

Figure 1: Suspension potentiometer (side view)

Introduction

Aim instruments can measure the relative displacement between two different points using a sensor (potentiometer) directly connected to the two measure points.

This sensor may be used to measure linear displacements, such as:

- Suspension spring cushion compression or extension.
- Steering column rotation measured by rack displacement.

Installation notes

This sensor has been designed to measure linear displacements between a fixed point, called “reference point”, and a movable one.

In order to get correct and accurate information from the sensor, the potentiometer has to be fixed using the two ball joints placed on the end points of the instrument.

When installing the sensor, Aim recommends to be very careful to avoid possible bending of the internal cylinder: these bending, caused by over tightened nuts or an incorrect mounting, may seriously damage the sensor.

Aim also recommends, while installing the sensor, to extract the internal cylinder from the external one for about 5 mm (0.2 inches) starting from the sensor’s lower boundary position.

The biggest instrument measure range goes up to 150 mm (5.91 inches). If you need to measure bigger displacements, please use a different sensor: an incorrect use may seriously damage the potentiometer.

Please, do not exceed the instrument’s maximum measure range.

Software

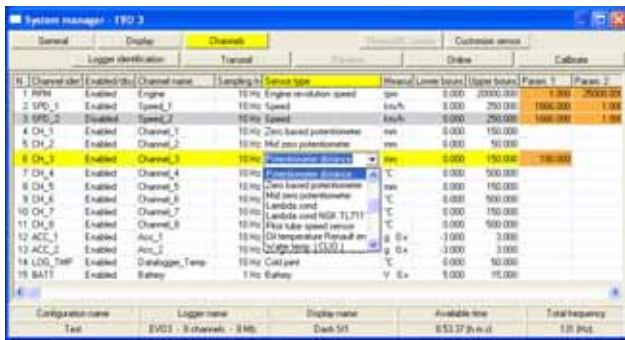
Once the potentiometer has been installed, it needs to be configured. To correctly configure the potentiometer, please use **Race Studio 2**, the software properly developed by Aim to configure its instruments and analyze stored data.

Race Studio 2

In **Race Studio 2** main window you can choose instrument where you wish to install the linear potentiometer (EVO 3, Drack, MyChron 3 Gold CAR, MyChron 3 Gold XG...). Once selected the gauge, please press “*System manager*” button.

Sensor configuration

In “*System manager*” main window, please press “*Channels*” button to set the sensors you have installed on your vehicle. The following screenshot appears.

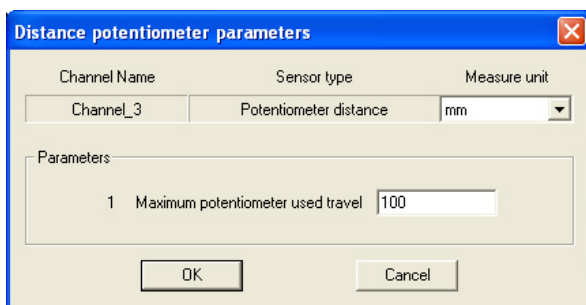


To set a sensor, please double-click in the box corresponding to “Sensor type” column and to “Ch_x” row (where x represents the channel number): a pop up menu like the one reported above appears.

You can choose between 3 different kind of potentiometers:

- Zero based potentiometer
- Mid zero potentiometer
- Distance potentiometer (recommended)

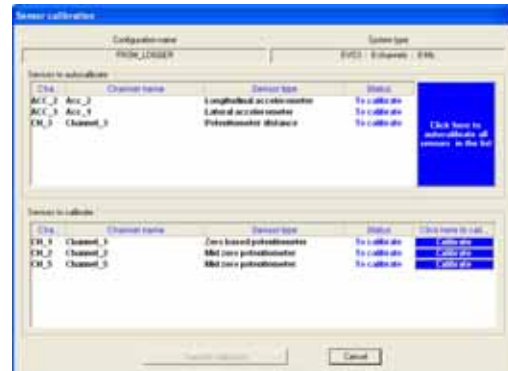
If you select a “Distance potentiometer” (recommended), a new screenshot where you are asked to insert the “Maximum potentiometer used travel”.



Once you have set the correct potentiometer type, please transmit the configuration to your gauge pressing “Transmit” button.

Calibration

Once the configuration correctly transmitted to your gauge, the potentiometer needs to be calibrated. In this datasheet is described how to calibrate the **Distance potentiometer** (recommended for suspension displacement acquisition). Please click on “*Calibrate*” button: this screenshot appears



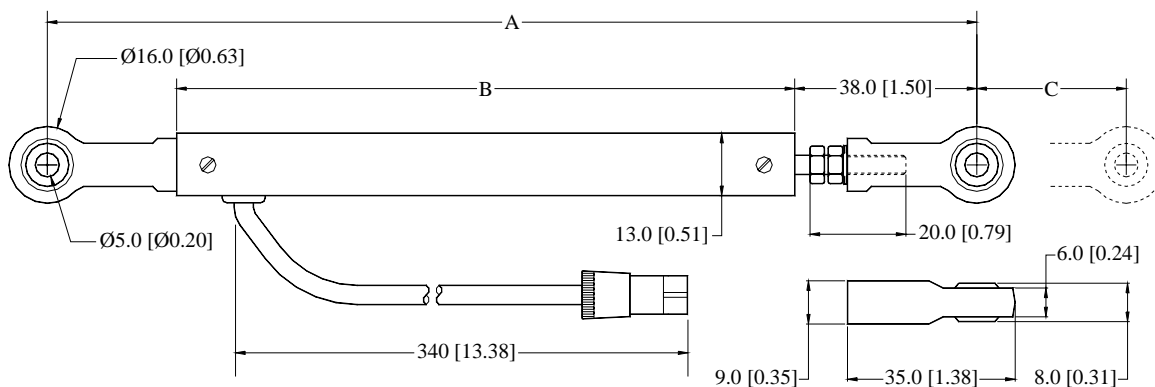
Press button “Click here to auto-calibrate all sensors in the list”: “Potentiometer distance” and internal accelerometers will automatically be auto-calibrated.

Once auto-calibration procedure has finished, press “Transmit calibration” button.



Please note: it is absolutely necessary to transmit the calibration, otherwise the logger will not be able to acquire correct data.

Dimensions



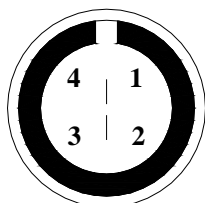
Dimensions in millimeters [inches]

Dimensions table

Stroke Length (C)	A	B
50 mm (1.97")	193 mm (7.6")	129 mm (5.09")
75 mm (2.95")	218 mm (8.58")	154 mm (6.06")
100 mm (3.93")	243 mm (9.57")	179 mm (7.05")
150 mm (5.91")	293 mm (11.54")	229 mm (9.02")

Connector pinout

Pin	Function	Pin	Function
1	Analog signal 0-5V	3	Not connected
2	GND	4	V reference (4.5 V)



4 pins Binder 719 male connector: solder termination view

Technical characteristics

Electrical characteristics	Value
Nominal Resistance	1 k Ω / 25 mm stroke
Operating mode	Voltage divider

Mechanical characteristics	Value
Operating temperature range	From -50°C to +85°C
Maximum shaft velocity	1000 mm/s
Operating force	2.45 N horizontal
Measure range	Up to 150 mm
Cable length	300 mm