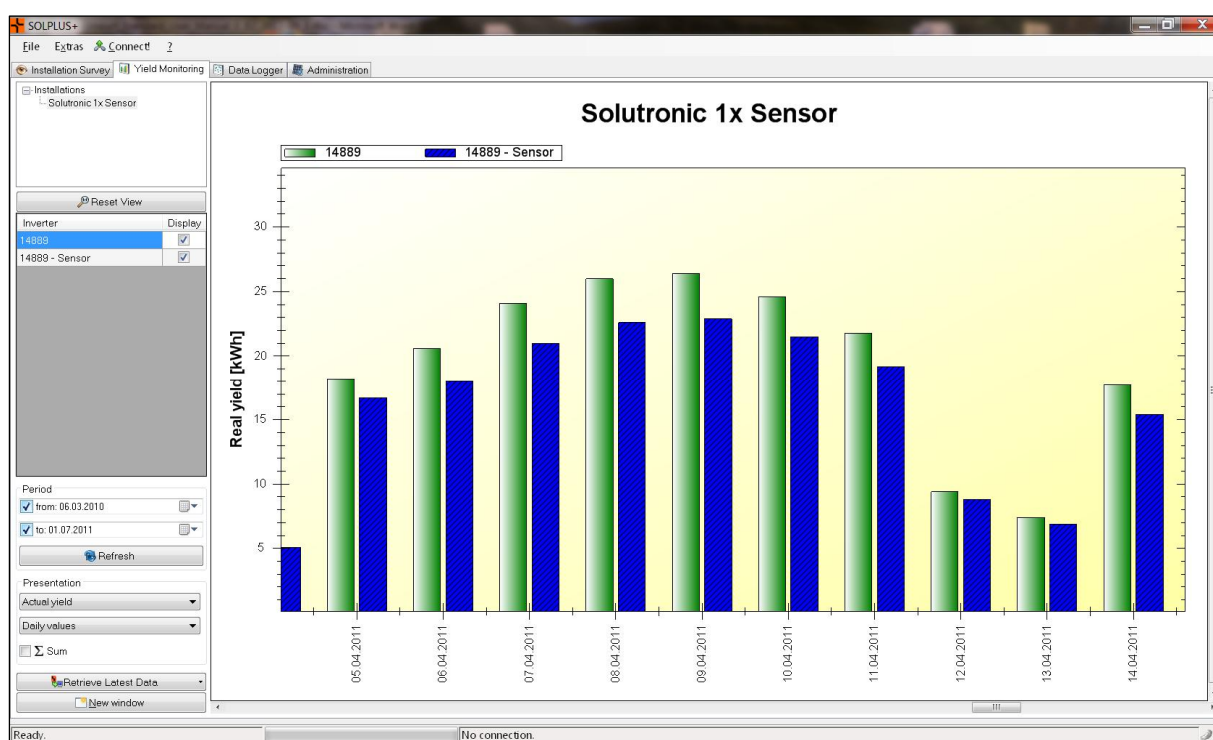


User Manual SOLPLUS+ (Standard and Comfort) As of Version 2.5



SOLPLUS

User Manual SOLPLUS+ SOLPLUS+
(Standard and Comfort) for
SOLPLUS 25 – 55, SOLPLUS 100 and 120
DS/ 2012-03 Version: B3, Subject to change without prior notice

Contents

User Manual SOLPLUS+	1
1 Notes About The SOLPLUS+ User Manual Standard	4
1.1 Scope.....	4
1.2 Symbols used in this document.....	4
2 Introduction.....	5
3 SOLPLUS+ System Requirements	6
3.1 Operating system	6
3.2 Hardware	6
4 Installing SOLPLUS+	7
4.1 Initial installation	7
4.2 Installing the latest version of SOLPLUS+ over an existing version	7
4.3 Installing SOLPLUS+ Comfort.....	7
4.4 Transferring SOLPLUS+ data to another PC	8
4.5 Restoring an old database status.....	8
5 Making SOLPLUS+ Settings on the PC.....	9
5.1 Setting up a PV installation in SOLPLUS+	9
5.2 Further settings.....	12
5.3 Types of connection between the PC (SOLPLUS+) and inverters	12
6 Data Evaluation	16
6.1 Installation Survey	16
6.2 Yield monitoring.....	18
6.3 Data logger	21
6.4 Yield/string logger.....	23
7 Chart Functions	26
8 Energy Management.....	29
8.1 Switching principle: activation time and duration	29
8.2 Switching principle: PV power output level.....	32
8.3 Switching principle: temperature threshold	33
9 Reading Inverter Data and Changing Settings	36
10 Setting the Time in the Inverter(s)	38
11 Reading and Saving Inverter Files	39
12 Exporting Data	41
13 SOLPLUS 100/120 Firmware Update	44
14 Advanced Features of the SOLPLUS+ Comfort Version	46
14.1 Installation Search Function.....	46
14.2 Group function.....	47
14.3 Automatic Yield Data Retrieval	49
15 Appendix: Types of Connection from the Inverter to the PC.....	52
15.1 RS232	54
15.2 RS485	55
15.3 Analogue or GSM modem.....	56
15.4 Ethernet (TCP/IP).....	57

1 Notes About The SOLPLUS+ User Manual Standard

Thank you for buying a Solutronic AG SOLPLUS solar inverter with SOLPLUS+ read-out and evaluation software.


1.1 Scope

This manual applies to the programs SOLPLUS+ Standard and SOLPLUS+ Comfort, which can be used to read out and evaluate the data of PV installations equipped with inverters from Solutronic's SOLPLUS family of solar inverters.

The user manual for the enhanced-function SOLPLUS+ Professional version of the program can be downloaded from our website at www.solutronic.de.

1.2 Symbols used in this document

Please pay attention to the following symbol while reading this manual.

	Note
Useful information and tips to help you use the SOLPLUS+ software.	

Solutronic AG
Küferstrasse 18
73257 Köngen
Germany

Tel.: +49 (0)7024 96128-0
Fax: +49 (0)7024 96128-50
info@solutronic.de
www.solutronic.de

2 Introduction

SOLPLUS+ offers the following basic functions:

- **Inverter configuration:** In the same way as with the display, you can use SOLPLUS+ to configure your inverter how you want it. You can, then, use the PC to enter a password and then alter all settings that are not relevant to safety.
- **Reading out and saving inverter data:** You can save set values, yield data and the values of the data logger.
- **Data evaluation graphics:** You can display the values of the yield memory, the data logger and string logger in the form of graphics.
- **Energy management:** This function enables you to control the relays and digital outputs in the inverter easily and conveniently. There is no need for any time-consuming configuration of parameters at the inverter itself.

The SOLPLUS+ Comfort version of the software also enables you to use the following functions:

- **Automatic data retrieval service:** The yield data are retrieved automatically from your installations.
- **Creation of more than one installation:** The Comfort version of the program allows you to create several installations, the Standard version only one.
- **Group function:** You can group inverters together and compare their yields. What's more, you can also link small installations to create a large one.
- **Installation search:** This function lets you search for installation data, such as inverter numbers.



Note

The yields and data read out from the installation remain saved in SOLPLUS+ and in your database even if you are not connected to the installation. This enables you to display those installation yields already read in without having to make a connection.

3 SOLPLUS+ System Requirements

3.1 Operating system

- Windows 2000 with Service Pack 4
- Windows Server 2003 with Service Pack 1
- Windows XP 32-bit with Service Pack 2
- Windows Vista 32-bit/64-bit
- Windows 7 32-bit/64-bit



Note

You must have at least **Microsoft.NET Framework 2.0 SP1** or higher installed on your computer for SOLPLUS+ to run. If this is not already the case, we recommended that you install [Microsoft .NET Framework 3.5 SP1](#).

3.2 Hardware

PC	Intel Pentium 500 MHz or higher
Free memory space / RAM	100 MB HD memory / 256 MB RAM
VGA monitor	min. resolution of 1024 x 768

4 Installing SOLPLUS+

You can find and download the latest version of SOLPLUS+ from www.solutronic.de.

4.1 Initial installation

Download the appropriate ZIP file for your operating system onto your computer:

- SolPP_V_2_5_Year-Month-Day-**x86.zip** for a **32-bit** operating system
- SolPP_V_2_5_Year-Month-Day-**x64.zip** for a **64-bit** operating system.

If you are not sure and need to find out whether you are running a 32-bit or a 64-bit system, click this link: <http://support.microsoft.com/kb/827218/>

Unpack the ZIP file in a separate folder. (You can delete the ZIP file again after you have installed the program.)

Then start the file "setup.exe".

Make sure you have administrator rights on the PC when you install the program, otherwise it will not run properly.

4.2 Installing the latest version of SOLPLUS+ over an existing version

If you install SOLPLUS+ over an older version already on your computer, all previous configurations and data will automatically be adopted in the new version.

Always uninstall an old version of SOLPLUS+ before installing a new one.

The uninstaller built into SOLPLUS+ can be started as follows:

- **Windows XP:** Start -> Control Panel -> Add/Remove Programs -> SOLPLUS+
- **Windows Vista:** Start -> Control Panel -> Programs and Features -> SOLPLUS+
- **Windows 7:** Start -> Control Panel -> Programs and Functions -> SOLPLUS+

4.3 Installing SOLPLUS+ Comfort



Note

Please uninstall the Standard version before you install SOLPLUS+ Comfort. For instructions on how to uninstall, please go to Section 4.2. of this manual.

The SOLPLUS+ Comfort software package you have purchased includes an installation CD. To install the software, please follow the installation wizard contained on the CD, which will guide you through the installation process.

4.4 Transferring SOLPLUS+ data to another PC



Note

If you want to transfer the latest data from SOLPLUS+ on one PC to another PC, always save and make a backup of the database file **SolPlus+.sdf**.

- 1) To make a backup of your current data, copy the database file **SolPlus+.sdf** to a different folder or drive.
SolPlus+.sdf is located in the following folder:
 - **Windows XP:** C:\Documents and Settings\All Users\Application Data\Solutronic AG\SOLPLUS+\SolPlus+.sdf
 - **Windows Vista:** C:\ProgramData\Solutronic AG\SOLPLUS+\SolPlus+.sdf
 - **Windows 7:** C:\ProgramData\Solutronic AG\SOLPLUS+\SolPlus+.sdf
- 2) Once you have saved SolPlus+.sdf to a different folder or drive, then uninstall the program (SOLPLUS+).
- 3) You can now install the latest version of SOLPLUS+ on your computer, BUT make sure you have administrator rights! (It also makes sense to reboot the PC after uninstalling the old version and before you install the new one.)
- 4) Once the installation routine has been completed, move or copy the database file **SolPlus+.sdf** to the default folder created during the installation routine (see Point 1 above for location).
- 5) If you have installed SOLPLUS+ in a folder other than the default installation folder, you can search for the installation location of the database file **SolPlus+.sdf** using the Search function of your operating system. Make sure you have activated the option for searching/finding/showing hidden files/folders. [The exact name of the option depends on the operating system (XP, Vista or 7).]

4.5 Restoring an old database status

If you ever decide you want to go back to using an older version of SOLPLUS+, you also have the option of restoring your backup copy of the database.

The backup copy is created automatically during installation, which enables you to access your old data again.

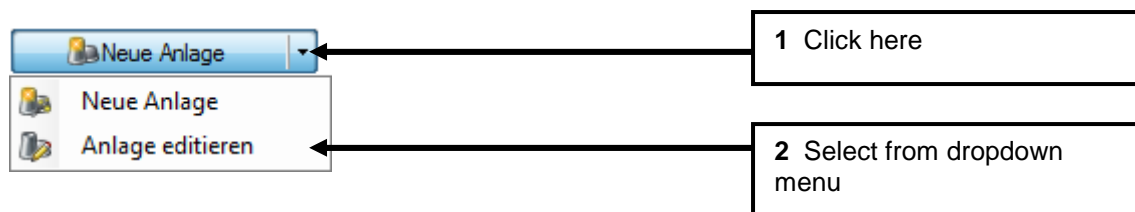
The SolPlus+.sdf backup file is located in the following folder:

- **Windows XP:** C:\Documents and Settings\All Users\Application Data\Solutronic AG\SOLPLUS+\SolPlus+ Vxx Year-Month-Day-Hour-Minute-Second.bak
- **Windows Vista:** C:\ProgramData\Solutronic AG\SOLPLUS+\SolPlus+Vxx Year-Month-Day-Hour-Minute-Second.bak
- **Windows 7:** C:\ProgramData\Solutronic AG\SOLPLUS+\SolPlus+Vxx Year-Month-Day Hour-Minute-Second.bak

5 Making SOLPLUS+ Settings on the PC

You only have to configure the installation once, so you can call up the data of your installation and inverters without any problem the next time you start the program. All data are stored.

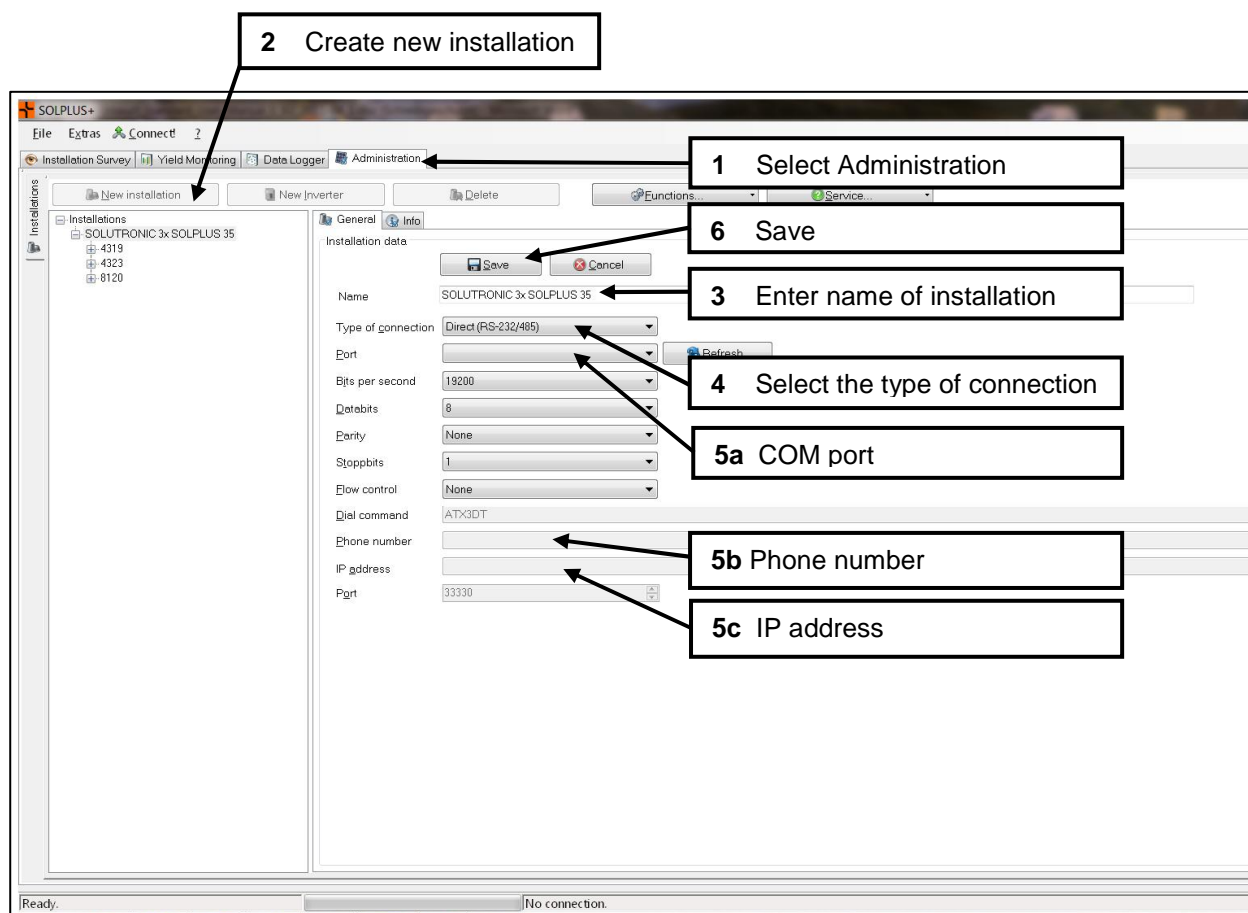
The easiest way for inexperienced users to configure their new installation is to use the wizard. To start the wizard, click the arrow next to the New Installation button to open the dropdown menu, select the Edit Installation option and follow the instructions displayed by the wizard.



If you don't want to use the wizard, please continue with section 5.1, "Setting up a PV installation in SOLPLUS+".

5.1 Setting up a PV installation in SOLPLUS+

To set up a connection between your PV installation and SOLPLUS+, you have to configure your PV installation in SOLPLUS+ first.



Step 1:

Click the "Administration" tab to open it.

Step 2:

Create your PV installation in the program by clicking the "New Installation" button.

Step 3:

Give your new PV installation a name („Solutronic 3x SOLPLUS 35“ in the example above).

Step 4:

Select the type of connection you want to use.



Note

You can find detailed information on the various options available for making a data transfer connection between your PC and PV installation and the associated settings required in Section 5.3. "Connection types" below.

- Direct (RS232/485)
- Modem
- TCP/IP (Master)
- TCP/IP (individual)

Step 5a: (for connection types "Direct" and "Modem" only)

Select the COM port to which the cable is connected.

Step 5b: (for connection type "Modem" only)

Enter the "phone number" of your PV installation.

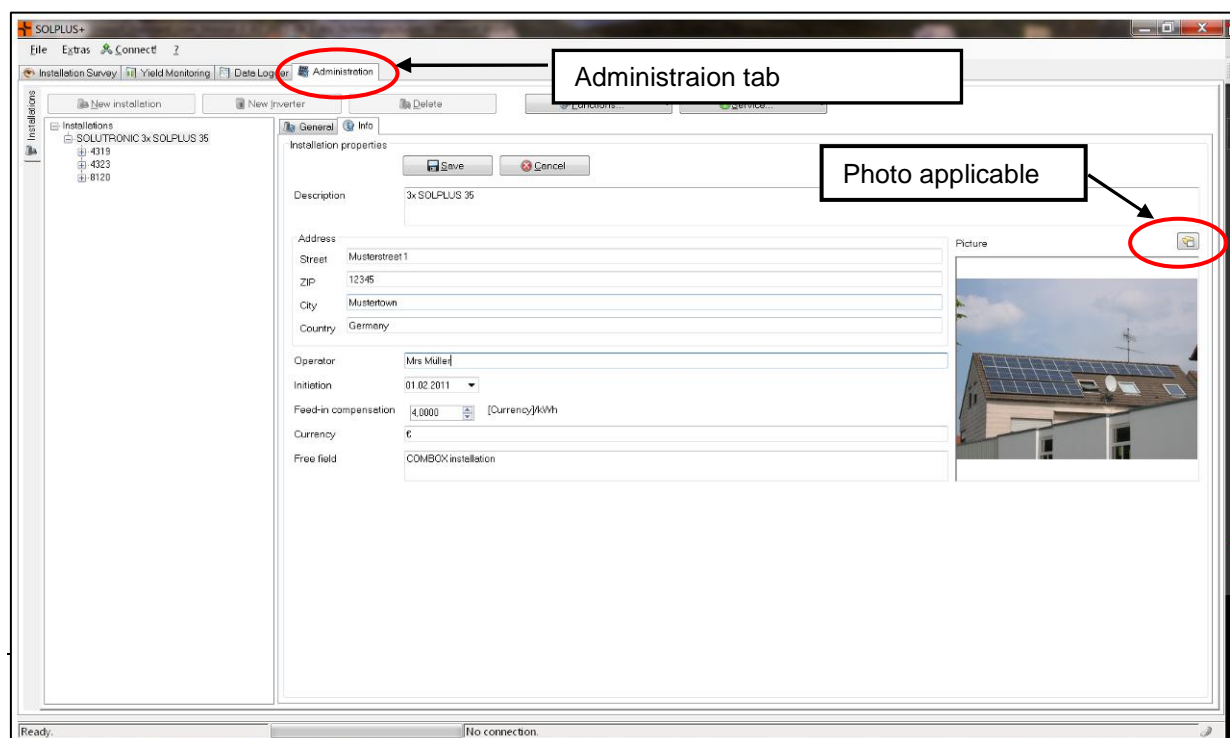
Step 5c: (for connection type "TCP/IP (Master)" only)

Enter the IP address of your master inverter.

