ELC Programmable Logic Controllers
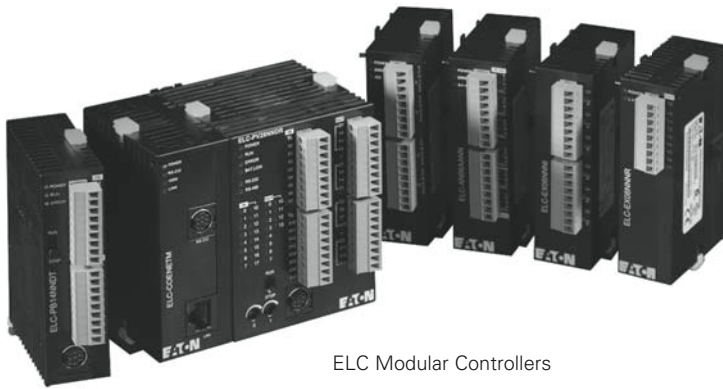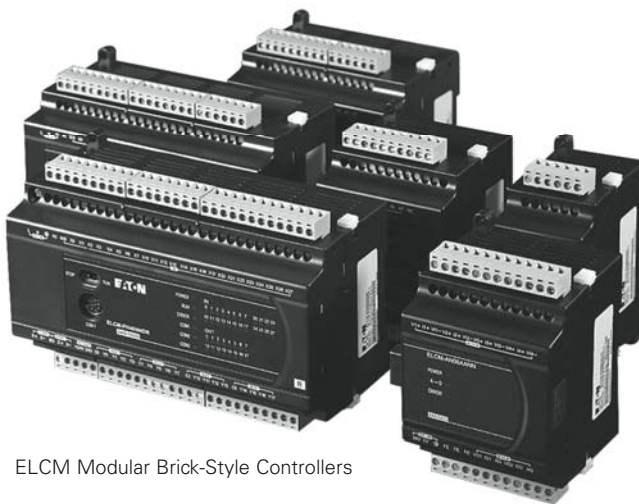

ELC Modular Controllers

ELCM Modular Brick-Style Controllers

ELCB Brick-Style Controllers

Powering Business Worldwide

Introduction

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.

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.

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.

Note: For more information, see **Volume 9—OEM** CA08100011E and **Volume 7—Motor Controls, Logic and Connectivity** CA08100008E.

## ELC—the scalable solution to machine control
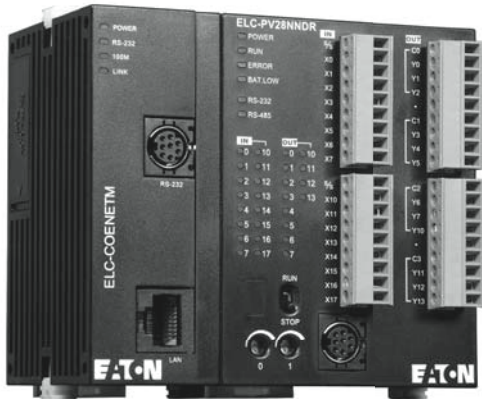
Power and flexibility in the smallest enclosures

The ELCs pack large controller modularity and power in a world-class small package. Capable of supporting hundreds of I/O points, these controllers thrive on putting together just the right mix of I/O into the smallest cabinets.

All controllers are 24 Vdc powered, and commonly use ELC-PS01 or ELC-PS02 power supplies to reduce space. There are five different styles of these controllers: ELC-PB, ELC-PC, ELC-PH, ELC-PA, and ELC-PV. Each style has different characteristics, but some shared features: they all have embedded 24 Vdc sink/source inputs and either 24 Vdc sinking transistor or relay outputs (with one exception being the ELC-PC controller that supports AC inputs); all controllers have two communication ports (RS-232 Modbus serial slave port and an RS-485 Modbus serial master/slave port), and can use DeviceNet™ or PROFIBUS-DP communication modules to enable the controller to be a slave to a remote scanning master; all supply the power for their attached digital I/O modules through an embedded I/O bus; all can support distributed I/O (using an ELC-CARS485 adapter module); all have high-speed input/output capability; and all support a robust instruction set that is programmed using ELCSOFT.

