

Discrete Input Modules

IC697MDL651

GFK-0377D
August 1997

TTL, Negative Logic, 32-Point Input Module

Features

- 32 TTL compatible Input points
- No user power required
- Each Input has pullup resistor
- Input filter selectable* - 1 ms or 10 ms
- One input configurable as interrupt*

* These features are available for all IC697 programmable controllers (PLCs). They may not be available when this module is used with other types of PLCs. See the applicable *Programmable Controller Installation Manual* for details.

Functions

The TTL Input Module for the IC697 programmable controller provides 32 TTL compatible input points which are configured as one group.

No user power is required and the use of open-collector drivers is simplified since each input has an internal pullup.

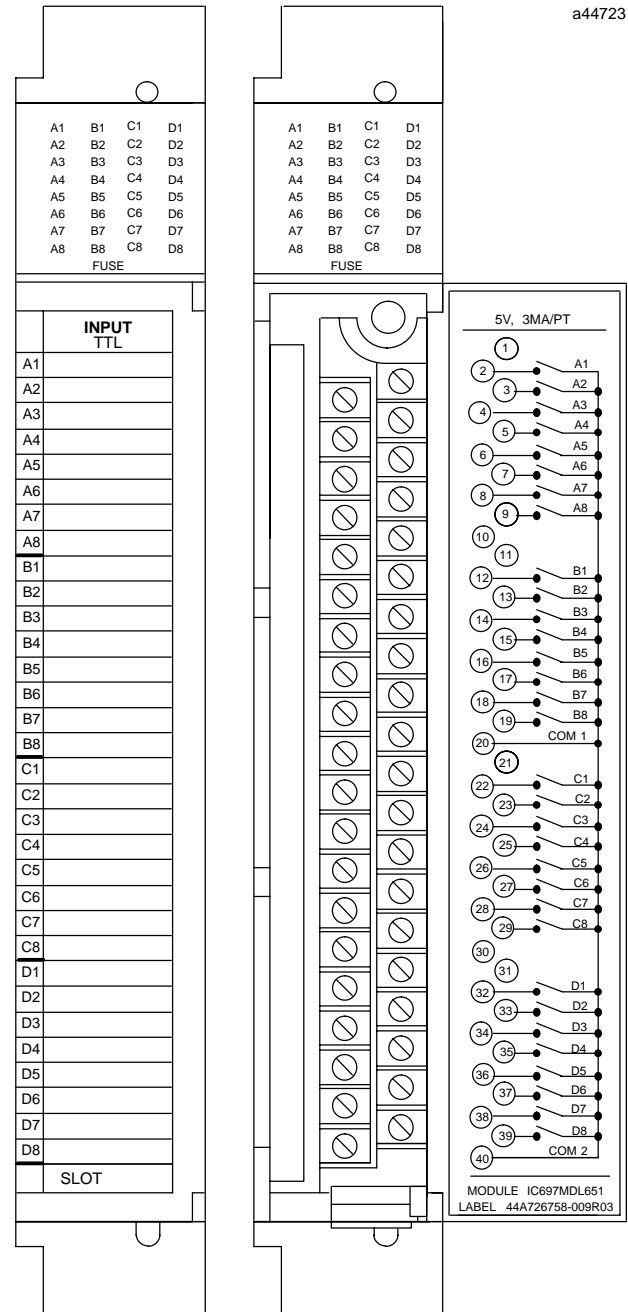
LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

Configuration is done using the configuration function of the MS-DOS® or Windows® programming software running on Windows® 95 or Windows NT® over Ethernet TCP/IP or through the SNP port. The Programming Software configuration function is installed on the programming device. The programming device can be an IBM® XT, AT, PS/2® or compatible Personal Computer.

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Operation - TTL Input Module

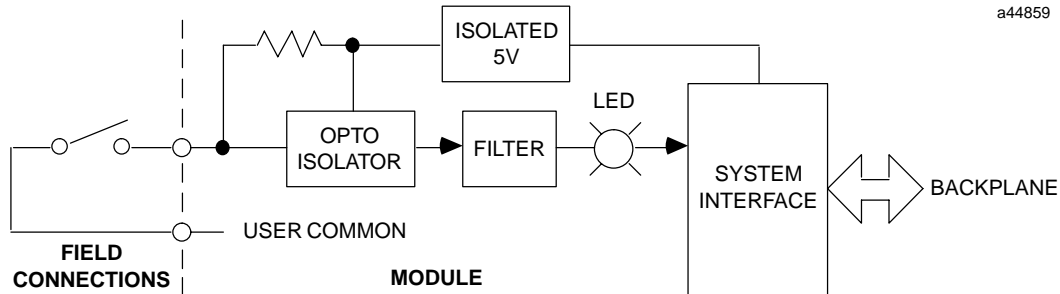


Figure 1. Block Diagram for IC697MDL651

Input Characteristics

This input module is designed to have negative logic characteristics - it sinks current from the input device to the user common. The input device is connected between the power bus and the module input as shown above.