Step 6:

Click the "Save" button to save the new PV installation data.

If you want, you can also enter the properties of the installation, such as the location, date of first start-up or a photograph of the installation, in the "Info" tab.

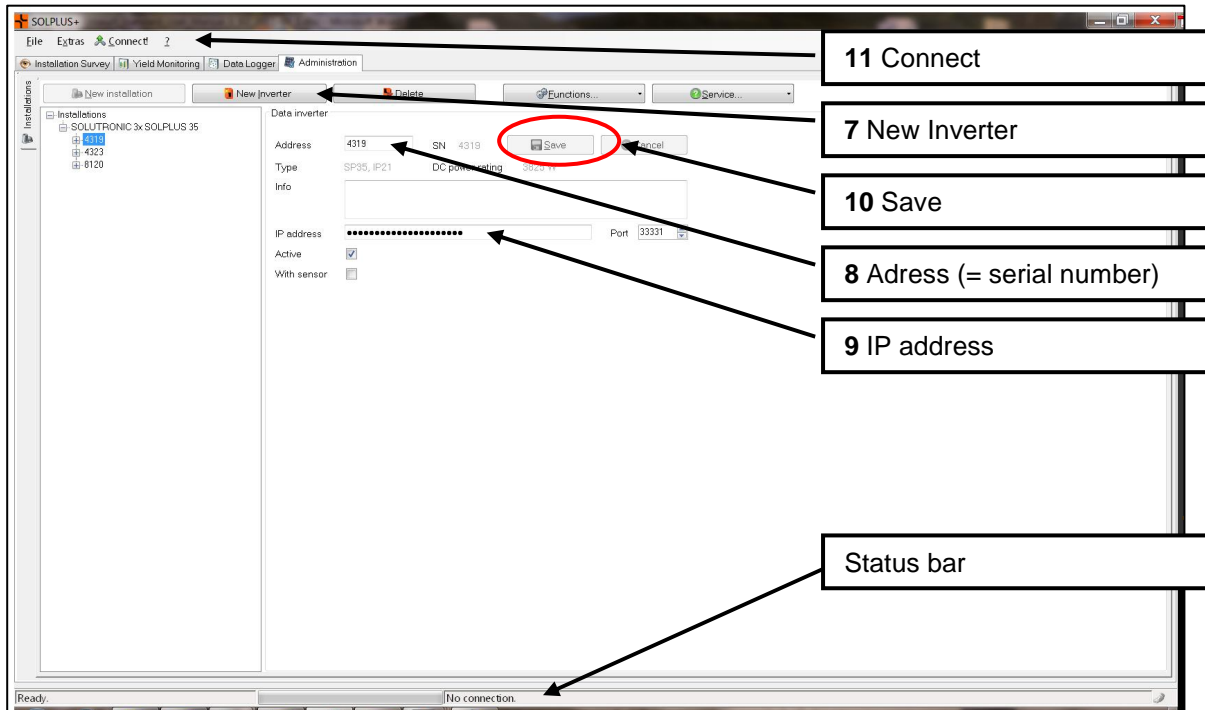


Once you have created your installation in SOLPLUS+, add your inverters to the installation in SOLPLUS+.

To do this, proceed as follows:

Step 7:

In the PV installation you have created, click the "New Inverter" button.



Step 8:

Enter the address of the inverter.

The address refers to the address set in the inverter (Parameter 89 "SPP address"), which is normally the serial number. In this example: serial number 12345

i	<h3>Note</h3> <p>The serial number of each inverter can be found on the right-hand side of the inverter, printed on a silver label. For example: S/N xxxx-01964. The serial number consists of the last five digits of the number sequence. Ignore the leading zeros when entering the number in SOLPLUS+.</p>
----------	---

Step 9: (to be performed for connection type "TCP/IP (individual)" only)

"IP address" and "Port". If you have selected the connection type "TCP/IP (individual)", you must enter the IP address and port set in the inverter in these two input fields.

Step 10:

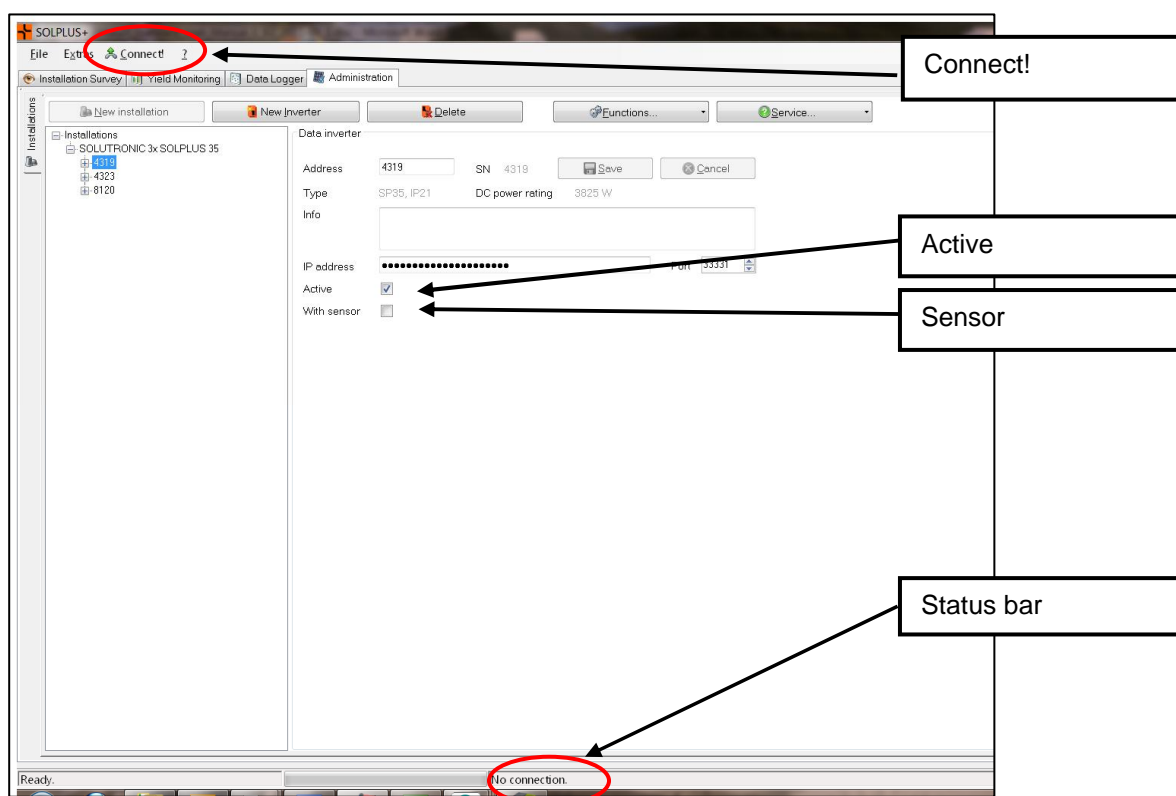
Click the "Save" button to save the inverter data.

If your installation consists of several SOLPLUS inverters, create a new entry for each inverter by repeating steps 7 to 10 for each one.

Step 11:

You have now completed configuration of your PV installation in SOLPLUS+ and you can use the software to retrieve the data from your inverters. However, you have to activate the connection before you can start reading out the data. You do this by clicking the "Connect!" button in the menu bar at the top. Check the status bar at the bottom of the screen to make sure the connection between SOLPLUS+ and the PV installation is activated.

5.2 Further settings



Connection

You have now completed configuration of your PV installation in SOLPLUS+ and you can use the software to retrieve the data from your inverters. However, you have to activate the connection before you can start reading out the data. You do this by clicking the "Connect!" button in the menu bar at the top. Check the status bar at the bottom of the screen to make sure the connection between SOLPLUS+ and the PV installation is activated.

Active

Uncheck this check box if you do not want the data of the inverter to be read out (retrieved) automatically. This may be the case, for example, with installations in which an inverter has been replaced. The data of the replaced inverter will remain saved and you avoid an error message when reading out the data.

Sensor

If there is a sensor connected to this inverter, check this checkbox. This means the sensor yield data will be displayed in the yield monitoring overview.

5.3 Types of connection between the PC (SOLPLUS+) and inverters



Note

Detailed information on all possible types of connection between the PC (SOLPLUS+) and the inverter(s) can be found in the appendix (including port assignments on the inverter).


5.3.1 Direct (RS232/485)

Use the connection type setting "Direct" for the following types of connection:


- Direct connection by means of the RS232 port on the PC or with the aid of RS232/RS485 adapters.

The COM port (USB or PCI) selected is displayed next to "Port" in SOLPLUS+ (example).

E.g.:

Port	COM6 USB Serial Port ▼	 Refresh
------	------------------------	---

or

Port	COM1 PCI Serial Port ▼	 Refresh
------	------------------------	---

If no port name is displayed, click the "Refresh" button next to the "Port" input field and select a COM port.

Port	COM6 USB Serial Port ▼	 Refresh
Bits per second	COM1 PCI Serial Port	
	COM2 PCI Serial Port	
	COM3 Motorola SM56 Speakerphone Mo	
	COM6 USB Serial Port	

5.3.2 Modem

Determine which COM port your modem is connected to and set this port in the "Port" input field.

E.g.:

Port	COM3 Motorola SM56 Speakerphone ▼	 Refresh
------	-----------------------------------	---

If no port name is displayed, click the "Refresh" button next to the "Port" input field and select a COM port.

You can find out which COM port of your PC the modem is connected to by looking it up in the Device Manager.



Note

If your installation is old and/or your modem is so old that it doesn't support dual-tone multi-frequency (DTMF) dialling, then you have to enter "ATX3DP" in the "Dial command" input field:

Tip: If your telephone system requires you to dial a "0" to make external calls, then enter a zero and a comma (0,, where the comma stands for a pause) before the phone number.

5.3.3 TCP/IP



Note

All SOLPLUS inverters are equipped with an Ethernet port. To integrate the inverters into your network, the addresses you assign to the inverters must be based on the PC network you have.

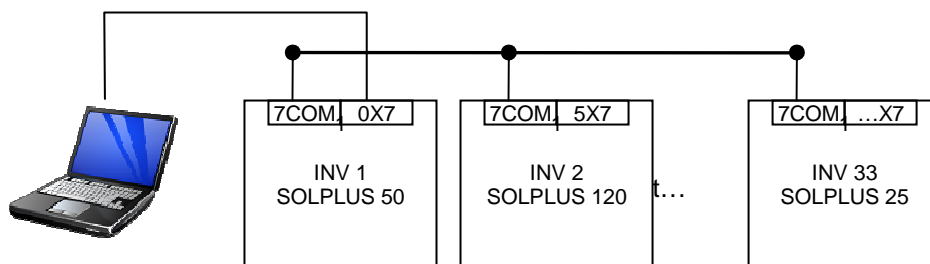
Detailed information can be found in the instruction manual entitled "SOLPLUS Inverter Data Retrieval via TCP/IP", which you can download from our website.

There are 2 different ways in which you can integrate your PV installation in the PC network. Depending on the number of inverters and the cabling, either the complete installation is connected by means of a master inverter (TCP/IP (Master)) or each inverter is connected individually to the network (TCP/IP (individual)).

TCP/IP (Master)

Use the connection type setting "TCP/IP (Master)" for the following types of connection:

- If you want to retrieve data from just one inverter directly.
- If you want to retrieve data from several inverters via TCP/IP and these inverters are interconnected via RS485 (e.g. in a master-slave network).



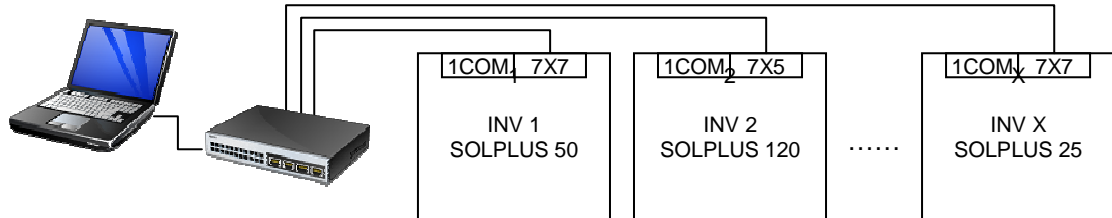
If you have selected the connection type "TCP/IP (Master)", you have to enter the IP address of the inverter in the input field "IP address" and the TCP port in the "Port" field next to that.

The screenshot shows a configuration window with three input fields: 'Phone number', 'IP-Address', and 'Port'. The 'IP-Address' field contains the value '192.168.0.99' and the 'Port' field contains '33330'. Two external labels with arrows point to these fields: 'IP-address' points to the IP-Address field, and 'TCP-port' points to the Port field.

You can find the preset IP address and TCP/IP port of the inverter in the "Communication" menu of the inverter under "IP Address Inverter" (parameters 110 – 113) and "SPP TCP Port" (parameter 208).

TCP/IP (individual)

You use the connection type "TCP/IP (individual)" if you have connected more than one inverter to an Ethernet (TCP/IP) port of the PC via a switch and each inverter can be addressed by means of its own individual TCP/IP address.



If you have selected the connection type "TCP/IP (individual)", you have to enter the IP address and the TCP/IP port of each inverter in the installation in the "IP address" input field in the "New Inverter" window.

The screenshot shows the 'Data inverter' configuration window. It includes fields for 'Address' (containing '4319'), 'SN' (containing '4319'), 'Type' (containing 'SP35, IP21'), and 'DC power rating' (containing '3825 W'). There are 'Save' and 'Cancel' buttons. Below these is an 'Info' section with a text area. The 'IP address' field is highlighted with a black arrow pointing to it from a label 'IP address'. The 'Port' field is also highlighted with a black arrow pointing to it from a label 'TCP/IP port'. The 'Active' checkbox is checked, and the 'With sensor' checkbox is unchecked.

You can find the preset IP address of the inverter in the "Communication" menu of the inverter under "IP Address Inverter" (parameters 110 – 113).

6 Data Evaluation

6.1 Installation Survey

The "Installation Survey" tab helps you gain a quick overview of the status of all the inverters in the PV installation.



Note

You will not be able to retrieve any installation data unless your PC is connected to the installation.

To set up a connection, select, i.e highlight the name of your installation and then click the "Connect!" button. You can activate or deactivate communication between the PC and a PV installation any time you want by clicking the "Connect!" or "Disconnect!" button in the menu bar at the top.

First click the "Connect!" button so you are connected to the installation.

Inverter	Curr. power	DC power rating	Type	State	Yield today	Yield week	Yield month	Yield year	Yield total	MP Firmware
4323	2691 W	3625 W	SP35, IP21	feed-in operation	11,325 kWh	42 kWh	309 kWh	3614 kWh	11949 kWh	2,56
4319	2613 W	3625 W	SP35, IP21	feed-in operation	11,130 kWh	41 kWh	303 kWh	3747 kWh	11776 kWh	2,56
8120	2651 W	3625 W	SP35, IP21	feed-in operation	11,416 kWh	43 kWh	312 kWh	3675 kWh	11159 kWh	2,56
Sum	8536 W	11475 W			33,870 kWh	126 kWh	924 kWh	11436 kWh	34884 kWh	

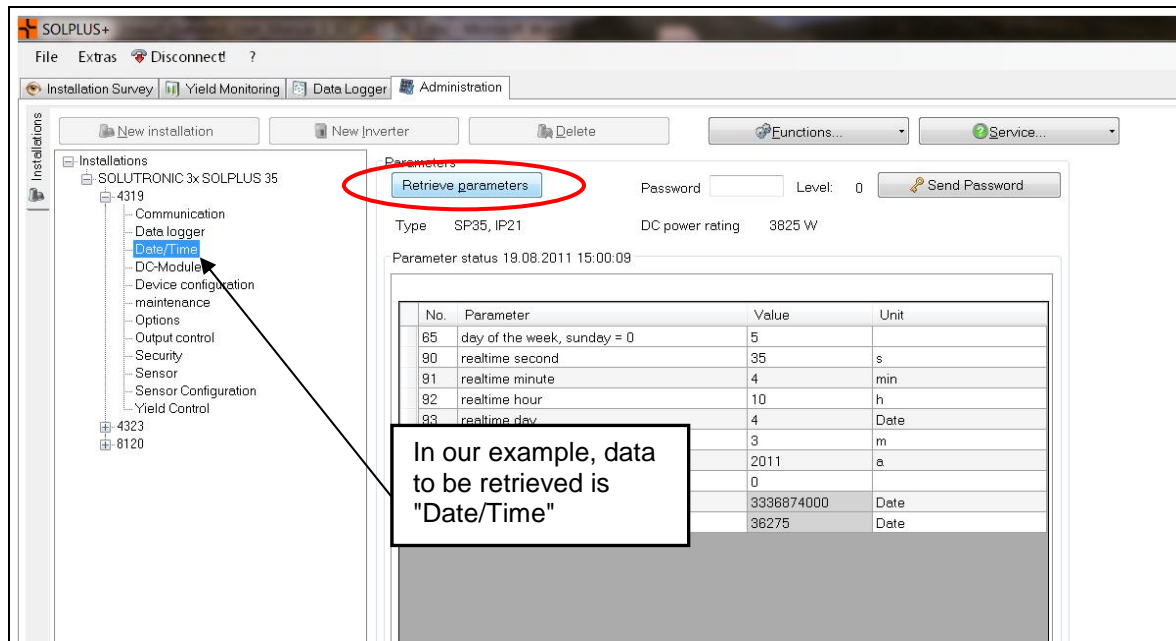
Status bar indicates the connection status

Connected to 'SOLUTRONIC 3x SOLPLUS 35'

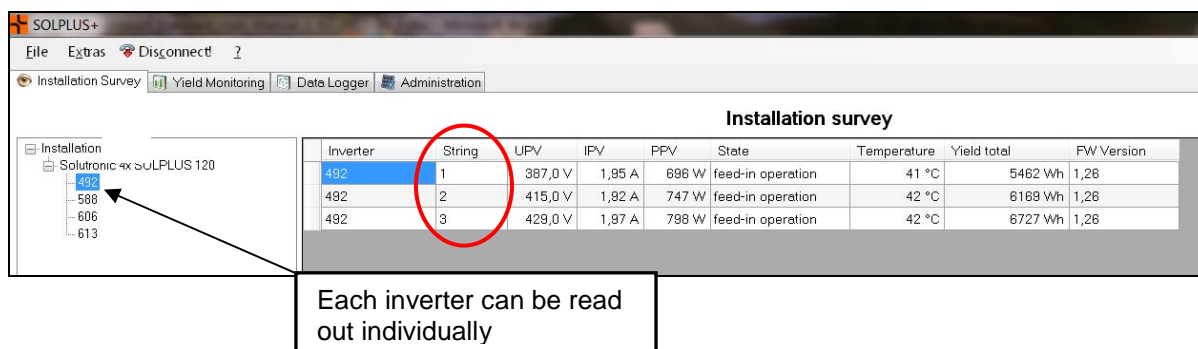
6.1.1 Reading inverter data into the Installation Survey

To be able to call up the string information of individual inverters in the Installation Survey, you have to read in (retrieve) the configuration of the individual inverters first before you call up the string information the first time.

