

# Electronic Control Module



## Introduction

The E-Plex 450ECM series combines a master programmer and controller functionality with a customizable touch-screen in one low-cost interface. The 450ECM is housed in a thin structure that extends less than 1/2" from the dash or wall surface. The 450ECM is capable of monitoring and controlling tanks, pumps, lighting, HVAC, gensets, engines and electronic systems.

A 128-character display (8 x 16) provides information, including alerts and diagnostics, from any of the modules within an E-Plex system. Customers have the opportunity to define custom artwork which is EL backlit within the touch-screen to provide the end user with an intuitive E-Plex system control interface.

## Key Features

- 255 unique alpha-numeric characters, 64-position touch glass display.
- System diagnostics and security lockout capabilities.
- Electroluminescent (EL) backlight for night-time display.
- 256KB of onboard memory including a master record of configuration data.
- Custom artwork overlays and bezel finishes.
- Rear 10-pin RS-232 monitor port.
- Same mounting and connection layout as the 400ECM series.
- LEN capacity 250.

## Design Specifications

- Shock: Mil Std 202 Method 213 test condition 1.
- Vibration: Tested to Lloyds Registered approval vibration test 2.
- Moisture resistance: IP50.
- PCB characteristics: UL94V-0.
- UVB certification: UVB 400 hours.
- Transient Voltage Protection: EN6100-6-1 (with optional EMI filter).

## Electrical Specifications

| Description                        | Minimum | Nominal     | Maximum |
|------------------------------------|---------|-------------|---------|
| Operating Voltage                  | 7 VDC   | 12 / 24 VDC | 32 VDC  |
| Operating Current, no E-Plex loads | 100 mA  | —           | 160 mA  |
| E-Plex Output Current              | —       | —           | 3 A     |

