



# DC (24V) Isolated Input Module

## Cat. No. 1771-IQ16

### Installation Data

#### To The Installer

This document provides information on:

- important pre-installation considerations
- power supply requirements
- installing the module
- installing and connecting the wiring
- using the module indicators for troubleshooting
- module specifications

#### Pre-installation Considerations

This module must be used in a series B I/O chassis. The 1771-IQ16 is not compatible with the 1771-AL local I/O adapter.

This module contains customer-selectable input filter times to limit the effects of voltage transients caused by contact bounce and/or radiated electrical noise. The delay due to filtering ranges from 0ms to 18.0ms for turning dc inputs on to off. Delay for turning dc inputs off to on is 1.0ms. The filter time is factory set to 1.0ms. Refer to "Setting the Input Filter Jumpers" for a description of available filter times.

This module is designed to operate with dc limit switches, float switches, selector switches, proximity switches and pushbutton switches.

The module can be used as either a sink or source input based on the wiring configuration of the load.

#### Power Supply Requirements

The isolated input module is powered by the power supply connected to the I/O chassis backplane. The module requires a maximum current of 100mA from the +5V dc output of this supply. Total the current requirements of this module with the other modules in the I/O chassis to avoid overloading the supply or the I/O chassis backplane.

## Installing the Module

In this section we tell you how to set your filter time jumpers, install your module, key your I/O chassis and make your wiring connections

### Module Location in the I/O Chassis

Group your modules to minimize adverse effects from radiated electrical noise and/or heat. We recommend the following:

- Group analog input and low voltage dc modules away from ac modules or high voltage dc modules to minimize electrical noise interference.
- Place analog input modules and other I/O modules sensitive to heat away from slot power supplies to minimize adverse heat effects.

### Initial Handling Procedures



**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.
- 
- Touch a grounded object to rid yourself of charge before handling the module.
  - Do not touch the backplane connector or connector pins.
  - When you configure or replace internal components, do not touch other circuit components inside the module. If available, use a static-safe work station.
  - When not in use, keep the module in its static-shielded bag.

### Setting the Input Filter Jumpers

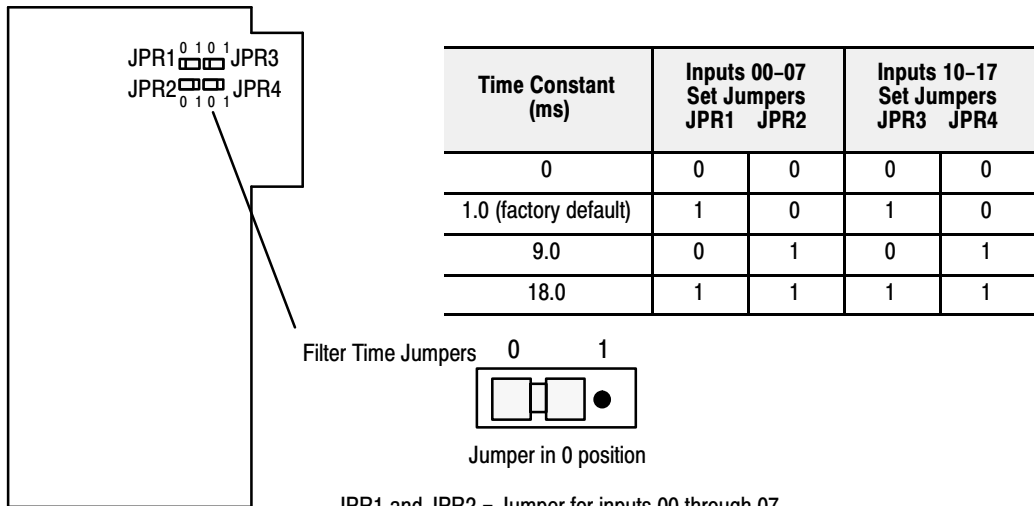
This module has four user-selectable filter time jumpers. Jumpers JPR1 and JPR2 are used for filter times on inputs 00 through 07, and jumpers JPR3 and JPR4 set filter times for inputs 10 through 17. The jumper sets provide four different filter times, as shown in [Figure 1](#).

