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DC (10-30V) Input Module

Cat. No. 1771-IBD Series B

Contents

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

To	See page
Prevent Electrostatic Discharge	Below
Important Preinstallation Considerations	2
Understand Compliance to European Union Directives	2
Calculate Power Requirements	3
Set the Filter Off Delay	3
Key the Backplane Connector	3
Install the Module and Field Wiring Arm	4
Connect Wiring to the Field Wiring Arm	5

For this reference information	See page
Status Indicators	6
Troubleshooting	6
CSA Hazardous Location	7
Specifications	8

Prevent Electrostatic Discharge

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

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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.

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.

Understand Compliance to European Union Directives

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 these 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.

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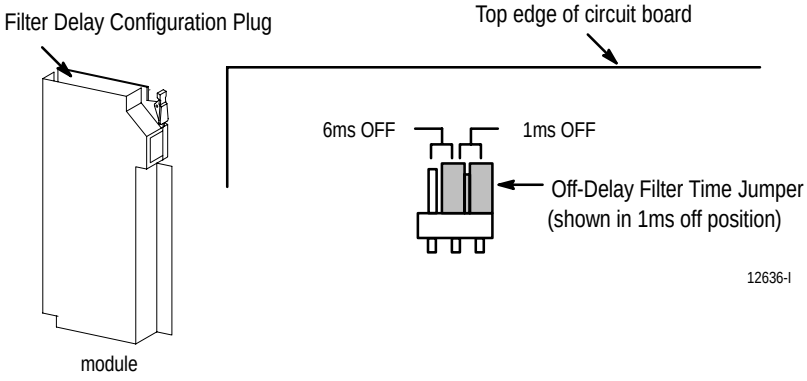
Power Requirements

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.

Set the Filter Off Delay

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

1. Turn off power to the I/O chassis.
2. Locate the off-delay filter time configuration plug on the top-left edge of the printed circuit board as shown below.



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

Key the Backplane Connector

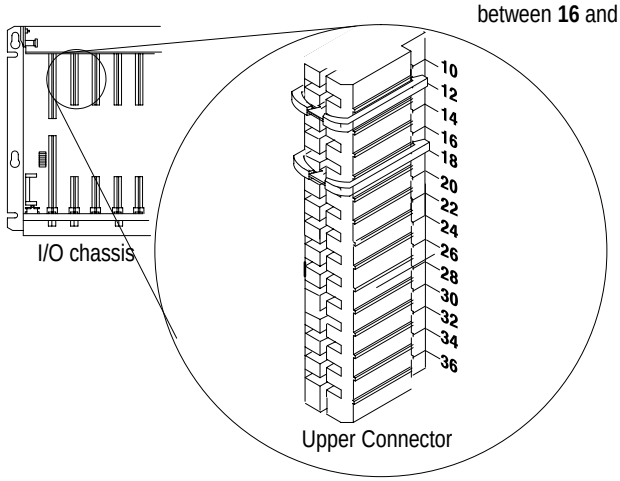
Place your module in any slot in the chassis except the leftmost slot which is reserved for processors or adapters.

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.

Position the keying bands in the backplane connectors to correspond to the key slots on the module. Place the keying bands:
between **10** and **12**
between **16** and **18**



You can change the position of these bands if subsequent system design and rewiring makes insertion of a different type of module necessary. 11022-I

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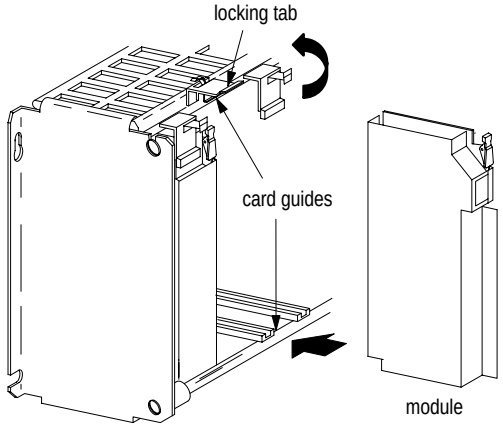
Install the Module and Field Wiring Arm

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.