You do this by clicking the "Administration" tab to open it. Then open the node of your installation/inverters in the tree view of the installation and select the first submenu of the inverter you want. Now click the "Retrieve parameters" button. All parameters are retrieved.



You can then read out each individual inverter you select/highlight (one at a time) in the "Installation Survey" tab.



Note

In the case of a SOLPLUS 120 inverter, you are able to read out strings individually (see figure above: Inverter 13).

6.2 Yield monitoring

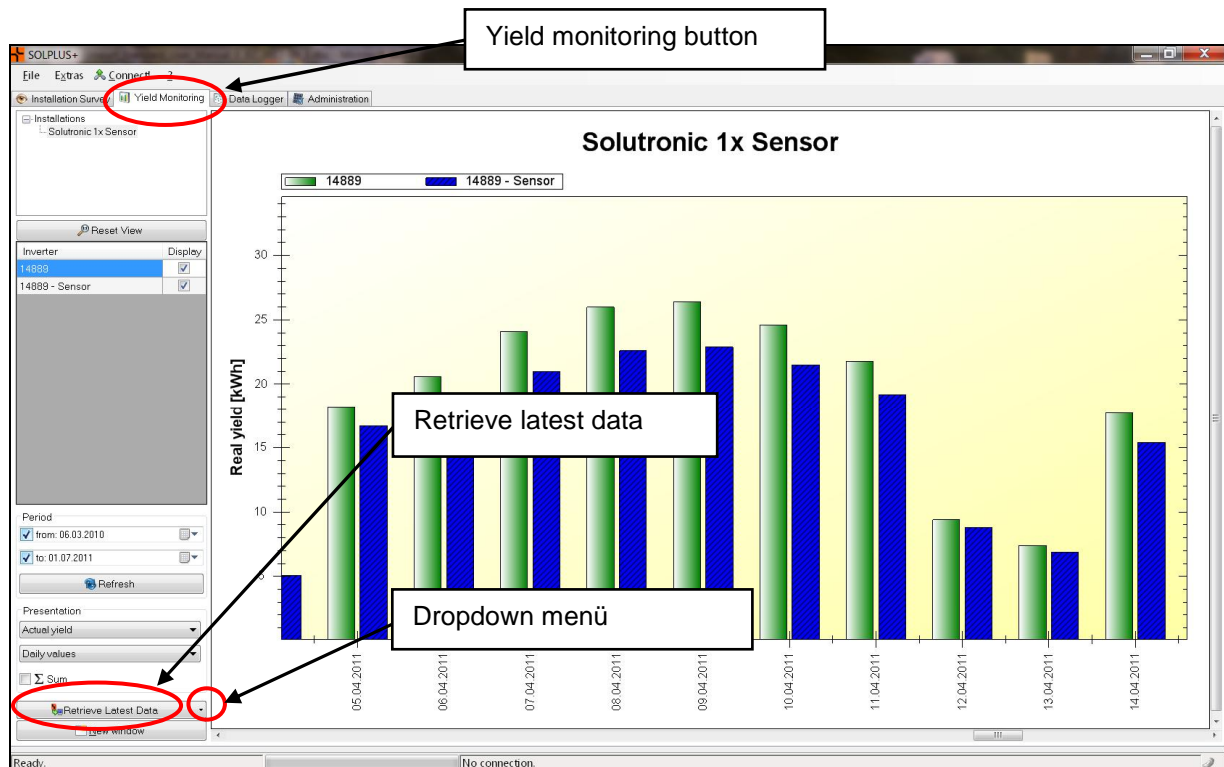
The "Yield Monitoring" tab enables you to gain a quick overview of your installations' yields in the form of a bar chart.



Note

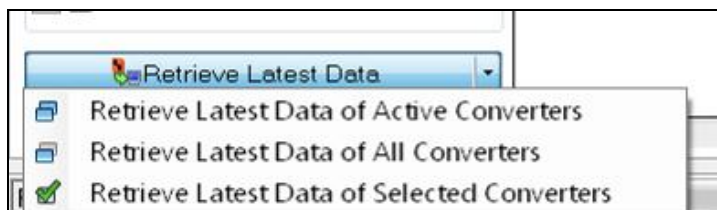
In contrast with the Installation Survey, the data are not called up automatically in this view, even if you are connected to the PV installation.

To retrieve the latest data, you have to click the "Retrieve latest data" button. The data downloaded are then saved to the database and are available for calling up again the next time you want them.



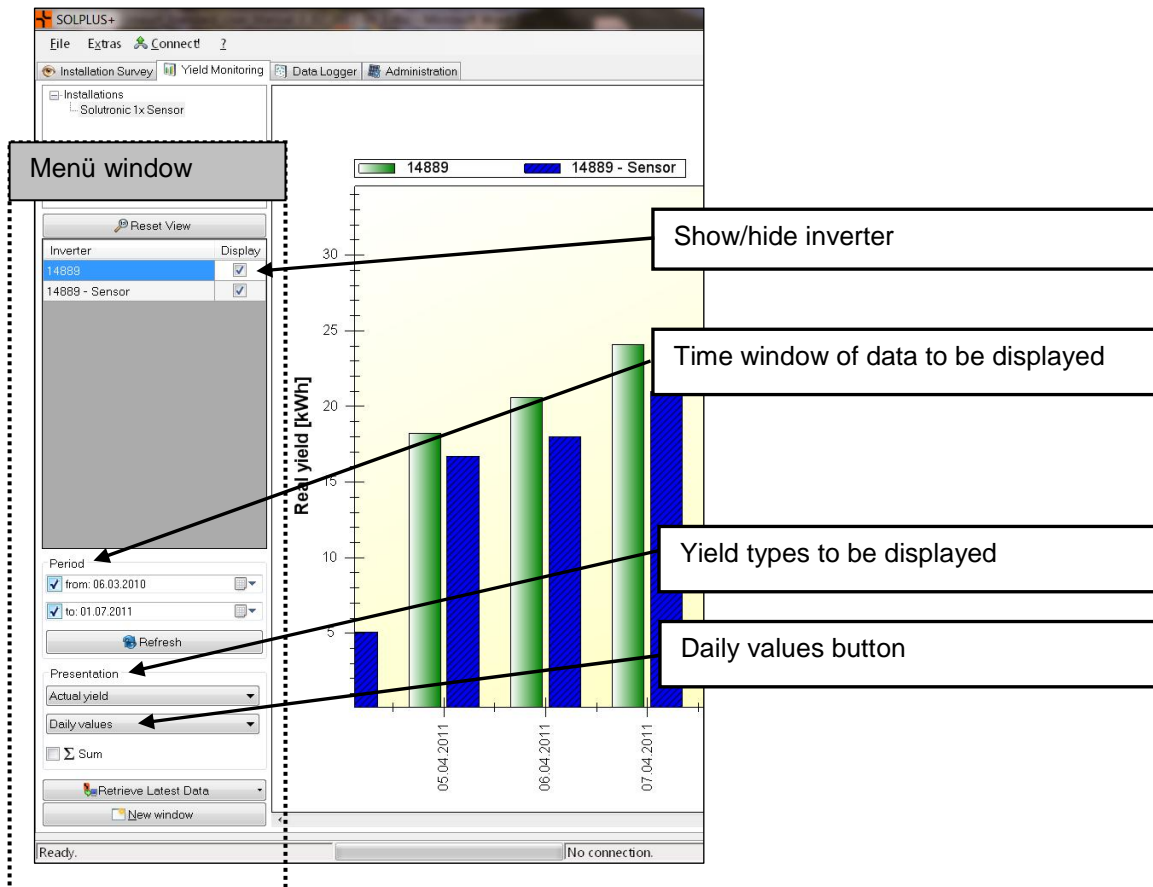
By opening the dropdown menu, you can:

- Retrieve the data of all inverters that are active
- Retrieve the data of all inverters
- Retrieve the data of selected inverters only



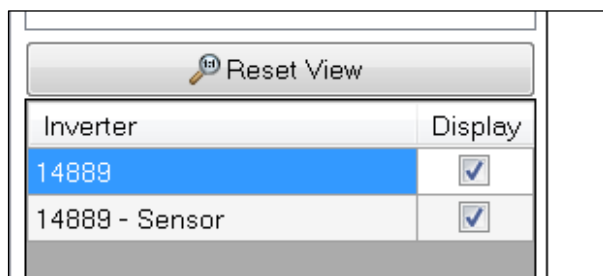
You can make the following settings in the left-hand section of the window next to the bar chart:

- Show/hide inverter
- Time window of data to be displayed
- Yield types to be displayed
- Period of yield values to be displayed



Show/hide inverter:

This section of the window enables you to select for which inverters you want to have data displayed. In our example, these are the inverters with the serial numbers 13 and 8 (check-marked).



Time window of data to be displayed:

This lets you set the period for which you want the data displayed.

In the example below, the period selected is from 6 November 2009 to 17 November 2010.

Yield types to be displayed:

You can choose between the following settings:

- "Actual yield": the yield of the individual inverter not referenced.
- "Final yield": the yield of the inverter referenced to the nominal DC output of the modules connected to the individual inverter.
- "Final yield (normalised to 1 day)": when annual, monthly and weekly values are selected, the final yield is normalized to a single day.

**Tip**

For effective monitoring of an installation comprising several inverters, we recommend you use the "*Final yield*" setting.

**Note**

To be able to display the final yields, you have to enter parameter 272 "Nominal DC output" (connected nominal DC output of the modules on the roof) in all inverters and transfer it as a parameter from the inverter to SOLPLUS+ (has to be done only once).

Period of yield values to be displayed:

You can choose between:

- Daily values
- Weekly values
- Annual values

6.3 Data logger

The "Data Logger" tab displays the values recorded by the data logger.

Up to 8 parameters can be read in and recorded in the data logger. You can select the parameters to be recorded in the data logger as you want.

By default, 3 parameter values are preset on delivery depending on the inverter type. You can find them in the "Data Logger" submenu. Instructions on how to change these values can be found in Section 8.



Note

The data logger in the inverter is only logged as long as the inverter is feeding into the grid.

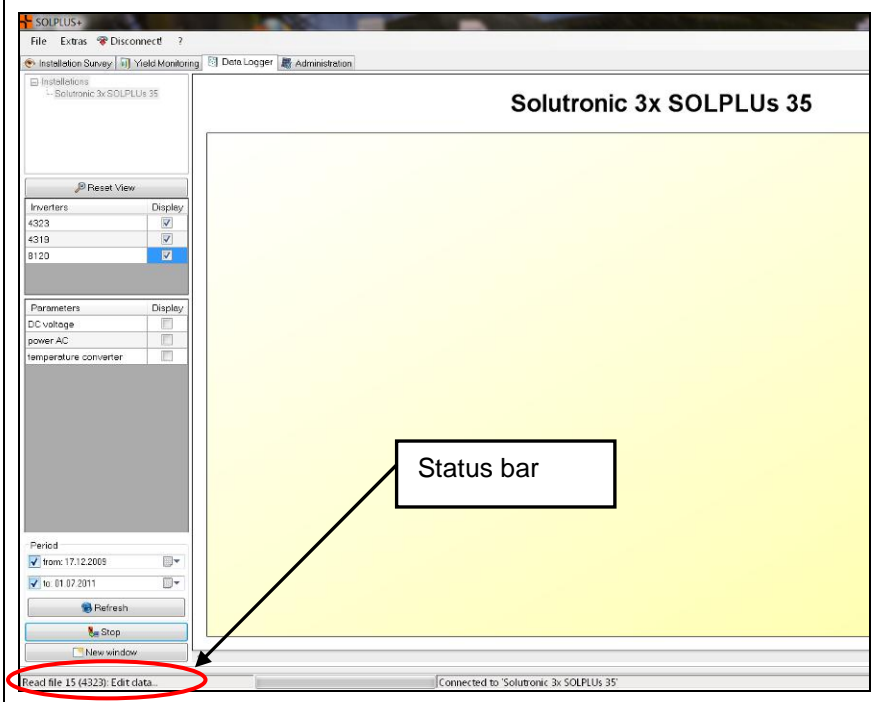
Clicking the "Retrieve latest data" button retrieves the data from all the data loggers of the complete installation and saves them to the database.



Note

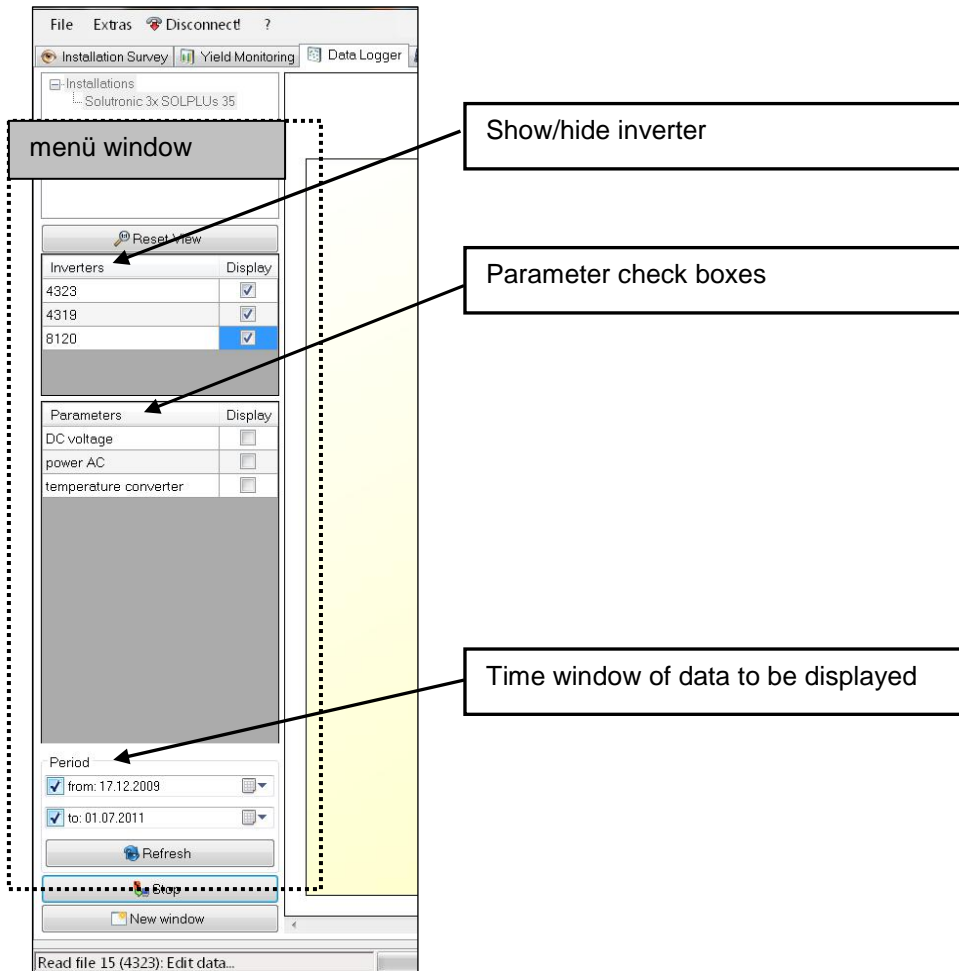
No values can be displayed while the data are being transferred.

The name of the inverter from which data is being read in at a given moment is displayed on the left of the status bar. In our example, inverter 4323 is being read in.



You can make the following settings in the left-hand section of this window:

- Show/hide inverter
- Parameter check boxes
- Time window
- Open new window



Show/hide inverter:

This section of the window enables you to select for which inverters you want to have data displayed. In our example, this is the inverter with the serial number 4323 / 4319 / 8120 (check-marked).

Parameter check boxes:

These check boxes allow you to select the parameters you want displayed graphically. Of course, only values that have been configured to be saved and have already been logged by the inverter can be displayed.

In the example above, the following parameters have been configured in the data logger:

- DC voltage
- Power AC
- Temperature converter

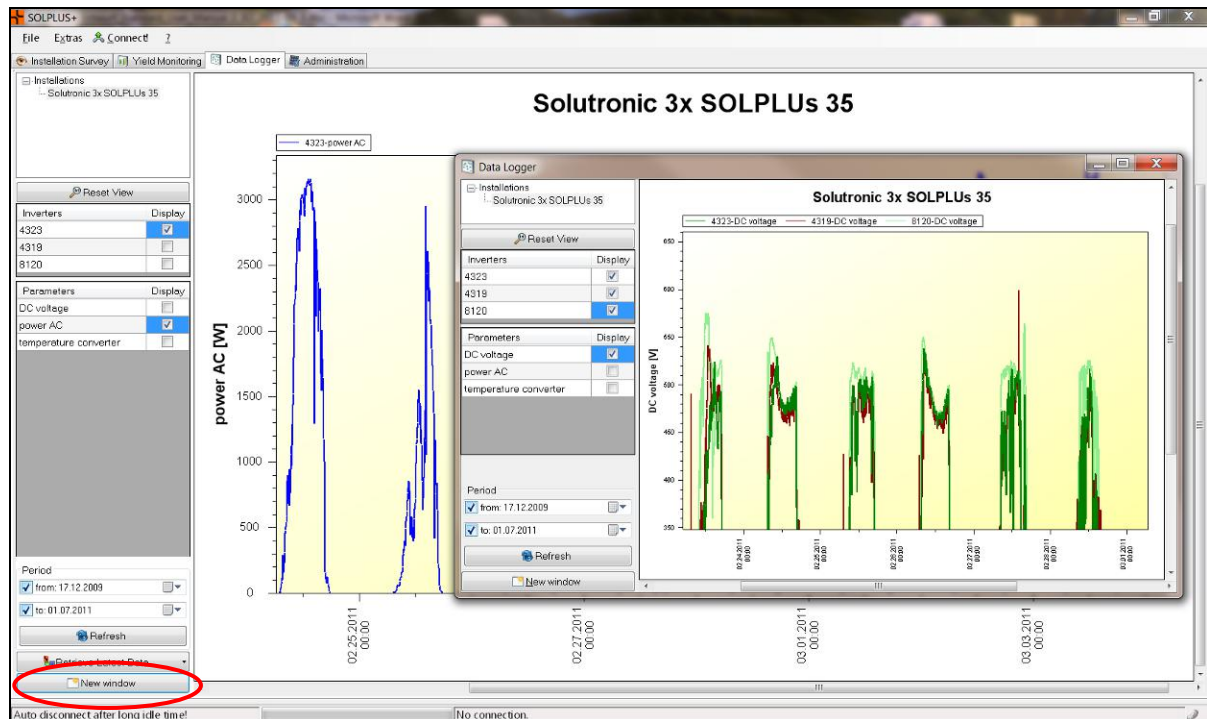
Time window of data to be displayed:

This lets you set the period for which you want the data displayed.



Open new window:

The "New window" button opens another window with a graphic in order to make it easier to compare data. This window can then be used to display another inverter/parameter of the same installation.



