# Whirlpool

» Knowledge Base » Software for Solar Inverters

- article

# Software for Solar Inverters

This page is intended to operate as a central location for links to the software and protocols used by various inverters.

## Inverters

- Aerosharp
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- SolarLord (Manuf=KLNE???)
- SolarRiver (Manuf=SamilPower)
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- SunnyRoo (TL and TLi)
- SunTeams (Manuf=KLNE)
- Xantrex

### AeroSharp

Details on the inverter and software. http://www.ozzicomp.com/aerosharp/
new windows program available /forum-replies.cfm?t=1804883&#bottom

### Aurora

RS-485 interface. Software for the Aurora – http://www.power-one.it/digilab/Digi.aspx?Code=15
The larger outdoor inverters have a USB port on the right hand side, labelled as 'service' in the manual. The smaller ones have a serial RS232 port. For short term connections, ie.to pull down the stats at the end of the day, this is ideal. Do not leave this port 'exposed' in wet weather or overnight as it compromises the IP65 enclosure.
Longer term connections should use the RS485 adapters and port through the bottom of the inverter. To use the USB/serial ports, download the USB driver from the link below because this creates a virtual serial port on the PC and this port will be assigned a COMx number eg. COM5. Please note that the inverter has to be connected so that software can see the port. In addition, extract the zip file first before launching the install/setup.exe file.

To setup first click on the icon which look like a "Cog wheel", open and select "Serial" and pick the "Com Port" which related to your cable connect to your laptop or desktop computer from the inverter, with you RS232/RS485 converter inline. Baud rate 19200 the rest as it.
Eg:

Port settings of the USB to Serial should be:
Bits per second: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None

Next click on the icon which looks like a spanner on top of a inverter, run "Auto Scan" once the software found your inverter, click on the inverter and click "Add" then "OK".
Next the inverter will now be shown in the "Inverter List" next click on the run which is located under "File" there would be a "red square" click on this to make the software run, this will now show a "Green Triangle".
Next open "Data Logger" and click "Configure Data Logging" click "Start when the first inverter switches on, stop when the last one switches off.
Next open "Data Logger" then Highlight "Enable Data Logger". "Save Interval": 1 minute.

*Change the length of time the inverter stays awake after the sun goes down*: Is called "UV Prot Time" and can be set to a maximum of 3600 seconds (1 hour).
This delays the off time of the inverter by one hour after the voltage goes too low.
http://img269.imageshack.us/img269/6489/70103008.jpg

Accessing your outputs per day:
Easy Double click on the inverter icon, this will open the "Inverter Control Panel"

Next at bottom of this page you see "Inverter", "Energy Harvesting", "Input Parameters", "System".

Click on "Energy Harvesting" it should run for the first time if not click on "Last 366 days" and then click on "Reload".

Once it has display the outputs you can now do, individual day via the "Selected Period"
You will need to do this for each days output, so get yourself a pen & paper or have www.pvoutput.org setup in the background to add your outputs.

Can download the Aurora Communicator User Manual from here: http://www.solarinverters.com
.au/images/downloads/downloads_14.pdf
Connect an Aurora Inverter to PC via a RS232: http://www.solarinverters.com
.au/images/downloads/downloads_15.pdf
Aurora User Manual for 3.0/, 3.6/, 4.2/ OUTD AU REV 1.0: http://www.solarinverters.com
.au/files/users_manuals/usermanual-5wj32r.pdf
Aurora Design Software: http://www.power-one.com/sites/power-one.com/files/aurora
_designer_excel2007_3.8.10_2013-01-15.zip
Replace lithium battery: http://img854.imageshack.us/img854/6383/battery.jpg
How to connect multiple Aurora inverter units via a RS485 adaptor: http://imageshack.us/photo/my-images/714/rs485daisychain.jpg/

Running Aurora Inverter on Linux or Windows with Aurora Monitor: http://auroramonitor.sourceforge.net/
(an open source alternative to Aurora Communicator).

