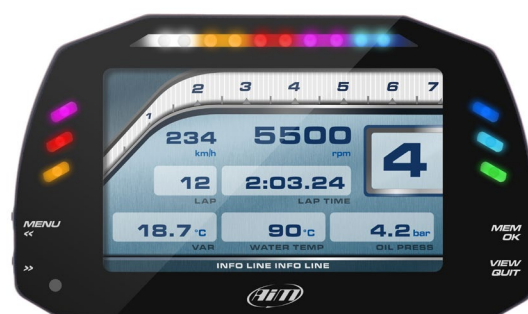


User Manual

MX 1.2 + 1.3 Strada series

Release 1.03





INDEX

1 – MX Strada series in a few words	3
2 – What is in the kit?	5
3 – Powering	6
4 – What you can do via keyboard	7
4.1 – Set Date/Time	8
4.2 – Set backlight	8
4.3 – Set Video input	9
4.4 – Counters management	9
4.5 – GPS & Tracks management	10
4.6 – System Information	10
5 – MX Strada series and the PC	11
5.1 – Connection to the PC	11
5.2 – Configuration of MX Strada series	11
5.2.1 – Channels configuration	12
5.2.2 – ECU Connection and configuration	16
5.2.3 – CAN2 Stream configuration	18
5.2.4 – CAN Expansions configuration	19
Setting LCU-One CAN	20
Setting Channel Expansion	21
Setting TC Hub.	22
Setting RIO_2a.	23
Setting Shift Lights Module.	25
Setting Steering Wheel 3 or GS Dash	26
5.2.5 – Math channels configuration	29
5.2.6 – Status variables configuration	30
5.2.7 – Parameters configuration	31
5.2.8 – Shift Lights and Alarms configuration	32
5.2.9 – Trigger commands configuration	37
5.2.10 – Icons manager configuration	40
5.2.11 – Display configuration	41
5.2.12 – SmartyCam stream setting	43
5.2.13 – CAN Output configuration	43
5.2.14 – Transmitting the configuration to MX1.3 loggers	45
5.3 – Managing a track on MX Strada with Race Studio 3	46
5.4 – ECU Driver builder	48
5.5 – The device window	50
5.5.1 – Live measures layer	50
5.5.2 – Online value forcing	51
6 – On the track	52
7 – Data recall	52
8 – New firmware upgrade	53
9 – RPM	54
9.1 – RPM from ECU	54
9.2 – RPM via a 5-50V square wave or coil (150-400V)	54
10 – Connection with the expansions	56
10.1 – Rear cameras connection and management	56
11 – Technical specifications and drawings	59



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 (necessary to connect thermocouple sensors) 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.



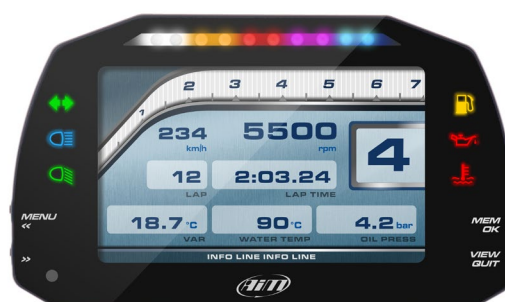
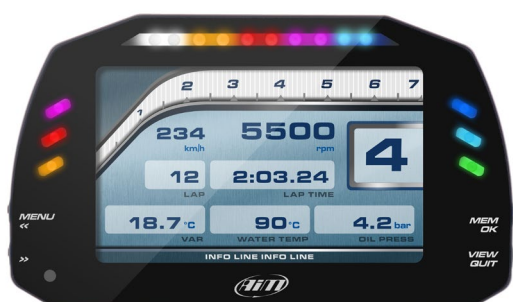
The table below shows the differences among the dashes.

FEATURE	MXG 1.2+1.3 Strada	MXP + MXP 1.3 Strada	MXS 1.2+1.3 Strada
Display	7" TFT	6" TFT	5" TFT
Resolution	800*480 pixels		
Contrast	1000:1	600:1	
Brightness	700cd/m² - 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 (necessary to connect thermocouple sensors), Lambda Controller, SmartyCamHD		
Analog Inputs	8 fully configurable, max 500 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.

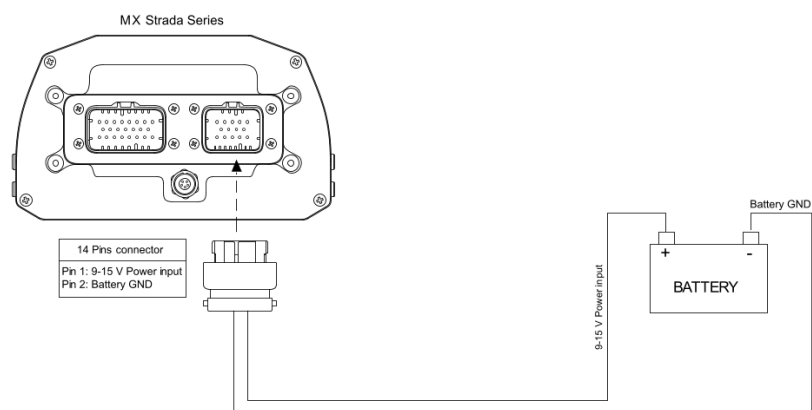


3 – Powering

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

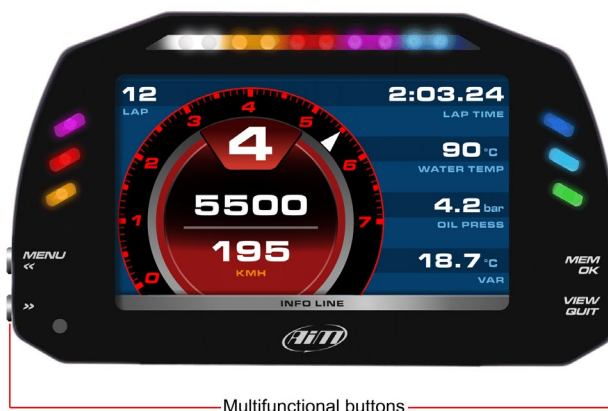
- Pin 1: Power (9-15 Volts)
- Pin 2: Ground

They must be connected as shown in the following diagram.

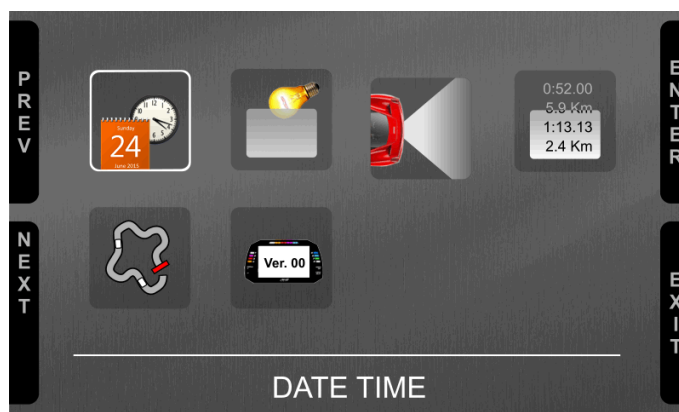


4 – What you can do via keyboard

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:



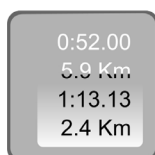
Date/Time



Backlight



Video in
(optional additional rear cameras)



Counters



GPS and Tracks



System Info



4.1 – Set Date/Time

Here you can:

- set time and date format
- synchronize date and time with the data supplied by the connected GPS; in this case if a near track is available and set the system will set date and time of that track; if on the contrary there is no synchronization date and time need to be set manually

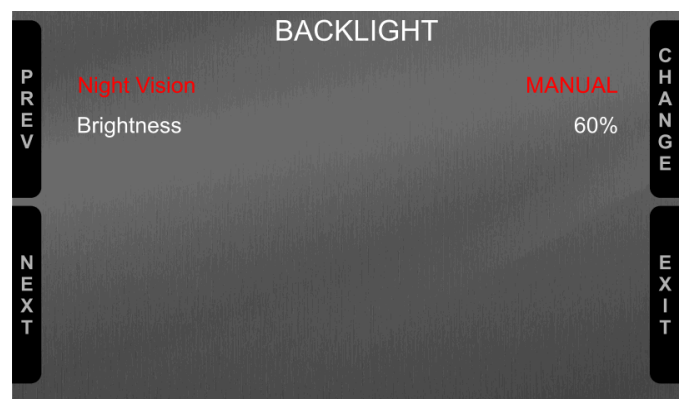
Bottom of the page current time and date are shown



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 GPS09 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.

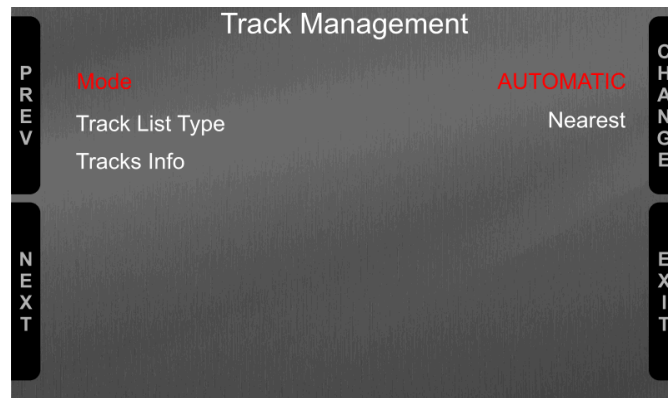
Manual:

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.

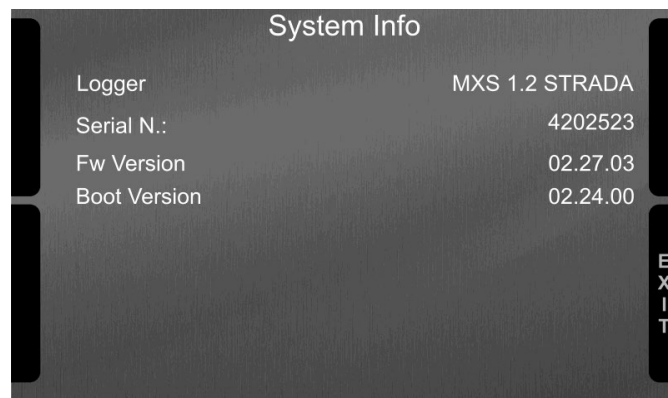
You can scroll the list of available tracks choosing among these options:

- 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.

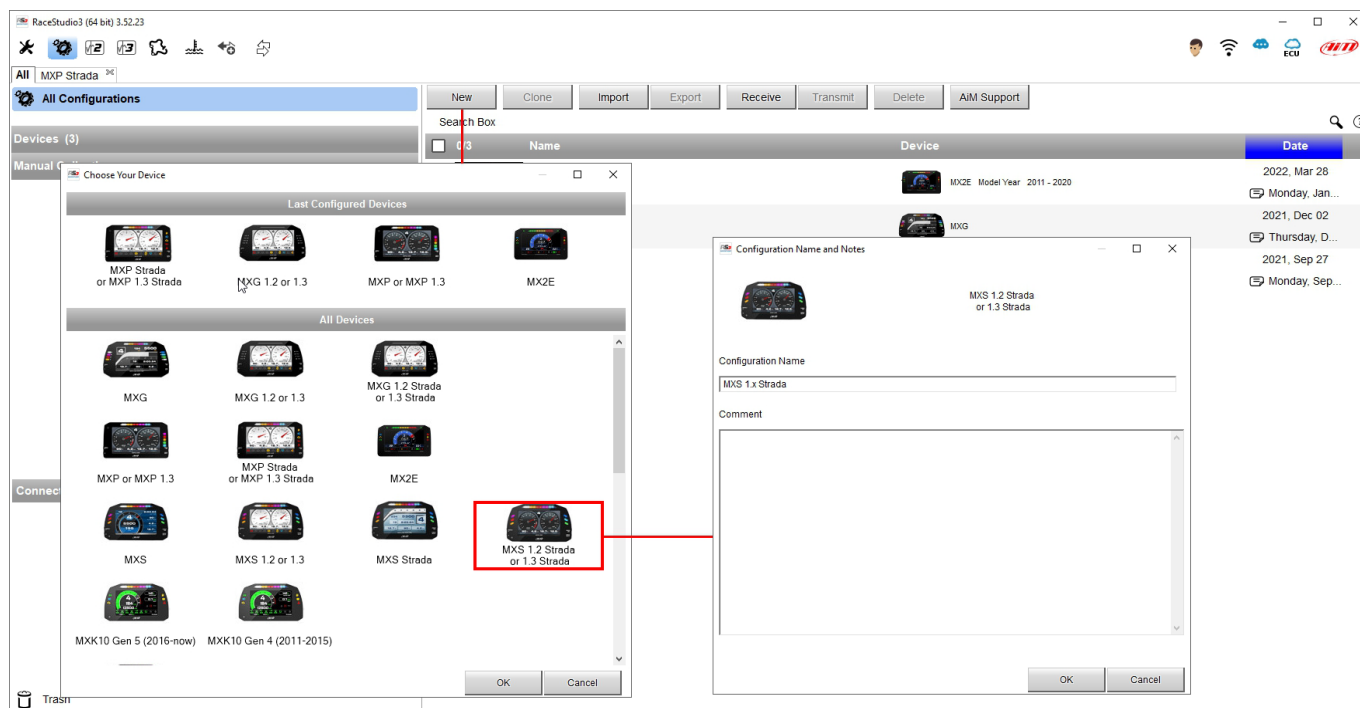
5.1 – Connection to the PC

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.



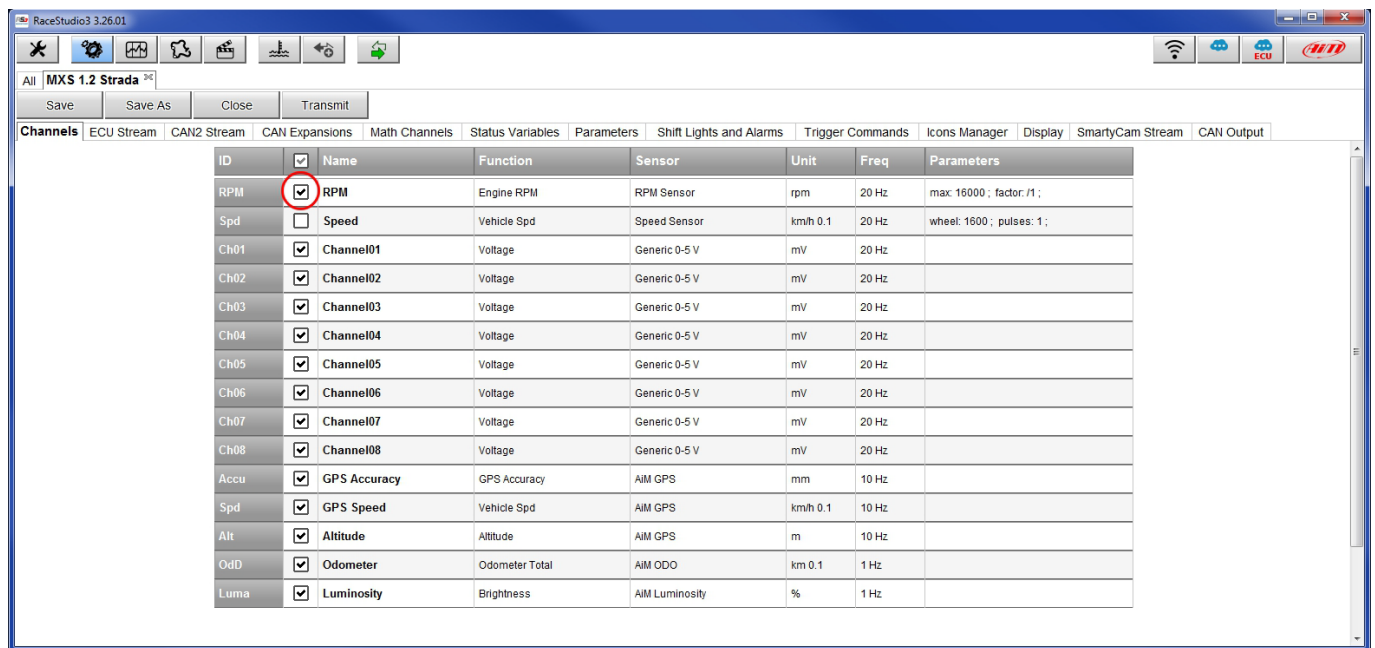
This is the list of the features you have to configure:

- 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, TC Hub necessary to connect thermocouples to MX 1.3 Strada, 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.

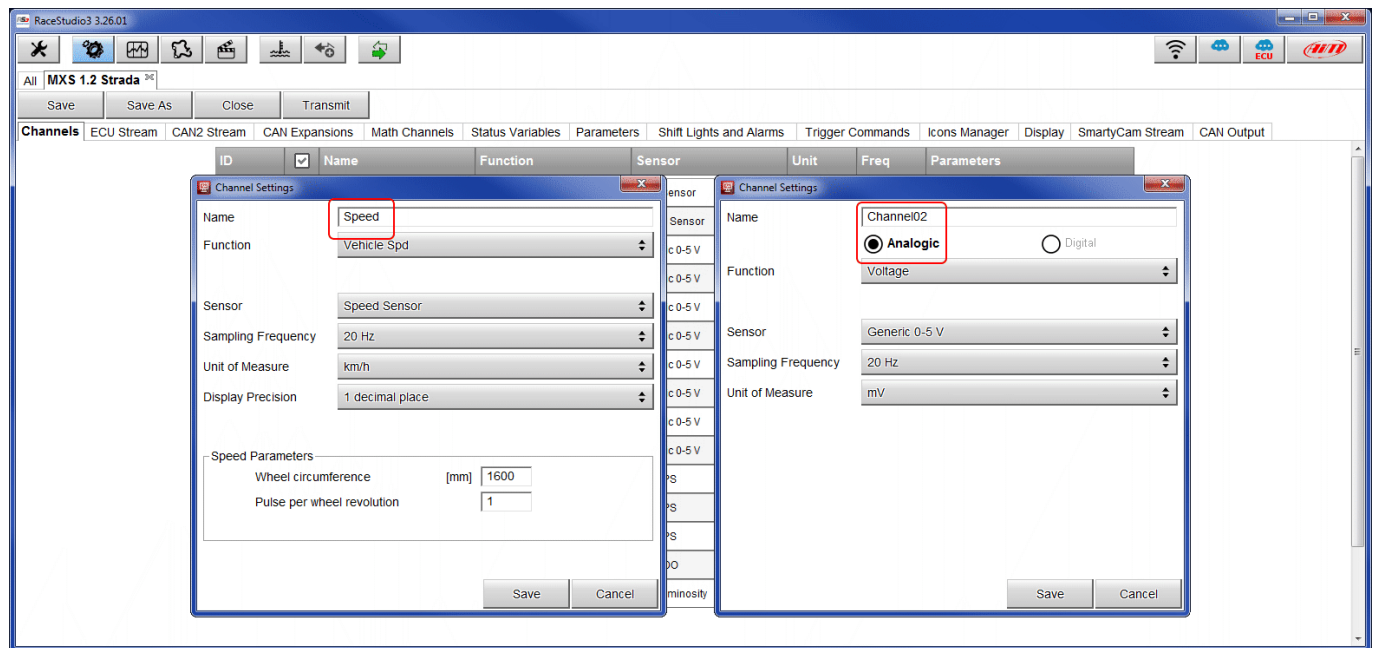
The first two channels in the list are RPM and speed, follows the configurable channels that can be managed as analog or as digital according to what they are connected to.

Typically analog sensors are pressure sensors, thermocouples (TC Hub needed to connect them MX1.3 Strada devices), potentiometers, etc... while digital inputs are used for managing pushbuttons, that may be used for activating the digital outputs

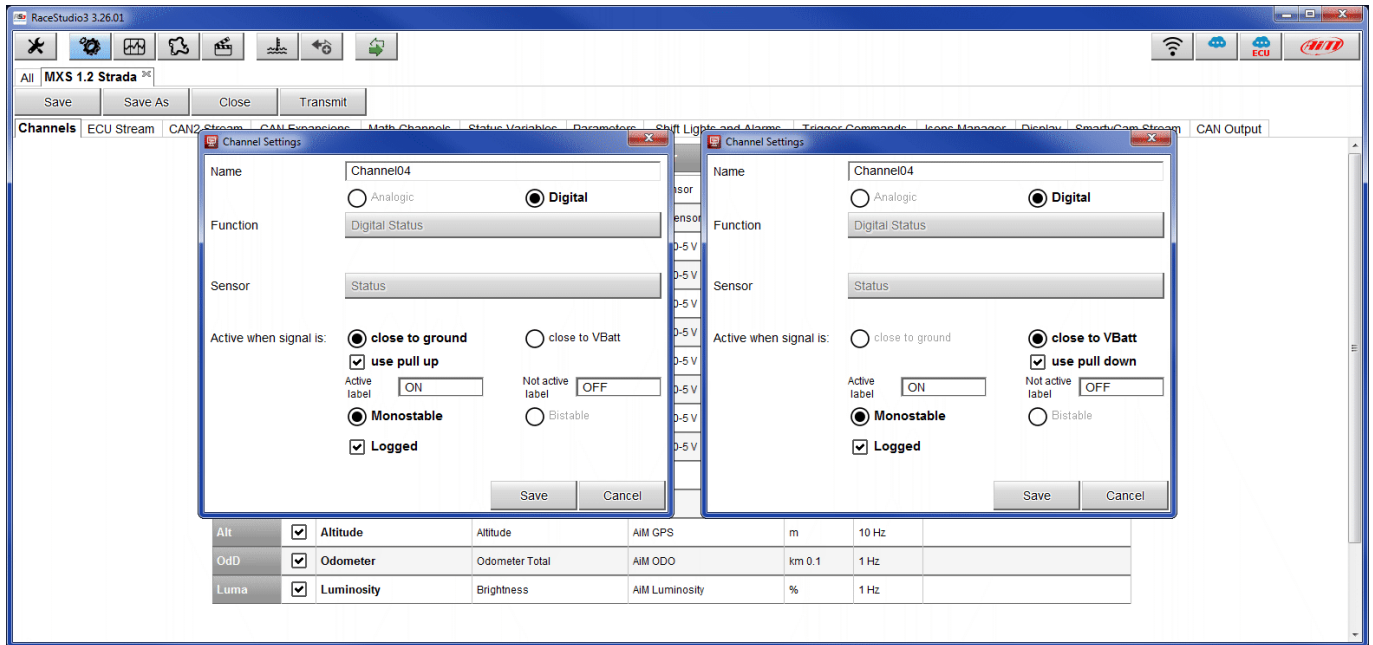
Selecting “**Analogic**” options to be set are:

- 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

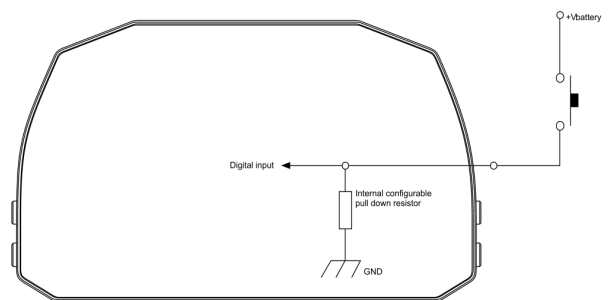
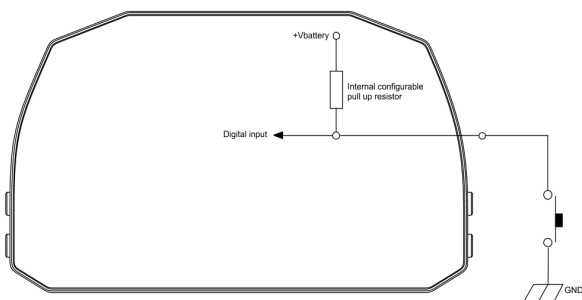
In the following image you see two different channels configuration windows.



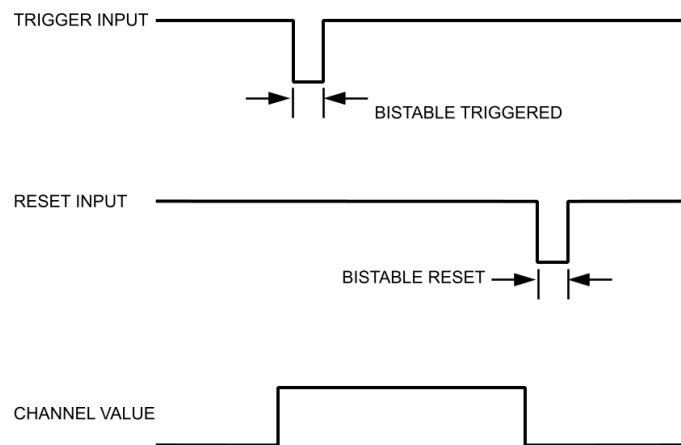
To use an input as **“Digital Input”** its parameters have to be configured as follows:



- **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.

