ControlLogix 32-Point DC output module Series B
Catalog Number 1756-OB32

Obtain a User Manual

This product also has a user manual (pub. no. 1756-UM058). To view it, visit www.rockwellautomation.com/literature.

To purchase a manual, contact your distributor or Rockwell Automation representative.

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment.
Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SGI-1.1
available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi)
describes some important differences between solid state equipment and hard-wired electromechanical
devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all people responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.
In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.
The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many
variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot
assume responsibility or liability for actual use based on the examples and diagrams.
No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits,
equipment, or software described in this manual.
Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell
Automation, Inc. is prohibited.
Throughout this manual we use notes to make you aware of safety considerations:

	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.
	Identifies information that is critical for successful application and understanding of the product.
	Identifies information about practices or circumstances that can lead to personal injury Or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence
	Labels may be located on or inside the drive to alert people that dangerous voltage may Be present.

	Labels may be located on or inside the drive to alert people that surfaces may be dangerous temperatures.

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. NOTE: See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. 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.

Prevent 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 wrist strap. • 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, store the equipment in appropriate static-safe packaging.

Removal and Insertion Under Power

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.

Personnel responsible for the application of safety-related programmable electronic systems (PES) shall be aware of the safety requirements in the application of the system and shall be trained in using the system.

EXPLOSION HAZARD -

•Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.

•Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. 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 only be changed in an area known to be nonhazardous.

European Zone 2 Certification (The following applies when the product bears the EEx Marking)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC.

DEMKO certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive. The examination and test results are recorded in confidential report No. 03NK30347.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50021.

IMPORTANT

Observe the following additional Zone 2 certification requirements.

- This equipment is not resistant to sunlight or other sources of UV radiation.
- The secondary of a current transformer shall not be open-circuited when applied in Class I, Zone 2 environments.
- Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Zone 2 environments.
- This equipment shall be used within its specified ratings defined by Allen-Bradley

Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Class I, Zone 2 environments

Identify the Module Components

You received the following components with your order:

- 1756-OB32 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 or a Bulletin 1492 Interface Module (IFM) to connect all field-side wiring. This module uses one of the following RTBs:

IMPORTANT

- 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. When using an IFM, consult the documentation that came with it to connect wiring.

Before you install your module, you should:

- install and ground a 1756 chassis and power supply.
- order and receive an RTB or IFM, and its components, for your application.

Note the Power Requirements

This module receives power from the 1756 chassis power supply and requires 2 sources of power from the ControlLogix backplane:

- 300mA at 5.IV dc
- 2mA at 24V dc

Add this current/power value (1.58W) to the requirements of all other modules in the chassis to prevent overloading the power supply.

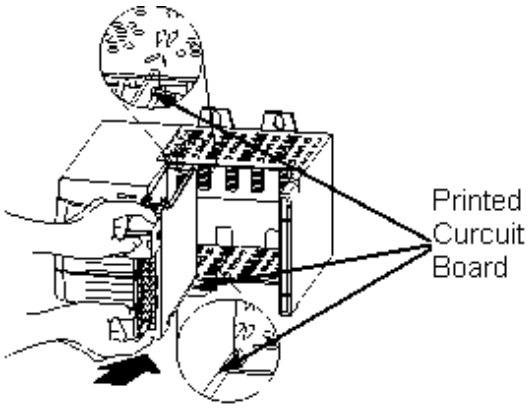
(1) The ControlLogix system has been agency certified using only the ControlLogix RTBs (i.e. 1756-TBCH, 1756-TBNH 1756-TBSH and 1756-TBS6H). Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application specific approval by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

Install the Module

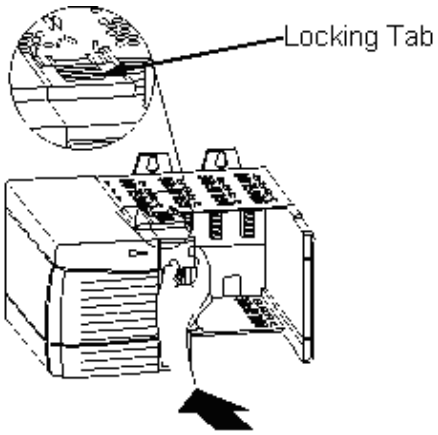
You can install or remove the module while chassis power is applied.

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.

