# AC (120/240V) Output Module

## Catalog Number 1771–OAN

## To The Installer

This document provides information on:



## Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Rockwell Automation be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Publication 1771-IN031B–EN–P – November 2002

Allen–Bradley publication SGI–1.1, Safety Guidelines for Application, Installation, and Maintenance of Solid–State Control (available from your local Rockwell Automation office), describes some important differences between solid–state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.



Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a  potential hazard. avoid a potential hazard, and recognize the consequences of a potential hazard.

**WARNING**

Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**ATTENTION**

Identifies information about practices or circumstances that may lead to personal injury or death, property damage, or economic loss.

**IMPORTANT**

Identifies information that is critical for successful application and understanding of the product.

**ATTENTION**

### Environment and Enclosure

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664–1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present, and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures. Also, see the appropriate sections in this publication, as well as the Allen–Bradley publication 1770–4.1, (“Industrial Automation Wiring and Grounding Guidelines”), for additional installation requirements pertaining to this equipment.

## Pre-installation Considerations

The 1771-OAN ac output module is a source output and requires a sink input. A sink input provides a path to ground and a source output provides a positive voltage path.

This module is not compatible with 2-slot addressing. You must use 1-slot addressing with restrictions, or 1/2-slot addressing with no restrictions.

**IMPORTANT** You must use this module in a 1771-A1B thru -A4B or later 1771 I/O chassis. Refer to the Table below for processor compatibility.

**Processor Compatibility Chart**

| System Type | Use with Processors: |
|---|---|
| Local | Mini-PLC-2/02 (cat. no. 1772-LZ, -LZP)<br>Mini-PLC-2/16 (cat. no. 1772-LX, -LXP)<br>Mini-PLC-2/17 (cat. no. 1772-LW, -LWP)<br>PLC-5/15, Series B and later (cat. no. 1785-LT) |
| Remote (with a 1771-ASB remote I/O adapter) | PLC-2/20 (cat. no. 1772-LP2)<br>PLC-2/30 (cat. no. 1772-LP3)<br>PLC-3 (cat. no. 1775-L1, -L2, -L3, -L4)<br>PLC-3/10 (cat. no. 1775-LP4, -LP8)<br>PLC-5/15, Series B and later (cat. no. 1785-LT) |

**Do not** place this module in the same I/O chassis as the 1771-IX thermocouple module. You can use this module in the same chassis as the 1771-IXE thermocouple module.

## Power Supply Requirements

The controller or I/O chassis power supply, connected through the backplane of the I/O chassis, powers the logic circuitry of the output modules. The maximum current drawn from this supply is 800mA.

## Initial Handling Procedures

**ATTENTION**

**Preventing Electrostatic Discharge**

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static–safe workstation.
- When not in use, keep modules in appropriate static–safe packaging.

## Key the Backplane Connector

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

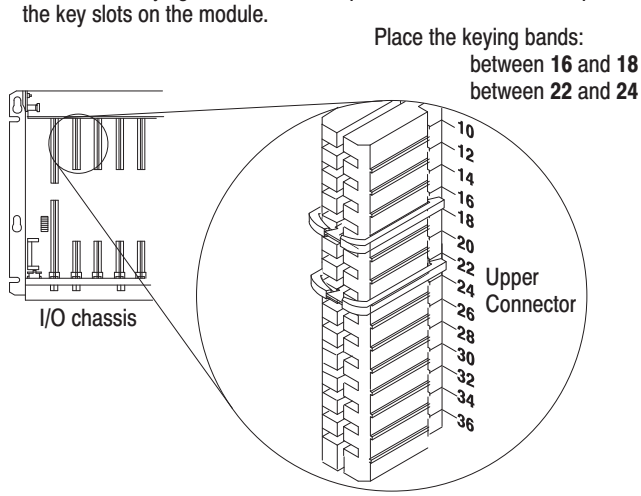
**ATTENTION**

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.




