Suntro(° STL200/400

SYSTEM MONITORING FOR YOUR PHOTOVOLTAIC SYSTEM

Installation and operating manual





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1 INTRODUCTION

The Suntrol200 and Suntrol400 (referred to as STL200/400 in the following) are 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 installation process is now much easier thanks to an integrated display with a membrane keyboard. All basic settings like the network configuration are now interactive and largely automated and can be made directly on the device.

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.

Thanks to the integrated SO 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 STL200/400, either using the S0 pulse output or parallel to the inverter using the RS485 interface.

The STL200/400 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 STL200/400 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 STL200/400.

Familiarize yourself with the STL200/400 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 STL200/400 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 STL200/400 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 STL200/400 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 STL200/400 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

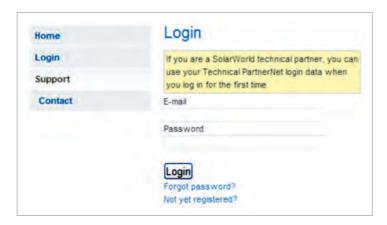
One interesting function of the STL200/400 is the option of storing system data on our own portal (www.suntrol-portal.com). This function lets you retrieve data remotely from any Internet connection and also lets you present your system to friends and anyone interested in solar power.

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 STL200/400. 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 STL200/400 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 "Not yet registered?"



