

Futura Temperature Sensor (FTS-1) Installation Instructions

Description

Novar's Futura Temperature Sensor (Model FTS-1) is a precision electronic sensor designed for maximum operation. It features the following items:

- A timed override button can be used to override the scheduled off mode for a software-specified period of time.

NOTE! The rounded, bottom portion of the timed override button must be pushed to activate the override. Pushing the top part of the button will have no effect.

- A light-emitting diode (LED) status indicator located directly below the timed override button flashes according to the schedule mode.
 - During the scheduled off mode, the LED is off and flashes on briefly when communicating with the executive module.
 - During the scheduled on mode, the LED is on and flashes off briefly when communicating with the executive module.

The high degree of accuracy and stability of the FTS-1 is achieved by eliminating the circuit's self-heating effect (by placing the self-heating components off-board in a component shield).

NOTE! To ensure proper sensor operation, the pigtail must not be damaged during installation.

Specifications

Power Requirements

Compliance Voltage: 16V to 35V

Output

4 mA to 20 mA

Accuracy of Reading

1 F (0.556 C)
Over 50 to 90 F (10 to 32 C) of stated temperature range

Controlling Range

Temperature: 20 to 120 F (–7 to 49 C)



Physical Dimensions

Width: 3¹/₈ inches
Height: 2¹/₈ inches
Depth: 1¹/₈ inches (at its deepest point)

Precautions

Observe all national and local electrical codes during installation.

Wiring the FTS-1

NOTE! The wiring connections to the sensor must be made *before* it is mounted. If the optional adapter plate is used, the plate must be mounted first so that the wires can be pulled through the middle of the plate before they are connected to the sensor. Novar's *Futura Adapter Plate Installation Instructions* (Doc. No. 560300000) provide instructions for mounting the plate.

The FTS-1 is designed for use with the following Novar modules:

- Savvy[®]
- Hawki[®]
- Executive Controller (EC)
- ETM-2010
- ETM-2020
- ETM-2024
- ETM-2040
- Input/Output Module (IOM)
- Input/Output Module 2 (IOM/2)
- MinIO

The wiring connections depend upon which module is being used and are outlined in Table 1. Refer to Figure 1, as necessary, when making the wiring connections.

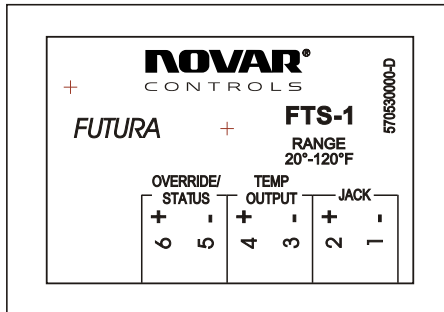


Figure 1. FTS-1 label located on the back of the sensor, next to the input connections

Table 1. FTS-1 Wiring Connections

MODULE TYPE	TEMPERATURE OUTPUT CONNECTIONS	OVERRIDE/STATUS CONNECTIONS
Savvy	<p>Connect to any of the Savvy's eight Class 2 inputs (Terminals 42–57). Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the positive (+) on the Savvy input. ■ Futura Terminal 3 (-) to the negative (-) on the Savvy input. 	<p>Connect to the Savvy at the Remote Override Inputs (Terminals 23–38) that correspond with the Savvy output option to be overridden. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 6 (+) to the Remote Override Input Terminal number that corresponds with the output being overridden. ■ Futura Terminal 5 (-) to the GND terminal adjacent to the Remote Override Input.
Hawki	<p>Connect to the Supply Air Temperature, Return Air Temperature, or Mixed Air Temperature. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the Current Loop (+) terminal of the Hawki. ■ Futura Terminal 3 (-) to the Supply Air Temperature Terminal 14, the Return Air Temperature Terminal 16, or the Mixed Air Temperature Terminal 18, as required. 	<p>Connect to the Hawki Timed Override input, Terminal 34. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 6 (+) to Terminal 34 of the Hawki. ■ Futura Terminal 5 (-) to any of the Common terminals (Terminals 29, 32, 35, or 38) of the Hawki.
Executive Controller	<p>Connect to any of the EC's eight Class 2 inputs (Terminals 42–57). Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the positive (+) on the EC input. ■ Futura Terminal 3 (-) to the negative (-) on the same EC input. 	<p>Connect to the EC Remote Override Inputs (Terminals 23–38) that correspond to the EC output number to be overridden. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 6 (+) to the Remote Override Input number that matches the output number being overridden. ■ Futura Terminal 5 (-) to the GND terminal adjacent to the Remote Override Input.
ETM-2010	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 3 (-) to ETM Terminal 9 (-). ■ Futura Terminal 4 (+) to ETM Terminal 10 (+). 	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 5 (-) to ETM Terminal 12 (-). ■ Futura Terminal 6 (+) to ETM Terminal 11 (+).
ETM-2020, ETM-2024	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 3 (-) to ETM Terminal 17 (-). ■ Futura Terminal 4 (+) to ETM Terminal 18 (+). 	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 5 (-) to ETM Terminal 16 (-). ■ Futura Terminal 6 (+) to ETM Terminal 15 (+).
ETM-2040	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the ETM Violet wire. ■ Futura Terminal 3 (-) to the ETM Gray wire 	<p>No remote override connections.</p> <p style="text-align: right;"><i>continued</i></p>

