# Race Studio Configuration

# User manual

**AiM**
Racing Data Power

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Racing Data Power

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# INDEX

# Chapter 1 – Race Studio 2 software

**Race Studio 2** is the application properly designed and developed by AIM to configure its loggers and analyze their data using a PC. It is made up of two software: **Race studio Configuration** and **Race Studio Analysis**.

**Race Studio 2** developed following the evolution of AIM loggers and ever improving its potentialities. Thanks to the configuration, the user can better customize its logger to take the most out of it.

With **Race Studio 2** it is possible to integrate in a flexible and dynamic system all the external expansion modules and the innovative devices that AIM Research and Development Dept. creates as well as all the custom sensors that any user can connect to his logger.

Configuring a logger with **Race Studio 2** means adapting it to one's needs, taking the most out of it.

## 1.1 – Compatibility between Race Studio 2 and operative systems

**Race Studio 2** has been developed to guarantee the maximum working reliability and its correct working has been tested with the following operative systems: Microsoft Windows XP and Microsoft Windows Vista 32 bit.

All operative systems (Linux, Unix, Macintosh®) not indicated in this tutorial are to be considered not supported by this application.

**Note: at present it is not possible to install AIM USB driver under Microsoft Window Vista 64 bit.**

For any problem it is suggested to check www.aim-sportline.com website to verify if any recent news has been issued and, if not, to contact the technical support at www.aim-sportline.com/pages/tech_support/section_tech_support.php.

# Chapter 2 – Installing Race Studio 2 and the USB Driver

To configure most of AIM loggers it is necessary to install **Race Studio 2** and the AIM USB driver.

## 2.1 – Preliminary operation.

Before starting software installation disconnect any AIM logger from the PC USB port and close all running applications.

A suggested preliminary operation is to check Windows$^{TM}$ "Driver signing" setting.

- Follow this path: Start ➡ setting ➡ Control Panel ➡ System and select "Hardware" layer (figure below on the left).
- Click on "Driver signing" and select "Warn – Prompt me each time to choose an action" (figure below in the right).
- Confirm pressing OK button and close all windows.
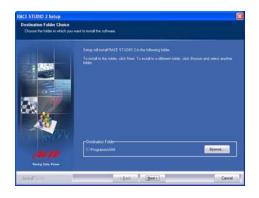
## 2.2 – Installing Race Studio 2 under Microsoft Windows XP

Before installing the software close all applications and insert **Race Studio 2** CD. If "auto play" option is enabled the installation starts automatically, otherwise click twice on "SETUP" icon.

In case of very first **Race Studio 2** installation the window on the right appears. It allows to select the window where to install the software.

Press "Browse" button to select **Race Studio 2** installation folder.

Press "Next" to install the software in the default folder X/program files/AIM, where "X" is the hard disk where the operative system is installed.

In case of new release of **Race Studio 2** the window on the right appears: enable "New Release of Race Studio 2" checkbox and click on "Next>"

From here onward the installation is the same. The window on the right appears and **Race Studio 2** is installed.

When the installation is over, in case of new release of **Race Studio 2**, the window on the right appears. Click on "Finish". Installation is completed.

In case of very first installation, on the contrary, the software starts AIM USB driver installation and the window on the right appears.
Disconnect any AIM USB cable from the PC USB port and click on "Start" button.

Close all applications and click on "Start".

Click on "Continue Anyway".

Click on "Continue".

Three panels will assist in the following steps.
Connect the USB cable to the PC USB port and switch the logger on. Wait some seconds and the following panel appears.

This pop up informs the user that the logger is correctly connected to the PC.

**Note**: when the procedure is over, connecting the logger to another PC USB port, the system could ask for USB driver installation on the new port too.
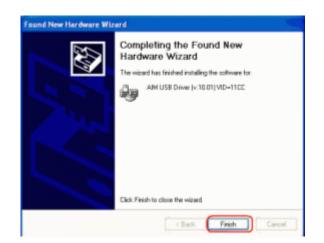
Enable "No, not now" checkbox and click on "Next>".

Enable "Install the software automatically (recommended)" checkbox and click on "Next >".

Click on "Finish".

Click on "OK".

Click on "Finish".

After the first installation two new icons, shown on the right, appear on the PC desktop: Race Studio 2 (Configuration) icon and Race Studio Analysis one. For this last one refer to the proper user manual.

Race Studio
Configuration icon

Race Studio
Analysis icon

When the first **Race Studio 2** installation is over, all new release installations will jump driver installation (please remember to periodically check www.aim-sportline.com download/software area).
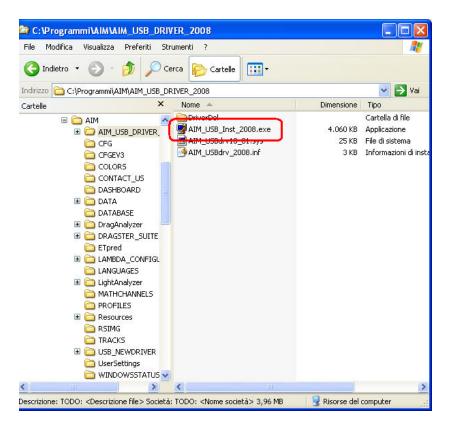
## 2.3 – Troubleshooting

In case driver installation ends incorrectly for any reason, starts maintenance procedure running AIM_USB_Inst_2008.exe. Follow this path: C:\Program files \ AIM \ AIM_USB_DRIVER_2008.



Run AIM_USB_Inst_2008.exe file.



This panel appears. Click on "Reinstall driver" and a procedure similar to the first installation starts.

## 2.4 – Installing Race Studio 2 under Microsoft Windows Vista

Microsoft Vista™ operative system introduced more rigid safety procedures.

**Note**: AIM has not yet obtained Microsoft "signature". This procedure is ongoing and, once finished, will make the installation completely automatic.

Installing "unsigned" driver needs to run the program "As administrator" that means starting Microsoft Vista™ using an "administrator" account. PC are normally sold with this account.

**Race Studio 2** installation creates a new icon on the PC desktop, that allows the user to start USB driver installation as "Administrator".



AIM_USB_Inst
_2008.exe

Before starting the installation, ensure that the logger is NOT connected to the PC USB port. In case it is, disconnect it.

Insert **Race Studio 2** CD in the CD Rom: if "auto play" option is enabled the installation starts automatically, otherwise click twice on "SETUP" icon.

In case of **Race Studio 2** very first installation the window on the right appears. It allows the user to select the software installation folder.
Click on "Browse" to select **Race Studio 2** destination folder or on "Next" to install the software in X/program files/AIM folder, where "X" is the hard disk where the operative system is installed on.



In case of new release of **Race Studio 2**, the window on the right appears: enable the checkbox "New Release of Race Studio 2" and click on "Next>".

The window on the right appears.



After the installation – in case of new release of **Race Studio 2** – the window on the right appears.
Click on Finish. The installation procedure is completed.
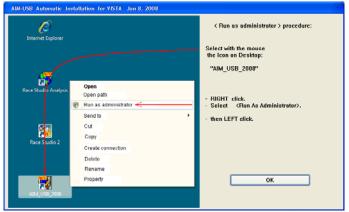


In case of very first installation the window on the right appears.
Click on "OK" button, to continue the installation.
Click on the question mark to know the <Run as Administrator> procedure. The following window appears.



It shows how to execute <Run as Administrator> procedure; click on "OK" to continue.
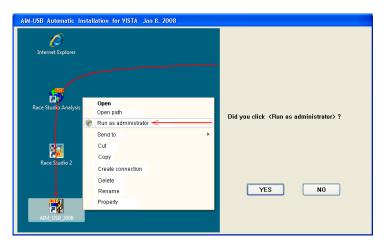
Click on "Finish".

## 2.5 – Installing the USB driver with "Run as Administrator" procedure



As explained in the image on the right, right click on AIM_USB_2008 icon on the PC desktop and select "Run as Administrator" option.
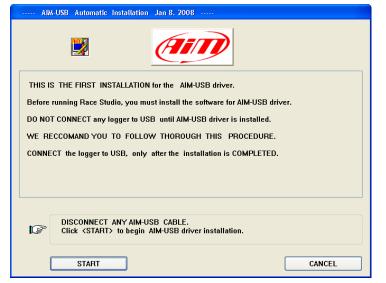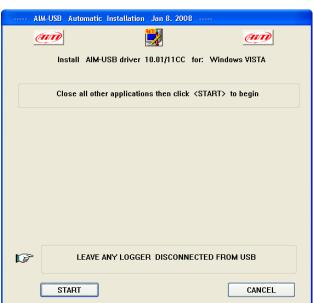


Click "YES" to continue.

Disconnect any USB cable and click on "START".



Click on "START". AIM USB driver installation starts.



Click on "OK".

Click on "Install this driver software anyway".



Click on "Continue".



Connect the USB cable to the PC USB port.



During **Race Studio 2** and AIM USB driver installation, three new icons appear on the desktop PC:



**AIM USB Driver icon**  |  **Race Studio 2 (Configuration) icon**  |  **Race Studio Analysis icon**

As far as Race Studio Analysis icon is concerned, refer to the proper user manual.

## 2.6 – Troubleshooting

In case USB driver installation ended incorrectly for any reason it is possible to start the maintenance procedure repeating the "Run as Administrator" procedure.

As shown in the figure on the right, right click on AIM_USB_2008 icon on the PC desktop and select "Run as administrator" option.

The panel on the right appears: click on "Reinstall driver".
The first step completely erases the first installation.

The system asks for confirmation.
Click on "Yes" to complete the new installation.
Click on "No" to quit and restart installation procedure later.

## 2.7 – Race Studio 2 visualization problems

Running **Race Studio 2** the display may show a misrepresented image like the one here below.



In this case it is necessary to change monitor settings.
**Warning**: close all running applications, **Race Studio 2** included. This operation requires PC rebooting.

Here below the explanation of the procedure to modify monitor settings:



Follow this path:
"Start/Setting/ Control Panel /Display".
The window "Display Properties", shown here on the right, appears.
Select "Settings" layer.
Press "Advanced".

Enable "Ask me before applying the new display settings" option.
Set DPI setting on "Normal (96 DPI)"

The window here below appears.

Press "OK".

Press "Apply".

The window here below appears:



Press "Yes".



Press "OK".

Press "Yes".
The system reboots.



After rebooting run "**Race Studio 2**" and all works correctly.

# Chapter 3 – System identification
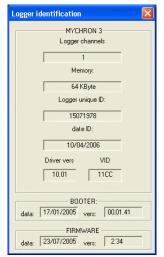
All AIM systems are univocally identified by **Race Studio 2** software. This allows to preliminarily check the communication between PC, software and the logger as to understand if the logger is supported by the software.

It is suggested to make a logger identification before starting any configuration. The procedure is:

- run **Race Studio 2**
- connect the USB cable to the PC and to the logger USB port
- switch the logger on
- press the button system identification. It is on **Race Studio 2** menu bar, in the left vertical keyboard and in system manager window (the button is labelled "System Identification" for all MyChron3 loggers and "CAN-net Info" for the other systems).



If all works correctly, "System identification/CAN-NET info" window, shown below, appears.



**MyChron3 logger identification window**          **CAN-net info window (other systems)**

## 3.1 – System identification of MyChron3

The window shows:

- **Logger channels**: number of channels of the logger
- **Memory**: memory size of the logger (no matter how much of it has already been used)
- **Logger unique ID**: logger serial number
- **Date ID**: logger production date
- **Driver vers. and VID**: information concerning the USB driver
- **Booter (date and vers.)**: logger booter date and version
- **Firmware (date and vers.)**: logger firmware date and version. It is suggested to check on www.aim-sportline.com that the logger firmware version is the latest available; if not, pls. download the latest one, install it and follow instructions that appear on the PC monitor.

## 3.2 – System identification of other loggers.

| N | Category of Logger | Type of Logger | Expansion Name | Logger ID | ID Date | Firmware ... | Firmware D... |
|---|---|---|---|---|---|---|---|
| 1 | MASTER | MXL PISTA | Master | 12345 | 16/01/2008 | 14.86.23 | 19/12/2007 |
| 2 | CAN EXPANSION | DaVid | | 47111881 | 18/01/2008 | 22.03 | 09/11/2007 |
| 3 | CAN EXPANSION | LCU-ONE | LC | 111111 | 13/12/2007 | 25.09 | 19/11/2007 |
| 4 | CAN EXPANSION | GPS | | 902499 | 14/01/2008 | 35.13 | 17/12/2007 |
| 5 | CAN EXPANSION | MEMORY KEY | | 7613105 | 17/12/2007 | 37.05 | 18/12/2007 |

The window shows:
- **N**: index of the item in the list. This window recognizes all loggers in their order starting always from the Master one (in the figure above an MXL Pista);
- **Category of logger**: role of the logger in the CAN net (master or CAN expansion)
- **Type of logger**: type of device connected
- **Expansion Name**: role of the logger in the CAN network
- **Logger ID**: logger univocal serial number
- **ID Date**: logger production date
- **Firmware Version**: firmware version installed on the logger. It is suggested to check on www.aim-sportline.com website that the firmware version is the latest available; if not, pls. download the latest one, install it and follow the instructions that appear on the PC monitor.
- **Firmware Date**: firmware date.

# Chapter 4 – How to configure MyChron3 kart Plus/Gold/Extreme

To correctly configure, **MyChron3 Kart** (**Plus/Gold/Extreme**) use a PC and **Race Studio 2** software.

**MyChron3 Kart** can be configured both via keyboard and via software but some parameters can be set only via software. To measure lateral acceleration (to create track maps), for instance, it is necessary to calibrate the internal accelerometer via software.

Before starting the configuration install **Race Studio 2** and the USB driver as explained in Chapter 2.

Run the software clicking on **Race Studio 2** icon and the window below appears.



In the title bar - white on a blue background in the figure above – you can see the version of **Race Studio 2** installed on the PC.

Immediately under there is the menu bar, that is shown in a more immediate way on the left thanks to the graphic buttons: Go to Analysis (this button runs Race Studio Analysis software), Download data, AIM system manager, AIM system Identification, Online, AIM system calibration, Custom sensors manager, Select language.
From this window it is possible to perform all operations necessary to manage all AIM systems.

To enter configuration menu click on "AIM system manager". A panel showing all systems managed through **Race Studio 2** appears: double click on **MyChron3 Kart Plus/Gold/Extreme** button or click on it and then press "✓Go to" button.



**Race Studio 2** "System manager" window appears.

This window has two keyboards.

- **General**: shows "System manager" window. In the central part, with grey background, all configurations currently included in the software database are listed. In case of first configuration, the system shows automatically new configuration window.
- **Configuration**: allows to set or modify an existing configuration.
- **Channels**: allows to set all logger channels.
- **System Identification**: allows to identify the logger connected to the PC.
- **Transmit**: transmits a configuration. Needs the logger to be switched on and connected to the PC.
- **Receive**: reads and saves the configuration of the logger connected to the PC.
- **Online**: allows to verify that the configuration is correct and has been correctly transmitted to the logger and that all works properly.
- **Calibrate**: allows to calibrate/auto-calibrate the sensors that need it.
- **New**: creates a new configuration
- **Delete**: deletes a configuration
- **Clone**: clones a configuration.
- **Import**: imports a configuration from a file.
- **Export**: exports a configuration to a file.
- **Exit**: quits "System manager" window.

To work on a configuration click on any cell of that configuration row and the entire row is selected (highlighted in yellow).

## 4.1 – Creating a new configuration

Pressing "New" button in system manager window, this window appears:



Some parameters need to be set:
- **Data logger type**: select the logger to be configured.
- **Vehicle name**: insert the vehicle name.
- **Speeds unit of measure**: choose between km/h and Mph;
- **Temperatures unit of measure**: choose between °C and °F;

Press "OK" to save ("Cancel" to quit without saving).
The system comes back to system manager window.



The next step is channels setting. Press "Channels" button.

## 4.2 – Channels

Pressing Channels button the window here below appears.



