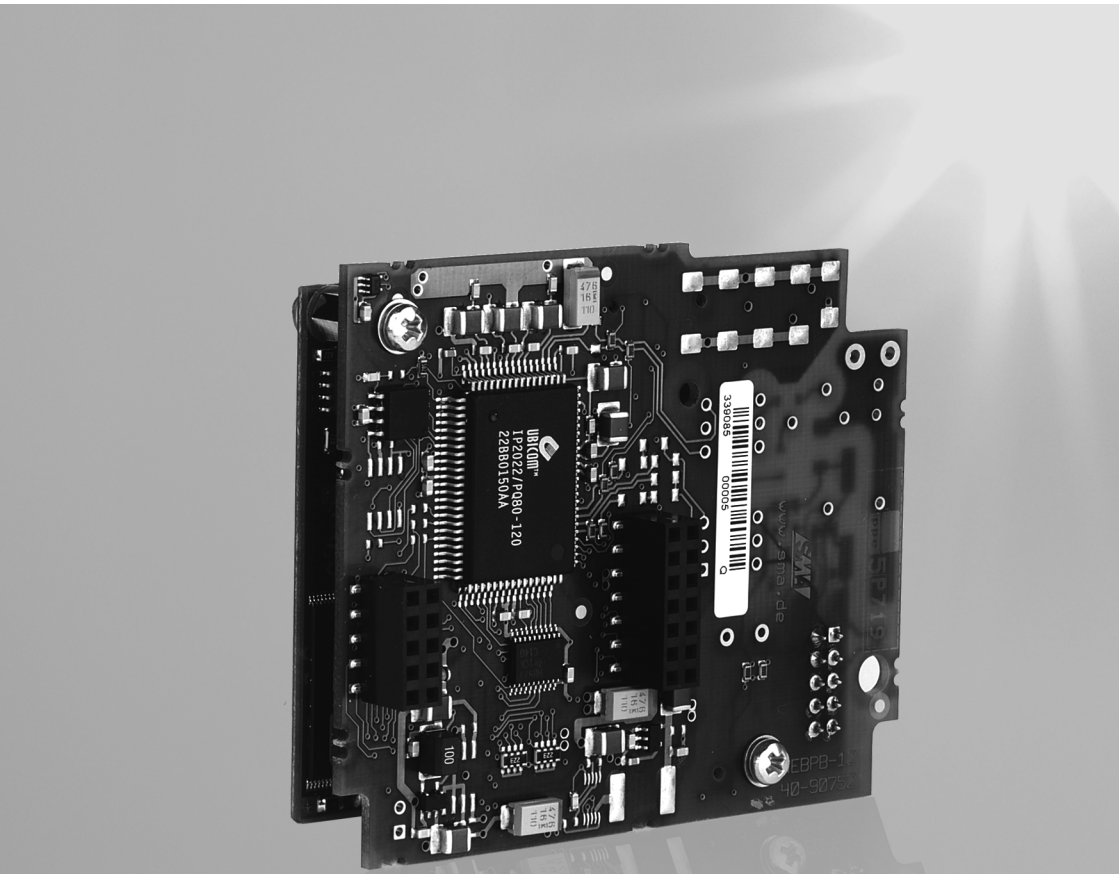
Accessories Solar Datatechnology

NET Piggy-Back

Technical Description



NETPB-TEN081708 | 98-0009733 | Version 3.3

EN

Table of Contents

1 Notes on this Manual

1.1 Validity

- This manual applies to the following devices:
- Sunny Boy Control (firmware version 4.09 or higher)
- Sunny Boy Control Plus (firmware version 4.09 or higher)
- Sunny Central Control (firmware version 4.0 or higher)

- Analog NET Piggy-Back (firmware version 2.01F or higher)
- NET Piggy-Back GSM (firmware version 2.01F or higher)
  - The Sunny Central Control is currently unable to send system data to the Sunny Portal.
- NET Piggy-Back ISDN (firmware version 2.01F or higher)
- NET Piggy-Back Ethernet (firmware version 1.08F or higher)

1.2 Target Group

This manual is intended for the installer.

1.3 Storage of the Manual

The NET Piggy-Back manual must be stored in the immediate vicinity of the Sunny Boy Control / Plus or the Sunny Central Control and must be accessible at all times.

1.4 Symbols Used

The following warnings and notes containing general information appear in this document:

DANGER!

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE!

NOTICE indicates a situation that can result in property damage if not avoided.

Information

Information provides tips that are valuable for the optimal installation and operation of your product.

2 Safety

2.1 Appropriate Usage

The NET Piggy-Back is an additional module for the Sunny Boy Control that allows you to e-mail the operating data of your PV system directly to the Sunny Boy Control. The NET Piggy-Back comes in four different versions. Depending on which version you order, the NET Piggy-Back can send data using one of the following methods:

- analog telephone network
- ISDN
- GSM (cellular phone network)
- Ethernet

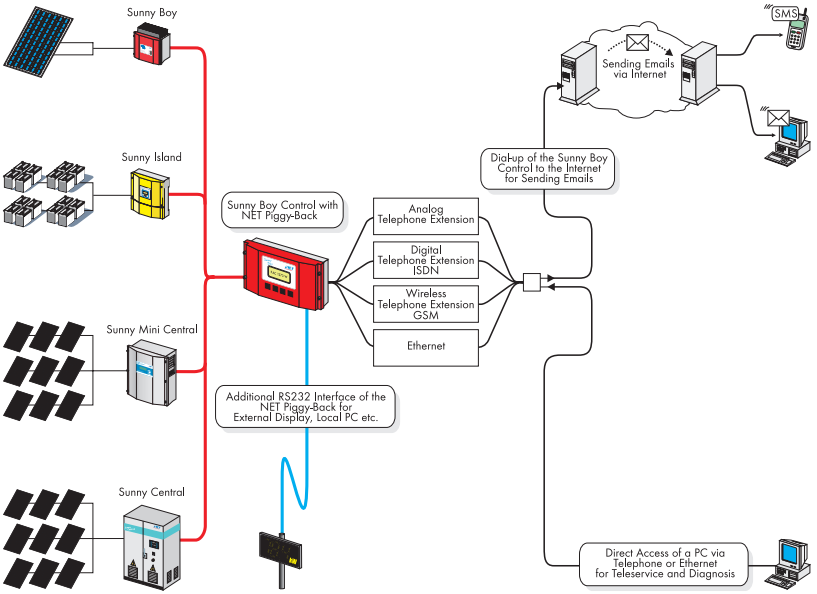
The Sunny Boy Control automatically sends the yield data of your system as well as any failure messages to up to three recipients everyday. You can also forward this data to your own cellular phone with an e-mail-to-SMS service. The Sunny Boy Control with NET Piggy-Back can dial up to the Internet using any Internet service provider (ISP). For sending e-mails, SMA provides a mail server free of charge or you can use the SMTP or ASMTP server of your provider.

Besides sending e-mails, the NET Piggy-Back also allows you to dial-in to your PV system with a PC and a compatible modem. You can therefore use public telephone network to perform remote diagnostics and configurations.

Establishing a Connection with the ISDN NET Piggy-Back

The ISDN NET Piggy-Back cannot be connected to a Sunny Boy Control via an analog modem. To establish such a connection, you must use an ISDN modem (terminal adapter) or an ISDN PC card!

The figure below shows the principle and the possibilities of communication via the NET Piggy-Back. The NET Piggy-Back can be retrofitted into all Sunny Boy Control (SBCO02) devices and Sunny Boy Control Plus (SBCOP02) devices with NET sockets.



E-mail Formats

Reports can be generated on the following events:

- System info: report on the energy yields of your system
- Errors/warnings: report on any errors or warnings which may have occurred

Errors and warnings are always transmitted together in a report. If you configure warnings as 'daily reports' and errors as 'hourly reports', notification will be sent at the next hour after an error occurs. This report contains all the errors and warnings that have occurred until the time it is sent. If a warning is issued, it will be reported at the end of the day.

2.2 Safety Precautions

DANGER!
Danger to life when opening the Sunny Boy Control.

All work on the Sunny Boy Control / Sunny Boy Control Plus and Sunny Central Control may only be carried out by a qualified electrician.

User Manual Supplement

This document is a supplement to the "Sunny Boy Control/Control Plus" user manual.

