# Octal Power Module

8 channel DC power distribution module


## Introduction

The E-Plex® 805OPM is an eight channel DC power distribution module capable of handling loads of up to 15 A per channel or 50 A total. The eight channels can be utilised as either inputs, outputs, or a combination of both. Output channels may be paired in order to handle larger amperage loads.

The 805OPM incorporates thermal, short circuit, and programmable overload protection in order to safeguard the module against incorrect wiring or load faults. Manual mode capabilities allow backup operation of the device loads in the event that the E-Plex system goes offline.

In addition, the 805OPM design allows for the ability to utilise all channels as dimmer circuits, providing a flexible solution for lighting control.

## Key features

- 8 channels with outputs capable of up to 15 amps each (50 amps total).
- Pairs of channels may be configured to operate in parallel.
- PWM dimming capability on all channels.
- Input capability on all channels.
- Reverse battery protected.
- Status LEDs for each channel.
- Thermal, short circuit, and programmable overload protection.
- Local manual override capabilities.
- Designed for motor and high inrush current loads.
- E-Plex LEN value 2.

## Design specifications

- Transient voltage suppression: EN6100-6-1.
- PCB characteristics: UL 94V-0.
- Power distribution: UL 1077 compliant (except high-voltage dielectric test).
- Load dump tested to ISO 16750-2.

## Electrical specifications

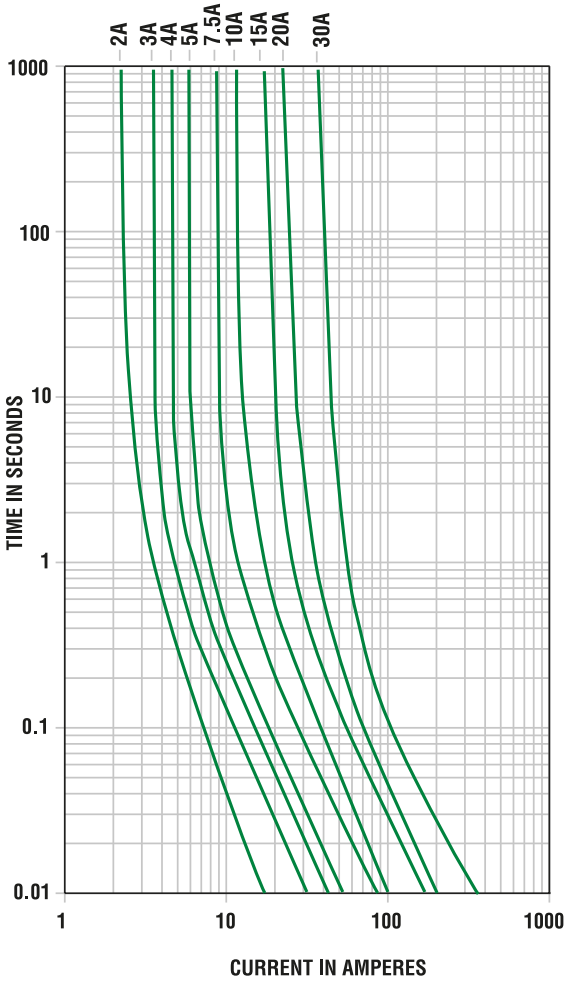
| Description | Minimum | Nominal | Maximum |
|---|---|---|---|
| Operating voltage[1] | 8 VDC | – | 32 VDC |
| Current, per output channel continuous | 0 A | – | 15 A |
| Total continuous output current | – | – | 50 A |
| Short circuit current limitation per channel | – | – | 90 A |
| Maximum resistance to activate input channel | – | – | 270 Ω |
| Lead inductance | 0 | – | 100 µH [2] |
| Load Inductance [3] | 0 | – | 100 mH |
| PWM Frequency | – | 120 Hz | – |

*The supply to the module should be protected by a fuse or circuit breaker, 50 A maximum*

