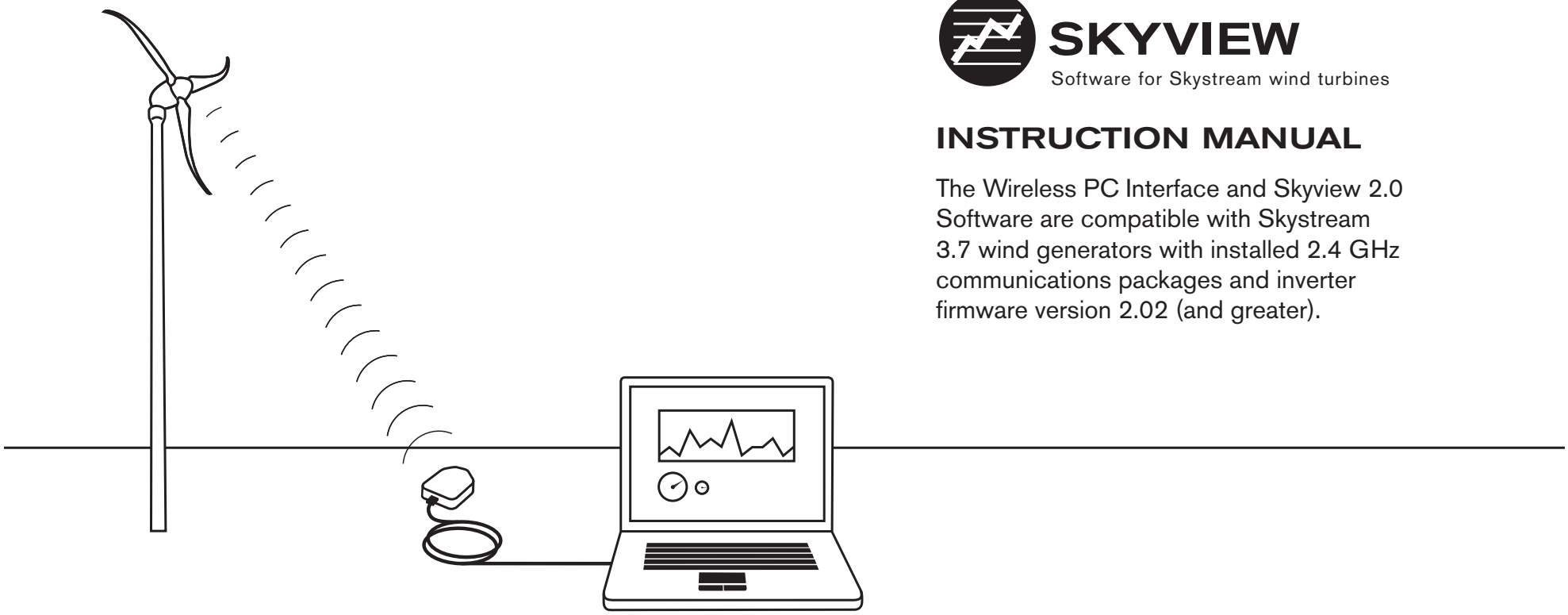
SOUTHWEST WINDPOWER™



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).

www.windenergy.com

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TIP: Helpful information to ease operation

Skyview Instruction Manual
3-CMLT-1097
Revision: D

Wireless PC Interface and Skyview Software

The Skystream Software CD includes the following files (see the Skyview folder):

- Skyview 2.0 program installation files.
- RTE and device driver files.
- Installer_Utilities folder, containing 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 must be installed for your PC to recognize the Wireless PC Interface. These drivers will work with the USB adapter and Skystream Datalogger programs, but the old drivers will not work with the Wireless PC Interface.

IMPORTANT: Disable any Windows or third-party antivirus programs prior to beginning installation of the driver files and Skyview program.

Southwest Windpower cannot assist you with disabling anti-virus programs on your PC since each version is unique. It may be necessary to disable more than one program. Please contact the software developer (such as www.microsoft.com, www.norton.com or www.macfee.com) for assistance.

System Requirements:
Your PC must have an available USB port running one of these operating systems:

- Windows XP
- Windows Vista 32-bit
- Windows 7

Vista 64-bit and Macintosh computers are not supported.

Microsoft Windows XP and Window's Vista® 32-Bit OS

(Window's Vista® 64-bit operating systems not supported)

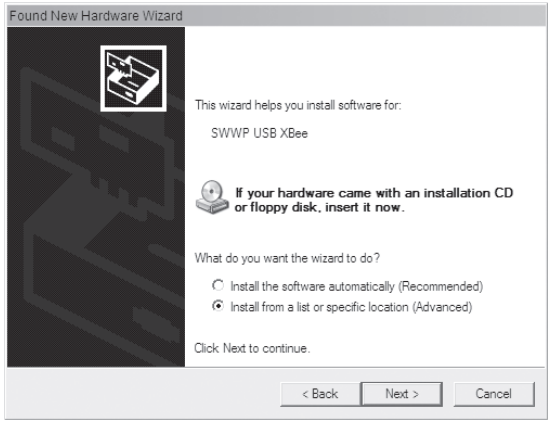
Installing Interface and Drivers

(If you are updating from a previous version of Skyview, do not re-install the Wireless PC Interface drivers. Skip to Installing Skyview Software).

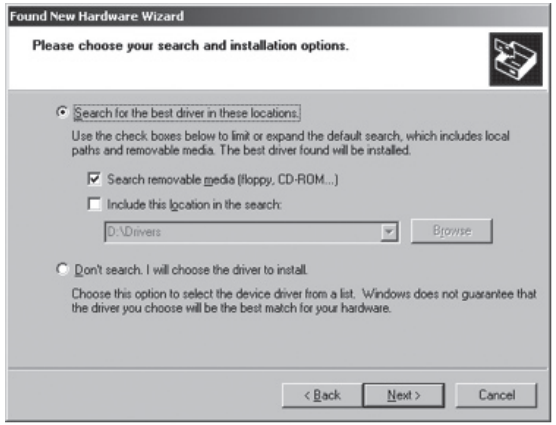
1. Attach the Wireless PC Interface to the computer's USB port using the USB cable provided.

2. Choose "No, not this time" on the first screen of the "Hardware Wizard."

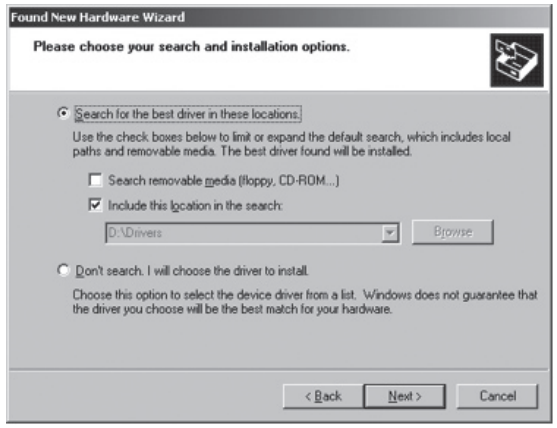
3. Choose "Install from a list or specific location."



4. Choose driver location. The drivers are located in the "Drivers" folder on the CD-ROM. Choose "Search removable media," and Windows should find the drivers.



5. If you received this software via download, choose "Include this location in the search". Browse to the folder in which you saved the drivers.

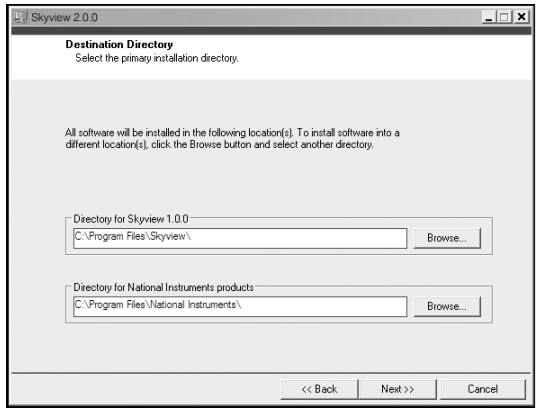


6. In the "Browse for Folder" window, **double** click the FTDI folder then **single** click the "Drivers" folder. Select "OK" and you should return to the Found New Hardware Wizard Window. Click "Next" and the drivers should install smoothly.

