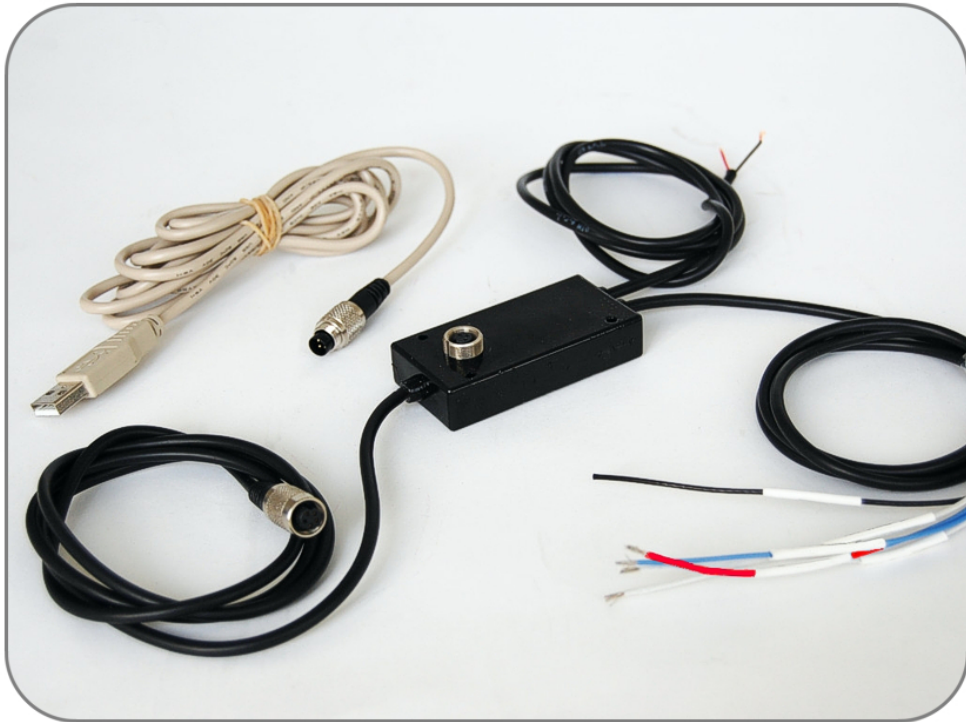# RPM Bridge

USER MANUAL

AiM

Racing Data Power

INTRODUCTION

RPM Bridge belongs to the last generation of AIM systems for car installations.

ECU Bridge samples but does not record RPM values coming from the vehicle. Data can be visualized connecting **RPM Bridge** to **SmartyCam**, the on-board camera or to an **AIM** dash (**MyChron3 Dash**, **TG Dash**, **Formula Steering Wheel**).

Technical features:

- AIM proprietary CAN protocol for external expansion modules;
- USB communication protocol for programming;
- RPM signal 150-450V coil;
- RPM signal 4-50V square wave;
- external power.

