MARELLI SRA ECU

Racing Data Power

INTRODUCTION

AIM has developed special applications for many of the most popular ECUs; by special applications we mean user-friendly systems which allow to easily connect your ECU to our high tech data loggers: user needs only to install harness between the **logger** and the ECU.

Once connected, the logger displays (and/or records, depending on the logger and on the ECU data stream and configuration) values like RPM, engine load, throttle position (TPS), air and water temperatures, battery voltage, speed, gear, lambda value (air/fuel ratio) analog channels…

All AIM loggers include – free of charge – **Race Studio 2** software, a powerful tool to configure the system and analyze recorded data on your PC.

Warning: once the ECU is connected to the logger, it is necessary to set it in the logger configuration in Race Studio 2 software.
Select Manufacturer "Marelli" Model "SRA_SRAE_SRT".
Refer to Race Studio Configuration user manual for further information concerning the loggers configuration.

Warning: it is always suggested to verify if the ECU needs any software/firmware setting or upgrade to export data to an external logger.

Chapter 1 – Technical communication notes

Marelli SRA 1 ECU communicates with AIM loggers via CAN bus. This requires careful check of hardware parameters and adequate software setting (see below).

1.1 – Hardware check

Marelli CAN line works with four wires: CAN High (corresponding to AIM CAN+), CAN low (corresponding to AIM CAN-), Battery+ (corresponding to AIM 9-15VDC) and Battery- (corresponding to AIM GND). It is crucial to make sure:

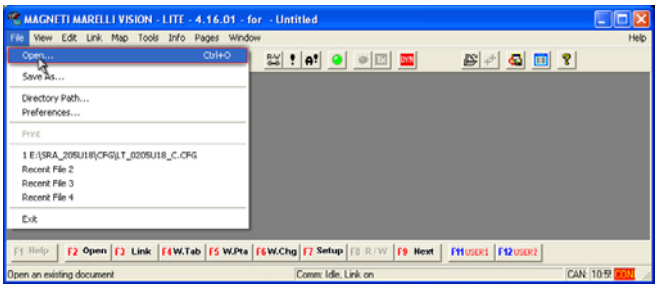
- that a 120 Ohm "line-end resistor" is installed between CAN+ and CAN-; use a multimeter; disconnect AIM logger from the ECU and make this check on both sides (ECU and logger);
- that the amplitude of each bit is 2V (or at least 1.8V); using a scope ground the probe on CAN- while measuring CAN+. Please ensure that no filtering feature is enabled on the scope: this because of high baud rate of this line.

1.2 – Software settings

To enable Marelli SRA communication with AIM loggers it is necessary to set the ECU via software using Marelli "Vision" software.

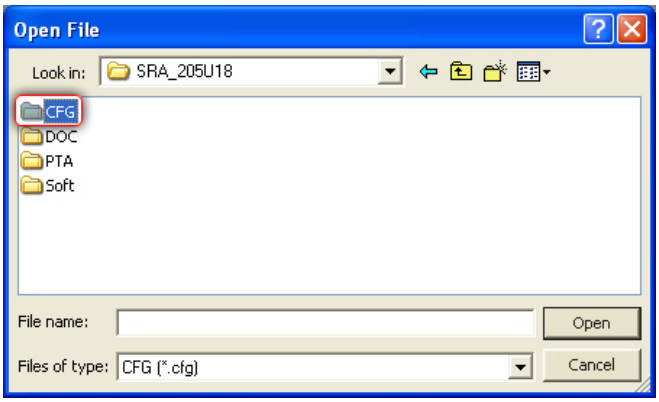
First of all run Marelli "Vision" software.

Press "File" on the menu bar and select "Open" option as shown here on the right.