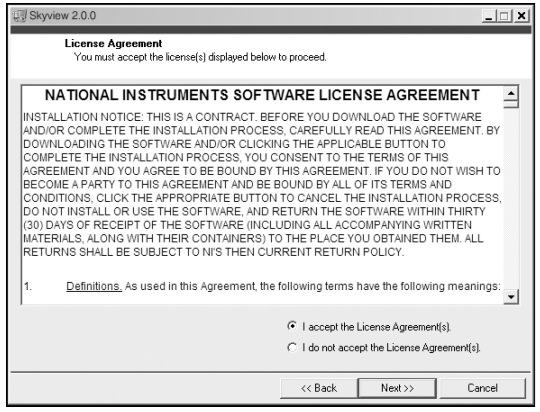
Installing Skyview Software -

1. Run the file “Skyview_Setup.exe” from the “Skyview” folder on the CD-ROM or from the folder in which you saved the downloaded files.
2. You will see the following screens during the installation process.

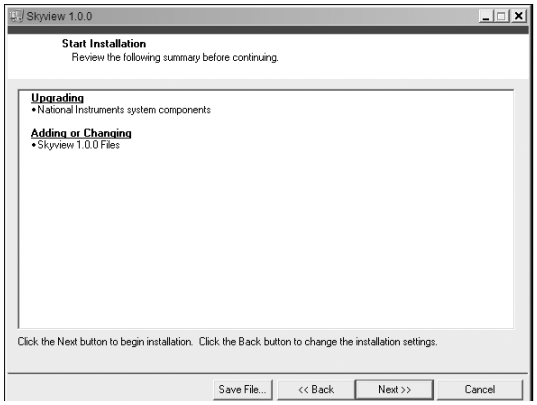
3. Choose the directory and click “Next.”



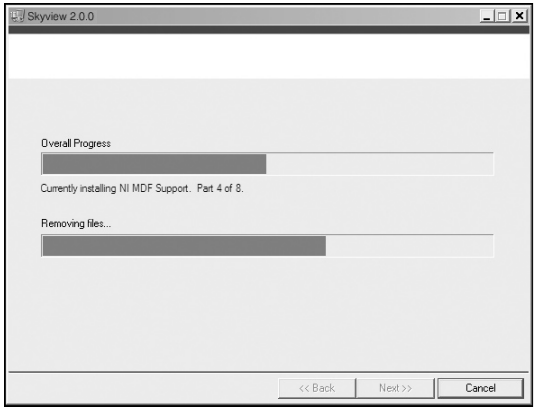
4. Wait while the software loads.



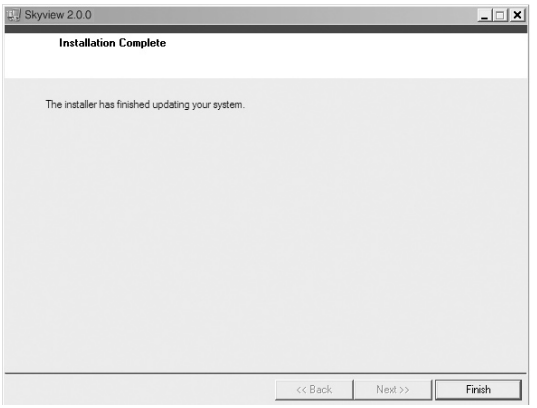
5. “Accept” the License Agreement, click “Next.”



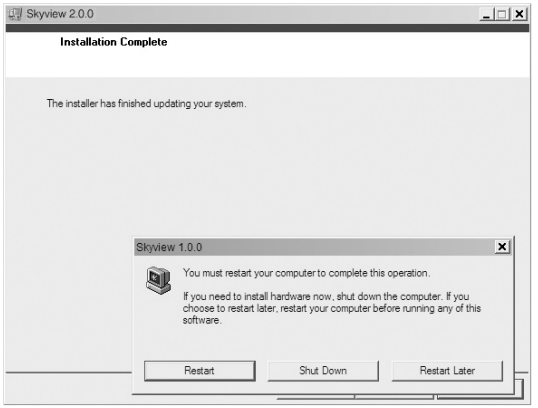
6. Click “Finish.”



