AEG

IMM TECHNOLOGY

IMM WEB PORTAL: OPERATION MANUAL

www.aeg-industrialsolar.de

TABLE OF CONTENTS

0 - GETTING STARTED

1. The computer must have an internet connection.
2. Recommended browsers are Mozilla Firefox and Google Chrome.
3. Resolution of the monitor should be higher than 1280*600.

0.1 - Login

To access the Webportal, enter the following address::

www.imm-portal.com

Figure 1: Start page with the possibility to change the language (upper left)

Select first the language in which you want to use the Webportal. The Webportal is currently available in English, German, and Chinese. In order to access the Webportal, you will need the corresponding login data. These will be given to you by the IMM team. To request them, click the "REGISTRATION" button. (Figure 2)
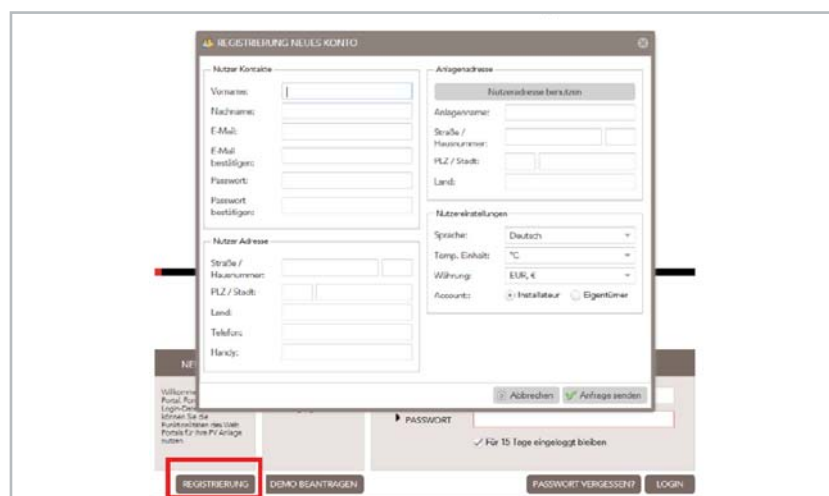

Figure 2: Webportal Registration

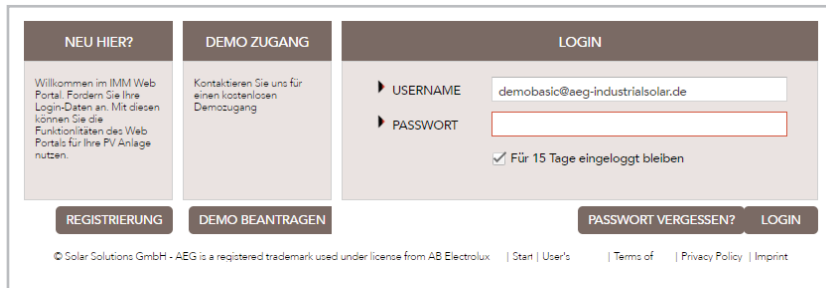After receiving your login data, you can now login to the Webportal by typing in your login data and clicking on "LOGIN".

Figure 3: Webportal login page

You are now logged in, and all your personal data are stored and can be edited via "My Profile" button.

1 - PLANT SELECTION

After successfully logging in you are now on the start page of the Webportal. From here you can navigate to various areas, access information, and change settings. In addition, an overview of the first plant on the list is shown. To display an overview of another plant, select the required plant from the drop –down list in "Plant selection".

Figure 4: Start page of the Webportal after logging in - with plant overview and plant selection

2 - MONITORING & ANALYSIS

To access monitoring functions, click on Monitoring & Analysis tab > Plant Status, and the following functions will show.

1. Total Overview: shows the total generated current since commissioning in kWh. To view the amount in EUR click on "€" button.

2. Yearly Overview: shows the total generated current during a selected year in KWh. To view the amount in EUR click on "€" button.

3. Monthly Overview: shows the total generated current during a selected month in KWh. To view the amount in EUR click on "€" button.

4. Messages: shows the current errors and warnings in the plant. (For more information on this, check section 3.1)

5. Location: shows the exact location of the power plant on a map.

6. Actual Power.

7. Harvest Index: shows the total ratio of the actual generated energy in kWh to the peak power in kWp (kWh/kWp) for the last 365 days.

