AiM Infotech

Car speed sensor

Release 1.03

1 Introduction

This datasheet explains how to use AiM car speed sensor, a non contact device that needs a metallic trigger to pass in front of it.

This sensor **part number** is: **X05SNVS00**.

It fits the wheel speed measurement and needs an accurate installation. This is why we suggest you to address to a specialized workshop. Once the sensor installed it needs to be configured using AiM Race Studio software freely downloadable from download area –> software of www.aim-sportline.com.

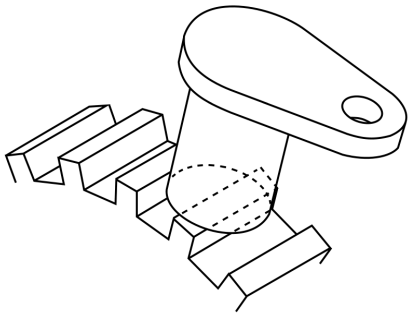
2 Installation

Install the sensor using a bracket and:

- ensure that distance between sensor and gear tooth is in a 0.5 – 2.0 mm (0.007-0.07 inches) range
- fix the sensor to the bracket
- connect the sensor to AiM device

The sensor measure range is 0.5–2 mm (0.1-0.07 inches). Optimum sensor performance depends on the following variables to be considered in combination: trigger building material, geometry, speed, metallic trigger /sensor distance and magnetic material in close proximity.

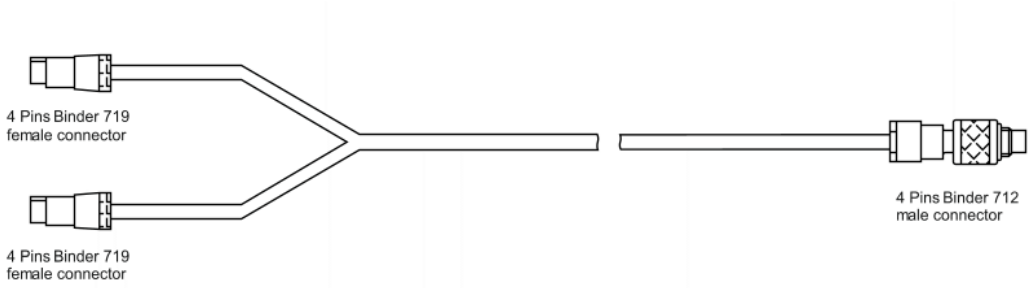
The image here below shows the sensor correctly installed.

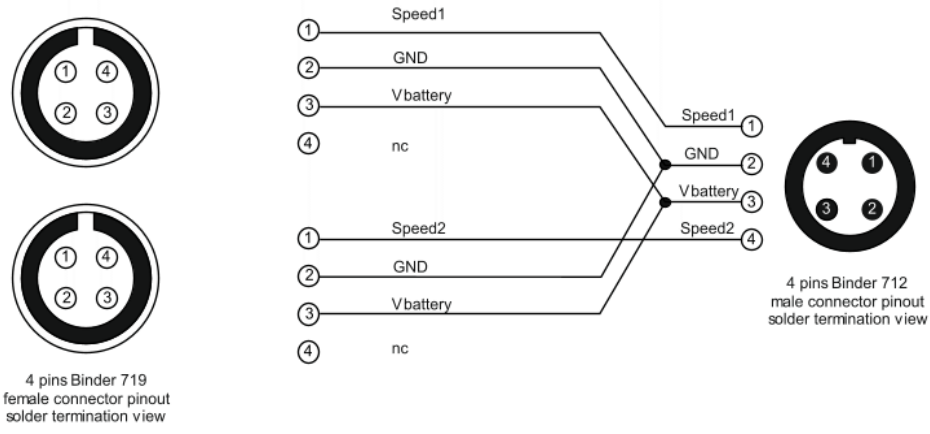


2.1
Specificity of AiM loggers

AiM loggers can support one or more speed sensors.

- **MXL2**, **MXG** and **MXS** can support up to four speed sensors one of which can be connected to the standard harness (**V02573010**) while the other three needs the optional harness (**V02573020**).
- **EVO4** and **EVO4S** can support up to two speed sensors that needs to be connected to a dedicated connector, labelled Speed. To connect both speed channels you need an optional split cable as the one shown here below on the right ;its part number is: **V02549030**. Below is construction scheme.





MXL Strada/Pista have one speed channel only. The seed sensor is included in the optional basic sensors kit – part number **X10MXLS00000** – that includes RPM, water temperature sensors and their harness. Part number of the harness only is: **V02554020**.
MXL Pro05 has four speed channels that needs to be connected to the following optional cables:

- part number **V02554200** for speed 1 and 2
- part number **V02554240** for speed 3 and 4.

