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Allen-Bradley 1756 Series ControlLogix Isolated Contact Module

# Allen-Bradley 1756 Series ControlLogix Isolated Contact Module Installation Guide

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*Allen-Bradley*

**Allen-Bradley 1756 Series ControlLogix Isolated Contact Module**

## Product Usage Instructions

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## FAQ

- **Q**: What are the power specifications for catalog numbes1r756-OX8IK and 1756-OW16IK?

  **A**: The power specifications for these modules are 10-265V AC and 5-150V DC.
- **Q**: Can untrained personnel perform activities like installation and maintenance on this product?

  **A:** No,

⚠️**ATTENTION:** Read this document and the documents listed in the Additional Resources section about the installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards. Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

**North American Hazardous Location Approval**
The following information applies when operating this equipment in hazardous locations: Products marked 'CL I, DIV 2, GP A, B, C, D' are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest 'T' number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.

⚠️**WARNING: EXPLOSION HAZARD**

- Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be non-hazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must be changed only in an area that is known to be non-hazardous.

## Environment and Enclosure

- ATTENTION: This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in EN 60664-1), at altitudes up to 2000 m (6562 ft) without derating. This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbances.
- 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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. 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.In addition to this publication, see the following:
- Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for additional installation requirements
- NEMA 250 and EN 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures

### Prevent Electrostatic Discharge

**ATTENTION:** 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.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

**ATTENTION:** This equipment is not resistant to sunlight or other sources of UV radiation.

### Removal and Insertion Under Power

**WARNING:** When you insert or remove the module while backplane power is on, an electrical arc can occur. This

could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

**Identify the Module Components**

You received the following components with your order:

**You received the following components with your order**

- ControlLogix isolated contact module
- Removable terminal block (RTB) door label

If you did not receive these components, contact your local distributor Rockwell Automation sales office.

This module mounts in a 1756 chassis and uses a separately ordered RTB(a) to connect all field-side wiring. This module uses one of the following RTBs:

- 1756-TBCH 36-position cage-clamp RTB
- 1756-TBS6H 36-position spring-clamp RTB

Use an extended-depth cover (1756-TBE) for applications with heavy gauge wiring or requiring additional routing space.

**IMPORTANT** Before you install your module, you should install and ground a 1756 chassis and power supply, then order and receive an RTB and its components, for your application.

## Power Requirements

This module receives power from the 1756 chassis power supply and requires two sources of power from the ControlLogix backplane:

- 100 mA at 5.1V DC
- 100 mA at 24V DC

Add this current/power value (2.9 W) to the requirements of all other modules in the chassis to prevent overloading the power supply. Field output supply power should be limited to 10KVA available short circuit power.

- The ControlLogix system has been agency-certified using only the ControlLogix RTBs (1756-TBCH,1756-TBNH, 1756-TBSH, and 1756-TBS6H). Any application that requires agency certification of theControlLogix system using other wiring termination methods may require application-specific approval by the certifying agency.

## Install the Module

You can install or remove the module while chassis power is applied.

**WARNING:** When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in a hazardous location installation.

WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This

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Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

1. Align the circuit board with the top and bottom chassis guides.



Printed Circuit Board
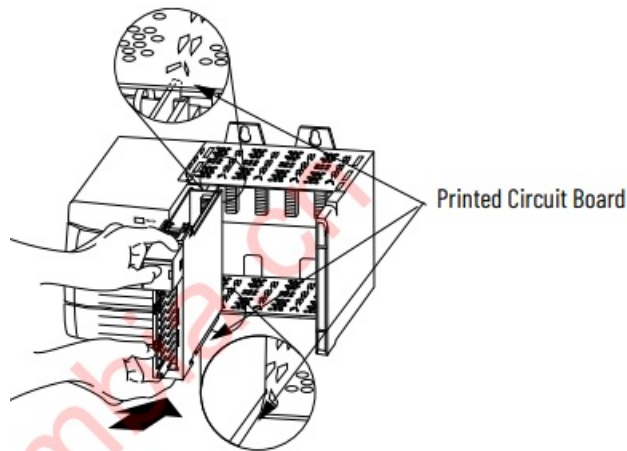
2. Slide the module into the chassis until the module locking tabs click.