INDEX

Chapter 1 – Kit and part numbers

RPM bridge kit includes:
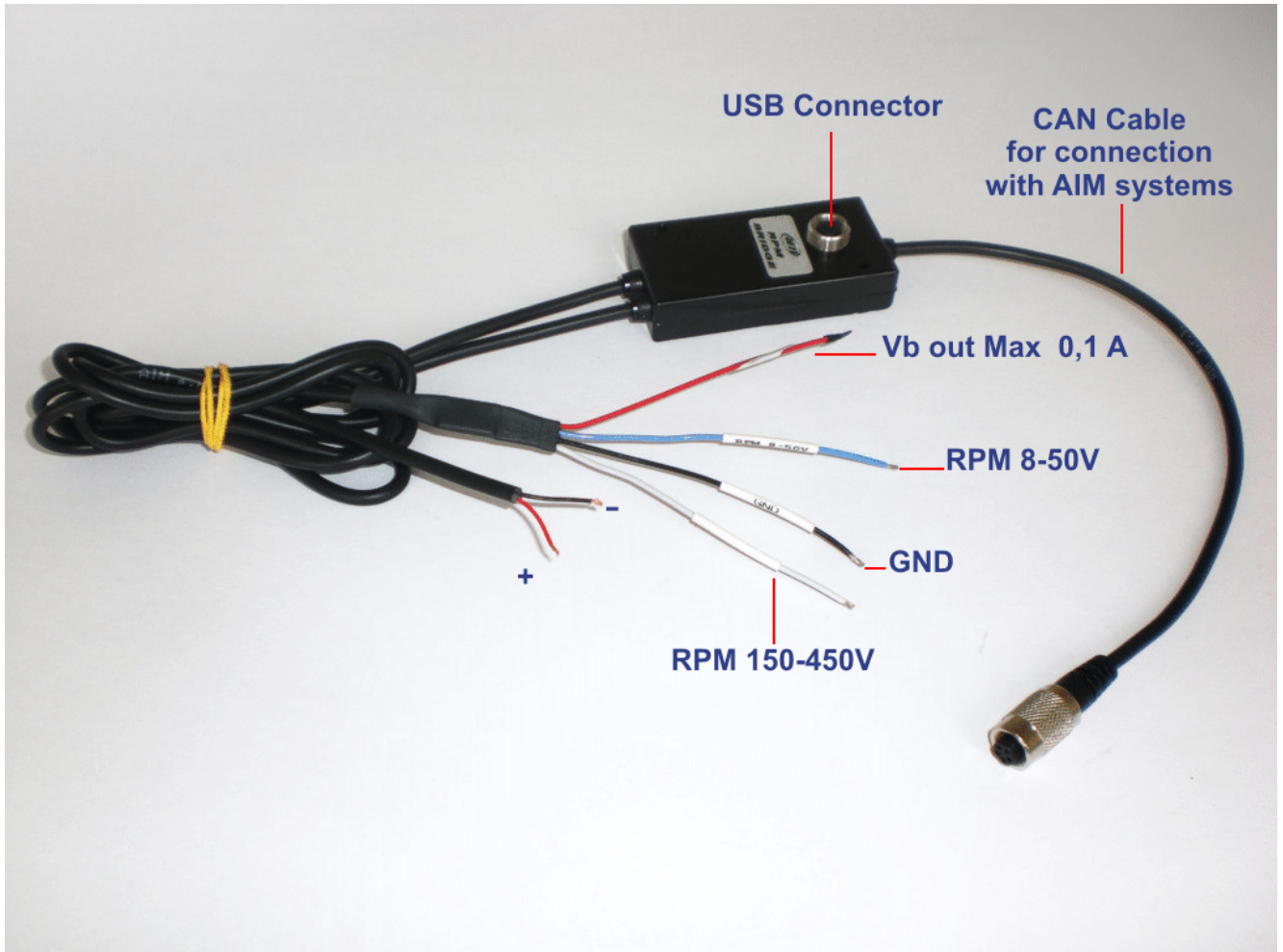
- **RPM Bridge** (4-50V and 150-450V)(**1**)
- USB programming cable (**2**)

RPM Bridge **part number** is: **X90BGRPMBM**

Chapter 2 – RPM Bridge characteristics

As shown here below **RPM Bridge** features a central 3 pins female Binder connector for PC interface via USB and three lateral cables for CAN communication, power supply and RPM signal.

Chapter 3 – Installation and powering

Please ensure that **RPM Bridge** and its expansions are not in contact with heat or electromagnetic interference sources (like spark plugs and coil).
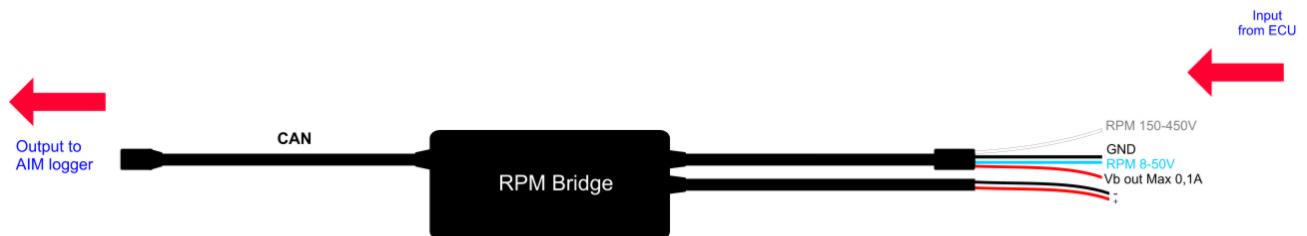
3.1 – How to receive the RPM signal

RPM Bridge can receive the RPM signal in two ways:

- from the ECU through a square wave signal (from 4 to 50V);
- from the coil low voltage input (from 150 to 450V).

3.1.1 – Receiving the RPM signal from the ECU through a square wave signal

In case the vehicle ECU does not communicate through the CAN bus, K line or RS232 protocol, it is possible to sample RPM signal using a square wave signal.

