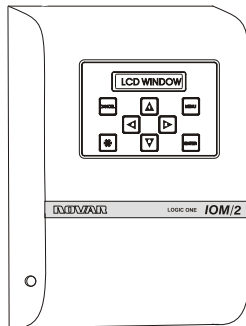


# IOM/2 Installation Instructions

## Description

The IOM/2 is the second-generation Input/Output Module for Novar's Logic One<sup>®</sup> Building Management System. It is an intelligent controller module that is designed to replace virtually any type of system controller. It provides

supervisory and primary closed-loop control of a building's electrical/mechanical equipment such as lighting, fans, HVAC units, pumps, valves, dampers, motors, compressors, chillers, and boilers. Although some of the IOM/2's hardware is similar to the IOM, much of it has been redesigned.



This document provides instructions for mounting the IOM/2's baseplate, installing the electronics assembly, wiring the module, and setting the module's address switches.

## IOM/2 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 VAC
Consumption:	30 VA

### Operating Environment

Temperature:	32° to 140°F (0° to 60°C)
Humidity:	0 to 95% Relative, noncondensing

### Physical Dimensions

Height:	15.75 inches
Width:	13.3 inches
Depth:	2.5 inches
Weight:	8 lb



### Precautions

Take the following precautions during installation:

- Observe all national and local electrical codes during installation.
  - Do *not* interconnect the outputs of different Class 2 circuits. Electrical shock or fire could result.
  - Do *not* use the IOM/2 as a final safety device.
  - Make sure the On/Off/Auto switches are in the proper position to turn off power during the installation procedure.
  - Connect the 24-VAC power wiring to a dedicated transformer. Do not use the same transformer to supply power to other devices.
  - Do not ground the transformer for this module on the secondary side.
- 

### Mounting the IOM/2 Baseplate

The top of the IOM/2 baseplate should be mounted level, not more than 6 feet above the floor (allowing access to the IOM/2's keypad and liquid crystal display [LCD]).

The following procedure should be used to mount the IOM/2 baseplate. Refer to Figure 1, as necessary.

<b>Step</b>	<b>Procedure</b>
1	Remove the cover from the IOM/2.
2	Position the baseplate against the wall and mark the location of the four slotted mounting holes.
3	Drill holes in each of the four locations marked and, if mounting the baseplate against paneling or drywall, insert hollow-wall anchors.
4	Insert screws into the holes or anchors, leaving approximately one-quarter inch between the wall and the head of each screw.
5	Position the baseplate over the screws, slide it down until the screws slide into the slots, and tighten the screws to secure the baseplate against the mounting surface.
6	Make sure all On/Off/Auto switches are in the off position.

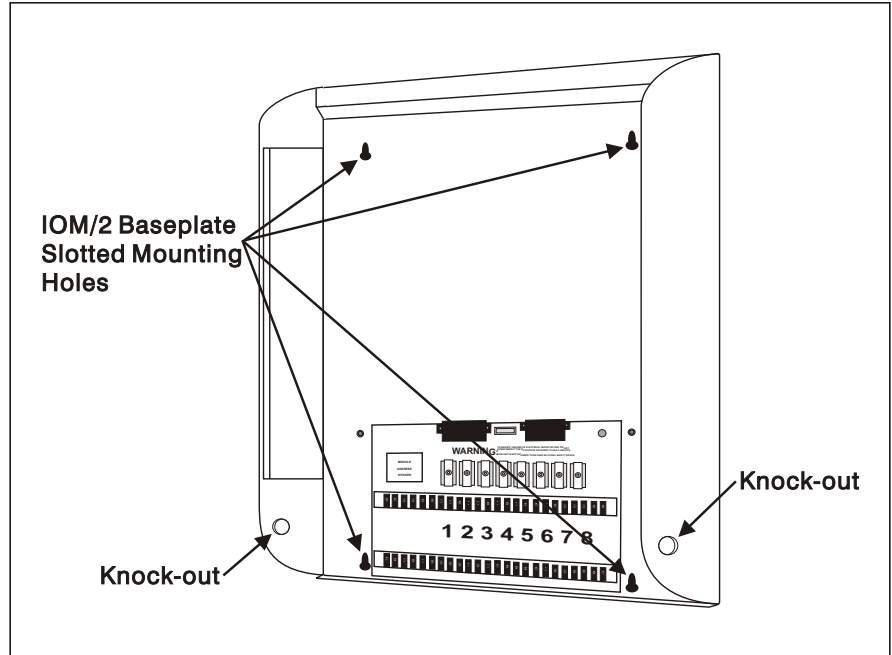


Figure 1. Mounting the IOM/2 baseplate

### Supplying the IOM/2 With Power

Install the 24-V, Class 2 transformer not more than 50 feet from the IOM/2 assembly (using minimum 18-gauge wire). The transformer may be directly connected to the baseplate through either of the knockouts on the sides of the assembly.

