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CONTROLLOGIX CONTROLLERS

SELECTION GUIDE

CATALOG NUMBERS

**1756-L61, 1756-L62,
1756-L63, 1756-L64,
1756-L65,
1756-L60M03SE**

ALLEN-BRADLEY • ROCKWELL SOFTWARE

Rockwell Automation

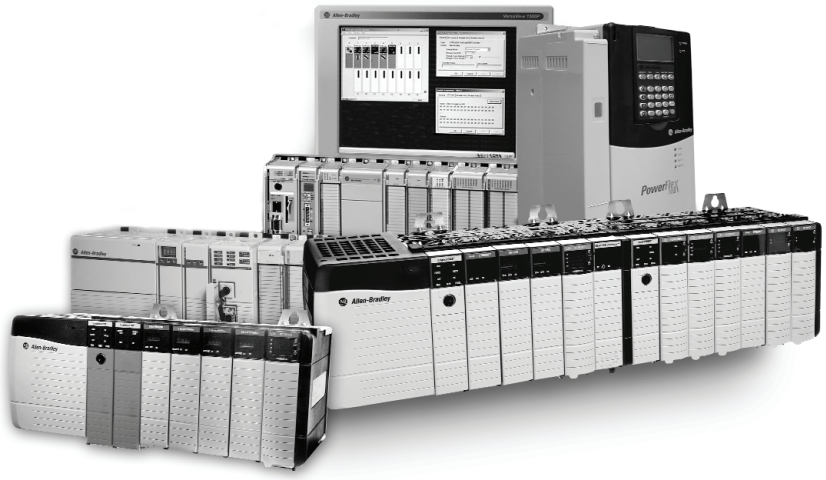
Logix Controllers Comparison

Characteristic	1756 ControlLogix	1756 GuardLogix	1768 CompactLogix	1769 CompactLogix	1789 SoftLogix5800	PowerFlex 700S Phase 2 with DriveLogix
Controller tasks: • Continuous • Periodic • Event	• 32 tasks • 100 programs/task • Event tasks: all event triggers	• 32 tasks • 100 programs/task • Event tasks: all event triggers	• 16 tasks • Event tasks: consumed tag, EVENT instruction, axis, and motion event triggers	• 1769-L35x: 8 tasks • 1769-L32x: 6 tasks • 1769-L31: 4 tasks • Event tasks: consumed tag and EVENT instruction triggers	• 32 tasks • 100 programs/task • Event tasks: all event triggers, plus outbound and Windows events	• 8 tasks • Event tasks: axis and motion event triggers
User memory	1756-L60M03SE: 750 KB 1756-L61: 2 MB 1756-L62: 4 MB 1756-L63: 8 MB 1756-L64: 16 MB	1756-L61S: 2 MB Standard 1 MB Safety 1756-L62S: 4 MB Standard 1 MB Safety	1768-L43: 2 MB 1768-L45: 3 MB	1769-L31: 512 KB 1769-L32x: 750 KB 1769-L35x: 1.5 MB	1789-L10: 2 MB; 1 controller; no motion 1789-L30: 64 MB; 3 controllers 1789-L60: 64 MB; 6 controllers	1.5 MB
Nonvolatile user memory	CompactFlash	CompactFlash	CompactFlash	CompactFlash	None	CompactFlash
Built-in communication ports	1 port RS-232 serial	1 port RS-232 serial	1 port RS-232 serial	• 1769-L31: 2 RS-232 ports • 1769-L32C, -L35CR: 1 ControlNet port and 1 RS-232 serial port • 1769-L32E, -L35E: 1 EtherNet/IP port and 1 RS-232 serial port	Depends on personal computer	• 1 port RS-232 serial
Communication options	• EtherNet/IP • ControlNet • DeviceNet • Data Highway Plus • Remote I/O • SynchLink	• EtherNet/IP (standard and safety) • ControlNet (standard and safety) • DeviceNet (standard and safety) • Data Highway Plus • Remote I/O • SynchLink	• EtheNet/IP • ControlNet • DeviceNet	• EtherNet/IP • ControlNet • DeviceNet	• EtherNet/IP • ControlNet • DeviceNet	• EtherNet/IP • ControlNet • DeviceNet
Serial port communication	• ASCII • DF1 full/half-duplex • DF1 radio modem • DH-485 • Modbus via logic	• ASCII • DF1 full/half-duplex • DF1 radio modem • DH-485 • Modbus via logic	• ASCII • DF1 full/half-duplex • DF1 radio modem • DH-485 • Modbus via logic	• ASCII • DF1 full/half-duplex • DF1 radio modem • DH-485 • Modbus via logic	• ASCII • DF1 full/half-duplex • DH-485 • Modbus via logic	• ASCII • DF1 full/half-duplex • DF1 radio modem • DH-485 • Modbus via logic
Controller connections	250	250	250	100	250	100
Network connections	Per network module: • 100 ControlNet (CN2/A) • 40 ControlNet (CNB) • 256 EtherNet/IP; 128 TCP (EN2*x*) • 128 EtherNet/IP; 64 TCP (ENBT)	Per network module: • 100 ControlNet (CN2/A) • 40 ControlNet (CNB) • 256 EtherNet/IP; 128 TCP (EN2*x*) • 128 EtherNet/IP; 64 TCP (ENBT)	Per network module: • 48 ControlNet • 64 EtherNet/IP; 32 TCP	Per controller: • 32 ControlNet • 32 EtherNet/IP; 32 TCP	Per network module: • 48 ControlNet • 128 EtherNet/IP; 64 TCP	Per network module: • 32 ControlNet • 32 EtherNet/IP; 32 TCP
Controller redundancy	Full support	None	Backup via DeviceNet	Backup via DeviceNet	N/A	N/A
Simple motion	• Stepper • Servo via DeviceNet • Analog ac drive	• Stepper • Servo via DeviceNet • Analog ac drive	• Stepper • Servo via DeviceNet • Analog ac drive	• Stepper • Servo via DeviceNet • Analog ac drive	• Stepper • Servo via DeviceNet • Analog ac drive	• Stepper • Servo via DeviceNet • Analog ac drive
Integrated motion	SERCOS interface Analog options: • Encoder input • LDT input • SSI input	SERCOS interface Analog options: • Encoder input • LDT input • SSI input	SERCOS interface	N/A	SERCOS interface Analog encoder input	• 1 full servo • 1 feedback axis
Programming languages	• Relay ladder • Structured text • Function block • SFC	• Relay ladder • Structured text • Function block • SFC	• Relay ladder • Structured text • Function block • SFC	• Relay ladder • Structured text • Function block • SFC	• Relay ladder • Structured text • Function block • SFC • External routines (developed in C/C++)	• Relay ladder • Structured text • Function block • SFC

Logix Platforms

Allen-Bradley Logix platforms provide a single integrated-control architecture for discrete, drives, motion, process, and safety control.

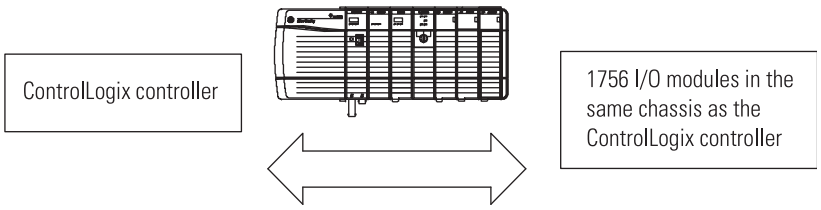
The Logix platforms provide a common control engine, programming software environment, and communication support across multiple hardware platforms. All Logix controllers operate with a multitasking, multiprocessing operating system and support the same set of instructions in multiple programming languages. One RSLogix 5000 programming-software package programs all Logix controllers. And, as part of the Integrated Architecture platform, all Logix controllers offer the benefits of the Common Industrial Protocol (CIP) to communicate via EtherNet/IP, ControlNet, and DeviceNet networks.



ControlLogix System Overview

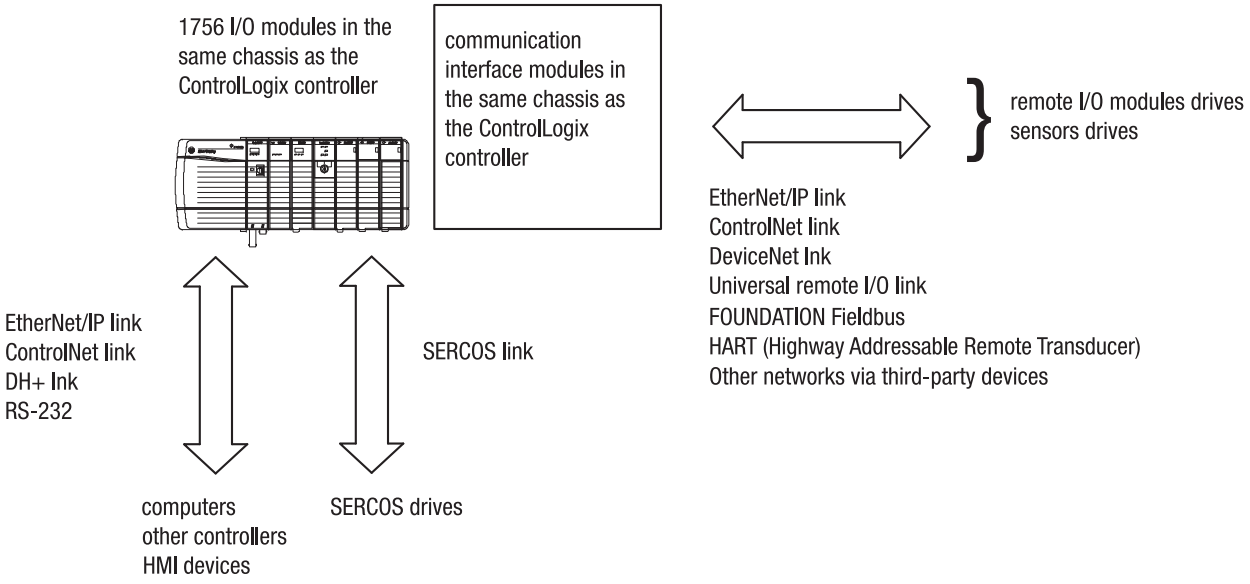
The ControlLogix system provides discrete, drives, motion, process, and safety control together with communication and state-of-the-art I/O in a small, cost-competitive package. The system is modular, so you can design, build, and modify it efficiently - with significant savings in training and engineering.

A simple ControlLogix system consists of a standalone controller and I/O modules in a single chassis.



You can also use the ControlLogix system as a gateway. Include the communication modules you need for connectivity to other networks. For this use, a controller is not required. The ControlLogix gateway integrates into existing PLC-based systems so that users with existing networks can send or receive messages to or from other networks. For a more flexible system, use:

- multiple controllers in a single chassis.
- multiple controllers joined across networks.
- I/O in multiple platforms that is distributed in many locations and connected over multiple I/O links.

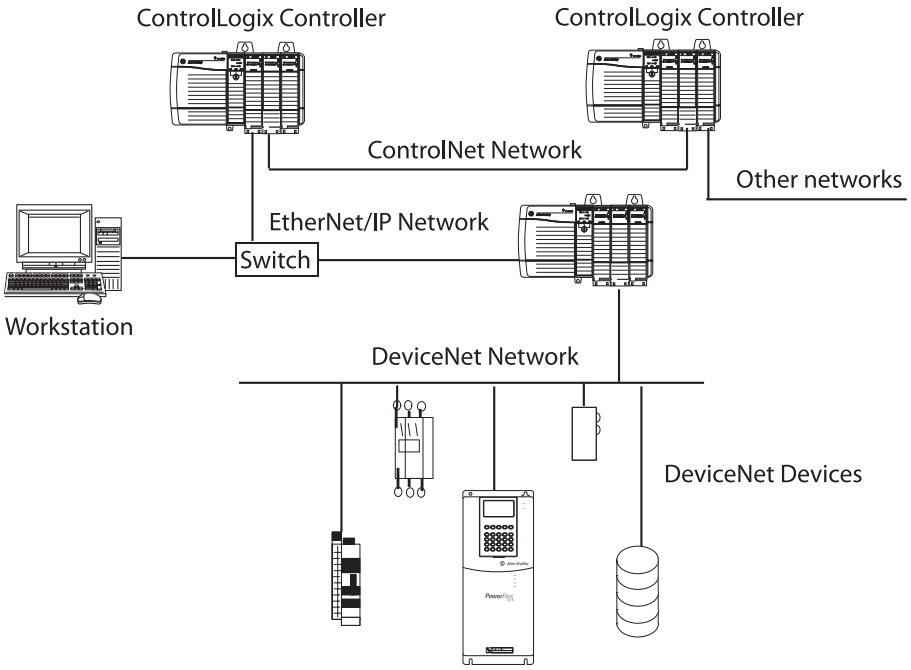


Lay Out the System

Lay out the system by determining the network configuration and the placement of components in each location. Decide at this time whether each location will have its own controller.

Place each controller's I/O on an isolated network to maximize the performance and to more easily accommodate future network or system configuration changes. If you plan to share I/O, make sure the I/O is on a network that each controller can access.

Evaluate what communication needs to occur between controllers and over which networks.



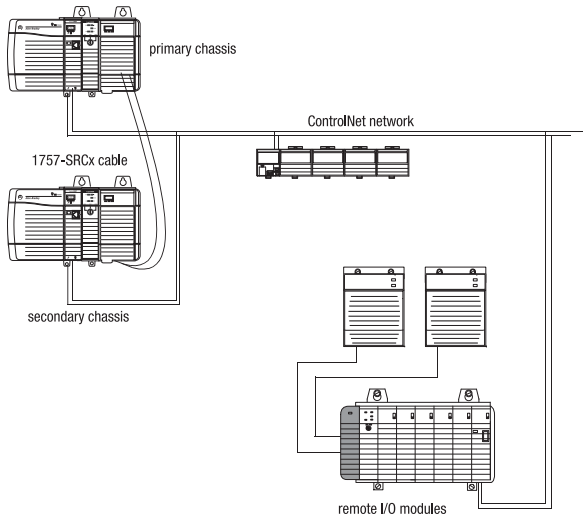
Lay Out a Redundant System

The ControlLogix environment offers different levels of redundancy that you can design into your system. These systems require additional hardware, so plan accordingly. You can design redundant:

- controller chassis.
- media for ControlNet networks.
- power supplies.

Redundant controller chassis

Redundancy requires no additional programming and is transparent to any devices connected over an EtherNet/IP or ControlNet network.

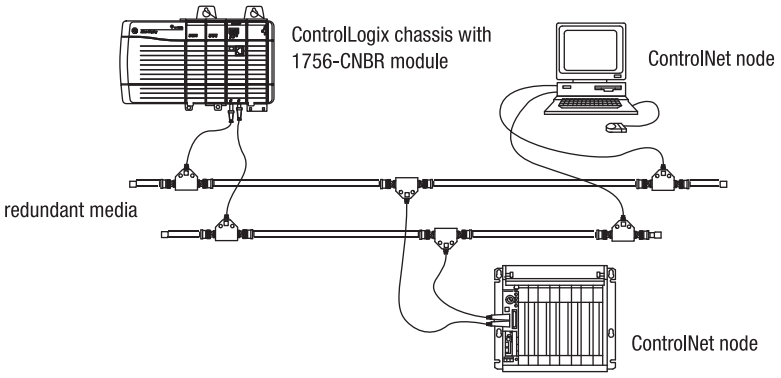


Requires:

- Same size for each redundant chassis with the same slot assignments in each chassis.
- One 1756-RM module per chassis, which supports:
  — two 1756-L61, 1756-L62, 1761-L63 controllers or one 1756-L64 controller
  — maximum of 7 communication modules, which can be 1756-CN2, 1756-CN2R series B, and 1756-EN2T modules
  or
  One 1757-SRM module per chassis, which supports:
  — one 1756-L61, 1756-L62, 1756-L63, 1756-L64 controller
  — maximum of 7 communication modules, which can be 1756-CNB, 1756-CNBR, and 1756-ENBT modules

All I/O must be remote from the redundant controllers on an EtherNet/IP or ControlNet link. To connect to other networks, bridge through another ControlLogix chassis (not one of the redundant controller chassis).

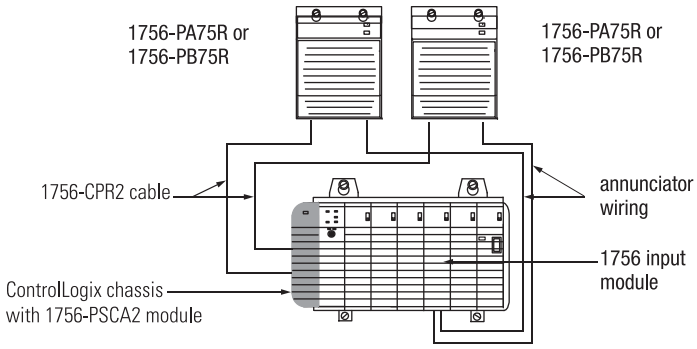
Redundant ControlNet media



Requires:

- 1756-CNBR ControlNet modules
- Two identical ControlNet links

Redundant power supplies



Requires:

- Two redundant power supplies, any combination of 1756-PA75R and 1756-PB75R
- 1756-PSCA2 chassis adapter module, in place of the standard power supply
- Two 1756-CPR2 cables to connect the power supplies to the 1756-PSCA2 adapter
- User-supplied annunicator wiring to connect the power supplies to the input modules, if needed

SIL3 Certification

The GuardLogix Controller system is type-approved and certified for use in safety applications up to and including SIL 3 according to IEC 61508, and applications up to and including category (CAT) 4, according to EN954-1. For more information, see:

- GuardLogix Controllers Systems Safety Reference Manual, publication 1756-RM093
- GuardLogix Controllers User Manual, publication 1756-UM020
- GuardLogix Safety Application Instruction Set Reference Manual, publication 1756-RM095

SIL2 Certification

Components of the ControlLogix system are type-approved and certified for use in SIL 2 applications, according to IEC 61508 and AK4 applications according to DIN V19250. For a list of ControlLogix system components that meet SIL 2 requirements, see Using ControlLogix in SIL 2 Applications Safety Reference Manual, publication 1756-RM001.

Specify a System

Follow these steps as you specify your ControlLogix system.

✓	Step	See	
	1 Select I/O devices. Use a spreadsheet to record the: • location of the device. • number of points needed. • appropriate catalog number. • number of points available per module. • number of modules.	I/O overview Digital I/O modules Analog I/O modules Specialty I/O modules HART instrumentation Wiring systems	page 7 page 8 page 11 page 12 page 13 page 14
	2 Select motion control and drives requirements. Add the number of motion modules to the I/O spreadsheet.	Motion overview SERCOS interface modules Analog interface modules	page 15 page 17 page 19
	3 Select communication modules. Add the number of communication modules to the I/O spreadsheet.	Network overview EtherNet/IP specifications ControlNet specifications DeviceNet specifications Safety specifications DH+/RIO specifications Foundation Fieldbus specifications Serial specifications DH-485 specifications SynchLink specifications Access the controller remotely	page 21 page 23 page 25 page 26 page 27 page 28 page 29 page 31 page 32 page 33 page 34
	4 Select controllers. Select the appropriate controller based on the: • required controller tasks. • number of I/O points needed. • number of communication cards needed. • required controller memory.	Controller specifications Determine memory requirements Determine battery requirements Compatibility Logix system connections	page 35 page 36 page 38 page 39 page 41
	5 Select chassis. Determine the number of chassis you need.	Chassis specifications	page 43
	6 Select power supplies. Calculate power requirements on the I/O spreadsheet.	Power supply specifications	page 47
	7 Select view products. Determine the view products that fit your operator interface needs.	FactoryTalk View software PanelView Plus terminals PanelView CE terminals VersaView industrial computers	page 51 page 52 page 52 page 52
	8 Select software. Determine the software products you need to configure and program your application. Based on the system design, determine the software products you need.	Available software products Programming software Communication software Network configuration software Emulation software Training software	page 53 page 54 page 56 page 57 page 59 page 60

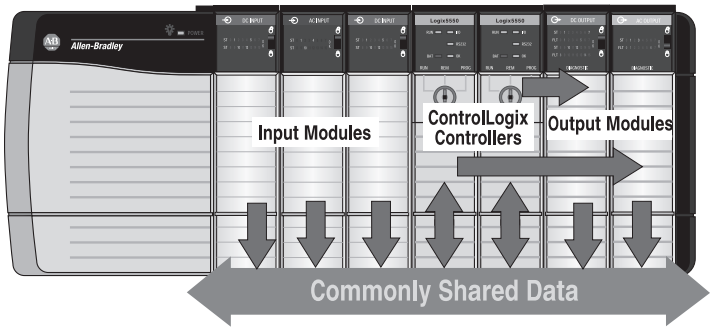
Step 1 - Select:

- *I/O modules - some modules have field-side diagnostics, electronic fusing, or individually isolated inputs/outputs*
- *A remote terminal block (RTB) or wiring system for each I/O module*
- *PanelConnect modules and cables if connecting input modules to sensors*

1756 ControlLogix I/O Modules

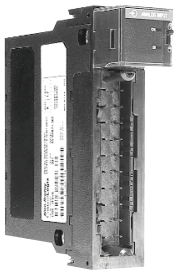
The ControlLogix architecture provides a wide range of input and output modules to span many applications, from high-speed digital to process control. The ControlLogix architecture uses producer/consumer technology, which allows input information and output status to be shared among multiple ControlLogix controllers.

