

DC Input/Relay Output/120 VAC Power Supply Module IC692MDR541

24 VDC Positive/Negative Logic Input, 16 Points

The 24 volt DC positive/negative logic input circuits provide 16 input points in two groups, with 4 inputs in one group and 12 inputs in the other group. The input circuits are designed to have positive or negative logic characteristics. To connect the inputs as positive logic circuits, the input switching device is connected between the positive power bus and the module input. The negative bus is connected to the input circuit common. To connect the inputs as negative logic circuits, the input switching device is connected between the negative power bus and the module input. The positive bus is connected to the input circuit common. Current into an input point results in a logic 1 in the input status table (%I).

Input characteristics are compatible with a wide range of input devices, such as: pushbuttons, limit switches, and electronic proximity switches. Power to operate field devices and the input circuits is supplied by an isolated +24 VDC supply. This power supply is limited to 220 mA maximum.

Table 5-8. Specifications For 24 Volt DC Positive/Negative Logic Input Circuits

	Negative Logic Mode	Positive Logic Mode
Points/Common	12 (I5-I16) and 4 (I1-I4 ; includes 2 High Speed Counter inputs)	
Rated Input Voltage	24 volts DC	24 volts DC
Input Voltage Range	0 to 30 volts DC	0 to 30 volts DC
Input Current	7.3mA typical	7.3mA typical
Input Threshold Voltage	ON: 15V minimum OFF: 5V maximum	15V minimum 5V maximum
Input Threshold Current	ON: 4mA maximum OFF: 1.5mA minimum	4mA maximum 1.5mA minimum
Response Time	4mstypical	4mstypical
Isolation Voltage:	1500V RMS field side to logic side 1500V RMS between each group if one group is powered by an external 24V power supply.	
Operating Temperature:	0° to 60°C 32° to 140°F	

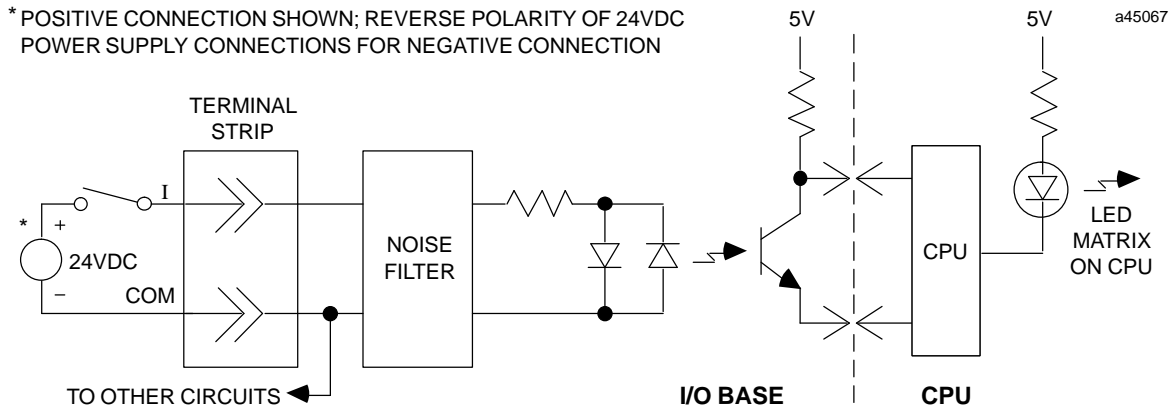


Figure 5-10. Typical 24 VDC Positive/Negative Logic Input Circuit

Relay Output, Normally Open, 2 Amp - 11 Points

The 2 Amp Relay Output circuits provide 11 normally-open relay circuits for controlling output loads provided by the user. The output switching capacity of each of these circuits is 2 amps. The output points are arranged in three groups; one with three outputs and two with four outputs. Each group has a common power output terminal. The relay outputs can control a wide range of user-supplied load devices, such as: motor starters, solenoids, and indicators. Power for the internal relay circuits is provided by the +5 volt DC internal supply. The user must supply the AC or DC power to operate field devices. Each common has a 10 amp replaceable fuse.

