AiM Infotech

Bike speed sensor

Release 1.02

1 Introduction

This datasheet explains how to use AiM bike speed sensor. This is a non contact sensor that needs a metallic trigger to pass in front of it. It is sold with a magnet and the needed locknuts and is available in two versions: with plastic connector (Binder 719) and with metallic connector (Binder 713).

This sensor **part numbers** are:

- Bike speed sensor ending with plastic connector **X02SNVM00**
- Bike spees sensor ending with metallic connector **X05SNVB301**

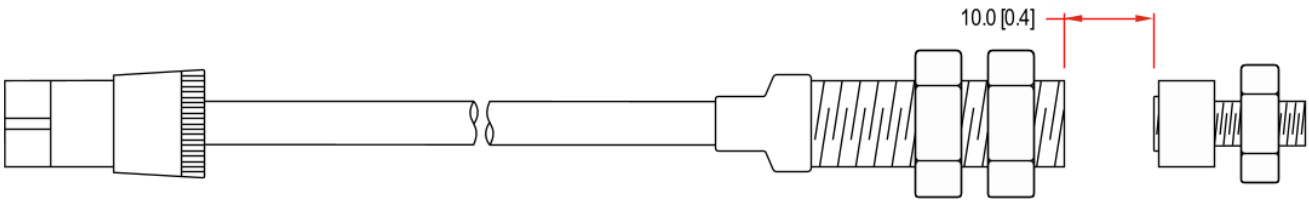
It fist the measurement of the wheel speed and needs an accurate installation. This is why we suggest to address to a specialized workshop. Once the sensor installed it needs to be setup using AiM Race Studio software freely downloadable from download area –> software of www.aim-sportline.com.

2 Installation

Install the sensor using a bracket and:

- ensure that the distance between sensor and magnet is between 8 and 20 mm (0.31-0.78 inches)
- fix the sensor to the bracket
- connect the sensor to AiM logger

The image here below shows the sensor with its magnet correctly installed.

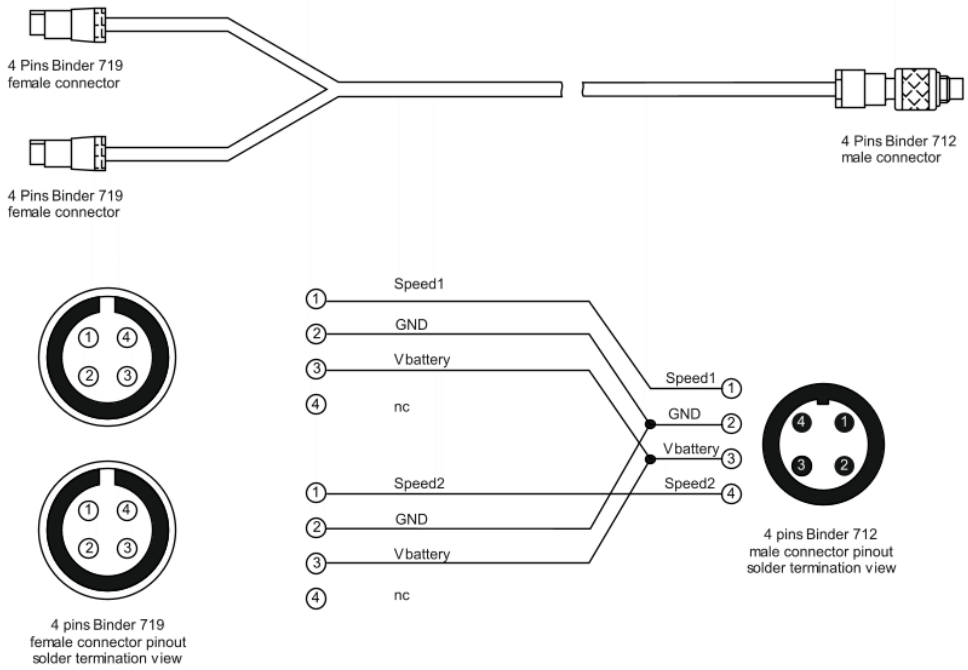


2.1
Specificity of AiM loggers

AiM loggers can support one or more speed sensor.

- **MXL2**, **MXG** and **MXS** can support up to four speed sensors: one can be connected to the standard harness (**V02573010**) and the other three to the optional harness (**V02573020**).
- **EVO4** and **EVO4S** can support up to two speed sensors that needs to be connected to the only available dedicated connector labelled Speed. To plug both sensors you need to buy an optional speed split cable like the one shown here below on the right; according to the sensor you are using its part number is:
    - **V02549030** for the split cable featuring two plastic Binder connectors and one metallic to be used for speed sensors ending with a plastic Binder connector (shown below)
    - **V02563100** for the split cable featuring three metallic Binder connectors to be used for speed sensors ending with a metallic Binder connector

Here below is the cable constructive scheme.



