

# 4.1

## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

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



Product Selection Guide

ELC Series Programmable Logic Controllers



**Model** ELCB Brick Style PLCs

**Model** ELCM Modular Brick PLCs

**Model** 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**

	ELCB Brick Style PLCs	ELCM Modular Brick PLCs	ELC Modular PLCs
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

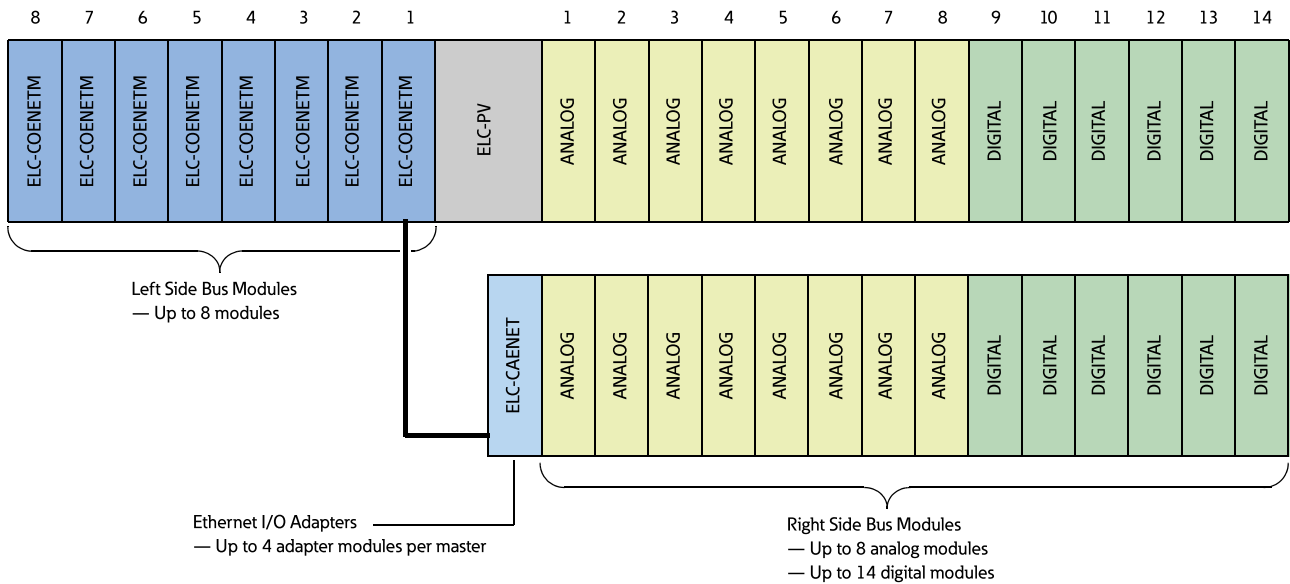
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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### System Overview

##### Configuration and Layout



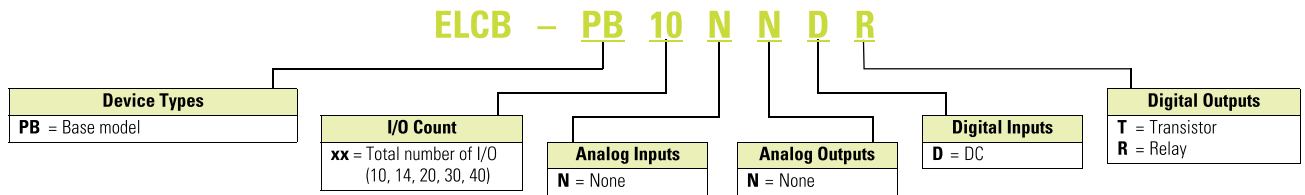
**Product Selection**

**ELCB Brick Style PLCs**

**Features**

- Basic PLC logic with just enough I/O for simple DC in/relay or transistor out applications
- This non-expandable PLC has a built-in AC power supply and provides up to 400 mA of DC sensor power
- Each controller supports one RS-232 programming port and one RS-485 Modbus serial (master/slave) port

**Controllers**



**ELCB-PB10NDR**

**Controllers**



Description	Inputs			Outputs			Catalog Number
	AC	DC	Analog	Relay	NPN Sinking Transistor	Analog	
10 I/O	—	6	—	4	—	—	ELCB-PB10NDR
	—	6	—	—	4	—	ELCB-PB10NDR
14 I/O	—	8	—	6	—	—	ELCB-PB14NDR
	—	8	—	—	6	—	ELCB-PB14NDR
20 I/O	—	12	—	8	—	—	ELCB-PB20NDR
	—	12	—	—	8	—	ELCB-PB20NDR
30 I/O	—	18	—	12	—	—	ELCB-PB30NDR
	—	18	—	—	12	—	ELCB-PB30NDR
40 I/O	—	24	—	16	—	—	ELCB-PB40NDR
	—	24	—	—	16	—	ELCB-PB40NDR

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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### ELCM Modular Brick PLCs

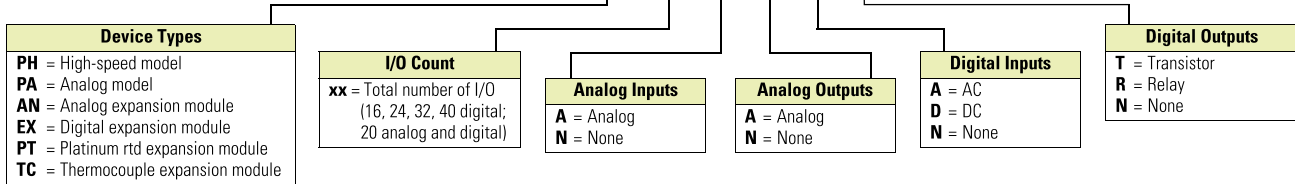
##### Features

- Midrange brick style controller with digital, analog, thermocouple and RTD expansion capability
- Expansion modules can optionally be used to increase the total number of I/O, to provide a mix of different types of I/O, or both
- These controllers include an embedded AC power supply and provide up to 400 mA of DC sensor power
- Each controller supports two RS-485 Modbus serial (master/node) and one RS-232 programming port