Locking Tab
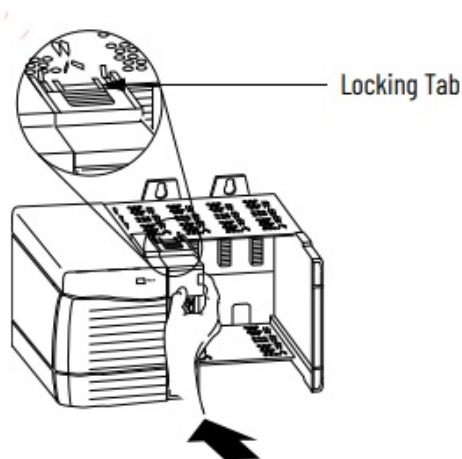
**Key the Module and Removable Terminal Block or Interface Module**
Use the wedge-shaped keying tabs and U-shaped keying bands to prevent connecting the wrong wires to your module. Key positions on the module correspond to unkeyed positions on the RTB. For example, if you key the first position on the module, leave the first position on the RTB unkeyed.

1. To key the module, insert the U-shaped band, as shown.

U-shaped bands
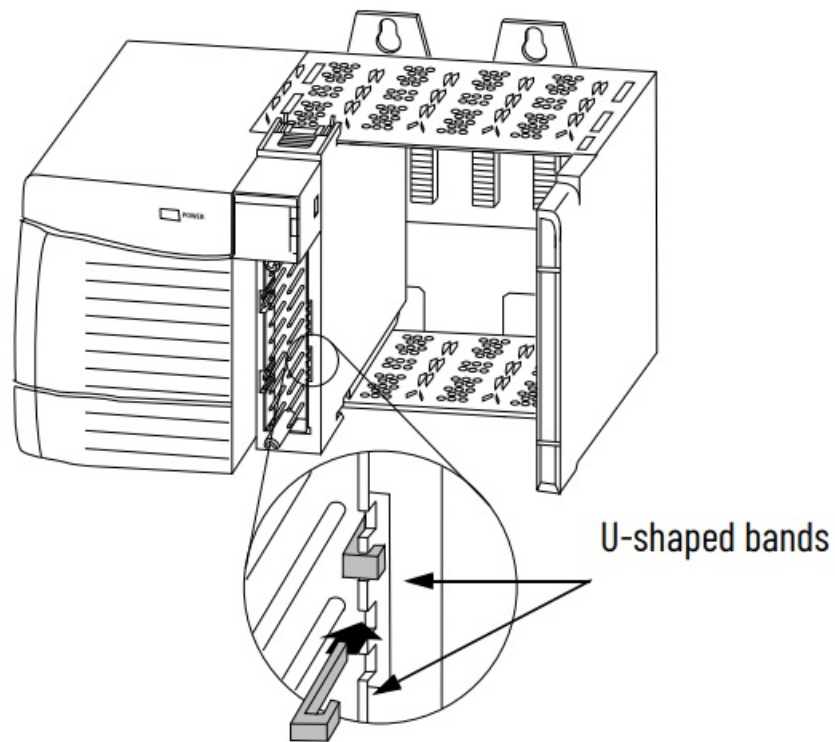
2. Push the band until it snaps in place.

3. To key the RTB, insert the wedge-shaped tab with a rounded edge first, as shown.



Wedge-shaped tab
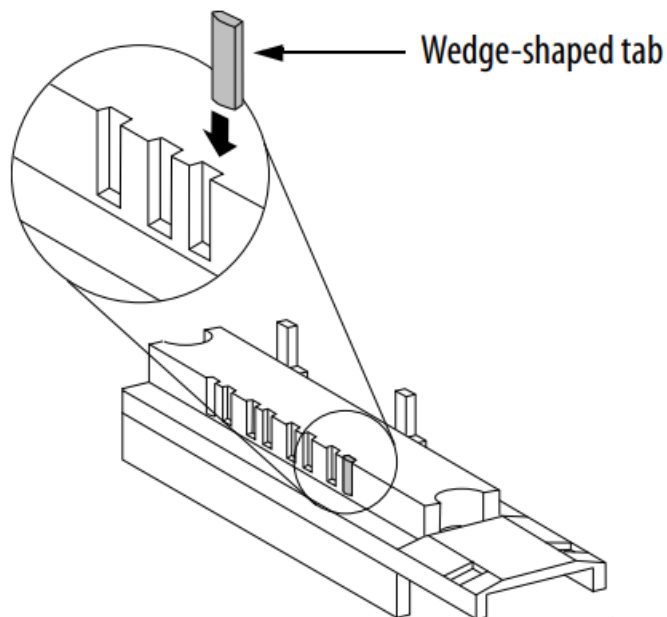
4. Push the tab until it stops.

