

SKYVIEW

Software for Skystream wind turbines

INSTRUCTION MANUAL

The Wireless PC Interface and Skyview 2.0 Software are compatible with Skystream 3.7 wind generators with installed 2.4 GHz communications packages and inverter firmware version 2.02 (and greater).

SKYSTREAM^{3.7}

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In this manual



IMPORTANT:
Please take note



TIP: Helpful information
to ease operation

Skyview Instruction Manual
3-CMLT-1097
Revision: B

Wireless PC Interface and Skyview Software

The CD that accompanies this Guide and your Skystream wind generator includes the following files:

- Skyview 2.0 program installation files.
- RTE and device driver files.
- An Installer_Uilities folder, which contains a “readme” text file with information and links to configuration utilities (intended for dealer/trained installer use only, as part of a turbine installation)

The drivers included with this package must be installed in order for your PC to recognize the Wireless PC Interface. These drivers will work with the USB adapter and the previous versions of the Skystream Datalogger programs, but the old drivers will not work with the Wireless PC Interface.

Since Windows may need to access the internet for certain RTE files, please perform this software installation while your PC has an active internet connection.



IMPORTANT: Disable any Windows Vista or third-party antivirus programs prior to beginning the installation of these driver files and the Skyview program. Almost all installation problems can be traced back to a failure to disable these antivirus functions.

Southwest Windpower cannot assist you with instructions on how to disable anti-virus programs that exist on your PC, as each version is unique. It is also common to encounter multiple programs, so you may have to disable more than one. Please contact the maker of your software (such as www.microsoft.com, www.norton.com or www.mcafee.com) for assistance.

System Requirements:

Skyview 2.0, and the Wireless PC Interface drivers, require a PC with an available USB port running these operating systems:

- Windows XP
- Windows Vista 32-bit

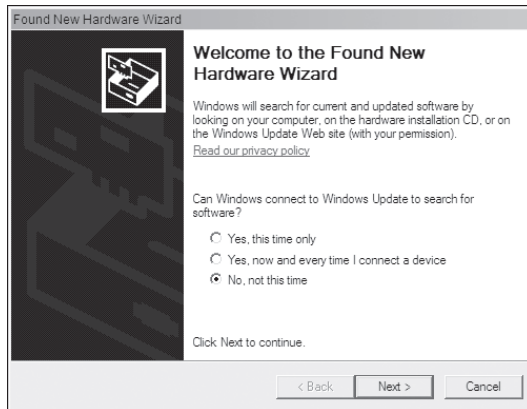
Vista 64-bit and Macintosh computers are not supported.

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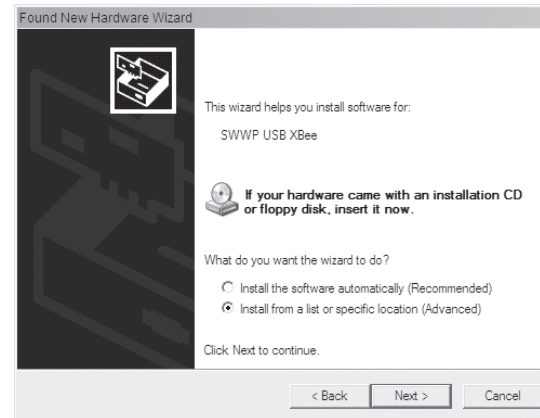
Installing Interface and Drivers - Microsoft Windows XP

(If you are updating from a previous version of Skyview, it is not necessary to re-install the Wireless PC Interface drivers and you can skip to Installing Skyview Software on a Windows XP PC).

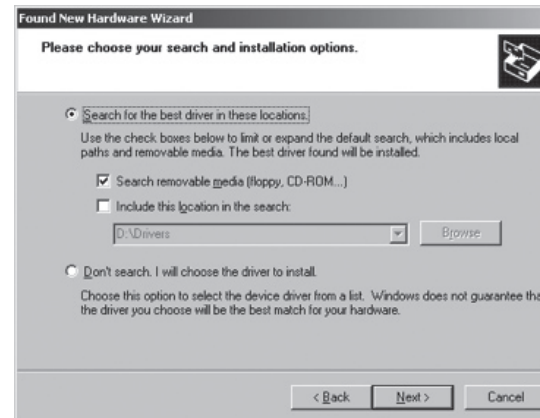
1. Attach the Wireless PC Interface to the computer's USB port using the USB cable provided.
2. Choose "No, not this time" on the first screen of the "Hardware Wizard."



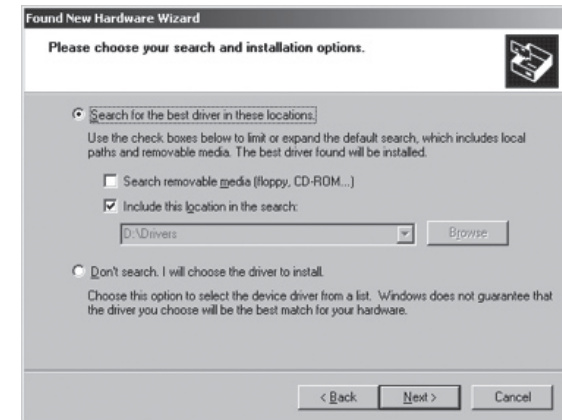
3. Choose "Install from a list or specific location."



4. Choose driver location. If you received this software on a CD-ROM, the drivers are located in the "Drivers" folder on that CD-ROM. If you choose "Search removable media," Windows should find the drivers.

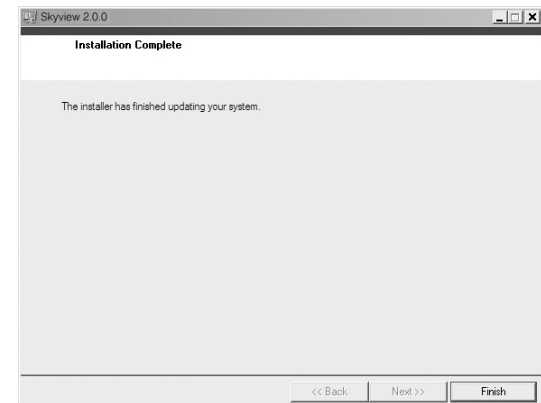
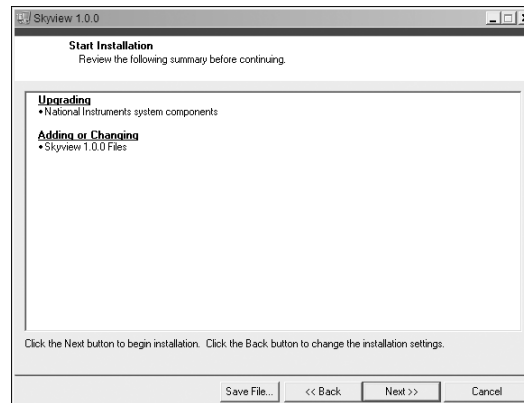
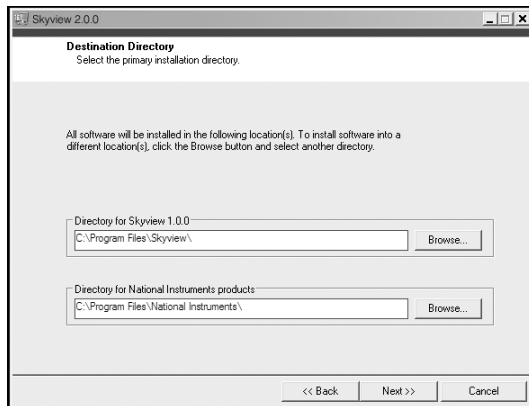


If you received this software via a download, deselect "Search removable media" and instead choose "Include this location in the search." Browse to the folder in which you saved the downloaded drivers.

