

ELC Series Programmable Logic Controllers



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Product Overview

Controllers

There are five controller styles:

ELCB Brick-Style Controllers

The ELCB controllers are the simplest and most affordable members of the ELC portfolio. With ELCB, the focus is on “just enough control” for applications up to 40 I/O points. These controllers pack a lot into a small, low-profile package. Like the ELCM controllers, these controllers are AC powered and provide 24 Vdc sensor power. But unlike the rest of the ELC family, the ELCB controllers do not offer expansion I/O. The ELCB is great as a standalone controller, or is capable of networking with other controllers, operator interfaces, drives, or other Modbus® serial devices.

ELCM Modular Brick-Style Controllers

The next member of the ELC portfolio of controllers is the ELCM. This midrange family comprises “brick-style” controllers, with expansion I/O modules. These all-in-one controllers combine inputs, outputs, logic processing, and an integrated AC power supply into a compact package—but also provide the means to expand as applications change or grow. The controller also provides 24 Vdc power for sensors, eliminating the space, wiring, and expense of an additional power supply. And with three communication ports, the ELCM is able to interface into a local operator interface, connect to other controllers or supervisory computers, and still maintain an open port for programming.

ELC Modular Controllers

The ELC lineup is focused on compact size, powerful features, and affordability. Whether your needs involve discrete standalone control, necessitate distributed control networks, or even a control system, using centralized control with distributed I/O, ELCs provide the solution your application demands.

While the ELCs are perfectly suited for small applications of <40 I/O with a diverse mix of I/O, they can also expand to hundreds of I/O points when needed. These controllers are modular, with a wide range of digital, analog, thermocouple, RTD, and even motion expansion modules. Despite a world-class small footprint—with controllers as small as 1.00-inch wide, these controllers perform like much larger

PLCs. With online editing, high-speed processing (basic instructions as fast as 0.24 microseconds), multiple high-speed inputs/outputs (up to 200 kHz), and multiple independent master communication channels, these controllers excel where only the largest PLCs could go only a few years ago.

Electrical/EMC

- ESD Immunity
 - 8 kV air discharge
- EFT Immunity
 - Power Line: 2 kV
 - Digital I/O: 1 kV
 - Analog and Communication I/O: 250V
- Damped-Oscillatory Wave
 - Power Line: 1 kV
 - Digital I/O: 1 kV
- RS Immunity
 - 26 MHz–1 GHz, 10 V/m

Standards and Certifications

- cULus
- CE; C-Tick
- RoHS



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Product Selection Guide

ELC Series Programmable Logic Controllers



Model

ELCB Brick Style PLCs

ELCM Modular Brick PLCs

ELC Modular PLCs

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Product Description

- Compact and economical PLCs
- Digital I/O only
 - 10, 14, 20, 30 or 40 I/O controllers
 - 24 Vdc inputs
 - Relay or transistor outputs
 - Non-expandable I/O
 - Built-in 110 Vac power supply
 - On board 400 mA 24 Vdc sensor power
 - RS-232 programming port
 - RS-485 Modbus serial port
 - DIN rail or panel mount

- Expandable brick PLCs
- Digital, analog, thermocouple and RTD I/O
 - 16, 20, 24, 32 or 40 I/O base controllers
 - 8 and 16 digital I/O expansion modules
 - 2, 4 and 6 analog I/O expansion modules
 - 24 Vdc inputs
 - Relay or transistor outputs
 - Built-in 110 Vac power supply
 - On board 400 mA 24 Vdc sensor power
 - RS-232 programming port
 - Two RS-485 Modbus serial ports
 - DIN rail or panel mount

- Modular and expandable PLCs with distributed I/O capability
- Digital, analog, thermocouple and RTD I/O
 - 10, 12, 14 and 28 I/O base controllers
 - 6, 8 or 16 digital I/O expansion modules
 - 2, 4 and 6 analog I/O expansion modules
 - 24 Vdc and 110 Vac inputs
 - Relay or transistor outputs
 - High current relay output module
 - High speed pulse capture and high speed pulse output up to 200 kHz
 - Two RS-485 Modbus serial ports
 - DIN rail mounting only
 - Distributed I/O adapters for EtherNet/IP, Modbus TCP, DeviceNet, PROFIBUS-DP and RS-485

