



# Top-Sensors RD-1 Display



Specifications and dimensions are subject to change without notice and do not constitute any liability whatsoever.





## KEY TO SYMBOLS

Below are the symbols used in the manual to draw the reader's attention:



Caution! Risk of electric shock



Caution! This operation must be performed by skilled personnel



Read the following indications carefully



Further information

## WARRANTY

24 months from the delivery document date. The guarantee covers only defected parts and includes the replacement parts and labour. All shipping and packing costs are paid by the customer. It is possible to have the repair in guarantee on condition that the returned product has not been transformed, damaged or repaired without authorization. No guarantee is applicable on returned products without the original label and/or serial number. No guarantee against misuse.

Batteries: Top Sensors provides 1 year guarantee from the date of delivery note, against material defects or battery manufacturing faults.

### Disposal of Waste Equipment by Users in Private Households in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste.

Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment.

The separate collection and recycling of your waste equipment at the time of disposal will help preserve natural resources and protect human health and the environment.

For more information about where you can drop off your waste equipment for recycling, please contact your local waste disposal Authority or the equipment retailer.



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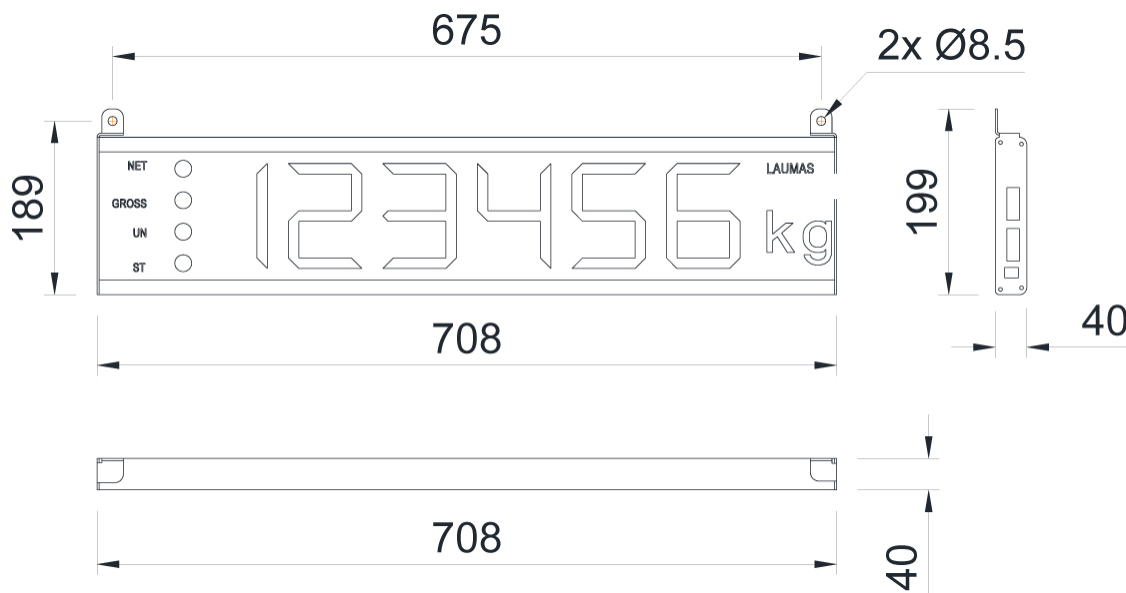
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## DIMENSIONS

All Dimensions in mm



## TECHNICAL SPECIFICATIONS

- Outer housing made of aluminium profile
- IP30 protection rating
- 6 digits, SMD LED display, 90 mm height
- 4 signalling LEDs
- 110° viewing angle from all directions
- Power supply 12 VDC, 1.5 A
- Working temperature from -10 °C to +50 °C
- Storage temperature from -10 °C to +60 °C
- Humidity: max 80%, non-condensing
- 9600 fixed baud rate, 1 start bit, 1 stop bit, no parity
- 15 available addresses
- RS232/RS485 serial ports
- PC programming via RS232 serial port (it is not necessary to open the box for configuration)

Signalling LEDs	
NET	Net Weight
GROSS	Gross Weight
UN	Weight not stable
ST	Weight stable

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## SERIAL INTERFACES MANAGEMENT

The display is equipped with an RS232 port and an RS485 port: both can be used for data reception.



Communication Port	Pin	Signal
RS-232	1	
	2	RS232: TXD
	3	RS232: RXD
	4	
	5	RS232: SHIELD, GND
	6	
	7	
	8	
	9	
RS-485	1	
	2	
	3	RS485: +
	4	
	5	RS485: SHIELD, GND
	6	
	7	
	8	RS485: -
	9	



## DISPLAY CONFIGURATION VIA PC

The RS232 port is used for the displays' configuration.