3 The NET Piggy-Back

When the NET Piggy-Back is installed, you have the option of having the operating data of your PV system sent to you by e-mail or forwarded to you by SMS. The NET Piggy-Back offers you convenient access to the current status and energy yields of your PV system regardless of your actual location.

This document describes the additional functions that are enabled when the NET Piggy-Back is installed. It supplements the Sunny Boy Control / Control Plus documentation and contains critical information for the installer and operator regarding the function, installation and use of the NET Piggy-Back.

Difference between Sunny Boy Control and Sunny Boy Control Plus

In the remainder of this document the Sunny Boy Control and the Sunny Boy Control Plus will be differentiated only when necessary. The range of functions with regard to the NET Piggy-Back is identical for both devices.

3.1 Packing List

NET Piggy-Back "Analog Modem" Version

1 WEBPB-AN2 (NET Piggy-Back "analog modem" version)

1 TAE-N/RJ11

1 Grounding cable

1 Spacer

1 Modular connection cable (5 m, 4 wires)

NET Piggy-Back "ISDN" Version

1 WEBPB-IS1(NET Piggy-Back "ISDN" version)

1 Spacer

1 ISDN connection cable (6 m, 4 wires)

NET Piggy-Back "GSM" Version

1 WEBPB-GS1 (NET Piggy-Back "GSM" version)

1 Spacer

1 Spacer

1 Rod antenna for D/E network
(antenna cable, washer, lock washer, nut, rod antenna)

NET Piggy-Back "Ethernet" Version

1 WEBPB-ET1 (NET Piggy-Back "Ethernet" version)

1 Spacer

1 Patch cable (SFTP, 3 m)

3.2 Identification

You can identify the NET Piggy-Back by the label on the PCB.

4 Electrical Connection

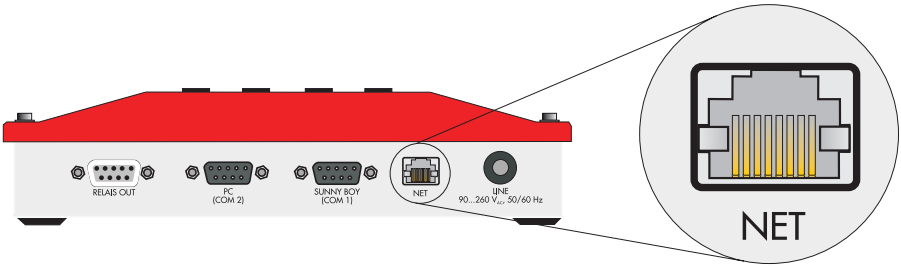
4.1 Connections

4.1.1 NET Socket

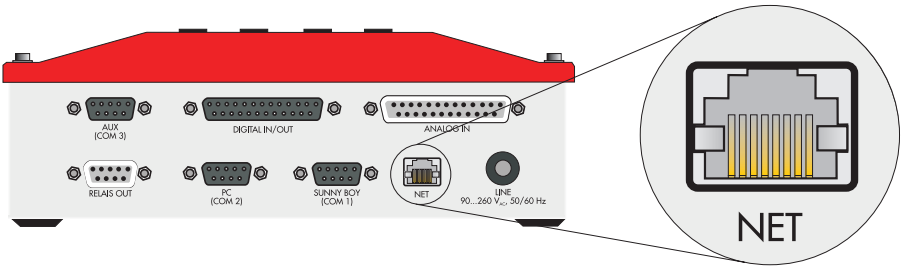
The NET Piggy-Back can be retrofitted into all Sunny Boy Control/Control Plus devices or Sunny Boy Control/Control Plus devices with NET sockets at SMA. An external modem is not required, the operating data of your PV system are transmitted by the communication module that is integrated in the NET Piggy-Back. Note the following changes when using a Sunny Boy Control with the NET Piggy-Back:

- External modem not required.
- System monitoring via fax reports is not supported.

Bottom view of Sunny Boy Control with NET socket



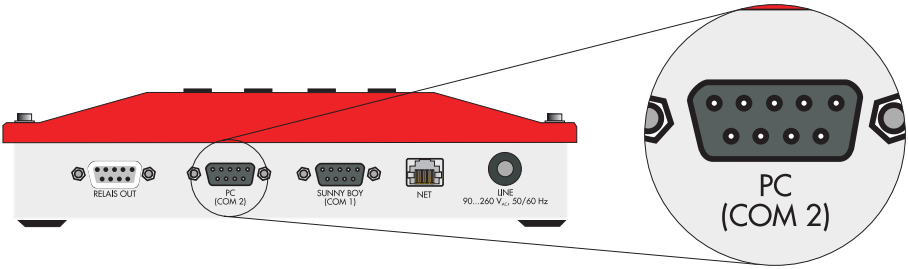
Bottom view of Sunny Boy Control Plus with NET socket



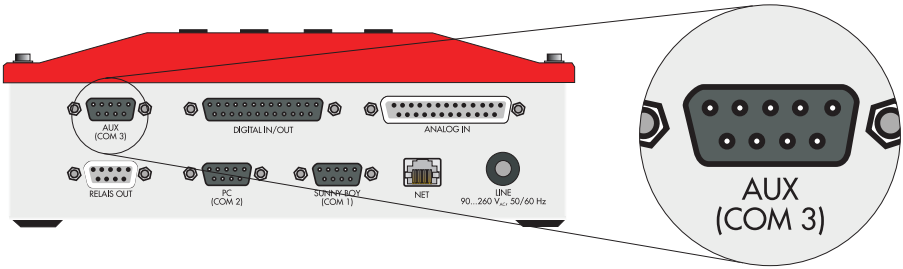
4.1.2 PC (COM2) / AUX (COM3) Serial Interface

Installing a NET Piggy-Back will not only enable the NET socket, but also an RS232 port at the PC port (COM2) of the Sunny Boy Control or the AUX port (COM3) of the Sunny Boy Control Plus. You can connect a PC equipped with Sunny Data Control or a large display, for instance, to these enabled ports.

NET Piggy-Back in the Sunny Boy Control enables the RS232 at the PC port (COM2).



NET Piggy-Back in the Sunny Boy Control Plus enables the RS232 at AUX (COM3).



4.2 Connection to the Data Network

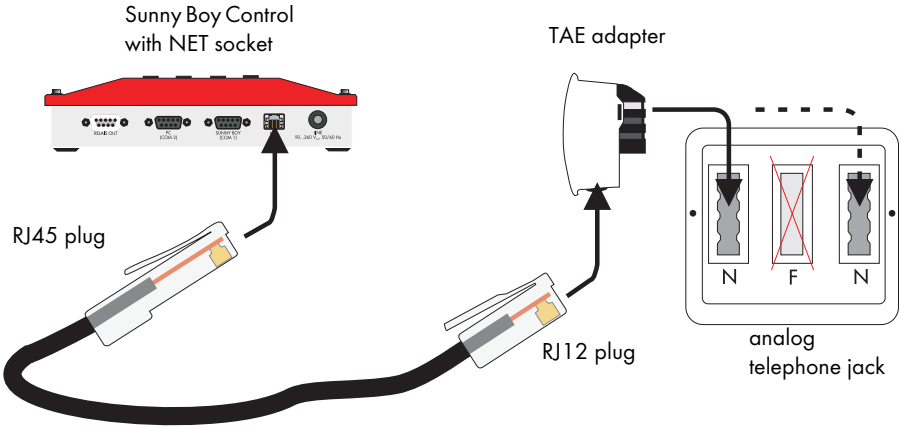
With the provided connection cable you can connect the NET sockets to the telephone network or Ethernet. In the GSM version the NET socket is disabled.

4.2.1 NET Piggy-Back "Analog Modem" Version

The accessories provided in the delivery include:

- Connection cable
  5 m, 4-wire, 6-pole modular plug (RJ12) on an 8-pole modular plug (RJ45)
- TAE adapter (for Germany)
  of 6-pole modular plug (RJ12) on TAE-N

Connecting the Sunny Boy Control to the analog telephone network



Insert the wide 8-pole modular plug into the NET socket of your Sunny Boy Control. Now connect the thin 6-pole end of the cable to the telephone wall jack. An adapter that makes the modular plug compatible with TAE-N is included for the TAE jacks commonly found in Germany. Connect it to one of the two N-coded jacks.

PIN Assignment of the NET Piggy-Back "Analog Modem" Version

Whereas the TAE plug is provided for connecting to the telephone network in Germany, the RJ45 plug is normally used for connecting to all other telephone networks. In special cases a connection can be made based on the information in the table below or else an adapter must be obtained from a specialist dealer.

