DC (5-30V) Selectable Input Module Cat. No. 1771-IQ

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

Each of the eight inputs to this module are switch selectable for current sourcing or current sinking of your device. The module can be set for either high true or low true logic. In addition, the module has selectable delay times of 12ms nominal (5ms minimum; 26ms maximum) in normal or 1ms (maximum) in fast position. Set these switches before you install your module.

The dc selectable input module can be installed in either a Series A or B 1771 I/O chassis.

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

Power Requirements

The logic circuitry of this module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 150mA 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.

Initial Handling

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

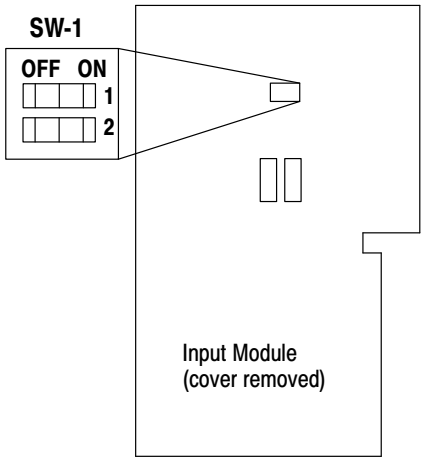
Electrostatic Discharge Damage

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 logic level switch, the input sink switch, the input source switch, key your I/O chassis, install your module and make your wiring connections.



Selecting the Logic Level

You can select one of two logic conditions:

If you choose:	Then:	Set Switch SW:
HIGH = TRUE logic	ON > 40% of customer supply voltage OFF < 20% of customer supply voltage	SW1 position 2 ON
LOW = TRUE logic	ON < 20% of customer supply voltage OFF > 40% of customer supply voltage	SW1 position 2 OFF

Selecting the Input Delay

You can select one of two input delay times:

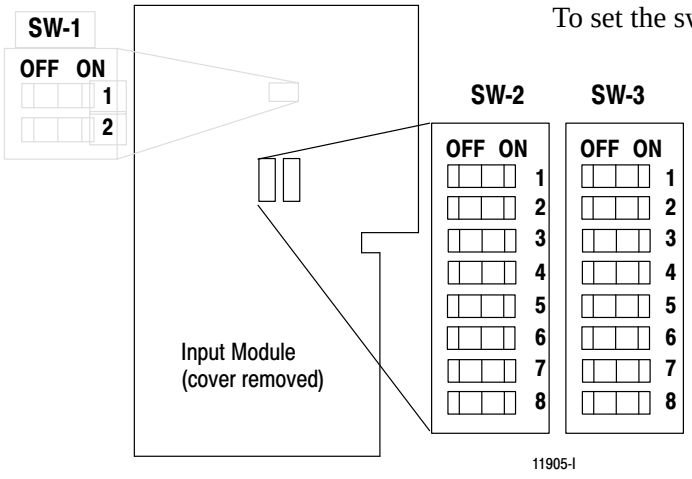
If you choose:	Then the delay time is:	Set Switch SW1:
Typical	12ms (5ms min.; 26ms max.)	SW1 position 1 ON
Fast	1ms maximum	SW1 position 1 OFF

The input delay time applies to all eight inputs. They are not individually selectable.

Selecting Sinking or Sourcing for Inputs

Two switches (SW2 and SW3) are provided for determining source or sink capability for each input. SW2 selects sink capability, and SW3 selects source capability.

To set the switches, follow the procedure below.



1. Remove the side cover from the module by removing the screws at the four corners.
2. Set the switches as needed for your application.
3. Reinstall the cover and secure with the four screws.

Input	Switch Position	Sink		Source	
		SW-2	SW-3	SW-2	SW-3
0	1	On	Off	Off	On
1	2	On	Off	Off	On
2	3	On	Off	Off	On
3	4	On	Off	Off	On
4	5	On	Off	Off	On
5	6	On	Off	Off	On
6	7	On	Off	Off	On
7	8	On	Off	Off	On

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 6 and 8
- Between 24 and 26

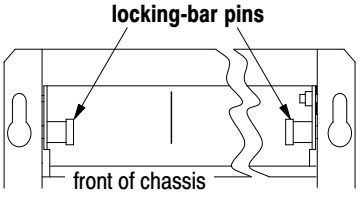
You can change the position of these keys if system redesign and rewiring makes insertion of a different module necessary.

Installing the Input Module

To install the 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. Remove power from the I/O chassis before inserting (or removing) the module.
2. On chassis equipped with a chassis locking bar, pull the locking-bar pins to release the locking bar and swing it up. If installing in an earlier chassis, lift the module locking latch up.
3. Insert the module into slot.
4. Place the module in the plastic tracks on the top and bottom of the leftmost slot. These slots guide the module into position.
5. Press firmly and evenly to seat the module in its backplane connectors.

ATTENTION: Do not force the module into the backplane connector. If you cannot seat the module with firm pressure, check the alignment and keying. Forcing the module can damage the backplane connector or the module.

