User Manual

MXS 1.2, MXP, MXG 1.2 Strada

Release 1.01

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1 – MX Strada series in a few words

What is MX Strada series?
MX Strada series is the new AiM dash that combines small dimensions, flexibility, usability and that may manage a wide range of channel inputs.

It features:

- ECU connection (CAN, RS232 and K-Line)
- 1 speed input
- 1 RPM input
- 8 analog/digital inputs
- 2 analog video camera inputs
- up to 8 configurable display pages
- a huge tracks database to automatically select the track you are racing on
- from 5 to 8 alarm LEDs
- 10 RGB LEDs that you may configure for clearly showing if you are improving or not.

What about ECU connection?
MX Strada series manages CAN, K-Line and RS232 ECU communication lines. Its huge database including more than 1500 ECU protocols is available.

Is MX Strada series an expandable device?
Yes. MX Strada series can be connected to various AiM expansions like GPS Module, Channel Expansion, TC Hub and LCU-One CAN to maximize your engine performances and to AiM SmartyCam to see your track performances on your PC with all the values you need in overlay.

Anything else?
You may connect up to two additional optional back cameras to the dedicated input in order to show a reverse mirror image directly on its display.

The table below shows the differences among the dashes.

FEATURE	MXG 1.2 Strada	MXP Strada	MXS 1.2 Strada
Display	7" TFT	6" TFT	5" TFT
Resolution	800*480 pixels		
Contrast	1000:1	600:1	
Brightness	700cd/m^2 - 1,100 Lumen		
Ambient Light Sensor	Yes		
Alarm Display Icons	Yes, freely configurable		
Alarm RGB LEDs	8 configurable	5 configurable	6 configurable
Shift Lights	10 configurable RGB LEDs		
CAN Connection	2		
ECU Connection	CAN, RS232 or K-Line to 1.000 + industry leading ECUs		
External Modules	GPS Module, Channel Expansion, TC Hub, Lambda Controller, SmartyCamHD		
Analog Inputs	8 fully configurable, max 1.000 Hz each		
Digital Inputs	1 speed input, coil RPM input		
Digital outputs	1 (1A each)		
Second CAN	Yes		
Body	Anodized Aluminium		
Pushbuttons	Metallic		
Connectors	2 AMP connectors+1Binder connector		
Dimensions	237*127.6*26 mm	189.6*106.4*24.9	169.4*97*23 mm
Weight	950g	640g	480g
Power Consumption	400mA		
Waterproof	IP65		

2 – What is in the kit?

MX Strada series kit includes:

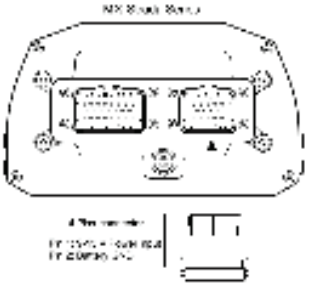
- MX Strada series **standard version or with street icons** as shown here below
- USB cable
- 14 pins connector harness for ECU connection and power; it is available in **two versions**:
    - standard for ECUs communicating through CAN/RS232 protocol or
    - with the OBDII connector for ECUs communicating with CAN/RS232 and K-Line.
- 23 pins AMP female connector with pins
- CD for software installation

3 – Powering

The power is managed by two pins of the 14 pins connector:

- Pin 1: Power (9-15 Volts)
- Pin 2: Ground

They must be connected as shown in the following diagram.



4 – What you can do via keyboard

MX Strada series needs to be configured via software but there are some functions you can manage via the device lateral buttons.

Press “Menu” button and this page appears.

The icons are to manage:

Date/Time

Counters

Backlight

GPS and Tracks

Video in (optional additional rear cameras)

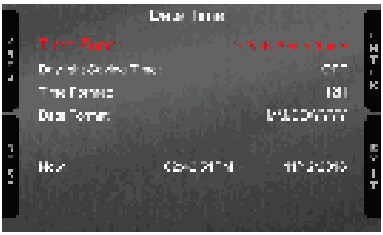
System Info

4.1 – Set Date/Time

Here you can:

- set time zone
- enable/disable Daylight saving time
- set time and date format

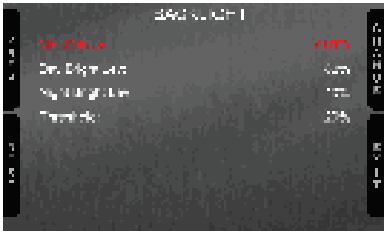
Bottom of the page current time and date are shown

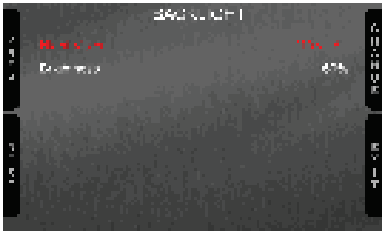


4.2 – Set backlight

The brightness of the display and LEDs may be adjusted in two ways, depending on the light captured by a dedicated sensor integrated in the dash

- AUTOMATIC: in case ambient light is higher than a defined threshold, the brightness is reduced; you can set day and night brightness level as well as the brightness threshold value that switches from day to night mode (left image below)
- MANUAL: you may define the brightness of the display and LEDs choosing among some values: 20%, 40%, 60%, 80%, 100% (right image below)





4.3 – Set Video input

Video In page manages up to two additional optional back cameras (that cannot be logged).

They are to be connected to the Binder 712 female connector rear central of MX Strada Series, as shown in the pinout you find at the end of this user guide.

Features to set are:

- Input: Video 1 / Video 2
- Format: NTSC/PAL
- Brightness and Contrast from 10 to 100%

Use "CHANGE" button to set each feature and "NEXT" to scroll the features

Please refer to paragraph 10.1 ("Rear cameras connection and management") for further information.

4.4 – Counters management

MX Strada series features 4 user odometers, labelled User 1 – User 4, plus a non-resettable System Odometer. All odometers are shown on the configuration software Race Studio 3 too (see chapter 5 – "MX Strada series and the PC").

Each odometer can be activated/deactivated and/or reset. To manage an odometer select it and press "CHANGE".

4.5 – GPS & Tracks management

MX Strada series can be used on track thanks to the optional AiM GPS08 Module. This is used for Lap time, Speed and Predictive lap time calculation
To calculate these data the system needs to know the start/finish line coordinates of the racetrack: MX Strada series comes with a long list of tracks, constantly updated by our technicians and loaded to your PC when you run Race Studio 3 software and a connection to the Internet is available. MX Strada series provides two track selection modes: automatic and manual.

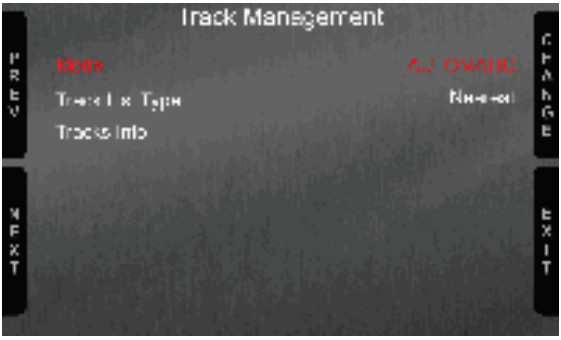
Automatic:

MX Strada series automatically recognizes the track you are running on, loads the start/finish line and the possible splits coordinates and calculates lap and split times without optical/magnetic receiver. This is the best mode in most cases.

Manual:

Allows to manually select the track from the internal database.
This mode is to be preferred when multiple track configurations are available nearby. In this case MX Strada series would anyway recognize the track but would need at least one complete track lap.
You can scroll the list of available tracks choosing among these options:

- nearest: shows only tracks in a 10 km distance
- all: shows all tracks stored in the system in alphabetical order
- custom: shows only the tracks you have previously created



4.6 – System Information

This page shows serial number as well as firmware and booter version of MX Strada series dash.

5 – MX Strada series and the PC

MX Strada series dash can be configured through AiM Race Studio 3 software; the software also manages its tracks database as well as check other device functions through the device window.

5.1 – Connection to the PC

MX Strada series can be connected to the PC using the USB cable included in the kit: plug it in the cable labelled "USB" of MX Strada series 14 pins connector harness and in the PC USB port.

5.2 – Configuration of MX Strada series

Once MX Strada series connected to the PC

- click "Configurations" icon and configurations page appears
- click "New" and new configuration panel appears: select "MX Strada series" dash and press "OK"; when performing subsequent configurations "Select configuration" panel shows on top the last four devices you configured.

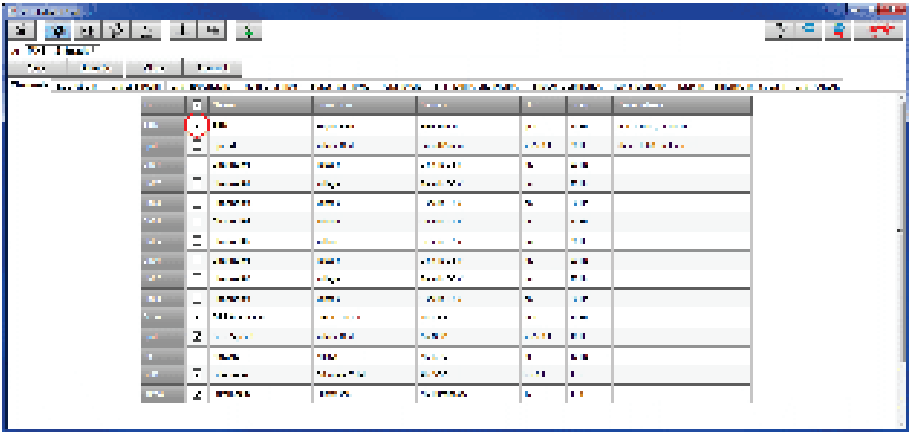
This is the list of the features you have to configure:

- Channels: analog and digital sensors directly connected to MX Strada series dash.
- ECU: the Engine Control Unit of the vehicle. MX Strada series dash manages CAN, RS232 and K-Line protocols
- CAN2: in case the system is connected to other CAN devices, beside the ECU, they have to be connected to CAN 2 port
- CAN expansions: other AiM CAN Devices, like, for example, Lambda controller, GPS Module, Channel expansions etc.
- Math channels: some calculated channels that may be helpful in some situations
- Some other calculated variables, useful for managing alarms, icons, LEDs.

5.2.1 – Channels configuration

To set all the channels.

RPM channel is by default enabled: since the direct RPM connection is used when the vehicle does not have an ECU. The software automatically disables it when an ECU protocol is selected. See chapter 9 for further information about the hardware RPM signal connection.



To set a channel just click on its line and the related panel shows up.

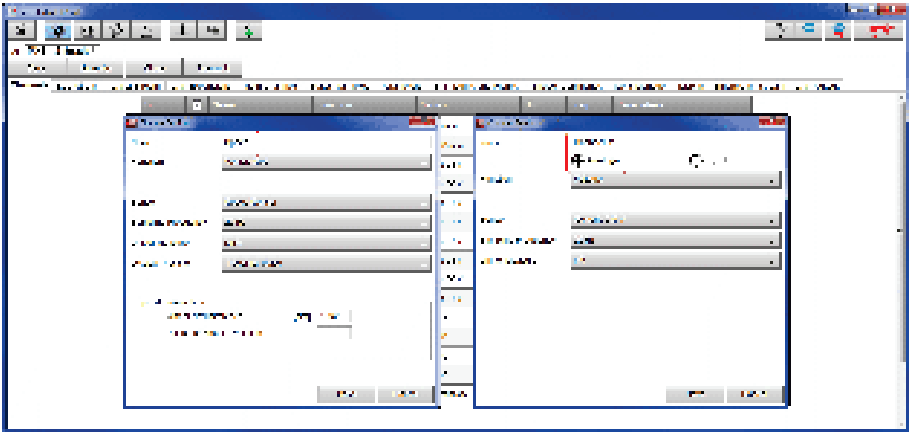
The first two channels in the list are RPM and speed, follows the configurable channels that can be managed as analog or as digital according to what they are connected to.

Typically analog sensors are pressure sensors, thermocouples, potentiometers, etc… while digital inputs are used for managing pushbuttons, that may be used for activating the digital ouputs

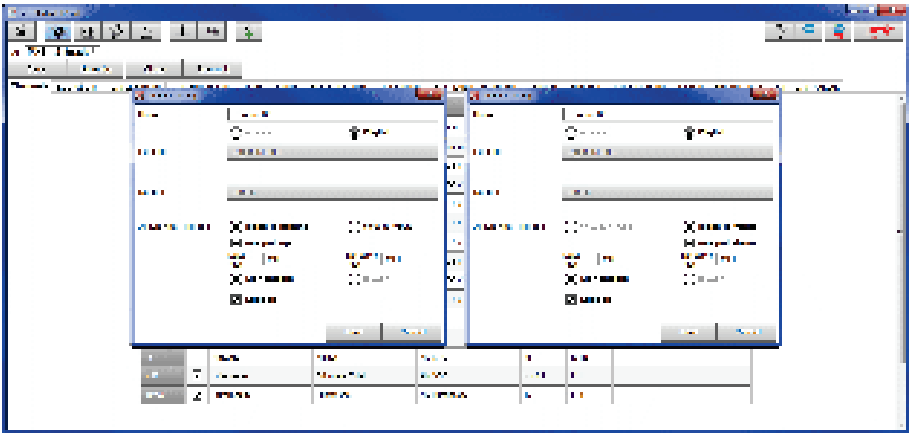
Selecting "**Analogic**" options to be set are:

- Channel name
- Function: this parameter is useful in the data analysis process
- Sensor type
- Measure unit
- Sampling frequency
- Display precision: it configures how many decimal digits will be shown on the display
- Specific parameters

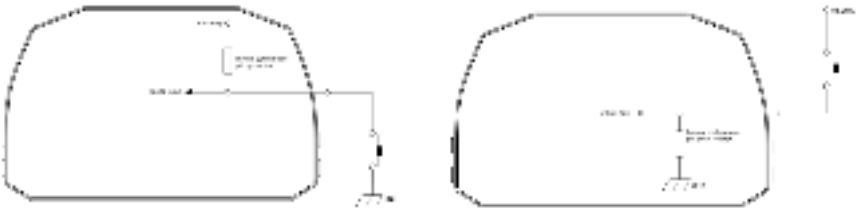
In the following image you see two different channels configuration windows.



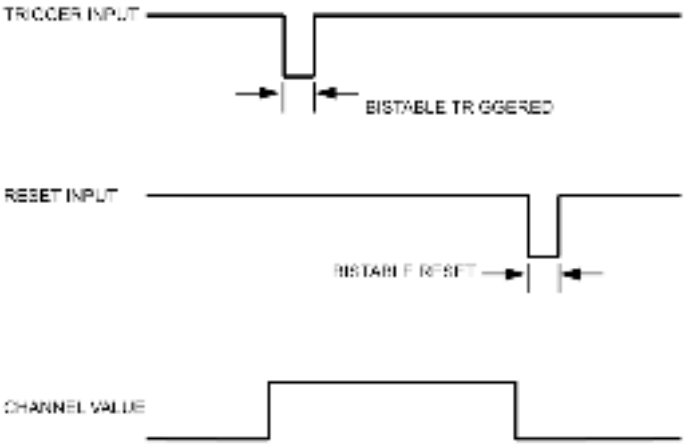
To use an input as "**Digital Input**" its parameters have to be configured as follows:



- **Working mode**: a digital input can work in two different ways:
    - The pushbutton closes to ground (with or without pull up resistor – left image below)
    - The pushbutton closes to VBattery (with or without pull down resistor – right image below)



- **Active/Not Active** labels: according to the status a Digital channel may assume the values 0/1, High/Low, ON/OFF, Closed/Open, True/False etc…
  The two different labels can be defined and eventually shown on the display, used by Math channels, Icons Management, alarm managements and in general, any time a digital channel is required; the labels appears in Device page too.
- Signal Type: can be bistable or monostable, to say
  - **Monostable**: the channel is active when the pushbutton is closed
  - **Bistable**: the channel is activated the first time you close the circuit and deactivated the second time the circuit is closed as shown here below.



