Solar-Log™
by Solare Datensysteme GmbH


# User Manual

## Solar-Log500

MAXIMIZED SUNPOWER

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# 1 General information

This user manual is intended to assist you in the operation of the Solar-Log$^{500}$. The yield data for the Solar-Log$^{500}$ can be displayed in several ways:

- via a web browser in a local network (↗page 6) or
- via the internet (↗page 28) or
- via the Solar-Log™ APP for iPhone (↗page 54).

# 2 Operation using the web browser in your own network

## 2.1 Requirements

**Information**

For faster access, enter "solar-log" in the address line of the browser and create a bookmark.

**In the local network**

To operate the Solar-Log$^{500}$ using a web browser you will need to be on a computer that is connected to the same local network as the Solar-Log$^{500}$ . This computer will also need to have a modern web browser installed on it.

You are also able to operate the Solar-Log$^{500}$ on a mobile device such as a tablet, smartphone. This device must also be connected to the same local network as the Solar-Log$^{500}$. It must also have a modern web browser installed on it.

**Via the internet**

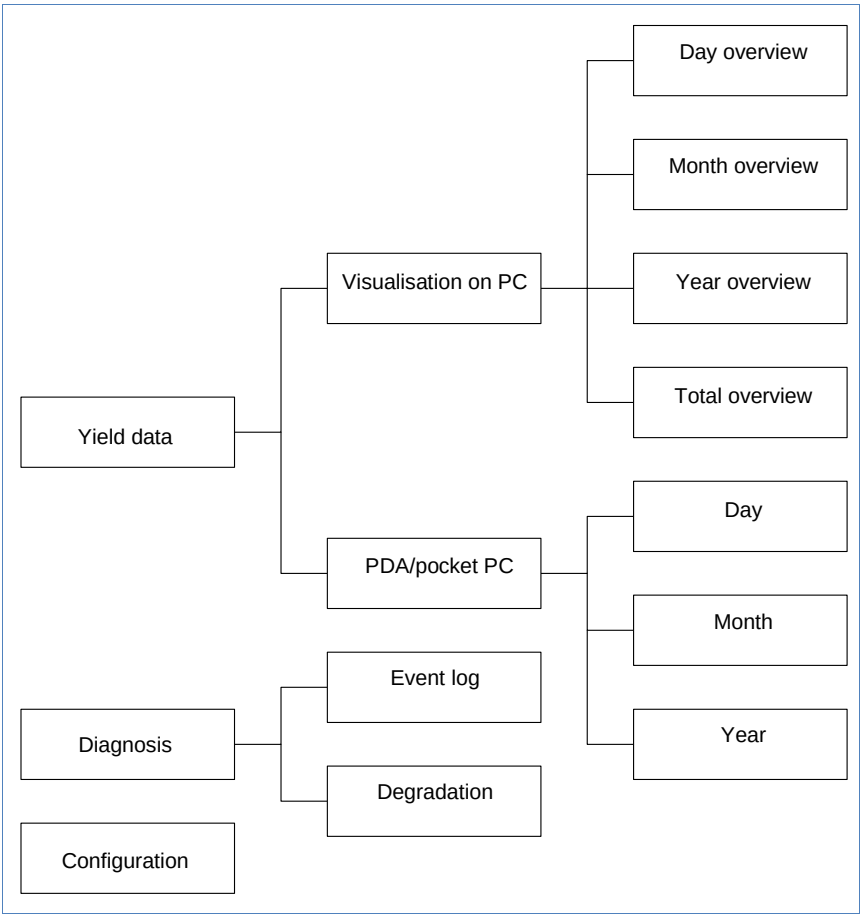
In addition to the computer or mobile computer with a web browser you need an active internet connection as well as a user account on a server.

- To set up a user account please contact your solar technician or find out more on our homepage under

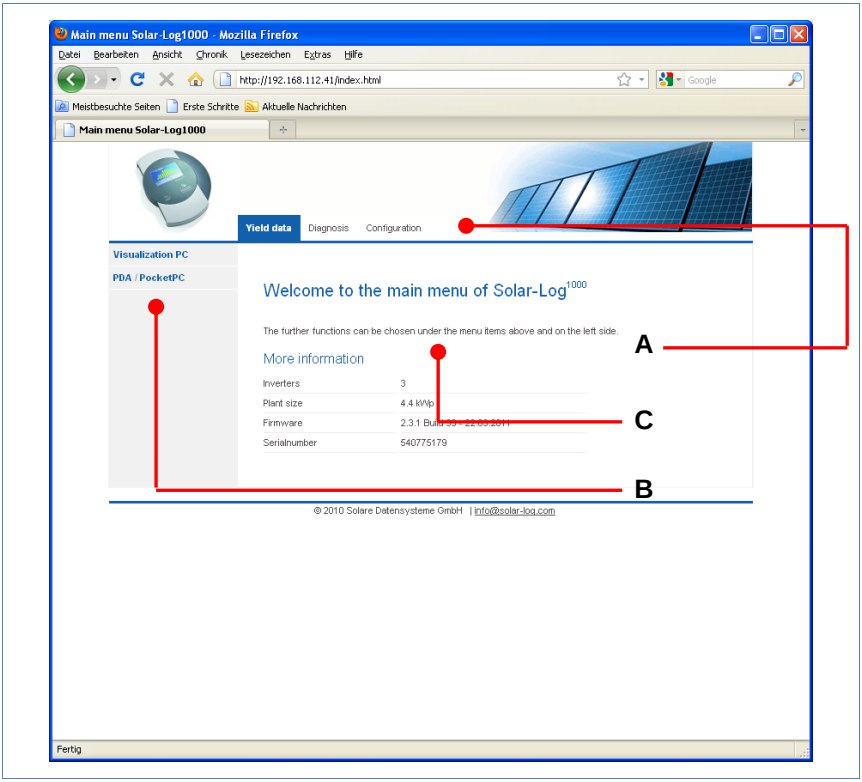
http://www.solar-log.com/en/products-solutions/solar-log-web.html

## 2.2 Overview

### 2.2.1 Navigation overview



## 2.2.2 Homepage




The homepage contains the following areas:

- Main navigation menu (A)
- Navigation bar (B)
- Information field (C)

### Main navigation menu

The main navigation menu contains three main operating groups:

- **Yield data**: Here you will find the yield information within certain periods of time such as day, month, year and the total yield to date of your plant.

- **Diagnosis**: Here you can call up the fault and process reports as well as filter according to desired criteria.
- **Configuration**: Here you can change the settings of your device as required.

**Left navigation bar**

Depending on the selected field in the main navigation menu you can access additional functions in the left navigation bar.

**Information field**

Device configuration will take place in this area. When viewing yield information an additional window will pop up and yield information can be found there.

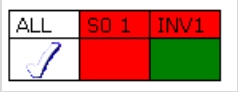
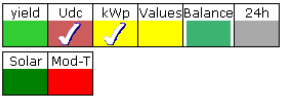
## 2.3 Calling up yield data

1 Start the web browser and enter "solar-log" in the address line of the browser or select the bookmark in the browser's navigation bar.
→ The homepage is displayed.

2 Select **Visualization PC** in the left navigation bar.
→ The output details for the current day are displayed in a new window.

### 2.3.1 How to navigate within the overviews

| Symbol | Meaning |
|---|---|
|  | Arrow keys: used to navigate to the previous or next period of time shown. Magnifying glass symbol: used to update the modified parameters. |

| Symbol | Meaning |
|---|---|
|  | Information on the inverter that is connected. Hold the cursor over a field to display the specific values. |
|  | Display of additional information on the plant (page 10). |

1 Click inside the colored area of the connected inverter or the desired yield values.

2 Click on the magnifying glass symbol.
→ The overview is updated and the yield information for the inverter or the yield values is shown in the selected overview, as a line.

3 Move to the next overview by clicking on the information under the heading.

4 Close the yield data window.
→ This allows you to return to the main menu.

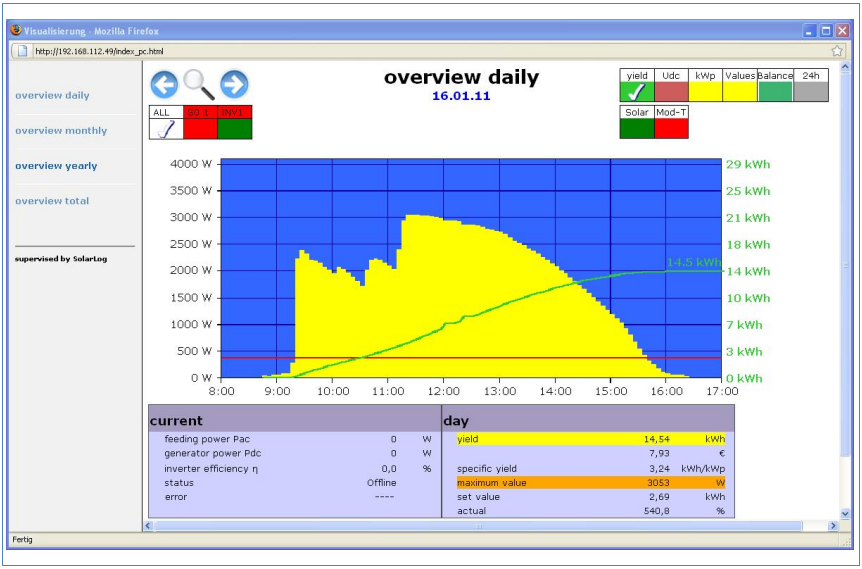
### 2.3.2 What the values in the overviews mean

| Description | Unit | Meaning |
|---|---|---|
| Power input<br>Pac | W | The current power input P on the AC voltage side |
| Generator output Pdc | W | The current power input P on the DC voltage side (solar generator) |
| Inverter efficiency η | % | The current efficiency from the generator output and the power input. The manufacturer's specifications regarding the efficiency of the inverter can be checked here. |

| Description | Unit | Meaning |
|---|---|---|
| Status / Error | | Status and error codes for the inverter. The codes shown are dependent on the manufacturer and must be looked up in the manual for the respective inverter. Status messages that are the same are collated. |
| Yield | kWh | The yield for the period of time shown (day, month, year, total) |
| Yield, specific | kWh/kWp | The output divided by the plant size. This value is a good reference value with respect to other plants. |
| Maximum value | W | The maximum output value within the period of time shown. |
| Target | kWh | The device runs a forecasting statistics function that specifies a certain target value for each time period. If the target value is attained or exceeded the forecast output has been achieved. |
| Actual | % | The actual value shows the percentage share for the actual yield and the target yield. |

### 2.3.3 Day overview

- Select **Overview Daily** in the left navigation bar.




The daily yields are shown in a curve chart. The red line shows the target value for each day.

### Buttons for the day overview

- **Yield**: Yield line via which the yield trend can take place. In addition, a red line is displayed as the total daily target.
- **Udc**: Generator voltage. To display voltage of the individual strings only one inverter may be selected.
- **kWp**: Converting the scaling from "Output in watts" to "Output in kWh/kWp". This makes all of the curves comparable in terms of their specific output. This also makes it easier to identify decreased outputs from specific inverters/strings.
- **°C / °F** : Display showing the inverter's internal temperature. This allows you to check that the fans are functioning correctly. **Please note that inverters are designed to have high internal temperatures.**
  The temperature display is shown only for inverters that provide the corresponding measured value.

- **24h**: Display showing the output over 24 hours of the day for a complete visualisation of the power consumption over the course of one day.

**Additional functions using S0 meter reader**

The following displays are also available to you by connecting an S0 meter to the Solar-Log™:

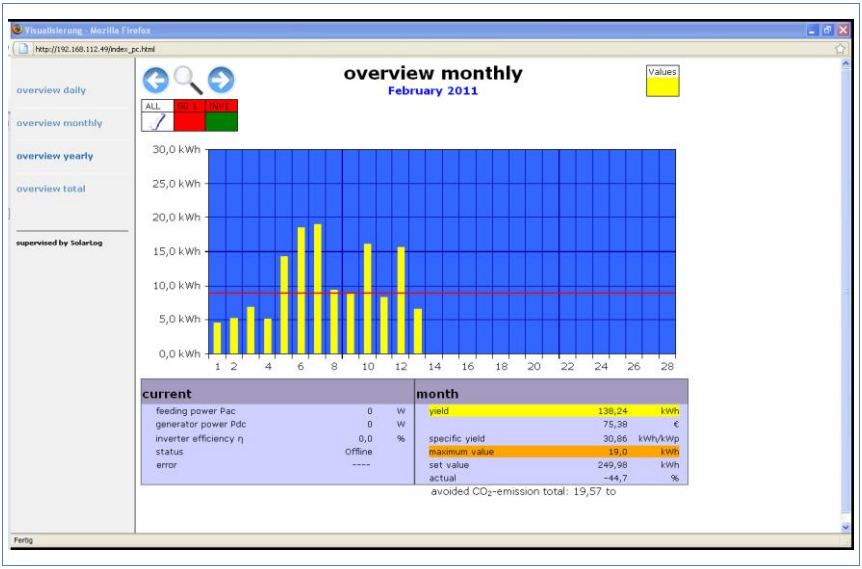
- **S0**: Shows the power consumption for your building as a graph, in watts.
- **Cons**.: Shows the power consumption for your building as a rising line, in kWh.
- **Values**: Shows various values for your inverter in text form.
- **Balance**: Shows you the ratio of your power consumption to your power yield. In the lower left text field the ratio is also shown as a percentage.

**Additional functions with the sensor box**

- **Solar**: Shows the reference value of an irridation sensor. The daily output of the plant must be within the measuring range of the sensor.
- **Mod T**: Shows the module temperature. The temperature is detected by the sensor box.

### 2.3.4 Month overview

▸ Select **Overview Monthly** in the left navigation bar.



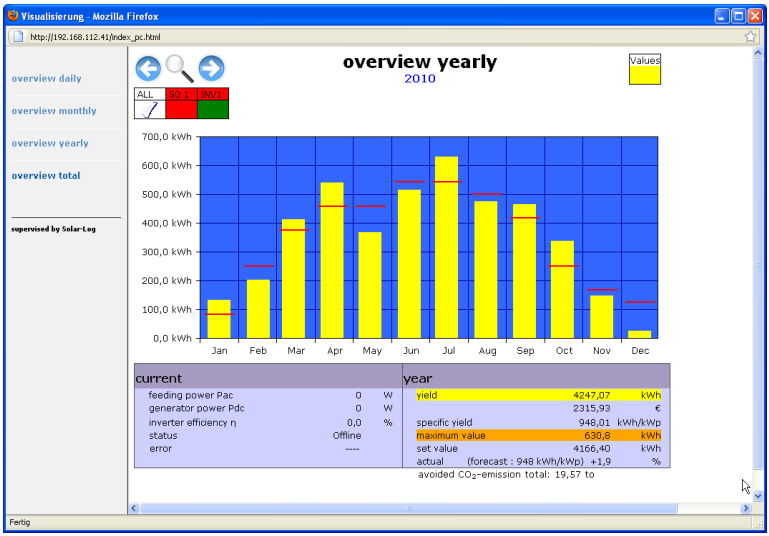

The daily yields for one month are shown as a total in a bar graph. The red line shows the target yield for each month.

**1** Move the mouse over a day bar.
→ The corresponding day's yield is shown.

**2** Click on an individual bar to switch to the corresponding day overview.

### 2.3.5 Year overview

- Select **Overview Yearly** in the left navigation bar.




The individual monthly yields are shown as a total in a bar graph. The red line shows the target yield for each month.

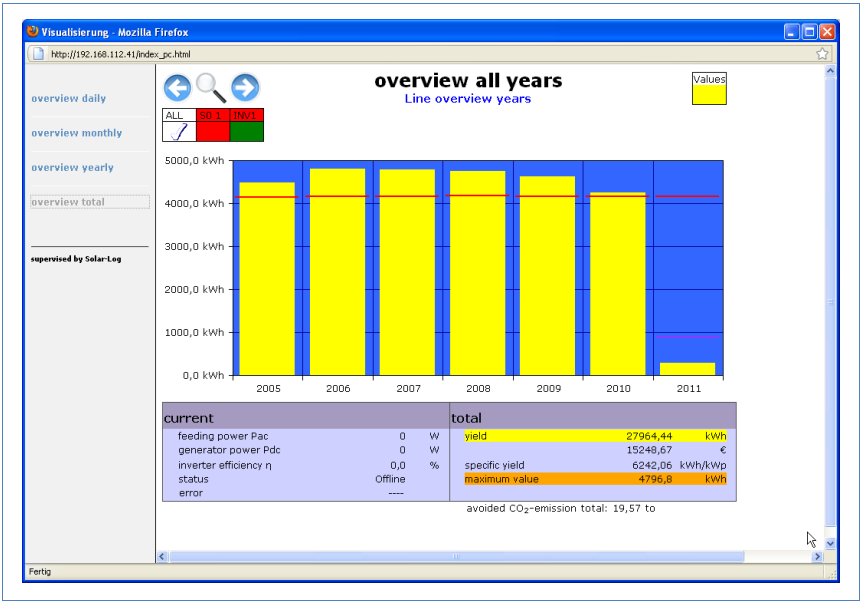
The "Forecast" value is calculated using the yields already achieved for the year and is then projected using the target yields for the remaining months of the year.