No racks required

A DIN rail lets you add as many as 14 I/O modules—with the restriction that no more than eight modules may be analog or specialty I/O per system. There are 17 different digital, analog, and specialty modules. Just snap on, and slide into place. All connections are done automatically.
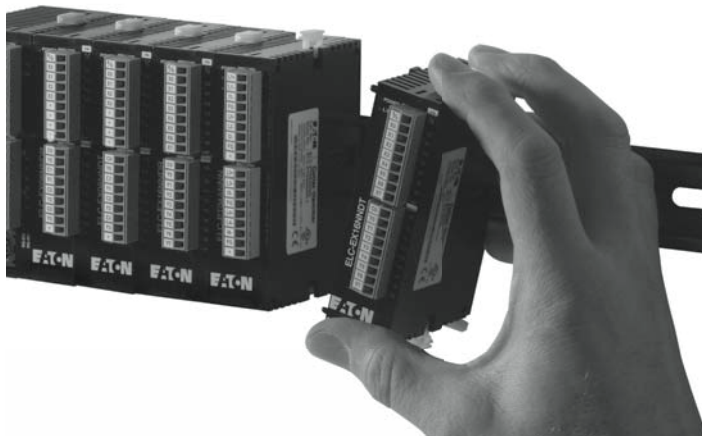
Built-in potentiometers

The ELC-PC, ELC-PH, and ELC-PV controllers have two built-in potentiometers that can be scaled and used for many applications such as increasing and decreasing the speed of a drive/motor.

Built-in display

An integral LED display on the ELC-PA provides user-assigned process monitoring, error messages, alarms, display counts, and more.

ELC programming software

Program on your PC and download to the ELC through a serial cable or over Ethernet. Make online changes, and monitor and remote-control the run/stop operation. Software wizards simplify the programming process and, with ELCSOFT 2.02 or later, offline simulation is supported so you can program, troubleshoot, and verify your ELC system without the need for physical inputs and outputs attached to your controller.
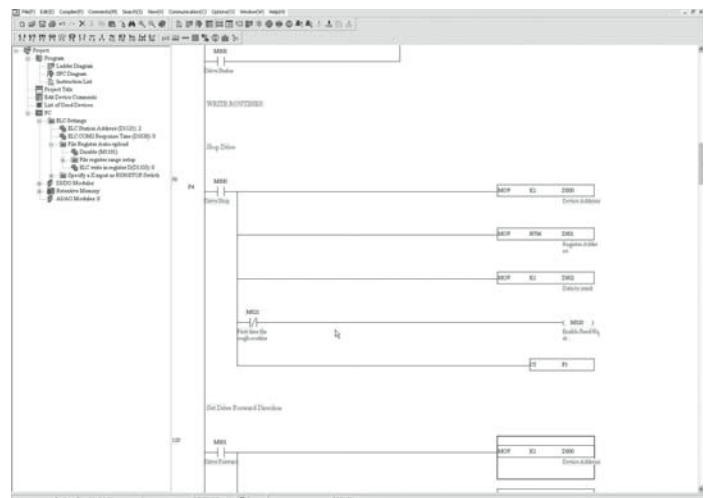
ELC's value-added differences

Five controller styles:

- *PB base model—14 I/O (8 in/6 out)* More than 130 instructions provide all the power you need; two serial ports for master/slave communications

- *PC clock/calendar model—12 I/O (8 in/4 out)* Same as the PB model, plus clock/calendar, twice the program steps, distributed I/O, and retentive data storage

- *PA analog model—10 I/O (6 in/4 out)* Same as the PC model, and includes embedded analog I/O

- *PH high-speed model—12 I/O (8 in/4 out)* Same as the PC model, plus the ability to capture or output 100 kHz pulses

- *PV high-speed model—28 I/O (16 in/12 out)* Almost 10 times faster than the other ELCs, high-speed I/O to 200 kHz, and additional advanced features; add left-side expansion modules for master communications on networks such as Ethernet and DeviceNet

More controller features

- High-speed pulse capture and high-speed pulse output on all controllers

- Broad selection of AC/DC in, relay/transistor, and high current output modules

- Large selection of analog I/O in various I/O counts per module

- Two Modbus (ASCII/RTU) serial ports: 1 slave only, 1 master/slave

- More than 200 instructions to choose from: floating point math, communications, 16- and 32-bit integer math, logical, block move, block compare, retentive data storage, conversion, time base from clock/calendar

ELC benefits solve applications

Size

Large PLC features in a 1.00-inch package. Half the size of some competitive offerings. ELC can retrofit more I/O in the same space or allow more cost savings by reducing cabinet size.

Flexibility

ELCs can address up to 252 I/O points.

- Add only the amount of I/O you need. Choose I/O counts as small as 2 analog points and as large as 16 digital points per module

- DIN rail mounting lets you add as many modules as needed by snapping them into mating connectors

Large PLC features

Multiple communications ports, distributed I/O capability, high-speed counters, high-speed pulse outputs, interrupts, timer resolution to 1 ms, PIDs, and much more.

Software

ELCSoft programs in standard ladder or sequential function chart programming.

