SolrenView™
Web-Based Monitoring

SolrenView Indoor (residential)
SolrenView LCD (external)

INSTALLATION AND OPERATION GUIDE

Revision C

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For more help and inquiries, please contact Solectria Renewables (see Appendix B – Contact Information).

1.0 DATA MONITORING SYSTEM OVERVIEW

SolrenView™ monitoring is a state-of-the-art data acquisition system (DAS) and is designed to interpret the signals from Solectria Renewables inverters and/or revenue grade metering system and send the information to the Solectria Renewables server for display on the internet (http://www.solrenview.com/). This is a subscription service for a period of 3 or 5 years, renewable at prevailing rates. Data is saved to Solectria Renewable servers for the life of the subscription plan, and the inverters history may be viewed or downloaded in CSV format to export to excel for the site owner to chart. The SolrenView DAS collects real-time data samples from inverters and pulse meters at 1-minute intervals. The data is then sent over the Internet to the SolrenView server when a connection can be established. Data samples received by the server are retrieved by the web server whenever a user queries the information with a browser.

This manual is written for external mounted SolrenView DAS units only; for commercial inverters 10kW and larger with built in display panels. Please review the inverter manual for installation and connection details.

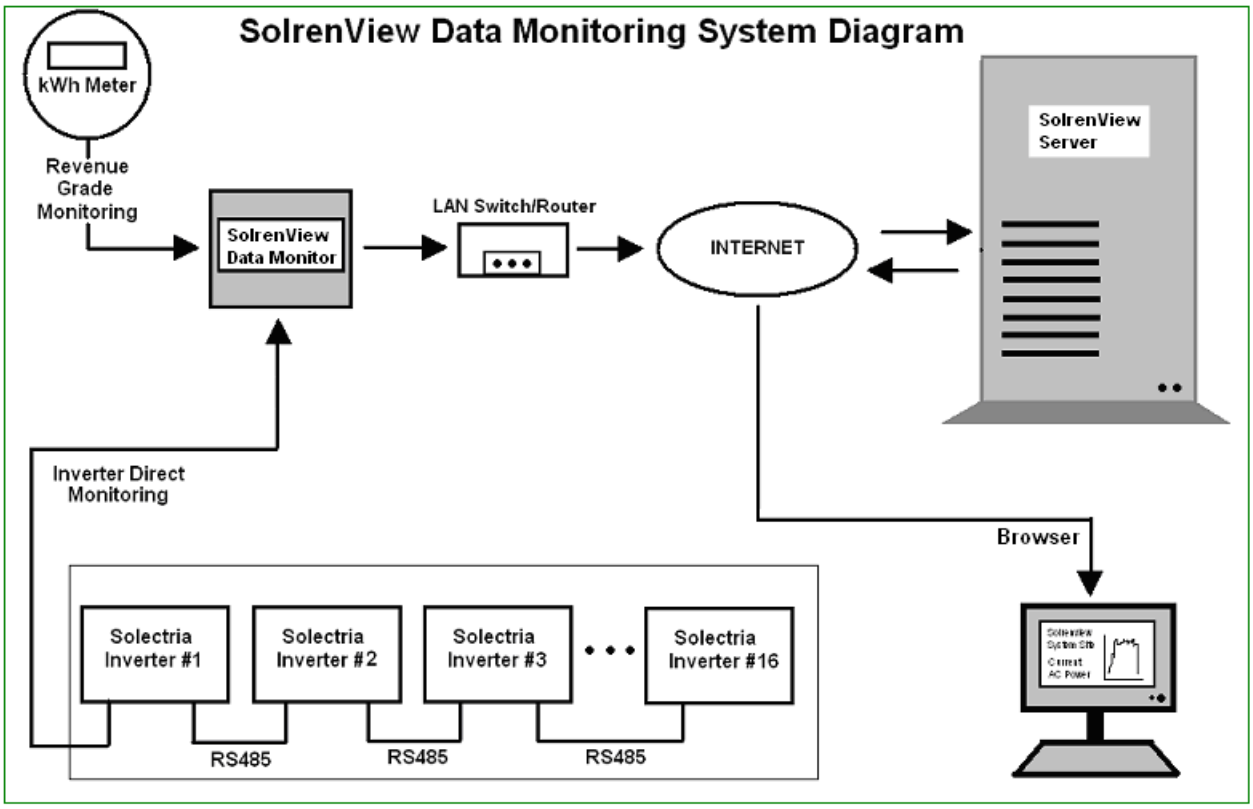


Figure 1.1 SolrenView over view

2.0 MONITORING OPTIONS

2.1 Revenue Grade Monitoring

The SolrenView DAS is connected to the pulse output of a KYZ meter or RS485 from a Veris meter (CT). The DAS keeps count of the meter-triggered pulses to provide the cumulative kWh value. Solectria Renewables may also report the revenue grade totals to certain agencies for net metering reimbursement; this is an additional *option* if a customer chooses. Any brand of inverter can provide revenue grade metering.

