



Mid-Range Wireless Modem System (Gen.3)

PRODUCT MANUAL

Item # 3393B, 3393W



Spectrum[®]
Technologies, Inc.

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This manual will familiarize you with the features and operation of your new Wireless Modem. Please read this manual thoroughly before using your instrument. For customer support, or to place an order, call Spectrum Technologies, Inc. at (800)248-8873 or (815) 436-4440 between 7:30 am and 5:30 p.m. CST, FAX at (815)436-4460, or E-Mail at info@specmeters.com.

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General Overview

The WatchDog Wireless Modem system will allow you to extend the range of your WatchDog Weather Station up to 2 miles with line-of-sight. The transceiver for the station is equipped with a solar panel that maintains battery power indefinitely under most climatic conditions. The wireless connection allows the user to download data, as well as remotely observe real-time weather conditions using the weather station monitor on a PC.

Components

The mid-range system (communicating up to 2 miles, line-of-sight) consists of the following:

A Base Station (catalog number 3393B), and one or more remote stations (catalog number 3393W) for full size and Mini Weather Stations.

This third-generation system is compatible with prior generations of the mid-range wireless, including the 3391B base and the 3391W and 3391M remote stations.

IMPORTANT

The 3393B Base Station requires SpecWare Pro version 9.04 Build 0249 or above. See "Setting Up Wireless Communications in SpecWare" for configuration details.

If the 3393W Remote Station is used with a 3391B Base Station, then the older base unit's requirement of SpecWare Pro version 7 or above for multipoint wireless communications is all that is necessary.

3393B Base Station Installation

Package Contents

- Transceiver with 50 ft. 4-wire cable
- 9-pin female RS-232 connector with attached DC power jack.
- A/C adapter. **WARNING:** this A/C adapter outputs lower voltage than previous units. Do not swap adapters between systems. This base unit will be damaged by the higher voltage, and older base units will not work reliably at the lower voltage.
- 2 U-bolts.



Installation

Connect the DC power jack at the end of the Base Station Transceiver cable to the A/C adapter. The 9-pin serial connector plugs directly into your computer's serial port (a USB to serial converter cable is required for PCs without serial ports). The Base Station Transceiver should be placed at as great a height as possible to facilitate line of sight with the weather station.

It may be necessary to experiment with placement of the two transceivers to attain the best line of sight. The signal can pass through a normal wood or concrete wall but metal will block the signal. Water causes severe signal degradation, and because plants are mostly water, heavy vegetation can also block the signal. Ideally, the base station transceiver should be attached outside the building for maximum performance.

Please assemble and test your wireless system (the base station plus the remote weather station) indoors first. Simple problems, such as inserting batteries backwards, are far easier to correct when they don't involve a journey or a climb to the roof.

3393W Remote Station Installation

Package Contents

- Solar panel / antenna mounting bracket (white)
- Solar panel, 2 Watt, 4.5 x 6.25 in (11.5 x 15.9 cm)
- 3393RA spread spectrum radio
- Antenna
- 4 AA NiCad batteries
- 6" communications cable
- Antenna cable
- Solar panel cable
- Rubber grommet
- 4 screw-washer-nut assemblies
- 2 6-32 x 3/8" screws



Tools required

- Phillips screwdriver
- Slotted tip screwdriver
- 5/16" wrench (or pliers)

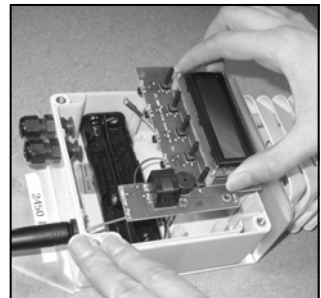
Installation

Note: the installation process involves several small parts, and should not be attempted in the field. If the weather station is already deployed, then it should be brought inside so radio installation can be done on a workbench, table, or desk.

In the following steps, **MS** indicates actions solely for the Mini Stations, **WS** solely for full size Weather Stations, and **OS** for first-generation (original) weather stations.