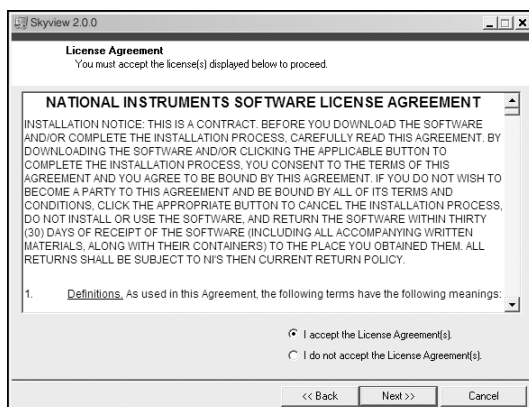


Installing Skyview Software - Microsoft Windows XP

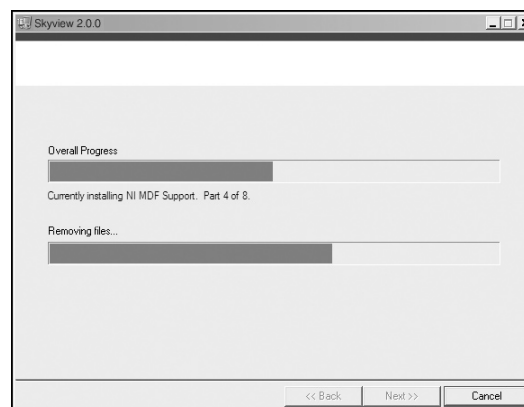
1. Run the file “Skyview_Setup.exe” from the “Skyview” folder included on this CD-ROM or from the folder in which you saved the files (if you downloaded them).
2. Choose the directory and click “Next.”
4. “Accept” the License Agreement, click “Next.”
6. Verify the version, click “Next.”



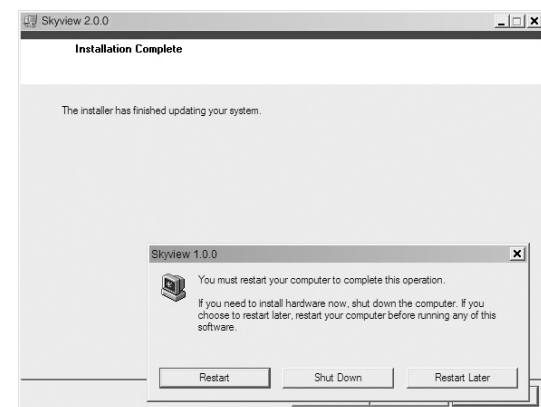
3. Wait while the software loads.



5. Click “Finish.”



7. Restart your computer if asked to do so.



8. You can now run Skyview from Start > Program Files > Southwest Windpower > Skyview



Installing Interface and Drivers - Window's Vista® 32-Bit OS Only (Window's Vista® 64-bit operating systems not supported)

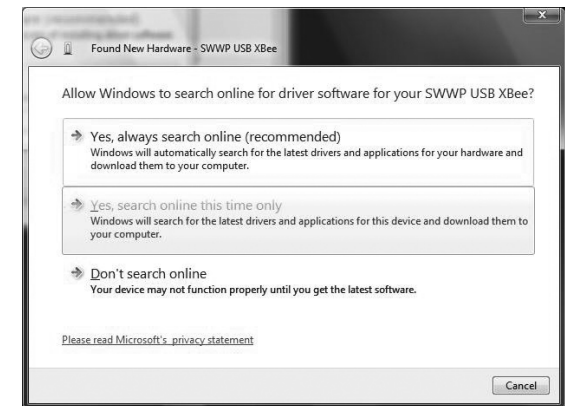
(If you are updating from a previous version of Skyview, it is not necessary to re-install the Wireless PC Interface drivers and you can skip to Installing Skyview Software on a Vista 32-bit PC.)

1. Attach the Wireless PC Interface to the computer's USB port using the USB cable provided and follow the installation prompts.
2. Click "Locate and install driver software" to continue.



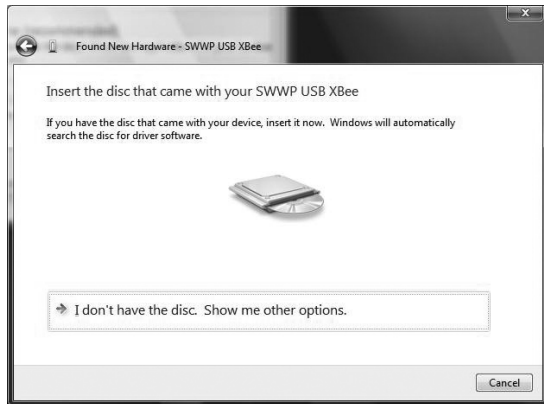
3. If a window labeled "User Account Control" appears, click "Continue."

4. Click "Don't search online" to continue.



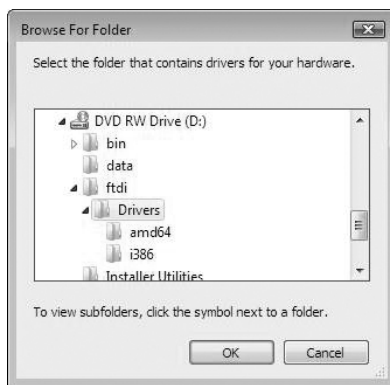
Note: If you do not see the above window, please wait while Window's Vista® searches on line for the drivers. Have patience as the process may take a few minutes. When prompted, follow Step 5.

5. If the Skyview CD provided has not yet been inserted, insert it now to continue. Click "Next" if the button is displayed.

