



**CANBUS  
LINE**



**INSTALLATION  
INSTRUCTIONS**

## **Direct Digital™ CAN BUS Tachometer**

SAN GIORGIO S.E.I.N.- ITALY

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SAN GIORGIO S.E.I.N - ITALY

## 1. GENERAL DESCRIPTION

Thanks to more than 10 years of experience in the CANBUS® development and acclaimed “Direct Digital” microprocessor technology SAN GIORGIO S.E.I.N. presents as worldwide preview a new and most advanced line of instruments compatible with this powerful protocol.

Different from other competitors these new instruments, available in the 52mm standard size, can be directly connected to the CANBUS® without the need for a master unit or a converter. With only two wires + power supply it is possible to bring engine and on board systems information everywhere on board. Each instrument is equipped with an analogue input that can be used as an alternative reading of the standard sensor thus allowing to handle both digital conventional applications with one single line of products.

Thanks to the acclaimed “Direct Digital” technology that combines a powerful microprocessor with a sophisticated electronic pointer control engine, these instruments grant the accuracy and resolution of a digital system and the easy and immediate readout of an analogue gauge.

Another worldwide preview is the new LED backlight system that can change the brightness using digital CANBUS® commands, allowing a simultaneous calibration of all gauges without additional wirings : if necessary it is possible to adjust the brightness also using a traditional dimmer input.

**Power supply input :** 10-30V dc

**Power supply operating current :** <100mA

**Input :** SAE J 1939 (other protocols on demand ) , W Alternator or Pick Up

**Dial :** White number on black dial or black number on white dial

**Accuracy deviation :** < ±0.5 %

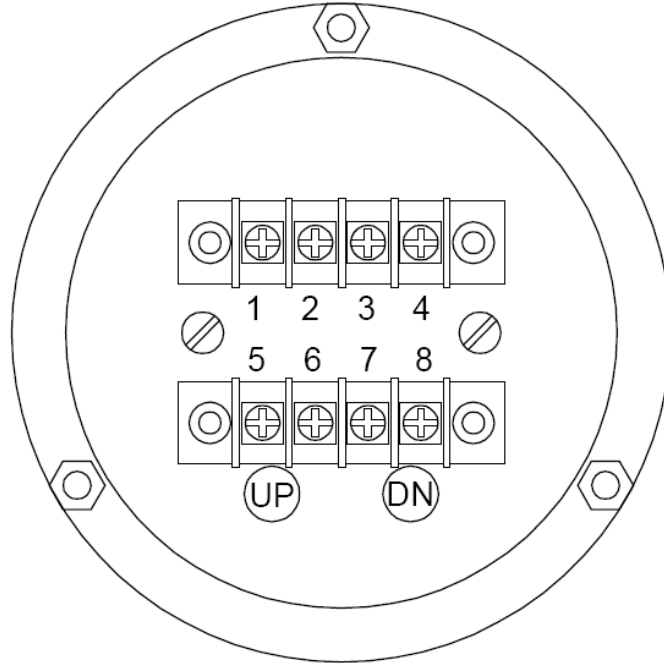
**Connectors:** terminal block 8 pins

**Operating temperature :** -25°C to + 70°C

**Environmental Sealed Enclosure :** IP 66

## 2. INSTALLATION

The CAN BUS tachometer rear panel is equipped with a eight pins terminal block and the here below pin out explain how to connect it :



Ingresso / Input	1	2	3	4	5	6	7	8
CAN_BUS	+ Batteria + Battery	- Batteria - Battery	Ingresso Frq. Frq. Input	+ Batteria + Battery	Ingresso A/D A/D Input	CAN_H CAN_H	CAN_L CAN_L	Uscita Frq. Frq. Output

The **power supply** can be 12V and 24V installation : it is recommend to protect power supply from short circuit using a fast fuse or breaker (also in common with other instruments of a panel).

The instrument uses high brightness led technology for life lasting light without lamp replacement. Please note that the **LIGHT connection** can accept linear voltage dimmer from 0 to 15V (12V) and from 17 to 28V (24V) allowing a gradual dimmering light effect. When the voltage exceeds 16V approximately the tachometer automatically switch light into 24V mode.

