

## SPEEDOMETER SMR6000



**GELEC**

**INDUSTRIAL ELECTRONICS**



## CONTENTS

1. PRECAUTIONS!.....	4
2. MANUFACTURER'S WARRANTY, GENERAL TERMS AND CONDITIONS.....	5
3. DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT.....	6
4. DIGITAL SPEEDOMETER SMR6000.....	6
5. GENERAL DESCRIPTION .....	7
6. SMR6000 OVERVIEW .....	8
7. MAIN FEATURES .....	9
8. USER MENU.....	10
9. ELECTRICAL SECTION .....	13
10. DIMENSIONS.....	14
11. TECHNICAL SPECIFICATIONS .....	15

## I. PRECAUTIONS!

There are no serviceable parts inside the **SMR6000** unit. Not to be opened by any unauthorized person. All repairs to the device must be carried out by the manufacturer or a qualified service engineer.

**Improper handling may result in serious personal injury and considerable material damage.** All connection and maintenance work must be carried out by qualified personnel.



### **RISK OF ELECTRIC SHOCK!**

**Use the correct voltage.** The SMR6000 is designed for use with specific voltage only. Connection to a different voltage may cause fire, electric shock or other damage.

**Do not touch the plug and the connectors with wet hands.**

**Disconnect the SMR6000 before cleaning it,** to avoid the risk of electric shock.

**Attempting to use a malfunctioning SMR6000 can be dangerous.**

**Do not block the ventilation slots on the cabinet of the SMR6000.**

**Keep liquids away from the SMR6000.**

Spillage into the cabinet may result to fire, electric shock, or equipment damage. If a small object or liquid falls/spills into the SMR6000 cabinet, unplug the unit immediately. Have the unit checked by a qualified service engineer before using it again.

**Set the SMR6000 in an appropriate location.**

Do not install in a dusty, humid, or vibrating environment. Do not place it near heater, or air conditioner. Keep it away from air, steam, extremely high or low temperature or humidity.

**Place the SMR6000 in an appropriate location.** Do not install in a dusty, humid or vibrating environment. Do not place it near heater, or air conditioner. Away from air steam, extremely high or low temperature and humidity.

***Always follow the instructions given by the manufacturer and use the SMR6000 in accordance to its specifications.***

## 2. MANUFACTURER'S WARRANTY, GENERAL TERMS AND CONDITIONS

Thank you for purchasing our product.

Our products have been manufactured with the latest technology, the highest quality components and have gone through rigorous quality control tests at the factory, before shipment. Make sure that the part number and type indicated in the identification label and pack correspond to the part number or type of your order. After receiving, inspect the unit to ensure that no damage have been caused during transportation.

GELEC and GELEC's authorized distributors warrant to the original purchaser that the product shall be free from defect in material and/or workmanship. The warranty period begins on the purchase date (proof of purchase by invoice or delivery note) and is valid for one (1) year.

In the event of malfunction during the warranty period attributable directly to faulty material and/or faulty construction and functional defects, GELEC and authorized distributors will, at their option, either repair or replace the faulty product with the same or similar model.

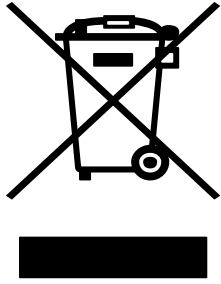
GELEC and authorized distributors shall have no obligation under this warranty, however, in the following cases:

- ▶ Any defect caused by freight damage, accident, disaster, faulty maintenance or improper handling.
- ▶ Any defect caused by modification, alteration, abuse, misuse or incorrect installation.
- ▶ Any defect of the product caused by improper repair by third party other than GELEC and GELEC's authorized distributors.
- ▶ Any incompatibility of the products with subsequent technical innovations or regulations.
- ▶ Any defect of the product caused by external equipment.
- ▶ Any defect of the product on which the original manufacturer's labeling has been altered or removed.

