Displayed and analysed: Solar-Log™ WEB keeps you up-to-date on the optimum work of your system at all times – even on the road, with the Solar-Log™ App.

SYSTEM MONITORING

Locally and remotely

Continuous system monitoring is recommended, or even essential, for obtaining the absolute maximum performance from your solar energy system at all times.

Steca offers you a number of different system monitoring methods:

Local monitoring is sufficient when the operator regularly checks the data on the display unit. Above and beyond this, the data logger monitors the functions of the system components, displays faults and stores all relevant system data.

Remote system monitoring is more convenient. The data logger can be connected to your PC and all system data can be displayed and analysed via the HTML user interface.

The most professional method is to use online monitoring. The data logger sends the system data to an external database. The operator can then log in to this database and not only analyse his or her data but can also compare the data with regional irradiance values. This thus provides the operator with an objective impression of the effectiveness of his or her PV system.
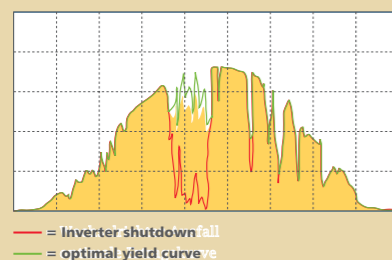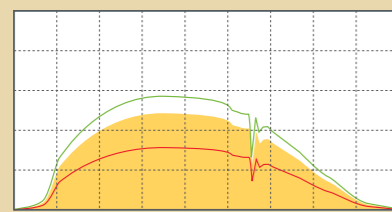
	StecaGrid 300 StecaGrid 500	StecaGrid 2000+ StecaGrid 2010+	StecaGrid 2020 StecaGrid 3000 StecaGrid 3600 StecaGrid 4200	StecaGrid 8000+ 3ph StecaGrid 10000+ 3ph StecaGrid 8000 3ph StecaGrid 10000 3ph
Local monitoring	**StecaGrid ALD1** Digital energy meter	**StecaGrid Connect User** PC network interface with stored HTML pages	**StecaGrid User** Visualisation software	**StecaGrid User** Visualisation software
			StecaGrid Vision Display unit	**StecaGrid Vision** Display unit
Remote monitoring		**StecaGrid Connect User** PC network interface with stored HTML pages	**Meteocontrol WEB'log Comfort** Data logger and Meteocontrol Web'log web portal	**Meteocontrol WEB'log Comfort** Data logger and Meteocontrol Web'log web portal
			Solar-Log 500/1000™ Data logger and Solar-Log™ Web HTML user interface	**Solar-Log 500/1000™** Data logger and Solar-Log™ Web HTML user interface

Monitoring protects your yields:
Examples of faults and their effects:

