



AC (48V) Input Module

Cat. No. 1771-IND1

Installation Data

To The Installer

This document provides information on:

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

Pre-installation Considerations

This module must be used with a 1771 Series B I/O chassis. If you are using a 1771-ASB remote I/O adapter you may use any combination of I/O modules. Otherwise, make sure no other input module or single card block transfer module is placed in the same I/O group.

This module contains input filtering to limit the effects of voltage transients caused by contact bounce and/or radiated electrical noise. The delay due to filtering is listed in the Specifications section.

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 backplane power supply.

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Initial Handling

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

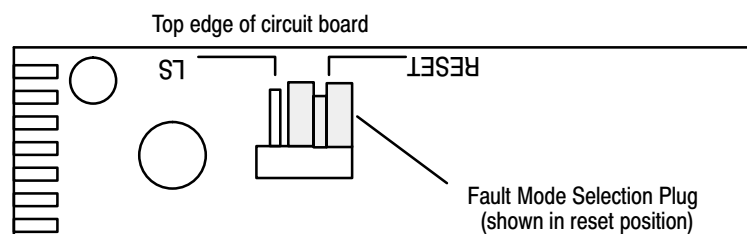
Setting the Fault Mode

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.

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



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 backplane connector:

- between 4 and 6
- between 8 and 10

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 ac 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.

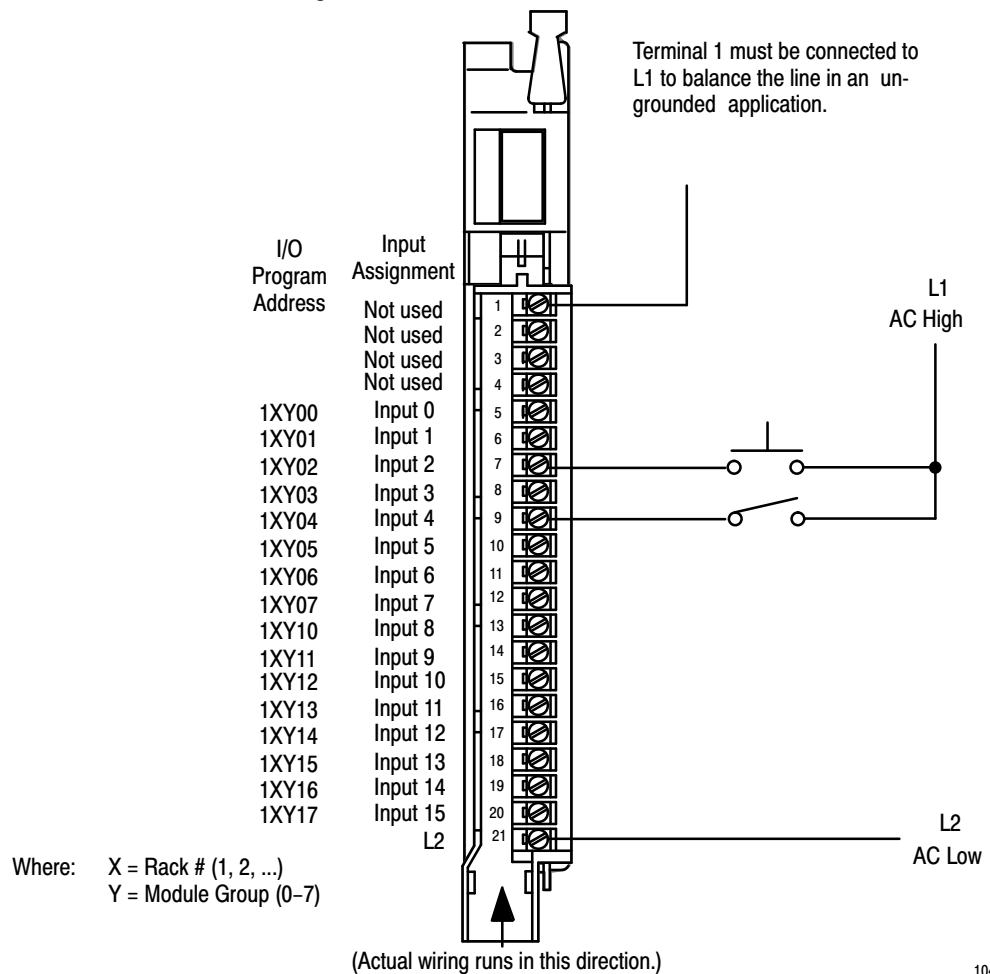
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1. Turn off power to the I/O chassis.
 2. Place the module in the plastic tracks on the top and bottom of the slot that guides the module into position.
 3. Do not force the module into its backplane connector. Apply firm, even pressure on the module 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

Connecting Wiring to the Input Module

Connections to the input module are made to the 21 terminal 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.