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 aboves.

```
Hello Michael Kelsey,

Thank you for registering with <a href="http://www.suntrol-portal.com/en">http://www.suntrol-portal.com/en</a>.

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

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.

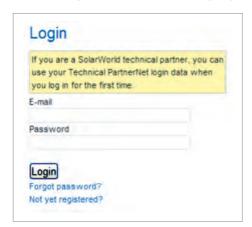
The link takes you to the portal, where you must choose your own password and re-enter it in the second box. Your password must contain at least 6 letters or numbers.



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

Password activated Your new password has been activated. You can now log in using your new login information.

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 My systems 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 . ic

You can also delete your system at any time by clicking the **X** 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 STL200/400:

- > STL200/400 base device
- > 12 volt plug-in power supply unit
- > Manual
- > Terminal block connector for all connections: two 6 pin
- > Four 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 STL200/400 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 STL200/400.

Bottom	
RS485/422-B	One RS485 interface (RS422 for Fronius/Phoenixtec) Connection to inverters or a large display
Power 12 V	12 volt DC input
Network	Ethernet network interface, 10/100 Mbit
Тор	
S0 In/Out	S0 pulse input for connecting to external electricity meter
	SO pulse output for connecting to an external large display
Reset	Reset button, multi-function:
	1. Restart Suntrol, 2. Reset to factory settings

2.2 CONNECTING TO INVERTERS

Since the STL200/400 must communicate with every single inverter directly, appropriate data cables are required. Green terminal block connectors are included for connecting the STL200/400 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.

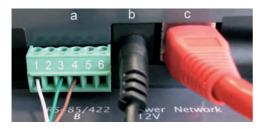
Note:

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 STL200/400 has an RS485 interface (labeled B) and can also be used as an RS422 interface (for Fronius/Phoenixtec inverters).

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

Note:

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

2.4.1 BLUETOOTH MODE

Note:

Bluetooth mode is only possible if the optional Bluetooth module is installed in the STL200/400. 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 STL200/400.

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 STL200/400 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 STL200/400. 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

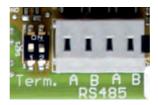
The individual inverters are connected using terminal blocks located inside the device.

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-BLUFPLANET 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)	В
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 SFRIFS

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 F SFRIFS

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

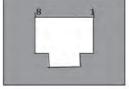
On the inverter side, RJ45 connectors are used to connect the RS485 data cable. These connectors are the same as those used in conventional network patch cables.

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:







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 STL200/400 to the inverter, an interface card, or "ComCard," must be installed.

2.8.1 INSTALLING THE FRONIUS COMCARD

 $The \ Com Card \ can be factory-installed \ in the inverters \ or installed \ later \ as \ a \ Com Card \ retrofit.$

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

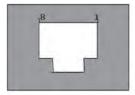
Connect the individual inverters together using conventional network cables with an RJ45 connector.

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	<u> </u>

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 (Serve-Master) 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

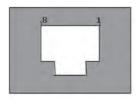
Connect the individual inverters together using conventional network cables with an RJ45 connector. The two RJ45 ports are located on the right side of the side cover, which can be unscrewed. Always follow the instructions in the Danfoss manual.

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	-
o unuscu	

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

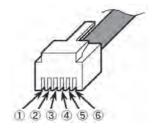
Connect all inverters using the RJ11 cables.

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

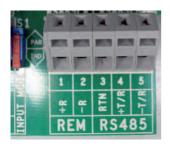
Never open the housing of the inverter when voltage is present. Always follow the information in the Power-One manual.

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.

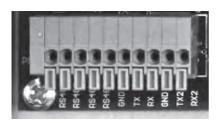
2.12 SUNWAYS — AT/NT

⚠ 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 VPL

