SolarVu™ for Outback Mate
Installation Guide

Site Preparation

SolarVu™ is an energy portal that enables remote monitoring of renewable energy generation sites over the web. It requires the installation of a K135 gateway which continuously transfers data from inverter(s). This guide explains how to connect the K135 gateway to Outback equipment.

An Outback MATE display unit must be connected using Outback's proprietary bus and hub components to view data from Outback devices locally. To access SolarVu from a browser and display the Outback device data remotely over the web, the Outback MATE must be connected to the internet through a Cachelan K135 gateway. The K135 is mounted in a SolarVu enclosure (Fig 1) connected to the Mate through a serial cable. A source of 120VAC power for the K135 power supply is required. An RJ45 ethernet jack, connected to the LAN building network is also needed. The LAN must have a connection to an ISP to provide an internet connection for the K135 to send data to the SolarVu servers.

K135 Installation

SolarVu enclosure: Wall mount the enclosure houseing the K135 near the MATE.
Power Supply: Connect a source of 120VAC control power to the internal receptacle. Unfasten the reusable tie wraps holding the power dongle to remove the receptacle cover plate.
Ethernet: Where possible use a factory made ethernet patch cable with RJ45 connectors to connect from the K135 directly to a network ethernet jack. Alternatively, punch down unterminated cat5e cable in the jack provided, being careful to match colours to the switch connection at the other end.
RS232 Serial: Connect the serial cable supplied between the Mate and K135 gateway or use the adapters provided if insufficient clearance in conduit holes (Fig 3).

Fig 1 SolarVu enclosure connections to

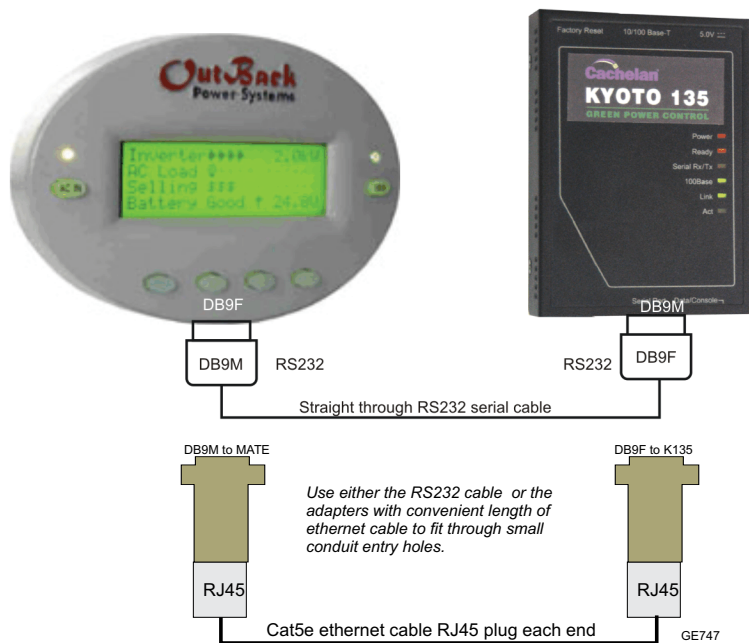*Fig 3 Connect the Mate to the K135-OB gateway using an RS232 cable or ethernet cable with DB9-RJ45 adapters supplied*
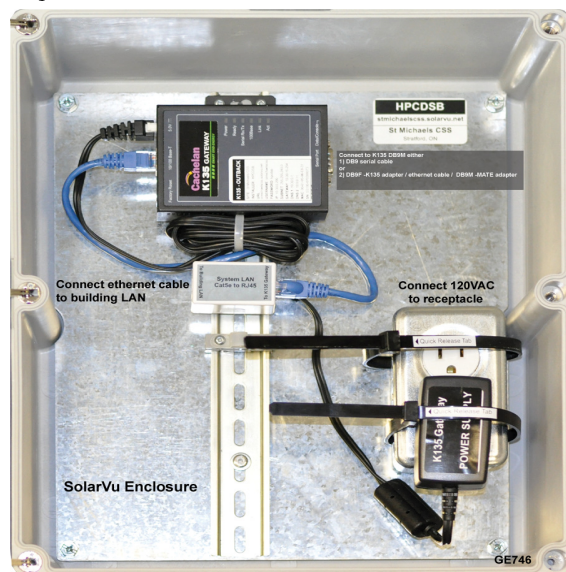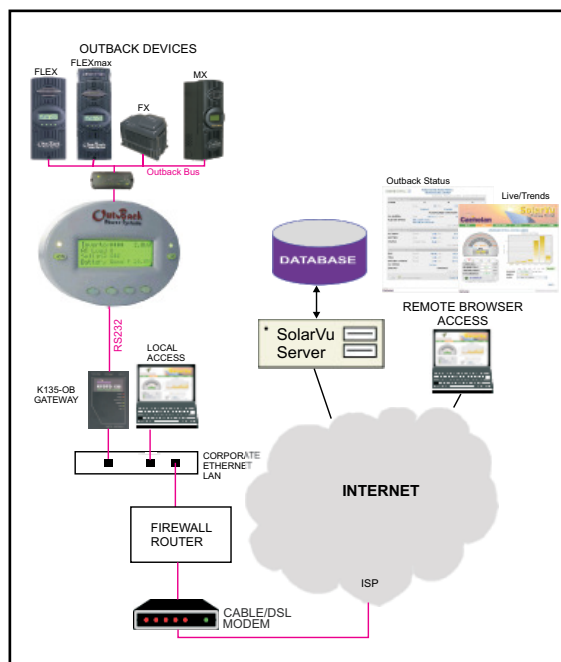
Fig 2 Internet Connection