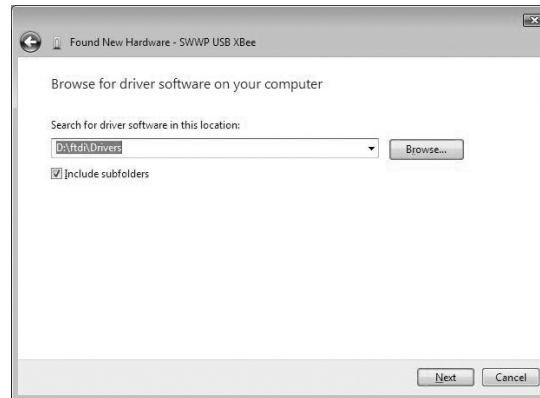


Note: If Window's Vista® will not access the CD in a few minutes, click "I don't have the disc. Show me other options," to continue. Follow the steps below:

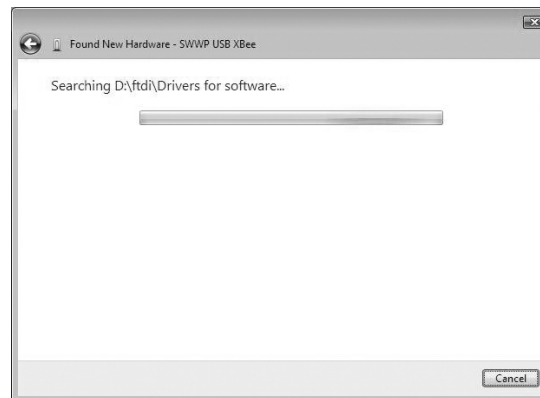
A) Select the drive in which the Skyview 2.0 CD is inserted and click "OK."



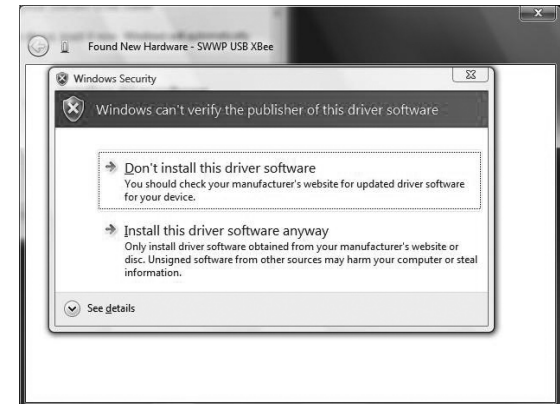
B) Verify the location and click "Next."



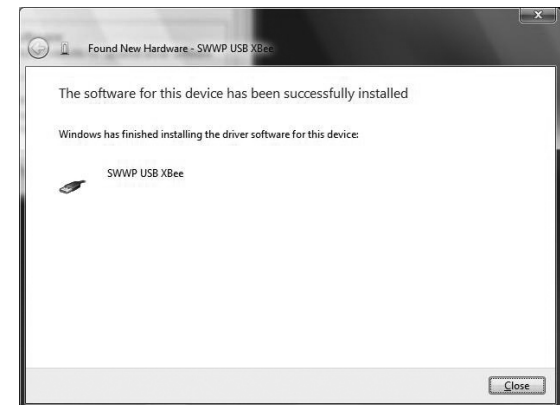
C) Wait while the drivers are found and installed.



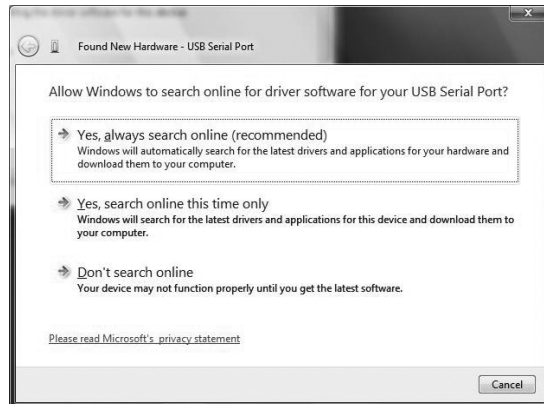
6. Click "Install this driver software anyway" to continue.



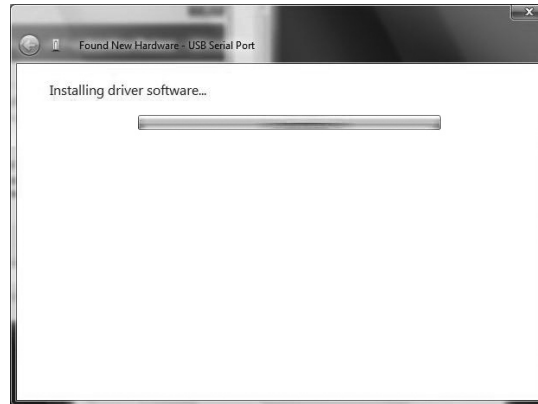
7. Click "Close" to proceed to the next driver installation.



8. Click "Don't search online" to continue.



10. The wizard will install the driver software- Please wait.



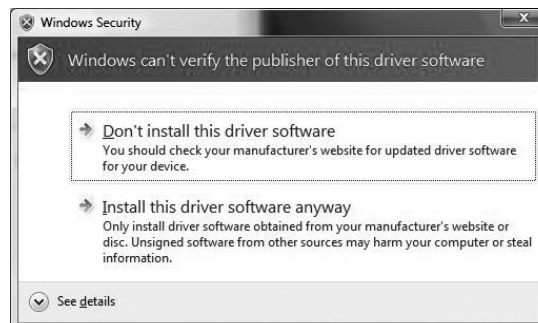
12. Click "Close" when the driver installation is complete.



9. The disc will still be inserted from the previous driver installation. Click "Next" to continue.

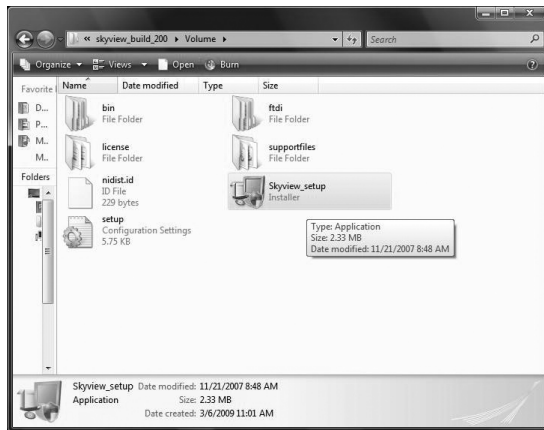


11. Click "Install this driver software anyway" to continue.



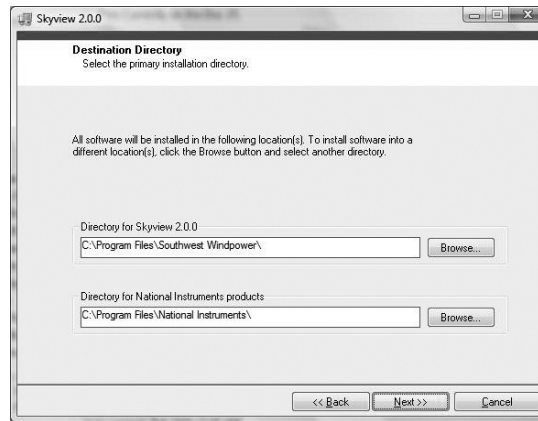
Installing Skyview Software - Window's Vista® 32-Bit OS Only (Window's Vista® 64-bit operating systems not supported)

