AiM Infotech

### Marelli SRAE-SRT ECU

### Release 1.02







This tutorial explains how to connect Marelli SRAE and Marelli SRT ECUs to AiM devices.

# 1 Hardware check

All AiM devices have a 120 Ohm CAN termination resistor. Before connecting Marelli CAN bus to any of them check that only two termination resistors work on the CAN bus once the network is completed. With a multimeter check the resistance between CAN High (positive probe) and CAN Low (ground probe).

- If the reading is 120 Ohm: there is one termination resistor on the ECU site, no additional operations are required: connect AiM device to the vehicle CAN bus.
- If the reading is 50-60 Ohm: there are two termination resistors: either AiM termination resistor located on the wiring or one of the resistor located on the vehicle CAN bus are to be removed;
- If the reading shows a very high resistance (nearly infinite): no termination resistor is present: add a resistor on the ECU CAN bus and leave the one included in AiM device.

# 2 Software setup

Marelli SRAE and Marelli SRT ECUs need a software setting through "Magneti Marelli Vision" application to correctly communicate with AiM devices. Run it and follow carefully these instructions.

• Follow the path: File -> Open

📽 MAGNETI MARELLI VISION - LITE - 4.16.01 - 1	for - Untitled	
File View Edit Link Map Tools Info Pages Windo	w	Help
Open Save As	** • • • • • • • • • • • • • • • • • •	
Directory Path Preferences		
Print		
1 E:\SRA_205U18\CFG\LT_0205U18_C.CFG		
Recent File 2		
Recent File 3		
Recent File 4		
Exit		



• "Open File" panel appears -> Select "SRA\_XXXXX" folder -> Select "CFG" folder.

Open File			? 🗙
Look in: 🔁 SRA_	205U18	 * 💷 •	
DTA Soft			
File name:			Open
Files of type: CFG (*.c	fg)	<b>•</b>	ancel

• Select the configuration file to open -> Click "Open".

Open File	?	×
Look in: 🗁 CFG	- 🖬 📸 🖬 -	
T_0205U18_C.CFG		
File name: LT_0205U18_C.CFG	Open	
Files of type: CFG (*.cfg)		$\Box$



• Follow the path: Map -> Map files (PTA)...

<b>*</b> MAGNETI MARELL	I VISION - LITE - 4.16.01.Jr - for MAGNETI MARELL	I - E:\SRA_20	5U18\CFG\LT_0205U18_C.	.CFG			EB
File View Edit Link	Map Tools Info Pages Window						He
	E2 files (.TAB)	Ctrl+F1	R + A 🖬 🤊	1			
	Map files (.PTA) 📐	Ctrl+F3		]			
🧰 General	Map <-> E2 files (.PTATAB)	Ctrl+Sh+F3	👼 Inj Corrections [Ctr+1	] 🔤 🛛 🗙	TURBO		
RPM	Macro Read/Write	Ctrl+U	K InjTrimSw	NoRx %	Turbo	NoRx	
TRO	Mapping Start	Ctrl+M	K_InjMAP	NoRx %	BangBang	NoRx	
IPS I	Open file [PTA] mapping		K_InjBaromP	NoRx %	Pos_SwLimitS	NoRx	
MAP			K_InjAirT	NoRx %	Turbo_RegON	NoRx	
	Graph mode 2D	Ctrl+G	K_InjWatT	NoRx %	Turbo_RegFrozen	NoRx	
Lambda	Graph mode 3D	Ctrl+H	K_InjFueIT	NoRx %			
P Barom	Graph row/col	Alt+/	K_InjOverall	NoRx %	Turbo_Target	NoRx mB	
P Oil	Y Axis	•	K_InjAccelEnrich	NoRx pliter	MAP	NoRx mbar	
P Fuel	Navigator		K InjDecelEnlean	NoRx uliter	Turbo_Error	NoRx mB	
T Air	Compare 3D table		CLL_Enable	NoRx	Turbo_P_corr	NoRx %	
T Water	Compare 2D table		CLL Target	NoRx AF	Turbo_I_corr	NoRx %	
T Oil	Capture Cmp point		CLL_I	NoRx			
T Fuel	Capcaro cimp point		CLL_P	NoRx	Turbo_Idle	NoRx %	
T ECU	1 E:\SRA_205U18\PTA\USM_205U18.PTA Data Elements Table	e	K_CLL	NoRx %	WG_DC	NoRx %	
VBatt			K OnOffLbda	NoRx %	CP_DC	NoRx %	
TCK1	NoRx °C						
			📠 Ign Corrections [Ctr+1	] 🔤 🖂 🗙	Tinj_Water	NoRx µliter	

