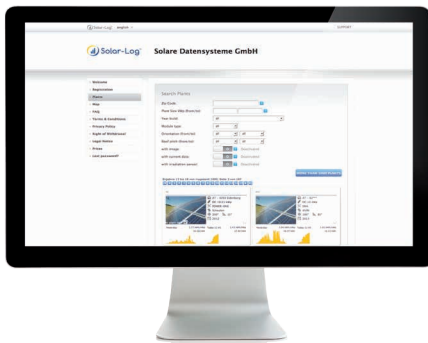
The Solar-Log WEB Enerest™ XL can process and analyze plant data in a graphic or numerical format in the form of daily, monthly and annual data reports. It also offers search functions and advanced monitoring and management. In addition, the yield line, input voltage, MPP trackers and inverters can be displayed. In connection with the Sensor Box Professional Plus or the Weather Data Comparison module, it is possible to display irradiance values and other reference values that aid plant monitoring.



**Comparison:** Reference plant data from the immediate surroundings is collected and converted according to the PV plant's orientation, pitch and location to allow for a direct comparison.



**Energy flow:** The usage of self-produced power can be visualized with the help of energy flows.



**Plant overview:** The informative plant overview with search options.



**Year overview:** Display of the power production and consumption.

# Solar-Log WEB Enerest™ M & L

## Online Monitoring for Plant Owners

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### Solar-Log WEB Enerest™ M

The Solar-Log WEB Enerest™ M edition is easy to configure and is intended for private plant owners who would like to monitor their plant themselves. It features basic plant monitoring functions and visual presentation of the PV plant and its power consumption. It is compatible with the new App - Solar-Log WEB Enerest™ (iOS/Android).

### Solar-Log WEB Enerest™ L

This edition is intended for plant owners and portal operators and technically adept plant owners who would like to monitor their plants themselves. It is easy to configure and offers basic plant monitoring functions and status notification analysis. It provides concise presentation and visualization of PV plant yields and power consumption. The Solar-Log WEB Enerest™ L features reference data comparisons, the presentation of fixed percentage reductions (x %) and the visualization of the power management function. The PV plant output data can be displayed via the Dashboard and Solar-Log™ Insight. User-defined, automated reports are available. It is compatible with the new App - Solar-Log WEB Enerest™ (iOS/Android)



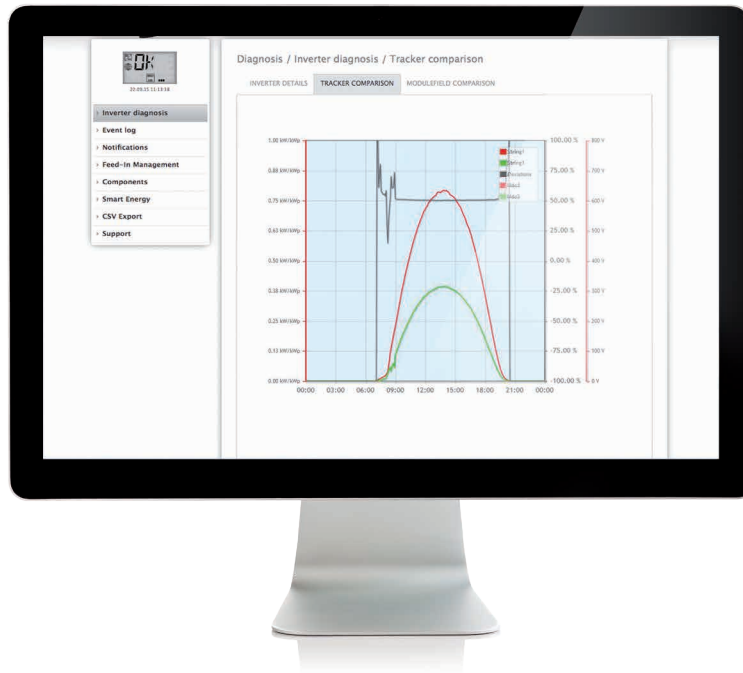
Start page of the Solar-Log WEB Enerest™.

# Comprehensive Solar-Log® failure monitoring and power balancing

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## 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 kWh/kWp output.

## Inverter status

The Solar-Log® continuously records the status and fault codes of the inverters, so you always have peace of mind knowing 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

Irradiance, module temperature C°, ambient temperature C° and wind speed can be displayed. Reference comparison data from the surrounding area are collected and converted according to the plant's orientation, pitch and location to facilitate in the detection of deviations between expected power and actual output.



## 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 PV Plant 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, CO<sub>2</sub> savings and performance. As an alternative, we also offer the newly enhanced Solar-Log™ Insight app for mobile access.

## Solar-Log® Dashboard

The Dashboard provides customers with a dynamic display of all of the important plant information such as yield, CO<sub>2</sub> savings and performance. The display can be set up by selecting up to any four of the following elements: Current Production, Yield History including self-consumption, 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. There is the option to display one tile or up to four tiles in the full-screen mode or to display the files as a slide-show.



Solar-Log® Dashboard – displaying PV plant performance at a glance. Remote access is possible with the Solar-Log WEB Enerest™ L and XL.

### Dashboard Slideshow

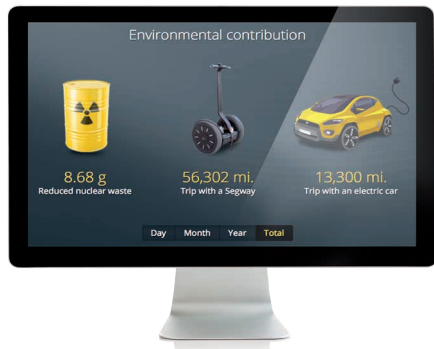
The new Slideshow mode allows you to select whether Dashboard modes are displayed at the same time or one after another. The graphs are automatically scaled to the entire Dashboard size available for the slide show. Regardless of whether they are used in the office, in public facilities, on a large display 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.

## Solar-Log® Insight

Solar-Log® Insight provides a more robust view of PV plant data including the Solar-Log® Dashboard image, for around the clock access to your data. Everything can be viewed at a glance, from the yield history and power consumption from the current day, to the total view. It provides a quick and easy overview of environmental contributions and the weather forecast for the coming days. Available in combination with the Solar-Log WEB Enerest™ L and XL.

### Available Views

Yield history including consumption and self-consumption, environmental contribution, financial yields, weather data, current output and total overview.



### Apple Watch

The Solar-Log® Insight app provides a connection to the Apple Watch. This allows for a quick overview of PV plant data by just glancing at your wrist. It can display the yield history, environmental contribution, financial yields and weather data.



Available in 12 languages (DE, EN, FR, IT, ES, NL, CN, JP, DK, SV, TR, PL), only in connection with the Solar-Log WEB Enerest™ XL





## Solar-Log WEB Enerest™

The new app for the Solar-Log WEB Enerest™ portal

The new app with its modern design and completely revised operating concept will be available in June 2017 for smartphones and tables free of charge from the app store. It offers many new features and interactive graphics. For example, a single PV plant or several plants can be presented on a pinboard with customized views. Its interactive graphics can visualize current and historical plant data as well as data from connected components such as heat pumps and heating rods. The feed-in and self-consumption data can be concisely presented and compared. The News Center keeps users informed and up-to-date.



The pinboard view is on the left and self-consumption on the right.



All PV plants that are connected to the Solar-Log WEB Enerest™ portal via the Internet are supported. The data from these plants is automatically available in the app.

