



Control the Future Today with Allen-Bradley's SLC 500™ Processors: Small Controllers for Big Applications

5/01, 5/02, 5/03, 5/04, 5/05 Processors



The SLC 500 line of small programmable controllers are some of the most powerful and flexible processors available. The SLC family offers a wide range of communications, features, and memory options.

- The 5/05 processor includes built-in 10Base-T Ethernet®.
- Communications enhancements enable the 5/03, 5/04, and 5/05 to provide master control of SCADA networks.
- Powerful features including indirect addressing, high-level math capability, and a compute instruction.
- The 5/04 and 5/05 processors provide 3 memory size options: 16K, 32K, and 64K.
- The 5/03 processor provides 2 memory size options: 8K and 16K.
- The 5/02 is available with 4K; the 5/01 is available with 1K or 4K.

Capacity to do More,
Flexibility to Cost Less

With up to 64K of configurable data/program memory available, the SLC 500 line has the power, flexibility, and expanded I/O selection to take on applications that previously required larger, more expensive control solutions. The 5/02, 5/03, 5/04, and 5/05 processors can address up to 4,096 input points and 4,096 output points. And, if less than 64K of memory will get your job done, you can take cost out of your project by using one of the many other memory sizes available.

Versatility for Stand-alone
Control or Distributed
Architectures

Stand-alone applications from Agriculture to Zinc mining are ideal for the SLC 500 because of:

- Cost effectiveness
- Small size
- Wide variety of I/O available
- Ease of expansion to include up to 30 slots of local I/O

Distributed applications can take advantage of six networking options:

- Ethernet
- Data Highway Plus™
- DH-485
- Remote I/O
- DeviceNet™
- RS-232

Communication Choices

Allen-Bradley gives you choices of built-in communications. The SLC 5/05 processors support 10 Mbps Ethernet communications with a built-in 10 Base-T Ethernet channel. The SLC 5/04 processors include built-in Data Highway Plus (DH+) for high-speed peer-to-peer communications, or , if your application doesn't need the full performance of Ethernet or DH+, you can choose the 5/01, 5/02, or 5/03 processors with built-in DH-485 communications.

Peer-To-Peer Communications

Network options include Ethernet on the 5/05 processor, Data Highway Plus (DH+) on the 5/04 processor, as well as the DH-485 network built into all SLC processors.



Ethernet communications, built into all SLC 5/05 processors, features TCP/IP protocol. Built-in Ethernet communication – not an add on module – means faster throughput because of no backplane delays. The 10 Base-T Ethernet connection provides an economical means of connecting to an Ethernet network. Communication takes place at

10 Mbps, providing high performance networking for program upload/download, online editing, and peer-to-peer messaging.

Data Highway Plus (DH+) communications, built-in to 5/04 processors, provide a high-speed peer-to-peer communication network and seamless connection to Allen-Bradley PLC-5 programmable controllers. DH+ is similar in nature to DH-485, but can support up to 64 devices (nodes) and operates up to 230.4K baud. Remote I/O passthrough is now available, enabling personal computers on the DH+ network to upload or download applications to MMI devices on the Remote I/O network, such as PanelView™ Operator terminals and Dataliner™ Message Displays. Other DH+ features in the 5/04, include:

- Global Status flags for high-speed broadcast to all processors
- DF1 Bridging which enables users to access an entire DH+ network through the RS-232 port, even through a modem connection.
- DH-485 Bridging which enables users to bridge one DH-485 network with one DH+ network.

DH-485 capability on all the SLC processors provides communications with up to 32 devices on a single network. This network allows monitoring of data and processor status, along with program uploading and downloading to any SLC on the network from one location. SLC processors are also able to pass data to each other on DH-485, and operator interface devices on the network may access data from any SLC processor on the network. The RS-232 port can also be configured as a second DH-485 port, enabling the 5/03 to connect to two DH-485 networks simultaneously, or enabling the 5/04 and 5/05 processors to connect to one DH-485 network.

Remote I/O

Remote I/O (RIO) options abound when the 1747-SN RIO scanner module is added to an SLC System. It allows users to take advantage of 1746 I/O, Flex™ I/O, Block I/O, and 1771 I/O devices. SLC 5/02, 5/03, 5/04, and 5/05 processors can address up to 4,096 input points and 4,096 output points, which includes all local and RIO points. The 5/01 can address up to 3,940 input points and 3,940 output points. The 1747-SN RIO scanner module and the 1747-ASB RIO adapter module both support discrete and block transfer options, which enables the use of the SLC 5/03, 5/04, and 5/05 processors with drives, operator interface, third party devices,

Device Level Control



The SLC programmable controller family can connect to the popular DeviceNet device network with the 1747-SDN DeviceNet Scanner module. DeviceNet is an open, global industry standard communication network based on the proven Controller Area Network (CAN) technology with more than 150 companies worldwide developing “smart” products. It is designed to provide an interface through a single cable from a programmable controller directly to “smart” devices such as sensors, push buttons, motor starters, simple operator interfaces, and drives.

