

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 any combination of channels as dimmer circuits, providing a flexible solution for lighting control.

Key features

- 8 channels with outputs capable of up to 15 amps each (no more than 50 amps continuously for the module).
- 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
Voltage ¹	9 VDC	–	32 VDC
Current, Total	–	–	50A
Current, per channel continuous	0 A	–	15 A
Short circuit current limit per channel	–	–	90 A
Input low threshold	0V	–	3.5V
Input high threshold	4.5 V	–	32V
Lead inductance	0	–	100 μH ²
Load Inductance ³	0	–	100 mH
PWM Frequency	–	120 Hz	–

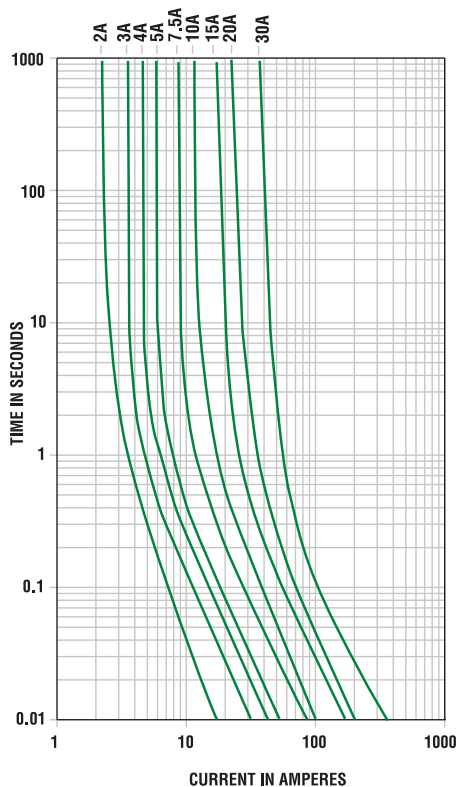
The supply to the module should be protected by a fuse or circuit breaker of appropriate capacity and no more than a maximum capacity of 50 A.

NOTES:

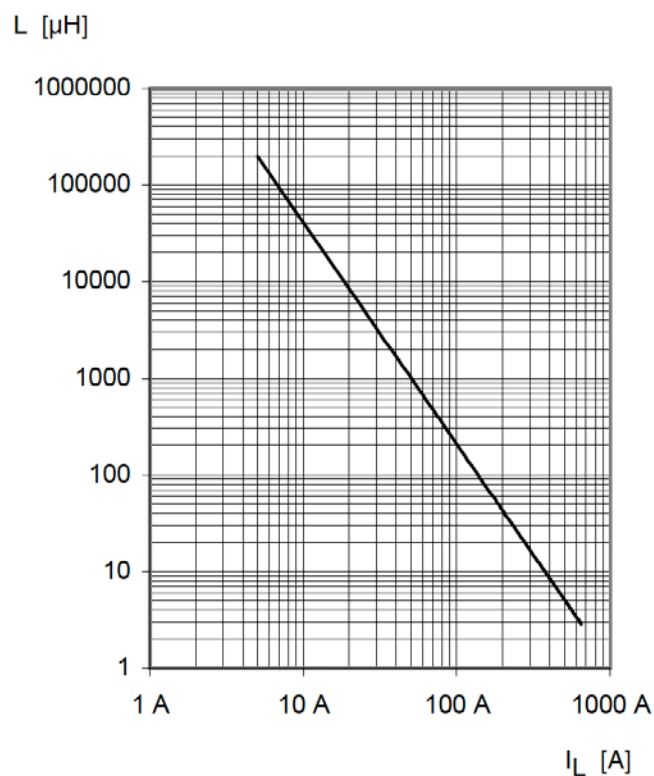
1. Module will shut down when voltage reaches 8.5 V and will power back up at 9 V
2. Specified as 50 feet of 2 AWG (43 mm²) wires with a 6 inch diameter spool for both power and ground.
3. Refer to maximum load inductance graph below