## Physical Specifications

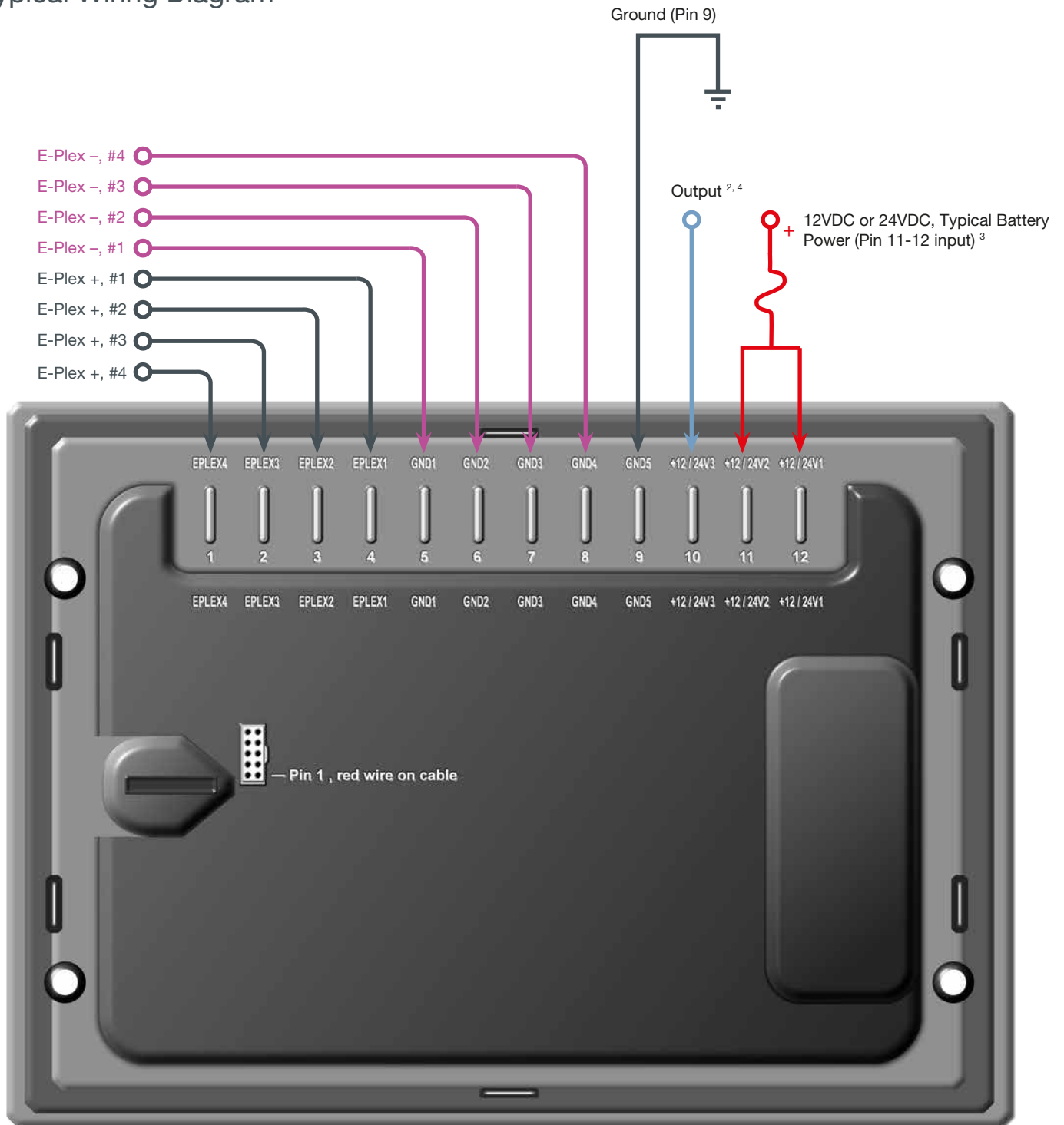
|   |   |
|---|---|
| LCD Brightness  | 100 cd / m <sup>2</sup>   |
| Electroluminescent (EL) Brightness                                  | 35 cd / m <sup>2</sup>  |
| Electroluminescent (EL) Lifespan                                    | 5,000 hours typical half-life   |
| Real-Time Clock Battery Life  | 25,000 hours typical  |
| LCD Horizontal Viewing Angle  | -40 / 40  |
| LCD Vertical Viewing Angle  | -35 / 35  |
| Front Bezel   | UL 94 V-0, approved molded ABS, powder-coat finish  |
| Back Cover  | UL 94 V-0, approved molded ABS  |
| Touch Glass Frame   | UL 94 V-0   |
| Operating Temperature   | -20°C to 70°C   |
| Storage Temperature   | -30°C to 85°C   |
| Operating Humidity  | 5% to 95% (non-condensing)  |
| Weight  | 0.65 lb (294 grams)   |
| Recommended Wire Specification for E-Plex Twisted Pair <sup>1</sup> | 16 AWG (1.3 mm) - Unshielded, twisted pair<br>General purpose: Belden 1035 A - Non-tinned<br>Marine: Belden 9410 - Tinned |

## Wiring Specifications

|                                   |   |
|-----------------------------------|---|
| Terminal Connector Specifications | Tin-plated male 0.250" quick-connect tabs |
| Mating Connector Specification    | 0.250" female spade terminal              |

NOTE: 1. Unrestricted topology: Star, Tree, Daisy Chain configurations all valid.

## Typical Wiring Diagram



**NOTE:**

2. Hardware version B and higher: Pin 10 is configured as a low current DC output.
3. User must install fuse or breaker to protect the circuit, rated for 5 A or less.
4. Diode auctioneered output from Pins 11 & 12.