6. Snap the chassis locking bar (or locking latch on earlier chassis) over the top of the module to secure it. Make sure the locking pins on the locking bar are fully engaged.

   Note: The chassis locking bar will not close if all modules are not properly seated.

7. Connect the field wiring arm to the module.

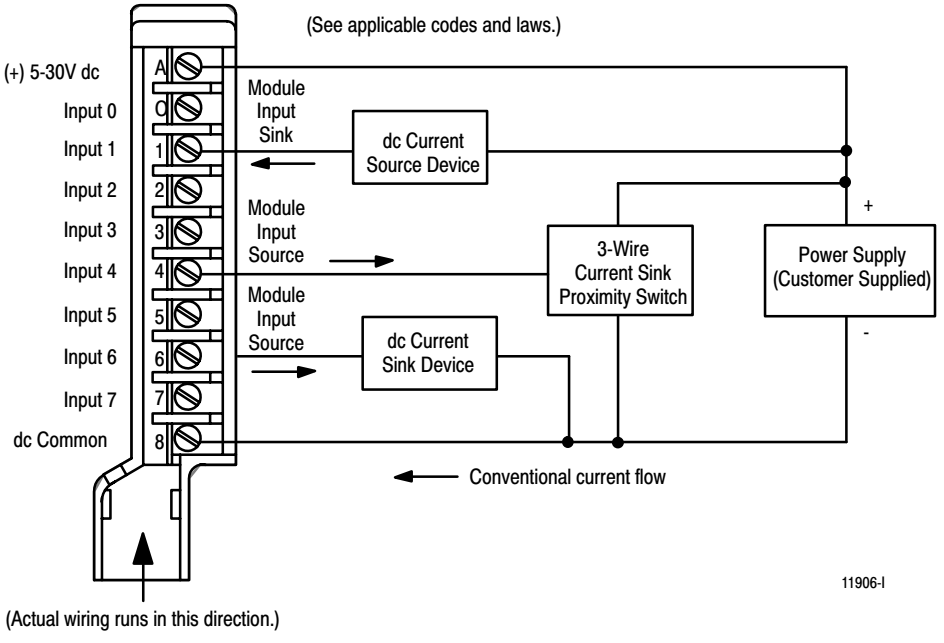
8. Make wiring connections to the field wiring arm as indicated below.

Connecting Wiring to the Input Module

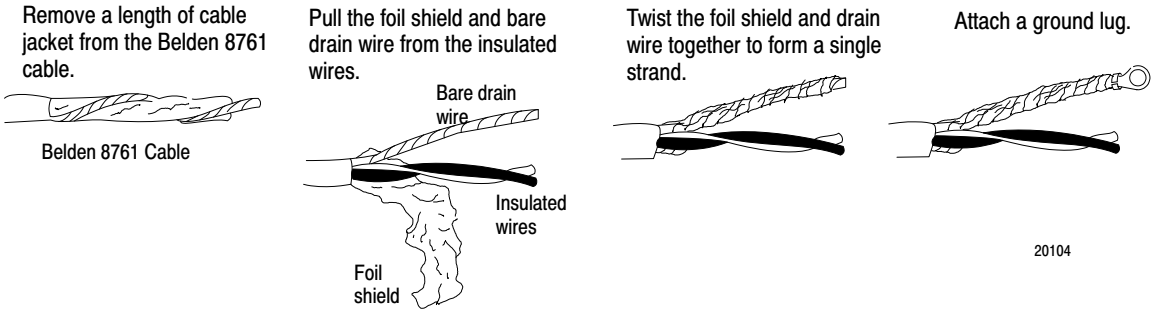
Connections to the input module are made to the field wiring arm (cat. no. 1771-WC) shipped with the module. Attach the wiring arm to the pivot bar on the bottom of the I/O chassis. The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.

ATTENTION: Do not apply ac or reverse dc voltage to module terminals. Circuitry at the input of module may be damaged.

Connection Diagram



1. Separate the shielded cables from wiring that radiates electrical noise. Refer to publication 1770-4.1, "Wiring and Grounding Guidelines" for more information.
2. Connect each user input device using shielded cable such as Belden 8761. Prepare the shielded cable as shown below. Do not exceed 50 cable feet for any output device. Connect the insulated wires to their respective terminals on the wiring arm.

