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AiM Infotech

RPM Bridge USER MANUAL

Release 1.03







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	
Chapter 2 – RPM Bridge characteristics	4
Chapter 3 – Installation and powering	5
3.1 – How to receive the RPM signal	5
3.1.1 – Receiving the RPM signal from the ECU through a square wave signal	5
3.1.2 – Sampling the RPM signal from the coil: low voltage RPM input	6
Chapter 4 – Connecting RPM Bridge to AIM systems	
Chapter 5 – Configuring RPM Bridge	9
5.1 – How to transmit the configuration	10
5.1.1 – Possible problems while transmitting the configuration	
5.2 – Online	10
Appendix – Technical drawing	11



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 connector¹);
- 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.



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.

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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.

New configuration		
Data logger type	RPM_Bridge	7
ECU Manufacturer	Not supported	-
ECU Model	Not supported	•
New configuration name	DEFAULT	
Vehicle name	DEFAULT	
Speed measure unit	km/h	-
Temperature measure unit	3"	-
Pressure measure unit	bar	•

• 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.

Race Studio 2 - version: 2.37.02										
ile AIM system manager Download data Analysis AIM system identification Online AIM system calibration Custom sensors manager Select Language ?										
	📓 System manag	er								
Racing Data Power	Trar	ısmit 📑) Receive		CAN-Net info			Sma	rtyCam Functions setting	<u>^</u>
AIM Sportline	u Current configuration					_				
The world ceader in Data Acquisition	Installation name	Data logger type	Ecu	Vehicle name	Available time	Time with GPS	Total frequency	Master frequency	Expansions frequ.	. Tot. Expansi
Go to Analysis	Manual Select configuration	RPM_Bridge	Not supported - N	DEFAULT	0.00.00 (h.m.s)	7.13.04 (h.m.s)	0 (Hz)	0 (Hz)	0 (Hz)	0
Download data	RPM RPM factor	/1	💌 1 Fill i	n RPM Facto	r according to	the vehicle				
AIM system manager	RPM max	16000	💌 2 Fill i	n RPM max v	alue only if an	AIM dash is c	onnected			
AIM system identification	C ₪ Use Track width:	GPS Lap Timer	Car/Rike 33	ft						
Conline			Boat 328 Specific 33	ft ft	3 Car/Bike	and Boat trac activate "S	cks are set by pecific" buttor	default. To se n and fill in the	t a specific tra track width	ck width
AIM system calibration	Reference speed Chan	GPS Speed	4	Reference	speed channe	el is set on "Gl	PS Speed" by	default		
Custom sensors manager										
Language selection										
aim-sportline.com										
ALL RIGHTS RESERVED										-
VIA CAVALCANTI, 8 CERNUSCO SUL NAVIGLIO, MILAN - ITALY	4									



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.

Select configuration Channels System configuration Display CAN-Expansions configurator
Available displays None
None M3-Dash
TG-dash Formula Steering Wheel
romad seconing wheel

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.

Race	StudioConf	
⚠	Impossible to communicate with da	ta logger!
	ОК	

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