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MXG 1.2 Strada MXP Strada MXS 1.2 Strada

**USER GUIDE 1.00** 













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### MXG 1.2 Strada - MXP Strada - MXS 1.2 Strada





#### MX STRADA SERIES

### 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 inputs
- 1 RPM input
- 8 analog 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 here below shows the difference among the loggers.

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 <sup>2</sup> - 1,100 Lum	nen	
Ambient Light Sensor	Yes		
Alarm Display Icons	Yes, freely configurab	le	
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 leadin	g ECUs
External Modules	GPS Module, Chanr SmartyCam HD	nel Expansion, TC Hub,	Lambda Controller,
Analog Inputs	8 fully configurable, r	nax 1.000 Hz each	
Digital Inputs	1 speed input, coil RP	M input	
Digital outputs	1 (1A each)		
Second CAN	Yes		
Body	Anodized Aluminium		
Pushbuttons	Metallic		
Connectors	2 AMP connectors+1	Binder 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

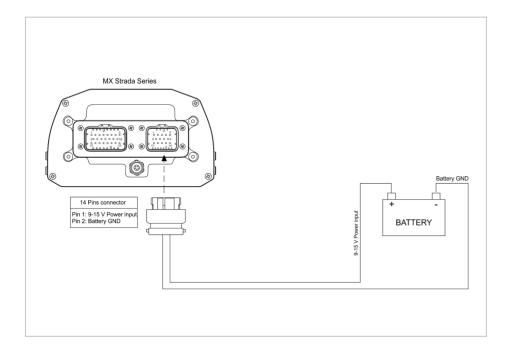
The power is managed by two pins of the 14 pins connector:

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

They must be connected as shown in the following diagram.



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





### 4.1 Set Date/Time



#### Press "Menu button and this page appears.



#### The icons are to manage:







Date/Time Backlight



Video in Counters (optional

additional

rear camera)

GPS and Tracks

System Info

Ver. 00



#### 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



#### MANUAL:

you may define the brightness of the display and LEDs choosing among some values: 20%, 40%, 60%, 80%, 100%



5.0 Km 1:13.13 2.4 Km

### 4.3 Set video input

logged).

Video In page manages up to two additio-

nal optional back cameras (that cannot be

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

Brightness and Contrast from 10 to 100%

Use "CHANGE" button to set each feature

Please refer to paragraph 11.1 ("Rear cameras connection and management")

Contrast

and "NEXT" to scroll the features.

the end of this user quide.

Features to set are: Input: Video 1 / Video 2

Format: NTSC/PAL

for further information.

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Х

NTSC

50%

### 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").

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

**VIDEO IN** P R E V Format: Brightness:



## 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 calculation
- Speed calculation
- Predictive lap time calculation

To calculate these data the system needs to know the start/finish line coordinates of the racetrack you are racing on: MX Strada series comes with a long list of the world main tracks, constantly updated by our technicians and automatically 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 (learning mode)



### 4.6 System Information



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

	System Info
Logger Serial N.:	MXS 1.2 Strada 4202523
Fw Version Boot Version	02.27.03 02.24.00

# 5 MX Strada series and the PC

Using AiM Race Studio 3 software you can configure MX Series, manage its tracks database as well as check other device functions through Race Studio 3 device window.

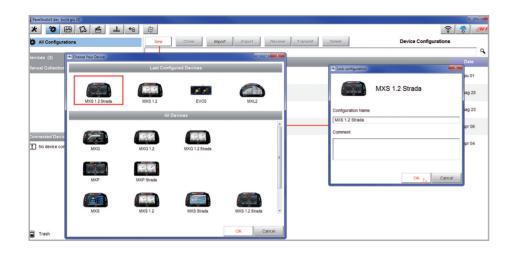
# 5.1 Connection to the PC

MX Series can be connected to the PC via Wi-Fi or using the USB cable included in the kit: plug it in the cable labelled "USB" of MX Series 37 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 to be configured:

- Channels: analog and digital sensors that 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.