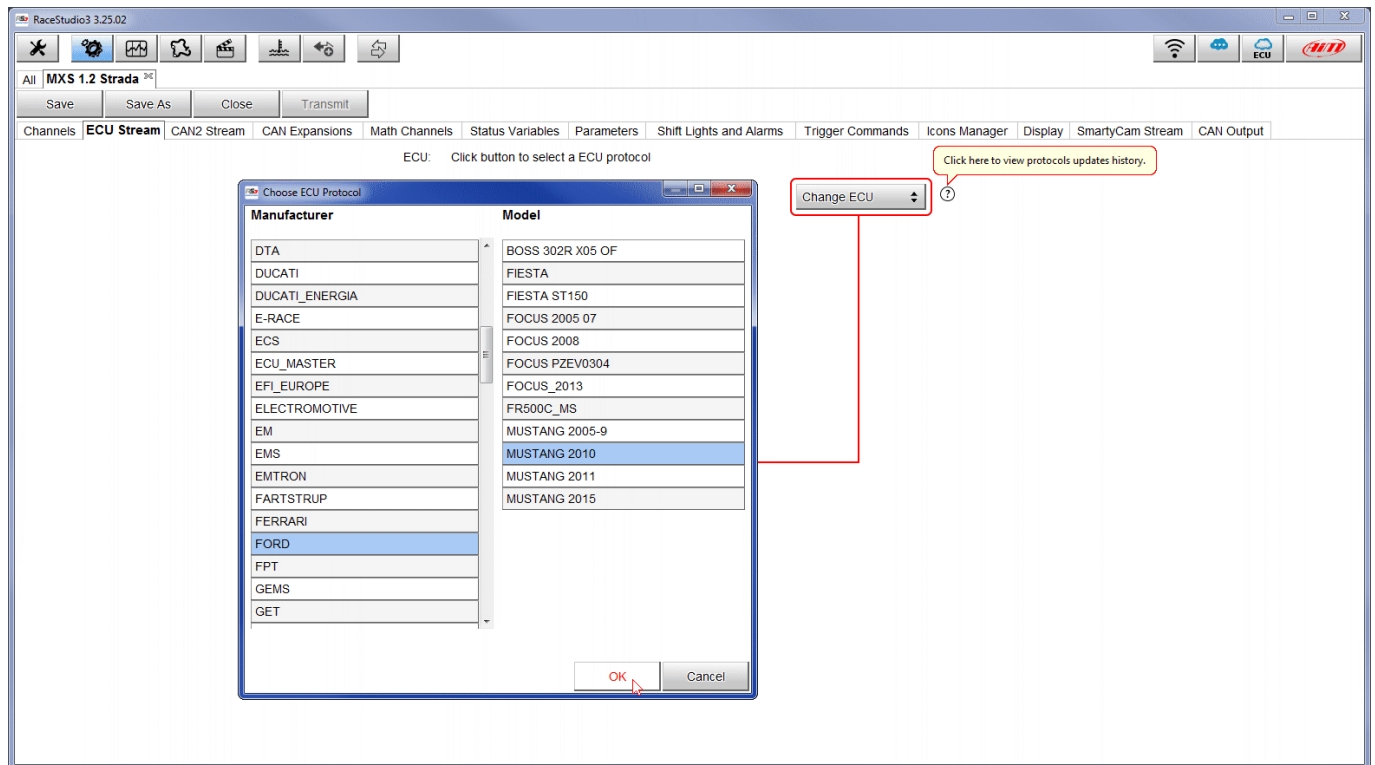
5.2.2 – ECU Connection and configuration

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.

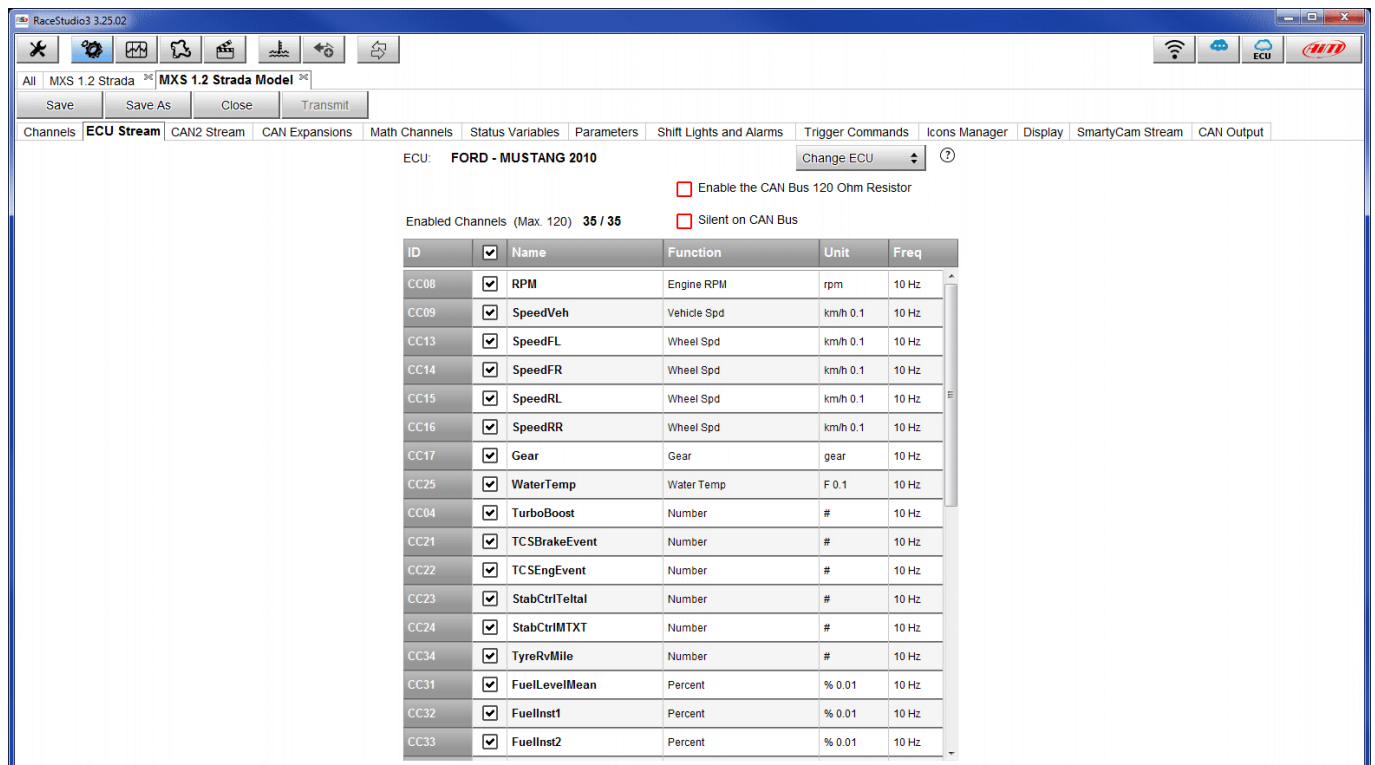
To load the ECU protocol in MX Strada series configuration:

- 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.



ECU: **FORD - MUSTANG 2010** Change ECU ?

☐ Enable the CAN Bus 120 Ohm Resistor

☐ Silent on CAN Bus

Enabled Channels (Max. 120) **35 / 35**

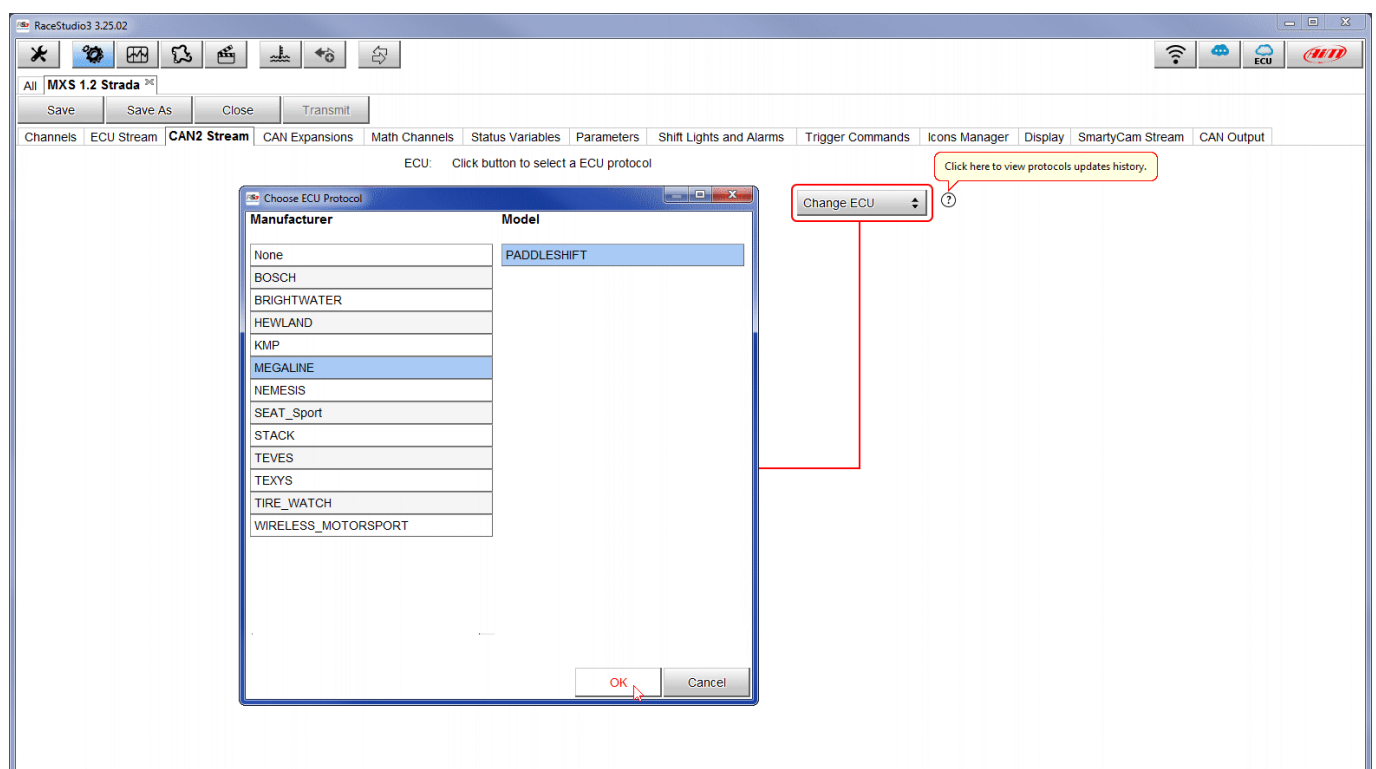
ID	✓	Name	Function	Unit	Freq
CC08	✓	RPM	Engine RPM	rpm	10 Hz
CC09	✓	SpeedVeh	Vehicle Spd	km/h 0.1	10 Hz
CC13	✓	SpeedFL	Wheel Spd	km/h 0.1	10 Hz
CC14	✓	SpeedFR	Wheel Spd	km/h 0.1	10 Hz
CC15	✓	SpeedRL	Wheel Spd	km/h 0.1	10 Hz
CC16	✓	SpeedRR	Wheel Spd	km/h 0.1	10 Hz
CC17	✓	Gear	Gear	gear	10 Hz
CC25	✓	WaterTemp	Water Temp	F 0.1	10 Hz
CC04	✓	TurboBoost	Number	#	10 Hz
CC21	✓	TCSBrakeEvent	Number	#	10 Hz
CC22	✓	TCSEngEvent	Number	#	10 Hz
CC23	✓	StabCtrlTaltal	Number	#	10 Hz
CC24	✓	StabCtrlMTXT	Number	#	10 Hz
CC34	✓	TyreRvMile	Number	#	10 Hz
CC31	✓	FuelLevelMean	Percent	% 0.01	10 Hz
CC32	✓	FuelInst1	Percent	% 0.01	10 Hz
CC33	✓	FuelInst2	Percent	% 0.01	10 Hz

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.

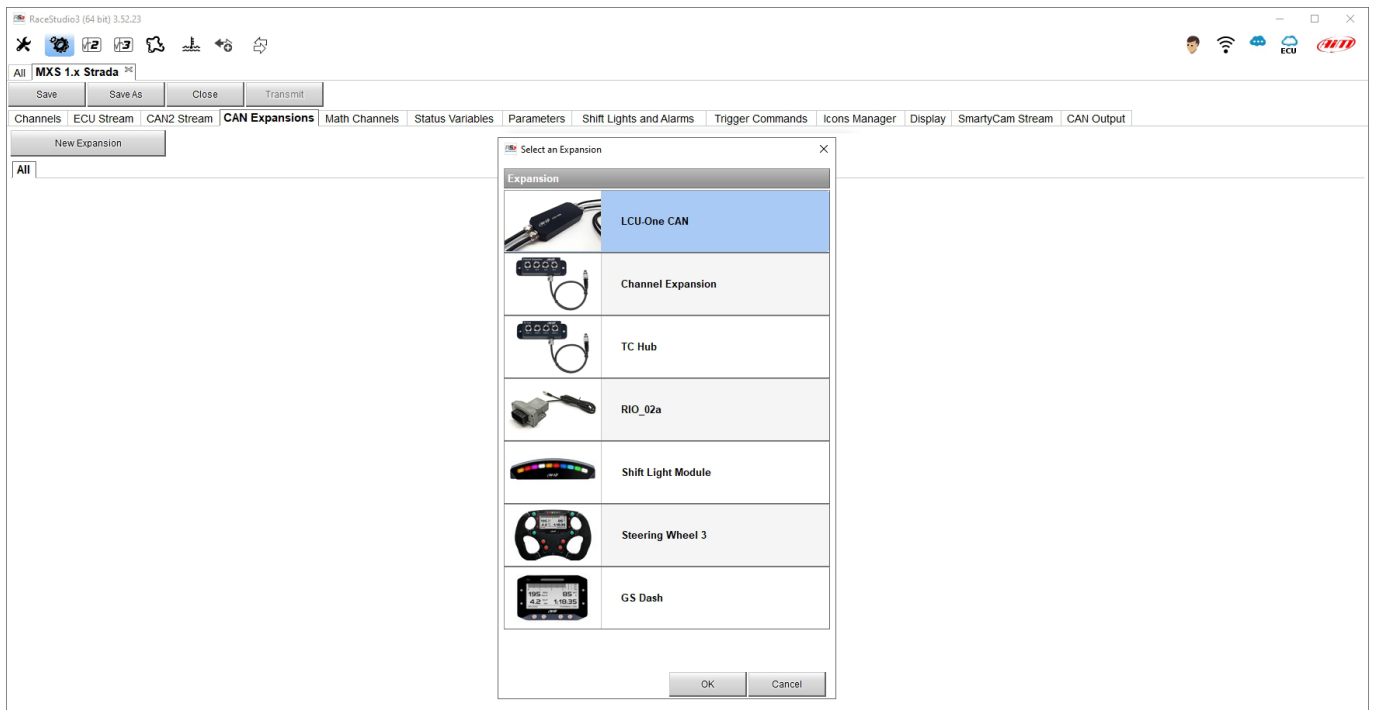


5.2.4 – CAN Expansions configuration

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

- LCU-One CAN
- Channel Expansions
- TC Hub (necessary to connect thermocouple sensors to MX 1.3 Strada)
- RIO_02a
- Shift Light Module
- Steering wheel 3
- GS Dash

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

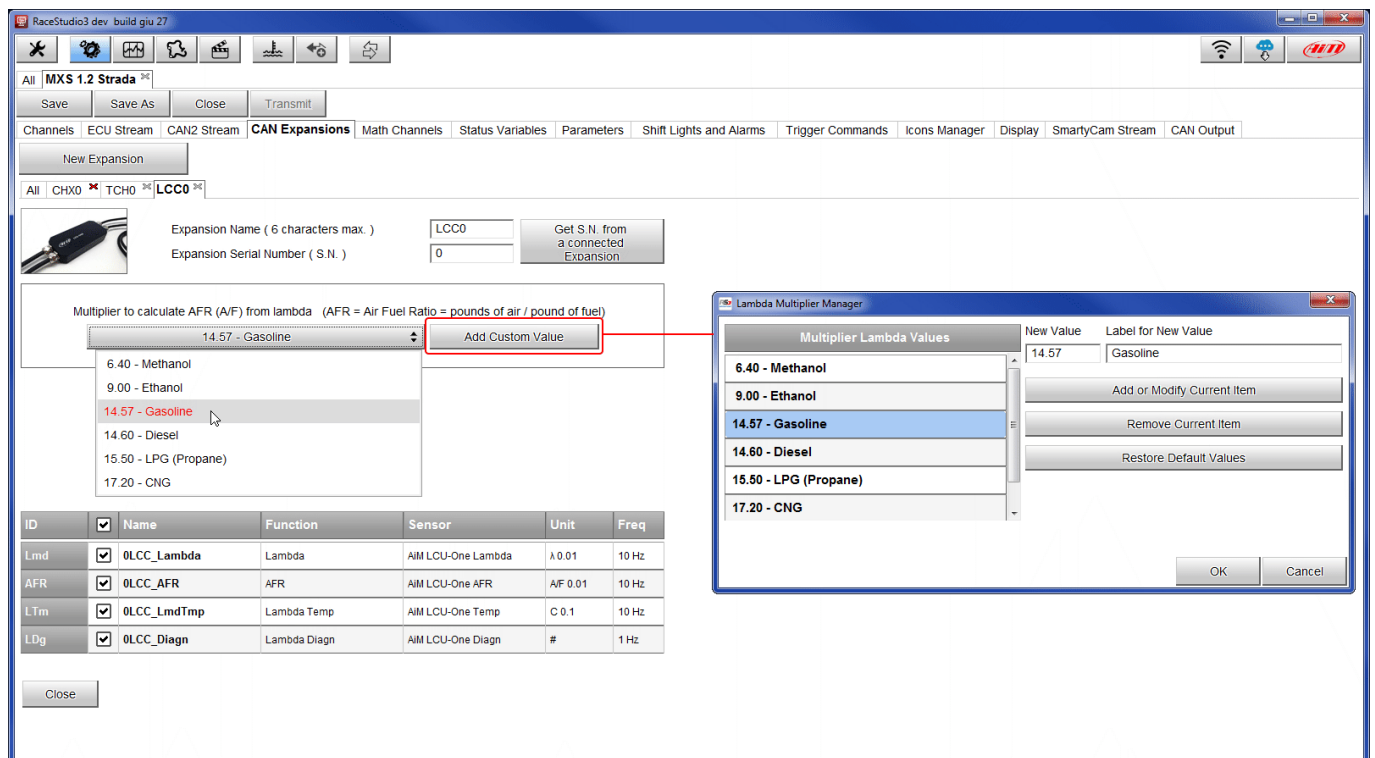


Select the CAN expansion to set and press "OK". Each expansion needs to be set filling in the related panel.

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

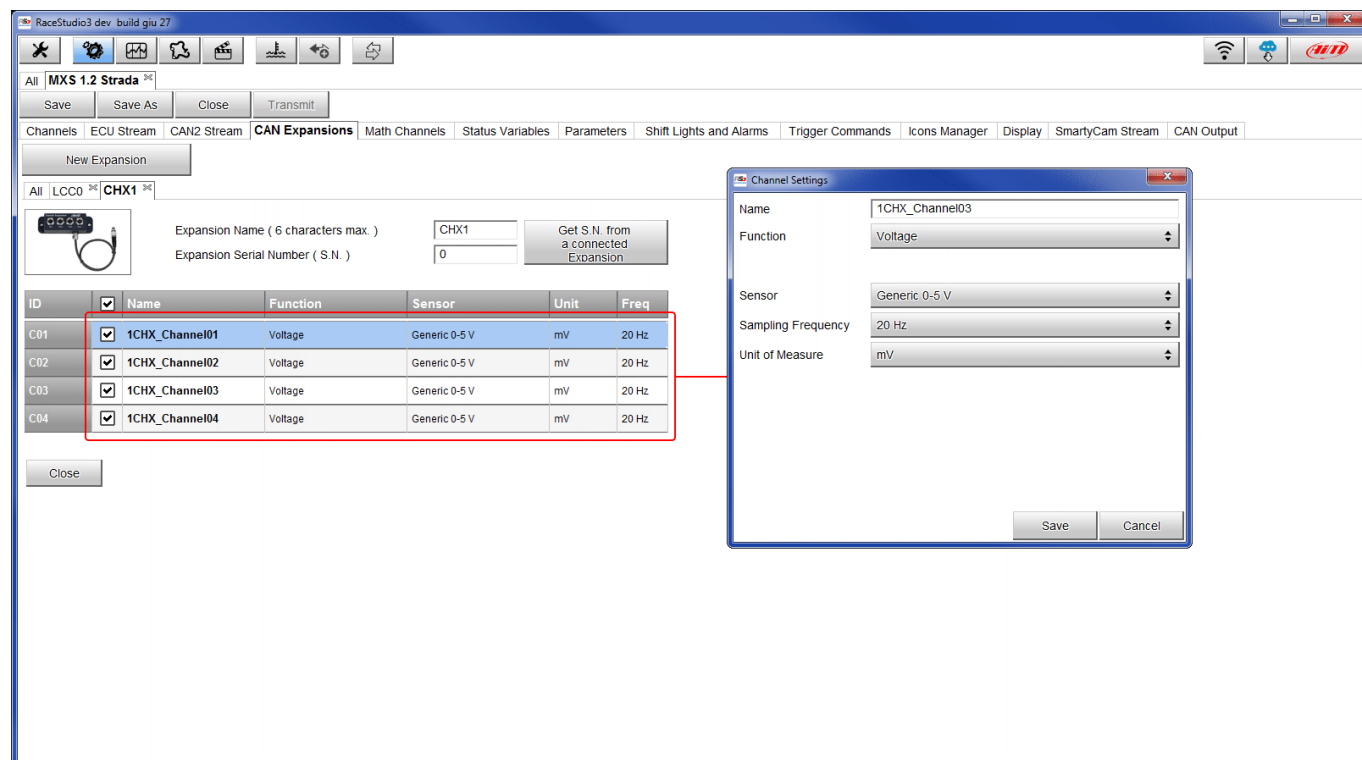


Please note: for any further information about AiM LCU-One CAN refer to the related user manual you can download from AiM website www.aim-sportline.com documentation area, products section.

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



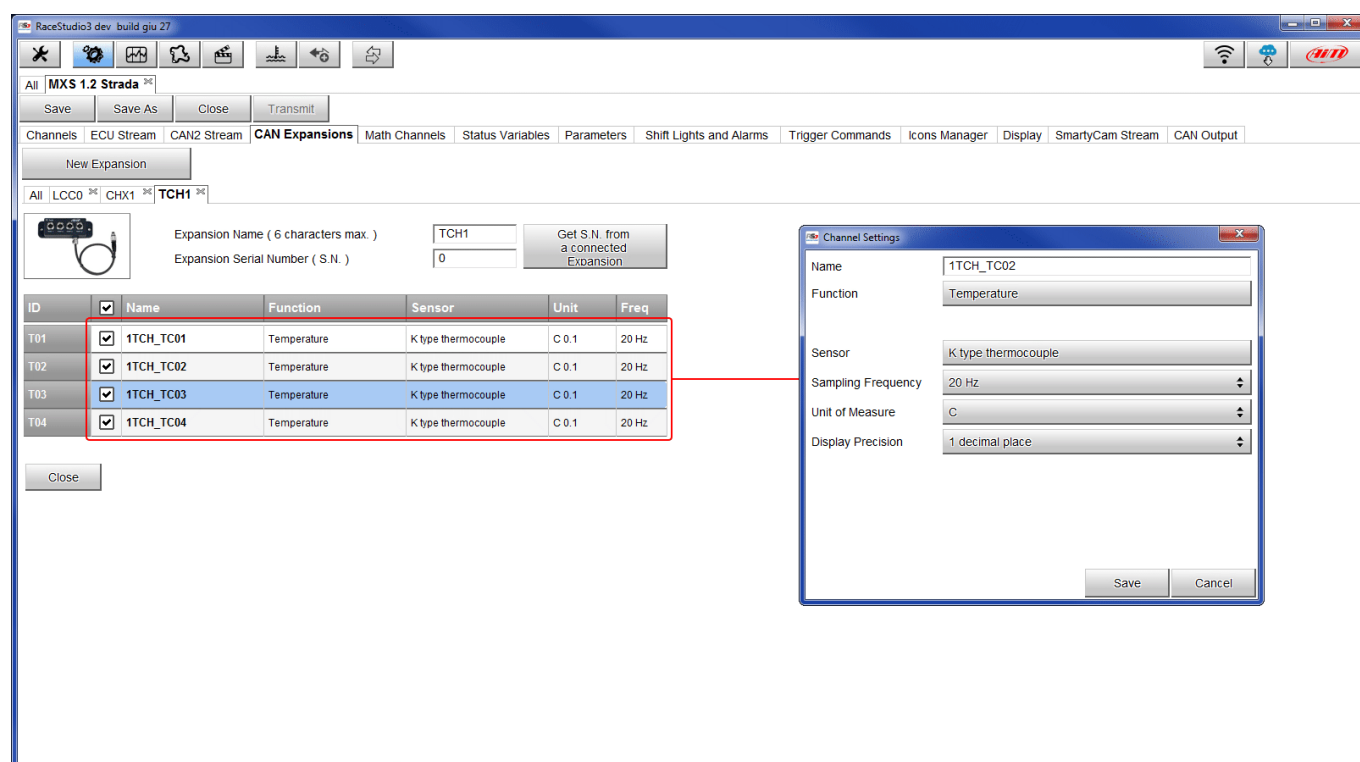
Please note: for any further information about AiM Channel expansion refer to the related user manual you can download from AiM website www.aim-sportline.com documentation area, products section.