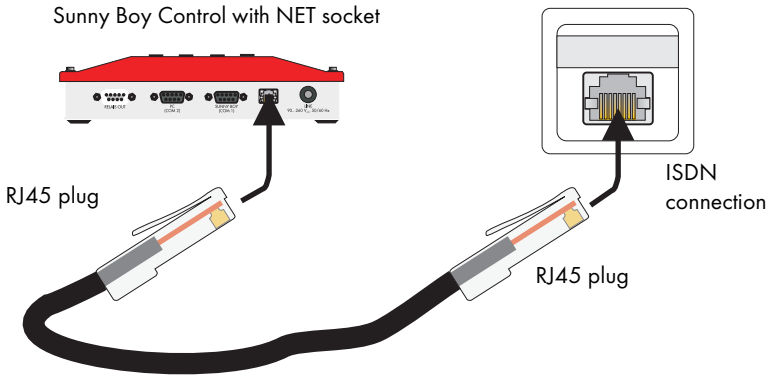
NET	RJ12	TAE	Specification	Description
1	-	-		not used
2	1	-		not used
3	2	5	b2	"Ring" relay
4	3	2	b	b line, also labeled as ring
5	4	1	a	a line, also labeled as tip
6	5	6	a2	"Tip" relay
7	6	-		not used
8	-	-		not used

4.2.2 NET Piggy-Back "ISDN" Version

The accessories provided in the delivery include:

- ISDN connection cable
  6 m, 4-wire, 8-pole modular plug (RJ45) on both ends

Connecting the Sunny Boy Control to the ISDN



Use the provided connection cable to connect the NET socket to the ISDN jack on the NTBA or telephone system.

PIN Assignment of the NET Socket for ISDN Modems

NET	RJ45	NTBA	Description
1	1	-	not used
2	2	-	not used
3	3	2a	transmitted data plus, also labeled as Tx(+) or SX1
4	4	1a	transmitted data minus, also labeled as Tx(-) or SX2
5	5	1b	received data minus, also labeled as Rx(-) or SR2
6	6	2b	received data plus, also labeled as Rx(+) or SR1
7	7	-	not used
8	8	-	not used

4.2.3 NET Piggy-Back "GSM" Version

The accessories provided in the delivery include:

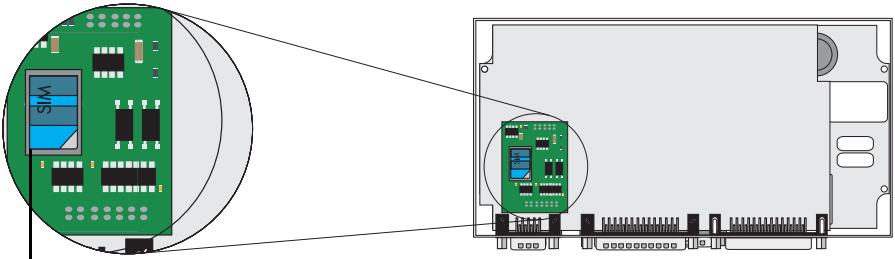
- Radio antenna with external thread

To prepare your Sunny Boy Control for use with a GSM NET Piggy-Back, proceed as follows:

DANGER!
Risk of lethal electric shock when opening the Sunny Boy Control.

Open the Sunny Boy Control as described in the Sunny Boy Control manual.

Inserting the SIM Card



Interior view of Sunny Boy Control

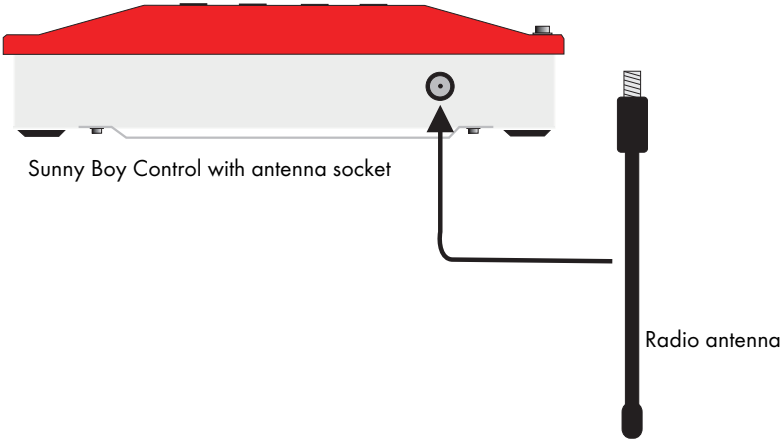
Slot for SIM card

Insert your SIM card into the device on the GSM NET Piggy-Back. To do so, you first need to release the lock and lift up the clamp. Now slide your card into the device and then close and lock it. Make sure the Sunny Boy Control is properly closed. Reconnect all peripherals.

Dial-In Function for Remote Maintenance

To use the dial-in function for remote maintenance, you need an SIM card with an active data link. This card is only available from cellular network providers as part of a contract. If you only want to send e-mails, then you can also use a prepaid card.

Attaching the Antenna



Screw the provided radio antenna into the antenna socket in a clockwise direction and tighten it manually. The device for the antenna is located on the top of your Sunny Boy Control.

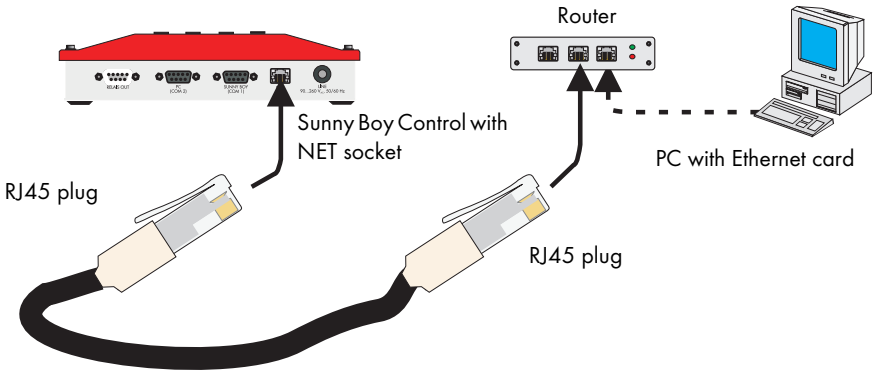
4.2.4 NET Piggy-Back "Ethernet" Version

The accessories provided in the delivery include:

- Cat 5 patch cable
  3 m, 8-wire, 8-pole modular plug (RJ45) on both ends

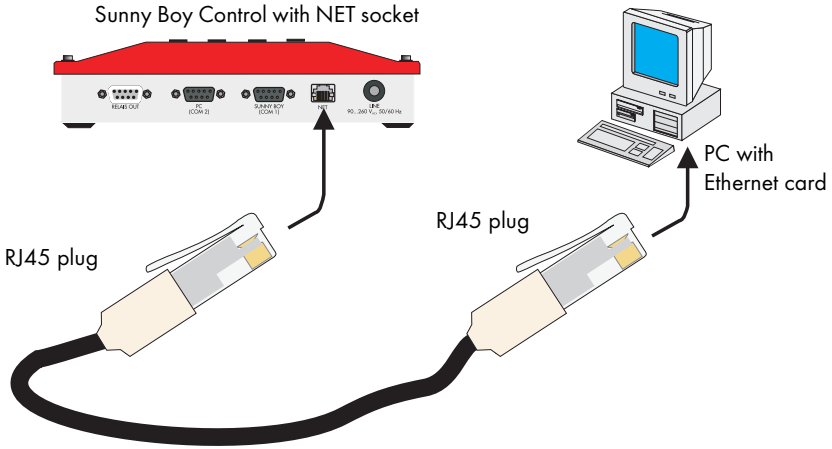
Connecting to a Network

To connect your Sunny Boy Control to an existing network, connect it to your router or switch as shown below. Use the provided patch cable for this purpose. An example of how to integrate the Sunny Boy Control in the network can be found in Section 5.4.



Connecting Directly to a PC

If you want to connect your Sunny Boy Control directly to a PC via the NET socket, you need to use a crossover patch cable (not included in the delivery).