7. Verify the version, click “Next.”



8. Restart your computer if asked to do so.

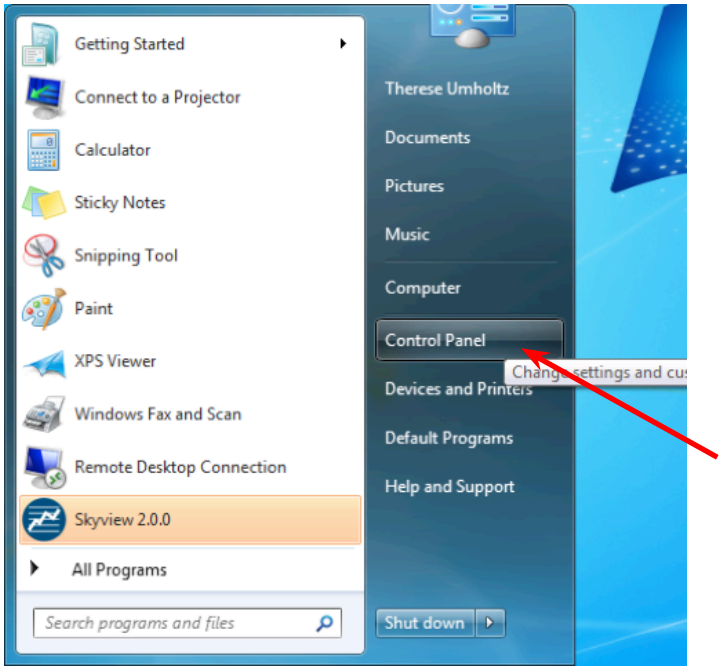


9. You can now run Skyview from Start > Program Files > Southwest Windpower > Skyview

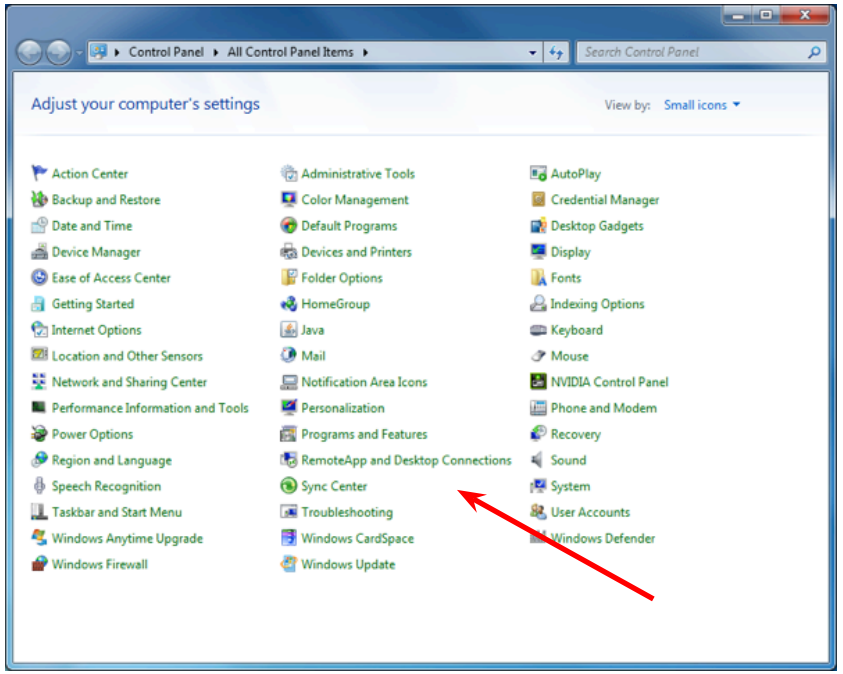
Microsoft Windows 7 OS

Installing Interface and Drivers

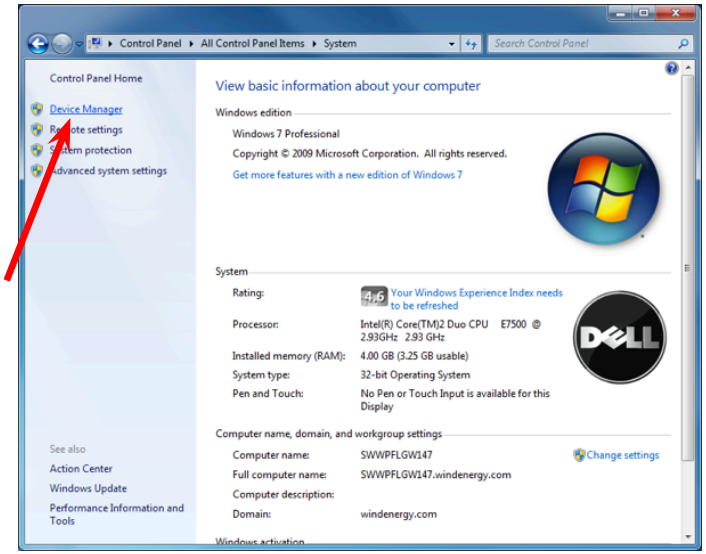
1. Attach the Wireless PC Interface to the computer's USB port using the USB cable provided.
2. From the "Start" button, select "Control Panel"



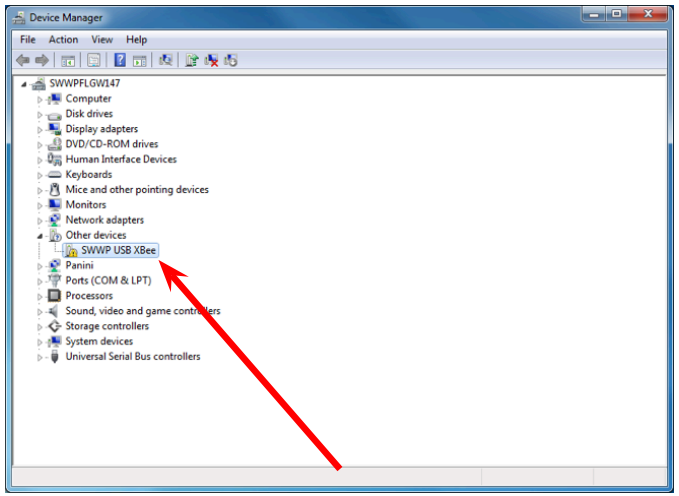
3. Select "System"



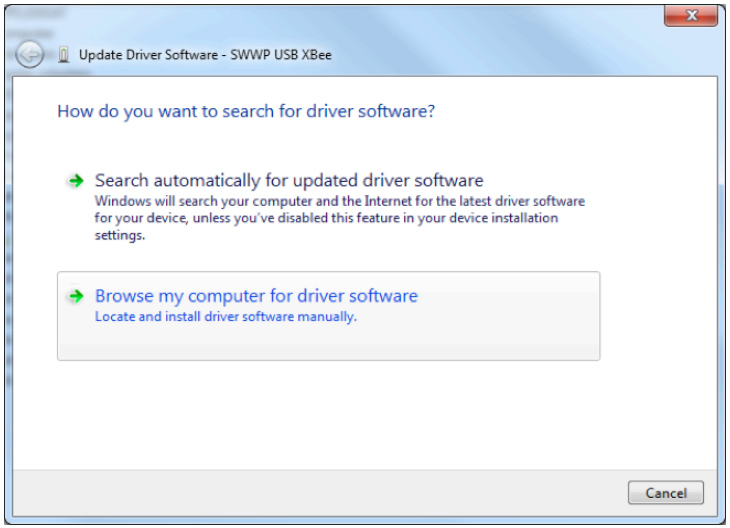
4. Select “Device Manager”



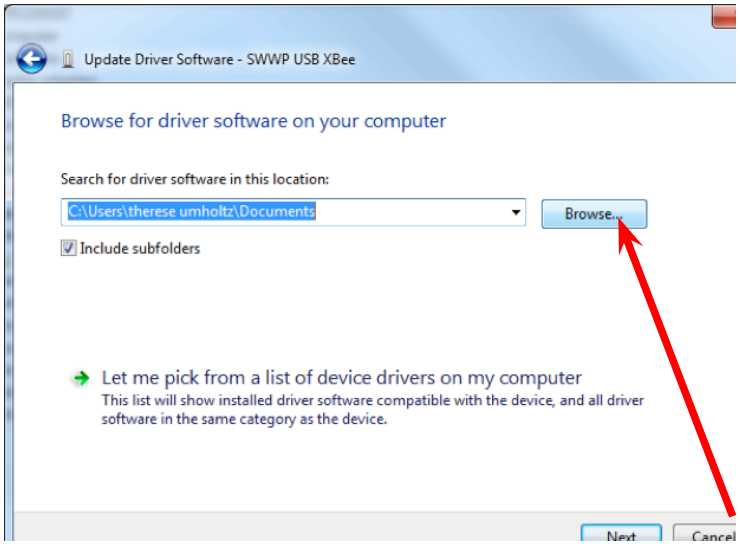
5. Locate the “SWWP USB Xbee” device either under “Other devices” or “Universal Serial Bus controllers” (you may have to “expand” that menu item to see the list)



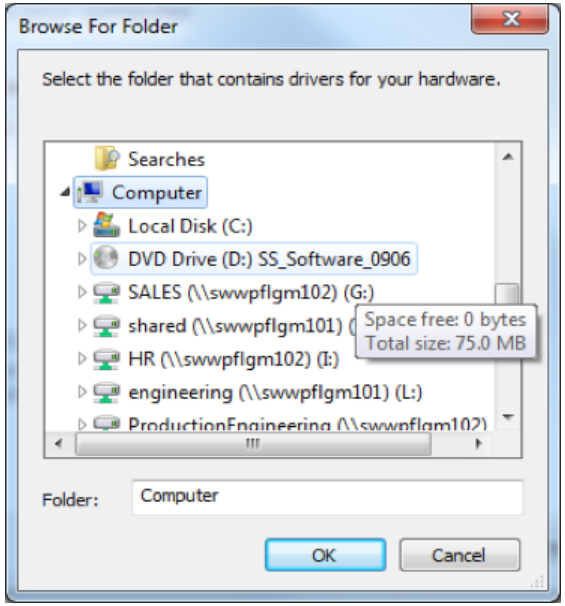
6. Right click on ”SWWP USB Xbee” and select “update driver”. The following screen will appear. Select “Browse my computer for driver software”



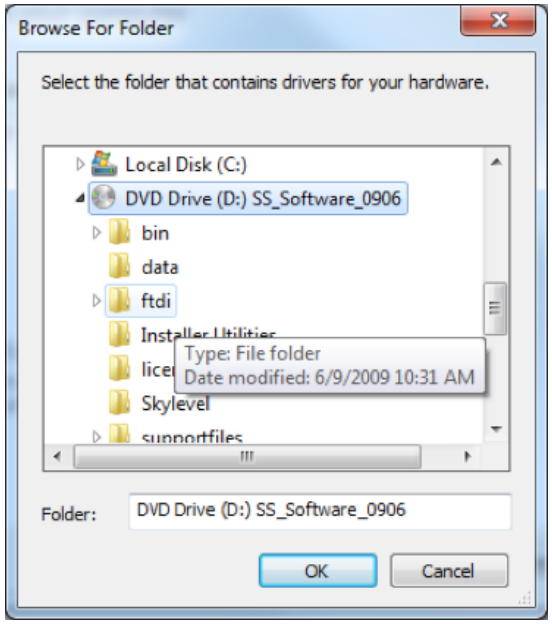
7. Click the “browse” button.