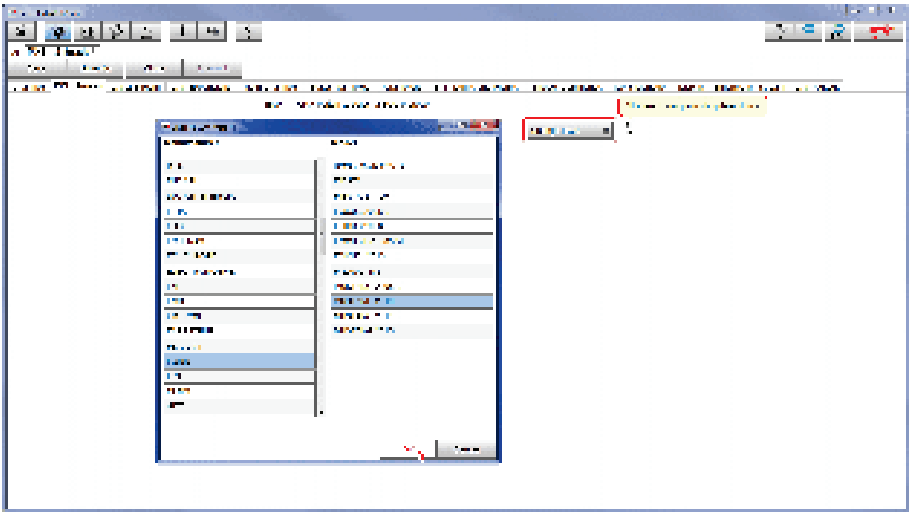
- **Logged**: if active, the system records the digital values, else they can be used and shown but they are not recorded.

5.2.2 – ECU Connection and configuration

MX Strada series can be connected to the vehicle ECU. Documents explaining how to connect MX Strada series to the ECU are published on our website www.aim-sportline.com and a PDF file with protocols updates history can be loaded clicking on the question mark as shown here below. MX Strada series can communicate through CAN, RS232 and K-Line communication lines.

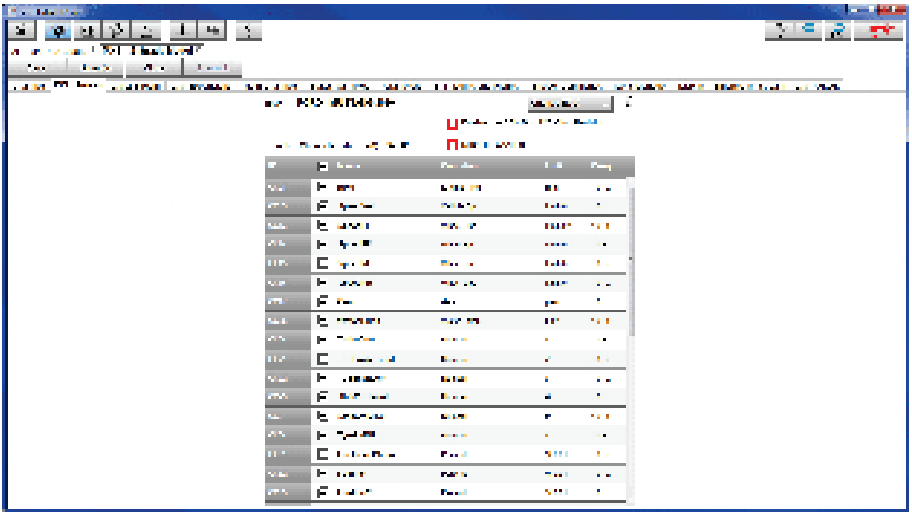
The ECU protocol database includes more than 1500 different protocols and is constantly updated by our technicians. In case of a CAN based ECU whose protocol is not in the database, the ECU Driver Builder function (paragraph 5.4) allows to develop it.
To load the ECU protocol in MX Strada series configuration:

- enter "ECU Stream" tab
- press "Change ECU" button
- select "ECU Manufacturer" and "ECU Model" (in the example FORD/ MUSTANG 2010)
- press OK



After setting the protocol the system comes back to "ECU Stream" page and two checkbox appears:

- "Enable the CAN Bus 120 Ohm Resistor" (enabled by default; to be disabled in case MX Strada series dash is additional to the vehicle one): the CAN bus needs two 120 Ohm resistors at its two extremes. In case MX Strada Series dash is the only device connected to the ECU the 120 Ohm resistor should be enabled, else, very easily, it is already present in the existing network and should be disabled;
- "silent on CAN Bus" (disabled by default): usually the ECU expects an acknowledge signal when transmits a message and, as default, the MX Strada series transmits this signal. Sometimes, particularly when there are other devices in the network, MX Strada series should not transmit it; in this case, enabling this flag, MX Strada series dash remains completely silent.

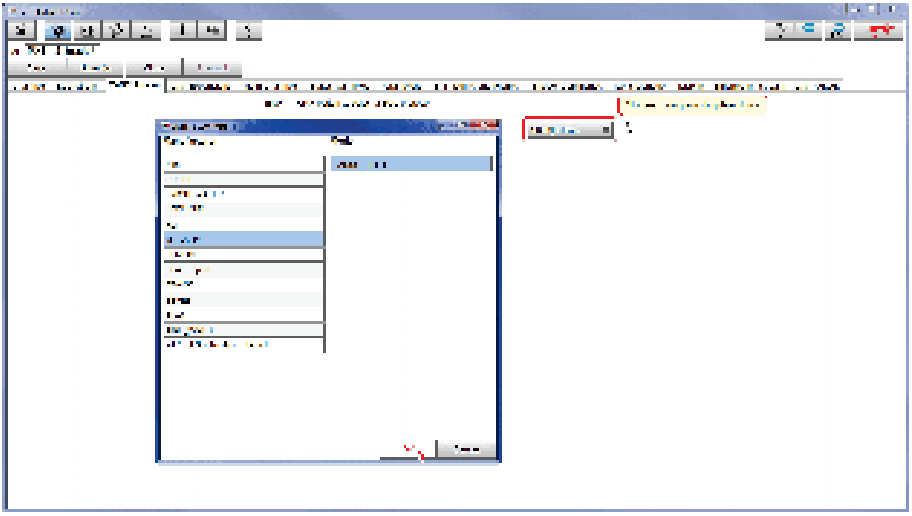


5.2.3 – CAN2 Stream configuration

This page works exactly like ECU Stream one. Here are additional CAN modules. To load one:

- enter “CAN2 Stream” tab
- press “Change protocol” button
- select “Manufacturer” and “Model” (in the example MEGALINE/PADDLESHIFT)
- press OK

As for ECU Stream a PDF file with protocols updates history can be loaded clicking on the question mark as shown here below and the two checkbox appears as explained before.

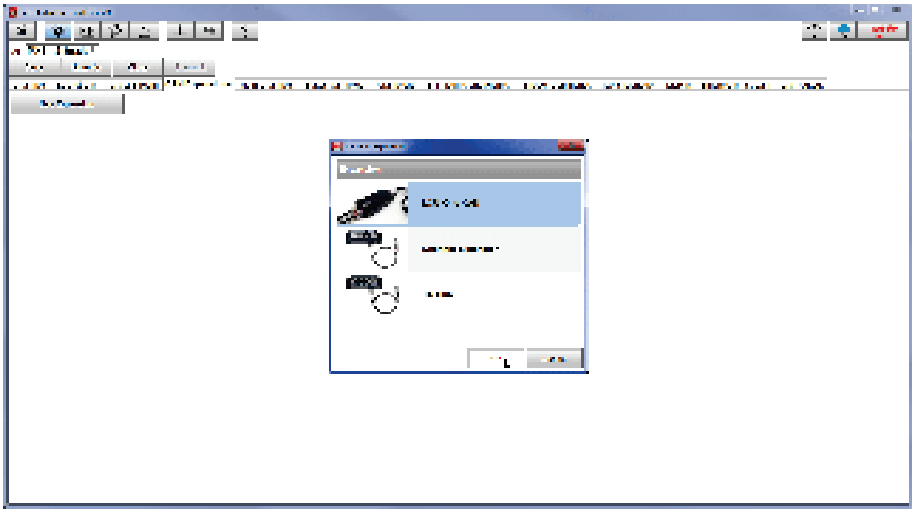


5.2.4 – CAN Expansions configuration

MX Strada series can be connected to various AiM CAN expansions:

- LCU-One CAN
- Channel Expansions
- TC Hub

At the very first MX Strada series connection this page shows up:

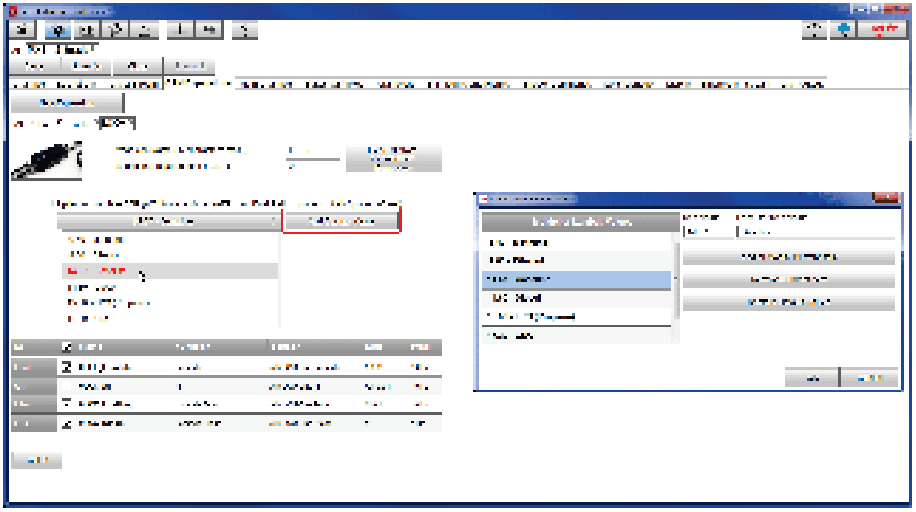


Select the CAN expansion to set and press “OK”. Each expansion needs to be set filling in the related panel.

Setting LCU-One CAN

To set an LCU-One CAN:

- press “New Expansion” button;
- select “LCU-One CAN” and press OK
- name the LCU One and fill in its serial number or press “Get SN from a connected expansion” to receive the serial number from the connected LCU-One
- select the multiplier to calculate AFR from lambda (in the example “14.57 Gasoline”) or add a custom value pressing “Add Custom Value” (the related panel shows up: fill it in)
- set the LCU One channels double clicking on each channel and setting the panel that shows up
- press “Close” to save and exit

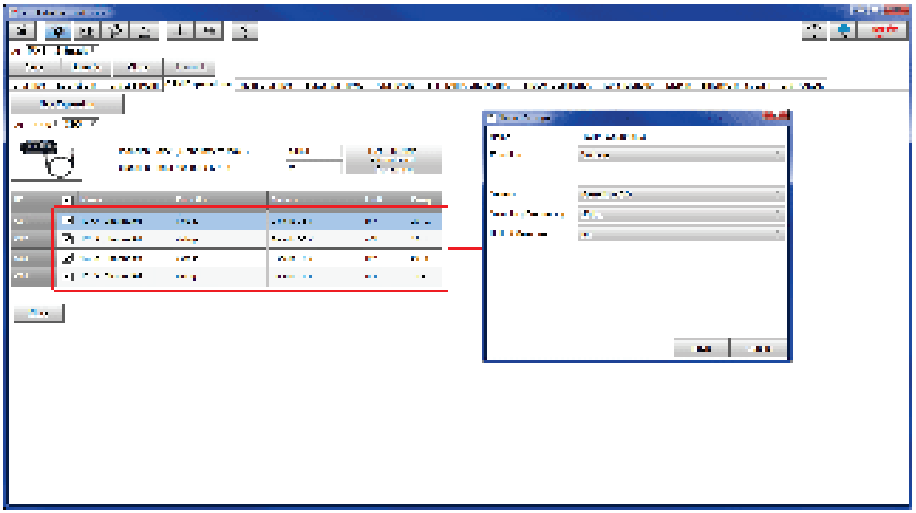


Please note: for any further information about AiM LCU-One CAN refer to the related user manual you can download from AiM website www.aim-sportline.com documentation area, products section.

Setting Channel Expansion

To set a Channel Expansion:

- press “New Expansion” button;
- select “Channel Expansion” and press OK
- name the Channel expansion and fill in its serial number or press “Get SN from a connected expansion” to receive the serial number from the connected Channel Expansion
- set each channel double clicking on each channel and setting the panel that shows up (it works exactly like channels configuration – see the related paragraph)
- press “Close” to save and exit

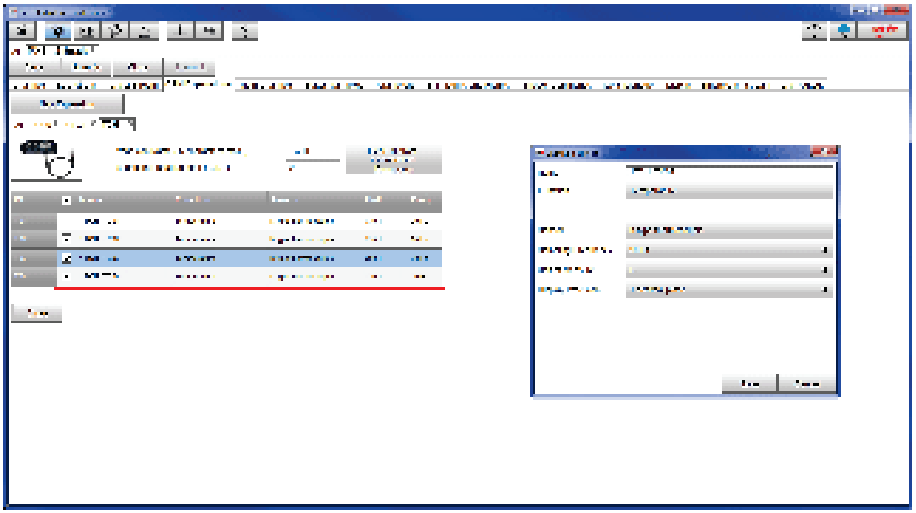


Please note: for any further information about AiM Channel expansion refer to the related user manual you can download from AiM website www.aim-sportline.com documentation area, products section.

Setting TC Hub.
This CAN expansion only supports K type thermo-couples.