= Dropout of a string
= optimal yield curve

= Inverter shutdown
= optimal yield curve

StecaGrid Connect User interface:
PV system yields based on a minute, day, month or annual profile
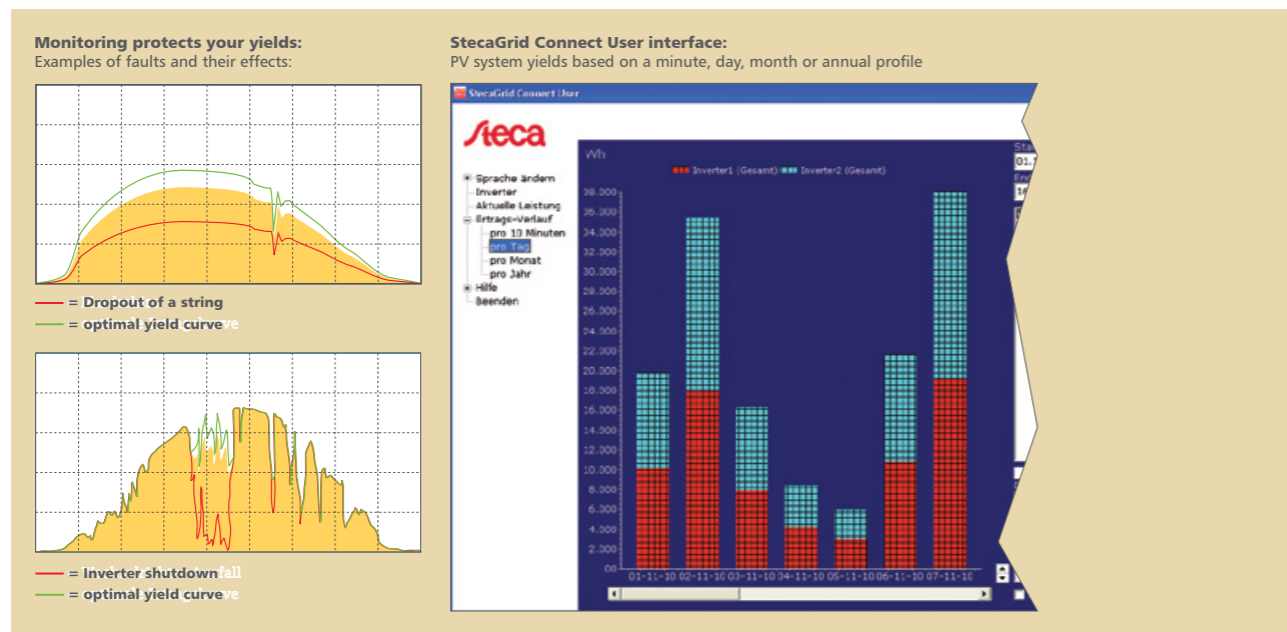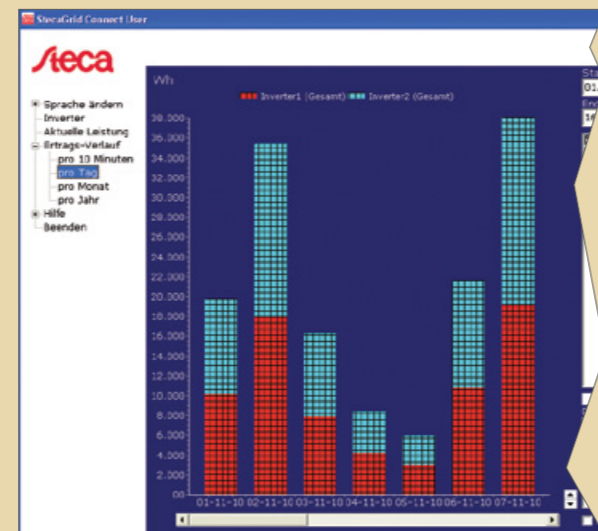
UfE ENS26NA and UfE ENS31NA
Grid and system monitoring

The ENS26NA (designed for StecaGrid 300 and StecaGrid 500) is a single-phase GS protection with integrated 25 A relays according to VDE-AR-N 4105 with the respective declaration of conformity and tested functional safety. The device has a test key and an LCD display showing trigger values, current measurements, status and the last 9 grid errors and can either be employed as GS protection pursuant to VDE-AR-N 4105 or as replacement for the permanently accessible disconnection point according to DIN VDE 0126-1-1. Due to its islanding detection function, any supplier can be used even if they have no islanding detection properties of their own. Thanks to the built-in 25 A relays, no further contactors are required. The ENS-26NA is the perfect grid monitoring device for single-phase systems up to 5.7 kW.

The ENS31NA (designed for StecaGrid 8000+ 3ph, StecaGrid 10000+ 3ph, StecaGrid 8000 3ph and StecaGrid 10000 3ph) is a central GS protection for section switches according to VDE-AR-N 4105 with the respective confirmation of conformity for controlling two contactors or motor switches with feedback contact and tested functional safety. The device has a test key and an LCD display showing trigger values, current measurements, status, parametrization menu and the last 5 grid errors and can either be employed as central GS protection according to VDE-AR-N 4105 or as replacement for the permanently accessible disconnection point according to DIN VDE 0126-1-1.

The ENS26NA and ENS31NA automatic isolation units continually monitor the following parameters of the public electricity supply
· Overvoltage and undervoltage
· Frequency deviation
· Impedance jumps

In the event of faults in the mains supply, the ENS26NA resp. ENS31NA interrupts the feeding of electricity in the mains to prevent island effects.

The safety functions are executed in a dual channel system, whereby each channel monitors the proper function of the other channel. In case of a failure the channels disconnect independently from each other. The channels monitor each other mutually to increase error protection.

