



DC (24V) Isolated Input Module

Cat. No. 1771-IQ16 Series C

To The Installer

This document provides information on:

	To:	See Page:
↓	Prevent Electrostatic Damage	1
↓	PreInstallation Information	2
↓	Understand compliance to European Union directives	3
↓	Calculate power requirements	3
↓	Set the input filter jumpers	4
↓	Key the backplane connector	5
↓	Install the module and field wiring arm	5
↓	Connect the wiring to the module	6
For this reference information		See page
➡	Interpret the Status Indicators	9
➡	CSA Hazardous Location	11
➡	Specifications	12

Prevent Electrostatic Damage

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

Pre-installation Considerations

This module must be used in a 1771 series B or later 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 0.57ms. The filter time is factory set to 0.57ms. 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.



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.
-

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.

European Union Directive Compliance

If this product is installed within the European Union or EEA regions and has the CE mark, the following regulations apply.

EMC Directive

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

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

The product described in this manual 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 “Industrial Automation Wiring and Grounding Guidelines For Noise Immunity,” Allen-Bradley publication 1770-4.1

Open style devices must be provided with environmental and safety protection by proper mounting in enclosures designed for specific application conditions. See NEMA Standards publication 250 and IEC publication 529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

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.

Allen-Bradley Replacements

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 below.

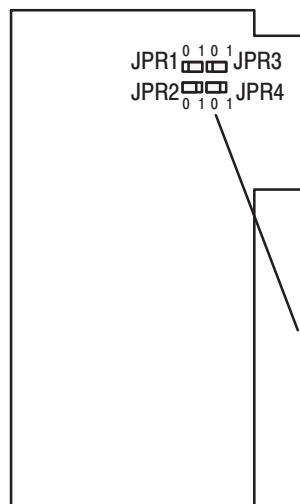
Table B
Minimum and Maximum Filter Times

Filter Time (ms)	On to Off (ms)		Off to On
	Minimum	Maximum	
0	0	0.56 μ s	200 μ s Typical
0.57	0.56	0.62	0.52 to 0.59ms
9.0	7.6	9.0	0.52 to 1.65ms
18.0	15.0	18.0	0.52 to 2.8ms

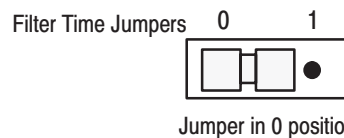
These filter times apply when the input is cycling from ON to OFF. The OFF to ON filter time is fixed at 0.57ms.

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.. Use your fingers to pull the jumper up and position it on the two pins corresponding to your selection (0 or 1).



Time Constant (ms)	Inputs 00-07 Set Jumpers		Inputs 10-17 Set Jumpers	
	JPR1	JPR2	JPR3	JPR4
0	0	0	0	0
0.57 (factory default)	1	0	1	0
9.0	0	1	0	1
18.0	1	1	1	1



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.

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 22 and 24 between 30 and 32

I/O chassis

Upper Connector

You can change the position of these bands if subsequent system design and rewiring makes insertion of a different type of module necessary. 11022-1

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.

19809

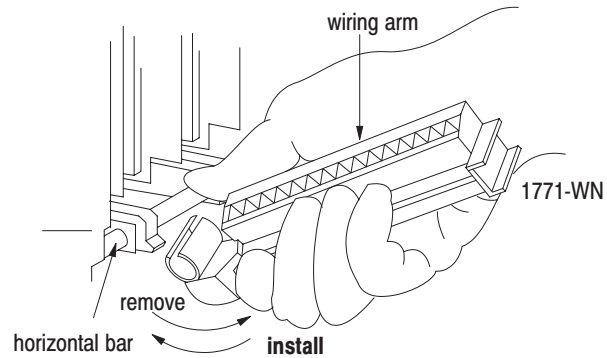


ATTENTION: A module inserted into a wrong slot could be damaged by improper voltages connected through the wiring arm. Use keying bands to prevent damage to the module.

2

Attach the wiring arm (1771-WN) 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.



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. The wiring arm allows the module to be removed from the chassis without disconnecting wiring.