Producer/Consumer I/O Model



Each ControlLogix I/O module mounts in a ControlLogix chassis and **requires** either a removable terminal block (RTB) or a 1492 interface module (IFM) to connect all field-side wiring. RTBs and IFMs are not included with the I/O modules. They must be ordered separately.

1756 Digital I/O Modules



The 1756 digital I/O modules support these features.

- Variety of voltage interface capabilities
- Isolated and nonisolated module types
- Point-level output fault states
- Direct-connect or rack-optimized communication
- Field-side diagnostics on select modules

In addition, you can select these types of digital I/O modules.

Digital I/O Type	Description
Diagnostic	These modules provide diagnostic features to the point level. These modules have a **D** at the end of the catalog number.
Electronic fusing	These modules have internal electronic fusing to prevent too much current from flowing through the module. These modules have an **E** at the end of the catalog number.
Individually isolated	These modules have individually isolated inputs or outputs. These modules have an **I** at the end of the catalog number.

Digital AC Input Modules

Cat. No.	Number of Inputs	Voltage Category	Operating Voltage	Current, On-State Input, Min.	Current, On-State Input, Max.	Current, Off-State Input, Max.	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-IA8D	8 diagnostic	120V AC	79...132V AC	5 mA @ 79V AC	16 mA @ 132V AC	2.5 mA	1756-TBNH 1756-TBSH	100 mA	3 mA	4.5 W @ 60 °C
1756-IA16	16	120V AC	74...132V AC	5 mA @ 74V AC	13 mA @ 132V AC	2.5 mA	1756-TBNH 1756-TBSH	105 mA	2 mA	5.8 W @ 60 °C
1756-IA16I	16 individually isolated	120V AC	79...132V AC	5 mA @ 79V AC 47…63Hz	15 mA @ 132V AC, 47…63HZ	2.5 mA	1756-TBCH 1756-TBS6H	125 mA	3 mA	4.9 W @ 60 °C
1756-IA32	32	120V AC	74...132V AC	5 mA @ 74V AC	15 mA @ 132V AC	2.5 mA	1756-TBCH 1756-TBS6H	165 mA	2.0 mA	6.1 W @ 60 °C
1756-IM16I	16 individually isolated	240V AC	159...265V AC	5 mA @ 159V AC, 60Hz	13 mA @ 265V AC, 60Hz	2.5 mA	1756-TBCH 1756-TBS6H	100 mA	3 mA	5.8 W @ 60 °C
1756-IN16	16	24V AC	10...30V AC	5 mA @ 10V AC, 60 Hz	1.2 mA @ 30V AC, 60 Hz	2.75 mA	1756-TBNH 1756-TBSH	100 mA	2 mA	5.1 W @ 60 °C

Input Delay ON to OFF: 8 ms, max. plus programmable filter of 9 ms or 18 ms.
Input Delay OFF to ON: 10 ms, max pllus programmable filter of 1 ms or 2 ms.

Digital AC Output Modules

Cat. No.	Number of Outputs	Voltage Category	Operating Voltage	Output Current Rating, per Point, Max.	Output Continuous Current per Module, Max.	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-OA8	8	120/240V AC	74...265V AC	2 A @ 60 °C (Linear derating)	5 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBNH 1756-TBSH	200 mA	2 mA	5.1 W @ 60 °C
1756-OA8D	8 diagnostic	120V AC	74...132V AC	1 A @ 30 °C (Linear derating) 0.5 A @ 60 °C (Linear derating)	8 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBNH 1756-TBSH	175 mA	250 mA	5.3 W @ 60 °C
1756-OA8E	8 electronic fusing	120V AC	74...132V AC	2 A @ 60 °C	8 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBNH 1756-TBSH	200 mA	250 mA	5.5 W @ 60 °C
1756-OA16	16	120/240V AC	74...265V AC	0.5 A @ 60 °C	4 A @ 60 °C	1756-TBNH 1756-TBSH	400 mA	2 mA	6.5 W @ 60 °C
1756-OA16I	16 individually isolated	120/240V AC	74...265V AC	2 A @ 30 °C (Linear derating) 1 A @ 60 °C (Linear derating)	5 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBCH 1756-TBS6H	300 mA	3 mA	5.5 W @ 60 °C
1756-ON8	8	24 V AC	10...30V AC	2 A @ 60 °C	5 A @ 30 °C 4 A @ 60 °C (Linear derating)	1756-TBNH 1756-TBSH	200 mA	2 mA	5.1 W @ 60 °C

Digital DC Input Modules

Cat. No.	Number of Inputs	Voltage, On-State Input, Nom.	Operating Voltage	Current, On-State Input, Min.	Current, On-State Input, Max.	Current, Off-State Input, Max.	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-IB16	16	12/24V DC sink	10...31.2V DC	2.0 mA @ 10V DC	10 mA @ 31.2V DC	1.5 mA	1756-TBNH 1756-TBSH	100 mA	2 mA	5.1 W @ 60 °C
1756-IB16D	16 diagnostic	12/24V DC sink	10...30V DC	2 mA @ 10V DC	13 mA @ 30V DC	1.5 mA/point	1756-TBCH 1756-TBS6H	150 mA	3 mA	5.8 W @ 60 °C
1756-IB16I	16 individually isolated	12/24V DC sink/source	10...30V DC	2 mA @ 10 V DC	10 mA @ 30V DC	1.5 mA	1756-TBCH 1756-TBS6H	100 mA	3 mA	5 W @ 60 °C
1756-IB16ISOE	16 individually isolated; sequence of events	24/48V DC sink/source	10...55V DC	5.5 mA @ 55V DC	2 mA @ 10V DC	1.5 mA	1756-TBCH 1756-TBS6H	275 mA	2 mA	5.5 W @ 60 °C
1756-IB32	32	12/24V DC sink	10...31.2V DC	2 mA	5.5 mA	1.5 mA	1756-TBCH 1756-TBS6H	120 mA	2 mA	6.2 W @ 60 °C
1756-IC16	16	48V DC sink	30...60V DC	2 mA @ 30V DC	7 mA @ 60V DC	1.5 mA	1756-TBNH 1756-TBSH	100 mA	3 mA	5.2 W @ 60 °C
1756-IG16	16 (8 points/common)	5V DC TTL source	4.5...5.5V DC	—	—	4.1 mA	1756-TBNH 1756-TBSH	110 mA	2 mA	1.4 W @ 60 °C
1756-IH16I	16 individually isolated	125V DC sink/source	90...146V DC	1 mA @ 90V DC	3 mA @ 146V DC	0.8 mA	1756-TBCH 1756-TBS6H	125 mA	3 mA	5 W @ 60 °C
1756-IH16ISOE	16 individually isolated; sequence of events	125V DC sink/source	90...140V DC	1.15 mA @ 90V DC	1.85 mA @ 140V DC	0.3 mA	1756-TBCH 1756-TBS6H	275 mA	2 mA	5.5 W @ 60 °C
1756-IV16	16	12/24V DC source	10...30V DC	2.0 mA @ 10V DC	10 mA @ 30V DC	1.5 mA	1756-TBNH 1756-TBSH	110 mA	2 mA	5.41 W @ 60 °C
1756-IV32	32	12/24V DC source	10...30V DC	2 mA @ 10V DC	3.5 mA @ 30V DC	1.5 mA	1756-TBCH 1756-TBS6H	120 mA	2 mA	4.1 W @ 60 °C

Digital dc Output Modules

Cat. No.	Number of Outputs	Voltage Category	Operating Voltage	Output Current Rating, per Point, Max.	Output Continuous Current per Module, Max.	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-OB8	8	12/24V DC source	10...30V DC	2.0 A @ 60 °C	8.0 A @ 60 °C	1756-TBNH 1756-TBSH	165 mA	2 mA	2.5 W @ 60 °C
1756-OB8EI	8 electronically fused, individually isolated	12/24V DC source	10...30V DC	2 A @ 60 °C	16.0 A @ 55 °C (Linear derating) 10.0 A @ 60 °C	1756-TBCH 1756-TBS6H	250 mA	2 mA	4.7 W @ 60 °C
1756-OB8I	8 individually isolated	12/24V DC source	10...30V DC	2.0 A @ 60 °C	16.0 A @ 60 °C	1756-TBCH 1756-TBS6H	165 mA	2 mA	4.6W A @ 60 °C
1756-OB16D	16 diagnostic	24V DC source	19.2...30V DC	2 A @ 30 °C (Linear derating) 1 A @ 60 °C (Linear derating)	8 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBCH 1756-TBS6H	250 mA	140 mA	3.3 W @ 60 °C
1756-OB16E	16 electronically fused	12/24V DC source	10...31.2V DC	1 A @ 60 °C	8 A @ 60 °C	1756-TBNH 1756-TBSH	250 mA	2 mA	4.1 W @ 60 °C
1756-OB16I	16 individually isolated	12/24V DC sink/source	10...30V DC	2 A @ 30 °C (Linear derating) 1 A @ 60 °C (Linear derating)	8 A @ 30 °C (Linear derating) 4 A @ 60 °C (Linear derating)	1756-TBCH 1756-TBS6H	350 mA	3 mA	3.6 W @ 60 °C
1756-OB16IS	16 individually isolated; 8 scheduled	12/24V DC sink/source	10...30V DC	2 A @ 30 °C 1 A @ 60 °C (Linear derating)	8 A @ 30 °C 4 A @ 60 °C (Linear derating)	1756-TBCH 1756-TBS6H	350 mA	2.5 mA	3.6 W @ 60 °C
1756-OB32	32	12/24V DC source	10...31.2V DC	0.5 A @ 50 °C (Linear derating) 0.35 A @ 60 °C	16 A @ 50 °C (Linear derating) 10 A @ 60 °C	1756-TBCH 1756-TBS6H	300 mA	2 mA	4.8 W @ 60 °C
1756-OC8	8	48V DC source	30...60V DC	2.0 A @ 60 °C	8.0 A @ 60 °C	1756-TBNH 1756-TBSH	165 mA	2 mA	4.9 W @ 60 °C
1756-OG16	16	5V DC TTL	4.5...5.5V DC	24 mA @ 60 °C	384 mA @ 60 °C	1756-TBNH 1756-TBSH	210 mA	2 mA	1.5 W @ 60 °C
1756-OH8I	8 individually isolated	120V DC sink/source	90...146V DC	2 A @ 60 °C	8 A @ 60 °C	1756-TBCH 1756-TBS6H	210 mA	2 mA	3.3 W @ 60 °C
1756-OV16E	16 electronically fused	12/24V DC sink	10...30V DC	1 A @ 60 °C	8 A @ 60 °C	1756-TBNH 1756-TBSH	210 mA	2 mA	6.72 W @ 60 °C
1756-OV32E	32 electronically fused	12/24V DC sink	10...30V DC	0.5 A @ 50 °C (Linear derating) 0.35 A @ 60 °C	16.0 A @ 50 °C (Linear derating) 10.0 A @ 60 °C	1756-TBCH 1756-TBS6H	390 mA	2 mA	5.88 W @ 60 °C

Digital Contact Output Modules

Cat. No.	Number of Outputs	Output Delay Time, ON to OFF, Max.	Type of Contact Output	Operating Voltage	Output Current	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-OW16I	16 individually isolated	10 ms	16 N.O.	10...265V ac 5...150V dc	2 A @ 5…30V dc 0.5 A @ 48V dc 0.25 A @ 125V dc 2 A @ 125/240V ac	1756-TBCH 1756-TBS6H	150 mA	150 mA	4.5 W @ 60 °C
1756-OX8I	8 individually isolated	13 ms	1 set of form-C contacts for each output	10...265V ac 5...150V dc	2 A @ 5…30V dc 0.5 A @ 48V dc 0.25 A @ 125V dc 2 A @ 125/240V ac	1756-TBCH 1756-TBS6H	100 mA	100 mA	3.1 W @ 60 °C

1756 Analog I/O Modules

The 1756 analog I/O modules support these features.

- On-board data alarming
- Scaling to engineering units
- Real-time channel sampling
- IEEE 32-bit floating point or 16-bit integer data formats

Cat. No.	Number of Inputs	Number of Outputs	Resolution	Ranges and/or Sensors	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-IF8	8 single-ended, 4 differential, 2 high-speed differential , current or voltage	—	16 bits	0...21 mA ±10.25V 0...5.125V 0...10.25V	1756-TBCH 1756-TBS6H	150 mA	40 mA	1.73 W - Voltage 2.33 W - Current
1756-IF6CIS	6 isolated, current sourcing	—	16 bits	0...21mA	1756-TBNH 1756-TBSH	250 mA	275 mA	5.1 W @ 60 °C
1756-IF6I	6 isolated, current or voltage	—	16 bits	0...21 mA ±10.5V 0...5.25V 0...10.5V	1756-TBNH 1756-TBSH	250 mA	100 mA	3.7 W - Voltage 4.3 W - Current
1756-IF16	8 differential, 4 high-speed differential, 16 single-ended , current or voltage	—	16 bits	0...21 mA ±10.25V 0...5.125V 0...10.25V	1756-TBCH 1756-TBS6H	150 mA	65 mA	2.3 W - Voltage 3.9 W - Current
1756-IF4FXOF2F	4 high-speed, sub-millisecond, differential, current or voltage	2 high-speed voltage or current	14 bits	Inputs 0...21 mA ±10.5V 0...5.25V 0...10.5V Outputs 0...21 mA ±10.5V	1756-TBCH 1756-TBS6H	375 mA	100 mA	4.3 W - Voltage 4.7 W - Current
1756-IR6I	6 isolated RTD	—	16 bits	• 100, 200, 500, 1000Ω Platinum, alpha=385 • 100, 200, 500, 1000Ω Platinum, alpha=3916 • 120Ω Nickel, alpha=672 • 100, 120, 200, 500Ω Nickel, alpha=618 • 10Ω Copper	1756-TBNH 1756-TBSH	250 mA	125 mA	4.3 W
1756-IT6I	6 isolated thermocouple 1 CJC	—	16 bits	-12 mV... +78 mV -12 mV... +38 mV Thermocouples: B, E, J, K, R, S, T, N, C	1756-TBNH 1756-TBSH	250 mA	125 mA	4.3 W
1756-IT6I2	6 isolated thermocouple 2 CJC	—	16 bits	-12 mV... +78 mV -12 mV... +38 mV Thermocouples: B, E, J, K, R, S, T, N, C, L, D	1756-TBNH 1756-TBSH	200 mA	120 mA	3.9 W
1756-OF4	—	4 current or voltage	15 bits	0...21 mA ±10.4V	1756-TBNH 1756-TBSH	150 mA	120 mA	3.25 W - 4 channel current
1756-OF6CI	—	6 isolated current	13 bits	0...21 mA	1756-TBNH 1756-TBSH	250 mA✶	300 mA❄	5.5 W (0…550 Ω loads) 6.1 W (551…1000 Ω loads)
1756-OF6VI	—	6 isolated voltage	14 bits	±10.5V	1756-TBNH 1756-TBSH	250 mA	175 mA	4.85 W
1756-OF8	—	8current or voltage	15 bits	0...21 mA ±10.4V	1756-TBNH 1756-TBSH	150 mA	210 mA	4.92 W - 4 channel current

1756 Specialty I/O Modules

1756-CFM Configurable Flow Meter Module

The 1756-CFM module provides Totalizer mode for metering applications, or high-speed frequency measurements for speed or rate control applications, on two channels connected to flowmeters.

Cat. No.	Mode of Operation	Number of Inputs per Channel	Voltage, Flowmeter Input	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-CFM	Totalizer fill and prover High-Resolution 100 kHz max. Frequency 0.0005 Hz resolution	2 – Flowmeter (F) Input – used for all modes 2 – Gate Input – used in Totalizer Mode for Prover/Store Count	± 30V - Selectable input thresholds of 50 mV, 1.3V & 4V: ± 30V peak unterminated open circuit voltage – Magnetic Pickup TTL Compatible – Input Voltage greater than 1.3V dc is Logic 1 and - 0.7V dc…1.3V dc is Logic 0 12…24V dc powered preamp output - 4V dc threshold	1756-TBNH 1756-TBSH	300 mA	6 mA	6 W @ 60°C

1756-HSC High-speed Counter Module

The 1756-HSC module provides four high-speed, output-switching, ON-OFF windows. The module uses pulses for counting and frequency.

Cat. No.	Mode of Operation	Number of Counters	Inputs per Counter	Counter Range	Number of Outputs	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-HSC	Counter - 1 MHz max. Rate Measurement - 500 kHz max. Encoder - 250 kHz max. Debounce filter - 70 Hz max.	2	3 (A, B, Z for Gate/Reset)	0…16, 777, 214	4 (2 per common)	1756-TBCH 1756-TBS6H	300 mA	3 mA	5.6 W @ 60°C

1756-PLS Programmable Limit Switch Module

The 1756-PLS module supports enhanced packaging applications.

Cat. No.	Mode of Operation	Number of Inputs	Number of Outputs	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-PLS	Requires 3 contiguous slots in chassis	16	16	Requires 3 RTBs 1756-TBNH or 1756-TBSH	1000 mA	125 mA	25.7 W @ 30 °C 21.3 W @ 60 °C

HART Smart Instrumentation

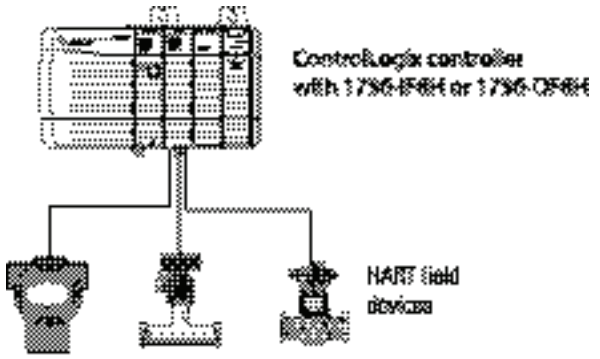
HART (Highway Addressable Remote Transmitter) is an open protocol designed to connect analog devices. For HART connectivity, select from products available from Rockwell Automation and our Encompass partners.

Select a HART Interface

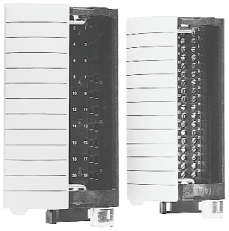
If Your Application has	Select	Description
• Analog and HART connectivity in one module • No external hardware required to access HART signal • HART commands can be transmitted as unscheduled messages • Supports asset management software to HART device	1756-IF8H 1756-OF8H	Rockwell Automation analog I/O modules
• Data acquisition or control application with slow update requirements (such as a tank farm) • No external hardware required to access HART signal • Does not connect directly to asset management software	MVI56-HART	Prosoft interface
• Analog and HART in one module • Instrumentation in hazardous locations (FLEX Ex modules) • HART commands can be transmitted as unscheduled messages • Directly connects asset management software to HART devices	1794 FLEX I/O 1797 FLEX Ex I/O	There are specific FLEX I/O and FLEX Ex modules designed for HART systems. These catalog numbers end in an **H**, such as 1797-IE8H.

