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PLC-5 PROGRAMMABLE CONTROLLERS

SELECTION GUIDE 1785 and 1771



PLC-5 Programmable Controllers Comparison

Category	Controller	Catalog Number	User Memory Words, Max	Total I/O, Max	Number of Communication Ports (mode)
Standard	PLC-5/11	1785-L11B	8000	512	1 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/20	1785-L20B	16,000	512	1 DH+ and 1 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/30	1785-L30B	32,000	1024	2 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/40	1785-L40B	48,000	2048	4 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/40L	1785-L40L	48,000	2048	2 DH+ or Remote I/O (Adapter or Scan) and 1 Extended Local I/O
	PLC-5/60	1785-L60B	64,000	3072	4 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/60L	1785-L60L	64,000	3072	2 DH+ or Remote I/O (Adapter or Scan) and 1 Extended Local I/O
	PLC-5/80	1785-L80B	100,000	3072	4 DH+ or Remote I/O (Adapter or Scan)
Standard with Protected Memory	PLC-5/26	1785-L26B	16,000	512	1 DH+ and 1 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/46	1785-L46B	48,000	2048	4 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/86	1785-L86B	100,000	3072	4 DH+ or Remote I/O (Adapter or Scan)
ControlNet	PLC-5/20C	1785-L20C15	16,000	512	1 ControlNet (Dual Media) and 1 DH+
	PLC-5/40C	1785-L40C15	48,000	2048	1 ControlNet (Dual Media) and 2 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/80C	1785-L80C15	100,000	3072	1 ControlNet (Dual Media) and 2 DH+ or Remote I/O (Adapter or Scan)
ControlNet with Protected Memory	PLC-5/46C	1785-L46C15	48,000	2048	1 ControlNet (Dual Media) and 2 DH+ or Remote I/O (Adapter or Scan)
Ethernet	PLC-5/20E	1785-L20E	16,000	512	1 Ethernet, 1 DH+ and 1 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/40E	1785-L40E	48,000	2048	1 Ethernet, 2 DH+ or Remote I/O (Adapter or Scan)
	PLC-5/80E	1785-L80E	100,000	3072	1 Ethernet, 2 DH+ or Remote I/O (Adapter or Scan)

Introduction

1785 PLC-5 Programmable Controller: The Foundation of Control Architecture

The PLC-5 programmable controller stands at the center of a control architecture that brings together existing and future systems by means of networks such as EtherNet/IP, ControlNet and DeviceNet, and offers connectivity among SLC 500, ControlLogix, and MicroLogix controllers. Because they include embedded network connections, PLC-5 controllers enable your control architecture to be flexible enough to include cost-effective connections to a wide range of devices.



Controllers
Information, Control, and Device Communication Capability

I/O Modules
Many Choices to Meet Your Exact Requirements

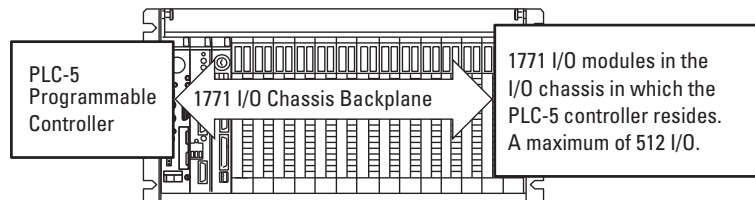
Software Tools
Program in Structured Text, Function Block, Sequential Function Charts or Ladder Logic Languages

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PLC-5 System Overview

A PLC-5/1771 control system, at minimum, consists of a programmable controller and I/O modules in a single 1771 chassis with a power supply. You choose the controller with the on-board communication ports you need.

