



# **DC (10-40V) Current Limiting Output Module Cat. No. 1771-OBDS**

## **Installation Instructions**

### **To The Installer**

This document provides information on:

- important pre-installation considerations
- power supply requirements
- initial handling
- installing the module
- short circuit protection
- using the indicators for troubleshooting
- replacing the fuse
- module specifications

### **Pre-installation Considerations**

This module must be used with a 1771-A1B thru -A4B or later I/O chassis. Make sure no other output module or single card block transfer module is placed in the same module group when using 2-slot addressing.

### **Power Requirements**

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 300mA 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 DC 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.

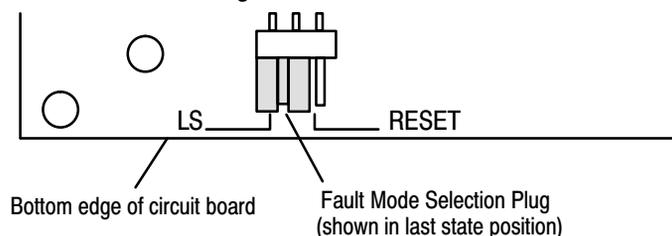
### Fault Mode Selection

You may select one of two input-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).
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.

**Figure 1**  
**Fault Mode Selection Plug**



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## 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 upper backplane connector:

- Between 10 and 12
- Between 22 and 24

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 DC 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 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.

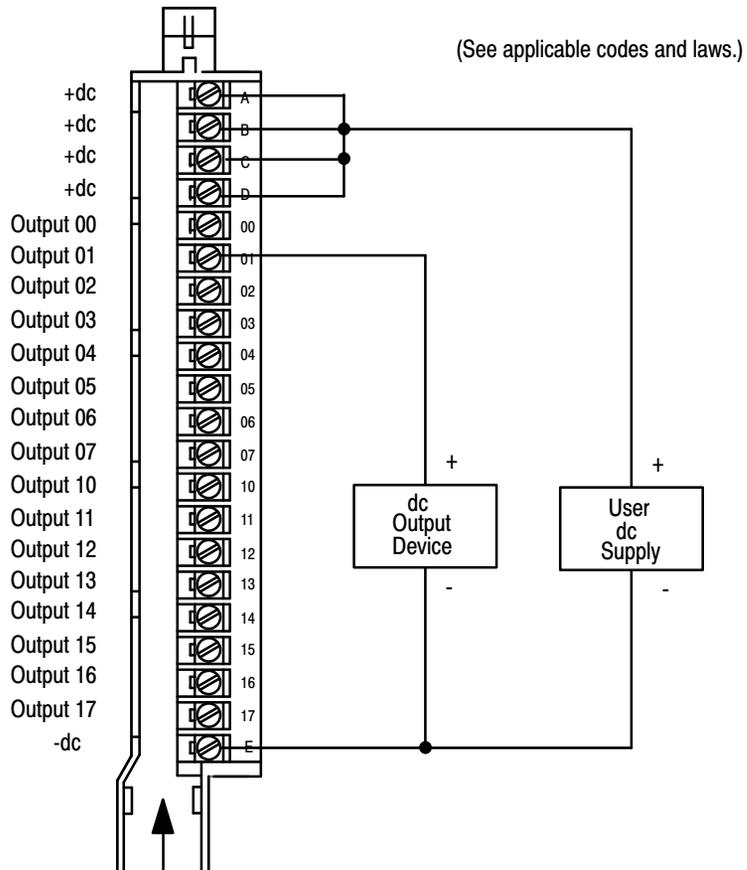
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1. Turn off power to the I/O chassis.
  2. Place the module in the plastic tracks on the top and bottom of the slot that guides the module into position.
  3. Do not force the module into its backplane connector. Apply firm, even pressure on the module 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 Figures 2 and 3.

### Connecting Wiring to the Output Module

Connections to the output module are made to the 21 terminal field wiring arm (cat. no. 1771-WH) 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.

**Figure 2**  
**Connection Diagram**



You must supply dc at terminals A through D on the wiring arm. You need four dc connections to accommodate the total required surge rating on the module without overstressing any single connection on the field wiring arm. Jumper all dc connections together to prevent module damage. Connect terminal E to dc common.



**ATTENTION:** Observe proper polarity, as indicated in the connection diagram (Figure 2) with dc power connections. Reverse polarity, or application of ac voltage, could damage the module.