Setting TC Hub.

This CAN expansion only supports K type thermo-couples and is necessary to connect MX 1.3 Strada devices to thermocouple sensors.

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.



Setting RIO_2a.

This CAN expansion allows to manage external switches.

To set a RIO_2a:

- press “New Expansion” button;
- select “RIO_02a” and press OK
- name the RIO_02a and fill in its serial number or press “Get SN from a connected expansion” to receive the serial number from the connected RIO_02
- RIO_02a channels work exactly as all MX series channels; please refer to paragraph 6.2.1 to set the channels
- press “Close” to save and exit

The screenshot shows the RaceStudio3 (64 bit) 3.32.12 interface. The main window displays the 'CAN Expansions' tab, where a new expansion named 'R2a' is being configured. The 'Expansion Name' is 'R2a' and the 'Expansion Serial Number (S.N.)' is '0'. Below this, the 'RIO 02a Channels' table is visible, listing 19 channels (Ch01 to Ch19) with their respective names, functions, sensors, units, and frequencies. A red box highlights the 'RIO 02a Channels' table. To the right, the 'Channel Settings' dialog box is open, showing the configuration for 'R2a Channel06'. The settings include: Name: R2a Channel06, Function: Digital Status, Sensor: Status, Sampling Frequency: 20 Hz, Logged: checked, Active when signal is: close to ground, Momentary: selected, use as button with pressure time dependent status: checked, Threshold for short/long pressure time (sec): 0.5, Rest label: OFF [0], Short time label: SHORT [1], Long time label: LONG [2].

ID	Name	Function	Sensor	Unit	Freq
Ch01	R2a Channel01	Digital Status	Status		20 Hz
Ch02	R2a Channel02	Digital Status	Status		20 Hz
Ch03	R2a Channel03	Digital Status	Status		20 Hz
Ch04	R2a Channel04	Digital Status	Status		20 Hz
Ch05	R2a Channel05	Digital Status	Status		20 Hz
Ch06	R2a Channel06	Digital Status	Status		20 Hz
Ch07	R2a Channel07	Digital Status	Status		20 Hz
Ch08	R2a Channel08	Digital Status	Status		20 Hz
Ch09	R2a Channel09	Digital Status	Status		20 Hz
Ch10	R2a Channel10	Digital Status	Status		20 Hz
Ch11	R2a Channel11	Digital Status	Status		20 Hz
Ch12	R2a Channel12	Digital Status	Status		20 Hz
Ch13	R2a Channel13	Digital Status	Status		20 Hz
Ch14	R2a Channel14	Digital Status	Status		20 Hz
Ch15	R2a Channel15	Digital Status	Status		20 Hz
Ch16	R2a Channel16	Digital Status	Status		20 Hz
Ch17	R2a Channel17	Digital Status	Status		20 Hz
Ch18	R2a Channel18	Digital Status	Status		20 Hz
Ch19	R2a Channel19	Digital Status	Status		20 Hz

Channel Settings

Name: R2a Channel06

Function: Digital Status

Sensor: Status

Sampling Frequency: 20 Hz

☒ Logged

Active when signal is: ☒ close to ground ☐ close to VBatt

☒ Momentary ☐ Toggle ☐ Multiposition

☒ use as button with pressure time dependent status

Threshold for short/long pressure time (sec)

Rest label [0]

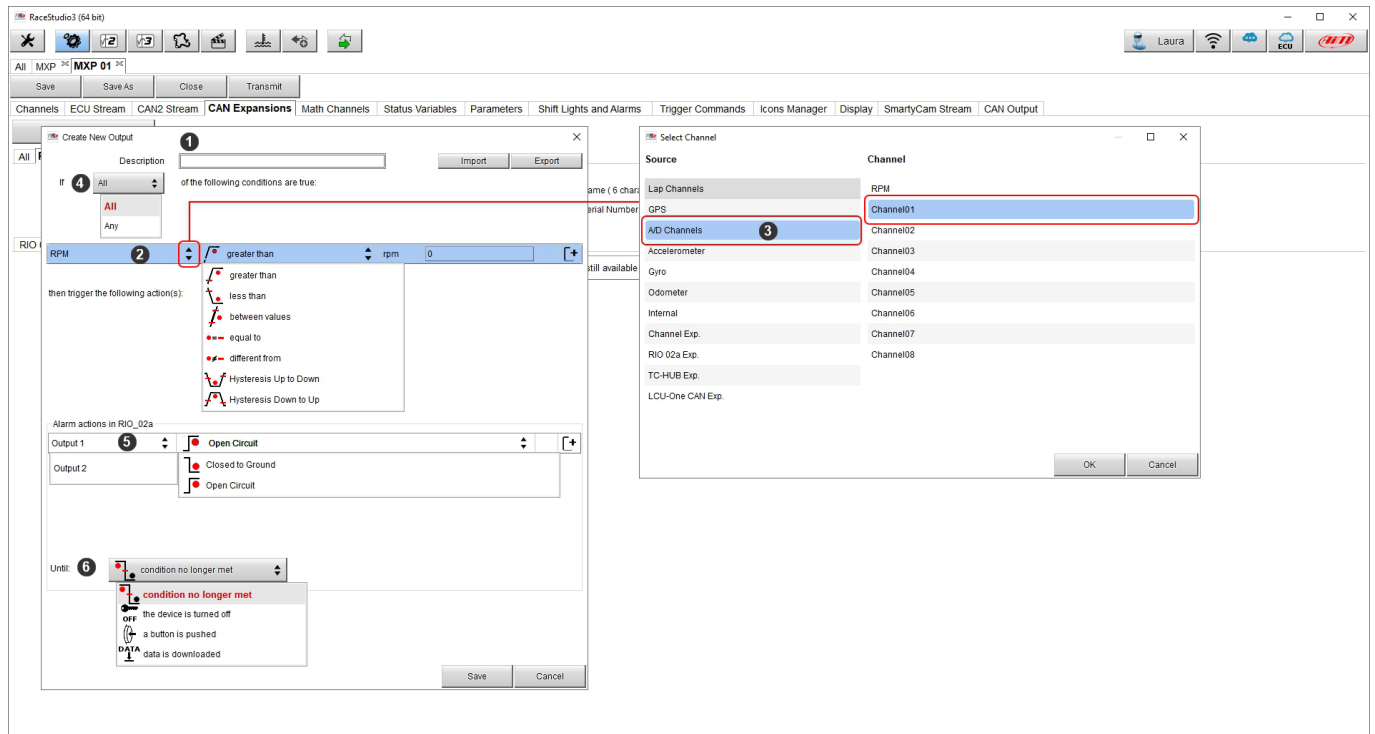
Short time label [1]

Long time label [2]

Save Cancel

To set a new output:

- fill in output name (1)
- choose channel, working mode and specify if all condition are to be satisfied or only one of them (2-4)
- decide if the circuit is to be open or closed (5)
- decide ending condition ("Until" – 6) among "condition no longer met", "the device is turned off", "a button is pushed" "data are downloaded"
- "+" buttons right of the panel are to add a new condition (top one) or a new output (bottom one)
- once all operations performed press "Save" in "Create New Alarm" panel.

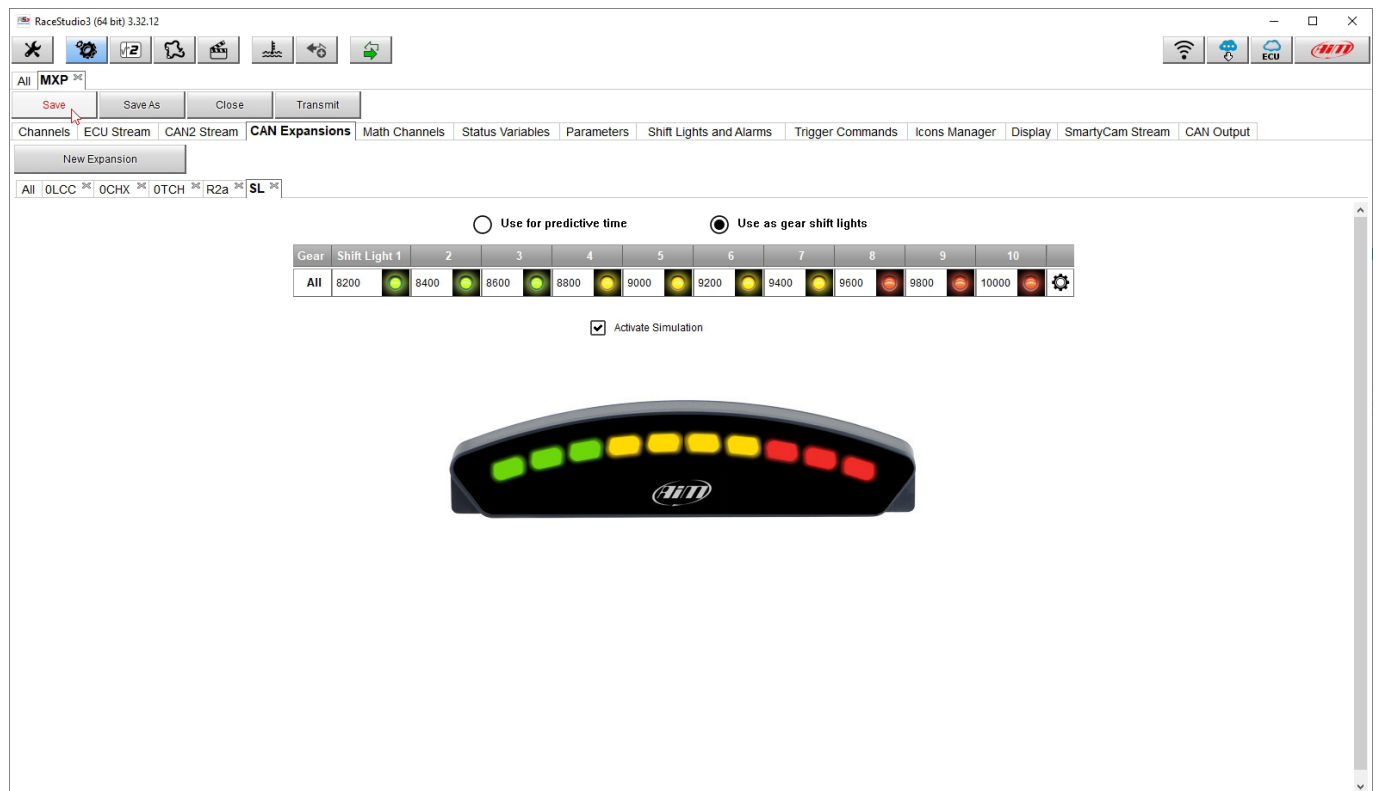


Setting Shift Lights Module.

This CAN expansion works exactly as MX series Shift Lights and can be placed in a position more comfortable than the shift lights for the racer.

To set Shift Light Module:

- press "New Expansion"
- select "Shift Light Module" and press OK
- the module works exactly like MX series shift lights so available options are:
 - use for predictive time
 - use as gear shift lights
- set it as explained in paragraph 6.2.9 and press "SAVE"

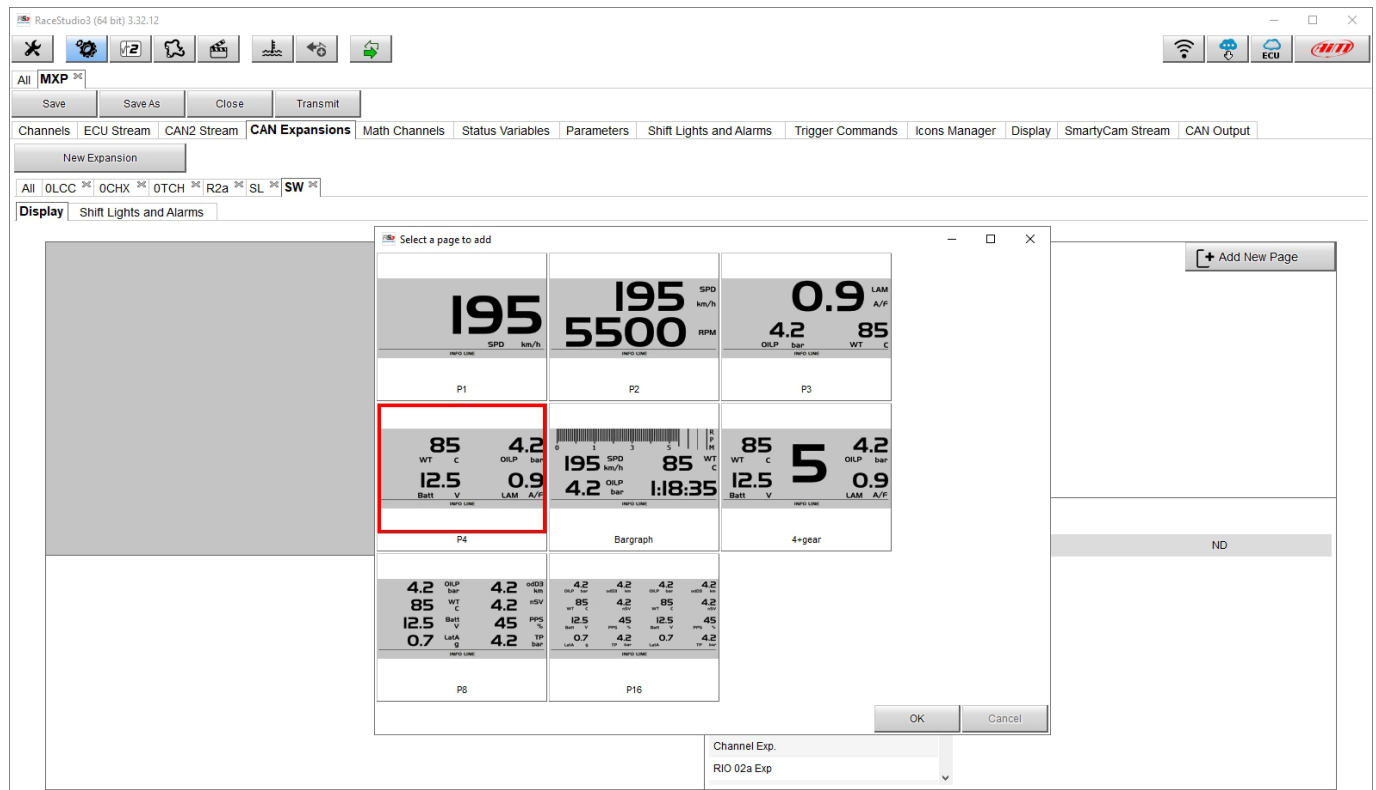




Setting Steering Wheel 3 or GS Dash

Steering Wheel and GS Dash are configured in the same way but you can install only one of them

- press "New Expansion";
- select "Formula Steering Wheel 3" and press OK
- the panel here below shows up: select the preferred page layout and press "OK" or double click on the desired layout.





The module allows to configure both display page and shift lights and alarms and works exactly like them (paragraphs 6.2.12 and 6.2.9) and is to be configured in the same way.

To configure the **display**

- select the display area where to place the desired channel or the not set row (1)
- choose the group of channels and then the channel to show (2-3) and double click on it to place it in the desired area (4)
- the row becomes configured (5)
- repeat the operation for all the display areas and press "SAVE"

The screenshot shows the RaceStudio3 (64 bit) 3.32.12 interface. The top menu bar includes options like Save, Save As, Close, and Transmit. Below the menu bar, there are tabs for Channels, ECU Stream, CAN2 Stream, CAN Expansions, Math Channels, Status Variables, Parameters, Shift Lights and Alarms, Trigger Commands, Icons Manager, Display, SmartyCam Stream, and CAN Output. The Display tab is selected, and the 'Page 1' configuration is shown. The main display area is divided into sections: a top section with a large '5' and 'Gear' text, a middle section with a large '5' and 'Gear' text, and a bottom section labeled 'INFO LINE'. The 'INFO LINE' section contains a table with columns for 'Gear' and 'gear'. The 'Gear' column has a checkbox and a gear icon, and the 'gear' column has a gear icon. The 'INFO LINE' section also contains three rows of 'channel not set' text. The right side of the interface shows a list of 'Channel Groups' and 'Channels'. The 'Channel Groups' list includes ECU, CAN 2, Lap Channels, GPS, A/D Channels, Accelerometer, Gyro, Odometer, Internal, Channel Exp., and RIO 02a Exp. The 'Channels' list includes RPM, SpeedVeh, SpeedFL, SpeedFR, SpeedRL, SpeedRR, Gear, WaterTemp, ECT, TurboBoost, TCSBrakeEvent, TCSB, and TCSEngEvent. The 'Gear' channel is selected in the 'Channels' list, and the 'RPM' channel is selected in the 'Channel Groups' list. The 'Gear' channel is also selected in the 'INFO LINE' section.



Shift lights can be set as gear shift lights or for predictive time and it is possible to add new alarms. Please refer to paragraph 6.2.9 to know how to configure shift lights and alarms.

RaceStudio3 (64 bit) 3.32.12

Save Save As Close Transmit

Channels ECU Stream CAN2 Stream **CAN Expansions** Math Channels Status Variables Parameters Shift Lights and Alarms Trigger Commands Icons Manager Display SmartyCam Stream CAN Output

New Expansion


All SW

Display **Shift Lights and Alarms**

☐ Use for predictive time ☒ Use as gear shift lights

Gear	Shift Light 1	2	3	4	5	6	
All	9000	9200	9400	9600	9800	10000	⚙️

☐ Activate Simulation



Events Alarms

Priority	Event	LED	Output	
↑	Water	1		⚙️

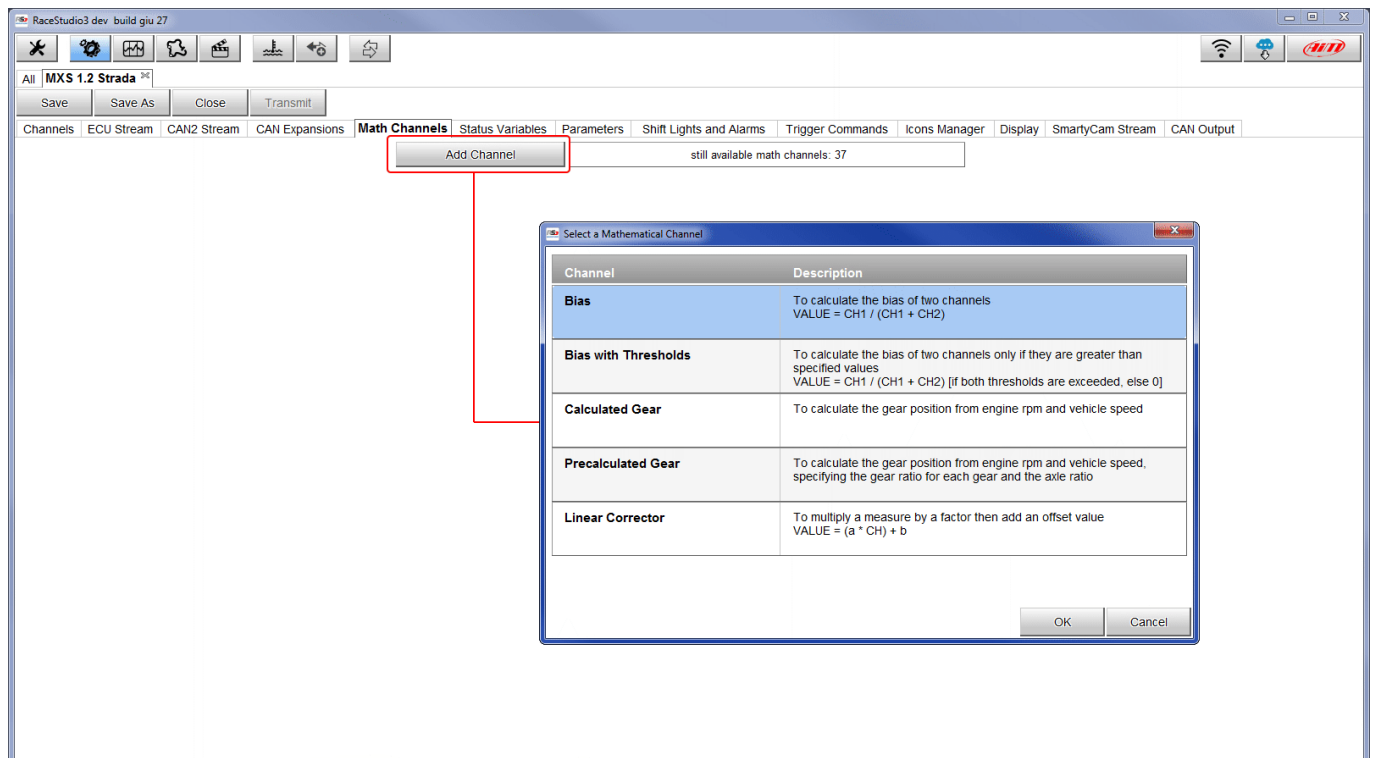
+ Add New Alarm still available alarms: 35 Import Alarm Export Alarm

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

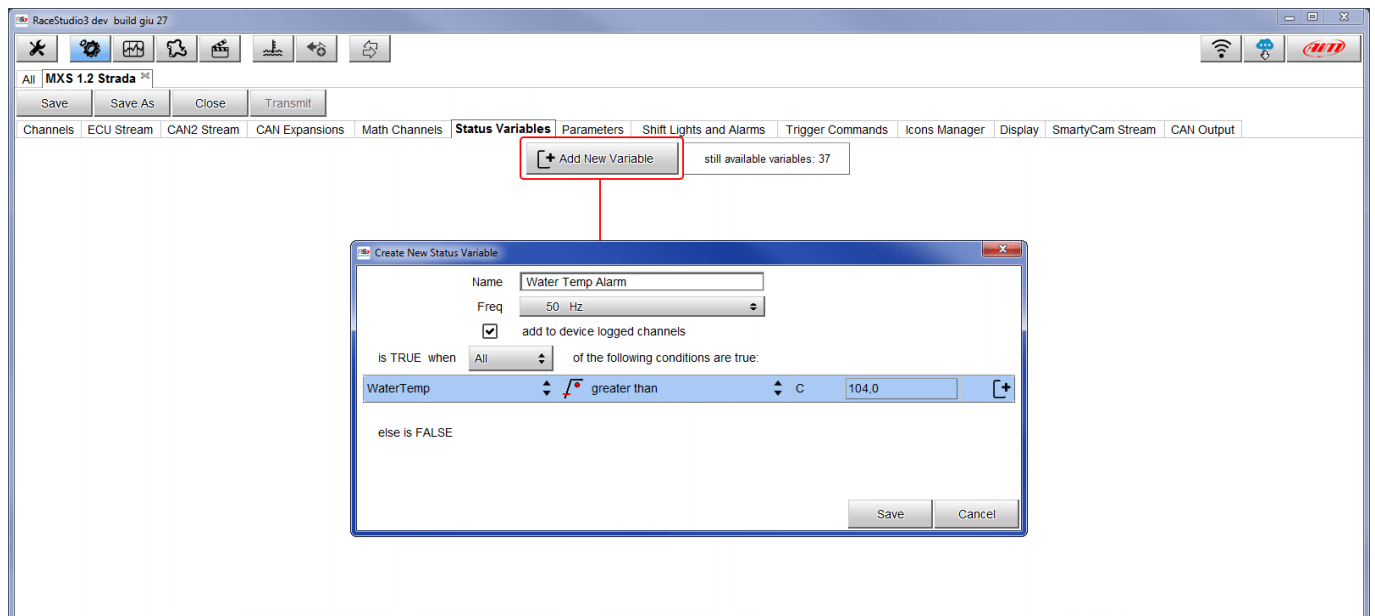
Status Variables are internal math channels that can have only two different values: 1 (TRUE) or 0 (FALSE). They may be useful for simplifying complex configurations, where it is required to evaluate if to activate alarms, LEDs, Icons etc..

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.

