

SolarVu™ for Sustainable Energy Technologies

Sunergy Installation Guide

Site Preparation

SolarVu™ is an energy portal that enables remote monitoring of renewable energy generation sites over the internet. It requires the installation of a K135 gateway which continuously transfers data from the inverter(s). This guide explains how to connect the K135 gateway to SET (Sustainable Energy Technologies) Sunergy inverters.

Each Sunergy inverter needs a ComLink-S communications module to be ordered and installed. To access SolarVu from a browser, the inverters are connected to the internet through a Cachelan K135 gateway. The K135 connects to multiple inverters over RS485 using shielded, twisted pair wire or direct burial CMX grade cat5e for outdoor installations. Daisy chain multiple inverters as shown in fig 2. Comlink-S node IDs must be programmed into each inverter to match the K135 settings. An RJ45 ethernet jack, connected to the LAN network and a 120VAC outlet for the gateway power dangle are required. The LAN must have high speed internet service to an ISP to provide a gateway to the internet as shown in figure 1.

K135 Installation

Mount the K135 gateway in an enclosure with conduit to the inverters or on the wall with a wire feed where mechanical protection is not required.

Power Supply: Plug the K135 power supply into a 120VAC receptacle and the the 5VDC connector into the K135.

Ethernet: Use a standard ethernet patch cable with RJ45 connectors of the appropriate length to connect from the K135 to the network ethernet at a RJ45 wall jack or the router/switch.

RS485 Serial: Normal installation is to mount the K135 gateway near the inverters. Connect shielded twisted pair or cat5e cable from the K135-DB9 to the ComLink-S terminals as shown in fig 2. Daisy chain to additional inverters matching the terminals adding the isolated local ground and optional terminating resistor on the last inverter in the string only. Using SCT (Sunergy Commissioning Tool PC configuration software) and instructions supplied by SET enter communications settings for each inverter to match the communications settings of the K135 gateway from the configuration form supplied as shown in fig 2. See the SCT instructions for further details.

Fig 2 K135 to Sunergy inverters serial connections

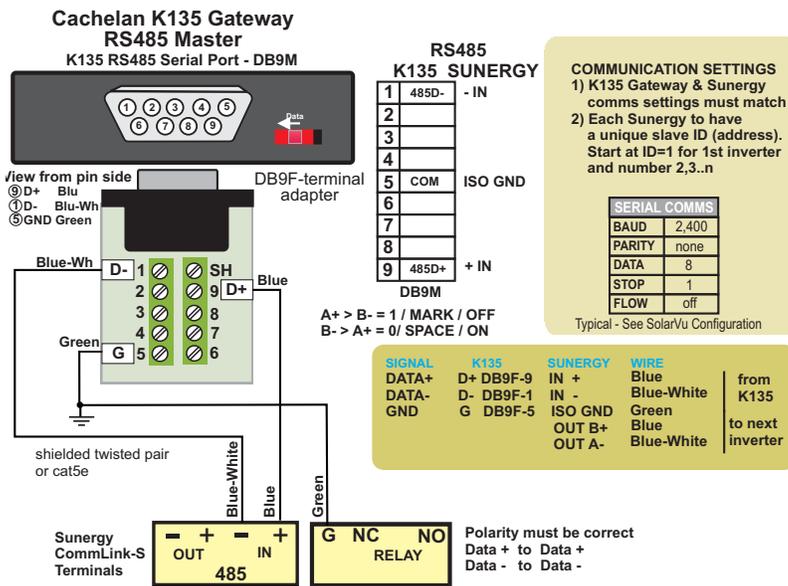
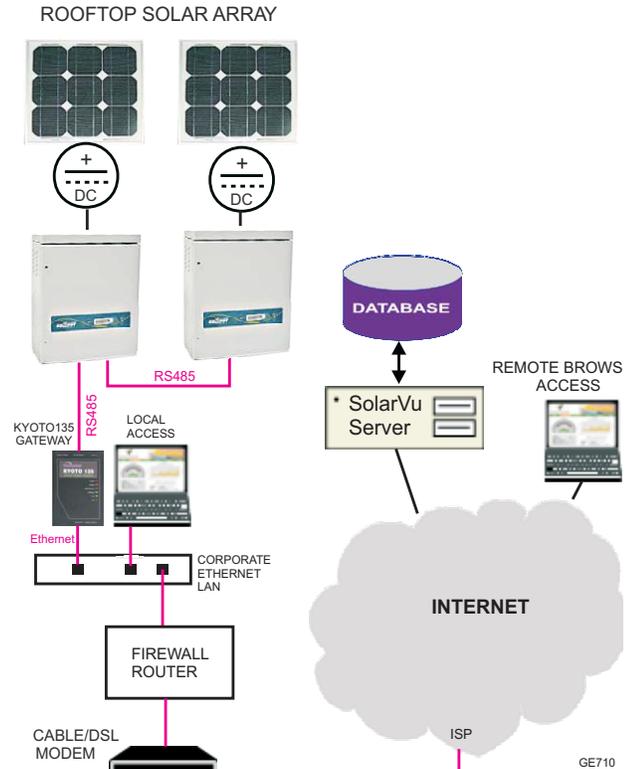


