Suntrol® STL800

SYSTEM MONITORING FOR YOUR PHOTOVOLTAIC SYSTEM

Installation and
operating manual

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1 INTRODUCTION

The Suntrol800 (referred to as STL800 in the following) is the newest generation of the Suntrol series. This generation consistently implements the many requests and concerns based on the Web technology of the previous devices.

The display opens up unimagined possibilities thanks to its modern touchscreen operation and numerous connection options.

The new housing design is not only attractive, it's also practical. All cables are now hidden in the new housing, and in the best case they lead out the back completely out of sight.

The STL800 supports a variety of inverters at the same time connected directly to its two data interfaces. Environmental data such as irradiation, temperatures, and even wind measurements can be recorded. You can also save data to a USB stick and analyze it using charts on your PC in your own time.

Thanks to the integrated S0 pulse meter connection, you can now connect digital electricity meters, letting you record electricity consumption. The Suntrol automatically calculates an energy balance, which also takes its own electricity consumption into account.

Last but not least, large displays can be connected to the STL800, either using the S0 pulse output or parallel to the inverter using the RS485 interface.

The STL800 is also available with a Bluetooth module option, which enables a wireless connection to the latest generation of SMA inverters.

The aim is for all of these options to help your photovoltaic system achieve the desired yield over a long time and help you detect and solve problems quickly.

On this note, we'd like to wish you much success using the STL800 and many sunny and high-yield days.

1.1 PROCEDURE

This manual comprises two parts. First, the installation process is described: how to assemble the Suntrol and connect the inverter to the Suntrol. The installation process is then followed by the user manual, which describes in detail how to configure and operate the STL800.

Familiarize yourself with the STL800 before installation. Do not begin installation without first taking time to read through the manual carefully, especially if this is your first installation.

1.2 SAFETY INSTRUCTIONS

First read the following safety instructions **before starting up the STL800 for the first time.**

- Our products were in perfectly safe condition when they left the factory. To maintain this condition, you must follow these safety instructions and the information on the type plates, labels and safety instructions on the device when handling the device (transportation, storage, installation, initial startup, operating, maintaining, taking out of service). Otherwise people could be endangered and the product or other equipment could be damaged.
- These safety instructions are valid in the Federal Republic of Germany. When using the device in other countries, follow the relevant national regulations.
- If the information in these safety instructions is insufficient, the manufacturer can be reached at any time at the specified address.
- Check the packaging and immediately report any damage to the shipper.
- Before starting up the device for the first time, make sure the power supply unit is not damaged. If in doubt, consult a qualified electrician or contact the address provided at the end of the manual.
- Before starting up the device for the first time, make sure the voltage of the device matches the grid voltage in your country.
- The device must only be operated using the power supply unit included in the scope of delivery.

- Condensation can occur if the power supply unit is moved directly from a cold environment to a warm environment. Wait until the temperature has equalized. Starting up the device when condensation is present can result in death!
- Have repairs carried out only by authorized staff. Contact the address provided at the end of the manual.
- Check the plug-in power supply unit regularly for damage. If it is damaged, take the plug-in power supply unit out of service immediately and replace it.
- The device is not intended for outdoor use.
- Before cleaning, switch off the power! Use a gentle cleaning agent and a damp cloth to clean. Never clean using a cloth that is soaking wet.

Other instructions

- The STL800 is operated with 12 volt direct current (12 V DC, max. 24 V DC). Using a different operating voltage renders the warranty null and void. Use only the power supply unit provided.
- The STL800 meets the requirements of protection degree IP20 and is suitable only for installation in dry, dust-free indoor areas.
- The maximum relay load should not exceed 24 V DC or 5 A.
- Before connecting any cables between the STL800 and inverter, disconnect all inverters from the power supply. First disconnect the AC side and then the DC side. Then wait at least 5 minutes until the capacitors in the inverters have discharged.

1.3 SUNTROL PORTAL

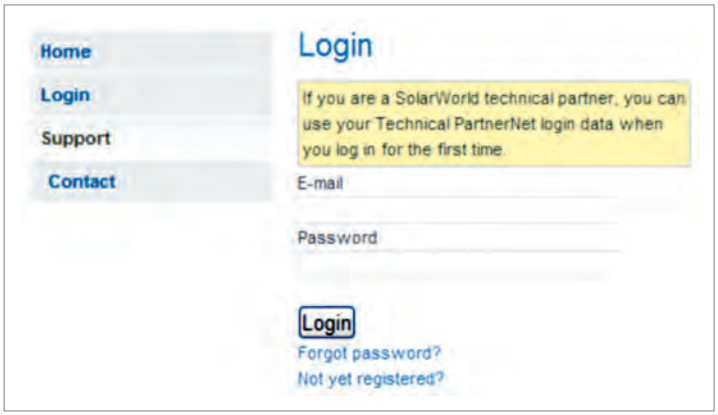
One interesting function of the STL800 is the option of storing system data on our own portal (www.suntrol-portal.com). This function lets you retrieve data remotely from any Internet connection and also lets you present your system to friends and anyone interested in solar power.

Create your own user profile and log in using your customer login data. Your profile provides you with access to all the data on your solar power system, such as yield data, event logs, and much more. In addition, you can also customize your profile by updating the system location, orientation, size, inverter types, contact data, etc. You can activate your solar power systems as reference systems so that portal visitors can see selected information.

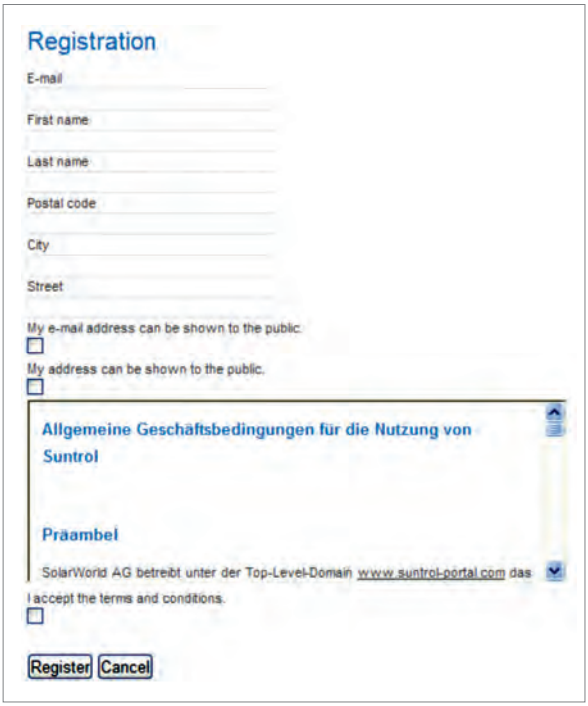
The Suntrol portal operates entirely independently from your STL800. You do not need a dedicated line or the like. Nor do you have to depend on an access portal. All you need is an Internet connection. The next step is to configure the STL800 correctly so that it "knows" where to upload the data on a regular basis.

1.3.1 REGISTERING ON THE SUNTROL PORTAL

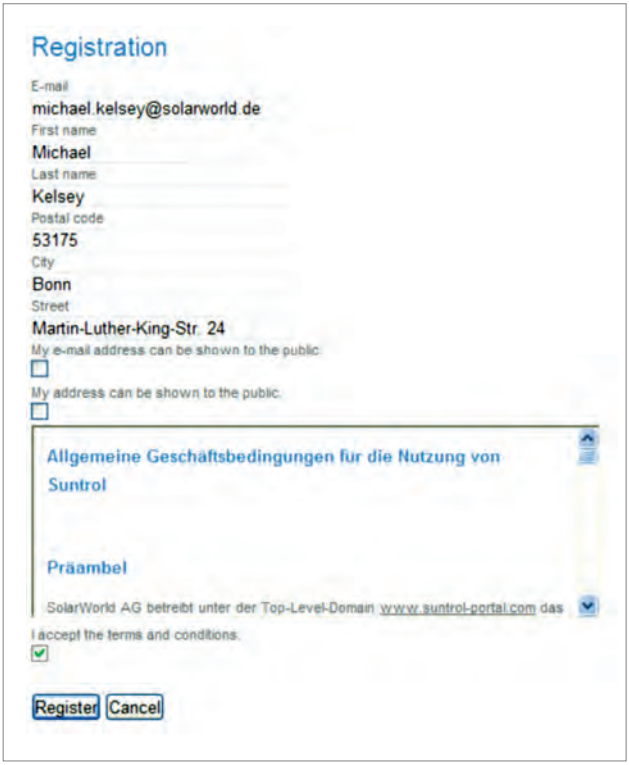
In your Internet browser, go to www.suntrol-portal.de, the portal's home page. The menu is located on the left side of the page. To connect your system to the portal, **the first time** you use it, click "Not yet registered" to allow you to log in to the site.



The following page is displayed:

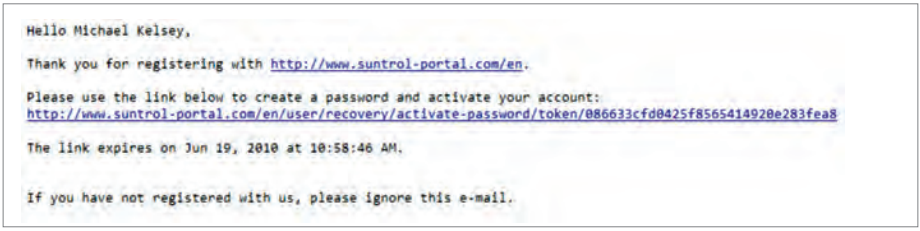


Please complete all the information. You can choose whether you want to check the top two boxes, but you must click the box indicating that you accept the general terms and conditions. A link to the general terms and conditions is located in the lower right. Next, click “Register.”



Once you have filled out all the information correctly, the following message is displayed:

Shortly thereafter, an email with the following information will be sent to the email address you provided above.



Hello Michael Kelsey,

Thank you for registering with http://www.suntrol-portal.com/en.

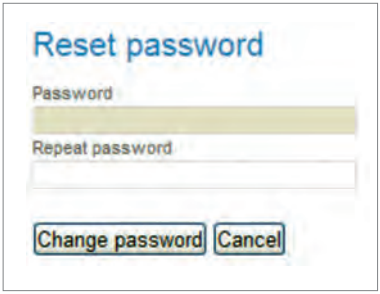
Please use the link below to create a password and activate your account:
http://www.suntrol-portal.com/en/user/recovery/activate-password/token/086633cfd0425f8565414920e283fea8

The link expires on Jun 19, 2010 at 10:58:46 AM.

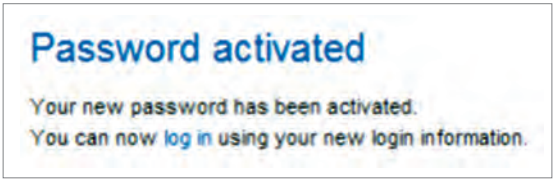
If you have not registered with us, please ignore this e-mail.

This email is valid for 2 days. The exact expiration date is specified in line 5 of the email. To activate your account, click the second link in the email.

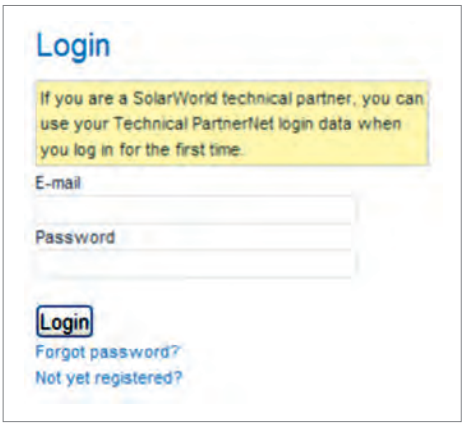
The link takes you to the portal, where you must choose your own password and re-enter it in the second box. Your password must contain at least 6 letters or numbers.



Once you have entered your password twice, click “Change password.” If your entries are correct, the following message is displayed:



Click the “Log in” button. The following page is displayed.



You can use the data you created to login here or directly from the portal home page using the Login button. Enter your email address and password and then click the “Log in” button. When you enter your data correctly, your profile opens, where you can view and modify all your data.

If you forget your password, you can click the “Forgot password” link at the bottom of the login interface to generate a new password. Enter your email address and submit your request. If your email address is found, the following screen appears and an email is sent to your inbox.

The new password is assigned as described above.

1.3.2 REGISTERING A SOLAR POWER SYSTEM ON THE SUNTROL PORTAL

First, log in to the portal as described in the registration instructions, or if you have already registered, log in to the portal.

Click the 

link. The “Manage systems” page opens and you can log in to your system using the 

link.

Complete the boxes in the screen that appears. You can choose the name yourself, which will then be the title of your system’s page.

The time zone for Germany is +0000.

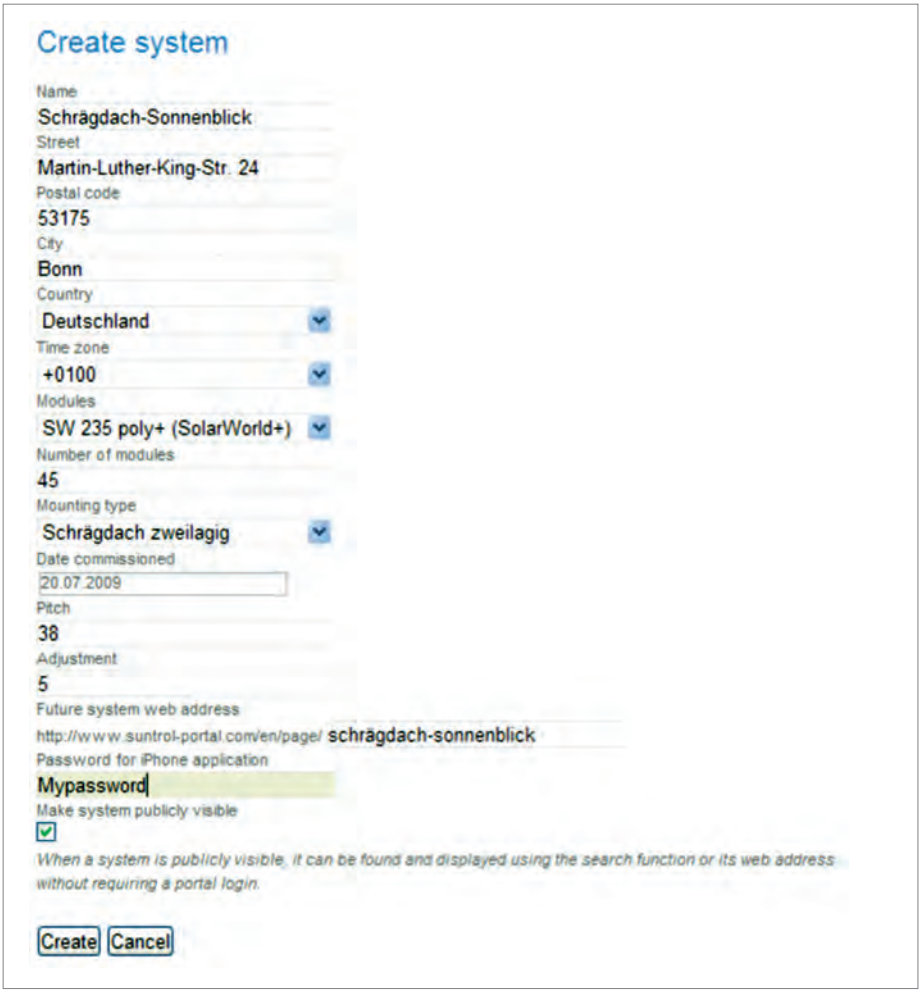
Select your type of module and mounting frame, which you can find, for example, on your offer. There, you will also find information on the (roof) pitch and the orientation of your solar power system. Enter the pitch and orientation as a number without the degree symbol (“°”). The starting point is South, with 0° deviation. Westward orientations have a positive or no sign, while eastward orientations have a negative sign.

Next, you can choose whether you want your system to be visible to the public. If you select this option, other portal users can see your system’s power data and your system photos.

When you define the address, you have the option of creating a custom Web address. The easiest option is to use the name you chose above. Replace spaces with a “-” or “_”. No special characters are permitted.

You only need to enter the “Password for the iPhone application” if you would like to retrieve your data on your iPhone using a special tool. Your password must contain at least six characters. Special characters are not permitted. You can also leave this box blank.

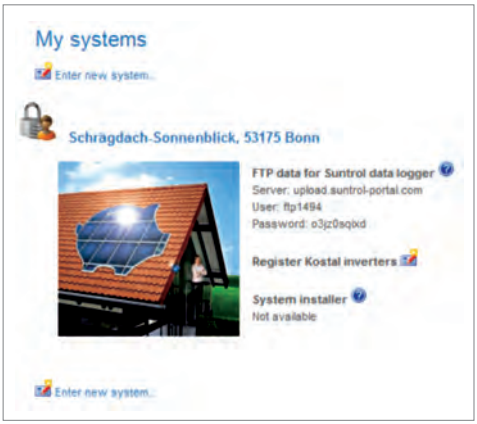
Once you have finished entering the necessary information, click “Create”.



If an entry does not comply with the requirements, a message indicating that you must correct your entry appears directly underneath the box.

Your system is now registered.

Next, you will then receive your personal login data for communicating with your data logger. Enter this data in your data logger to enable the portal to communicate with your system.