2.2 Inverter Direct Monitoring

The SolrenView DAS is directly connected to the RS485 line of one Solectria Renewables inverter. 15 additional Solectria Renewables inverters can be connected to the line with 'daisy-chain' cables. Each device connected must have a unique ID number between 1 and 16. In the example on the next page, inverter PV#1 is directly connected to the monitor, while subsequent inverters (PV#2 onwards) are connected in series to each other. Inverters 10kW and larger with built-in display units cannot be daisy-chained. Please refer to the inverter manual for instructions.

2.3 Weather Station

The real-time weather package allows a customer to use an internet connection to retrieve information about the operation of their PV system via www.solrenview.com. The crucial environmental information provided with this *option* is: irradiance, ambient temperature, module temperature, wind speed and wind direction. Please refer to the weather station manual for details about this product.

2.4 Kiosk View

The web view is enabled with flash to be shown on a local monitor, usually in a lobby or classroom. This will scroll through several different photos and site information (provided by the customer) and includes a short tutorial about solar. This *option* is available with either revenue grade or Inverter Direct monitoring package.

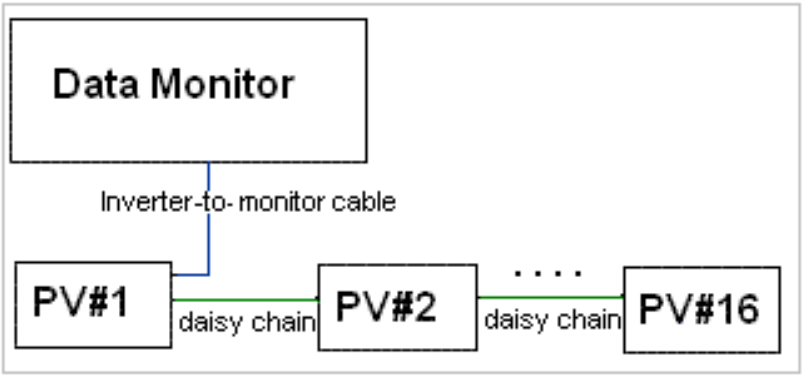


Figure 1.2 Inverter connections

A 6-foot inverter to SolrenView cable will be provided, as well as the inverter to inverter 'daisy-chain' cables to link two neighboring inverters together.

3.0 ORDERING INFORMATION

The SolrenView monitoring DAS is normally ordered through the solar system installer or distribution agent. Please contact one of our distributors for current pricing structure (please see: http://www.solren.com/distributors.html for a list of distributors). Monitoring contract renewals can be purchased directly from Solectria Renewables.

Solectria Renewables must program the SolrenView DAS for each installation. A site survey form must be completed and returned to Solectria Renewables prior to the shipment of the equipment (see Appendix C – SolrenView™ Site Survey).

The SolrenView DAS will ship with the electronic receiving and sending unit, power cable, cable from the unit to 1 inverter and if multiple inverters are monitoring daisy-chain cables for interconnections. For outdoor installations, weatherproof housing is required (this is optional if indoor installation).

4.0 SYSTEM REQUIREMENTS

To send the information to Solectria Renewables server, the SolrenView DAS requires a high speed internet connection. A CAT5 Ethernet cable connects the DAS to a router or other LAN device capable of providing an IP address. The WAN connects to an internet equipped device.

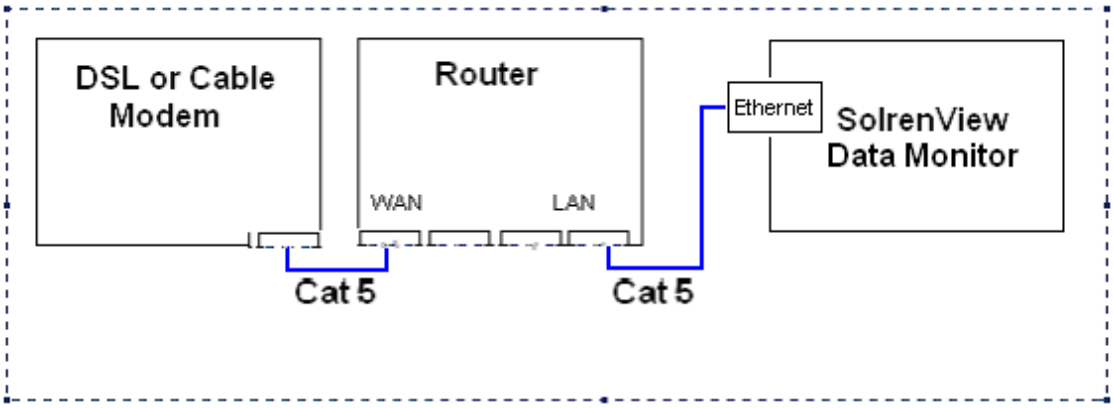


Figure 2.1 LAN configuration

4.1 Wire/Cable Lengths

The total wiring distance between two final endpoints of a network must not exceed 100 meters (328 ft). This rule applies to both the Ethernet (wire length from DAS to router/switch/modem) and RS485 (wire length from DAS to the last inverter of a daisy-chain) networks. The wires from the KYZ meter pulse outputs to the data monitor must not exceed 100 ft.

4.2 Site Preparation

The SolrenView DAS is designed for wall mounting and should be installed in an indoor location close to the inverter(s). A standard 120VAC outlet for the DAS power supply is required the power supply cable is 6 feet. For outdoor installations, weatherproof housing is required (this is optional if indoor installation).

