

## STANDARD & INDUSTRIAL EXTERNAL TEMPERATURE/ HUMIDITY SENSOR

### INSTALLATION MANUAL

The External Temperature/Humidity Sensor (T/H Sensor), may be used with the Weather Monitor II<sup>®</sup>, GroWeather<sup>®</sup>, Energy EnviroMonitor<sup>®</sup>, and the Health EnviroMonitor<sup>®</sup>. The T/H Sensor enables you to display temperature and humidity-related conditions. For a complete list of the conditions you may display using the T/H Sensor, consult your station manual.

## Components

The T/H Sensor includes the following components. Please make sure you have all listed components before continuing.

◆ **Temperature/Humidity Sensor with cable**

The standard version comes with a 40' (12 m) cable. The industrial version comes with a 16' (5 m) shielded cable.

◆ **Five #4 x 1/2" pan headself-threading screws**

◆ **One #4 Flat Washer**

◆ **One Cable Clamp**

## Tools and Materials Needed

In addition to the components listed above, you will need the following tools and materials. Please be sure you have everything you need before beginning the installation.

◆ **Small Phillips-head screwdriver**

◆ **Drill and 1/16" to 3/32" (#43, 2 mm) drill bit.**

◆ **Cable clips or weather-resistant cable ties with screw holes or other means for mounting. Do not use staples.**

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## Testing the T/H Sensor

Be sure to test the sensor before installing it.

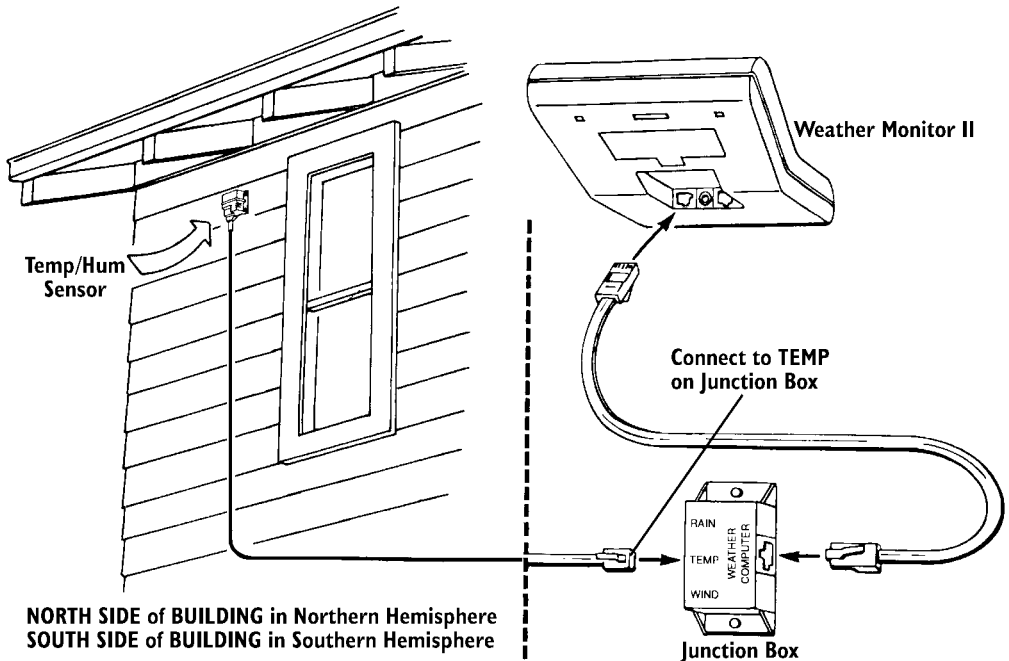
1. Attach the sensor cable to the appropriate connector on the junction box/sensor interface module (SIM). Refer to the T/H Sensor installation information shown below and on the following pages.
2. Press the appropriate key on your console as necessary to make sure you are getting an outside air temperature reading on the console.
3. Press the appropriate key on your console as necessary to make sure you are getting an outside humidity reading on the console.

## Installing the T/H Sensor

Follow the instructions in this section to install your sensor. Make sure you read “Choosing a Location for the T/H Sensor” on page 4 as it contains important information concerning placement of the sensor.

### Typical Weather Monitor II Installation

The illustration below shows a typical T/H Sensor installation for the Weather Monitor II.



