

ETM-2020/ETM-2024 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

Electronic Thermostat Modules (ETMs) are intelligent control modules distributed throughout a building to provide local direct digital control of unitary, packaged HVAC systems. The ETM-2020 and ETM-2024 are designed with confirmation inputs for all output stages (except damper) and a second temperature input. When applying two sensor inputs, one of several “control-to” strategies can be selected.

The ETM-2020 and the ETM-2024 have the same appearance and features, but the ETM-2024 has a relay to provide a dry contact closure in the scheduled off mode. This relay allows ventilation dampers to bypass minimum position switches and close completely during unoccupied times.

NOTE! The Nite Mode Jumper on the ETM board should only be used for ETM-2024 applications. For all other applications, it should be removed. Removing it disables the Night Mode Damper relay.

The following Logic One[®] indoor temperature sensors can be used with the ETM-2020 and ETM-2024 models:

- Futura Temperature Sensor (FTS-1) (20° to 120°F)
- Wall-Mount Temperature Sensor (WTS-10) (20° to 120°F)
- Duct Temperature Sensor (DTS-50) (20° to 120°F)
- Remote Temperature Sensor (RTS-50) (20° to 120°F)
- Duct Temperature Sensor (DTS-30) (20° to 170°F)
- Remote Temperature Sensor (RTS-30) (20° to 170°F)

NOTE! The zone temperature sensor requires a range of 20°–120°F. Any of the listed sensors can be used as the auxiliary temperature sensor.

Specifications

Agency Approvals

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

Power Requirements

ETM Base: Voltage: 20 to 28 VAC, 60 Hz, Class 2
Consumption: 8 VA

ETM Electronics: Voltage: VDC from base board
Consumption: 185 mA max.

Ambient Limits

Operating:	-40° to 158°F (-40° to 70°C)
Storage:	-40° to 185°F (-40° to 85°C)
Humidity:	0 to 95% RH, noncondensing

Mechanical

Dimensions:	Electronics:	7.1 in. × 4.9 in. × 1.8 in.
	Base:	9.4 in. × 7.0 in. × 2.1 in.
Weight:	Electronics:	6.7 oz.
	Base:	7.4 oz.
Torque:	Electrical terminals:	10 inch-pounds
	Mounting:	8 inch-pounds

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 Base

Three models of the ETM-2020 and the ETM-2024 are available:

- ETM factory-mounted in an indoor enclosure
- ETM factory-mounted in an outdoor enclosure
- ETM without enclosure

These instructions are for mounting the model that comes without an enclosure. The ETM base can be mounted in a location other than the space being controlled.

Use the following procedure to mount the ETM base.

Step	Procedure
1	Turn off all power to the HVAC equipment and to the ETM base.
2	Position the base against the mounting surface and mark the surface to show where mounting screw holes should be drilled.
3	Drill the holes and, if necessary, install hollow-wall anchors.
4	Position the base over the drilled holes/anchors.
5	Insert screws and tight to secure the base.

NOTE! Do not install the ETM module until after all terminal strip connections are made and the wiring has been checked and verified.

**Wiring the
ETM-2020/ETM-2024**

Refer to Figure 1, as necessary, when wiring the ETM-2020 and ETM-2024.

**Supplying the ETM-2020 and
2024 with Power**

Connect the 24-VAC power supply to Terminals 23 and 24 on the base's terminal strip.

Control Outputs

Connect the control wires from the HVAC unit to the terminal strip's heating, cooling, fan, and damper outputs (Terminals 1–6).

NOTE! Connect the HVAC unit's low voltage switched leg, usually designated as "R," to Terminal 7.

