Selection Guide

ControlLogix System

Catalog Numbers 1756 Series

1756 ControlLogix I/O Modules
1756 ControlLogix Integrated Motion
1756 ControlLogix Communication Modules
1756 ControlLogix Controllers
1756 ControlLogix Chassis
1756 ControlLogix Power Supplies

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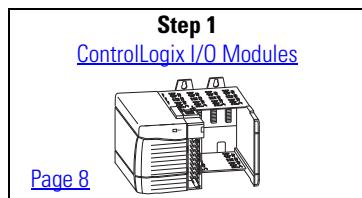
Select:
- I/O modules - some modules have field-side diagnostics, electronic fusing, or individually isolated inputs/outputs
- A remote terminal block (RTB) or wiring system for each I/O module

Step 2
ControlLogix Integrated Motion

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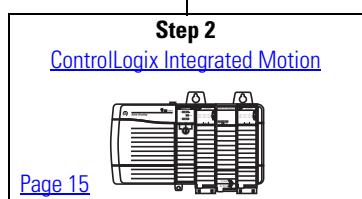
Select:
- A SERCOS or analog interface module
- Associated cables
- A removable terminal block (RTB) - only for analog interface modules
- Select drives, motors, and accessories (use the Motion Analyzer software)

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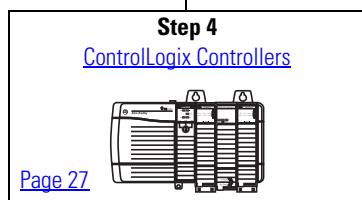
Select:
- A controller with sufficient memory
- Secure Digital or CompactFlash card
- Replacement batteries, if needed

Step 5
ControlLogix Chassis

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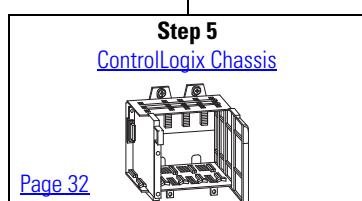
Select:
- A chassis with sufficient slots
- Slot fillers for empty slots

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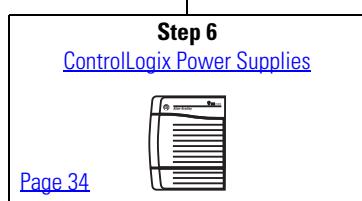
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Select:
- One power supply for each chassis, if you are using standard power supplies
- A power supply bundle if you are planning a redundant power supply system

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
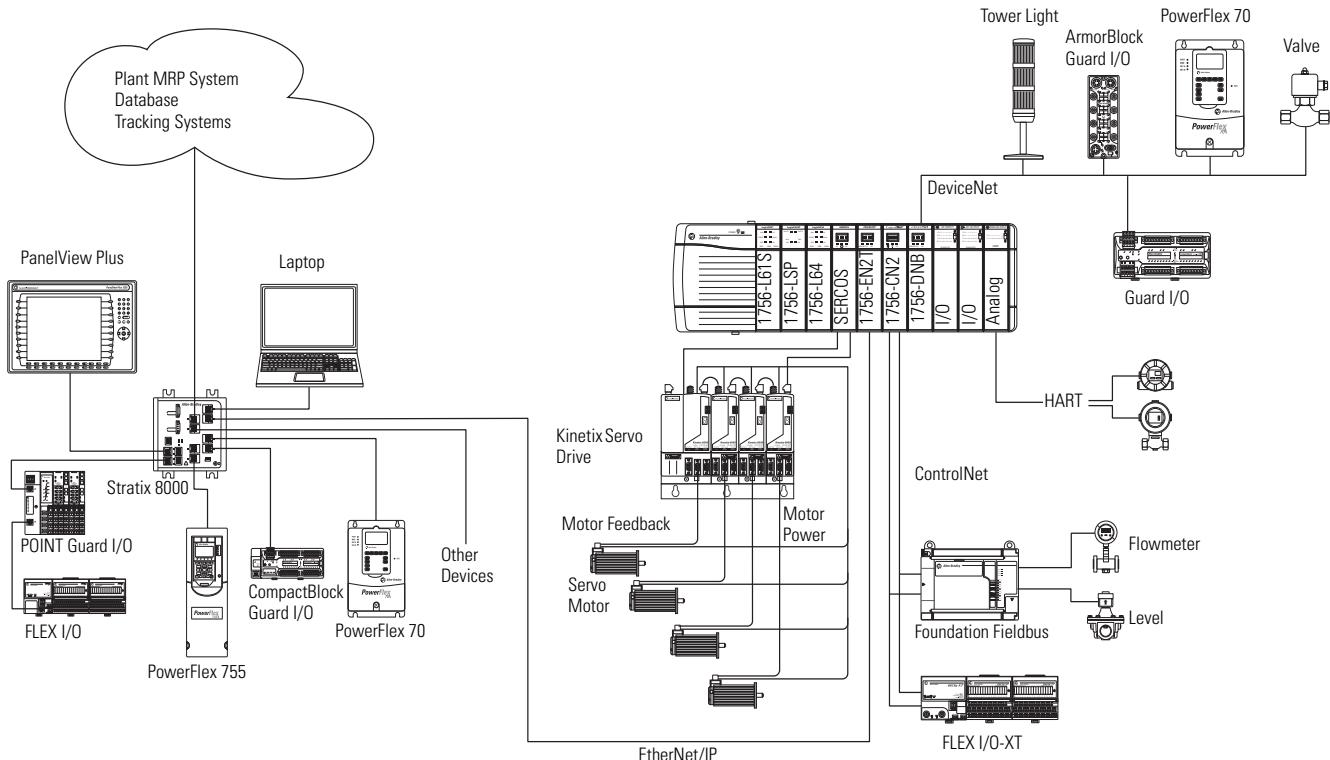
ControlLogix-XT System