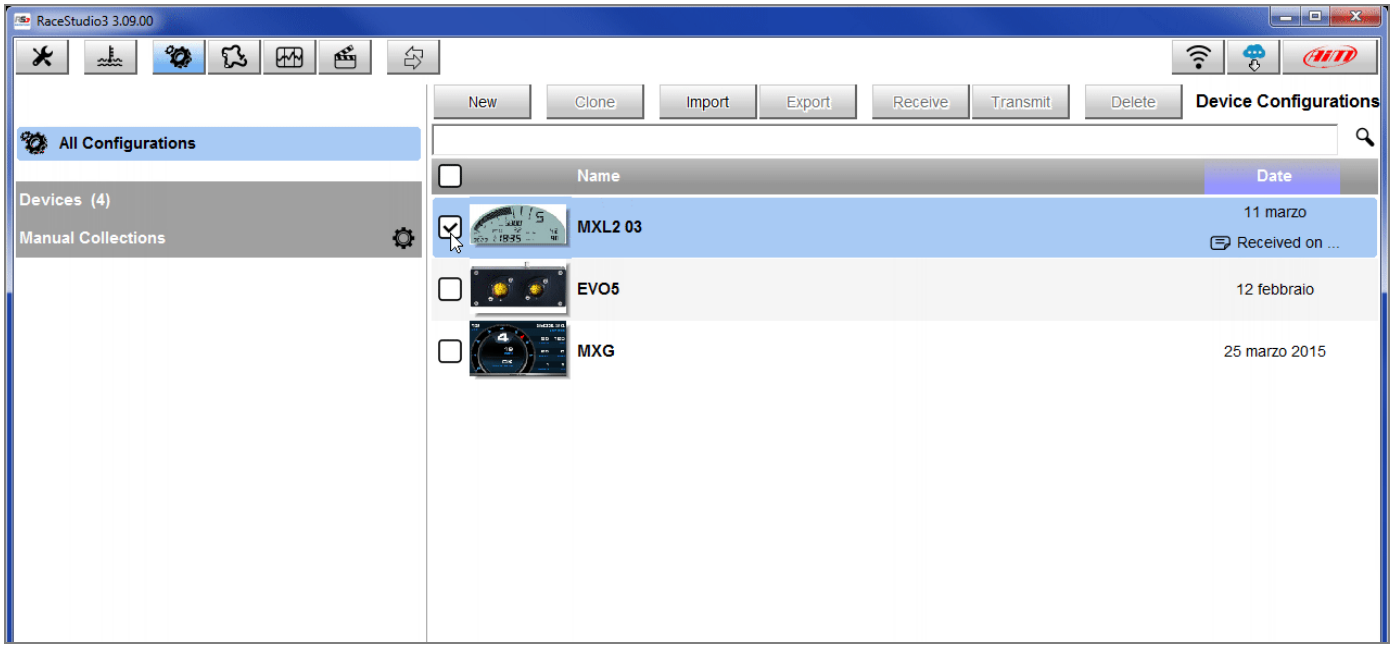
All harness are labelled and the sensor is to be connected to the cable labelled "Speed".

3
Software setup

Once the sensor installed it is necessary to load it in the configuration of its logger.

