

With WeatherLink[®] for APRS

INTRODUCTION

The following document is intended to provide users specific instructions on connecting their weather station directly to their Ham Radio for the purpose of transmitting weather data over the APRS network. The necessary components and troubleshooting steps are covered. For information on using APRS software on the PC, please consult the software manufacturer's documentation. For transmitting weather data with the use of a PC *and* Ham Radio, consult the WeatherLink documentation.

REQUIRED COMPONENTS

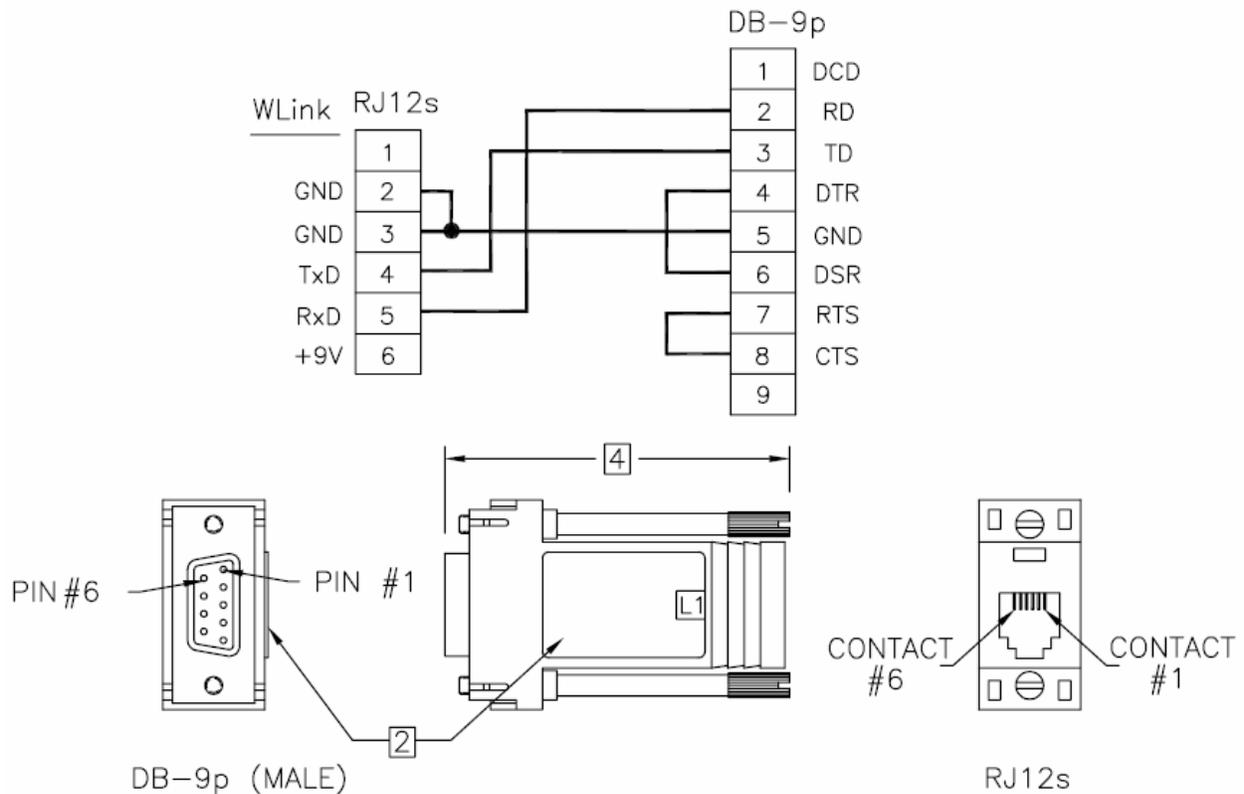
In addition to the requirements for WeatherLink, the streaming data capability of this product has the following additional hardware requirements.

- One Free Serial Port or One Free USB port with the Serial to USB adapter (Part # 8434) connected to a Windows PC (for configuration only).
- Ham Radio with attached or built-in TNC modem capable of accepting APRS data packets. (A second one is necessary to verify transmission).
- Computer running any version of Windows[™] with at least 3 MB free of RAM and 512 KB of free hard disk space (for configuration, testing and troubleshooting only).
- TNC modem adapter (with the correct pinout size).
- Computer modem cable to connect your TNC to your Ham Radio (if not built-in).
- A second set of modem cables (as appropriate) or an Internet Connection (if you want to verify transmission).