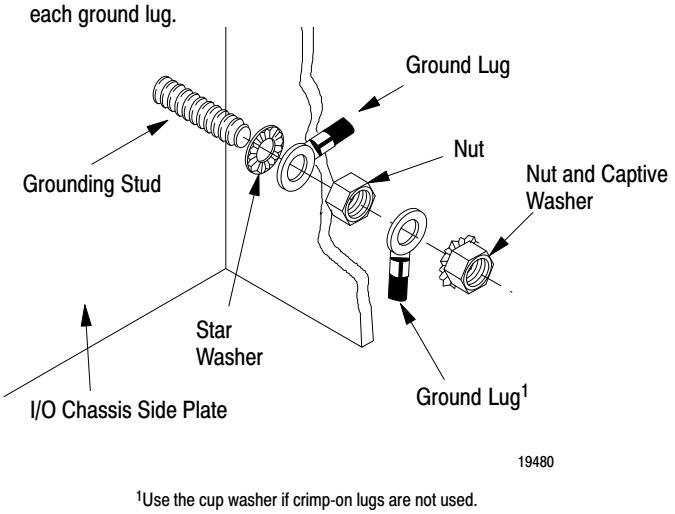


Important: Connect the insulated signal return wire in each transmission cable to the dc common terminal of your +5V dc power supply at one end, and to the dc common terminal of the wiring arm at the other end. Do not confuse the signal return lead with the shield/drain wire.

3. Ground the single strand (foil shield and drain wire) to the grounding stud on the I/O chassis or by using single-point grounding (below).

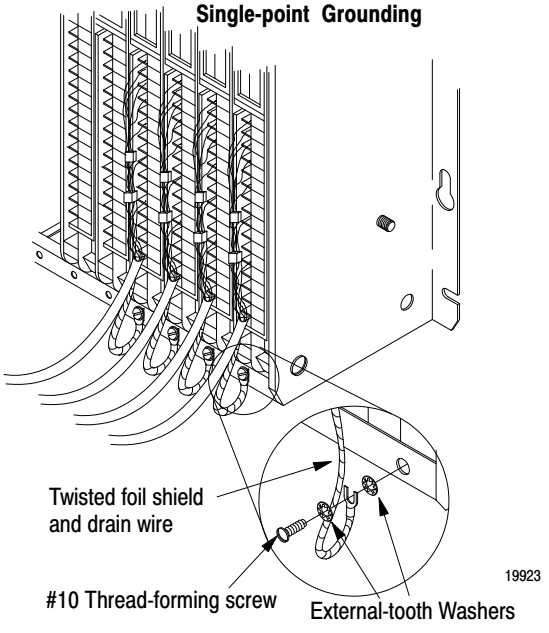
Chassis Ground

When you connect grounding conductors to the I/O chassis grounding stud, place a star washer under the first lug, then place a nut with captive lock washer on top of each ground lug.



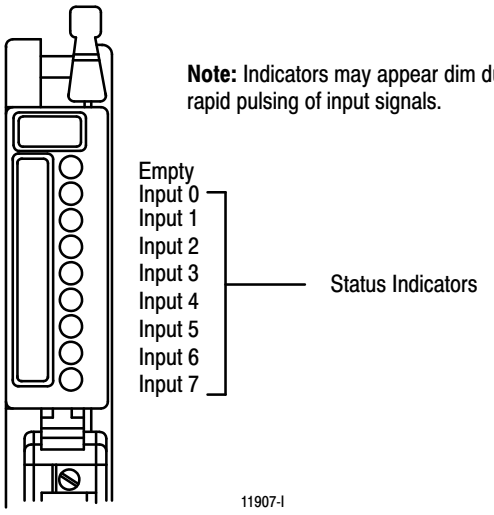
[1]Use the cup washer if crimp-on lugs are not used.

Single-point Grounding



Interpreting the Status Indicators

The front panel of your module contains eight status indicators.. Each of the eight red indicators light when their corresponding input terminal is in the true state, regardless of whether the module is selected for High True or Low True logic.



Specifications

Inputs per Module	8
Module Location	1771 I/O chassis
Nominal Input Current	5mA @ 5V dc; 25mA @ 30V dc
Input Voltage Range HIGH = TRUE LOW = TRUE	 ON: > 40% of customer supply voltage OFF: < 20% of customer supply voltage ON: < 20% of customer supply voltage OFF: > 40% of customer supply voltage
Customer Supply Voltage	5V dc to 30Vdc
Customer Supply Current per Module	All inputs ON and connected for source capability: 100mA per module @ 5V dc 350mA per module @ 30V dc
Input Impedance	1.2K ohms nominal
Input Signal Delay	Fast: Less than 1ms Normal: 12ms typical (-7ms, +14ms)
Power Dissipation	6.8 Watts (max.), 0.8 Watts (min.)
Thermal Dissipation	23.2 BTU/hr (max.), 2.7 BTU/hr (min.)
Backplane Current	150mA max.
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 ($2mm^2$) stranded maximum 3/64 inch (1.2mm) insulation maximum 2[1]
Keying	Between 6 and 8 Between 24 and 26
Wiring Arm	Catalog Number 1771-WC
Wiring Arm Screw Torque	7-9 inch-pounds
Agency Certification (when product or packaging is marked)	• CSA certified • CSA Class I, Division 2, Groups A, B, C, D certified • UL listed • CE marked for all applicable directives

[1] You use this conductor-category for planning conductor routing as described in the system-level installation manual.

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