

## SENTINEL Intelligent Battery transducer Impedance, Voltage and Temperature measurements

The Sentinel is a state of the art, System on Chip (SoC) digital sensor designed to monitor, VRLA, gel, or flooded stationary battery systems. Through the continuous monitoring and evaluation of each cell or monobloc's key electrical parameter, the risk of costly system downtime is minimized. Data is transmitted over a dedicated communication bus to proprietary and non-proprietary devices.

Available in two models:

|                            |           |
|----------------------------|-----------|
| LV: Low voltage cell/block | 2 V       |
| HV: High voltage block     | 6 or 12 V |



### Electrical data

|          |                               | Types |               |            |
|----------|-------------------------------|-------|---------------|------------|
| $V_c$    | Supply voltage range          | LV    | + 1.5 to + 3  | V          |
|          |                               | HV    | + 4.8 to + 15 | V          |
| $V_{PM}$ | Voltage measurement range     | LV    | + 1.5 to + 3  | V          |
|          |                               | HV    | + 4.8 to + 15 | V          |
| $T_{PM}$ | Temperature measurement range |       | - 10 .. + 70  | °C         |
| $Z_{PM}$ | Impedance measurement range   |       | 0.05 to 250   | m $\Omega$ |
| $I_c$    | Current consumption @ 2.3 V   | LV    | 23            | mA         |
|          | @ 13.8 V                      | HV    | 10            | mA         |

### Accuracy - Dynamic performance data (@ 20°C)

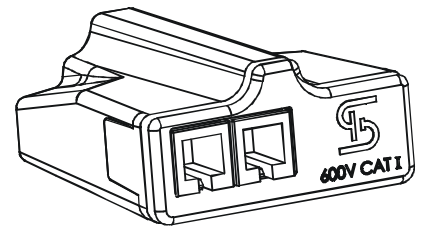
|       |                                       |           |     |
|-------|---------------------------------------|-----------|-----|
| $X_G$ | Overall voltage accuracy (full scale) | $\pm 0.5$ | %   |
|       | Temperature measurement accuracy      | $\pm 2$   | °C  |
|       | Impedance measurement repeatability   | $\pm 2$   | %   |
|       | S-Bus Communication                   | 9600      | bps |
|       | Send / Receive cycle <sup>1)</sup>    | Max       |     |
|       | Voltage + temperature only            | 25        | m s |
|       | Impedance only <sup>2)</sup>          | 5         | s   |

### General data

|       |                               |                   |    |
|-------|-------------------------------|-------------------|----|
| $T_A$ | Ambient operating temperature | - 10 .. + 70      | °C |
| $T_S$ | Ambient storage temperature   | - 25 .. + 85      | °C |
| $m$   | Mass                          | 35                | g  |
|       | Standards                     | EN 50178: 1997    |    |
|       |                               | IEC 61010-1: 2001 |    |

**Notes:** <sup>1)</sup> The actual sampling rate of measurement will depend on the number of Sentinels connected onto the S-Bus and on the communication system management as well.

<sup>2)</sup> To avoid over-heating of the Sentinel an internal timer doesn't allow more than 1 impedance request every 10 minutes.



### Features

- Communication interface isolation 3.7 kV
- Compact design
- Fast, simple fittings
- Interface with OEM equipment
- LED status indicators.

### Advantages

- Excellent sensitivity, accuracy, and repeatability
- High current stimulation for secure impedance measurement
- High immunity to electrical interference.

### Applications


- UPS
- Telecommunications
- Battery supplied applications
- Utilities
- Fire & Safety system
- Remote monitoring.

### Application domain

- Energy & Automation and Industrial.

**SENTINEL****Isolation characteristics**

|  |     |    |
|--|-----|----|
| Input/output communication interface isolation rms voltage | 3.7 | kV |
| <b>dCp</b> Creepage distance                               | 6   | mm |
| <b>dCl</b> Clearance distance                              | 6   | mm |