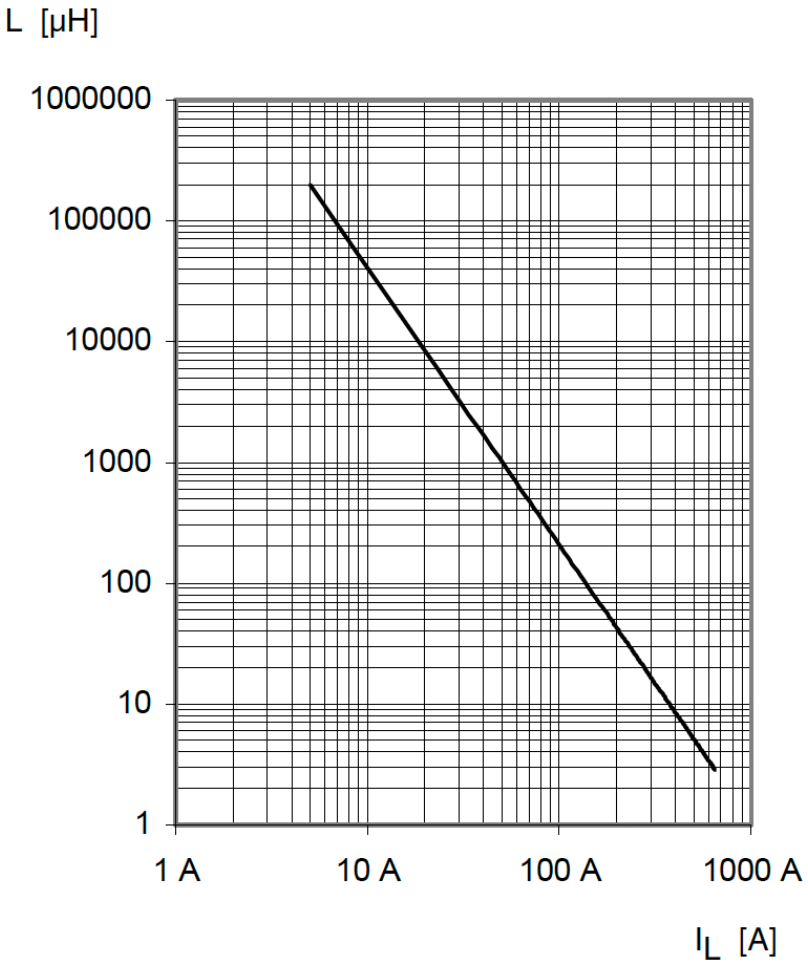
NOTES:
1. *Module shuts down at 8.5 V and powers back up at 8.5 V*
2. *Specified as 50 feet of 2 AWG (43 mm²) wires with a 6 inch diameter spool for both power and ground.*
3. *Refer to maximum load inductance graph below.*

*Taking the device outside the limits specified above may cause permanent damage to the device.*

