Selection Guide

A·B QUALITY **Allen-Bradley**

ControlLogix System

Catalog Numbers 1756 Series

Rockwell Automation

A·B *Allen-Bradley* • *Rockwell Software*

Logix Controllers Comparison

Characteristic	1756 ControlLogix	1756 GuardLogix	1768 CompactLogix	1768 Compact GuardLogix	1769-L3x CompactLogix	1769-L23x CompactLogix	1789 SoftLogix5800
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	• 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	• 3 tasks • 16 programs/task • Event tasks: consumed tag and EVENT instruction triggers	• 32 tasks • 100 programs/task • Event tasks: all event triggers, plus outbound and Windows events
User memory	1756-L61: 2 MB 1756-L62: 4 MB 1756-L63: 8 MB 1756-L64: 16 MB 1756-L65: 32 MB 1756-L72: 4 MB 1756-L73: 8 MB 1756-L74: 16 MB 1756-L75: 32 MB	1756-L61S: 2 MB Standard 1 MB Safety 1756-L62S: 4 MB Standard 1 MB Safety 1756-L63S: 8 MB Standard 3.75 MB Safety	1768-L43: 2 MB 1768-L45: 3 MB	1768-L43S: 2 MB Standard 0.5 MB Safety 1768-L45S: 3 MB Standard 1 MB Safety	1769-L31: 512 KB 1769-L32x: 750 KB 1769-L35x: 1.5 MB	512 KB	1789-L10: 2 MB; 1 controller; no motion 1789-L30: 64 MB; 3 controllers 1789-L60: 64 MB; 6 controllers
Nonvolatile user memory	1756-L6x: CompactFlash 1756-L7x: Secure Digital card	CompactFlash	CompactFlash	CompactFlash	CompactFlash	None	None
Built-in communication ports	1756-L6x: 1 port RS-232 serial 1756-L7x: 1 port USB	1 port RS-232 serial	1 port RS-232 serial	1 port RS-232 serial	• 1769-L31: 2 RS-232 ports • 1769-L32C, 1769-L35CR: 1 ControlNet port and 1 RS-232 serial port • 1769-L32E, 1769-L35E: 1 EtherNet/IP port and 1 RS-232 serial port	• 1769-L23E-QB1B: 1 EtherNet/IP port and 1 RS-232 serial port • 1769-L23E-QBFC1B: 1 EtherNet/IP port and 1 RS-232 serial port • 1769-L23-QBFC1B: 2 RS-232 serial ports	Depends on personal computer
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	• EtherNet/IP • ControlNet • DeviceNet	• EtherNet/IP (standard and safety) • ControlNet (standard and safety) • DeviceNet (standard)	• EtherNet/IP • ControlNet • DeviceNet	• EtherNet/IP • DeviceNet	• EtherNet/IP • ControlNet • DeviceNet
Controller connections	1756-L6x: 250 1756-L7x: 500	250	250	250	100	100	250
Network connections	Per network module: • 100 ControlNet (CN2/A) • 40 ControlNet (CNB) • 256 EtherNet/IP; 128 TCP (EN2x) • 128 EtherNet/IP; 64 TCP (ENBT)	Per network module: • 100 ControlNet (CN2/A) • 40 ControlNet (CNB) • 256 EtherNet/IP; 128 TCP (EN2x) • 128 EtherNet/IP; 64 TCP (ENBT)	Per network module: • 48 ControlNet • 128 EtherNet/IP; 64 TCP	Per network module: • 48 ControlNet • 128 EtherNet/IP; 64 TCP	Per controller: • 32 ControlNet • 32 EtherNet/IP; 32 TCP	Per controller: • 32 EtherNet/IP; 8 TCP	Per network module: • 48 ControlNet • 128 EtherNet/IP; 64 TCP
Controller redundancy	Full support	None	Backup via DeviceNet	Backup via DeviceNet	Backup via DeviceNet	Backup via DeviceNet	N/A
Simple motion	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive	• Stepper • Servo via DeviceNet • Analog or networked AC drive
Integrated motion	EtherNet/IP SERCOS interface Analog options: • Encoder input • LDT input • SSI input	EtherNet/IP SERCOS interface Analog options: • Encoder input • LDT input • SSI input	SERCOS interface	SERCOS interface	N/A	N/A	SERCOS interface Analog encoder input
Programming languages	• Relay ladder • Structured text • Function block • Sequential function chart	• Standard task: all languages • Safety task: relay ladder, safety application instructions	• Relay ladder • Structured text • Function block • Sequential function chart	• Standard task: all languages • Safety task: relay ladder, safety application instructions	• Relay ladder • Structured text • Function block • Sequential function chart	• Relay ladder • Structured text • Function block • Sequential function chart	• Relay ladder • Structured text • Function block • Sequential function chart • External routines (developed in C/C++)