SolarVu Installation Guide for Outback Mate, FX & MX

MATE Setup

The MATE display and each Outback device must be connected to the Outback HUB for communications to work (Fig 2). With the Outback devices powered on, verify that the MATE is communicating with them according to the Outback instruction manuals. A light next to the device HUB port should be flashing for each connected Outback component (MATE, FX, MX). Verify that the MATE can locally display status for each connected device by consulting the Outback instruction manuals.

For remote data access, the K135 gateway must be connected to the MATE DB9F RS232 jack (Fig 3) and the MATE set for remote PC serial communications. From the top level MAIN MATE display, select this sequence to enable serial PC RS232 communications:
MAIN: SETUP --> MATE --> PG2 --> COMM --> PC --> ON
With communications successfully set up, you should observe the K135 Serial RxTx indicator periodically flashing green.
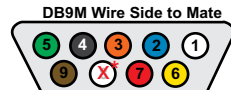
MATE - K135 signals

DTR-4 set HI under software control
RTS-7 forced low. Hardwire to GND-5 in K135

WINFORD DB9		K135		MATE	
RJ45	WIRE	SIGNAL	DB9M	DB9F	SIGNAL
1	WHITE	485 D-	1	1	-
2	BLUE	232 RxD	2	2	TxD
3	ORANGE	232 TxD	3	3	RxD
4	BLACK	DTR	4	4	-
5	GREEN	GND	5	5	GND
6	YELLOW	DSR	6	6	-
7	RED	RTS	7	7	-
8	BROWN	485 D+	9	9	-
no connection		CTS	8	8	-

RJ45 Plug Pin Side View

T-568A

GE748

Straight through RS232 connection using cat5e cable between adapters

DB9F Wire Side to K135

WINFORD #MJD9F8P8C COLORS   *Pin 8 NC

DB9M Wire Side to Mate

WINFORD #MJD9M8P8C COLORS   *Pin 8 NC

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 to get a dedicated IP address, subnet mask and DNS server address. 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.

Plug in the K135-OB Gateway

Ensure the Mate, Outback devices and K135 are powered on. The ethernet cable is plugged into a network jack and the RS232 cable is connected between the K135 and the Mate. 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 light is normally 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 name label shipped with the K135 and on the front panel of the K135. The opening screen is the site view. Click ANALYZER > INVERTER STATUS. If a connection has been established, a screen with a green indicator and inverter data will appear. The K135-OB gateway does not need to be connected to the MATE to communicate. If the indicator is red, no communications have been established. Check internet connections at the site by trying to browse with a PC.