It shows all loggers channels with the related characteristics:

- **Channel identifier**: shows the channel label.
- **Enabled/Disabled**: shows the channel status (enabled/disabled). It can be modified double clicking on the cell except for RPM and SPD that can be modified only through system configuration window.
- **Channel name**: allows to name the channel.
- **Sampling Frequency**: allows to set each channel sampling frequency. This last one influences the total available time – highlighted by a blue box in the figure above – that diminishes increasing the sampling frequency because the memory fills up faster.
- **Sensor type**: allows to select the sensor installed on that channel from the drop down menu that appears clicking on that cell. Channels CH_1 and CH_2 are temperature channels: the logger can distinguish automatically a thermocouple from a thermo resistor and no configuration is needed. Channels CH_3 and CH_4 can be temperature or pressure channels: it is thereby necessary to configure them. CH_5 is the gear sensor installed in the gearbox that allows **MyChron3** to measure the engaged gear; **MyChron3 Gold**/**Extreme** has got an **internal accelerometer** to measure lateral g. It allows to create track maps.
- **Measure unit**: show the selected unit of measure for each channel. It is possible to change it double clicking on the cell.
- **High/Low scale**: shows the range of values shown by the graph that will be created in Race Studio Analysis after data download.
- **Param.1/Param2**: values of RPM and speed set in system configuration window.

When all parameters have been set, it is necessary to transmit the configuration to the logger.

## 4.3 – System configuration

**MyChron3 Kart Plus/Gold/Extreme** has got 14 fully configurable coloured led; the 2 on the left and on the right of the display represent the 4 max and min alarm of the analog channels (temperatures and pressures), while the other 10 led on top of the display are the Shift lights that inform the pilot to shift gear.



To set alarms, high/low threshold values and configuration parameters it is necessary to complete the window shown here above.

First of all select the display language from the drop down menu red circled above.

### 4.3.1 – Speed box



- **Wheel circumference**: fill in the kart wheel circumference (in mm or in inches); this value is fundamental to correlate the wheel revolution speed to the kart one.
- **Pulses per wheel revolution**: fill in the number of magnets installed on the wheel. When the magnet passes in face of the sensor it generates an electric pulse.

### 4.3.2 – Shift Lights box

Sets the 5 RPM values, each one corresponding to two of the coloured led placed on top of MyChron3.
Led colors: the first two on the left and on the right are green, the central two are orange and the last four are red. To set the RPM threshold values fill in the cases. The led switches progressively on and when the engine reaches RPM value set in the fifth case all led start blinking, warning the pilot to shift gear. If a value is set on 0 the corresponding led is disabled.

### 4.3.3 – RPM box

- **Multiply factor**: it is possible to choose among different values: for a one cylinder two strokes kart the proper value is /1.
- **Max value**: set the RPM high scale.

### 4.3.4 – Channels alarm boxes

These boxes (2 for **MyChron3 Plus**/**Gold**, 4 for **MyChron3 Extreme**) allow to set the channels threshold values linking them to the four lateral led of the system.
For **MyChron3 Plus** and **Gold** it is possible to connect the min and max threshold values to different Led while for **MyChron3 Extreme** max and min threshold values have to be connected to the same led. Insert max and min value corresponding to the sensors installed on the kart.

### 4.3.5 – Lap box



- **Obscuring time**: is a time period during which the lap receiver installed on the kart, after having sampled a lap signal, is "blind" (it does not record signals). This function is useful for split times management on tracks with more magnetic strips/optical transmitters: set obscuring time on a minimum value to sample split times; not to record split times, set obscuring time on a value lower than best lap time and higher then the time elapsed between last split and start/finish line.
- **Number of split times**: is the number of splits the track is divided in and corresponds to the number of magnetic strips/optical transmitters installed there.

### 4.3.6 – Gear sensor box



- **None**: not to see the engaged gear number.
- **Calculated**: to calculate the engaged gear number (see the related procedure – paragraph 5.7). In this last case, "Highest gear number" case is enabled: fill in the kart number of gears.

### 4.3.7 – Unit of measure box



- **Speed Unit**: choose between km/h and mph
- **Temperature unit**: choose between °C and °F

When all configuration parameters have been set, click on "OK" button to save ("Cancel" to quit without saving). It is now necessary to transmit the configuration to the logger.

## 4.4 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in system manager window and the system automatically will transmit the configuration to the logger.

**Warning: when the configuration has been transmitted to the logger it is not saved in the software configurations database. This means that - to have a copy of it in the database - users need to read and save it. To do so press "Receive" button in "System manager" window: the configuration appears as last row in the central part of the window and is highlighted in yellow.**

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate the accelerometer and calibrate the gear sensor installed on the kart.

**Warning**: if the gear potentiometer and the accelerometer have not been correctly calibrated, it is not possible to sample the engaged gear number, nor create the track map. It is strongly recommended to pay particular attention to sensors calibration/ auto-calibration procedures.

### 4.4.1 – Possible problems that may occur while transmitting the configuration

While transmitting the configuration various error messages can appear:

Check that the USB cable is correctly plugged in the PC and in the logger USB port, that the logger is switched on and try again transmitting the configuration.

The system informs the user that the configuration he is trying to transmit has a different gear setting. Press "Yes" only if you wish to change gear setting.

The system informs the user that the logger has data stored in its memory and they will be deleted if the configuration is transmitted. Press "Yes" only if you wish to delete the logger memory.

## 4.5 – Auto calibration of the accelerometer (Gold/Extreme only)

This procedure is analog to the one used for MyChron3 Car/Bike Plus/Gold/Extreme. See paragraph 5.6.2 for further information.

## 4.6 – Gear Calculation

The procedure is the same used to calculate gears on MyChron3 Car/Bike Plus/Gold/Extreme. See paragraph 5.7 for further information.

## 4.7 – Online

When the calibration procedure is over and the calibration has been transmitted to the logger, it is suggested to enter "Online" mode pressing the corresponding button in the menu bar, in system manager window or in the left vertical keyboard, to check that all works properly.
Ensure that the logger is switched on and correctly connected to the PC. The window here below appears. See paragraph 5.8 for further information.

# Chapter 5 – How to configure MyChron3 Car/Bike Plus/Gold/Extreme

To correctly configure **MyChron3 Car/Bike Plus/Gold/Extreme** use a PC and **Race Studio 2** software.

**MyChron3 Car/Bike** can be configured both via keyboard and via software but some channels, like these with temperature or pressure sensors, accelerometer or gyroscope, cannot be set via keyboard.

Before starting the configuration install **Race Studio 2** and the USB driver as explained in Chapter 2.
Run the software clicking on **Race Studio 2** icon and the window below appears:



In the title bar – white on a blue background in the figure – you can see the version of **Race Studio 2** installed on the PC.
Immediately under there is the menu bar, that is shown in a more immediate way on the left thanks to graphic buttons: Go to Analysis (this buttons runs the analysis software Race Studio Analysis), Data download, AIM system manager, AIM system identification, Online, AIM System Calibration, Custom sensors management, Select language.
Through this window it is possible to perform all operations necessary to manage all AIM systems.

To enter configuration menu click on "AIM System manager". A panel showing all systems managed through **Race Studio 2** appears: double click on **MyChron3 Car/Bike Plus/Gold/Extreme** button or select it and click on "✓Go to" button.



**Race Studio 2** System manager window appears.

This window has two keyboards.

- **General**: shows "System manager window". In the central part, with grey background, all configurations currently included in the software database are listed. In case of first configuration the software shows directly "New configuration" window.
- **Configuration**: allows to set or modify a configuration.
- **Channels**: allows to set all loggers channels.
- **System Identification**: allows to identify the logger connected to the PC.
- **Transmit**: transmits a configuration to the logger. It needs the logger to be switched on and connected to the PC.
- **Receive**: reads and saves the configuration of the logger connected to the PC.
- **Online**: allows to check that the configuration is correct and has been correctly transmitted to the logger and that all works properly.
- **Calibrate**: allows to calibrate/auto-calibrate the sensors that need it.
- **New**: creates a new configuration.
- **Delete**: deletes a configuration.
- **Clone**: clones a configuration.
- **Import**: imports a configuration from a database or from a file.
- **Export**: exports a configuration in a file.
- **Quit**: quits "System Manager" window.

To work on a configuration click on any cell of that configuration row and the entire row is selected (highlighted in yellow).

## 5.1 – Creating a new configuration

Pressing "New" button in "System Manager" window, this window appears.

Some parameters need to be set:
- **Data Logger type**: select the logger to be configured.
- **Vehicle Name**: insert the vehicle name.
- **Speeds unit of measure**: choose between km/h and Mph.
- **Temperatures unit of measure**: choose between °C and °F.
- **Pressures unit of measure**: choose between Bar and PSI.

Press "OK" to save ("Cancel" to quit without saving).
The system comes back to system manager window.

The next step is channels setting. Press "Channels".

### 5.1.1 – MyChron3 Plus/Gold Bike Plug&Play configurations

**MyChron3 Plus**/**Gold** Plug&Play kits for Bike installations include, beside the logger, all what is needed for an easy installation on the bike (wiring, bracket, screws, washers, etc.). At present, the most important models/brands have got their kits available. Refer to AIM corporate website www.aim-sportline.com for further information.

c
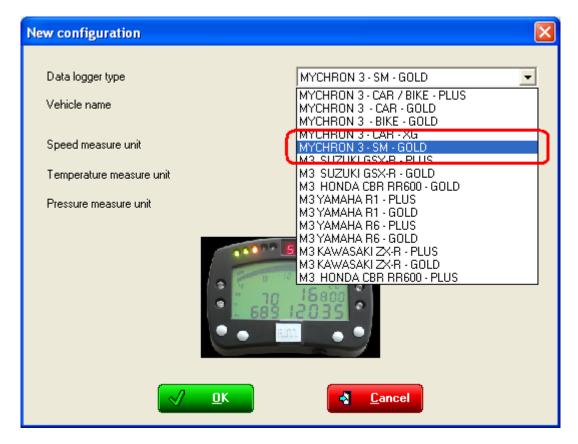


If the bike is completely corresponding to the stock one sold by the manufacturer, selecting the related configuration is enough to transmit it to the logger. In case, on the contrary, additional sensors have been installed, they need to be configured following the procedures here described.

**Warning**: all parameters set in Plug&Play configurations have been tested to work correctly. Refer to each kit user manual for any information concerning the configuration and to modify it.

## 5.1.2 – MyChron3 Gold Snow Mobile configuration

AIM produces a particular version of **MyChron3 Gold** for **Snowmobile** installations. This particular MyChron3 application is supported by the configuration labelled "MyChron3 – SM – Gold". When the logger has been correctly installed and the eventual additional sensors connected (refer to the related documentation for further information), it is necessary to configure the logger. Select the logger between these available in "New configuration" window.



Pressing "OK" the system comes back to System manager window. The next step is channels setting; press "Channels".

## 5.2 – Channels

Pressing Channels button this window appears.



It shows all channels set on the logger with the related characteristics:

- **Channel Identifier**: shows channel label.
- **Enabled/Disabled**: shows channel status (enabled/disabled). It is modifiable with a double click on the cell except for RPM, Speed and Gear that can be modified only through System configuration window.
- **Channel name**: allows to name the channel.
- **Sampling Frequency**: allows to set each channel sampling frequency. This last one influences the total available sampling time - highlighted by a blue box in the figure above - that diminishes increasing the sampling frequency because the memory fills up faster.
- **Sensor type**: allows to select the sensor installed on that channel from the drop down menu that appears clicking on that cell. Channels CH_1-CH_4 support temperature or pressure sensors (**MyChron3 Plus**), potentiometers and Lambda probe (**MyChron3 Gold/Gold XG**). User can set the desired sensor selecting it from the drop down menu. Channel CH_5 is gear channel. **MyChron3 Gold Bike** allows to install an external gyroscope on channel CH_7 to create the track map while **MyChron3 Gold/Gold XG** (Car) has a lateral internal accelerometer (labelled ACC_1) for the same purpose.
- **Measure unit**: allows to select the sensor unit of measure.
- **High**/**Low scale**: shows the range of values visualized by the graph that will be created by Race Studio Analysis after data download.
- **Param.1**/**Param2**: the values of RPM and speed parameters set in system configuration window.

When all parameters have been set it is necessary to transmit the configuration to the logger.

## 5.3 – Creating a custom sensor

This function allows to configure a "custom" sensor setting the proper curve: it is very useful when the used sensor (pressure, temperature or other) is not included in the available sensors list.

**Please note: "Custom sensors" option is intended for expert users only.**

Press "Custom sensors manager" button in channels window or in the menu bar or in the left vertical toolbar.



This window appears:



It allows to create/delete a custom sensor and import/export a sensor (or all sensors).

To create a custom sensor:



Click on the drop down menu corresponding to "Measure type" case and select the category the sensor belongs to.



Select the unit of measure corresponding to the sensor to be created.



Enable the left cases corresponding to the number of experimental values to be used (up to 20 allowed).
Fill in the values corresponding to the sensor to be created in the two left columns.

- x[mV]: sensor output voltage in mV (X axle of the calibration curve);
- y: values of the selected measure concerning the output voltage – the values are interpolated using a polynomial (Y axle);

Curve error: this column is useful to verify that the curve computed by the software is consistent with the experimental values.

**Customize sensor**

Type of measure: Length

| | x [mV] | y km | Curve Error |
|---|---|---|---|
| ☑ 1 | 0 | 118 | -0.812 |
| ☑ 2 | 123 | 109 | 0.889 |
| ☑ 3 | 562 | 88 | 0.243 |
| ☑ 4 | 1398 | 61 | -0.624 |
| ☑ 5 | 2709 | 31 | 0.617 |
| ☑ 6 | 3603 | 14 | -0.405 |
| ☑ 7 | 4484 | -3 | 0.092 |
| ☐ 8 | 0 | 0 | 0.0 |
| ☐ 9 | 0 | 0 | 0.0 |
| ☐ 10 | 0 | 0 | 0.0 |
| ☐ 11 | 0 | 0 | 0.0 |
| ☐ 12 | 0 | 0 | 0.0 |
| ☐ 13 | 0 | 0 | 0.0 |
| ☐ 14 | 0 | 0 | 0.0 |
| ☐ 15 | 0 | 0 | 0.0 |
| ☐ 16 | 0 | 0 | 0.0 |
| ☐ 17 | 0 | 0 | 0.0 |
| ☐ 18 | 0 | 0 | 0.0 |
| ☐ 19 | 0 | 0 | 0.0 |
| ☐ 20 | 0 | 0 | 0.0 |

Compute Curve

$$y = a_0 + a_1 * x + a_2 * x^2 + a_3 * x^3 + a_4 * x^4$$

| | |
|---|---|
| a0 | 117.188278 |
| a1 | -6.184270e-002 |
| a2 | 0.000021 |
| a3 | -4.599420e-009 |
| a4 | 3.770901e-013 |

Select sensor

Sub_H2O
Custom_001
Custom_002

Sensor name

Sub_H2O

Save sensor

Delete sensor

Import sensors

Export selected sensor

Export all sensor

Exit

After inserting the experimental values:
- click on "Compute curve";
- fill in "Sensor name" box;
- click on "Save sensor";
- click on "Exit";
- set the new sensor on the desired channel in channels window.

## 5.4 – System configuration

**MyChron3 Car/Bike Plus/Gold/Extreme** has 14 fully configurable alarm led; the 2 on the left and on the right of the display are the 4 high/low alarm led of the analog channels (temperatures and pressures), while the other 10 on top of the display are the Shift lights that warn the pilot to shift gear.



To set alarms, high/low threshold values and configuration parameters it is necessary to fill in the above reported window.

First of all select the display **language** red circled in the figure above.

**Note**: in case of a Plug&Play kit this window is already configured.

This window is to be completed like that of MyChron3 Kart (see paragraph 4.2.) except for Gear sensor box, shown here below. Available options are:

- "None": not to see the engaged gear on the display.

-  "Potentiometer": a gear potentiometer[1] is available.

- "Calculated": to calculate the engaged gear[2]; specify whether a neutral sensor is available or not if required.



---

[1] Gear sensor calibration procedure is described at paragraph 5.6.3.
[2] Gear calculation procedure is described at paragraph 5.7.

## 5.4.1 – System configuration of MyChron3 Gold Snow Mobile

In case of a **MyChron3 Gold Snowmobile**, configuration window is slightly different, as shown below. It has an additional box labelled "Shaft rotation speed".



The window is to be completed like the other MyChron3 of this group (see paragraphs 4.2 and 5.2) except for Shaft rotation speed box, reported here below.