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 STL200/400. 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 block – 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)	В
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:

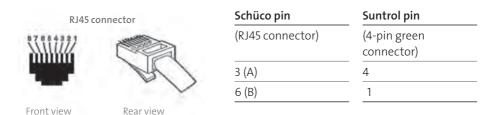
Never open the housing of the inverter when voltage is present. Always follow the information in the Schüco manual.

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.



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 REFUSO

⚠ 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 and press ENTER.
- > Enter numerical value 9600 Press ENTER

Press ESC twice to return to the power display.

\triangle 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

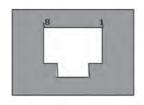
The RS485 interface is factory-integrated in all Mastervolt inverters, and connectors can be plugged into RJ45 ports on the bottom of the housing.

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:







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:

R+ (white)	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

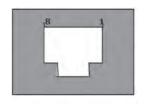
The RS485 interface is factory-integrated in all Diehl-AKO inverters, and connectors can be plugged into RJ45 ports on the bottom of the housing.

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:







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 EXTERNAL FLECTRICITY METERS

An external electricity meter can be connected to the STL200/400 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 STL200/400 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 STL200/400 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 SO port of the external electricity meter is connected to the 6-pin SO In/Out connector as follows:



Suntrol	SO
1	S0+
2	SO-
3 — Bridged	
Bridged	
5	Unassigned
6	Unassigned

The cables between the electricity meter and STL200/400 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.

2.21 CONNECTING A LARGE DISPLAY

There are essentially two different ways to connect large displays to the STL200/400:

- 1. Using an RS485
- 2. Using the SO 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 STL200/400.

If you use the SO 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.

2.22 WIRING THE RS485 INTERFACE

If you choose to connect using RS485, the RS485 interface of the STL200/400 is available. A large display can be connected to this interface even if inverters are already connected to the interface.

Note:

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

2.23 WIRING THE SO OUTPUT

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

2.23.1 CURRENT-CONTROLLED SO 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 SO In/Out
S0+	4
SO- Bridged	5
	6

2.23.2 CONTACT-CONTROLLED SO 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 SO In/Out	
SO-	6	
SO+	5	

2.23.3 PULSE FACTOR 56

The STL200/400 outputs 1000 pulses /kWh at the SO 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).

System size kWp	Pulse factor	
30 kWp	2000	
60 kWp	1000	
100 kWp	600	
150 kWp	400	
300 kWp	200	
600 kWp	100	

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

2.24 CONNECTING TO A PC/NETWORK

The STL200/400 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 STL200/400. 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 STL200/400 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 STL200/400 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 STL200/400, you can start up, i.e. configure, the device.

The STL200/400 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 DISPLAY

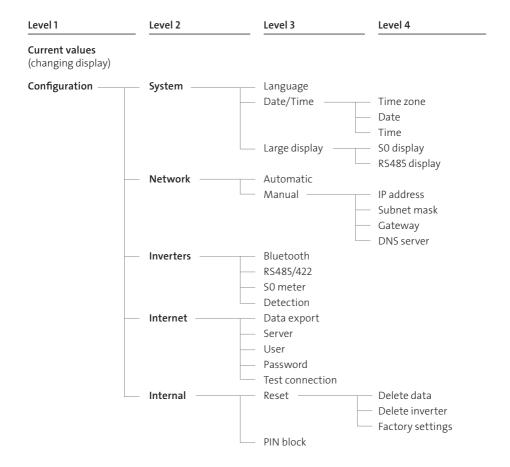
The text display is used primarily for configuring the STL200/400, less often for retrieving data while the system is running. Data is intended to be retrieved using a PC in your local network or over the Internet.

Using the display is intuitive with the membrane keypad. Use the arrow keys to navigate through the individual menu items and press Enter to select them. If you want to discard an entry without saving, you must press ESC.

The system's current operating data is displayed in default mode. Press any key to go to the configuration. Press ESC to go back to overview mode.

Use the arrow keys to navigate up and down to enter numbers.

3.1.1 TEXT DISPLAY MENU STRUCTURE



3.2 PC DISPLAY

You do not need to install any additional software to operate the Suntrol on your PC. The Suntrol 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 STL200/400 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 STL200/400.

To open the main dialog box of the STL200/400, start your Web browser and enter the network address.

3.2.1 PC DISPLAY MENU STRUCTURE

Level 1	Level 2	Level 3
Yield data	PC visualizationPalm/PocketPC	
Diagnostics	Event logDegradation	
Configuration ————————————————————————————————————	— Basis —————	LAN Inverters Forecast Chart
