AC (24V) Input Module
Cat. No. 1771-IN

Contents

Use this document as a guide when installing the catalog number 1771-IN ac input module.

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

Publication 1771-IN082A-EN-P - February 2005

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Throughout this manual we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence

ATTENTION

Environment and Enclosure

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

ATTENTION

Preventing Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.

Preinstallation Considerations

This module contains filtering to limit the effects of voltage transients caused by contact bounce and/or radiated electrical noise. The delay due to filtering is nominally 18ms (±10ms) for turning ac inputs on or off.

This module is designed to operate with ac proximity switches and other input devices with an off-state leakage current less than 2.8mA peak.

Calculate Power Requirements

The module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 80mA from the output of this supply .

Add this current to the requirements of all other modules in the I/O chassis to prevent overloading the chassis backplane and/or backplane power supply.

ATTENTION

Do not insert or remove modules from the I/O chassis while system power is applied. Failure to observe this rule could result in:

- module damage or degradation of performance
- injury or equipment damage due to possible unexpected operation.

Key the Backplane Connector

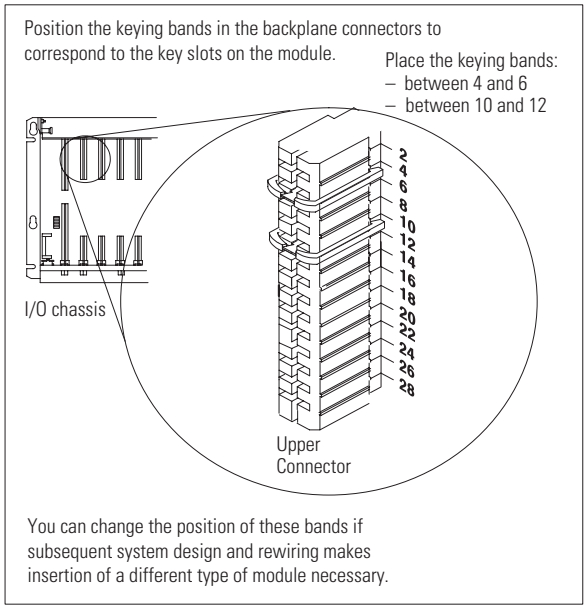
Place your module in any slot in the chassis except the leftmost slot which is reserved for processors or adapters.

ATTENTION

Observe the following precautions when inserting or removing keys:

- insert or remove keys with your fingers
- make sure that key placement is correct

Incorrect keying or the use of a tool can result in damage to the backplane connector and possible system faults.



Install the Field Wiring Arm

ATTENTION

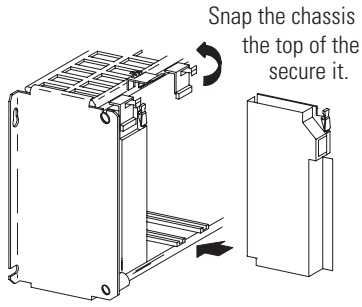
Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing the I/O module. Failure to remove power from the backplane or wiring arm could cause:

- module damage, degradation of performance, or injury.
- injury or equipment damage due to possible unexpected operation.

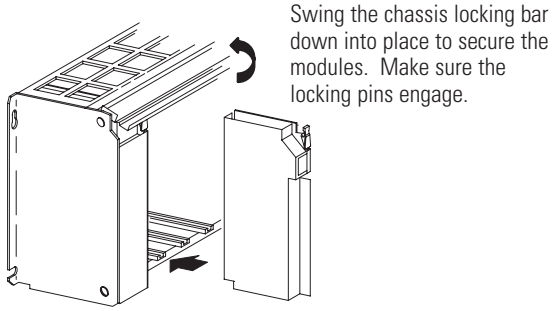
1 Place the module in the card guides on the top and bottom of the chassis that guide the module into position.

Important: Apply firm even pressure on the module to seat it into its backplane connector .

