Field Scout®
EC 110
Data Logger
Manual

Catalog #2220

Spectrum
Technologies, Inc.

CONTENTS

This manual will familiarize you with the features and operation of your new data logging EC 110 meter. Please read this manual thoroughly before using your instrument. For customer support, or to place an order, call Spectrum Technologies, Inc.
(800)248-8873 or (815) 436-4440
between 7:30 am and 5:30 p.m. CST,
FAX (815)436-4460,
e-mail: specmeters.com.
www.specmeters.com

Spectrum Technologies, Inc
12360 S. Industrial Dr. East
Plainfield, IL 60585

General Overview

Thank you for purchasing the data logging EC 110 meter from Spectrum Technologies, Inc. This user's guide deals with the features that are unique to the data logging EC 110 meter. Information on general meter operation is contained in the accompanying Instruction manual.

The integrated data logger allows the user to easily collect field data with the EC 110 meter. The logger can be used with or without GPS/DGPS. After data has been collected, it is transferred to a PC using the included software. The data is in ASCII text file format and can be exported into mapping software or popular spreadsheet software for analysis.

Caution: Avoid touching the tip of probe as this can affect the accuracy of the readings (see p. 11)

NOTE: THIS BOOKLET CONTAINS INSTRUCTIONS ON OPERATING THE DATALOGGER AND MAINTAINING THE DIRECT-INSERT PROBE. INFORMATION REGARDING THE METER'S GENERAL OPERATION, CALIBRATION PROCEDURE, AND DESCRIPTIONS OF ERROR MESSAGES ARE DETAILED IN THE ACCOMPANYING MANUAL.

Data Logger Operation

The data logger has two modes of operation: **Communication** and **Measurement**. These modes are indicated by the green LED in the lower left corner of the meter. When this light is flashing, the meter is in **Communication** mode. When the light glows steadily, the meter is in **Measurement** mode.

Communication Mode

When the meter is turned on, it will be in **Communication** mode for approximately 10 seconds. While in this mode, the green LED will flash. It is only in this mode that a user can initiate a logger communication (download or reconfiguration). If communication between the logger and software is attempted during this 10-second period, the logger will remain in **Communication** mode indefinitely. The meter must be turned off and then on to change to **Measurement** mode (see following section).

Measurement Mode

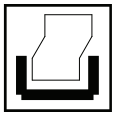
Approximately 10 seconds after turning on the meter, the LED light will glow steadily. This indicates the logger is in **Measurement** mode. In this mode, you can calibrate the meter and record data. When you are finished collecting data, the meter must be put into **Communication** mode by turning it off and back on (see previous section). If you are collecting data from several sites and need to turn off the meter between data collection sessions, wait until the meter transitions from **Communication** to **Measurement** mode after turning the meter back on.

Calibration

The procedure for calibrating the meter is given in the accompanying meter instruction manual.

Taking and Data Logging Measurements

When the probe is inserted in soil or water, the meter's LCD will immediately begin indicating the EC. When this value stabilizes, the meter locks on to that value and the LCD will display READY in the upper right corner. To capture this value with the data logger, press the **HOLD/ ENTER** button followed by the **Print** button. The **Print** button is on the lower right corner of the keypad next to the **Range** button.



Print button

If the readings are not being geo-referenced, the green LED will briefly flash off and then back on. If the readings are being geo-referenced (see GPS Connection, p. 10) and a GPS signal is found, the green LED will turn off for a slightly longer time, then glow steadily. If the readings are being geo-referenced but no GPS signal is found, the LED will flash 3 times, then glow steadily. In this case, the EC reading will be recorded without latitude/logitude values. Check the GPS battery status as well as the connection to the data logger.

Measuring Range

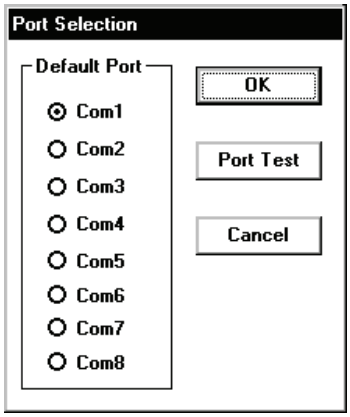
The meter has 5 EC measuring ranges (listed in section 4.1 of the accompanying meter instruction manual). When using the 2.76 mS/cm calibrating solution, the meter should, ideally, be in range r4. However, the range the meter is using is not generally visible on the LCD. Pressing the **Range** button allows the user to manually select a different range. When the **Range** button is pressed, the meter will transition to the next range which will briefly be displayed on the LCD in place of the temperature. When initially inserted into a sample, the meter will transition to the most appropriate range.

