ALLEN-BRADLEY

DC (10-30V) Input Module
Cat. No. 1771-IBD Series B

Installation Instructions

To the Installer

This document provides information on:

- important pre-installation considerations
- power supply requirements
- initial handling procedures
- installing the module
- using the indicators for troubleshooting
- module specifications

Pre-installation Considerations

The 1771-IBD Series B module is compatible with all chassis **except** 1771-A1, 1771-A2, 1771-A4 chassis. Make sure no other input module or single card block transfer module is placed in the same module group when using 2-slot addressing. Any discrete output module may be used within the same module group.

The 1771-IBD Series B module has a selectable off-delay filter time of either 1ms or 6ms.. To select the off-delay filter time, use the procedure on page 3.

Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 130mA from the output of this supply. To calculate the requirements for the backplane power supply, add 130mA to the power requirements of all other modules in the I/O chassis. Calculating the requirements will prevent an overload to the chassis backplane and/or backplane power supply.

Initial Handling

The dc input module is shipped in static-shielded packaging to guard against electrostatic discharge damage. Observe the following precautions when handling the module.

ATTENTION: This module is equipped with a plastic cover that is unique to assembly numbers 960364-05 and 961344-01. (This part number is located near the backplane edge connector pins on the component-side of the circuit board.) Do not use this plastic cover on any other module.

Electrostatic Discharge Damage

ATTENTION: Under some conditions, electrostatic discharge can degrade performance or damage the module. Observe the following precautions to guard against electrostatic damage.

- Wear an approved wrist strap grounding device, or touch a grounded object to discharge yourself before handling the module.
- Do not touch the backplane connector or connector pins.
- If you configure or replace internal components, do not touch other circuit components inside the module. If available, use a static-free work station.
- When not in use, keep the module in its original static-shielded packaging.

Installing Your Module

In this section, we tell you how to key your I/O chassis, install your module and connect your wiring.

Keying Your I/O Chassis

Use the plastic keying bands, shipped with each I/O chassis, to key the I/O slots to accept only this type of module.

The module circuit board is slotted in two places on the rear edge. The position of the keying bands on the backplane connector must correspond to these slots to allow insertion of the module. You can key any connector in an I/O chassis to receive this module except for the left-most connector reserved for adapter or processor modules. Place keying bands between the following numbers labeled on the upper backplane connector:

- Between 10 and 12
- Between 16 and 18

You can change the position of these keys if system redesign and rewiring makes insertion of a different module necessary.

Installing the Input Module

To install the dc input module in your 1771 I/O chassis, follow the steps listed below.

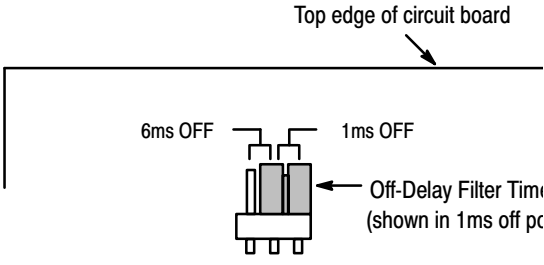
ATTENTION: Remove power from the 1771 I/O chassis backplane and wiring arm before removing or installing an I/O module.

- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

1. Turn off power to the I/O chassis.
2. You can change the off delay filter time from 1ms to 6ms. Do this by positioning a jumper on the top-left edge of the printed circuit board.

   The off delay filter time is preset to 1ms. To change the filter time to 6ms, do the following:

   - Locate the off-delay filter time configuration plug on the top-left edge of the printed circuit board as shown below.



   - Use your finger to slide the jumper off the 1ms position (the middle post and the right post).
   - Carefully reposition the jumper by sliding it onto the 6ms position (the middle post and the left post).