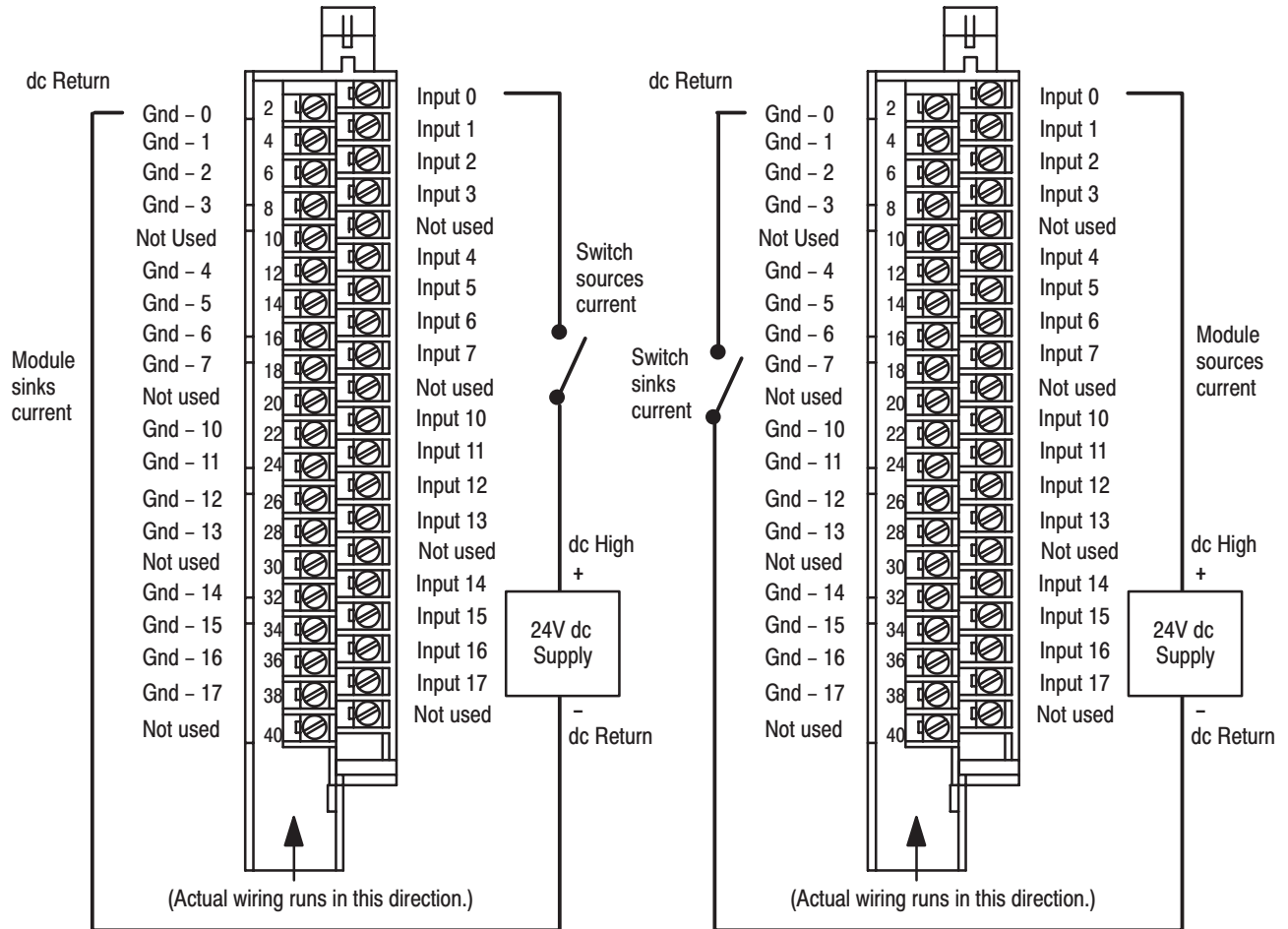
1. Make certain all power is removed from the module before making wiring connections.
2. Swing the wiring arm up into position on the front of the module. The locking tab on the module will secure it into place.
3. Make your connections to the field wiring arm as shown in the connection diagram. (Use 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.