* 🐲 🖽 🕄	e =	🚣 🕫 🖨						<b>?</b>
MXS 1.2 <sup>™</sup>								
Save Save As	Close	Transmit						
Channels ECU Stream CAN	2 Stream CA	W Expansions Math Channels	Status Variables Para	ameters Shift Lights and Alarms	Trigger	Commands	Icons Manager Display SmartyCa	n Stream CAN
	ID	Name	Function	Sensor	Unit	Freq	Parameters	
	RPM	RPM	Engine RPM	RPM Sensor	rpm	20 Hz	max: 16000 ; factor: /1 ;	]
	Spd1	Speed1	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
	Spd2	Speed2	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
	Spd3	Speed3	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
	Spd4	Speed4	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
	Ch01	Channel01	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch02	Channel02	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch03	Channel03	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch04	Channel04	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch05	Channel05	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch06	Channel06	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch07	Channel07	Voltage	Generic 0-5 V	mV	20 Hz		
	Ch08	Channel08	Voltage	Generic 0-5 V	mV	20 Hz		
	Acc1	InlineAcc	Inline Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
	Acc2	LateralAcc	Lateral Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
	Acc3	VerticalAcc	Vertical Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
	Gyr1	RollRate	Roll Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
	Gyr2	PitchRate	Pitch Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
	Gyr3	YawRate	Yaw Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
	Accu	GPS Accuracy	GPS Accuracy	AIM GPS	mm	10 Hz		
	P	Cal contract	una de la		lane e e			1

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.

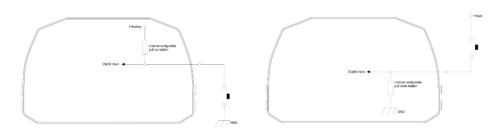
RaceStudio3 3.26.01											- • ×
									-		
* 🐄 🖽 🛱	5 🖻 🔟 🏀	i 🔐							((•		an
All MXS 1.2 Strada 36											
Save Save As	Close Trans	mit									
Channels ECU Stream CA	N2 Stream CAN Expansi	ons Math Channels	Status Variables Paramet	ers	Shift Light	s and Alarms Trigger C	Commands Icon	ns Manager Display	SmartyCam Stream	CAN Output	
	ID 🗹 N	ame	Function	Sen	sor	Unit	Freq Par	rameters			
	Channel Settings			×	ensor	Channel Settings					
	Name	Speed		_	Sensor	Name	Channel02				
	Function	Vehicle Spd		\$	c 0-5 V		Analogic	0	igital		
				_	c 0-5 V	Function	Voltage	Ŭ	:		
	Sensor	Speed Sensor		\$	c 0-5 V						
	Sampling Frequency	20 Hz		\$	c 0-5 V	Sensor	Generic 0+5 V		\$		
	Unit of Measure	km/h		\$	c 0-5 V	Sampling Frequency	20 Hz		\$		
	Display Precision	1 decimal place		\$	c 0-5 V	Unit of Measure	mV		\$		
					c 0-5 V						
	- Speed Parameters				c 0-5 V						
	Wheel circumf	erence [mm]	1600		s	1					
	Pulse per when	el revolution	1		s						
					s	1					
					0						
			Save Can		minosity			Save	Cancel		
			Save Can	.ei				Save	Cancer		

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

ECU Stream CAN2		nsmit Halk Channole	Etalue Variablee Docomole	envit Ligt	Channel Setti	ngs	Commando Id	one Hanaaa	r Dieniau C	moduCom Ekron	n CAN Output
	Name	Channel04			Name		Channel04				
		O Analogic	Digital	ISOT			O Analogic		Digita	d i	
	Function	Digital Status		ensor	Function		Digital Status				
				0-5 V							
	Sensor	Status		0-5 V	Sensor		Status				
				D-5 V							
	Active when signal i		O close to VBatt		Active when s	ignal is:	O close to gro	und	close		
		Active ON	Not active OFF	0-5 V 0-5 V			Active ON		Not active abel		
		Monostable	Bistable	0-5 V			Monostat		D Bistab		
		Logged	Obstable	0-5 V			Logged		O		
		C Logged		~			Cogged				
			Save Car	ncel					Save	Cancel	
	Alt 🕑	Altitude	Altitude	AIM GPS		m	10 Hz				
	OdD 💽	Odometer	Odometer Total	AIM ODO		km 0.1	1 Hz				
	Luma 🕑	Luminosity	Brightness	AiM Luminosity	(	%	1 Hz				