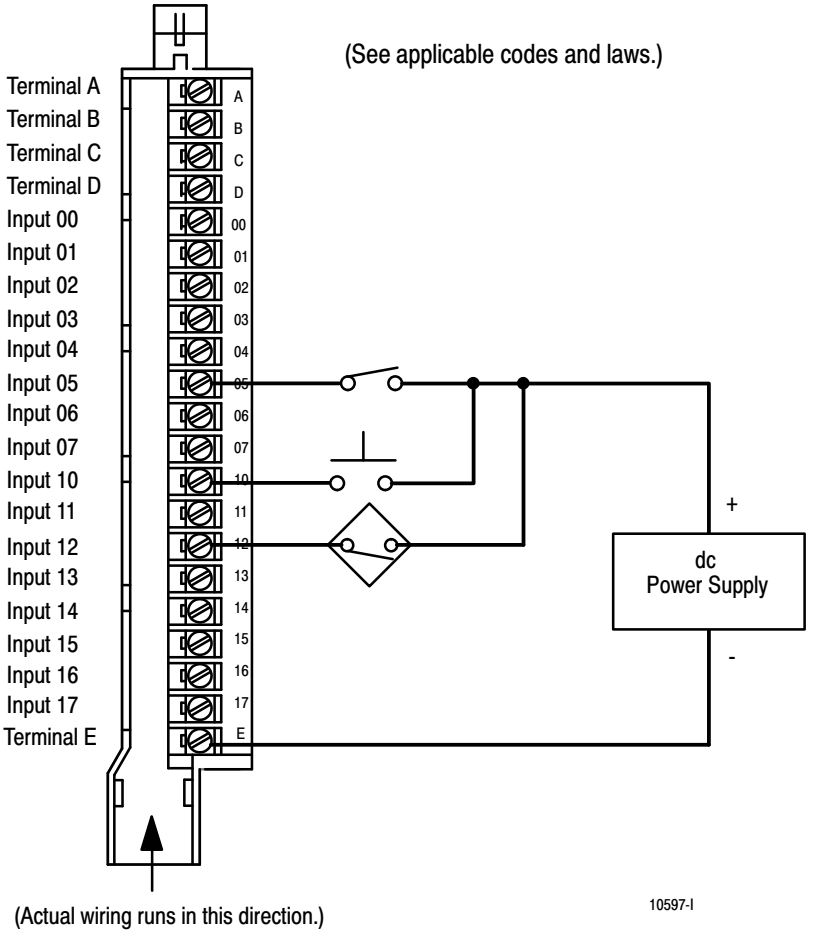
3. Place the module in the plastic tracks on the top and bottom of the slot that guides the module into position.

4. Do not force the module into its backplane connector. Apply firm, even pressure on the module to seat it properly.
5. Snap the chassis latch over the top of the module to secure its position.
6. Connect the wiring arm to the module.
7. Make wiring connections to the field wiring arm as indicated in Figures 1 and 2.

Connecting Wiring to the Input Module

Connections to the input module are made to the field wiring arm (cat. no. 1771-WH) shipped with the module. Attach the wiring arm to the pivot bar on the bottom of the I/O chassis. The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.

Figure 1
Connection Diagram (2-Wire Devices)

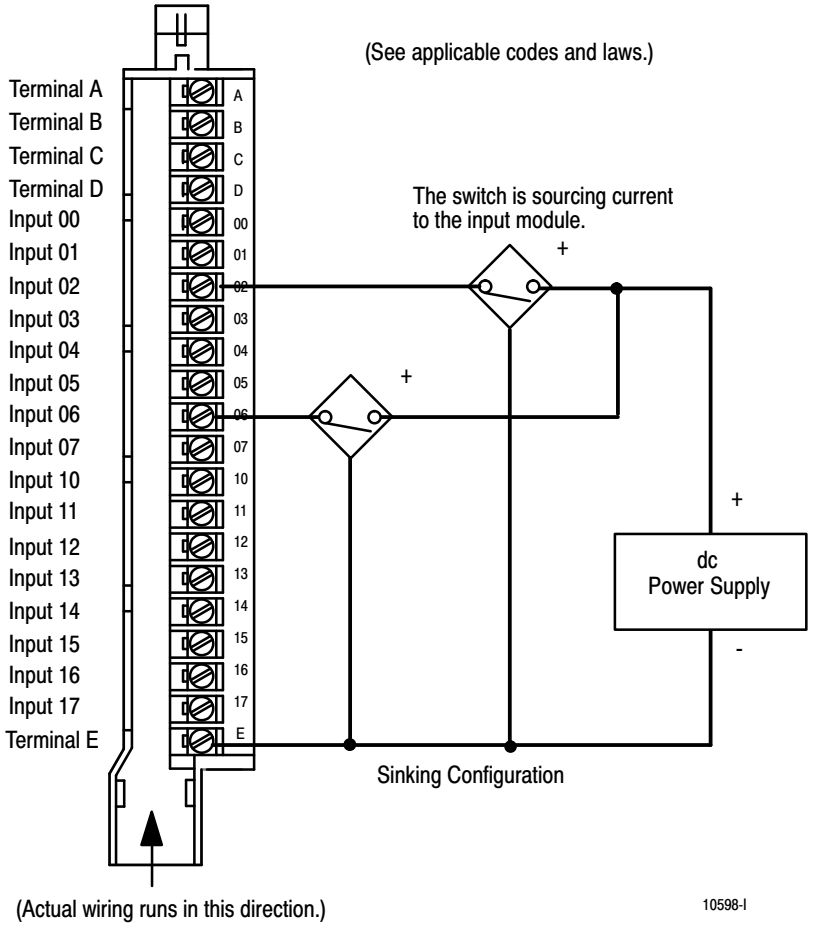


Connect one terminal of your two or three-wire input device to terminals 00 through 17 ( ). Connect the +dc line to the other terminal of your input devices. Connect three-wire input devices, such as Allen-Bradley proximity switches (Bulletin 871), to operate in a current source mode (Figure 2).