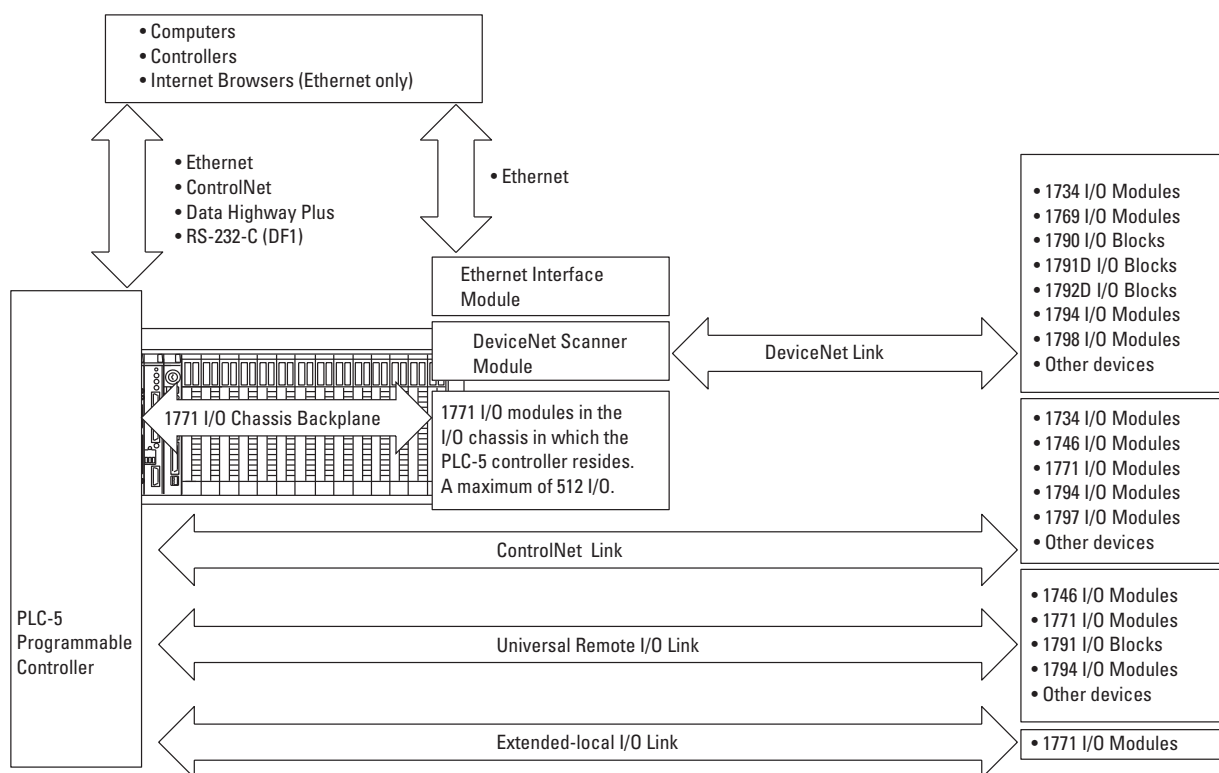
A simple system can consist of only a standalone controller and I/O modules all in a single chassis



On-board remote I/O scanner ports are available on all PLC-5 controllers. On-board extended-local I/O scanner ports are available on some PLC-5 controllers. On-board ControlNet ports are available on some PLC-5 controllers. To provide a DeviceNet I/O scanner port to the system, you must add a 1771-SDN DeviceNet Scanner Module.

In the typical configuration illustration, a ControlNet port on the controller interfaces the processor to the ControlNet link. In each of the two chassis remote from the controller, a 1771-ACN15 I/O Adapter Module provides I/O modules in those chassis with an interface to the ControlNet link. In this configuration, the PLC-5 controller monitors/controls the I/O in its local I/O chassis as well as the I/O in the remote locations.

Multiple controllers can communicate across networks; and I/O in multiple platforms can be distributed in many locations connected over multiple I/O links



Plug a 1771 power supply module into an I/O module slot, or connect a standalone 1771 power supply into the left end of each chassis.