Identifying the Correct Com Port

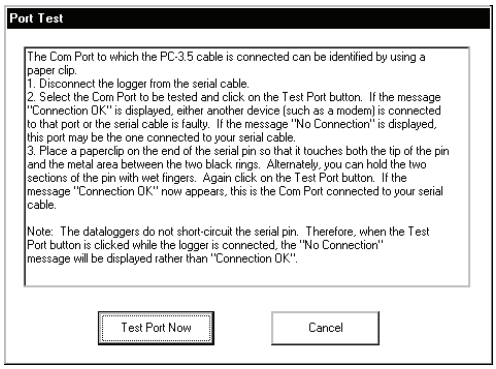
The computer **Com**munications **Port** to which the PC-3.5 serial cable is connected can be identified by using a paper clip

1. Disconnect the meter from the serial cable.

2. Click on the **Com Port** button on the main software screen. This will bring up the **Port Selection** screen.



3. Select the Com port to be tested and click on the **Port Test** button. In the **Port Test** screen, click the **Test Port Now** button.



4. If the “Connection OK” message box (see fig. 1) is displayed, another device (such as a modem) is probably connected to that port. This is not the port you will be using with your meter. If the “No Connection” message box (see fig. 2) is displayed, this port may be the one connected to your serial cable and you can proceed to the next step.

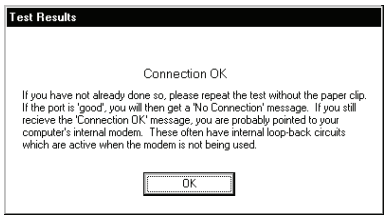


Figure 1

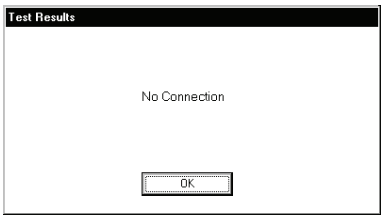


Figure 2

5. Place a paperclip on the end of the serial pin so that it touches both the tip of the pin and the metal area between the two black rings (see fig. 3). Again click on the **Test Port Now** button. If the message “Connection OK” now appears, this is the Com port connected to your serial cable.

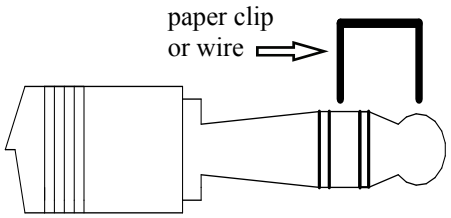
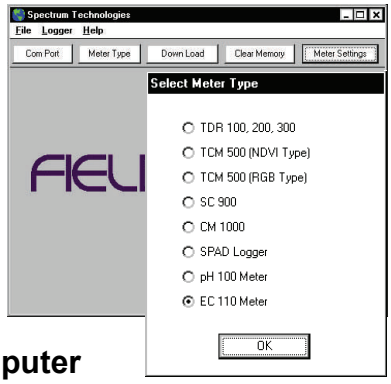


Figure 3

Logger Software

Meter Type

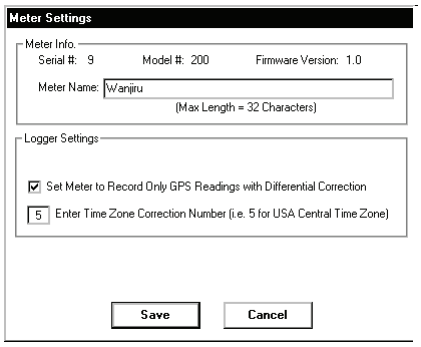
The Field Scout software supports all of Spectrum Technologies' portable data logging meters. Be sure to select the EC 110 Meter from the **Select Meter Type** screen



Connecting to your Computer

To communicate with the data logger, connect the gray interface cable to the EC 110 meter's RS-232 port. The port is located behind the panel at the base of the meter (marked *RS-232*). Open the software and turn on the meter so it is in **Communication** mode (see Data Logger Operation, p. 4). In order to communicate through your computer, the COM port connected to your serial port must be selected. For most machines, this will be COM 1. If you are having trouble connecting, try selecting another COM port. This can be done by clicking the COM port toolbar button or by clicking "Select Comm Port" from the File menu.

Meter Settings

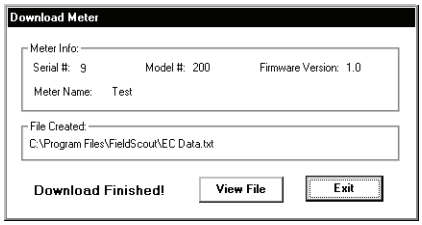


Clicking on this button will bring up the **Meter Settings** screen. This screen allows you to configure the data logger. The **Meter Name** will be the title on the first line of the downloaded files.

