

ETM-2040 Installation Instructions

Regulatory Compliance

Safety

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, Signal Equipment, and is Certified by Underwriters Laboratories, Inc., for installations in Canada.

Electromagnetic Compatibility (EMC)

Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE! This device has been tested and found to comply with the limits established for Class A digital devices. It is intended to be used in a commercial environment. Operation of this equipment in residential environments may cause harmful interference, in which case the user may be required to correct the interference at his own expense.

CAUTION! Any changes or modifications not expressly approved by Novar Controls Corporation could void your authority to operate this equipment.

Industry Canada

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003, of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller: *Appareils Numériques*, NMB-003, édictée par l'Industrie Canada.

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Description

The Electronic Thermostat Modules (ETMs) are Logic One® intelligent control modules that can be distributed throughout a building to provide local direct digital control of unitary, packaged, staged HVAC systems. The ETM-2040 is a wall-mount module that must be mounted in the space being controlled because the sensor is connected directly to the module. One *additional* remote temperature sensor and a digital dirty filter switch can be wired to the ETM-2040.

This document provides instructions for mounting the ETM baseplate, wiring the module, setting the address, installing the electronics, and checking the installation.

ETM-2040 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:	24 VDC, Class 2
Current:	75 mA

Operating Environment

Temperature:	32° to 122°F (0° to 50°C)
Humidity:	0 to 95% Relative, noncondensing

Physical Dimensions

Height:	4.875 inches
Width:	7.093 inches
Depth:	1.75 inches
Weight:	1 lb

Precautions

Take the following precautions during installation:

- Observe national and local electrical codes.
 - Observe voltage and current limits marked on the module.
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Mounting the ETM-2040 Baseplate

The ETM-2040 baseplate should be mounted horizontally, approximately 5 feet above the floor, in an area that is free from drafts and sudden changes in temperature. The baseplate may be mounted to an electrical junction box or directly to a wall or panel.

NOTE! When the baseplate is mounted to paneling or drywall, hollow-wall anchors should be used. When it is mounted to a cement block or brick wall, a 3/8-inch to 1/2-inch layer of insulation should be used between the wall and the baseplate.

Use the following procedure and refer to Figure 1, as necessary to mount the baseplate.

Step	Procedure
1	Turn off all power to the HVAC equipment before mounting the baseplate.
2	Position the baseplate against the mounting surface and mark the surface to show the location of the four screw holes in the corners of the baseplate. <hr/> <p>NOTE! To mount the baseplate to a junction box, use the two holes located directly above and below the large hole through which the wires will pass.</p> <hr/>
3	Drill holes in the locations marked on the mounting surface and insert hollow-wall anchors (and insulation, if necessary).
4	Position the baseplate over the screws.
5	Tighten the screws to secure the baseplate.

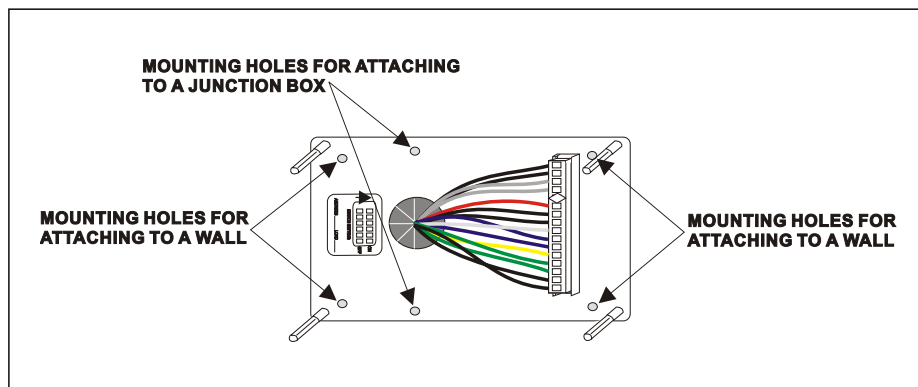


Figure 1. Mounting the baseplate

Supplying the ETM-2040 with Power

Connect the ETM-2040 to a suitable 24-VDC power supply. Connect the positive (+) and negative (-) power terminals to the appropriate wire as indicated in Table 1.

Wiring the ETM-2040 Control Outputs

Use the wire nuts provided and the wiring scheme outlined in Table 1 to connect the ETM-2040 baseplate wires to the HVAC control/interface equipment.