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

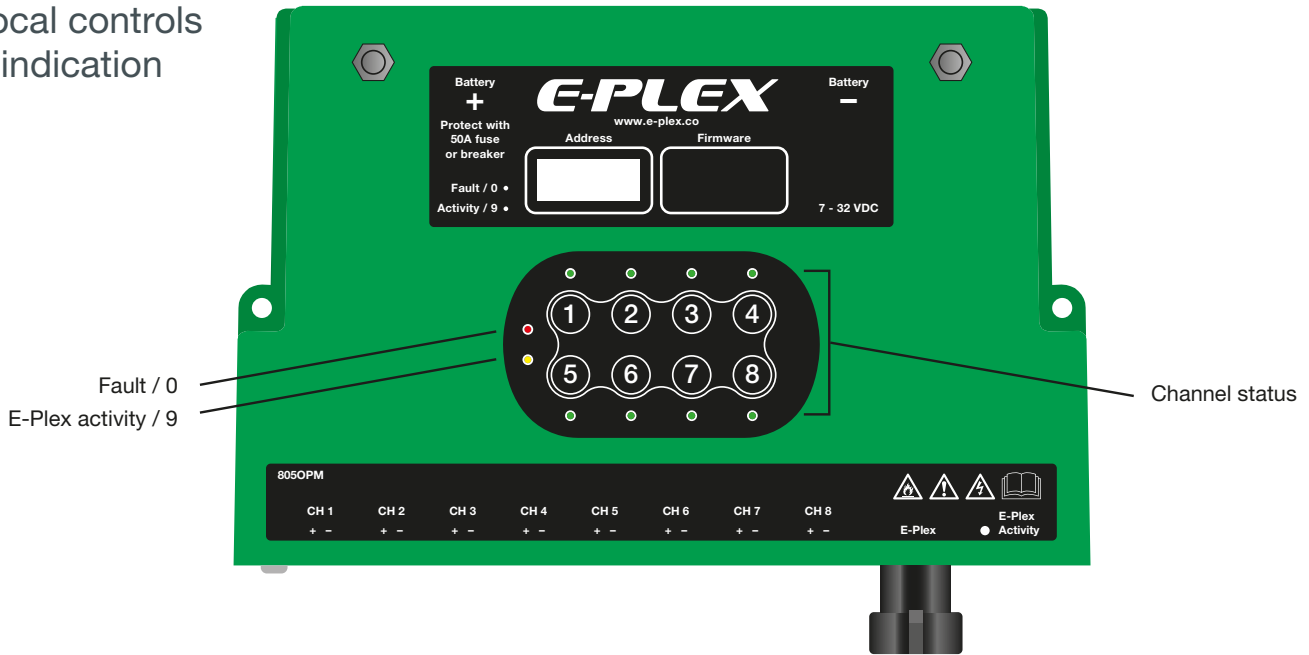
Trip speed characteristics



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

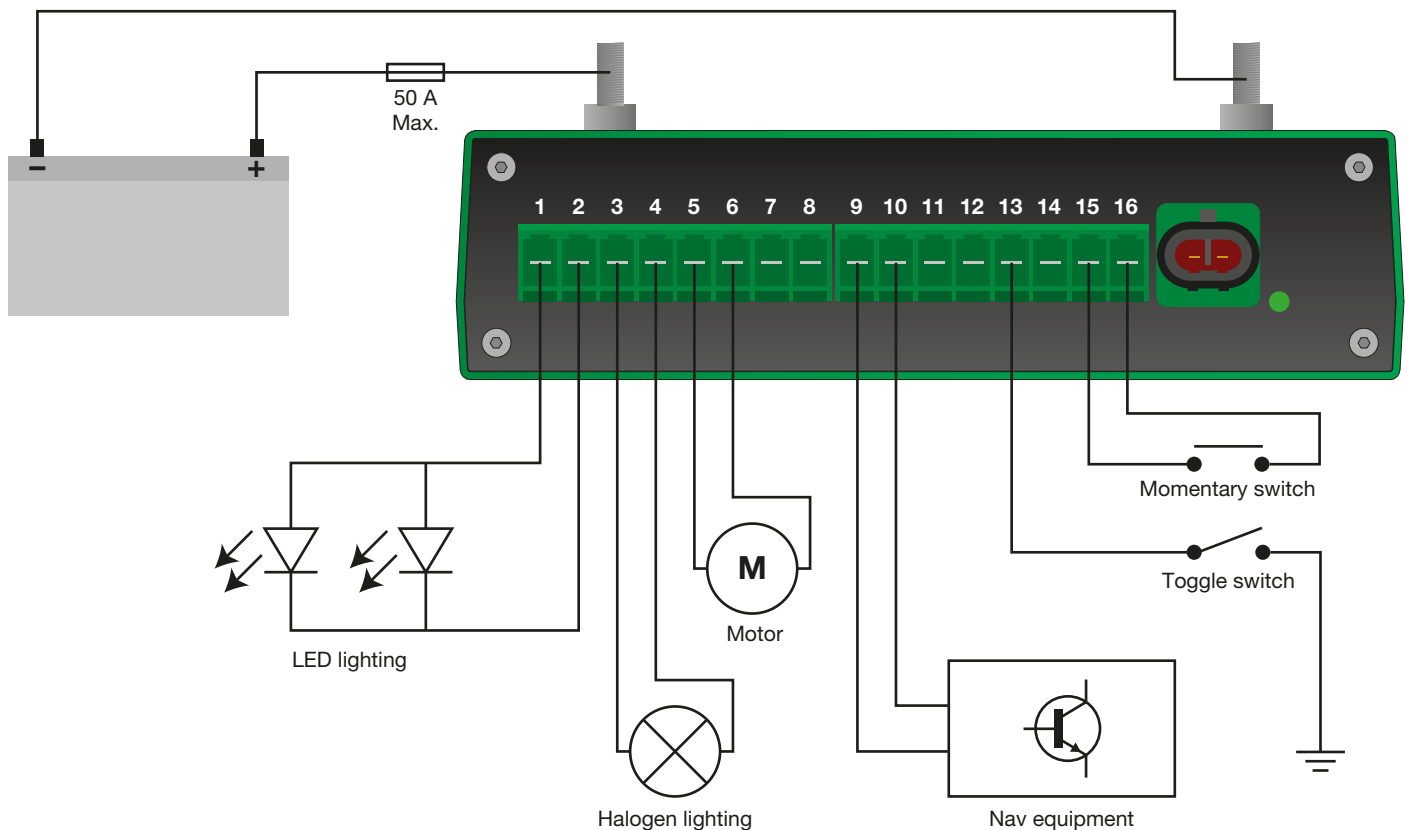
When automatic control is enabled the channel can be set to turn its output on or off when the module enters manual