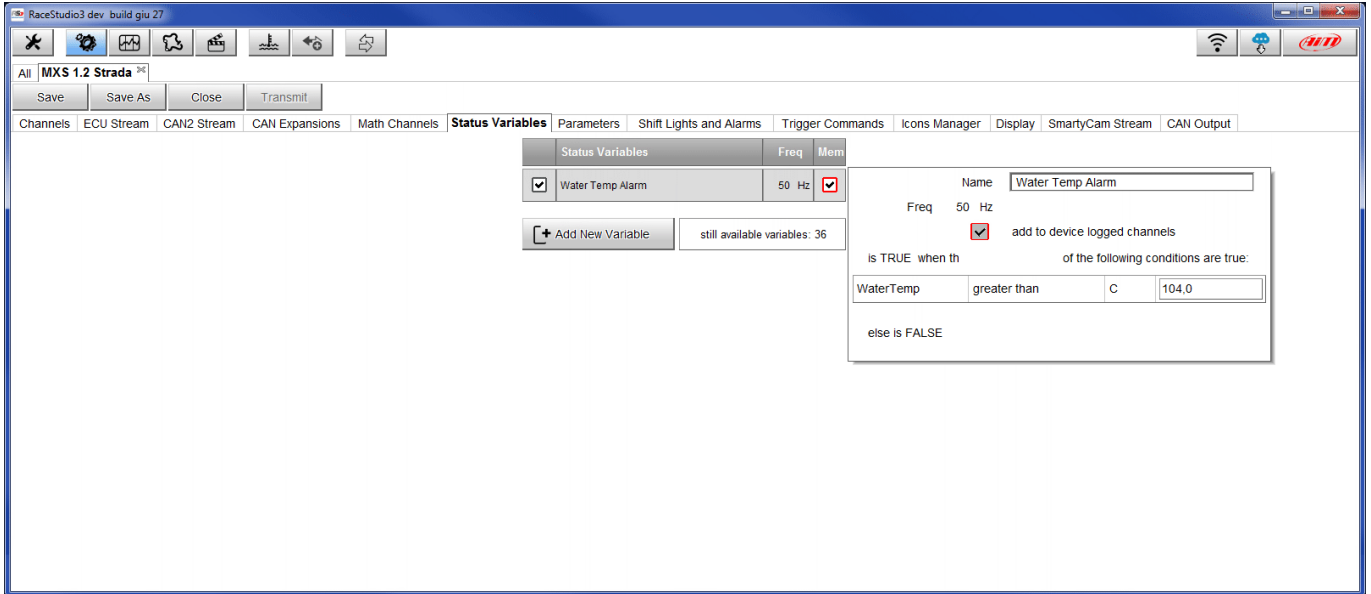
And use Water Temp Alarm for managing Icons and LEDs.

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.

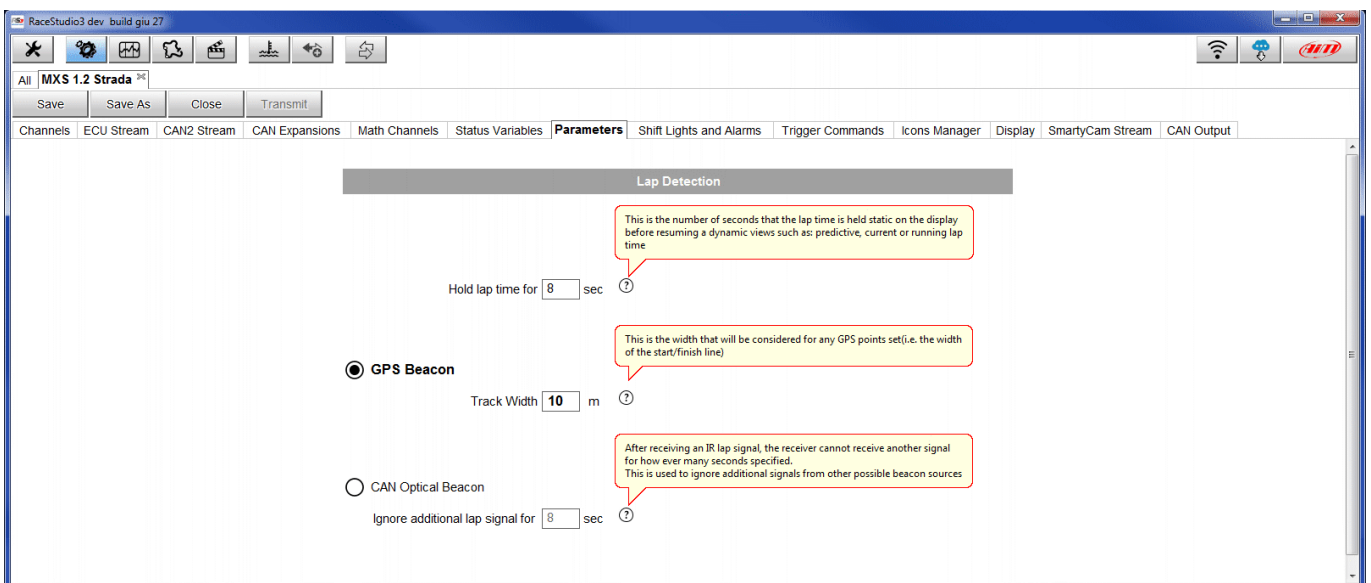


5.2.7 – Parameters configuration

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.



Use for predictive time ☐ Use as gear shift lights ☒

Gear	Shift Light 1	2	3	4	5	6	7	8	9	10
All	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000

LED 1 LED 2 LED 3 LED 4 LED 5 LED 6

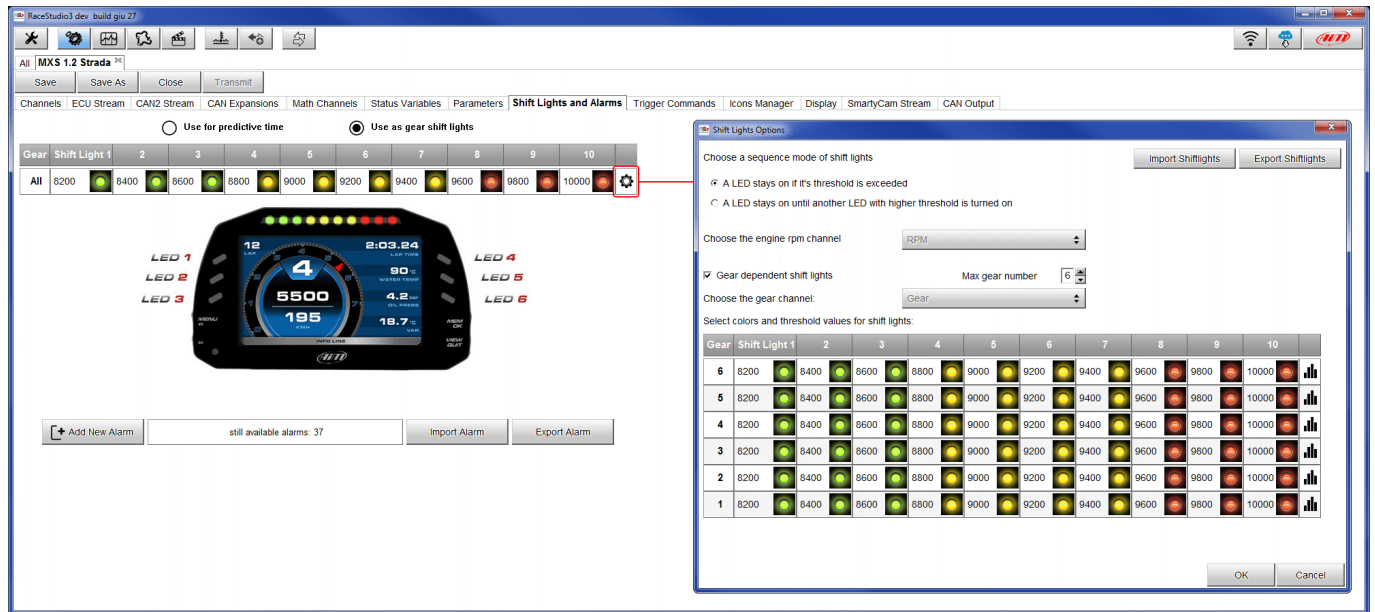
+ Add New Alarm still available alarms: 37 Import Alarm Export Alarm

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;



The screenshot shows the RaceStudio3 dev build 27 interface. The main window displays a dashboard with a tachometer showing 5500 RPM and a gear indicator showing 4. The dashboard is surrounded by six LED indicators labeled LED 1 through LED 6. Below the dashboard, there are buttons for 'Add New Alarm', 'Import Alarm', and 'Export Alarm'. The 'Shift Lights and Alarms' tab is selected in the top menu. A 'Shift Lights Options' dialog box is open, showing configuration options for the shift lights. The dialog box has two radio buttons: 'Use for predictive time' (unselected) and 'Use as gear shift lights' (selected). Under 'Use as gear shift lights', there are two options: 'A LED stays on if its threshold is exceeded' (selected) and 'A LED stays on until another LED with higher threshold is turned on' (unselected). There are also fields for 'Choose the engine rpm channel' (set to RPM), 'Gear dependent shift lights' (checked), 'Choose the gear channel' (set to Gear), and 'Max gear number' (set to 6). At the bottom, there is a table for 'Select colors and threshold values for shift lights'.

Gear	Shift Light 1	2	3	4	5	6	7	8	9	10
6	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000
5	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000
4	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000
3	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000
2	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000
1	8200	8400	8600	8800	9000	9200	9400	9600	9800	10000

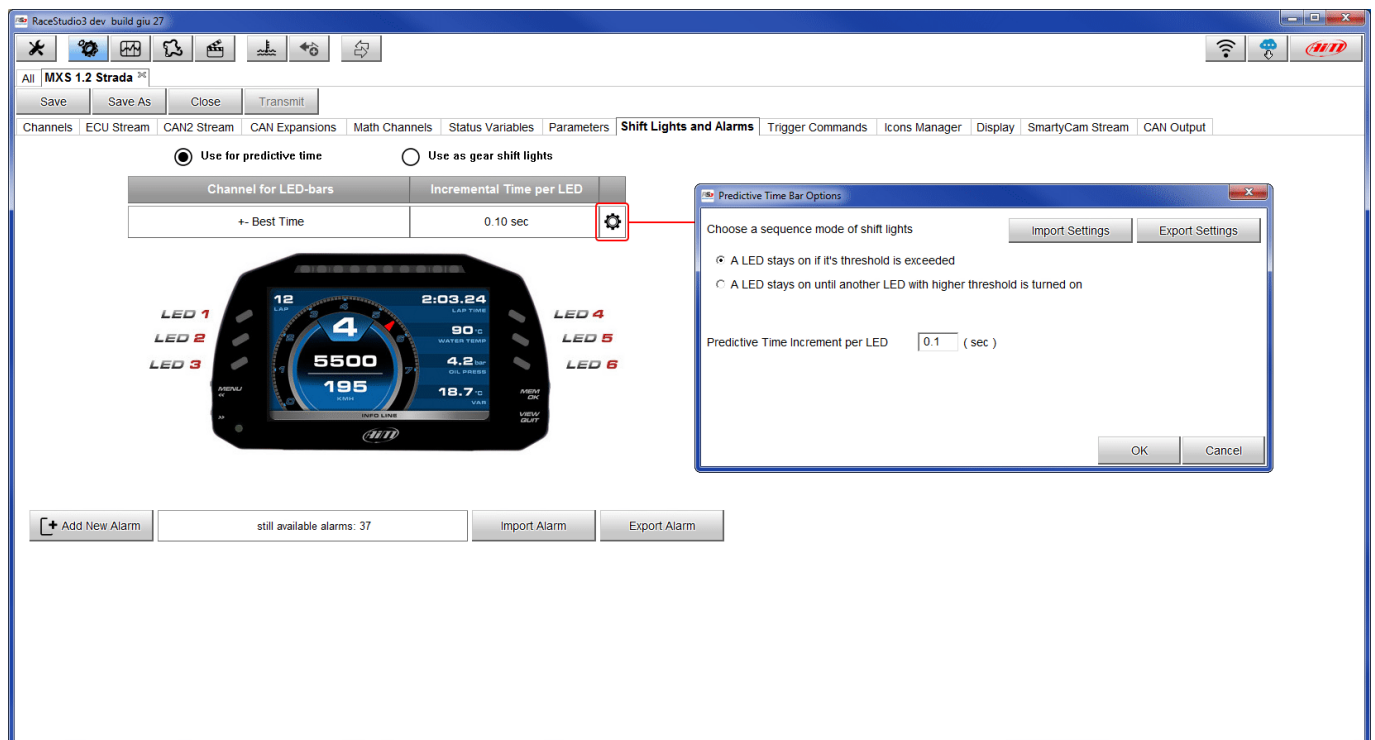
Use for predictive time. Click the icon (⚙️) for setting the parameters.

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.

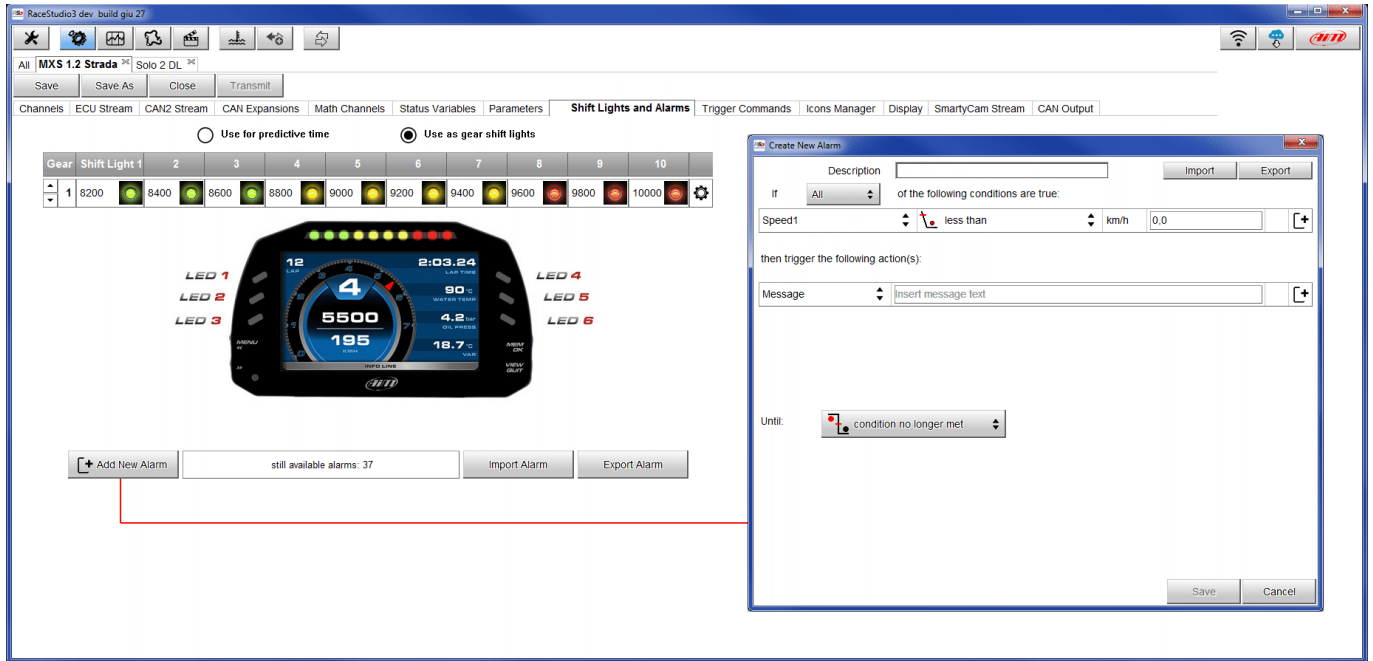
Please note: this option only works if an optional GPS Module is connected.





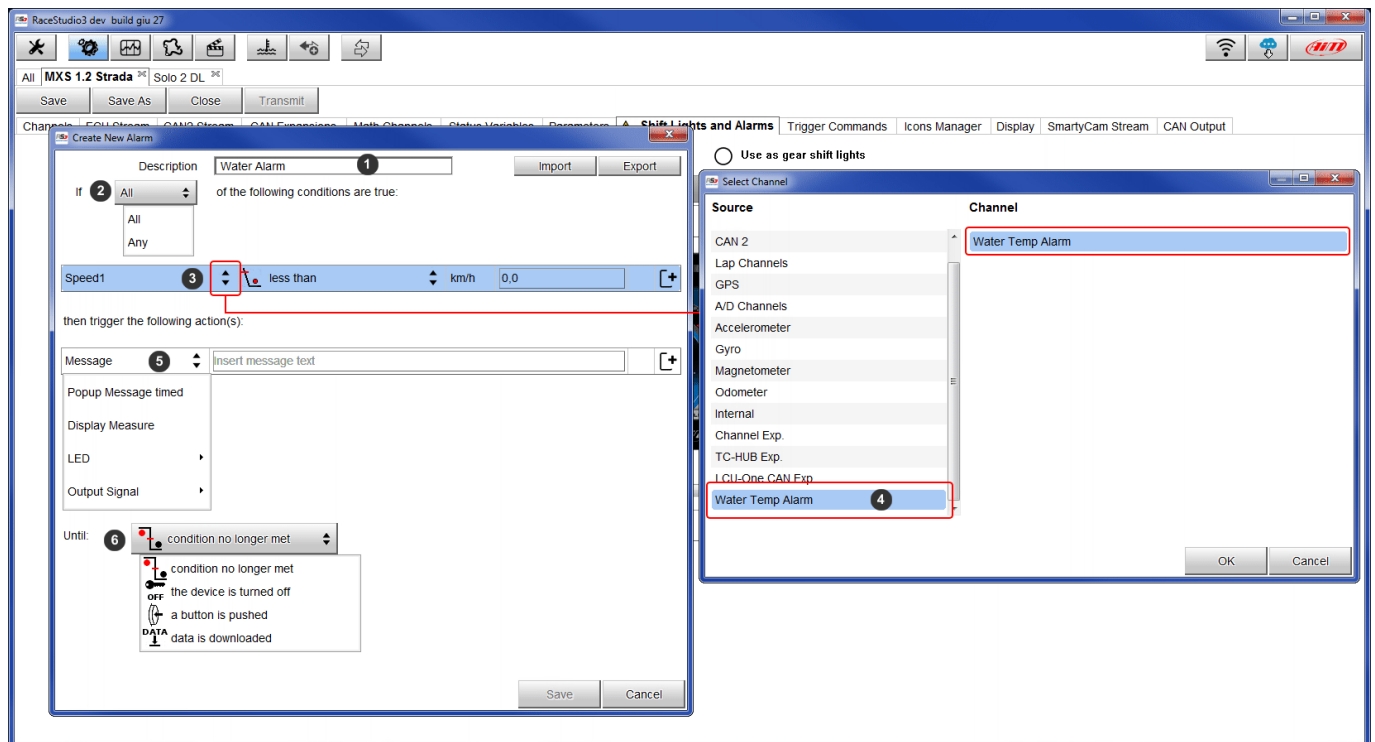
Create and set MX Strada series alarm

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 triggered (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 ("Until" – 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.

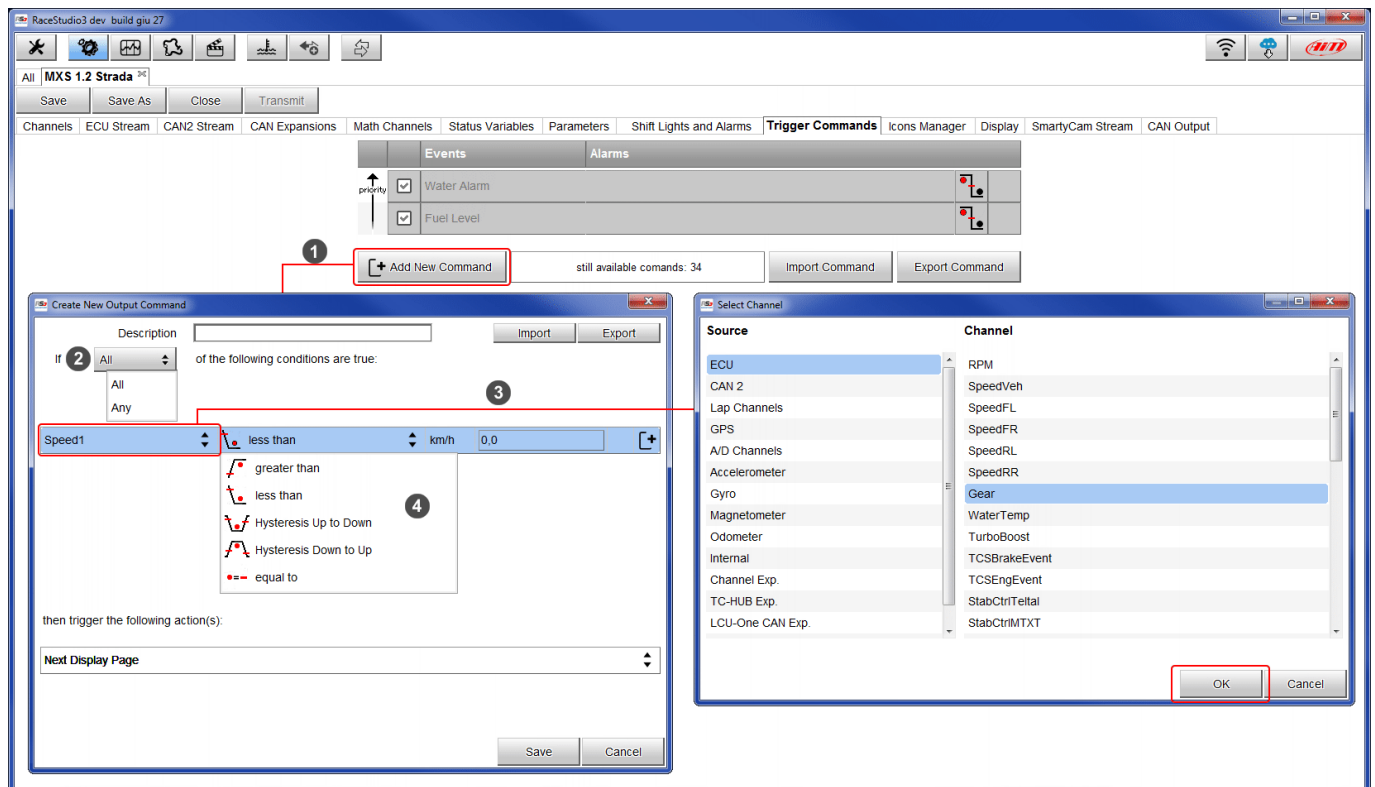
The commands available up to now are:

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

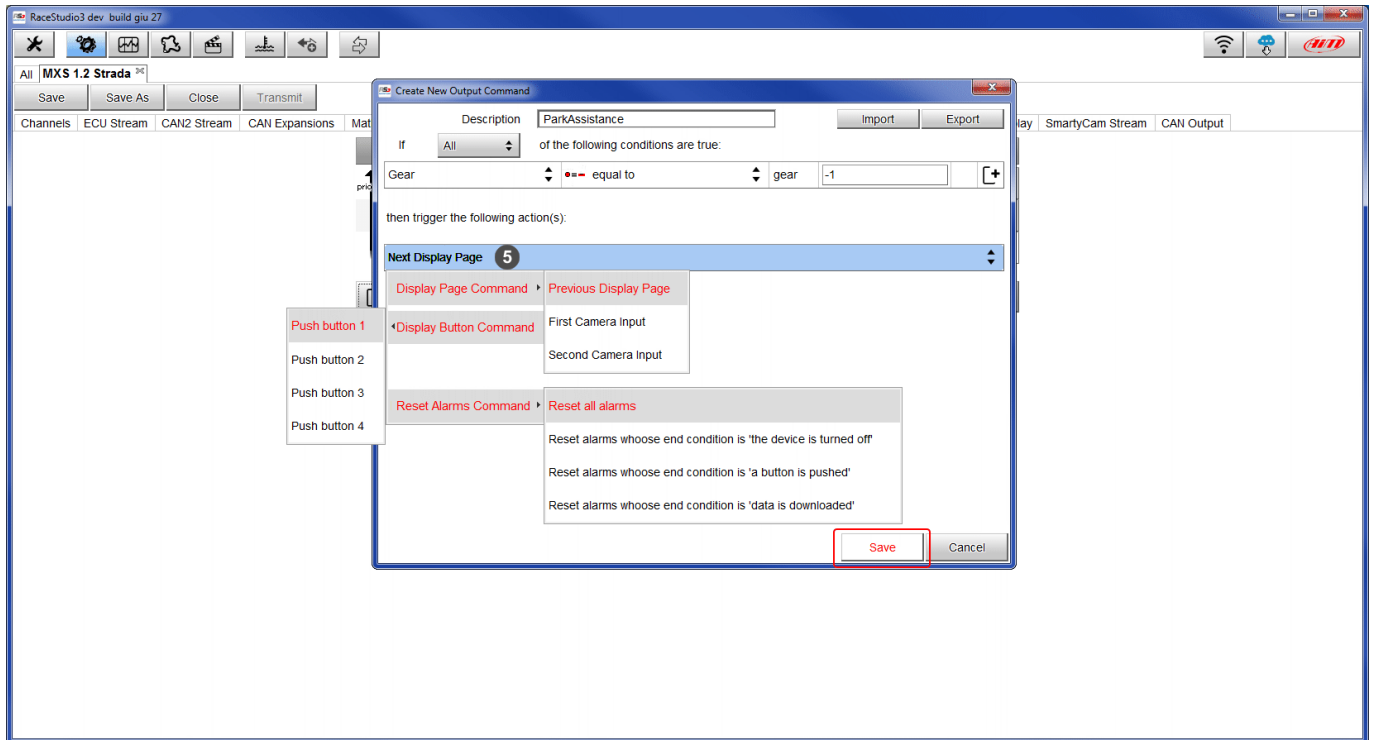
Other commands will be available in the next software/firmware releases.

To add a new command.

