



TECHNICAL DOCUMENTATION	21/03/2007	ECU	Supported ECUs
Notes: ECUs communication protocols and loggers connection Version 1.21			

“ECU communication protocol”: general information

The “available channels list” you find inside Race Studio 2 “Configuration” window is inferred from the ECU’s communication protocol.

The communication protocol includes all the available channels of a generic Pectel/DTA etc. ECU. The channels you may sample among the “available channels list” are function of the ECU model, of the ECU configuration and of the wiring.

The number of channels that your data logger is able to sample depends on the ECU type and configuration, on the wiring and on the sensors connected to the ECU itself. To know which channels are acquired by your AIM logger, please check your Logger channel page in Race Studio 2 software, where all recorded channels are shown.

Please note: for specific information on ECUs pinout and wirings always refer to Your ECU user manual. Here follow some examples of ECU configuration and connection with AIM loggers; these information come from tests made by AIM research and development board or from our dealers or customers that have verified them.

“Supported ECUs”: general information

AIM loggers support both CAN and RS232 communication protocol ECUs.

To know if your ECU model and communication protocol is supported, please refer to the table next page:

CAN protocol	RS232 serial protocol
<ul style="list-style-type: none"> • ***AIM – Proprietary CAN Protocol • ***BMW – Mod. PT6 • ***BMW – Mod. Z4 Coupè • BMW_Mini – Mod. BMW_Mini • ***Bosch – Mod. Audi • Bosch – Mod. MS3 • Bosch – Mod. MS4 • ***Bosch – Mod. MS4 997 • Bosch – Mod. BoschVWGroup • Bosch – Mod. Porsche 911 (Mod. 996) • ***Bosch – Mod. Porsche 911 (Mod. 997) • ***Bosch – Mod. Seat Leon Cup • Brightwater – Mod. TyrePress4Sensor • Delphi – Mod. Mefi 4B • DTA – Mod. S60 • EFI EUROPE – Mod. EURO 1 • ***EFI EUROPE – Mod. EURO 4 • EFI EUROPE – Mod. EURO 6 • EFI EUROPE – Mod. EURO 12 • EFI EUROPE – Mod. EURO 96 • ***EFI EUROPE – Mod. EURO 6/12 New • Marelli – Customer Protocol • Marelli – Mod. FR2000 • ***Marelli – Mod. FR2000 JPN • Marelli – Mod. FR1600 • ***Marelli – Mod. MMTc2000 • Marelli – Mod. RSA • Marelli – Mod. Toyota • Marelli – Mod. ToyotaB • Mazda – Mod. RX8 (Denso) • ***Mazda – Mod. MX5 (Denso) • ***MBE – Mod. 992 • MecTronic – Mod. MK_E4 • MoTec – Mod. M400 • MoTec – Mod. M400 – 1M • MoTec – Mod. M600 • MoTec – Mod. M600 – 1M • MoTec – Mod. M800 • MoTec – Mod. M800 – 1M • MoTec – Mod. M800 – 1M V3 • Racetech – Mod. EM_46 • SEAT – Mod. ECU_1 • ***Sybele – Mod. CAN • Sodemo – Mod. EV_11 • TMS – Mod. TyrePress • TMS – Mod. TyrePress4Sensor 	<ul style="list-style-type: none"> • ***AIM – Proprietary RS232 protocol • ***AEM – Mod. RS232 • Autronic – Mod. SM2_V190/1 • Autronic – Mod. SMC_V191 • Autronic – Mod. SM2_V193/195 • Autronic – Mod. SM4 • Carmo – Mod. AFI_2003 • Carmo – Mod. AFI_2005 • DTA – Mod. P8 • DTA – Mod. P8V29 • DTA – Mod. P8V30 • EFI USA – Mod. 2.1 • EMS – Mod. Stinger • ***EMS – Mod. Stinger V123 • ***EMS – Mod. Stinger 4 • ***EMS – Mod. Stinger 8860 • GEMS – Mod. OMEX • ***Haltech – Mod. E11V2 • MBE – Mod. 967 • MBE - Mod. 970 • MoTec – Mod. M4 (DataSet5 and DataSet3) • MoTec – Mod. M 48(DataSet5 and DataSet3) • ***MoTec – Mod. M4-M48 (DataSet5 19200)*** • MoTec – Mod. M8 (DataSet1) • ***Nira – Mod. I3+ • Pectel – Mod. T2 • Pectel – Mod. T6 • Racetech – Mod. ENGMAN_18 • Sybele – Mod. RS232 • ***Walbro – Mod. Benelli 01 • ***Walbro – Mod. Benelli 04 • ***Walbro – Mod. Bimota • Wolf – Mod. WOLF3D

Note: (*)- Connection chapter under preparation.**

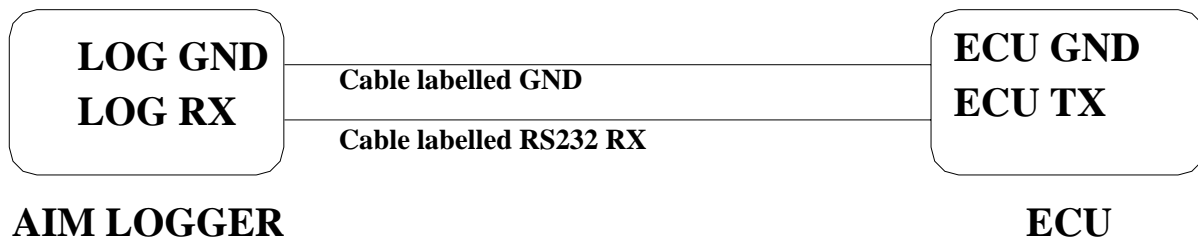
ECU connection: general information

Aim instruments can communicate with the ECU both with a **CAN** protocol and with an **RS232** protocol, using respectively a **CAN cable** or a **Serial cable**.

The connection is usually done as below explained:

- **Serial Communication Set-Up**

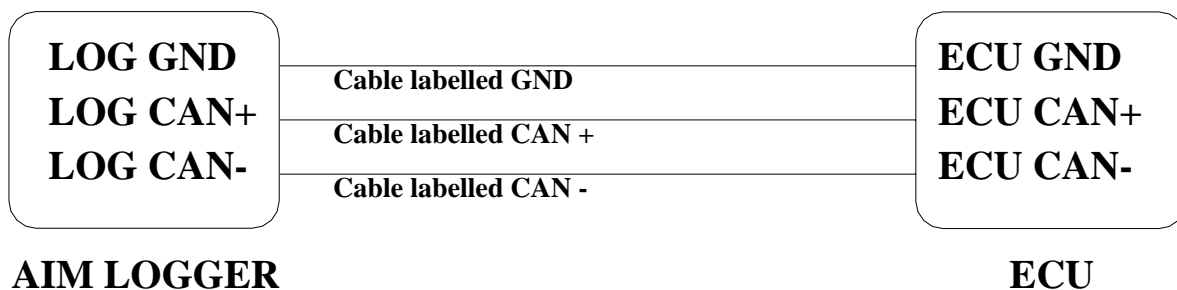
The usual connection is as follows: please connect cable called **RS232 RX** with **ECU TX** and cable called **GND** with **ECU GND** as in the figure below.



Please note: this setup is all right for almost all ECU communicating with **RS232** protocol; there can anyway be ECUs that need **LOG TX** cable to be connected to **ECU RX** too. For further information, please see paragraphs in the following pages, related to the single ECUs.

- **CAN Communication Set-Up**

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.



Please note: once your ECU is connected to the AIM Logger, you need to set it in the logger configuration in **Race Studio 2** software.

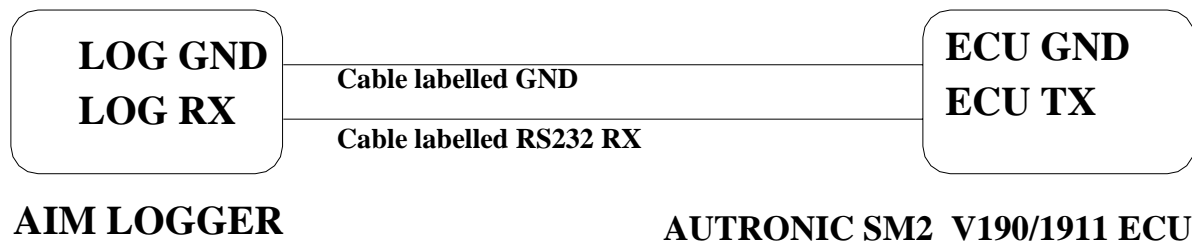
“AUTRONIC – SM2_V190/191 / SM2_V193/195 / SMC_V191”

- **Serial Communication Set-Up**

The ECU is has a serial communication protocol (RS 232) and is equipped with a 36 pins connector whose pinout is reported below used to communicate parameters to an external data logger, or to configure the ECU itself.

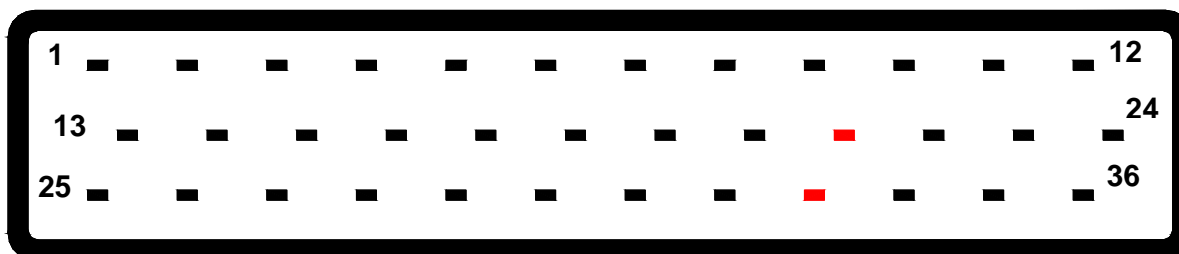
- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect AIM cable labelled as “**RS232RX**” with **pin 33** of the ECU (**ECU TX**), AIM cable labelled as “**GND**” with **pin 21** of the ECU (**ECU GND**) as in the draw below.



Pin	Function	Comments
21	GND	
33	RS232TX	

Here below is shown the 36 pins connector and its pinout.

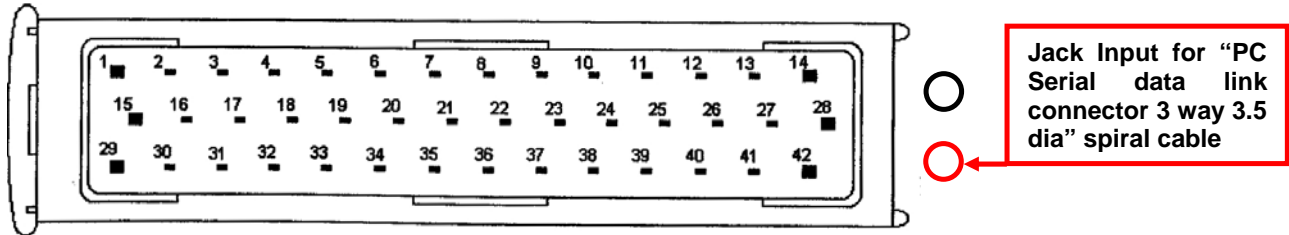


Pin	FUNCTION
1	Ignition O/P 7
2	Injector O/P 6
3	Injector O/P 4
4	Injector O/P 2
5	Injector O/P 1
6	Coolant Temp I/P
7	O2 I/P
8	Ref Trigger I/P
9	Serial I/O Rxd
10	Ignition O/P 4
11	Ignition O/P 2
12	Auxiliary O/P
13	ECU +12V supply
14	Injector O/P 8
15	Injector O/P 5
16	Injector O/P 3
17	Sensor GND
18	Throttle Position I/P
19	Throttle Position Supply
20	Trigger Supply
21	Serial I/O GND
22	Ignition O/P 3
23	Diagnostic O/P
24	Fuel Pump O/P
25	+12V Pump Rly Supply
26	+12V Aux O/P Supply
27	ECU GND
28	ECU GND
29	Ignition SW I/P
30	Air Intake Input I/P
31	Trigger GDN
32	Cyl Pulse Trigger I/P
33	Serial O/P Txd
34	GND
35	Ignition O/P 1
36	Ignition O/P

“AUTRONIC – SM4”

- **Serial Communication Set-Up**

The ECU has a serial communication protocol (RS 232) and is equipped with a 42 pins connector and two jack input on its right, as shown in the figure below.



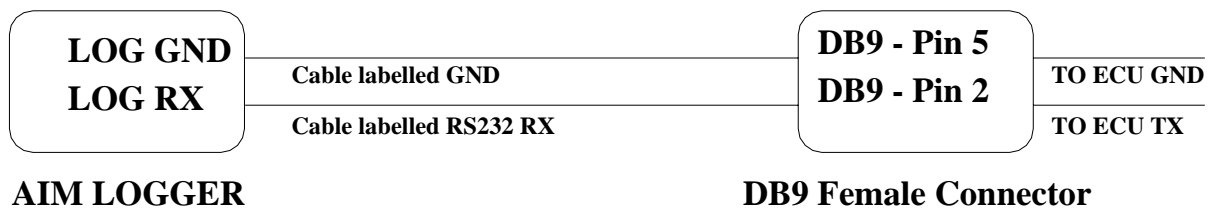
In the ECU package you find also a spiral cable, called “Pc Serial data link connector 3 way 3.5 dia” with a jack connector on one side, to insert in the right bottom jack input (drawn in red colour in the previous figure) and a DB9 female connector on the other side. To correctly connect your ECU to your AIM logger you have to connect your logger to the DB9 female connector.

Here below you see the “PC Serial data link” spiral cable.



- **Connection With AIM Data logger**

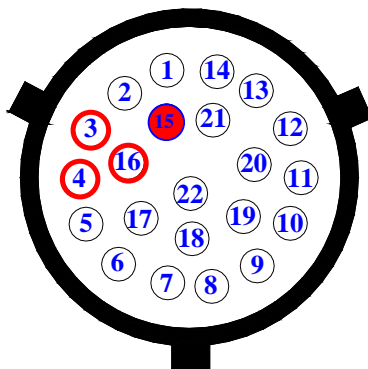
To connect Your AIM logger to the ECU, please connect AIM cable labelled as “**RS232RX**” with **pin 2** of the **DB9 female** connector (**that goes to ECU TX**), AIM cable labelled “**GND**” with **pin 5** of the **DB9 female** connector (**that goes to ECU GND**) as in the draw below.



Pin	Function	Comments
5	GND	
2	RS232TX	

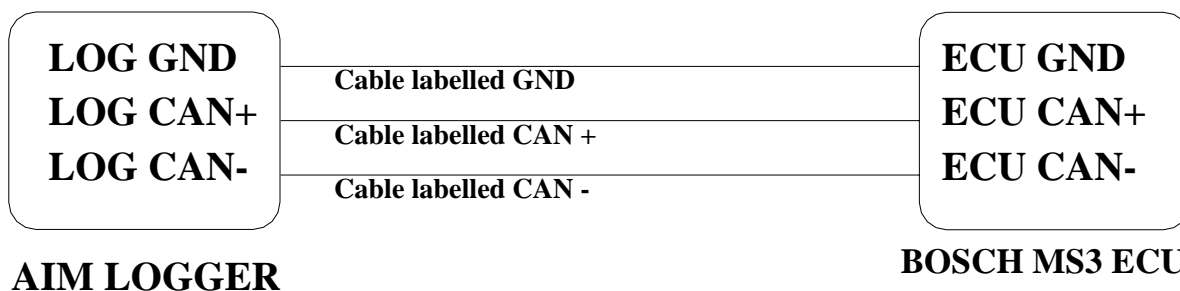
“BOSCH – MS3”

This ECU can be installed on Porsche 911 GT3 Cup cars.
 On Porsche 911 GT3 Cup cars that have this ECU you find a 22 pins Deutsch connector with red threading (Part Number RP 3759339), shown below.



- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **pin 4** of the ECU, cable labelled **CAN –** with **pin 16** of the ECU and cable labelled **GND** with **pin 3** of the ECU as shown in the figure below:

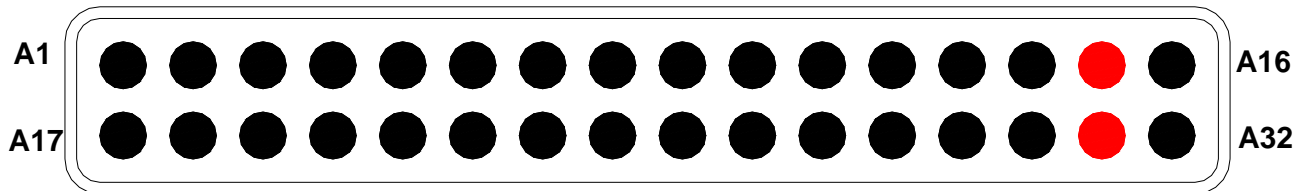


Pin	Function	Comments
4	CAN +	
16	CAN -	
3	GND	

Please note: if you want to **power** your **AIM logger** directly from the ECU, you can use **pin 15 of the ECU (+12V)**, highlighted with a red coloured circle in the figure below.

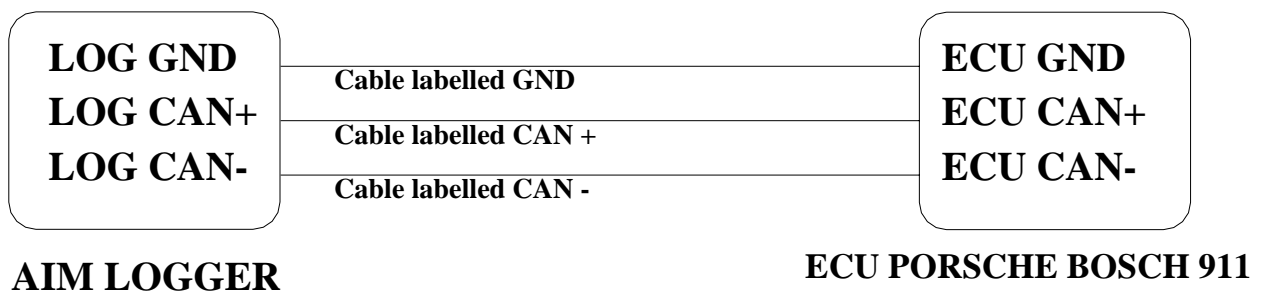
“BOSCH - PORSCHE 911 (Mod. 996)”

The ECU we call Bosch Porsche 911 is an ECU made by Bosch manufacturer and generally installed on Porsche 911 cars (996 model). This ECU has a CAN Protocol and is equipped with a 32 Pins green connector called “A” and used to communicate with an external data logger as well as to configure the ECU itself. Bosch Porsche 911 connector is shown below.



- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **pin A15** of the ECU (**CAN HIGH**), cable labelled **CAN –** with **pin 31** of the ECU (**CAN LOW**) and cable labelled **GND** with pin **GND** of the ECU, as shown in the figure below:



Pin	Function	Comments
A15	CAN +	
A31	CAN -	

Please note: as far as GND is concerned, please use the same GND you use for the ECU

“CARMO - AFI 2003”

AIM loggers can be connected to both Carmo ignition or injection unit (AFI 2003); they can acquire data from Carmo units installed on Honda CBR600, Kawasaki ZX6R, Yamaha YZ6F and Suzuki GSXR600.

The configuration procedure is the same for every bike; when you have selected the channels to acquire or to display, the logger will be able to automatically select the right set of sensors, using the information given by AFI unit.

PLEASE NOTE: every manufacturer has its own set of sensors; if the set of sensors is not the one usually used by the manufacturer for that type of bike, the acquired data could be wrong.

Injection unit

All ECU channels listed in the configuration dialog window are available when the logger is connected to the injection unit.

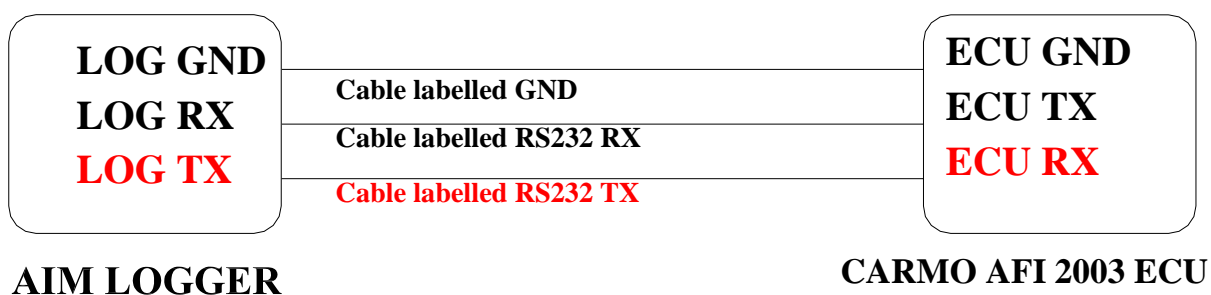
Ignition unit

Only RPM and Throttle Position channels are available when the logger is connected to the ignition unit. In this case we recommend to disable the other ECU channels in order to save memory.

- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **ECU TX** pin, cable called **RS 232 TX** with **ECU RX** pin and cable called **GND** with **ECU Power GND** pin as shown in the figure below.

Please refer to Your ECU user manual to know Your ECU pinout.



Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

“CARMO - AFI 2005”

AIM loggers can be connected to both Carmo ignition or injection unit (AFI 2005); they can acquire data from Carmo units installed on Honda CBR600, Kawasaki ZX6R, Yamaha YZ6F and Suzuki GSXR600.

The configuration procedure is the same for every bike; when you have selected the channels to acquire or to display, the logger will be able to automatically select the right set of sensors, using the information given by the AFI unit.

PLEASE NOTE: every manufacturer has it's own set of sensors; if the set of sensors is not the one usually used by the manufacturer for that type of motorbike, the acquired data could be wrong.

Injection unit

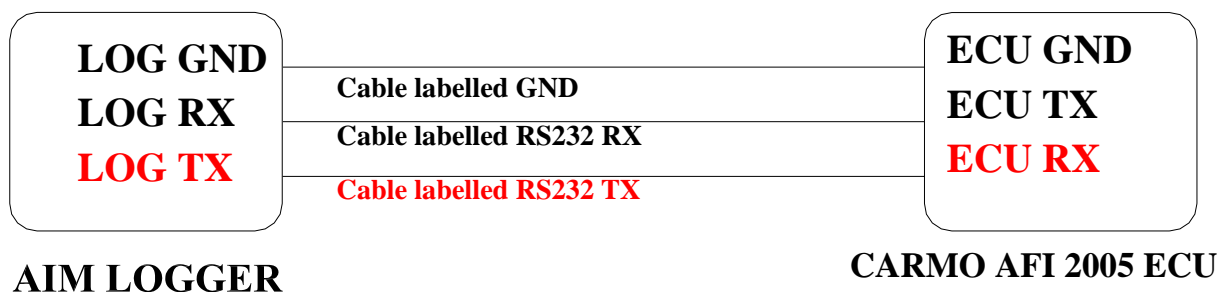
All the ECU channels listed in the configuration dialog window are available when the logger is connected to the injection unit.

Ignition unit

Only RPM and Throttle Position channels are available when the logger is connected to the ignition unit. In this case we recommend to disable the other ECU channels in order to save memory.

- **Connection With AIM Data logger**

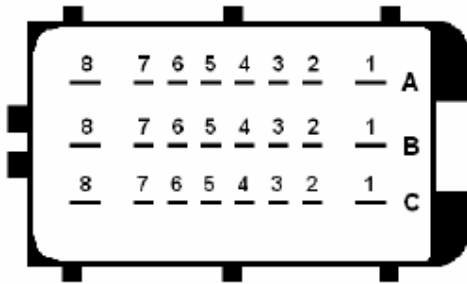
Your Carmo AFI 2005 ECU has two coloured connectors mounted on the backside, a grey one and a black one. To connect your ECU with AIM loggers you need to connect cable called **RS 232 RX** with **ECU TX** (pin **A4** of the **ECU grey connector**), cable called **RS 232 TX** with **ECU RX** (pin **A5** of the **ECU grey connector**) and cable called **GND** with the **ECU GND** (pin **A6** of the **ECU grey connector**) as shown in the figure below.



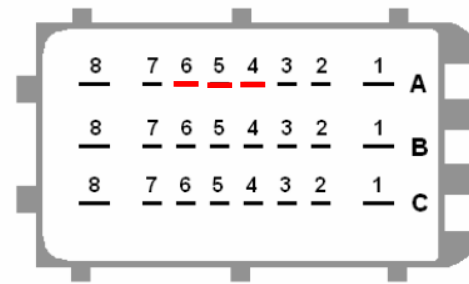
Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

Pin	Function	Comments
A6	GND	
A5	RS232RX	
A4	RS232TX	

Here below are shown AFI 2005 connectors and their pinout.



AFI 2005 Black Connector



AFI 2005 Grey connector

Pin	FUNCTION
A8	Ignitioncoil #3
A7	Ignitioncoil #2
A6	Ignitioncoil #1
A5	Injector #1
A4	Shower injector #1
A3	Injector #2
A2	Shower injector #2
A1	Injector #3
B8	Ignitioncoil #4
B7	EXUP (-) not connected
B6	EXUP (+) not connected
B5	Ground EXUP-position-not connected
B4	Signal EXUP-position-not connected
B3	VCC EXUP-position-not connected
B2	-
B1	Injector #4
C8	Power Ground
C7	Power Ground
C6	-
C5	-
C4	Shift-light output
C3	Fan output
C2	Shower injector #4
C1	Shower injector #3

Pin	AIM Logger	Function
A8		Ground
A7		Down sensor
A6	LOG GND	ECU Ground
A5	LOG TX	ECU RX
A4	LOG RX	ECU TX
A3		ECT sensor
A2		IAT sensor
A1		MAP sensor
B8		Ground
B7		Launch control output
B6		Quick-shift input
B5		Ground TX RX (2)
B4		TX (2)
B3		2 nd map input
B2		TPS sensor
B1		+12V
C8		Ground
C7		+5V sensors
C6		Tacho output
C5		Ground
C4		RX (2)
C3		Cam signal
C2		Crank signal
C1		Fuel pump relays output

“DTA - P8”

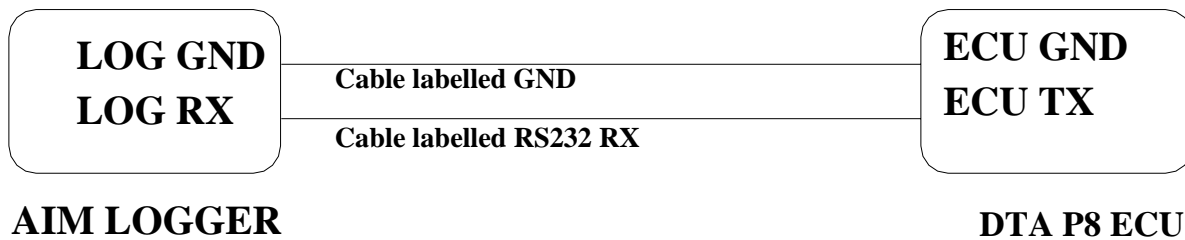
- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect AIM cable labelled as “**RS232RX**” with **ECU TX**, AIM cable labelled as “**GND**” with **ECU GND** as in the draw below.

Please refer to Your ECU user manual to know Your ECU pinout.



“DTA - P8V30”

- **Serial Communication Set-Up**

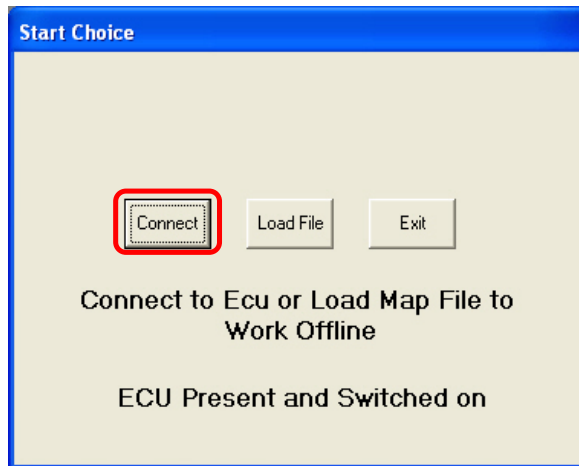
The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

- **DTA Configuration**

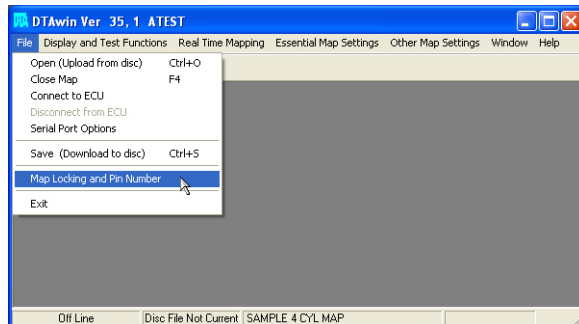
In order to make DTA ECU communicate with AIM Logger you need to configure the ECU using DTAWin software. To do so, please follow these steps.

Launch DTAWin software. “Start Choice” window is prompted. Please click on “Connect” button.

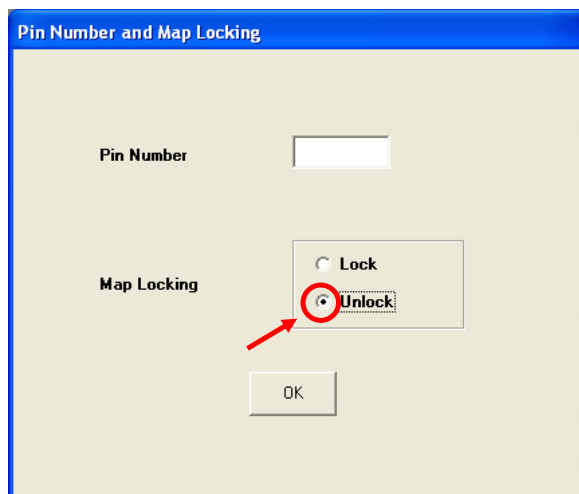
If a windows saying “No Matching File on disc Use Save to Make one” appears, please click on “OK” button and then on “Connect” button



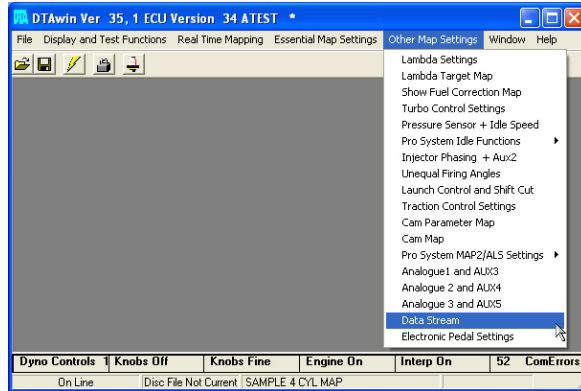
DTAWin main window appears. Please click on “File” button on the top toolbar and select “Map Locking and Pin Number” option.



When “Pin Number and Map Locking” window appears, please enable “Unlock” checkbox and press “OK” button.