5. Reposition the tabs to rekey future module applications.

**Wire the Removable Terminal Block**

Wire the RTB with a 1/8 inch (3.2 mm) maximum flat-bladed screwdriver before installing it onto the module.

**WARNING:** When you connect or disconnect the removable terminal block (RTB) while field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.
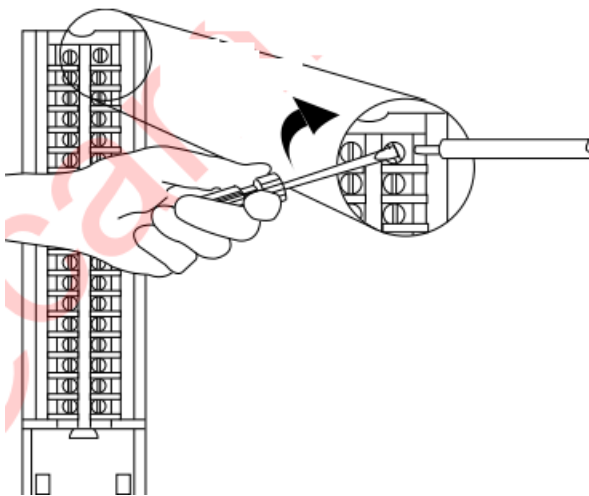
Be sure that power is removed or the area is nonhazardous before proceeding.

**Spring Clamp RTB**
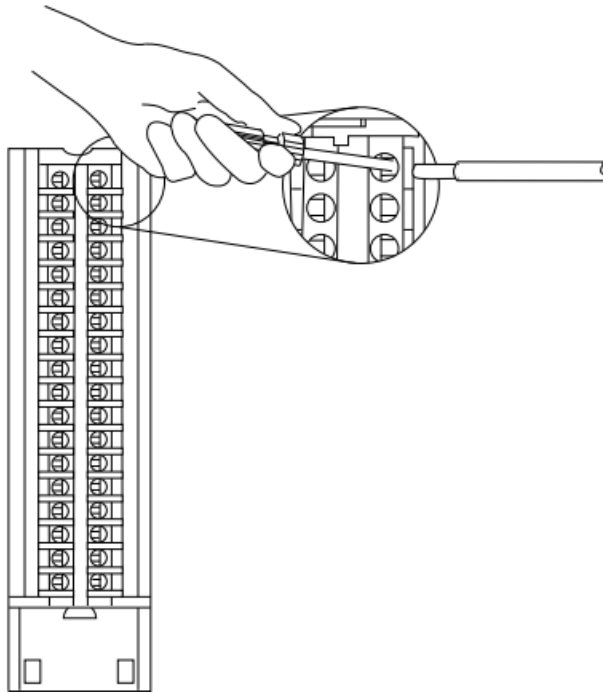
1. Strip 7/16 inch (11mm) maximum length of wire.
2. Insert the screwdriver into the inner hole of the RTB.
3. Insert the wire into the open terminal and remove the screwdriver.
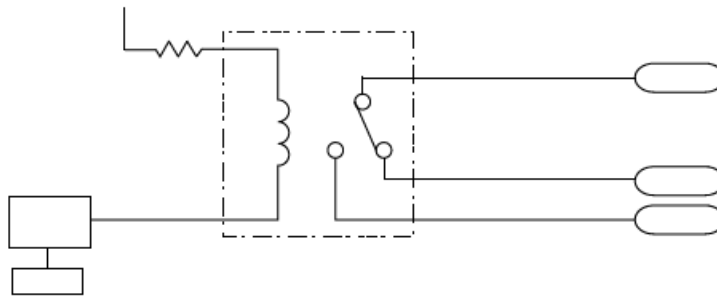
**Cage Clamp RTB**