- Display registers "in use" and modules attached to the ELC

- Monitor runtime applications. Force (except PB model), and enter/modify register values

- Wizards and programming of ELC Link for distributed I/O, standard communications, high-speed counters, pulse outputs, positioning, interrupts, PIDs, and extension module setup

Communications

- Connecting to networks is easy on Modbus, Modbus TCP, DeviceNet, and PROFIBUS-DP

Table 1. ELC Controller Features and Specifications

Controller	ELC-PB14NNDR/DT	ELC-PA10AADR/DT	ELC-PC12NNAR/DR/DT	ELC-PH12NNDT	ELC-PV28NNDR/DT
Dimensions W x H x D (mm)	25.2 x 90.0 x 60.0	37.4 x 90.0 x 60.0	37.4 x 90.0 x 60.0	37.4 x 90.0 x 60.0	70.0 x 90.0 x 60.0
Maximum I/O—expandable		Up to 14 expansion modules (maximum of 8 of these can be analog/specialty modules)			
I/O type—embedded	14 (8DI/6DO)	10 (4DI/2DO/2AI/2AO)	12 (8DI/4DO)	12 (8DI/4DO)	28 (16DI/12DO)
DC inputs sink/source	Yes	Yes	Yes (DR/DT)	Yes	Yes
AC inputs	None	None	Yes (AR)	None	None
Execution speed		Basic instructions—2 µs minimum			0.24 µs minimum
Program language		Instructions + ladder logic + SFC			
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 quantity	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 quantity	128	250	250	250	253
High-speed counters (see note)	Up to 4	Up to 6	Up to 6	Up to 8	Up to 8
Max. high-speed counting (see note)	2 at 20 kHz	1 at 30 kHz	1 at 30 kHz	1 at 100 kHz	2 at 200 kHz
Pulse output	2CH, 10 kHz maximum	50 kHz maximum	50 kHz maximum	100 kHz	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		(Analog in/analog out/TC/RTD/PT) up to a maximum of 8			
Serial ports		2 Modbus (ASCII/RTU) 1=slave (RS-232)/1=master-slave (RS-485)			
ELC link	No	With 16 other devices	With 16 other devices	With 16 other devices	With 16 other devices
Online 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, 7-segment displays	2 potentiometers	2 potentiometers	2 potentiometers High-speed, left-side bus

Note: High-speed counter inputs can be used for different types of 32-bit counting, such as single-ended, single-phase two inputs, and quadrature. Therefore, all high-speed counters may not be used at the same time. Please refer to the ELC Systems Manual, MN05003006E, for details.

Table 2. Controller Module

	Inputs	Outputs				
Controller Module	110 Vac	24 Vdc Sink/Source	Analog	Relay	24 Vdc Sinking	Analog
ELC-PB14NNDR	—	8	—	6	—	—
ELC-PB14NNDT	—	8	—	—	6	—
ELC-PC12NNAR	8	—	—	4	—	—
ELC-PC12NNDR	—	8	—	4	—	—
ELC-PC12NNDT	—	8	—	—	4	—
ELC-PA10AADR	—	4	2	2	—	2
ELC-PA10AADT	—	4	2	—	2	2
ELC-PH12NNDT	—	8	—	—	4	—
ELC-PV28NNDR	—	16	—	12	—	—
ELC-PV28NNDT	—	16	—	—	12	—

Table 3. ELC Expansion Features (Dimensions W x H x D [mm] 25.2 x 90.0 x 60.0)

| Model Number | Power | Input Unit | | Output Unit | |
		Point	Type	Point	Type
Digital I/O Model					
ELC-EX08NNAN	24 Vdc	8	110 Vac	0	—
ELC-EX08NNDN	24 Vdc	8	DC sink or source	0	—
ELC-EX16NNDN	24 Vdc	16	DC sink or source	0	—
ELC-EX08NNNR	24 Vdc	0	DC sink or source	8	Replay
ELC-EX08NNNT	24 Vdc	0	DC sink or source	8	Transistor DC sink
ELC-EX06NNNI	24 Vdc	0	DC sink or source	6	High current relay
ELC-EX08NNDR	24 Vdc	4	DC sink or source	4	Relay
ELC-EX16NNDR	24 Vdc	8	DC sink or source	8	Relay
ELC-EX08NNDT	24 Vdc	4	DC sink or source	4	Transistor DC sink
ELC-EX16NNDT	24 Vdc	8	DC sink or source	8	Transistor DC sink
ELC-EX16NNDP	24 Vdc	8	DC sink or source	8	Transistor DC source
Analog I/O Model					
ELC-AN02NANN	24 Vdc	0	—	2	0 to +20 mA/0 to +10V
ELC-AN04NANN	24 Vdc	0	—	4	0 to +20 mA/0 to +10V
ELC-AN06AANN	24 Vdc	4	−20 to +20 mA/−10 to +10V	2	0 to +20 mA/0 to +10V
ELC-AN04ANNN	24 Vdc	4	−20 to +20 mA/−10 to +10V	0	—
ELC-PT04ANNN	24 Vdc	4	Platinum temperature	0	—
ELC-TC04ANNN	24 Vdc	4	Thermocouple	0	—