6.4 Yield/string logger

In the case of the 3-phase SOLPLUS 100/120 inverters, the following yield and string logger data can be logged in the data logger at the same time:

- DC voltage
- DC current
- DC output (calculated)

The yield/string logger must be activated for the data to be displayed.



Note

Logging these data as well shortens the storage time of the data logger.

6.4.1 Activating the yield/string logger in the inverter

Parameter 66: Set default settings

Menu: Device Configuration

Unit: ---

Resolution: ---

Default setting: 0

If you set this parameter to 66, the values stored in the data logger will be deleted. This must be done prior to activating and following deactivation. In order not to lose the values recorded by the data logger, please download them before you delete the values stored in the logger.

Parameter 259: General configuration

Menu: Device Configuration

Special feature: Bit-programmed

Default setting: 0

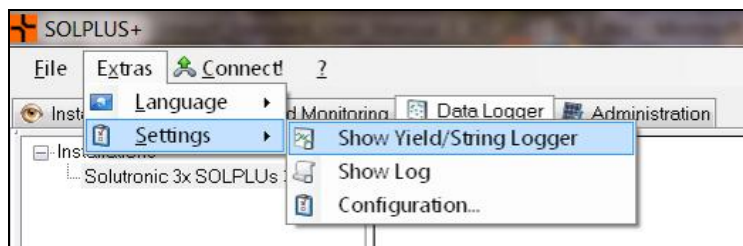
- By setting bit 4 = "Reset" to 1, the inverter performs a restart.

The default factory setting is 0, i.e. the yield/string logger in the inverter is not active. To activate the logger, set bit 14 (value 16384).

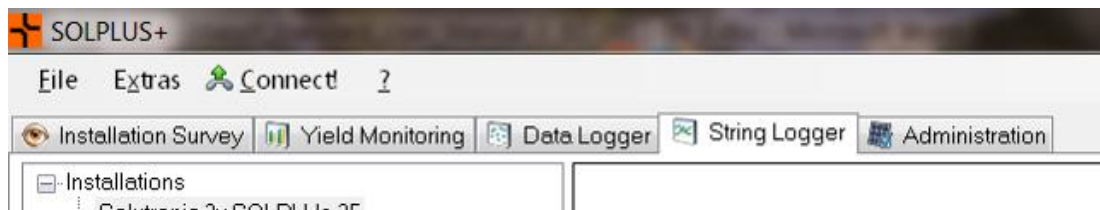
6.4.2 Displaying the yield/string logger in SOLPLUS+

These pieces of data and the yield curves of the inverter (or string) can be displayed in the "String Logger" tab.

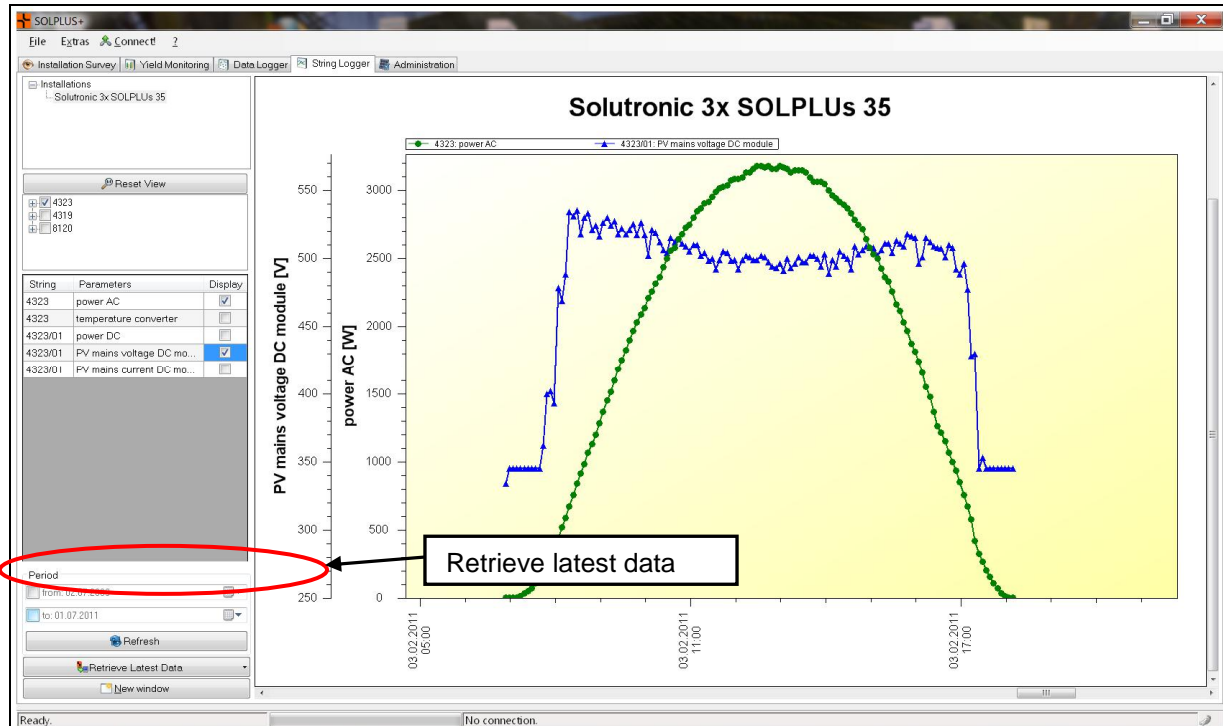
You do this by activating the "Show Yield/String Logger" option under *Extras -> Settings* from the SOLPLUS+ menu.



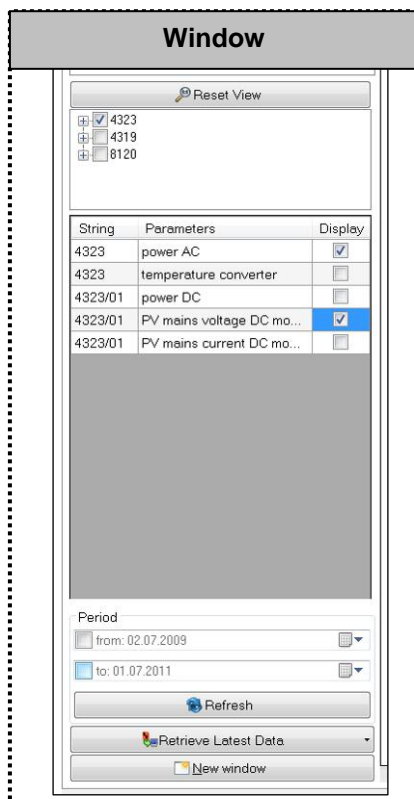
This leads to the "Yield/String Logger" tab being displayed between the "Data Logger" and "Administration" tabs.



To retrieve the latest data, you have to click the "Retrieve latest data" button. The data downloaded are then saved to the database and are available for calling up again the next time you want them.



You can make the following settings in the left-hand section of this window:



String check boxes:

This section of the window enables you to select for which strings you want to have data displayed. In our example.

Parameter check boxes:

These check boxes allow you to select the individual string parameters (SOLPLUS 100 and 120 and SOLPLUS 300) you want displayed graphically. The current and voltage values of each string are logged.

7 Chart Functions

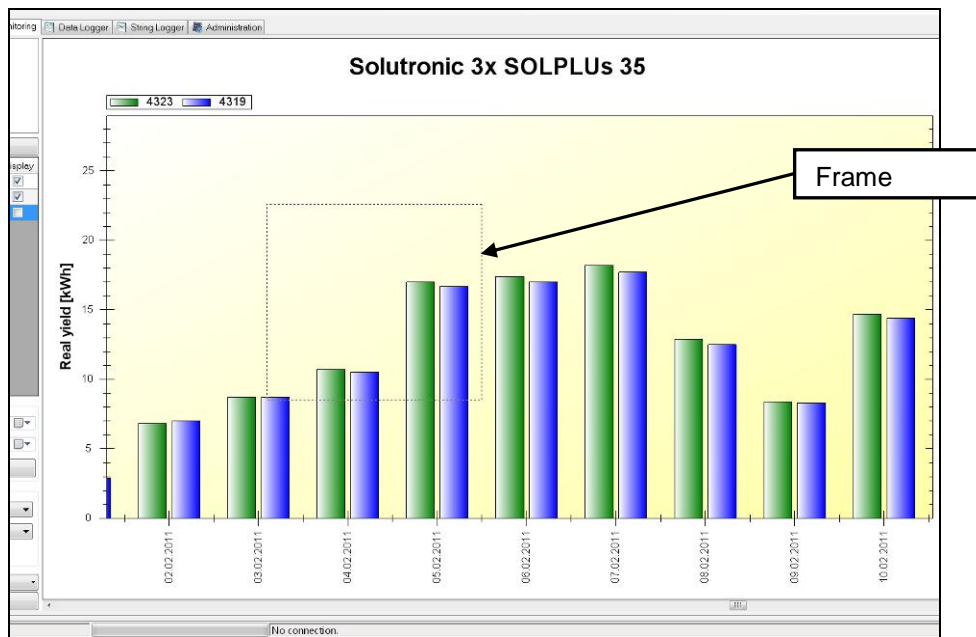
A range of different graphics functions are available for use in all charts.

Changing the value range

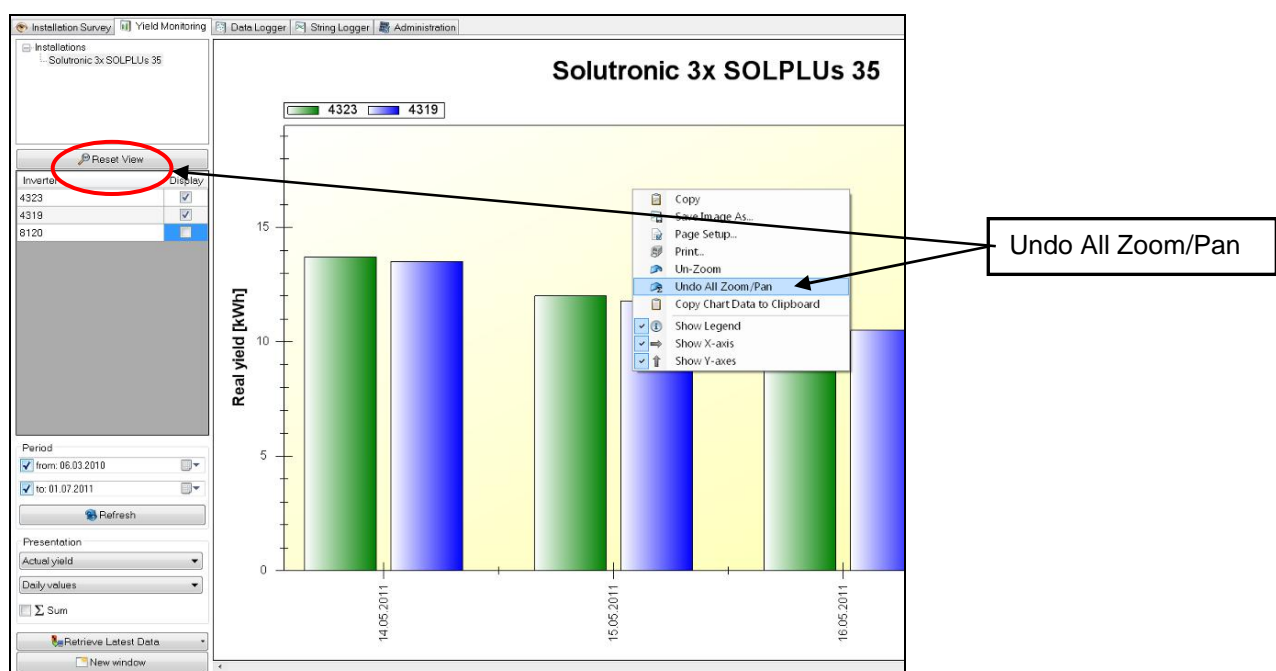
You can change the value range displayed by dragging the scrollbars on the right and at the bottom of the chart.

Zoom function

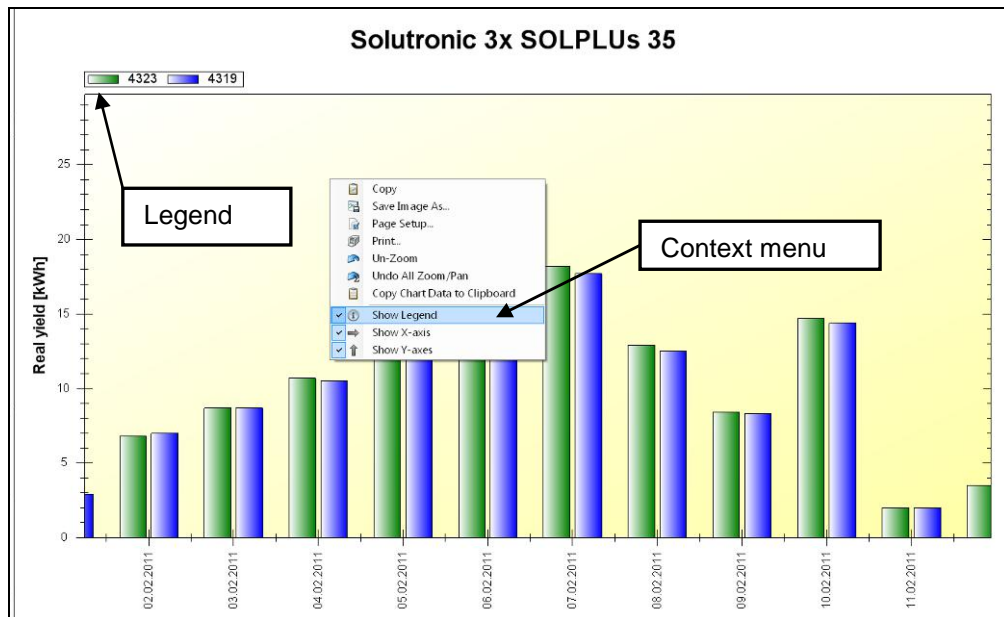
You can increase the size of an area of the chart, i.e. zoom into it, by opening a frame. You fix the initial point of the frame by clicking and holding the left mouse button, then move the mouse to expand the frame. The end point of the frame is set by releasing the mouse button.



To reset the view, right-click inside the zooming frame and select the "Undo All Zoom/Pan" command or click the "Reset View" button in the left-hand section of the window.



Functions of the context menu



By right-clicking inside a chart, you open a context menu with the following functions:

Copy: The chart is copied to the clipboard on your computer from where you can paste (insert) it into any other text file/e-mail etc. by typing the key combination "CTRL+V".

Save Image As...: Saves the chart as a file on the PC.

Page Setup...: Selection menu in which you prepare the page for printing ("Print...").

Print...: Prints the chart on the printer connected to the PC.

Un-Zoom: Resets the last zoom command.

Undo All Zoom/Pan: The chart is reset to the standard view.

Copy Diagram Data to Clipboard: All the data on which the chart is based are copied to the clipboard and can then be pasted to another program for evaluation purposes, e.g. Excel.

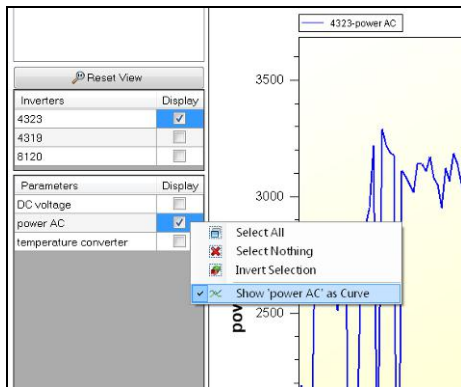
Show Legend: Displays a legend that shows the colour coding scheme used for the bars depicted in the chart.

Show X-axis: Shows/hides the X-axis values (timeline).

Show Y-axis: Shows/hides the Y-axis values.

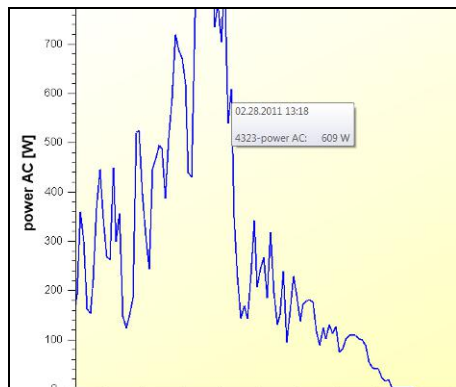
Changing the view: dots or curve

By right-clicking on a value you have selected, the display mode changes from a curve to dots or vice versa.



Displaying power and time values in the graphic

If you hold the mouse over a measured value, the exact power and time values are displayed in a small popup.



8 Energy Management

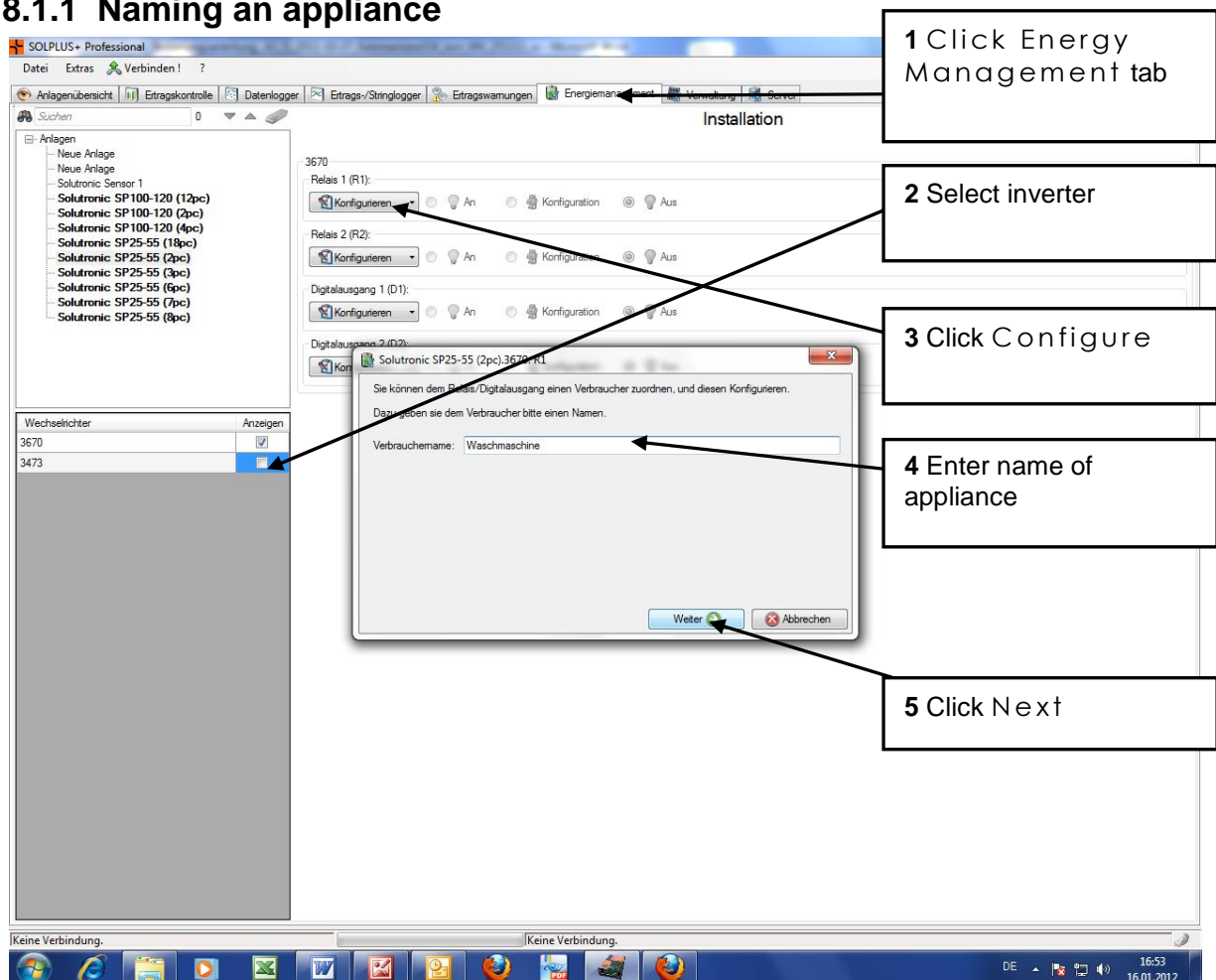
This function enables you to put the energy generated by your PV installation to use in your own home/building. It offers a variety of options that allow you to run appliances in your building.

