# EM32-4B-LED

The EM32-4B-LED is a 4 digit LED data display which is designed to be panel mounted in most low and medium volume applications. The display features 8mm digit height, 3 decimal points and a very low current consumption. This product is designed so no soldering is required. Connection is via 2 rows of square posts for the main functions and the optional external LEDs. The module features a round metal bezel, requiring a 32.5mm (1.28") diameter cut-out. It is secured with the nut provided. Protection from the front to IP 67/NEMA 4X standards is achieved by placing the rubber seal between the module and panel during assembly.

#### **FEATURES**

- 8mm (0.31") Digit Height
- 20mA @ 5Vd.c. Operation
- Programmable Decimal Points
- Drives up to 4 External LEDs
- Connection via 2 Rows of Posts
- Round Metal Bezel
- Requires 32.5mm (1.28") Diameter Cut-out
- IP67 / NEMA 4X Protected



### **TYPICAL APPLICATIONS**

- Panel Mount Instrumentation
- Process & Control
- Automotive

#### **ORDERING INFORMATION**

Standard Display

Stock Number EM32-4B-LED

### **ELECTRICAL SPECIFICATIONS**

| Specification               | Min. | Тур. | Max. | Unit   |
|-----------------------------|------|------|------|--------|
| Supply voltage              | 4    | 5    | 9    | V d.c. |
| Supply current              |      | 20*  |      | mA     |
| Operating temperature range | -10  |      | 60   | °C     |
| Storage temperature range   | -10  |      | 60   | °C     |
| Vled                        |      | 3    |      | V d.c. |
| Clock input frequency       |      | 500  |      | kHz    |

Unless otherwise noted, specifications apply at  $T_A = 25^{\circ}$ C,  $V_{supply} = 5$ Vd.c.

Supply current depends on supply voltage, brightness setting and number of LEDs illuminated.

#### **SAFETY**

To comply with the Low Voltage Directive (LVD 93/68/EEC), input voltages to the module's pins must not exceed 60Vdc. The user must ensure that the incorporation of the panel meter into the user's equipment conforms to the relevant sections of BS EN 61010 (Safety Requirements for Electrical Equipment for Measuring, Control and Laboratory Use).

LASCAR ELECTRONICS LTD. MODULE HOUSE WHITEPARISH WILTSHIRE SP5 2SJ UK TEL: +44 (1794) 884567 FAX: +44 (1794) 884616 E-mail: sales@lascar.co.uk LASCAR ELECTRONICS INC. 3750 West 26th Street Erie PA 16506 USA TEL: +1 (814) 835 0621 FAX: +1 (814) 838 8141 E-mail: us-sales@lascarelectronics.com LASCAR ELECTRONICS (HK) LIMITED FLAT C, 5/FL, LUCKY FTY. BLDG. 63-65 HUNG TO ROAD KWUN TONG KOWLOON HONG KONG TEL: +852 2797 3219 FAX: +852 2343 6187 E-mail: b4lascar@samsongroup.com.hk

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## EM32-4B-LED

| TIMING<br>$Ck \xrightarrow{v_{1}} c_{1} c_{2} c_{1} c_{1} c_{2} c_{1} c_{2} c_{1} c_{2} c_$ |   |     |   |       |     |   |  |
|---|---|-----|---|-------|-----|---|--|
|   | 50%   | 50% | 7 | BIT n |     | _ |  |
| * THE INTERNAL RESET ONLY CLEARS ALL INTERNAL SHIFT REGISTERS.<br>** THE EXTERNAL RESET CLEARS ALL INTERNAL SHIFT REGISTERS AND LATCHES.  |   |     |   |       |     |   |  |
| 111111  | Clock mules width   | 250 |   |       |     |   |  |
| A   | Crock pulse width   | 250 |   |       | 115 |   |  |
| В   | Serial data setup time  | 30  | _ | _     | ns  |   |  |
| C   | Serial data hold time   | 30  | _ | _     | nS  |   |  |
| D   | lime between clock activation & internal load pulse activation    | 35  | - | _     | nS  |   |  |
| Е   | Time between clock falling & internal reset pulse activation      | 35  | _ | _     | nS  |   |  |
| F   | External reset pulse duration                                     | 25  | - | -     | nS  |   |  |
| G   | External reset inactive setup time                                | 120 | _ | _     | nS  |   |  |
| Н   | Data enable setup time  | 70  | _ | _     | nS  |   |  |
| Ι   | Time between external reset activation & the output off           | 25  | _ | _     | nS  |   |  |
| J   | Time between internal load activation & new output states arising | 30  | _ | _     | nS  |   |  |

| SERIAL DATA INPUT SEOUENCE          | Bit | Segment | Bit | Segment |
|-------------------------------------|-----|---------|-----|---------|
|                                     | 1   | A4      | 18  | B2      |
|                                     | 2   | B4      | 19  | C2      |
|                                     | 3   | C4      | 20  | D2      |
|                                     | 4   | D4      | 21  | E2      |
|                                     | 5   | E4      | 22  | F2      |
| А                                   | 6   | F4      | 23  | G2      |
|                                     | 7   | G4      | 24  | DP2     |
| F 4 B 3 2 1                         | 8   | DP4     | 25  | A1      |
|                                     | 9   | A3      | 26  | B1      |
|                                     | 10  | B3      | 27  | C1      |
|                                     | 11  | C3      | 28  | D1      |
| DP4 DP3 DP2                         | 12  | D3      | 29  | E1      |
|                                     | 13  | E3      | 30  | F1      |
| Data is clocked into latches in     | 14  | F3      | 31  | G1      |
| reverse order, starting with bit 35 | 15  | G3      | 32  | L3      |
| (see timing diagram above)          | 16  | DP3     | 33  | L1      |
|                                     | 17  | A2      | 34  | L2      |
|                                     |     |         | 35  | L4      |
|                                     |     |         |     |         |

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### CONNECTION

- 0V Negative power supply to the display.
- V+ Positive power supply to the display.
- D Serial data input.
- Ck Clockinput.
- E Data enable input (actively held low).
- R Reset connect to V + to reset.
- VL Positive power supply to external LEDs.
- L1 Drive pin for external LED (Bit 33).
- L2 Drive pin for external LED (Bit 34).
- L3 Drive pin for external LED (Bit 32).
- L4 Drive pin for external LED (Bit 35).

- Although reset (R) is not required for normal operation, this pin

- E (Enable input) is connected to 0V via link LE. Cut this link if you need to control the Enable function.



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Optional high efficiency LEDs

 $(I_{\text{LED}} = 2.5 \text{mA typ.})$ 

Notes:

can be put under microprocessor control to clear the display.