## Connection Specifications

| Pin # | Pin Description   | Inputs & Outputs | Remarks                           |
|-------|-------------------|------------------|-----------------------------------|
| 1     | E-Plex Data Bus + | I / O            | 750 mA max E-Plex load            |
| 2     | E-Plex Data Bus + | I / O            | 750 mA max E-Plex load            |
| 3     | E-Plex Data Bus + | I / O            | 750 mA max E-Plex load            |
| 4     | E-Plex Data Bus + | I / O            | 750 mA max E-Plex load            |
| 5     | E-Plex Data Bus - | I / O            |                                   |
| 6     | E-Plex Data Bus - | I / O            |                                   |
| 7     | E-Plex Data Bus - | I / O            |                                   |
| 8     | E-Plex Data Bus - | I / O            |                                   |
| 9     | Power Return -    | I                | Battery – (GND)                   |
| 10    | Power Source 3 +  | O                | 1 amp max load <sup>2, 4</sup>    |
| 11    | Power Source 2 +  | I                | Battery + connection <sup>3</sup> |
| 12    | Power Source 1 +  | I                | Battery + connection <sup>3</sup> |

## Mounting Specifications

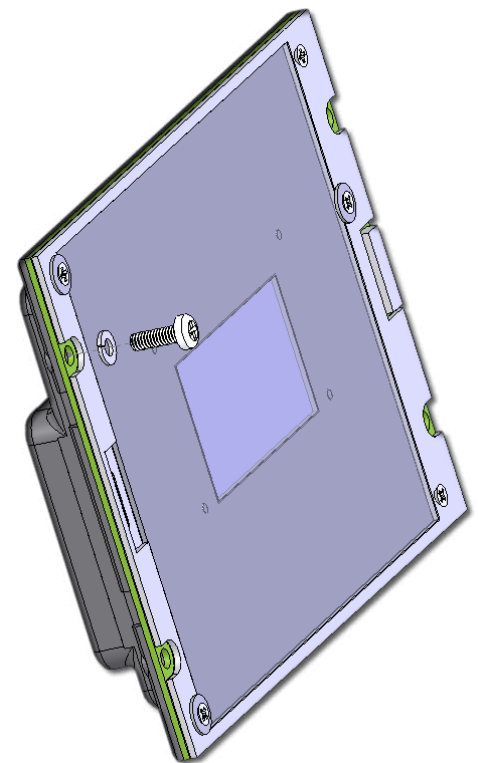
A rectangular hole the size of the keep out area (labeled on the dimensional drawings) must be cut from mounting surface. The keep out area is 163.32mm x 109.73 mm [6.43" x 4.32"]. The depth of the module is approximately 19.69mm [0.775"]. Please allow sufficient room for all wires connected to the clock as well.

## Mounting Instructions

**Metric fasteners:** Use M4 size screw with M4 split lock washer and torque to 180~215 N cm. Do not exceed this torque as it could cause damage to the electronics.

**Imperial (English) fasteners:** Use #8 size screw with #8 split lock washer and torque to 16~19 in-lb. Do not exceed this torque as it could cause damage to the electronics.