Table 5-9. Specifications For Relay Output, 2 Amp Circuits

Operating Voltage:	5 to 30 volts DC 5 to 250 volts AC
Outputs per Module:	11 (three groups: one with 3 outputs; two with 4 outputs)
Isolation:	1500 volts RMS
Leakage Current:	1 mA at 240 VAC maximum
Maximum Load:	2 amps resistive maximum per output
Minimum Load:	10 mA
Maximum Inrush:	20 amps maximum for one cycle
On Response Time:	15 ms maximum
Off Response Time:	15 ms maximum
Operating Temperature:	0° to 60°C (32° to 140°F)
Contact Life:	(also refer to the following table)
Mechanical:	20 x 10 ⁶ operations
Electrical:	200,000 operations resistive load (2A), typical.

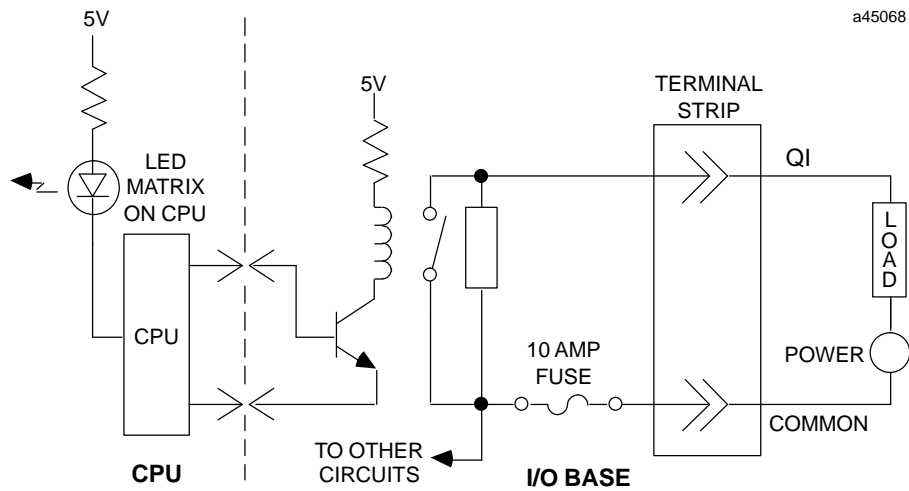


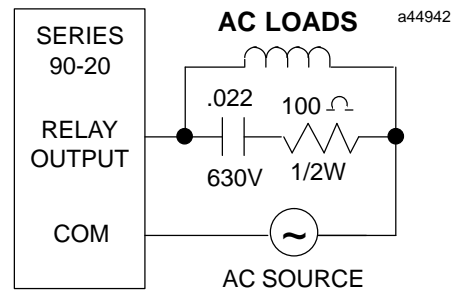
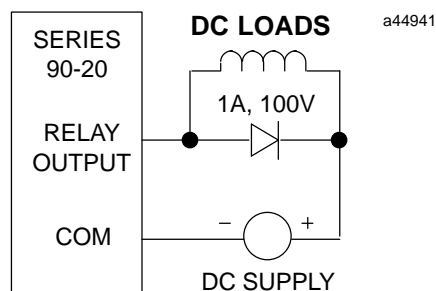
Figure 5-11. Typical Relay Output Circuit

Table 5-10. Typical Contact Life

Voltage	Current		Typical Operations
	Resistive	Lamp and Solenoid	
240VAC, 120VAC, 24VDC	2A	.6A	200,000
240VAC, 120VAC, 24VDC	1A	.3A	400,000
240VAC, 120VAC, 24VDC	.5A	.1A	800,000

User replaceable fuses are supplied internally on the common of each output group. This fuse does not guarantee that the output point will be protected by a direct short. It is recommended that each output point be externally fused (minimum 2 amp) to protect the output point. For lighter loads, the internal common fuse (10 amps) can be replaced with a 5 amp fuse to protect the output point without adding the external fusing.

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 DC and AC loads. The 1A, 100V diode shown in the DC load typical suppression circuit is an industry standard 1N4934.



High Speed Counter Input Circuits, I1 and I2

Two 12/24VDC input positive/negative logic circuits are available to provide inputs for type A counter inputs: count and strobe/preload. These circuits function as either %I1 and %I2 or as count and strobe/preload inputs. These inputs share the same common as %I3 and %I4. The inputs can be connected either as positive or negative inputs as described in the DC input circuit section. With the high frequency selection, the highest frequency guaranteed to be detected is 10Khz with a 50/50 duty cycle (50ms ON, 50ms OFF). The maximum frequency in the low frequency mode is 30 Hz (16.7 ms ON, 16.7 ms OFF).