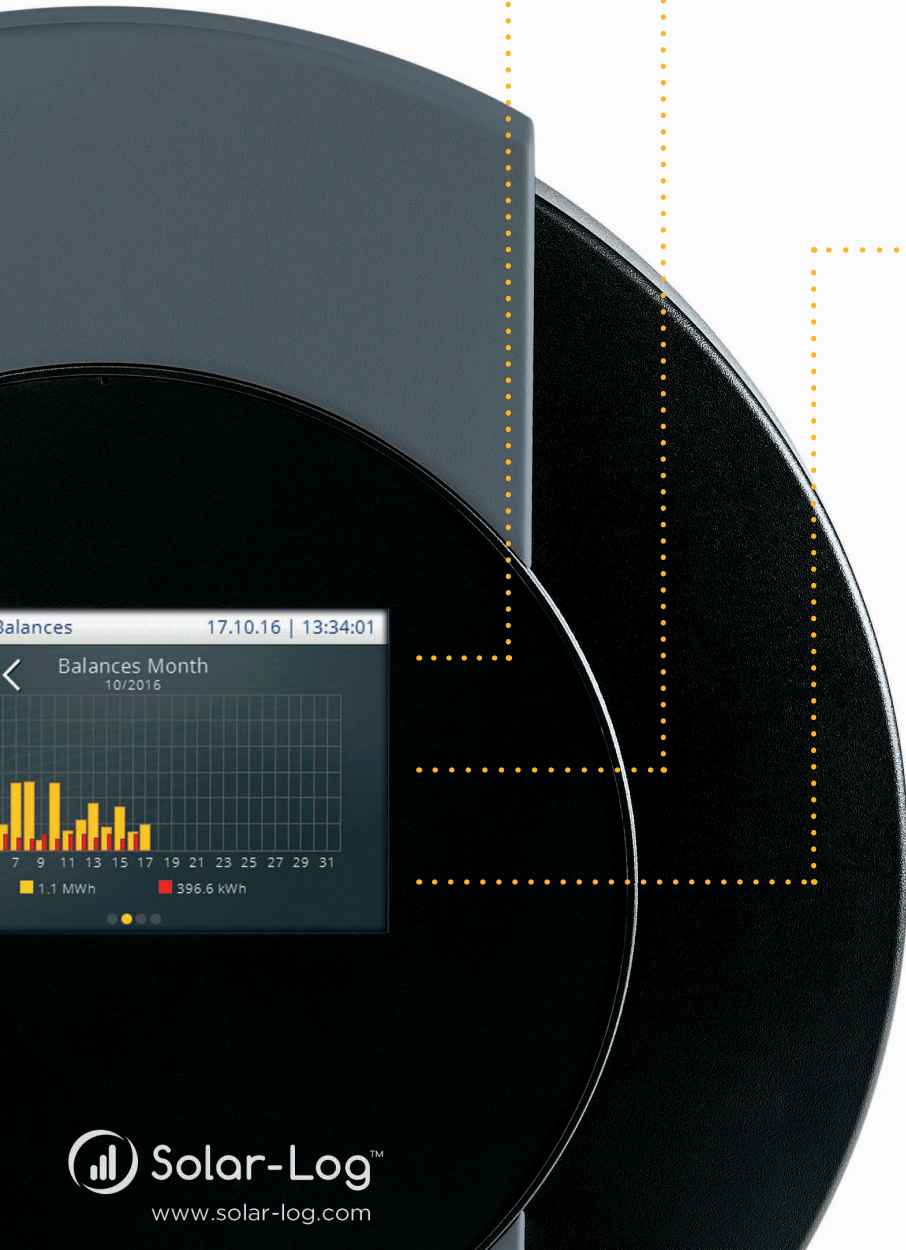
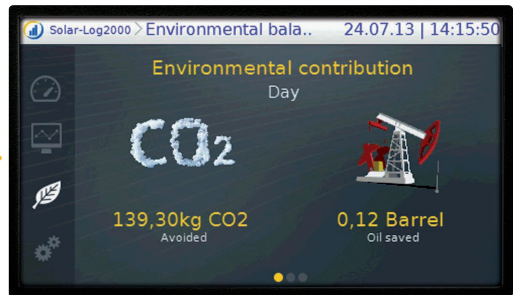
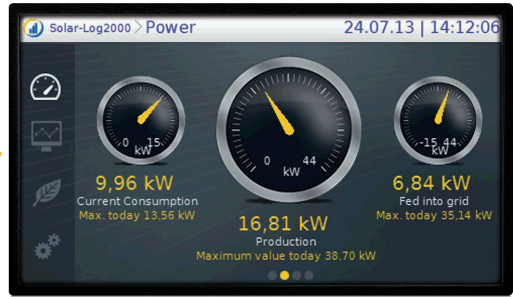


Product comparison Solar-Log WEB Enerest™

	M	L	XL	
Basis functions	Several plants per user	●	●	●
	Plant size	up to 30 kWp	unlimited	unlimited
	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 tracker	●	●	●
	Data and fault messages via e-mail	●	●	●
	Mobile Apps for iOS and Android	●	●	●
	Compatible with Solarfox® large external display	●	●	●
	Number of e-mail addresses for performance / fault messages	1	1	4 per category
Data visualization interval	30 min, 1 h, 2 h, 4 h, 8 h, daily	30 min, 1 h, 2 h, 4 h, 8 h, daily	10 Min, 15 Min, 30 Min, 1 h, 2 h, 4 h, 8 h, daily	
Monitoring & Management	Reference data comparison	-	●	●
	Yield overview with specific yields	-	●	●
	Centralized and concise monitoring of several plants at a glance	-	-	●
	Weather data comparison	-	-	●
	Plant Monitoring at the Tracker / Module Field Level	-	-	●
	Remote configuration of the Solar-Log™	-	-	●
	Plant Logbook with a Ticketing System and Task Assignments	-	-	●
	Timeline (protocol of all configuration changes)	-	-	●
	Dashboard including Solar-Log™ Insight	-	●	●
	Visualization of a 70% Feed-in Reduction	-	●	●
Visualization of a Powermanagement Reduction	-	●	●	
General	User-defined, automated reports: self-consumption with balances, sensor values, performance ratios, comparison of several years, yield reports based on the inverter level, power management report with yield loss calculations (only when sensors are employed)	-	Limit of 5 automated reports	Unlimited number of automated reports
	Integration of current data (total yield, total power output, CO <sub>2</sub> emissions and much more) into one's own texts	-	-	●
	Display all plant locations on a map	-	-	●
	Overview of the reference plant with search options	-	-	●
	Automatic Incentive Reporting	-	-	●

## Product comparison Solar-Log WEB Enerest™

	M	L	XL	
Graphical arrangement of up to 10 Solar-Logs	-	-	●	General
Performance Ratio graphic	-	-	●	
Value overview to present current data	-	-	●	
String Connection Box graphic	-	-	●	
Compatible with SMA Sunny WebBox (limited functionality)	-	-	●	
Available languages DE, EN, FR, IT, ES, NL, CN, JP	●	●	●	Portal design
Additional Languages available for the Dashboard DK, SE, TR	-	●	●	
Page layout with precise color selection and customized logo	-	-	●	
Custom page design due to flexible Content Management System (CMS)	-	-	●	
Customized templates	-	-	●	
Configuration wizard to design the web pages	-	-	●	
Easily customized contact form	-	-	●	
Additional language options	-	-	●	
Upon request: Individual corporate design template	-	-	●	
Upon request: domain name of your choice (.de / .eu / .com)	-	-	●	
Central Plant Data Management	-	-	●	
User management with assigned rights	-	-	●	
Plant monitoring at the string level	-	-	●	



# 03

## Smart Energy

### Efficient power management

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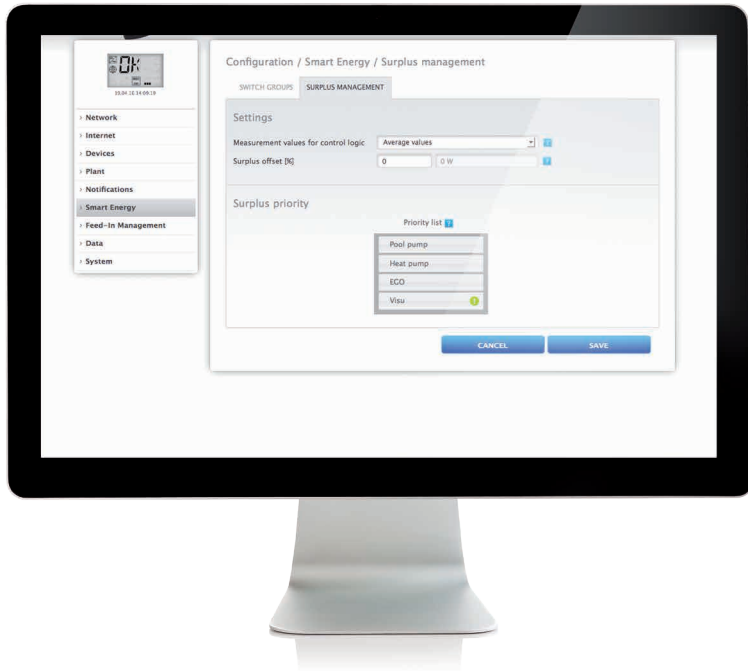
Feed-in tariffs are being reduced, tax incentives and subsidies are expiring, and energy prices continue to rise.

As a result, the need for storage and optimized consumption of self-produced power is essential to meet the increasing energy needs.

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.



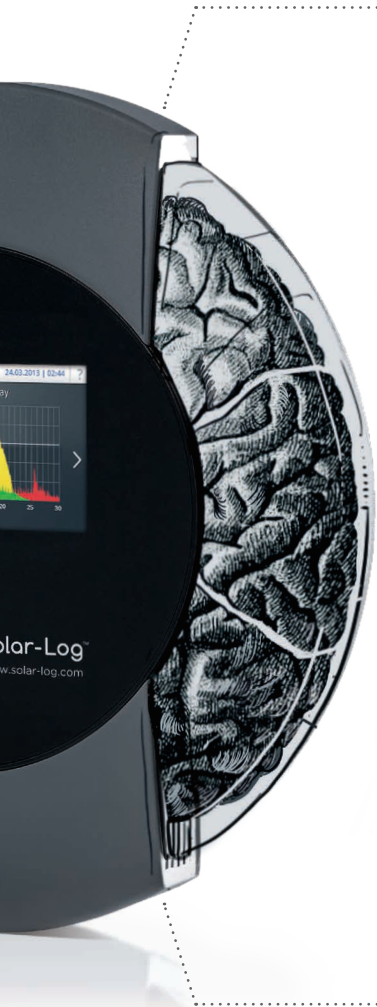
Smart Energy Configuration: Switching contacts can be added to switching groups and will be actively managed by the Solar-Log™.



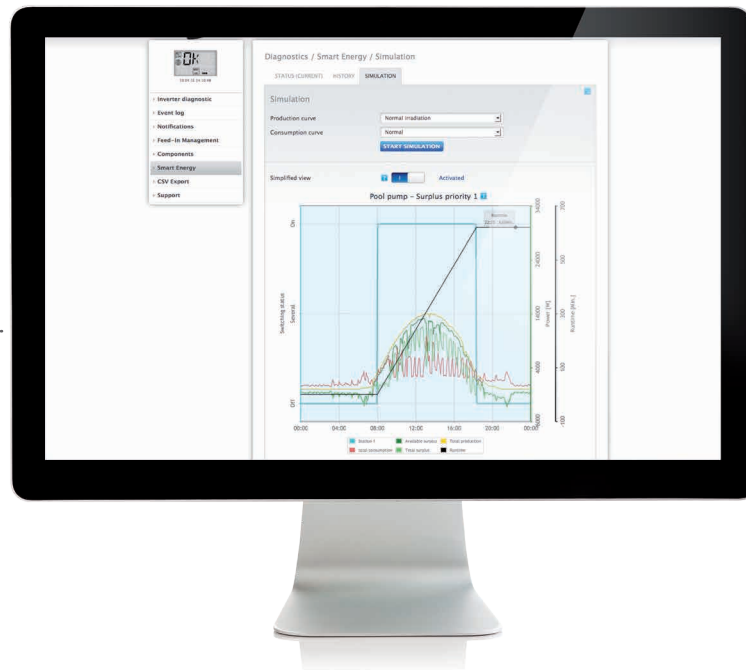
Smart Energy Management: The top entry in the priority list is switched on before the other devices.







