

I/O Modules in the ControlLogix System

ControlLogix modules mount in a ControlLogix chassis and use a removable terminal block (RTB) or a Bulletin 1492 interface module (IFM)⁽¹⁾ cable to connect to all field-side wiring.

This section assumes that you've selected and sized the components of your ControlLogix system. In addition to standard ControlLogix power supplies, ControlLogix Redundant Power Supplies are also available.

IMPORTANT

The power requirements of series B and C 1756-OF4, 1756-OF4K, 1756-OF8, or 1756-OF8K modules are higher than series A modules. Prior to module replacement, consider the following:

- The total power supply consumption of a system that includes one or more series B and C 1756-OF4, 1756-OF4K, 1756-OF8, or 1756-OF8K modules within a series C chassis, cannot exceed 75 W @ 60 °C (140 °F).
 - The total power supply consumption of a system that includes one or more series B and C 1756-OF4, 1756-OF4K, 1756-OF8, or 1756-OF8K modules within a series B chassis, cannot exceed 75 W @ 55 °C (131 °F).
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For more information on choosing the correct power supply for your ControlLogix system, see these resources:

- The *ControlLogix Selection Guide*, publication [1756-SG001](#), provides a high-level selection process for ControlLogix system components.
- The *1756 ControlLogix I/O Modules Technical Specifications*, publication [1756-TD002](#), provides detailed specifications for ControlLogix I/O modules that are needed to size a system.
- The Integrated Architecture® Builder (IAB) software from Rockwell Automation <https://www.rockwellautomation.com/en-us/support/product/product-selection-configuration/integrated-architecture-builder.html> provides advanced selection assistance and a graphical interface for designing systems.
- The interactive spreadsheet available in Knowledgebase Technote, [Sizing the ControlLogix Power Supply](#) that lets you enter a chassis configuration and automatically calculates the total power supply consumption.

IMPORTANT

You must have a support agreement with Rockwell Automation to access the Knowledgebase.

For more information, contact your local Allen-Bradley distributor or sales representative.

(1) 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 the ControlLogix system using other wiring termination methods can require application-specific approval by the certifying agency. To see what analog interface modules are used with each ControlLogix analog I/O module, see [Appendix B](#).

1492 AIFMs for Analog I/O Modules

As an alternative to buying RTBs and connecting the wires yourself, you can buy a wiring system that connects to I/O modules through pre-wired and pre-tested cables.

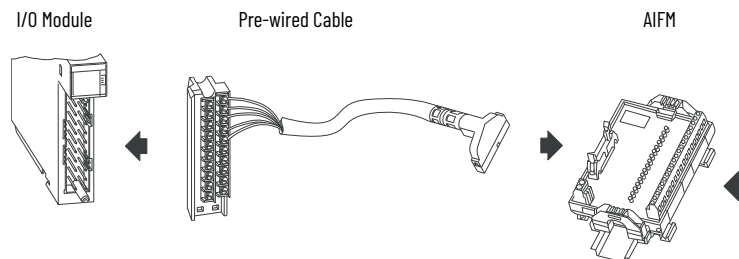
IMPORTANT

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 the ControlLogix system using other wiring termination methods can require application specific approval by the certifying agency.

Module Wiring Options

The combinations include the following:

- **Analog interface modules (AIFMs)** mount on DIN rails to provide the output terminal blocks for the I/O module. Use the AIFMs with the pre-wired cables that match the I/O module to the interface module.



Feed-through and **fusible AIFMs** let you customize the wiring system to your application. The fused AIFMs have 24V DC blown fuse indicators to locate and replace blown fuses.

For a complete list of the AIFMs available for use with ControlLogix analog I/O modules, see the table on [page 136](#).

- **Pre-wired cables** have a pre-wired RTB on one end to connect to the front of an analog I/O module and a D-shell connector on the other end to plug into a D-shell terminal. The D-shell connectors, with either 15 or 25 pins, have a slide-locking mechanism for a more secure connection.