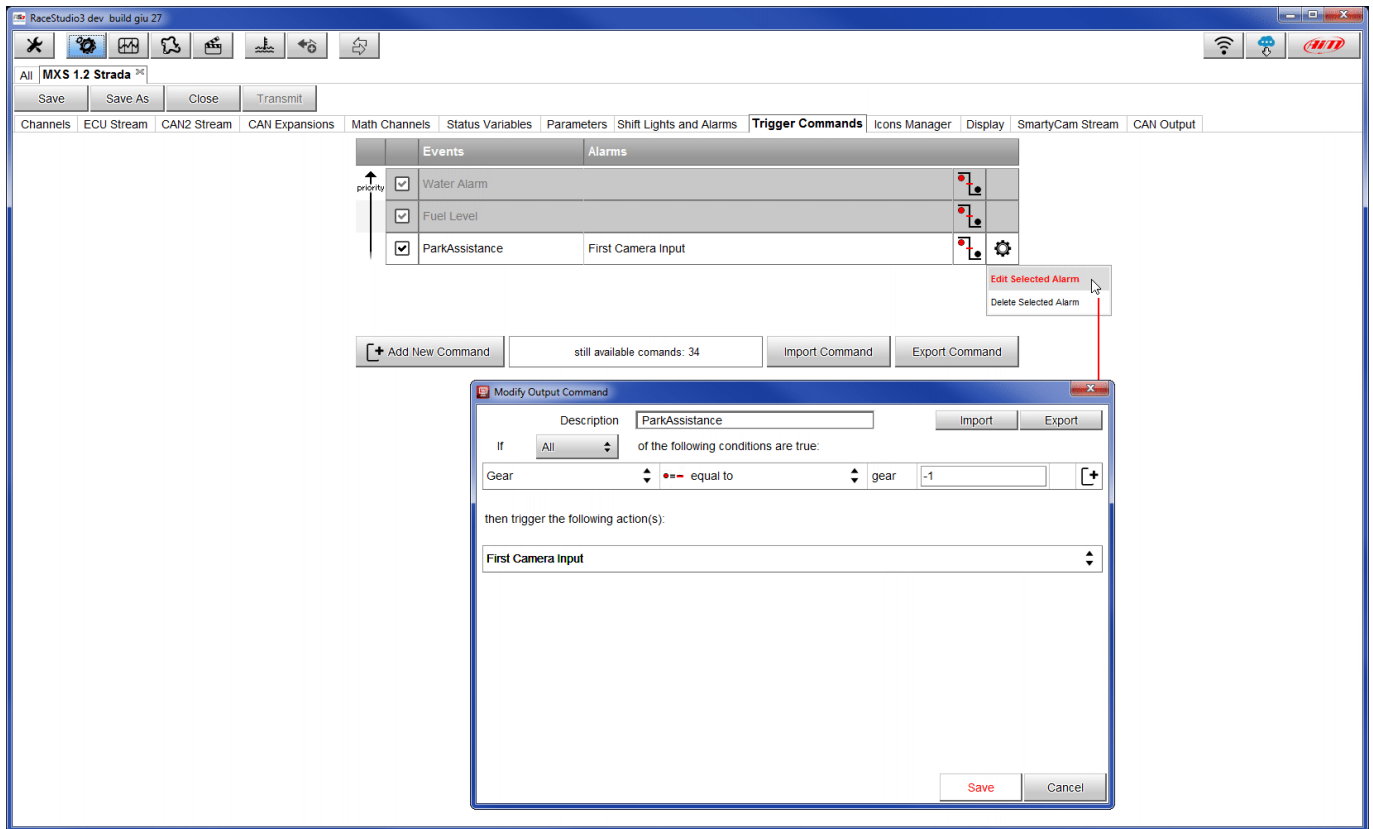
- Press “Add new Command” (1)
- a combination of conditions are allowed for setting a Trigger Commands and it is possible to decide if the conditions are to be ALL valid or just one of them (2-4)



- 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.



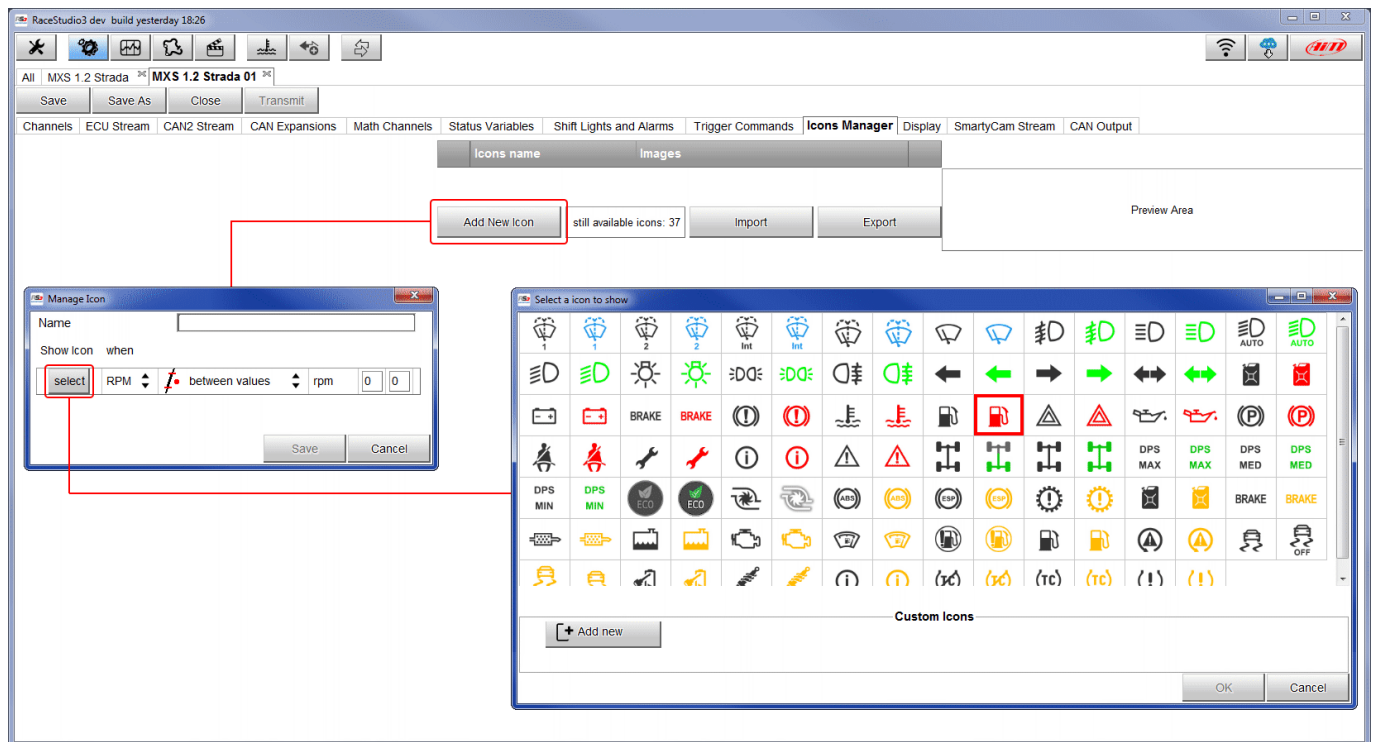
For example:

- 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

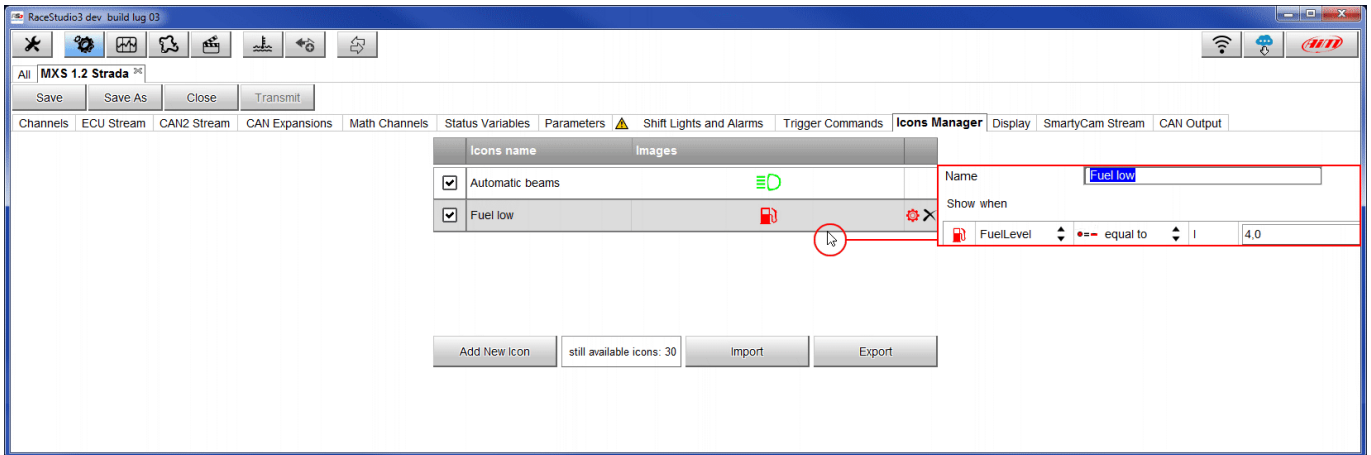
- press "Add New Icon"
- "Manage Icon" panel shows up
- press "Select" to see the panel showing all images
- select the image you want to set
- the software comes back to "Manage Icon" panel
- set the image conditions according to the channel they are related to



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.

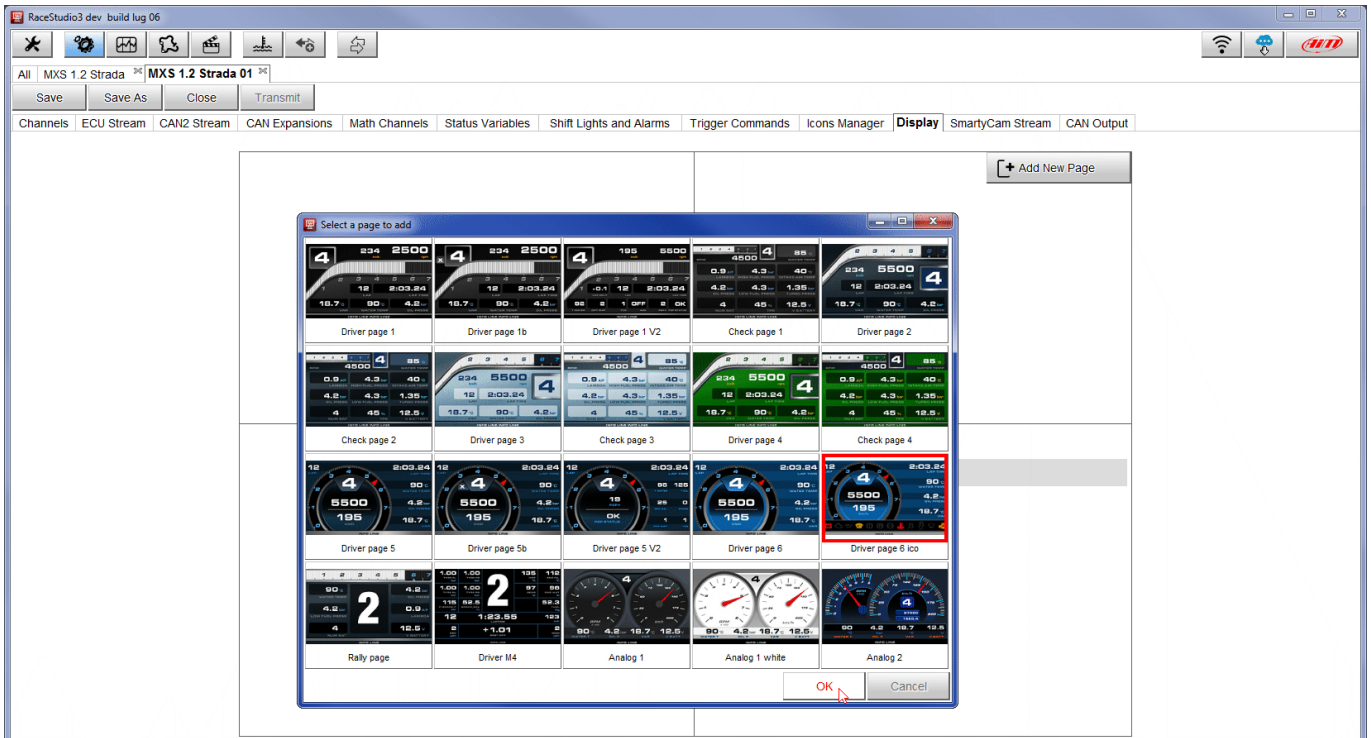
Icon can be edited/selected pressing .



5.2.11 – Display configuration

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

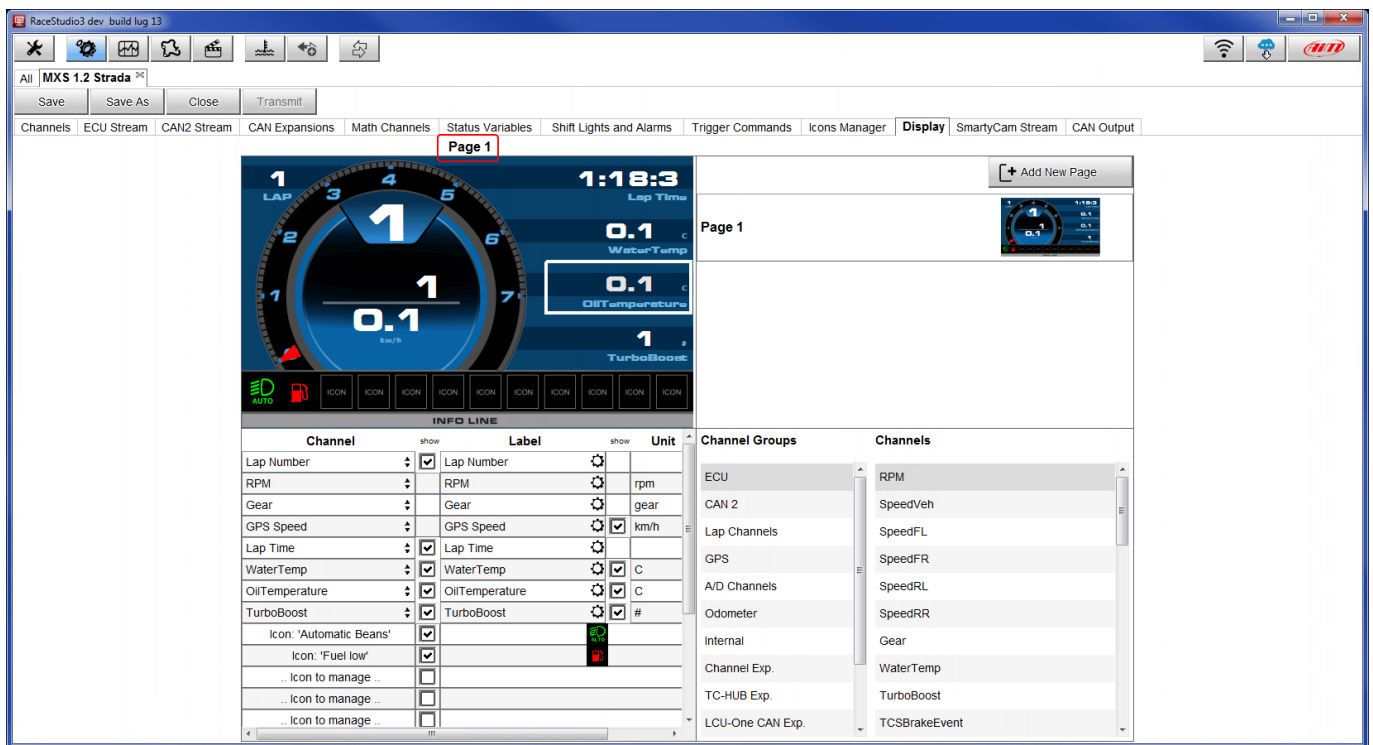
- enter “Display” tab
- a panel shows up: select a display page (in the example a page with icons bar has been chosen)
- select the page and press “OK”
- repeat the operation for the number of pages to set





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

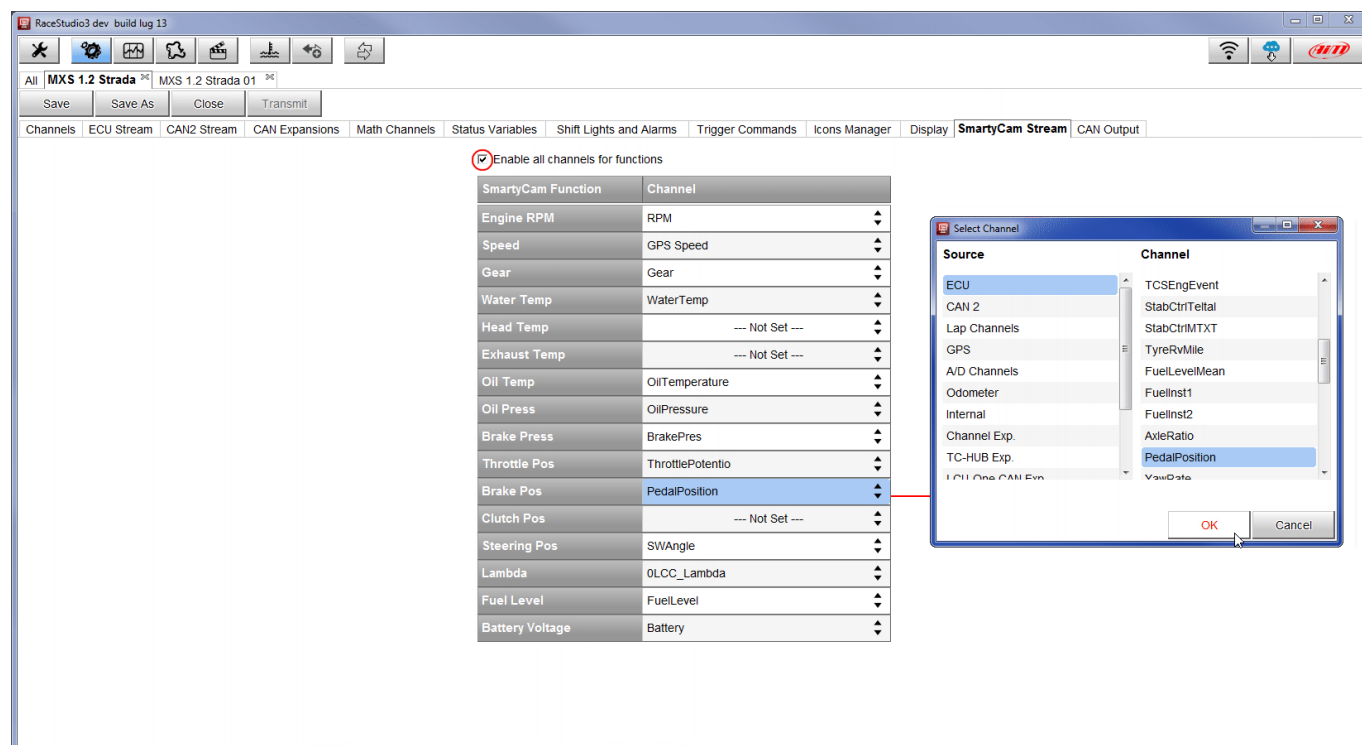
- on the left a panel that shows as many rows as the fields to be set
- on the right a panel that shows the channels group that can be set in that field and all the channels in it included; drag and drop the channel to set in the desired field or double click on it
- if more display pages have been added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



5.2.12 – SmartyCam stream setting

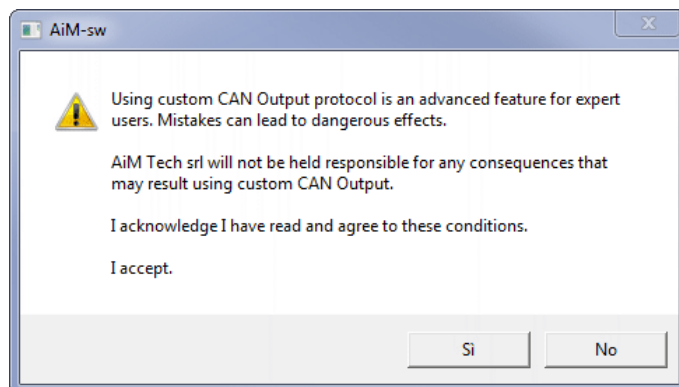
MX Strada series can be connected to AiM SmartyCam to show the desired data on SmartyCam video. To set each channel:

- 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

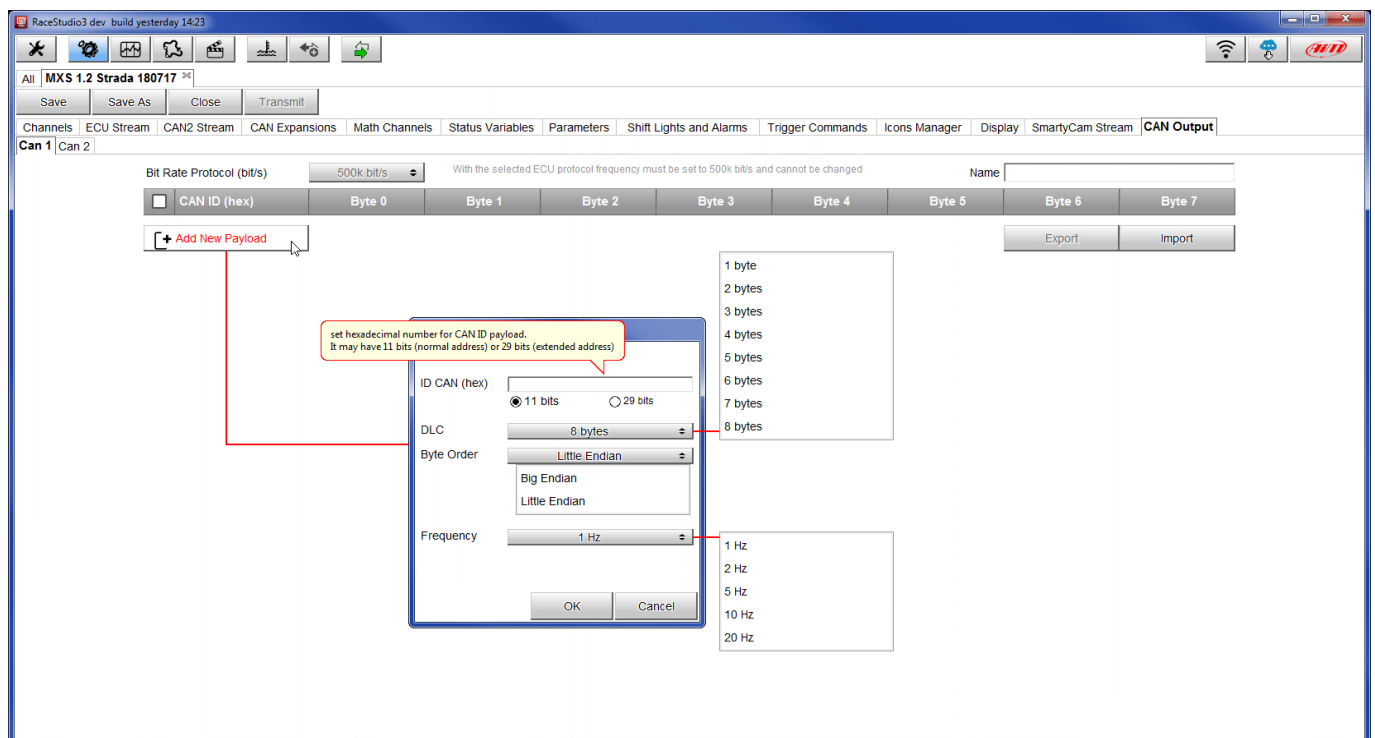
Please note: this function is for expert users only. At very first configuration this panel shows up.

