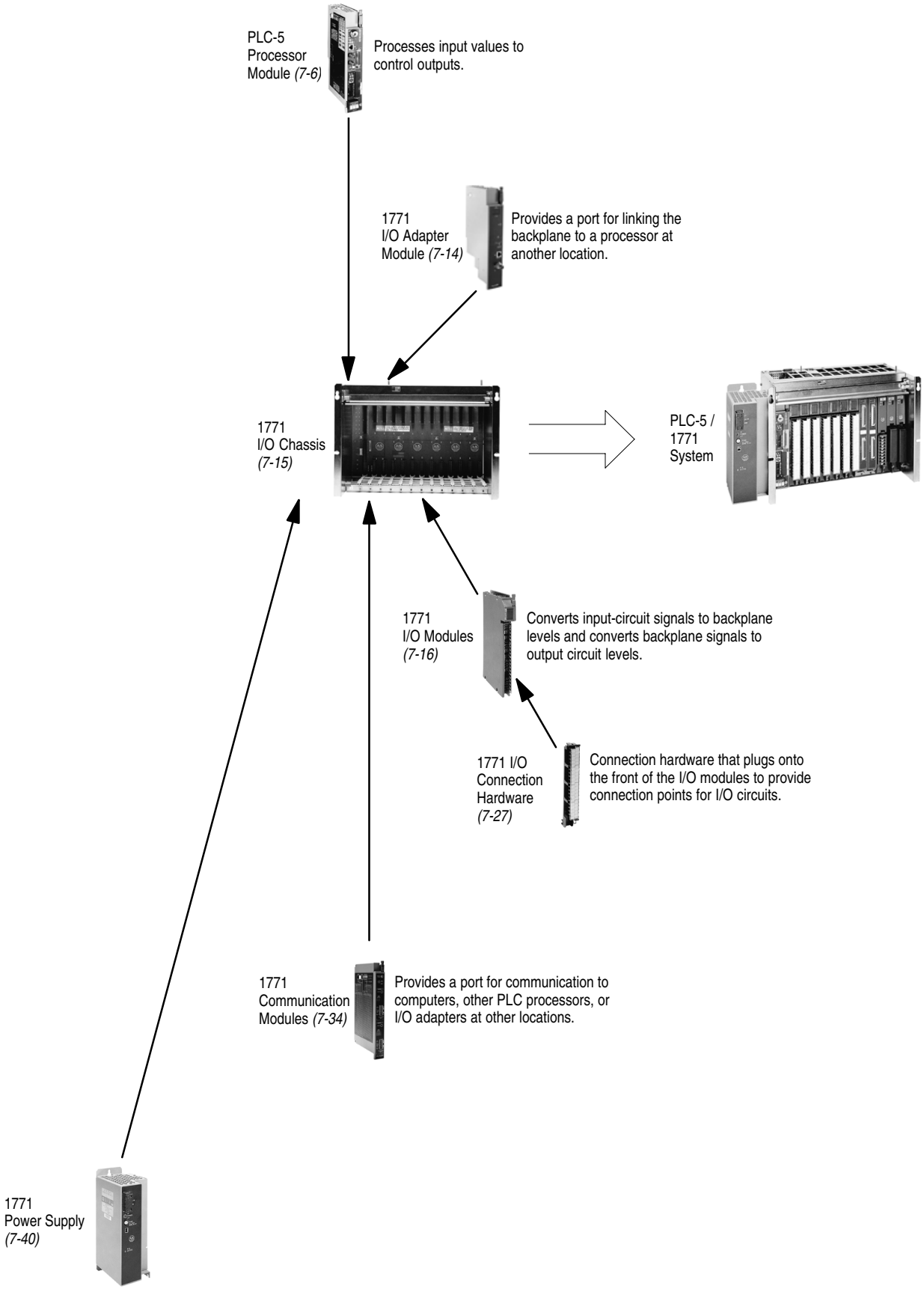
94. System Overview



Advantages

The PLC-5 processor module in a 1771 platform provides a proven approach for industrial control. PLC-5 processors are available in a range of functional design, and can be connected in a variety of networks for distributed processing and distributed I/O. The 1771 I/O products offer a full range of digital and analog I/O (including intelligent I/O) in a rugged modular assembly.