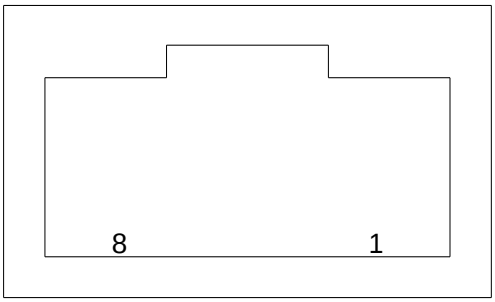
5.0 INSTALLING SOLRENVIEW

It is recommended to install the SolrenView DAS module and attach all wiring prior to applying the power to the DAS.

5.1 Inverter Direct Connections

For one inverter, connect the RJ45 connector to the appropriate port inverter and the bare wire connections labeled A and B to the RS485A and RS485B connections on the SolrenView DAS.

For Inverter Models PVI1800 and PVI2500, the brown wire is to the RS485A and the Brown/white wire is to RS485B. For the PVI3000, PVI4000, PVI5000 and PVI 5300, the brown wire is the RS485A and the green wire is the RS485B.



Pin	
1	Not used
2	RXD (RS232)
3	TXD (RS232)
4	GND (RS232/RS485)
5	TERM (RS485)
6	RX_B (RS485)
7	TX_A (RS485)
8	Not used

Figure 4.1 PVI1800 and PVI2500 RS485 connections

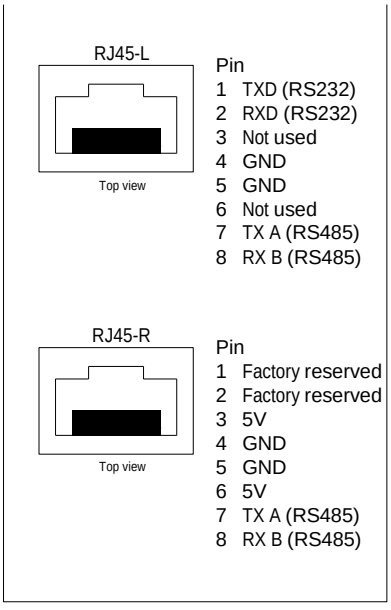


Figure 4.2 PVI3000 through PVI5300 RS485 connections

5.2 Connecting multiple inverters

Multiple inverters are connected from one to another using the cables supplied. If the distances between the inverters are greater than the standard cables, CAT5 cables may be used. If mixing PVI1800 or PVI2500 with any PVI3000-PVI5300, a hybrid cable must be used as the pin configurations are different. Up to 16 inverters may be connected to one SolrenView DAS. Each inverter must have a unique ID number between 1 and 16. If you received inverters with the same ID numbers, please contact Solectria Renewables for assistance (see Appendix B – Contact Information).

5.3 Revenue Grade Monitoring

A pulse type revenue grade meter is installed into the AC wiring between the inverter and the grid (please follow applicable codes). The following meters have been configured for use with the SolrenView DAS:

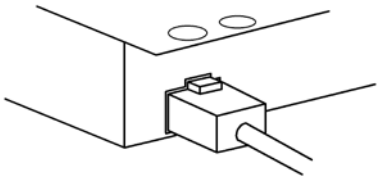
- For 3 phase AC service GE KV2c meter
- For single phase AC service the ABB FM2S

When installing the pulse meter, verify the inverter(s) AC line is wired to the top lugs (line) of the meter base and the building/utility is wired to the bottom lugs (load) of the meter base to enable correct forward counting. Connect pulse output of KYZ meter to the DAS. The Red wire to **'K',** Yellow wire to **'Y1',** in some instance the Black to **'Z1'** to the terminal blocks on the SolrenView DAS. Extend pulse wires up to 100'as needed.

The Veris meter "current transducer" (CT's) is installed on 3-phase AC service. Connect to the DAS using the RS485 connections with the + from the meter to the RS485A and the – from the meter to the RS485B.

5.4 Ethernet Connection

With the SolrenView DAS installed and the inverter and/or revenue grade meter attached, the Ethernet cable can be attached to the Ethernet port. The SolrenView DAS can now have the power applied using the supplied AC adapter. The SolrenView DAS will perform a self test and can be verified by the power light, server light and device light all turn on and off twice. Once there is network activity, the LED's near the Ethernet port on the data monitor will blink.



Note: Blinking of the LEDs on the Ethernet port (green, orange) only indicates the existence of a physical connection. This does not guarantee that a successful outbound network connection if the logical IP configuration (DHCP or LAN gateway, etc) has not been configured properly.

6.0 SOLRENVIEW OPERATION

6.1 Device Sensing

When power is applied to the SolrenView DAS, the unit will poll the connected devices for information once per minute. This can be verified as the device light will blink once per device every 60 seconds. For example, if there are 2 inverters, the device light will blink twice each minute. If there are 3 inverters and one revenue grade meter, the device light will blink 4 times. While the inverters are off they will not be recognized by the SolrenView DAS.