1. Double-click the "Skyview_setup" file on the CD included to start the installer.

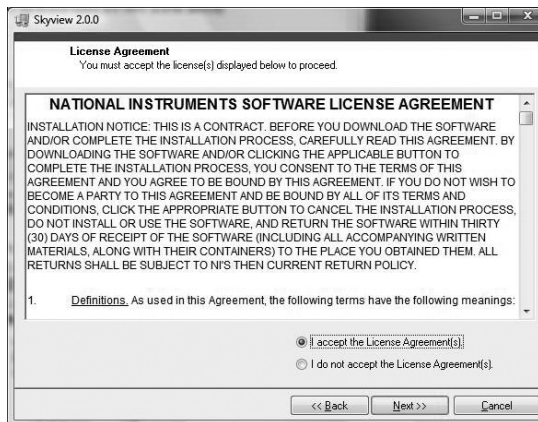


2. If a window labeled "User Account Control" appears, click "Allow" to continue.

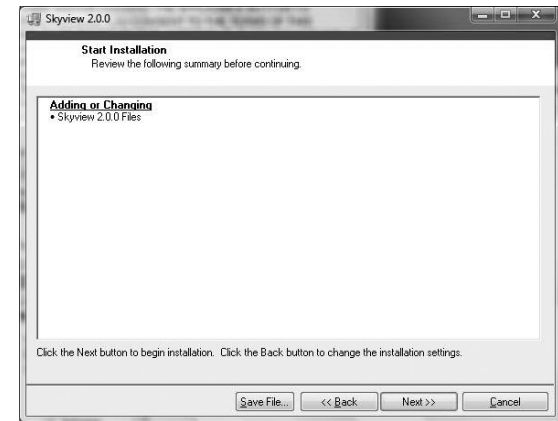
3. Click "Next" to continue.



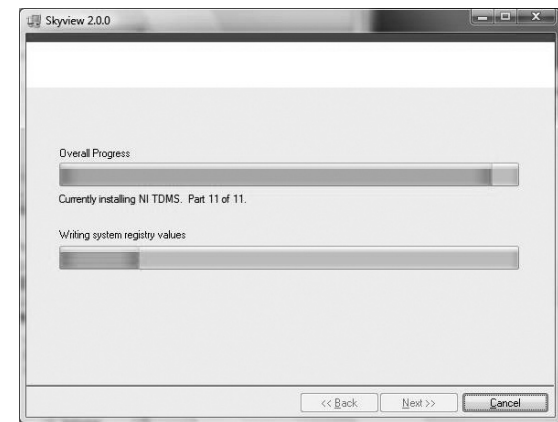
4. Select "I accept the License Agreement" and click "Next" to continue.



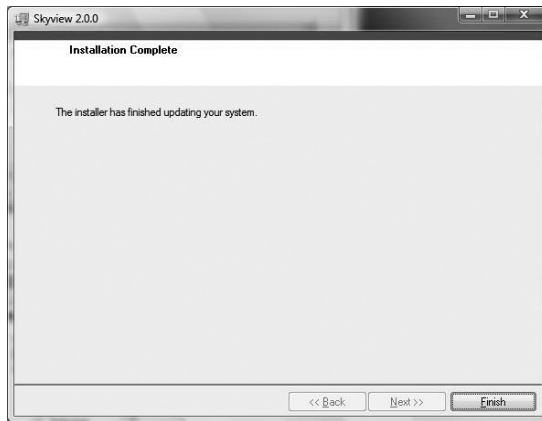
5. Click "Next" to continue.



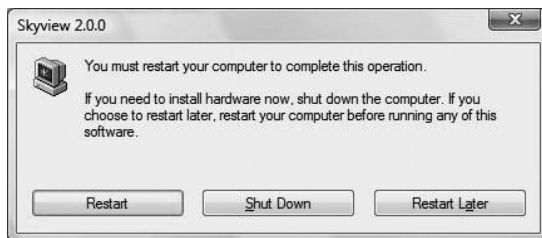
6. The installer will install Parts 1 through 11 of 11. Please wait.



- Click "Finish" to complete the installation.



- Click "Restart" to complete the operation.

