

8.4 Mixed I/O Module: IC694MDR390

The 24Vdc 8-Input/8-N.O. Relay Output module provides eight isolated input points with one common power input terminal, and eight isolated normally open relay circuits in the same module.

The input circuits can have either positive or negative characteristics in that they sink or source current to/from the input devices to/from the user common. Input characteristics are compatible with a wide range of user-supplied devices, such as pushbuttons, limit switches, and electronic proximity switches. Current through an input results in a logic 1 in the input status table (%I).

The relay output circuits are arranged in two groups of four circuits each. Each group has a common power output terminal. The normally-open relay circuits are used for controlling output loads provided by the user. The output switching capacity of each output is 2 Amps. The relay outputs can control a wide range of user-supplied load devices, such as motor starters, solenoids, and indicators.

The top half of the outside left edge of the insert is color-coded blue to indicate low-voltage circuits and the bottom half of the outside left edge is color-coded red to indicate high-voltage circuits.

This module can be installed in any I/O slot in an RX3i PLC System.

Module does not support insertion into or removal from an RX3i Universal Backplane which is under power (see *Hot Insertion and Removal Not Supported*, Section 2.6.4.2).

Power for the internal relay circuits is provided by the +24Vdc bus on the backplane. The user must supply the AC or DC power to operate field devices. There are no fuses on this module.

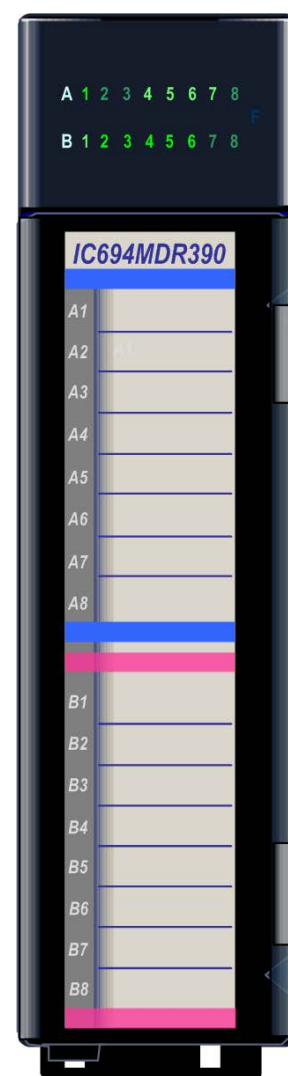


Figure 252: IC694MDR390

8.4.1 LEDs: MDR390

LED indicators that provide the ON/OFF status of each point are visible through the lens at the top of the module. The LEDs are arranged in two horizontal rows with eight green LEDs in each row. The top row (labeled A1 through A8) indicates the states of the input points (1 through 8). The bottom row (labeled B1 through B8) indicates the states of the relay output points (1 through 8).

8.4.2 Specifications: MDR390

Inputs	
Rated Voltage	24 Vdc
Input Voltage range	–30 to +32 Vdc
Inputs per Module	8 (one group of eight inputs)
Isolation	1500 Vrms between field and logic side 500 Vrms between inputs
Input Current	7.5 mA (typical) at rated voltage
Input Characteristics	
On-State Voltage	15 to 32 Vdc
Off-State Voltage	0 to +5 Vdc
On-State Current	4 mA (minimum)
Off-State Current	1.5 mA (maximum)
On Response Time	7 ms typical
Off Response Time	7 ms typical
Outputs	
Rated Voltage	24Vdc, 120/240 Vac
Operating Voltage	5 to 30 Vdc 5 to 250 Vac, 50/60 Hz
Outputs per Module	8 (two groups of four outputs each)
Isolation	1500 Vrms between field and logic side 500 Vrms between groups
Maximum Load	2 Amps maximum per output 4 Amps maximum per common
Minimum Load	10 mA
Maximum Inrush	5 Amps
On Response Time	15 ms maximum
Off Response Time	15 ms maximum
Internal Power Consumption	80 mA (all I/O on) from +5Vdc backplane bus 70 mA (all outputs on) from relay +24Vdc backplane bus

Maximum load current is dependent on operating voltage as displayed in the following table.

8.4.2.1 Load Current Limitations: MDR390

Operating Voltage	Maximum Current for Load Type		Typical Operations (number of operations)
	Resistive	Lamp or Solenoid ⁴⁰	
240 Vac, 120 Vac, 24 Vdc	2A	0.6A	200,000
240 Vac, 120 Vac, 24 Vdc	1A	0.3A	400,000
240 Vac, 120 Vac, 24 Vdc	0.5A	0.1A	800,000

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, 100V diode shown in the DC load typical suppression circuit is an industry standard 1N4934. The resistor and capacitor shown for AC load suppression are standard components, available from most electronics distributors.

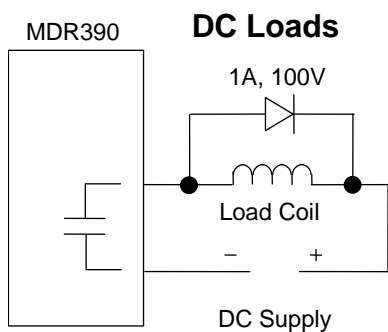


Figure 253: Suppression of DC Loads MDR390

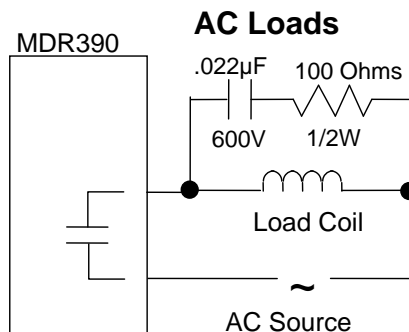


Figure 254: Suppression of AC Loads MDR390

⁴⁰ For inductive loads.