

Weather Data Transfer Utility for Envoy8X

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Welcome

Welcome to Weather Data Transfer Utility for Envoy8X, the solution for logging data from up to eight Davis weather stations, simultaneously.

Envoy8X can log data from any of these Davis transmitting stations: Vantage Vue®, Vantage Pro2™, Vantage Pro2™ Plus, Weather Envoy for Vantage Pro2™, Anemometer Transmitter Kit, Wireless Leaf & Soil Moisture/Temperature, Wireless Temperature, and Wireless Temperature/Humidity. It is compatible with the Universal Anemometer Interface and all Davis repeaters.

Weather Data Transfer Utility for Envoy8X Features

- Allows you to choose to see data from some or all sensors on the browser.
- Allows you to export your data to an Excel spreadsheet.
- "Listens" to 8 different transmitting stations, in any combination, even 8 Integrated Sensor Suites.
- Exports data to WeatherLink.
- Archives your weather data at user-selectable intervals ranging from 10 seconds to 2 hours.
- 32 times more memory than Weather Envoy.
- Raw signal support allows for use with third party sensors.

Note: Some listed features may require optional software or hardware.

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What's New in this Version

Version 1.2

- Fixed temperature readings from Leaf & Soil stations for alarms. The temperature will be displayed in the user's preferred units (°C or °F).

Version 1.1

- Ability to configure and run [automatic downloads](#) added.
- When using a MySQL database, the password field in the database connect form may be left empty.
- Users now set preferred units before setting up the barometer in the setup process to allow for barometer units to be specified before setup.
- Users can now view an event log for use in troubleshooting by selecting "Open Event Log" in the View menu.



Getting Started

Note: For best results using Windows Vista® or above, you should run the program as Administrator. (To do this, launch the program using right click, choose Run as Administrator; or see your OS Help.)

The first time you run the Weather Data Transfer Utility for Envoy8X, you will be prompted to set up your database. The program uses MS Access as the default database (included with the software), but you can also use MySQL® or Microsoft SQL Server®. (These must be installed separately.)

When you have finished setting up the database, you will be asked if you want to add a new receiver. Click **Yes** and you will be guided through the setup.

When you have finished adding the new receiver, the [Main Screen](#) will open.

You can add new receivers at any time by clicking [Add New Receiver](#) in the **Setup** menu.

Two appendices are also available. [Appendix A: Weather Data](#), is a reference for weather terms and data. [Appendix B: Specifications](#) gives specification information for the Envoy8X.

Short Glossary of Terms:

Sensors: The parts of your weather station that measure or detect physical quantities (such as temperature, pressure, speed, direction) and convert it into an electronic signal, such as voltage.

Examples of Davis Sensors:

- Temperature/Humidity sensor
- Anemometer
- Barometer
- Rain collector
- Temperature Probe
- Leaf Wetness sensor
- Soil Moisture sensor

Transmitter or **Transmitting Station:** The part (or parts) of your weather station that wirelessly transmits the data, in the form of radio waves from an antenna. (In cabled systems, transmitters send a RS485 signal down a cable.)

Transmitter ID (TX ID): Each transmitter in your system should be set up with a unique Transmitter ID, from 1 (factory default) to 8, which identifies it to the receiver.

Examples of Davis Transmitters

- Vantage Pro2, Pro2 Plus or Vantage Vue Integrated Sensor Suite
- Anemometer/Sensor Transmitter Kit
- Wireless Leaf Wetness & Soil Moisture/Temperature Station
- Wireless Temperature/Humidity Station
- Wireless Temperature Station

Note: In a Vantage Pro2 or Vantage Vue system, the sensors and transmitters are combined into the outdoor Integrated Sensor Suite (or ISS).

Repeater: (Optional) A transceiver device used to extend the range of a transmitting station.

Examples of Davis Repeaters:

- Standard Repeater
- Long Range Repeater

Receiver: The part of your station that converts the radio signal into usable information. Receivers with an LCD screen also display the information. (In cabled systems, receivers are not radio receivers.)

Examples of Davis Receivers:

- Envoy8X
- Weather Envoy (not compatible with this software)
- Vantage Pro2 or Vantage Vue console (not compatible with this software)

Note: A Vantage Pro2 or Vantage Vue console can also be set to retransmit.

Data Logger: The part of your weather station that records and stores data over time. We refer to this memory as archive memory. Davis data loggers are part of the WeatherLink package and can be installed in any receiver. In the Envoy8X, the archive memory is built into the unit, however a data logger is still required to facilitate communication with the computer.

Software: Computer programs that take the weather data stored in the data logger and present or store it for use as archives, graphs, analysis and other reports and special usage.

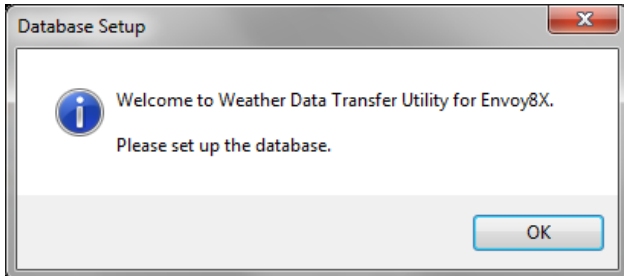
Examples of Davis Software:

- Weather Data Transfer Utility for Envoy8X
- WeatherLink

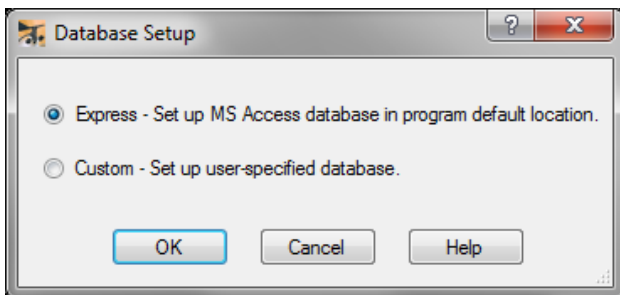
Database Setup

The first time you use Weather Data Transfer Utility for Envoy8X, you will be prompted to set up your database for the software to use.

The **Database Setup Screen** will display:

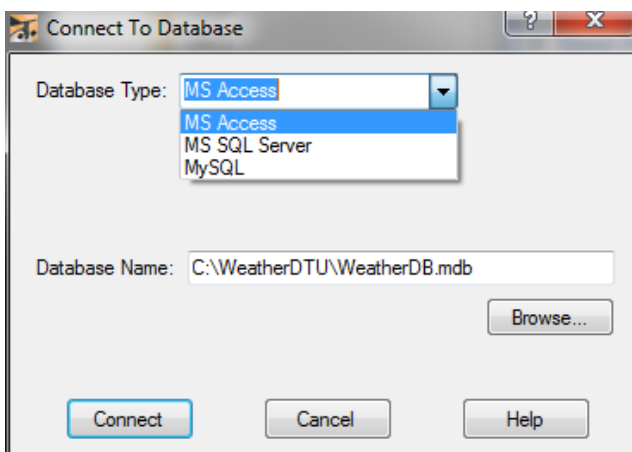


You may select **Express** database setup or **Custom** database setup.



Choose **Express** setup to have the software create a Microsoft Access database in the program's default location (the Weather DTU installation location).

Choose **Custom** setup to have the software connect to a MySQL or MS SQL Server database or set up an Access database in another directory. Click **OK** to open the **Database Connection** dialog. This dialog allows you to select which database to connect to.



For help with this step, see [Choosing Your Database](#).

Note: You may change database type selection at any time from Database menu. Select Connect To Database. Select the database type in the Database Type drop-down list. (Based on the database type selected, database connection information needed for that type will be shown.)

Choosing Your Database

Weather Data Transfer Utility for Envoy 8X supports three different database types: MS Access, MS SQL Server and MySQL.

Single-User Database:

- MS Access (Microsoft Access)

Of the supported databases, MS Access is the easiest to use. There is no additional software to buy if you use MS Access.

Note: MS Access has limitations on the number of users connected simultaneously to the database, the size of the database, and reliability of the database.

The maximum database size for MS Access is 2 gigabytes. If you log the weather data frequently, the database size increases rapidly. If you use MS Access and log frequently, you should backup your data at least once a month.

An MS Access database needs to be compacted on a regular basis to maintain proper performance and prevent the database from becoming too big. Weather DTU will automatically compact the Access database when you exit the software. For this reason, it is a good practice to close Weather DTU regularly to allow the Access database to be compacted and repaired. (If the database size is so large that compacting will take some time, a message will appear allowing you to choose Yes or No to compacting.)

Multi-User Databases:

MySQL and MS SQL Server database servers are very powerful databases, which can support large amounts of data and multiple simultaneous connections with good performance.

- MySQL

MySQL is a database server developed by a company named MySQL AB as an Open Source Project. It is considered to be fast, stable, less expensive relatively easy to setup compared to database servers like MS SQL Server.

Note: There is a free version of MySQL available for download on the MySQL web site.

- MS SQL Server (Microsoft SQL Server)

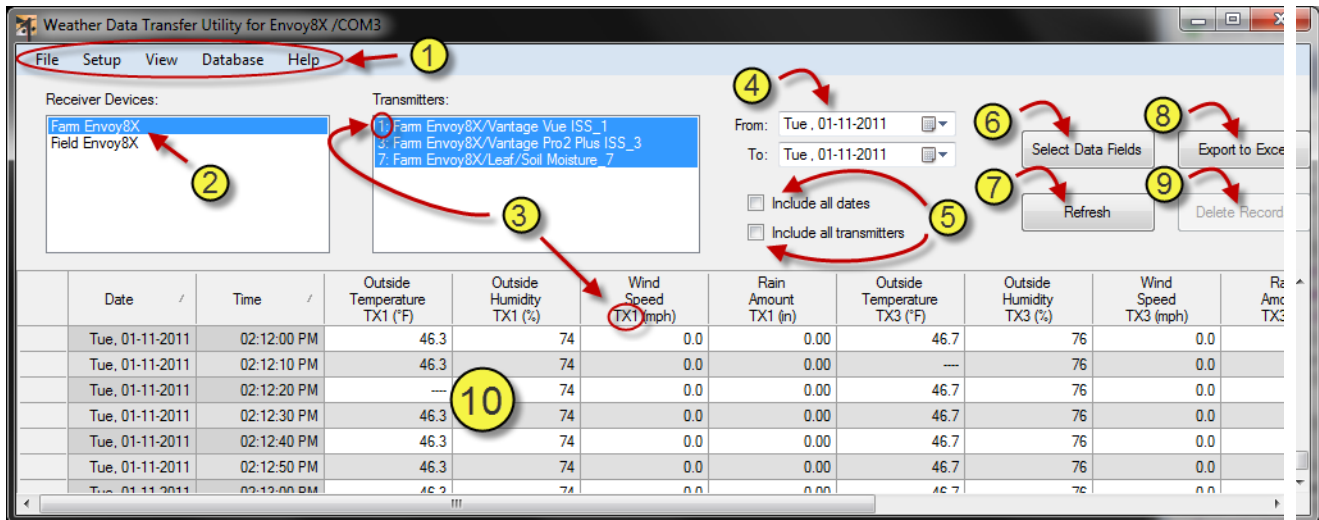
MS SQL Server is a powerful database server from Microsoft. It is also easy to setup, but MS SQL Server is more expensive than MySQL.

Note: If you choose MySQL or MS SQL Server, we recommend that you have IT personnel who have the knowledge to maintain these database servers.

Main Screen

The Weather Data Transfer Utility for Envoy8X provides a dynamic browser on the main screen.

From here, you can see your receivers and transmitters and can choose which data to view by sensor and Transmitter ID (TX ID).



1. Menu Commands

2. Highlight shows which device's data is being displayed.

3. Data from highlighted transmitter(s) is displayed. The data in each column is from the sensor identified by Transmitter ID. (In this example, the data in the third column is from the anemometer on the Vantage Vue ISS, which is identified as Transmitter 1. The wind data in the sixth column is from the Vantage Pro2 Plus ISS, identified as Transmitter 3.)

4. Set custom dates for display in the browser. The default date is the most recent date on which data was downloaded from the selected transmitter; if no data has been downloaded, the default is today.

5. Choose to include all dates and/or all transmitters. (Note that this will increase the refresh time, depending on how much data is stored.)

6. Use the [Select Data Fields](#) button, or the command in the **View** pull-down menu, to choose which data fields to display.

7. [Refresh](#) the screen using this button, or the command in the **View** pull-down menu.

8. Click the [Export to Excel](#) button to export all the data shown in the browser to an Excel file.

9. **Delete Records** deletes a row or rows selected in the browser. (Deletes the whole row, cannot be used to delete records in a single cell.)

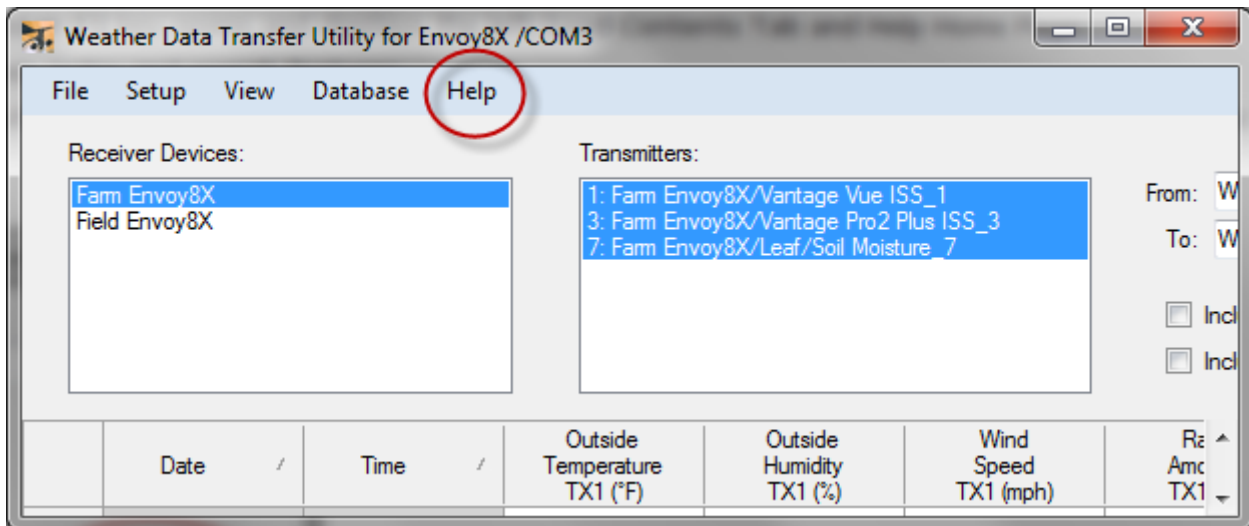
10. Data display area. The data displayed is from the device highlighted.

Note: The buttons on this screen control only what is shown in the browser.

Back to [Getting Started](#)

Using Help

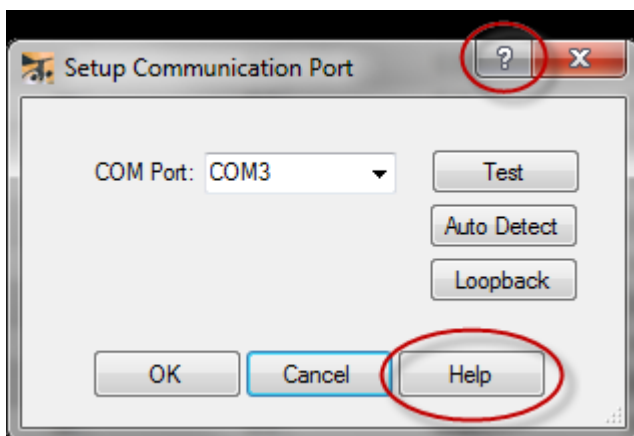
Click **Help** or press **F1** to access this document.



The **Help** menu command or **F1** key opens and displays the left-hand Contents Tab and Help Home Page.

You may also use the Help Index and search features.

If a **Help** button or **?** button appear on any dialog box, use it to get more information about that dialog box, or press **F1**.



Click **About Weather Data Transfer Utility** in the **Help** menu to see software version, firmware version of connected Envoy8X, copyright and other information.

You may also find answers in the [Troubleshooting Guide](#).

Menu Commands

Click on a topic below to view help for the indicated Weather Data Transfer Utility menu bar:

[Setup](#)

[File](#)

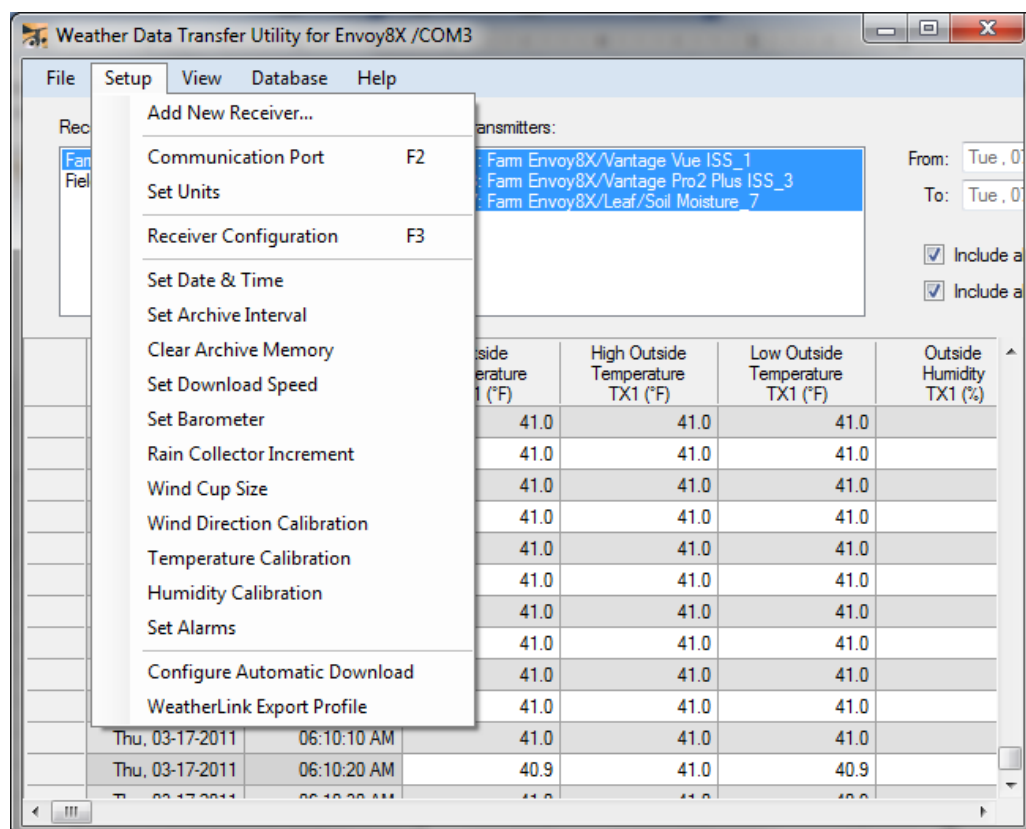
[View](#)

[Database](#)

[Help](#)

Setup

Use the **Setup Menu** to configure the transmitting stations and sensors, set time and units, calibrate rain and wind readings, set alarms, and create or modify WeatherLink export profiles.



Add New Receiver

Communication Port

Set Units

Receiver Configuration

Set Date & Time

Set Archive Interval

Clear Archive Memory

Set Download Speed

Set Barometer

Rain Collector Increment

Wind Cup Size

Wind Direction Calibration

Temperature Calibration

Humidity Calibration

Set Alarms

Configure Automatic Download

WeatherLink Export Profile



Add New Receiver

The Weather Data Transfer Utility software includes a walkthrough that steps you through the steps to set up and configure your Envoy8X receiver. If there are no Envoy8X receivers already set up, you will be prompted to add a new receiver when the program starts.

You can set up and configure your receivers by separately selecting all of the necessary setup options from the **Setup** menu, at any time. The **Add New Receiver** option in the Setup menu allows you to access the receiver setup walkthrough at any time.

The Envoy8X is a radio receiver designed to listen to up to 8 Davis transmitters in the field. A transmitting station can be any one of the following:

- **Vantage Pro2 ISS:** Vantage Pro2 Integrated Sensor Suites: product numbers 6152/6322, 6153/6323
- **Vantage Pro2 Plus ISS:** Vantage Pro2 Plus Integrated Sensor Suites: product numbers 6162/6327, 6163/6328
- **Vantage Vue ISS:** Integrated Sensor Suite, product number 6250/6357
- **Leaf/Soil Moisture:** Wireless Leaf & Soil Moisture/Temperature Station, product numbers 6345 & 6345CS
- **Temperature/Humidity:** Wireless Temperature/Humidity Station, product number 6382
- **Temperature:** Wireless Temperature Station, product number 6372
- **Wind:** Anemometer/Sensor Transmitter Kit with Anemometer, product numbers 6332 and 6410
- **Rain:** Anemometer/Sensor Transmitter Kit with Rain Collector, product numbers 6332 and 7852
- **Leaf/Soil Raw Signals:** Third-party sensors (See [Raw Data Inputs.](#))
- **Vantage Pro2 ISS Raw Signals:** Third-party sensors (two voltage inputs) (See [Raw Data Inputs.](#))

Before you installed your Envoy8X and its software, you should have already installed any transmitting stations you want it to "listen" to. When you installed each of the transmitting stations, you should have set the Transmitter ID to a unique ID from 1 to 8. (Stations come with a factory-set default Transmitter ID of 1. To change the Transmitter ID, see the manual that came with your transmitting stations. Manuals are also online at davisnet.com.) In the next screen, you will specify which station is "broadcasting" on each Transmitter ID.

1. The **Add New Receiver** menu command opens a dialog box that makes sure your receiver is connected to a COM Port. If the receiver is connected to the port used the last time you configured a receiver, the **Add New Receiver** dialog will appear. Otherwise the **Communication Port** dialog box will appear to allow you to change the port.
2. Click Set to continue. In the next screen, you will specify which station is "broadcasting" on each Transmitter ID.

Note: You can add transmitting stations at any time. Once the new station is installed and set to an unused Transmitter ID number, click Receiver Configuration in Setup to

add the transmitter. **Remember to download data first, as reconfiguring the Envoy8X with a new station requires the archive memory in the data logger to be erased.**

3. The **Add New Receiver** dialog box appears.

TX ID	Transmitter Type	Repeater	Transmitter Name
TX ID 1	Vantage Vue ISS	No	Farm Envoy8X/Vantage Vue ISS_1
TX ID 2	Off	No	
TX ID 3	Vantage Pro2 Plus ISS	No	Farm Envoy8X/Vantage Pro2 Plus ISS_3
TX ID 4	Off	No	
TX ID 5	Vantage Pro2 Plus ISS	No	
TX ID 6	Leaf/Soil Moisture	No	
TX ID 7	Temperature/Humidity	No	
TX ID 8	Rain	No	Farm Envoy8X/Leaf/Soil Moisture_7

Receiver ID: This ID number is automatically assigned to your Envoy8X receiver. You can change it to any number you like, or keep the default ID number.

Receiver Name: Enter a name for this Envoy8X that you choose, such as "John's Envoy8X" or "Field 10." If you plan to add other receivers, this name will make it easier to keep track of the devices.

4. **Configure the Transmitters:**

TX ID and **Transmitter Type:** Refer to the table you filled in with Transmitter IDs when setting up your transmitting stations. For each Transmitter ID ("TX ID"), use the pull-down menu to specify what kind of transmitting station has been configured to transmit on that ID. If there is no transmitting station with a particular Transmitter ID, leave the "Station Type" set to "Off" for that ID.