Fig 1 Internet Connection



Daisy Chain Multiple Inverters with Increasing Address IDs

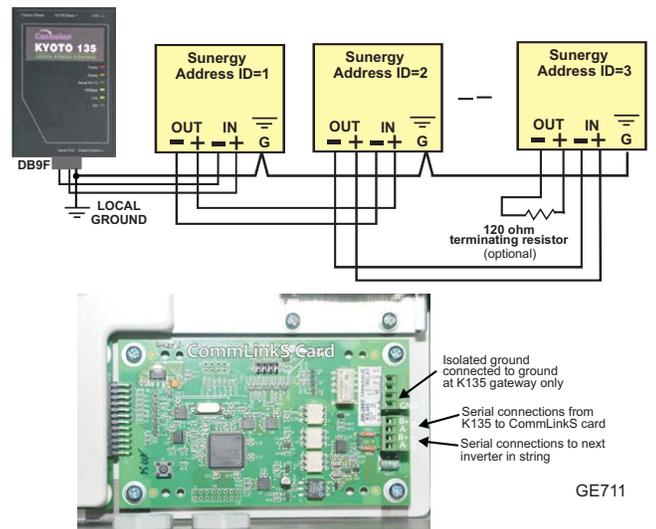
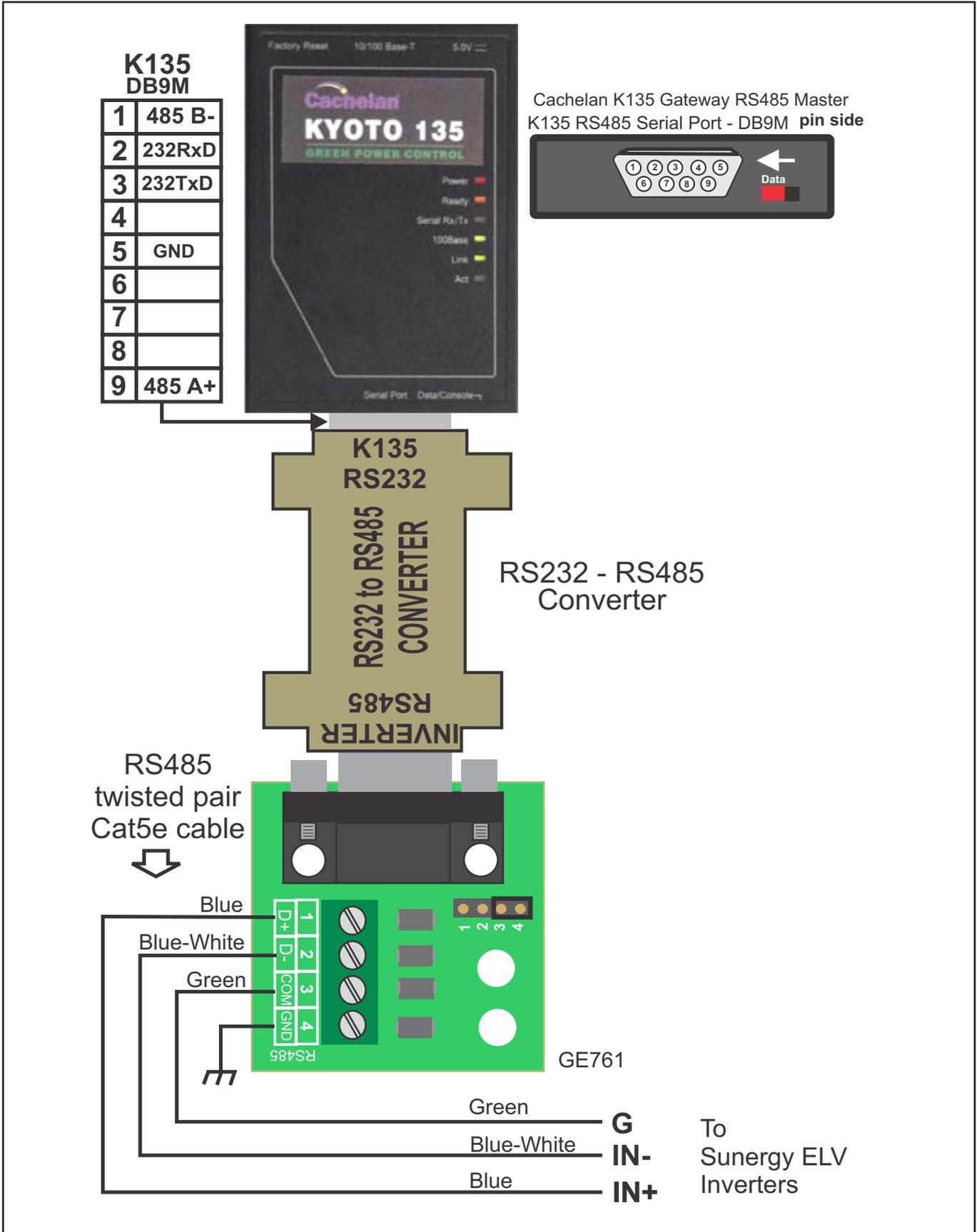