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

Secondary ControlLogix Chassis

1756-RM

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

1756-CN2R/B

1756-EN2T

1756-RM

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

1756-CN2R/B

1756-EN2T

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.

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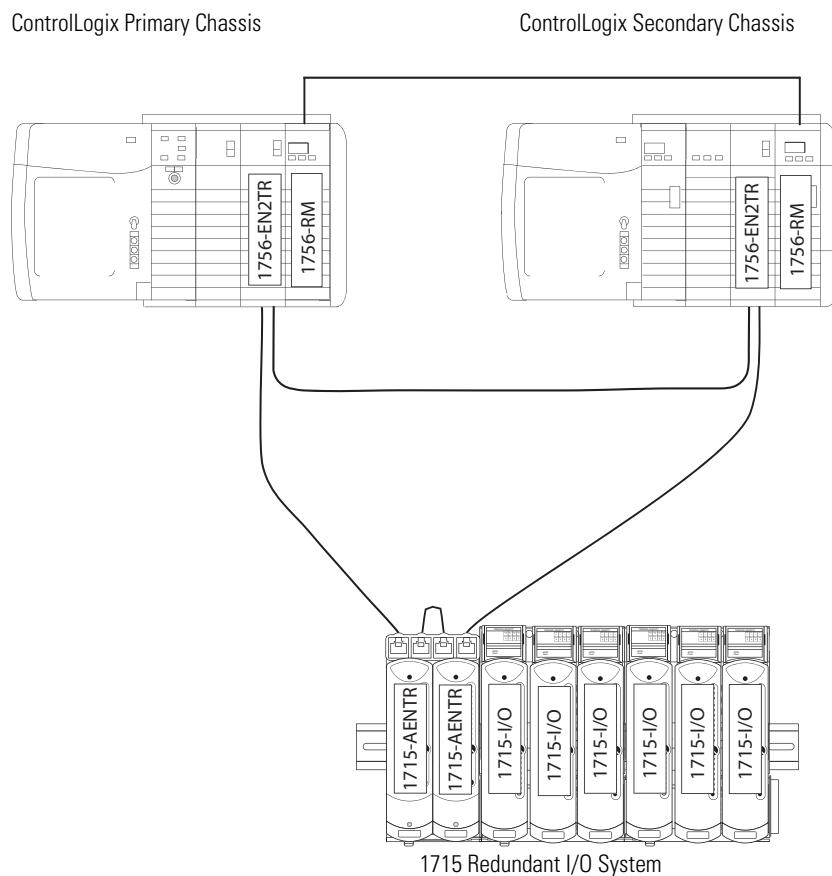
For detailed specifications, see the 1715 Redundant I/O System Specifications Technical Data, publication 1715-TD001A-EN-P.

ControlLogix Integrated Motion

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

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

For detailed specifications on motion interface modules, see 1756 ControlLogix Integrated Motion Specifications, 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 http://www.ab.com/motion/software/analyzer.html
- 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 • PowerFlex 755 drives
ControlLogix controller	As many as 100 drives per controller
ControlLogix EtherNet/IP communication module	• 1…8 position configured drives with 1756-EN2TR module • 1…255 position configured drives with 1756-EN3TR module