Cat. No.	Number of Inputs	Number of Outputs	Resolution	Ranges	RTB	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation, Max.
1756-IF8H	8 voltage or current	—	16...21 bits for all ranges	0...5V 1...5V 0...10V ±10V 0...20 mA 4...20 mA	1756-TBCH 1756-TBS6H	300 mA	70 mA	3.21 W voltage 4.01 W current
1756-OF8H	—	8 voltage or current	15...16 bits for all ranges	±10.4V 0...20 mA 4...20 mA	1756-TBNH 1756-TBSH	200 mA	230 mA	4.92 W - 8 channel current

Typical HART Configuration



1756 Removable Terminal Blocks



Removable terminal blocks (RTBs) provide a flexible interconnection between your plant wiring and 1756 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.

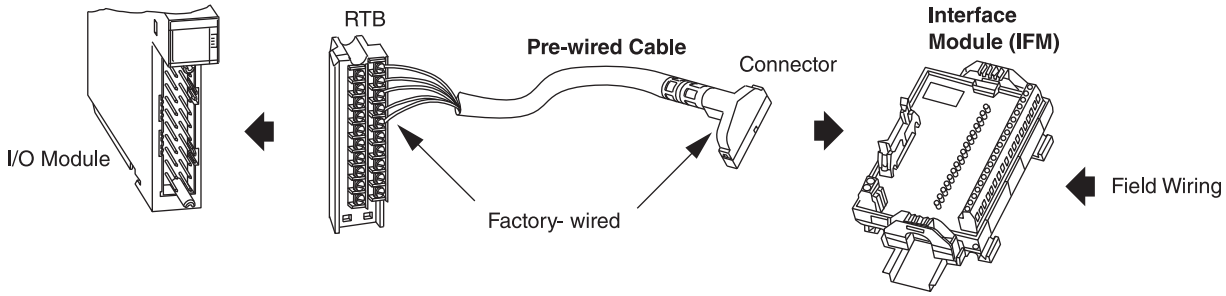
RTBs are not shipped with I/O modules. You must order them separately. The standard housing on the front of the wiring arm is not deep enough for 2.5 mm^2 (14 AWG) wiring. If you plan to use 2.5 mm^2 (14 AWG) wiring, also order the extended housing.

Cat. No.	Description	Weight
1756-TBNH	Screw-clamp with 20-pin connection	0.1 kg (0.3 lb)
1756-TBSH	Spring-clamp with 20-pin connection	0.1 kg (0.3 lb)
1756-TBCH	Screw-clamp with 36-pin connection	0.1 kg (0.3 lb)
1756-TBS6H	Spring-clamp with 36-pin connection	0.1 kg (0.3 lb)
1756-TBE	Extended housing; required for additional wiring space if using 2.5 mm^2 (14 AWG) wiring	0.05 kg (0.1 lb)

Wiring Systems

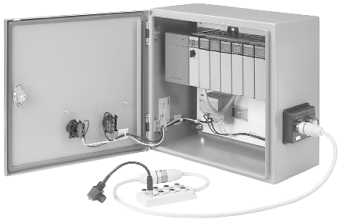
As an alternative to buying RTBs and connecting the wires yourself, you can buy a wiring system of:

- interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the pre-wired cables that match the I/O module to the IFM.
- analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the pre-wired cables that match the I/O module to the AIFM.
- I/O module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.



For more information, go to http://www.ab.com.

PanelConnect Modules



A PanelConnect module and its sensor connection system connect sensors directly to I/O modules using convenient pre-built cables and connectors.

The PanelConnect module mounts on the enclosure and creates the correct seal for the entry of the sensor connections. You do not need to seal the opening where the sensor cables enter the enclosure, create custom connectors, or wire to those custom connectors.

For more information, go to http://www.ab.com.

Step 2 - Select:

- *Size the motion application (use the Motion Analyzer)*
- *How you want to interface the controller and drives*
- *A SERCOS or analog interface module*
- *Associated cable(s)*
- *A removable terminal block (RTB) - only needed for analog interface modules*
- *Select drives, motors, and accessories (use the Motion Analyzer)*

Motion Control Requirements

The Logix approach to motion control employs synchronized, distributed processing and provides a highly-integrated motion solution. The Logix system integrates sequential and motion control to bring unmatched flexibility to machine design and unprecedented efficiency to the manufacturing floor. RSLogix 5000 Enterprise series software supports a comprehensive set of embedded motion instructions that can be programmed using the relay ladder, structured text, or sequential function chart editors.

The Logix architecture supports motion components that work in a wide variety of machine architectures:.

- The Kinetix integrated-motion solution uses a SERCOS interface module to perform complex, multi-axis, synchronized motion. With a Kinetix system, you reap the full benefit of the Integrated Architecture platform because the integration doesn't stop at the controller. This system integrates the drive, the motor, and even the actuator at a lower cost per axis of motion. Use the same RSLogix 5000 programming software to configure, program, and commission your application.
- Logix integrated motion uses the analog family of servo modules for controlling drives/actuators that do not support the SERCOS interface. The analog family of servo modules provide a ±10 voltage analog output and can interface with a variety of feedback device types including rotary/linear absolute and incremental.
- Networked motion provides the ability to connect via the DeviceNet network to a single-axis drive to perform simple, point-to-point indexing. You need Ultraware software for drive and indexing configuration.

Use this selection guide to select the appropriate motion interface. For more information, use the:

- Motion Analyzer CD, publication PST-SG003, to size your motion application and to make final component selection.
- Kinetix Motion Control Selection Guide, publication GMC-SG001, to verify drive, motor, and accessory specifications.

Select a Motion Interface

You can communicate directly to a servo drive using a motion interface or over a network.

Communicate Directly to a Servo Drive

The controller can control these servo drives through these motion interfaces.

If your application requires	Select
Rockwell Automation SERCOS interface drives	• 1756-M16SE (16 axes) • 1756-M08SE (8 axes) • 1756-M03SE (3 axes) • 1756-L60M03SE (3 axes)
SERCOS interface drives that are Extended Pack Profile compliant	1756-M08SEG (8 axes)
• Analog command signal • Quadrature feedback	1756-M02AE
• Analog command signal • LDT feedback	1756-HYD02
• Analog command signal • SSI feedback	1756-M02AS

Communicate Over a Network

Some servo drives are supported through communication interface modules. The controller can communicate with these servo drives over these networks.

Drives*	EtherNet/IP	ControlNet	DeviceNet	Universal Remote I/O	RS-232 Serial	DH-485
1394 GMC drive and control	No	No	No	Yes	Yes	Yes
2098 Ultra3000 DeviceNet servo drive	No	No	Yes	No	No	No
2098 Ultra5000 intelligent positioning	No	No	Yes	No	Yes	No

*Each drive has different options you order for its supported communication networks. See the appropriate catalog or selection information for a drive to make sure you select the appropriate option when specifying a drive for a specific network.

For more information on drives, motors, and accessories, see the Kinetix Motion Control Selection Guide, publication GMC-SG001.

SERCOS Interface Modules

The SERCOS-interface servo modules serve as a link between the ControlLogix platform and intelligent, servo drives. SERCOS is the IEC 61491 SErial Real-time COmmunication System protocol over a fiber-optic medium. The SERCOS interface is an open, controller-to-digital drive interface designed for high-speed, real time, serial communication using noise-immune, fiber-optic cables.

The SERCOS interface modules use a single, digital fiber-optic link, which eliminates as many as 18 digital wires per axis. Detailed drive-status information can be sent from drive to controller and from controller to drive.

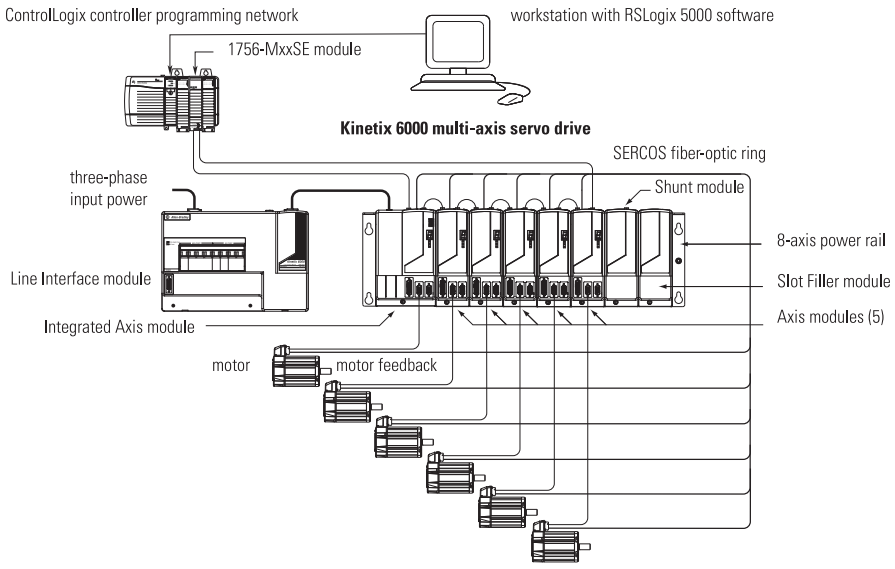
The modules are compatible with the RSLogix 5000 motion instructions set and axis configuration utilities. The motion instructions provide a wide range of motion capability, including point-point positioning, gearing, position and time-based camming, and multi-axis linear and circular motion.

The SERCOS interface modules can connect to these servo drives.

- 2093 Kinetix 2000 multi-axis servo drive
- 2094 Kinetix 6000 multi-axis servo drive
- 2099 Kinetix 7000 high-power servo drive
- 2098 Ultra3000 SERCOS servo drive
- 1394C SERCOS drive
- 8720MC spindle

Cat. No.	Number of Axes, per Module, Max.	Number of Axes, per Controller, Max.	Power Dissipation	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	SERCOS Data Rate
1756-M03SE	3	32	5.1 W	760 mA	2.5 mA	4 Mbits or 8 Mbits per second
1756-L60M03SE†	ControlLogix controller combined with 3 SERCOS axes 6 axes total with addition of another motion module	32	8.5 W	1960 mA	16.5 mA	
1756-M08SE	8	32	5.1 W	760 mA	2.5 mA	
1756-M08SEG	8					
1756-M16SE	16					

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE
†The 1756-L60M03SE is a 1756-L60 ControlLogix controller with an embedded 1756-M03SE SERCOS interface. This is a 2-slot module.



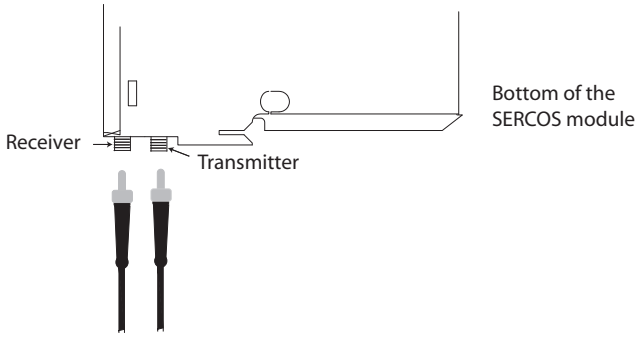
Cables for Use with the SERCOS Interface Modules

Select one of these fiber optic cables to connect the SERCOS interface module to the drive.

Cat. No.	Description
	Plastic Fiber-optic Cables✶
	1000 µm plastic simplex fiber-optic cable
2090-SCEP*x-x* (no jacket)	Transmission range of 1...32 m (3.28...104.99 ft).
2090-SCVP*x-x* (standard jacket)	Allen-Bradley offers plastic, fiber-optic cable assemblies that come in a variety of jackets:
2090-SCNP*x-x* (nylon jacket)	• No jacket (chlorinated polyethylene) for use inside an electrical cabinet
	• A standard jacket (polyvinyl chloride) for use outside of electrical cabinets
	• A nylon jacket for use in harsh environments
	Glass Fiber-optic Cables❄
	200 µm glass fiber optic cable
2090-SCVG*x-x*	Transmission range of 1...200 m (3.28...656.17 ft).
	Allen-Bradley offers glass, fiber-optic cable assemblies that come with a standard jacket (polyvinyl chloride) for use in normal environments.

✶The *x-x* determines the length in meters. Specify 0-1 for 0.1 m, 0-3 for 0.3 m, 1-0 for 1 m, 3-0 for 3 m, 5-0 for 5 m, 8-0 for 8 m, 10-0 for 10 m, 15-0 for 15 m, 20-0 for 20 m, 25-5 for 25 m, or 32-0 for 32 m.
❄The *x-x* determines the length in meters. Specify 1-0 for 1 m, 5-0 for 5 m, 8-0 for 8 m, 10-0 for 10 m, 15-0 for 15 m, 20-0 for 20 m, 25-0 for 25 m, 32-0 for 32 m, 50-0 for 50 m, 100-0 for 100 m, 150-0 for 150 m, or 200-0 for 200 m.

Both the transmitter and receiver connections use a F-SMA standard plug that conforms to the F-SMA screw type connector.



Analog Interface Modules

The ControlLogix family of analog servo modules is a cost effective option for closed-loop or open-loop motion control of devices that support an analog interface. The analog servo modules provide an ±10 volt analog output-command reference and support a variety of position feedback devices. As many as two axes can be controlled per module, and multiple modules can be used to provide as many as 32 axes of control per ControlLogix controller.

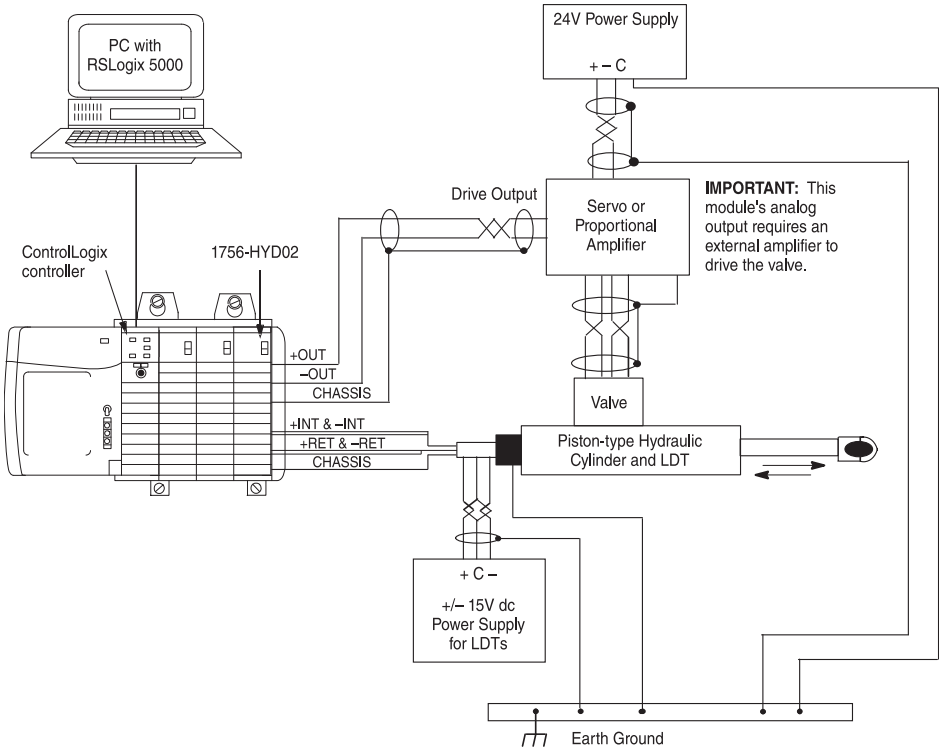
Select the appropriate analog interface module.

This interface module	Offers
1756-M02AE	The 1756-M02AE is a two-axis servo module optimized for control of drives/actuators that requires a ±10V velocity or torque reference input. The 1756-M02AE provides a quadrature-position feedback output and is compatible with a wide range of quadrature-output rotary and linear transducers.
1756-HYD02	The 1756-HYD02 is a two-axis servo module optimized for control of hydraulic actuators that requires a ±10V velocity reference input. The 1756-HYD02 provides an LDT feedback input. Typical actuators include hydraulic motors and hydraulic cylinders. The 1756-HYD02 is compatible with a wide range of magnostrictive linear transducers (LDT) feedback devices. Compatible LDTs include: • Temposonics II: RPM or DPM • Balluff: BTL-2-L2 or BTL-2-M2 • Santest: GYRP or GYRG • Gemco Quick-Stick II: 951 VP or 951 RS
1756-M02AS	The 1756-M02AS is a two-axis servo module optimized for control of drives/actuators that requires a ±10V velocity or torque reference input. The 1756-M02AS provides a serial synchronous input (SSI) position-feedback output and is compatible with a wide range of quadrature output rotary and linear transducers. SSI devices are available in many versions. • Linear absolute and incremental encoders • Rotary absolute and incremental encoders • Linear absolute glass scales • Linear magnostrictive • Linear laser distance

Cat. No.	Number of Axes, per Module, Max.	Number of Axes, per Controller, Max.	Power Dissipation	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Removable Terminal Block Housing
1756-M02AE	2	32	5.5 W	700 mA	2.5 mA	1756-TBCH 1756-TBS6H✶
1756-HYD02			5.5 W	700 mA	2.5 mA	1756-TBCH 1756-TBS6H✶
1756-M02AS			5.5 W	700 mA	2.5 mA	1756-TBCH 1756-TBS6H✶

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE
✶Maximum wire size will require the extended depth RTB housing (1756-TBE).

The following example shows a sample configuration using the 1756-HYD02 analog interface module.



Step 3 - Select:

- *Networks*
- *Communication modules*
- *Associated cables and network equipment*
- *Sufficient modules and cables if you are planning a redundant system*

Network Communication

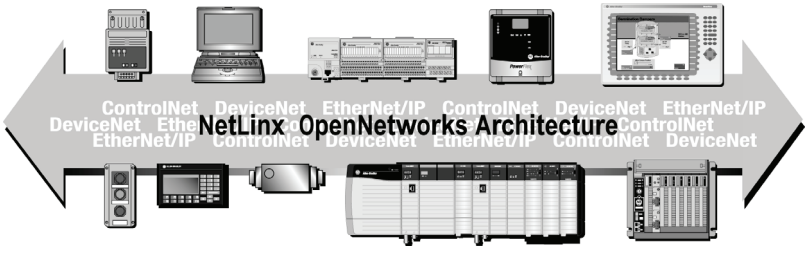
Separate communication interface modules are available for different networks. Install multiple communication-interface modules into the ControlLogix backplane to configure a gateway to bridge or route control and information data between different networks.

Messages are sent directly from one communication interface module across the backplane to another. You can route a message through a maximum of four chassis (eight communication hops). You do not need a ControlLogix controller in the chassis.

NetLinx Open Network Architecture

NetLinx Open Network Architecture is the Rockwell Automation strategy of using open networking technology for seamless, top-floor to shop-floor integration. The NetLinx-based networks – DeviceNet, ControlNet, and EtherNet/IP – all use the Common Industrial Protocol (CIP), so they speak a common language and share a universal set of communication services. NetLinx architecture, part of the Integrated Architecture platform, seamlessly integrates all the components in an automation system from a few devices on one network to multiple devices on multiple networks including access to the Internet – helping you to improve flexibility, reduce installation costs, and increase productivity.

- The EtherNet/IP network is an open industrial-networking standard that supports implicit and explicit messaging and uses commercial, off-the-shelf Ethernet equipment and physical media.
- The ControlNet network allows intelligent, high-speed control devices to share the information required for supervisory control, work-cell coordination, operator interface, remote device configuration, programming, and troubleshooting.
- The DeviceNet network offers low-cost, high-speed access to plant-floor data from a broad range of plant-floor devices and a significant reduction in wiring.



Select a Network

You can configure your system for information exchange between a range of devices, computing platforms, and operating systems.

