



AC (24V) Output Module

Cat. No. 1771-OND Series B

To The Installer

This document provides information on:

- important pre-installation considerations
- power supply requirements
- installing the module
- setting the fault mode
- using the indicators for troubleshooting
- replacing the fuses
- module specifications

Pre-installation Considerations

This module must be used with a 1771-A1B thru -A4B or later I/O chassis. If you are using a 1771-ASB remote I/O adapter you may use any combination of I/O modules. Otherwise, make sure no other output module or single card block transfer module is placed in the same I/O 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

Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 700mA 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 ac output 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 fault mode selection plug, key your I/O chassis, install your module and make your wiring connections.

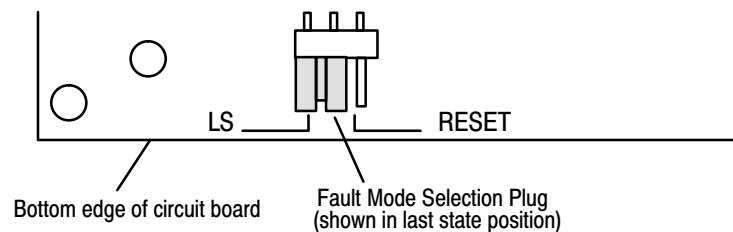
Fault Mode Selection

You may select one of two output-failure configurations (last state or reset) by positioning a configuration plug on the bottom edge of the printed circuit board. This configuration plug is independent of the last state switch on the I/O chassis backplane.

To set the fault mode selection, proceed as follows:

1. Locate the fault mode selection plug at the bottom edge of the module circuit board (Figure 1).

Figure 1
Fault Mode Selection Plug



2. Using your finger, slide the plug off the two posts.,
3. Carefully position the plug on two of the three posts that correspond to your requirement.

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 20 and 22
- Between 32 and 34

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

Installing the Output Module

To install the ac output 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 the module.

- Failure to remove power from the backplane or field 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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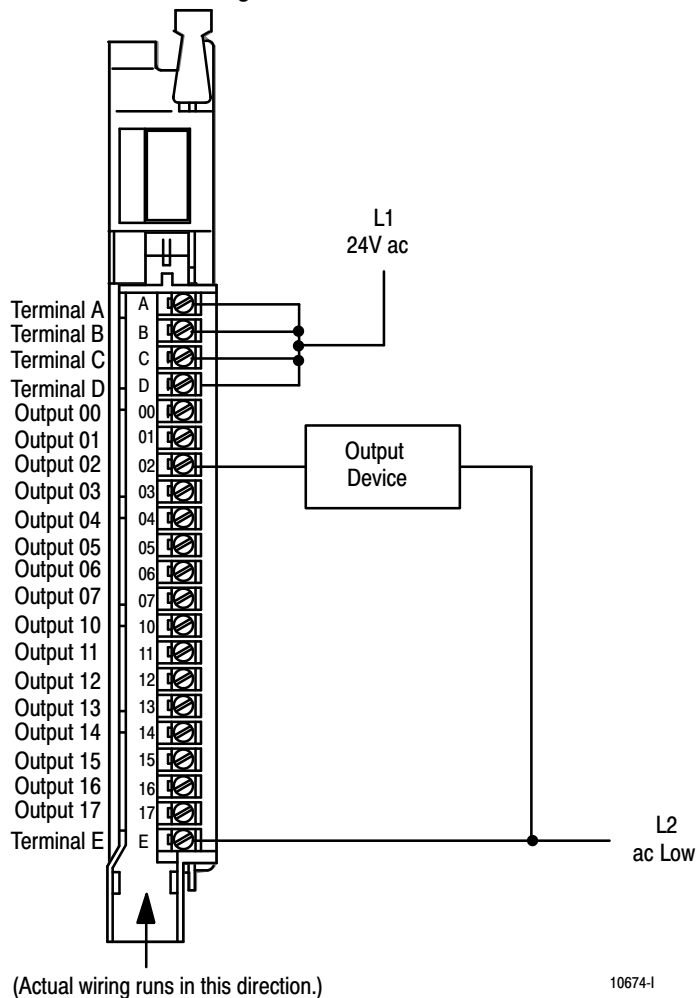
1. Turn off power to the I/O chassis.
2. Place the module in the plastic tracks on the top and bottom of the slot that guides the module into position.
3. Do not force the module into its backplane connector. Apply firm, even pressure on the module to seat it properly.
4. Snap the chassis latch over the top of the module to secure its position.
5. Connect the wiring arm to the module.
6. Make wiring connections to the field wiring arm as indicated in

Connecting Wiring to the Output Module

Connections to the output module are made to the field wiring arm (cat. no. 1771-WH) shipped with the module. An optional fused wiring arm is available (cat. no. 1771-WHF) which provides individual fusing for each circuit. 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.