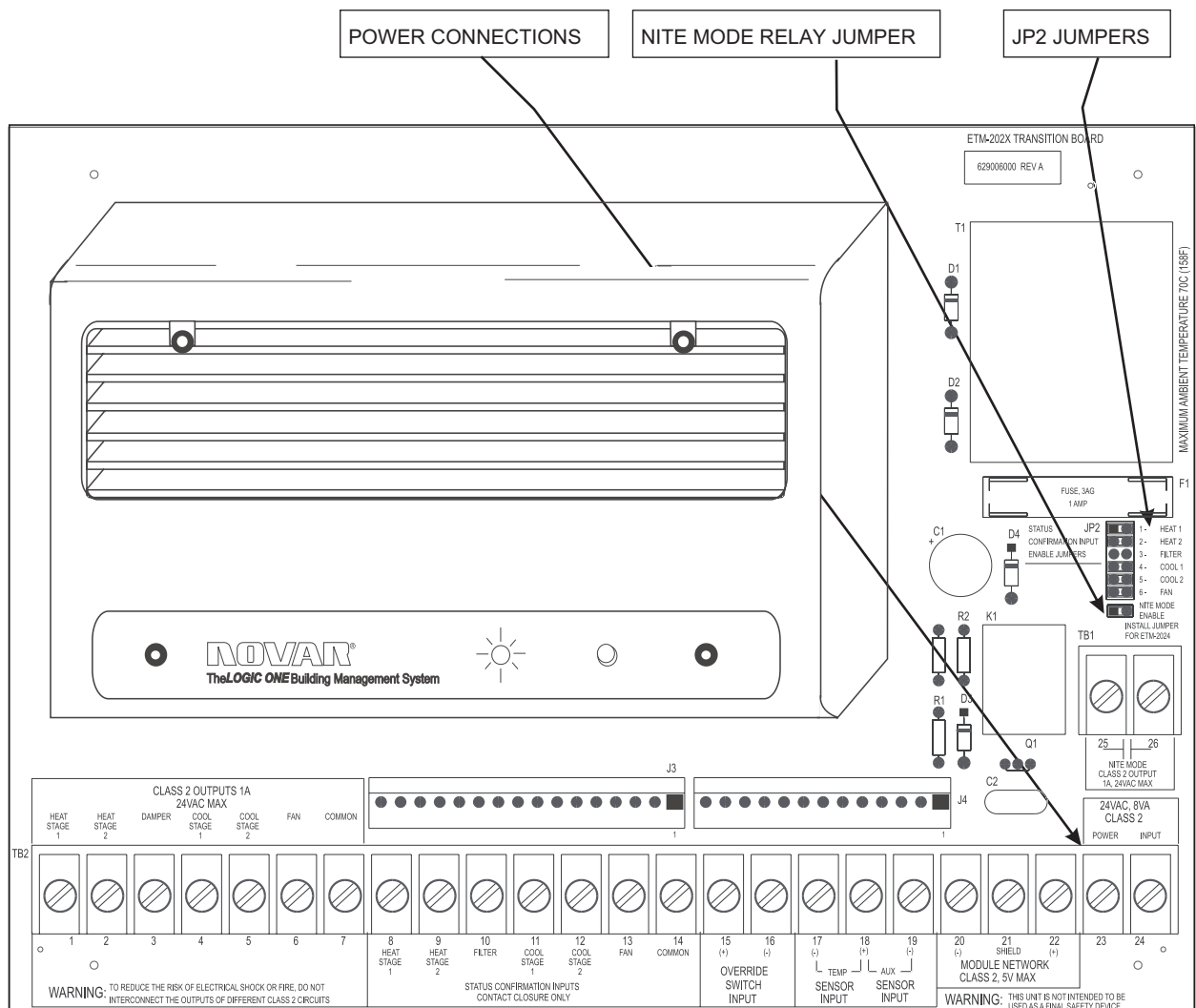


Figure 1. ETM-2020/ETM-2024 board

Temperature Sensors

Temperature sensors should be selected on the basis of the installation requirements. Each sensor is shipped with installation instructions that provide mounting and wiring details.

When connecting the wires to the base, observe sensor polarity. Be sure to trim the shield back cleanly to avoid short circuits.

Module Communications Network

Use a suitable shielded cable (Belden 8761, Novar Controls WIR-1010, or equivalent) to make the communication connection between the Module Network connections (Terminals 20 through 22) at the ETM base and the module communications terminals of the executive module..

CAUTION! Connect the communication shield to Terminal 21.

Remote Override Switch

The ETM-2020 and ETM-2024 timed override switch is mounted remotely. It is a momentary pushbutton and is wired to Terminals 15 and 16.