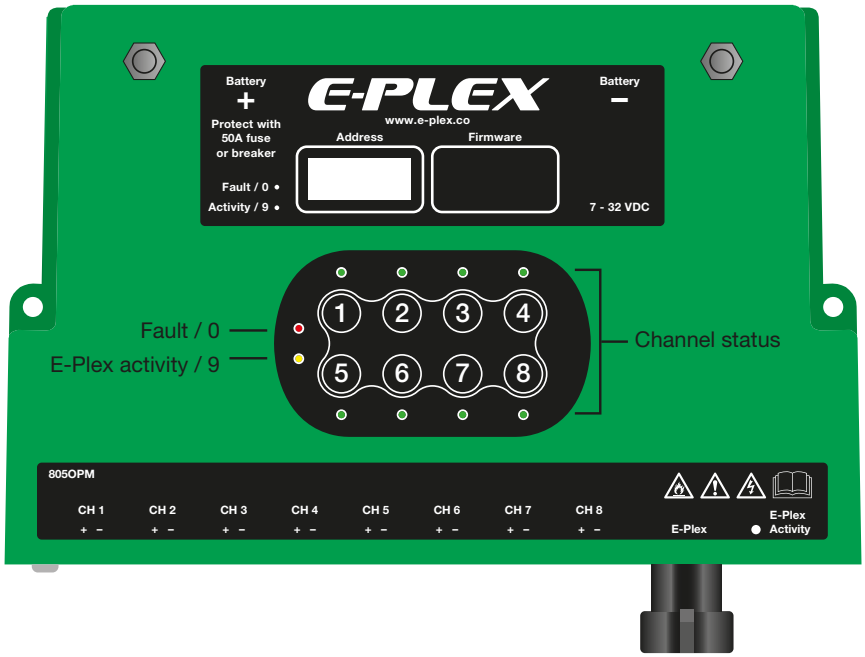
## Trip speed characteristics




## Maximum load inductance



## Local controls & indication




## Channel status LED (configured as output)

| LED state | Description |
|---|---|
| Off | Channel off |
| On | Channel on |
| Flashing alone or out of phase with fault LED | Channel tripped due to over current |
| Flashing together with fault LED | Channel fault (short circuit or hardware fault) |

## Channel status LED (configured as input)

| LED state | Description |
|---|---|
| Off | Channel inactive (open circuit) |
| On | Channel active (shorted to ground) |

## Fault LED

| LED state | Description |
|---|---|
| Off | No fault |
| On | Outside of operating conditions (reverse battery, over temperature, or low battery) |
| Flashing | Channel fault (see above) |

## E-Plex activity LED

| LED state | Description |
|---|---|
| Off | No E-Plex active |
| On | E-Plex activity |

## E-Plex address indication

At power up the module will indicate its E-Plex address by flashing the LEDs. One of the LEDs will flash for 2 seconds, this indicates the most significant digit of the address. This will be followed by one second with all LEDs off. Then another LED will flash to indicate the next digit of the address. This pattern will repeat until all 4 digits have been displayed. For example if LED 1 flashes followed by LED 6, then fault (0), then 8, the modules address is 1608.

All LEDs flash repeatedly with the above sequence at power up if the module has not been assigned an address.

## Manual mode

Manual mode is a backup mode of operation which is automatically enabled if no commands are received from the main control unit (clock module). This allows for a minimum level of device control even when there are faults with other parts of the system.

If a module is unprogrammed all channels are disabled.

