



**Bi-Directional  
GPRS / CDMA  
Modems & Solar Panels**

**PRODUCT MANUAL**

Item 3388BGU, 3388BGE, 3388BC, 3388SP5



***Spectrum***<sup>®</sup>  
***Technologies, Inc.***

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Thank you for purchasing the WatchDog Bi-Directional GPRS or CDMA modem with solar power. Please read this manual thoroughly before assembling and using your modem.

## COMPONENTS

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### WatchDog Modem

The modem is packed in a single box containing the waterproof enclosure. The modem, cables, and electronics come pre-assembled within the enclosure. The enclosure should have two sets of saddle mounting brackets attached to the back.

### Solar Power System

The Solar Power system consists of a 5W Solar Panel (11" x 7.5") with cable, a 5A-Hr sealed lead-acid battery, and the three mounting components pictured below.



1. Angle Bracket
2. Flange Nuts
3. Hex Bolts

# CONFIGURATION

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The WatchDog Modems are designed for use with the WatchDog 2000 Series Mini and Full Weather Stations. If you are adding the modem to an existing station, the station microcontroller may need to be upgraded to operate with the WatchDog modem.

You must configure your WatchDog 2000 Series Station to work with the WatchDog Modem. If you are using the WatchDog Modem outside the United States, or sending data to an Internet location other than SpecWeather.com, you will need to configure the Modem as well. Both processes are easier to do at a desk in an office, compared to balancing a laptop computer in a field. You must have SpecWare 9 Pro (or later) software installed on your computer in order to perform the configurations. If you have not installed SpecWare, do so before continuing. Be sure to set key parameters, such as the English/Metric option, and the communications port.

## Configuring the WatchDog 2000 Series Station

Connect your station to the PC using the 6' (2m) black direct-connect cable provided with SpecWare software. Note: when the direct connect cable is inserted, the AUX port is disabled. Start SpecWare Pro and start the WatchDog Manager (click the toolbar button, or the "WatchDog Manager" option in the Logger menu). Select "<Direct Connect 2000 Series>" and click "Properties". If requested, give your station a name (or approve the default). When the WatchDog Properties screen displays, set the configuration of your external sensors to match the ones you are using.

SpecWare allows you to specify both a logging interval and a data transmission interval. The "Data Collection Interval" specifies how often data is logged to the internal memory of the station. This may or may not match the frequency you will be transmitting current conditions to the Internet. Data saved on the station can be retrieved at the station by using a WatchDog Data Shuttle or downloaded using a PC with SpecWare.

The "Repeat- Transmit Interval" is used to specify how often your station will send current conditions via the WatchDog Modem. If this does not appear on your Properties screen, contact Spectrum Technologies to have the station firmware upgraded to support the modem.

The "Repeat-" "Format" allows you to specify the record format for the current conditions transmissions. The following formats will be listed for a full-size WatchDog Weather Station:

- Format "1 Text" sends 128 bytes of text information at a time. This format is currently required for use with SpecWeather.com.
- Formats "H Binary E" and "G Binary M" are shorter forms that compress the data into a 40 byte record. The format you see will be based on your English/Metric setting in SpecWare. In general, this is the format you should choose if you are building your own web site.
- Formats "J Short Bin E" and "I Short Bin M" are even shorter forms that compress the data into a 28 byte record by omitting the values for external sensor ports A-E. They are designed to fit in the smallest Iridium packet to minimize satellite costs as much as possible. **They should only be used with a satellite modem, and where there are no external sensors (except in Port F, which is used for the Solar Pyranometer on the 2900ET station).**

The WatchDog Mini Stations have two “Repeat-” “Format” options:

- Format “3 Text” sends 64 bytes of text information at a time. This format is currently required for use with SpecWeather.com.
- Formats “H Binary E” and “G Binary M” are shorter forms that compress the data into a 24 byte record. The format you see will be based on your English/Metric setting in SpecWare. In general, this is the format you should choose if you are building your own web site.