These filter times apply when the input is cycling from ON to OFF. The OFF to ON filter time is fixed at 1ms. Refer to [Table A](#) for filter times and jumper settings.

To set the filtering time constant, proceed as follows:

1. Remove the side covers from the module circuit board by removing the four screws securing the covers to the module and remove the circuit board.
2. Position the jumpers as required to provide the filter time constant you require. Refer to Figure 1. Use your fingers to pull the jumper up and position it on the two pins corresponding to your selection (0 or 1).

**Figure 1**  
**Setting the Filter Time Jumpers**



JPR1 and JPR2 = Jumper for inputs 00 through 07

JPR3 and JPR4 = Jumper for inputs 10 through 17

10561-I

3. Reinstall the covers on the module circuit board and secure with four screws.

**Table A**  
**Minimum and Maximum Filter Times**

Filter Time (msec)	On to Off (ms)		Off to On Typical
	Minimum	Maximum	
0	0	0.20	200 $\mu$ s
1.0	0.95	1.25	1.0ms
9.0	8.55	9.65	1.0ms
18.0	17.10	19.10	1.0ms

### Keying the I/O Chassis

Use the plastic keying bands, shipped with each I/O chassis, to key your I/O slots to accept only this type of module. Place keying bands between these numbers labeled on the backplane connector:

- between 22 and 24
- between 30 and 32

Slots on the rear edge of the circuit board are matched 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.



**ATTENTION:** A module inserted into a wrong slot could be damaged by improper voltages connected through the wiring arm. Use keying bands to prevent damage to the module.

---

### Inserting the Module into the Chassis

1. Position the module so that the circuit board on the rear of the module lines up with the top and bottom card guides in the chassis.
2. Slide the module into the chassis.
3. Press firmly to seat the module in the chassis backplane connector.
4. Swing the module locking latch down into place over the front of the module.

**Note:** A shorting bar can be used to connect the commons if no channel-to-channel isolation is required.

### Connecting Wiring to the Module

You make connections to the module through the 1771-WN field wiring arm shipped with the module. The arm pivots on the chassis to connect with the 40 terminals on the front of the module ([Figure 2](#)). The wiring arm allows the module to be removed from the chassis without disconnecting wiring.

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.