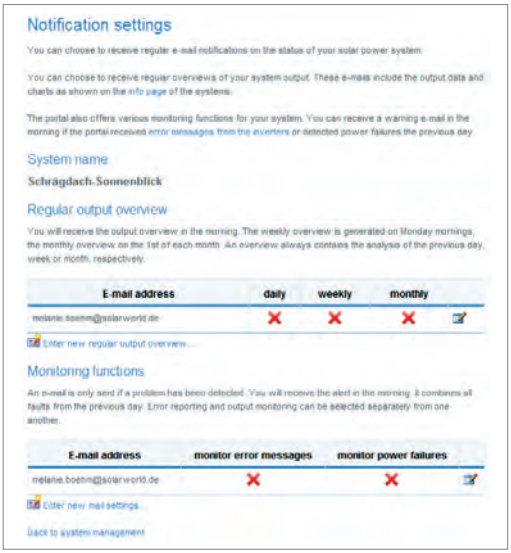
You can now manage your data at any time on the right . You can also upload photos of your solar power system. To do so, click the icon, then Upload new image... and then "Browse" to select a photo from your computer. In the "Comment" box, you can enter a title for your photo. The photo is uploaded when you click "Save." This may take some time depending on your connection speed. Save your photos in .jpg, .bmp, or .gif format to make sure they can be displayed correctly.

You can also delete your system at any time by clicking the icon.

You can add other photovoltaic systems following the same procedure described above.

1.3.3 SETTING UP EMAIL SERVICE

The Suntrol portal has an email function, which sends emails in certain situations on request. To set up the email function, go to www.suntrol-portal.com, select “Login,” then ‘“My systems,” and click the  icon.



Follow the instructions and then click “Save”.

1.4 SCOPE OF DELIVERY

The following components are included with the STL800:

- STL800 – base device
- 12 volt plug-in power supply unit
- Manual
- Terminal block connector for all connections (except CAN): 2 3-pin, 1 4-pin, 2 6-pin
- 4 anchors and screws for wall mounting

You need an additional network cable (RJ45-CAT5 or CAT6) in the required length to connect the device to your PC or network. You also need the right cables to connect the inverters together.

2 INSTALLATION

The STL800 must be installed indoors under protection from dust. If you intend to use the Suntrol outdoors or in dusty environments, it must be installed in an appropriate protective housing. The device is mounted using 4 fastening points at the rear panel of the housing. You must remove the top and bottom housing shells first.

2.1 CONNECTION OPTIONS

There are several connection options on the top and bottom of the housing of the STL800.

Bottom	
Rel.	Relay, to relay external signals such as rotating flashing beacons and the like
RS485-A	First RS485 interface. Connection to inverters, SensorBox, or a large display
RS485/422-B	Second RS485 interfaces (RS422 for Fronius/Phoenixtec). Connection to inverters, SensorBox, or a large display
Power 12 V	12 volt DC input
Network	Ethernet network interface, 10/100 Mbit
RS232	RS232 modem interface. Connection to analog or GPRS modem

Top	
S0 In/Out	S0 pulse input for connecting to external electricity meter S0 pulse output for connecting to an external large display
Alarm	Connection for induction loop for anti-theft protection. With bell wire up to 1000 m.
CAN	CAN bus, for future expansion. Not currently in use. No terminal block connector is included for this port.
USB	USB host port. Suitable for USB sticks up to 2 GByte capacity (Important: not suitable for connecting to your PC!)
Reset	Reset button. Restarts STL800; does not reset data.

2.2 CONNECTING TO INVERTERS

Since the STL800 must communicate with every single inverter directly, appropriate data cables are required. Green terminal block connectors are included for connecting the STL800 to the first inverter.

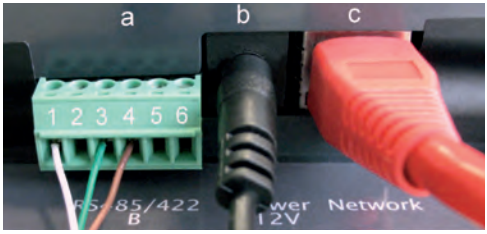
Since every inverter manufacturer uses different wiring and connections, the corresponding data cables must be adjusted correctly. The next section describes the connection configurations for all supported manufacturers.

Note:
The manufacturer's specifications for connecting the data cables must be followed. You can find these specifications in the manufacturers' documentation.

2.3 TERMINAL BLOCK CONNECTORS

The STL800 has two RS485 interfaces, labeled A and B. Interface B can also be used as an RS422 interface (for Fronius/Phoenixtec inverters).

RS485-A: 4-pin green connection plug
RS485/422-B: 6-pin green connection plug



The connection plugs are numbered 1 to 4 or 6 from left to right.

The pins are assigned as follows:

Pin	RS485-A	RS485-B	RS422 (for Fronius/Phoenixtec)
1	Data+	Data+	T/RX+
2	12 V	12 V	12 V
3	Ground	Ground	Masse
4	Data-	Data-	T/RX-
5			R/TX+
6			R/TX-

Note:
This means that the first 4 pins of the RS485/422-B port are connected identical to the RS485-A port. The terms "Data+" and "Data-" are manufacturer-specific. They are sometimes referred to as "A" and "B" or other combinations. Follow the description in the manual exactly. Otherwise the inverters will not be detected later.

2.4 SMA

SMA-RS485 Piggy-Back: 3-pin wiring

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the SMA manual. A 4-pin connector can also be plugged into the first four pins (from the left) of the 6-pin port. Caution: Plugging into pins other than the first four from the left can damage the STL800 and interface cards.

2.4.1 BLUETOOTH MODE

Note:
Bluetooth mode is only possible if the optional Bluetooth module is installed in the STL800. Currently only SMA-SB3000/4000/5000-20 inverters support wireless Bluetooth mode (as of May 2009). You do not need to do anything to the inverter for Bluetooth mode. Currently up to 2/7 SMA Bluetooth inverters can be read using the STL800.

If at all possible, inverter detection should take place in the room where the inverters are installed. This prevents any detection errors due to too great a range. You can then try using the Suntrol from greater distances. Unfortunately, there is no signal strength indicator.

2.4.2 IMPORTANT INSTALLATION INFORMATION

The inverters must be opened to install the Piggy-Back interface cards. The inverters should only be opened by trained professionals. Always follow all the instructions in the inverter manual.

2.4.3 INSTALLATION

Disconnect the supply voltage before performing any work on the inverter. To do so, first disconnect the AC side and then the DC side. Next, wait 30 minutes until all live components have discharged.

Also note that the inverter and interface card contain sensitive electronic components that can be destroyed by static discharges.

2.4.4 SMA-RS485 PIGGY-BACK

Note:
Three-pin wiring is required.

Installation is described in detail in the Piggy-Back manual from SMA, which is included with the interface board. It describes how to connect the inverters with each other on page 6 of 8 in the section “Connecting an SB/SWR to your PC using RS485.” Connect the inverters with a shielded, 3-pin data cable as described in the SMA manual.

Next, connect jumper A to the Piggy-Back of the last inverter as described on pages 5 of 8 and 6 of 8 of the SMA manual.

To connect the Suntrol to the first inverter, you can use a prefabricated data cable (accessory, not included in the scope of delivery) or your own cable.

Pull the exposed wires through the inverter's cable opening and connect:

Suntrol	Terminal block in the inverter
White (1)	2
Green (3)	5
Brown (4)	7

Pull the data cable through the insulation tube provided. Connect terminal block 5 on the inverter with the blade terminal (provided) on the inverter housing.

This completes the hardware installation. You can now close the inverters and put them into operation.

2.5 KOSTAL PIKO/SOLAR-FABRIK CONVERT T (RS485)

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Kostal manual.

The RS485 interface is factory-integrated in all Kostal inverters. The terminal block is located inside the housing. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc.

Unfortunately the RS485 address cannot be changed directly on the display. It must be configured using the inverter Web server. To do so, you must temporarily connect a PC to the inverter using a network cable and change the IP address on the PC to enable access to the inverter's Web server. (The inverter's IP address is shown on the display.)

Once you enter the IP address, a login window opens. You need to enter different users/ passwords depending on the manufacturer and software version:

Kostal Piko	User:	PIKO
	Password:	pvwr
Solar-Fabrik Convert, old firmware	User:	convert
	Password:	pvwr
or new firmware	User:	pvserver
	Password:	pvwr

More information on how to connect the PC and network cable is provided in the manufacturer's documentation.

Kostal Piko
The procedure is described in the manuals "Com_Manual_PIKO _Version_1-21.pdf" or "Com_ Manual_PIKO _Version_2-0.pdf."

Solar-Fabrik Convert T models
The procedure is described in the manual "Installation_and_Operating Manual_convert_ Netboard__Version_3.1_.pdf."

SolarWorld AG cannot provide the documents due to copyright restrictions. You can download them from the manufacturer's Web site.

2.5.1 WIRING

Connect the inverters together using a 3-pin, shielded data cable connected to the inverter's 10-pin connection terminal block. The terminal block is located directly below the display. Connect terminals 1, 2 and 3 (A, B, GND) together.

10	9	8	7	6	5	4	3	2	1
							GND	B	A

Use a cable you assemble yourself to connect the STL800 to the first inverter.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Suntrol	Terminal connector on the inverter (from right)
White (1)	Terminal 1-A
Green (3)	Terminal 3-GND
Brown (4)	Terminal 2-B

2.5.2 MULTI-STRING TECHNOLOGY

Piko/Convert inverters are equipped with several MPP trackers, which means that each string input is monitored separately and adjusted optimally to the connected modules. The Suntrol can read data from up to 3 individual strings. The number of strings depends on whether there is parallel connection inside the inverter and may be reduced. During inverter detection, the Suntrol automatically detects how many strings are active.

The inverter must be supplying power for the individual strings to be detected successfully.

2.6 KACO – POWADOR/PVI-BLUEPLANET WITH RS485 INTERFACE

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Kaco manual.

2.6.1 POWADOR

The RS485 interface is factory-integrated into all Powador models. The interface must be activated using the operating display, however. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can also be made on the operating display. Follow the instructions in the Kaco manual.

The Suntrol shows the Kaco central inverters as three independent inverters. If you have two central inverters, for example, which have been assigned RS485 addresses 1 and 2, the Suntrol will show a total of 6 inverters.

2.6.2 PVI-BLUEPLANET

PVI-BluePlanet models were rolled out until around mid-2005 and were available with an RS232 or RS485 option from the factory. You must have the RS485 option for operation with the STL800. Kaco can retrofit the interface. Ask your installer or Kaco directly.

Each inverter must be assigned a separate communication address. You assign addresses using a DIP switch inside the inverter. Follow the instructions in the Kaco manual. We recommend identifying addresses sequentially beginning with 0, in other words, 0, 1, 2, etc.

Note:
If there is no DIP switch on the control board, the PVI-BluePlanet inverter is the RS232 version.

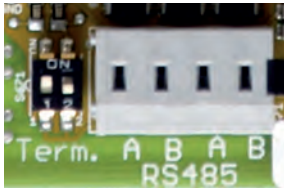
2.6.3 WIRING

The individual inverters are connected using terminal blocks located inside the device.

2.6.4 TERMINAL BLOCK – POWADOR MODELS

Powador manufactured
up to 06/2007

Powador manufactured beginning roughly 06/2007
(terminated with DIP switch)



Powador 8000xi (6400xi/7200xi):
The 8000xi models have a special wiring feature since three 8000xi models can be connected to form a group. You can also use one or two devices without creating a group. The wiring is entirely different depending on which option you choose. For specific instructions, see the installation manual for Kaco inverters.

8000xi in a group:
One of the three inverters must be jumpered as a master, and the two others must be designated as slaves. Important! Jumpers that are plugged in ALWAYS indicate a slave, while a removed jumper ALWAYS indicates a master regardless of the label on the main board. In other words, the jumper must be removed on the master inverter, and the jumper must be plugged in on the two slaves.

- The Suntrol data cable is connected to the LOGGER terminal block of the master inverter.
- The 3 inverters are additionally connected to each other using the SYM terminal block.
- All three inverters must have a consecutive RS485 address, which can be configured on the inverter display.
- Switch “SYM-Bus” to active on the inverter display

Individual 8000xi models:
- Jumper the inverters to slave, i.e. the jumper must be plugged in.
- The Suntrol data cable is connected to the SYM terminal block of the slave inverters.
- All three inverters must have a consecutive RS485 address, which can be configured on the inverter display.
- Switch “SYM-Bus” to inactive in the configuration dialog box on the inverter display.

2.6.5 TERMINAL BLOCK – PVI-BLUEPLANET MODELS

Connect the individual inverters together via the RS485 terminal blocks using a shielded, 2-pin data cable as described in the Kaco manual. Each inverter has two RS485 ports to enable the inverters to be connected in a series.

Connect terminal A to terminal A of the next inverter and do the same for terminal B.

To connect the Suntrol to the first inverter, you can use a partially prefabricated data cable (accessory, not included in the scope of delivery) or your own cable.

Pull the exposed wires through the inverter's cable opening and connect:

Suntrol	Terminal block in the inverter
White (1)	B
Brown (4)	A

BluePlanet/Series 1 Powador:
A 330 Ohm terminal resistor (included with the inverter) must be connected to the terminal block on the inverter farthest away from the Suntrol. The resistor connects the unused A and B terminals.

Series 2 Powador:
A terminal resistor must also be connected to the inside DIP switch (see figure above) on the inverter farthest away from the Suntrol. Make sure the DIP switches on the other inverters are set to Off. Otherwise data communication will not work properly.

Note:
If the cables are kept relatively short, you may not need terminal resistors.

2.7 SOLARMAX – SERIES S, C AND E WITH RS485 INTERFACE

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Sputnik/SolarMax manual.

2.7.1 S AND C SERIES

The RS485 interface is factory-integrated into all S/C series models. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can also be made on the operating display. Follow the instructions in the SolarMax manual.

S series: Note that only the RS485 interface is activated on the inverter display (factory setting), not the Ethernet interface, which is also built in.

Note:
The inverter's factory setting is address 255, which is not a valid address number. Even if only one inverter is connected to the Suntrol, the communication address must be set manually to 1.

2.7.2 CX SERIES

The Cx series models do not include an RS485 interface as standard and must be retrofitted. Contact your installer or the manufacturer.

2.7.3 E SERIES

The E series models do not have a communication interface as standard. An interface must be installed before the Suntrol can be connected.

Follow the installation instructions included with the interface. In particular, make sure to use the correct setting for the RS485/RS232 jumper and the terminal resistor on the interface card (see the interface card manual).

Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can also be made on the operating display. Follow the instructions in the SolarMax manual.

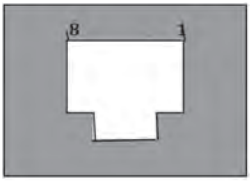
2.7.4 WIRING

On the inverter side, RJ45 connectors are used to connect the RS485 data cable. These connectors are the same as those used in conventional network patch cables.

Important! The Suntrol also has an RJ45 port. This port must never be connected to the inverter's RJ45 ports. This could destroy the Suntrol!

Note:
We recommend the prefabricated SolarMax data cable, which is available as an accessory.

If you assemble the cable yourself, use the following wiring:



Front view of RJ45 connector

RJ45 pin	Suntrol RS485
1	2
2	2
3	3
4	3
5 - unused	
6 - unused	
7	1
8	4

Connect the individual inverters together using conventional network cables with an RJ45 connector.

SolarMax S/C series:
The inverters can be wired at any time since they do not need to be opened.

The two RJ45 ports for system communication are located on the bottom of the inverters. Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter. In the same manner, connect inverter number 2 to inverter 3 and so on.

Connect the prefabricated Suntrol data cable with the RJ45 connector to the unused port on the last inverter.

SolarMax E series:
Disconnect the inverters from the power supply or wait until evening. (You must enter the information for setting the communication address on the display during the day.)

Since the RJ45 ports inside the inverter are located on the interface card, the network cables must be led through the cable opening on the bottom of the inverter. Two cables are always fed through all inverters after the first inverter: one cable from the preceding inverter and one cable to the next inverter or Suntrol. Plug the cable from the preceding inverter into the left-hand port labeled "RS-485 in" and the cable to the next inverter into the right-hand port labeled "RS-485 out". Connect the prefabricated Suntrol data cable with the RJ45 connector to the unused port on the last inverter.

2.8 FRONIUS – IG 15-60 (HV) AND IG 35+ TO IG 150+ WITH COMCARD

⚠ **Important note:**

Never open the housing of the inverter when voltage is present. Always follow the information in the Fronius manual.

Before you can connect the STL800 to the inverter, an interface card, or "ComCard," must be installed.

2.8.1 INSTALLING THE FRONIUS COMCARD

The ComCard can be factory-installed in the inverters or installed later as a ComCard retrofit.

Note:
You must open the inverter to install the ComCard. Follow the guidelines in the Fronius-IG manual for your inverter.

The manual describes how to install the ComCard in great detail. Follow all instructions in the manual.

We recommend leaving a slot open between the installed ENS card and the ComCard.

2.8.2 COMMUNICATION ADDRESS

Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can be made on the operating display. To do so, follow the instructions in the “Setup menu” section of the “Operating concept” chapter of the Fronius manual.