Table 1. FTS-1 Wiring Connections		
MODULE TYPE	TEMPERATURE OUTPUT CONNECTIONS	OVERRIDE/STATUS CONNECTIONS
Input/Output Module (IOM)	<p>Connect to any of the IOM's eight Class 2 inputs on TB 3 (Terminals 35–50). Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the IOM Input positive (+). ■ Futura Terminal 3 (–) to the same IOM Input negative (–). 	<p>Connect to the IOM Override Input (Terminals 54–68 on the optional remote override board) that matches the IOM output number to be overridden. See the IOM instructions for information about installing the remote override board. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 6 (+) to the Override Input number that matches the output number being overridden. ■ Futura Terminal 5 (–) to the GND terminal adjacent to the Override Input.
Input/Output Module 2 (IOM/2)	<p>Connect to any of the IOM/2's eight Class 2 inputs (Terminals 31–46). Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to the IOM/2 Input positive (+). ■ Futura Terminal 3 (–) to the same IOM/2 Input negative (–). 	<p>Connect to the IOM/2 Override Input (on the optional remote override board) that matches the IOM/2 output number to be overridden. See the IOM/2 instructions for information about installing the remote override board. Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 6 (+) to the Override Input number that matches the output number being overridden. ■ Futura Terminal 5 (–) to any of the three GND terminals on the override board.
MinIO	<p>Connect a wire from:</p> <ul style="list-style-type: none"> ■ Futura Terminal 4 (+) to MinIO source. ■ Futura Terminal 3 (–) to MinIO input. 	No remote override connections.

Mounting the FTS-1

Before the sensor is mounted, the wiring connections should be checked to verify that they are correct and secure.

The FTS-1 should be mounted horizontally on an interior wall in an area with ample air circulation. The location should be free from drafts and sudden temperature changes. The sensor comes fully assembled. Mounting the sensor involves:

- Removing its cover.

A cover locking screw is located at the bottom of the sensor on the right side (see Figure 2). The locking screw should be removed (a Phillips screwdriver will be needed). Then, the right side of the sensor case should be lifted carefully and the cover removed.

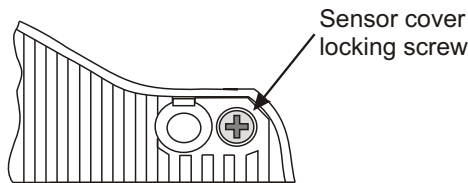


Figure 2. Bottom right corner of the sensor

- Mounting the sensor to one of the following options:
 - A wall.
 - The optional adapter plate over a 2-inch by 4-inch utility box.
 - A 1½-inch by 2½-inch thermostat rough-in box.

Procedures for each option are provided below. The mounting holes used for each of these options are shown in Figure 3.

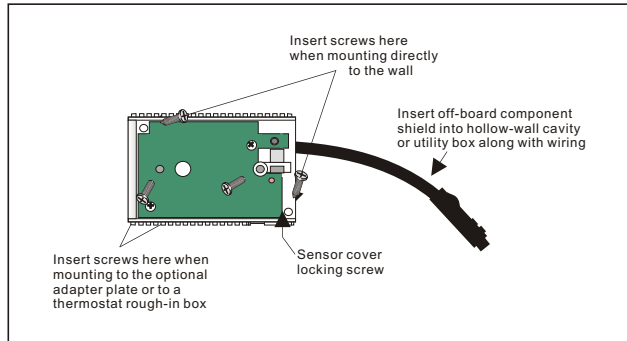


Figure 3. FTS-1 mounting options

- Replacing the cover.

Once the sensor is wired correctly and mounted securely to the wall or adapter plate, the cover should be reappplied by:

- Sliding the left side of the cover on first. The small lip on the cover should catch under a corresponding lip on the sensor case.
- Pushing down the right side of the cover.
- Inserting the cover locking screw into the hole on the bottom of the sensor so that it catches the threaded insert inside the sensor and tightening until secure.

Mounting the Sensor Directly to the Wall

The following procedure should be used to mount the FTS-1 directly to a wall.

Step	Procedure
1	Position the base of the uncovered sensor against the wall and mark the location of the two corner mounting holes (see Figure 3).
2	Drill holes in the marked locations and install hollow-wall anchors, if necessary.
3	Position the sensor's base over the holes, feeding the component shield with the wiring through the hole in the wall, and tighten the screws into the fasteners until the sensor is secure. <ul style="list-style-type: none"> ■ Use two appropriate #6 screws for mounting.

Mounting the Sensor to the Adapter Plate

Before the FTS-1 can be installed over a utility box, the adapter plate must be mounted to the box (see Novar’s *Futura Adapter Plate Installation Instructions*, Doc. No. 560300000). The two pan-head machine screws that are included with the adapter plate can be used for attaching the sensor to the plate.

The following procedure should be used to mount the sensor to the adapter plate.

Step	Procedure
1	Match the mounting holes on the sensor to the holes with the threaded inserts on the adapter plate (see Figure 3).
2	Feed the component shield with the wiring through the center hole of the adapter plate.
3	Insert the pan-head machine screws that were included with the adapter plate and tighten the screws until the sensor is secure.

Mounting the Sensor to the Thermostat Rough-in Box

The following procedure should be used to mount the sensor to the thermostat rough-in box.

Step	Procedure
1	Match the mounting holes on the sensor with the appropriate holes on the rough-in box.
2	Feed the component shield with the wiring into the rough-in box.
3	Insert #6 pan-head or flat-head machine screws into the mounting holes and tighten until the sensor is securely attached to the rough-in box.

Model and Part Numbers

The part numbers in Table 2 should be used to order the appropriate Novar parts.

PRODUCT	MODEL NO.	PART NO.
Futura Temperature Sensor Baseplate	FTS-BPL	732900000
Futura Temperature Sensor (20°–120°F)	FTS-1	732203000

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