



AC/DC (120V) Input Module (Cat. No. 1771-IAD Series D)

Contents

Use this document as a guide when installing the catalog number 1771-IAD series D input module.

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Prevent Electrostatic Damage

The ac/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 all assembly numbers with the prefix 961440. (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: Electrostatic discharge can damage integrated circuits or semiconductors if you touch backplane connector pins. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential
- Wear an approved wrist-strap grounding device
- Do not touch the backplane connector or connector pins
- Do not touch circuit components inside the module
- If available, use a static-safe work station
- When not in use, keep the module in its original static-shielded packaging

AB Parts

Important Pre-installation Considerations

The 1771-IAD Series D module is compatible with all chassis except the 1771-A1, 1771-A2 and 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.

European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Guidelines for Handling Lithium Batteries, publication AG-5.4
- Automation Systems Catalog, publication B111

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

Calculate Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 195mA 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.

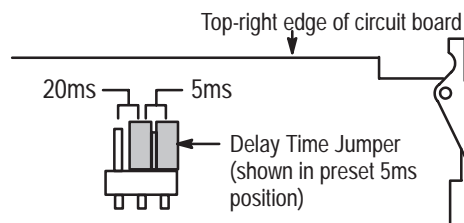
Setting the Delay Time Jumper

Your module is equipped with an adjustable delay time jumper. Use the jumper to select between two input channel delay times. The delay time you choose applies to all sixteen of the module's channels.

Use this delay time:	If you want:
5ms	to detect typical input readings
20ms	to prevent detection of false inputs in high-noise environments

The module is shipped with the delay time jumper preset to 5ms. To change the delay time jumper to 20ms, do the following:

1. Locate the delay time jumper selection plug at the top-right edge of the module circuit board, as shown in the following figure.



2. Use your finger to slide the jumper off the 5ms position (the middle post and the right post).
3. Carefully reposition the jumper by sliding it onto the 20ms position (the middle post and the left post).

Key the Backplane Connector

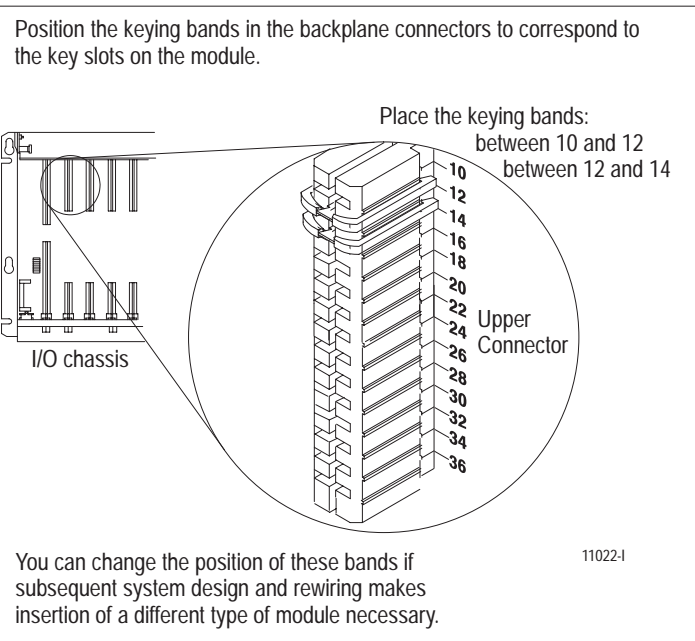
Place your module in any slot in the chassis except the leftmost slot which is reserved for processors or adapters.



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 Module and Field Wiring Arm



ATTENTION: Remove power from the 1771 I/O chassis backplane before you install the module. Failure to remove power from the backplane could cause:

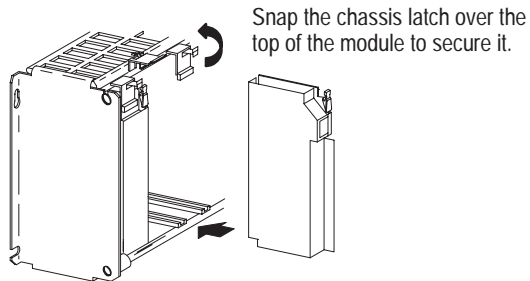
- module damage
- degradation of performance
- injury or equipment damage due to possible unexpected operation

1

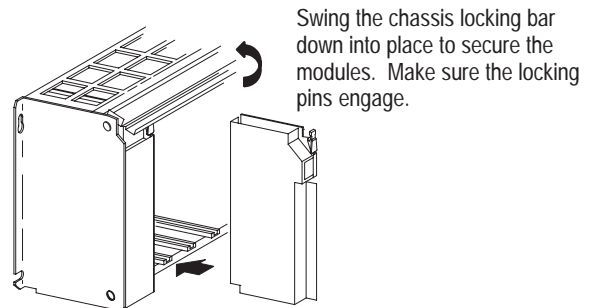
Place the module in the card guides on the top and bottom of the chassis that guide the module into position.

