

# 8-Input Module (8-IM) 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.

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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 Controls Corporation 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 brouilleur: *Appareils Numériques*, NMB-003, édictée par l'Industrie Canada.

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### Disclaimer

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## Description

Novar Controls 8-Input Module (8-IM) has been designed to replace Novar Controls' 8-IME, 8-IMR, and the Local Expansion Network (LEN-I1) modules. It can be configured as part of the Novar Controls Logic One<sup>®</sup> system or as part of the Novar Controls Spectrum<sup>®</sup> Refrigeration Control system to provide eight additional analog and/or digital inputs for system use and alarms. It comes in a metal case that protects it from some environmental conditions and can be connected directly to an executive module.

This document provides instructions for mounting, wiring, setting the module address, and checking the operation of the module.

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## Specifications

### Agency Approvals

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

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### Power Requirements

Voltage and Current:	Class 2, 24-VDC, 30 mA or 24-VAC, 2-VA
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### Operating Environment

Temperature:	32° to 158°F (0° to 70°C)
Humidity:	0 to 95% Relative, noncondensing.

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### Physical Dimensions

Length:	17.25 inches
Width:	2.85 inches
Depth:	1.1 inches
Weight:	1 lb 5 oz

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## Precautions

Take the following precautions during installation:

- Observe all national and local electrical codes.
  - Make sure the power source is isolated from other devices. If multiple 8-IMs are powered by a single 24-VDC or 24-VAC power source, maintain polarity between units.
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## Mounting the 8-IM

The 8-IM can be mounted to a wall or in a control panel with other Novar Controls components. When the module is mounted to paneling or drywall, hollow-wall anchors should be used to make certain that the assembly is secure.

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

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**NOTE!** Although the 8-IM's design protects it from some environmental conditions, it is *not* waterproof. Mount the module in a dry location.

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## 8-Input Module (8-IM) Installation Instructions

Step	Procedure
1	Position the metal case against the mounting surface and mark the surface to indicate the location of the two mounting holes.
2	Drill holes in the marked locations and, if necessary, insert hollow-wall anchors.
3	Place the module against the mounting surface and insert and tighten the mounting screws to secure the module.

### Wiring the Module

Use the following procedure and refer to Figure 1, as necessary, to prepare the module for wiring.

Step	Procedure
1	Take off the cover of the enclosure by removing the two screws at corners of the cover.
2	Remove the screw holding the foam rubber clamp (see Figure 1) at the right end of the module.

**NOTE!** This clamp allows the wires to pass through but helps protect the circuit board from environmental conditions. The clamp *must* be returned to its original position once the wiring has been completed.

The location of the wiring terminals is shown in Figure 2. Figure 3 provides a wiring diagram.