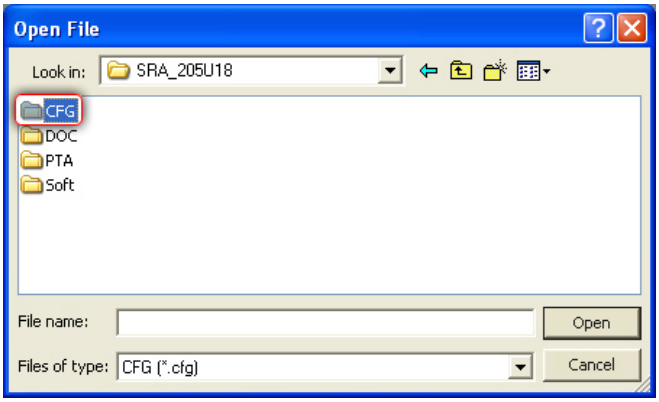


"Open file" window appears.

Select "SRA_xxxxxx.CFG".

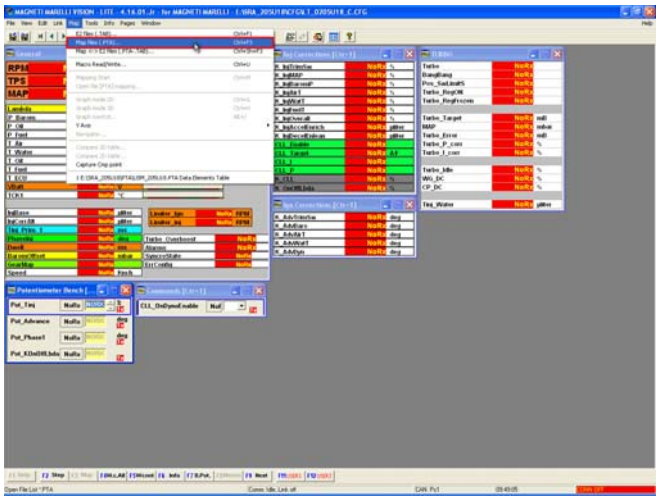


Select the configuration to open and click “Open”



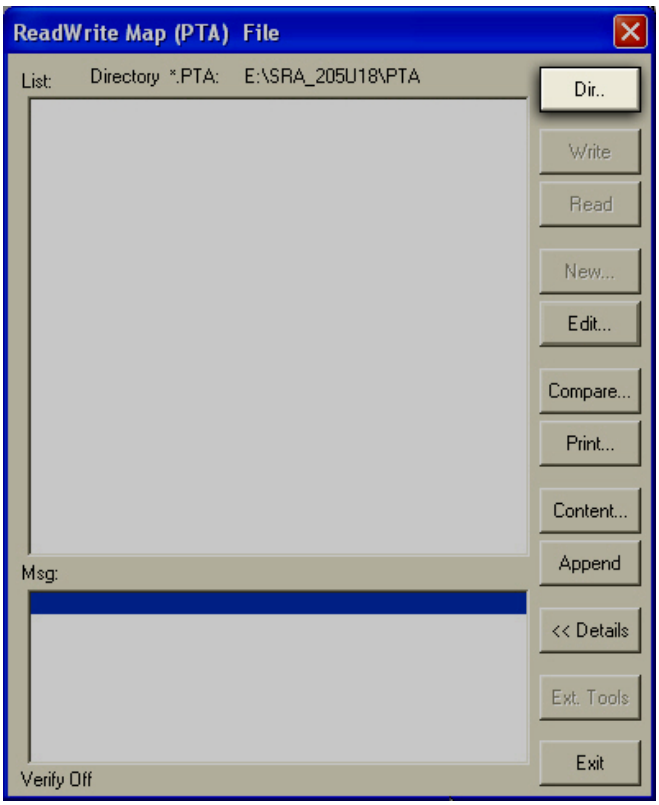
“Vision” software main window appears.