MXL Strada/**Pista** have one only speed channel. Speed sensor is included in the optional basic sensor kit – part number **X10MXLS00000** – that includes RPM and water temperature sensors too. The cable part number is: **V02554020**.
MXL Pro05 has four speed channels. Speed sensors have to be connected to these optional cables:

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

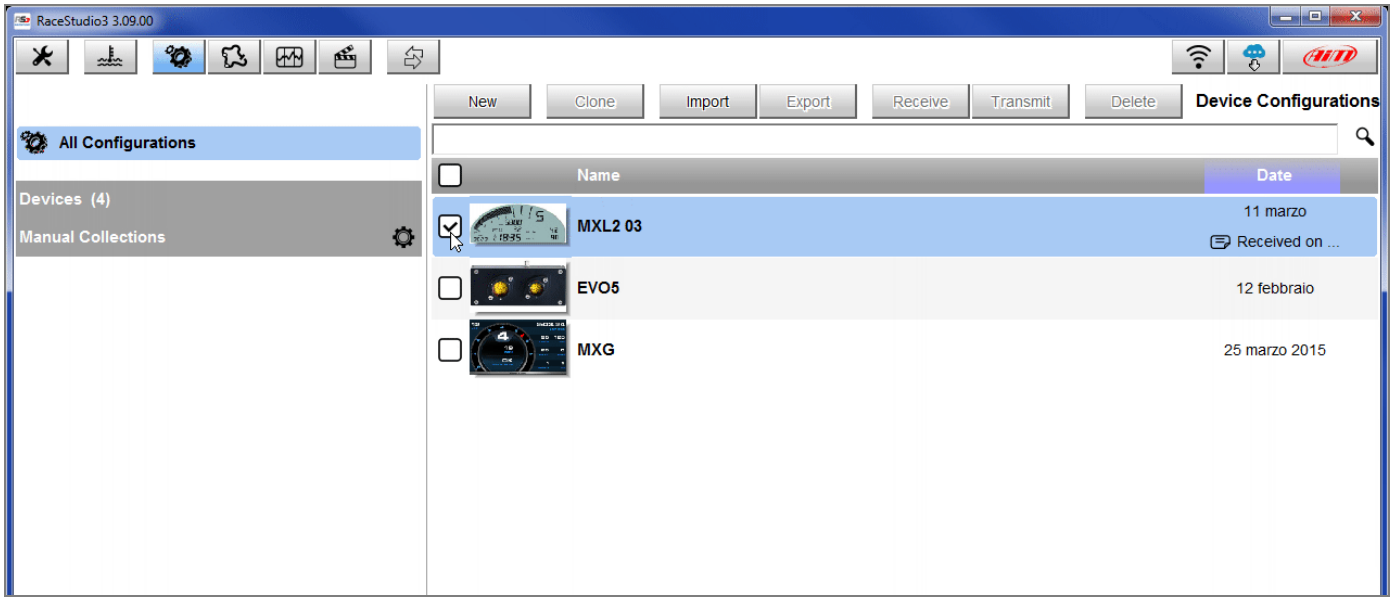
The harnesses are labelled and the sensors have to be plugged to the cables labelled "Speed".