Repeater: If any transmitting station is transmitting via a repeater, indicate the Repeater ID (A -H) that is nearest to and the last in the chain from the transmitter to your device.

Transmitter Name: You may assign a name to each Transmitter ID or accept the default, which is the station type, automatically preceded by the receiver name and followed by the Transmitter ID number. Each transmitter reporting to the same receiver must have a unique name.

For example, if all your transmitters are different types, then the default (such as "Field 10/Vantage Vue ISS_1" and "Field 10/Vantage Pro2 ISS_3") would be fine.

If some of your transmitter types are the same, you may want to give them unique names to set them apart (such as "Field 10/Upper Leaf/Soil Moisture_1" and "Field 10/Lower Leaf/Soil Moisture_3").

Archive Interval: The default is set at 30 minutes. To change this, use the pull-down menu to choose 10, 15, 20, or 30 seconds; 1, 5, 10, 15, or 30 minutes; or 1 or 2 hours. Since a more frequent archive interval will write more data to memory, the **Days of Storage** will indicate how many days of data the logger can store in its archive memory, at that interval, before being overwritten. Consider how often you will be downloading data, as well as how often you want data to be archived, when you set the archive interval.

Log Inside Data: The Envoy8X houses not only the data logger, but also inside temperature and humidity sensors and barometer. If you would like to log inside data reported by these sensors, check the **Log Inside Data** box.

5. When you have finished configuring this receiver, click **Set**. If you wish to start over, click **Clear** to clear all the values you have entered. To exit the Add New Receiver walkthrough, click **Cancel**, then click **Yes** when you are asked to confirm quitting. You can also skip any step by clicking **No** in the step's message box.

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Back to [Setup](#)

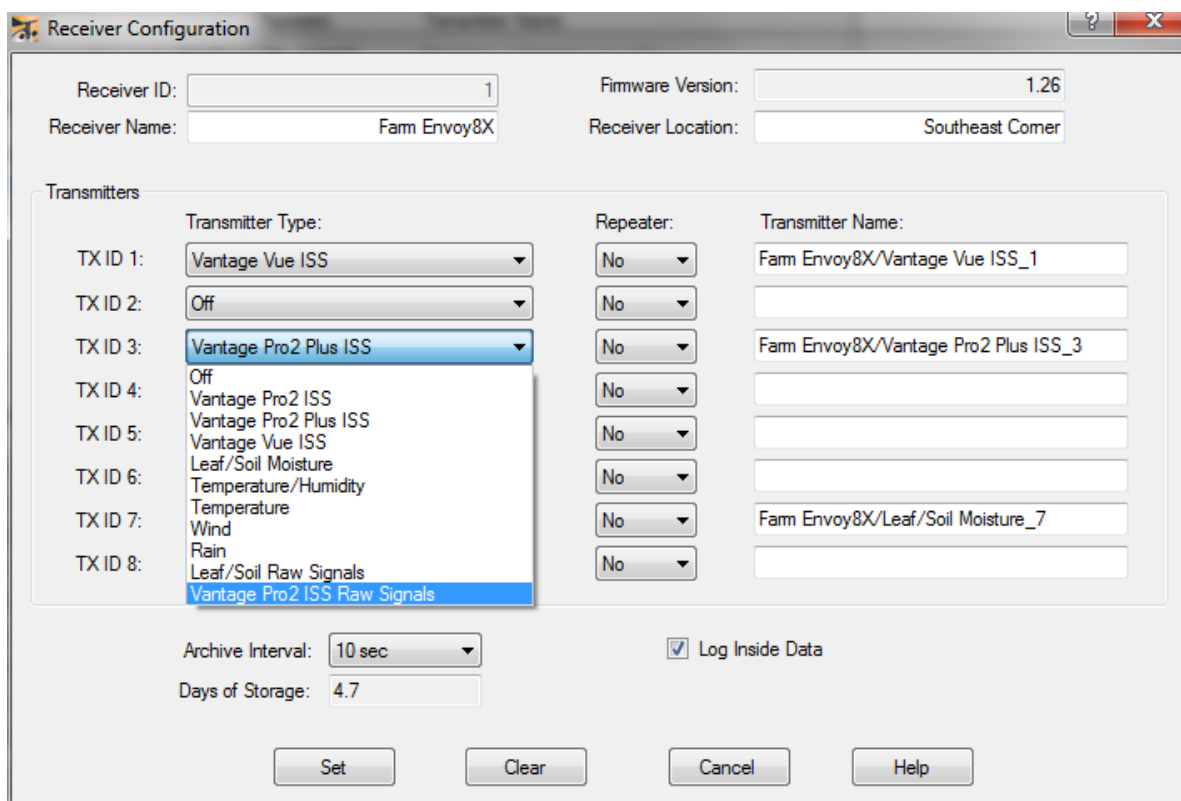
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Raw Data Inputs

The Envoy8X can log data from third-party sensors that report in a range of 0 - 3 volts. You will use the **Raw Data Inputs** screen to tell the software what kind of sensor, its reporting units and the ranges of data and voltage. This information can be obtained from the manufacturer of the sensor.

To add a third-party sensor:

1. Use the **Receiver Configuration** or **Add New Receiver** menu command. The configuration screen appears. Choose either "Leaf/Soil Raw Signals" or "Vantage Pro2 ISS Raw Signals" from the pull-down menu for that Transmitter ID, depending on which type of transmitter in which the sensor is installed.



The Receiver Configuration window shows the following settings:

- Receiver ID: 1
- Receiver Name: Fam Envoy8X
- Firmware Version: 1.26
- Receiver Location: Southeast Comer

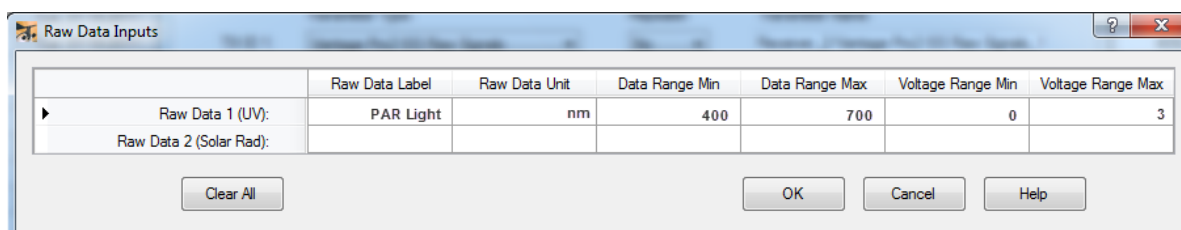
Transmitters

TX ID	Transmitter Type	Repeater	Transmitter Name
TX ID 1	Vantage Vue ISS	No	Fam Envoy8X/Vantage Vue ISS_1
TX ID 2	Off	No	
TX ID 3	Vantage Pro2 Plus ISS	No	Fam Envoy8X/Vantage Pro2 Plus ISS_3
TX ID 4	Off	No	
TX ID 5	Vantage Pro2 ISS	No	
TX ID 6	Vantage Pro2 Plus ISS	No	
TX ID 7	Vantage Vue ISS	No	
TX ID 8	Leaf/Soil Moisture	No	
	Temperature/Humidity	No	
	Temperature	No	
	Wind	No	
	Rain	No	
	Leaf/Soil Raw Signals	No	
	Vantage Pro2 ISS Raw Signals	No	

Archive Interval: 10 sec
Days of Storage: 4.7
☒ Log Inside Data

Buttons: Set, Clear, Cancel, Help

2. The **Raw Data Inputs** screen appears. For each input into which a sensor is plugged, enter a label, the units, and the ranges for the input. In the example below, a PAR Light sensor, which reports 400 to 700 nanometers, has been plugged into the UV sensor input of a Vantage Pro2 ISS.

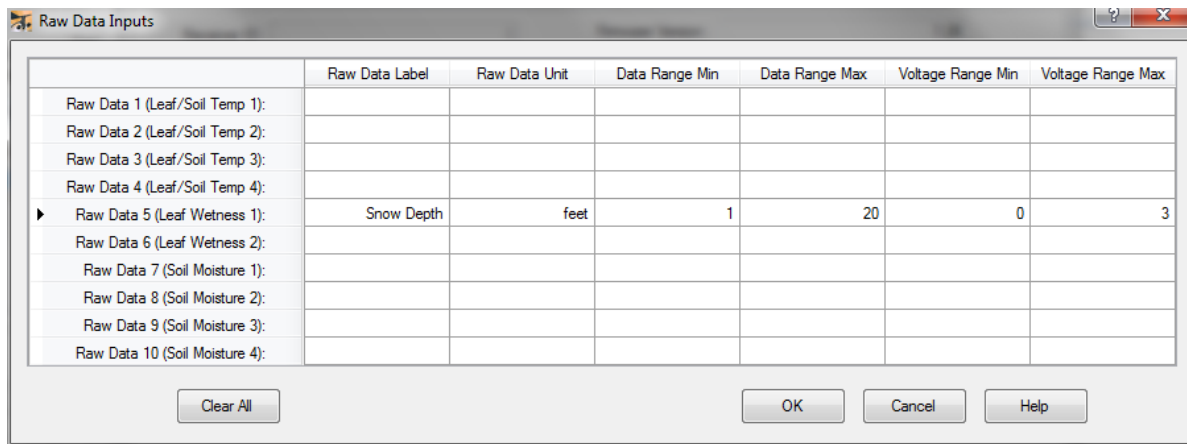


The Raw Data Inputs window shows the following table:

	Raw Data Label	Raw Data Unit	Data Range Min	Data Range Max	Voltage Range Min	Voltage Range Max
Raw Data 1 (UV):	PAR Light	nm	400	700	0	3
Raw Data 2 (Solar Rad):						

Buttons: Clear All, OK, Cancel, Help

In the example below, the sensor is a snow depth indicator that reports from 1 to 20 feet of snow depth and has been plugged into the first Leaf Wetness sensor input of Leaf Wetness/Soil Moisture station.



The image shows a software window titled "Raw Data Inputs". It contains a table with 7 columns: "Raw Data Label", "Raw Data Unit", "Data Range Min", "Data Range Max", "Voltage Range Min", and "Voltage Range Max". The first column lists 10 raw data inputs. The fifth input, "Raw Data 5 (Leaf Wetness 1)", is selected and contains the values "Snow Depth", "feet", "1", "20", "0", and "3". At the bottom of the window are three buttons: "Clear All", "OK", and "Cancel".

	Raw Data Label	Raw Data Unit	Data Range Min	Data Range Max	Voltage Range Min	Voltage Range Max
Raw Data 1 (Leaf/Soil Temp 1):						
Raw Data 2 (Leaf/Soil Temp 2):						
Raw Data 3 (Leaf/Soil Temp 3):						
Raw Data 4 (Leaf/Soil Temp 4):						
▶ Raw Data 5 (Leaf Wetness 1):	Snow Depth	feet	1	20	0	3
Raw Data 6 (Leaf Wetness 2):						
Raw Data 7 (Soil Moisture 1):						
Raw Data 8 (Soil Moisture 2):						
Raw Data 9 (Soil Moisture 3):						
Raw Data 10 (Soil Moisture 4):						

Note: Some application engineering may be necessary to determine into which input a sensor should be plugged.

3. Click **OK** to save, **Clear All** to clear any entries, or **Cancel** to exit without saving.

Back to [Add New Receiver](#)

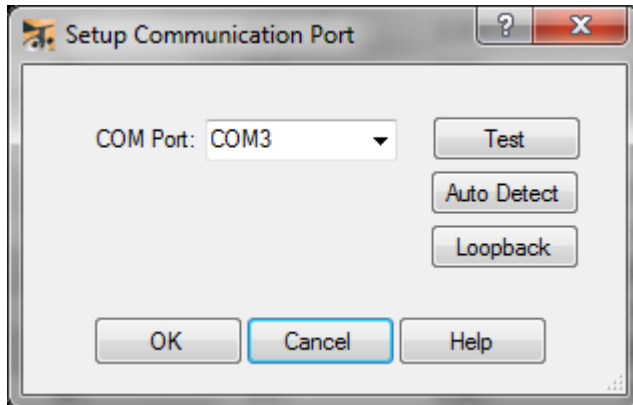
Back to [Receiver Configuration](#)

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Communication Port

The **Communication Port** dialog box in the **Setup** menu allows you to specify the communications port used to connect each Envoy8X to the Weather Data Transfer Utility software. To configure your communication port, select **Communication Port** from the Setup menu.

1. The **Setup Communication Port** dialog box appears.

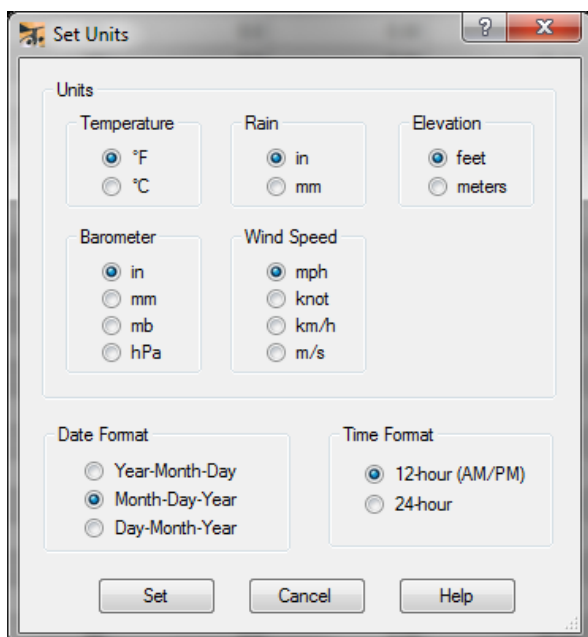


2. Select the communication port that connects your Envoy8X to the computer from the **COM Port** pull-down menu.
If you are not sure which to choose, click **Auto Detect** to let the software detect the correct port.
If you are using a serial port and are not sure which serial port your console is connected to, or if you want to test that the port works correctly, use the Loopback device, included with WeatherLink-Serial version and the **Loopback** button.
3. Click **Test** to verify the connection. The software checks the connection and lets you know if it is successfully connected to your Envoy8X.
4. Once the communication port settings are correct, click **OK** to save the correct communication port settings; or **Cancel** to exit without saving.

Back to [Setup](#)

Set Units

Select the units of measure in which data is displayed within the software.



1. Select **Set Units** from the Setup menu.
2. Select the desired units of measure:

Temperature:

Fahrenheit (°F) or Celsius (°C)

Note: Wind chill, dew point, and heat indexes are all displayed in the same unit of measure as temperature.

Barometer:

Inches of Hg (in), Millimeters of Hg (mm), Millibars (mb), or Hectopascals (hPa)

Wind Speed:

Miles per hour (mph), knots (knot), kilometers per Hour (km/hr), or meters per second (m/s)

Rain:

Inches (in) or Millimeters (mm)

Elevation:

Feet or Meters

Date Format:

Year-Month-Day (2011-01-31)

Month-Day-Year (01-31-2011)

Day-Month-Year (31-01-2011)

Time Format:

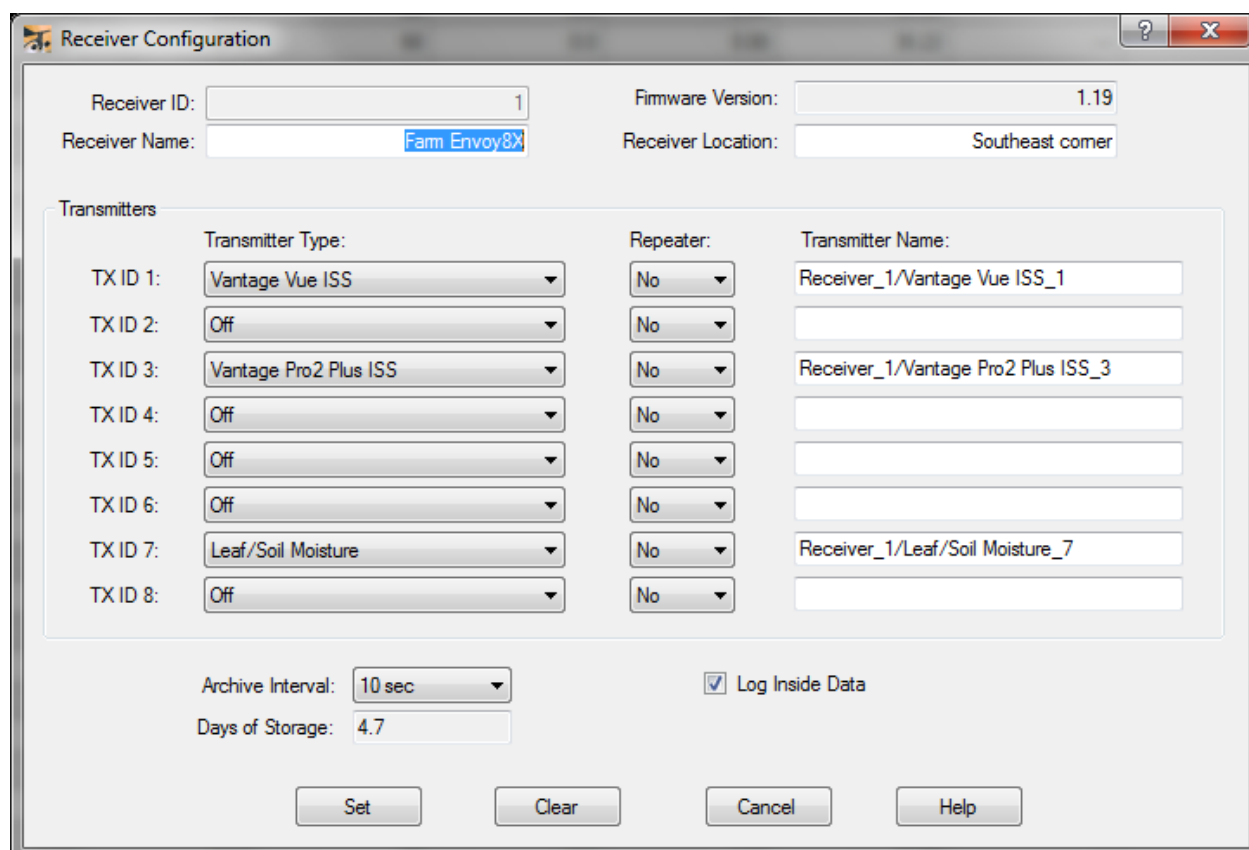
12-hour or 24-hour

3. After selecting units of measure, click **Set**. The software saves your choices. All information is displayed in the units of measure you selected.

Receiver Configuration

You can add, delete, or reconfigure transmitting stations at any time. To add a new transmitting station, (make sure it has been installed in the field and set to an unused Transmitter ID number), change or delete any transmitters already entered, click **Receiver Configuration** in the Setup menu.

Note: Remember to download data before reconfiguring the Envoy8X, as reconfiguring requires the archive memory in the data logger to be erased.



The Receiver Configuration dialog box contains the following fields and controls:

- Receiver ID:** Text field with value 1.
- Receiver Name:** Text field with value Fam Envoy8X.
- Firmware Version:** Text field with value 1.19.
- Receiver Location:** Text field with value Southeast corner.
- Transmitters Section:**
 - Transmitter Type:** A list of 8 dropdown menus. Values: TX ID 1: Vantage Vue ISS, TX ID 2: Off, TX ID 3: Vantage Pro2 Plus ISS, TX ID 4: Off, TX ID 5: Off, TX ID 6: Off, TX ID 7: Leaf/Soil Moisture, TX ID 8: Off.
 - Repeater:** A list of 8 dropdown menus, all set to No.
 - Transmitter Name:** A list of 8 text fields. Values: Receiver_1/Vantage Vue ISS_1, (empty), Receiver_1/Vantage Pro2 Plus ISS_3, (empty), (empty), (empty), Receiver_1/Leaf/Soil Moisture_7, (empty).
- Archive Interval:** Dropdown menu with value 10 sec.
- Days of Storage:** Text field with value 4.7.
- Log Inside Data:** Checked checkbox.
- Buttons:** Set, Clear, Cancel, Help.

See [Add New Receiver](#) and [Raw Data Inputs](#) for more help with this menu command.

Click **Set** to save your changes; **Clear** to reset all values to defaults, or **Cancel** to exit without saving changes.

Back to [Setup](#)

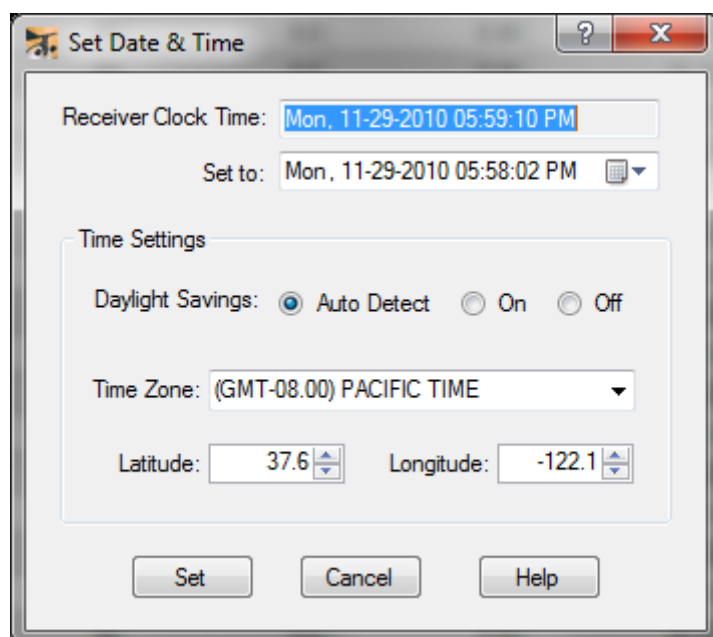
Set Date & Time

You can set the time and date on your Envoy8X at any time. Upon first power up, the time will not be current, so you will be prompted to set it. At any other time, you may set or change the time of your Envoy8X. You should make sure that both Envoy8X and computer display the same time and date.

Note: When you set the time to one earlier than what is currently set in the receiver, the archive memory will be cleared. You should download data before changing time to avoid losing any data in the data logger.

1. Select **Set Time & Date** from the **Setup** menu.

The **Set Time & Date** dialog box displays. The time and date currently set in the Envoy8X appear at the top of the dialog box. The software automatically displays the current computer time and date in both the text boxes labeled **Receiver Clock Time** and **Set to:**. If you are happy with the computer date and time for your receiver, skip to step 3.



2. If you want the time and date to be different from that displayed in the "Set to" box, click on the number you want to change to select it and type in the new number. Click the calendar icon to bring up a calendar if you would prefer to choose a day (including "Today") from the calendar.
3. If you want the Envoy8X to automatically detect Daylight Saving Time, click **Auto Detect**. (Make sure your time zone and latitude/longitude are correct.)

Note: If you are in a time zone with a negative offset from UTC (North America) then daylight saving starts on the second Sunday in March at 2:00 am. Daylight saving in a time zone with a negative offset ends on the first Sunday in November.

You can manually select daylight saving time by selecting **On** when daylight saving time is in effect and selecting **Off** when standard time is in effect.

4. Select your local time zone from the list. Time zones are defined by the number

of hours the local time is offset from Greenwich Mean Time (GMT).

5. Enter your latitude and longitude. Latitude and longitude together comprise a spherical grid that allows pinpointing positions on the earth. For example, Davis Instruments' Hayward, California, factory is located at 37° 38' 10" North latitude, (or 37.4), and 122° 07' 30" West longitude, (or -122.1).

