

Corporate Headquarters

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School Power...Naturally Troubleshooting Guide

A Non-Technical Guide to Troubleshooting System Operation and the Heliotronics Data Acquisition System (DAS)

For Further Technical Assistance, Please Contact

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1. Check SunServer™ Designated Computer

A. Check indicator lights on the SunServer™ computer display.

1. If the "Receiving Data" light on the SunServerTM Status display is green and it says "yes", that means the computer is communicating properly with the data logger. If the light is Red, close the SunServer application and reboot the computer. To close SunServerTM, click on the *SunServer Administrator* button and then type a lower case z in the text box. If the light has not turned green, go to Step 1D.



SunServerTM Status display.

2. If "Internet Status" light is green, there is a connection to the internet present and the system is able to upload data to the NYSERDA database. If the light is Red, close the SunServer application and reboot the computer. Then relaunch the SunServer application and wait 15 minutes for connection to the internet. If red light stays on after 15 minutes, go to step 1E.

B. Check Status of data on the NYSERDA Internet Database

- 1. Go to http://www.sunviewer.net/portals/NYSERDA_SPN/ and find the data output for your school. Select the previous "day" and look at "Daily Data" and select the "power" button. If the DAS system was reporting, there is a red line shown on the graph. If there is no line present, the DAS system was not uploading data to the internet on that day. Go to step 1E.
- 2. If the power graph is a changing line showing different levels of kW output, then the PV system is working. If the line is horizontal and running at 0, then the DAS

system was reporting to the internet but the PV system was not producing power. This lack of production may be because of weather (snow covering panels, or no sunlight present), or the inverter may have shutdown due to a fault. Go to Step 3, "Check Inverter & Switchgear".

C. Check "Monitoring Center"

- 1. Does speedometer show PV output when the Sun is shining? If zero is shown on a sunny day, check inverter for proper operation (Step #3).
- 2. Are the other sensors showing measurements? If not, check sensors by PV array and cabling.

D. Check RS422 communication adapter

1. The RS422 Communication Adapter (R422CA) connects to an RS232 serial communication plug that attaches to the back of the SunServer computer.



Check to see that:

- A. On the R422CA there are 3 LEDs. The yellow LED should be on all the time, indicating that power is being received. If the yellow light is off:
 - i. Confirm that the R422CA power supply is plugged in.
 - ii. Confirm that the wire from the power R422CA power supply is properly connected to the R422CA unit.
 - iii. Confirm that there is power to the outlet by plugging something else in and testing that it works.

- iv. If i., ii., and iii. do not cause the yellow light to turn on it is likely that your power supply has gone bad. Contact Bill Peruzzi at billperuz@aol.com to arrange a replacement.
- B. If the yellow LED is on, then check that the unit is communicating properly with the data monitor. The red and green lights will blink indicating that data is being sent and received. If the red and green lights are NOT blinking, then perhaps the wiring from the RS422 adapter to the datalogger has been damaged, or the datalogger is not receiving power.
- C. The RS422 communications adapter is plugged into the serial port on the computer. The COM Port is a 9-pin connector like that shown. More recent computers have an adaptor that plugs into the USB port at one end and the other end has a 9 pin connector like that shown in the photo.



- D. the Com Port number shows #1 on the SunServer startup screen.
- E. Confirm that the wires from the data logger are correctly connected to the RS422CA.

The connections are as follows:

Data Logger		RS422CA
R+	connects to	T+
R-	connects to	T-
T+	connects to	R+
Т-	connects to	R-

Notice that the R's to the T's and the T's go to the R's. T stands for Transmit and R stands for Receive.

F. If none of the above gets the lights blinking, then there may be a problem with the data logger. Go to step #2

E. Check Network, Software, & Firewall settings

- 1. The dedicated computer running SunServerTM should have either of the two following operating systems:
 - Windows 2000 with Service Pack 4 or higher,
 - Windows XP with Service Pack 2 or higher.

SunServer runs only on these platforms and cannot run on Windows 98 or Apple OS.

- 2. Is SunServer set as an "exception" in the Windows Firewall exception list? Go to Control Panel and the Windows Firewall to see that exception is set.
- 3. Can you access internet with Microsoft Explorer? If not confer with your IT person to get the computer Internet access.
- 4. Launch the Administration Console in SunServer using the password "Zapotec" (case sensitive needing a capital Z). Select InternetConfig from the menu. An orange dialog box will come up that allows you to configure internet settings.