For a complete list of the pre-wired cables available for use with ControlLogix analog I/O modules, see the table on [page 137](#).

Module-ready Pre-wired Cables

This table describes the I/O module-ready pre-wired cables available for use with your ControlLogix analog I/O modules.

Cat. No. ⁽¹⁾	No. of Conductors ^{(2) (3)}	Conductor Size	Nominal Outer Diameter	RTB at the I/O Module End
1492-ACABLExM	11 twisted pairs	22 AWG	11.5 mm (0.45 in.)	1756-TBCH
1492-ACABLExX	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBNH
1492-ACABLExY	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBNH
1492-ACABLExYT	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBNH
1492-ACABLExZ	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBNH
1492-ACABLExTA	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExTB	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExTC	5 twisted pairs	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExTD	5 twisted pairs	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExUA	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExUB	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBCH
1492-ACABLExUC	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBCH
1492-ACABLExUD	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBCH
1492-ACABLExVA	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBNH
1492-ACABLExVB	20 conductors	22 AWG	8.4 mm (0.33 in.)	1756-TBNH
1492-ACABLExWA	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBNH
1492-ACABLExWB	9 twisted pairs	22 AWG	6.8 mm (0.27 in.)	1756-TBNH

(1) Cables are available in lengths of 0.5 m (1.6 ft), 1.0 m (3.3 ft), 2.5 m (8.2 ft), and 5.0 m (16.4 ft). To order, insert the code for the desired cable length into the catalog number in place of the x: 005=0.5 m, 010=1.0 m, 25=2.5 m, 050=5 m. Build-to-order cable lengths are also available.

(2) Each cable for analog I/O has an overall shield with a ring lug on a 200 mm (8.87 in.) exposed drain wire at the I/O module end of the cable.

(3) Not every connection is always used.

1756 Removable Terminal Blocks



Removable terminal blocks (RTBs) provide a flexible interconnection between your plant wiring and 1756 ControlLogix I/O modules. The RTB plugs into the front of the I/O module. The type of module determines which RTB you need. You can choose screw-clamp or spring-clamp RTBs.

RTBs are not shipped with I/O modules. You must order them separately. The standard housing on the front of the wiring arm is not deep enough for 2.5 mm² (14 AWG) wiring. So, if you plan to use 2.5 mm² (14 AWG) wiring, order the extended housing.



ATTENTION: If separate power sources are used, do not exceed the specified isolation voltage. See the specifications for each individual module on the preceding pages.



WARNING: Do not use 1756-TBNHS, 1756-TBSHS, 1756-TBCHS, or 1756-TBS6HS safety RTBs and 1756-TBES extended-depth terminal block housings with non-safety I/O modules.

RTB Specifications

Attribute	1756-TBCH 1756-TBCHS 1756-TBCHXT	1756-TBNH 1756-TBNHS 1756-TBNHXT	1756-TBSH 1756-TBSHS 1756-TBSHXT	1756-TBS6H 1756-TBS6HS 1756-TBS6HXT	1756-TBE 1756-TBES 1756-TBEXT
Description	36-pin cage-clamp removable terminal block with standard housing	20-position NEMA screw-clamp removable block	20-pin spring-clamp removable terminal block with standard housing	36-pin spring-clamp removable terminal block with standard housing	Extended depth terminal block housing
Screw torque	0.5 N•m (4.4 lb•in)	1.36 N•m (12 lb•in)	–	–	–
Wire size ⁽¹⁾	Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max. Do not wire more than one conductor on any single terminal. Double wire connection: 0.33...1.3 mm ² (22...16 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max. Do not wire more than two conductors on any single terminal.		Single wire connection: 0.33...2.1 mm ² (22...14 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Do not wire more than one conductor on any single terminal.		–
Screwdriver width	3.2 mm (1/8 in.)	8 mm (5/16 in.) Max	–	–	–

(1) Maximum wire size requires extended housing, catalog number 1756-TBE.