

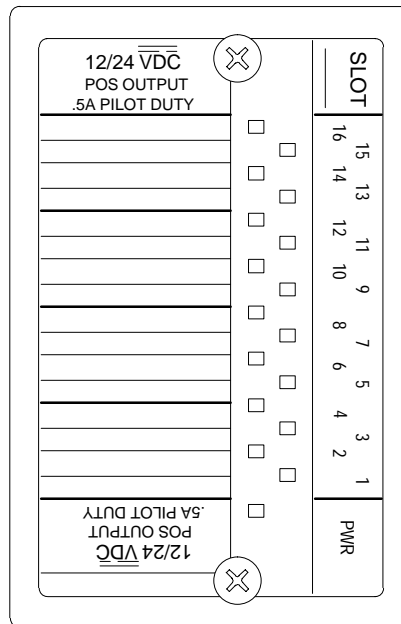
Discrete Output Module

IC670MDL740

GFK-0891H
February 1998

12/24 VDC Positive Output Module

The 12/24 VDC Positive Output Module (IC670MDL740) provides a single group of 16 discrete outputs. The outputs are positive logic or sourcing-type outputs. They switch the loads to the positive side of the DC supply, and thus supply current to the load.



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Power Sources

The power that runs the module itself comes from the power supply in the Bus Interface Unit.

An external source of DC power must be provided for the switches that power the loads. Within the module, the external power supply is connected to a 5A fuse. During operation, the module monitors this power to be sure it is above 9.8VDC. If not, it is interpreted as a fault by the Bus Interface Unit.

LEDs

Individual LEDs (logic side), visible through the transparent portion of the module top, indicate the on/off status of each output. The PWR LED is on when field and backplane power are present and the module fuse is not blown.

Host Interface

Intelligent processing for this module is performed by the Bus Interface Unit or elsewhere in the system. This includes configuring features such as output default and fault reporting. The module has 16 bits (two bytes) of discrete output data. A Bus Interface Unit is required to obtain this output data from the host and/or local processor.

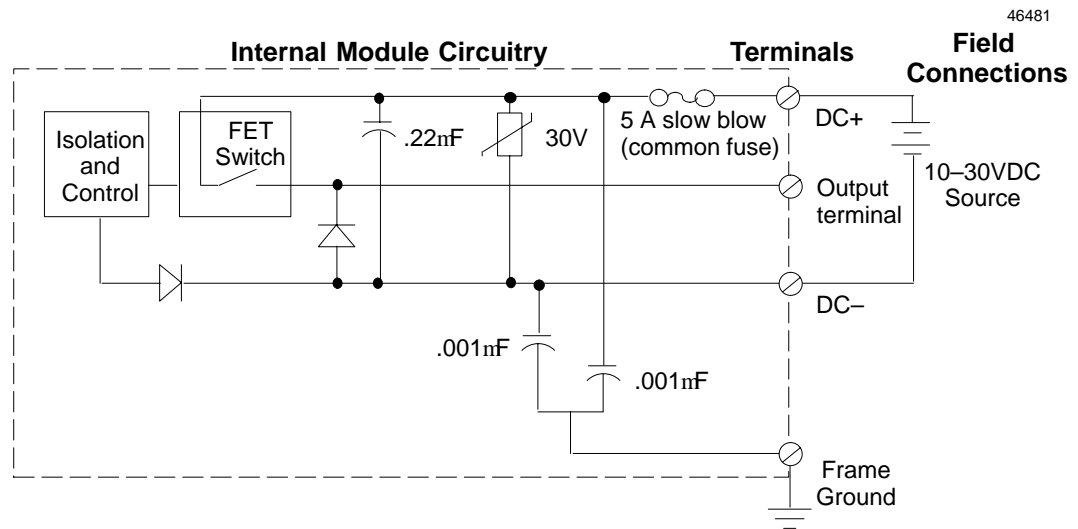
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Module Operation

After checking the Board ID and verifying that the module is receiving appropriate logic power from the Bus Interface Unit (as reflected by the state of the module's Power LED), the Bus Interface Unit then sends output data to the module in serial format. During transmission, the module automatically loops this data back to the Bus Interface Unit for verification.

Serial to parallel converters convert this data into the parallel format needed by the module. Opto-isolators isolate the module's logic components from field outputs. Power from the external power supply is used to drive the FETs that source current to the loads.