8. Actual Performance: shows the percentage of the ratio for the actual generated energy in kWh to the expected energy in kWh (%).

9. Info.

10. Plant Photo.

Figure 5: Start page of the Webportal with the selected plant overview

The bar chart in Figure 5 displays the total produced energy of the plant last week. More information such as actual power, actual performance, and the harvest index are displayed below the chart. It is immediately apparent, for example, whether the system has errors or is running normally. Furthermore, by clicking on "Details" from "Actual Performance", more detailed information about the performance of the plant compared to the previous year can be

displayed, and the period can be changed from the drop-down menu in "Period". (Figure 6)

Figure 6: "Details" window for performance comparison

Monitoring & Analysis consists of five tabs as shown in Figure 7. By default, you are initially on "Charts & Statistics" tab. "Simulation" tab is only available if you have connected an irradiation sensor.
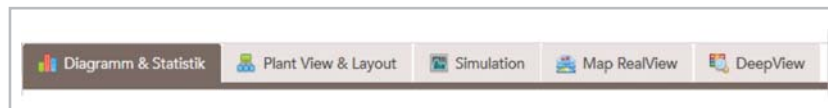

Figure 7: "Monitoring & Analysis" tabs

2.1 - Chart & Statistics

Here you get a detailed overview of inverters, strings, and individual modules. [1]
Adjustable time periods: daily, weekly, monthly, and yearly as well as a custom time period. [2]
Adjustable subdivision: quarterly (15 minutes), hourly, daily, weekly, and monthly. [3]
Selectable parameters: Output in kWh, Gain in €, Voltage in V, Current in A, kWh/kWp, Performance %, and Temperature in °C. [4]
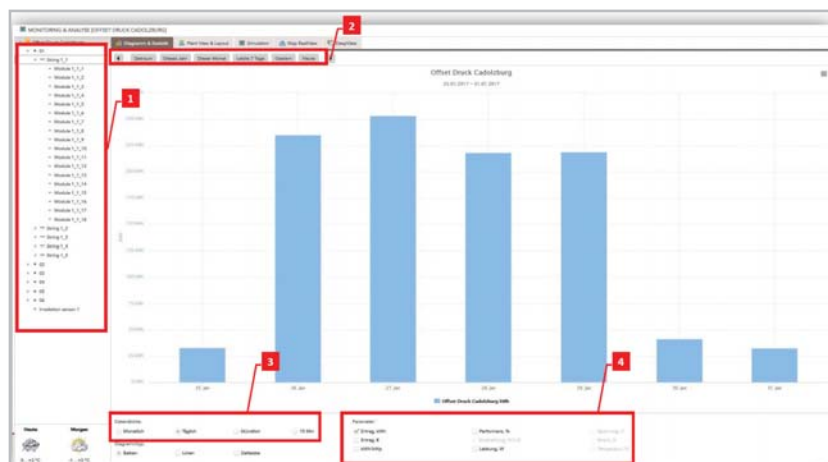

Figure 8: Charts & Statistics

The following bar chart shows the output in kWh of the plant "Offset Druck Cadolzburg" from 16.12.2016 to 22.12.2016 for the module 6_3_10.
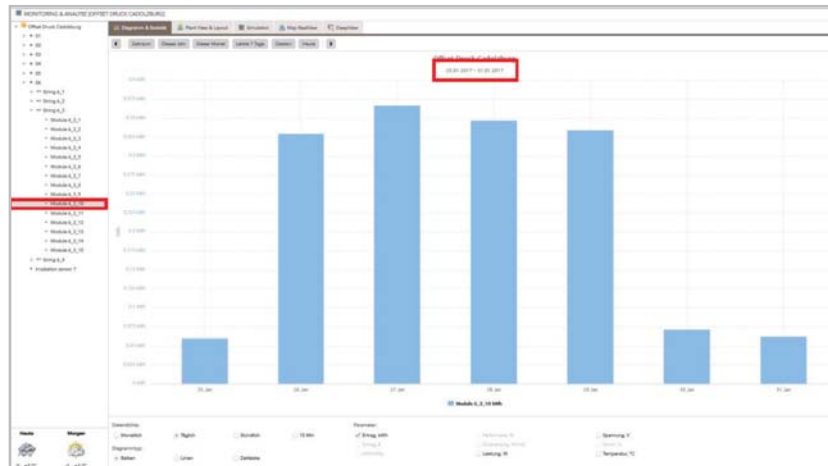

Figure 9: Output diagram for module 6_3_10 for the time period 16.12.2016-22.12.2016.