This module is compatible with a wide variety of input devices, such as:

- Pushbuttons, limit switches, selector switches;
- Counters, BCD outputs, and other TTL compatible outputs.

In addition, inputs on this module may be directly driven by any IC697 PLC voltage compatible output module.

The module contains an isolated 5V supply and pull-up resistors for each input point. This configuration simplifies the use of open-collector drivers and eliminates the need for a user supplied power source.

Input current is typically 1.7mA in the ON state, and can accept up to 1.1mA leakage current in the OFF state without turning on.

Input Filter Selection

With the IC697 PLC and certain other CPU options, this module may be configured to have either a 1 ms or 10 ms input filter. Configuration is on a module, not per point basis; all points have the same filter time. See the applicable *Programmable Controller Installation Manual* and the *Programming Software User's Manual* for detailed information.

Interrupt

When used with an IC697 CPU, input point A1 may be configured to cause a CPU interrupt. Configuration allows the CPU to be interrupted on either the rising or falling edge of the signal transition. Interrupt response is not affected by input filter time selection. Refer to the *Programmable Controller Installation Manual* for detailed information.

Module Mechanical Keying

This module includes a mechanical key that prevents inadvertent substitution of one module type for another in a given slot. The key fits a uniquely shaped area on the board below the connector. Each module has a key packaged with it.

When the module is first installed, the key latches onto the backplane center rail. When the module is extracted, the key remains in the center rail, configuring the slot to accept only identical module types.

If it is necessary to change the module location in the rack after the key has been latched onto the center rail of the rack, the key can be removed by pushing it upward to unhook the latch while pulling it off the rail. It may then be reinserted onto the module and the module inserted into the rack in the desired location.

Note that in an IC697 PLC rack only the power supply can be placed in the leftmost rack position, and slot 1 (adjacent to the power supply) must always contain a CPU (in rack 0 - the CPU rack), or a Bus Receiver Module (in an expansion rack).

Field Wiring

The module is wired as shown in Figure 2. Since the 32 points share a common, only one connection is required between user common and the module common (pin 20 or 40). However, two user connections are provided for wiring convenience.

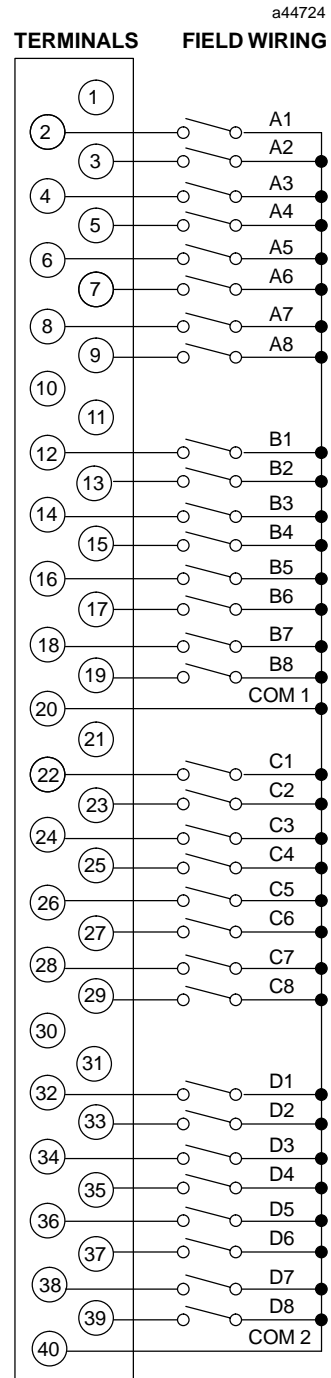


Figure 2. Field Wiring Connections for IC697MDL651

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Recommended Field Wiring Procedures

The following procedures are recommended when connecting field wiring to the detachable terminal board on this input

module. Module features referenced in the following procedures which are common to all IC697 I/O modules are illustrated in the following figure.

