FISHBOWL

VERSION 1.3 USERS MANUAL
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Introduction

FishBowl is a Windows based application that will monitor the Xantrex Sun Tie XR series of grid-tie inverters. The program will visually display a variety of inverter operating parameters including power production counters. Optionally, the program will log this data to a file. A separate daily total log file will also be generated.

Features

- Displays ambient and heatsink temperatures.
- Displays AC (grid) voltage and frequency.
- Displays DC (array) voltage and current.
- Displays AC and DC watts.
- Displays the current MPPT point.
- Displays inverter efficiency.
- Displays the current day's total Whrs generated, the peak AC power and lifetime kWh.
- Displays any inverter errors.
- Logs data to files for graphing or analysis.
- More than one instance can be run for monitoring multiple inverters on a single PC

System Requirements

Windows 95 or better (XP preferred)
P120 minimum. (add 100MHz for each instance)
50MB free hard drive space (space needed is dependent on logging levels).
One opto-isolated serial port for each inverter being monitored.

Note: ___*An optically isolated serial port must be used*___ for safety reasons. **Use of a non-isolated port can result in personal injury and/or equipment damage.**

Installation

Unzip the installation program into a temporary directory.
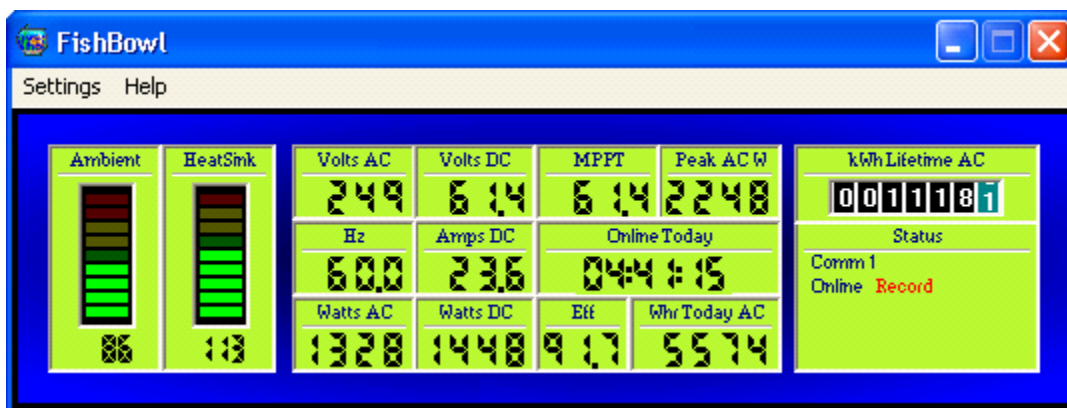Run the setup.exe program and follow the installation prompts.

Note: If monitoring more than one inverter, the program must be installed into a separate directory for each inverter.

Starting FishBowl

Click on FishBowl from the Start menu.
Select the appropriate options as described in the settings section.

Display

The FishBowl display is comprised of the following:

<u>Ambient and Heat Sink temperatures.</u>

Both temperatures are displayed both numerically and graphically. The numeric display below the bar graph will display the current temperature in degrees Celsius or Fahrenheit. Each bar graph is scaled from 0° to 85° C. The ambient bar graph will be in the green from 0° - 44° C, yellow from 45° - 64° C and red above 65° C. The heat sink will be green from 0°-54° C, yellow from 55° - 74° C and red above 75° C.

<u>Volts AC</u>

AC (grid) voltage.

<u>Hz</u>
AC frequency.

<u>Watts AC</u>

AC watts being generated.

<u>Volts DC</u>

DC (array) voltage.

DC Amps

DC (array) current.

Watts DC

DC watts.

Mppt

Maximum power point tracking. The array voltage that the inverter's algorithm has determined to produce the most power.

Peak ACW

Peak output watt level for the current day.

Online Today

Total time the inverter has been online for the day.

Eff

Inverter efficiency.

Whr Today AC

Total Whrs produced for the day.
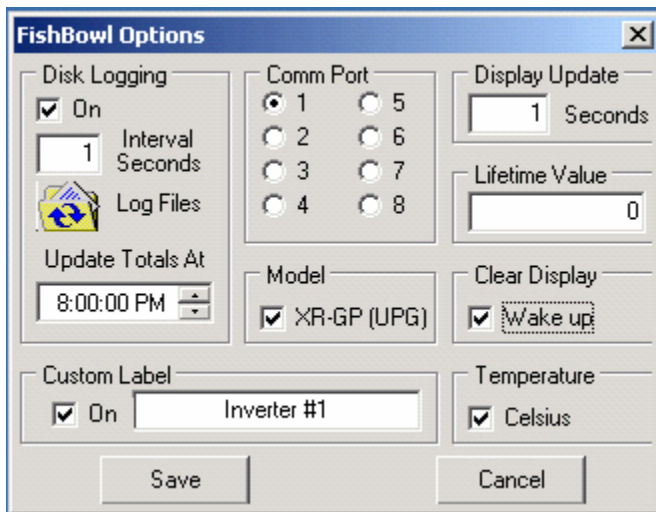
kWhr Lifetime AC

Total kWhr produced.