6.2 Internet connection

Following the device light blink indicating collecting the information from the devices, the server light will blink once to indicate the information has been sent to the internet for transmission to the Solectria Renewables server. If the server light does not blink, this is an indication the DAS does not have access to the internet (see troubleshooting).

7.0 WEB VIEW

Using any web enabled device the SolrenView site can be viewed via a direct a browser to: http://www.solrenview.com. Click on 'Live Sites' at the top of the page and a list of public system sites will be displayed sorted by installer. If your site isn't listed yet, please call to check Solectria Renewables (see Appendix B) on the status of your site's availability.

7.1 Web page information

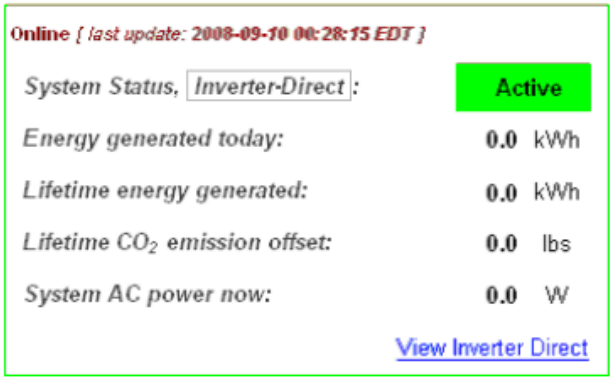
Solectria Renewables designates several status indications as a quick visual for the site:

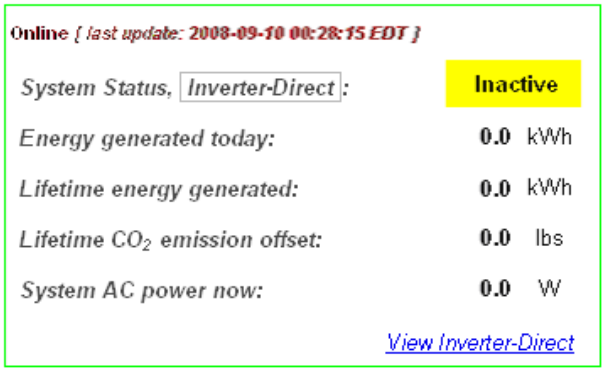
Status Indications

Active	System is active (inverter/meter communicating)
Asleep	System is not currently active, ie at night or during low sunlight levels
Inactive	System has been asleep for almost a day
Offline	System is not currently connected to the SolrenView server

During normal daylight hours the status indication should be green and "active" The top line indicates the DAS is online and the last update time stamp. The server will update the view every 15 minutes. For kiosk view, the server will update at each full cycle.

Example of system status'

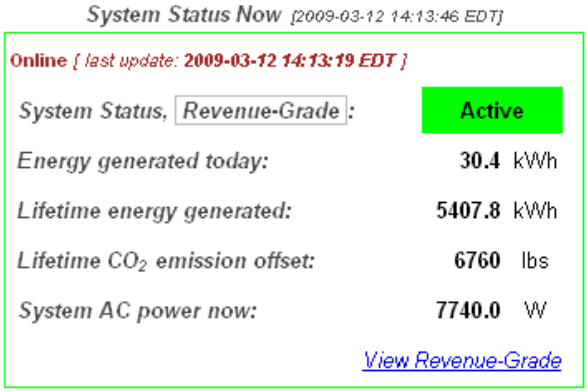




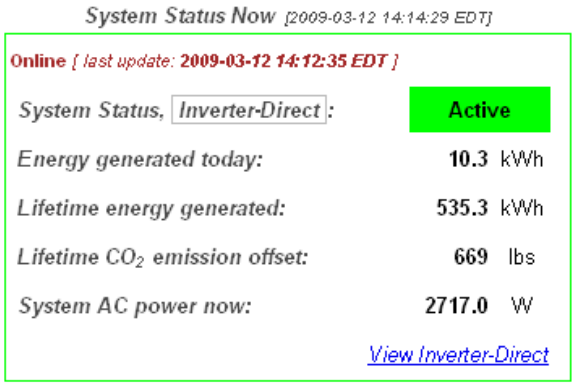
An inactive status indication is the result of the inverter(s) not communicating or the revenue grade meter not communicating.

7.2 Inverter Direct and Revenue Grade Displays

On the summary page, if Revenue Grade monitoring is selected as an option, the data shown under 'Current System Status' is calculated from the Revenue Grade meter.



If Revenue Grade monitoring is not selected, the system summary data is calculated from Inverter Direct data instead.



7.3 Inverter and Revenue Grade history data

To view logged data history, click on 'View Inverter Direct' or 'View Revenue Grade' link. The data log navigator is on the top left of the page.

The day mode (default) will show the current day view. To move back one day select the single back arrow < to go back to the first day select the double back arrow <<. To return to the current day, select the forward arrow > or double forward arrow >>. By selecting week or month, the view will change accordingly. The back and forward arrows will step back either one week at each selection or one month.

On the top right, a list of data values can be selected for viewing.

