

Solenoid Valve Output Module

IC693MDL760

GFK-1881A
November 2000

Product Description

Description

This IC693MDL760 output module provides eleven pneumatic outputs and five 24VDC sourcing outputs. For each pneumatic output, the module contains an internal 3-way solenoid-actuated valve and an associated output fitting, which is located on the front panel. When an output is turned ON, its internal valve connects a user-supplied pressure source (100 psi maximum) to the output fitting. The pressure source is connected to the fitting on the bottom of the module. When the output is turned OFF, the valve's output port is vented to atmosphere inside the module. Solenoid power is supplied from an external 24VDC source to the "DC Outputs" connector on the front panel.

A 12-pin connector, located on the module's front panel, allows the user to connect the optional IC693ACC760 Solenoid Forcing Pendant, described later.

The five 24VDC outputs can each drive up to a maximum 0.5A, with a limit of 2.0A total for all five points. Field wiring is connected to these outputs via a 10-pin connector located on the front panel. The user must provide 24VDC to this connector to power the positive logic outputs, which source current to the field connections. This group of five discrete outputs is electrically isolated from the PLC backplane; however, the outputs are not individually isolated from each other.

The module is accessed from the logic program as a standard 16-point output module. When using VersaPro version 2.0 (or later version) programming software, it should be configured by its catalog number. When using programming software other than VersaPro version 2.0 (or later version), the module must be configured as a standard 16-point generic output module.

The module is enclosed in a standard IC693 plastic housing.

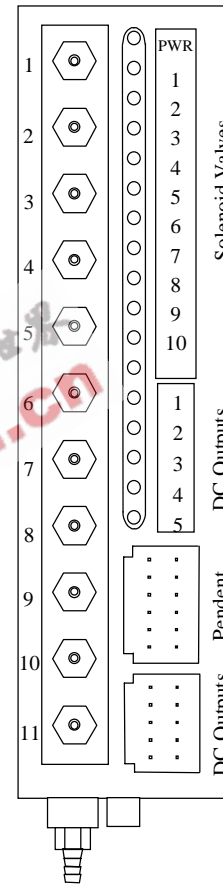


Figure 1. IC693MDL760 Module

Module Specifications

Table 1. Module Specifications

| Module Specifications | |
|----------------------------------|---|
| Pneumatic Outputs | |
| Outputs per Module | 11 (grouped) |
| Thermal Derating | Refer to Table 2 |
| Supply Pressure | 100 psi max. |
| Pressure Drop | 25 psi max. @ 0.25scfm |
| External Solenoid Power | 21.6-26.4VDC, 24VDC nominal |
| Isolation | 1500 volts between field side and logic side; 500 volts between groups |
| Solenoid Inrush Current | 33mA/valve @ 24VDC |
| Solenoid Holding Current | 13mA/valve @ 24VDC |
| ON Response Time | 12ms max. |
| OFF Response Time | 12ms max. |
| Maximum Solenoid ON Time | 30 days max. (must be turned OFF at least once every 30 days) |
| Output Fitting | Threaded for 10-32 adapter, 1/16" hose barb provided |
| Supply Fitting | Threaded for 10-32 adapter, 1/8" hose barb provided |
| LED Indicators for output points | One LED per output point indicates ON/OFF state |
| LED "PWR" Indicator | LED indicates solenoid power is present |
| DC Outputs | |
| Outputs per Module | 5 (grouped) |
| Thermal Derating | None |
| Output Voltage | 18-30VDC, 24VDC nominal |
| Isolation | 1500 volts between field side and logic side; 500 volts between groups |
| Continuous Load Current | 0.5A @ 30VDC per point, 2.0A total for all five points |
| Inrush Current | 2.0A for 100ms |
| Voltage Drop | 0.5V max |
| Leakage Current | 1mA @ 30VDC max |
| ON Response Time | 2ms max. |
| OFF Response Time | 2ms max. |
| Protection (each output) | No internal fuse |
| LED Indicators | One LED per output shows on/off state |
| Module Characteristics | |
| Operational Ambient Temperature | 45°C (113° F) max. |
| Backplane Current | 75mA from 5V bus (solenoid LEDs are powered from external power source) |

Environmental Requirements and Solenoid Valve Output Thermal Derating

Table 2. Environmental Requirements

| Parameter | Min. | Max. | Units |
|---------------------------------|------|------|-----------|
| Storage Temperature | -40 | 85 | Degrees C |
| Operational Ambient temperature | 0 | 45 | Degrees C |

Note

This module has a lower operating temperature rating than standard IC693 I/O modules.