• ReadWrite Map (PTA) File panel appears: click "Dir.."

Read	Vrite Map	(PTA)	File	×
List:	Directory	*.PTA:	E:\SRA_205U18\PTA	Dir., N
USM	_205U18	Bin	SRA2.05.U18 - Base SRA Calibr	لخطتتها
UST	_205U18	Bin	SRA2.05.U18 - Base SRA Calibra	Write
				Read

• Select "PTA" folder -> Select the file to open -> Click "Open"

Select Pta path			? 🗙
Look in: 🗀 PTA		- 🕈 🖬 -	
USM_205U18.PTA			
File name: USM_205	U18.PTA	[	Open
Files of type: Pta Files (	*.PTA)	<b>•</b>	Cancel



• ReadWrite Map (PTA) File panel appears: click "Edit..."

Read	Write Map	(PTA)	File	
List:	Directory	*.PTA:	E:\SRA_205U18\PTA	Dir.
USN	4_205U18	Bin	SRA2.05.U18 - Base SRA Calibra SRA2.05.U18 - Base SRA Calibra	
	_203010	DIII	31 MZ.03.010 - Dase 31 M Calibre	Write
				Read
				New
				Edit

• PTA Table panel appears: click "FIND"

PTA table: E:\SRA_205U1	8\PTA\USM_2	05U18.PTA		
Header Co <u>m</u> ment		C Head	e <u>r</u> 🖲 Table	
Title	Reference	Enab.	Sz.	
1 - COMMENTS		GROUP		~
		?	=000000	
2 - SPARK ADVANCE		GROUP		
3 - INJECTION TIME		GROUP		
4 - INJECTION PHASE		GROUP		
5 - PRE - INJECTION		GROUP		_
		?	=000000	
6 - REVS LIMITERS		GROUP		
		?	=000000	
7 - LAMBDA HEATER		GRUUP		
8 - LAMBDA NARRUW BAND		GRUUP		
9 - LAMBDA WIDE BAND		GRUUP	000000	
		ć noun	=000000	
		CDOUD		
		CDOUD		
		GENIP		
		choup		<u>×</u>
E2 Start Addr.(*.TAB) 400000	<u>U</u> NIT Offset Ad	ldr. 0	FIND	



• Fill in "Data Elements" and if the panel re-appears click "No"

Find table name/refere	nce 🔀
Data Elements	ОК

It is now necessary to set these parameters:

- Data Acquisition CAN Line (paragraph 1.1)
- Frequencies repartition table (paragraph 1.2)
- Data Elements Table (paragraph 1.3)

## 2.1 Setup of Data acquisition CAN line

These Marelli ECUs features two CAN Lines; it is therefore necessary to set via software the CAN Line that will be used when connecting AiM devices.

• Double click "Data acquisition CAN line".