In case of complaint please contact our company or send the unit un-dismantled to your local dealer. Any necessary replacement parts and necessary repair work are totally covered free of charge.

All products are designed and produced by the manufacturer GELEC Co. Ltd to be in compliance with the EU norms applying to them. GELEC is not responsible for direct or indirect damages or malfunction caused by improper use or installation of the SMR6000.

### 3. DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT



This symbol, found on your product, indicates that this should not be treated as household waste when you wish to dispose it.

**It should be handed over to an applicable collection point for the recycling of electrical and electronic equipment.**

By ensuring this product is disposed of correctly, you will prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product.

The recycling of materials will help to preserve natural resources.

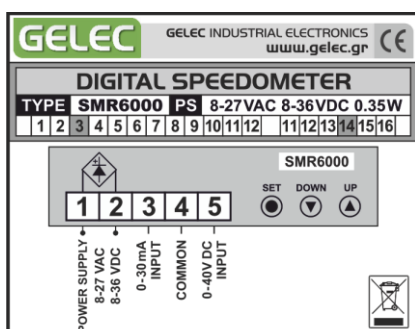
### 4. DIGITAL SPEEDOMETER **SMR6000**

This operator's manual explains the functions and operation of the **SMR6000**. It also gives some troubleshooting tips as well as general precautions to be taken when operating the unit. In order to ensure the best performance and effective use of the SMR6000, we recommend that you read the information in this manual carefully and follow the instructions contained.

This manual is a complete guide to the SMR6000 with information on unit user maintenance, unit installation and instructions on how to operate it. Do not touch any part of the SMR6000 the manual does not cover. Keep the manual for immediate reference. It should help in solving any operational questions you may have.

No part of this manual may be quoted, reproduced, stored in a retrieval system, transmitted, transcribed or translated into any other language in any form or by any means, electronic, mechanical, or otherwise, without prior written permission of **“Gelec Co. LP”**.

Although every effort has been made to ensure that this manual provides up to date information, please note that the contents in this manual and the unit specifications are subject to change without notice.



Do not forget to refer the exact type and version of your SMR6000 whenever you contact the manufacturer, asking for any further information. You can find this information down on the identification label on the side of the unit.

## 5. GENERAL DESCRIPTION

The SMR6000 is a user calibrated multi-meter device with a programmable indication value, based either in Volt or mA input, for industrial use. The philosophy behind its operation is that it can calculate and display any physical quantity like speed, pressure, temperature etc. that is directly proportional to an electric signal (mA or Volt) connected at the input of the device. Any common transducer which has an output signal within the SMR6000 measurement ranges (0-40V or 0-30mA), can be connected as input.



It is commonly used in dyeing applications, where a Volt or mA electric signal from the fabric reel motor driver has to be converted in standards of speed (e.g. meters/min). However, the device can actually convert and indicate any value within its display range, based on a linear value range of Volt or mA input.

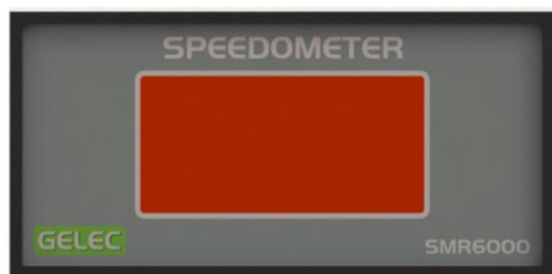
Having a panel mounting enclosure, bright red LED display and connection terminal block at the rear of the device, it can be easily installed at the front panel of an electrical control system. The device calibration can be done with the buttons located at the back side of the device.