CAUTION! Make sure the wiring is connected properly to prevent permanent damage to the system.

Table 1. ETM-2040 Wiring Scheme	
PIN NUMBER/COLOR	FUNCTION
1 White/Blue	Heat Stage 2
2 White	Heat Stage 1
3 White/Black	Module Communication (-)
4 White/Red	Module Communication (+)
5 Dark Blue	Heat/Cool Return (Transformer Power)
6 Yellow	Cool Stage 1
7 Orange	Cool Stage 2
8 White/Black/Green	Module Power (-)
9 White/Black/Red	Module Power (+), +24-VDC
10 Light Blue	Heating Stage 3 or Dampers
11 Green	Fan
12 Brown	Fan Status Input
13 White/Brown	Filter Status Input
14	Polarizing Key
15 Black	Status Return
16 Black	Status Return
17 Black	Module Communication (Shield)
18 Violet	Temperature Sensor (+)
19 Gray	Temperature Sensor (-)

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Temperature Sensor

The distance between the ETM and the temperature sensor can be up to 1000 feet. Refer to the sensor's installation instructions for mounting and complete wiring details.

Step	Procedure
1	Mount the remote temperature sensor in the zone being controlled or in the supply air of the HVAC unit.
2	Run a shielded 2-conductor cable (Belden 8761, Novar Controls WIR-1010, or equivalent) from the sensor to the baseplate.
3	Connect the plus (+) lead to the violet wire.
4	Connect the minus (-) lead to the gray wire at the ETM-2040.

Fan Status

Use a shielded 2-conductor cable (Belden 8761, Novar Controls WIR-1010, or equivalent) to connect the fan status switch to the ETM.

Step	Procedure
1	Connect one lead from the fan status switch to the ETM's brown wire.
2	Connect the other lead from the fan status switch to one of the ETM's black wires (see Table 1, Status Return).

The fan status switch contact is open when the fan is off and closed when the fan is on.

Dirty Filter Switch

Use a shielded 2-conductor cable (Belden 8761, Novar Controls WIR-1010, or equivalent) to connect the filter status switch to the ETM.

Step	Procedure
1	Connect one lead from the filter status switch to the ETM's white/brown wire.
2	Connect the other lead from the filter status switch to one of the ETM's black wires (see Table 1, Status Return).

The filter status switch contact is closed when the filter is dirty.

Communications Network

Use a shielded 2-conductor cable to connect communications between the ETM and the network communication terminals of the executive module. Use the following procedure to make the connections at the ETM.

Step	Procedure
1	Connect the plus (+) lead to the white/red wire.
2	Connect the minus (-) lead to the white/black wire.
3	Connect the shield to the black wire (see Table 1, Module Communication Shield).

Installing the ETM-2040 Module

NOTE! Before the module is installed, make sure that the baseplate has been properly installed.

Setting the Module's Address

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 shows the address of the ETM being installed.

The address switches are located on the rear of the ETM module (Figure 2). Set the switches to the correct address from 00 to 63 (see Figure 3) and record the address in the space provided on the backs of the module and the baseplate.

NOTE! Address 00 cannot be used by the ETM when operating on an Executive Controller (EC) or Savvy®. The IOM section of the EC or Savvy uses address 00.