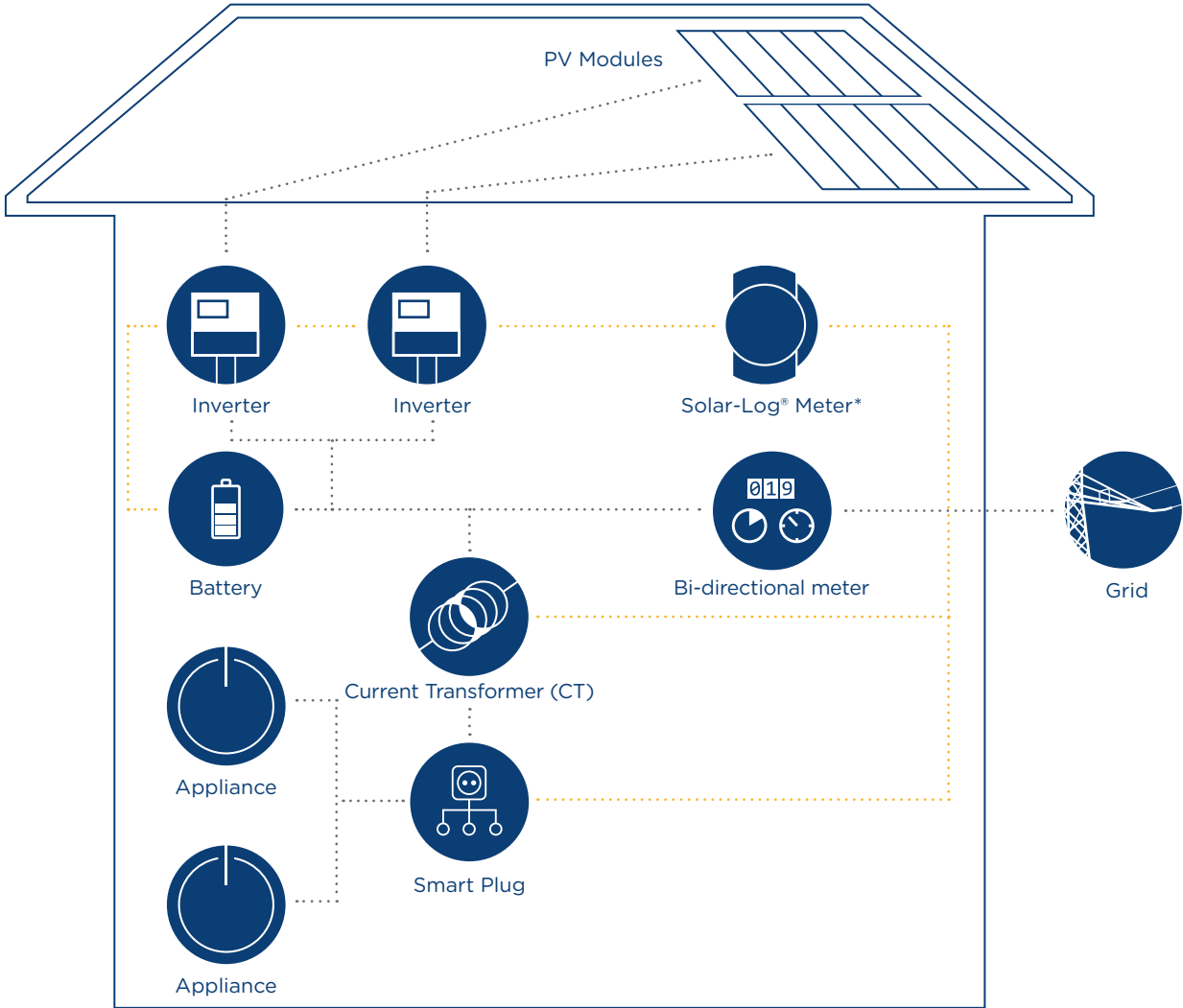
History: The configured Smart Energy profiles are visualized here. This provides a quick and easy way of checking configured settings.



Simulation: Based the selected day or simulated day, the graphic displays whether the configured settings perform as expected.

# 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

Networked smart plugs and integrated relays offer the option to precisely control appliances with the Solar-Log 300, 1200, 2000, or 370.



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

The built-in color touch screen display on the Solar-Log 1200 and 2000 can be used for configuration and display of the plant yields and self-consumption data.



Graph of the daily consumption from the connected appliances.

The new Solar-Log® menu structure provides an intuitive user interface. This new structure allows smart electrical appliances, such as an EGO Smarter Heater in combination with Smart Plugs, to be controlled and prioritized based on the amount of surplus power. Different energy profiles and components can be linked and checked based on the simulation.

## Visualization of self-produced power consumption



The smart Solar-Log® energy management controls, displays, and presents self-consumption of generated PV power, shown on the graph above in green.



The Solar-Log® Web application calculates financial returns based on plant size, yield forecasts, and applicable electricity rates.

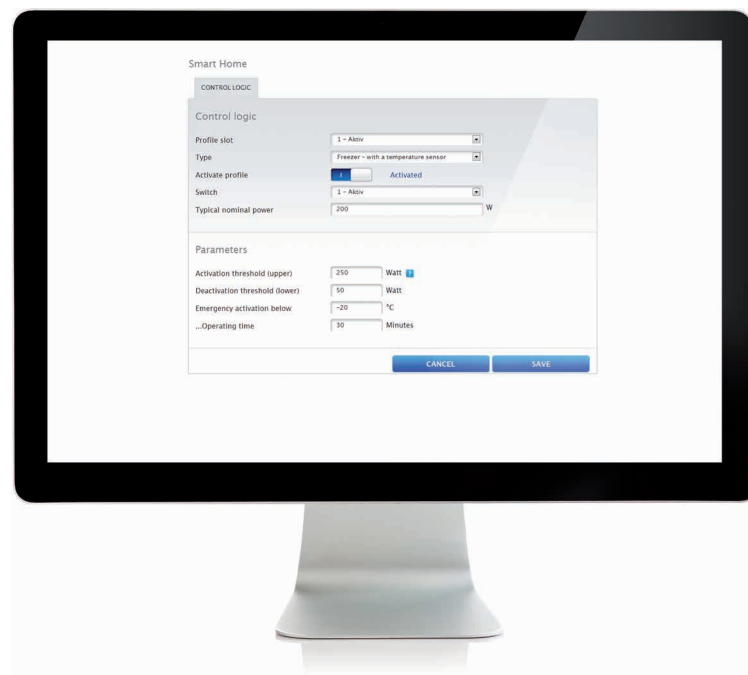
# Control of Energy Consumption

## Maximizing the self-consumption of generated PV power

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The maximization of self-consumption becomes very important when feed-in tariffs are less than the grid electricity cost, net-metering is not available, or power export to the grid is not allowed.

Solar-Log® offers innovative energy management solutions that are tailored to controlling the use of generated PV power. The configuration of consumption profiles for heat pumps and other electrical appliances, and graphical and numerical visualizations of its effect on self-consumption are useful tools for controlling the use of electrical energy.



Electrical appliances such as heat pumps and domestic hot water heater rods are turned on and off based on predefined generated PV values in kW

# Battery storage monitoring

## Visualization of the battery's charging capacity

Battery storage systems store excess power from PV plants for future self-consumption, making them essential for the optimization of consumption.

The Solar-Log® monitors battery storage capacity and charging capacity values and provides a forecast and trend line.