Running Aurora Inverter on Linux: http://www.curtronics.com/Solar/AuroraData .
Running Aurora Inverter on Linux: http://manpages.ubuntu.com/manpages/lucid/man1/aurora.1.html#contenttoc5
Running Aurora Inverter on Linux: http://www.123solar.org

Running Aurora Inverter on Hexin 2108E-B RS485 to Ethernet Converter
Read this page on how to do: https://www.dropbox.com/s/pr027pj1qk8lely/Aurora%20PV%20I
nverter%20Monitoring%20with%20Hexin%202108E-B.doc?m

Texas Instruments TUSB3410 driver: http://focus.ti.com/docs/toolsw/folders/print/tusbwinvcp.html
USB to RS422 / RS485 adapter Driver: http://www.usconverters.com/downloads/prolific_drivers_manuals_all.zip
HXSP-2108G USB 2.0 To RS-485/RS-422 Converter: http://www.hexin-technology.com/USB_2.0_To_RS-485_RS-422_Converter-Product-256.html
Windows 7 Driver for HXSP-2108G USB 2.0 To RS-485/RS-422 Converter: http://www.hexin-technology.com/shared/software_driver/vista-windows7-for-serial-adapters.rar
PL2302 Driver, supports the following Windows OSes:
- Windows 2000 SP4
- Windows XP SP2 and above (32 & 64 bit)
- Windows Server 2003 (32 & 64 bit)

- Windows Server 2008 / 2008 R2 (32 & 64 bit)
- Windows Vista (32 & 64 bit)
- Windows 7 (32 & 64 bit)
. USB host controller
. Device using PL-2303H/HX/X version chip
Download here: http://www.prolific.com.tw/eng/downloads.asp?id=31

****If your terminal blocks are missing from Inverter****
This plug is included in your inverter package, but as I found out, many installers do not leave the packet containing the plugs, torx driver and cables for some reason.
A plug that will fit can be purchased from good electronics stores or Jaycar once you know the pitch of the plug (3.81mm).
They come in 2,4 and 6 connections but you only require 2 connections for T+ and T- which are side by side on the RS485 connection.
Here a photo of terminal block with cable connected: http://solar.poirus.com.au/Inverter1.jpg

Call your installer first and demand the plug be sent to you.
You can purchase from here: http://au.element14.com/jsp/search/productdetail.jsp?SKU=1860022

### Clenergy

The Clenergy inverter can use the same hardware as the Sunny Roo TLi inverter as both as PowerCom units
Comes standard with a USB port, but also features a RS-232 port and an "advanced port" which if u obtain the module would add RS-485 functionality.

Photos of a Clenergy SPH20 in service

Datasheet

Latest version of the monitoring and logging software [Solar Control(v1.27)]
Software user manual provided, and accessable from the 'Help' menu within the program.

Solar Control Software v1.28 is now available for download from the Clenergy web site.
The default password for setting the inverter's parameters via the software is *administrator*.

### CMS (Carbon Management Solutions) (Manuf=Phoenixtec)

Details on the inverter: http://www.carbonmanagement.com.au/
Software (ProControl or MonitorView2) http://www.carbonmanagement.com.au/support
NOTE: CMS have disabled links to firmware & software, contact them direct.

Serial Protocol:
http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-100.html#p2727

I got the parameter change password for the older ProControl 1.0.0.0, the one on the CMS website, by contacting CMS to try to fix regular FAC Out of Range Faults. However you are very limited in the parameter changes you can make. It's very similar to password for latest ProControl 2.5.1.3 (Orion version, & has greater parameter change range).

Also I had to install the latest CMS2000 firmware to do so as otherwise it wont stick (spoke to CMS).
The latest firmware now has ETODAY, so if your version is missing ETODAY you may wish to upgrade it – contact CMS direct.

Firmware: 21Dec2011 – Where abouts is the firmware posted on the website please? The CMS website doesn't appear to have a link to the Monitoring Software or Firmware avail anymore. "We have taken it off as the supply authorities don't want people to be able to download and change parameters so we will only supply on request now."

ProControl:

- 1.0.0.0 http://www.carbonmanagement.com.au/support
- 2.5.1.3 http://www.solaraustralia.com.au/solar_grid_feed_inverter_orion.html
- 2.5.2.4 contact CMS direct (includes fix for export to csv)

Scripts:

- Python based monitor for the CMS2000 – http://pv.codeplex.com/
- C# Windows Application for CMS2000 and similar – http://code.google.com/p/pvbeancounter/
- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410

### Eaton (Manuf=Phoenixtec)

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above).