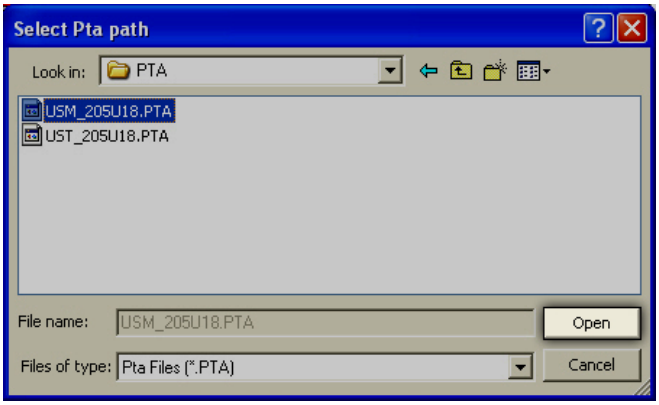
Click “Map” on the menu bar and select “Map files (PTA)..” option as shown here on the right.



“ReadWrite Map (DTA) File” window appears.

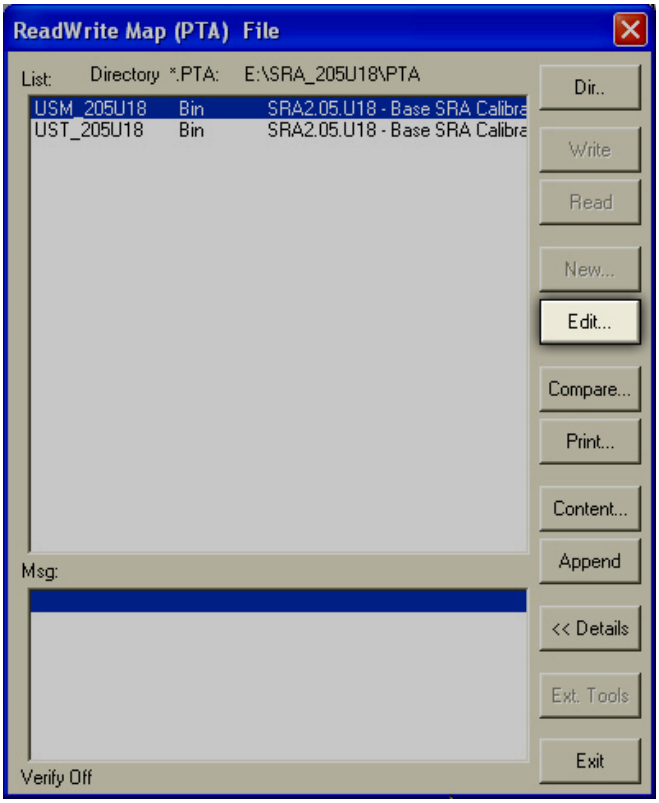
Click “Dir…”.





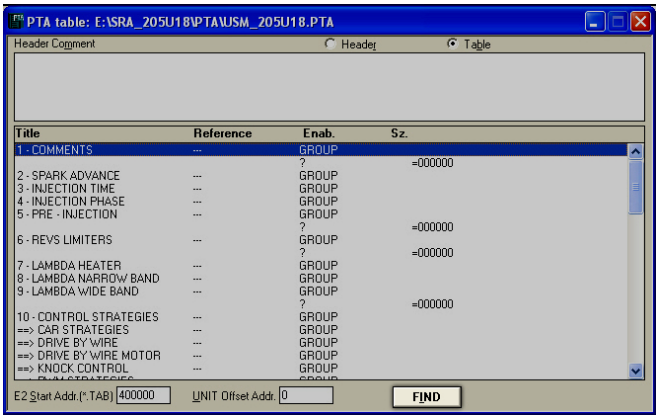
"Select PTA path" window appears.

Select the file to open and click "Open".



"ReadWrite Map (DTA) File" window appears.

Click "Edit…".



"PTA Table" window appears.

Click "Find".

"Find table name/reference" window appears: fill in "Data Elements" and click "OK".

If "Find table name/reference" window appears click "No".