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

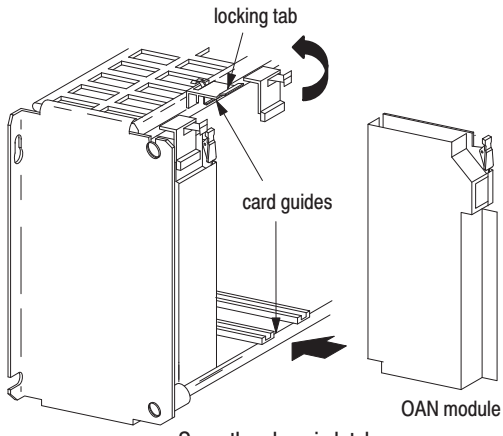
## Install the Module and Field Wiring Arm

**ATTENTION**

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

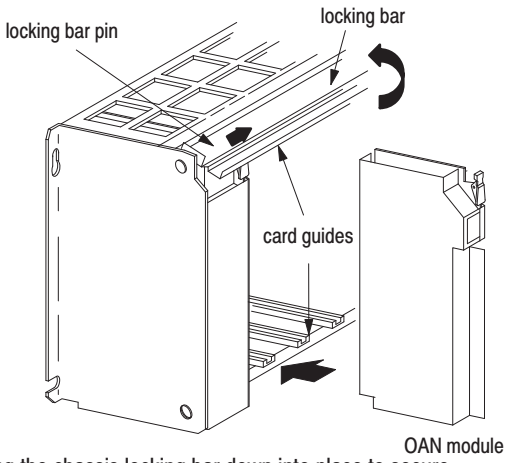
- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

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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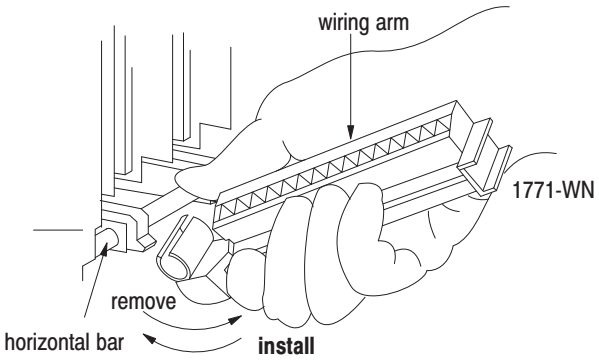
Attach the wiring arm (1771-WN) to the horizontal bar at the bottom of the I/O chassis.

The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.

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## Connecting Wiring to the Module

You make connections to the module through the field wiring arm (cat. no. 1771-WN). The arm pivots on the I/O chassis to connect with terminals on the front of the module and acts as a terminal strip. The wiring arm allows the module to be removed from the chassis without disconnecting wiring.

**ATTENTION**

Turn the power to the chassis off before connecting or disconnecting any wiring. Turn off power to the I/O chassis before inserting the module into the chassis.

- Failure to remove power from the backplane 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. 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 which controls that output.

### I/O Module Groups

Each module condenses two full module groups (32 outputs) into each I/O chassis slot. For example:

- Module group 1 = outputs 00 through 17
- Module group 2 = outputs 00 through 17 (module group 2 represents the second set of outputs).