1. **MS**: Loosen the four screws in the front of the case (they are captive, and should not be completely removed), and remove the front cover of the mini station.
2. Remove the batteries from your station.
3. Disconnect all sensors from your station. Mark the cables so you can replug them into the correct ports.
4. Remove the right-most strain relief (**MS, OS**: black plastic cover) from your weather station. Insert the Antenna cable through the hole with the female end inside the enclosure.
5. Insert the solar panel cable through the same hole, so that

- the end with bare wires is inside the station enclosure.
- Open the grommet and place it around the cables. Slide it up to fill the open hole in the enclosure.
 - For weather stations with a rain collector, thread the antenna and solar cables through the $\frac{3}{4}$ " (2 cm) hole in the side of the weather station mounting bracket.
 - Attach the solar panel to the wireless mounting bracket using the four screw-washer-nut assemblies (use only the top two with the oversized solar panels). The screw terminals on the solar panel should be oriented toward the top of the bracket. The lock washers should be next to the nuts.
 - Remove the nut from the connector on the end of the antenna cable. Leaving the lock washer on the antenna connector, insert the connector up through the smaller of the two holes in the top of the wireless mounting bracket, securing it with the nut.
 - Feed the two connectors on the end of the solar cable up through the larger of the two holes in the top of the wireless mounting bracket. Use the screws on the solar panel terminals to attach the two connectors: red to the left terminal (marked "+") and black to the right terminal (marked "-").
 - WS, OS:** Using the screws on the weather station (if they are missing, two replacement 6-32x3/8" screws are provided in this kit), mount the wireless bracket assembly to the weather station. For weather stations with a rain collector, use the two horizontal holes to mount the bracket at the rear of the station, under the rain collector, and above the radiation shield. For weather stations without a rain collector, use the two vertical holes to mount the wireless bracket on the right side of the station's bracket. **MS:** Set the mini station and the wireless brackets back-to-back, then insert the U-bolt through both brackets. The two parts will be loosely connected until the mini station is attached to its mounting post in the field.
 - OS, optional WS:** Set the Spread Spectrum Radio into the bottom (open) portion of your weather station enclosure. Skip to Step 15.
 - WS:** Remove the four screws on the face of the module, and then remove the module from the case, setting it face-down on the work surface. **MS:** Remove the four screws on the face





of the circuit board. Use a thumb and finger to grasp the sides of the display panel, and carefully lift the combined boards straight up out of the case. Leaving the wires to the battery holder attached, set the board upside-down on the work surface.

14. **WS:** Push the circular black plastic cover out of the aluminum baseplate. Feed the solar panel wires and the antenna cable through the circular opening you just uncovered.
15. Insert the two bare wire ends of the solar panel cable into the two openings on the side of the Spread Spectrum Radio. The red wire goes in the hole marked “+”, and the black in “-”. Tighten the “Solar” screws on the face of the radio using a small slot or Phillips screwdriver. Check that the wires do not pull out.
16. Screw the antenna cable onto the brass connector on the Spread Spectrum Radio.
17. Plug one end of the 6” communications cable into the Radio’s AUX port. **WS:** Pass the communications cable through the circular opening in the module’s base plate, plugging the connector into the module’s “AUX” port.
18. **OS**, optional **WS:** Plug the other end of the communications cable into the station module’s “AUX” port. Skip to Step 21.
19. **MS:** Set the mini station circuit board loosely back in the case. Ensure that the loose end of the communications cable is accessible near the battery holder. As before, use a thumb and finger to grasp the sides of the display panel, and carefully lift the combined boards straight up slightly, and then straight down into the case. The six pins at the top of the board need to fit into the socket just below the top of the case. If you have inserted it correctly, the board will be cen-

tered left-to-right in the case, and the four screw holes in the board will be aligned with the mounting posts. **WS**: Insert the weather station module back into the case. **All**: Secure using the four screws removed in Step 13.