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

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



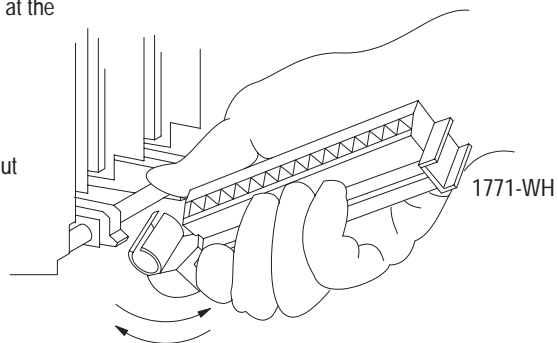
1771-A1B, -A2B, -A4B Series B I/O chassis



2

Attach the wiring arm (1771-WF) 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.



Connect Wiring to the Field Wiring Arm

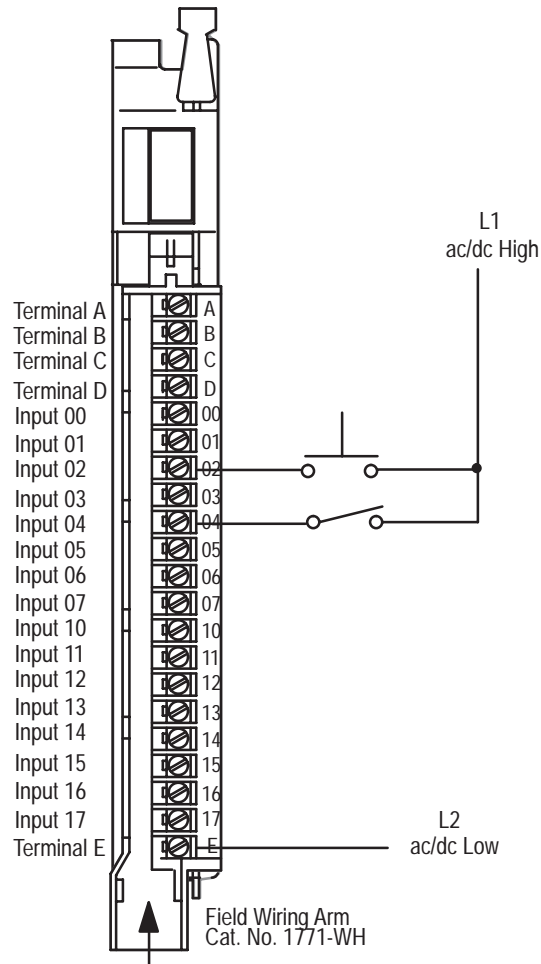
Connect your I/O devices to the field wiring arm (cat. no. 1771-WH) shipped with the module.



ATTENTION: Remove power from the 1771 I/O chassis backplane and field 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. Connect one terminal of your 2-wire input device to terminals 00 thru 17. Connect L1 (high) ac/dc line to the other terminal of your input devices.
2. Connect terminal E to the L2 (low) ac/dc return. Terminals A thru D are not used. Use stranded 14 or 16 gauge wire to minimize the voltage drop over long cable distances.



(Actual wiring runs in this direction.)

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AB Parts

Important: You can use an AC (120V) Output Module (cat. no. 1771-OAD) to directly drive terminals on an AC/DC (120V) Input Module (cat. no. 1771-IAD) as shown below.

You can also use a 1771-OA output module to drive an AC/DC (120V) input module (cat. no. 1771-IAD) but you must connect one of the following between the output terminal and L2 (common).

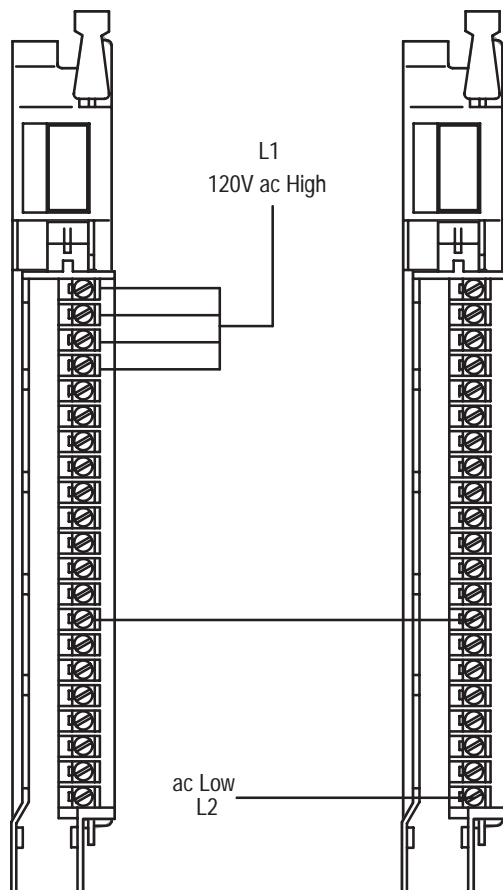
- 2500 ohm, 10W resistor
- RG-1676-1 Electrocube (San Gabriel, California)

Use the same ac power source to power both modules to ensure proper phasing and prevent module damage.