**1** Move the mouse over a month bar.
→ The corresponding month's yield is shown.

**2** Click on an individual bar to switch to the corresponding month overview.

### 2.3.6 Total overview

- Select **Overview Total** in the left navigation bar.



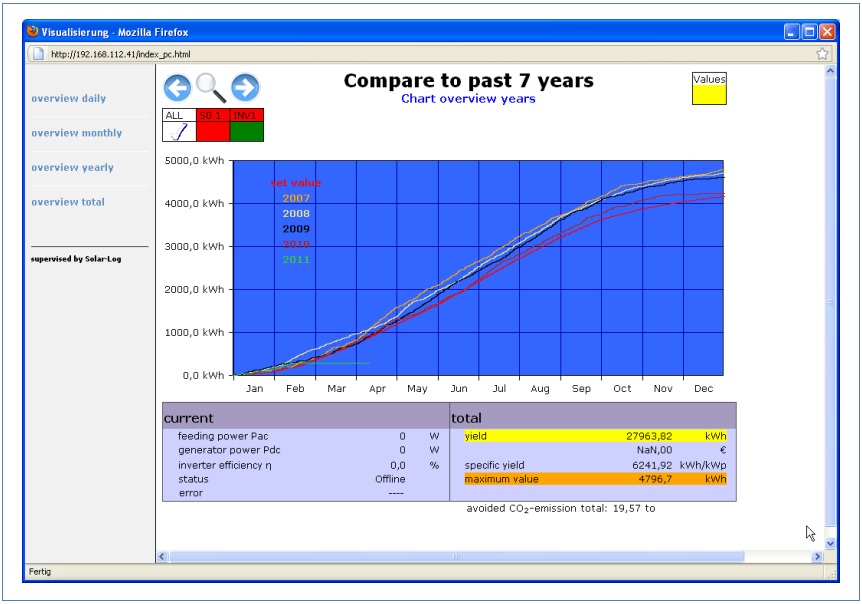

The individual annual yields are shown as a total in a bar graph. The red line shows the total target yield. For the current year two red lines are shown:

- The top line shows the annual target.
- The bottom line shows the annual target accumulated to the present day.

**1** Move the mouse over a year bar.
→ The corresponding year's yield is shown.

**2** Click on an individual bar to switch to the corresponding year overview.

**3** Click on **Line overview, years** to display a line view for the total yield.




4 Click on **Chart overview, years** to display a bar view for the total yield.

## 2.4 Calling up yield data on a mobile computer

You can also call up the current yield data for your plant via mobile computer (e.g. smart phone). To do this your smart phone logs onto the internet or your local server and calls up your data.

**Note**

This function is only available in the local network or for plants which run on our "Classic 1 Server".

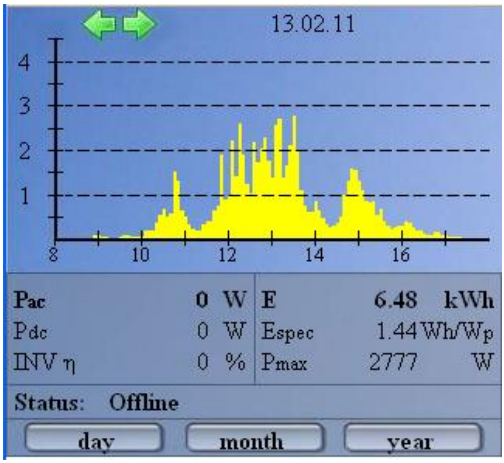
Please note that additional costs for the internet connection may be charged by your mobile service provider.

1 Start the web browser on the mobile computer and enter "solar-log" or the IP address for the Solar-Log™ in the address line of the browser or select the bookmark in the browser's navigation bar.
→ The homepage is displayed.

2 Select **PDA/Pocket PC** in the left navigation bar.

### 2.4.1 Day

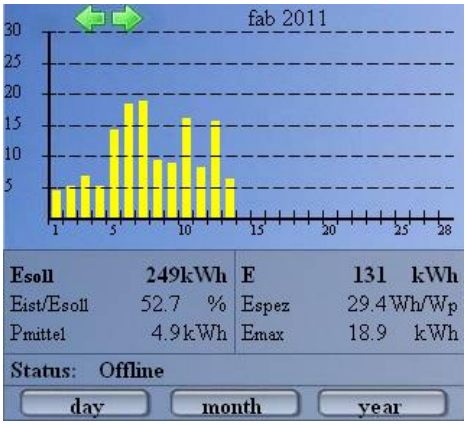
- Select **Day** in the left navigation bar.




The updated yield data for the day is shown.

### 2.4.2 Month

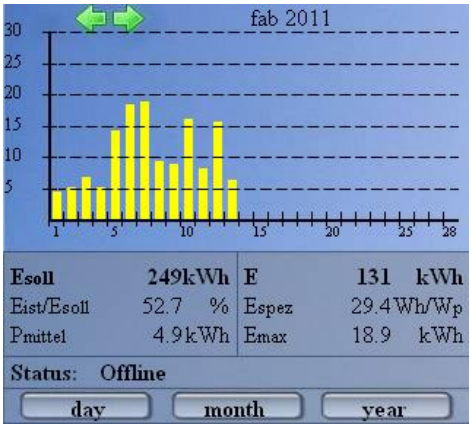
- Select **Month** in the left navigation bar.




The yield data for the current month is shown.

### 2.4.3 Year

- Select **Year** in the left navigation bar.




The yield data for the previous year is shown.

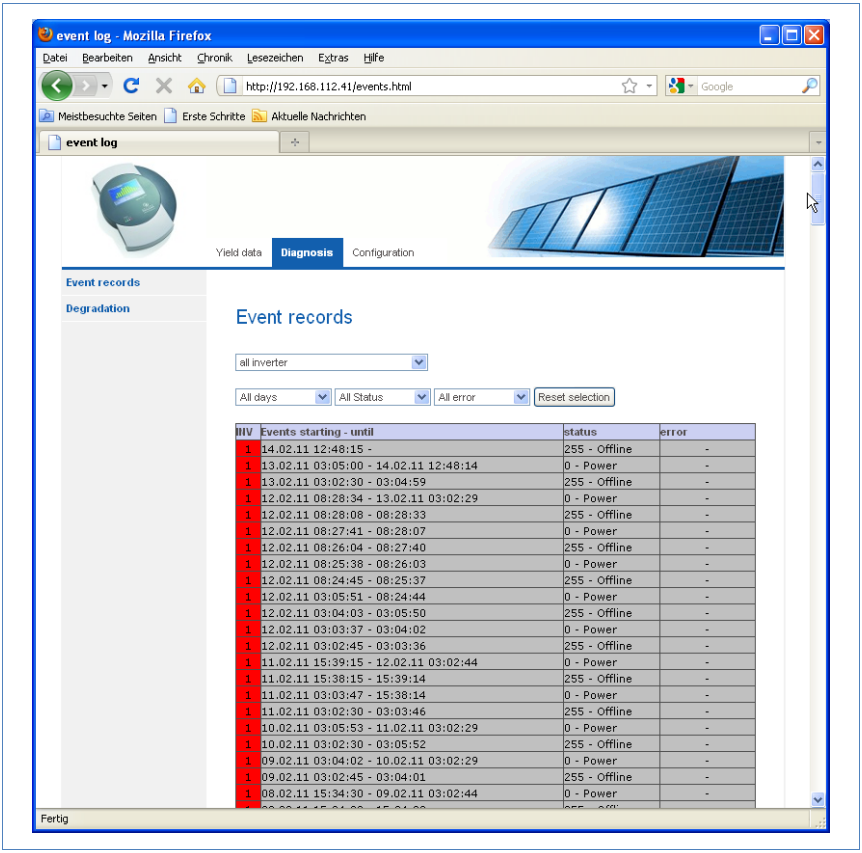
## 2.5 Calling up the diagnosis function

With the diagnosis function you are accessing the device's event log. You can display a total overview of all of the errors, malfunctions and status changes that have occurred for the connected inverters. You can also filter them according to your desired criteria.

Moreover, the diagnosis menu also shows you the decrease in output ("degradation") of your plant.

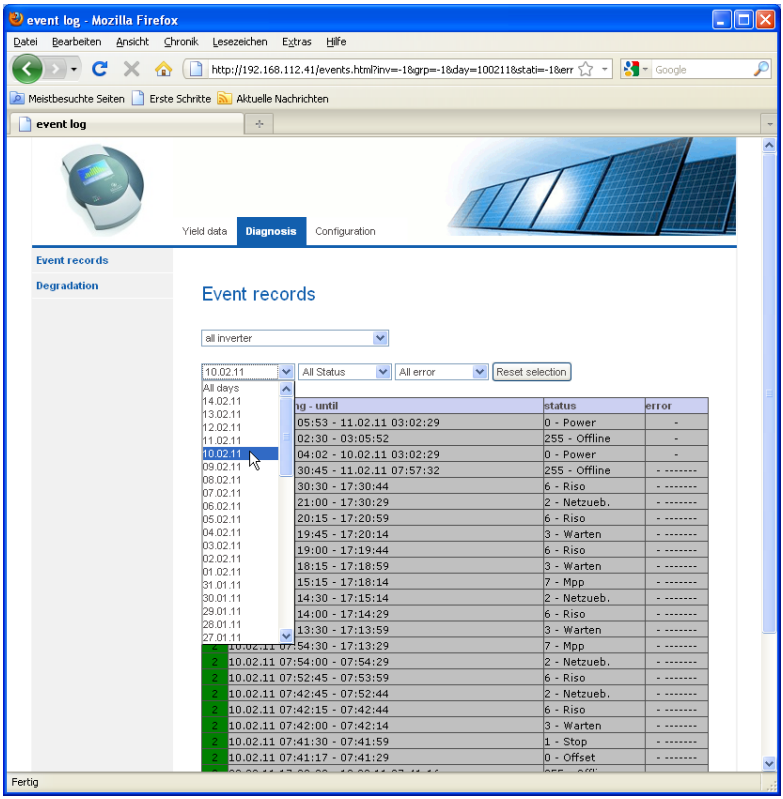
**1** Start the web browser and enter "solar-log" in the address line of the browser or select the bookmark in the browser's navigation bar.
→ The homepage is displayed.

**2** Select **Diagnosis** in the main navigation menu.
→ The event log is shown.




### 2.5.1 Calling up and filtering the event log

- Select **Even log** in the left navigation bar.
  → The complete list of all system events is shown.




To display only certain events or events that occurred on a certain day in the previous 35 days, use the filter function.

1 Select the desired inverter in the **All inverters** drop-down menu.
   → Only the events for the selected inverter are shown.

2 Narrow down the selection by selecting the desired day in the **All days** drop-down menu.
   → Only the events for the selected day are shown.

3 Narrow down the selection further by selecting the desired status in the **All statuses** drop-down menu.
   → The only statuses available are those which occurred within the selected period of time.

4 Narrow down the type of error by selecting the desired error in the **All errors** drop-down menu.
→ Only those errors are shown which occurred within the selected period of time.

5 Click on **Reset selection** to cancel all of the filter settings.

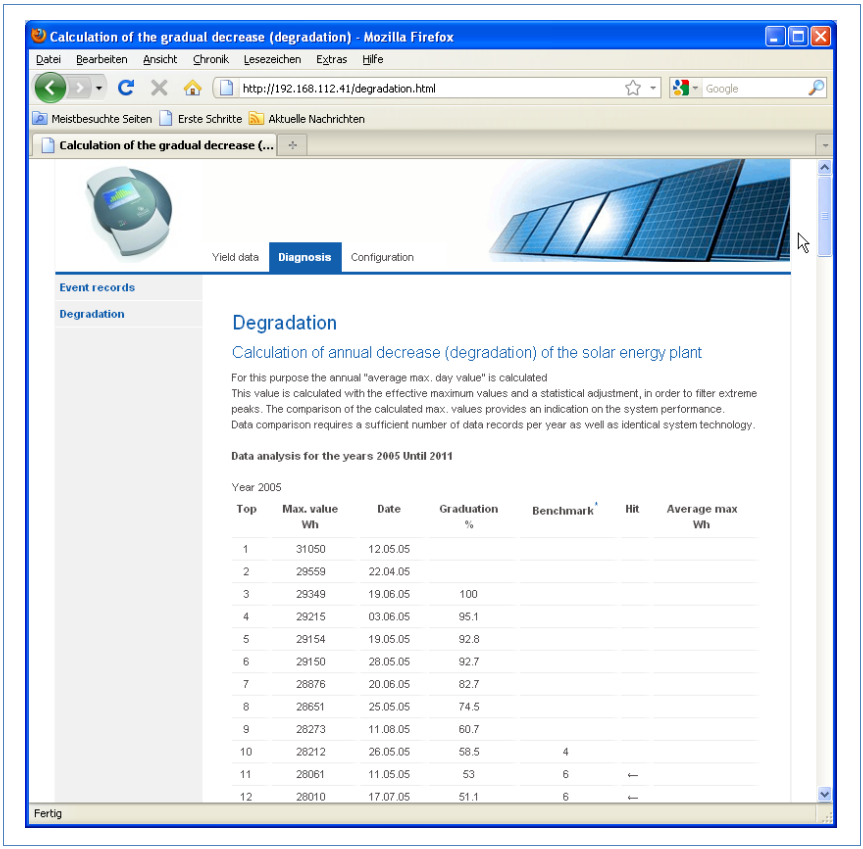
### 2.5.2 Displaying the decrease in output for your plant

To obtain an overview of the total output for the previous years and the current performance, the device offers a tabular view.

1 Start the web browser and enter "solar-log" in the address line of the browser or select the bookmark in the browser's navigation bar.
→ The homepage is displayed.

2 Select **Diagnosis** in the main navigation menu.

3 Select **Degradation** in the left navigation bar.
→ Your plant's decrease in performance is shown.




The performance of your modules decreases gradually over the years. Depending on the quality of the modules, this leads to a continuous reduction in the total yield of your plant, so-called "degradation".

To this end the "average maximum day value" is calculated for each year. It is calculated from the actual maximum values and a statistical adjustment to filter out extreme peaks. The comparison of these calculated maximum values allows conclusions to be drawn regarding the performance on the plant.

### 2.5.3 Pac Correction Factor

At photovoltaic plants, several measuring points and power generators (inverters) are combined with one another. The Solar-Log™ evaluates this data and partially looks for any correlations.

Since some of the components are not calibrated, deviations in the values measured can easily arise.

For example, if the total amount of energy produced based on what the inverters display is compared with the values from calibrated power meters, deviations of up to 8% can arise.

In practice, meters and inverters both can display too much or too little kWh.

To correct these inaccuracies in the medium term, the Solar-Log™ firmware uses a PAC correction factor.

**Note**

A calibrated power meter has a tolerance of +/- 1 % and an has a tolerance of +/- 8 %.

From experience, if the the deviations are greater than 8-10 a problem somewhere else and the measuring devices are source of this deviation.

### 2.5.4 Calculating the PAC correction factor

All of the yield data is saved internally without the correction factor. The correction factor is only applied to the data output. The factor can therefore be adjusted at any time.

The formula for calculating the correction factor is as follows:

$$\frac{\text{Yield Power Meter}}{\text{Yield Inverter}} * 1000$$

If the inverter does not have a display, it is advisable to use the values which are recorded by the Solar-Log™ from a period over a week.

That is why it is recommended to leave the default PAC correction factor at 1000 initially.

The correction factor can be adjusted yearly after receiving the statement from the utility company.

