

ETM-3051T Mounting & Wiring Instructions

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Introduction

Electronic Thermostat Modules (ETMs) are Logic One® intelligent control modules distributed throughout a building to provide local direct digital control of unitary, packaged, staged HVAC systems. The ETM-3051T controls the fan, two stages of heating, two stages of cooling, and the damper.

In addition to the typical connections for discharge and return air (or space) temperature sensors, the ETM-3051T provides a connection for a third temperature sensor that controls the space temperature. This sensor provides the option of programming a fall-back control mode of operation. The fall-back mode of operation is programmed in Novar’s software to switch control to the return air sensor if the signal is lost from the switch-over sensor.

This document provides the installation procedures for mounting the ETM-3051T, connecting power, making the appropriate wiring connections, setting the module address, and verifying installation.

NOTE!



If needed, instructions for wiring sensors to the older ETM-3051 can be found in Novar’s ETM-3051 Installation Instructions, available in the Documents folder on the Novar Software Package CD.

Specifications

Agency Approvals

Listed device: CUL/UL E90949
Standards used: UL 916, Energy Management Equipment
CSA C22.2, No. 205-M1983, Signal Equipment

Power Requirements

Voltage (Input): 24 VAC, 50/60 Hz, Class 2
Consumption: 10VA
Relay Contacts (Output): 24 VAC, 1A, Class 2

Operating Environment

Temperature: -40 to 158 F (-40 to 70 C) Humidity: 0% to 90%
Relative, noncondensing

Storage

Temperature range: -40 F to 185 F (-40 C to 85 C)
0% to 90% Relative, noncondensing

Physical Dimensions

Height: 5.9 inches Width: 7.5 inches Depth: 1.625 inches
Weight: 1 lb

Precautions

Take the following precautions during installation:

CAUTION!



Observe national and local electrical codes.

CAUTION!



Do not connect 115 volts to any terminal of the ETM-3051T.
The ETM-3051T is a Class 2 (low voltage) control device.

Do not use the ETM-3051T as a final safety device.

Observe voltage and current limits marked on the module.

Replacing ETM-3051 with ETM-3051T

The ETM-3051T can be used to replace the older ETM-3051. Its mounting footprint, sensors, and terminal strip locations can be transferred directly—no changes are necessary. The new ETM-3051T is designed to use thermistor temperature sensors (hence, the “T” in the model number); however, in replacement situations, it will automatically detect and work with the temperature sensors that were installed with the

older ETM-3051.

The following procedure should be used to replace an ETM-3051.

Step	Procedure
1	Set the address switch of the new module to match the address of the old module.
2	Remove the terminal strip and mounting screws of the old module.
3	Position the replacement module (the new ETM-3051T) in the same mounting location (using the same mounting holes) as the older module and insert and tighten the mounting screws to secure the module.
4	Replace the removable wiring terminal strip. <ul style="list-style-type: none"> • Double check the names of the inputs on the label throughout the installation process.
5	Verify that the ETM-3051T is operating properly.

Mounting the ETM-3051T

Novar recommends mounting the ETM-3051T horizontally with the terminal strip at the bottom of the module; however, the module can be mounted vertically. Make sure that the module and the mounting hardware do not interfere with proper operation of the equipment.

Refer to Figure 1 and use the following procedure to mount the ETM-3051T to the wall of the control panel.

Step	Procedure
1	Turn off power to the HVAC equipment and the ETM-3051T before installing the unit.
2	Position the module against the mounting surface and mark the surface to show the location of the four corner mounting holes.
3	Drill the holes in the places marked on the mounting surface and, if necessary, install hollow-wall anchors.
4	Position the module against the mounting surface and insert and tighten screws (not included) to secure the module.