Fill in the pulses for shaft revolution. This value corresponds to the number of magnets installed on the snowmobile transmission shaft.

## 5.5 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in system manager window and the system automatically transmits the configuration to the logger. For further information refer to paragraph 4.4.

## 5.6 – Sensors calibration and auto-calibration

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate accelerometer, gyroscope and distance potentiometer and calibrate the gear sensor, the mid zero potentiometer and the zero based potentiometer installed on the vehicle.

**Warning**: if potentiometers, gyroscope and accelerometers have not been correctly calibrated it is not possible to sample correct data, nor the engaged gear nor create the track map. It is recommended to pay particular attention to sensors calibration/auto-calibration procedures.

To enter calibration/auto calibration window press "AIM system calibration" button on the left keyboard or on **Race Studio 2** menu bar.



**Warning: to correctly perform the described procedures keep the vehicle as horizontal as possible (in case of a Bike leave it on the prop stand).**

### 5.6.1 – Sensors calibration procedure (except gear sensor)

Press "calibrate" button corresponding to the channel to be calibrated and follow the instructions that appear on the PC monitor. The figures here below show, on the left a mid zero potentiometer and on the right a zero based potentiometer calibration panel.



When the sensors have been calibrated their status in "Sensor calibration" window turns into "Calibrated" in red and "✓ Transmit calibration" button is enabled. Press it to transmit the calibration.



This procedure is fundamental to sample correct data.

### 5.6.2 – Sensors auto calibration procedure

Press "Click here to auto-calibrate all sensors in the list" to auto-calibrate accelerometer, gyroscope or distance potentiometer.



Sensors calibration status in "Sensor calibration" window turns into "Calibrated", in red and "✓Transmit calibration" button, bottom left, is enabled: press it to transmit the calibration.
This procedure is fundamental to sample correct data.

### 5.6.3 – Gear sensor calibration procedure

To calibrate the gear sensor it is necessary that the related panel in "System configuration" window is set on "Potentiometer" as shown here below.



In case during the transmission of the configuration the panel here below appears click on "Yes".
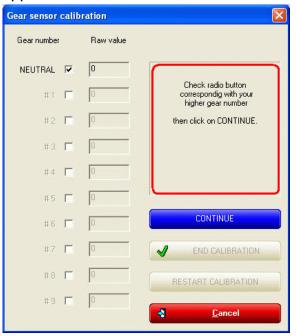
then press "AIM system calibration" button in the menu bar or in the left vertical keyboard: this window appears:



Press "Calibrate" button corresponding to the gear potentiometer.
The window here below appears:



Follow the instructions that appear on the right part of the window (enable the checkbox corresponding to the highest gear number; engage neutral gear, press "Continue"; engage the first gear, press "Continue" and repeat until the highest gear has been engaged).

When the procedure is over "✓ End calibration" button is enabled: press it.



The system comes back to sensor calibration window. Gear potentiometer status turns into "Calibrated" in red and "✓ Transmit Calibration" button is enabled: press it.

## 5.7 – Gear calculation procedure

Gear calculation procedure is to be set via software:
- set "Calculated" option in system calibration window;
- specify if a neutral sensor is available;
- fill in highest gear number;
- transmit the configuration to the logger.



**Note**: **DaVid**, the Data Video Recorder, needs that "Restart gear calibration" checkbox in "Select Configuration" layer is enabled, as shown here below.



When the gear sensor is set and the configuration has been transmitted, **calculation procedure** is to be performed through the logger keyboard and **is made up of three steps**: **start**, **learning lap** and **calculation**.

The correct procedure requires you to strictly follow these instructions.

Gear calibration proceeding is made using two inputs: RPM and speed. These two channels should be correctly configured and the related sensors installation should be faultless.

In case the logger has more than one speed input, gear calibration proceeding will take as reference speed the one shown on the display. It is suggested to take as reference the speed of the driving wheel. Gear calculation proceeding can be made also on not driving wheel, but in this case it is necessary to pay more attention not to have the wheels sliding or blocked during learning lap.

**Start (via keyboard)**

To start this function or to reset previous values and re-start gear calculation proceeding (except for DaVid that needs a restart via software):

- press [MENU/<<] button until the display shows: GEAR CALIBRATION;
- press [MEM/OK] button: the display shows: calculated gear:
- press [MEM/OK] button and fill in the highest gear number using [<<] and [>>] buttons;
- confirm pressing [MEM/OK] button;
- quit the menu pressing [QUIT/VIEW] button.

As a confirmation of the activation the display shows "running GEAR CAL": calibration procedure is correctly started.

**Learning lap**

After gear calibration proceeding activation, a track lap needs to be run. During this learning lap, follow carefully these instructions.

- Engage all gears.
- Keep each gear engaged for at least 5/6 seconds.
- Drive in a smooth way (avoiding sudden accelerations or wheels blocks during brakes); let the engine keep RPM gradually and keep brakes as long as possible too in line with track characteristics and traffic situation. If using a reference speed coming from a not driving wheel, pay particular attention to driving style, reducing sliding between driving wheels and not driving ones.
- Go to the pit lane alter the learning lap and switch the engine off.

**Warning**: totally avoid "revs" while the vehicle is moving; avoid running through the pit lane with friction engaged. If needed, it is possible to press the accelerator before switching the engine off but when the vehicle is completely stopped.

**Gear Calculation**

After engine switch off gear calculation proceeding starts automatically. During this period LED AL1 blinks. After a few seconds (duration of the calculation depends on learning lap length) LED AL1 switches off and the display does no more show: "running GEAR CAL".

All AIM systems allow gear calculation proceeding working also if engine switch off is needed. In this case just re-switch the system on and calculation proceeding re-starts automatically with recorded values. Calculation proceeding takes more time and blinking led will be LED AL2 and, after, LED AL1.

**Warning**: do not move the vehicle and do not switch the engine on during gear calculation. Moving the vehicle the logger could record values that would make it misdoing the calculation.

**Final suggestions**
Gear calculation proceeding is only possible thanks to the measurement of the angular speed of the driving shaft and of the driving wheel. When the friction is completely engaged between the two speeds there is a ratio mechanically defined by the engaged gear. If the friction slides this ratio is no more determinable. If reference speed comes from a not driving wheel the sliding between driving wheel and not driving one due to accelerations and brakes implies an error in the gear computation. This is why it is strongly recommend to drive as smoothly as possible during learning lap.

## 5.8 – Online

When the calibration is over and the configuration has been transmitted to the logger, it is suggested to enter "Online" pressing the corresponding button on the menu bar, in system manager window or on the left vertical keyboard to verify that all works properly.

Ensure that the logger is switched on and correctly connected to the PC. The window here below appears:



It shows:

**On top:**
- **logger type**: the type of logger connected to the PC.
- **Firmware version**: firmware version installed on that logger.
- **Total frequency**: sum of all channels sampling frequency.

**Central:** channels table

**On the right:**
- **Show ADC counts and show mV**: buttons mainly used by AIM staff.
- **Battery**: shows battery voltage; in some loggers beside this case there is another one labelled V Ref. that shows V Ref value.
- **Memory**: shows memory status (logger is storing data or logger isn't storing data).
- **Lap marker**: checks transmitter/receiver channels. Place the transmitter in front of the receiver to test this function.
- **Logger-PC link**: shows the status of the USB connection.
- **Configuration status**: shows the configuration status.
- **Exit**: quits online window.

**Note**: if this message appears check that the logger is switched on, the cable is correctly plugged in the PC and in the Logger USB port; then try again.

# Chapter 6 – How to configure MyChron3 Log/Visor/XGLog

To correctly configure **MyChron3 Log/Visor/XGLog**, use a PC and **Race Studio 2** software.
**MyChron3 Log/Visor/XGLog** can be configured both via keyboard and via software but some channels can only be set via software. Temperature or pressure sensors, as well as ECU signals cannot be set via keyboard, exactly like accelerometers, potentiometers, the gyroscope etc….

Before starting the configuration, install **Race Studio 2** and the USB driver as explained in chapter 2.

Run the software clicking on the related icon and the window here below appears.



In the title bar – white on a blue background in the figure – you can see the **Race Studio 2** version installed on the PC .
Immediately under there is menu bar, shown in a more intuitive way on the left thanks to the graphic buttons: Go to Analysis (this button runs Race Studio Analysis software), Data download, AIM system manager, AIM system identification, Online, AIM system calibration, Custom sensors management, Select language.
From this window it is possible to perform all operations necessary to manage all AIM systems.

To enter configuration menu click on "AIM system manager" button . A panel showing all systems managed through **Race Studio 2** software appears: double click on "**M3Log/Visor XGLog**" or select it and click on "✓Go to" button.



**Race Studio 2** "System manager" window appears.

Top and bottom keyboards allows the user to perform all needed operations to manage an AIM system. For further information concerning each button refer to the related paragraph in the chapter concerning **MyChron3 Car/Bike Plus/Gold/Extreme** configuration.

Central is the database of the available configurations. To work on one of them click on any cell of that configuration and the entire row is selected (highlighted in yellow).

## 6.1 – Premise on MyChron3 Log/Visor/XGLog

Systems managed through this button are: **MyChron3 LOG Advanced**, **MyChron3 Visor**, **MyChron3 XG LOG FR2000J** (configuration properly created for Japanese Formula Renault 2000 championship), **MyChron3 XG LOG**, **MyChron3 LOG Bike** and they differ from these previously explained because they can be connected to the engine control unit (from here onward ECU) of the vehicle.

For any information regarding the ECUs currently supported by AIM loggers, the procedures for a proper communication and connection between ECUs and AIM loggers, pls. refer to the proper Pdf document downloadable from AIM website at this link:
http://www.aim-sportline.com/pages/download/section_documentation_ecus.htm

## 6.2 – Creating a new configuration

Pressing "New" button in system manager window this window appears.



Some parameters need to be set:

- **Data logger type**: select the logger to be configured (please note: logger labelled M3 XG LOG FR2000J creates a configuration properly developed for Japanese Formula Renault 2000 championship);
- **ECU Manufacturer**: select the manufacturer of the ECU installed on the vehicle or none. This last option is only available for **MyChron3 XG Log** and **MyChron3 Log Bike**, the only loggers of this group that can work also without being connected to an ECU.
- **ECU Model**: select the ECU model or none.
- **New configuration name**: fill in the configuration name.
- **Vehicle name**: fill in the vehicle name.
- **Speeds unit of measure**: choose between km/h and Mph.
- **Temperatures unit of measure**: choose between °C and °F.
- **Pressure unit of measure**: choose between Bar and PSI.

Press "OK" to save ("Cancel" to quit without saving).
The system comes back to system manager window.

The next step Is channels setting. Press "Channels".

## 6.2.1 – MyChron3 XG Log FR2000J configuration

AIM produces a particular version of MyChron3 XG Log properly created for Japanese Formula Renault 2000 championship and labelled MyChron3 XG Log FR2000J. This particular application is supported by a configuration included in the available configurations database in MyChron3 Log/Visor XG Log menu. When the logger has been correctly installed and the sensors connected it is necessary to configure the logger. Select the logger between these available in "New Configuration" window.



Pressing "OK" the system comes back to System manager window. The next step is channels setting, press "Channels".

## 6.3 – Channels

Pressing Channels button this window appears.

| Channel id... | Enabled/di... | Channel name | Sampli... | Sensor type | Mea... | Low scale | High scale | Param. 1 |
|---|---|---|---|---|---|---|---|---|
| SPD_1 | Enabled | Speed_1 | 10 Hz | Speed | km/h... | 0.0 | 250.0 | 1666.0 |
| CH_1 | Enabled | Channel_1 | 10 Hz | Thermocouple | °C | 0 | 150 | |
| CH_2 | Enabled | Channel_2 | 10 Hz | Thermocouple | °C | 0 | 150 | |
| CH_3 | Enabled | Channel_3 | 10 Hz | Thermocouple | °C | 0 | 150 | |
| CH_4 | Enabled | Channel_4 | 10 Hz | Thermocouple | °C | 0 | 1000 | |
| CH_5 | Enabled | Channel_5 | 10 Hz | Thermocouple | °C | 0 | 50 | |
| CH_6 | Disabled | Channel_6 | 10 Hz | Calculated Gear | # | 0 | 9 | |
| ACC_1 | Enabled | Acc_1 | 10 Hz | Lateral accelerometer | g .01 | -3.00 | 3.00 | |
| LOG_TMP | Enabled | Datalogger_Temp | 10 Hz | Cold joint | °C | 0 | 50 | |
| BATT | Enabled | Battery | 1 Hz | Battery | V .1 | 5.0 | 15.0 | |
| ECU_1 | Enabled | AEM_RPM | 10 Hz | Engine speed sensor | rpm | 0 | 20000 | |
| ECU_2 | Enabled | AEM_LOAD | 10 Hz | Pressure sensor | bar ... | 0.00 | 150.00 | |
| ECU_3 | Enabled | AEM_TPS | 10 Hz | Percentage sensor | % .1 | 0.0 | 100.0 | |
| ECU_4 | Enabled | AEM_AIR_TEMP | 10 Hz | Temperature sensor | °C | -30 | 60 | |
| ECU_5 | Enabled | AEM_WATER_TEMP | 10 Hz | Temperature sensor | °C | -30 | 120 | |
| ECU_6 | Enabled | AEM_ADCR11 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_7 | Enabled | AEM_ADCR13 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_8 | Enabled | AEM_ADCR14 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_9 | Enabled | AEM_ADCR17 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_10 | Enabled | AEM_ADCR18 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_11 | Enabled | AEM_ADCR15 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_12 | Enabled | AEM_ADCR16 | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |
| ECU_13 | Enabled | AEM_BATTERY | 10 Hz | Voltmeter | V .1 | 0.0 | 20.0 | |

| Installation name | Logger type | Vehicle name | Available time | Total frequency |
|---|---|---|---|---|
| DEFAULT | M3LOG - Advanced | DEFAULT | 1.02.13 (h.m.s) | 271 (Hz) |

It shows all channels set on the logger with the related characteristics:

- **Channel identifier**: shows channel label. "ECU_X" are the ones received from the vehicle ECU.
- **Enabled/Disabled**: shows channel status (enabled/disabled). It can be modified with a double click on the cell except for RPM, speed and gear channel that are only modifiable through system configuration window.
- **Channel name**: allows to name the channel.
- **Sampling frequency**: allows to set each channel sampling frequency. This last one influences the total available sampling time, highlighted by a blue box in the figure above, that diminishes increasing the sampling frequency because the memory fills up faster.
- **Sensor type**: allows to select the sensor installed on that channel selecting it from the drop down menu that appears clicking on that cell. On channels from CH_1 to CH_4 (for MyChron3 XG Log FR2000J, MyChron3 Log Bike) or CH_5 (for MyChron3 Log Advanced, MyChron3 XG Log) it is possible to connect temperature or pressure sensors, potentiometers, Lambda probe and gyroscopes (except for MyChron3 Log Bike that has channel CH_7 devoted to the gyroscope). To set the desired sensor select it from the available sensors list. Channel CH_6 is the gear channel.
- **Measure unit**: allows to select the sensor unit of measure.
- **High/Low scale**: shows the range of values shown by the graph that will be created by Race Studio Analysis software after data download.
- **Param.1**: is the value of RPM or speed parameters set in system configuration window.

When all parameters have been set transmit the configuration to the logger.

### 6.3.1 – MyChron3 Visor and MyChron3 XG Log FR2000J channels

**MyChron3 Visor**, being just a dash, does not allow sensor installation on the different channels but only receives ECU signals.

MyChron3 XG Log FR2000J channels are already set but it is possible to set additional temperature and pressure sensors, potentiometers, gyroscope and Lambda probe on channels from CH_1 to CH_4.

## 6.4 – Creating a custom sensor

This function allows to configure a "custom" sensor setting its characteristic curve and is very useful when the used sensor (temperature, pressure or other) is not included in the available sensor lists.

**Please note: "Custom sensors" option is intended for expert users only.**

Press "Custom Sensor Manager" button in channel window or in the menu bar or in the left vertical keyboard.



The procedure to create a custom sensor is the same already explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.3).

## 6.5 – System configuration

**MyChron3 Log/Visor/XGLog** has 14 fully configurable coloured led; the 2 on the left and on the right of the display are the four high/low alarm led of the analog channels (temperatures and pressures), while the other 10 led on top of the display are the Shift lights that warn the pilot to shift gear.



