MARELLI SRA ECU







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".

MAGNETI MARELLI VISION - LITE - 4.16.01 - for - Untitled	
File Wew Edit Link Map Tools Info Pages Window	Help
Save Ra	
Directory Path Preferences	
Print	
1 E:\\$RA_205U18\CFG]LT_0205U18_CCFG	
Recent File 2	
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Ext	
PI Help I 2 Open I 2 Link FIW.Tab IS W.Pta I 6W.Chg I7 Setup F0 RTW I 9 Hext MUSORI F2USOR2	
Open an existing document Comm: Idle, Link on CAR	t 10.57 👥 🕢
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	_
(CFG)	
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☐ PTA	
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File name:	000
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Select the configuration to open and click "Open"

Open File		? 🗙
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File name:		Open
Files of type:	CFG (*.cfg)	Cancel



"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...".



ReadWrite Map	(PTA)	File		
List: Directory *	PTA:	E:\SRA_205U18\	PTA	Dir
USM_205U18 UST_205U18	Bin Bin	SRA2.05.U18 - SRA2.05.U18 -	Base SRA Calibr Base SBA Calibr	
00.77000.1	0	0.1.12.00.2.12	Duco or a realized	Write
				Read
				New
				Edit
				Compare
				Print
				Content
				Angend
Msg:				
				<< Details
				Ext. Tools
Verify Off				Exit
rony on				
PTA table: E:\SRA_205U	18\PTA\US	M_205U18.PTA		
Treader common		* House	** Topio	
	D=(Fact	0	
1 ite 1 - COMMENTS		ce Enab. GROUP	-900000	
2 - SPARK ADVANCE 3 - INJECTION TIME		GROUP GROUP GROUP		=
5 - PRE - INJECTION		GROUP ?	=000000	-
6 - REVS LIMITERS		GROUP ? GBOUP	=000000	
8 - LAMBDA NARROW BAND 9 - LAMBDA WIDE BAND		GROUP	200000	
10 - CONTROL STRATEGIES ==> CAR STRATEGIES		GROUP GROUP	=00000	
==> DRIVE BY WIRE ==> DRIVE BY WIRE MOTOR		GROUP GROUP GROUP		
E2 Start Addr.(*.TAB) 400000	<u>U</u> NIT Offs	et Addr. 0	FIND	`

"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".

Find next tabl	e name/r	efe 🗙
Search again ?	No	Yes

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

Double click "Data acquisition CAN line".

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

PA table:sion_EVO4\M/	RELLIN_MARELLI_	SOFTWARE\visi	on\Mappa_Base_SRA-E.PTA	
Header Comment		C Header	Table	
CAN telemetry element : Address, Typ TYPE : Describe source data type and TYPE : Byte=0x01, Word=0x02, DWord TYPE : LSB -> source , 3 bytes MSB of	e, Gain, Offset. d destination type. =04,Float3=0x0E -> SB lestination. EXAMPLE:	yte,SWord,SDWord Pdl value : Convers	I = 0x8X. ion Float -> sword : TYPE =0x0000820E	
Title	Reference	Enab.	Sz	
==> CAN LINK				
DATA ACQUISITION		?	=00	
Data acquisition CAN line	EE.CanU.Acquisi	×	=01	
Frequencies Repartition Table	EE.SizeFreqTele	×	1x8x1	
Data Elements Table 🛛 🤍	EE.TelemTable	х	4X32X1	
		1	=00	
EXPANSION MODULES		?	=00	
Selection module present on CAN	EE.CanExpMod.	×	1x15x1	
Expansion modules CAN line	EE.CanU.Expans	×	=00	
		?	=00	
PROG. CAN PACKETS		?	=00	
CAN IDs	EE.CanU.IdUser	X	3x1x1	
CAN packets definition	EE.CanU.tbl_US	X	4x3x1	
E2 <u>S</u> tart Addr.(*.TAB) 400000	UNIT Offset Addr.	0	FIND	

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.