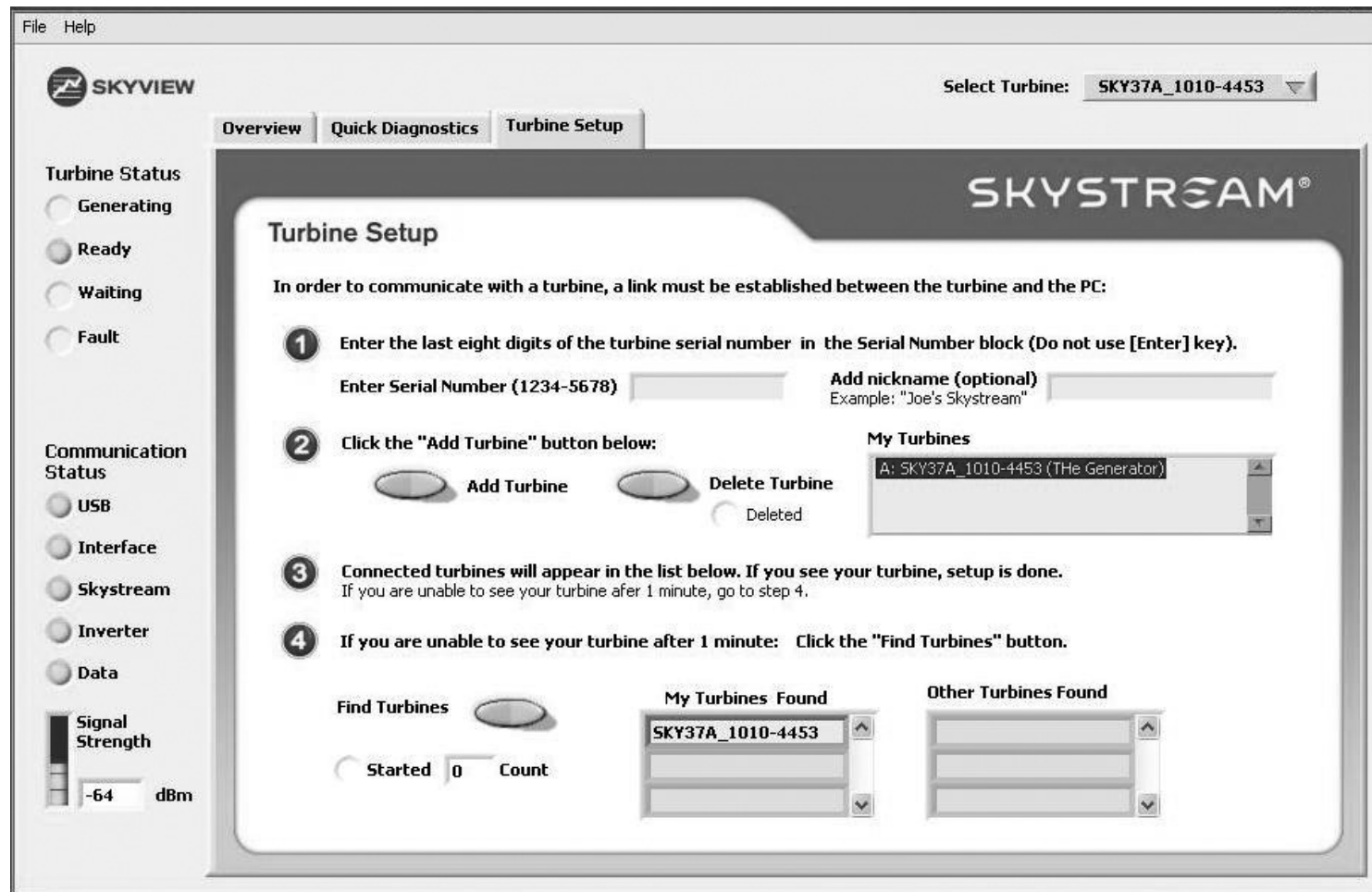


- Access the Start Menu (small Windows icon in lower left corner of your computer screen) and select All Programs>Southwest Windpower>Skyview 2.0.0 to start Skyview.

Establishing a communications link to your Skystream wind generator

The first time you open Skyview, you will see the Turbine Setup tab, as shown below. Before the Skyview software can communicate with your turbine and show any information, it is necessary to link your Wireless PC Interface with the turbine's radio and add your turbine to the Select Turbine list. The first time you visit Skyview, or any time you add a new turbine, you should go to the Turbine Setup tab.

If your USB and Interface indicators are not illuminated and the Wireless PC Interface is plugged into your PC, click on File > Connect to USB Converter. Then, follow the naming and joining instructions located on the screen.



Once your turbine shows up in the My Turbines Found list, this indicates that you have created a communications link between your Skystream and your Wireless PC Interface module.



TIP: If you have multiple Skystream wind generators, you can enter each of those serial numbers and link with all of them. Although Skyview will only show the data from one turbine at a time, each of your turbines will show up in the Turbines Found list until the links are broken.

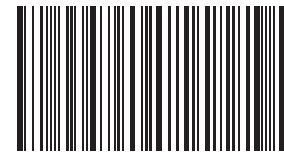
Here are some important notes regarding Wireless PC Interface and Skystream links:

- If you “delete” a turbine, you should click File>Disconnect from USB Converter and then click File>Connect to USB Converter before adding a new turbine.
- As long as a Wireless PC Interface module is powered up (by connection to an active USB port on your PC), the link established between it and a Skystream turbine will remain intact even if the Skystream loses power. When the Skystream is powered back up, it will automatically attempt to re-establish communication with the Wireless PC Interface with which it was previously linked.
- As long as a Skystream turbine is powered up, the link established between it and a Wireless PC Interface should remain intact even if the Wireless PC Interface is unplugged from your PC or loses power.
- If your installer used a Wireless PC Interface for turbine setup but you have your own Wireless PC Interface you wish to use, follow these steps to create a new link:
 1. Make sure your installer’s Wireless PC Interface is either out of range or unplugged from the PC.
 2. Power down the turbine for 10 minutes to break the first Interface link.
 3. Plug your Wireless PC Interface into an active USB port on your PC and open the Skyview program.

4. Reconnect the Skystream power and follow the joining instructions on the Turbine Setup tab.

- If at any time the link becomes lost, you can click Find Turbines. If that doesn’t work, then disconnect the power to the Skystream by turning off either the circuit breaker or the disconnect switch for 5 minutes. To restore the link, click Find Turbines and restore power to the Skystream during the 60-second Find Turbines countdown.
- If you lose communication with your Skystream, try unplugging the Wireless PC Interface module from the USB cable for a few seconds and then reconnecting it. We have found that the USB port on some PCs will fail to operate properly at times, especially after PC power-ups or hibernation. If this happens, the USB and Interface lights in Skyview can be illuminated and the lights on the Wireless PC Interface can even blink, but the Interface may not work until unplugged and re-connected.
- **You must use the correct serial number in order to join with your Skystream. Most initial joining difficulties are caused by the use of a wrong serial number or a number that is not a Skystream serial number (such as the model number or even the example 1234-5678). Please ask your Skystream dealer/installer if you don’t know your turbine serial number.**

1-SSL-10-240 ← NOT a serial number



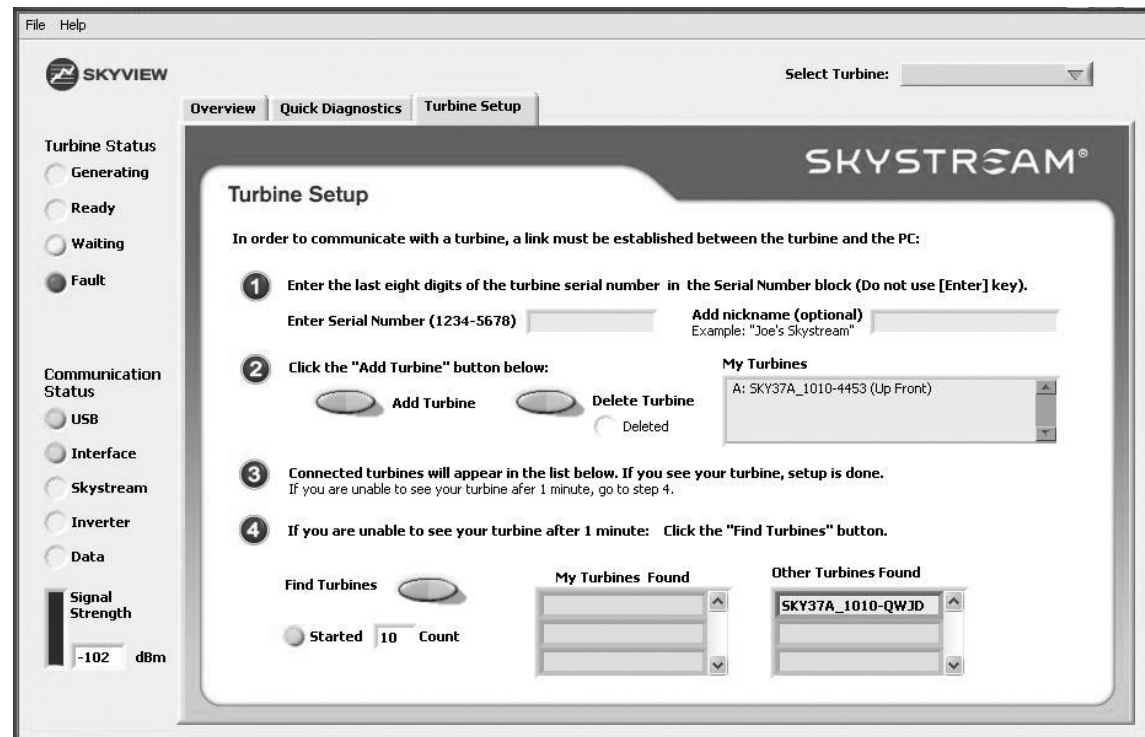
HJ-1010-1234 ← Serial number looks like this