Table 3. Solenoid Valve Output Thermal Derating

| Ambient Temperature | Solenoid Valve Output Rating (with DC Outputs Operating at “Continuous Load Current” Rating) |
|---------------------|--|
| 30° C (86° F) | All pneumatic outputs may be on continuously |
| 40° C (104° F) | Six pneumatic outputs may be on continuously |
| 45° C (113° F) | Four pneumatic outputs may be on continuously |

Note

- IC693MDL760A does not have CE or UL approvals/listings.
- IC693MDL760B (and later versions), when available, will have CE and UL approvals/listings.

Optional IC693ACC760 Solenoid Forcing Pendant

The IC693ACC760 Solenoid Forcing Pendant is an optional system maintenance tool. This pendant is a small hand-held unit containing eleven switches, one for each valve. Each switch is labeled to allow the user to easily establish a correlation between any given switch and its corresponding valve. The pendant is attached to the Solenoid Valve Output Module via the 12-pin connector, labeled “Pendant,” on the module’s front panel.

With solenoid power applied (to the DC Outputs connector), the user may turn the solenoids ON and OFF with the pendant switches. This pendant is intended to allow maintenance personnel to operate the valves during shut down periods when the main power to PLC system has been turned off. If the pendant is attached during normal operation (with the PLC system running), a command from the PLC can turn a valve ON even if the pendant switch for that valve is in the OFF position, and a pendant switch can turn a valve ON even if the PLC is commanding it to be OFF.

LED Operation

This module has 17 LED indicators (see Figure 1):

- **Solenoid Power** - 1 LED, labeled PWR, indicates presence of solenoid power.
- **Point Status** - 16 LEDs, labeled 1-11 and 1-5, indicate individual I/O point ON/OFF status.

The solenoid valve status LEDs (the top group, labeled 1 to 11) are powered from the 24VDC external Solenoid Power source; these LEDs will not illuminate unless this power source is present. The “PWR” LED indicates the presence of external solenoid power. Each valve status LED illuminates while its corresponding valve is open (valve coil is energized), whether by PLC command or by use of the Solenoid Forcing Pendant. The discrete output LEDs (the bottom group, labeled 1 to 5) are powered from the PLC backplane and can illuminate even if the external DC Output field power (24VDC) is off.

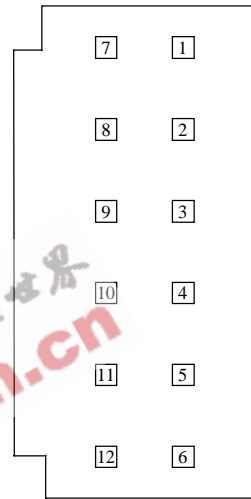
Field Wiring

Two AMP brand .025 square double-row .100 X .100 shrouded male pin headers provide the field connection to the five 24VDC discrete outputs and the Solenoid Forcing Pendant. These connectors have detent windows to retain the mating field connector. The field connectors are not supplied with the module; however, the optional pendant comes with cable and connector. See the next section, "Field Connectors," for specifications.

Table 4. Pendant Connector Pin Assignments

| Pin Number* | Connection |
|-------------|-------------------------------|
| 1 | Output Point 2 (Solenoid 2) |
| 2 | Output Point 4 (Solenoid 4) |
| 3 | Output Point 6 (Solenoid 6) |
| 4 | Output Point 8 (Solenoid 8) |
| 5 | Output Point 10 (Solenoid 10) |
| 6 | Output Point 11 (Solenoid 11) |
| 7 | Output Point 1 (Solenoid 1) |
| 8 | Output Point 3 (Solenoid 3) |
| 9 | Output Point 5 (Solenoid 5) |
| 10 | Output Point 7 (Solenoid 7) |
| 11 | Output Point 9 (Solenoid 9) |
| 12 | Solenoid Power Common |

* Connector numbering was changed in version A of this data sheet to meet a customer requirement. This did not involve any physical changes to the module.