Table 5-11. High Speed Counter Input Circuit Specifications

	Negative Logic Mode	Positive Logic Mode
Rated Input Voltage:	12VDC/24VDC	12VDC/24VDC
Input Voltage Range:	0 to 30VDC	0 to 30VDC
Input Current:	8.2 mA typical at 24VDC 2.8 mA typical at 12VDC	8.2 mA typical at 24VDC 2.8 mA typical at 12VDC
Input Threshold Voltage	ON: 11.5V minimum OFF: 5V maximum	11.5V minimum 5V maximum
Input Threshold Current	ON: 2.9 mA maximum at 11.5V OFF: .5 mA minimum at 5V	2.9 mA maximum at 11.5V .5 mA minimum at 5V
Response Time (low filter):	10mstypical	10mstypical
Response Time (high filter):	40μstypical	40μstypical
Isolation Voltage:	1500V field to logic side	1500V field to logic side
Operating Temperature:	0° to 60°C (32° to 140°F)	0° to 60°C (32° to 140°F)

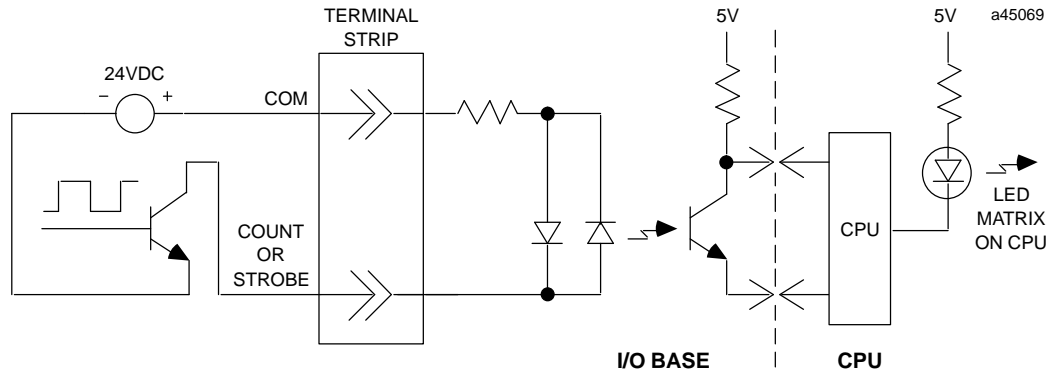


Figure 5-12. High Speed Counter Circuit - Negative Logic Connection

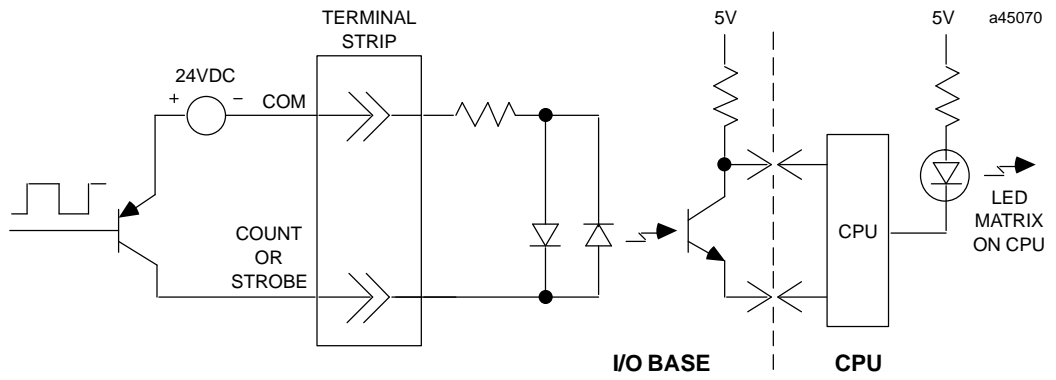


Figure 5-13. High Speed Counter Circuit - Positive Logic Connection

5/12/24 Volt DC Negative Output Q1 or High Speed Counter Output-1.5 Amp

The 5/12/24 volt DC negative logic 1.5 Amp output circuit provides one isolated output point. The output circuit is designed to have negative logic characteristics in that it sinks current from the loads to the user common or negative power bus. The output device is connected between the positive power bus and the module output.

The output characteristics are compatible with a wide range of user-supplied load devices, such as: motor starters, solenoids, and indicators. Power to operate the field devices must be supplied by the user.