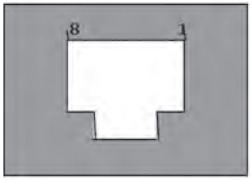
2.8.3 WIRING

Connect the individual inverters together using conventional network cables with an RJ45 connector.

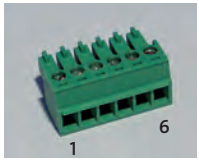
Each ComCard has two RJ45 ports, which are labeled IN and OUT. It is very important to follow the correct sequence when connecting the inverters. Otherwise data will not be able to be exchanged.

Important!
The Suntrol also has an RJ45 port. This port must never be connected to the inverter’s RJ45 ports. This could destroy the Suntrol!

RS422-B



Front view of RJ45 connector



RJ45 pin	Suntrol RS422 B (6-pin)
1	-
2	-
3	5
4	1
5	4
6	6
7	-
8	-

Terminating connector:
The terminating connector is an 8-pin RJ45 dummy plug in which the following wires are bridged:
RJ45 PIN bridged
3 and 4
5 and 6

Use the prefabricated cable with the 6-pin connector to connect the Suntrol RS422-B to the IN port of the first inverter.

Next connect all inverters by connecting inverter 1-OUT to inverter 2-IN, inverter 2-OUT to inverter 3-IN, and so on. Plug the terminating connector into the OUT port of the last inverter.

Note:
The LED-E on the Suntrol indicates the communication status. Once all cables are connected correctly and the inverters are active, the red LED switches off.

2.9 SOLARWORLD SUNPLUG/DANFOSS INVERTERS

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Danfoss manual.

Danfoss (PowerLynx) also produces inverters for other manufacturers, such as IBC (ServeMaster) and CentroSolar (Powerstocc®) and previously for Kyocera (KC x) and SolarWorld (SunPlug).

These inverters are largely equivalent and use the same data protocol.

The interfaces used may differ.

The Suntrol supports all inverters from Danfoss.
1. UniLynx
2. TripleLynx

2.9.1 RS485 INTERFACE

An RS485 interface is needed for data monitoring using the Suntrol. This interface is factory-installed in all UniLynx inverters built 02/2007 and later. Earlier models were equipped with an RS485 or a wireless interface. The wireless interface cannot be used for the Suntrol. If you have this interface, your solar technician must install the RS485 interface.

The RS485 interface is always installed in all TripleLynx models.

No other settings need to be made on the inverter display.

⚠ **Important note:**
If an internal modem (e.g. GSM) is installed in TripleLynx inverters, the modem must be deactivated since the inverter's RS485 interface is inactive when the modem is active. Contact your inverter supplier if this is the case.

2.9.2 WIRING

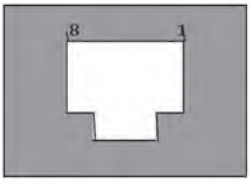
Connect the individual inverters together using conventional network cables with an RJ45 connector. The two RJ45 ports are located on the right side of the side cover, which can be unscrewed. Always follow the instructions in the Danfoss manual.

Connect all inverters using commercially available network cables. Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter. In the same manner, connect inverter number 2 to inverter 3 and so on.

Plug the cable you assembled into the available port of the first inverter.

Plug the terminating connector into the available port of the last inverter.

Danfoss/PowerLynx terminal assignment:
RS485



Front view of RJ45 connector

RJ45 pin	Suntrol RS485
1	3
2	3
3	4
4 - unused	1
5 - unused	4
6	1
7 - unused	-
8 - unused	-

Terminating connector:
The terminating connector is an 8-pin RJ45 dummy plug in which the following wires are bridged:
RJ45 PIN bridged
3 and 4
5 and 6

2.10 MITSUBISHI WITH RS485 INTERFACE

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Mitsubishi manual.

The RS485 interface is factory-integrated into all Mitsubishi inverters. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can be made on the operating display. Follow the instructions in the Mitsubishi manual. (Address number 1 is the factory setting for all Mitsubishi inverters.)

2.10.1 WIRING

Connect the individual inverters together using conventional telephone cables with RJ11 connectors. RJ11 connectors are 6-pin. Usually only the middle 4 pins are assigned, which is sufficient. It is important for the 4 (or 6) pins to be looped through 1 to 1.

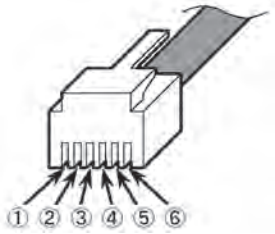
The two RJ11 ports are located on the lower left inside the inverter. You must unscrew the front panel of the inverter before installation. Always follow the instructions in the Mitsubishi manual.

Connect all inverters using the RJ11 cables.

Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter. In the same manner, connect inverter number 2 to inverter 3 and so on. Set the DIP switch for the terminal resistor to ON on the last inverter.

The cable connecting the Suntrol and the first inverter can be assembled as follows:

Mitsubishi terminal assignment:
RS485



RJ11 pin	Suntrol
3	1
4	4

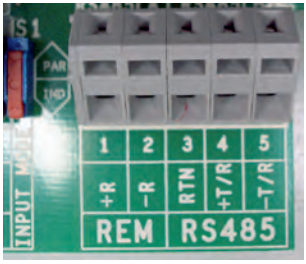
2.11 POWER-ONE/AURORA

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Power-One manual.

The RS485 interface is factory-integrated into all Power-One inverters. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 2 (not 1!) in other words, 2, 3, 4, etc. This setting can also be made on the operating display. Follow the instructions in the Power-One/Aurora manual.

Wiring
The individual inverters are connected using terminal blocks located inside the device. Different interfaces are sometimes installed in the indoor/outdoor models. The following section covers wiring using an RS485.

2.11.1 TERMINAL BLOCK – OUTDOOR MODELS



Connect the individual inverters together via the RS485 terminal blocks using a shielded, 3-pin data cable as described in the inverter manual. Connect the +T/R terminal to the +T/R terminal of the next inverter and similarly connect the -T/R and RTN terminals.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Pull the exposed wires through the inverter's cable opening and connect:

Suntrol	Terminal block in the inverter
White (1)	+T/R
Brown (4)	-T/R
Green (3)	RTN

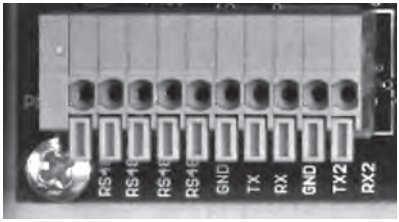
Also connect the terminal resistor to the inverter farthest from the Suntrol. The small switch must be set to ON.

2.12 SUNWAYS – AT/NT

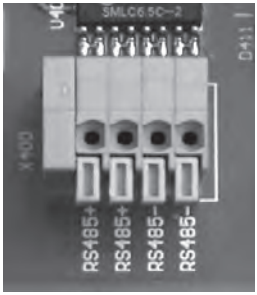
⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Sunways manual.

Note that a different internal address must be configured for each Sunways-AT/NT inverter. The factory setting is always address 1. The Sunways manual describes how to configure the address, which is done on the inverter's operating display. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc.

2.12.1 TERMINAL BLOCK 750 V – MODELS



2.12.2 TERMINAL BLOCK 850 V – MODELS



Connect the individual inverters together via the RS485 terminal blocks using a shielded, 2-pin data cable as described in the Sunways manual. Each inverter has two RS485 ports to enable the inverters to be connected in a series.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Pull the exposed wires through the inverter's cable opening and connect:

Suntrol	**Terminal block in the inverter**
White (1)	RS485+
Brown (4)	RS485-

The jumper JP must be plugged in on the inverter farthest from the Suntrol. This jumper must not be plugged in on the other inverters.

2.13 VAILLANT – AUROPOWER VPI/1 AND VPI (RS485)

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Vaillant manual.

2.13.1 VAILLANT – AUROPOWER VPI/1

The RS485 interface is factory-integrated into all auroPOWER VPI /1 models. The interface must be activated using the operating display, however. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can be made on the operating display. Follow the instructions in the Vaillant manual.

2.13.2 VAILLANT – AUROPOWER VPI

The auroPOWER VPI models were rolled out until approximately mid-2005 and factory-equipped with an RS232 option. You must have the RS485 option for operation with the STL800. Vaillant can retrofit the interface. Ask your installer or Vaillant directly.

Each inverter must be assigned a separate communication address. In inverters with a transformer, the address is assigned using the inverter menu. In inverters without a transformer, you assign addresses using a DIP switch inside the inverter. Follow the instructions in the Vaillant manual. We recommend identifying addresses sequentially beginning with 0, in other words, 0, 1, 2, etc.

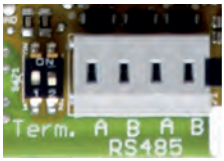
Note:
If there is no RS485 interface on the control board, the auroPOWER VPI inverter is the RS232 version.

2.13.3 WIRING

The individual inverters are connected using terminal blocks located inside the device.

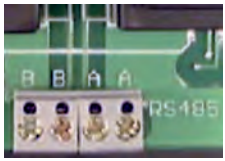
Disconnect the inverters from the power supply or wait until evening. (In VPI /1 models, you must enter the information on the display during the day.)

Terminal blocke – auroPOWER VPI xx00/2 models



Terminal block – auroPOWER VPI/1 models

Terminal block – auroPOWER VPI models



Connect the individual inverters together via the RS485 terminal blocks using a shielded, 2-pin data cable as described in the Vaillant manual. Each inverter has two RS485 ports to enable the inverters to be connected in a series.

Connect terminal A to terminal A of the next inverter and do the same for terminal B.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Pull the exposed wires through the inverter's cable opening and connect:

Suntrol	**Terminal block in the inverter**
White (1)	B
Brown (4)	A

A 330 Ohm terminal resistor (included with the inverter) must be connected to the terminal block on the inverter farthest away from the Suntrol. The resistor connects the unused A and B terminals.

Note:
If the cables are kept relatively short, you may not need terminal resistors.

Note:
In inverter generations VPI xx00/2 and higher, the 330 Ohm resistor is connected using DIP switches as needed. The terminal resistor is connected on delivery. This currently only applies for inverters without transformers.

2.14 SOLUTRONIC (RS485)

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Solutronic manual.

⚠ **Important note:**
All inverters must have **firmware version 1.2.39 or higher.** The latest firmware version and information on how to install the firmware is available at www.solutronic.de. The inverters must be grounded. Otherwise, problems can occur during inverter detection.

The RS485 interface is factory-integrated into all Solutronic inverters (port X2). Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can be made on the operating display (parameter 230). The COM interface must be set to "Protocol 9 – Suntrol" using parameter 265.

Follow the instructions in the Solutronic manual.

2.14.1 WIRING

Connect the inverters together using a 3-pin, shielded data cable connected to the X2 port on the inverter.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Suntrol	Terminal connector on the inverter (from left)
White (1)	Pin 1-RS485-A
Green (3)	Pin 3-GND
Brown (4)	Pin 2-RS485-B

2.15 SCHÜCO SGI SERIES (RS485)

⚠ **Important note:**
Never open the housing of the inverter when voltage is present. Always follow the information in the Schüco manual.

The RS485 interface is factory-integrated into all models. Each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. This setting can be made on the operating display. Follow the instructions in the Schüco manual.

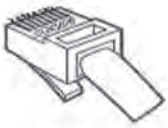
2.15.1 WIRING

Connect the individual inverters together using conventional network cables with an RJ45 connector. Schüco uses special IP65-compatible network connectors, which are needed for outdoor use. If you are installing the inverters indoors, you can use normal network cables.

The data cable included with the Suntrol is an IP20 cable and only suitable for indoor use.

RJ45 connector

Front view



Rear view

Schüco pin (RJ45 connector)	Suntrol pin (4-pin green connector)
3 (A)	4
6 (B)	1

Connect all Schüco inverters using commercially available network cables. The two RJ45 ports for system communication are located on the bottom of the inverters behind a port cover. Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter. In the same manner, connect inverter number 2 to inverter 3 and so on.

Use a cable you assemble yourself to connect the Suntrol to the first inverter.

Connect the data cable with the RJ45 connector to the unused port on the first/last inverter. Connect the terminating connector (IP20!) to the other end. You do not need to use a terminating connector if the cables are shorter than 100 m.

2.16 REFUSOL

⚠ **Important note:**
All inverters must have firmware version 800.2.20 or higher (to check firmware version: Menu F1\Numerical list\Parameters 1.1 to 1.3). The latest firmware version and information on how to install the firmware is available at www.refu-elektronik.de.

In all REFU-Elektronik inverters, the RS485 interface is factory-integrated into the bottom of the housing (RS485 IN/OUT). The Suntrol type of communication must be communicated to each inverter, and each inverter must be assigned a separate communication address. We recommend identifying addresses sequentially beginning with 1, in other words, 1, 2, 3, etc. The highest possible address is 255. Make the settings on the REFUSOL inverter display as follows:

> Press F1
> Select “Numerical list” and press ENTER.
> Set parameter number 2000 [password protection] and press ENTER twice.
> Enter numerical value 72555. Press ENTER.
> Set parameter number 0407. Press ENTER.
> Select subparameter 0407,3. Press ENTER.
> Enter numerical value 2 [RS485 communication type: Suntrol]. Press ENTER.
> Set parameter number 0406. Press ENTER.
> Select subparameter 0406,3. Press ENTER.
> Enter numerical value xx [address]. Press ENTER.

The interface speed must also be set to 9600 baud:
> Set parameter number 0420. Press ENTER.
> Select subparameter 0420,3. Press ENTER.
> Enter numerical value 9600. Press ENTER.

Press ESC twice to return to the power display.

⚠ **Important note:**
After you set the parameters on the display, use the DC breaker installed on the inverter to switch off the inverter briefly so the settings can take effect. The **date and time** must be set correctly on the inverter.

2.16.1 WIRING

Use a shielded 2-pin data cable to connect the individual inverters together using the RS485 ports. Each inverter has two RS485 ports – IN/OUT – to enable the inverters to be connected in a series. Accessories such as the two 4-pin SACC -M12MS-4SC connectors and other accessories are included in a separate package along with each inverter. Connect one connector to the OUT port of one inverter (X14B) and the other connector to the IN port (X15B) of the other inverter.

To connect the Suntrol to the first inverter, assemble a cable according to the following description.

Connect the pins on the green 4/6-pin terminal connector of the Suntrol and on the 4-pin REFUSOL round connector:

Suntrol	REFUSOL
1 (white)	2
4 (brown)	3

Terminal resistor:
The REFUSOL round connector at RS485 OUT on the inverter farthest from the Suntrol must be bridged (PIN 1 to PIN 2 and PIN 3 to PIN 4) to terminate the data bus.

2.17 MASTERVOLT WITH RS485

Note:
You do not need to open the housing for installation. All necessary ports are located outside the inverter.

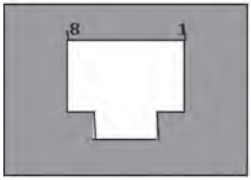
The RS485 interface is factory-integrated in all Mastervolt inverters, and connectors can be plugged into RJ45 ports on the bottom of the housing.

2.17.1 WIRING

On the inverter side, RJ45 connectors are used to connect the RS485 data cable. These connectors are the same as those used in conventional network patch cables.

Important! The Suntrol also has an RJ45 port. This port must never be connected to the inverter's RJ45 ports. This could destroy the Suntrol!

If you assemble the cable yourself, use the following wiring:



Front view of RJ45 connector

RJ45 pin	Suntrol RS485
4	1
3	4

Connect all inverters using commercially available network cables.

Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter.

In the same manner, connect inverter number 2 to inverter 3 and so on.

Plug the cable you assembled into the available port of the first inverter.

Multi-string technology
Mastervolt inverters are equipped with 1 or 2 MPP trackers depending on the model, which means that each string input is monitored separately and adjusted optimally to the connected modules. Some inverters are divided internally into 2 or even 3 individual inverters. For example, the QS6400 is detected as 2 inverters with 2 strings each, while the XL15 is detected as 3 independent XL5000 inverters.

During inverter detection, the Suntrol automatically detects how many inverters and strings are active.

⚠ **Important note:**
The sequence in which the inverters are displayed in the Suntrol after they are detected is random. We highly recommend reorganizing the inverters in the "Configuration/Basis/Inverters" dialog box immediately following detection. You can identify the inverters by the serial numbers displayed.

2.18 SUNTENSION (SUNVILLE)/PHOENIXTEC (RS485)

Note:
An RS485 data card, which is available as an option and which must be installed in each inverter, is required for installation. You do not need to open the inverter to do so. The card can be inserted and screwed down on the bottom of the inverter.

2.18.1 WIRING

The RS485 data card on the inverter has two sets of 4 terminal blocks, which are labeled R+ R- T- T+. The inverters are connected to each other 1 to 1 using a 4-wire, shielded data cable.

If you assemble the cable yourself, use the following wiring:

Suntrol-RS485-B	RS485 data card
1	R+ (white)
4	R- (yellow)
5	T+ (green)
6	T- (brown)

Important!
Be sure to match T-/T+ on the data card.

Multi-string technology
Sunville/Phoenixtec inverters are equipped with 1 or 3 MPP trackers depending on the model, which means that each string input is monitored separately and adjusted optimally to the connected modules. During inverter detection, the Suntrol automatically detects how many inverters and strings are active.