To set alarms, high/low threshold values and all configuration parameters it is necessary to complete the window shown here above.

First of all select the display language red circled in the figure above.

### 6.5.1 – Speed box



- **Channel**: select from the drop down menu the speed channel to be used as reference and that will be shown by the logger display, used for gear calculation (paragraph 5.7), for some Race Studio Analysis computations etc. Available options are: speed coming from the speed sensor, speed coming from the ECU and none.
- **Wheel circumference**: fill in the vehicle wheel circumference;
- **Number of pulses per wheel revolution**: fill in the number of pulses per wheel revolution (that corresponds to the number of magnets installed on the wheel).

### 6.5.2 – Shift Light box



Sets 10 led placed on top of MyChron3. Led colors: the first two on the left and on the right are green, the central two are orange and the last four are red. To set RPM threshold value fill in the cases. Led switches progressively on and when the engine reaches the RPM value set for Led 5 all led start blinking warning the pilot to shift gear. If a value is set on 0 the corresponding led is disabled.

### 6.5.3 – RPM box



This box layout depends on the logger and on the settings defined by the user when creating a new configuration.

MyChron3 XG Log e MyChron3 Log Bike are the only loggers of this group that can work also without the connection with the ECU. So, setting ECU parameters of the new configuration on "none", the button labelled AIM sensor is enabled – figure above on the left. Ensure that RPM sensor is correctly installed and connected and insert Multiply factor and RPM Max value.

All other loggers can work only if connected to the vehicle ECU, which means that their system configuration window always shows this box with the only ECU signal button enabled (figure above on the right). Fill in RPM max value.

### 6.5.4 – Display Pages 1/2 – Channels and alarms box



These boxes are connected to the field shown by the logger display. Each logger of this family shows two pages and each of them is configurable as follows:

- match each case labelled as field (1, 2, 3 e 4) with a channel
- match, if needed, a led to that channel max/min values and insert these values.

Available led for these function are the four logger lateral led. Each of them can be associated to each channel no matter its position and can work as minimum or maximum alarm.

### 6.5.5 – Lap box



- **Obscuring time**: it's a time period during which the optical receiver installed on the vehicle, after having recorded a lap signal, is "blind": it does not record signals. This function is useful for split times management on tracks with more magnetic strips/optical transmitters: set obscuring time on a minimum value to sample split times; not to sample split times set obscuring time on a value lower than best lap time and higher then the time elapsed between last split and start finish line.

- **Number of split times**: is the number of segments the track is divided in and corresponds to the number of transmitters there installed.

### 6.5.6 – Gear sensor box

- **None**: not to see the engaged gear on the display.
- **Potentiometer** (except for **MyChron3 Visor**): there is a gear potentiometer (see – paragraph 5.6.3 for its calibration procedure).
- **ECU**: to sample gear signal from the ECU (assuming it can transmit it).
- **Calculated**[3]: to calculate gears; fill in highest gear number.

### 6.6.7 – Measure unit box

Select the unit of measure used for speeds (km/h or mph) and Temperatures (°C or °F).

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[3] Gear calculation procedure is described at paragraph 5.7.

## 6.5.8 – System configuration of MyChron3 XG Log FR2000J

In case of a **MyChron3 XG Log FR2000J**, configuration window – shown below – is partially set.



This window is to be completed following the same procedure explained for all other MyChron3 of this group.

## 6.6 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Pressing "Transmit" button in system manager window, the system automatically will transmit the configuration to the logger. See paragraph 4.4 for further information.

## 6.7 – Sensors calibration and auto-calibration

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate the accelerometer, the gyroscope and the distance potentiometer and calibrate the gear sensor, the mid zero potentiometer and the zero based potentiometer installed on the vehicle. The procedure is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.6).

**Warning**: if potentiometers, gyroscope and accelerometers have not been correctly calibrated it will not be possible to sample correct data nor the engaged gear or create the track map. Pls. pay particular attention to sensors calibration/auto-calibration procedures.

## 6.8 – Gear calculation

Gear calculation procedure is the same for all AIM loggers (paragraph 5.7).

## 6.9 – Online

When the calibration is over and the configuration has been transmitted to the logger it is suggested to enter "Online" pressing the corresponding button on the menu bar, in System Manager window or on the left vertical keyboard to check that all works properly. Ensure that the logger is switched on and correctly connected to the PC. The window here below appears. See paragraph 5.8 for further information.

# Chapter 7 – How to configure MXL Strada/Pista/Pro/Pro05

To correctly configure **MXL Strada/Pista/Pro/Pro05** (from here onward **MXL**), use a PC and **Race Studio 2** software. This logger can only be configured via software.

Before starting the configuration install **Race Studio 2** and the USB driver, as explained in chapter 2.
Run the program clicking on **Race Studio 2** icon: the window below appears.



In the title bar – white on a blue background in the figure – you can see the **Race Studio 2** version installed on the PC.
Immediately under there is the menu bar, shown in a more intuitive way on the left thanks to the graphic keys buttons: Go to Analysis (this button runs Race Studio Analysis software), Data download, AIM system manager, AIM system identification, Online, AIM system calibration, Custom sensors management, Select language.
From this window it is possible to perform all necessary operations to manage all AIM systems.

To enter configuration menu click on "AIM system manager" button. A panel showing all systems managed through **Race Studio 2** software appears: double click on "**MXL**" or select it and click on "✓Go to".



**Race Studio 2** system manager window appears.

## 7.1 – System manager window



Using the keyboards and the layers (pointed out by an arrow in the figure above) it is possible to perform all necessary operations to manage AIM systems.

The **top keyboard** of system manager window, shown here below, is made up of for buttons:



- **Transmit**: transmits a configuration to the logger and is active in any layer; needs the logger to be switched on and connected to the PC.
- **Receive**: reads and saves the configuration of the logger and is active only in "Select configuration" layer.
- **CAN-Net info**: identifies the CAN network connected to the PC, that means the logger and its eventual peripherals. Pressing it a waiting window appears and – once the connection established – "CAN-Net info" window shown here below appears. It shows all the CAN network components. In the example below the CAN network is made of an MXL Pista Master and four CAN expansions: DaVid, LCU-ONE, GPS and Memory Key.

**Set acquisition system time**: makes the logger time matching the PC one. Pressing it "Acquisition system time" window - below on the left - appears with PC clock on the left and **MXL** one on the right. Pressing the central button, PC and **MXL** will have the same time. This operation does not modify data sampled by the logger nor influence its peripherals. In case the window on the right appears it means that PC-logger connection is wrong. Check it and try again.

**Current Configuration Table**, immediately under the keyboard and shown here below, shows the main information concerning the configuration user is working on.

| Installation name | Data logger type | Ecu | Vehicle name | Available time | Time with GPS | Total frequency | Master frequency | Expansions freq... | Tot. Expansions |
|---|---|---|---|---|---|---|---|---|---|
| DEFAULT | MXL PISTA | None - None | DEFAULT | 9.32.39 (h.m.s) | 4.06.35 (h.m.s) | 121 (Hz) | 121 (Hz) | 0 (Hz) | 0 |

Again under this table are **four layers**:

- **Select configuration**: allows the user to select the configuration to work on; it is always active.
- **Channels**: allows to set **MXL** channels. It is active only if there are configurations in "Select configuration" layer.
- **System configuration**: allows to set or modify **MXL** configuration. It is active only if there are configurations in "Select configuration" layer.
- **CAN-expansions configurator**: allows to configure the expansions connected through the CAN bus to **MXL**, DaVid Slave video system included. It is active only if there are configurations in "Select configuration" layer; if not, it doesn't even appear.

### 7.1.1 – Select configuration layer

"Select configuration" layer shown here below, is made as follows:

| N | Installation name | Logger | ECU Manufacturer | ECU Model | Vehicle name | Obs... | Spli... | Speed | Temp | Created | Vi... | Tot... | Tot. ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DEFAULT | MXL STRADA | None | None | DEFAULT | 8 | 1 | k... | °C | February 13,... | ● | 1 | 0 |
| 2 | DEFAULT | MXL PISTA | AUTRONIC | SM2_V190/1 / SMC_... | DEFAULT | 8 | 1 | k... | °C | February 13,... | ○ | 0 | 0 |
| 3 | DEFAULT | MXL PRO | BOSCH | MS3 | DEFAULT | 5 | 3 | k... | °C | February 14,... | ● | 0 | 0 |
| 4 | DEFAULT | MXL PRO 05 | None | None | DEFAULT | 8 | 1 | k... | °C | February 15,... | ● | 0 | 0 |
| 5 | DEFAULT | MXL PISTA | None | None | DEFAULT | 8 | 1 | k... | °C | February 15,... | ● | 0 | 0 |
| 6 | DEFAULT | MXL PISTA ... | None | None | DEFAULT | 8 | 1 | k... | °C | February 15,... | ○ | 0 | 0 |
| 7 | DEFAULT | MXL PISTA ... | YAMAHA | R1_04_06 | DEFAULT | 8 | 1 | k... | °C | February 27,... | ○ | 0 | 0 |
| 8 | DEFAULT | MXL PISTA ... | None | None | DEFAULT | 8 | 1 | k... | °C | February 15,... | ○ | 0 | 0 |
| 9 | DEFAULT | MXL STRADA ... | SUBARU | SSM | DEFAULT | 8 | 1 | k... | °C | March 06, 2008 | ○ | 0 | 0 |
| 10 | DEFAULT | MXL STRADA | None | None | DEFAULT | 8 | 1 | k... | °C | March 12, 2008 | ○ | 0 | 0 |

**On top** is a keyboard made up of five buttons.
- **New**: creates a new configuration;
- **Delete**: deletes a configuration;
- **Clone**: clones a configuration;
- **Import**: imports a new configuration from a file;
- **Export**: exports a configuration to a file;

**Central** is the available configurations database. To work on one of them click on any cell of its row and the entire row is selected (highlighted in yellow).

In case of first configuration central table shows up empty.

## 7.2 – Creating a new configuration

Pressing "New" button in select configuration layer this window appears:



Some parameters need to be set:

- **Data logger type**: select the logger to be configured.
- **ECU Manufacturer**: select the Manufacturer of the ECU installed on the vehicle if supported or none.
- **ECU Model**: select the ECU model.
- **New configuration name**: fill in the new configuration name.
- **Vehicle name**: fill in the vehicle name.
- **Speeds unit of measure**: choose between km/h and mph.
- **Temperatures unit of measure**: choose between °C and °F.
- **Pressures unit of measure**: choose between Bar and PSI.

Press "OK" to save ("Cancel" to quit without saving).
The system comes back to system manager window.

## 7.2.1 – MXL Strada/Pista and Pro05 Plug&Play configurations

**MXL Strada/Pista/Pro05** Plug&Play kits for Car or Bike installations include, beside the logger, all what is needed for an easy installation on the vehicle (wiring, bracket, screws, washers, user manuals etc..). Currently the mpst common models/brands are available. For further information refer to AIM corporate website www.aim-sportline.com.

Once correctly installed the kit (see the kits user manuals for further information) just switch the vehicle on. In case there are problems depending on the configuration select the correct one in "New configuration" window shown here below. The blue box highlights Plug&Play configurations currently available.



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**Warning: all parameters set in Plug&Play configurations have been tested to work properly with vehicles completely corresponding to the stock ones sold by the manufacturers. Refer to the kits user manuals for any further information.**

## 7.3 – Channels

Enable "Channels" layer.



This layer sets all channels sampled by the logger and its layout depends on the logger version.

### 7.3.1 – Speed panels

On top of the layer you see the panels concerning speeds (1 for **MXL Strada** and **Pista** and 4 for **MXL Pro** and **Pro05)**. They are labelled like speed channels in the table below. Changing the channel name in the tables the panel label is modified live.

The panels are enabled through the related checkbox as shown in the figure below. Fill in wheel circumference and number of pulses for wheel revolution (corresponding to the number of magnets installed on the vehicle wheel). Enable and set the speeds to be used and disable the ones not to be used.

## 7.3.2 – Channels table



This table shows al logger channels with the related characteristics:

- **Channel identifier**: shows the channel label. "ECU_X" channels are the ones received from the vehicle ECU.
- **Enabled/disabled**: shows channel status (enabled or disabled). It can be modified double clicking on the cell except for RPM, Speed and Gear that has to be modified through "System Configuration" layer.
- **Channel name**: allows to name the channel.
- **Sampling Frequency**: allows to set each channel sampling frequency. This last one influences the total available time, highlighted in blue in the figure above, that diminishes growing sampling frequency because the memory fills up faster.
- **Sensor type**: shows the type of sensor installed on that channel; it is selected through the drop down menu that appears clicking on the cell. See the following page for further information.
- **Measure unit**: shows the selected unit of measure for each channel; it is possible to change it double clicking on the cell.
- **High/low scale**: shows high/low scale values of the sensor and can be modified double clicking on the cell.

This table shows which sensors can be installed on each channel of MXL.

| | Temperatures | Pressures | Potentiometers | Lambda Probe | Gyroscope | Accelerometer |
|---|---|---|---|---|---|---|
| **MXL Strada/MXL Pista** | | | | | | |
| **Ch_1** | X | X | X | X | | |
| **Ch_2** | X | X | X | X | | |
| **Ch_3** | X | X | X | X | | |
| **Ch_4** | X | X | X | X | X | X |
| **Ch_5** | X | X | X | X | X | X |
| **Ch_6** | X | X | X | X | X | X |
| **Ch_7** | X | X | X | X | X | X |
| **Ch_8*[4]** | X | X | X | X | X | X |
| **MXL Pro** | | | | | | |
| **Ch_1** | X | X | X | X | X | X |
| **Ch_2** | X | X | X | X | X | X |
| **Ch_3** | X | X | X | X | X | X |
| **Ch_4** | X | X | X | X | X | X |
| **Ch_5** | X | X | X | X | X | X |
| **Ch_6** | X | X | X | X | X | X |
| **Ch_7** | X | X | X | X | X | X |
| **Ch_8[4]** | X | X | X | X | X | X |
| **MXL PRO05** | | | | | | |
| **Ch_1** | X | X | X | X | | |
| **Ch_2** | X | X | X | X | | |
| **Ch_3** | X | X | X | X | | |
| **Ch_4** | X | X | X | X | | |
| **Ch_5** | X | X | X | X | | |
| **Ch_6** | X | X | X | X | | |
| **Ch_7** | X | X | X | X | X | X |
| **Ch_8** | X | X | X | X | X | X |
| **Ch_9** | X | X | X | X | X | X |
| **Ch_10** | X | X | X | X | X | X |
| **Ch_11** | X | X | X | X | X | X |
| **Ch_12[4]** | X | X | X | X | | |

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[4] Channels CH_8 (MXL Strada/Pista/Pro) and CH_12 (Pro05) are gear channels. If system configuration window (paragraph 7.2) sets them on "Potentiometer CH_8" (MXL Strada/ Pista/Pro), "Potentiometer CH_12" (Pro05) or on "Calculated+Neutral Signal" channel CH_8 or CH_12 sets on calculated gear and it is only possible to set channel name, sampling frequency, high and low scale. If not these channels work as shown in the table.

Setting some sensor on some channels that support them a configuration panel appears (bottom left of Channels layer). The figure below shows distance potentiometer configuration panel.

## 7.4 – Creating a custom sensor

This function allows to configure a "custom" sensor setting the proper calibration curve and it is very useful when the used sensor (pressure, temperature or other) is not included in the available sensors list.

**Please note: "Custom sensors" option is intended for expert users only.**

Press "Custom sensors manager" button in the menu bar or in the left vertical keyboard.



The procedure to create a custom sensor is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.3).

## 7.5 – System configuration

**MXL** has 16 fully configurable coloured led; the 3 on the left and on the right of the display represent the 6 max or min alarms of the analog channels (temperatures and pressures), while the other 10 led on top of the display are the Shift Lights that warn the pilot to shift gear.



To set the alarms, max and min threshold values and all parameters it is necessary to fill in the window above.
**Note**: in case of Plug&Play kit this window is already set.

### 7.5.1 – RPM box



Select "**AIM Sensor**" to sample this value from an RPM sensor installed on the vehicle; fill in multiply factor and RPM max value. RPM row in channel table (see paragraph 7.3) is enabled.
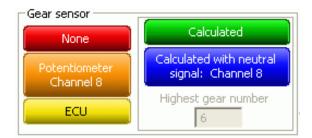
Select "**ECU sensor**" and set RPM max value to sample this value from the ECU, assuming it can transmit it.

