DC (20–60V) Input Module
Cat. No. 1771–ICD

Installation Data

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–ICD module must be used in a series B 1771 I/O chassis (1771–A1B through –A4B) or a 1771-AM or -AM1 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.

Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 250mA from the output of this supply. Add this to the requirements of all other modules in the I/O chassis to prevent overloading the chassis backplane and/or chassis power supply.

Initial Handling

The dc input module is shipped in a static–shielded bag 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 961046–01 through 961046–09. (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 a static–shielded bag.

Installing Your Module

In this section we tell you how to set the fault mode selection plug, key your I/O chassis, install your module and make your wiring connections.

Setting the Fault Mode

You may select one of two input–failure configurations (last state or reset) by positioning a configuration plug on the top edge of the printed circuit board. This configuration plug is independent of the last state switch on the I/O chassis backplane during a module fault. During a chassis fault, the I/O chassis backplane last state switch setting overrides the module fault mode selection.

To set the fault mode selection, proceed as follows:

1. Locate the fault mode selection plug at the top edge of the module circuit board (Figure 1).

2. Using your finger, slide the plug off the 2 posts.

3. Carefully position the plug on 2 of the 3 posts that correspond to your requirement.

Figure 1
Fault Mode Selection Plug

Fault Mode Selection Plug
(shown in last state position)   Top edge of circuit board

LS   RESET
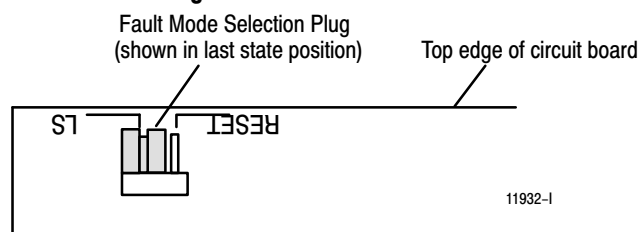
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Keying Your I/O Chassis

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 18 and 20

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

3. Do not force the module into its backplane connector. Apply firm, even pressure on the module to seat it properly.

4. Snap the chassis latch over the top of the module to secure its position.

5. Connect the wiring arm to the module.

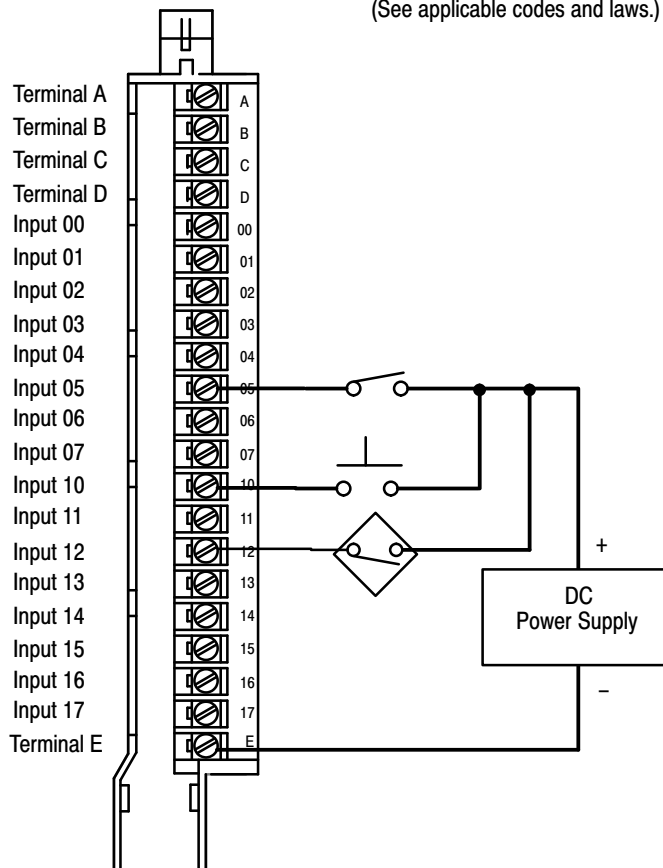6. Make wiring connections to the field wiring arm as indicated in Figures 2 and 3.