**Installation Instructions**  
 DC (10-40V) Current Limiting  
 Output Module (Cat. No. 1771-OBDS)

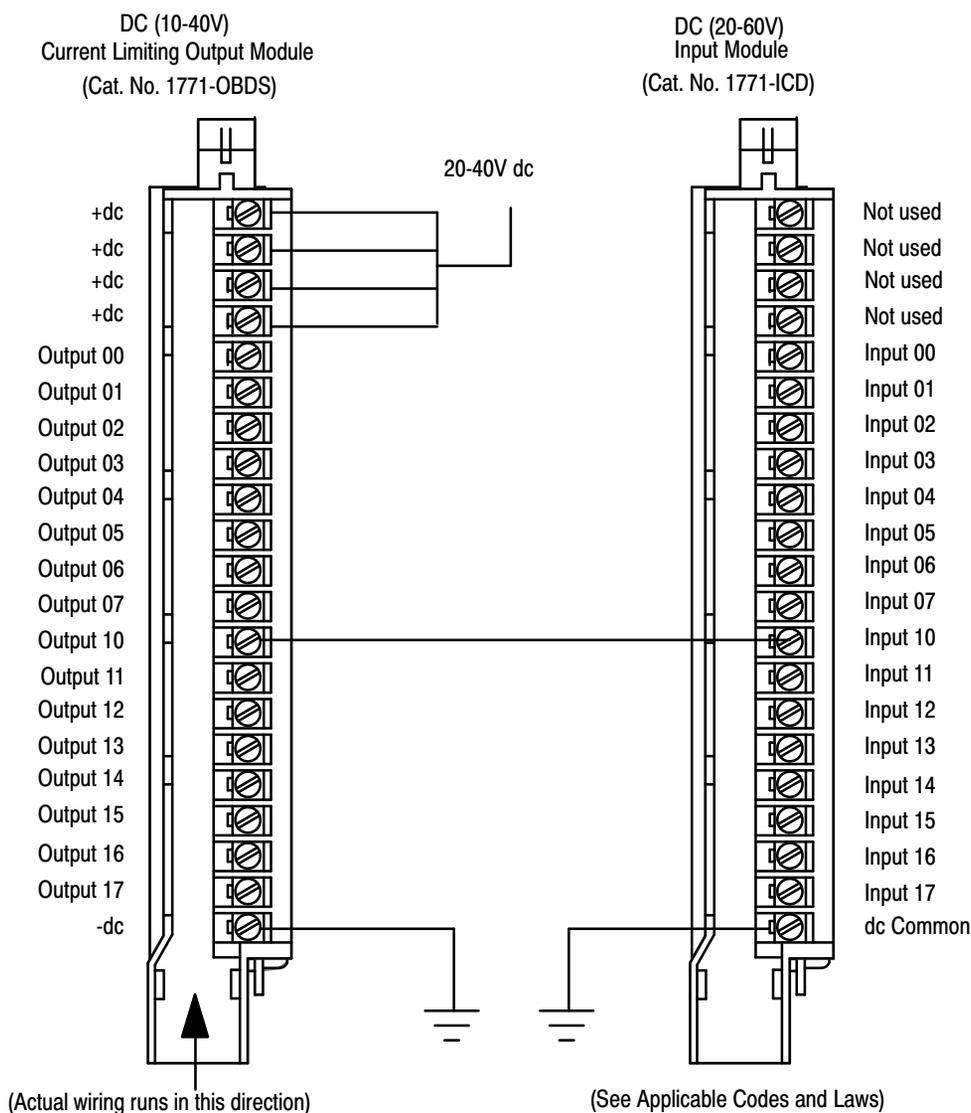
**Important:** You can use a DC (10-40V) Output Module (cat. no. 1771-OBDS) to directly drive terminals on the following modules:

- DC (10-30V) Input module (cat. no. 1771-IBD)
- DC (20-60V) Input module (cat. no. 1771-ICD)
- DC (12-24V) Input module (cat. no. 1771-IB)

Refer to Figure 3 for direct connection to a 1771-ICD input module.