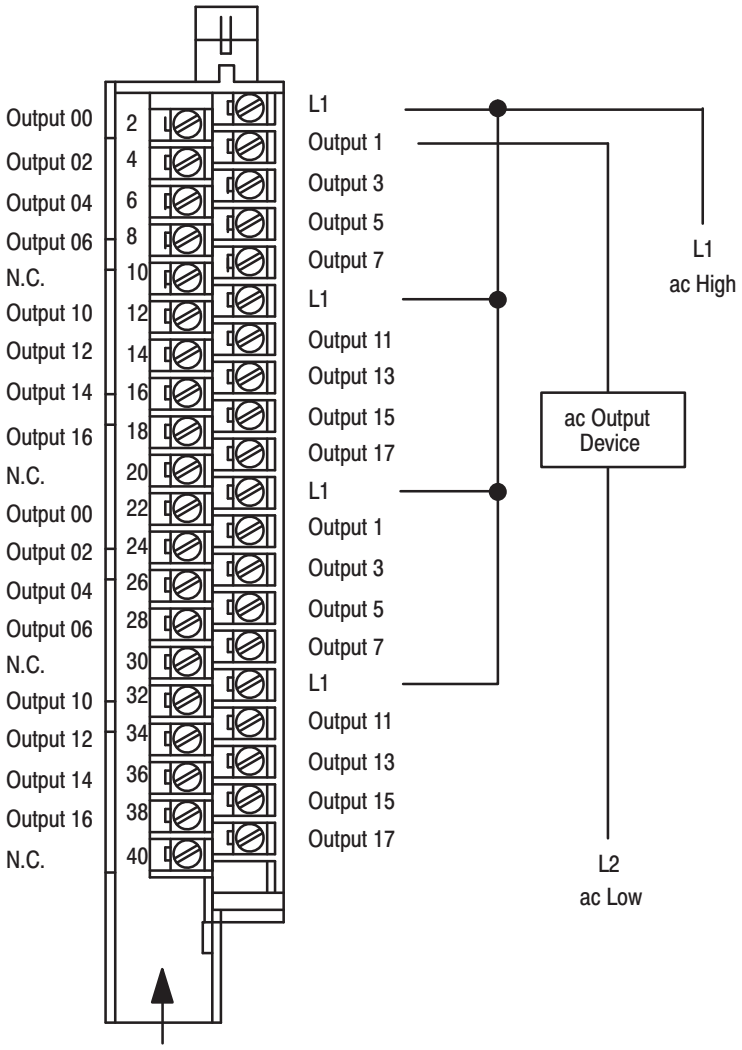
Terminals 1 through 20 represent module group 1. Terminals 21 through 40 represent module group 2. Terminals 1, 11, 21 and 31 are ac high (L1).

## Connection Diagram for the 1771-OAN AC Output Module

Note: Terminals on the left are even numbered (2 thru 40) , and terminals on the right are odd numbered (1 thru 39).

Module group 1 = outputs 00 through 17
Module group 2 = outputs 00 through 17
(module group 2 represents the second set of outputs.)

Terminals 1 through 20 represent module group 1. Terminals 21 through 40 represent module group 2. Terminals 1, 11, 21 and 31 are ac high (L1).




**If multiple power supplies are used, do not exceed the specified isolation voltage.**

For operating voltages greater than 120V ac, each channel group must be connected to the same operating voltage phase at L1.

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**Table A**
**Module Output Terminal Assignments**

| Terminal Number | Output Assignment | I/O program address | Terminal Number | Output Assignment | I/O program address |
|---|---|---|---|---|---|
| 01 | [1] 120V ac | - | 21 | [1] 120V ac | - |
| 02 | Output 00 | 0RG00 | 22 | Output 00 | 0R(G+1)00 |
| 03 | Output 01 | 0RG01 | 23 | Output 01 | 0R(G+1)01 |
| 04 | Output 02 | 0RG02 | 24 | Output 02 | 0R(G+1)02 |
| 05 | Output 03 | 0RG03 | 25 | Output 03 | 0R(G+1)03 |
| 06 | Output 04 | 0RG04 | 26 | Output 04 | 0R(G+1)04 |
| 07 | Output 05 | 0RG05 | 27 | Output 05 | 0R(G+1)05 |
| 08 | Output 06 | 0RG06 | 28 | Output 06 | 0R(G+1)06 |
| 09 | Output 07 | 0RG07 | 29 | Output 07 | 0R(G+1)07 |
| 10 | N.C. | - | 30 | N.C. | - |
| 11 | [1] 120V ac | - | 31 | [1] 120V ac | - |
| 12 | Output 10 | 0RG10 | 32 | Output 10 | 0R(G+1)10 |
| 13 | Output 11 | 0RG11 | 33 | Output 11 | 0R(G+1)11 |
| 14 | Output 12 | 0RG12 | 34 | Output 12 | 0R(G+1)12 |
| 15 | Output 13 | 0RG13 | 35 | Output 13 | 0R(G+1)13 |
| 16 | Output 14 | 0RG14 | 36 | Output 14 | 0R(G+1)14 |
| 17 | Output 15 | 0RG15 | 37 | Output 15 | 0R(G+1)15 |
| 18 | Output 16 | 0RG16 | 38 | Output 16 | 0R(G+1)16 |
| 19 | Output 17 | 0RG17 | 39 | Output 17 | 0R(G+1)17 |
| 20 | N.C. | - | 40 | N.C. | - |