### 3. BASIC CALIBRATION

#### 3.1. CAN BUS INPUT

The **tachometer input** is designed to work directly with a standard CAN BUS signal SAEJ 1939 or with other CAN BUS protocols on customer demand .The CAN BUS input makes the calibration not necessary because it receive directly the exact data from the engine's ECU and the CAN BUS protocol is uploaded during the production of the instrument .

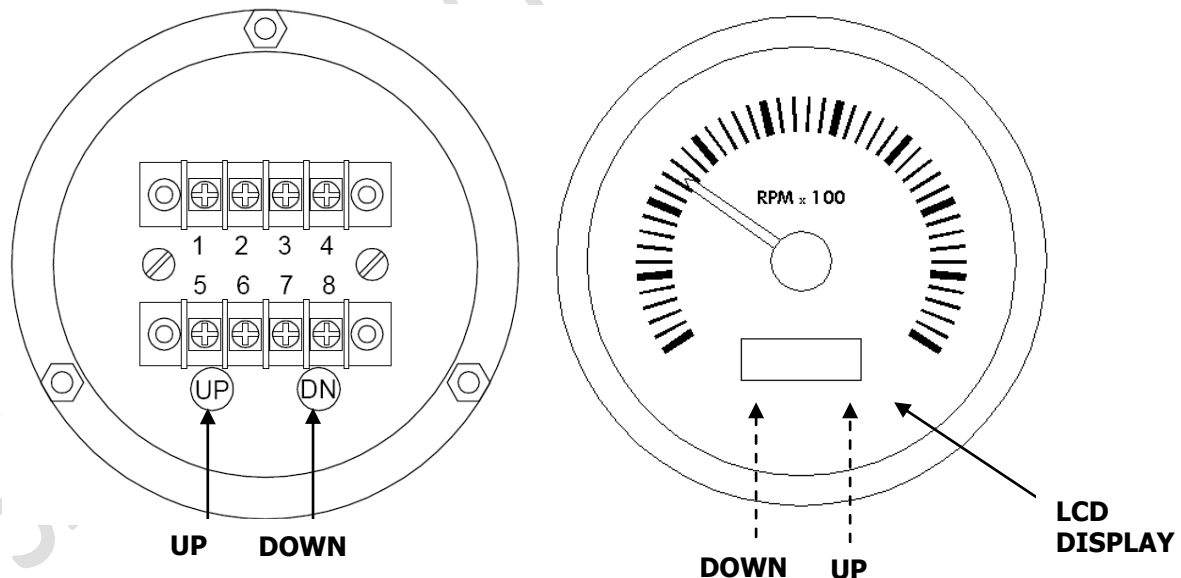
#### 3.2. ANALOGUE INPUT

Thanks to its powerful microprocessor , the tachometer is able to work also with 12V and 24V alternator W output signal or pickup signal with at least 10Vpp signal and frequency not exceeding 5 KHz (special execution on request). The tachometer has two dedicated pin (N°3) that can be connected to the W alternator or Pick Up .

If the tachometer is used in **ANALOGUE mode** it must be calibrated to allow an accurate indication of engine rpm because it is not possible to know in advance which type of W or pulse (Pick Up) is present in the engine .

##### 3.2.1. Calibration procedure

The basic calibration requires to read the actual engine rpm from a known source (a portable calibration tachometer for example) while the engine is running and calibrate the tachometer using two very small screwdriver to access two pushbuttons located in the rear panel as follows :



Holding the instrument with the front face in front of You the **UP** button is on the right side and viceversa. To calibrate the tachometer please run the engine close to its maximum rpm and adjust indication inserting a small screwdriver and pressing / hold the up (increase) or down (decrease) pushbuttons as necessary.

#### **NOTE**

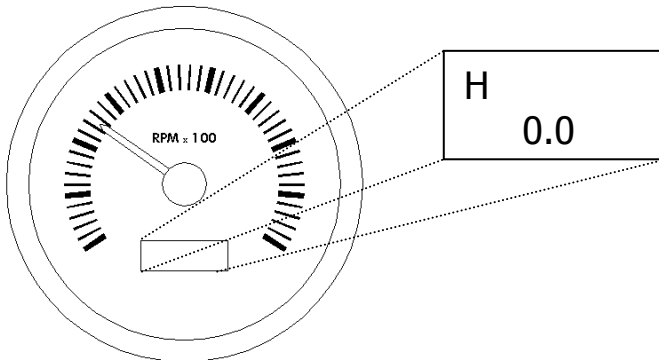
It is recommended to calibrate at high rpm values to minimize error in the entire range.