8.0 ALARM/EVENT NOTIFICATIONS

To be notified of system-related events, be sure to specify an e-mail address under the site survey/PO checklist. To get notification through SMS, the 10-digit phone number and service provider must be provided. For example: 978-123-1234 (T-Mobile)

Table of Supported Events:

Alarm/Event	DAS Unit	PVI1800-2500	PVI3000-5300	PVI13/15kW	PVI60/82/95kW	Description	Clears when	Severity Levels	Action Recommended
System- Offline	x					Data monitor not communicating to server	Network communication resumes	Informative	Check ethernet connection to DAS, power supply, router. Reboot the DAS
System- Inactive	x					Inverters, meters not communicating to Data Monitor	Devices communicate again	Informative	The inverter(s) may be off, check wiring to DAS
Inverter- Inactive		x	x	x	x	Inverter not communicating, triggered if 'System-Inactive' isn't	Inverter communicates	Informative	The inverter(s) may be off, check wiring to DAS
Inverter- Fan Life reached				x	x	Fan hours>40000; Trigger bit set by inverter	Inverter trigger bit clears	Warning	Replace fan
Inverter- MOV Fault			x	x	x	MOV Fault; Trigger bit set by inverter	Inverter trigger bit clears	Warning	The inverter may have had a high voltage event. MOV may need replacement
Inverter- AC Voltage Too High		x	x	x	x	AC Voltage Too High; Trigger bit set by inverter	Inverter trigger bit clears	Informative	Verify the grid conditions
Inverter- AC Voltage Too Low		x	x	x	x	AC Voltage Too Low; Trigger bit set by inverter	Inverter trigger bit clears	Informative	Verify the grid conditions
Inverter- AC Frequency Too High		x	x	x	x	AC Frequency Too High; Trigger bit set by inverter	Inverter trigger bit clears	Informative	Verify the grid conditions
Inverter- AC Frequency Too Low		x	x	x	x	AC Frequency Too Low; Trigger bit set by inverter	Inverter trigger bit clears	Informative	Verify the grid conditions
Inverter- Ground Fault		x	x	x	x	Ground Fault; Trigger bit set by inverter	Inverter trigger bit clears	Critical	Check the array for ground fault
Inverter- DC Voltage Too High		x	x	x	x	DC Voltage Too High; Trigger bit set by inverter	Inverter trigger bit clears	Critical	Remove DC voltage from inverter
Inverter- Hardware Error		x	x	x	x	Hardware Error; Trigger bit set by inverter	Inverter trigger bit clears	Critical	Contact Solectria Renewables

9.0 TROUBLESHOOTING

Fault Condition	Possible Cause	Possible Solutions
No power light	No power to the DAS	1. Verify power cable is plugged in to an outlet. 2. Verify the outlet has proper voltage. 3. Check VDC voltage at the DAS, If not present replace the power cable. 4. Replace the DAS. 5. Contact Solectria Renewables.
Device light not flashing	The DAS is not detecting any devices	1. If Inverter Direct, verify inverter connections to RS485 A and B. 2. Verify the inverter ID number is between 1 and 16. 3. If multiple inverters installed, verify the ID numbers are not duplicated. Check daisy-chain cables. 4. If revenue grade option, verify the pulse meter is connected to Y1 and K, CT meter to RS485 A and B.
Server light not flashing	The DAS is not sending to the internet	1. The DAS is not receiving an IP address from the router. 2. The CAT5 Ethernet cable is not attached or defective. 3. The router is not allowing the DAS traffic through. 4. A firewall is blocking the outgoing port. 5. There is an IP address conflict.

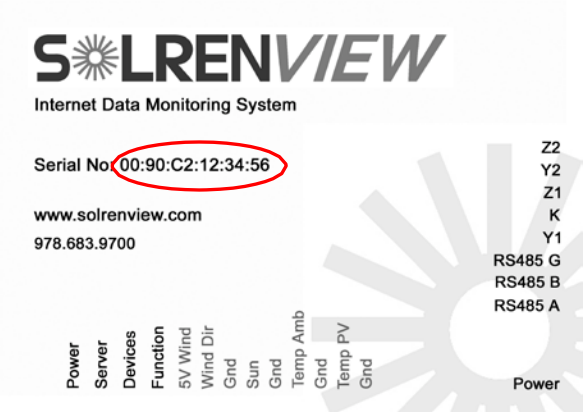
9.1 Server Light not Flashing

If the SolrenView DAS is not connecting to the internet, verify the "server" light is flashing at least once per minute. If not flashing and the SolrenView is configured with DHCP "dynamic host configuration protocol", it may have temporarily lost the connection and has selected the "fall back" IP address of 192.168.1.11, and this IP address is not compatible with your LAN. Using a browser window, enter the LAN IP address to see if the router can communicate with the DAS. The Ethernet cable must be attached prior to powering up the DAS.