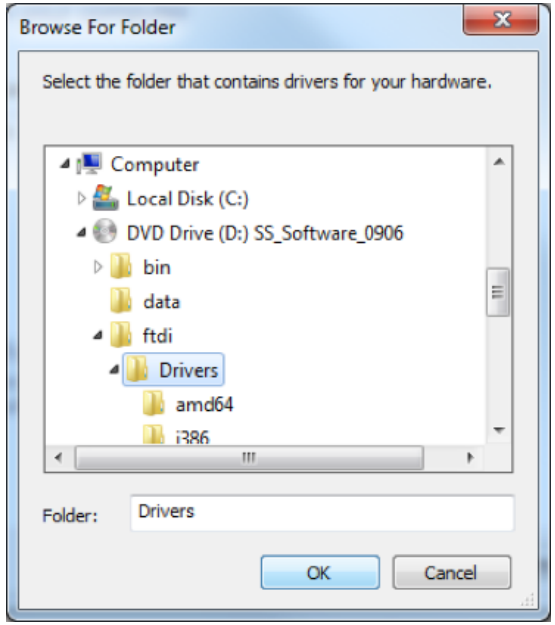
8. Locate the CD Rom drive containing the Skyview 2.0 software or the location of your downloaded Skyview 2.0 file.



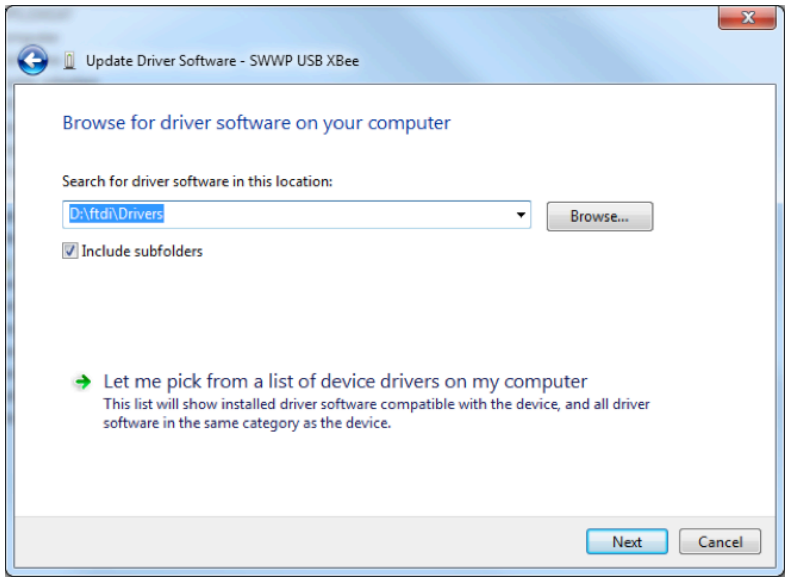
9. Double click on the “FTDI” folder.



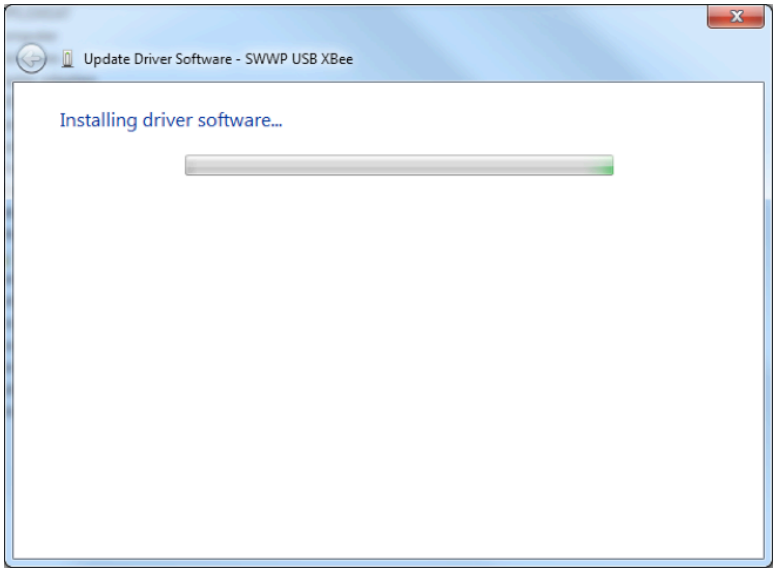
10. **Single** click the “Drivers” folder and select “OK”



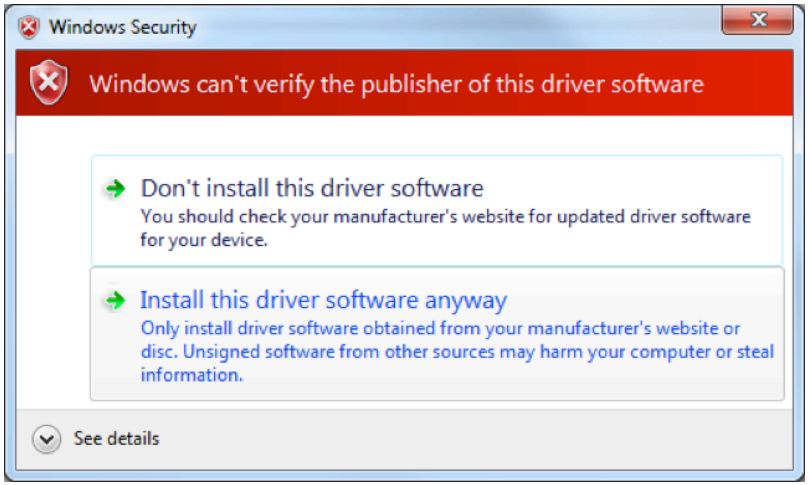
10. The next screen that comes up should look like the one below. Click “Next”.



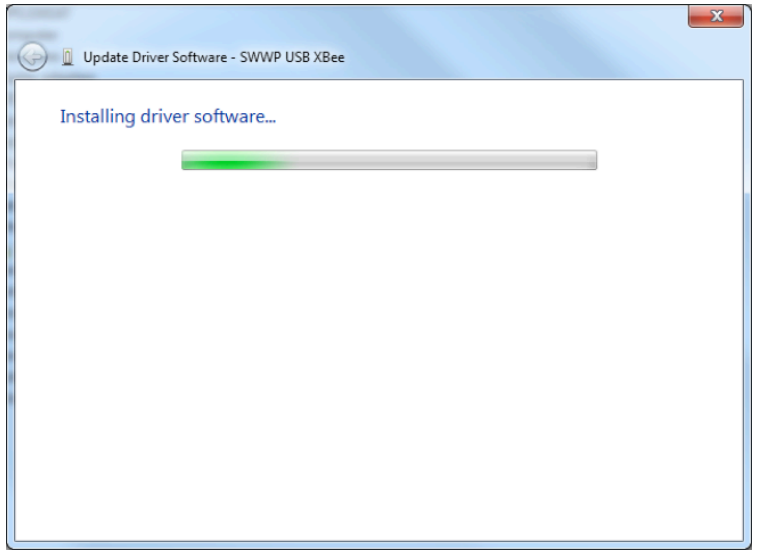
11. Your computer should bring up the screen below.



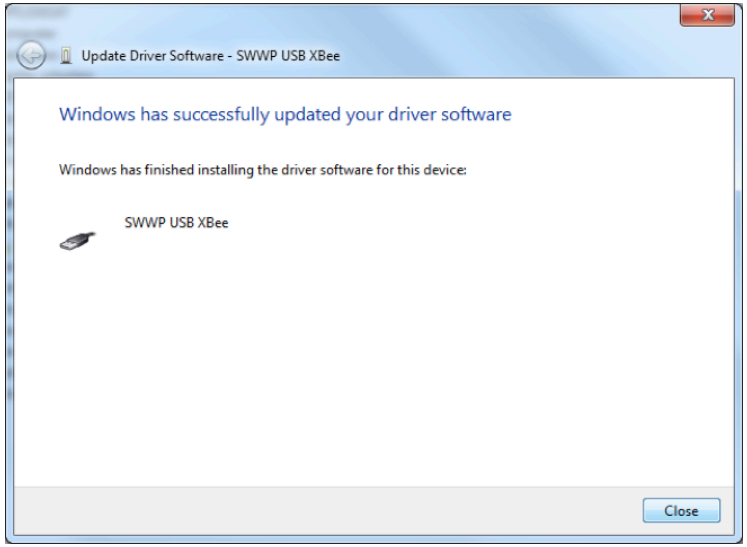
12. If the following warning appears, select “Install this driver software anyway.”