1771-A1B, -A2B, -A3B, -A4B I/O chassis

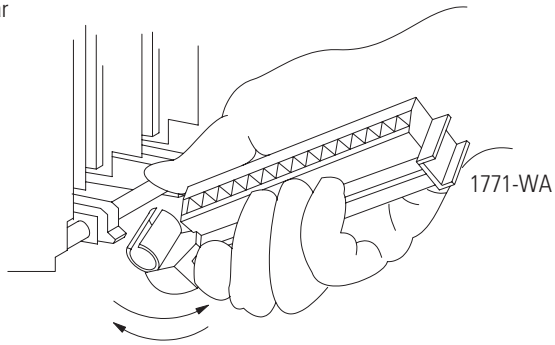


1771-A1B, -A2B, -A4B Series B I/O chassis



2 Attach the wiring arm (1771-WA) to the horizontal bar at 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.



The 1771-IN module is a modular component of the 1771 I/O system requiring a properly installed system chassis. Refer to publication 1771-IN075 for detailed information on acceptable chassis, proper installation, and grounding requirements. Limit the maximum adjacent slot power dissipation to 10W maximum.

Connect Wiring to the Field Wiring Arm

Make wiring connections to the module through the 10 terminal field wiring arm (cat. no. 1771-WA). The arm pivots on the I/O chassis to connect with terminals on the front of the module and acts as a terminal strip. The wiring arm allows the module to be removed from the chassis without disconnecting the wiring.

ATTENTION

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

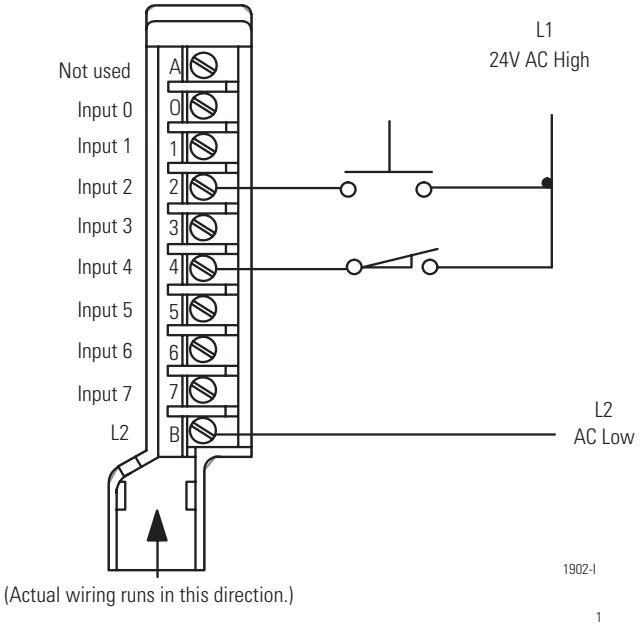
- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

1. Make certain all power is removed from the module before making wiring connections.

2. Swing the wiring arm up into position on the front of the module. The locking tab on the module will secure it into place.

IMPORTANT

The field wiring arm terminal identification number is not the same as the number of the bit which controls that output



3. Connect one terminal of your 2-wire input device to terminals 0 thru 7. Use stranded 14 or 16 AWG (2.0-1.5mm^2) to minimize the voltage drop over long cable distances.

4. Connect terminal B to the L2 (low) ac return. Terminal A is not used. Use stranded 14 or 16 AWG (2.0-1.5mm^2) to minimize the voltage drop over long cable distances