### 2.5.5 Example calculation

| Inverter 1 | Inverter 2 | Calibrated power meter |
|---|---|---|
| Total energy | Total energy | Total energy |
| 259.12 kWh | 305.22 kWh | 550.55 kWh |
| 564.34 kWh | | Deviation= 13.79 kWh |

By comparing the values, you see that the inverters are more likely to display too much.

| Pac Correction Factor | |
|---|---|
| Calibrated power meter total energy | Inverter total energy |
| 550. 55 kWh | 564.34 kWh |
| **Calculated PAC correction factor in the example:** | |
| $\frac{\mathbf{550.55kWh}}{\mathbf{564.34KwH}} = \mathbf{975.66}$ | |
| **Rounded PAC correction factor = 976** | |

## 2.6 Changing settings in the configuration menu

The configuration menu allows you to make changes and adjustments to the device software. The device should have been put into service and fully configured by your solar technician. However, you may like to make changes at a later date, such as changing your password or the network settings (because you want to use a new router, for example), etc.

- To make changes to the configuration please contact your solar technician.
- If you would like to make changes yourself, obtain the installation manual that is available for download from our internet site (↗page 100).

# 3 Showing performance data on the display

Besides controlling the Solar-Log via the Web browser Solar-Log500 also has a 2 line text display. With this display you can view actual performance values.

Following values are displayed on the device, changing regularly:

| Description | Unit | Meaning |
|---|---|---|
| Power input Pac | W | The current power input P on the AC voltage side |
| Generator output Pdc | W | The current power input P on the DC volatage side (solar generator)<br>If only one multi string inverter is selected, all individual strings will be displayed separately |
| EDay | kWh | Day yield |
| Espez | Wh/Wp | The energy yield divided by the maximum output. This value is a good reference value with respect to other plants. |

# 4 E-mail Notification

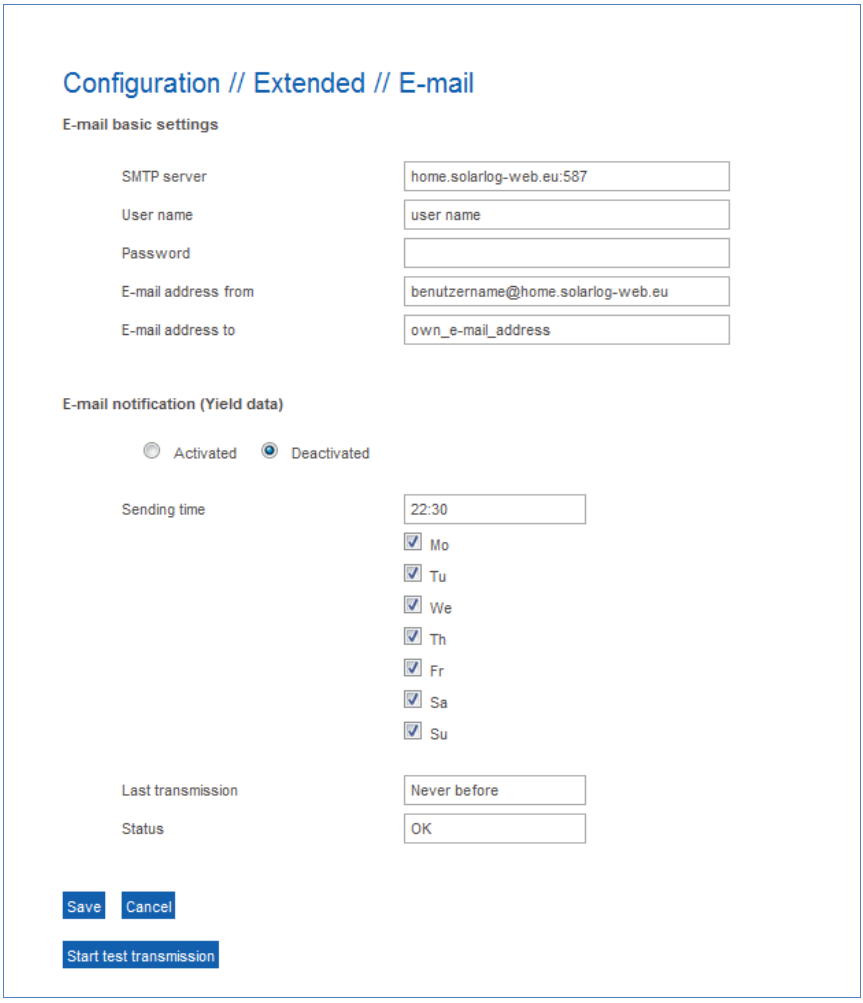
## 4.1 Yield E-mail

The Solar-Log™ comes with an e-mail program that can send a daily overview of the day's performance to two different e-mail addresses (maximum of 57 characters, separated with a semicolon).

### Open the dialog box

Select e-mail from the Configuration // Advance menu.

→ The following dialog box appears on the right.




**The basic e-mail settings as well as the *E-mail Notification* are configured here. (See the chapter Configuring E-mail Notifications in the Installation Manual (*Advanced/E-mail*))**

**Sent Yield E-mail**

Von: noreply@solarlog-web.de [mailto:noreply@solarlog-web.de]
Gesendet: Dienstag, 13. März 2012 23:04
An: [redacted] - Solar-Log
Betreff: Income overview - Plant 4 - 13.03.12

Day:

| | |
|---|---|
| yield | 44.91 kWh |
| specific yield | 0.61 kWh/kWp |
| set value (cumulative) | 202.7 kWh |
| maximum value | 9.73 kW |
| expected | 22 % |
| consumption | 86.432 kW |

Month:

| | |
|---|---|
| yield | 1662 kWh |
| specific yield | 22.6 kWh/kWp |
| set value (cumulative) | 2635.1 kWh |
| maximum value | 352.8 kW |
| average | 128 kW |
| expected | 63 % |

Year:

| | |
|---|---|
| yield | 8545 kWh |
| specific yield | 116 kWh/kWp |

*Screenshot of a yield message*

**Explanation of the message:**

**Subject:** The Solar-Log serial number and time and date

**Day**

| Field | Explanation Text |
|---|---|
| Sum | The actual amount of energy fed into the grid for the day in kWh. |
| Specific | Yield specific. The energy yield divided by the amount of generator power installed. (Values are normalized to 1 kWp.) |
| Max. | The maximum power in Kw |
| Target Yield | The yield in kWh which can be achieved according to the forecast. |
| Actual Yield | Percentage of days on which the target was achieved. The daily yield achieved in percent. The total to target ratio. |

**Month**

| Field | Explanation Text |
|---|---|
| Sum | The actual amount of energy fed into the grid for the month in kWh. |
| Specific | Yield specific. The energy yield divided by the amount of generator power installed. . (Values are normalized to 1 |

| Field | Explanation Text |
|---|---|
| | kWp.) |
| Max. | Displays the maximum daily production for this month in kWh. |
| Medium | The average daily production which was achieved for this month. |
| Target Yield | The yield in kWh which had been achieved up to the current day according to the forecast. |
| Actual Yield | Percentage of the monthly target that has already been achieved up to the current day.<br>The month target already achieved as a percentage. The total to target ratio. |

**Year**

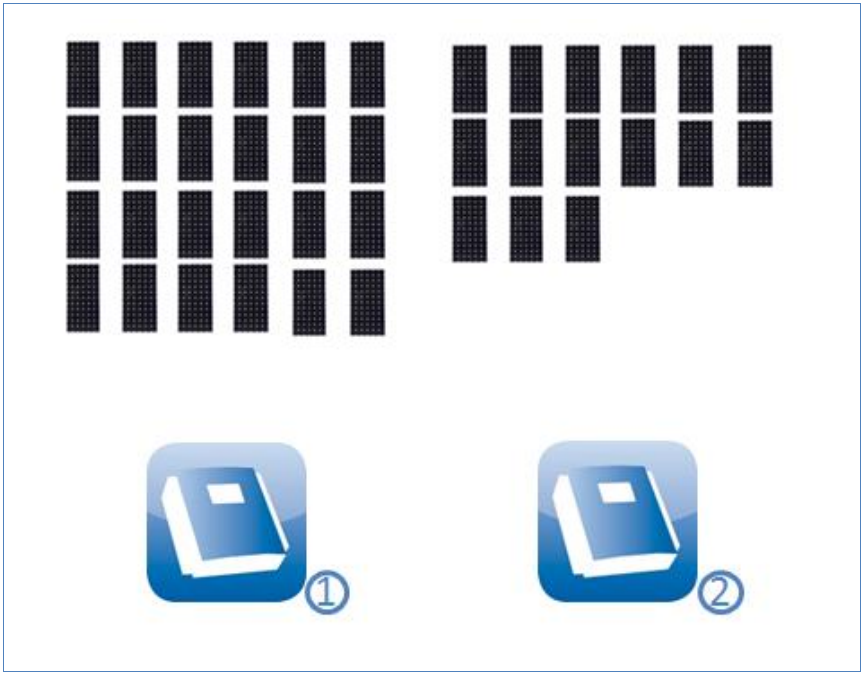
| Field | Explanation Text |
|---|---|
| Sum | The actual amount of energy fed into the grid for the year. In kWh |
| Specific | Yield specific. The energy yield divided by the amount of generator power installed. (Values are normalized to 1 kWp.) |

## 4.2 Performance Monitoring

To monitor different sized inverters, the Solar-Log™ scales down**** the value from every inverter to 1 kWp. The Solar-Log™ uses the amount of generator power set in Configuration // Basic // Inverter.

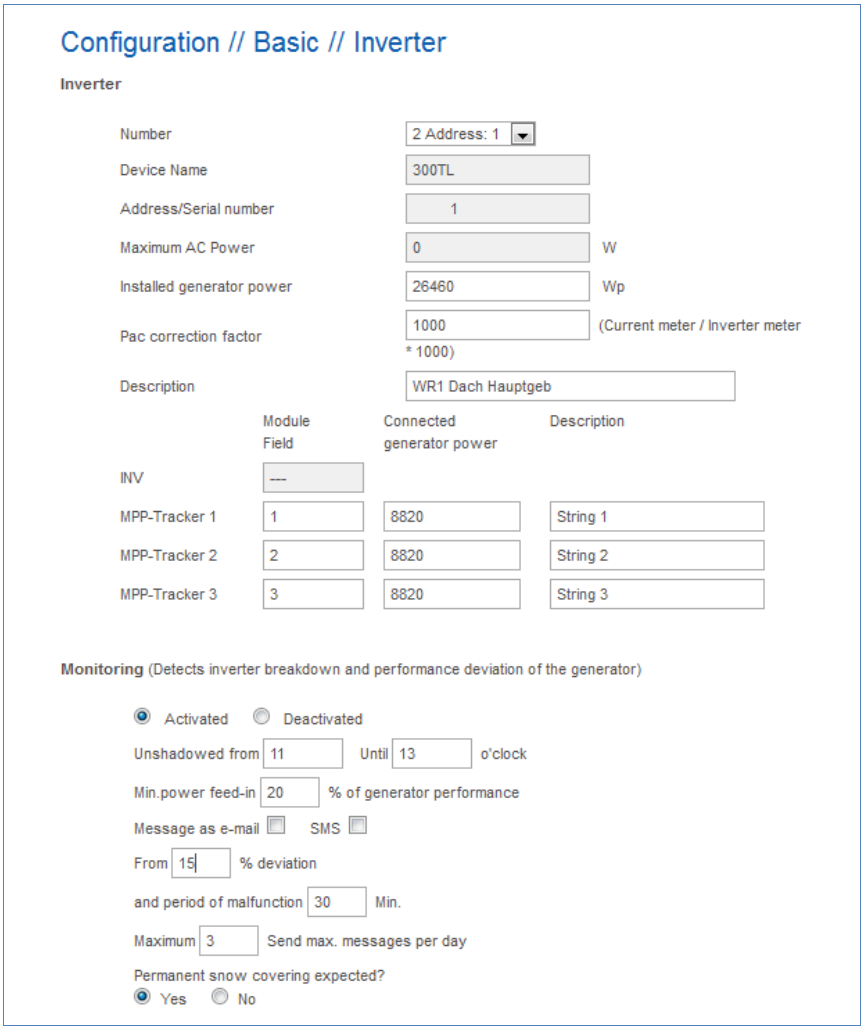
The generator power is equivalent to 100% and the value here is normalized to 1 kWp)

**Example plant:**



| Inverter 1, Inverter 1 house | Inverter 2, Inverter 2 house |
|---|---|
| Generator Power:<br>25* 220W (Modules) = 5500 Wp | Generator Power:<br>15* 220W (Modules) = 3300 Wp |
| Module Field 1 | Module Field 1 |

The Solar-Log™ compares all of the inverters that are located in the same module field.
Performance Monitoring Configuration under Configuration // Basic // Inverter.




The output measured from the inverters is contrasted with the generator capacity that is listed in the system.
The notification is sent when the deviation exceeds the amount configured (for example 15%) over set time period (for example 30 minutes).

**Performance Monitoring Notification**

**Example Notification:**

Module field 1 – INV1,Inverter 1 house'
Ptarget = 4916W ( INV2 ,Inverter 2 house' ),
Pactual = 3950W, Diff= 19,65 %

The notification contains the following information:

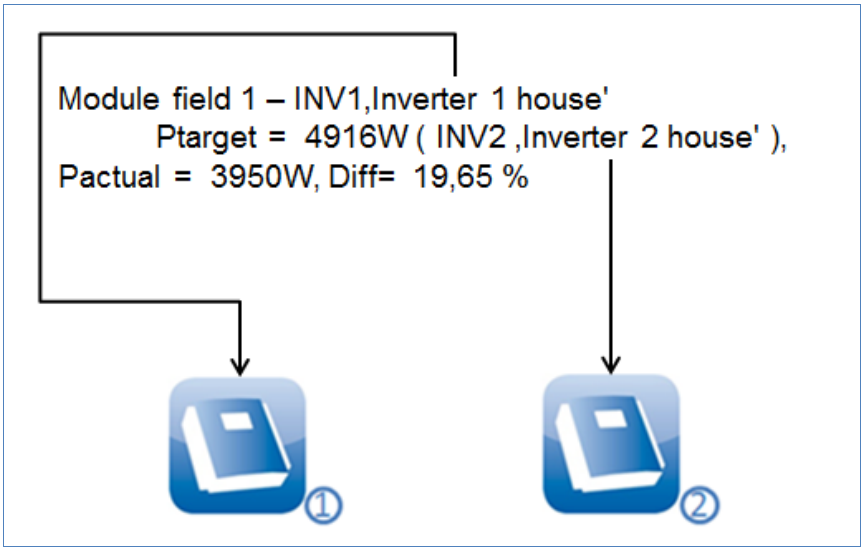
**Module field:** The module field which was affected or at least the module field in which a deviation was detected.

**Inverter with a deviation:** "Inverter 1"

**IRV:***** The reference value that is used to contrast inverters. It comes from the most effective operating inverter, the value is in W.

IAV***: The amount of output from inverter with a deviation.

**Dev:** The amount of deviation as a percentage of the reference value.




| | Inverter 1 Inverter 1 house | Inverter 2 Inverter 2 house |
|---|---|---|
| Generator Power:= | 5500 Wp | 3300 Wp |
| Current production | = 3950 W | = 2950 W |
| Current efficiency | = 71.81 % | = 89.39 % |
| | Inverter with a difference | Reference Inverter |

Inverter has generated the most power with its value of 0.8939 and is thus used as the reference inverter.

**Calculation and Explanation of the Notification**

In regard to the reference inverter, inverter 1 is compared to all of the inverters in the same module field (in the example only output is used). A deviation of 19.65 is determined based on the comparison of the gen-

erator capacity and IRV forecast.

### Calculating the Deviation for Inverter 1

| Deviation Calculation | |
|---|---|
| Inverter 1 IRV calculation | (5500*89.39): 100= IRV 4916 W |
| Efficiency of Inverter 1 | (3950 W: 5500 W)* 100= 71.81 % |
| corresponds to 71.81 % of the generator power or a value of 0.7181 kWp. | |
| **Deviation as a percentage** | |
| IRV Inverter 1 - IAV Inverter 1 | 4916 W – 3950 W= 966 W |
| Deviation as a percentage | (966 W: 4916 W)* 100= 19.65 % |

Inverter 2 is used as the reference inverter since it was the most effective one at the time of the measurement. Inverter 1 should have produced an output of 4916 W based on the measurement and the calculations comparing all of the inverters in the same module field. The actual output was 3950 W, a deviation of 19.65%. This caused a notification to be sent.

