AIM Infotech

# AEM 2 series V 1.17 and V 1.17+Dynoshaft ECU

#### Release 1.00







This tutorial explains how to connect AEM 2 series V 1.17 and V.117 + Dynoshaft ECU to AIM loggers through the CAN Bus. AEM Dyno is an on-vehicle dynamometer System that allows user to see some additional channels marked as "DY" in the channels list.

## 1 Prerequisites

For AEM 2 series V 1.17 ECU (with or without dynoshaft) to communicate with AIM loggers two prerequisites are to be satisfied:

- ECU firmware version: 1.17 or higher
- AEM Tuner software version 2.7 or higher

# 2 ECU Software configuration

Using AEM Tuner software – provided by AEM – follow these steps:

- run the software
- follow this path: Wizard >> Setup Wizard as shown here below

| File Edit Displa                          | y Tabs ECU  | Logging Tools | Wizard Live Tracing Help            |  |  |
|---|-------------|---------------|-------------------------------------|--|--|
| 🖄 Tuning Breakpoints 🔇 Limiters 💷 Start 😁 |             |               | Setup Wizard                        |  |  |
| Channels-Tuning 🛛 🗢 🔀                     |             |               | Set Throttle Range Wizard           |  |  |
| Name                                      | Value       | Unit          | Ignition Timing Sync Wizard         |  |  |
| Engine Speed                              |             | rpm           | Change Injector Flow/Pressure       |  |  |
| Engine Load                               |             | PSIg          | Configure Gear Ratio Wizard         |  |  |
| Throttle                                  |             | %             | Staged Injection Wizard             |  |  |
| Coolant Temp                              |             | с             |                                     |  |  |
| Air Temp                                  |             | С             |                                     |  |  |
| lgn Timing                                |             | Degrees       |                                     |  |  |
| Stat Syno'd                               |             |               |                                     |  |  |
| O2 Target                                 |             | AFR           |                                     |  |  |
| 02#                                       |             | AFR           | Function Explananation              |  |  |
|   |             | 04            |                                     |  |  |
| Workspace 👻 Calib                         | ration× 👻 🔚 |               | ECLINGT Coppected Firmware: N/A 6 7 |  |  |



- "Setup Wizard" panel appears: select "Telemetry CAN" (1);
- "Configuration name" appears in the table shown below (2) notifying the user that firmware version matches system requirements;
- press "Apply" (3).

| Wizard Types:  | Configuration Name   | Matched |   |  |  |
|--|--|---------|---|--|--|
| Feedback:Boost control<br>Feedback:02 control<br>Ignition: Coil Dwell<br>Injectors: Staged<br>Bev limit: 2Sten     | CAN Datastream (01v17 firmware)  | Matched | 2 |  |  |
| Rev limit: Main<br>Sensor: Air Temperature (AIT)<br>Sensor: Cam/Crank Position (<br>Sensor: Coolant Temperature    |  |         |   |  |  |
| Sensor: Exhaust Gas Temp (E<br>Sensor: Manifold Pressure (MA<br>Sensor: Mass Air Flow (MAF)<br>Sensor: 02#1 (AFR)  |  |         |   |  |  |
| Sensor: U2#2 (AFR)<br>Sensor: Vehicle Speed (VSS)<br>Setup: Automatic Trasmission<br>Setup: Variable Value Control |  |         |   |  |  |
| Telemetry: Serial  | Configuration Notes:   |         |   |  |  |
|  | This wizard will enter in the default CAN Telemetry settings into the calibration file 🦳 for a CAN Datastream Gauge.                                   |         |   |  |  |
|  | WARNING: Settings from other Series 2 firmware will not work with this<br>firmware version, this wizard must be used if CAN telemetry will be enabled. |         |   |  |  |
|  |  |         |   |  |  |



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# 2 Wiring Connection

AEM 2 Series V 1.17 ECU is equipped with 4 AMP male connectors. Starting from left: a 32 pins, a 25 pins, a 31 pins and a 16 pins connector.



The connector to be used for CAN Connection is the 31 pins. It is shown here below: please note that pins are to be numbered from right to left in each row.



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# 3 AIM Logger configuration

Once the ECU connected to the logger, this last one is to be configured as connected to that ECU.

