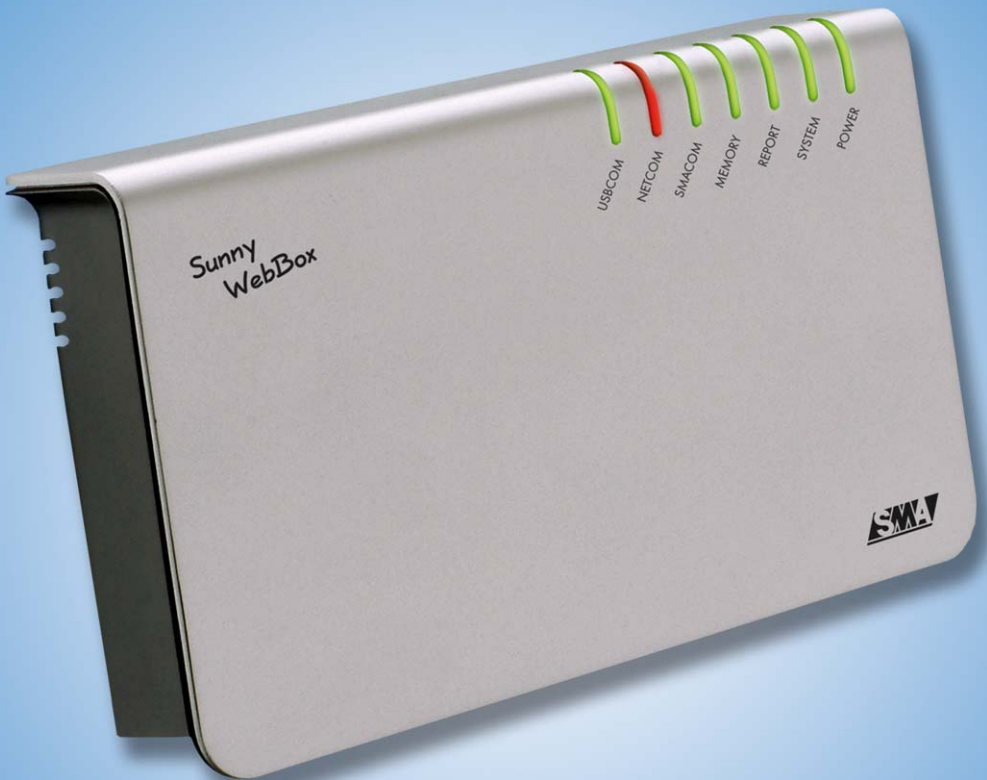




Sunny WebBox

Web Enabled Data Logger and Controller for Alternative Energy Systems



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1 Symbols

In order to ensure optimal use of these instructions, please note the following explanation of symbols used.

This symbol identifies a notice where failure to follow the advice will make the procedure or operation more difficult.



This symbol identifies a warning, which indicates a fact or feature which, if ignored, can cause serious damage to the device.



This symbol indicates a statement which, if ignored, could possibly damage the device and above all, lead to serious injury or death.



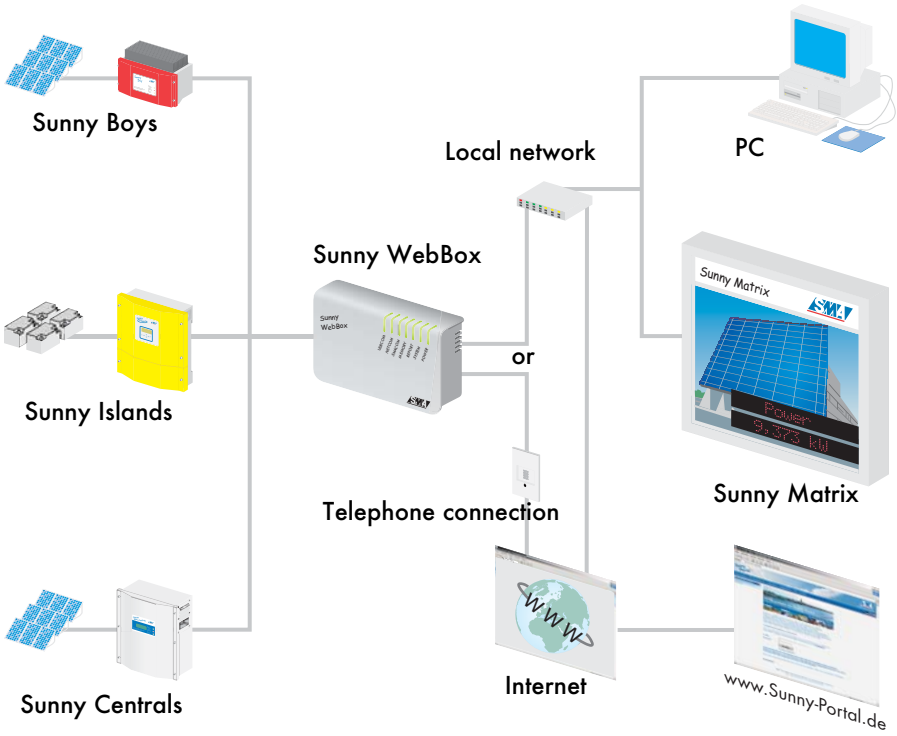
2 Introduction

The Sunny WebBox is the information gateway for SMA inverters. This internet ready data logger is able to communicate with every kind of Sunny Boy and Sunny Central grid interactive inverter available in the U.S. and provides the latest in system monitoring for your PV plant. The Sunny WebBox contains an integrated HTTP web server and an FTP data server to allow the simplest and most flexible network integration of any data logger currently on the market. The user-friendly browser based interface provides you system level access in moments. Several configuration options ensure that any SMA inverter system, regardless of the number of inverters, remoteness of the plant or internet connection type, can be used with the Sunny WebBox.

2.1 Delivery Options

The Sunny WebBox supports serial communications protocols such as RS-485 for the connection between the SMA inverters and the WebBox. For Sunny Central inverters with the built in Sunny Central Control, the WebBox can communicate via a TCP/IP Local Area Network (LAN) or the same serial communication methods as the Sunny Boys. For connection to the internet, the WebBox can be used with a LAN, a Wide Area Network (WAN), an analog telephone modem or a GSM based cellular data network.

No matter which connection options are desired, the data collected by the WebBox can be accessed through its integrated FTP server. This data can be stored in the common data formats of comma separated values (.csv) or extensible markup language (.xml). Once the data has been accessed these common formats make it easy to create custom web sites, analyze the data with tools such as Microsoft Excel or send the information to SMA's free custom data site, Sunny Portal. (www.sunnyportal.com)



2.2 Function Overview

These instructions for the Sunny WebBox apply to firmware version 1.20F.

Supported inverters:

- All Sunny Boy SB's
- All Sunny Boy SWR's
- All Sunny Centrals

Connecting the WebBox to the inverters via:

- RS485 (up to 3600 ft. (1,200 m), max. 50 inverters)

Connecting the device to the PC via:

- Ethernet Cable (max. 300 ft. (100 m), can be extended using additional devices.)

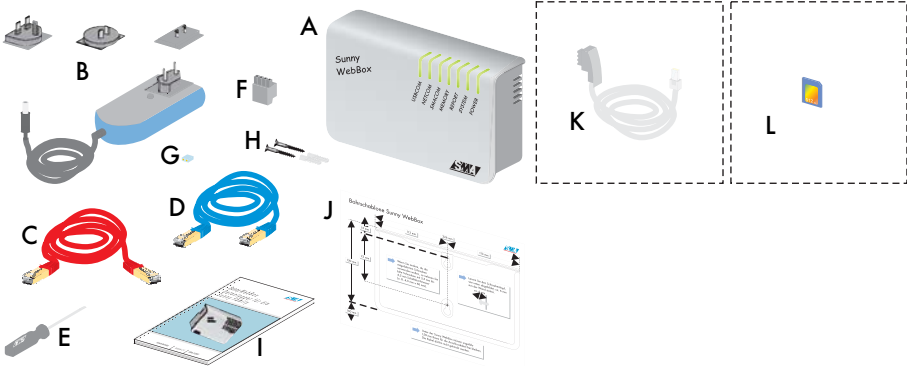
Displaying the system data via:

- The integrated web server
- Sunny Portal (via internet or modem)
- Data files in .xml or .csv formats available by:
 - SD memory card
 - FTP server

Installation site requirements:

- Indoor installation
- The site must be dry
- There must be a 120V outlet nearby for the power supply

2.3 Bill of Material



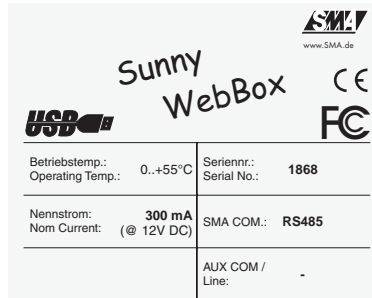
The following items are included with the Sunny WebBox when shipped:

- A Sunny WebBox
- B Plug-in power supply with adaptors
- C Red Ethernet cable (patch cable)
- D Blue Ethernet cable (crossover cable)
- E Screwdriver
- F Plug for SMACOM
- G Jumper for SMACOM (10 units)
- H Screws and drywall anchors
- I User manual
- J Mounting template
- K Modem cable (when ordered)
- L SD memory card – inserted in Sunny WebBox (when ordered)

2.4 Identification

2.4.1 Label

You can identify the Sunny WebBox by using the label (see figure on right) located on the underside of the Sunny WebBox.

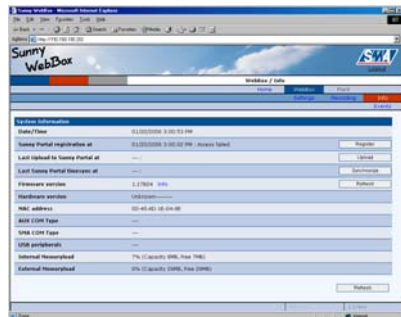


2.4.2 Software Version

The software version is found by using the web interface. This is displayed in the lower right-hand corner of each web page of the Sunny WebBox web interface. They are also displayed on the "WebBox / System / Info" web page.

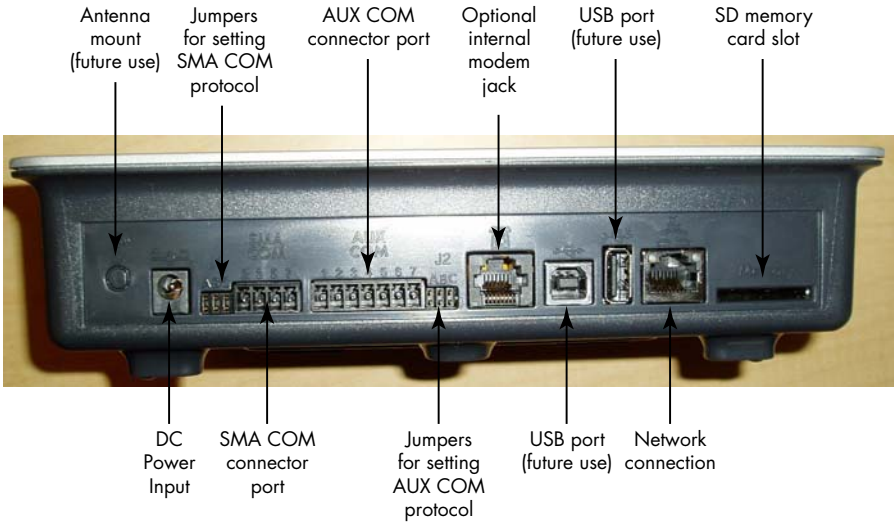
For example, the following versions are displayed in the figure on the right:

- Version 1.20F



The firmware can be updated from the web. For more information on updating, refer to chapter 9.12.2 Software Version and Software Updates.

2.5 Guide to the Connectors



3 Safety Instructions

Please follow all operating and safety instructions in this manual. Failure to follow these instructions could result in damage to the device and cause personal injury.

Only use the Sunny WebBox in an indoor, dry environment. There is a risk of electric shock if used outdoors or in a wet environment.



Opening or modifying the Sunny WebBox will void the warranty.



Only use the plug-in power supply delivered with the Sunny WebBox. Use of alternate power supplies will void the warranty.



Operating Instructions

Data collected by the Sunny WebBox regarding the power generated by your solar system can deviate from the electricity meter. The Sunny WebBox data should not be used for billing purposes.



The Sunny WebBox can be connected to the Internet via an additional router. Adequate security measures must be taken using upstream hardware and software (firewall).



Please note that telephone costs may be incurred when using the Sunny WebBox with an integrated modem.



4 Mounting

The Sunny WebBox can be used as a table-top or wall-mounted unit. It can be mounted directly to the wall or on Din rail.

Suitable Locations

Please note the following required ambient conditions:

- Protect the Sunny WebBox from dust, liquids, acidic or caustic substances and vapors.
- The Sunny WebBox power supply requires 100 to 230 VAC, 50-60 Hz utility power.
- The ambient temperature must be between 0°C and 55°C.
- The communication distance to the inverters may not be greater than the maximum permitted distance of the corresponding SMACOM protocol, (Ethernet, RS485, etc). Please note the specifications in the respective chapters.
- The cable feeds require space below the Sunny WebBox. Allow for adequate access space.

If the Sunny WebBox will be used to send data from your PV system to the Sunny Portal, the following items may be required:

- To send data via an Ethernet network, there must be a router in the network to provide Internet access.
- To send data via a telephone line, the Sunny WebBox must be equipped with an internal modem and it must be near a suitable telephone wall jack.

4.1 Tabletop Use

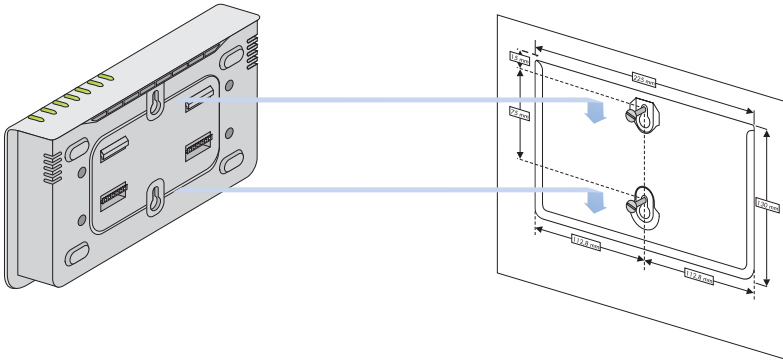
If using the Sunny WebBox as a tabletop unit:

- Arrange the cables so that their weight does not cause them to disconnect.
- Do not cover the Sunny WebBox, this can cause overheating. Allow normal airflow around the unit.