You can also change the chart type from the "Chart Type" menu [5]. A weather forecast for the current day and the day after is displayed on the lower left corner [6]. The individual components of the inverters up to the module can be opened up from the drop-down menu on the left column.
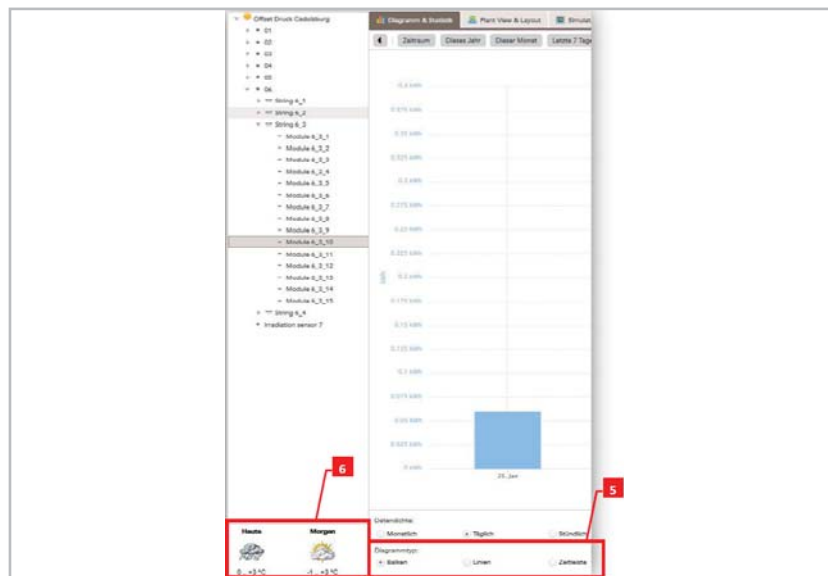

Figure 10: Modules of string 6_3 from inverter 06 in the drop-down menu.

Several modules can be selected at a time and compared to each other by pressing and holding the "Strg" key as shown in Figure 11.
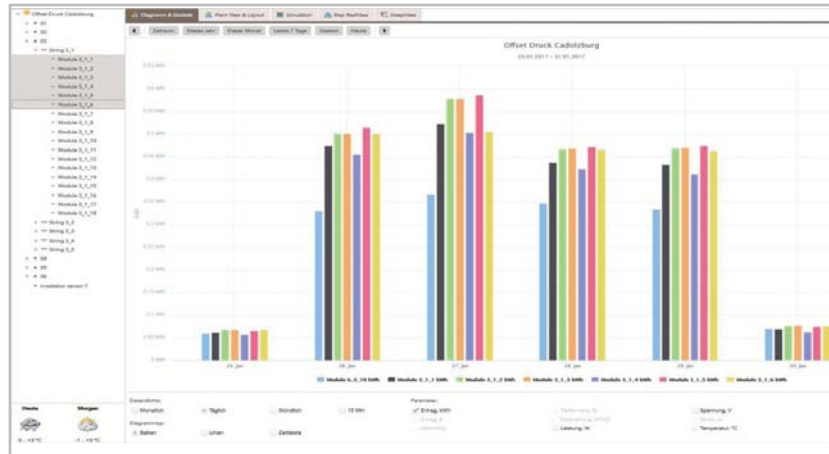
Figure 11: Comparison of several modules at a time

This can also be done on strings and inverters. If you want to compare all modules of a string with each other, it would be easier to use the "Shift" key. To do so click on the first module of the string, then press and hold the "Shift" key and then click on the last module. All modules in between will be highlighted as well.
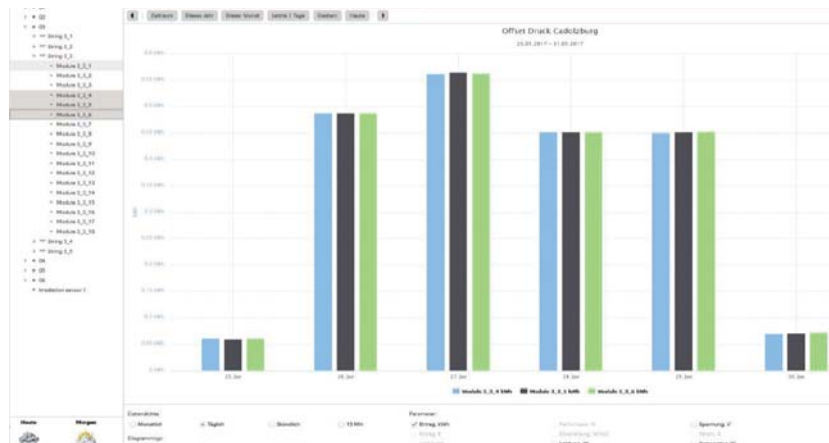