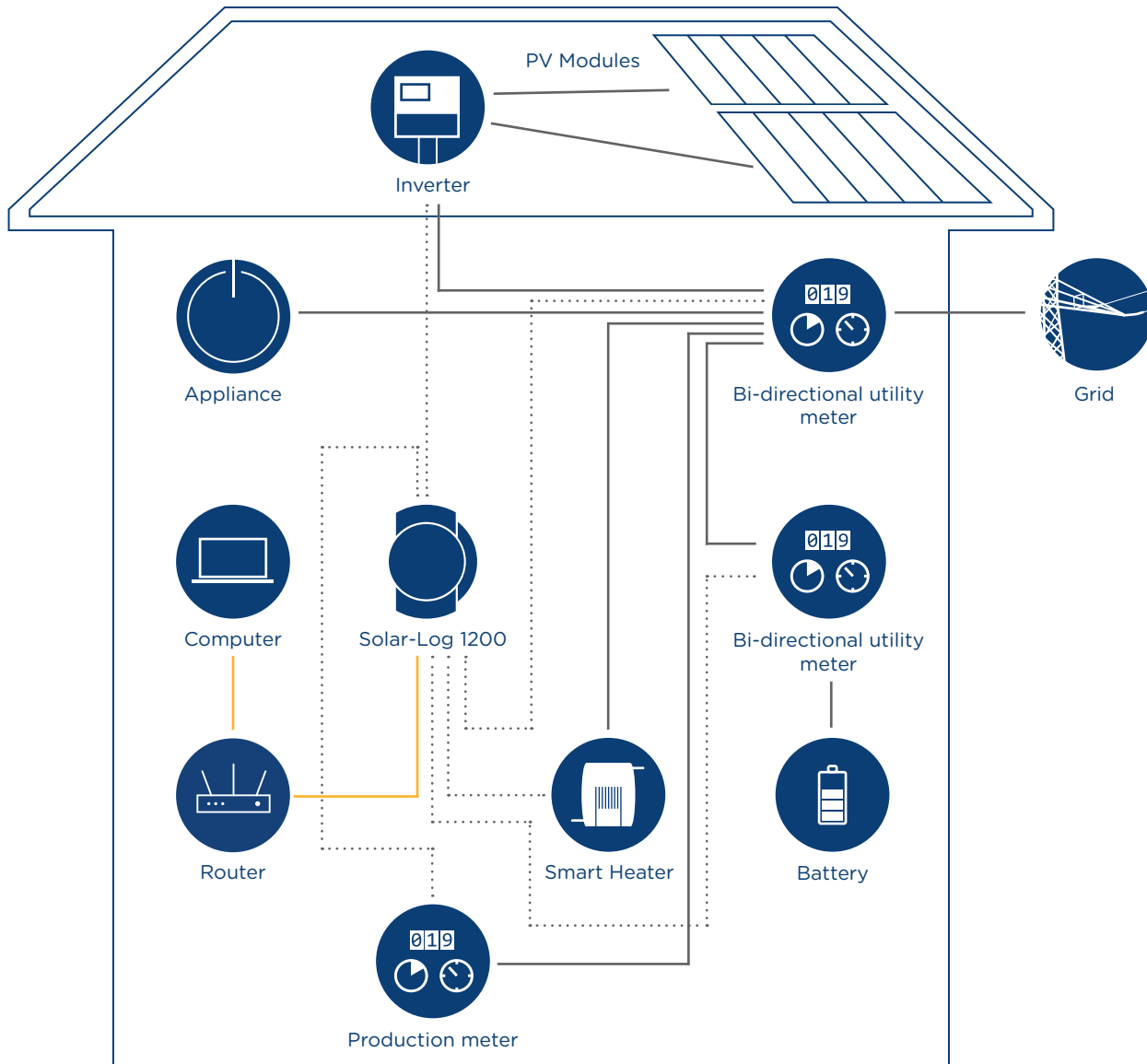
### Visualization of self-consumption

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



Daily overview: Surplus PV (in light green) is used to charge batteries for later use of the stored electricity, increasing self-consumption and reducing electricity bills

## Schematic Setup of a Smart Energy Installation



This diagram of the storage system may differ in some points, depending on the particular manufacturer.

### Our Partners



# Solar-Log® and KEBA EV Charging Stations

Efficiency during Charging: Solar-Log® in combination with KEBA Power Charging Stations

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With the combination of a photovoltaic plant, a Solar-Log® device and a KEBA charging station, electromobility becomes even more efficient.

The interaction of these three components ensures that electric cars are always charged with the maximum amount of available power from the photovoltaic plant – cost effective and environmentally friendly at the same time.

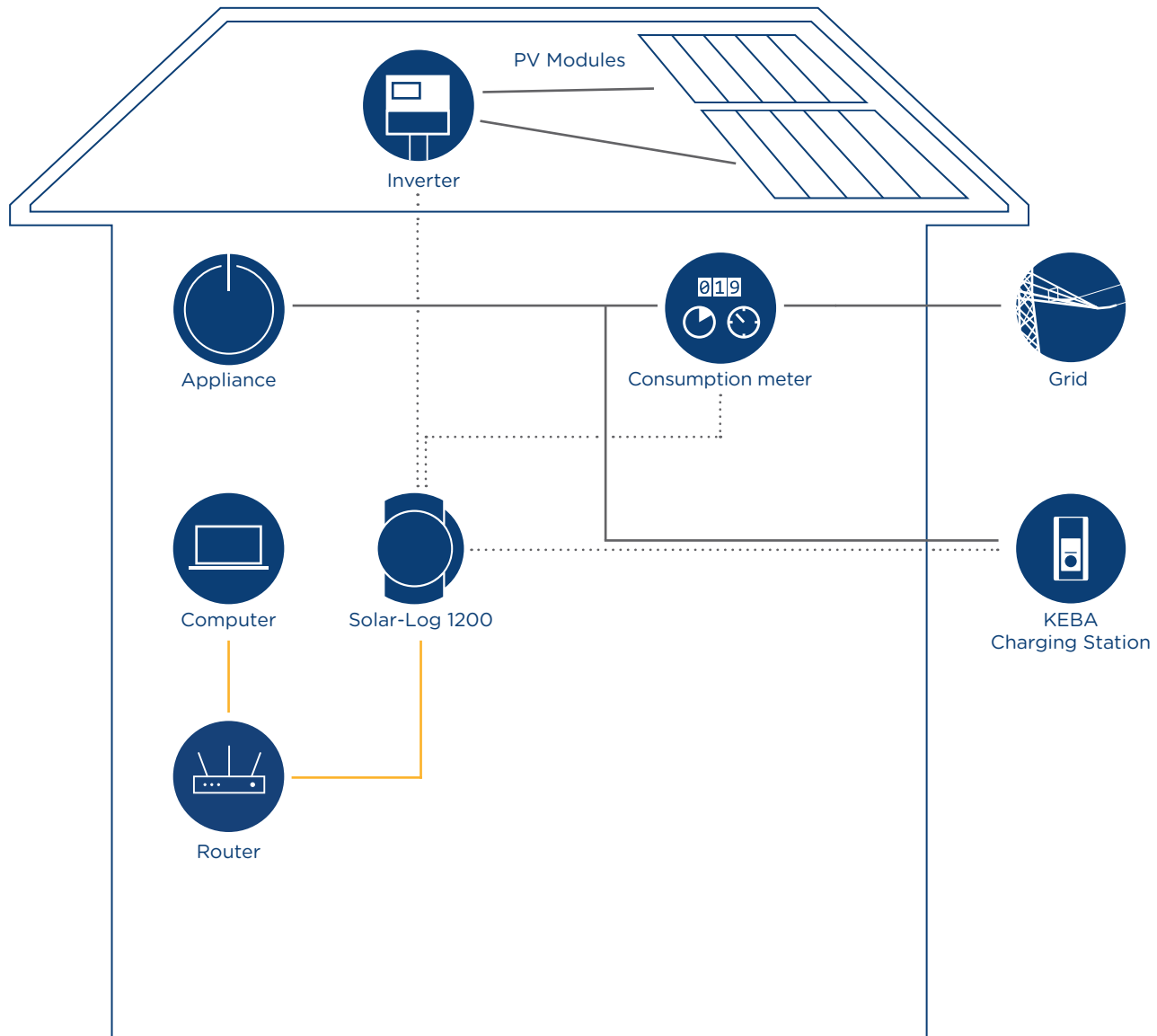
Even when there is not enough power available from a photovoltaic plant, the Solar-Log's "Surplus/Minimum Charge" function can be set to keep charging process running. This function ensures that your electric car always has a defined minimum charge regardless of the amount of power produced from the photovoltaic plant. When additional PV surplus power is available, your electric car will be charged beyond the defined minimum charge level. The "Surplus/Minimum Charge" function offers the combination of reliable driving distances and cost-efficient charging..

## Advantages for Plant Owners

- The charge data is recorded and concisely visualized with the Solar-Log WEB Enerest™ portal.
- Charging station malfunctions are detected and reported by the Solar-Log® to allow for rapid troubleshooting.

KEBA is now among the top 3 manufacturers of intelligent charging infrastructure in the world with more than 35,000 charging stations sold.

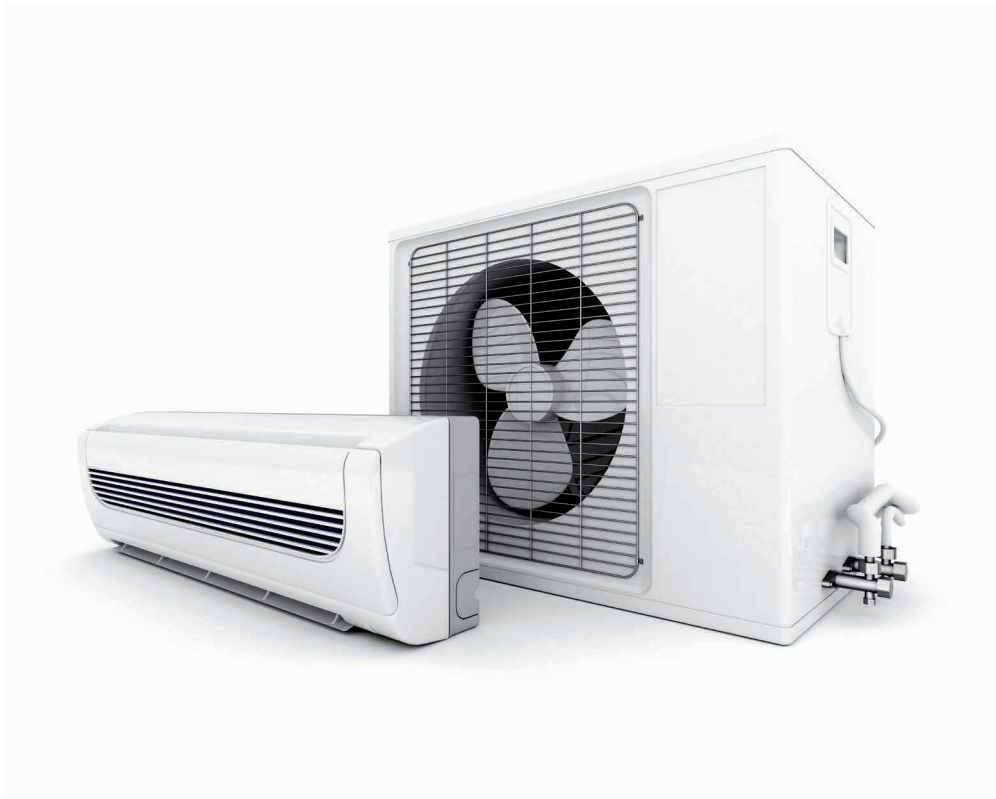
According to the ranking of the best-selling electric cars from the year 2016, the KEBA charging stations are used the most.