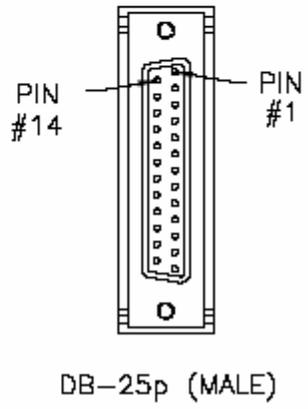
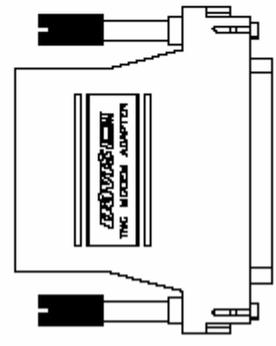
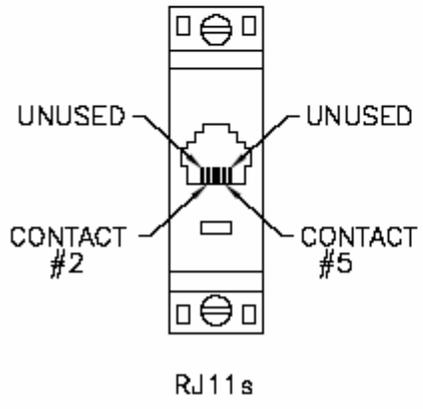
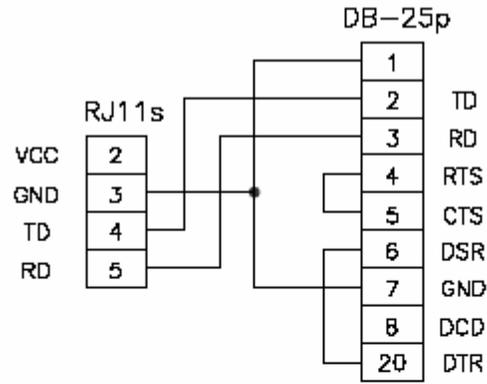
SETUP AND CONFIGURATION

First, configure your streaming data logger by connecting it to the PC using your PC adapter and Streaming Data Utility software. Please refer to the APRS Addendum for specific instructions on using the Streaming Data Utility. Using this software utility, you should use a 1-minute transmission rate for testing and the fastest baud rate your TNC modem can handle (not to exceed 19200). Similarly, the TNC modems should be set to this same baud rate.

Check the pinout connection of your TNC modem. Every TNC modem will have two connections: One connects to your Ham Radio; the other connects to the weather station (or computer, for testing purposes). Older TNCs have a 25-pin connection to the weather station/PC. Newer TNCs utilize a 9-pin connection. Both vintages commonly use a 9-pin connection to the Ham Radio. However, some Ham Radios come with the TNC built-in. Serial connector kits can be purchased at most electronics or computer supply stores. If you do not already have the correct adapter type, a TNC adapter can be created by using a kit and the following diagrams:



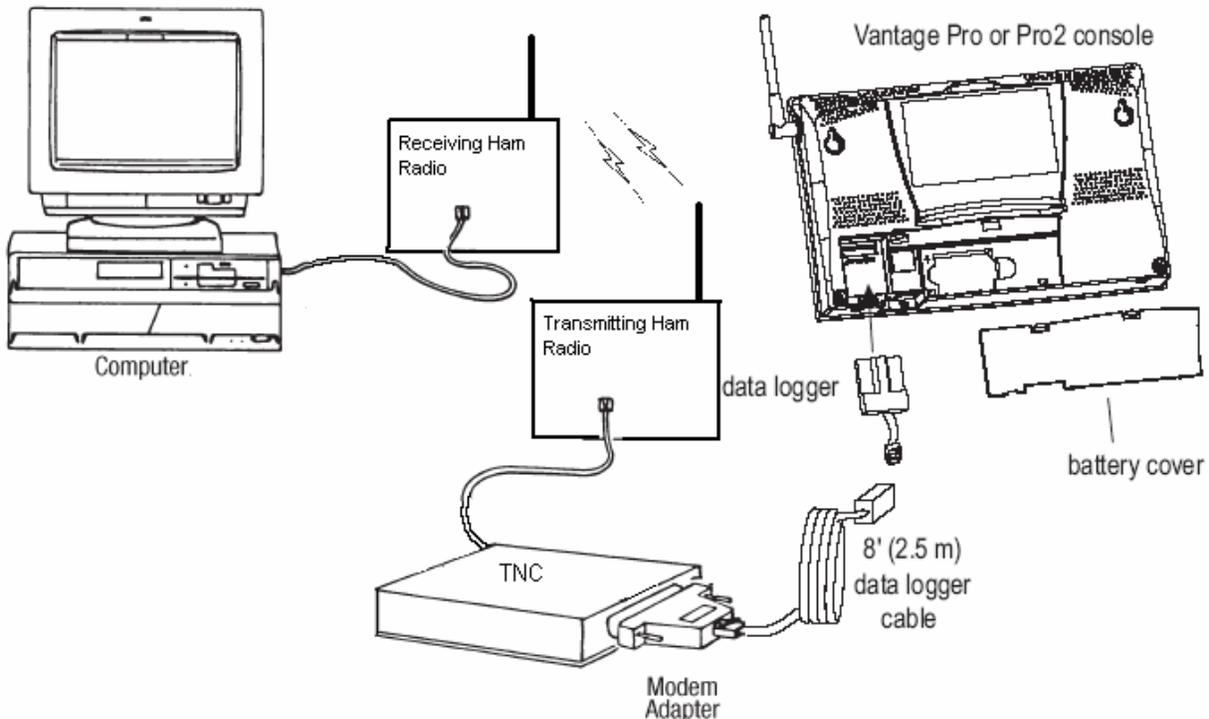
9-PIN TNC MODEM ADAPTER WIRING



25-PIN TNC MODEM ADAPTER WIRING

Next, connect your weather station to the Ham Radio using the data logger cable supplied and the TNC modem adapter. Then, connect the TNC (unless built-in to the Ham Radio) to the Ham Radio using a standard modem cable.

Now, you can verify that the APRS data packet is being correctly transmitted and received. To do this, you will either need to connect a second Ham Radio to your PC or you may go to an Internet site that captures APRS data (<http://www.findu.com/>) to determine whether you are transmitting. You will need at least one more modem cables for the second Ham Radio connection. If the second Ham Radio does not have a TNC built-in, you will need to connect a second TNC between the PC and Ham Radio (not shown).



Open HyperTerminal on the PC configuring it to the correct baud rate (same as the receiving TNC modem) and COM port. Then, configure your transmitting TNC for “TRANSPARENT” mode. In this mode, the TNC will automatically transmit APRS data packets when received by the weather station. With the second Ham Radio connected to the PC, open your HyperTerminal program configured to the correct COM port to verify that you are receiving APRS packets every minute or so. Alternatively, you may also use APRS software on a PC (<http://www.winaprs.org/>) instead of HyperTerminal. Once this is established, you can have confidence that your weather station data is being transmitted successfully over the air.

Note 1: APRS uses specific frequencies for transmission, which vary by location. Check to find out which frequency is the correct one for your area.

Note 2: When transmitting over the airwaves, avoid using the 1-minute transmission rate setting on the APRS datalogger for long periods of time, as it tends to clutter the APRS band.

Note 3: When in “BEACON” mode (see details in section below), the TNC transmits data on a user-defined interval itself. Some models may repeatedly transmit old data in this mode making it difficult to determine whether the weather station is successfully transmitting fresh APRS data.

TROUBLESHOOTING

If you do not have success, you can use the following troubleshooting hints to determine where the problem may lie:

- Connect the weather station directly to the PC to see if the datalogger is functioning correctly. Using HyperTerminal, you should be able to see the APRS data packets come across every minute or so. Make sure HyperTerminal is configured for the correct baud rate and the correct COM port. It may take a few minutes to see data packets come across depending upon your datalogger settings and whether you recently configured it using the software utility.
- If that checks, reconnect the weather station to the transmitting Ham Radio. TNCs and Ham Radios often have transmit and receive lights that will tell you if data is being correctly transmitted. If you fail to see the transmit light illuminate, check that your transmitting TNC is connected properly and, if you made it yourself, whether you wired it correctly. Also, it is possible that your transmitting TNC is bad.
- If these items all check out, then look to see if the receive light on the receiving Ham Radio or TNC illuminates. If not, your data transmission may not be making it to the receiving Ham Radio. Check your antenna connections on both Ham Radios.
- If you see both transmit and receive lights, but no data on the PC, verify that you can hear the modem “squawk” sound over your receiving Ham Radio when the data packet is received. Some Ham Radios require that you disconnect the PC to actually hear the sound. If you can hear the sound, but no data shows up in HyperTerminal, then the problem may lie in your receiving TNC modem.
- Also, if all else fails, make sure the modem cables are good.

SETTINGS FOR NORMAL OPERATION

You now have the opportunity to configure your transmission interval in a variety of ways. As stated before, the TNC has a passive “TRANSPARENT” mode where the TNC transmits what it receives immediately. The other option is to use “BEACON” mode. In this mode, the TNC transmits at a user defined interval. Additionally, you may control the transmission rate using the APRS datalogger settings.

In most cases, it is easier and less disruptive to your data reporting to use the “BEACON” mode setting to control how often you report data. In this case, for example, you may set the APRS datalogger for a more or less permanent transmission interval of 1 minute. Then, use the “BEACON” mode interval setting to determine the actual data transmission rate. Normally, this would be no faster than every 5 minutes. However, in the case of a severe weather event, you want to temporarily up this rate until the bad weather clears. This is particularly useful if you report data for emergency service agencies.

Otherwise, you may use either the APRS datalogger or the TNC to control your transmission rate provided that you abide by the “no more often than 5 minutes” rule.