Figure 12: Comparison of the output power of three modules

Information on the modules for every string can be obtained from the "Modules Performance" window. To do so right-click on the desired string and then choose "Modules Performance". (Figure 13)
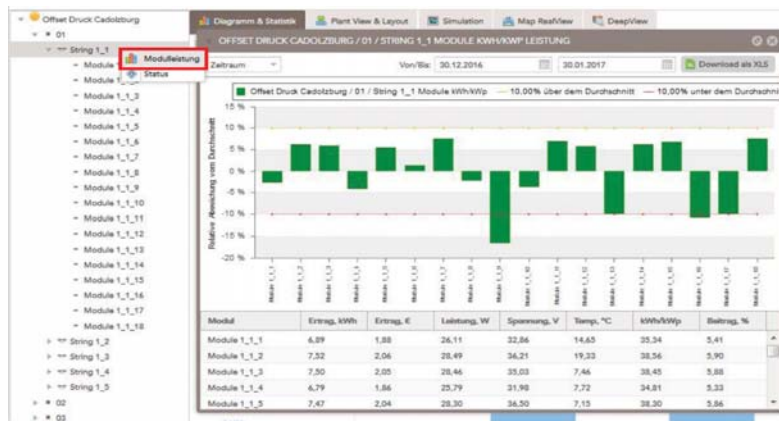

Figure 13: Opening the module performance window

The yellow line marks 10% over the average value, whereas the red line marks 10% below the average value. These lines are the limits for the acceptable range. From the module listing below the chart, important data such as power and gain can be obtained. The time period can be adjusted above the chart. This information can be downloaded as an excel file (Figure 14).
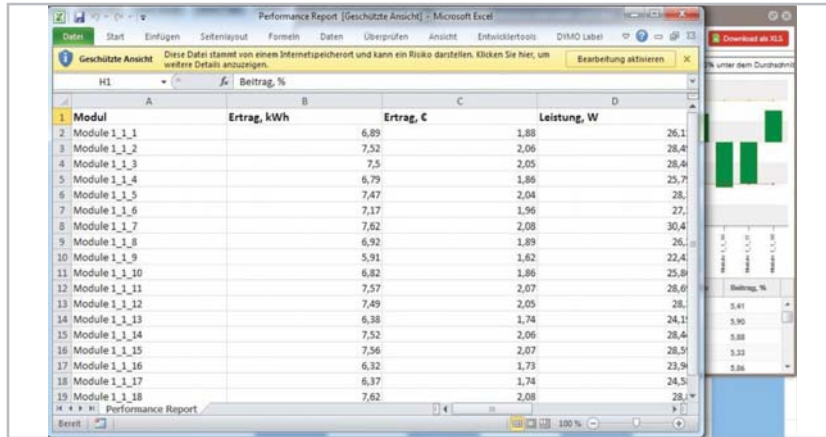

Figure 14: Excel file of the modules' performance.

The status of each module can be seen in the „Status" window. Current data can be read from the „Status" window afterwards. (Figure 15)
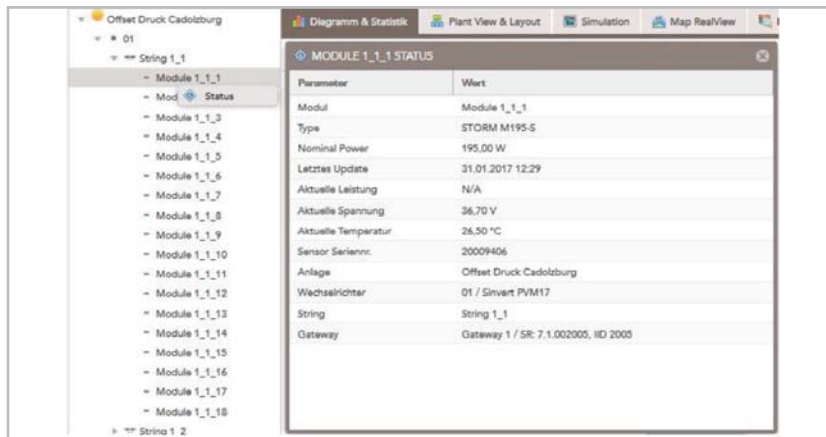