## Effective use of heat pumps

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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. Here, depending on how the heat pump is connected to the Solar-Log® can switch on and off heat pumps and other appliances depending on the amount of available PV or time of day.



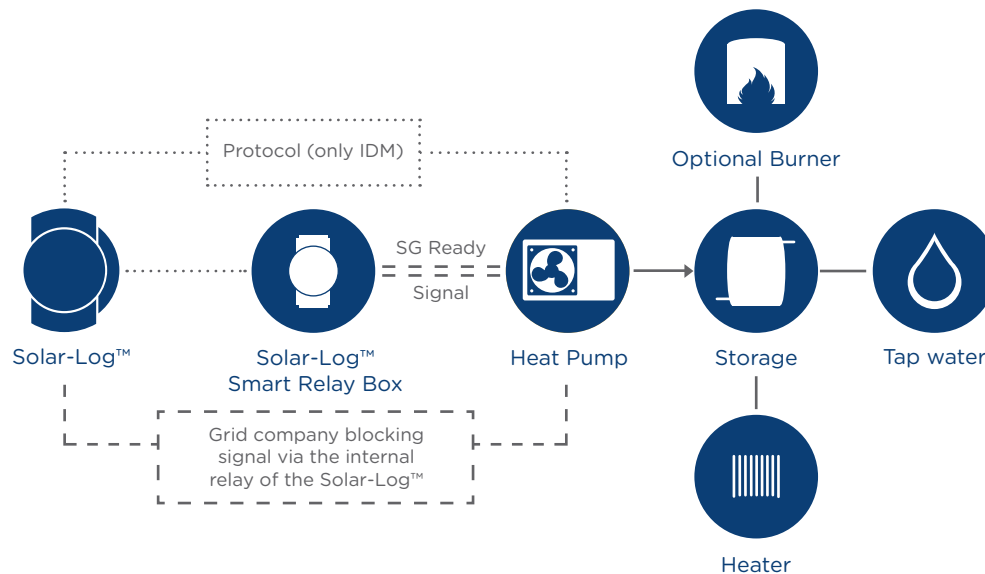
### Additional benefits for plant owners:

- A building can be used as a heat buffer storage.
- Energy efficient buildings (i.e. energy-efficient building shell) are especially well suited for this.
- The target temperature in the rooms is then maintained by the IDM heat pumps depending on the selected comfort mode.



Solar-Log® controls heat pumps or other electrical appliances via the Smart Relay Box. Solar-Log® Energy Management System even communicates directly with some heat pump brands via integrated protocol. The internal relay of the Solar-Log 1200 and 2000 can also be used to control heat pumps and other electrical appliances.

The integration with the IDM heat pump is a good example of how Solar-Log® manages energy consumption. The integrated Solar-Log® satellite weather forecast predicts the temperature changes in advance and allows Solar-Log® to maximize the consumption of PV power by using the building mass as an energy buffer. If it is getting colder, Solar-Log® starts the controlled heating of the building in advance and vice versa when the temperature gets warmer.



## Our Partners



# Smart Energy Logics and Devices

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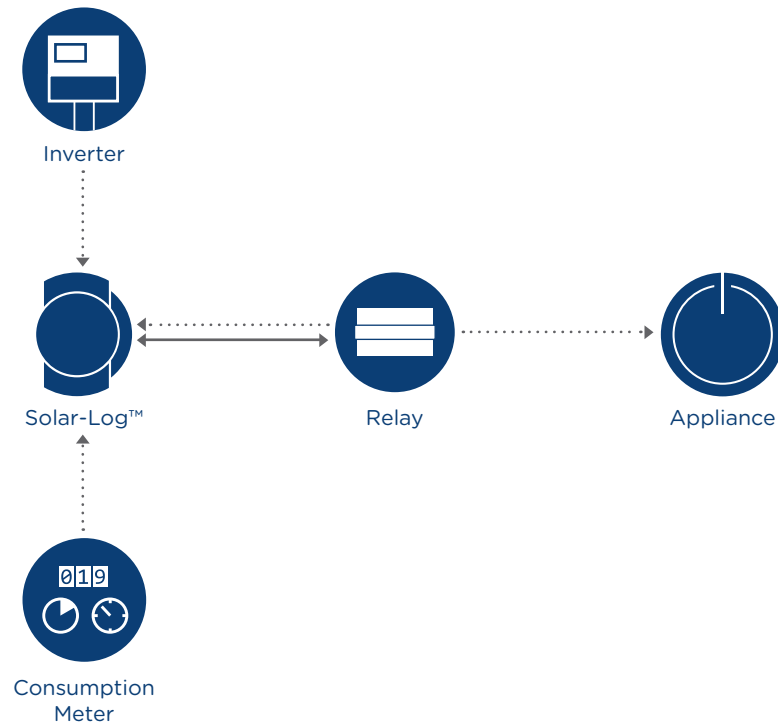
Smart Energy Logics allow the Solar-Log® to control appliances depending on various pre-defined conditions. These Smart Energy devices include internal relay, a Smart Plug, the Solar-Log® Smart Relay Box or the Solar-Log® Smart Relay Station. An appliance can be controlled via the internal relay of the Solar-Log®. The Solar-Log® Smart Relay Box provides eight additional relays for the data logger to use. Up to three appliances can be switched on and off with the Solar-Log® Smart Relay Station; additionally, the Relay Station records their consumption via an internal meter.

## Solar-Log® Smart Relay Box

- is equipped with potential-free contacts, e.g. for heat pumps (SG Ready).
- is connected to the Solar-Log® via RS485.
- is well-suited in combination with load relays to control motors, pumps and ventilation and air-conditioning systems.

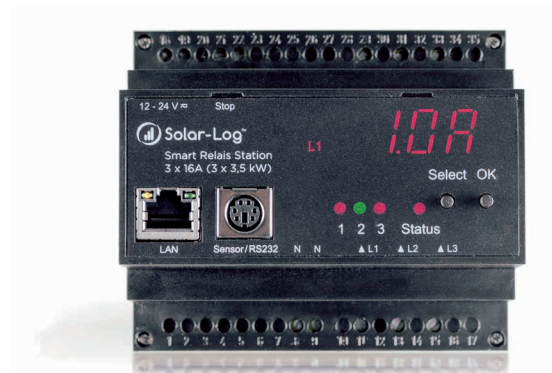


Appliances with line voltage and maximum power consumption of 16 amps can be directly switched with an external power relay, the Solar-Log® Smart Relay Station. In addition to the switching, this also records the consumption of the appliance that is switched on. For this reason, the Solar-Log® Smart Relay Station can be used as a sub-consumer without any additional hardware.



### Solar-Log® Smart Relay Station

- is equipped with 3 relays to directly switch loads up to 16A/230V.
- receives a response with the consumption values from each individual relay.
- is connected to the Solar-Log® via Ethernet.



# Solar-Log<sup>®</sup> Meter

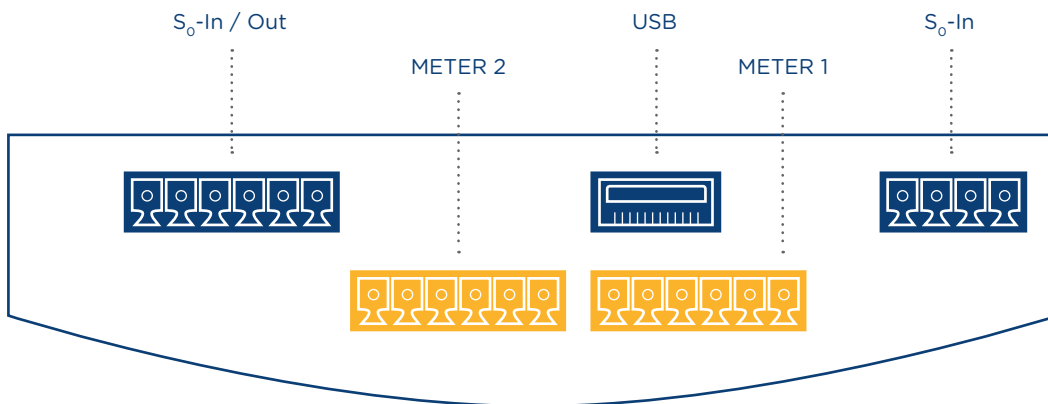
## Effective & integrated electrical power measurement

The Solar-Log<sup>®</sup> Meter measures AC power such as PV production and consumption via up to 6 current transformers (CTs) connected directly to the data logger. It supports different configurations such as single (split) phase and 3 phase. Solid core and split core CTs are provided by Solar-Log<sup>®</sup>.

The Solar-Log 300 and 1200 Meter support the measurement of PV production and self-consumption, as well related energy management functions in a single device, with minimal installation time.



External Solar-Log<sup>®</sup> certified meters connected to the Solar-Log<sup>®</sup> via RS485 are needed to measure bi-directional AC power often seen at the main utility connection (net-metering) point. The Solar-Log<sup>®</sup> Meter does not sense the AC voltage and therefore cannot measure bi-directional AC power.