# 5 Using Solar-Log WEB

You can also use Solar-Log™ WEB to call up the yield data and event logs for your plant via the internet, as well as set up a daily email containing the yield and fault reports to be sent out to an email address. To do this you need a Solar-Log™ WEB account.

In addition to this option we also offer further levels of expansion with a corresponding range of service to fulfil every requirement. For further information, contact your solar technician directly or visit the following address

http://www.solar-log.com/en/products-solutions/solar-log-web.html

## 5.1 Register with Solar-Log™ WEB "Classic 2nd Edition"

Registration for the Solar-Log™ WEB "Classic 2nd Edition" takes place quickly and simply online.

**Information**

It is important to note that the following addresses are for the German “Classic 2nd Edition”. To determine which address to visit for your country ask your installer or visit

http://www.solar-log.com/?L=1 for more information

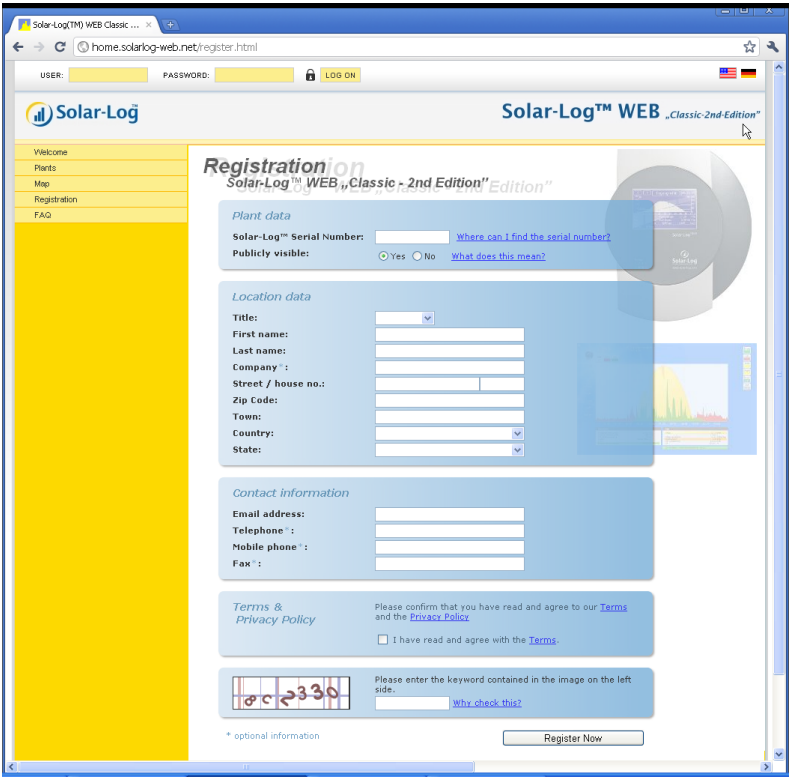
I ADDED THE ABOVE AS I THOUGHT IT WAS NECESSARY TO MENTION. DELETE THIS COMMENT BEFORE PRINT

1 Open the browser and navigate to the Solar-Log™ WEB registration page under

http://www.solar-log.com/classic2/

**2** Select **Registration** in the left navigation bar.

→ The registration form is shown.




**3** Enter the **Serial number** of your device.

→ The serial number (SN) can be found under the top cover (↗page 99).

**4** Select whether you would like the data to be **Publicly visible** to the internet.

→ Your plant information is then able to be viewed by other visitors to the site. If you select "No", you must log in using the user data that you receive from Solare Datensysteme GmbH in the course of the registration process (↗page 42).

→ The "publicly visible" setting can be changed at any time afterwards on your website in the "Configuration" area.

5 Enter your **Location data** and your **Contact information**.

6 Confirm acceptance of the General Terms and Conditions (**AGB**) and the **Privacy Policy** after you have read them.

7 Enter the **Code word** shown in the chart in order to ensure that no automated programs (Bots) are performing the registration which could then paralyze the server.

8 Confirm your entries by pressing **Register now**.

→ If you have not entered a code word or have entered the code word incorrectly, a new code word is automatically displayed and you do not need to re-enter your data.

On successful completion of your registration you will receive an email sent to your designated email address which you must confirm. After your data has been manually checked your access will be granted.

**Note**

The activation takes place during normal business hours and can take up to 24 hours.

## 5.2 Calling up plant data

- In the browser, open the homepage for Solar-Log™ WEB or enter the URL in the address line of the browser:

http://home.solarlog-web.eu/

→ The homepage is displayed.


### Logging in to Solar-Log™ WEB

If you have refused "visibility to all" when registering, you must log in to the Solar-Log™ WEB internet site. If your plant is visible to all, you can skip the log in.

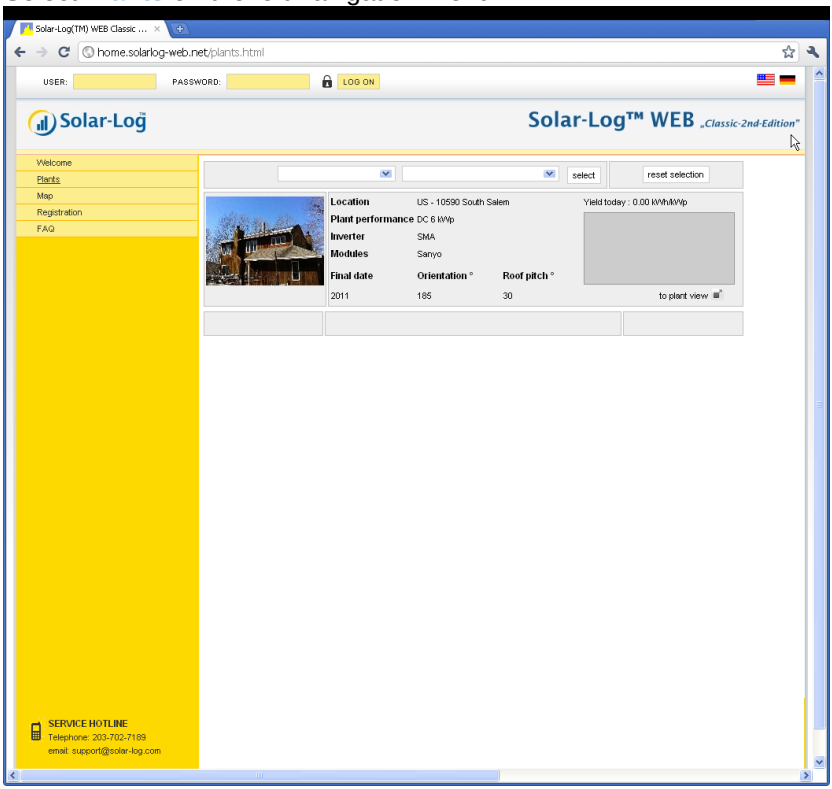
- In the header enter your **User** and **Password** information and click on **Log On**.

### Calling up the plant overview

All of the plants are shown in the overview. The plants are anonymous. You can directly display the plants that are visible to all under the day chart.

Plant data that has been given a password can only be called up by registering.

- Select **Plants** on the left navigation menu



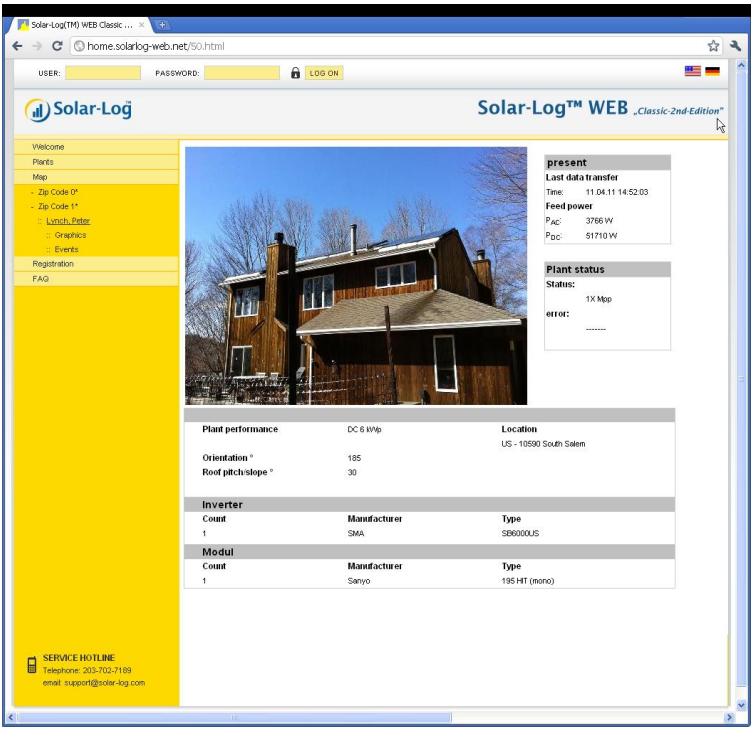

1 Select the **Zip Code** of your location, **Inverter** manufacturer, **Final Date** of installation or the manufacturer of the **Modules** in your plant.

**2** Click on **Select** to filter the list according to the criteria selected or click on **Reset selection** to cancel the selection criteria.
→ A list of plants is shown that correspond with the filter criteria.


The overview shows the installed inverters, their output, module manufacturer, year of manufacture, orientation and the roof slope of the plants. If no picture of the plant has been made visible to all, a standard image is shown.

In addition, in the right column you can find an overview of the plants' current yield.

**3** Click on **to plant view** below the yield diagram.
→ The detailed overview of the plant is shown.




The detailed overview shows additional technical details about the plant as well as the plant status including any error messages that have occurred.

**4** To navigate directly to the plant details, place a bookmark in your browser.

## 5.3 Calling up yield data

### 5.3.1 How to navigate within the overviews

The navigation on the internet site for the overviews is similar to the navigation on the overview pages in your local network (page 9).

**Switching between the overviews**

1 Move the cursor onto the small triangle on the left next to the display for the period of time.
→ An overview of the time periods is shown.


2 Click on the desired time period.
→ The overview of the time period is shown.

### 5.3.2 What the values in the overviews mean

The values provided below the diagrams are similar to the values on the overview pages in your local network (page 10).

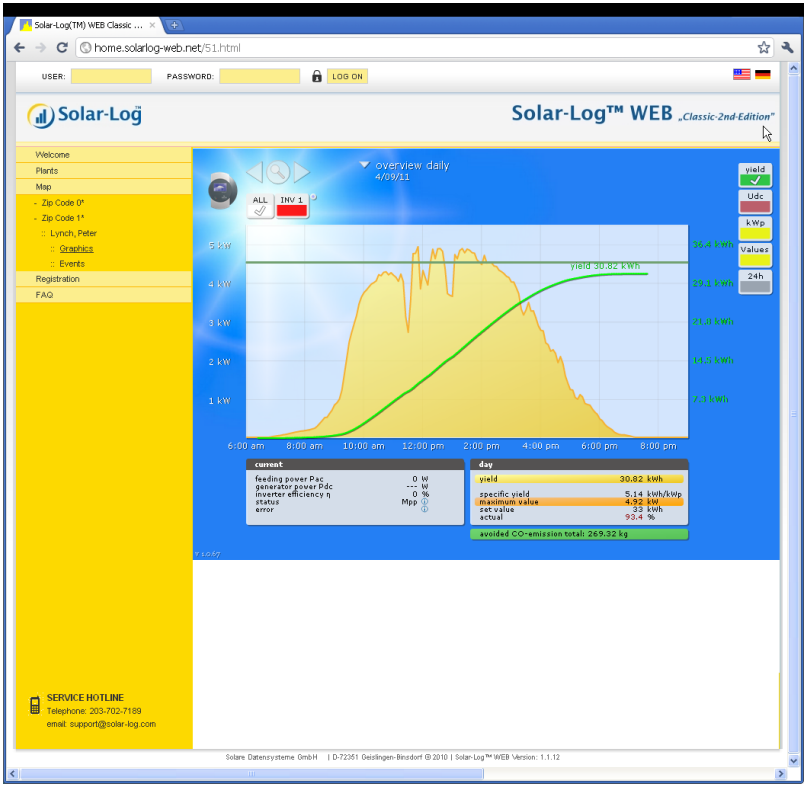
Any information regarding revenue is not shown on the internet site for reasons related to privacy.

### 5.3.3 Day overview

1 Open the browser and click on the bookmark for your plant.
→ You may have to log in (page 42).

→ The detailed overview of your plant is shown.

**2** Select **Graphics** in the left navigation bar.
→ The day overview of the plant is shown.




The daily yields are shown in a curve chart. The dark green line shows the target value for the day.

Move the cursor over the curves to display the corresponding values.

### Buttons for the day overview

- **Yield**: Yield line via which the yield trend can take place. In addition, a dark green line is displayed as the total daily target.

- **Udc**: Generator voltage. To display voltage of the individual strings only one inverter may be selected.
- **kWp**: Converting the scaling from "Output in watts" to "Output in kWh/kWp". This makes all of the curves comparable in terms of their specific output. This also makes it easier to identify decreased outputs from specific inverters/strings.
- **24h**: Display showing the output over 24 hours of the day for a complete visualisation of the power consumption over the course of one day

**Additional functions using S0 meter reader**

The following displays are also available to you by connecting an S0 meter reader to the Solar-Log™:

- **S0**: Shows the power consumption for your building as a graph in watts.
- **Cons**.: Shows the power consumption for your building as a rising line in kWh.
- **Values**: Shows various values for your inverter in text form.
- **Balance**: Shows you the ratio of your power consumption to your power yield. In the lower left text field the ratio is also shown as a percentage.

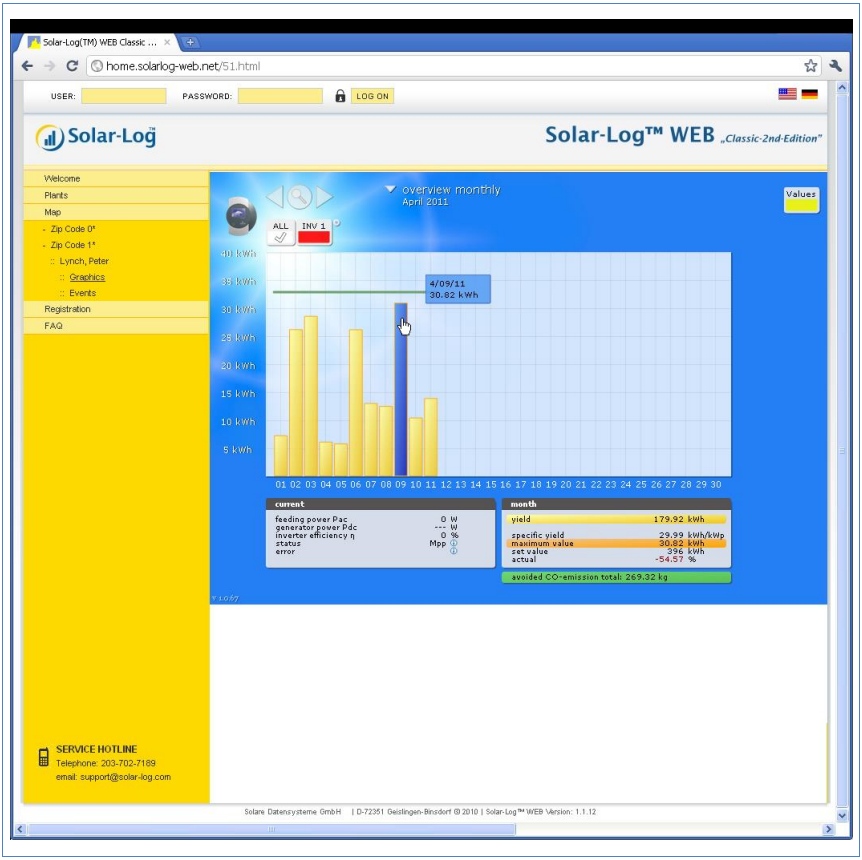
**Additional functions with the sensor box**

- **Solar**: Shows the reference value of an irridation sensor. The daily output of the plant must be within the measuring range of the sensor.
- **Mod T**: Shows the module temperature. The temperature is detected by the sensor box.

**3** Click on one of the buttons and then on the magnifying glass symbol.
→ The selected curve is shown.

### 5.3.4 Month overview

▸ Select **Overview Monthly** in the navigation menu.