Working mode: a Digital input can work in two different ways:

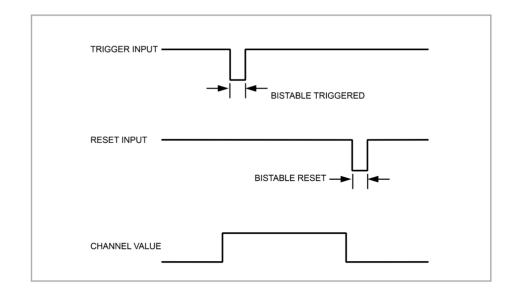
- The pushbutton closes to ground (with or without pull up resistor left image below)
- The pushbutton closes to VBattery (with or without pull down resistor – right image below)



■ 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 monostable or bistable, 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 includes 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 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 serie should not transmit it; in this case, enabling this flag, MX Strada series dash remains completely silent.

RaceStudio3 3.25.02	
* * * * * *	?
All MXS 1.2 Strada 14	
Save Save As Close Transmit	
Channels ECU Stream CAN2 Stream CAN Expansions Math Channels Stat	tus Variables Parameters Shift Lights and Alarms Trigger Commands Icons Manager Display SmartyCam Stream CAN Output
ECU: Click bu	utton to select a ECU protocol Click here to view protocols updates history.
Choose ECU Protocol	Change ECU 🔹
Manufacturer	Model
None	PADDLESHIFT
BOSCH	
BRIGHTWATER	
HEWLAND	
KMP	
MEGALINE	
NEMESIS	
SEAT_Sport	
STACK TEVES	
TEXYS	
TIRE_WATCH	
WIRELESS MOTORSPORT	
· · · ·	
	OK Cancel
L	

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MXS 1	2 Strada × MX		lodel ×									
Save	Save As	Close	Transmit									
annels	ECU Stream C/	AN2 Stream	CAN Expansions	Math Channels	Status	Variables Parameters	Shift Lights and Alarms	Trigger Comm	nands Icons I	Manager Display	SmartyCam Stream	CAN Output
				ECU: F	DRD - N	IUSTANG 2010		Change ECU	: 0			
							Enable the CAN I	Bus 120 Ohm Re	esistor			
				Enabled C	hannels	(Max. 120) 35/35	Silent on CAN Bu	s				
				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 8			
				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	•	StabCtrlTeltal	Number		10 Hz			
				CC24	•	StabCtrIMTXT	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

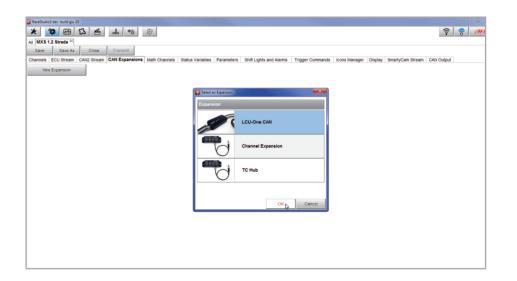
As for ECU Stream a PDF file with protocols updates history can be loaded clicking on the question mark as shown here below and the two checkbox appears as explained before.

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:

tudio3 3.25.02			
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(S 1.2 Strada <sup>34</sup>			
ve Save As Close Transmit			
els ECU Stream CAN2 Stream CAN Expansions Math Channels	tatus Variables Darameters Obi# Liphts and Al	Trigger Commands I kons Manager Display Cmathd	Cam Stream CAN Output
	button to select a ECU protocol		
ECO. Cito		Click here to view protocols updates h	istory.
Choose ECU Protocol		Change ECU 💠	
Manufacturer	Model		
None	PADDLESHIFT		
BOSCH			
BRIGHTWATER	-		
HEWLAND			
KMP			
MEGALINE			
NEMESIS			
SEAT_Sport			
STACK	_		
TEVES	_		
TEXYS TIRE_WATCH			
WIRELESS_MOTORSPORT	-		
The cebo_no for or o			
1			
	OK Cancel		
¢			