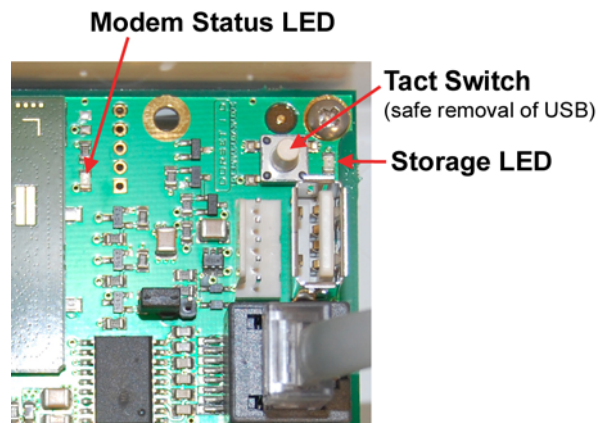
Once set, the “Repeat-Transmit” will send current conditions data out at the selected interval until you reconfigure the station to disable it. If the batteries are removed and replaced, the “Repeat-Transmit” will resume once the batteries are reinserted.

After all configuration options have been selected, click the “OK” button to send your configuration settings to the Station.

### Configuring the WatchDog Modem

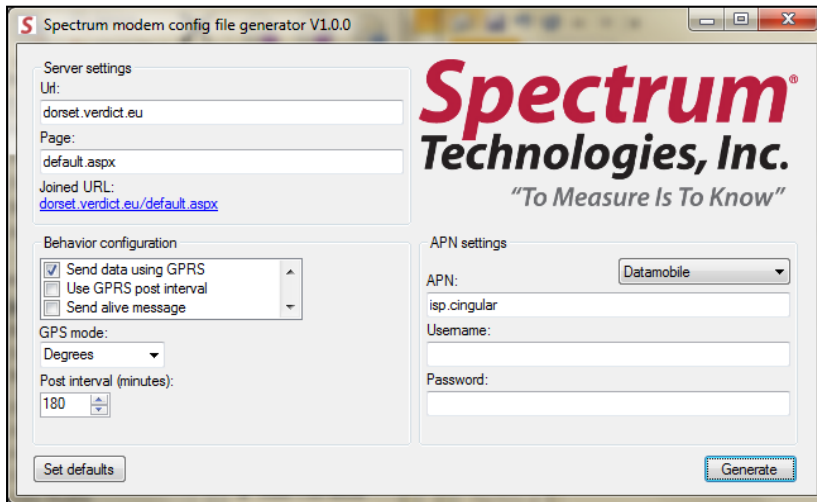
If you are using Verizon, Sprint, or AT&T in the United States, and you are using the SpecWeather.com web site, then you do not have to configure your WatchDog Modem. Otherwise follow these steps to configure your modem.

- You must provide your own USB stick to configure your modem. Without any power from the solar panel or battery, plug the USB stick into the telemetry board’s USB connector.
- Power-up the board with the 12v battery and wait at least 60 seconds until the storage and modem status LED light on the board has stopped flickering. During this time the telemetry board will create a configuration file to the USB stick. **IMPORTANT: THE BLACK WIRE MUST BE CONNECTED TO THE NEGATIVE TERMINAL ON THE BATTERY (MARKED “-” OR “NEG” AND/OR COLORED BLACK), AND THE RED WIRE MUST BE CONNECTED TO THE POSITIVE TERMINAL (MARKED “+” OR “POS” AND/OR COLORED RED).**



- Unplug the battery and remove the USB stick by first pressing on the Tact Switch. **CAUTION: Not using the Tact Switch can corrupt the firmware, data and/or configuration files.**
- Connect the USB stick to your PC. On the USB stick you should have two files the “LOG.TXT” and “CONFIG.EXE” file. Open the “CONFIG.EXE” file to start configuring the modem settings.

- Within the Spectrum Cellular Configuration screen you will have the following options:



**URL:** The “Uri” should only be changed if data will be sent to your own server, otherwise keep the default setting “gprs.meteodata.info.”

**Page:** The “Page” should only be changed if data will be sent to your own server, otherwise keep the default setting “default.aspx.”

**Behavior configuration:** By default the “Send data using the GPRS” will be checked, this will transmit data to the server using the GPRS modem on the unit as well as store data on the USB stick (if left connected to the USB port after configuration is completed.) Unchecking it will simply store data on the USB stick and will **NOT** transmit any data to the server.