PIN Assignment of the NET Socket for the Ethernet Module

NET	RJ45	Description
1	1	transmitted data plus, also labeled as Tx(+)
2	2	transmitted data minus, also labeled as Tx(-)
3	3	received data plus, also labeled as Rx(+)
4	4	not used
5	5	not used
6	6	received data minus, also labeled as Rx(-)
7	7	not used
8	8	not used

5 Initial Start-up

Once all connections have been properly made, you can switch on the Sunny Boy Control. The NET Piggy-Back can be configured after the boot process is complete (this can take a few minutes).

Configuring the Sunny Boy Control to send e-mails can be done either on the device itself (see Section 9) or from a local PC running the Sunny Data Control system monitoring software (see Section 8).

Password Protection

To make changes in the Sunny Data Control menu or on the Sunny Boy Control itself, the installer password must be entered first. The passwords are written down a separate information leaflet included in the Sunny Boy Control delivery package. The default installer password is only valid until the installer sets his or her own password.

Checklist for Parameter Setting

When configuring the Sunny Boy Control, we recommend that you fill out the enclosed checklist and perform all the settings on a step by step basis. With the help of this checklist you should be able to avoid making any incorrect or incomplete settings in the Sunny Boy Control / Control Plus.

5.1 NET Piggy-Back "Analog Modem" Version

The following basic parameter settings must be made on the Sunny Boy Control / Sunny Boy Control Plus to enable an incoming and outgoing data link.

Required parameter settings on the device:

- CO_NET Auto Answer:
  - Set a value greater than "0" here (recommendation: "2").
- FI_ISP Phone No:
  - The access number of your Internet service provider (ISP).
- FI_ISP User ID:
  - The user ID that you received from the Internet service provider (ISP).
- FI_ISP Password:
  - The password that corresponds to the user ID.

For information on configuring the device for e-mail transmission, see Section 6.

5.2 NET Piggy-Back "ISDN" Version

The following basic parameter settings must be made on the Sunny Boy Control / Sunny Boy Control Plus to enable an incoming and outgoing data link.

Required parameter settings on the device:

- CO_NET-ISDN MSN:
  - Telephone number used to receive calls.
- CO_NET Auto Answer:
  - Set a value greater than "0" here (recommendation: "2").
- FI_ISP Phone No:
  - The access number of your Internet service provider (ISP).
- FI_ISP User ID:
  - The user ID that you received from the Internet service provider (ISP).
- FI_ISP Password:
  - The password that corresponds to the user ID.

For information on configuring the device for e-mail transmission, see Section 6.

5.3 NET Piggy-Back "GSM" Version

In contrast to landline phones, cellular network providers make a clear distinction between

voice services and data services. For example, they provide

different numbers for voice and data with GSM devices.

A separate data number is required for incoming data connections (access by modem) on the data logger. This can be requested when arranging the contract with the network provider. Retroactive activation is also possible via telephone by calling the relevant technical service line and stating the customer password defined in the contract. If in doubt, please consult your cellular network provider.

Outgoing data connections from the data logger (access to an Internet service provider) are possible without an additional data number.

If not just outgoing, but also incoming data connections are to be enabled,

a dedicated data number which operates over the CSD data service is an absolute necessity. Other data services are not supported. A standard SIM card with additional data connectivity always has two telephone numbers (multi-numbering).

The GSM data service must be activated.

Please note that the GSM data service must be activated

in your contract. If in doubt, please consult your cellular network provider.

5.3.1 Outgoing Data Connection

This data connection method allows you to send your system data by e-mail using your Internet service provider. You do not require an additional data number.

Prepaid Card

If you would like to use a prepaid card, please consult your cell phone provider in advance concerning the card's loading options.

Required parameter settings on the device:

- CO_NET-GSM PIN:
  - The respective PIN number of the SIM card.
- FI_ISP Phone No:
  - The access number of your Internet service provider (ISP).
- FI_ISP User ID:
  - The user ID that you received from the Internet service provider (ISP).
- FI_ISP Password:
  - The password that corresponds to the user ID.

Access Number of your Service Provider

The access number of your Internet service provider depends on the cell network of your SIM card. You receive this telephone number from your Internet service provider.

For information on configuring the device for e-mail transmission, see Section 6.

5.3.2 Incoming Data Connection

This data connection method allows you to access the system and set system parameters or retrieve available data from a PC. The SIM card requires a data connection through the CSD data service in order for the NET Piggy-Back to receive data. Other data services such as GPRS are not available.

Prepaid Cards

In most cases, prepaid cards cannot be used for this purpose.
If in doubt, please consult your cell phone network provider.

Required parameter settings on the device:

- CO_NET-GSM PIN:
  - The respective PIN number of the SIM card.
- CO_NET Auto Answer:
  - Set a value greater than "0" here (recommendation: "2").

For information on configuring the device for e-mail transmission, see Section 6.

5.3.3 Incoming and Outgoing Data Connection

This data connection method is a combination of the two methods described above. This means that the Sunny Boy Control can automatically send data at regular intervals and using your PC, you can access the system to set the system parameters. The SIM card requires a data connection through the CSD data service in order for the NET Piggy-Back to receive data. Other data services such as GPRS are not available.

Prepaid Cards

In most cases, prepaid cards cannot be used for this purpose.

If in doubt, please consult your cell phone network provider.

Required parameter settings on the device:

- CO_NET-GSM PIN:
  - The respective PIN number of the SIM card.
- CO_NET Auto Answer:
  - Set a value greater than "0" here (recommendation: "2").
- FI_ISP Phone No:
  - The access number of your Internet service provider (ISP).
- FI_ISP User ID:
  - The user ID that you received from the Internet service provider (ISP).
- FI_ISP Password:
  - The password that corresponds to the user ID.

Access Number of your Service Provider

The access number of your Internet service provider depends on the cell network of your SIM card. You receive this telephone number from your Internet service provider.

For information on configuring the device for e-mail transmission, see Section 6.

5.4 NET Piggy-Back "Ethernet" Version

Subnet address of PC and NET Piggy-Back

The IP address of your PC must be in the same subnet as the IP address of the NET Piggy-Back (in this case 10.xxx.xxx.xxx).

Example:·IP address: 10.6.1.1·

Subnet: 255.0.0.0

After start-up you should be able to access the Sunny Boy Control at the address **10.170.170.170**. If you want to use a different configuration because, for instance, you are using multiple devices at the same time or your local network is using a different address range such as Class B or Class C addresses (see "Example topology for a Class A network" (Page 23)), set the following parameters:

- CO_NET-ETH IP
  - IP address of the Sunny Boy Control / Sunny Boy Control Plus
- CO_NET-ETH SNET
  - Subnet mask
- CO_NET-ETH GW
  - Gateway address
- CO_NET-ETH DNS
  - IP address of the domain name server

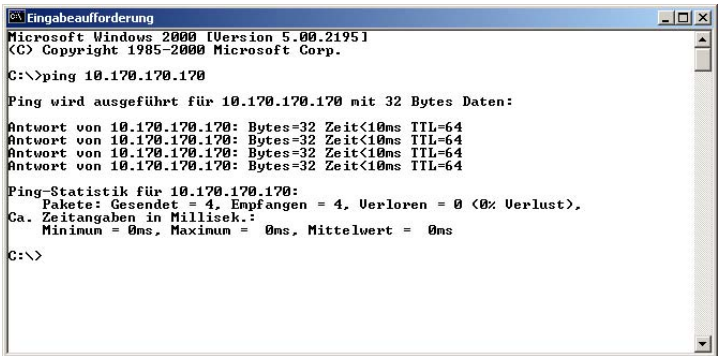
For information on configuring the device for e-mail transmission, see Section 6.