Solar-Log<sup>®</sup> Meter connections for up to 6 current transformers / CTs

### Part number

Solar-Log 300 Meter	see page 24
Solar-Log 1200 Meter	see page 24
Warranty	2 years

## Solar-Log® Current Transformers (CTs)

Current transformers (CTs) are connected directly to the Solar-Log® data logger and measure AC currents. The Solar-Log® multiplies these AC currents by either the relevant voltages received from inverters or a manual configuration. The Solar-Log® displays the measured power numerically.



Inverters	Power	Status
WR 3	89 W	4-MPP
WR 4	89 W	4-MPP
WR 5	89 W	4-MPP
WR 6	89 W	4-MPP
WR 7	88 W	4-MPP
WR 1	829 W	MPP
WR 2	829 W	MPP
WR 3	829 W	MPP
WR 4	828 W	MPP
WR 5	828 W	MPP
WR 6	828 W	MPP
WR 7	828 W	MPP
WR 8	828 W	MPP
WR 9	828 W	MPP
WR 10	828 W	MPP

Consumption meter	Power	Status
Total Consumption Meter	40500 W	Power

Sensor	Irradiation	Status
S 8	1 W/m²	Offline

Daily consumption tables from the connected appliances.



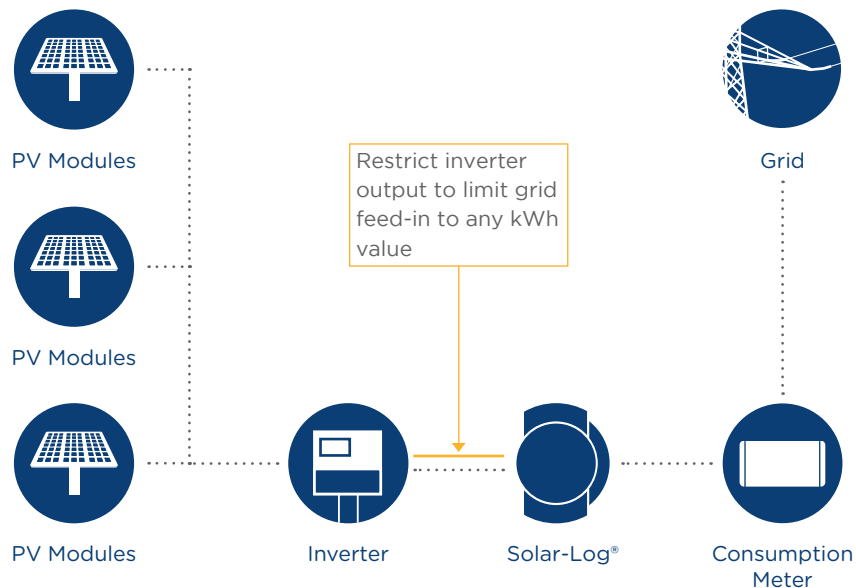
### Technical data

	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)		
Warranty	1 year		
Part number	255639	255640	255638

# Power Management

## Intelligent Grid Feed-in Control

Solar-Log® offers a wide range of solar PV power management solutions to meet various grid feed-in restrictions across the globe. Solar-Log® provides grid feed-in control by monitoring building load and restricting inverter power output. This innovative solution largely minimizes losses that result from feed-in caps proposed by grid operators or other regulations, and offers advanced solutions for a more reliable, stable grid.

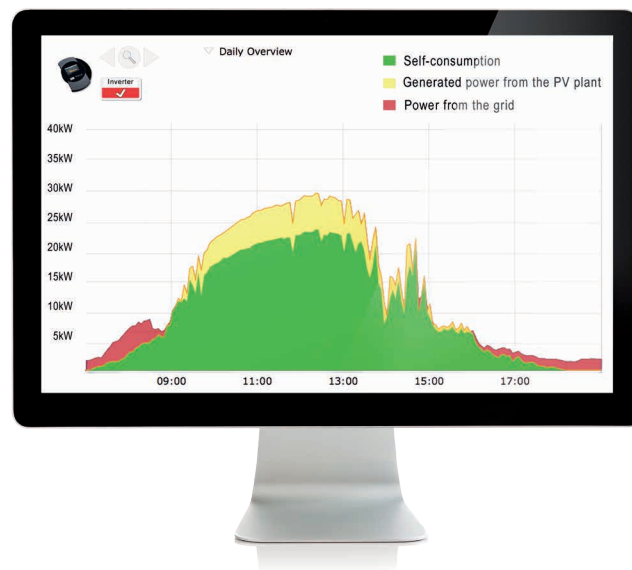


- Maximize on PV plant size while adhering to local feed-in restrictions
- Increase PV plant return on investment by shifting peak demand
- Direct PV power towards self-consumption and storage after feed-in cap is met
- Solar-Log® calculates the current power surplus and can turn appliances on/off via networked smart plugs or smart relays to optimize self-consumption
- Control power factor, increasing reactive power
- Maintain PV plant profitability even after net metering caps have been met

## Limited feed-in power

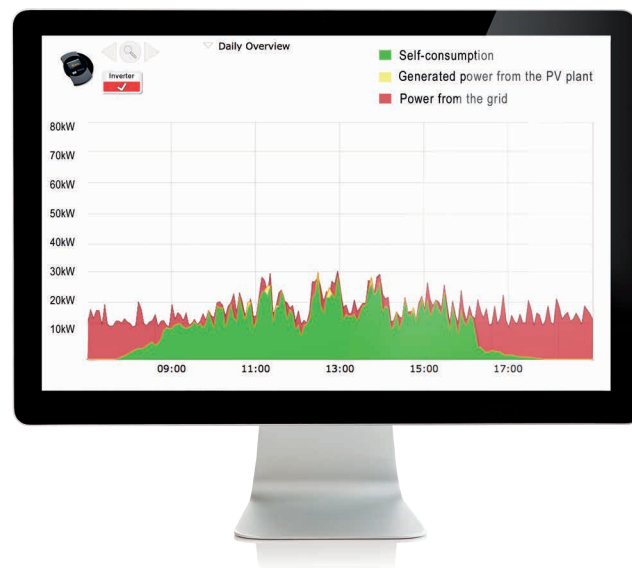
### Limited Grid Feed-in

Solar-Log® measures building consumption with an integrated consumption meter. The inverters are adjusted accordingly to ensure that grid export (the difference between the current production and consumption) does not exceed the maximum amount specified. With the use of a consumption meter, Solar-Log® is able to control grid feed-in by either a certain percentage of the total PV inverter power or in kW.



### Zero Grid Feed-in

In area where grid feed-in is not allowed at all, Solar-Log® controls the inverters to produce just enough power to cover the building load, resulting in zero grid export.



# Solar-Log™ and EGO Smart Heater

Intelligent Heating with PV Power

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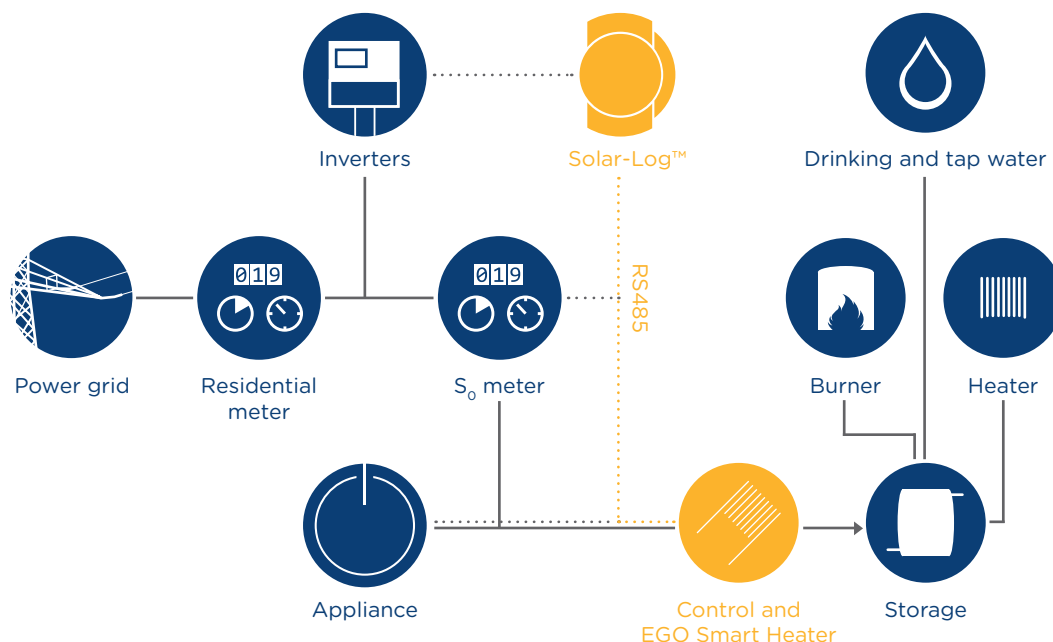
Thanks to the combination of the Solar-Log™ and the EGO Smart Heater, surplus PV power can be used to heat water which can also be used later when stored in combination storage tanks. The heating elements are activated to operate at different levels from 0 to 3500 watts depending on the amount of surplus power. This combination offers savings potential and increases the degree of self-sufficiency, especially in the summer and in transitional periods when there is a high amount of surplus PV power. Thanks to this stored surplus power, no fossil fuels are needed by the water heater boiler. Soon, the minimal boiler temperature can be defined with the device configuration. This will ensure that there is enough warm water available regardless of the amount of surplus PV power. The EGO Smart Heater can be conveniently configured from the Solar-Log™ web interface.

