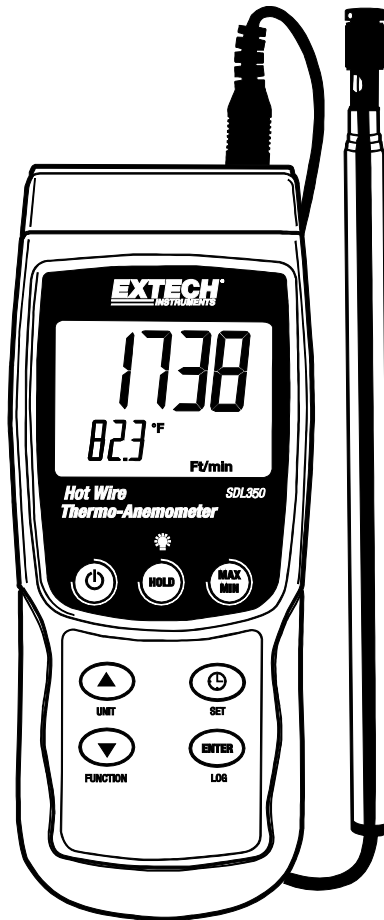


## Hot Wire Thermo-Anemometer with Datalogger

Model SDL350



## Introduction

Congratulations on your purchase of the Extech SDL350 Hot Wire Thermo-Anemometer Datalogger. This meter displays and stores temperature readings from the built-in thermometer or from an externally connected thermocouple probe. This instrument is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

## Safety

### International Safety Symbols

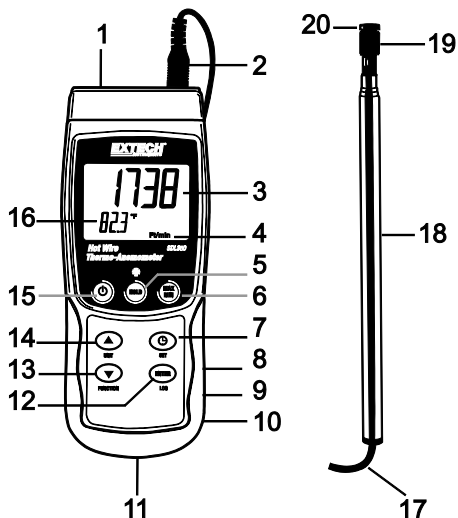


This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.

## Description

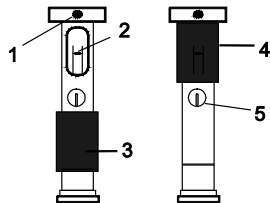
### Meter and Hot Wire Probe

1. Thermocouple input
2. Hot Wire plug
3. Display for air velocity and air flow readings
4. Units of measure
5. HOLD / Backlight key
6. MAX-MIN key
7. SET and Clock key
8. PC interface jack
9. Reset key
10. Power adaptor jack
11. SD card slot
12. ENTER and LOG key
13. Down arrow and FUNCTION key
14. Up arrow and UNIT key
15. Power key
16. Temperature reading with units of measure
17. Hot Wire probe cable
18. Telescoping probe handle
19. Protective sensor cover
20. Colored dot must face air flow



### Hot Wire Probe Top (detail)

1. Direct the air stream towards the colored dot
2. Air velocity sensor
3. Sliding protective cover OPEN position
4. Sliding protective cover CLOSED position
5. Temperature sensor



### NOTES:

Battery compartment, tilt stand, and tripod mount are located on the rear of the instrument.  
Items 8, 9, and 10 are located behind the snap-off compartment cover on the right side of meter.

## Operation

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### Power ON-OFF

Long press the power button  to switch ON or OFF.

### Meter Functions

This meter has three modes of operation: air velocity (with temperature), thermocouple temperature, and air flow/volume (CFM/CMM). Long press the FUNCTION button to select a mode.

- Air velocity plus temperature mode; the meter displays **An** icon.
- Type K or J thermocouple temperature mode; the meter displays **tP** icon).
- Air flow mode (volume, CFM/CMM); the meter displays **F-US** or **F-EU** depending on the selected unit of measure for area (see the SETUP mode).

### Air Velocity plus Temperature Mode

1. Select the air velocity plus temperature mode as described above.
2. Connect the vane probe to the jack at the top of the meter.
3. Allow the air flow to enter the sensor area, facing the colored dot.
4. The air velocity (upper display) and air temperature (lower display) will appear.

### Changing the Air Velocity Unit of Measure

This meter has five (5) units of measure selections for air velocity: m/s (meters per second), FPM (feet per minute), Km/h (kilometers per hour), knots, and mph (miles per hour).