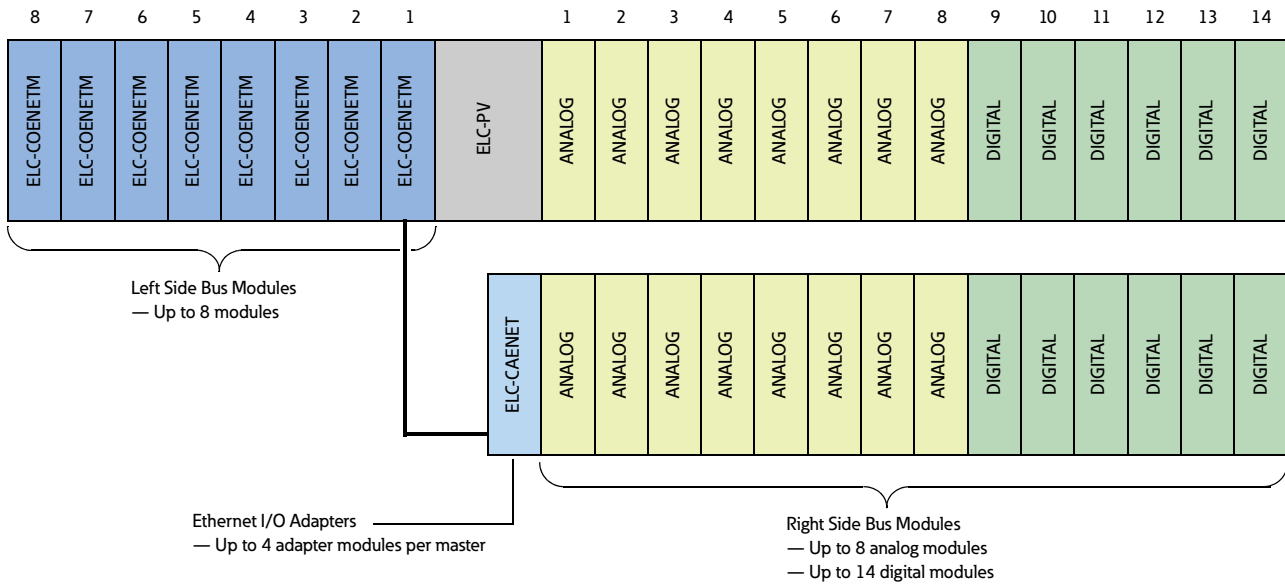
Features

Input voltage	120 Vac	120 Vac	24 Vdc
Maximum local I/O points	40	264	252
Built-in power supply	Yes	Yes	No
Built-in 24 Vdc sensor power supply	Yes	Yes	No
DC inputs	Yes	Yes	Yes
AC inputs	No	No	Yes
Transistor outputs	Yes	Yes	Yes
Relay outputs	Yes	Yes	Yes
High current relay outputs	No	No	Yes
Clock/calendar	No	No	Yes
Expandable	No	Yes	Yes
Removable terminal blocks	No	Yes	Yes
Built-in display	No	No	Yes
RS232 communication ports	1	1	1
RS485 communication ports	1	2	1
High speed counters	No	Yes	Yes
Analog I/O	No	Yes	Yes
Thermocouple module	No	Yes	Yes
Platinum RTD module	No	Yes	Yes
Single axis motion control module	No	No	Yes
DeviceNet master	No	No	Yes
Ethernet (Modbus TCP) master	No	No	Yes
Distributed I/O adapters	No	No	Yes

System Overview

Configuration and Layout

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ELC Modular PLCs**Features****• PB Base Model—**

- 14 I/O (8i/6o)
- Over 130 instructions
- Two Modbus (ASCII/RTU) serial ports for master/slave communications
- RS-485 master port with the ability to communicate to 31 other devices
- The master port can also be configured to communicate to devices such as ASCII, bar code readers, and so on
- EEPROM program retention in the event of power loss