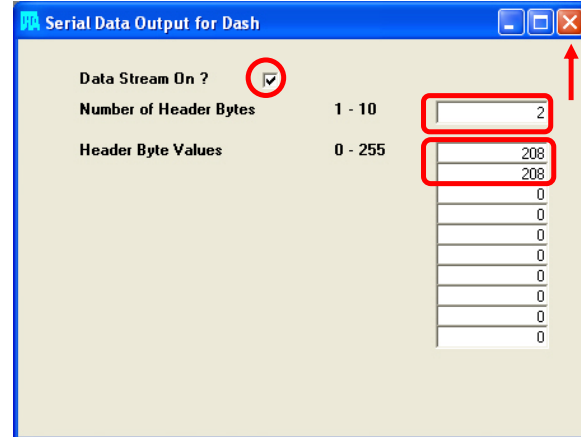


You step back to DTAwin Main window; please click on “Other Map Settings” on the top toolbar and select “Data Stream” option.

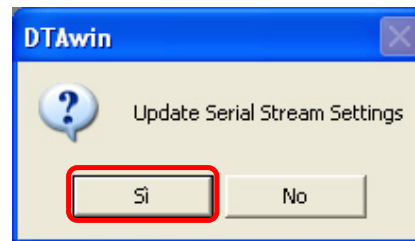


When Serial Data Output for Dash window appears, please set it as follows:

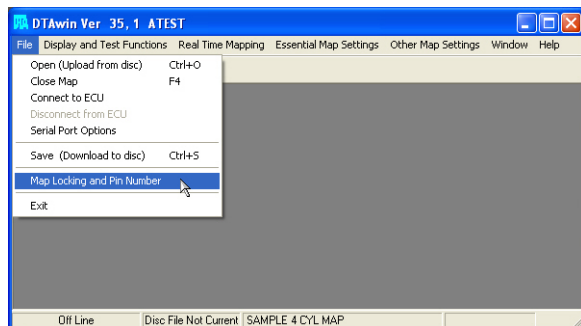
- enable “Data Stream on?” checkbox
- Fill “Number of Header Bytes 1-10” box with number “2”
- Set 208 on the first two rows of Header Bytes Value box
- Close the window clicking on the red cross on the top right corner



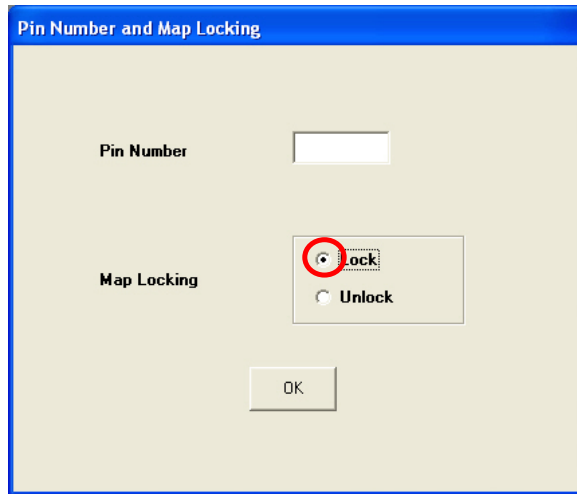
A window asking you if you want to update Serial Stream Settings appears; please click on “Yes” button.



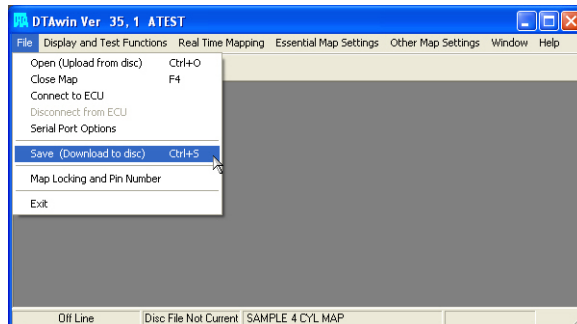
DTAwin main window appears. Please click on “File” button on the top toolbar and select “Map Locking and Pin Number” option.



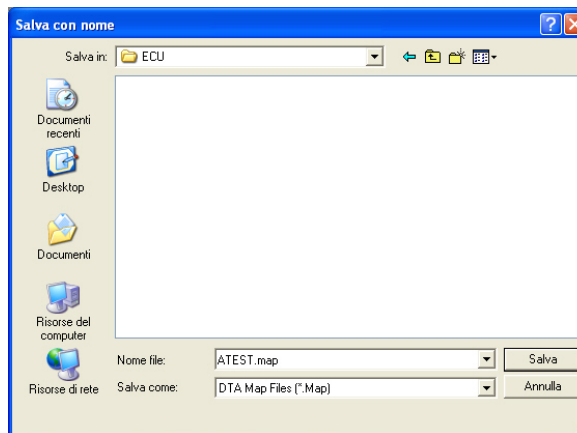
When “Pin Number and Map Locking” window appears, please enable “Lock” checkbox and then press “OK” button.



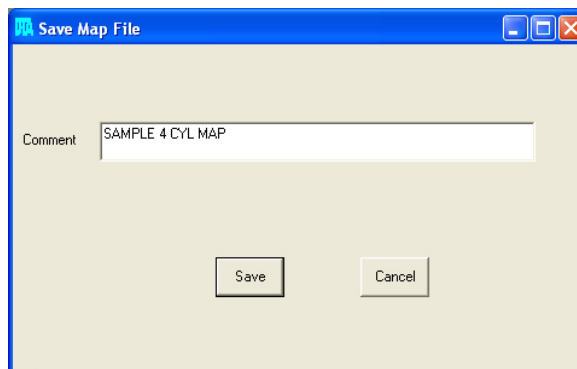
DTAWin main window appears. Please click on “File” button on the top toolbar and select “Save (Download to disc)” option.



“Save as” window appears. Please insert file name and press “Save” button.



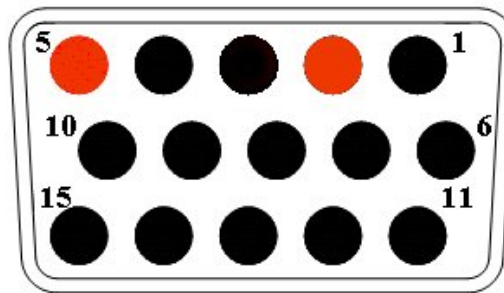
“Save Map file” window appears. Please insert Map comment and click on “Save” button.



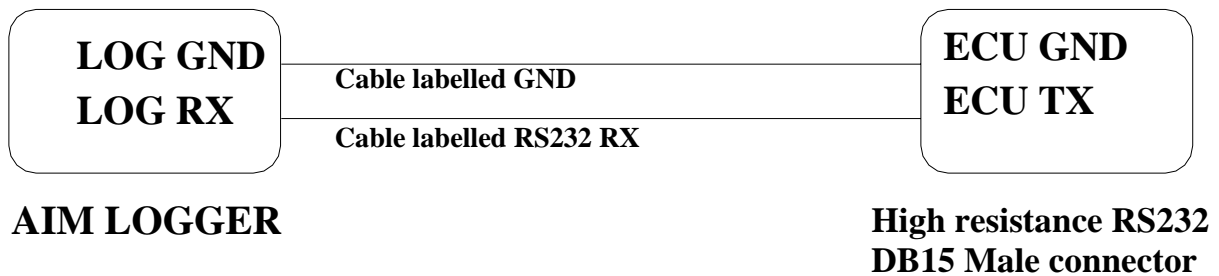
Please note: this configuration has been tested on DTA P8V30 ECU, but we have good reasons to think that this configuration should fit DTAP8 and DTA P8V29 ECU too.

- **Connection With AIM Data logger**

DTA P8V30 ECU has a DB15 female connector; to connect the ECU with AIM loggers you need to have an RS232 DB15 male high resistance connector, shown below.



To connect Your AIM logger to the ECU, please connect AIM cable labelled as “**RS232RX**” with **Pin 2** of the **RS232 DB15 male connector** (goes to ECU TX), AIM cable labelled as “**GND**” with **Pin 5** of the **RS232 DB15 male connector** (goes to ECU GND) as in the draw below.



Pin DB15	Function	Comments
5	GND	
2	RS232TX	

“EFI EUROPE ECU GENERAL INFORMATION”

- **Introduction**

EFI ECUs actually supported by all those AIM instruments that can be interfaced with an ECU are:

- EURO 1
- EURO 4
- EURO 6
- EURO 12
- EURO 96

- **Technical communication notes**

All EFI ECUs have a CAN line to export data to a third party data logger; this CAN line normally works with two only wires

1. CAN hi (corresponding to AIM Can + **white wire**)
2. CAN low (corresponding to AIM Can - **blue wire**)

It is normally unnecessary to ground CAN line with our system.

To have communication between EFI and AIM devices you have to configure his ECU with ECT software; please choose 2D data stream (this is valid for all models) in the proper page. You can normally choose one of the following options:

1. UDA91 (for Magneti Marelli Dashboard)
2. **2D** (for 2D and AIM loggers and dashes)

If getting data from the ECU is not possible first of all, please make an **hardware check**:

1. check if “line-end resistor” is installed: a 120 Ohm resistor should be found between CAN+ and CAN- (this can be done with any multimeter); to do so, please disconnect AIM instrument from the ECU and make this check on both side (ECU and logger);
2. check if amplitude of each “bit” is 2V (or at least 1.8 V); this test can be done with a scope grounding the sond on CAN- wire and measuring on CAN+ ; please ensure that no filtering feature is enabled on the scope (this because of high baud rate of this line)

On a second step, please ensure that your dashboard is firm upped with the latest firm up version and configured with the latest Race Studio 2 release.

Once those conditions are satisfied, if the system continues not getting data from EFI hardware, the problem is in EFI firmware. Please refer to the following table and contact an EFI dealer to have the ECU upgraded.

EFI MODEL	EFI FIRMWARE VERSION	CONNECTIBILITY AIM LOGGERS-EFI FIRMWARE	WHAT TO DO
EURO 1	300	From 380	Nothing to select
EURO 1	400	Always	2d stream selection via software
EURO 96	300	From 310	2d stream selection via software
EURO 96	400	Always	2d stream selection via software
EURO 6 & 12	300	Always	2d stream selection via software
EURO 6 & 12	400	Always	2d stream selection via software
All models	200	Never	ECU Firm up needed; please contact EFI for maps compatibility with the new firmware

“EFI EUROPE – EURO 1”

- **EFI ECU to AIM CAN Configuration**

Please note: EFI Euro 1 ECU communication with AIM loggers depends on ECU firmware version.

Euro 1 – until firmware version 379 included.

It is not possible to communicate; please contact EFI manufacturer to upgrade Your ECU firmware.

Euro 1 – from firmware version 380 until firmware version 400:

In EFI configuration software protocol implemented in your ECU is perfectly compatible with AIM loggers and works.

Euro 1 – from firmware version 400:

In ECU software, “ECT”, you can choose different datasets for CAN protocol management concerning output data:

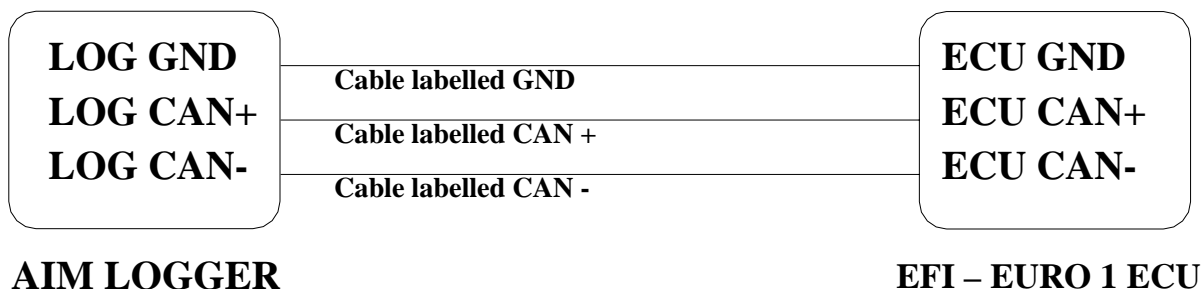
- UDA 91
- None
- 2D

Please select **2D** protocol

- **Connection With AIM Data logger**

Your ECU is equipped with a 35 pins AMP connector used to communicate parameters to an external data logger or to configure the ECU itself.

To connect your AIM logger to the ECU, please connect cable labelled **CAN +** with pin 22 of the ECU (**CAN +**), cable labelled **CAN -** with pin 6 of the ECU (**CAN -**) and cable labelled **GND** with pin 23 of the ECU as in the figure below:



Pin	Function	Comments
23	GND	
22	CAN +	
6	CAN -	

“EFI EUROPE – EURO 12”

- **EFI ECU to AIM CAN Configuration**

In the ECU software, “ECT”, you can choose different dataset for CAN protocol management concerning output data:

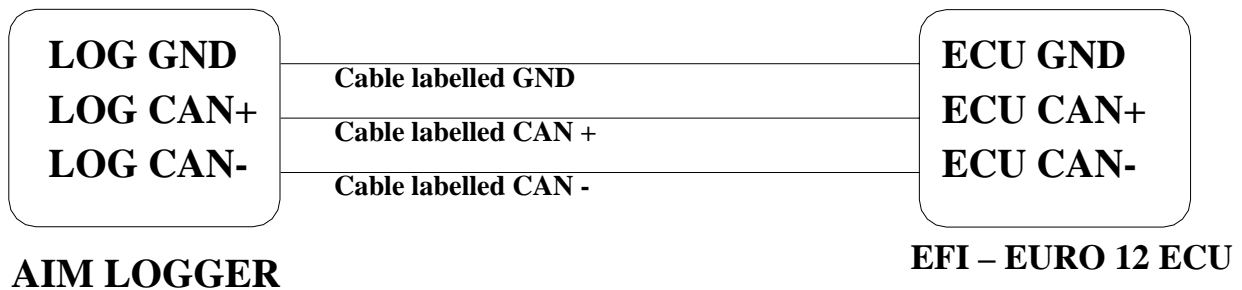
- UDA 91
- None
- 2D

Please select **2D** protocol

- **Connection With AIM Data logger**

The ECU is equipped with a 79 pins connector used to communicate parameters to an external data logger or to configure the ECU itself.

To connect Your AIM logger to the ECU, please connect cables labelled **CAN +** with **pin 10** of the **ECU (CAN +)**, cable labelled **CAN –** with **pin 9** of the **ECU (CAN -)** and cable called **GND** with **pin 72** of the **ECU (GND)** as shown in the figure below:



Pin	Function	Comments
72	GND	
10	CAN +	
9	CAN -	

“EFI EUROPE – EURO 96”

- **EFI ECU to AIM CAN Configuration**

In ECU software, “ECT”, you can choose different datasets for CAN protocol management concerning output data:

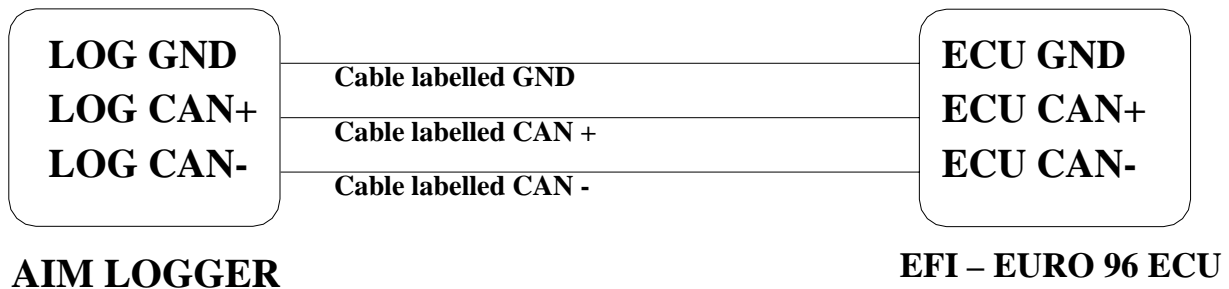
- UDA 91
- None
- 2D

Please select **2D** protocol

- **Connection With AIM Data logger**

The ECU is equipped with a 79 pins connector used to communicate parameters to an external data logger or to configure the ECU itself. This connection should not change with different firmware versions.

