ControlLogix Integrated Motion

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

- Integrated Motion on the EtherNet/IP network supports a connection to Ethernet drives.
- The Kinetix® integrated-motion solution uses a SERCOS or EtherNet/IP interface to perform multi-axis, synchronized motion.
- Logix integrated motion supports the analog family of servo modules for controlling drives/actuators.
- Networked motion provides connection via the DeviceNet network to one axis drive to perform point-to-point indexing.

For detailed specifications on motion interface modules, see the 1756 ControlLogix Integrated Motion Modules Specifications Technical Data, publication 1756-TD004.

For more information, see these publications:

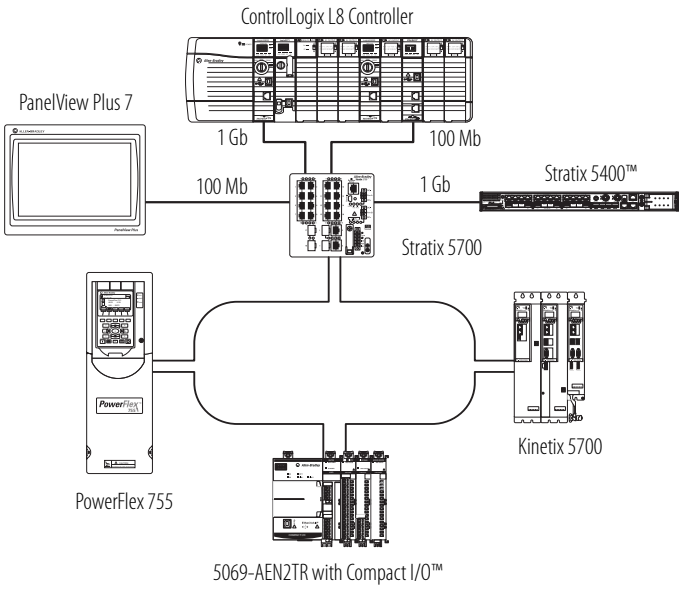
- Motion Analyzer CD to size your motion application and to make final component selection

  Download the software from https://motionanalyzer.rockwellautomation.com/

- Kinetix Motion Control Selection Guide, publication GMC-SG001, to verify drive, motor, and accessory specifications

Integrated Motion on an EtherNet/IP Network

Product	Consideration
Drive that supports EtherNet/IP connections	Unlimited velocity, torque, and VHz configured drives: • Kinetix 6500 drives • Kinetix 5700 drives • Kinetix 5500 drives • Kinetix 350 drives • PowerFlex 755 drives • PowerFlex 527 drives
ControlLogix controller	• 1756-L7: as many as 100 drives per controller • 1756-L8: as many as 256 drives per controller
ControlLogix EtherNet/IP communication module	• 1…8 position loop axes that are configured with the 1756-EN2T or 1756-EN2TR modules • 1…128 position loop axes that are configured with the 1756-EN3TR module



ControlLogix Communication Modules

Separate communication modules are available for different networks. Install multiple communication modules into the ControlLogix backplane to bridge or route control and information data between different networks. You can route a message through a maximum of four chassis (eight communication hops). You do not need a ControlLogix controller in the chassis.

Application	Network	Page
• Plant management (material handling) • Configuration, data collection, and control on one high-speed network • Time-critical applications with no established schedule • Inclusion of commercial technologies (such as video over IP) • Internet/Intranet connection • High-speed transfer of time-critical data between controllers and I/O devices • Integrated Motion on the EtherNet/IP network and safety • Redundant controller systems	EtherNet/IP	19
• High-speed transfer of time-critical data between controllers and I/O devices • Deterministic and repeatable data delivery • Media redundancy • Intrinsic safety • Redundant controller systems	ControlNet	20
• 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	20
• Plant-wide and cell-level data sharing with program maintenance • Data sent regularly • Transfer of information between controllers	Data Highway Plus	21
• 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	21
• Fieldbus transmitters and actuators • Closed-loop control • Process automation	Foundation Fieldbus	22

For detailed specifications, see the 1756 ControlLogix Communication Modules Specifications Technical Data, publication 1756-TD003.

EtherNet/IP Communication Modules

EtherNet/IP (Ethernet Industrial Protocol) is an open industrial-networking standard that supports real time I/O messaging and message exchange. The EtherNet/IP network uses off-the-shelf Ethernet communication chips and physical media.