ENS26NA, ENS31NA similar

	ENS26NA	ENS31NA
AC output side (Grid connection)		
Rated grid voltage	230 V	3 x 230 V
Rated frequency	50 Hz	
Characterisation of the operating performance		
Switched power	< 5,750 W	depends on the allocated switches
Rated current of power feeder	25 A	depends on the switched output of the switches
Own consumption	1.5 W	3.5 W
Safety		
Grid monitoring	compliant with DIN VDE 0126-1-1	
Overvoltage (fast shutdown)	> 300 V (response time 0.02 s)	
Overvoltage	> 264 V (response time 0.2 s)	
Overvoltage	230 V +10 % over 10 min.	
Undervoltage	< 184 V (response time 0.2 s)	
Frequency deviation	+1.5 Hz / -2.5 Hz (response time 0.2 s)	+1.5 Hz / -2.5 Hz (response time 0.1 s)
Impedance jump and islanding detection	> 0.5 Ohm (response time 5 s)	
Operating conditions		
Ambient temperature	-20 °C … +40 °C	
Relative humidity	10 % … 90 %, non-condensing	
Fitting and construction		
Dimensions (X x Y x Z)	146 x 111 x 80 mm	220 x 111 x 80 mm
Test certificate	certificate of compliance as per DIN VDE 0126-1-1, CE-Zeichen, VDE AR N 4105	

StecaGrid Connect
and software for system monitoring

PC network interface for StecaGrid 2000+ and StecaGrid 2010+

Monitoring with the optionally available StecaGrid Connect network card is convenient. Here, the integrated web server makes it possible to display data in a normal web browser (e.g. Internet Explorer) without additional software.

The free StecaGrid Connect User software offers additional possibilities for graphical analysis and archiving of data.

Your own PC is all you need in order to view and analyse all of the solar power system's data at your desk, conveniently presented with the aid of the software, in a graphically understandable format.

With StecaGrid Connect Service, the installer has the ideal tool with which to guarantee prompt, precise, and problem-free service.

Remote monitoring
If the inverter is also connected to the Internet, it is possible to monitor the solar energy system from any computer in the world via StecaGrid Connect. Password-protected access occurs with the StecaGrid Connect User/Service software, or simply via a normal web browser.

In addition, Steca offers the option of external system monitoring. Via e-mail, the user is not only informed of their inverters' yields, but also of any faults which arise.

StecaGrid Connect User user interface

Product features
· Integrated web server

Interfaces
· Ethernet interface
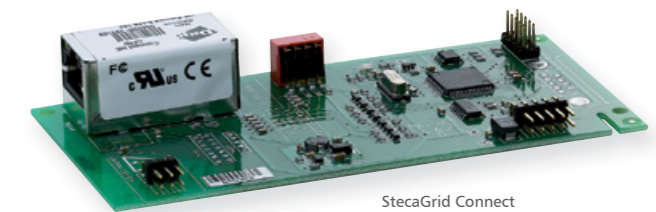
StecaGrid Connect network interface card

	StecaGrid Connect
Fitting and construction	
Dimensions (X x Y x Z)	128 x 62 x 20 mm
Weight	0.05 kg
Communication interface	Ethernet interface
Test certificate	CE mark

StecaGrid ALD1
Digital energy meter

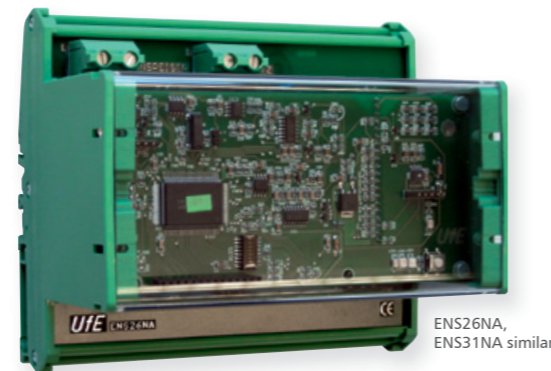**System monitoring for StecaGrid 300 and StecaGrid 500**

Product features
· Wall-mounting with top-hat rail

Displays
· LCD display with backlight, digits 5 mm high for current output, energy yields, voltage and current

Operation
· via button

	StecaGrid ALD1
AC output side (Grid connection)	
Rated grid voltage	230 V (-20 % / +15 %)
Rated frequency	50 Hz
Rated current	5 A
Measurement current	32 A
Characterisation of the operating performance	
Accuracy class	1 (1 %) as per IEC 62 053-21 or B in accordance with EN 50 470-3 (devices in accordance with MID)
Operating conditions	
Ambient temperature	-10 °C … +55 °C
Storage temperature	-30 °C … +85 °C
Relative humidity	95 % at 25 °C … 40 °C, non-condensing
Fitting and construction	
Terminal (fine / single wire)	primary circuit: max. 6 mm² impulse output: max. 2.5 mm²
Dimensions (X x Y x Z)	17.5 x 89.2 x 63.4 mm
S0 output	optocoupler max. 30 V / 20 mA and min. 5 V, impedance 100 Ω, impulse range 50 ms, transmission distance max.1,000 m (at 30 V / 20 mA)
Pulses per kWh	2,000 (LC display), 1,000 (S0 output)
Test certificate	CE mark