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#### Controllers

### ELCM – PA 16 A A D R



#### ELCM-PH16NDR

#### Controllers



Description	Inputs			Outputs			Catalog Number
	AC	DC	Analog	Relay	NPN Sinking Transistor	Analog	
16 I/O PH model	—	8	—	8	—	—	ELCM-PH16NDR
	—	8	—	—	8	—	ELCM-PH16NNDT
24 I/O PH model	—	16	—	8	—	—	ELCM-PH24NDR
	—	16	—	—	8	—	ELCM-PH24NNDT
32 I/O PH model	—	16	—	16	—	—	ELCM-PH32NDR
	—	16	—	—	16	—	ELCM-PH32NNDT
40 I/O PH model	—	24	—	16	—	—	ELCM-PH40NDR
	—	24	—	—	16	—	ELCM-PH40NNDT
20 I/O PA model	—	8	4	6	—	2	ELCM-PA20AADR
	—	8	4	—	6	2	ELCM-PA20AADT

**Right Side Digital Expansion Modules**

Description	Inputs		Outputs		Catalog Number
	AC	DC Sink/Source	Relay	NPN Sinking Transistor	
8 DC input module	—	8	—	—	ELCM-EX08NNDN
16 DC input module	—	16	—	—	ELCM-EX16NNDN
8 Relay output module	—	—	8	—	ELCM-EX08NNNR
16 Relay output module	—	—	16	—	ELCM-EX16NNNR
8 Transistor output module	—	—	8	—	ELCM-EX08NNNT
16 Transistor output module	—	—	16	—	ELCM-EX16NNNT
8 DC input/relay output module	—	4	4	—	ELCM-EX08NNDR
16 DC input/relay output module	—	8	8	—	ELCM-EX16NNDR
8 DC input/output module	—	4	—	4	ELCM-EX08NNDT
16 DC input/output module	—	8	—	8	ELCM-EX16NNDT

**Right Side Analog and Specialty Modules**

Description	Analog Inputs	Analog Outputs	Catalog Number
4 Analog input module	4	—	ELCM-AN04ANNN
2 Analog input module	—	2	ELCM-AN02NANN
4 Analog input module	—	4	ELCM-AN04NANN
6 Analog input/output module	4	2	ELCM-AN06AANN
4 Thermocouple input module (J, K, R, S, T)	4	—	ELCM-TC04ANNN
4 Platinum RTD input module (PT100)	4	—	ELCM-PT04ANNN

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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### 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

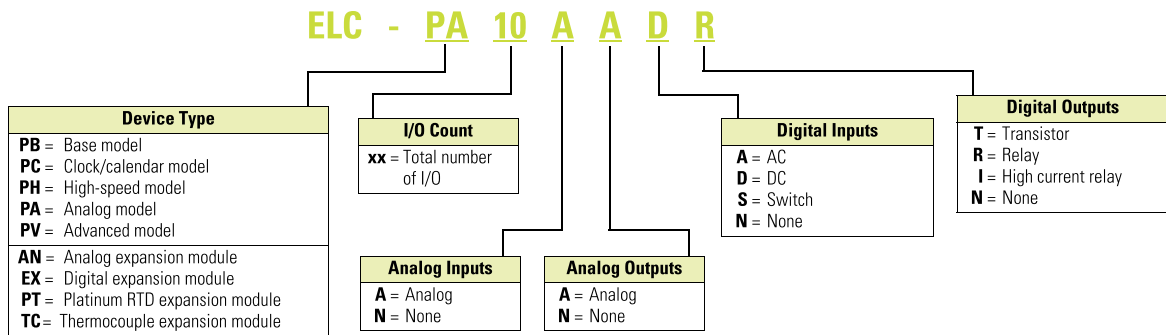
###### • PA Analog Model

- 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 $\mu$  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	<b>ELC-PB14NDR</b>
	(8) 24 Vdc	(6) Transistor, 100 mA	—	(2) 20 kHz inputs	150 mA	<b>ELC-PB14NNDT</b>
ELC-PC model and 12 I/O built-in	(8) 24 Vdc	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	<b>ELC-PC12NDR</b>
	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 30 kHz inputs	150 mA	<b>ELC-PC12NNDT</b>
	(8) 110 Vac	(4) Relay, 1.5A	—	(1) 30 kHz inputs	150 mA	<b>ELC-PC12NNAR</b>
ELC-PH model and 12 I/O built-in	(8) 24 Vdc	(4) Transistor, 100 mA	—	(1) 100 kHz inputs	170 mA	<b>ELC-PH12NNDT</b>
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	<b>ELC-PA10ADR</b>
	(4) 24 Vdc	(2) Relay, 1.5A	(2) In and (2) Out	(1) 30 kHz inputs	210 mA	<b>ELC-PA10ADT</b>
ELC-PV model and 28 I/O built-in	(16) 24 Vdc	(12) Relay, 1.5A	—	(2) 200 kHz inputs	220 mA	<b>ELC-PV28NDR</b>
	(16) 24 Vdc	(12) Transistor, 100 mA	—	(2) 200 kHz inputs	220 mA	<b>ELC-PV28NNDT</b>