If you do not enter the correct serial number, your Skystream will not show up in the My Turbines Found list. However, any other Skystream wind generator that is located will show up in the Other Turbines Found, with the serial number encrypted as shown here. If you are unable to join with your Skystream using the serial number provided by your dealer/installer and you encounter this situation, then Southwest Windpower can decode the correct serial number for you. In this case, please contact a Techni-

cal Support Representative who will verify your ownership of the turbine and provide the correct serial number. Once you have the correct serial number, the Technical Support Representative can then assist you with establishing a link to your Skystream.

! **IMPORTANT:** Once you have created a link and joined to your Skystream, select the desired turbine using the Select Turbine drop-down menu in the upper right corner of the program screen. This menu remains visible and is selectable from any tab within the Skyview program.

Now that you have joined to your Skystream, you are ready to start using Skyview.



Using the Skyview Software



NOTE: The power production information provided by the Skystream, through the Skyview system, is for reference use only. The power production is actually measured by an onboard inductive coil, but this measurement system is not calibrated to the same standards as is an external utility-grade meter. The power production measurements are accurate to within 5-7%.

In some circumstances, normally caused by either a power spike or a loss of power during the memory write process, it is possible for the watt-hour meter to become corrupted or re-set. If greater accuracy, or a permanent record, is required we recommend the use of a dedicated external meter.

There are three primary tabs available, intended for the end user/owner:

- Overview
- Quick Diagnostics
- Turbine Setup tabs

In addition, there are three additional tabs that can be revealed by clicking File > Advanced Diagnostics. These tabs are intended for dealer and factory diagnostic use.

If you have used previous versions of the Skystream software, you may notice that the Installer tab is not present. This tab is no longer needed for the following reasons:

- The Skystream wind generator no longer requires that the altitude be manually set, so that function is not needed.
- The date and time setting functions have been automated and made available with a single button click on the Overview tab.
- The grid type adjustment utility has been

updated and moved to a separate program, which is located on this CD. This utility will automatically detect your grid type and configure your Skystream. This utility is intended for dealer or trained installer use only, as part of the Skystream installation process.

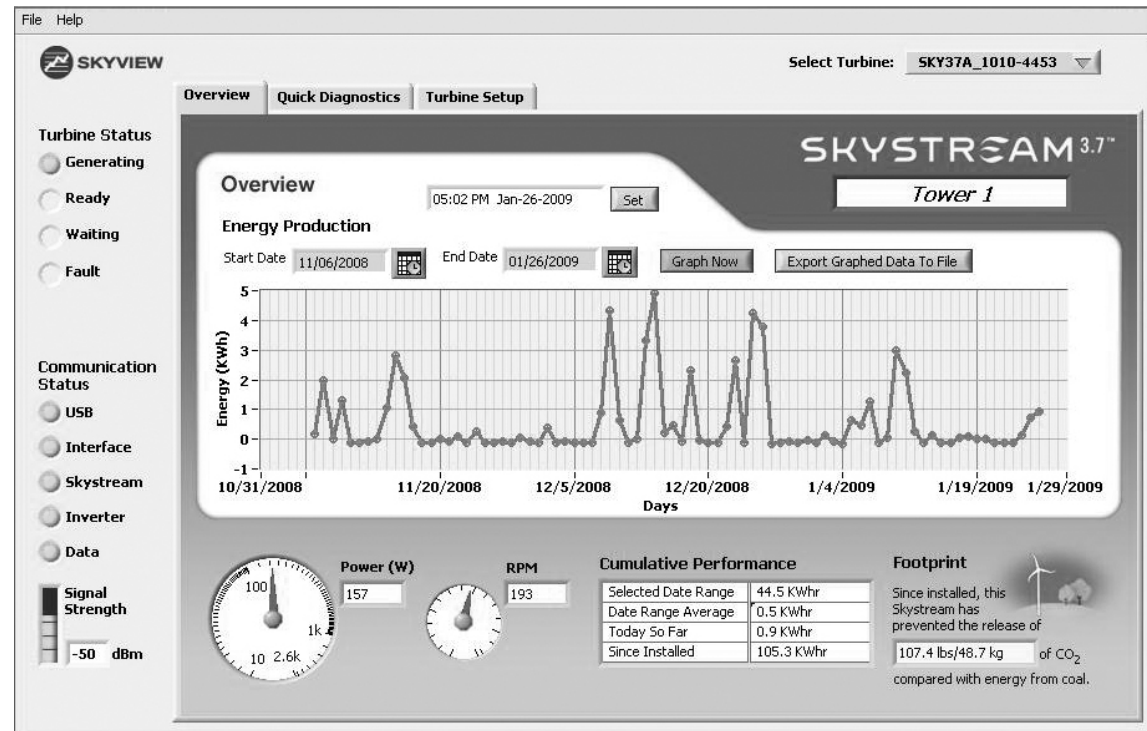
As the Turbine Setup tab has already been described above, an overview of each remaining tab follows.

Overview Tab

The main screen of the Skyview Software shows turbine power output and RPMs, plus turbine and communications status indicators. This tab also allows charting of energy production, with user adjustable options. Please note that the first time you use Skyview, you may not have any data to graph.

Once you have joined to your Skystream wind generator and selected the desired turbine using the Select Turbines drop-down menu, the instantaneous status and production data transmitted from your Skystream will display on the Overview tab. This will show up in the Communication and Turbine Status indicator lights and on the Power and RPM dials. Each status indicator light has a mouse-over description available.

The Signal Strength indicator shows the strength of the radio signal being received by your Wireless PC Interface module. The green bar meter indicates relative strength, with more green being better. The digital indicator shows the received signal strength as a function of absolute power, indicated in dBm – in this case, the “smaller” the number the higher the signal strength. So, -50 indicates a stronger signal than does -80. As the 2.4GHz frequency that the Skystream uses is very reflective, small changes in Interface position can have a large impact on signal strength as the module moves into, or out of, reflection zones. Try moving your Wireless PC Interface around to locate your best radio signal location. Note: When the interface is not connected, the signal strength bar will show a spurious maximum signal.