4.2 Wall Mounting

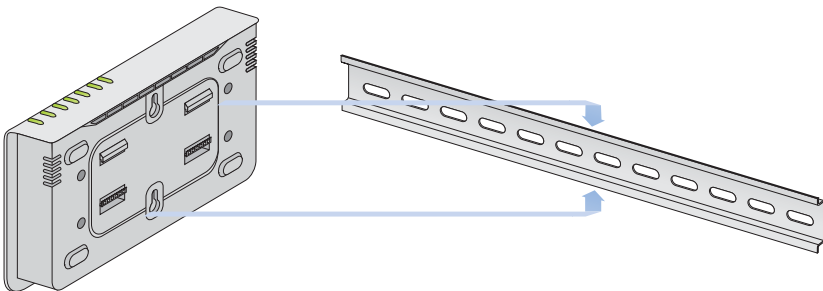
The Sunny WebBox is delivered with a paper drilling template for mounting the device to a wall.

1. Use the drilling template to determine the position of the Sunny WebBox on the wall.
2. Mark the position of the drill holes.
3. Drill the holes and install the screws. (Use appropriate hardware & wall anchors as needed)
4. Hang the Sunny WebBox onto the screws.



4.3 Din Rail Mounting

1. Hook both lower Din rail slots of the Sunny WebBox under the lower edge of the Din rail.
2. Push the Sunny WebBox upwards.
3. Snap the upper Din rail slots of the Sunny WebBox over the upper edge of the Din rail. *To remove, perform the above steps in reverse order.



5 Connection to Inverters

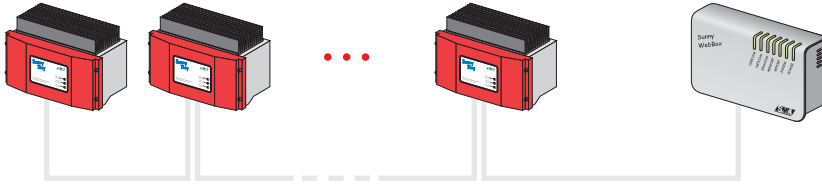
All work on the inverters may only be performed by qualified personnel! Please follow all safety instructions in the inverter manual.



The inverters of the PV system can send data to the Sunny WebBox using various types of communication formats. Please note the following general instructions regarding communication:

- The type of communication must be specified upon ordering the device and is printed on the type plate; see chapter 2.4.1 Label.
- SMA can update the Sunny WebBox with different communication interfaces. To have additional communication interfaces added, the Sunny WebBox must be sent to SMA.
- The communication options selected for the Sunny WebBox must be compatible with the options installed in the inverters.
- Refer to Section 2.3 for Bill of Materials.

5.1 RS-485 Communication



RS-485 communication characteristics:

- Up to 50 inverters can be connected to a Sunny WebBox
- Each inverter requires a RS485 piggy-back card (RS-485-N)
- The maximum total cable length is 3600 ft. (1,200 m)

5.1.1 Cabling Recommendation

- The cable length, type and quality can affect signal quality. For more information, refer to the RS-485 cabling tech. note available at www.sma-america.com.

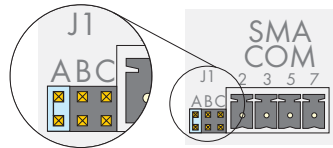
5.1.2 Jumper Settings

Termination

If the Sunny WebBox is one of the two end points of the RS-485 data bus, mount jumper J1-A.

(The jumper is mounted at the factory.)

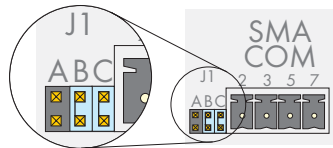
If the Sunny WebBox is NOT one of the ends of the RS-485 data bus, leave the J1-A jumper off.



Signal Biasing

To properly bias the RS-485 data bus, mount jumpers J1-B and J1-C.

(These jumpers are mounted at the factory.)

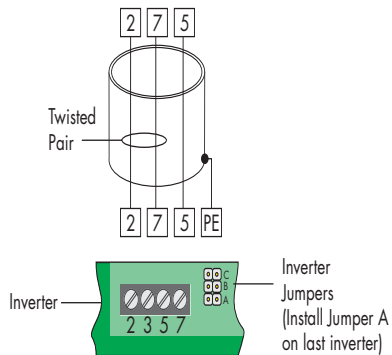
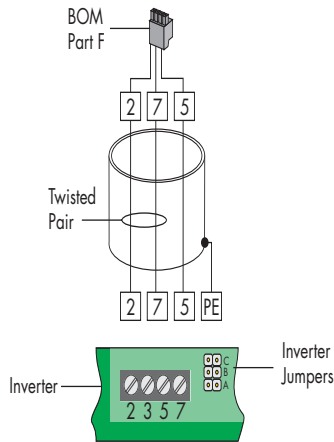
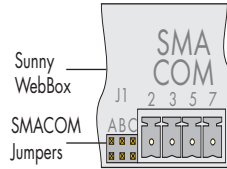


5.1.3 RS-485 Wiring diagram

All work on the inverters may only be performed by qualified personnel! Please follow all safety instructions in the inverter manual.



1. Use the provided plug for the SMA-COM connection. (BOM Part F)
2. Mount jumper J1-A if the Sunny WebBox is one of the two final points.
3. Mount jumpers J1-B and J1-C.
4. Please read the inverter manual for the exact position of the interface in the inverter.
5. Connect pin 2 of the Sunny WebBox interface to pin 2 of the inverter. Connect 7 to 7 and 5 to 5. (2 & 7 should be a twisted pair inside the wire harness)
6. Connect one side of the cable shield to the inverter housing. (Do not connect the shield to the WebBox)
7. Install the communication piggy-back board(s) in the inverter(s) as described in the inverter manual.
8. Repeat the procedure until you have reached the last inverter. (Up to 50 inverters can be connected to a Sunny WebBox using RS-485)
9. Mount jumper A on the last inverter.

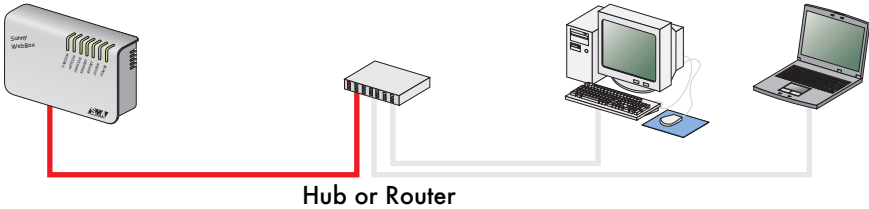


6 Connecting to an Ethernet Network

When using the Sunny WebBox for the first time, it will need to be configured with a PC via an Ethernet connection. The Sunny WebBox may be connected to a PC directly or via a network. Both configurations are described in the following sections.

If the Sunny WebBox is connected to a network with Internet access, it can automatically transmit the data of your PV system to Sunny Portal.

6.1 Connecting to a PC via a Local Network (LAN)



The Sunny WebBox is equipped with an integrated network connection, which enables it to be connected to any Ethernet network. The connection supports both 10Mb as well as 100Mb networks. The connected hub, router or PC, switches the speed automatically.

To connect the device via a local network, use the red straight-through Ethernet cable provided with the Sunny WebBox.



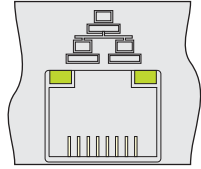
6.1.1 Cabling Recommendation

If the red Ethernet cable provided is not long enough, note the following information when purchasing an additional cable. The cable length, type and quality can affect the signal quality. To achieve good results:

- Use a straight-through patch cable.
- Use high quality, category 5 (STP Cat 5 or higher) shielded twisted pair cable.
- Maximum length for Ethernet cable is 300 ft. (100 m).
- Don't bend the cable excessively. This can cause internal conductors to break.

6.1.2 Network Connection Wiring

The network connection on the Sunny WebBox is labeled as shown in the adjacent graphic. A similar label for the network connection is typically found on your hub or router. If this is not the case, please refer to the hub or router manual.



6.2 Connecting Directly to a PC



One PC can be connected directly to the Sunny WebBox.



To connect the device directly to a PC, use the blue crossover Ethernet cable provided with the Sunny WebBox.

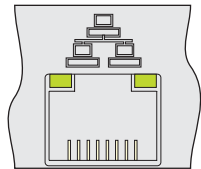
6.2.1 Cabling Recommendation

If the blue Ethernet cable provided is not long enough, note the following information when purchasing an additional cable. The cable length, type and quality can affect the signal quality. To achieve good results:

- Use a crossover cable.
- Use high quality, category 5 (STP Cat 5 or higher) shielded twisted pair cable.
- Maximum length for Ethernet cable is 300 ft. (100 m).
- Don't bend the cable excessively. This can cause conductors to break.

6.2.2 Direct Connection Wiring

The network connection on the Sunny WebBox is labeled as shown in the adjacent graphic. A similar label for the network connection is typically found on your PC. If this is not the case, please refer to the PC manual.



7 Connecting to an Analog Phone Line

If the WebBox is connected to a network without internet access or is not connected to a network at all, it can still access the internet with an internal analog modem. This way FTP access and data transmission can still occur even in remote locations.

7.1 Connecting to an RJ11 Jack



To connect the Sunny WebBox to an analog telephone connection, use the telephone cable provided. (Section 2.3 Bill of Materials item K)

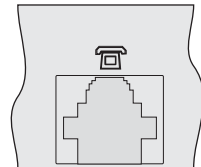
7.1.1 Cabling Recommendation

If the telephone cable provided is not long enough, note the following information when purchasing an additional cable. The cable length, type and quality can affect the signal quality. To achieve good results:

- Use high quality cable. The wire gauge must be at least AWG 26. The telephone plug for the RJ11 jack must be type N.
- Maximum cable length for analog telephones is 600 ft. (200 m).
- If the cable is installed outdoors, make sure that it is weather and UV resistant. (Typically, standard telephone type cables are only designed for indoor installation.)
- Do not bend the cable excessively. This can cause the conductors to break.

7.1.2 RJ11 Jack Wiring

The modem connection on the Sunny WebBox is labeled as shown in the adjacent graphic.



8 Connecting the Power Supply

Make all cable connections to the Sunny WebBox before connecting the power supply.



Ensure that the following connections are properly connected before plugging the power supply into the Sunny WebBox:

- Inverter
- Ethernet network
 - The hub or router must be switched on.
 - If the device is directly connected, the PC must be switched on.
- Modem

8.1 Connection of the Plug-in Power Supply

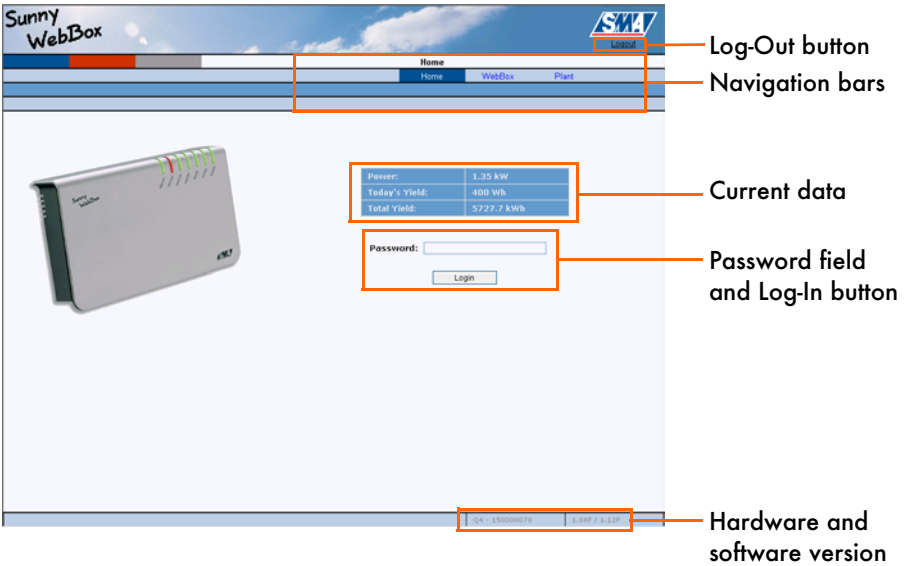


Plug the DC plug of the power supply into the Sunny WebBox and then plug the power supply into an 120 VAC socket.

Once the power supply is plugged in, the Sunny WebBox requires approximately 1 minute to initialize. Until this process is complete, access to the integrated web server may not be available.

9 Operation

The Sunny WebBox has an integrated web interface. All of the operation, configuration and setup features are controlled by this web interface and can be accessed by any web browser on any operating system. All of the examples in this section are shown with Internet Explorer on Windows 2000, but any compatible browser like Mozilla Firefox or operating system like LINUX or MAC will also work.



The figure above shows the home screen of the Sunny WebBox which, by default, can be accessed by typing in the web address <http://192.168.0.168> into any web browser. On this page elements like the Logout button and the software version number will be visible on every page of the interface. Elements in the center of the screen and the navigation menu will change depending on which part of the interface is currently being accessed.

9.1 Initial Startup

The following sections describe the procedure for connecting the Sunny WebBox to different Ethernet networks. Please select the appropriate procedure for your Ethernet network. If your network is maintained by an administrator, contact your administrator and arrange to have the Sunny WebBox connected with their assistance.

9.1.1 Selecting the Ethernet Network Connection

To access the Sunny WebBox, the PC must be in the same IP address range and subnet as the Sunny WebBox. The Sunny WebBox is set to the following IP address and subnet mask at the factory:

IP Address: 192.168.0.168

Subnet mask: 255.255.255.0

There are three general forms for an Ethernet network. Please select the form that best matches your actual Ethernet setup to find the correct network setup instructions.

- For a network in which each PC has a static IP address the required PC and Sunny WebBox settings can be found in chapter 9.1.1.1 Ethernet Network with Static IP Addresses.
- For a network in which a DHCP server assigns IP addresses to the individual PCs the required PC and Sunny WebBox settings can be found in chapter 9.1.1.2 Ethernet Network with a DHCP Server.
- For a network in which there is only the Sunny WebBox and one PC which will be directly wired to one another, the required PC and Sunny WebBox settings can be found in chapter 9.1.1.3 Direct Connection of a PC and the WebBox.