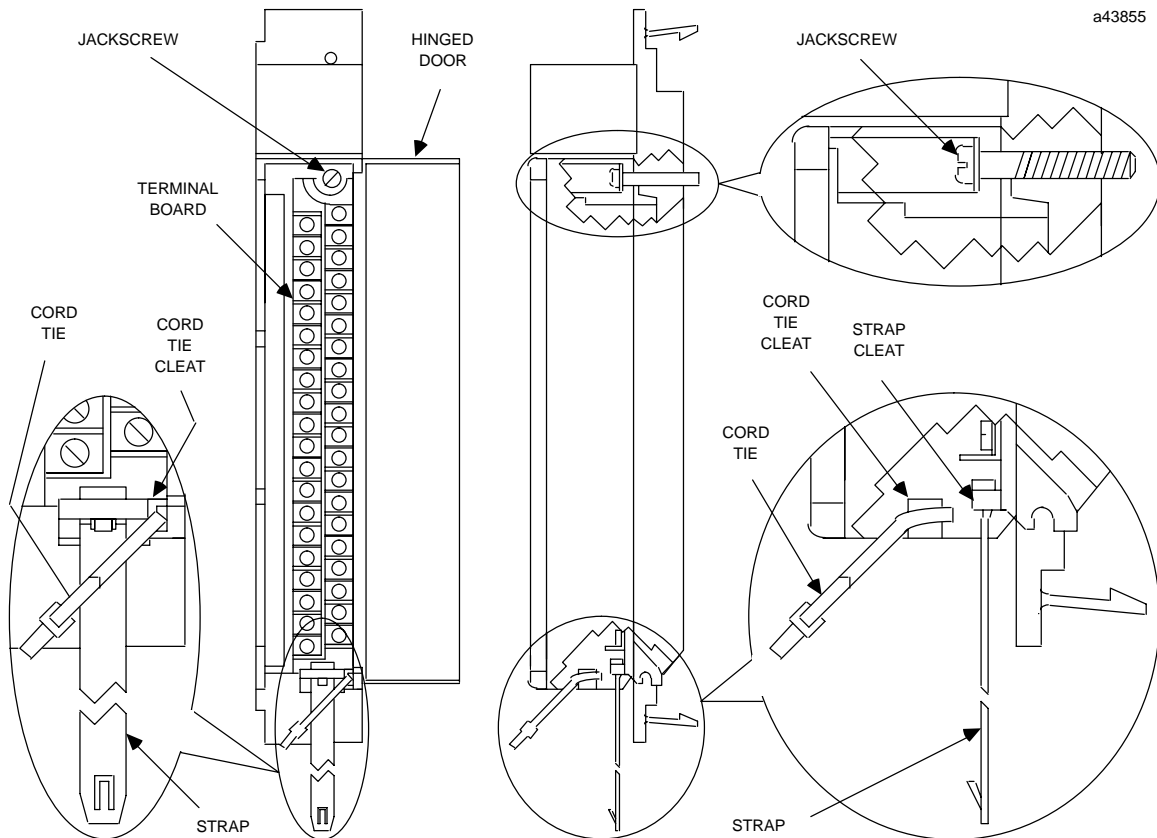


Figure 3. I/O Module Features

1. Turn off power before removing or installing terminal boards. Open the hinged door on the module to access a jackscrew which holds the terminal board securely in place. The detachable field wiring terminal board can now be removed from the module by turning the jackscrew counter-clockwise until it is fully disengaged.
2. To remove the terminal board, grasp the top of the terminal board and swing it outward as shown in Figure 3.
3. The terminal board is designed to accept wire sizes from AWG #22 (0.36 mm²) through AWG #14 (2.10 mm²). It is important that when using AWG #14 (2.10 mm²) wire for wiring all points, that a maximum insulation diameter of .135 inch (3.43mm) not be exceeded. To ensure proper connection, two wires may be terminated on any one terminal only if both wires are the same size.
4. The terminal board is designed to accept a maximum of (40) AWG #14 (2.10 mm²)wires. If AWG #14 (2.10 mm²) wires are to be used, then wire markers should be placed at least 8 inches (203 mm) from termination end to provide sufficient space for the hinged door to close.

Caution

Do not use the hinged door to remove the terminal board. The hinged door could be damaged if this is done.