URL is http://www.sunviewer.net/cgi-bin/catcher.cgi

Your user name, password, and site ID are found on the last page of the SunServer Manual. If you don't have this manual, please contact Bill Peruzzi. Make sure "enable thrower" is checked. If any settings are changed, make sure to click "*Update the Configuration*" button and reboot the computer.

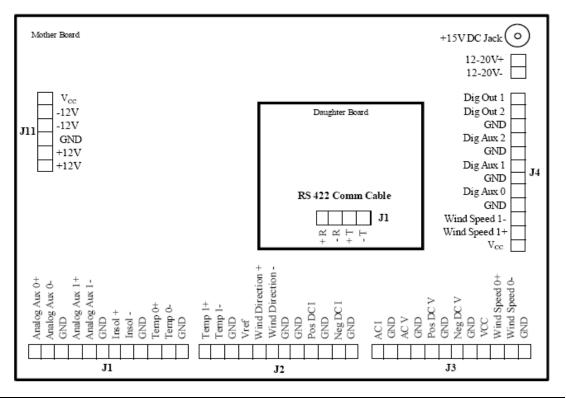
5. Look in the c:\program files\Heliotronics\SunServer directory for a file called thrower.dat . If it is there rename it to thrower9.dat . If there is no Thrower.dat file in the directory that is fine.

2. Check Data Acquisition Unit

The Data Acquisition System (DAS) unit is mounted on the inverter/switchgear board next to the kWh meter. This unit is usually located in the main electrical room or an electrical closet.

- 1. Check that the DAS unit is receiving AC power:
 - A. Is the power cube for the DAS plugged into the outlet on the electrical board?
 - B. Verify that there is power to the outlet by testing using a light or voltage tester. If there is no power, reset the circuit breaker for that outlet.
- 2. Remove cover from DAS unit and confirm that all wires are connected to terminals.
- 3. Troubleshooting the inside of the DAS unit only should be conducted by qualified technicians. Refer as needed to the Heliotronics DAS Installation Manual provided with your system, which is also available as a PDF on the SunServer software CD.

Appendix B: Data Monitor Terminal Map - RS 422



3. Check Inverter and Switchgear

If system shows no output on a sunny day, go to the inverter which usually is located in the electrical room or closet.

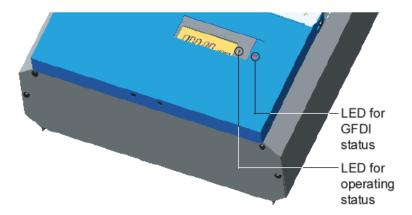
1. On systems with SMA Sunny Boy inverter, see what the indicator lights show. Consult the chart on the following page and the operator's manual. Report any fault codes to Solar Works through Bill Peruzzi at billperuz@aol.com.

LED indicator		Operating condition	Description
green: red: yellow:	⊗ ⊗ ⊗	standby (night)	input voltage < 120 V
green: red: yellow:	•	initialization	input voltage: 120 V 240 V
green: red: yellow:	€ ⊗ ⊗	stop	changing operating condition or manually initi- ated condition
green: red: yellow:	●⊗⊗	waiting, checking grid	starting conditions are being checked
green: red: yellow:	⊗⊗	feeding grid MPP or constant voltage mode	normal operation
green: red: yellow:		derating mode	Reduction of power fed to the grid due to in- creased temperature of the heat sink
green: red: yellow:	O •	insulation failure	ground fault of the PV-panels see chapter 4.2
green: red: yellow:	0	failure	GFDI fuse is defective see chapter 4.2
green: red: yellow:	0	failure	internal or external failure, exact description depending on blink code see chapter 4.3
green: red: yellow:	⊗ ⊗ ●	Consistent Failure	A failure of the utility has occurred

Table 4.1: Operation indication overview

2. On a system using Fronius IG2500 inverters, what do the indicator lights (2) and the LCD screen show? Consult the chart below and the operator's manual as needed.

LED for operating status



Depending on the operating status, the LED assumes different colors

(1) LED lights up green:

- a green light starts as soon as the FRONIUS IG unit has completed the startup phase, and stays green as long as the operation of feeding power into the grid continues
- it indicates faultless operation of the photovoltaic equipment

(2) LED flashes green:

- as long as the photovoltaic equipment is operating without fault
- an additional message is displayed on the screen



 Note! A service code may appear, for example, if there is a fault in the DatCom system. That does not affect the function of the FRONIUS IG. However, it is recommended that the fault is remedied as soon as possible.