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)
- set the LCU One channels double clicking on each channel and setting the panel that shows up
- press "Close" to save and exit

*	🐲 🕰 🕰 🏘	* * 2	3					?
MXS	1.2 Strada ≥		_					
Save	Save As Close	Transmit						
annels	ECU Stream CAN2 Stream	CAN Expansions Mi	ath Channels Status Variab	les Parame	ters Shift Lig	hts and Alarms Trigger Commands Icons Mana	iger Display Smart	yCam Stream CAN Output
N	ew Expansion							
CHX	0 × TCH0 × LCC0 ×							
	Expansion N	lame ( 6 characters max. )	LCC0	Get S.N. a conne				
	Expansion S	Serial Number ( S.N. )	0	Expans				
	Multiplier to calculate AFR (A/F	) from lambda (AFR = A	ir Fuel Ratio = pounds of air /	pound of fuel		🐏 Lambda Multiplier Manager		
		- Gasoline	Add Custom			Multiplier Lambda Values	New Value	Label for New Value
	6.40 - Methanol					6.40 - Methanol	14.57	Gasoline
						6.40 - Methanol	14.57	
	6.40 - Methanol 9.00 - Ethanol					9.00 - Ethanol	14.57	Add or Modify Current Item
	6.40 - Methanol 9.00 - Ethanol					9.00 - Ethanol 14.57 - Gasoline	E	
	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline					9.00 - Ethanol	E	Add or Modify Current Item
	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel				•	9.00 - Ethanol 14.57 - Gasoline		Add or Modify Current Item Remove Current Item
	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel 15.50 - LPG (Propane) 17.20 - CNG					9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel	14.57	Add or Modify Current Item Remove Current Item
	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel 15.50 - LPG (Propane) 17.20 - CNG	Function	Sensor	Unit	Freq	9.00 - Ethanol 14.57 - Gasoline 14.80 - Diesel 15.50 - LPG (Propane)	14.57	Add or Modify Current Item Remove Current Item
	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel 15.50 - LPG (Propane) 17.20 - CNG	Function Lambda	Sensor AMLCU-One Lambda	Unit A0.01	Freq 10 Hz	9.00 - Ethanol 14.57 - Gasoline 14.80 - Diesel 15.50 - LPG (Propane)	14.57	Add or Modify Current Item Remove Current Item Restore Default Values
ıd	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel 15.50 - LPG (Propane) 17.20 - CNG					9.00 - Ethanol 14.57 - Gasoline 14.80 - Diesel 15.50 - LPG (Propane)	+	Add or Modify Current Item Remove Current Item
ıd R	6.40 - Methanol 9.00 - Ethanol 14.57 - Gasoline 14.60 - Diesel 15.50 - LPG (Propane) 17.20 - CNG V Name V Name	Lambda	Aill LCU-One Lambda	λ0.01	10 Hz	9.00 - Ethanol 14.57 - Gasoline 14.80 - Diesel 15.50 - LPG (Propane)	14.57	Add or Modify Current Item Remove Current Item Restore Default Values

**Please note:** for any further information about AiM LCU-One CAN refer to the related user manual you find in the box or 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

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.0000.						Name	1CHX_Channel03	
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	V Name	Function	Sensor	Unit	Freq	Sensor	Generic 0+5 V	
н	✓ 1CHX_Channel01	Voltage	Generic 0-5 V	mV	20 Hz	Sampling Frequency	20 Hz 🗘	
2	ICHX_Channel02	Voltage	Generic 0-5 V	mV	20 Hz	Unit of Measure	mV 🗘	
13	ICHX_Channel03	Voltage	Generic 0-5 V	mV	20 Hz			
4	✔ 1CHX_Channel04	Voltage	Generic 0-5 V	mV	20 Hz			
Close							Save Cancel	

**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 expansion 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

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D	V Name	Function	Sensor	Unit	Freq		Function	Temperature
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	✓ 1TCH_TC03	Temperature	K type thermocouple	C 0.1	20 Hz		Sampling Frequency	20 Hz 🗘
	✓ 1TCH_TC04	Temperature	K type thermocouple	C 0.1	20 Hz		Unit of Measure	c 🗘
							Display Precision	1 decimal place 🗢
Close								Save Cancel