Table 4. ELC Electrical Specifications

Description	Specification
Input voltage requirements	ELC: 24 Vdc (−15 to +20%) (with DC input reverse polarity protection), Expansion unit: supplied by the ELC
Power consumption	Typically 3–6W
Insulation resistance	>5M ohms at 500 Vdc (between all inputs/outputs and earth)
Noise immunity	ESD: 8 kV air discharge / EFT: power line 2 kV / Digital I/O: 1 kV / Analog and communication I/O: 1 kV / Damped-oscillatory wave: Power Line: 1 kV / Digital I/O: 1 kV / RS: 26 MHz–1 GHz / 10 V/m
Temperature	Operation: 0°C to 55°C (temperature), 50 to 95% (humidity), pollution degree 2; Storage: −25°C to +70°C (temperature), 5 to 95% (humidity)
Vibration/shock resistance	Standard: IEC 61131-2, IEC 68-2-6 (Test Fc) / IEC 61131-2 and IEC 68-2-27 (Test Ea)
Certifications	C-Tick, cULus, CE

Table 5. ELC Accessories

Catalog Number	Description
ELCSOFT	ELC programming software
ELC-PS01	24W, 24 Vdc, 1A power supply
ELC-PS02	48W, 24 Vdc, 2A power supply
ELC-HHP	Hand-held programmer (includes cable)
ELC-CBPCELC1	Cable to connect a PC or ELC-GP unit to ELC, one meter with right angle connector (DB9 pin female to 8-pin DIN)
ELC-CBPCELC3	Cable to connect a PC or ELC-GP unit to ELC, three meters (DB9 pin female to 8-pin DIN)
ELC-CBPCGP3	Cable to connect a PC to an ELC-GP unit, three meters (DB9 pin female to DB9 pin female)
ELC-GPXFERMOD	Program transfer module for ELC-GP units
ELC-ACPGMXFR	Program transfer module for ELCs
ELC-ACCOVER	Plate mount for specialty modules, qty. 10
ELCSTARTKIT1	ELC starter kit (includes ECL-PA10AADT, ELC-PS01, ELC-GP04, ELC-CBPCELC3, ELC-CBPCGP3, ELCSoft, ELCSoft GP)
ELC-COENETM	10/100 Ethernet module, need ELC-PV, Modbus TCP, P-P, for use with ELC-PV only
ELC-CODNETM	DeviceNet module, need ELC-PV, scanner, poll, CC, COS, BS, for use with ELC-PV only
ELC-COPBDP	PROFIBUS-DP slave module
ELC-CODNET	DeviceNet slave module
ELC-485APTR	RS-485 easy connect adapter, DB9, RJ-12, 2-pin connections to RS-485
ELC-MC01	Motion control, one axis module (up to eight modules per controller)
ELC-CARS485	Modbus remote I/O communication module
ELC-CADNET	DeviceNet remote I/O communication module
ELC-CAENET	10/100 Ethernet remote I/O communication module, EtherNet/IP Modbus TCP
ELC-CAPBDP	PROFIBUS-DP remote I/O communication module

ELCM—compact, modular, and ready to communicate
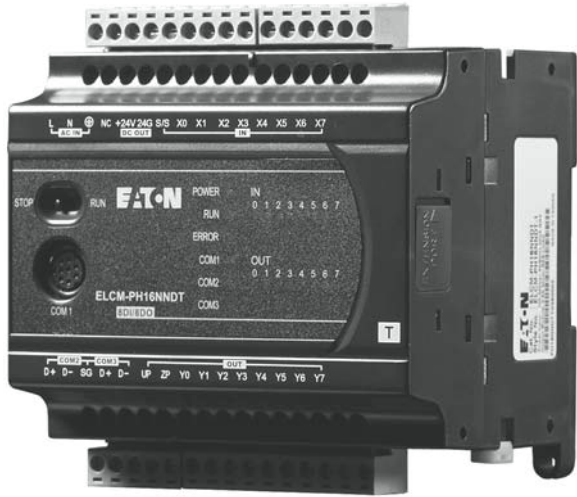
The ELCM controllers merge the best parts of a "brick" controller with the flexibility and power of a modular system. Like the ELCB, the ELCM is an "all-in-one" form factor controller—embedding 24 Vdc sink/source inputs and either 24 Vdc sinking transistor or relay outputs, logic processing, and an embedded 100–240 Vac at 50/60 Hz (nominal) power supply into a compact form factor. But the ELCM controllers may also be expanded with digital, analog, and specialty I/O modules.