An Output Module Driving an Input Module

AC (12-120V) Output Module
(Cat. No. 1771-OAD)

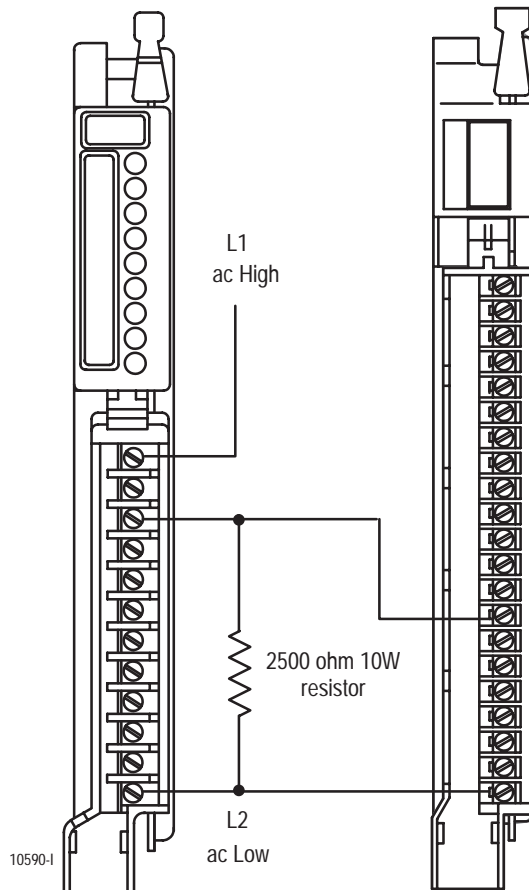
AC/DC (120V) Input Module
(Cat. No. 1771-IAD)



Note: 1771-OAD output voltage range is 12-138V ac. However, the on-state voltage range of the 1771-IAD is 79-138V ac.

AC (120V) Output Module
(Cat. No. 1771-OA)

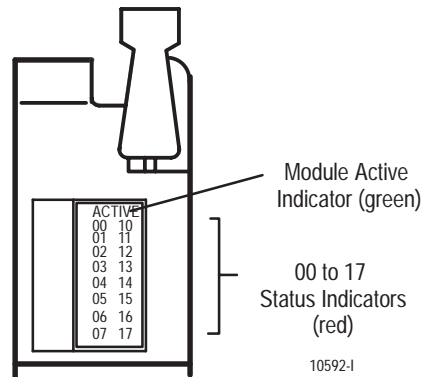
AC/DC (120V) Input Module
(Cat. No. 1771-IAD)



Note: 1771-OA output voltage range is 92-138V ac. However, the on-state voltage range of the 1771-IAD is 79-138V ac.

Interpreting the Status Indicators

The front panel of your module contains one green module active indicator, and 16 red status indicators as shown below.





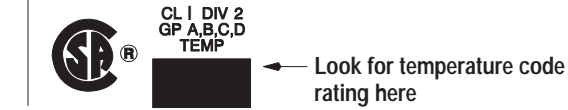
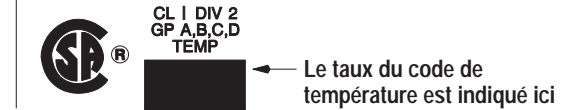


When the green module active indicator lights, the rack power supply has properly established 5Vdc. The module active indicator must be lit to properly interpret the red status indicators.

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 cause, and recommended action to take for common faults based on indicator responses.

Troubleshooting

Use this table to help you interpret the 1771-IAD 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 module.
	No voltage on terminal.	None
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.