1. Long press the UNIT button and release it when the desired units are shown.
2. Quick scrolling is possible by continuing to hold the button.

### Thermocouple (Type J or K) Temperature Mode

1. Long press the FUNCTION button to scroll to the thermocouple temperature mode.
2. The meter will display the thermocouple type (**J** or **K**) on the left. To change the thermocouple type, refer to the Setup Mode section of this manual.
3. Connect a thermocouple to the jack at the top of the meter.
4. Hold the thermocouple in the air.
5. The meter will display the thermocouple temperature in the main display area.
6. To change the temperature units (°C/°F), refer to the Setup Mode section of this manual.

### Air Flow (Volume): CFM (Cubic Feet Per Minute); CMM (Cubic Meters Per Minute)

1. Measure and note the area of the duct in **square feet** or **square meters**. For rectangular ducts, area is calculated by multiplying **length** by **width**; for circular ducts, multiply **3.14** by **R (radius)**<sup>2</sup>.
2. Enter the area value, as explained in the SETUP mode section of this manual.
3. Select the air volume mode by long pressing the FUNCTION button.
4. Connect the hot wire probe to the jack at the top of the meter and slide the protective cover open to expose the hot wire sensor. Close the protective cover when the probe is not in use.
5. Allow the air flow to pass through the sensor area, facing the colored dot on the probe.
6. The air volume (upper display) and the unit of measure, **EU** or **US** (lower display) appears. To change the units, see the SETUP Mode section of this manual.

### Data Hold


To freeze a measurement on the display, short press the HOLD button. The meter will beep, the reading will hold, and the HOLD display icon will appear. Press the HOLD button again to exit the mode.

## MAX-MIN Memory

The meter records the highest (MAX) and lowest (MIN) readings for later recall in this mode.

1. Short press the MAX-MIN button to start recording (the REC icon appears).
2. Press the MAX-MIN button again to view the maximum reading (the MAX icon appears).
3. Press the MAX-MIN button again to view the minimum reading (the MIN icon appears).
4. Long press the MAX-MIN button to exit this mode. The meter will beep, the REC-MAX-MIN icons will switch off, the memory will clear, and the meter will return to the normal operating mode.

## Display Backlight

Long press the backlight button  to switch the backlight ON or OFF (the meter will beep). See the SETUP Mode section of this manual to disable the backlight function.

## System Reset

If the display freezes or the meter becomes otherwise inoperable, use the RESET button to reset.

1. Use a paper clip or similar item to short press the RESET button. The RESET button is in the hidden compartment on the right side of the meter.
2. After the reset, long press the power button to switch ON the meter. If using a power adaptor to power the meter, unplug and replace the adaptor to power the meter.

## AC Power Adaptor

An optional 9 V power adaptor is available to power the meter. To use the adaptor, plug it into the jack in the hidden compartment on the right side of the meter. Plug the other end of the adaptor to an AC power source. When using the adaptor, the power ON-OFF button is disabled.

## Datalogger

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### Types of Logging

- **Manual Datalogging:** Manually log up to 99 readings onto an SD card by pressing the LOG button.
- **Automatic Datalogging:** Automatically log data onto an SD memory card where the number of data points is limited only by the card size. Readings are logged at a rate specified by the user.

### SD Card Information

- Insert an SD card (16 G, maximum) into the card slot at the bottom of the meter. Insert card with the front of the card (label side) facing the rear of the meter.
- On first use, format the SD card and set the internal clock. See the SETUP Mode section of this manual.
- The meter defaults to **US** data formatting, where a decimal point is used to separate units from tenths, i.e. **20.00**. To switch to the **EU** format, where a comma is used, i.e. **20,00**, refer to the Setup Mode section of this manual.

### Manual Datalogging

In the manual mode, press the LOG button to manually log a reading.

1. Set the sampling rate to '0' seconds.
2. Long press the LOG button. The lower display area shows p-n ( $n$  = memory position, from 1 to 99).
3. Short press LOG to store a reading (the REC icon will flash). Note that the SCAN SD icon will appear when the meter accesses the SD card.
4. Use the ▲ and ▼ keys to select one of the 99 data memory positions in which to record.
5. To exit the manual datalogging mode, long press the LOG button.

## Automatic Datalogging

In automatic datalogging mode the meter stores a reading at the user-specified sampling rate (default: one second). To change the rate, refer to the Setup Mode section (the rate cannot be '0' for automatic logging). It is recommended that a short logging session be performed first, to test and learn about the datalogging process, before committing to a long-term logging session.

