

WATCHDOG™ DATA LOGGERS

OPERATION MANUAL

MODEL #'S
200, 225, 250, 400, 425, 450



Spectrum
Technologies, Inc.

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This manual will familiarize you with the features and operation of your new WatchDog Data Logger. 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.
www.specmeters.com

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GENERAL OVERVIEW

Thank you for purchasing a WatchDog Data Logger.

This manual describes how to use your WatchDog Logger and how to keep it working accurately for many years. Read this manual thoroughly in order to make effective use of your data logger.

The WatchDog Data Logger series will allow you to record and visually monitor environmental conditions at remote sites. The WatchDog's exclusive liquid crystal display (LCD) eliminates the need to download the data logger to observe current conditions.

These loggers give you the flexibility to change external sensors as your needs vary. Simply plug the sensor into the logger port and configure the logger to the corresponding sensor through the software.

Download the accumulated data at your convenience using the powerful SpecWare software. SpecWare will present the data in graphical and tabular form. Use the software to calculate growing degree days and chill hours, and/or view daily, monthly, and yearly reports. Optional disease models aid the user with Integrated Pest Management decisions.

WatchDog Model 400

SpecWare version 6.02 Build0001 or later is required to communicate with the WatchDog Model 400 data logger.

It is not possible to use the regular WatchDog radiation shield (item #3663) with the Watchdog Model 400 because this shield cannot accommodate 4 sensor wires. Instead, you can use item #3658 to enclose the data logger.

SPECIFICATIONS

Model	Internal Sensors	Measurement Range	Accuracy	Measurement Capacity	External Channels
200	None	N/A	N/A	7,000 measurements ----- (3,500 per channel)	2
225	Temp	-4° to 158°F -20° to 70°C	±1°F ±0.6°C	7,000 measurements ----- (3,500 per channel)	1
250	Temp/RH	-4° to 158°F -20° to 70°C ----- 20-100% RH @ 5° to 50°C	±1°F ±0.6°C ----- ±3%RH	7,000 measurement ----- (3,500 per channel)	None
400	None	N/A	N/A	15,000 measurements ----- (3,750 per channel)	4
425	Temp	-4° to 158°F -20° to 70°C	±1°F ±0.6°C	15,000 measurements ----- (3,750 per channel)	3
450	Temp/RH	-4° to 158°F -20° to 70°C ----- 20-100% RH @ 5° to 50°C	±1°F ±0.6°C ----- ±3%RH	15,000 measurements ----- (3,750 per channel)	2

EXTERNAL SENSORS

WatchDog model 200, 225, 400, 425, and 450 loggers have external channels (ports) for external sensor input. The following table lists the available optional sensors. Most sensors include a 6-foot cable with pin-type connector. Items 3667-20 and 6450WD20 have 20 foot cables.

Item #	Description	Measurement Range	Accuracy
3665R	Tipping Bucket Rain collector	N/A	±2%
3666	Leaf Wetness Sensor	0(Dry) - 15(Wet)	N/A
3667 3667-20	External (Soil) Temperature Sensor	-30° to 100°C -22° to 212° F	±0.6°C ±1°F
3670	Silicon Pyranometer	1-1250 W/m ²	±5%
3668	Quantum Light Sensor	0-2500 umol m ⁻² s ⁻¹	±5%
3669 3669LT	Soil Moisture Transducer	0-100 kPa	±2%
6450WD 6450WD20	Watermark Soil Moisture Sensor	0 - 200 cbars	N/A
6451	Irrigation Sensor	Switches at 5 psi	±1 psi
3673 3674	Input Cable for user-supplied sensor	0-2.5V 4-20mA	N/A

To connect the external sensor to the logger, plug the data cable into the logger port that has been programmed for that particular sensor. If the sensor is not connected, a “- -” will appear on the LCD display for the respective logger port until the sensor is connected.