StecaGrid User

**Visualisation software
for StecaGrid 2020, 3000, 3600, 4200,
8000+ 3ph, 10000+ 3ph, 8000 3ph and 100000 3ph**

Universal and individual
The StecaGrid User software allows system operators to transfer entries from inverter data loggers to a computer and subsequently analyse the data. Inverters store diurnal variation curves, among other data. After 31 days, the oldest data are overwritten with new data. Using the StecaGrid User software, data can be read regularly and stored permanently on a computer.

The StecaGrid User software allows users to read the data of up to 100 inverters via a bus and have the data arranged and presented in a graph. The programme provides a clear overview of diurnal, monthly and annual variation curves both for the entire system and for each individual inverter. Yield data of several inverters can thus be compared. Various presentation options and colour schemes ensure that comparisons are clearly laid out.

The StecaGrid User also presents current measurements on the computer screen. The data that can be called up individually on the inverter's display are clearly presented on one StecaGrid User page.

Prepared for the future!
Choosing the ‚information' menu item, users can read the hardware and software status of the connected inverters. The StecaGrid User software also carries out updates when new, improved software is available or new technical requirements necessitate a software adaptation.

The yield data read from one inverter can be transferred to another inverter using the StecaGrid User software.

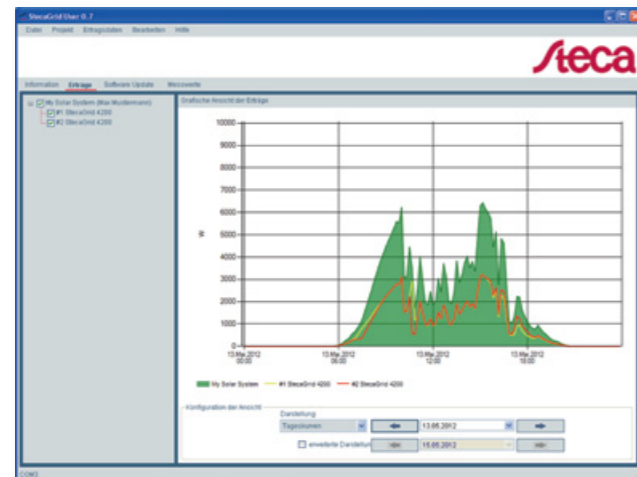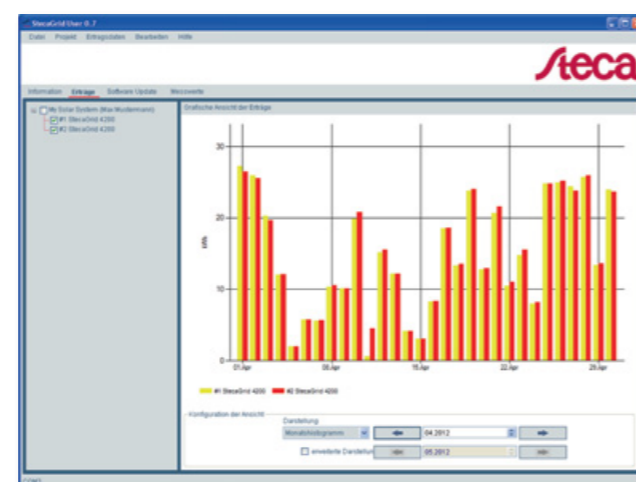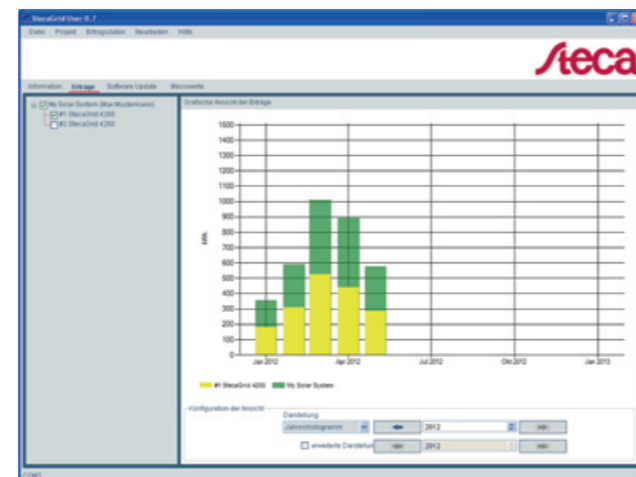The software is available for free download at **www.steca.com**. The computer connection requires a RS485 USB adapter cable.