Do not change any parameters on your PC or the Sunny WebBox if you are uncertain of the consequences. Changing certain parameters on your PC can completely or partially corrupt your existing LAN network. In severe cases, the Sunny WebBox can no longer be accessed from the PC. When in doubt, ask your network administrator.

9.1.1.1 Ethernet Network with Static IP Addresses

Use the following steps to go through the process of connecting the Sunny WebBox to an Ethernet network with static IP addresses:

- Setting up a second IP address on the PC.
- Setting the proxy server advanced rules of the Internet Explorer.
- Setting the Sunny WebBox IP address.

The following descriptions apply to Windows 2000 with Internet Explorer 6. The descriptions are similar and should be applicable when using Windows XP or Internet Explorer 5 or other similar web browsers such as Mozilla Firefox.



1. Click "Start > Settings > Network and Dial-up Connections", the "Network and Dial-up Connections" window opens.
2. Right-click "LAN Connection" and click "Properties".
3. Click "Internet Protocol (TCP/IP)" and then "Properties".
4. Click "Advanced".
5. In the IP addresses area, click "Add" > and enter 192.168.0.100 as the IP address and 255.255.255.0 as the subnet mask. Click "Add". (NOTE: If this address causes a conflict, please select an address in the range of 192.168.0.1 to 192.168.0.254 that does not conflict.)
6. Confirm your settings in each of the three windows clicking "OK".
7. Close the "Network and Dial-up Connections" window.
8. Start Internet Explorer
9. Click "Tools > Internet Options", the "Internet Options" window opens.
10. Select the "Connections" tab and then click the "Settings" button.
11. If there is no check mark in the box before "Use a proxy server for your LAN", click "Cancel" twice. If there is a check mark in the box before "Use a proxy server for your LAN", click "Advanced...". Enter 192.168.* at the end of the entry in the "Do not use proxy server for addresses beginning with" field. Use the semicolon as a separator, if required. Confirm your settings in each of the three windows clicking "OK".
12. Enter 192.168.0.168 in the address bar of Internet Explorer, the Sunny WebBox start screen should now appear.

If the Sunny WebBox will be sending data via the router of your Ethernet network, perform the following steps. If the Sunny WebBox will be sending data via the integrated modem, refer to chapter 9.15.2 Selecting the Web Interface Type. (The Sunny WebBox also contains an integrated FTP server for additional data retrieval options. See 9.16.1 FTP Server Access for details.)



13. Log into the Sunny WebBox. The factory-set password is **sma**.

14. Navigate to the "WebBox / Network" page.
15. Enter the valid data for your network in each of the following four fields.
 - IP address
 - Subnet Mask
 - Gateway address
 - DNS server address
16. Click "Save" and then "Confirm". The Sunny WebBox displays the IP address that was just entered. The Sunny WebBox is now properly set up for your Ethernet network and can be accessed via the new IP address after a few minutes.

9.1.1.2 Ethernet Network with a DHCP Server

Use the following steps to go through the process of connecting the Sunny WebBox to an Ethernet network with a DHCP server:

- Changing the PC network settings.
- Setting the proxy server advanced settings of the Internet Explorer.
- Modifying the Sunny WebBox to DHCP.
- Resetting the PC to DHCP.

The following descriptions apply to Windows 2000 with Internet Explorer 6. The descriptions are similar and should be applicable when using Windows XP or Internet Explorer 5 or other browsers such as Mozilla Firefox.



The Sunny WebBox can only be accessed via its IP address. Before setting the WebBox to dynamic IP address assignment, check your DHCP server. The DHCP server must extend the lease of the assigned IP address. If the DHCP server assigns a new IP address after the lease has expired, we do not recommend using the DHCP server. DHCP servers can normally list all devices, to which you have assigned an IP address. The Sunny WebBox can then be identified via its MAC address. The MAC address of your Sunny WebBox is located on the "WebBox / System / Info" page or on the Sunny WebBox label.



1. On the PC: Click "Start > Settings > Network and Dial-up Connections", the "Network and Dial-up Connections" window opens.
2. Right-click "LAN Connection" and click "Properties".
3. Click "Internet Protocol (TCP/IP)" and then "Properties".
4. Switch the setting to "Use the following IP address" by clicking the preceding circle.
5. Enter 192.168.0.100 as the IP address. (NOTE: If this address causes a conflict, please select an address in the range of 192.168.0.1 to 192.168.0.254 that does not conflict.)
6. Enter 255.255.255.0 as the subnet mask.
7. Confirm your settings in each of the two windows clicking "OK".
8. Close the "Network and Dial-up Connections" window.
9. Start Internet Explorer or similar web browser
10. Click "Tools > Internet Options", the "Internet Options" window opens.
11. Select the "Connections" tab and then click the "Settings" button.
12. If there is no check mark in the box before "Use a proxy server for your LAN", click "Cancel" twice. *The Sunny WebBox also contains an integrated FTP server for additional data retrieval options. See 9.8.3 for details.* If there is a check mark in the box before "Use a proxy server for your LAN", click "Advanced...". Enter 192.168.* at the end of the entry in the "Do not use proxy server for

addresses beginning with" field. Use the semicolon as a separator, if required. Confirm your settings in each of the three windows clicking "OK".

13. Enter 192.168.0.168 in the address bar of Internet Explorer, the Sunny WebBox start screen should now appear.
14. Log into the Sunny WebBox. The factory-set password is **sma**.
15. Navigate to the "WebBox / Network" page.
16. Select the dynamic IP address by clicking the preceding circle.
17. Click "Save" and then "Confirm". The Sunny WebBox displays the IP address assigned by the DHCP server. The Sunny WebBox is now properly set up for your Ethernet network.
18. The PC must now be reset to the dynamic IP address. Click "Start > Settings > Network and Dial-up Connections", the "Network and Dial-up Connections" window opens.
19. Right-click "LAN Connection" and click "Properties".
20. Click "Internet Protocol (TCP/IP)" and then "Properties".
21. Reactivate the setting to "Obtain an IP address automatically" by clicking the preceding circle.
22. Confirm your settings in each of the two windows clicking "OK".
23. Close the "Network and Dial-up Connections" window. The PC is once again integrated in the Ethernet network.

9.1.1.3 Direct Connection of a PC and the WebBox

Use the following steps to go through the process of connecting the Sunny WebBox to an Ethernet network, which does not have access to the Internet via a router:

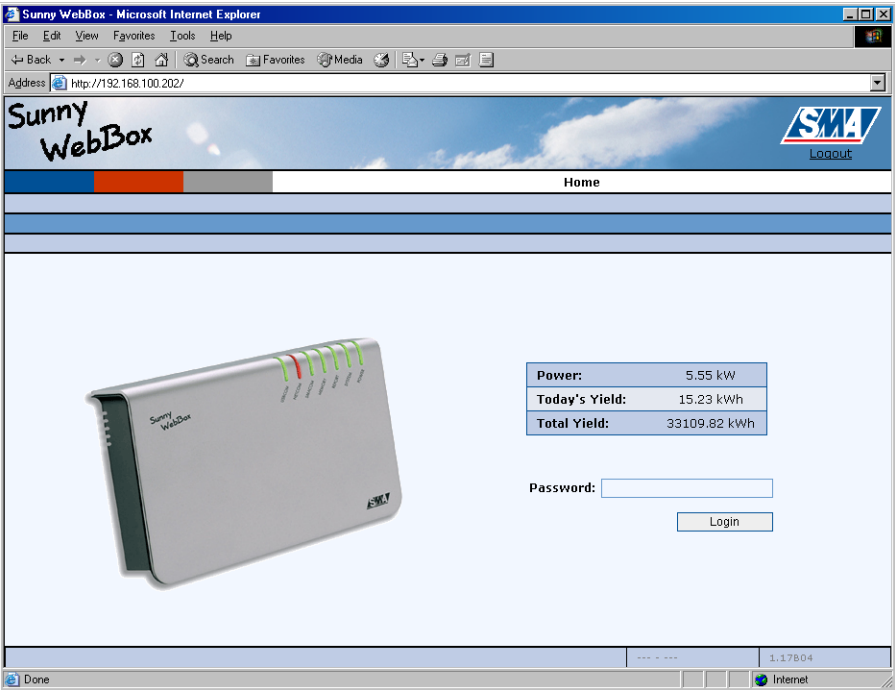
- Setting up an IP address on the PC.
- Setting the proxy server advanced rules of the Internet Explorer.

The following descriptions apply to Windows 2000 with Internet Explorer 6. The descriptions are similar and should be applicable when using Windows XP or Internet Explorer 5 or other similar browsers like Mozilla Firefox.



1. Click "Start > Settings > Network and Dial-up Connections", the "Network and Dial-up Connections" window opens.
2. Right-click "LAN Connection" and click "Properties".
3. Click "Internet Protocol (TCP/IP)" and then "Properties".
4. In the IP addresses area, click "Add" > and enter 192.168.0.100 as the IP address and 255.255.255.0 as the subnet mask. Click "Add". (NOTE: If this address causes a conflict, please select an address in the range of 192.168.0.1 to 192.168.0.254 that does not conflict.)
5. Confirm your settings in each of the three windows clicking "OK".
6. Close the "Network and Dial-up Connections" window.
7. Start Internet Explorer
8. Click "Tools > Internet Options", the "Internet Options" window opens.
9. Select the "Connections" tab and then click the "Settings" button.
10. If there is no check mark in the box before "Use a proxy server for your LAN", click "Cancel" twice. If there is a check mark in the box before "Use a proxy server for your LAN", click "Advanced...". Enter 192.168.* at the end of the entry in the "Do not use proxy server for addresses beginning with" field. Use the semicolon as a separator, if required. Confirm your settings in each of the three windows clicking "OK".
11. Enter 192.168.0.168 in the address bar of Internet Explorer, the Sunny WebBox start screen should now appear.
12. No other Ethernet network settings are required on the Sunny WebBox. *The Sunny WebBox also contains an integrated FTP server for additional data retrieval options. See 9.8.3 for details.*

9.2 Operator Levels



To begin using the Sunny WebBox, the operator must log in using the home screen.

There are two access levels for operators, the User and the Installer.

If the operator is logged in as a User they have the ability to:

- Set the date and time
- Set the network settings
- Register the WebBox with Sunny Portal
- Enable or disable the integrated FTP server
- View inverter performance and operating values and settings
- Update the firmware
- View the event history of the plant
- Change the data recording interval
- Detect or re-detect inverters in the plant

In addition to the functions available to the User, if the operator logs in as an Installer they are also able to:

- Change the user and installer passwords
- Change the inverter operating parameters
- Reset the WebBox to factory default settings
- Perform a software shutdown

In order to prevent multiple users from making conflicting changes to the system, only one operator can log into the Sunny WebBox at a time. The operator level is recognized by the Sunny WebBox based on the password that is entered by the operator. If both user and installer passwords are the same, the operator will be logged in as an installer. By default, both the user and installer passwords are the same: **sma**

Safety related inverter parameters may only be changed by qualified personnel and, if required, only after consulting with your utility company.

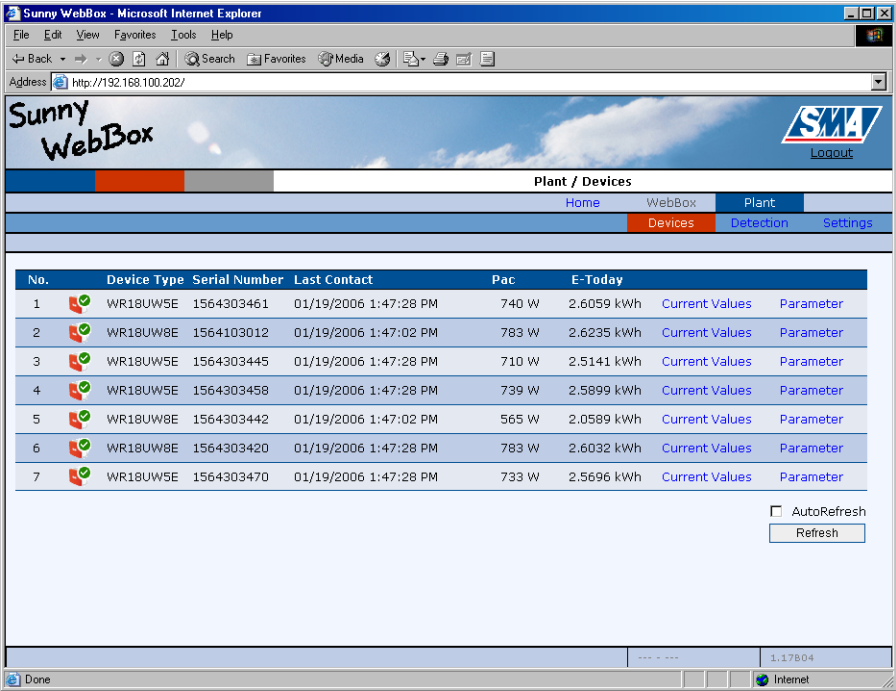


9.3 The Home Screen and Logging In

To log into the Sunny WebBox you must first know one of the two operator passwords. By default, both the user and the installer passwords are set to: **sma**. In any case:

1. Using the mouse, click on the field labeled "Password" so that the cursor blinks in that field.
2. Using the keyboard, enter the appropriate operator level password.
3. Using the mouse, click on the button labeled "Login".
4. If an incorrect password is entered, the error message "Access denied. Please check your password." appears. Ensure that you are using one of the passwords set for your system.

9.4 The Devices Screen



After the operator has successfully logged in, the first visible screen will be the Devices Screen. The Devices Screen will give the operator a quick overview of the status of the PV plant. On this screen are the number of inverters detected in the plant, their serial numbers, each inverters communication status with the WebBox, instantaneous AC power output values and the total energy produced today. The inverter's communication status is indicated by the inverter icon located on the left side of the screen.



This status icon indicates that the inverter is operating and communicating properly.



This status icon indicates that the inverter is communicating properly and that there is an inverter indicating a fault condition.



This status icon indicates that the inverter is not communicating with the Sunny WebBox. This icon will appear at night when the inverter is off or when an actual communication error has occurred.

To see more detailed information about each inverter, click on the button labeled “Current Values” to see their instantaneous input and output values. Clicking on the button labeled “Parameters” displays the current configuration of the inverter. For more information, see section 9.5. The Current Values Screen and section 9.6 The Parameters Screen respectively.