Checking Default Parameters

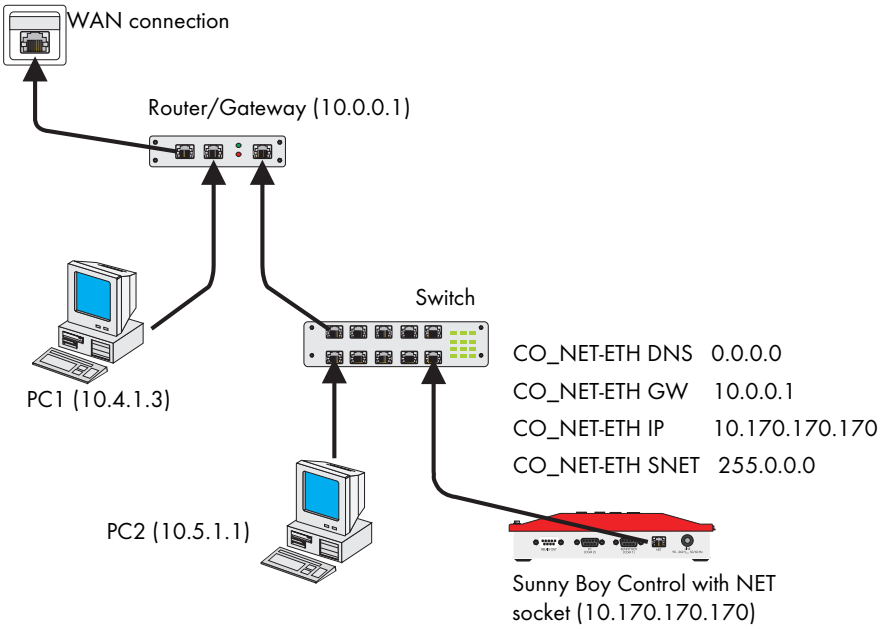
To check communication based on the default parameters, proceed as follows:

Open a command prompt window on another PC in the network. Enter "ping 10.170.170.170", which is the default IP address of the Sunny Boy Control.

You should now see the following information on your screen:



Example topology for a Class A network



Address space for local networks

Class	Address space	Subnet mask
A	10.0.0.1 to 10.255.255.254	255.0.0.0
B	172.16.0.1 to 175.31.255.254	255.255.0.0
C	192.168.0.1 to 192.168.255.254	255.255.255.0

6 Configuration for E-mail Transmission

This section will show you how to set the appropriate configuration depending on whether you want to send data to an e-mail recipient of your choice or directly to the Sunny Portal.

Required Information

The information that is required to send e-mails to an "E-mail recipient of your choice" or the "Sunny Portal" is listed below. You can also perform additional settings as specified in Section 7.

6.1 E-mail Recipient of your Choice

- FI_EMAIL:
  - Set this parameter to <activated>.
- FI_EMAIL TO:
  - Please enter the e-mail address of the recipient to whom the e-mail is to be sent here.

6.2 Data Transmission to Sunny Portal

- FI_SPMail:
  - Set the parameter to hours or daily report.
- FI_SPMail from:
  - Here you must enter your login, which is the same as the e-mail address you registered in Sunny Portal.
- FI_SPMail to:
  - Do not change the e-mail address entered here (datacenter@sunny-portal.de).
- FI_Plant Name1
  - Used to identify your system.

6.2.1 Calculating the Data Volume for Sunny Portal

All the recorded channels of the Sunny Boy Control / Sunny Boy Control Plus with Sunny Portal Mail (SPMail) will be sent. Since the amount of data in the e-mail is limited, the data volume must be adjusted to match the recorded channels and measuring interval.

The formulas for calculating the number of channels and the measuring interval for the hourly and daily reports are described below.

Legend

Variables:

- K = number of channels
- MI = measuring interval
- ED = period of radiation per day – a maximum of 17 hours is assumed here

Constants:

- 61,000 = maximum memory capacity of an e-mail
- 10 = maximum size of a character in Sunny Portal
- 53 = describes the beginning of a row

SP Mail Daily Report

- Number of channels:

$$K = \frac{61.000}{\left(\frac{ED \times 60\ min \times 10}{MI}\right) + 53}$$

  - A measuring interval of 15 minutes and an assumed radiation period of 17 hours results in 83 channels.

- Measuring interval:

$$MI = \frac{K \times ED \times 60\ min \times 10}{61.000 - (K \times 53)}$$

  - If there are 83 channels, the shortest possible measuring interval is 15 minutes.

SP Mail Hourly Report

- Number of channels:

$$K = \frac{61.000}{\left(\frac{60\ min \times 10}{MI}\right) + 53}$$

  - A measuring interval of one minute results in 93 channels.

- Measuring interval:

$$K = \frac{61.000}{\left(\frac{60\ \text{min} \times 10}{MI}\right) + 53}$$

  - If there are 93 channels, the shortest possible measuring interval is 1 minute.

7 Parameter List

7.1 Communication Parameters (KO_)

7.1.1 General Settings

CO_NET Medium

Shows the recognized NET Piggy-Back version. Version recognition can occur only after the Sunny Boy Control firmware has been completely loaded and serial communication has been initialized (up to 2 minutes after it is turned on). "- - -" is displayed until these conditions are met.

- - - - (no module recognized)
- Analog modem
- ISDN
- GSM
- Ethernet

7.1.2 NET Piggy-Back "Analog Modem" Version

CO_NET Auto Answer

(0 ... 9 pulses)

Number of ring pulses until a call is answered in the analog version.

0 = no answer

7.1.3 NET Piggy-Back "ISDN" Version

CO_NET Auto Answer

(0 ... 9 pulses)

Number of ring pulses until a call is answered in the analog version (calls are answered after the first pulse in the ISDN version).

0 = no answer

CO_NET-ISDN MSN

ISDN MSN for specifying the telephone number under which calls are answered. If no MSN is specified, the "data" service indicator will be used to respond to all telephone numbers.

CO_NET-GSM PIN (for GSM version only)

Enter the personal identification number (PIN) of your SIM card. The four-digit PIN cannot be changed in the Sunny Boy Control.

7.1.4 NET Piggy-Back "GSM" Version

CO_NET Auto Answer
(0 ... 9 pulses)

Number of ring pulses until a call is answered in the analog version (calls are answered after the first pulse in the GSM version).

0 = no answer

CO_NET-GSM PIN

Enter the personal identification number (PIN) of your SIM card. The four-digit PIN cannot be changed in Sunny Boy Control.

KO_NET-GSM LEV

Shows the current reception field strength as a percentage. This value is updated every time an e-mail is sent.

7.1.5 NET Piggy-Back "Ethernet" Version

CO_NET-ETH IP

IP address of the Sunny Boy Control

Default value: 10.170.170.170

CO_NET-ETH SNET

Subnet mask

Default value: 255.0.0.0

CO_NET-ETH GW

Gateway address

Default value: 0.0.0.0

CO_NET-ETH DNS

IP address of the domain name server. If no address is specified (0.0.0.0), the gateway address will automatically be used as the DNS server address.

Default value: 0.0.0.0

7.2 Remote Information Parameters (FI_)

7.2.1 General Settings

FI_Function

- - -	Default setting
Send Testmail	Sends a test e-mail. Identical to sending atest e-mail from the Sunny Boy Control menu.
Send SPTestmail	Sends a test e-mail to the Sunny Portal. Sunny Portal sends a response to the e-mail address ("SP_Mail FROM") it has stored.
SET SMA SMTP	Sets the SMA SMTP server

FI_Function	- - -	Default setting
	SET NET Default	Resets all NET / eMail settings
	Werkseinstell.	Returns all values to their factory settings
FI_Plant-Info	System Info reports the yield of each Sunny Boy at the end of the day	
	no report	
	daily report	System Info once everyday (see FI_Send at)
FI_Plant Name1	The name of your PV system. The system name is essential for identifying your system in the Sunny Portal.	
	Example:	SBCO1234567890
FI_Plant Name2	2nd line of the name of your PV system.	
FI_Report-Warnings	This report is sent when a warning is issued. A warning usually refers to a temporary failure.	
	no report	
	hourly report	Report at the top of the next hour
	daily report	Report once everyday (see FI_Send at)
FI_Report-Error	This report is sent when an error occurs. An error refers to a failure that may affect the yield of the PV system.	
	no report	
	hourly report	Report at the top of the next hour
	daily report	Report once everyday (see FI_Send at)
FI_Send at	Sunny Boy Control assumes it's the end of the day if there is no contact to the PV system for 30 minutes or longer. The earliest time when this check is performed is 3:00 PM. You can, however, increase this time to 11:00 PM. Changing the hour setting is generally only useful if you are using an analog phone line for regular telephone calls during the day (e.g., during office hours). This prevents a phone conversation from being interrupted when an e-mail is sent.	

7.2.2 Data Transmission to Sunny Portal

FI_SPMail Here you can specify how often you want data to be sent to the Sunny Portal. All recorded channels are sent in the SPMail. Formula for calculating the e-mail size since the recording is limited by the size of the e-mail.

no report

hourly report	Report at the top of the next hour
daily report	Report once everyday (see FI_Send at)

FI_SPMail FROM Enter your login here, which is the e-mail address you registered in Sunny Portal. If you fail to do so, the data of your system will not be allocated in Sunny Portal and will be deleted.