mode. When disabled the output will remain in the same state as it was in before entering manual mode.

Manual control

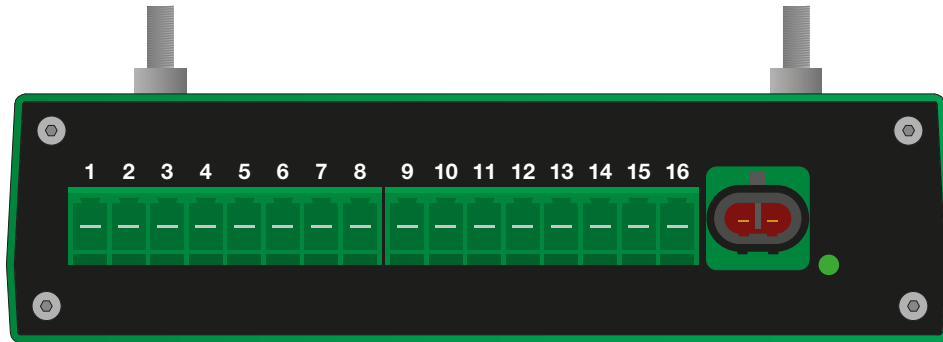
The keypad switches may be programmed to override the automatic control with either momentary or latching behaviour.

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.

