Temperature Sensor Mounting for DataTime® Time & Temperature Displays

Temperature Sensor Overview

The temperature sensor enclosure is made up of eight plastic disks, a metal mounting bracket, and a 25' weather-resistant cable. Refer to **Figure 1**.

In most cases, the enclosure is mounted using two screws. The cable is plugged into the back of the display.

In certain cases, it may be necessary to disassemble the enclosure or rewire the temperature sensor board. Instructions are provided for those situations. If replacement or additional parts are needed, refer to the following chart for part numbers.
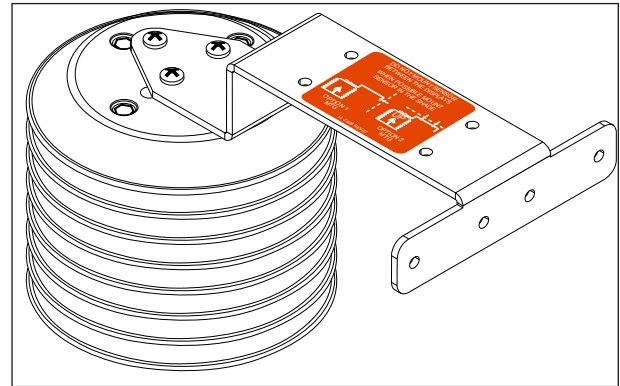

Figure 1: *Temperature Sensor with Mounting Bracket*

Part Description	Part Number
Temperature sensor housing	0A-1151-0005
Temperature sensor	0P-1247-0008
22 AWG 2-pair shielded cable	W-1234
4-pin Male Conxall cable	W-1819
30' extension cable	W-1820
100' extension cable	W-1821
200' extension cable	W-1822

Mounting Locations

For greater accuracy of temperature readings, follow these mounting recommendations:

- An ideal location is under a north eave or on a northern exposure away from direct sunlight. Refer to **Figure 4**.

- Mount the sensor above grass or vegetation rather than concrete or other paving.

- Mount at least 20' away from chimneys, vents, air conditioners, or other items that would influence correct temperature readings.

- Do not mount between displays or in any location that restricts air movement.

- Mount the sensor so that the cable can be protected from weather and vandalism.

The most common location for the temperature sensor is on the display cabinet, as shown in **Figure 2**, or on the display structure, as shown in **Figure 3**. A light-colored display is preferred in this location. Location of the sensor should be below or on a northern edge of the display to keep the sensor shaded, as shown in **Figure 4**.
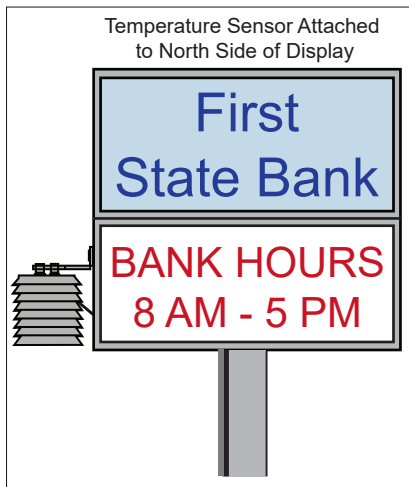

Figure 2: Located on Display

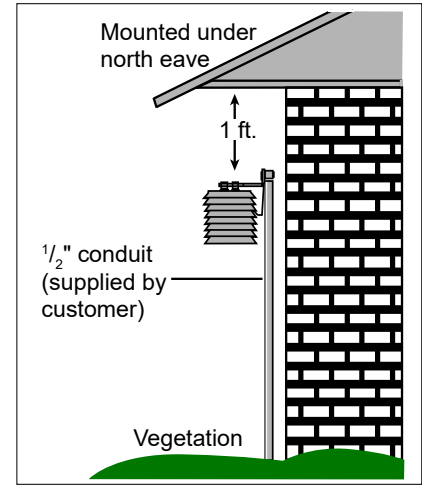*Figure 3: Located on Structure*

Figure 4: Located Under North Eave

When exposed to outdoor conditions, route cable through conduit. In cases such as this, extend the quick-connect cable or replace it with four-conductor, 22 AWG, shielded cable. The maximum length of the cable should be no more than 500'.

Mounting to a Sheet Metal Surface

When mounting the sensor to a sheet metal surface, follow these steps:

1. Drill two pilot holes using a 5/32" drill bit. Horizontally space the holes 1.5" apart.

2. Insert two self-drilling screws through the holes of the mounting bracket, and then screw them into the pilot holes.

3. Route cable up to the quick-connect jack on the back of the display and plug into **J31**.

Choosing the Host Display

The temperature sensor assembly is connected to the host display in a multiple-display installation. Any display can be designated as the host display by installing a protocol plug in the MASC driver. Refer to **Figure 5**.