To set your Skystream inverter's date and time, which is necessary to record and chart the proper data, simply click the Set button next to the time/date field near the top of the tab. This synchronizes the turbine clock to your PC clock, so please make sure your PC date and time are correct.

Once your Skystream's date is set properly and if it has inverter software version 2.02 or greater, it will begin making use of memory storage that is available on the inverter board. Every night, near midnight, your Skystream will write its daily power production totals to this memory chip, and you can download and graph that production data using the Graph Now function.

The start and end dates are user adjustable, to show the time period you prefer. Once downloaded, you can also export this data to a file using the Export Graphed Data to File button.

When reviewing the exported daily production totals, you may see negative numbers on days with no wind. The Skystream does draw a small amount of power, which is required for communication and to maintain the turbine in a ready state. This power draw is about the same as a small night light, approximately 7 watts per hour.

Other information available here is a Cumulative Performance chart and a carbon footprint (offset) calculation.

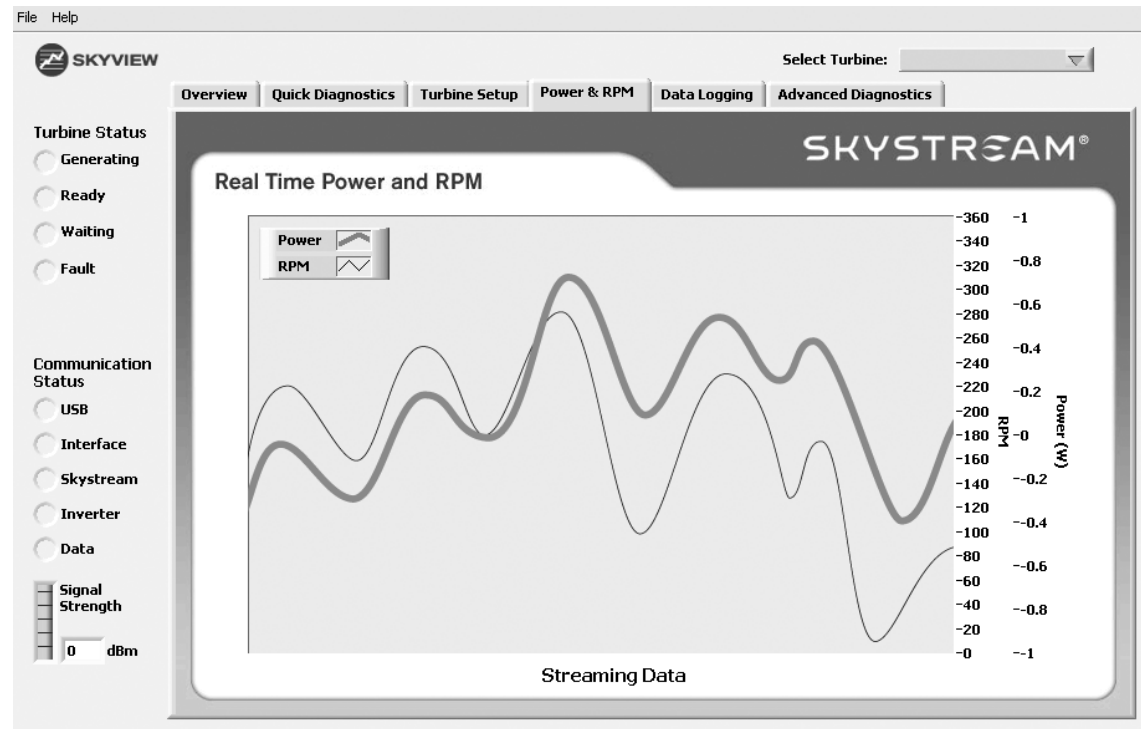
Quick Diagnostics Tab

The information on this tab provides important diagnostic data and indicators, which are useful when communicating with Southwest Wind-power technical support staff. Each data field on this tab has a brief description to aid in your understanding. If your Skystream has stopped, the information on this tab can tell you if the wind generator is sensing any grid voltage or frequency fluctuations that have caused it to shut down. If additional information is needed, in the event of a Skystream problem, you can record a data log file that will capture your turbine's performance and status. Please see the Data Logging section for instructions.

The screenshot shows the Skyview software interface. At the top, there is a menu bar with 'File' and 'Help'. Below the menu bar is a header area with the 'SKYVIEW' logo on the left and a 'Select Turbine:' dropdown menu on the right. The main interface is divided into three tabs: 'Overview', 'Quick Diagnostics' (which is selected), and 'Turbine Setup'. On the left side of the 'Quick Diagnostics' tab, there is a sidebar with two sections: 'Turbine Status' and 'Communication Status'. The 'Turbine Status' section has four radio buttons: 'Generating' (selected), 'Ready', 'Waiting', and 'Fault'. The 'Communication Status' section has five radio buttons: 'USB', 'Interface', 'Skystream', 'Inverter', and 'Data'. Below these is a 'Signal Strength' indicator showing a bar graph and a numerical value '0 dBm'. The main content area of the 'Quick Diagnostics' tab is titled 'Quick Diagnostics' and features the 'SKYSTREAM' logo. It contains several data fields with numerical values and descriptions: 'Power Out: 0 Last reported wattage output of the inverter.', 'RPM: 0 Last reported blade speed in revolutions per minute.', 'Turbine Temperature (Celcius): 0 The temperature inside the nacelle (body).', 'Anemometer Mode: 0 When illuminated, Skystream may slow while it measures windspeed.', 'Software Version: 0 This is the firmware version that is installed in the Skystream inverter.', 'Timer: 0 After power-up or certain events, the timer will count to 0 before the brake is released.', and 'Last Event: 0 The Last Event code reported can be helpful for diagnosis in the event of an anomaly.'. Below these fields is a section titled 'Grid Voltages and Frequency: If outside of spec will stop the turbine and illuminate a Low/High light.' which contains three rows of data: 'Voltage Line 1: 0', 'Line 2: 0', and 'Line Frequency: 0'. Each row has three small square indicators next to the numerical value.

Power and RPM Tab

This graph shows power production and turbine rotor speed information in a real-time, streaming format. The RPM scale is fixed, but the Power scale will vary depending upon the power output.