⚠ **ATTENTION:** Proper polarity must be observed with dc power connections. Reverse polarity, or application of ac voltage could damage the module.

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 2
Connection Diagram (2–Wire Devices)

(See applicable codes and laws.)

Terminal A	A
Terminal B	B
Terminal C	C
Terminal D	D
Input 00	00
Input 01	01
Input 02	02
Input 03	03
Input 04	04
Input 05	05
Input 06	06
Input 07	07
Input 10	10
Input 11	11
Input 12	12
Input 13	13
Input 14	14
Input 15	15
Input 16	16
Input 17	17
Terminal E	E

DC Power Supply

+ / −

(Actual wiring runs in this direction.)

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Connect one terminal of your 2–wire input device to terminals 00 through 17 (Figure 2). Connect the +dc line to the other terminal of your input devices. Connect 3–wire input devices, such as Allen–Bradley proximity switches (Bulletin 871), to operate in a current source mode (   ).
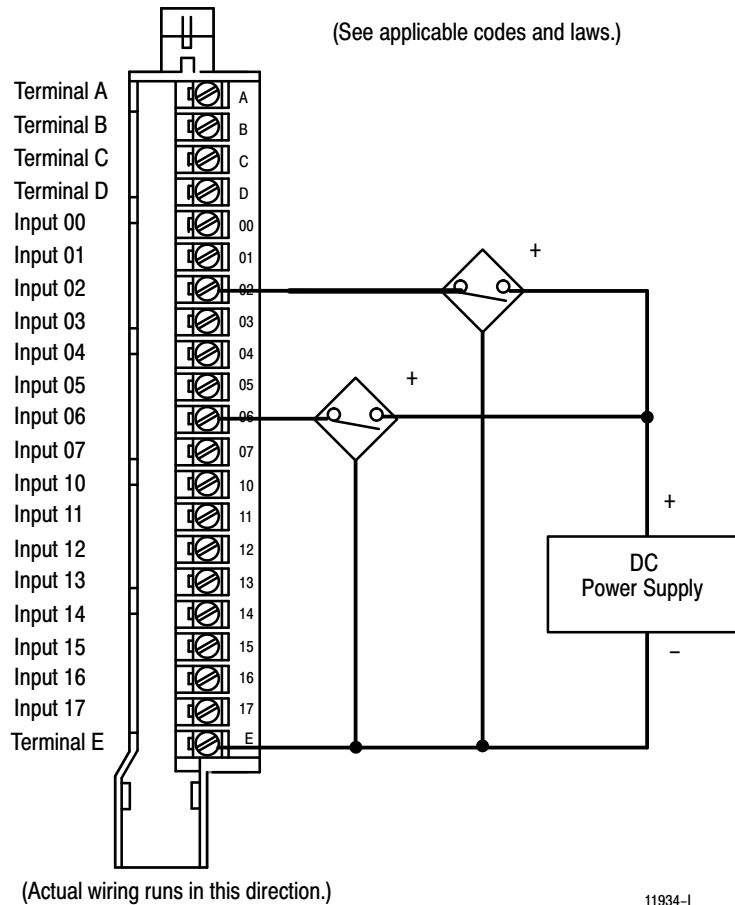
Connect terminal E to the dc common. Terminals A thru D are not used.
Use stranded 14 or 16 gauge wire to minimize the voltage drop over long
cable distances.

Important: You can directly drive terminals on a DC (20–60V) Input
Module (cat. no. 1771–ICD) from terminals on the following modules:

- DC (10–60V) Output module (cat. no. 1771–OBD)

- DC (48V) Output module (cat. no. 1771–OC)

- DC (12–24V) Output module (cat. no. 1771–OB)

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

Figure 3
Connection Diagram (3–Wire Devices)

(See applicable codes and laws.)