Figure 15: "Status" window for module 1_1_1

2.2 - Plant View and Layout

You can find a location plan of the modules of your power plant in the "Plant View & Layout" tab (Figure 16). This can be helpful in repair for example to determine the position of specific modules.

Navigation through the location plan is done through the mini-map on the upper right corner of the window. Also through choosing an inverter, string or module from the drop-down list on the left column, the selected modules will be shown and marked green on the location plan.

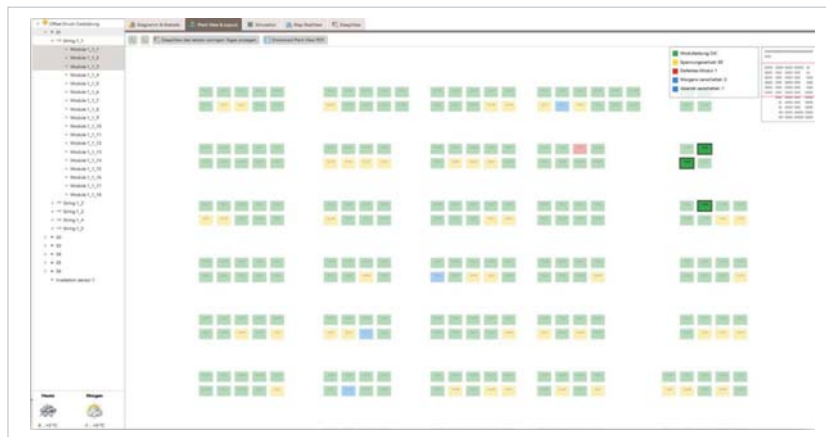

Figure 16: Location plan with marked modules.

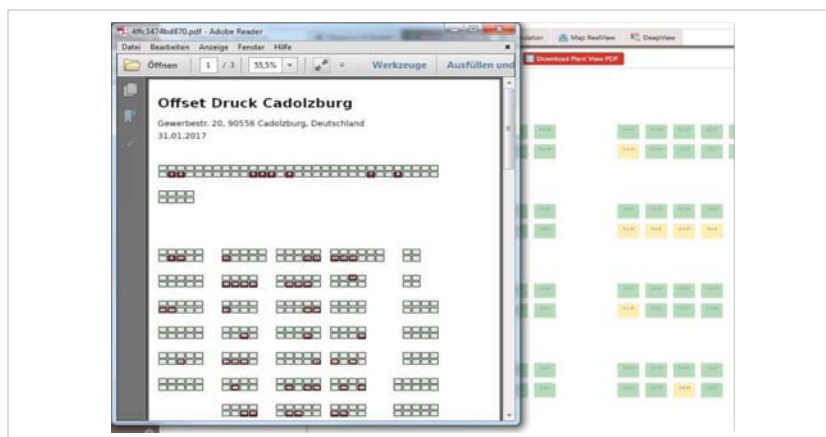The Plant View can also be downloaded as a PDF file.

Figure 17: Plant View in a PDF file.

2.3 - Map RealView

The Map RealView is perfectly suited to get a good overview of the location of the power plant. This is especially important when work on site is planned. Information that can make the work easier can be collected. Is the power

plant located on a roof or free space? Are helping tools such as a scaffold or a ladder required? Where and how is the power plant accessible? The map view can be changed alternatively between map and satellite on the upper left corner.

Figure 18: Map RealView of the plant "Offset Druck Cadolzburg"

2.4 - DeepView

The last tab is the so-called DeepView. It shows the power of all the modules of the selected components colorfully, so that defected modules can be immediately identified.