Note: This model does not provide a real-time clock

• PC Clock/Calendar Model

- 12 I/O (8i/4o)
- Same features as the basic model plus clock/calendar
- Distributed I/O capability with up to 16 devices
- File area for data storage and retrieval
- RAM program memory with battery backup
- Replaceable battery has greater than a 5-year life
- Two digital potentiometers that vary the data in internal registers

• PH High-Speed Model

- 12 I/O (8i/4o)
- All the features of the PC model
- High speed pulse capture up to 100 kHz
- Single-axis motion control

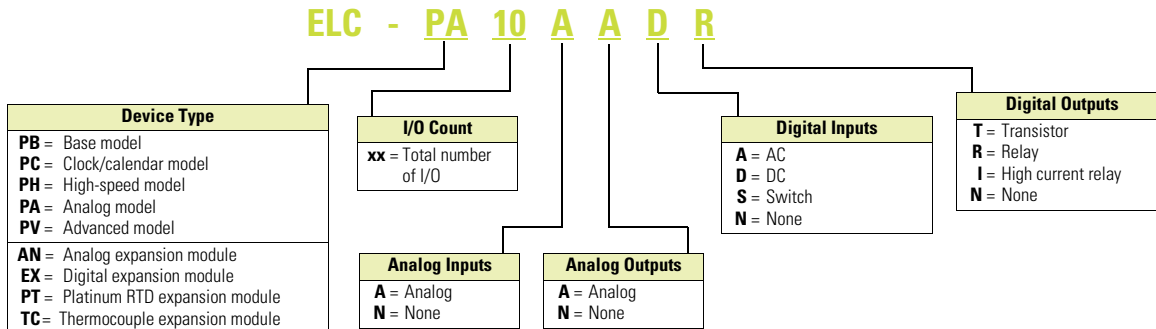
• PA Analog Model

- 10 I/O (6i/4o)
- Same features as PC model with a different I/O mix
- Four digital inputs, two digital outputs, two analog inputs, and two analog outputs
- Analog channels can be set up for either voltage or current
- Two 7-segment LEDs that can be used to display unit ID, error codes, process steps, and so on

• PV Advanced Model

- 28 I/O (16i/12o)
- The PV model has the most extensive features
- Programs written for the other controllers can be migrated to a PV model controller where greater speed or more I/O is required
- 10 times increase in processing speed for about 0.24 μ seconds/step
- RAM program storage and backed using a rechargeable lithium-ion battery that charges with normal use
- Includes 2-axis motion control
- Additional expansion bus to the left of the controller
- Add high-speed and specialty modules to the left
- Left side Ethernet master and DeviceNet master modules are available for use with the PV model controller

Controllers and Modules



ELC-PV_

Controllers (PB, PC, PH, PV, PA)



Description	Inputs	Outputs	Analog	High Speed I/O	Max. Current Consumption (at 24 Vdc)	Catalog Number
ELC-PB model and 14 I/O built-in	(8) 24 Vdc	(6) Relay, 1.5A	—	(2) 20 kHz inputs	150 mA	ELC-PB14NNDR
	(8) 24 Vdc	(6) Transistor, 100 mA	—	(2) 20 kHz inputs	150 mA	ELC-PB14NNDT
ELC-PC model and 12 I/O built-in	(8) 24 Vdc	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	ELC-PC12NNDR
	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 30 kHz inputs	150 mA	ELC-PC12NNDT
	(8) 110 Vac	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	ELC-PC12NNAR
ELC-PH model and 12 I/O built-in	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 100 kHz inputs	170 mA	ELC-PH12NNDT
ELC-PA model and 10 I/O built-in	(4) 24 Vdc	(2) Relay, 1.5A	(2) In and (2) Out	(1) 30 kHz inputs	210 mA	ELC-PA10AADR
	(4) 24 Vdc	(2) Relay, 1.5A	(2) In and (2) Out	(1) 30 kHz inputs	210 mA	ELC-PA10AADT
ELC-PV model and 28 I/O built-in	(16) 24 Vdc	(12) Relay, 1.5A	—	(2) 200 kHz inputs	220 mA	ELC-PV28NNDR
	(16) 24 Vdc	(12) Transistor, 100 mA	—	(2) 200 kHz inputs	220 mA	ELC-PV28NNDT