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**WARNING!** Use a dedicated transformer. Do *not* connect any other devices to the transformer.

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The IOM/2 requires continuous power for proper operation. Make sure the power to the module cannot be switched off accidentally.

The following procedure should be used to connect the transformer.

Step	Procedure
1	Connect leads from the transformer secondary (load) to the screw terminals labeled 24 VAC Class 2 (Terminals 23 and 24; see Figure 2) located on the IOM/2 transition board.
2	Connect the transformer primary leads (line) to a 120-VAC power source.
3	Apply power to check the voltage at the 24-VAC terminals. <ul style="list-style-type: none"> <li>■ The voltage should be approximately 25–28 VAC.</li> </ul>

# IOM/2 Installation Instructions

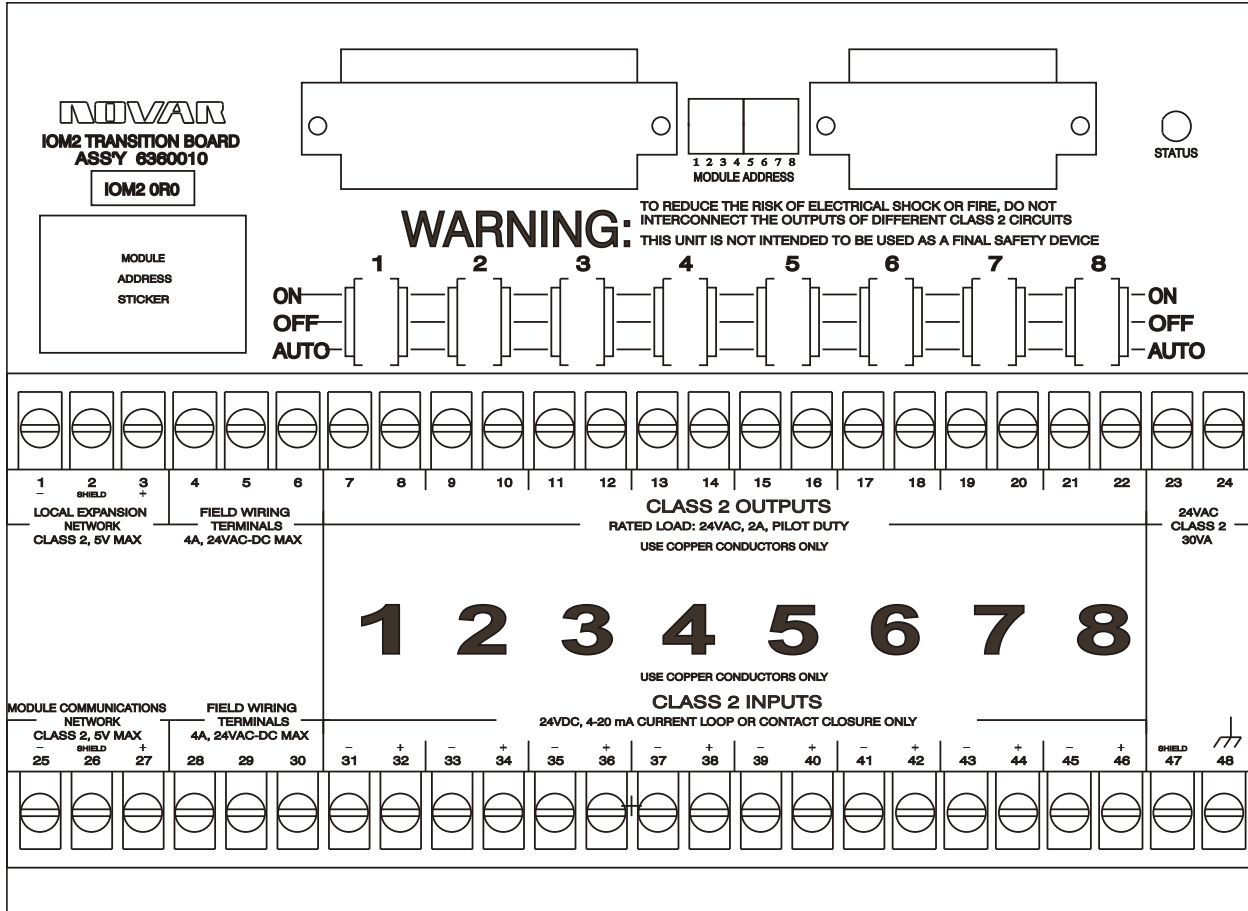


Figure 2. IOM/2 transition board (terminal strips)

## Wiring the IOM/2 Inputs and Outputs

Instructions for wiring the IOM/2 transition board (through the knockouts on the side of the IOM/2) are provided below. Refer to Figure 2, as necessary.