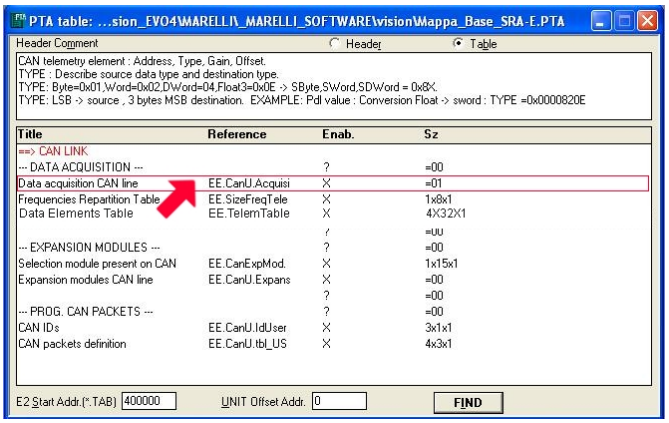
Now it is necessary to set the following parameters:

- 1 – Data acquisition CAN line.
- 2 – Frequencies Repartition Table.
- 3 – Data Elements Table.

1.2.1 – "Data acquisition CAN line" setup

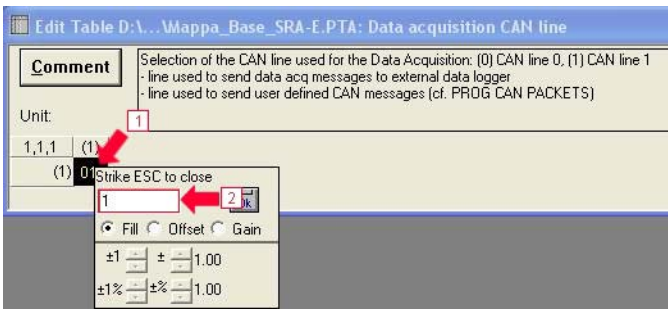
The first step to set Marelli SRA ECU is CAN selection:

Double click "Data acquisition CAN line".



To change table value:

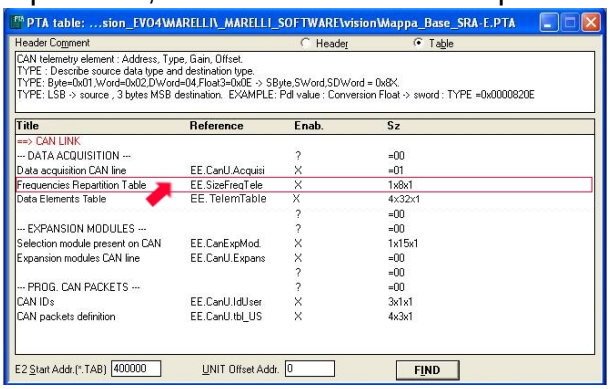
- right click on the highlighted cell shown on the right;
- Select "FILL";
- Put the desired value (0/1).
- Click "ok" to confirm
- Click "ESC" to come back to the starting point.



1.2.2 – "Frequencies Repartition Table" setup.

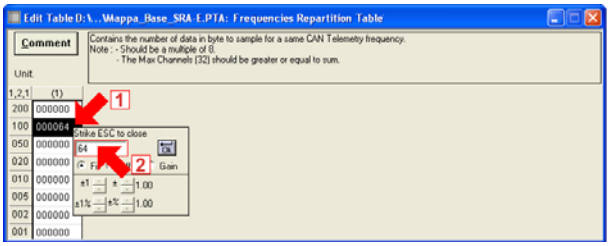
This table allows to select data transmission frequencies; to set it follow these steps:

Double click "Frequencies Repartition Table".



To change table value:

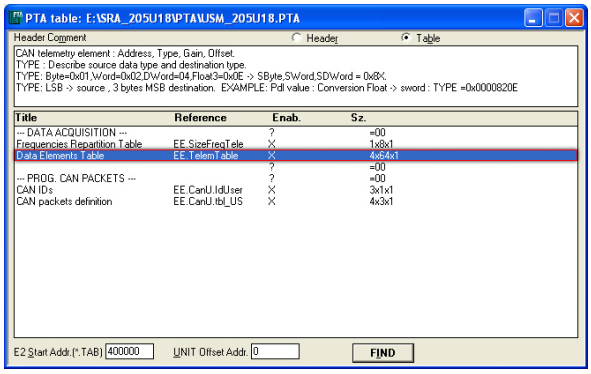
- right click on the highlighted cell shown on the right;
- Select "FILL";
- Put the desired value (Es: 64);
- Click "ok" to confirm.