13. The computer will continue installing the driver software.

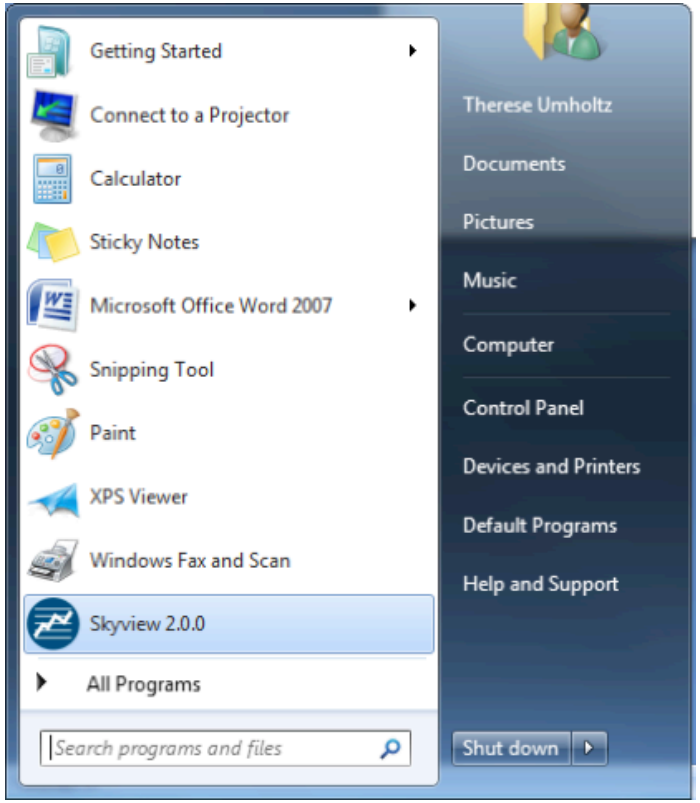


14. This should take 30 – 60 seconds. The confirmation screen below should appear.



Installing Skyview Software - See "Installing Skyview Software" in the Microsoft Windows XP section; the steps are very similar.

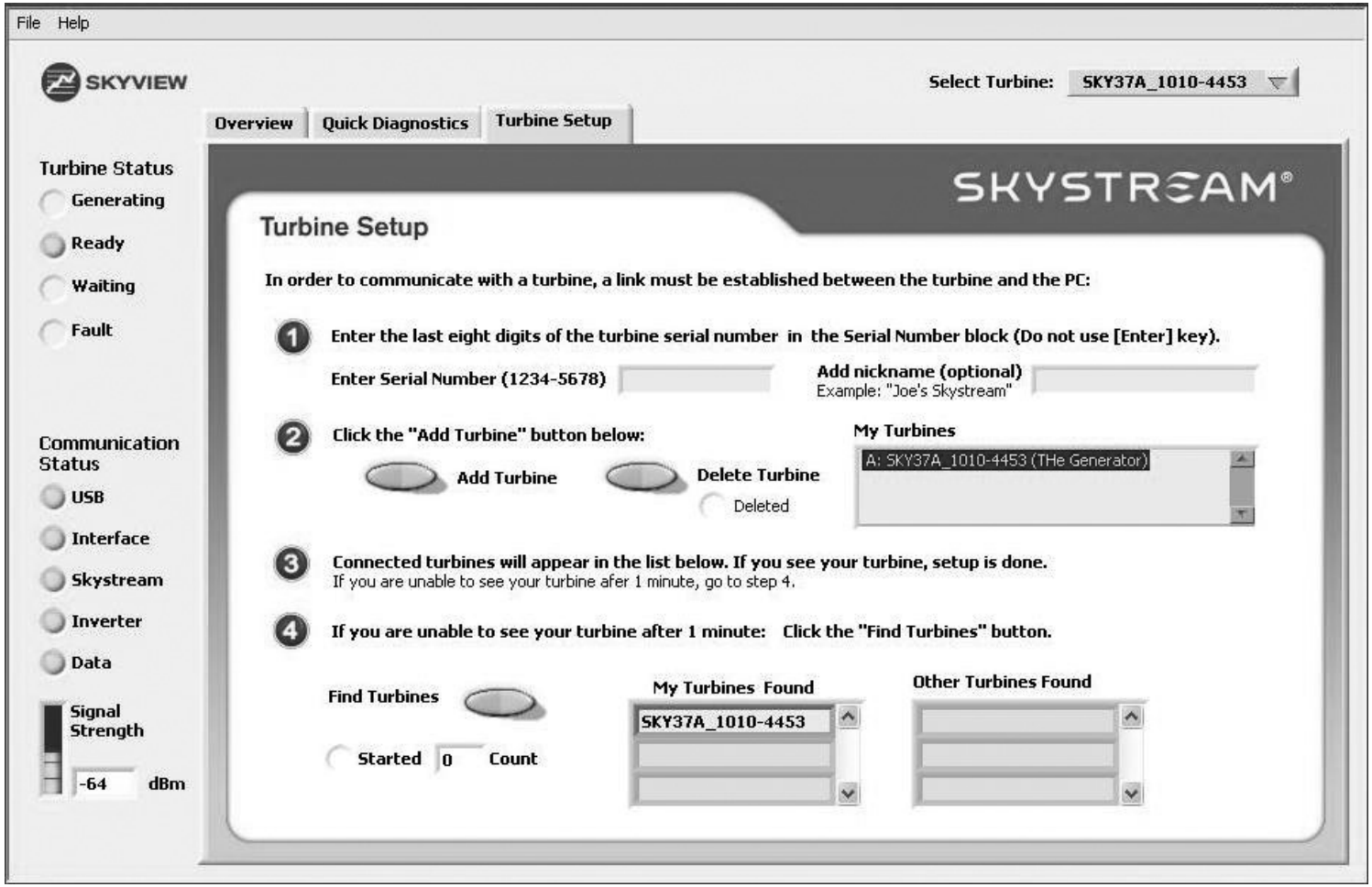
When software is installed and you have re-started your computer, go to Programs on the Start button and select "Skyview 2.0"



Establishing a communications link to your Skystream turbine

The first time you open Skyview, you will see the Turbine Setup tab. You must to link your Wireless PC Interface with the turbine's radio and add the turbine to the "My Turbines" list before Skyview can communicate with your turbine. Anytime you add a new turbine go to the Turbine Setup tab.

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

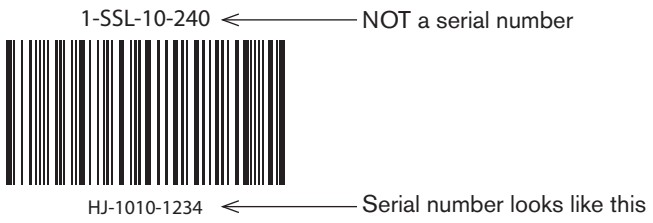


If your turbine shows up in the “My Turbines Found” list, you have successfully created the communications link.

TIP: Multiple Skystream turbines can be setup at the same time. 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 unless the links are broken.

Important notes regarding Wireless PC Interface and Skystream links:

- If you “delete” a turbine, click File>Disconnect from USB Converter
- Click File>Connect to USB Converter before adding a new turbine
- If the Wireless PC Interface module is powered up (connected to an active USB port on your PC), the link to Skystream remains intact even if the turbine loses power. When Skystream powers back up, it automatically attempts to re-establish communication with the Wireless PC Interface.
- If Skystream is powered up, the link 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. Ensure 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. Power up the turbine and follow the joining instructions on the Turbine Setup tab.
- If the link is lost, click Find Turbines.
  - If that doesn’t work, select File>Disconnect from USB Converter, wait a few seconds then select File>Connect to USB Converter
  - If that doesn’t work, close Skyview, disconnect the USB cable from the PC’s port, wait a few seconds, reconnect the USB cable and restart Skyview.
  - If all else fails, power down Skystream by turning off either the circuit breaker or 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 in between sessions, unplug the Wireless PC Interface module from the USB cable for a few seconds then reconnect it. USB ports on some PCs sometimes fail to operate properly, especially after Windows Updates, PC power-ups or long hibernation. Although the USB and Interface lights may indicate proper operation, the Interface may not work until unplugged and re-connected.
- You must use the correct serial number to link with a target Skystream. Most initial joining difficulties are caused by using the wrong serial number or a number that is not a Skystream serial number (such as the model number or the example 1234-5678). Contact your Skystream dealer/installer if you don’t know your turbine serial number.