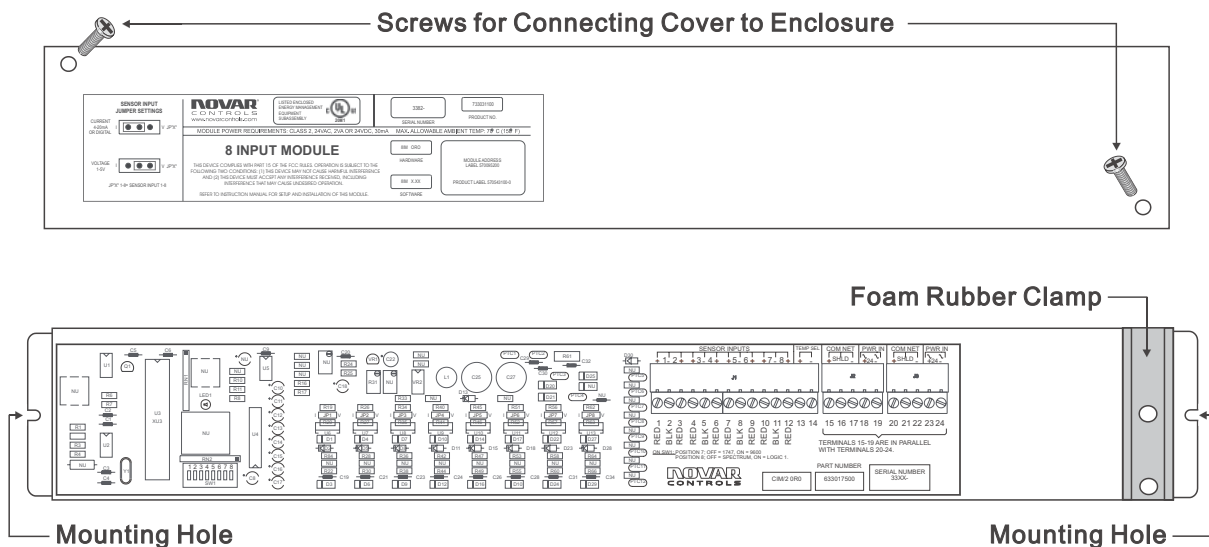


Figure 1. Mounting the 8-IM

# 8-Input Module (8-IM) Installation Instructions

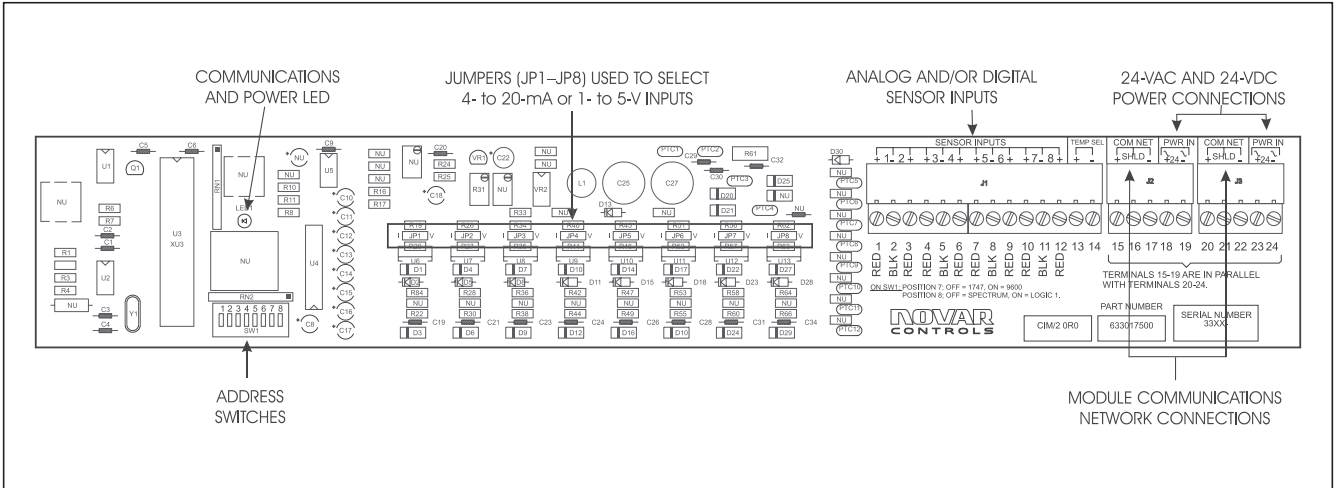


Figure 2. 8-IM circuit board

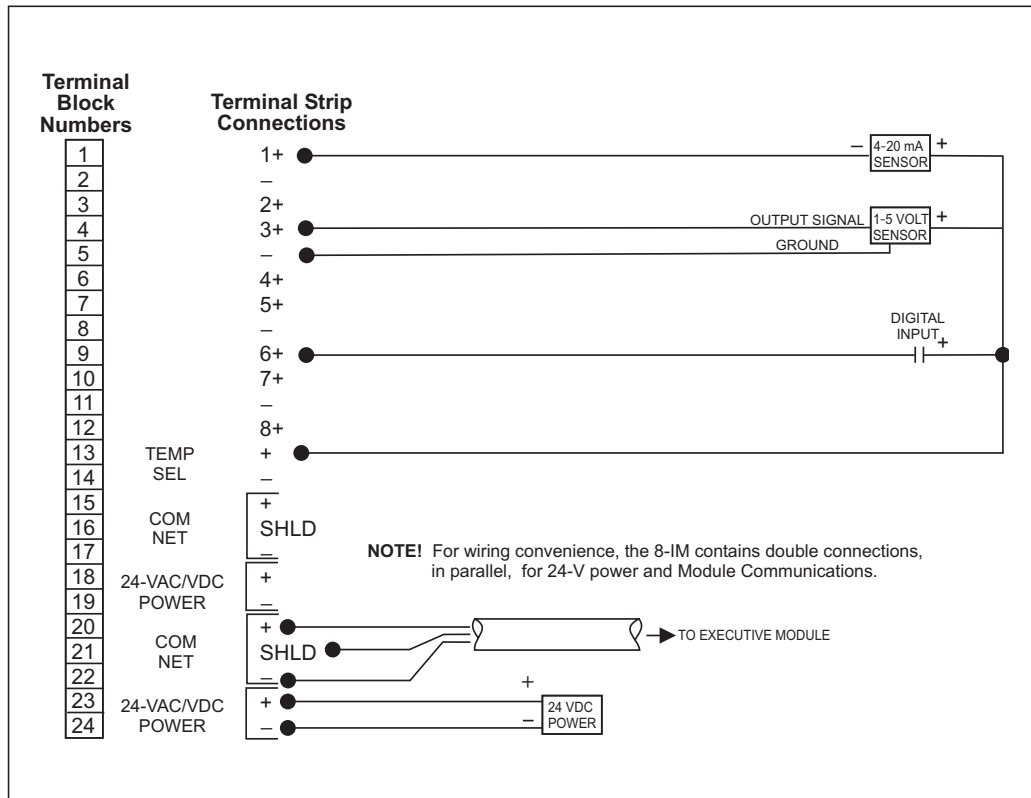


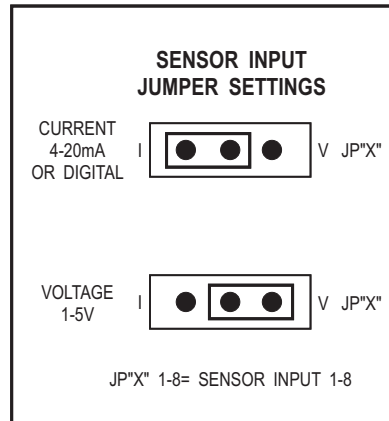
Figure 3. 8-IM wiring diagram

## 8-Input Module (8-IM) Installation Instructions

### Sensor Inputs

There are eight available inputs on the 8-IM for connecting sensors. This module is designed to be used with 4- to 20-mA or 1- to 5-volt analog sensors or dry contact closures.

Figure 4 shows how the jumpers should be placed on the 3-pin headers:



**Figure 4.** 8-IM jumper settings

- For 1- to 5-V sensor inputs, place the jumper on the right two pins of the 3-pin header that corresponds to the input terminals shown in the following table.
- For 4- to 20-mA and digital inputs, place the jumper on the left two pins of the 3-pin header.

INPUT	3-PIN HEADER	SIGNAL TERMINALS	RETURN TERMINALS
1	JP1	Terminal 1	Terminal 2
2	JP2	Terminal 3	Terminal 2
3	JP3	Terminal 4	Terminal 5
4	JP4	Terminal 6	Terminal 5
5	JP5	Terminal 7	Terminal 8
6	JP6	Terminal 9	Terminal 8
7	JP7	Terminal 10	Terminal 11
8	JP8	Terminal 12	Terminal 11

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**NOTE!** Terminals 13 and 14 cannot be used as inputs.

