

### Fast Response I/O IC610MDL115

The Fast Response I/O module allows a Series One or Series One Plus PC to respond quickly to an input and/or monitor very short input pulses. The module's four 24 V dc inputs and two relay outputs use 8 I/O references to interface with user logic. Each of the 2 outputs can operate in a manual or fast response mode. An output in manual mode is controlled from user logic similar to any other discrete output. An output in the fast response mode can be controlled independent of CPU scan time by its 2 associated inputs, with one input enabling it, and the other disabling it. Up to 14 Fast Response I/O modules can be included in a Series One or Series One Plus PC system, thereby providing 28 fast response outputs and 56 inputs total. Following are specifications for each of the input and output circuits.

DC INPUT CIRCUITS	
Number of Circuits	4
Maximum Voltage (Open Circuit)	36 V dc
Input Current	16 mA (maximum)
ON Level	0 - 3 V dc
OFF Level	18 - 36 V dc
OFF to ON Response	0.3 to 1 ms
ON to OFF Response	50 to 150 ms
Maximum OFF Current	3 mA
Minimum ON Current	7 mA
Input Pulse Width	1 ms (minimum)
Circuit Indicator	Field Side

#### NOTE

Input Switching Voltage Provided by Module

RELAY OUTPUT CIRCUITS	
Number of Circuits	2
Operating Voltage	5-265 V ac/dc
Ac Frequency Range	47-63 Hz
Maximum Current*	4 amp (resistive) 0.5 amp (inductive)
Maximum Leakage Current	1 mA
Smallest Recommended Load	10 mA
Maximum Inrush	5 amps
OFF To ON Response	5 ms (maximum)
ON To OFF Response	5 to 10 ms
Circuit Indicator	Field Side
Circuit Indicator	Field Side
Fuse (In Output Common Line)	3 amp
Internal Power Consumption	50 mA + 53 mA/Output ON Circuit at 9 V dc, 15 mA/Input @ 24 V dc Units of Load: 16 (9 V dc) 6 (24 V dc)

Since non-solid state relays are used as the power switching devices, the limitations as shown in table below must be observed for reliable operation.

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Table 6-11. Maximum Current vs. Load Type for Relay Outputs

OPERATING VOLTAGE	MAXIMUM CURRENT FOR LOAD TYPE			TYPICAL LIFE (OPERATIONS)
	RESISTIVE	LAMP	SOLENOID	
220 V ac	4 Amp	0.5 Amp	0.5 Amp	100,000
220 V ac		0.05 Amp	0.05 Amp	800,000
110 V ac	4 Amp	0.5 Amp	0.5 Amp	150,000
110 V ac		0.1 Amp	0.1 Amp	650,000
24 V dc	5 Amp	0.5 Amp	0.5 Amp	100,000
50 V dc	1 Amp	0.1 Amp	0.1 Amp	100,000
100 V dc	0.5 Amp	0.05 Amp	0.05 Amp	100,000
250 V dc	0.3 Amp	0.03 Amp	0.03 Amp	100,000

NOTE

Lamp loads are defined as a X10 inrush with a power factor (PF) of 1.00 and when turned OFF represent a PF of 1.00. Solenoids are defined with a X10 inrush, a PF of 0.65, and when turned OFF represent a PF of 0.35.

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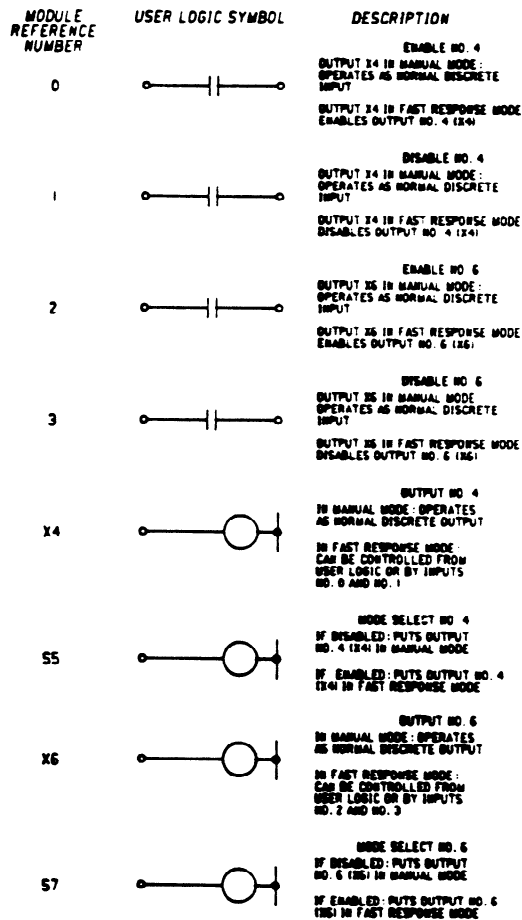