Table 5-12. Specifications For 5/12/24 Volt DC Negative Logic - 1.5 Amp Output Circuit

Rated Voltage:	5/12/24VDC
Output Voltage Range:	5 to 30 VDC
Outputs per Module:	1
Isolation:	1500 volts RMS between field side and logic side; 500 volts to other groups
Output Current:	2 amps maximum, 12 to 24 VDC, 0 to 25 °C (32 to 77 °F); see derating diagram below 1.5 amps maximum, 12 to 24 VDC, 60 °C (140 °F) .75 amps maximum, 5 to 11 VDC, 60 °C (140 °F)
Output Characteristics:	
Output Voltage Drop	0.2 volts maximum at 12 to 24 VDC, 25 °C (77 °F) 0.4 volts maximum at 5 to 11 VDC, 25 °C (77 °F)
Off-state Leakage	250 μA maximum
On Response Time	.1 ms maximum
Off Response Time	.1 ms maximum
Operating Temperature:	0° to 60°C (32° to 140°F)

It is recommended that this output be externally fused since the internal fuse is not easily replaceable (it is soldered into the board).

Caution

Connecting the power supply to DCPWR (+) and DCCOM (-) with polarity reversed will cause an internal fuse to blow.

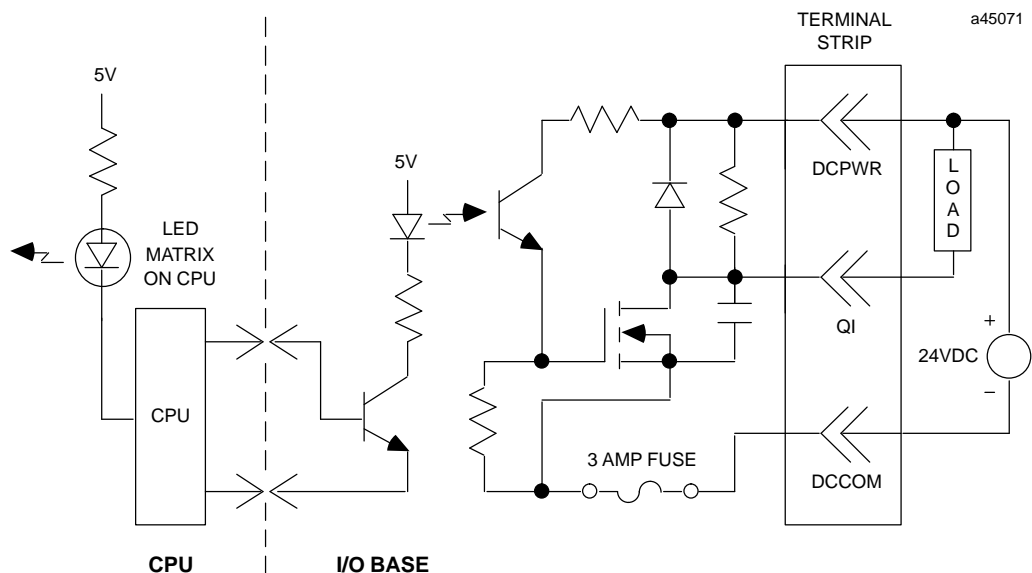


Figure 5-14. Typical 5/12/24 Volt DC Negative Logic Output Circuit

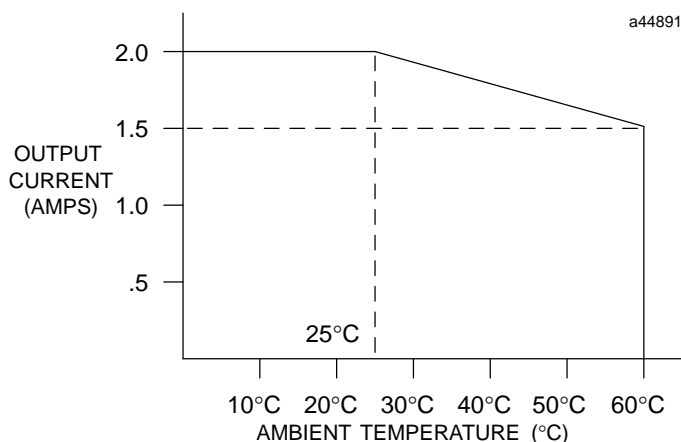


Figure 5-15. Temperature vs. Current for High Speed Counter Output

24 VDC Power Supply On DC Input Modules

An isolated 24 VDC output power supply is available on the I/O Base modules with DC input circuits. This supply is available for user devices and is typically used to power the DC input circuits at about 7.3 mA per input. The combination of input circuit current and external device current must not exceed 220 mA.