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



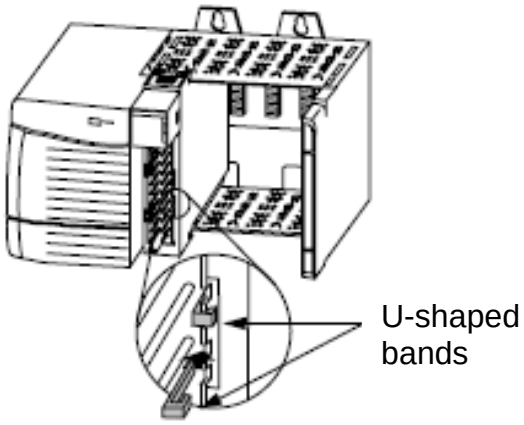
2. Slide the module into the chassis until the module locking tabs click.



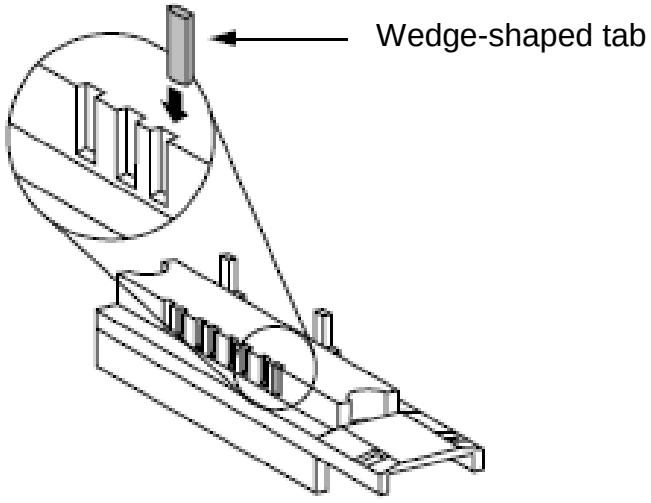
Key the Module and Removable Terminal Block/interface Module

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 that 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.



2. Push the band until it snaps in place.
3. To key the RTB or IFM, insert the wedge-shaped tab with rounded edge first, as shown.



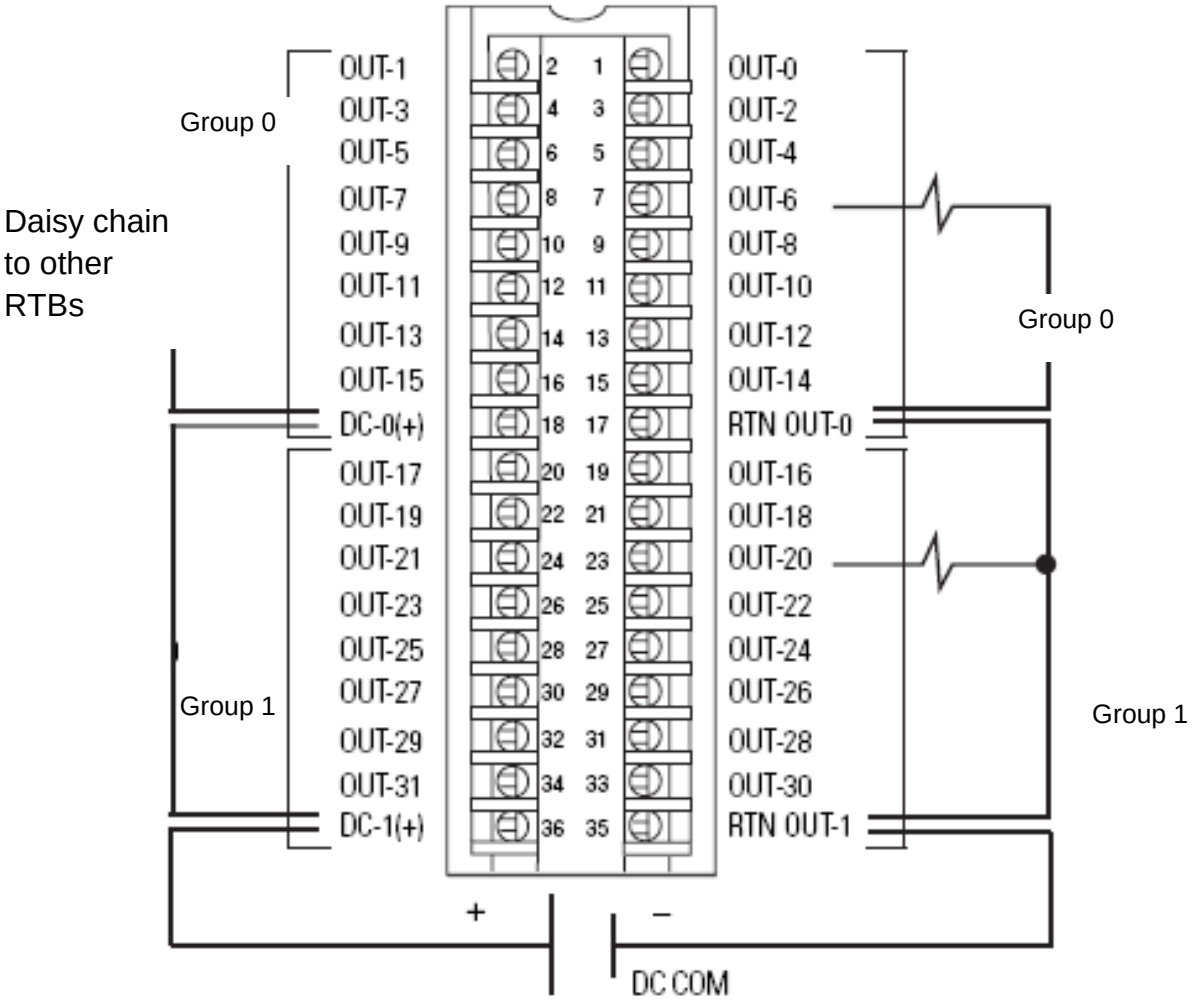
4. Push the tab until it stops.