Hea	der Comment		01 14 (05)	_200010.11	″ С н	eader	¢	Table	L L	
CAN	I telemetro ele	ment : Address T	vne Gain Offs	et		loggoj		Table		
TYF	E:Describe:	ource data type	and destination	type.						
TYP	PE: Byte=0x01 PE: LSB -> sou	,Word=0x02,DW irce , 3 bytes MSE	ord=04,Float3=1 3 destination. E	0x0E -> SByte,S\ XAMPLE: PdI v	word alue	I,SDWord = : Conversio	∘0x8X. n Float -> sw	ord : TYPE =0:	(0000820E	
Title	8		Reference	Ena	b.	S	2.			
D	ATA ACQUIS	ITION		?			=00			
Fred	quencies Repi a Elements Ta	artition Table	EE.SizeFreq EF.TelemTa	Tele X ble X	_		1x8x1 4x64x1			
			E.E. Forontina	?			=00			
CAN	HUG. CAN P/ IDs	AUKETS	EE.CanU.Id	Jser X			=00 3x1x1			
CAN	I packets defi	nition	EE.CanU.tbl	_US X			4x3x1			
520		m [400000	LINUT OF	A 44 0	٦	Г	FINID	1		
E25	(tart Addr.(*, 1 A	AB) 400000	UNIT Uffset	Addr. U		L	FIND			
_										
Edit 1	Table E:\\	USM_205U18.	PTA: Data E	lements Table						
omn	CAN	telemetry element	: Address, Type	, Gain, Offset.	-					
201111	TYP	E : Describe source	e data type and	destination type.	. CE	the Chilard	Distant - De	ev.		
uit:	TYP	E: LSB -> source .	3 bytes MSB de	estination. EXAM	PLE:	Pdl value : I	Conversion F	loat -> sword : T	YPE =0x0000	820E
	(1)	1 (2)	(2)	(4)	1					
(15	(1)	(2)	(3)	(4)	-	1				
m	0000000000	00000002	35000000	00000000	-1					
(2)	00000000	00000001	37 800000	00000000	-					
(3)	002080AA	00000082	31800000	00000000						
(4)	00000000	00000001	3F800000	00000000						
(5)	00208084	00000082	3F800000	00000000						
(8)	00000000	00000001	3F800000	00000000						
(7)	0020808A	00000082	3F800000	00000000						
(8)	00000000	00000001	3F800000	00000000						
(9)	00209099	00000082	3F800000	00000000						
(10)	00000000	00000001	3F800000	00000000						
(11)	002080BC	00000002	3F800000	00000000						
(12)	00000000	00000001	3F800000	00000000						
(13)	00208086	00000002	3F800000	00000000						
(14)	00000000	00000001	3F800000	00000000						
(15)	00208386	00000001	3F800000	00000000						
(16)	002085C4	00000001	3F800000	00000000						
(17)	00208398	00000002	3F800000	00000000						
(18)	00000000	00000001	3F800000	00000000						
(19)	00208094	00000082	3F800000	00000000						
(20)	00000000	00000001	3F800000	00000000						
(21)	00208129	00000004	35800000	00000000						
(22)	00200129	00000001	35800000	00000000						
(22)	00200302	00000001	25 900000	00000000						
(23)	00208086	00000002	37800000	00000000						
(24)	00000000	0000001	37800000	00000000						
(25)	UU208E04	0000002	39,800000	00000000						
(26)	00000000	00000001	3F800000	00000000						
(27)	00208550	00000204	3F800000	00000000						
(28)	00000000	00000001	3F800000	00000000						
(29)	00208520	00000082	35800000	00000000	-					



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".

PTA table: E:\SRA_205U18\	PTA\USM_205U18.P	TA	
Header Comment CAN telemetry element : Address, Type TYPE : Describe source data type and TYPE: Byte=0x01,Word=0x02,DWord= TYPE: LSB -> source , 3 bytes MSB de	; Gain, Offset. destination type. :04,Float3=0x0E -> SByte,S istination, EXAMPLE: Pdl \	C Header (* Table Word,SDWord = 0x8X. value : Conversion Float -> sword : TYF	'E =0x0000820E
Title I	Reference Ena	ab. Sz.	
TOATA ACQUISITION Frequencies Repartition Table Data Elements Table	E.SizeFreqTele X	=00 1x8x1 4x64v1	
PROG. CAN PACKETS CAN ID: E CAN packets definition E	? ?E.CanU.IdUser X E.CanU.IdLUS X	=00 =00 3xl xl 4x3xl	
E2 <u>S</u> tart Addr. (*. TAB) 400000	INIT Offset Addr. 0	F <u>I</u> ND	
Vision Windo	ws Applicatio e changes to E:\SI Yes r	n RA_205U18\PTA\USM_20 No Cancel	Х 5018.рта
Save As			?×
Save in: 🛅 PTA			.
団 USM_205U18.PTA 団 UST_205U18.PTA			
File name: USM_2	05U18.PTA		Save
Save as type: Binary t	able files(*.pta)	•	Cancel
ReadWrite Map	(PTA) File		
List: Directory *	PTA: E:\SRA_2	205U18\PTA 05 U18 - Base SBA Calibra	Dir
UST_205U18	Bin SRA2.	05.U18 - Base SRA Calibra	Write
			Read
			New
			E dit
			Compare
			Content
Msg:			Append
			<< Details
			Ext. Tools
Verify Off			Exit
r - Untitl	ed		
R-₩ 🚦	A! 🥝	🛬 Tx 🛛 DYN	