**Please note:** for any further information about AiM 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.

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						Select a Mathe	matical Channel					×		
						Channel	_	Description						
						Bias		To calculate the bia	is of two channels					
								VALUE = CH1 / (CH	11 + CH2)					
						Bias with T	hresholds	To calculate the bia						
								specified values VALUE = CH1 / (CH	1					
						Calculated	Gear	To calculate the ge	and vehicle speed					
						Precalculat	ed Gear	To calculate the ge specifying the gear	ar position from er ratio for each gea	ngine rpm a ar and the a	and vehicle speed, axle ratio			
						Linear Corr	rector	To multiply a measu VALUE = (a * CH) +	ure by a factor the b	en add an o	ffset value			
											OK Cance	el		

## 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.

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	Add Hen Variable still available variables: 37
	Create New Status Variable
	Name Water Temp Alarm
	Freq 50 Hz •
	add to device logged channels
	is TRUE when All  of the following conditions are true:
	WaterTemp 🗘 🖍 greater than 🗘 C 104,0
	etse is FALSE
	Save Cancel

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.

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			Freq 50 Hz			·
	+ Add New Variab	le still available variables: 36	<b>~</b>	add to device logged ch	annels	
			is TRUE when th	of the following	conditions are true:	1
			WaterTemp greate	er than C	104,0	٦
						-1
			else is FALSE			- 1
						_

# 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;

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	C A LED stays on until another LED with higher threshold is turned on									
12 2:03.24	Choose the engine rpm channel RPM									
LED 1 LED 4										
LED 2	🕫 Gear dependent shift lights Max gear number 6									
LED 3 4.2 to LED 6	Choose the gear channet: Gear  Select colors and threshold values for shift lights:									
	Gear Shift Light 1 2 3 4 5 6 7 8 9 10									
o (iiii)	6 8200 🧰 8400 🧰 8600 🧰 8800 🧰 9000 🏹 9200 🏹 9400 🏹 9600 🜉 9800 🌉 1000 🌉 🍶									
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	OK Cancel									

#### 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.

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	LED 2 / 4		Predictive Time Increment per LED 0.1 (sec )
	LED 3 🖌 1 5500		
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	35 INTO LINE	OUT OUT	
	(and		OK Cancel
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#### Create and set MX Strada series alarm

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

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Use for predictive time Use as gear shift lights	Treate New Alarm	
Gear Shift Light 1 2 3 4 5 6 7 8 9 10	Description	Export
🕂 1 8200 👩 8400 👩 8600 👩 8600 🧑 9000 👩 9200 🧑 9400 🧑 9600 👩 9600 🥘 9000 🦉 🗘	If All ¢ of the following conditions are true:	Export
	Speed1 Contract Speed1 Speed1 Speed1 Speed1	C+
	then trigger the following action(s):	
LED B LED B 19500 1951 18.7. 2019	Message 🗘 jusofi nessage tod	
Evport Alarm etill available alarms 37 import Alarm Euport Alarm	Linit To condition no longer met	

#### 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.

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👻 Create New Alarm	
Description Water Alarm Import Export O Use as gear shift lights	- 0 - X -
If 🙆 All 💠 of the following conditions are true:	
All Source Channel	
Any CAN 2 CAN 2 Water Temp Alam	
Lap Channels	
Speed Speed Carbon Carb	
2 A/D Channels	
then trigger the following action(s): Accelerometer	
Gyro Gyro	
Message 3 timeer message text	
Popup Message timed Odometer	
Display Measure Sinternal	
Uspay weasure Channel Exp.	
LED • TC-HUB Exp.	
Outrust Siznal	
Output Signal • Water Temp Alarm	
Condition no longer met	Cancel
ore the device is turned off	
() a button is pushed	
<sup>D</sup> I <sup>A</sup> data is downloaded	
Save Cancel	

### 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.

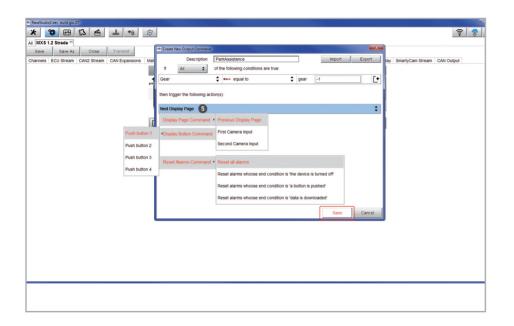
To add a new command.