To connect Your AIM logger to the ECU, please connect cables labelled **CAN +** with **pin 55** of the ECU (**CAN +**), cable labelled **CAN –** with **pin 70** of the ECU (**CAN -**) and cable called **GND** with the **pin 77** of the ECU (**GND**) as shown in the figure below:



Pin	Function	Comments
77	GND	
55	CAN +	
70	CAN -	

“EFI USA – 2.1”

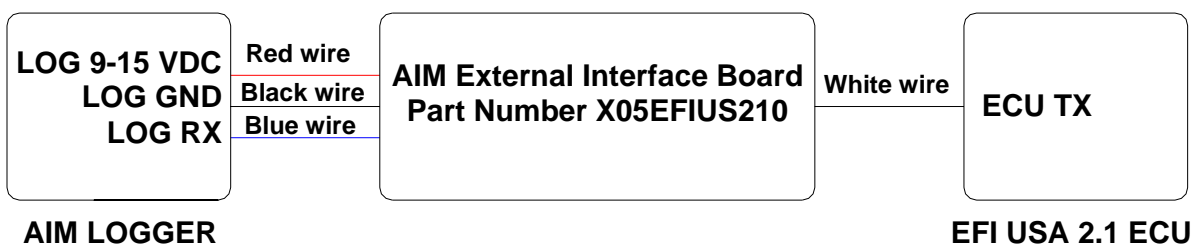
- **ECU communication protocol: general information**

The “available channels list” you find inside **Race Studio 2** “Configuration” window is inferred from the ECU’s communication protocol.

The communication protocol includes all the available channels of an EFI USA 2.1. ECU. The ECU is equipped with a 55 pins Deutsch connector used to communicate with an external data logger or to configure the ECU itself.

- **AIM External Interface Board connection**

To connect this ECU to AIM Loggers you need an external interface board supplied by AIM (Part Number **X05EFIUS210**). This board needs to be connected to both the 55 pins Deutsch connector of the ECU and to AIM Logger as shown below.



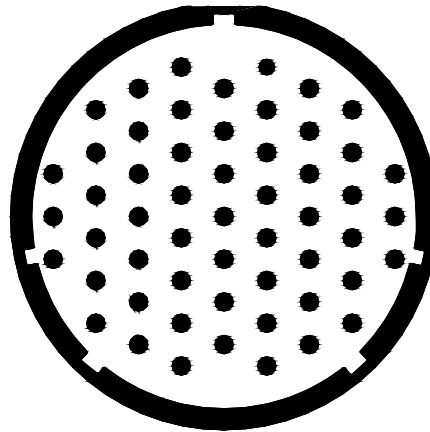
The External interface board has all wires already labelled as follows:

- **Red wire:** 9-15 VDC to connect to 9-15 VDC pin of AIM Logger
- **Black wire:** GND to connect to GND pin of AIM Logger
- **Blue wire:** Data out to connect to RS232RX pin of AIM Logger
- **White wire:** Data in to connect to **pin “L” of the ECU 55 pins Deutsch connector.**

Warning: please ensure that ECU GND, AIM External Interface Board GND and AIM Logger GND are the same (in the pinout table below reported GND has been connected to pin “AA”).

- **EFI USA 2.1 – 55 Pins Deutsch connector pinout**

The ECU is equipped with a 55 pins Deutsch connector, shown below and its pinout is described in the following table.



Pin	Description	Pin	Description
A	INJ1	f	Cam
B	INJ2	g	Oil P
C	INJ3	h	Boost sw
D	INJ4	i	Beacon
E	Pump	j	Lambda
F	Duty1	k	Mixture
G	Duty2	m	Fuel T
H	Heater	n	Air T
J	Vref	p	Water T
K	Vref	q	Oil T
L	TXD	r	Tach
M	ECU 12v	s	IGN1
N	FCM/DC2	t	IGN2
P	Lamp/Dc1	u	IGN3
R	INJ6	v	IGN4
S	INJ7	w	IGN5/Step1+
T	INJ8	x	IGN6/Step1-
U	INJ5	y	IGN7/Step2+
V	SW 1	z	IGN8/Step2-
W	SW2	AA	GND
X	MAP	BB	GND
Y	Fuel P	CC	GND
Z	Wheel	DD	GND
a	Wheel2	EE	GND
b	TPS	FF	GND
c	NGK/Knock	GG	GND
d	Crank	HH	GND
e	EBP		

“GEMS – OMEX”

- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger or to configure the ECU itself. The ECU connector is made of four sections: “A”, “B”, “C”, and “D” so characterised:

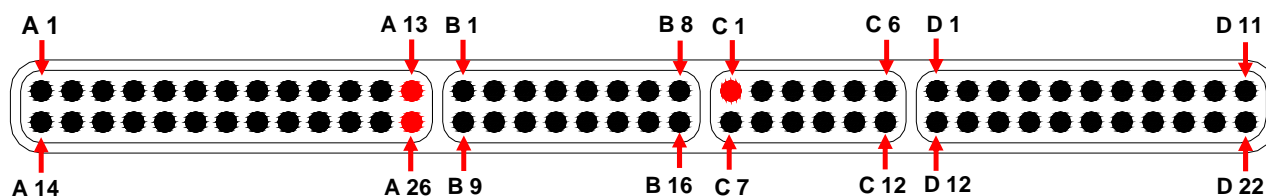
“A” - 26 pins

“B” - 16 pins

“C” - 12 pins

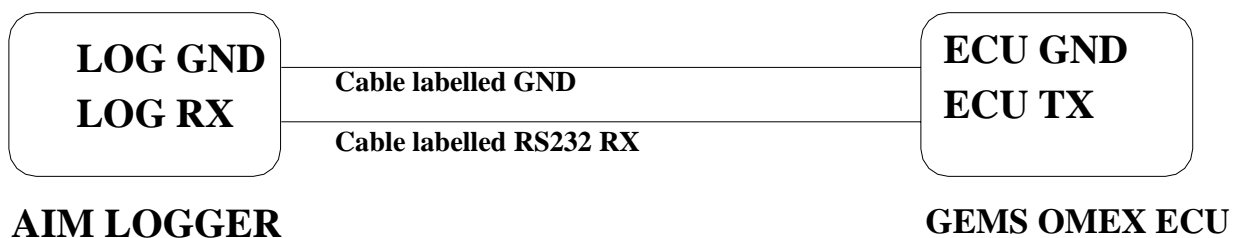
“D” – 22 pins

GEMX OMEX connector is shown below:



- **Connection With AIM Data logger**

Connect the cable called **RS 232 RX** with pin “C1” of the **ECU (ECU TX)** and cable called **GND** with pin “A 13” or with the pin “A 26” of the **ECU (GND pins)** as shown in the figure below:



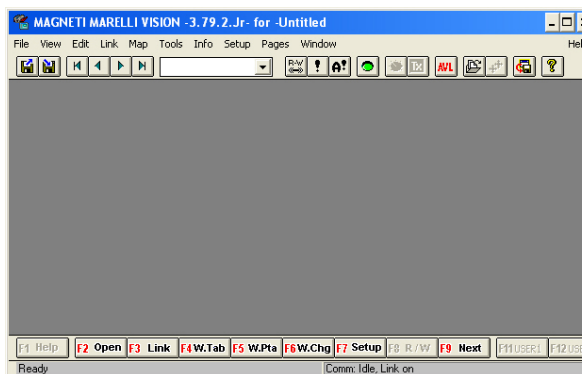
“MARELLI – Customer Protocol (12 channels configuration)”

- **ECU Marelli configuration**

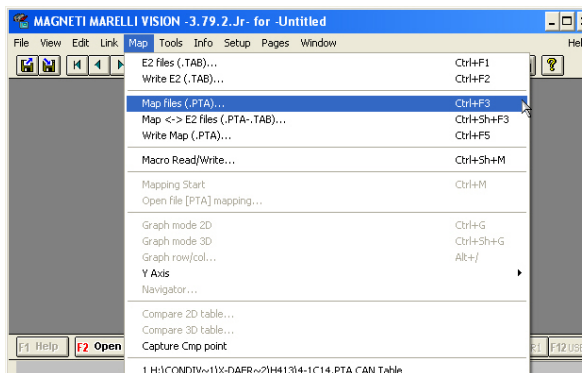
Marelli ECUs can be configured so to communicate with AIM logger through Vision Software (the software properly developed by Marelli for their ECU). This communication protocol is called “Customer Protocol” because is a configuration you can set, with few differences, on more ECUs. At present available configurations are for Marelli MF4 and Marelli RSA. Others are following.

Customer protocol: Marelli MF4

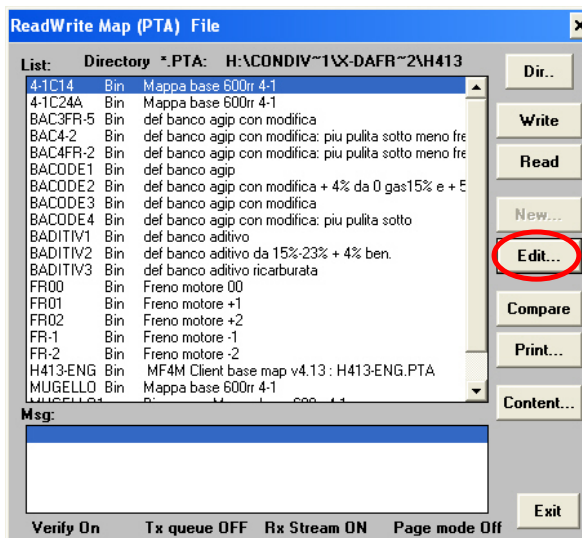
First of all, please run Vision Software.
The window on the right appears



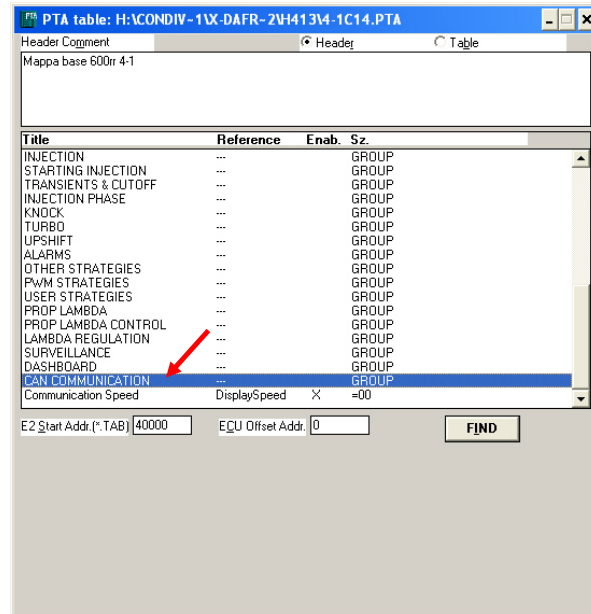
Please click on “Map” button on the top toolbar and select Map Files (PTA)...



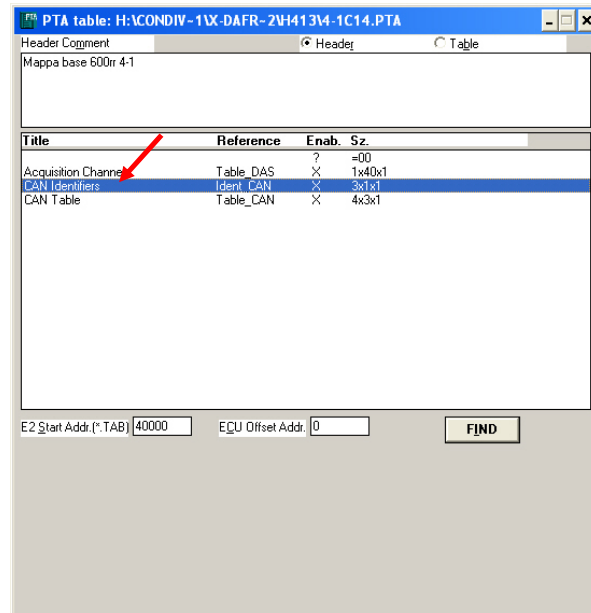
“ReadWrite Map (PTA) File” window appears. Please press “Edit” button.



“PTA table” window appears. Please scroll the until “CAN COMMUNICATION” option and double click on it.



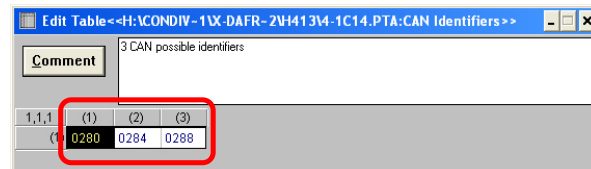
The window on the right appears. Please double click on “CAN Identifiers” option.



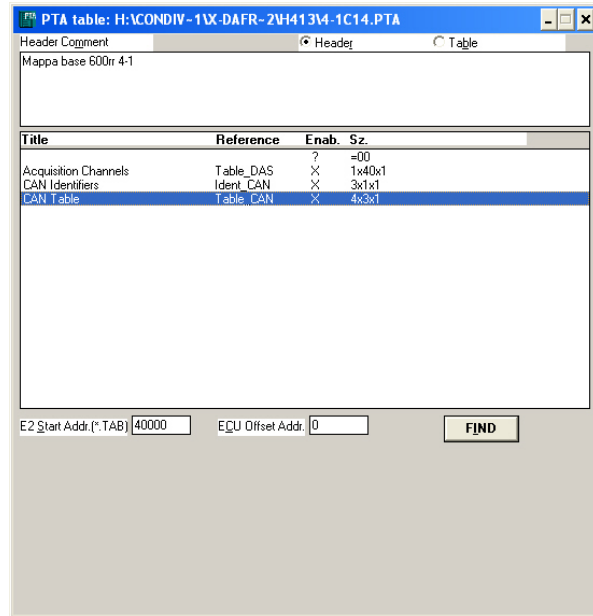
“Edit Table” window appears. Please insert the following values:

- column (1): 280
- column (2): 284
- column (3): 288

and close the window.



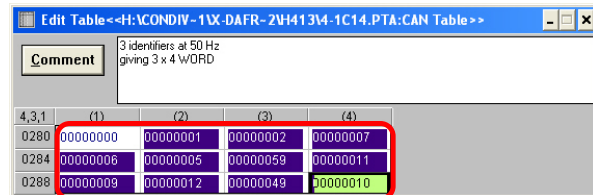
The window on the right appears again. Please double click on “CAN Table” option.