FI_SPMail TO Do not change the e-mail address entered here (datacenter@sunny-portal.de).

FI_SPMail TO(2) Second e-mail address for your own use

7.2.3 E-mail Recipient of your Choice

FI_EMAIL This parameter is the central switch for activating or deactivating e-mail transmission.

activated	E-mail transmission possible
deactivated	E-mail transmission blocked

FI_EMAIL FROM The FI_EMAIL FROM parameter contains the e-mail address that is transmitted to the mail server as the message sender. Make sure the address is entered as sender@domainname. The domain name must refer to an existing domain.

Example of a correct entry:	PV-system@SMA.de
Example of an incorrect entry:	PV-system

SMA default setting

You normally do not have to change the default "seriesnumber@SMA.de" setting for e-mail transmission.

FI_EMAIL TO The e-mail address of the recipient who is to be sent reports.

Example: John@Smith.com

FI_EMAIL Copy1 and FI_EMAIL Copy2 You can send copies of the e-mail messages to two recipients.

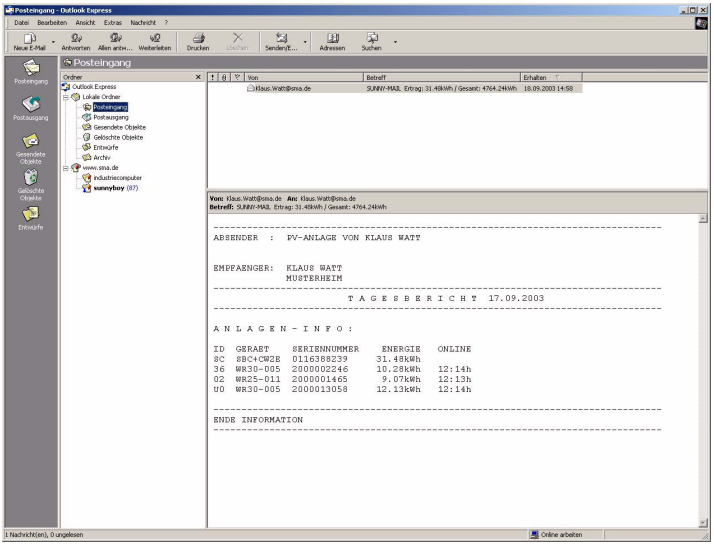
FI_EMAIL Copy1: Joe@Smith.com

FI_EMAIL Copy2: Jane@Smith.com

Address Header (Sender and Recipient)

To identify the sender and recipient of a message, four rows with 20 characters each are available in the address header. This information is not required for transmission, but does facilitate allocation if reports from multiple systems are received.

The subject heading of all e-mails (daily yield reports, error/warning reports, Sunny Portal e-mails) now includes the name of the system as specified in the "FI_Plant Name1" SBC parameter (V4.09 or higher: max. 30 characters (formerly 20) and lowercase letters are permitted).



FI_Plant Name1 (up to 20 characters)

FI_Plant Name2 (up to 20 characters)

FI_EMAIL TO (up to 20 characters)

FI_Company/Name (up to 20 characters)

7.2.4 ISP (Internet Service Provider)

The ISP provides the dial-up connection to the Internet. After dialing the telephone number of the provider, you will be asked to log in with your username and password for identification.

No ISP Parameters for Ethernet Version

The ISP parameters have no effect in the Ethernet version. In this case the Internet connection is not established by the NET Piggy-Back, but through the gateway of the network. If you have any questions about this, please contact your network administrator.

The ISP settings in the analog and ISDN versions (telephone number, username and password) are the same as the RDT settings your PC uses to access the Internet.

For security reasons, the password can no longer be seen after the settings are saved on your PC. "*****" will be displayed in its place.

FI_ISP Phone No

The telephone number for dialing the provider. For some telephone systems it is recommended that you insert a comma (for a short pause) into the dial string after connecting to an outside line.

Character set: 0-9W, #

Example 0,0192658

Call-by-call dial-in numbers

For GSM, most cellular network operators provide special call-by-call dial-in numbers for cases where no default ISP account with username and password is to be used.

FI_ISP User ID

Username assigned by the provider.

FI_ISP Password

Password associated with the username.

7.2.5 SMTP (Mail Server)

The SMTP server is used to send outgoing e-mails. SMA provides an SMTP server free of charge (mail.SMA-Portal.de). Although not recommended, you can use a different SMTP server if you want.

The parameters of the mail server (URL, username, password) correspond to the e-mail account settings as specified in the e-mail program on your PC.

FI_SMTP Server

The name or IP address of the server is specified by the provider. If you only know the name (URL), then it can also be entered as a parameter. If you still want to enter the IP address of your provider, you can find it by entering "ping NAME" in a command prompt window (e.g., ping smtp.1und1.com shows IP 212.227.xxx.xxx). If your provider requires SMTP authentication, then your username (user) and password (pass) will have to be entered as well.

Example URL: smtp.1und1.com

Example IP: 212.227.126.162

FI_SMTP User

Username for the e-mail account.

FI_SMTP Pass

Password of the e-mail account.

8 Setting Parameters with Sunny Data Control

Install Sunny Data Control from the enclosed CD or download the latest version from the SMA website at www.SMA.de (version 4.0 or higher).

Before starting configuration with Sunny Data Control, make sure that the Sunny Boy Control is connected to your PC via the RS232 port. The parameters can be edited after you enter the installer password. A list of already initialized default values is included in the appendix.

For information on how to set parameters with Sunny Data Control, refer to the current Sunny Data Control user manual.

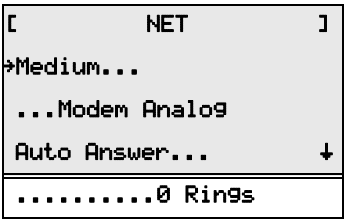
9 Setting Parameters on the Sunny Boy Control

The parameter settings for e-mail transmission are made in the "Einstellungen" -> "NET/eMAIL" menu of Sunny Boy Control. The following section describes which settings you need to make for running the NET Piggy-Back.

9.1 NET/eMail->NET Menu

The installed version of NET Piggy-Back is automatically recognized by the Sunny Boy Control system during start-up. You can check whether the correct version was recognized using the "NET" parameter.

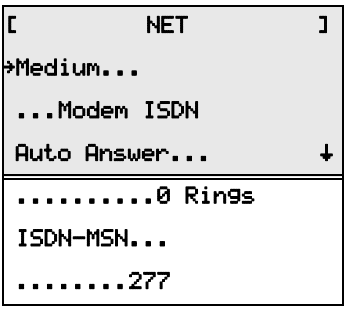
NET Interface for Analog Modem



CO_NET Medium parameter

CO_NET Auto Answer parameter

NET Interface for ISDN Modem

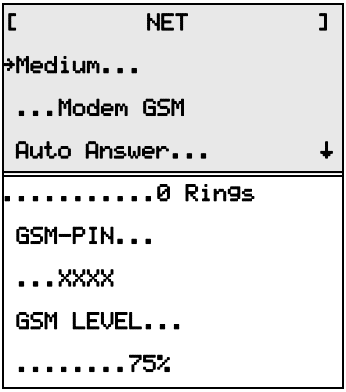


CO_NET Medium parameter

CO_NET Auto Answer parameter

CO_NET-ISDN MSN parameter

NET Interface for GSM Modem



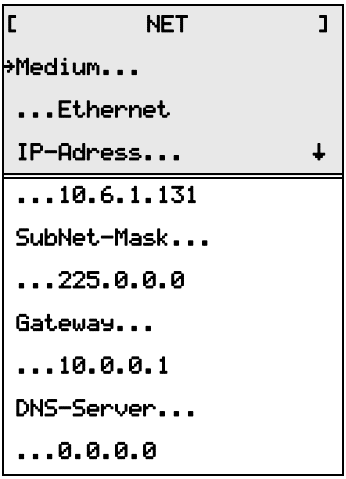
CO_NET Medium parameter

CO_NET Auto Answer parameter

CO_NET-GSM PIN parameter

KO_NET LEV parameter

NET Interface for Ethernet



CO_NET Medium parameter

CO_NET-ETH IP parameter

CO_NET-ETH SNET parameter

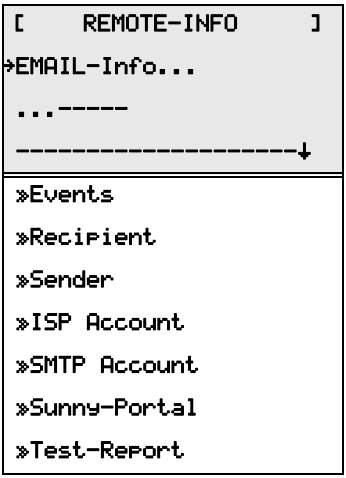
CO_NET-ETH GW parameter

CO_NET-ETH DNS parameter

9.2 NET/eMail->Remote Info Menu

The "EMAIL-Info" parameter activates or deactivates notification by e-mail.

