

## 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.



#### Electrical data

$V_C$	DC supply voltage	+ 0.9 .. + 16	V
$V_{PM}$	DC voltage measurement range	+ 0.9 .. + 16	V
$T_{PM}$	Temperature measurement range	- 10 .. + 70	°C
$Z_{PM}$	Impedance measurement range	0.05 .. 250	mΩ
		- 10 .. + 50	°C
$I_C$	Typical current consumption @ 2.3 V	55	mA
	@ 13.8 V	20	mA

#### Accuracy - Dynamic performance data

$X_G$	Overall voltage accuracy (@ 25°C)	± 0.5	%
	Temperature coefficient	0.015	%/°C
	Temperature measurement accuracy	± 2	°C
	Impedance measurement repeatability	± 2	%
	S-Bus Communication	9600	bps
$t_r$	Response time	Max	
	Voltage and temperature	20	ms
	Impedance <sup>1)</sup>	5	s

#### General data

$T_A$	Ambient operating temperature	- 10 .. + 70	°C
$T_S$	Ambient storage temperature	- 25 .. + 85	°C
	Altitude	up to 2000	m
	Max relative humidity without condensing	85	%
$m$	Mass	52	g
	Standards	EN 50178: 1997	
		IEC 61010-1: 2001	

#### Features

- Communication interface isolation 2.16 kV
- Compact design
- Temperature patch
- Fast, simple fittings
- Interface with OEM equipment
- LED status indicator
- DIN rail mounting.

#### 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 Domains

- Energy & Automation
- Industrial.

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

## SENTINEL

### Isolation characteristics

	Input/output isolation voltage rms	2.16	kV AC
		Min	
<b>dCp</b>	Creepage distance	6	mm
<b>dCl</b>	Clearance distance	2.9	mm



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

### Safety



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

Sentinel is intended to be used in measurement category I (CAT I) environment, under IEC 61010-1.

It must not be used in CAT II, III, or IV environments. Furthermore, the maximum operating voltage shall not exceed 600 V, and the maximum transient overvoltage shall not exceed 2.8 kV.

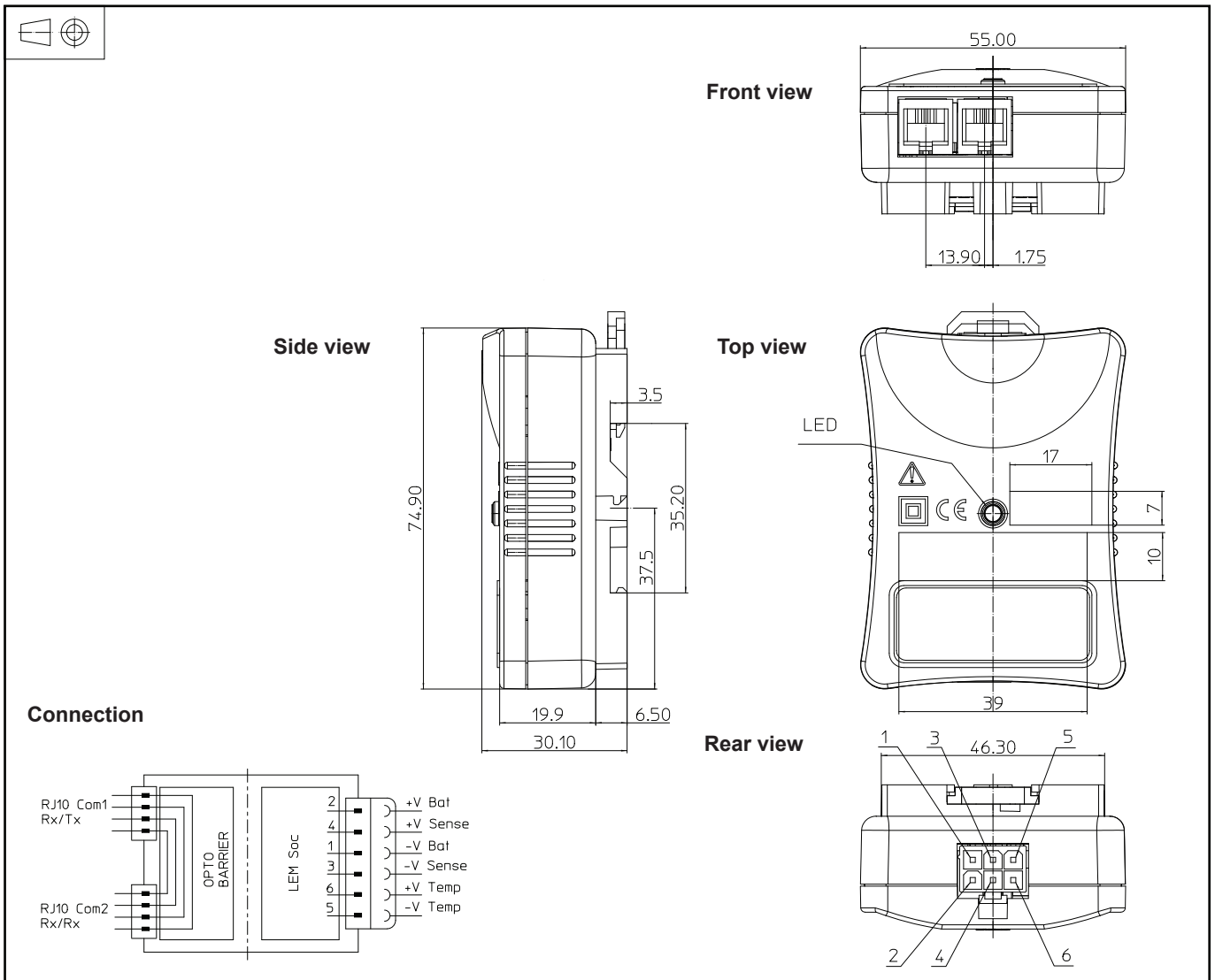
Maximum current used during communication pulse is 0.1 A @ 1.5 V.

In case of polarity inversion, Sentinel internal fuse will be blown and will not be able to operate anymore.



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

## Dimensions SENTINEL



### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Module fastening  
The Sentinel module is designed to be DIN rail mounted with the possibility of applying Sentinel directly onto the battery by using double sided tape.  
Please Refer to the user manual for optimum condition of installation.  
The double sided tape is not considered as a Sentinel component and therefore its performance is not guaranteed

### 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, temperature & Sense leads (1 x minifit - 4 x 4.8 mm Faston - temperature patch) 400 mm and 600 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.