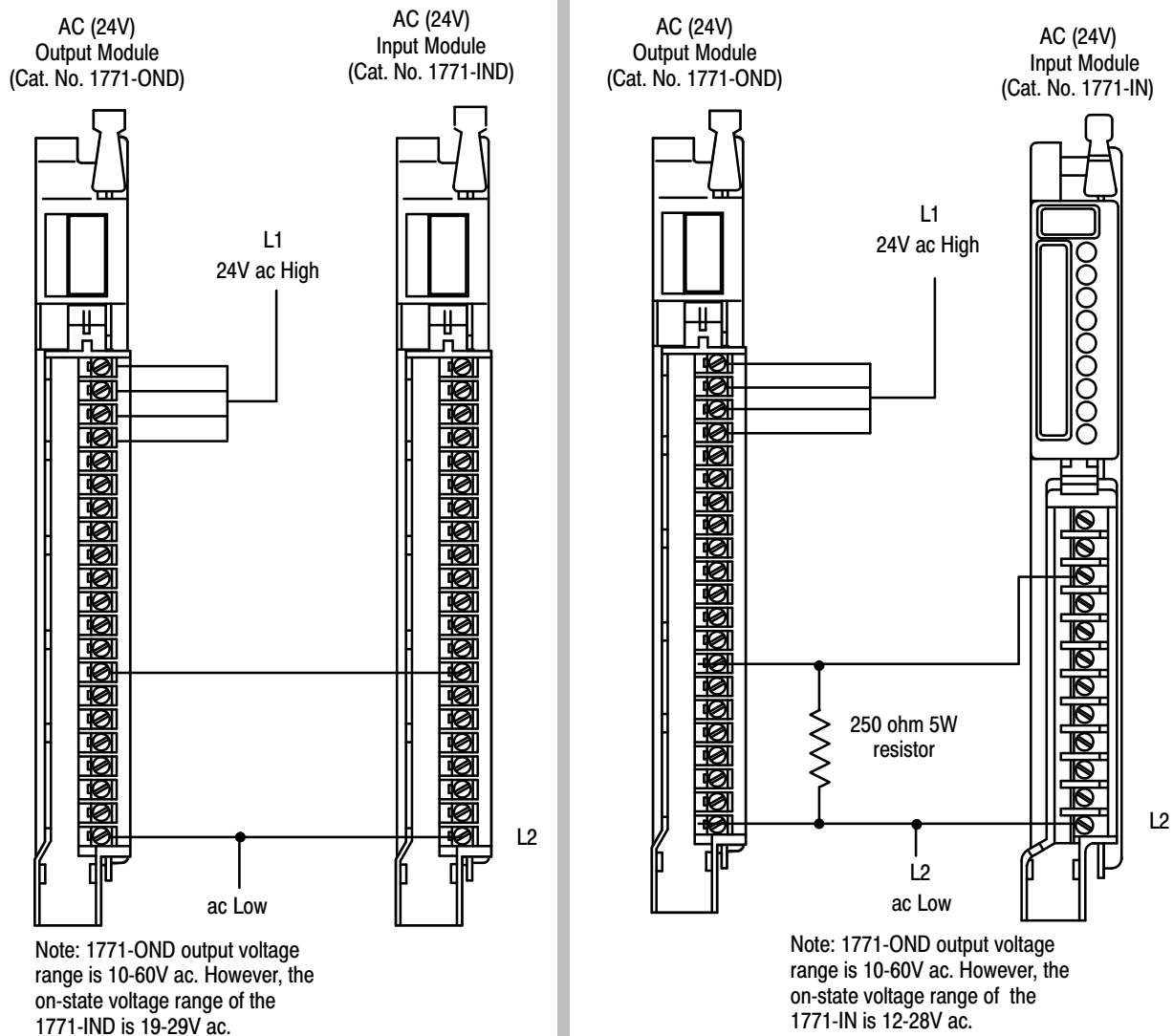
You must supply ac (L1) at terminals A through D on the wiring arm. You need four ac connections to accommodate the total required surge rating on the module without overstressing any single connection on the field wiring arm. Jumper all ac (L1) connections together to prevent module damage.

Figure 2
Connection Diagram



Important: You can use an AC (24V) Output Module (cat. no. 1771-OND) to directly drive terminals on an AC (24V) Input Module (cat. no. 1771-IND) (Figure 3). You can also use a 1771-OND Output module to drive an AC (24V) Input Module (cat. no. 1771-IN) but you must connect a 250 ohm, 5W resistor between the output terminal and L2 (common) as shown in Figure 3. **Use the same ac power source to power both modules to ensure proper phasing and prevent module damage.**

Figure 3
Driving an Input Module with an Output Module

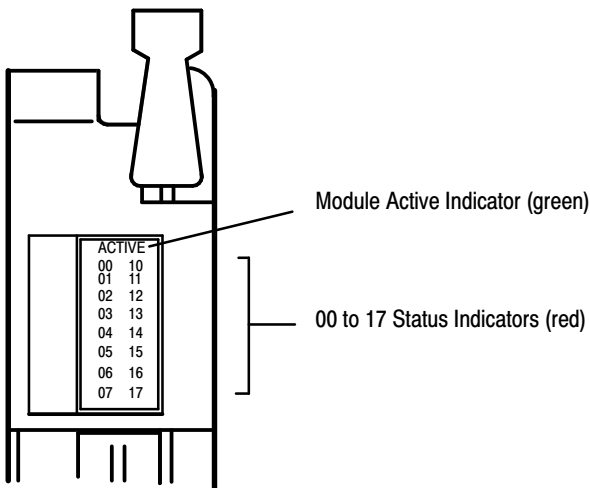


Interpreting the Status Indicators

The front panel of your module contains one green, module active indicator, and 16 red status indicators (Figure 4). The 1771-OND performs diagnostics in a handshaking mode when first powered up. Upon successful completion of the diagnostics, the green module active indicator lights. It turns off if a fault occurs in the data paths or the opto-isolators.