120 VAC Power Supply

Table 5-13. Specifications for 120 VAC Power Supply

Range	102 volts AC to 132 volts AC
Frequency	47 to 63 Hz
Input Current	250mA, maximum
Hold-up	10 ms, minimum
Inrush Current	2.4 amps maximum

Table 5-14. Specifications for 24 VDC Power Supply

Voltage:	24 VDC, " 10%
Current:	220mA maximum
Fusing:	.25 amp fast blow (removable)

Replacing Fuses

The Series 90-20 PLC provides replaceable fuses for output points and for a user accessible 24 volt power supply (on the dc input versions of I/O Power Supply baseplate only). To replace these fuses:

- Remove power from the unit.
- Remove the CPU module.
- Confirm that power is removed from the I/O Power Supply baseplate. Use a small screw driver or fuse extractor to remove the fuse from the clips on the I/O circuit board. The 24 volt power supply fuse is located near the input terminal board. The output fuses are located near the output terminal board. The output fuses are located on the common of several circuits; therefore, if a fuse is blown it will prevent the entire group associated with it from working. The following figure shows the location of the fuses on the I/O Base module, and the table following the figure provides a list of these fuses with location, rating, part number, third party source, and the type of fuse.

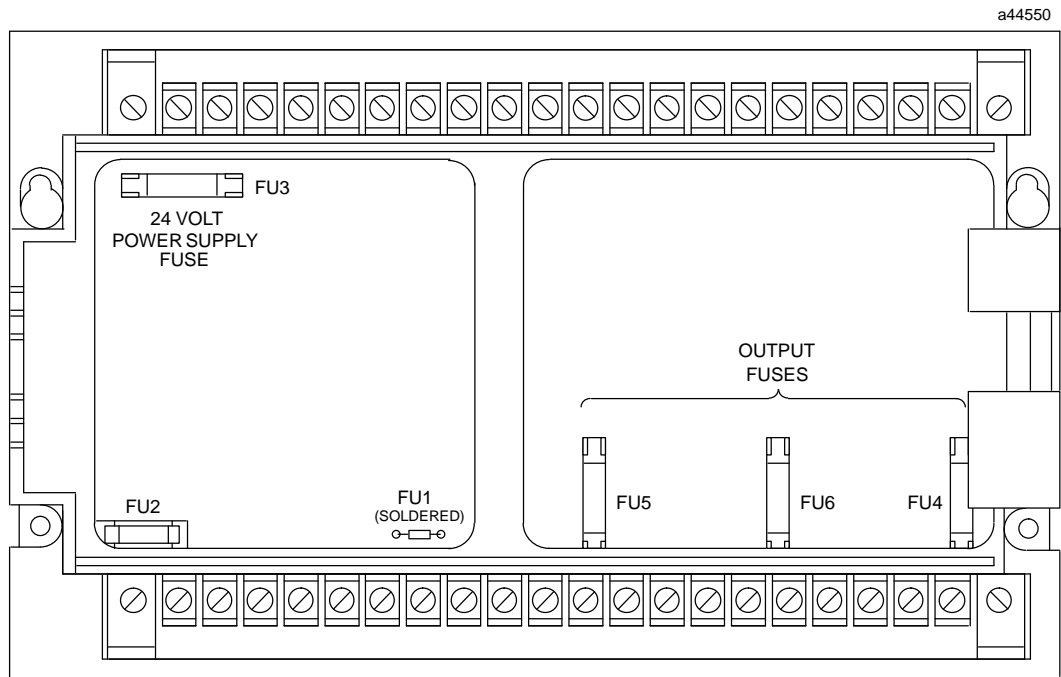


Figure 5-16. Location of Fuses

Warning

Failure to remove power when changing fuses could cause severe or fatal injury to the operator or maintenance personnel.