Figure 19 shows the DeepView for string 1_1. This means all modules connected to string 1_1 are marked with colors according to their power during any time period. The color palette ranges from blue (0 Watt) over yellow (100 Watt) to red (>150 Watt). The color scale is also shown on the upper right corner. The respective modules are shown on the vertical axis, and a time beam is for a chosen time period is shown on the horizontal axis.

The modules are colored blue at night because nothing is produced at night. In the course of the day the power increases till it reaches its peak at noon, then it drops. Vertical lines in the chart are due to cloud cover.
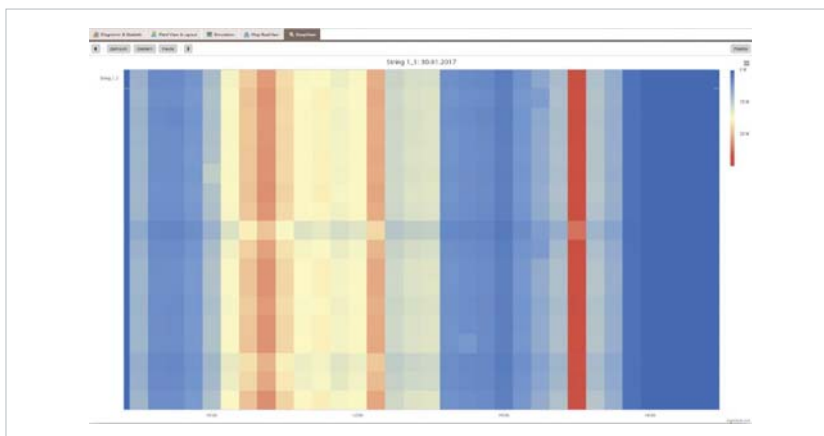

Figure 19: DeepView of string 1_1

3 -PLANT MAINTENANCE

3.1 - Fault Management

The errors and warnings of the modules can be seen in Fault Management. Errors identify problems that should be resolved urgently. Warnings can be sometimes from shadowing or a sensor that doesn't function. These are therefore not urgent, but they should be examined and resolved if possible. If the problem is identified and can't be fixed, then you can mark it and move it to the "Maintenace History" with the button "Ignore". These errors will not be shown in the future.
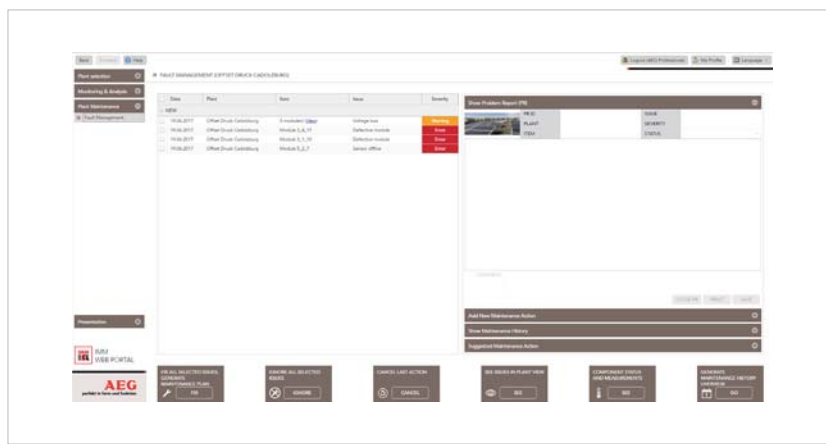

Figure 20: "Fault Management" window

Errors are displayed on the left window. You can find the position of the module by clicking on PlantView. Similarly you can retrieve measurement data and status of the module.
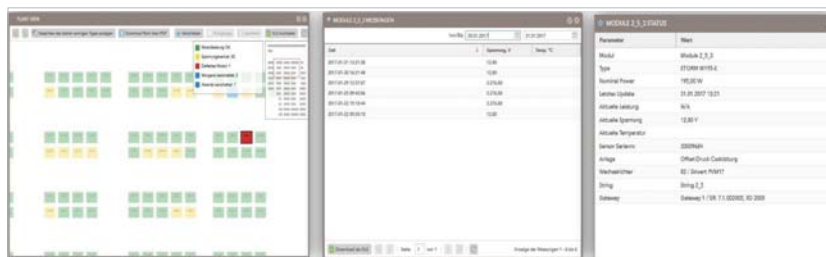

Figure 21: PlantView, measurements, and status of a defect module.

Table 1: Possible error messages and counter-measures are listed in the following table.

