OM-40 Series
DATA LOGGERS
OM-41, OM-42,
OM-43, OM-44
User's Manual

MADE IN USA
1 YEAR WARRANTY

CE

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Inside this package:
OM-40 Series loggers are shipped with:
1. One OM-40 Series
2. Mounting Accessories
   Magnet
   Hook and loop tape
   Double-sided tape

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Thank you for buying an OM-40 Series data logger. With proper care it will give you years of accurate and reliable measurements.

This manual covers the OM-40 Series of products. All members share a common feature set and store 7944 time-stamped measurements. The measurements available on each model are:

| Model	Part Number	Temp	RH	External Input
Temp	OM-41	✔		
Temp/External	OM-42	✔		✔
RH/Temp	OM-43	✔	✔	
RH/Temp/2x External	OM-44	✔	✔	✔

Common Specifications

Operating range (logger): -20°C to +70°C (4°F to +158°F), 0 - 95% RH non-condensing

Time accuracy: approx. ±1 minute per week (±100 ppm at +20°C or +68°F), full dependance shown in Plot A

Measurement capacity: 7944 measurements total, stored in non-volatile memory

Size: 2.4" x 1.9" x 0.8"

Weight: approximately 1 oz.

Battery: CR-2032 (lithium) user-replaceable

Battery life (continuous use): 1 year

Storage temperature: -40°C to +75°C (-40°F to +167°F)

Plot A
Time Accuracy
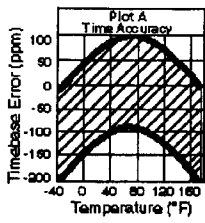
Measurement Specifications

Temperature - Each OM-40 Series logger has an internal temperature sensor on a 4 inch wire which is mounted on the circuit board inside the snap lid case. Typically, the sensor is left inside the case and measures ambient air temperature over the operating range of the logger; -20°C to +70°C (-4°F to +158°F) with a response time of about 15 minutes in still air typical to 90%. The internal sensor can be placed outside the case when a shorter response time is needed (less than 1 minute in air and about 2 seconds in water typical to 90%). The temperature sensor is capable of measuring temperature from -40°C to +120°C (-40°F to +248°F) when extended from the case (see "Using the Sensor Outside the Box" for more information). The temperature resolution and accuracy are shown in Plot B. This error includes the measurement uncertainty due to the sensor resolution.

Plot B
Temperature Accuracy & Resolution
Dashes indicate external temp range
Accuracy
Resolution
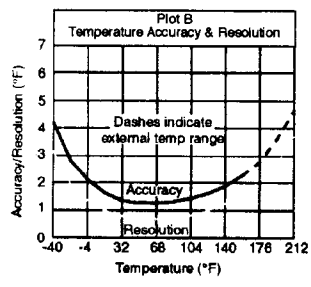
Relative Humidity - The user-replaceable relative humidity sensor is temperature compensated, and the logger's relative humidity accuracy is ±5% over the entire +5°C to +50°C (+41°F to +122°F) operating range of the sensor when used with OmegaSoft 3.7.3. **NOTE:** Accuracy specifications reflect improvements made to OmegaSoft 3.7.3. Earlier software versions provide ± 5% accuracy except in elevated humidity environments (60% to 95% non-condensing and non-fogging) where accuracy is ± 10%. Upgrading to OmegaSoft 3.7.3 or later version will bring all current and old data file accuracy to ±5% for the full operating range. The relative humidity sensor's operating RH range is 25% to 95% at +25°C (+77°F) for logging intervals of 10 seconds or longer. Full dependance shown in Plot C. RH sensor drift is < 1% per year. **NOTE:** The RH sensor will be damaged by condensation. It must not be exposed to fog, mist or other condensing conditions.

Diagram A - 4-20 mA input cable
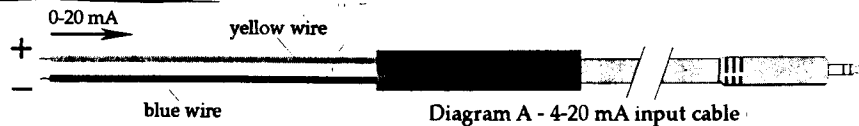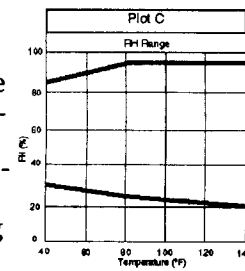
4-20 mA Input Cable - This cable (part number OM-40-C-I) measures currents from 0 to 20.1 mA. The accuracy is ±1% of full scale. The 4-20 mA cable must be connected such that the current flows through, and with the proper polarity, as shown in Diagram A. Do not expose to current above 20 mA or negative current. Do not cut off the end of the gray cable where it connects to the blue and yellow wires as that contains the precision resistor required for current measurement.