If your application requires	Use this network	Select
• Plant management (material handling) • Configuration, data collection, and control on a single, high-speed network • Time-critical applications with no established schedule • Data sent regularly • Internet/Intranet connection	EtherNet/IP network	1756-EN2F, 1756-EN2T 1756-ENBT 1756-EWEB
• High-speed transfer of time-critical data between controllers and I/O devices • Deterministic and repeatable data delivery • Media redundancy • Controller redundancy • Intrinsic safety • Redundant controller systems	ControlNet network	1756-CN2, 1756-CN2R 1756-CNB, 1756-CNBR
• Connections of low-level devices directly to plant floor controllers, without interfacing them through I/O modules • Data sent as needed • More diagnostics for improved data collection and fault detection • Less wiring and reduced start-up time than a traditional, hard-wired system	DeviceNet network	1756-DNB
• Plantwide and cell-level data sharing with program maintenance • Data sent regularly • Transfer of information between controllers	Data Highway Plus network	1756-DHRIO
• Connections between controllers and I/O adapters • Data sent regularly • Distributed control so that each controller has its own I/O and communicates with a supervisory controller	Remote I/O network	1756-DHRIO
• Fieldbus transmitters and actuators • Closed-loop control • Process automation	FOUNDATION Fieldbus network	1757-FFLD 1788-CN2FF
• Modems • Supervisory control and data acquisition (SCADA)	Serial network	Built-in serial port
• Connections to existing DH-485 networks	DH-485 network	Built-in serial port 1756-DH485

For more specialized communication requirements, select from these options.

If your application requires	Select
SynchLink fiber-optic communication to: • controllers. • power distribution systems. • PowerFlex 700S drives.	1756-SYNCH
Remote access to controllers.	9300-RADES 9300-RADKIT

EtherNet/IP Network

The Ethernet Industrial (EtherNet/IP) network protocol is an open industrial-networking standard that supports both real-time I/O messaging and message exchange. It emerged due to the high demand for using the Ethernet network for control applications. The EtherNet/IP network uses off-the-shelf Ethernet communication chips and physical media.

The EtherNet/IP network provides excellent drive and I/O control performance along with HMI information processing and many commercial technologies.

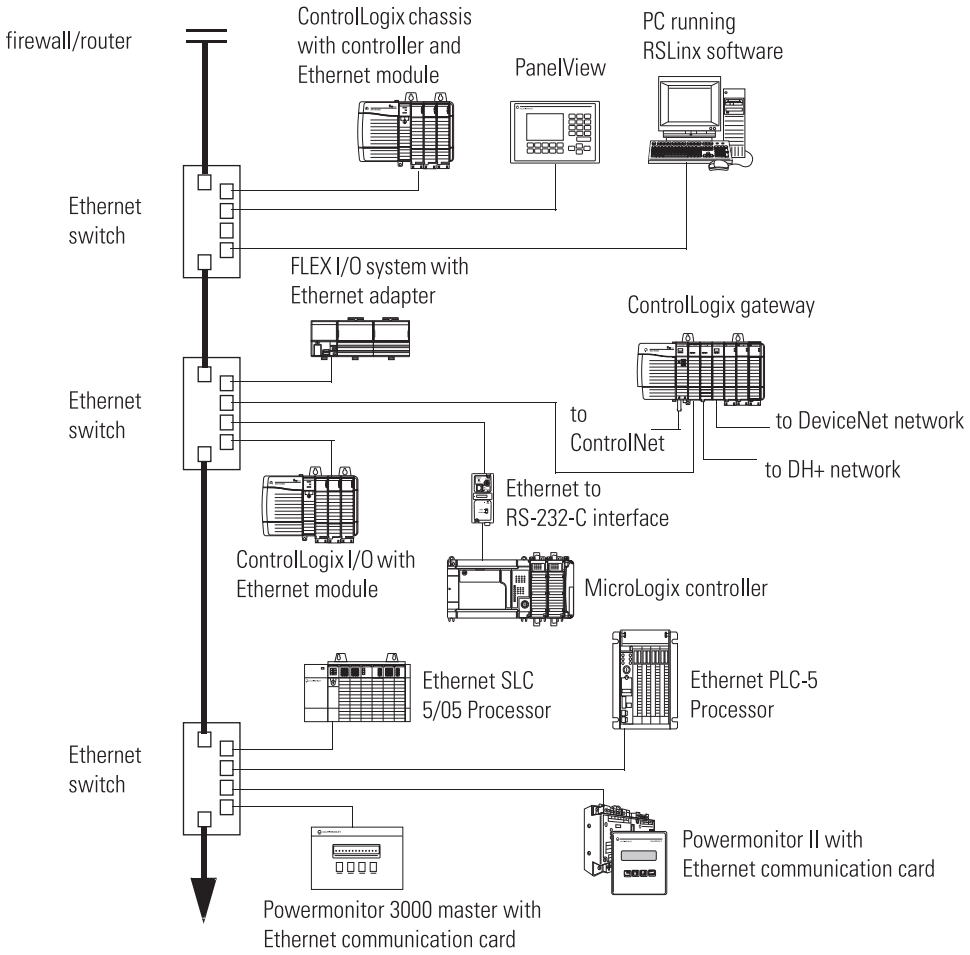
Select the appropriate controller and EtherNet/IP interface depending on the application and how the controller interacts with the devices.

If your application	Select	Description
• Controls I/O modules • Requires an adapter for disibuted I/O on EtherNet/IP links • Communicates with other EtherNet/IP devices (messages) • Bridges EtherNet/IP links to route messages to devices on other networks	1756-EN2F 1756-EN2T 1756-ENBT	The EtherNet/IP communication module: • controls I/O over an EtherNet/IP network. • acts as an adapter for distributed I/O on remote EtherNet/IP links. • routes messages to devices on other networks.
• Requires remote access via an Internet browser to tags in a local ControlLogix controller • Communicates with other EtherNet/IP or generic Ethernet devices (messaging only; no I/O control) • Bridges EtherNet/IP links to route messages to devices on other networks	1756-EWEB	The enhanced Web-server module provides Internet browser access so you can monitor and modify data remotely via XML Web pages. The Web-server module supports: • data access (read and write) to ControlLogix controllers. • bridging and routing of messages. • custom Web pages. • email capability. • open socket services.

Cat. No.	Communication Rate	Connections	Power Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
1756-EN2F	100 Mbps	Each module supports a maximum of: • 128 TCP/IP connections. • 256 Logix connections (I/O and information).	5.1 W	1 A	3 mA
1756-EN2T	10/100 Mbps		5.1 W	1 A	3 mA
1756-ENBT	10/100 Mbps	Each module supports a maximum of: • 64 TCP/IP connections. • 128 Logix connections (I/O and information).	3.65 W	700 mA	3 mA
1756-EWEB			3.65 W	700 mA	3 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick

Typical EtherNet/IP Configuration



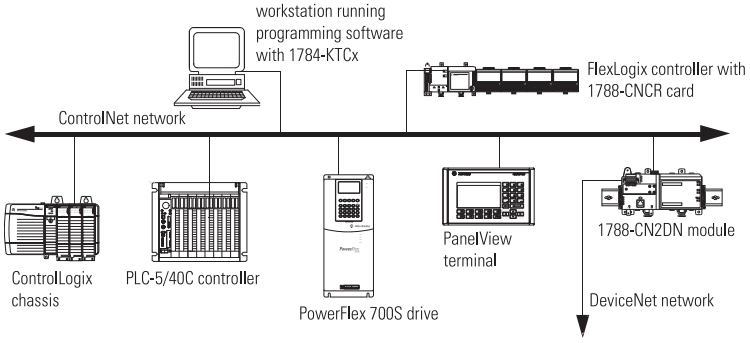
ControlNet Network

The ControlNet network is an open, state-of-the-art control network that meets the demands of real-time, high-throughput applications. The ControlNet network uses the proven Common Industrial Protocol (CIP) to combine the functionality of an I/O network and a peer-to-peer network providing high-speed performance for both functions.

The ControlNet network gives you deterministic, repeatable transfers of all mission-critical control data in addition to supporting transfers of non-time-critical data. I/O updates and controller-to-controller interlocking always take precedence over program uploads and downloads and messaging.

Cat. No.	Communication Rate	Connections	Cable	Power Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
1756-CN2	5 Mbps • Standalone controller systems only	100 (any combination of scheduled and unscheduled)	RG-6 coaxial cable 1786-RG6 (shield high flex cable) 1786-RG6F (quad shield high flex coax cable) 1786-XT termination resistor Choose taps: • 1786-TPR (T-tap right angle) • 1786-TPS (T-tap straight) • 1786-TPYR (Y-tap right angle) • 1786-TPYS (Y-tap straight)	5.14 W	970 mA	1.7 mA
1756-CN2R	5 Mbps • Standalone controller systems only • Redundant media			5.14 W	970 mA	1.7 mA
1756-CNB	5 Mbps • Standalone and redundant controller systems	40...48 (any combination of scheduled and unscheduled)		5.14 W	970 mA	1.7 mA
1756-CNBR	5 Mbps • Standalone and redundant controller systems • Redundant media			5.14 W	970 mA	1.7 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick



Connect to Other Devices via a ControlNet Network

The RSLogix 5000 Enterprise Series software supports a generic ControlNet module that allows connections to ControlNet nodes for which there is no specific support currently available in the programming software. A module configured as a generic ControlNet module communicates with the controller in the form of input, output, status, and configuration tags. These tags and their characteristics vary depending on the type of module.

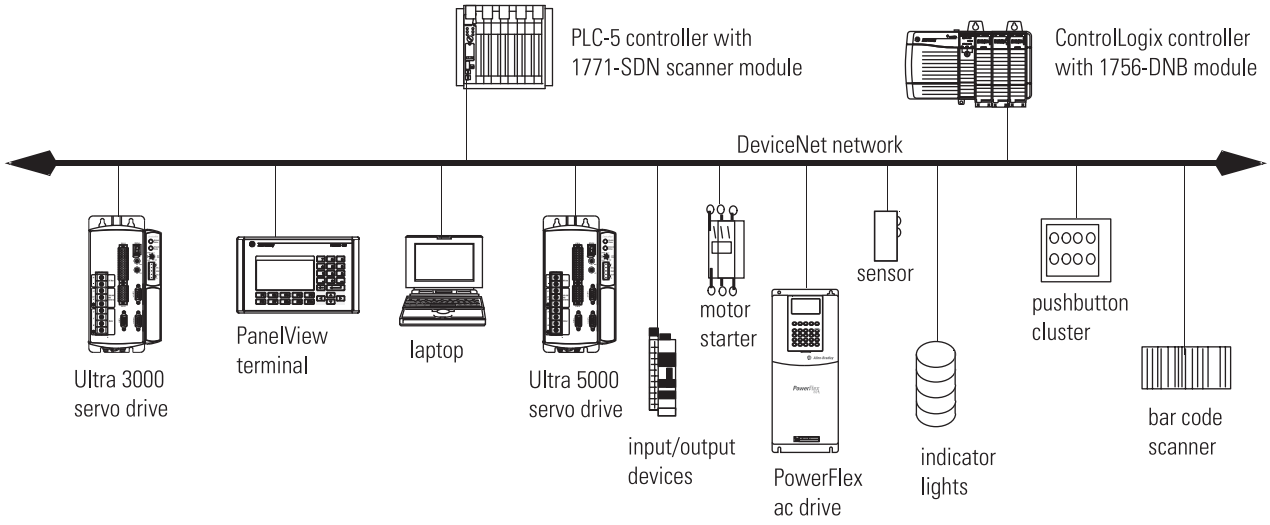
For example, use the generic module configuration to set up communication between a ControlLogix controller and a 1203-CN1 ControlNet communication module. Then use the CIP generic MSG instruction type to send and receive messages from the 1203-CN1 module.

DeviceNet Network

The DeviceNet network is an open low-level network that provides connections between simple industrial devices (such as sensors and actuators) and higher-level devices (such as PLC controllers and computers). The DeviceNet network uses the proven Common Industrial Protocol (CIP) to provide the control, configure, and data collection capabilities for industrial devices.

Cat. No.	Communication Rate	Connections	Cable	Power Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
1756-DNB series C	• 125 Kbps • 250 Kbps • 500 Kbps	2 connections to dedicated ControlLogix controller	Choose: • KwikLink™ flat media • Thick-trunk round media • Thin-trunk round media	5.8 W	850 mA	3 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick



Safety Networks

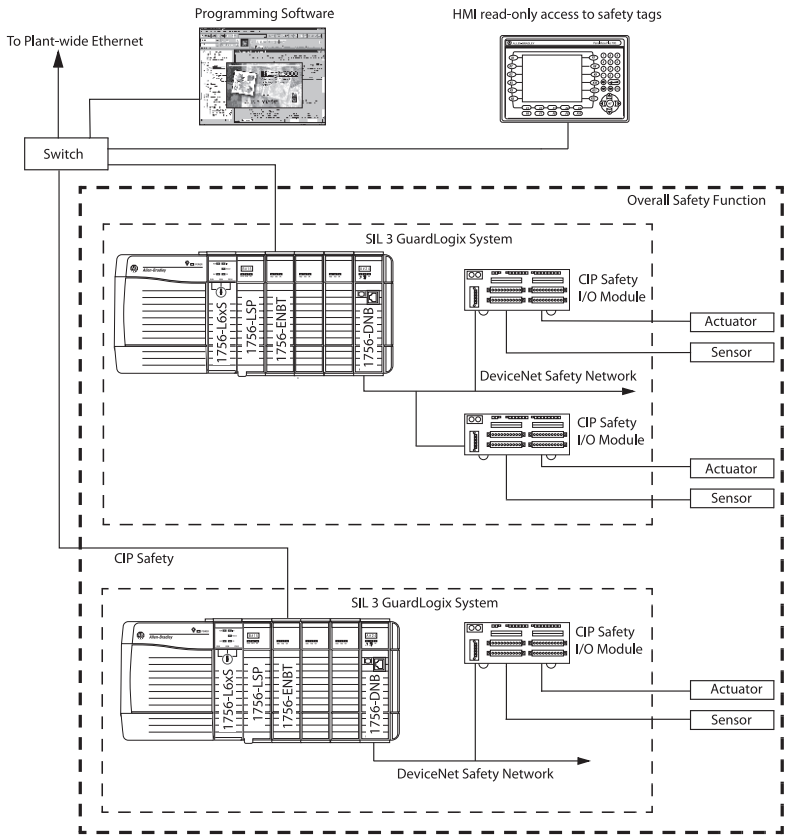
Safety-related communication between GuardLogix controllers takes place via produced and consumed safety tags. These safety tags use the CIP Safety protocol, which is designed to preserve data integrity during communication.

Select a Safety Network

These communication interface modules use the CIP Safety procotol.

Safety Network	Description
EtherNet/IP network	The 1756-ENBT module provides safety interlocking between GuardLogix controllers on an EtherNet/IP network. The GuardLogix controller supports the ability to produce (broadcast) and consume (receive) system-shared tags over the Ethernet/IP network.
ControlNet network	The 1756-CNB, 1756-CNBR module provides safety interlocking between GuardLogix controllers on a ControlNet network. The GuardLogix controller supports the ability to produce (broadcast) and consume (receive) system-shared tags over the ControlNet network.
DeviceNet network	A 1756-DNB module communicates and exchanges data with DeviceNet Safety I/O modules. You can use both standard and safety DeviceNet networks, but you must not use standard data in the safety program. Field DeviceNet Safety I/O can be connected to safety input and output devices, allowing these devices to be controlled by the GuardLogix control system.
Serial network	The built-in serial port of the GuardLogix controller supports the same serial communication as the built-in serial port in all Logix controllers.

Typical Safety Configuration with GuardLogix Controllers



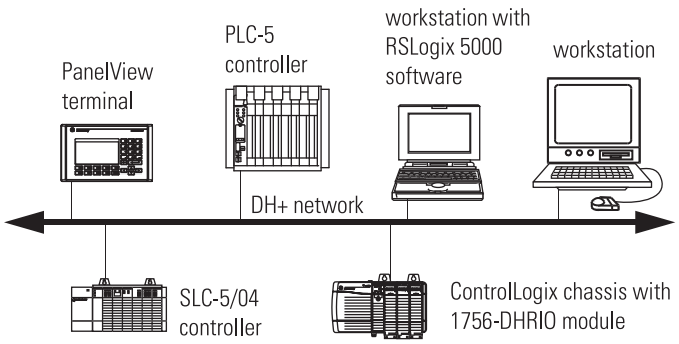
DH+ and Remote I/O Networks

The DH+ and remote I/O module supports messaging between devices on DH+ networks. The remote I/O functionality enables the module to act as a scanner for transferring digital and block-transfer data to and from remote I/O devices.

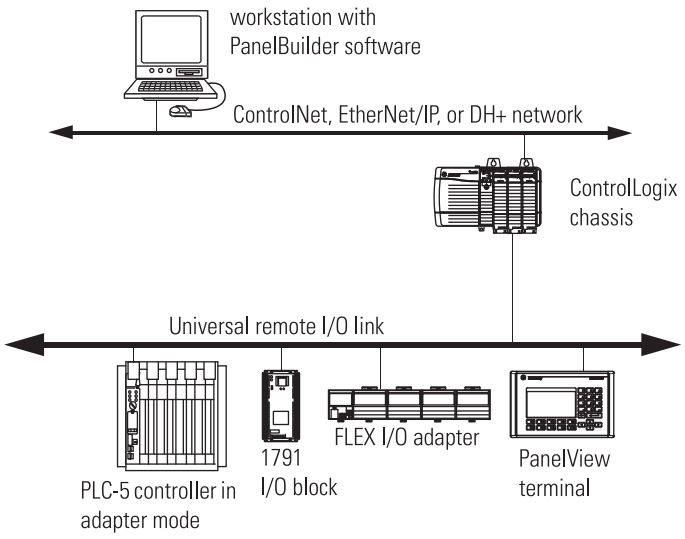
Cat. No.	Communication Rate	Connections	Cable	Power Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
1756-DHRIO	• 57.6 Kbps • 115.2 Kbps • 230.4 Kbps	32 DH+ messages per module 32 logical rack connections per remote I/O channel 16 block-transfer connections per remote I/O channel	1770-CD Belden 9463 150 Ω and 82 Ω termination resistors ship with the module	4.5 W	850 mA	1.7 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick

Typical DH+ Configuration



Typical Remote I/O Configuration



FOUNDATION Fieldbus Network

FOUNDATION Fieldbus is a communication network created by the Fieldbus Foundation. It is a protocol designed for robust, distributed control of process control applications. Devices connected by a FOUNDATION Fieldbus network can be used for sophisticated, highly-distributed process control.

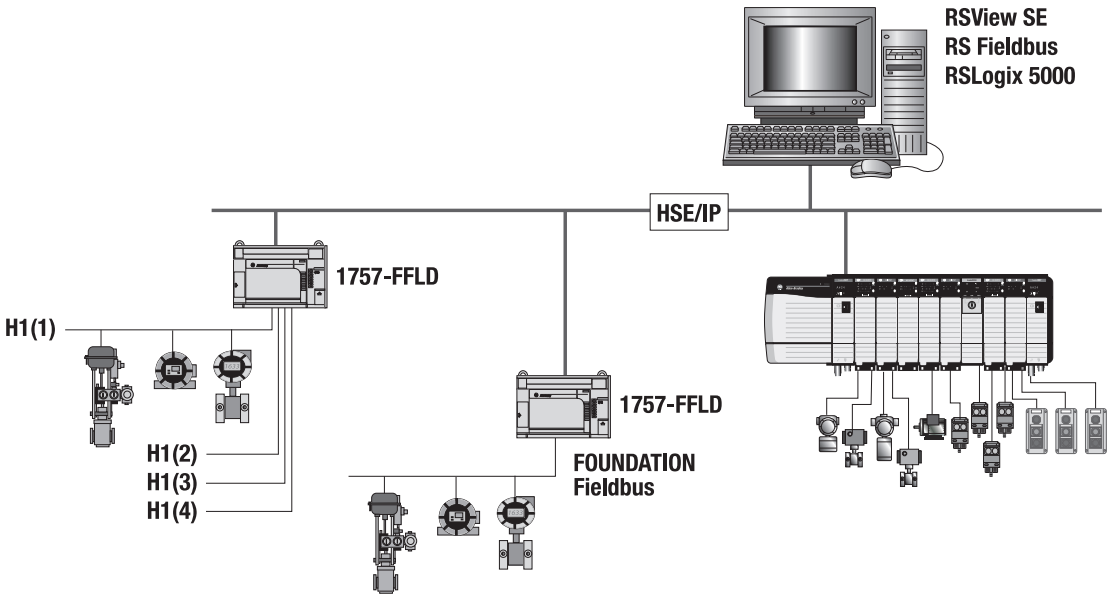
Select the appropriate FOUNDATION Fieldbus interface.