Note: When directional designators are omitted, such as in this software, southern latitudes and western longitudes are given negative values.

You can find your latitude and longitude in a variety of sources. You can use a geographical atlas to estimate your position, of course, but it's easier to use the world wide web.

6. Click **Set** to save changes, or **Cancel** to exit without saving changes.

Note: To change the time or date format (for example from 12-hour to 24-hour, or from MM-DD-YYY to DD-MM-YYYY), click [Set Units](#) in the Setup Menu.

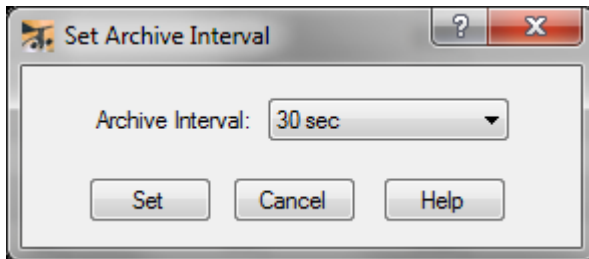
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Set Archive Interval

The **Set Archive Interval** option in the **Setup** menu allows you to select the time interval the data is stored onto the data logger's archive memory. The choices in the pull-down menu are: 10, 15, 20, or 30 seconds; 1, 5, 10, 15, or 30 minutes; or 1 or 2 hours. This interval is known as the archive interval.

Caution: Changing the archive interval from minutes to seconds or seconds to minutes requires the data logger archive memory to be cleared. You should download data before changing archive interval.

1. Select **Set Archive Interval** from the Setup menu.



2. Select the desired archive interval and click **Set**. If you have changed the archive interval from seconds to minutes or minutes to seconds, the software warns you that it is about to clear the archive memory. Click **Cancel** to exit without saving changes.

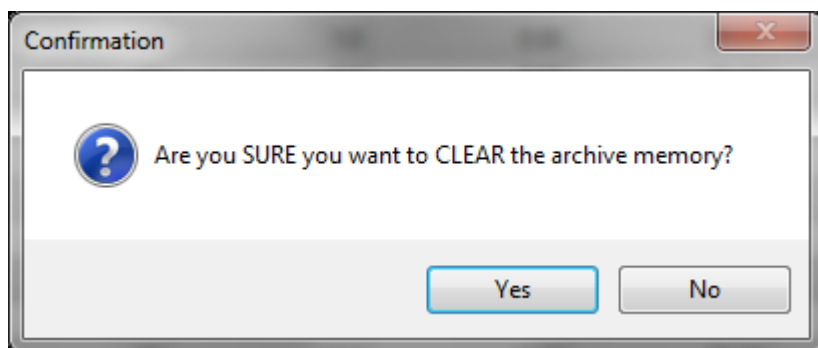
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Clear Archive Memory

The archive memory is the weather information storage area, built into the Envoy8X. At each archive interval, the Envoy8X stores one record to archive memory.

If you want to clear the data in the archive memory, click **Clear Archive Memory** in the **Setup Menu**.

A confirmation message box appears.



Click **Yes** to clear, or **No** to exit without clearing.

Note: When the archive memory fills to capacity, the logger overwrites old data each time it stores a new record. Because of this, it's best to choose the longest archive interval that suits your purpose. In addition, make sure to download data before your archive memory fills or you will have gaps in your database.

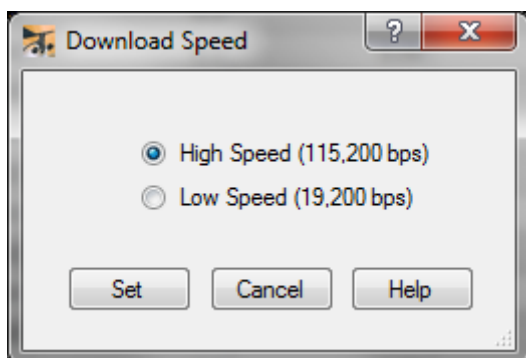
Note: The software may need to clear an archive memory when changes are made to the configuration of the transmitting stations or to the time and date. It will give you a warning before clearing. If you do not want to lose the data, click **Cancel** when the warning appears, download the data, then repeat the procedure that initiated the archive memory clearing.

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Set Download Speed

The software's default download speed is High (115,200 bps).

1. To change the download speed, click on **Set Download Speed** in the **Setup Menu**. If your connection is slower, select **Low Speed**.



2. Click **Set** to save the settings, or **Cancel** to exit without saving.

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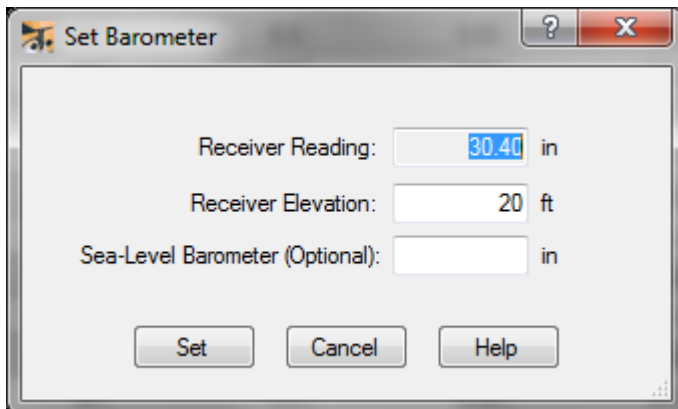
Set Barometer

1. Enter the elevation of your Envoy8X.

The barometer is housed in the Envoy8X, so in order to get accurate barometric pressure data; as well as for ET and THSW Index calculations to work correctly, you need to specify the elevation of your Envoy8X. If you don't know your elevation, there are many ways to find out. For example, you can try calling the reference desk at your local library, look up your town in an almanac, try calling a local airport, search the Internet or use Google Maps (in "terrain" view). In the USA, you can look for a United States Geological Survey topographical map of your area.

Another way to find your elevation is to download [Google Earth](#).

Tip: Of course, the more accurate your elevation is the better, but it should be within 10' (3 m). Don't forget to consider the floor the Envoy8X is on. If your Envoy8X is in your office on the 5th floor of a building, you will need to add that elevation as well.



2. Optional: Enter the correct sea-level barometric pressure.
For the most accurate barometer readings, enter a **Sea-level Barometer** pressure from a reliable nearby reference. The Envoy8X uses this value to fine-tune its own adjusted barometric pressure calculations.

Note: Enter this only if you have a current reading from a very reliable nearby reference. If you leave the Sea-Level Barometric pressure blank, the Envoy8X will report the pressure reading altered by the station elevation only.

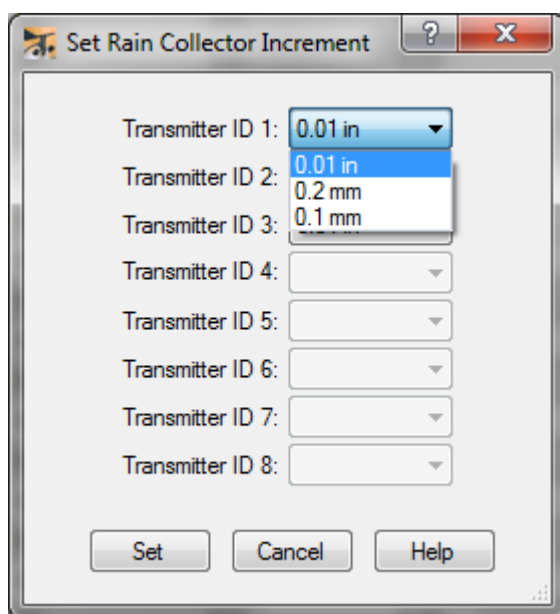
3. Click **Set** to save or **Cancel** to exit without saving.

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Set Rain Collector Increment

Your Davis rain collector reports rain by increments of either 0.01 inches or 0.2 mm. Use this function to make sure the Envoy8X rain increment matches your rain collector.

1. Select **Set Rain Collector Increment** from the **Setup** menu. The Rain Calibration dialog box displays.



Note: Only TX IDs that have an ISS or a rain collector will be available to change.

2. Select the correct increment from the pull-down list.
3. Click **Set** to save the settings, or **Cancel** to exit without saving.

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Wind Cup Size

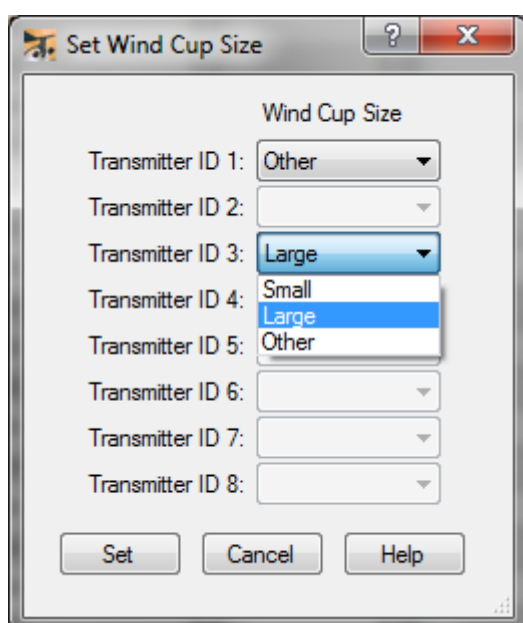
Wind cup size -- small, large, or other -- is automatically set to the default for each type of transmitter.

The default sizes are:

- Vantage Vue ISS: Other
- Vantage Pro2 or Pro2 Plus ISS: Large
- Anemometer Transmitter Kit ("Wind"): Large

If your wind cups are different from these defaults, you must set the Envoy8X to match.

1. Select **Wind Cup Size** from the **Setup** menu.



Note: Only TX IDs that have an ISS or an Anemometer Transmitter Kit ("Wind") will be available to change.

2. Select the correct wind cup size on your anemometer from the pull-down menu
3. Click **Set** to save the settings, or **Cancel** to exit without saving.

Note: If you use the [Receiver Configuration](#) screen, the default setting will be restored.

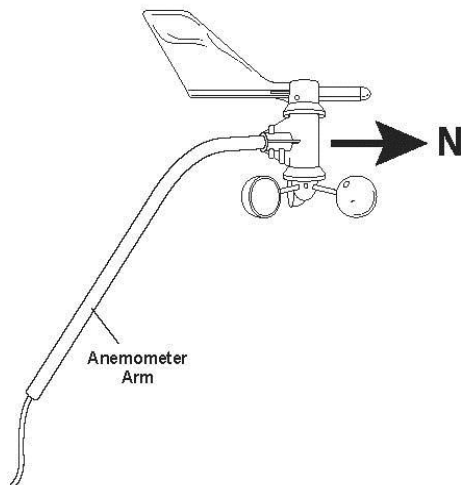
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Wind Direction Calibration

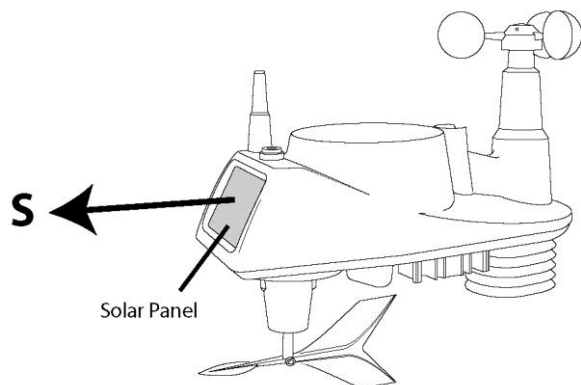
Davis anemometers are calibrated at the factory to be accurate when installed as directed. For the Vantage Pro2, the wind direction is calibrated to be accurate when the anemometer arm is pointing true north. For the Vantage Vue, the wind direction is accurate when the solar panels are facing south.

Note: Calibration should be done with the anemometer or ISS mounted in its final position.

Vantage Pro2 or Anemometer Transmitter Kit: If your anemometer arm aims true north, simply click **Set** to skip without entering anything in the Desired Reading column.



Vantage Vue: If ISS is mounted so that the solar panels face south, simply click **Set** to skip without entering anything in the Desired Reading column.

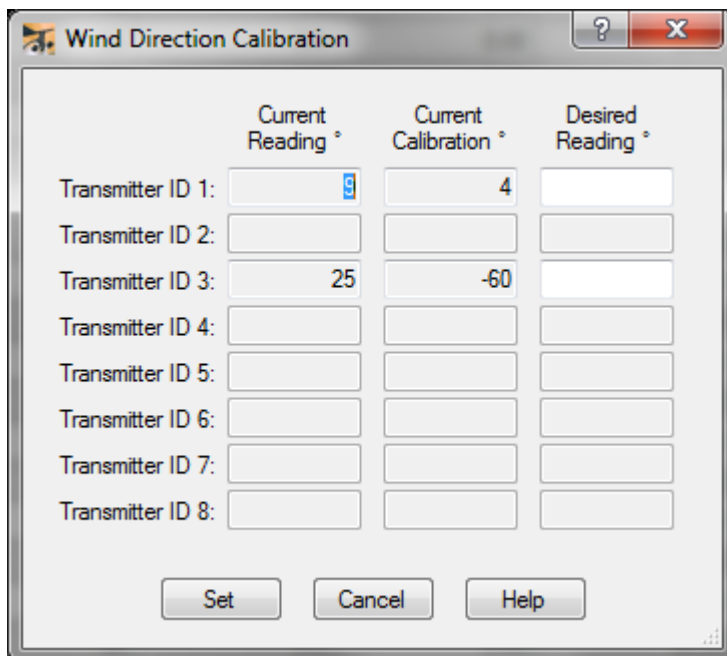


If your anemometer or ISS is **not** mounted as directed, you must calibrate the Envoy8X by observing the wind vane to determine the actual wind direction (or, if no wind, the direction the vane pointing) to determine the desired reading; and then compare this reading to the Envoy8X's current reading.

Tip: Remember, wind direction indicates where the wind is coming from. The nose of the wind vane points into the wind.

Note: To use this method, you will need to either do this calibration when there is no wind, or when you can stabilize the vane so it doesn't move before you can calibrate the reading in the software. If this is impractical, see the alternate method below.

1. Select **Wind Direction Calibration** from the **Setup** menu. The Wind Direction Calibration screen displays.



The image shows a software dialog box titled "Wind Direction Calibration". It contains a table with three columns: "Current Reading °", "Current Calibration °", and "Desired Reading °". There are eight rows, each labeled "Transmitter ID 1:" through "Transmitter ID 8:". The "Current Reading" column has values 9 and 25 for IDs 1 and 3 respectively. The "Current Calibration" column has values 4 and -60 for IDs 1 and 3 respectively. The "Desired Reading" column is empty for all rows. At the bottom of the dialog are three buttons: "Set", "Cancel", and "Help".

	Current Reading °	Current Calibration °	Desired Reading °
Transmitter ID 1:	9	4	
Transmitter ID 2:			
Transmitter ID 3:	25	-60	
Transmitter ID 4:			
Transmitter ID 5:			
Transmitter ID 6:			
Transmitter ID 7:			
Transmitter ID 8:			

Buttons: Set, Cancel, Help

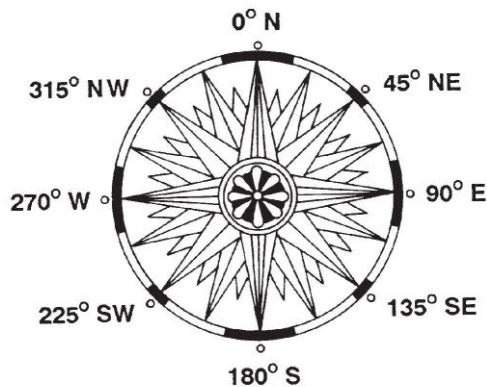
Note: Only TX IDs that have an ISS or an Anemometer Transmitter Kit ("Wind") will be available to change.

2. Enter the desired reading; that is, the true wind direction. The software will automatically calculate the calibration.
3. Click **Set** to save the settings, or **Cancel** to exit without saving.

Alternate Method:

If it is impractical to observe the vane when there is no wind, or to stabilize the vane, you can also determine how far "off" the anemometer is mounted, and add or subtract the number of degrees the anemometer is "off" to the current reading to get an the desired reading. Use a compass, and this diagram, if necessary to determine this number.

First determine what direction your anemometer arm for Vantage Pro2, or the solar panel for Vantage Vue, is actually pointing. Imagine rotating the compass below so that the arm (Vantage Pro2) points to 0° or so that the solar panel (Vantage Vue) points to 180°: a clockwise rotation will require you to calibrate by adding degrees; counter-clockwise by subtracting degrees.



Examples:

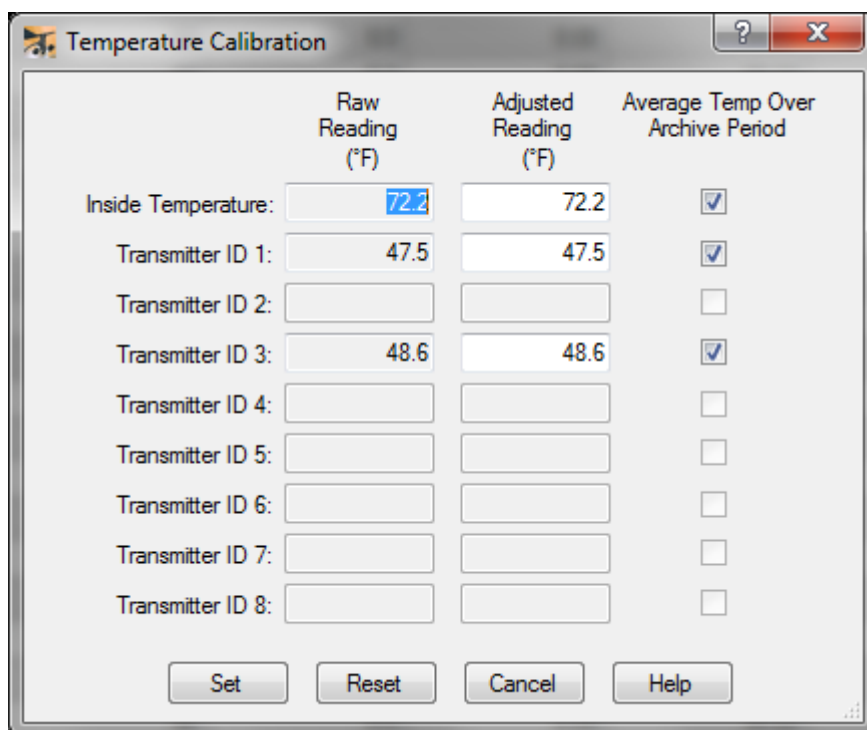
- Your **Vantage Pro2** anemometer arm is mounted so that it points **west**, or 270°: It is factory-calibrated to "think" this direction is north and will report 0° instead of 270°. The compass would need to rotate counter-clockwise 90°. **In the Desired Reading column, enter the reading that is 90° less than the Current Reading value.**
- Your **Anemometer Transmitter Kit** anemometer arm is mounted so it points **southeast**, or 135°: Therefore it will report 0° instead of 135°. The compass would need to rotate clockwise 135°. **In the Desired Reading column, enter the reading that is 135° more than the Current Reading value.**
- Your **Vantage Vue ISS** solar panel is facing **north** (as it would be in the Southern Hemisphere), or 0°: Therefore it will report 180° instead of 0°. The compass would need to rotate 180°. **In the Desired Reading column, enter the reading that is 180° from the Current Reading value.**
- Your **Vantage Vue ISS** solar panel is facing **east** or 90°: Therefore it will report 180° instead of 90°. The compass would need to rotate counter-clockwise 90°. **In the Desired Reading column, enter the reading that is 90° less than the Current Reading value.**
- Your **Vantage Vue ISS** solar panel is facing **northwest** or 315°. Therefore it will report 180° instead of 315°. The compass would need to rotate clockwise 135° (315-180). **In the Desired Reading column, enter the reading that is 135° more than the Current Reading value.**

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Temperature Calibration

You may add or subtract a constant value to the temperature reading.

1. Select **Temperature Calibration** from the **Setup** menu. The **Temperature Calibration** screen appears.



The Temperature Calibration dialog box contains a table with three columns: Raw Reading (°F), Adjusted Reading (°F), and Average Temp Over Archive Period. The rows include Inside Temperature and Transmitter IDs 1 through 8. Checkmarks are present in the Average Temp Over Archive Period column for Inside Temperature, Transmitter ID 1, and Transmitter ID 3. Buttons at the bottom include Set, Reset, Cancel, and Help.

	Raw Reading (°F)	Adjusted Reading (°F)	Average Temp Over Archive Period
Inside Temperature:	72.2	72.2	<input checked="" type="checkbox"/>
Transmitter ID 1:	47.5	47.5	<input checked="" type="checkbox"/>
Transmitter ID 2:			<input type="checkbox"/>
Transmitter ID 3:	48.6	48.6	<input checked="" type="checkbox"/>
Transmitter ID 4:			<input type="checkbox"/>
Transmitter ID 5:			<input type="checkbox"/>
Transmitter ID 6:			<input type="checkbox"/>
Transmitter ID 7:			<input type="checkbox"/>
Transmitter ID 8:			<input type="checkbox"/>

Buttons: Set, Reset, Cancel, Help

Note: Only TX IDs that have an ISS or an temperature sensor will be available to change.

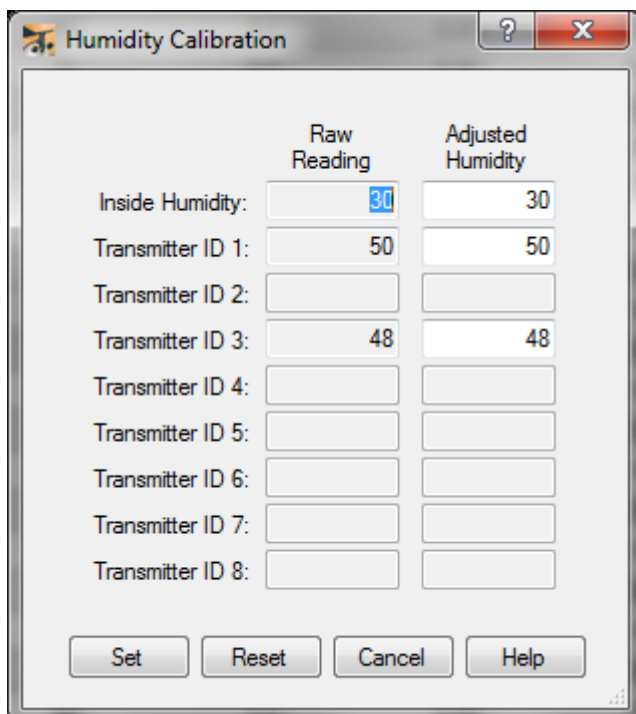
2. The **Raw Reading** is the uncalibrated reading. Enter the value you want the Envoy8X to report in the **Adjusted Reading** column. For example, if you want outside temperatures to report one degree higher, enter a value one degree higher than the raw reading value.
3. If you have set a rather long archive interval, such as one or two hours, or if you need an average temperature, you may choose to average the temperature over the archive period instead of getting one "snapshot" of the temperature. Check the **Average Temperature Over Archive Period** box to average temperature over the period.
4. Click **Set** to save the settings, **Reset** to clear the entries, or **Cancel** to exit without saving.

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Humidity Calibration

You may add or subtract a constant value to the humidity reading.