### Class 2 Outputs

Connect the output wiring to the Class 2 Outputs labeled 1 through 8 (Terminals 7–22). The control outputs are rated for 2 amps, 24 VAC.

### Local Expansion Network

**NOTE!** This connection can be used only when the IOM/2 is connected to an EP/2 or Savvy (not an Executive Controller).

Connect the wiring from Novar’s local expansion input/output modules to Terminals 1–3.

**Field Wiring Terminals**

Output Terminals 4–6 and Input Terminals 28–30 are provided as a convenient place for interfacing field wiring. They are not internally connected and can be used as required.

**Class 2 Inputs**

The terminals labeled Class 2 Inputs (Terminals 31–46) must be from dry contact switch closures or 4–20 mA transmitters.

Connect the input cable shield wire to Terminal 47 or 48.

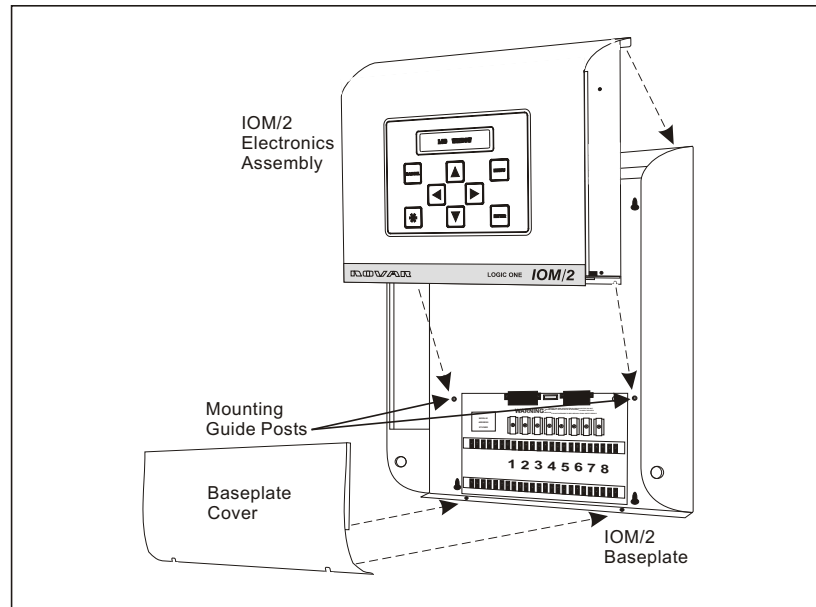
**Module Communications**

<b>Step</b>	<b>Procedure</b>
1	Connect the Network Communications Cable (Belden 8761, Novar WIR-1010, or equivalent) to the terminals labeled Module Communications Network (Terminals 25–27).
2	Connect the black wire to the negative (–) terminal.
3	Connect the shield drain wire to the Shield terminal.
4	Connect the red wire to the positive (+) terminal.

**Installing the IOM/2 Electronics Assembly**

The following procedure should be used to install the IOM/2 electronic assembly on the baseplate. Refer to Figure 3, as necessary.

<b>Step</b>	<b>Procedure</b>
1	Remove the baseplate cover (if it has not already been removed).
2	Make sure that all On/Off/Auto (HOA) switches on the transition board are in the off position.
3	Make sure the baseplate’s address switch setting is correct (see “Setting the Address Switches” in this document) and the wiring is connected properly.
4	Use the On/Off/Auto switches to verify the operation of the loads. <ul style="list-style-type: none"> <li>■ After verifying the operation, place all On/Off/Auto switches in the auto position.</li> </ul>
5	Hook the IOM/2 electronics assembly over the lip at the top of the baseplate and slide it down over the mounting guide posts.
6	Guide and lower the assembly over the DB-37 and DB-25 connectors on the transition board.
7	Secure the electronics assembly to the baseplate by tightening the two retaining screws on the mounting guide posts.