Error message	What to do
Sensor offline	Replace sensor / Ignore because it is not yield relevant
String Reader offline	Replace string reader
Power plant offline	Restart the gateway and router, check the internet contract
Shading in the morning / evening	Eliminate shading, if not possible then ignore the error message
Voltage loss	Check the module for dirt / shading. If no dirt or shading, then replace the module
Module defective	Check the connection socket. If it is ok, then check the module for shading. If no shading, then replace the module.
Cabling error	DC conduction of the string is interrupted, check immediately
Weak string	The string performs comparatively little, even when there are no errors in the modules. Check the string
Various inverter errors	Fix the error according to the inverter manual
PID	PID is present in the string, fix

3.2 - Add input & History

Here you can enter the service performed at the power plant. That way you can always have an overview of the work done. This can also be downloaded as a PDF file.
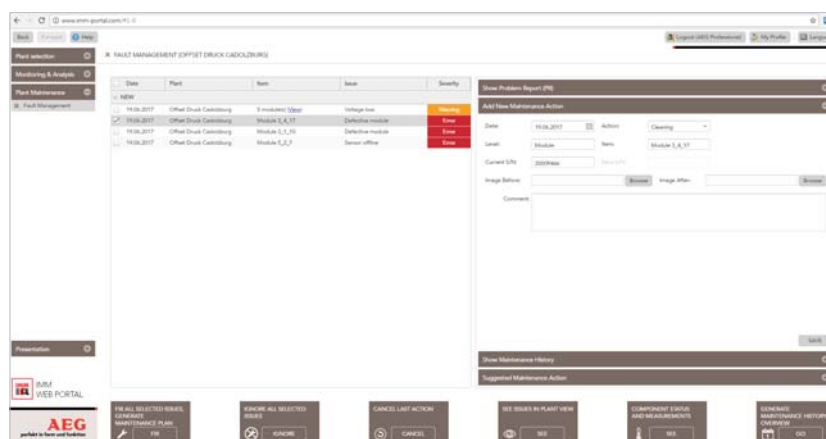

Figure 22: Add Input & History

To add a new entry, choose the component and service, and then click on "SUBMIT INPUT". Uploading pictures and adding comments are optional.

4 - REPORTS

4.1 - E-Mail Subscription

This page offers the possibility to receive automatically generated emails about the power plant status. The desired parameters are added by clicking on "Add subscription".

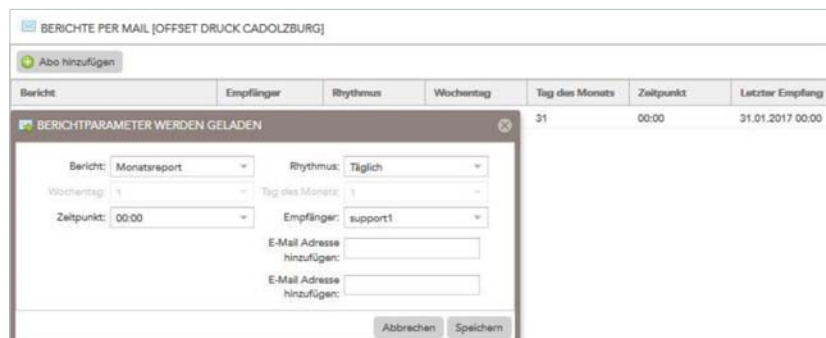*Figure 23: E-Mail Subscription*

Figure 24: Adding an e-mail subscription

You can choose between daily, weekly, and monthly from „Recurrence" tab.
You can also add two additional e-mail addresses.

4.2 - Plant Overview

The power plant overview provides a quick overview of the kWp, power, gain, and alarms of the power plant. In the case of several power plants in your portfolio a clear representation of the different locations and gain data is shown. You can save this data on your computer with the "Download as XLS" button. Also the data level (inverter, string, module) can be chosen.

4.3 - Monthly Report

A report for the plant in the respective month is listed in this tab.

5 - PLANT CONFIGURATION

5.1 - Fault Notification

Similar to section 4.1, you can add an email address here to get the error messages. You can choose to be informed about new errors daily or weekly. If there are no new errors, you will not receive an email.

Figure 25: Adding e-mail notification

5.2 - Documents

Here you can upload documents of your plant such as invoices and plans, write and save notes, and organize all documents related to your plant..