1. Select **Humidity Calibration** from the **Setup** menu. The **Humidity Calibration** screen appears.



The dialog box titled "Humidity Calibration" contains a table with two columns: "Raw Reading" and "Adjusted Humidity". The rows are labeled "Inside Humidity:" and "Transmitter ID 1:" through "Transmitter ID 8:". The "Raw Reading" column has input fields with values 30, 50, and 48. The "Adjusted Humidity" column has input fields with values 30 and 48. At the bottom are buttons for "Set", "Reset", "Cancel", and "Help".

	Raw Reading	Adjusted Humidity
Inside Humidity:	30	30
Transmitter ID 1:	50	50
Transmitter ID 2:		
Transmitter ID 3:	48	48
Transmitter ID 4:		
Transmitter ID 5:		
Transmitter ID 6:		
Transmitter ID 7:		
Transmitter ID 8:		

Buttons: Set, Reset, Cancel, Help

Note: Only TX IDs that have an ISS or a humidity sensor will be available to change.

2. The **Raw Reading** is the uncalibrated reading. Enter the value you want the Envoy8X to report in the **Adjusted Humidity** column. For example, if you want outside humidities to report one percent higher, enter a value one percent higher than the raw reading value.
3. Click **Set** to save the settings; **Reset** to return to defaults, or **Cancel** to exit without saving.

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Set Alarms

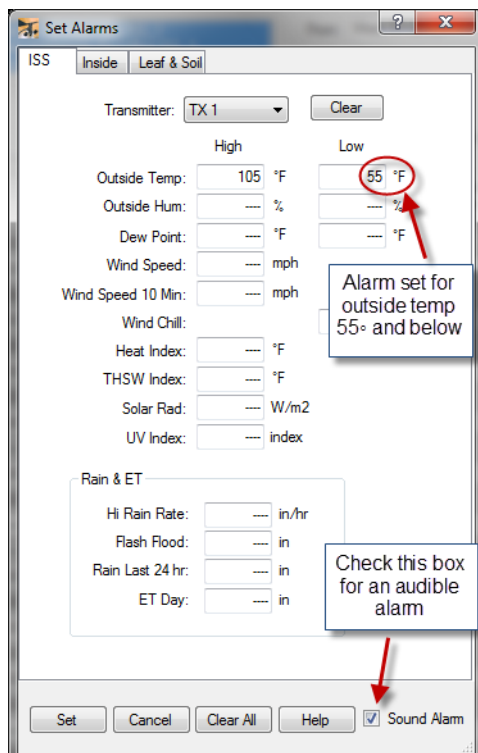
Your Envoy8X can be set to sound an audible alarm when weather conditions reach highs or lows you set.

- High Outside Temperature
- Low Outside Temperature
- High Outside Humidity
- Low Outside Humidity
- High Dew Point
- Low Dew Point
- High Wind Speed
- High 10-minute Wind Average
- Low Wind Chill
- High Heat Index
- High THSW Index
- High Solar Radiation
- High UV Index
- High Rain Rate
- High Flash Flood
- High Rain for Last 24 Hours
- High Daily Evapotranspiration

Note: The alarms are set only on the Envoy8X connected on the COM port you have selected. If you have more than one Envoy8X, set alarms for each Envoy8X separately.

To set alarms:

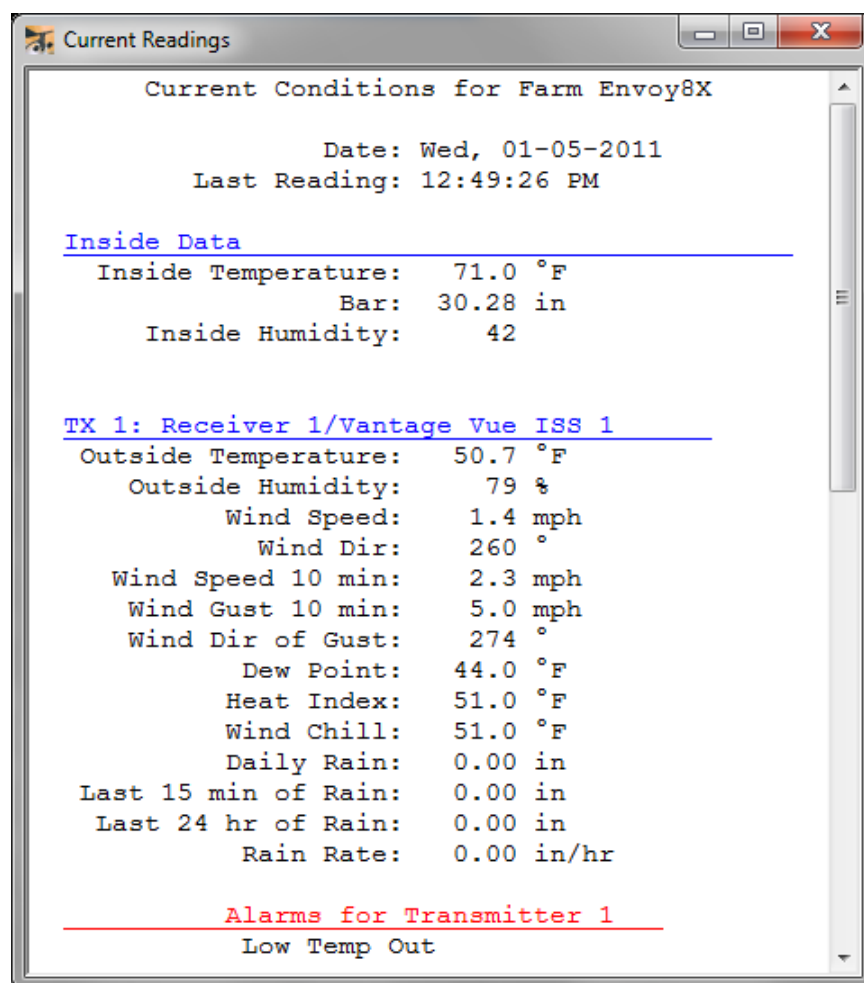
1. Select **Set Alarms** in the **Setup** menu. The **Set Alarm** dialog box displays.



2. Choose the transmitter: Each type of transmitter you have configured appears on a separate tab. On each transmitter type tab, choose the Transmitter ID number of the transmitter you want to set alarms for.

For example, if you have a Vantage Pro2 ISS with TX ID 1 and a Vantage Vue ISS set to TX ID 3, you can set separate alarms for each. First, click the ISS tab, select TX1 for the Vantage Pro2 ISS. Set the alarms you want for that ISS's data. Then select TX 3 for the Vantage Vue ISS and set the alarms you want for that ISS's data.

3. When the Envoy8X receives data that meets or exceeds the values you enter, an alarm sounds if the **Sound Alarm** box is checked.
4. When you have set alarms you want for all the transmitting station data, click Set to save the settings. Click **Cancel** to exit without saving, or **Clear All** to clear all alarms on the transmitter and exit.
5. To turn off the alarm, reenter the **Set Alarms** dialog box (click **Set Alarms** in the **Setup** menu) and enter a different value or dashes in the alarm field that has been triggered.
6. To see which alarm has been triggered, select **Current Readings** or **Transmitter Status** from the **View** menu.



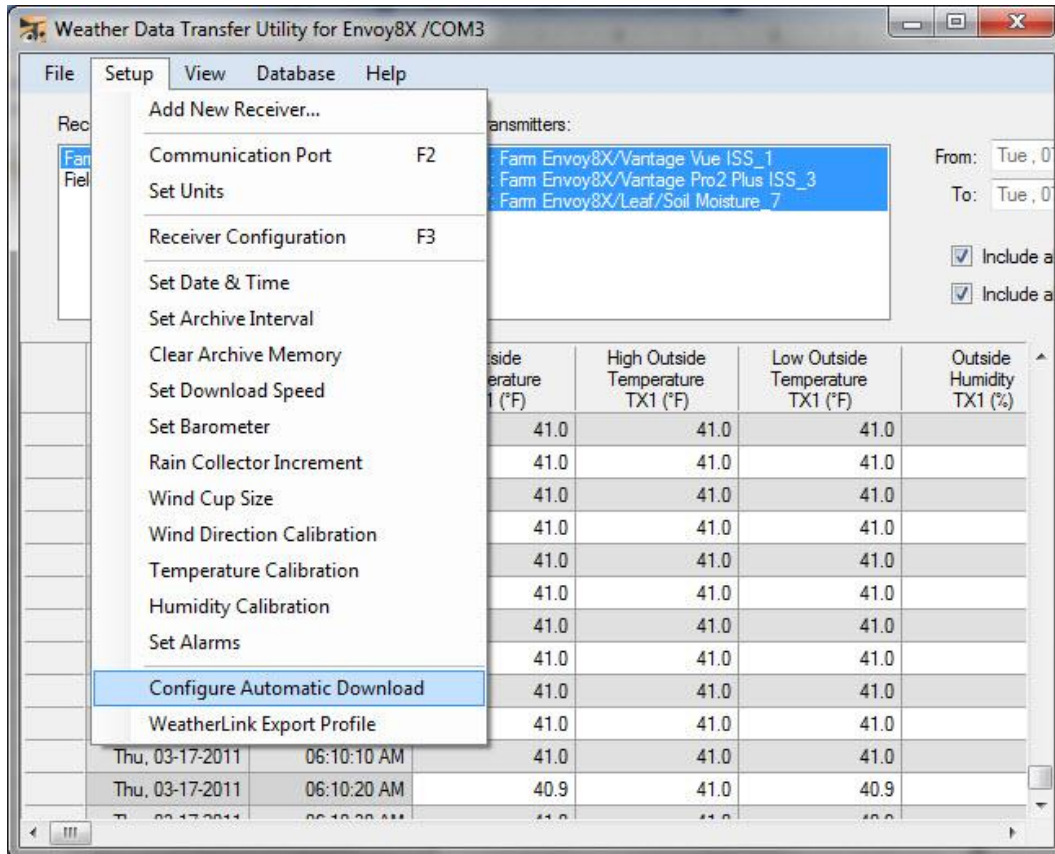
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Configure Automatic Download

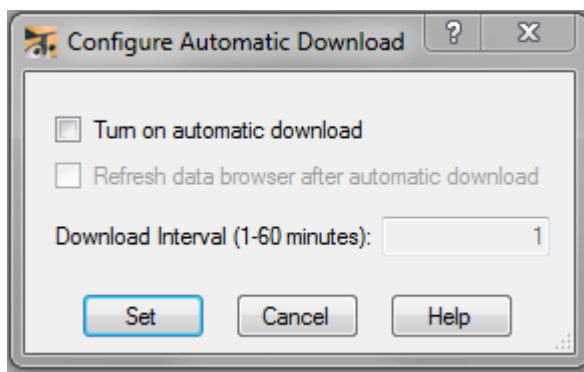
You can set up your system so that data downloads automatically.

Note: The data will be automatically downloaded only when the program is running. If you have setup automatic downloads, you should leave the program running. (You may minimize it.)

1. In the **Setup** menu, select **Configure Automatic Download**.



2. The automatic download configuration dialog box appears.



3. Check the box to turn on automatic download.
4. Check the refresh data box if you would like your browser to automatically refresh.

Note: If you choose a very short interval, the refresh rate may be so long as to overlap the next scheduled download and cause that download to be delayed or skipped. If you are downloading

from several sensors and want to set a short download interval, leave this box unchecked and refresh the screen manually to avoid missing downloads.

5. Choose a download interval from one minute to 60 minutes.
6. Click Set.

Only new data (since the last download) will be automatically downloaded at each interval. The data will be exported to WeatherLink in the same way as if it was manually downloaded if a WeatherLink profile has been set up.

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WeatherLink Export Profile

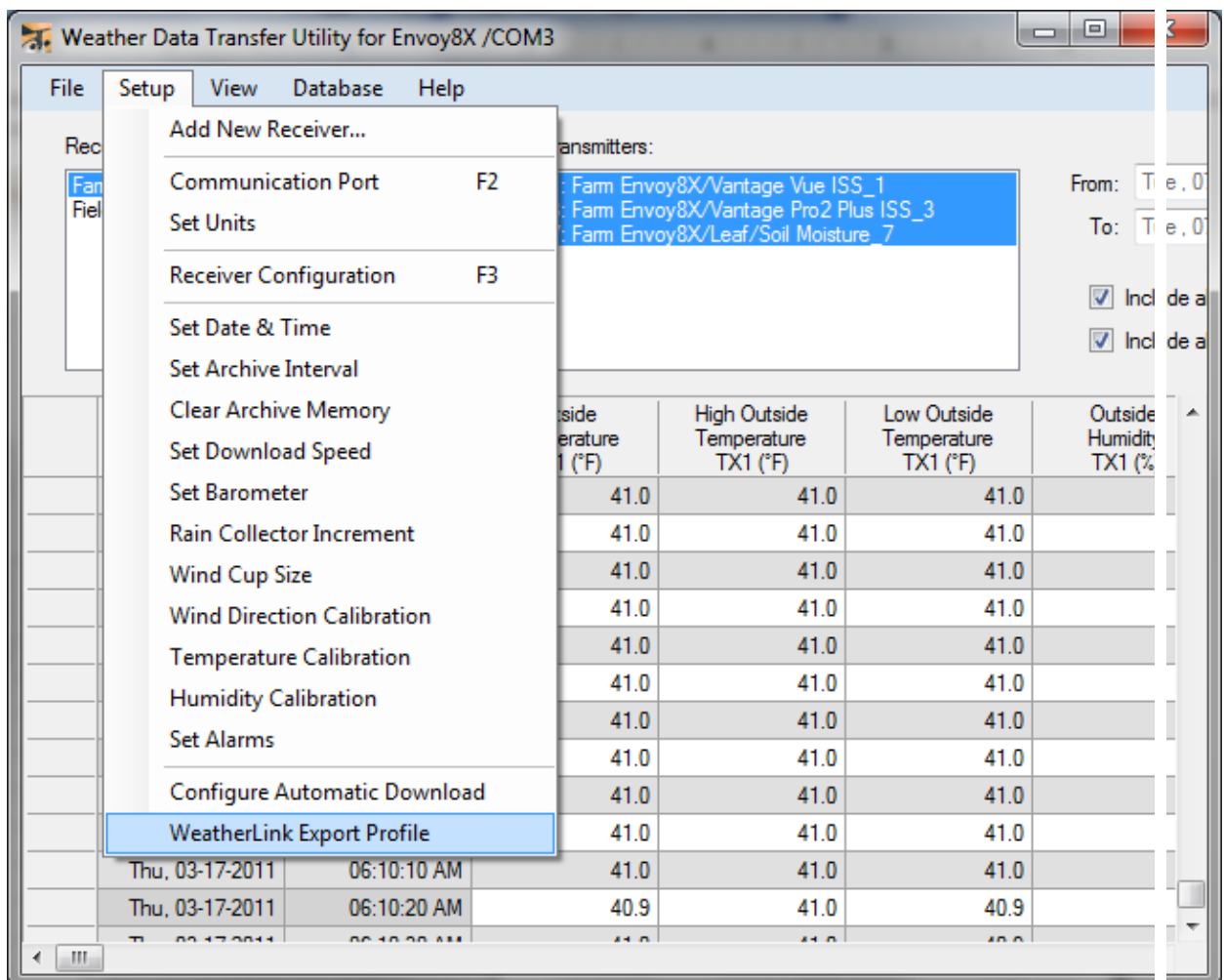
Use the **WeatherLink Export Profile Setup** dialog to create export profiles which specify how to map your Envoy8x data to the older WeatherLink format.

Note: Archive intervals of less than one minute are not supported for exporting to WeatherLink. (If "second" data is imported, only the first record of the minute is imported.)

When you download data in the Envoy8X software, an export file will be created from the downloaded data that can be imported into WeatherLink Software versions **5.93** and later.

Note: A profile is actually a text file that specifies how the data is to be mapped. This file is saved in the Profiles folder of your program folder. If your profile name is, "MyProfile", then the file saved will be called, "MyProfile.txt". The export file that is created uses the profile name, but adds the ".bin" extension. If your profile name is "MyProfile", then the export file will be called, "MyProfile.bin", and is saved in the Profiles\Export folder of your program folder. In the WeatherLink software choose "Import Envoy8x data", from the File menu to quickly import the data into WeatherLink.

1. From the Setup Menu, choose **WeatherLink Export Profile**.



2. The **WeatherLink Export Profile Setup** dialog box appears.

WeatherLink Export Profile Setup

Profile Name: MyExportProfile

Receiver Name: Field Envoy8X

Export Data to: C:\Weather DTU\Profiles\Export\MyExportProfile.bin

Inside Temperature: Inside Temp / Receiver (Inside) Data	Leaf Wetness 1: Leaf Wet 1 / TX ID 7
Outside Temperature: Outside Temp / TX ID 1	Leaf Wetness 2: Leaf Wet 2 / TX ID 7
High Outside Temperature: Outside Temp / TX ID 1	Leaf Temperature 1: Outside Temp / TX ID 1
Low Outside Temperature: Outside Temp / TX ID 1	Leaf Temperature 2: Outside Temp / TX ID 3
Inside Humidity: Inside Hum / Receiver (Inside) Data	Soil Temperature 1: Soil Temp 1 / TX ID 7
Outside Humidity: Outside Hum / TX ID 1	Soil Temperature 2: Soil Temp 2 / TX ID 7
Wind Speed: Wind Speed / TX ID 1	Soil Temperature 3: Soil Temp 3 / TX ID 7
UV: UV / TX ID 3	Soil Temperature 4: Soil Temp 4 / TX ID 7
Solar Radiation: Solar Panel Volts / TX ID 1	Soil Moisture 1: Soil Moist 1 / TX ID 7
High Solar Radiation: Super Cap Volts / TX ID 1	Soil Moisture 2: Soil Moist 2 / TX ID 7
Rain: Rain / TX ID 1	Soil Moisture 3: Soil Moist 3 / TX ID 7
ET: ET / TX ID 3	Soil Moisture 4: Soil Moist 4 / TX ID 7
Extra Temperature 1: Outside Temp / TX ID 1	Wind Samples: Packets Received / TX ID 1
Extra Temperature 2: Outside Temp / TX ID 1	
Extra Temperature 3: Outside Temp / TX ID 1	
Extra Humidity 1: Outside Hum / TX ID 1	
Extra Humidity 2: Outside Hum / TX ID 1	

New Profile Open Profile Save Profile

Close Help Delete Profile

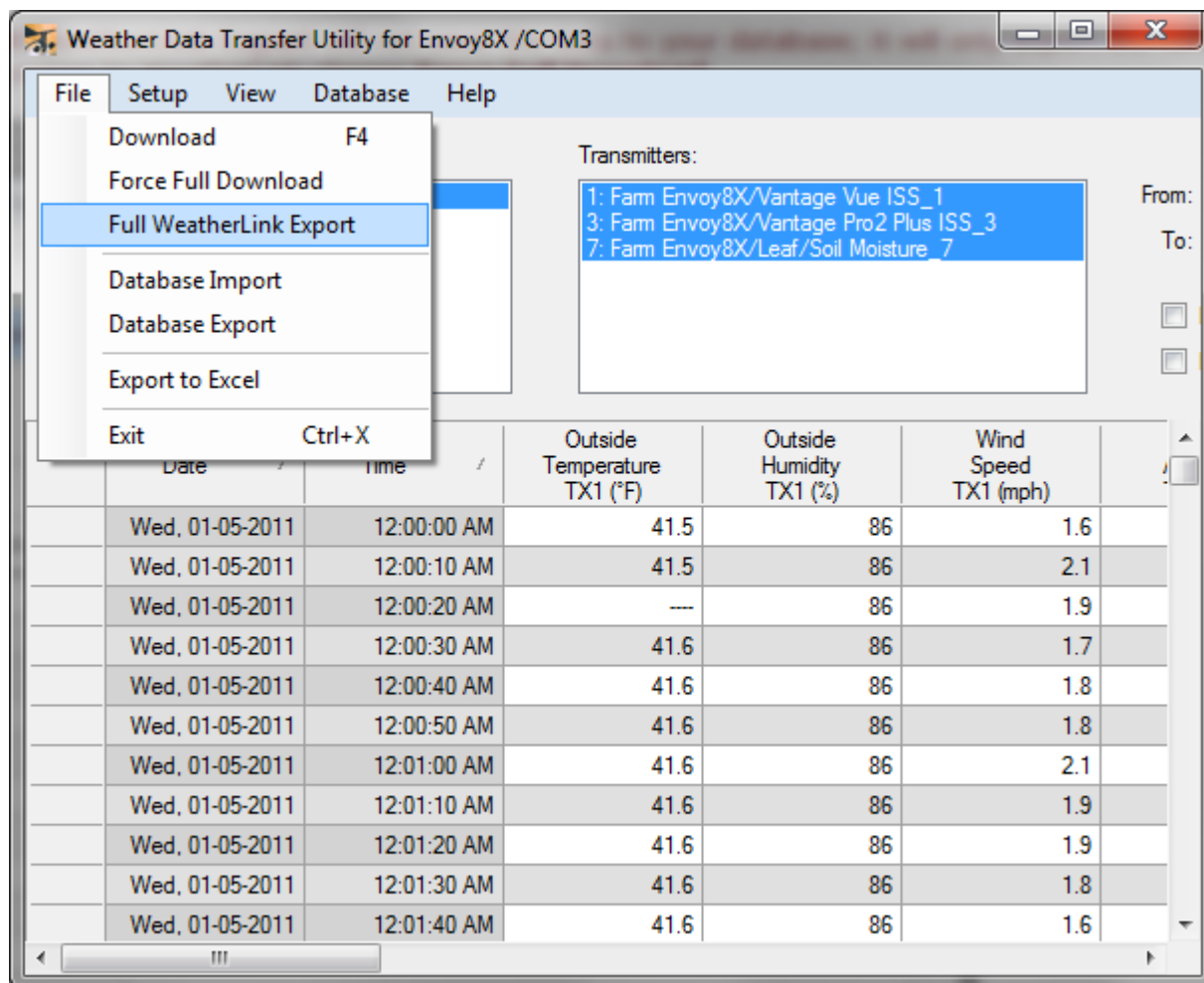
3. Click **New Profile** and give the profile a name in the **Profile Name** field. You can have as many profiles for a given Envoy8x as you need (they each will have their own export file).
4. Choose the receiver this profile will be used with in the **Receiver Name** pull-down menu.
5. The labels on the left are the WeatherLink field names. For each WeatherLink field (Inside Temperature, Outside Temperature etc.), you can select what Envoy8X data you want to map to that field.
6. Click **Save Profile** to save the profile. Now, whenever you download data an export file will be written with the new data and can be imported into WeatherLink.
7. Click **Close** to exit without saving. Click **Open Profile** to edit an existing profile. Click **Delete Profile** to delete the profile.
8. You may use this command set up several profiles or delete profiles.

Exporting to WeatherLink

Once you have saved a profile, the export file will be updated with new data whenever that

Envoy8X is downloaded. It can then be imported to WeatherLink, using the **Import to Envoy8X** command in the WeatherLink software.