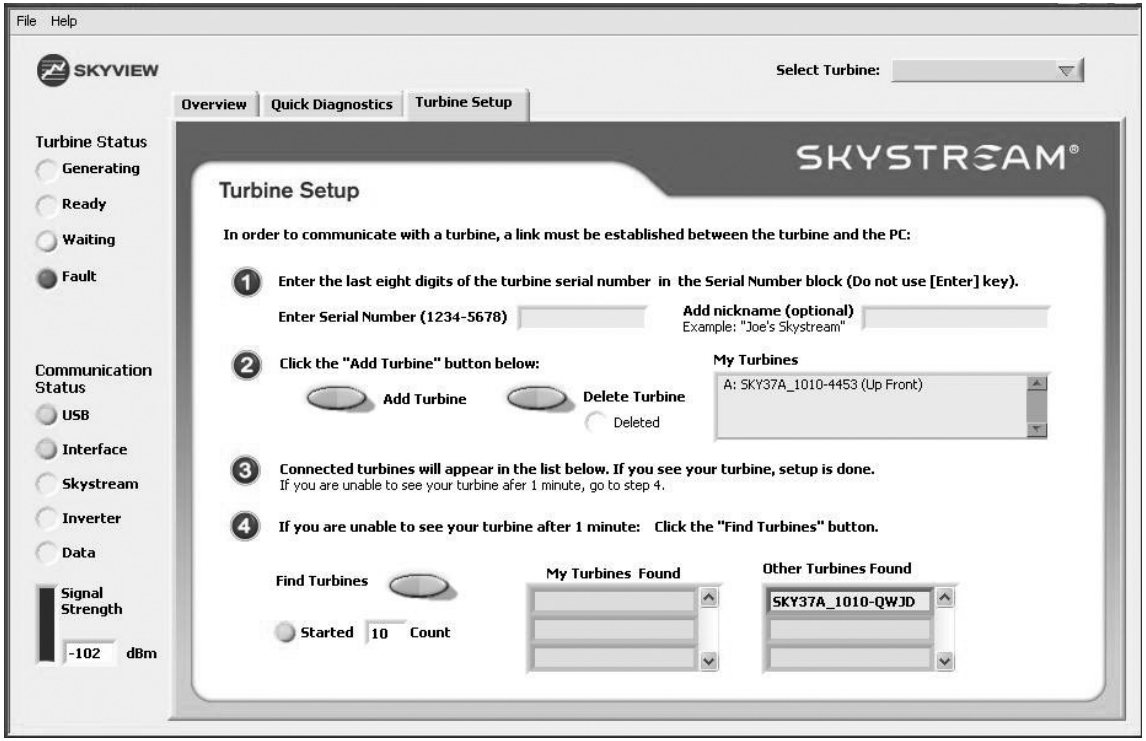


- If you do not enter the correct serial number, your Skystream will not show up in the My Turbines Found list. Other Skystream turbines detected will show up in the Other Turbines Found list, with the serial number encrypted as shown here.

- If you are unable to join with your Skystream using the provided serial number, contact a Southwest Windpower Technical Support Representative who will verify turbine ownership and the correct serial number. The Technical Support Representative can then assist you with establishing a link to your Skystream.

IMPORTANT: Once joined to your Skystream, select the desired turbine using the Select Turbine drop-down menu in the upper right corner of the pro¬gram screen. This menu remains visible and is selectable from any tab within the Skyview program.

You are ready to start using Skyview.



Using the Skyview Software

NOTE: The power production information visible via Skyview is for reference only. Skystream power production is measured by an onboard inductive coil which is not calibrated to the same standards as an external utility-grade meter. These measurements are accurate to within 5-7%.
In some circumstances, normally resulting from a power spike or power loss during the memory write process, the watt-hour meter may reset or become corrupted. If greater accuracy or a permanent record is required, we recommend using a dedicated external meter.

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

- Overview
- Quick Diagnostics
- Turbine Setup

Three additional tabs, intended for dealer and factory diagnostic use, are available by clicking File > Advanced Diagnostics.

The Installer tab, available on previous versions of Skyview, is no longer needed because:

- Skystream no longer requires manually setting the altitude.
- Date and time setting functions are automated and available on the Overview tab.
- The grid type adjustment utility is now in a separate program on this CD. This utility automatically detects the grid type and configures Skystream. This utility is for dealer or trained installer use as part of the Skystream installation process.

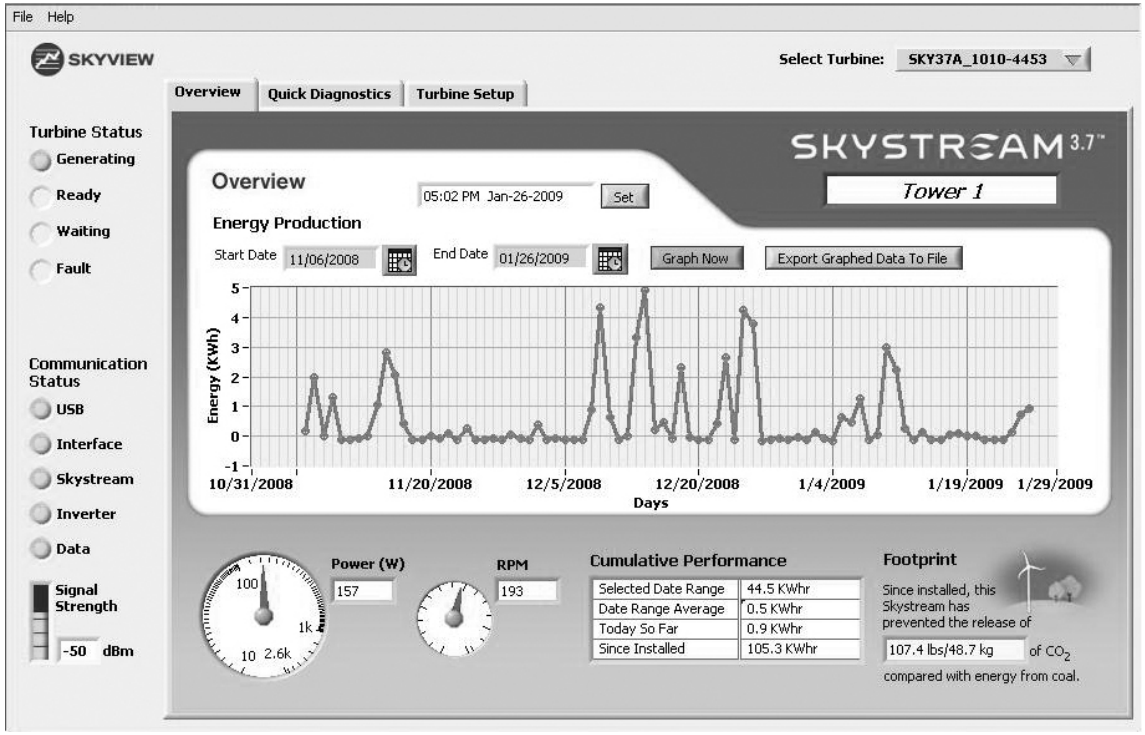
Overview Tab

The main Skyview screen displays instantaneous turbine power output and RPMs, plus turbine and communications status indicators. Information about the communication and turbine status indicator lights and the Power and RPM dials is available as a mouse-over description. This tab also allows energy production charting with user adjustable options. *Please note: the first time you use Skyview, you may not have data to graph.*

The Signal Strength indicator shows the radio signal strength received by your Wireless PC Interface. The green bar meter indicates relative strength; the more green the better. The digital indicator shows received signal strength as a function of absolute power (dBm); the "smaller" the number the better. So, -50dBm indicates a stronger signal than -80dBm. The 2.4GHz frequency used by Skystream is very reflective and changes in Interface position have an impact on signal strength as the module moves into or out of reflection zones. Move your Interface around to locate your best radio signal location. Note: When the interface is not connected, the signal strength bar will show a false maximum signal.