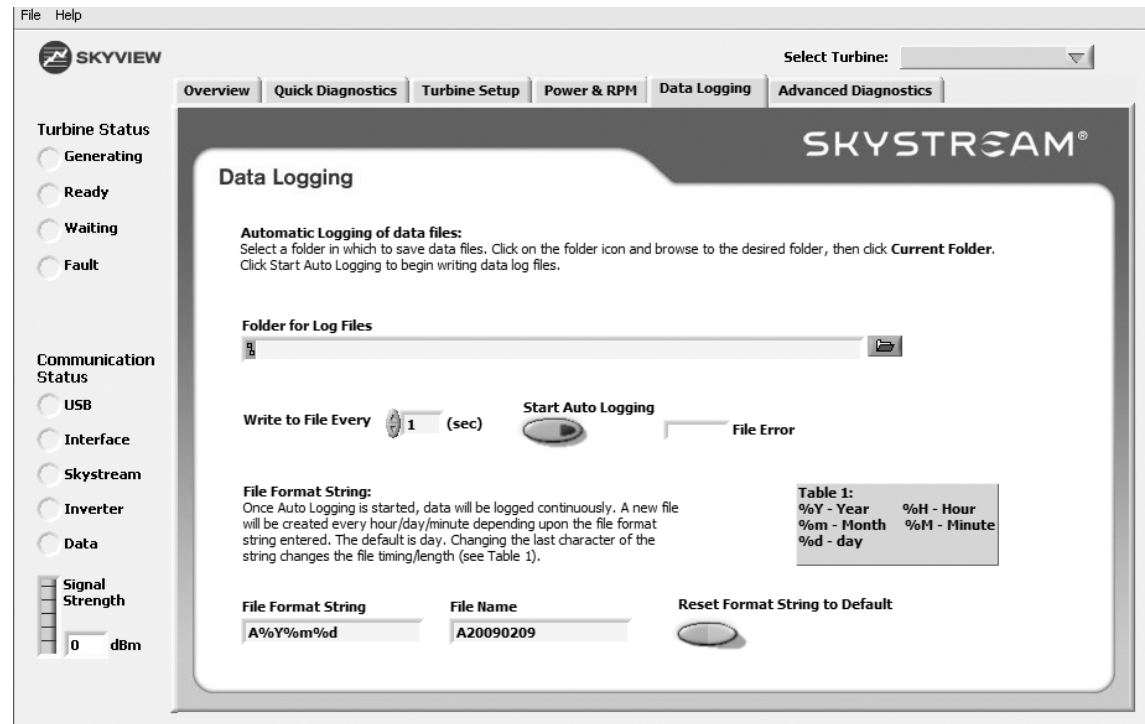


Data Logging Tab

If instructed to do so, for troubleshooting or diagnostic purposes, you can record a data log file which can be emailed to our Tech Support staff at techsupport@windenergy.com for review. To access this function, click on File and then Advanced Diagnostics to reveal this tab.

Click on the new Data Logging tab that has appeared and follow these instructions to record either a single or a string of data log files.

1. Click on the folder icon to the right of the Folder For Log Files field. Use the Windows pop-up menu to locate a folder (or your desktop) where you can later find the recorded data files.
2. Do not enter a file name in the File Name field of the Save As pop-up. Leave that field blank.
3. Once your preferred storage location is located, click the Current Folder button (below Save and Cancel).
4. Verify that the folder location is now in the Folder For Log Files field.
5. Click Start Auto Logging to begin recording. If you get a File Error light, then please verify that you left the File Name field blank and that you clicked the Current Folder button.
6. The program will record data and will continue to create a new file, every day, until you close the program or stop auto logging.
7. The file names are formatted by date, so you can easily find a particular file. For example, a data log file "a20090615" will contain the data from June 15, 2009.



8. The default recording period is one day per file. Although it's not normally necessary, you can change or add the final character of the file format string (as shown in Table 1) to alter the recording period. For example, a file format string of "a%Y%m%d_%H" will record hour-long files. To restore the default string and revert to daily files, simply click the Reset Format String button.

The resulting log files are in a tab delimited spreadsheet format. The resulting files are relatively small and easy to email. The most helpful ones are those that show a particular shutdown event or any unusual behavior.

Advanced Diagnostics Tab

Although we are frequently asked for definitions of each data field or light, these indicators are intended for engineering use only. Some of the indicator lights and data fields will reveal different information depending upon the inverter software version. Some fields are reserved or designed for future use. Because of these variables, we cannot define every field. While a dealer may be asked for the data from a particular field, for diagnostic purposes there is no “master decoder” and this is not a supported tab.

For end users and owners, the most important information has been conveniently located on the Overview and Quick Diagnostics tabs.

File Help

SKYVIEW

Select Turbine:

Overview Quick Diagnostics Turbine Setup Power & RPM Data Logging **Advanced Diagnostics**

SKYSTREAM®

Advanced Diagnostics

Data

Software Rev	Current Out	TargetTSR	Event Count
0	0	0	0
OpVersion	Power Out	Ramp	Last Ev Code
0	0	0	0
Time	Power Reg	Boost PW	Event Status
0	0	0	0
Watt-Hours	Power Max	Max BPW	Event Value
0	0	0	0
Voltage In	Line Freq	Current Amp	Turbine Status
0	0	0	0
Voltage DC Bus	Inverter Freq	Heatsink T1	Grid Status
0	0	0	0
Voltage L1	Line R	Heatsink T2	System Status
0	0	0	0
Voltage L2	RPM	T3	Slave Status
0	0	0	0
Voltage Rise	ws (ref)	V From RPM	Access Level
0	0	0	0
			Timer
			0

System Status

- ☐ HS Backoff
- ☐ SIP TX Too Long
- ☐ Improper Rst
- ☐ Batt Timeout
- ☐ Drive Off
- ☐ Slave Shutdown
- ☐ Temp Shutdown
- ☐ Run
- ☐ Disabled
- ☐ Waiting
- ☐ High Temp
- ☐ Temp Backoff
- ☐ Bad Setpoints
- ☐ Bad CRC

Grid status

- ☐ L1 Low Voltage
- ☐ L1 High Voltage
- ☐ L2 Low Voltage
- ☐ L2 High Voltage
- ☐ Offset Limit
- ☐ Phase Error
- ☐ Frequency Low
- ☐ Frequency High
- ☐ DPLL Unlock
- ☐ Grid Disconnect
- ☐ Anti-Islanding

Turbine Status

- ☐ Low Windspeed
- ☐ Braking
- ☐ Overspeed
- ☐ Spinup
- ☐ No Stall
- ☐ High Wind Test
- ☐ Anemometer
- ☐ Ramp
- ☐ TSR Incr
- ☐ Power High
- ☐ TSR Limit
- ☐ Quiet
- ☐ Incr Delay
- ☐ RPM Control
- ☐ Vin High

Communication Status

- ☐ Generating
- ☐ Ready
- ☐ Waiting
- ☐ Fault
- ☐ USB
- ☐ Interface
- ☐ Skystream
- ☐ Inverter
- ☐ Data

Signal Strength

0 dBm

Show Ripple

Ripple 0

Ripple Trip 0

SKYSTREAM 3.7[®]

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