9.5 The Current Values Screen

Plant / Devices / Current Values

Home WebBox Plant

Devices Detection Settings

Current Values Parameter

WR18UW5E:1564303461 01/19/2006 2:03:05 PM

No.	Name	Value	Unit
1	Error	-----	
2	E-Total	4906.25	kWh
3	Fac	60.01	Hz
4	h-Total	7638.1712	h
5	Iac	5755	mA
6	Ipv	3187	mA
7	Mode	Mpp	
8	Pac	684	W
9	Power On	1139	
10	Serial Number	1564303461	
11	Vac	119	V
12	Vpv_PE	0	V
13	Vpv	231	V
14	Vpv-Setpoint	232	V
15	Zac	0	Ohm

AutoRefresh
Refresh

The current values screen provides real-time detailed information on the performance of each inverter. Some of the values available to for viewing are:

- Error - Any error messages
- E-Total - Total energy produced per inverter
- Fac - AC input frequency
- h-Total - Total number of hours the inverter has been connected to the grid
- Iac - AC output current
- Ipv - DC input current
- Mode - Operating mode of the inverter

- Pac - AC output power
- Vac - AC input voltage
- Vpv - DC input voltage
- Serial Number - The inverter's serial number

The above list is not meant to be complete. The actual parameters displayed will vary based on the inverter model and firmware version. For more information about each item on the Current Values Screen, see the appropriate inverter manual.

9.6 The Parameters Screen

Plant / Devices / Parameter

Home WebBox Plant
Devices Detection Settings
Current Values Parameter

WR18UW5E:1564303461 01/20/2006 1:02:32 PM

No.	Name	Value	Unit
1	Hardware-BFS	16	Version
2	Operating mode	Mpp-Operation	
3	Plimit	1800	W
4	SMA-SN	1564303461	
5	Software-BFR	8.94	Version
6	Software-SRR	8.9	Version
7	T-Start	300	s
8	T-Stop	2	s
9	V-Const Setval	400	V
10	Vpv-Start	160	V

Refresh

9.6.1 User Level Parameters

The Parameters Screen will display all of the current operating parameters of the inverter. If the operator is logged in as the user, all parameters will be displayed as “read-only”. Some of the available parameters are:

- Operating Mode - Mode of operation
- Plimit - Maximum output power limit
- Software-BFR & SRR - Software version

The above list is not meant to be complete. The actual parameters displayed will vary based on the inverter model and firmware version. For more information about each item on the Parameters Screen, see the appropriate inverter manual.

Plant / Devices / Parameter

Home WebBox Plant

Devices Detection Settings

Current Values Parameter

WR18UW5E:1564303461 01/20/2006 1:05:19 PM

No.	Name	Value	Unit
1	dFac-Max	0.5	Hz/s
2	dZac-Max	2000	mOhm
3	Fac-delta-	0.69	Hz
4	Fac-delta+	0.49	Hz
5	Hardware-BFS	16	Version
6	KP-vreg	1	
7	Memory Function	No function	
8	Operating mode	Mpp-Operation	
9	Plimit	1800	W
10	Pmax	1800	W
11	SMA-SN	1564303461	
12	Software-BFR	8.94	Version
13	Software-SRR	8.9	Version
14	Storage	permanent	
15	Testcurrent Zac	8000	mA
16	Tn-vreg	0.35	s
17	T-Start	300	s
18	T-Stop	2	s
19	Vac-Max	130	V
20	Vac-Min	107	V

9.6.2 Installer Level Parameters

The major differences between the installer level Parameter Screen and the user level is the number of parameters displayed and that the installer has the ability to change some of the parameters. For more information about each item on the Parameters Screen, see the appropriate inverter manual.

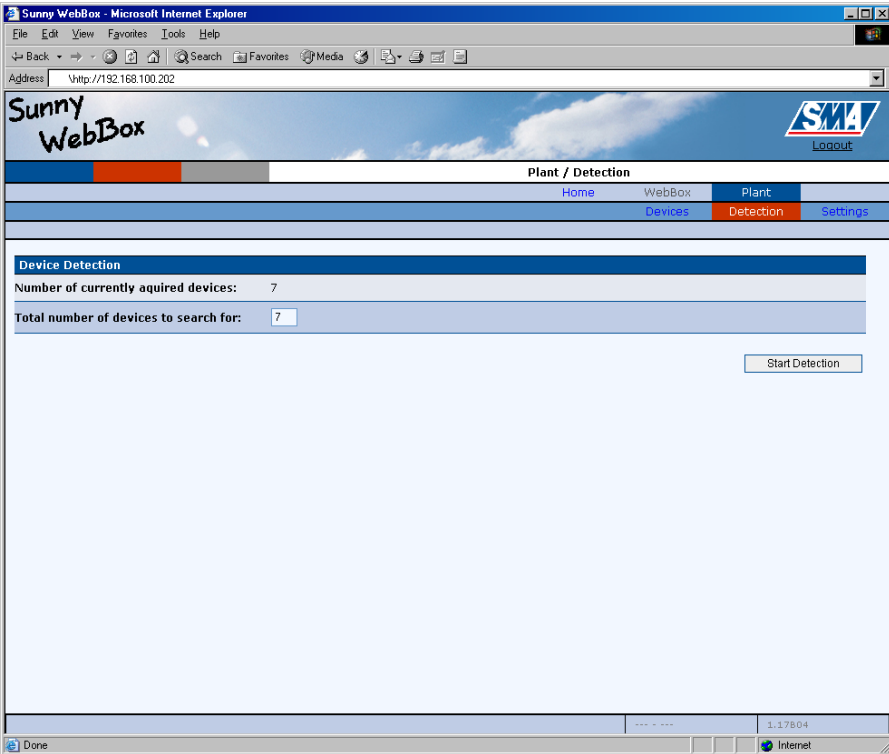



Safety related inverter parameters may only be changed by qualified personnel and, if required, only after consulting with your utility company.




Parameters pertaining to UL protective functions cannot be changed even at the installer level. If these parameters require that they be changed, please provide a letter of authorization from UL and the local utility describing the changes. All changes to UL protective function parameters must be performed at the factory.

9.7 The Detection Screen



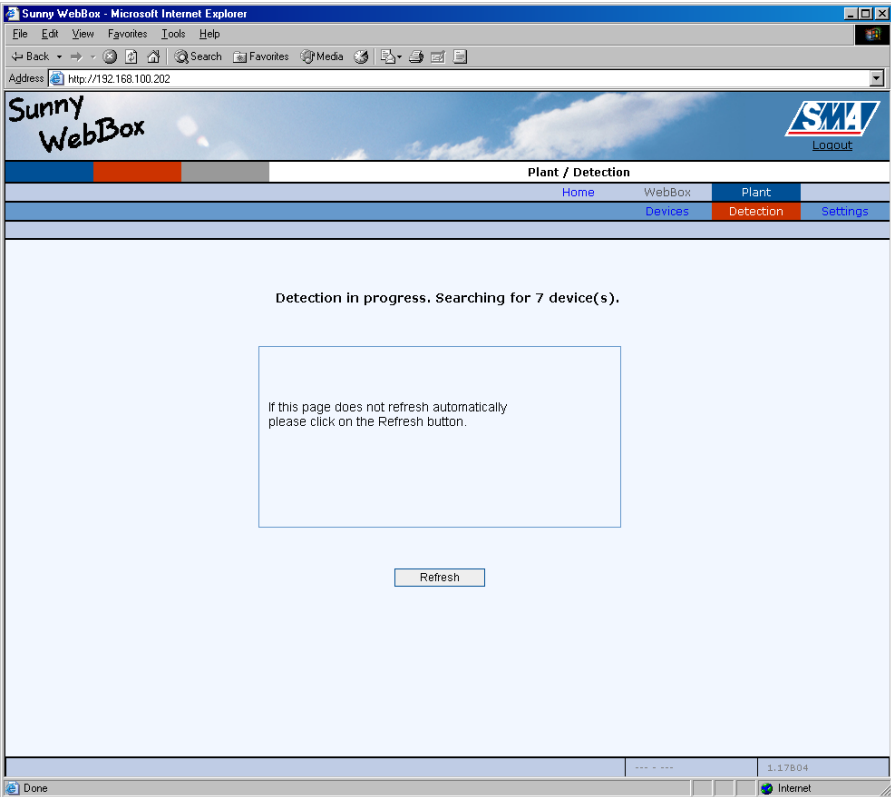
When the WebBox is installed for the first time, it may begin to detect the installed inverters automatically. If this does not occur, attempt this detection process. If all inverters are not detected after this process, refer to Section 11 on Troubleshooting to locate and clear the error. 

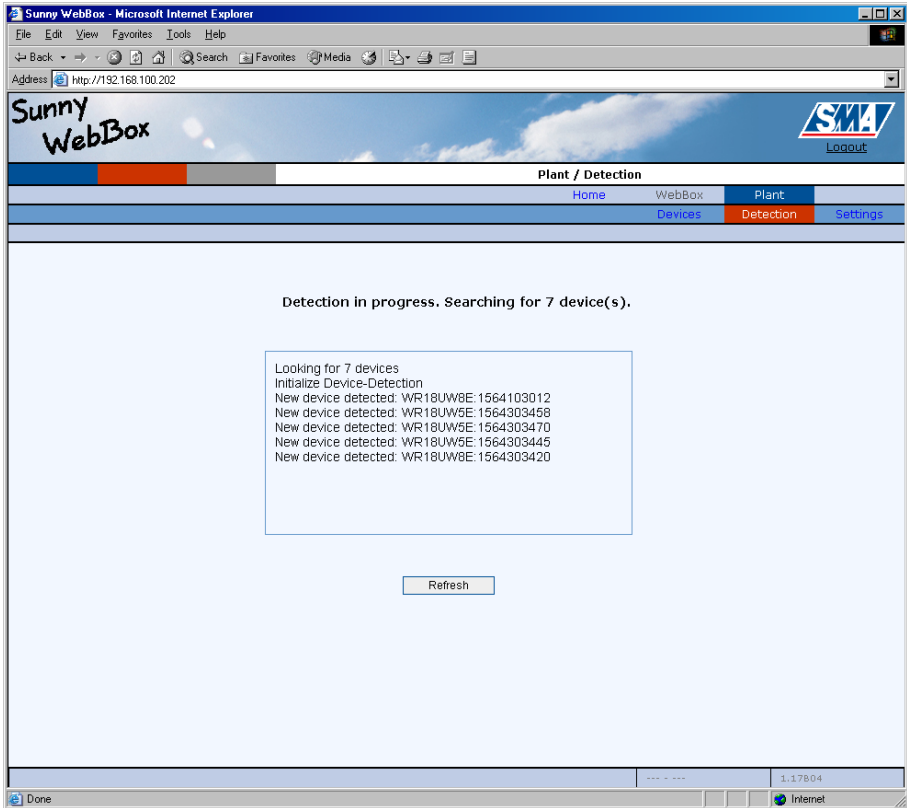
The Detection Screen can be located by clicking on the button labeled “Plant” in the main navigation bar. Then click on the button labeled “Detection”. To begin the detection process, enter the number of inverters in the PV plant into the field labeled “Total number of devices to search for”.

Entering a number other than the actual number of devices will not cause an error. If you replace, remove or add any new inverters, restart the detection process and simply adjust the “Total number of devices to be detected” parameter. Inverters that no longer exist are automatically deleted from the list. Previously recorded data from those inverters will remain in the data logs. 

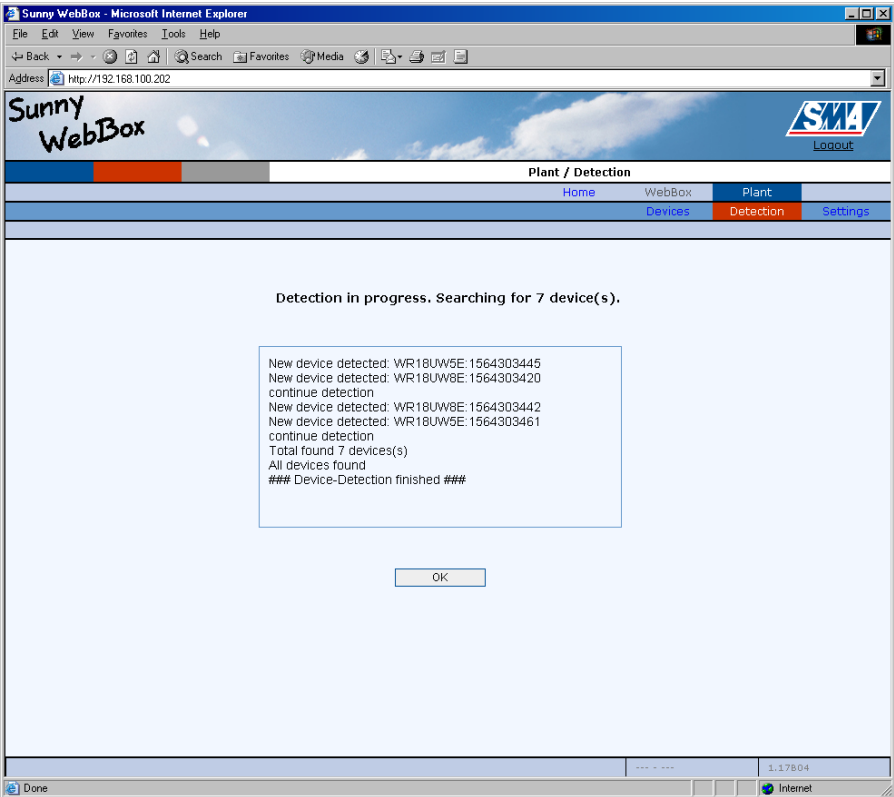
After the correct number of inverters to search for has been entered, begin the process by clicking on the button labeled "Start Detection".

The detection process should proceed automatically. An example of the process is seen in the following graphics.