**Transmit Interval:** Allows you to select how often the modem transmits stored data to the server by changing the “Transmit/alive message interval.”

*Example: if your weather station is set to a “Repeat Transmit” interval of 10 minutes and the “Transmit interval” is **unchecked** the data is immediately sent to the server. If the “Transmit interval” is **checked** the modem will store multiple measurements before transmitting them to the server.*

**Send alive message:** The default setting sends a message to the server with information about the telemetry units network, signal strength GPS coordinates (when enabled).

**Use GPS:** The telemetry unit has an optional GPS receiver (STD-3388GPS), must be purchased separately. When checked the telemetry board will use the installed GPS receiver to send its coordinates with the “Alive message,” or during the start-up (GPS idle feature).

**GPS idle after receiving first coordinate:** When checked the telemetry board will only send the GPS coordinates the first time the weather station is powered-up.

**Set defaults:** Re-sets the values back to their default settings.

**APN, Username and Password:** Fill in the appropriate settings required by your cellular carrier.

**Generate:** Clicking the “Generate” button, will create a “CONFIG.CFG” file with all your new settings. Remove the USB stick from your PC and re-attach it to the USB connector on the board. Power-up the board again and wait at least 60 seconds until the storage and modem LEDs are no longer flickering.

# ASSEMBLY

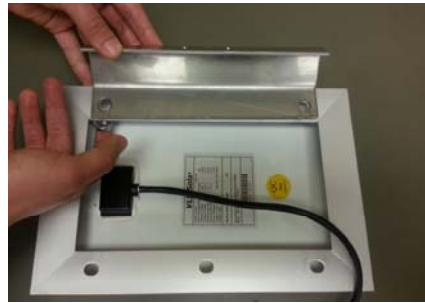
Note: If the station is going to be permanently located at the measurement site, it is recommended that the mounting pole be installed in the ground before attaching any components.