If your application bridges from	Select	Description
EtherNet/IP	1757-FFLD2 1757-FFLD4	The 1756-FFLD*x* linking device bridges from an Ethernet network to either two or four H1 ports. Each H1 port can support the recommended maximum 8 to 10 devices. Each H1 network can support a maximum of 16 publisher and 16 subscriber VCR connections.
ControlNet	1757-FFLDC2 1757-FFLDC4	The 1756-FFLDC*x* linking device bridges from a ControlNet network to either two or four H1 ports. Each H1 port can support the recommended maximum 8 to 10 devices. Each H1 network can support a maximum of 64 publisher and 64 subscriber VCR connections. The 1757-FFLDC is compatible with ControlLogix redundancy and supports redundant ControlNet media.

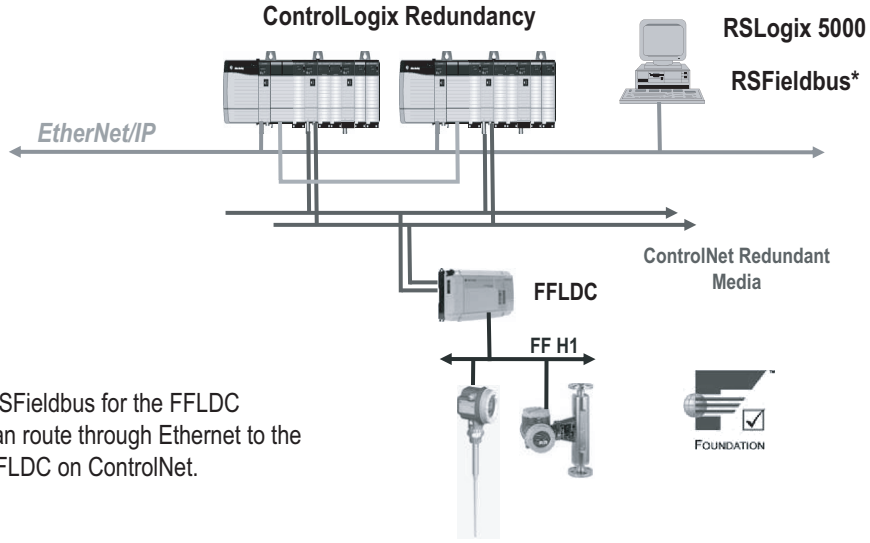
Cat. No.	Communication Rate	Connections	Power Requirement
1757-FFLD2	10/100 Mbps over EtherNet/IP 31.25 Kbps over Fieldbus	Two H1 networks	300 mA
1757-FFLD4		Four H1 networks	300 mA
1757-FFLDC2	5 Mbps over ControlNet 31.25 Kbps over Fieldbus	Two H1 networks	300 mA
1757-FFLDC4		Four H1 networks	300 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick

Typical EtherNet/IP 1757-FFLD Configuration



Typical ControlNet 1757-FFLDC Configuration

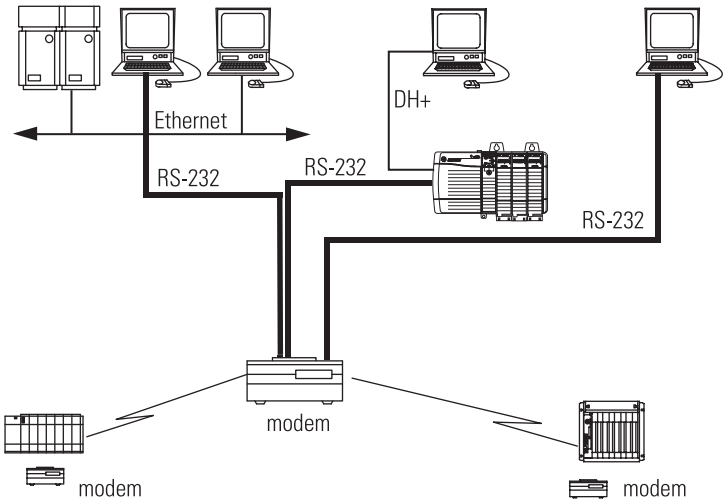


RSFieldbus for the FFLDC can route through Ethernet to the FFLDC on ControlNet.

Serial Network

The serial port is compatible with RS-232 serial communication. The serial port supports the DF1 protocol to communicate with other devices on the serial link.

Use this DF1 mode	For
Point to point	Communication between a controller and other DF1-compatible devices using DF1 full-duplex protocol.
DF1 radio modem	SCADA applications where controllers exchange data via radio transmission.
DF1 master	Control of polling and message transmission between the master and each slave using DF1 half-duplex polled protocol.
DF1 slave	Using the controller as a slave station in a master/slave serial network using DF1 half-duplex protocol.
User mode (ASCII)	Communication between a controller and an ASCII device, such as a bar code reader.



Modbus Support

To use Logix5000 controllers on Modbus, you connect through the serial port and execute a specific ladder logic routine. The controller project is available with RSLogix 5000 Enterprise programming software. For more information, see Using Logix5000 Controllers as Masters or Slaves on Modbus Application Solution, publication CIG-AP129.

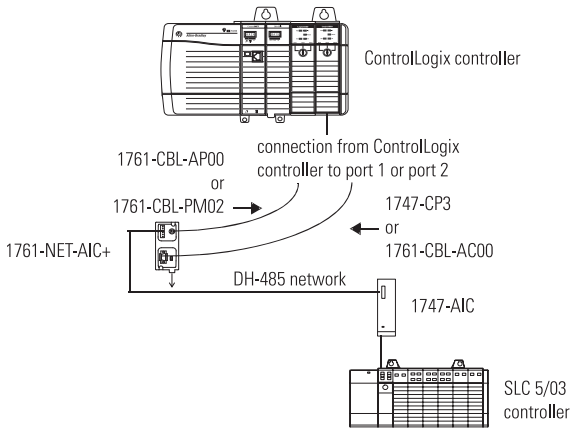
DH-485 Network

On the DH-485 network, the controller can send and receive messages to and from other controllers on the network. The DH-485 connection does support remote programming and monitoring via RSLogix 5000 software. However, excessive traffic over a DH-485 connection can adversely affect overall performance and can lead to timeouts and loss in RSLogix 5000 configuration performance.

Important: Use Logix5000 controllers on DH-485 networks only when you want to add controllers to an existing DH-485 network. For new applications with Logix5000 controllers, networks in the NetLinx open architecture are the recommended networks.

You need a 1761-NET-AIC converter for each controller you want to put on the DH-485 network. You can have two controllers per one 1761-NET-AIC converter, but you need a different cable for each controller. Connect one controller to port 1 (9-pin connector) and one controller to port 2 (mini-DIN connector).

To connect to this port	Use this cable
Port 1 DB-9 RS-232, DTE connection	1747-CP3 or 1761-CBL-AC00
Port 2 mini-DIN 8 RS-232 connection	1761-CBL-AP00 or 1761-CBL-PM02



1756-DH485 Communication Module

The 1756-DH485 module provides two 9-pin connector, D-shell, DH-485 connections. You need a 1761-NET-AIC converter to directly connect the module to a DH-485 network.

Cat. No.	Communication Rate	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V	Power Dissipation
1756-DH485	19.2 Kbps (default) and 9600 Kbps	850 mA	1.7 mA	4.5 W

SynchLink Communication

The SynchLink module provides time synchronization and data broadcasting capabilities for distributed motion and coordinated drive control.

1756-SYNCH SynchLink Module

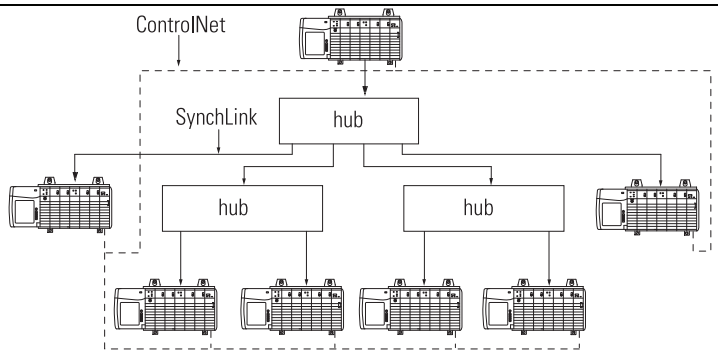
The 1756-SYNCH SynchLink module connects a ControlLogix chassis to a SynchLink fiber-optic communication link. The module:

- coordinates CST time across multiple ControlLogix chassis.
- moves a limited amount of data from one chassis to another at a high speed.
- lets one controller consume motion axes data from a controller in another chassis.

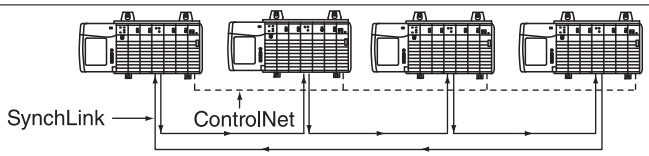
Cat. No.	Communication Rate	Cable	Power Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
1756-SYNCH	Operating wavelength: 650 nm (red) Data rate: 5 Mbps Baud rate: 5 Mbps	Order 1403-CF*xxx* cable or from Lucent Technologies, Specialty Fiber Technologies division✶ Length 200/230 micron Hard Clad Silica (HCS) Versalink V-System1…300 m (3.28...984.25 ft)	6.19 W	1200 mA	2.5 mA

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE
✶The *xxx* determines the length. Select 001, 003, 005, 010, 020, 050, 100, or 250 meters.

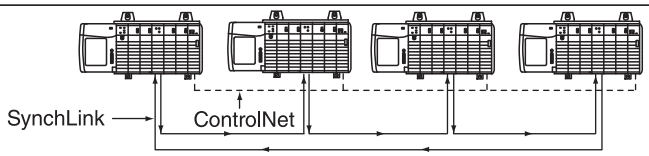
Star configuration
Requires:
1751-SLBA base block
1751-SL4SP four-port splitter block
Supports:
2 layers of hubs
16 end nodes per hub
257 nodes (including master node) per star network



Daisy chain configuration
Optional:
1751-SLBP bypass switch block
Supports:
10 nodes (including master and end nodes) per daisy chain network



Ring configuration
Optional:
1751-SLBP bypass switch block
Supports:
10 nodes (including master and end nodes) per ring network



Access the Controller Remotely

Remote access dial-in kits let you connect via modem to a remote site's network and controller. Once connected, you can monitor the process, collect data, and make program changes remotely. Each remote access dial-in kit includes a:

- pre-configured modem.
- communication module.
- DIN rail mounting hardware.
- associated cables.

Each kit also includes a CD-ROM-based installation guide and tutorial that takes you step-by-step through establishing a remote dial-in connection.

The modem supports remote configuration, so you can modify the remote network modem's command settings through a dial-up connection. This helps you recover modem communication if a change occurs in the controller's channel configuration.

The remote access modem also has call-back security that is authenticated with a password.

Cat. No.	Communication	Supported Controllers	Power Requirements
9300-RADES	56 Kbps modem connection to devices on an Ethernet network	• ControlLogix, CompactLogix, FlexLogix controllers • MicroLogix controllers • Enhanced PLC-5 processors • SLC 5/03, 5/04, 5/05 processors • 1203-SSS	8...48V dc 200 mA at 24V dc
9300-RADKIT	56 Kbps modem connection to devices on DH+ or DH-485 network		8...48V dc 100 mA at 12V dc

Step 4 - Select:

- *A controller with sufficient memory*
- *1784-CFxxCompactFlash card for each 1756-L6x controller*
- *1756-BA2 for 1756-L6x series B controllers*
- *Replacement batteries*

1756 ControlLogix Controllers

The ControlLogix controller provides a scalable controller solution that is capable of addressing a large amount of I/O points.

The ControlLogix controller can be placed into any slot of a ControlLogix I/O chassis and multiple controllers can be installed in the same chassis. Multiple controllers in the same chassis communicate with each other over the backplane (just as controllers can communicate over networks) but operate independently.

ControlLogix controllers can monitor and control I/O across the ControlLogix backplane, as well as over I/O links. ControlLogix controllers can communicate with computers or other processors across RS-232-C (DF1/DH-485 protocol), DeviceNet, DH+, ControlNet, and EtherNet/IP networks. To provide communication for a ControlLogix controller, install the appropriate communication interface module into the chassis.

The multitasking operating system supports 32 configurable tasks that can be prioritized. One task can be continuous. The others must be periodic or event tasks. Each task can have as many as 100 programs, each with its own local data and logic, allowing virtual machines to operate independently within the same controller.

Specification	Description
Battery✶	1756-BA1 for series A controllers 1756-BA2 for 1756-L6*x*, series B controllers 1756-BATM (contains a 1756-BATA battery assembly) for series A controllers
Programming cable	1756-CP3 or 1747-CP3 serial cable

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM (1756-L6x controllers only), C-Tick, EEx ATEX
✶For Australian Mining certification, use a 1756-BA1 battery. For guidelines, see your local distributor or sales office.

ControlLogix Controllers

Cat. No.	Memory			Power Dissipation, Max.	Thermal Dissipation, Max.	Backplane Current (mA) at 5V	Backplane Current (mA) at 24V
	Available User Memory✶	I/O Memory❄	CompactFlash‡				
1756-L61	2 MB	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L61S	2 MB Standard 1 MB Safety	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L62	4 MB	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L62S	4 MB Standard 1 MB Safety	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L63	8 MB	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L64	16 MB	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L65	32 MB	478 KB	Yes	3.5 W	11.9 BTU/hr	1200 mA	14 mA
1756-L60M03SE❖	750 KB	478 KB	Yes	8.5 W	11.9 BTU/hr	1960 mA	6 mA
1756-LSP	NA - Safety Partner	NA	NA	3.5 W	11.9 BTU/hr	1200 mA	14 mA

✶User memory stores: tags other than I/O, produced, or consumed tags; logic routines; and communication with OPC/DDE tags that use RSLinx software.
❄I/O memory stores: I/O tags, produced tags, consumed tags, communication via Message (MSG) instructions, communication with workstations, and communication with OPC/DDE tags that use RSLinx software.
‡Supports a 1784-CF64 or 1784-CF128 Industrial CompactFlash card.
❖The 1756-L60M03SE is a 1756-L60 ControlLogix controller with an embedded 1756-M03SE SERCOS interface. This is a 2-slot module.

The 1756-L60M03SE controller combines a 1756-L6*x* controller and a SERCOS motion module in a two-slot module. This controller is ideal for small motion systems and can control three SERCOS axes with the included interface. This controller can control as many as six axes if you add an additional motion module.

Select a Controller for a Safety System

If you are designing a safety controller system, consider:

- SIL 2 safety systems use standard ControlLogix controllers. See Using ControlLogix in SIL 2 Applications Safety Reference Manual, publication 1756-RM001.
- SIL 3 safety systems use GuardLogix controllers (1756-L61S, 1756-L62S) and the Safety Partner (1756-LSP). See GuardLogix Controllers Systems Safety Reference Manual, publication 1756-RM093.

Select a Controller for a Redundant Controller System

If you are designing a redundant controller system, you need:

- Same size for each redundant chassis with the same slot assignments in each chassis.
- One 1756-RM module per chassis, which supports:
  — two 1756-L61, 1756-L62, 1761-L63 controllers or one 1756-L64 controller
  — maximum of 7 communication modules, which can be 1756-CN2, 1756-CN2R series B, and 1756-EN2T modules
  or
  One 1757-SRM module per chassis, which supports:
  — one 1756-L61, 1756-L62, 1756-L63, 1756-L64 controller
  — maximum of 7 communication modules, which can be 1756-CNB, 1756-CNBR, and 1756-ENBT modules

Cat. No.	Supports	Cable	Power Dissipation, Max.	Thermal Dissipation, Max.	Backplane Current
1756-RM	Supports:: • Two 1756-L61, 1756-L62, 1756-L63 controllers per chassis • One 1756-L64 controller per chassis • 1756-CN2, 1756-CN2R series B module • 1756-EN2T module	Choose: • 1756-RMC1, 1 m (3.28 ft) • 1756-RMc3, 3 m (9.84 ft) • 1756-RMC10, 10 m (32.81 ft)	9.0 W	31 BTU/hr	4 mA @ 1.2V dc 120 mA @ 24V dc 1.2 A @ 5.1V dc
1757-SRM	Supports: • One 1756-L61, 1756-L62, 1756-L63, 1756-L64 controller per chassis • 1756-CNB, 1756-CNBR module • 1756-ENBT module	Choose: • 1757-SRC1, 1 m (3.28 ft) • 1757-SRC3, 3 m (9.84 ft) • 1757-SRC10, 10 m (32.81 ft) • 1757-SRC50, 50 m (164.04 ft) • 1757-SRC100, 100 m (328.08 ft)	9.6 W	38.49 BTU/hr	0.75 A @ 3.3V dc 1.0 A @ 5.1V dc 0.160 A @ 24V dc

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick

Determine Memory Requirements

The following equations provide an estimate of the memory needed for a controller. These numbers are rough estimates.

Controller Tasks	_____ * 4000	=	_____ bytes (minimum 1 task)
Digital I/O points	_____ * 400	=	_____ bytes
Analog I/O points	_____ * 2600	=	_____ bytes
Communication modules✞	_____ * 2000	=	_____ bytes
Motion axes	_____ * 8000	=	_____ bytes

✞When estimating memory use by communication modules, count all the communication modules in the system, not just those in the local chassis. This includes device connection modules, adapter modules, and ports on PanelView terminals.

For redundant controller systems, double the memory estimate you calculate. For example, if you estimate you need 2 MB of memory, select a controller with 4 MB of memory.

CompactFlash Memory

The CompactFlash card offers nonvolatile memory (flash) to permanently store a user program and tag data on a controller.

- 1784-CF64 has 64 MB of memory.
- 1784-CF128 has 128 MB of memory.

The 1756-L6*x* controllers support a removable CompactFlash card for nonvolatile memory. You install the CompactFlash card in a socket on the controller. The CompactFlash card stores the user program, tag data, and controller firmware. This lets you upgrade firmware on a 1756-L6*x* controllers without using RSLogix 5000 software or ControlFlash software.

Determine Battery Requirements

Each controller ships with a battery.

Cat. No.	Description	Estimated Worst Case Battery Life
1756-BA1	Lithium battery (0.59 g) installed in each ControlLogix controller. Order only if you need a replacement.	Estimate @ 25 °C (77 °F) • Series A 1756-L6*x*: 21 days • 1756-L60M03SE: 21 days
1756-BATM	Externally mounted battery assembly. Provides longer battery life than the 1756-BA1. Contains: • One 1756-BATA assembly • 1 m (3.28 ft) cable to connect housing to controller	Estimate @ 25 °C (77 °F) • Series A 1756-L6*x*: 146 days
1756-BATA	Lithium battery assembly (maximum of 5 g lithium per each D cell; assembly contains 2 D cells) included with the 1756-BATM. Order only if you need a replacement.	
1756-BA2	Lithium battery (0.59 g) installed in each 1756-L6*x* series B controller. Order only if you need a replacement.	Estimate @ 60 °C (140 °F) • Series B 1756-L6*x*: 8 months

Controller	1756-BATM	1756-BATA	1756-BA1	1756-BA2
1756-L60M03SE	Highly recommended	For a replacement	For a replacement	Not supported
1756-L61	Highly recommended Series A only	For a replacement Series A only	Series A only	Series B only
1756-L61S	Not supported	Not supported	Not supported	Only battery supported
1756-L62	Highly recommended Series A only	For a replacement Series A only	Series A only	Series B only
1756-L62S	Not supported	Not supported	Not supported	Only battery supported
1756-L63	Highly recommended Series A only	For a replacement Series A only	Series A only	Series B only
1756-L64	Not supported	Not supported	Not supported	Only battery supported
1756-L65	Not supported	Not supported	Not supported	Only battery supported
1756-LSP Safety partner	Not supported	Not supported	Not supported	Only battery supported

Compatibility

Control Distributed I/O Modules

The ControlLogix controller can control these distributed I/O modules using the I/O Configuration tree in RSLogix 5000 programming software.