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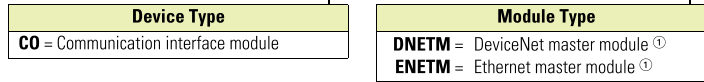
## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### ELC Master Communication Modules

##### ELC Master Communication Modules

### ELC - CO ENETM



#### Ethernet Master Communication Module (Left Side Bus)

##### Features

- Ethernet communication module
- Enables the ELC-PV model controller to connect to Modbus TCP networks auto detecting 10/100MB connections
- Enables the uploading and downloading of programs in addition to program monitoring
- Use ELCSOft to search for all the Ethernet modules attached to the network and manage them remotely
- Share data in a peer-to-peer network to reduce long I/O wiring
- Send e-mails for alerts and notifications. For example, advise personnel of alarm condition or send daily production yield summaries
- Keep accurate time with the NTP (Network Time Protocol) feature, which synchronizes your controller with an NTP server
- The Ethernet module will automatically detect and use the type of patch or crossover cable attached
- IP addresses may be filtered to manage module traffic in order to maximize communication performance.

##### ELC-COENETM



#### Ethernet Master Communication Module (Left Side Bus)

Description	Inputs Points	Type	Outputs Points	Catalog Number
Ethernet Modbus TCP (master/slave)	N/A	Modbus TCP	N/A	ELC-COENETM

#### DeviceNet Master Communication Module (Left Side Bus)

##### Features

- DeviceNet master module maps up to 380 bytes of data directly into the PV model controller for quick and easy access
- Use Polled, Bit-Strobe and Change of State/Cyclic DeviceNet commands, or send explicit messages
- Configuration of DeviceNet components in ELCSOft is easy with the drag-and-drop interface
- Use the pre-populated EDS files within ELCSOft and add others to simplify the configuration

##### ELC-CODNETM



#### DeviceNet Master Communication Module (Left Side Bus)

Description	Inputs Points	Type	Outputs Points	Catalog Number
DeviceNet Scanner (master/slave)	190 bytes	DeviceNet	190 bytes	ELC-CODNETM

##### Note

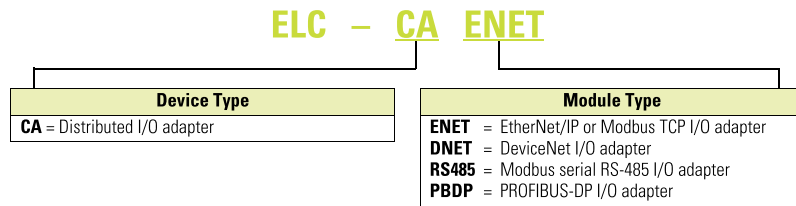
① Left side bus communications module—for use with ELC-PV controllers only.

### ELC Distributed I/O Adapters

#### Features

- Combine with ELC expansion modules to create distributed I/O racks for different PLC networks
- Use ELC-CAENET and ELC-COENETM to create distributed I/O racks to the ELC-PV controllers
- Connect cost effective ELC expansion modules to third-party PLCs using standard networks
- EtherNet/IP, Modbus TCP, DeviceNet, PROFIBUS-DP and Modbus serial RS-485 distributed I/O adapters
- Connect up to 8 analog expansion modules or 14 digital expansion modules

### ELC Distributed I/O Adapters



#### ELC-CAENET



#### Distributed I/O Adapter Modules

Description	Catalog Number
EtherNet/IP or Modbus TCP I/O adapter	<b>ELC-CAENET</b>
Modbus serial RS-485 I/O adapter	<b>ELC-CARS485</b>
DeviceNet I/O adapter	<b>ELC-CADNET</b>
PROFIBUS-DP I/O adapter	<b>ELC-CAPBDP</b>

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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### Digital Expansion Modules (Right Side Bus)

##### Features

- Digital right side expansion modules can be used with any ELC controller
- They simply snap together to allow the ELC backplane to pass through each connected module
- Add only the amount of I/O you need
- Choose I/O counts as small as 6 points and as large as 14 points per module
- I/O modules are available in a broad selection of AC/DC inputs, relay/transistor and high current outputs that may be used together in any combination
- Maximum of 14 modules per controller

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#### ELC-EX08NNDN



#### Digital Expansion Modules (Right Side Bus) 1 of 2

Description	Inputs	Outputs	Max. Current Consumption (at 24 Vdc)	Catalog Number
8 DC input module	(8) 24 Vdc	—	50 mA	ELC-EX08NNDN
8 AC input module	(8) 110 Vac	—	50 mA	ELC-EX08NNAN
8 Transistor output module	—	(8) Transistor (sink), 0.3A	70 mA	ELC-EX08NNNT
8 Relay output module	—	(8) Relay, 1.5A	70 mA	ELC-EX08NNNR

#### ELC-EX08NNDT



#### Digital Expansion Modules (Right Side Bus) 2 of 2

Description	Inputs	Outputs	Max. Current Consumption (at 24 Vdc)	Catalog Number
8 DC input/output module	(4) 24 Vdc	(4) Transistor (sink), 0.3A	70 mA	ELC-EX08NNDT
8 DC input/relay output module	(4) 24 Vdc	(4) Relay, 1.5A	70 mA	ELC-EX08NNDR
6 High current relay output module	—	(6) Relay, 6A	70 mA	ELC-EX06NNNI
16 DC input module	(16) 24 Vdc	—	100 mA	ELC-EX16NNDN
16 DC input/output module	(8) 24 Vdc	(8) Transistor (sink), 0.3A	90 mA	ELC-EX16NNDT
16 DC input/output module	(8) 24 Vdc	(8) Transistor (source), 0.3A	100 mA	ELC-EX16NNDP
16 DC input/relay output module	(8) 24 Vdc	(8) Relay, 1.5A	90 mA	ELC-EX16NNDR

**ELC-AN04ANNN**



**Analog Input and Output Modules (Right Side Bus)**

Analog input/output modules uses voltage or current mode for any channel—see table for resolution based on type and mode.