Status

A variety of status messages including:
Comm port selected
Inverter online/offline
Logging on/off
Inverter errors

Settings Menu

Various settings and options can be selected from the settings menu.

Note: Fishbowl will remember the screen location of this window if moved.

Disk Logging

> Selects whether or not to log data to the hard drive. Check the box to turn disk logging on.

Interval Seconds

> Used to set the interval that the data samples are logged to the hard drive. Valid input is 1-3600. One second will generate the most detailed logs but will result in larger daily files (approx 0.5MB per logging hour). Longer intervals will result in smaller files but will have less detail.

> Note: No averaging is done on disk logging regardless of the logging interval used or the Display Update interval selected. The data logged is always the unaltered data stream output of the inverter at the interval chosen.

Log Files

Used to select location and name given to log files. Note: The file name will have Log File and the date appended to it. For example if using the default name 'Sun Tie GP' the file generated would be 'Suntie GP Log File 4-29-2003.xls'. The daily totals log file will also have Daily Totals appended to the name selected. For example, using the default name 'Suntie GP', the daily total log will be named 'Suntie GP Daily Totals.xls'.

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Update Totals At

Used to set the time that the daily total log is written.

Note: this time should be set for a time after the inverter normally goes off line in the evening and before it comes on line in the morning.

Comm Port

Used to select the computer serial port that the inverter is connected to. Choices are 1-8.

Model

Used when an upgraded XR/GP inverter is being monitored or a STXR-UPG inverter is used. Do not check the box for an original STXR inverter.

Display Update

Used to set the interval that the display is updated. Valid range is 1-60 seconds. This setting is independent of the disk logging interval.
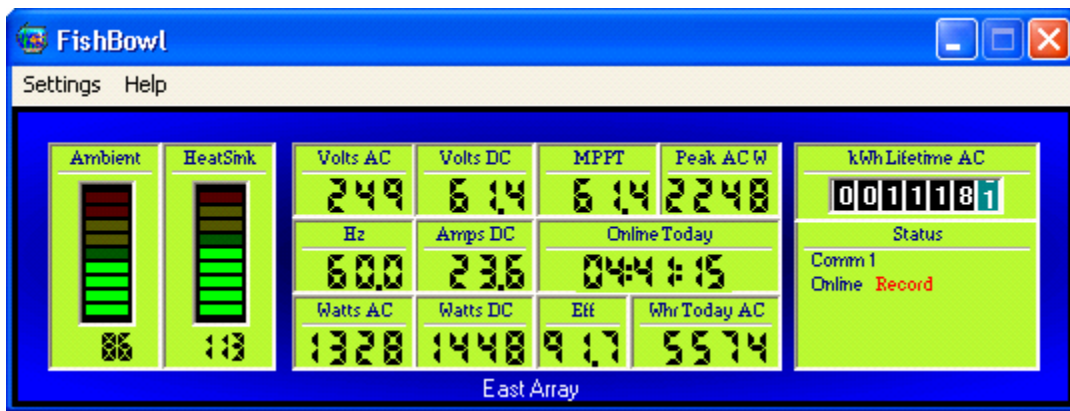
Note: Averaging is done on the display regardless of the interval selected.

Lifetime Value

Used to initially set the display lifetime kWh or to adjust if necessary if FishBowl has not been run for a period of time. Note: The number input here should be the lifetime value at the time of input.

Custom Label

Used to add a text label to the bottom of the display. Useful if running more than one instance of FishBowl due to multiple inverters. Check the box to turn it on and enter the desired text.

Temperature

Used to select whether the display temperature readings are in Fahrenheit or Celsius. Check the box to select Celsius.

Clear Display

Used to select when the display is cleared of the Peak AC W, Online Today and Whr Today AC values. Normally it is cleared at the time selected for writing the Daily Total log. Check the box to have the values cleared when the inverter next wakes up after FishBowl writes the Daily Totals log.

Exiting FishBowl

Click the close box to exit the program. You will be asked if you are sure you want to exit. You will also be asked if you want to save the current daily totals to the Daily Log file. FishBowl will remember it's screen position when restarted.

Note: Closing the program during inverter production will stop all logging. When the program is started back up, all display values other than kWhr Lifetime AC will be reset. Adjustments to the Lifetime Value may need to be made in the settings menu to compensate for the period that was not logged. As a general rule, program shutdown should be avoided while the inverter is on-line.

Log Files

The log files are tab delimited text files. They have a .xls extension but are not true Excel files. The .xls extension is added to facilitate opening in Excel for graphing or other analysis.