## Even more advantages for plant owners:

- Easy and quick installation for new and existing plants
- Universally applicable in hot water storage tanks with and without corrosion protection thanks to its insulated construction
- Frost protection function: when water temperature drops below 4°C, the EGO Smart Heater starts to heat the water at 500 watts to prevent the boiler from freezing (breakdown of the primary heater), regardless of the PV yield and settings
- Integrated power (no external electric contactor required)
- Once the target water temperature has been achieved, the PV power can be used by other appliances
- Up to a total of six EGO Smart Heater Ethernet devices can operate together



Technical Data	EGO Smart Heater	EGO Smart Heater Ethernet
Compatible with Solar-Log™ series:	Solar-Log <sup>200, 500, 1000</sup> 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 +40°C	
Heating capacity	Adjustable operating level from 0 - 3500 watts in 500 watt steps	
Heating temperature	Adjustable to a max. of 80° C	
Minimal and Maximum Temperature	Configurable	
Power frequency	50 Hz	
Protection level	IP54 DIN EN 60529	
Environmental type	For indoor use only	
Maximum operating altitude	2,000 meters (VDE regulations) above sea level	
Input voltage	1N/PE AC 230 V	
Protection class	I	
Overvoltage category	II	
Power supply	230 V / 16 A	
Self-consumption on standby	ca. 0,5 W	ca. 1 W
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 on the Solar-Log™	Ethernet
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	
Protective temperature limit	Device installed internally (according to DIN EN 60730-1)	
Warranty	2 years	
Part number	255840	256014



# Feed-In Management

CONTROL STATE   FEED-BALANCE   PM-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 <sup>1</sup>	57.96 <sup>1</sup>

## Reactive power control

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

# 04

## Solar-Log® Accessories

Sophisticated products for all-encompassing solutions

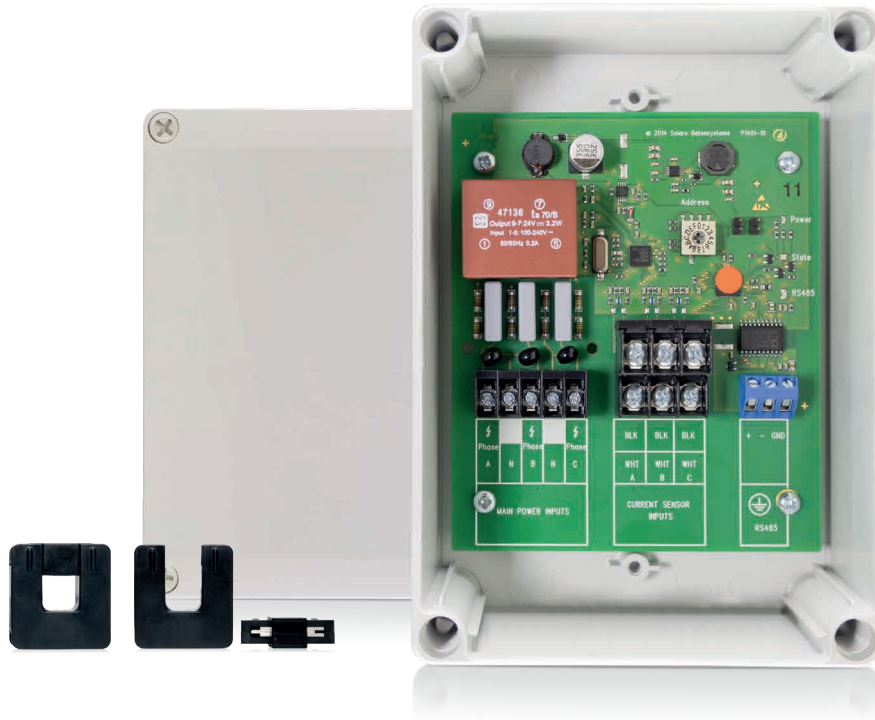
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The Solar-Log® solutions can be enhanced using a wide variety of high quality accessory products. They can be fully integrated with the Solar-Log 300, 1200, 2000, and 370 and controlled by the Solar-Log WEB Enerest™ application. These accessories cover all the PV monitoring needs from one source: Solar-Log®.

# Solar-Log 10 Power Meter

Measure, Record, and Display the Amount of Self-Consumed Power

---



Maximize plant performance and confirm net metering bills by automatically calculating the amount of consumed grid power using the Solar-Log 10 Meter. This bidirectional power meter connects to Solar-Log® data loggers via RS485 and allows plant owners to monitor total building-load by measuring power inside the main distribution panel at the utility connection. The meter includes 2 current transformers for measuring the current and phase voltage.

The Solar-Log 10 with 2 split core current transformers are an integral part of the Solar-Log 360 & GE Meter assembly for PV production and consumption monitoring.

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## Part number

Solar-Log 10 Meter

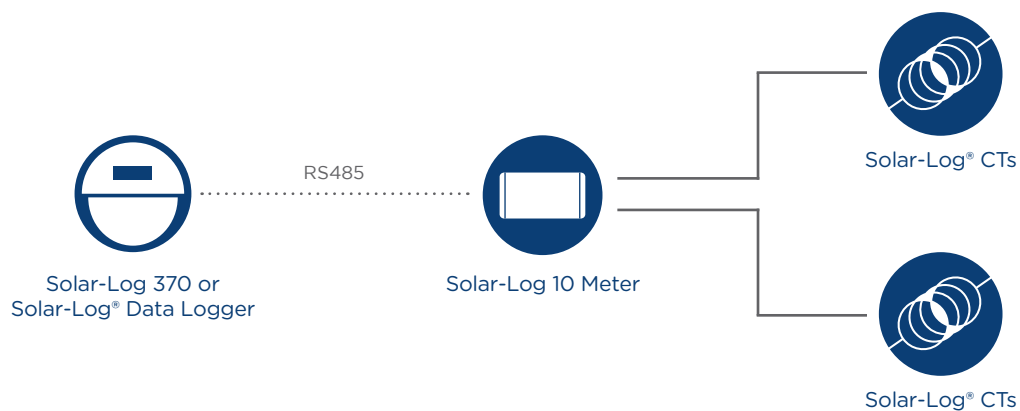
255853

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## Technical Data

## Solar-Log 10

Input Voltage Configuration	Single (split) Phase or 3 Phase
Main Voltage Input	100-240 VAC, -15% / +10%
Input Power	<1.2 Watt
Current Sensor Rating*	Up to 200A
Power Factor	0.0 - 1.0 CosPhi
Accuracy	<1% with calibrated CTs
Line Frequency	50 - 60 Hz
Voltage Operating Rate	+/- 10 % Of Rated Load
Temperature Range	-40F to 140F
Altitude	2000 Meters Maximum
Voltage Overload	10%
Current Sensor Overload	10%, 100% for 1 minute
Installation (Surge Category)	CAT III
Measurement Category	CAT III
Enclosure Material	NEMA 4X/6 // IP 66/67 :
Standards	EN 62208, UL Listed
Current Transformers	Single (Split Phase), 120/240 VAC: up to 200 A 3 Phase (4 Wire Wye), 120/208 VAC: up to 200 A
Current Transformers	(2) Solar-Log® 200 A Split Core Outside Diameter 2 inch x 2 inch x 0.5 inch opening 0.75 inch 10 feet (extension options available)



The Solar-Log 10 Meter connects to Solar-Log® Data Logger or the Solar-Log 370 via RS485. The included 200A CTs connect inside the main distribution panel at the utility connection

## Sensor Box Professional Plus

Irradiance sensor specifically designed for large-scale PV plants

Sensors deliver a temperature compensated reference value for irradiance and record deviations between the potential power production and the current power production. Even at low levels of irradiation, power dips can be identified and error messages will be generated when a deviation is detected, providing more accurate tracking of PV plant performance.



The irradiance sensor is equipped with a high-quality monocrystalline cell which is rugged and specifically designed for long-term, outdoor use. As many as nine Sensor Boxes can be connected with most RS485 inverters. The Sensor Box Professional Plus can also be connected to an ambient temperature sensor and wind sensor.

Technical data	Sensor Box Professional Plus
Solar cell, laminated inside glass	Mono crystalline silicon (5 cm x 3.3 cm)
Dimensions (w x h x d) in mm, weight	145 x 85 x 40; 360 g
Housing	Powder-coated aluminum
Protection mode	IP65
Operating temperature	-20 °C to +70 °C
Power supply	Via RS485 data cable from Solar-Log®, No additional power supply required
Supply Current	Typical 80 mA
Communication Port	RS485
Protocol	Solar-Log®, 9600 Baud, 8N1
Irradiance	Irradiance : ± 5 % (0 W/m <sup>2</sup> to 1400 W/m <sup>2</sup> ) Cell-temperature: ± 1K (-20 °C to +70 °C) / ± 2 K (-40 °C to +85 °C)
Installation	Same orientation and pitch as the PV generator
Connection cable	4 pole, 3 m (10 feet), weather and UV resistant (LiYCI1Y (4 x 0,14) prolongable up to 50 m (0,14 mm <sup>2</sup> ))
Conformity	CE nach DIN EN-61000-6-1:2007 and DIN EN-61000-6-3:2007
Wind sensor	●
Ambient temperature sensor	●
Warranty	2 years
Part number	220060

## Sensor Box Professional Plus accessories

### Ambient temperature and wind sensors

The optional ambient temperature sensor (PT1000) delivers additional information about actual power production versus current power production. This sensor will detect decreased yields resulting from problems like ice buildup on the panels.

The optional wind sensor tracks wind speeds to better identify wind conditions a possible cause of power reductions or losses.



### Part number

Wind sensor for connection to the Sensor Box Professional Plus, including a 5 m connection cable	220061
Ambient temperature sensor for connection to the Sensor Box Professional Plus, including a 3 m connection cable	220062

## 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 integrated CMP3 pyranometer measures the amount of solar irradiation. Measuring the local irradiance provides information on the influence of weather conditions on the PV plant's performance. The data from the Weather Station is used in the Solar-Log WEB Enerest™.