External Input for Sensors with Voltage Output - The external port can alternatively accommodate a voltage input cable (part number OM-40-C-V) which allows a single voltage input to be recorded. This input reads 0

Voltage Input Cable Connection	
red wire	switched 2.5 v output
white wire	voltage input
black wire	0 volts

to 2.5 DC volts, with a ±0.1 μA maximum leakage between measurements and a ±0.4 μA during sensor measurements (5.4 ms each). The accuracy is ±10 mV ±1% of reading. Input impedance is 10kΩ. The input line should not be exposed to signals below 0 volts or above 2.5 volts. The external sensor's zero volt input is not the same as the serial port's ground connection. Connecting the zero volt connection to ground may damage the logger.

Switched 2.5 V Output - This signal can be used to power a sensor directly (like the external temperature sensor) or it can be used to trigger an external circuit. External sensors should draw no more than 2 mA when powered. The switched 2.5 V output blinks on for about 5.4 ms every time a measurement is made of any channel. A logger with four channels enabled will cause four blinks after each measurement interval expires. The external channels are the last of the blinks whether one, two, three or four channels are enabled. The four enabled channels example is shown in Diagram B.
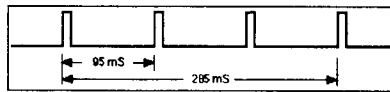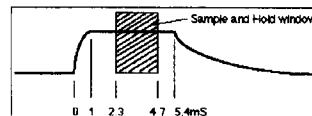

Diagram B

Diagram C

Details of the blink - The input is sampled at a specific point in each blink in Diagram C. The start of the sample window is 2.3 mS after the beginning of the blink, and end 2.4 mS later.

Connecting the Communications Cable and Launching

A Starter Kit, which includes a PC interface cable and software, is required to operate your logger. Connect the interface cable into the 3.5 mm jack on the logger and into a working serial port of your computer. Install and start the logger's software. Select **Launch** under **Logger** on the menu bar and a launch dialog box will be provided. For a complete explanation on installing the software and launching your logger, please refer to the software manual.
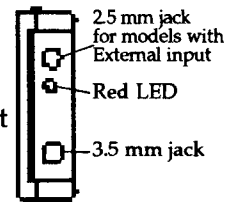
2.5 mm jack for models with External input

Red LED

3.5 mm jack

Diagram D

Note: layout is slightly different for OM-44 logger

Operation Indicator

The data loggers have a red LED that blinks while they are logging. The LED blinks brightly at every measurement, and weakly every two seconds if the interval between measurements is longer than two seconds. The blinking LED is most visible when viewed straight on, as shown in Diagram D.

Mounting Options

Included with your data logger are three options for mounting it on location: a magnet, hook and loop tape, and double-sided tape. These can be stuck on the back of your data logger. When using the magnet, note that it works best on flat surfaces.

Readout

Reconnect the data logger to the PC interface cable, start the logger software, select **Readout** under **Logger** on the menu bar and the data will be displayed in a graphical or tabular form. For a complete explanation on reading out your logger, please refer to the software manual.

Using the Sensor Outside the Box

In normal operation, the logger's internal temperature sensor should be left inside the case. To use the sensor outside the case, open the snap-lid case as shown in Diagram E and remove the circuit board. Unwind the four inch sensor wire from the circuit board and place the board back into the case. When closing the case, make sure the sensor is aligned in the small notch in the case as shown in Diagram F and press the snap-lid closed. Be careful, the sensor is fragile and easily damaged! When using the sensor outside the box, the logger must still be kept within its operating range of -20°C to +70°C (-4°F to +158°F).

Keep it Dry
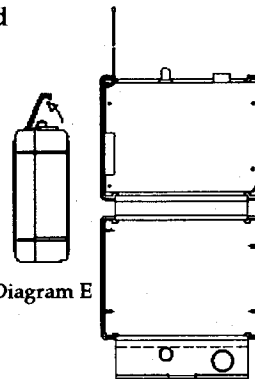
Diagram E

Your Omega data logger is meant for **indoor use only** and can be permanently damaged by corrosion if it gets wet. Protect it from water or condensation, which will damage the RH sensor. If the sensor does get wet it will need to be replaced (part number OM-40-HUM).

Diagram F

Changing the Battery

We recommend changing the battery when its level is less than 30% (battery level is displayed on the host computer during Launch or Readout). Data stored in the logger will not be lost when removing the battery. To change the battery, open the case, lift the circuit board and remove the battery by carefully pushing it out with a small screwdriver or other small, blunt instrument. Be sure to install the battery with the printed side away from the logger's circuit board as shown in Diagram G. The logger's red LED will blink a number of times after the battery has been installed. If you will not be using the logger right away, bring the logger to the launch window of OmegaSoft and select cancel or you can offload the data. This action puts the logger into its low power state to conserve your battery power. Note: **Do not cut open, incinerate, heat above +85°C (+185°F) or recharge lithium battery. Dispose per local regulations.**

Diagram G

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,

2. Model and serial number of the product under warranty, and

3. Repair instructions and/or specific problems relative to the product.

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