	— Advanced —————	Internet Email SMS Export Fault
	– Internal –	Internal backup System Update

3.3 INITIAI STARTUP

Initial startup takes place first on the text display and then, if necessary, on a connected PC/notebook. The menu navigation on the display is designed so that you must work through every item and subitem from top to bottom. As you can see on the display menu structure, all necessary configurations are made one after the other.

⚠ Important note:

To go to the configuration, you must press Enter at the start to exit the current value display.

3.3.1 CONFIG. / SYSTEM / LANGUAGE

Select the display language you want to use.

3.3.2 CONFIG. / SYSTEM / DATE / TIME

You can select the "Date" and "Time" subitems to adjust the settings. The Suntrol has a backup capacitor, which caches the date and time, but you may need to set the correct information once after the device is stored for a longer period of time.

3.3.3 CONFIG. / SYSTEM / LARGE DISPLAY

You can connect large displays to the Suntrol using 2 technologies.

- 1. Using the SO pulse output
- 2. Using an RS485

We recommend using the RS485 port since the numerical values of the Suntrol are synchronized with the display values. If you use certain inverters (Fronius and Phoenixtec/Suntension), you must use the SO interface since parallel use is not possible. In general, data is only sent to the large display when the inverters are supplying power.

3.3.4 SO DISPLAY

Enter the pulse factor, which must match the factor on the display. The factory setting is: 1000

3.3.5 RS485 DISPLAY

Enable display activation by RS485. Note that data can only be sent correctly to the large display after the inverter has been configured.

Note:

If no manufacturer is configured for the RS485 interface (for example, in Bluetooth mode), the Suntrol uses the following parameters to send data: 9600 baud, 8N1

3.3.6 CONFIG. / NETWORK

You can configure the network, i.e. assign an IP address and connect to a router (if required), automatically or manually.

To configure the network automatically, you must connect the Suntrol to an Internet router, which is assigned a network address automatically (DHC P). In general, all routers are preset to attempt automatic detection first.

3.3.7 CONFIG. / NETWORK / AUTOMATIC

Once the search has started, the Suntrol attempts to have an IP address assigned using an Internet router. The search can easily take up to 60 seconds.

When a network address is assigned, it is displayed. Take note of the address. The address will be used later for access from your PC. All other settings such as the subnet mask, gateway, etc. are now also set.

3.3.8 CONFIG. / NETWORK / MANUAL

If the Suntrol is not connected to a router or if the DHC P server in the router is disabled, you must configure the network manually.

Contact your network specialist, who can assign an appropriate network address and make any additional settings for the gateway, etc.

3.3.9 CONFIG. / INVERTERS

In this configuration, you must configure the data interfaces of the STL200/400 to the inverters used.

3.3.10 CONFIG. / INVERTERS / BLUETOOTH

(This menu item only appears if the Bluetooth module is integrated into the Suntrol.)

Enable the Bluetooth function if you want the Suntrol to communicate wirelessly with the SMA-SB 3000/4000/5000-20.

3.3.11 CONFIG. / INVERTERS / RS485

Select the manufacturer of the device to which the RS485/422 interface is connected.

You can run Bluetooth and RS485/422 in parallel, essentially enabling mixed inverter mode, for example SMA inverter via Bluetooth and Fronius inverter via RS485/422.

3.3.12 CONFIG. / INVERTERS / SO METER

If you use the SO input, you must enable this setting. Three different modes are available:

- 1. Meter as "Electricity consumption"
- 2. Meter as "Inverter"
- 3. Meter as "Meter for the entire system"

The SO meter is very flexible: measurement as electricity consumption for calculating own electricity use, inverter mode to read data of an inverter whose data protocol is not supported, or for highly accurate logging of the entire system's energy production.

You must configure the pulse meter factor afterwards.

3.3.13 CONFIG. / INVERTERS / DETECTION

This option lets you begin the inverter detection process. The individual interfaces of the Suntrol are polled one after the other if they are enabled:

1. Bluetooth

First, all SMA Bluetooth inverters are displayed in a list. Since more inverters than actually installed on site may be found (e.g. inverters on the neighbor's property), you must check the inverters listed. To delete an inverter from the list, press Enter.

Once the selection is correct, press ESC.

- 2. R S485/422
- 3. SO meter

The meter must send at least 1 pulse every 60 seconds.

Each inverter found during detection will be displayed. Detection can take some time. If you have SMA inverters, channel lists are loaded, which can take several minutes per inverter.