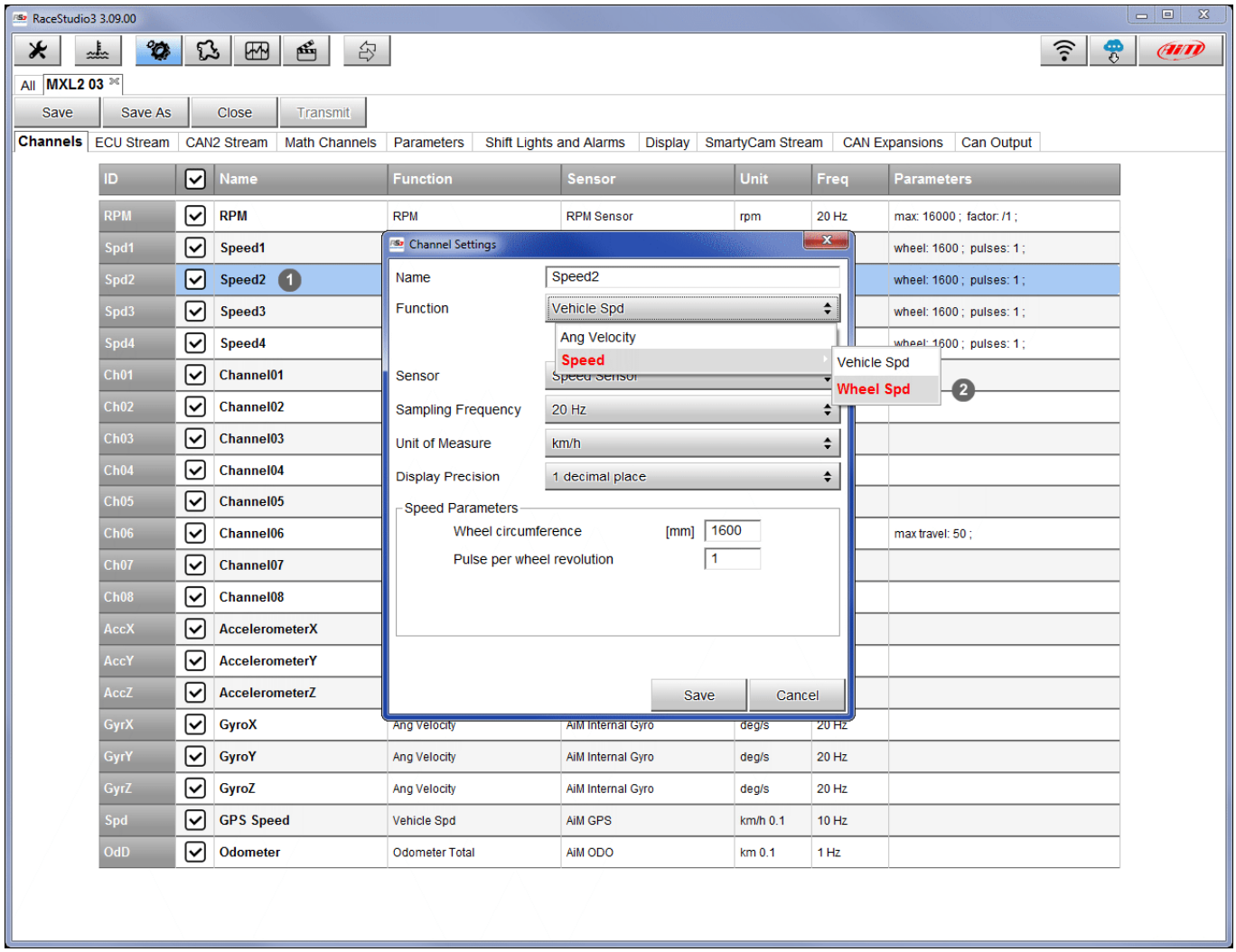
3.1
Setup with Race Studio 3

To load the car speed sensor in AiM logger configuration run the software and select the configuration you are going to load it on (in the example MXL2 03).



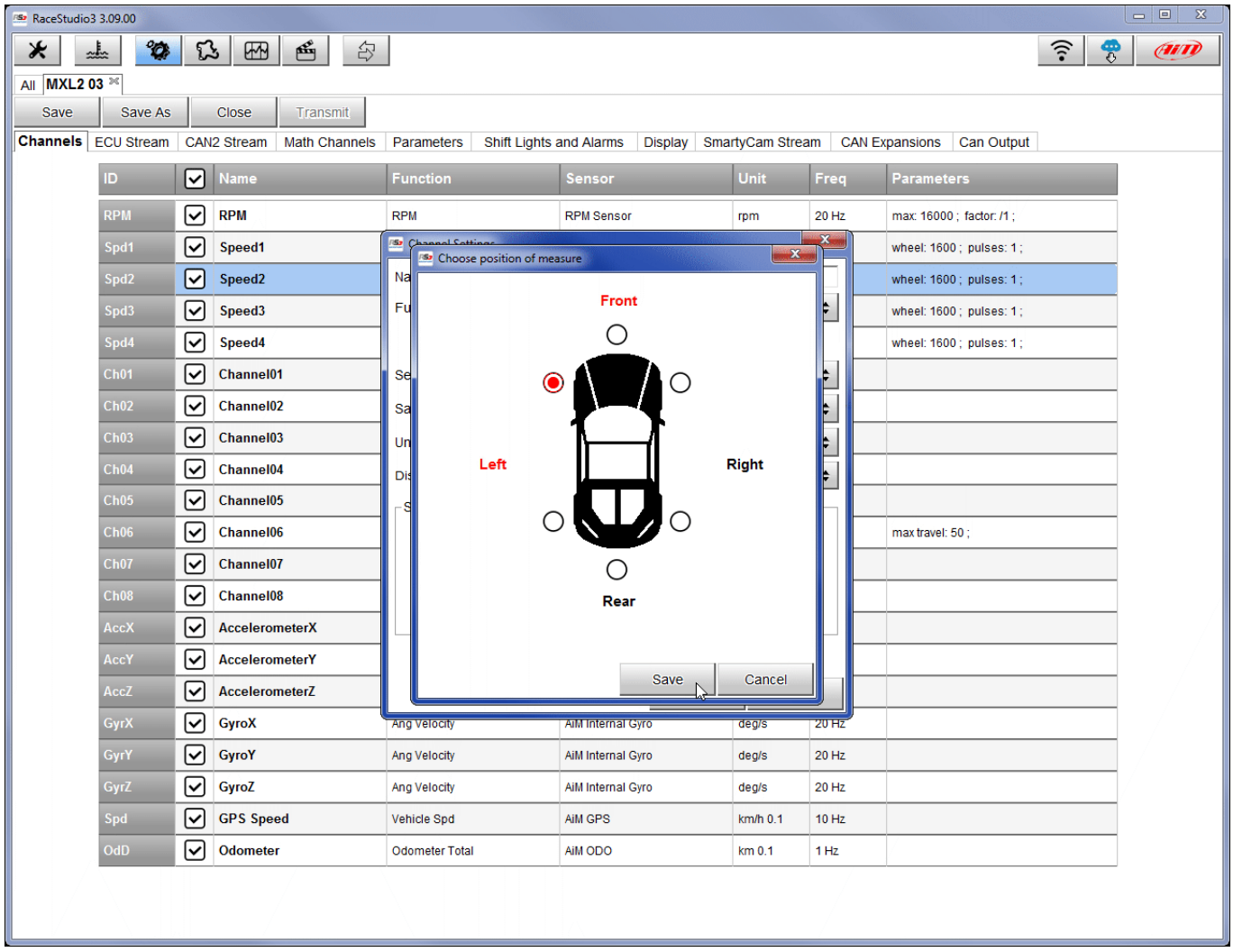
The software enters "Channels" layer.