To set a TC Hub:

- press “New Expansion” button;
- select “TC Hub” and press OK
- name the TC Hub and fill in its serial number or press “Get SN from a connected expansion” to receive the serial number from the connected TC Hub
- for each channel set sampling frequency, measure unit and display precision
- press “Close” to save and exit



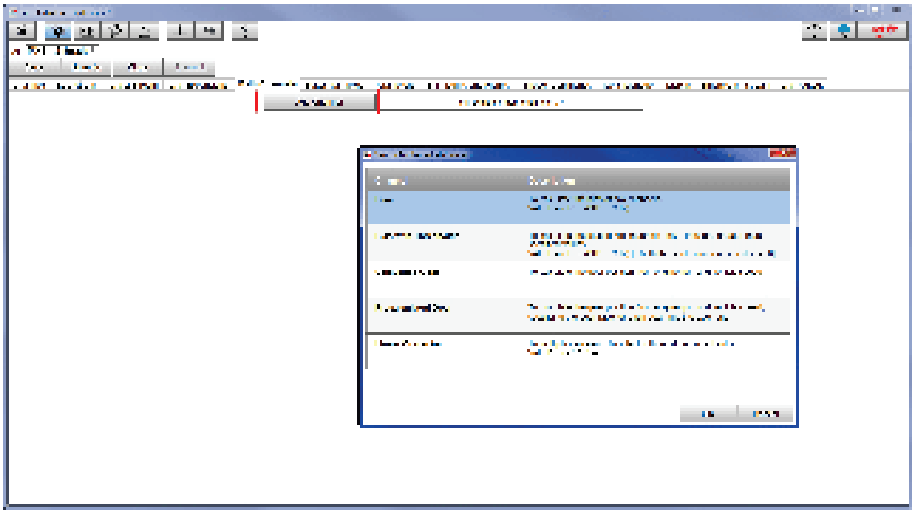
Please note: for any further information about TC Hub refer to the related user manual you can download from AiM website www.aim-sportline.com documentation area, products section.

5.2.5 – Math channels configuration

To create math channels; available options are:

- Bias: considering a relation between two mutually compatible channels it computes which one is prevailing (typically used for suspensions or brakes);
- Bias with threshold: it needs the user to set a threshold value for the considered channels; once these threshold are both exceeded the system makes the calculation;
- Calculated gear: it calculates the gear position using engine RPM and vehicle speed
- Precalculated gear: it calculates the gear position using Load/Shaft ratio for each gear and for the vehicle axle too
- Linear correction: typically used when a channel is not available in the desired format or if it is wrongly tuned and cannot be tuned again

Each option asks the user to fill in a proper panel.



5.2.6 – Status variables configuration

Status Variables are internal math channels that can have only two different values: 1 (TRUE) or 0 (FALSE). They may be useful for simplifying complex configurations, where it is required to evaluate if to activate alarms, LEDs, Icons etc..

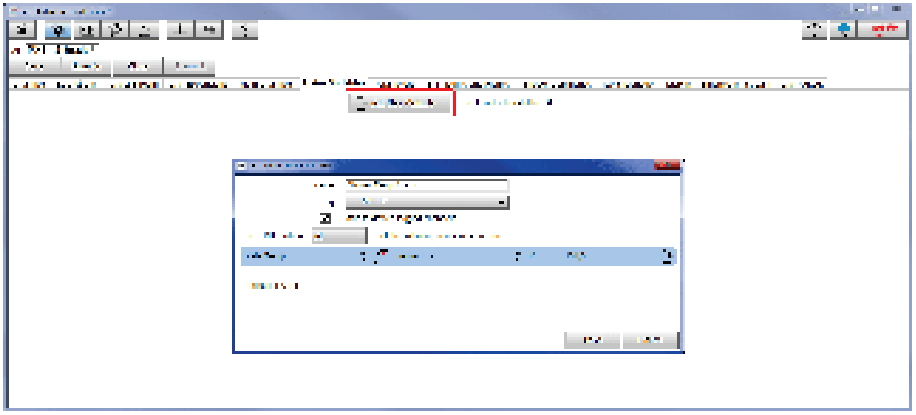
Let us explain with an example. We would like to turn ON a LED and an Icon when Water temperature reaches 100°C and the RPM are higher than 2000. Instead of defining the same logic for managing the icon and for managing the LED, we could define a Status Variable, Water Temp Alarm and link Icon and LEDs to this variable. In this case we could define:

- Water Temp Alarm is High when:
    - Water Temp is higher than 100°C and
    - RPM is greater than 2000.

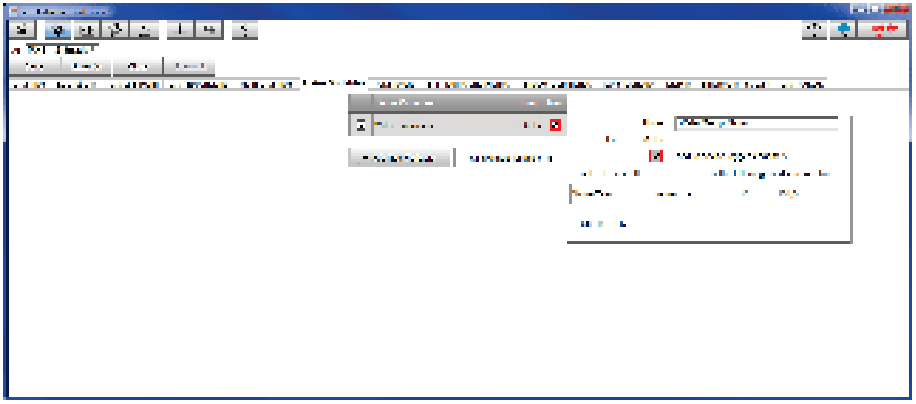
And use Water Temp Alarm for managing Icons and LEDs.

As you may see, the Status Variables are more useful when the logic to be evaluated is complex and involves different channels.

In order to define a Status Variable enter the proper TAB.



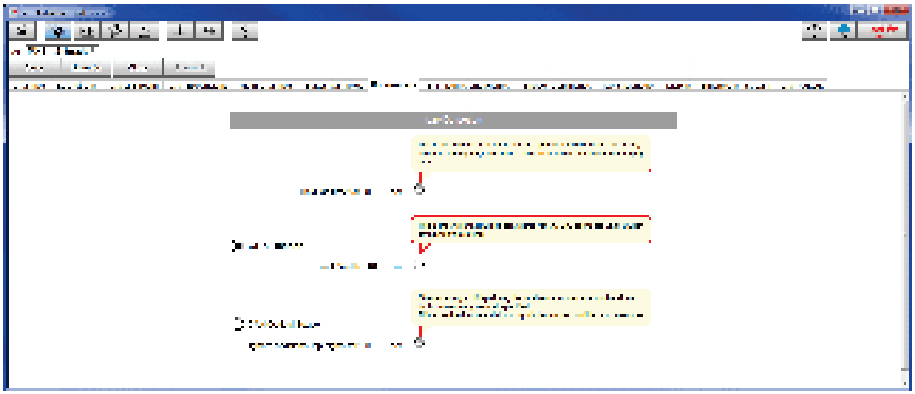
The Status variables can be used as any other channel, so they may be seen online, transmitted to the CAN stream, recorded, used for triggering a command or for turning ON a LED or an Icon.
Mousing over the Status Variable a summary panel appears on the right as shown here below.



5.2.7 – Parameters configuration

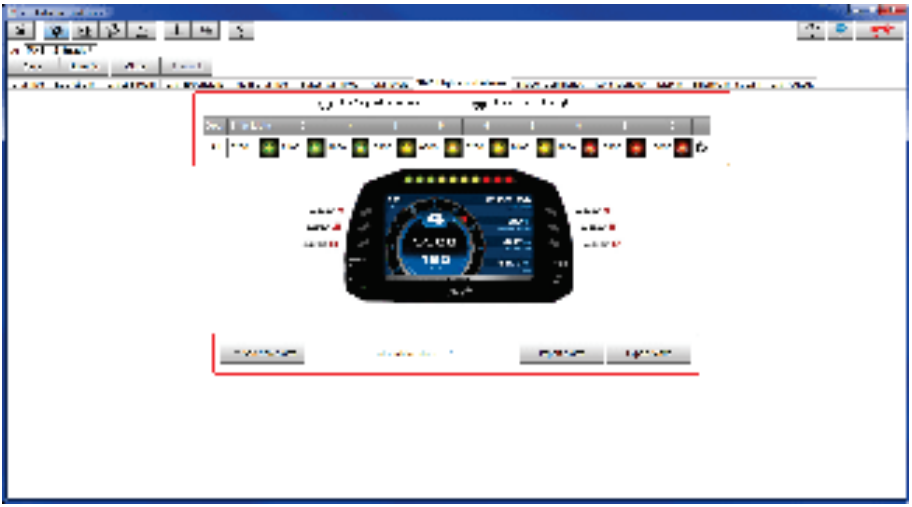
To set the beacon.
Mousing over the question marks a pop up message explains the working mode of:

- **GPS Beacon (needs an optional GPS08 Module)**:
    - hold lap time for: the time period for which lap time is shown on your MX Strada series display
    - the track width: width that will be considered for any GPS point you set
- CAN Optical beacon (not recommended):
    - ignore additional lap signal for: after receiving an Infrared lap signal, the receiver does not detect another signal for the time period fixed in the related box. This is useful if more lap transmitters are placed nearby on the side of the track. Needs an optional IR lap receiver to work.



5.2.8 – Shift Lights and Alarms configuration

To set shift lights (on top) and alarm LEDs (bottom) of your MX Strada series.

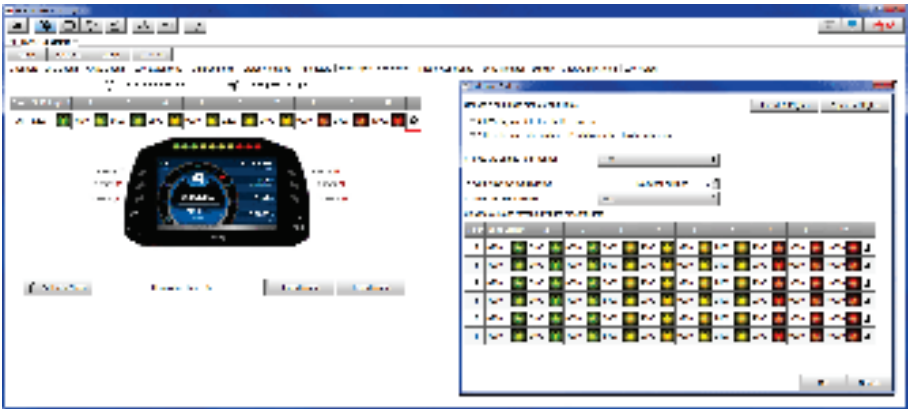


On top MX Strada series shift lights working mode can be set. Available options are:

- shift lights, for helping in changing gear and
- predictive time: for easily understanding if the current lap is faster or slower than the reference lap.

Use as gear Shift Lights To use the LED bar as shift lights click the icon (⚙) for setting the parameters. Configure:

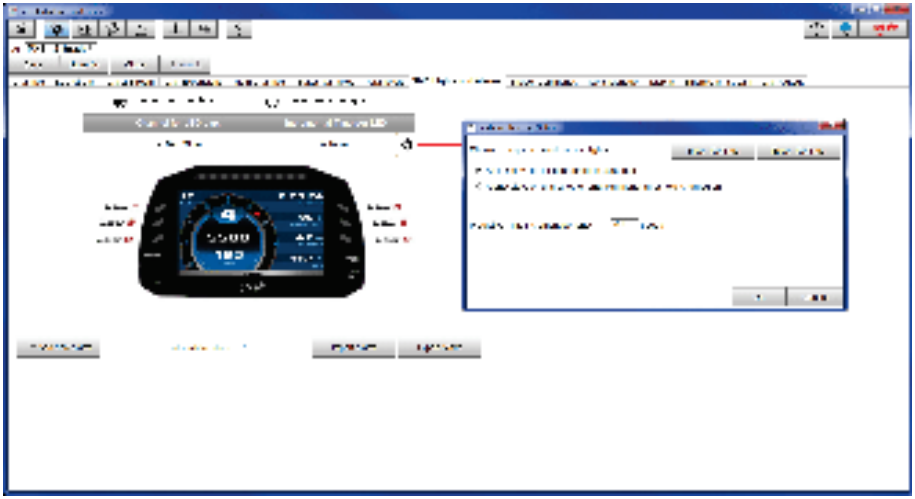
- at which RPM value the single LED turns ON
- the sequence mode of the LEDs enabling the desired option:
    - a LED stays on if its threshold is exceeded
    - a LED stays on until another LED with higher threshold turns on or
- link the shift lights to the engaged gear enabling the related checkbox;



Use for predictive time. Click the icon (⚙) for setting the parameters.
In this case the LEDs colour are fixed in:

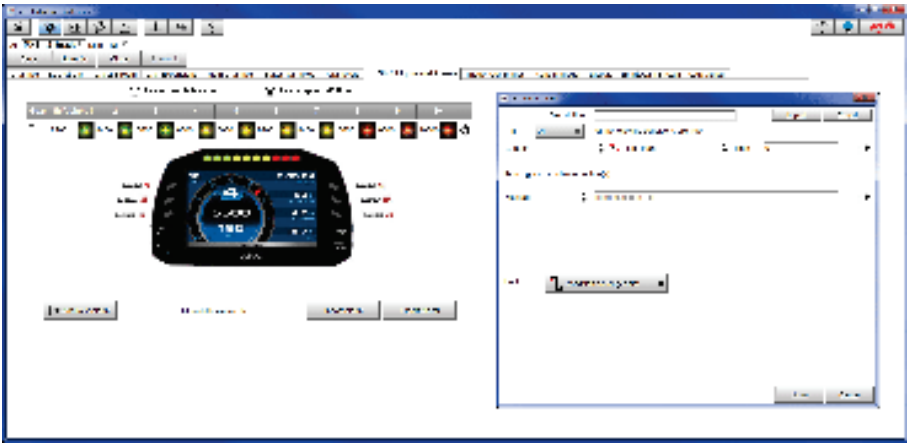
- Green if the lap time is improving
- Red if the lap time is worse than the reference lap

The threshold at which one LED is turned ON can be customized. Assuming "0.10 sec" is fixed and the lap time is improving of 0.30 sec toward the reference lap, MX Strada series will switch on 3 LEDs green; if, on the contrary, the lap time is worsening the LEDs will switch on red.
Please note: this option only works if an optional GPS Module is connected.



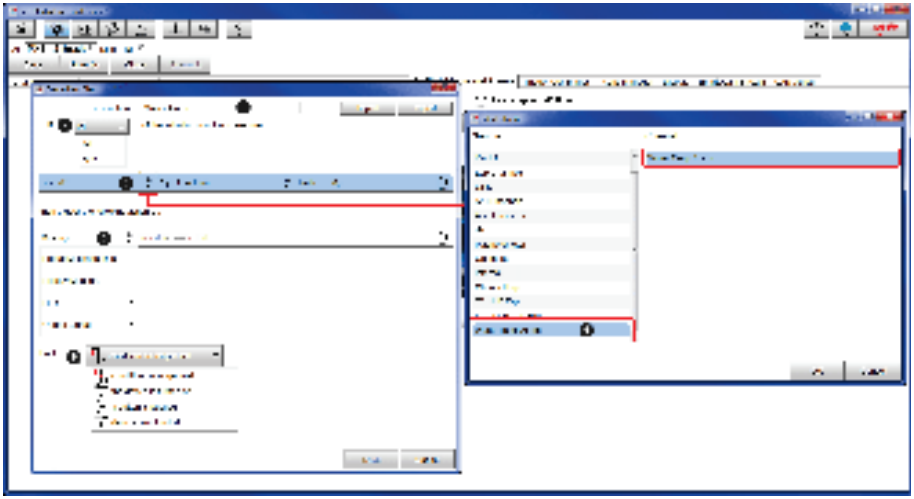
Create and set MX Strada series alarm

To create a new alarm press “Add New Alarm” and the related panel shows up.