It is also possible to connect RPM max value to one of the 6 alarm led (in the figure above on the right it has been linked to led 4) so that it switches on when the engine reaches a fixed RPM value. The led does not switch off until data download is made. In this situation, the channel for alarm corresponding to that led is disabled. It is suggested to set over-rev threshold on a value corresponding to the ECU limiter[5].

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[5] This setting can be very useful to detect over-revs situation without opening Race Studio Analysis.

### 7.5.2 – Gear sensor box
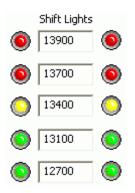


**MXL** can sample the engaged gear from a gear sensor or from the vehicle ECU. It can also calculate it with an algorithm based on RPM and speed. Available options are:

- "**None**": there is no gear sensor on the vehicle (or not to see the engaged gear). This option is disabled on the display.
- "**Potentiometer Channel 8/12**": there is a gear potentiometer installed on channel 8/12. The corresponding row in channel table (see paragraph 7.3) is set on Calculated Gear.
- "**ECU**": to sample this information from the vehicle ECU (assuming it can transmit it).
- "**Calculated**": to calculate the engaged gear with an algorithm based on RPM and speed; fill in "Highest gear number" case.
- "**Calculated with neutral signal: Channel 8/12**":there is a neutral sensor that can be used to see neutral gear and to calculate gears. "Highest gear number" case enables: fill it in.

**Note**: gear channel is always the last one of the logger. This means that it's Channel 8 for **MXL Strada**, **Pista** and **Pro** (having 8 channels) and channel 12 for **MXL Pro05** (having 12 channels).

### 7.5.3 – Shift light box
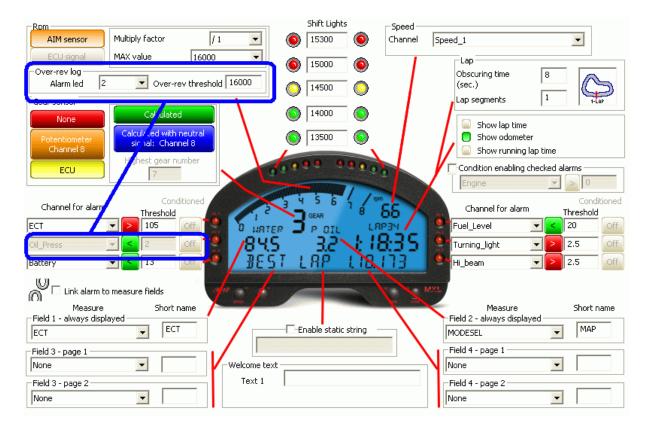


It manages the 10 led placed on top of **MXL**. Led colors: the first two on the left and on the right are green, the central two are orange and the last two are red. To set RPM threshold values fill in the cases. The led switch progressively on and when the engine reaches RPM values set for the top case all led start blinking, warning the pilot to shift gear.
If one case is set on "0" the corresponding led is disabled.

### 7.5.4 – Channel for alarm and measure boxes

Channel for alarm boxes are linked to the 6 alarm led of MXL.



- Set each channel as Max (">") or Min ("<") alarm.
- Fill in the threshold value.
- See the paragraph "Condition enabling checked alarm" for further information concerning "status" (grey) button right of "threshold" cases, disabled in the figure above.

**Note**: setting "Over-rev log/alarm led" in RPM box, the channel linked to that channel is completely disabled as shown above.

Channels for alarm cases are linked to the field shown by MXL display. The first on the left and on the right are always shown. The other four channels can be shown two by two on the display static string with the name set in "Short name" case or as "CH_X".

Select the channel to show and fill in its short name.



"**Link alarm to measure field**" option (enabled in the figure on the right) allows to link the 6 alarm led to the 6 shown alarms.
In this case channel for alarm cases disables and it is only possible to set threshold value and ">"/"<" (except if over-rev alarm led has been set as explained before).

### 7.5.5 – Speed box



It is possible to select the reference speed, that will be used for gear calculation and for some Race Studio Analysis computations. Available options are logger speed(s) (1 speed for **MXL Strada/Pista** and up to 4 speeds for **MXL Pro/Pro05**) and ECU speed(s). In the figure below the logger is connected to an Autronic ECU that transmits two speed channels.

## 7.5.6 – Lap box

**Obscuring time**: is a time period during which the optical receiver installed on the vehicle, after having recorded a lap signal, is "blind": it does not record signals. This function is useful to manage split times on tracks where more optical receivers are installed: set obscuring time on a low value (min accepted value is 3 seconds) to record splits and set it on a value lower than best lap time and higher than the time elapsed between last split and start/finish line (max accepted value is 255 seconds) not to record splits.

**Lap segments**: is the number of segment the track is divided in and corresponds to the number of transmitters there installed.

**Show lap time**: **MXL** display shows lap time in the related field.

**Show odometer**: **MXL** display shows odometer in the related field.

**Show running lap time**: **MXL** display shows running lap time from last lap signal in the related filed. The value resets when the logger detects a lap signal.

**Notes:**
Split number setting is ignored in case the track has the new lap/split transmitter installed.

Setting "Show odometer", the system switches automatically on "Show lap time" when detects a lap signal.

The logger stores the visualization set.

Refer to **MXL** user manual for any further information concerning the fields shown by the logger display.

### 7.5.7 – Condition enabling checked alarms box



This box - disabled by default - allows, if enabled, to condition the alarm led to an additional condition that – once set – becomes discriminating. It is very useful to avoid "false alarms", as explained in the following pages.

**Warning: to set the condition that enables checked alarms it is necessary to have previously set channels for alarm.**

To set channels for alarms follow this procedure:

1. set - selecting from the drop down menu - the channels for alarm to be shown;
2. fill in its threshold value;
3. set the alarm limit (">"/"<");
4. enable "Condition enabling selected alarms" case (this operation enables "status" button but shows them all red and set on "Off");
5. select the channel to use as conditioning one from the drop down menu;
6. fill in its threshold value;
7. set its alarm limit (">"/"<");
8. select the alarms to condition setting the related button on "On" (green).
9. this setting implies that the led of the conditioned alarms switches on only if two conditions occur contemporarily: their threshold value is overcome and, at the same time, the threshold value of the conditioning channel is overcome.

The images in the following pages show this procedure.
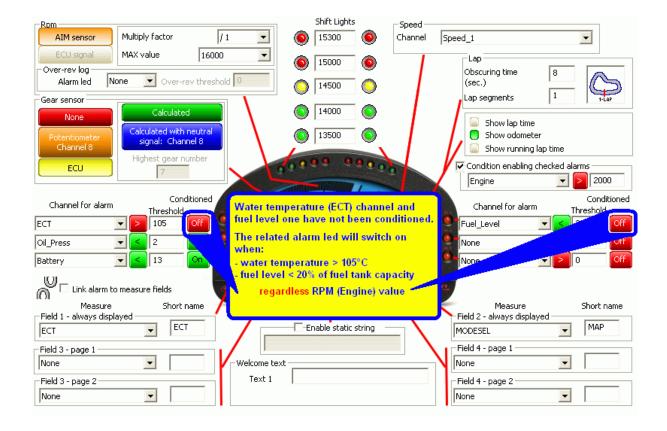
Set the channel for alarm to show

Fill in its threshold value

Set alarm limit (">"/"<")



Enable "Condition enabling checked alarms" checkbox.

Select the channel to use as condition.

It enables "status" buttons but sets them all on "Off".

Fill in a threshold value for the conditioning channel

Set its alarm limit (">"/"<")



Select which alarms between these set submit to that condition setting the related "Status" button on "On" (green)

**Screenshot 1:**

Rpm
AIM sensor | Multiply factor /1
ECU signal | MAX value 16000

Over-rev log
Alarm led None | Over-rev threshold 0

Gear sensor
None
Potentiometer Channel 8
ECU
Calculated
Calculated with neutral signal: Channel 8
Highest gear number 7

Shift Lights
15300
15000
14500
14000
13500

Speed
Channel Speed_1

Lap
Obscuring time (sec.) 8
Lap segments 1
1-LAP

Show lap time
Show odometer
Show running lap time

Condition enabling checked alarms
Engine > 2000

Channel for alarm | Conditioned Threshold
ECT | > | 105 | Off
Oil_Press | < | 2 | On
Battery | < | 13 | On

20 Off
0 Off
None 0 Off

Link alarm to measure fields

Measure | Short name
Field 1 - always displayed
ECT | ECT
Field 3 - page 1
None
Field 3 - page 2
None

Welcome text
Text 1

Measure | Short name
Field 2 - always displayed
MODESEL | MAP
Field 4 - page 1
None
Field 4 - page 2
None

*Yellow box:* Oil pressure and Battery channels have been conditioned to RPM (Engine) channel. The related led will switch on only if:
- Oil pressure <2 Bar + RPM >2000
or
- Battery voltage <13 Volts + RPM >2000

**Screenshot 2:**

Rpm
AIM sensor | Multiply factor /1
ECU signal | MAX value 16000

Over-rev log
Alarm led None | Over-rev threshold 0

Gear sensor
None
Potentiometer Channel 8
ECU
Calculated
Calculated with neutral signal: Channel 8
Highest gear number 7

Shift Lights
15300
15000
14500
14000
13500

Speed
Channel Speed_1

Lap
Obscuring time (sec.) 8
Lap segments 1
1-LAP

Show lap time
Show odometer
Show running lap time

Condition enabling checked alarms
Engine > 2000

Channel for alarm | Conditioned Threshold
ECT | > | 105 | Off
Oil_Press | < | 2 |
Battery | < | 13 | On

Channel for alarm | Conditioned Threshold
Fuel_Level | < | | Off
None | | | Off
None | > | 0 | Off

Link alarm to measure fields

Measure | Short name
Field 1 - always displayed
ECT | ECT
Field 3 - page 1
None
Field 3 - page 2
None

Enable static string
Welcome text
Text 1

Measure | Short name
Field 2 - always displayed
MODESEL | MAP
Field 4 - page 1
None
Field 4 - page 2
None

*Yellow box:* Water temperature (ECT) channel and fuel level one have not been conditioned.
The related alarm led will switch on when:
- water temperature > 105°C
- fuel level < 20% of fuel tank capacity
regardless RPM (Engine) value

### 7.5.8 – Enable static string box

the static string is a message that is shown on bottom of **MXL** display. To enable it enable the related checkbox and fill in the text of the message to show.

When the static string is disabled the corresponding part of the display shows two by two the fields connected to field 3 and 4 of page 1 and 2 of the display.

**Note**: if gear sensor box is set on "Calculated", **MXL** has to calculate the engaged gear (paragraph 5.7). During this procedure the static string is excluded and the display shows "Running Gear Cal" on its bottom part.

### 7.5.9 – Welcome message box

The welcome message is a text shown for some seconds at start up on the bottom of the logger display. To show it fill in the text in the case shown here above.

## 7.6 – Configuring the CAN expansions (video system excluded)

**MXL** can be connected to different expansions that, communicating with him through the CAN bus, supply him with a lot of additional information without engaging any analog channel of the logger. To select the expansion to configure, enable "CAN expansions configurator" layer, shown here below.



In case of first expansions configuration or of very first configuration the layer shows up empty. To select the expansion to configure press "Add Expansion" button and the panel shown here below appears.



Select the expansion to configure pressing the button placed under each one.

**It is suggested to perform all expansions configuration with all of them (except for DaVid) switched on and connected to the logger.**

For all CAN expansions, **except for DaVid**, the fields placed under the keyboard enables, as shown below.



- Fill in the expansion name.
- Press "Get serial number from a connected expansion" button – highlighted in the figure above – and the system uploads the expansion univocal serial number.
- press "OK" (or "Cancel" to quit without saving).

The system loads the configuration layer of the added expansion and it appears in "CAN expansions configurator" layer. This operation is to be repeated for each CAN expansions to be added. The image below shows "CAN expansions configurator" layer with three activated expansions (red circled): the video system, a Lambda Controller CAN (LCU-ONE CAN) and a TC Hub.
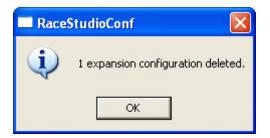


Each MXL expansion is optional to the logger and is supplied with the related user manual. Refer to those user manuals for further information concerning each expansions configuration.

To delete an expansion from MXL configuration press "Del. expansion" button. This window appears:



Enable the checkbox of the expansion to delete and press "Delete selected expansions" button. The system shows a confirmation message…



...and the related layer is deleted from "CAN expansions configurator" layer.

The images below show – on the left - "CAN Expansions configurator" layer with three expansions (DaVid, LCU-ONE CAN and TC Hub) and – on the right – the same layer where LCU-ONE expansion deleted: the related layer disappeared.

Among CAN expansion that can be connected to **MXL** there is also a Video system, **DaVid** Slave Expansion, connected with up to two cameras. For further information on these objects refer to **DaVid** User Manual.

When the video system has been correctly installed and connected to **MXL** it will be necessary to load it as expansion using the panel shown before and its configuration window, shown here below, appears.



It allows to show all parameters of the video system. It is the same used to configure **DaVid** master and works exactly at the same way. Refer to paragraph 8.6 for further information.

## 7.7 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in system manager window and the system automatically transmits the configuration to the logger. See paragraph 4.4 for further information.

## 7.8 – Sensors calibration and auto-calibration

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate the accelerometer, the gyroscope and the distance potentiometer and calibrate the gear sensor, the mid zero potentiometer and the zero based potentiometer installed on the vehicle. The procedure is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.6).

**Warning**: if potentiometers, gyroscope and accelerometers have not been correctly calibrated it will not be possible to sample correct data nor the engaged gear or create the track map. Pls. pay particular attention to sensors calibration/auto-calibration procedures.

## 7.9 – Gear calculation

Gear calculation procedure is the same for all AIM loggers (paragraph 5.7).

## 7.10 – Online

When the calibration is over and the configuration has been transmitted to the logger it is suggested to enter "Online" pressing the corresponding button on the menu bar, in System Manager window or on the left vertical keyboard to check that all works properly. Ensure that the logger is switched on and correctly connected to the PC. The window here below appears. See paragraph 5.8 for further information.

# Chapter 8 – How to configure DaVid

To configure DaVid, use a PC and **Race Studio 2** software. This logger can only be configured via software.

Before starting the configuration, install **Race Studio 2** and the USB driver as explained in chapter 2.

Run the software clicking on **Race Studio 2** icon and the window here below appears.



In the title bar – white with blue background in the figure – you can see the **Race Studio 2** version installed on the PC.

Immediately under there is the menu bar, shown in a more intuitive way on the left thanks to the graphic buttons: Go to Analysis (this button runs Race Studio Analysis software), Data download, AIM system manager, AIM system identification, Online, AIM system calibration, Custom sensors management, Select language.

From this window it is possible to perform all operations necessary to manage all AIM systems.

To enter configuration menu press "AIM system manager" button; a panel showing all systems managed through **Race Studio 2** software appears: double click on "**MXL**" or select it and click on "✓Go to".



**Race Studio 2** system manager window appears.

## 8.1 – System manager window



Using the keyboards and the layers (red circled in the figure above) it is possible to perform all operations needed to manage an AIM system.

The top keyboard, shown below, is made up of two buttons:



- **Transmit**: transmits a configuration to the logger and is active with any layer; it needs the logger to be switched on and connected to the PC.
- **Receive**: reads and saves the configuration of the logger and is active only in "Select Configuration" layer.

Current configuration table, immediately under the keyboard and shown here below, shows the main information concerning the configuration user is working on.

| Installation name | Data logger type | Ecu | Vehicle name | Available time | Total frequency |
|---|---|---|---|---|---|
| DEFAULT | DaVid Standalone | AUTRONIC - SM2_V190/1 / SM... | DEFAULT | 4.59.57 (h.m.s) | 231 (Hz) |

Again, under this table there are **four layers**:



- **Select configuration**: allows to select the configuration to work on; it is always active.
- **Channels**: allows to set **DaVid** channels. It is active only if there are configurations in "Select Configuration" layer.
- **Display**: allows to set the configuration of **DaVid** display. It is active only if there are configurations in "Select Configuration" layer.
- **DaVid**: allows to configure **DaVid** video. It is active only if there are configurations in "Select Configuration" layer.