**Use the same dc supply to power both modules to ensure that ground is at the same potential.**

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



## Short Circuit Protection

Each output of the module is capable of withstanding a short circuit condition. When an output is shorted, it will become "latched off", but its corresponding status indicator will remain lighted. Once the short circuit is removed from that output, the output image table bit for that output must be reset. This is done by "toggling" the bit off and then back on. This resumes normal operation. This toggling procedure can be done several ways, depending on your system setup:

- modifying the data table
- switching the programmable controller from RUN to PROGRAM mode, and back again
- cycling power to the system.

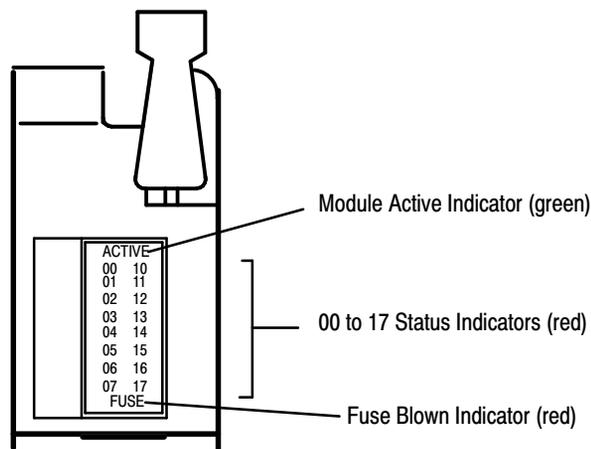
## Interpreting the Status Indicators

The front panel of your module contains one green module active indicator, 16 red status indicators and one red fuse blown indicator (Figure 4). The green module active indicator lights when the module is powered, the processor keyswitch is on "run", and the opto-isolators and data paths are functioning properly. It turns off if a fault occurs in the data paths or the opto-isolators. The module then resets its outputs or sets them to last state.

The module active indicator must be on to properly interpret the red status indicators. The red status indicators are provided for indication of individual outputs. They indicate the state to which the transistor is commanded by the processor and are powered by circuitry within the module. The indicators will turn on and off as commanded by the processor. They do not indicate the presence or absence of dc power at an output terminal. However, all output status indicators will turn off if the fuse is blown.

The fuse blown indicator turns on when the fuse is blown. When the fuse blown indicator is lit, check the fuse. After checking the fuse, make sure the field wiring arm is firmly in place. Do this before checking the status of the other indicators.

**Figure 4**  
**Status Indicators**



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## Replacing the Fuse

The individual output transistors are thermally protected and current limited. However, a module overload may cause the single, replaceable onboard fuse to blow when the module output exceeds 10A. The onboard fuse is not intended to protect individual output transistors. You can replace the onboard 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. Remove the module from the chassis and replace the blown fuse with a 10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse part number 322010. The fuse is accessible through the side of the module.
  3. Replace the module in the chassis and attach the field wiring arm.
  4. Turn system power ON.

## Installation Instructions

DC (10–40V) Current Limiting

Output Module (Cat. No. 1771–OBDS)

## Specifications

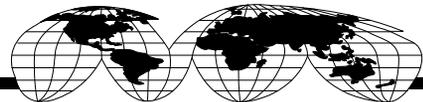
Outputs per Module	16	
Module Location	1771-A1B, thru -A4B or later I/O chassis	
Output Voltage Range	10 to 40V dc	
Output Current Rating	1A per output - not to exceed 8A per module	
On State Voltage Drop (max.)	1.5V at rated current	
Off State Leakage Current (max.)	0.5mA per output	
Signal Delay	Off to On On to Off	1.0ms 1.0ms
Power Dissipation	14 Watts (max.), 2 Watts (min.)	
Thermal Dissipation	47.8 BTU/hr (max.), 6.9 BTU/hr (min.)	
Backplane Current	300mA @ 5V dc $\pm$ 5%	
Isolation Voltage	1500V ac (RMS)	
Environmental Conditions		
Operational Temperature	0° to 60°C (32° to 140°F)	
Storage Temperature	-40° to 85°C (-40° to 185°F)	
Relative Humidity	5 to 95% (without condensation)	
Conductors	Wire Size	14 gauge stranded maximum 3/64 inch insulation maximum
	Category	1 <sup>1</sup>
Keying		Between 10 and 12 Between 22 and 24
Fuse		10A, 250V rectifier fuse (1/4 x 1-1/4 inch)
Field Wiring Arm		Catalog Number 1771-WH
Wiring Arm Screw Torque		7-9 inch-pounds

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



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