20. **MS**: Plug the loose end of the communications cable into the “AUX Port” on the board.
21. Reattach all the sensor cables disconnected in Step 3.
22. Screw the antenna onto the antenna cable connector on the top of the wireless mounting bracket.
23. Insert the four AA NiCad batteries into the station, and replace the battery cover.
24. For 2000 Series Weather and Mini Stations, use the SET button to set date and time (if necessary), and then use the arrow button to display “CONFIGURE RADIO”, and press SET twice to configure the wireless parameters. (**OS**: *First-generation weather stations must be launched to begin recording data.*)
25. When deploying the station, be sure to orient it so the solar panel receives the most sunlight.
26. See the “Setting up a Weather Station in SpecWare” for instructions on how to configure SpecWare and use your wireless modems.

LEDs on the Radio

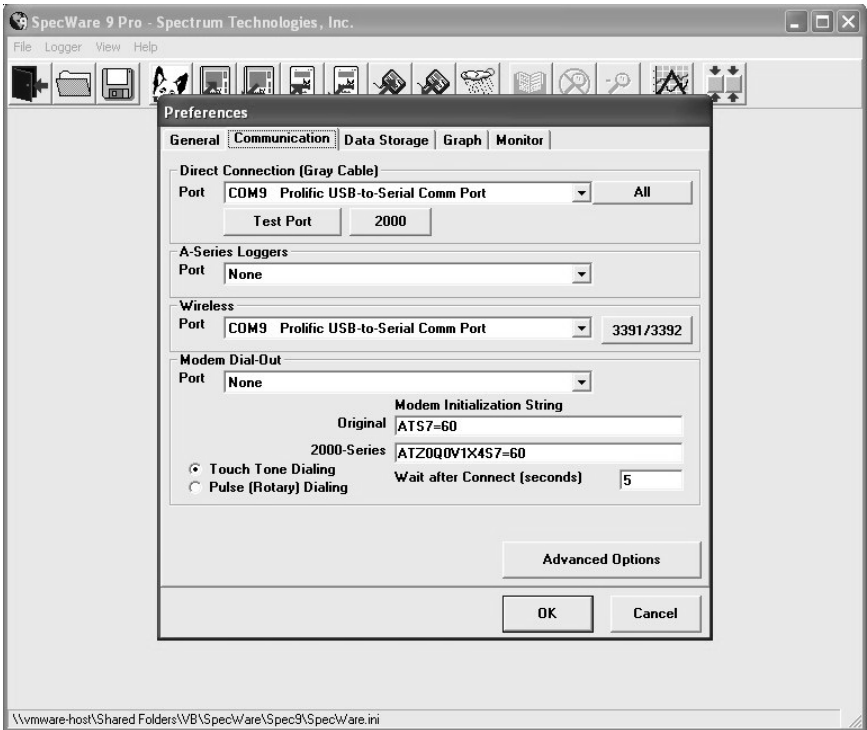
The Spread Spectrum Radio has two LEDs.

PWR/TX is lit whenever the radio is powered. The base is always powered; the remote is powered once every 8 seconds, and while communicating. This LED blinks to show that data is being transmitted. RX is lit whenever receiving data.



SETTING UP WIRELESS COMMUNICATIONS IN SPECWARE

For SpecWare (Pro version 9.04 Build 0249 or above) to communicate with the 3393B Wireless Base Station, wireless communications must be configured in Preferences. On the main SpecWare screen choose menu option File, and then Preferences. On the Preferences screen, click the Communication tab.



In the Wireless box, choose the port the base station is connected to. If the button to the right of the port selection reads “3391/3392”, click it to change it to read “3393”. Click “OK” at the bottom to save your changes.