Each SOLPLUS 25 – 55 inverter is equipped with two relays and two digital outputs that can be used to switch appliances to run off the power generated by your own solar panels. In the case of SOLPLUS 100 and SOLPLUS 120 inverters, the appliances are connected via the SOLCOMBOX.

In our yield evaluation program, SOLPLUS+, these relays and digital outputs are controlled easily and conveniently via the "Energy Management" tab. There is no need for any time-consuming configuration of parameters at the inverter itself.

8.1 Switching principle: activation time and duration

8.1.1 Naming an appliance



Step 1:

Click the Energy Management tab.

Step 2:

Select the inverter to open the Energy Management window.

Step 3:

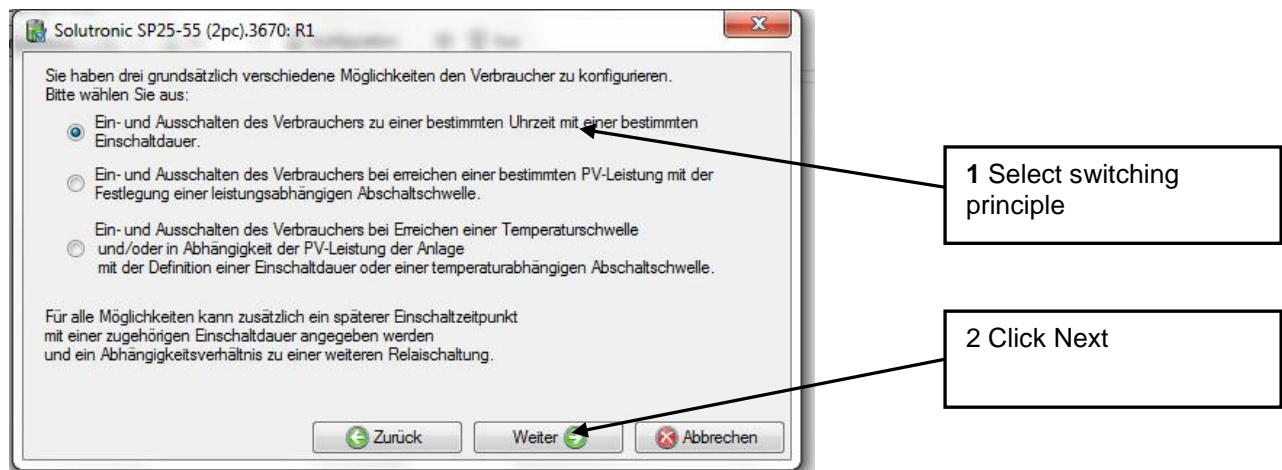
Click the Configure button.

Step 4:

Enter the name of the appliance, e.g. "Washing machine".

Step 5: Click the Next button.

8.1.2 Selecting the switching principle



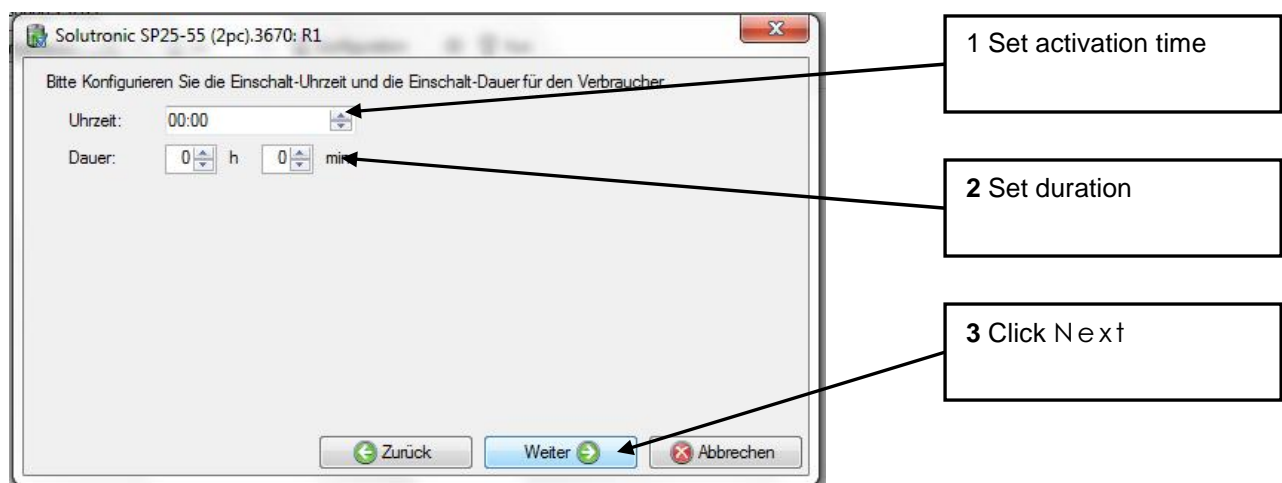
Step 1:

Select the switching principle "Activation of an appliance at an exact time and for a fixed duration".

Step 2:

Click the Next button.

8.1.3 Activation settings



Step 1:

Set the time at which the appliance is to be activated, i.e. switched on.

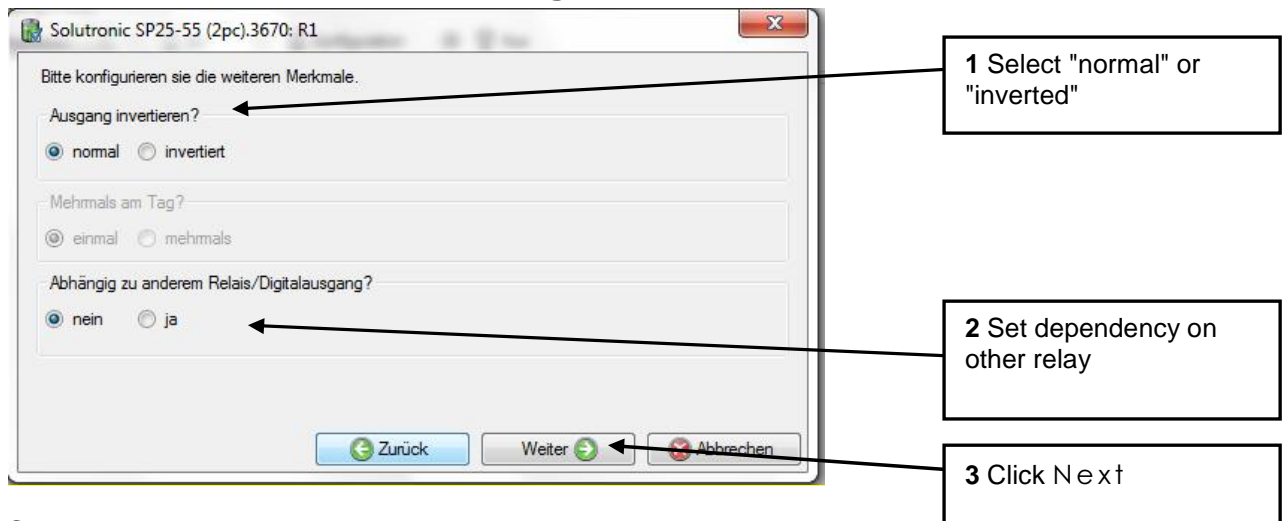
Step 2:

Set the activation duration, i.e. the length of time the appliance is to be switched on.

Step 3:

Click the Next button.

8.1.4 Additional activation settings



Step 1:

Select whether the switching state of the relay/digital output is to be normal or inverted. A relay set to the "normal" switching state is OFF when in its normal state. If the switching state is inverted, the relay is ON when in its normal state.



Note

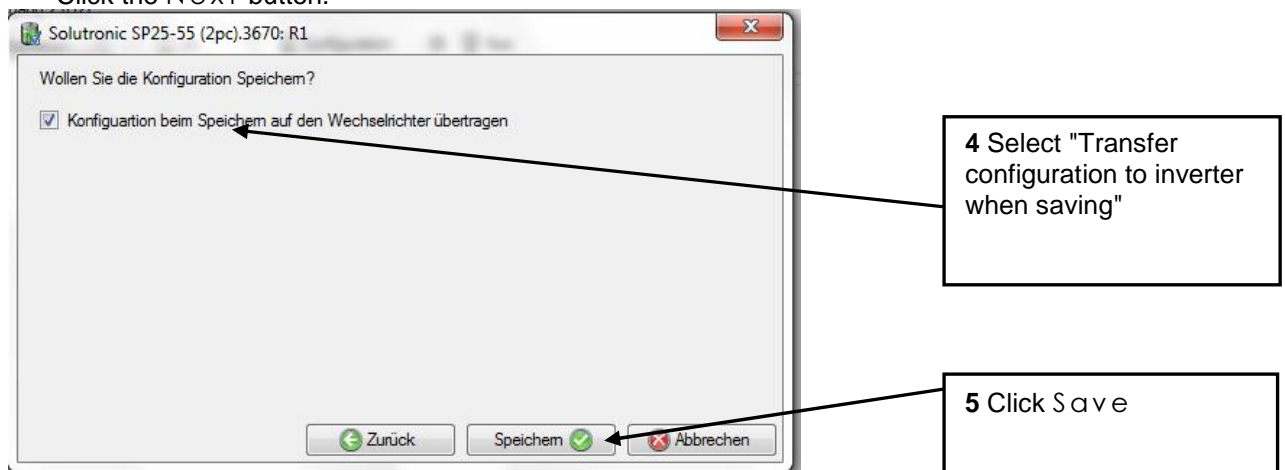
If you select the "inverted" switching state, please connect the inverter using a plug-in AC adapter, otherwise the output will be switched off as soon as the inverter is de-energised.

Step 2:

Set whether the relay/digital output is to be dependent on another relay or digital output. If you select "yes", make sure that no 2 outputs are switched at the same time. This settings applies to the 2 relay outputs or the 2 digital outputs, respectively.

Step 3:

Click the Next button.



Step 4:

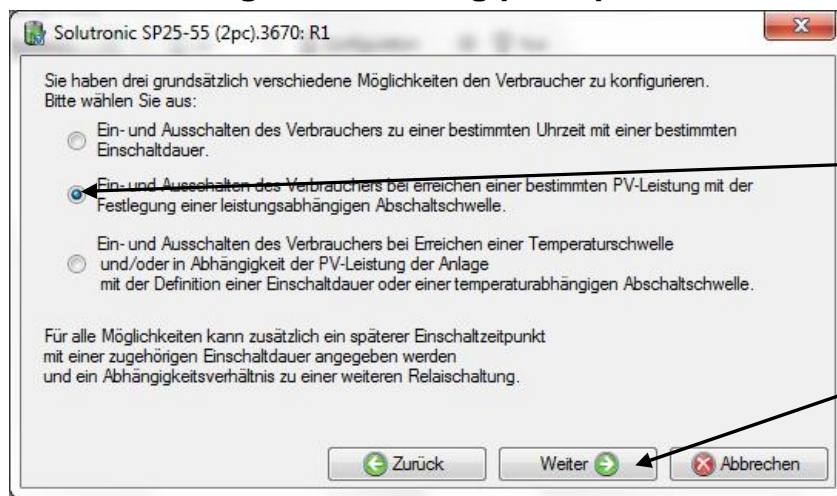
Select the "Transfer configuration to inverter when saving" option.

Step 5:

Click the Save button to confirm all activation settings.

8.2 Switching principle: PV power output level

8.2.1 Selecting the switching principle



1 Perform steps 1 – 5 as in section 8.1.1

2 Select switching principle

3 Click Next

Step 1:

Perform steps 1 to 5 as described in section 8.1.1.

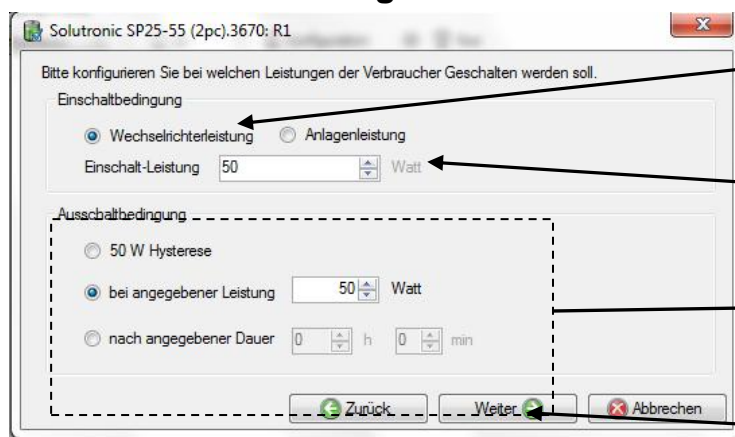
Step 2:

Select the switching principle "Activation of an appliance as of a preset PV output and with a specified output-dependent deactivation threshold".

Step 3:

Click the Next button.

8.2.2 Activation settings



1 Select inverter power or installation power

2 Set activation power

3 Select deactivation requirement

4 Click Next

Step 1:

Select "Inverter power" or "Installation power".

Step 2:

Set the activation power level.

Step 3:

Select the deactivation requirement: at 50 W hysteresis, at a specified power level or after a specified time. 50 W hysteresis means that the appliance will only be switched off if the power output level drops by 50 W.

Step 4:

Click the Next button.

8.2.3 Additional activation settings



1 Alternatively:
activation at a fixed time

Step 1:

Select the alternative setting for the appliance to be activated at a fixed time and for a fixed duration.

Step 2:

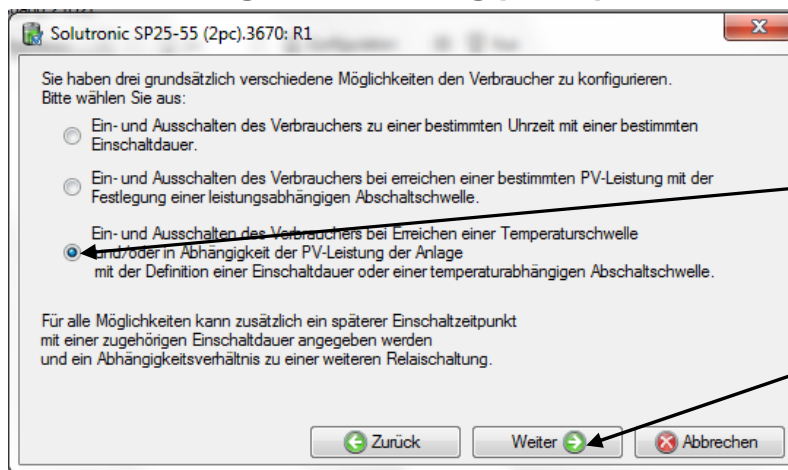
Select the other activation settings relating to inverting of the switch output, activation once or several times a day and dependency on other relay, as described in section 8.1.4.

Step 3:

Click the **Save** button to confirm all activation settings (as described in section 8.1.4).

8.3 Switching principle: temperature threshold

8.3.1 Selecting the switching principle



1 Perform steps 1 – 5 as
in section 8.1.1

2 Select switching
principle

3 Click **Next**

Step 1:

Perform steps 1 to 5 as described in section 8.1.1.

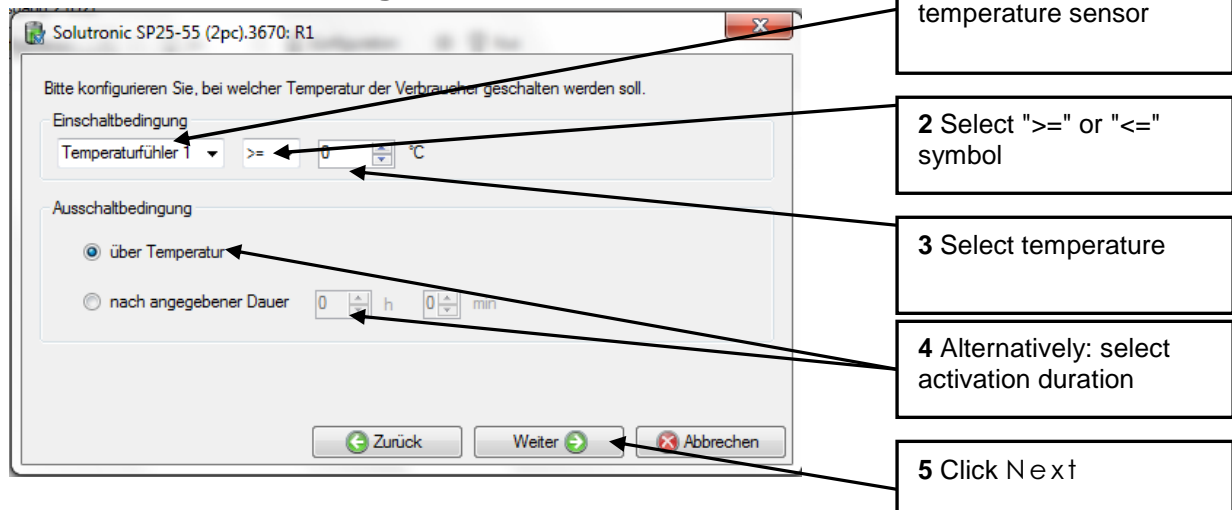
Step 2:

Select the switching principle "Activation of an appliance as of a preset temperature threshold and/or ...".

Step 3:

Click the **Next** button.

8.3.2 Activation settings



Step 1:

Select the temperature sensor (by its number) whose temperature reading is to be used as the activation requirement.

Step 2:

Select the activation requirement ">=" or "<=". If you select ">=", the appliance will be switched on when the temperature reading of the temperature sensor is greater than or equal to the temperature value you will set in the next step; if you select "<=", it will be switched on when the temperature reading is less than or equal to the temperature you will set.

Step 3:

Select the temperature-based deactivation requirement: the appliance will be switched off if the temperature reading of the temperature sensor falls by 5°C.