StecaGrid Vision

**Display unit for StecaGrid 2020, 3000, 3600 and 4200,
StecaGrid 8000+ 3ph and StecaGrid 10000+ 3ph,
StecaGrid 8000 3ph and StecaGrid 10000 3ph**

One photovoltaic system – one display
The philosophy behind the StecaGrid Vision display unit is to provide the system operator with a representation of the entire system's data. In the default display, the output and yields of all connected StecaGrid inverters are shown as combined totals. Thus, the operator does not need to go from one inverter to the next, reading out the values individually and adding them up themselves. Naturally, it is also possible to view and compare data from individual inverters.

Up to 20 inverters can be connected
One to 20 StecaGrid inverters can be connected to the optional StecaGrid Vision display unit. The wired connections between the inverters and to the display unit are realised via Steca's own communication bus.

Easy to operate
The StecaGrid Vision impresses with its design. It is operated by means of four modern capacitive buttons. Graphic curves show the energy yields from the system as a whole, and from individual inverters, thus providing information at a glance, regarding the performance over the course of the day. In addition, StecaGrid Vision has a data logging function, which also enables querying of historical data. Error messages regarding the system as a whole, as well as individual inverters, are shown in plain text.

Diurnal, monthly and annual variation curves are clearly presented on one StecaGrid User page.
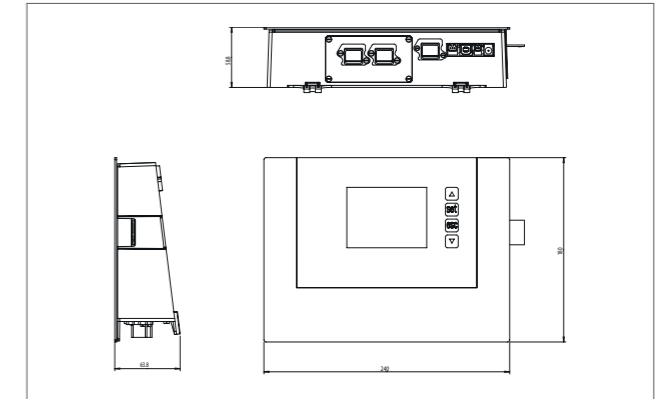
Product features
· Self-test feature for Italy

Display
· Multifunction graphic LCD display with backlighting for current output, energy yields, operating parameters, date, time, service information
· Animated representation of yield

Operation
· Multilingual menu navigation

	StecaGrid Vision
Application conditions	
Area of application	indoor rooms, with or without air conditioning
Interface to inverter	Steca bus with max. 1,000 m cable length
Ambient temperature	-20 °C … +45 °C
Humidity	0 % … 95 %
Noise emissions in standard operating conditions	silent
Equipment and design	
Protection class	IP 20
Dimensions (X x Y x Z)	240 x 180 x 63.8 mm
Weight	450 g
Power supply	230 V mains adapter plug (included in delivery)
Communication interface	USB
Range	1,000 m
Test certificate	CE mark

Exemplary interconnection

**StecaGrid 10000 3ph, StecaGrid 8000 3ph,
StecaGrid 3000 and StecaGrid 3600 inverters with
StecaGrid Vision display unit:**

| StecaGrid Vision | StecaGrid 10 000+ 3ph | + StecaGrid 8000+ 3ph | + StecaGrid 8000+ 3ph | + StecaGrid 3000 | + StecaGrid 3600 |

Solar-Log™ data logger

Professional remote monitoring

Data loggers by Solare Datensysteme are sought-after specialists for optimised remote monitoring of photovoltaics systems.

The combination of StecaGrid inverters with Solar-Log™ now guarantees complete monitoring of your photovoltaic system: all operating parameters, status and error messages of the connected inverters can be viewed simply and reliably. That guarantees maximum yield from your system at all times.

