

## Bosch MS 4.3 GA ECU with PDM MoTec



Racing Data Power

## INTRODUCTION

AIM has developed special applications for many of the most popular ECU: 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 “Bosch” and Model “MS43\_GA\_with\_PDM\_MoTeC”.**

**Refer to Race Studio Configuration user manual for further information concerning the loggers configuration.**

**For any further information concerning ECU firmware/software settings and/or upgrading it is always recommended to address to the ECU dealer.**

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## Chapter 1 – PDM setting

“MS43\_GA\_with\_PDM\_MoTec” communication protocol allows to receive and transmit more data to AIM logger than the **standard** configuration thanks to MoTec PDM (Power Distribution Module) connection.

AIM supports the following PDM models:

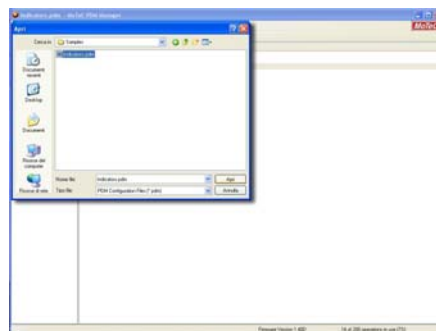
- PDM15
- PDM16
- PDM30
- PDM32

PDM must be properly set to communicate with AIM loggers; default settings are correct, but it is strongly recommended to check the software settings before the connections. Follow these steps:

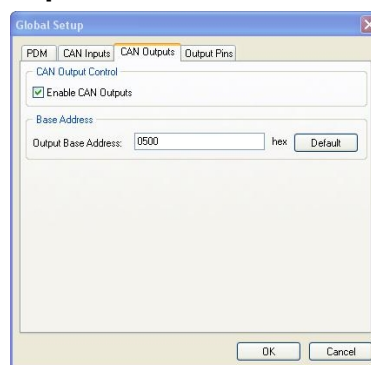
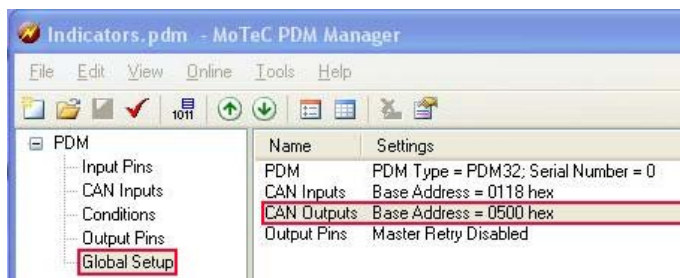


- Launch PDM Manager

- Open a configuration file (.PDM)



- Click “GLOBAL SETUP” then double click “CAN Outputs”



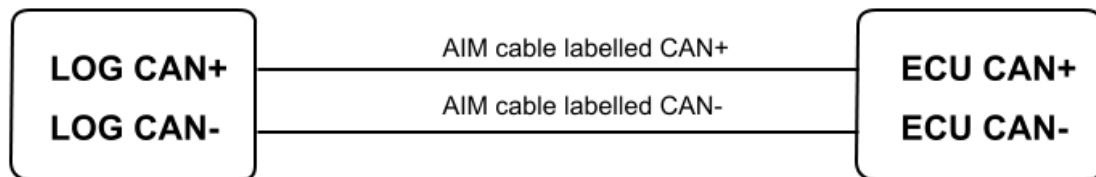
- Set Base Address: 0\*500
- Enable CAN output

## Chapter 2 – Connections

### 2.1 – CAN communication Setup

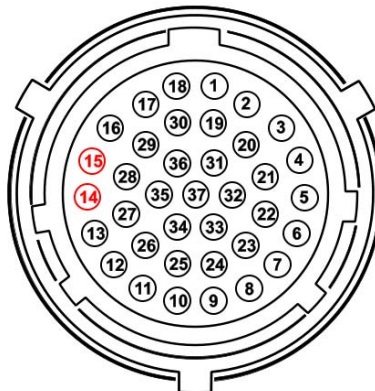
Bosch MS4.3 GA are equipped with a CAN communication Setup used to communicate with an external logger.

The image here below shows the standard CAN communication setup.



### 2.2 – Connection to AIM loggers

Bosch MS4.3 GA are equipped with a 37 pins Deutsch male connector shown here below.



With reference to the image here below, to connect Bosch MS 4.3 GA ECU to AIM loggers:

- connect pin 14 of 37 pins Deutsch connector to AIM cable labelled CAN+
- connect pin 15 of 37 pins Deutsch connector to AIM cable labelled CAN-

## Chapter 3 – Communication protocol

Channels received by AIM loggers connected to Bosch MS 4.3 GA with PDM MoTec and ECU are.