1. Strip 3/8 inch (9.5mm) maximum length of wire.
2. Insert the wire into the open terminal.
3. Turn the screw clockwise to close the terminal on the wire.
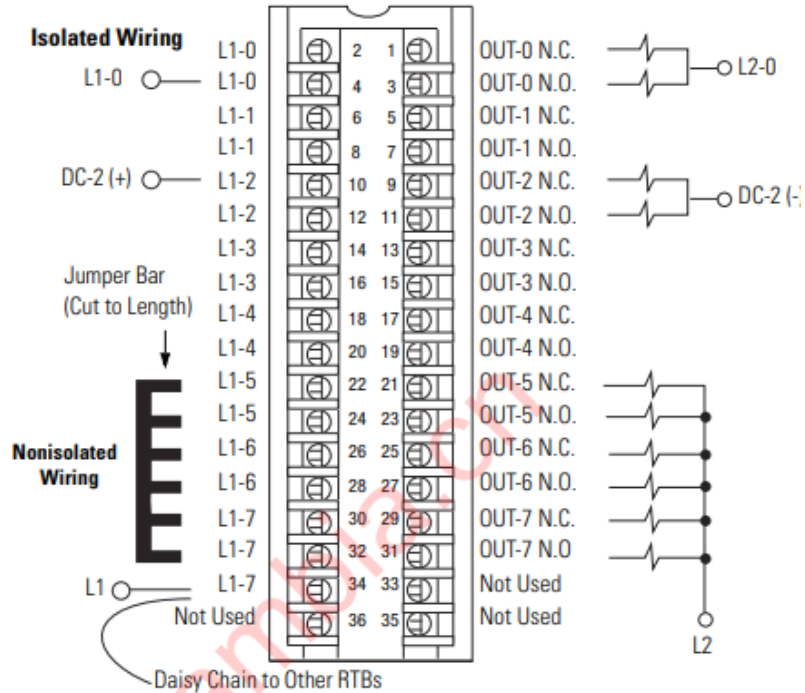
## Wire the Module

You can connect wiring to your module with only an RTB. 1756-OX8I
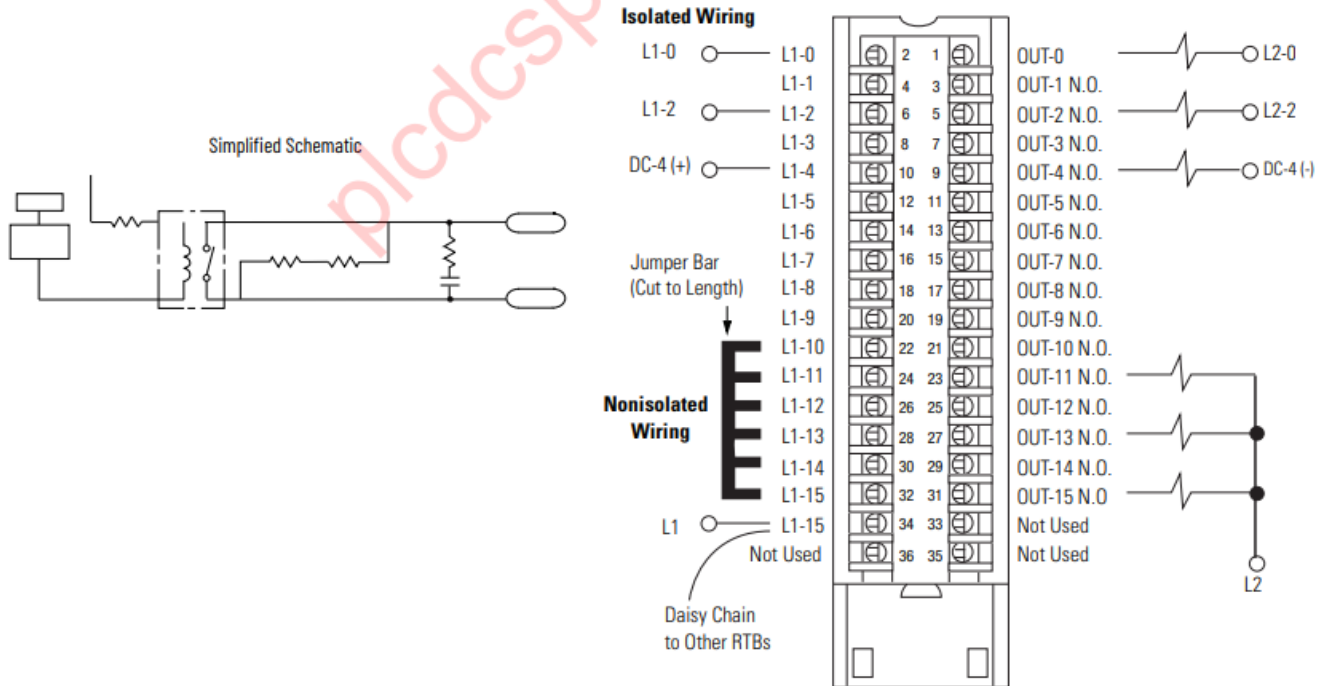
**Wiring and Schematic**