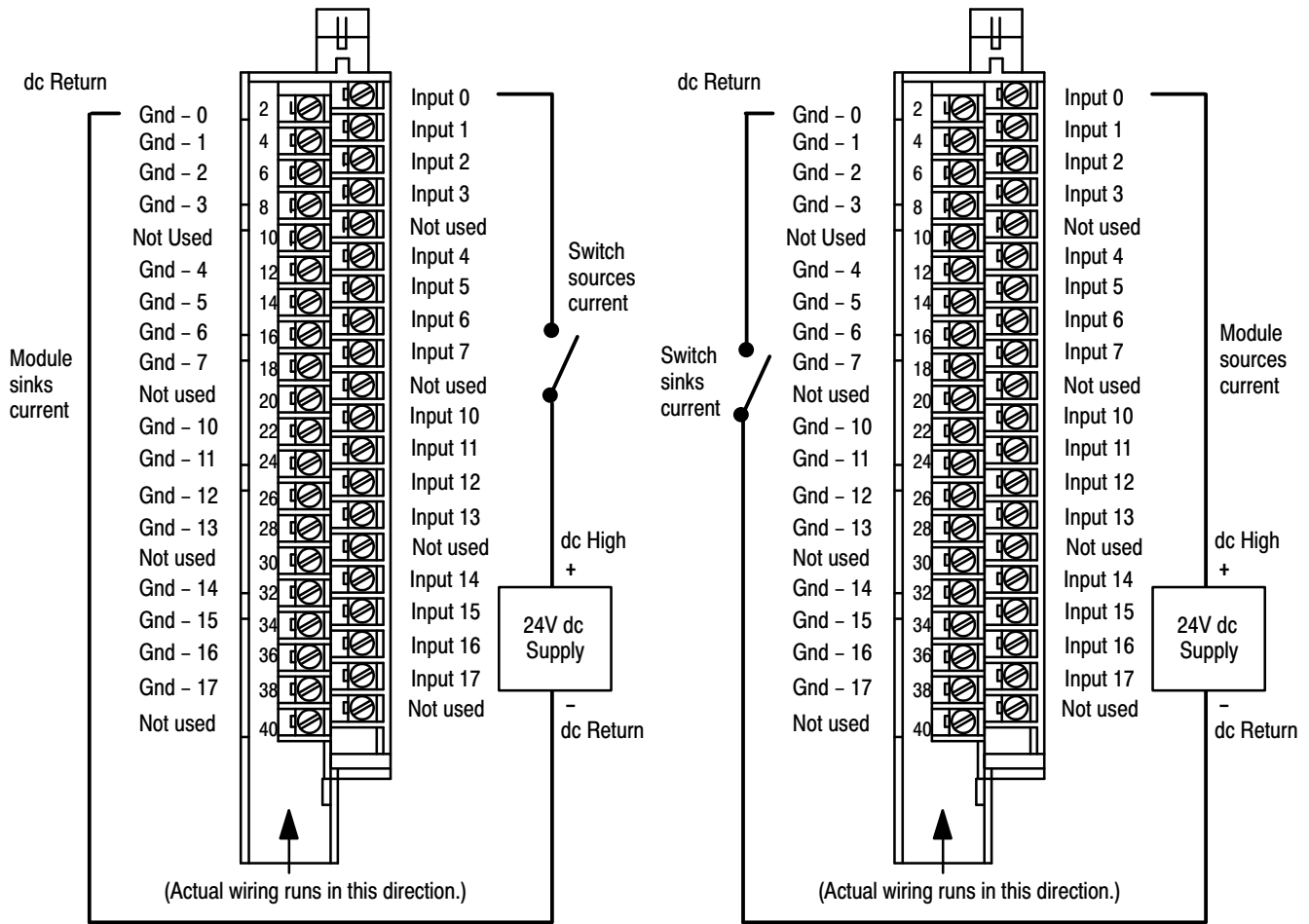
3. Make your connections to the field wiring arm as shown in Figure 2. (Use the label on the front of the wiring arm to identify your wiring.)



**ATTENTION:** The field wiring arm terminal identification number is not the same as the number of the bit associated with that input.

You should identify the labels on the wiring arm with the name or number of the device connected at each terminal.