⚠ **Important note:**
The sequence in which the inverters are displayed in the Suntrol after they are detected is random. We highly recommend reorganizing the inverters in the "Configuration/Basis/Inverters" dialog box immediately following detection. You can identify the inverters by the serial numbers displayed.

2.19 DIEHL AKO WITH RS485 INTERFACE

Note:
You do not need to open the housing for installation. All necessary ports are located outside the inverter.

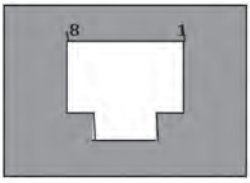
The RS485 interface is factory-integrated in all Diehl-AKO inverters, and connectors can be plugged into RJ45 ports on the bottom of the housing.

2.19.1 WIRING

On the inverter side, RJ45 connectors are used to connect the RS485 data cable. These connectors are the same as those used in conventional network patch cables.

Important! The Suntrol also has an RJ45 port. This port must never be connected to the inverter's RJ45 ports. This could destroy the Suntrol!

If you assemble the cable yourself, use the following wiring:



Front view of RJ45 connector

RJ45 pin	Suntrol RS485
6	1
3	4

Connect all inverters using commercially available network cables.

Plug one of the cable's connectors into any of the ports of the first inverter. Plug the other connector on the cable into any port of the second inverter. In the same manner, connect inverter number 2 to inverter 3 and so on.

Plug the cable you assembled into the available port of the first inverter.

⚠ **Important note:**
The sequence in which the inverters are displayed in the Suntrol after they are detected is random. We highly recommend reorganizing the inverters in the "Configuration/Basis/Inverters" dialog box immediately following detection. You can identify the inverters by the serial numbers displayed.

2.20 CONNECTING THE SMA SENSORBOX

Connecting the STL800 to the SMA SensorBox enables it to record and save environmental data.

Environmental data includes:
> Irradiation sensor
> Module temperature
> Ambient temperature (optional, accessory)
> Wind speed (optional, accessory)

In terms of in-depth evaluations and analyses, these are important parameters for monitoring the yield.

You can connect up to 1 SensorBox to the STL800.

The SensorBox is connected using one of the RS485 interfaces on the STL800, which you must configure to interface type "SMA" using the display.

If SMA inverters are already connected, the SensorBox can be "attached" as an extension to the existing RS485 data cable. The second RS485 remains available for connecting other equipment, such as a large display or additional inverters from another manufacturer if you expand your system.

2.20.1 WIRING

Connecting the SensorBox is easier than with original SMA data loggers because you do not need the RS485 Power Injector. The SensorBox is supplied the required 12 V operating voltage from the STL800.

This means that the cables connecting the SensorBox must be 4-pin.

Note
As a general rule, follow the instructions and information in the SMA operating manual for the SensorBox about the cables to use.

The pin assignment is as follows:

RS485 Suntrol	SensorBox
1 (Data+)	D+
2 (+12 V)	+12 V
3 (GND)	GND
4 (Data-)	D-

The connection is described in the SMA manual beginning on page 54.

Note that the terminal resistor is plugged into the SensorBox from the SMA factory. If you want to use the SensorBox by itself on the RS485, you do not need to do anything else. If other SMA inverters are connected upstream, you must remove the terminal resistors there.

The maximum cable length between the STL800 and the SensorBox is approximately 150 meters.

2.20.2 OTHER SENSORS

Additional sensors can be connected to the SensorBox:

> Ambient temperature sensor
> Wind wheel for wind speed

The SMA SensorBox manual describes how to connect this equipment in detail. Follow the instructions in the manual.

2.20.3 INITIAL STARTUP

When you switch on the STL800, power is automatically supplied to the SensorBox. It then takes around 1 minute until the SensorBox is fully initialized.

The "Inverter detection" dialog box on the display integrates the SensorBox inverter into the system just like a normal inverter.

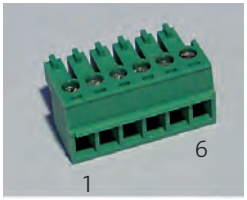
2.21 CONNECTING EXTERNAL ELECTRICITY METERS

An external electricity meter can be connected to the STL800 using the S0 input. An external three-phase electricity meter for the entire system can serve as an exact reference measurement to enable precise calculations for parts of solar investment projects, for example.

The STL800 lists the electricity meter as a virtual inverter. The pulses represent the momentary power value (Pac) and are added up to the total yield.

This way, the STL800 is actually able to monitor a system without connecting to any inverters, for example if the installed inverters are not yet supported by the data protocol. The Suntrol can also be used as a monitor for such systems together with the SensorBox irradiation sensor.

The S0 port of the external electricity meter is connected to the 6-pin S0 In/Out connector as follows:



Suntrol		S0
1		S0+
2		S0-
3	Bridged	
4		
5		Unassigned
6		Unassigned

The cables between the electricity meter and STL800 should be no longer than 10 m.

The pulse factor is set to 1000 pulses/kWh as standard, which can be changed on the Suntrol display in the “Config./Basis/Inverter” dialog box on inverter 1.

2.22 CONNECTING A LARGE DISPLAY

There are essentially two different ways to connect large displays to the STL800:
1. Using an RS485
2. Using the S0 pulse output

In general, connecting using the RS485 is preferred if you have the choice. The cables can be up to 1000 m long, as is standard when using RS485, and the data you want to display can be output selectively using the STL800.

If you use the S0 output, only the current feed-in power can be relayed as a series of pulses. The display must calculate the actual power and the total yield independently.

2.23 WIRING THE RS485 INTERFACE

If you choose to connect using RS485, you can choose from both RS485 interfaces of the STL800. A large display can be connected to both interfaces, in some instances, even if inverters are already connected to the interface. Preferably, you should connect the display to an available RS485 interface.

Hinweis:
As a general rule, you must follow the manufacturer's instructions for connecting the display.

Schneider Displaytechnik display
3-pin control cable, 3x0.5 mm²

Display	Suntrol RS485-A/B
Brown-A	1
	2 (unused)
Gray-GND	3
Blue-B	4

SolarWorld Suntrol display/RiCo-Electronic display
To connect the SolarWorld Suntrol display/RiCo display to the Suntrol using the RS485 interface, you must connect pins 1 and 2 on terminal block 3 on the display. For more detailed information, see the operating manual for the display.

2-pin control cable, 2x0.5 mm²

Display	Suntrol RS485-A/B
Pin1: Data+	1
	2 (unused)
	3 (unused)
Pin2: Data-	4

2.24 WIRING THE S0 OUTPUT

The S0 output can be operated in various configurations, which are activated depending on how the 6-pin terminal connector is wired.

2.24.1 CURRENT-CONTROLLED S0 OUTPUT

(e.g. displays from Schneider Displaytechnik)

You need a 2-pin shielded cable, 2x0.6 mm², max. length 100 m.

Make sure also to follow the manufacturer's data from the display manufacturer.

Display		Suntrol S0 In/Out
S0+		4
S0-	Bridged	5
		6

2.24.2 CONTACT-CONTROLLED S0 OUTPUT

(e.g. RiCo-Electronic/SolarWorld Suntrol displays)

You need a 2-pin shielded cable, 2x0.6 mm², max. length 100 m.

Make sure also to follow the manufacturer's data from the display manufacturer.

Display	Suntrol S0 In/Out
S0-	6
S0+	5

2.24.3 PULSE FACTOR

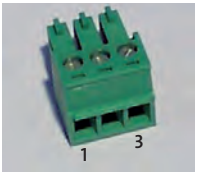
The STL800 outputs 1000 pulses/kWh at the S0 output as standard. You can change this value as required on the Suntrol display in the “Config./Advanced/Large display” dialog box. The pulse factor must be changed based on the system size (kWp).

Note that the pulse factor setting in the Suntrol and on the display must be identical.

2.25 CONNECTING THE RELAY

The STL800 has a floating control relay that is switched on in the event of an alarm or fault. The maximum load is 24 volts and 5 amperes, which means that a 220 volt load must be connected using an additional power relay, not directly.

Connection uses a 3-pin connection plug:



In the OFF state:

> Pins 1-2 are open
> Pins 2-3 are closed

In the ON state (alarm/fault active):

> Pins 1-2 are closed
> Pins 2-3 are open

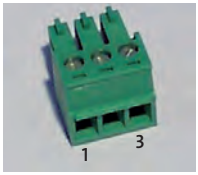
PIN 1 and PIN 2 are usually used to connect the power relay.

You can test the relay conveniently on the Suntrol display in the “Config./Advanced/Anti-theft protection” dialog box.

2.26 CONNECTING THE ALARM CONTACT

The STL800 has an alarm contact, which is triggered if the connection is interrupted. A thin weather-resistant cable that breaks under stress should be used to connect to the mounting support or modules. The maximum cable length is 1000 meters.

Connection uses a 3-pin connection plug:



PIN 1 and PIN 3 must be connected. If they are disconnected, this triggers an alarm, which can be signaled via the relay or by email.

You can configure and test the alarm function on the Suntrol display in the “Config./Advanced/Anti-theft protection” dialog box.

2.27 CONNECTING TO A PC/NETWORK

The STL800 is equipped with a standard Ethernet RJ45 network port, which can be connected to a commercially available network cable. It supports speeds of 10 Mbit and 100 Mbit.

In general, any PC network technology can be used to connect the STL800.

The following technologies are available:
1. Direct cable connection
2. Connection using a network router
3. Powerline connection
4. Wireless connection (WLAN/GSM)

Connect the STL800 to your PC's network card or your network router, if you have one, using an Ethernet RJ45 network cable.

Note that if you connect the STL800 directly to your PC, you need to use a crossover network cable.

If you use the Suntrol-PowerLine Package, you can connect the Suntrol to the power plug using the network cable provided. Next, connect the PC/switch or Internet router using the second power plug. The two power plugs connect to each other automatically and serve as a powerline network cable. If possible, the power plugs should not be plugged into a power strip since other power supply units could disrupt the data quality.

You can configure the Suntrol's IP address conveniently on the display. This procedure is described in the "Initial startup" section of the user manual.

3 USER MANUAL

Once all cables and accessories are connected to the STL800, you can start up, i.e. configure, the device.

The STL800 is designed to let you configure the initial settings directly on the display without a PC. To configure the other settings, you must connect a PC.

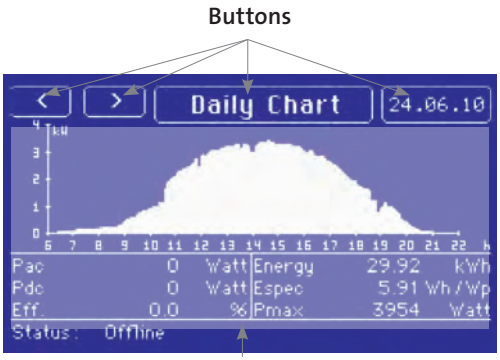
Startup is especially easy since you are automatically asked to make all important settings one after the other. You can configure the other settings later. All initial settings can of course also be changed later.

3.1 TOUCHSCREEN DISPLAY

The STL800 can be operated conveniently using the integrated touchscreen display. You can use your finger to press components on the touchscreen display similar to pointing with your mouse on your PC. You "point" to the required function to run it. The amount of pressure you use to press buttons on the touchscreen is unimportant. You only need to press the buttons lightly with your fingerprints. If the STL800 does not react immediately, wait a few seconds and try again. Do not under any circumstances press harder.

⚠ **Important note:**
Using hard, sharp objects is hard on the glass surface and can break the glass and void the warranty.

All areas of the display are sensitive to touch; i.e. control elements can be distributed anywhere on the screen. The following illustration is an example of where you can trigger actions.

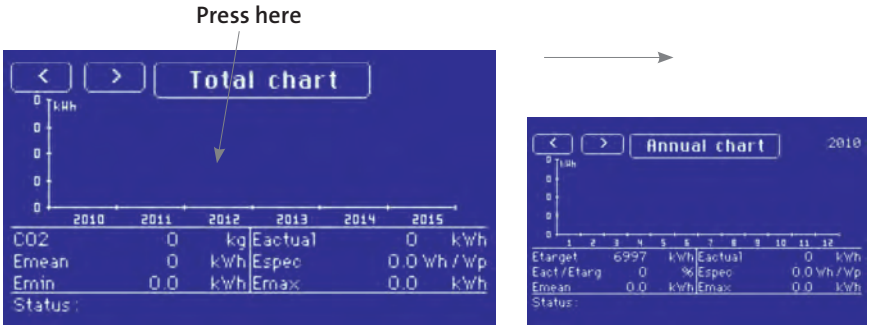


Buttons
These buttons let you call functions, which differ from one dialog box to the next.

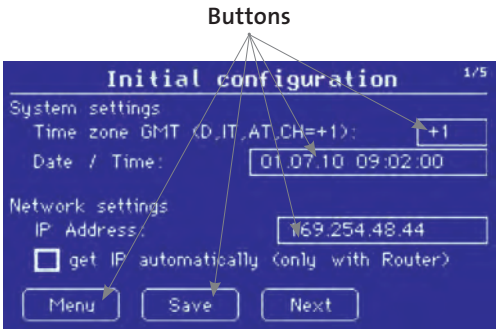
Active area
Pressing the active area opens the main menu so you can go to other dialog boxes.

In general, there are two types of dialog boxes:
> Graphical dialog boxes (like the one above)
> Text dialog boxes

Graphical dialog boxes generally have special functions, which sometimes include hidden active areas that you cannot see. For example, pressing the year bar in the "Summary chart" dialog box takes you to that year. In other words, the bar itself is an active area.

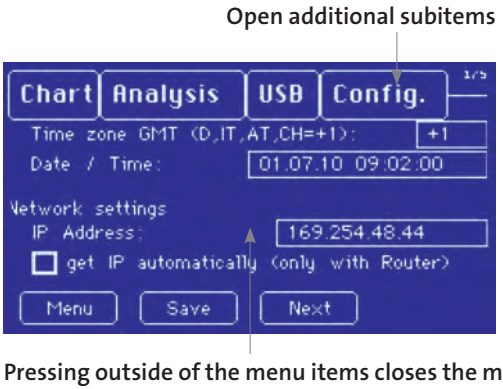


Text dialog boxes are usually configuration dialog boxes. They contain only buttons, but no active areas:



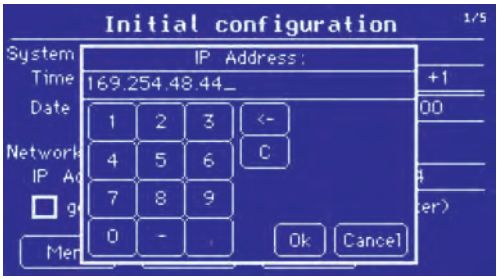
Text dialog boxes always have one or more buttons at the bottom of the display. The button on the left is always the “Menu” button. The other buttons differ depending on the dialog box.

The main menu always opens at the top of the display:



Pressing the individual menu items opens additional subitems. Pressing outside the menu buttons closes the menu.

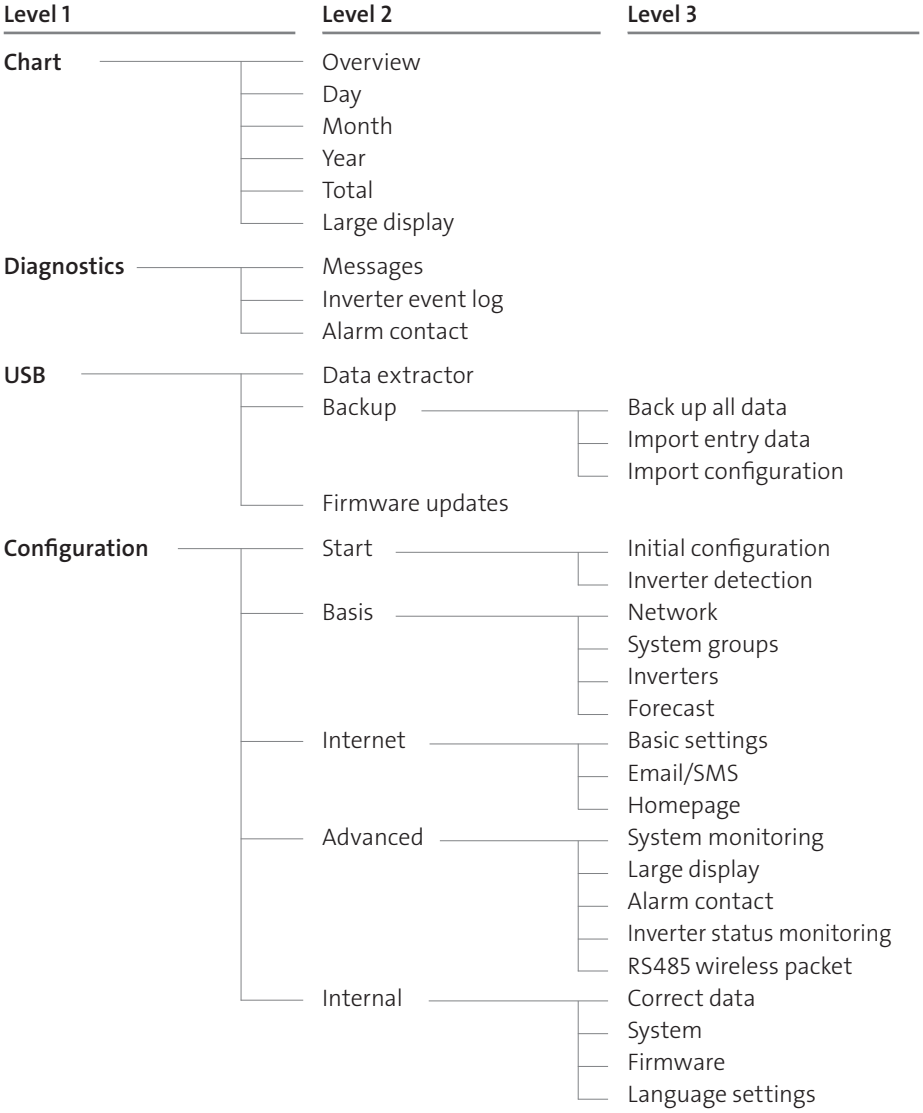
You enter text on the touchscreen display using a “virtual keyboard”:



The virtual keyboard opens on the display as needed, and you can enter information similar to using a real keyboard. A small numerical keypad or a full alphanumeric keyboard is displayed depending on the type of text to enter.