## Simplified Schematic



**1756-OX8I**



| Isolated Wiring | | | | | |
|---|---|---|---|---|---|
| L1-0 | L1-0 | 2 | 1 | OUT-0 N.C. | |
| L1-0 ○— | L1-0 | 4 | 3 | OUT-0 N.O. | ○ L2-0 |
| | L1-1 | 6 | 5 | OUT-1 N.C. | |
| | L1-1 | 8 | 7 | OUT-1 N.O. | |
| DC-2 (+) ○— | L1-2 | 10 | 9 | OUT-2 N.C. | ○ DC-2 (-) |
| | L1-2 | 12 | 11 | OUT-2 N.O. | |
| | L1-3 | 14 | 13 | OUT-3 N.C. | |
| Jumper Bar (Cut to Length) | L1-3 | 16 | 15 | OUT-3 N.O. | |
| | L1-4 | 18 | 17 | OUT-4 N.C. | |
| | L1-4 | 20 | 19 | OUT-4 N.O. | |
| | L1-5 | 22 | 21 | OUT-5 N.C. | |
| | L1-5 | 24 | 23 | OUT-5 N.O. | |
| **Nonisolated Wiring** | L1-6 | 26 | 25 | OUT-6 N.C. | |
| | L1-6 | 28 | 27 | OUT-6 N.O. | |
| | L1-7 | 30 | 29 | OUT-7 N.C. | |
| | L1-7 | 32 | 31 | OUT-7 N.O | |
| L1 ○ | L1-7 | 34 | 33 | Not Used | |
| | Not Used | 36 | 35 | Not Used | L2 |

Daisy Chain to Other RTBs

**1756-OW16I Wiring and Schematic**

1756-OW16I

**Isolated Wiring**

| | | | | | | |
|---|---|---|---|---|---|---|
| L1-0 | L1-0 | 2 | 1 | OUT-0 | | L2-0 |
| | L1-1 | 4 | 3 | OUT-1 N.O. | | |
| L1-2 | L1-2 | 6 | 5 | OUT-2 N.O. | | L2-2 |
| | L1-3 | 8 | 7 | OUT-3 N.O. | | |
| DC-4 (+) | L1-4 | 10 | 9 | OUT-4 N.O. | | DC-4 (-) |
| | L1-5 | 12 | 11 | OUT-5 N.O. | | |
| | L1-6 | 14 | 13 | OUT-6 N.O. | | |
| Jumper Bar | L1-7 | 16 | 15 | OUT-7 N.O. | | |
| (Cut to Length) | L1-8 | 18 | 17 | OUT-8 N.O. | | |
| | L1-9 | 20 | 19 | OUT-9 N.O. | | |
| | L1-10 | 22 | 21 | OUT-10 N.O. | | |
| | L1-11 | 24 | 23 | OUT-11 N.O. | | |
| **Nonisolated Wiring** | L1-12 | 26 | 25 | OUT-12 N.O. | | |
| | L1-13 | 28 | 27 | OUT-13 N.O. | | |
| | L1-14 | 30 | 29 | OUT-14 N.O. | | |
| | L1-15 | 32 | 31 | OUT-15 N.O | | |
| L1 | L1-15 | 34 | 33 | Not Used | | |
| | Not Used | 36 | 35 | Not Used | | L2 |