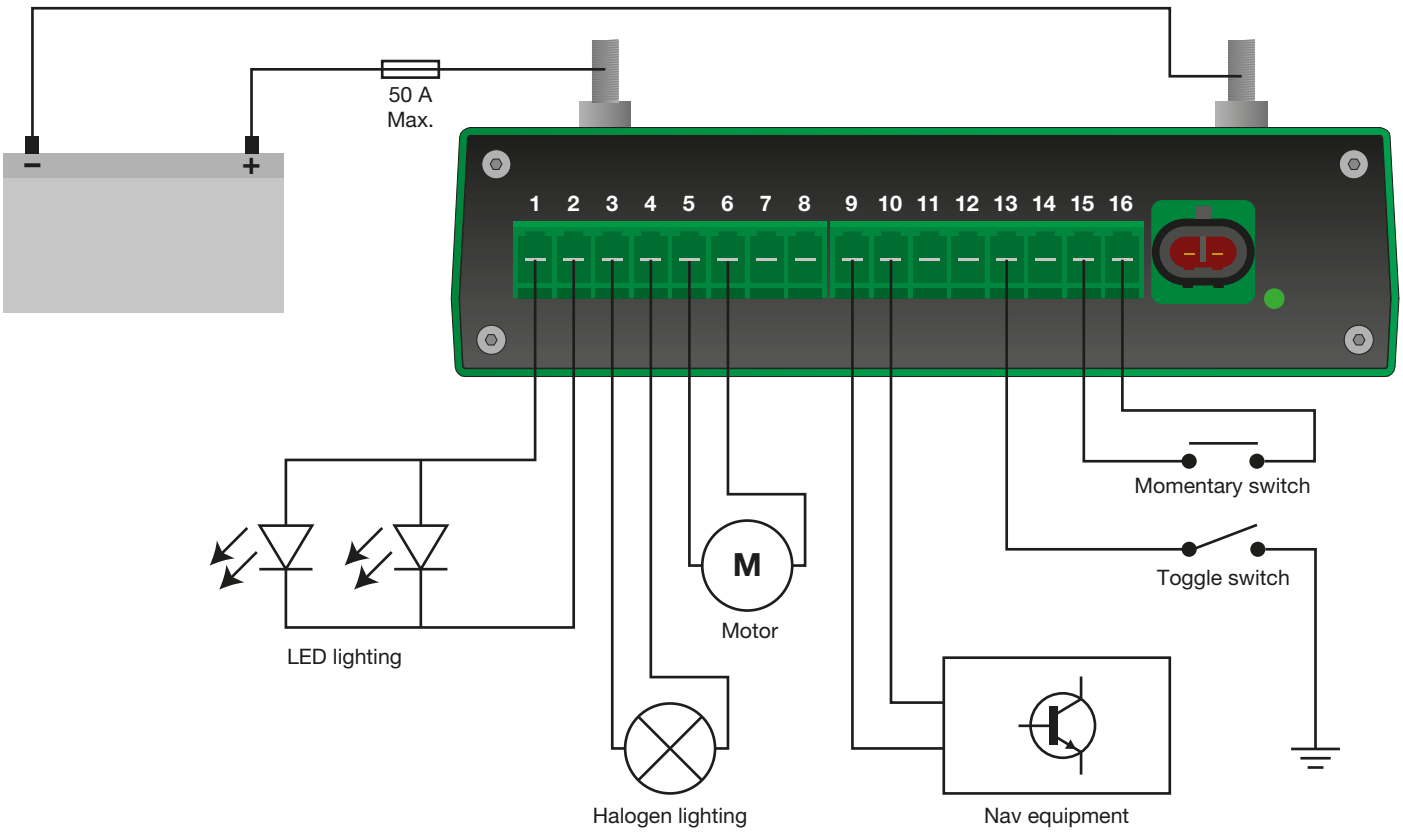
When the network is inactive there are two parameters that may be configured for output channels; automatic and manual control.

**Automatic control**
When automatic control is enabled the channel can be set to turn its output on or off when the module enters manual mode. When disabled the output will remain in the same state as it was in before entering manual mode.

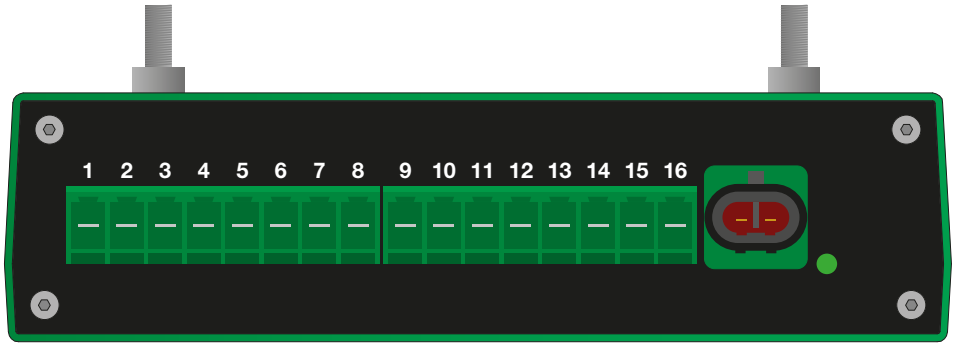
**Manual control**
The keypad switches may be programmed to override the automatic control with either momentary or latching behaviour.

When the network is active the functionality of the buttons is determined by the system software.