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### Module Communication Network

Combine the power and communication network connections into a single four-conductor shielded cable (Belden 9155, Novar Controls WIR-1020, or equivalent) to make the connection between the 8-IM and the executive module. If separate cables are used, use a two-conductor shielded cable (Belden 8761, Novar Controls WIR-1010, or equivalent) for the communication wiring.

- EP/2 and Lingo<sup>®</sup>

Make the connection at either the A Module or B Module Network Communication terminals.

- Savvy<sup>®</sup>

Make the connection at the Module Network terminals.

- Spectrum

Make the connection at the Refrigeration Controller Module Communications Network A, B, or C.

The module communication connection on the 8-IM is labeled COM Net and is located next to the power connection. There is a communication LED located above the address switch that should blink on intermittently when the power is turned on and proper communication is occurring. If the LED does not blink on, there is a loss of communication and/or power.

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### Power Connection

Connect the 8-IM to a 24-VDC or 24-VAC power source to power the 8-IM and a 20-mA load for each input used. For example, if all eight inputs are being used on the 8-IM, the power source would need to support 190 mA.

For wiring convenience, the 8-IM contains double connections, in parallel, for 24-V power and Module Communications.

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### Setting the Module Address

Every module must have a unique address for the executive module to identify it. Addresses are assigned in the software during system formatting. The system printout shows the address of the 8-IM being installed.

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**NOTE!** Only Switches 1–6 are used for addressing the module. Switches 7 and 8 are set as follows:

***To operate like an 8-IME:***

Switch 7 = Off  
Switch 8 = On

***To operate like an 8-IMR or LEN-II:***

Switch 7 = On  
Switch 8 = Off

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The address switches are located on the left side of the circuit board (see Figure 2). Set the switches with the correct address from 00 to 63 (see Figure 4) and record the setting on the module address label.

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**NOTE!** Address 00 may not be used by the 8-IM when operating on a Savvy. (The IOM section uses address 00.)

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The EP/2 is designed to accept module addresses from 00 to 127 for any type of Novar Controls module. Address settings 64–127 duplicate the sequence of settings shown in Figure 4 (address setting 64 is the same as address setting 00, etc.)

The EP/2 would require a Network Expander to communicate with addresses 64–127. Only unitary controllers can be connected to the Network Expander. More information about setting addresses 64–127 can be found in the Novar Controls *Network Expander Module Installation Instructions* (Doc. No. 560092000). If additional modules are connected to the EP/2, the 128-input or 128-output limits must not be exceeded.

ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS	ADDRESS	SWITCH SETTINGS
00	ON ↑ 1 2 3 4 5 6	16	ON ↑ 1 2 3 4 5 6	32	ON ↑ 1 2 3 4 5 6	48	ON ↑ 1 2 3 4 5 6
01	↓ 1 2 3 4 5 6	17	↓ 1 2 3 4 5 6	33	↓ 1 2 3 4 5 6	49	↓ 1 2 3 4 5 6
02	↑ 1 ↓ 2 3 4 5 6	18	↑ 1 ↓ 2 3 4 5 6	34	↑ 1 ↓ 2 3 4 5 6	50	↑ 1 ↓ 2 3 4 5 6
03	↓ 1 ↑ 2 3 4 5 6	19	↓ 1 ↑ 2 3 4 5 6	35	↓ 1 ↑ 2 3 4 5 6	51	↓ 1 ↑ 2 3 4 5 6
04	↑ 1 ↑ 2 3 4 5 6	20	↑ 1 ↑ 2 3 4 5 6	36	↑ 1 ↑ 2 3 4 5 6	52	↑ 1 ↑ 2 3 4 5 6
05	↓ 1 ↓ 2 3 4 5 6	21	↓ 1 ↓ 2 3 4 5 6	37	↓ 1 ↓ 2 3 4 5 6	53	↓ 1 ↓ 2 3 4 5 6
06	↑ 1 ↓ 2 ↑ 3 4 5 6	22	↑ 1 ↓ 2 ↑ 3 4 5 6	38	↑ 1 ↓ 2 ↑ 3 4 5 6	54	↑ 1 ↓ 2 ↑ 3 4 5 6
07	↓ 1 ↑ 2 ↓ 3 4 5 6	23	↓ 1 ↑ 2 ↓ 3 4 5 6	39	↓ 1 ↑ 2 ↓ 3 4 5 6	55	↓ 1 ↑ 2 ↓ 3 4 5 6
08	↑ 1 ↑ 2 ↑ 3 4 5 6	24	↑ 1 ↑ 2 ↑ 3 4 5 6	40	↑ 1 ↑ 2 ↑ 3 4 5 6	56	↑ 1 ↑ 2 ↑ 3 4 5 6
09	↓ 1 ↓ 2 ↓ 3 4 5 6	25	↓ 1 ↓ 2 ↓ 3 4 5 6	41	↓ 1 ↓ 2 ↓ 3 4 5 6	57	↓ 1 ↓ 2 ↓ 3 4 5 6
10	↑ 1 ↓ 2 ↑ 3 ↓ 4 5 6	26	↑ 1 ↓ 2 ↑ 3 ↓ 4 5 6	42	↑ 1 ↓ 2 ↑ 3 ↓ 4 5 6	58	↑ 1 ↓ 2 ↑ 3 ↓ 4 5 6
11	↓ 1 ↑ 2 ↓ 3 ↑ 4 5 6	27	↓ 1 ↑ 2 ↓ 3 ↑ 4 5 6	43	↓ 1 ↑ 2 ↓ 3 ↑ 4 5 6	59	↓ 1 ↑ 2 ↓ 3 ↑ 4 5 6
12	↑ 1 ↑ 2 ↑ 3 ↑ 4 5 6	28	↑ 1 ↑ 2 ↑ 3 ↑ 4 5 6	44	↑ 1 ↑ 2 ↑ 3 ↑ 4 5 6	60	↑ 1 ↑ 2 ↑ 3 ↑ 4 5 6
13	↓ 1 ↓ 2 ↓ 3 ↓ 4 5 6	29	↓ 1 ↓ 2 ↓ 3 ↓ 4 5 6	45	↓ 1 ↓ 2 ↓ 3 ↓ 4 5 6	61	↓ 1 ↓ 2 ↓ 3 ↓ 4 5 6
14	↑ 1 ↓ 2 ↑ 3 ↓ 4 ↑ 5 6	30	↑ 1 ↓ 2 ↑ 3 ↓ 4 ↑ 5 6	46	↑ 1 ↓ 2 ↑ 3 ↓ 4 ↑ 5 6	62	↑ 1 ↓ 2 ↑ 3 ↓ 4 ↑ 5 6
15	↓ 1 ↑ 2 ↓ 3 ↑ 4 ↓ 5 6	31	↓ 1 ↑ 2 ↓ 3 ↑ 4 ↓ 5 6	47	↓ 1 ↑ 2 ↓ 3 ↑ 4 ↓ 5 6	63	↓ 1 ↑ 2 ↓ 3 ↑ 4 ↓ 5 6
	OFF		OFF		OFF		OFF

Figure 4. Setting the address for the 8-IM



### Checking Operation

When the installation has been completed, check the following items to make sure that the 8-IM is operating properly.

- Double check all wiring before turning on the power.
  - Supply power to the system and check the communication LED. If proper communication is taking place, it should blink intermittently.
  - Check the executive module for alarm messages indicating faults or malfunctions. Use the executive module's keypad and display to monitor the system. Change the control settings and check the equipment's response.
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### Model and Part Numbers

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

<b>PRODUCT</b>	<b>MODEL NO.</b>	<b>PART NO.</b>
8-Input Module	8-IM	733031100
Four-conductor cable (Belden #9155 equivalent)	WIR-1020	709002000
Two-conductor cable (Belden #8761 equivalent)	WIR-1010	709001000

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