- **Modularity** of I/O and communication interfaces provides a configurable and expandable system. You configure your system for the number of I/O and the communication networks you need. Later, when you want to expand the system, you can add I/O or communication interfaces.
- **Fast** delivery of messages between networks, between links within networks, and between modules across the backplane.
- **Industrial-hardened** hardware platform is designed to withstand the vibrations, thermal extremes, and electrical noise associated with harsh industrial environments.
- **Compact** design of hardware lets it fit in limited panel space.
- **Distributed processing** is possible by connecting processors across Ethernet, ControlNet, and DeviceNet networks.
- **Distributed I/O** at locations remote from the processor can be connected across ControlNet, DeviceNet, and Universal Remote I/O links.

Functional Design

PLC-5 processors are available in a range of forcible I/O (512 maximum thru 3072 maximum) and maximum user memory (6K thru 100K words). All are capable of controlling remotely located I/O. The maximum number of I/O locations remote from the processor ranges from 5 thru 125. The processor can monitor/control these I/O across ControlNet, DeviceNet, and Universal Remote I/O links.

Mechanical Design

The 1771 platform provides a rack-based modular assembly. The PLC-5 processors are single-slot modules that you place into the left-most slot of a 1771 I/O chassis. For 1771 I/O in a location remote from the processor, the I/O adapter is a single-slot module that you place into the left-most slot of a 1771 I/O chassis.

Some 1771 I/O chassis are built for back-panel mounting and some are built for rack mounting. The 1771 I/O chassis is available in sizes of 4, 8, 12, or 16 I/O module slots. The 1771 I/O modules are available in densities of a maximum of 32 I/O per module.

Mechanical keying of each I/O module to its backplane connector guards against inadvertently replacing a module with another module of a different type. Because you wire to a wiring arm that unplugs from the module, you do not need to disconnect wiring to replace an I/O module. (For I/O connection hardware, see page 7-27.)

Power supply modules are available for installation in I/O module slots. Also stand-alone power supplies are available and can be mounted separately or directly on the left end of the 1771 I/O chassis.

Communication

A PLC-5 processor communicates across the 1771 backplane to 1771 I/O modules in the chassis in which the processor resides. The different models of PLC-5 processors have various on-board ports for communication with other processors, computers, and remotely located I/O. Also, separate modules are available to provide additional communication ports.

Each PLC-5 processor has a built-in RS-232/422/423 (DF1-protocol) port. Each PLC-5 processor also has one or more on-board ports that can be configured for either Data Highway Plus or Universal Remote I/O. As a Universal Remote I/O port, it can be configured as either an I/O scanner port or an I/O adapter port. Selected models of PLC-5 processors have on-board ports for Ethernet, ControlNet, or Extended Local I/O communication.

In addition to the on-board ports available with PLC-5 processors, you have the option of providing another communication port for a PLC-5 processor by adding a communication module. (For communication modules, see page 7-34.)

I/O adapter modules for 1771 I/O are available for ControlNet, Universal Remote I/O, and Extended Local I/O links. An I/O adapter module in a chassis with I/O modules interfaces the I/O modules with the I/O link for communication with a scanner port for a processor at another location. (For I/O adapter modules, see page 7-14.)

96. PLC-5 Processor Selection

1785 PLC-5 Processors

Processor/ Cat. No.	Max User Memory Words [1]	Memory Types	Total I/O Maximum [5]	Analog I/O Max	Program Scan Time/Kword	I/O Scan time/Rack [6] (in a single Chassis, ext-local or remote)
97. **Standard PLC-5 Processors**						
PLC-5/11 (1785-L11B)	8K	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 512 (any mix) or • 384 in + 384 out (complementary)	512	0.5ms (min) 2ms (typ)	• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/20 (1785-L20B)	16K	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 512 (any mix) or • 512 in + 512 out (complementary)	512		• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/30 (1785-L30B)	32K	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 1024 (any mix) or • 1024 in and 1024 out (complementary)	1024		• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/40 (1785-L40B)	48K [2]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 2048 (any mix) or • 2048 in + 2048 out (complementary)	2048		• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/40L (1785-L40L)	48K [2]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 2048 (any mix) or • 2048 in + 2048 out (complementary)	2048		• 0.5ms (ext. local) • 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/60 (1785-L60B)	64K [3]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 3072 (any mix) or • 3072 in + 3072 out (complementary)	3072		• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/60L (1785-L60L)	64K [3]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 3072 (any mix) or • 3072 in + 3072 out (complementary)	3072		• 0.5ms (ext. local) • 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/80 (1785-L80B)	100K [4]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100	• 3072 (any mix) or • 3072 in + 3072 out (complementary)	3072		• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
98. **Standard PLC-5 Processors with Protected Memories**						
PLC-5/26 (1785-L26B)	16K	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100 • Protected	• 512 (any mix) or • 512 in + 512 out (complementary)	512	0.5ms (min) 2ms (typ)	• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/46 (1785-L46B)	48K [2]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100 • Protected	• 2048 (any mix) or • 2048 in + 2048 out (complementary)	2048	0.5ms (min) 2ms (typ)	• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s
PLC-5/86 (1785-L86B)	100K [4]	• Battery-backed static RAM • EEPROM program backup option using 1785-ME16, -ME32, -ME64, and -M100 • Protected	• 3072 (any mix) or • 3072 in + 3072 out (complementary)	3072	0.5ms (min) 2ms (typ)	• 10ms @ 57.6k bit/s • 7ms @ 115.2k bit/s • 3ms @ 230.4k bit/s