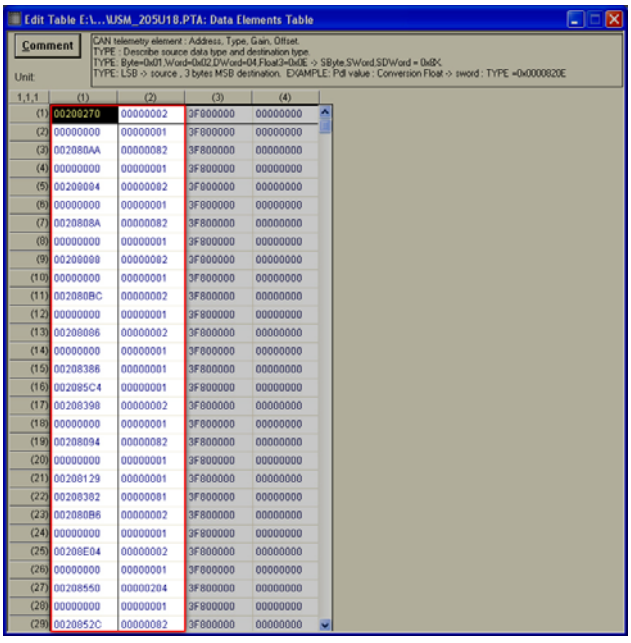
1.2.3 – "Data Elements Table" setup.

This table allows to setup ECU Channels.

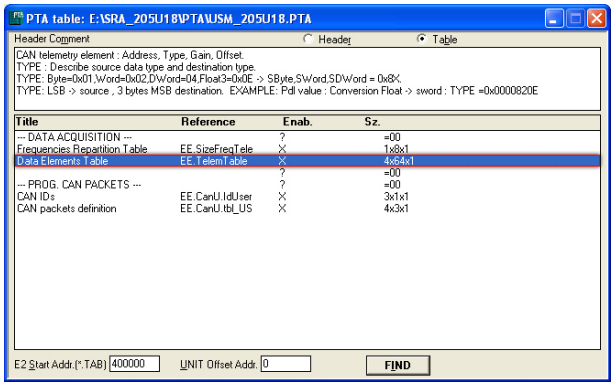
Double click "Data Elements table".



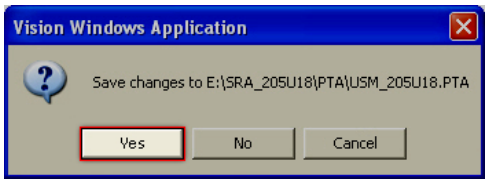
The table is called "Data elements table" and is made up of 4 columns: "ADDRESS", "TYPE", "GAIN" and "OFFSET". Each row corresponds to an ECU channel; to set the table it is necessary to put in the columns all digits of the table reported in paragraph 1.3, then close the window.



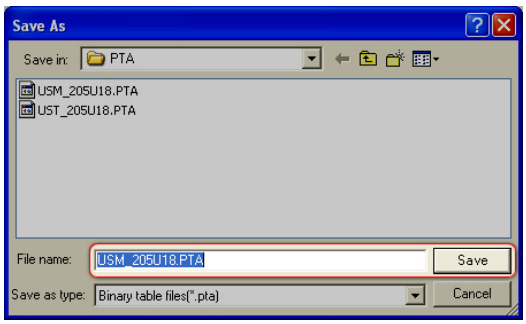
The system comes back to the previous window. Quit (clicking on the top right red cross).