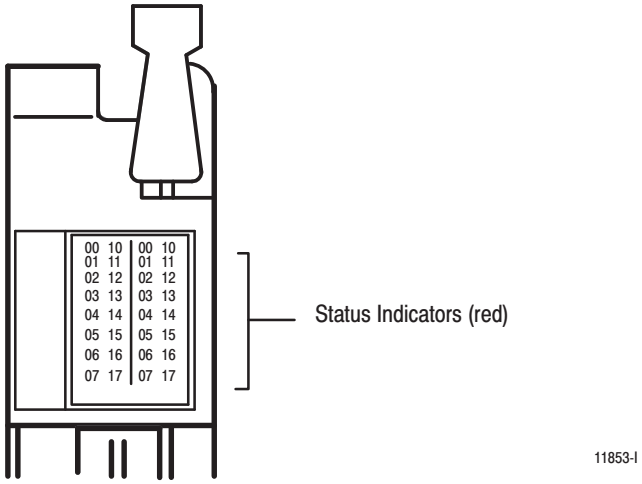
Where: R = rack number (1, 2, 3, etc.)
G = I/O group (0 - 7)
G+1 = I/O group plus 1

**Note:** If multiple power supplies are used, do not exceed the specified isolation voltage.

[1] For operating voltages greater than 120V ac, each channel group must be connected to the same operating voltage phase at L1.

## Interpreting the Status Indicators

The module has 32 status indicators on the module front plate. These represent the control status of the outputs. Each indicator is lit when its corresponding output is energized.




## Replacing the Fuses

Each group of eight outputs share a common fuse. To replace a blown fuse, proceed as follows:

**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. Turn off power to the chassis.
2. Remove the module from the I/O chassis.
3. Remove the blown fuse from the fuse holder (accessible through the side cover), and replace it with a 4A, 250V normal blow fuse.
4. Reinsert the module into the I/O chassis.
5. Turn on power to the chassis.