- Select the speed channel where to set the sensor – in the example Speed2 (**1**) and fill in the panel that shows up
- Select "Speed" function and choose:
    - Vehicle Speed, fill in the panel and press "Save" or
    - Wheel Speed(**2**)

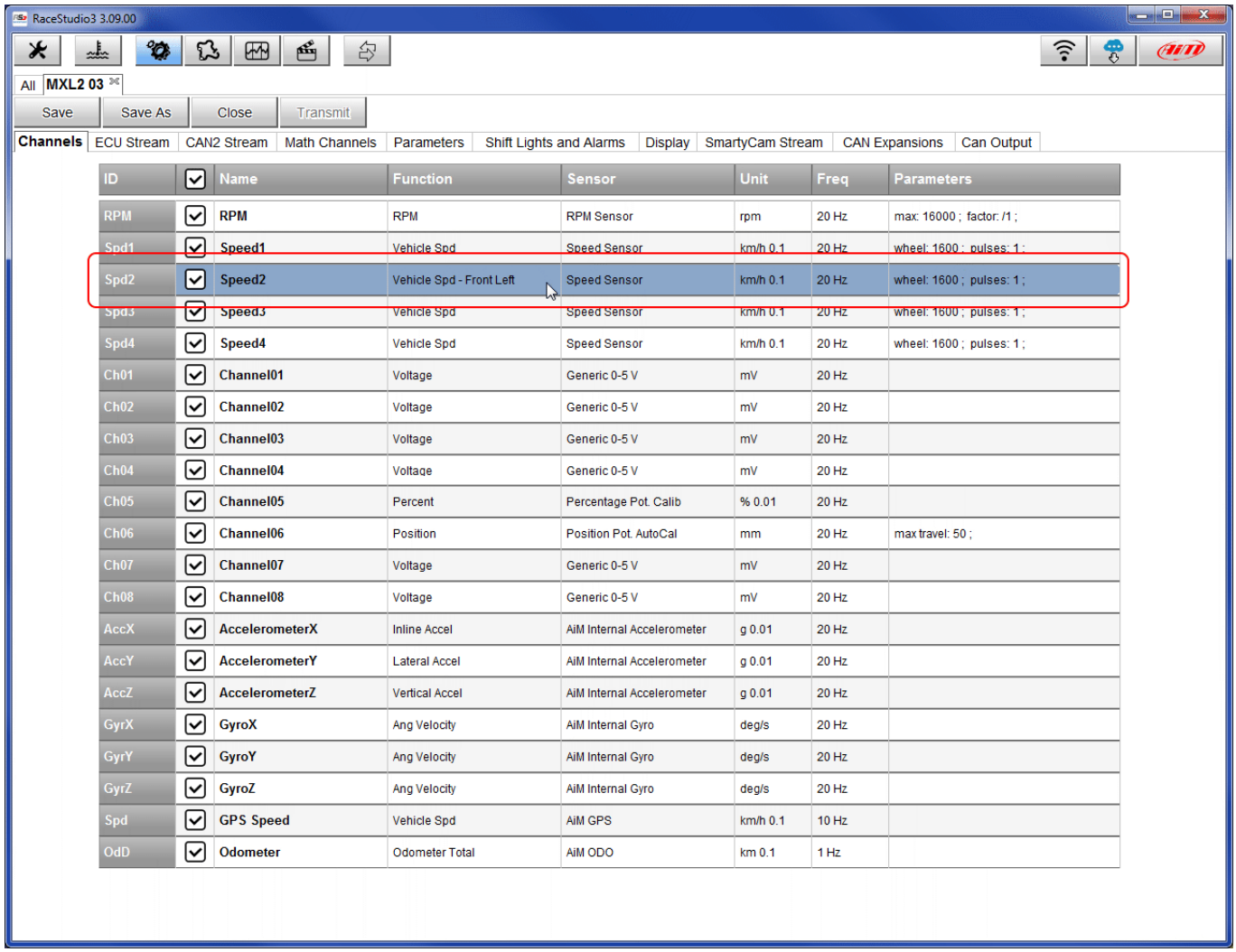


In this second case a "position" option appears:

- click it and choose the panel below shows up:
- select the wheel
- press "Save"
- press "Save" again

