

E33 eSM—Sealed Multiplexed Rocker Switch Units

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E33 eSM –Keypad Multiplexed Switch Module
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Product Description

Sealed Multiplexed Master Module using a LIN sub bus to communicate with up to seven expansion modules.

Eaton is pleased to introduce the newest line of multiplexed electronic Switch Modules (eSM), the E33 product line. The E33 eSM offers an increased level of flexibility over previous modules including:

- Fully sealed to IP68 from the front and rear
- Locking rocker options
- Palm guard option

The E33 eSM offers a complete range of switch circuits as well as indicator options to meet all your control requirements. Similar to the E32 eSM product line, the E33 eSM includes individual icon lighting as well as a multi-color center indicator option allowing for steady state, flashing and dimming controlled via messaging. Additional flexibility is available by using the Eaton IP68 sealed SVR switch line for high-current, hard-wired applications in conjunction with our multiplexed solution.

Compared with electromechanical switches, multiplexed switch modules offer several advantages.

- Reduced assembly labor due to ease of installation, allowing for mounting and connection of three switches at one time versus individually
- Reduced wire harness complexity, using one harness to a controller to accommodate up to 24 switches and a three-wire interconnect between expansion and master modules
- Reduced harness size offers an overall reduction in weight, improving operational efficiency of the equipment
- Increase in switch life-cycle over traditional electromechanical switches (500k cycles)
- Reduced connections resulting in less possible failure points

Application Description

Target Market Segments

This product is targeted at harsh environment applications where a ruggedized product is needed to meet demanding requirements. Additionally, applications where there is concern over inadvertent switch actuation driving the need for guarding or locking features are also well-suited. Typical applications include:

- Construction equipment
- Agricultural equipment
- Specialty vehicle
- Material handling
- Emergency vehicle
- School and transit bus

Features and Benefits

- Fully compliant with J1939 CAN 2.0b messaging
- IP68 degree of protection front and rear
- 9–32 V DC rated
- Immune to SAE J1455 and J1113 power disturbances
- Top, bottom and full guard option available
- Locking rocker available
- Front panel removable for ease of maintenance
- Sleep mode available to reduce current draw on the battery
- Wake on switch change configurable
- LED lighting in top, center-indicator and bottom position
- Decorative style rocker with matching indicator option
- Late point definition of circuit and rockers to reduce inventory
- Diagnostic

Product Selection

To minimize inventory and maximize flexibility base modules and rocker assemblies can be ordered separately and assembled as required by the customer. All complete modules assembled with rocker buttons are custom ordered, contact your local Eaton Sales Representative for information.

Base Module Part Number Selection

Series	Number of Switches (note 1)	Module Type	LED Color Top (note 2)	LED Color Center (note 2)	LED Color Bottom (note 2)	Guard (notes 3 and 4)	Address
E33	3	M	W	4	W	X	1
	3	M=Master E=Expansion	W = White R = Red G = Green B = Blue A = Amber	4 = 4 colors R/G/B/A)	W = White R = Red G = Green B = Blue A = Amber	X - None F = Full T = Top B = Bottom	F = unassigned or select 1-8

Notes:

- Only 3 switch modules available at this time.
- The current available LED color combination is W4W, contact local your sales rep for price, MOQ and lead time for other options
- Guard codes T & B are available in switch position 3 only.
- Guard code F is available in any position. In addition this guard can be ordered separately installed by the customer.
- Base modules come assembled with the necessary switching components (plunger, spring, magnets and magnet holder). Rockers, circuit profiles and plunger seals must be purchased separately. See Rocker button assembly on Page xxxxx.

Accessories

Rocker Assemblies

Rocker				Top Graphic	Top Graphic Color	Center Indicator Bar	Bottom Graphic	Bottom Graphic Color	Circuit Note 3
E33	BF			AW	W	Y	AS	W	XX
	Color	Description	Code	Graphics Code	Description	Indicator	Graphics code	Description	XX = None See Table below for circuit selection
Standard	Black	Full-throw	BF	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
		Half throw up	BU						01 or 02
		Half throw down	BD						08 or 09
		Indicator	BI						None
		Guard - Top/Bottom	BG						03, 04, 05, 06, 07, 10, 11
		Guard -Full	BL						03, 04, 05, 06, 07, 10, 11
	Red	Full-throw	RF						03, 04, 05, 06, 07, 10, 11
		Half throw up	RU						01 or 02
		Half throw down	RI						
		Indicator	RD						08 or 09
		Guard - Top/Bottom	RG						03, 04, 05, 06, 07, 10, 11
		Guard -Full	RL						03, 04, 05, 06, 07, 10, 11
Locking	Black	Lower - Lock down	LD	N/A (XX) Note 2					06
		Lower - Lock up	LU						06
		Lower - Lock both	LB						06
		Upper - Lock down	UD						06
		Upper - Lock up	UU						06
		Upper - Lock both	UB						06