ControlLogix Controller

PanelView Plus Terminal

Workstations

Drive with EtherNet/IP Connection

POINT I/O Modules
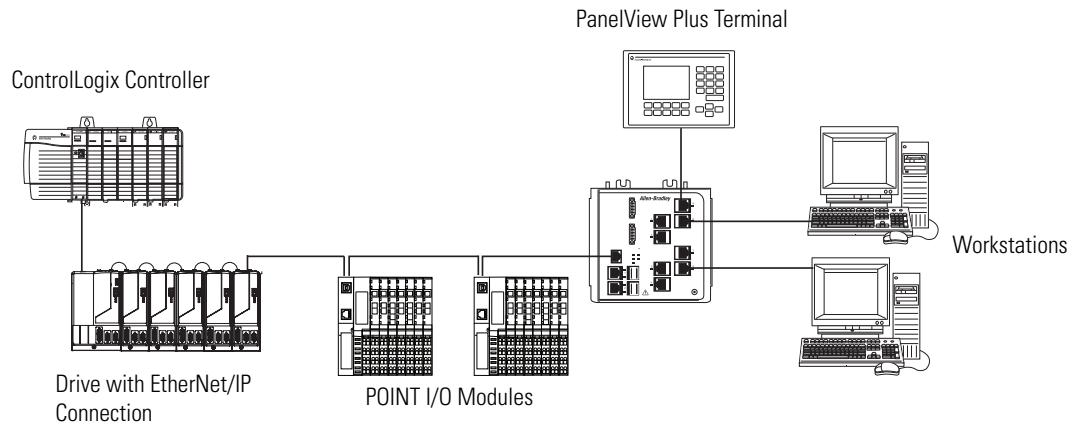
SERCOS Interface Modules

Cat. No.	Description	Number of Axis
1756-M16SE	Rockwell Automation SERCOS interface modules	16
1756-M08SE		8
1756-M03SE		3
1756-M08SEG	SERCOS interface drives that are Extended Pack Profile compliant	8

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

Diagram labels:
- RSLogix 5000 Software
- 1756-MxxSE Module
- ControlLogix Controller
- Kinetix 6000 Multi-axis Servo Drive
- SERCOS Fiber-optic Ring
- Three-phase Input Power
- Shunt Module
- Line Interface Module
- Slot Filler Module
- Integrated Axis Module
- Axis Modules
- Motor
- Motor Feedback
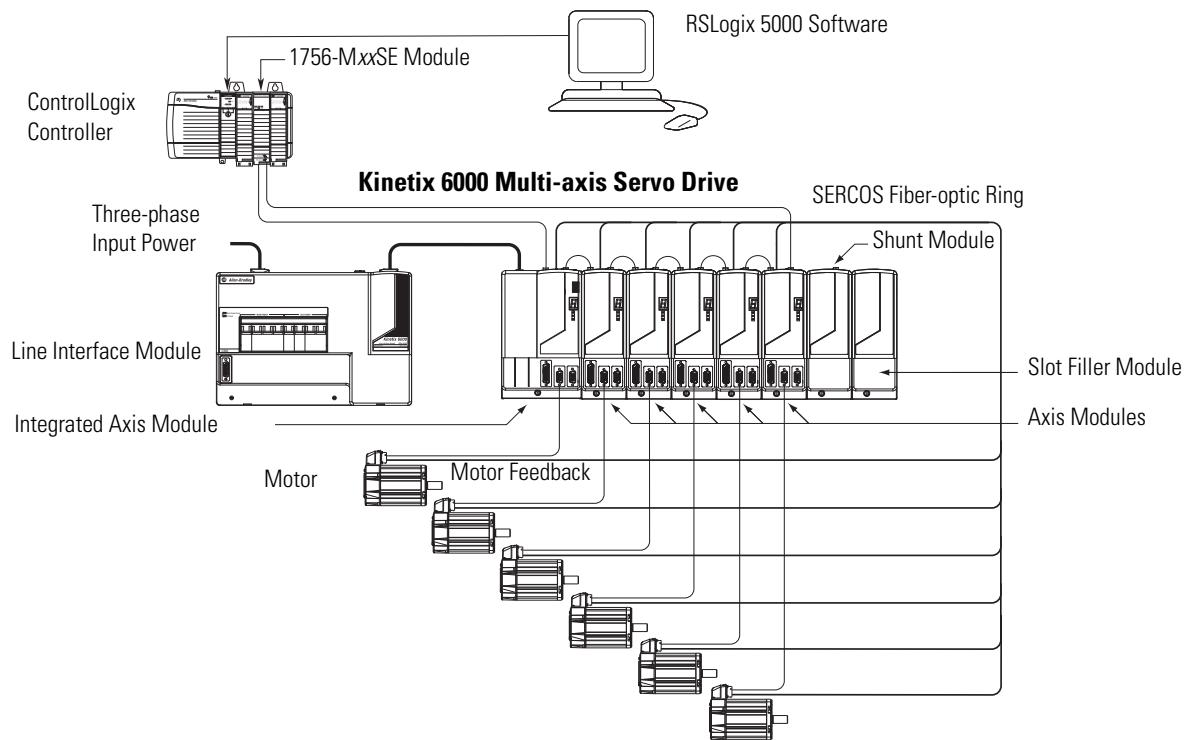
Analog Motion Interface Modules

Cat. No.	Description	Number of Axis
1756-M02AE	Analog servo interface drives with quadrature feedback	2
1756-HYD02	Analog, hydraulic servo interface drives LDT feedback	2
1756-M02AS	Analog servo interface drives with SSI feedback	2