## Attaching the Solar Panel

1. Align the Angle Bracket with the two solar panel openings on the back.



2. Place the bottom of the flange nut under the solar panel and align it .



3. Attach and tighten both bolts to the solar panel and flange nuts.



4. Remove the top saddle mounting brackets from both ends of the enclosures



5. Attach Modem Enclosure to post and tighten bottom saddle mounting bracket.



6. Tighten the spacers and nuts on mounting saddles.

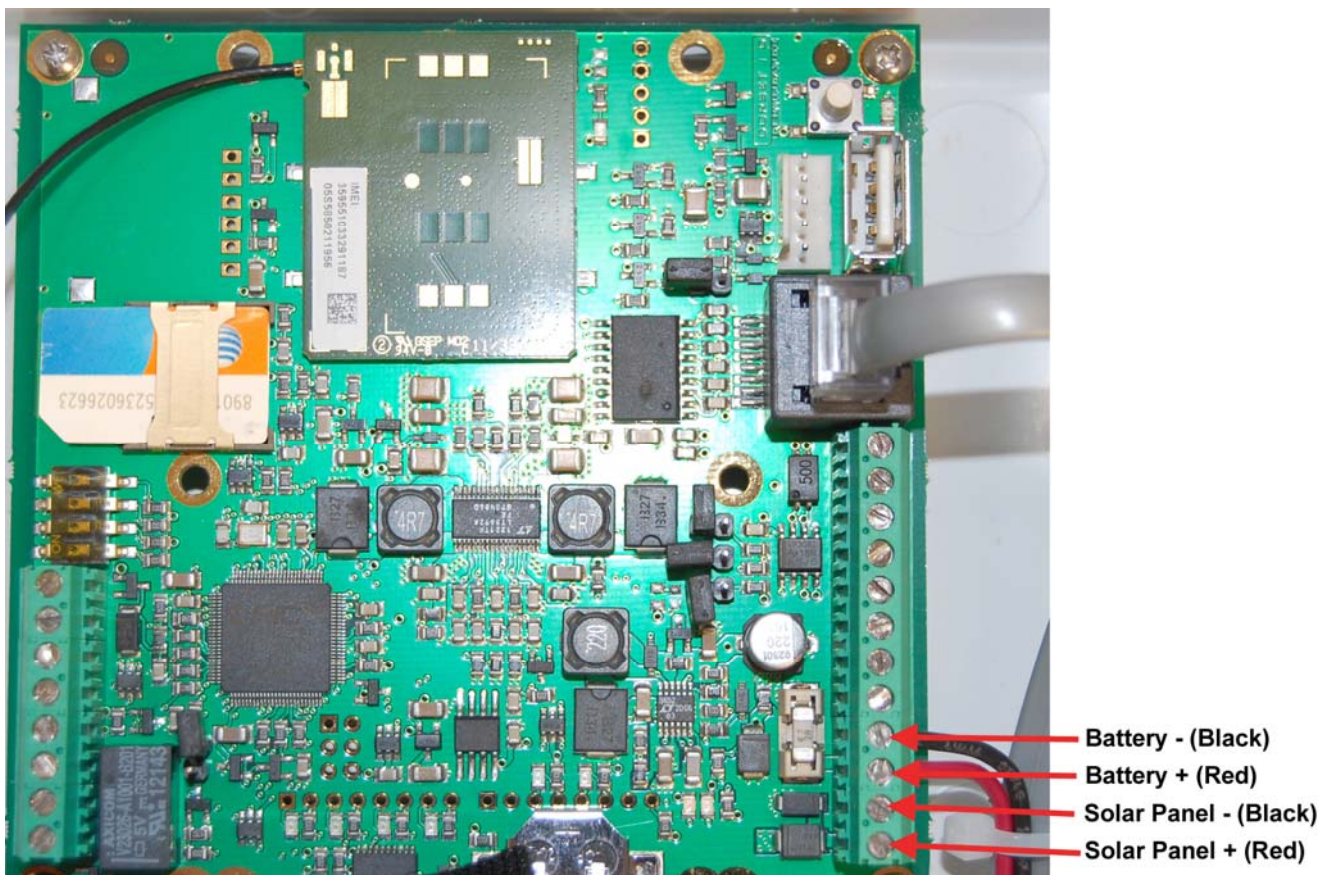


## Connecting the GPRS modem to the battery and solar panel

Before connecting the solar panel to the modem, temporarily cover the panel with cardboard to prevent any current from being generated during the installation.

1. Feed the black cable from the solar panel through the strain relief on the bottom of the Modem Enclosure.
2. Attach the black and red solar panel wires to the green circuit board as diagrammed below. The black wire attaches to the second slot from the bottom. The red wire attaches to the first slot from the bottom. The slot is opened by loosening up the screw with a small screwdriver. Before tightening on the screws insert the tinned leads into the holes. Next, tighten the screws completely. Repeat for the second wire. Give the wires a slight tug to ensure they are attached securely.

Note: Attaching the solar panel wires can be a little challenging. If you are having difficulty, try using a needle-nose plier to help push the wires into the slots.



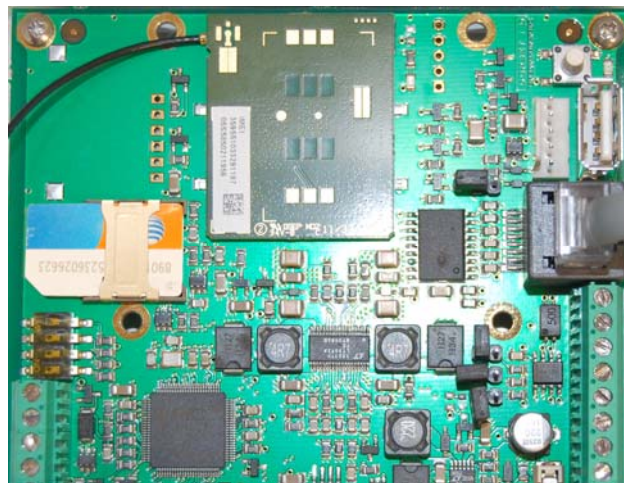
- 3. Connect the red and black leads that are attached to the Battery+ and Battery- terminals to the red and black terminals on the lead-acid battery (marked “-” or “NEG” and/or colored black), and the red wire must be connected to the positive (marked “+” or “POS” and/or colored red). (Caution: Reversing the wires can damage the modem). Slide the battery to the back of the enclosure as shown in photo below. This allows the door to close properly



4. Your cellular carrier may require the modem’s IMEI/MEID number. This number should be written on the box in which the modem was shipped. If not, it will be listed on the modems white sticker.