## 8.1.1 – Select configuration layer

"Select configuration" layer is shown here below:



**On top** is a keyboard whose buttons are used to:

- **New**: creates a new configuration;
- **Delete**: deletes a configuration;
- **Clone**: clones a configuration;
- **Import**: imports a new configuration from a file.
- **Export**: exports a configuration to a file.

**Beside the keyboard** is a checkbox:

- **Restart gear calibration**: it allows to start/re-start **DaVid** gear calibration; to do so enable this checkbox, transmit the configuration to the logger and follow the procedure described at paragraph 5.7.

**Under the keyboard** there are two panels:

**Lap box:**



- **Obscuring time**: is a time period during which the optical receiver installed on the vehicle, after having recorded a lap signal, is "blind": it does not record signals. This function is useful to manage split times on tracks where more optical receivers are installed: set obscuring time on a low value (min accepted value is 3 seconds) to record splits and set it on a value lower than best lap time and higher than the time elapsed between last split and start/finish line (max accepted value is 255 seconds) not to record splits.
- **Lap segments**: is the number of segments the track is divided into and corresponds to the number of transmitters installed there .

**Measure units box:**



- **Speed units**: allows to modify the unit of measure to be used for speed (mph or km/h) in the selected configuration (highlighted in yellow).
- **Temperature unit**: allows to modify the temperatures unit of measures (°C or °F) in the selected configuration (highlighted in yellow).

**Central in the layer** is configurations database. To work on one of them click on any cell of its row and the entire row is selected (highlighted in yellow).

In case of first configuration the central table shows up empty.

## 8.2 – Creating a new configuration

Pressing "New" in "Select configuration" layer of "System manager" window this window appears:



Some parameters need to be set:

- **ECU Manufacturer**: select the manufacturer of the ECU installed on the vehicle or none.
- **ECU Model**: select the ECU model.
- **New configuration name**: fill in the configuration name.
- **Vehicle name**: fill in the vehicle name.
- **Display type**: select the type of display installed and connected to DaVid.
- **Speeds measure unit**: choose between km/h and mph.
- **Temperatures unit of measure**: choose between °C and °F.
- **Pressures unit of measure**: choose between Bar and PSI.

Press "OK" to save (or "Cancel" to quit without saving).
The system comes back to "System Manager" window.

## 8.3 – Channels

Activate "Channels" layer.



This layer allows to set the logger sampled channels.

**On top of the window** are the panels concerning RPM, speed and gear sensor. Their layout depends on the configuration set.

Enable and set the speed to be used and disable the ones not to be used.

### 8.3.1 – RPM panel



- Select "**AIM Sensor**" to sample this information from an RPM sensor installed on the vehicle; set Multiply factor and RPM Max value. RPM row in the table below enables (figure below on the left).
- Select "**ECU Signal**" and set RPM Max value to sample this value from the vehicle ECU. RPM row in the table below disables (figure above on the right).
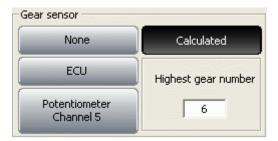
### 8.3.2 – Speed panel



The panels and their channels are enabled/disabled through the related button, as shown here above. The button changes its color.

Once enabled the speed fill in wheel circumference and number of pulses per wheel revolution (corresponding to the number of magnets installed on the vehicle wheel).
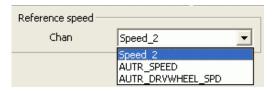
### 8.3.3 – Gear sensor panel



**DaVid** can sample the engaged gear from a gear sensor or from the vehicle ECU. It can also calculate it with an algorithm based on RPM and speed. Available options are:

- "**None**": there is no gear sensor on the vehicle (or not to see the engaged gear). This option is disabled on the display and channel table shows row labelled CH_5 enabled with configurable sensor and row labelled CH_6 disabled.
- "**ECU**": to sample this information from the vehicle ECU (assuming it can transmit it); channel table shows row labelled CH_5 enabled with configurable sensor and row labelled CH_6 set on calculated gear.
- "**Potentiometer Channel 5**": there is a gear potentiometer installed on channel 5. Channel table shows row labelled CH_5 enabled and set on gear potentiometer and row labelled CH_6 disabled and set on calculated gear.
- "**Calculated**": to compute the engaged gear with an algorithm based on RPM and speed; fill in "Highest gear number". Channel table shows row labelled CH_5 disabled (but can be enabled with configurable sensor) and row labelled CH_6 enabled and set on calculated gear.

### 8.3.4 – Reference speed panel



It is possible to select the reference speed, that is used for gear calculation and for some Race Studio Analysis calculation.

Available options are: logger speed/speeds (depending on how many of them were enabled) and speed(s) coming from the vehicle ECU.

In the figure below the logger has one only speed enabled and is connected to an Autronic ECU that transmits two speed channels.

### 8.3.5 – Channel table:

**System manager**

Transmit    Receive

Current configuration

| Installation name | Data logger type | Ecu | Vehicle name | Available time | Total frequency |
|---|---|---|---|---|---|
| DEFAULT | DaVid Standalone | BOSCH - MS3 | DEFAULT | 4.11.03 (h.m.s) | 276 (Hz) |

Select configuration | Channels | Display | DaVid

**Rpm**: AIM sensor | ECU signal — Multiply factor /1 — MAX value 4000

**Speed_1**: Disabled — Wheel circumference (mm) 1666 — Pulses per wheel revolution 1

**Speed_2**: Enabled — Wheel circumference (mm) 1666 — Pulses per wheel revolution 1

**Gear sensor**: None | ECU | Potentiometer Channel 5 — Calculated — Highest gear number 6

**Reference speed**: Chan BOSCH_SPEED1

| Channel identifier | Enabled/disa... | Channel name | Samplin... | Sensor type | Measure ... | Low scale | High scale | Param. 1 | Param. 2 |
|---|---|---|---|---|---|---|---|---|---|
| RPM | Disabled | Engine | 10 Hz | Engine revolution speed | rpm | 0 | 20000 | 1.000 | 0 |
| SPD_1 | Disabled | Speed_1 | 10 Hz | Speed | km/h .1 | 0.0 | 250.0 | 1666.0 | 1.0 |
| SPD_2 | Enabled | Speed_2 | 10 Hz | Speed | km/h .1 | 0.0 | 250.0 | 1666.0 | 1.0 |
| CH_1 | Enabled | Channel_1 | 10 Hz | Temperature VDO 50-150 °C | °C | 0 | 5 | | |
| CH_2 | Enabled | Channel_2 | 10 Hz | Distance potentiometer | mm .1 | 0.0 | 5.0 | 100.0 | |
| CH_3 | Enabled | Channel_3 | 10 Hz | Generic linear 0-5 V | V .1 | 0.0 | 5.0 | | |
| CH_4 | Enabled | Channel_4 | 10 Hz | Generic linear 0-5 V | V .1 | 0.0 | 5.0 | | |
| CH_5 | Disabled | Channel_5 | 10 Hz | Thermocouple | °C | 0 | 5 | | |
| CH_6 | Enabled | Channel_6 | 10 Hz | Calculated Gear | # | 0 | 6 | | |
| ACC_1 | Enabled | Acc_1 | 10 Hz | Lateral accelerometer | g .01 | -3.00 | 3.00 | | |
| ACC_2 | Enabled | Acc_2 | 10 Hz | Longitudinal accelerometer | g .01 | -3.00 | 3.00 | | |
| LOG_TMP | Enabled | Datalogger_Temp | 10 Hz | Cold joint | °C | 0 | 50 | | |
| BATT | Enabled | Battery | 1 Hz | Battery | V .1 | 5.0 | 15.0 | | |
| ECU_1 | Enabled | BOSCH_RPM | 10 Hz | Engine speed sensor | rpm | 0 | 18000 | | |
| ECU_2 | Enabled | BOSCH_SPEED1 | 10 Hz | Bosch speed sensor | km/h .1 | 0.0 | 500.0 | | |
| ECU_3 | Enabled | BOSCH_SPEED2 | 10 Hz | Speed sensor | km/h .1 | 0.0 | 500.0 | | |
| ECU_4 | Enabled | BOSCH_OIL_PRESS | 10 Hz | Pressure sensor | bar .1 | 0.0 | 15.0 | | |
| ECU_5 | Enabled | BOSCH_FUEL_PRESS | 10 Hz | Pressure sensor | bar .1 | 0.0 | 15.0 | | |
| ECU_6 | Enabled | BOSCH_ATM_PRESS | 10 Hz | Pressure sensor | mbar | 0 | 130 | | |
| ECU_7 | Enabled | BOSCH_FUEL_TEMP | 5 Hz | Temperature sensor | °C | -50 | 215 | | |
| ECU_8 | Enabled | BOSCH_OIL_TEMP | 5 Hz | Temperature sensor | °C | -50 | 215 | | |
| ECU_9 | Enabled | BOSCH_ENGINE_TEMP | 5 Hz | Temperature sensor | °C | -50 | 150 | | |
| ECU_10 | Enabled | BOSCH_AIR_TEMP | 5 Hz | Temperature sensor | °C | -50 | 150 | | |
| ECU_11 | Enabled | BOSCH_THROTT_ANG | 10 Hz | Throttle position sensor | % .1 | 0.0 | 100.0 | | |
| ECU_12 | Enabled | BOSCH_IGNIT_ANG | 10 Hz | Angle sensor | deg | -90 | 90 | | |
| ECU_13 | Enabled | BOSCH_AIR_CHARGE | 10 Hz | Percentage sensor | % | 0 | 190 | | |
| ECU_14 | Enabled | BOSCH_INJEC_TIME1 | 10 Hz | System clock | ms .01 | 0.00 | 210.00 | | |
| ECU_15 | Enabled | BOSCH_INJEC_TIME2 | 10 Hz | System clock | ms .01 | 0.00 | 210.00 | | |
| ECU_16 | Enabled | BOSCH_LAMBDA1 | 10 Hz | Lambda sensor | # .001 | 0.000 | 16.000 | | |
| ECU_17 | Enabled | BOSCH_LAMBDA2 | 10 Hz | Lambda sensor | # .001 | 0.000 | 16.000 | | |
| ECU_18 | Enabled | BOSCH_LAM_CONTR1 | 10 Hz | Raw value | # .001 | 0.000 | 2.000 | | |
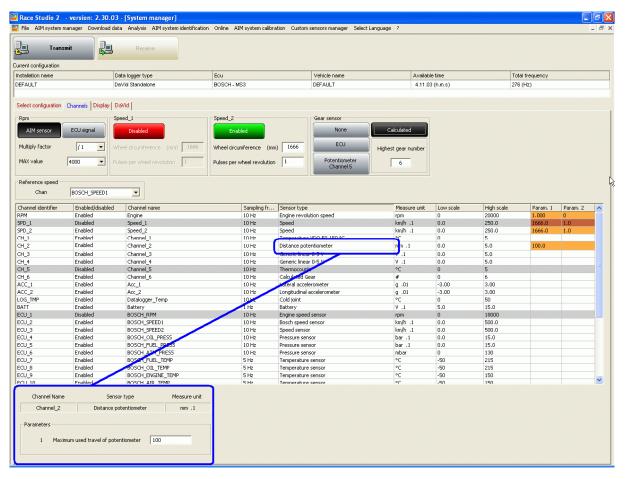
This table shows all loggers channels with the related characteristics:

- **Channel identifier**: shows the channel label. "ECU_X" channels are the ones coming form the ECU.
- **Enabled/disabled**: shows the channel status (enabled or disabled). It can be modified double clicking on the cell except for RPM, Speed and CH_6 that need to be modified through the above described panels.
- **Channel name**: it allows to give a name to the channel.
- **Sampling frequency**: allows to set each channel sampling frequency. This last one influences the total available time highlighted by a blue box in the figure above, that diminishes increasing sampling frequency because the memory fills up faster.

- **Sensor type**: allows to select the sensor installed on that channel from the drop down menu that appears clicking on the cell. Channel labelled CH_5 is always configurable except when "Gear Sensor" panel is set on calculated gear.

**Note**: setting some sensors on some channels that support them, a configuration panel appears on bottom of the layer. The figure below shows the distance potentiometer configuration panel.



- **Measure unit**: shows the selected unit of measure for each channel; it is possible to change it with a double click on the cell.
- **High/low scale**: shows high/low scale values of the sensor and allows to change them double clicking on the cell.

## 8.4 – Creating a custom sensor

This function allows to configure a "custom" sensor setting the proper calibration curve and it is very useful when the sensor (pressure, temperature or other) is not included in the available sensors list.

**Please note: "Custom sensors" option is intended for expert users only.**

Press "Custom sensors manager" button in the menu bar or in the left vertical keyboard.



The procedure to create a custom sensor is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.3).

## 8.5 – How to configure DaVid displays

Video recording with data acquisition system **DaVid** can be connected with two kinds of display: **TG-Dash** and **MyChron3 Dash**. To configure them (optional to the logger) activate the related layer (circled here below):



The first time the layer shows up empty. Activate the drop down menu and select the proper display.

### 8.5.1 – How to configure MyChron3 Dash

Select M3-Dash display and its configuration window appears.



**Speed Channel box:**



This drop down menu allows to select the speed shown by the display.
In the example above **DaVid** is connected to a Bosch ECU that transmits two speed channels which are additional to the logger ones, both enabled.

## Display Pages 1 e 2 – Channels and alarms



These boxes allow to set the displayed channels linking them to one of the four alarm led placed sideways of the display.

- select the channel to show from the drop down menu;
- set High/Low alarm selecting the led to link them to;
- fill in the threshold value.

## Shift Lights box



It manages the 10 led placed on top of the logger display.
Led colors: the first two on the left and on the right are green, the central two are orange and the last four are red. To set RPM threshold values fill in the cases. The led switch progressively on and when the engine reaches RPM value set for led 5 all led start blinking, warning the pilot to shift gear.
If a case is set on "0" the corresponding led is disabled.

## Display messages box



This drop down menu allows the user to select the display language. Available options are: English, Italian, Deutsch, French, Spanish and Slovene.

### 8.5.2 – How to configure TG Dash

Select TG-Dash display and this window appears.



The only settable channel is the speed.



In the example below **DaVid** is connected to a Bosch ECU, that transmits two speed channels; it is thereby possible to show one of **David** speeds or one of the ECU ones.

**Note**: TG-Dash is mainly configurable via keyboard; refer to its user manual for further information.

## 8.6 – How to configure DaVid

Activate "DaVid" layer.

The figure below shows video configuration window with video objects preview circled in light blue.

### 8.6.1 – Video Configuration Manager box:



Press "**Logos Setup**" button and the window here below appears.



- Using +/- buttons it is possible to resize the logos shown on the video.
- If there are logos shown on the video it is possible to remove them pressing "Delete Logo" button. If there are no logos "Delete Logo" button is disabled (like in the figure above) and pressing "Add Logo" button the window here below appears.



This window allows to both import and remove bitmap logos.

- Pressing "**Import Logo Bitmap**" button windows explorer opens and it will be possible to upload logo bitmaps.
- Pressing "**Delete Bitmap Logo**" button it is possible to delete bitmap logo.

The system allows to import up to 25 bitmaps and in case there are no available logos "Delete bitmap logo" button is disabled.
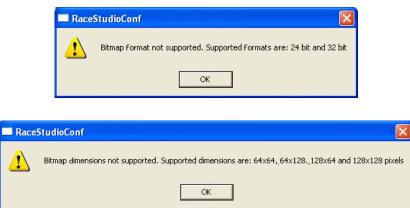
The logo user is working on is highlighted in yellow in video preview window.

The system supports the following logos:

- **Format**: bitmap 24 bit and bitmap 32 bit
- **Dimensions**: 64x64; 64x128; 128x128;128x64

In case format or dimensions of the Logo Bitmap to import are not supported, the system shows one of the following messages.





**New Object / Delete object:**



Video objects preview window can be modified adding or removing objects.

To **add** an object:
- press "New object";
- use the slider red circled in the figure above, to select that object layout;
- configure the parameters that appear beside the slider;
- a new video object appears in the bottom part of the window; it is possible to displace it using the mouse; pay attention not to over impose more video objects;
- each new object adds a layer to the central part of the layer. In the figure above is circled "Engine" layer.