Port A is the only channel that will record rainfall data

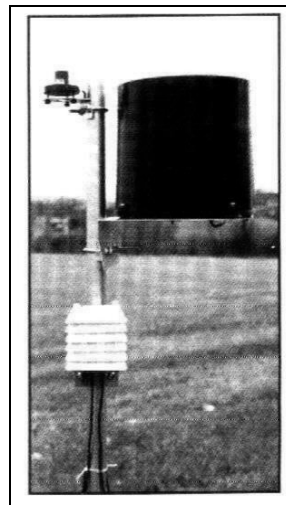
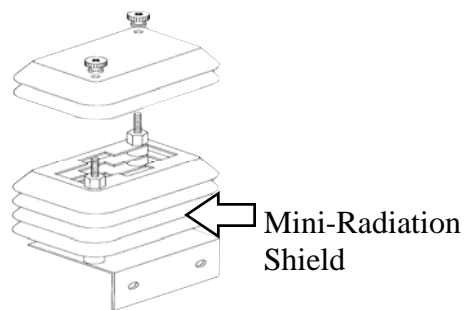
Program each channel (port) to a specific sensor through the SpecWare launch screen. Refer to the **SpecWare Software User's Guide** for more detailed instructions on launching and sensor configuration.

INSTALLATION AND PLACEMENT

WatchDog loggers, or mini-weather stations, have the versatility to be located in any micro-climate for recording weather data. The optional sensors and mini-radiation shield include hardware for attaching them to a 1" to 1¼" outside diameter mast (pipe). Use a 5' - 10' length of conduit or pipe as the mast mount. When purchasing and/or cutting the mast to size, plan on placing 1½' - 2' of the mast into the ground. Refer to the illustration as an example of how to install your "mini-weather station."

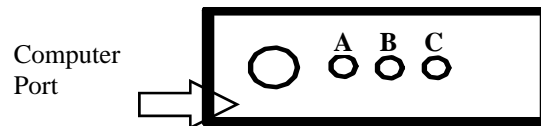
For outdoor and greenhouse use, the WatchDog logger must be placed in a mini-radiation shield to protect it from solar radiation and other sources of reflected heat. The radiation shield also protects the logger from rain. Place the WatchDog inside the radiation shield by unscrewing the two finger-nuts and removing the top of the radiation shield.

Important: Secure the external sensor wires to the mast just below the radiation shield with a plastic tie. This will insure that the sensor wires do not become disconnected while recording.



CONNECTING TO THE COMPUTER

To launch and/or download data from the logger, connect the logger to a computer via the data transmission cable. This cable is included with the SpecWare software package. The data cable connects to an available serial port on your personal computer and the port labeled “computer” on the logger.



The only time you must have the WatchDog connected to the computer is during the launching and downloading of the data logger. After the logger has been launched, and/or downloaded, disconnect the logger and place it in the environment you wish to monitor.

If the computer will not connect with the logger, you may need to change the battery or change the com port settings. Refer to the **Battery Replacement** section on page 12 for battery instructions. Refer to the **SpecWare Software User's Guide** for complete instructions on launching and downloading the WatchDog loggers.

SPECWARE SOFTWARE

To use the WatchDog Data Logger, SpecWare software is required. SpecWare software is an integral part of the WatchDog logger.

- Use SpecWare software to initially program or configure the logger for the specific external sensors being used.
- Use SpecWare software to launch the logger to record specified parameters at chosen measurement intervals. Interval choices offered are 1, 5, 10, 15, 30, 60, and 120 minutes.
- Use SpecWare software to read-out the logged data.
- Once the data has been downloaded to the computer, SpecWare software offers a wide variety of Report options and Disease Model options. Refer to the **SpecWare Software User's Guide** for more detailed instructions.

Launch Options

Spectrum Technologies, Inc. - WatchDog S/N 5142 09/30/2002 03:57 PM Model 450 v 2

Data Identification:

Measurement Interval: Maximum Duration: 316 Days

Channel	Port	Enabled	Sensor / Units	Reading
1	A	<input type="checkbox"/>	Temperature [F]	<input type="text"/>
2	B	<input type="checkbox"/>	Temperature [F]	<input type="text"/>
3	RH (<input checked="" type="checkbox"/>	RH (%)	<input type="text"/>
4	Temp	<input checked="" type="checkbox"/>	Temperature [F]	<input type="text"/>

Update

Alarm: No Alarm (Value)

Wrap around when full (overwrite oldest data)

Delayed Start

Start Cancel

OPERATION OF DIGITAL DISPLAY

The digital LCD display is an exclusive feature of the WatchDog 200 and 400 series dataloggers. A visual display of the on-site readings correlates to the sensor configuration of the logger.