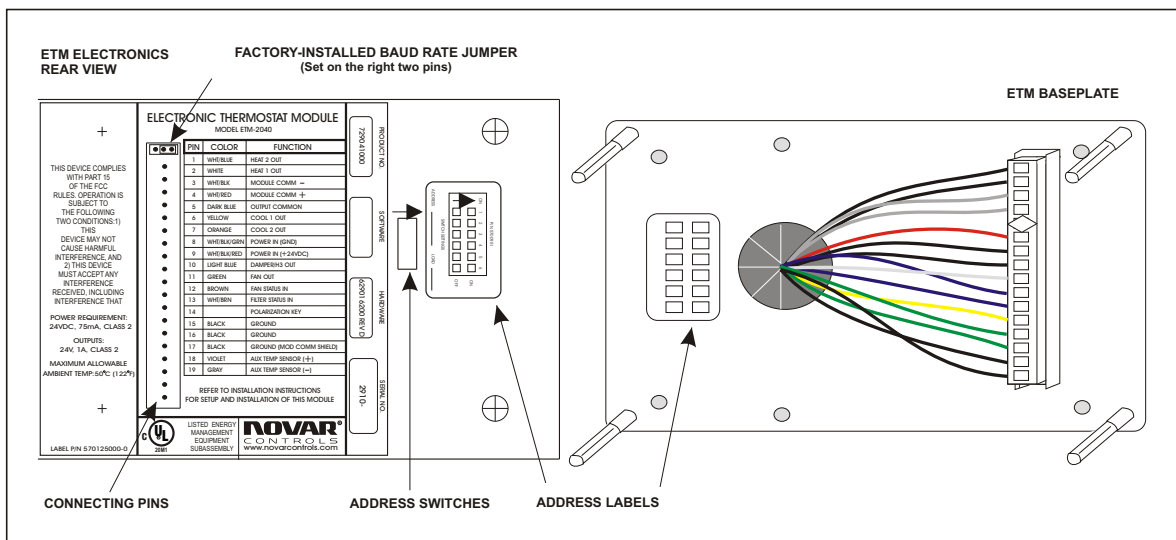


Figure 2. ETM address switches, address labels, and baud rate jumper

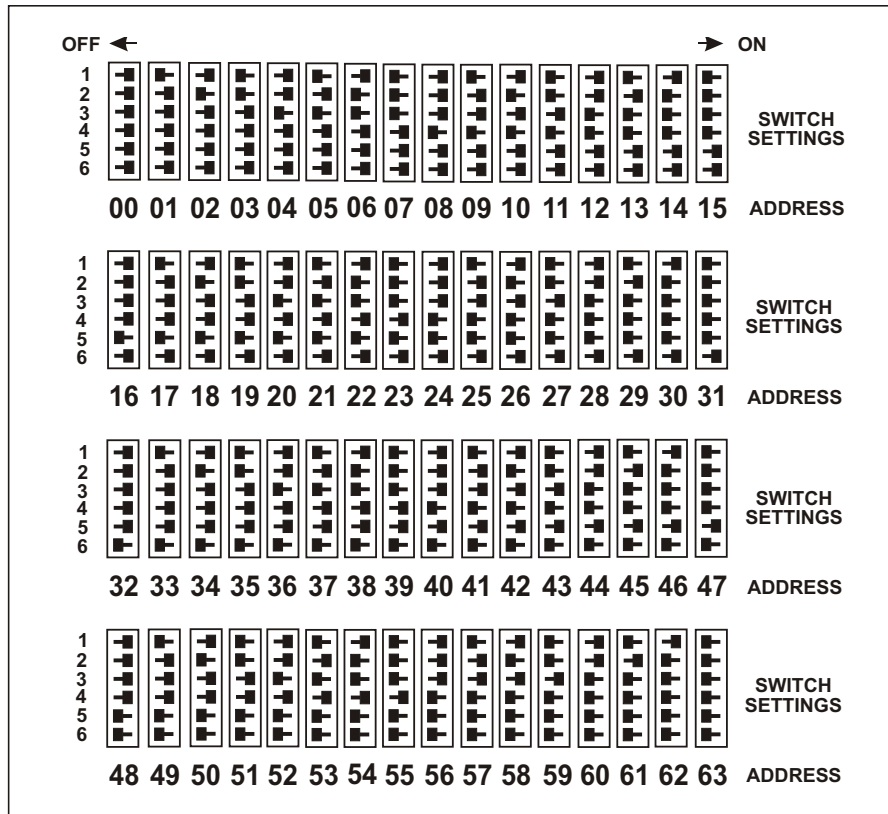


Figure 3. Setting the module address

Installing the ETM Electronics

Check the Module's Communications Baud Rate Jumper

A communications baud rate jumper has been installed at the factory to match the ETM's normal (default) baud rate of 1747. The jumper should be positioned on the center and right pins located at the top of the connecting pins on the back of the module (see Figure 2).

The baud rate should only need to be changed to 9600 baud (i.e., the jumper should only be moved to the left and center pins) under special circumstances. If the baud rate jumper is set to 9600 baud, the system software will also need to be modified to match the ETM's baud rate.

NOTE! If the baud rate jumper is removed, the module will default to 1747 baud rate.