I/O Modules	EtherNet/IP	ControlNet	DeviceNet	Remote I/O
1732 ArmorBlock I/O	Yes	No	Yes	No
1734 POINT I/O	Yes	Yes	Yes	No
1734D POINTBlock I/O	No	No	Yes	No
1738 ArmorPoint I/O	Yes	Yes	Yes	No
1746 SLC I/O	No	No	No	Yes
1756 ControlLogix I/O	Yes	Yes	No	No
1769 Compact I/O	No	No	Yes	No
1771 Universal I/O	No	Yes	No	Yes
1790, 1790D, 1790P CompactBlock LDX I/O	No	No	Yes	No
1791D, 1791P, 1791R CompactBlock I/O	No	No	Yes	No
1792D ArmorBlock MaXum I/O	No	No	Yes	No
1794 FLEX I/O	Yes	Yes	Yes	Yes
1797 FLEX Ex I/O	No	Yes	No	No
1799 Embedded I/O	No	No	Yes	No

Communicate with Display Devices

The ControlLogix controller can communicate with these display devices.

Display Devices	EtherNet/IP	ControlNet	DeviceNet	DH+	Remote I/O	RS-232 (DF1)	DH-485
PanelView Plus and PanelView CE terminal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VersaView industrial computer	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PanelView standard terminal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PanelView enhanced terminal	No	Yes	No	Yes	Yes	No	No
InView message display	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Communicate with Other Controllers

Controller	EtherNet/IP	ControlNet	DeviceNet	DH+	RS-232 (DF1)	DH-485♣
1756 ControlLogix 1756 GuardLogix	Yes	Yes	Yes	Yes	Yes	Yes
1768, 1769 CompactLogix	Yes	Yes	Yes	No	Yes	Yes
1789 SoftLogix5800	Yes	Yes	Yes	No	Yes	No
1794 FlexLogix	Yes	Yes	Yes	No	Yes	Yes
PowerFlex with DriveLogix	Yes	Yes	Yes	No	Yes	Yes
1785 PLC-5	Yes✶❄	Yes	Yes‡	Yes	Yes	N/A
1747 SLC	Yes§	Yes	Yes‡	Yes	Yes	Yes
1761 MicroLogix	Yes	No	Yes‡	No	Yes	Yes
1762 MicroLogix	Yes	No	Yes‡	No	Yes	Yes
1763 MicroLogix	Yes	No	Yes‡	No	Yes	Yes
1764 MicroLogix	Yes	No	Yes‡	No	Yes	Yes
1772 PLC-2	N/A	N/A	N/A	Yes➤	Yes⌘	N/A
1775 PLC-3	N/A	N/A	N/A	Yes✦	Yes❖	N/A
5250 PLC-5/250	N/A	N/A	No	Yes	Yes	N/A

✶The Ethernet PLC-5 controller must be series C, firmware revision N.1 or later; series D, firmware revision E.1 or later; or series E, firmware revision D.1 or later.
❄The 1785-ENET Ethernet communication interface module must be series A, firmware revision D or later.
‡The PLC-5, SLC, and MicroLogix processors appear as I/O points to the Logix controller. Use the appropriate DeviceNet interface for the controller.
§Use a 1747-L55*x* controller with OS501 or greater.
➤The PLC-2 controller requires a 1785-KA module for DH+ communications.
⌘The PLC-2 controller requires a 1771-KG module for serial (DF1) communications.
✦The PLC-3 controller requires a 1775-S5 module for DH+ communications.
❖The PLC-3 controller requires a 1775-KA module for serial (DF1) communications.
♣The 1756-DH485 module supports full DH-485 functionality.

Communicate with Other Communication Devices

The ControlLogix controller can communicate with these communication devices.

Communication Device	EtherNet/IP	ControlNet	DeviceNet	DH+	RS-232 (DF1)	DH-485
1770-KFC15, 1770-KFCD15, 1747-KFC15	N/A	Yes	N/A	N/A	N/A	N/A
1770-KFD, 1770-KFG	N/A	N/A	Yes	N/A	N/A	N/A
9355 RSLinx software	Yes	Yes	No	Yes	Yes	No
1784-PCC, 1784-PCIC, 1784-PCICS, 1784-PKTCS, 1784-KTCS, 1784-KTCX15	N/A	Yes	N/A	N/A	N/A	N/A
1784-PCD, 1784-PCID, 1784-PCIDS, 1784-CPCIDS	N/A	N/A	Yes	N/A	N/A	N/A
1784-PCMK, 1784-PKTX, 1784-PKTXD, 1784-KT, 1784-KTX, 1784-KTXD	N/A	N/A	N/A	Yes	N/A	N/A
1788-CN2DN	N/A	Yes	Yes	N/A	N/A	N/A
1788-EN2DN	Yes	N/A	Yes	N/A	N/A	N/A
1788-CN2FF	N/A	Yes	N/A	N/A	N/A	N/A
1203-CN	N/A	Yes✶	N/A	N/A	N/A	N/A
1203-FM1/FB1 SCANport	N/A	Yes❄	N/A	N/A	N/A	N/A

✶Use the generic module configuration to configure the 1203-CN1 module and a CIP generic MSG instruction to communicate with the module.
❄Use a CIP generic MSG instruction to communicate with the 1203-FM1 SCANport module on a DIN rail that is remote to the controller. The remote DIN rail also requires a 1794-ACN(R)15 ControlNet adapter module.

How a Logix System Uses Connections

A Logix system uses a connection to establish a communication link between two devices. Connections can be:

- controller to local I/O modules or local communication modules.
- controller to remote I/O or remote communication modules.
- controller to remote I/O (rack-optimized) modules.
- produced and consumed tags.
- messages.

You indirectly determine the number of connections the controller uses by configuring the controller to communicate with other devices in the system.

Method	Description
Scheduled connection • Level of determinism • Unique to the ControlNet network	A scheduled connection is unique to ControlNet communication. A scheduled connection lets you send and receive data repeatedly at a predetermined interval, which is the requested packet interval (RPI). For example, a connection to an I/O module is a scheduled connection because you repeatedly receive data from the module at a specified interval. Other scheduled connections include connections to: • communication devices. • produced/consumed tags. On a ControlNet network, you must use RSNetWorx for ControlNet software to enable all scheduled connections and establish a network update time (NUT).
Unscheduled connection • Deterministic • Used by both ControlNet and EtherNet/IP networks	An unscheduled connection is a message transfer between controllers that is triggered by the requested packet interval (RPI) or the program (such as a MSG instruction). Unscheduled messaging lets you send and receive data when needed. All EtherNet/IP connections are unscheduled.
Unconnected message • Least deterministic	An unconnected message is a message that does not require connection resources. An unconnected message is sent as a single request/response.

The communication module you select determines the number of connections you have available for I/O and messages.

This communication module	Supports this number of connections
1756-CN2, 1756-CN2R	100 (any combination of scheduled and unscheduled)
1756-CNB, 1756-CNBR	40...48 (any combination of scheduled and unscheduled)
1756-EN2F, 1756-EN2T	128 TCP/IP connections 256 Logix connections
1756-ENBT	64 TCP/IP connections 128 Logix connections

Determine Total Connection Use

The ControlLogix controller supports 250 connections. To calculate the total connections for a controller, consider the connections to local I/O modules and the connections to remote modules.

Use the following table to tally **local** connections.

Connection Type	Device Quantity	Connections per Device	Total Connections
Local I/O module (always a direct connection)		1	
1756-M16SE, 1756-M08SE, 1756-M02AE, 1756-M02AS, 1756-HYD02 module 1756-L60M03SE controller		3	
1756-CN2, 1756-CN2R communication module 1756-CNB, 1756-CNBR communication module		0	
1756-EN2F, 1756-EN2T communication module 1756-ENBT, 1756-EWEB communication module		0	
1756-DNB communication module		2	
1756-DHRIO communication module		1	
1756-DH485 communication module		1	
Total			

Regardless of how you configure local I/O modules (rack-optimized or direct connect), the controller establishes a direct connection for each local I/O module.

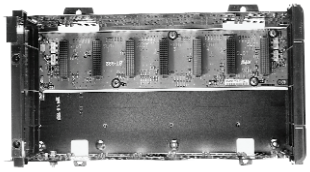
Remote connections depend on the communication module. The number of connections the module itself supports determines how many connections the controller can access through that module. Use the following table to tally **remote** connections for the controller.

Connection Type	Device Quantity	Connections per Device	Total Connections
Remote ControlNet communication module Configured as a direct (none) connection Configured as a rack-optimized connection		0 **or** 1	
Remote I/O module over a ControlNet network (direct connection)		1	
Remote Ethernet communication module Configured as a direct (none) connection Configured as a rack-optimized connection		0 **or** 1	
Remote I/O module over an EtherNet/IP network (direct connection)		1	
Remote device over a DeviceNet network (accounted for in rack-optimized connection for local 1756-DNB module)		0	
Other remote communication adapter		1	
Produced tag		1	
Each consumer		1	
Consumed tag		1	
Cached message		1	
Block-transfer message		1	
Total			

Step 5 - Select:

- *A chassis with sufficient slots*
- *1756-N2 filler strips for empty slots*

ControlLogix Chassis



The ControlLogix system is a modular system that requires a 1756 I/O chassis. Chassis are available in sizes of 4, 7, 10, 13, and 17 module slots. You can place any module into any slot.

The backplane provides a high-speed communication path between modules. Multiple controller modules on the backplane can pass messages between one another. With multiple communication interface modules on the backplane, a message can be sent from across a link into a port on one module, routed across the backplane and out another module's port, and sent across another link to its ultimate destination.

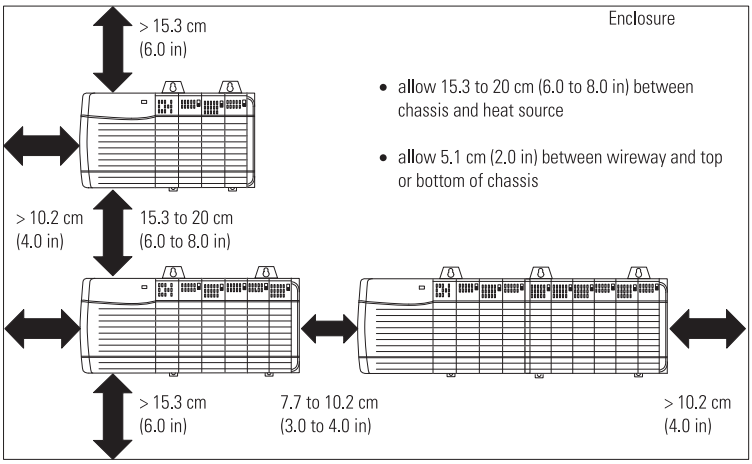
Cat. No.	Slots	Weight, Approx.	Dimensions (HxWxD), Approx.	Cabinet Size (HxWxD)	Backplane Current (mA)
1756-A4	4	0.75 kg (1.7 lb)	137 x 263 x 145 mm (5.4 x 10.4 x 5.8 in.)	508 x 508 x 203 mm (20 x 20 x 8 in.)	4.0 @ 3.3V dc 15.0 A @ 5V dc 2.8 A @ 24V dc
1756-A7	7	1.10 kg (2.4 lb)	137 x 368 x 145 mm (5.4 x 14.5 x 5.8 in.)	508 x 610 x 203 mm (20 x 24 x 8 in.)	
1756-A10	10	1.45 kg (3.2 lb)	137 x 483 x 145 mm (5.4 x 19.0 x 5.8 in.)	508 x 762 x 203 mm (20 x 30 x 8 in.)	
1756-A13	13	1.90 kg (4.2 lb)	137 x 588 x 145 mm (5.4 x 23.2 x 5.8 in.)	610 x 762 x 203 mm (24 x 30 x 8 in.)	
1756-A17	17	2.20 kg (4.8 lb)	137 x 738 x 145 mm (5.4 x 29.1 x 5.8 in.)	762 x 914 x 203 mm (30 x 36 x 8 in.)	

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM

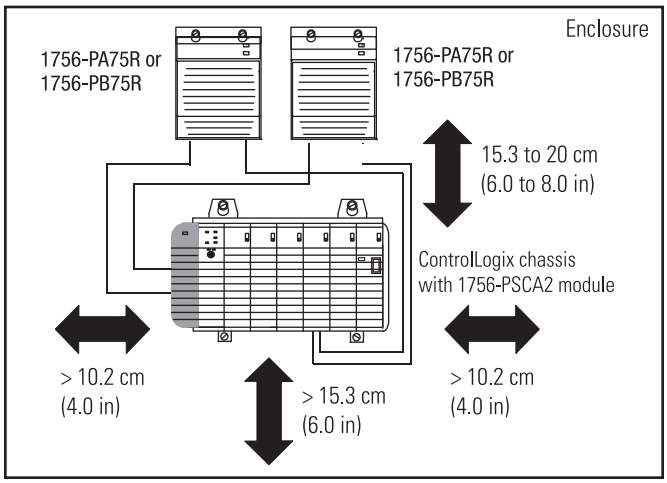
All of the chassis are designed for horizontal-only, back-panel mounting. Use a slot filler module to fill empty slots. Each 1756-N2 comes with two slot filler modules.

Minimum Spacing Requirements

When you mount a chassis with a standard power supply in an enclosure, meet these minimum spacing requirements.

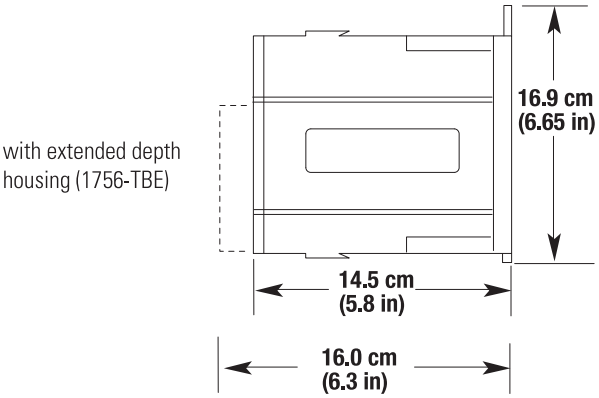


When you mount a chassis with a standard power supply in an enclosure, meet these minimum spacing requirements.

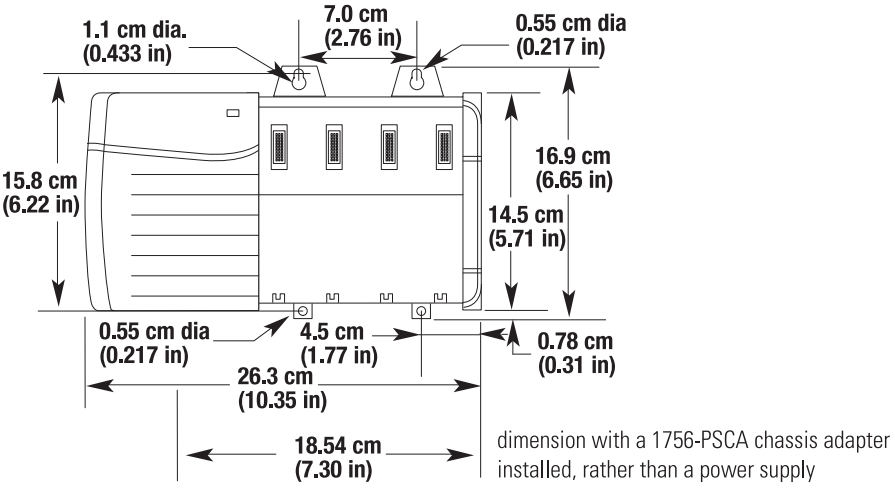


Mounting Dimensions

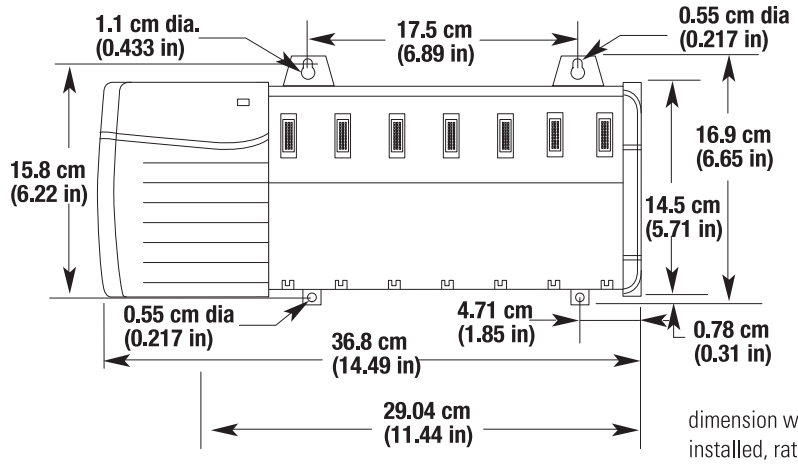
Right-side View of Chassis



1756-A4 with Power Supply

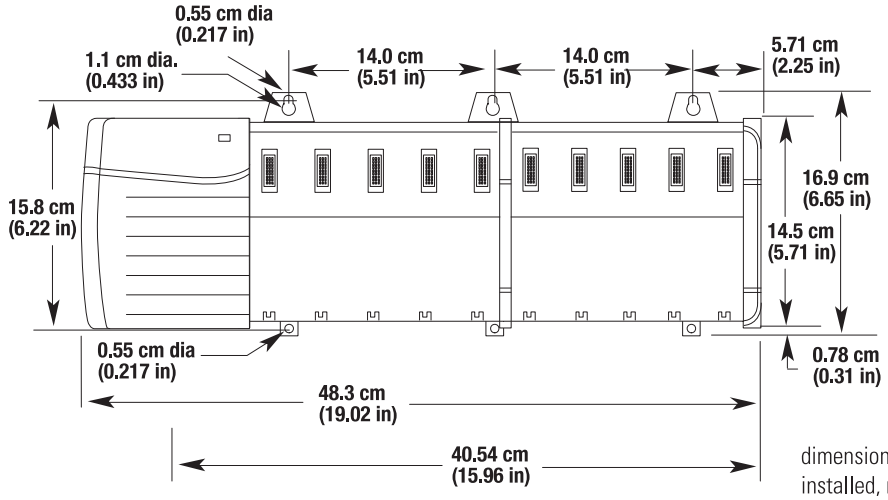


1756-A7 with Power Supply



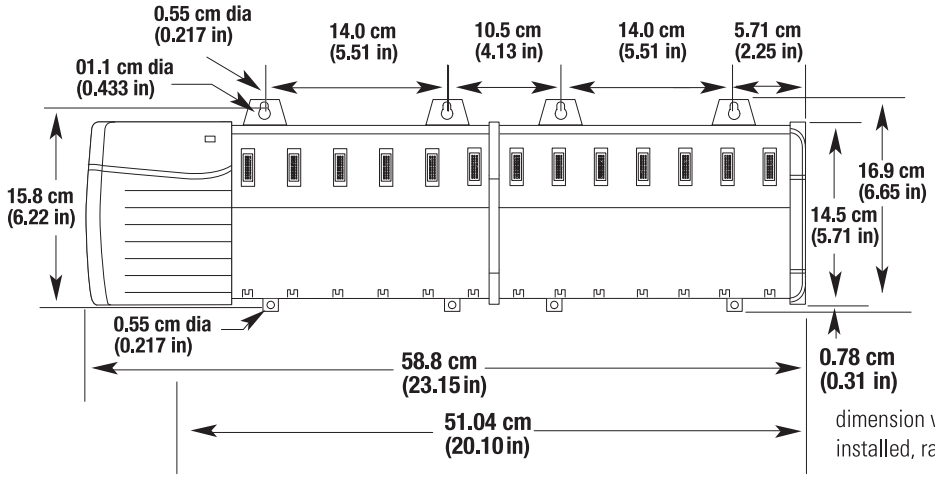
dimension with a 1756-PSCA chassis adapter installed, rather than a power supply

1756-A10 with Power Supply



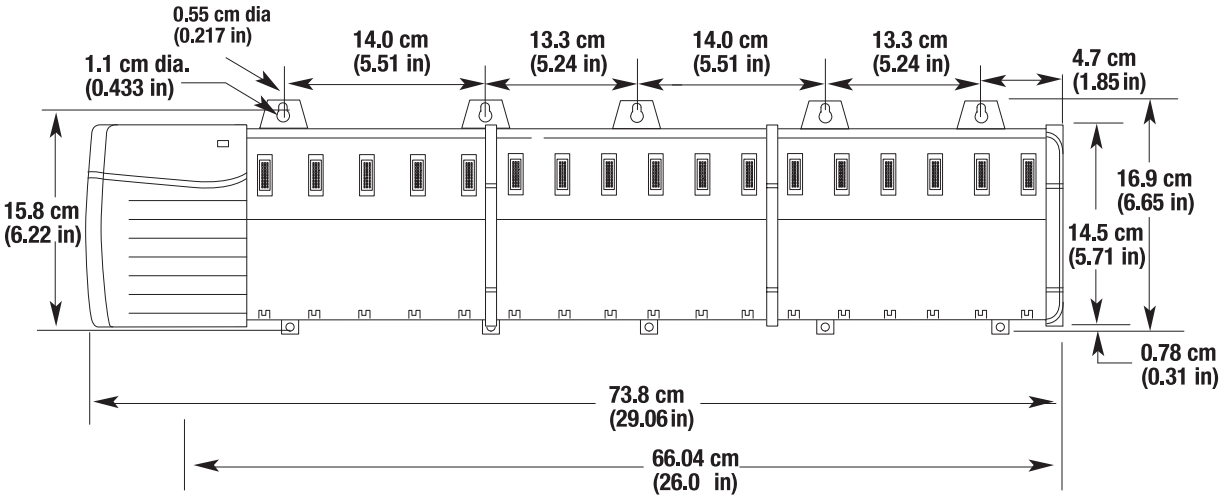
dimension with a 1756-PSCA chassis adapter installed, rather than a power supply

1756-A13 with Power Supply



dimension with a 1756-PSCA chassis adapter installed, rather than a power supply

1756-A17 with Power Supply



dimension with a 1756-PSCA chassis adapter installed, rather than a power supply

Step 6 - Select:

- *One power supply for each chassis*
- *A power supply bundle if you are planning a redundant power supply system*

ControlLogix Power Supplies

ControlLogix power supplies are used with the 1756 chassis to provide 1.2V, 3.3V, 5V, and 24V dc power directly to the chassis backplane. Standard (1756-PA72, 1756-PB72, 1756-PA75, 1756-PB75, 1756-PC75, 1756-PH75) and redundant (1756-PA75R, 1756-PB75R) power supplies are available.