- The LCD display is **only** active after the logger is launched from the PC and is logging data. View the LCD to confirm that the logger is working and to observe current weather conditions.
- The parameters are updated for every complete cycle of sequencing through all internal and/or external sensors. A complete cycle takes approximately 8 seconds for a model 200 series logger and 16 seconds for a model 400 series logger. (ex. a model 225 with 2 channels would take 8 seconds to cycle, or show the status of both channels). A “_” appears above the port for which a reading will follow. If three dashes appear on the display, the external sensor is not connected properly.
- When logger’s memory becomes full, the logger will display FULL. A FULL logger needs to be downloaded and re-launched.
- If the WatchDog display is blank, the logger is not recording. This could mean that the logger needs a new battery or that it was not launched properly.

BATTERY REPLACEMENT

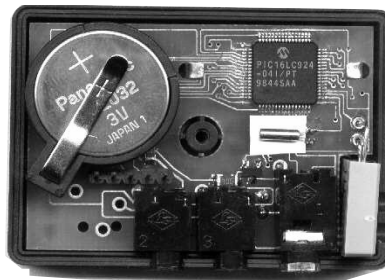
Each WatchDog Data Logger is powered by a 3 Volt CR2032 battery. The battery has a life of 8 months continuous use, and a 2-year shelf life. It is user replaceable and can be purchased locally. Other battery numbers that may be substituted for a CR2032 are BR2032 or DL2032.

To replace the battery:

1. Remove the screw on the back cover of the WatchDog.
2. Remove the back cover.
3. Slide the battery out of the battery holder.
4. Insert a new CR2032 battery positive side up.
5. Replace WatchDog cover.
6. Tighten back cover screw.

Confirm that the logger is actively working by initially viewing the fully lit LCD directly after battery installation, or by going through a readout/launch sequence with the SpecWare software.

Insert a flat-edged screwdriver completely underneath old battery. Gently lift edge of battery over the casing lip, slide battery out. Slide new battery into battery casing.



TROUBLE SHOOTING

Commonly asked questions include:

- Q. Why will logger not connect with computer?
A. Data logger needs a new battery, or the com-port settings need to be changed through SpecWare software. Refer to SpecWare User's Guide for details.
- Q. Why will logger not record rainfall?
A. Make sure rainfall sensor is plugged into port A, and that Port A is configured for rainfall through the launch screen.
- Q. Why is logger displaying "- - -"?
A. The logger will display dashes for the external sensors if i.) the rainfall sensor is connected to the wrong port ii.) another external sensor is connected to the port meant to record rainfall or iii.) the sensor is not securely plugged into a channel port.
- Q. Why is logger displaying and/or logging bogus, or out-of-range, readings?
A. External sensors are not plugged into correct ports.

SERVICE AND SUPPORT

The WatchDog data loggers are easy to use and reliable. Should you have a problem, or have questions:

Who do I contact?

Contact the company you purchased the data logger from: Spectrum Technologies, Inc. or an authorized Spectrum Dealer.

When Contacting Spectrum Technologies:

Please indicate that you need Technical Support.

Be prepared to:



1. Provide details on the hardware and software configuration of your components including: manufacturer, model number, peripherals and versions of the operating system.
2. Completely describe the problem. The more information you provide, the faster and more accurately we will be able to respond.

WARRANTY

The Datalogging Rain Gauge is warranted to be free from defects in materials and workmanship for a period of 1 year from the date of original purchase. During the warranty period, Spectrum will, at its option, either repair or replace products that prove to be defective. This warranty is void if the product has been damaged by customer error or negligence, or if there has been an unauthorized modification.

Returning Products to Spectrum

Before returning a failed unit, you must obtain a Returned Goods Authorization (RGA) number from Spectrum. You must ship the product(s), properly packaged against further damage, back to Spectrum (at your expense) with the RGA number marked clearly on the outside of the package. Spectrum is not responsible for any package that is returned without a valid RGA number or for the loss of the package by any shipping company.

	DECLARATION OF CONFORMITY
	Spectrum Technologies, Inc. 12360 S. Industrial Dr. East Plainfield, IL 60585 USA
Model Numbers:	200, 225, 250, 400, 425, 450
Description:	WatchDog Data Loggers
Type:	Electrical equipment for measurement, control, and laboratory use
Directive:	2004/108/EC
Standards:	EN 61326-1:2006 EN 61000-4-2:1995, including A1:1998 and A2:2001 EN 61000-4-3:2002 EN 55011:2007
	
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