Status Confirmation Inputs

Terminals 8–13 provide connections for Status Confirmation Inputs (dry contact only) for each stage of heating, cooling, fan, and filter. Terminal 14 provides a shared Common for these connections. The wires from the HVAC unit's confirmation points must be connected to the appropriate terminals.

One of the following methods must be used to enable the input connection:

- If the ETM base is shipped with gray wires connected to Terminals 8–13:
 - Remove the gray wire from each terminal to which an HVAC confirmation input is to be connected.
 - Connect each HVAC confirmation input to the appropriate ETM terminal.
 - Connect all unused gray status confirmation wires to the Common.
- If the ETM base is shipped with Status Confirmation Input Enable Jumpers at JP2 (see Figure 1):
 - Remove the jumper(s) at JP2, as necessary, according to the labeling provided on the base. Leave all other jumpers in place.
 - Connect each HVAC confirmation input to the appropriate ETM terminal.

Closed contacts on the fan, Heat 1, Heat 2, Cool 1, or Cool 2 indicate confirmed operation. Closed contact on the filter indicates a dirty filter (alarm condition).

Night Mode Damper Control

NOTE! This connection is for the ETM-2024 *only*. The Nite Mode jumper should be removed on all other ETM applications.

Connect the Nite Mode Terminals 25–26 (see Figure 1) to the circuitry of the HVAC unit so that it bypasses the minimum position switch and causes the damper to close during unoccupied times.

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 back of the module.