Connect one terminal of your 2-wire input devices to terminals 5 through 20 (Figure 2).

Figure 2
Connection Diagram

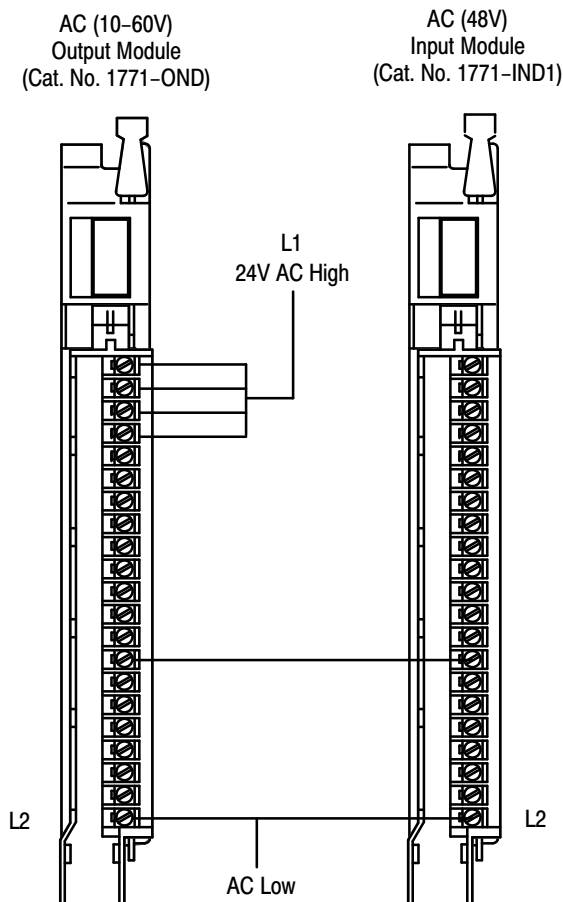


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Connect terminal 21 to the L2 (low) ac return. Terminals A through D are not used. (Note: In ungrounded applications, connect terminal 1 to L1 to balance the line.) Connect the L1 (high) ac line to the other terminal of your input devices. Use stranded 14 or 16 gauge wire to minimize the voltage drop over long cable distances.

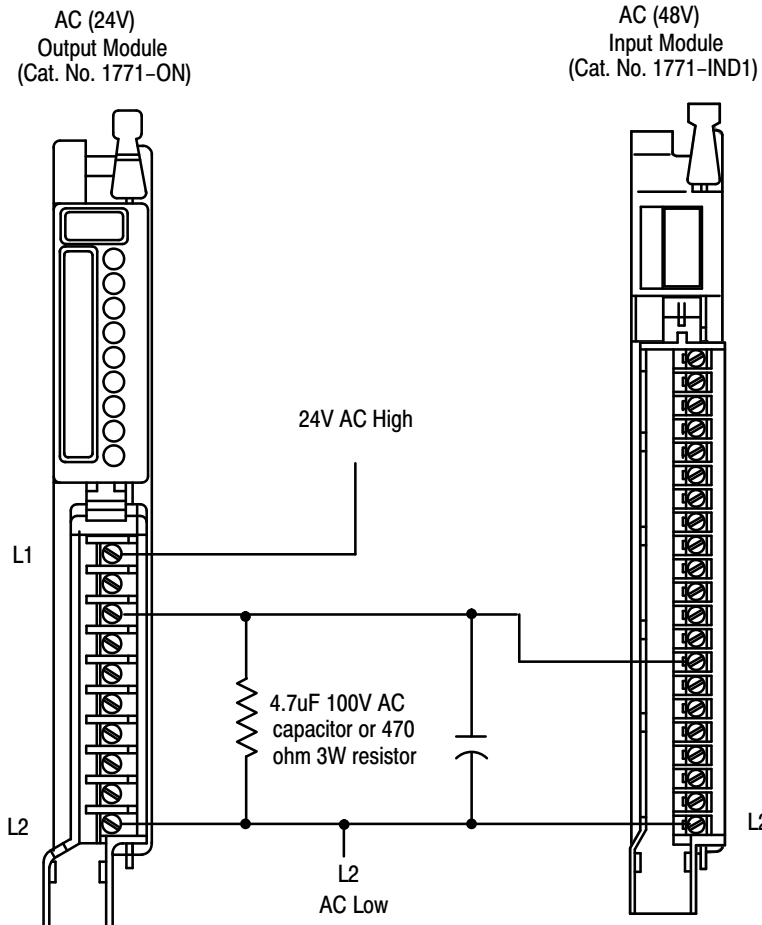
Important: You can use an AC (10–60V) Output Module (cat. no. 1771-OND) to directly drive terminals on an AC (48V) Input Module (cat. no. 1771-IND1) (Figure 3). You can also use a 1771-ON Output module to drive an AC (48V) Input Module (cat. no. 1771-IND1) but you must connect a 470 ohm, 3W resistor or a 4.7 ufd, 100V ac capacitor between the output terminal and L2 (common) as shown in . **Use the same ac power source to power both modules to ensure proper phasing and prevent module damage.**