Description	Input Points	Resolution	Mode	Output Points	Resolution	Mode	Maximum Current Consumption (at 24 Vdc)	Catalog Number
4 Analog input module	4	V = 12 bit I = 13 bit	±10V ±20 mA	—	—	—	90 mA	<b>ELC-AN04ANNN</b>
2 Analog output module	—	—	—	2	12 bit	0–20 mA; 4–20 mA 0–10V; 2–10V	125 mA	<b>ELC-AN02NANN</b>
4 Analog output module	—	—	—	2	12 bit	0–20 mA; 4–20 mA 0–10V; 2–10V	170 mA	<b>ELC-AN04ANNN</b>
6 Analog input/output module	4	V = 12 bit I = 11 bit	±10V ±20 mA	2	12 bit	0–20 mA 0–10V	170 mA	<b>ELC-AN06AANN</b>

**ELC-PT04ANNN**



**Temperature Input Modules (Right Side Bus)**

Thermocouple and Platinum RTD temperature sensor input modules with 14 bit resolution.

Description	Input Points	Resolution	Sensor Type	Maximum Current Consumption (at 24 Vdc)	Catalog Number
4 Thermocouple input module	4	—	J, K, R, S, T	90 mA	<b>ELC-TC04ANNN</b>
4 Platinum RTD input module	4	14 bit	PT100	90 mA	<b>ELC-PT04ANNN</b>

**ELC-MC01**



**Motion Control Module (Right Side Bus)**

Single axis motion control module—up to 8 modules can be added to controllers.

If used with PH controller, it can provide a second axis since the PH controller has a single axis built-in.

If used with the PV controller, it can provide a third axis since the PV incorporated two axis of motion control and is capable of output pules up to 200 kHz

Description	Input Type	Output Type	Catalog Number
Single axis motion control module	Phase in, start, stop, and so on	Phase, pulse, direction	<b>ELC-MC01</b>

**ELC-485APTR**



**RS-485 Adapter Module (Right Side Bus—End Module)**

Passive RS-485 connection device module.

RJ12 port for connecting to a drive.

2-pin screw terminal to connect to ELC controller.

Male and female DB9 connectors to connect to other RS-485 devices.

Description	Connector Types	Catalog Number
RS-485 Connect adapter module	RJ12, DB9 (male and female), 2-pin screw terminals	<b>ELC-485APTR</b>

**ELC-EX08NNSN**



**Toggle Switch Input Module (Right Side Bus)**

8 input switch module for manual switch inputs to the ELC controllers—used for debugging applications or product training demonstrations

Description	Maximum Current Consumption (at 24 Vdc)	Catalog Number
8 Toggle switch input module	20 mA	<b>ELC-EX08NNSN</b>

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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### Accessories

##### Power Supplies

All ELC controllers, analog and specialty expansion modules operate from 24 Vdc.

These power supplies provide a convenient way to provide robust DC voltage for ELC and other products.

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##### ELC-PS01

##### Power Supplies



Description	Input Power	Output Volts	Output Current (A)	Watts	Catalog Number
24 watt, 1 amp power supply	100–240 Vac 50/60 Hz	24 Vdc	1A	24	<b>ELC-PS01</b>
48 watt, 2 amp power supply	100–240 Vac 50/60 Hz	24 Vdc	2A	48	<b>ELC-PS02</b>

##### Cables

Use these cables to connect your PC's RS232 serial port to your ELC controller to download, upload and monitor your ELC controllers,

or to connect any ELC-GP to an ELC controller. The ELC-CBPCELC1 cable is 1 meter long and has a right angle connector to

the ELC controller to help reduce depth when cable is attached. The ELC-CBPCELC3 is 3 meters long with a straight connector.

##### Cables

Description	Catalog Number
Cable to connect a PC or an ELC-GP unit to ELC, 3 meters (DB 9-pin female to 8-pin DIN)	<b>ELC-CBPCELC3</b>
Cable to connect a PC or an ELC-GP unit to ELC, 1 meter with right angle connector (DB 9-pin female to 8-pin DIN)	<b>ELC-CBPCELC1</b>

##### Storage Devices

The ELC-ACPGMXFR module is a multifunction device that provides the ability to back up an application already loaded onto one of the ELC controllers. The transfer module can be used for copying the same application

to multiple controllers and to transfer an existing application to a new controller in the event of a failure. It will store system settings, passwords and the application, including the data registers for pre-loaded

recipes. Once stored in the module, the application, data registers and settings can be transferred to another ELC controller of the same model number.

##### Storage Devices

Description	Catalog Number
Program transfer module for ELC controllers	<b>ELC-ACPGMXFR</b>

##### Hand-Held Programmer

ELC-HHP is an easy-to-use, hand-held programming and monitoring tool for ELC controllers when a PC is not available. With ELC-HHP, applications can be programmed directly with the

attached keypad. Applications can also be uploaded from an ELC, saved and transferred to a different ELC, or downloaded from a PC and transferred to other ELCs. External power is not

required when using the hand-held programmer because it draws its power from either the ELC or the PC through the attached cable.

##### Hand-Held Programmer

Description	Catalog Number
Hand-held programmer (Includes interface cables)	<b>ELC-HHP</b>

### Plate Mount

Use the ELC-ACCOVER surface mount stand-alone modules instead of mounting to a DIN rail. This may be

used to mount analog, temperature or the RS-485 adapters remotely.