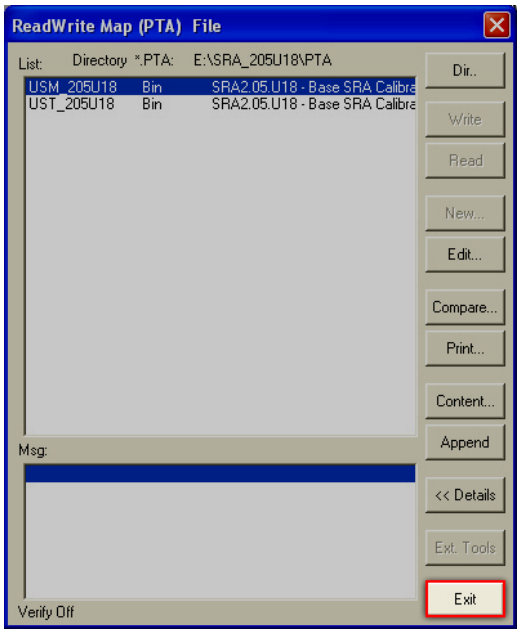
“Vision Application window” appears, asking to save changes. Click “Yes”.



“Save as” window appears. Fill in file name, select file destination folder and click “Save”.



“ReadWrite Map (PTA) file” window appears again. Click “Exit”.



Click “Tx” button on the toolbar to transmit the configuration to the ECU.

Warning: when transmission is over it is possible to connect Marelli SRA ECU to AIM logger using the preferred CAN channels. It is recommended to use CAN1.

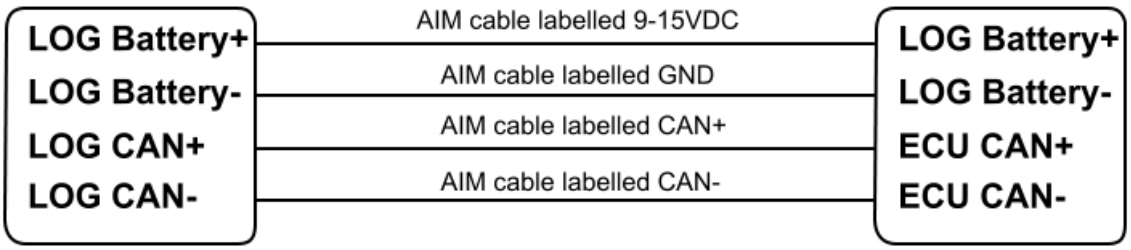
1.3 – Data elements table for Marelli SRA

COUNTER	ADDRESS	TYPE	GAIN	OFFSET
1	00208270	00000002	3F800000	00000000
2	00000000	00000001	3F800000	00000000
3	00208080	00000082	3F800000	00000000
4	00000000	00000001	3F800000	00000000
5	0020808C	00000082	3F800000	00000000
6	00000000	00000001	3F800000	00000000
7	002080A0	00000082	3F800000	00000000
8	00000000	00000001	3F800000	00000000
9	0020808A	00000082	3F800000	00000000
10	00000000	00000001	3F800000	00000000
11	002080A8	00000082	3F800000	00000000
12	00000000	00000001	3F800000	00000000
13	00208088	00000082	3F800000	00000000
14	00000000	00000001	3F800000	00000000
15	00208086	00000082	3F800000	00000000
16	00000000	00000001	3F800000	00000000
17	00208084	00000082	3F800000	00000000
18	00000000	00000001	3F800000	00000000
19	002080A4	00000082	3F800000	00000000
20	00000000	00000001	3F800000	00000000
21	002080BC	00000002	3F800000	00000000
22	00000000	00000001	3F800000	00000000
23	00208392	00000082	3F800000	00000000
24	00000000	00000001	3F800000	00000000
25	00208082	00000082	3F800000	00000000
26	00000000	00000001	3F800000	00000000
27	0020808E	00000082	3F800000	00000000
28	00000000	00000001	3F800000	00000000
29	002080AA	00000002	3F800000	00000000
30	00000000	00000001	3F800000	00000000
31	00208094	00000082	3F800000	00000000