Please Note: - LED Lighting modules must support PWM Dimming or incorrect operation may occur.

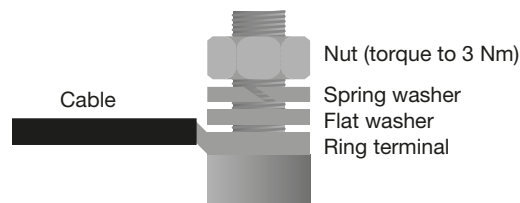
Reversed Battery Conditions:

To effectively protect both the connected device and the Module, the power supply to the module input must be protected by 50A over current protection device. If the module is powered up with the polarity reversed the supply breaker or upstream fuse will trip, but loads will be protected.



The warranty may be voided if powered up with reversed battery connections and with incorrectly rated upstream protection.

Washer arrangement



Cable sizing

For Power / Battery Connections

Must be protected at a maximum of 50 A. Maximum wire size should be sized based on upstream fuse capacity. 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 damage to the unit and intermittent operation due to terminals loosening over time.

When using a single conductor, a 35 mm² cable with a typical ring terminal thickness can be used. When using two conductors, 25 mm² 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 to the module and cabling.

Parallel Operation

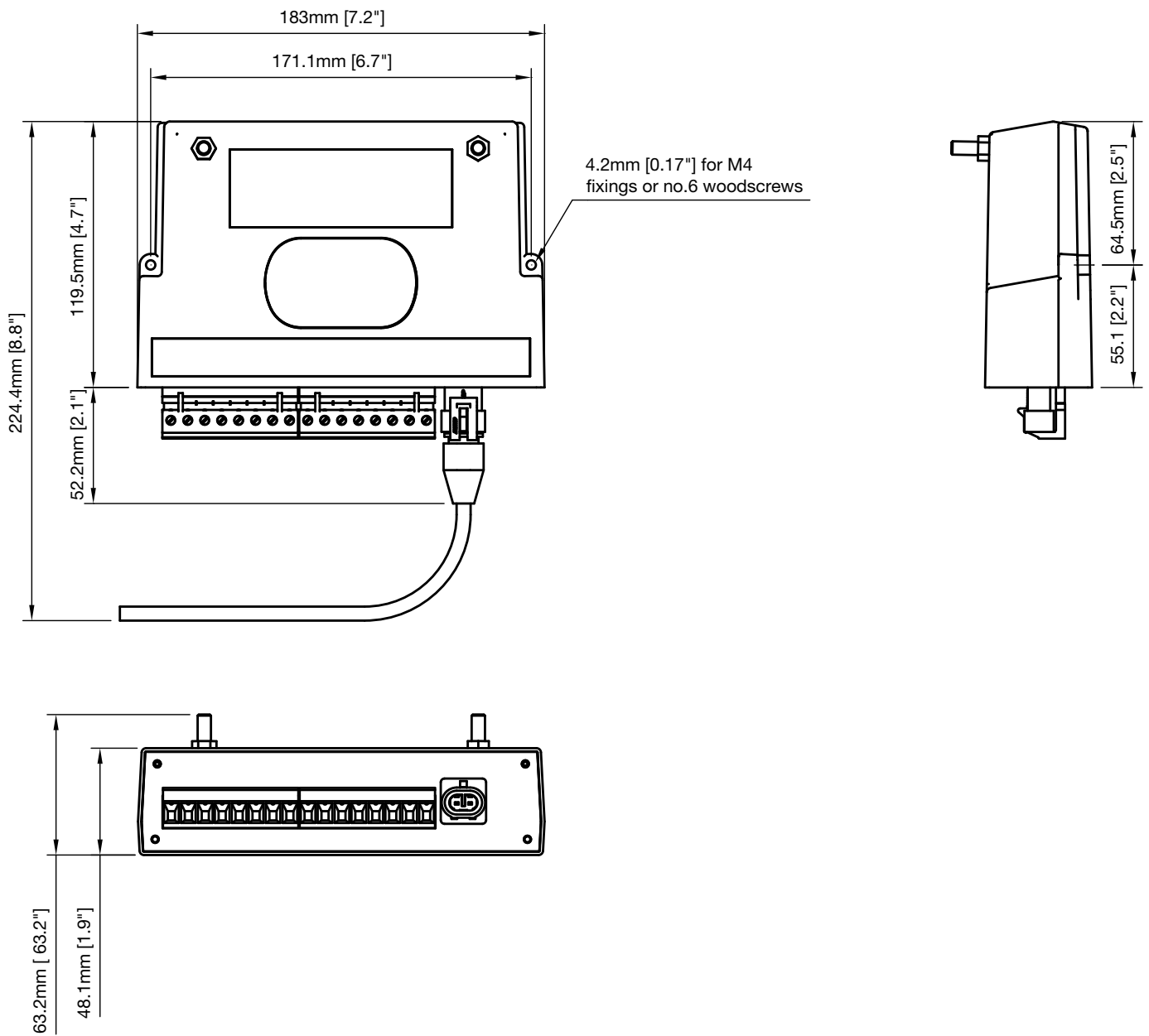
When connecting channels in parallel, it is important to match the resistance of the wires from each channel. If the wires are not balanced, one will carry more current than the other, which may result in the channel tripping prematurely.

