MARELLI MF4M 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 "MF4M_BlackboxTab". 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.



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Chapter 1 – Software settings

For Marelli MF4M BlackBoxTab (from here onward MF4M) to correctly communicate with AIM loggers it is necessary to set the ECU via software using Marelli "Vision" software.

PTA table: C:\ VISION\MF4\MF4_431E.PTA

Header Comment CAN link to the Data logger

Install and run Marelli vision software and load MF4M.PTA file. The window here on the right appears. Select "Marelli data channels" row.

itle		Enab.	Sz.
Marelli data channels	t6LUDA	? X	=00 1 x40x1
CAN Identifiers	IdU ser1	×	=00 3x1x1
AN Table	tbl_USER	×	4x3x1
Edit Table< <c:< td=""><td>VISION\MF4_</td><td>431E.P</td><td>TA:Marelli data channels>></td></c:<>	VISION\MF4_	431E.P	TA:Marelli data channels>>
	Programming of the "irst 20 channels al	channels : 100 Hz I	sent to Marelli Data Loggers then 20 channels at 20 Hz
1,1,1 (1)			
(1) 0000000			
(2) 0000000			
(4) 0000002			
(4) 00000003			
(6) 0000000			
(7) 0000000			
(8) 0000000	· · · · ·		
(9) 00000019			
(10) 00000012			
(11) 00000010			
(17) 0000001E	-		
(12) 00000022	, – I		
(14) 00000020			
(15) 00000055			
(16) 0AE1D402	2		
(17) 0AE1D602			
(18) 0AE1D201			
(19) 0000000			
(20) 00000020			
(21) 0000000	;		
(22) 0000007			
(23) 0000008			
(24) 0000000			
(25) 0000083			
(26) 0000004	\		
(27) 00000030			
(28) 0000050			
(29) 0000062	2		
(30) 0000028	;		
(31) 00000031			
(32) 00000032	2		
(33) 00000033			
(34) 00000034			
(35) 00000038	;		
(36) 00000050			
(37) 00000063			
(38) 0000081			

The table here on the right appears. Fill in these digits. Please note, digits shown here on the right are in Hexadecimal format.

(39) 00000082(40) 0AE00E02



In case the system does not accept alphabetical digits you have to insert digits in equivalent decimal format as shown here on the right.

Please note: if you have to fill in decimal digits ALL DIGITS ARE TO BE IN DECIMAL.

Some decimal are made up of nine digits in spite of 8; to fill them in right click on the cell and fill in the panel that appears.



Chapter 2 – Marelli CAN Communication setup

Magneti Marelli MF4M ECU is equipped with a CAN communication setup used to communicate parameters to an external logger.



Chapter 3 – Connection to AIM loggers

Magneti Marelli MF4M ECU is equipped with A 55 pins front Deutsch connector shown here below.



With reference to the image here above, to connect Marelli ECU to an AIM logger:

- connect AIM cable labelled CAN+ to pin q (CAN+) of the 55 pins connector;
- connect AIM cable labelled CAN- to pin r (CAN-) of the 55 pins connector;
- connect AIM cable labelled GND to pin K, L, e or f (GND) of the 55 pins connector;
- connect AIM cable labelled 9-15 VDC to pin **n** or **u** (VBatt) of the 55 pins connector.



FUNCTION

Chapter 4 – Communication protocol

Channels received by AIM loggers connected to Magneti Marelli MF4M Customer Protocol ECU are:

ID	CHANNEL NAME
ECU_1	MF4M_RPM
ECU_2	MF4M_TPS
ECU_3	MF4M_IN_AIR_PR
ECU_4	MF4M_BARO_PR
ECU_5	MF4M_DYN_PR
ECU_6	MF4M_FUEL_PR
ECU_7	MF4M_OIL_PR
ECU_8	MF4M_LAMBDA_V
ECU_9	MF4M_LAMBDA
ECU_10	MF4M_TINJH
ECU_11	MF4M_QINJH_ul
ECU_12	MF4M_QINJ_ul
ECU_13	MF4M_BINJ_MAP_ul
ECU_14	MF4M_SPARK_ADV
ECU_15	MF4M_BMAP_ADV
ECU_16	MF4M_BADV_TRBO
ECU_17	MF4M_QINJT_ul
ECU_18	MF4M_WAST_DUCY
ECU_19	MF4M_VBAT
ECU_20	MF4M_VEH_SPEED
ECU_21	MF4M_WATER_T
ECU_22	MF4M_AIR_T
ECU_23	MF4M_FUEL_T
ECU_24	MF4M_OIL_T
ECU_25	MF4M_TCK
ECU_26	MF4M_GEAR_BARR
ECU_27	MF4M_KLAMBDA
ECU_28	MF4M_GEAR
ECU_29	MF4M_EN_ACC_ul
ECU_30	MF4M_KOBJ

RPM
Throttle position
Intake Air Pressure
Barometric Pressure
Dynamic Pressure sensor
Fuel Pressure
Oil Pressure
Lambda Sensor Analogue Voltage
Lambda Value
Injection Time Ramp 1 High
Fuel Quantity Injection Ramp 1 High
Global Injection Quantity
Base Injection Map
Spark Advance
Base Map Advance
Base Advance Turbo Mode
Base Fuel Quantity in Turbo Mode
Wastegate Duty Cycle
Battery Voltage
Vehicle speed
Water Temperature
Intake Air Temperature
Fuel Temperature
Oil Temperature
Thermocouple Temperature
Gear Barrel Position
Lambda Correction Gain in closed loop
Engaged gear
Enrichment on Acceleration
Richness Target



ECU_31	MF4M_DIAG_ACQ1
ECU_32	MF4M_DIAG_ACQ2
ECU_33	MF4M_DIAG_ACQ3
ECU_34	MF4M_ALARM_ACQ
ECU_35	MF4M_FUEL_CONS
ECU_36	MF4M_ST_SWITCH
ECU_37	MF4M_EN_DEC_ul
ECU_38	MF4M_GAIN_LOOP
ECU_39	MF4M_ECU_T

ECU_40 MF4M_ANAUPSHFT

- I/O Defaults diagnostic
- I/O Defaults diagnostic
- I/O Defaults diagnostic
- I/O Alarm
- Fuel consumption
- State of the switches
- Enleaning on deceleration
- Gain for closed loop
- **ECU** Temperature
- Up shift Input voltage