If available, use a DHCP-enabled router or temporarily enable DHCP on an existing router to find the IP address of the data monitor by following these steps:

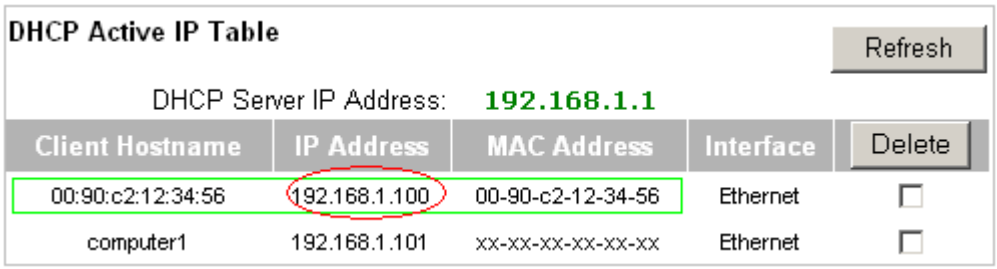
9.2 Find the LAN IP address of the SolrenView Data Monitor

Access and view the DHCP client list of your local DHCP server. Refer to your network admin and/or router manual for help. If the DHCP server is your router, open a web page to the router, usually http://192.168.1.1 to find the DHCP client list. The serial number of the SolrenView DAS is the MAC address. Locate this number to compare with the DHCP client list. The MAC address format is 00:90:c2:XX-XX-XX.



The IP address of the data monitor should be displayed in the client entry.

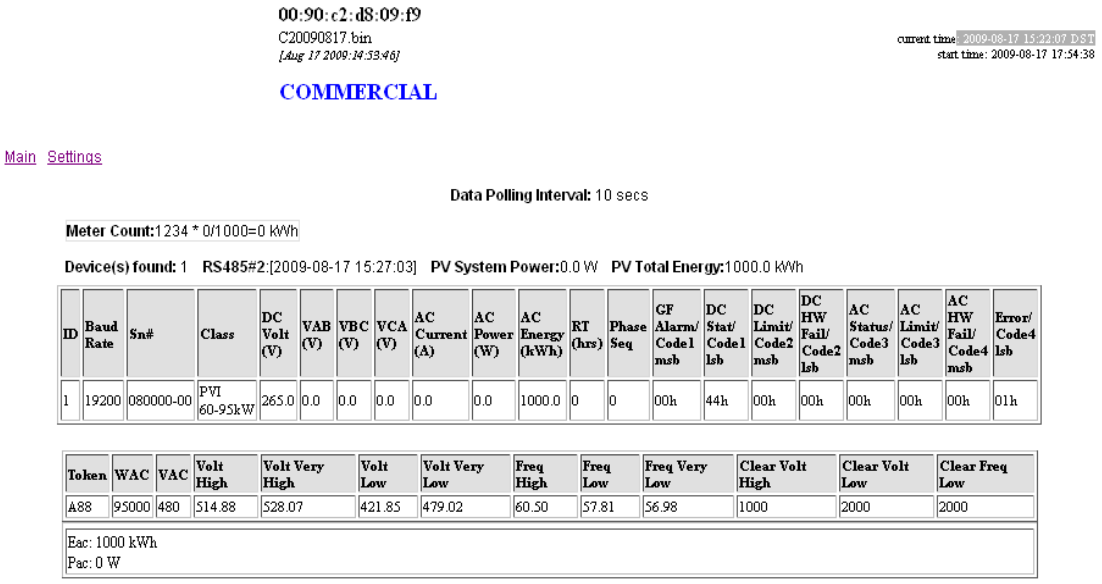
Example DHCP client list



If the DHCP router drops the SolrenView DAS, or if there are address conflicts, it is recommended to set the DAS to a Static or fixed IP address. This can only be accomplished if you have the current LAN IP address and have a computer connected to the same network.