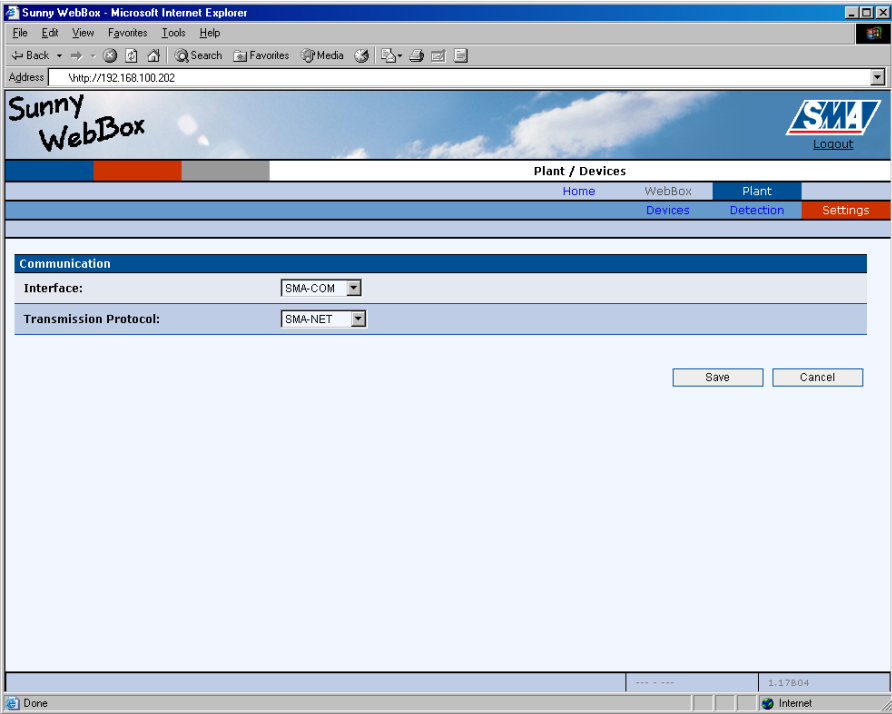


All inverters in the system are detected simultaneously. If other inverters are added to the PV system in the future, the Sunny WebBox can perform the detection process again and see the new inverters.



When the detection process has finished, the last line of the text area should read, “###Device-Detection finished###” and the button should change its label to read “OK”. Clicking OK will return to the Devices Screen.

9.8 The Plant Settings Screen



The Plant Settings Screen can be located by clicking on the button labeled “Plant” in the main navigation bar and then clicking on the button labeled “Settings”. In the Settings Screen it is possible to set:

- Interface - The communication port
- Transmission Protocol - The communications protocol

To save and apply any configuration changes, click on the button labeled “Save”. To leave the screen without applying the changes, click the button labeled “Cancel”.

9.8.1 Selecting the Communication Port

The Sunny WebBox can communicate with SMA inverters through an RS-485 interface using the SMACOM port or over TCP/IP using the Ethernet port. To date, communicating with Sunny Boy inverters requires using the SMACOM port and an RS-485 communications link. Communicating with Sunny Central type inverters with an installed Sunny Central Control requires using the Ethernet port and a TCP/IP network. Select either SMACOM or ETHERNET to correctly configure the WebBox for communication with the inverters in your PV plant.

For more information on setting up networks of these types please see the respective user manuals for the Sunny Boy and Sunny Central inverters. Additional information may also be found in the Technical Notes section of the SMA America Web site, www.sma-america.com

9.8.2 Selecting the Communications Protocol

There are two different communication protocols used by SMA to communicate with our inverters, SMA-NET and SUNNY-NET.

SMA-NET will communicate with the following types of inverters:

- SWR type Sunny Boys starting from firmware version 8.22 (SWR 1800U, SWR 2500U)
- SB type Sunny Boys with all firmware versions (SB6000U, SB3800U)
- Sunny Centrals with all firmware versions (SC125U)
- Sunny Islands with all firmware versions (SI4248U)



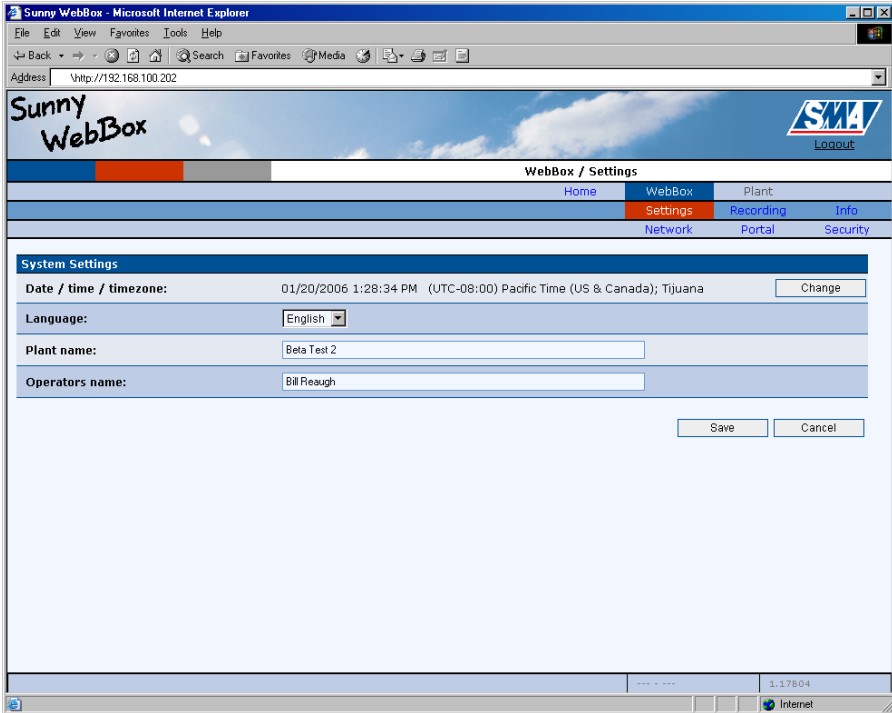
All US inverters will communicate via SMA-NET.

SUNNY-NET will communicate with the following type of inverters:

- SWR type Sunny Boys before firmware version 8.22 (No US examples exist)

Please make the appropriate "Transmission Protocol" selection for communicating with the inverters in your PV plant.

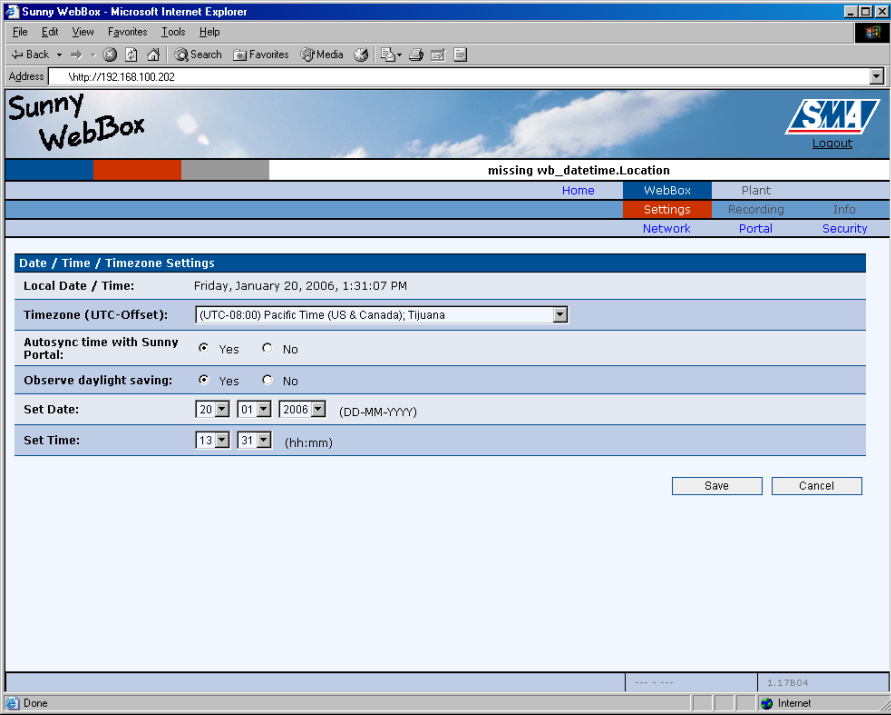
9.9 The WebBox Settings Screen



The WebBox Settings Screen may be accessed by using the navigation system. Click on the button labeled "WebBox". This screen will allow any operator to:

- Set the date, time and time zone
- Set the interface language
- Enter the name of the plant
- Enter the name of the owner

9.9.1 Setting the Date, Time and Time Zone



To set the date, time and time zone of the WebBox, click on the button labeled “Change” in the settings screen. This will open the date and time window shown in the adjacent graphic.

The first line of this screen shows the current date and time. To change the date and time, simply select the appropriate value for each area. Note that the date format is DAY/MONTH/YEAR. The date shown in the example is January 10, 2006. Also note that the time format is 24 hr. So the time shown in the example is 1:34 PM. It is also possible to have the date and time kept current via the server at the Sunny Portal web site. Simply choose “yes” to this option and the date and time will be set automatically when connecting to the Sunny Portal.

When all changes have been made, click Save to save the settings and return to the previous screen. To exit without saving, click Cancel or the browser’s Back button.

9.9.2 Setting the Interface Language

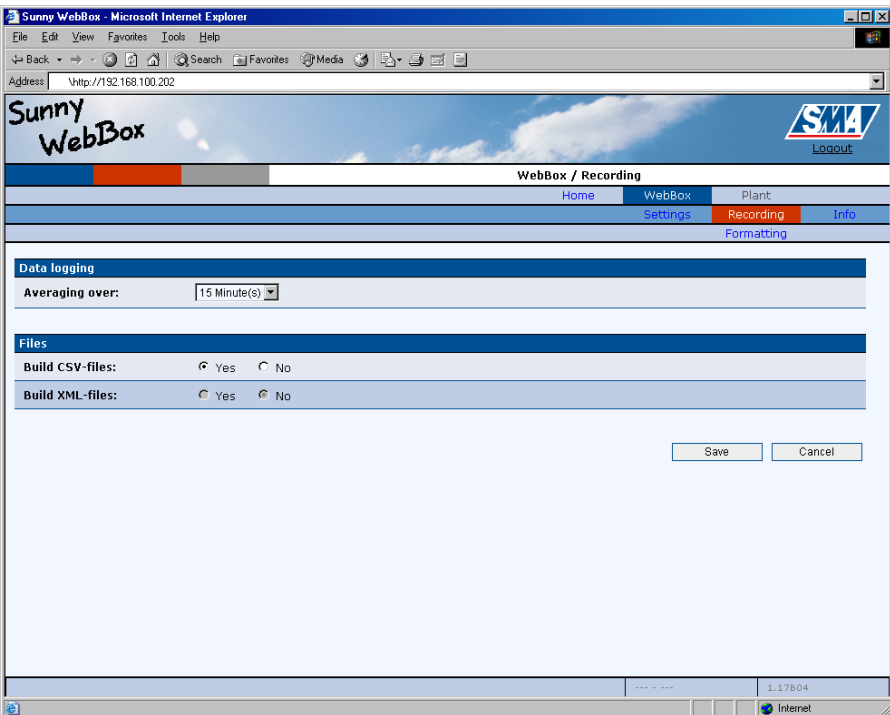
Select the interface language by using the drop down menu in the Settings Screen shown in Section 9.9. The languages currently supported by the Sunny WebBox are English, (default) and Deutsch (German). Once the selection has been made, click Save to set the language.

9.9.3 Entering the PV Plant/Owner/Operator Name

To enter the PV plant name, click on the box labeled “Plant Name” and enter a name for the plant. This name will be used by the Sunny Portal to identify the WebBox and associated system.

To set the Owner/Operator name, click in the box labeled “Operator Name” and enter a name.

9.10 The Recording Screen



To access the Recording Screen, click on “WebBox”, and then on “Recording”.

This screen allows the operator to:

- Set the data recording interval
- Activate or deactivate the output of daily energy values in the .csv (comma separated values) format
- Activate or deactivate the output of daily energy values in the .xml (extensible markup language) format

9.10.1 Recording Interval

The Sunny WebBox will time-average data in 5, 10 and 15 minute intervals. The only difference between these selections is the number of data points which will be recorded each day for your PV plant. Please make the appropriate "Averaging" selection for your plant. When finished, click Save to apply the settings, or Cancel to leave without saving the changes.



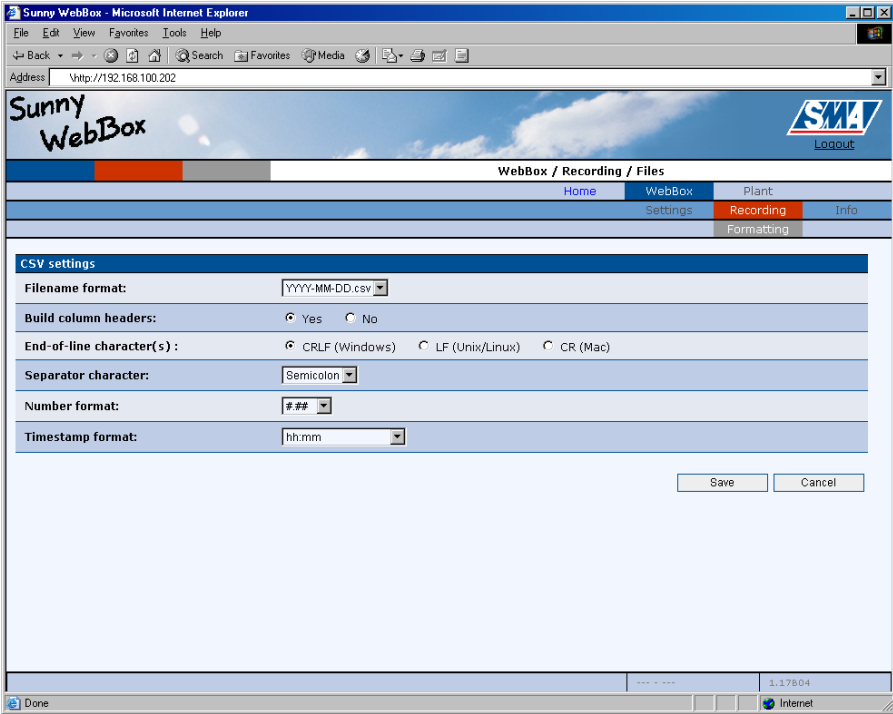
Note that if there is a large number of inverters in the PV plant and an interval of 5 minutes is selected it is recommended that a large external storage device be used for data collection. See 9.12.3 Memory and Data Storage for more detailed information.

9.10.2 Selecting Output File Types

With firmware version 1.20 and later, the Sunny WebBox will save formatted daily data files to record the performance of your system. To activate this feature, click "yes" next to "Build CSV Files". If "no" is selected, the files will not be created.