To set the new alarm:

- define the Alarm name (**1**)
- a combination of Alarm conditions can be set: choose if the conditions are to be ALL valid or just one of them (**2-4**)
- decide which action is to be trigged (**5**) among displaying a message or a timed popup message, display a measure, switch a LED on or activate an output signal (CAN output page, see the related paragraph)
- decide the alarm ending condition ("Untill" – **6**) among: condition no longer met, the device is turned off, a button is pushed or data are downloaded
- "+" buttons right of the panel are to add new alarms (the top one) or to add new actions to an alarm (bottom one)
- when all operations have been performed press "Save" in "Create New Alarm" Panel and the software comes back to "Shift Lights and Alarm" page.



5.2.9 – Trigger commands configuration

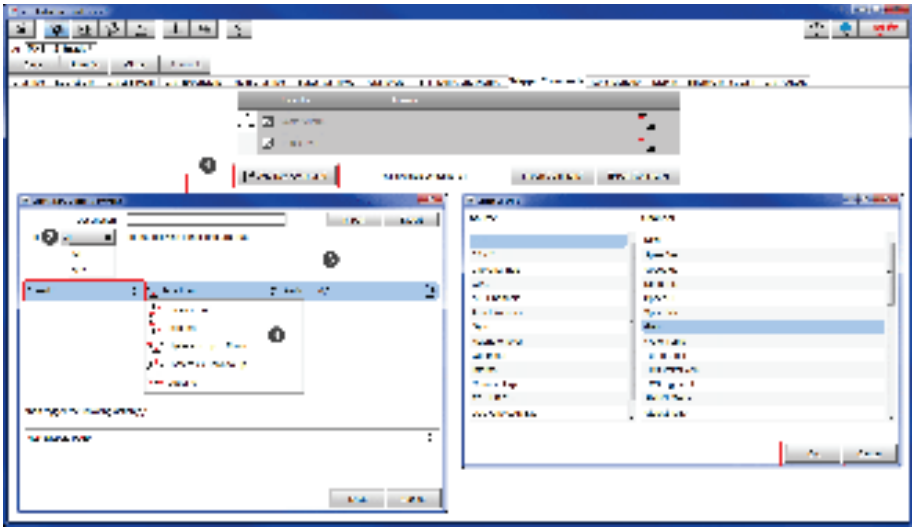
"Trigger Command" executes some specific actions on MX Strada series.
The commands available up to now are:

- set next/previous page
- show camera input page
- reset alarms
- activate pushbuttons 1-4

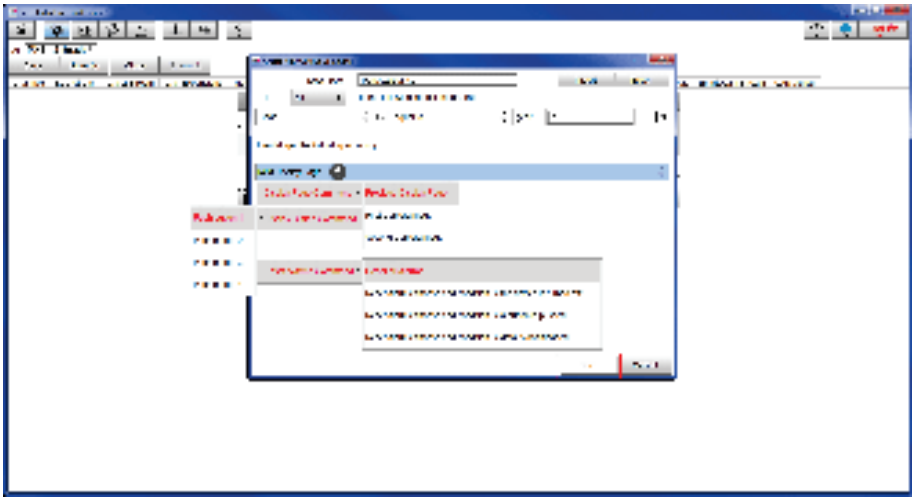
Other commands will be available in the next software/firmware releases.

To add a new command.

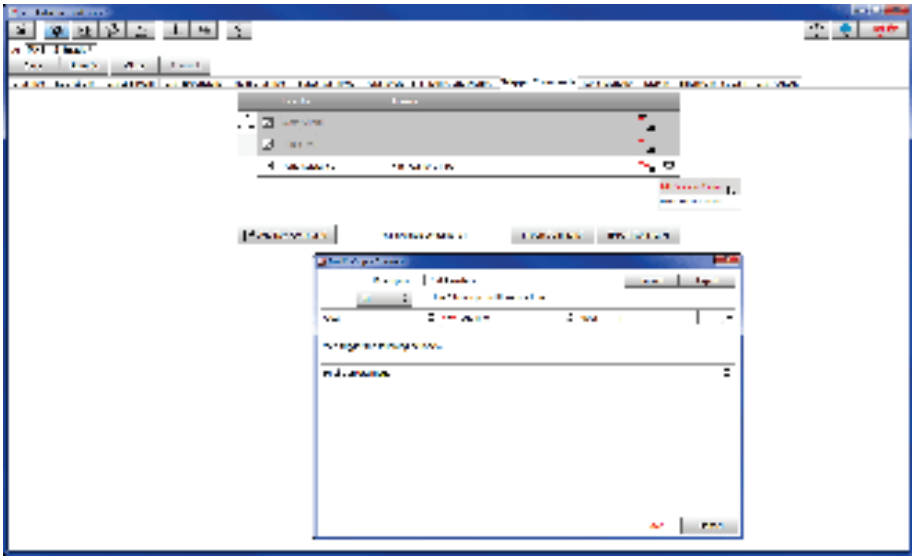
- Press "Add new Command" (**1**)
- a combination of conditions are allowed for setting a Trigger Commands and it is possible to decide if the conditions are to be ALL valid or just one of them (**2-4**)



- decide the action to be performed (**5**)
- Click “Save”



In the Trigger Commands summary page, trigger command can be modified/deleted right clicking on the setting icon placed right of the trigger row.



5.2.10 – Icons manager configuration

The "Icon" is a set of images, each one of them to be shown on each page as desired, that depend on a fixed condition that, when exists, triggers the proper image.

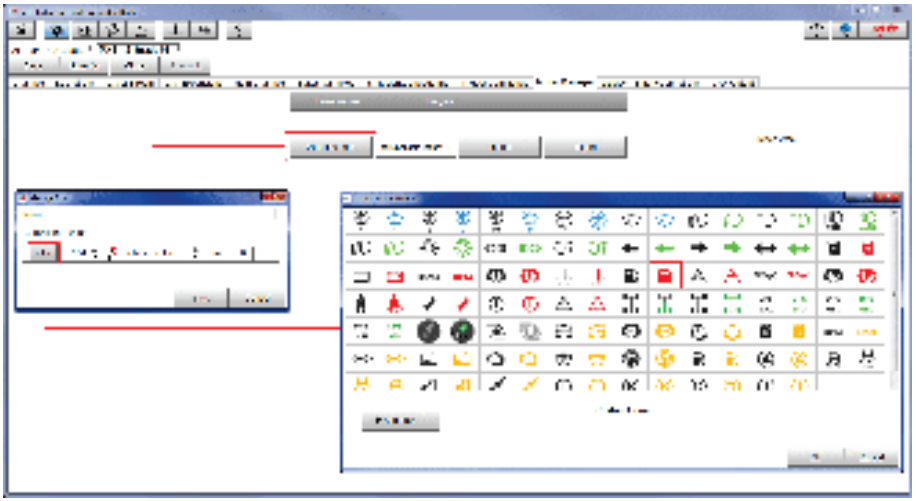
For example:

- the first image has to be shown when the signal Turn Right is TRUE
- the second when the signal Turn Left is TRUE
- the third when the signal Hazard is TRUE
- the fourth when no signal is TRUE

Not all display pages offer the possibility to show icons but our technicians are working for offering more pages with this feature.

To configure an Icon

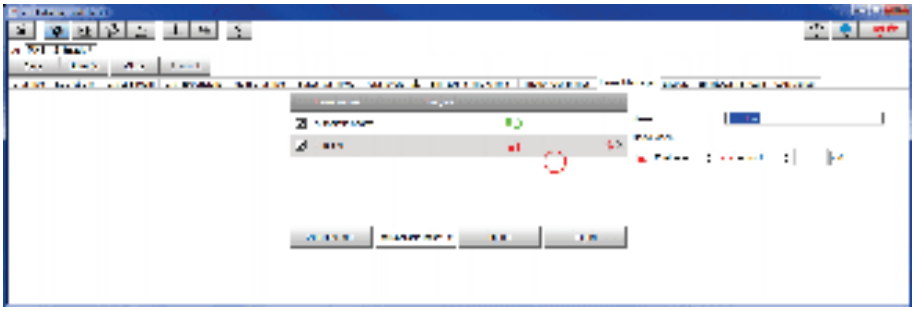
- press “Add New Icon”
- “Manage Icon” panel shows up
- press “Select” to see the panel showing all images
- select the image you want to set
- the software comes back to “Manage Icon” panel
- set the image conditions according to the channel they are related to



It is possible to use custom images pushing “Add New Icon” pushbutton. They have to be 64x64 pixels .png format.

The “Icons page” shows a summary of the selected icons. If you mouse over any Icon, a panel with all the information appears.

Icon can be edited/selected pressing .



5.2.11 – Display configuration

MX Strada series can have up to eight pages to be set via software.

- enter “Display” tab
- a panel shows up: select a display page (in the example a page with icons bar has been chosen)
- select the page and press “OK”
- repeat the operation for the number of pages to set

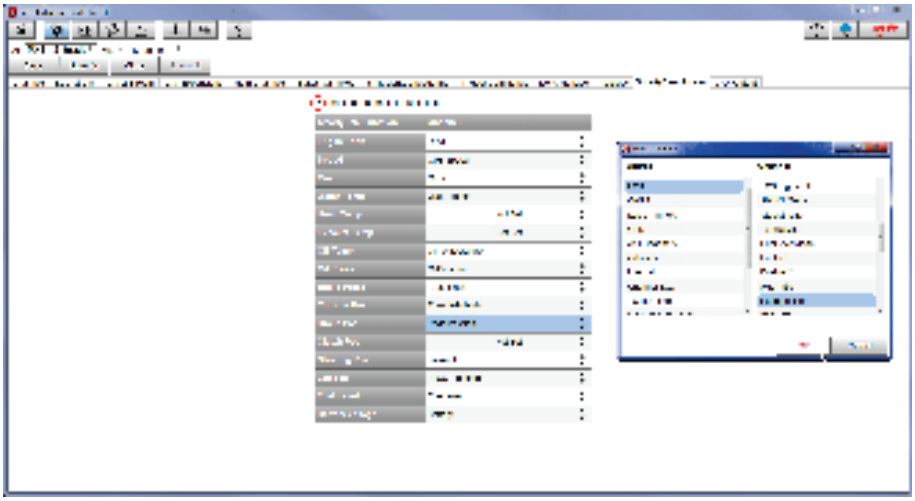
When the page has been selected two setting panels appear bottom of the page:

- on the left a panel that shows as many rows as the fields to be set
- on the right a panel that shows the channels group that can be set in that field and all the channels in it included; drag and drop the channel to set in the desired field or double click on it
- if more display pages have been added a label top of the tab indicates the one in use as highlighted here below.

5.2.12 – SmartyCam stream setting

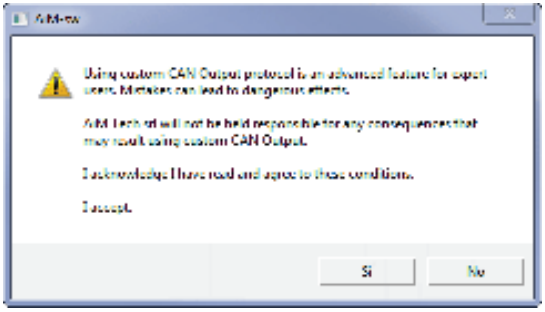
MX Strada series can be connected to AiM SmartyCam to show the desired data on SmartyCam video. To set each channel:

- click on it and a setting panel shows up
- it shows all channels and/or sensors that fits the selected function
- in case the desired channel or sensor is not in the list enable "Enable all channels for functions" checkbox and all channels/sensors will be shown.



5.2.13 – CAN Output configuration

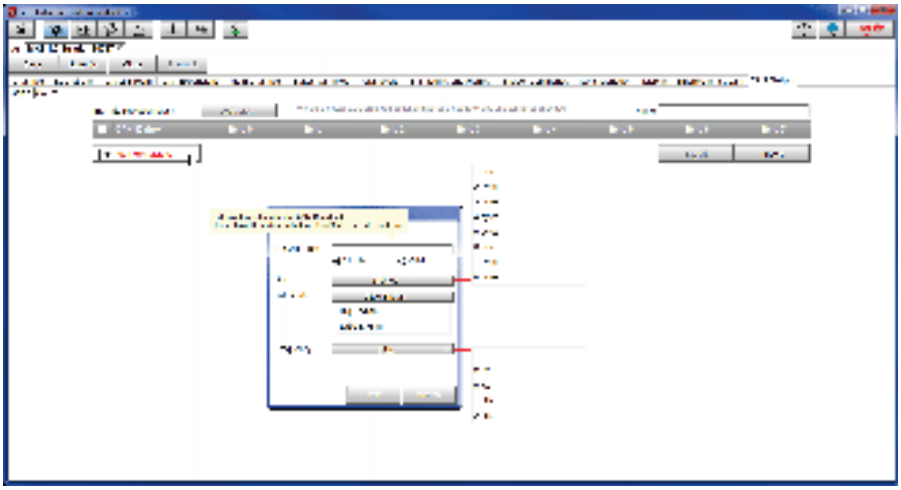
Please note: this function is for expert users only. At very first configuration this panel shows up.

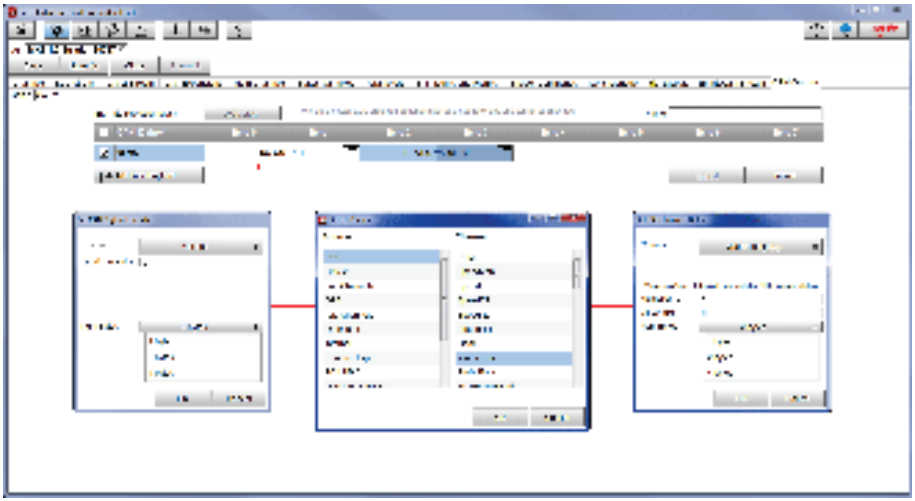


The dash can transmit a CAN data stream containing the channels required both on CAN1 and CAN2.