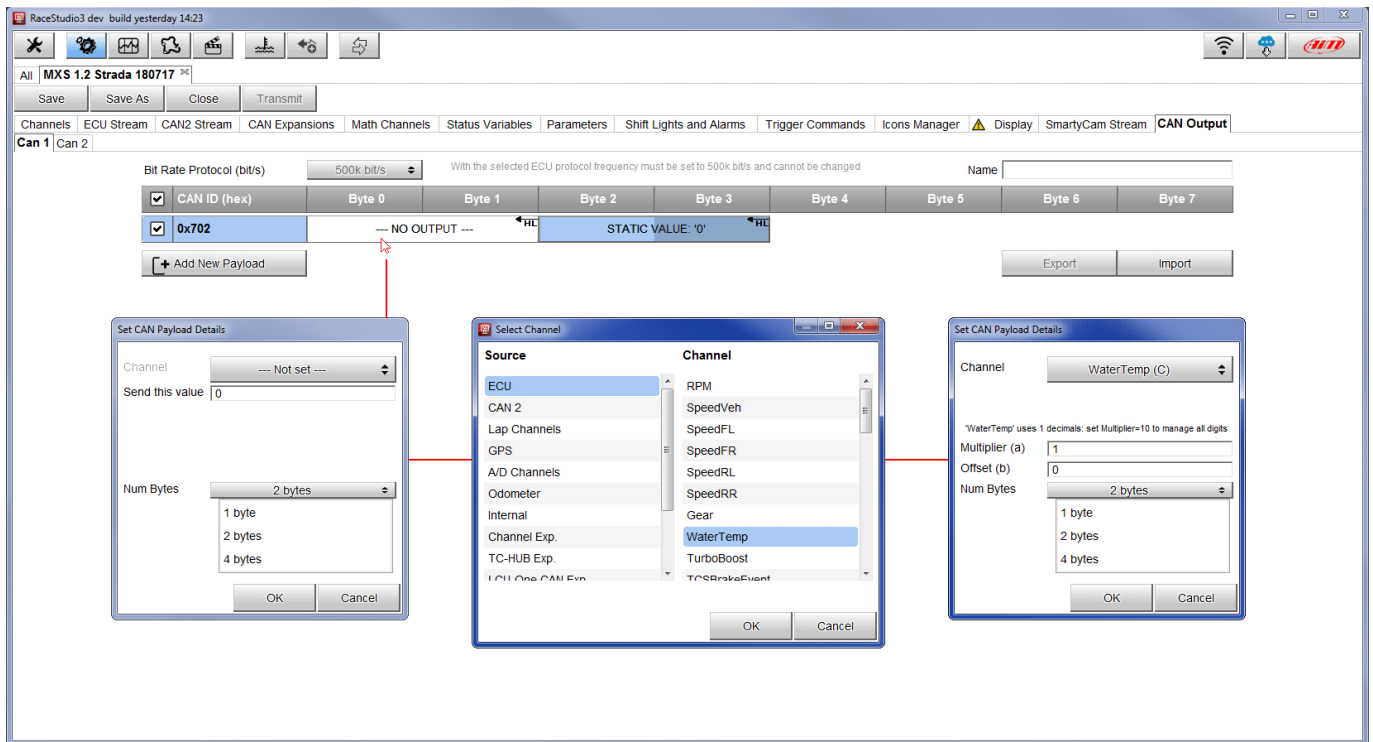


The dash can transmit a CAN data stream containing the channels required both on CAN1 and CAN2.

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:

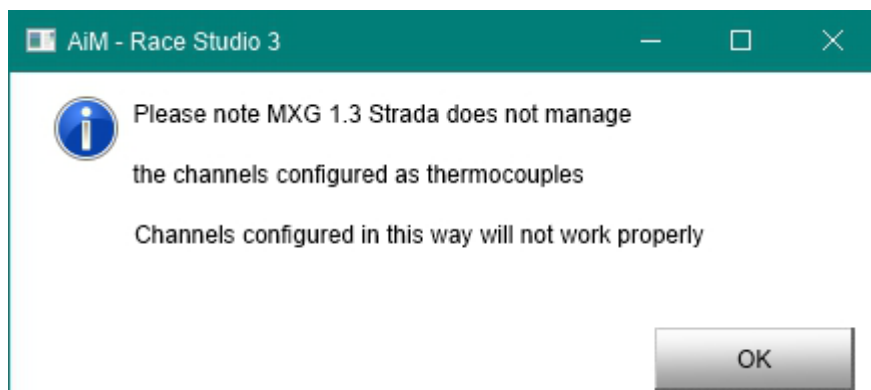
- press "Save" on the page top keyboard
- press "Transmit" to transmit the configuration to MX Strada series



5.2.14 – Transmitting the configuration to MX1.3 loggers

As said before: **MX1.3 strada loggers do not support thermocouple sensors except through a TC Hub** so if you set these sensors you need to add a TC Hub to AiM network

For this reason if your configuration includes one or both of these features and no TC Hub is connected when you transmit the configuration to the logger the panel shown below is prompted.



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**:

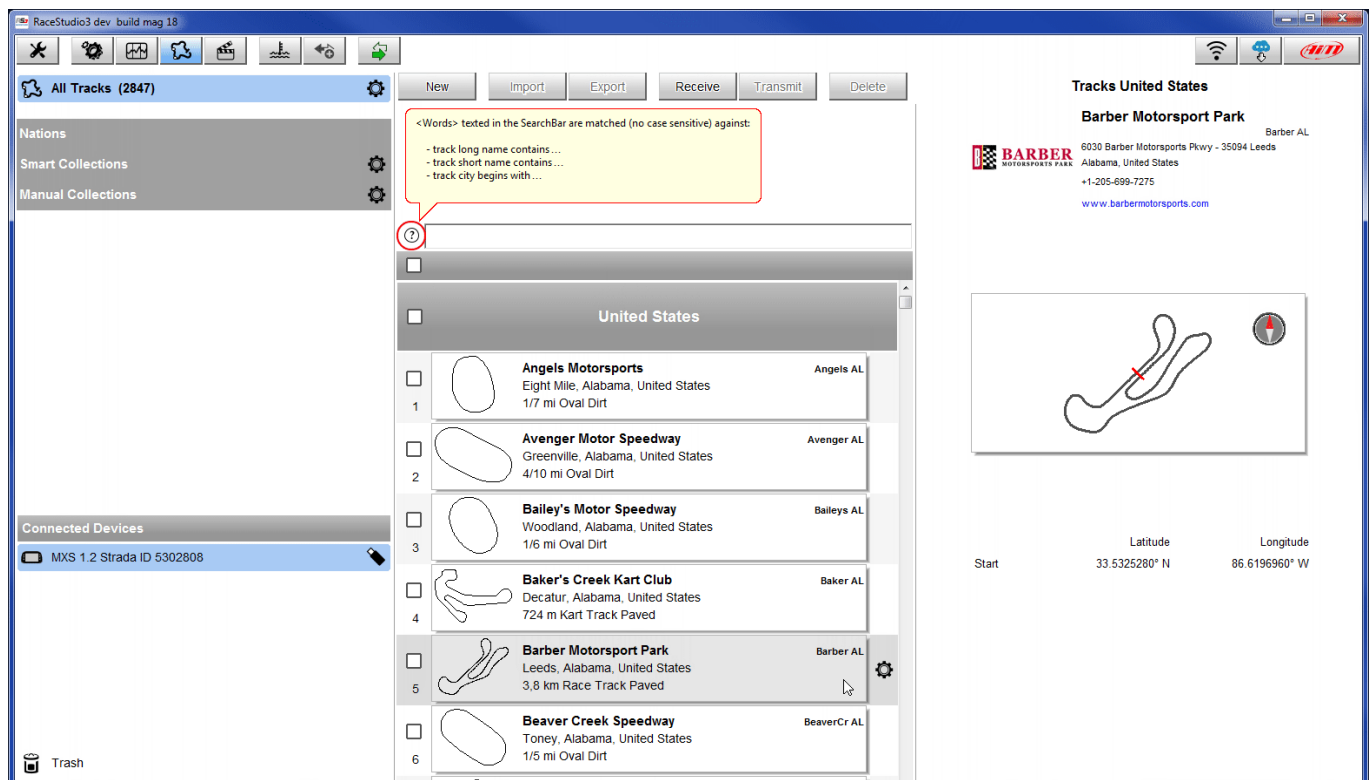
- on top, the filters that allow to collect many tracks following customized criteria; by default, all tracks are shown (light blue “All Tracks” filter in the image below).
- bottom left, the connected devices (“MXS 1.2 Strada ID 5302808” below)

The column **in the middle** shows:

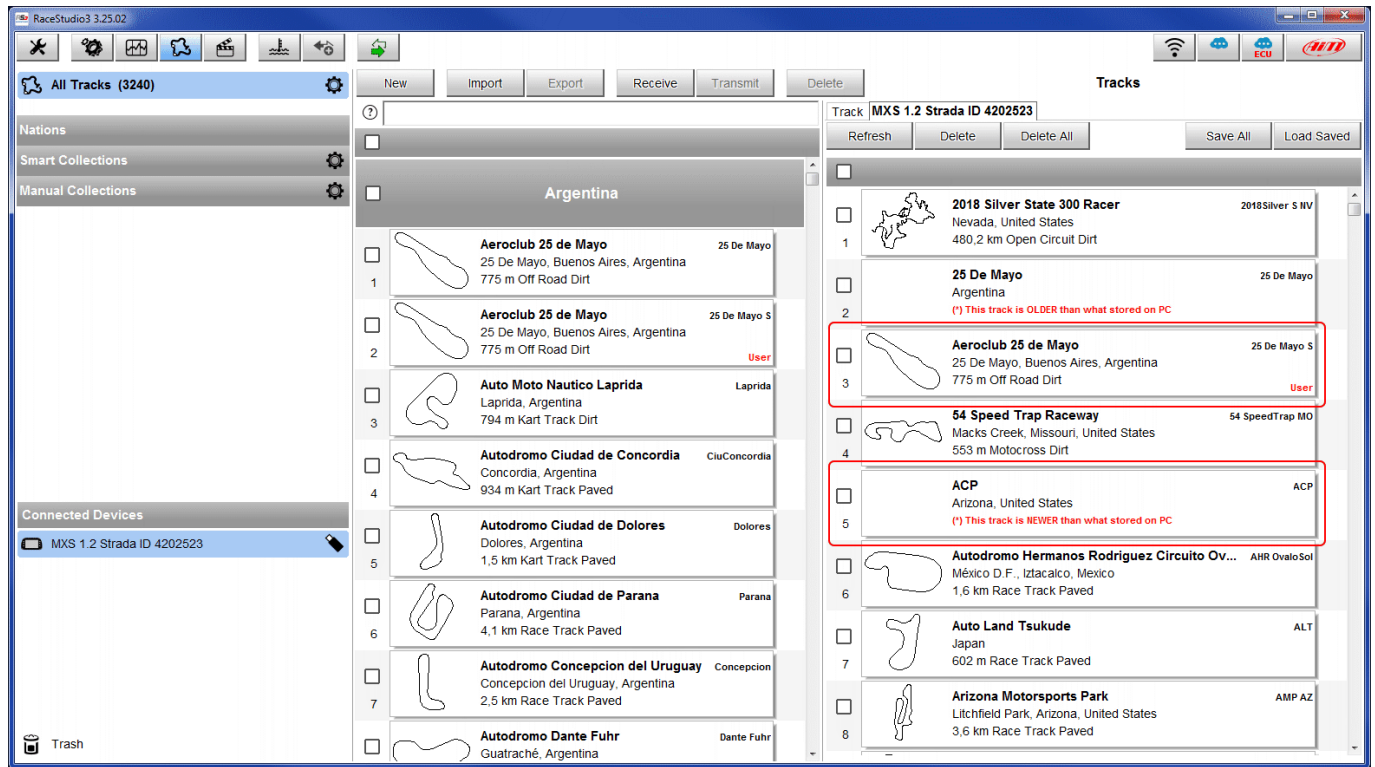
- on top a fast search bar, that allows to select the tracks which satisfy your personal research criteria; pressing “?” a pop-up message explains research criteria (highlighted in red below), to say:
 - long name is the name in bold in each track box
 - short name is the track name shown on the display 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

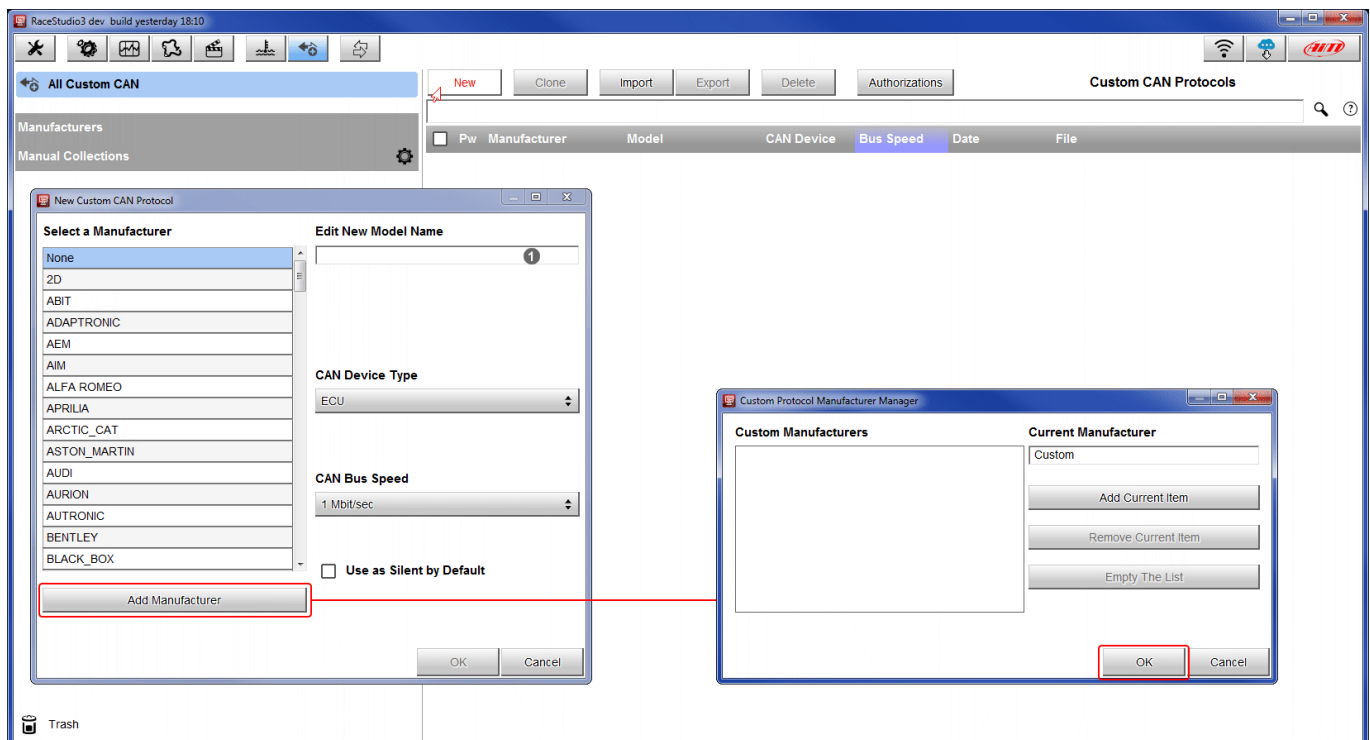


If the vehicle ECU is not included in Race Studio 3 software a specific CAN protocol can be created using CAN Driver builder.

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

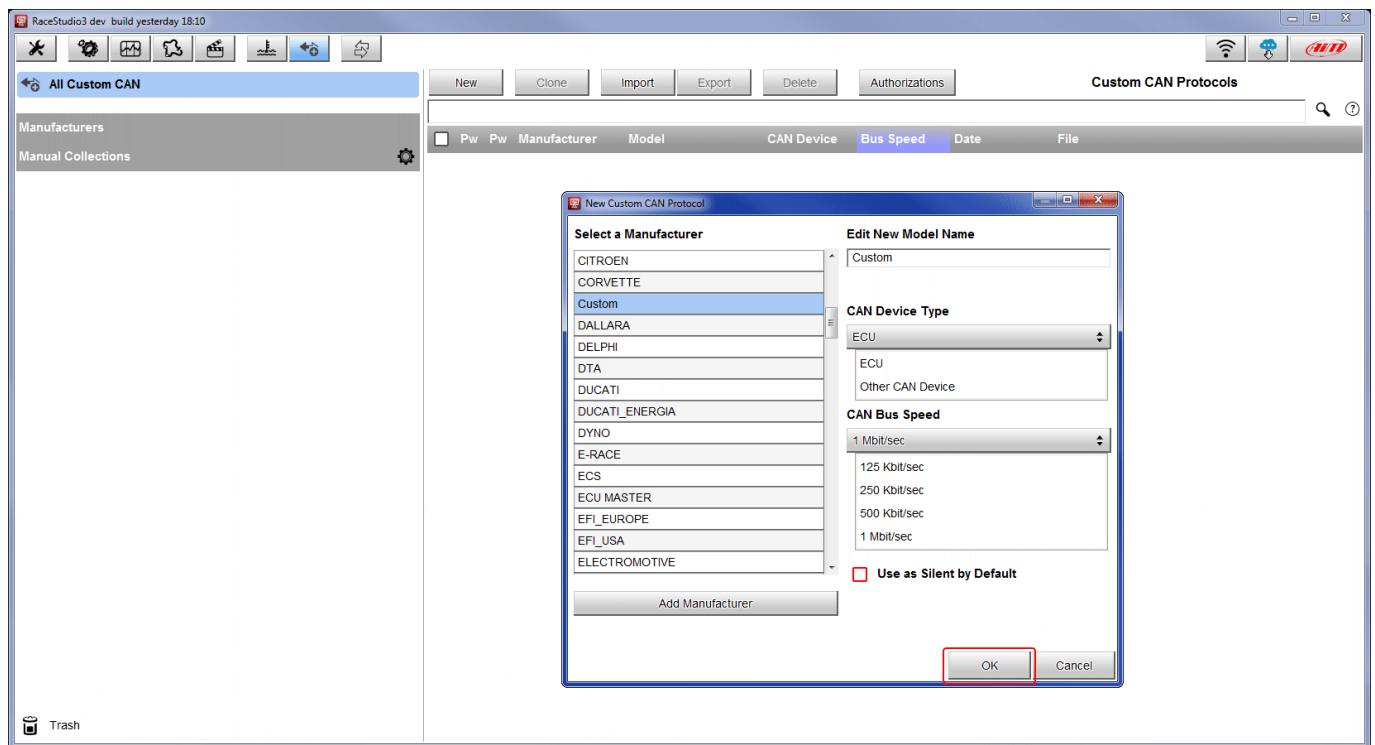
It is possible to add a new ECU Manufacturer and/or a new ECU model. To do so:

- 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.



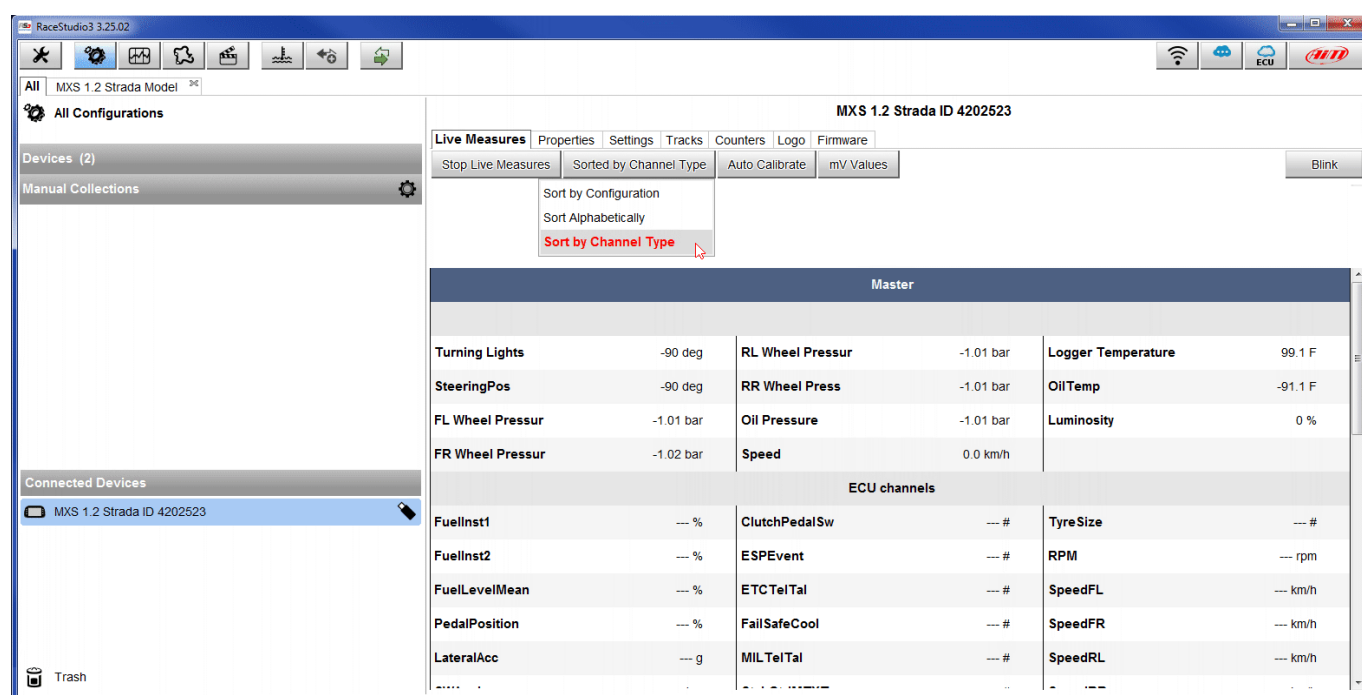
The software comes back to “New Custom CAN Protocol”:

- 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

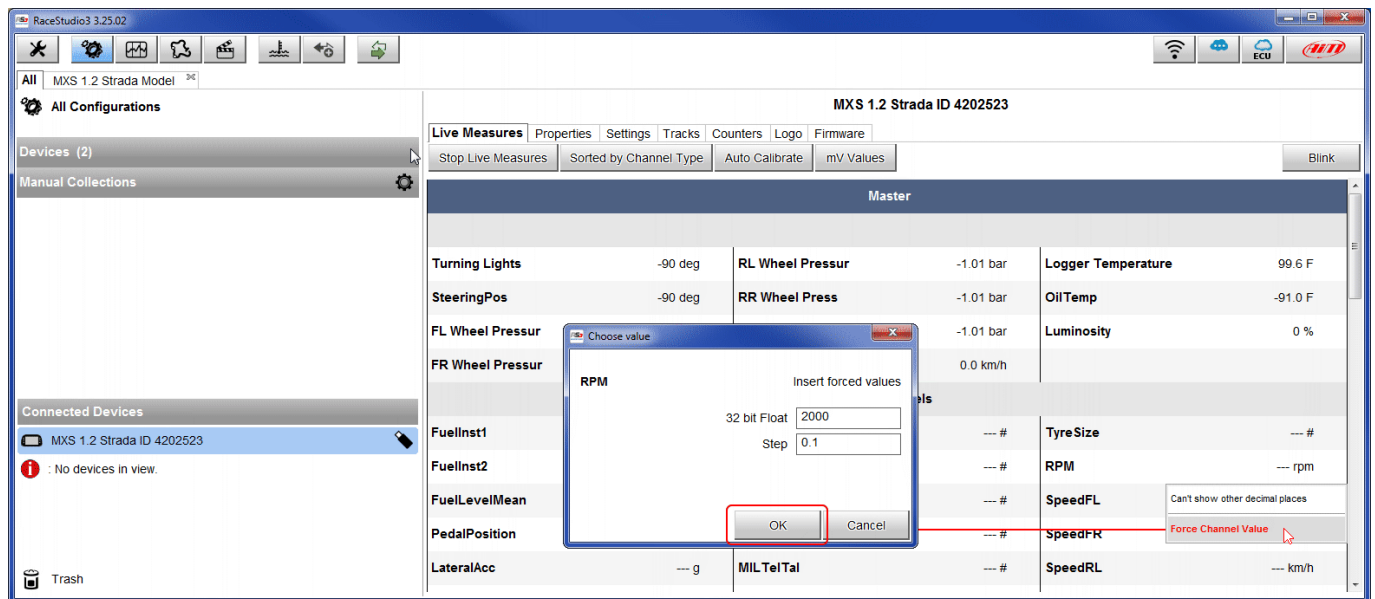
Once the configuration has been transmitted "Live Measures" page shows ECU Channels too and some operations can be performed, like start recording and stop live measures as well as making the device blinking pressing the button top right of the page. This last operation is the easiest and quickest way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

5.5.2 – Online value forcing

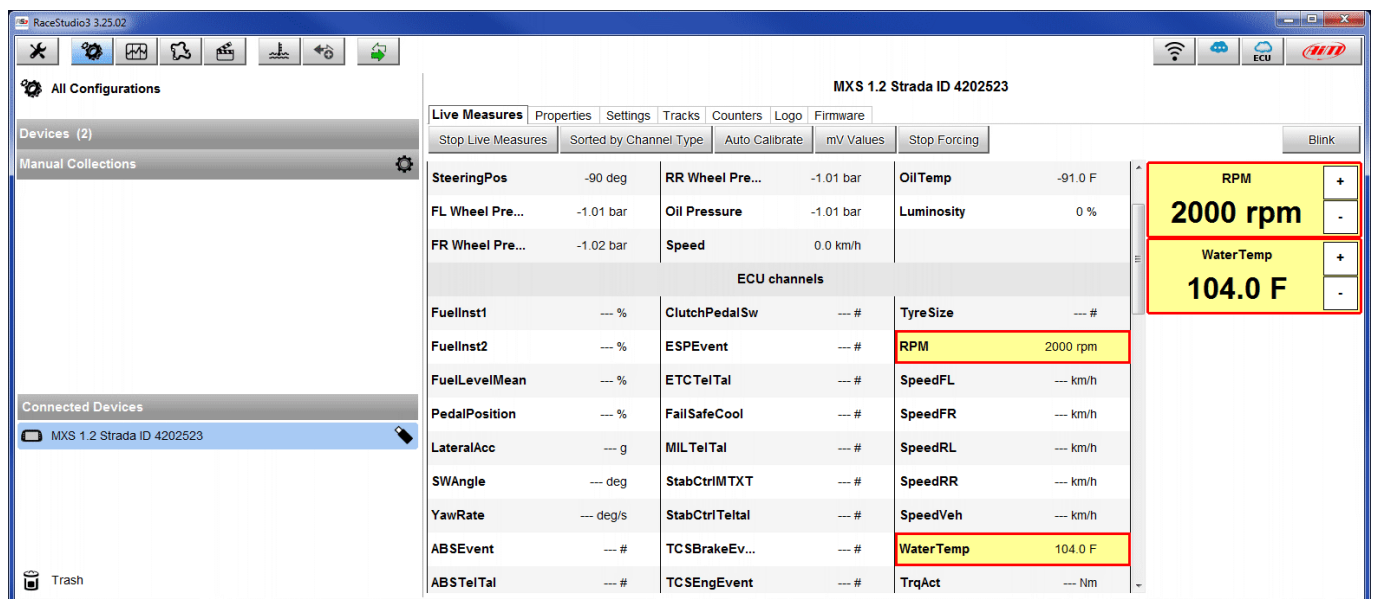
Starting from Race Studio 3.24.02 Device page Live measures layer features a new and very useful option: online measure value forcing. This feature allows the user to simulate one or more channels value to test icons, alarms, power output and harnesses behaviour. With reference to the configuration we 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"

TODAY 02.02PM			
MAX RPM 10048		MAX SPEED 282	
Lap	Best Laps	RPM	Km/h
4	1:57:56	10048 5592	280 73
11	1:57:94	10100 5450	277 70
8	1:58:02	10300 5700	278 69

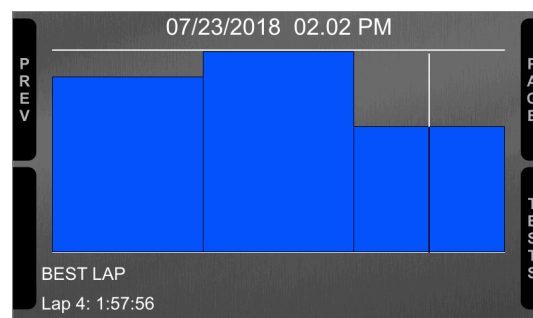
Second is "Summary" page that shows all the last tests with date and place. Select the day to see and press "ENTER".