| ID     | CHANNEL NAME     | FUNCTION                             |
|--------|------------------|--------------------------------------|
| ECU_1  | MS43_RPM         | RPM                                  |
| ECU_2  | MS43_SPEED       | Speed                                |
| ECU_3  | MS43_WH_SPD_FL   | Front Left wheel speed               |
| ECU_4  | MS43_WH_SPD_FR   | Front rear wheel speed               |
| ECU_5  | MS43_WH_SPD_RL   | Rear left wheel speed                |
| ECU_6  | MS43_WH_SPD_RR   | Rear right wheel speed               |
| ECU_7  | MS43_TPS         | Throttle position sensor             |
| ECU_8  | MS43_MAP_BE_T1   | Map before Throttle 1                |
| ECU_9  | MS43_MAP_BE_T2   | Map before Throttle 2                |
| ECU_10 | MS43_MAP_AF_T1   | Map after throttle 1                 |
| ECU_11 | MS43_MAP_AF_T2   | Map after throttle 2                 |
| ECU_12 | MS43_AIR_P       | Air pressure                         |
| ECU_13 | MS43_WATER_P     | Water pressure                       |
| ECU_14 | MS43_CRANK_P     | Crank pressure                       |
| ECU_15 | MS43_OIL_P       | Oil pressure                         |
| ECU_16 | MS43_BRAKE_F_P   | Front brake pressure sensor          |
| ECU_17 | MS43_BRAKE_R_P   | Rear brake pressure sensor           |
| ECU_18 | MS43_FUEL_P1     | Fuel pressure 1                      |
| ECU_19 | MS43_FUEL_P2     | Fuel pressure 2                      |
| ECU_20 | MS43_FUEL_USED   | Used fuel                            |
| ECU_21 | MS43_ECT         | Engine cooling temperature           |
| ECU_22 | MS43_OIL_T       | Oil temperature                      |
| ECU_23 | MS43_FUEL_T      | Fuel temperature                     |
| ECU_24 | MS43_AIR_T       | Air temperature                      |
| ECU_25 | MS43_EXH_T1      | Exhaust temperature 1                |
| ECU_26 | MS43_EXH_T2      | Exhaust temperature 2                |
| ECU_27 | MS43_GEAR_T1     | Gearbox temperature 1                |
| ECU_28 | MS43_LAMBDA_T1   | Lambda temperature 1                 |
| ECU_29 | MS43_LAMBDA_T2   | Lambda temperature 2                 |
| ECU_30 | MS43_LAMBDA1     | Lambda sensor 1                      |
| ECU_31 | MS43_LAMBDA2     | Lambda sensor 2                      |
| ECU_32 | MS43_LAMB_CTRL1  | Lambda control 1                     |
| ECU_33 | MS43_LAMB_CTRL2  | Lambda control 2                     |
| ECU_34 | MS43_INJ_TIME1   | Injection time 1                     |
| ECU_35 | MS43_INJ_TIME2   | Injection time 2                     |
| ECU_36 | MS43_IGN_ANGLE   | Ignition angle                       |
| ECU_37 | MS43_GEAR        | Engaged gear                         |
| ECU_38 | MS43_STEER_ANGLE | Steering wheel angle                 |
| ECU_39 | MS43_YAW_RATE    | Yaw rate                             |
| ECU_40 | MS43_TC_ACTIVE   | Traction Control Active              |
| ECU_41 | MS43_LONG_ACC    | Longitudinal acceleration (X – axis) |
| ECU_42 | MS43_LATE_ACC    | Lateral acceleration (Y – axis)      |

|        |                |                                                    |
|--------|----------------|----------------------------------------------------|
| ECU_43 | MS43_VERT_ACC  | Vertical acceleration (Z – axis)                   |
| ECU_44 | MS43_MAP_POS   | Manifold air pressure position                     |
| ECU_45 | MS43_ECU_BATT  | ECU battery voltage                                |
| ECU_46 | PDM_BATT_VOLT  | Battery voltage                                    |
| ECU_47 | PDM_GLOB_ERR   | Global error outputs (0 no error/1=error outputs)  |
| ECU_48 | PDM_TOT_CURR   | Total current                                      |
| ECU_49 | PDM_OUTPUT_S1  | Output status – 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR |
| ECU_50 | PDM_OUTPUT_S2  | Output status – 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR |
| ECU_51 | PDM_OUTPUT_S3  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_52 | PDM_OUTPUT_S4  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_53 | PDM_OUTPUT_S5  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_54 | PDM_OUTPUT_S6  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_55 | PDM_OUTPUT_S7  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_56 | PDM_OUTPUT_S8  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_57 | PDM_OUTPUT_S9  | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_58 | PDM_OUTPUT_S10 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_59 | PDM_OUTPUT_S11 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_60 | PDM_OUTPUT_S12 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_61 | PDM_OUTPUT_S13 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_62 | PDM_OUTPUT_S14 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_63 | PDM_OUTPUT_S15 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_64 | PDM_OUTPUT_S16 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_65 | PDM_OUTPUT_S17 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_66 | PDM_OUTPUT_S18 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_67 | PDM_OUTPUT_S19 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_68 | PDM_OUTPUT_S20 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_69 | PDM_OUTPUT_S21 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_70 | PDM_OUTPUT_S22 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_71 | PDM_OUTPUT_S23 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_72 | PDM_OUTPUT_S24 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_73 | PDM_OUTPUT_S25 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_74 | PDM_OUTPUT_S26 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_75 | PDM_OUTPUT_S27 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_76 | PDM_OUTPUT_S28 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_77 | PDM_OUTPUT_S29 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_78 | PDM_OUTPUT_S30 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_79 | PDM_OUTPUT_S31 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |
| ECU_80 | PDM_OUTPUT_S32 | Output status– 0=OFF/1=ON/ 2=CURR ERR/4=FAULT ERR  |