1. Long press the LOG button to begin.
2. The meter will scan for an SD card and verify that it can be used to store data. If a card is not inserted or is unformatted or defective, the meter will display SCAN SD indefinitely. In this case, switch the meter OFF and try again with a valid SD card.
3. If the SD card is valid, logging will begin, and the display will show the LOG icon (or the LOG icon alternating with the temperature display). The REC icon will flash each time a reading is stored.
4. To pause or resume logging, short press the LOG button (the REC icon will stop flashing when paused).
5. To end the datalogging session, long press the LOG button.
6. When an SD card is used for the first time a folder is created on the card, named **AHB01**. Up to 99 spreadsheet documents (each with 30,000 readings) can be stored in this folder.
7. When datalogging begins, a new spreadsheet document, named **AHB01001.xls**, is created on the SD card in the AHB01 folder. The data recorded will be placed in the AHB01001.xls document until 30,000 readings have been logged.
8. If the measurement session exceeds 30,000 readings, a new document will be created (AHB01002.xls) where another 30,000 readings can be stored. This method continues for up to 99 documents, after which another folder is created (AHB02) where another 99 spreadsheet documents can be stored. This process continues with folders AHB03 through AHB10 (last allowable folder) being created.

## Transfer SD Card Data to a PC

1. With the meter switched OFF, remove the SD card.
2. Plug the SD card into a PC card reader or PC card port.
3. Power the PC and run a spreadsheet software program. Open the saved document in the spreadsheet software program (see example of a spreadsheet display below).

### Spreadsheet data example

	A	B	C	D	E	F	G
1	Position	Date	Time	Value	Unit	Value	Unit
2	1	8/24/2011	15:12:00	0.8	m/s	28.8	AM Temp C
3	2	8/24/2011	15:12:01	0.8	m/s	28.8	AM Temp C
4	3	8/24/2011	15:12:02	0.8	m/s	28.8	AM Temp C
5	4	8/24/2011	15:12:03	0.8	m/s	28.8	AM Temp C
6	5	8/24/2011	15:12:04	0.8	m/s	28.8	AM Temp C
7	6	8/24/2011	15:12:05	0.8	m/s	28.8	AM Temp C
8	7	8/24/2011	15:12:06	0.8	m/s	28.8	AM Temp C
9	8	8/24/2011	15:12:07	0.8	m/s	28.8	AM Temp C
10	9	8/24/2011	15:12:08	0.8	m/s	28.8	AM Temp C
11	10	8/24/2011	15:12:09	0.8	m/s	28.8	AM Temp C
12	11	8/24/2011	15:12:10	0.8	m/s	28.8	AM Temp C
13	12	8/24/2011	15:12:11	0.8	m/s	28.8	AM Temp C
14	13	8/24/2011	15:12:12	0.8	m/s	28.8	AM Temp C
15	14	8/24/2011	15:12:13	0.8	m/s	28.8	AM Temp C
16	15	8/24/2011	15:12:14	0.8	m/s	28.8	AM Temp C
17	16	8/24/2011	15:12:15	0.8	m/s	28.8	AM Temp C
18	17	8/24/2011	15:12:16	0.8	m/s	28.8	AM Temp C

## RS-232/USB PC Interface

To stream data to a PC, using the meter's RS232 jack, you must obtain the Extech 407001-USB kit (interface cable and PC driver) and the Extech 407001-PRO (software) from the Extech website or an authorized Extech distributor. Install the driver on the PC, connect the meter to the PC, and run the 407001-PRO software to communicate with the meter.

## Setup Mode

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### Basic settings at a glance

Short press the SET button to view the current settings for time, date, thermocouple type, and datalogging sampling rate. The meter scrolls through the settings quickly; repeat as necessary to note all settings.

### Accessing the Setup mode

1. Long press the SET button to access the Setup menu.
2. Short press the SET button to step through the parameters. The parameter type is shown on the bottom of the display with its current setting shown above it.
3. Use the arrow buttons to change a setting and press ENTER to confirm.
4. Long press the SET button to exit the Setup mode. Note that the meter automatically exits the Setup mode if no key is pressed in seven seconds.
5. The Setup parameters are listed below. Additional information is provided below this list:

<b>dAtE</b>	Clock time (year/month/date; hours/minutes/seconds)
<b>SPt</b>	Datalogger sampling rate (1 to 3600 seconds)
<b>PoFF</b>	Automatic power OFF (APO) enable/disable
<b>bEEP</b>	Beeper ON/OFF
<b>dEC</b>	SD card decimal character (comma for EU format)
<b>SdF</b>	SD memory card format
<b>t-CF</b>	Temperature units of measure (C or F)
<b>tYPE</b>	Thermocouple type to K or J
<b>F-US/F-EU</b>	<b>F-US</b> for CFM (cubic feet per minute); <b>F-EU</b> for CMM (cubic meters per minute) for air flow (volume) measurements.
<b>ArEA</b>	For CFM/CMM air flow (volume) measurements, enter the area of the duct in units of square feet or square meters.