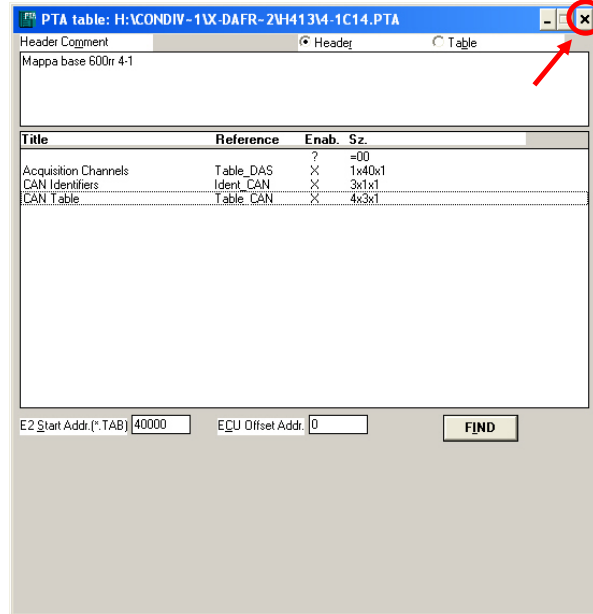
“Edit Table” window appears again. Please insert the following values:

- row 0280: **0, 1, 2, 7**
- row 0284: **6, 5, 59, 11**
- row 0288: **9, 12, 49, 10**

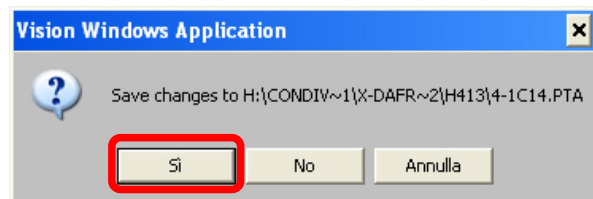
and close the window.



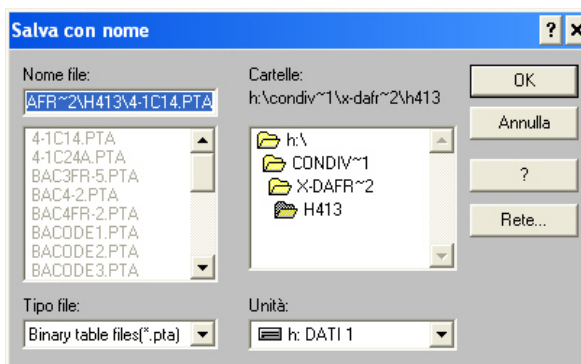
The window on the right appears; please close it clicking on the cross on the top right corner.



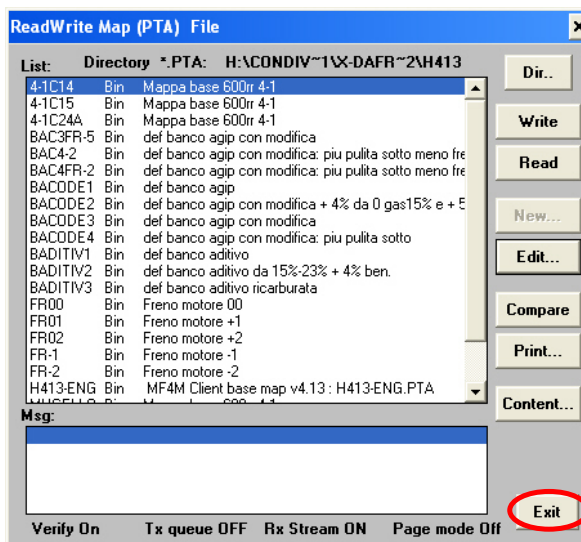
“Vision Windows Application” window appears, asking if you want to save changes. Please click on “Yes” button



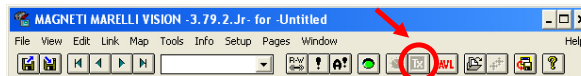
“Save as” window appears. Please insert file name in the proper cell, choose file destination folder and then click on “OK” button.



“ReadWrite Map (PTA) File” window appears. Please click on Exit button.

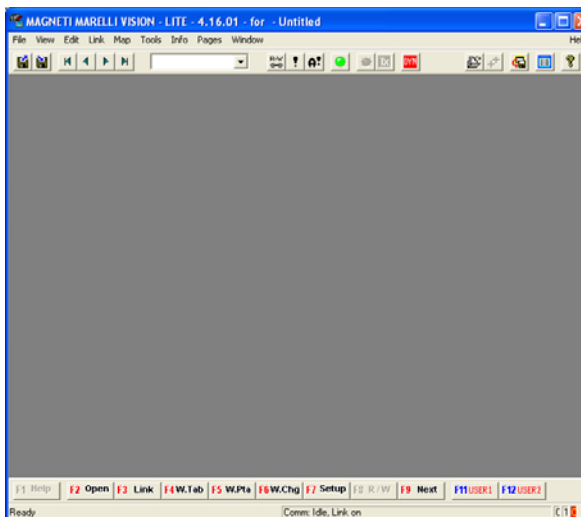


It is now necessary to transmit this configuration to your ECU. “TX” button, on the icons toolbar becomes enabled: please press it.

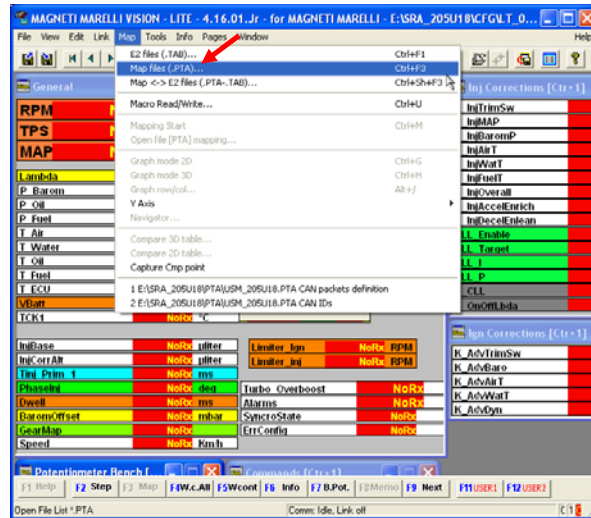


Customer protocol: Marelli RSA

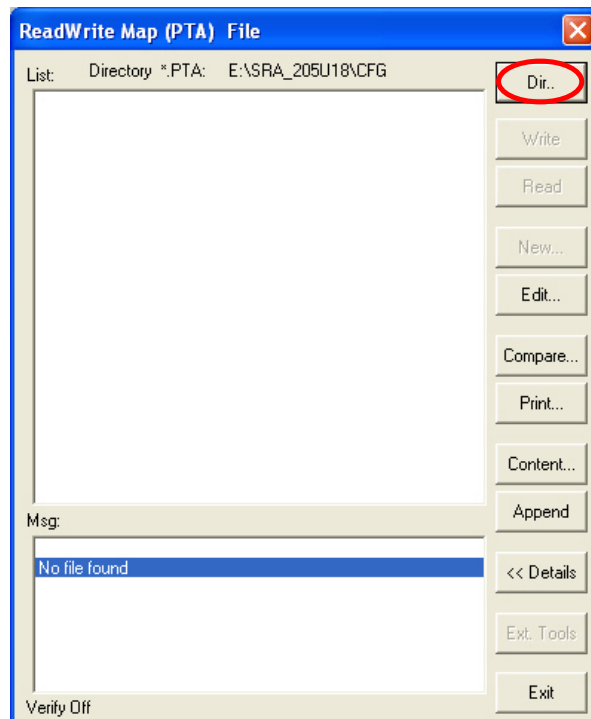
First of all, please run Marelli “Vision” software. First software window appears.



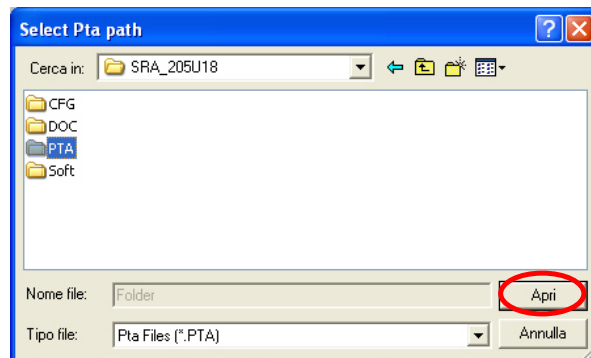
Please click on “Map” button on the top toolbar and then select “Map files(PTA)..” option as in the figure on the right.



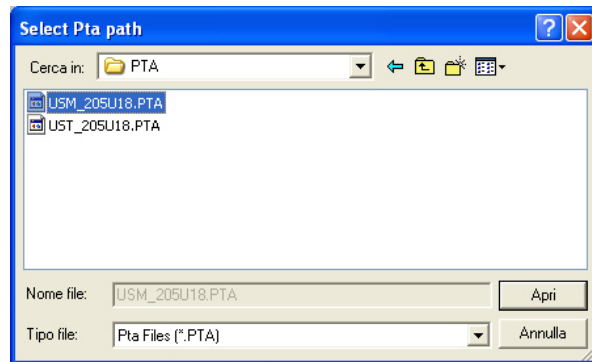
“ReadWrite Map (PTA) File” window appears. Please click on “Dir” button.



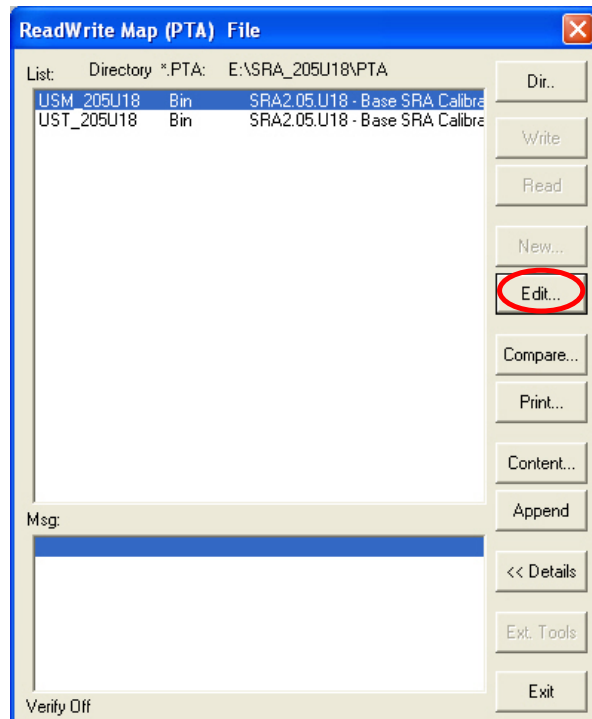
“Select PTA path” window appears. Please select “PTA” folder and click on “Open” button.



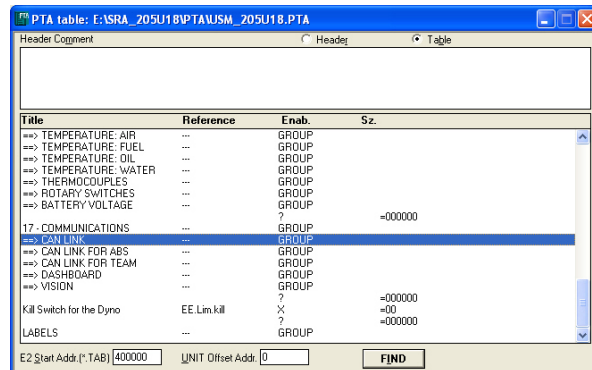
Please select the desired file.



“ReadWrite Map (PTA) File” window appears. Please click on “Edit” button.



“PTA Table” window appears. Please scroll it and select “CAN LINK” option.



Please double click on “CAN IDs” voice.

Title	Reference	Enab.	Sz.
--- DATA ACQUISITION ---		?	=00
Frequencies Reparation Table	EE.SizeFreqTele	X	1x8x1
Data Elements Table	EE.TelemTable	X	4x64x1
---		?	=00
--- PRDG. CAN PACKETS ---		?	=00
CAN IDs	EE.CarJIdUser	X	3x1x1
CAN packets definition	EE.CarJIdUser	X	4x3x1

“Edit Table” window appears. Please insert the following values:

- column (1): 280
- column (2): 284
- column (3): 288

and close the window.

(1)	(2)	(3)
280	284	288

Please double click on “CAN packets definition” voice.

Title	Reference	Enab.	Sz.
--- DATA ACQUISITION ---		?	=00
Frequencies Reparation Table	EE.SizeFreqTele	X	1x8x1
Data Elements Table	EE.TelemTable	X	4x64x1
---		?	=00
--- PRDG. CAN PACKETS ---		?	=00
CAN IDs	EE.CarJIdUser	X	3x1x1
CAN packets definition	EE.CarJIdUser	X	4x3x1

“Edit Table” window appears again. Please insert the following values:

- row 0280: **0, 1, 2, 7**
- row 0284: **6, 5, 26, B**
- row 0288: **D, C, 31, A**

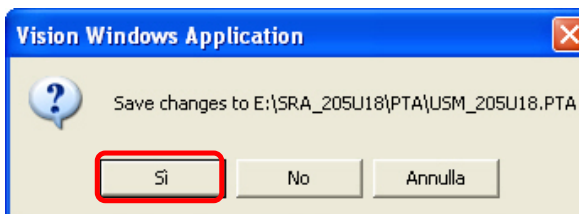
and close the window.

Row	Col 1	Col 2	Col 3	Col 4
0280	00000000	00000001	00000002	00000007
0284	00000006	00000005	00000026	0000000B
0288	0000000D	0000000C	00000031	0000000A

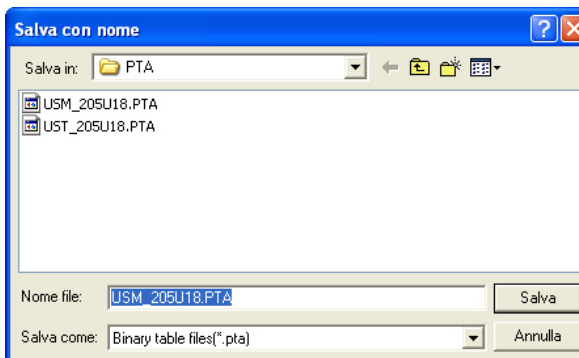
The window on the right appears. Please close it clicking on the red cross on the top right corner.

Title	Reference	Enab.	Sz.
--- DATA ACQUISITION ---		?	=00
Frequencies Reparation Table	EE.SizeFreqTele	X	1x8x1
Data Elements Table	EE.TelemTable	X	4x64x1
---		?	=00
--- PRDG. CAN PACKETS ---		?	=00
CAN IDs	EE.CarJIdUser	X	3x1x1
CAN packets definition	EE.CarJIdUser	X	4x3x1

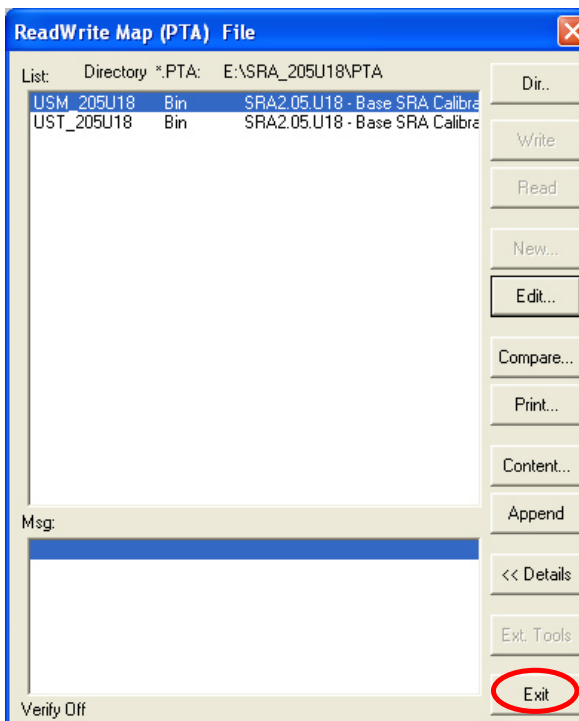
“Vision Application window” appears, asking you to save changes. Please click on “Yes” button.



“Save As” window appears. Please insert file name, select file destination folder and then click on “Save” button.



“ReadWrite Map (PTA) File” appears again. Please click on “Exit” button.



To transmit the configuration to your ECU, please click on “TX” icon, that has become enabled, on the top icons bar.

