IOM Analog Output Module Installation

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Regulatory Compliance

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 préscrites dans la norme sur le matériel brouiller: *Appareils Numériques*, NMB-003, édictée par l'Industrie Canada.

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Description

The IOM Analog Output Module (IAO-1010) is designed to convert a single, pulsing IOM or IOM/2 output into a 4–20 mA signal (overrange and underrange of 3–21 mA). It is intended to be used only with positioning-type, closed-loop systems.

This document provides instructions for mounting and wiring the IAO-1010 and checking its operation.

Mounting the IAO-1010 Module

The IAO-1010 should be installed within easy access of the IOM or IOM/2 to which it is to be connected. Use the following procedure and refer to Figure 1, as necessary, to mount the module.

Step	Procedure
1	Position the module against the mounting surface and mark the surface to show the location of the four mounting holes.
2	Drill holes in the locations marked on the mounting surface.
3	Position the module over the holes and insert and tighten screws (not included) to secure the sensor.

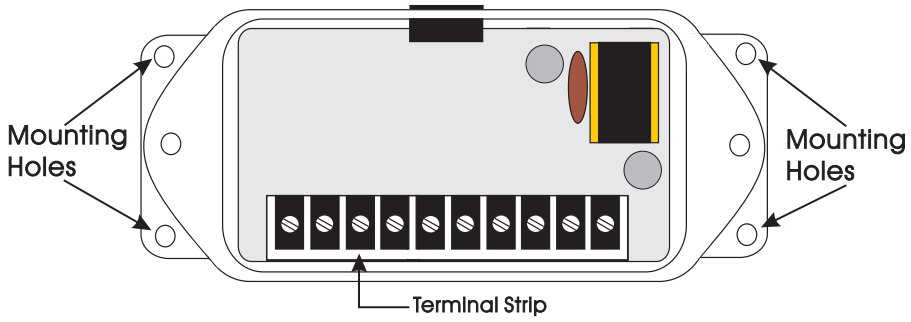

Figure 1. IOM Analog Output Module

Wiring the IAO-1010

Use the following procedure and refer to Figure 2, as necessary, to wire the IAO-1010.

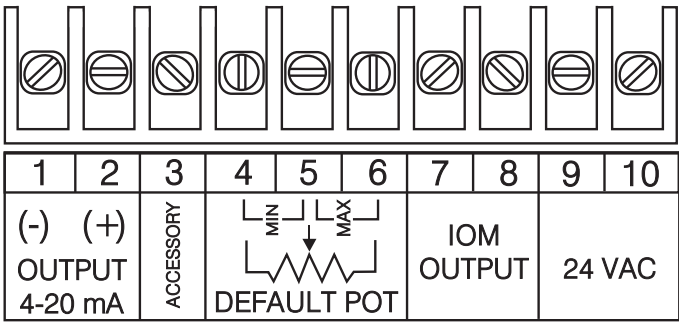

Figure 2. IAO-1010 Terminal Strip

Step	Procedure
1	Connect the IAO Terminals 9 and 10 to a 24-VAC source. ■ The maximum power usage is 3 VA. ■ The circuit does not require isolation or conditioning. ■ Several modules can be supplied by the same transformer.
2	Connect Terminals 7 and 8 directly to either the triac-type (not relay) IOM or IOM/2 output terminals. ■ Do not connect any other supplies or grounds.
3	Connect a jumper or potentiometer to the Default/Potentiometer Terminals 4, 5, and 6. ■ If the module does not receive the IOM's pulse output or if a maintenance override is activated, the module's output goes to the default mode set at these terminals.
4	Determine how the module is to fail and connect the wiring according to the following instructions: ■ To fail closed (minimum 3–4 mA output current): Place the jumper across Terminals 4 and 5. ■ To fail open (maximum current output 20–21 mA): Place the jumper across Terminals 5 and 6. ■ To fail at an intermediate position: Remove the jumper and install a potentiometer (not supplied) across Terminals 4 and 6, wiper on 5. The potentiometer can be any value between 135 ohms and 50K ohms. To calibrate with the IOM or IOM/2 terminals unconnected, adjust the potentiometer so the controlled equipment fails to the desired position. *continued*

Step	Procedure
5	Decide which device is going to be the current source for the 4–20 mA loop. ■ If it is the IAO-1010, connect Terminal 1 to the controlled equipment's Common and Terminal 2 to its Signal. ■ If it is the controlled equipment, connect Terminal 4 to the controlled equipment's positive voltage supply and Terminal 2 to its return. **CAUTION!** If the controlled equipment is the source, do *not* wire the IAO-1010 as the source or both devices could be damaged.

To convert the 4–20 mA to a voltage, install an IAO Ranging Card (refer to Novar Controls' *IAO Ranging Cards Installation Instructions* [Doc. No. 560033000]).

Testing the IAO-1010

The IOM and IOM/2 typically pulse an output every 4.33 seconds. The IAO-1010 converts the timing pulse to a current level.

Example:

0.59 seconds = 4 mA
2.93 seconds = 20 mA

The pulse is generated by the IOM or IOM/2 output opening and closing like a contact closure, which allows the DC current (supplied by the interface module) to flow.

The IAO-1010 module has been designed to default to manual operation if a pulse is not detected within 10 seconds. In manual operation the output current level is determined by the jumper position or the potentiometer setting (whichever has been used).

If the IOM or IOM/2 maintenance override switch is set to on or off, no pulse occurs. After 10 seconds the module defaults to manual (potentiometer or jumper setting).

When the installation is complete, test the following items to ensure proper operation.

- Check Terminals 9 and 10 to verify the presence of 24-VAC power.
- Check Terminals 4 and 6 to verify the presence of 5-VDC power.
- Attach a meter to the module to get an actual reading of what the module is doing.
  - — If the module is in the current loop mode, put a millimeter in series with Terminal 2 and the final equipment.
  - — If the module is in the voltage ramp output mode (IAO Ranging Card), put a DC voltmeter across Terminals 1 and 3.

- Check and/or set the manual default level if an IAO Ranging Card is not used.

  Set the maintenance override switch to on or off *or* remove one of the IOM or IOM/2 output connections. This prevents a pulse from occurring, and the module enters into manual operation after approximately 10 seconds. With the jumper in place, the output goes to 4 mA (jumper set to minimum) or 20 mA (jumper set to maximum).

  If using a potentiometer, vary its position and watch the current change accordingly.

  NOTE! If IAO Ranging Cards are used, the same test should be performed. Look for minimum and maximum voltage across Terminals 1 and 3. (The actual minimum and maximum reading depends on the ranging card is used.)

- Check the module's reaction to a timing pulse if the module is being used in the current mode.

  Switch the maintenance override switch from off to on and back to off to induce a timing pulse to the module. The amount of time the switch is left on determines the output current of the IAO-1010 module (0.59 seconds = 4 mA; 2.93 seconds = 20 mA; discretely variable in between). Throw the switch as described and watch for the module's output current to determine if it is the correct range. Readings must be taken before the unit enters into a 10-second timeout.

  NOTE! If an IAO Ranging Card is being used, the readings measured from Terminal 1–3 will be 0.59 seconds = low voltage; 2.93 seconds = high voltage.

- Place a DC voltmeter across Terminals 7 and 8 to check the module-supplied DC power. The voltage should switch between approximately 7 volts (IOM output light off) and 1.5 volts (IOM output light on). Levels other than these indicate a defective module.

Model Numbers

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

Table 1. Novar Controls Part Numbers

PRODUCT	MODEL NO.	PART NO.
IOM Analog Output Module	IAO-1010	724000000