 Isolation class II, IEC 61010-1 CAT I 600 V DC  
Pollution degree PD 2

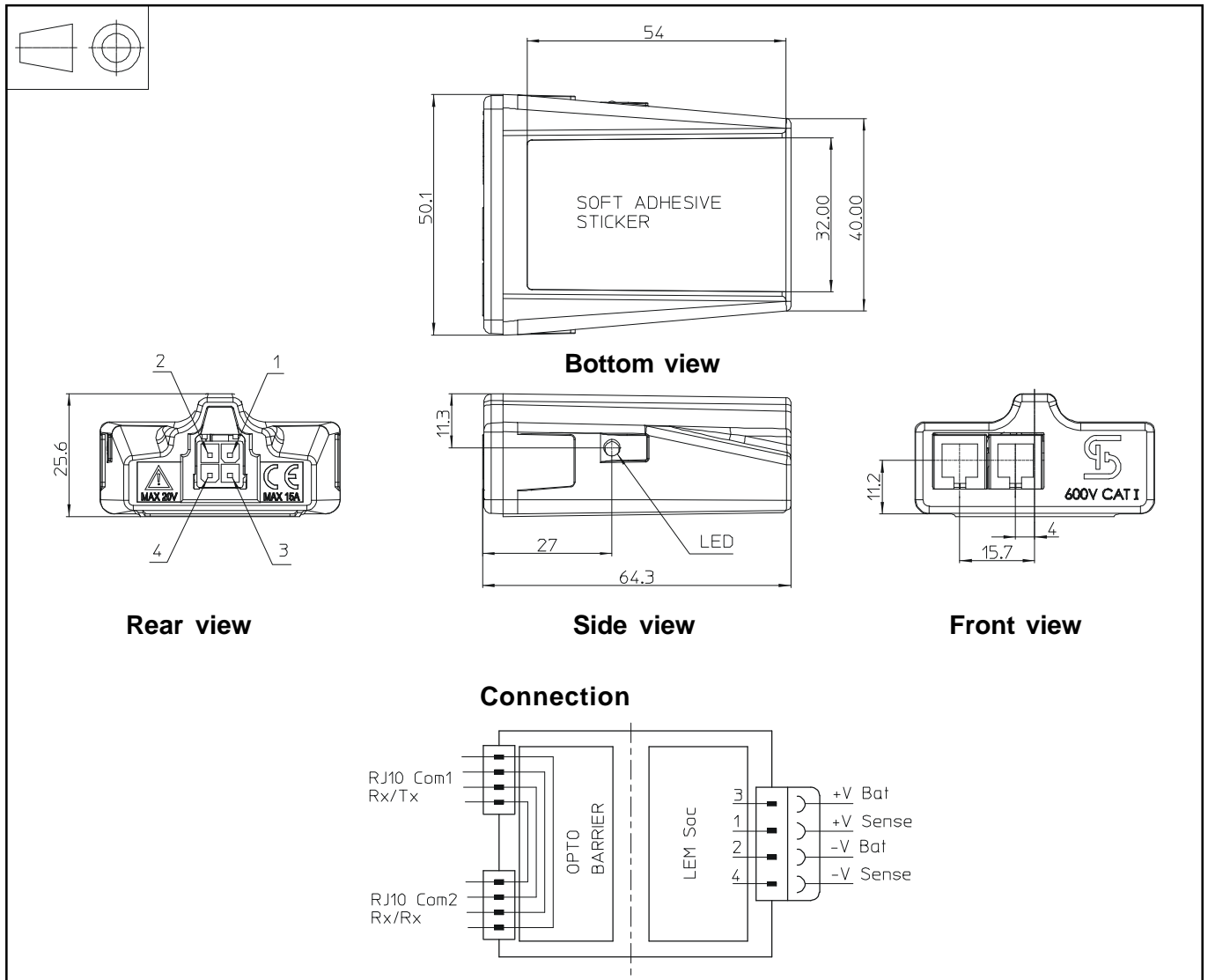
**Safety**

This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.



Caution, risk of electrical shock: do not remove any parts of the Sentinel.

## Dimensions SENTINEL (in mm. 1 mm = 0.0394 inch)



### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Module fastening  
The Sentinel module is designed to be affixed onto the battery side using a double side adhesive tape (included). Please refer to the user manual for optimum condition of installation.

### Accessories (not included) <sup>1)</sup>

- Communication leads (2 x RJ10 - 2 pairs)
  - Module to module (Daisy chain): 400 mm <sup>2)</sup>
  - Module to end point: 2 m, 5 m, 10 m, 15 m <sup>2)</sup>
- Power & Sense leads (1 x minifit - 4 x 4.8 Faston) 250 mm, 400 mm <sup>2)</sup>
- Battery terminal connection
  - Kelvin washers for M6, M8, M10 & M12 terminals
Please refer to the user manual for accessories installation and uses.

**Notes:** <sup>1)</sup> LEM will only guarantee the performance of the Sentinel Component with LEM approved Accessories.

<sup>2)</sup> Cable length may change without prior notice.