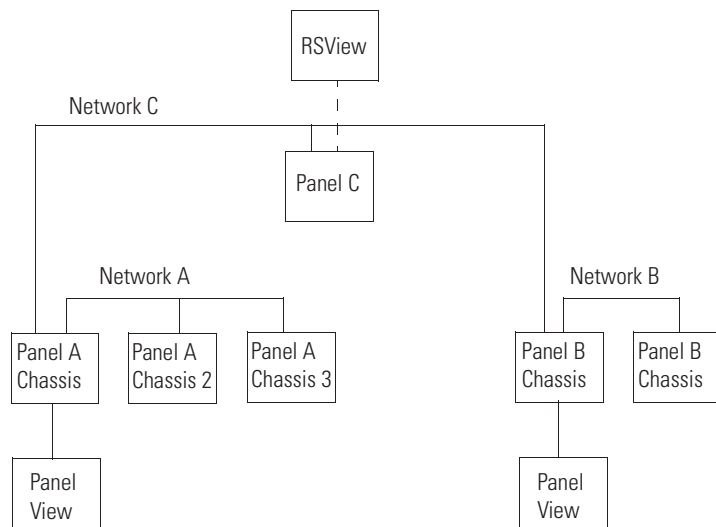
Depending on the communication ports available on your particular PLC control system, you can select operator interfaces that are compatible with those particular ports.

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.

Assume that Network A and Network B both require a controller and its I/O. Both controllers interact with time-critical information.



For a PLC-5 controller to control I/O modules, both the controller and the I/O modules must be directly attached to the same network.

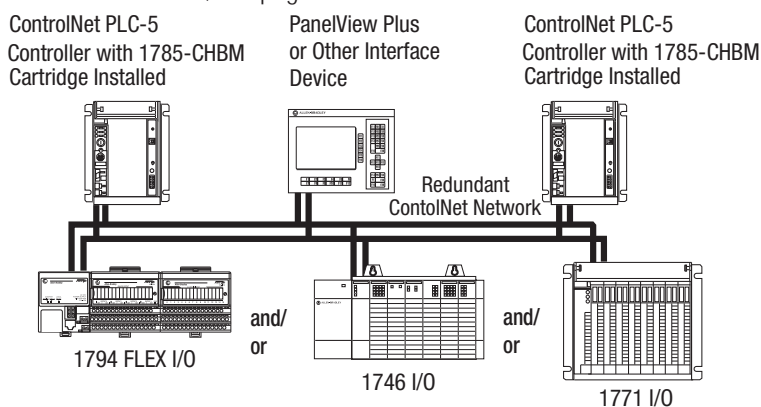
I/O Location	Controller in Panel A, Chassis 1	Controller in Panel B, Chassis 1
Panel A, chassis 1	Yes	Yes
Panel A, chassis 2	Yes	No
Panel A, chassis 3	Yes	No
Panel B, chassis 1	Yes	Yes
Panel B, chassis 2	No	Yes
Panel C, chassis 1	Yes	Yes

Evaluate what communications need to occur between controllers. If there is sporadic information that is not time-critical, use a message-based network such as an EtherNet/IP (the information portion), Data Highway Plus, or the unscheduled portion of the ControlNet network. If the information is time-critical, such as producer/consumer tags between controllers, use the ControlNet or EtherNet/IP network.