If the box below the logger name field is checked, the logger will store GPS data only if it has been differentially corrected. If the differential correction is not found, only the pH reading will be stored in the data file. A time zone correction should be entered in the last box. Appendix 1 (p. 13) lists time zone corrections for several cities.

Download

After clicking the **Download** button, a progress bar will confirm that data is being extracted from the logger. When completed, the **Save Data As** box will appear. From here you can give the data file a descriptive name and select a folder in which to save it. The folder selection field on the right allows you to browse to any folder in your system.



When the file has been saved, the software will give you the option of immediately viewing the file. The data file is stored as a comma-delimited text file and may be viewed in any text editor or spreadsheet software.

Clear Memory

Data is not automatically removed from the logger memory after a download. The **Clear Memory** button clears all data from the memory.

GPS Connection

The data logger searches for a GPS signal when the meter is powered up. If a signal is found, latitude and longitude values will be added to the data file. If a GPS signal is **not** found when powering up, the meter will not search for it when taking readings. If the meter is turned off and back on, it will again search for the GPS signal. Be sure the meter is in **Measurement** mode (see p. 4) before taking any readings.

When taking a geo-referenced data measurement, the LED will turn off while collecting the GPS signal. The meter is again ready to take a reading when the LED returns to a steady glow. If the datalogger loses the GPS signal, the LED will flash briefly before returning to **Measurement** mode. In this case, check the GPS battery status as well as the connection to the data logger.

GPS Settings

Your GPS unit should be set to NMEA 0183 input/ output messages. This standard requires your unit be set to the following:

GGA data string
4800 baud rate
Timing - 1 second
8 data bits
No parity
1 stop bit

Tip: If you have your GPS unit set properly and have checked the connection but still are not getting geo-referenced data, uncheck the box requiring the digital correction in Meter Settings (pp. 8 - 9) .

Direct- Insert Probe

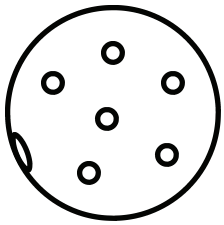


Figure 4. Orientation of pins on probe/meter interface

Connecting the Probe

The female connector for the direct-insert probe pushes straight onto the 6-pin male socket on the digital reader (see fig. 4). When inserting the probe, rotate the plug to align the notch on the probe with the guide on the inner wall of the socket. Secure the plug by rotating the locking ring until it is snug.

Figure 5. Probe sensor tip

Probe Maintenance

The EC value measured by the sensor is highly sensitive to surface contamination, especially from skin oil. Therefore, the probe tip (see fig. 5) should be cleaned regularly with rubbing alcohol to ensure accurate conductivity measurements.

Specifications

Measurement Capacity:
- 1,080 data points without GPS
- 648 data points with GPS

Operating Environment:
- Weather Resistant

Power:
- 4 x AAA batteries
- Provides 40 hours of logging

Software Requirements:
- Windows 95 or higher
- Field Scout Software v. 3.4 or higher (included)

Appendix 1
Time zone corrections

Time Zone Correction	City
0	Dublin, Lisbon, London
3	Rio de Janeiro, Montevideo
4	Asuncion
5	Atlanta, Indianapolis, New York, Ottawa, Bogota, Montreal, Toronto
6	Guatemala City, Houston, New Orleans, Chicago, Mexico City, Winnipeg
7	Phoenix, Denver, Edmonton
8	San Francisco, Los Angeles, Vancouver
9	Anchorage
10	Honolulu
11	Wellington
13	Adelaide, Melbourne, Sydney
14	Vladivostok, Brisbane
15	Seoul, Tokyo
16	Beijing, Hong Kong, Manila, Singapore, Taipei
17	Hanoi, Jakarta, Vientiane
18	Calcutta, New Delhi
19	Kabul, Islamabad
20	Tehran, Abu Dhabi, Dubai
21	Moscow, Nairobi, Kampala, Riyadh
22	Ankara, Athens, Helsinki, Istanbul, Cairo, Johannesburg, Harare
23	Amsterdam, Barcelona, Berlin, Geneva, Paris, Prague, Rome, Brussels, Madrid, Stockholm, Warsaw, Lagos

Service and Support

In the unlikely event that you have a problem with the hardware or software, please read the following.

Who do I contact?

Contact the company that you bought the loggers from: Spectrum Technologies, Inc. or a Spectrum Authorized Dealer.

Before calling, you can evaluate and often solve your problem if you try the following.

1. Read this manual. It may only take a few moments to get the answer you need.

2. Write down the events that led to the problem. Have you changed anything in your computer recently? Are you doing anything differently?

When Contacting Spectrum Technologies, Inc. please indicate that you need Technical Support. Be prepared to:

1. Provide details on the hardware and software configuration of your computer 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

This product is warranted to be free from defects in material or workmanship for 1 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 is void if the Spectrum products have 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.

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