Simplified Schematic

Daisy Chain to Other RTBs

## ASSEMBLY

### Assemble the Removable Terminal Block and the Housing

1. Align the grooves at the bottom of the housing with the side edges of the RTB.
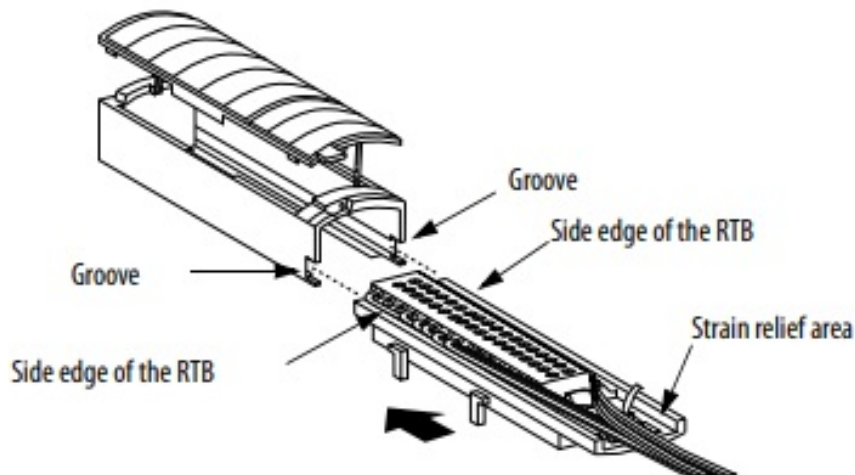


2. Slide the RTB into the housing until it snaps into place.

### Install the Removable Terminal Block onto the Module

**WARNING:** If you connect or disconnect the removable terminal block (RTB) with field-side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations.

### Before proceeding with RTB installation, make certain:

- power is removed or the area is nonhazardous.
- field-side wiring of the RTB has been completed.
- the RTB housing is snapped in place on the RTB.

- the RTB housing is closed.
- the locking tab at the top of the module is unlocked.
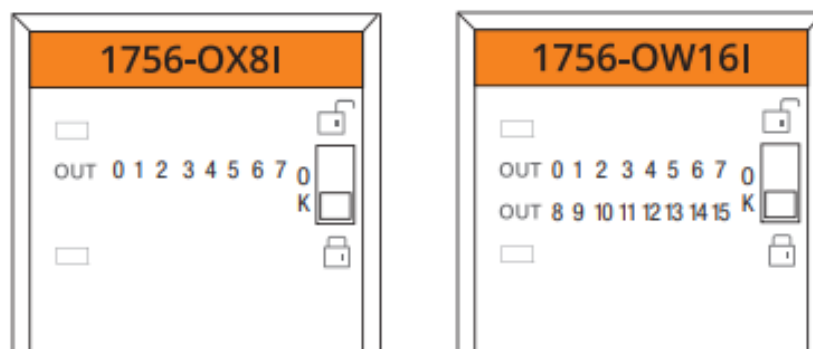
1. Align the side, top, and bottom guides.
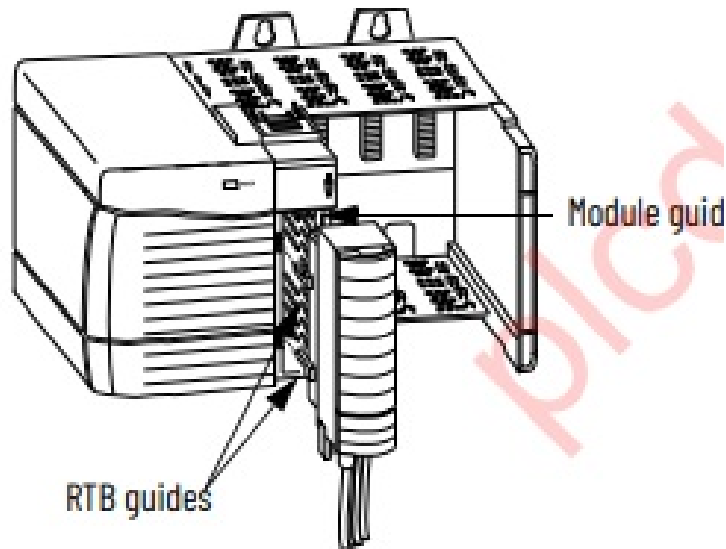