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.

Figure 4
Status Indicators



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Replacing the Fuse

The module's output circuitry is protected from overload or shorts by a fuse. You can replace the fuse as outlined below.

1. Turn off all power to the I/O chassis and all output device power to the field wiring arm.



ATTENTION: Remove power from the 1771 I/O chassis backplane and wiring arm before removing or installing the module.

- Failure to remove power from the backplane or field 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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2. Pivot the wiring arm away from the module and remove the module from the chassis.
3. Replace the blown fuse with a 10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse part number 322010.
4. Replace the module in the chassis and attach the field wiring arm.

Troubleshooting

If a problem occurs, follow the procedure listed below.

Modules with Internal Fuses Only

1. Turn off all power to the I/O chassis and all output device power to the field wiring arm.



ATTENTION: Remove power from the 1771 I/O chassis backplane and wiring arm before removing or installing the module.

- Failure to remove power from the backplane or field 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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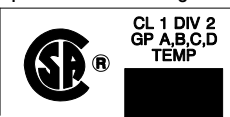
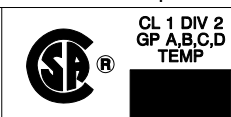
2. Pivot the wiring arm away from the module and remove the module from the chassis.
3. Replace the blown fuse with a 10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse part number 322010.
4. Replace the module in the chassis and attach the field wiring arm.
5. Turn OFF all outputs to the module.
6. Turn ON power to the I/O chassis only.
7. Check that the red status indicators on the front of the module () are off (no outputs on). Make sure the red fuse blown indicator is off.
8. Turn on output device power to the field wiring arm.
9. Start with bit 00 and turn on individual outputs one at a time. Turn off the previous output before turning on the next output.
10. If the red fuse blown indicator turns on, note which output is faulty and trace the output wiring to the faulty device.

After correcting the fault problem, return to step 1 and begin again. If you cannot locate a faulty output, return to step 9 and turn on 2 or more outputs at the same time. Total output current should not exceed 2A per output, or 8A total per module.

Modules with External Fuses Only

1. Turn off all power to the I/O chassis and all output device power to the field wiring arm.
2. Pivot the wiring arm away from the module.
3. Use a continuity checker (meter in low ohms setting) to check fuses for an open (high resistance) reading.
4. Note if fuse is open and trace the output wiring back to the output device.
5. Check the remaining fuses (refer to step 3).
6. After all faulty fuses are replaced and any wiring problems solved, reposition the wiring arm on the module.
7. Turn off all outputs to the module.
8. Turn on power to the I/O chassis.
9. Check that the red status indicators on the front of the module are off (no outputs on). Make sure the red fuse blown indicator is off.
10. Turn on output device power to the wiring arm.
11. Start with bit 00 and turn on individual outputs one at a time. Turn off last output before turning on the next output.
12. If the red fuse blown indicator lights, note which output is faulty and trace the output wiring to the faulty device.

After correcting the fault problem, return to step 1 and begin again. If you cannot locate a faulty output, return to step 8 and turn on 2 or more outputs at the same time. Total output current should not exceed 2A per output, or 8A per module.

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  Look for temperature code rating here	Taux du code de température  Le taux du code de température est indiqué ici
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 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.

Specifications

Outputs per Module	16
Module Location	17711-A1B thru -A4B or later I/O chassis; 1771-AM1, -AM2
Output Voltage Range	10 to 60V ac @ 47 - 63Hz
Output Current Rating	2A per output - not to exceed 8A per module
Surge Current (maximum)	25A per output for 100ms, repeatable every 1 second 25A per module for 100ms, repeatable every 1 second
Minimum Load Current	50mA per output @ 24V ac, 60Hz
On State Voltage Drop (max.)	1.6V at 2A
Off State Leakage Current (max.)	3mA per output @ 24V ac
Signal Delay Off to On On to Off	1.0ms; 8.3 to 9.1ms @ 60Hz
Power Dissipation	16.5 Watts (max.), 3.7 Watts (min.)
Thermal Dissipation	56.2 BTU/hr (max.), 12.6 BTU/hr (min.)
Backplane Current	700mA @ 5V dc $\pm$ 5%
Isolation Voltage	Tested at 1500V ac (rms) for 1s
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 ¹
Keying	Between 20 and 22 Between 32 and 34
Fuse	10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse PN 322010
Field Wiring Arm Standard Optional	Catalog Number 1771-WH Catalog Number 1771-WHF (fused)
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 Refer to publication 1770-4.1, Programmable Controller Wiring and Grounding Guidelines.



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