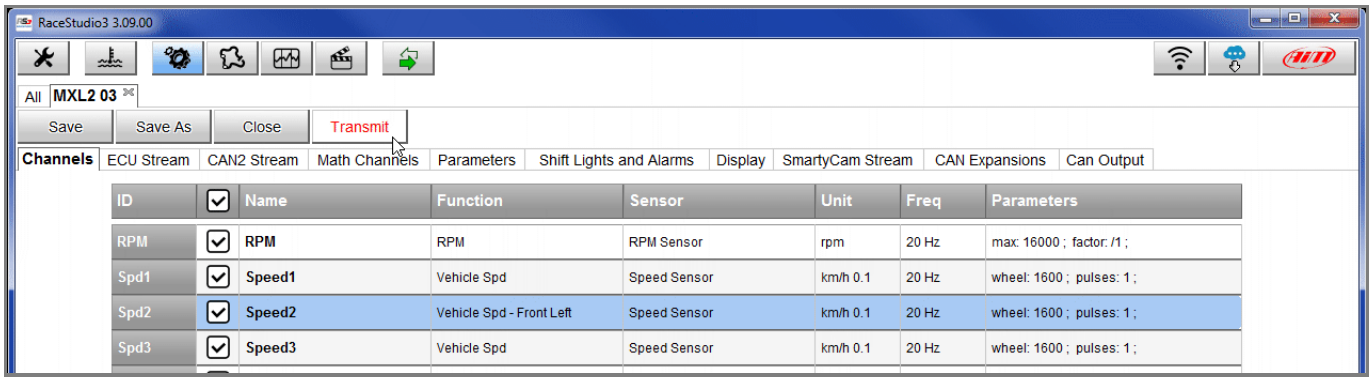


The software shows the sensor properly set. In the example the sensor is set on "Speed2" channel and connected to the front left wheel.



ID	Name	Function	Sensor	Unit	Freq	Parameters
RPM	RPM	RPM	RPM Sensor	rpm	20 Hz	max: 16000 ; factor: /1 ;
Spd1	Speed1	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd2	Speed2	Vehicle Spd - Front Left	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd3	Speed3	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd4	Speed4	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Ch01	Channel01	Voltage	Generic 0-5 V	mV	20 Hz	
Ch02	Channel02	Voltage	Generic 0-5 V	mV	20 Hz	
Ch03	Channel03	Voltage	Generic 0-5 V	mV	20 Hz	
Ch04	Channel04	Voltage	Generic 0-5 V	mV	20 Hz	
Ch05	Channel05	Percent	Percentage Pot. Calib	% 0.01	20 Hz	
Ch06	Channel06	Position	Position Pot. AutoCal	mm	20 Hz	max travel: 50 ;
Ch07	Channel07	Voltage	Generic 0-5 V	mV	20 Hz	
Ch08	Channel08	Voltage	Generic 0-5 V	mV	20 Hz	
AccX	AccelerometerX	Inline Accel	AiM Internal Accelerometer	g 0.01	20 Hz	
AccY	AccelerometerY	Lateral Accel	AiM Internal Accelerometer	g 0.01	20 Hz	
AccZ	AccelerometerZ	Vertical Accel	AiM Internal Accelerometer	g 0.01	20 Hz	
GyrX	GyroX	Ang Velocity	AiM Internal Gyro	deg/s	20 Hz	
GyrY	GyroY	Ang Velocity	AiM Internal Gyro	deg/s	20 Hz	
GyrZ	GyroZ	Ang Velocity	AiM Internal Gyro	deg/s	20 Hz	
Spd	GPS Speed	Vehicle Spd	AiM GPS	km/h 0.1	10 Hz	
OdD	Odometer	Odometer Total	AiM ODO	km 0.1	1 Hz	

Transmit the configuration to the logger pressing "Transmit".