Reposition the tabs to rekey future module applications.

Wire the 1756-OB32 Module

WARNING If you connect or disconnect wiring while the 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.

You can only connect wiring to your module with an RTB or IFM.



NOTES: 1. When you daisy chain from a group to another RTB, always connect the daisy chain as shown above. Do not connect more than 2 wires to any single terminal.
2. This wiring example uses a single voltage source.
3. If separate power sources are used, do not exceed the specified isolation voltage.

After completing field-side wiring, secure the wires in the strain relief area with a cable-tie.

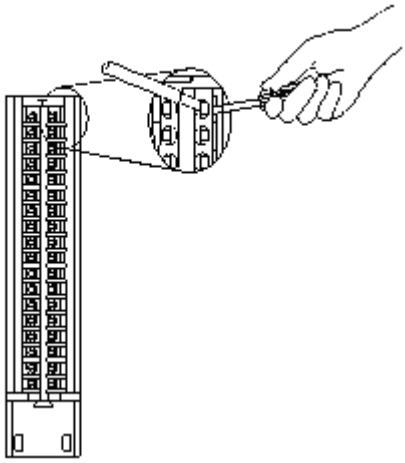
Wire the Removable Terminal Block (RTB)

Wire the RTB with 3.2 mm (1/8 in.) maximum 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 the power is removed or the area is nonhazardous before proceeding.

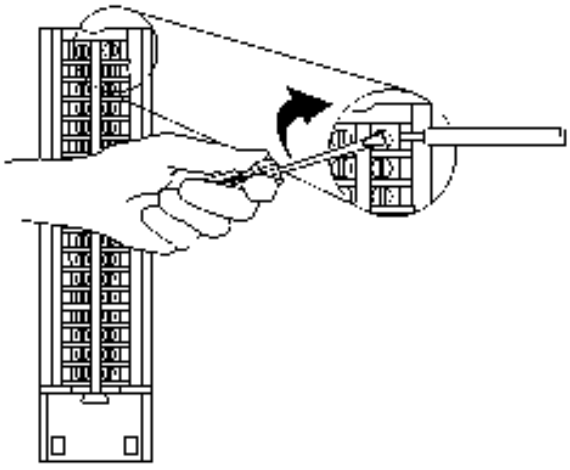
Spring Clamp RTB

1. Strip 11 mm (7/16 in.) 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 9.5 mm (3/8 in.) maximum length of wire.
2. Insert the wire into the open terminal.
3. Turn the screw clockwise to close the terminal on the wire.