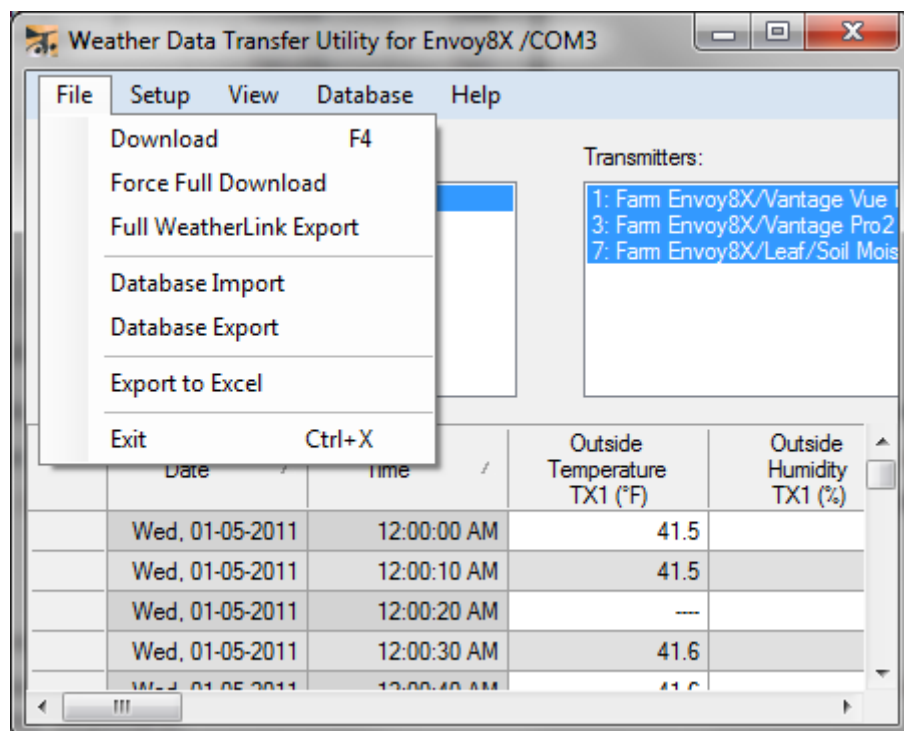
Note: To save time, **Full WeatherLink Export** will not save the data to your database; it will only export the data to WeatherLink. If you want to save all data to the database, as well as exporting to WeatherLink choose **Force Full Download**.



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File

Use the **File** Menu to download, export or import to a database, or export data to WeatherLink.



[Download](#): Use to download new data since the last download. It will save new data to the database and to the export file for WeatherLink.

[Force Full Download](#): Use to download all the data in the memory, save it to the database and to the export file for WeatherLink.

[Full WeatherLink Export](#): Use to download all the data in the memory and to the export file for WeatherLink, but not save to the database.

[Database Import](#)

[Database Export](#)

[Export to Excel](#): Use to export the data shown in the browser to a CVS or XLS file.

Exit: Click to exit the Weather Data Transfer Utility program. You may also click the red X in the upper right corner of the window, or press the control and x keys on your keyboard.

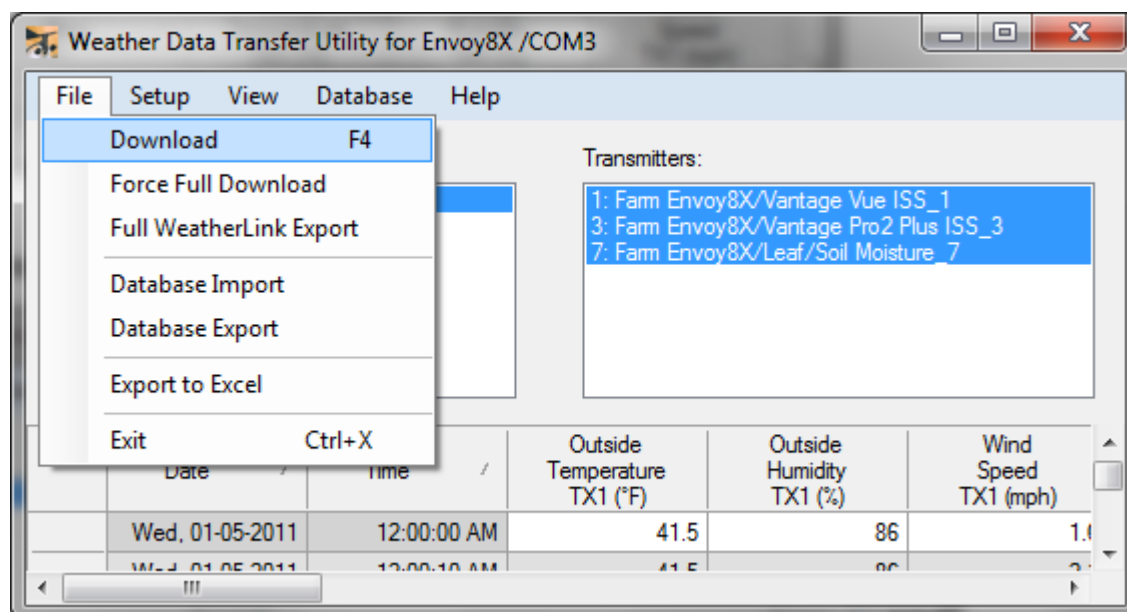
Download

You can download only new data, or all the data in the receiver's archive memory. Use the **Download** command to download only new data since the last download. It will save new data to the database and export to WeatherLink.

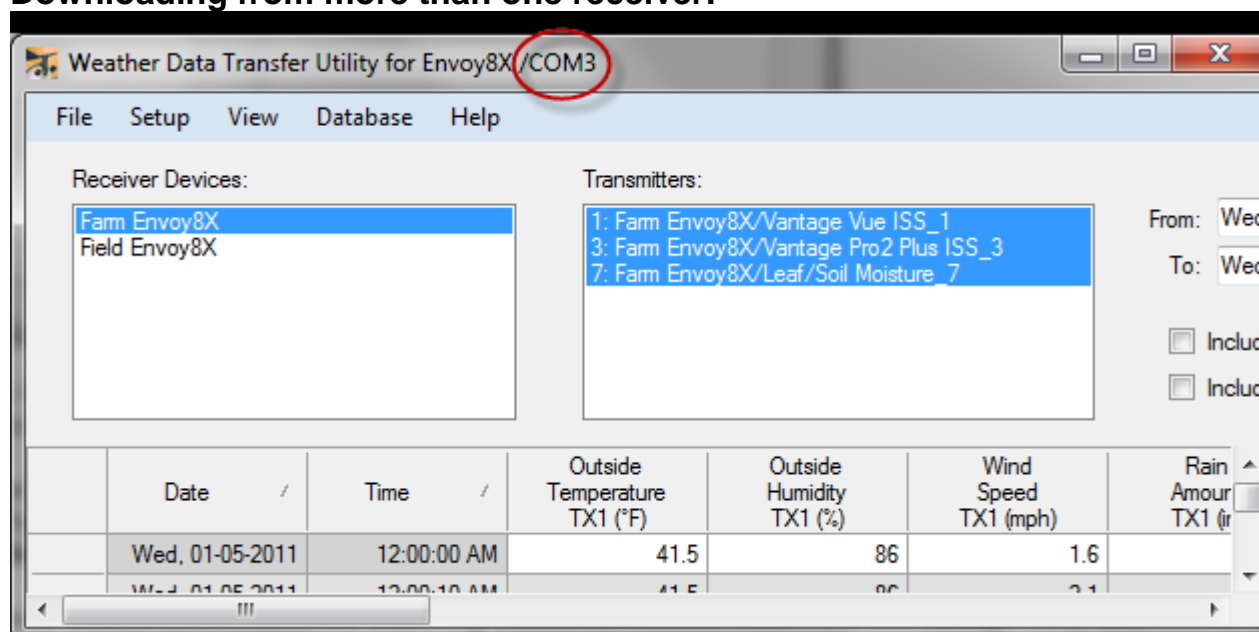
You can also set up your system so that data downloads automatically at intervals from one minute to 60 minutes. See [Configure Automatic Download](#) for more information.

Note: All downloaded data will be stored in the database, including data that is not selected to display in the browser.

Click **Download** from the **File** menu to download the data that has been logged since the last time you downloaded.



Downloading from more than one receiver:

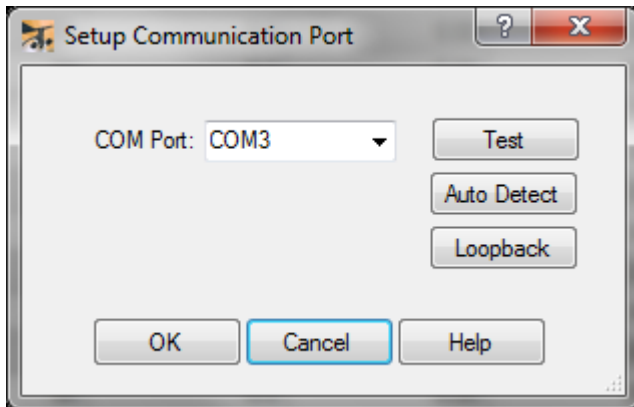


If you have set up more than one receiver, they will all appear in the **Receiver Devices**

field. However, the data downloaded will be from the receiver currently connected to the computer.

If more than one receiver is connected at the same time, the data downloaded will be from the the receiver connected to the COM port, as shown in the title bar, that was last used for any communication between the computer and the receiver, such as downloading or changing something in setup. **(This may NOT be the receiver selected in the Receiver Devices field.)**

You can see which receiver will be downloaded by selecting **Communication Port** from the **Setup** menu and choosing the COM port to which the receiver you want to download is connected. (You will need to know which receiver is connected to which port; you can use the [Receiver Configuration](#) screen to see which receiver is on the current port.)

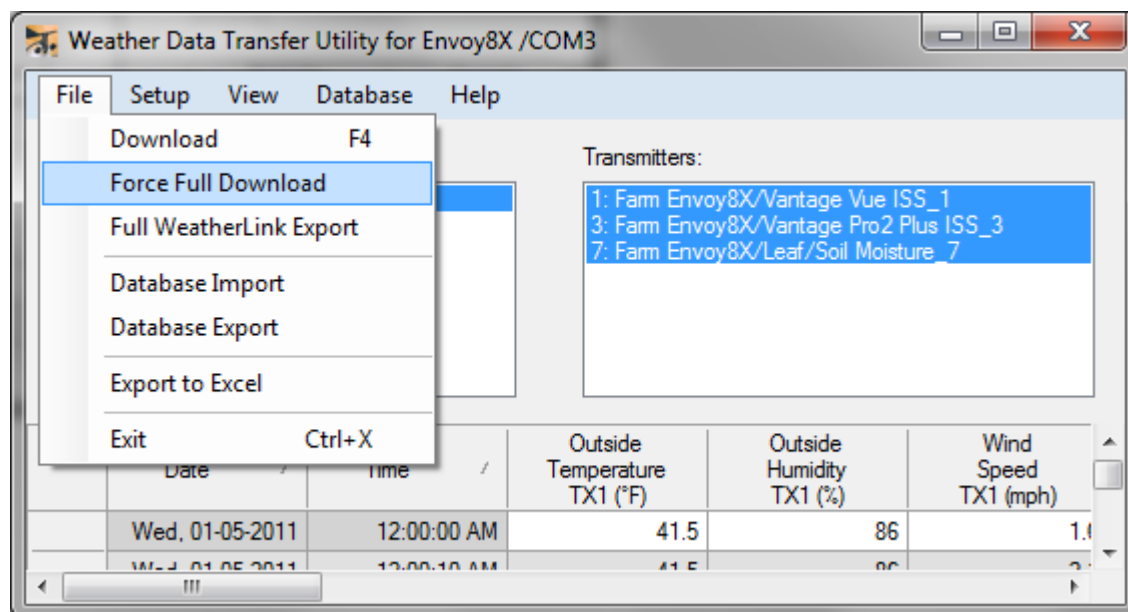


See [Force Full Download](#) to download all the data stored in the receiver's memory.

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Force Full Download

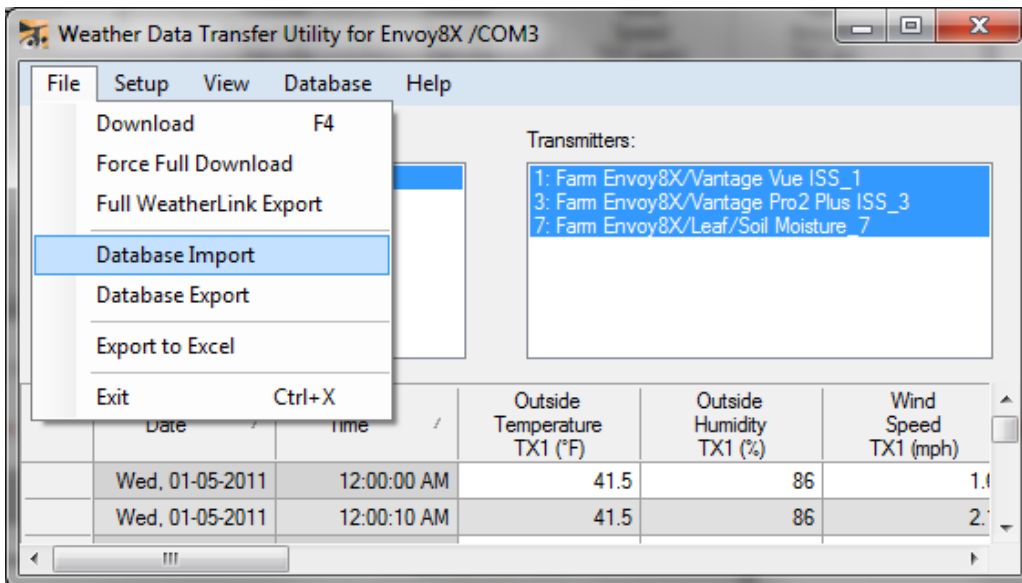
To download all the data stored in your Envoy8X (including data that has already been downloaded) save it to the database and export to WeatherLink, click **Force Full Download** from the **File** menu.



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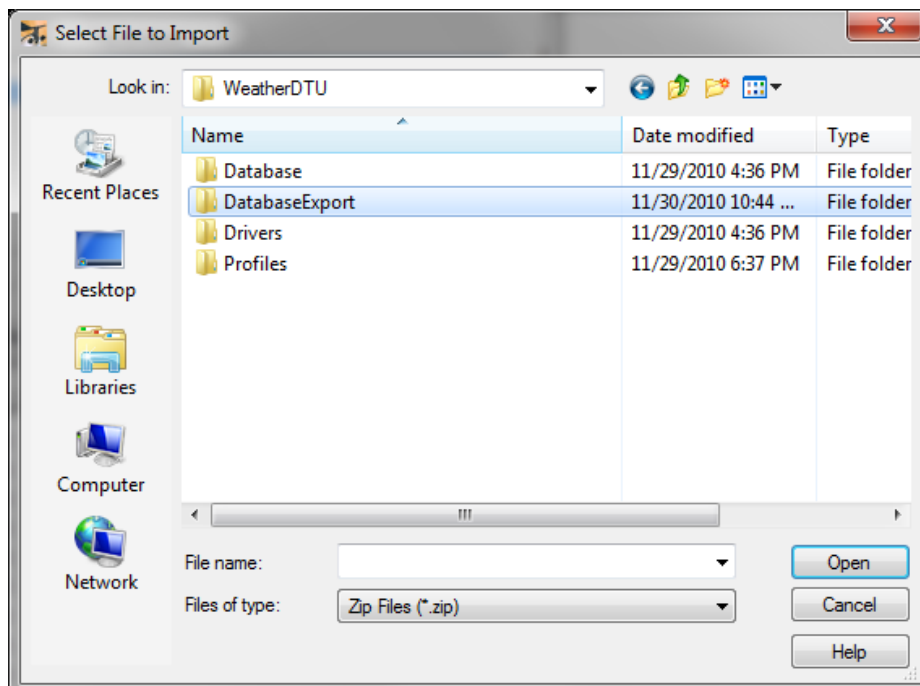
Database Import

You can import data from another database into Weather Data Transfer Utility for Envoy8X by selecting **Database Import** in the **File** menu.



Select the file you want to import. (It must be a *.zip formatted file.)

Note: When you use the Database Export function, the output file will be a *.zip file and will be stored by default in the DatabaseExport folder.



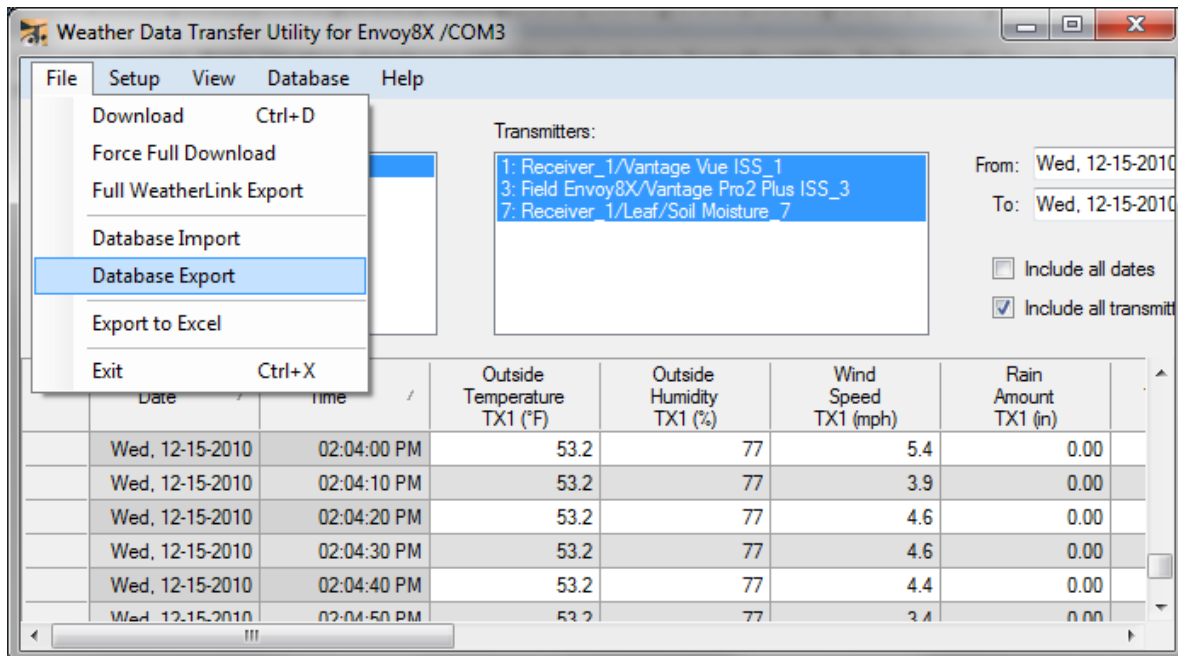
Click **Open** to import the file, or **Cancel** to exit without importing.

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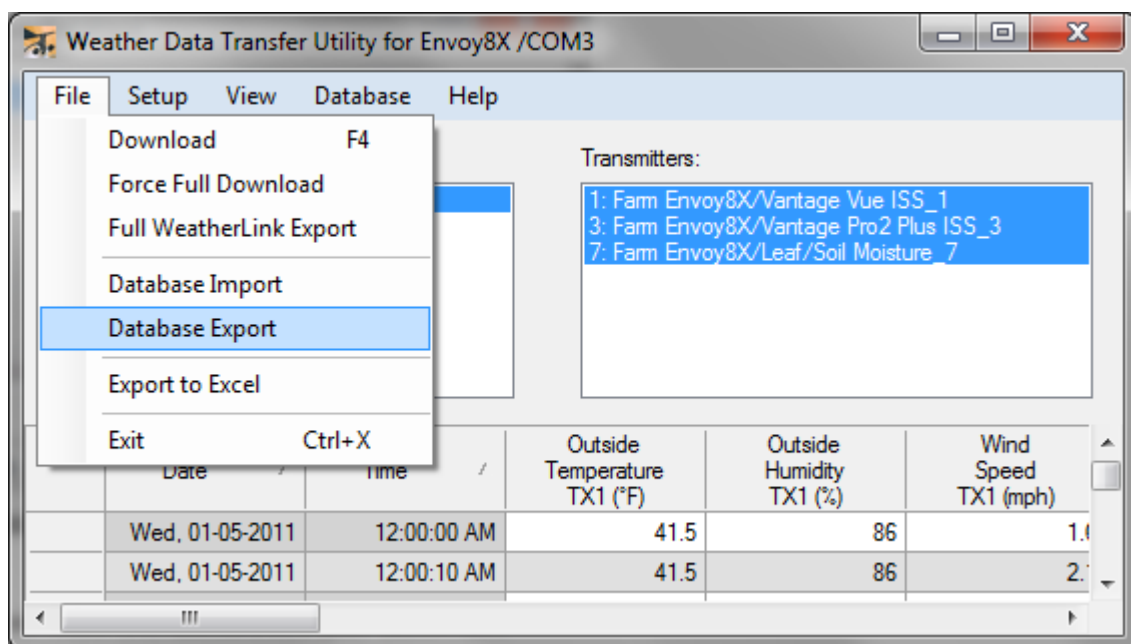
Database Export

You may export data from the Weather Data Transfer Utility for Envoy8X. The output file of this operation will be a *.zip file and will be stored by default in the DatabaseExport folder in the WeatherDTU folder. You can specify a different location. This file can be imported later.

1. Click **Database Export** in the **File** menu.

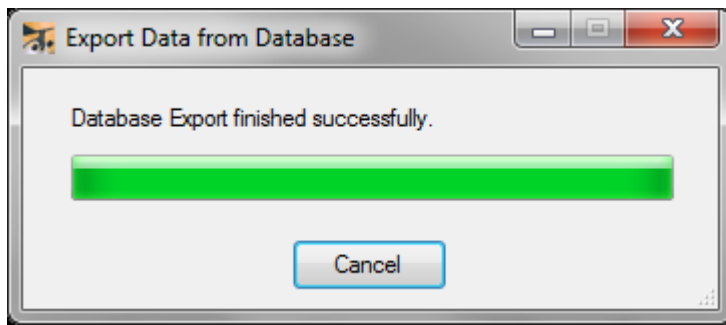


2. The **Export Data from Database** dialog box opens.



3. Select the receiver from the **Receivers** pull-down list.
4. Select the range of dates you want to export.

5. Select the location you want to export the data to. (The default is DatabaseExport folder.)
6. Click **Export**. A progress dialog box will open. Click **Cancel** to stop the export.



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Export To Excel

Exporting your data to Microsoft Excel allows you to create graphs, charts, and reports in Excel.

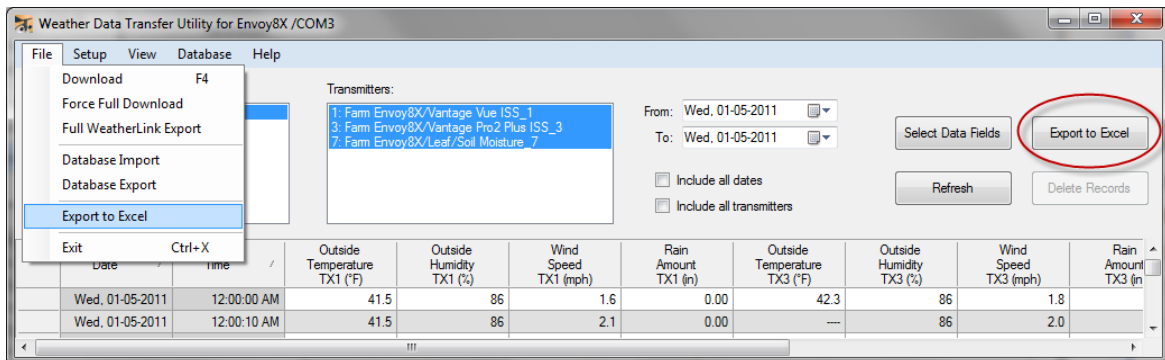
Note: You must have Microsoft Excel installed on your computer to use this feature.