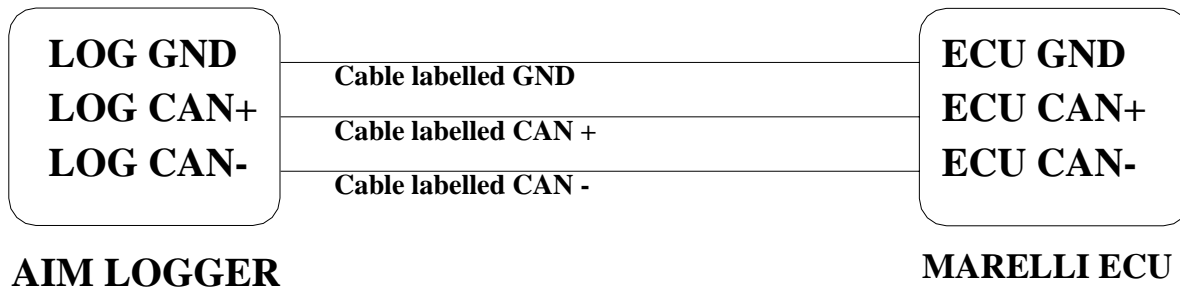


When transmission is finished, please connect your Marelli ECU to your AIM logger following the above reported CAN Communication Set-up

- **CAN Communication Set-Up**

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.

Please refer to your ECU's user's manual to know its pinout.

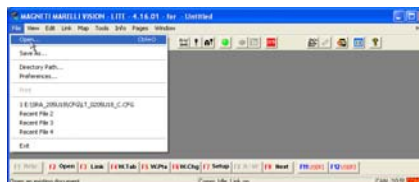


“MARELLI – RSA (complete 64 Channels configuration)”

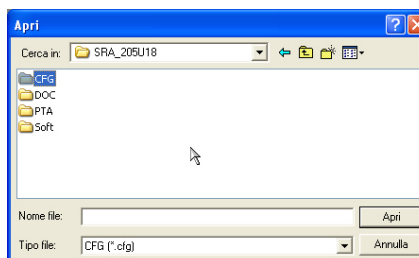
- **ECU Marelli RSA configuration (64 Channels),**

To configure your ECU Marelli RSA, please follow these steps.

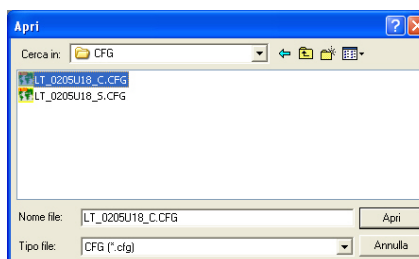
- Launch Vision software.
- Click on File/ Open on the top toolbar as in the figure on the right.



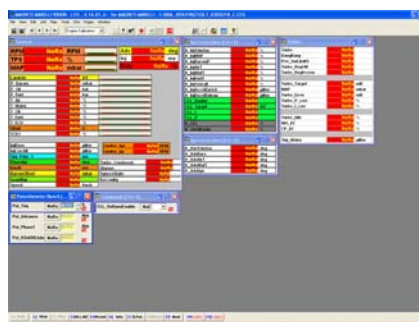
- The following windows appears. Please look for CFG folder and open it, as in the figure on the right.



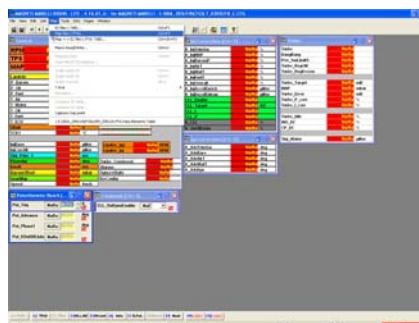
- Select the desired CFG file and open it.



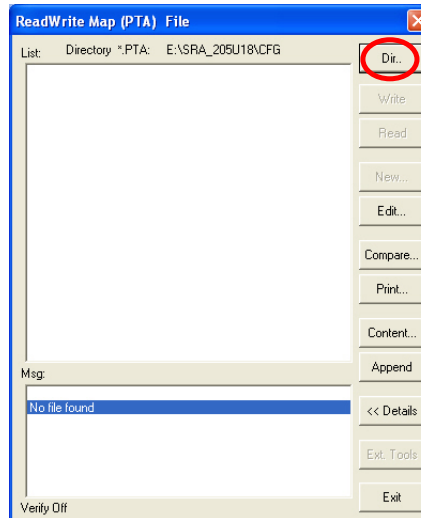
- Click on “Map” button on the top toolbar.



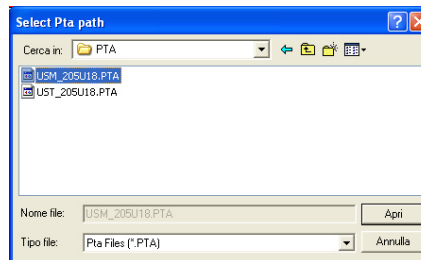
- And select “Map files” option.



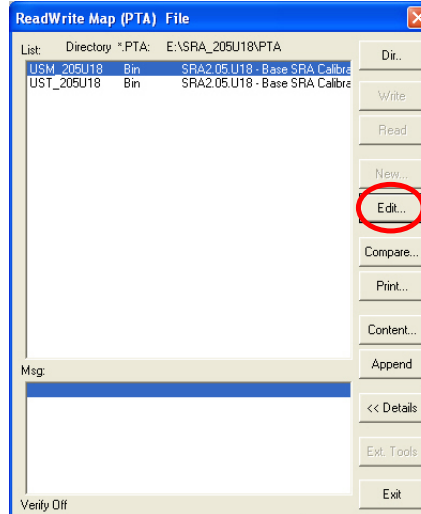
- Click on “Dir” button.



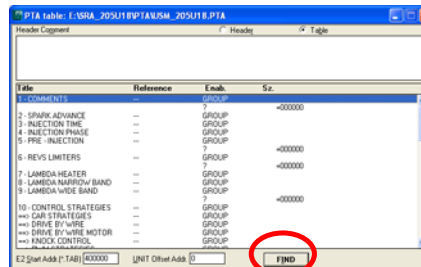
- Select the desired PTA file.



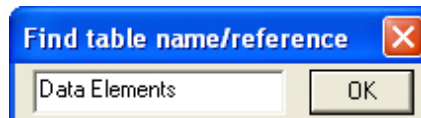
- Click on “Edit” button.



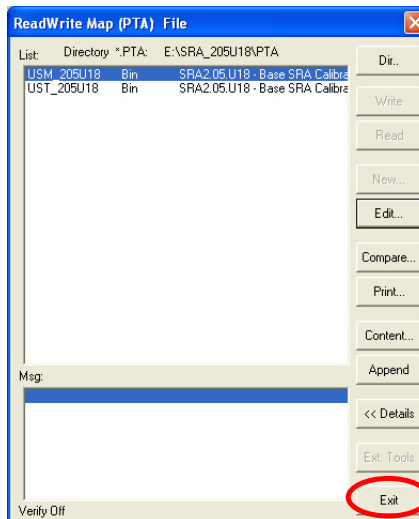
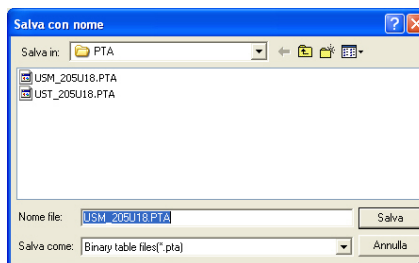
- Click on “Find” button, red circled in the figure on the right.



- Digit “Data Elements” and click on “OK” button.



- The system asks you to choose file destination folder; please select the desired one and click on “Save” button.
- ReadWrite Map (PTA) file windows appears, please press “Exit” button.



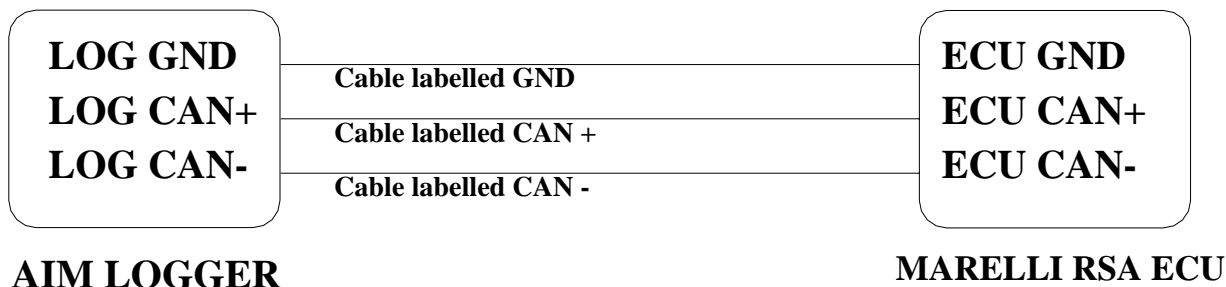
- TX icon, on the top icons toolbar, becomes enabled, please click on it to transmit the configuration to the ECU



When transmission is finished, please connect your Marelli RSA ECU to your AIM logger following the above reported CAN Communication Set-up

• CAN Communication Set-Up

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.



Digits Table

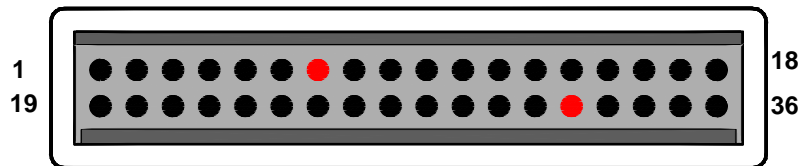
	(1)	(2)	(3)	(4)
(1)	00208270	00000002	3F800000	00000000
(2)	00000000	00000001	3F800000	00000000
(3)	00208080	00000082	3F800000	00000000
(4)	00000000	00000001	3F800000	00000000
(5)	0020808C	00000082	3F800000	00000000
(6)	00000000	00000001	3F800000	00000000
(7)	0002080A	00000082	3F800000	00000000
(8)	00000000	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

“MBE – 967”

- **Serial Communication Set-Up**

The ECU has a serial communication protocol (RS232) and a 36 pins connector, whose pinout is below, used to communicate with an external logger, or to configure the ECU itself.



Pin	Function	Comments
1	Fuel trim	Mp 06
2	Water temp. signal	
3	Air temp. signal	
4	5v analogue	Mp 04
5	Analogue GND	Mp 05
6	Power GND	Mp 01
7	POWER GND	
8	Power GND	
9	Power GND	
10	Gear input	
11	Crank return	
12	Crank signal	
13	ECU supply	
14	Serial receive	Mp 03: RS232 com. – ECU RX
15	Fault light / switch	
16	Shift light	Switched Ground
17	Fuel pump relay drive	Switched Ground
18	Ignition drive 2	Cylinders 2 + 3
19	Power shift input	Ground active
20	Throttle signal	
21	Map signal	
22	5v analogue	
23	Analogue GND	
24	Analogue GND	
25	Oil temperature	
26	Ignition trim	Mp 07
27	Oil pressure	
28	Barom. press./launch input	
29	Lambda signal	
30	Not used	Not used
31	Not used	Not used
32	SERIAL TRANSMIT	Mp 02: RS232 com. – ECU TX
33	Radiator fan relay drive	Switched Ground
34	Tachometer signal	
35	Injection output	All Cylinders
36	Ignition drive 1	Cylinders 1 + 4 (coil if distributor fitted)

Mp = Mapping plug

To connect the ECU to a PC, using a standard DB9 female connector, **pin 32 (ECU TX)** of the **ECU** must be connected to **pin 2** of the **DB9** and **pin 7** (or other **Power GND** pins) of the **ECU** must be connected to **pin 5** of the **DB9**.

To communicate with the PC ECU's Fuel Trim (pin 1) and Ignition Trim (pin 26) inputs must be hold at a voltage other than zero; this procedure enables the "Byte Mode" and allows the ECU to communicate with **EasiMap** Windows tool (the MBE configuration program – see ECU manual for more information).

- **ECU Configuration**

In order to communicate with the data logger, the ECU must be properly configured using the program "**EasiMap**" provided with the same ECU.

PLEASE NOTE: **EasiMap v5.0** software can be used to configure data logging feature only by user with "**Advanced**" profile; see MBE site: <http://www.mbesystems.com/index.html>

1. Connect the ECU to a PC with **EasiMap 5.0** installed, and turn on power to the ECU [ECU pin 13 at 12V and ECU pin 6 (or other **Power GND**) at GND].
2. Launch **EasiMap 5.0** software; choose the [Get Data...] option from the [Data] menu.
3. In the window [Select Parameter] open the [Data Logging] directory and select [Data Logger Link]; choose [ECU Device] in the [Data Source] options and then press [OK].
4. Now the program reads information from the ECU and opens a new window to configure the communication.
5. The parameters must be configured **in the right sequence and with the right scaling** in order to communicate with the AIM data logger:

Data Logger Link: choose [**Transmitting at 19200**]

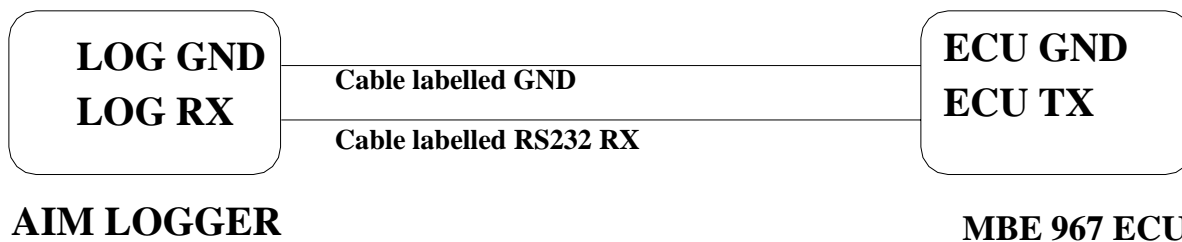
RPM: choose [**4,00**]

Parameter	Scaling
1: choose [Engine Speed]	Choose 16 bit
2: choose [Ignition]	Choose 8 bit
3: choose [Injection Time]	Choose 16 bit
4: choose [Throttle Angle]	Choose 8 bit
5: choose [Coolant Temp]	Choose 8 bit
6: choose [Air Temp]	Choose 8 bit
7: choose [Baro Pressure]	Choose 8 bit
8: choose [Lambda]	Choose 8 bit
9: choose [Ri]	Choose 16 bit
10: choose [Engine Oil Pressure]	Choose 8 bit
11: choose [Fuel Pressure]	Choose 8 bit
12: choose [Water Pressure]	Choose 8 bit
13: choose [Engine Oil Temp]	Choose 8 bit
14: choose [Gearbox Oil Temp]	Choose 8 bit
15: choose [Boost Pressure]	Choose 8 bit
16: choose [Gear Position]	Choose 8 bit

6. When all parameter are configured, please press [Send] button and choose [ECU Device] when requested; configuration is saved in the ECU memory.
7. Please close configuration window and quit the program. Before connecting ECU to the Data logger, please enable "Broadcast Mode" ensuring a nominally zero voltage (or open circuit) on Fuel Trim and Ignition Trim inputs.

- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **pin 32** of the **ECU (ECU TX)** and cable labelled **GND** with **pin 7** of the **ECU** (or other **Power GND** pins) as shown in the figure below:



Pin	Function	Comments
7	GND	
32	RS232TX	

“MBE – 970”

- **Serial Communication Set-Up**

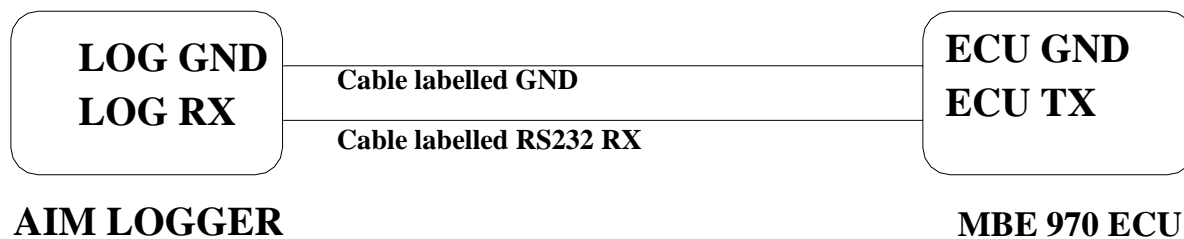
The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

The pinout for MBE-967 ECU is shown below:

Pin	Function	Comments
50	POWER GND	
46	RS 232 TX	

- **Connection With AIM Data logger**

Connect the cable labelled **RS 232 RX** with **pin 46** of the **ECU (ECU TX)**, and cable labelled **GND** with **pin 50** of the **ECU (ECU GND)** as shown in the figure below:



“MecTronik – MK_E4”

- **MecTronik connection to AIM data logger.**

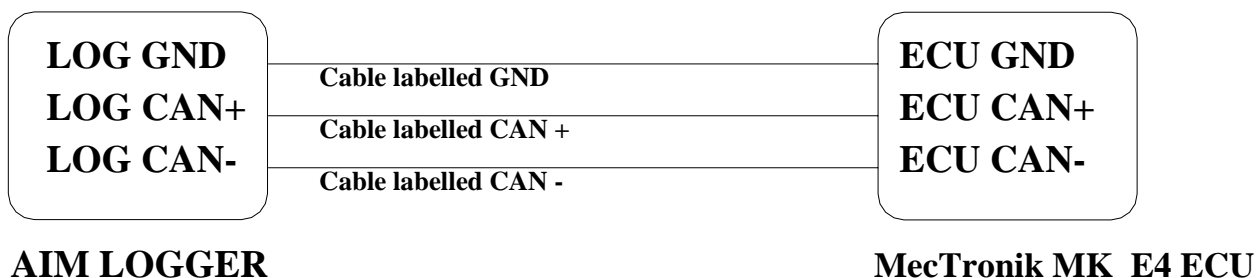
MecTronik company produces two **MK_E4 ECU** version: the **standard** one and the **drive by wire** one.

Identification of the two version is possible through the ECU serial number.

- **Standard** version serial numbers are:
 - xx HA xxx
 - xx HB xxx
 - xx HC xxx
- **Drive by Wire** version serial numbers are
 - Xx HD xxx

Where “HA” “HB” “HC” “HD” are the codes that identify the ECU version.

Both **MK_E4** ECUs are equipped with a 41 pins connector. To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **ECU CAN +** pin, cable called **CAN -** with **ECU CAN -** and cable called **GND** with **ECU GND** as shown in the figure below:



As far as ECUs pins are concerned, please refer to the following tables to know which pin is to be connected to which cable.

MK_E4 – Standard version (codes: “xx HA xxx”, “xx HB xxx”, “xx HC xxx”)

Pin	Function	Comments
H	ECU GND	
J	CAN +	
Y	CAN -	

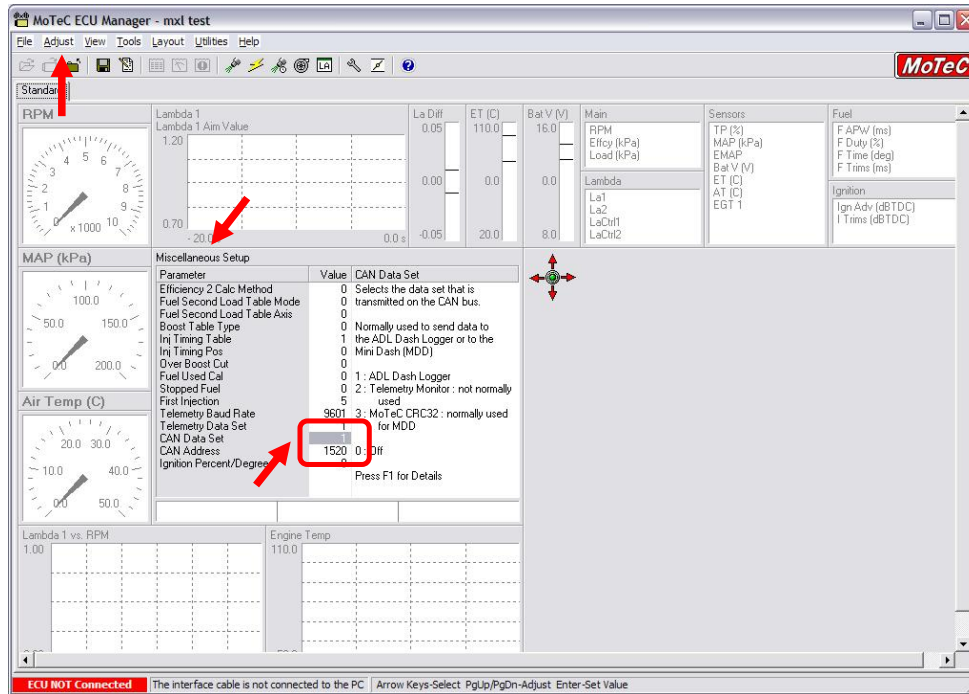
MK_E4 – Drive by Wire version (codes: “xx HD xxx”)

Pin	Function	Comments
H	ECU GND	
J	CAN +	
c	CAN -	

“MoTec – M400 / M600 / M800”

- **MoTec ECU to AIM CAN Configuration**

In MoTec ECU Manager configuration, go to Adjust/General Setup/ Miscellaneous Setup and set the CAN data set to 1 and the CAN Address to 1520 as in the figure below.

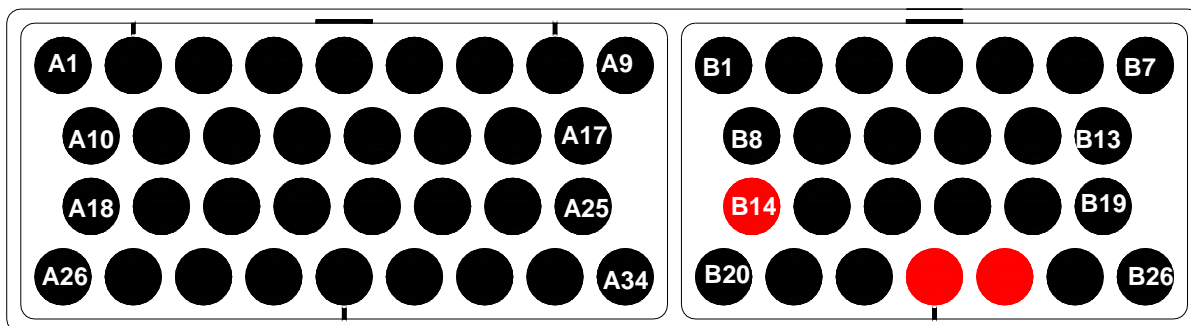


Please note: If the MoTec CAN communication cable is connected, PC will take CAN priority. AIM logger will not receive data. **After configuration, please ensure that MoTec communication cable is disconnected.**

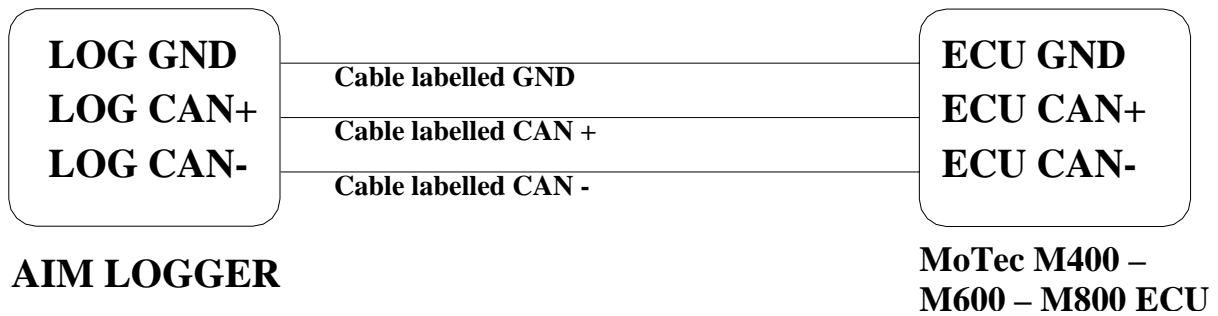
- **Connection With AIM Data logger**

The ECU is equipped with a CAN communication interface used to communicate parameters to an external data logger or to configure the ECU itself.

MoTec M800 ECU has two connectors, shown in the figure below. The two connectors are labelled “A” connector and “B” connector.



To connect Your AIM logger to the ECU You need to use connector labelled as “B”. Please connect cable labelled **CAN +** with **pin 23** of the **ECU (CAN +)**, cable labelled **CAN -** with **pin 24** of the **ECU (CAN -)** and cable called **GND** with **pin 14** of the ECU as in the figure below:



Pin	Function	Comments
B 14	POWER GND	
B 23	CAN +	
B 24	CAN -	

- **AIM Data logger configuration**

For **ECU with MoTec firmware version 2.30S2 onward**, once you have correctly connected your AIM Logger to the ECU to correctly configure your logger with **Race Studio 2** software, please select the following configuration options.

- **ECU Manufacturer:** **MoTec**
- **ECU Model:** **M800-M600-M400-1M**

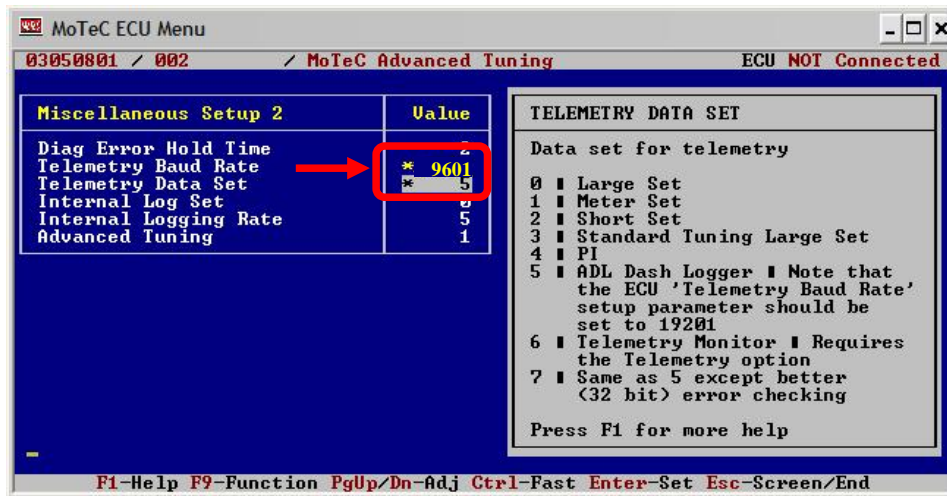
“MoTec – M4”

Please note Motec M4 ECU is supported only from serial number 3000 onwards.

- **MoTeC ECU to AIM RS232 Configuration**

Please run MoTeC configuration Software and press enter button. Then select Adjust function and press enter button. Scroll the page and select General Setup in “Select” window. Then choose Miscellaneous Setup 2.

Set Telemetry Baud Rate to 9601, (9600) and Telemetry Data Set to 5, (ADL Dash Logger).

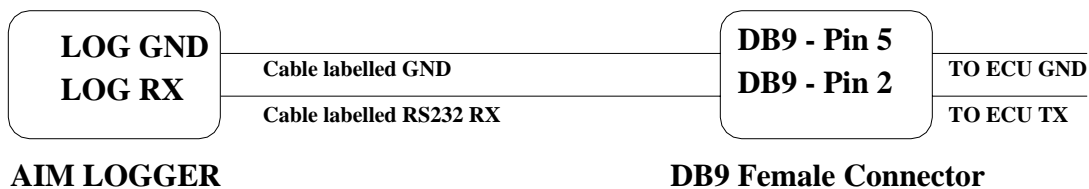


- **MoTeC ECU to AIM RS232 Connection**

Please note: if MoTeC RS-232 communication cable is connected to the ECU and MoTeC software is active, PC takes priority. AIM does not receive data. **Close MoTeC software or make sure that MoTeC software is not active.**

The ECU is equipped with an RS232 communication protocol used to communicate parameters to an external data logger, or to configure the ECU itself.

To connect AIM logger to the ECU you need to use a DB9 female connector. Please connect **Pin 2** of the **DB9 female connector** to AIM cable labelled as “RS232RX” and **Pin 5** of the **DB9 female connector** to AIM cable labelled as “GND” as in the draw below:



Pin	Function	Comments
5	GND	
2	RS232RX	

“MoTec – M48”

- **MoTec ECU to AIM RS232 Configuration**

Motec M-48 ECU can be interfaced to Aim loggers through two different communication protocols based upon two different setups agreed by MoTec firmware.

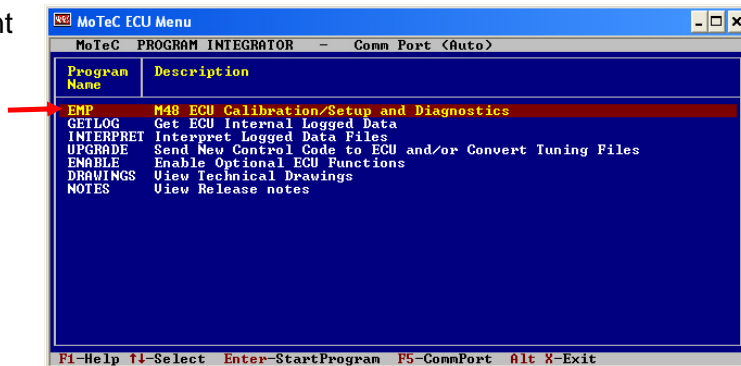
Motec M 48 needs a MoTec PC connection cable to be interfaced to a Pc; please address to MoTec to know its part number.

Before connecting Your ECU to AIM loggers, please check its setup; to do so, connect it to the serial port of Your Pc using MoTec ECU Menu V6.20 software you can download free of charge from MoTec website www.motec.com.au.

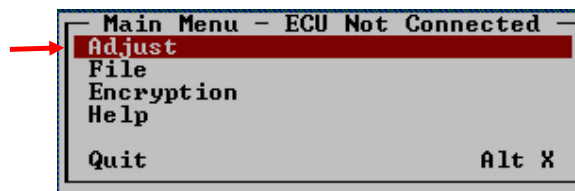
If when connecting your ECU to the Pc MoTec software recognizes an older version, an upgrade is needed and this is possible through a Software Update Unit, available from most MoTec dealers. Upgrading is automatically done by the software selecting the related voice in MoTec software. If on the contrary, when connecting your ECU to the Pc MoTec software recognizes a corresponding software version, upgrade is not needed.

Once the ECU upgraded (when necessary), please run MoTec software and follow this procedure:

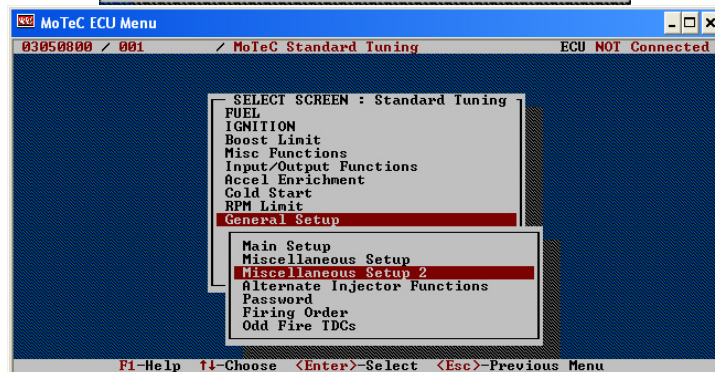
Select EMP (Engine Management Program).



