PACSystems* RX3i and Series 90-30

IC693MDL940 / IC694MDL940

Output Module, Relay, NO, 2 Amp, 16 Point

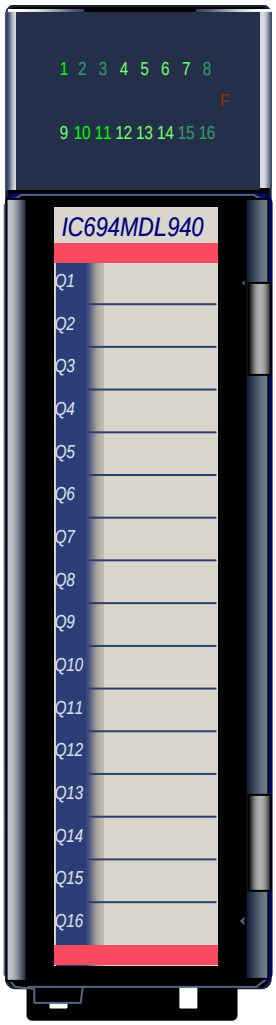
GFK-2704B
May 2015

The Series 90*-30 and PACSystems* MDL940 ***2 Amp Relay Output*** module provides 16 normally-open relay circuits for controlling output loads. The output switching capacity of each output is 2 Amps. The output points are in four groups of four points each. Each group has a common power output terminal. The relay outputs can control a wide range of load devices, such as: motor starters, solenoids, and indicators. Power for the internal relay circuits is provided by the +24 volt DC bus on the backplane.

Individual numbered LEDs show the ON/OFF status of each output point. There are no fuses on this module. The red bands on the label show that MDL940 is a high-voltage module.

This module can be installed in any I/O slot in a Series 90-30 or RX3i system.

The user must supply the AC or DC power to operate field devices connected to this module.



Caution

This module is not compatible with hot swap operations in any backplane. Hot removing or inserting this module into a backplane can cause damage to the module or other system components.

Related Documents

For product standards, general operating specifications and installation requirements refer to:

RX3i:	*PACSystems RX3i System Manual (GFK-2314)*
Series 90-30:	*Series 90-30 PLC Installation and Hardware Manual (GFK-0356)* *Installation Requirements for Conformance to Standards (GFK1179)*

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Specifications

Rated Voltage	24 volts DC, 120/240 VAC (nominal - see the following table for exceptions)
Operating Voltage	5 to 30 volts DC 5 to 250 VAC, 50/60 Hz
Outputs per Module	16 (four groups of four outputs each)
Isolation:	
Field to Backplane and to Frame Ground	250 VAC continuous; 1500 VAC for 1 minute
Point to Point	250 VAC continuous; 1500 VAC for 1 minute
Maximum Load	2 Amps pilot duty maximum per output 4 Amps maximum per common 16 amps maximum per module
Minimum Load	10mA
Maximum Inrush	5 Amps
On Response Time	15ms maximum[1]
Off Response Time	15ms maximum[1]
Power Consumption, all outputs on	7mA from 5 volt bus on backplane 135mA from relay 24V bus on backplane

[1] When this module is used with DC power supply IC695PSD040 or PSD140, special precautions should be taken because dropouts in the source voltage will be seen by this module and may cause relay dropouts.

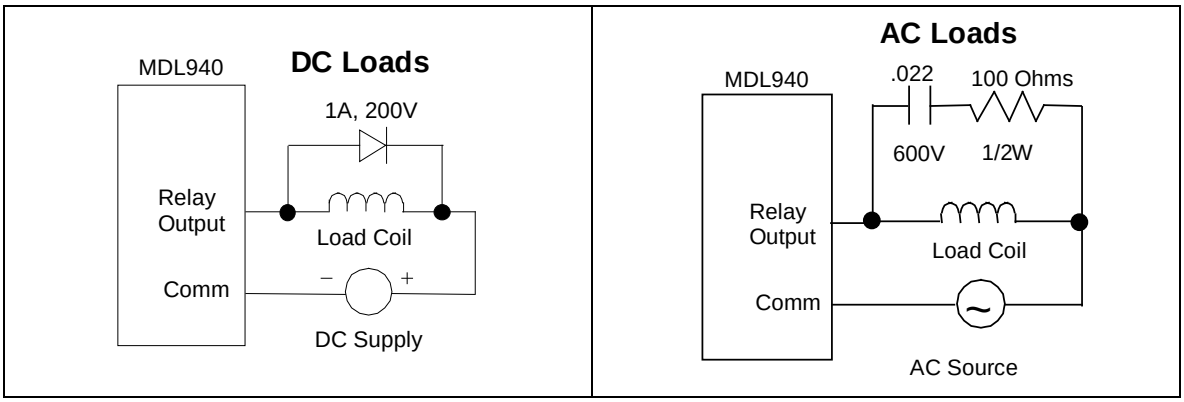
Load Current Limitations: MDL940

Operating Voltage	***Maximum Current for Load Type***		***Typical Contact Life (Number of Operations)***
	Resistive	***Lamp or Solenoid[2]***	
24 to 120 VAC	2 Amps	1 Amp	300,000
24 to 120 VAC	1 Amp	0.5 Amp	500,000
24 to 120 VAC	0.1 Amp	0.05 Amp	1,000,000
240 VAC	2 Amps	1 Amp	150,000
240 VAC	1 Amp	0.5 Amp	200,000
240 VAC	0.1 Amp	0.05 Amp	500,000
24 VDC	–	2 Amps	100,000
24 VDC	2 Amps	1 Amp	300,000
24 VDC	1 Amp	0.5 Amp	500,000
24 VDC	0.1 Amp	0.05 Amp	1,000,000
125 VDC	0.2 Amp	0.1 Amp	300,000