Table 5-15. List of FusesDC in Relay Out/120 VAC PS module

Location	Current Rating	GE Fanuc Fuse Part Number	Third Party Source and Part Number	Fuse Type
FU1	3A	259A9598P10	Littlefuse,239003	Soldered-in
FU2	250mA	44A724627-105	Bussman,GMD0.50 Littlefuse,239.500	Replaceable
FU3	250mA	259A9578P6	Bussman,AGC-1/4 Littlefuse,312.250	Replaceable
FU4, FU5, FU6	10A	259A9578P19	Bussman,AGC-10 Littlefuse,312010	Replaceable

Field Wiring Information

The following figure provides wiring information for connecting user supplied input and output devices and power sources for the 120 VAC Power Supply/ DC input / Relay Output Base Module.

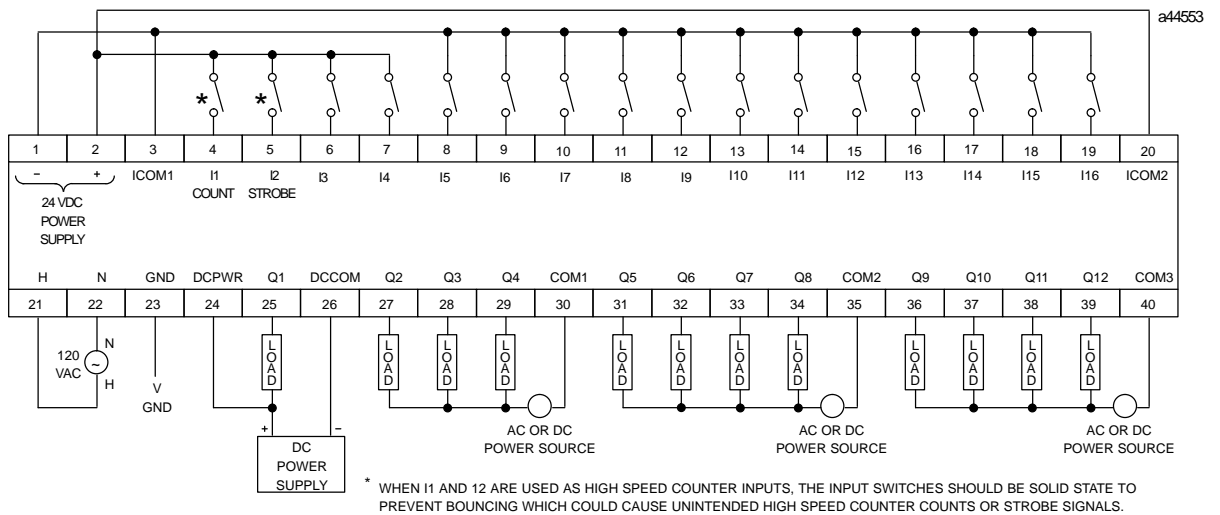


Figure 5-17. Field Wiring Information - IC692MDR541

Note

Although I1 through I4 are shown connected as positive Logic; and I5 through I16 are shown connected as negative Logic, all inputs can be connected as either positive or negative logic.

Derating Information

The following figure provides derating information for this module.

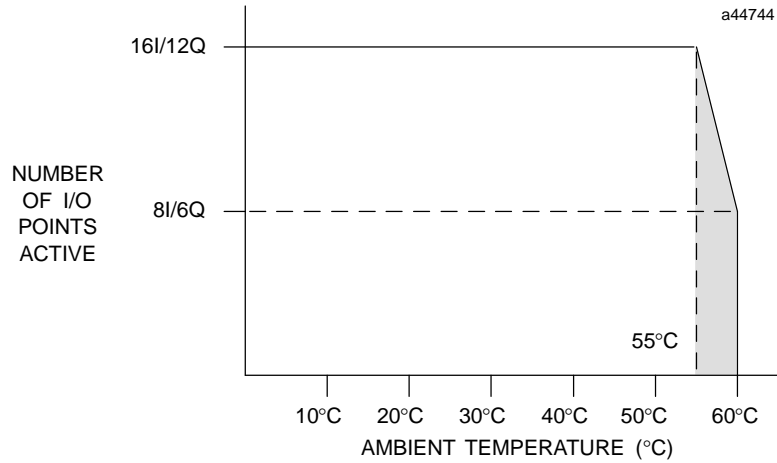


Figure 5-18. Temperature vs. Input/Output Points for IC692MDR541

Notes

- (1) The Hand-Held Programmer or RS-422/RS-485 to RS-232 Converter should not be connected continuously in the shaded region (above 55°C (131°F)).
- (2) For non-standard orientation, derate the temperature in the above figure by 10°C (18°F).