To **delete** an object select the layer corresponding to the object to delete and press "Delete object" layer.

To **modify** an object select its layer, use the slider to select its layout and modify the related fields.

### 8.6.2 – Video objects limits

**The number of objects that can be visualized depends on the type of objects.**

For all objects whose video refreshing frequency is 50Hz (typically RPM and speed, these with the pointer) the max. allowed number of objects is two.

Some objects, like the accelerometer, Lap Time box, etc. are considered as one only objects but are made up of more active parts.

The accelerometer, for instance, is considered as one object but is made up of two active parts, that allow to see lateral and longitudinal acceleration.

Lap Time box, shown here below, is considered as one only object but is made up of six active parts.



- Lap Number (1)
- Lap Time (2)
- Split Number (3)
- Split Time (4)
- Best lap number (5)
- Best lap time (6)

**The total number of objects and active parts that can be shown is 16.**

This information is written in "Video Configuration Manager" box shown here below and is labelled as "Number of video obj." (red circled).



In case the maximum allowed number of objects is overcome, the related digit turns into red.

It is possible to create up to 22 video objects in the same configuration before the warning message shown here below appears.

It is anyway necessary that the number of object/active parts included in a configuration is not higher than 16. If higher, the system shows again this message and does not transmit the configuration.



*8.6.3 – Visualization box:*



This box allows to modify the window that shows video objects preview (the one circled in light blue at the end of paragraph 8.5).

- "**Draw Grid**": shows a grid in the preview window to help positioning the objects.
- "**Video Objects On**": enabled or disabled shows or hides the video objects preview.
- "**Zoom**": sets the dimensions of the video objects preview. Available options are: from 1 (real dimensions) to 4.



This image can be enlarged up to four times

Warning: these functionalities only influence the layout of the configuration shown by Race Studio 2 and not that of the real Video.

### 8.6.4 – TV Standard box:



This box allows to set the video TV standard.

To know the TV standard of the camera connected to the Video system refer to that object user manual.

In general, anyway, NTSC television standard is mainly used in the USA while PAL television standard is mainly used in Europe.

### 8.6.5 – Possible graphical visualization problems.

The PC monitor may show the grey scale non homogeneous (exactly like in the figure below).



A possible solution to this problem is working on the video board properties, "OpenGL" settings.

- Close **Race Studio 2** and follow this path: "Start / Settings/ Control Panel / Display / Settings / Advanced".
- Video board properties panel appears. Its layout depends on the type of board.
- Open GL settings can be on a dedicated layer, in 3D layer of that panel on PC that do not have a specific "OpenGL" layer or on a layer labelled with the name of the video board pressing graphic settings button.
- It is necessary to increase 3D quality in "OpenGL" settings. This operation can sometimes solve the problem.

It is also suggested to check if video board driver is the last available from the manufacturer. If not, pls. update it.

### 8.6.6 – Sampling frequency

With reference to system manager window – Channel layer – it is reminded that from that window it is possible to set each channel sampling frequency.
As far as RPM and shown speed channels it is suggested to set them on 50 Hz because this is the refreshing frequency of the image on the video.

## 8.7 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in system manager window and the system automatically will transmit the configuration to the logger. See paragraph 4.4 for further information.

## 7.8 – Sensors calibration and auto-calibration

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate the accelerometer, the gyroscope and the distance potentiometer and calibrate the gear sensor, the mid zero potentiometer and the zero based potentiometer installed on the vehicle. The procedure is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.6).

**Warning**: if potentiometers, gyroscope and accelerometers have not been correctly calibrated it will not be possible to sample correct data nor the engaged gear or create the track map. Pls. pay particular attention to sensors calibration/auto-calibration procedures.

## 8.9 – Gear calculation

Gear calculation procedure is the same for all AIM loggers (paragraph 5.7). To restart this procedure, **DaVid** needs that "Restart gear calibration" checkbox left of the central keyboard of "Select Configuration" layer is enabled and the configuration is transmitted to the logger.

## 8.10 – Online

When the calibration is over and the configuration has been transmitted to the logger it is suggested to enter "Online" pressing the corresponding button on the menu bar, in System Manager window or on the left vertical keyboard to check that all works properly. Ensure that the logger is switched on and correctly connected to the PC. The window below appears. See paragraph 5.8 for further information.

# Chapter 9 – How to configure EVO3 Pro/Pista

To correctly configure **EVO3 Pro/Pista** (from here onward **EVO3**), use a PC and **Race Studio 2** software. This logger can only be configured via software.
Before starting the configuration, install **Race Studio 2** and the USB driver as explained in chapter 2.
Run the software, clicking on **Race Studio 2** icon and the window here below appears.



In the title bar – white on a blue background in the figure – you can see the **Race Studio 2** version installed on the PC.
Immediately under there is the menu bar, shown in a more intuitive way on the left thanks to the graphic buttons: Go to Analysis (this button runs Race Studio Analysis software), Data download, AIM system manager, AIM system identification, Online, AIM system calibration, Custom sensors management, Select language.
From this window it is possible to perform all needed operations to manage all AIM systems.

To enter configuration menu press "AIM system manager" button; a panel showing all systems managed through **Race Studio 2** software appears: double click on "**EVO3**" or select it and click on "✓Go to".



**Race Studio 2** system manager window appears.

# 9.1 – System manager window



Using the keyboard and the layers, circled in the figure, it is possible to perform all operations necessary to manage an AIM system.
The top keyboard, shown here below, is made up of four buttons:



- **Transmit**: transmits a configuration to the logger and is active with any layer; it needs the logger to be switched on and connected to the PC.
- **Receive**: reads and saves the configuration of the logger and is active only in "Select Configuration" layer.
- **CAN-Net Info**: identifies the CAN network connected to the PC, that means the logger and its peripherals. Pressing it a waiting window appears and – when the connection has been established - "CAN-Net info" window, shown here below, appears. It shows all the CAN Network components. In the example below the CAN network includes an **EVO3 Pro** Master and four expansions: DaVid, LCU-ONE, GPS and MemoryKey.

**Set acquisition system time**: makes the logger time matching the PC one. Pressing it "Acquisition system time" window, below on the left, appears with PC clock on the left and **EVO3** one on the right. Pressing the central button, PC and **EVO3** will have the same time. This operation does not modify data sampled by the logger nor influence its peripherals. In case the window on the right appears it means that PC-logger connection is wrong. Check it and try again.



**Current Configuration Table**, immediately under the keyboard, shows the main information concerning the configuration user is working on.

| Installation name | Data logger type | Ecu | Vehicle name | Available time | Time with GPS | Total frequency | Master frequency | Expansions freq... | Tot. Expansions |
|---|---|---|---|---|---|---|---|---|---|
| DEFAULT | EVO3 PRO | None - None | DEFAULT | 11.29.05 (h.m.s) | 6.24.31 (h.m.s) | 202 (Hz) | 171 (Hz) | 31 (Hz) | 1 |

Again, under this table are five layers:



- **Select configuration**: allows the user to select the configuration to work on; it is always active.
- **Channels**: allows to set **EVO3** channels. It is active only if there are configurations in "Select configuration" layer.
- **System configuration**: allows to set or modify **EVO3** configuration. It is active only if there are configurations in "Select configuration" layer.
- **Display**: allows to set the configuration of **EVO3** display. It is active only if there are configurations in "select configuration" layer.
- **CAN-expansions configurator**: allows to configure the expansions connected through the CAN bus to **EVO3**, DaVid Slave video system included. It is active only if there are configurations in "Select configuration" layer; if not, it doesn't even appear.

### 9.1.1 – Select configuration layer

The "Select configuration" layer – shown here below – is made of:

| N | Installation name | Logger | ECU Manufacturer | ECU Model | Vehicle name | Obs... | Spli... | Speed | Temp | Created | Vi... | Tot... | Tot. ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DEFAULT | EVO3 PRO | None | None | DEFAULT | 8 | 1 | mph | °F | November 12... | | 0 | 0 |
| 2 | LOGGER_CONF | EVO3 PRO | BOSCH | MS3 | READ | 8 | 1 | mph | °F | November 15... | | 0 | 0 |
| 3 | LOGGER_CONF | EVO3 PRO | BOSCH | MS3 | READ | 8 | 1 | mph | °F | November 16... | | 0 | 0 |
| 4 | LOGGER_CONF | EVO3 PRO | BOSCH | MS3 | READ | 8 | 1 | mph | °F | November 16... | | 2 | 2 |
| 5 | LOGGER_CONF | EVO3 PRO | BOSCH | MS3 | READ | 8 | 1 | mph | °F | November 16... | | 0 | 0 |
| 6 | LOGGER_CONF | EVO3 PRO | BOSCH | MS3 | READ | 8 | 1 | mph | °F | November 16... | | 0 | 0 |
| 7 | LOGGER_CONF | EVO3 PISTA | None | None | READ | 8 | 1 | k... | °C | November 28... | | 0 | 0 |
| 8 | LOGGER_CONF | EVO3 PISTA | None | None | READ | 8 | 1 | k... | °C | November 28... | | 0 | 0 |
| 9 | DEFAULT | EVO3 PRO | None | None | DEFAULT | 8 | 1 | k... | °C | January 14, ... | | 1 | 2 |
| 10 | LOGGER_CONF | EVO3 PISTA | AIM | PROT_CAN | READ | 8 | 1 | k... | °C | March 12, 2008 | | 0 | 0 |

**On top** is the keyboard made up of five buttons.

- **New**: creates a new configuration;
- **Delete**: deletes a new configuration;
- **Clone**: clones a configuration;
- **Import**: imports a configuration from a file;
- **Export**: exports a configuration to a file.

**Central** is the available configurations database. To work on one of them click on any of its cell and the entire row is selected (highlighted in yellow).

In case of first configuration central table shows up empty.

## 9.2 – Creating a new configuration

Pressing "New" button in "Select Configuration" layer this window appears:



Some parameters need to be set:

- **Data logger type**: select the logger to be configured.
- **ECU Manufacturer**: select the Manufacturer of the ECU installed on the vehicle if supported or none.
- **ECU Model**: select the ECU model.
- **New configuration name**: fill in the new configuration name.
- **Vehicle name**: fill in the vehicle name.
- **Speeds unit of measure**: choose between km/h and mph.
- **Temperatures unit of measure**: choose between °C and °F.
- **Pressures unit of measure**: choose between Bar and PSI.

Press "OK" to save (or "Cancel" to quit without saving).
The system comes back to system manager window.

## 9.3 – Channels

Activate "Channels" layer.



This layer allows to set all channels sampled by the logger and its layout depends on **EVO3** version.

In case of an **EVO3 Pista** configuration this window appears.

**Current configuration**

| Installation na... | Data logger t... | Ecu | Vehicle name | Available time | Time with GPS | Total frequen... | Master frequ... | Expansions f... | Video system | Tot. Lambda | Tot. Expansio... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LOGGER_CO... | EVO3 PISTA | None - None | READ | 8.48.56 (h.m... | 3.58.06 (h.m... | 131 (Hz) | 131 (Hz) | 0 (Hz) | Yes | 0 | 0 |

Speed
Wheel circumference (mm) 1666
Pulses per wheel revolution 1

| Channel ide... | Enabled/disabled | Channel name | Sampling frequ... | Sensor type | Measure unit | Low scale | High scale |
|---|---|---|---|---|---|---|---|
| RPM | Enabled | Engine | 10 Hz | Engine revolution speed | rpm | 0 | 20000 |
| SPD_1 | Enabled | Speed | 10 Hz | Speed | km/h .1 | 0.0 | 250.0 |
| CH_1 | Enabled | Channel_1 | 10 Hz | Thermocouple | °C | 0 | 5 |
| CH_2 | Enabled | Channel_2 | 10 Hz | Thermocouple | °C | 0 | 5 |
| CH_3 | Enabled | Channel_3 | 10 Hz | Thermoresistance PT100 | °C | 0 | 5 |
| CH_4 | Enabled | Channel_4 | 10 Hz | Thermoresistance PT100 | °C | 0 | 5 |
| CH_5 | Enabled | Channel_5 | 10 Hz | Thermoresistance PT100 | °C | 0 | 5 |
| CH_6 | Enabled | Channel_6 | 10 Hz | Thermoresistance PT100 | °C | 0 | 5 |
| CH_7 | Enabled | Channel_7 | 10 Hz | Generic linear 0-5 V | V .1 | 0.0 | 5.0 |
| CH_8 | Enabled | Channel_8 | 10 Hz | Gear potentiometer | # | 0 | 5 |
| CALC_GEAR | Disabled | Calculated_Gea | 10 Hz | Calculated Gear | # | 0 | 9 |
| ACC_1 | Enabled | Acc_1 | 10 Hz | Lateral accelerometer | g .01 | -3.00 | 3.00 |
| ACC_2 | Enabled | Acc_2 | 10 Hz | Longitudinal accelerometer | g .01 | -3.00 | 3.00 |
| LOG_TMP | Enabled | Datalogger_Tem | 10 Hz | Cold joint | °C | 0 | 50 |
| BATT | Enabled | Battery | 1 Hz | Battery | V .1 | 5.0 | 15.0 |

In case of an **EVO3 Pro** configuration this window appears.

**Configurazione selezionata**

| Nome installazione | Tipo centralina | Ecu | Nome veicolo | Tempo disponibile | Tempo con GPS | Frequenza totale | Frequenza master | Frequenza espa... | Tot. Espansioni |
|---|---|---|---|---|---|---|---|---|---|
| DEFAULT | EVO3 PRO | None - None | DEFAULT | 10.56.35 (h.m.s) | 6.14.10 (h.m.s) | 212 (Hz) | 181 (Hz) | 31 (Hz) | 1 |

Speed_1 Circonferenza ruota (mm) 1666 Impulsi per giro ruota 1
Speed_2 Circonferenza ruota (mm) 1666 Impulsi per giro ruota 1
Speed_3 Circonferenza ruota (mm) 1666 Impulsi per giro ruota 1
Speed_4 Circonferenza ruota (mm) 1666 Impulsi per giro ruota 1

| ID | Abil. | Nome canale | Freq. | Sensore usato | Unità | Inizioscala | Fondoscala |
|---|---|---|---|---|---|---|---|
| RPM | ABILITATO | Engine | 10 Hz | Giri motore | rpm | 0 | 20000 |
| SPD_1 | ABILITATO | Speed_1 | 10 Hz | Velocità | km/h .1 | 0.0 | 250.0 |
| SPD_2 | DISABILITATO | Speed_2 | 10 Hz | Velocità | km/h .1 | 0.0 | 250.0 |
| SPD_3 | ABILITATO | Speed_3 | 10 Hz | Velocità | km/h .1 | 0.0 | 250.0 |
| SPD_4 | DISABILITATO | Speed_4 | 10 Hz | Velocità | km/h .1 | 0.0 | 250.0 |
| CH_1 | ABILITATO | Channel_1 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_2 | ABILITATO | Channel_2 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_3 | ABILITATO | Channel_3 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_4 | ABILITATO | Channel_4 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_5 | ABILITATO | Channel_5 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_6 | ABILITATO | Channel_6 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_7 | ABILITATO | Channel_7 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_8 | ABILITATO | Channel_8 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_9 | ABILITATO | Channel_9 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_10 | ABILITATO | Channel_10 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_11 | ABILITATO | Channel_11 | 10 Hz | Generico lineare 0-5 V | V .1 | 0.0 | 5.0 |
| CH_12 | ABILITATO | Channel_12 | 10 Hz | Potenziometro marce | # | 0 | 5 |
| CALC_GEAR | DISABILITATO | Calculated_Gear | 10 Hz | Marce calcolate | # | 0 | 9 |
| ACC_1 | ABILITATO | Acc_1 | 10 Hz | Accelerometro trasversale | g .01 | -3.00 | 3.00 |
| ACC_2 | ABILITATO | Acc_2 | 10 Hz | Accelerometro longitudinale | g .01 | -3.00 | 3.00 |
| LOG_TMP | ABILITATO | Datalogger_Temp | 10 Hz | Giunto freddo | °C | 0 | 50 |
| BATT | ABILITATO | Battery | 1 Hz | Batteria | V .1 | 5.0 | 15.0 |

### 9.3.1 – Speed panels

On top of Channels layer can be from one to four panels (depending on **EVO3** version) labelled "Speed". It is possible to enable/disable them through the channel table below. To enable a Speed channel just enable the checkbox in the corresponding row of channel table.