"Remote-Info" Menu



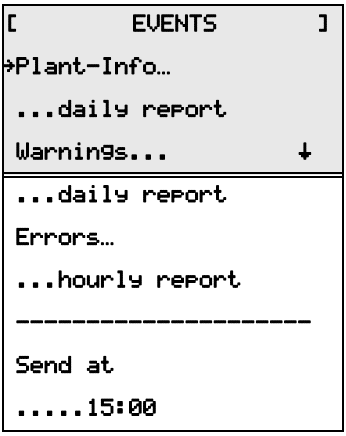
FI_EMAIL parameter

CO_NET-ETH SNET parameter

CO_NET-ETH GW parameter

CO_NET-ETH DNS parameter

Configure Events



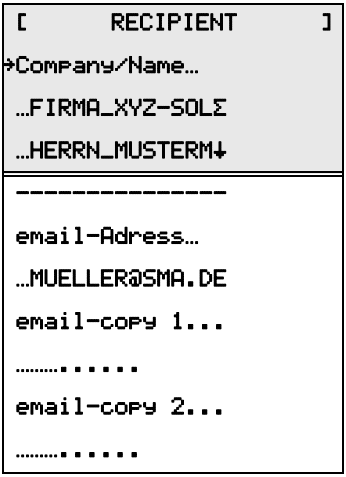
FI_Plant-Info parameter

FI_Report-Warnings parameter

FI_Report-Error parameter

FI_Send at parameter

Configure Recipient



FI_Company/Name (1) parameter

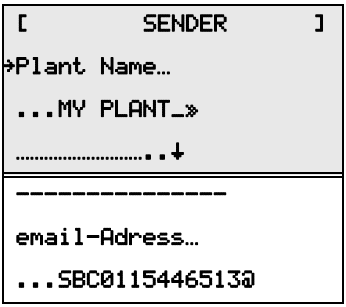
FI_Company/Name (2) parameter

FI_EMAIL TO parameter

FI_EMAIL Copy1 parameter

FI_EMAIL Copy2 parameter

Configure Sender



FI_Plant Name1 parameter

FI_Plant Name2 parameter

FI_EMAIL FROM parameter

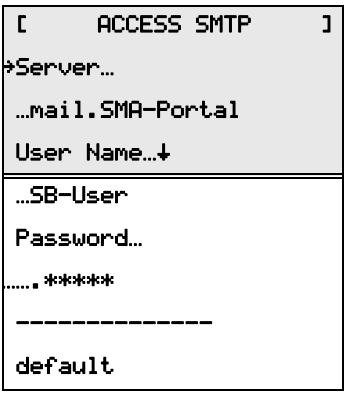
ISP Access

FI_ISP Phone No parameter

FI_ISP User ID parameter

FI_ISP Password parameter

SMTP Access

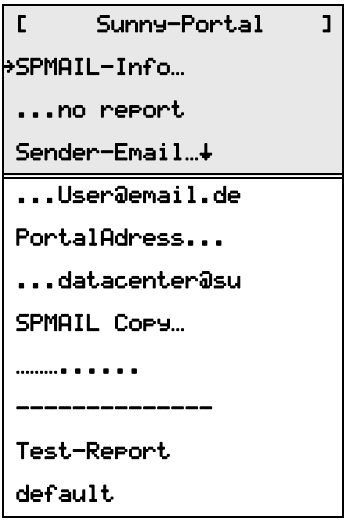


FI_SMTP Server parameter

FI_SMTP User parameter

FI_SMTP Pass parameter

Sunny Portal Access



FI_SPMail parameter

FI_SPMail from parameter

FI_SPMail to parameter

CAUTION: Do not change this address

9.3 Sending a Test E-mail

Once all the settings are complete you can send a test e-mail. To do so, select "FI_Function" channel and "Kanalwert" "Send Testmail" in the parameter list. If you have performed the configuration correctly, you will soon receive an e-mail at the specified address, as well as at the addresses you specified as a copy. You can monitor the status of the e-mail transmission and any error codes that may occur by observing the "FI-Status" and "FI-Code" channels in the online window of the Sunny Data Control.

To send a test e-mail to Sunny Portal, select "Send SPTestmail".

Sending a test report can be useful in checking the settings.

Sending Test Report

Sending a test e-mail

If you are unable to send the test report, the following will be displayed:

Error Code Display

For information on the error cause and the meaning of the code, see Section 10.3

The meaning of the error code is described in the appendix.

10 Appendix

10.1 Preconfigured Settings

A system report is sent at the end of each day. Any warnings or errors that occur will be reported as well. Major failures (errors) will be sent at the next full hour after they occur while minor failures (warnings) will be sent once everyday.

Parameter	Setting	Note
EMAIL		
FI_EMAIL	deactivated	enable for e-mail transmission
Events		
FI_Plant-Info	daily report	
FI_Report-Warnings	daily report	
FI_Report-Error	hourly report	
FI_Send at	15:00	
SMTP		
FI_SMTP Server	mail.SMA-Portal.com	
FI_SMTP User	SB-User	
FI_SMTP Pass	*****	
ISP		
FI_ISP User ID		no default setting
FI_ISP Phone No		no default setting
FI_ISP PasswordFI_ISP Password		no default setting
Sunny Portal		
FI_SPMail	no report	
FI_SPMail from		no default setting
FI_SPMail to	datacenter@sunny-portal.de	
FI_SPMail to (2)		

10.2 The Access Data of your Provider

Internet Access and E-mail Account with the same Provider (1und1)

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	019102345	
FI_ISP User ID	1und1/ptxxxx-xxx@online.de	
FI_ISP Password	*****	
SMTP (Mail Server)		
FI_SMTP Server	smtp.1und1.com	
FI_SMTP User	ptxxxx-xxx	
FI_SMTP Pass	*****	

Different Internet Access (MSN Call-by-call) / E-mail Provider (puretec)

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	0192658	call-by-call with MSN
FI_ISP User ID	MSN	
FI_ISP Password	MSN	the password is always MSN
SMTP (Mail Server)		
FI_SMTP Server	mail.hotmail.com	
FI_SMTP User	ptxxxx-xxx	
FI_SMTP Pass	*****	

Access via T-Online, Non-authenticated E-mail Transmission

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	0191011	
FI_ISP User ID	00012345678904012 3456#0001	T-Online number
FI_ISP Password	*****	access password

Parameter	Setting	Note
SMTP (Mail Server)		
FI_SMTP Server	mailto.t-online.de	
FI_SMTP User		not required
FI_SMTP Pass		not required

T-Online Account

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	0191011	
FI_ISP User ID	00012345678904012 3456#0001	T-Online number
FI_ISP Password	*****	access password
SMTP (Mail Server)		
FI_SMTP Server	smtpmail.t-online.de	
FI_SMTP User	firstname.lastname@t-online.de	e-mail address
FI_SMTP Pass	*****	POP3 password

T-Online E-Mail Account via POP3, ISP comundo

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	0192117	
FI_ISP User ID	Loginname@comundo	
FI_ISP Password	*****	access password
SMTP (Mail Server)		
FI_SMTP Server	smtpmail.t-online.de	
FI_SMTP User	firstname.lastname@t-online.de	e-mail address
FI_SMTP Pass	*****	POP3 password

ISP Freenet, Call-by-call

Parameter	Setting	Note
ISP (Internet Service Provider)		
FI_ISP Phone No	01929	
FI_ISP User ID	***	any (except blank!)
FI_ISP Password	***	any (except blank!)

AOL E-Mail Account

Not possible since AOL does not use SMTP.

10.3 Result Codes

Sunny Boy Control generates a warning each time an e-mail transmission fails. If an e-mail cannot be sent after three attempts, an error will be registered. The warning or error is shown in the Online Info display. Details can be found in the "Diagnose" -> "Ereignisse" -> "Warnungen" menu or "Diagnose" -> "Ereignisse" -> "Fehler" menu. To view the result code, select the corresponding event and press ENTER.