**1756 ControlLogix System**

Step 1
ControlLogix I/O Modules

Page 8
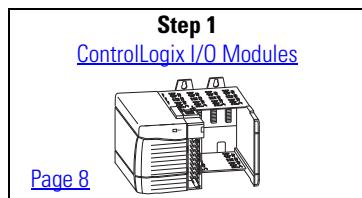
Select:
- I/O modules - some modules have field-side diagnostics, electronic fusing, or individually isolated inputs/outputs
- A remote terminal block (RTB) or wiring system for each I/O module

Step 2
ControlLogix Integrated Motion

Page 15
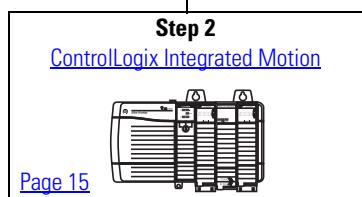
Select:
- A SERCOS or analog interface module
- Associated cables
- A removable terminal block (RTB) - only for analog interface modules
- Select drives, motors, and accessories (use the Motion Analyzer software)

Step 3
ControlLogix Communication Modules

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

Step 4
ControlLogix Controllers

Page 27
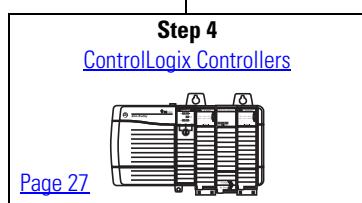
Select:
- A controller with sufficient memory
- Secure Digital or CompactFlash card
- Replacement batteries, if needed

Step 5
ControlLogix Chassis

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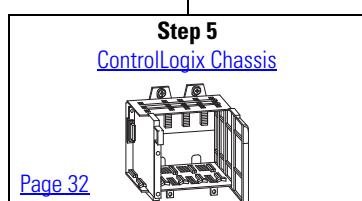
Select:
- A chassis with sufficient slots
- Slot fillers for empty slots

Step 6
ControlLogix Power Supplies
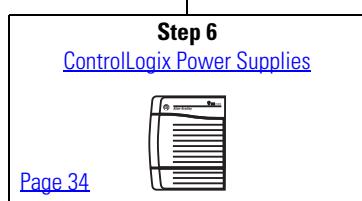
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Select:
- One power supply for each chassis, if you are using standard power supplies
- A power supply bundle if you are planning a redundant power supply system

Optional Step
Visualization Products

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Optional Step
Programming Software

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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.

Example Configuration - ControlLogix System

A simple ControlLogix system consists of a standalone controller and I/O modules in a single chassis. For a more comprehensive system, use the following:

- Multiple controllers in a single chassis
- Multiple controllers joined across networks
- I/O in multiple platforms that are distributed in many locations and connected over multiple I/O links
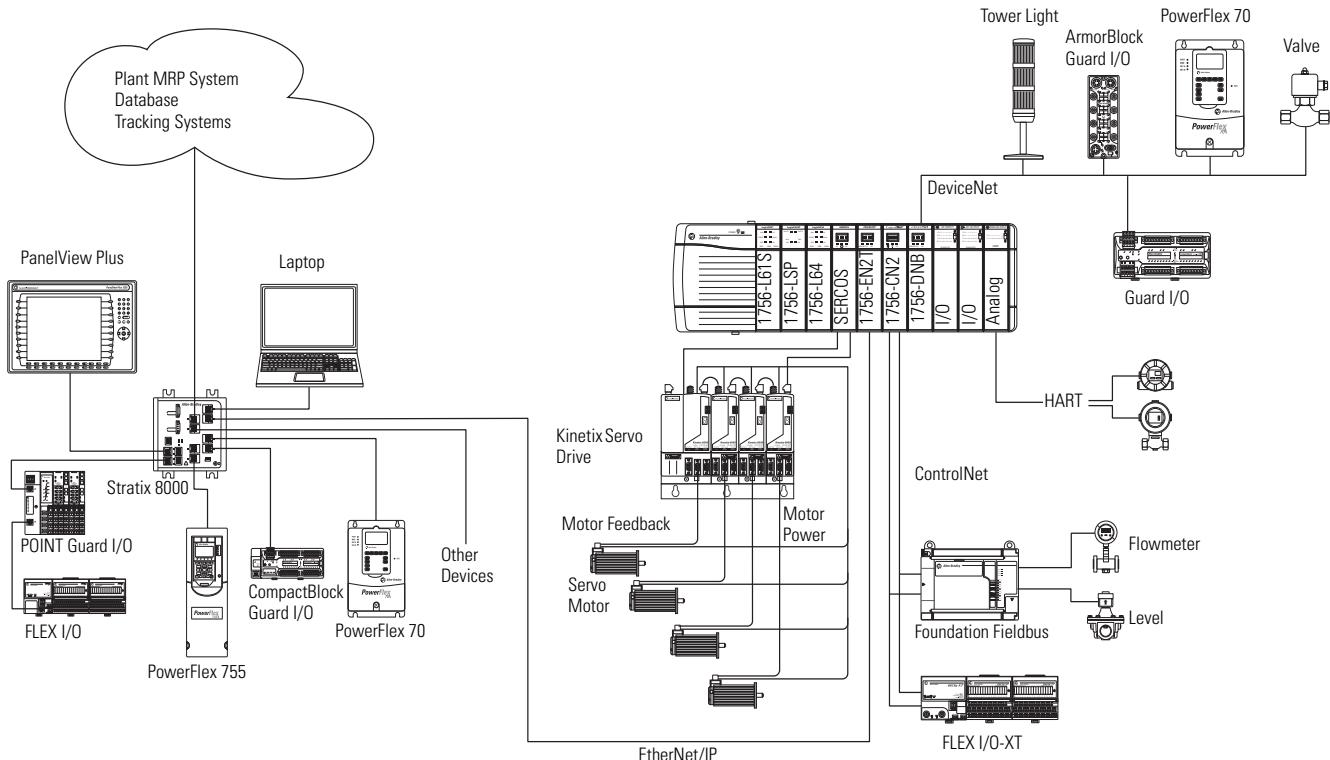
ControlLogix-XT System