Working with PV Bean Counter on an ETN 2000 for at least one user – http://code.google.com/p/pvbeancounter/

### Eversolar

Has a RS-485 interface. You can purchase a Power Management Unit (http://www.ever-solar.com/English/Product_content.php?pid=24 ) for approx US$300 which provides USB & Ethernet interfaces and comes with a software application for Windows called AS Control. A potential Linux solution is being developed – see http://www.sjcnet.id.au/computers/eversolar-inverter-monitoring-with-linux and https://code.google.com/p/eversolar-monitor/

### Effekta

Australian support site http://effekta.com.au
Software updates for 2kw to 5kw Models

### Fronius

Data recording and archiving for photovoltaics is an important tool for controlling the functionality and yield of a PV system. The Datalogger is the heart of a photovoltaic system. It represents the interface between the inverter and the PC: It collects and processes data for use with the Fronius Solar.access software.
The Datalogger can also be used for remote monitoring.
Fronius offers the right product for every PV system and every requirement.

Software: http://www.fronius.com/cps/rde/xchg/SID-9ACCCACF-945C605E/fronius_australia/hs.xsl/25_7672.htm
Drivers: http://www.fronius.com/cps/rde/xchg/SID-9ACCCACF-945C605E/fronius_australia/hs.xsl/25_7670.htm
Software Updates: http://www.fronius.com/cps/rde/xchg/SID-9ACCCACF-945C605E/fronius_australia/hs.xsl/25_7671.htm
Operating Manuals: http://www.fronius.com/cps/rde/xchg/SID-BA356229-DF71C54C/fronius_australia/hs.xsl/25_7491.htm

### Ginlong (AGL, Eko-Energy)

Has a RS-485 interface, and a Bluetooth antenna. You can configure the inverter with an identifying number if you have multiple inverters using bluetooth. Some Bluetooth adaptors do not seem to work – some more research needs to be done here.

The pvoutput perl script mentioned elsewhere on this page would need to be modified to work with this inverter. Since the script mentioned below is based on the pvoutput script, it shouldn't be too hard to get it working. The main change is the addition of the "flip" configuration option and making the script print a line of text that cacti can use. The current wattage is calculated from the IAC and VAC values, as this inverter does not output wattage directly.

Perl Script (for use with Cacti & pvouput): https://github.com/Crosenhain/ginlong_poller
Official Software: http://www.ginlong.com/Ginlong-technolgoies-download-Grid-Tie-Inverter-Manuals.htm

The EKO 1500s is actually a rebranded SAMIL SolarRiver 1600TL – works with PVBeanCounter using Samil settings on their wiki.

### Growatt (also applies to Sungold inverters)

Both Growatt and Sungold are manufactured by the same company (Growatt).

Growatt inverters have 2 MPP Trackers, while Sungold have only one.

See forum on /forum/index.cfm?action=reply&t=1548929

http://solarmegamart.com.au/files/Growatt-Product-Catalogue.pdf

More information about the Growatt/Sungold inverters can be found on the manufacturer's web site (http://www.ginverter.com/ ).

**Communication options**

RS-232 is standard on all inverters.
An optional RS-232 to Bluetooth adapter can be purchased from Growatt suppliers.
RS-485 is standard on Growatt inverters but optional for Sungold.

The RS-232 connector is located under a small metal plate attached with two philips screws on the bottom side of the inverter.

For RS-485 there are two round 2-pin connectors at the bottom. Both connectors are wired in parallel. To connect one single inverter to a computer, only one of these two RS-485 connectors should be used. The second RS-485 connector is only required to daisy-chain inverters in multi-inverter scenarios. Pin 1 at the inverter is Negative and pin 2 is Positive.

**Software**

This latest software can be found on the manufacturer's FTP server:
ftp://113.106.58.169
User ID: ftpguest
User password: ftpguest

The original ShineNET 1 software is available from http://www.ozemail.com.au/~nekjevic/Solar/ShineNET.rar

PV Bean Counter (see below) also supports Growatt and Sungold inverters (both older models using a Growatt protocol and newer models using Modbus) and can automatically upload yield data to http://www.pvoutput.org

### JFY (Manuf=JingFuYuan)

PV Bean Counter (see below) now supports JFY inverters and can automatically upload yield data to http://www.pvoutput.org

### Orion (Manuf=Phoenixtec)

You can download the Pro Control software from http://www.solaraustralia.com .au/solar_grid_feed_inverter_orion.html

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above).