The best way to ensure that the wires are matched is to join them as close to the module as possible using wires of equal length and cross sectional area. This should be 4 mm² (14 AWG) wire, no longer than 100 mm (4"). E-Plex Ltd. can supply a pre-made assembly for this purpose. See below for the 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 resistor which will protect against back feeding whilst still allowing feedback to be monitored. See below for the ordering code.

Dimensions



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.

Mechanical specifications

Description	Specifications
Front Bezel Material	Aluminum
Back Case Material	ABS
IP Rating	IP 20
Operating Temperature ¹	-20°C - 6°C (-4°F - 140°F)
Storage Temperature	-30°C - 85°C (-22°F - 185°F)
Operating Humidity	5% to 95% (Non Condensing)
Weight	541g (5.25oz)
Overall Length	183 mm (7.21")
Overall Height	63 mm (2.50")
Overall Depth (including Cable)	224 mm (8.8")
Mounting Hole Size	M4
Power Connecting Stud Size	M5

NOTES:

1. Outputs shut down at 80°C and come back on at 75°C.

805OPM Retrofit and personalities³

The 805OPM device can be supplied as a retro fit module and will have the relevant firmware personality for the older module it is replacing.

These modules are the 366HMM, 407QHM, 413DWM⁴ when ordered (see part number below) they will require the relevant adapter cable to allow it to be connected to the original wiring. Due to the size of the 805OPM module vs the older modules a diagram showing module and cable space requirements is shown below.

The personality in the 805OPM module makes the system believe that the original module type is connected and the programming and responses will be the same.