The ControlLogix-XT controllers function in the same way as the traditional ControlLogix controllers. The ControlLogix-XT products include control and communication system components that are conformally coated to extend product life in harsh, corrosive environments.

- When used with FLEX I/O-XT products, the ControlLogix-XT system can withstand temperatures range from -20...70 °C (-4...158 °F).
- When used independently, the ControlLogix-XT system can withstand temperature ranges from -25...70 °C (-13...158 °F).

GuardLogix Safety System

A GuardLogix controller is a ControlLogix controller that also provides safety control. The GuardLogix system is a dual controller solution — you must use a 1756-L6xS primary controller and a 1756-LSP safety partner to achieve SIL 3/CAT. 4. A major benefit of this system is that it's still a single project, safety and standard together. The safety partner controller is a part of the system, is automatically configured, and requires no user setup.

Application	Description
SIL 3	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 the following: • 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
SIL 2	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

Example Configuration - Redundant ControlLogix System

The ControlLogix controller supports controller redundancy.

EOI or HMI

EtherNet/IP or ControlNet

Primary ControlLogix Chassis

1756-RM

1756-L61, 1756-L62, or 1756-L63

1756-EN2T

1756-CN2R/B

Secondary ControlLogix Chassis

1756-RM

1756-L61, 1756-L62, or 1756-L63

1756-EN2T

1756-CN2R/B

Fiber Optic Cable

1756-PA75R or 1756-PB75R
Redundant Power Supplies

Redundant ControlNet

1756-CNBR

1756-CPR2
Cables

1203-CN1

1756-PSCA2
Chassis Adapter

ControlLogix I/O

FLEX I/O

1336 Plus II AC Drive

Example Configuration - Redundant I/O System

The 1715 redundant I/O system lets a ControlLogix controller communicate to a remote, redundant I/O chassis over an EtherNet/IP network. The 1715 redundant I/O system provides fault tolerance and redundancy for critical processes by using a redundant adapter pair and multiple I/O modules that have diagnostics.

The redundant I/O system must be connected to a ControlLogix system via an EtherNet/IP network. All connections are established via the Ethernet network by using the topologies supported by the 1756-EN2TR communication bridge.