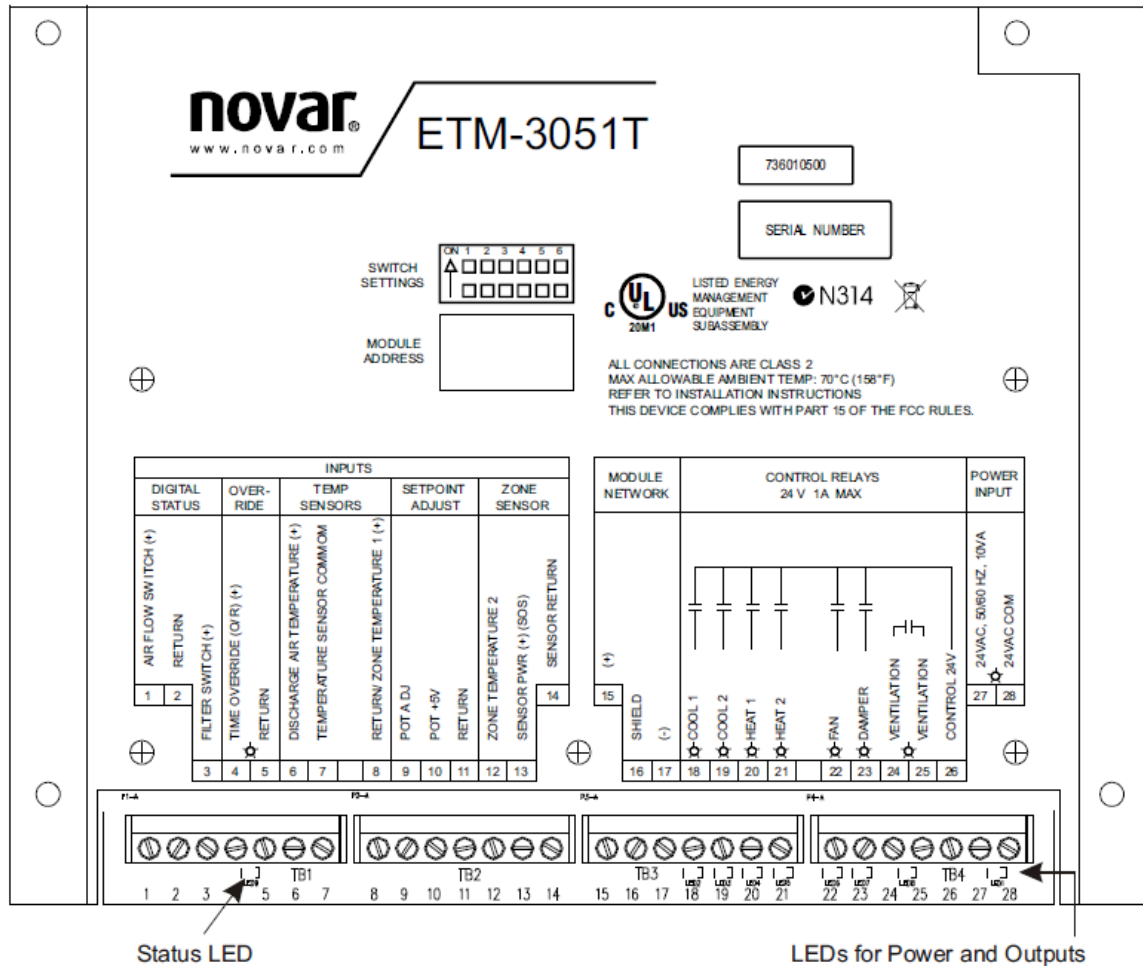


Figure 1. ETM-3051T board

Supplying the ETM-3051T with Power

The ETM-3051T requires 24-volt AC power, with a consumption rating of 10VA. Connect the 24-VAC to Terminals 27 and 28, labeled “Power Input, 24 VAC, 50/60 Hz, 10VA” and “24VAC COM.” One control transformer can be used to power multiple modules within the restrictions of the rating of the control transformer.

NOTE!



If the secondary winding of the transformer is grounded, the grounded leg of the transformer must be connected to Terminal 28 ((24VAC COM) and a jumper wire (as short as possible) must be installed between Terminals 11 and 28.

Wiring the ETM-3051T

Inputs

The ETM-3051T uses removable screw connections. The inputs are Terminals 1 through 14. Refer to the terminal descriptions on the shield of the ETM-3051T (see Figure 1) to ensure proper wiring connections.

Air Flow Switch Input

Terminals 1 and 2 are for the Air Flow Switch input. This is a dry contact, digital input and is connected as normally open with the contacts closing when the fan is on. The following procedure should be used to connect the Air Flow Status Input.