If your application is likely to expand over time or requires a variety of input or output types, the ELCM is the controller for today and tomorrow. The ELCM controllers come in 10 varieties with embedded 24 Vdc digital sink/source inputs and either 24 Vdc sinking or relay outputs. Two of these controllers (ELCM-PA20AADR and ELCM-PA20AADT) also have four analog inputs and two analog outputs. To expand the ELCM controller, simply attach modules to the right side. The ELCM supports a maximum of 14 extension modules, where up to 8 of them can be analog or speciality modules. There are 13 different digital, analog, and specialty expansion modules. Communication is also a strength with these three comm port controllers—port 0: RS-232 Modbus serial master/slave; ports 1 and 2: RS-485 Modbus serial master/slave ports. The ELCM controllers also program using ELCSoft (version 2 and higher). The ELCM controllers offer flexibility and processing power not usually found in small brick controllers.

No racks required

A DIN rail lets you add up to 14 expansion I/O modules, giving you the ability to add I/O as your appropriations needs grow, or to mix I/O types for more complex systems.
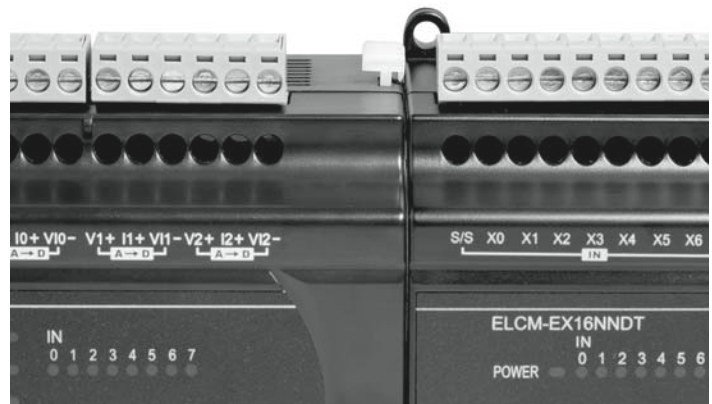
Table 6. ELCM Controller Electrical Specifications

Description	Specification
Input voltage requirements	100 to 240 Vac (−15 to +10%), 50/60 Hz (−5% to +5%)
Power consumption	30 VA
Insulation resistance	> 5M ohms at 500 Vdc (between all I/O point and ground)
Noise immunity	ESD: 8 kV air discharge EFT: power line 2 kV, Digital I/O 1 kV, analog and communication I/O 1 kV RS: 26 MHz to 1 GHz, 10 V/m
Temperature	Operation: 0°C to 55°C (temperature), 50 to 95% (humidity), pollution degree 2; storage: −25°C to +70°C (temperature), 5 to 95% (humidity)
Vibration/shock resistance	Standard: IEC 61131-2, IEC 68-2-6 (test Fc) / IEC 61131-2 and IEC 68-2-27 (test Ea)
Certifications	C-Tick, cULus, CE

Table 7. ELCM Expansion Module Electrical Specifications

Description	Specification
Input voltage requirements	24 Vdc (20.4 Vdc to 28.8 Vdc), expansion bus: supplied by the ELC
Power consumption	0.5 to 3W
Insulation resistance	> 5M ohms at 500 Vdc (between all I/O point and ground) 500 Vdc between analog circuits and ground, 500 Vdc between analog circuits and digital circuits
Noise immunity	ESD: 8 kV air discharge EFT: power line 2 kV, digital I/O 1 kV, analog I/O 1 kV RS: 26 MHz to 1G Hz, 10 V/m
Temperature	Operation: 0°C to 55°C (temperature), 50 to 95% (humidity), pollution degree 2; storage: −25°C to +70°C (temperature), 5 to 95% (humidity)
Vibration/shock resistance	Standard: IEC 61131-2, IEC 68-2-6 (Test Fc) / IEC 61131-2 and IEC 68-2-27 (Test Ea)
Certifications	C-Tick, cULus, CE