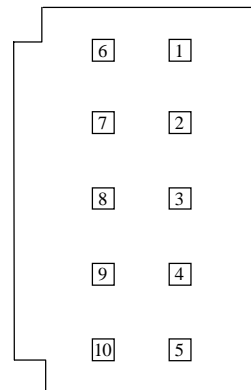


View: Looking at Front of Module

Table 5. DC Output Connector Pin Assignments

| Pin Number* | Connection |
|-------------|-------------------------------------|
| 1 | External Solenoid Power COM |
| 2 | Output Point 15 (DC Output 4) |
| 3 | Field Power +24VDC (for DC Outputs) |
| 4 | Output Point 12 (DC Output 1) |
| 5 | Output Point 16 (DC Output 5) |
| 6 | External Solenoid Power +24VDC |
| 7 | N/C |
| 8 | Field Power Common (for DC Outputs) |
| 9 | Output Point 13 (DC Output 2) |
| 10 | Output Point 14 (DC Output 3) |

* Connector numbering was changed in version A of this data sheet to meet a customer requirement. This did not involve any physical changes to the module.



View: Looking at Front of Module

Field Connectors

The following specifications are for the mating connectors (not supplied with the module) for the module's two faceplate connectors ("Pendent" and "DC Output").

Pendent Connector (Supplied with Optional Pendent)

| Item | Vendor | Part Number | Note |
|------------------------------|--------|-------------|---|
| Male Housing | AMP | 87631-7 | 12-pin connector housing |
| Crimp Contacts (12 required) | AMP | 1-87523-9 | Female pins, rated for AWG 20-24 gauge wire |
| Crimping Tool | AMP | 90202-2 | |

DC Output Connector

| Item | Vendor | Part Number | Notes |
|------------------------------|--------|-------------|---|
| Male Housing | AMP | 87631-5 | 10-pin connector housing |
| Crimp Contacts (10 required) | AMP | 1-87523-9 | Female pins, rated for AWG 20-24 gauge wire |
| Crimping Tool | AMP | 90202-2 | |

Pneumatic Fitting Specifications and Installation Instructions

| Module Fitting | Number per Module | Vendor | Part Number | Notes |
|----------------|-------------------|----------|-------------|--|
| Front | 11 | Clippard | 11752-2 | 10-32 threads, 1/16" hose barb, 1/4" hex. shoulder |
| Bottom | 1 | Clippard | 11752-3 | 10-32 threads, 1/8" hose barb, 1/4" hex. shoulder |

Due to limited room in the module's packing container, it is necessary to ship the module with its fittings removed. Use the following guidelines to install the fittings on the module:

- Place the provided gasket over the threaded end of the fitting and carefully push it over the threads until it stops against the hexagonal shoulder.
- Carefully thread the fitting into the manifold by hand.
- Tighten the fitting to a maximum of 7 to 9 inch/pounds.

| |
|----------------|
| Caution |
|----------------|

Overtightening may cause a fitting to crack or snap off, or could result in thread damage. Limit tightening torque to 7 to 9 inch/pounds.

Pneumatics Installation and Safety Requirements

Since the IC693MDL760 module's internal valves exhaust inside the module, it is important that you adhere to the following guidelines:

- Compressed air or other inert gas used in the module's valves must be clean and dry. No water, oil, or other contaminants can be tolerated in the air/gas stream. The presence of these will cause module failure and possible damage to surrounding components.
- Only clean, dry, compressed air or inert gas may be used. Use of an explosive or flammable gas will result in explosion or fire if used with this module.
- The module should not be used in an airtight, unvented cabinet. Use in an airtight cabinet could result in the cabinet becoming pressurized, which could lead to personal injury and equipment failure.

Warning

Failure to follow the above “Pneumatics Installation and Safety Requirements” can result in personal injury, module failure, and damage to associated equipment.

Compatibility

Hardware

This module is a standard size IC693 module, compatible with all IC693 series CPUs and baseplates. It will function in any CPU, Expansion, or Remote baseplate.

Software

When configuring this module with VersaPro version 2.0 (or later version), it should be configured by its catalog number. When configuring with programming software other than VersaPro version 2.0 (or later version), the module must be configured as a standard 16-point generic output module.

Scan Time Contribution

This module has the same scan time contribution rating as a standard 16-point output module, as specified in the I/O Scan Time Contribution tables in Chapter 2 of the IC693 PLC CPU Instruction Set Reference Manual.