CSV files are a commonly used specially formatted text file that records data from several different channels and separates that data using a text character, typically ",". These data files can be easily imported into many different types of processing software for further analysis and manipulation. Some common examples are Microsoft Excel or My SQL. See 9.11 The Formatting Screen, for more details.

9.11 The Formatting Screen



Locate the Formatting Screen by clicking on “WebBox”, then on “Recording” and finally on “Formatting”. With the formatting screen it is possible to change several parameters for the daily output file. Possible changes are:

- The file name format
- Activate column headers
- Set end-of-line character
- Set column-separator character
- Set the number-precision and decimal-indicator characters
- Select the time-stamp format

Once selections have been made, click Save to apply the settings or Cancel to leave the window without saving any changes.

9.11.1 File Name Formatting

To change the file name format, use the “File Name Format” drop down. The available formats are:

- MM-DD-YYYY.csv
- DD-MM-YYYY.csv
- YYYY-MM-DD.csv
- JJJ-YYYY.csv

Each of the sections in the filename stand for the following: DD is for the two digits of the day of the month, MM is for the two digits for the month of the year and YYYY is for the four digits of the year. JJJ is for the Julian date of the year. The Julian date is calculated by counting the days of the year. For example, January 20 would be 020. December 19 has a Julian date of 353, or 354 during a leap year. Using the date of January 20, 2006 as an example, the format options listed above would look like this:

- 01-20-2006.csv
- 20-01-2006.csv
- 2006-01-20.csv
- 020-2006.csv

9.11.2 Column Header, End-of-Line, Separator Characters

The next selection area is “Build Column Headers”. This allows the header information to be turned on or off. The header information consists of the inverter type, serial number, channel name and relevant units of measure.

The “End-of-Line Character(s)” can be used to help facilitate the use of the text file on different computer operating systems. Choose:

- CRLF for Windows
- LF for UNIX and LINUX
- CR for Mac

The “Separator Character” can be selected from standard characters. These types of characters are used because they are typically absent from the actual recorded data and therefore reduce confusion. The default character is a semicolon, “;”. Other characters are the comma, “,” the colon “:” and tabular, the tab white space character. Most interpretation programs can accept any of these separator characters.

9.11.3 Number Precision, Decimal and Timestamp Formatting

The “Number Format” selection allows the numeric precision and the decimal formatting to be changed. The numeric precision can be changed to 1, 2, or 3 digits after the decimal separator. The decimal separator can be either a decimal point “.” or a decimal comma “,”.

The timestamp may be formatted in the following ways:

- hh:mm (default)
- DD-MM-YYYY hh:mm
- MM-DD-YYYY hh:mm
- jji hh:mm

Where hh is the hour of the day using a 24 hour clock and mm are the minutes. The other formats have been described previously in 9.11.1 File Name Formatting. Using January 20, 2006 2:55 PM as an example, the above formats would look like this:

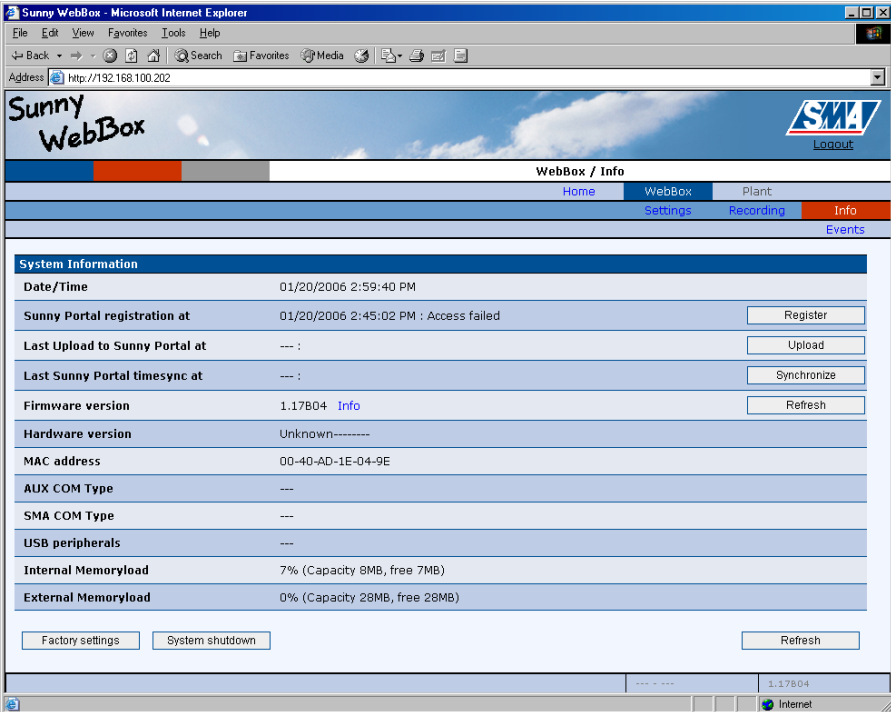
- 14:55
- 20-01-2006 14:55
- 01-20-2006 14:55
- 020 14:55

9.12 The Info Screen

System Information	
Date/Time	01/20/2006 3:00:53 PM
Sunny Portal registration at	01/20/2006 3:00:02 PM : Access failed <input type="button" value="Register"/>
Last Upload to Sunny Portal at	--- : <input type="button" value="Upload"/>
Last Sunny Portal timesync at	--- : <input type="button" value="Synchronize"/>
Firmware version	1.17B04 Info <input type="button" value="Refresh"/>
Hardware version	Unknown-----
MAC address	00-40-AD-1E-04-9E
AUX COM Type	---
SMA COM Type	---
USB peripherals	---
Internal Memoryload	7% (Capacity 8MB, free 7MB)
External Memoryload	0% (Capacity 28MB, free 28MB)

The Info Screen may be accessed by clicking on “WebBox” and on the next page click on “Info”. The Info Screen contains much of the basic interface information for the Sunny WebBox. There are small differences in the information depending on if the operator is logged in as a user or an installer. Logging in as a user will display:

- The current date and time
- The last time the WebBox confirmed the registration status with Sunny Portal
- The last time data was posted to Sunny Portal
- The last time the date and time were synced with the Sunny Portal
- The current software version
- The hardware version and serial number
- The MAC address of the Ethernet controller
- The Auxiliary communication device type, if installed
- The SMA communication device type, if installed
- The USB peripheral connection status
- The amount of internal and external memory used (if installed)



If the operator has logged in as an installer, the additional items are available:

- Reset button
- Shut Down button

9.12.1 Sunny Portal Communication Status

In the Info Screen described previously in section 9.12 The Info Screen, there are three items that pertain to the current communication status with the Sunny Portal. These items are labeled, “Sunny Portal Registration at”, “Last upload to Sunny Portal” and “Sunny Portal timesync at”.

Once a day, when the first data upload attempt is made by the Sunny WebBox, the WebBox will confirm the registration status of the PV plant with the Sunny Portal. The date and time shown for “Sunny Portal Registration at:” indicate the last time the Sunny WebBox performed a registration confirmation. Registration can be performed manually at any time by clicking on “Register”.

The date and time shown for “Last upload to Sunny Portal” indicates the last time the Sunny WebBox performed a successful data upload to Sunny Portal. Uploading data may also be performed manually at any time by clicking on “Upload”.



The amount of delay between this date and time and the current date and time will vary based on the Average Interval selected in 9.10 Plant Settings and the Upload Frequency selected in 9.15 Portal Settings.

The date and time shown in “Sunny Portal timesync at:” indicates the time the WebBox was last synced with the Sunny Portal clock. A time sync is typically performed each time data is successfully uploaded to the Sunny Portal. The time and date may be synchronized manually at any time by clicking on “Synchronize”.

9.12.2 Software Version and Software Updates

The current software version is displayed in the lower right of the WebBox screens. If a new version of software is available there are two ways to have it installed. One way is to enable automatic updates using the Portal Screen, see section 9.15 for details. The other option is to manually update the WebBox. To update manually, ensure that the Automated Firmware Update option is set to “no”. Then, when a new software version becomes available, a message will appear next to the software version number indicating that it is available for download. The button name will change from “Refresh” to “Update”. Clicking on Update will initiate the process.



The software updating process can take several minutes. During this time the WebBox may become unresponsive. Please wait until the LEDs on the WebBox turn green and begin flashing before attempting to restore contact with it.



Do not remove power from the Sunny WebBox during the software updating process. This may damage the software and/or hardware of the Sunny WebBox.

9.12.3 Memory and Data Storage

The internal memory capacity of the Sunny WebBox is 8MB. Depending on the number of inverters connected to the WebBox, this will provide 2 to 30 days of data storage. The data is written in a first in-first out (FIFO) ring buffer system. This means that when the memory reaches capacity, the WebBox will begin to overwrite its memory beginning with the oldest data first. The item labeled “Internal Memory Load” indicates how full the internal memory has become. The memory load is represented as a percentage where 0% is empty and 100% is completely full. Any data sent to the Sunny Portal is redundantly stored on SMA’s Sunny Portal servers. If more local memory storage is desired, additional memory may be added to the WebBox by either inserting a USB Flash Memory stick or an SD (Secure Data)

Memory card. These come in a variety of sizes and can be used in any available size. The item labeled “External Memory Load” indicates how full the external memory device has become. The external memory load is also represented as a percentage where 0% is empty and 100% is completely full.

SMA recommends using a name-brand memory device to ensure the long-term reliability of the data storage device.



Both the SD memory card and the USB memory stick are hot-swappable and can be removed from the Sunny WebBox at any time to transfer data to a PC. If the external memory device is removed for a long period of time, i.e. more than one data cycle, the data is still written to the WebBox’s internal memory. When the external memory device is reconnected to the WebBox, the WebBox will write all of the data stored in the internal memory to the external device. New data will be written to the external device as long as it remains connected. If the external device becomes full, the data will be overwritten in the same FIFO manner as the internal memory.

Do not remove the external memory device from the Sunny WebBox while the Sunny WebBox is actually writing data to the memory device. This may cause the data to become corrupted and could cause damage to the external memory device.



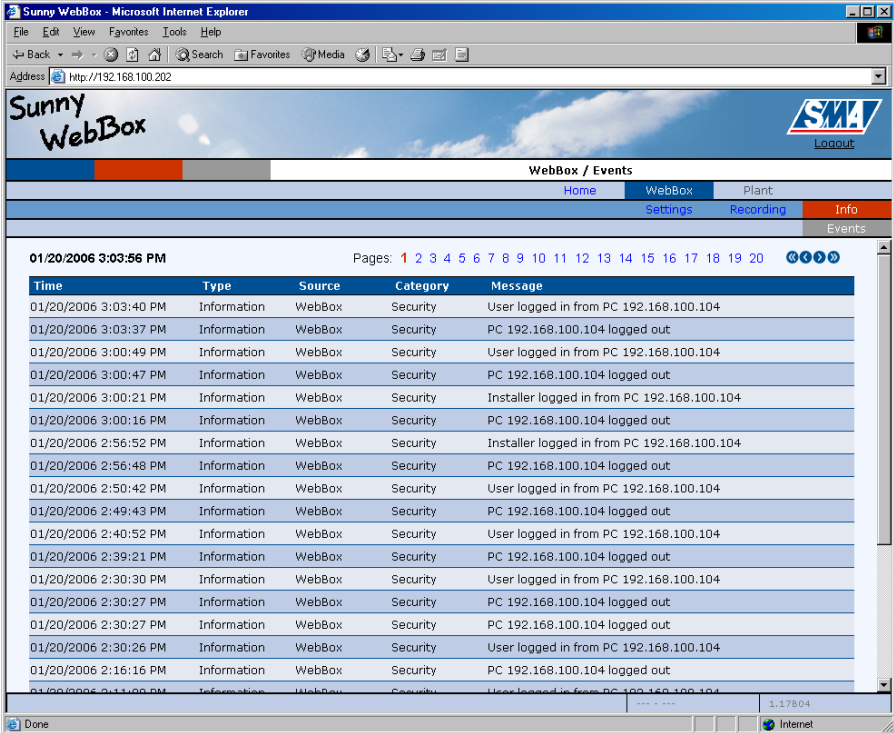
9.12.4 Resetting to Factory Default Status

Resetting the WebBox is a command only available to the installer level. When the operator logs in as an installer, the button labeled “Factory Settings” will appear at the bottom of the info screen. Clicking this button restores all factory default settings to the WebBox.

9.12.5 Performing a Shutdown

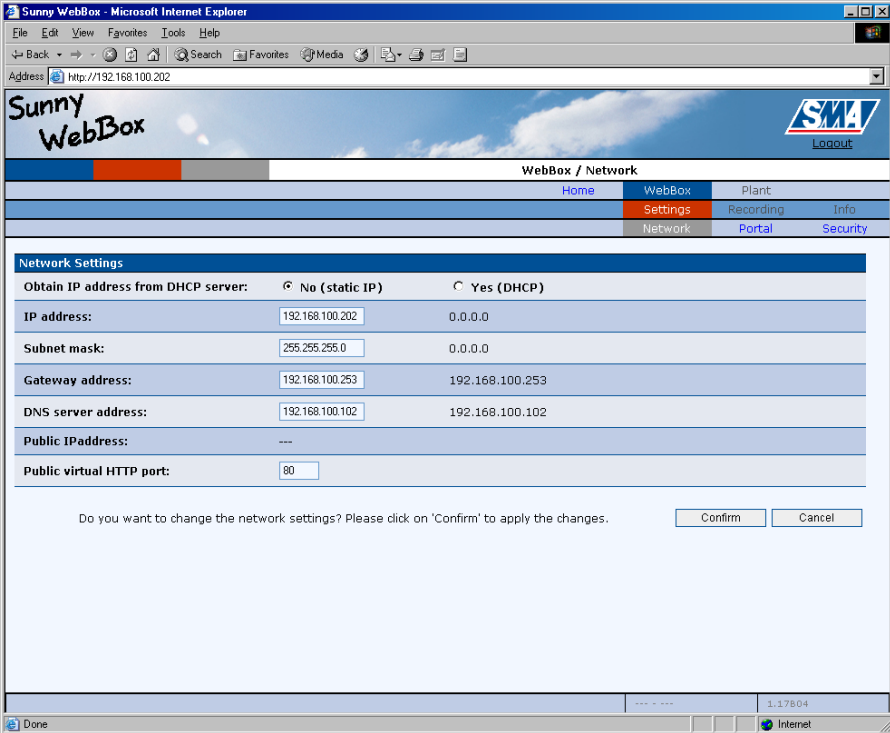
The shut down feature is available only to operators logged in as an installer. When the operator logs in as an installer, the button labeled “System Shutdown” appears at the bottom of the info screen. Clicking this button will cause the WebBox to completely shut down, after which the power cable can be safely removed from the WebBox. To restart the WebBox, simply plug the power cable back in.