- Set the following communication parameters:  
**baud rate:** 9600; **start bit:** 1; **stop bit:** 1; **parity:** none.
- Disconnect any devices from the displays' RS485 port.
- Connect to the displays' RS232 port.
- Turn on the display, the following message is received:

```
Laumas Elettronica SRL.  
43022 Montechiarugolo
```

```
Version: 1.01L --- EEP: CRC OK  
--- Protocol : TLU  
--- Protocol address : N  
Enter command line interface with +++  
Type '*help' for command set
```

- Send the command [+++] to enter the configuration mode; the repeater display shows "MENU" and the following message is received:

```
+++  
Command mode entered.  
OK
```

- To set the displays' address, send the command [\*protocol X], where X can assume one of the following values: A, B, C, D, E, F, G, H, I, L, M, N, O, P, T; the following message is received:

```
TLU selected.  
Current protocol address is: L  
Changes will take effect after reset.  
OK
```

- Send the command [\*exit] to exit the configuration mode; the repeater display goes off and the following message is received:

```
Leaving command mode  
OK
```

- Turn off the display, wait a few seconds and switch it on again to apply the change.



## SERIAL COMMUNICATION PROTOCOL

Set the communication parameters as follows:

**baud rate:** 9600; **start bit:** 1; **stop bit:** 1; **parity:** none.

The format of the strings that can be sent to the RD-1 Display is as follows:

**&AxxxxxxByyyyyy\ckckCR**

- **&** = ASCII string start character (ASCII code 38)
- **A** = character corresponding to the address of the first part of the string: can have the values A, B, C, D, E, F, G, H, I, L, M, N, O, P, T
- **xxxxxx** = 6 ASCII characters to be shown on the display: can be numbers, letters or the minus "-" character, and can include the character "." representing the decimal point
- **B** = character corresponding to the address of the first part of the string: can have the values A, B, C, D, E, F, G, H, I, L, M, N, O, P, T
- **yyyyyy** = 6 ASCII characters to be shown on the display: can be numbers, letters or the minus "-" character, and can include the character "." representing the decimal point
- **\** = ASCII separation character used as string end (ASCII code 92)
- **ckck** = 2 ASCII control characters: corresponds to the two hexadecimal digits obtained by performing the character by character logical XOR operation on characters "AxxxxxxByyyyyy".

If there is an error in these characters, the string is ignored

*Example: if the byte by byte logical XOR operation carried out on the ASCII codes of the characters of the "AxxxxxxByyyyyy" string returns the hexadecimal value 0x2A, the control characters ckck are "2" and "A".*

- **CR** = ASCII string end character (ASCII code 13)

If a string containing two different messages is sent to a pair of appropriately configured remote displays, these will correctly display the two different messages.

1. *Example: &L-00123N-12345\03CR*  
*the remote display with address L displays "-123"*  
*the remote display with address N displays "-12345"*
2. *Example: &A00.023D1.2345\05CR*  
*the remote display with address A displays "0.023"*  
*the remote display with address D displays "1.2345"*


**NOTE:** a string can contain two equal address letters; in this case, the message in the second part of the string will be displayed.

*Example: &C000123C000546\...*  
*the remote display with address C displays "546"*





## DECLARATION OF CONFORMITY - EU

	<b>Top Sensors products are sold by:</b>	<b>Zemic Europe B.V</b> <b>Leerlooierstraat 8</b> <b>4871 EN Etten-Leur</b> <b>The Netherlands</b>	<b>Tel: +31 765039480</b> <b>Fax: +31 765039481</b> <b>info@top-sensors.com</b> <b>www.top-sensors.com</b>
	<b>A Zemic Europe brand ®</b>		

<b>GB</b>	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards.
<b>D</b>	Konformitäts-erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
<b>E</b>	Declaración de conformidad	Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las siguientes normas
<b>F</b>	Déclaration de conformité	Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
<b>I</b>	Dichiarazione di conformità	Dichiariamo che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.
<b>NL</b>	Conformiteit-verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt.
<b>CZ</b>	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami.
<b>P</b>	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes.
<b>PL</b>	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami.
<b>RUS</b>	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам.

Model: RD-1


Mark Applied	EU Directive	Standards
	<b>2014/30/EU</b> <b>EMC Directive</b>	<b>EN 55011:2016+A1+A11:2020</b> <b>EN 61000-6-2:2019</b> <b>EN 61000-6-4:2019</b>








## DECLARATION OF CONFORMITY - UKCA

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Mark Applied	EU Directive	Standards
	<b>Electromagnetic Compatibility Regulations 2016</b>	BS EN 55011:2016+A1+A11:2020 BS EN 61000-6-2:2019 BS EN 61000-6-4:2019