Cat. No.	Description	Media	Communication Rate	Integrated Motion on the EtherNet/IP Network Axes, max	TCP/IP Connections	Logix Connections
1756-EN2F	EtherNet/IP bridge, fiber	Fiber	100 Mbps	8	128	256
1756-EN2T	EtherNet/IP bridge, copper	Copper	10/100 Mbps	8	128	256
1756-EN2TR	EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	8	128	256
1756-EN3TR	EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	128	128	256

Cat. No.	Description	Media	Communication Rate	Integrated Motion on the EtherNet/IP Network Axes, max	TCP/IP Connections	Logix Connections
1756-EN2TXT	ControlLogix-XT, extended temperature EtherNet/IP bridge, copper for extreme environments	Copper	10/100 Mbps	8	128	256
1756-EN2TRXT	ControlLogix-XT, extended temperature EtherNet/IP bridge, embedded switch, copper	Dual copper	10/100 Mbps	8	128	256
1756-EN2TSC	EtherNet/IP secure communication module	Copper	10/100 Mbps	—	128	256
1756-ENBT	EtherNet/IP bridge, copper	Copper	10/100 Mbps	—	64	128
1756-EWEB	Ethernet web server module	Copper	10/100 Mbps	—	64	128

ControlNet Communication Modules

The ControlNet network combines the functionality of an I/O network and a peer-to-peer network, providing high-speed performance. The ControlNet network provides deterministic, repeatable transfers of critical control data.

Cat. No.	Description	Communication Rate	Logix Connections	Number of Nodes
1756-CN2	ControlNet bridge, standard media	5 Mbps	128(1)	99
1756-CN2R	ControlNet bridge, redundant media	5 Mbps	128(1)	99
1756-CNB	ControlNet bridge, standard media	5 Mbps	64(2)	99
1756-CNBR	ControlNet bridge, redundant media	5 Mbps	64(2)	99
1756-CN2RXT	ControlLogix-XT, extended temperature ControlNet bridge, redundant media	5 Mbps	128(1)	99

(1) 128 connections are available for standard use. An extra three connections are reserved for redundant control.
(2) Recommend using only 40…48 Logix connections for I/O.

DeviceNet Communication Module

The DeviceNet network provides connections between simple, industrial devices (such as sensors and actuators) and higher-level devices (such as controllers and computers).

Cat. No.	Description	Communication Rate	Number of Nodes
1756-DNB	DeviceNet bridge	125 Kbps (500 m max) 250 Kbps (250 m max) 500 Kbps (100 m max)	64

Armor ControlLogix and Armor GuardLogix Controllers

The Armor ControlLogix controller, extends the standard ControlLogix platform to the On-Machine space. The Armor GuardLogix controller delivers safety control up to SIL 3, PLe, CAT 4.

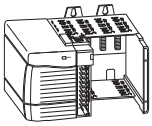
Both controllers have the equivalent of two embedded 1756-EN3TR modules, which offer dual independent Ethernet ports that support a DLR network topology.

Feature	1756-L71ER0M, 1756-L72ER0M	1756-L71ERM0S, 1756-L72ER0MS
Communication options	Standard • EtherNet/IP	Standard and safety • EtherNet/IP
Network connections	• 256 EtherNet/IP; 128 TCP per connection • 128 EtherNet/IP; 64 TCP (1756-ENBT) • 128 ControlNet (1756-CN2/B) • 100 ControlNet (1756-CN2/A) • 64 EtherNet/IP; 32 TCP (5069-AENTR) • 40 ControlNet (1756-CNB)	
Controller redundancy	Not supported	
Programming languages	• Relay ladder • Structured Text • Function block • Sequential function chart	• Relay ladder(1) • Structured Text • Function block • Sequential function chart • Safety application instructions(1)

(1) The safety task supports only relay ladder logic.

Select a ControlLogix System

Step 1
ControlLogix I/O Modules



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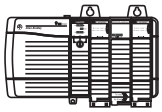
Select:
- I/O modules—Some modules have field-side diagnostics, electronic fusing, or individually isolated inputs/outputs
- A remote terminal block (RTB) or wiring system for each I/O module

Step 2
ControlLogix Integrated Motion



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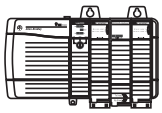
Select:
- An EtherNet/IP communication module for Integrated Motion
- Associated cables
- Select drives, motors, and accessories (use the Motion Analyzer software)

Step 3
ControlLogix Communication Modules



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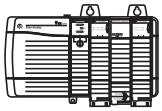
Select:
- Networks
- Communication modules
- Associated cables and network equipment
- Sufficient modules and cables if you are planning a redundant system

Step 4
ControlLogix Controllers



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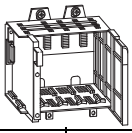
Select a controller:
- Standard ControlLogix controller
- Redundant ControlLogix controller
- Safety GuardLogix controller
- Extreme environment ControlLogix controller
- Standard Armor ControlLogix controller
- Safety Armor GuardLogix controller