### Plate Mount

Description	Catalog Number
Plate mount for specialty modules, qty. 10	ELC-ACCOVER

### Starter Kit

#### Starter Kit

Description	Catalog Number
ELC starter kit (includes ELC-PA10AADT, ELC-PS01, ELC-GP04, ELC-CBPCELC3, ELC-CBPCCGP3, ELCSOFT, ELCSOFTGP)	ELCSTARTKIT1

### Spare Parts

#### ELC Spare Parts

Description	Quantity	Catalog Number
Kit consists of:		ELC-SPKIT
Module to module locking clips (white)	4	
Module DIN rail clip (white)	2	
3-pin power plug and cable assembly (white)	4	
2-pin RS-485 communications connector (green—for latest version PA, PB, PC and PH)	4	
3-pin RS-485 communications connector (green—PV controllers only)	2	
Left side expansion port cover (PV controllers and left side communications modules)	2	
Right side I/O expansion port cover (all controllers and I/O modules)	2	
Battery cover door (for PA, PC and PH controllers)	2	
Metal mounting clips (only for PV controllers)	2	
Kit consists of:		ELC-IOBLOCK
9-pin replacement I/O blocks (green)	4	
Kit consists of:		ELC-BAT
Battery with pigtail and connector (for PA, PC and PH controllers only)	2	

### Programming Software

ELCSOFT programming software configures all ELC controllers. With ELCSOFT, applications can be created, edited and monitored. Move programs from one controller to another with ease. Program in ladder, sequential function chart or instruction language. ELCSOFT is the single program to develop

ELC controller applications. ELCSOFT is also used to configure the DeviceNet master and Modbus TCP Ethernet modules.

New program simulation capabilities are available in ELCSOFT ver. 2.

#### Requirements

Operating Systems

- Windows® 2000
- Windows XP
- Windows Vista
- Windows 7

Hard Drive

- At least 100M bytes

RAM

- At least 512M bytes.

#### ELCSOFT Editor



#### ELC Software

Description	Catalog Number
Programming Software for ELC Controllers	ELCSOFT

# 4.1

## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

#### 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 $\mu$ s minimum	Basic Instructions— 2 $\mu$ s minimum	Basic Instructions— 2 $\mu$ s minimum	Basic Instructions— 2 $\mu$ s minimum	0.24 $\mu$ s 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

**Distributed I/O Adapter Modules**

ELC-CANET, refer to **Volume 9—OEM**, CA08100011E, Tab 3, section 3.2.

**Environmental Ratings**

Description	Specification
<b>Transportation and Storage</b>	
Temperature	-13° to +158°F (-25° to +70°C)
Humidity	5-95%
<b>Operating</b>	
Temperature	32° to 131°F (0° to 55°C)
Humidity	50-95%
Power supply voltage	ELC: 24 Vdc (-15%-20%) (with DC input reverse polarity protection), expansion unit: supplied by the ELC
Power consumption	3-6W
Insulation resistance	>5M ohms at 500 Vdc (between all inputs/outputs and earth)
Grounding	The diameter of grounding wire cannot be smaller than the wire diameter of terminals L and N (All ELC units should be grounded directly to the ground pole)
Vibration / shock resistance	IEC1131-2, IEC 68-2-6 (TEST Fc)/IEC1131-2 and IEC 68-2-27 (TEST Ea)

**DC Input Point Electrical Specifications**

Description	Specification
Input type	DC (SINK or SOURCE)
Input current	24 Vdc 5 mA
Active level	OFF → ON, above 16 Vdc ON → OFF, below 14.4 Vdc
Response time	About 10 ms (an adjustment range of 0-10,000 ms could be selected through D1020 and D1021)

**Output Point Electrical Specifications**

Output Type	Relay-R	Transistor-T
Current specification	1.5A/1 point (5A/COM)	0.3A/1 point @ 40°C; When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 30 mA
Voltage specification	Below 250 Vac, 30 Vdc	30 Vdc
Maximum loading	75 VA (inductive) 90W (resistive)	9W/1 point When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 0.9W (Y0 = 32 kHz, Y1 = 10 kHz), Y0 can be 50 kHz using D registers
Response time	Adjustable 0-15 ms, default is 10 ms	OFF → ON 20 μs. Y0 and Y1 are specified points for high-speed pulse ON → OFF 30 μs. Y0 and Y1 are specified points for high-speed pulse



# 4.1

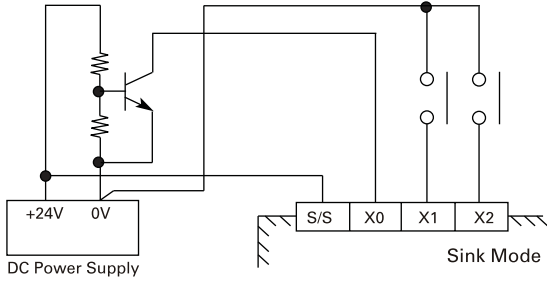
## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