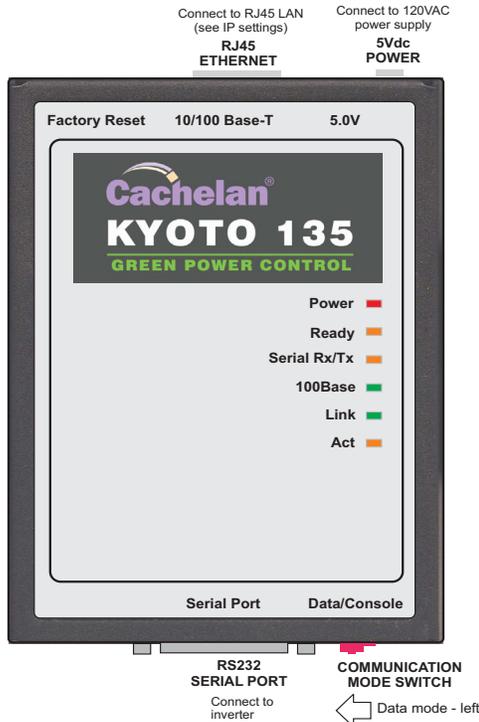
Fig 3 The K135 gateway may be fitted with an alternative 232-485 adapter. Physical appearance may vary but terminal labelling is the same.



Network Setup

On power up, the K135 looks for a DHCP server to provide it a dynamic IP address. If a PC connected to the network can automatically connect to the internet through a browser then the network is already configured to accept the K135. Otherwise consult the IT systems administrator for assistance. If a dedicated IP address, subnet mask and DNS server address are required, this needs to be entered into the K135 before shipment. Once the K135 receives its IP address it acts as a client. It will automatically try to connect to the SolarVu™ server and begin transferring data from the inverter to the server.

K135 indicators and connections



Testing

Ensure the inverters and K135 are powered on, the ethernet cable is plugged into a network jack and the RS485 cable is connected between the K135 and the inverter. The Power and Ready lights should be on if the power supply is plugged in. The Link light on indicates the ethernet connection is working. 100Base will only be on for high speed connections; for 10Base it is off. The Act light will periodically flash showing network activity. The Serial Rx/Tx flashes when the inverter is polled by the K135 but most of the time the light is off.

Internet Connection

Power on the K135 and allow at least 2 minutes for communication to be established. From any internet connected computer, open the browser and type in the site address assigned for your account. This will be found on the account label shipped with the K135 and on the front panel of the K135 after the URL.

Once the website is reached, the opening screen is the SITE view. Click ANALYZER > INVERTER STATUS. If there is a connection from the site, the Last Communication light will be green. The K135 gateway does not need to be connected to the inverter for this light to be green. If this indicator is red, it indicates no internet connection has been established. Check internet connections at the site by trying to browse the internet at the site with a PC connected to the network.

On a new system, the K135 gateway will search for the address of each connected inverter. The Last Data Updated indicator will be green and inverter data will appear. If this indicator is red but the Last Communication indicator is green, check the RS485 serial connection to the inverter which must be operating. When both lights are green the gages on the SITE screen will display live data and graphs will begin recording site energy output. Contact Cachelan Technical Support for assistance if you cannot get a connection.