9.13 The Events Screen



This screen will provide a log of status messages about the Sunny WebBox and all connected SMA inverters. The last 500 messages are stored in memory and displayed on up to 20 pages on this screen. For a complete list of possible messages, see section 11 Troubleshooting.

9.14 The Network Screen




The Network Screen shows all of the current network settings for the Sunny WebBox. The WebBox can be configured to use a static IP address or to obtain an IP address from a DHCP server. To use a static IP address, click on the circle labeled “No (static IP)” and enter an IP address, subnet mask, default gateway server and primary DNS server address. To obtain an IP address from a DHCP server, click on the circle labeled “Yes (DHCP)” and the WebBox will automatically find the IP address, subnet mask, default gateway and primary DNS server addresses.


The Sunny WebBox is by default set up to be addressed by its assigned IP address number. If the DHCP option is selected, it is possible to set up a named resource with the DNS server. Please check with your IT administrator to set up this option. In most cases it is SMA’s recommendation that a static IP address be assigned to the Sunny WebBox.



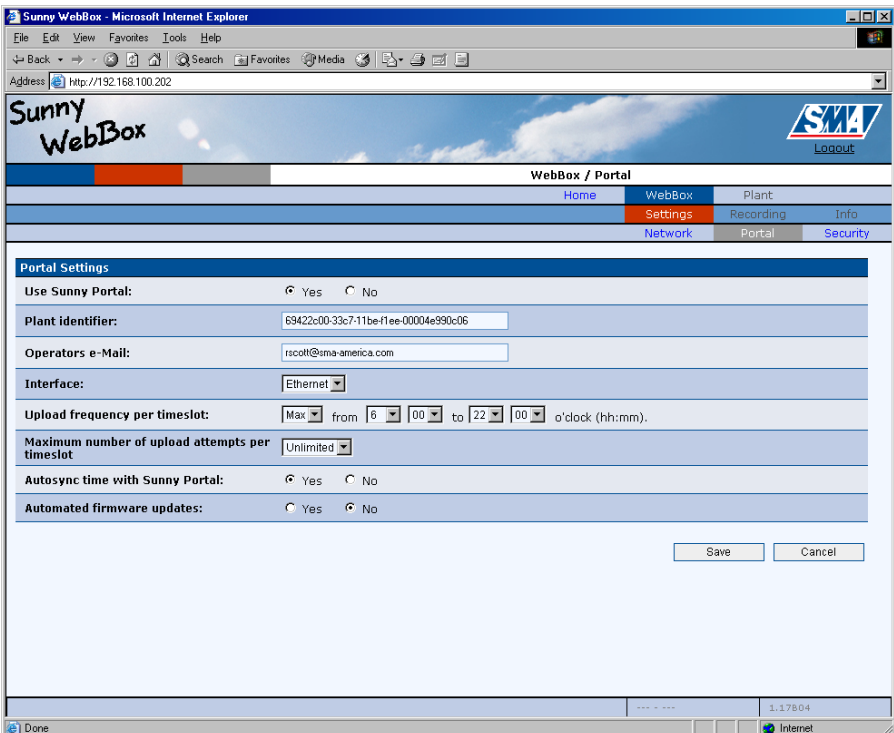
It is also possible to connect to the Sunny WebBox from outside the LAN to which the WebBox is connected. The "Public IP Address" lists the IP address which should be used from outside the LAN - provided that the appropriate security settings have been made in the firewall to allow this type of access.

 Please consult with your IT administrator to make sure that the necessary changes have been made in the firewall security settings to allow outside access if this option is to be enabled.

Depending on the firewall security settings, the "Public Virtual HTTP Port:" can be changed to match whatever firewall port is appropriate for your network. The default port for HTTP access is port 80.

 Consult with your IT administrator to determine if this default port needs to be changed and if so, what the port number should be.

9.15 The Portal Screen



The Portal Screen is used by the operator to configure the Sunny WebBox for communication with the Sunny Portal web service. If the decision is made to use the Sunny Portal, then all of the relevant system configurations are completed on this page. For more information on SMA's free Sunny Portal visit the Sunny Portal web site at: www.sunnyportal.com.

After making any changes to the Portal screen, click save to apply the changes or click cancel to leave the screen without saving the changes.

9.15.1 Enabling Sunny Portal Access

To enable Sunny Portal access, select "Yes" for "Use Sunny Portal". Selecting "No" will disable this feature. The "Plant Identifier" line is used by the Sunny Portal to uniquely distinguish this plant from any other in the world. In the box labeled "Operator's E-mail", enter an E-mail address for Sunny Portal to use to send messages to regarding the PV plant.

9.15.2 Selecting the Web Interface Type

The "Interface" selection is used to determine how the Sunny WebBox should contact the Sunny Portal. The two options are via Ethernet or through the integrated analog modem. The analog modem is only an option when the modem unit has been installed in the Sunny WebBox. To use the modem, enter the phone number, user name and password into the fields labeled "ISP Phone Number", "ISP User Name" and "ISP Password" respectively. If the Ethernet option is to be used, these fields may be left blank.

9.15.3 Configuring the Data Upload Intervals

Regardless of which interface option is being used to communicate with the Sunny Portal, the following options need to be configured. To set the number of times a day the WebBox sends data to the Sunny Portal, use the field labeled "Upload frequency per timeslot". The first item selects how often data is uploaded to the Sunny Portal per day. Selecting "1X" means that the data will be sent to the Sunny Portal once at the end of each day. Selecting "20X" will send data to the Sunny Portal 20 times a day. Selecting "Max" will send data every time a new data point becomes available. The next four fields allow the user to define the hours of the timeslot or "day". The first pair of fields denote the beginning time, HH and MM, and the second pair indicate the ending time in HH and MM. The default "day" is from 6:00 AM (06 and 00) to 10:00 PM (22 and 00).

The next section, "Maximum number of upload attempts per timeslot" sets the number of times the Sunny WebBox will attempt to resend data to the Sunny Portal per connection. The lowest setting "5X" means that the WebBox will attempt to resend the data 5 times, "50X" means it will try 50 times to send the data. "Unlimited" means that the WebBox will continue to resend the data until it is successful.

9.15.4 Time Autosync

The “Autosync time with Sunny Portal” feature allows the internal clock of the Sunny WebBox to be synced with that of the Sunny Portal system clock each time it uploads data.

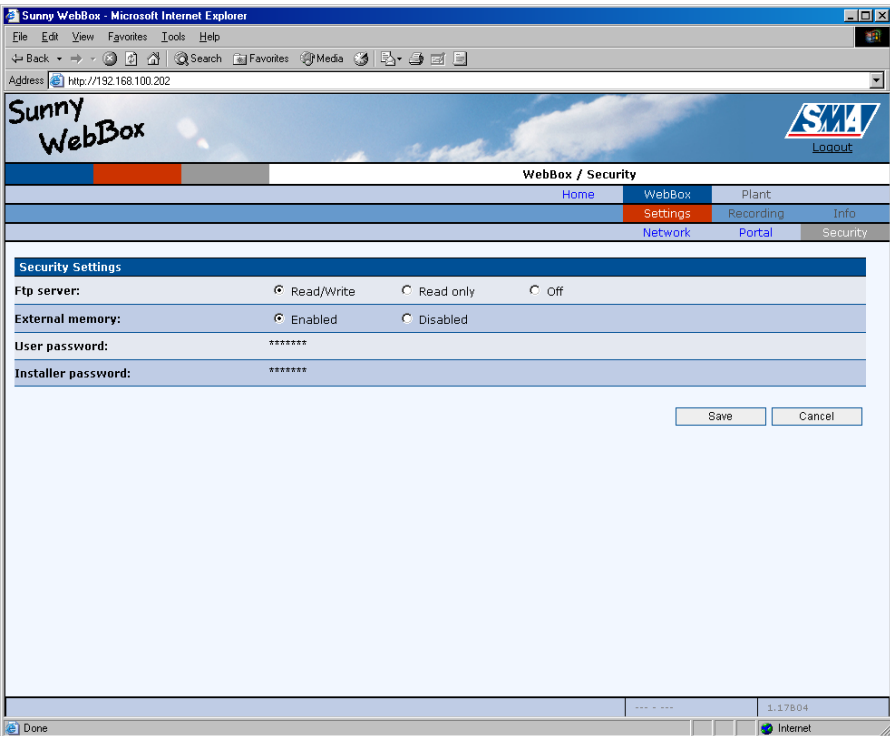


It is recommended that the Sunny WebBox be set to autosync with the server clock. Otherwise the internal clock of the WebBox will drift over time and result in inaccuracies in the recorded data to appear.

9.15.5 Software Updating

The Sunny WebBox software may be updated automatically or manually. To have the software updated automatically as soon as a new version becomes available, set the “Automated firmware update” to “Yes”. If set to “No”, updates must be performed manually, See section 9.12.2 for details.

9.16 The Security Screen



The Security Screen is used to change the different security and access parameters of the Sunny WebBox. Read the following sections carefully as some security settings may introduce significant vulnerabilities to the WebBox.

9.16.1 FTP Server Access

Warning: The integrated FTP server will allow anonymous access and is not password protected. Unless security measures are implemented at the network firewall a malicious operator could access the data storage area of the Sunny WebBox through the FTP server.



If the operator is logged on as a user, they will be able to:

- Change the internal FTP server access level
- Enable or disable the external memory system

The integrated FTP server is one possible way to gather system performance data from the Sunny WebBox for use in other applications. For more information on the available data and possible uses of it, see section 9.17 Exporting Data. The three different access levels for the integrated FTP server indicate only the level of access an outside operator has available when connecting with an FTP client. No matter which access level is chosen, the WebBox will always be able to read from and write to the memory storage area accessed by the FTP server. The most open option, “Read/Write”, will allow an outside operator to both read from and write to the FTP file area, including the ability to delete data files.

Warning: If the “Read/Write” security option is selected, then it is possible for a malicious outside operator to write programs, delete data or perform other harmful actions on the Sunny WebBox. Please use this security setting with caution.



Another option is “Read Only” access. At this access level outside operators will only be able to read data from the file storage area of the WebBox and copy them to another location.

The most secure option is to completely disable the FTP server. If the FTP server is disabled, all FTP requests made to the Sunny WebBox will be refused and no data can be transferred in or out of the WebBox via FTP. If this selection is made, the only way to transport data out of the WebBox is by an external memory storage device. See section 9.5.3 Memory and Data Storage for detailed information on external memory storage devices.

If both the FTP server access and external memory access are disabled, the data files will only be available through the Sunny Portal.



To apply changes, click Save, otherwise click Cancel to leave without saving any changes.

9.16.2 External Memory Storage Access

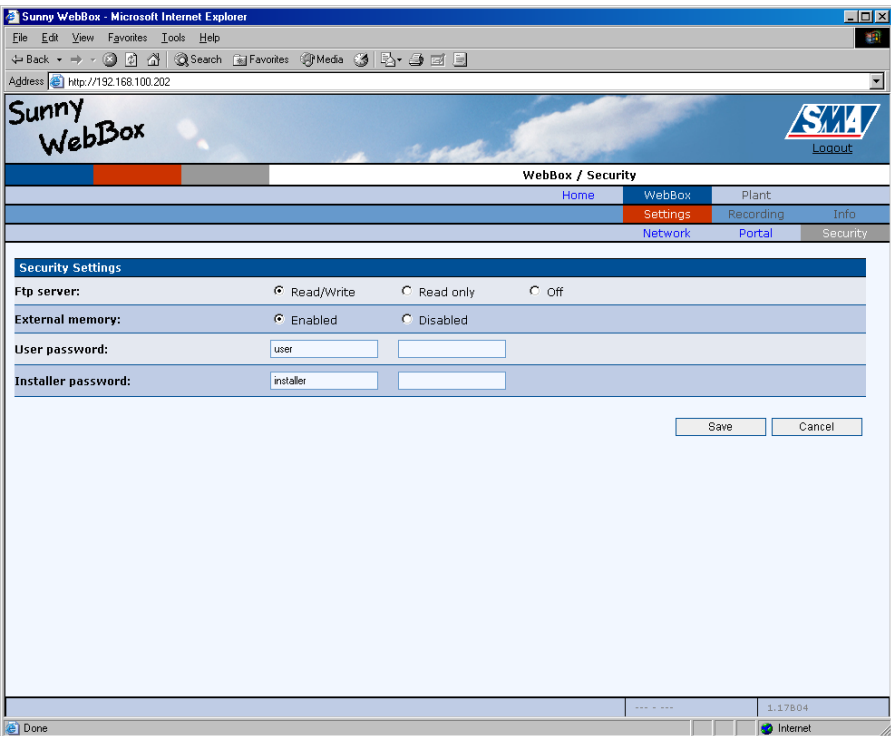
The operator can enable or disable external memory storage access through the "External Memory" item. Select "Enabled" to access external memory or "Disable" if this feature is not desired.



If both the FTP server access and external memory access are disabled, the data files will only be available through the Sunny Portal.

To apply changes, click Save, otherwise click Cancel to leave without saving any changes.

9.16.3 Operator Access Passwords



If the operator is logged on as an installer, then the operator can change the user level access password, the installer level access password or both. To change the access level password, type the new password into both fields of the appropriate line and click Save. If the password has been successfully changed, the message, "The password was successfully changed" will appear next to the operator level password that was changed.

If the message "The password was successfully changed" does not appear after clicking Save, there was a problem with the new password. Reenter the password and make sure the two fields match before clicking on Save.



To apply changes, click Save, otherwise click Cancel to leave without saving any changes.