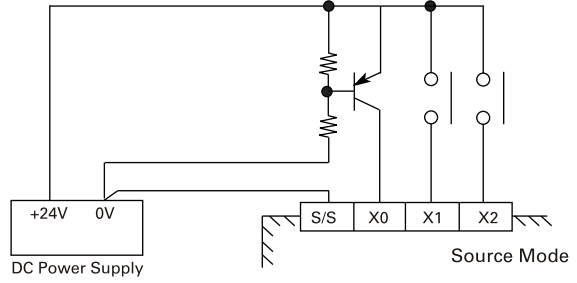
4

#### Circuit Diagrams

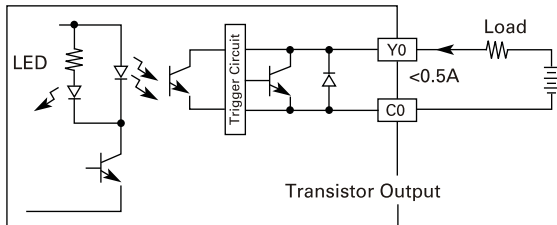
##### DC Input Sink Mode



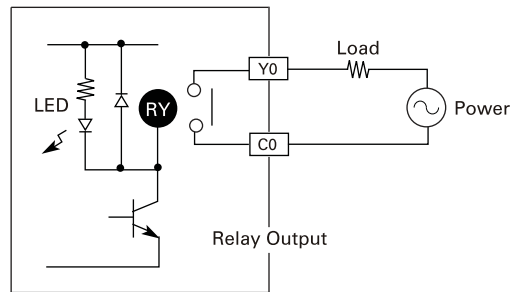
##### DC Input Source Mode



##### DC Transistor Sinking Output



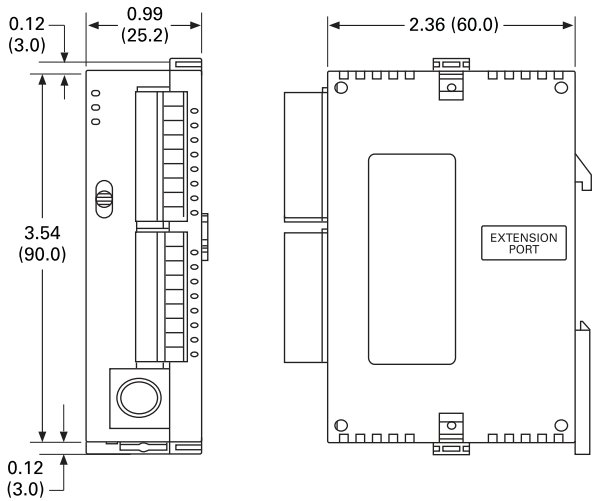
##### Relay Outputs



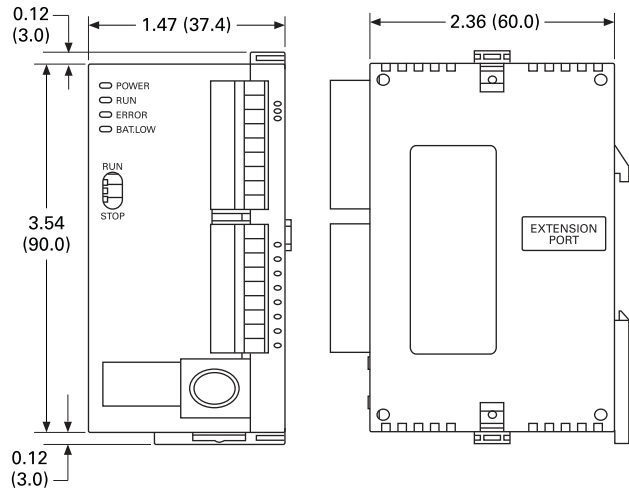
#### Dimensions

Approximate Dimensions in Inches (mm)