To add a payload:

- press "+Add new Payload" and "Set CAN Header details" appears;
- fill in ID CAN (hex), available options are:
    - 11 bits (normal address)
    - 29 bits (extended address)
- select the payload max bytes number (DLC), available options are from 1 to 8 bytes
- select the byte order according to the used processor, available options are:
    - Little endian for Intel processor
    - Big Endian for Motorola processor
- set the sampling frequency among: 1,2, 5, 10 or 20 Hz





When all channels set your configuration is finished:

- press “Save” on the page top keyboard
- press “Transmit” to transmit the configuration to MX Strada series

5.3 – Managing a track on MX Strada with Race Studio 3

With Track Manager function of Race Studio 3 tracks can be created, deleted and modified transmitted and received to/from MX Strada series. Press “Tracks” icon.
Please remember: an optional GPS08 Module is needed.

The main page is divided in three columns; on the **left**:

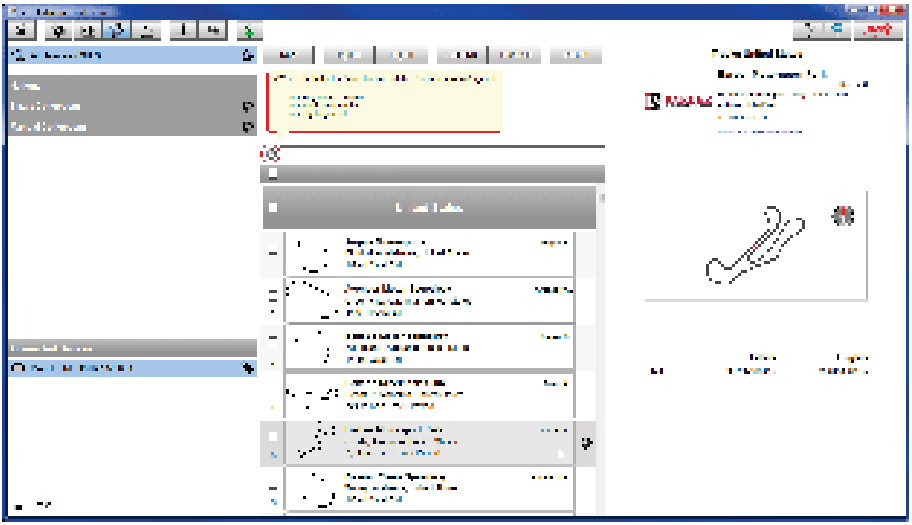
- on top, the filters that allow to collect many tracks following customized criteria; by default, all tracks are shown (light blue "All Tracks" filter in the image below).
- bottom left, the connected devices ("MXS 1.2 Strada ID 5302808" below)

The column **in the middle** shows:

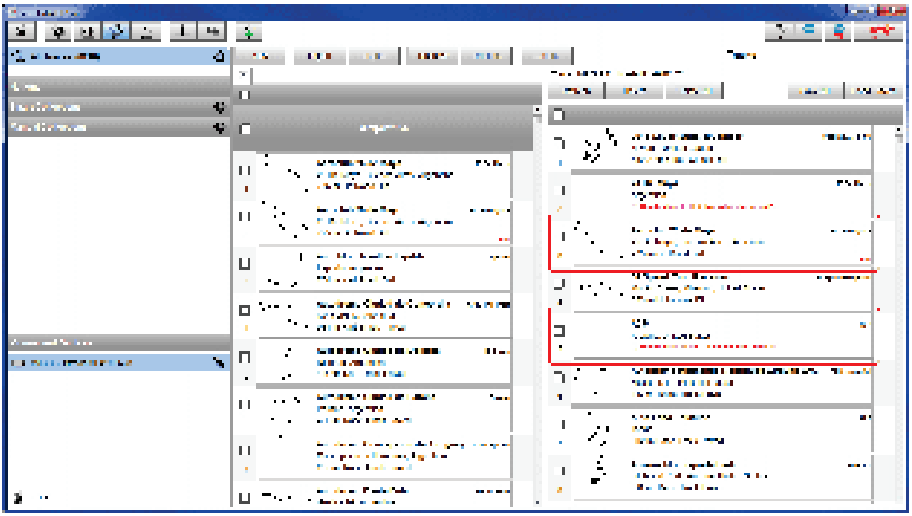
- on top a fast search bar, that allows to select the tracks which satisfy your personal research criteria; pressing "?" a pop-up message explains research criteria (highlighted in red below), to say:
    - long name is the name in bold in each track box
    - short name is the track name shown on the display of MX Strada series and is the name shown top right of each track box
    - track city is the name of the city the track is located in
- all the tracks listed in Race Studio 3 database. It automatically updates at start up if a connection to the Internet is available.

The column on the **Right** shows:

- the datasheet of the track you are mousing over.



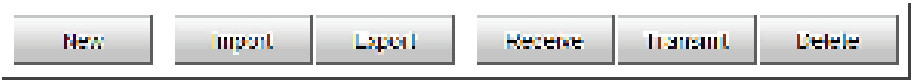
When MX Strada series is connected it is shown on the left bottom part of the page as said before. Clicking on it all the tracks it contains are shown in the right column of the page.



Tracks created by the user are labelled “User” and if the track stored in MX Strada series dash is different from the one stored on AiM database this is notified as shown here above.

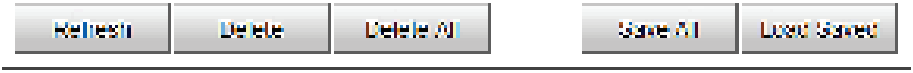
The page keyboards are used to manage the tracks.

The keyboard above the central column allows to:



- **New**: create a new track
- **Import**: import one or more tracks stored in the device or in another external device
- **Export**: export one or more tracks to a specific PC folder or to another peripheral device
- **Receive:** receive from the connected device the tracks user created (if no device is connected the button is disabled)
- **Transmit:** transmit one or more tracks from the PC to the connected device (if no device is connected the button is disabled)
- **Delete:** delete one or more tracks from Race Studio 3 database

The keyboard you find above the right column allows to:



- **Refresh**: refresh the track list stored in the connected device
- **Delete**: delete one or more tracks from the device memory
- **Delete All**: delete all tracks stored in the device memory
- **Save all**: save all the tracks stored in the device; it creates a zip file that can be loaded to another AiM device
- **Load Saved**: load the tracks previously saved in the device memory

Since the software is constantly updated, may be other information or features will be available soon. Please check our website www.aim-sportline.com, documentation area, software/firmware section "Track Manager" manual.

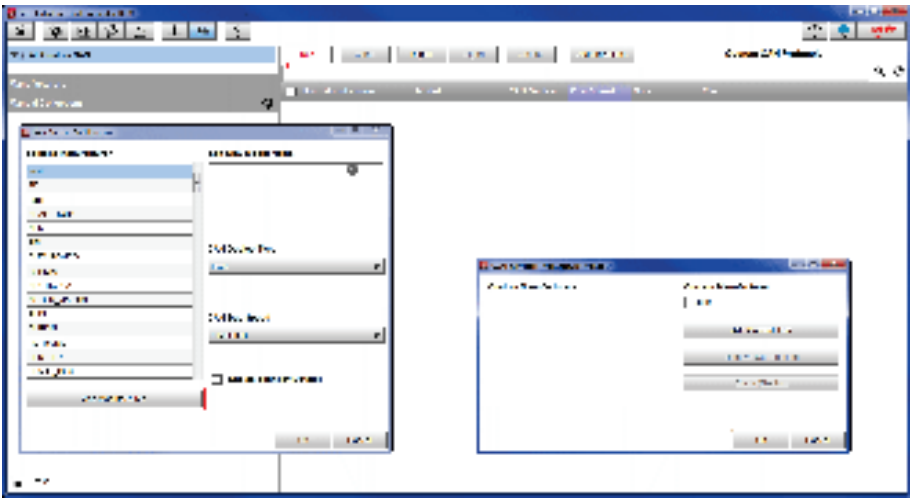
5.4 – ECU Driver builder

If the vehicle ECU is not included in Race Studio 3 software a specific CAN protocol can be created using CAN Driver builder.

Please note: this Race Studio function is for expert users only.

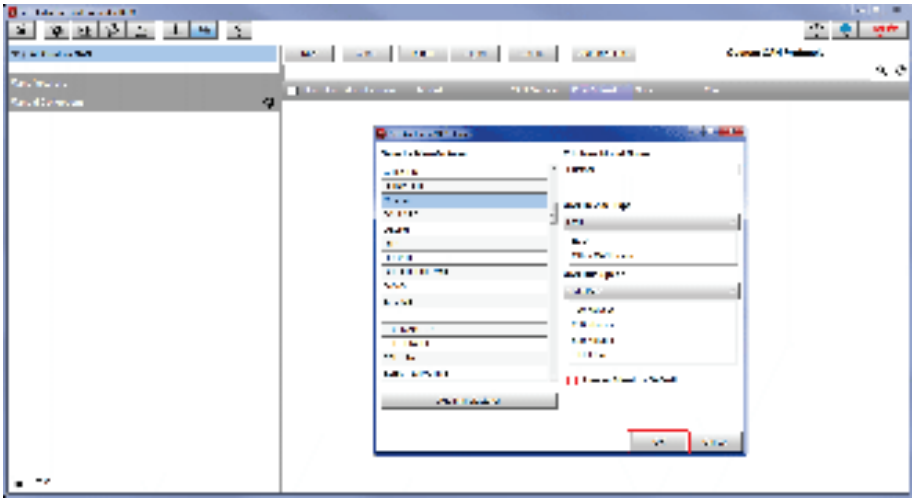
It is possible to add a new ECU Manufacturer and/or a new ECU model. To do so:

- press "New" on the top central keyboard
- "New Custom CAN Protocol" panel shows up
- press "Add Manufacturer" to add a new Manufacturer and "Custom Protocol Manufacturer Manager" panel shows up
- Fill in the Manufacturer name ("Custom" in the example below)
- press "OK"
- to add a new ECU Model for an existing Manufacturer just select the manufacturer and fill in "Edit new model name" box.



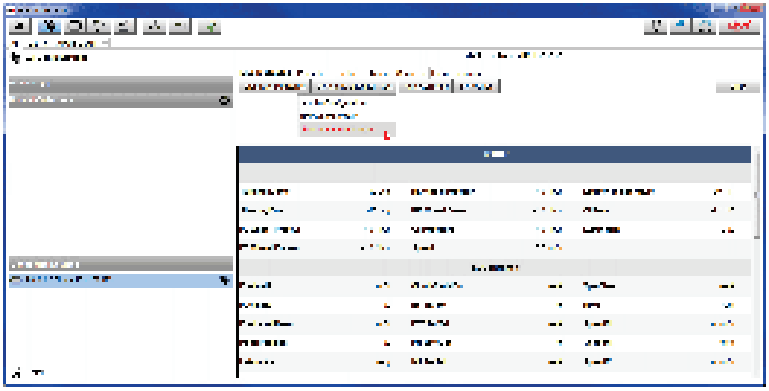
The software comes back to “New Custom CAN Protocol”:

- select the ECU Manufacturer previously created
- fill in the Model name in the panel top right box
- select the CAN Device type; available options are:
  - ECU
  - other CAN Devices
- select the CAN Bus speed; available options are:
  - 125 Kbit/sec
  - 250 Kbits/sec
  - 500 Kbit/sec
  - 1 Mbit/sec
- if the network features multiple devices we suggest to enable “Use as Silent by Default” checkbox
- Press “OK” and a new CAN Driver has been added



For further information about how to set the new CAN Driver refer to the CAN Driver builder user manual downloadable from www.aim-sportline.com, documentation area software/firmware section.

5.5 – The device window



The device window is shown clicking the device bottom left of the software page. Here are:

- **Live Measures**: to check all device channels and force online values to:
    - start live measures
    - sort the channel visualization as preferred: as managed by the firmware (sort by configuration), alphabetically, by channel type (they will be shown by device, channel type and measure type)
    - calibrate sensors that need the calibration
    - show the measure in Mv
- **Properties**: to name the device, fill in racer's and vehicle name or number, championship and venue type (generic or qualifying testing, warm up, race, test type)
- **Settings** to:
    - set date
    - enable/disable daylight time
    - set time format and time zone
- **Tracks**: to manage the tracks stored in the device memory
- **Counters**: to set/reset the device odometers
- **Logo**: transmit/receive the logo that shows up when switching the device on; supported image format are JPEG or BMP; always use the most recent Windows™ versions (Windows8 or Windows10) whose graphic libraries are more updated
- **Firmware**: to check or update MX Strada series firmware version.

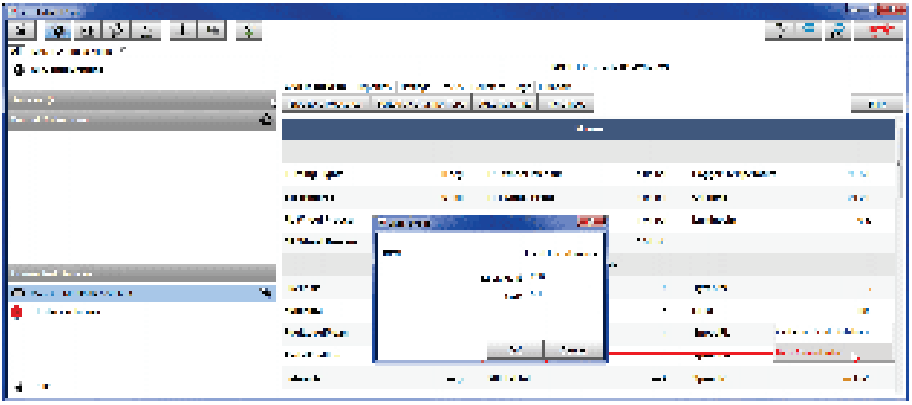
5.5.1 – Live measures layer

Once the configuration has been transmitted “Live Measures” page shows ECU Channels too and some operations can be performed, like start recording and stop live measures as well as making the device blinking pressing the button top right of the page. This last operation is the easiest and quickest way to test PC-Device communication.