Table 8. ELCM Accessories

Catalog Number	Description
ELCSOFT	ELC programming software
ELC-HHP	Hand-held programmer (includes cable)
ELC-CBPCELC1	Cable to connect a PC or ELC-GP unit to ELCM, one meter with right angle connector (DB9 pin female to 8-pin DIN)
ELC-CBPCELC3	Cable to connect a PC or ELC-GP unit to ELCM, three meters (DB9 pin female to 8-pin DIN)
ELC-ACPGMXFR	Program transfer module for ELCM controllers

Table 9. ELCM Controller Features and Specifications

Controller	ELCM-PH16NNDR/T	ELCM-PH24NNDR/T	ELCM-PH32NNDR/T	ELCM-PH40NNDR/T
Dimensions W x H x D (mm)	105.0 x 110.0 x 78.0	125.0 x 110.0 x 78.0	145.0 x 110.0 x 78.0	157.0 x 110.0 x 78.0
Maximum I/O—expandable	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)
I/O type—embedded	16 (8DI/ 8DO)	24 (16DI/8DO)	32 (16DI/16DO)	40 (24DI/16DO)
DC inputs sink/source	Yes	Yes	Yes	Yes
AC inputs	None	None	None	None
Execution speed	Basic instructions— 0.54 µs minimum	Basic instructions— 0.54 µs minimum	Basic instructions— 0.54 µs minimum	Basic instructions— 0.54 µs minimum
Program language	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC
Program capacity (steps)	15,872	15,872	15,872	15,872
Data memory capacity (bits)	4096	4096	4096	4096
Data memory capacity (words)	10,000	10,000	10,000	10,000
Index registers	16	16	16	16
File memory capacity (words)	None	None	None	None
Retentive storage	Yes	Yes	Yes	Yes
Commands basic/advanced	32/193	32/193	32/193	32/193
Floating point	Yes	Yes	Yes	Yes
SFC commands (steps)	1024	1024	1024	1024
Timers quantity	256 standard with additional timers for subroutine and retentive applications	256 standard with additional timers for subroutine and retentive applications	256 standard with additional timers for subroutine and retentive applications	256 standard with additional timers for subroutine and retentive applications
Timers resolution	1/10/100 ms	1/10/100 ms	1/10/100 ms	1/10/100 ms
Counters quantity	254	254	254	254
High-speed counters (see note)	Up to 8	Up to 8	Up to 8	Up to 8
Maximum high-speed counting (see note)	2 at 100 kHz, 6 at 10 kHz	2 at 100 kHz, 6 at 10 kHz	2 at 100 kHz, 6 at 10 kHz	2 at 100 kHz, 6 at 10 kHz
Pulse output	2 at 100 kHz, 2 at 10 kHz	2 at 100 kHz, 2 at 10 kHz	2 at 100 kHz, 2 at 10 kHz	2 at 100 kHz, 2 at 10 kHz
PID	Yes	Yes	Yes	Yes
Master control loop	8 loops	8 loops	8 loops	8 loops
Subroutines	256 subroutines	256 subroutines	256 subroutines	256 subroutines
For/next loops	Yes	Yes	Yes	Yes
Interrupts	21	21	21	21
Real-time clock/calendar	None	None	None	None
Password security	Yes	Yes	Yes	Yes
Diagnostic relays	Yes	Yes	Yes	Yes
Diagnostic word registers	Yes	Yes	Yes	Yes
Specialty expansion modules	Up to 8	Up to 8	Up to 8	Up to 8
Serial ports	RS-232 x 1 (master/slave), RS-485 x 2 (master/slave)	RS-232 x 1 (master/slave), RS-485 x 2 (master/slave	RS-232 x 1 (master/slave), RS-485 x 2 (master/slave	RS-232 x 1 (master/slave), RS-485 x 2 (master/slave
ELC link	With 16 other devices	With 16 other devices	With 16 other devices	With 16 other devices
Online editing	Yes	Yes	Yes	Yes
Run/stop switch	Yes	Yes	Yes	Yes
Removable terminal strips	Yes	Yes	Yes	Yes

Note: High-speed counter inputs can be used for different types of 32-bit counting, such as single-ended, single-phase two inputs, and quadrature. Therefore, all high-speed counters may not be used at the same time. Please refer to the ELCM Systems Manual, MN05003006E for details.