CSA Hazardous Location Approval	Approbation d'utilisation dans des emplacements dangereux par la CSA
<p>CSA® certifies products for general use as well as for use in hazardous locations. Actual CSA certification is indicated by the product label as shown below, and not by statements in any user documentation.</p>	<p>La CSA® certifie les produits d'utilisation générale aussi bien que ceux qui s'utilisent dans des emplacements dangereux. La certification CSA en vigueur est indiquée par l'étiquette du produit et non par des affirmations dans la documentation à l'usage des utilisateurs.</p>
<p>Example of the CSA certification product label</p> 	<p>Exemple d'étiquette de certification d'un produit par la CSA</p> 
<p>To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for CSA-certified Allen-Bradley industrial control products.</p> <ul style="list-style-type: none"> This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, or non-hazardous locations only. The products having the appropriate CSA markings (that is, Class I Division 2, Groups A, B, C, D), are certified for use in other equipment where the suitability of combination (that is, application or use) is determined by the CSA or the local inspection office having jurisdiction. 	<p>Pour satisfaire à la certification de la CSA dans des endroits dangereux, les informations suivantes font partie intégrante de la documentation des produits industriels de contrôle Allen-Bradley certifiés par la CSA.</p> <ul style="list-style-type: none"> Cet équipement convient à l'utilisation dans des emplacements de Classe 1, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux. Les produits portant le marquage approprié de la CSA (c'est à dire, Classe 1, Division 2, Groupes A, B, C, D) sont certifiés à l'utilisation pour d'autres équipements où la convenance de combinaison (application ou utilisation) est déterminée par la CSA ou le bureau local d'inspection qualifié.
<p>Important: Due to the modular nature of a PLC® control system, the product with the highest temperature rating determines the overall temperature code rating of a PLC control system in a Class I, Division 2 location. The temperature code rating is marked on the product label as shown.</p>	<p>Important: Par suite de la nature modulaire du système de contrôle PLC®, le produit ayant le taux le plus élevé de température détermine le taux d'ensemble du code de température du système de contrôle d'un PLC dans un emplacement de Classe 1, Division 2. Le taux du code de température est indiqué sur l'étiquette du produit.</p>
<p>Temperature code rating</p> 	<p>Taux du code de température</p> 
<p>The following warnings apply to products having CSA certification for use in hazardous locations.</p>	<p>Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.</p>
 <p>ATTENTION: Explosion hazard —</p> <ul style="list-style-type: none"> Substitution of components may impair suitability for Class I, Division 2. Do not replace components unless power has been switched off or the area is known to be non-hazardous. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous. Do not disconnect connectors unless power has been switched off or the area is known to be non-hazardous. Secure any user-supplied connectors that mate to external circuits on an Allen-Bradley product using screws, sliding latches, threaded connectors, or other means such that any connection can withstand a 15 Newton (3.4 lb.) separating force applied for a minimum of one minute. 	 <p>AVERTISSEMENT: Risque d'explosion —</p> <ul style="list-style-type: none"> La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 2. Couper le courant ou s'assurer que l'emplacement est désigné non dangereux avant de remplacer les composants. Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux. Avant de débrancher les connecteurs, couper le courant ou s'assurer que l'emplacement est reconnu non dangereux. Attacher tous connecteurs fournis par l'utilisateur et reliés aux circuits externes d'un appareil Allen-Bradley à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens permettant aux connexions de résister à une force de séparation de 15 newtons (3,4 lb. - 1,5 kg) appliquée pendant au moins une minute.

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Specifications

Inputs per Module	16
Module Location	1771 Series B or later I/O chassis, 1771-AM1, -AM2 chassis
Nominal Input Voltage	120V ac @ 50/60Hz; 125V dc
Nominal Input Current	9.9mA @ 120V ac 60Hz; 8.7mA @ 120V ac 50Hz; 2.56mA @ 125V dc
On-state Voltage Range	79V to 138V ac or dc
Minimum On-state Current	5.95mA @ 79V ac 60Hz; 1.5mA @ 79V dc
Maximum Off-state Voltage	43V ac or dc
Maximum Off-state Current	3.0mA @ 43V ac 60Hz; 0.8mA @ 43V dc
Input Impedance	11.2K ohms @ 60Hz (0.18 microfarad in parallel with 47K ohms, in series with 820 ohms)
Peak Inrush Current	Inrush = $V_{PS}/820$ ohm, where V_{PS} = customer supply peak voltage
Input Signal Delay	Off to On On to Off
	5ms (+3ms) or 20ms (+5ms) @ 120V ac 60Hz selectable 3ms (+.1ms) or 10ms (+1ms) @ 120V dc selectable 25ms (+5ms) @ 120V ac or dc
Power Dissipation	8.8 Watts (max.), 1.0 Watts (min.)
Thermal Dissipation	30.1 BTU/hr (max.), 3.42 BTU/hr (min.)
Backplane Current	195mA @ 5V
Isolation Voltage	Tested at 2500V dc for 1 second per UL508 & CSA C22.2 #142
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 (2mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum
Category	1 ¹
Keying	Between 10 and 12 Between 14 and 16
Field Wiring Arm	Catalog Number 1771-WH
Wiring Arm Screw Torque	7-9 inch-pounds
Agency Certification (when product is marked)	<ul style="list-style-type: none"> • CSA certified • CSA Class I, Division 2, Groups A, B, C, D certified • UL listed • CE marked for all applicable directives

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



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