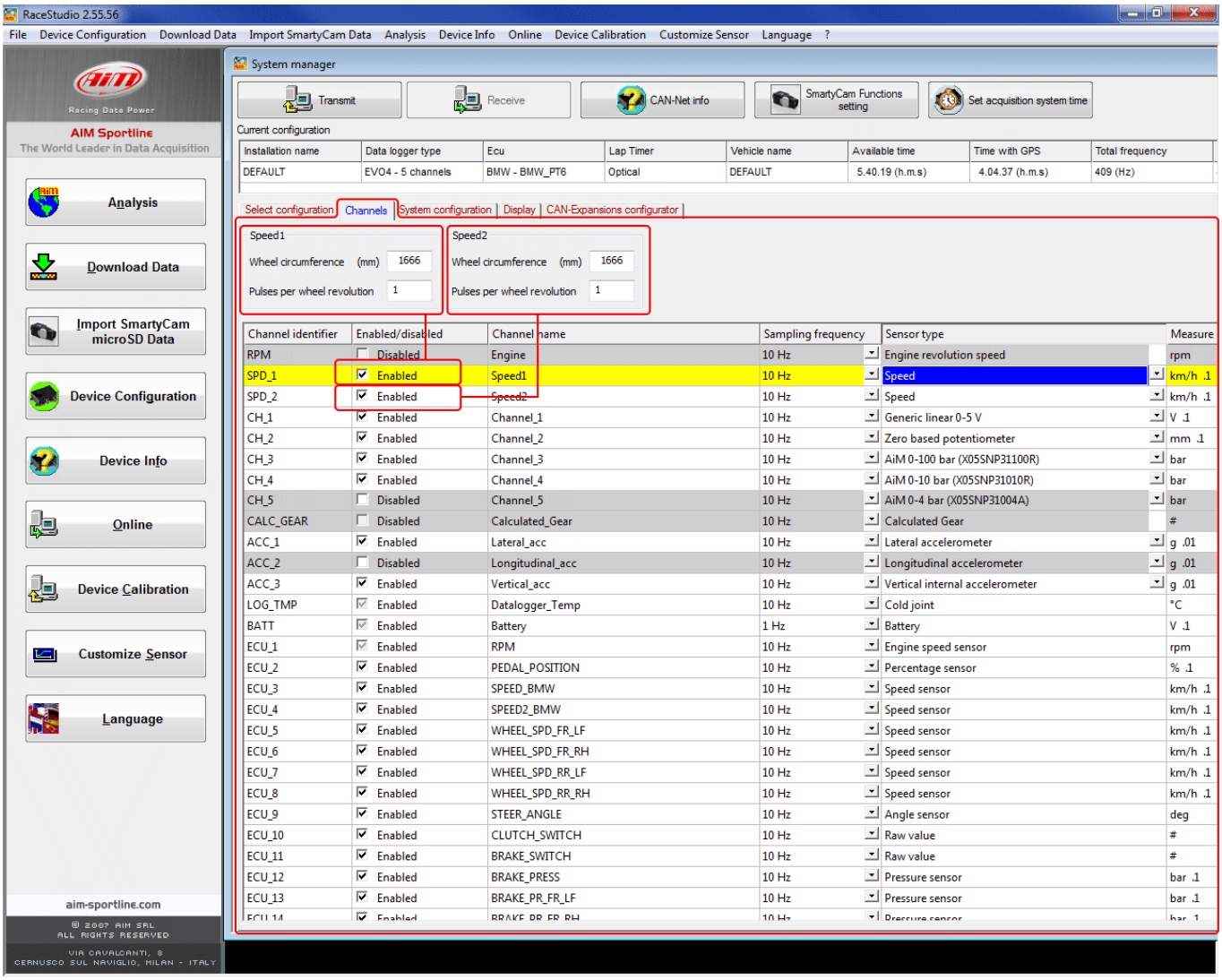


ID	Name	Function	Sensor	Unit	Freq	Parameters
RPM	RPM	RPM	RPM Sensor	rpm	20 Hz	max: 16000 ; factor: /1 ;
Spd1	Speed1	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd2	Speed2	Vehicle Spd - Front Left	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd3	Speed3	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;

