E30 eSM—Multiplexed Rocker Switch Units

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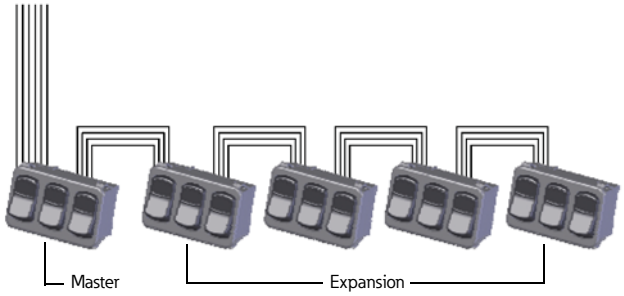
Product Description

Tailored to meet the same look and feel of Eaton's NGR product line, the E30 eSM offers the added benefits of multiplexed control and system simplification. The E30 eSM is a below-panel styled multiplexed rocker module capable of communicating via SAE J1939 CAN 2.0b. The modules are set up in a master-expansion configuration capable of supporting up to seven expansion modules per master thus minimizing the impact on a controller to a single CAN node. Additionally, up to eight master modules per system can be accommodated. Communication with the expansion modules is done via a four-wire sub-bus.

Multiplexing of switches can significantly reduce harness costs and complexity as well as improve installation cycle time.

Master Expansion Modules



Application Description

The E30 eSM is especially suited for applications that require both high current independently wired switches using Eaton NGR switches as well as those applications realizing the benefits of multiplexing. The E30 eSM is styled to match the Eaton NGR switch for a consistent look and feel to your dash panel.

The E30 eSM also has the capability of having a separate input for key switch and dimmer control functions to increase the flexibility of the product to interface seamlessly to your vehicle.

Customization of the E30 eSM is done by creating an application specific rocker with icons representing the function as well as by use of colored LEDs to highlight status. Two and three position as well as momentary or maintained circuits are identified using a sub-actuator to offer complete flexibility.

Target Market Segments:

- Motor coach/bus
- Specialty vehicle
- Truck

Product Selection

Note: All products are custom ordered. Contact your local Eaton Sales Representative.

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Technical Data and Specifications

E30 eSM Specifications

Description	Specification
Power supply	12 Vdc regulated power, 1.5A
Operating temperature	–40° to 85°C
Storage temperature	–40° to 85°C
Sealing	IP42
Illumination	Dependent or search lighting, customer defined LED color
Switch life cycle	
Electrical life	250,000 cycles
Mechanical life	250,000 cycles
Radiated immunity	SAE J1113/21, 100 v/m
Radiated emissions	SAE J1113/41, Class 2
Dimming	0–10 Vdc Analog Input (0 = 0% and 10V = 100% brightness)
Connectors	Delphi Micro VHT 15499927 Delphi Micro VHT 13513469

SAE J1455

Description	Specification
Dust test (Non-operational)	SAE J726 Course
Mechanical vibration	2gs from 10 to 2 kHz
Mechanical shock	30g
Handling drop	1m, 3-axis
Load dump transient	Table 4A and 4B
Reverse voltage	–28 Vdc for 5 mins
Over-voltage	48 Vdc for 5 mins
Under-voltage	4 Vdc for 5 mins

Power Supply

A regulated 12 Vdc power supply capable of providing 1.5A should be connected to terminals 1, 5 and 6 of the six-pole connector of the master module only. All connected expansion modules receive their supply power from the master module.

Diagnostics

The LED indicators at the back of the modules show the status of the internal diagnostics as follows:

Diagnostics

Label	Color	Meaning
J1939 ACTIVE	Red	CANbus active
MODULE ACTIVE	Amber	Sub bus active
SWITCH CHANGE	Green	Switch change

Communication

The communication to and from the master module is fully compliant to the SAE J1939/CAN 2.0b protocol.

The application-specific J1939 message parameters are as follows:

Transmission Repetition

Description	Specification
Transmission repetition rate	100 ms
Data length	8 bytes
Data page	0
PDU format	255
PDU specific	160
Default priority	5
Parameter group number	65440

Message Contents

Status

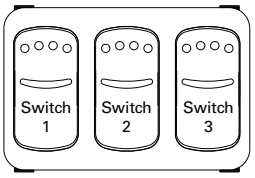
Byte	Status
Byte 1	Master module status
Byte 2	Expansion module 1 status
Byte 3	Expansion module 2 status
Byte 4	Expansion module 3 status
Byte 5	Expansion module 4 status
Byte 6	Expansion module 5 status
Byte 7	Expansion module 6 status
Byte 8	Expansion module 7 status

Within each status byte, the bits are assigned to the individual switches as follows:

Bit	Switch
Bit 8&7	Not defined
Bit 5&6	Switch 1 status
Bit 3&4	Switch 2 status
Bit 1&2	Switch 3 status

where the switches are numbered as shown below.

Switches

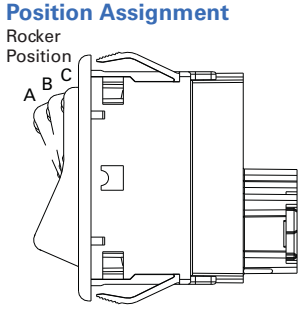


The two status bit pairs represent the switch state in the following manner:

Bit	Switch
00	Switch in DOWN position
01	Switch in MIDDLE position
10	Switch in UP position
11	Not defined

where the position assignment is as shown below.

Position Assignment

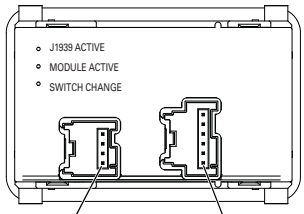


A = DOWN
B = MIDDLE
C = UP

Wiring

The master unit is connected using six unshielded wires. The connection from the master to the first expansion module and between any consecutive expansion modules is made using four unshielded wires.

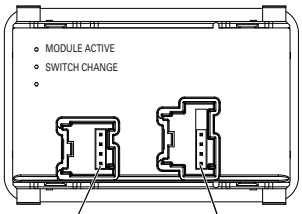
Master Module



Pin	Function
4	Vcc out
3	Ground
2	Sub bus +
1	Sub bus –

Pin	Function
6	Keyswitch
5	Dimmer
4	Ground
3	J1939 +
2	J1939 –
1	+12 Vdc

Expansion Module



Pin	Function
4	Vcc out
3	Ground
2	Sub bus +
1	Sub bus –

Pin	Function
4	Vcc in
3	Ground
2	Sub bus +
1	Sub bus –

Master wiring:
- Six unshielded wires

Expansion wiring:
- Four unshielded wires

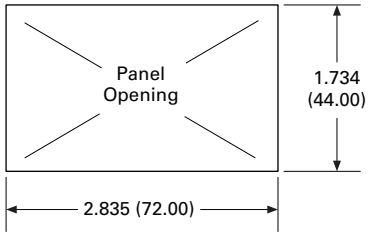
Dimensions

Approximate Dimensions in Inches (mm)

Mounting Dimensions

If you want to mount the modules in a panel, the opening in the panel should be rectangular, 2.835 in wide and 1.732 in high (72.00 mm wide and 44.00 mm high).

The panel thickness should be between 0.039 and 0.157 in (1.00 and 4.00 mm).



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