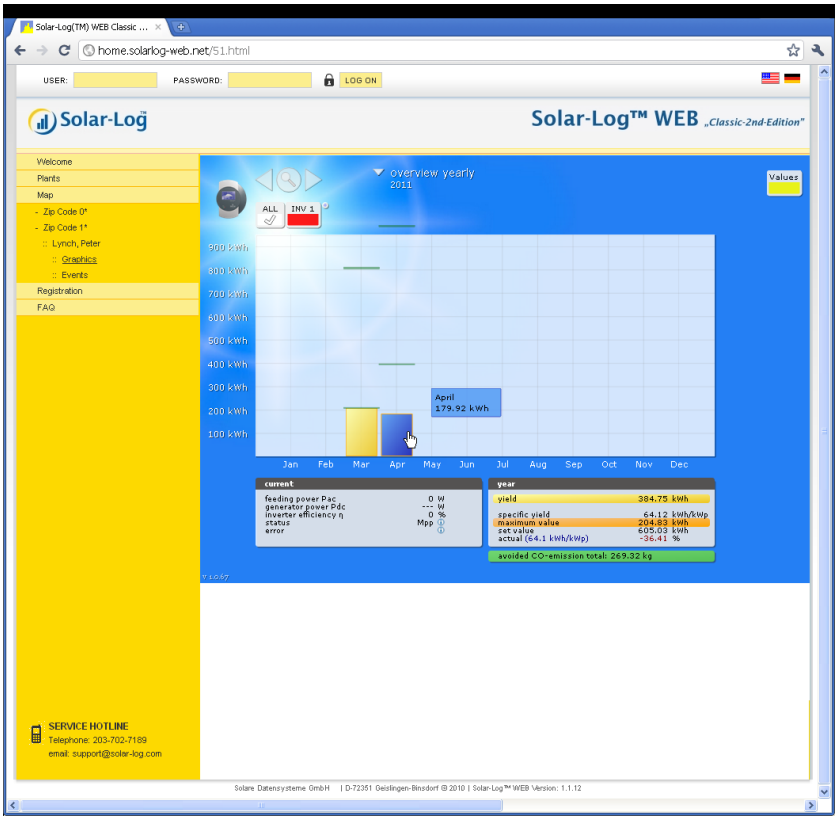

The daily yields for one month are shown as a total in a bar graph. The dark green line shows the target value for the month.

1 Move the mouse over a day bar.
→ The corresponding day's yield is shown.

2 Click on an individual bar to switch to the corresponding day overview.

### 5.3.5 Year overview

- Select **Overview Yearly** in the navigation menu.




The individual monthly yields are shown as a total in a bar graph. The dark green line shows the target value for the month.

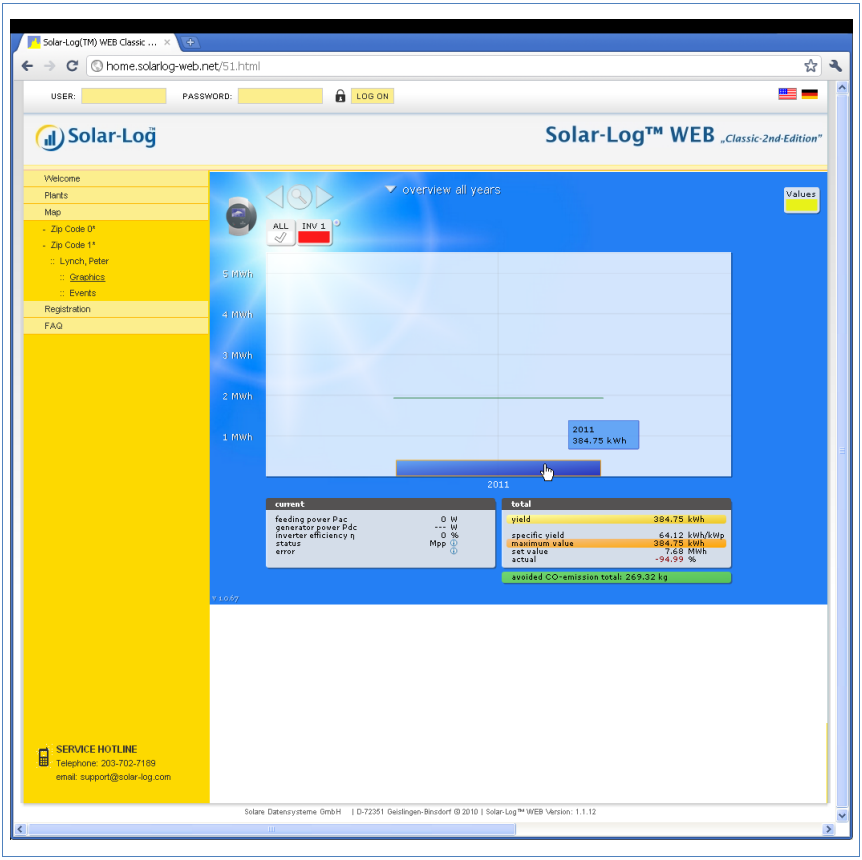
The "Forecast" value is calculated using the yields already achieved for the year and is then projected using the target yields for the remaining months of the year.

**1** Move the mouse over a month bar.
→ The corresponding month's yield is shown.

**2** Click on an individual bar to switch to the corresponding month overview.

### 5.3.6 Overview of all years

- Select **Overview all years** in the navigation bar.




The individual annual yields are shown as a total in a bar graph. The dark green line shows the target value for the year. For the current year two green lines are shown:

- The top line shows the annual target.
- The bottom line shows the annual target accumulated to the present day.

**3** Move the mouse over a year bar.

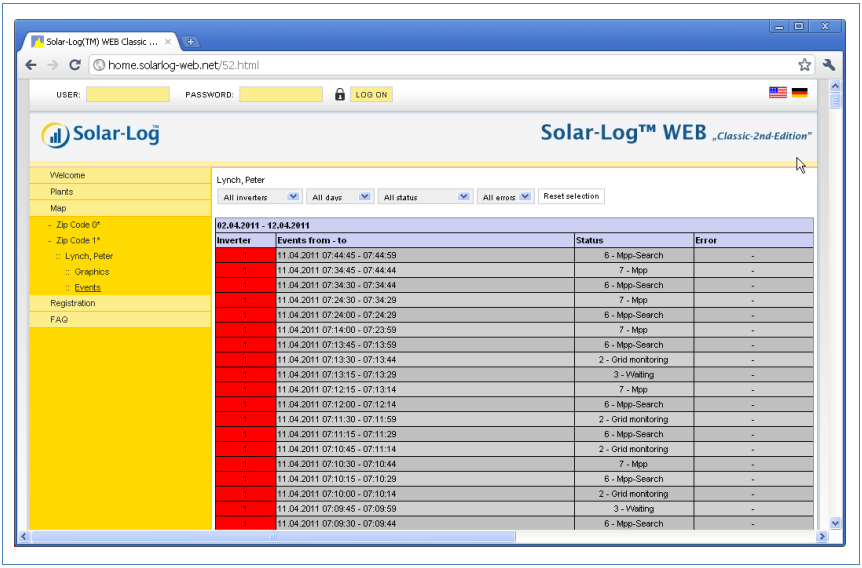
→ The corresponding year's yield is shown.

4 Click on an individual bar to switch to the corresponding year overview.

5 Click on **Line overview, years** to display a line view for the total yield.

### 5.3.7 Calling up and filtering the event log

▸ Select **Events** in the left navigation bar.
→ The complete list of all system events is shown.




To display only certain events or events that occurred on a certain day in the previous 35 days, use the filter function.

1 Select the desired inverter in the **All inverters** drop-down menu.
→ Only the events for the selected inverter are shown.

2 Narrow down the selection by selecting the desired day in the **All days** drop-down menu.
→ Only the events for the selected day are shown.

3 Narrow down the selection further by selecting the desired status in the **All status** drop-down menu.
→ Only those statuses are available which occurred within the selected period of time.

4 Narrow down the type of error by selecting the desired error in the **All errors** drop-down menu.
→ Only those errors are shown which occurred within the selected period of time.

5 Click on **Reset selection** to cancel all of the filter settings.

# 6 Using the Solar-Log™ APP iPhone V3 for iPhones

We offer a Solar-Log™ App iPhone V3 for iPhones, iPads and iPod Touches to allow you to access your plant data at any time and from any location. The App is available for free from the Apple App Store.

The App displays current and past yield data in a graphical form. In addition, there is the possibility to display power consumption. Intuitive finger gestures (swipes) enable you to quickly navigate between different time period views (daily, monthly, yearly and total).

**Note**

When starting the App for the first time, there is a brief introduction on how to operate the App.

### Requirements

Our Solar-Log™ App is compatible with every iPhone, iPod Touch and iPad starting from iOS version 3.0.

**Note**

The Solar-Log™ App only runs with the server solution Solar-Log™ Web Classic 2 and the WEB Commercial Edition from Solare Datensysteme GmbH.
The Solar-Log™ Web Classic 1* and Self-made* editions are not supported.

*It only pretains to new plants, existing plants will continue to be displayed.

## 6.1 Installing the App

The App is available for free from the Apple App Store.

### Loading the App

**6** Search for "Solar-Log" in the ***Apple App Store***.

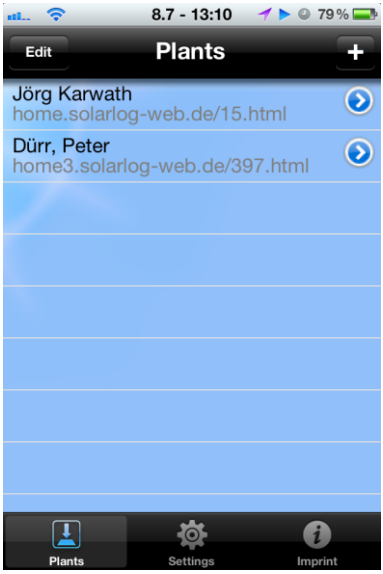
**7** Follow the directions to download and install the App on your mobile iOS device.

### Start the App


**8** Start the App on your iOS device.
→ The start screen is displaed with the saved plant.

## 6.2 Add plants

You can monitor as many plants with the App as are connected with a Solar-Log™.




**9** Touch the **+** symbol.
→ The screen ***New Plant*** is then displayed.


**10** Enter the ***URL***, ***Serial Number*** and ***Password*** from the registration email that you received from Solare Datensysteme GmbH.

**11** ***Save*** the added plant.

**12** The plant now appears with a name and URL in the plant menu.

## 6.3 Retrieving Yield Data

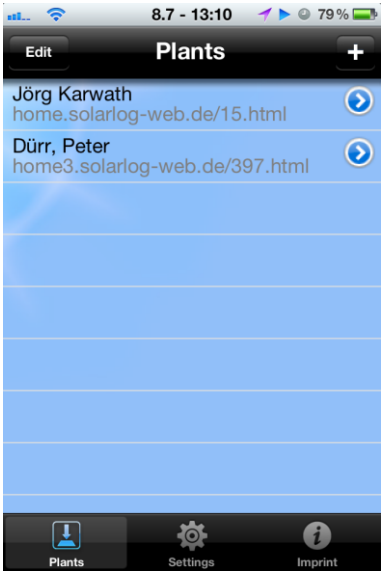
After your plant has been correctly recognized, the yield data is displayed in the plant overview.

**Note**

The data is only updated when your iOS device is connected to the internet.

### 6.3.1 How to navigate between different time periods

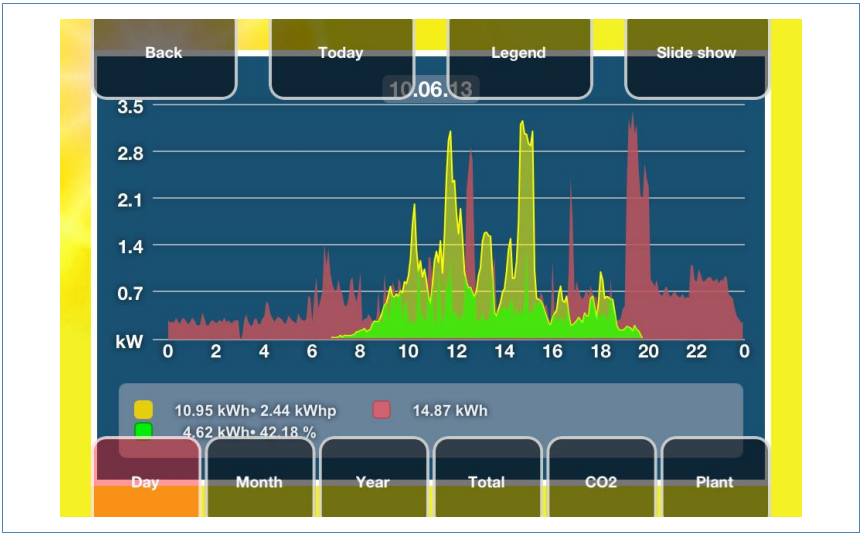
**13** Start the App




**14** Touch the blue arrow next to the name of your plant.

The current Daily Overview is displayed with the yield values, percentage (based on the forecast) and consumption (only if a meter is connected and activated, see the chapter Retrieving Plant Data).

**15** By touching the screen, a menu appears on the top and bottom the screen from which you can select the desired view.

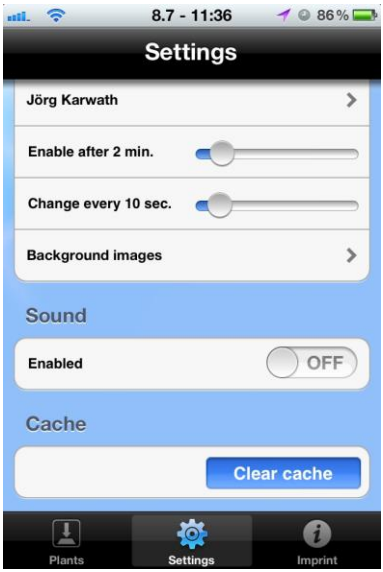



## 6.4 The top menu bar

The following items can be selected from the top menu bar:

- Back
- Today
- Legend****
- Slide show

Touch Back to go back to the plant settings page.




The following settings can be configured:

- Update intervals
  → Plant update intervals from 5 to 60 minutes.
- $CO_2$
  → The $CO_2$ factor can be adjusted from 0.0 to 1.0 (see the chapter Viewing $CO_2$ Savings).
- Slide Show (see the chapter The Yield Data as a Slide Show).
- Sound (see the chapter The Yield Data as a Slide Show).
- Clear cache.
  → Delete all of the App's cached data. It is necessary to restart the App.

Touch Today from any view to go to the current Daily values.

Touch Legend*** to hide and unhide these values.

Touch Slide Show to start this with the previously adjusted settings. (see the chapter The Yield Data as a Slide Show)

## 6.5 The bottom menu bar

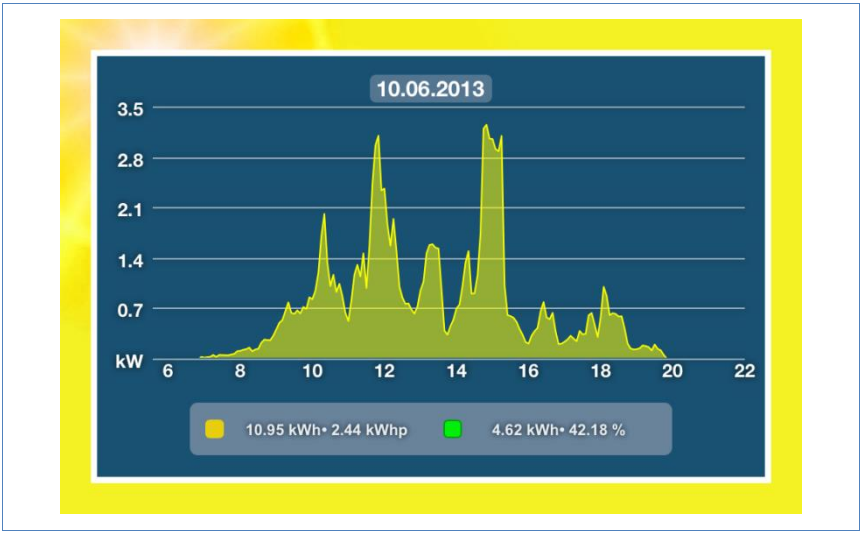
The following items can be selected from the top menu bar:

- Day
- Month
- Year
- Total
- CO2
- Plant

### 6.5.1 Day

**16** Touch the screen.
→ The bottom menu bar is displayed.

**17** Select ***Day*** to go the Daily Values.




The daily yields are displayed as a graphical curve.