Select a Standard Power Supply

You mount a standard power supply directly on the left end of the chassis, where it plugs directly into the backplane. The power supply you select can determine which chassis you can use.

	Power Supplies					
Attribute	**1756-PA72/C**	**1756-PA75/B**	**1756-PB72/C**	**1756-PB75/B**	**1756-PC75/B**	**1756-PH75/B**
Power Supply Input Voltage, Nom.	120/240 V ac	120/240 V ac	24V dc	24V dc	48V dc	125V dc
Operating Voltage Range	85…265V ac	85…265V ac	18...32V dc❄	18...32V dc❄	30…60V dc	90…143V dc
Input Power, Max.	100V A / 100 W	100V A / 100 W	95 W	95 W	95 W	95 W
Input Frequency Range	47…63 Hz	47…63 Hz	dc	dc	dc	dc
Current Capacity, Max.	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 10.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 13.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 10.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 13.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 13 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 A @ 1.2V dc 4.0 A @ 3.3V dc 13 A‡ @ 5V dc 2.8 A‡ @ 24V dc
Power Supply Output	75 W @ 60 °C (140 °F)	75 W @ 60 °C (140 °F)	75 W @ 60 °C (140 °F)	75 W @ 60 °C (140 °F)	75 W @ 60 °C (140 °F)	75 W @ 60 °C (140 °F)
Hold Up Time✶	5 cycles @ 85V ac, 50/60 Hz 6 cycles @ 120V ac, 50/60 Hz 6 cycles @ 200V ac, 50/60 Hz 6 cycles @ 240V ac, 50/60 Hz		35 ms @ 18 V dc 40 ms @ 24 V dc 40 ms @ 32 V dc		50 ms @ 30…60V dc nom	50 ms @ 90…143V dc nom§
Chassis Compatibility	Series A Series B	Series B	Series A Series B	Series B	Series B	Series B
Mounting Location	Left side of 1756 chassis		Left side of 1756 chassis		Left side of 1756 series B chassis	Left side of 1756 series B chassis

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick
✶The hold up time is the time between input voltage removal and dc power failure.
❄Input may drop to 16V for a maximum of two minutes each hour for motor starting.

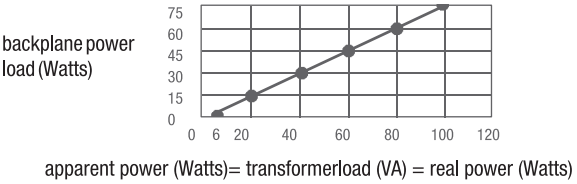
Standard Power Load and Transformer Sizing

Use these graphs to determine the input power requirements for the supplies, given the power they are providing to the modules in the chassis. The vertical axis of each graph shows the backplane power consumed by all of the modules in the chassis; the horizontal axis shows input power requirements of the power supply. Follow these steps to use the graphs:

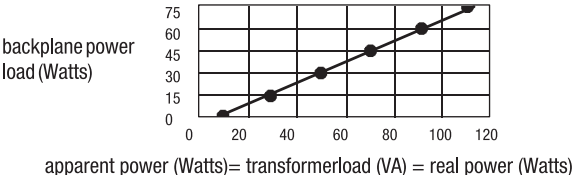
1. Add all of the backplane power (watts) for all of the modules in the chassis.
2. Find the number from step 1 on the vertical axis.
3. Follow that value to the right until it intersects the line on the graph.
4. Find the associated input power rating consumed by the power supply on the horizontal axis.

For example, if the power consumption of all of the modules in the chassis is 30 watts, a 1756-PB75/B consumes approximately 40 watts of Real Power.

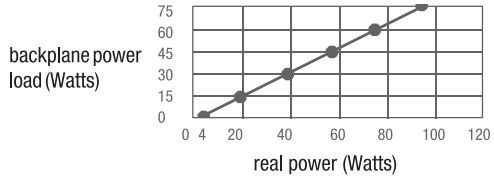
1756-PA72/C
1756-PA75/B
ac



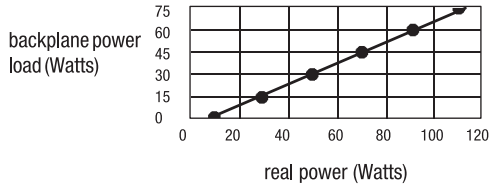
1756-PA75R
ac



1756-PB72/C
1756-PB75/B
dc



1756-PB75R
dc



Select Redundant Power Supply

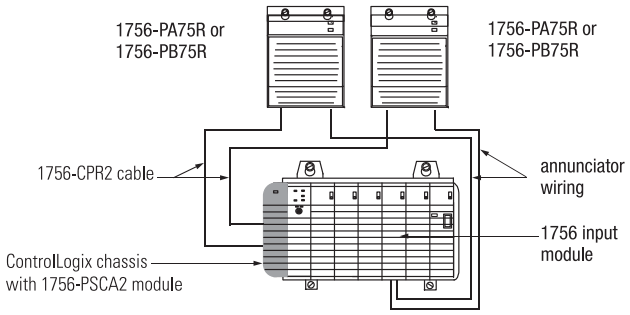
To build a redundant power supply system, you need:

- two redundant power supplies (both 1756-PA75R or 1756-PB75R).
- one 1756-PSCA2 chassis adapter module.
- two 1756-CPR2 cables to connect the power supplies to the 1756-PSCA2 chassis adapter module (0.91 m (3 ft) length).
- user-supplied annunciator wiring to connect the power supplies to the input modules, as needed.

	Power Supplies		Adapter
Attribute	**1756-PA75R**	**1756-PB75R**	**1756-PSCA2**
Power Supply Input Voltage, Nom.	120/220V ac	24V dc	
Operating Voltage Range	85…265V ac	19…32V dc	
Input Power, Max.	115 W	110 W	
Apparent Input Power, Max.	120V A	—	
Transformer Load, Max.	120V A	—	
Input Frequency Range	47…63 Hz	dc	
Current Capacity, Max.	1.5 @ 1.2V dc 4.0 @ 3.3V dc 13.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	1.5 @ 1.2V dc 4.0 @ 3.3V dc 13.0 A‡ @ 5V dc 2.8 A‡ @ 24V dc	—
Power Supply Output	stbUCString::convert: Character with charcode: "12332" met	stbUCString::convert: Character with charcode: "12332" met	
Hold Up Time✶	2 cycles @ 85V ac, 60 Hz 6 cycles @ 120V ac, 60 Hz 20 cycles @ 220V ac, 60 Hz	20 ms @ 19 V dc 70 ms @ 24 V dc	
Chassis Compatibility	Series B	Series B	
Mounting Location	Panel-mounted§	Panel-mounted§	Left side of 1756

Certifications: UL, CSA (Class I, Division 2, Group A, B, C, D), CE, FM, C-Tick
✶The hold up time is the time between input voltage removal and dc power failure.
❄This can be a maximum of 0.91 cable-metered (3 cable feet) from the ControlLogix chassis.

The 1756-PSCA2 chassis adapter module is a passive device that funnels power from the redundant power supplies to the single power connector on the ControlLogix series B chassis backplane.



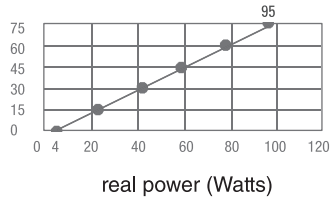
The 1756-PSCA2 chassis adapter module reduces horizontal space (on the right side of the chassis) when compared to a standard power supply, but increases vertical space (power supplies mounted above controller).

The redundant power supplies are available in ac (1756-PA75R) and dc (1756-PB75R) versions. They are also available in bundled systems.

Redundant Power Supply Bundle	Contents
1756-PAR2	• Two 1756-PA75R power supplies • Two 1756-CPR2 cables • One 1756-PSCA2 chassis adapter module
1756-PBR2	• Two 1756-PB75R power supplies • Two 1756-CPR2 cables • One 1756-PSCA2 chassis adapter module

Redundant Power Load and Transformer Sizing

1756-PC75
1756-PH75
dc



Step 7 - Select:

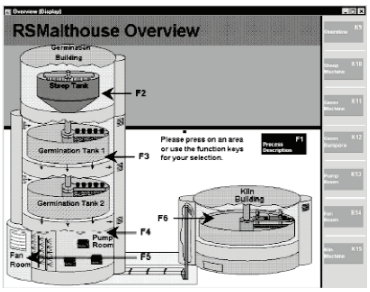
- *RSLinx Enterprise software*
- *Operator interface terminal or computer*

View Products

Visualization products, together with Logix for control and NetLinx architecture for communication, make up Rockwell Automation's Integrated Architecture strategy. The visualization strategy combines Rockwell Automation's expertise in Allen-Bradley electronic operator interface and industrialized personal computer hardware with Rockwell Software's supervisory control software. Current visualization products include:

- FactoryTalk View software.
- PanelView Plus operator interface.
- VersaView industrial computers and monitors.
- VersaView CE industrial computer.

FactoryTalk View Software



FactoryTalk View software is a suite of HMI software products designed with a common look, feel, and navigation to help speed HMI application development and training time. Supporting the Rockwell Automation Integrated Architecture, FactoryTalk View software is part of the scalable and unified suite of monitoring and control solutions.

- FactoryTalk View Studio software lets you create applications in a single design environment. It configures FactoryTalk View Site Edition, FactoryTalk View Machine Edition, PanelView Plus CE, and PanelView Plus applications.
- FactoryTalk View Machine Edition (ME) software is a machine-level HMI product that supports both open and dedicated operator interface solutions. It provides a consistent operator interface across multiple platforms (including Microsoft Windows CE, Windows 2000/XP, and PanelView Plus solutions), and is ideal for monitoring and controlling individual machines or small processes.
- FactoryTalk View Site Edition (SE) software is an HMI software for supervisory-level monitoring and control applications. It has a distributed and scalable architecture that supports distributed-server/multi-user applications. This highly scalable architecture can be applied to a standalone, one-server/one-user application or to multiple users interfacing with multiple servers.

FactoryTalk View Products	Cat. No.	Description
FactoryTalk View Studio	9701-VWSTENE	FactoryTalk View Studio for FactoryTalk View
FactoryTalk View Machine Edition	9701-VWMR015AENE	FactoryTalk View ME station runtime 15 displays — Windows XP/Windows 2000
	9701-VWMR030AENE	FactoryTalk View ME station runtime 30 displays — Windows 2000
	9701-VWMR075AENE	FactoryTalk View ME station runtime 75 displays — Windows XP/ Windows 2000
	9701-VWMR250AENE	FactoryTalk View ME station runtime 250 displays — Windows XP / Windows 2000
FactoryTalk View Site Edition	9701-VWSCWAENE	FactoryTalk View SE client
	9701-VWSCRAENE	FactoryTalk View SE view client
	9701-VWSS025AENE	FactoryTalk View SE server 25 displays
	9701-VWSS100AENE	FactoryTalk View SE server 100 displays
	9701-VWSS250AENE	FactoryTalk View SE server 250 displays
	9701-VWSS000AENE	FactoryTalk View SE server unlimited display
	9701-VWSB015AENE	FactoryTalk View SE station 15 displays
	9701-VWB025AENE	FactoryTalk View SE station 25 displays
	9701-VWB100AENE	FactoryTalk View SE station 100 displays
	9701-VWB250AENE	FactoryTalk View SE station 250 displays
	9701-VWSB000AENE	FactoryTalkView SE station unlimited display

PanelView Plus Terminal

The PanelView Plus terminal is ideal for applications that need to monitor, control, and display information graphically, allowing operators to quickly understand the status of their application. PanelView Plus terminals come with RSView Studio software and have embedded RSView Machine Edition software functionality. PanelView Plus terminals combine the best features from the popular Allen-Bradley PanelView Standard and PanelView **e** operator-interface products and adds new functionality.

- Multi-vendor communication
- Trending
- Expressions
- Data logging
- Animation
- RSView Studio software direct browsing of RSLogix 5000 addresses

PanelView Plus CE Terminal

VersaView CE products offer open Windows CE terminals in Windows desktop environments, bringing together features of operator interfaces and industrial computers. It is a high performance computer with a CompactFlash drive and integrated RSView Machine Edition runtime (no activation required). There's no hard disk, no fan, and no moving parts, which means maximum reliability on the plant floor. Easy to set up and maintain, VersaView CE products provide an open system that's rugged and economical, offering high functionality in an easy to use package.

VersaView Industrial Computers and Monitors

VersaView products are a family of industrial computer and monitor solutions, comprised of integrated display computers, workstations, non-display computers, and flat panel monitors. VersaView products offer effortless management of changing technology, a rugged but cost-effective design, and easier product configuration. All VersaView products provide the latest industrial solution available, optimized for visualization, control, information processing, and maintenance application.

Step 8 - Select:

The appropriate package of RSLogix 5000 Enterprise Series software and any options

Other software packages for your application

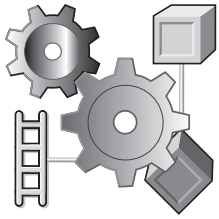
An appropriate operator interface

Software for a ControlLogix System

Your selection of modules and network configuration determines what software packages you need to configure and program your system.

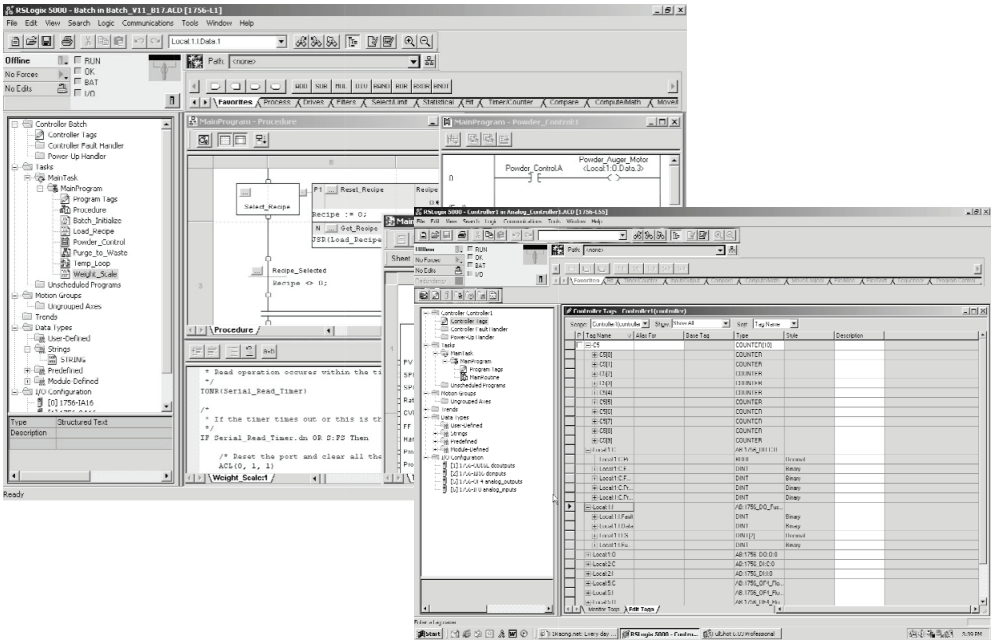
If you have	You need	Order
1756 ControlLogix controller 1756 SERCOS or analog motion module	RSLogix 5000 Enterprise Series software	9324 series
1756-CN2, -CN2R 1756-CNB, -CNBR ControlNet communication module	RSNetWorx for ControlNet software (comes with the Standard/NetWorx and Professional Editions of RSLogix 5000 Enterprise Series software)	9324-RLD300NXENE (RSNetWorx option) or 9324-RLD700NXENE (RSLogix 5000 Professional software) or 9357-CNETL3 (RSNetWorx for ControlNet)
1756-DNB DeviceNet communication module	RSNetWorx for DeviceNet software (comes with the Standard/NetWorx and Professional Editions of RSLogix 5000 Enterprise Series software)	9324-RLD300NXENE (RSNetWorx option) or 9324-RLD700NXENE (RSLogix 5000 Professional software) or 9357-DNETL3 (RSNetWorx for DeviceNet)
1756-EN2F, 1756-EN2T 1756-ENBT, 1756-EWEB EtherNet/IP communication module (set the IP address)	RSLinx software or BOOTP/DHCP server utility to set IP addresses (RSLinx Lite and BOOTP server come with RSLogix 5000 Enterprise Series software) Optional RSNetWorx for EtherNet/IP software (comes with the Standard/RSNetWorx and Professional Editions of RSLogix 5000 Enterprise Series software)	9324 series Optional 9357-ENETL3 (RSNetWorx for EtherNet/IP)
1756-DHRIO communication module 1756-DH485 communication module	RSLinx software	9324 series
1757-FFLD FOUNDATION Fieldbus linking device	RSFieldbus Configuration Software	9308 series
1788-CN2FF FOUNDATION Fieldbus linking device	NI-FBUS Configurator Software and one of the following: RSLinx Gateway, OEM, or Professional software (RSLinx Lite software is not sufficient)	1788-FFCT and 9355 series
Communication card in a workstation	RSLinx software (RSLinx Lite comes with RSLogix 5000 Enterprise Series software)	9324 series

Programming Software



RSLogix 5000 Enterprise Series software is designed to work with Rockwell Automation's Logix platforms. RSLogix 5000 Enterprise Series software is an IEC 61131-3 compliant software package that offers relay ladder, structured text, function block diagram, and sequential function chart editors for you to develop application programs. Create your own instructions by encapsulating a section of logic in any programming language into an add-on instruction.

RSLogix 5000 Enterprise Series software also includes axis configuration and programming support for motion control. With RSLogix 5000 Enterprise Series software, you need only one software package for sequential, process, drive, motion control, and safety programming.