Table 10. Controller Module

Controller Module	Inputs			Outputs	
	24 Vdc Sink/Source	Analog	Relay	24 Vdc Sinking	Analog
ELCM-PH16NNDR	8	—	8	—	—
ELCM-PH16NNDT	8	—	—	8	—
ELCM-PH24NNDR	16	—	8	—	—
ELCM-PH24NNDT	16	—	—	8	—
ELCM-PH32NNDR	16	—	16	—	—
ELCM-PH32NNDT	16	—	—	16	—
ELCM-PH40NNDR	24	—	16	—	—
ELCM-PH40NNDT	24	—	—	16	—
ELCM-PA20AADR	8	4	6	—	2
ELCM-PA20AADT	8	4	—	6	2

Table 11. ELCM Expansion Module Features (Digital)

Digital I/O Model	Power	Input Unit		Output Unit	
		Point	Type	Point	Type
ELCM-EX08NNDN	24 Vdc	8	DC sink or source	—	—
ELCM-EX08NNDR	24 Vdc	4	DC sink or source	4	Relay
ELCM-EX08NNDT	24 Vdc	4	DC sink or source	4	Transistor
ELCM-EX08NNNR	24 Vdc	—	DC sink or source	8	Relay
ELCM-EX08NNNT	24 Vdc	—	DC sink or source	8	Transistor
ELCM-EX16NNDN	24 Vdc	16	DC sink or source	—	—
ELCM-EX16NNDR	24 Vdc	8	DC sink or source	8	Relay
ELCM-EX16NNDT	24 Vdc	8	DC sink or source	8	Transistor
ELCM-EX16NNNR	24 Vdc	—	DC sink or source	16	Relay
ELCM-EX16NNNT	24 Vdc	—	DC sink or source	16	Transistor

Table 12. ELCM Expansion Module Features (Analog)

Analog I/O Model	Power	Input Unit		Output Unit	
		Point	Type	Point	Type
ELCM-AN02NANN	24 Vdc	—	—	2	−10 to +10V 0 to 20 mA 4 to 20 mA
ELCM-AN04NANN	24 Vdc	—	—	4	
ELCM-AN06AANN	24 Vdc	4	−10 to +10V, −5 to +5V −20 to +20 mA 0 to 20 mA, 4 to 20 mA	2	
ELCM-AN04ANNN	24 Vdc	4		—	—
ELCM-PT04ANNN	24 Vdc	4	Platinum temperature	—	—
ELCM-TC04ANNN	24 Vdc	4	Thermocouple	—	—

ELCB—when just enough I/O is just what you need

The ELCB controllers are designed to be "just enough" controllers. These non-expandable controllers are designed for applications where cost is more critical than I/O flexibility.

Budget balanced with value

When the application calls for simplicity and the budget calls for value, the ELCB family is an excellent choice.

There are 10 different sized controllers equipped with 24 Vdc sink/source inputs and either 24 Vdc sinking transistor or relay outputs.

Communication ready

Communication between controllers, to local operator interface devices, or to supervisory/programming devices is accomplished through an RS-232 Modbus serial slave port or through an RS-485 Modbus serial master/slave port.

Low-profile designs

These compact controllers contain 100–240 Vac @ 50/60 Hz (nominal) power supplies to eliminate the need for an external DC supply. They also have an embedded 24 Vdc output power supply for sensors. Smaller controllers (with 10 or 14 I/O points) supply up to 200 mA; larger controllers (20 to 40 I/O points) provide up to 300 mA for input sensors.

Simplified configuration

Program your ELCB with ELCSoft (version 2 and higher), an easy-to-use programming environment with high-end capabilities, including offline simulation.