The figure below shows two Speed channels enabled and two of them disabled: so are the related panels.



When a panel is enabled it is necessary to set its parameters.



Fill in:

- wheel circumference of the vehicle;
- number of pulses for wheel revolution (that corresponds to the number of magnets installed on the wheel).

## 9.3.2 – Channel Table



It shows all logger channels with the related characteristics

- **Channel identifier**: shows the channel label. Channels labelled "ECU_X" are the ones received from the ECU.
- **Enabled/disabled**: shows channel status (enabled or disabled). The status can be modified double clicking on the cell except for RPM, Speed and CH_12; RPM and CH_12 needs to be set through "System Configuration" panel, while Speed one is to be set as explained before.
- **Channel name**: allows to name the channel.
- **Sampling frequency**: allows to set each channel sampling frequency. This last one influences the total available time, highlighted by a blue box in the figure below, because the memory fills up faster.
- **Sensor type**: shows the type of sensor installed on that channel; it is selected through the drop down menu that appears clicking on the cell. See the following page for further information.
- **Measure unit**: shows the unit of measure selected for each channel; to change it double click on the cell.
- **Low/High scale**: shows high/low scale values of the sensor and allows to change it double clicking on the cell.

| | Temperatures | Pressures | Potentiometers | Lambda Probe | Gyroscope | Accelerometer |
|---|---|---|---|---|---|---|
| **EVO3 Pista** | | | | | | |
| **Ch_1** | X | X | X | X | | |
| **Ch_2** | X | X | X | X | | |
| **Ch_3** | X | X | X | X | | |
| **Ch_4** | X | X | X | X | X | X |
| **Ch_5** | X | X | X | X | X | X |
| **Ch_6** | X | X | X | X | X | X |
| **Ch_7** | X | X | X | X | X | X |
| **Ch_8**[6] | X | X | X | X | X | X |
| **EVO3 Pro** | | | | | | |
| **Ch_1** | X | X | X | X | | |
| **Ch_2** | X | X | X | X | | |
| **Ch_3** | X | X | X | X | | |
| **Ch_4** | X | X | X | X | | |
| **Ch_5** | X | X | X | X | | |
| **Ch_6** | X | X | X | X | | |
| **Ch_7** | X | X | X | X | | |
| **Ch_8** | X | X | X | X | X | X |
| **Ch_9** | X | X | X | X | X | X |
| **Ch_10** | X | X | X | X | X | X |
| **Ch_11** | X | X | X | X | X | X |
| **Ch_12**[6] | X | X | X | X | X | X |

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[6] Channels CH_8 (**EVO3 Pista**) and CH_12 (**EVO3 Pro**) are gear channels and if system configuration layer (paragraph 9.4) sets them on "Potentiometer CH_8" (**EVO3 Pista**), "Potentiometer CH_12" (**EVO3 Pro**) or on "Calculated + Neutral Signal" channel CH_8 or CH_12 sets on calculated gear and it is only possible to set Channel name, Sampling frequency and High/Low scale. If not they work as shown in the table above but need to be enabled.

Setting some sensors on some channels that support them, a configuration panel appears bottom left of Channels layer. The figure below shows distance potentiometer configuration panel.

## 9.4 – Creating a custom sensor

This function allows to configure a "custom" sensor setting the proper curve. It is very useful when the sensor installed (pressure, temperature or other) is not included in the available sensors list.

**Please note: "Custom Sensor" option is intended for expert users only.**

Press "Custom sensors manager" button in the menu bar or in the left vertical keyboard.



The procedure to create a custom sensor is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.3).

## 9.5 – System configuration

Activate "System Configuration" layer:

### 9.5.1 – RPM box



- Select "**AIM Sensor**" to sample this information from an RPM sensor installed on the vehicle. Set Multiply factor and RPM Max value. RPM row in the central table of channels layer enables.
- Select "**ECU signal**" and set RPM Max value to sample this information from the vehicle ECU. RPM row in the central table of channel layer disables.

### 9.5.2 – Lap box



- **Obscuring time**: it is a time period during which the optical receiver installed on the vehicle, after having recorded a lap signal, is "blind": it does not record signals. This function is useful to manage split times on tracks where more optical receivers are installed: set obscuring time on a low value (min accepted value is 3 seconds) to record splits and set it on a value lower than best lap time and higher than the time elapsed between last split and start/finish line (max accepted value is 255 seconds) not to record splits.
- **Lap segments**: is the number of segments the track is divided in and corresponds to the number of transmitters installed there.

### 9.5.3 – Gear sensor box
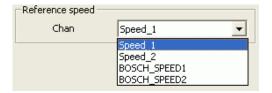


**EVO3Pro/Pista** can sample the engaged gear from a gear sensor or from the ECU. It can also calculate it using an algorithm based on RPM and speed. Available options are:

- **None**: there is no gear sensor on the vehicle (or not to see the engaged gear): this option is disabled on the display. Row labelled CH_8/12 (depending on the logger) on central table of channel layer can be enabled with configurable sensor.
- **Potentiometer Channel 8/12**: there is a gear potentiometer installed on channel 8/12; row labelled CH_8/12 (depending on the system) in the central table of channels layer is enabled and set on gear potentiometer.
- **ECU**: this information is sampled from the ECU (assuming it can transmit it); row labelled CH_8/12 (depending on the system) in the central table of channels layer is disabled and can be enabled with configurable sensor.
- **Calculated**: to calculate the engaged gear with an algorithm based on RPM and speed; fill in "Highest gear number". Row labelled CH_8/12 (depending on the system) in the central table of channels layer can be enabled with configurable sensor.
- **Calculated + neutral signal**: **Channel 8/12** (depending on the system): there is a neutral sensor that can be used to both see neutral gear and calculate the engaged gear. Fill in "Highest gear number". The central table of channel layer shows row labelled CH_8/12 enabled and set on calculated gear.

**Note: "Calculated" and "Calculated + neutral signal: Channel 8/12" options are available only if EVO3 Pro/Pista is connected to a display that can show the engaged gear like MyChron3 Dash or Formula Steering Wheel.**
**Moreover refer to paragraph 5.7 for further information on gear calculation.**
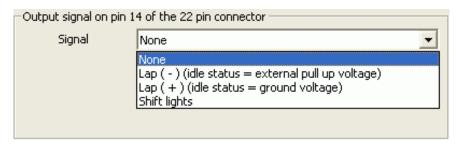
### 9.5.4 – Speed reference box



It is possible to select the reference speed used for gear calculation and for some Race Studio Analysis calculation. Available option are the loggers speed(s) (depending on how many have been enabled) and ECU speed(s). In the figure above the logger has two enabled speeds and is connected to a Bosch ECU that transmits two speed channels.

### 9.5.5 – Output signal on pin 14 of the 22 pin connector



This function allows **EVO3 Pro** – and only **EVO3 Pro** – to send a signal to an external device, typically a display or an ECU. This output signal is connected to pin 14 of 22 pins Deutsch connector of **EVO3 Pro** and has the following characteristics:

- **Voltage**: Depends on the external pull-up voltage
- **Output duration**: about 0,8 seconds [for Lap (-) and Lap (+)only]
- **Type**: can be type "Lap" or type "Alarm".

Available options are:

- **None**: signal disabled.
- **Lap (-) (idle status = external pull up voltage)**: when **EVO3 Pro** receives a lap signal, the signal emitted decreases from pull-up voltage (idle status) to 0V (lap) for about 0,8 seconds.
- **Lap (+) (idle status = ground voltage)**: when **EVO3 Pro** receives a lap signal, the signal emitted grows from 0V (idle status) to pull-up (lap) voltage for around 0,8 seconds.
- **Shift lights**: when RPM are over threshold value, the signal emitted grows from 0V (OFF status) to pull-up voltage (ON status) for the time period the threshold value is overcome. This function can be useful to switch on an alarm led on the display.

## 9.6 – How to configure EVO3 Pro/Pista displays

**EVO3 Pro/Pista** available displays are: **MyChron3 Dash**, **TG-Dash** and **Formula Steering Wheel**. To configure the display (optional to the logger) activate the related layer:



The first time the layer shows up empty. Select the proper display through the drop down menu.

### 9.6.1 – How to configure MyChron3 Dash

Selecting **M3-Dash** display this configuration window appears.



To configure this display see paragraph 8.5.1.

### 9.6.2 – How to configure TG Dash

Selecting **TG-dash** display the related window appears It needs no via software configuration. Just select the display from the drop down menu.



### 9.6.3 – How to configure Formula Steering Wheel

Selecting **"Formula Steering Wheel"** display this window appears:



**Display Pages 1and 2 –Channels and alarm Boxes**



These boxes allow to set the displayed channels connecting them to one of the four alarm led placed laterally on the display.

To set them:
- select the channel to show from the drop down menu;
- set it as High/Low alarm selecting the led to link it to
- fill in threshold value case.

**Shift Light box**



Sets the 10 led placed on top of the logger display. Led colors: the first two on the left and on the right are green, the central two are orange and the last four are red. The led switch progressively on and when the engine reaches RPM value fixed for led 5 all led start blinking, warning the pilot to shift gear.
If one case is set on "0" the corresponding led is disabled.

## 9.7 – Configuring CAN expansions

**EVO3 Pro/Pista** can be connected to different expansions that, communicating with it through the CAN bus, supply it with a lot of additional information without engaging any analog channel of the logger. To select the expansion to configure enable "CAN-Expansions configurator" layer shown here below.



In case of first expansion configuration or of very first configuration the layer shows up empty.
CAN expansions configuration procedure is the same for all AIM loggers. Refer to paragraph 7.6 (Configuring the CAN expansions **DaVid** excluded) and 8.6 (How to configure **DaVid**) for further information.

## 9.8 – Transmitting the configuration

To transmit the configuration the logger has to be switched on and connected to the PC USB port through the proper cable. Press "Transmit" button in system manager window and the system automatically transmits the configuration to the logger. See paragraph 4.4 for further information.

## 9.9 – Sensors calibration and auto-calibration

When the configuration has been transmitted it is necessary to perform calibration procedure, to say auto-calibrate the accelerometer, the gyroscope and the distance potentiometer and calibrate the gear sensor, the mid zero potentiometer and the zero based potentiometer installed on the vehicle. The procedure is the same explained for MyChron3 Car/Bike Plus/Gold/Extreme (paragraph 5.6).

**Warning**: if potentiometers, gyroscope and accelerometers have not been correctly calibrated it will not be possible to sample correct data nor the engaged gear or create the track map. Pls. pay particular attention to sensors calibration/auto-calibration procedures.

## 9.10 – Gear calculation

Gear calculation procedure is the same for all AIM loggers (paragraph 5.7).

## 9.11 – Online

When the calibration is over and the configuration has been transmitted to the logger it is suggested to enter "Online" pressing the corresponding button on the menu bar, in System Manager window or on the left vertical keyboard to check that all works correctly. Ensure that the logger is switched on and correctly connected to the PC. The window here below appears. See paragraph 5.8 for further information.

# Chapter 10 – How to download data

Once a test session is over it is possible to download data sampled by the logger.
The software procedure is slightly different for the different loggers. On the contrary, the mechanical procedure is the same:

- connect the USB cable to the logger and to the PC USB port;
- switch the logger on;
- press "Download data" on the menu bar or on the left vertical keyboard.

## 10.1 – Download data from MyChron3 (all versions) and DaVid

Pressing download buttons the related window appears.

**Warning: default setting is clear logger memory after saving data.**

It is possible to disable that checkbox. The figures here below show the two options:



On top of the window there is a waiting bar that shows download progression in percentage.



When download is completed "✓Save" button – bottom right – enables.

Pressing it without specifying anything the file is saved as "NEW.DRK" in this folder: "X:\Program files\AIM\DATA" (where X is the hard disk where **Race Studio 2** has been installed).



It is also possible to save the file with some specific characteristics and in a desired folder following the procedure here explained.

**Saving the file in a specific folder**

- Press "Browse".
- "Save as" window appears.
- Browse it and select the desired folder.



- fill in File name case.
- press "Save".

**Saving the file with some specific characteristics.**



Select the desired characteristics through the drop down menus placed beside the different characteristics: Track, Vehicle, Driver, Championship or Test type.

To **add new characteristics**:

- press lateral "Add/Modify" button and the window here below appears;



- fill in a new name in the top right case of the window;

- "<< Add value to database" button enables;
- press it and the new characteristic are inserted in the database;
- press "✓OK" button to save the new characteristic (or "Cancel" to quit without saving);
- the system comes back to the previous window;
- this new characteristic is now selectable from the drop down menu.

To **modify or delete a characteristic**
- press "Add/Modify" button and the window here below appears;



- select the characteristic to be deleted/modified
- "<< Modify database value" and "<<Delete database value" buttons enable;
- press the desired one;
- modify the characteristics if this is the selected option;
- press "✓OK" button to save changes (or "Cancel" to quit without saving);
- the system comes back to the previous window.

When all characteristics have been inserted press "✓ Save".

The system asks if the logger memory has to be deleted or not. Press the desired button.



During data download the system can show different warning messages:



The system informs the user that downloaded data have not been saved. Press "No" to save data before quitting.



The system warns that that file name already exists and gives two options:
- using a progressive nomenclature: press "Yes"
- filling in a new name manually: press "NO" and follow the procedure explained before.

## 10.2 – Downloading data from other systems

Pressing "Download data" button the related window, shown here below, appears.



Data download from **MXL** and **EVO3 Pro/Pista** requires an inverted procedure compared to MyChron3 and DaVid one.

While before data were characterised after download, now it is necessary to before characterise the data and after download them.

Starting download procedure the system shows - in the central table - data stored in the logger memory.
This window allows to select which data to download, if showing or hiding and how to group them.

**Choose folder button**

This button allows the user to select the file destination folder.



As shown here above, the system has a default destination folder, that is on the hard disk where **Race Studio 2** is installed (in this case hard disk "C"). To save the data elsewhere press "Choose folder" button. "Choose folder" window appears:



Browse it to select the destination folder or create a new one pressing "New folder" button.

## DRK File name button

This button allows to save data with a custom name.



As shown in the figure above, the default name has some specific characteristics that have to be defined.

In case user does not select these characteristics they are automatically set on "None", as shown here below:



To define the characteristics press "DRK file name" button and the window here below appears.



To fill in each field:
- select it from "Choose name items" case;
- place the pointer in the point where to insert the item;
- press "Add to name";

To **insert a custom text in the name**, insert it in the related case;
- select the custom text from the left list;
- place the pointer in the point where to insert the new item;
- press "Add to name";

When all name characteristics have been defined press "✓OK" (or "Cancel" to quit without saving) and the new name is saved.
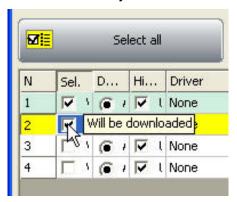
## Central keyboard

| ☑☰ Select all | ☐☰ Deselect all | 🞨 Hide runs marked as "Hidden" | 🗘 Options... |

These buttons allow to decide which data to download.

- Pressing "**Select all**" button all runs stored in the logger memory are downloaded.
- Pressing "**Deselect all**" no run is downloaded.
- To **download only some runs**: select them manually in the central table. As shown here below, placing the mouse pointer near to each run the system automatically shows the actual setting of that run. Just change it as needed.




Pressing "**Option**" button it is possible to decide how to group runs, if showing them or setting them as hidden after download. The figures below show the two options.




In case the choice is to set run as hidden after download it is possible to show them in a second time pressing "**Show run marked as hidden**" button on the central keyboard of download window.

## Bottom keyboard



Bottom buttons manage data download and memory deletion of the logger.

- "**Clear data logger memory**": deletes the logger memory without downloading data.
- "**Download selected runs, then clear memory**": downloads selected runs and then deletes the logger memory.
- "**Download selected**": downloads selected runs and does not clear logger memory.

**Note**: each time an operation involving memory deletion is performed the system asks for confirmation showing the related window.



"**DO NOT clear memory**": quits data download without performing it nor deleting the logger memory.

When data download is set and data characteristics defined, press the desired download button. Download waiting bar starts showing the download progression and at the end the software comes back to **Race Studio 2** main window.