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

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* Create New Output Command	Select Channel
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Next Display Page \$	OK Canc
Save Cancel	

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.



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And Alarm	
Fuel Level	
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+ Add New Command still available comands 34 import Command Export Command	
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Didotify Couput Command	
Description ParMassistance Import Export	
If All   of the following conditions are true:	
Gear C even equal to C gear 1	
then trigger the following action(s):	
First Camera Input	
Save Cancel	

## 5.2.10 Icons manager configuration

The "lcon" 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 lcon

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

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

# 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



The "lcons page" shows a summary of the selected icons. If you mouse over any icon, a panel with all the information appears.

Icons can be edited/selected pressing

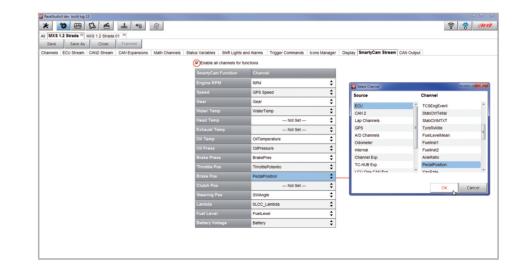


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## 5.2.12 SmartyCam stream setting

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



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

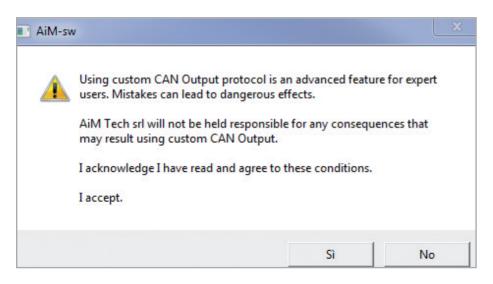
- on the left a panel that shows as many rows as the fields to be set
- on the right a panel that shows the channels group that can be set in that field and all the channels in it included; drag and drop the channel to set in the desired field or double click on it
- if more display pages have been added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



# 5.2.13 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

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1 Can 2				
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CAN ID (hex) Byte 0	Byte 1 Byte 2	Byte 3 Byte 4	Byte 5 Byte 6	Byte 7
Add New Payload			Export	Import
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		2 bytes		
		3 bytes		
set hexadecimal	umber for CAN ID payload. s (normal address) or 29 bits (extended address)	4 bytes		
it may have 11 b	s (normal address) or 29 bits (extended address)	5 bytes		
	ID CAN (hex)	6 bytes		
	€ 11 bits ○29 bits	7 bytes		
	DLC 8 bytes	a 8 bytes		
	Byte Order Little Endian			
	Big Endian			
	Little Endian			
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Can 1 Can 2		
Bit Rate Protocol (bit/s) 500k bit/s	With the selected ECU protocol frequency must be set to 500k bit/s and cannot be o	changed Name
CAN ID (hex) Byte 0		yte 4 Byte 5 Byte 6 Byte 7
✓ 0x702 NO OUT	TPUT *HL STATIC VALUE: 10' *HL	
+ Add New Payload		Export Import
Set CAN Payload Details	Select Channel	Set CAN Payload Details
Channel Not set 🖨	Source Channel	Channel WaterTemp (C)
Channel Not set \$	ECU ARPM	(Matericing (o))
Send this value 10	CAN 2 SpeedVeh	
	Lap Channels SpeedFL	WaterTemp' uses 1 decimals: set Ilutiplier+10 to manage all digits
	GPS E SpeedFR	Multiplier (a) 1
	A/D Channels SpeedRL	Offset (b) 0
Num Bytes =	Odometer SpeedRR	Num Bytes 2 bytes =
1 byte	Internal Gear	1 byte
2 bytes	Channel Exp. WaterTemp	2 bytes
4 bytes	TC-HUB Exp. TurboBoost	4 bytes
	I CII One CAN Evn TCQBrokeEvent	
OK Cancel		OK Cancel
	ок с	Cancel