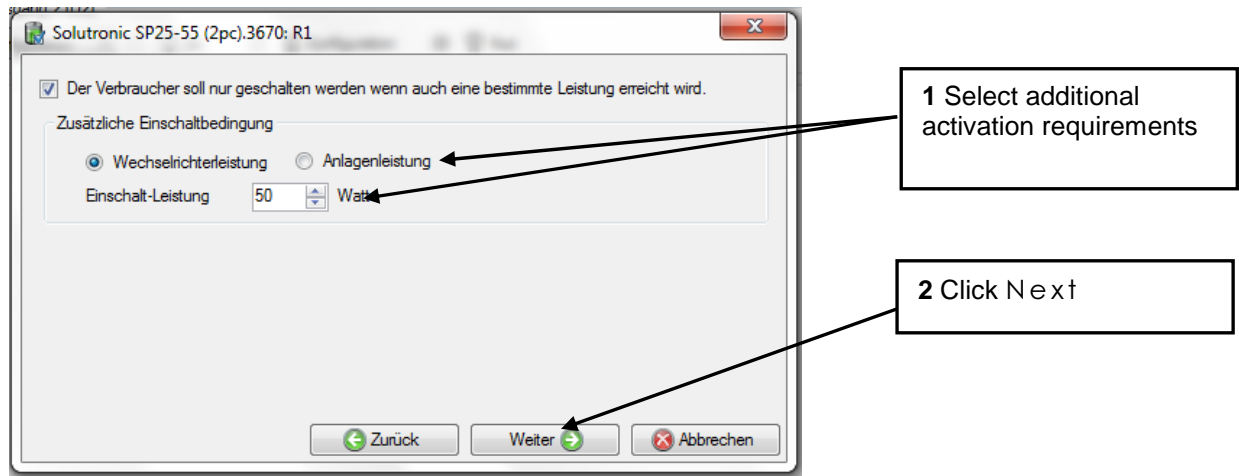
Step 4:

Alternatively, select a specified time after which the appliance is to be deactivated.

Step 5:

Click the Next button.

8.3.3 Additional activation settings



Step 1:

This page enables you to select an additional activation requirement: the appliance is only to be activated once an inverter power or installation power specified by you has been reached.

Step 2:

Click the **N**ext button.

Step 3:

Alternative setting: set the appliance to be activated at a fixed time and for a fixed duration (see section 8.2.3).

Step 4:

Click the **N**ext button.

Step 5:

Select the other activation settings relating to inverting of the switch output, activation once or several times a day and dependency on other relay, as described in section 8.1.4.

Step 6:

Select the "Transfer configuration to inverter when saving" option.

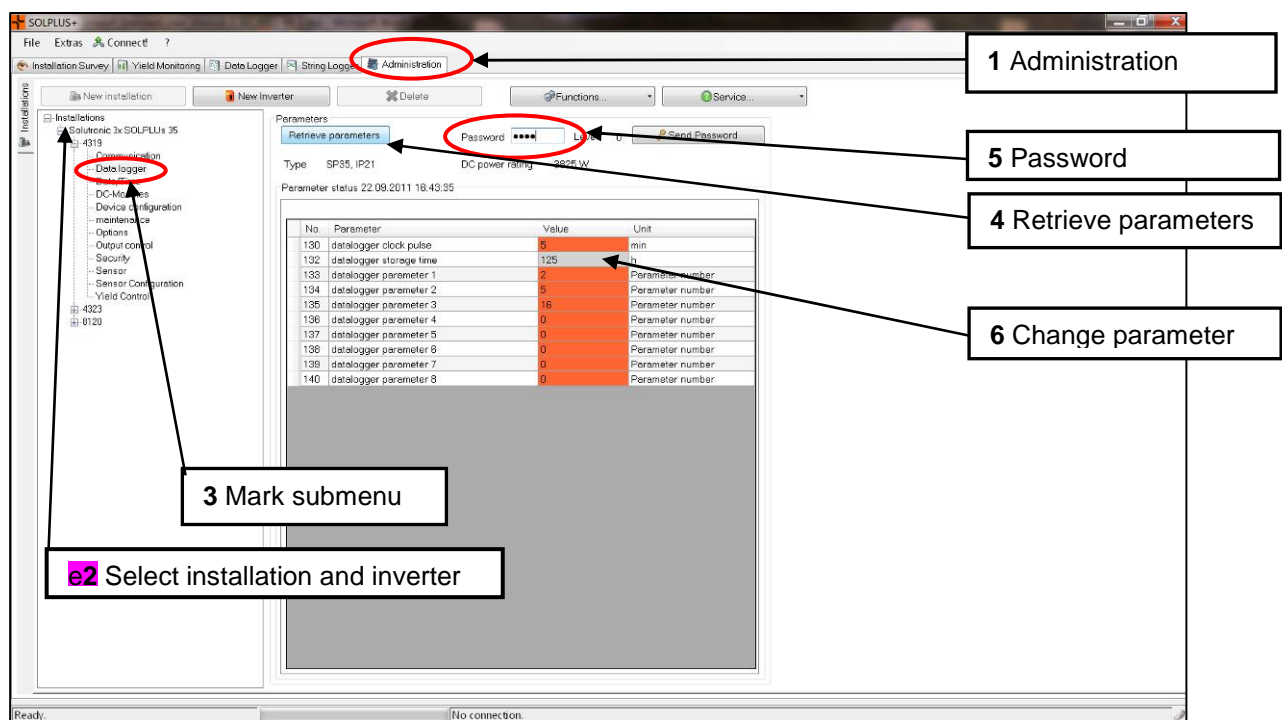
Step 7:

Click the **S**ave button to confirm all activation settings (as described in section 8.1.4).

9 Reading Inverter Data and Changing Settings

SOLPLUS+ enables you to read out each individual piece of data of an inverter. You can also change settings after entering the password.

The following figure and explanation shows how to read out and change the parameters of the data logger.



Step 1:

Click the "Administration" tab to open it.

Step 2:

Open the node of your installation and select the inverter whose data you want to read out and change.

Step 3:

Select the submenu in which your data are located. All actions described below always relate to the submenu marked.

For example: Installation: Mustermann; Inverter: 13; Submenu: Data logger

Step 4:

Click the "Retrieve parameters" button. All the parameters of the submenu are read out and highlighted by Value field markers.

Colour coding of Value field markers:

- Fields highlighted **grey** indicate values that cannot be changed.
- Fields highlighted **white** can be changed in the current password level.
- Fields highlighted **orange** cannot be changed in the current password level.

Step 5:

To change parameters, you have to enter the relevant password.



Note

As the end customer, you are only allowed to change values that are of no relevance to safety and covered by password level 1. The password for this level is the serial number of the inverter.

Enter the password in the input field "Password" and then click the "Send password" button. The password level assigned is then displayed next to "Level".

In our example: Password = 13 for the inverter with the serial number 13, and the password level = 1.

Step 6:

You are now able to change the values displayed in the "Value" column. Confirm your changes and send them to the inverter by pressing "Enter" on the computer keyboard.



Note

If the changed value is not adopted when you press "Enter", either the password is incorrect or the value you have entered is too high or too low. This is indicated by a red exclamation mark next to the value. If you hold the mouse over the red exclamation mark, a popup opens that contains an error message.

Basic settings				
Modem RS 485 Web				
No.	Parameter	Value	Unit	
89	Adresse SPP	13		
110	IP address 1. digit	192		
111	IP address 2. digit	168		
112	IP address 3. digit	0		
113	IP address 4. digit	99		
114	Subnet mask 1. digit	255		

If the new value you have entered and sent is correct, it is displayed in the field in the "Value" column.

10 Setting the Time in the Inverter(s)

SOLPLUS+ lets you set the time in your inverter(s).

Proceed as follows:

Step 1:

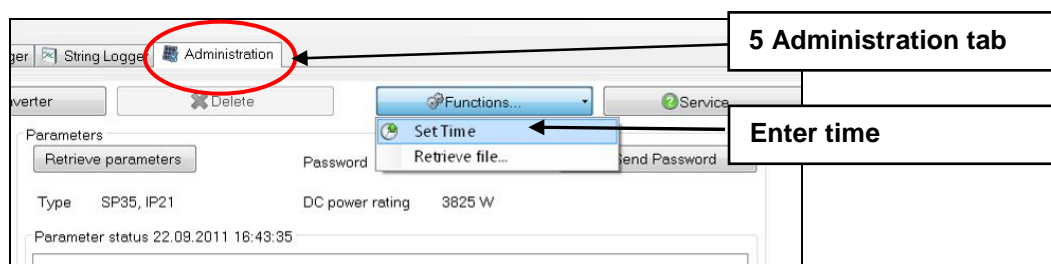
Click the "Administration" tab to open it.

Step 2:

Click the "Functions..." button.

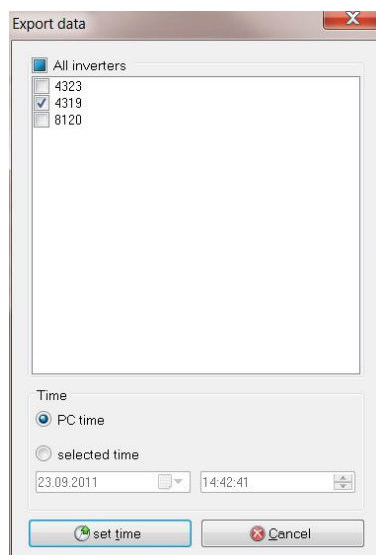
Step 3:

Select the "Set time..." option from the dropdown menu that opens.



Step 4:

In the window that opens, select the inverters for which you want to set the time. You can either use the system time of your PC or set the time and date yourself.



Step 5:

When you click the "Set Time" button, the time you have selected is automatically adopted for the inverter(s) you have selected.

11 Reading and Saving Inverter Files

The inverter generates a number of files that can be downloaded and saved on your PC with the help SOLPLUS+.

The following files can be read in:

Files	Content	Meaning
2	List of all parameters	All parameters sorted in ascending order according to their parameter number
6	Data logger	The parameter contents that were defined beforehand in the data logger, with date and time stamp. When displayed graphically (as a chart), the data values are saved to a database. No values are lost. Only the instantaneous values are saved in the inverter. Old values are overwritten.
7	Annual energy logger	When displayed graphically (as a chart), the yield values are saved to a database. No values are lost. Only the instantaneous values are saved in the inverter. Old values are overwritten.
8	Energy sensor logger	When displayed graphically (as a chart), the sensor values are saved to a database. No values are lost. Only the instantaneous values are saved in the inverter. Old values are overwritten.

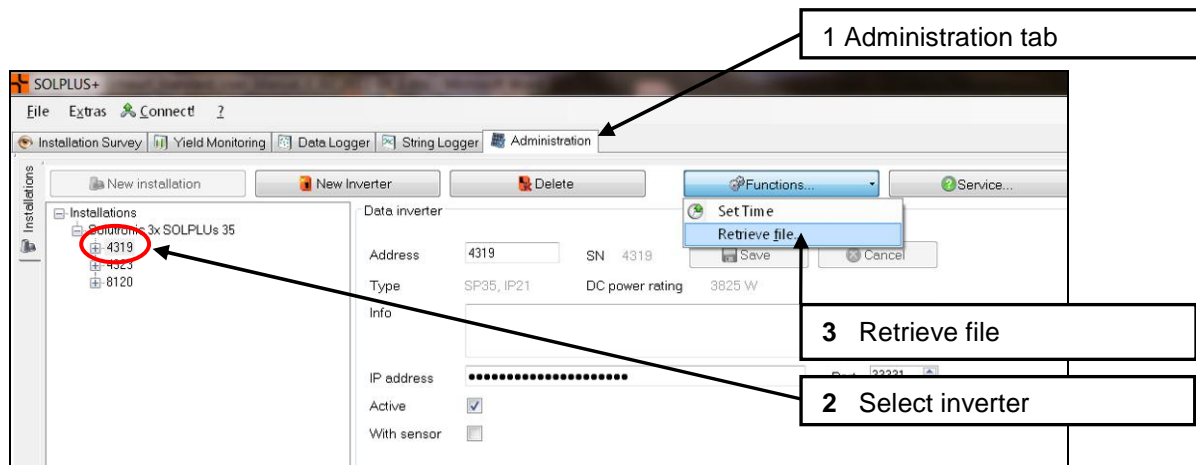
Proceed as follows:

Step 1:

Click the "Administration" tab to open it.

Step 2:

Open the node of your installation and select the inverter whose files you want to read out.



Step 3:

Click the "Functions..." button and select the "Retrieve file..." option from the dropdown menu.

Step 4:

A separate window opens in which you must enter the number of the file you want.

Step 5:

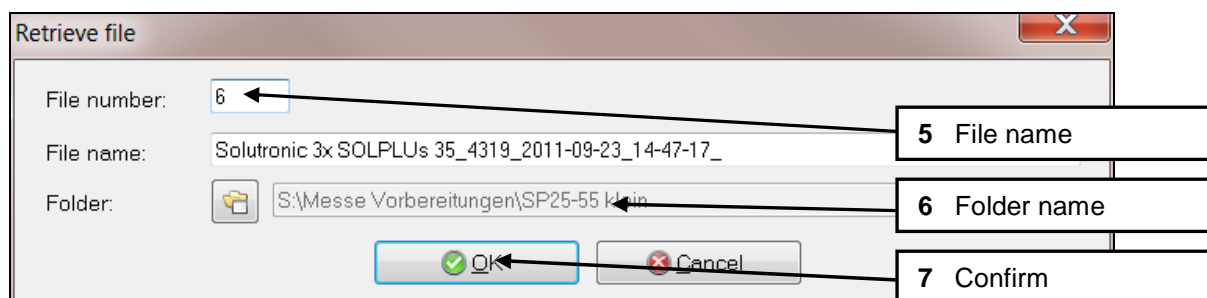
Accept or change the file name suggested.

Step 6:

Accept or change the folder to which the file is to be saved.

Step 7:

Confirm your entry by clicking the "OK" button.



12 Exporting Data

All the data of your installation can be exported to a service file for servicing purposes.



Note

This function enables you to send installation data to Solutronic or your dealer for servicing purposes.

You can only export data to a file as long as the PC is not connected to the installation.

Proceed as follows:

Step 1:

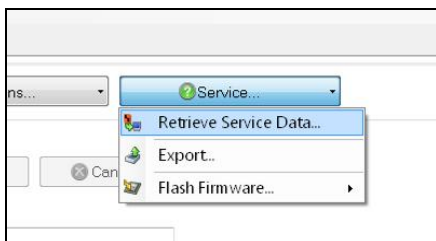
Click the "Administration" tab to open it.

Step 2:

Click the "Service..." button.

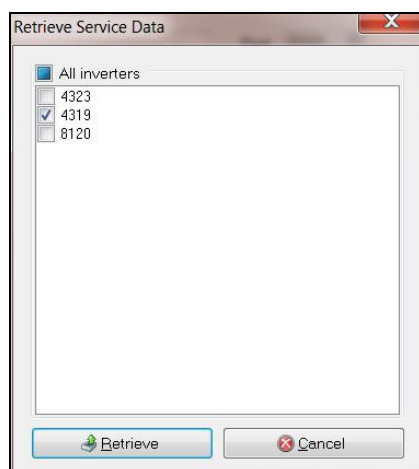
Step 3:

Select the "Retrieve service data..." option from the dropdown menu that opens.



Step 4:

In the window that opens, select the inverters you want to read out.

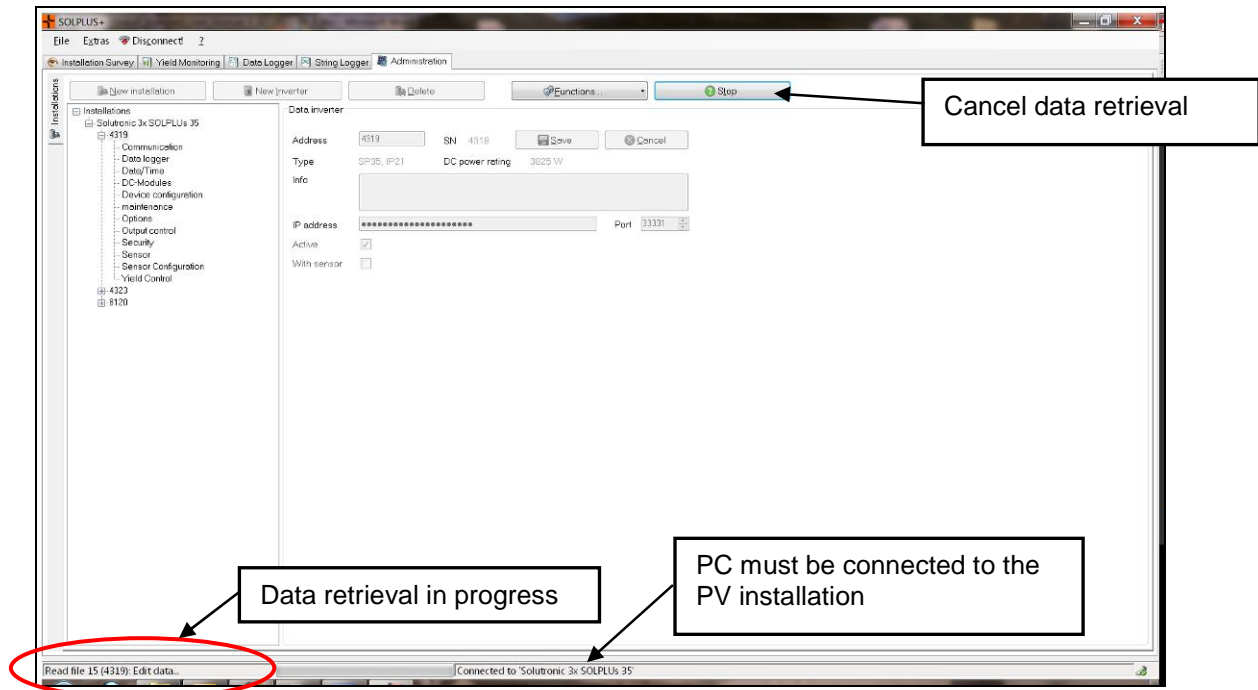


Step 5:

A connection to the PV installation is then made automatically and the file is retrieved.

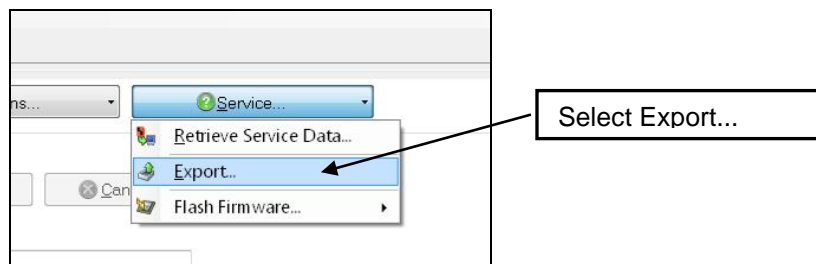
While the data is being retrieved, the "Service..." button changes to "Stop".

The "Stop" button enables you to cancel data retrieval from the inverters at any time.



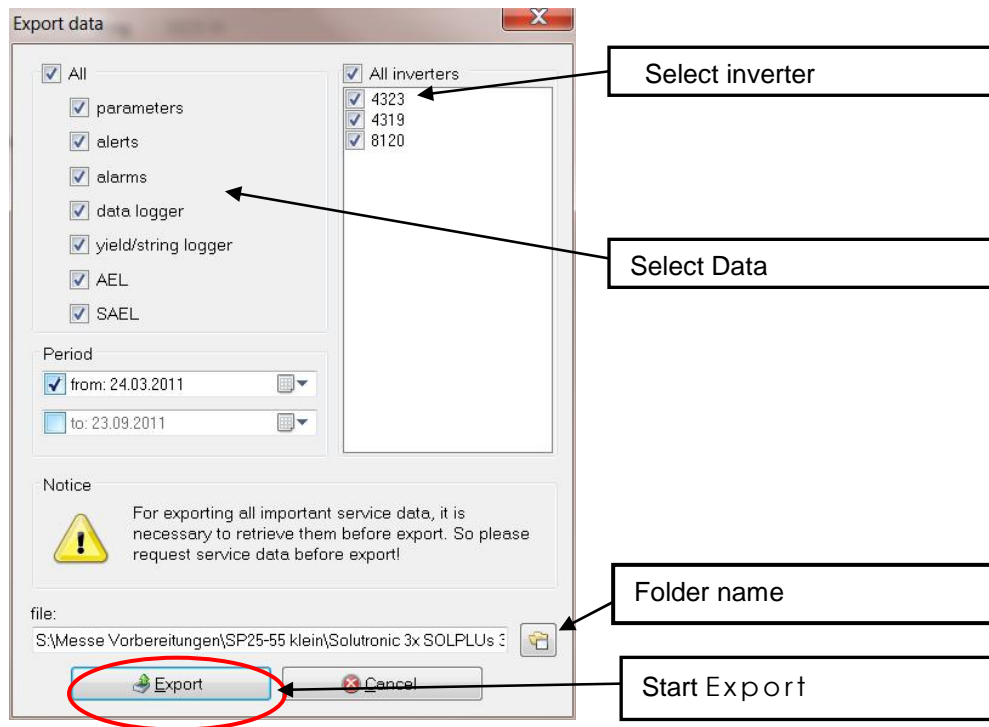
Step 6:

Once data retrieval has been completed, click the "Service..." button again and then select the "Export..." function.