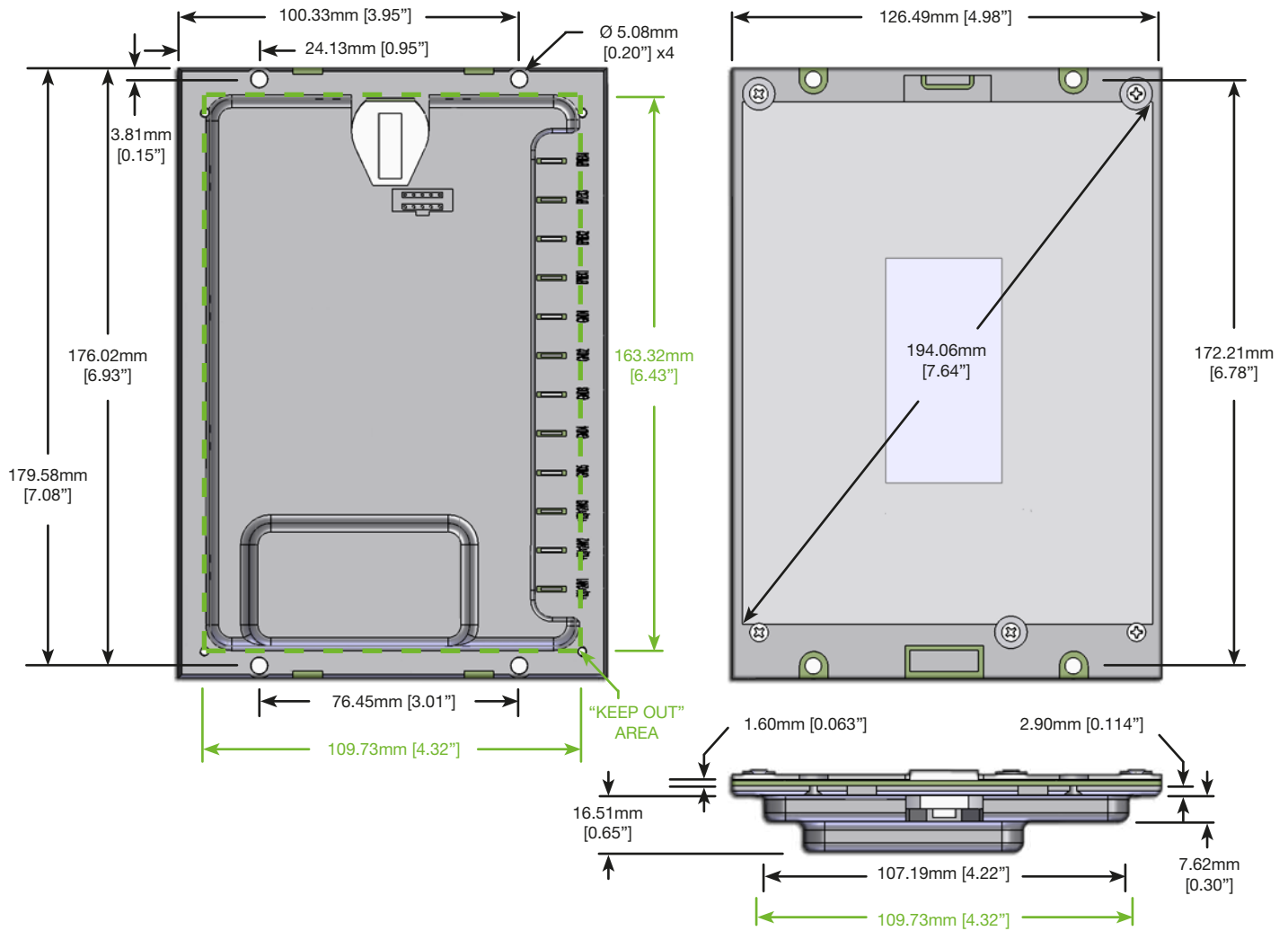
Height of mounting screw head and split lock washer must be less than 0.3556 mm [0.014"] Screw assembly to flat mounting surface in four places, as shown to the right.



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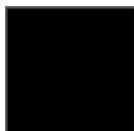
## Dimensional Diagram



## Ordering Information

| Description                               | E-Plex Part Number       |
|---|--------------------------|
| 400ECM Series - Electronic Control Module | EP-CLOCK-450ECM-B3       |
| Customer Defined Bezel (see below)        | EP-BEZEL-CLOCK-MC0067-XX |

## Standard Bezel Options



Flat Black Bezel  
EP-BEZEL-CLOCK-MC0067-FB



Black Gloss Bezel  
EP-BEZEL-CLOCK-MC0067-GB



Grey Gloss Bezel  
EP-BEZEL-CLOCK-MC0067-GR



White Gloss Bezel  
EP-BEZEL-CLOCK-MC0067-GW



Silver Chrome Gloss Bezel  
EP-BEZEL-CLOCK-MC0067-SR



Metallic Nickel Gloss Bezel  
EP-BEZEL-CLOCK-MC0067-NI



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