3
Software setup

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

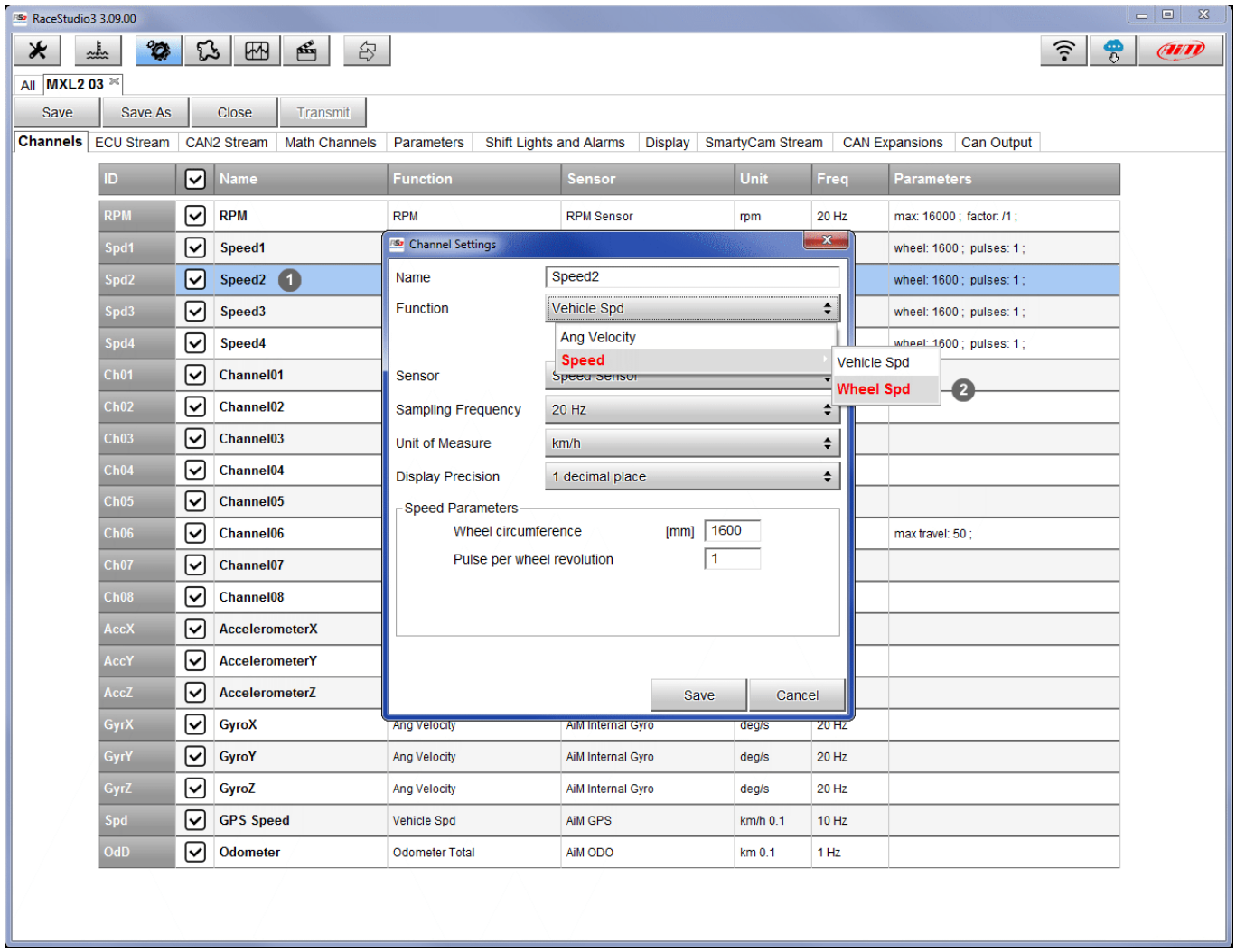
3.1
Setup with Race Studio 3