Figure 3
Driving a 1771-IND Module with a 1771-OND Module



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Figure 4
Driving an Input with an Output



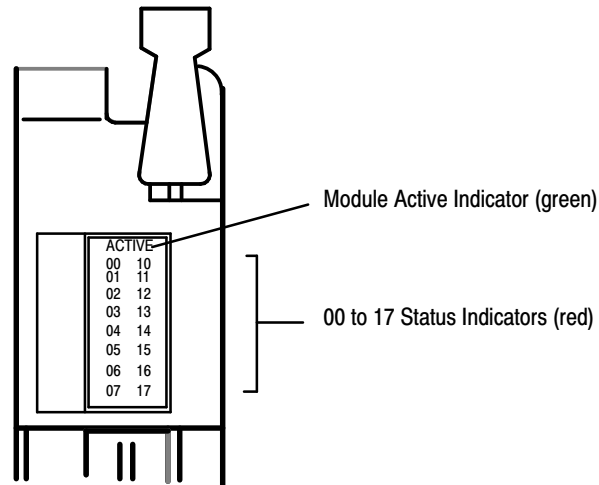
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Interpreting the Status Indicators

The front panel of your module contains one green, module active LED, and 16 red status LED indicators (). The 1771-IND1 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.

The red status indicators are provided for system logic side indication of individual inputs. When a red LED lights, voltage is present on the terminal. The module transfers this information to the backplane for the processor to read.

Figure 5
Status Indicators



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Troubleshooting

Use the table below to help you interpret the status indicators and to isolate module or system faults.

LED Indication	Description of fault or system status	Action to take
ACTIVE ON (green)	Normal indication	None
ACTIVE ON (green) STATUS ON (red)	Check for voltage on terminal.	If voltage is not present, replace module.
ACTIVE ON (green) STATUS OFF (red)	Input devices not functioning properly, or faulty input circuitry on module	Check input devices. If input devices are functioning properly, replace module.
	No voltage on terminal.	None
ACTIVE OFF	Module is not powered, or fault in opto-isolators and/or data path. Module resets its inputs or goes to last state.	Check the following: <ul style="list-style-type: none"> • Check chassis power supply and module input power • If power supplies are okay, replace module.
ACTIVE OFF and STATUS ON or OFF	Not valid unless module active indicator is on. When active indicator is off, indications do represent processor status	Check the following: <ul style="list-style-type: none"> • Check chassis power supply and module input power • If power supplies are okay, replace module.

Specifications

Inputs per Module	16
Module Location	1771-A1B, -A2B, -A3B, -A3B1, -A4B, -AM1, -AM2 I/O chassis
Nominal Input Voltage	48V ac @ 47-63HZ
Nominal Input Current	10.0mA(±1mA) at 50Hz
On-state Voltage Range	31.5V to 60V ac
Minimum On-state Current	6.7mA at 31.5V ac, 50Hz
Maximum Off-state Voltage	15.5V ac at 50/60Hz
Maximum Off-state Current	3.3mA at 15.5V ac
Input Impedance	0.68uF in parallel with 13.3K ohms (4.6K ohms at 50Hz)
Input Signal Delay	On-state (48V ac, 50Hz) 25ms ±5ms; Off-state (48V ac, 50Hz) 35ms ±10ms
Power Dissipation	8.5 Watts (max.), 1.3 Watts (min.)
Thermal Dissipation	29.1 BTU/hr (max.), 4.5 BTU/hr (min.)
Backplane Current	250mA @ 5V dc ±5%
Opto-electrical Isolation	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 gage stranded maximum 3/64 inch insulation maximum
Category	1 ¹
Keying	Between 4 and 6 Between 8 and 10
Field Wiring Arm	Catalog Number 1771-WH

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

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