If more than one Time and Temperature display is included in this installation, the temperature information runs through the signal wires from the host display to the following displays in the setup. No additional wiring is needed to carry temperature information.
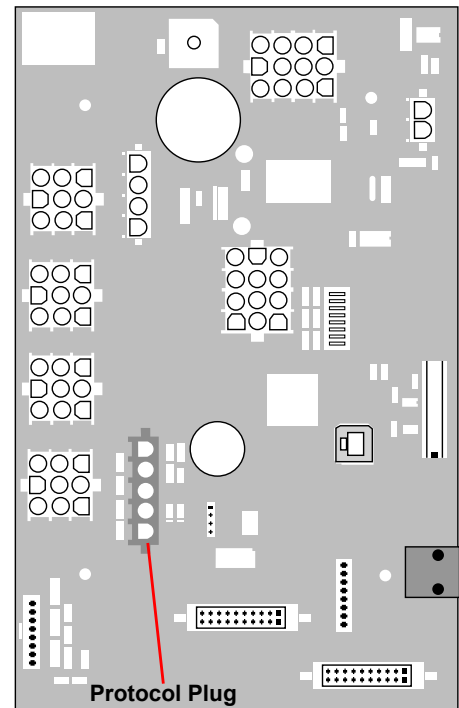

Protocol Plug

Figure 5: Protocol Plug Location

Temperature Sensor Cable Options

Using The Provided 25' Quick-Connect Cable

1. The temperature sensor is provided with a 25' weather-resistant cable. This cable does not need to be in conduit. The sensor connects to the quick-connect plug on the back of the display. Refer to **Figure 6** for the location of the quick-connect plug.

2. Secure any excess cable to discourage vandalism.

Between displays, the quick-connect signal cable connects both communication and temperature signal; therefore no additional wiring is required from display to display for the temperature sensor.

Figure 6: Quick-Connect Cable

Using The Quick-Connect Cable and Less Than 25' Cable

1. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Figure 10** for details on sensor housing disassembly.

2. Disconnect the quick-connect CAN temperature sensor cable from the temperature terminal block in the CAN temperature sensor housing.

3. Cut the cable to the desired length and reattach to the temperature sensor terminal block in the CAN temperature sensor housing. Refer to the table at right and **Figure 7** for the temperature sensor wiring.

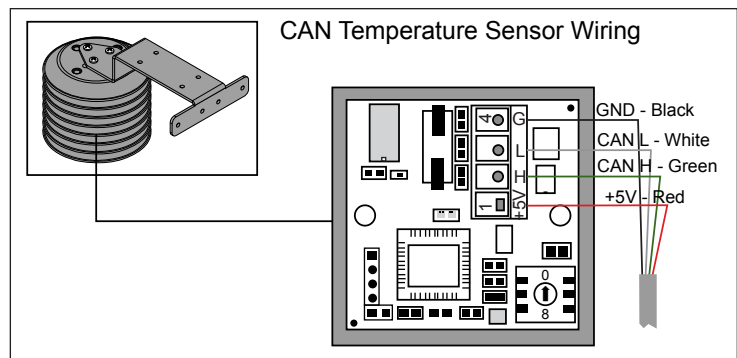4. Make sure to route cable around the sensor board as shown in **Figure 8**.

Figure 7: Temperature Sensor Connection

Wiring to Temperature Sensor		
Wire Color	**Terminal Block Pin Number**	**Function**
Red	Pin 1	+5 V
Green	Pin 2	CAN H
White	Pin 3	CAN L
Black	Pin 4	GND
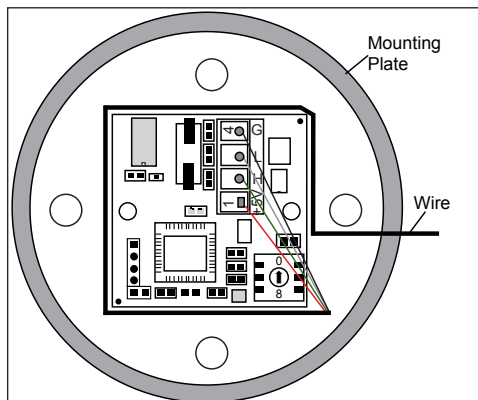
Figure 8: Wiring Around Sensor

5. Reconnect the cable and reassemble the sensor.

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Using More Than 25' of Cable

To meet customer needs, Daktronics has designed extension cables that allow extra length from the sensor to the display without separate rewiring. These cables contain the correct circular ends to be used with the quick-connect cable and quick-connect input. Refer to the parts list on **Page 1** for the cable options available.

If 22 AWG shielded cable is used instead of the cable extensions, follow these steps:

1. Run 1/2" conduit from the temperature sensor to a knockout on the back of the host display. The cable must be routed through 1/2" metal conduit that should be earth-grounded to protect the sensor and MASC driver from lightning damage.

2. Use a 2-pair 22 AWG individually shielded cable to connect the sensor to the 8-position terminal block in the display labeled CAN (TB1). Connect to the host display driver as shown in **Figure 9**.