Mounting the ETM-2040 Electronics

Use the following procedure and refer to Figure 4 to mount the ETM electronics on the baseplate. Make sure the connector on the rear of the ETM fits properly into the pigtail wiring connector on the baseplate.

Step	Procedure
1	Align the module over the mounting posts and press onto the baseplate connector as shown in Figure 4.
2	Insert the mounting screws and tighten to secure the module.

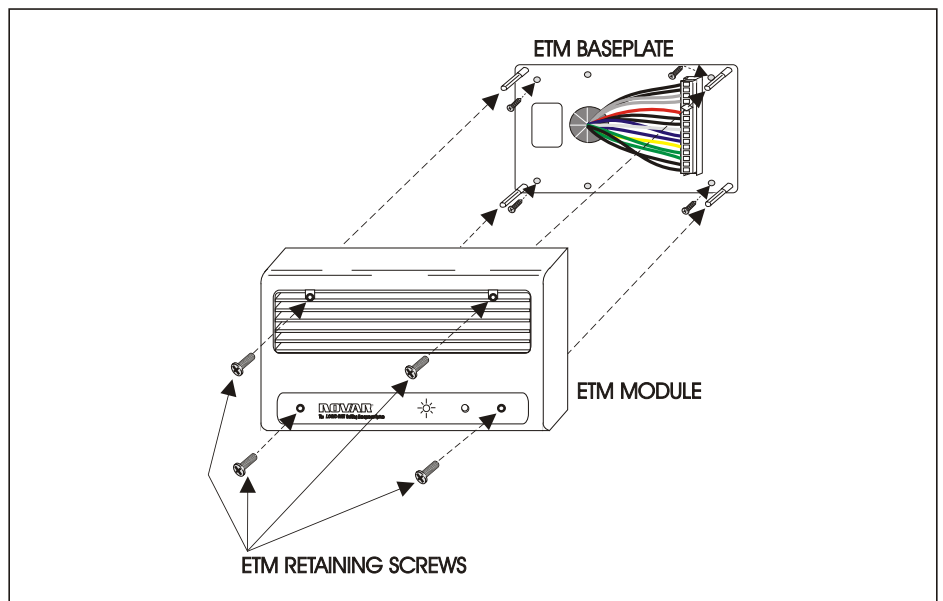


Figure 4. Installing the ETM electronics

Checking Installation

Turn on power to the ETM-2040. Make sure that power to the HVAC equipment and its control circuitry is on. If the executive module is operating properly, the ETM begins to control the HVAC equipment in about 3 minutes (after performing a self-diagnostic check and establishing communications with the executive module).

■ **Output Status Indicators**

There are six output status indicators (inside the ETM case and visible through the front grill) that show the status of each output. The indicator is lit when the corresponding output is on.

■ Override Switch Input

The ETM-2040 has a built-in timed override switch. To test the switch for proper function, press the switch when the schedule status indicator is off (if set to “active” in the software). The schedule status indicator exhibits a steady flash that stops when the override period ends. On a call for heating or cooling, the ETM’s output indicators should show a change in status.

To cancel the timed override, press the button a second time. The schedule status indicator stops flashing when the timed override is canceled.

■ Schedule Status Indicator

Observe the flashing pattern of the schedule status indicator to verify proper communications between the ETM and the executive module.

- The schedule status indicator should be on during scheduled on periods.
- The schedule status indicator should be off during scheduled off periods.

It flashes on or off regularly when communicating with the executive module, depending upon the schedule status (off or on). When a scheduled timed override has been implemented, the schedule status indicator flashes steadily and stops when the override period ends. The steady flash is broken when the ETM is communicating with the executive module.

■ Checking from the Executive Module

If any faults or malfunctions still exist, they are picked up by the executive module and announced by alarm messages.

Monitor the executive module display during the test procedures. The ETM’s setpoints can be altered from the executive module keypad and the status display monitored for proper equipment response from the keypad.

Model and Part Numbers

Use the part numbers provided in Table 2 to order the necessary Novar Controls parts.

PRODUCT	MODEL NO.	PART NO.
ETM-2040 Baseplate	ETM-2040-BPL	705100000
ETM-2040 Electronics	ETM-2040	729041000
Two-conductor, shielded cable (Belden 8761 equivalent)	WIR-1010	709001000
Wall-Mount Temperature Sensor	WTS-10	712003000
Futura Temperature Sensor	FTS-1	732203000