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



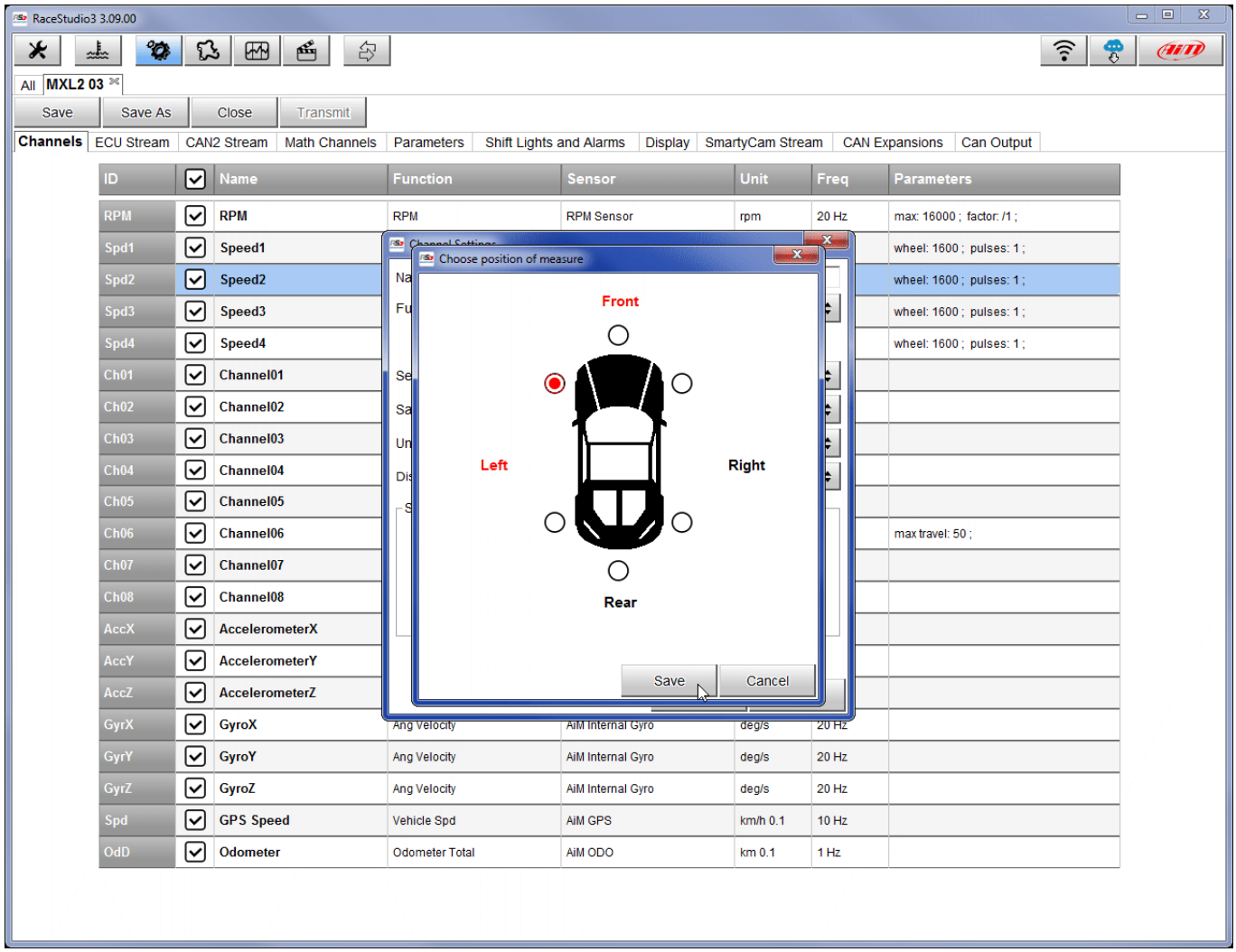
The software enters "Channels" layer.