Step	Procedure
1	Connect one wire from the air flow switch to the module at Terminal 1.
2	Connect the second wire from the air flow switch to Terminal 2.

Filter Status Input

Terminals 2 and 3 are for the Filter Status input. This is a dry contact, digital input and is connected as normally open with the contacts closing when the filter is dirty. Use the following procedure to connect the Filter Status input.

Step	Procedure
1	Connect one wire from the dirty filter switch to the module at Terminal 2.
2	Connect the second wire from the dirty filter switch to the module at Terminal 3.

Timed Override Switch

An optional momentary contact switch can be connected for use as a timed override. Use the following procedure to connect a timed override switch.

Step	Procedure
1	Connect one wire to Terminal 4.
2	Connect the other wire to Terminal 5.

The override switch can have a status light-emitting diode (LED). The time period that the override stays in effect is defined in the software.

If Novar's Futura Zone Temperature Sensor (Model FTS-4 or FTS-4A) is used, connections for the timed override are on Terminals 5 and 6.

Zone, Return Air, and Discharge Air Temperature Sensors

The ETM-3051T temperature inputs are designed for use with standard 10,000-ohm, Type II thermistors. In a wall-mount configuration, Novar's FTS-4 or FTS-4A would be appropriate. For a duct-mount configuration, Novar's 4-inch duct-mountable Thermistor Temperature Sensor (Part No. TS-2004-FA-10-AA) would be appropriate.

Thermistors are not polarity sensitive; the two wires of the sensors can be hooked to the two wiring terminals for each temperature sensor input as follows:

- **Temperature Sensor Common and Return/Zone Temperature 1 (+):** Terminals 7 and 8
- **Zone Temperature 2 and Sensor Return:** Terminals 12 and 14
- **Discharge Air Temperature Sensor (+) and Temperature Sensor Common:** Terminals 6 and 7
- Novar's FTS-4A potentiometer: Connect FTS-4A Terminals 5, 7, and 8 to
- ETM-3051T Terminals 5, 9, and 10 respectively

Zone Temperature Sensors Software Notes:

The ETM-3051T can be controlled to one zone temperature sensor, or it can be configured to control to a zone sensor and provide "fall-back" control to a second sensor in case the first sensor fails.

- If just one sensor is used for control, the sensor will be connected to the terminals labeled **Temperature Sensor Common and Return/Zone Temperature 1 (+)** (Terminals 7 and 8).
- If two sensors are used for control, the ETM will control to the terminals labeled **Zone Temperature 2 and Sensor Return** (Terminals 12 and 14) and **fall-back** to **Return/Zone Temperature 1 (+)**.

NOTE!



As stated earlier, if the secondary winding of the power (control) transformer is grounded, a jumper wire must be installed between Terminals 11 and 28 to prevent fluctuations of the temperature readings.

FTS-4A Setpoint Adjustment Potentiometer

The FTS-4A setpoint adjustment potentiometer can be connected to the ETM-3051T at Terminals 9, 10, and 11 for remote setpoint control adjustment.

The following procedure should be used to connect an auxiliary potentiometer.

Step	Procedure
1	Connect FTS-4A Terminal 7 (“Aux Pot Adj”) to the ETM-3051T Terminal 9 (“Pot Adj”).
2	Connect FTS-4A Terminal 8 (“Aux Pot +5V”) to ETM-3051T Terminal 10 (“Pot +5V”).
3	Connect FTS-4A Terminal 5 (“Override Status, – (Ret)”) to ETM-3051T Terminal 11 (“Return”).

Outputs

The ETM-3051T provides seven digital outputs at Terminals 18 through 26 (Figure 2).