Step 7:

In the new window that is opened, select the inverters whose data you want to export and enter the path and file name of the export file under "File".

**Step 8:**

When you click the Export button, a TAR file is created in the folder you have specified.

13 SOLPLUS 100/120 Firmware Update

SOLPLUS+ makes updating the firmware of SOLPLUS 100 and SOLPLUS 120 inverters very easy.



Note

The latest firmware version can be found in the Service section of our website (www.solutronic.de).

Proceed as follows:

Step 1:

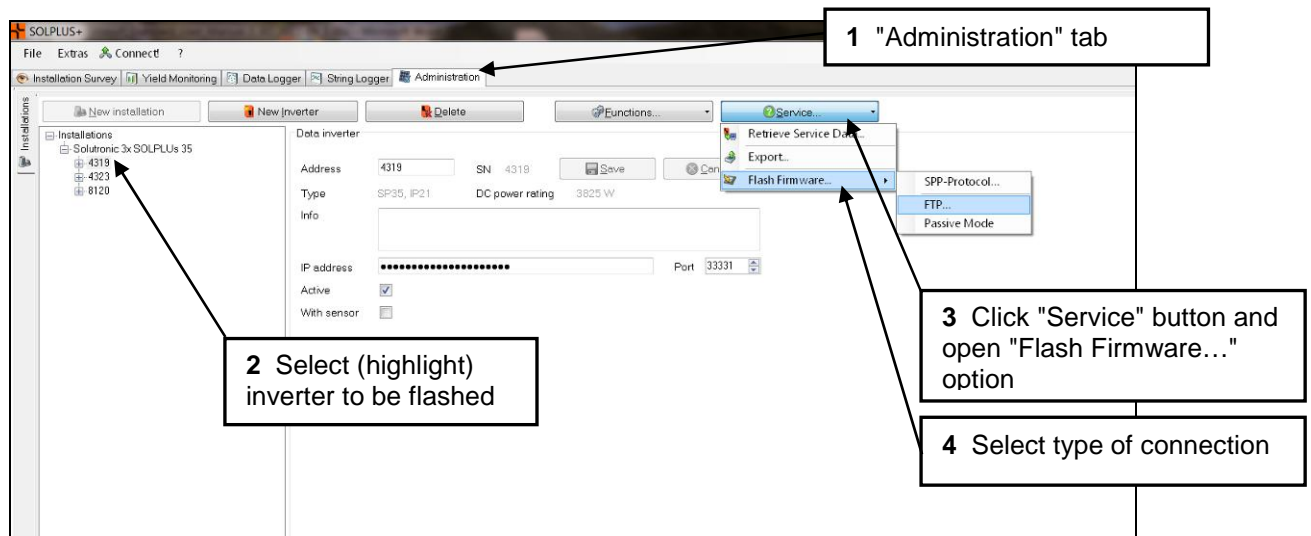
Click the "Administration" tab to open it.

Step 2:

Select the inverter in your installation for which you want to update the firmware.

Step 3:

Then click the "Service" button. This opens a dropdown menu in which you must select the type of connection you want to use from the "Flash Firmware..." option.



Step 4:

Select the type of connection you want to use.

The following options are available depending on the type of connection:

SPP Protocol	Firmware update using SOLPLUS protocol
<p>The connection to the inverter is set up using the SOLPLUS protocol. The firmware update takes approx. 15 minutes per inverter.</p> <p>This connection type can be selected for connections via the Ethernet or RS485 port.</p> <p>Inverters that are connected via RS485 can only be updated by means of this protocol.</p>	
FTP	Firmware update via FTP and using TCP/IP protocol
<p>The connection to the inverter is set up actively via FTP ports 20 and 21. The firmware update takes approx. 2 minutes per inverter.</p> <p>This connection type is only available for Ethernet connections.</p>	
Passive Mode	Firmware update via FTP (passive) and using TCP/IP protocol
<p>If this option is activated, the connection to the inverter is set up passively. This can be advantageous if a firewall is installed to protect the network against remote access.</p> <p>This connection type is only available for Ethernet connections.</p>	

Step 5:

Select a valid firmware file in the file selection window.

Valid firmware files for SOLPLUS 100 – 120 have the following format: "SP120_Se_Vxx_yy.bin"

Step 6:

Check the "OK" button to upload the file to the inverter.

Once the upload has been completed, the inverter begins installation of the firmware update.

The remainder of the update procedure is performed automatically.

**Note**

Make sure that the data connection and the power supply of the inverter are not interrupted while the update procedure is in progress.

If, however, the update procedure is interrupted, restart it and wait until it has been successfully completed.

14 Advanced Features of the SOLPUS+ Comfort Version

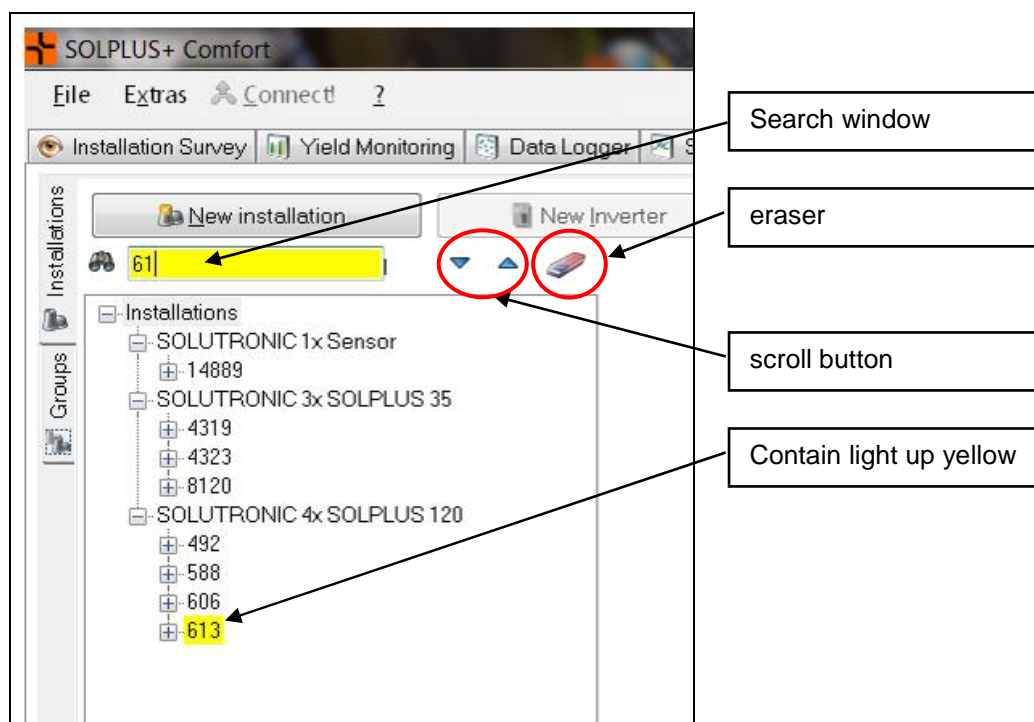
The Comfort version of SOLPLUS+ differs from the Standard version with regard to the following aspects:

- It offers you an automatic data retrieval service
- You can set up more than one installation
- There is a group function for comparing yields and linking small installations to a large installation.
- There is an installation search function

14.1 Installation Search Function

SOLPLUS+ Comfort allows you to search your data.

Simply enter the word or number you want to search for in the search bar and press the Enter key (number 61 in the example shown below). After you have pressed Enter, those installations/inverters that contain the word or number you are searching for (inverter 613 in our example) will light up yellow. To delete your input from the search bar, click the eraser button. Click the arrow buttons to scroll through the tree view.



14.2 Group function

The basic prerequisite for setting up a group is the configuration of at least 2 installations in SOLPLUS+.

Proceed as follows:

Step 1:

Click the "Administration" tab to open it.

Step 2:

Click the "Groups" button at the left-hand edge of the window. (You can switch to displaying installations at any time by clicking "Installations".)

Step 3:

Click the "New Group" button to create a new group.

Step 4:

Enter a name for this group in the "Name" field under "Group Data".

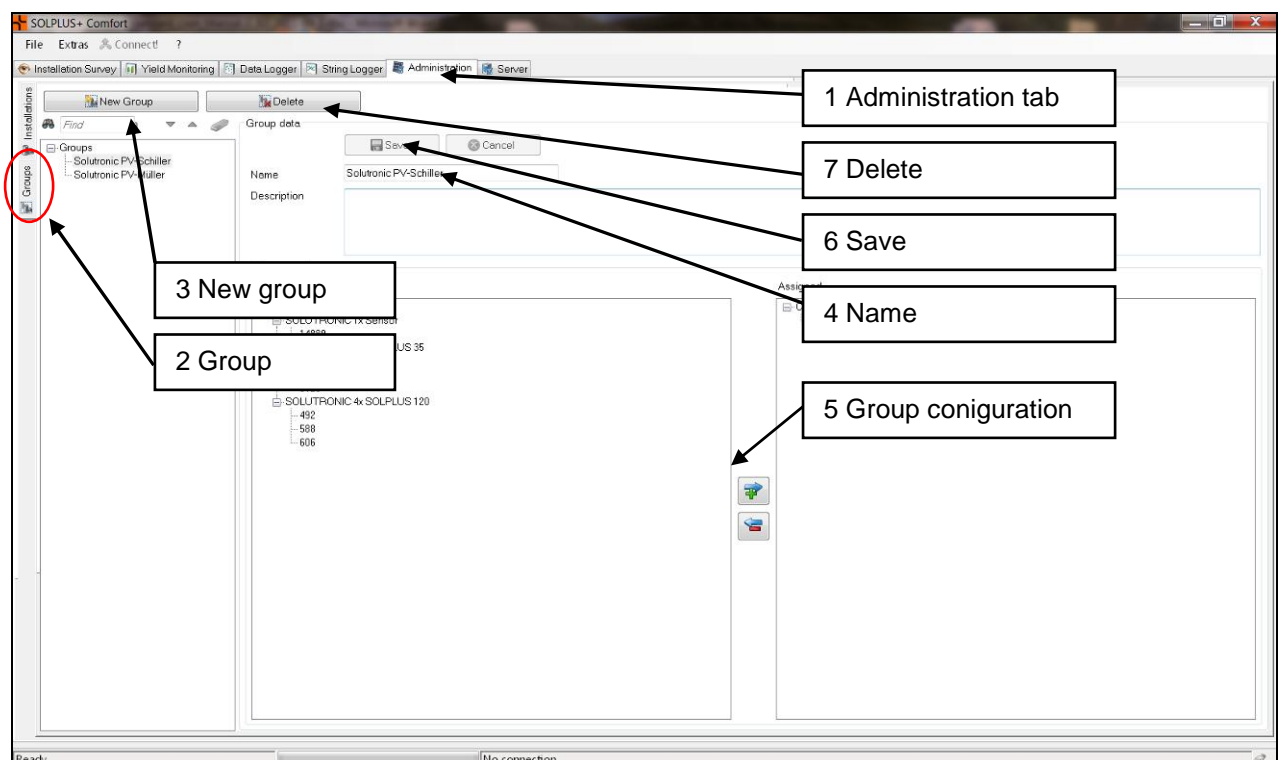
Step 5:

Add installations and/or individual inverters to your group.

Listed in the box on the left-hand side are all the available installations and inverters that can be added to the new group (right-hand side) by means of the arrow buttons.

Step 6:

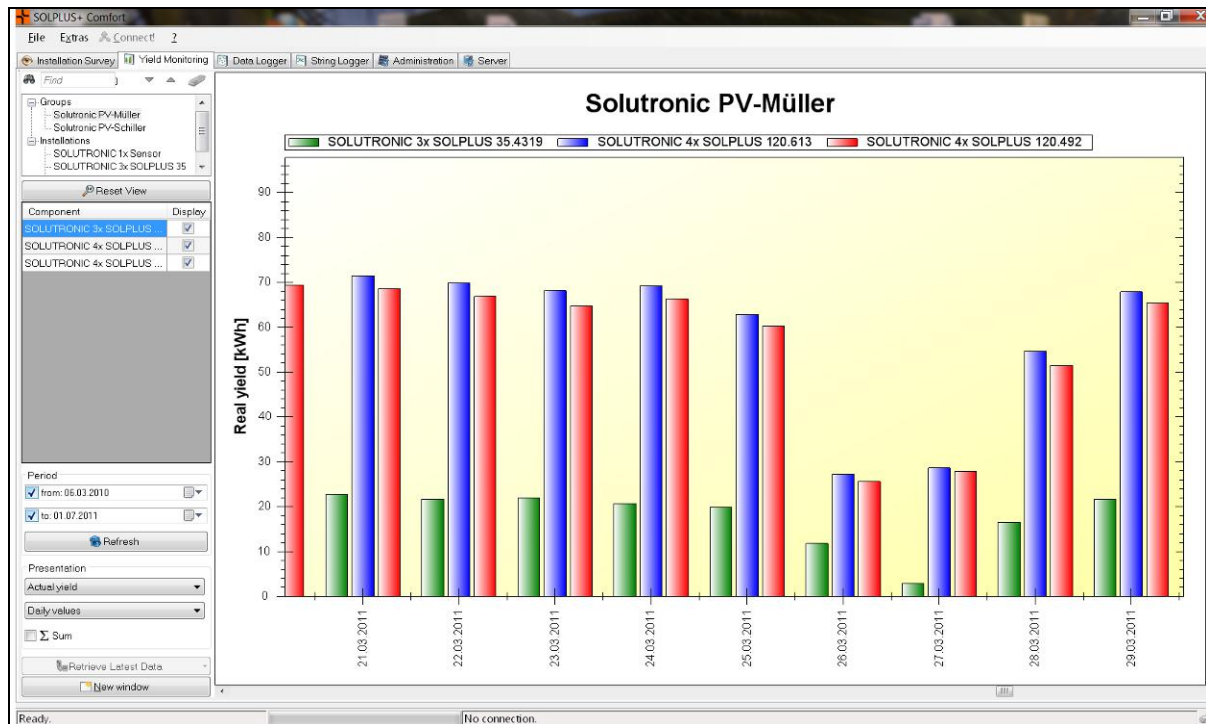
Click the "Save" button to save the group configuration.



Step 7:

To delete a group, click the "Delete" button positioned next to the "New Group" button.

The groups are now displayed and compared in the "Yield Monitoring" tab.



14.3 Automatic Yield Data Retrieval

SOLPLUS+ Comfort allows you to automatically retrieve the yield data of your installations.

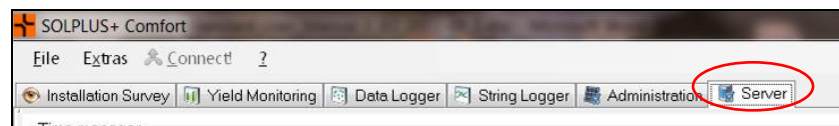


Note

Automatic data retrieval only functions when the "Server" tab is active.

To activate the "Server" tab, you have to uninstall SOLPLUS+ and then reinstall it (see section **Fehler! Verweisquelle konnte nicht gefunden werden.**: *Installing the latest version of SOLPLUS+ over an existing version.*

When reinstalling the program, you are asked whether you want to use the automatic data retrieval function, so reply "Yes" to this prompt to activate the function. The "Server" tab will then be displayed.



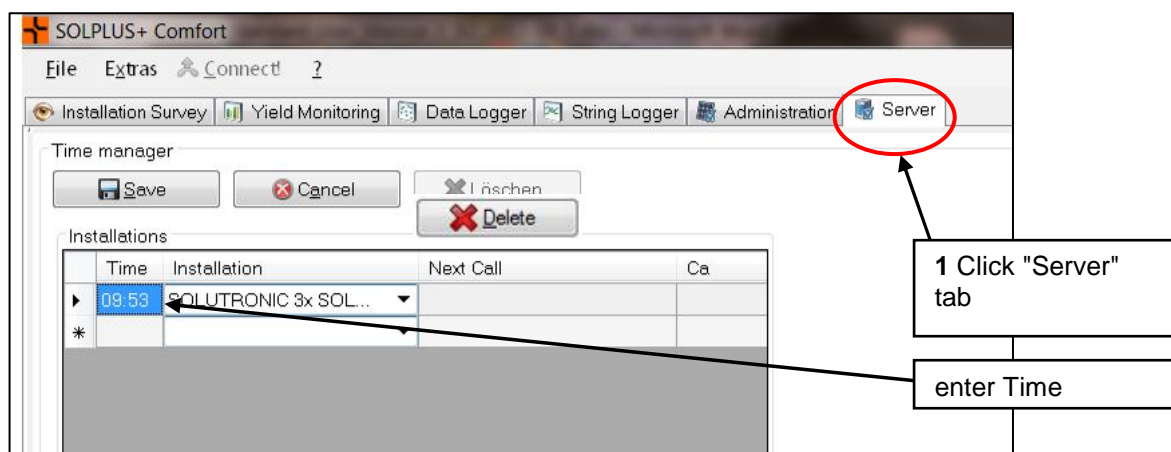
To retrieve your yield data automatically, you have to configure the retrieval times and which installations you want to retrieve data from in the "Server" tab.

Step 1:

Click the "Server" tab to open it.

Step 2:

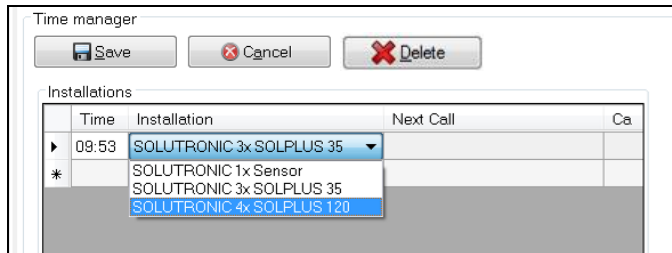
Then enter the time of day at which you want the data to be retrieved in the empty "Time" input field (9:53 a.m. in the example shown here).



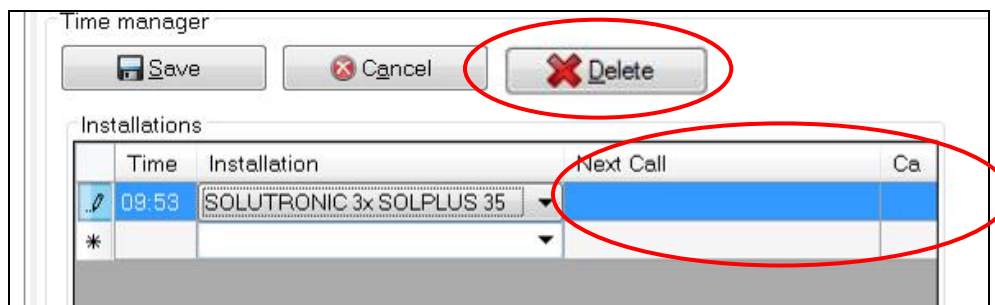
Step 3:

The click the empty "Installation" field. This opens a dropdown menu from which you can select the installation whose data you want to retrieve.