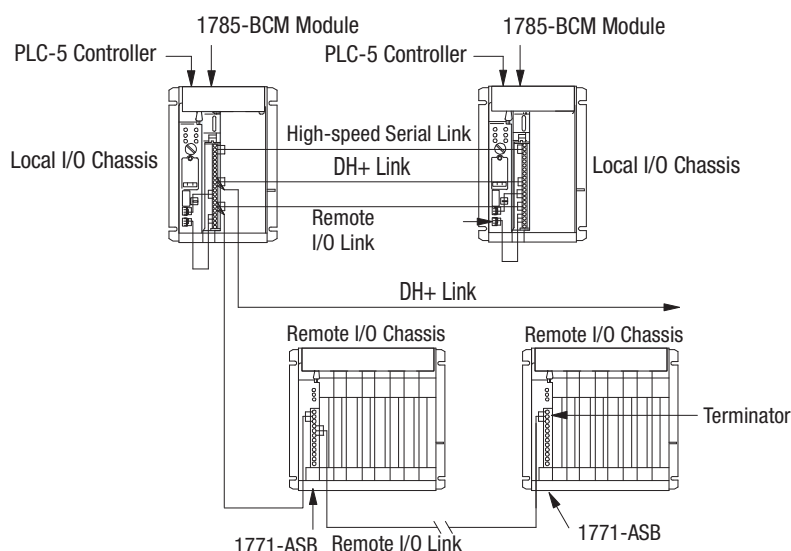
Apply Backup Solutions

The ControlNet Hot Backup Module, 1785-CHBM, provides backup of ControlNet I/O. A secondary controller qualifies critical-control information with the primary controller. Both controllers consume information from inputs and connect to outputs, but only the primary controller controls the outputs. The secondary controller establishes control of outputs if the primary controller shuts down.

For more information, see page 23.



The PLC-5 Backup Communication Module, 1785-BCM, helps increase the fault tolerance of PLC-5 programmable controller systems controlling I/O on a remote I/O link by providing backup of the PLC-5 programmable controller.



Cat. No.	Connections	Customer Relay	Design Considerations	Power Dissipation	Backplane Current Load
1785-BCM	1771-WG wiring arm (included)	0.25 A @ 24V dc (resistive)	Place in local I/O chassis	10 W max	1 A

Use the following checklist as a guide to completing your own system specification. The inside of the back cover of this selection guide is a worksheet you can use to record your selections.

✓	Step	For more information, see
<input type="checkbox"/>	1 Select I/O Modules Select I/O based on: <ul style="list-style-type: none"> • type of information to send/receive. • application requirements. • electrical requirements. 	1771 I/O Modules page 8 1746 I/O Modules page 13 1794 I/O Modules page 14 1797 I/O Modules page 15 1791D I/O Modules page 16 1734 I/O Modules page 17
<input type="checkbox"/>	2 Select Network Communications Select Networks based on: <ul style="list-style-type: none"> • type of information to send/receive. • system performance. • distance/size of application. • available networks. • future expansion. 	NetLinx Architecture page 19 Select a Network page 20 EtherNet/IP Protocol page 21 ControlNet page 23 DeviceNet page 25 Serial Network page 26 Data Highway Plus page 29 Remote I/O page 30
<input type="checkbox"/>	3 Select Controllers Select a controller based on: <ul style="list-style-type: none"> • I/O requirements. • memory requirements. • communication requirements. 	Enhanced Controllers page 32 Ethernet Controllers page 33 ControlNet Controllers page 34 Protected Controllers page 35 Backing Up Memory page 36 Battery Replacement page 36
<input type="checkbox"/>	4 Select Chassis Select a chassis based on: <ul style="list-style-type: none"> • the number of slots you need. 	1771 Chassis page 37 Mounting Dimensions page 38
<input type="checkbox"/>	5 Select Power Supplies Select a power supply based on: <ul style="list-style-type: none"> • input voltage. • output current. • number of slots required. 	1771 Power Supplies page 39 Power Requirements and Transformer Sizing page 40
<input type="checkbox"/>	7 Select Software Select software based on: <ul style="list-style-type: none"> • computer platform. • operating environment. • programming language. 	Select Software page 43 Programming Software page 44 RSLinx Software page 45 Network Configuration Software page 46 RSLogix Emulate 5 Software page 47 PLC-5 and Training Software page 48 ViewAnyWare Products page 50

Select Controllers

Step 3 - Select:

- Enhanced PLC-5 Controllers
- Ethernet PLC-5 Controllers
- ControlNet PLC-5 Controllers
- Protected PLC-5 Controllers
- EEPROM Memory Modules
- Replacement Batteries

PLC-5 controllers are high-speed, single-slot controllers you can use for control and information processing. PLC-5 controllers are designed for larger sequential and regulatory control applications with specialized I/O requirements and/or the need to coordinate with other controllers and devices.