**Specifications – ac (120–240V) Output Module, Cat. No. 1771–OAN**

| | |
|---|---|
| Outputs per module | 32 (4 groups of 8) |
| Module Location | 1771-A1B thru -A4B or later 1771 I/O Chassis |
| Voltage Range | 85 to 264V ac, 47-63Hz |
| Nominal Voltage | 120/240V ac |
| Maximum Output Current Per Point<br>Per Group<br>Per Module | 1.0A at 30°C; Derate linearly to 0.3A at 60°C<br>2.0A at 30°C; Derate linearly to 0.6A at 60°C<br>8.0A at 30°C; Derate linearly to 2.4A at 60°C |
| Maximum Surge Current | 10A for 25ms at 1s intervals at 30°C<br>10A for 25ms at 2s intervals at 60°C |
| Minimum Load Current | 10mA per output2 |
| Maximum On-state Voltage Drop | 1.5V ac (rms) @ 1A |
| Maximum Off-state Leakage Current | 2.3mA per output @ 230V ac, 60Hz<br>1.2mA per output @ 120V ac, 60Hz |
| Maximum Output Signal Delay Off to On<br>On to Off | 1.0ms maximum<br>9.3ms @ 60Hz; 11.0ms @ 50Hz |
| Power Dissipation | 16.2W (max); 1.0W (min) |
| Thermal Dissipation | 55.4 BTU/hr (max); 3.4 BTU/hr (min) |
| Isolation Voltage | Tested to withstand 1000V for 60s |
| Backplane Current | 800mA maximum @ 5V DC |
| Environmental Conditions | |
| Operational Temperature | IEC 60068–2–1 (Test Ad, Operating Cold)<br>IEC 60068–2–2 (Test Bd, Operating Dry Heat)<br>IEC 60068–2–14 (Test Nb, Operating Thermal Shock)<br>32 to 140°F (0 to 60°C) |
| Storage Temperature | IEC 60068–2–1 (Test Ab, Unpackaged, Nonoperating Cold)<br>IEC 60068–2–2 (Test Bb, Unpackaged, Nonoperating Dry Heat)<br>IEC 60068–2–14 (Test Na, Unpackaged, Nonoperating Thermal Shock)<br>–40 to 185°F (–40 to 85°C) |
| Relative Humidity | IEC 60068–2–30 (Test Db, Unpackaged, Nonoperating Damp Heat)<br>5 to 95% noncondensing |
| Shock<br>Operating<br>Nonoperating | IEC 60068–2–27 (Test Ea, Unpackaged Shock)<br>30g<br>50g |
| Vibration | IEC 60068–2–6 (Test Fc, Operating)<br>2g @ 10–500Hz |
| ESD Immunity | IEC 61000–4–2<br>4kV contact discharges |
| Radiated RF Immunity | IEC 61000–4–3<br>10V/m with 1kHz sine–wave 80% AM from 30MHz to 1000MHz<br>10V/m with 200Hz 50% Pulse 100% AM at 900MHz |
| EFT/B Immunity | IEC 61000–4–4<br>±1kV @ 5kHz on signal ports |
| Surge Transient Immunity | IEC 61000–4–5<br>±1kV line–line (DM) and +2kV line–earth (CM) on signal ports |
| Conducted RF Immunity | IEC 61000–4–6<br>10V rms with 1kHz sine wave 80% AM from 150kHz to 30MHz |

| Specifications – ac (120–240V) Output Module, Cat. No. 1771–OAN | | |
|---|---|---|
| Emissions | | CISPR 11<br>Group 1, Class A (with appropriate enclosure) |
| Enclosure Type Rating | | None (open style) |
| Keying | | Between 16 and 18<br>Between 22 and 24 |
| Fuses | | Four 4.0A, 250V normal blow fuses (1 per group) |
| Field Wiring Arm | | Cat. No. 1771–WN |
| Field Wiring Arm Screw Torque | | 7–9 pound–inches (0.7–1.0Nm) |
| Conductors | Wire Size | 14–22AWG (2.5–0.25mm$^2$) stranded copper wire rated at 60ºC or greater<br>3/64 inch (1.2mm) insulation (max) |
| | Category | 1[1] |
| Certifications<br>(when product is marked) | UL | UL Listed Industrial Control Equipment |
| | CSA | CSA Certified Process Control Equipment |
| | CE[2] | European Union 89/336/EEC EMC Directive, compliant with:<br>EN 61000–6–4, Industrial Emissions<br>EN 50082–2, Industrial Immunity<br>EN 61326, Meas./Control/Lab., Industrial Requirements<br>EN 61000–6–2, Industrial Immunity<br>European Union 73/23/EEC LVD Directive, compliant with:<br>EN 61131–2, Programmable Controllers |
| | C–Tick[2] | Australian Radiocommunications Act,compliant with AS/NZS 2064, Industrial Emissions |

1 Use this conductor category information for planning conductor routing . Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."
2 See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

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