Fig 4. Status Indicators

	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
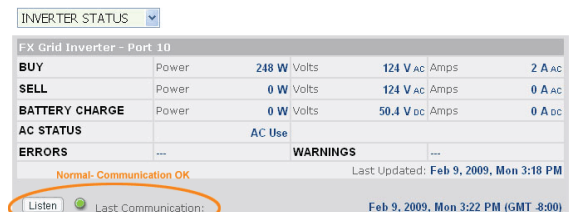
Video Tour

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

PLAY 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 but-
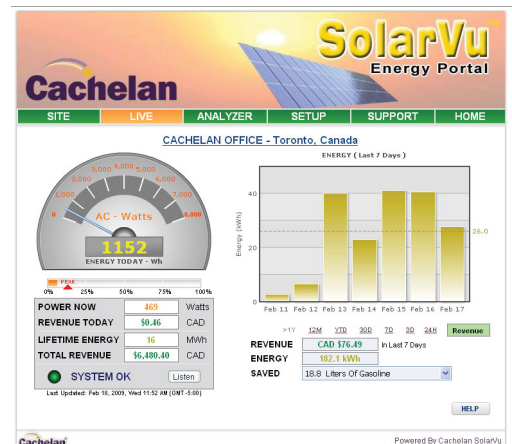
Site Summary Screen
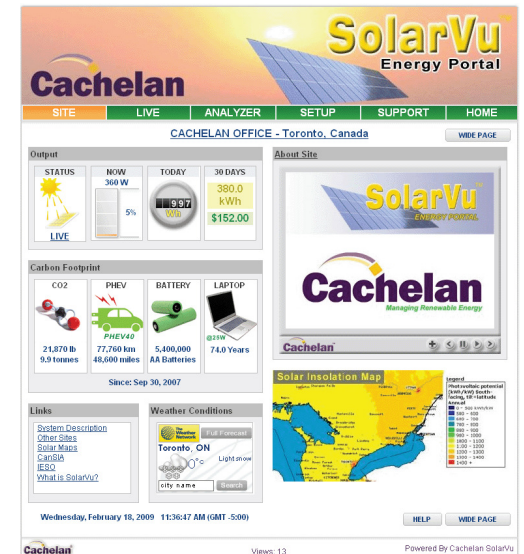
Live Data

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.

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.

LIVE view shows current conditions

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 equipment 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 include buy/sell energy use, performance and payback can be selected in the pulldown menu. The screen will return to the last value selected on return.

ANALYSER - performance view

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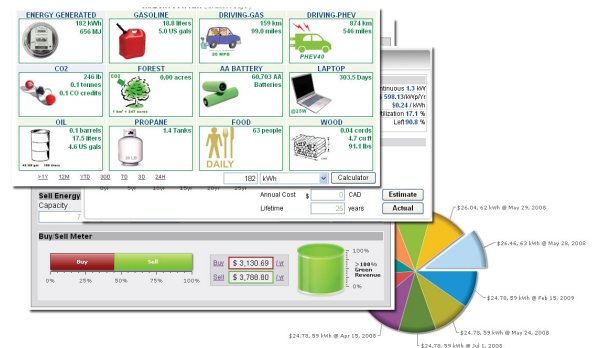
Analyzer - Troubleshooting

When problems occur with the system or to check inverter operation, click ANALYZER > INVERTER STATUS. Each Outback MX, FX or Flex device connected to the MATE will have its own display panel showing actual values sent. Alarms codes are interpreted and shown also. 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.

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

Each MX, FX, FLEX device displays its current status

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.

See K135 label for login to SETUP for configuring the site

K135-OB 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: Outback Mate
DATE: Feb 2009
SUPPORT: cachelan.com

Support

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

Cachelan Technical Support

contactus@cachelan.com
905.470.8400 x228