PLC-5 controllers come with different memory sizes and network connections. The Enhanced PLC-5 controllers offer a standard set of functions and communication options. The other PLC-5 controllers offer different communication options, while maintaining the same functions. Choose the controller that best meets your needs.

If your application requires	Select from
<ul style="list-style-type: none"> • Connectivity to a large number of Remote I/O devices • Connectivity to a large number of DH+ devices 	Enhanced PLC-5 Controllers see page 32
<ul style="list-style-type: none"> • EtherNet/IP connectivity • Communication with other Ethernet PLC-5 controllers and host computers 	Ethernet PLC-5 Controllers see page 33
<ul style="list-style-type: none"> • High-speed communication for control and information processing • Deterministic, repeatable data transfers • ControlNet connectivity 	ControlNet PLC-5 Controllers see page 34
<ul style="list-style-type: none"> • Limited access to critical or proprietary areas of programs • Selectively access to processor memory and I/O elements • Restricted use of processor operations 	Protected PLC-5 Controllers see page 35

Enhanced PLC-5 Controllers



Every PLC-5 controller offers built-in, configurable ports for Data Highway Plus (DH+) or Remote I/O. A DH+ connection supports remote programming and information access, in addition to peer-to-peer communication between the PLC-5, other controllers, and devices. A Remote I/O connection supports real-time data exchange for I/O, operator interface, and other third-party devices.

Cat. No.	User Memory (words), Max	Total I/O, Max	Channels	Number of I/O Chassis, Max				Power Dissipation, Max	Backplane Current Load
				Total	Extended -local	Remote	ControlNet		
1785-L11B	8000	512 any mix or 384 in + 384 out (complement)	1 DH+/remote I/O	5	0	4	0	12 W	2.3 A
1785-L20B	16,000	512 any mix or 512 in + 512 out (complement)	1 DH+ 1 DH+/remote I/O	13	0	12	0	12 W	2.3 A
1785-L30B	32,000	1024 any mix or 1024 in + 1024 out (complement)	2 DH+/remote I/O	29	0	28	0	12 W	2.3 A
1785-L40B	48,000	2048 any mix or 2048 in + 2048 out (complement)	4 DH+/remote I/O	61	0	32 max/link	0	17.3 W	3.3 A
1785-L60B	64,000	3072 any mix or 3072 in + 3072 out (complement)	4 DH+/remote I/O	93	0	32 max/link	0	17.3 W	3.3 A
1785-L80B	100,000	3072 any mix or 3072 in + 3072 out (complement)	4 DH+/remote I/O	93	0	32 max/link	0	17.3 W	3.3 A

Ethernet PLC-5 Controllers



The Ethernet PLC-5 controller integrates the Allen-Bradley architecture into an industry-standard EtherNet/IP system, offering a flexible and open solution.

With the Ethernet PLC-5 controller's built-in communication capabilities, your entire enterprise can use standard Ethernet or Internet connectivity to control and monitor production. Using the Internet and Web browser, you can create your own custom Web pages to provide executive summaries of process information. These pages are accessible to any Internet user who has network access to the PLC-5 controller. The embedded Web server provides access to PLC-5 diagnostics. Domain Name Service (DNS) and Simple Network Management Protocol (SNMP) are also supported.

Cat. No.	User Memory (words), Max	Total I/O, Max	Channels	Number of I/O Chassis, Max				Power Dissipation, Max	Backplane Current Load
				Total	Extended -local	Remote	ControlNet		
1785-L20E	16,000	512 any mix or 512 in + 512 out (complement)	1 Ethernet 1 DH+ 1 DH+/remote I/O	13	0	12	0	19 W	3.6 A
1785-L40E	48,000	2048 any mix or 2048 in + 2048 out (complement)	1 Ethernet 2 DH+/remote I/O	61	0	60	0	19 W	3.6 A
1785-L80E	100,000	3072 any mix or 3072 in + 3072 out (complement)	1 Ethernet 2 DH+/remote I/O	65	0	64	0	19 W	3.6 A

ControlNet PLC-5 Controllers



The ControlNet PLC-5 controller offers embedded ControlNet communication capabilities for control and information processing. The ControlNet network provides both I/O control and peer-to-peer communications on a 5 Mbps network, with repeatability and determinism.