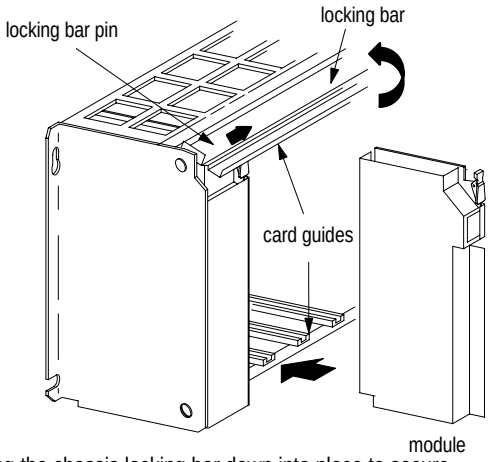
1

1771-A1B, -A2B, -A3B, -A3B1, -A4B I/O chassis



Snap the chassis latch over the top of the module to secure it.

1771-A1B, -A2B, -A3B1, -A4B Series B I/O chassis



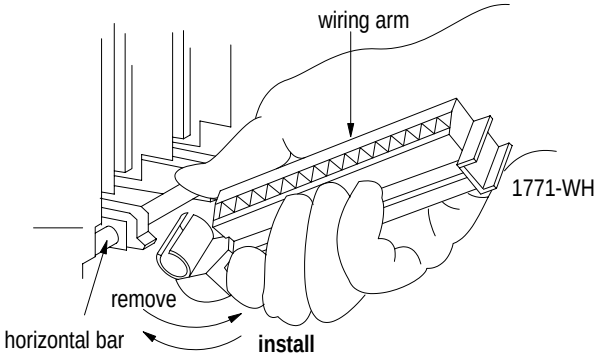
Swing the chassis locking bar down into place to secure the modules. Make sure the locking pins engage.

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Attach the wiring arm (1771-WH) 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.



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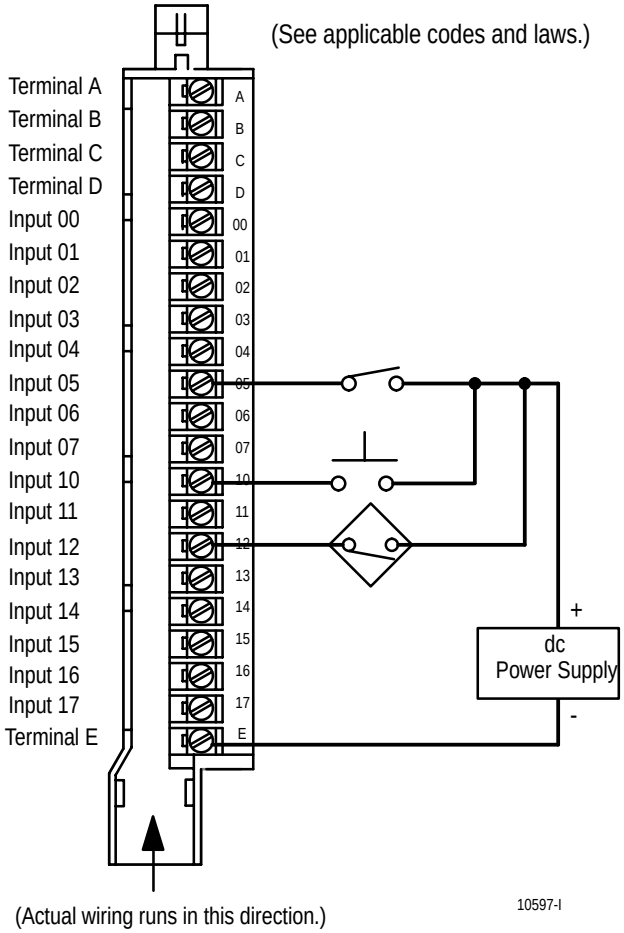
Connect Wiring to the Field Wiring Arm

Make wiring connections to the field wiring arm (cat. no. 1771-WH) shipped with the module.