Daily Log

The following is an example of a few samples of data logged in the Daily Log:

Suntie Performance Logger Version 1.3 ... Copyright 2003 www.solar-guppy.com

Date	Time	VDC	DC Amps	Mppt	DC Pwr	AC Pwr	Eff	VAC	AC Wh	AmbTmp	HS Tmp	Freq	Status
05-18-2003	14:12:44	60.125	16.562	60.250	995	906	91.06	243	1120	82	104	60.1	Normal operation
05-18-2003	14:12:59	60.625	16.438	60.250	996	909	91.27	244	1124	82	104	60.0	Normal operation
05-18-2003	14:13:14	57.625	17.312	59.875	997	918	92.08	243	1128	82	104	60.0	Normal operation

Daily Totals

The following is an example of the Daily Totals log file:

Suntie Performance Logger Version 1.3 ... Copyright 2003 www.solar-guppy.com

Date	AC Wh	AC Peak Wh	Time Online	Lifetime AC Wh
05-08-2003	5991	1168	12:09:54	602209
05-09-2003	6430	1057	12:09:57	608639
05-10-2003	6029	1032	11:36:45	614668
05-11-2003	6052	962	11:50:26	620791

Serial Port Pin Connections

Inverter , DB9 connections

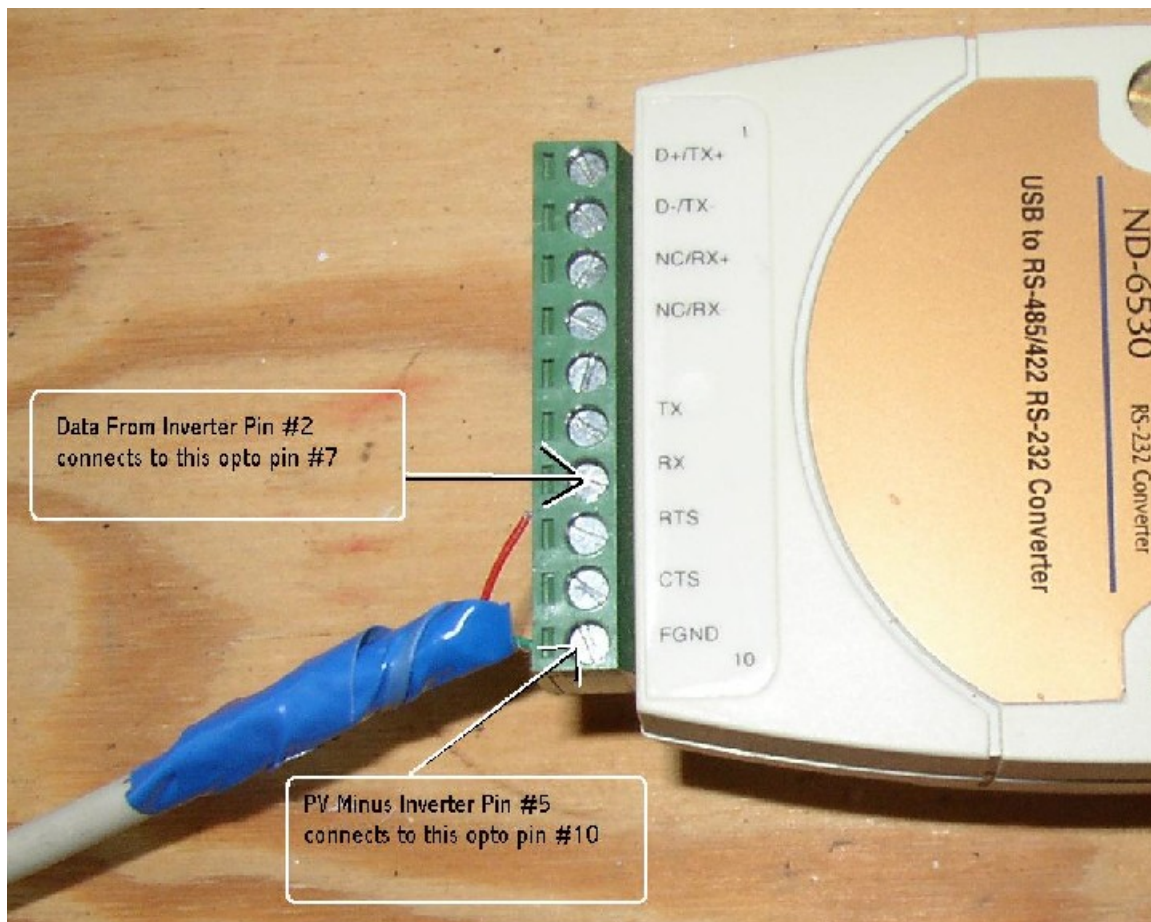**Data   pin #2**
PV minus   pin #5

Opto-Isolator Information

An opto-isolator allows two circuits to exchange signals yet remain electrically isolated. In the case of the Sun Tie inverter, pin 5 is at PV minus not earth ground. Therefore it is necessary isolate the inverter from the computer which will have pin 5 at earth ground. A serial port opto-isolator such as model ND-6530 from www.web-tronics.com will work fine for Windows 98 or better computers with a USB port.

If you use this Opto-Isolator , the connections would be

Inverter pin# 2 to Opto Pin #7
Inverter pin# 5 to Opto Pin #10

Monitoring FishBowl Remotely

If using Windows XP Professional with network connection, it is possible to create a Remote Desktop session to monitor FishBowl from another computer remotely. For more information on how to configure XP Professional and the remote computer, see: www.microsoft.com/windowsxp/pro/using/howto/gomobile/remotedesktop/default.asp