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

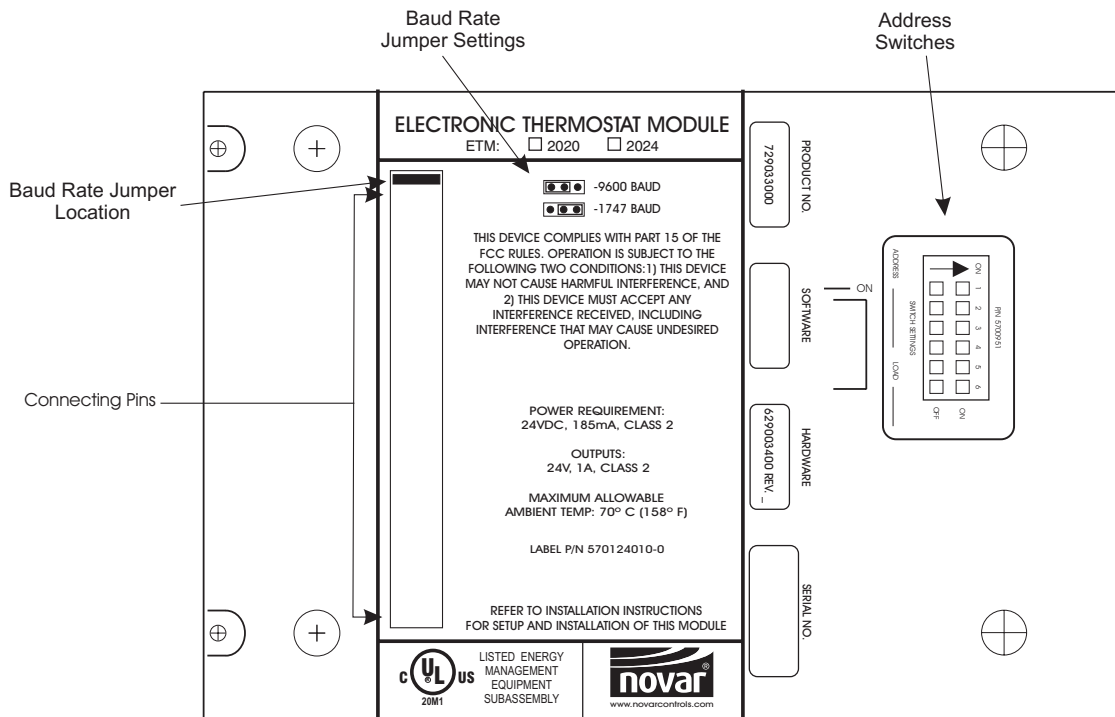


Figure 2. Rear view of the ETM module

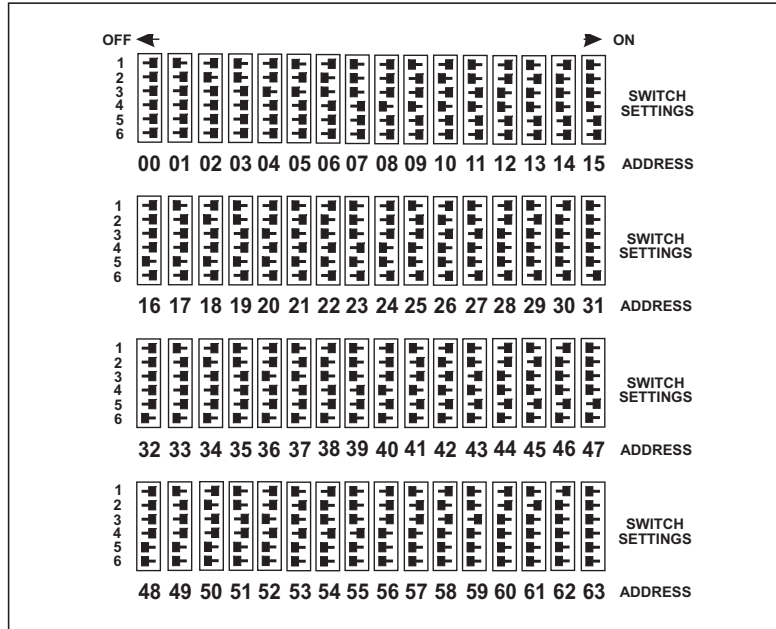


Figure 3. ETM-2020/ETM-2024 address switches

Installing the ETM-2020 and 2024 Module

Use the following procedure to install the ETM module.

Step	Procedure
1	Position the ETM module over the ETM base, aligning the mounting holes on the back of the module over the hexagonal standoffs on the base.
2	Press the module down onto the base until the connector on the back of the module engages with the connector on the base.
3	Insert and tighten the mounting screws.

Setting the Module's Communications Baud Rate

The communications baud rate jumper has been set at the factory to match the ETM's normal (default) baud rate (1747). It should not need to be changed to 9600 baud unless there are 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. The baud rate can be changed by moving the jumper on the back of the module to the setting shown on the module's label (see Figure 2).

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

Checking Installation

Turn on power to the ETM. Make sure that power to the HVAC system and its control circuitry is on.

If the executive module is operating properly, the ETM begins to control the HVAC unit in about 3 minutes (after performing a self-diagnostic check and establishing communications with the executive module).

NOTE! Observe the flashing pattern of the LED to verify proper communications between the ETM and the executive module.

NOTE! A 1-amp circuit board fuse protects the ETM circuitry and can be pulled during maintenance to disconnect power from the ETM.

■ Output Status Indicators

Six output status indicators (inside the ETM-2020 and ETM-2024 but visible through the front grill) indicate the status of each output. The indicator is lit when the corresponding output is on.

■ Override Switch Input

If a remote override switch has been installed, it can be tested for proper function by pressing it when the schedule status indicator is off. 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.

■ Alarm messages on the executive module

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

Change the ETM's setpoints and monitor the executive module's display for proper equipment response.

Model and Part Numbers

Use the part numbers provided in Table 1 to order the necessary Novar Controls parts.

Table 1. Novar Controls Part Numbers		
PRODUCT	MODEL NO.	
ETM-2020 Electronics, 6 relay outputs, indoor or outdoor mounting	ETM-2020	729032000
ETM-2020 Indoor Enclosure 24-VAC	ETM-2020IE/AC	729001100
ETM-2020 Outdoor Enclosure 24-VAC	ETM-2020OE/AC	729001000
ETM-2024 Electronics, 6 relay outputs, night mode damper, indoor or outdoor mounting	ETM-2024	729036000
ETM-2024 Indoor Enclosure 24-VAC	ETM-2024IE/AC	729001900
ETM-2024 Outdoor Enclosure 24-VAC	ETM-2024OE/AC	729001800
Wall-Mount Temperature Sensor	WTS-10	712003000
Futura Temperature Sensor	FTS-1	732203000
Duct Temperature Sensor	DTS-30	712007000
Duct Temperature Sensor	DTS-50	712000000
Remote Temperature Sensor	RTS-30	712006000
Remote Temperature Sensor	RTS-50	712201000