K135 Status Indicator Interpretation

INDICATOR STATUS			
LED	NORMAL	STATUS	
POWER	ON	OFF- no power	ON-power OK
READY	ON	OFF	No DHCP or static IP address. Check IP settings, ethernet connection
SERIAL	FLASHING	OFF	Check RS232 to inverter connection. Inverter may be off.
100Base	ON	ON- 100Base, OFF- 10Base or no ethernet connection	
Link	ON	OFF	No ethernet connection
Activity	FLASHING	FLASH - data traffic activity	

TROUBLESHOOTING CHECKLIST

IP	Obtain IP by DHCP or set static IP. Network configured to recognize K135
Serial	RS232 serial cable connected between inverter and K135
Inverter	Inverter is powered on
Internet	Internet connection from ISP to LAN is operating normally
K135	K135 in data mode (red switch set to left viewed from top)
Support	Technical support: contactus@cachelan.com

K135 front panel label with web address and login

K135 GATEWAY

URL: mysite.solarvu.net
USER: myusername
PASSWORD: mypassword
IP: DHCP
MAC: 00-01-95-06-E8-33
ID: SS100 070300075 v1.4.1
TYPE:

Check ANALYSER > INVERTER STATUS for communication
 Screen shots may vary by inverter type



LIVE - for valid data, green status light and time received



Video Tour

For an overview of available features, visit www.solarvu.net and play the What is SolarVu video. Each screen has a HELP button that explains how all the features work. An online help guide is available for printing under **SETUP > DOWNLOADS > PRINTED HELP**.

Visit www.solarvu.net for a features video



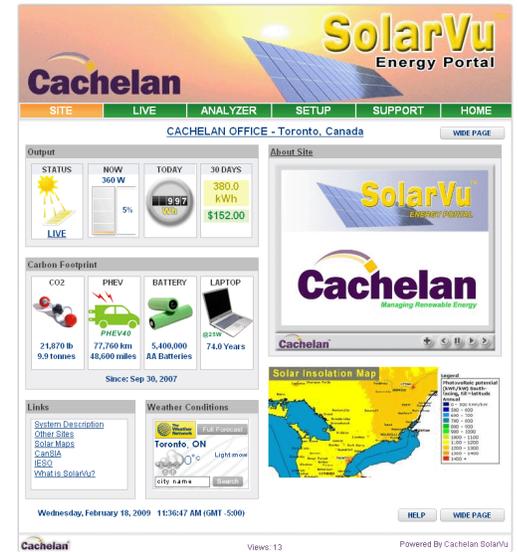
Help guide



Site Screen

For a summary of information about the site, click the **SITE** menu button. On the upper left, the current charging status of the solar panels, total power being generated now and in the last 30 days is displayed. Underneath, the carbon footprint of energy equivalents is displayed since startup. Links to other websites can be left as defaults or changed in **SETUP** to personal preferences. The local weather is preset. Email contactus@cachelan.com to have it changed. For viewing on a widescreen TV suitable for display in a public place, click the **WIDE PAGE** button. On the right is a slideshow for public viewing. Content can be personalized using uploaded graphics in **SETUP**.

Site Summary Screen



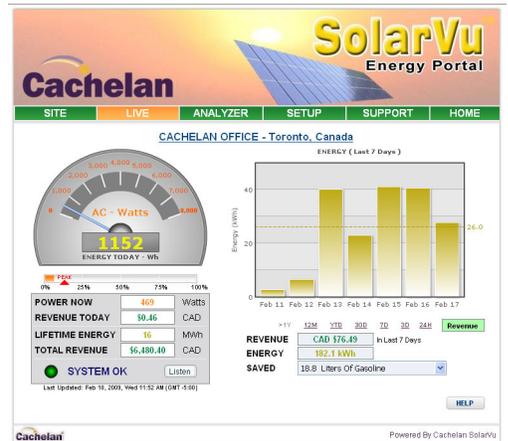
Select wide screen view for public display on an HDTV



Live Data

Click the **LIVE** menu button to display current power being generated in the array. Actual power and energy generated today are shown on the meter dial. For a normally operating system, the status indicator should be green with the last update time less than 15 minutes ago. Lifetime energy and revenue are shown digitally. For correct revenue display, the sell price per kWh must be entered in **SETUP**. If connection to the site is lost, or if an alarm is detected, the status indicator will be red. Click the Listen button with sound on for more information.