2. Press quickly and evenly to seat the RTB until the latches snap into place.
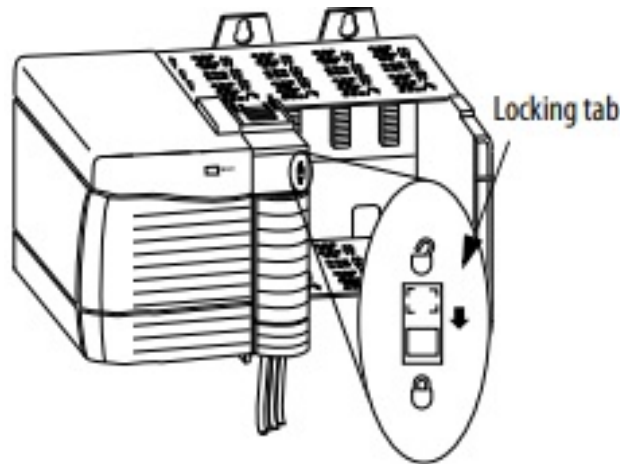


3. Slide the locking tab down.

**Check the Indicators**
The indicators show individual I/O status (yellow) for each point and a bi-colored LED for module "OK" (red/green).



During powerup, an indicator test is done and the following occurs:

- OK' indicator turns red for 1 second and then turns to flashing green if it has passed the self-test.
- I/O status indicators turn ON for a maximum of 2 seconds and then turn OFF

**Status Indicators**

| Indicator | Display | Meaning | Action |
|-----------|---------|---------|--------|
| OK | Steady green | The inputs are being multicast and in normal operating state. | None |
| OK | Steady green | The outputs are actively being controlled by a system processor. | None |
| OK | Flashing green | The module has passed internal diagnostics but is not multicasting inputs. | Configure the module with RSLogix 5000® programming software. |
| OK | Flashing green | The module has passed internal diagnostics but is not actively controlled. | Configure the module. |
| OK | Flashing red | Previously established communication has timed out. | Check controller and chassis communication. |
| OK | Steady red | An unrecoverable error has occurred on the module. | Replace the module. |
| IN | Yellow | The input is active. | None |
| OUT | Yellow | The output is active. | None |

**Remove the Removable Terminal Block from the Module**
If you need to remove the module, you must first remove the RTB.

**WARNING:** When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding

Before removing the module, you must remove the RTB.

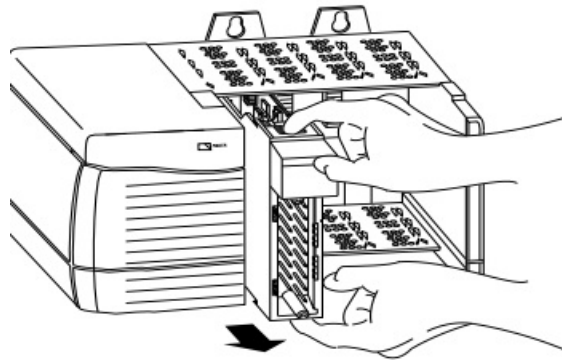1. Unlock the locking tab at the top of the module
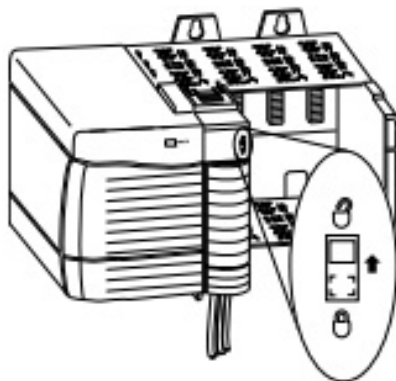