Terminal A — A
Terminal B — B
Terminal C — C
Terminal D — D
Input 00 — 00
Input 01 — 01
Input 02 — 02
Input 03 — 03
Input 04 — 04
Input 05 — 05
Input 06 — 06
Input 07 — 07
Input 10 — 10
Input 11 — 11
Input 12 — 12
Input 13 — 13
Input 14 — 14
Input 15 — 15
Input 16 — 16
Input 17 — 17
Terminal E — E

DC
Power Supply

(Actual wiring runs in this direction.)

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Interpreting the Status Indicators

The front panel of your module contains one green, module active indicator, and 16 red status indicators (Figure 4). The 1771–ICD performs diagnostics in a handshaking mode when first powered up. Upon successful completion of the diagnostics, the green module active indicator lights. It turns off if a fault occurs in the data paths or the opto–isolators.

If a module fault occurs, the module resets its inputs or sets them to last state, depending on the fault mode selection. The module active indicator must be on to properly interpret the red status indicators.

The red status indicators are provided for system logic side indication of individual inputs. When a red 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 4
Status Indicators

Module Active Indicator (green)

00 to 17 Status Indicators (red)
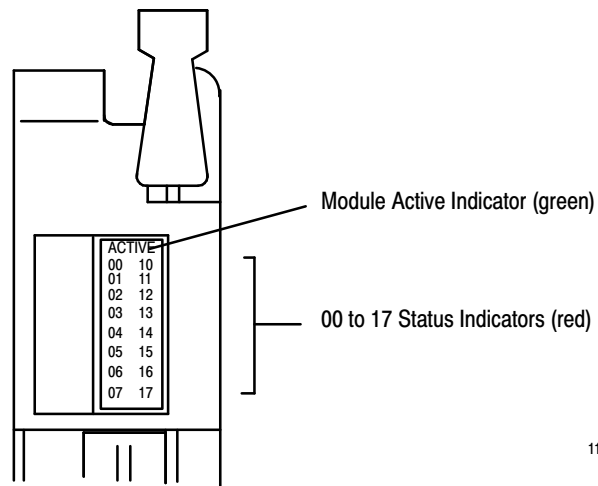
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Troubleshooting

Use this table to help you interpret the 1771–ICD 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 none, replace 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 module
	No voltage on terminal	None
Module active OFF	Module is not powered or fault in opto–isolators and/or data paths; module resets inputs or goes to last state	1. Check chassis power supply and module input power 2. If power supplies are OK, replace module
Module active OFF and Input status ON (red) or OFF	Not valid unless module active indicator is on; when active is off, indicators do not represent processor status	1. Check chassis power supply and module input power 2. If power supplies are OK, replace module

Specifications

Inputs per Module	16
Module Location	1771–A1B, –A2B, –A3B, –A3B1, –A4B I/O chassis
Input Voltage Range	20 to 60V dc
Minimum Input Current	2mA at 20V dc; 6mA at 60V dc
Minimum Off–state Current	1.2mA @ 12V dc
Maximum Off–state Voltage	12V dc
Minimum On–state Voltage	20V dc
Input Impedance	10K ohms maximum
Input Signal Delay	Low to high propagation delay – 6ms(±2ms) High to low propagation delay – 20ms (±1ms)
Power Dissipation	5.9 Watts (max.), 1.3 Watts (min.)
Thermal Dissipation	19.93 BTU/hr (max.), 4.3 BTU/hr (min.)
Backplane Current	250mA @ 5V dc ±5%
Isolation Voltage	1500V ac (rms)

Environmental Conditions
   Operational Temperature
   Storage Temperature
   Relative Humidity
	
	$0°$ to $60°C$ ($32°$ to $140°F$)
	$-40°$ to $85°C$ ($-40°$ to $185°F$)
	5 to 95% (without condensation)

Conductors Wire Size Category	14 gauge stranded maximum 3/64 inch insulation maximum 1^1
Keying	Between 10 and 12 Between 18 and 20
Field Wiring Arm	Catalog Number 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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