LIVE view shows current conditions

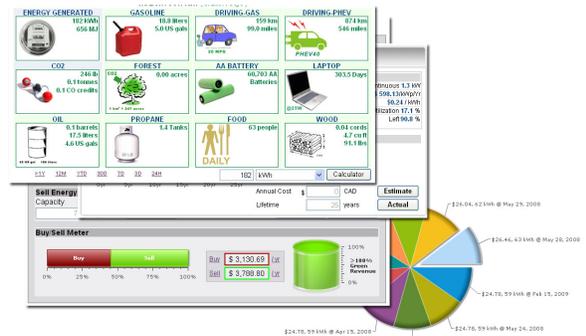


Trends are shown for the lifetime of the system using the graphs on the right. Select either an Energy or Revenue view using the button. Click the desired time period under the graph. Scroll over a data point with the mouse for more detailed information about that day. The carbon footprint pulldown gives energy equivalents for the solar power generated for the selected time period.

Analyzer - Performance

Click the **ANALYZER** menu button and select a category in the pulldown menu and a time period under the graph. The carbon footprint will compute the energy equivalents to the solar energy generated over the selected time period. This helps visitors get a practical feel for the benefits available. To find the carbon equivalent for an arbitrary value, override the actual solar amount by entering a kWh value and selecting a category, then click the Calculator button. Other views including buy/sell energy use, performance and payback can be selected with in the pulldown menu. The screen will return to the last value selected on return.

ANALYSER - select performance views from pulldown



Analyzer - Troubleshooting

When problems occur with the system or to check inverter operation, click ANALYZER > INVERTER STATUS. Each inverter connected to the system with a K135 gateway will have its own display panel showing actual values sent. Remotely located technical personnel can assist in interpreting what the values are conveying. If no communication has been received from the device for more than 2 hours a No Data Available message will be shown.

For detailed analysis, it may be helpful to download all readings for the time period of interest into a spreadsheet for further analysis using SETUP > DOWNLOAD.

Download printable HELP guide or actual readings for any time period

Setup

For entering settings to configure your site, click the SETUP menu button. Enter your unique username and password from the account label. The setup screen appears showing communication status and current preference settings. Check the last communication time ❶. It should show a time within the last 15 minutes if communication between the site and SolarVu™ server is working normally.

For the payback and revenue calculators to work properly, correct parameters for energy sell rate, capacity, average insolation etc should be entered. Account > Equipment Setup is for factory use. All changes take immediate effect. The Site Setup tab is used to customize the banner, links, slideshow and system description. Click the Help ❷ button for each section for a description of the effect for each entry. For further analysis, individual energy readings for any time period can be downloaded into a spreadsheet from the DOWNLOAD section.

Enter the email address ❸ for each individual that wants a regular status report sent to them and select the frequency. This report will include energy and revenues for different time periods and indicate if there are any alarms. In the Password tab, include an email address to receive the Setup login password if this is forgotten.

Support

See the What is SolarVu? video at www.solarvu.net for a feature overview. Each screen has a HELP button with details for the items on that view. A printable HELP guide can be downloaded in SETUP > DOWNLOAD.

For additional technical support, send an email to contactus@cachelan.com or dial our support line in Toronto, Canada at 905.470.8400

Click ANALYZER > INVERTER STATUS for troubleshooting

Lifetime Energy 1,800 Whr	AC Output	Power	0 W	Vrms (L1-L2)	217 V	Current	0.0 A
		Vrms (L1-N)	125 V	Vrms (L2-N)	132 V	Frequency	60.0 Hz
AC Output Power 0 W	DC Input	Power	33 W	Volts	349 V	Current	0.1 A
		Power Efficiency	0 %	Heatsink Temp.	29 °C		
PV Input Power 33 W	Performance	Today On-Grid	2.2 Hrs	Lifetime	13.5 Hrs	Relay Cycle	36
		DC Input	2,700 Whr	AC Output	1,800 Whr	Efficiency	67 %
	Inverter	Model	PVI 5000	S/N	10010063	RS485 Address	15
		Hardware Ver.	65	DSP1 Ver.	1.40	DSP2 Ver.	1.18
Status		Fault mode Vach - The AC voltage of mains utility is over the upper limit Vact - The AC voltage of mains utility is under the lower limit COM4 - External communication failed warning message Vact2 N - The voltage between L2 and neutral is exceeding the upper limit					

Listen ● Last Data Updated: **Apr 19, 2010, Mon 11:54 AM (GMT -5:00)**
 Listen ● No Communication Since: **Apr 16, 2010, Fri 3:54 PM (GMT -5:00)**

See K135 label for SETUP login

K135 GATEWAY	
URL:	mysite.solarvu.net
USER:	myusername
PASSWORD:	mypassword
IP:	DHCP
MAC:	00-01-95-06-E8-33
ID:	SS100 070300075 v1.4.1
TYPE:	
DATE:	Feb 2009
SUPPORT:	cachelan.com

Configure site settings in SETUP

Cachelan Technical Support

contactus@cachelan.com

905.470.8400 x228