Can be accessed by PV Bean Counter – http://code.google.com/p/pvbeancounter/

### Oelmaier

/forum-replies.cfm?t=1447917&p=4

### Powercom (PCM Solar King)

Similar to SunnyRoo TLi series inverters.

For Windows you can download software direct from Powercom www.pcmups.com.tw
Version 1.27 is current and available here http://www.pcmups.com.tw/upload/File/SolarControlPlusV127.rar the software has options for both RS232 and USB connections.

For Linux you can use the libpowercom library http://libpowercom.sourceforge.net/ to retrieve values from the

inverter over RS232.

RS232 and USB ports only function when the inverter has power from PV panels and is in a waiting/online state.

Discussion thread on Powercom Solar King inverter monitoring here /forum-replies.cfm?t=1597408

### Sharp

The Sharp JH-1600E (http://www.sharp.net.au/product-catalogue/products/JH1600E/ ) uses an RS-485 interface. Information on connecting to the inverter http://power.vacated.net/jh1600e.php

SharpMon (C# based monitor software for JH-1600E) – http://code.google.com/p/sharpmon/

### SMA

SMA Protocol for direct connect RS232/485 'SunnyNet' protocol information.
http://256.com/solar/scripts/swrnet_session_protocol.pdf

For Bluetooth, SMA changed the protocol and haven't released the protocol.

http://code.google.com/p/sma-bluetooth/ is a reverse engineering attempt

PV Bean Counter automates the use of Sunny Explorer to extract yield via Bluetooth. It also accesses SMA Inverters connected to an SMA (Sunny) WebBox; – available here:

http://code.google.com/p/pvbeancounter/

Or upload via this web site directly to www.pvoutput.org : http://pv.corra.com.au/welcome/main

If you are interested simply go to http://pv.corra.com.au/ to sign up – everything is automated and it should work as soon as you put the settings into your webbox's FTP push interface. (Make sure you select XML format.
*Hint* for anyone about to do it.
Wait for the second email response that has all the details.
There is no up load directory, so leave this blank on the Webbox set up

Forum discussion on this FTP push interface: /forum-replies.cfm?t=1760734

Arduino SMA Bluetooth-to-pvoutput.org box: https://github.com/angrytongan/dfinvrelay
Running SMA Inverter on Linux: http://www.123solar.org

SMA Command line tool for Linux, based on YASDI: http://code.google.com/p/sma-get

### SolarLord (Manuf=KLNE???)

Appears to be a rebadged SunTeams KLNE inverter.

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above) & SunTeams (below).

### SolarRiver (manuf=SamilPower)

http://www.samilpower.com/en/index.asp
SolarRiver series of Grid-Tied Inverter.
Forum discussing the software – /forum-replies.cfm?t=1562090

The protocol has been at least partially document on http://www.radio-active.net.au/images/files/Samil%20Inverter.pdf per above thread. The protocol is somewhat similar to the SunnyRoo TLi series inverters, although not similar enough to operate with the same unmodified software.

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above).

PV Bean Counter (see below) also supports SAMIL inverters and can automatically upload yield data to

http://www.pvoutput.org

### SunEzy (Manuf=Phoenixtec)

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above).

### SunnyRoo

#### SunnyRoo TLi series inverters

http://sunnyrooproducts.com/?page_id=531

Information on reverse engineering the protocol is available http://reisfun.wordpress.com/
Library for communicating with the inverter http://libpowercom.sourceforge.net/
Protocol Description http://www.radio-active.net.au/images/files/Sunny%20Roo%20Inverter.pdf

#### SunnyRoo TL series inverters

The SunnyRoo TL inverters are a Modbus device. The inverters have an RS-232 port on the base of the unit. The protocol can be downloaded on http://www.radio-active.net.au/images/files/5000tl.pdf

The software is available from http://sunnyrooproducts.com/downloads/TL_Series_Inverters1.9.2.zip
Manual for Sunnyroo TLI Inverter: http://www.sunnyrooproducts.com/downloads/Solar_Control_software_usermanual_V1%5B1%5D.0_-20100921.pdf

PV Bean Counter (see below) has a SunnyRoo Modbus configuration that should work but no usage results have been reported. If you try this new PVBC feature please record the results as a PVBC "Issue" at:
http://code.google.com/p/pvbeancounter/issues/list

### Sungold (Manuf=Growatt)

Please see Growatt above.