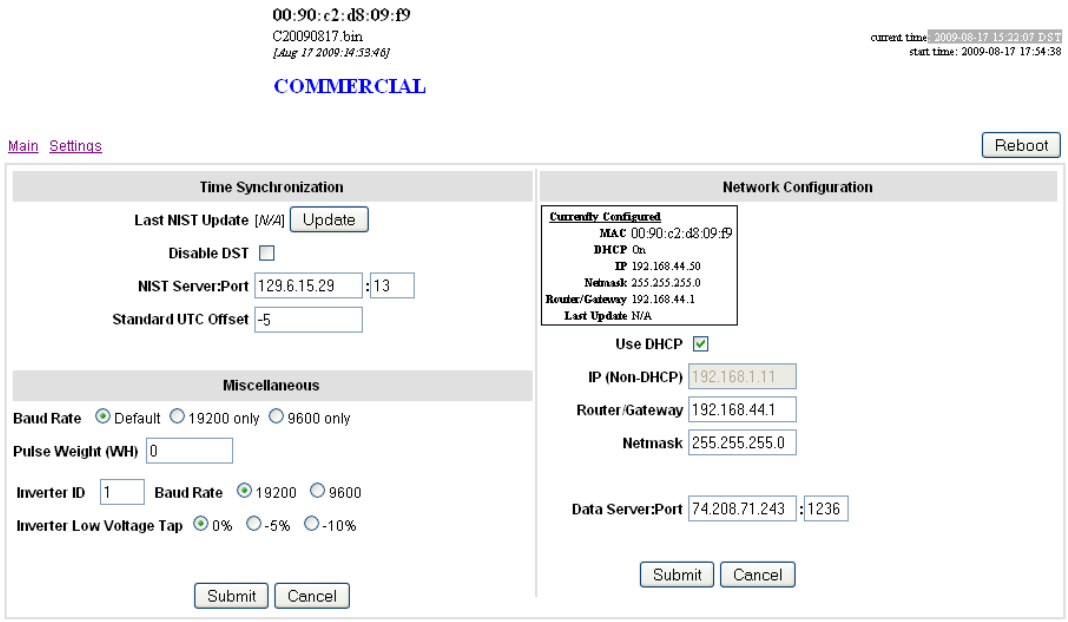
9.3 Setting a Static LAN IP Address

SolrenView DAS units shipping DCHP enabled have a *"fall back" IP address* of **192.168.1.11** and a *subnet mask* of **255.255.255.0**, the *default gateway* is **0.0.0.0** in the event that DHCP fails during start-up. Use a switch, hub, router, and/or crossover cable to connect to this IP address via a web browser in order to reconfigure its IP settings. After entering the IP address, click on the settings tab.

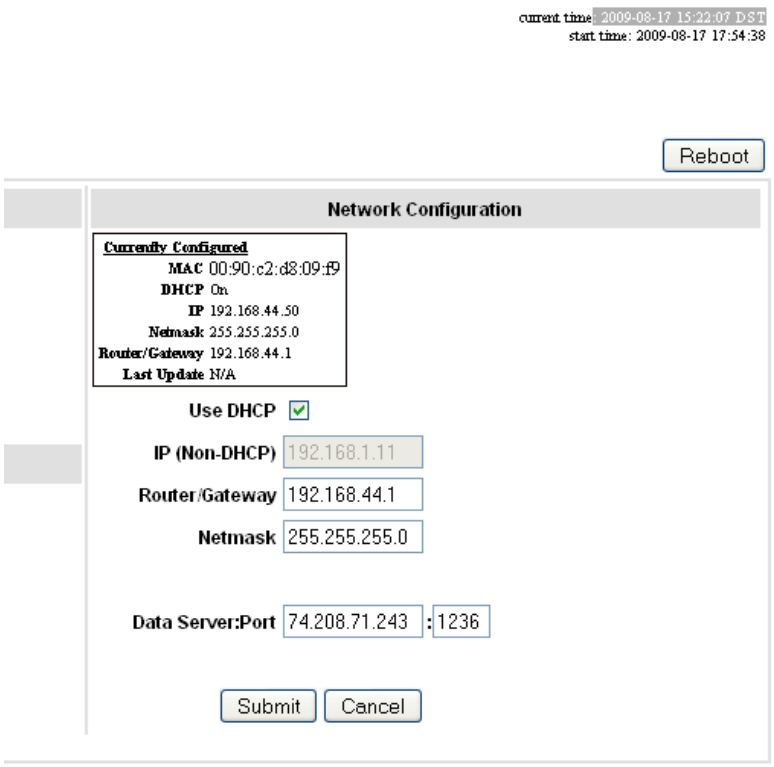


Browser window DAS view

1. Click the settings tab to open the page for setting the static IP address.



2. Un-check the Use DHCP box.



3. Enter the LAN IP address, router gateway and netmask. Make sure these numbers match the exact numbers for the server or router LAN. If they are not correct the DAS will not connect to the internet.

4. Press submit at the bottom of the page. If the IP address is different from the address typed into the browser window, it will not reopen. To verify the settings, please type the new static IP address into the browser window.

5. Verify the server light flashes at least once per minute.

10.0 Product Warranty and RMA Policy

The current warranty and RMA statement for the product is available online at http://www.solectria.com/support/documentation/warranty-information/grid-tied-inverter-warranty-letter/ . If you do not have access to the internet or to request a copy to be mailed to you, please contact our Technical Service department 978-683-9700 x 2.

11.0 APPENDICES

Appendix A – SolrenView Data Sheet
https://solectria.com/support/documentation/solrenview-datasheets/solrenview-web-based-monitoring/

Appendix B – String Sizing Tool
https://solectria.com/support/string-sizing-tool/

Appendix C – Contact Information
Yaskawa – Solectria Solar
360 Merrimack Street
Building 9, Floor 2
Lawrence, Massachusetts 01843
USA

Tel:	978.683.9700
Fax:	978.683.9702
Sales/General Info:	inverters@solectria.com
Technical Support & Service:	978-683-9700 x2
Website:	www.solectria.com

Appendix D – Authorized Distributors
https://solectria.com/pv-inverters/how-to-buy/

Appendix E – SolrenView™ Site Survey
In order to have enough information to customize a web site and enable data monitoring, the site survey must be filled and turned in *before the data monitor is shipped*. The site survey may be downloaded here: SolrenView Site Survey Please submit the survey with the purchase order for the SolrenView monitoring or email to inverters@solren.com.

Contact information
Please provide contact information in the event we have questions about the site. We will also need the site name and address. For residential installations the street address can be omitted.

Email for Event Notifications
Provide email address for notifications.

Inverter Direct, Revenue Grade and Agency Reporting
Please select options here and on the purchase order. If revenue grade please let us know the agency for the reporting.

SolrenView LAN Configuration
DHCP mode Yes or No, if NO you must provide the LAN IP address, router gateway and

subnet mask.

Hardware Details

If inverters have not yet arrived, you can leave this blank. If the inverters are on site please add serial number(s).