Table 13. ELCB Controller Features and Specifications

Controller	ELCB-PB10NNDR/T	ELCB-PB14NNDR/T	ELCB-PB20NNDR/T	ELCB-PB30NNDR/T	ELCB-PB40NNDR/T
Dimensions W x H x D (mm)	95.0 x 107.6 x 48.5	95.0 x 107.6 x 48.5	150.0 x 107.6 x 48.5	150.0 x 107.6 x 48.5	164.0 x 107.6 x 48.5
Maximum I/O—expandable	None	None	None	None	None
I/O type—embedded	10 (6DI/4DO)	14 (8DI/6DO)	20 (12DI / 8DO)	30 (18DI / 12DO)	40 (24DI / 16DO)
DC inputs sink/source	Yes	Yes	Yes	Yes	Yes
AC inputs	None	None	None	None	None
Execution speed	Basic instructions— 2 µs minimum	Basic instructions— 2 µs minimum	Basic instructions— 2 µs minimum	Basic instructions— 2 µs minimum	Basic instructions— 2 µs minimum
Program language	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC	Instructions + ladder logic + SFC
Program capacity (steps)	3792	3792	3792	3792	3792
Data memory capacity (bits)	1280	1280	1280	1280	1280
Data memory capacity (words)	744	744	744	744	744
Index registers	2	2	2	2	2
File memory capacity (words)	None	None	None	None	None
Retentive storage	Yes	Yes	Yes	Yes	Yes
Commands basic/advanced	32/107	32/107	32/107	32/107	32/107
Floating point	Yes	Yes	Yes	Yes	Yes
SFC commands (steps)	128	128	128	128	128
Timers quantity	128	128	128	128	128
Timers resolution	1–100 ms	1–100 ms	1–100 ms	1–100 ms	1–100 ms
Counters quantity	128	128	128	128	128
High-speed counters (see note)	Up to 4	Up to 4	Up to 4	Up to 4	Up to 4
Maximum high-speed counting (see note)	2 at 20 kHz	2 at 20 kHz	2 at 20 kHz	2 at 20 kHz	2 at 20 kHz
Pulse output	2 at 1 kHz	2 at 1 kHz	2 at 1 kHz	2 at 1 kHz	2 at 1 kHz
PID	Yes	Yes	Yes	Yes	Yes
Master control loop	8 loops	8 loops	8 loops	8 loops	8 loops
Subroutines	64	64	64	64	64
For/next loops	Yes	Yes	Yes	Yes	Yes
Interrupts	6	6	6	6	6
Real-time clock/calendar	None	None	None	None	None
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	None	None	None	None	None
Serial ports	RS-232 x 1 (slave), RS-485 x 1 (master/slave)	RS-232 x 1 (slave), RS-485 x 1 (master/slave)	RS-232 x 1 (slave), RS-485 x 1 (master/slave)	RS-232 x 1 (slave), RS-485 x 1 (master/slave)	RS-232 x 1 (slave), RS-485 x 1 (master/slave)
ELC link	None	None	None	None	None
Online editing	None	None	None	None	None
Run/stop switch	None	None	None	None	None
Removable terminal strips	None	None	None	None	None

Note: High-speed counter inputs can be used for different types of 32-bit counting, such as single-ended, single-phase two inputs, and quadrature. Therefore, all high-speed counters may not be used at the same time. Please refer to the ELCB Systems Manual, MN05003006E for details.

Table 14. Controller Module

| Controller Module | Inputs | Outputs | |
	24 Vdc Sink/Source	Relay	24 Vdc Sinking
ELCB-PB10NNDR	6	4	—
ELCB-PB10NNDT	6	—	4
ELCB-PB14NNDR	8	6	—
ELCB-PB14NNDT	8	—	6
ELCB-PB20NNDR	12	8	—
ELCB-PB20NNDT	12	—	8
ELCB-PB30NNDR	18	12	—
ELCB-PB30NNDT	18	—	12
ELCB-PB40NNDR	24	16	—
ELCB-PB40NNDT	24	—	16

Table 15. ELCB Electrical Specifications

Description	Specifications
Input voltage requirements	100 to 240 Vac (–15 to 10%), 50/60 Hz (–5 to 5%)
Power consumption	12 VA to 15.6 VA
Insulation resistance	>5M ohms at 500 Vdc (between all inputs/outputs and earth)
Noise immunity	ESD: 8 kV air discharge / EFT: power line 2 kV / Digital I/O: 1 kV / Analog and communication I/O: 1 kV / Damped-oscillatory wave: Power Line: 1 kV / Digital I/O: 1 kV / RS: 26 MHz–1 GHz / 10 V/m
Temperature	Operation: 0°C to 55°C (temperature), 50 to 95% (humidity), pollution degree 2; storage: –25°C to 70°C (temperature), 5 to 95% (humidity)
Vibration/shock resistance	Standard: IEC 61131-2, IEC 68-2-6 (Test Fc) / IEC 61131-2 and IEC 68-2-27 (Test Ea)
Certifications	C-Tick, cULus, CE

Table 16. ELCB Accessories

Catalog Number	Description
ELCSOFT	ELC programming software
ELC-HHP	Hand-held programmer (includes cable)
ELC-CBPCELC1	Cable to connect a PC or ELC-GP unit to ELC, 1 meter with right angle connector (DB9 pin female to 8-pin DIN)
ELC-CBPCELC3	Cable to connect a PC or ELC-GP unit to ELC, 3 meters (DB9 pin female to 8-pin DIN)
ELC-ACPGMXFR	Program transfer module for ELCs

For easy reference

HMI: **Volume 7—Motor Controls, Logic and Connectivity** CA08100008E, Tab 39

XV/XP: **Volume 7—Motor Controls, Logic and Connectivity** CA08100008E, Tab 39

Sensors: **Volume 8—Sensing Solutions** CA08100010E

Count Control: **Volume 8—Sensing Solutions** CA08100010E

Pushbuttons: **Volume 7—Motor Controls, Logic and Connectivity** CA08100008E, Tab 37

Power Supplies/Terminal Block/Relays: **Volume 7—Motor Controls, Logic and Connectivity** CA08100008E, Tab 43

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