**Figure 3.** Installing the IOM/2 electronics assembly

## Memory Backup Batteries

The IOM/2 electronics assembly has a built-in NiCad battery for 90-day memory backup during power failures. Removing the IOM/2 from its baseplate resets the IOM/2. The battery can only be serviced by factory-trained personnel.

## Remote Override Option

The IOM/2 offers a remote override option that can be used to install up to eight remote override push buttons to supplement the keypad/display on the IOM/2. The remote override option consists of a factory-installed terminal board (located in the electronic assembly to the left of the DB-37 connector) and a removable terminal barrier strip (on the remote override board).

The following procedure should be used to wire the remote override option.

Step	Procedure
1	Remove the baseplate cover, if not already removed.
2	Remove the terminal barrier strip.  <hr/> <p><b>NOTE!</b> Remove the terminal barrier strip <i>before</i> disconnecting the IOM/2 electronic assembly from the transition board (after the wiring is connected). Do not attempt to connect the wiring while the terminal barrier strip is still on the remote override board. Failing to do so could result in damage to the remote override board.</p> <hr/> <p style="text-align: right;"><i>continued</i></p>

Step	Procedure
3	Make the necessary wiring connections and replace the strip carefully, making sure it aligns correctly with the board pins.
4	<p>Make the necessary remote override switch assemblies and use 2-conductor wiring to connect them to the terminal barrier strip.</p> <ul style="list-style-type: none"> <li>■ The connections are numbered 1 through 8.</li> <li>■ Use the three grounds on the remote override terminal board or common all grounds remotely and return a single ground.</li> <li>■ Parallel as many remote switches across one input as required.</li> </ul> <hr/> <p><b>NOTE!</b> Remote switches must be momentary dry contact only, not a held contact. A spring-return keylock switch is acceptable. The contact resistance must be less than 20 ohms.</p> <hr/>
5	<p>Install a standard red light-emitting diode (LED) directly across the switch with the cathode lead connected to a ground to indicate an output's schedule status.</p> <ul style="list-style-type: none"> <li>■ A dropping resistor is not needed for a single light.</li> <li>■ For more than one indicator, series each LED with a 22-ohm, ¼-watt resistor before paralleling them across the switch. The resistor can be placed in series with either the anode or cathode of each LED (see Figure 4).</li> </ul> <hr/> <p><b>NOTE!</b> When the LED is on, schedule status is on. The remote override cannot be activated. Pressing the remote override switch causes the LED to flash once but has no effect on the override condition. If the LED is off, schedule status is off, and the remote override can be activated. The LED flashes continuously during remote override.</p> <hr/>

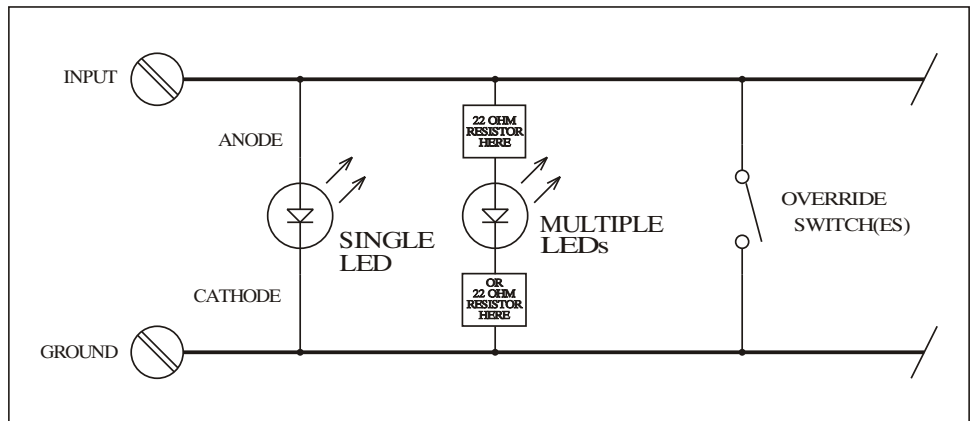
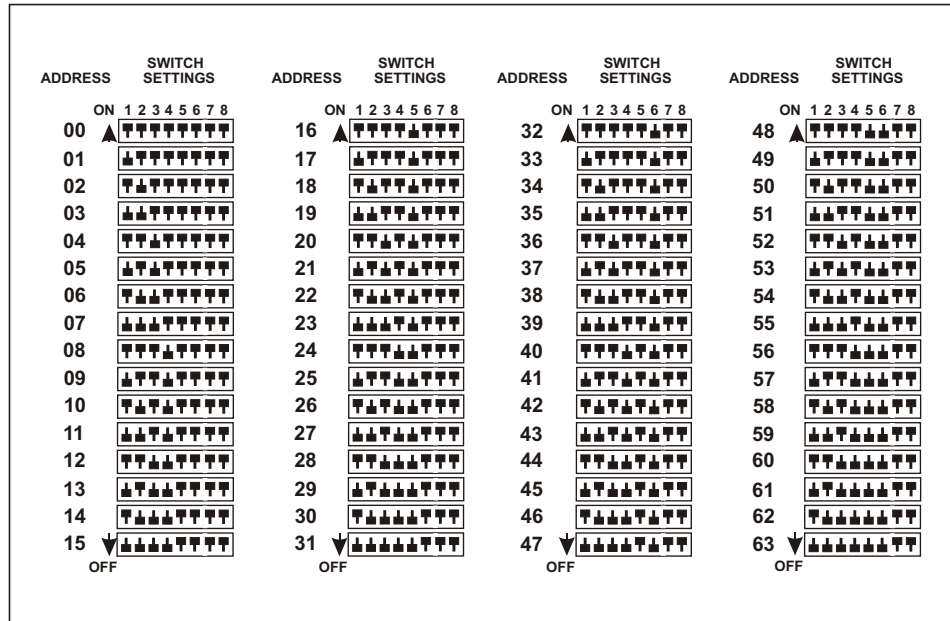