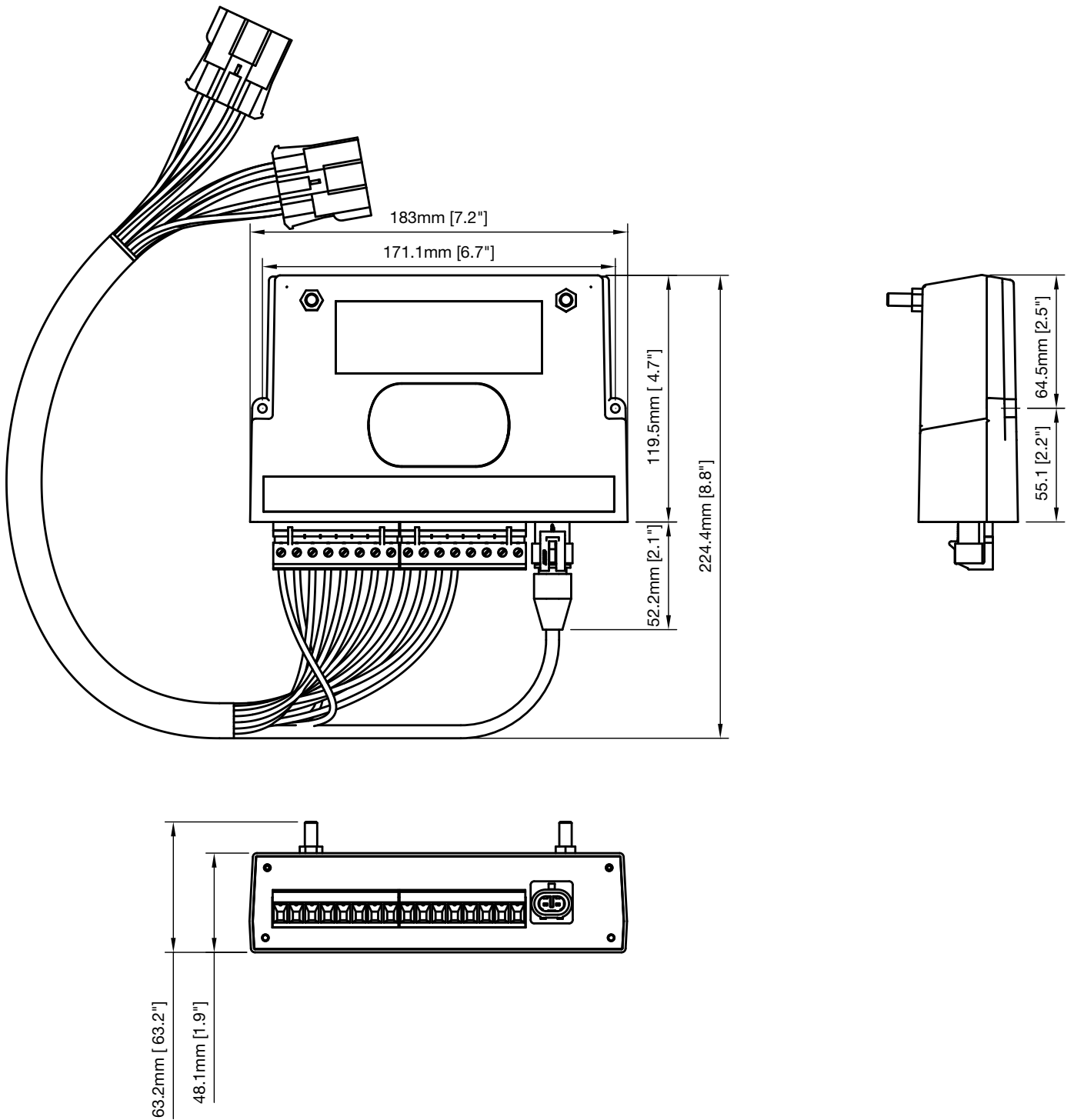
For information on specification changes and connections an additional information sheet is available and provided with the supplied module.

NOTES:

³ It is not recommended to use emulated devices for new installs and only as necessary for retrofits. We would always recommend using the native 805OPM for future compatibility and upgradability.

⁴ When emulating a 413DWM, additional external diodes may be required, depending on application. If in doubt, please contact your local dealer.

Dimensioned Drawing with retro fit cable fitted



Ordering codes

Description	Ordering Code
805OPM Series - Octal Power Module	EP3-SW-IO-8CH-805OPM-C3
Connector - 1 to 8	CO-CONN-805OPM-PLUG1
Connector - 9 to 16	CO-CONN-805OPM-PLUG2
Y-cable for paralleling	-Y-10M
Back feed blocking diode	EP-MISC-821BD
0.5 Metre EP3 Cable	EP3-CA-0.5M

When used as emulated device type

Description	Ordering Code
805OPM with 336HMM Personality	EP3-SW-IO-6CH-366HMM-REV O
336HMM Personality cable	EP3-CA-HOI
805OPM with 407QHM Personality	EP3-SW-IO-6CH-407QHM-REV O
470QHM Personality cable	EP3-CA-QOI
805OPM with 413DWM Personality	EP3-SW-IO-6CH-414DWM-REV O
413DWM Personality cable	EP3-CA-HOI



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