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

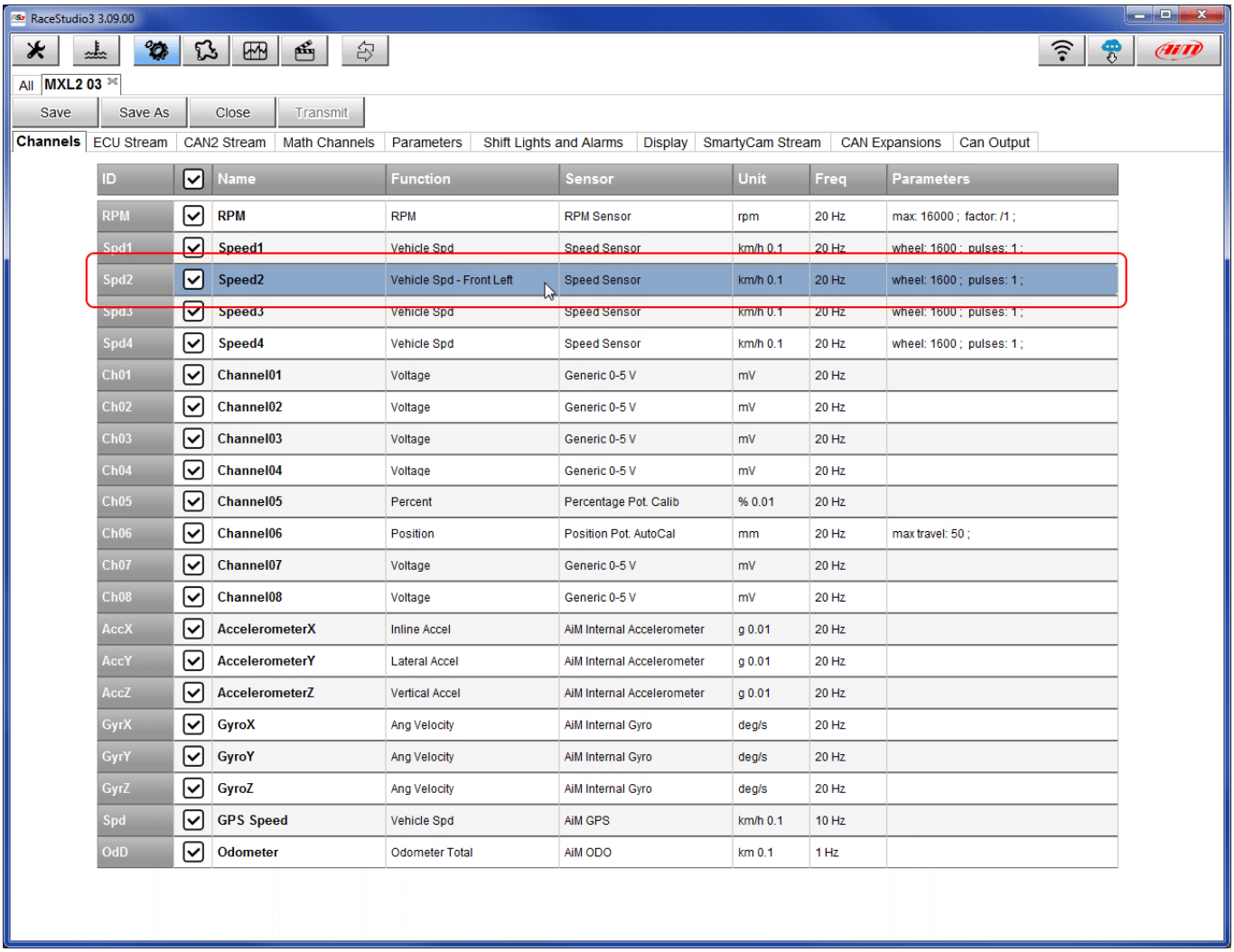


In this second case "Position" option appears in the panel:

- click and the panel below shows up:
    - choose the wheel the sensor is connected to
    - press "Save"
- press "Save" again

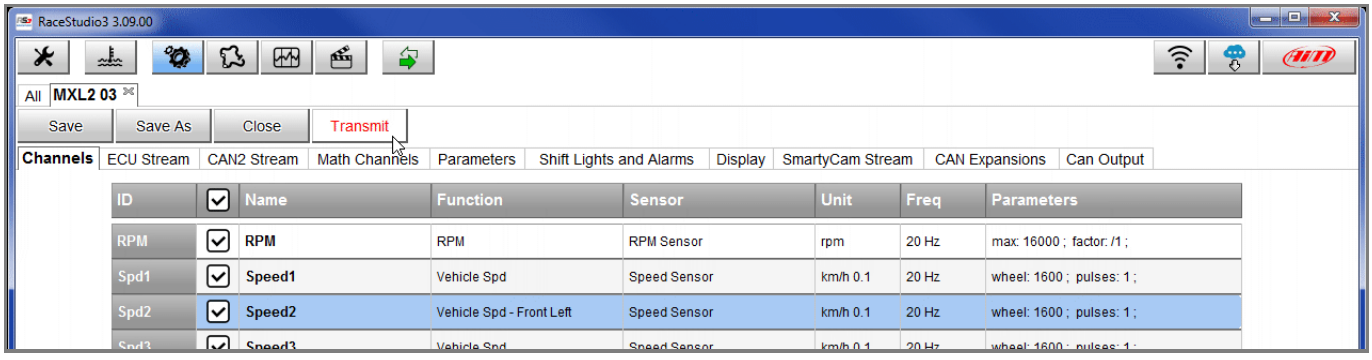


The software shows the sensor installed: in the example it is installed on the front left wheel.



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".