TEST SESSIONS	
TODAY: COTA Austin	
21/07/2018:	Albany GA
21/07/2018:	Albany GA
20/07/2018:	Albany GA
20/07/2018:	Albany GA

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".

TODAY: COTA Austin					
PREV	02.02 PM	12.02 AM	10.43 AM	ENTER	BACK
	17 Laps	10 Laps	11 Laps		
	B 1.57.56	B 1.50.46	B 1.54.14		
NEXT	09.52 AM	09.02 AM	7.39 AM		
	7 Laps	9 Laps	10 Laps		
	B 1.55.56	B 1.53.46	B 1.55.16		

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



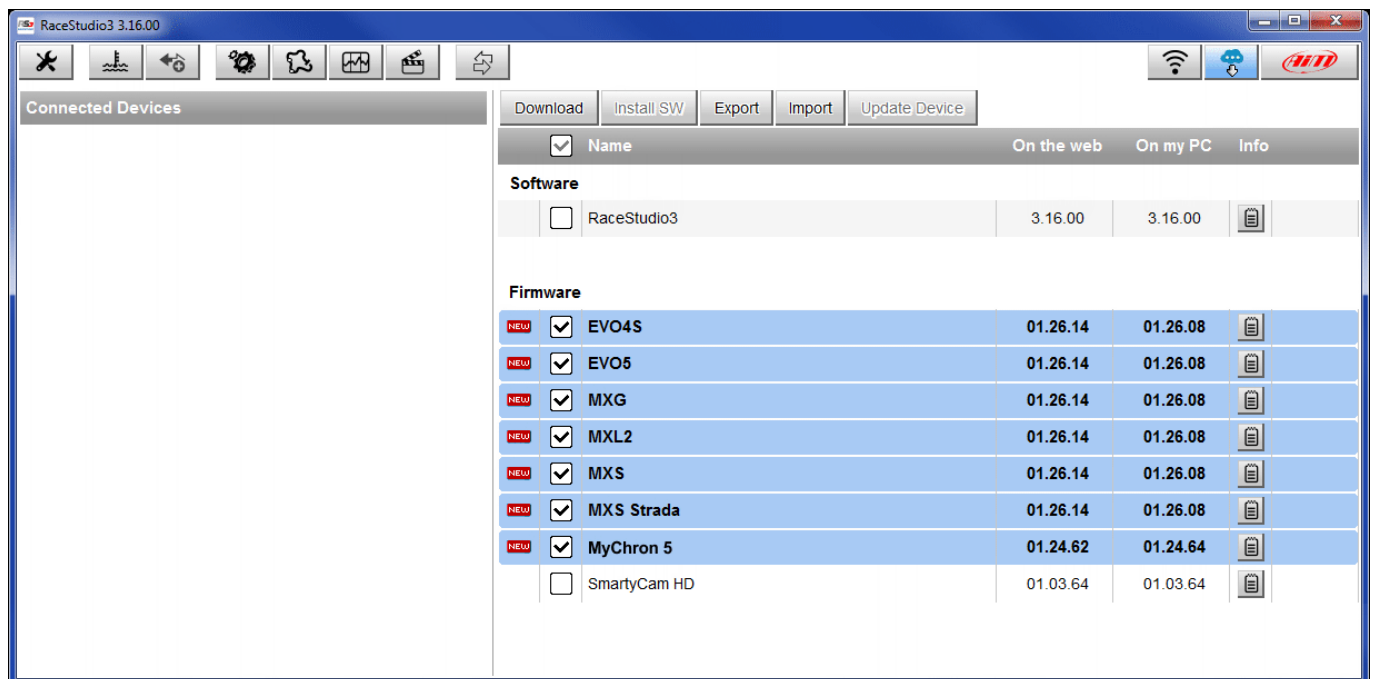
8 – New firmware upgrade



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

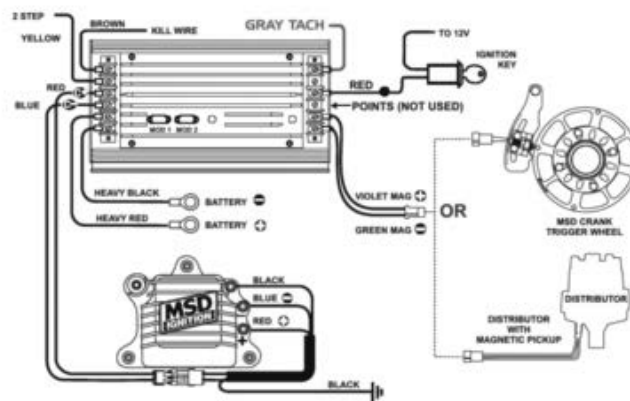
To get the RPM from the ECU just connect MX Strada series dash to the ECU and it will automatically sample that value.

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.



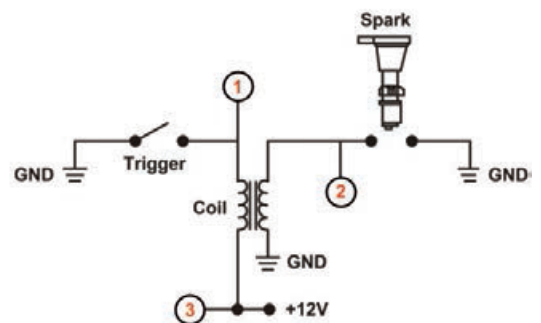
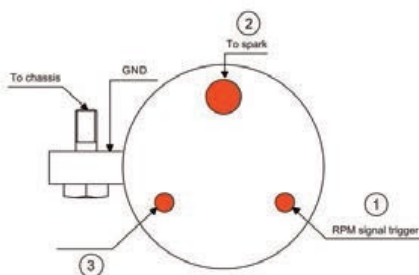
The output labelled "GRAY TACH" gives a 5-50V output that can be directly sampled by MX Strada series dash.

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.

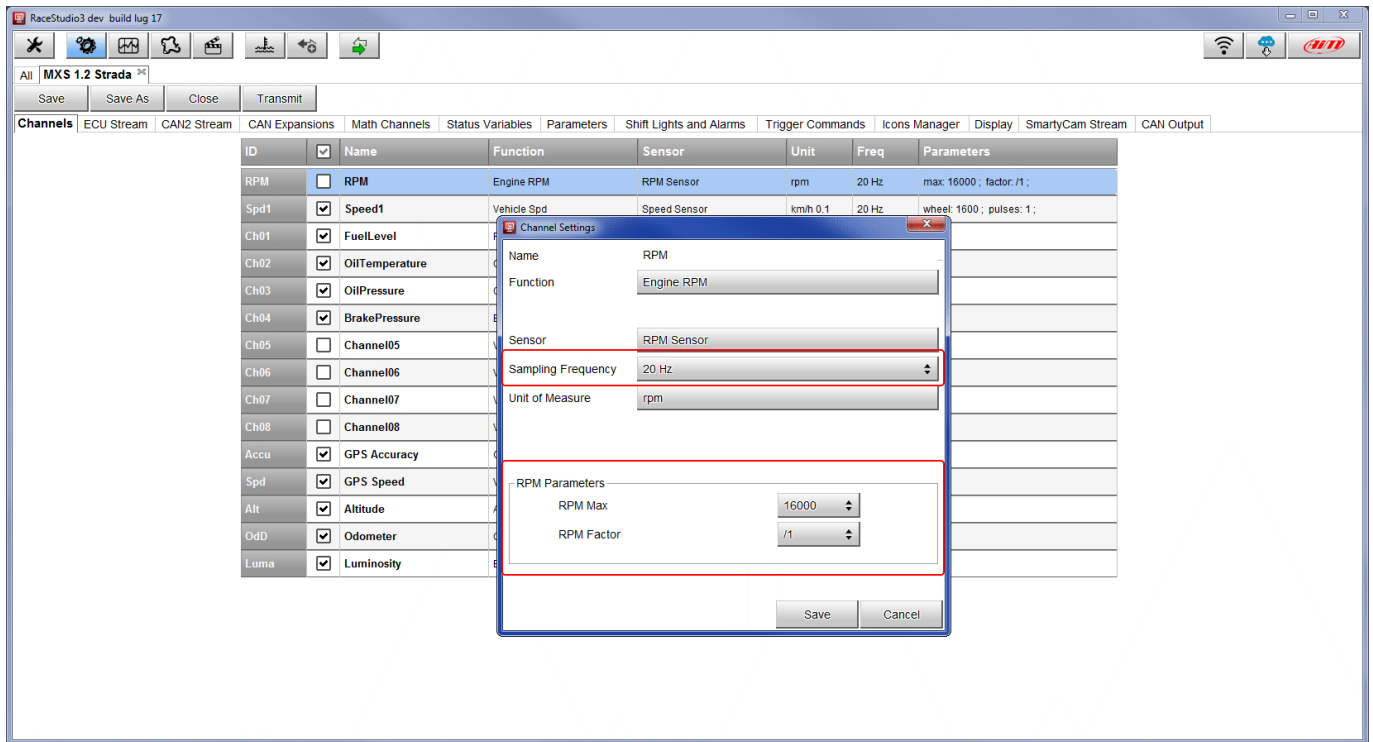
Point 1: low voltage of the coil

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 Smartcam 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.



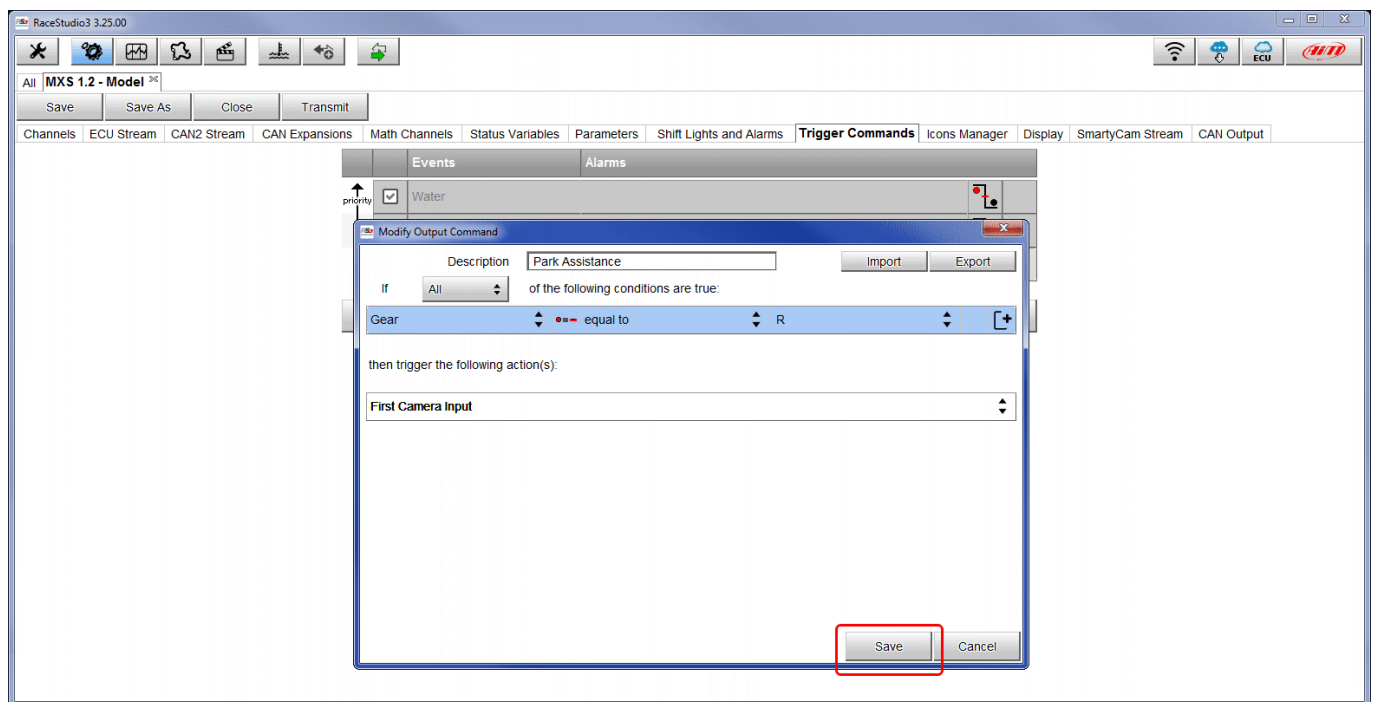
Rear cameras need to be connected to the logger, set in the logger configuration through Race Studio 3 software and executed through the logger keyboard. Here follows explanation of how to perform all these operations.

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.

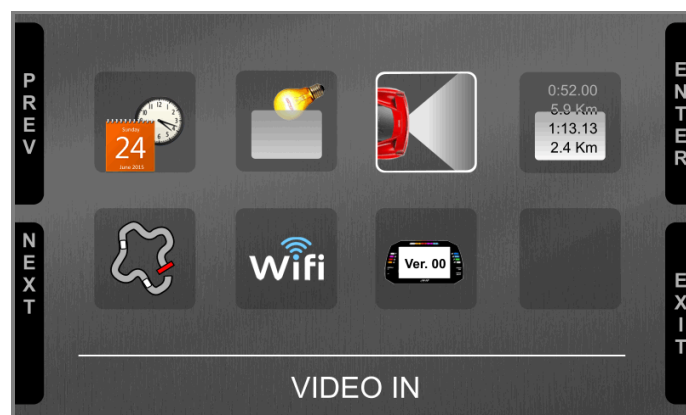
Please note: rear camera dimensions and MX Strada series camera input pinout are shown in chapter 11.

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"

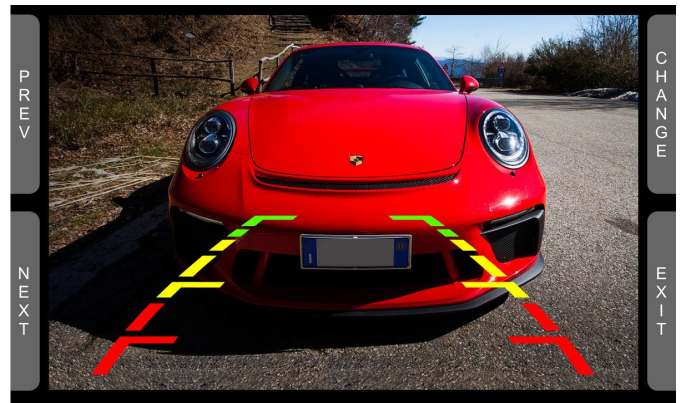
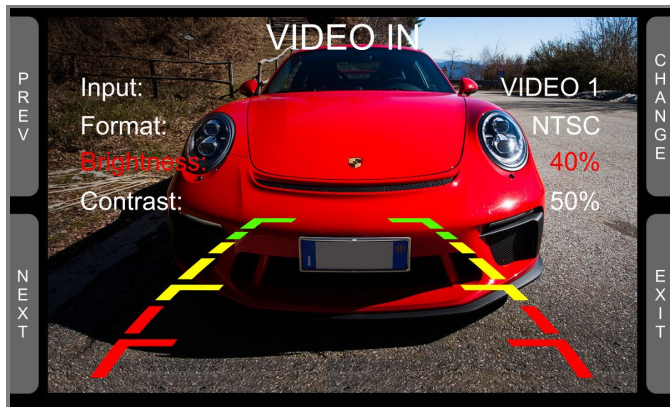


To perform the command on the dash press "MENU" button and scroll up to "VIDEO IN".





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.



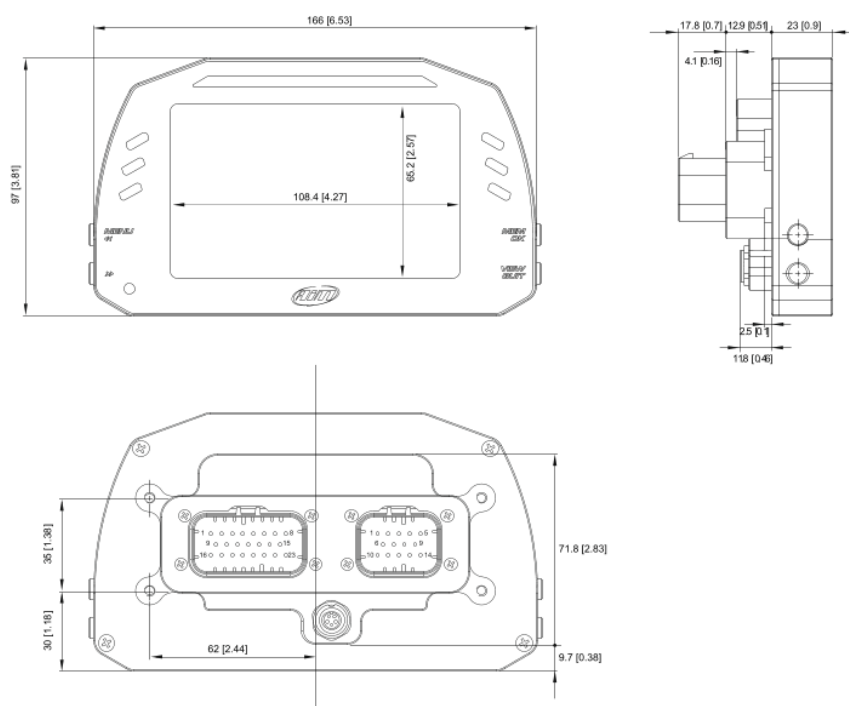


11 – Technical specifications and drawings

• 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

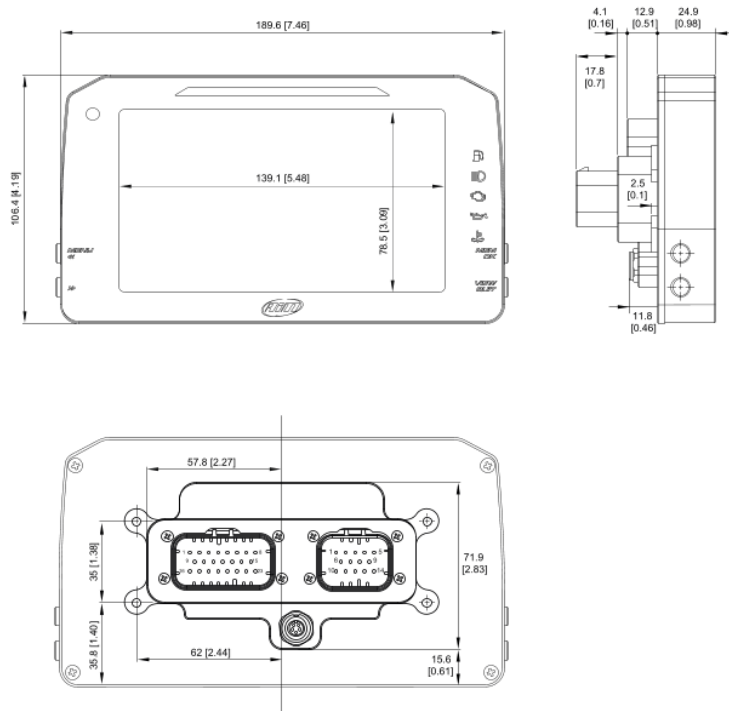


MXS 1.2 Strada dimensions in mm [inches]



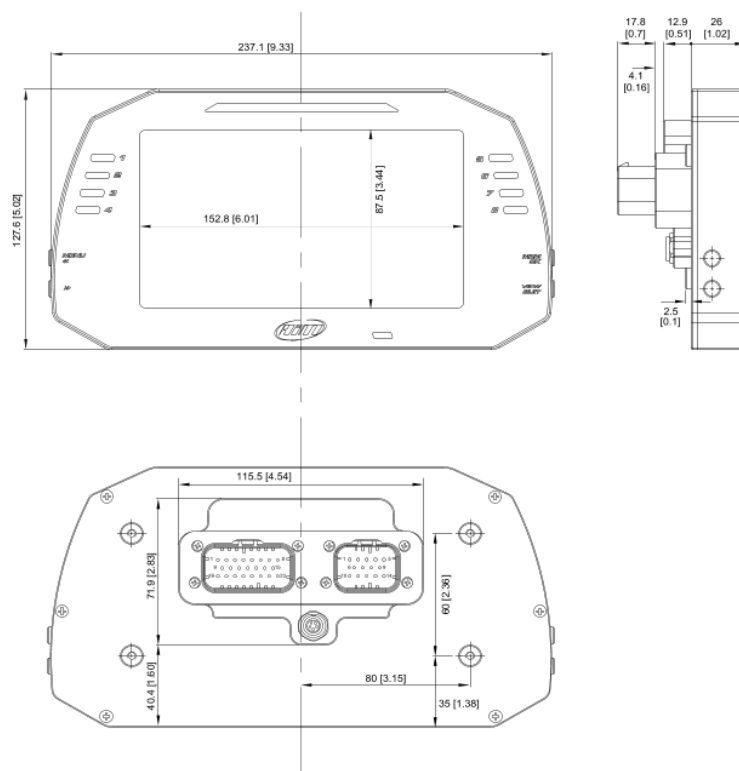


MXP Strada dimensions in mm [inches]

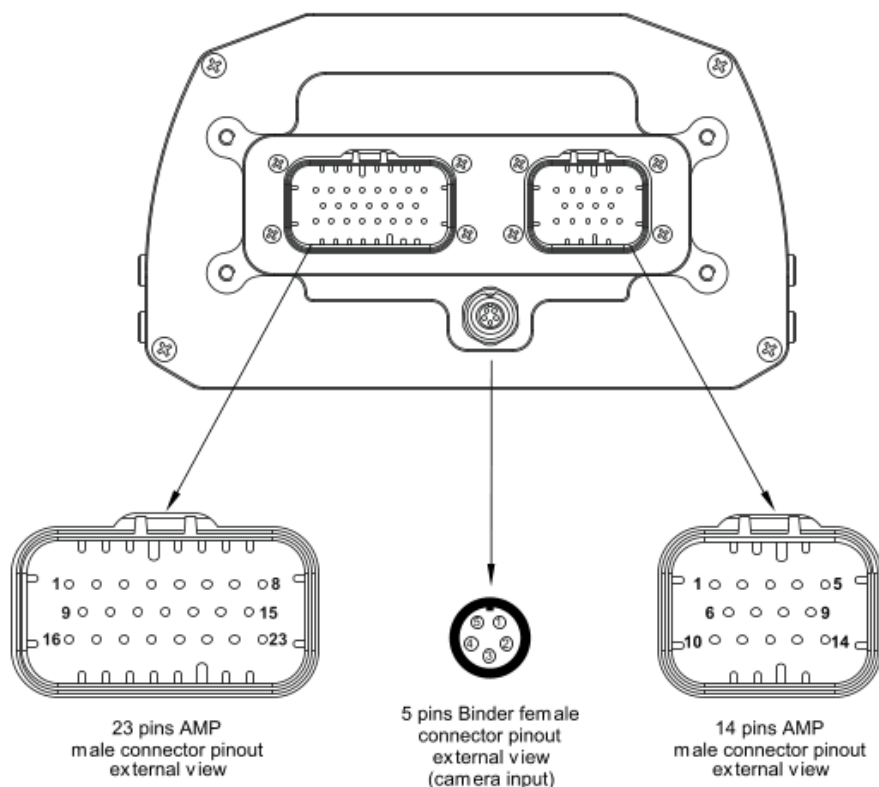




MXG 1.2 Strada dimensions in mm [inches]