Figure 4. Multiple-LED remote override wiring

**Setting the Address Switches**

The address switches are located on the IOM/2 transition board between the DB-37 and DB-25 connectors. Although there are eight switches, only the first six are currently used to set the addresses. The address switches should be set as shown in Figure 5 to correspond to the address location listed in the Module Configuration printout. Switches 7 and 8 should always be kept in the on position.

For future reference, the correct address should be marked on the module address label located on the upper left corner of the transition board.



**Figure 5.** Setting the IOM/2 address switches

**When Using a Network Expander**

In an EP/2 system, an IOM/2 should not be connected to Novar’s Network Expander Module. The IOM/2 should be connected directly to the EP/2’s Communication Port A or B and must be assigned a module address between 00 and 63.

This only applies to IOM/2s that have been configured as IOM/2s in ESS32 (the 32-bit version of Novar’s Personal Computer Engineering and Support System). IOM/2s configured as IOMs can be connected directly to the Network Expander.

For more information about the Network Expander, refer to the installation instructions included with that module.



## Checking Installation

The following items should be checked to verify that the IOM/2 is operating properly following installation:

- The executive module display should be checked for alarm messages indicating malfunctions. Using ESS32 to monitor the executive module, the installer should vary the IOM/2 setpoints to verify that the equipment is responding properly.
- The status LED, located in the upper right corner of the transition board, should operate as follows:
  - When all the On/Off/Auto switches are in the auto position, the LED is off and blinks on when the IOM/2 is communicating.
  - If any of the switches are not in the auto position, the LED is on and blinks off while communicating.

If the IOM/2 is operating properly, the baseplate cover should be placed on the baseplate assembly and the retaining screws secured.

### *IOM/2 Keypad and Display*

For information about using the IOM/2's keypad and display, refer to Novar's *IOM/2 Keypad and Display Instructions*, available in the Documents folder on Novar's Software Package CD.

## Model and Part Numbers

The part numbers in Table 1 should be used to order the necessary Novar parts.

<b>Table 1. Novar Part Numbers</b>		
<b>PRODUCT</b>	<b>MODEL NO.</b>	<b>PART NO.</b>
IOM/2 Baseplate	IOM/2 BPL	737100000
<ul style="list-style-type: none"> <li>■ IOM/2 Electronics (Triac Outputs)</li> <li>■ IOM/2 Electronics (Relay Outputs)</li> <li>■ IOM/2 Electronics (Remote Override)</li> <li>■ IOM/2 Electronics (Relay Outputs, Remote Override)</li> </ul>	IOM/2 IOM/2-R IOM/2-O IOM/2-R-O	737001000 737006000 737002000 737008000
115/24 VAC, Class 2 Transformer	IOM-XFR	355025000
Network Communications Cable	WIR-1010	709001000

### 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.

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#### 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.

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**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.

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

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##### 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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Novar; 6060 Rockside Woods Blvd., Cleveland, OH 44131  
Tel.: 800.348.1235 www.novar.com

**Notes**

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