Please select “Adjust”. This way the software acquires ECU setup. If asked, please select the voice “use matching file”



Please select “General Setup” and then Miscellaneous setup 2.



In this setup you can use DataSet5 (the most recent and common) or DataSet3. Here are values corresponding to the two setups.

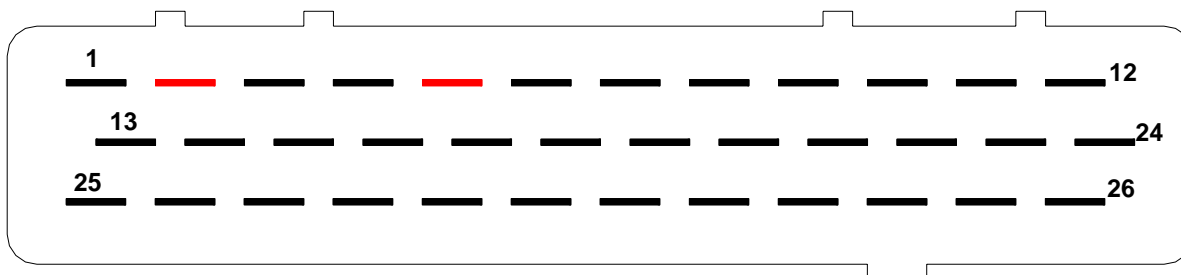
DataSet5		DataSet3	
Diag Error Hold Time	0	Diag Error Hold Time	0
Telemetry Baud Rate	9601	Telemetry Baud Rate	9601
Telemetry DataSet	5	Telemetry DataSet	3
InternalLogSet	0	InternalLogSet	3
InternalLoggingRate	5	InternalLoggingRate	5
Advanced Tuning	1	Advanced Tuning	1

Once entered these values You can save Setup on current file or on a new one. Changes are automatically saved by the software and the ECU is restarted.

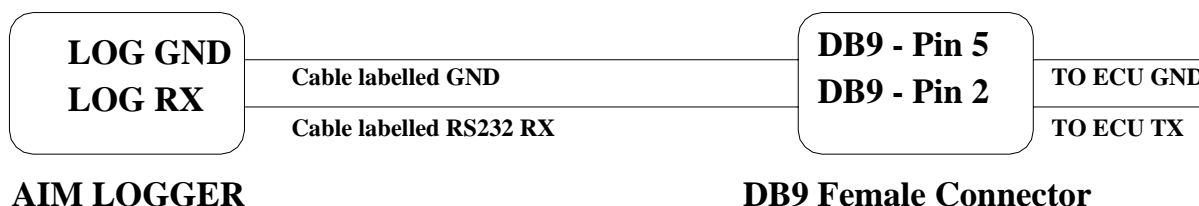
- **MoTeC ECU to AIM RS232 Connection**

Please note: if MoTeC RS-232 communication cable is connected to the ECU and MoTeC software is active, PC takes priority. AIM logger does not receive data. So, please **close MoTeC software or make sure that is not active.**

The ECU is equipped with an RS232 communication protocol used to communicate parameters to an external data logger, or to configure the ECU itself. MoTec M4 ECU has a 36 pin connector, shown in the figure below and needs a DB9 female connector for external communication and of course to communicate to AIM logger too.



Please connect AIM cable labelled “RS232RX” to **Pin 2** of the **DB9 female connector** and **Pin 5** of the **DB9 female connector** to AIM cable labelled as “GND” as in the draw below:



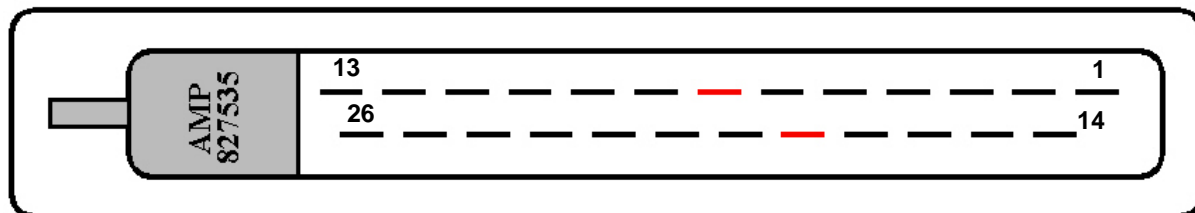
Pin	Function	Comments
5	GND	
2	RS232RX	

“PECTEL – T2”

- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

The pinout for Pectel T2 ECU is shown below:



Pin	Function	Comments
1	IGN1	Build option: low side / TTL coil driver
14	IGN2	Build option: low side / TTL coil driver
2	INJ1 HIGH IMP	High impedance only
15	INJ2 HIGH IMP	High impedance only
3	INJ3 HIGH IMP	High impedance only
16	INJ4 HIGH IMP	High impedance only
4	PWM1	Low side (10A maximum)
17	PWM2	Low side (10A maximum)
5	ENG GROUND	
18	ENG GROUND	
6	12V+ve	
19	RS 232 RX	RS 232 communication – ECU RX
7	RS 232 TX	RS 232 communication – ECU TX
20	PWM3	Low side (10A maximum)
8	CRANK	Crank sensor input
21	CAM	Cam sensor input
9	MAF/MAP	Analog input
22	TPS	Analog input
10	LAMV	Lambda sensor
23	ECT	Analog input
11	ACT	Analog input
24	SPARE ANALOG	Analog input
12	SENSOR GND	Analog ground
25	5V+ve	200 mA maximum
13	SPARE DIGITAL	Switched input

To connect the ECU to a PC, you need a standard DB9 female connector; please connect pin 7 (**ECU TX**) of the ECU to pin 2 of the DB9 and pin 18 (GND) of the ECU to pin 5 of the DB9.

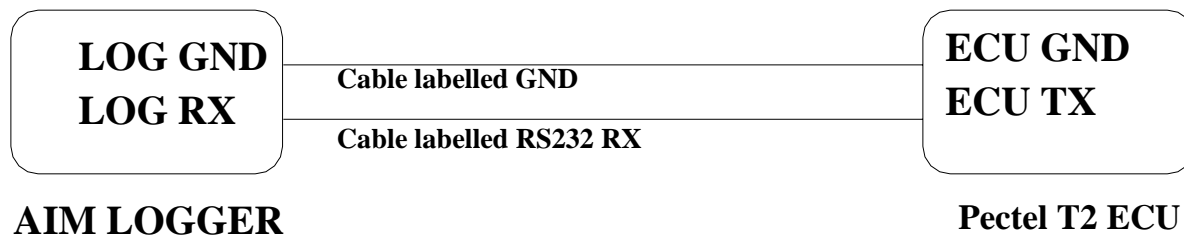
- **ECU Configuration**

The ECU needs an appropriate configuration through the program “**Descpro**”, provided by Pectel to communicate with AIM logger. To configure the ECU, please follow these steps:

1. Connect the ECU to a PC with **Descpro** installed, and turn on power to the ECU (ECU pin 6 at 12V and ECU pin 5,18 at GND).
2. Launch **Descpro** software; at start-up mark [**Serial**], choose the right [**COM**] port and click on [**On-line**] button.
3. The software reads the ECU configuration (called “**MAPS**”); when finished, press [**Menu**] button top-right on the screen, and choose [**Software Setup**] in the next window.
4. Now choose [**Data Logging And Serial Comms**] with arrow-keys and press return (or double click with mouse pointer).
5. Select [**Default Communication Mode**] and press return.
6. The default mode should be [**PC**], press return and a dialogue-windows appears (**Set to:**); you must choose [**STACK**] and press return.
7. The new configuration must be transmitted to the ECU before quitting the program: click on [**File**] button (bottom-left) and choose [**Program current maps into ECU flash**]; confirm the operation when prompted.
8. After the transfer is finished quit the program **Decspro**; ECU is ready to communicate with AIM loggers.

- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **pin 7** of the **ECU (ECU TX)**, and cable labelled **GND** with **pin18** of the **ECU (ECU GND)** as shown in the figure below:



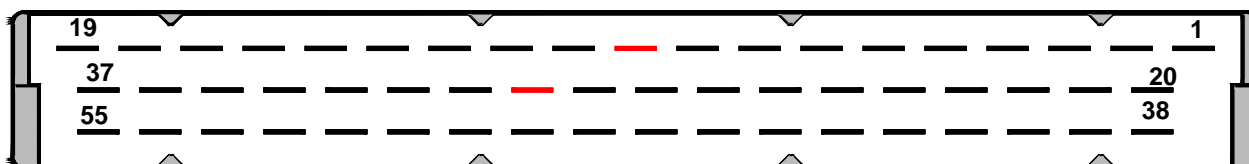
Pin	Function	Comments
18	GND	
7	RS232TX	

“PECTEL – T6”

- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

Pectel T2 ECU has a 55 pins AMP connector shown below:



Pin	Function	Comments
1	SW2	Switch input. Internal 22k Pullup
20	SW1	Switch input. Internal 22k Pullup
38	LAMI2	Lambda Sensor 2
2	LAMV2	Lambda Sensor 2
21	PWM6/DET2	Build Option. Knock Sensor 2 or Low side drive
39	LAMI1	Lambda Sensor 1
3	LAMV1	Lambda Sensor 1
22	5V SENSOR SUPPLY	200mA maximum
40	Sensor GND	
4	SP2(AN8)	Analog input. Software Select Input Type
23	SP1(AN7)	Analog input. Software Select Input Type
41	MAP (AN6)	Analog input. Software Select Input Type
5	TPS(AN5)	Analog input. Software Select Input Type
24	SP4(AN4)	Analog input. Software Select Input Type
42	SP3(AN3)	Analog input. Software Select Input Type
6	ECT(AN2)	Analog input. Software Select Input Type
25	ACT(AN1)	Analog input. Software Select Input Type
43	ROT4	Digital input. Software Select 10k Pullup
7	THERMOSIG	K Type thermocouple input
26	ROT3	Digital input. Software Select 10k Pullup
44	ROT2	Digital input. Software Select 10k Pullup
8	ROT1	Digital input. Software Select 10k Pullup
27	DET1	Knock Sensor 1
45	PWM5	Low Side Drive
9	CAMSIG	CAM sensor
28	CRANKSIG	Crank sensor
46	COMMSGND	Comms ground
10	RS232TX	RS232 comms
29	RS232RX	RS232 comms
47	CAN LOW	CAN communications
11	CAN HIGH	CAN communications
30	ENGGND	
48	ENGGND	
12	ENGGND	

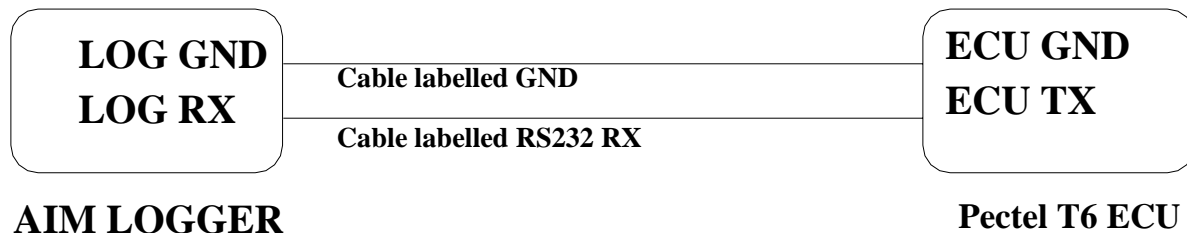
31	12V ECU SUPPLY	
49	PWM4	Low Side Drive (10A maximum)
13	PWM3	Low Side Drive (10A maximum)
32	PWM2	Low Side Drive (10A maximum)
50	PWM1	Low Side Drive (10A maximum)
14	INJ12/IGN8/PWM10	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
33	INJ11/IGN7/PWM9	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
51	INJ10/IGN6/PWM8	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
15	INJ9/IGN5/PWM7	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
34	INJ8	Software Select Low/High impedance injector drive (10A max)
52	INJ7	Software Select Low/High impedance injector drive
16	INJ6	Software Select Low/High impedance injector drive
35	INJ5	Software Select Low/High impedance injector drive
53	INJ4	Software Select Low/High impedance injector drive
17	INJ3	Software Select Low/High impedance injector drive
36	INJ2	Software Select Low/High impedance injector drive
24	INJ1	Software Select Low/High impedance injector drive
18	IGN4	Build Option: Low Side/TTL Coil Drive
37	IGN3	Build Option: Low Side/TTL Coil Drive
55	IGN2	Build Option: Low Side/TTL Coil Drive
19	IGN1	Build Option: Low Side/TTL Coil Drive

- **ECU Configuration**

1. To connect the ECU to a PC, you need to use a standard DB9 female connector; please connect **pin 10 (ECU TX)** of the ECU to **pin 2** of the DB9 and **pin 30 (GND)** of the ECU to **pin 5** of the DB9
2. The ECU must be properly configured using the program “**Descpro**” provided by Pectel to communicate with the data logger. Suggested configuration is the same of Pectel T2 ECU. Please note: pins used to power Pectel T6 are: pin 31 12V and pins 30, 48 or 12 for GND.

- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **pin 10** of the ECU (**ECU TX**), and cable called **GND** with **pin 30** of the ECU (**ECU GND**) as shown in the figure below:

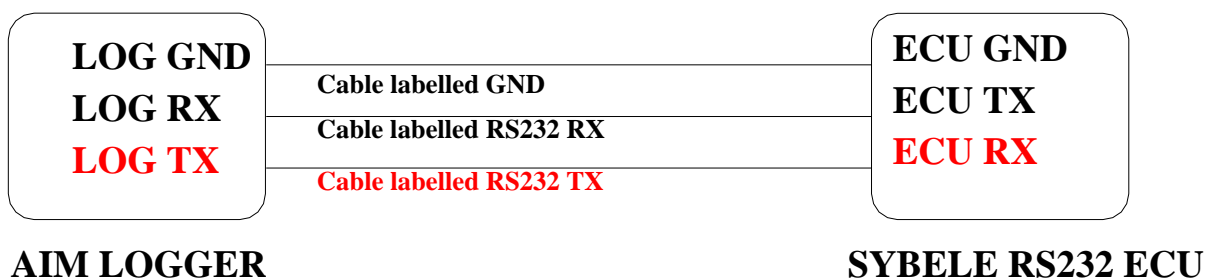


“SYBELE – RS232”

Sybele RS232 ECU is equipped with a 35 pins male connector (shown below) used to communicate with an external data logger and to configure the ECU itself.

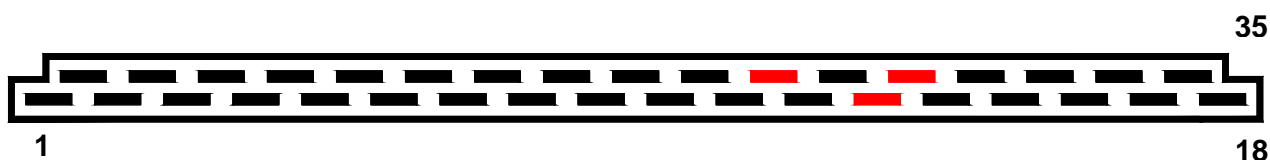
- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **ECU TX** (pin 13 of the 35 pins male connector), cable called **RS 232 TX** with **ECU RX** (pin 31 of the 35 pins male connector) and cable called **GND** with **ECU Power GND** (pin 29 of the 35 pins male connector) as shown in the figure below.



Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

Here below you can see Sybele RS232 35 pins male connector and its pinout.



PIN	Function	Comments
31	RS232RX	
13	RS232TX	
29	GND	