### FEATURES

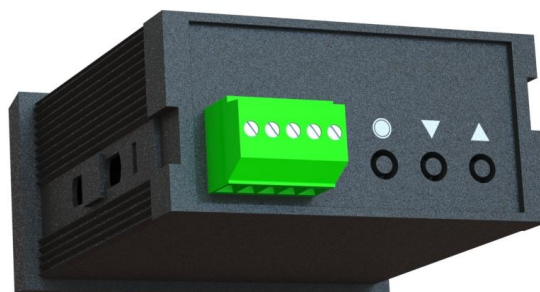
- ▶ Wide power supply range 8-36VDC / 8-27VAC
- ▶ Voltage measurement range 0 - 40V
- ▶ Current measurement range 0 - 30mA
- ▶ 3-digit bright red LED display (4 digits available upon request)
- ▶ DIN 43700 enclosure, IP64 waterproof front panel
- ▶ 000-999 / 0000-9999 display range depending on version
- ▶ Indication of positive/negative values (upon request)
- ▶ Selectable number of decimals
- ▶ Auto-gain function
- ▶ Easy installation

## 6. SMR6000 OVERVIEW

**SMR6000** is a complete unit with a bright red LED display and connection terminal block at the rear of the device. It is suitable for electrical control panels, having a self-extinguishing PPO, panel mounting enclosure acc. to DIN 43700, with plastic fastening elements on each side and IP64 degree of protection.



**Front view**



**Rear view**

### DISPLAY

High brightness and contrast, red color 3-digit display, with 7-segment LED digits (10mm). A 4-digit display is also available upon request.

### CONNECTION TERMINAL BLOCK

Used for the connection of the device's power supply and the input signal. Please check the connection diagram shown in the *ELECTRICAL SECTION* of this manual.

### PUSH BUTTONS

Used for menu navigation and calibration of the device, according to the instructions in the *USER MENU* section.

### SMR6000 VERSIONS

**SMR6000**.....3-DIGIT DISPLAY, POSITIVE VALUES INDICATION (STANDARD VERSION)  
**SMR6000-N**.....3-DIGIT DISPLAY, POSITIVE/NEGATIVE VALUES INDICATION  
**SMR6000-4**.....4-DIGIT DISPLAY, POSITIVE VALUES INDICATION  
**SMR6000-4N**.....4-DIGIT DISPLAY, POSITIVE/NEGATIVE VALUES INDICATION



## 7. MAIN FEATURES

### CALIBRATION

Calibration process made by the user is mainly needed to set the highest and the lowest indication values for the corresponding measured values of the input. Calibration process also includes number of displayed decimals and password specification if needed. Advise the relative section about the calibration process.

### ERROR DETECTION

Several conditions may result in Error situation during the calibration process, or a working cycle of SMR6000. Below are the possible error codes.



No signal detected in both inputs during the calibration process.



Input value detected is higher than the selected *HLC* parameter.



Input value detected is lower than the selected *LLC* parameter.

### PASSWORD

Specifying a password protects the device from parameter modification by unauthorized personnel. After having a password specified, you will have to enter it whenever it is required. Otherwise, you will be able to enter and read the values, but you will not be able to change them.

If you forget your password contact us to give you instructions on how to reset the device.

## 8. USER MENU

Through the **USER MENU** you can see and modify all the device parameters in order to adjust the SMR6000 to your application needs.

This menu should be used from the installer of the device or from any authorized personnel who is familiar with the device functions and the general operation of the application which is installed.

### CALIBRATION PROCESS

#### GENERAL INSTRUCTIONS

To enter **USER MENU** press and hold the **SET (●)** button.

You can navigate through the parameters with the **UP (▲)**, **DOWN (▼)** buttons and enter them with the **SET (●)** button. Parameter modification is explained below.

To exit **USER MENU** press and hold the **SET (●)** button.

#### PARAMETERS

##### 1. (PSU) - USER PASSWORD

In this parameter you should enter the password, which is required for modifying any parameter of the device.

If the password is not correct, you can navigate through the parameters and their values, but any modification is not allowed.