When all channels set the configuration is finished:

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

			1
Save	Save As	Close	Transmit
ouve	ouve no	01030	

# 5.3 Managing a track on MX Strada series 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 in the image, "MXS Strada ID 5302808")

The column **in the middle** shows:

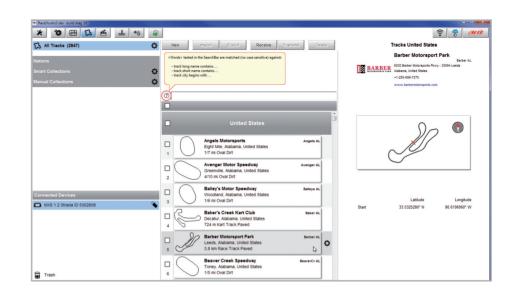
on top a fast search bar, that allows to select the tracks which satisfy your personal research criteria; pressing "?" a pop-up window explains research criteria (highlighted in red below), to say:

long name is the name in bold in each track box

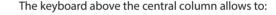
- short name is the track name shown on the display of MX Strada series and is the name shown top right of each track box
- track city is the name of the city the track is located in
- all the tracks listed in Race Studio 3 database. It automatically updates at start up if a connection to the Internet is available.

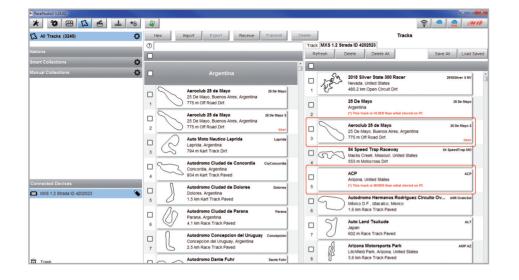
The column on the Right shows:

the data sheet 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.



- **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 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 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 connected 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 section "Track Manager" manual.

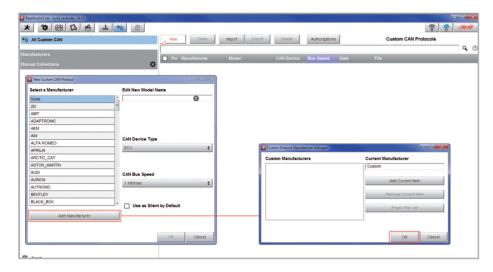
# 5.4 ECU Driver builder

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:
  - 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

_		
RaceStudio3 dev build yesterday 18:10		
* * * * * * *		?
All Custom CAN	New Clone Import Export Delete	e Authorizations Custom CAN Protocols
		۹. ©
Manufacturers	Pw Pw Manufacturer Model CAN De	
Manual Collections	Pw Pw Manufacturer Model CAN De	vice Bus Speed Date File
	I New Custom CAN Protocol	
	Select a Manufacturer	Edit New Model Name
	CITROEN	Custom
	CORVETTE	
	Custom	CAN Device Type
	DALLARA	ECU \$
	DELPHI	ECU
	DTA	
	DUCATI	Other CAN Device
	DUCATI_ENERGIA	CAN Bus Speed
	DYNO	1 Mbit/sec 🗘
	E-RACE	125 Kbit/sec
	ECS	250 Kbit/sec
	ECU MASTER	500 Kbit/sec
	EFI_EUROPE	1 Mbit/sec
	EFI_USA	T MUNIPEL
	ELECTROMOTIVE	Use as Silent by Default
	Add Manufacturer	
	Add Manufacturer	
		OK Cancel
	L	
Trach		