Note: This function exports only the data shown in the browser.

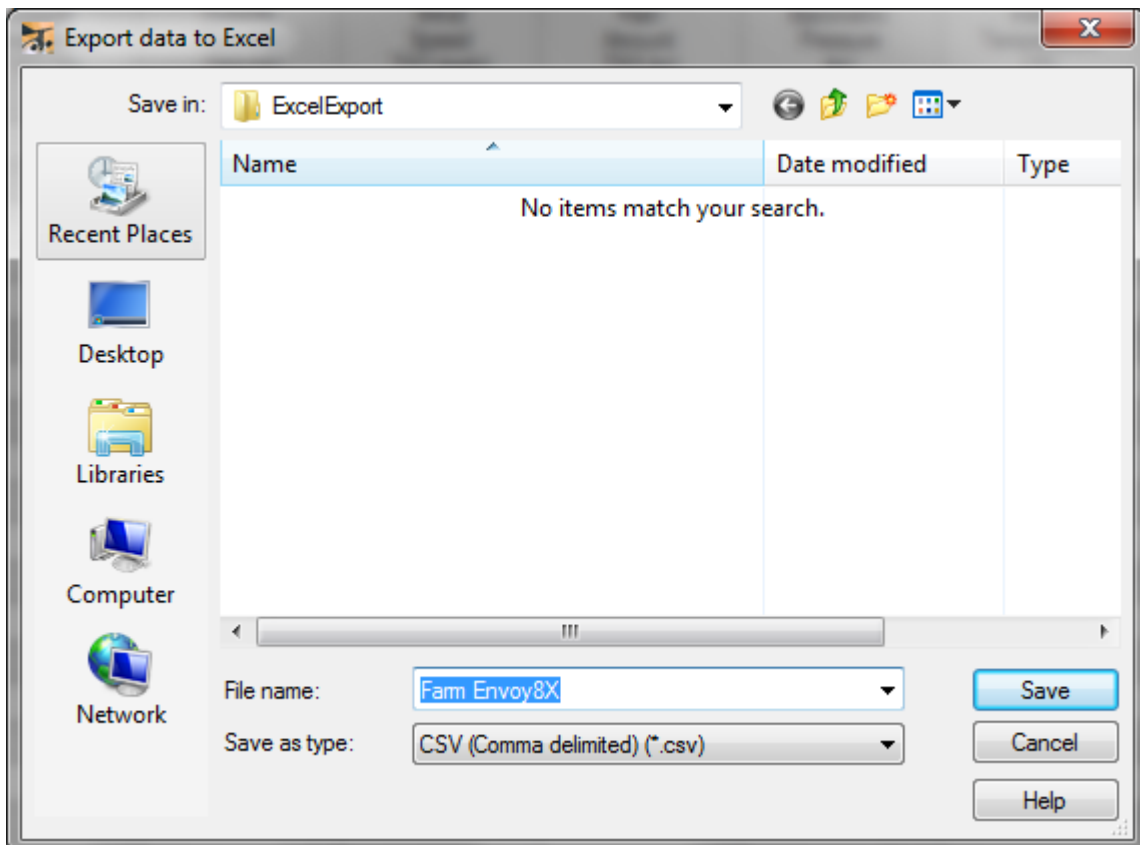
There are two ways to get your data into an Excel file: export all the data in the browser or cut and paste specific data.

If you want to export all the data shown in the browser:

1. Click **Export to Excel** in the **File** menu, or click the **Export to Excel** button.



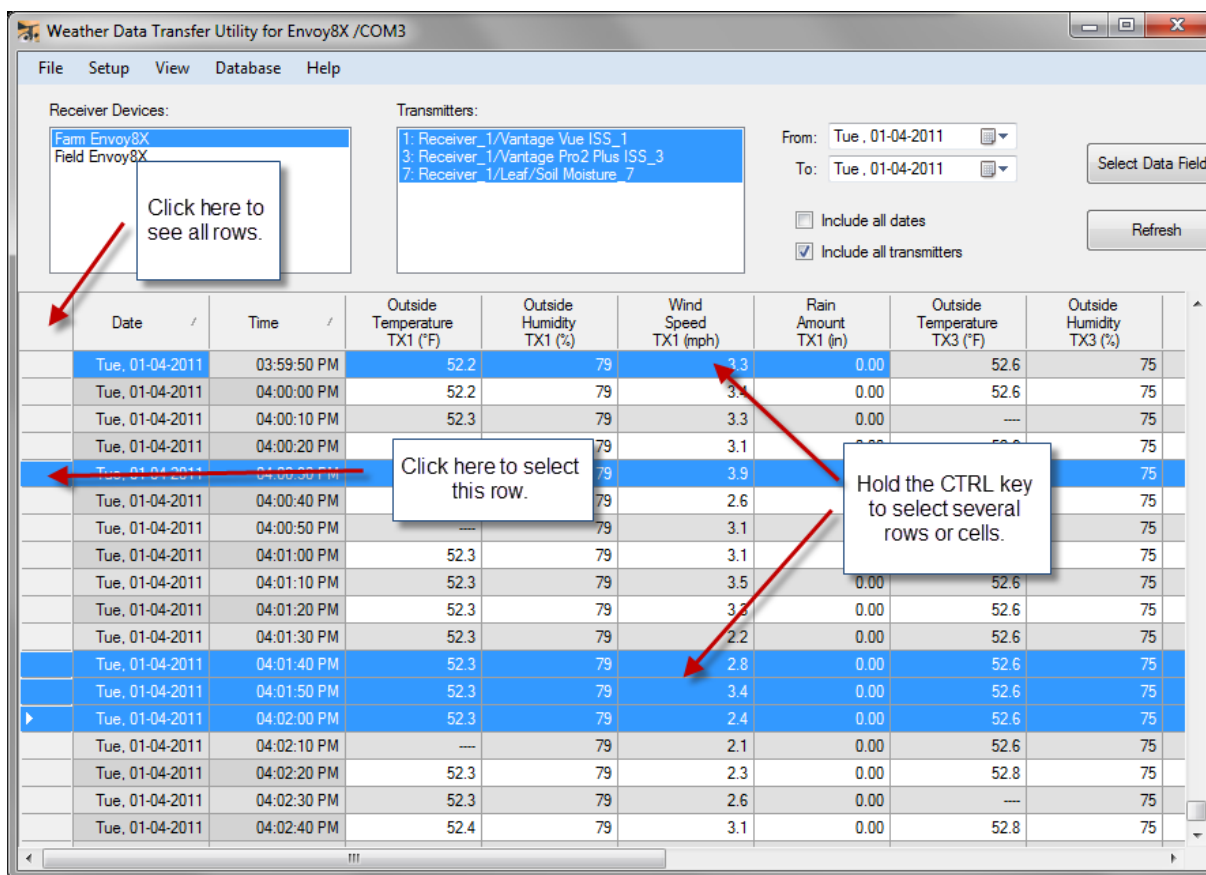
2. The default directory is ExcelExport. You can change this by selecting another directory in the **Save in** field.



3. The file will be saved as a CSV file. CSV is a comma-delimited text file and can be opened in Excel. (Excel is the default program to open this type of file.) Click **Save**.
4. An Excel spreadsheet with your data will open automatically.

If you want to export data from only specific rows or cells, you may use cut and paste.

1. Select the cells or rows of data you want to export. You can select specific cells using the **CTRL** key. Select entire rows by clicking in the empty cell in the leftmost column of the row you want to select, or click and drag to select a range of cells.

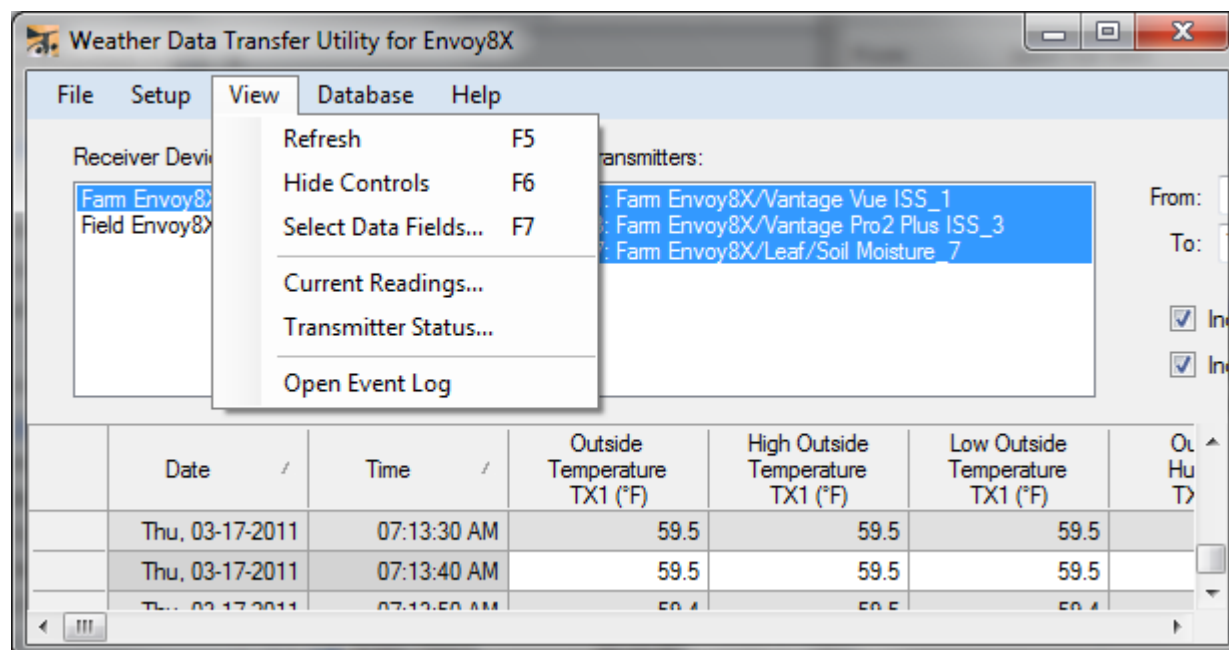


2. Hold the **CTRL + C** keys on your keyboard to copy the selected cells.
3. Open your Excel file and paste the copied data into it.

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View

Use the **View** Menu to refresh the screen and see text versions of current readings and transmitter status.



[Refresh](#)

[Hide Controls](#)

[Select Data Fields](#)

[Current Readings](#)

[Transmitter Status](#)

Open Event Log: Used for troubleshooting

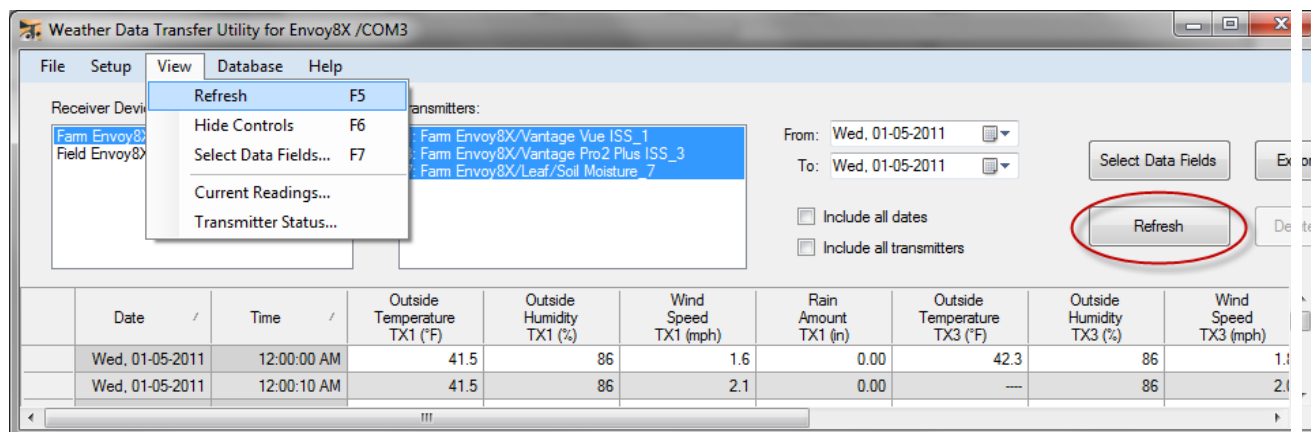
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Refresh

If you select a different Envoy8X or select different Transmitter IDs, you will need to refresh the screen.

Click **Refresh** from the **View** menu to refresh the screen.

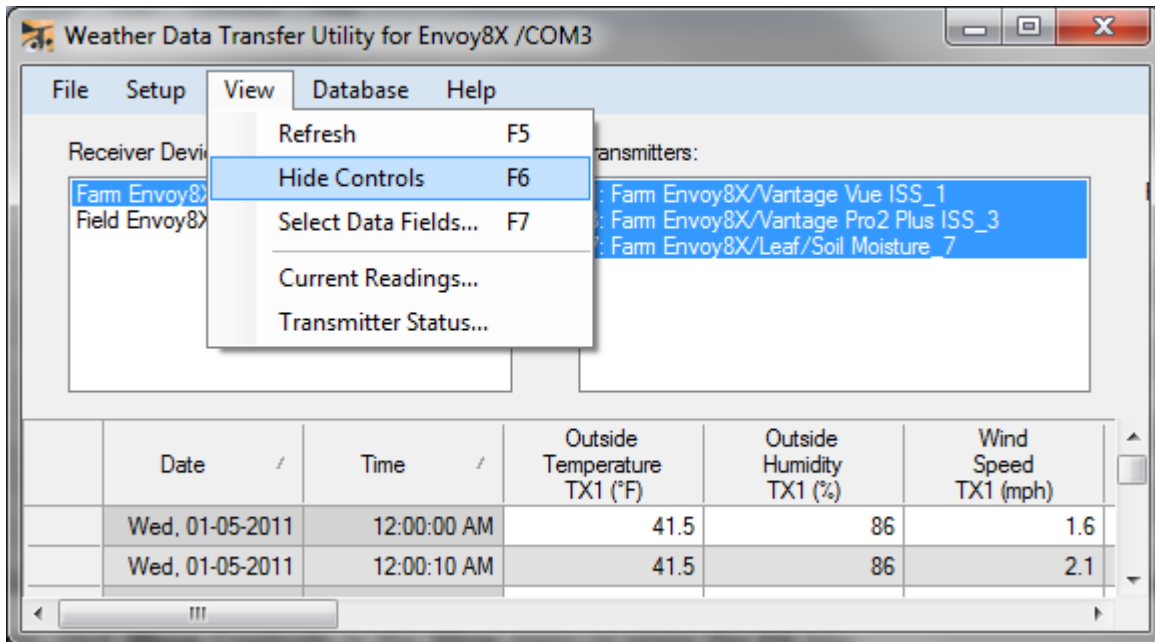
Or, you can click on the **Refresh** button.



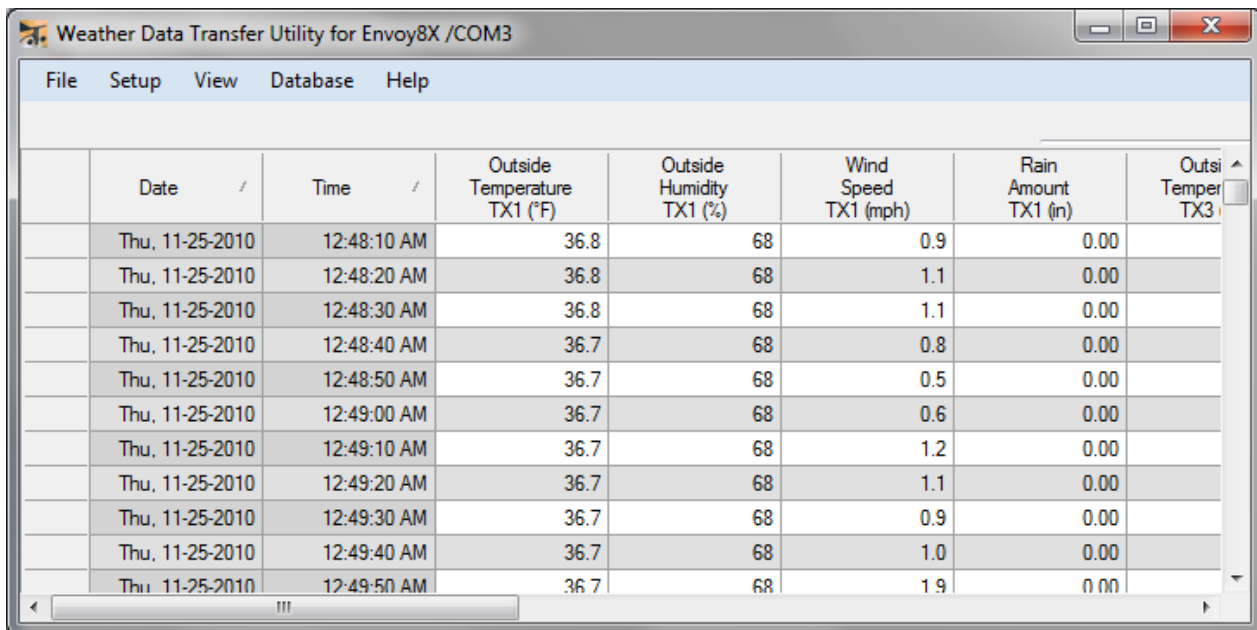
Back to [View](#)

Hide Controls

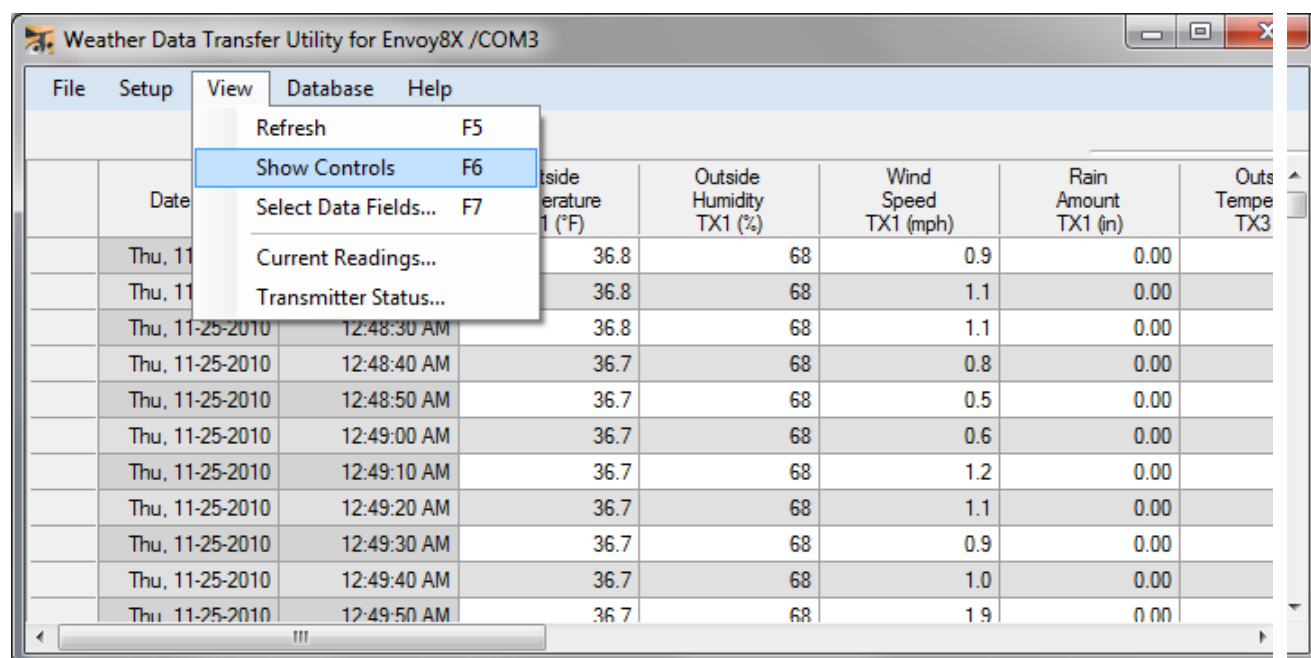
The top part of the screen below the menu bar that shows the Envoy8X and Transmitter details, can be hidden to allow more space for data.



Click **Hide Controls** in the **View** menu, or press the **F6** key.



To return, click **Show Controls** in the **View** menu or press the **F6** key.



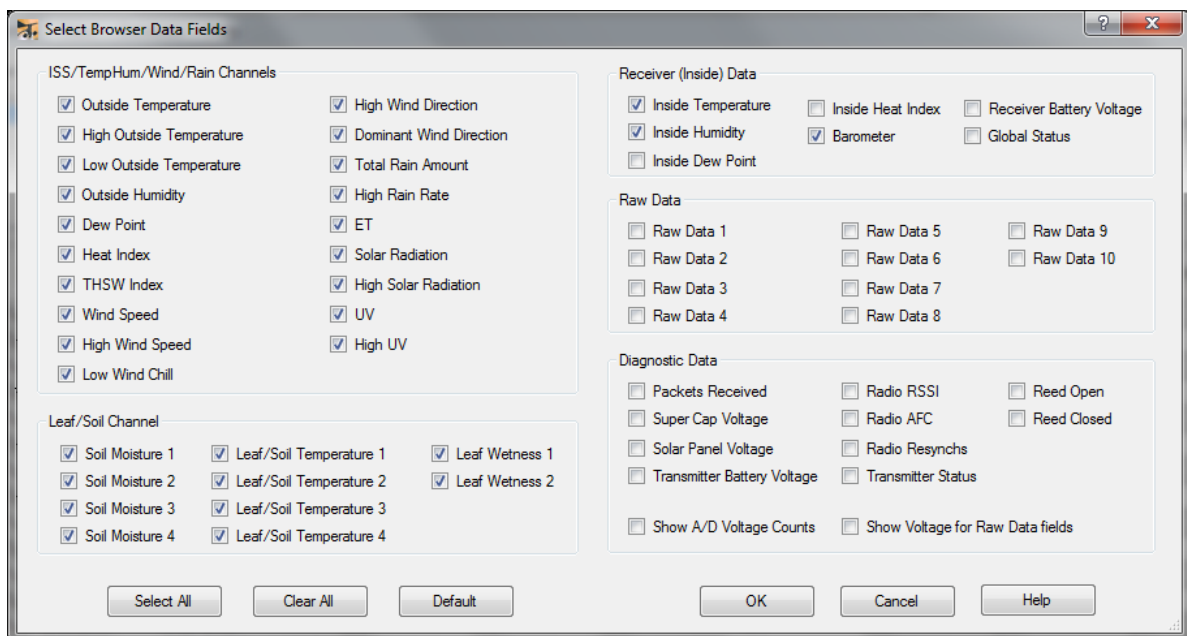
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Select Data Fields

The Weather Data Transfer Utility software browser shows data in columns; each column shows data from one sensor on one Transmitter ID. You can select which data to display in the browser columns in this window.