**18** Rotate iOS device horizontally for a better view.

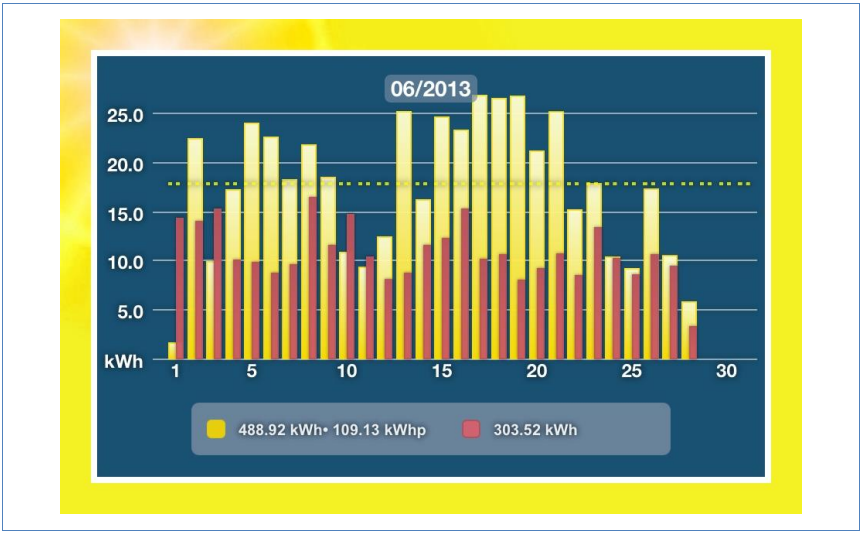
**19** Swipe to the left go to the next view or to the right to go back to the previous view.

**20** Swipe up or down to change the module views.

### 6.5.2 Monthly Overview

**21** Touch the screen.
→ The bottom menu bar is displayed.

**22** Select ***Month*** to go the monthly values.




The daily yields of the selected month are displayed as a bar graph. The dotted line in the view displays the plant's calculated target value based on the annual forecast.

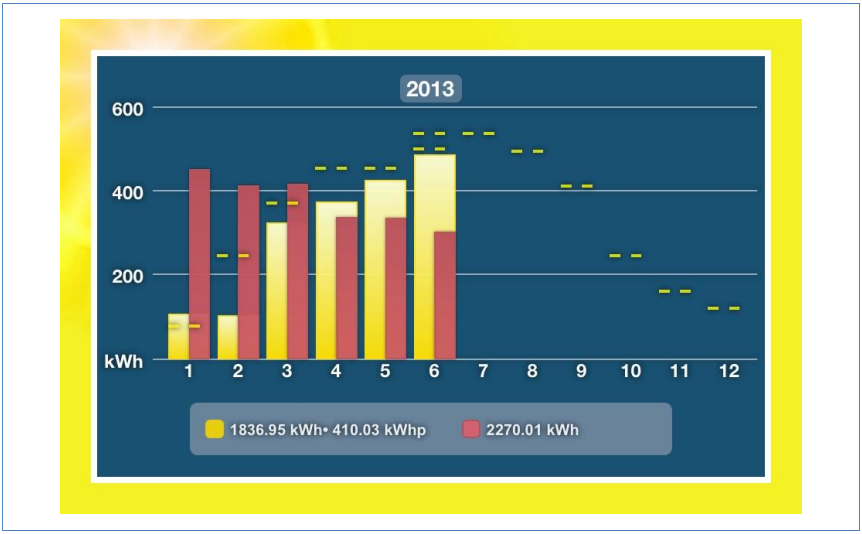
**23** Swipe to the left go to the next view or to the right to go back to the previous view.

**24** Swipe up or down to change the module views.

### 6.5.3 Annual Overview

**25** Touch the screen.
→ The bottom menu bar is displayed.

**26** Select ***Year*** to go the yearly values.




The monthly yields of the selected year are displayed as a bar graph. The dotted line in the view displays the plant's calculated target value based on the annual forecast.

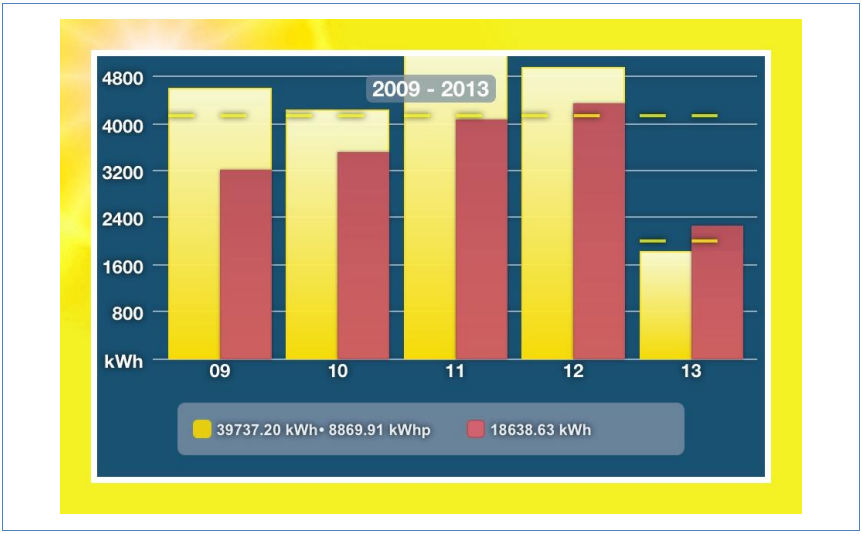
**27** Swipe to the left go to the next view or to the right to go back to the previous view.

**28** Swipe up or down to change the module views.

### 6.5.4 Total Overview

**29** Touch the screen.
→ The bottom menu bar is displayed.

**30** Select ***Total*** to go the total view.




The annual yields of the total view are displayed as a bar graph. The dotted line in the view displays the plant's calculated target value based on the annual forecast.

**31** Swipe up or down to change the module views.

## 6.6 Viewing $CO_2$ Savings

**32** Touch the screen.

→ The bottom menu bar is displayed.

**33** Select *CO2*.

→ The total accumulated amount of carbon dioxide emissions that have been prevented by your plant is displayed.


→ The $CO_2$ savings depends on how much $CO_2$ emissions are produced to generate 1 kWh of power. (g/kWh)

## 6.7 Retrieving Plant Data

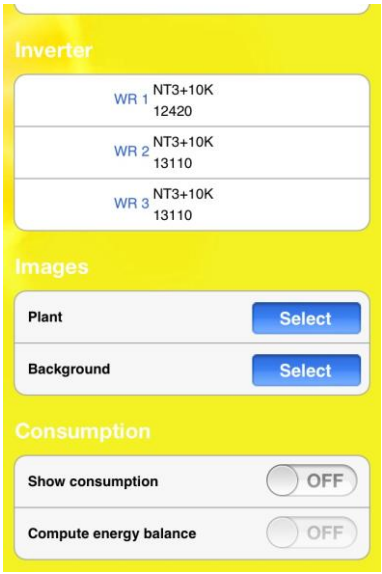
**34** Touch the screen.
→ The bottom menu bar is displayed.

**35** Select ***Plant*** to go to the page with the plant details.

The page displays the following plant data:

- Plant Name
- Location
- Module
- Inverter
- Plant size
- Installation Date

- Orientation of the plant and pitch of the modules
- Number of Modules
- Consumption
- Inverter Label
- Connected Senors



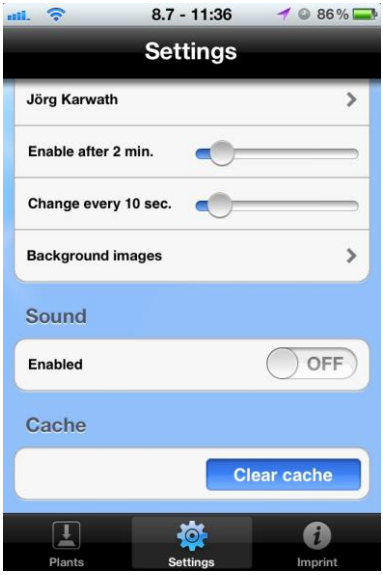

In addition, you can also adjust the following settings from these menu items:

- Images.
  → Select plant image.
  → Select background image.
- Consumption (can only be activated if a meter is connected).
  → Activate display power consumption (has to be manually activated)
  → Activate calculate energy balance (has to be manually activated)

## 6.8 The Yield Data as a Slide Show

With the slide show function, you can turn your iOS device into an "electronic picture frame". The "picture frame" alternates in displaying the various modules of the Solar-Log™ App.

The Slide Show function can be configured in the settings menu.



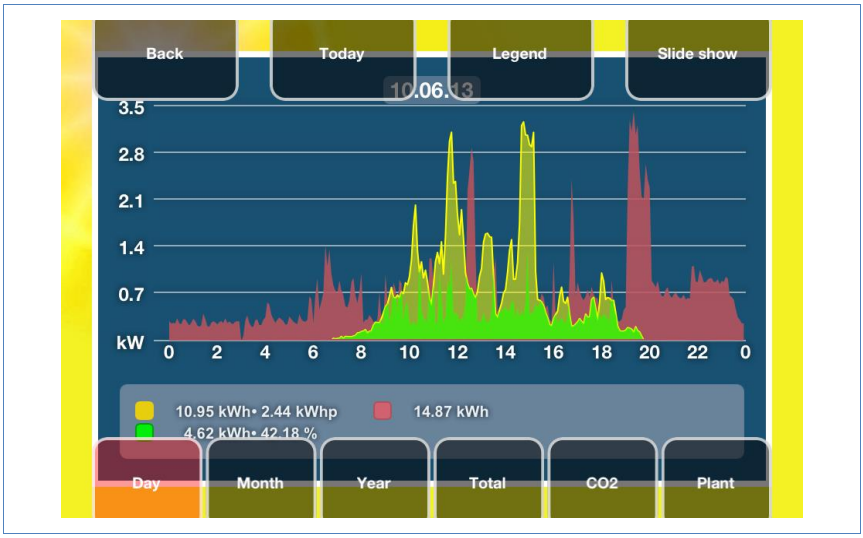

In addition to the activating the the Slide Show function, the options can be configured:

- Enable after - adjustable from 1 to 10 minutes.
  → Time settings for when the Slide Show starts
- Change every – adjustable from 5 to 60 seconds.
  → Interval in which the images switch.
- Background image.
  → Adjust which background image is set for the Slide Show.
- Sound.
  → Here the standard sound can be enabled. By default, this function is deactivated.
- Cache

→ Delete all of the App's cached data. It is necessary to restart the App.

### 6.8.1 Start the Slide Show

**36** Tap the screen. The menu bar is displayed.




**37** Select ***Slideshow*** from the top menu bar.

→ Now you can always see the current values.

# 7 Using the Solar-Log™ Android App

We offer a Solar-Log™ App for Android tablet PCs and smartphones to allow you to access your plant data at any time and from any location. The App is available for free from the Google Play store.

The App displays current and past yield data in a graphical form.

**Note**

The screen shots and instructions refer to using the Solar-Log™ App with Android tablets. The operating instructions for smartphones may differ. The differences are explained in detail in **Chapter 1.9** ↘ Using the Android App with a smartphone.

**Requirements**

Our Solar-Log™ App is compatible with every Android tablet PC and smartphone starting from OS version 2.3 Gingerbread (4.0 Ice Cream Sandwich is recommended).

The Solar-Log™ App runs with the server solution from C2 and the WEB Commercial Edition from Solare Datensysteme GmbH.

## 7.1 Installing the App

The App is available for free from the Play store.

**Loading the App**

1. Search for "Solar-Log" in the ***Play store***.
2. Follow the ***directions*** to download and install the App on your smartphone.

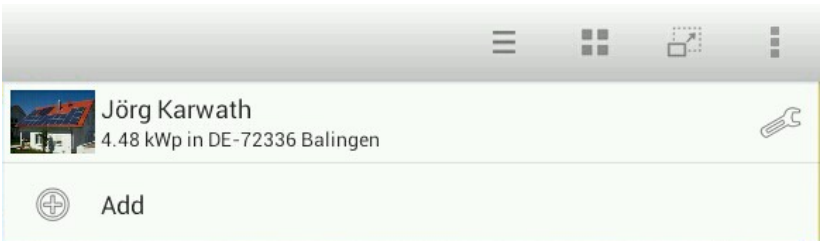
**Start the App**


**3** Start the ***App*** on your smartphone.
→ The start screen is displayed.

## 7.2 Add plants

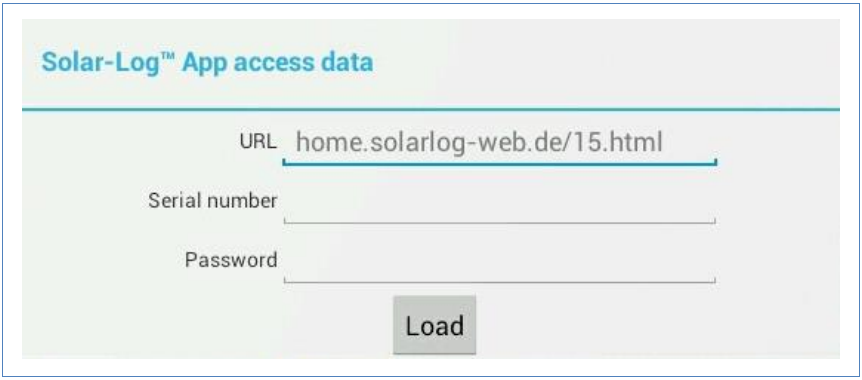
You can monitor as many plants with the App as are connected with a Solar-Log™.

**1** Touch the ☰ symbol in the toolbar.



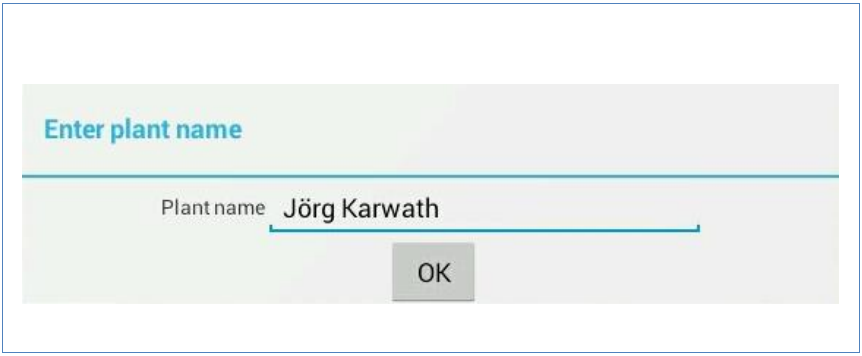

**2** Touch the ⊕ symbol.

→ The screen ***Solar-Log™ App Access Data*** is then displayed.




3 Enter the ***URL***, ***Serial Number*** and ***Password*** from the registration email that you received from Solare Datensysteme GmbH.

4 After that tap on the button ***Load***.



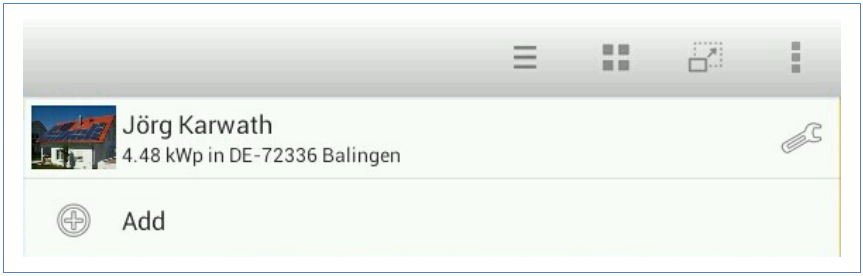

5 After that the ***Plant Name*** appears. Check that everything is correct and then touch ***Ok***.

6 The plant's current daily values will then be loaded. This can take a moment.

## 7.3 Plant Settings

By selecting add ***Plants*** , you can adjust the ***Settings*** for the view displayed.