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	9-15v 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

N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by
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MXS 1.2 Strada/MXP Strada/MXG 1.2 Strada standard harness for 14 pins AMP connector

14 pins AMP female flying connector

5 pins Binder 712 female connector pinout solder termination view

4 pins Binder 719 female connector pinout solder termination view


14 pins AMP connector pinout contact insertion view

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material	N. articolo / Item N.		
Progettato da / Designed by D.B.	Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 13/12/2017	Scala / Scale
		Titolo/Title Cablaggio standard connettore AMP 14 pin per MXS1.2 Strada/MXP Strada/MXG 1.2 Strada			
		N. disegno / Drawing N. 04.573.32		Rev. / Rev 3	Foglio / Sheet 1 of 2

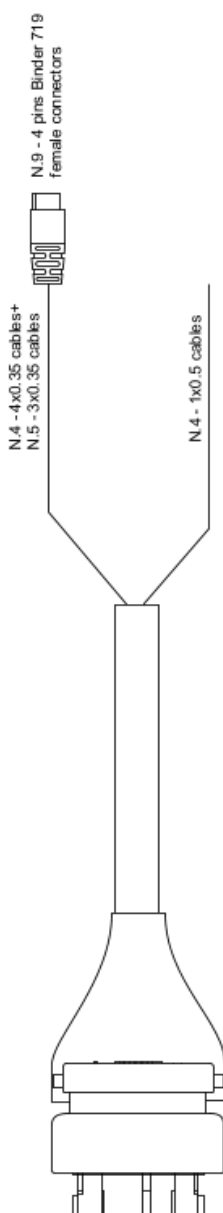

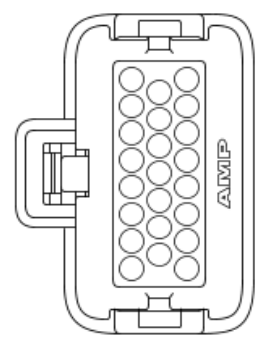

N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by		
Table of cables ending with 4 pins Binder 719 female connector						
14 pins AMP connector	Cable colour	Destination connector pin	Cable type	Length	Channel	Label
11 13 12	White twisted Black Blue twisted n.c.	1 2 3 4	twistato 2x0.35+1x0.35	1100mm	USB D+ USB GND USB D- n.c.	USB

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
3 4 5 6 7	White Black Red Blue Orange	1 2 3 4 5	5x0.25 mm ²	350mm	CAN+ Exp GND Vb out CAN CAN- Exp Vb ext CAN	Exp

Table of not cabled cables				
14 pins AMP connector	Cable colour	Cable type	Length	Label
2 1	Black Red	1x0.5 mm ² 1x0.5 mm ²	550mm	Battery GND 9-15V Power input
8 9	White Blue	1x0.5 mm ² 1x0.5 mm ²	550mm	CAN1+/ECU RS232TX CAN1-/ECU RS232RX
14	Yellow	1x0.5 mm ²	550mm	RESERVED


Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.		
Progettato da / Designed by D.B.		Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 13/12/2017	Scala / Scale
			Titolo/Title Cablaggio standard connettore AMP 14 pin per MXS 1.2 Strada/MXP Strada/MXG 1.2 Strada			
			N. disegno / Drawing N. 04.573.32		Rev. / Rev 3	Foglio / Sheet 2 of 2

MX Strada series 23 pins AMP connector harness – standard version

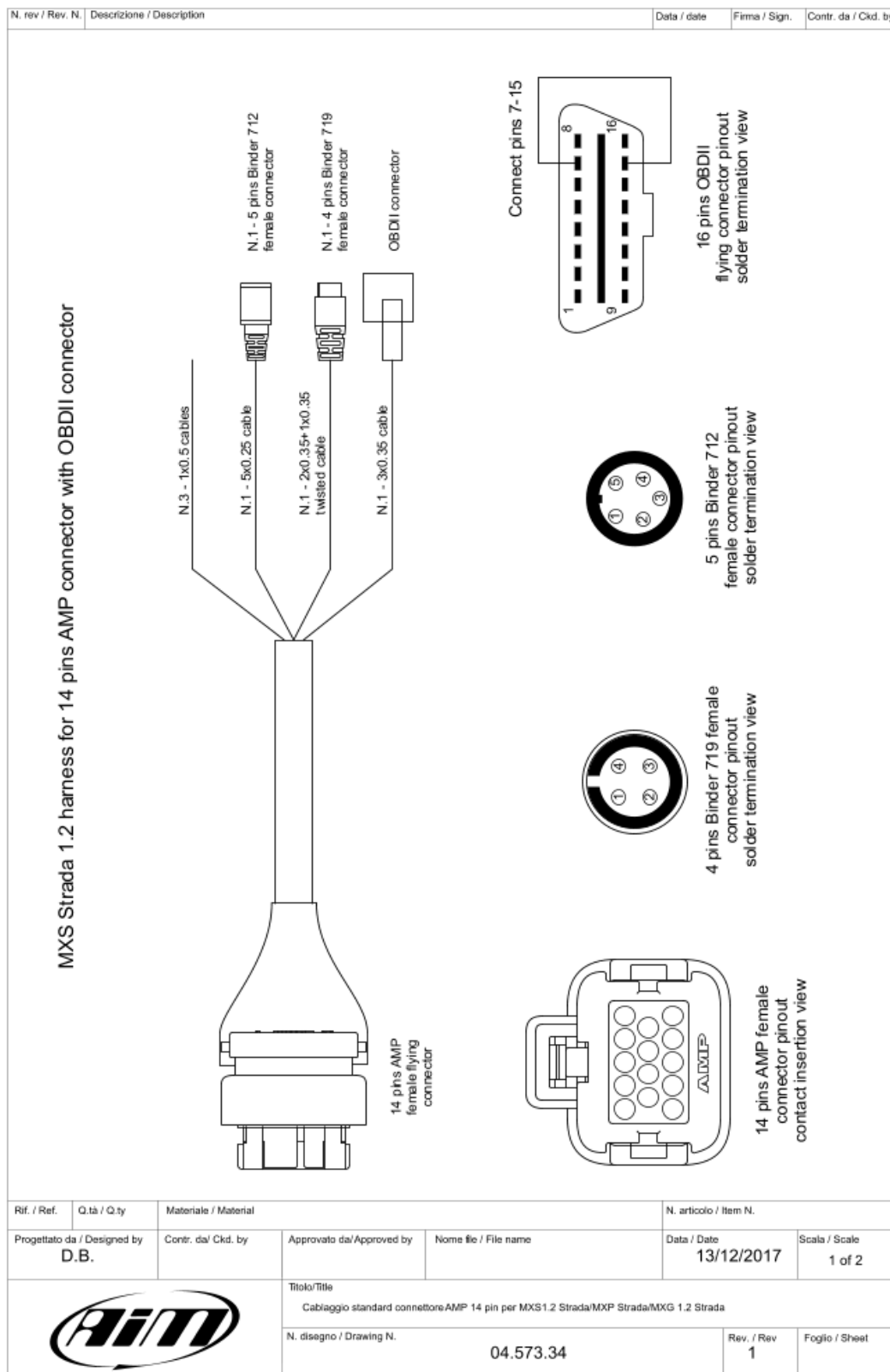
N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>MXS Strada 1.2 standard harness for 23 pins AMP connector</p>  <p style="text-align: center;">23 pins AMP female flying connector</p> </div> <div style="width: 45%;">  <p>4 pins Binder 719 female connector pinout solder termination view</p>  <p>23 pins AMP female connector pinout contact insertion view</p> </div> </div>				
Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.
Progettato da / Designed by D.B.	Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 13/12/2017
		Titolo/Title Cablaggio standard connettore AMP 23 pin per MXS1.2 Strada/MXP Strada/MXG 1.2 Strada		
		N. disegno / Drawing N. <div style="text-align: center;">04.573.33</div>	Rev. / Rev	Foglio / Sheet 1 of 2


N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by		
Table of cables ending with 4 pins Binder 719 female connectors						
23 pins AMP Connettor pin	Cable colour	Destination connector pin	Cable type	Length	Channel	Label
1 2 3 4	White Black Red Blue	1 2 3 4	4x0.35mm ²	340mm	+Analog channel 1 Analog GND +Vb output +Vreference	Channel 1
5 2 3 4	White Black Red Blue	1 2 3 4	4x0.35mm ²	340mm	+Analog channel 2 Analog GND +Vb output +Vreference	Channel 2
6 7 8 9	White Black Red Blue	1 2 3 4	4x0.35mm ²	360mm	+Analog channel 3 Analog GND +Vb output +Vreference	Channel 3
10 7 8 9	White Black Red Blue	1 2 3 4	4x0.35mm ²	360mm	+Analog channel 4 Analog GND +Vb output +Vreference	Channel 4
11 2 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35mm ²	380mm	+Analog channel 5 Analog GND nc +Vreference	Channel 5
14 12 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35mm ²	380mm	+Analog channel 6 Analog GND nc +Vreference	Channel 6
15 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35mm ²	400mm	+Analog channel 7 Analog GND nc +Vreference	Channel 7
17 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35mm ²	400mm	+Analog channel 8 Analog GND nc +Vreference	Channel 8
18 19 3	White Black n.c. Blue	1 2 3 4	3x0.35mm ²	320mm	Speed 1 GND +Vb output 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 mm ² 1x0.5 mm ² 1x0.5 mm ² 1x0.5 mm ²	550mm	Low Side digital output RPM Input CAN2+ CAN2-	

Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.		
Progettato da / Designed by D.B.	Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name		Data / Date 13/12/2017	Scala / Scale
		Titolo/Title Cablaggio standard connettore AMP 14 pin per MXS 1.2 Strada/MXP Strada/MXG 1.2 Strada				
		N. disegno / Drawing N. 04.573.33		Rev. / Rev	Foglio / Sheet 2 of 2	





MX Strada series 14 pins AMP connector harness with OBDII connector



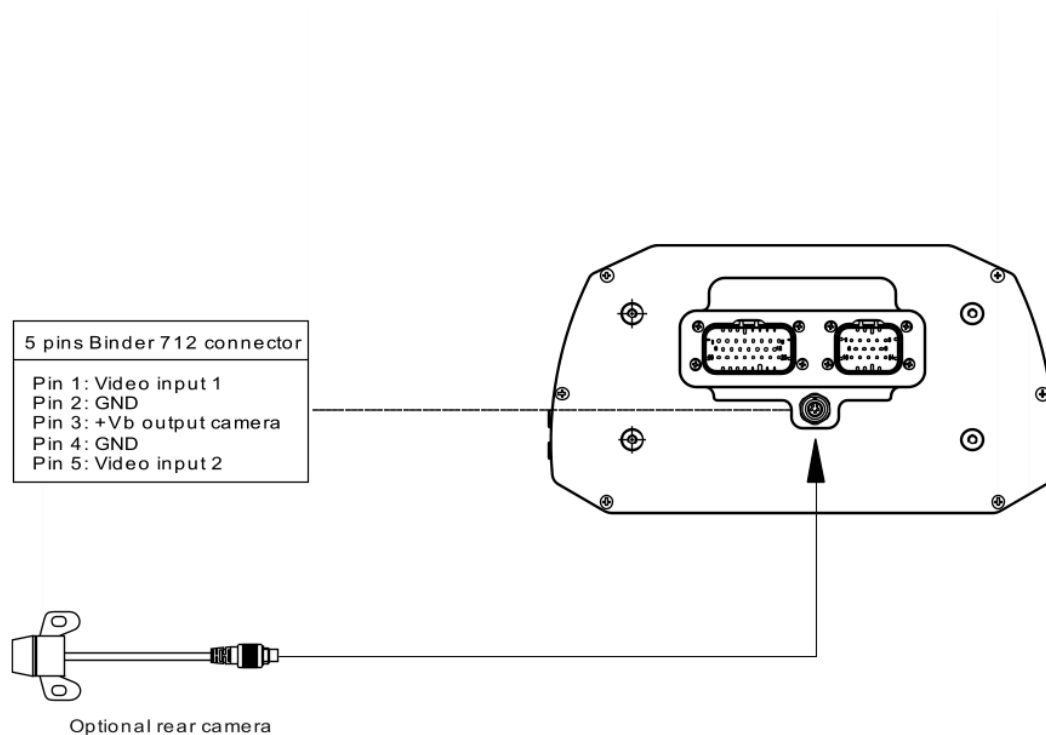
N. rev / Rev. N.	Descrizione / Description				Data / date	Firma / Sign.	Contr. da / Ckd. by																					
<table border="1"> <tr> <th colspan="7">Table of cables ending with 4 pins Binder 719 female connector</th> </tr> <tr> <th>14 pins AMP connector pin</th> <th>Cable colour</th> <th>Destination connector pin</th> <th>Cable type</th> <th>Length</th> <th>Channel</th> <th>Label</th> </tr> <tr> <td>11 13 12</td> <td>White twisted Black Blue twisted n.c.</td> <td>1 2 3 4</td> <td>2x0.35+1x0.35 twisted</td> <td>1100 mm</td> <td>USB D+ USB GND USB D- n.c.</td> <td>USB</td> </tr> </table>								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 13 12	White twisted Black Blue twisted n.c.	1 2 3 4	2x0.35+1x0.35 twisted	1100 mm	USB D+ USB GND USB D- n.c.	USB
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 13 12	White twisted Black Blue twisted n.c.	1 2 3 4	2x0.35+1x0.35 twisted	1100 mm	USB D+ USB GND USB D- n.c.	USB																						
<table border="1"> <tr> <th colspan="7">Table of cables ending with 5 pins Binder 712 female connector</th> </tr> <tr> <th>14 pins AMP connector</th> <th>Cable colour</th> <th>Destination connector pin</th> <th>Cable type</th> <th>Length</th> <th>Channel</th> <th>Label</th> </tr> <tr> <td>3 4 5 6 7</td> <td>White Black Red Blue Orange</td> <td>1 2 3 4 5</td> <td>5x0.25 mm²</td> <td>350 mm</td> <td>CAN+ Exp GND Vb out CAN CAN- Exp Vb ext CAN</td> <td>Exp</td> </tr> </table>								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	3 4 5 6 7	White Black Red Blue Orange	1 2 3 4 5	5x0.25 mm ²	350 mm	CAN+ Exp GND Vb out CAN CAN- Exp Vb ext CAN	Exp
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																						
3 4 5 6 7	White Black Red Blue Orange	1 2 3 4 5	5x0.25 mm ²	350 mm	CAN+ Exp GND Vb out CAN CAN- Exp Vb ext CAN	Exp																						
Rif. / Ref.	Q.tà / Q.ty	Materiale / Material			N. articolo / Item N.																							
Progettato da / Designed by D.B.		Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 13/12/2017	Scala / Scale																						
			Titolo/Title Cablaggio standard connettore AMP 14 pin per MXS 1.2 Strada/MXP Strada/MXG 1.2 Strada																									
			N. disegno / Drawing N. 04.573.34		Rev. / Rev 3	Foglio / Sheet 2 of 2																						



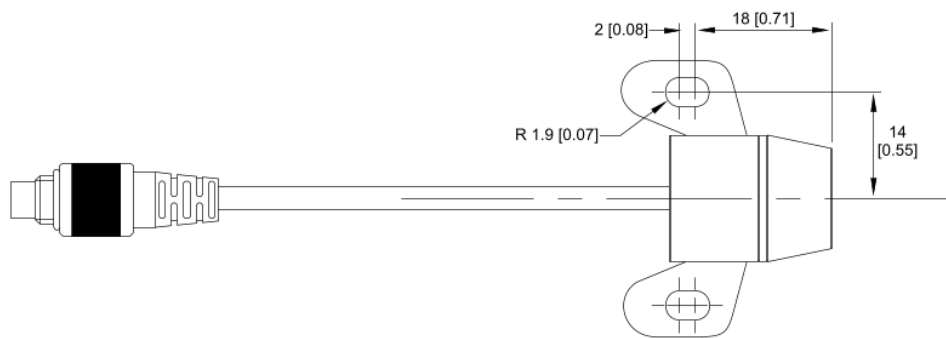
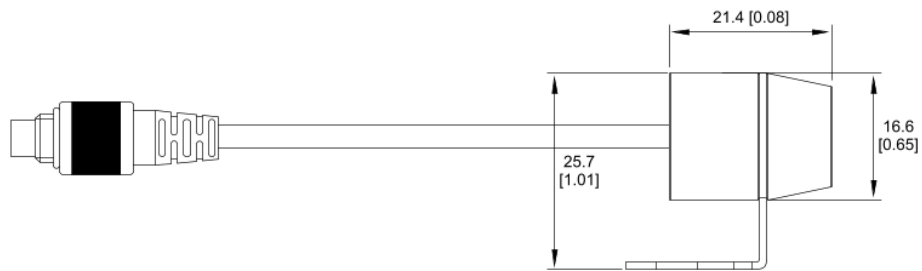
MX Strada Series USB Cable

N. rev / Rev. N.		Descrizione / Description		Data / date		Firma / Sign.		Contr. da / Ckd. by	
<div><div><div>Mini USB cap</div><div></div></div><div><div></div><div>4 pins Binder 719 male connector</div></div><div><div><div>Green Black White</div><div>USB D+ GND USB D- 1 2 3 4</div></div><div><div></div><div>4 pins Binder 719 male connector pinout solder termination view</div></div></div></div>									
Rif. / Ref.		Q.tà / Q.ty		Materiale / Material		N. articolo / Item N.			
Progettato da / Designed by D.B.		Contr. da/ Ckd. by		Approvato da/ Approved by		Nome file / File name		Data / Date 31/08/12	
		Titolo/Title Cavo adattatore USB per MXL2/MXG/MXG 1.2/MXP/MXS/MXS1.2							
		N. disegno / Drawing N. 04.573.20						Rev. / Rev 8 Foglio / Sheet 1 of 1	

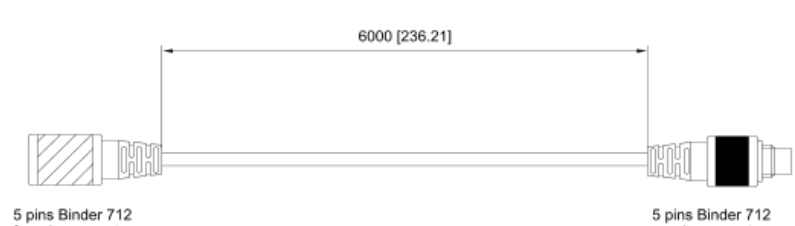



MX Strada series mirror camera input



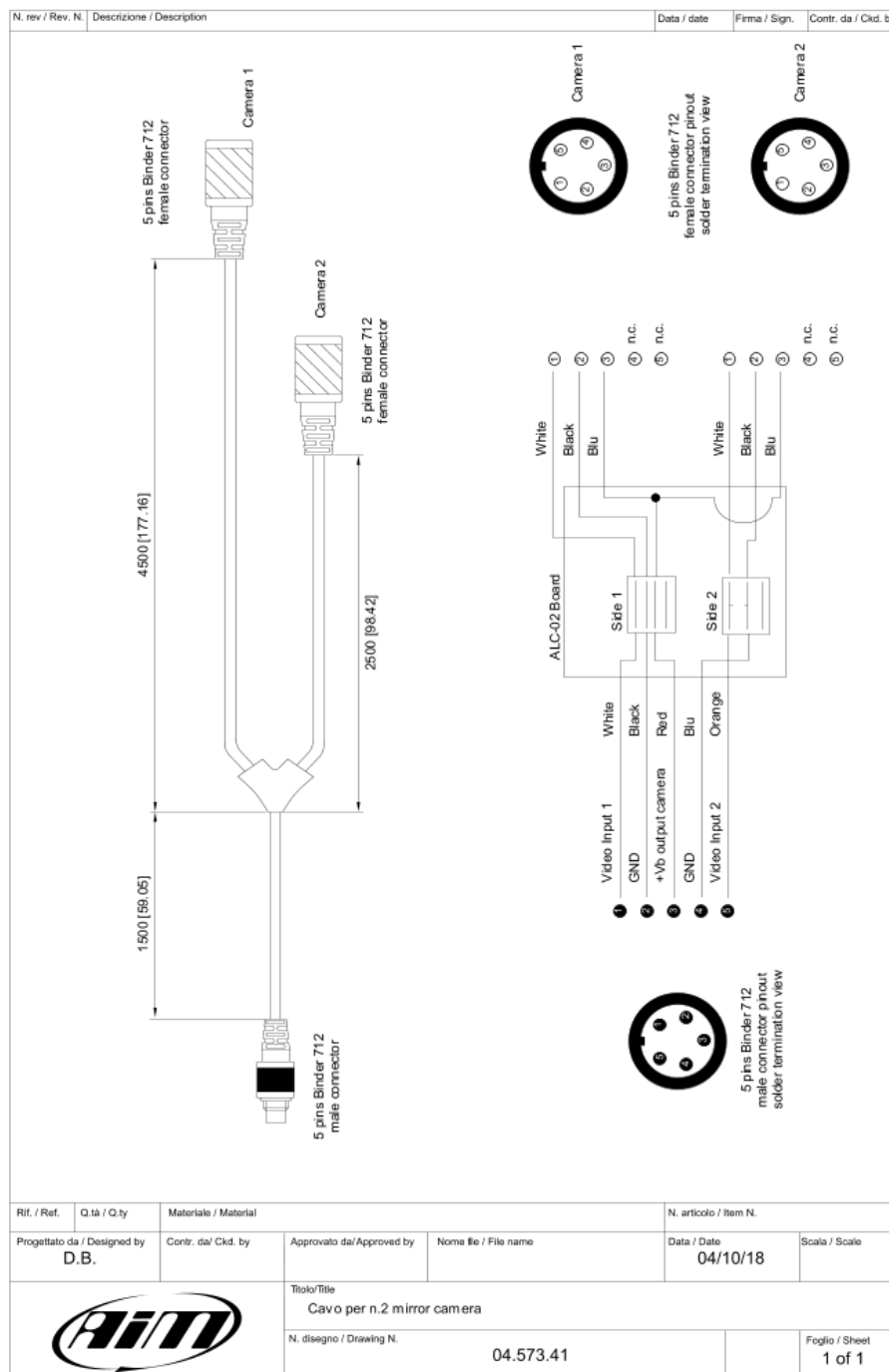
Mirror camera dimensions in mm [inches]



MX Strada series cable for single AiM mirror camera

N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by															
 <p>5 pins Binder 712 female connector</p> <p>5 pins Binder 712 male connector</p>																			
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>5 pins Binder 712 female connector pinout solder termination view</p> </div> <div style="text-align: center;"> <table border="0"> <tr><td>①</td><td>White</td><td>①</td></tr> <tr><td>②</td><td>Black</td><td>②</td></tr> <tr><td>③</td><td>Red</td><td>③</td></tr> <tr><td>④</td><td>Blue</td><td>④</td></tr> <tr><td>⑤</td><td>orange</td><td>⑤</td></tr> </table> </div> <div style="text-align: center;">  <p>5 pins Binder 712 male connector pinout solder termination view</p> </div> </div>					①	White	①	②	Black	②	③	Red	③	④	Blue	④	⑤	orange	⑤
①	White	①																	
②	Black	②																	
③	Red	③																	
④	Blue	④																	
⑤	orange	⑤																	
Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.															
Progettato da / Designed by D.B.	Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 04/10/18															
		Titolo/Title Prolunga CAN single camera																	
		N. disegno / Drawing N. 04.551.17		Foglio / Sheet 1 of 1															

MX Strada series cable for n.2 AiM mirror camera





MX Strada series cable for single non AiM rear camera

N. rev / Rev. N.	Descrizione / Description	Data / date	Firma / Sign.	Contr. da / Ckd. by															
<div><p>5m [196.85]</p><p>RCA male video connector</p><p>DC power male connector</p><p>5 pins Binder 712 male connector</p><table><tr><td>1</td><td>Video Input 1</td><td>White</td></tr><tr><td>2</td><td>GND</td><td></td></tr><tr><td>3</td><td>+Vb output camera</td><td>Red</td></tr><tr><td>4</td><td>nc</td><td></td></tr><tr><td>5</td><td>nc</td><td></td></tr></table><p>5 pins Binder 712 male connector pinout solder termination view</p></div>					1	Video Input 1	White	2	GND		3	+Vb output camera	Red	4	nc		5	nc	
1	Video Input 1	White																	
2	GND																		
3	+Vb output camera	Red																	
4	nc																		
5	nc																		
Rif. / Ref.	Q.tà / Q.ty	Materiale / Material		N. articolo / Item N.															
Progettato da / Designed by D.B.	Contr. da/ Ckd. by	Approvato da/ Approved by	Nome file / File name	Data / Date 04/10/18															
		Titolo/Title Cavo per rear master camera - lunghezza 5m																	
		N. disegno / Drawing N. 04.573.39																	
		Rev. / Rev	Foglio / Sheet 1 of 1																

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