With reference to the above image, to receive the RPM from the ECU using a square wave, connect:

- the cable labelled "RPM 8-50 V" to the RPM signal out coming from the ECU (or take RPM signal directly on the stock dashboard connector[1]);
- the red cable labelled "V battery" to the positive pole of the vehicle battery;
- the black cable labelled "GND" to the vehicle chassis earth;
- the CAN connector to **SmartyCam** or to an AIM dash.

Please note: it is always suggested to connect **RPM Bridge** to the vehicle master switch.

Always refer to the ECU user manual for further information. In case ECU output signal is not a steady square wave, an RPM adaptor (optional) is needed.
The images here below show a not-square RPM signal on the left and a filtered one on the right.

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[1] RPM signal is often used to power stock dashes. This is why the signal is available on that wiring.

3.1.2 – Sampling the RPM signal from the coil: low voltage RPM input

If the vehicle is not equipped with an ECU, RPM signal can be taken directly from the low tension control of the coil.
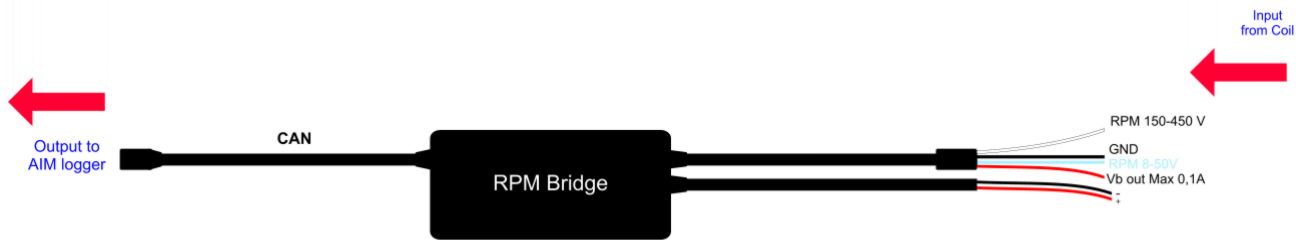

To sample RPM signal from the coil on the dedicated RPM input (from 150 to 450 V) connect:

- RPM Bridge cable labelled "RPM 150-450 V" to the coil control;
- the red cable labelled "V battery" to the positive pole of the vehicle battery;
- the black cable labelled "GND" to the chassis earth of the vehicle wiring;
- CAN connector to **SmartyCam** or to an AIM dash;

Please note: it is always suggested to connect **RPM Bridge** to the vehicle master switch.

The image here below shows a non filtered unstable coil signal.
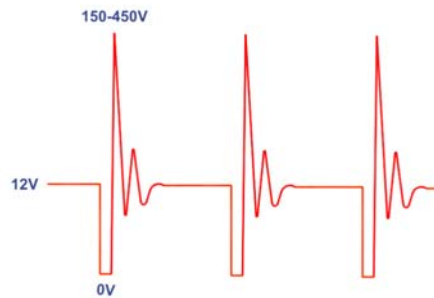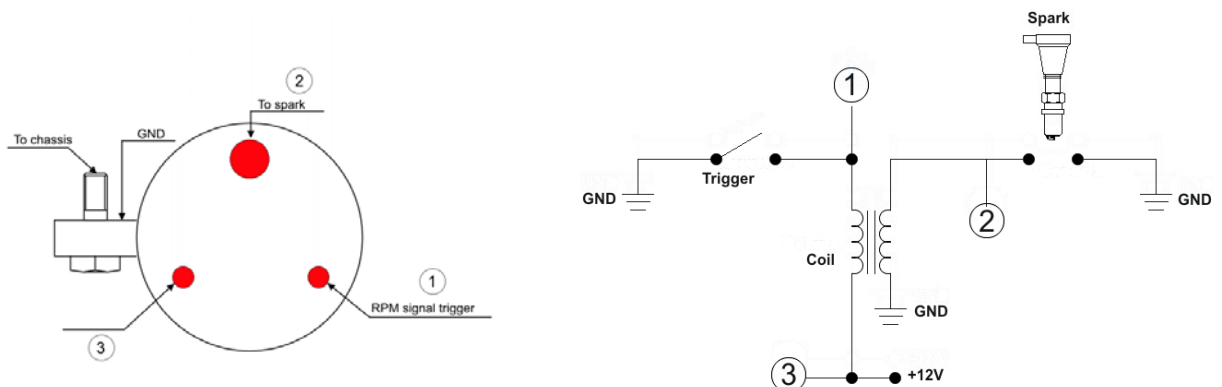

The coil to sample the signal from, shown here below, is a black cylinder with three cables (labelled 1,2 and 3).