If the user password **(PSU)** appears in the menu:

- Select the password with **UP (▲)** & **DOWN (▼)** buttons.
- Press **SET (●)**. The value is registered and the menu leads us to parameter **(dP)**.

If the user password **(PSU)** doesn't appear in the menu, the menu starts with the parameter **(dP)**.

The way to set a new password, or even cancel it, are described below (parameter **CdU**).

In case of password loss, in order to do any modification the *parameter reset procedure* is required.

**2. (dP) - DECIMAL POINTS**

In this parameter you select the number of decimal digits, which will appear on the display.

- 0** → integer
- 1** → 1 decimal digit
- 2** → 2 decimal digits
- 3** → 3 decimal digits (4-digit device)

- Use the **UP (▲)** & **DOWN (▼)** buttons to select the desirable value.
- Press **SET (●)**. The value is registered and the menu leads us to parameter **(HLI)**.

**3. (HLI) - HIGH LEVEL INDICATION**

In this parameter you select the highest indication of the device, when it measures the highest value of the application.

**Selection range for devices with positive values.**

**000 - 999** with 3 digits, **0000 - 9999** with 4 digits, (HLI > LLI)

**Selection range for devices with positive and negative values.**

**-98 - 999** with 3 digits, **-998 - 9999** with 4 digits, (HLI > LLI).

Follow the below procedure.

- Apply the application's highest measured value, at the device's proper analog input.
- Use the **UP (▲)** & **DOWN (▼)** buttons to select the desirable indication value.
- Press **SET (●)**. The value is registered and the menu leads us to parameter **(LLI)**.

**4. (LLI) - LOW LEVEL INDICATION**

In this parameter you select the lowest indication of the device, when it measures the lowest value of the application.

**Selection range for devices with positive values.**

**000 - 999** with 3 digits, **0000 - 9999** with 4 digits, (LLI < HLI)

**Selection range for devices with positive and negative values.**

**-98 - 999** with 3 digits, **-998 - 9999** with 4 digits, (LLI < HLI).

Follow the below procedure.

- Apply the application's lowest measured value, at the device's proper analog input.
- Use the **UP (▲)** & **DOWN (▼)** buttons to select the desirable indication value.
- Press **SET (●)**. The value is registered and the menu leads us to parameter **(CdU)**.

At this point, the program does the linearization between the highest and the lowest measured value and their reduction to the selected indication values **(HLI, LLI)**.

## 5. **(CdU)** - USER CODE

In this parameter you create the user password, which is required for any other parameter modification in *USER MENU*.

If you set **(0000)** in this parameter, the user password **(PSU)** will not be required when entering *USER MENU*, giving the user free access for any modification.

If you set any other value, then this value will be the new password and should be entered when the user password parameter **(PSU)** appears.

### Selection range

**000 - 999** (with 3 digits)  
**0000 - 9999** (with 4 digits)

Follow the below procedure.

- Use the **UP (▲)** & **DOWN (▼)** buttons to select the desirable value.
- Press **SET (●)** to register the value.

At this point, the calibration process ends and the menu leads you to the first parameter **(dP)**.

## NOTES

If you press and hold **SET (●)** while you are inside a value selection, then that value will be registered and you will exit *USER MENU*. Just after exiting, if you keep holding the **SET (●)** button, the device display will flash the measured value (0-9999).

When modifying parameters **(HLI)** and **(LLI)**, this has to be done for both of them and with the order described above.

## 9. ELECTRICAL SECTION

The SMR6000 has a wide power supply range. Supply with either **8-27VAC** or **8-36VDC** regulated, unregulated or stabilized.

Its maximum power consumption is approx. **0.35W** in total operation, when all display segments are on. The connection polarity (+/-) is not crucial, as there is an internal bridge rectifier.

The SMR6000 is designed for use with specific voltage only. Connection to a different voltage may cause fire, electric shock or other damage. There is not an electrical safety fuse in the internal power circuit.