Figure 6-54. Module Reference NUMBER/LOGIC Symbol Definition

### Mode Selection

The Operating Mode Selection of outputs X4 and X6 is determined by the status of their mode select references S5 and S7 as shown in table 6.12.

**Table 6-12. Operating Mode Selection**

MODE SELECT	OUTPUT
(S5 and S7) Disabled (0) Enabled (1)	(X4 and X6) Manual Mode Fast Response Mode

### Output Logic - Manual Mode

An output operating in the manual mode is controlled through user logic similar to any other discrete output. Its associated inputs on the fast response module do not affect it any way.

### Output Logic - Fast Response Mode

In the fast response mode of operation, a combination of three factors determines the status of the output.

- State of Associated Enable Input (Reference number 0 or 2)
- State of Associated Disable Input (Reference number 1 or 3)
- User Logic

The truth table (following) shows how the output can be controlled from user logic or with its enable and disable inputs.

**Table 6-13. Truth Table for Output in Fast Response Mode  
(S5 or S7 Have Been Enabled)**

ENABLE INPUT No. 0 or 2	DISABLE INPUT No. 1 or 3	USER LOGIC X4 or X6	OUTPUT
1	0	0	1
0	0	1	1
1	0	1	1
1	1	1	0
1	1	0	0
0	1	0	0
0	0	0	0

0: Disabled 1: Enabled

It can be seen from the first three rows in the truth table that the output can be enabled from its enable input or from user logic. The last four rows of this truth table show the various conditions that disable the outputs.

The logic diagram shown below in figure 6.55 summarizes the operation of this module.

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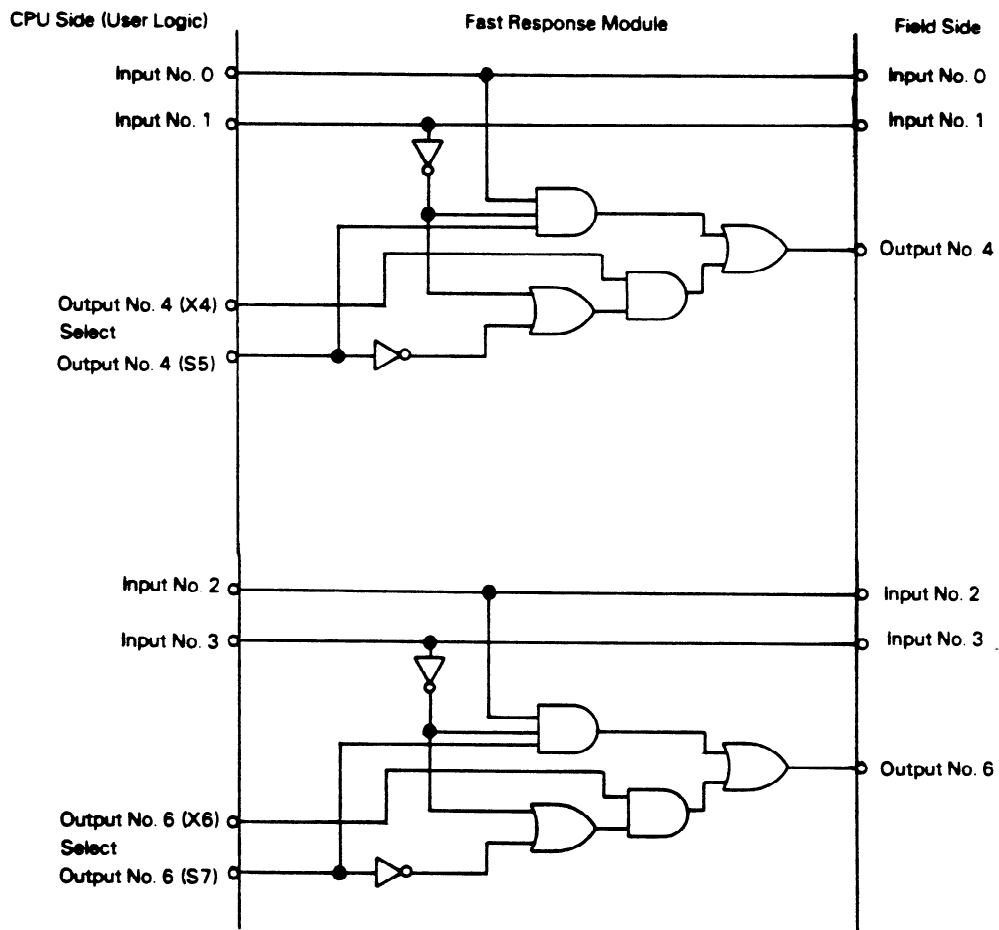
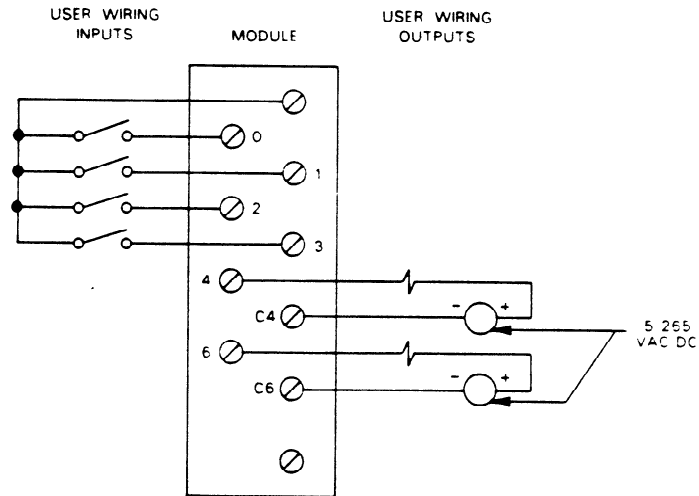