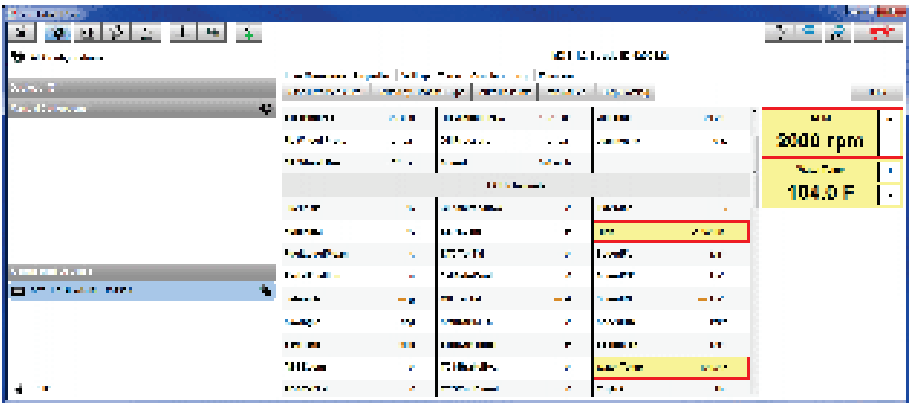
5.5.2 – Online value forcing

Starting from Race Studio 3.24.02 Device page Live measures layer features a new and very useful option: online measure value forcing. This feature allows the user to simulate one or more channels value to test icons, alarms, power output and harnesses behaviour.
With reference to the configuration we created it is possible to verify if Water Alarm status variable works.
The set conditions (paragraph 5.2.6) are: water Temperature greater than 100 +RPM greater than 2000. To force these values:

- mouse over the value to force and click the setting icon
- a popup menu appears: select "Force Value" option and fill in the following panel
- click "OK" and the LED blinks continuously as set in the device configuration



As shown in the image below, once the values have been forced they are shown right of the page hedged in red. With the two "+" and "-" lateral buttons it is possible to change the forced values.



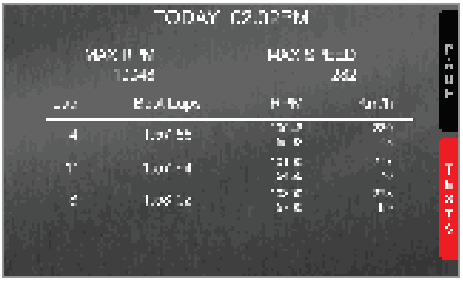
6 – On the track

MX Strada series can show up to eight pages. To scroll them press ">>" lateral button. Pages can change according to the device configuration.

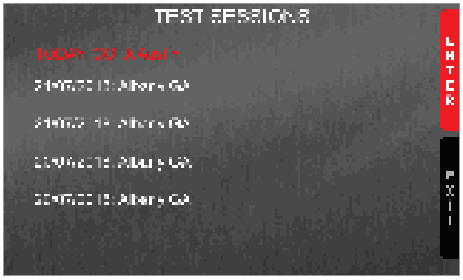
7 – Data recall

At the end of the test sampled data can be recalled pressing "MEM/OK".

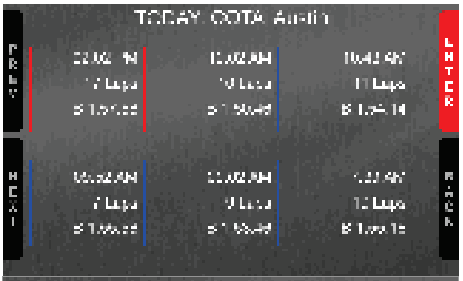
First is "Today" page.
Press "TESTS"



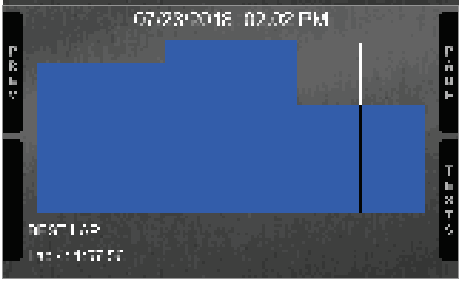
Second is "Summary" page that shows all the last tests with date and place. Select the day to see and press "ENTER".



Third is “Summary” page that shows all tests in a box with time of the test, number of laps and best lap of the test.
Select the test to see and press “ENTER”.



This page is a histogram test summary. Moving the cursor left and right all laps and their lap time are shown.

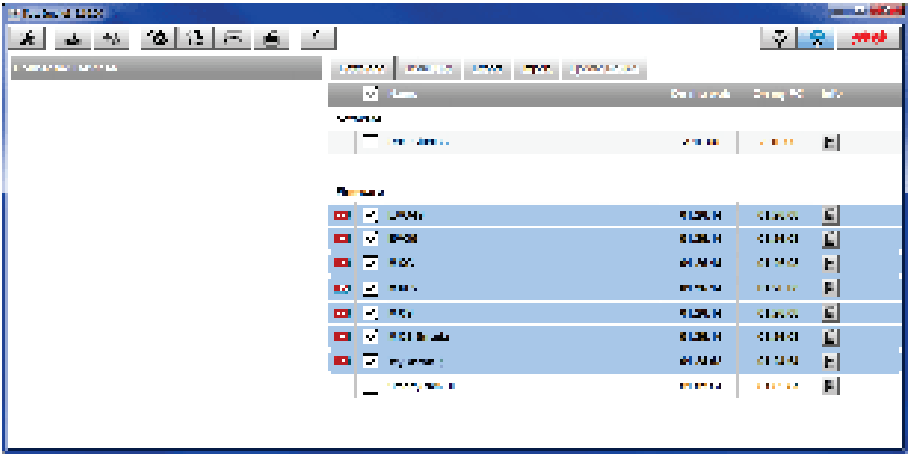


8 – New firmware upgrade

Our technicians and engineers are constantly working to improve both the firmware (the application that manages your device) and the software (the application installed on the PC).

Each time a new firmware and/or software version is available the icon here above appears with an arrow indicating that something is available for download (otherwise the icon only shows the cloud).

Click it and freely download the new applications.



Once the new firmware has been downloaded connect your device to the PC using the USB cable included in the kit to perform a firmware upgrade. In a few seconds the device is ready.

9 – RPM

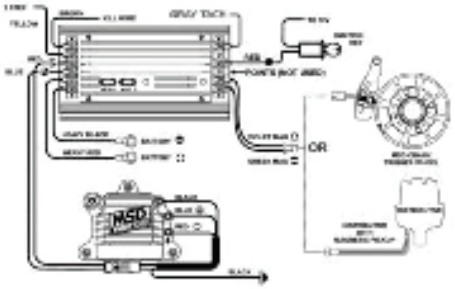
MX Strada series dash can receive RPM value from the ECU. If on the contrary the vehicle does not have an ECU RPM can be sampled using the wire labelled "RPM" (corresponding to pin 21 of MX Strada series 23 pins connector).

9.1 – RPM from ECU

To get the RPM from the ECU just connect MX Strada series dash to the ECU and it will automatically sample that value.
Please note: if your vehicle ECU can be reached through an OBDII plug, a dedicated harness for MX Strada series AMP 14 pins connector is available, as shown at the end of this user guide.

9.2 – RPM via a 5-50V square wave or coil (150-400V)

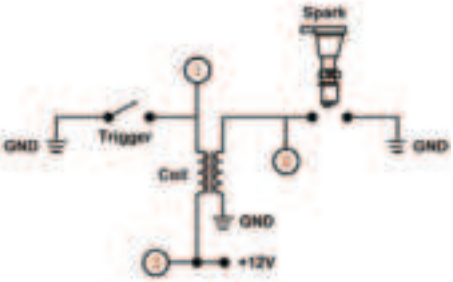
If the vehicle has no ECU connect the wire labelled "RPM" (corresponding to pin 21) of the device 23 pins connector harness to the ignition system. This way MX Strada series can read the signal from the low voltage of the coil (whose peak can be from 150 to 400 V) or from a possible square wave (the peak can be from 5 to 50 V).
The image below shows an example of wiring of the ignition system.



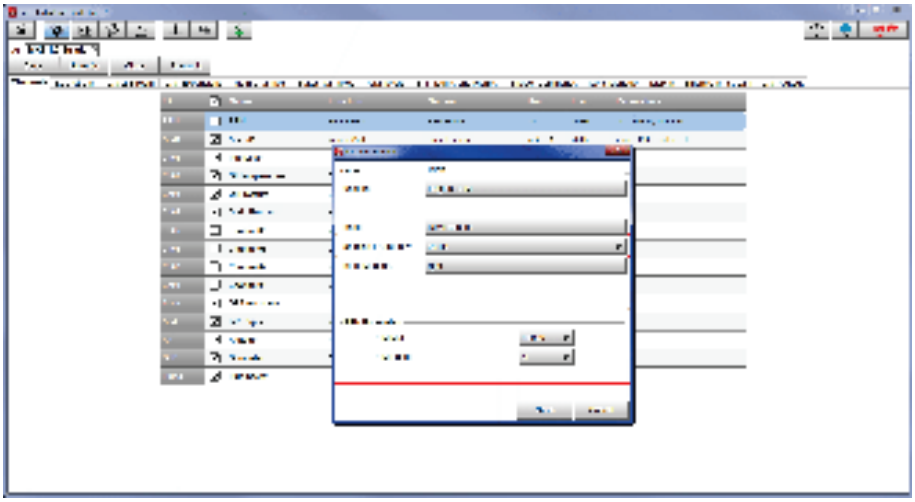
The output labelled "GRAY TACH" gives a 5-50V output that can be directly sampled by MX Strada series dash.

In case the vehicle ignition system has no output MX Strada series dash should be connected to the low voltage of the coil as shown in the following images.

Point 1: low voltage of the coil
Point 2: connected to the spark plug
Point 3: connected to the +12V of the battery



Once MX Strada series connected to RPM signal enable it and set its parameters in channels page of Race Studio 3 as explained in “Channels configuration” paragraph.



10 – Connection with the expansions

MX Strada series can be connected to AiM GPS08 Module, LCU-One CAN, Channel expansion, TC Hub, SmartyCam HD and SmartyCam GP HD in order to improve its functionality.

Please note that LCU-one, Channel expansion TC HUB and Smartycam HD have to be configured with Race Studio 3 software as already explained in the related paragraphs ("CAN Expansions configuration", "Channels configuration" and "SmartyCam stream setting").

Moreover, for further information concerning AiM expansions and AiM SmartCam HD refer to the related manuals.

10.1 – Rear cameras connection and management

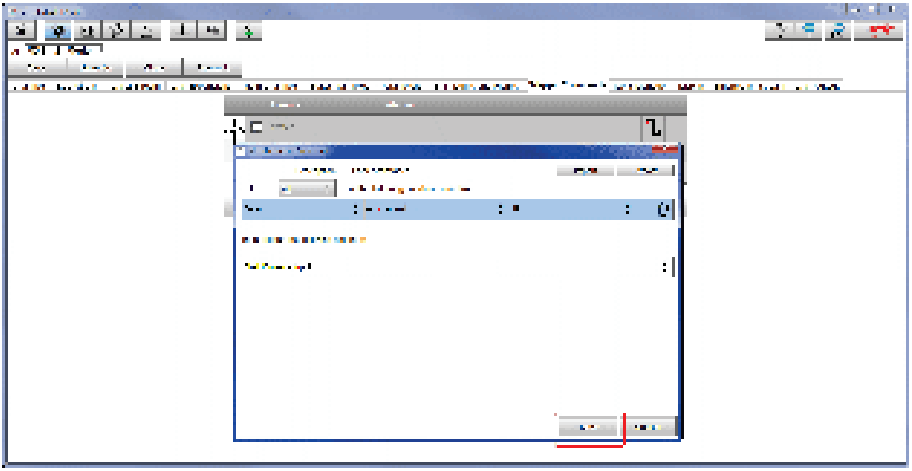
MX Strada Series dashes can manage rear cameras through the 5 pins Binder 712 female connector labelled "VIDEO IN" and placed rear central as shown here below. Please see the dash pinout reported in chapter 11 (Technical specifications and drawings) for further information about the Binder pinout.
The connector allows the connection of up to two analog cameras.

Rear cameras needs to be connected to the logger, set in the logger configuration through Race Studio 3 software and executed through the logger keyboard. Here follows explanation of how to perform all these operations.

A wide number of analog cameras, both PAL and NTSC, are compatible with MX Strada series dashes and patch cables for connecting most of them are available. Please refer to our website www.aim-sportline.com for more information about them.
Please note: rear camera dimensions and MX Strada series camera input pinout are shown in chapter 11.

Once "Gear" channel set it is necessary to create a new "Trigger command". To do so:

- press "Add new command"
- fill in the panel that shows up, in the example
    - Description: park assistance
    - channel "Gear equal to R"
    - trigger the command "First camera input"



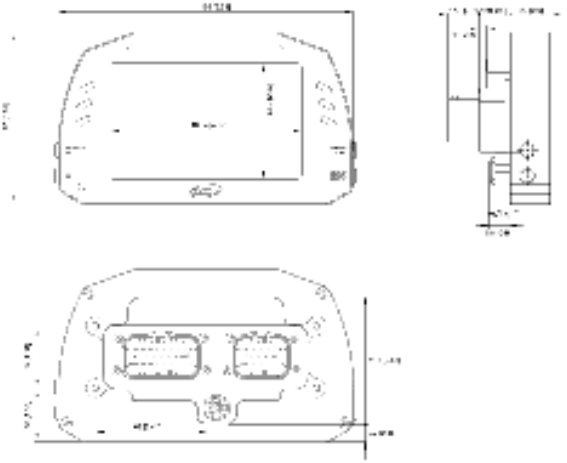
To perform the command on the dash press “MENU” button and scroll up to “VIDEO IN”.

Set the camera as explained in paragraph 4.3. If no key is pressed in 5 seconds, the menu disappears and the dash shows the camera image in live streaming, that is very useful to check the camera position. Images below shows the image of the camera set on the left and the live stream on the right.