Appendix D – SolrenView™ Order Forms

Customer Name (Company):	
Project Name:	
PO Number:	
Original PO # of Site (if applicable):	
Requested Delivery Date:	
New Order: ○ Change Order: ○ N/A: ○	

YASKAWA SOLECTRIA SOLAR
360 Merrimack Street,
Building 9, Floor 2
Lawrence, MA 01843 USA
978-683-9700 x580
monitoring@solectria.com
www.solectria.com

SOLRENVIEW for COMMERCIAL & UTILITY-SCALE

For PVI 14-60TL, PVI 50-100KW, SGI 225-500PE, SGI 500XT, and SGI 500/750XTM INVERTERS

INSTALLER CONTACT INFORMATION															
Contact Name:						Phone Number:									
Installer's Website: ■															
INSTALLATION SITE DETAILS															
Street Address: ■															
City: ♦		State: ♦		Zip Code: ♦		Country: ♦									
OPTIONAL SOLRENVIEW MONITORING															
Years of Service:**	○ 5	○ 10													
Add Revenue Grade Meter?** ♦	○ Yes	○ No													
Add Agency Reporting?**	○ Yes	○ No	If added, years of service matches Revenue Grade Monitoring Service												
If yes, choose agency:**			Other												
Add SolZone DC Current Monitoring?** ♦	○ Yes	○ No	If yes, choose number of sensors:**												
Add SolrenView AIR 4G Modem?	○ Yes	○ No	If yes, enter number of ports												
Add Weather Station?** ♦	○ Yes	○ No	If yes, add wind option:** ○ Yes ○ No												
XML Feed?** ■	○ Yes	○ No													
E-mail(s) for Event Notifications:															
Cell Phone Number:			Cell Phone Provider:												
SolZone INFORMATION (applicable only if SolZone DC Current Monitoring is added)(PVI 14-36TL - 2 Zones))(PVI 50-100KW/SGI 225-500PE/SGI 500XT - 2-8 Zones)(SGI 500-750XTM - up to 16 Zones)															
Total Isc Design Amperage															
Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14	Zone 15	Zone 16
Number of ARCCOM boxes on each zone															
Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone 9	Zone 10	Zone 11	Zone 12	Zone 13	Zone 14	Zone 15	Zone 16
HARDWARE DETAILS															
AC Voltage: ♦ ○ 208 VAC ○ 240 VAC ○ 380 VAC ○ 480 VAC ○ 600 VAC ○ Other* VAC															
Inverter Model(s) and amount of each model (example (2) PVI 60KW): ♦															
(continued)															
Seriel Numbers of Inverters (if known): ♦															
SolrenView MAC Address(es) (if purchased in bulk, listed as "Serial No." on back of SolrenView box): ♦															
(continued)															
(continued)															
Set site to: ■ ○ Public ○ Private															

DC PANEL INFORMATION		
PV Module Quantity	PV Module Type	DC Watts

COMMENTS

*If another voltage is required, please call customer service at 978-683-9700 x2 or email monitoring@solectria.com. **Cost Adder
♦ These fields are used to populate website
■ Optional field to be displayed

DOCUMENT ID: 03-04-10, Rev.E

Customer Name (Company):
Project Name:
PO Number:
Original PO # of Site (if applicable):
Requested Delivery Date:
New Order: ○ Change Order: ○ N/A: ○

YASKAWA SOLECTRIA SOLAR
360 Merrimack Street,
Building 9, Floor 2
Lawrence, MA 01843 USA
978-683-9700 x580
monitoring@solectria.com
www.solectria.com

SOLRENVIEW RESIDENTIAL

PVI 1800-7500 & PVI 3800-7600TL SolrenView Order Form and Site Survey

INSTALLER CONTACT INFORMATION			
Contact Name:			
Installer's Website:■			
Phone Number:			
INSTALLATION SITE DETAILS			
Street Address:■			
City:♦	State:♦	Zip Code:♦	Country:♦
OPTIONAL SOLRENVIEW MONITORING			
Years of Service:** Choose			
Revenue Grade Meter?** Choose	(Please note: meter is not factory installed)		
If yes, choose meter: Choose	Please provide pulse weight if custom meter:		
Add Agency Reporting?** Choose	If added, years of service matches inverter direct.		
If yes, choose agency:** Choose			
Add Weather Station?** Choose			
If yes, add wind option?** Choose			
Add XML Feed?** Choose			
E-mail(s) for Event Notifications:			
Cell Phone Number:	Cell Phone Provider:		
HARDWARE DETAILS			
DC Panel Information			
PV Module Quantity	PV Module Type	**DC Watts**	
Inverter Information			
Serial Number	Inverter Model	Inverter AC Volts	
SolrenView MAC Address(es) (If purchased in bulk, listed as "Serial No." on back of SolrenView box):			
(continued)			
(continued)			
Set site privacy to:■ ○ Public ○ Private			
COMMENTS			

Solectria Renewables, LLC is not responsible and makes no representation that the product meets the needs of its intended application. Buyer assumes all responsibility for appropriate product specification.
** Cost Adder ♦ These fields are used to populate website ■ Optional field to be displayed

E-mail