To set your Skystream inverter's date and time (important for recording the proper data) click the Set button next to the time/date field. This synchronizes the turbine clock to your PC clock, so ensure your PC date and time are correct.

Once the date is set, and if the turbine has software version 2.02 or greater, it will begin storing information on the inverter board. Nightly, near midnight, Skystream will write its daily



power production totals to a memory chip which you can download and graph using the Graph Now function. Skystream's inverter memory stores production data up to approximately five years.

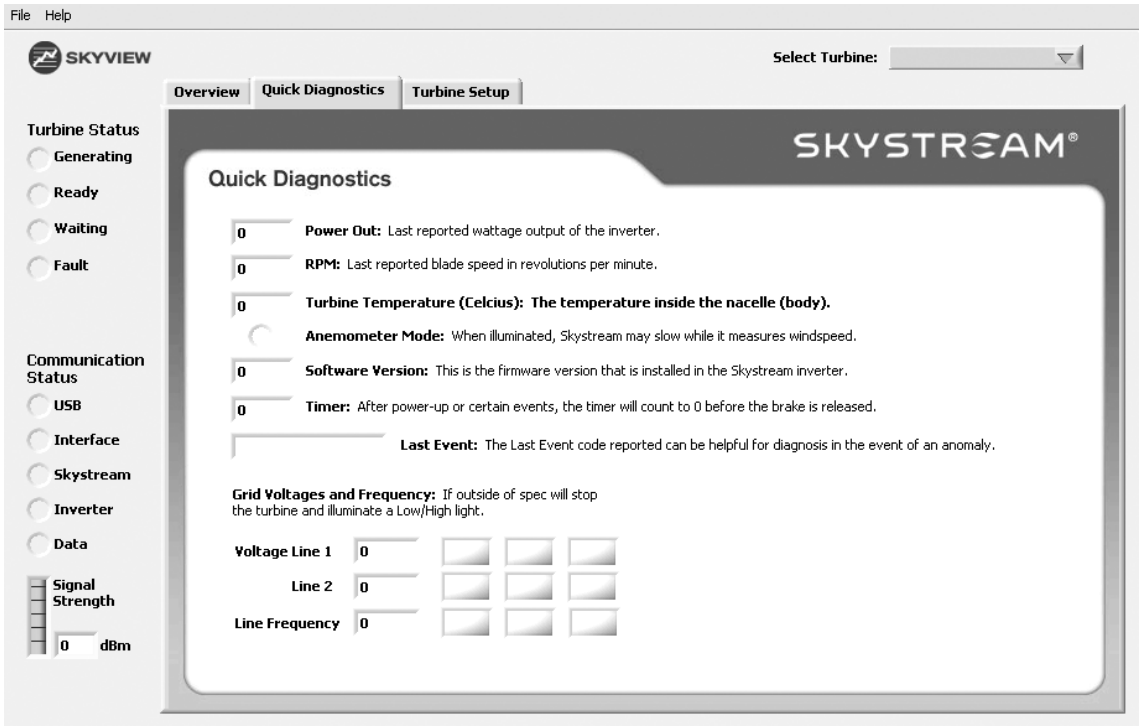
The start and end dates are user adjustable for the time period you prefer. Once downloaded, the data can be exported using the Export Graphed Data to File button.

Exported daily production totals may show negative numbers on days with no wind. Skystream does draw approximately 7 watts per hour to maintain communication and keep the turbine in a ready state.

Also available are a Cumulative Performance chart and a carbon footprint (offset) calculation.

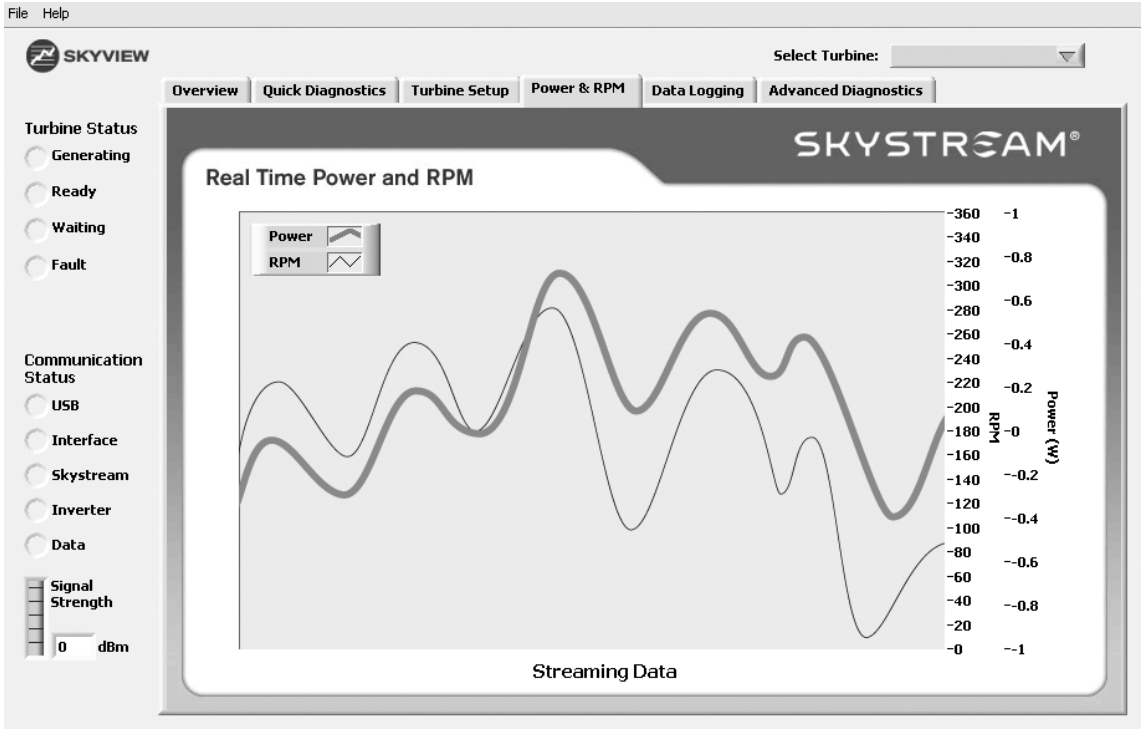
Quick Diagnostics Tab

The information on this tab provides important diagnostic data and indicators, which are useful when communicating with Southwest Windpower technical support staff. Each data field contains a brief explanation. If your Skystream has stopped, reference this tab to see if the turbine is sensing grid voltage or frequency fluctuations which caused it to shut down. In the event of a Skystream problem, you can record a data log file to capture your turbine's performance and status (see Data Logging section).



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.