Advantages
· Guaranteed yield via comprehensive system monitoring and a wide range of alarm options
· Web-based software – no need to install programmes
· Clear presentation of the yield and system values in graphs and tables
· View data via internet connection – anywhere, any time
· Optional recording, calculation and optimisation of electricity consumption
· Comprehensive range of accessories – provides many other functions

Solar-Log¹⁰⁰⁰

Solar-Log⁵⁰⁰

Solar-Log⁵⁰⁰
(up to 10 inverters)

Solar-Log¹⁰⁰⁰
(up to 100 inverters)

+ StecaGrid
10000+ 3ph

+ StecaGrid
10000+ 3ph

+ StecaGrid
10000+ 3ph

Solar-Log™ monitoring circuit

Solar modules

StecaGrid inverter
Conversion into alternating current.
Information on Solar-Log™.

Digital electricity meter
Recording energy quantity.
Information on Solar-Log™.

Local alarm

Customer/operator
Notification per email, SMS or FAX in case of alarm.

Solar-Log™
collects and sends all system data for evaluation to the Solar-Log™-Server.

Sensor system
On-site recording of irradiation, temperature, etc.

Solar-Log™-Server
Evaluation and archiving of data, generating reports.

Local monitoring via integrated display

The displays on Solar-Log 500™ and Solar-Log 1000™ show all relevant data of the photovoltaics system.
Solar-Log 1000™ also offers an alarm output, to which a siren or alarm lamp can be connected.

All important information at a glance: Daily profile, current, daily and overall energy yield. Errors are signalled acoustically.

Remote monitoring via internet

The photovoltaics system can be monitored remotely for even greater convenience: For this function, Steca offers Solar-Log™ WEB on a separate server (www.stecalog.com). This provides you with access to all important yield values anywhere and at any time.

Displayed and analysed: Solar-Log™ WEB keeps you up-to-date on the optimum work of your system at all times – even on the road, with the Solar-Log™ App.

Monitoring guarantees your yield: Examples of faults and their consequences:
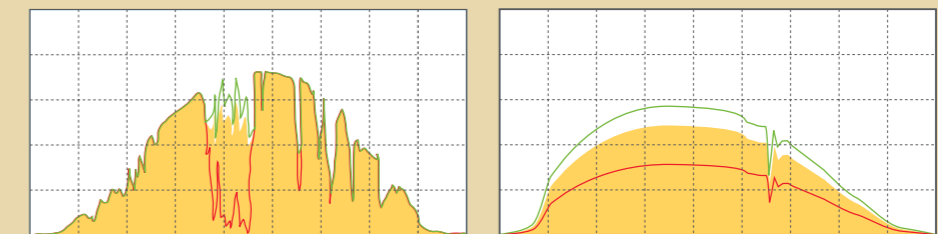
—— = Inverter shutdown
—— = optimal yield curve

—— = Dropout of a string
—— = optimal yield curve

Installation, configuration and system management

Select the cost-effective basic service or convenient combined package:

Photovoltaic system setup
We set up your system on the Steca server. The server then informs you regularly via e-mail of the status and error messages of the photovoltaic system.

Photovoltaic system setup and monitoring
If you want us to take on all the work, our employees can monitor your system constantly after setup: if anything out of the ordinary occurs, we inform you personally and diagnose the error. That minimises system downtime and guarantees optimum yield! At the end of the day, that saves time and money!

Meteocontrol WEB'log
for commercial systems

Professional remote monitoring

Area of application
· Remote monitoring of photovoltaic systems

· **Product features**
· Solar management
   — Web portal in several languages
   — Convenient evaluation of measurement data
   — High-performance report generator
   — Target/actual comparison of energy yield
   — Online values
· Safer'Sun info
   — Access to your system via your own homepage
   — Administration and allocation of guest access
   — You can integrate evaluations and diagrams in your website
· Safer'Sun portal
   — The Safer'Sun portal can be adapted to your own corporate design
   — Custom-made to your wishes and requirements

Advantages
· Best energy yield
· Innovative and intelligent technology
· Maximum safety
· Guaranteed pay-back!

| Meteocontrol WEB'log | + StecaGrid 8000+ 3ph | + StecaGrid 8000+ 3ph | + StecaGrid 8000+ 3ph |