**Figure 2**  
**Connection Diagram for the 1771-IQ16 Isolated Input Module**



**Sink Configuration**

**Source Configuration**

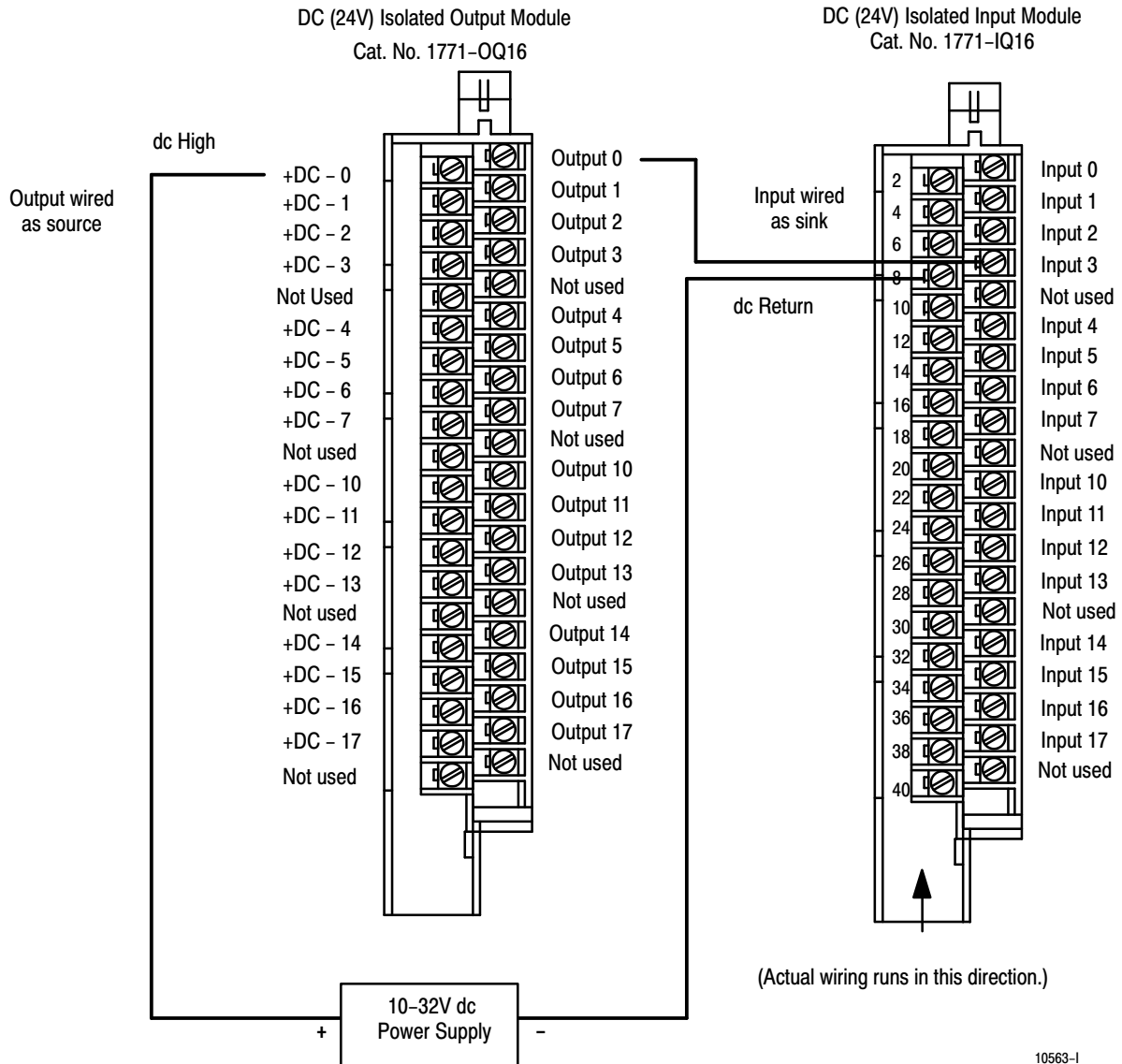
10562-I

## Installation Data

DC (24V) Isolated Input Module  
(Cat. No. 1771-IQ16)

You can use an output of the 1771-OQ16 module to drive an input of a 24V DC input module (1771-IQ16) to indicate status of turning on a motor starter, for example (Figure 3). The configuration shown has the output of the 1771-OQ16 wired as a source, and the input on the 1771-IQ16 wired as a sink.