3.1.1 TOUCHSCREEN DISPLAY MENU STRUCTURE

The following menu structure provides an overview of the dialog boxes available on the touchscreen display:



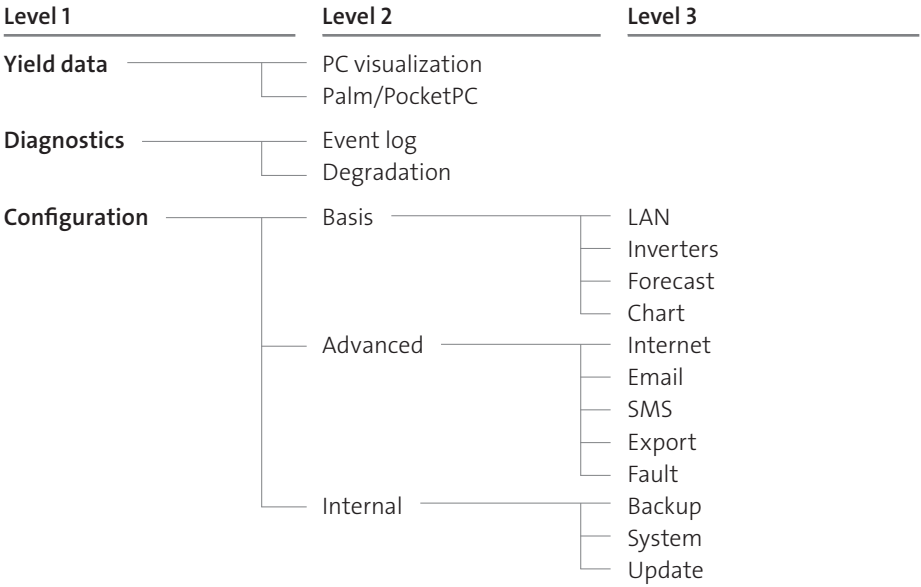
3.2 PC DISPLAY

You do not need to install any additional software to operate the STL800 on your PC. The STL800 has an integrated Web server, which contains all the software. All graphs and configurations can be run conveniently on your PC. All you need is the Web browser of your choice.

You must have a network connection between the PC and STL800 to operate the Suntrol using a Web browser. First, you need to configure the network on the text display. We recommend using Mozilla Firefox as your Web browser, which is available for all common operating systems.

Generally, you can use any modern Web browser. Enable Javascript to use the STL800. To open the main dialog box of the STL800, start your Web browser and enter the network address.

3.2.1 PC DISPLAY MENU STRUCTURE



3.3 INITIAL STARTUP

Once all cables and accessories are connected to the STL800, you can start up, i.e. configure, the device.

The STL800 is designed to let you configure all settings directly on the display without a PC.

However, there are some dialog boxes that are available only on the display (such as inverter detection) or only using a Web browser on your PC (such as sorting the inverter sequence). In general, we recommend configuring settings directly on the display, but if your installer is particularly knowledgeable, configuring systems of a certain size may be easier and faster on a PC.

Startup is very easy since all important dialog boxes and settings are displayed automatically one after the other. You can configure the other settings later. All initial settings can of course also be changed later.

Startup is generally divided up as follows:

Initial configuration
- Specifying the manufacturers of the inverters used
- Inverter detection
- Configuring the inverters (only connected module power)

Internet configuration (if required)
- Configuring the Internet connection (DSL, modem, wireless)
- Specifying homepage login data
- Testing the Internet connection

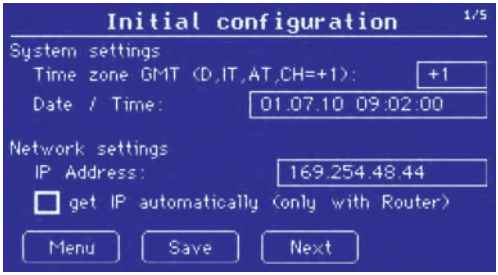
Other functions (if required)
- Alarm functions
- Large display

Note:
Most settings are already preconfigured in the STL800 and do not need to be changed.

3.3.1 INITIAL CONFIGURATION

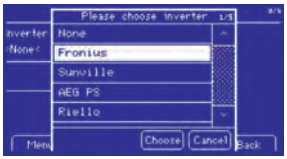
Begin with the information in the initial configuration.

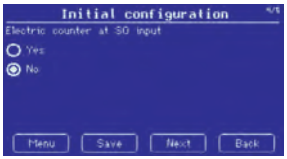
To do so, in the main menu, select “Config./Start/Initial configuration.” This dialog box contains important settings like the date and time, network address, and inverters used.



Be sure to check the date and time. The STL800 contains a backup capacitor, which backs up the factory-set time even after a long time. Nevertheless, you should adjust the date and time if necessary. You can also set the IP address of the STL800 to speed up access to the STL800 from your PC. Alternatively, you can configure the address later. See the section “Connecting to a PC/network.” If the STL800 is connected to an Internet router, the network address can also be configured automatically.

You can configure the connected inverters in the next 3 dialog boxes. You can choose from the corresponding inverter manufacturers for each interface type, RS485-A, RS485/422-B and the S0 input. Choose equivalent OEM devices based on the original manufacturer since the datagrams are generally identical.





You can then skip directly to the “Inverter detection” dialog box.

Bluetooth option:
You can order the STL800 with a Bluetooth option to be able to read data from certain inverter models from SMA using Bluetooth technology. If you have this option, the relevant selection appears in dialog box 2/5 in the initial configuration. If you select Bluetooth, inverter is set automatically to SMA.

3.3.2 INVERTER DETECTION

Inverter detection runs a search for all enabled interfaces to detect the number and, if required, the type of inverters. Detection can take some time, especially if you have SMA or Sputnik/SolarMax inverters. The status and number of inverters detected is indicated on the display. You can press the “Stop” button to stop the search once all inverters have been detected.

If the inverter configuration changes later, you must run inverter detection again. The STL800 automatically detects that redetection is required and reformats the existing data. This procedure can take a relatively long time depending on the amount of existing data and number of existing inverters. The Suntrol must not be disturbed or switched off during this time since this would cause data to be lost. We therefore recommend backing up all your data to a USB stick or to your hard drive using your Web browser before redetecting inverters.

Check the number of inverters following detection. If no inverters or not all of the inverters were detected, check the cables and inverter settings. Depending on the manufacturer, an address number and possibly the RS485 interface as well may need to be enabled.

Once you have accepted the detected inverters, the STL800 immediately begins recording data. There are no data recording or configuration restrictions. The STL800 next gives you the option of continuing with inverter configuration, which is recommended.

3.3.3 INVERTER CONFIGURATION

At first glance, inverter configuration seems very involved. In fact, only the information about the connected generator power needs to be changed. All other parameters for monitoring are already preconfigured with meaningful values and generally can be accepted without changes. The SensorBox and S0 input are also configured as inverters. Special information is required, which you can access by pressing the “Next” button.

The information you need to enter may vary depending on the inverter manufacturer and type of inverter.

Number	This option lets you select the additional inverters from a list.
New number	(only visible for some inverter manufacturers) Since SMA and Danfoss inverters do not have address numbers that can be set on the inverter display, the sequence of inverters is sorted by serial number following detection, which is more or less random and many not correspond to the required addressing. This option lets you change the current position. **Note:** We recommend changing the numbers immediately following inverter detection since data that has already been logged is not transferred to the new position. If you need to resort a large number of inverters, use the “Inverter sequence” dialog box on the Web interface on your PC.
Device name/ serial number	Varies depending on the inverter manufacturer.
Description	You can enter any description, which is displayed in most selection dialog boxes on the display or on your PC.

Next, in dialog box 2, you can specify the connected module power. You can configure the total power or string power depending on the type of inverter. Enter the exact power data with no errors, since these values will be used to monitor the system's power.

Module array	The module array number lets you allocate the same type of strings/inverters. Only strings/inverters with the same module array number are compared in system monitoring. Example: 4 inverters are connected to East-facing modules and 3 inverters to West-facing modules. The module array number for the East-facing inverters should then be 1, and the number for the West-facing inverters 2. This parameter is important for comparing the power of the inverters.
Connected module power	You must specify the exact total module power for the inverter or string (only for multi-string inverters). For 28 x 160 watt modules = 4480
Description	The string description displayed on the homepage or in PC view (only for multi-string inverters)

You configure the system monitoring data in dialog box 3 and the following dialog boxes. All parameters for the STL800 are preconfigured to meaningful values. You should not change anything during initial startup.

Press "Save." Next, configure all inverters one after the other as described above.

This completes the usual startup process for the inverters. The STL800 will now record the inverter data and monitor the system.

3.4 DISPLAY MENU NAVIGATION

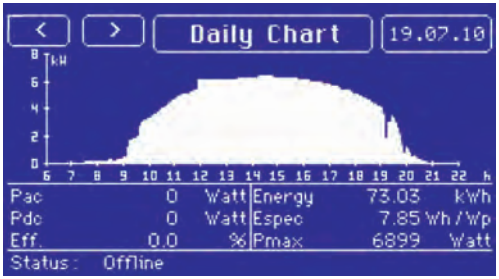
You operate the STL800 on the display using various dialog boxes, which you can select from the main menu. During development, we made a point of ensuring the STL800 can be operated and configured entirely without a PC.

3.4.1 CHART

3.4.1.1 OVERVIEW

This dialog box gives you an overview of the date, time, detected inverters, accessories, current daily and total values, and CO_2 savings.

3.4.1.2 DAILY CHART



The daily chart shows the inverters' performance values (Pac) as a curve. The Y axis scale is calculated automatically from the total of the displayed inverters. You can configure the hours displayed on the X axis separately for every month.

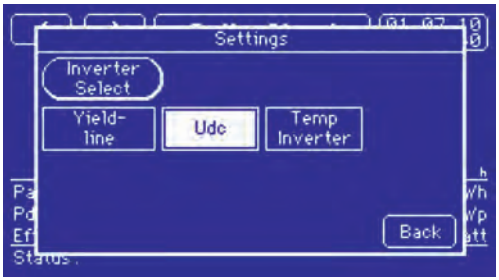
The legend underneath shows the most important parameters as numerical values:

Pac	Current feed-in power
Pdc	Current module power
Eff	Efficiency based on the formula Pac/Pdc*100
Energy	Total daily yield in kWh
Espec	Specific energy = daily yield kWh/system size kWp
Pmax	Pmax

The status always indicates the latest inverter statistics and error codes. Inverters with the same status are grouped. The status and error text is manufacturer-specific and should be looked up in the manufacturer's user manual. A status of MPP, which stands for maximum power point, means that electricity is being fed into the grid. Offline means that the inverters are in night mode, i.e. switched off.

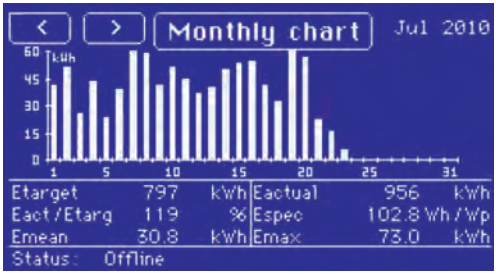
You can use the buttons at the top of the screen to page through the date, forwards and backwards. Pressing the date always takes you to today's date. Pressing the bottom of the screen opens the main menu.

Pressing the "Daily chart" button in the middle opens a submenu:



This submenu lets you select additional options. Which options are displayed depends on whether a SensorBox is connected. The rectangular selection boxes are parameters that can be shown on a second Y axis in addition to the power curve. Only 1 parameter can be selected at a time since otherwise you would lose track. (Several parameters can be shown in color in Web view.)

3.4.1.3 MONTHLY CHART



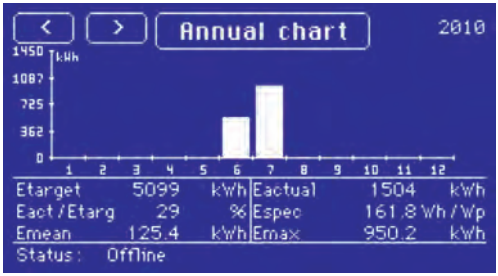
The monthly chart shows the daily values. Like the daily chart, the Y scale is calculated automatically based on the inverters selected.

Use the buttons at the top of the screen to navigate as you would in the daily chart. You can use the "Monthly chart" button to select the inverters. If you click a daily bar, the daily chart for that date opens. The correct date may not always open because the bars are relatively narrow. If that happens, you can use the "Next/Back" buttons to navigate to the correct day.

The legend shows the most important parameters as numerical values:

Ytarget	The STL800 calculates a target yield for every month based on the desired annual yield.
Yactual/Ytarget	Shows the target/actual yield percentage achieved.
Yavg	The average of all days in a month
Yactual	The actual monthly yield achieved in kWh
Espec	Specific energy = monthly yield kWh/system size kWp
Ymax	Highest daily yield in the month

3.4.1.4 ANNUAL CHART



The annual chart shows the monthly values. Like the daily and monthly charts, the Y scale is calculated automatically based on the inverters selected.

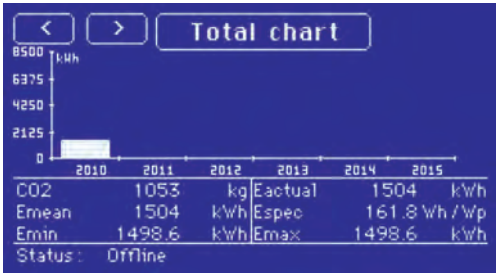
Use the buttons at the top of the screen to navigate as you would in the daily and monthly charts. You can use the “Annual chart” button to select the inverters.

If you click a monthly bar, the monthly chart for that date opens.

The legend shows the most important parameters as numerical values:

Ytarget	The target annual value is calculated using the desired annual yield in the “Forecast” dialog box.
Yactual/Ytarget	Shows the target/actual yield percentage achieved.
Emi Yavg ttel	The average of all months in a year
Yactual	The actual annual yield achieved in kWh
Espec	Specific energy = annual yield kWh/system size kWp
Ymax	Highest monthly yield of the year

3.4.1.5 SUMMARY CHART



The summary chart displays all saved annual values. A chart shows up to 6 years. If you have data for 7 years or more, you can use the “Back/Next” buttons to scroll through the years.

Use the buttons at the top of the screen to navigate as you would in the daily, monthly, and annual charts.

You can use the “Summary chart” button to select the inverters. If you click an annual bar, the annual chart for that date opens.

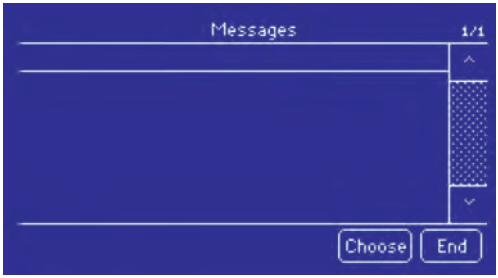
The legend shows the most important parameters as numerical values:

Highest annual yield	
CO_2	Total CO_2 savings
Yavg	Average of all years
Ymin	Lowest annual yield
Yactual	Total yield
Espec	Specific energy = total yield kWh/system size kWp
Ymax	Highest annual yield

3.4.2 DIAGNOSTICS

“Diagnostics” provides detailed information on the system status.

3.4.2.1 MESSAGES



The STL800 generates messages when errors and faults occur or only about the current daily yield depending on the configuration. Every message can se be sent as an email. All messages are also cached and can be opened on the display. You can open the 50 most recent messages. Opening the list of messages acknowledges a connected relay triggered by system monitoring.

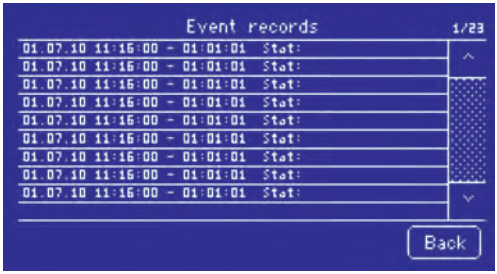
Example: During inverter configuration, a parameter was defined to switch on the relay when an inverter is down. If an inverter malfunctions, the relay switches on. It remains on until you open the “Messages” dialog box. This acknowledges the error.