1 Tap on to go the ***Plant***.




2 Tap on the symbol to get to the following settings:

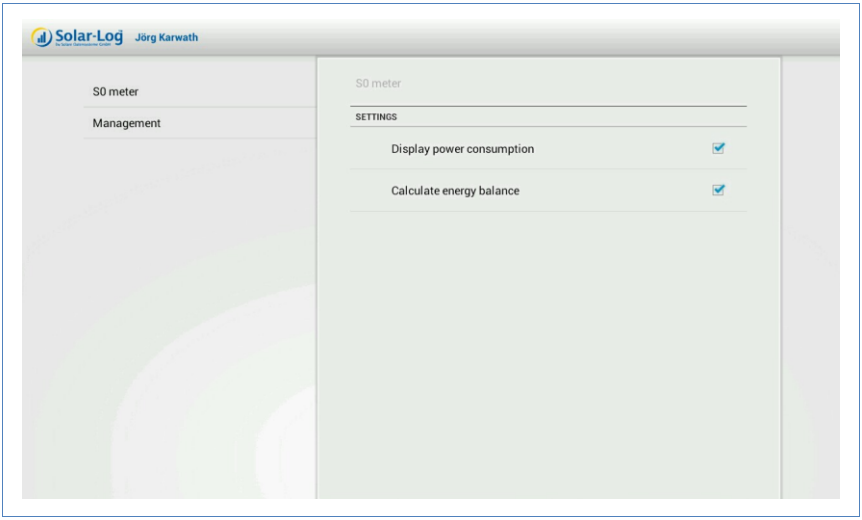
- S0 meter
- Management

### 7.3.1 S0 meter

By selecting ***S0 meter***, you have the option to adjust the settings for the view displayed.

1 Tap on the symbol to get to the settings.

2 Tap on the ***S0 meter***.



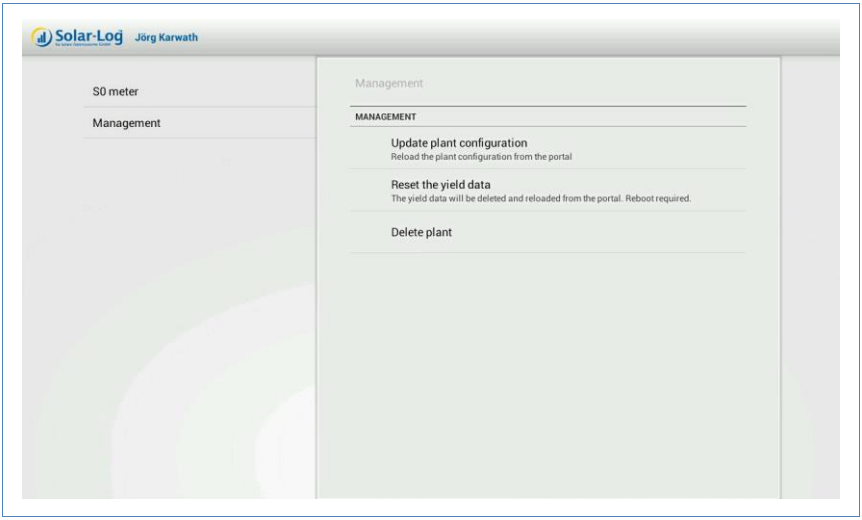

3 The S0 meter's view settings has the following options:
→ Display power consumption
→ Calculate energy balance

### 7.3.2 Management

Be selecting ***Management***, you can update the plant configuration, reset yield data or also delete the plant.

1 Tap on the symbol to get to the settings.

2 Tap on ***Management***.

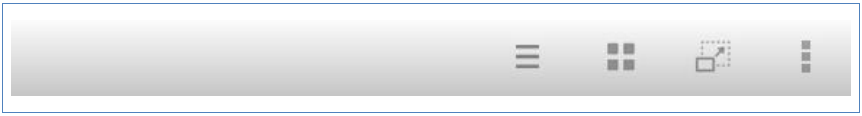



**3** In the ***Management*** section, the following options are available:

- → ***Update plant configuration***. Reload the plant configuration from the portal.
- → ***Reset the yield data.*** The yield data will be deleted and reloaded from the portal. Reboot required.
- → ***Delete plant.*** This plant can be completely deleted here.

## 7.4 The Toolbar

You can select the desired menu from the toolbar at the top right corner.



Use the symbol to add a plant. (See section **1.2** ↗)

By selecting the symbol, you can display various yield values. (See section **1.3** ↗)

- Day
- Month
- Year
- Total
- $CO_2$

Tap on the symbol to start the slide show. (See section **1.8** ↘)

By selecting the symbol, you can perform various actions. (See section **1.7** ↘)

- Update
- Today
- Settings
- End

## 7.5 Retrieving Yield Values

After your plant has been correctly recognized, the yield values are displayed with the current daily values in the overview.

**Note**

The data is only updated when your mobile device is connected to the internet.


By selecting the symbol, you can display various yield values.

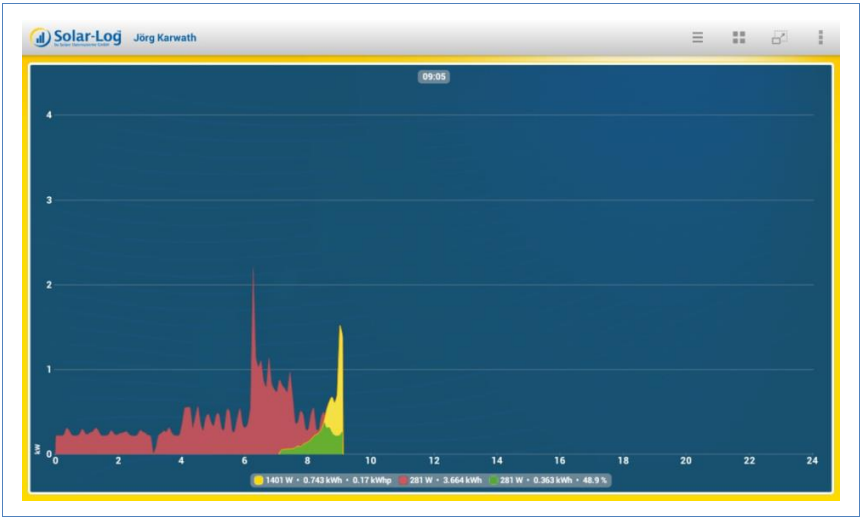
- Day
- Month
- Year
- Total
- $CO_2$

### 7.5.1 Daily Overview

1 Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

2 Select ***Day*** to go the daily overview.




3 Swipe to the left go to the next view or to the right to go back to the previous view.

4 Swipe up or down to change the module views.

### 7.5.2 Monthly Overview

1 Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

2 Select ***Month*** to go the monthly overview.


The daily yields of the selected month are displayed as a bar graph.

3 Swipe to the left go to the next view or to the right to go back to the previous view.

4 Swipe up or down to change the module views.

### 7.5.3 Annual Overview

1 Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

2 Select *Year* to go to the annual overview.


The monthly yields of the selected year are displayed as a bar graph.

3 Swipe to the left go to the next view or to the right to go back to the previous view.

4 Swipe up or down to change the module views.

### 7.5.4 Total Overview

**1** Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

**2** Select ***Total*** to go the total overview.


**3** Swipe up or down to change the module views.

## 7.6 Viewing $CO_2$ Savings

**1** Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

**2** Select ***$CO_2$***.

→ The total accumulated amount of carbon dioxide emissions that have been prevented by your plant is displayed.

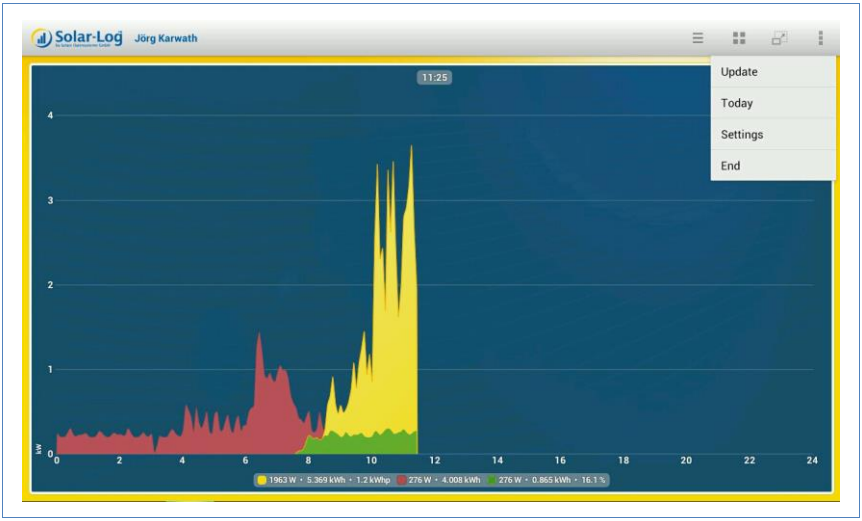

The savings shown is calculated using the quantity of carbon dioxide that would have been created in order to generate the same amount of energy using fossil fuels.

## 7.7 App Settings

Tap on the symbol in the toolbar at the top right corner of the screen.

→ The navigation screen then appears.

- Update
- Today
- Settings
- End




→ Select ***Update*** to update the plant's data.

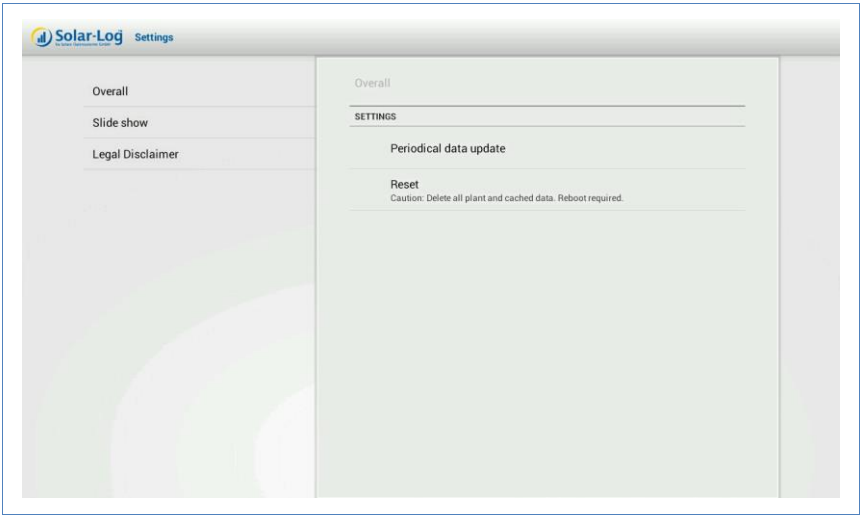
→ Select ***Today*** to leave the yield data and to switch to the current daily overview.

→ Select ***End*** to quit the application.

By selecting ***Settings*** from the menu, the following categories are available:

- Overall

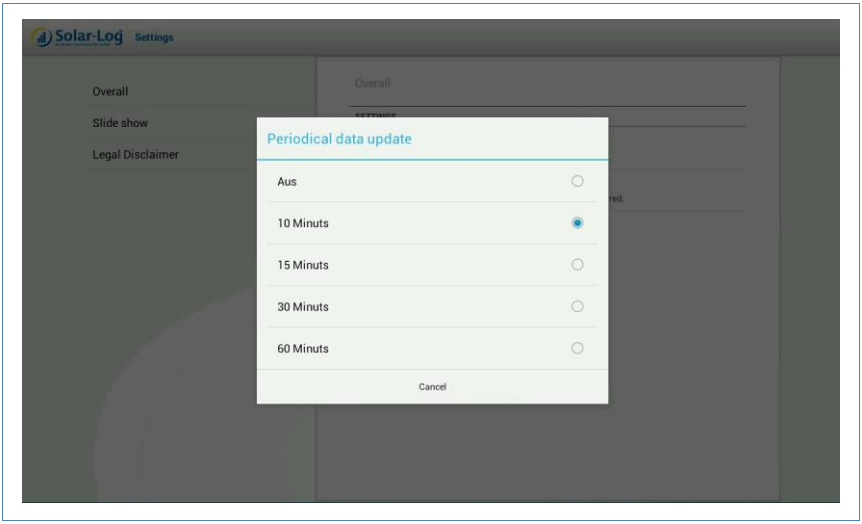
- Slide show
- Legal Disclaimer




### 7.7.1 Periodical data update

1 Under ***General***, tap on ***Periodical data update***

→ The following setting options will become visible.




2 Tap on the update interval to automatically update the data. The window automatically closes after the selection.

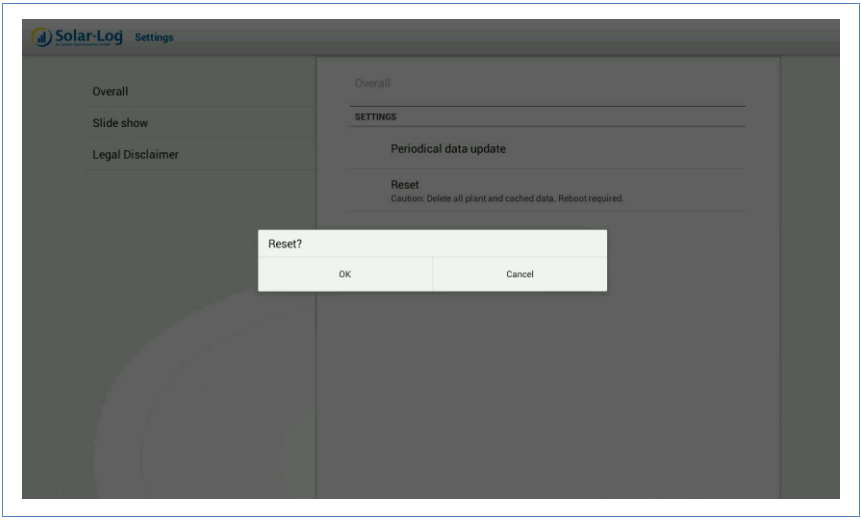
### 7.7.2 Reset

With the ***Reset*** function, you can delete all of the plants and cached data.

After tapping on ***Reset***, you will receive the following message:

→ Click on ***Ok*** to confirm the selection and to delete the plants and cached data. (The application automatically closes and has to be restarted.)

→ By clicking on ***Cancel***, you return to the main menu.

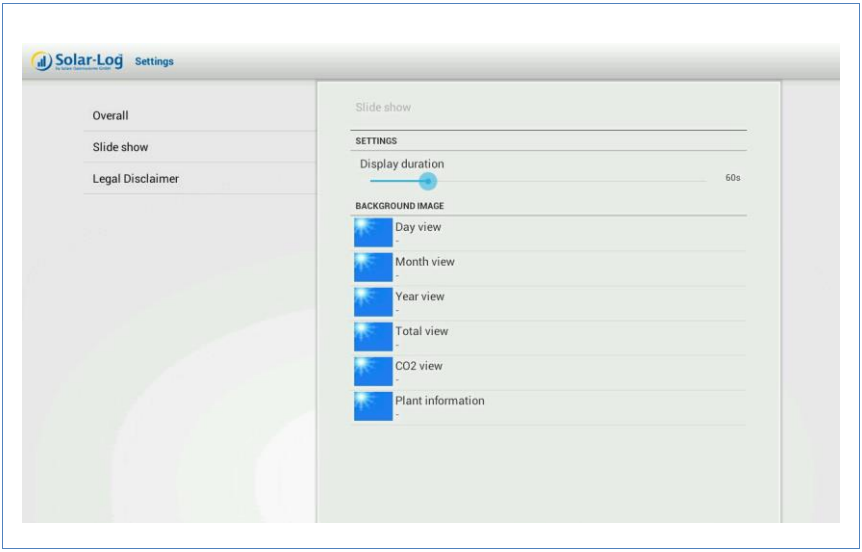



### 7.7.3 Slide show

In the ***Slide Show*** menu, you have the option to adjust the display duration settings and to select a background image.

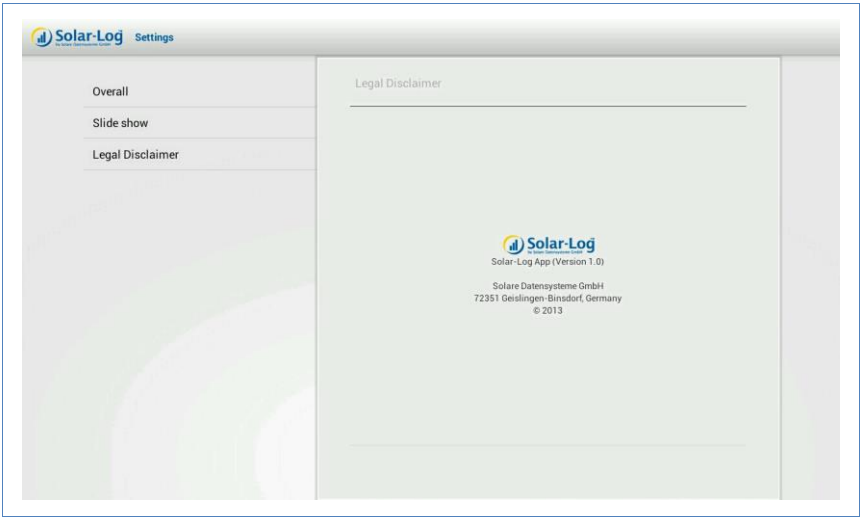
By selecting ***Slide Show***, the following settings are available:

- → ***Display duration***. You can determine after how many seconds the image should switch.
- → ***Background image***. You can select the background image that is to be displayed when the respective value is activated.