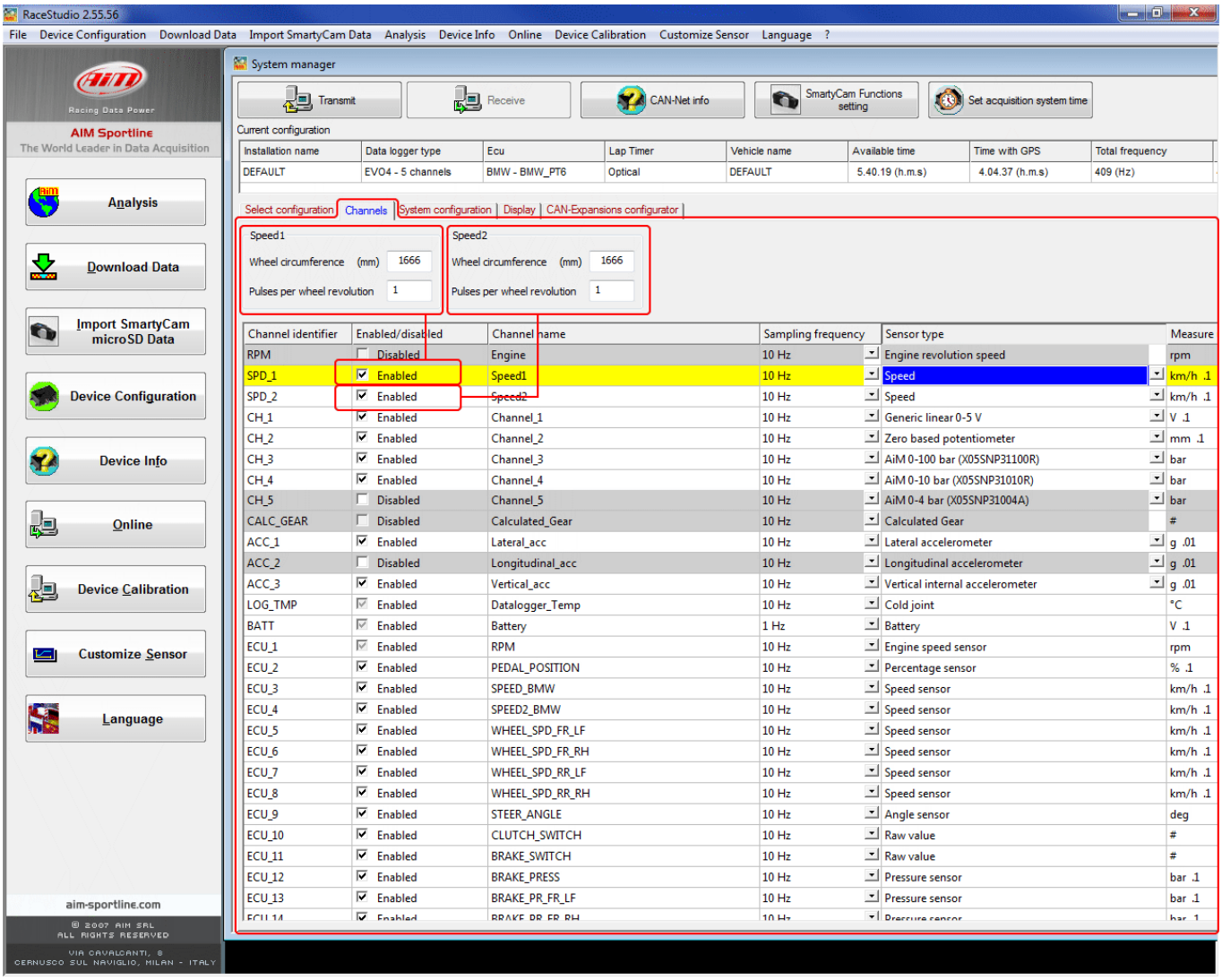


ID	Name	Function	Sensor	Unit	Freq	Parameters
RPM	RPM	RPM	RPM Sensor	rpm	20 Hz	max: 16000 ; factor: /1 ;
Spd1	Speed1	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd2	Speed2	Vehicle Spd - Front Left	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;
Spd3	Speed3	Vehicle Spd	Speed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