Since all messages are usually also sent as emails, the corresponding message is also saved in the list of messages. This lets you determine the reason the relay was triggered later.

The following information is saved in the list of messages:

- Date and time of the event
- Type of event. The following types of events can occur: “Daily yield,” “Power monitoring,” “Inverter status/error,” “Inverter offline,” “Alarm contact”
- Transmission type “Email” or “---” (no transmission)
- Transmission status
  „OK“ sent
  „#x“ x = number of failed transmission attempts
  “NOK” is displayed after 4 attempts.

3.4.2.2 INVERTER EVENT LOG



The event log records all inverter status changes in a separate log. The status and error codes from the inverters are read every 15 seconds (or longer depending on the number and type of inverters). If a change occurs, it is saved to the log. Two hundred events can be saved per inverter. The current status is always at the very top of the list on page 1 of the dialog box.

The flashing text “Err” indicates that an error has occurred. Some inverter manufacturers do not offer additional error codes in the datagram. The errors are “packed” as a status code. In this case, “Err” is not displayed.

By default, system monitoring is configured to send error codes as emails. Critical messages therefore also appear in the “Diagnostics/Messages” dialog box.

3.4.2.3 ALARM CONTACT

The STL800 constantly monitors its internal alarm contact. As soon as the contact is broken, an alarm is triggered. You can configure what happens in this event in the “Config./ Advanced/Alarm contact” dialog box (email/relay notification).

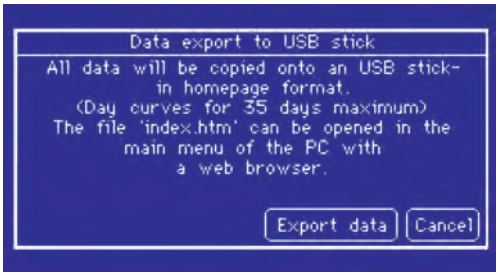
Once an alarm is triggered, it remains active for a maximum of 20 minutes, after which time it is automatically acknowledged. You can acknowledge or fully reset the alarm manually at any time. You should only reset the alarm after the cause has been resolved since the alarm will be triggered again immediately.

3.4.3 USB

The STL800 has a USB host interface to which any USB-compatible stick can be connected. The maximum memory must not exceed 2 GByte.

Note:
You cannot connect a PC to this interface.

3.4.3.1 DATA EXTRACTOR

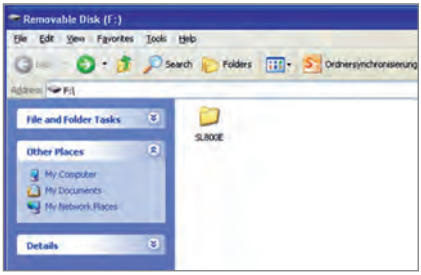


This dialog box lets you copy all STL800 data to a USB stick. What is unique is that you can then display the full visualization with all options offline on your PC, i.e. without a direct network connection. Visualization takes place using your Web browser; you do not need to install any additional software on your PC.

The data extractor always transfers the data for the daily curves for the last 31 days. To ensure seamless recording, extract data to your USB stick at least once every 31 days. The old data is of course saved. A 512 MByte USB stick will have enough capacity for several years' data.

Once you have extracted data, you can plug your USB stick into your PC. The following window opens automatically in Windows after a short time:

Select “Open folder to display files.” If no window opens, open Windows Explorer and select the USB stick from the list of drives.



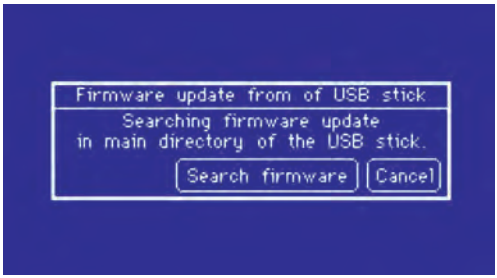
You will see the “index.htm” file and the “STL800” folder, which contains all the data. Double-click or open “index.htm” to open the visualization.

3.4.3.2 BACKUP

You can back up data on your USB stick or to the data logger at any time. All data (daily curves up to 60 days), i.e. configuration and measurement data, is always saved.

When you restore data, you can selectively back up measurement data or the configuration.

3.4.3.3 FIRMWARE UPDATE



You can also update firmware using your USB stick. Just download the latest firmware from www.suntrol-portal.com and copy it to the USB stick's main directory.

The STL800 can also install firmware updates automatically. You can enable this function in the "Config./Internal/Firmware" display dialog box. If you have a DSL connection, the function is enabled by default.

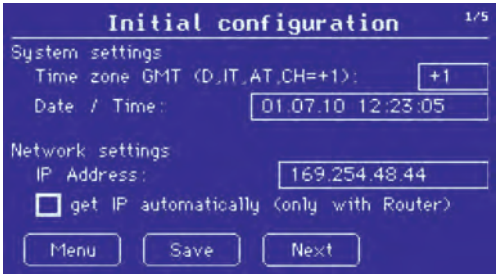
3.4.4 CONFIGURATION

The next sections explain the dialog boxes in the configuration in the menu navigation sequence.

3.4.4.1 INITIAL CONFIGURATION

The initial configuration contains the most important settings that need to be made before data logging and monitoring can begin.

When you start the STL800 for the very first time, the first dialog box opens automatically. All other times, you have to navigate to the dialog box manually using the main menu. The default setting is time zone GMT+1, which is the correct time zone for all countries in Central Europe.

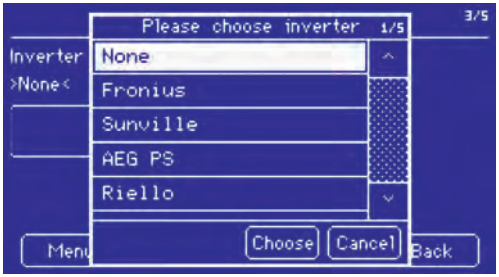


The time is important. It is factory-set but can be lost after a long time in storage. In this case, the value is random and must be corrected.

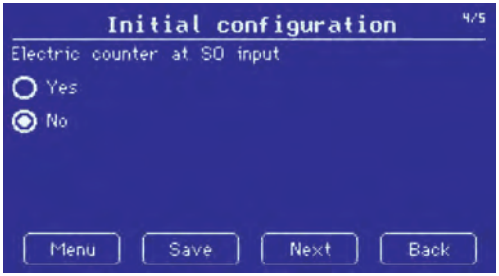
The IP address is factory-set to 192.168.178.49 and can be changed to a network address that matches the local network. When you save the new network address, the STL800 restarts. As a general rule, you only need to change or check the IP address if you want to connect the STL800 to a router or PC.

In addition, you have the option of assigning the network address automatically. This is only possible if the STL800 is connected to an Internet router that enables this function (DHCP). After you save and restart, the new IP address is displayed. The STL800 can now be addressed using this address and automatically has Internet access.

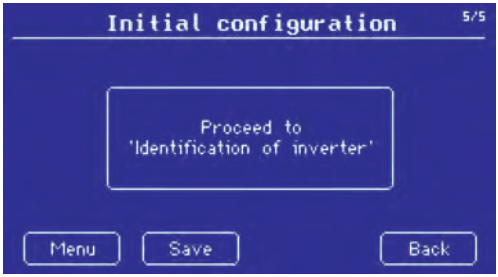
In the second dialog box, you can specify the manufacturer of the inverter connected to the RS485-A interface. Note that the SMA SensorBox is treated like an inverter and is therefore listed under inverter type SMA.



The RS485/422-B interface is defined in the third dialog box, where you also define settings for Fronius inverters.



If an electricity meter is connected to the S0 input, this dialog box is where you enable that meter. This information is important since the STL800 manages the electricity meter as a virtual inverter. An electricity meter "inverter" will always be number 1; all additional "real" inverters follow.

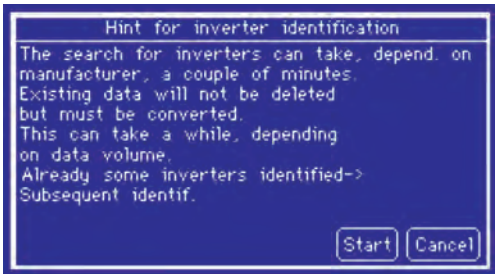


Since the initial configuration is intended to be a quick way to get your system running and ready, you can also skip directly to the “Inverter detection” dialog box. All data previously set is saved automatically.

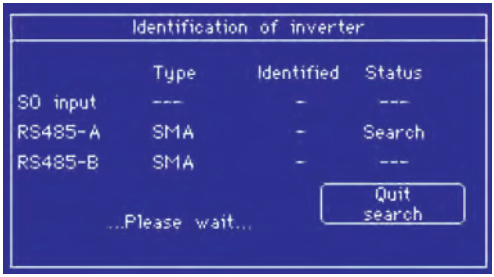
3.4.4.2 INVERTER DETECTION

“Inverter detection” lets you record all inverters connected to the STL800 and assign them address numbers. First, in the “Initial configuration” dialog box you must define which interfaces are assigned to which inverters. The number and type of inverters are detected automatically. The memory in the STL800 is divided up optimally based on the number and type of inverters to ensure data is saved as long as possible. If the number of inverters changes later, the internal database must be reformatted, which can be a long and tedious process depending on the data already stored.

The following dialog box appears the first time you run inverter detection:



Press “Start” and the following table opens:

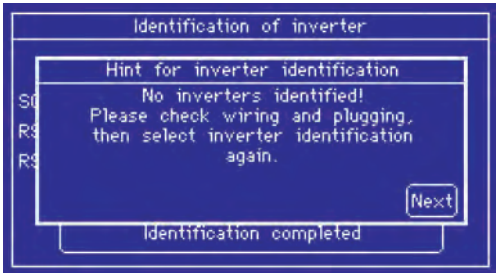


Every interface is shown with the pre-defined inverter type, and everything is searched in sequence. This process can take a relatively long time. For example, if you have Sputnik/ SolarMax inverters, an address range of 253 addresses is searched.

Important:
All inverters must be active to be detected. In other words, you cannot run detection when it is dark.

Check the number of inverters found following detection. If one is missing, check the inverter settings and cables again (see installation manual) and repeat detection. Only continue once every single inverter has been detected.

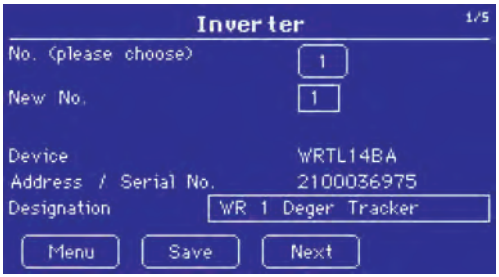
If no inverters are found, this is indicated, and you must repeat detection.



Once you have finished detection, you are asked whether you would like to continue with “Inverter configuration.” Press “Yes” to confirm.

3.4.4.3 INVERTER CONFIGURATION

Inverter configuration comprises 5 subdialog boxes, but only the first 2 are important for the initial configuration. The other settings relate to system monitoring and the graph scale, which are already preset with good values. You do not usually need to change any of these settings.



All dialog boxes always refer to a single inverter. The inverter you are currently configuring is displayed at the top of dialog box 1 under “Number.” You can press the number to change it. A list of all inverters is displayed for you to choose from.

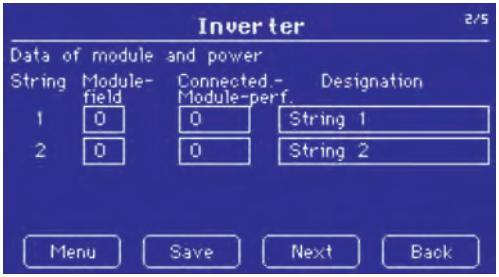
The number is the internal number used to manage the inverter. The number directly reflects the address the inverter was assigned on the display. Inverters without an address setting, like SMA and Kyocera/PowerLynx inverters, are displayed more or less randomly or sorted by serial number. You can and should change the sequence to the real, desired address position using the “New number” function. You should change the sequence immediately following inverter detection since the data associated with the inverter is not converted to the new number. The “New number” box is only visible for inverter manufacturers for which you cannot set the address number.

The device name and address number/serial number are display fields only and cannot be changed.

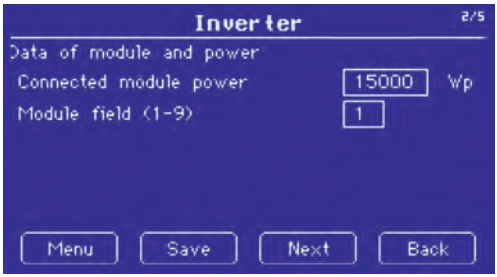
You should change or at least check the description. You should choose a clear, meaningful text for the inverter since this text is used as the description (name) in many selection lists and displays.

In dialog box 2, you need to configure the inverter's connected generator power. This information is very important for ensuring proper system monitoring. Take great care when calculating the values and be sure not to make any mistakes when entering them.

Dialog box for multi-string inverters (such as SMA SB5000TL, SolarWorld Sunplug and Power-One, depending on model):

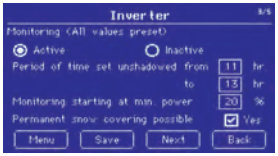


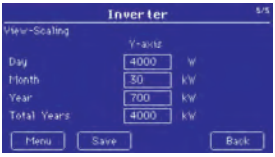
Dialog box for standard inverters (in which the individual strings are connected internally):



- **Module array**
  The "Module array" function groups the same type of strings for system monitoring and monitors them together. If a roof has the same modules, same orientation, and identical roof pitch, all strings are assigned module array 1. If additional inverters that serve a roof with a different orientation are connected, these strings are assigned module array number 2, and so on.
- **Connected module power**
  This value is needed to compare the power of the different inverters and offset them against each other.

The remaining dialog boxes are already preconfigured and do not generally need to be changed. For a description of the input boxes, see the sections beginning on page 101 on configuration using a Web browser.

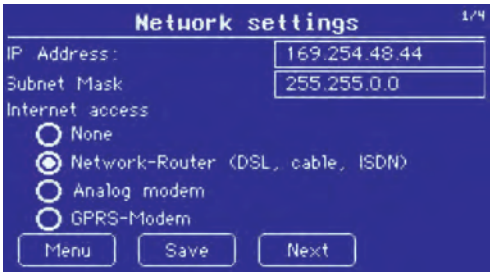




3.4.4.4 NETWORK SETTINGS

You always need to configure network settings if you would like to
> access the STL800 via the network using your PC
> connect the STL800 to the Internet using a router
> connect an analog modem or GPRS modem for remote monitoring to the STL800

Dialog box 1 – basic settings



This dialog box lets you configure the IP address and subnet mask of the STL800. The factory-set address is 192.168.178.49 and must be changed to enable access from a PC. For a detailed description of what needs to be done, see page 61.

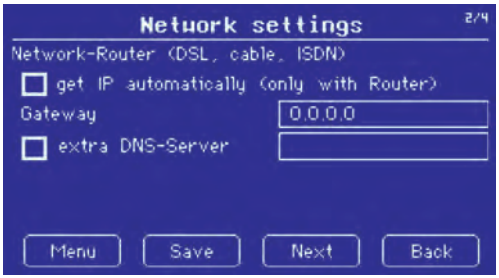
Next, define the right Internet connection for you.

“Network router” means that a router must be connected to the network interface of the STL800. The router handles all dialing in and data transfer. Routers are usually DSL routers but increasingly may be routers connected to a cable modem. What is important is that the STL800 can connect to the Internet at all times. The router must not be switched off, as otherwise if a fault occurs, notifications will not be sent properly or the homepage will not be populated correctly with data.

“Analog modem” is used for a telephone line.

“GPRS modem” means connecting to the Internet via a wireless network.

Dialog box 2 – network router



The connected Internet router has its own IP address, which you must specify in this dialog box under “Gateway.”

In many networks, especially company networks, the DNS server is a separate address and is not the same as the Internet router (gateway) address. If this is the case, you can configure a separate DNS server.

Dialog box 3 – analog modem

If you have a telephone line, the STL800 can use it to connect to the Internet using the STL800 modem package. This is important when you want to be informed remotely by email or on the homepage.

Internet-By-Call access from Arcor is set as the default and includes the dial-in number, user name, and password. At 1 euro cent/minute, the cost is based on time. Of course you can use any other Internet by-call connection.

Note:
SolarWorld AG is not liable for any data connection costs.

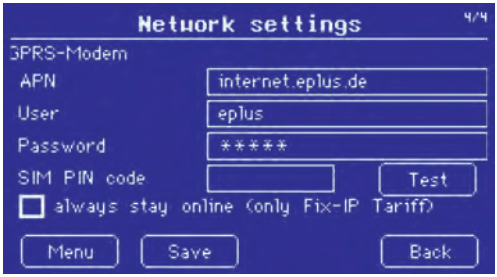
Some telephones require you to dial a 0 before the actual telephone number. You can define this setting in this dialog box as well. By default, you can hear the modem dialing, which is a good indicator whether the connection is working. You can then switch off the dial tone later.

If problems with your Internet connection occur, it is best to test whether the connection is working or enabled using a conventional telephone. This also lets you easily and quickly test whether you need to dial a 0 first.

If you use an analog modem, the STL800 can be dialed into. In other words, the STL800 can be dialed from an external PC and another modem. The STL800 detects this and establishes a data connection.