PTA table:sion_EVO4\W/	RELLIN_MARELLI_	SOFTWARE\visio	n\Mappa_Base_SRA-E.PTA 👘 🔳 🗖 🔀
Header Co <u>m</u> ment		C Heade <u>r</u>	Table
CAN telemetry element : Address, Typ TYPE : Describe source data type and TYPE: Byte=0x01,Word=0x02,DWord TYPE: LSB -> source , 3 bytes MSB d	e, Gain, Offset. d destination type. =04,Float3=0x0E -> SB lestination. EXAMPLE:	yte,SWord,SDWord = Pdl value : Conversio	= 0x8X. n 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	X	1x8x1
Data Elements Table	EE.TelemTable	Х	4X32X1
		?	=UU
EXPANSION MODULES		?	=00
Selection module present on CAN	EE.CanExpMod.	×	1x15x1
Expansion modules CAN line	EE.CanU.Expans	X	=00
		?	=00
PROG. CAN PACKETS		?	=00
CAN IDs	EE.CanU.IdUser	X	3x1x1
CAN packets definition	EE.CanU.tbl_US	×	4x3x1

Find next tab	le name/re	efe 🔀
Search again ?	No	Yes



To change the CAN line set by default – if necessary – follow these steps:

- right click on the cell highlighted in the image here below
- enable "fill" checkbox
- fill in the CAN line to be used (1 or 0)
- click "OK"
- Press "Esc"



# 2.2 Setup of Frequencies repartition table

To set the data transmission frequencies used by AiM devices follow these instructions.

• Double click "Frequencies repartition table"

PTA table:sion_EVO4\MA	RELLIN_MARELLI_	SOFTWARE\visio	n\Mappa_Base_SRA-E.PTA 👘 🔳 🗖	×			
Header Co <u>m</u> ment		O Header	Table				
CAN telemetry element : Address, Type, Gain, Offset. TYPE : Describe source data type and destination type. TYPE: Byte=0x01,Word=0x02,DWord=04,Float3=0x0E -> SByte,SWord,SDWord = 0x8X. TYPE: LSB -> source , 3 bytes MSB destination. EXAMPLE: PdI value : Conversion Float -> sword : TYPE =0x0000820E							
Title	Reference	Enab.	Sz				
==> CAN LINK							
DATA ACQUISITION		?	=00				
Data acquisition CAN line	EE.CanU.Acquisi	X	=01				
Frequencies Repartition Table	EE.SizeFreqTele	X	1x8x1				
Data Elements Table	EE.TelemTable	Х	4X32X1				



To properly set this table:

- right click on the cell highlighted in the image here below
- enable "fill" checkbox and fill in the desired frequency (for example 0x64)
- click "OK"
- Press "Esc"

📕 Edit Ta	ble D: \ Wappa_Base_SRA-E.PTA: Frequencies Repartition Table
<u>C</u> omm	Int Contains the number of data in byte to sample for a same CAN Telemetry frequency. Note : - Should be a multiple of 8. - The Max Channels (32) should be greater or equal to sum.
Unit.	
1,2,1 (	
200 0000	00 Right click here
100 0000	64 Shile ESC to along
050 0000	
020 0000	00 • Fill © Offset © Gain
010 0000	00 ±1 = ± = 1 m
005 0000	
002 0000	

### 2.3 Setup of Data Elements Table

This table sets ECU channels.

• Double click "Data Elements Table"

PTA table: E:\SRA_205U1	8\PTA\USM_205	U18.PTA				
Header Co <u>m</u> ment		C He	ade <u>r</u>	Table		
CAN telemetry element : Address, Type, Gain, Offset. TYPE : Describe source data type and destination type. TYPE: Byte=0x01,Word=0x02,DWord=04,Float3=0x0E -> SByte,SWord,SDWord = 0x8X. TYPE: LSB -> source , 3 bytes MSB destination. EXAMPLE: Pdl value : Conversion Float -> sword : TYPE =0x0000820E						
Title	Reference	Enab.	Sz.			
DATA ACQUISITION		?	=00			
Frequencies Repartition Table	EE.SizeFreqTele	×	1x8x1			
Data Elements Table	EE.TelemTable	X	4x64x1			
		?	=00			



The table that appears is made up of four columns that correspond to the four fields of each record. Each row corresponds to an ECU channel. Change cell digits as shown before, using values shown in the table of paragraph 1.4.