[2] Assumes a 7 ms time constant

Relay contact life, when switching inductive loads, will approach resistive load contact life if suppression circuits are used. The following figures are examples of typical suppression circuits for AC and DC loads. The 1A, 200V diode shown in the DC load suppression circuit is an industry standard 1N4935. The resistor and capacitor shown for AC load suppression are standard components, available from most electronics distributors.

Load Suppression Examples for Output Module IC694MDL940



General Installation Requirements

This product is intended for use with a Series 90-30 or RX3i system. Its components are considered open equipment [having live electrical parts that may be accessible to users] and must be installed in an ultimate enclosure that is manufactured to provide safety. As a minimum, the enclosure shall provide a degree of protection against solid objects up to 12mm (e.g. fingers). This equates to a NEMA/UL Type 1 enclosure or an IP20 rating (IEC60529) providing at least a pollution degree 2 environment.

Installation in Hazardous Areas

The system containing the MDL940 module must be mounted within an ultimate enclosure that can be accessed only by the use of a tool.

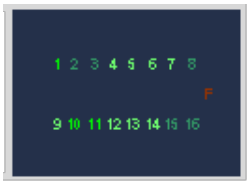
The following information is for products bearing the UL marking for Hazardous Locations or ATEX marking for explosive atmospheres:

- EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C & D, DIV. 2 HAZARDOUS AREAS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS AREAS ONLY
- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2;
- WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS AREAS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES; AND
- WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.

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LEDs

Individual numbered LEDs display the ON/OFF status of each output point.

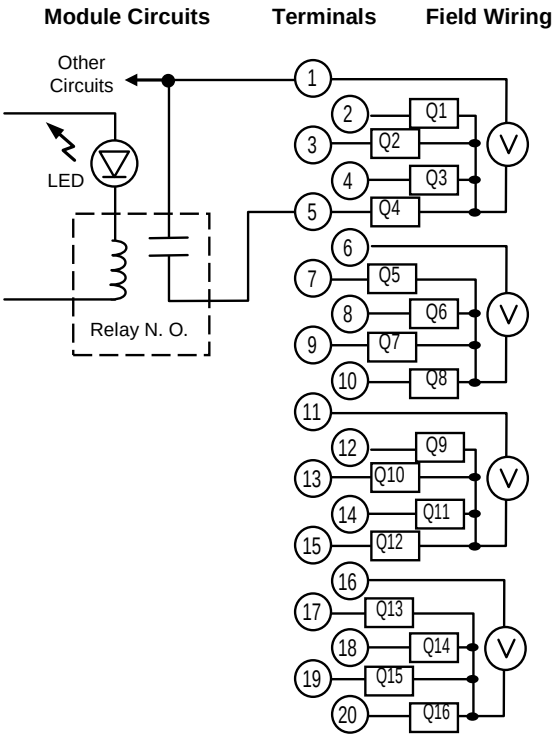


Module Data

The module receives 16 bits of output data from the host controller CPU. The starting location of this data is selected using the Proficy* Machine Edition configuration tool.

Field Wiring

Terminal	Connection
1	Outputs 1 – 4 common (return)
2	Output 1
3	Output 2
4	Output 3
5	Output 4
6	Outputs 5 -8 common (return)
7	Output 5
8	Output 6
9	Output 7
10	Output 8
11	Outputs 9 - 12 common (return)
12	Output 9
13	Output 10
14	Output 11
15	Output 12
16	Outputs 13 – 16 common (return)
17	Output 13
18	Output 14
19	Output 15
20	Output 16



Screw terminals accept two copper wires in the range AWG #22 (0.36 mm^2) to AWG #16 (1.3 mm^2), or one AWG #14 (2.1 mm^2) copper 90°C (194°F) wire. Each terminal can accept solid or stranded wires, but the wires into any given terminal must be the same type (both solid or both stranded) and the same size. Screw torque is from 9.6 in-lbs to 11.5 in-lbs (1.1 to1.3 Newton-meters).

Release History

Version	*Date*	*Description*
IC693MDL940N	May 2015	Change in fab color from Green to Blue. No change in form-fit-functionality.
IC694MDL940E	Jan 2015	Updated modules are RoHS converted product with applicable exemptions.
IC693MDL940M / IC694MDL940D	Jun 2013	Hardware update to resolve component obsolescence issue. No changes to features, functions or compatibility.
IC693MDL940J / IC694MDL940A	Aug 2008	Initial release.