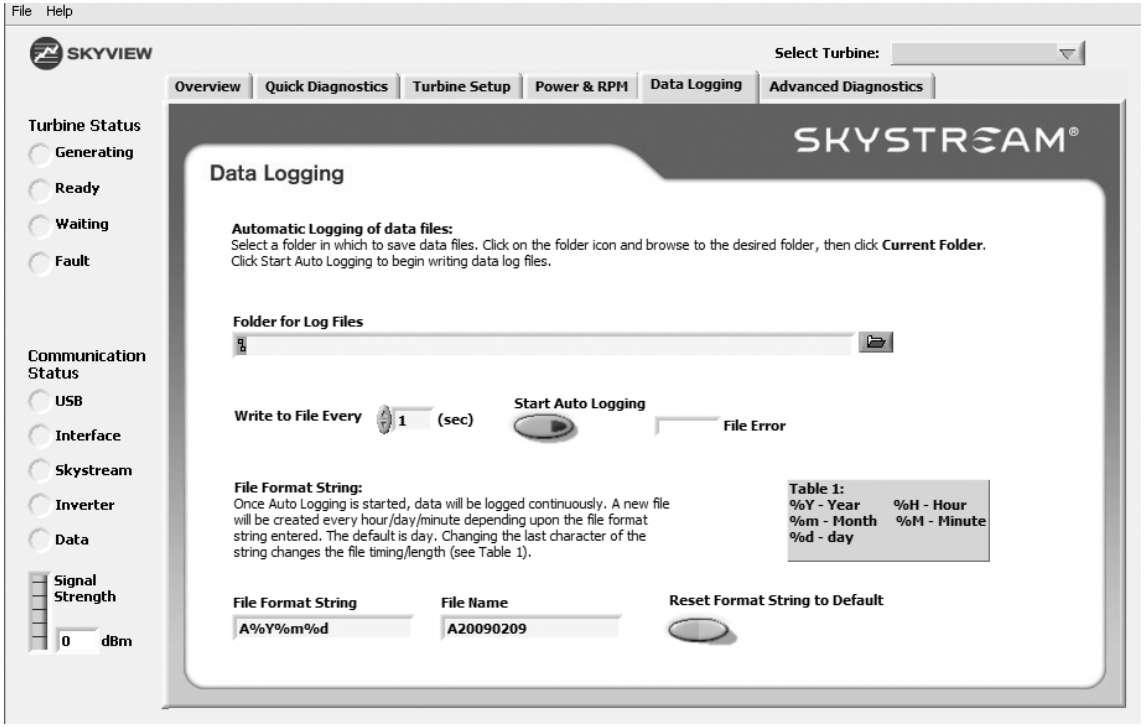


Data Logging Tab

Southwest Windpower tech support may request an emailed data log file for diagnostic purposes. To access this tab, click File> Advanced Diagnostics.

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

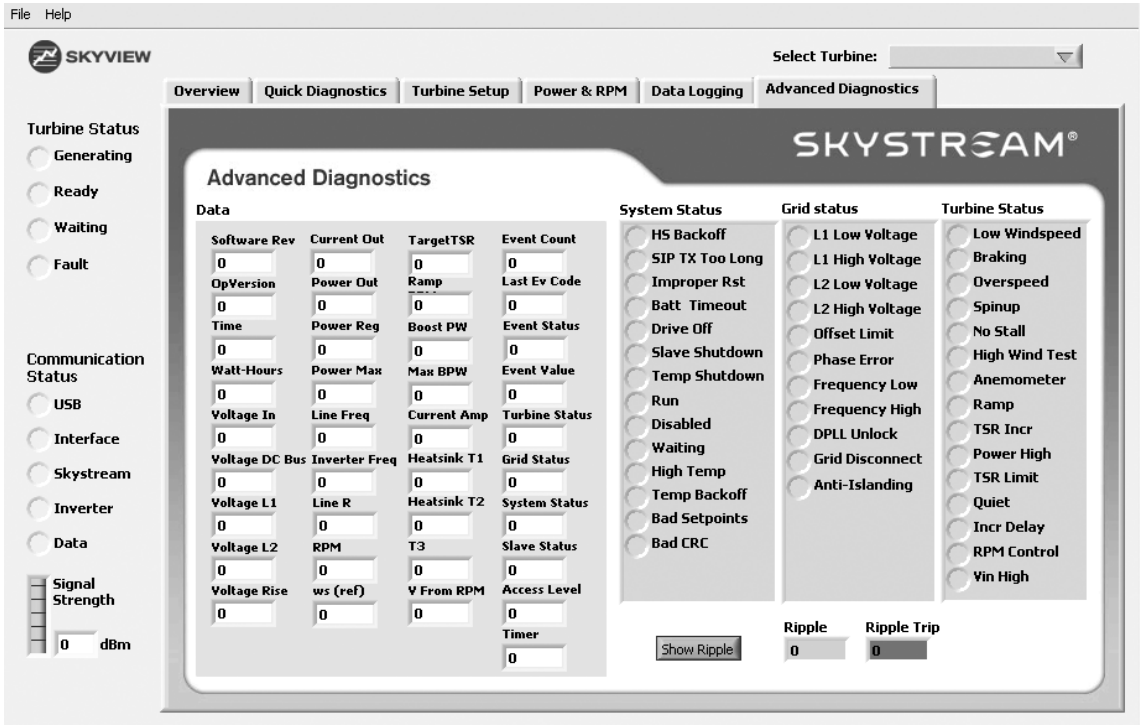
1. Click on the folder icon to the right of the Folder for Log Files field. Select a location to save the recorded data files.
2. Do not enter a file name in the File Name field of the Save As pop-up. Leave that field blank.
3. Once a storage location is selected, click the Current Folder button (below Save and Cancel).
4. Verify the folder location is displayed in the Folder for Log Files field.
5. Click Start Auto Logging to begin recording. If you get a File Error light, verify the File Name field is blank and you clicked the Current Folder button.
6. The program continues to record data and create a new file every day (at midnight) until you either close it or stop auto logging.
7. The file names are formatted by date for easy identification. For example, a data log file “a20090615” contains data from June 15, 2009.
8. The default recording period is one day per file. You can change 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, click the Reset Format String button.



The log files are in tab delimited spreadsheet format and are relatively small and easy to email. Files showing a particular shutdown event or any unusual behavior are most helpful.

Advanced Diagnostics Tab

This tab is intended for engineering use only. For end users and owners, the most important information is located on the Overview and Quick Diagnostics tabs.



Extended Range Antenna Kit

In some circumstances communication with a Skystream 3.7 via the Skyview 2.0 wireless interface is difficult or impossible. Often this is due to one (or a combination) of the following:

- Poor line of sight between the wireless interface and turbine
- Too much distance between the wireless interface and turbine
- Obstruction of the radio signal by buildings
- Signal interference by the building in which the wireless interface is located

If communication with the Skystream 3.7 is difficult due to any of these factors, an extended range antenna may alleviate the problem. The extended range antenna kit comprises a wireless interface with a threaded external antenna coupling, a unique coaxial communication cable and a Yagi style directional antenna.

The Yagi directional antenna overcomes issues of interference and range in applications where better line of sight is needed. It is designed for outdoor use moving the reception point outside buildings which may impede signal strength. Also, its narrow acceptance angle means it has a more focused beam on line of sight to the turbine.

Installation of the Extended Range Antenna

Identify a location outside of the building providing easy access, a clear and unobstructed line of sight to the turbine and an easy path from the antenna to the wireless interface (inside the building near the computer running Skyview). The distance from the antenna location to the wireless interface must be less than 18m (60'). Using the clamp at the base of the Yagi antenna, mount it to the building and point it directly at the Skystream 3.7.

This specific length of coaxial cable (60 ft-18m) is required to maintain the appropriate signal strength and gain certified by the FCC. Do not alter the coaxial cable in any way. The antenna must be located within 60' of the wireless interface. If the distance is less, carefully coil the excess cable in loops at least 10 inches in diameter. Do not crush or sharply bend the coaxial cable.

The coaxial cable has two unique connectors for use with the extended range antenna kit. The end mating to the Yagi antenna is a traditional N-Type male connector. The end mating to the wireless interface is a small RP-SMA connector, which is only slightly larger than the cable. It may be easier to "feed" the cable from outside the building to the inside depending on how the cable penetrates the exterior of the building.

Carefully lead the coaxial cable from the antenna location to the wireless interface location inside the building, making sure to avoid sharp bends in the route between the two. Secure the cable. Carefully attach the N Type female connector to the Yagi antenna and the RP-SMA connector to the wireless interface. Attach the Mini USB connector of the USB accessory cable (supplied with the Skyview 2.0 communication kit) to the wireless interface and the USB serial adapter plug to the computer operating Skyview 2.0. Proceed with the Skyview 2.0 setup instructions specific to the computer operating system.

Southwest Windpower Inc.
1801 West Route 66
Flagstaff, Arizona 86001 USA
t: +1 928.779.9463
f: +1 928.779.1485

www.windenergy.com

Southwest Windpower GmbH
Mannesmannstr. 6
50996 Cologne Germany
t: +49 (0) 221 16 53 94 50