[1] Max number of **data table words** and max number of **timers and counters** are user-configured.

[2] Limit of 32K words per data table file.

[3] Limit of 32K words per data table file and 56K words per program file.

[4] Limit of 32K words per data table file and a total data table size of 64K words. Limit of 56K words per program file.

[5] **Total I/O Maximum** — actual I/O circuits, regardless of the number of connection points or I/O image bits. The number of I/O image bits (8, 16, or 32) that correspond to an I/O module limit the number of I/O at that module; however, some modules may have less I/O than I/O image bits. This includes local I/O, extended local I/O, and Universal Remote I/O combined. This does not include DeviceNet I/O.
Any mix — means that any number of the I/O can be inputs and any number can be outputs, with no placement restrictions.
Complementary — means that to configure this many I/O, pairs of modules must have duplicate addresses. This pair must be either 2 output modules sharing the same output image bits or an input module and an output module complementing each other. In either case, module placement must conform to these restrictions.

[6] For Universal Remote I/O unless otherwise specified.
I/O rack — an I/O addressing unit that can contain a maximum of 128 I/O with unique addressing of I/O modules or 256 I/O with duplicate addressing of I/O modules.

See page 7-11 for memory devices.

1785 PLC-5 Processors (continued)

Number of Remote/Extended Local-I/O/DH+ Ports — Mode	Maximum Number of I/O Chassis				Number of RS-232-C/422-A /423-A Ports [2]	Control Coprocessor Expn Port	Backplane Current Load	Processor/ Cat. No.
	Total	Extended Local	Universal Remote [1]	ControlNet				
Standard PLC-5 Processors								
• 1 DH+/Remote I/O (Adap or Scan)	5	0	4	0	1	Yes	2.3A	**PLC-5/11 (1785-L11B)**
• 1 DH+ • 1 DH+/Remote I/O (Adap or Scan)	13	0	12	0			2.3A	**PLC-5/20 (1785-L20B)**
• 2 DH+/Remote I/O (Adap or Scan)	29	0	28	0			2.3A	**PLC-5/30 (1785-L30B)**
• 4 DH+/Remote I/O (Adap or Scan)	61	0	32 max per I/O link	0			3.3A	**PLC-5/40 (1785-L40B)**
• 2 DH+/Remote I/O (Adap or Scan) • 1 Extended Local I/O	61	16	32 max per I/O link	0			3.3A	**PLC-5/40L (1785-L40L)**
• 4 DH+/Remote I/O (Adap or Scan)	93	0	32 max per I/O link	0			3.3A	**PLC-5/60 (1785-L60B)**
• 2 DH+/Remote I/O (Adap or Scan) • 1 Extended Local I/O	81	16	32 max per I/O link	0			3.3A	**PLC-5/60L (1785-L60L)**
• 4 DH+/Remote I/O (Adap or Scan)	93	0	32 max per I/O link	0			3.3A	**PLC-5/80 (1785-L80B)**
Standard PLC-5 Processors with Protected Memories								
• 1 DH+ • 1 DH+/Remote I/O (Adap or Scan)	13	0	12	0	1	Yes	2.3A	**PLC-5/26 (1785-L26B)**
• 4 DH+/Remote I/O (Adap or Scan)	61	0	32 max per I/O link	0	1	Yes	3.3A	**PLC-5/46 (1785-L46B)**
• 4 DH+/Remote I/O (Adap or Scan)	93	0	32 max per I/O link	0	1	Yes	3.3A	**PLC-5/86 (1785-L86B)**

[1] **Universal Remote I/O Chassis** — any device with a remote I/O adapter port compatible with the Allen-Bradley Universal Remote I/O link. This includes 1771 I/O chassis, 1791 I/O blocks, PanelView displays, RediPANEL displays, Dataliner displays, 1336 drives.

[2] RS-422-A and RS-423-A both have a cable length limitation of 61m (200 ft).