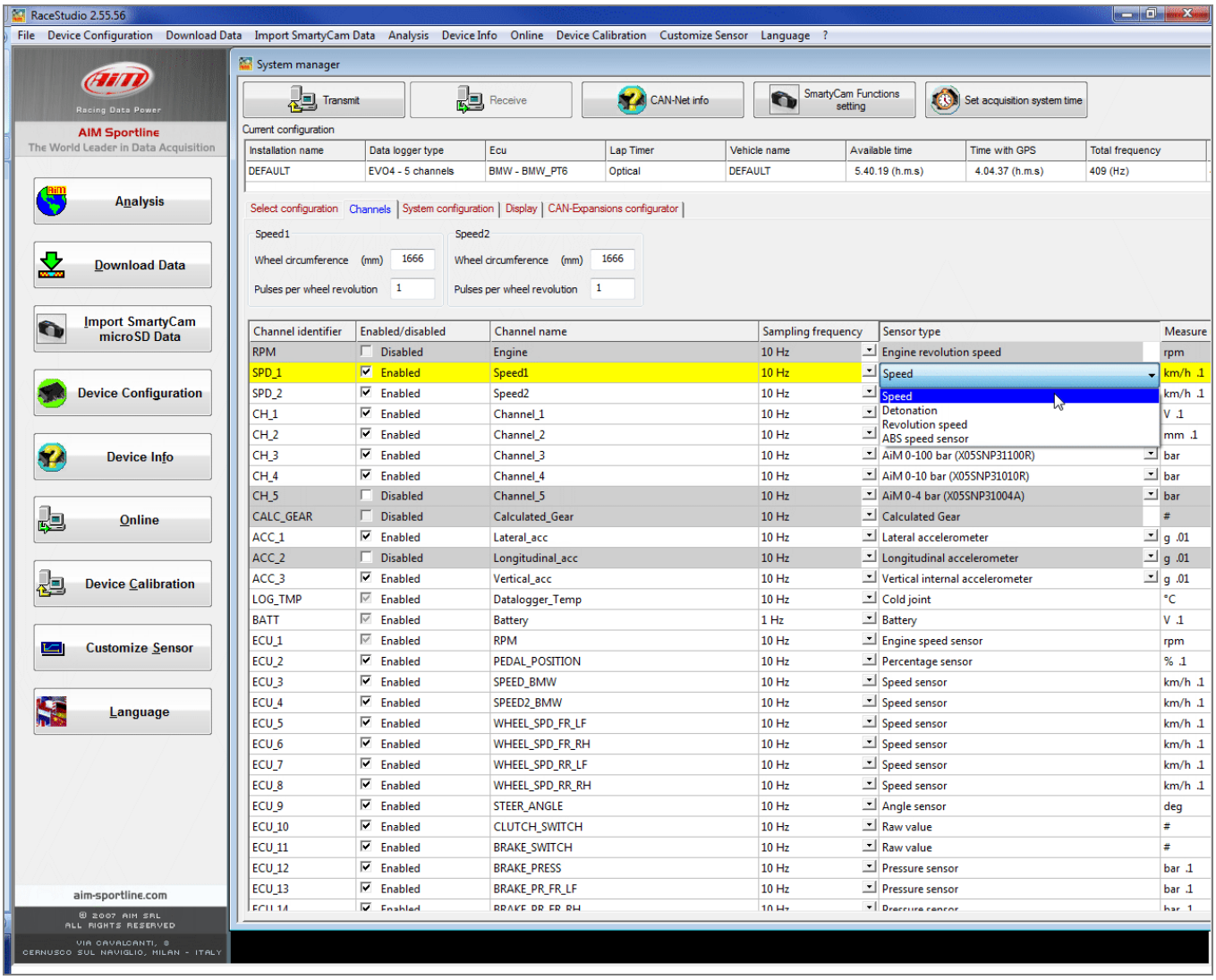
3.2
Setup with con Race Studio 2

To load the sensor in the logger configuration:

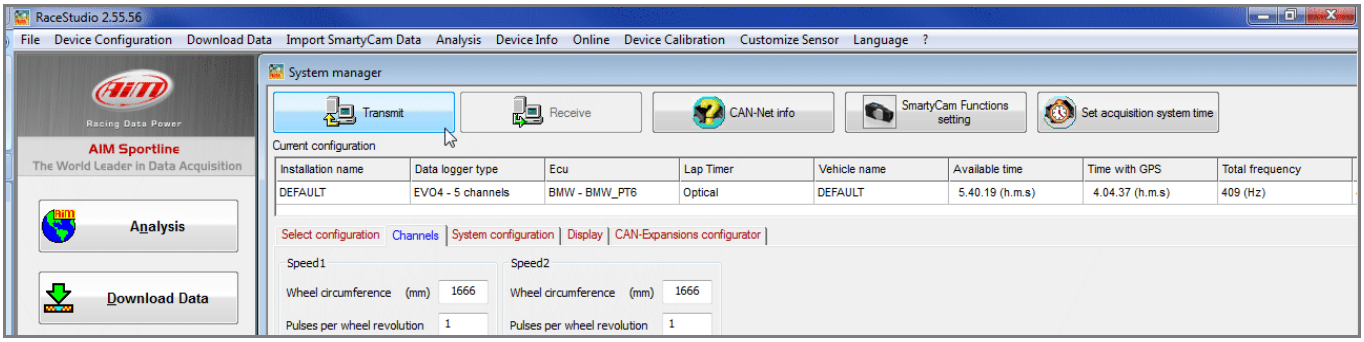
- run the software
- select the logger in use and the configuration to set the sensor on (in the example EVO4)
- enter "Channels" layer
- if speed channels are enabled you can fill in the related panels highlighted here below.



- Select the speed channel where to set the sensor on and select "Speed" in "Sensor type" column as shown here below. Fill in the related panel.



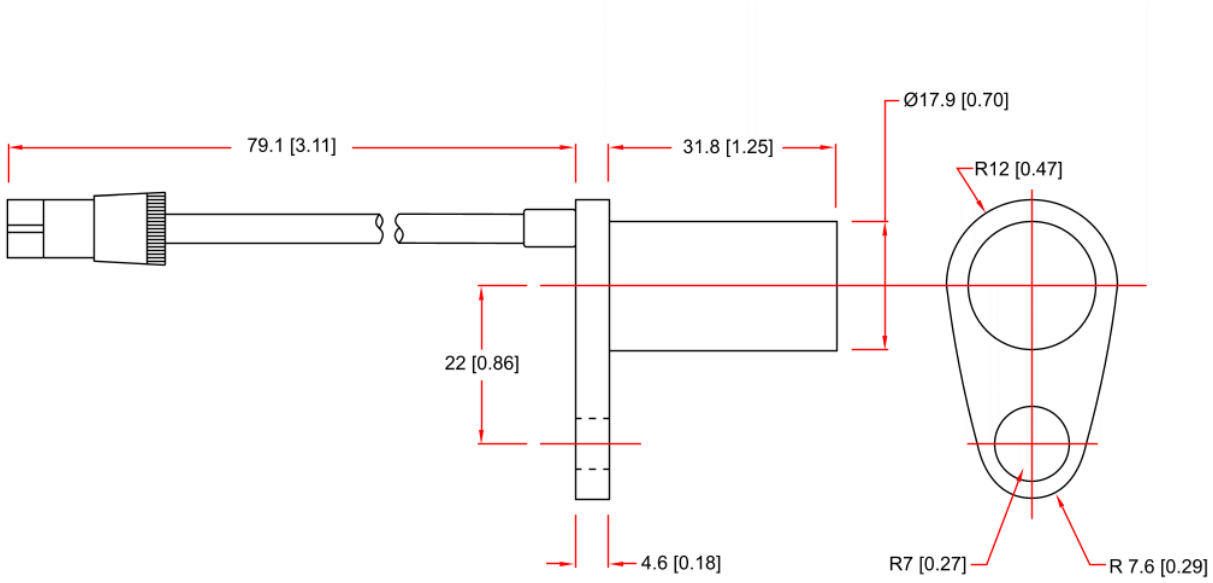
Transmit the configuration to the logger pressing "Transmit".