📕 Edit	Table E:\W	ISM_205U18.	PTA: Data Ele	ments Table				
<u>C</u> omr Unit:	Comment         CAN telemetry element : Address, Type, Gain, Offset. TYPE : Describe source data type and destination type. TYPE: Byte=0x01,Word=0x02,DWord=04,Float3=0x0E -> SByte,SWord,SDWord = 0x8X. TYPE: LSB -> source , 3 bytes MSB destination. EXAMPLE: Pdl value : Conversion Float -> sword : TYPE =0x0000820E							
1,1,1	(1)	(2)	(3)	(4)				
<del>()</del>	00208270	0000002	3F800000	00000000	~			
(2)	00000000	00000001	3F800000	00000000				
(3)	002080AA	00000082	3F800000	00000000				
(4)	00000000	00000001	3F800000	00000000				
(5)	00208084	00000082	3F800000	00000000				
(6)	00000000	00000001	3F800000	00000000			1,1,1 = Counter	
(7)	0020808A	00000082	3F800000	00000000			1 = Address	
(8)	00000000	00000001	3F800000	00000000			2 = Type 3 = Gain	
(9)	00208088	00000082	3F800000	00000000			4 = Offset	
(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	00000001	3F800000	00000000				
(22)	00208382	00000081	3F800000	00000000				
(23)	002080B6	00000002	3F800000	00000000				
(24)	00000000	00000001	3F800000	00000000				
(25)	00208E04	00000002	3F800000	00000000				
(26)	00000000	00000001	3F800000	00000000				
(27)	00208550	00000204	3F800000	00000000				
(28)	0000000	00000001	3F800000	00000000				
(29)	0020852C	00000082	3F800000	00000000	~			

When the table has been completely filled in and ESC is pressed again, the software comes back to the previous page: quit clicking on the red cross top right of the window.



It is necessary to save changes: click "Yes" and then fill in "Save as" panel and click "Save".

Vision V	/indows Appli	ication		×
?	Save changes t	:o E:\SRA_205U	18\PTA\USM_205	5U18.PTA
	Ves 🔒	No	Cancel	

Save As				?
Savein: 📔	PTA	 - 🗧 🖶	•	
図 USM_205U 図 UST_205U1	18.PTA 8.PTA			
			— r	Savak
File name:	J3M_200010.F1A			3010

Click "Exit"

Read	Write Map	(PTA)	File	X
List: USN	Directory 4_205U18	*.PTA: Bin	E:\SRA_205U18\PTA SRA2.05.U18 - Base SRA C	alibra
UST	r_205U18	Bin	SRA2.05.U18 - Base SRA Ca	Write
				Read
				New
				Edit
				Compare
				Print
				Content
Msg:				Append
				<< Details
				Ext. Tools
Verify	Off			Exit

Clix "Tx" to transmit the configuration to the ECU.

- Untitled
Ex ! A! 🕘 💌 🔣 🏧



COUNTER	ADDRESS	ТҮРЕ	GAIN	OFFSET
1	00210270	0000002	3F800000	00000000
2	0000000	0000001	3F800000	00000000
3	00210080	0000082	3F800000	00000000
4	0000000	0000001	3F800000	00000000
5	0021008C	0000082	3F800000	00000000
6	0000000	0000001	3F800000	00000000
7	002100A0	0000082	3F800000	00000000
8	0000000	0000001	3F800000	00000000
9	0021008A	0000082	3F800000	00000000
10	0000000	0000001	3F800000	00000000
11	002100A8	0000082	3F800000	00000000
12	0000000	0000001	3F800000	00000000
13	00210088	0000082	3F800000	00000000
14	0000000	0000001	3F800000	00000000
15	00210086	0000082	3F800000	00000000
16	0000000	0000001	3F800000	00000000
17	00210084	0000082	3F800000	00000000
18	0000000	0000001	3F800000	00000000
19	002100A4	0000082	3F800000	00000000
20	0000000	0000001	3F800000	00000000
21	002100BC	0000002	3F800000	00000000
22	0000000	0000001	3F800000	00000000
23	00210392	0000082	3F800000	00000000
24	0000000	0000001	3F800000	00000000
25	00210082	0000082	3F800000	00000000
26	0000000	0000001	3F800000	00000000
27	0021008E	0000082	3F800000	00000000
28	0000000	0000001	3F800000	00000000
29	002100AA	0000002	3F800000	00000000
30	0000000	0000001	3F800000	00000000
31	00210094	00000082	3F800000	00000000