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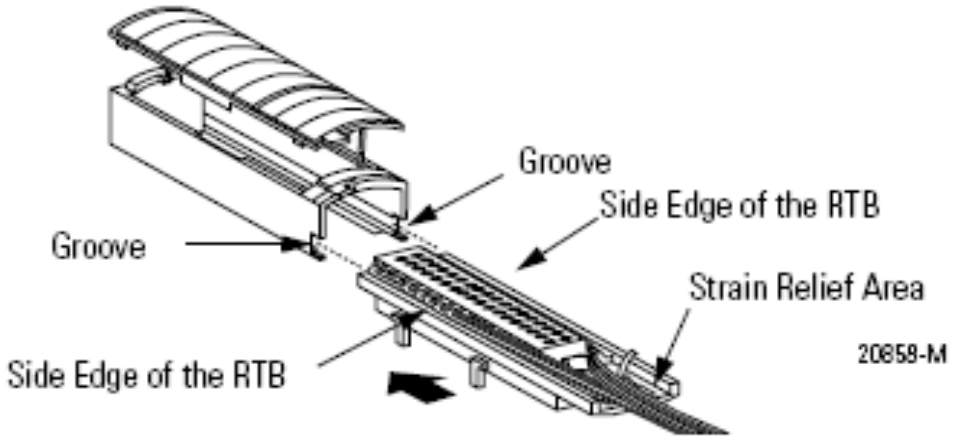
Assemble the Removable Terminal Block (RTB) and the Housing

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.

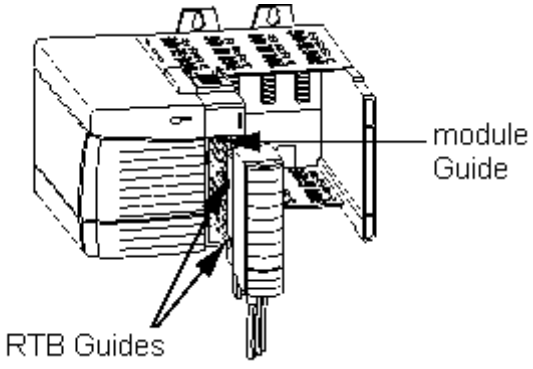
Install the Removable Terminal Block (RTB) onto the Module

When 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. Be sure that power is removed or the area is nonhazardous before proceeding.

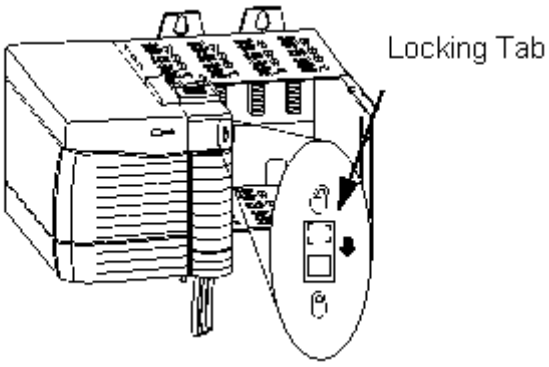
Before proceeding with RTB installation, verify:

- 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.



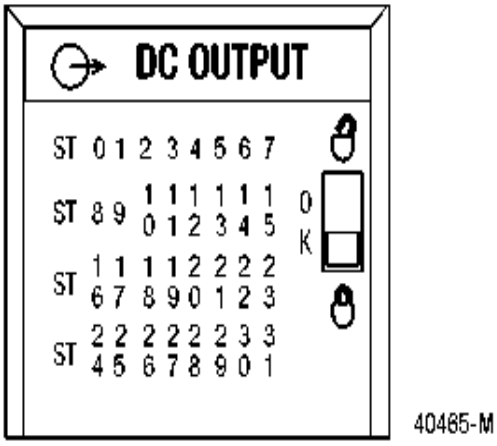
2. Press quickly and evenly to seat the RTB until the latches snap into place.



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 power up, 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.

Indicator:	Displaying:	Means:	Take this action:
OK	Steady green light	The outputs are actively being controlled by a system processor.	None
OK	Flashing green light	The module has passed internal diagnostics but is not actively controlled.	Configure the module.
OK	Flashing red light	Previously established communication has timed out.	Check controller and chassis communication.
OK	Steady red light	An unrecoverable error has occurred on the module.	Replace the module.
I/O State	Yellow	The output is active.	None

This completes installation of the module. Use the following information to remove the module, if necessary.

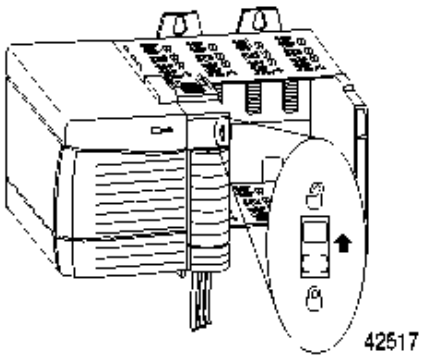
Remove the Removable Terminal Block from the Module

If you need to remove the module, you must remove the RTB first.