**Figure 3**  
**Driving an Input with an Output**

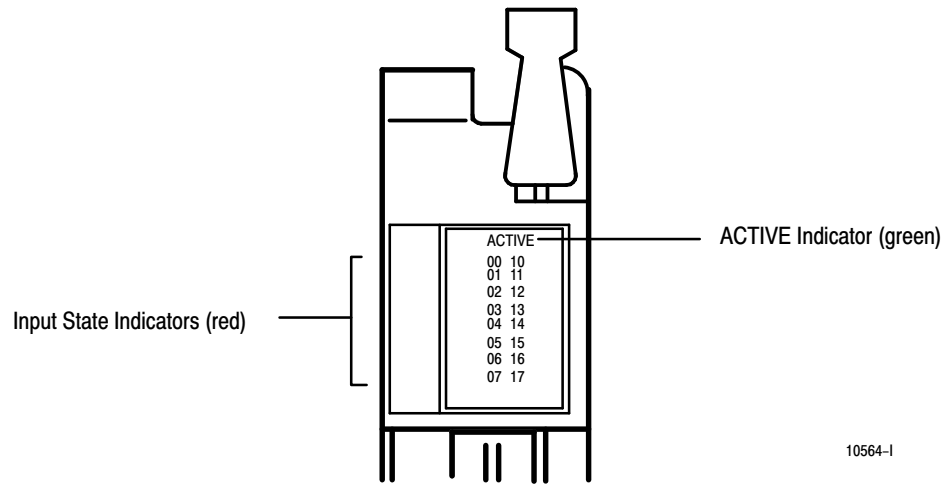


## Interpreting the Status Indicators

The module has 17 indicators (Figure 4), consisting of 16 input status indicators and an active indicator. The 16 status indicators reflect the state of the signals on the customer's terminals. They light when the field load has been applied to the field wiring arm of the module.

The ACTIVE indicator lights when the module has successfully started up and has initialized.

**Figure 4**  
Status Indicators



10564-I

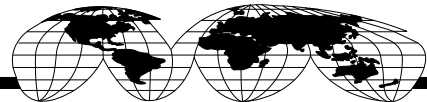
## Specifications

Inputs per Module	16
Module Location	1771-A1B thru -A4B I/O Chassis
Voltage Range	10–32V dc
Nominal Input Voltage	24V dc
Minimum On-state Voltage	10V dc
Maximum Off-state Voltage	5V dc
Minimum On-state Current	6.0mA @ 10V dc
Minimum Off-state Current	2mA @ 5V dc
Maximum Input Current	30mA @ 32V dc
Input Impedance	1.6K ohms maximum
Signal Delay Times	Off to On On to Off
	1.0ms Customer Selectable: 0, 1, 9, 18ms
Power Dissipation	15.0 Watts (max.); 0.5 Watts (min)
Thermal Dissipation	51.0 BTU/hr (max); 1.7 BTU/hr (min)
Backplane Current	100mA maximum
Tested Isolation Voltage	1500V ac channel-to-channel for 1 second 1500V ac channel to backplane for 1 second
Maximum Cable Length	1000 ft (304.8 m)
Conductors	Wire Size Category
	14 gauge stranded maximum 3/64 inch insulation maximum 1 <sup>1</sup>
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)
Keying	Between 22 and 24 Between 30 and 32
Field Wiring Arm	Catalog Number 1771-WN
Wiring Arm Screw Torque	7-9 inch-pounds

<sup>1</sup> Refer to publication 1770-4.1, Programmable Controller Wiring and Grounding Guidelines



Allen-Bradley has been helping its customers improve productivity and quality for 90 years. A-B designs, manufactures and supports a broad range of control and automation products worldwide. They include logic processors, power and motion control devices, man-machine interfaces and sensors. Allen-Bradley is a subsidiary of Rockwell International, one of the world's leading technology companies.



With major offices worldwide.

Algeria • Argentina • Australia • Austria • Bahrain • Belgium • Brazil • Bulgaria • Canada • Chile • China, PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic • Denmark • Ecuador • Egypt • El Salvador • Finland • France • Germany • Greece • Guatemala • Honduras • Hong Kong • Hungary • Iceland • India • Indonesia • Israel • Italy • Jamaica • Japan • Jordan • Korea • Kuwait • Lebanon • Malaysia • Mexico • New Zealand • Norway • Oman • Pakistan • Peru • Philippines • Poland • Portugal • Puerto Rico • Qatar • Romania • Russia-CIS • Saudi Arabia • Singapore • Slovakia • Slovenia • South Africa, Republic • Spain • Switzerland • Taiwan • Thailand • The Netherlands • Turkey • United Arab Emirates • United Kingdom • United States • Uruguay • Venezuela • Yugoslavia

World Headquarters, Allen-Bradley, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414 382-2000 Fax: (1) 414 382-4444