You can have multiple ControlNet PLC-5 controllers on one ControlNet network, with each controller handling its own I/O on the network, and at the same time communicating with each other. Multiple controllers can receive input data from one I/O or device node.

Cat. No.	User Memory (words), Max	Total I/O, Max	Channels	Number of I/O Chassis, Max			ControlNet I/O Map Entries	Power Dissipation, Max	Backplane Current Load
				Total	Extended -local	Remote			
1785-L20C15	16,000	512 any mix or 512 in + 512 out (complement)	1 ControlNet 1 DH+ 1 DH+/remote I/O	77	0	12	64	15.8 W	3.0 A
1785-L40C15	48,000	2048 any mix or 2048 in + 2048 out (complement)	1 ControlNet 2 DH+/remote I/O	125	0	60	96	15.8 W	3.0 A
1785-L46C15 Protected	48,000	2048 any mix or 2048 in + 2048 out (complement)	1 ControlNet 2 DH+/remote I/O	125	0	60	96	15.8 W	3.0 A
1785-L80C15	100,000	3072 any mix or 3072 in + 3072 out (complement)	1 ControlNet 2 DH+/remote I/O	125	0	92	128	15.8 W	3.0 A

Protected PLC-5 Controllers



The Protected PLC-5 controller lets you limit access to critical or proprietary areas of programs, selectively guard controller memory and I/O, or restrict use of controller operations. The distinctive safety-yellow labels on the controller identify the protected PLC-5 controller.

Use the programming software to assign class privileges to specific user accounts or a user's job function, such as system administrator, plant engineer, maintenance engineer, or operator. Using four privilege classes and associated passwords, you can limit access to critical areas of programs and restrict access to:

- communication channels.
- remote nodes attached to the ControlNet or DH+ network.
- program files.
- data files.

The protected PLC-5 controller expands system validity and security beyond that provided by the password-and-privilege feature of the other PLC-5 controllers. The Rockwell Automation clutch/brake application package combines the protected PLC-5 controller with specially-designed software to support stamping press applications.

Cat. No.	User Memory (words), Max	Total I/O, Max	Channels	Number of I/O Chassis, Max			ControlNet I/O Map Entries	Power Dissipation, Max	Backplane Current Load
				Total	Extended -local	Remote			
1785-L26B	16,000	512 any mix or 512 in + 512 out (complement)	1 DH+ 1 DH+/remote I/O	13	0	12	0	12 W	2.3 A
1785-L46B	48,000	2048 any mix or 2048 in + 2048 out (complement)	4 DH+/remote I/O	61	0	32 max/link	0	17.3 W	3.3 A
1785-L46C15 Protected	48,000	2048 any mix or 2048 in + 2048 out (complement)	1 ControlNet 2 DH+/remote I/O	125	0	60	96	15.8 W	3.0 A
1785-L86B	100,000	3072 any mix or 3072 in + 3072 out (complement)	4 DH+/remote I/O	93	0	32 max/link	0	17.3 W	3.3 A

Back Up Controller Memory

You can back up program files using an EEPROM module.

Cat. No.	Provides this amount of backup memory
1785-ME16 ⁽¹⁾	16,000 words
1785-ME32	32,000 words
1785-ME64	64,000 words
1785-CHBM	100,000 words

⁽¹⁾Not for use with ControlNet PLC-5 controllers.

Battery Replacement and Life Estimates

Cat. No.	Applies to	When used in this controller	At this temperature	Battery Life Estimate	
				Power off 100%	Power off 50%
1770-XYC	All PLC-5 Programmable Controllers	PLC-5/11, -5/20 and -5/20E	60 °C (140 °F)	256 days	1.4 years
			25 °C (77 °F)	2 years	4 years
		All Others	60 °C (140 °F)	84 days	150 days
			25 °C (77 °F)	1 year	1.2 years