### Setting the Clock Time

1. Access the **dAtE** parameter.
2. Use the arrow buttons to change a value.
3. Use the ENTER button to step through the selections.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).
5. The clock will keep accurate time even when the meter is switched off. However, if the batteries expire, the clock will have to be reset after battery replacement.

## Setting the Datalogger Sampling Time (Rate)

1. Access the **SP-t** parameter.
2. Use the arrow buttons to select the desired sampling rate. The available settings are: 0, 1, 2, 5, 10, 30, 60, 120, 300, 600, 1800, and 3600 seconds.
3. Press the ENTER button to confirm the entry.
4. Long press the SET key to exit (or wait 7 seconds for the meter to exit automatically).

## Enabling/Disabling the Auto Power OFF Feature

1. Access the **PoFF** parameter.
2. Use the arrow buttons to select **ON** (enable) or **OFF** (disable). With the Auto Power OFF feature enabled, the meter will automatically switch OFF after 10 minutes of inactivity.
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## Set the Beeper Sound ON or OFF

1. Access the **bEEP** parameter.
2. Use the arrow button to select **ON** (enable) or **OFF** (disable).
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## Numerical Setting (comma or decimal)

EU and US numerical formats differ. The meter defaults to the US mode, where a decimal point is used to separate units from tenths, i.e. **20.00**; EU formats use a comma, i.e. **20,00**. To change this setting:

1. Access the **dEC** parameter.
2. Use the arrow buttons to select.
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait 7 seconds for the meter to automatically exit).

## SD Card FORMATTING

1. Access the **Sd F** parameter.
2. Use the arrow buttons to select **YES** to format the card (select **NO** to abort). Note that all data on the card will be lost if formatting is attempted.
3. Press ENTER to confirm the selection.
4. Press ENTER again to re-confirm.
5. The meter will automatically exit when formatting is complete. To force exit, long press the SET button.

## Set the Temperature Units of Measure (°C or °F)

1. Access the **t-CF** parameter.
2. Use the arrow buttons to select **°C** or **°F**.
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## Set the Temperature Thermocouple Type (J or K)

1. Access the **tYPE** parameter.
2. Use the arrow buttons to select **J** or **K**.
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## Set the Air Flow Volume measurement units to CFM (F-US) or CMM (F-EU)


1. Access the **SET F-US / F-EU** parameter.
2. Use the arrow buttons to select **US** or **EU**. **US** represents CFM (cubic feet per minute), and **EU** represents CMM (cubic meters per minute).
3. Press ENTER to confirm the setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## Set the Area value for an air duct (Air Flow Volume measurements)

1. Access the **ArEA** parameter.
2. Use the arrow buttons set the area of the duct (the equation  $L * W$  is used for rectangular ducts; **3.14 \* R<sup>2</sup>** is used for circular ducts). Note that the value must be set in square feet or square meters; therefore, if the measurement is made in square inches, the area value must be converted to square feet. The setting range is 0.01 to 322.93.
3. Press ENTER to confirm setting.
4. Long press the SET button to exit (or wait seven seconds for the meter to automatically exit).

## ***Battery Replacement***

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Replace the batteries when the low battery  icon appears. Several hours of accurate readings are still possible after the icon appears.

1. Remove the two (2) Phillips screws from the rear of the meter (directly above the top of the tilt stand).
2. Remove the battery compartment cover.
3. Replace the six (6) 1.5V 'AA' batteries observing correct polarity.
4. Replace the battery compartment cover with the two (2) Phillips screws.

### **Battery Safety Reminders**

- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.
- Dispose of batteries responsibly.