Meteocontrol WEB'log Comfort
Ultimate display comfort for private installations

Professional remote monitoring

Area of application
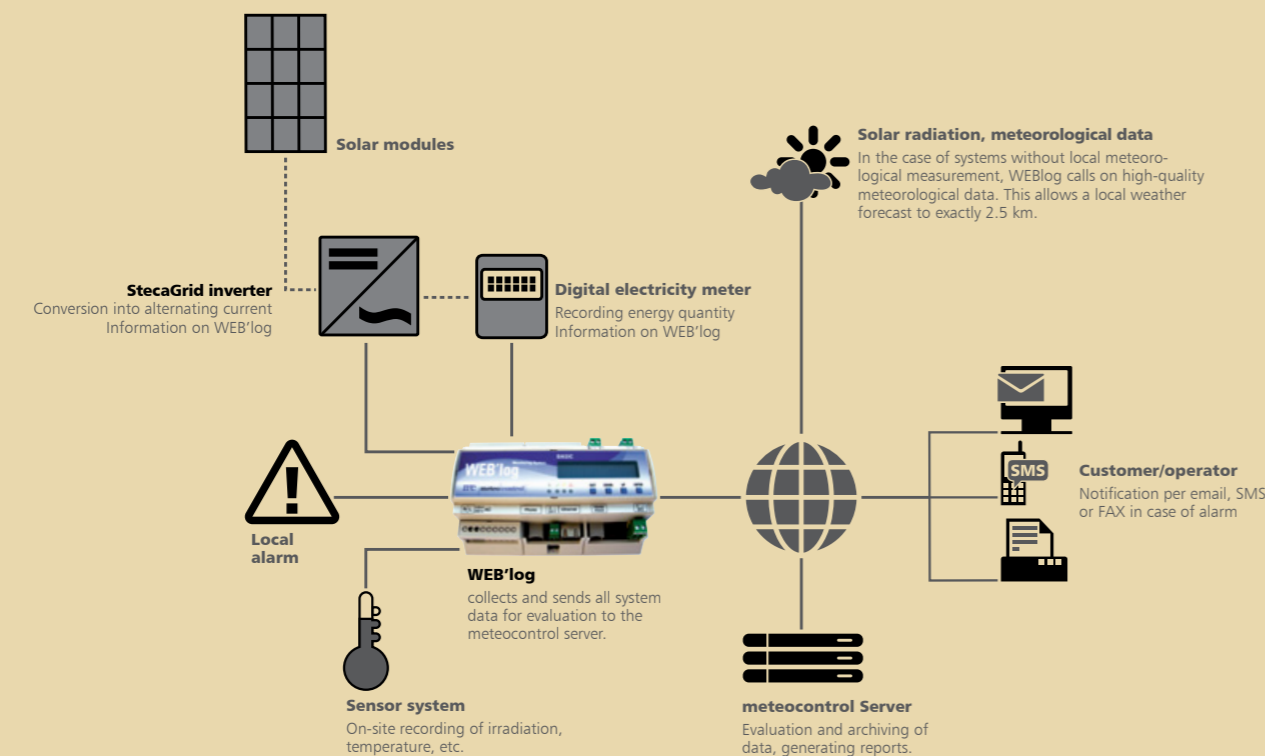· Remote monitoring of photovoltaic systems

Product features
· Solar management
   — Free web portal in several languages
   — Convenient evaluation of measurement data
   — High-performance report generator
   — Target/actual comparison of energy yield
   — Online values
· Safer'Sun info
   — Access to your system via your own homepage
   — Administration and allocation of guest access
   — You can integrate evaluations and diagrams in your website
· Safer'Sun portal
   — The Safer'Sun portal can be adapted to your own corporate design
   — Custom-made to your wishes and requirements

Advantages
· Best energy yield
· Innovative and intelligent technology
· Maximum safety
· Guaranteed pay-back!
· Control of loads to increase the self consumption of generated pv-power

| Meteocontrol WEB'log Comfort | + StecaGrid 3600 | + StecaGrid 3600 | + StecaGrid 3600 |

Functional principle of meteocontrol WEB'log

Solar modules

Solar radiation, meteorological data
In the case of systems without local meteorological measurement, WEBlog calls on high-quality meteorological data. This allows a local weather forecast to exactly 2.5 km.

StecaGrid inverter
Conversion into alternating current.
Information on WEB'log

Digital electricity meter
Recording energy quantity
Information on WEB'log

Local alarm

WEB'log
collects and sends all system data for evaluation to the meteocontrol server.

Customer/operator
Notification per email, SMS or FAX in case of alarm

Sensor system
On-site recording of irradiation, temperature, etc.

meteocontrol Server
Evaluation and archiving of data, generating reports.