Technical Data and Specifications

Controllers

Description	ELC-PB14NNDR/DT	ELC-PC12NNAR/DR/DT	ELC-PH12NNDT	ELC-PA10AADR/DT	ELC-PV28NNDR/DT
Dimensions W x H x D (mm)	25.2 x 90 x 60	37.4 x 90 x 60	37.4 x 90 x 60	37.4 x 90 x 60	70 x 90 x 60
I/O type—embedded	14 (8DI/6DO)	12 (8DI/4DO)	12 (8DI/4DO)	10 (4DI/2DO/2AI/2AO)	28 (16DI/12DO)
Maximum additional I/O points	Up to 14 expansion modules (maximum of 8 analog/specialty modules)	Up to 14 expansion modules (maximum of 8 analog/specialty modules)	Up to 14 expansion modules (maximum of 8 analog/specialty modules)	Up to 14 expansion modules (maximum of 8 analog/specialty modules)	Up to 14 expansion modules (maximum of 8 analog/specialty modules)
DC in sink/source	Yes	Yes	Yes	Yes	Yes
Execution speed	Basic Instructions— 2 μs minimum	Basic Instructions— 2 μs minimum	Basic Instructions— 2 μs minimum	Basic Instructions— 2 μs minimum	0.24 μs minimum
Program language	Instructions + Ladder Logic + Sequential Function Chart				
Program capacity (steps)	3792	7920	7920	7920	15,872
Data memory capacity (bits)	1280	4096	4096	4096	4096
Data memory capacity (words)	744	5000	5000	5000	10,000
Index registers	2	8	8	8	16
File memory capacity (words)	None	1600 words	1600 words	1600 words	10,000 words
Retentive storage	Yes	Yes	Yes	Yes	Yes
Commands basic/advanced	32/107	32/168	32/168	32/168	32/193
Floating point	Yes	Yes	Yes	Yes	Yes
SFC commands (steps)	128	1024	1024	1024	1024
Timers qty.	128	244 Standard with additional timers for subroutine and retentive applications			
Timers resolution	1–100 ms	1–100 ms	1–100 ms	1–100 ms	1–100 ms
Counters qty.	128	250	250	250	253
High-speed counters (see note)	Up to 4	Up to 6	Up to 8	Up to 6	Up to 8
Max. high-speed counting (see note)	2 at 20 kHz	1 at 30 kHz	1 at 100 kHz	1 at 30 kHz	2 at 200 kHz
Pulse output	2 channels, 10 kHz max.	2 channels, 50 kHz max.	100 kHz	2 channels, 50 kHz max.	200 kHz
PID	Yes	Yes	Yes	Yes	Yes
Master control loop	8 loops	8 loops	8 loops	8 loops	8 loops
Subroutines	64 subroutines	256 subroutines	256 subroutines	256 subroutines	256 subroutines
For/next loops	Yes	Yes	Yes	Yes	Yes
Interrupts	6	15	15	15	22
Real-time clock/calendar	No	Built-in	Built-in	Built-in	Built-in
Password security	Yes	Yes	Yes	Yes	Yes
Diagnostic relays	Yes	Yes	Yes	Yes	Yes
Diagnostic word registers	Yes	Yes	Yes	Yes	Yes
Specialty expansion modules	Up to a maximum of 8 (Analog In/Analog Out/TC/RTD/PT) Modules				
Serial ports	2 Modbus (ASCII/RTU) 1 = Slave (RS-232)/11 = Master-Slave (RS-485)				
Remote I/O	No	With 16 other devices	With 16 other devices	With 16 other devices	With 32 other devices
Runtime editing	No	Yes	Yes	Yes	Yes
Run/stop switch	Yes	Yes	Yes	Yes	Yes
Removable terminal strips	Yes	Yes	Yes	Yes	Yes
Special features	—	2 potentiometers	2 potentiometers	2, 7-segment displays	2 potentiometers high-speed, left side bus