Connection Diagram for the 1771-IQ16 Isolated Input Module



Sink Configuration

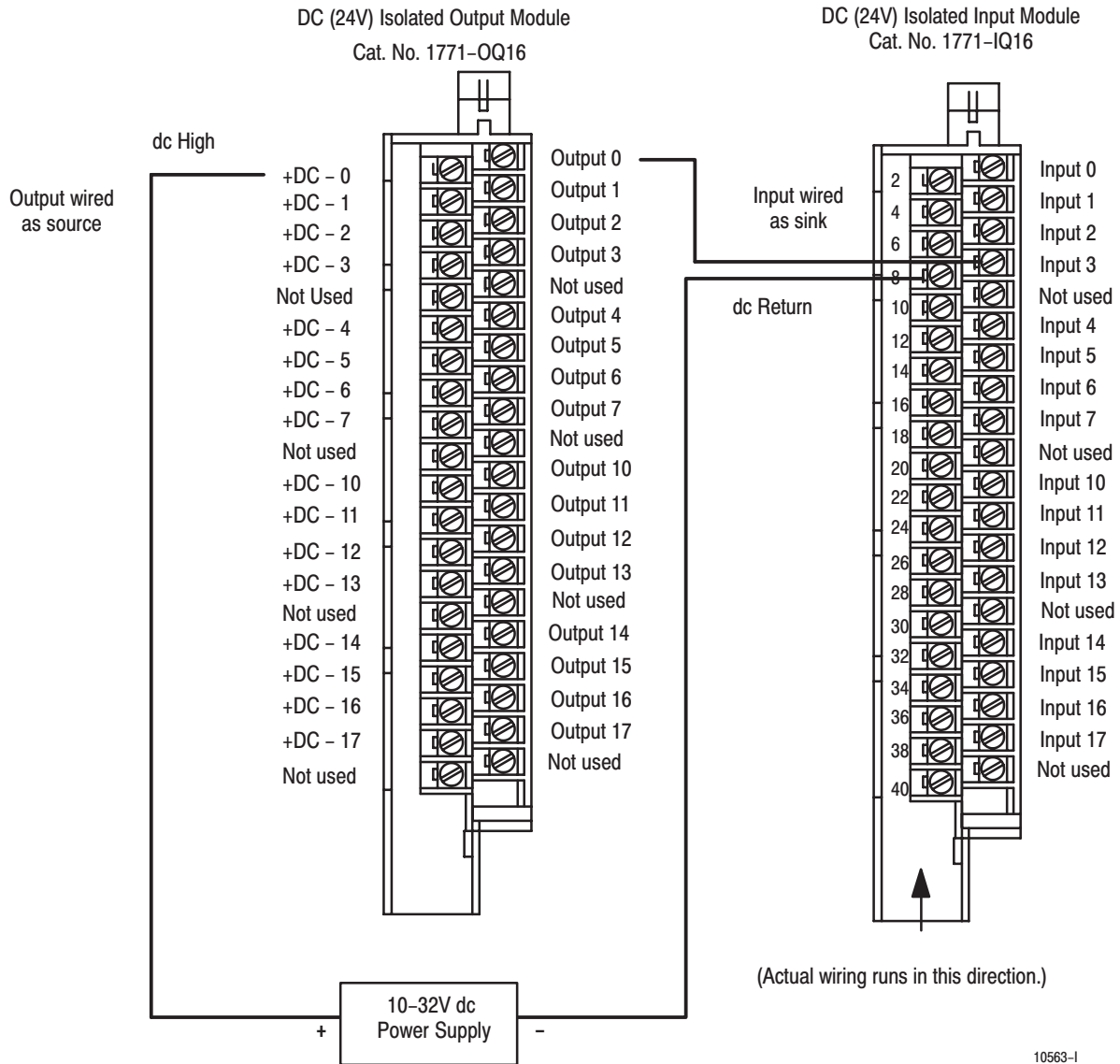
Source Configuration

10562-I

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

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. 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.