Once detection is complete, the total number of inverters is displayed. You can confirm/save the detected inverters or repeat or cancel the detection process.

Redetecting inverters

If you add a new inverter to the system or replace an SMA inverter for example, you must repeat the detection process. Your data will not be lost. The Suntrol reformats the data automatically. We nevertheless recommend strongly backing up the configuration and data before repeating the detection.

3.3.14 CONFIG. / INTERNET

Before the Suntrol can send data to the Internet, you must connect it to an Internet router and finish configuring the network.

Portal

The Suntrol portal adds considerable value, especially for system operators and installers: easy installation, convenient configuration, simple system monitoring at a glance. www.suntrol-portal.com

3.3.15 CONFIG. / INTERNET / DATA EXPORT

This option lets you choose whether you want to export the Suntrol data to the Suntrol portal automatically.

3.3.16 CONFIG. / INTERNET / SERVER

In general, you do not need to make any changes here since the right server name (upload.suntrol-portal.com) is already entered.

3.3.17 CONFIG. / INTERNET / USER

You must enter the user name (ftp_...) created when you generated a new system on the Suntrol portal (see 1.3). You can find the name on the Internet at www.suntrol-portal.com under "My systems".

3.3.18 CONFIG. / INTERNET / PASSWORD

As described in 3.3.17, you must enter the correct ten-digit password. If you cannot use upper case letters when entering the user name and password, you must install the latest firmware on the device. See 3.4.3

3.3.19 CONFIG. / INTERNET / TEST CONNECTION

You can use the "Test connection" function to check whether all settings are correct and whether the online transfer works. The "Test connection" function transfers only a small file to reduce the transfer duration and wait time.

If an error is detected, an error code is displayed:

- 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

Check the settings and repeat the connection test until OK is returned.

3.3.20 CONFIG. / INTERNAL / RESET

There are 3 different options for resetting the Suntrol:

1. Delete data

In some instances, meaningless data values can be displayed following inverter detection. If this happens, it is a good idea to delete the database again to prevent the entire device from having to be reset.

2. Delete inverter

If you want to start inverter detection again without deleting the rest of the configuration, this option lets you delete specific inverter data.

3. Factory settings

This option lets you reset the device to its original state on delivery. It will not delete the network configuration.

3.3.21 CONFIG. / INTERNAL / PIN BLOCK

This option lets you enter a 4-digit PIN, which you can use to protect the configuration on the Suntrol display. The PIN does not affect operation using a Web browser, which can be protected separately.

3.4 CONFIGURATION USING A PC

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



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

Note:

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

The main STL200/400 menu opens:

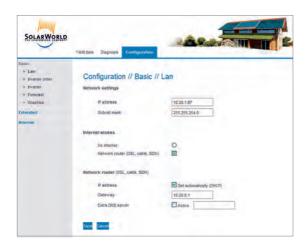


Select "Configuration" in the upper right.

3.4.1 BASIC CONFIGURATION

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

3.4.1.1 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 STL200/400 is connected to the Internet. Different options open on the bottom of the screen depending on the setting.

If you select "Network router", the Suntrol 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 STL200/400 restarts. Changes to the network configuration take place immediately.

3.4.1.2 INVERTER

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.



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:

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 STL200/400. Malfunctions can be reported by email.

The STL200/400 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 irradiance 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.

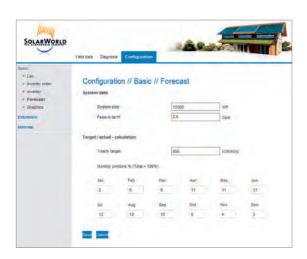
You can define a maximum number of messages per day to prevent fault messages from being issued too often.

Graphical scale

You do not normally need to change anything here since the Suntrol 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).

3.4.1.3 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 STL200/400 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 Suntrol 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.

3.4.1.4 CHART

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

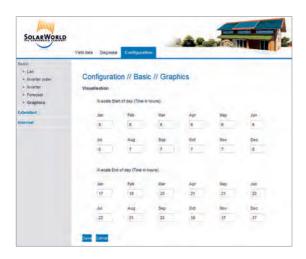
The X axis always indicates the time, while the Y axis indicates the measured value.

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 STL200/400 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.