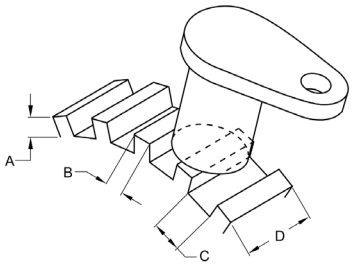
4
Dimensions, pinout and technical characteristics

The drawings here below shows:

- sensors dimensions in mm [inches].

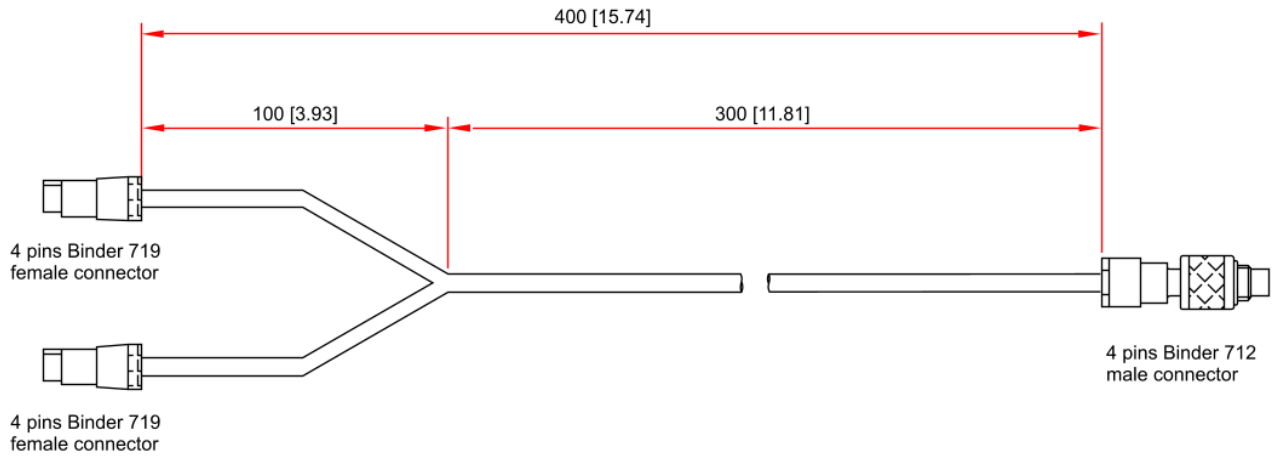


- dimensions required for a correct sensor installation in mm [inches].

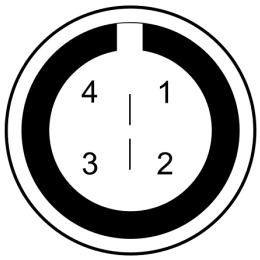


Point description	Value (minimum)
A = tooth highness	5,06 [0.19]
B = tooth wideness	2,54 [0.09]
C = space between the teeth	10,16 [0.39]
D = Tooth thickness	6,35 [0.24]

- dimensions of the speed split cable needed to connect two speed sensors to the only **EVO4** and **EVO4S** available speed connector in mm [inches].



The speed sensor comes with a cable ending with a 4 pins Binder 719 male connector. The table below shows the connector – solder termination view – on the left and its pinout on the right.



Binder 719 connector pin	Function
1	Speed
2	GND
3	V battery
4	Not connected

Car speed sensor electrical characteristics are:
- power supply voltage: 4.5-24 VDC
- current consumption: 10 mA (typical) 20 mA (max)
- output signal type: pulse 0-5 volt
- max current output: 20 mA
- max operating frequency: 100 kHz
- sensibility distance: from 0.5 to 2 mm (from 0.007 to 0.07 inches)
- recommended distance: 1mm

Car speed sensor mechanical characteristics are:
- operating temperature range: from – 40 to +150 °C (from 104 to 302 °F)
- Cable length: 80 mm (3.14 inches)

5
Extension cables

The sensor comes with an 80 mm cable and optional extension cables are available with standard length from 0,5 to 3m; specific length extension cables are also available.

Extension cable part number changes according to their length and to the device the sensor has to be connected to.

Extension cables for connection with:
- Channel Expansion
- MyChron Expansion
- EVO4.

Part number:
V02PCB05BTXG – cable length: 500mm
V02PCB10BTXG – cable length: 1000mm
V02PCB15BTXG – cable length: 1500mm
V02PCB20BTXG – cable length: 2000mm
V02PCB25BTXG – cable length: 2500mm
V02PCB30BTXG – cable length: 3000mm

Extension cables for connection with:
- EVO4/split cable
- MXL2
- MXG
- MXS
- MXL all versions

Part number:
V02PCB05B – cable length: 500mm
V02PCB10B – cable length: 1000mm
V02PCB15B – cable length: 1500mm
V02PCB20B – cable length: 2000mm
V02PCB25B – cable length: 2500mm
V02PCB30B – cable length: 3000mm