### 7.7.4 Legal Disclaimer

By selecting ***Legal Disclaimer***, you can see the App's version and who is legally responsible.




## 7.8 The Yield Data as a Slide Show

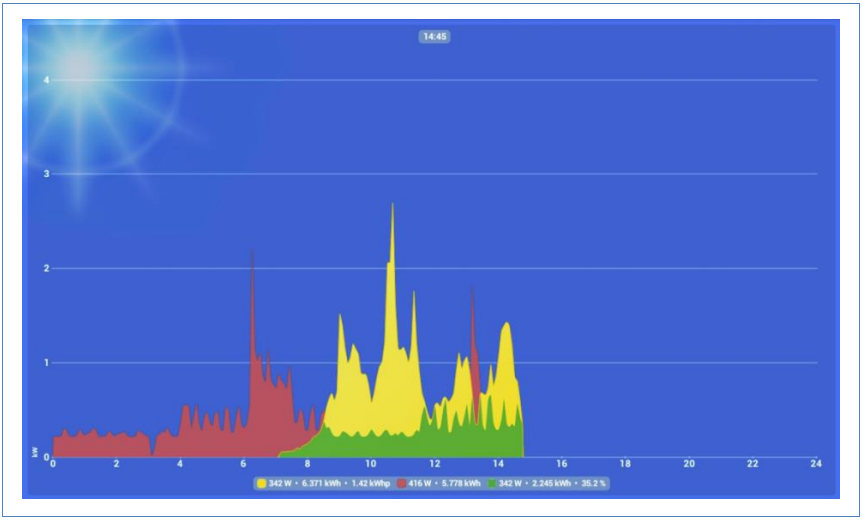
With the slide show function, you can turn your tablet PC or smartphone into an "electronic picture frame". The "picture frame" alternates in displaying the various modules of the Solar-Log™ App.

**Note**

Proper cradles to mount the device are available at specialist shops.

1 Tap the screen.

→ The slide show function appears in the top right edge of the screen by touching the symbol.




**2** Tap on and place your tablet PC or smartphone into a cradle.

→ Now you can always see the current values.

## 7.9 Using the Android App with a Smartphone

When using the Android App with a smartphone, some menus differ from those with a tablet PC.

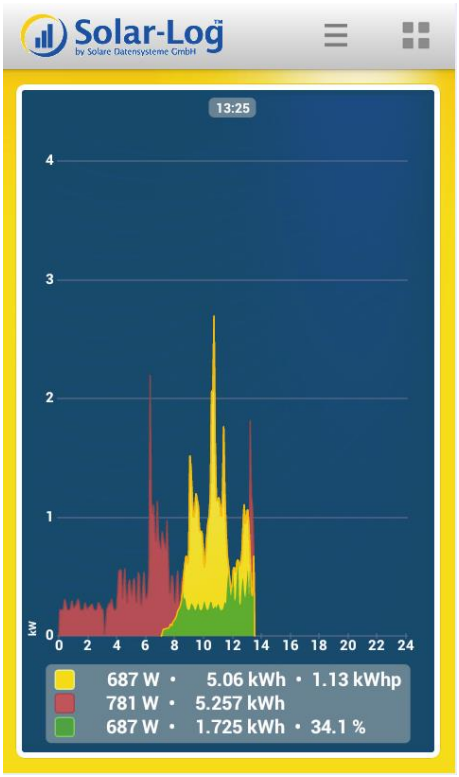
In contrast to the tablet PC, there are minor differences between the vertical and horizontal format.

The configuration possibilities for tablet PCs and smartphones, however, are identical.

### 7.9.1 Smartphone vertical format

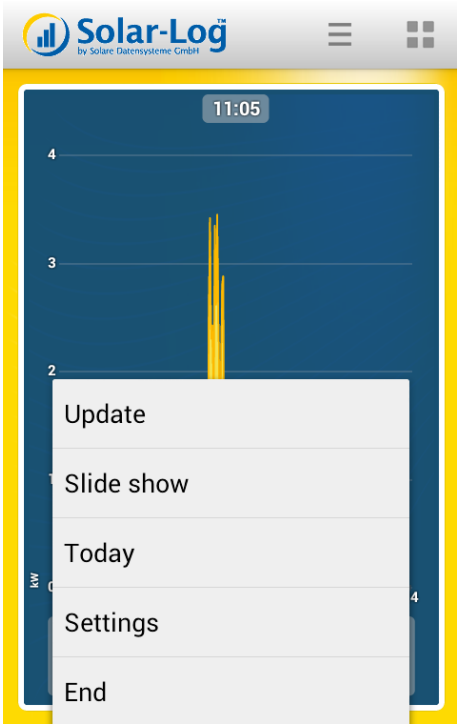
Use the ☰ and 🔧 symbols from the toolbar in the top right corner of the screen to add plants and adjust settings.

Similarly, use the ⊞ symbol to select the yield data.




When in the vertical format, click on the smartphone's ***Menu button*** for the ***App Settings*** and ***Slide show***. (See your smartphone's manual.)

After pressing the ***Menu button***, the options that are accessible with the  App settings symbol and  Slide show symbol on the tablet PC appear.

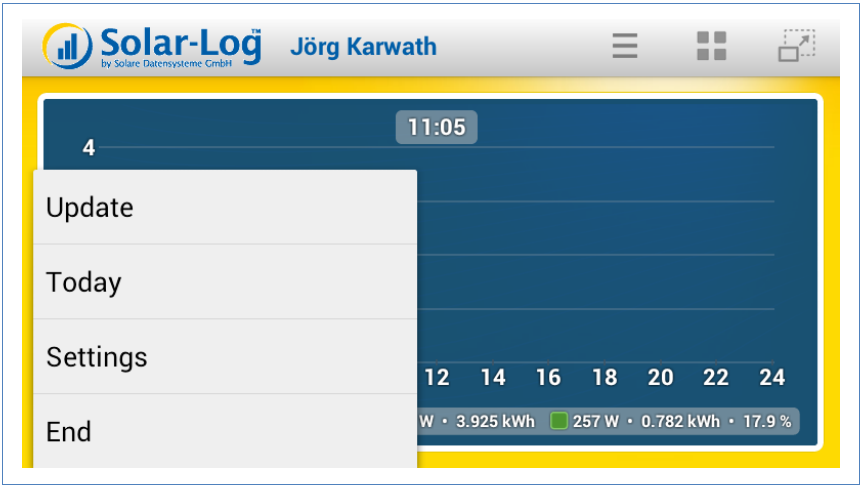



Use the ***Back button*** to return to the program.

### 7.9.2 Smartphone - horizontal format

The only difference between the horizontal and vertical format is that slide show can also be selected from the toolbar.

The App settings have to be accessed with the smartphone's ***Menu button***.




Use the ***Back button*** to return to the program.

### 7.9.3 Solar-Log™ Widget for Smartphones

With an Android smartphone, you can display yield reports from your plant with the Solar-Log™ Widget (Activating Widgets: see the user manual).

The Widget allows the plant's current daily yields to be display directly on your smartphone's home screen.

**Changing the view:**

The view can be directly changed in the App. All you have to do is tap on the Widget.

**Adjusting the size and positioning the Widget:**

Press on the Widget 1 to 2 seconds to change the size. A box with four points pops up. Move one of the four points to define the size.
To select the Widget's position, press down on the Widget and move it to the desired position.

**Note**

For Android versions less than 4.0, 2x1, 2x2 and HD can selected for the Widget.
Only HD is available for Android versions greater than 4.0.
The HD format for the newer Android versions, however, can be displayed in variable sizes.

# 8 Cleaning and care

## 8.1 Cleaning tips

**Caution**

Be sure to unplug the device prior to cleaning it!

- Clean the device on the outside only with a dry, lint-free cloth.
- If very dirty, the device can be cleaned with a slightly damp cloth and a commercially available household cleaner.

**Caution**

When cleaning, ensure that no moisture enters the device!

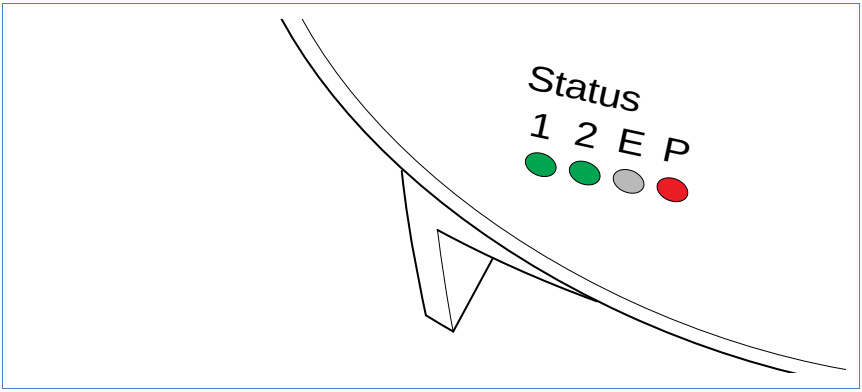
## 8.2 Care tips

- Ensure that the device is not exposed to any moisture at the location where it is kept.
- Ensure that the device is not exposed to any heat or strong sunlight at the location where it is stored.
  Please take note of the Technical Data (↗page 102).

# 9 Malfunctions

## 9.1 Status display for the LEDs

On the front side of the device in the lower left area there are four LEDs that show the operating status of the device.




Depending on the operating status, LED **1**, LED **2**, and LED **E** can flash quickly or slowly, be permanently illuminated or not be illuminated.

The red LED **P** indicates the power supply.

The LED **E** is generally not illuminated during normal fault-free operation. If it is illuminated or flashing, this indicates that a system malfunction has occurred.

**Normal operation**

| Normal operation | | | |
|---|---|---|---|
| **LED 1** | **LED 2** | **LED E** | **Meaning** |
| quickly | quickly | off | Max. 5 min.: Device starts |
| illuminated | slow | off | Import time via internet |
| off | quickly | off | Read configuration from inverter |

| Normal operation | | | |
|---|---|---|---|
| illuminated | illuminated | off | Normal operation, inverter online |
| illuminated | off | off | Normal operation, inverter offline |

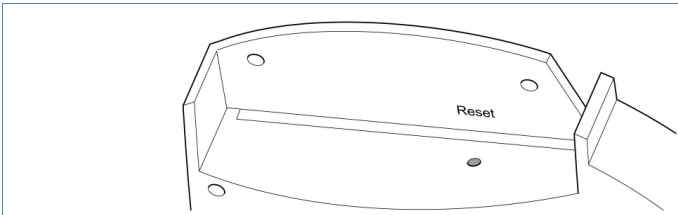
**System malfunctions**

| System malfunctions | | | |
|---|---|---|---|
| **LED 1** | **LED 2** | **LED E** | **Meaning and possible remedy** |
| quickly | quickly | off | For 5 min. during initialization: Error!<br>▸ Unplug power plug and plug in again. |
| illuminated | slow | slow | Import time via internet failed:<br>▸ Set time manually<br>▸ Check internet access |
| off | slow | slow | Configuration invalid or nonreadable:<br>▸ Check interface<br>▸ Check cable<br>▸ Perform re-start (↗page 100) |
| | | illuminated | **Only for Fronius inverters**:<br>No data communication!<br>▸ Wait until inverters import<br>▸ Check wiring |
| | | quickly | Plant has signalled a fault. |

## 9.2 Remedying faults yourself

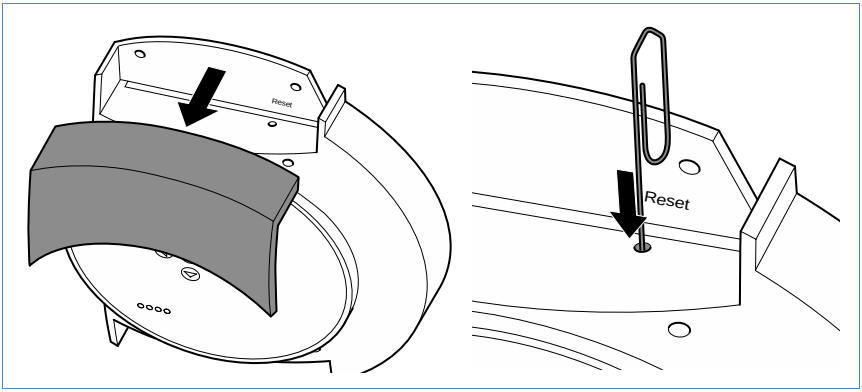
You can remedy faults yourself by restarting the device. A restart is necessary if the device no longer reacts to entries in the web browser. All of the settings made on the device remain in place, as does the saved yield data.

To restart the device, use the reset button at the top of the device.




**Opening the cover**

If the cover is fitted, you must first open the cover of the device.




- Pull the cover frontwards to remove.

**Performing a restart**

**1** Press the reset button e.g. with an open paper clip.
→ LED 1 goes out.

**3** Release the reset button.
→ After approx. 5 seconds LED 1 illuminates again.
→ After approx. 20 seconds LED 1 and LED 2 start to flash, the device restarts with the set values.

**4** Wait until normal operation has recommenced and then close the cover.

**Caution**
Do not perform a restart by pulling out the power plug!

### 9.2.1 Obtaining information from the internet

You can also obtain support for operating the device or the settings on our internet site under the following URL:

http://www.solar-log.com/en/service-support/technical-support.html

Here you will also find additional product information and manuals available for download.

### 9.2.2 Informing a specialist technician

Should problems occur with the Solar-Log$^{500}$ that are not able to be remedied using them measures described, we recommend that you contact your solar technician or our customer service.

The contact addresses for our customer service can be found on the back of the envelope.

# 10 Disposal

**Caution**

Your Solar-Log™ contains electronic components that can release highly toxic substances if burned or disposed of via the domestic garbage disposal system.

- Be sure to dispose of the Solar-Log™ in a recycling center as electronic scrap.

# 11 Technical data

| | |
|---|---|
| Supply voltage | 12V DC |
| Energy consumption | approx. 3 watts |
| Power supply | External wall power supply 12V DC |
| Dimensions in cm | 22.5 / 28.5 / 4 (W x H x D) |
| Housing | Plastic housing, passively ventilated |
| Interfaces | Ethernet RJ45 bushing 10/100MBit<br>RS485/RS422 combined<br>S0 impulse in/output (in accordance with DIN43864 and DIN62056)<br>Reset buttons |
| Memory capacity | 8 MB RAM + 2 GB SD RAM (internal only) |
| Protection class | IP 20 (exclusively for inside use) |
| Temperature range | -10°C to 50°C |
| Display | 4 LEDs for status displays |
| Mounting | Wall mounted |
| Weight | 0.61 kg |

# Glossary

| Term | Meaning |
|---|---|
| Account | User account on a server into which the user must log with their name and password. |
| App | Abbreviation for application, programme |
| Back-up | Data back-up A method of archiving or to ensure against loss of data. |
| Browser, web browser | Programme used to display internet sites in the worldwide web |
| Derating | Loss in power of an electronic component depending on the surrounding temperature, e.g. decrease in output delivered in order to protect against overheating. |
| DHCP | Dynamic Host Control Protocol. Characteristic setting in local networks in which the IP addresses for the connected devices are assigned by the router. |
| Firmware | Operating system for your device |
| Gateway | Router that serves as a "gateway" for network access from outside, e.g. via the internet. |
| iOS | iOS is an operating system from Apple for mobile devices. |
| IP address | Network address for the device. Each device in the network is identified by its own number. This number consists of four blocks of maximum three figures. The network address is usually assigned by the router. |
| Local network | Several computers or network-compatible devices that exchange data with one another within a closed area. |

| Term | Meaning |
|---|---|
| MPP | The Maximum Power Point (MPP) is the point of maximum output. It is not constant but depends on the irradiation intensity, the temperature and the type of solar cells. |
| PDA | Personal Digital Assistant, a form of mobile computer |
| Server | Computer in the local network or internet which provides the available data to authorised users. |
| SMS | Short Message Service. Transfer of short messages in text form. They can be received by numerous types of mobile phones. |

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