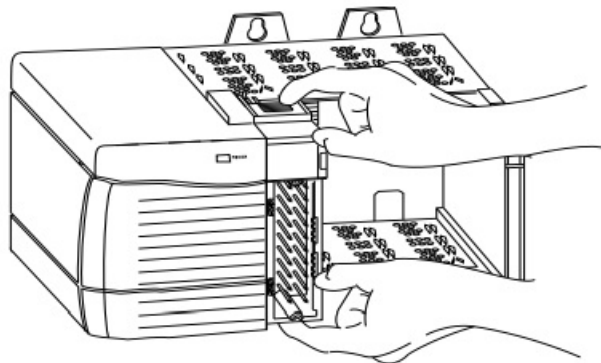2. Open the RTB door and pull the RTB off the module
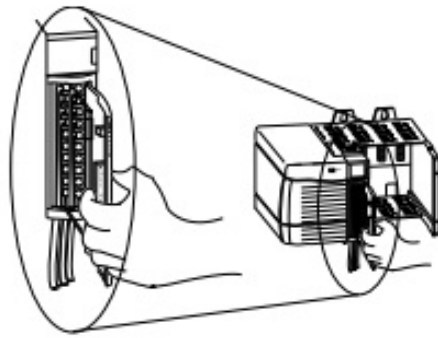
**Remove the Module**

1. Push in top and bottom locking tabs.



2. Pull module out of the chassis.



## Specifications

These tables list a subset of the module specifications. For a list of all specifications, see the 1756 ControlLogix I/O Specifications Technical Data, publication 1756-TD002K-EN-E.

| Attribute | 1756-OX8I, 1756-OX8IK | 1756-OW16I, 1756-OW16IK |
|---|---|---|
| Temperature, operating<br>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) | 0...60 °C (32...140 °F) | |
| Temperature, surrounding air, max | 60 °C (140 °F) | |
| Corrosive Atmosphere[1]<br>ASTM B845-97 Method H Accelerated Test (20-Day Exposure) | Severity Level G3 per ANSI/ISA 71.04-2013, Airborne Contaminants—Gases<br>Severity Level CX[2] per IEC 60721-3-3:2019, Chemically Active Substances | |
| Isolation voltage | 250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output | |
| Initial contact resistance, max | 100 mΩ @ 6V 1 A | — |
| Switching frequency, max | 1 operation/3 s (0.3 Hz at rated load) | |
| Bounce time, mean | 1.2 ms | |
| Expected contact life | 300 kHz resistive<br>100 kHz inductive | |
| Scheduled outputs | Synchronization within 16.7 s max, reference to the Coordinated System Time | |
| States in Fault mode per point | Hold last state, On or Off (Off is default) | |
| States in Program mode per point | Hold last state, On or Off (Off is default) | |
| Removable terminal block | 1756-TBCH<br>1756-TBS6H | |
| RTB keying | User-defined mechanical | |
| Slot width | 1 | |
| Wire category | 1[3] | |
| Enclosure type | None (open-style) | |
| North American temperature code | T4A | |

1. Only applicable to modules that end with a 'K' or 'XT'.

2. Up to 9.6 microns per year, the corrosion rate of copper.

3. Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

**Additional Resources**
These documents contain additional information concerning related products from Rockwell Automation.

| Publication | Description |
|---|---|
| 1756 ControlLogix I/O Specifications Technical Data, publication 1756-TD002K-EN-E | Provides specification information for the ControlLogix I/O modules. |
| ControlLogix Digital I/O Modules User Manual, publication 1756-UM058I-EN-P | Provides information about how to install, configure, operate, and maintain ControlLogix digital I/O modules. |
| Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 | Provides general guidelines for installing a Rockwell Automation industrial system. |
| Product Certifications website: rok.auto/certifications | Provides declarations of conformity, certificates, and other certification details. |

You can view or download publications at https://www.rockwellautomation.com/en_NA/overview.page.

## Documents / Resources

**Allen-Bradley 1756 Series ControlLogix Isolated Contact Module** [pdf] Installation Guide
1756-OX8I, 1756-OX8IK, 1756-OW16I, 1756-OW16IK, 1756 Series ControlLogix Isolated Contact Module, 1756 Series, ControlLogix Isolated Contact Module, Isolated Contact Module, Contact Module, Module

## References

- 🔶 **Product Certifications | Rockwell Automation | US**
- 🔶 **Rockwell Automation Tech Support ... 24 x 7 around the globe!**
- 🔶 **Literature Library | Rockwell Automation | US**
- 🔶 **Support | Rockwell Automation | US**
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- 🔶 **Smart Manufacturing Industrial Automation | Rockwell Automation | US**
- **User Manual**