## Typical wiring diagram



## Wiring specifications




| Pin # | Pin Description |
|---|---|
| 1 | Input / Output +VE CH 1 |
| 2 | CH 1 Return -VE |
| 3 | Input / Output +VE CH 2 |
| 4 | CH 2 Return -VE |
| 5 | Input / Output +VE CH 3 |
| 6 | CH 3 Return -VE |
| 7 | Input / Output +VE CH 4 |
| 8 | CH 4 Return -VE |

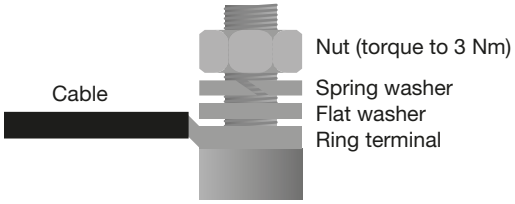
| Pin # | Pin Description |
|---|---|
| 9 | Input / Output +VE CH 5 |
| 10 | CH 5 Return -VE |
| 11 | Input / Output +VE CH 6 |
| 12 | CH 6 Return -VE |
| 13 | Input / Output +VE CH 7 |
| 14 | CH 7 Return -VE |
| 15 | Input / Output +VE CH 8 |
| 16 | CH 8 Return -VE |

All outputs are PWM capable and may be used to dim halogen and LED lighting loads.

Reversed Battery Conditions: If no loads are connected no damage will occur. If loads are connected damage may occur dependent on loads.

⚠ Initial power up must be performed without loads connected. The warranty will be void if powered up with reversed battery inputs and loads connected.

## Washer arrangement




## Cable sizing

Power / Battery Connections: Must be protected at a maximum of 50 A. Maximum wire size should be sized based on upstream fuse. When connecting the power source to the power studs on the module, the M5 hex nuts should be torqued to 3 Nm (22 in lb) after installing the battery terminals to the studs. Failure to properly torque hex nuts may result in intermittent operation due to terminals loosening over time.

When using a single conductor, a 35 $mm^2$ cable with a typical ring terminal thickness can be used. When using two conductors, 25 $mm^2$ cable with typical ring terminal thickness can be used. At least one turn of thread must be visible over the nut after tightening. It is important not to fit a washer below the ring terminal as the increased resistance will cause heating and damage.

**Parallel Operation**
When paralleling channels, it is important to match the resistance of the wires from each channel. If the wires are not balanced, one will carry more current than the other, which may result in the channel tripping prematurely. The remaining channel will then have to carry the entire load current, and will also trip. The best way to ensure that the wires are matched is to join them as close to the module a possible using wires of equal length and cross sectional area. This should be 4 $mm^2$ (14 AWG) wire, no longer than 100 mm (4”). E-Plex Ltd. can supply a pre-made assembly for this purpose. See below for ordering code.