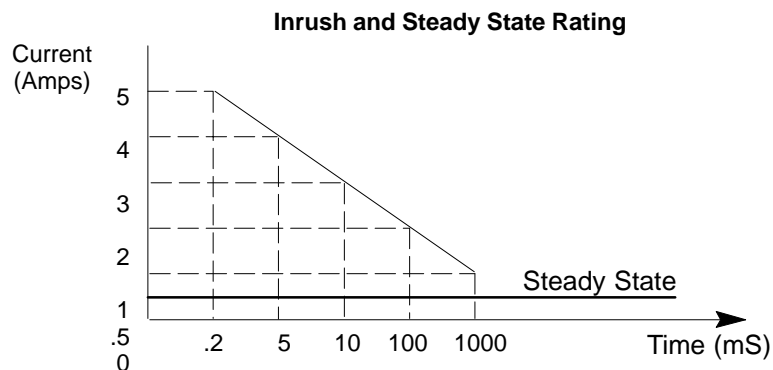
Maximum Load Rating

The outputs can switch loads over the range of 10 to 30 Vdc and are capable of sourcing a maximum of 0.5A per point. The total maximum steady-state load for the entire module is 4A.

Caution

Failure to observe this maximum load guideline could result in misoperation or destruction of the module.

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Module Specifications

| Module Characteristics | |
|--|--|
| User Input Voltage | 10 – 30VDC, 24VDC nominal, 4A maximum |
| Output Voltage Range | 9.2 VDC to 29.5 VDC |
| Output Current | 0.5 Amps maximum per point 4 Amps maximum per module |
| Outputs per module | 16 |
| Indicators | Logic side LEDs indicate on/off status of each output; blown fuse fault and user supply below 9.8VDC. |
| Isolation: User input to logic, user input to frame ground, group to group | 250 VAC continuous, 1500 VAC for 1 minute. No isolation between individual points in a group. |
| Current Drawn from Bus Interface Unit Power Supply | 111 mA maximum |
| Output Characteristics | |
| Inrush Current | 2A maximum for 100mS (see Inrush and Steady State Rating diagram) |
| Maximum Load Current (resistive) | 0.5 Amps from 10 VDC to 30 VDC |
| Minimum Load Current | 1 mA per point |
| Output Voltage Drop | 0.5 volts maximum |
| Output Leakage Current | 0.5 mA at 30 VDC |
| Response Time-On | 200μs maximum with 0.5A resistive load |
| Response Time-Off | 200μs maximum with 0.5A resistive load |
| Protection (each output) | Fuse: Metric 5 x 20 mm – 5 Amp, 250 V, Slow Acting Common to all outputs |

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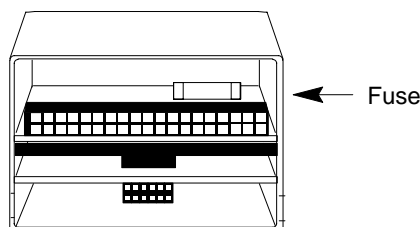
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Module Fuse

The module's 5 Amp fuse protects outputs against the effects of polarity reversal of the external power supply or excessive current through the output points.

If incorrect connection of the power supply blows the fuse, it is indicated by the module's LED. In addition, the module provides a Blown Fuse diagnostic message to the BIU. If the fuse blows, disconnect power; remove the module and replace the fuse. *CAUTION: Electrostatic discharge can damage the module when it is not installed on an I/O Terminal Block. Always observe normal ESD protection practices when handling an un-installed module.*

Fuse location is shown below. Pry the fuse upward to remove it, taking care not to damage any components in the module. Place the new fuse in position and press it into the holder.



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Spare fuses can be stored in the fuse holder compartment of the I/O Terminal Block (under the I/O module). The fuse should be a 5A, 5x20mm 250VAC slow-blow type.

Keying Locations

Optional keying locations for the 12/24 VDC Positive Output Module are shown below.