- Cable labelled 1 is the coil low tension input.
- Cable labelled 2 is connected to the coil.
- Cable labelled 3 is connected to the battery positive pole (+12V).

Moreover the coil is generally grounded with the chassis as shown here below on the right.

The scheme below shows the voltage in the point labelled "**1**" in the previous images.
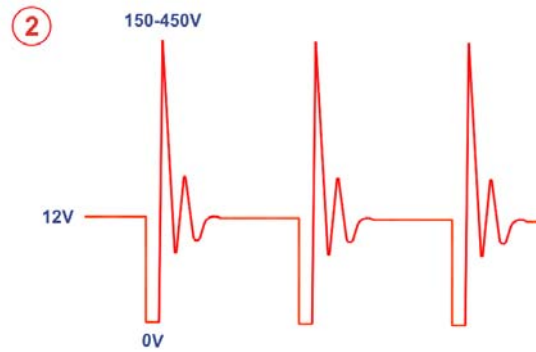
It is reminded that RPM Bridge white cable, labelled "RPM 150-450 V" is to be connected to the RPM trigger wiring indicated by digit 1 in the previous schemes.

Chapter 4 – Connecting RPM Bridge to AIM systems

RPM Bridge can be connected directly to **SmartyCam** (top image) or to AIM dashes (bottom image) through a **DataHub**.
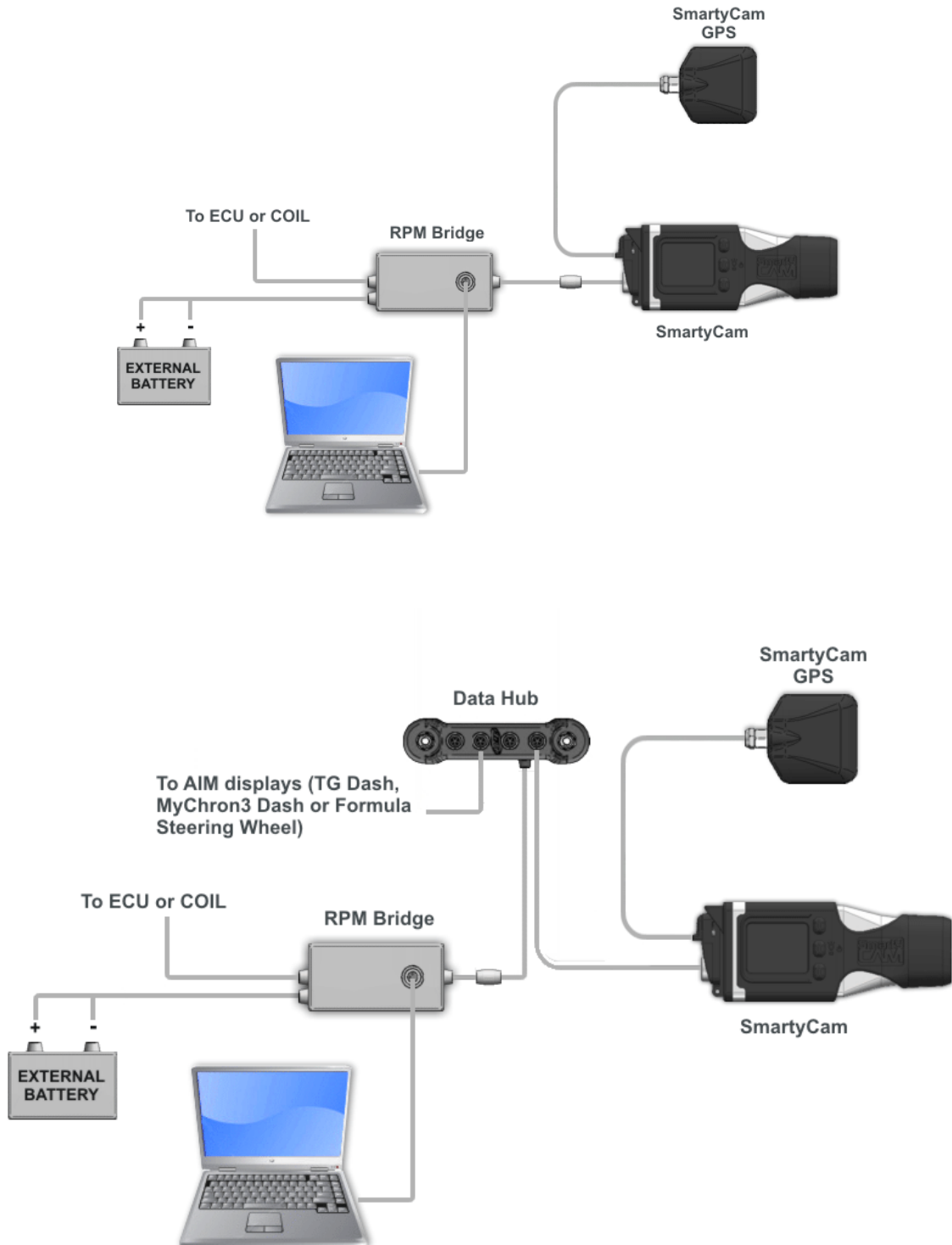
Warning: connect RPM Bridge to AIM devices when both devices are OFF.