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Examples of rocker part numbers:

Catalog No.	Color	Style	Top	Center	Bottom	Circuit (Note 1)
E33RFXNNXXXXX	Red	Guard				None
E33BFRWWYRXWXX	Black	No Guard	⬆		⬇	None
E33BFYSWYYTD10	Black	No Guard	⬆		⬇	10

- Notes
- See Symbol table in Section 2.14 of the Electrical Sector Solutions Product Guide V11-T2. Product Guide #CA08100013E).
 - Not applicable due to locking mechanism.
 - If the rocker is specified with a circuit profile it comes assembled with the profile (61-4079-xx) and the dust boot/plunger seal (32-3157), otherwise these two components must be purchased separately.
 - Rocker buttons used with guards are smaller than standard. Full and half guards require a different rocker button, see codes in table above.

Circuit Profile

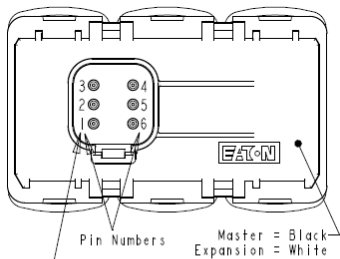
Circuit Up-Middle-Down	Circuit Number	Color	Catalog Number
On-On-None	01	Black	61-4079
Mom-On-None (02)	02	Red	61-4079-2
On-On-On (03)	03	Light Blue	61-4079-3
Mom-On-Mom (04)	04	White	61-4079-4
Mom-On-On	05	Yellow	61-4079-5
On-None-On	06	Gray	61-4079-6
Mom-None-On	07	Pink	61-4079-7
None-On-On	08	Maroon	61-4079-8
None-On-Mom	09	Light Purple	61-4079-9
On-On-Mom	10	Orange	61-4079-10
On-None-Mom	11	Green	61-4079-11
All locking configurations	06	Gray	61-4079-6

Other Accessories

Guard Assembly	Black	73-6194
Guard Assembly	Red	73-6194-2
Plunger Seal	N/A	32-3157
Panel seal	N/A	32-3163
Blank Rocker	Black	53-7832-4
Panel Blank	Black	E33X

Wiring

Master/Expansion Module Wire Harness



Pin	Master	Expansion
1	VBATT	VBATT
2	Common	Common
3	CAN High	LIN
4	CAN Low	LIN
5	Common	Common
6	LIN	VBATT

The interconnection between master module and controller uses a simple four-wire harness. Addressing of the master can be done by software or via address claim process. Interconnect wiring between master-expansion as well as expansion-expansion uses a three-wire harness.

Mating Connector Information

- Mating connector: Deutsch plug DT06-6S
- Wedge lock: W6S
- Socket contact: 0462-201-16141 (1.0–0.5 mm² [16–20 AWG])
- Hole plug: 0413-217-1605

Technical Data and Specifications

E33 Specifications

Description	Specification
Operational Temperature	-40 to +85 C
Storage Temperature	-40 to +95 C
Operational Voltage	9 to 32 V DC
Degree of Protection	IP68
Mechanical Shock	30 g for 11 ms
Mechanical Vibration	MIL-STD-202F/201A, 3.6g Swept Sine
Electrical / Mechanical Life	500,000 cycles
Sleep Current Draw	Master = 800 μ A, Expansion = 750 μ A
EMC	SAE J1455/J1113
Communication	Master - SAE J1939 CAN 2.0B, Expansion - LIN 2.0

Full technical details and message formats are available in document TD070001EN

Dimensions

Standard Cut-Out

The modules are easily mounted with plastic retention clips. Modules are mounted in a single, space-saving cutout reducing assembly time and accommodating up to three switches in a compact design.

Approximate Dimensions in Inches (mm)

Serviceability

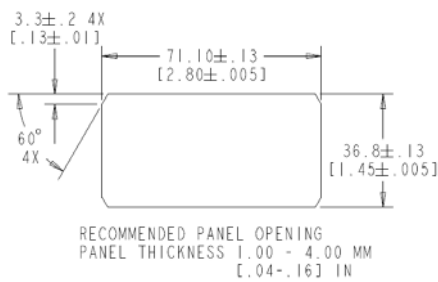
By modifying the standard cut-out to include the optional front panel removable slots shown below, the modules are easily serviceable from the front of the panel without further disassembly.