32	00000000	00000001	3F800000	00000000
33	002080B4	00000002	3F800000	00000000
34	00000000	00000001	3F800000	00000000
35	002080BA	00000002	3F800000	00000000
36	00000000	00000001	3F800000	00000000
37	00208E04	00000002	3F800000	00000000
38	00000000	00000001	3F800000	00000000
39	002080A6	00000082	3F800000	00000000
40	00000000	00000001	3F800000	00000000
41	00208D25	00000001	3F800000	00000000
42	00208D26	00000001	3F800000	00000000
43	00208D17	00000001	3F800000	00000000
44	00208D18	00000001	3F800000	00000000
45	00208846	00000001	3F800000	00000000
46	00208845	00000001	3F800000	00000000
47	0020883D	00000001	3F800000	00000000
48	00208130	00000001	3F800000	00000000
49	00208385	00000001	3F800000	00000000
50	00208383	00000001	3F800000	00000000
51	00208381	00000001	3F800000	00000000
52	002085B7	00000001	3F800000	00000000
53	002085B8	00000001	3F800000	00000000
54	002085B6	00000001	3F800000	00000000
55	002085B5	00000001	3F800000	00000000
56	00208386	00000001	3F800000	00000000
57	002080B0	0000820E	3F800000	00000000
58	00000000	00000001	3F800000	00000000
59	00208A18	0000820E	3F800000	00000000
60	00000000	00000001	3F800000	00000000
61	00000000	00000001	3F800000	00000000
62	00000000	00000001	3F800000	00000000
63	00000000	00000001	3F800000	00000000
64	00000000	00000001	3F800000	00000000

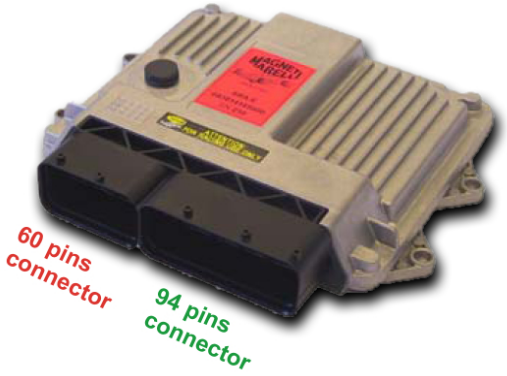
Chapter 2 – Marelli CAN Communication setup

Magneti Marelli SRA ECU is equipped with a CAN communication setup used to communicate parameters to an external logger: it is shown here below.



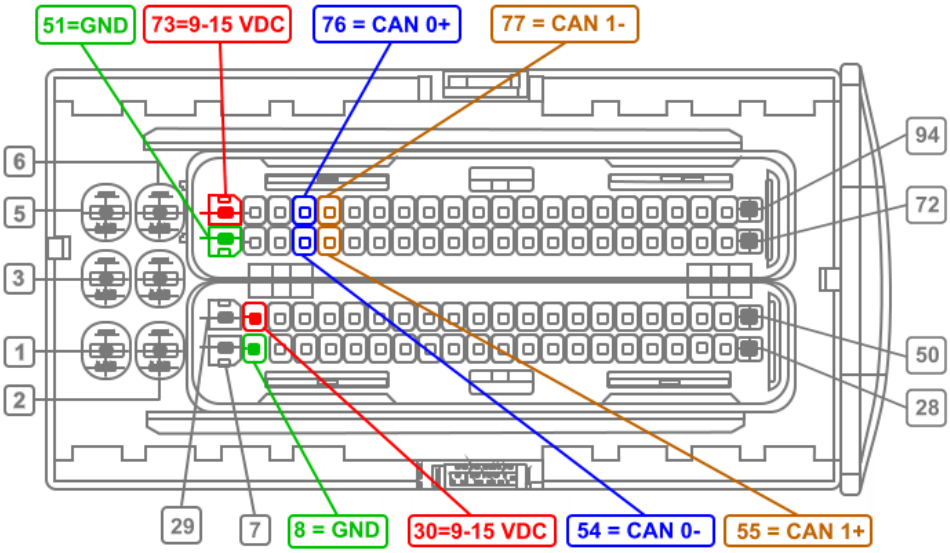
Chapter 3 – Connection to AIM loggers

Magneti Marelli SRA ECU is equipped with two front connectors, a 60 pins connector and a 94 pins one shown here below.