### SunTeams (Manuf=KLNE)

The software is available from http://www.microsolar.at/Datenblaetter/SunteamsCOM.rar
Protocol readings similar to CMS-2000.

- Perl script for: CMS/Eaton/Orion/SolarLord/SolarRiver/SunEzy/SunTeams
  as at 08Mar2012: http://www.solarfreaks.com/cms2000-inverter-rs232-serial-port-hack-cms-2000-rs232-t271-240.html#p3410
  See CMS (above).

Can be accessed by PV Bean Counter (both older models using a Growatt protocol and newer models using Modbus) – http://code.google.com/p/pvbeancounter/

### Xantrex

Both the 2.8kW and the 5kW models have an RS-232 port on the base of the unit. Communications software is available from the Australian distributor here http://www.gtinverter.com.au/apps/150-0114-01-07_rev-a.zip

The Powermon software is available also for the Xantrex. There is a link on
http://www.planetchan.com/laurie/energy/solar/

At least some Xantrex inverters communicate via Modbus http://www.altestore.com/mmsolar/others/Gateway_Modbus_Serial_.pdf

## Uploading Data

### PvOutput.org

PV Output is a location where people can upload their solar generation and examine the generation of others.

Links to downloads for programs to upload for various inverters http://pvoutput.org/help.html

# Data Storage in Local Database an PvOutput.org Upload

### PV Bean Counter

This package is a windows service that extracts data from inverters, stores it in an SQL database (currently SQLite, MS Access, MySQL or SQL Server) and optionally uploads the data to pvoutput.org. It has now been tested on a multi-inverter installation. It stores yield data for each inverter in a database. This data is consolidated to 5 or 10 minute site averages for upload to pvoutput.org.

The package provides automated suspend / resume management of the monitor computer, helping to reduce power consumption associated with system monitoring.

The software currently works with SMA Sunny Explorer compatible inverters, SMA Inverters connected to an SMA (Sunny) WebBox, CMS or similar inverters (including Eaton ETN2000 and Orion inverters), JFY Inverters, KLNE Sunteams, Growatt, SAMIL, Sungold and any inverter monitored using – Current Cost, Owl or Watts Clever EW4008 / 4009 energy meters.

PVBC now has a Modbus inverter monitor facility that comes with Modbus configurations for Growatt, KLNE Sunteams and SunnyRoo TL inverters. It is possible to add extra configurations if you have the Modbus Map for the inverter.

Energy meter data is stored in a database and can be uploaded to pvoutput.org as consumption or inverter yield.

Software is available at http://code.google.com/p/pvbeancounter/

### EMA Electricity Meter Analyzer

EMA (Electricity Meter Analyzer) is a FREE program that helps you determine the accuracy of power bills from your electricity retailer, it does this by analysing each half hour interval by time of day and the power type (peak, off peak, shoulder and controlled load) then applying the rate for each of the types to come up with what it believes is a total cost for the power used.

It also allows you to obtain the Solar Exposure for your area and plot solar export against solar exposure, you can also record cumulative meter totals to obtain average daily consumption, export cost and a lot more.

download from here http://c-sharplizards.com/Downloads/ElectricityMeterAnalyzerSetup.zip

### EMA Data Logger Demo App

This demo app allows you to see in real time the same information as if you were standing in front of the system monitoring the meter.

The meter(s) being polled is/are class 1 meter(s) (which will need to be installed in a suitable area of your meter box or within a metre or so using a weatherproof enclosure) this software does not poll your existing utility meter, the software records, volts, watts, current, power factor and solar export.

From the information obtained from the meter, the software calculates interval totals in kWh's and cost / income along with other useful information.

You do not need to have any physical hardware to be able to see what the meter is doing.

As the software is being developed, facilities to upload to pvoutput.org will be included at the prescribed 5 minute intervals.

download the demo from here http://c-sharplizards.com/Downloads/EMADataLogger_Demo_Setup.zip

Self Extracting database file with over 800,000 1 second intervals of my power consumption / generation http://c-sharplizards.com/downloads/EMDLog_1.exe extract this into the database folder of the data logger.

I have tested upload to PVOutput just for the purpose of ensuring that pvoutput accepts the data stream, which id does, see http://pvoutput.org/list.jsp?id=5971&sid=4772

You can also tag a power event to determine actual power consumption, cost and other details while in record

mode.