RSLogix 5000 Enterprise Series Software Requirements

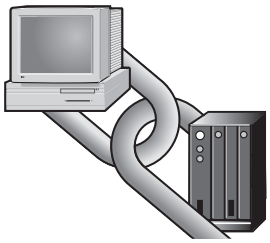
Description	Value
Personal computer	Pentium II 450 MHz min Pentium III 733 MHz (or better) recommended
Software requirements	Supported operating systems: • Microsoft Windows XP Professional version 2002 (with Service Pack 1 or 2) or XP Home version 2002 • Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3 • Microsoft Windows Server 2003
RAM	128 MB of RAM min 256 MB of RAM recommended
Hard disk space	100 MB of free hard disk space (or more based on application requirements)
Video requirements	256-color VGA graphics adapter 800 x 600 min resolution (True Color 1024 x 768 recommended)

Select the RSLogix 5000 Enterprise Series Software Package

Available Features	Service 9324-RLD000*xx*E✶♠	Mini 9324-RLD200*xx*E✶	Lite 9324-RLD250*xx*E✶	Standard 9324-RLD300*xx*E✶	Standard/ NetWorx 9324-RLD300NX*xx*E✶	Full: Node Locked 9324-RLD600*xx*E Concurrent License 9324-RLD600*xx*F✶	Professional 9324-RLD700NXxxE✶
Logix5000 controllers	All♠	CompactLogix FlexLogix	CompactLogix FlexLogix	All	All	All‡	All
Relay ladder diagram§	Upload/download and view	Full support	Full support	Full support	Full support	Full support	Full support
Function block diagram 9324-RLDFBDENE	Upload/download and view	Upload/download Available separately	Full support	Upload/download Available separately	Upload/download Available separately	Full support	Full support
Sequential function chart 9324-RLDSFCE	Upload/download and view	Upload/download Available separately	Full support	Upload/download Available separately	Upload/download Available separately	Full support	Full support
Structured text 9324-RLDSTXE	Upload/download and view	Upload/download Available separately	Full support	Upload/download Available separately	Upload/download Available separately	Full support	Full support
PhaseManager 9324-RLDPME	Upload/download	Upload/download	Upload/download	Upload/download	Upload/download	Full support	Full support
GuardLogix Safety 9324-RLDGLXE♥	Upload/download and view	NA	NA	Upload/download and view	Upload/download and view	Full support	Full support
Highly integrated motion	Upload/download and view	Upload/download	Full support	Full support	Full support	Full support	Full support
Graphical trending	Full support	Full support❖	Full support❖	Full support	Full support	Full support	Full support
DriveExecutive Lite 9303-4DTE01ENE	Available separately	Available separately	Available separately	Included	Included	Included	Included
PIDE autotune 9323-ATUNEENE	Available separately	Available separately	Available separately	Available separately	Available separately	Included	Included
RSMACC audit support	Included	Included	Included	Included	Included	Included	Included
FuzzyDesigner 9324-RLDFZYENE♥	NA	Available separately	Available separately	Available separately	Available separately	Available separately	Available separately
RSLogix Emulate 5000 9310-WED200ENE	Available separately	NA	NA	Available separately	Available separately	Available separately	Included
Logix CPU security	Included	Included	Included	Included	Included	Included	Included
Routine source protection	Included	Included	Included	Included	Included	Included	Included
RSMACC client	Included	Included	Included	Included	Included	Included	Included
Standalone security server	Included	Included	Included	Included	Included	Included	Included
RSLinx Classic software	Lite included	Lite included	Lite included	Lite included	Lite included	Lite included	OEM included♥
RSNetWorx ControlNet, RSNetWorx DeviceNet, RSNetWorx EtherNet/IP software❄	Available separately	Available separately	Available separately	Available separately	Included	Available separately	Included
RSLogix Architect 9326-LGXARCHENE❖	Available separately	Available separately	Available separately	Available separately	Available separately	Available separately	Included
FBD ActiveX faceplates	Included	Included	Included	Included	Included	Included	Included
Tag data up/download	Included	Included	Included	Included	Included	Included	Included
RSLogix 5000 project compare	Included	Included	Included	Included	Included	Included	Included
Tag custom data monitor	Included	Included	Included	Included	Included	Included	Included
FactoryTalk View SE demo	Available separately	Available separately	Available separately	Available separately	Available separately	Available separately	Included
Upgrades	To Standard: 9324-RLD0U3*xx*E To Full: 9324-RLD0U6*xx*E To Professional: 9324-RLD0U7*xx*E	To Standard: 9324-RLD2U3*xx*E To Professional: 9324-RLD2U7*xx*E	To Full: 9324-RLD25U6*xx*E To Professional: 9324-RLD25U7*xx*E	To Full: 9324-RLDMLPE multi-language pack▮ To Professional: 9324-RLD3U7xxE	NA	Node Locked to Concurrent License: 9324-RLD6U6F*xx*U To Professional: 9324-RLD6U7*xx*E	NA

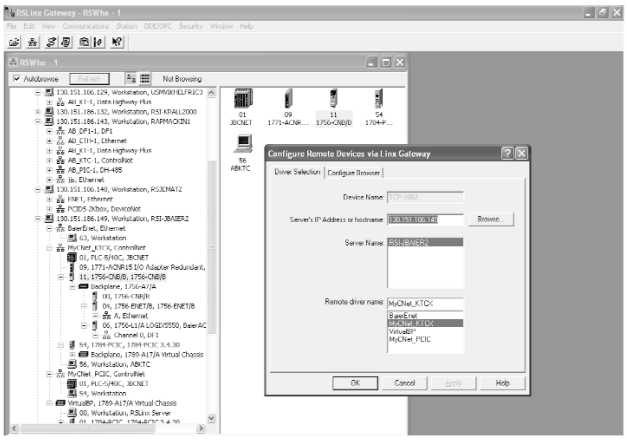
✶Replace *xx* in the catalog number with the appropriate language designation: ZH=Chinese, EN=English, FR=French, DE=German, IT=Italian, JP=Japanese, KO=Korean, PT=Portuguese, and ES=Spanish.
♠Service Edition supports controllers running firmware revision 12 and later.
‡Full Edition supports controllers running firmware revision 10 and later.
§A multiple language editor package is available as 9324-RLDMLPE. It contains the function block, sequential function chart, and structured text editors.
✶RSNetWorx for ControlNet software is 9357-CNETL3. RSNetWorx for DeviceNet software is 9357-DNETL3. RSNetWorx for EtherNet/IP software is 9357-ENETL3. They are available together as 9357-ANETL3.
▮The multiple language editor package (9324-RLDMLPE) is not the same as an upgrade, but it extends the programming languages to match those in a Full package. Add PhaseManager (9324-RLDPME), RSLogix 5000 GuardLogix Safety Editor (9324-RLDGLXE), and PIDE Autotune (9323-ATUNEENE) options to extend Standard to match Full
❖As of RSLogix 5000 programming software, version 15.
♥As of RSLogix 5000 programming software, version 16.

RSLinx Software



RSLinx software is a complete communication server providing plant-floor device connectivity for a wide variety of software applications. In addition, several open interfaces are provided for third-party HMI, data collection and analysis packages, and custom client-application software.

RSLinx software, version 2.*x*, is joined by RSLinx Enterprise software, another product within the RSLinx family that provides unparalleled connectivity to Logix processors. RSLinx Enterprise software works as a data server.



RSLinx Software Requirements

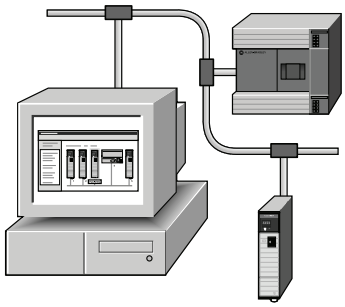
Description	Description
Personal computer	Pentium100 MHz processor (faster processors will improve performance)
Operating system	Supported operating systems: • Microsoft Windows XP • Microsoft Windows 2000 • Microsoft Windows NT version 4.0 with Service Pack 3 or greater • Microsoft Windows ME • Microsoft Windows 98
RAM	32 MB of RAM min 64 MB or more of RAM recommended
Hard disk space	35 Mbytes of free hard disk space (or more based on application requirements)
Video requirements	16-color VGA graphics display 800 x 600 or greater resolution

In most cases, RSLinx Lite software comes bundled with controller programming software packages.

You can also download RSLinx Lite for free from the Software Updates link on the Get Support Now website at http://support.rockwellautomation.com

Cat. No.	RSLinx Products
Available only bundled with other products such as RSLogix software products.	RSLinx Lite
9355-WABSNENE	RSLinx Single Node
9355-WABOEMENE	RSLinx OEM
9355-WABENE	RSLinx Professional
9355-WABGWENE	RSLinx Gateway
9355-WABCENE	RSLinx SDK
9355-RSLETENE	RSLinx Enterprise

Network Configuration Software



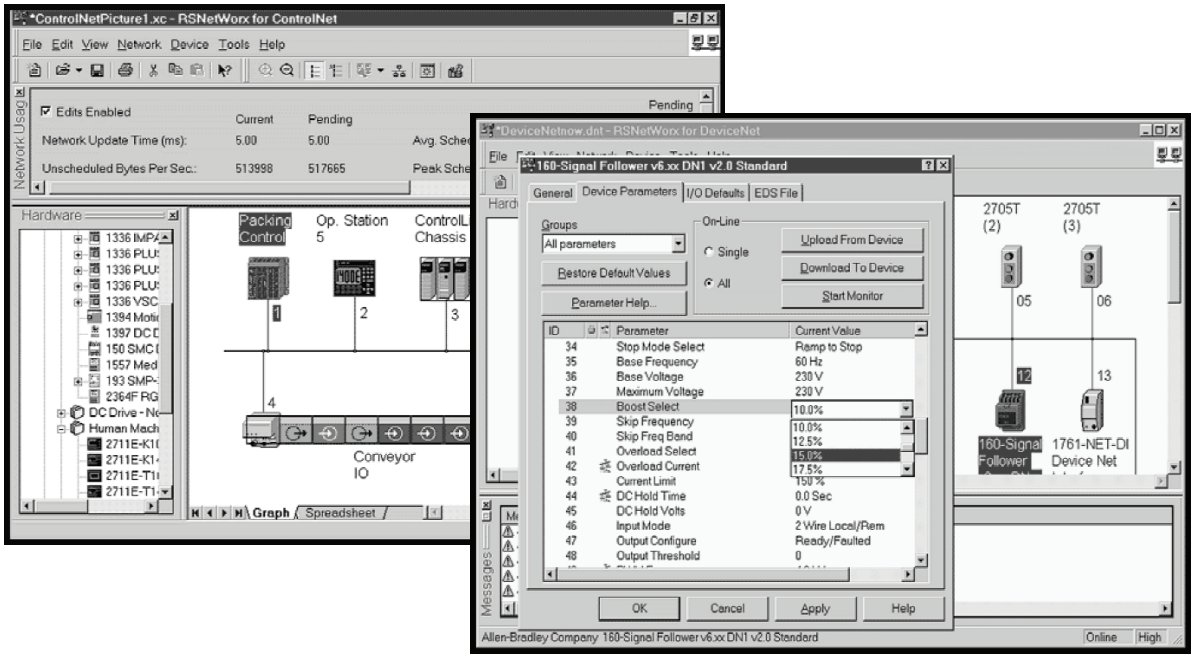
RSNetWorx software is the configuration tool for your control network. With RSNetWorx software you can create a graphical representation of your network configuration and configure the parameters that define your network.

Use RSNetWorx software for:

ControlNet software to schedule network components. The software automatically calculates network bandwidth for the entire network, as well as the bandwidth used by each network component. You must have RSNetWorx software to configure and schedule ControlNet networks.

DeviceNet software to configure DeviceNet I/O devices and create a scan list. The DeviceNet scanner stores the configuration information and scan list.

EtherNet/IP software to configure EtherNet/IP devices using IP addresses or host names.



RSNetWorx Software Requirements

Description	EtherNet/IP	ControlNet	DeviceNet
Personal computer	Intel Pentium or Pentium-compatible computer		
Operating system	Supported operating systems: • Microsoft Windows XP • Microsoft Windows 2000 • Microsoft Windows 2000 Terminal Server • Microsoft Windows NT version 4.0 with Service Pack 6 or later • Microsoft Windows ME • Microsoft Windows 98		
RAM	32 MB of RAM min More memory is required for large networks		
Hard disk space	Minimum: 108 MB (includes program and hardware files) Full support: 115...125 MB (includes program, online help, tutorial, and hardware files)	Minimum: 115 MB (includes program and hardware files) Full support: 168...193 MB (includes program, online help, tutorial, and hardware files)	Minimum: 190 MB (includes program and hardware files) Full support: 230...565 MB (includes program, online help, tutorial, and hardware files)
Video requirements	16-color VGA graphics adapter 640 x 480 resolution minimum 800 x 600 resolution recommended		
Other	RSLinx Lite software, version 2.41 or later, to use RSNetWorx software online	RSLinx Lite software, version 2.4 or later, to use RSNetWorx software online	RSLinx Lite software, version 2.4 or later, to use RSNetWorx software online

In some cases, RSNetWorx software comes bundled with controller programming software packages.

Select the RSNetWorx Software Package

Cat. No.	Description
9357-CNETL3	RSNetWorx for ControlNet software
9357-DNETL3	RSNetWorx for DeviceNet software
9357-ENETL3	RSNetWorx for Ethernet/IP software
9357-ANETL3	RSNetWorx for ControlNet, Ethernet/IP and DeviceNet software
9357-CNETMD3E	RSNetWorx for ControlNet software with MD, includes DriveExecutive Lite software
9357-DNETMD3E	RSNetWorx for DeviceNet software with MD
9357-ENETMD3E	RSNetWorx for EtherNet/IP software with MD
9357-ANETMD3E	RSNetWorx for ControlNet, DeviceNet, and Ethernet/IP software with MD

RSLogix Emulate 5000 Software

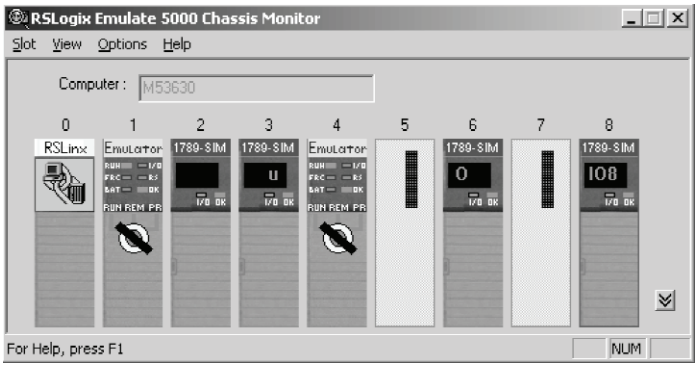
RSLogix Emulate 5000 software (9310-WED200ENE) is the emulation package for the Logix5000 controllers. RSLogix Emulate 5000 software, used in conjunction with RSLogix 5000 software, lets you run and debug your application code while at your computer. In addition, RSLogix Emulate 5000 software lets you test HMI screens, developed in RSView software for example, without the need to connect to a real controller.

You can set tracepoint and breakpoint instructions (ladder diagram only) in your application code, use traces, and also vary the execution speed of the emulator. RSLogix Emulate 5000 software supports all the programming languages (ladder diagram, function block diagram, structured text, and sequential function chart). RSLogix Emulate 5000 software does not allow for control of real I/O.

Use RSLogix Emulate software for:

troubleshooting.
Stop the process whenever a selected rung goes true, effectively freezing the process at the instant that any error occurs.

ladder logic scanning options.
Scan your ladder logic continuously, one program scan at a time, rung-by-rung, or select a specific block of rungs to emulate. Selecting a block of rungs lets you isolate a particular section of the program for testing purposes. You can also set trace points to trace application program tags and set break points to halt program execution at predetermined locations.



RSLogix Emulate 5000 Requirements

Description	Description
Personal computer	IBM-compatible Intel Pentium II 300 MHz or Celeron 300A (Pentium III 600 MHz recommended)
Operating system	Supported operating systems: • Microsoft Windows XP with Service Pack 1or later • Microsoft Windows 2000 with Service Pack 2 or later • Microsoft Windows NT version 4.0 with Service Pack 6A or later
RAM	128 MB of RAM min
Hard disk space	50 MB of free hard disk space
Video requirements	16-color VGA graphics display 800 x 600 or greater resolution

RSLogix Emulate 5000 software includes RSTestStand Lite software. RSTestStand Lite software lets you create virtual operator consoles that can help test your application code. RSTestStand Lite software can be upgraded to the standard version by ordering catalog number 9310-TSTNDENE.

RSLogix Emulate 5000 and RSTestStand Lite software are included with RSLogix 5000 Professional software.

Logix-based Training

Rockwell Automation offers several different levels of training for your Logix system. While most of these training aids are ControlLogix specific, the lessons and tools also apply to the other Logix platforms.

Option	Description
Instructor-led courses	Courses are best suited for people new to the Logix architecture and for those new to programmable controllers. For available ControlLogix courses and descriptions, see http://www.rockwellautomation.com/services/training/clgxrslgx5000.html
Computer-based and web-based training programs	Programs that are designed to provide essential information to perform ControlLogix job-related tasks. Students learn through realistic simulations, detailed graphics and animations, hands-on interactive exercises, and review questions. Computer-based and web-based training can be used as a pre-requisite for more advanced training, or it is best used as a resource following an instructor-led course. Course content can be repeated to continuously refresh knowledge and review important information. See http://www.rockwellautomation.com/services/training/cbt.html
Training workstations	Workstations can be used to reinforce and practice skills, train new employees, and ease the transition from one technology to another in a plant. Workstations also provide users with hands-on maintenance, troubleshooting, and programming experience using actual equipment. Workstations are used with most of the available instructor-led courses. A variety of standard ControlLogix workstations are available and they include combinations of network hardware (ControlNet, DH+), control hardware (controller, programming cable, power supply, I/O modules), motion control hardware (motion module, servo drive, motor), and operator interface hardware (pushbutton potentiometer, voltmeter). See http://www.rockwellautomation.com/services/training/workstations.html
Job aids	Useful resources to take back to your facility after completing instructor-led and computer-based training. Job aids ensure that you are consistently using best practices, and they provide immediate hardware and software information when it is needed so production does not slow. See http://www.rockwellautomation.com/services/training/jobaids.html

Additional Resources

These documents contain additional information about ControlLogix products.

Resource	Description
ControlLogix Controllers Installation Instructions Publication number 1756-IN101	**Install and Connect a ControlLogix Controller** This manual describes how to assemble and install a ControlLogix controller.
ControlLogix System User Manual Publication number 1756-UM001	**Configure, Program, and Operate a ControlLogix Controller** This manual describes the necessary tasks to configure, program, and operate a ControlLogix system.
ControlLogix Redundancy System User Manual Publication number 1756-UM523	**Configure, Program, and Operate Redundant ControlLogix Controllers** This manual describes the necessary tasks to configure, program, and operate redundant ControlLogix controllers.
Logix5000 Controllers Design Guidelines Publication number 1756-RM094	**Design Considerations for Logix5000 Systems** This reference manual provides guidelines you can follow to optimize your system. This manual also provides system information you need to make system design choices.
Logix5000 Controllers Common Procedures Programming Manual Publication number 1756-PM001	**Common Controller Procedures for All Users** This manual guides the development of projects for Logix5000 controllers. It provides links to individual guides for information on: • Add-On Instructions, 1756-PM010 • ASCII Strings, 1756-PM001 • Controller Information and Status, 1756-PM015 • I/O and Tag Data, 1756-PM004 • Major and Minor Faults, 1756-PM014 • Messages, 1756-PM012 • Nonvolatile Memory, 1756-PM017 • Produced and Consumed Tags, 1756-PM011 • Programming: Function Block Diagram, 1756-PM009 • Programming: Relay Ladder, 1756-PM008 • Programming: Sequential Function Chart, 1756-PM006 • Programming: Structured Text, 1756-PM007 • Security, 1756-PM016 • Tasks, Programs, and Routines, 1756-PM005 • IEC 61131-3 Compliance, 1756-PM018
Motion Modules in Logix5000 Control Systems User Manual Publication number LOGIX-UM002	**Configure and Use Motion Modules** Use this manual to setup and program motion control using a Logix5000 motion module.
Integrated Architecture Recommended Literature Publication number IASIMP-RM001	**Recommended Literature** This guide provides a list of recommended literature for products that comprise an Integrated Architecture solution.

You can view or download publications at http://literature.rockwellautomation.com. To order paper copies, contact your local Rockwell Automation distributor or sales representative.

www.rockwellautomation.com

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