Regardless of the above, the warnings/errors with the result code will be transmitted by e-mail in the warnings/error report as soon as a transmission can be performed again.

Result	Meaning/Cause	Remedy
1004	The module is sending an e-mail.	Wait until the line is free again. Try again later.
1005	A firmware update is running.	Wait until the line is free again. Try again later.
1006	A firmware update is running.	Wait until the line is free again. Try again later.
1500	The permanently stored system data are invalid. The memory is defective.	Please contact the Service Line.
2000	The system was restarted by a watchdog reset.	If this occurs repeatedly, please contact the Service Line.
3003	The length of the "FI_SMTP Server" parameter does not fall between 4 and 256 characters.	Check the length of the "FI_SMTP Server" parameter. If possible, replace the URL with the IP address or set the "FI_Function" parameter to SET SMA SMTP.
3004	The maximum length of the "FI_SMTP User" parameter has exceeded 50 characters.	Check the length of the "FI_SMTP User" parameter. If possible, set the "FI_Function" parameter to SET SMA SMTP.

Result	Meaning/Cause	Remedy
3005	The maximum length of the "FI_SMTP Pass" parameter has exceeded 50 characters.	Check the length of the "FI_SMTP Pass" parameter. If possible, set the "FI_Function" parameter to SET SMA SMTP.
3006	The maximum length of the "FI_SMTP FROM" parameter has exceeded 50 characters.	Check the length of the "FI_SMTP FROM" parameter.
3007	The maximum length of the "FI_SMTP TO", "FI_SMTP CC1" or "FI_SMTP" parameter has exceeded 50 characters.	Check the lengths of the "FI_SMTP TO", "FI_SMTP CC1" and "FI_SMTP" parameters.
3009	The maximum length of the e-mail subject line has been exceeded.	Update the module to the latest firmware.
3011	An e-mail transmission failed and the precise cause of the failure could not be determined.	If this occurs repeatedly, please contact the Service Line.
3017	An API command with incorrect data length was received. Possible error: ISP or SMTP password does not exist or is too short.	Update the module to the latest firmware.
5001	The modem module failed to initialize.	Update the module to the latest firmware.
5002	The modem did not respond to a command.	Update the module to the latest firmware.
5003	Modem module, not ready (busy). SBC is trying to send an e-mail while a dial-up connection to the system exists. The e-mail will be sent as soon as the telephone line is free.	If this occurs repeatedly, please contact the Service Line.
5004	Modem module, failed to establish connection (causes: no physical connection, bad line quality, receiver busy or not reachable).	Check the „FI_ISP Phone No“ and the connection.
5005	Modem module, connection terminated by receiver.	Check the connection. Select another ISP user if necessary.
5006	Unable to set the MSN for the ISDN terminal adapter.	Check the MSN.

Result	Meaning/Cause	Remedy
5007	SIM card incorrectly installed or defective.	Check the installation of the SIM card.
5008	PIN is incorrect or unset.	Check the PIN and reset it if necessary.
5009	Incorrect PIN has been entered three times. PUK is required.	Remove the SIM card, insert it into a cellular phone and enter the PUK.
6000	The maximum length of the "FI_ISP TelNr" parameter has exceeded 50 characters.	Check the length of the "FI_ISP TelNr" parameter.
6001	The maximum length of the "FI_ISP User ID" parameter has exceeded 50 characters.	Check the length of the "FI_ISP User ID" parameter.
6002	The maximum length of the "FI_ISP Pass" parameter has exceeded 50 characters.	Check the length of the "FI_ISP Pass" parameter.
6003	ISP access refused (invalid password or username)	Check the "FI_ISP User ID" and "FI_ISP Password" parameters.
6004	Some of the parameters required to dial-up the ISP have not been set.	Check the "FI_ISP Phone No", "FI_ISP User ID" and "FI_ISP Password" parameters.
7001	Unable to connect to the mail server.	Check whether the "FI_SMTP Server" parameter is set correctly.
7002	TCP/IP, failed to establish connection to mail server (possible cause: incorrect SMTP-IP).	Check the "FI_SMTP Server" parameter.
7003	The TCP stack is overflowing. (Data could not be sent fast enough, possibly due to a bad connection).	Update the module to the latest firmware.
8000	Unable to properly close the connection to the SMTP server.	Set the "FI_Function" parameter to SET SMA SMTP.
8001	There was an unexpected message from the SMTP server when the connection began.	Set the "FI_Function" parameter to SET SMA SMTP.
8002	The server being used does not support ASMTP.	Use a mail server with ASMTP support (e.g. mail.sma-portal.com).
8003	Authentication is required to use the SMTP server.	Set the "FI_SMTP User" and "FI_SMTP Pass" parameters.

Result	Meaning/Cause	Remedy
8004	SMTP, authentication failed (cause: invalid SMTP user or SMTP password).	Check the "FI_SMTP User" and "FI_SMTP Pass" parameters.
8014	Mail server does not support ESMTP.	Use a different server (e.g. SMA server).
8015	A parameter required for e-mail transmission (IP address of the mail server, sender address, recipient address) was not set.	Set the missing parameters.
8016	The CMD_SET_SMTP_FROM or CMD_SET_SMTP_TO command was sent without data.	Check the "FI_EMAIL FROM" and "FI_EMAIL TO" parameters. These parameters may not be left blank and must contain a syntactically valid e-mail address (xxx@y.z). If valid data are entered and errors still occur, then a reset following by reconfiguration of the NET Piggy-Back parameter may help ("FI_Function"->SET Default).
8017	The server does not know the mail address of the recipient.	Check the "FI_EMAIL TO" parameter. This parameter may not be left blank and must contain a syntactically valid e-mail address (xxx@y.z). If valid data are entered and errors still occur, then a reset following by reconfiguration of the NET Piggy-Back parameter may help ("FI_Function"->SET Default).
9002	Unable to determine the IP address of the mail server.	Check the Ethernet connection. Is the link LED on the switch blinking? Can you reach the SBC by ping? Is the IP address of the SBC blocked by a firewall? It may be the case that the DNS queries of the SBC are not being routed to the outside by the router (check whether port 53 is enabled in the router). If so, explicitly enter a DNS server (e.g. 194.25.0.125) in the CO_NET-ETH DNS parameter.
9008	The server was unable to resolve the DNS query.	Check the KO_NET DNS-ETH DNS parameter and use an alternative DNS server if possible.
9011	An IP address for a DNS server was not set.	Set the CO_NET-ETH DNS server.

Result	Meaning/Cause	Remedy
9200	Sunny Portal Mail sending error.	Check the SBC error memory (code 9220 ... 9250).
9205	Error while accessing measurement data.	Restart Sunny Boy Control.
9215	PAC was not recorded in the Sunny Boy Control.	Activate the PAC channel of the Sunny Boy Control for recording.
9210	Sunny Portal Mail deactivated.	Activate Sunny Portal Mail (SPMail-Info = "daily report" or "hourly report").
9220	Data recording deactivated.	Turn on archiving.
9230	Max. memory capacity of the Net PB exceeded.	Reduce the number of recording channels or increase the recording interval.
9240	Recording interval too small for daily report.	Recording interval: 15 minutes at least.
9250	Recording interval too large for daily report.	Recording interval: 60 minutes at most.

Other Error Messages

If you see an error message not listed above, please contact the SMA Service Line.

11 Contact

If you have technical problems concerning our products, contact the SMA Service Line. We require the following information in order to provide you with the necessary assistance:

- Device type (e.g. SBCOP02)
- Series number of device
- NET Piggy-Back version (e.g. "analog")
- Error code if applicable

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Fax +49 561 95224699
serviceline@SMA.de
www.SMA.de

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- Improper or inappropriate use of the product
- Operating the product in an unintended environment
- Operating the product whilst ignoring relevant, statutory safety regulations in the deployment location
- Ignoring safety warnings and instructions contained in all documents relevant to the product
- Operating the product under incorrect safety or protection conditions
- Altering the product or supplied software without authority
- The product malfunctions due to operating attached or neighboring devices beyond statutory limit values
- In case of unforeseen calamity or force majeure

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- Supplied software not developed by SMA Solar Technology AG is subject to the respective licensing and liability agreements of the manufacturer.

SMA Factory Warranty

The current guarantee conditions come enclosed with your device. These are also available online at www.SMA.de and can be downloaded or are available on paper from the usual sales channels if required.

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