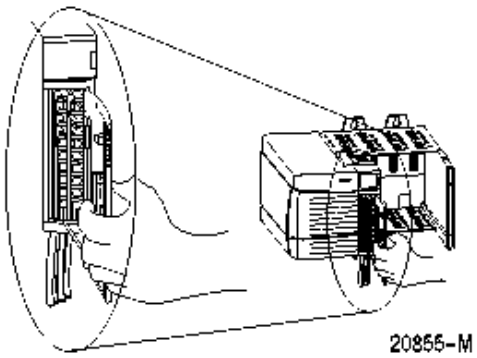
When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

Before removing the module, you must remove the RTB.

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

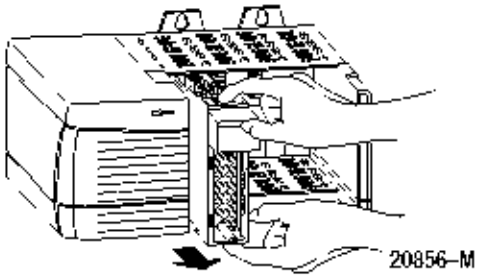


2. Open the RTB door and pull the RTB off the module.

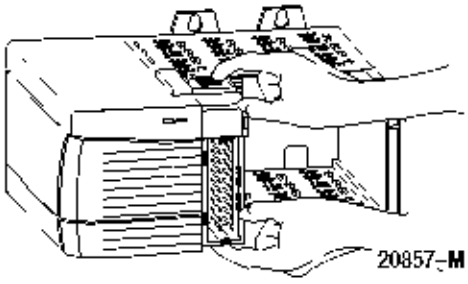


Remove the Module

1. Push in top and bottom locking tabs.



2. Pull module out of the chassis.



1756-OB32 Specifications

Number of Outputs	32 (16 points/common)
Module Location	1756 ControlLogix Chassis
Backplane Current	300mA @ 5.1V dc & 2mA @ 24V dc (Total backplane power 1.58W)
Output Voltage Range	10-31.2V dc
Output Current Rating Per Point Per Module	 0.5A maximum @ 50℃ (Linear derating) 0.35A maximum @ 60℃ 16A maximum @ 50℃ (Linear derating) 10A maximum @ 60℃
Surge Current per Point	1A maximum inrush for 10ms (repeatable every 2 seconds)
Minimum Load Current	3mA per point
Maximum On-State Voltage Drop	200mV dc @ 0.5A
Maximum Off-State Leakage Current	0.5mA per point
Output Delay Time OFF to ON ON to OFF	 1ms maximum 1ms maximum
Scheduled Outputs	Synchronization within 16.7s maximum, reference to the Coordinated System Time
Configurable Fault States/Point	Hold Last State, ON or OFF (OFF is the default)
Configurable States in Program Mode per Point	Hold Last State, ON or OFF (OFF is the default)

Fusing	Not protected - Fused IFM can be used to protect outputs (See publication 1492-2.12). However, the ControlLogix system has been agency certified using only the ControlLogix RTBs (i.e. 1756-TBCH, 1756-TBNH 1756-TBSH and 1756-TBS6H). Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application specific approval by the certifying agency.
Reverse Polarity Protection	None - If module is wired incorrectly, outputs may be damaged.
Module Keying (Backplane)	Software configurable
RTB Keying	User defined mechanical keying
Field Wiring Arm and Housing	36 Position RTB (1756-TBCH or TBS6H)[2]
Conductors	
Wire Size	#22 to #14 AWG (0.324 to 2.08 sq. mm) stranded[1] 3/64 inch (1.2mm) insulation maximum
Wire Type	Copper
Category	1 (3) , (4)
Environmental Conditions	
Operating Temperature	0 to 60℃ (32 to 140℉)
Storage Temperature	-40 to 85℃ (-40 to 185℉)
Relative Humidity	5 to 95% non-condensing
Operating Shock	30g
Non-operating Shock	50g
Emissions	CISPR 11: Group 1, Class A
Enclosure Type Rating	None (open-style)
Certifications[1] (when product is marked)	CE European Union 89/336/EEC EMC Directive, compliant with: EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EExEuropean Union 94/9/EC ATEX Directive, compliant with: EN 50021: Potentially Explosive Atmospheres, Protection "n" (Zone 2)