- Low node cost and ease of integration
- Reduced installation costs and wiring
- Additional diagnostics from intelligent devices
- Rapid troubleshooting

RS-232

A built in RS-232 port on the 5/03, 5/04, and 5/05 processors provides communication flexibility. It can be used for ASCII, modem communications (DF1) and an operator interface/programming port.

ASCII capability of the RS-232 port provides direct connection to bar code decoders, serial printers, weigh scales or any device that uses ASCII to communicate. This advantage eliminates the need for additional modules. Instructions in ladder logic are also provided, allowing you to read, write and manipulate ASCII strings.

Direct connection to a modem enables the 5/03, 5/04, and 5/05 processors to act as remote terminal units (RTUs) or as master terminal units (MTUs), communicating with up to 254 other devices. The 5/03, 5/04, and 5/05 processors have the ability to report by exception, which means you can keep your SCADA system’s response high. You can select the RS-232 port to run the Allen-Bradley DF1 protocol. The DF1 protocol allows transmission of information across modems (dial-up, leased line and radio), and permits communication between Allen-Bradley products and third-party products.

Direct personal computer connection to the programming port, without the need for interface products, or use the port for an operator interface.

Range of Applications

The SLC 500 uniquely combines the ability to address high speed discrete applications and process control applications from a single platform.

High Speed Discrete

Extensive features in the SLC 5/03, 5/04, and 5/05 processors are ideal for high speed applications like bottling lines and packaging. These features include:

Throughput time of less than 1ms/K of program is typical for 5/03, 5/04, and 5/05 processors.

Advanced instructions like immediate Input/Output and Service Communications process your most critical tasks.

Built-in communications eliminate backplane delays.

High speed discrete and analog I/O complement the high speed processor functions.

Selectable timed interrupt function allows you to interrupt the scan of the main program automatically, on a periodic basis, to execute a specified subroutine file as often as every millisecond.

Event-driven interrupt, called Discrete Input Interrupt, is for use in any application that needs to respond to an event quickly.

Process Control

Process applications and complex math are supported by a wide range of specialized instructions, such as:

- Compute Instruction, which minimizes ladder programming and provides users with the ability to develop their own complex mathematical expressions within one ladder rung instruction.
- Floating Point Math
- Built-in PID
- Trigonometric Functions
- Exponential Math

Other process and math oriented features include:

- Multiple Data File Types (String, Integer, ASCII, Floating Point)
- Dynamically Allocated Memory which allows the programmer complete control over how memory resources are used for either ladder program or data, even down to what data types are used in each program.
- Real Time Clock, Year 2000 and Leap Year ready.
- Wide variety of analog modules, including Thermocouple and RTD to meet your exact process requirements.

Security Features

Hardware and software security features enable you to protect your system from undesired or unauthorized changes to the program or data.

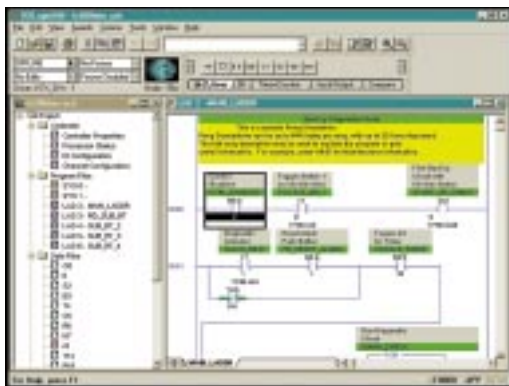
- Key switch security
- Communication port protection
- Global password protection
- Selectable protection of programs and data files