1. Click **Select Data Fields** in the **View** menu. The **Select Browser Data Fields** dialog box displays.

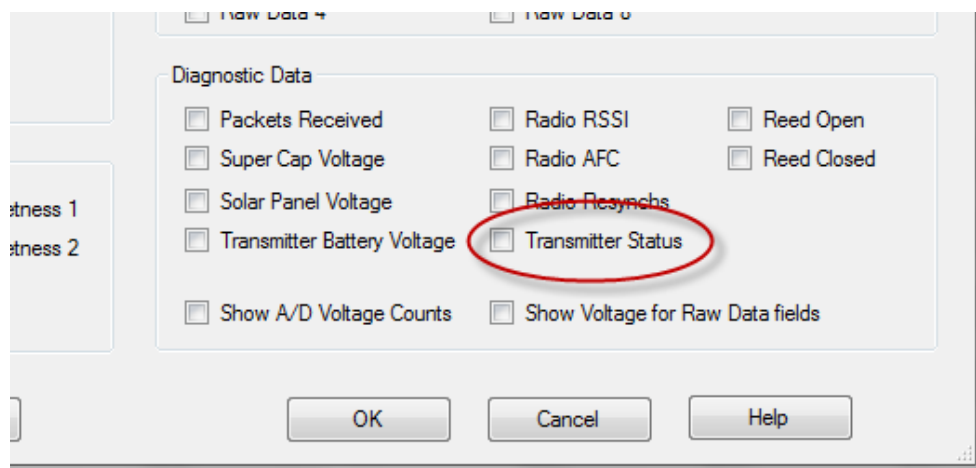


Data fields for all transmitters appear, organized by ISS, Temperature/Humidity, Wind, and Rain transmitting stations; Leaf Wetness & Soil Temperature/Moisture transmitting stations; Inside (Env8X) Data; Raw Data; and Diagnostic Data.

Note: Use Raw Data when one of your Transmitter IDs is reporting data from a compatible third-party sensor. Use Diagnostic data for troubleshooting and debugging. However, when you use a third-party anemometer and our Universal Anemometer Interface, it will behave as if it were a Davis anemometer.

2. Check the box next to the data field you want to be displayed in the browser.

Note: You may choose to see Diagnostic Data in your browser.



If you choose Transmitter Status the column in the browser will show the following codes:

OK	At the time of the archive, the transmitter was tracked with no error conditions.
R	At the time of the archive the receiver was trying to resynch (find) the transmitter
L	At the time of the archive the receiver was lost (not currently being tracked). It will go into the R state at a later time to try to find the transmitter.
B	The low battery bit was set in one or more packets coming from the transmitter during the archive interval.

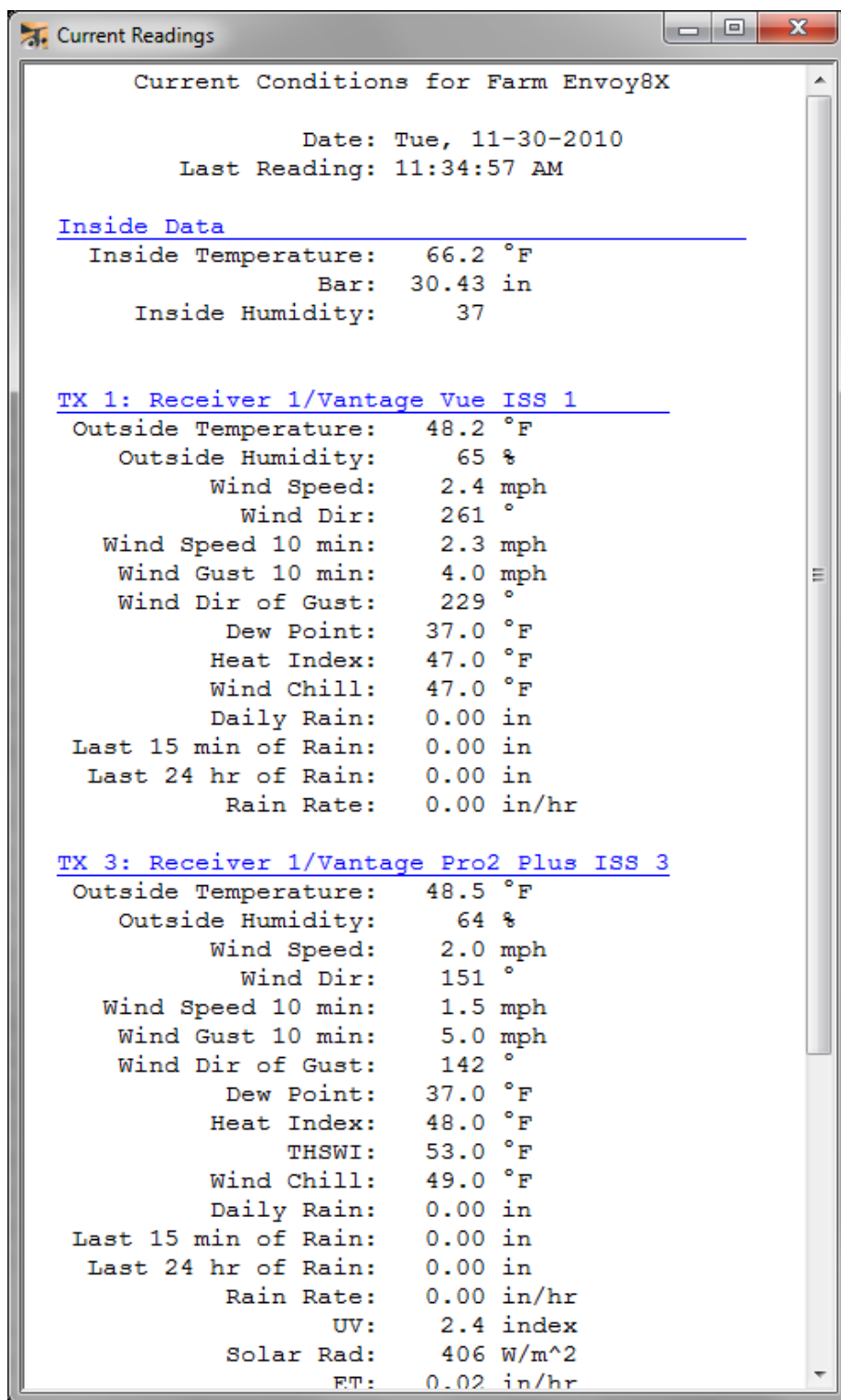
The number in parentheses following the code is the hex value for the status byte.

- When you have selected all the data fields you want to see in the browser, click **OK**. You may select all the data fields with the **Select All** button, or uncheck all boxes with the **Clear All** button. Click **Default** to select the default sensors (Outside Temperature and Humidity, Wind Speed, Total Rain Amount; Inside Temperature and Humidity, Barometer).

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Current Readings

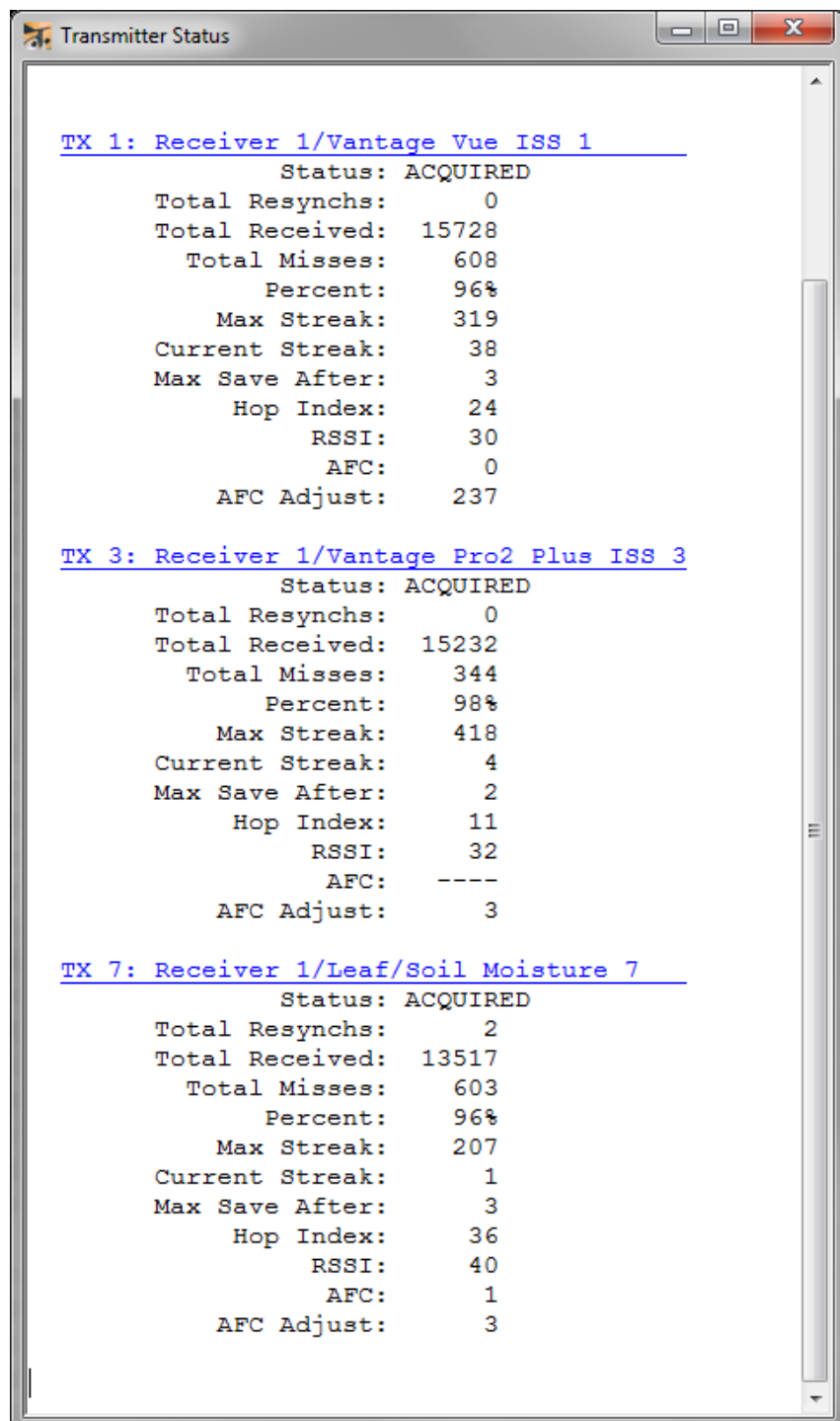
Click **Current Readings** in the **View** menu to see the last data received by your Envoy8X. The Data will be updated every 10 seconds automatically.



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Transmitter Status

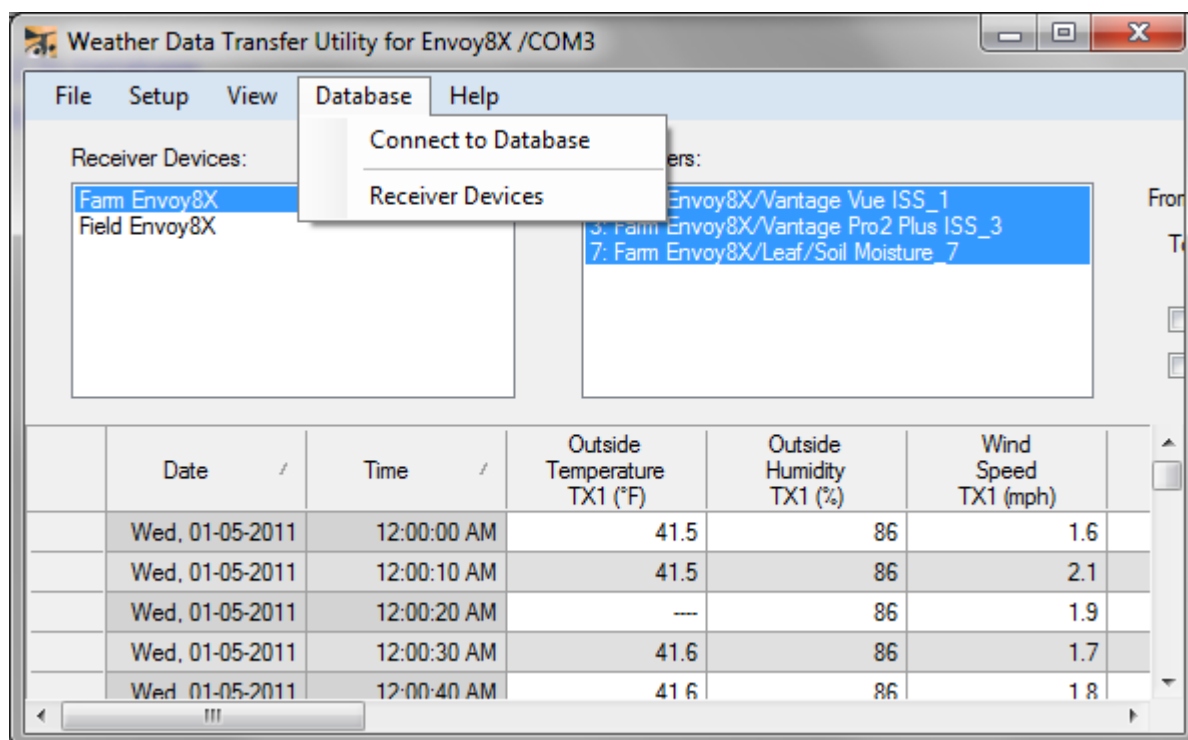
Click **Transmitter Status** in the **View** menu to see the diagnostic status of each transmitting station.



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Database

Use the **Database** Menu to manage databases.



[Connect to Database](#)

[Receiver Devices](#)

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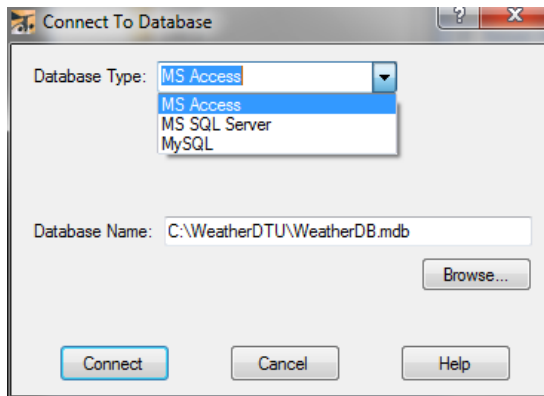
Connect to Database

Use the **Connect to Database** dialog box to set up your database. MS Access is the default Database Type.

For help in deciding which database to use, see [Choosing Your Database](#).

If you are using MS Access:

For an MS Access database, the full path and name of the database file is required to connect to the database. Click the **Browse** button to select the Access Database (.mdb file) you want to connect to. Click **Connect**.



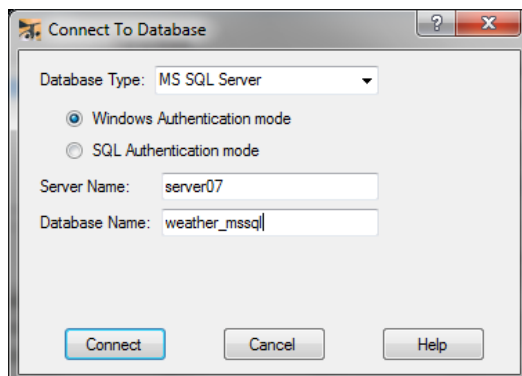
If you are using MS SQL Server:

Note: Contact your database administrator if any step below is not clear.

If MS SQL Server is selected, you will need to choose the Authentication mode for the database connection.

Choose either Windows Authentication mode or SQL Authentication mode.

- When **Windows Authentication mode** is selected, your Window login name and password will be used in database connection. You will only need to provide the Server Name and the Database Name.
 - **Server Name:** The name of the server on which the Weather Data Transfer Utility database is running.
 - **Database Name:** The name of the database running on the server. The database can be empty but it must be created before running the Weather Data Transfer Utility.

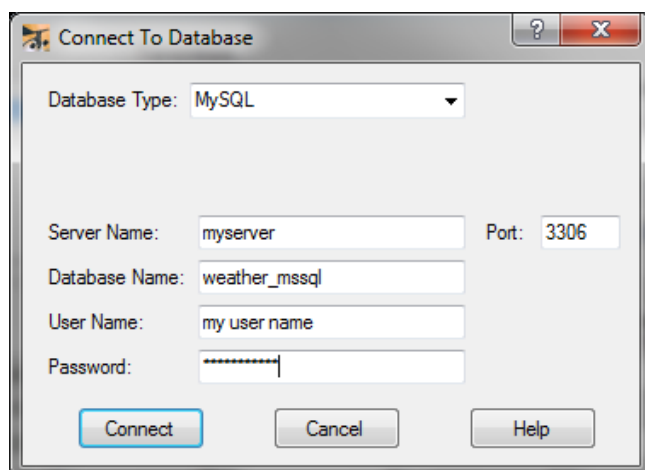


- When **SQL Authentication mode** is selected, in addition to the Server Name and Database Name, you must enter a **User Name** and **Password**. The User Name and Password should be provided by your DBA.

If you are using MySQL:

Note: Contact your database administrator if any step below is not clear.

If MySQL database is selected, enter the following information:



- **Server Name:** The name of the server on which the Weather Data Transfer Utility database is running.
- **Database Name:** The name of the database running on the server. The database can be empty but it must be created before running the Weather Data Transfer Utility.
- **User Name:** The User Name provided by your DBA.
- **Password:** The password provided by your DBA.
- **Port:** The default is 3306. This usually does not need to be changed.

Click **Connect** to connect to the database.

If the database is connected successfully a dialog box appears and the database connection information will be saved and used for the next connection. If the connection fails, you may reenter the connection information and try again.

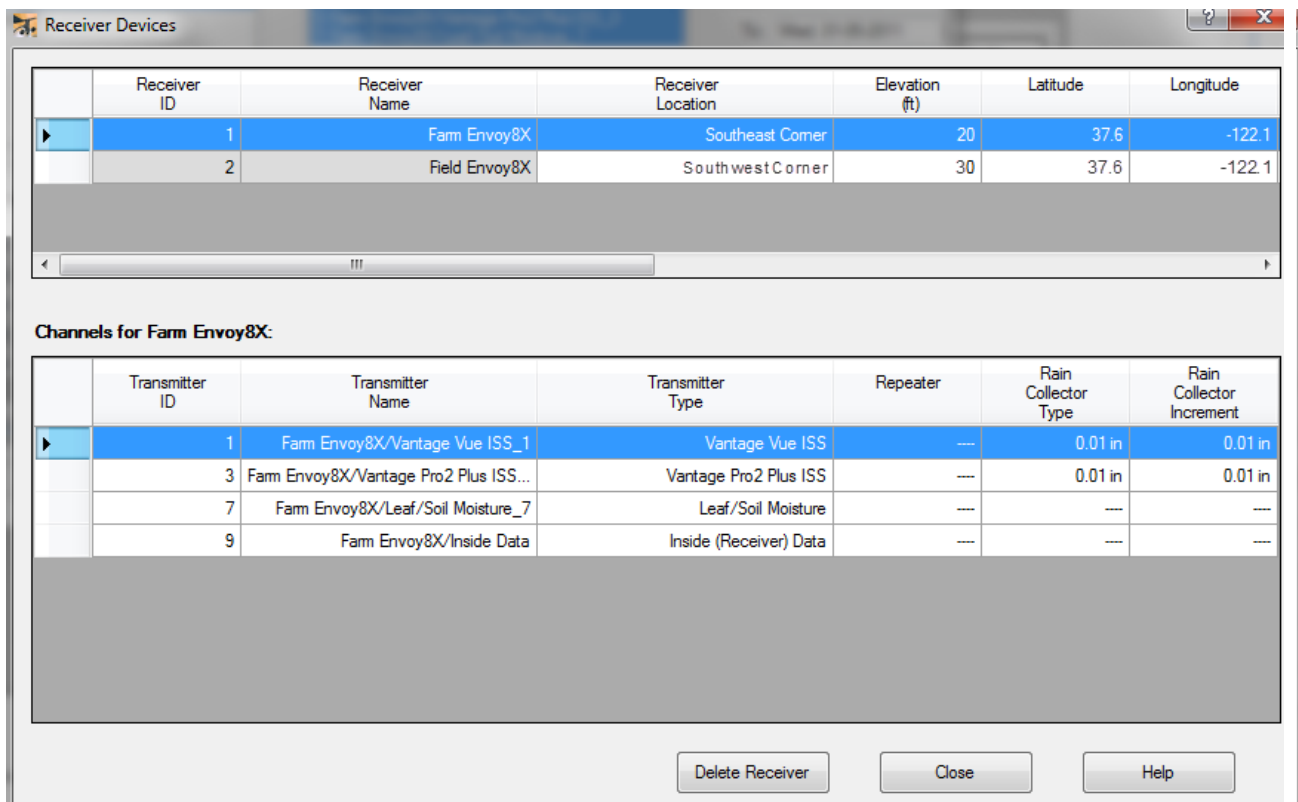
Note: The **Connect To Database** dialog can be accessed from the **Database** menu whenever you want to switch to other database. There is no need to close the software.

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Receiver Devices

The **Receiver Devices** command, in the **Database** menu, lets you see all the Envoy8X receivers configured in the database, listed by Receiver ID, with their configured location, elevation, latitude, and longitude. You can use this screen to see the Transmitters IDs and transmitter types of your configured receivers.

You can also use it to delete a receiver and all its data by selecting the receiver and clicking the **Delete Receiver** button.



The screenshot shows a window titled "Receiver Devices". It contains a table with the following data:

Receiver ID	Receiver Name	Receiver Location	Elevation (ft)	Latitude	Longitude
1	Farm Envoy8X	Southeast Corner	20	37.6	-122.1
2	Field Envoy8X	South west Corner	30	37.6	-122.1

Below the table is a section titled "Channels for Farm Envoy8X:" which contains another table:

Transmitter ID	Transmitter Name	Transmitter Type	Repeater	Rain Collector Type	Rain Collector Increment
1	Farm Envoy8X/Vantage Vue ISS_1	Vantage Vue ISS	---	0.01 in	0.01 in
3	Farm Envoy8X/Vantage Pro2 Plus ISS...	Vantage Pro2 Plus ISS	---	0.01 in	0.01 in
7	Farm Envoy8X/Leaf/Soil Moisture_7	Leaf/Soil Moisture	---	---	---
9	Farm Envoy8X/Inside Data	Inside (Receiver) Data	---	---	---

At the bottom of the window are three buttons: "Delete Receiver", "Close", and "Help".

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Technical Support and Contacting Davis

You may contact Davis Instruments for technical support or product information using any of the methods shown below.

Technical Support

Technical Support is available Monday through Friday, 7:00 am to 5:30 pm Pacific Time. Or use our web site, fax, fax-back, or email any time day or night.

510-732-7814 Phone Technical Support

510-670-0589 Fax Technical Support

support@davisnet.com Email Technical Support

[Internet Support](#) Includes manuals for all products, technical notes, spec sheets, installation diagrams, and more.

Other Ways to Contact Davis Instruments

800-678-3669 Sales (US & Canada)

510-732-9229 Sales (Outside the US & Canada)

510-670-0589 Fax

sales@davisnet.com Email to our Customer Service Department

info@davisnet.com Email for comments or general information on Davis Instruments

[Davis Web Site](#) Davis Instruments' home page on the World Wide Web

[E-News Sign Up](#) Sign Up for Weather Club E-Newsletter



Troubleshooting Guide

The following section answers some of the most commonly asked questions about the Envoy8X and Weather Data Transfer Utility.

Communications Problems

If you are having trouble establishing communication between the Envoy8X and the Weather Data Transfer Utility, start by checking the Envoy8X's own diagnostics. Follow these steps:

Note: The data logger uses non-volatile memory, so you won't lose any data you've already recorded.