32	0000000	0000001	3F800000	00000000
33	002100B4	0000002	3F800000	00000000
34	0000000	0000001	3F800000	00000000
35	002100BA	0000002	3F800000	00000000
36	0000000	0000001	3F800000	00000000
37	00210E06	0000002	3F800000	00000000
38	0000000	0000001	3F800000	00000000
39	002100A6	0000082	3F800000	00000000
40	0000000	0000001	3F800000	00000000
41	00210D25	0000001	3F800000	00000000
42	00210D26	0000001	3F800000	00000000
43	00210D17	0000001	3F800000	00000000
44	00210D18	0000001	3F800000	00000000
45	00210846	0000001	3F800000	00000000
46	00210845	0000001	3F800000	00000000
47	0021083D	0000001	3F800000	00000000
48	00210130	0000001	3F800000	00000000
49	00210385	0000001	3F800000	00000000
50	00210383	0000001	3F800000	00000000
51	00210381	0000001	3F800000	00000000
52	002105B7	0000001	3F800000	00000000
53	002105B8	0000001	3F800000	00000000
54	002105B6	0000001	3F800000	00000000
55	002105B5	0000001	3F800000	00000000
56	00210386	0000001	3F800000	00000000
57	002100B0	0000820E	3F800000	00000000
58	0000000	0000001	3F800000	00000000
59	00210A18	0000820E	3F800000	00000000
60	0000000	0000001	3F800000	00000000
61	0000000	0000001	3F800000	00000000
62	0000000	0000001	3F800000	00000000
63	0000000	0000001	3F800000	00000000
64	0000000	0000001	3F800000	00000000



### 3 Wiring connection

SRAE and SRT ECUs feature the same communication protocol based on CAN but the hardware is different.

- SRAE has two front connectors: a 60 pins and a 94 pins. The CAN bus is on the 94 pins connector.
- SRT has two front Deutsch connectors: AS218-35PA (with yellow ring) and AS218-35PN (with red ring). The CAN bus is on the AS218-35PA (yellow ring).

Here below you see the two ECUs – SRAE on the left and SRT on the right – with connectors indication and connector pinout.











#### Here is connection table

SRAE Connector pin	Pin function	AiM cable
56	CAN1 High	CAN High
78	CAN1 Low	CAN Low
80	CAN0 High	CAN High
58	CAN0 Low	CAN Low
SRT Connector pin	Pin function	AiM Cable
SRT Connector pin 21	<b>Pin function</b> CAN1 High	<b>AiM Cable</b> CAN High
SRT Connector pin 21 29	<b>Pin function</b> CAN1 High CAN1 Low	<b>AiM Cable</b> CAN High CAN Low
<b>SRT Connector pin</b> 21 29 40	Pin function CAN1 High CAN1 Low CAN0 High	<b>AiM Cable</b> CAN High CAN Low CAN High

Please note: remember to connect the CAN line you set in software setup (paragraph 1.1).

### 4 AiM device configuration

Before connecting the ECU to AiM device set this up using AiM Race Studio software. The parameters to select in the device configuration are:

- ECU manufacturer "Marelli"
- ECU Model "SRA\_SRAE\_SRT"



### 5 Available channels

Channels received by AiM devices connected to "Marelli" "SRA\_SRAE\_SRT" protocol 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 bank 1
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 bank 2
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 Up shift
ECU_22	SRA_KTEATFIL	Advance Correction F (Up shift)
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 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)