Measurement	Measuring Range	Measuring Method
Pyranometer	1,400 W/m <sup>2</sup> ; 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 – 75 m/s	Ultrasound

### Technical data

Power supply	24 Vdc +/- 10%
Power consumption	20 VA at 24 V
Connection	RS485
Protection class	IP66
Dimensions in mm	Diameter: 150, Height: 332, Weight: 1.5 kg
Warranty	2 years
Part number	on request
Compatible pyranometer types	WS 301 UMB, WS 501 UMB



## Solar-Log® RS485 Wireless Package

Connecting inverters wirelessly

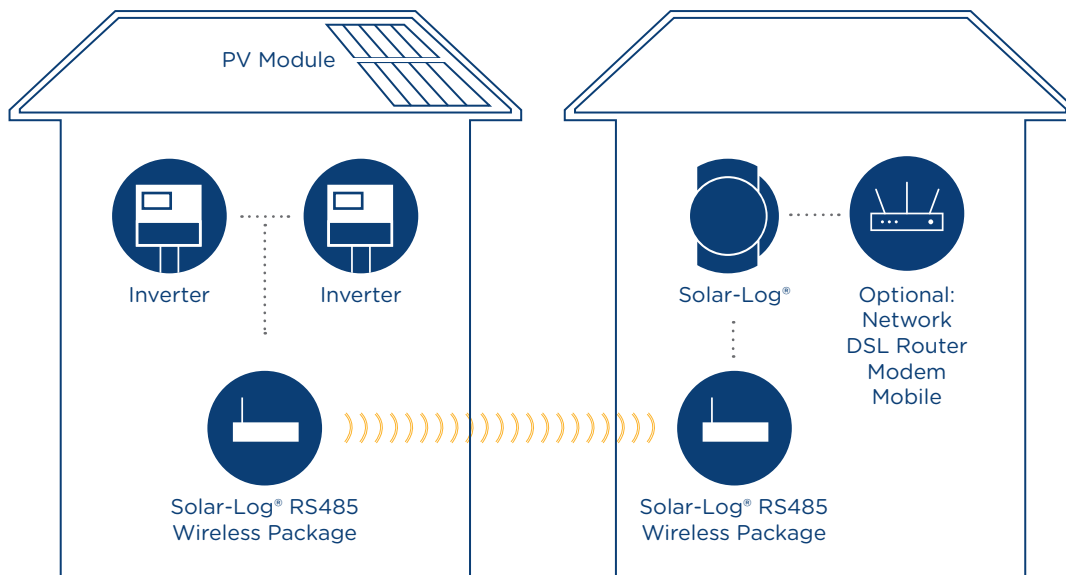
The Solar-Log® RS485 Wireless Package makes it possible to connect to inverters even in places where cable connections are difficult. Radio modules are always deployed in pairs. When used in conjunction with the external and directional radio antenna, connections can be made at larger distances. The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



**Note:** When placing an order, please always provide the name of the inverter manufacturer so that the Wireless Packages can be fully pre-configured. The Wireless Package cannot be used with all inverters.

### Technical data

Range inside buildings	Up to 262 feet (up to three concrete walls)
Range over open field	Up to 500 m, with directional radio antenna up to .5 mile
Protection class, approval	IP 20, only suitable for internal use, CE standard
Power supply/performance	7-18 V, 1 watt
Frequency	900 MHz
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
Warranty	1 year
Part number	220058



## 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	3680 watts	1840 watts	3680 watts
Maximum current	16 A	8 A	16 A
Control	LAN	WLAN: LAN (WLAN)	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
Part number	255879	255616	255841

## 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

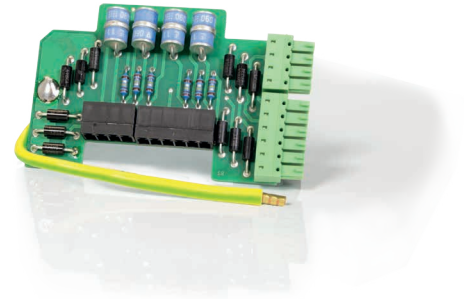
Outputs	8 relays (30 V / 1 A to 230 V / 250 mA), 4 of which are alternating relays
Rated operating voltage	10 - 24 V
Warranty	1 year
Part number	255656

## Surge Protection

Greater security thanks to optimal protection

The Solar-Log® surge protector protects the Solar-Log® from power surges that could come from removing inverter communication cables from the logger while the inverter operates, or from lightning strikes in the vicinity.

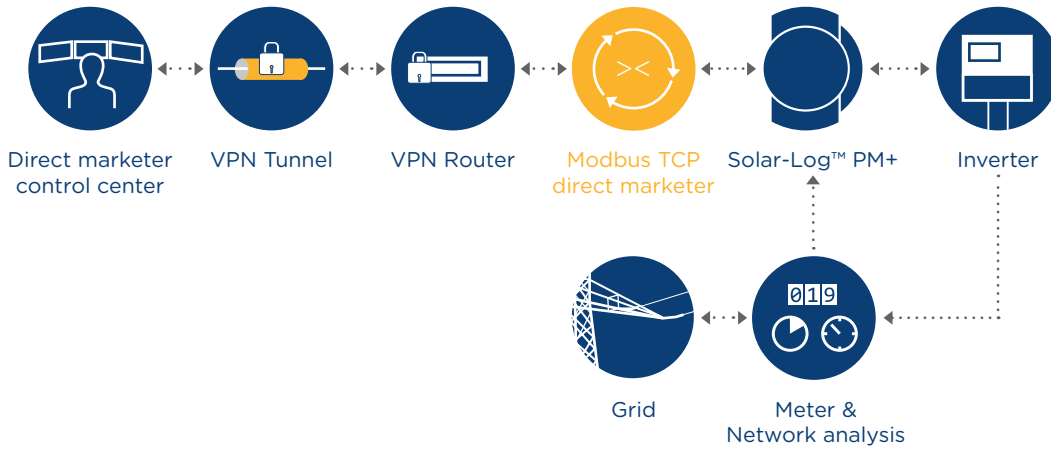
This protection device has been specially developed to retrofit the RS485/422 interface of the Solar-Log®. It can be easily installed in just a few quick steps. Failures due to power surges are minimized tremendously with this accessory.



Technical data	Solar-Log 300	Solar-Log 1200 and 2000
Nominal operating voltage		5 V
Maximum operating voltage		6 V <sub>DC</sub> ; 4,25 V <sub>AC</sub>
Maximum operating current		500 mA
Protection level data line ground		<= 25 V
Protection level data line GND		<= 8,5 V
Fused interfaces	1 (RS485/422)	2 (RS485 A + RS485/422 B)
Dimensions (w x h x d) in mm		52 x 88 x 14
Warranty		1 year
Part number	255602 Extended cover and over-voltage protection	255601 Extended cover and over-voltage protection

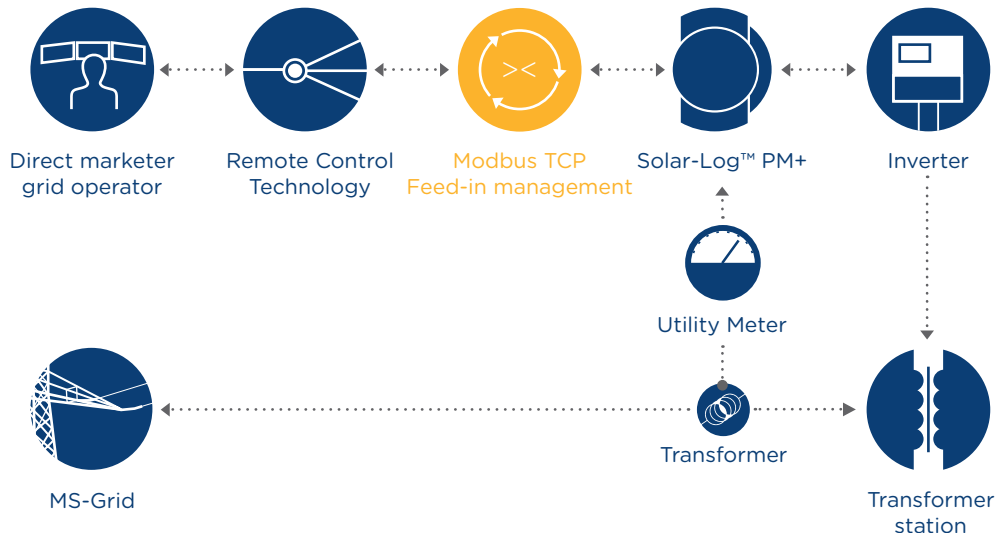
## Solar-Log® Modbus TCP Direct Marketing License

For simple and efficient communication between direct marketers and remote controllable PV plants. The Solar-Log® can receive reduction commands from the direct marketer and report the current output via this interface. This means that all prerequisites for the management bonus are met. A VPN router is required for data transfers between the production plant and direct marketer.



## Solar-Log® Modbus TCP Feed-in Management

With some grid operators, the remote control technology connects to the Solar-Log® PM+ via the Modbus TCP feed-in management interface. Active and reactive power commands and response signals for various measured values are sent via this digital interface.



## Solar-Log® FTP License

With the FTP license, the data export can be used for third-party portals. This allows for multiple, periodical data transfers.



### Part number

Solar-Log™ Modbus TCP Direct Marketing License	255935
Solar-Log™ Modbus TCP Feed-in Management	255511
Solar-Log™ FTP License	255653
Plant Expansion License for the Solar-Log 300 to 30 kWp	256034

# Solar-Log® compatibility



# Solar-Log® worldwide

## Headquarters

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info@solar-log.com  
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## Subsidiaries

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## Service Partners

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