## 4. OPERATION

### 4.1 INDICATION AND DISPLAY

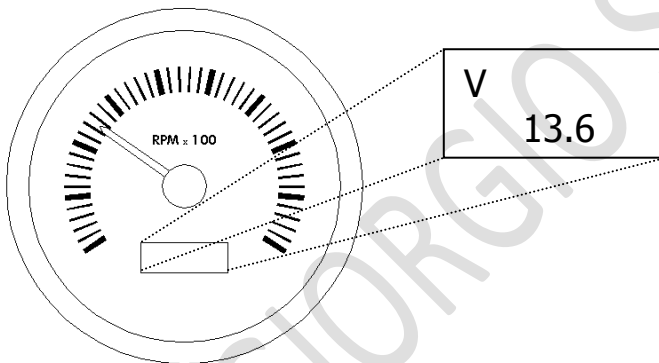
After power on the display shows a self test (888888) for 1 second, while the pointer moves to zero. After approximately 1 second the LCD display shows the following information

#### 4.1.1 Engine Hourcounter



#### 4.1.2 Power supply voltage

If enabled the tachometer can also show the value of power supply voltage as follows :



If voltage monitor is enabled the LCD display toggles between the two indications showing voltage for 8 seconds and hourcounter for 2 seconds continuously.

### 4.2 RETURN TO ZERO

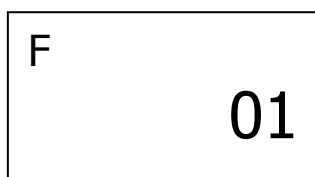
The tachometer is designed to return to zero indication when power supply is switched off but only when engine is running below 1000rpm and the tachometer has been switched on for at least 1 minute.

The indication only goes to zero for aesthetic purpose and if it fails (for instance because engine was running above 1000rpm) the correct indication is always granted when power is switched on again

## 5. ADVANCED SETUP

### 5.1 Advanced setup menu

The tachometer offers an advanced setup that is described in the following section. The features of this menu are not necessary for a standard operation, furthermore not all options may have been included in every release : please consult Your dealer for more details. To enter the advanced setup menu please switch the tachometer supply off, press and keep pressed the "DOWN" key, switch power on and release the DOWN key only when the "SETUP" indication appears in the LCD. In this menu setup mode please use the "DOWN" key to switch between setup parameters and the "UP" key to change the value of each parameter. Please see the flowchart below for details. To exit the main setup menu please switch the tachometer supply off.



Press "DOWN" to advance to next



#### **Filter selection.**

Press "R" to change software filtering.  
01= Min, 03 = Max. High Filtering (3) increase noise rejection but slow down tachometer response.

#### **Return to Zero procedure.**

This parameter affects how tachometer returns to zero when it is switched off. 00= Never, 01 (Default) = When rpm is below 1000, 02 = Always.

## 5.2 Custom features

S  
250.0

### **Service reset.**

Press "UP" to reset the actual service counter. Press "UP" again to preset a different service interval among one of the following:

100.0 / 200.0 / 250.0 / 300.0 / 500.0 hours

Press "DOWN" to advance to next

H  
0.0

### **Hourcounter set/reset (\*)**

Press "UP" to reset to zero the hourcounter.

It is not possible to preset to a value greater than zero.

Press "DOWN" to advance to next

E  
01

### **Engine (factory calibration) type select.**

Press "UP" to select one of the following preset factory calibration :

01 , 02 , 03 , 04 , 05 (\*)

Press "DOWN" to advance to next

R  
4000

### **Tachometer Range selection**

Press "UP" to select the range of the tachometer (this option is for factory preset only):

3000 , 4000 , 5000 rpm

(\*) This feature is visible only after an activation that is done with an hidden key sequence.

## 6. TYPICAL QUICK INSTALLATION DIAGRAM