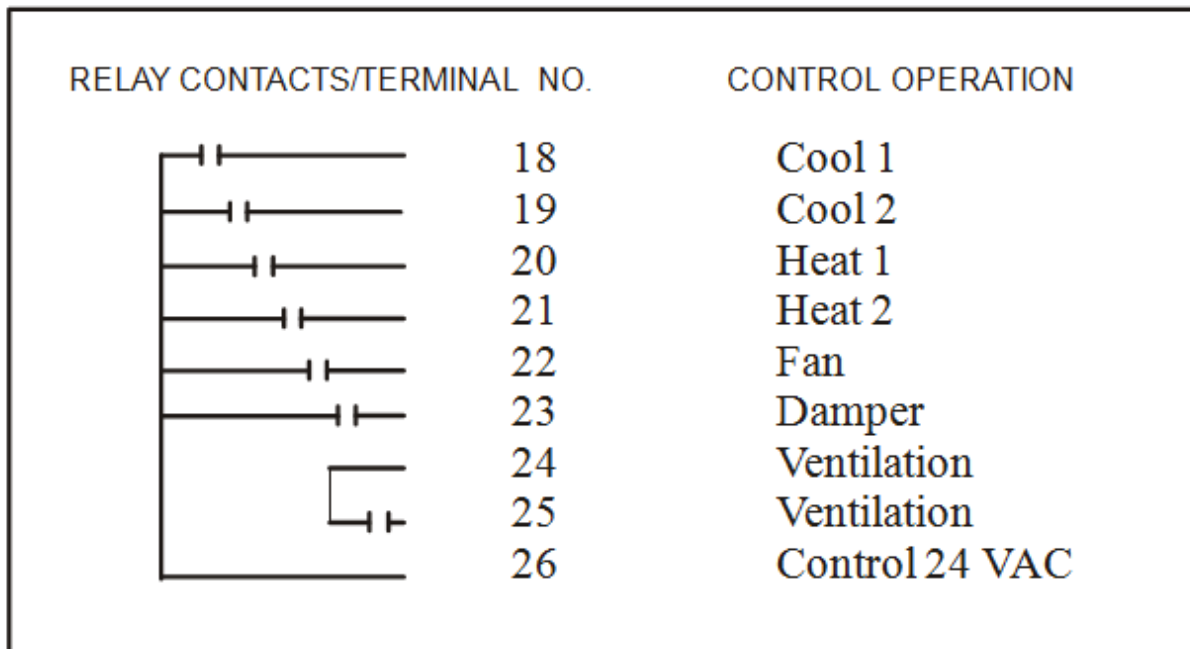


Figure 2. ETM-3051T outputs

Make the appropriate wiring connections from these terminals to the devices being controlled. The status of the digital relay outputs is shown by seven relay output status LEDs located next to the terminal strip. The relay output status LEDs match the status of the relay.

- If the contact is closed, the relay is energized, and the LED is on.
- If the contact is open, the relay is de-energized, and the LED is off.

Terminal 26 is for one side of a 24-VAC source to be regulated (switched) through the relay outputs. The outputs are isolated from the other connections to permit the use of an additional power source. The

transformer powering the module can be used if it has enough capacity. Each relay is rated at 24 VAC, 1A.

NOTE!

The Ventilation connections are isolated from the other outputs and do not use the 24-VAC source.

Module Network Communications

A suitable shielded cable (Belden 8761, Novar WIR-1010, or equivalent) should be used to make the communication connections between the ETM-3051T and the module communication terminals of the system's executive module.

On the ETM-3051T, the connections are Terminals 15, 16, and 17. Make certain that the positive (+) and negative (-) connections are made to the correct terminals on the ETM-3051T and the executive module.

CAUTION!

The shield connection is not a ground. It is dedicated for communications only. Do not connect any other grounds to the Shield connection (Terminal 16).

Setting the Module Address Switches

Every Logic One module must have a unique address for the executive module to identify it. Addresses are assigned in the software during system programming. The system printout will show the address of the ETM-3051T being installed.

The address switch is located near the center of the shield (see Figure 1). The switches should be set to match the address as indicated in Figure 3, and the address settings should be recorded on the module shield label.

NOTE!

The address switches should only be changed while the ETM-3051T is powered down.

Address 00 may not be used by the ETM-3051T when operating on an EC or Savvy®. (The IOM section uses address 00.)

ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS
00	ON ↑ TTTTTT	16	ON ↑ TTTTTT	32	ON ↑ TTTTTT	48	ON ↑ TTTTTT
01	TTTTTT	17	TTTTTT	33	TTTTTT	49	TTTTTT
02	TTTTTT	18	TTTTTT	34	TTTTTT	50	TTTTTT
03	TTTTTT	19	TTTTTT	35	TTTTTT	51	TTTTTT
04	TTTTTT	20	TTTTTT	36	TTTTTT	52	TTTTTT
05	TTTTTT	21	TTTTTT	37	TTTTTT	53	TTTTTT
06	TTTTTT	22	TTTTTT	38	TTTTTT	54	TTTTTT
07	TTTTTT	23	TTTTTT	39	TTTTTT	55	TTTTTT
08	TTTTTT	24	TTTTTT	40	TTTTTT	56	TTTTTT
09	TTTTTT	25	TTTTTT	41	TTTTTT	57	TTTTTT
10	TTTTTT	26	TTTTTT	42	TTTTTT	58	TTTTTT
11	TTTTTT	27	TTTTTT	43	TTTTTT	59	TTTTTT
12	TTTTTT	28	TTTTTT	44	TTTTTT	60	TTTTTT
13	TTTTTT	29	TTTTTT	45	TTTTTT	61	TTTTTT
14	TTTTTT	30	TTTTTT	46	TTTTTT	62	TTTTTT
15	OFF ↓ TTTTTT	31	OFF ↓ TTTTTT	47	OFF ↓ TTTTTT	63	OFF ↓ TTTTTT

Figure 3. ETM-3051T address settings

Checking Installation

After the ETM-3051T has been installed, the following items should be checked to ensure proper operation.

Overall operation

Power to the ETM-3051T, the HVAC system, and its control circuitry should be restored. If the executive module for the Logic One system is operating properly, the ETM-3051T will perform a self-diagnostic check, establish communications with the executive module, and begin to control the HVAC unit.

Schedule Status

Indicator LED

A schedule status indicator LED is located on the module's circuit board, next to Terminals 4 and 5. If the module is communicating properly, this LED should be flashing according to the schedule mode.

- When the ETM-3051T is in scheduled off mode, the LED is off and flashes on briefly when communicating.
- When the ETM-3051T is in scheduled on mode, the LED is on and flashes off briefly when communicating.

Timed Override Switch

If a timed override switch has been installed and programmed, it can be tested for proper operation by pressing it during a scheduled off mode. The LED flashes rapidly until the override period ends.

Output Status LEDs

The seven relay output status LEDs indicate the status of each active digital output. Verify that the LEDs are lit when the corresponding digital output is on.

Check the executive module for alarm messages.

If any faults or malfunctions still exist, they are picked up by the executive module and announced by alarm messages. The executive module display should be monitored during the test procedures. The ETM-3051T's setpoints can be altered from the keypad or touchscreen of those executive modules that have them, and the status display can be monitored for proper equipment response.

Model & Part Numbers

The part numbers provided in the table should be used to order the appropriate Novar parts.

Table1: Novar Part Numbers

Product Name	Part No.	
Electronic Thermostat Module ETM-3051T	ETM-3051T	736010500
Thermistor Temperature Sensor (4-inch duct-mountable)	—	TS-2004-FA-10-AA
Futura Temperature Sensor (wall-mount)	FTS-4	732503000
Futura Temperature Sensor (wall-mount with temperature setpoint adjustment)	FTS-4A	732501000
Two-Conductor, shielded cable (Belden 8761 equivalent)	WIR-1010	709001000
Indoor Air Quality Monitor	CO2S	770071000

Regulatory Compliance

This device has been tested and found to be in compliance with the requirements set forth in UL 916, Energy Management Equipment, and is listed by Underwriters Laboratories, Inc., for installations in the United States.

This device has been tested and found to be in compliance with the requirements set forth in C22.2, No. 205-M1983, and is Certified by Underwriters Laboratories, Inc., for installations in Canada.

Federal Comms. Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 Subpart B of the FCC Rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case, users at their own expense will be required to take whatever measures may be required to correct the interference. Any unauthorized modification of this equipment may result in the revocation of the owner's authority to continue its operation.

Canadian Dept. of Comms. (DOC)

NOTE!



This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Waste Electrical & Electronic Equip.

NOTE!



Customers are advised to dispose of this product at the end of its useful life according to applicable local laws, regulations, and procedures.

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