### - CONNECTION TERMINALS -

The unit is equipped with a 3,5mm pitch, plug-in connector. Insert and screw only one wire in each terminal in order to be in compliance with VDE norms. Take care to apply the recommended tightening torque.

The wire range should be 28-16AWG (UL) or 0.5-1.5mm<sup>2</sup> (IEC).

#### **Terminals #1 - #2**

Connect the power supply to the terminals #1 and #2. Specific polarity (+/-) is not crucial.

#### **Terminals #3 - #4 - #5**

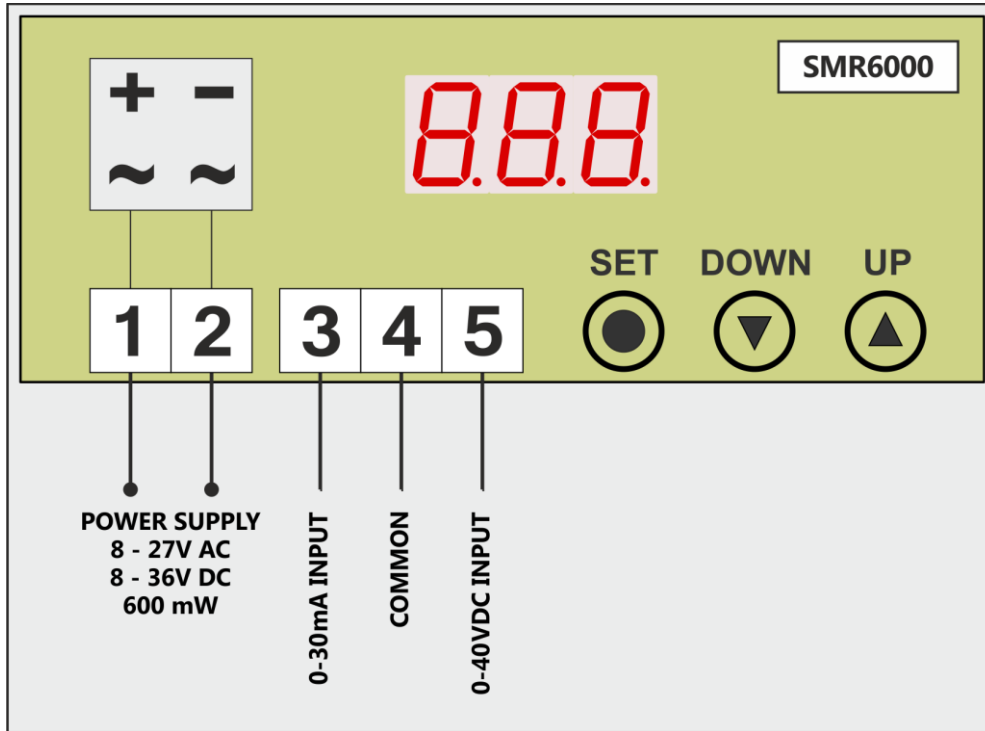
Depending on your sensor/transducer output type (V or mA), select the appropriate terminals to connect it as input to the SMR6000.

Use terminals **#3/#4** for mA input, or **#4/#5** for Volt input.