##### ELC-PB14 Controllers

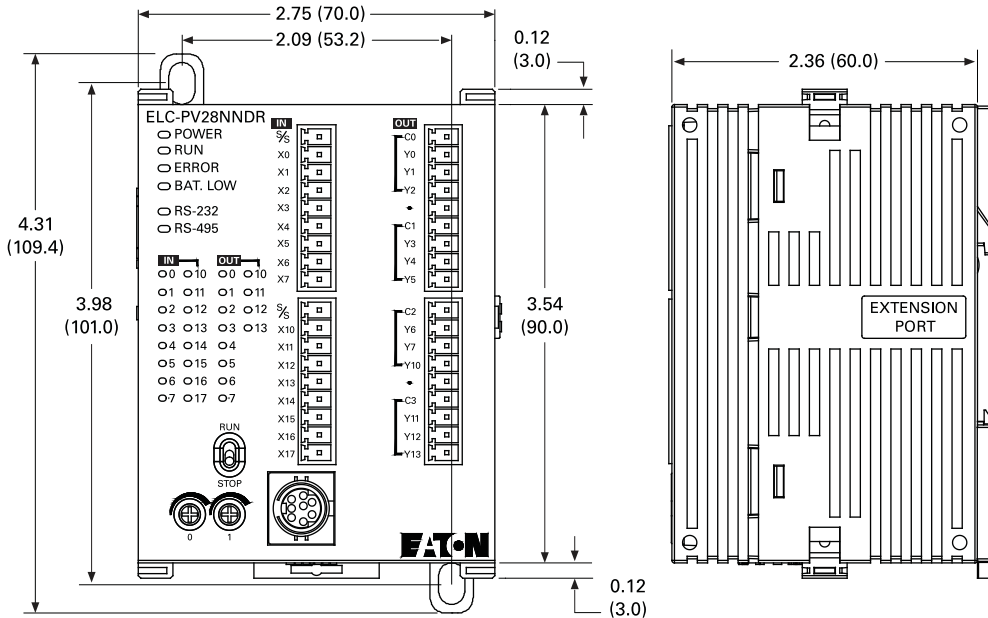


##### ELC-PC12, ELC-PH12 and ELC-PA10 Controllers

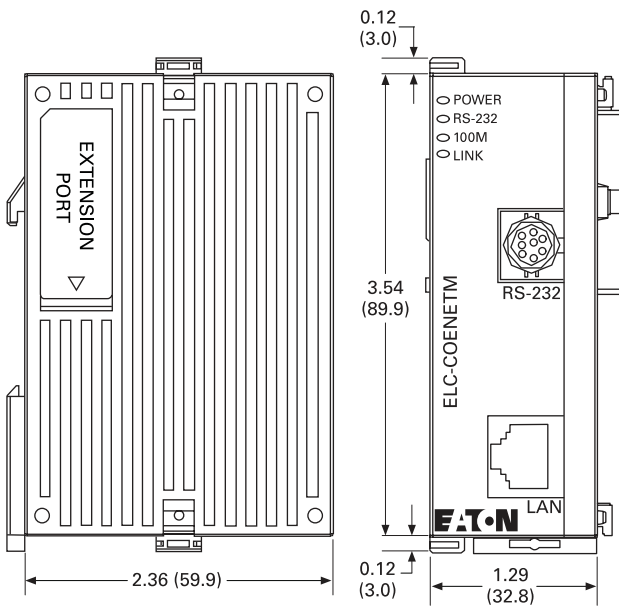


Approximate Dimensions in Inches (mm)

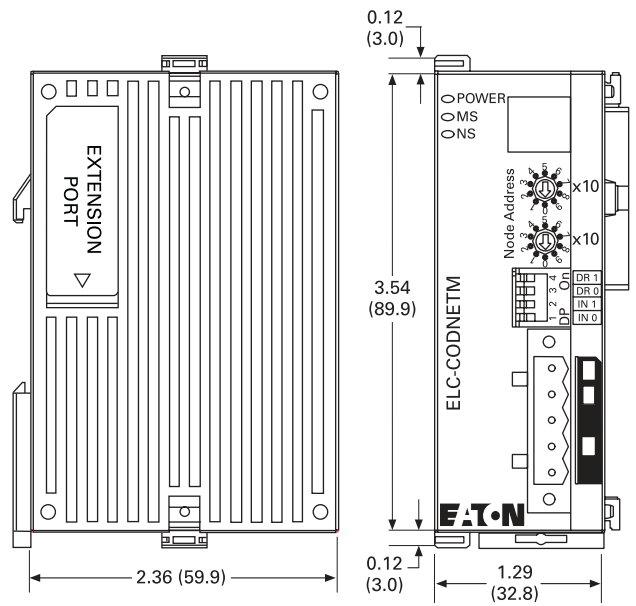
**ELC-PV Controller**



**ELC-COENETM**



**ELC-CODNETM**



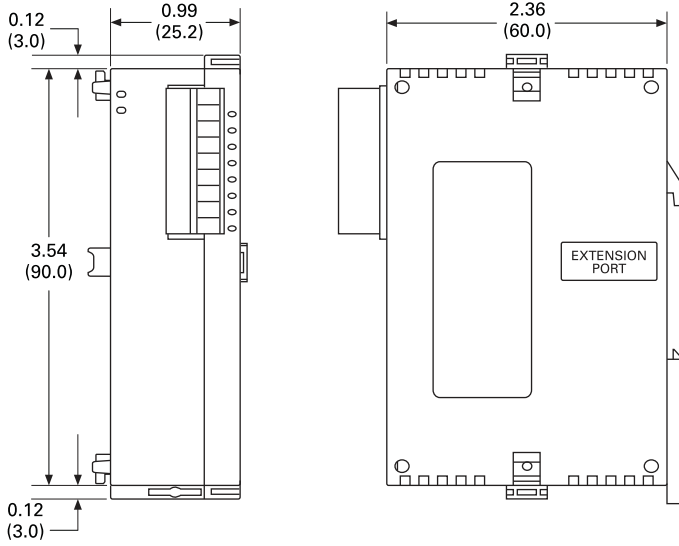
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## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

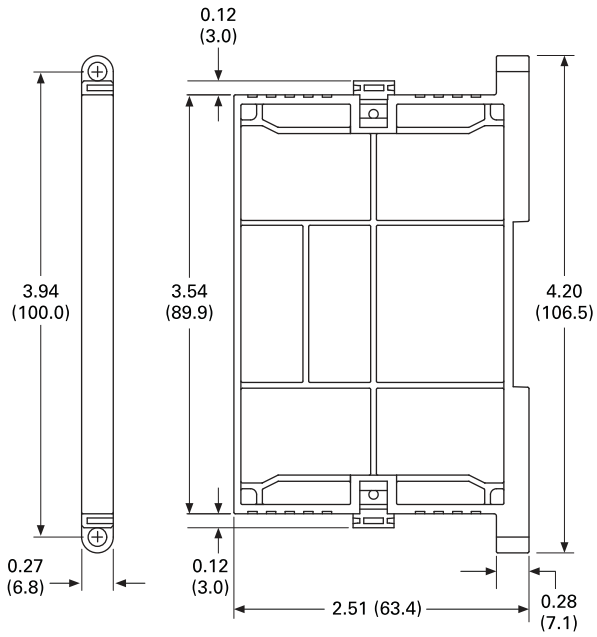
Approximate Dimensions in Inches (mm)