Chapter 5 – Configuring RPM Bridge

To configure RPM Bridge:

- run **Race Studio 2** software,
- go through these steps: press "AIM System Manager" >> "SMC Bridge" >> "Go to";
- press "New" to create a new configuration;
- "New configuration" panel, shown here below, appears.
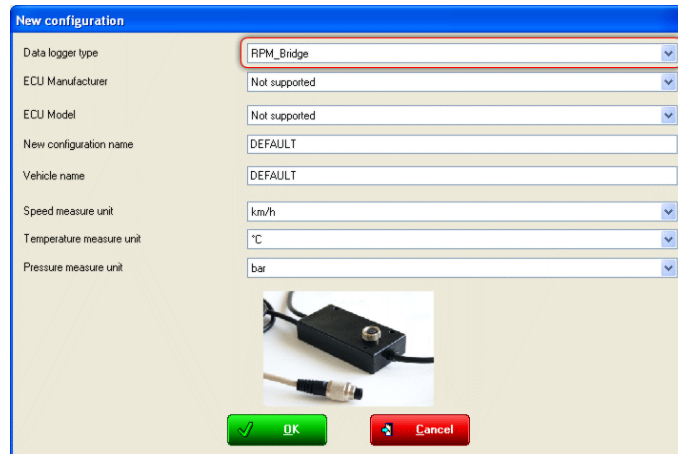
- select **RPM Bridge** in the drop down menu, fill in the panel and press OK.

The system comes back to "System manager" window. Enable "System Configuration" layer.

In case an AIM Display is available it needs configuration: activate "Display" layer and select the right display. Refer to **Race Studio Configuration** user manual to know how to configure each display.