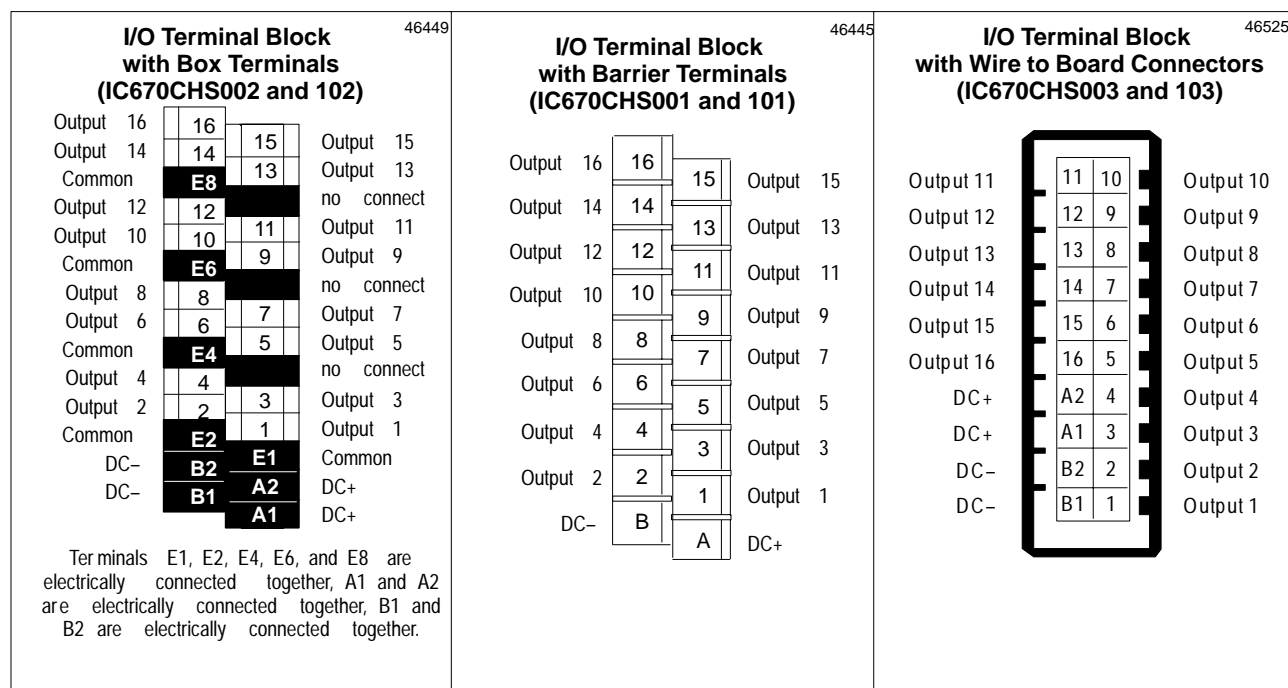
| Keying Locations | | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | J | K |
| ✓ | | n | | | | | | ✓ | ✓ |

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The Terminal Block with box terminals has 25 terminals for each module, each of which accommodates one AWG #14 (avg 2.1mm² cross section) to AWG #22 (avg 0.36mm² cross section) wire, or two wires up to AWG #18 (avg. 0.86mm² cross section). When an external jumper is used, the wire capacity is reduced from AWG #14 (2.10mm²) to AWG #16 (1.32mm²).

The I/O Terminal Block with Connectors has one 20-pin male connector per module.

The following illustration shows terminal assignments for the 12/24 VDC Positive Output Module.



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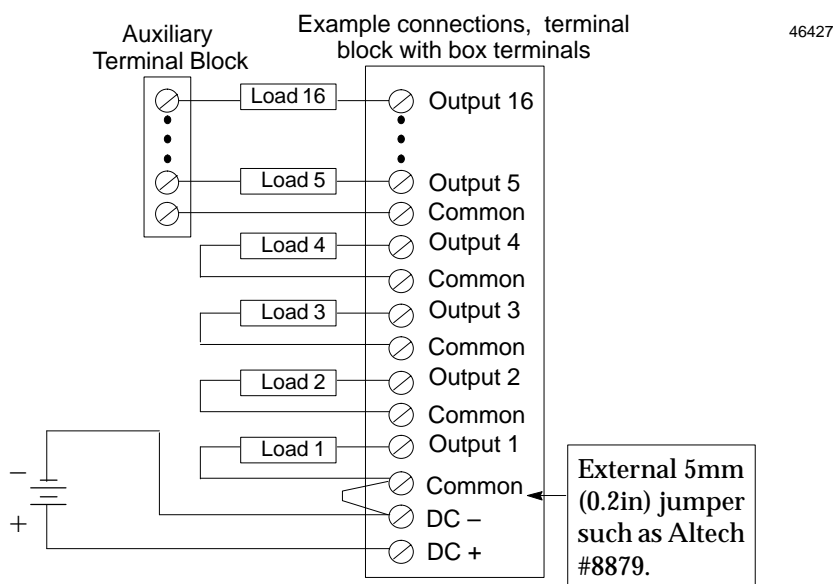
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Wiring Examples with Auxiliary Terminal Blocks

If the module is installed on an I/O Terminal Block with Box Terminals or an I/O Terminal Block with Barrier Terminals, an Auxiliary Terminal Block may be required to provide additional wiring terminals. For the I/O Terminal Block with Wire to Board Connectors, external connection points are usually preferred, although an Auxiliary Terminal Block can be used..

Auxiliary Terminal Blocks have all terminals connected together internally. The Auxiliary Terminal Block with box terminals has 13 terminals, each of which accommodates one AWG #14 (avg 2.1mm² cross section) to AWG #22 (avg 0.36mm² cross section) wire, or two wires up to AWG #18 (avg. 0.86mm² cross section). The Auxiliary Terminal Block with barrier terminals has nine terminals, each of which can accommodate one or two wires up to AWG #14 (avg 2.1mm² cross section).

The following illustration shows how an optional Auxiliary Terminal Block with Box Terminals can be used for power connections when installing this module on an I/O Terminal Block with Box Terminals.



For an I/O Terminal Block with Barrier Terminals or an I/O Terminal Block with Wire to Board Connectors, an Auxiliary Terminal Block with Barrier Terminals might be connected as shown in the following example.