SETTING UP A WEATHER STATION IN SPECWARE

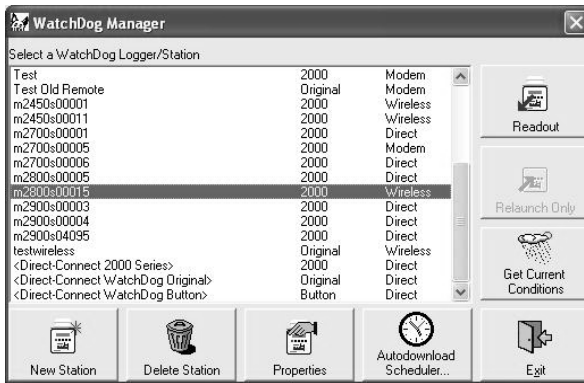


Figure 1. WatchDog Manager screen

For SpecWare (Pro version 7 or above) to communicate with the wireless modem, the station must be set up in the **WatchDog Manager** screen (Fig. 1). If the station has already been established, select the station and click the **Properties** button to bring up the **WatchDog Properties** screen (Fig. 2). To set up a new, remotely connected weather station, click the **New Station** button on the **WatchDog Manager** screen to bring up the **WatchDog Properties** screen (Fig. 2).

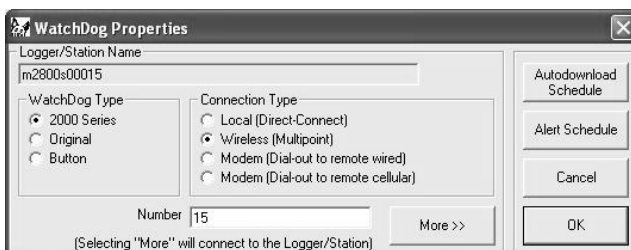


Figure 2. WatchDog Properties screen

1. If this is a new entry, enter a Logger/Station Name in the top text field. If the station has been previously used, the name entered in this field must exactly match the name entered into **Data Identification** field when the weather station was previously launched.

2. Select the **WatchDog Type** (**2000 Series** or **Original** (for first-generation stations))
3. For **Connection Type** select **Wireless (Multipoint)**.
4. Enter the Radio Address into the **Number** field. For 2000 Series stations, the radio number is the station's serial number. **Note: If you did not perform the "CONFIGURE RADIO" step at the end of the Installation instructions, go back and do it now.** For first-generation stations, the number will be printed on a sticker on the side of the transceiver or mounting bracket.

Once a weather station is set up in SpecWare, it can be launched, downloaded and queried for current conditions by a PC connected to the base station transceiver (refer to **Operation**).

OPERATION

Contacting the Weather Station

WatchDog Manager must be used to communicate with stations via the wireless modem. The communication options on the **WatchDog Manager** screen (Fig. 1) are:

1. **Readout** or **Readout and Relaunch** - Downloads the station (and immediately relaunches first-generation stations).
2. **Relaunch Only** - (First-generation stations only) Launches the weather station but does not download data. The station is launched with same configuration as when it was downloaded. To change the configuration, access the **Launch Options** screen, connect your computer to the display module with the gray PC interface cable. Refer to the **SpecWare Software User's Guide** for details on downloading WatchDog data loggers. Remember, the station must be initially launched directly from a PC.
3. **Get Current Conditions** - Activates **Weather Station Monitor** to view real-time weather conditions from your station.

SPECIFICATIONS

Frequency Range	902 - 928 MHz, unlicensed ISM Band
Transmit Power	100 mW (+20 dBm)
Receiver Sensitivity	-106dBm
Operating Range	Outdoor: 2 miles (3 km) line-of-sight Indoor: up to 1000 ft (300 m)
Operating Temperature	-40 °F to 185 °F (-40 °C to 85 °C)
FCC Part 12.247	MXQ-XBEEEXSC
A/C Adapter	Input: 100-240V 50-60Hz; Output: 5VDC

WARRANTY

This product is warranted to be free from defects in material or workmanship for one year from the date of purchase. During the warranty period Spectrum will, at its option, either repair or replace products that prove to be defective. This warranty does not cover damage due to improper installation or use, lightning, negligence, accident, or unauthorized modifications, or to incidental or consequential damages beyond the Spectrum product. Before returning a failed unit, you must obtain a Returned Materials Authorization (RMA) from Spectrum. Spectrum is not responsible for any package that is returned without a valid RMA number or for the loss of the package by any shipping company.

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