The default password for this is suntrol, but it can and should be changed here.

Dialog box 4 – GPRS modem



In many cases where no DSL or telephone connection is available, connecting to the Internet over a wireless network is the only option. Very reasonably priced data connections are now possible, especially using the wireless provider Simyo. Monthly costs under EUR 5 are possible depending on the size of the system and number of transfers per day.

Configuration is very easy. You only need to enter an access point name (APN), user name, and password. Everything is already factory-set for the provider Simyo. If you operate the GPRS modem with a SIM card, you do not need to change any settings.

Note:
The data option for many SIM cards needs to be enabled making a phone call.

Use the following APN/user settings for the most common German wireless operators:

	Simyo/Eplus	**O2**	**Vodafone**	**T-Mobile**
Network used	EPlus	Eplus + D1	D2	D1
APN	internet.eplus.de	surfo2	web.vodafone.de	internet.t-mobile
User	eplus	[leave blank]	[leave blank]	t-mobile
Password	eplus	[leave blank]	[leave blank]	tm

(information may be subject to change)

Also enter the valid PIN.

Note regarding the user and password:
If the GPRS provider recommends leaving the user and password blank, you may need to enter something to successfully establish a data connection.

3.4.5 INTERNET

The “Internet” settings let you enter all information regarding the Internet server used and homepage data.

3.4.5.1 BASIC SETTINGS

You must enter the login data for your Internet connection in this dialog box.

The server is already specified. The user name and password are your login data for the Suntrol portal. You can find them online at www.suntrol-portal.com > login > My Systems (see page 16).

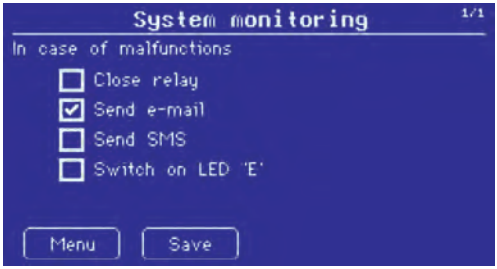
3.4.5.2 HOMEPAGE

This section lets you define the update interval for exporting data to the Internet. “Daily” is the default setting. Depending on the type and cost of your Internet connection, you can reduce the interval to a minimum of 10 minutes.

Note:
You do not need to enter the system data in the following dialog boxes. You already did so when you logged into the portal or you can do it later at www.suntrol-portal.com > login > My Systems (see page 14).

The last dialog box lets you test the connection. The status codes (e.g. Err 1) are described on page 115.

3.4.6 ADVANCED



The advanced functions are generally not used very often and are therefore grouped under a separate menu item. The following items are available:

- System monitoring
- Large display
- Alarm contact (anti-theft protection)
- RS485 wireless packet

3.4.6.1 SYSTEM MONITORING

These helpful settings let you centrally define the alarm functions you would like to be triggered for all types of faults. We recommend defining these parameters at the end of configuration.

LED E: If a fault occurs, LED E on the STL800 starts to flash. This function is helpful if you use the STL800 without an Internet connection but want to give the system owner a simple way to monitor the system.

Relay: If a fault occurs, the floating contact (relay) on the STL800 closes. This function lets you connect an external alarm light, for example, to provide a quick visual check even without an Internet connection.

3.4.6.2 LARGE DISPLAY

Currently 3 “traditional” large displays are supported:

- Schneider Displaytechnik
- RiCo Electronic
- HvG Hard & Software Engineering

These displays can be connected using an RS485 bus or using the S0 pulse output. If the RS485 bus is already used for inverters, you can often still loop a display into the data bus in parallel. Be sure to follow the instructions from the display manufacturer regarding wiring and any preconfiguration.

3.4.6.3 RS485 WIRELESS PACKET

The RS485 wireless packet is an optional accessory package for connecting the STL800 to distant inverters that would be hard to connect using cables. Since wireless connections are never 100% predictable, the package includes a test function for testing the connection. It is important that you have already configured the RS485 interface you want to test to the correct inverter manufacturer in the “Config./Start/Initial configuration” dialog box and that the wireless modules have been preset to the inverters’ transmission speed. The wireless package provides a test adapter for the test. Follow the setting instructions in the manual for the wireless package.

3.4.7 INTERNAL

The dialog boxes in the “internal” section are not needed often, usually only for the initial installation.

The following items are available:

- Correct data
- System settings
- Firmware
- Language settings

3.4.7.1 SYSTEM

The system functions control the display light, in other words the time it switches on and off, and the dimmer function when the display is not in use for longer periods of time.

Similar to a screen saver, the “Slideshow” function displays the individual chart functions on a rotating basis.

You can also protect the display from unauthorized access using a PIN. The last subdialog box lets you reset the STL800 to the factory settings.

3.5 CONFIGURATION USING A PC

You must configure additional settings on your PC using a Web browser.

To go to the configuration dialogs, enter the STL800 network address.

Note:
The address above is just an example. Use the network address displayed on screen during automatic network detection.

The main STL800 menu opens:

Select “Configuration” in the upper right.

3.5.1 BASIC CONFIGURATION

The basic configuration comprises the most important settings. These settings are usually sufficient for operation without an Internet connection.

3.5.1.1 LAN SETTINGS

In general, you will already have configured the network setting on the display, and it will no longer need to be changed.

Internet connection
Define the way the STL800 is connected to the Internet. Different options open on the bottom of the screen depending on the setting.

If you select “Network router”, the STL800 will transfer all Internet-related data to the gateway address via the network interface. The router is responsible for sending the data correctly.

Note:
Configuring the network settings using the Web browser is identical to operation directly on the display.

When you save the settings, the STL800 restarts. Changes to the network configuration take place immediately.

3.5.1.2 INVERTERS

This dialog box lets you save all data relevant to the inverter.

The device name and serial number is automatically output for devices from SMA and various other manufacturers. The communication address is displayed for other inverters.

Check whether all inverters have been detected correctly. Each inverter is uniquely identified by its serial number.

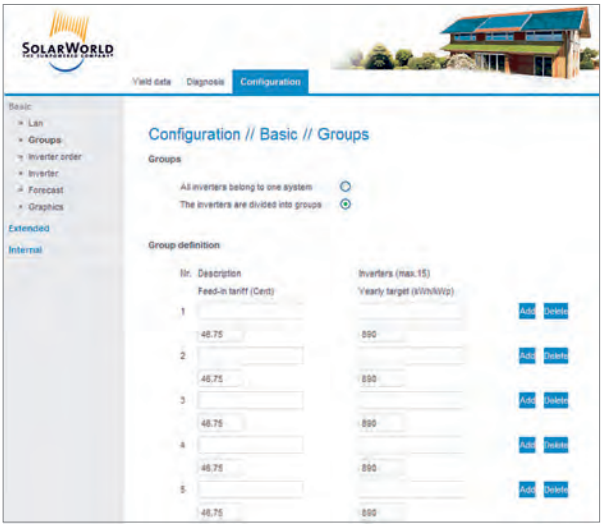
The inverters are always displayed sorted by serial number or communication address. If they are sorted by serial number (SMA/Danfoss/Mastervolt), you can use the “New number” box to set the inverter’s position manually to another number. This option lets you define the desired sequence easily. Note that the sequence must be defined immediately following inverter detection.

3.5.1.3 SYSTEM GROUPS

Since the STL800 can manage a large number of inverters at once, the individual inverters need to be grouped. These system groups are then used in all inverter selection dialog boxes, which much improves the overview. Of course you can still select the individual inverters in a subitem, for example to gain a detailed view of the data.

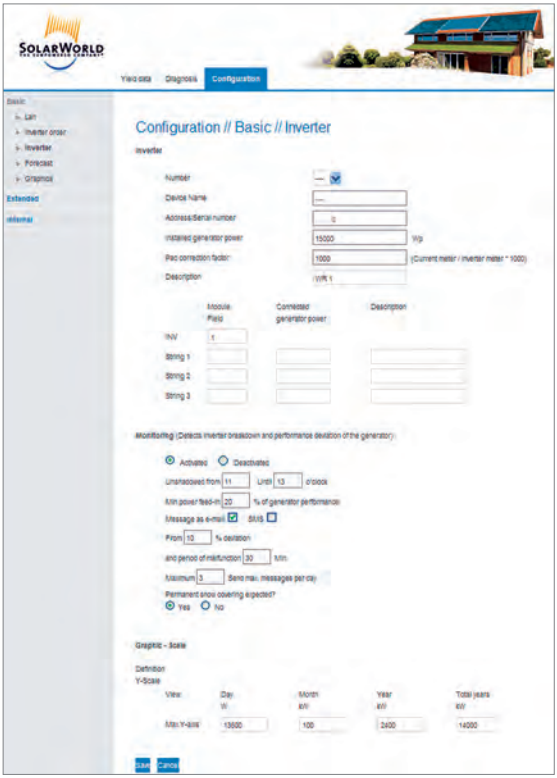
You can even store a separate feed-in rate and an annual target value for each system group. System groups are therefore also ideal for covering system expansions. A system from 2004, which originally had 5 inverters and 30 kWp and which was expanded in 2007 to include 3 more inverters and 20 kWp, can conveniently be managed using system groups in the STL800. The feed-in rate and annual target are configured in the “Forecast” dialog box, currently only directly using the display.

You can also display data on a separate large display for each system group.



Up to 10 system groups with 15 inverters each can be managed. You can use the “Add” and “Remove” buttons to conveniently assign individual inverters to or remove them from a group.

Settings take effect as soon as you save.



Connected generator power
The connected generator power on the inverter is equal to the number of modules multiplied by the rated module power (do not confuse with the total generator power).

Pac correction factor
If you compare the yields displayed by the inverter to the calibrated electricity meter, you will notice a deviation. The yield displayed by the inverter is either too high or too low. You can define a correction factor to compensate approximately for this imprecision.

All yield data is always saved internally without a correction factor. The factor is only applied when the data is output. This allows the factor to be adjusted later at any time.

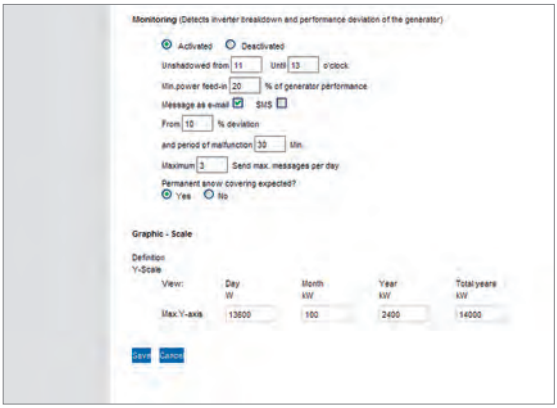
The formula for calculating the correction factor is:

$$\frac{\text{Electricity meter yield}}{\text{Inverter yield}} \times 1000$$

If the inverters do not have a display, you must leave the correction factor 1000 at first so that a factor can be calculated around a week later.

Initial rated power
Enter the inverter's initial rated power. This information is located in the inverter's operating manual. It is intended for subsequent diagnostics calculations and has no relevance at this point.

Description
Short description of the inverter; if you have non-multi-string inverters, you may also indicate the location of the connected modules.



Monitoring

Monitoring the individual inverters, their strings and the connected modules is an important function of the STL800. Malfunctions can be reported by email.

The STL800 monitors and detects:
1. Inverter malfunctions
2. Module array power drops

Monitoring involves comparing the power of all inverters including the individual strings in multi-string inverters. If the target power deviates from the actual power by a certain tolerance, a message may be triggered after a defined delay. Each connected string is assigned to a module array. Module arrays are grouped by module type, module tilt and module orientation. If all modules within a system are the same type and have the same orientation, only one single module array, e.g. 1, is defined. Unassigned strings must be switched off by defining them as 0.

If the orientation differs, you must define additional module arrays.

Ideally, each array is formed from at least two individual strings, which monitor each other.

Example:
A 23.6 kWp system is divided into 3 SMA SB5000TL and 2 SMA SB2500.

Of those arrays, 18 kWp with 30° pitch, 20° SE deviation are located on a barn roof, and 5 kWp, elevated, 32° pitch, 0° S deviation are located on a neighboring garage.

Location	Inverter	String power	Module array
Barn	1.SB5000TL	2000	1
Barn	1.SB5000TL	2000	1
Barn	1.SB5000TL	2200	1
Barn	2.SB5000TL	2000	1
Barn	2.SB5000TL	2000	1
Barn	2.SB5000TL	2200	1
Barn	3.SB5000TL	2000	1
Barn	3.SB5000TL	2000	1
Barn	3.SB5000TL	2200	1
Garage	1.SB2500	2500	2
Garage	2.SB2500	2500	2

All connected strings can monitor each other; the strings from module array 1 can monitor multiple strings, while the two strings from module array 2 each monitor the other.

If a single module loses power and if the irradiation remains constant, the string power will drop, which will be detected and reported.

The power comparison always works reliably even if it is cloudy. You only need to make sure that no module is in the shade. You can define a monitoring period in the configuration when you can guarantee that the modules will be out of the shade.

Since the power measurement in the inverter is very imprecise below a certain threshold, you can also specify a minimum percentage below which monitoring stops.

Unfortunately incorrect notifications can also occur if the modules are covered by snow. These messages are from the power comparison, which occur if the modules are partially covered or malfunction messages if the inverter cannot even switch on because the modules are completely covered by snow.

There are two ways to minimize this problem:

1. Choose a high minimum percentage above which power monitoring begins, for example 30%. If the generator power is 4500 Wp, power monitoring begins at 1350 watts. Modules in partial shade bring the power of the modules not in the shade so far down that you will rarely if ever reach the required 1350 watts. This solves the problem when the modules are partially covered.
2. Malfunction messages always occur when the inverter is not working/online during the time configured as unshaded. A defect is assumed. Modules fully covered by snow would therefore also be reported as a malfunction. There is an indicator for snow coverage to solve this problem. If this indicator is set, no malfunction message is issued if all inverters are offline. Although it is possible that all installed inverters could be broken (for example if they are struck by lightning), this is unlikely. If the indicator is set, it is assumed that the inverters are not working because the modules are fully covered. The indicator also depends on the date. It is only taken into account between the beginning of November and the end of April. It is disabled automatically outside of these months, i.e. in spring, summer, and fall. Monitoring works as usual during these times and also reports a full outage of all inverters.

The fault duration indicates how long a fault must be present without interruption before it is recognized as a fault. The minimum fault duration is 5 minutes, but you should select a longer duration.

You can define a maximum number of messages per day to prevent fault messages from being issued too often.

Graphical scale
You do not normally need to change anything here since the STL800 automatically calculates the values when you enter the generator power. But you can of course adjust the values to your own specifications.

You can enter the maximum value to display in kW for every period (daily value, monthly value, annual value, total).

3.5.1.4 FORECAST

The forecast gives you an idea during the current year whether the system will achieve the required annual yield. Each month is assigned a percentage, which is composed of German yield statistics from the previous years.

Of course you can never know what the summer will be like or whether an entire month will be "ruined" by rain, but the annual forecast is generally surprisingly accurate by September.

The STL800 always calculates the cumulative target value to the day. In other words, at the beginning of the month the target is only the target from the elapsed days plus the current day, not the target for the entire month. The STL800 forecast also includes the yields of all prior years, which lets it take local weather into account (for example, usually snow in December).

System size
Enter the system size in watts peak.

Feed-in tariff
Enter the feed-in tariff you receive. This factor is used to calculate the yield in euros in the visualization.

Annual target
Enter your desired annual target in kWh/kWp.

Monthly percentage
The monthly percentages must total 100%. Otherwise you can adjust the values to your local conditions.

You do not generally have to make any changes.

3.5.1.5 CHART

The chart is determined by the allocation of the X and Y axes.

The X axis always indicates the time, while the Y axis indicates the measured value.

To view daily measurements, you must define the time the day starts and ends for each month to prevent the start or end of the measurement data from being "swallowed up" in the chart.

Note:
The STL800 works independently of this setting and collects data as soon as it is returned by the inverter and stops as soon as the inverter shuts down for the night.

The two top rows are assigned to the start of the day and the two bottom rows are assigned to the end of the day.

As a general rule, changes should not be made.

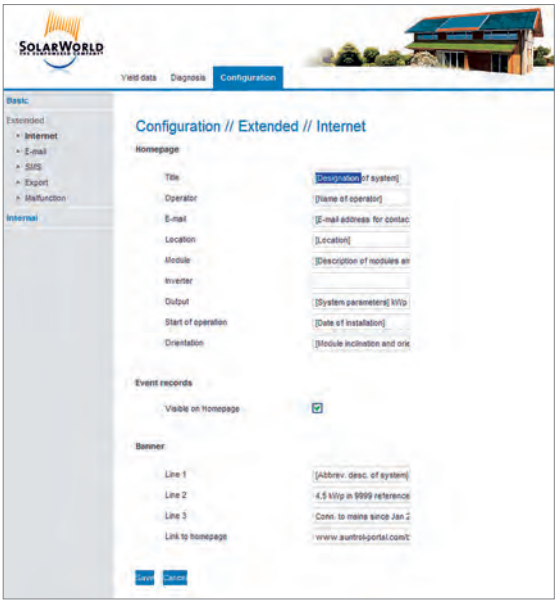
3.5.2 ADVANCED

The “Advanced” configuration includes Internet-based functions in particular. If the STL800 is not connected via an Internet router, you can skip this part of the configuration.