*Typical Weather Monitor II installation*

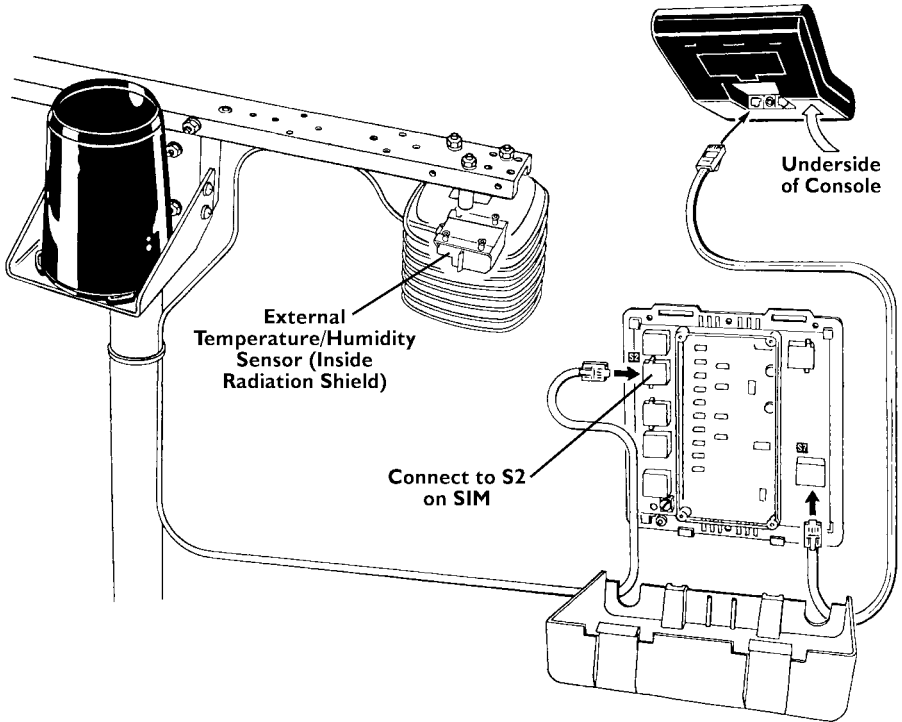
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**Note:** You may also use the Radiation Shield and Sensor Mounting Arm (pictured below) if desired.

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## Typical Standard GroWeather/EnviroMonitor Installation

The illustration below shows a typical Standard T/H Sensor installation for the GroWeather, Energy EnviroMonitor, or the Health EnviroMonitor.

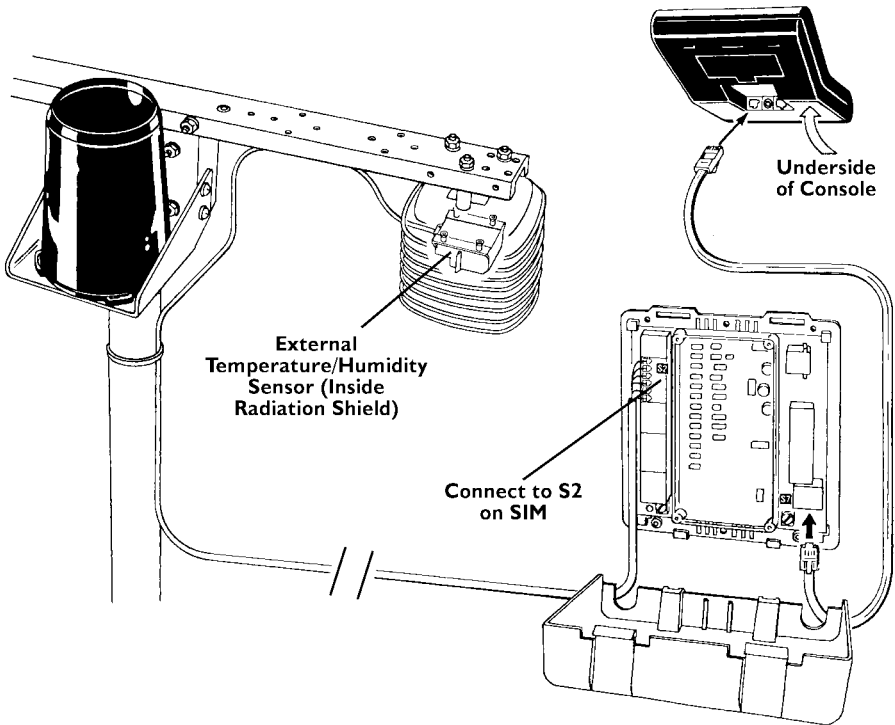


*Typical standard GroWeather/EnviroMonitor installation*

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## Typical Industrial GroWeather/EnviroMonitor Installation

The illustration below shows a typical Industrial T/H Sensor installation for the GroWeather, Energy EnviroMonitor, or the Health EnviroMonitor.