Run Race Studio 2 software and follow this path:

- Device Configuration -> Select the device you are using;
- select the configuration or press "New" to create a new one;
- select ECU manufacturer "AEM" and ECU Model "EMS V1.17 CAN+Dynoshaft";
- transmit the configuration to the device pressing "Transmit".



## 4 Available channels

Channels received by AIM loggers connected to AEM 2 Series V 1.17 and V 1.17+Dynoshaft ECU are listed here below. Please note: channels from 20 to 26 marked as "DY" are only available if AEM Dynoshaft is connected. Otherwise these channels will be shown as in error.

| ID     | CHANNEL NAME   | FUNCTION                               |
|--------|----------------|--|
| ECU_1  | EMS_RPM        | RPM                                    |
| ECU_2  | EMS_ENG_LOAD   | Engine Load                            |
| ECU_3  | EMS_TPS        | Throttle position sensor               |
| ECU_4  | EMS_AIR_TEMP   | Air Temperature                        |
| ECU_5  | EMS_COOL_TEMP  | Engine Coolant Temperature             |
| ECU_6  | EMS_ADCR11     | Analog Digital Converter 11; 0-5 Volts |
| ECU_7  | EMS_ADCR13     | Analog Digital Converter 13; 0-5 Volts |
| ECU_8  | EMS_ADCR14     | Analog Digital Converter 14; 0-5 Volts |
| ECU_9  | EMS_ADCR17     | Analog Digital Converter 17; 0-5 Volts |
| ECU_10 | EMS_ADCR18     | Analog Digital Converter 18; 0-5 Volts |
| ECU_11 | EMS_ADCR15     | Analog Digital Converter 15; 0-5 Volts |
| ECU_12 | EMS_ADCR16     | Analog Digital Converter 16; 0-5 Volts |
| ECU_13 | EMS_ADCR08     | Analog Digital Converter 08; 0-5 Volts |
| ECU_14 | EMS_O2_#1      | Lambda sensor                          |
| ECU_15 | EMS_02_#2      | Lambda sensor                          |
| ECU_16 | EMS_VEH_SPEED  | Vehicle speed                          |
| ECU_17 | EMS_GEAR       | Engaged Gear                           |
| ECU_18 | EMS_IGN_TIM    | Ignition Time                          |
| ECU_19 | EMS_BATT_VOLT  | Battery Voltage                        |
| ECU_20 | EMS_ENG_LOAD2  | Engine Load 2                          |
| ECU_21 | DY_DSH_RPM     | Driveshaft RPM                         |
| ECU_22 | DY_DSH_TQ_FTLB | Driveshaft Torque - ft-lb              |
| ECU_23 | DY_DSH_PW_HP   | DriveShaft Power - HP                  |



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| ECU_24 | DY_TQ_FR_FTLB  | Torque Fraction ft-lb                 |
|--------|----------------|---------------------------------------|
| ECU_25 | DY_PW_FR_HP    | PowerFraction - HP                    |
| ECU_26 | DY_DSH_RPM2    | DriveShaft RPM                        |
| ECU_27 | DY_DSH_TQ2FTLB | Driveshaft Torque (low range) - ft-lb |
| ECU_28 | DY_DSH_PW2_HP  | Driveshaft Power (low range) - HP     |
| ECU_29 | DY_SYS_VOLT    | System Voltage                        |
| ECU_30 | DY_TANK_VOLT   | Tank Voltage                          |
| ECU_31 | DY_SENS_VOLT   | Sensor Voltage                        |
| ECU_32 | DY_POW_LEV     | Power level                           |
| ECU_33 | DY_SENS_TEMP   | Sensor Temp                           |
| ECU_34 | DY_DRV_FREQ    | Drive Frequency                       |
| ECU_35 | DY_SYST_TEMP   | System Temp                           |
| ECU_36 | DY_ERROR       | Mixed Errors and status:              |
|        |                | bit = 0 – Sensor firmware error       |
|        |                | bit = 1 – Controller firmware error   |
|        |                | bit = 2 – Sensor comms active         |
|        |                | bit = 3 – Got good zero offset        |

bit = 4 – Got good calibration

bit = 5 – Led aligned

bit = 7 – not used

bit = 6 – Auto zero active

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