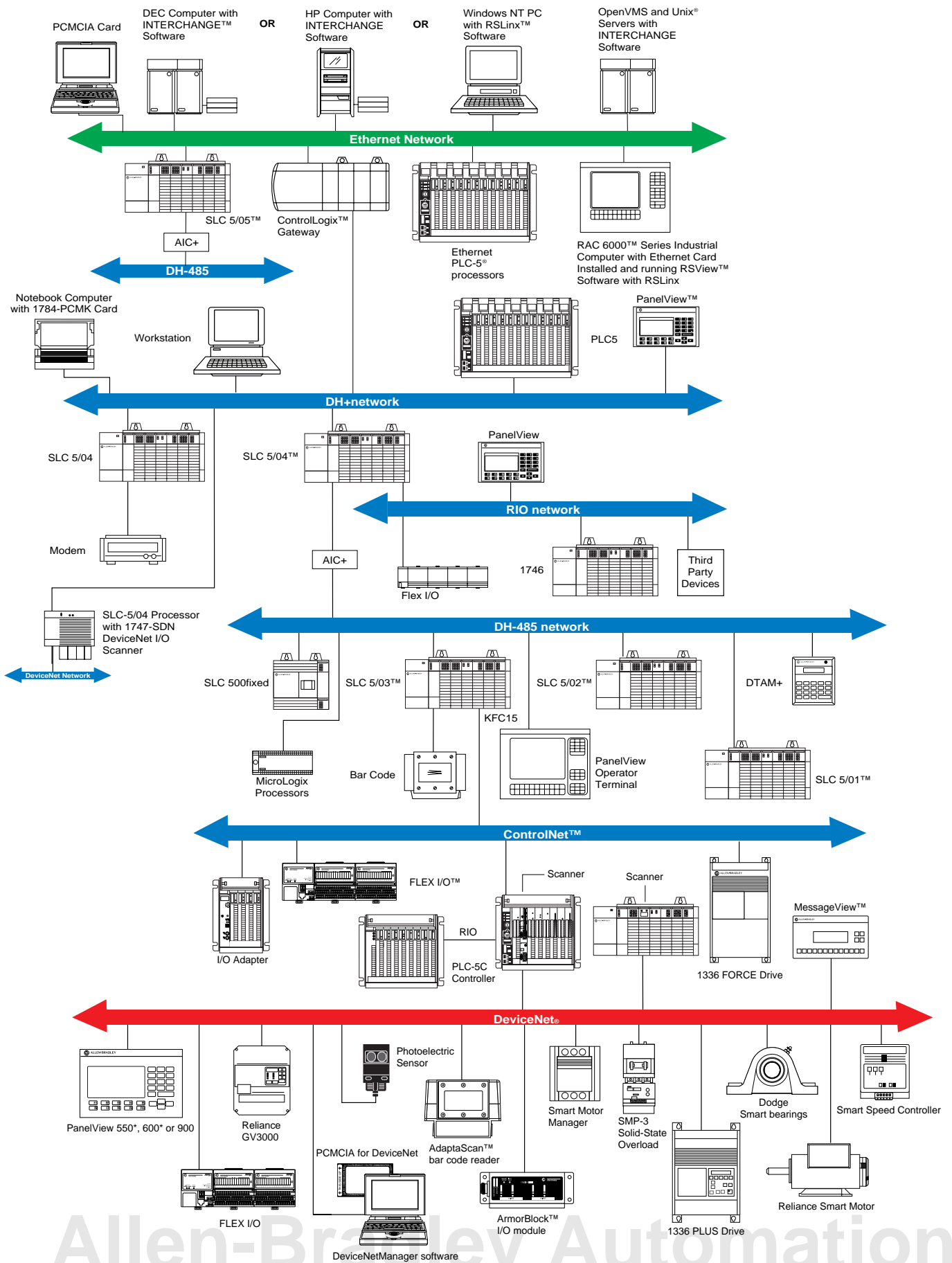
Programming Features

RSLogix 500™, a Microsoft® 32-bit Windows 95® and Windows NT™ programming software package, supports Allen-Bradley SLC 500 and MicroLogix™ families of processors. RSLogix 500 is designed to offer you powerful functionality, superior diagnostics, reliable communications, and an easy-to-use interface.

RSLogix 500 provides you everything you expect in a programming software package, from consolidated project view to drag-and-drop editing. Plus RSLogix 500 is part of the RSLogix family of products that share:

- A common user interface and feature set
- Flexible, easy-to-use Editors
- Point-and-click I/O configuration
- Powerful database editor
- Diagnostic and troubleshooting tools
- Dependable communications