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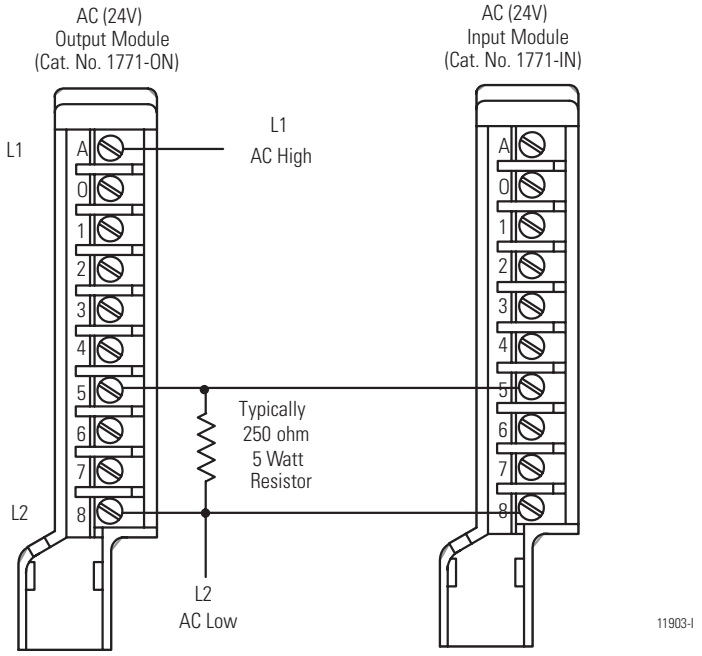
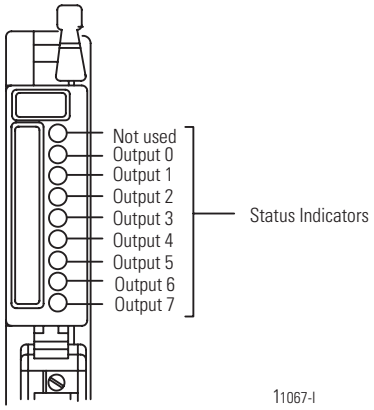
ATTENTION

You can use an ac (24V) output module (cat. no. 1771-ON) to directly drive terminals on an ac (24V) input module (cat. no. 1771-IN), but you must connect a 250Ω, 5W resistor between the output terminal and L2 (common) as shown in the following figure. **Use the same ac power source to power both modules to ensure proper phasing and prevent module damage.**



Interpret the Status Indicators

The front panel of your module contains 8 red status indicators (below). The red status indicators are on when the associated output is on.



Specifications

Specifications	ac (24V) Input Module (cat. no. 1771-IN)
Number of Inputs	8
Module Location	1771-I/O Chassis, 1 slot
Nominal Input Voltage	24V ac @ 47-63Hz
Nominal Input Current	7mA @ 12V ac 18mA @ 24V ac 22mA @ 28V ac
Onstate Voltage Range	12V ac to 28V ac
Maximum Offstate Voltage	10.5V ac peak
Maximum Offstate Current	2.8mA ac peak
Input Signal Delay[1]	18ms (±10ms), on or off for ac
Isolation Voltage	Tested at 1500V dc for 60s between user and system No isolation between individual channels
Backplane Current	80mA @ 5V dc
Power Dissipation	5.4W maximum, 0.4W minimum
Thermal Dissipation	18.5 BTU/hr maximum, 1.4 BTU/hr minimum
Environmental Conditions	
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	–40 to 85°C (–40 to 185°F)
Relative Humidity	5 to 95% noncondensing
Vibration	2g @ 10-500Hz
Enclosure Type Rating	None (open-style)
ConductorsWire Size	14 to 22AWG (2.0 to 0.34mm^2) stranded copper wire rated at 75°C or higher 3/64 inch (1.2mm) insulation maximum
Category[2]	2
Field Wiring Arm	Catalog Number 1771-WA
Field Wiring Arm Screw Torque	7-9 pound-inches (0.8-1.0Nm)
Keying	between 4 and 6 between 10 and 12
Certifications (when product is marked)	**UL** UL Listed Industrial Control Equipment **CSA** CSA Certified Process Control Equipment

1 Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off filter time is time from the input signal dropping below the valid level to recognition by the module.
2 You use this category information for planning conductor routing as described in Allen-Bradley publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.

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Publication 1771-IN082A-EN-P - February 2005 PN 957899-72
Supersedes Publication 1771-2.41 - June 1990