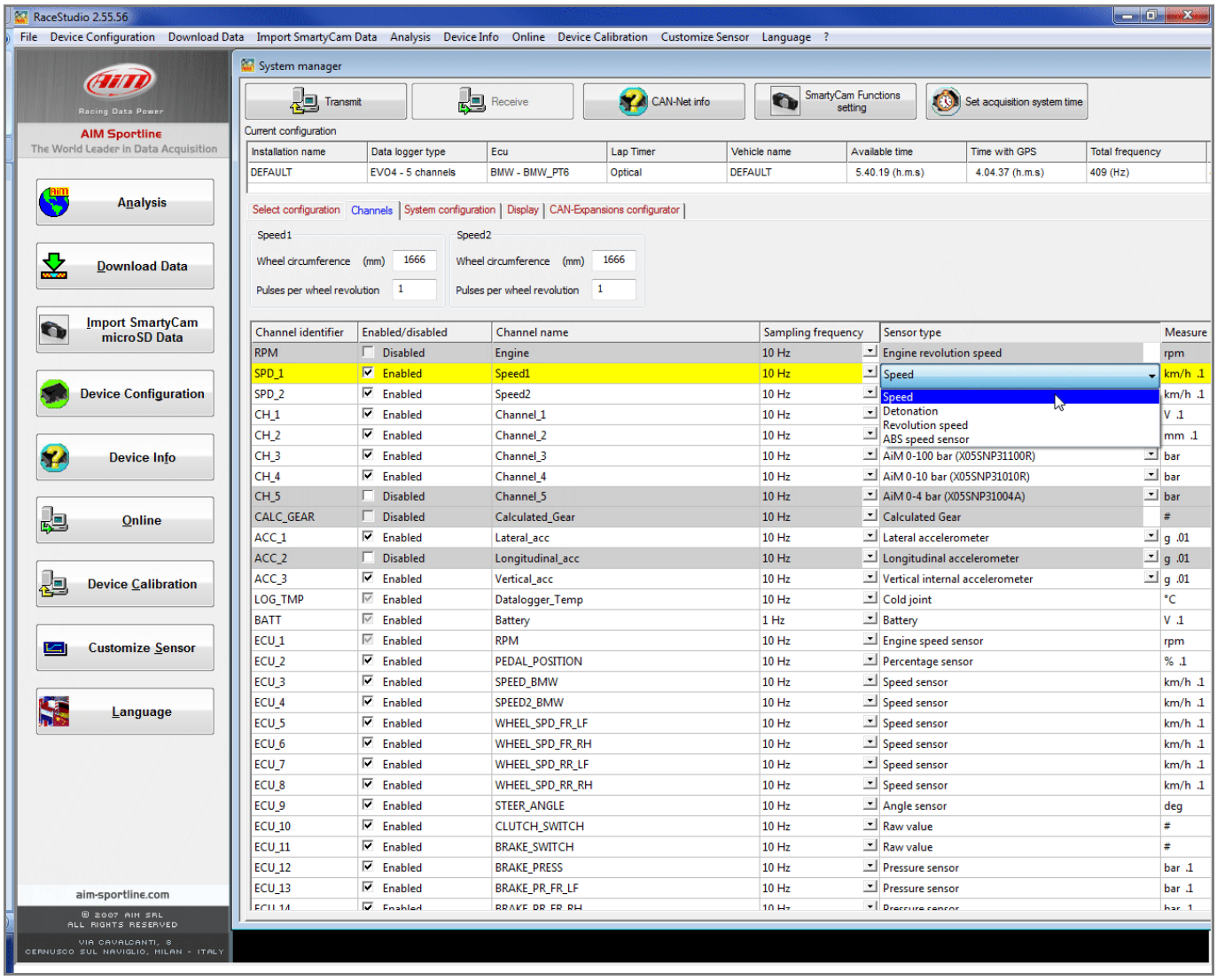
3.2
Setup with Race Studio 2

To load the sensor in AiM logger configuration:

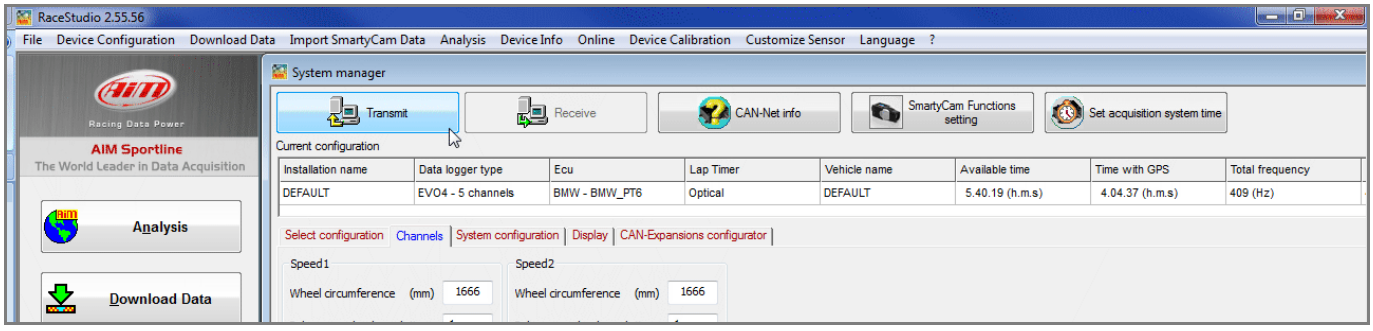
- run the software
- select the logger in use and the configuration where to load the sensor (in the example EVO4)
- enter "Channels" layer
- if speed channels are enabled you can fill in the related panels highlighted here below.



- 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.



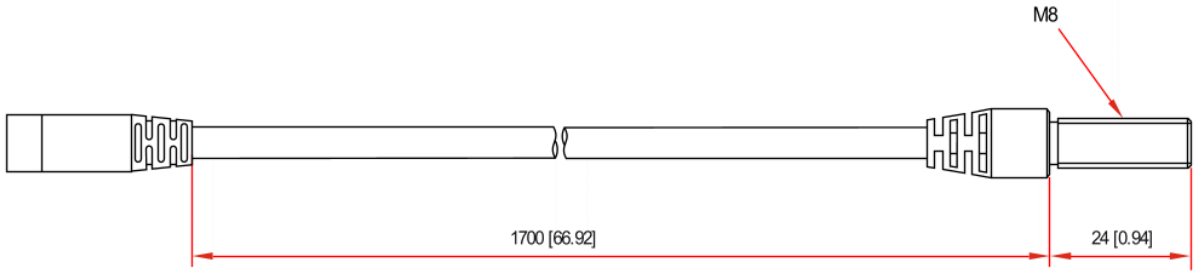
Transmit the configuration to the logger pressing "Transmit".