Functional principle of Meteocontrol WEB'log Comfort

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meteocontrol Server
Evaluation and archiving of data, generating reports

DC circuit breaker for StecaGrid 300 and StecaGrid 500

250 V DC, 6 A DC, 6-pole
One DC circuit breaker can be used for one to three inverters. If the inputs are single-phased, up to six inverters can be connected via one DC circuit breaker.

Certificates
· Compliant with DIN VDE 0100-712

DC circuit breaker for StecaGrid 300 and StecaGrid 500	
DC input side (PV-generator)	
Maximum input voltage	250 V
Maximum input current	6 A per contact
Operating conditions	
Area of application	indoor rooms, with or without air conditioning, outdoors with or without protection
Ambient temperature	-40 °C … +60 °C
Relative humidity	0 % … 95 %
Fitting and construction	
Degree of protection	IP 65
Terminal (fine / single wire)	10 mm² / 16 mm²
Dimensions (X x Y x Z)	125 x 200 x 122 mm
Weight	1.2 kg
Test certificate	CE mark

▶ Wiring information for the DC circuit breaker can be found on our website (www.steca.com).

DC circuit breaker for StecaGrid 2000+

450 V DC, 16 A DC, 2-pole, 4-pole and 6-pole
Steca offers suitable DC circuit breakers especially designed for these inverters. 2-pole, 4-pole and 6-pole circuit breakers are available.

Product features
· Compliant with DIN VDE 0100-712

DC circuit breaker	2-pole	4-pole	6-pole
Operating conditions			
Area of application	indoor rooms with or without air conditioning, outdoors with or without protection		
Ambient temperature	-20 °C … +55 °C		
Relative humidity	0 % … 95 %		
Fitting and construction			
Degree of protection	IP 66		
Terminal (fine / single wire)	10 mm² / 16 mm²		
Dimensions (X x Y x Z)	100 x 190 x 93 mm		145 x 250 x 107 mm
Weight	0.6 kg		1 kg
Test certificate	CE mark		

Rated values (PV-generator)			
Operational current	4.68 A	5.54 A	6.79 A
Operational voltage	450 V DC	380 V DC	310 V DC
Max. open circuit voltage	520 V DC		
Rated insulation voltage	690 V		
Operational current	8.77 A	12.38 A	26.32 A
Operational voltage	240 V DC	170 V DC	80 V DC
Max. open circuit voltage	520 V DC		
Rated insulation voltage	690 V		

2-pole, 4-pole DC circuit breaker, 6-pole DC circuit breaker similar

▶ Wiring information for the DC circuit breaker can be found on our website (www.steca.com).

PROFESSIONAL SYSTEM MONITORING
with StecaGrid Configurator 3.3

The update version of the StecaGrid Configurator makes it possible to plan a photovoltaic system in an even more professional manner. It offers a wealth of improvements compared to its forerunner, the 3.2 version.

Among the new features is the inclusion of the new 70 percent rule for design relationships where the output power is only 70 percent of the module power. To consider the reactive power, Cos Phi (1.00; 0.95 or 0.90) can be selected. The system planner can also specify the maximum and minimum module temperatures. The number of modules to be used in the selected system configuration can be modified subsequently. The effects on the system values and yields as well as exceeding of the input parameters are clearly shown.

This version is self-contained, offering a convenient user interface. There are four different options for determining the size of a photovoltaic system after selecting a module type. In addition, modules stored in a large database can be filtered according to specific criteria. If the required module is not stored in the database, you can add own modules to the programme. This is followed by the selection of the inverters according to a range of specifications, for example the installation site and rated AC or DC power. The calculated cost of generating electricity is taken as the standard selection criterion. To help with

the specifications, the programme includes different values for the cost of systems planning as well as for modules, wiring, installation systems, etc. The installing company can provide their client data and company logo, which will appear on the printouts. A total of 100 locations throughout Europe offer irradiation data to help predict annual energy yield.

The predicted annual energy yield and the similarly editable values for the discount factor and operating time together allow the exact calculation in cents per kilowatt hour of the costs incurred by a system in producing electricity. On the basis of the electricity generation costs, it is possible to ascertain at a glance whether it would be more efficient to use the inverter with one more solar module, or one fewer. A list of required parts, the connection diagram and a summary of the project data all guarantee professional preparation for sales meetings with customers.

The programme's menu navigation can be set to German, English, French, Italian or Spanish.

The software is available free of charge at:
www.steca.com

For updates please refer to the Steca web site.