5.1 – How to transmit the configuration

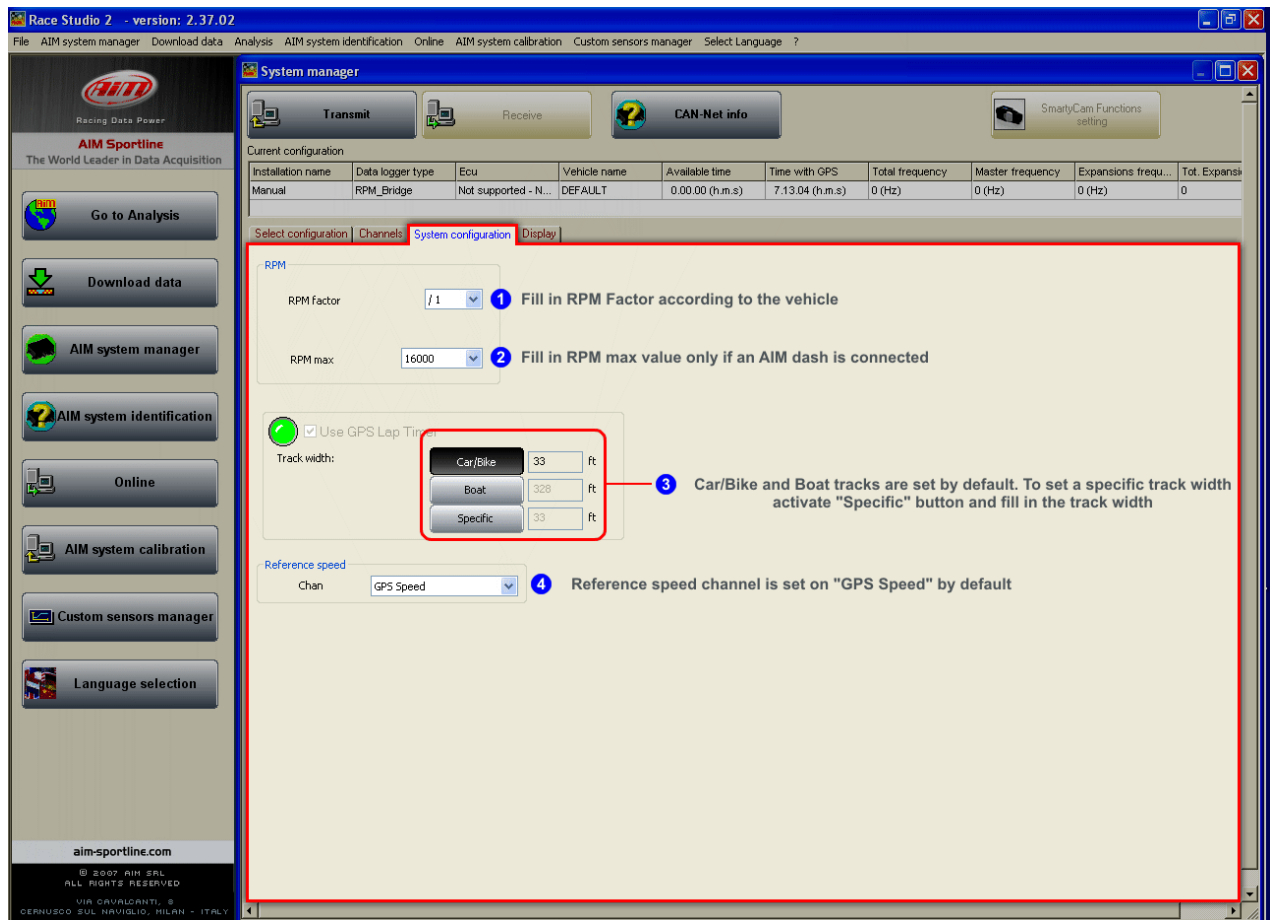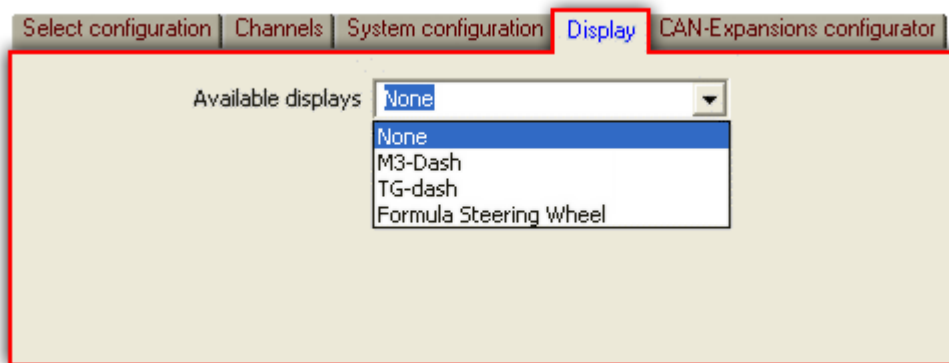To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in "System manager" window and the system will automatically transmit the configuration to the device.

5.1.1 – Possible problems while transmitting the configuration

While transmitting the configuration this error message can appear:

Check that the USB cable is correctly plugged in the PC and in the device USB port, that the logger is switched on and try again transmitting the configuration.

5.2 – Online

When the configuration has been transmitted to the logger, it is suggested to enter "Online" pressing the corresponding button on the menu bar, on the left vertical keyboard to verify that all works properly. Ensure that **RPM Bridge** is switched on and well connected to the PC.

Appendix – Technical drawing

N.rev. / Rev. N.	Descrizione / Description		Data / date	Firma / Sign	Contr. da / Ckd. by

RPM Bridge pinout

White cable
RPM 150-450V

Black cable
GND

Blue cable
RPM 8-50V

Red cable
Vb out Max 0,1A

Black cable
GND

Red cable
+Vb ext

RPM Bridge

5 pins Binder 712
female connector pinout
Solder termination view

5 pins Binder 712 female connector pinout	
1	CAN+
2	GND
3	+Vb
4	CAN-
5	+Vbatt

5 pins
Binder 712
female connector

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.	
Progettato da / Designed by	Contr. da / Ckd. by	Approvato da / Approved by	Nome file / File name	Data / Date	Scala / Scale

Titolo / Title: Pinout RPM Bridge

Racing Data Power

N. disegno / Drawing N.		Rev. / Rev.	Foglio / Sheet
			1 of 1