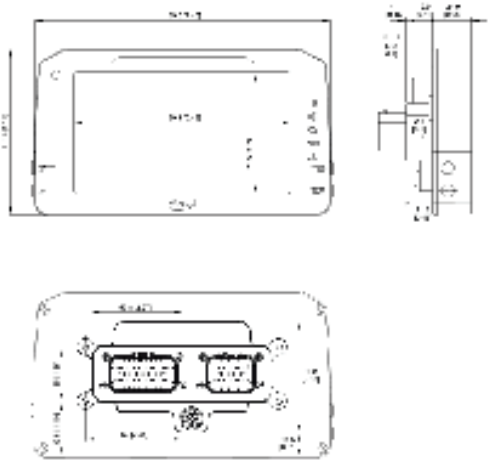
11 – Technical specifications and drawings

• TFT Display dimensions	5" (MXS 1.2 Strada), 6" (MXP Strada) 7" (MXG 1.2 Strada)
• Display resolution	800x480 pixels
• Contrast	600:1 (MXP Strada, MXS 1.2 Strada), 1000:1 (MXG 1.2 Strada)
• Brightness	700cd/m^2 – 1,100 Lumen
• Ambient light sensor	Yes
• Alarm Display Icons	Yes, freely configurable
• Alarm RGB LEDs	6 (MXS 1.2 Strada), 5 (MXP Strada), 8 (MXG 1.2 Strada), configurable
• Shift lights	10 configurable RGB LEDs
• Display pages	Up to 8 freely configurable
• CAN connections	2
• Second CAN	Yes
• ECU Connection	CAN, RS232, K-Line to 1.000+leading ECUs
• External Modules	GPS Module, Channel Expansion, TC Hub, Lambda Controller, SmartyCam HD
• Analog inputs	8 fully configurable, max 1.000 Hz each
• Digital inputs	1 Speed input, coil RPM input
• Digital outputs	1 (1A each)
• Backlight	Yes
• Pushbuttons	Metallic
• Connectors	2 AMP connectors + 1 Binder connector
• Body	Anodized Aluminium
• Weight	480g (MXS 1.2 Strada), 640g (MXP Strada), 950g (MXG 1.2 Strada)
• Dimensions	169.4x97x23mm (MXS 1.2 Strada), 189.6x106.4x24.9mm (MXP Strada), 237X127.6X26mm (MXG 1.2 Strada)
• Waterproof	IP65

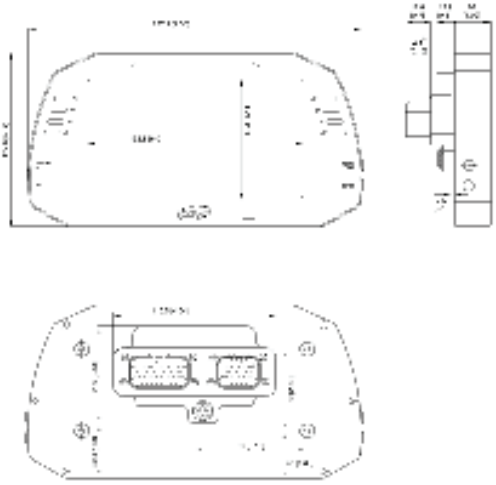
MXS 1.2 Strada dimensions in mm [inches]



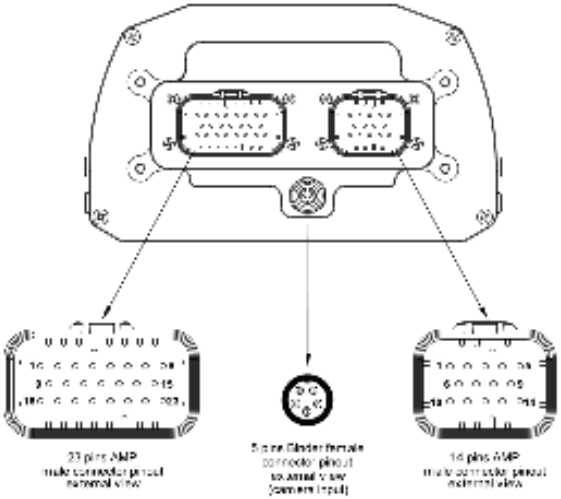
MXP Strada dimensions in mm [inches]



MXG 1.2 Strada dimensions in mm [inches]



MX Strada Series pinout

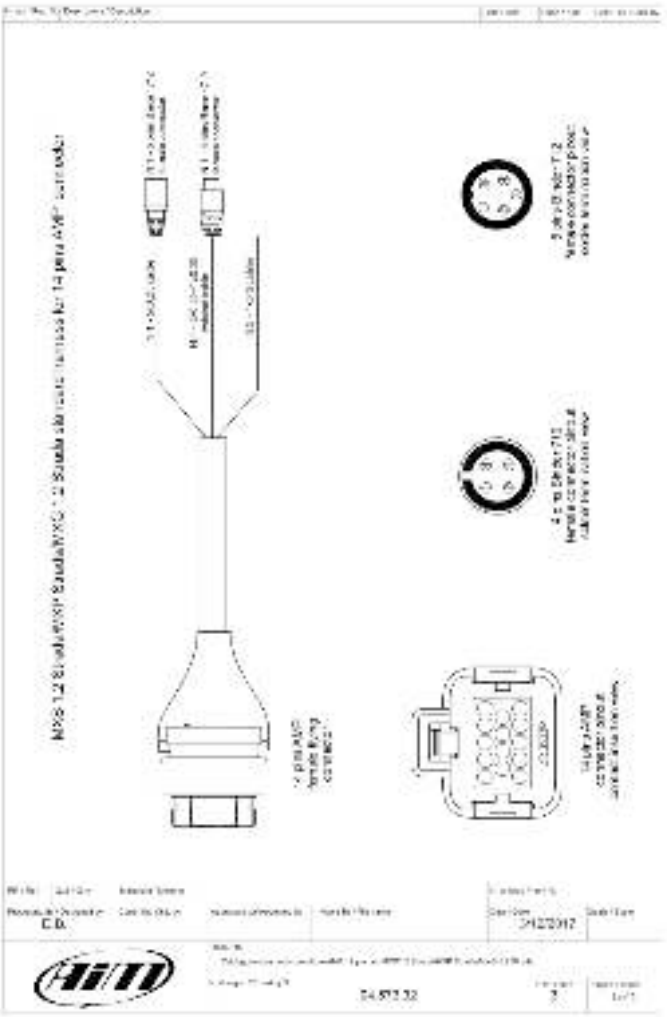


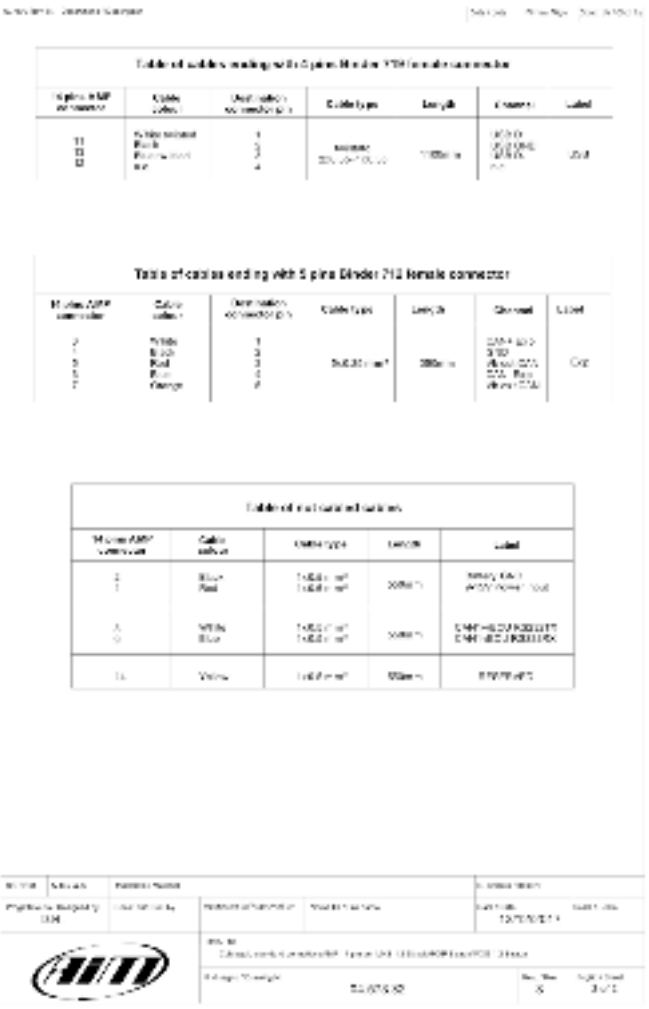
Pin	Function
1	Analog input 1
2	Analog GND
3	+Vb output
4	-Vreference
5	Analog input 2
6	Analog input 3
7	Analog GND
8	+Vb output
9	-Vreference
10	Analog input 4
11	Analog input 5
12	Analog GND
13	-Vreference
14	Analog input 6
15	Analog input 7
16	-Vreference
17	Analog input 8
18	Speed input
19	GND
20	Low Side output
21	RPM input
22	CAN 2+
23	CAN 2-

Pin	Function
1	Video input 1
2	GND
3	+Vb output camera
4	GND
5	Video input 2

Pin	Function
1	5-15v Power input
2	Battery GND
3	CAN+ Exp
4	GND
5	+Vb out CAN
6	CAN- Exp
7	+Vb Ext CAN
8	CAN1+/ECU RS232TX
9	CAN1-/ECU RS232RX
10	K Line ECU
11	USB D+
12	USB D-
13	USB GND
14	Reserved

MX Strada series 14 pins AMP connector harness – standard version





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MX Strada series 23 pins AMP connector harness – standard version

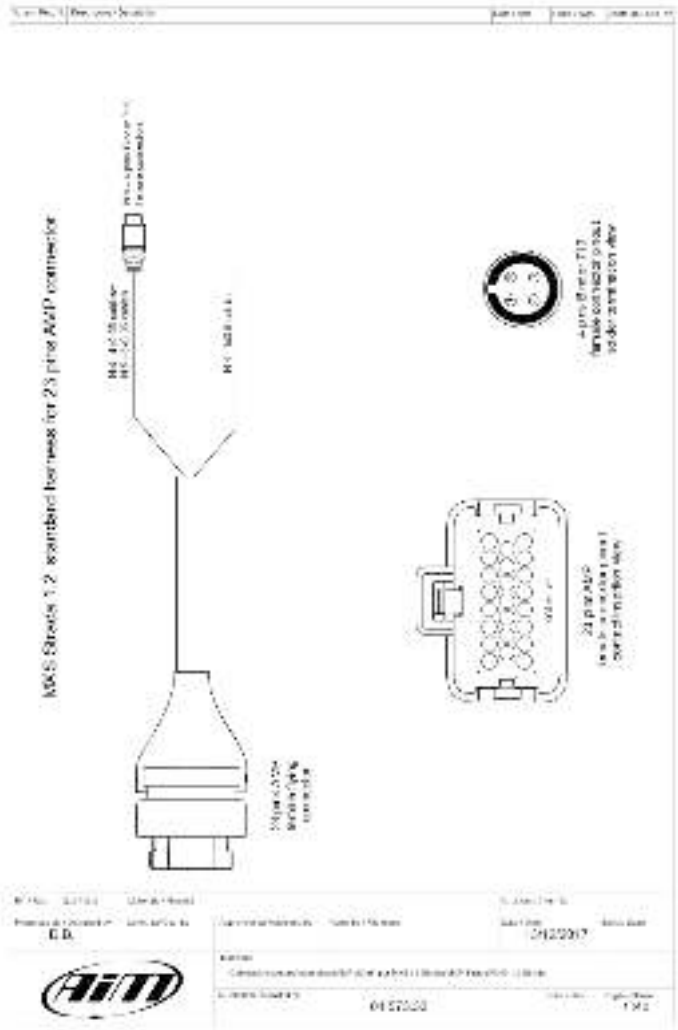


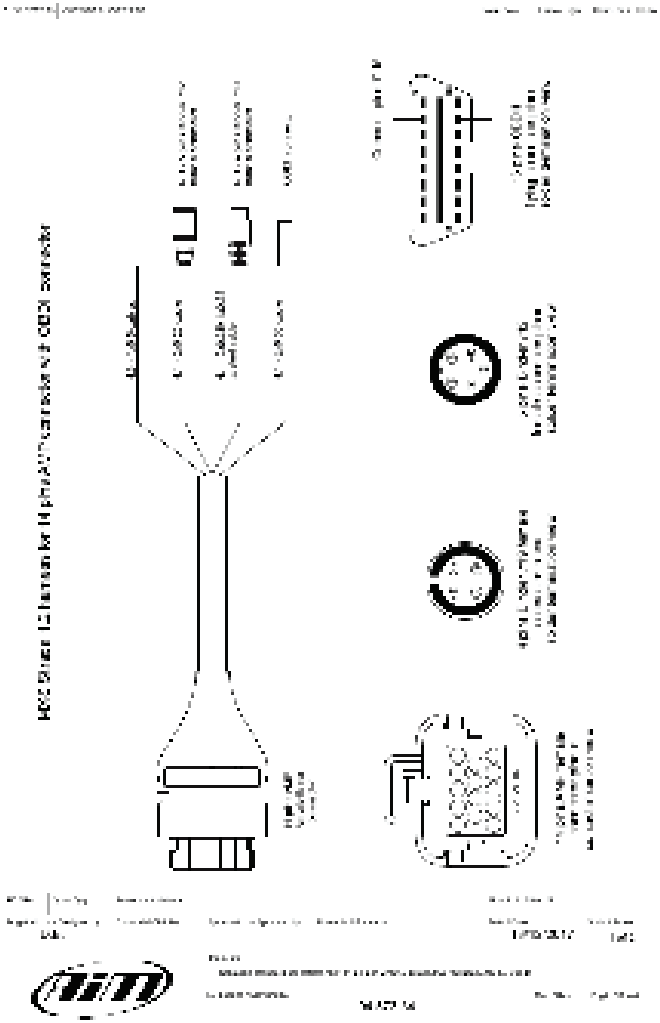
Table of cables ending with 4 pins Binder 719 female connectors

23 pins AMP Connector pin	Cable colour	Destination connector pin	Cable type	Length	Channel	Label
1 2 3 4	White Black Red Blue	1 2 3 4	4x0.35mm²	340mm	+Analog channel 1 Analog GND +Vb output +Vreference	Channel 1
5 6 7 8	White Black Red Blue	1 2 3 4	4x0.35mm²	340mm	+Analog channel 2 Analog GND +Vb output +Vreference	Channel 2
6 7 8 9	White Black Red Blue	1 2 3 4	4x0.35mm²	360mm	+Analog channel 3 Analog GND +Vb output +Vreference	Channel 3
10 7 8 9	White Black Red Blue	1 2 3 4	4x0.35mm²	360mm	+Analog channel 4 Analog GND +Vb output +Vreference	Channel 4
11 7 nc 13	White Black Red Blue	1 2 3 4	3x0.35mm²	360mm	+Analog channel 5 Analog GND nc +Vreference	Channel 5
14 12 nc 13	White Black Red Blue	1 2 3 4	3x0.35mm²	360mm	+Analog channel 6 Analog GND nc +Vreference	Channel 6
15 12 nc 16	White Black Red Blue	1 2 3 4	3x0.35mm²	400mm	+Analog channel 7 Analog GND nc +Vreference	Channel 7
17 12 nc 19	White Black Red Blue	1 2 3 4	3x0.35mm²	400mm	+Analog channel 8 Analog GND nc +Vreference	Channel 8
18 19 3	White Black Red Blue	1 2 3 4	3x0.35mm²	320mm	Speed GND +Vreference nc	Speed

Table of not cabled cables

23 pins AMP connector pin	Cable colour	Cable type	Length	Label
20 21 22 23	Red White White Blue	1x0.5 mm² 1x0.5 mm² 1x0.5 mm² 1x0.5 mm²	550mm	Low Side digital output RPM input CAN2+ CAN2-