1. Remove power, both AC and batteries.
2. Unplug the data logger.
3. Wait at least two minutes, then plug the data logger back in. Make sure it is plugged in firmly and completely.
4. On power up, you should hear two beeps, each of which occurs when the Envoy8X passes one of its diagnostic tests. Each beep follows the previous after about a second. The first beep tells you the processor is running. The second beep verifies the installation of the data logger. If you do not hear two beeps, contact Davis Instruments Technical Support.
5. If you hear both beeps, see "Troubleshooting Serial Point Communication" for instructions on checking your standard serial ports. If this identifies a serial port other than the one you selected in station setup, try connecting to the data logger again. See "Troubleshooting USB Communication" if you are troubleshooting a USB connection.

Note: Generally, if the loopback test identifies a serial port, your PC will be okay. Remove any extension cables that are in the system.

Troubleshooting Serial Port Communication

If the port settings or the loop back process identifies a serial port other than the one selected, try connecting to the data logger again.

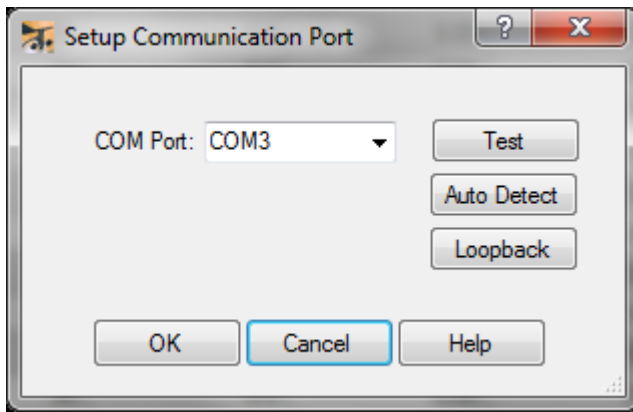
Check the serial port adapter if using a serial port connection. Use only the blue serial port adapter supplied with WeatherLink. Older models, or models not supplied in the WeatherLink connection kit, are not compatible.

Test the serial port using the provided loopback connector. Use the Loopback button (as opposed to the Test button) in the Communications Port dialog box to test and find the correct serial port connection. If a communications problem exists, it determines whether the serial port or the data logger is not communicating properly.

Use the loopback connector (the short cable with a phone jack on one end and a red plastic tip on the other) supplied with a serial port data logger.

5. If necessary, disconnect the cable from the blue serial adapter.
2. Insert the loopback connector into the adapter.
3. Select Communication Port from the Setup menu.

The Communication Port dialog box displays.



4. Click Loopback.

The software searches all standard ports and displays the COM port number where the loopback connector is located.

The correct COM port is automatically selected in the Communications Port dialog box. If the loopback connector is not found on any COM port, your serial port may not be working. If a connection still does not exist or if the loopback test identifies the same serial port you have selected, eliminate the following possibilities:

Note: Contact your PC vendor or technical support for more information on device difficulties.

Hardware device conflict—Check the Device Manager tab in the Windows System Properties dialog box to ensure that Windows recognizes the selected COM port. Consult your computer's documentation to see how to access the System Properties dialog box.

The communication port uses a nonstandard device name— Weather Data Transfer Utility for Envoy8X recognizes serial ports named COM1 through COM18 only.

Your serial port is defective.

The loopback connector is defective.

Note: See the WeatherLink Online Help if you are troubleshooting a Modem connection.

Troubleshooting USB Communication

Close the Weather Data Transfer Utility for Envoy8X software.

Disconnect the USB cable from the Envoy8X.

Plug the cable back into the Envoy8X.

Open the Weather Data Transfer Utility for Envoy8X software again.

Open the Communications Port dialog box.

Click Auto Detect. If the software finds the receiver, a success message will appear to verify communication between the station and the software.

If Auto Detect is unsuccessful, either the station is malfunctioning or the drivers for communicating with the data logger have not been installed successfully. To verify that the driver is installed, look in the Windows' System Properties for Device Manager -> Silicon Labs CP210X USB to UART Bridge. If the driver is listed and there is still no communication between the station and the computer, call Technical Support. If the drivers are not listed, contact Technical Support for instructions on installing the necessary drivers.

If you are using a third party application that requires the USB connection to emulate a com port connection, see WeatherLink Online Help for more information or Contact Technical Support.

Program Problems

- ? **Weather Data Transfer Utility for Envoy8X says "No new data to download" but I know there's data there. What can I do?**

The Envoy8X system is smart enough to send only data it hasn't already been sent to the computer. So, when you initiate a new download, the program will retrieve the first record after the last record shown in the software's browser window. Reboot and reseal the data logger.

1. Remove power, both AC and batteries.
2. Unplug the data logger.
3. Wait at least two minutes, then plug the data logger back in. Make sure it is plugged in firmly and completely.
4. On power-up, you should hear two beeps, each of which occurs when the Envoy8X passes one of its diagnostic tests. Each beep follows the previous one after a second. The first beep tells you the processor is running. The second beep verifies the installation of the data logger. If you do not hear two beeps, contact Davis Instruments Technical Support.

Older data may still be in the data logger, if you have not cleared its memory. To see how many of these older records are stored in the logger, create a new station (File>New Station) and download the data into this new database. Because there are no records stored in the database you just created, WeatherLink will download everything it has stored.

Next, try clearing the archive memory using the clear dialog box. You will lose any data not already downloaded in your archive memory, but all of your calibration numbers and alarm settings will remain intact. If this doesn't work, reboot your weather station (that is, remove and then restore all power to the station).

? ***When viewing data, dashes appear in place of a value for functions other than wind direction. Why?***

If no data was recorded by a sensor (for example, the sensor was disconnected or radio interference blocked reception), or if bad data was recorded for a sensor (for example, the sensor was malfunctioning), the software dashes out the entry rather than showing invalid data. You can use the record editor to correct these entries.

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Appendix A: Weather Data

Refer to this appendix to learn more about the weather variables measured and/or calculated by the Envoy8X, by the Vantage Pro2 Integrated Sensor Suite (ISS), and by the optional Vantage Pro2 sensors. Each section includes a brief discussion of the weather condition and a listing of the various ways in which the unit displays or stores that condition.

Note: Some of the weather conditions require an optional sensor in order to measure or calculate a value.

Wind

The anemometer measures wind speed and wind direction and is part of the Integrated Sensor Suite (ISS).

Temperature

The Envoy8X uses the ISS temperature sensor to measure the outside air temperature. A second temperature sensor in the Envoy8X measures the inside air temperature. The Envoy's inside temperature sensor can be replaced with an external temperature probe. You may use the probe to measure any other temperatures that are within the sensor's range, including the temperature of liquids such as water.

Apparent Temperatures

The Envoy8X calculates four apparent temperature readings: wind chill, heat index, the temperature/humidity/wind index (THW Index), and the temperature/humidity/solar radiation/wind index (THSW Index).

Wind chill

Wind chill takes into account how the speed of the wind affects our perception of the air temperature. Our bodies warm the surrounding air molecules by transferring heat from the skin. If there's no air movement, this insulating layer of warm air molecules stays next to the body and offers some protection from cooler air molecules. However, wind sweeps that warm air surrounding the body away. The faster the wind blows, the faster heat is carried away and the colder you feel. Wind has a warming effect at higher temperatures.

Note: Wind chill is not calculated above 92° F (33° C).

Wind chill is not stored in archive memory. Wind chill is calculated whenever it is displayed. Editing temperature or wind speed values changes the wind chill value.

Note: Envoy8X software uses the Osczevski (1995) equation to calculate wind chill. This is the adopted method used by the US National Weather Service.

Heat Index

The Heat Index uses the temperature and the relative humidity to determine how hot the air actually "feels." When humidity is low, the apparent temperature will be lower than the air temperature, since perspiration evaporates rapidly to cool the body. However, when humidity is high (i.e., the air is saturated with water vapor) the apparent temperature "feels" higher than the actual air temperature, because perspiration evaporates more slowly.

Note: Heat Index is equal to the air temperature at or below 0° F (-18° C) air temperature.

THW (Temperature - Humidity - Wind)

The THW Index uses humidity and temperature to calculate an apparent temperature like Heat Index, but includes the cooling and heating effects of wind on our perception of temperature.

THSW (Temperature - Humidity - Solar - Wind)

The THSW Index uses humidity and temperature like for the Heat Index, but also includes the heating effects of sunshine and the cooling effects of wind (like wind chill) to calculate an apparent temperature of what it “feels” like out in the sun. The THSW Index requires a solar radiation sensor.

Humidity

Humidity itself simply refers to the amount of water vapor in the air. However, the total amount of water vapor that the air can contain varies with air temperature and pressure. Relative humidity takes into account these factors and offers a humidity reading which reflects the amount of water vapor in the air as a percentage of the amount the air is capable of holding. Relative humidity, therefore, is not actually a measure of the amount of water vapor in the air, but a ratio of the air’s water vapor content to its capacity. When we use the term humidity in the manual and on the screen, we mean relative humidity.

It is important to realize that relative humidity changes with temperature, pressure, and water vapor content. A parcel of air with a capacity for 10 g of water vapor which contains 4 g of water vapor, the relative humidity would be 40%. Adding 2 g more water vapor (for a total of 6 g) would change the humidity to 60%. If that same parcel of air is then warmed so that it has a capacity for 20 g of water vapor, the relative humidity drops to 30% even though water vapor content does not change.

Relative humidity is an important factor in determining the amount of evaporation from plants and wet surfaces since warm air with low humidity has a large capacity to absorb extra water vapor.

Dew-Point

Dew point is the temperature to which air must be cooled for saturation (100% relative humidity) to occur, providing there is no change in water vapor content. The dew point is an important measurement used to predict the formation of dew, frost, and fog. If dew point and temperature are close together in the late afternoon when the air begins to turn colder, fog is likely during the night. Dew point is also a good indicator of the air’s actual water vapor content, unlike relative humidity, which takes the air’s temperature into account. High dew point indicates high water vapor content; low dew point indicates low water vapor content. In addition a high dew point indicates a better chance of rain, severe thunderstorms, and tornados.

You can also use dew point to predict the minimum overnight temperature. Provided no new fronts are expected overnight and the afternoon relative humidity is greater than or equal to 50%, the afternoon’s dew point gives you an idea of what minimum temperature to expect overnight, since the air can never get colder than the dew point. Dew Point is equal to the air temperature when the Humidity is 100%.

Rain

Vantage Pro2 incorporates a tipping-bucket rain collector in the ISS that measures 0.01" for each tip of the bucket. A metric adapter can be installed to measure 0.2 mm for each tip of the bucket. Your station logs rain data in the same units it is measured in and converts the logged totals into the selected display units (inches or millimeters) at the time it is displayed. Converting at display time reduces possible compounded

rounding errors over time.

Four separate variables track rain totals: "rain storm," "daily rain," "monthly rain," and "yearly rain." Rain rate calculations are based on the interval of time between each bucket tip, which is each 0.01" rainfall increment or 0.2 mm.

Barometric Pressure

The weight of the air that makes up our atmosphere exerts a pressure on the surface of the earth. This pressure is known as atmospheric pressure. Generally, the more air above an area, the higher the atmospheric pressure, this means that atmospheric pressure changes with altitude. For example, atmospheric pressure is greater at sea level than on a mountaintop. To compensate for this difference and facilitate comparison between locations with different altitudes, atmospheric pressure is generally adjusted to the equivalent sea level pressure. This adjusted pressure is known as barometric pressure. In reality, the Vantage Pro2 measures atmospheric pressure. When you enter your location's altitude in Setup Mode, the Vantage Pro2 stores the necessary offset value to consistently translate atmospheric pressure into barometric pressure.

Barometric pressure also changes with local weather conditions, making barometric pressure an extremely important and useful weather forecasting tool. High pressure zones are generally associated with fair weather while low pressure zones are generally associated with poor weather. For forecasting purposes, however, the absolute barometric pressure value is generally less important than the change in barometric pressure. In general, rising pressure indicates improving weather conditions while falling pressure indicates deteriorating weather conditions.

Solar Radiation

Note: Requires that the Envoy8X listens to station with optional solar radiation sensor attached (#6450, included on Vantage Pro2 Plus weather stations).

What we call "current solar radiation" is technically known as Global Solar Radiation, a measure of the intensity of the sun's radiation reaching a horizontal surface. This irradiance includes both the direct component from the sun and the reflected component from the rest of the sky. The solar radiation reading gives a measure of the amount of solar radiation hitting the solar radiation sensor at any given time, expressed in Watts/sq. m (W/m²).

UV (Ultra Violet) Radiation

Note: Requires optional UV sensor (#6490, included on Vantage Pro2 Plus weather stations).

Energy from the sun reaches the earth as visible, infrared, and ultraviolet (UV) rays. Exposure to UV rays can cause numerous health problems, such as sunburn, skin cancer, skin aging, cataracts, and can suppress the immune system. The Envoy8X can help analyze the changing levels of UV radiation and can advise of situations where exposure is particularly unacceptable.

Caution: Be aware that the UV sensor readings do not take into account UV reflected off snow, sand, or water, which can significantly increase the amount of UV to which you are exposed. Nor do the readings take into account the dangers of prolonged exposure to UV radiation. The readings do not suggest that any amount of exposure is safe or healthful. Do not use the UV readings to determine the amount of UV radiation to which you expose yourself. Scientific evidence suggests that UV exposure should be avoided and that even low UV doses can be harmful.

Envoy8X presents UV readings in two scales: MEDs and UV Index.

UV MEDs (Minimum Erythral Dose) is defined as the amount of sunlight exposure necessary to induce a barely perceptible redness of the skin within 24 hours after sun exposure. In other words, exposure to 1 MED will result in a reddening of the skin. Because different skin types burn at different rates, 1 MED for persons with very dark skin is different from 1 MED for persons with very light skin.

Both the U.S. Environmental Protection Agency (EPA) and Environment Canada have

developed skin type categories correlating characteristics of skin with rates of sunburn.

Table A-1: EPA Skin Phototypes

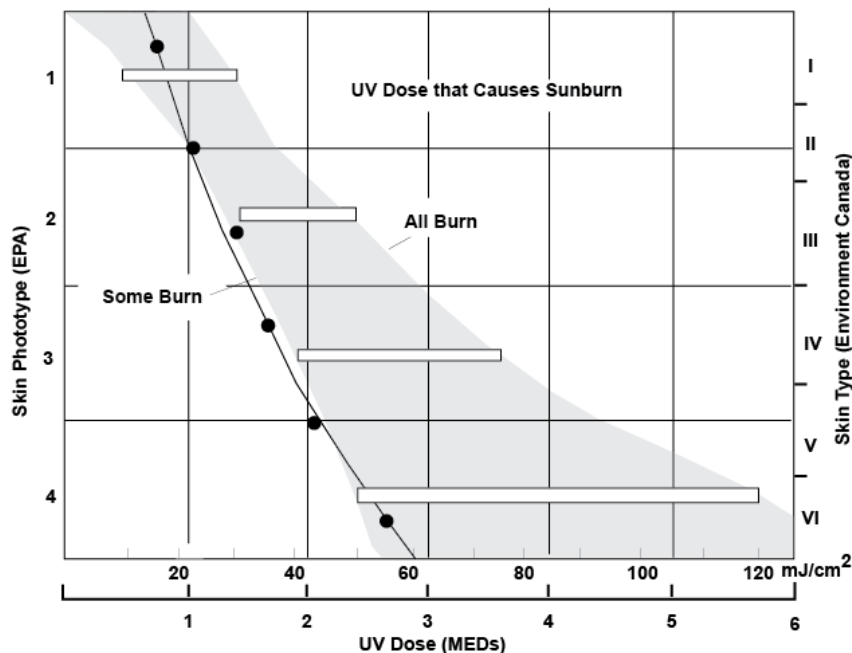
Skin Phototype	Skin color	Tanning & Sunburn history
1 - Never tans, always burns	Pale or milky white; alabaster	Develops red sunburn; painful swelling, skin peels
2 - Sometimes tans, usually burns	Very light brown; sometimes freckles	Usually burns, pinkish or red coloring appears; can gradually develop light brown tan
3 - Usually tans, sometimes burns	Light tan; brown, or olive; distinctly pigmented	Rarely burns; shows moderately rapid tanning response
4 - Always tans; rarely burns	Brown, dark brown, or black	Rarely burns; shows very rapid tanning response

Table A-2: Environment Canada Skin Types and Reaction to the Sun.

Skin Type	Skin Color	History of Tanning & Sunburning
I	White	Always burns easily, never tans
II	White	Always burns easily, tans minimally
III	Light Brown	Burns moderately, tans gradually
IV	Moderate Brown	Burns minimally, tans well
V	Dark Brown	Burns rarely, tans profusely
VI	Black	Never burns, deep pigmentation

Developed by T. B. Fitzpatrick of the Harvard Medical School. More about the Fitzpatrick Skin Types is available in: Fitzpatrick TB. Editorial: the validity and practicality of sun-reactive skin types I through VI. Arch Dermatol 1988; 124:869-871

UV Dose and Sunburn - Use this plot to estimate the MED dose leading to sunburn. A person with Type II (Environment Canada) skin type might choose 0.75 MED as the maximum for the day; in contrast, a person with Type V (Environment Canada) Skin Type might consider 2.5 MEDs a reasonable dose for the day. NOTE: the Envoy8X assumes a Fitzpatrick (Environment Canada) Skin Type of II.



UV Index

Envoy8X can also record UV Index, an intensity measurement first defined by Environment Canada and since been adopted by the World Meteorological Organization. UV Index assigns a number between 0 and 16 to the current UV intensity. The US EPA categorizes the Index values as shown below. The lower the number, the lower the danger of sunburn. The Index value published by the U.S. National Weather Service is a forecast of the next day's noontime UV intensity. The Index value displayed in WeatherLink is the result of a real-time measurement.

Table A-3: UV Index

Index Values	Exposure Category
0 - 2	Minimal
3 - 4	Low
5 - 6	Moderate
7 - 9	High
10+	Very High

EvapoTranspiration (ET)

Note: Requires optional solar radiation sensor (#6450, included on Vantage Pro2 or Vantage Pro2 Plus weather stations).

Note: If it is receiving data from more than one transmitter with a solar sensor, the Envoy8X uses the one with the lowest TX ID number for ET calculations.

EvapoTranspiration (ET) is a measurement of the amount of water vapor returned to

the air in a given area. It combines the amount of water vapor returned through evaporation (from wet vegetation surfaces and the stoma of leaves) with the amount of water vapor returned through transpiration (exhaling of moisture through plant skin) to arrive at a total. Effectively, ET is the opposite of rainfall, and it is expressed in the same units of measure (Inches, millimeters).

The Envoy8X uses air temperature, relative humidity, average wind speed, and solar radiation data to estimate ET which is calculated once per hour on the hour.

Leaf Wetness

Note: Leaf Wetness is available with the Envoy8X using the optional Leaf and Soil Moisture/Temperature station (#6345) with a Leaf Wetness sensor (#6420).

Leaf wetness provides an indication of whether the surface of foliage in the area of the sensor is wet or dry by indicating how wet the surface of the sensor is. The leaf wetness reading ranges from 0 (dry) to 15.

Soil Moisture

Note: Soil Moisture is available with the Envoy8X using the optional Leaf and Soil Moisture/Temperature station (#6345) with a Soil Moisture sensor (#6440).

Soil Moisture, as the name suggests, is a measure of the moisture content of the soil. Soil moisture is measured on a scale of 0 to 200 centibars, and can help choose times to water crops. The soil moisture sensor measures the vacuum created in the soil by the lack of moisture. A high soil moisture reading indicates dryer soil; a lower soil moisture reading means wetter soil.

Time

The Envoy8X has a clock and a calendar for tracking time and date. The calendar automatically adjusts for daylight saving time in most of North America and Europe and allows manual adjustment elsewhere) and for leap years providing you have entered the correct year, latitude and longitude, and daylight savings settings in the Setup Mode.

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Appendix B: Specifications

General	
Operating Temperature	+0° to +140°F (-18° to +60°C)
Storage Temperature	-22° to +158°F (-30° to +70°C)
Current Draw	0.90 mA average, 20 mA peak, (plus 0.125 mA for each optional wireless transmitter in use) at 4 to 6 VDC
AC Power Adapter	5 VDC, 200 mA, regulated
Batteries	3 AA-cells
Battery Life	up to 4 months, depending on number of TX IDs selected
Connectors	Modular RJ-11
Cable Type	4-conductor, 26 AWG
Housing Material	UV-resistant PVC plastic
Dimensions (includes antenna)	6.5" x 3.75" x 1.5" (165 mm x 95 mm x 38 mm)
Weight (with batteries)	0.58 lbs. (0.26 kg)
Communications	
Transmit/Receive Frequency	US Models: 902-928 MHz FHSS, Overseas Models: 868.0 - 868.6 MHz FHSS
ID Codes Available	8
Output Power	902-928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required 868.0 - 868.6 MHz FHSS: CE-certified, less than 8 mW, no license required
Range: Line of Sight	up to 1000 feet (300 m)
Range: Through Walls	200 to 400 feet (75 to 150 m)
Sensor Inputs	
RF Filtering	RC low-pass filter on each signal line
Sensor Outputs	
<i>Inside Temperature (sensor located in Envoy8X)</i>	
Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range	+32° to +140°F (0° to +60°C)
Sensor Accuracy	±1°F (±0.5°C) up to 110°F (43°C), ±2°F (±1°C) over 110°F (43°C)
Update Interval	1 minute
Current Data	Instant Reading (user adjustable); Daily and Monthly High and Low
Historical Data	Hourly Readings; Daily and Monthly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading
<i>Barometric Pressure (sensor located in Envoy8X)</i>	
Resolution and Units	0.01" Hg, 0.1 mm Hg, 0.1 hPa/mb (user-selectable)
Corrected Range	26.00" to 32.00" Hg, 660.0 to 810.0 mm Hg, 880.0 to 1080.0 hPa/mb
Uncorrected Range	18.00" to 33.50" Hg, 457.0 to 850.0 mm Hg,

	592.0 to 1130.0 hPa/mb
Elevation Range	-1500' to +15,300' (-460 m to 4670 m)
Uncorrected Reading Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equation	Altimeter
Equation Source	NOAA
Equation Accuracy	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
Elevation Accuracy Required	±10' (3m) to meet equation accuracy specification
Overall Accuracy	±0.04" Hg (±1.0 mm Hg, ±1.4 hPa/mb)
Trend (change in 3 hours)	Change ±0.6" (2 hPa/mb, 1.5 mm Hg) = Rapidly Change ±0.2" (.7hPa/mb, 0.5 mm Hg)= Slowly
Trend Indication	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval	1 minute
Current Data	Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
Historical Data	15-min. and Hourly Reading; Daily, Monthly Highs and Lows
Alarms	High Threshold from Current Trend for Storm Clearing (Rising Trend Low Threshold from Current Trend for Storm Warning (Falling Trend)
Rising and Falling Alarms	0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)
<i>Inside Relative Humidity (sensor located in Envoy8X)</i>	
Range	1 to 100% RH
Accuracy	±5%
Update Interval	1 minute
Current Data	Instant (user adjustable) and Hourly Reading; Daily, Monthly High and Low
Historical Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading
<i>External Temperature Probe (Optional)</i>	
Resolution and Units	1°F or 1°C (user-selectable)
Historical Graph Data and Alarms:	1°F or 1°C (user-selectable)
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) typical
Update Interval	62.5 to 75 seconds
<i>Clock</i>	
Resolution	1 minute
Units	Time: 12 or 24 hour format (user-selectable) Date: US or International format (selectable)
Accuracy	±8 seconds/month
Adjustments	Time: Automatic Daylight Savings Time (for users in North America and Europe that observe it in AUTO mode, MANUAL setting available for all other areas) Date: Automatic Leap Year