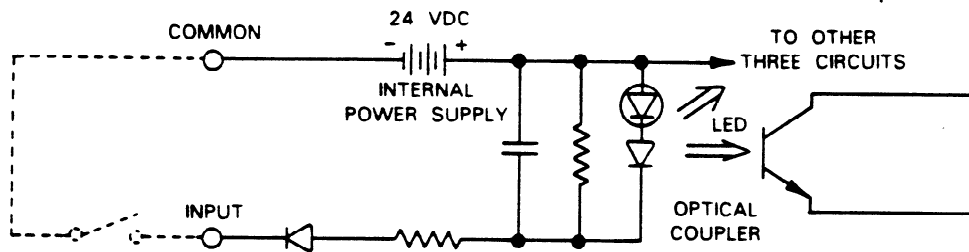
Figure 6-55. Fast Response Module Logic Diagram

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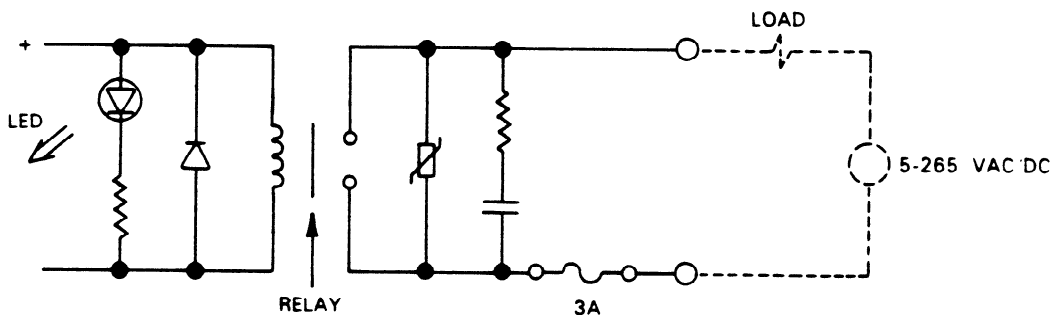


USER WIRING DIAGRAM

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SAMPLE OUTPUT CIRCUIT

Figure 6-56. Wiring for Fast Response I/O Module