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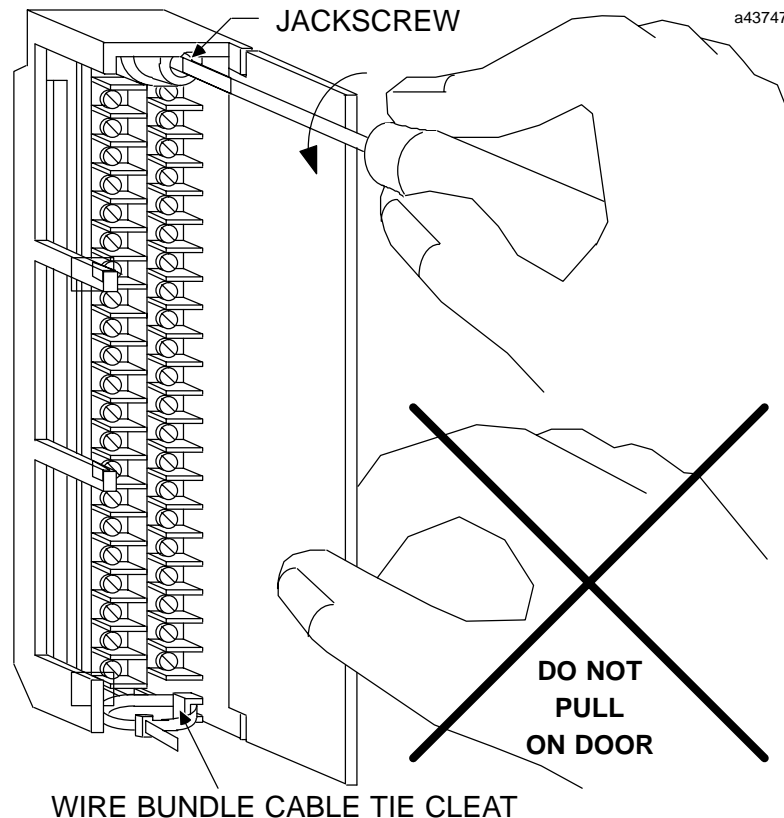
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Figure 4. Removal of I/O Terminal Board

5. After completing connections to all modules in a rack, the wire bundle must be secured. To ensure that the wire bundle is secured properly, it is recommended that a cable tie be wrapped around the wire bundle and tightly secured through the cable tie cleat located at the lower right corner of the terminal board. For extremely large wire bundles, additional cable ties should be used.
6. A door label insert is included with each module to indicate circuit wiring information and provide space to record user circuit wiring identification. A slot is provided on the hinged door to allow for insertion of this label. If the label is difficult to insert, crease the scored edge before insertion. The outside label has a color coded stripe to allow quick identification of the module voltage type (blue: low voltage; red: high voltage).
7. After field wiring is completed, the terminal board should be securely fastened to the rack by inserting the terminal board strap (attached to each module) into the small rectangular slots in the bottom card guide grill on the rack. This strap not

only secures the terminal board to the rack, it also provides a way of identifying the wired terminal board with its correct mating rack slot location.

8. For adequate module ventilation, it is recommended that at least a 6 inch (152mm) clearance be allowed above and below the rack grill. Wire bundles should not obstruct the rack grill work.

Removing an I/O Module

The instructions below should be followed when removing an I/O module from its slot in a rack.

- Grasp the board firmly at the top and bottom of the board cover with your thumbs on the front of the cover and your fingers on the plastic clips on the back of the cover.
- Squeeze the rack clips on the back of the cover with your fingers to disengage the clip from the rack rail and pull the board firmly to remove it from the backplane connector.
- Slide the board along the card guide and remove it from the rack.

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Table 1. Specifications for IC697MDL651 †

Rated Voltage:	5 volts DC
Inputs per Module:	32 98.4' (30m) maximum cable length
Isolation:	1500 volts - any input to backplane
Input Voltage Range (V_s):	-3 to +7 volts DC
Input Characteristics	
Impedance:	5.9K ohms, ±5%
On-state Voltage:	-3 volts to 0.5 volts
Off-state Voltage:	2 volts to 7 volts
On-state Current:	1.7mA (typical) at rated voltage
Off-state Current:	1.1mA (maximum)
Filter Delay Time:	1 ms or 10 ms configurable
Current Required from 5V Bus:	.53 amp
VME	System designed to support the VME standard C.1

† Refer to GFK-0867B, or later for product standards and general specifications. For installations requiring compliance to more stringent requirements (for example, FCC or European Union Directives), refer to *Installation Requirements for Conformance to Standards*.

Table 2. Ordering Information

Description	Catalog Number
Input Module, Negative Logic TTL, 32 Points	IC697MDL651

Note: For Conformal Coat option, or Low Temperature Testing option please consult the factory for price and availability.