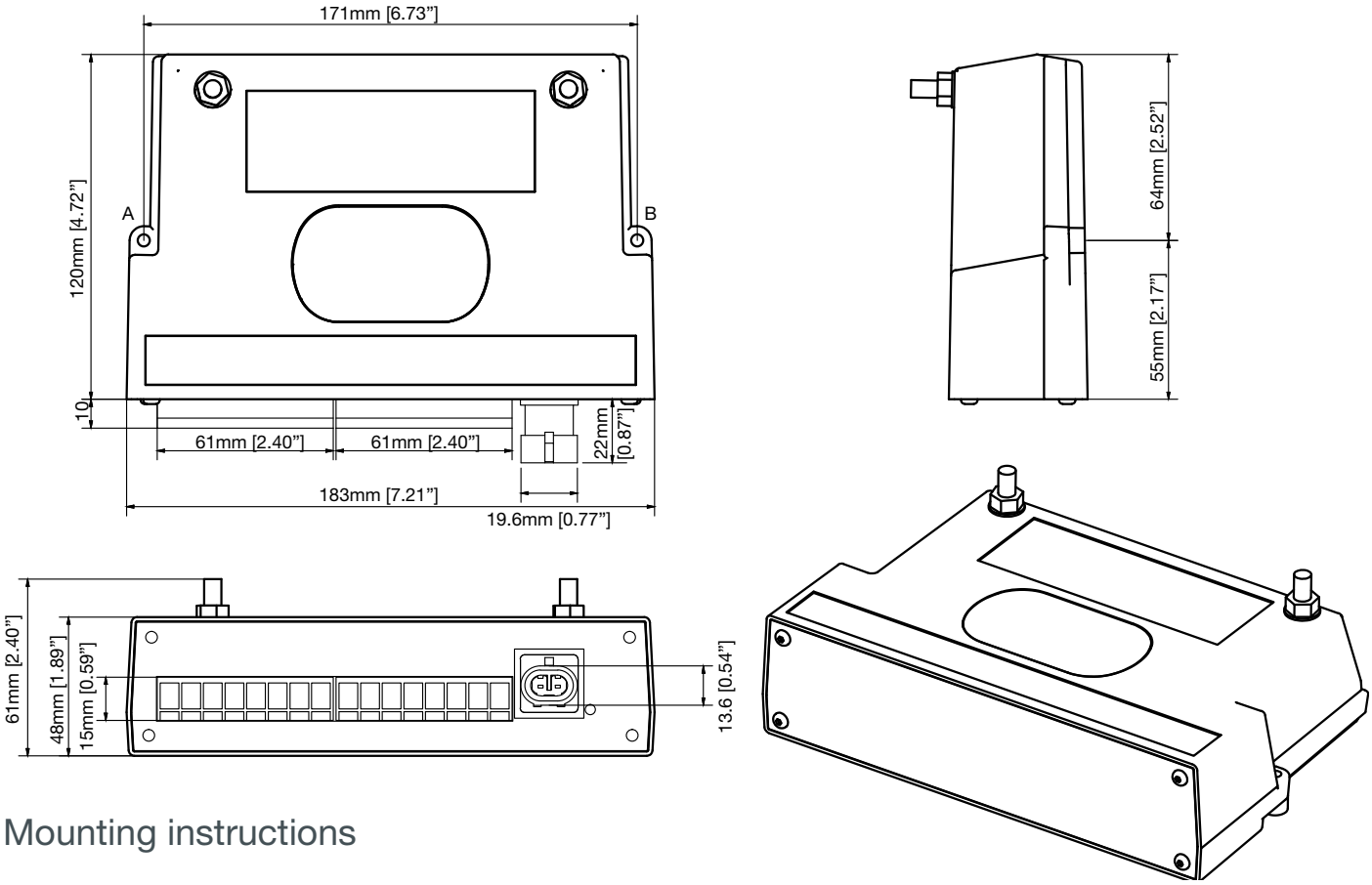
**Loads with multiple supplies**
When a channel is used to power a load it is necessary to fit a back feed prevention diode to protect against equipment damage when the OPM channel is off but the other channel is on. E-Plex Ltd. can supply a back feed diode with integral resister which will protect against back feeding whilst still allowing feed back to be monitored. See below for ordering code.

## Mechanical specifications

| Description | Specifications |
|---|---|
| Operating Temperature [1] | -20 °C to 60 °C (non freezing) |
| Storage Temperature | -40 °C to 85 °C |
| Operating Humidity | 5 % to 95 % (non-condensing) |
| IP Rating | IP20 |
| Weight | 541 g |

NOTES:
*1. Outputs shut down at 80 ºC and come back on at 75 ºC.*

*Taking the device outside the limits specified above may cause permanent damage to the device.*




## Mounting instructions

Screw assembly to a flat mounting surface in two places, as shown in the illustration labels A and B. Use M4 size panhead screw, M4 split lock washer and M4 washer or No. 6 wood screw Torque to 250~280 N-cm. Do not exceed this torque as it could cause damage to the enclosure.

## Ordering codes

| Description | Ordering Code |
|---|---|
| 805OPM Series - Octal Power Module | EP-SW-IO-8CH-805OPM |
| Connector - 1 to 8 | CO-CONN-805OPM-PLUG1 |
| Connector - 9 to 16 | CO-CONN-805OPM-PLUG2 |
| Y-cable for paralleling | CA-Y-10M |
| Backfeed blocking diode | EP-MISC-821BD |

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