AiM Infotech

MARELLI MF4
Toyota ECU

Release 1.01

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 "Toyota".
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 – Technical communication notes

Marelli MF4 Toyota ECU can communicate with AIM loggers through the CAN bus. This communication can be wrong due to different reasons related also to ECU hardware.

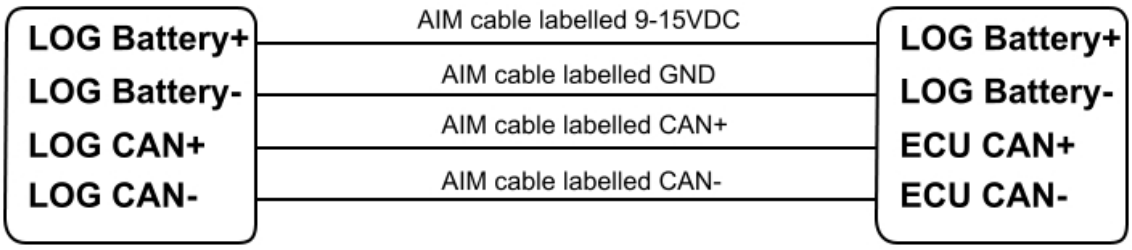
1.1 – Hardware check

EFI CAN line works normally with four wires: CAN High (corresponding to AIM CAN +), CAN low (corresponding to AIM CAN-), Battery+ (corresponding to AIM 9-15VDC) and Battery- (corresponding to AIM GND). To check if hardware is ok:

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

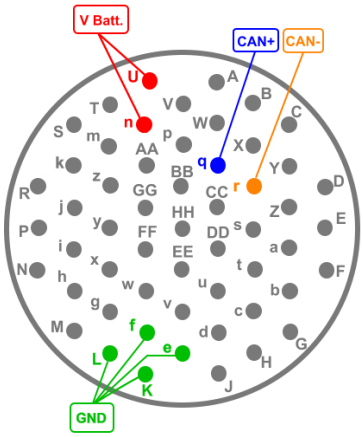
Chapter 2 – CAN Communication setup

Magneti Marelli MF4 Toyota ECU is equipped with a CAN communication setup used to communicate parameters to an external logger and shown here below.



Chapter 3 – Connection with AIM loggers

Magneti Marelli MF4 ECU is equipped with a 55 pins connector shown here below.



To connect AIM logger to the ECU:

- connect AIM cable labelled CAN+ with pin “**q**” of 55 pins connector;
- connect AIM cable labelled CAN- with pin “**r**” of 55 pins connector
- connect AIM cable labelled GND with pin “**K**”, “**L**”, “**e**” or “**f**” of 55 pins connector;
- connect AIM cable labelled “VBatt” with pin “**n**” or “**U**” of 55 pins connector.

Chapter 4 – MF4 Toyota communication protocol

Channels received by AIM loggers connected to Magneti Marelli MF4 Toyota are:

ID	CHANNEL NAME	FUNCTION
ECU_1	Toyota_RPM	RPM
ECU_2	Toyota_TPS	Throttle position sensor
ECU_3	Toyota_MAP	Manifold air pressure
ECU_4	Toyota_ATMP	Atmospheric pressure
ECU_5	Toyota_FUELP	Fuel pressure
ECU_6	Toyota_OILP	Oil pressure
ECU_7	Toyota_WATT	Engine cooling temperature
ECU_8	Toyota_AIRT	Intake air temperature
ECU_9	Toyota_FUELT	Fuel temperature
ECU_10	Toyota_OILT	Oil temperature
ECU_11	Toyota_BARREL	Gear barrel position
ECU_12	Toyota_VBATT	Battery voltage
ECU_13	Toyota_GEAR	Engaged gear
ECU_14	Toyota_N_USED1	Not used 1
ECU_15	Toyota_FUELCONS	Fuel consumption