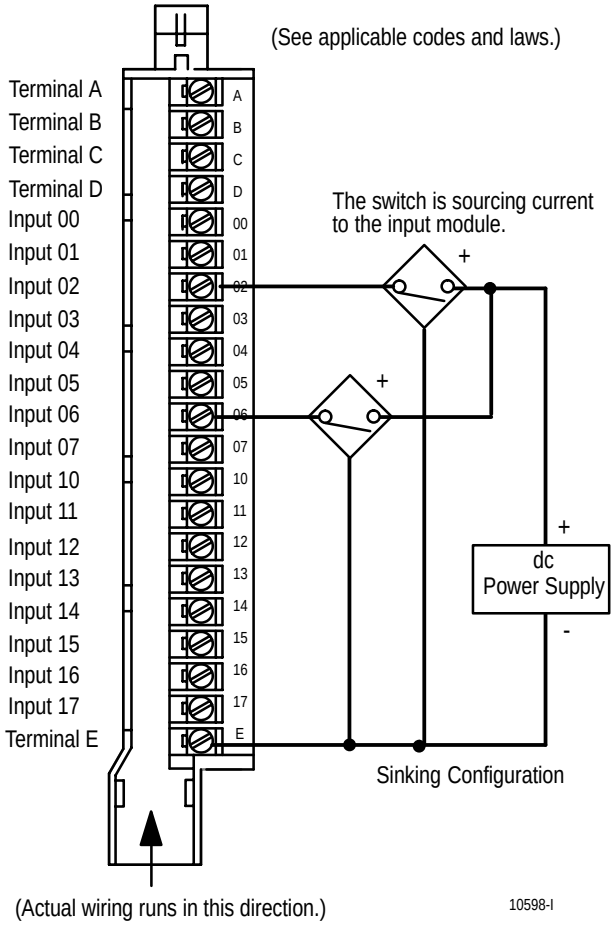
1. Connect one terminal of your two or three-wire input device to terminals 00 through 17.
2. Connect the +dc line to the other terminal of your input devices. Connect three-wire input devices, such as Allen-Bradley proximity switches (Bulletin 871), to operate in a current source mode.
3. Connect terminal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

Connection Diagram (2-Wire Devices)



Connection Diagram (3-Wire Devices)



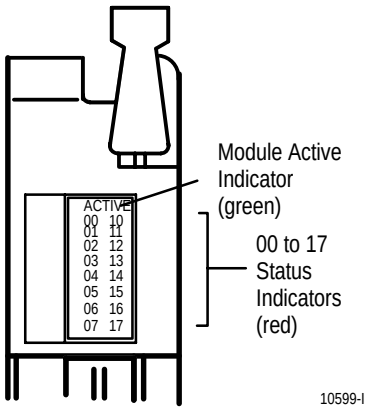
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Important: You can directly drive terminals on a DC (10-30V) Input Module (cat. no. 1771-IBD Series B) from terminals on the following modules:

- 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.

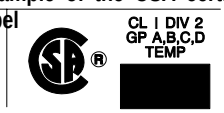
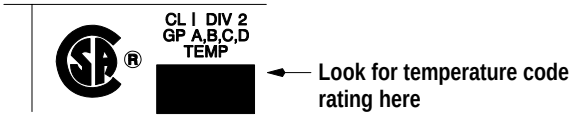
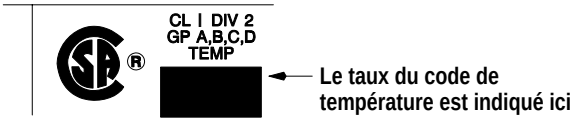
The green active indicator turns on when the module is powered. The red status indicators are provided for system logic side indication of individual inputs. When a red status indicator lights, voltage is present on the terminal. The module transfers this information to the backplane for the processor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

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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CSA Hazardous Location Approval	Approbation d'utilisation dans des emplacements dangereux par la CSA
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.	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.
Example of the CSA certification product label 	Exemple d'étiquette de certification d'un produit par la CSA 
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. • 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.	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. • 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.
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.	**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.
Temperature code rating 	Taux du code de température 
The following warnings apply to products having CSA certification for use in hazardous locations.	Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.
ATTENTION: Explosion hazard — • 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.	**AVERTISSEMENT:** Risque d'explosion — • La substitution de composants peut rendre ce matériel inacceptable pour lesemplacements de Classe I, Division 2. • Couper le courant ou s'assurer quel'emplacement est désigné non dangereux avant de remplacer lescomposants. • 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	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 $\pm$5%
Isolation Voltage	This isolation meets or exceeds the requirements of UL Standard 508, and CSA Standard C22.2 No. 142.
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity	 0º to 60ºC (32º to 140ºF) -40º to 85ºC (-40º to 185ºF) 5 to 95% (without condensation)
Conductors Wire Size Category	14 gauge ($2mm^2$) stranded maximum 3/64 inch (1.2mm) insulation maximum 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
Agency Certification (when product is marked)	• CSA certified • CSA Class 1, 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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