6 - PRESENTATION

6.1 - LCD Statistics

This tab is used to display data and graphics on an external monitor. For example, waiting customers in your company's entrance hall can get some information about their PV plants. Check the option "Autoswitch" to make the LCD statistics automatically switch between output, power, CO_2 saved, and the different time periods.
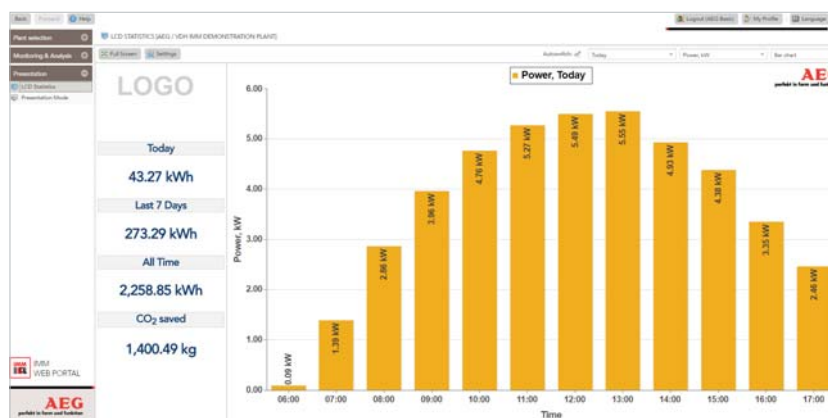

Abbildung 26: LCD Statistik

You can also press F11 to expand the browser window so that the address line is hidden.

6.2 - Presentation Mode

Similar to the LCD statistics, the presentation mode serves as information and advertising page for the customers of your company, where the amount of CO2 saved is compared to different forms of energy consumption such as domestic heating oil. Unlike the LCD statistics, the presentation mode is static, which means that the displayed values are only updated in longer time intervals. The logo of your company can be placed on the upper left corner. To do so, click on "Settings" and upload the logo image.
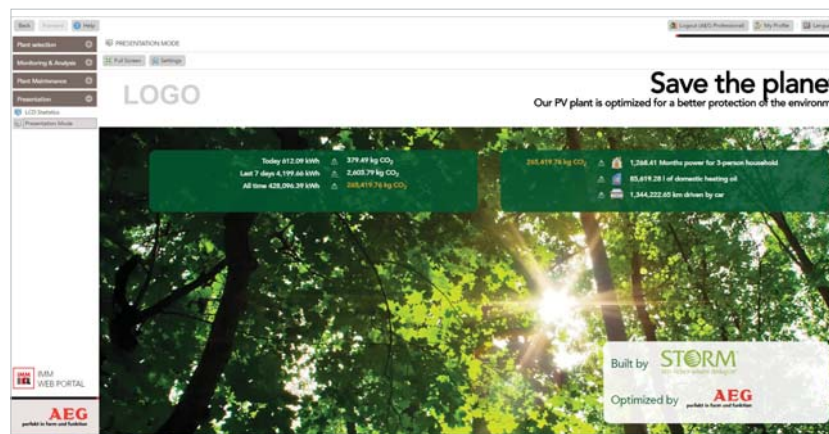

Figure 27: Presentation Mode

7- FREQUENTLY ASKED QUESTIONS

An error message is displayed in the Webportal. What am I supposed to do?
Read the error message in "Plant Maintenance" and follow the tips in Table 1.

How can I find out where the error is located in the plant?
The exact position of the error is shown in PlantView (except if the error is from an inverter). PlantView can be accessed from the menu "Monitoring & Analysis" from the tab "Plant View & Layout". You can also check where the error is from the list of errors in the menu "Fault Management".

My plant is offline. What am I supposed to do?
Check and restart the router as well as the gateway. Double check if all the Ethernet cables are correctly plugged in. Check if the contract from the internet provider is still valid.

Where can I see how well my plant is operating?
This information can be retrieved directly from the page "Plant Status" from the menu "Monitoring & Analysis". (Figure 15)

Who sets up my plant on the Webportal?
The plant installer is the one who usually sets it up on the Webportal.

8 - CONTACT

Solar Solutions GmbH
Schneckenhofstrasse 19
60596 Frankfurt am Main, Germany
www.aeg-industrialsolar.de
info@aeg-industrialsolar.de