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	0000002	3F800000	0000000
2	0000000	0000001	3F800000	0000000
3	00208080	0000082	3F800000	0000000
4	0000000	0000001	3F800000	0000000
5	0020808C	00000082	3F800000	0000000
6	00000000	0000001	3F800000	0000000
7	002080A0	00000082	3F800000	0000000
8	00000000	0000001	3F800000	0000000
9	0020808A	0000082	3F800000	0000000
10	0000000	0000001	3F800000	0000000
11	002080A8	0000082	3F800000	0000000
12	0000000	0000001	3F800000	0000000
13	00208088	0000082	3F800000	0000000
14	0000000	0000001	3F800000	0000000
15	00208086	0000082	3F800000	0000000
16	0000000	0000001	3F800000	0000000
17	00208084	0000082	3F800000	0000000
18	0000000	0000001	3F800000	0000000
19	002080A4	0000082	3F800000	0000000
20	0000000	0000001	3F800000	0000000
21	002080BC	0000002	3F800000	0000000
22	0000000	0000001	3F800000	0000000
23	00208392	0000082	3F800000	0000000
24	0000000	0000001	3F800000	0000000
25	00208082	0000082	3F800000	0000000
26	0000000	0000001	3F800000	0000000
27	0020808E	00000082	3F800000	0000000
28	0000000	0000001	3F800000	0000000
29	002080AA	0000002	3F800000	0000000
30	0000000	0000001	3F800000	0000000
31	00208094	00000082	3F800000	0000000



32	00000000	0000001	3F800000	0000000
33	002080B4	0000002	3F800000	0000000
34	0000000	0000001	3F800000	0000000
35	002080BA	0000002	3F800000	0000000
36	00000000	0000001	3F800000	0000000
37	00208E04	0000002	3F800000	0000000
38	0000000	0000001	3F800000	0000000
39	002080A6	0000082	3F800000	0000000
40	0000000	0000001	3F800000	0000000
41	00208D25	0000001	3F800000	0000000
42	00208D26	0000001	3F800000	0000000
43	00208D17	0000001	3F800000	0000000
44	00208D18	0000001	3F800000	0000000
45	00208846	0000001	3F800000	0000000
46	00208845	0000001	3F800000	0000000
47	0020883D	0000001	3F800000	0000000
48	00208130	0000001	3F800000	0000000
49	00208385	0000001	3F800000	0000000
50	00208383	0000001	3F800000	0000000
51	00208381	0000001	3F800000	0000000
52	002085B7	0000001	3F800000	0000000
53	002085B8	0000001	3F800000	0000000
54	002085B6	0000001	3F800000	0000000
55	002085B5	0000001	3F800000	0000000
56	00208386	0000001	3F800000	0000000
57	002080B0	0000820E	3F800000	0000000
58	0000000	0000001	3F800000	0000000
59	00208A18	0000820E	3F800000	0000000
60	0000000	0000001	3F800000	0000000
61	0000000	0000001	3F800000	0000000
62	0000000	0000001	3F800000	0000000
63	0000000	0000001	3F800000	0000000
64	0000000	0000001	3F800000	0000000



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.

LOG Batterv+	AIM cable labelled 9-15VDC	LOG Batterv+
LOG Battery-	AIM cable labelled GND	LOG Battery-
	AIM cable labelled CAN+	
	AIM cable labelled CAN-	
LUG CAN-		ECU CAN-

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_IFUEL	Fuel temperature
ECU_21	SRA_KINGFIL	Injection Correction During Upshift
ECU_22	SRA_KIEAIFIL	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_IISP	Injection trim switch position
ECU_29	SRA_ASTP	Absolute throttle position (default 90%)
	SKA_KAVVI	Coefficient engine cooling temperature multiplier
	SRA_KABARU	Ign coefficient barometric pressure multiplier (Cranking)
	SRA_INTA	Coefficient Intake all temperature multiplier (Cranking)
		Los coefficient beremetric pressure multiplier (Cranking)
		Inj. coefficient barometric pressure multiplier (Cranking)
		Advance Correction F (Faulilission)
		Active throttle position
	STA_FUL SRA TOSE	Throttle position sensor (Encoder)
LCO_30		