Driving an Input with an Output

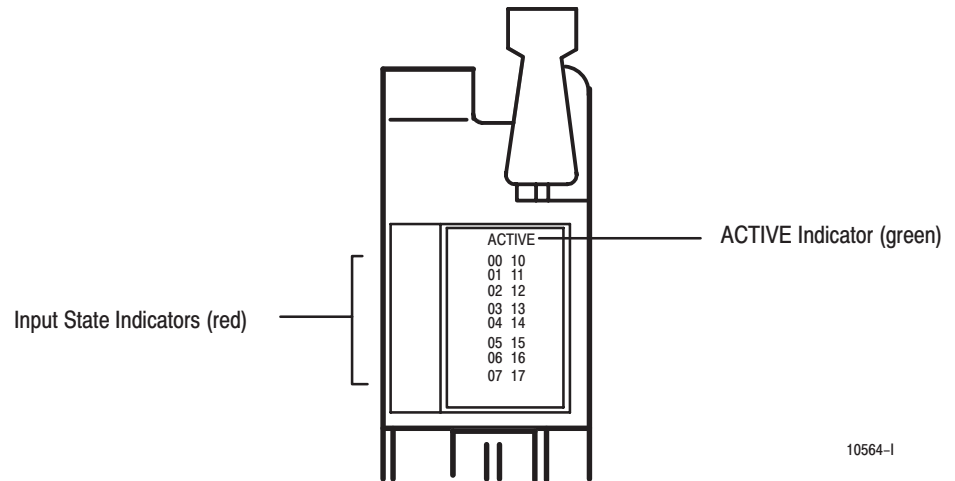




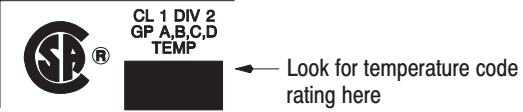
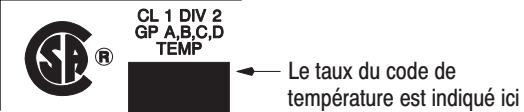


10563-I

Interpreting the Status Indicators

The module has 17 indicators, 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.



<p>CSA Hazardous Location Approval</p>	<p>Approbation d'utilisation dans des emplacements dangereux par la CSA</p>
<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 1, Division 2, Groups A, B, C, D, or non-hazardous locations only. • The products having the appropriate CSA markings (that is, Class 1 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 1, 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>WARNING: Explosion hazard —</p> <ul style="list-style-type: none"> • Substitution of components may impair suitability for Class 1, 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 1, 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.

CSA logo is a registered trademark of the Canadian Standards Association
 PLC is a registered trademark of Allen-Bradley Company, Inc.

Le sigle CSA est la marque déposée de l'Association des Standards pour le Canada.
 PLC est une marque déposée de Allen-Bradley Company, Inc.

Specifications

Inputs per Module	16
Module Location	1771-A1B thru -A4B I/O Chassis
Voltage Range (user supply)	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	3.2K ohms maximum
Signal Delay Times	Off to On On to Off
	0.57ms Customer Selectable: 0, 0.57, 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	Tested to 1500V channel-to-channel for 1s; 1500V channel to backplane for 1s.
Maximum Cable Length	1000 ft (304.8 m)
Conductors	Wire Size
	14 to 22 gauge (2.5mm ² to 0.25mm ²) stranded or solid copper ^{1, 2}
	3/64 inch (1.2mm) insulation maximum
	Category
	1 ³
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	9 pound-inches (1.0Nm)
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 • C-Tick marked for all applicable acts

¹ One or two 14–22 AWG solid or stranded copper wires per terminal. Must be same size. Do not intermix solid and stranded wires. Use copper wire only

² 14 gauge wire connected to all terminals may not allow the field wiring arm cover to close. A smaller wire size may be required.

³ Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."



Allen-Bradley, a Rockwell Automation Business, has been helping its customers improve productivity and quality for more than 90 years. We design, manufacture and support a broad range of automation products worldwide. They include logic processors, power and motion control devices, operator interfaces, sensors and a variety of software. Rockwell is one of the world's leading technology companies.



Worldwide representation.

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 • Ireland • Israel • Italy • Jamaica • Japan • Jordan • Korea • Kuwait • Lebanon • Malaysia • Mexico • Netherlands • New Zealand • Norway • Pakistan • Peru • Philippines • Poland • Portugal • Puerto Rico • Qatar • Romania • Russia–CIS • Saudi Arabia • Singapore • Slovakia • Slovenia • South Africa, Republic • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • United Arab Emirates • United Kingdom • United States • Uruguay • Venezuela • Yugoslavia

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