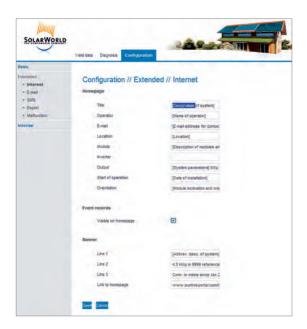
3.4.2 ADVANCED

The "Advanced" configuration includes Internet-based functions in particular. If the STL200/400 is not connected via an Internet router, you can skip this part of the configuration.

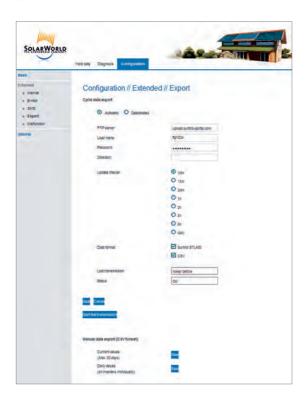
We do recommend connecting the Suntrol to the Internet to at least ensure you receive automatic email messages.

3.4.2.1 INTERNET

This dialog box lets you configure the PV system data.



3422 FXPORT



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 do not need to specify a directory. You can leave this box blank.

The update interval determines how often the STL200/400 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 STL200/400 last attempted to copy data.

Possible status codes:

- 1 Cannot resolve the IP address
 - = Cannot connect to the Internet

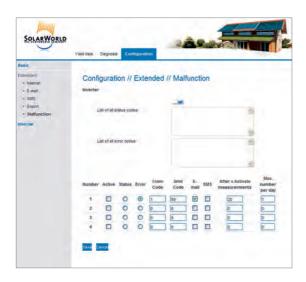
Reason:

- 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 STL200/400 is not connected to the Internet, you can also export the data manually (in CSV format) to your hard drive.

3.4.2.3 FAUIT



The STL200/400 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.

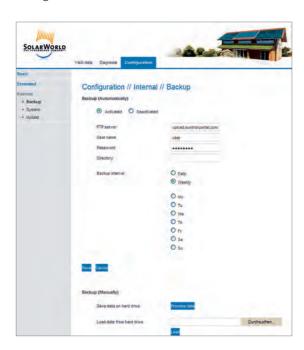
The status and error codes that are available depend on the type of inverter. See the inverter manual for the status and error codes that are relevant for automatic notification. All error codes are reported by default (which is the appropriate setting for SMA).

3.4.2.4 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.

3.4.3 INTERNAL

Internal configuration includes data backup, data import from an initial database and updating the STL200/400 software.



3.4.3.1 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 STL200/400. 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 STL200/400. 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 STL200/400. 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.

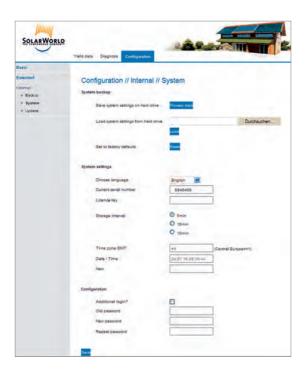
3.4.3.2 SYSTEM

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 STL200/400. Enter

User name: suntrol Password: suntrol



Date/Time

The STL200/400 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".

3.4.3.3 UPDATE



This item lets you update the STL200/400 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 STL200/400. 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.

3.5 AUTOMATIC NOTIFICATIONS

One important aspect of the STL200/400 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.

3.5.1 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!

3.5.2 FAULT MESSAGE FROM POWER MONITORING — FMAIL

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%

3.5.3 FAULT MESSAGE FROM STATUS/ERROR CODE MONITORING — EMAIL

Subject:

Suntrol - fault message from status/error code monitoring 02.01.06 - 15:47:30

Body:

Inverter1 "Garage" (serial number 1100046563) fault! Status=8-fault, Error=55-shutdown,

3.5.4 ALARM MESSAGE DUF TO ALARM CONTACT — FMAIL

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!

3.5.5 YIFI D OVFRVIEW — FMAIL

(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%

Year: Total 7 kWh

Spec. 1 kWhp

3.6 LED STATUS DISPLAY

LED 1	LED 2	LED E	Status	Meaning	Solution
<u> </u>	<u> </u>	0	Initial- ization	Suntrol is starting up. Flashing > 5 minutes	Wait. Error. Power off/on – try again.
•	•	0	OK	Reading the time via Internet	
•	•	•	Error	Cannot read time	Set the time manually Check the Internet connection
0		0	OK	Reading configuration from inverter	Wait
0	<u> </u>	<u> </u>	Error	Invalid configura- tion or cannot read configuration	Check the interface Check the cables Reset to factory settings
•	•		OK	Normal mode Inverter online	
•	0		OK	Normal mode Inverter offline	
		•	Note/ Error	Fronius only: no data communication	 Wait until the inverters are supplying power Check the cables Check the interface converter power supply
_	_	©		System reported fault	Fault message and acknowledge in the "Diagnostics/ Messages" dialog box
O LEC				D flashing slowly D flashing quickly	

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

3.7 RESET BUTTON

You can use the reset button to trigger various functions.

- 1. Restart the STL200/400 (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 STL200/400 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 STL200/400 is reset to the factory settings.

Note:

If you press the button again within 5 seconds, the STL200/400 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 1 RS485/RS422 combined S0 pulse in/output (acc. to DIN 43864 and reset	d 62056)
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 manual, power supply unit, cables C).61 kg).33 kg .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 TIMFR

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

STL200/400

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	5/25/09	STL200/400

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