The connector used to connect Magneti Marelli SRA ECU to AIM logger is the 94 pins one.

To connect a Marelli ECU to an AIM logger it is possible to use both CAN0 and CAN1, though AIM suggests to use CAN1 (keep in mind to select on Marelli software the choice - See the related paragraph).



To connect Magneti Marelli SRA ECU to AIM loggers using CAN1:

- connect AIM cable labelled CAN+ to pin 55 (CAN1+) of the 94 pins connector;
- connect AIM cable labelled CAN- to pin 77 (CAN1-) of the 94 pins connector;
- connect AIM cable labelled GND to pin 8 or 51 (Battery negative pole) of the 94 pins connector;
- connect AIM cable labelled 9-15 VDC to pin 30 or 73 (Battery positive pole) of the 94 pins connector

To connect Magneti Marelli SRA ECU to AIM loggers using CAN0:

- connect AIM cable labelled CAN+ to pin 76 (CAN0+) of the 94 pins connector;
- connect AIM cable labelled CAN- to pin 54 (CAN0-) of the 94 pins connector;
- connect AIM cable labelled GND to pin 8 or 51 (Battery negative pole) of the 94 pins connector;
- connect AIM cable labelled 9-15 VDC to pin 30 or 73 (Battery positive pole) of the 94 pins connector

Chapter 4 – Communication protocol

Channels received by AIM loggers connected to Magneti Marelli SRA ECU are:

ID	CHANNEL NAME	FUNCTION
ECU_1	SRA_RPM	RPM
ECU_2	SRA_TPS1	Throttle position sensor bank 1
ECU_3	SRA_PDL1	Active throttle position
ECU_4	SRA_WTEMP	Engine coolant temperature
ECU_5	SRA_OILP	Oil pressure
ECU_6	SRA_OILT	Oil temperature
ECU_7	SRA_FUELP	Fuel pressure
ECU_8	SRA_ATMP	Atmospheric pressure
ECU_9	SRA_MAP	Manifold air pressure
ECU_10	SRA_AIRT	Intake air temperature
ECU_11	SRA_AFR	Air fuel ratio
ECU_12	SRA_ADV	Ignition advance
ECU_13	SRA_TPS2	Throttle position sensor bank 2
ECU_14	SRA_PDL2	Active throttle position
ECU_15	SRA_TPS	Throttle position sensor
ECU_16	SRA_TCK1	Thermocouple 1
ECU_17	SRA_GEAR	Engaged gear
ECU_18	SRA_LAMBDAmV	Lambda value in mV
ECU_19	SRA_SPEED	Speed
ECU_20	SRA_TFUEL	Fuel temperature
ECU_21	SRA_KINGFIL	Injection Correction During Upshift
ECU_22	SRA_KTEATFIL	Advance Correction F (Upshift)
ECU_23	SRA_PWM1	Duty cycle of Pwm1
ECU_24	SRA_PWM2	Duty cycle of Pwm2
ECU_25	SRA_DPV	Derivative pressure
ECU_26	SRA_DWG	Duty cycle waste gate
ECU_27	SRA_PRLD	Rotary switch position for bang bang start limiter
ECU_28	SRA_ITSP	Injection trim switch position
ECU_29	SRA_ASTP	Absolute throttle position (default 90%)
ECU_30	SRA_KAWT	Coefficient engine cooling temperature multiplier
ECU_31	SRA_KABARO	Ign coefficient barometric pressure multiplier (Cranking)
ECU_32	SRA_IKTA	Coefficient intake air temperature multiplier (Cranking)
ECU_33	SRA_IKTF	Coefficient Fuel temperature multiplier (Cranking)
ECU_34	SRA_IKBARO	Inj. coefficient barometric pressure multiplier (Cranking)
ECU_35	SRA_IKADM	Injection correction F (Padmission)
ECU_36	SRA_CLAV	Advance Correction F (Trimmer Position)
ECU_37	SRA_PDL	Active throttle position
ECU_38	SRA_TPSE	Throttle position sensor (Encoder)