9.17 Exporting Data

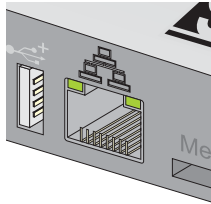
Data can be exported from the Sunny WebBox for viewing in several ways. One option is to send the data to the Sunny Portal. To send data to the Sunny Portal see section 9.15 The Portal Screen for detailed information. Another way is via the integrated FTP interface. File Transfer Protocol (FTP) is the standard method for moving files across the internet. The integrated FTP server will allow anonymous access using any standard FTP client. To change the access permissions see section 9.16.1 FTP Server Access for detailed information. If you are using Internet Explorer you can begin an FTP session by typing ftp://addressofwebbox into the address bar of the browser window. Once you have initiated an FTP session you can move files to and from the WebBox based upon the access permission settings. The data available from the Sunny WebBox comes in two common data formats:

- Extensible Markup Language (XML)
- Comma Separate Values (CSV)

Many experienced web masters and web site designers can use either of these two formats to create a large variety of web sites using information from your PV plant. See sections 9.10 The Recording Screen and 9.11 The Formatting Screen for detailed information.

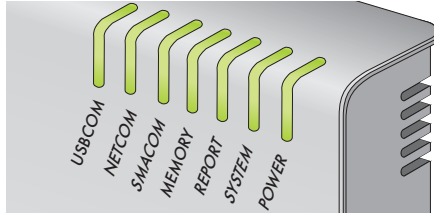
10 Indicators and Messages

10.1 Ethernet Connection LEDs



LED	Status	Display
Speed (left)	Off	10 MB connection speed
	On	100 MB connection speed
Link / Activity (right)	Off	No connection established
	On	Connection (link) established
	Flashing	Data is transmitted or received (Activity)

10.2 LED Indicators



LED Label	Status / Color	Description
USBCOM	Flashing/Green	Data is being transferred via the USB port.
	Steady/Green	The most recent data transmission was successful.
NETCOM	Steady/Red	The most recent data transmission failed. The Sunny WebBox will attempt to re-transmit the data according to its settings.
SMACOM	Flashing/Green	The Sunny WebBox is communicating with an inverter.
MEMORY	Steady/Green	SD card is installed.
	Flashing/Orange	Data is being written to the SD card.
	Steady/Orange	SD card is >90% full.
	Steady/Red	SD card is full.
REPORT		Reserved for SMA use.
SYSTEM	Flashing/Red	The Sunny WebBox is starting up.
	Steady/Green	The Sunny WebBox is running.
POWER	Steady/Green	The power supply is connected and correct.

10.3 Event Log Message List

The following list contains messages produced by the Sunny WebBox. These messages are recorded in the Event Log. Included is a description for each message and tips for correcting issues if required. The character “#” is used to indicate a name, quantity, code or device number that will be generated by the WebBox as part of the message.

Message	Description	Tip
WebBox Startup	WebBox has started operation	N/A
Boot-Time (#)	The WebBox boot sequence has completed and took (#) ms to finish.	N/A
WebBox Shutdown	WebBox was shutdown by Operator	N/A
CommPortException detected: (#)	An OS failure associated with the communications ports was detected. The failure message is (#).	Please contact SMA Technical support for further assistance.
Unexpected Exception: (#)	An OS failure not caught somewhere else was detected. The failure message is (#).	Please contact SMA Technical support for further assistance.
IP Address changed by DHCP: (#)	The IP address of the WebBox was changed by a DHCP server to IP address (#)	N/A
Carried out update from version (#) to (#)	An update of the WebBox software was performed from the old version (#) to the new version (#)	N/A
(#) detected	Number of inverters detected (#) during detection routine.	N/A
(#) removed	Number of previously detected inverters (#) removed during last detection routine.	N/A

Message	Description	Tip
PC (#) logged out	PC with IP address (#) has logged out.	N/A
PC (#) logout failed	PC with IP address (#) has failed to log out.	N/A
(#) logged in from PC (#)	Operator level (#) logged into the WebBox interface from a computer with IP address (#).	N/A
Login from PC (#) failed	Operator login from a computer with IP address (#) failed because the password was incorrect.	This could indicate a mistake on the part of the operator or could indicate a hacking attempt.
PC (#) inactivity for 5 min.	Operator was logged out from a computer with IP address (#) because they were idle for 5 minutes.	N/A
User password changed	The Installer has changed the User level password.	N/A
Installer password changed	The Installer has changed the Installer level password.	N/A
Startup Communication (#)(#)(#)	Communication between the WebBox and inverters has begun using com port (#), com system (#), and com method (#).	Com Ports are SMA-COM and Ethernet Com Systems are RS-485, RS-232, and TCP/IP Com methods are SUNNY-NET and SMA-NET
Startup Communication failed (#)(#)(#)	Communications has failed during initialization using com port (#), com system (#), and com method (#).	See above for definitions of (#), (#), and (#). Check to ensure that the options selected for (#), (#), and (#) match the com system you are using for the plant.

Message	Description	Tip
Port (#) changed framing to (#)	The communications port (#) has changed to com method (#)	Please see above for the com port and com method settings.
Device (#):(##) comes online	Inverter of type (#) and serial number (#) has started operating.	N/A
Device (#):(##) goes offline	Inverter of type (#) and serial number (#) has stopped operating.	N/A
Response failure of (#):(##), wrong mask	An inverter of type (#) with serial number (#) failed to respond properly to a data request.	Check the communications link to that inverter.
Response failure of (#):(##), wrong Sync Time	An inverter of type (#) with serial number (#) failed to respond properly to a data request.	Check the communications link to that inverter.
Set Parameter (#):(##) to (#,##)	The Inverter model (#) with serial number (#) has had the parameter (#) set to value (#).	N/A
Set Parameter (#):(##) to (#) failed: (#)	The Inverter model (#) with serial number (#) failed to update the parameter (#) due to reason (#).	Please retry setting the parameter.
End of day, Total Yield: (#) kWh	The previous day has ended and the total yield of the plant was (#) kWh.	N/A
Start Dialing (#)	A WebBox with an internal modem has started to dial an ISP at phone number (#).	N/A
Connection Established	A WebBox with an internal modem has successfully connected to the ISP.	N/A

Message	Description	Tip
Dialup failed: (#)	A WebBox with an internal modem has been unsuccessful when connecting to the ISP at phone number (#).	Please check the phone number for the ISP and ensure that all necessary cables are securely connected.
Connection closed by Watchdog	A WebBox with an internal modem has closed the connection to an ISP due to an internal error.	N/A
Connection closed (total (#) seconds online)	A WebBox with an internal modem has successfully disconnected from an ISP and was connected for (#) seconds.	N/A
Open connection error: (#)	A WebBox with an internal modem has failed to connect to an ISP because of error (#).	N/A
Missing phonenumber	A WebBox with an internal modem has failed to connect to an ISP because the ISP phone number was missing.	Please check the ISP phone number.
Register failed, result: (#)	The WebBox failed to register with the Sunny Portal because of reason (#).	Please ensure that all Sunny Portal connection information is correct.
Sunny-Portal not accessible	The Sunny Portal was not available for connection.	Please check the connection status to the internet for the WebBox. Also please ensure that all Sunny Portal settings are correct.
Update WAN-IP: (#)	The WAN IP address of the WebBox has been updated to IP (#).	N/A

Message	Description	Tip
Update WAN-IP failed: (#)	The WAN IP address of the WebBox has not been updated because of (#).	Please ensure that any routers used to assign the WAN IP address are properly configured and the WebBox is communicating with it.
Upload of (#) Bytes in (#) ms	Data has been uploaded to the Sunny Portal successfully. (#) Bytes has been send in (#) ms.	N/A
Upload failed, result: (#)	An attempt was made to send data to the Sunny Portal, but if failed due to (#).	Please check the connection path to the Sunny Portal.
Download of (#) offset (#) succeeded ((#) Bytes in (#) ms)	The WebBox has downloaded file (#), (#). The download was (#) Bytes in size and took (#) ms.	N/A
Download of (#) failed	The WebBox has failed to download the file (#).	Please check the connection path to the Sunny Portal.
Daily Traffic: Upload (#) Bytes, Download (#) Bytes	At the end of the day a total of (#) Bytes has been sent to the Sunny Portal, and a total of (#) Bytes has been received by the WebBox.	N/A
File Not Found (#)	The file (#) being requested by the WebBox was not found.	Please check the file name and connection path.
Memory Card detected (Capacity, (#) MB, free (#) MB)	An external memory storage device was detected. The total capacity is (#) MB and it has (#) MB free.	N/A
Memory Card removed	A detected external memory storage device was removed from the WebBox.	N/A

Message	Description	Tip
<p>Memory Card low memory (Capacity (#) MB, free (#) MB)</p>	<p>An external memory storage device with a capacity of (#) is nearly full, but has (#) MB of space remaining.</p>	<p>Please remove some or all of the currently stored information or replace the external memory storage with an empty device.</p>
<p>Memory Card out of space (Capacity (#) MB, free (#) MB)</p>	<p>An external memory storage device with a capacity of (#) is full and has (#) MB of free space remaining.</p>	<p>Please remove some or all of the currently stored information or replace the external memory storage with an empty device. No new data can be stored to the device until this is accomplished.</p>
<p>Memory Card locked</p>	<p>The WebBox cannot write to the external memory storage device because it is locked.</p>	<p>Please unlock the external memory storage device so that the WebBox can write data to it.</p>
<p>Memory Card has unknown format</p>	<p>The external memory storage device has a file format that is unusable by the WebBox.</p>	<p>Please format the external memory storage device for FAT or FAT32 memory system.</p>

11 Ethernet Guide

11.1 Information on IP Addresses

A brief overview on IP addresses is provided here. For further information, please consult your specialized computer dealer or visit the web site of the manufacturer of your network devices.

IP addresses are unique identifiers, which allow a computer or similar devices to be identified within an Ethernet network. This means that no IP addresses can be used twice in an Ethernet network.

An example of an IP address written in decimals is 192.168.1.8.

Each number can be between 0 and 255; however, there are some restrictions. For example, 0 is not permitted as the first number and the fourth number may not be 0 or 255.

The Internet service provider (ISP) assigns the computer or router such an IP address when the device is connected to the Internet.

Since each IP address may only occur once in the network, this would present difficulties in large-scale networks. Therefore, you can create small-scale networks, which do not conflict with the IP address range of the Internet.

To do so, the IP address is extended by a subnet mask. The IP address still indicates the device and the subnet mask determines the size of the network. Similar to the IP address, the subnet mask also has four numbers; however, each number is usually either 255 or 0. The network range is indicated by 255 and the device range is indicated by 0. To allow two devices to communicate with each other, they must be in the same subnet. This means they must have the same subnet mask.

The Sunny WebBox IP address belongs to one of the IP address ranges, which does not conflict with the Internet. This IP address range lies between 192.168.0.1 and 192.168.0.254 and has the subnet mask 255.255.255.0. This IP address range provides sufficient capacity for 254 computers and similar devices.

11.2 Ethernet Networks

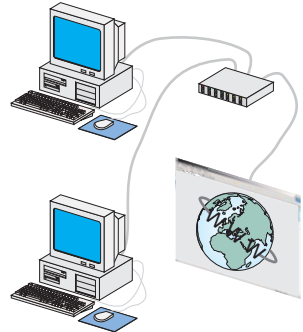
A brief overview on Ethernet networks is provided here. For further information, please consult your specialized computer dealer or visit the web site of the manufacturer of your network devices.

Ethernet networks are currently the most common computer networks and consist of the following components:

1. Computers and similar end devices, for example
 - Computers
 - Sunny WebBox
 - Printers
2. Connecting devices, for example
 - Hubs, switches
 - Routers

All devices within one network are called nodes. A node can be a computer or any other device. A small-scale network consists of one or two computers and a hub or router.

A hub is used to link computers. A router has another connection, which can connect the LAN network with another network type, for example the Internet. In addition to the router, you also require an Internet service provider (ISP), which provides technical access to the Internet.



If you would like to setup an Ethernet network, note the points below:

- Each computer and each device in the network require an Ethernet connection
- The maximum cable length is 100 meters
- Use a category 5 (CAT5 STP) shielded cable or higher

12 Care and Maintenance

To clean your Sunny WebBox, use a mild, non-corrosive cleaning agent or a damp cloth. Make sure that the cloth is made of scratch-free material so the surface of the Sunny WebBox will not be damaged.

Place the Sunny WebBox in a location where damage to the cables or connectors will be unlikely.

13 Contact Information

If you have any questions or queries, please contact us. A large team of qualified engineers and technicians is available during business hours.

Help us to help you by having the following information ready when you call us:

- Type of inverters and serial numbers
- Type of the connected modules or batteries
- Type of communication interface between Sunny WebBox and the inverters
- Sunny WebBox serial number

13.1 Packaging for Shipment

If returning the device to us, be sure to use packaging, which adequately protects the device from damage during transport (if possible, use the original packing).

13.2 Disposal

Please dispose of the Sunny WebBox at an authorized disposal company or e-waste recycling center.



Address:

SMA America, Inc.
12438 Loma Rica Drive
Grass Valley, CA
95945

Tel. 530.273.4895

Fax 530.274.7271

www.sma-america.com

14 Specifications and Documentation

Interfaces

SMACOM	RS485 (up to 50 inverters, max. 3600 ft. (1,200 m) cable)
Ethernet	10Mb / 100Mb auto sensing

Data Storage

Internal	8 MB archiving memory
External	SD memory card, 16 MB upwards USB memory stick, USB 2.0 host

Dimensions

Size	8.85 x 5.11 x 2.24 in. (width x height x depth)
Weight	1.65 lbs.

Power Requirements

Wall Transformer	Type 300 mA @ 12 V Max. 1 A @ 12 V
Power Consumption	Max 12W

Ambient Temperature Rating

Ambient temperature range	0°C to 55°C
Relative air humidity	5% to 95%, non-condensing

Miscellaneous

Operating System	Windows CE NET
Status Display	7 LEDs
Mounting Options	Wall mount, DIN rail mount, desktop

Options

Integrated analog modem

14.1 CE Declaration of Conformity

CE Declaration of Conformity



for data recording equipments

Product: Sunny WebBox

We declare that the above specified device is compliant with the regulations of the European Community, in terms of the design and the version fabricated by SMA. This especially applies for the EMC Regulation defined in 89/336/EWG and the low voltage regulation defined in 73/23/EWG.

The device is compliant with the following standards:

Immunity:	DIN EN 61000-6-1
	DIN EN 61000-6-2
Utility Interference	DIN EN 61000-6-3
	DIN EN 61000-6-4
Device Safety:	DIN EN 60950-1

The above mentioned device is therefore marked with a CE sign.

Niestetal, 09th. of May 2005

SMA Technologie AG

Peter Drews
(Member of the Board)

SMA Technologie AG

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WebBox-CE11-DE1905

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- 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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Solar Today...
Energy Tomorrow