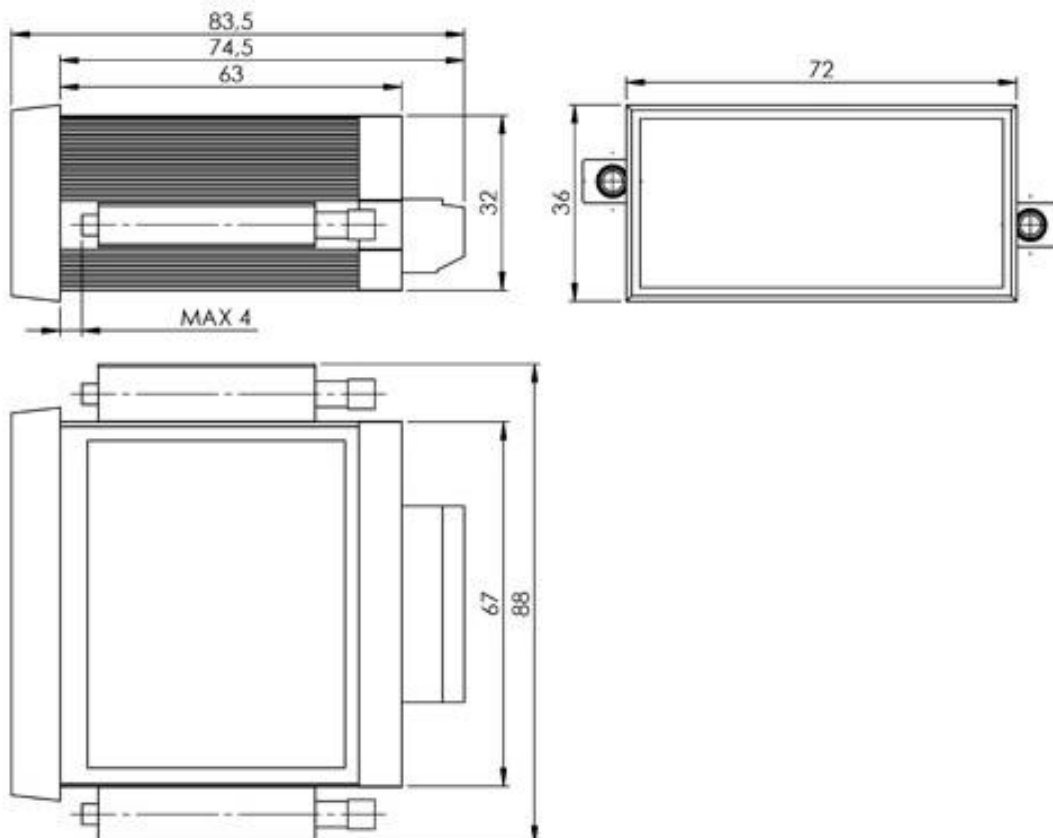
**Wrong connection (e.g. applying Volt at the device's mA input), or an applied value out of input range, will cause internal damage to the device!**

**!! Always cut the power off before connecting or disconnecting the unit. !!**

## Connection diagram for SMR6000



## 10. DIMENSIONS



## II. TECHNICAL SPECIFICATIONS

<b>GENERAL DATA</b>	
Unit absolute dimensions L x W x H (mm)	72 x 72 x 36
Housing area dimensions L x W x H (mm)	83,5 x 88 x 36
Weight	86 gr.
Enclosure	Self-extinguishing PPO black, DIN43700
Mounting	Panel mounting
Degree of protection	IP64 front panel
<b>Features</b>	
Input type	V / mA
Input voltage range	0 - 40 VDC
Input amperage range	0 - 30 mA
Indication range	0 - 999 (0 - 9999 for 4-digit display)
Decimal points	2 max (3 max for 4-digit display)
Display	3-digit 10mm bright red 7-segment led
Keypad	3 push buttons (SET-DOWN-UP)
Protective functions	Password protected parameters modification Calibration error detection
<b>Unit operating conditions</b>	
Ambient temperature under bias	-20°C ... 70°C
Storage temperature	-20°C ... 70°C
<b>ELECTRICAL DATA</b>	
Operating voltage (AC values at 50/60 Hz)	8-36 VDC / 8-27 VAC
Power consumption	0.35 W max
<b>Connector characteristics</b>	
Pitch	3.5 mm
Wire range	28-16AWG (UL) , 0.5-1.5mm <sup>2</sup> (IEC)
Tightening torque	0.2 Nm (1.7Lb-In.)
<b>STANDARDS</b>	
In conformance with the following standards:	CE

*Specifications are subject to change without prior notice.*



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