*Typical industrial GroWeather/EnviroMonitor installation*

## Choosing a Location for the T/H Sensor

Use the following suggestions to find a suitable location in which to mount the sensor. Care taken in choosing a location improves the accuracy, reliability, and durability of the sensor. The ideal location would be on the North side of the building in the Northern Hemisphere, or the South side in the Southern Hemisphere.

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**Note:** When you choose a location for the sensor, always take into consideration nearby objects. Objects which heat up in direct sunlight such as pavement, or that produce radiative cooling effects such as a fountain, may affect the temperature of the air in the vicinity which can affect the temperature and relative humidity readings from the sensor.

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Look for a location which satisfies the following requirements:

- ◆ Ideally, install the sensor in a Davis radiation shield.
- ◆ Place the sensor in a location shielded from rain and other sources of water such as rainfall runoff.

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**CAUTION:** *It is important that no water strike the sensor.*

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- ◆ Place the sensor in a location where it will not be in direct sunlight and where it will have limited exposure to reflected sunlight.

If possible, place the sensor at least 5 feet (1.5 m) from any surface which is exposed to direct sunlight because the heat from this surface may affect air temperature readings in the vicinity.

- ◆ Limit the exposure of the sensor to the open night sky.

If you are unsure about a location's exposure to the night sky, check for dew at that location on a light dewy morning. If the area is dry, the location should work well.

- ◆ Place the sensor in a location at least 10 feet (3 m) away from any lights or lamps.
- ◆ Place the sensor at least 5 feet (1.5 m) from man-made sources of heat, such as vents.
- ◆ Keep the sensor away from AC power lines.

Keep the sensor and most of the cable at least 10 feet (3 m) from 110 VAC, 60 Hz utility power. Do not run the sensor cable parallel to house wiring. Mount the sensor at least 30 feet (9 m) from high-voltage power lines and transformers.

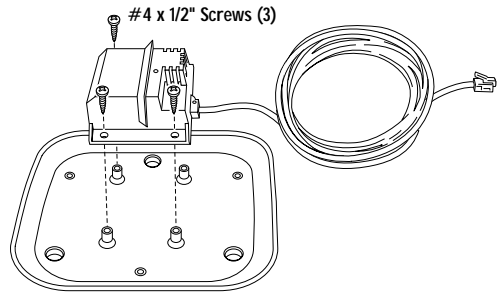
- ◆ When running the sensor cable, try not to run it across large metal objects (e.g., aluminum siding).

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## Mounting the T/H Sensor in a Davis Radiation Shield

In order to attach the External Temperature/Humidity Sensor (T/H Sensor) to the Radiation Shield, you will need to expose the Radiation Shield's closed plate. Refer to your Radiation Shield installation manual for complete instructions on mounting the Radiation Shield.

1. Position the T/H Sensor over the four mounting posts on the closed plate, lining up the holes in the mounting posts with the holes in the T/H Sensor's casing as shown.



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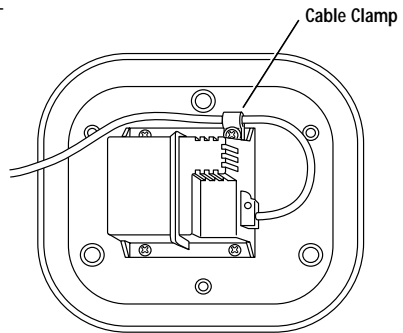
**Note:** Make sure you orient the T/H Sensor with the long side of the sensor parallel to the long side of the plate.

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2. Using three #4 x 1/2" pan head self-threading screws, attach THREE CORNERS of the T/H Sensor to the closed plate.  
Do not attach the final corner yet.
3. Place the cable clamp around the sensor cable approximately 4" (10 cm) from the T/H Sensor.

4. Attach the cable clamp to the remaining corner of the T/H Sensor and to the closed plate (using a #4 x 1/2" pan head self-threading screw and a #4 flat washer) so that a loop of cable is formed.

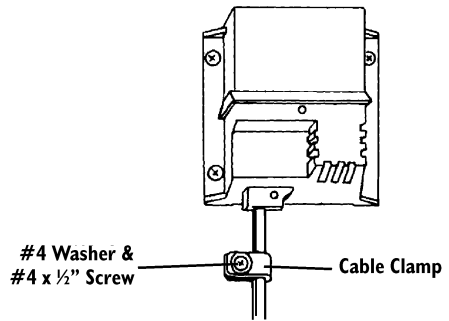
Make sure to mount the clamp with the flat side up and the bulge side down. Tighten the screw completely so that the cable cannot move within the cable clamp.