#### Right Side Specialty and Expansion Modules



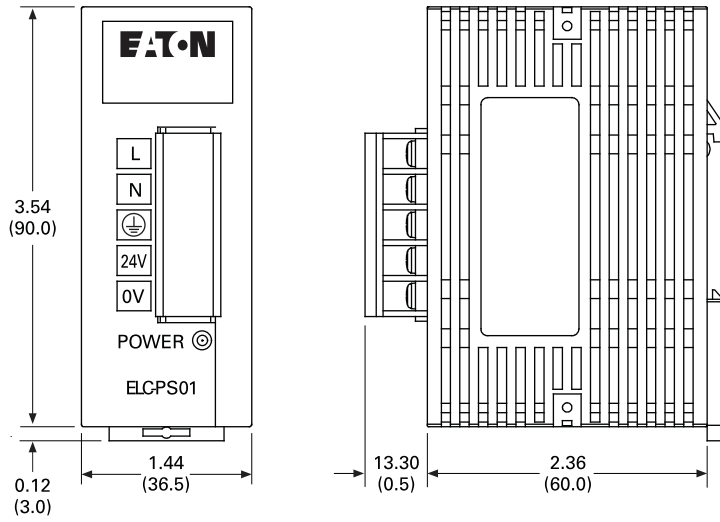
4

#### ELC-ACCOVER Plate Mount for Specialty Modules

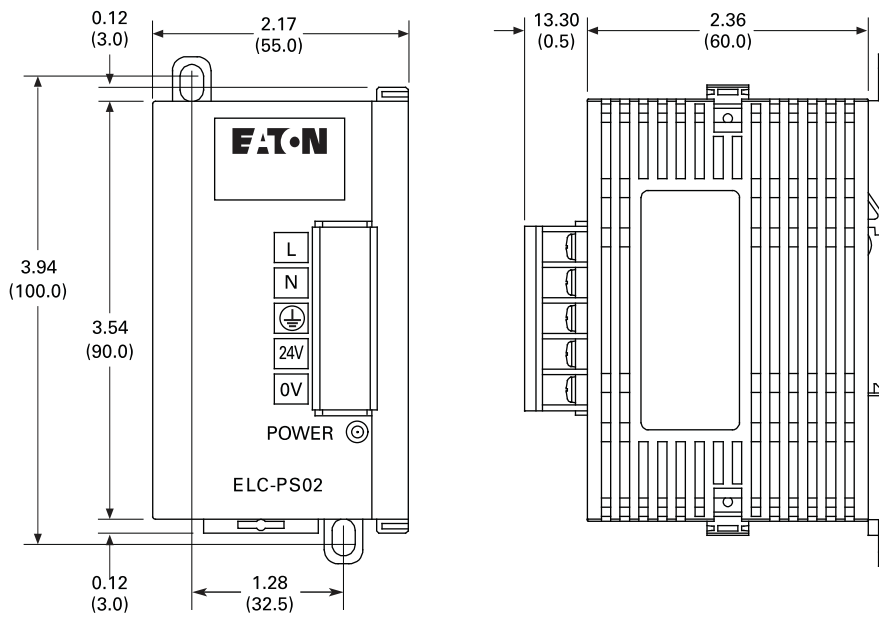


Approximate Dimensions in Inches (mm)

**ELC-PS01**



**ELC-PS02**



# 4.1

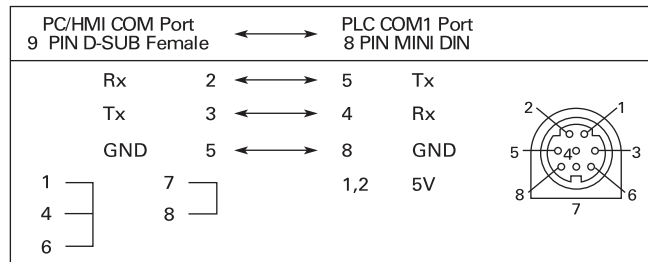
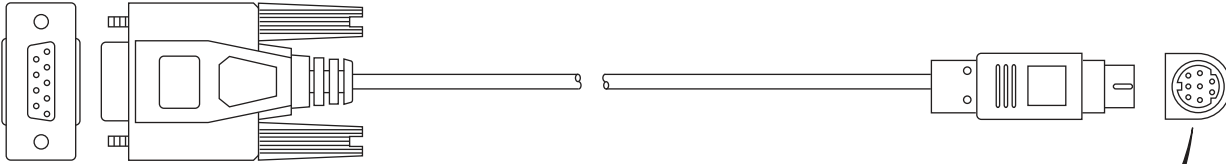
## PLC, I/O and Communications Products

### ELC Series Programmable Logic Controllers

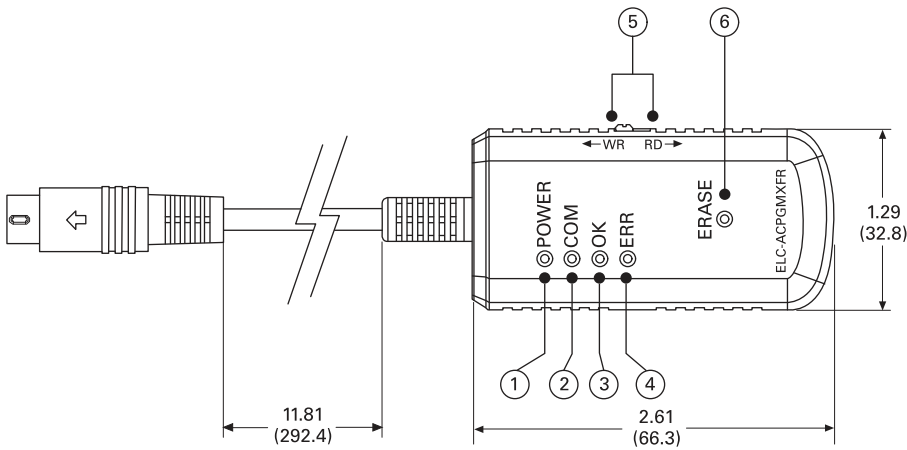
Approximate Dimensions in Inches (mm)

**ELC-CBPCELC1 Cable (Right Angle Connector not Shown) and ELC-CBPCELC3 Cable (Straight Connector as Shown)**

4



**ELC-ACPGMXTFER Storage Device**



Approximate Dimensions in Inches (mm)

**ELC-HHP Hand-Held Programmer**