ControlLogix Primary Chassis   ControlLogix Secondary Chassis

1715 Redundant I/O System
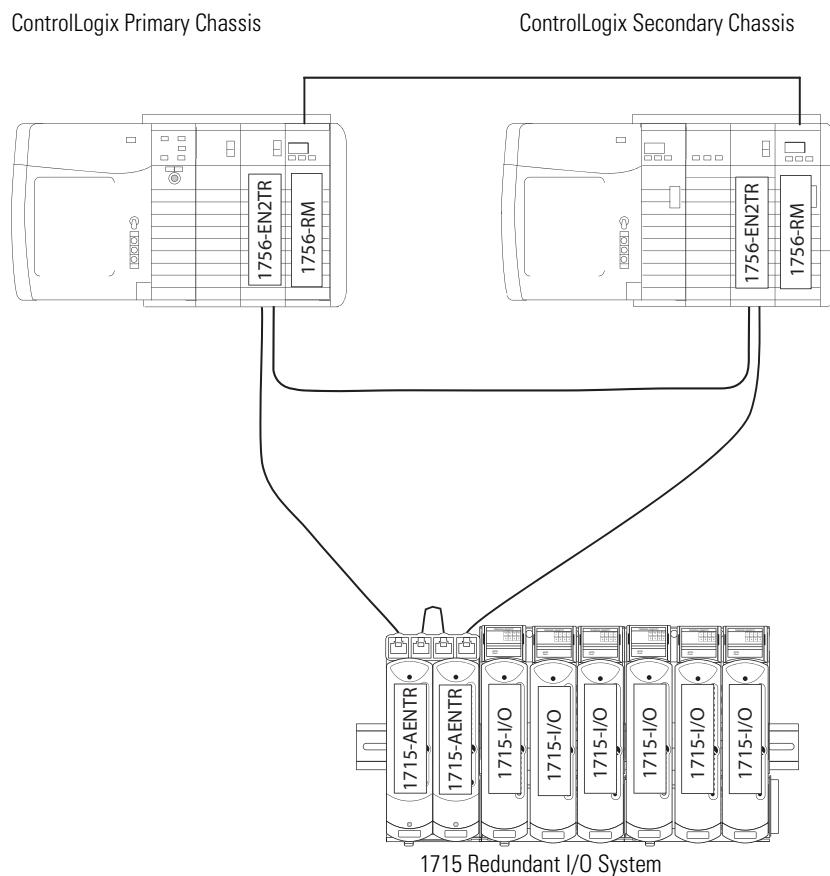
For detailed specifications, see the 1715 Redundant I/O System Specifications Technical Data, publication 1715-TD001A-EN-P.

1756 ControlLogix Batteries

Each 1756-L6x controller ships with a battery. With a memory card installed, the controller can be used without a battery. If you do not use a battery, current tag data will be at the state it was when the memory card was saved.

Attribute	1756-BA1	1756-BA2	1756-BATM[1]	1756-BATA
Description	Lithium battery (0.59 g)	Lithium battery (0.59 g)	Externally mounted battery assembly	Replacement lithium battery for 1756-BATM (5 g max lithium per each D cell; contains 2 D cells)
ControlLogix controllers	1756-L61, 1756-L62, 1756-L63 series A	1756-L61, 1756-L62, 1756-L63 series B 1756-L64, 1756-L65	1756-L61, 1756-L62, 1756-L63 series A	1756-BATM battery module
GuardLogix controllers	—	1756-L61S, 1756-L62S, 1756-L63S	—	—
ControlLogix-XT controllers	—	1756-L63XT	—	—

[1] The 1756-BATM externally mounted battery assembly is highly recommended for use with all series A 1756-L6x controllers and provides longer battery life than the 1756-BA1 battery. The 1756-BATM includes one 1756-BATA lithium battery assembly and a 1 m (3.28 ft) cable to connect housing to controller.

ControlLogix Chassis

The ControlLogix system is a modular system that requires a 1756 I/O chassis. Place any module into any slot. The backplane provides a high-speed communication path between modules.
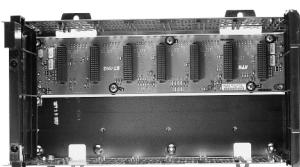
All of the chassis are designed for horizontal-only, back-panel mounting. The chassis are available in these configurations:

- Standard chassis
- ControlLogix-XT chassis

For detailed specifications, see 1756 ControlLogix Chassis Specifications Specifications, publication 1756-TD006.

Features - Chassis

- Slot guides and snap-in retention for easy and secure module fit for any type of 1756 module.
- Direct mounting accommodates any 1756 power supply.

Standard Chassis

The chassis backplane provides a high-speed communication path between modules and distributes power to each of the modules within the chassis.

Cat. No.	Description	Slots
1756-A4	ControlLogix, standard chassis	4
1756-A7		7
1756-A10		10
1756-A13		13
1756-A17		17

ControlLogix-XT Chassis

The ControlLogix-XT chassis support extreme temperature environments.

Cat. No.	Description	Slots	Temperature Range
1756-A4LXT	ControlLogix-XT chassis	4	-25...60 °C (-13...140 °F)
1756-A5XT		5	-25...70 °C (-13...158 °F)
1756-A7LXT		7	-25...60 °C (-13...140 °F)

Accessories - Chassis

Use a slot filler module to fill empty slots.

Cat. No.	Description
1756-N2	Slot filler module for empty slots in standard ControlLogix chassis
1756-N2XT	Slot filler module for empty slots in ControlLogix-XT chassis