## Mounting the T/H Sensor without a Radiation Shield

1. If necessary, disconnect the sensor cable from the junction box/SIM.
2. Hold the sensor housing against the mounting surface and use a pencil to mark the location of the four holes on the sensor housing.
3. Use a 1/16" or 3/32" drill bit (2 mm) drill bit to make pilot holes in these locations.
4. Drive the four #4 x 1/2" pan head self-threading screws through the holes on the sensor housing and into the mounting surface.

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5. If using the industrial version of the sensor, secure the cable to the mounting surface using the cable clamp, a #4 x 1/2" screw, and a #4 washer.
  6. Connect the sensor cable to the junction box/SIM.



## Routing Sensor Cable

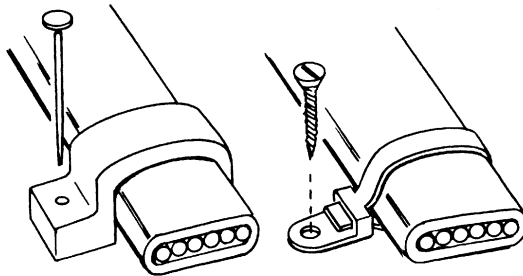
To prevent fraying or cutting of the cable where it is exposed to weather, it is important that you secure it so it doesn't whip about in the wind.

- ◆ Use cable clips or weather-resistant cable ties to secure the cable.
- ◆ Place clips or ties approximately every 3 to 5 feet (1 to 1.5 m).

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**CAUTION:** Do not use metal staples or a staple gun to secure cables. Metal staples—especially when installed with a staple gun—have a tendency to cut the cables.

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*Securing cable (standard cable shown)*

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**Note:** When running the sensor cable, try not to tug on the cable in such a way as to loosen the connections between cables. Also, make sure the sensor cable is not so taut that connections loosen or pull free due to the strain. Many sensor problems occur because cable connections come loose. If you need to check the cable connection to the sensor itself, see the section below.

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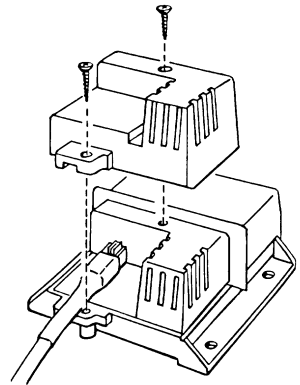
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## Detaching the Cable from the Sensor

If you ever need to remove the sensor or check the sensor cable's connection to the sensor and want to leave the cable in place when you do so, follow the procedure below.

### To Detach the Sensor Cable from the Sensor

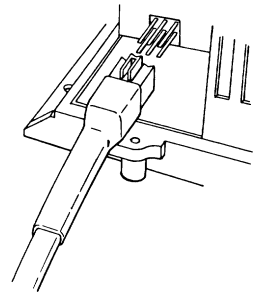
1. Remove the front piece of the sensor housing by removing the two screws on top of the housing.
2. Once the screws are out, lift the front piece away.  
Keep the screws and the front piece in a safe location until you reattach the front piece.
3. Detach the cable connector from the pin header by pulling straight back on the connector. Do not tug on the cable itself to detach the connector.



*Removing the front piece*

### To Reattach the Sensor to the Cable

1. If necessary, remove the front piece from the sensor as described above.
2. Making sure the tab is on top of the cable connector, slide the cable connector over the pins on the pin header.
3. Replace the front piece. Make sure the sensor cable runs through the cable slot created by the front piece and the sensor housing.
4. Secure the front piece by replacing the two screws.



*Connecting the sensor cable*

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## Displaying Dew Point on the Weather Monitor II

Follow the directions below to use the dew point function on your Weather Monitor II. For a description of dew point, consult the appropriate section of the Weather Monitor II manual.

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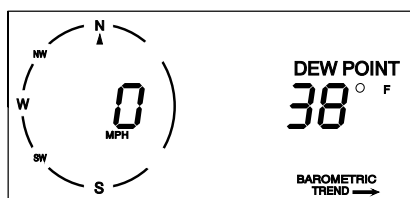
**Note:** Instructions for displaying dew point are contained in the GroWeather, Energy EnviroMonitor, and Health EnviroMonitor manuals.

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You may display dew point in either °F or °C. The Weather Monitor II records high and low dew points, and has an alarm to alert you when temperature comes within 2°F (1°C) of dew point.

### To Display the Current Dew Point

Press DEW. The dew point and the words DEW POINT appear on the display.