Due to the E33's design allowing for late-point definition on assembly, both the actuator and circuit profile are serviceable as individual component

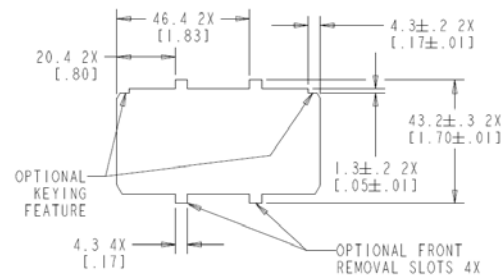
1.4 Electronic Products

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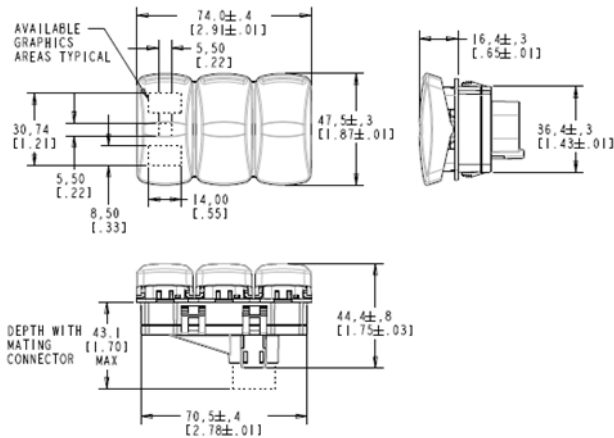
Standard Cut-Out



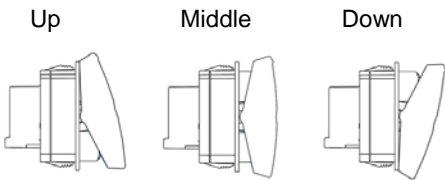
Optional Front Removal Panel Cut-Out



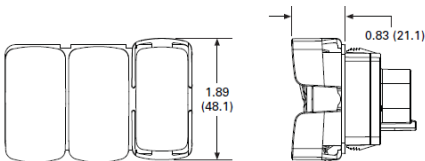
E33 eSM Sealed Multiplexed Rocker Switch Units



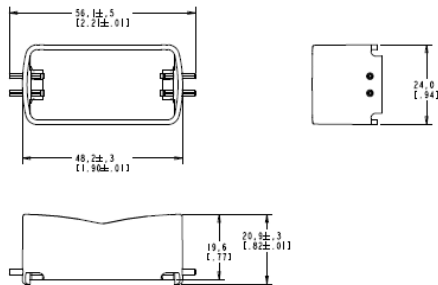
Switching Positions



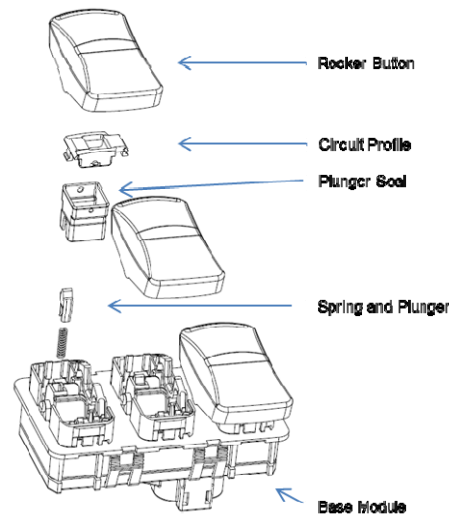
E33 eSM Sealed Multiplexed Rocker Switch Units (Palm Guard Version)



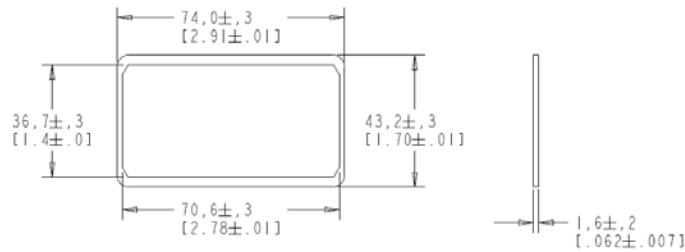
Guard Assembly (full)



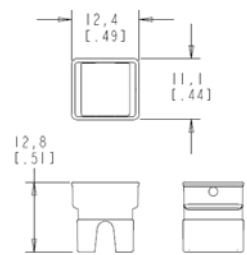
Rocker Button Assembly



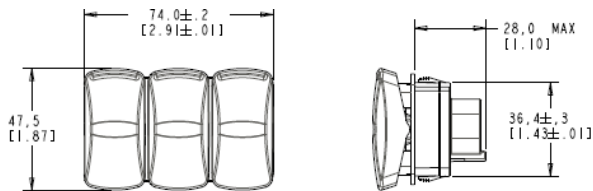
Panel Seal



Plunger Seal



Panel Blank



Standard and Guarded Rocker