Connect terminal E to the dc common. Terminals A thru D are not used. Use stranded 14 or 16 gauge wire to minimize the voltage drop over long cable distances.

ATTENTION: Observe proper polarity with dc power connections. Reverse polarity, or application of ac voltage could damage the module.

Figure 2
Connection Diagram (3-Wire Devices)



Important: You can directly drive terminals on a DC (10-30V) Input Module (cat. no. 1771-IBD Series B) from terminals on the following modules:

- DC (10-30V) Output module (cat. no. 1771-OBN)

- DC (10-60V) Output module (cat. no. 1771-OBD)
- DC (12-24V) Output module (cat. no. 1771-OB)
- DC (24V) Output module (cat. no. 1771-OQ)
- DC (24V) Output module (cat. no. 1771-OQ16)

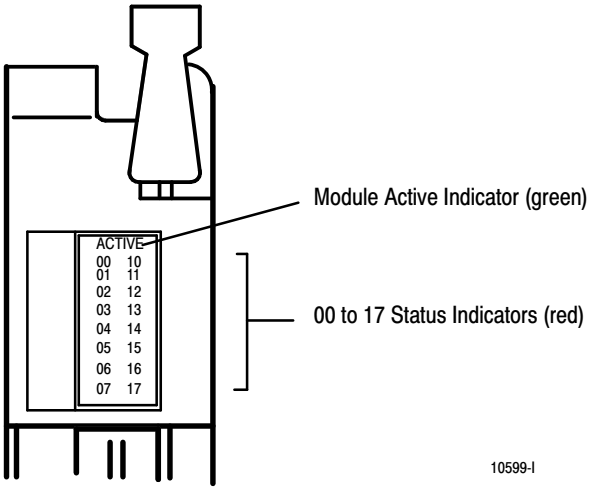
Important: Use the same dc power source to power both modules to ensure that ground is at the same potential.

Interpreting the Status Indicators

The front panel of your module contains one green module active indicator, and 16 red status indicators (Figure 3).

The green active indicator turns on when the module is powered. The red status indicators are provided for system logic side indication of individual inputs. When a red status indicator lights, voltage is present on the terminal. The module transfers this information to the backplane for the processor to read. See ‘‘Troubleshooting” for a description, probable causes, and recommended actions to take for common faults based on indicator responses.

Figure 3
Status Indicators



Troubleshooting

Use this table to help you interpret the 1771-IBD Series B status indicators and to troubleshoot module and system faults.

Indicator Status (color)	Description of Fault or System Status	Action to Take
Module active ON (green)	Normal Indication	None
Module active ON (green) and Input status ON (red)	Check for voltage on terminal.	If voltage is present, take no action. If no voltage is present, replace the module.
Module active ON (green) and Input status OFF	Input devices not functioning properly or faulty input circuitry on module.	1. Check input devices. 2. If input devices are OK, replace the module.
	No voltage on terminal.	None
Module active OFF and Output status ON (red) or OFF	Module not functioning properly.	Check chassis power supply and processor. If they are OK, replace the module.

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Specifications

Inputs per Module		16
Module Location		All 1771 I/O chassis **except** 1771-A1, -A2, and -A4
Input Voltage Range		10 to 30V dc
Minimum Input Current		4.5mA at 10V dc 15mA at 30V dc
Minimum Off-state Current		2.0mA @ 5V dc
Maximum Off-state Voltage		5V dc
Minimum On-state Voltage		10V dc
Input Impedance		2.2K ohms maximum
Input Signal Delay		Low to High propagation delay - 1ms High to Low propagation delay selectable - 1ms or 6ms
Power Dissipation		7.3 Watts (max.), 1.0 Watts (min.)
Thermal Dissipation		24.7 BTU/hr (max.), 3.4 BTU/hr (min.)
Backplane Current		130mA @ 5V dc ±5%
Isolation Voltage		1500V ac rms
Environmental Conditions		
	Operational Temperature	0° to 60°C (32° to 140°F)
	Storage Temperature	-40° to 85°C (-40° to 185°F)
	Relative Humidity	5 to 95% (without condensation)
Conductors	Wire Size	14 gauge stranded maximum 3/64 inch insulation maximum
	Category	2[1]
Keying		Between 10 and 12 Between 16 and 18
Field Wiring Arm	Standard	Cat. No. 1771-WH
Wiring Arm Screw Torque		7-9 inch-pounds

[1] Refer to publication 1770-4.1, Programmable Controller Wiring and Grounding Guidelines.

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