*Current dew point*

### To Change the Unit of Measure

1. Press DEW.
2. Press UNITS.

The console display switches from °F to °C or from °C to °F. To return to the previous format, press UNITS again

### To Display High and Low Dew Points

1. Press DEW.
2. Press RECL.

The high dew point appears. After a few seconds, the display will show the time the high was recorded, and then the date it was recorded.

3. Press RECL again.

The low dew point appears. After a few seconds, the display will show the time the low was recorded, and then the date it was recorded.

4. Press any key to exit.

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## To Clear High and Low Dew Points

1. Press DEW.
2. Press RECL once or twice to select the high or low dew point, as desired.
3. Press CLEAR and hold it down.

The value will flash several times. When the value stops flashing it means that the high/low has been cleared. It is not uncommon for another high/low reading to appear almost immediately. This is simply because the Weather Monitor II is constantly in the process of recording new highs and lows.

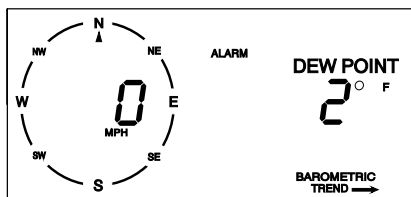
4. Press any key to exit.

High and low dew points are independent of each other. Clearing the high dew point does not clear the low dew point, and clearing the low dew point does not clear the high dew point. You must clear each dew point individually.

## To Set the Dew Point Alarm

1. Press DEW.
2. Press ALARM.
3. Press ENTER.

The display will show 2°F (1°C) which is the only possible setting for the dew point alarm.



*Dew point alarm*

4. Press any key to exit.

The alarm sounds if dew point and temperature are within 2°F (1°C).

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# Weather Monitor II Humidity Calibration Number

Versions of the Weather Monitor II manufactured after 1994 allow the user to set a calibration number (CAL) for outside humidity. To determine which version of the Weather Monitor II you have, look at the manufacturing code (Mfg. Code) on the underside of the console. If the manufacturing code begins with the letters "M" or "MB" (e.g., "MB30302F41") you will not be able to set CAL for Outside Humidity.

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**Note:** *The GroWeather, Energy EnviroMonitor, and Health EnviroMonitor allow the user to set a calibration number for outside humidity. See the appropriate manual for instructions.*

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Change CAL if you wish to adjust the Weather Monitor II's outside humidity reading. Note that a calibration number exists for outside humidity only.

Calibrated Outside Humidity = Outside Humidity + CAL

Default CAL = 0.

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**Note:** *For general information on CAL numbers, consult the Weather Monitor II manual.*

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## Troubleshooting

While your T/P Sensor is designed to provide years of trouble-free operation, occasional problems may arise. If you are having a problem with your unit, check the following troubleshooting tips before sending the T/P Sensor in for repair. If, after checking these procedures you are unable to solve the problem, contact Davis Technical Support for further instructions (See "Contacting Davis Instruments Technical Support" on page 12). Please do not return your unit for repair without receiving prior authorization.

### Troubleshooting Tips

- Carefully check all cable connections from the sensor to the console. Cable connections account for a large portion of the potential sensor problems.
- Connections should be firmly seated in the jacks and plugged in straight.
- If you think a connection may be faulty, try jiggling the cable while looking at the display. If a reading appears intermittently on the display as you jiggle the cable, the connection is faulty.

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## Contacting Davis Instruments Technical Support

If you have any questions about our products, please call Davis Technical Support. We'll be glad to help. Most questions can be answered while you're on the phone. You can also email us for support, or visit our website. Sorry, we are unable to accept collect calls.

Voice Line: 510-732-7814, Monday - Friday, 7:00 am - 5:30 pm, PST

Fax: Line 510-670-0589

Email: [support@davisnet.com](mailto:support@davisnet.com)

World Wide Web: [www.davisnet.com](http://www.davisnet.com)

## SPECIFICATIONS

### Temperature

Range: -50° to 140° F (-45° to 60° C)

Resolution: 0.1° F (0.1° C)

Accuracy:  $\pm 1^{\circ}\text{F}$  ( $\pm 0.5^{\circ}\text{C}$ )

### Humidity

Range: 0 to 100% RH

Resolution: 1% RH

Accuracy:  $\pm 3\%$

Product Numbers: 7859 & 7860

Davis Instruments Part Number: 7395.027

External Temperature/Humidity Sensor, Standard & Industrial

Rev. G Manual (3/13/2001)

This product complies with the essential protection requirements of the EC EMC Directive 89/336/EC.

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