5. If you have a GPRS modem and subscribe to a Spectrum Technologies data plan (US market only), the SIM card may already be installed. Insert your SIM card according to the image below with the metallic circle towards the bottom of the holder. Note: Placing the SIM card incorrectly will not allow for data to transmit properly.

**SIM  
Card  
Holder**





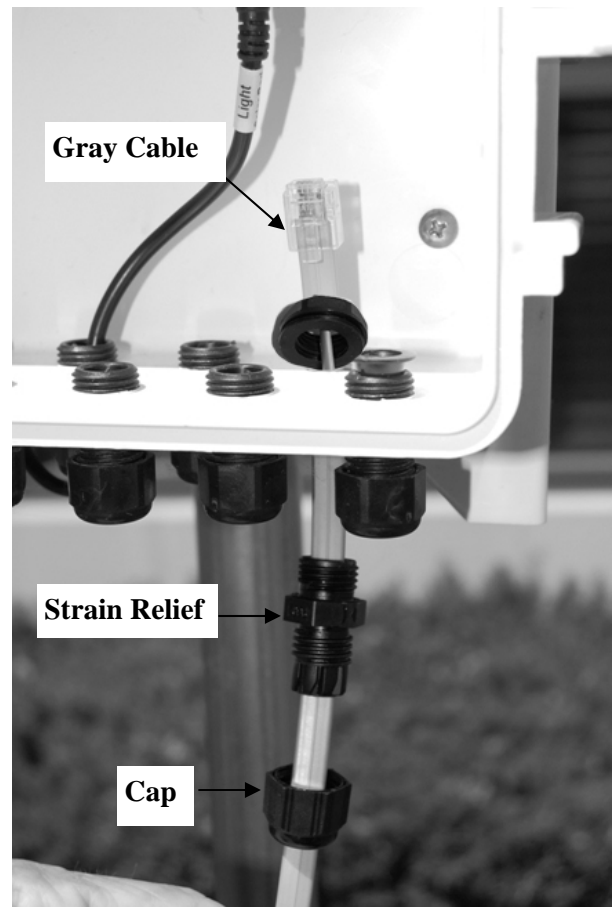
## Deploying the weather station

Attach the WatchDog Weather Station to the pole (See the instructions in the WatchDog Weather Station manual provided with your station). Remove the far-right gland (cap and strain relief) from the bottom of the station. Remove the top nut and washer from the RJ12 (telephone), now feed the end of the gray cable with the RJ12 connector (it is hanging from the modem box) through the opening in the bottom of the station and re-attach the spacer and nut. This cable has its own gland. Loosen the cap so it can rotate freely around the wire, and screw the strain relief into the bottom of the station. Plug the RJ12 connector into the weather station's AUX jack, and tighten the cap onto the strain relief.



**AUX Port**

**Gland re-attached to station**



**Gray Cable**

**Strain Relief**

**Cap**

You may need to rotate the modem enclosure so it points toward your nearest cell tower. The antenna may have difficulty connecting to the tower if the signal must pass through the battery, modem, and circuit board.

The antenna can be carefully removed from the inside of the door and mounted at the top of a pole to improve the connection to the cell tower. Do not attach the antenna directly to a metal pole. Instead, attach a length of PVC pipe to the top of the metal pole, and attach the antenna to the PVC.



# 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.



The modem within this enclosure was manufactured by  
Telit Communications S.p.A  
Via Stazione di Prosecco, 5/B  
I - 34010 Sgonico (Trieste), Italy

Model Number: GC864-QUAD V2  
Description: Wireless Modem

The Manufacturer lists the following certifications:

EMC: CE Mark, R&TTE  
Network: FCC Part 15 and 24, GCF and IC  
PTCRB

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