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

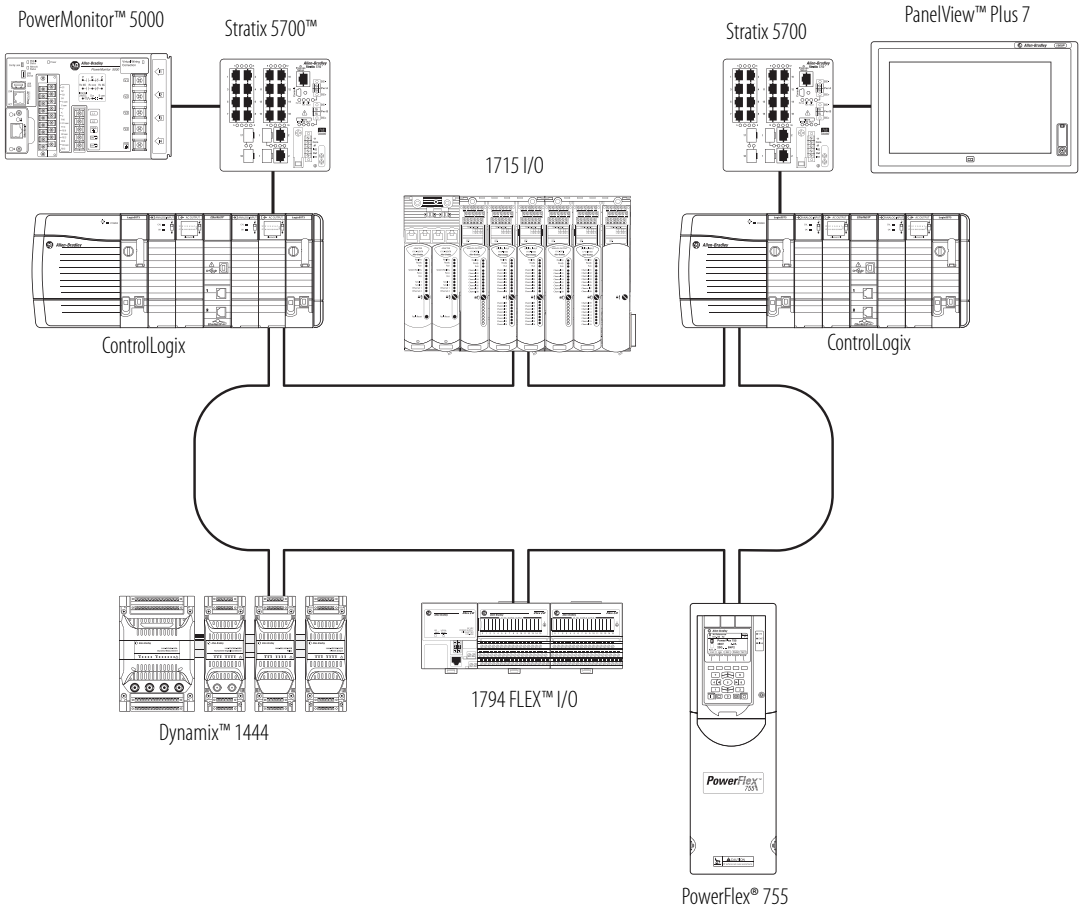
ControlLogix System Overview

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 one chassis. For a more comprehensive system, use the following:

- Multiple controllers in one chassis
- Multiple controllers joined across networks
- I/O in multiple platforms that are distributed in many locations and connected over multiple I/O links



Conformal Coating

A conformal coating solution is offered on select ControlLogix products. Conformal coating helps protect the assembly by providing a layer of protection against contaminants and humidity to extend product life in harsh, corrosive environments. Conformally coated products have a 'K' suffix at the end of the catalog number, such as 1756-A4K. Conformally coated, Allen-Bradley® products meet or exceed these requirements:

- ANSI/ISA 71.04.2013 G3 Environment (10-year exposure)
- IEC 61086-3-1 Class 2
- IPC-CC-830
- MIL-I-46058C
- EN600068-2-52 salt mist test, severity level 3

The most current list of conformally coated products can be found by contacting your local Rockwell Automation distributor, sales office, or at the following location:

http://www.ab.com/en/epub/catalogs/12762/2181376/2416247/360807/ControlLogix-System.html

ControlLogix-XT System

ControlLogix-XT™ (Extended Temperature) controllers function the same way as traditional ControlLogix controllers with an extended temperature range. The ControlLogix-XT products include control and communication system components that are conformally coated to extend product life in harsh, corrosive environments:

- The standard ControlLogix system can withstand temperature ranges from 0…60 °C (33…140 °F).
- When used independently, the ControlLogix-XT system can withstand temperature ranges from -25…70 °C (-13…158 °F).