MX Strada series 14 pins AMP connector harness with OBDII connector



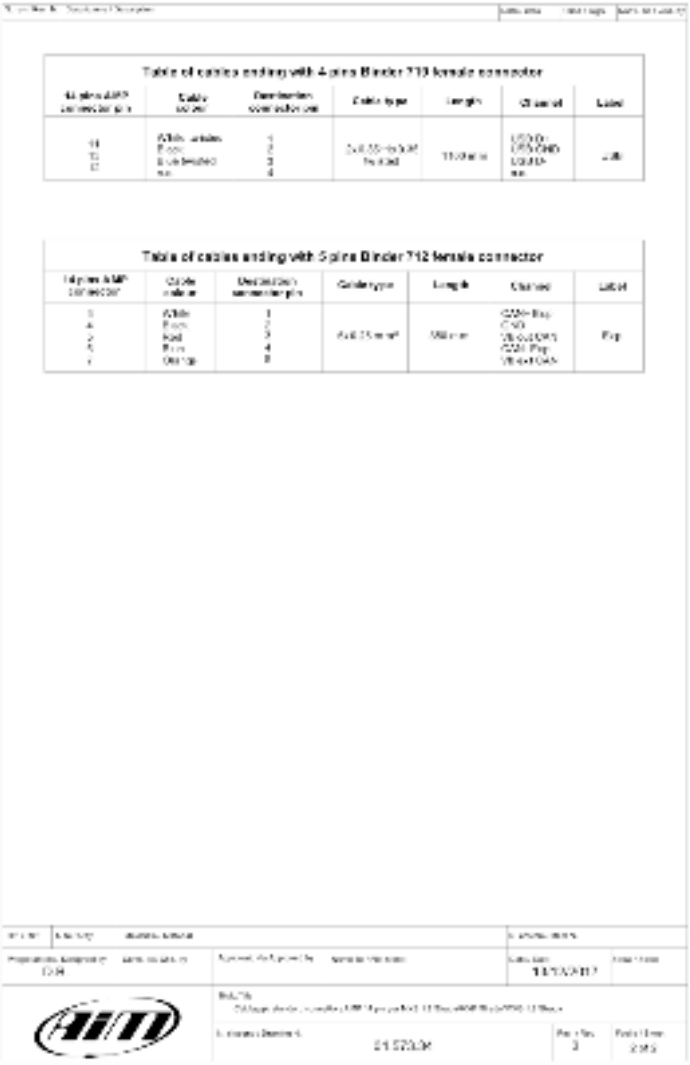


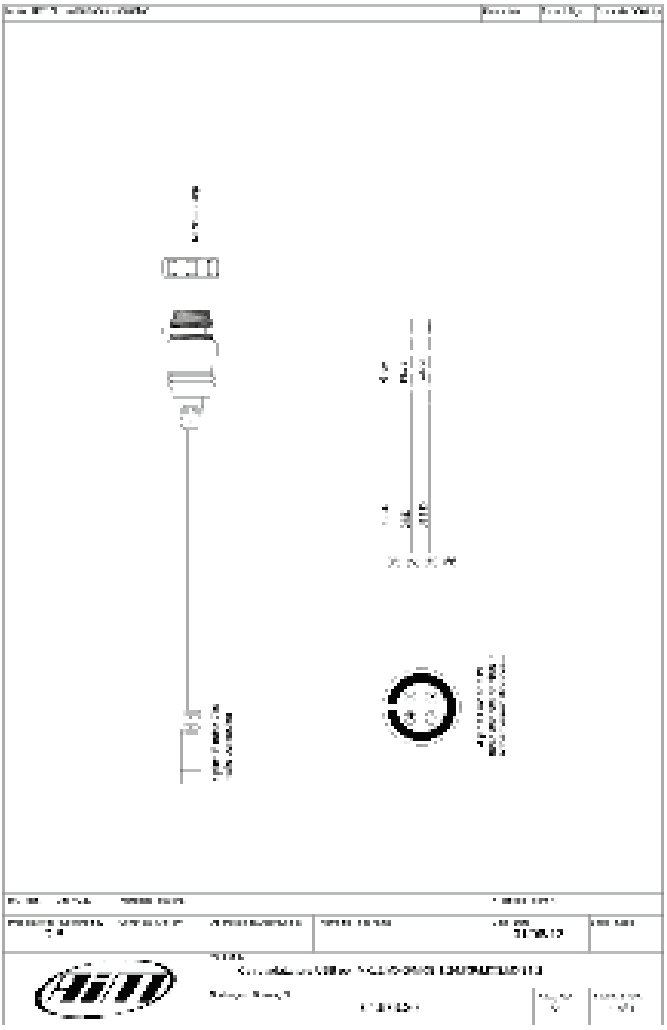
Table of cables ending with 4 pins Binder 719 female connector

14 pins AMP connector pin	Cable colour	Destination connector pin	Cable type	Length	Channel	Label
11 12 13	White, white Black Blue/bleached no	1 2 3 4	[illegible] Twisted	[illegible]	USB D+ USB GND USB D- no	[illegible]

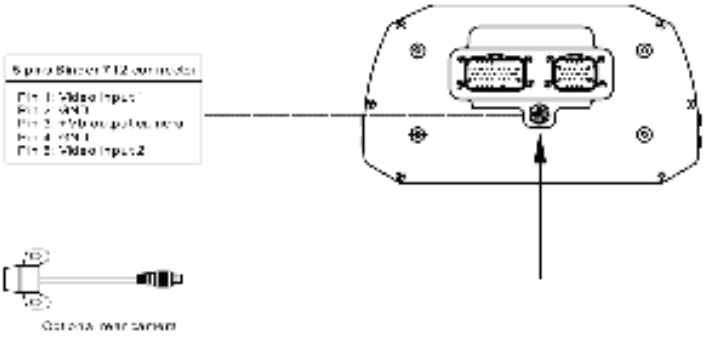
Table of cables ending with 5 pins Binder 712 female connector

14 pins AMP connector	Cable colour	Destination connector pin	Cable type	Length	Channel	Label
1 4 5 6 7	White Black Red Blue Orange	1 2 3 4 5	[illegible]	[illegible]	GAIN Exp GND Vbias GAIN GAIN Exp Vbias GAIN	Exp

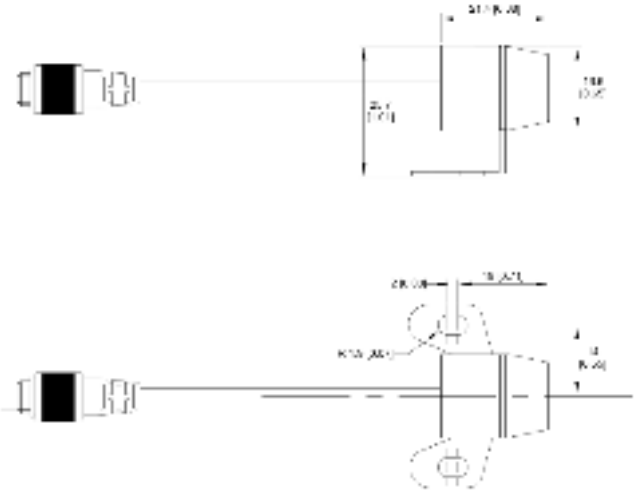
MX Strada Series USB Cable



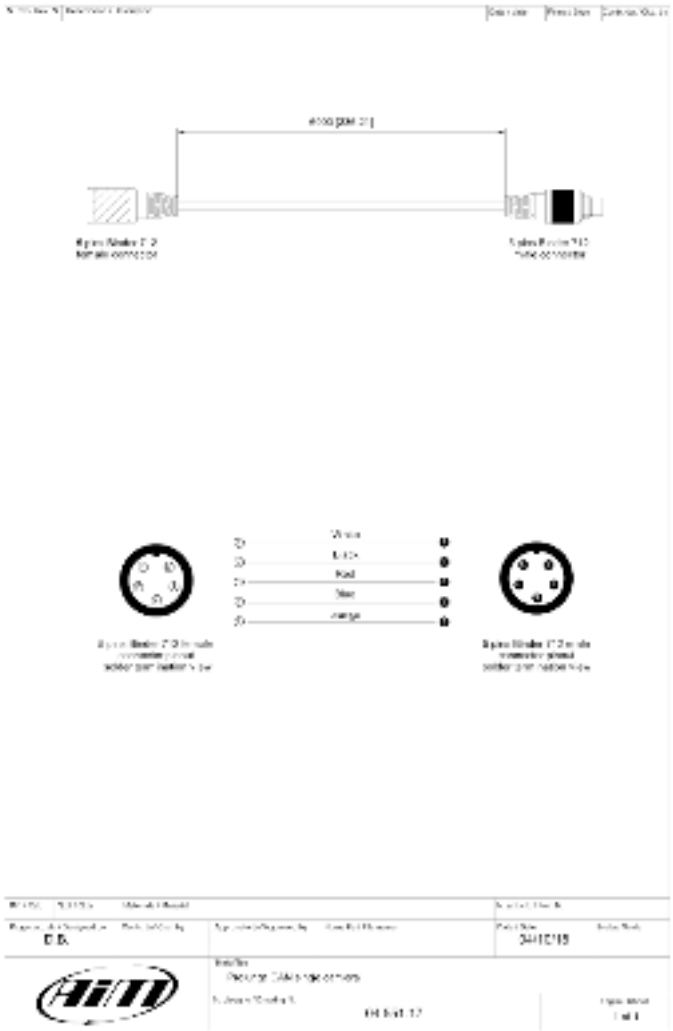
MX Strada series mirror camera input



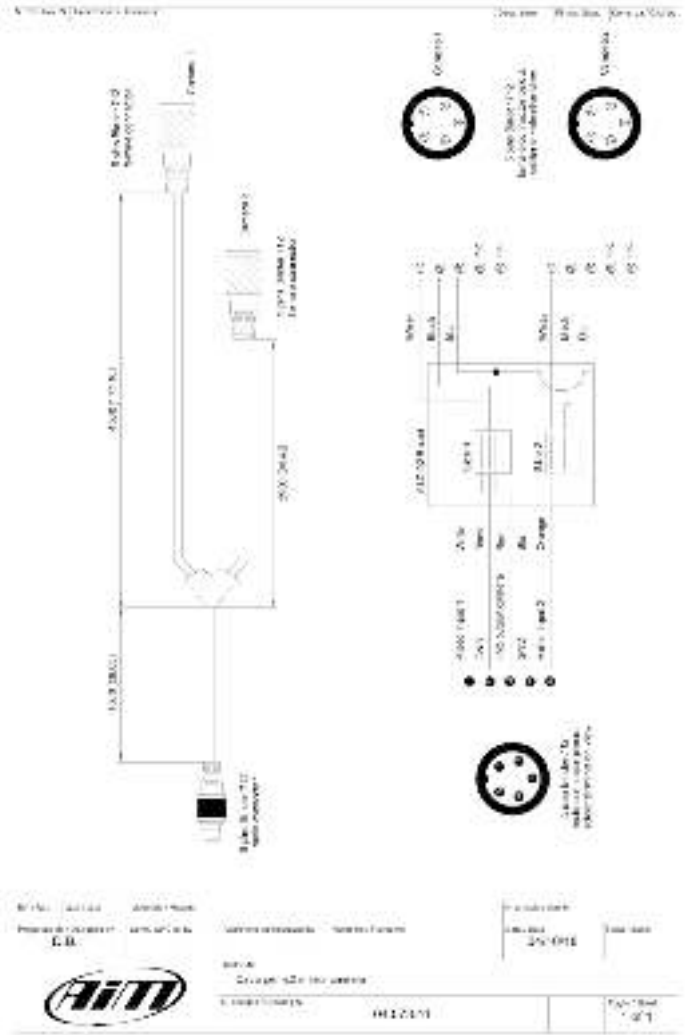
Mirror camera dimensions in mm [inches]



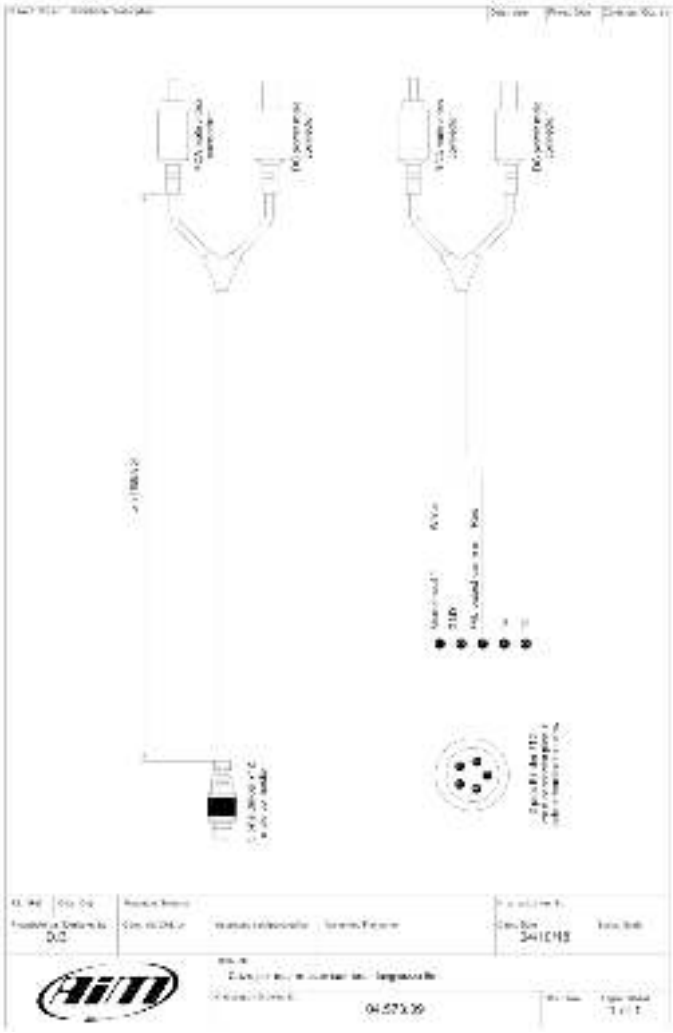
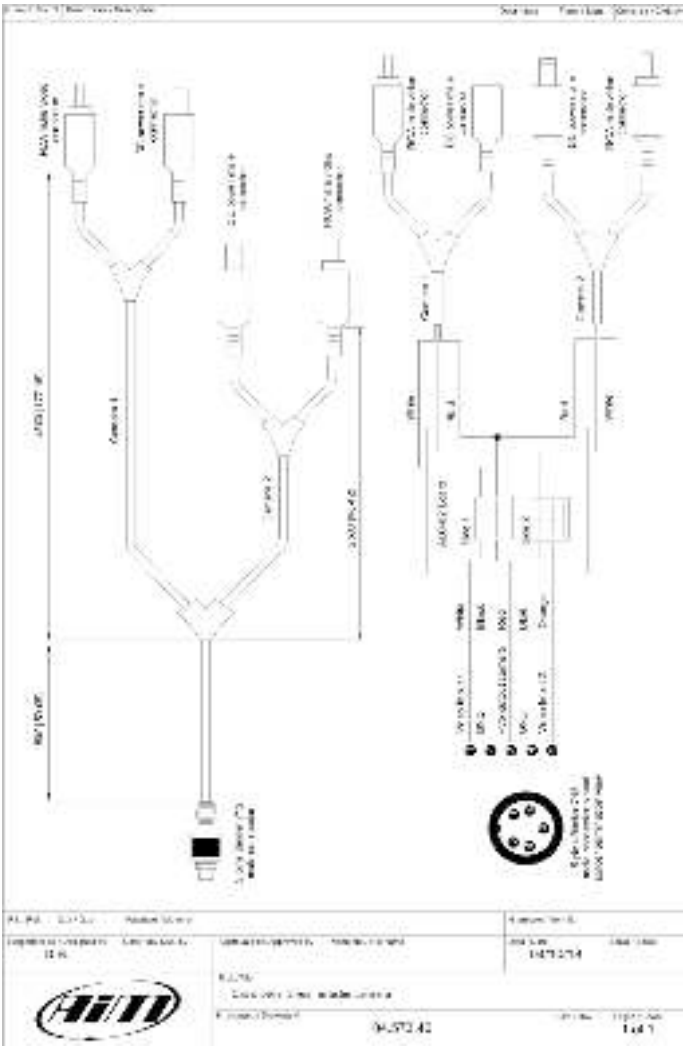
MX Strada series cable for single AiM mirror camera



MX Strada series cable for n.2 AiM mirror camera



MX Strada series cable for single non AiM rear camera



MX Strada series cable for n.2 non AiM rear cameras