Allen-Bradley Automation

Specifications

	SLC 5/01	SLC 5/02	SLC 5/03	SLC 5/04	SLC 5/05
Memory Size (words)	1K (1747-L511) 4K (1747-L514)	4K (1747-L524)	8K (1747-L531) 16K (1747-L532)	16K (1747-L541) 32K (1747-L542) 64K (1747-L543)	16K (1747-L551) 32K (1747-L552) 64K (1747-L553)
Max. I/O Capacity (including RIO)	3940 in/3940 out	4096 in/4096 out	4096 in/4096 out	4096 in/4096 out	4096 in/4096 out
Max. Rack/Slots	3/30	3/30	3/30	3/30	3/30
Standard RAM Mem. Back-up	Cap 2 weeks on 1747-L511 Lithium Battery, 2 years on 1747-L514	Lithium Battery 2 years	Lithium Battery 2 years	Lithium Battery 2 years	Lithium Battery 2 years
Memory Back-up Options	EEPROM or UV PROM	EEPROM or UV PROM	Flash EPROM	Flash EPROM	Flash EPROM
LED Indicators	Run, CPU, Forced I/O, Battery Low	Run, CPU, Forced I/O Battery Low, Comm	Run, CPU Fault, Forced I/O Battery Low, DH-485, RS-232	Run, CPU Fault, Forced I/O Battery Low, DH+, RS-232	Run, CPU Fault, Forced I/O Battery Low, ENET, RS-232
Programming	RSLogix 500, AI 500, APS	RSLogix 500, AI 500, APS	(8K) RSLogix 500 V. 1.26.03 & above; AI 500 (16K) RSLogix 500 V. 1.24.04 & above; AI 500 V. 8.10 & above; APS V. 6.0 & above	RSLogix 500 V. 1.24.04 & above; AI 500 V. 8.10 & above; APS V. 6.0 & above	RSLogix 500 V. 2.0 & above;
Typical throughput time ¹	8ms/K	4.8ms/K	1ms/K	0.9ms/K	0.9ms/K
Bit Execution (XIC)	4µs	2.4µs	0.44µs	0.37µs	0.37µs
Communication					
Built in peer-to-peer RIO	DH-485 receive only N/A	DH-485 1746 I/O, 1794 Flex™ I/O, 1791 Block I/O, & 1771 I/O w/the 1747-SN Scanner	DH-485 1746 I/O, 1794 Flex™ I/O, 1791 Block I/O, & 1771 I/O w/the 1747-SN Scanner	DH+, DH-485 1746 I/O, 1794 Flex™ I/O, 1791 Block I/O, & 1771 I/O w/the 1747-SN Scanner	Ethernet, DH-485 1746 I/O, 1794 Flex™ I/O, 1791 Block I/O, & 1771 I/O w/the 1747-SN Scanner
Device Level Built in RS-232 configurable for	N/A N/A	DeviceNet w/1747-SDN Scanner N/A	DeviceNet w/1747-SDN Scanner DF1 full-duplex, DF1 half-duplex master or slave, ASCII, DH-485	DeviceNet w/1747-SDN Scanner DF1 full-duplex, DF1 half-duplex master or slave, ASCII, DH-485	DeviceNet w/1747-SDN Scanner DF1 full-duplex, DF1 half- duplex master or slave, ASCII, DH-485
Real Time Clock	N/A	N/A	Yes	Yes	Yes
Key Switch Positions	N/A	N/A	Remote, Program, Run	Remote, Program, Run	Remote, Program, Run
Operating Temperature	0° to +60°C (+32° to +140°F)	0° to +60°C (+32° to +140°F)	0° to +60°C (+32° to +140°F)	0° to +60°C (+32° to +140°F)	0° to +60°C (+32° to +140°F)
Storage Temperature	40° to +85°C (-40° to +185°F)	40° to +85°C (-40° to +185°F)	-40° to +85°C (-40° to +185°F)	-40° to +85°C (-40° to +185°F)	-40° to +85°C (-40° to +185°F)
Humidity Rating	5 to 95% (non condensing)	5 to 95% (non condensing)	5 to 95% (non condensing)	5 to 95% (non condensing)	5 to 95% (non condensing)
Certification	UL listed/CSA approved, CE Class 1, Groups A, B, C, or D. Division 2. CE compliant for all applicable directives	UL listed/CSA approved, CE Class 1, Groups A, B, C, or D. Division 2. CE compliant for all applicable directives	UL listed/CSA approved, CE Class 1, Groups A, B, C, or D. Division 2. CE compliant for all applicable directives	UL listed/CSA approved, CE Class 1, Groups A, B, C, or D. Division 2. CE compliant for all applicable directives	UL listed/CSA approved, CE Class 1, Groups A, B, C, or D. Division 2. CE compliant for all applicable directives

¹ Throughput time is typical for a 1K ladder logic program consisting of simple ladder logic and communications servicing. Actual scan times depend on your program size, instructions used and communications.

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