3. Open the temperature sensor housing by removing the four nuts from the bottom and then removing the five bottom disks. Refer to **Figure 10** for details on sensor housing disassembly.

4. Disconnect the quick-connect temperature sensor cable from the terminal block in the temperature sensor housing.

5. Connect the cable coming from the host display driver to the temperature sensor board in the temperature sensor housing. Refer to **Figure 9** and table at right for wiring locations at the sensor and the driver.

Figure 9: CAN Temperature Sensor Connections

Connections from Temperature Sensor to Host Driver			
Temperature Sensor (TB1)	**Wire Color**	**Function**	**Host Driver (TB1)**
Pin 1	Red	+5 V	Pin 2
Pin 2	Green	CAN H	Pin 3
Pin 3	White	CAN L	Pin 4
Pin 4	Black	GND	Pin 5

6. Make sure to route cable around the sensor board as shown in **Figure 8**. Connect the cable and reassemble the sensor.

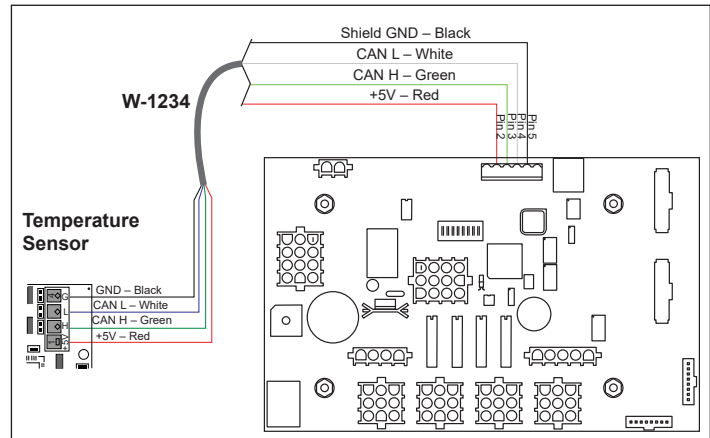**Note:** The cable length from the sensor to the display should not exceed 500'.

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Sensor Board Replacement

If a problem occurs with the temperature sensor board or the wiring to the sensor, follow these steps to access the board:

1. Open the temperature sensor housing by removing the four nuts from the bottom, and removing the five bottom disks. Refer to **Figure 10** for details on sensor housing disassembly.

2. Label the wires connected to the temperature sensor board, and then disconnect the cable from the temperature sensor terminal block in the temperature sensor housing.

3. Remove the two screws holding the board to the plastic disk. Install the new board, and replace the two screws.

4. Reconnect the cable to the temperature sensor board, making sure all the wire make a good electrical connection.

5. Make sure to route cable around the sensor board as shown in **Figure 8**, and reassemble the sensor enclosure.
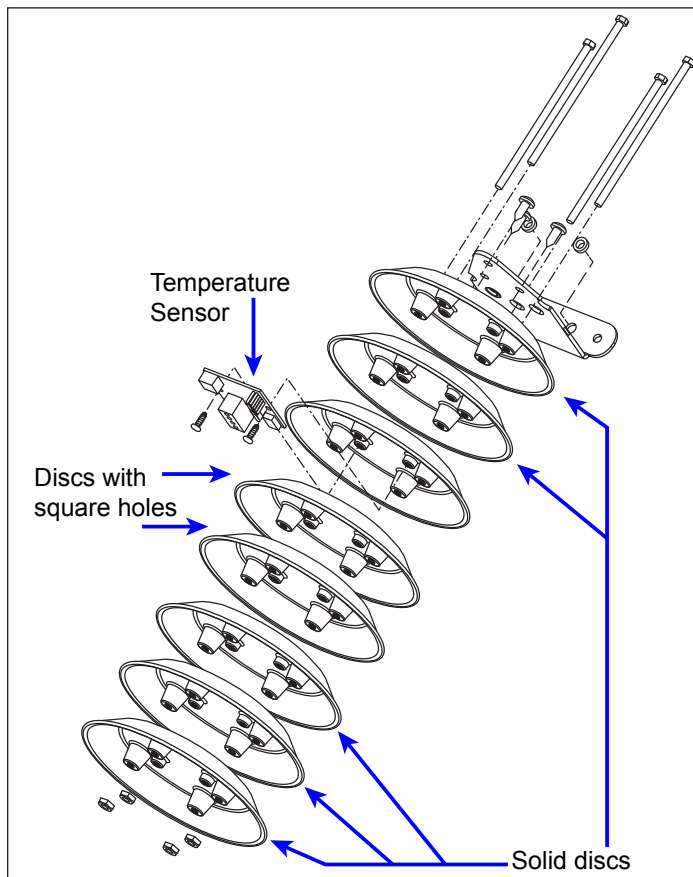

Figure 10: *Temperature Sensor Housing Disassembled*