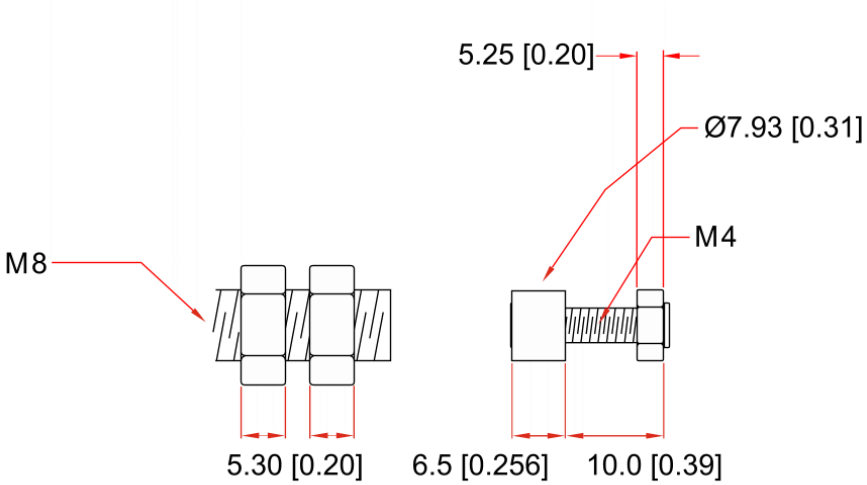
4
Dimensions, pinout and technical characteristics

The drawings shows:

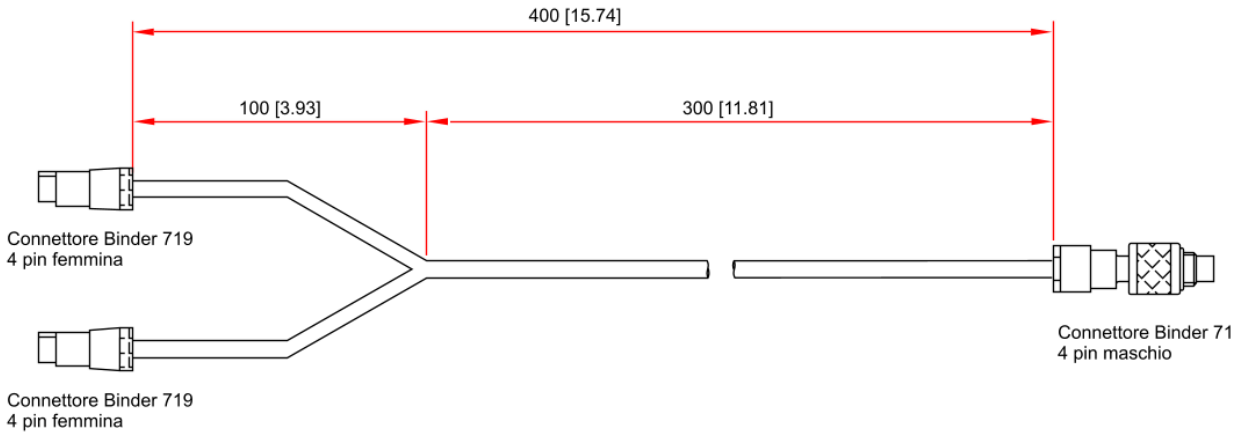
- sensor dimensions in millimeters [inches].



- magnet and locknuts dimensions in mm [inches].



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



The sensor has a cable ending with a 4 pins Binder (719 or 712) 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

Sensor electrical characteristics:

- power tension: 6-24 VDC
- power supply: 13.5 mA
- output signal type: pulse 0-5 volt
- max current output: 20 mA
- max operating frequency: 100 kHz
- max sensibility distance: 20 mm
- recommended distance: 10 mm
- Number of pulses for wheel revolution: 1

Sensor mechanical characteristics:

- operating temperature range: from – 20 to +85 °C
- cable length: 1700 mm

5
Extension cables

The sensor is sold with an 1700 mm cable and optional extension cables are available with standard length: from 0,5m to 3m; specific length extension cables are also available.
Extension cable part numbers changes according to their length and to the device the sensor is to be connected.

Extension cable for connection with **X02SNVM00** sensor (plastic Binder):

- Channel Expansion
- MyChron Expansion
- EVO4
- EVO4S.

Part numbers:
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 cable for connection with **X02SNVM00** sensor (plastic Binder):

- EVO5EVO4S and EVO4 speed split cable **V02549030** (plastic Binder)
- 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

Extension cable for connection with **X02SNVB301** sensor (metallic Binder):

- EVO4S and EVO4 speed split cable **V02549030** (metallic Binder)
- Channel Expansion
- MyChron Expansion
- EVO4
- EVO4S.

Part number:
V02552620 – cable length: 500mm
V02552630 – cable length: 1000mm
V02552640 – cable length: 1500mm
V02552650 – cable length: 2000mm
V02552660 – cable length: 3000mm