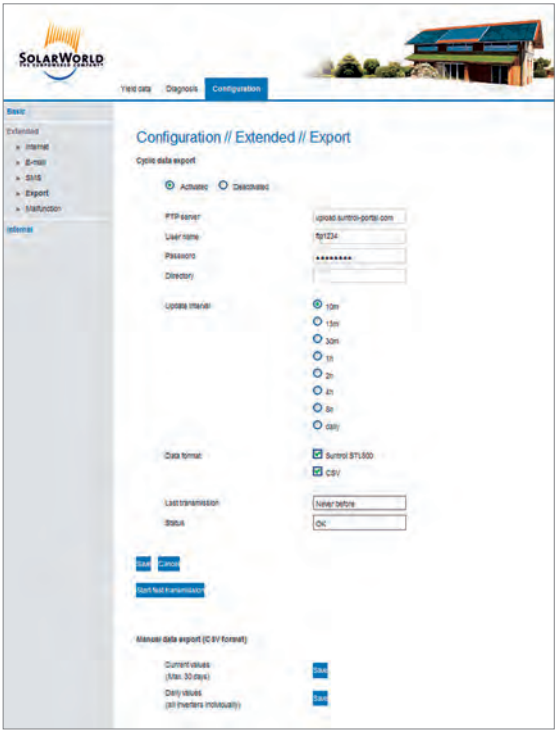
We do recommend connecting the STL800 to the Internet to at least ensure you receive automatic email messages.

3.5.2.1 INTERNET

This dialog box lets you configure the PV system data.



3.5.2.2 EXPORT



The “Export” function transfers yield data to the Suntrol portal at regular intervals to present the system and its online data on the Internet. Change the examples based on your own data.

The FTP server is already specified. The user name and password are your login data for the Suntrol portal. You can find them online at www.suntrol-portal.com > login > My Systems. See also page 16. You do not need to specify a directory. You can leave this box blank. The update interval determines how often the STL800 transfers data. All 5-minute data not sent is always copied even if the interval is much greater, for example 1 hour. You can select the required transfer volume indirectly based on your Internet rate. Only a maximum of around 10 kByte are transferred with each transmission, in other words, not much.

If you want to "seed" the Suntrol portal using the export, select Suntrol as the data format. Alternatively, or in addition, you can choose to export data in CSV format. These files are then transferred to the Web site in a format that is compatible with Excel, where they can be used for other evaluations as needed. All saved data is always exported in the morning and at night (when the system goes on or offline). Additionally, the 5-minute data is always stored with the date, which creates an archive including even very old data.

Note:
Data is not necessarily transferred immediately following configuration. It can take up to 12 hours until all data is transferred. This is because the data farther in the past, the volume of which is somewhat greater, is only transferred when the inverter is switched on and off (when the system goes on or offline). To speed up this process, you can also switch the Suntrol off and back on again. The data is transferred after around 10 minutes.

If there are problems with the data transfer, you can check in the "Last transmission" and "Status" boxes when the STL800 last attempted to copy data.

Possible status codes:

```
1 – Cannot resolve the IP address
    = Cannot connect to the Internet
    Reason:
    - Gateway has not been configured yet
    - DNS server is not available/cannot be reached
      (firewall?)
2 – FTP server not found. Please check the spelling.
3 – User name or password incorrect or not accepted
4 – Cannot go to the required directory
5 – Could not send file
```

You can test the data transmission during the configuration using the "Start test transmission" button. Save the settings you changed first.

If you do not have an Internet connection via a router, i.e. if the STL800 is not connected to the Internet, you can also export the data manually (in CSV format) to your hard drive.

3.5.2.3 FAULT

The STL800 can trigger an email message if a certain status or error code occurs.

This dialog box lets you configure any status/error codes, which, if they occur, trigger a message after the error has persisted for a specified time. You can also specify the maximum number of messages to send. This prevents emails from being sent constantly when persistent “minor” system problems occur.

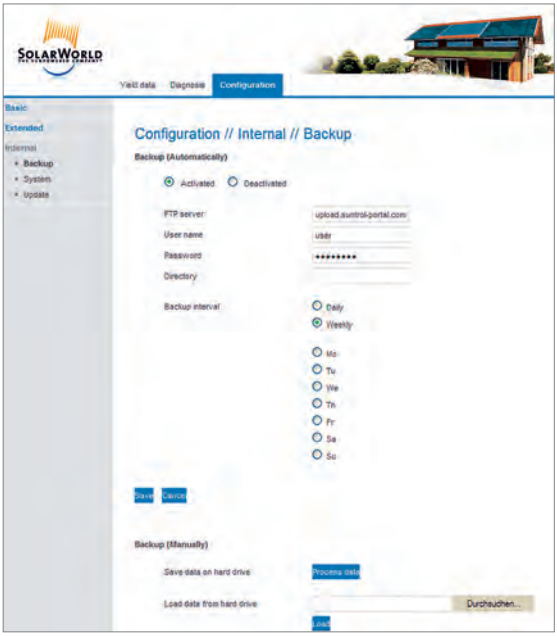
The status and error codes that are available depend on the type of inverter. See the inverter manual for the status and error codes that are relevant for automatic notification. All error codes are reported by default (which is the appropriate setting for SMA).

3.5.2.4 STATUS AND ERROR CODES IN SOLARMAX INVERTERS

The range from 1 to 31 refers to error messages.
The range from 32 to 49 refers to status messages.

3.5.3 INTERNAL

Internal configuration includes data backup, data import from an initial database and updating the STL800 software.



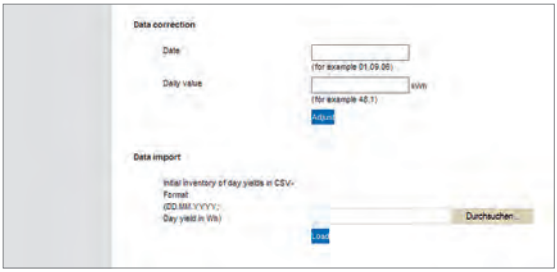
3.5.3.1 BACKUP

Backup – automatic
This option lets you configure a regular backup to any Web site using the FTP protocol. All statistical data is backed up. Since large volumes of data are transferred (> 1 MByte), automatic backup may not be enabled for analog or wireless transmissions.

Backup – manual
If you do not have an Internet connection, you can back up data manually. In this case, a file is saved directly to a specified directory on your PC.

You can also import an old backup. You may need to do this if you update your software, for example. To import the backup, you need to enter your user name and password on the STL800. Enter
User name: suntrol
Password: suntrol

Correct data



This option lets you subsequently edit or re-enter the daily total for any day at any time. The date must always contain 8 digits: 2 digits for the day, 2 digits for the month, and 2 digits for the year separated by decimal points.

The daily value is entered in Wh and must match the electricity meter reading, i.e. the actual daily value.

Importing old daily data
You can also import an initial database with daily data already entered manually in the STL800. This is always a good idea if you need to record a lot of data after the fact, which would take too long using the “Correct data” function.

The file must consist of individual rows of text, in which the date and daily yield value in Wh must be separated by semicolons.

Example:
01.04.06;136435
02.04.06;128219
etc.

Note:
The year can also be specified as a 4-digit number.

The data import deletes the entire memory before importing the daily data. Therefore, you should import data as soon as possible after starting up the Suntrol.

The total daily value is divided up proportionally according to the configured inverter power. Make sure that the total configured inverter power matches the total system power value in the Configuration/Basis/Dialog dialog box. If it does not match, the Suntrol will display differing daily values after the data is imported.

Enter the electricity meter reading. The daily value is adjusted accordingly using the correction factor. If you do not know the correction factor yet, use 1000.

You can only import data once all inverters have been detected and configured correctly.

To import the data, you need to enter your user name and password on the STL800. Enter
User name: suntrol
Password: suntrol

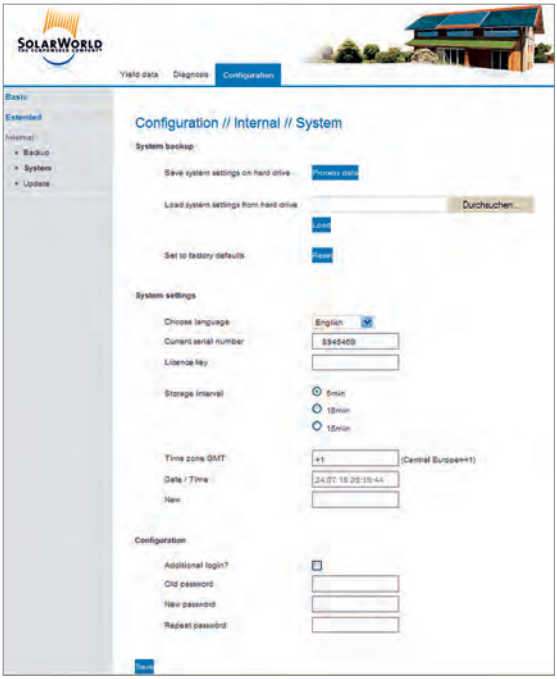
Note:
Make sure the data format meets the above requirements. To do so, start the Wordpad program, which comes with every Windows installation. Open the old data file and check the format. There should be no apostrophes at the beginning or end of the row, for example. You can correct the file in Wordpad and then save it.

3.5.3.2 SYSTEM

The system data is all data you store in the configuration. We recommend backing up the system data when the configuration is changed.

Updating the firmware can reinstall, i.e. delete, all data. If this happens, import your system backup immediately after updating the firmware.

When you import the system backup, you need to enter your user name and password on the STL800. Enter
User name: suntrol
Password: suntrol



Date/Time

The STL800 has an integrated real time clock, which continues to tell time over a long time (100 days) even if the power goes out or it is disconnected from the grid. If you are connected to the Internet, the clock is reset daily, so you should never have to set the clock manually. If, however, the date or time is set incorrectly, this is easy to correct or reset. Just re-enter the required date and time. Example: To enter February 28, 2007 5:31 p.m., enter 28.02.07 17:31:00

The clock is set to daylight savings time automatically. This does not need to be done manually.

Additional password prompt

To protect access to the configuration area, you can store a password. You then have to enter the password the first time you access the configuration. The Suntrol then allows you to view and modify the configuration. Access is denied after 5 minutes after the last time the configuration was accessed, and you have to log in again.

To change the password, you must always enter the old password for security purposes. No password is stored on delivery or after you reset to the factory settings. You do not need to enter anything in the field “Old password”.

3.5.3.3 UPDATE

This item lets you update the STL800 software, which lets you integrate new functions into the system at any time or eliminate errors.

To install the firmware, you need to enter your user name and password on the STL800. Enter
User name: suntrol
Password: suntrol

You absolutely must backup all data, including the system data, before updating the firmware.

Depending on the update, you may need to reorganize the internal data structure, which will delete all data.

Therefore, you must always back up all data!

The latest updates can always be downloaded from www.suntrol-portal.com.

3.6 AUTOMATIC NOTIFICATIONS

One important aspect of the STL800 is the automatic notifications that can be sent by email.

The following notifications are available:
1. Inverter malfunction message
2. Fault message from power monitoring
3. Fault message from status/error code monitoring
4. Alarm message due to alarm contact
5. Yield overview

Examples of each type of message are listed in the following.

3.6.1 INVERTER MALFUNCTION MESSAGE – EMAIL

Subject:
Suntrol – inverter message from 29.12.05 - 11:50:00
Body:
Inverter1 "Garage" (serial number 1100046563) is offline.
It may have malfunctioned! The inverter must be checked!

3.6.2 FAULT MESSAGE FROM POWER MONITORING – EMAIL

Subject:
Suntrol – fault message from power monitoring
from 01.01.06 - 11:05:00
Body:
Module array 1 – inverter1 "Inverter 1"
(serial number 1100046563)
String 2: Ptarget = 931 W, Pactual = 534 W, deviation = 43%

3.6.3 FAULT MESSAGE FROM STATUS/ERROR CODE MONITORING – EMAIL

Subject:
Suntrol – fault message from status/error code monitoring from
02.01.06 - 15:47:30
Body:
Inverter1 "Garage" (serial number 1100046563) fault!
Status=8-fault, Error=55-shutdown

3.6.4 ALARM MESSAGE DUE TO ALARM CONTACT – EMAIL

Subject:

```
Suntrol – Alarm contact triggered on 02.01.06 - 15:47:30
```

Body:

```
System: ... family solar power system
Operator: ... family
Important! The anti-theft system alarm contact was triggered.
Please check as soon as possible!
```

3.6.5 YIELD OVERVIEW – EMAIL

(total of all inverters)

Subject:

```
Suntrol – yield overview from 01.01.06 - 20:00:00
```

Body:

```
Day:          Total          7.10 kWh
              Spec.          1.58 kWhp
              Max            3.13 kW
              Target         2.55 kWh
              Actual yield   278 %
Month:        Total          7.1 kWh
              Spec.          1.5 kWhp
              Max            0.0 kWhMax
              Average        0.0 kWh
              Target         2.5 kWh
              Actual yield   278 %
Jahr:         Total          7 kWh
              Spec.          1 kWhp
```

3.7 LED STATUS DISPLAY

LED 1	LED 2	LED E	Status	Meaning	Solution
◎	◎	○	Initial-ization	Suntrol is starting up. Flashing > 5 minutes	Wait. Error. Power off/on – try again.
●	⊙	○	OK	Reading the time via Internet	
●	⊙	⊙	Error	Cannot read time	Set the time manually Check the Internet connection
○	◎	○	OK	Reading configuration from inverter	Wait
○	⊙	⊙	Error	Invalid configura-tion or cannot read configuration	Check the interface Check the cables Reset to factory settings
●	●		OK	Normal mode Inverter online	
●	○		OK	Normal mode Inverter offline	
		●	Note/ Error	Fronius only: no data communication	1. Wait until the inverters are supplying power 2. Check the cables 3. Check the interface converter power supply
		◎		System reported fault	Fault message and acknowledge in the “Diagnostics/Messages” dialog box

○ LED off
● LED on
⊙ LED flashing slowly
◎ LED flashing quickly

The red P LED is always on and indicates the power supply. If an electricity meter is connected to the S0 input, P flashes with the pulse rhythm.

3.8 RESET BUTTON

You can use the reset button to trigger various functions.

1. Restart the Solar-LogT (the actual reset function)

2. Reset to factory settings

To start the functions, hold down the button. If you press the button, LED1 goes out immediately as an indicator. This indicates that the button has been pressed. LED1 goes back on after 5 seconds. If you release the button, the Solar-LogT restarts “normally,” similarly to a Windows restart. In any event, avoid unplugging the power plug.

LEDs 1+2 go back on after 20 seconds. If you release the button, the STL800 is reset to the factory settings. Note: If you press the button again within 5 seconds, the STL800 is not reset to the factory settings. This is a security mechanism that interrupts the process.

4 TECHNICAL DATA

Supply voltage	**12 V DC (24 V DC max.)**	
Energy consumption	approximately 3.5 watts	
Power supply	external 12 V DC power supply unit	
Dimensions (W x H x D)	225 x 285 x 40 mm	
Housing	plastic housing, passive ventilation	
Interfaces	Ethernet – RJ45 port – 10/100 Mbit 2 RS485, 1 of which is an RS422 relay, 24 V DC max, 5 A max S0 pulse in/output (acc. to DIN 43864 and 62056) alarm contact, max. cable 1000 m, USB host, reset	
Memory	8 MB RAM + 512 MB flash RAM	
Protection degree	IP 20 (for indoor use only)	
Temperature range	-10°C to +50°C	
Display	4 LEDs for status display	
Installation	wall mounting	
Weight	net Suntrol net manual, power supply unit, cables gross including packaging	0.61 kg 0.33 kg 1.13 kg

4.1 INTERNET PORTS

If the Suntrol is connected to the Internet via a router, you must make sure the following ports are enabled for the Suntrol:

Port 21	TCP	FTP data transfer (passive mode)
Port 25	TCP	SMTP email transmission
Port 53	UDP/TCP	DNS name resolution (separate DNS possible)
Port 80	TCP	HTTP Web server
Port 123	UDP	NTP time server

4.2 TIMER

You can use a timer to disconnect the Suntrol from the grid at night between midnight and 3:30 a.m. The Suntrol must be switched on again by 4:00 a.m. since the time is compared and the switch to and from daylight savings time takes place at this time.

4.3 CE DECLARATION OF CONFORMITY

STL800
This declaration of conformity confirms that the device described is compliant with the Directives of the European Union, in particular the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.

The device is compliant with the following standards:

EMC emission:	EN 61000-6-3
EMC immunity:	EN 61000-6-1
Equipment safety:	EN 60950-1

Therefore, the device stated above is labeled with the CE marking.

Any modifications made to the device and its components without the manufacturer's written permission shall render this Declaration of Conformity null and void.

Rosenfeld, May 6, 2009
Solare Datensysteme GmbH

Jörg Karwath
Managing Director

Thomas Preuhs
Managing Director

4.4 CHANGE LOG

Version	Date	Description
1.0.0	May 25, 2009	STL800

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service@solarworld.de

www.solarworld-usa.com

SOLARWORLD

We turn sunlight into power.