# Specifications

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## General Specifications

Display	Backlit LCD; 2 x 1.5 in. (52 x 38 mm)
Sensor types	Hot-wire thermistor for air velocity and flow measurements Thermistor for built-in temperature sensor Thermocouple for remote temperature measurements
Measurement Units	Air velocity: m/S (meters per second) Km/h (kilometers per hour) Ft/min (FPM; feet per minute), Knots (nautical miles per hour), Mile/h (mph; miles per hour)  Air temperature: °C / °F  Air Flow (Volume): CFM or CMM  Type K / Type J thermocouple: °C / °F
Datalogger Sampling Rate	AUTO LOGGING: 1, 2, 5, 10, 30, 60, 120, 300, 600, 1800, 3600 seconds. Note that a one (1) second sampling rate can cause some data loss on slower PC.  MANUAL LOGGING: Set the sampling rate to '0'
Memory card	SD memory card; 16 GB maximum
Temperature compensation	Automatic temperature compensation for the anemometer and thermocouple functions
Data Hold	Freeze the display reading
MAX-MIN memory	Record and recall the maximum and minimum readings
Display update rate	Approx. 1 second
Data output	RS-232 / USB PC interface
Operating temperature	32 to 122°F (0 to 50°C)
Operating humidity	85% RH max.
Auto Power OFF	After 10 minutes of inactivity (can be disabled)
Power supply	Six (6) 1.5 V AA batteries (optional 9 V adaptor)
Power consumption	Normal operation (backlight and datalogger OFF): Approx. 30 mA DC With backlight OFF and datalogging ON: Approx. 50 mA DC
Weight	0.76 lbs. (347 g); meter only
Dimensions	Main instrument: 7.1 x 2.9 x 1.9 in. (182 x 73 x 47.5 mm) Telescoping probe: 0.5 in. (12 mm) diameter x 11 in. (280 mm) min. length; 0.5 in. (12 mm) diameter x 37 in. (940 mm) max. length Cable length: 7 ft. (2.1 m)

## Electrical Specifications (Ambient temperature 73.4°F ± 9°F [23°C ± 5°C])

### Air velocity

Measurement	Range	Resolution	Accuracy
m/s (meters/second)	0.2 to 5.0 m/s	0.01	± (5%rdg + x) or ± (1%FS + x) (whichever is greater)  (for x, see below)
	5.1 to 25.0 m/s	0.1	
Km/h (kilometers/hour)	0.7 to 18.00 km/h	0.01	
	18.0 to 72.0 km/h	0.1	
mph (miles/hour)	0.5 to 11.20 mph	0.01	
	11.2 to 44.7 mph	0.1	
Knots	0.40 to 9.70 knots	0.01	
	9.7 to 38.8 knots	0.1	
FPM (Ft/min)	40 to 3940 ft/min	1	
x = 0.1 m/S; 0.3 km/h; 0.2 mph; 0.2 knots; or 20 ft/min			

### Air temperature (built-in thermistor)

Measurement	Range	Resolution	Accuracy
°C/°F	32 to 122°F (0 to 50°C)	0.1°	± 1.5°F (0.8°C)

### Air Flow (CFM/CMM Volume)

Measurement unit	Range	Resolution
CMM (m <sup>3</sup> / minute)	0 to 54,000 CMM	0.001 to 1 CMM
CFM (ft <sup>3</sup> / minute)	0 to 1,907,000 CFM	0.001 to 100 CFM

### Air Temperature (Thermocouple)

Sensor Type	Resolution	Range	Accuracy
Type K	0.1°C	-50.0 to 1300.0°C -100.0° to -50.1C	± (0.4%rdg+ 0.5°C) ± (0.4%rdg+ 1°C)
	0.1°F	-58.0 to 2372.0°F -148.0 to -58.1°F	± (0.4%rdg+ 1°F) ± (0.4%rdg+ 1.8°F)
Type J	0.1°C	-50.0 to 1200.0°C -100.0 to -50.1°C	± (0.4%rdg+ 0.5°C) ± (0.4%rdg+ 1°C)
	0.1°F	-58.0 to 2192.0°F -148.0 to -58.1°F	± (0.4%rdg+ 1°F) ± (0.4%rdg+ 1.8°F)

**Note:** Above specifications tested under an environmental RF Field Strength lower than 3 V/M and a frequency lower than 30 MHz

## **Three-year Warranty**

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*Teledyne FLIR warrants this Extech brand instrument to be free of defects in parts and workmanship for **three years** from date of shipment (a six-month limited warranty applies to sensors and cables). To view the full warranty text please visit:*

<https://www.flir.com/support-center/warranty/instruments/extech-product-warranty/>.

## **Calibration and Repair Services**

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Teledyne FLIR offers calibration and repair services for the Extech brand products we sell. We offer NIST traceable calibration for most of our products. Contact us for information on calibration and repair availability.

## **Contact Customer Support**

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**Customer Support - Local Telephone List:**

<https://support.flir.com/contact>

**Obtain a Return Material Authorization (RMA):**

<https://customer.flir.com/Home>

**Contact Customer Service:**

<https://support.flir.com/ContactService>

**Technical Support Center:**

<https://support.flir.com>

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