This dropdown menu contains all the installations you have created.

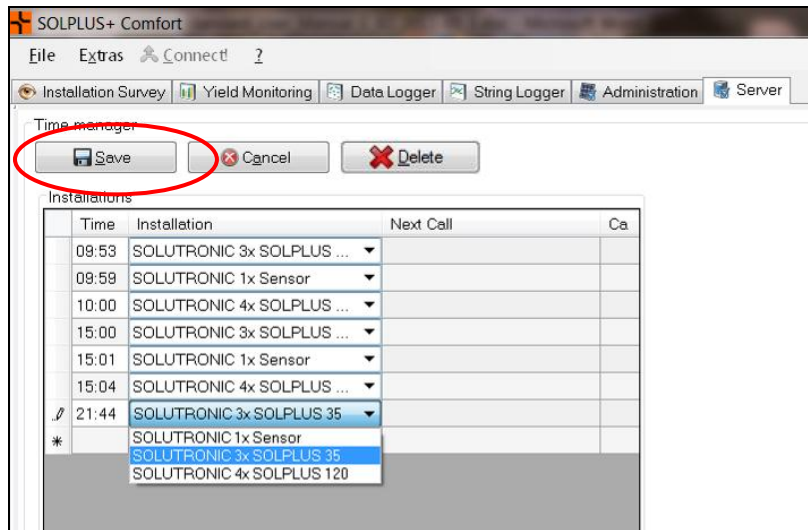


To delete a line that already exists, first highlight the line and then click the "Delete" button.



- The "Next Retrieval" column shows the time at which the next automatic data retrieval will take place (this value is only displayed once you have saved your entry).
- The "Ca" column indicates how many unsuccessful connection attempts there have been.

If you want, you can also retrieve data from your installations several times a day (see figure below).



Step 4:

Click the "Save" button to save the data retrieved.

If you now look at the task bar, you can see the status of the automatic data retrieval function.



Retrieval inactive: SOLPLUS+ active, data retrieval not in progress



Retrieval active: SOLPLUS+ active, data retrieval in progress



Fault status: SOLPLUS+ inactive, data retrieval not functioning



Note

Once you have configured the data retrieval function on the "Server" tab, it runs completely automatically.

Please note that each retrieval can cost you money, depending on the type of connection you have set up.

- Data retrieval via TCP/IP = good, low connection costs
- Data retrieval via modem = Caution: you may incur high connection costs

15 Appendix: Types of Connection from the Inverter to the PC

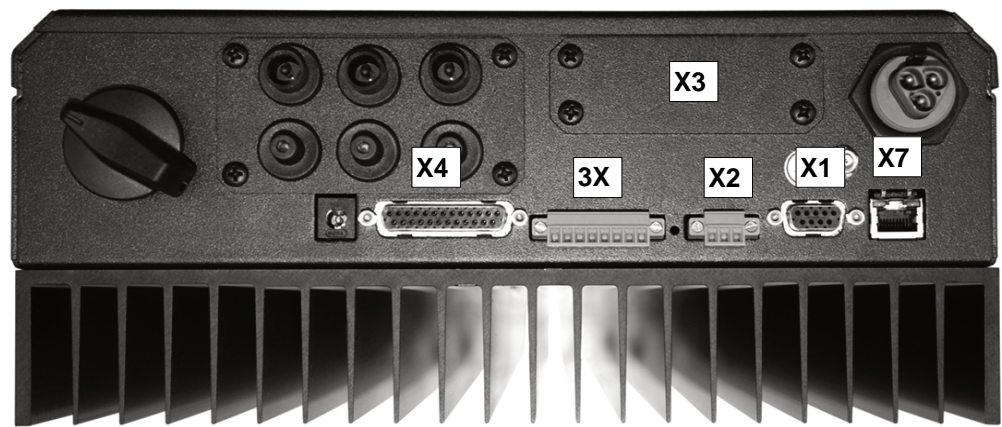
The following options are available to you for connecting your SOLPLUS 25 – 55 and SOLPLUS 100 and 120 inverters to your PC:

1. RS232
2. RS485
3. Analogue or GSM modem
4. Ethernet (TCP/IP)

Connection options

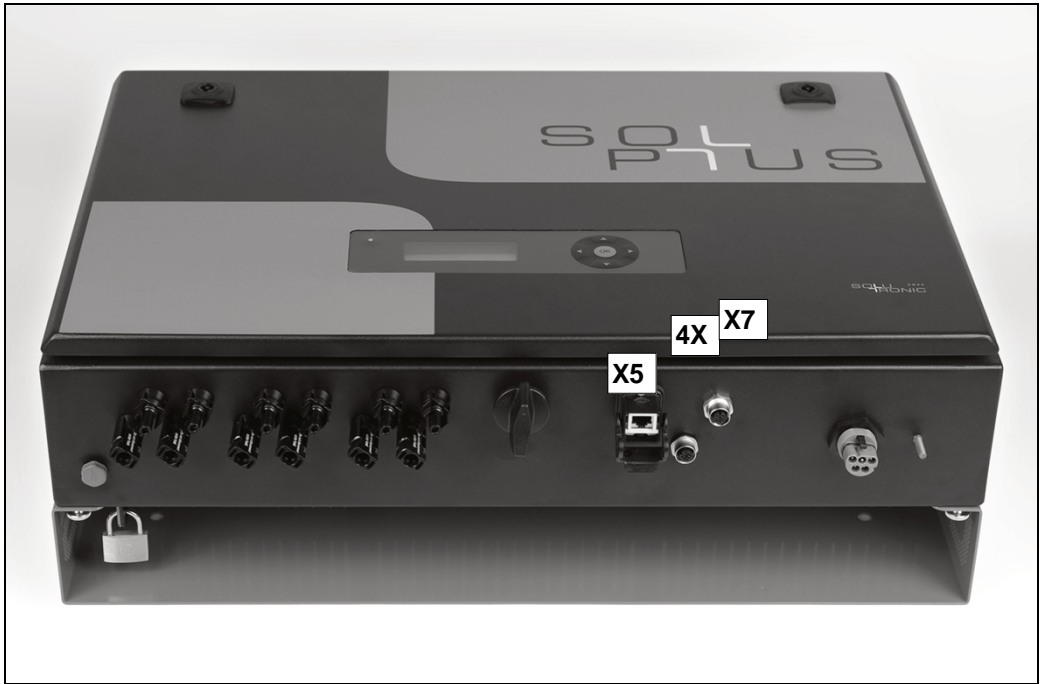
	SOLPLUS	
	25 - 55	100 - 120
RS232	Yes	No
RS485	Yes	Yes
Remote data retrieval with analogue modem	Internal / External / SOLCOMBOX	SOLCOMBOX
Remote data retrieval with GSM modem	Internal / External / SOLCOMBOX	SOLCOMBOX
Network Local connection	Yes	Yes
Network Remote retrieval with router	Yes	Yes

SOLPLUS 25 – 55 port designations



SOLPLUS 25 – 55	
X1	RS232
X2	RS485
X3	Slot for option cards
X4	External connections
X5	External terminal strip
X7	Ethernet

SOLPLUS 100 and 120 port designations



SOLPLUS 100/120	
5	Ethernet X7
6	M12 (RS485)
7	M12 (RS485)

15.1 RS232



Note

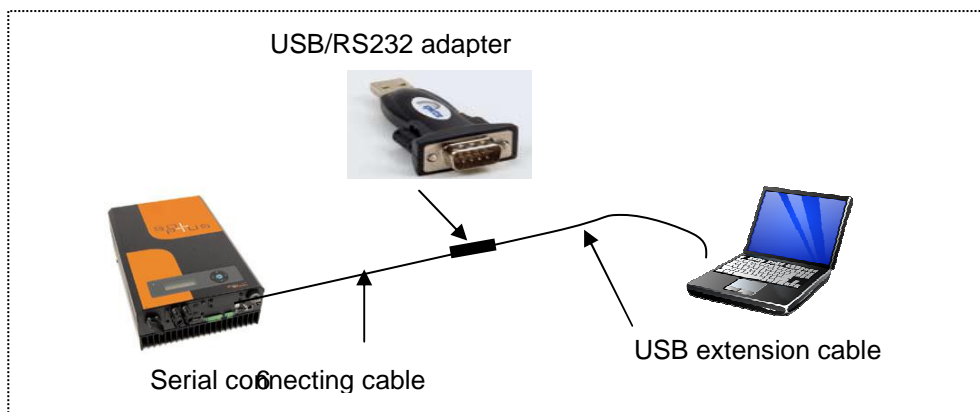
A RS232 adapter is required to connect SOLPLUS 25 – 55 inverters to the PC.

The RS232 port can be used to connect just a single inverter at a time.

The PC to be connected must have an RS232 port. If your PC does not have a RS232 port, you can use a USB/RS232 adapter.

Connection using a USB/RS232 adapter

Plug the 9-pin D-Sub connector of the serial connecting cable into the RS232 port X1 of the inverter. Use the USB/RS232 adapter and USB extension cable to connect to the PC.



USB/RS232 adapter:

for reading out the data of an inverter connected to the RS232 port via the USB port of the PC. The set contains a USB extension cable (order ref.: USB/RS232). The USB/RS232 adapter is black in colour.

Direct connection to RS232

If your PC is still equipped with a serial port, you can use to make a connection as follows:

- Plug the 9-pin D-Sub connector of the serial connecting cable into the RS232 port X1 of the inverter. Plug the 9-pin D-Sub socket into the COM port (RS232) of the PC.

15.2 RS485



Note

A RS485 adapter is required to connect the SOLPLUS inverters to the PC.

The RS485 port can be used to connect several inverters at the same time.

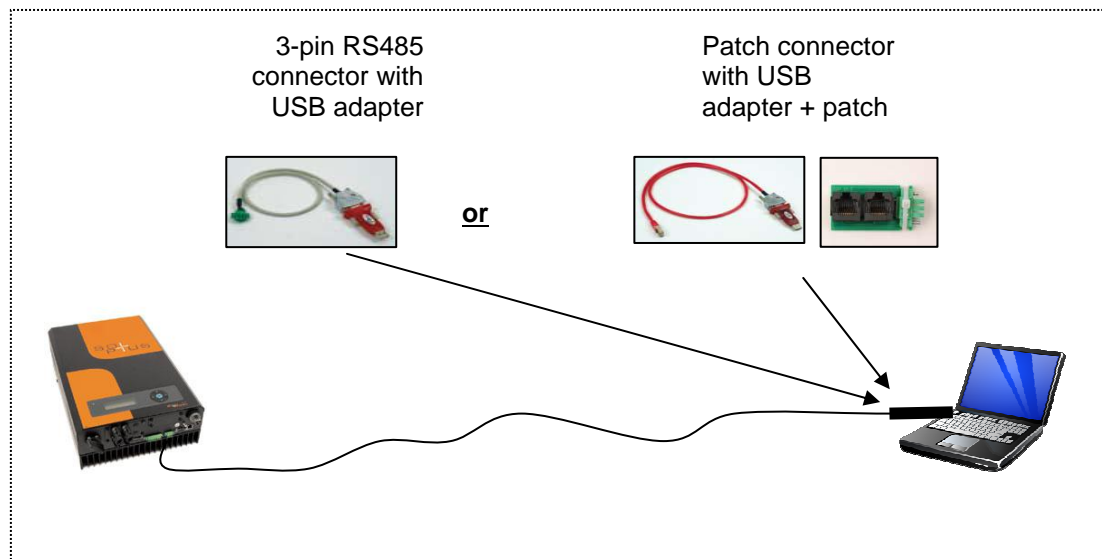
As long as SOLPLUS+ is connected to the installation, no installation data can be accumulated in the inverter that you have configured as the master. This is because the PC acts as the master during this time.

Connection using a USB/RS485 adapter

Connecting SOLPLUS 25 – 55 inverters

Plug the 3-pin RS485 connector of the serial connecting cable into the RS485 port X2 of the inverter. Or plug the patch connector of the serial connecting cable into the RS485 port X7 of the inverter. Plug the USB/RS485 adapter into the PC.

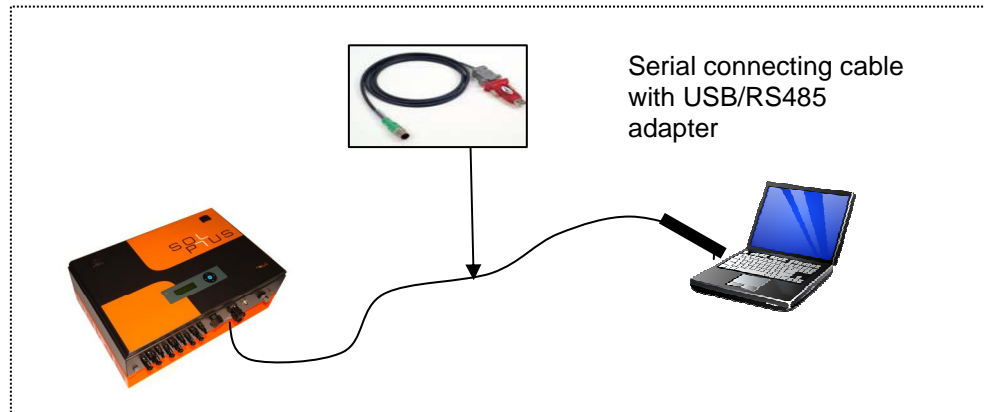
USB/RS485 adapter for wiring (order ref.: USB/RS485-D),
USB/RS485 for patch adapter (order ref.: USB/RS485-P) +
patch adapter for X2 for IP54 enclosure (order ref.: PATCHADX2-IP54) / patch adapter for X2 for IP21 enclosure (order ref.: PATCHADX2-IP21). (The USB/RS485 adapter is red in colour.)



Connecting SOLPLUS 100 / 120 inverters

Plug the M12 connector of the serial connecting cable into the RS485 port X6 or X7 of the inverter.
Plug the USB/RS485 adapter into the PC.

USB/RS485 adapter for M12 (order ref.: USB/RS485-M12),



15.3 Analogue or GSM modem



Note

The connection via a modem only functions with a SOLPLUS 25 – 55 inverter or SOLCOMBOX.

To enable data to be retrieved from a SOLPLUS 100/120 inverter, close the inverter to a SOLCOMBOX using a modem.

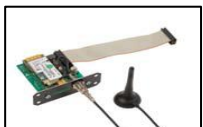
The following modems are available:



Internal analogue modem (order ref.: AMOI)



External analogue modem (order ref.: AMOE)



Internal GSM modem (order ref.: GSMI)



External GSM modem (order ref.: GSME)

Further details on installation and assembly can be found at www.solutronic.de or on the CD enclosed with the inverter.

15.4 Ethernet (TCP/IP)



Note

You require a patch cable to connect the inverters to the PC via Ethernet ports (TCP/IP).

If making the connection directly (without a switch) to an older PC, you require a patch cable to crosslink cable adapter.

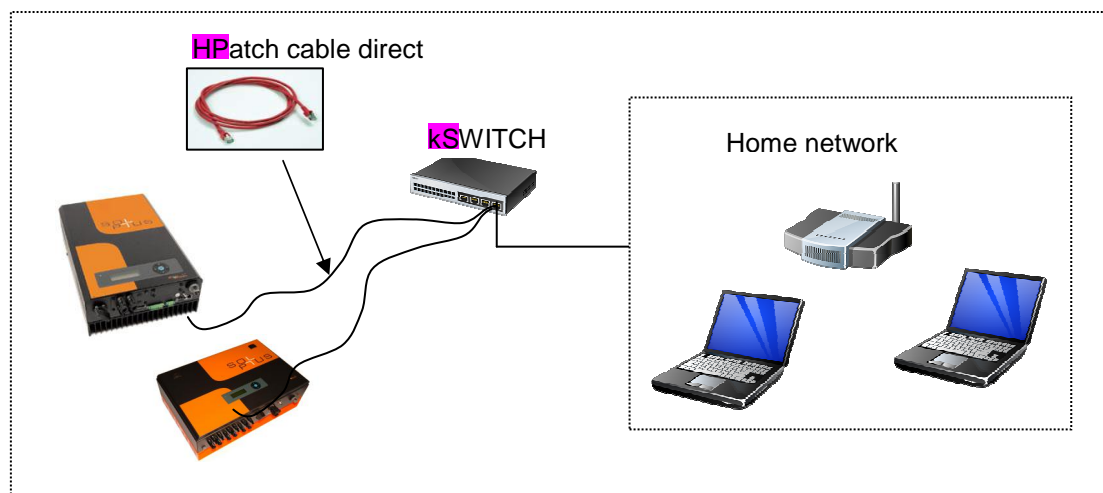


(Order ref.: STP-Cross)

Connecting via a switch/hub with patch cable

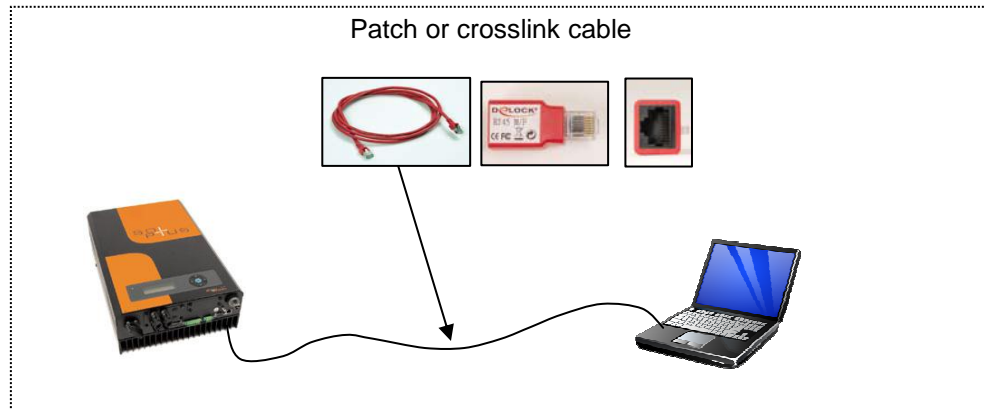
You can connect your inverter to your home network and then retrieve data via TCP/IP with the aid of a switch with patch cable.

Plug the patch cable into Ethernet port X7 (SOLPLUS 25 – 55) or X5 (SOLPLUS 100/120) of the inverter. Plug the patch cable into the Ethernet port of the switch.



Direct connection with a patch cable

If you are not running a home network, you can connect the SOLPLUS inverter directly to your PC with the aid of a patch cable and STP-Cross or crosslink cable. To do this, connect the STP-Cross adapter with patch cable or the crosslink cable to Ethernet port X7 (SOLPLUS 25 – 55) or X5 (SOLPLUS 100/120). Plug the patch cable into the Ethernet port of the PC.



We hope that this documentation has helped you familiarise yourself with our SOLPLUS+ software. However, if you still have any questions or problems, please do not hesitate to get in touch with us.
Your Solutronic Team

Solutronic AG
Küferstrasse 18
73257 Köngen
Germany

Tel.: +49 (0)7024 96128-0
Fax: +49 (0)7024 96128-50
info@solutronic.de
www.solutronic.de