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

* RaceStudio3 3.25.02						(
* * * * * *					((:-	🗢 🔒 🐠
All MXS 1.2 Strada Model <sup>36</sup>						
2 All Configurations			MXS 1.2	Strada ID 4202523		
	Live Measures F	Properties Settings Tracks	Counters Logo Firmware			
Devices (2)	Stop Live Measure	s Sorted by Channel Type	Auto Calibrate mV Values			Blink
Manual Collections	5	Sort by Configuration				
		Sort Alphabetically				
		Sort by Channel Type				
			Ма	ster		
			1		1	
	Turning Lights	-90 deg	RL Wheel Pressur	-1.01 bar	Logger Temperature	99.1 F
	SteeringPos	-90 deg	RR Wheel Press	-1.01 bar	OilTemp	-91.1 F
	FL Wheel Pressur	-1.01 bar	Oil Pressure	-1.01 bar	Luminosity	0 %
	FR Wheel Pressur	-1.02 bar	Speed	0.0 km/h		
Connected Devices			ECU d	hannels		
MXS 1.2 Strada ID 4202523	FuelInst1	%	ClutchPedalSw	#	Tyre Size	#
	FuelInst2	%	ESPEvent	#	RPM	rpm
	FuelLevelMean	%	ETCTelTal	#	SpeedFL	km/h
	PedalPosition	%	FailSafeCool	#	SpeedFR	km/h

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 then by channel type and at the end by 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<sup>™</sup> 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

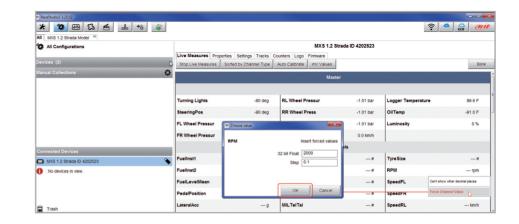
Once the configuration has been transmitted "Live Measures" page shows ECU Channels too and some operations can be performed, like start recording and stop live measures as well as making the device blinking pressing the button top right of the page. This last operation is the easiest and quickest way 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 pop up menu appears: select "Force Value" option and fill in the panel that appears
- 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.

Recestudio3 325.02								
* * ** ** ** **							<u> </u>	UD)
2 All Configurations	1			MXS 1.2	Strada ID 4202523			
	Live Measures Pro	perties Settings	Tracks Counters Log	go Firmware				
Devices (2)	Stop Live Measures	Sorted by Chan	nel Type Auto Calibra	mV Values	Stop Forcing		B	Blink
Manual Collections	SteeringPos	-90 deg	RR Wheel Pre	-1.01 bar	OilTemp	-91.0 F	RPM	F
	FL Wheel Pre	-1.01 bar	Oil Pressure	-1.01 bar	Luminosity	0 %	2000 rpm	H
	FR Wheel Pre	-1.02 bar	Speed	0.0 km/h			WaterTemp	
			ECU cha	nnels			104.0 F	
	FuelInst1	%	ClutchPedalSw	#	Tyre Size	#		
	FuelInst2	%	ESPEvent	#	RPM	2000 rpm		
	FuelLevelMean	%	ETCTelTal	#	SpeedFL	km/h		
Connected Devices	PedalPosition	%	FailSafeCool	#	SpeedFR	km/h		
MXS 1.2 Strada ID 4202523	LateralAcc	g	MILTelTal	#	SpeedRL	km/h		
	SWAngle	deg	StabCtrIMTXT	#	SpeedRR	km/h		
	YawRate	deg/s	StabCtrlTeltal	#	SpeedVeh	km/h		
	ABSEvent	#	TCSBrakeEv	#	WaterTemp	104.0 F		
C Trash	ARCTAITA		TOREnativent	-	Tradat	Men		

### 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.

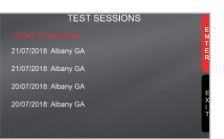
## 7 Data recall

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 SP	EED 282	P A G E
Lap	Best Laps	RPM	Km/h	E
4	1:57:56	10048 5592	280 73	
	1:57:94	10100 5450	277 70	Ţ
	1:58:02	10300 5700	278 69	STS

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



- 😤

8 New firmware upgrade

Our technicians and engineers are constantly working to improve both the firmware (the application that manages the 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.

🛥 RaceStudio3 3.16.00					_ <b>-</b> ×
* ** ** \$* 5 6 6 6				((•	; (11)
Connected Devices	Download	Install SW Export Import Update Device			
	🗹 N	lame	On the web	On my PC	Info
	Software				
	R	laceStudio3	3.16.00	3.16.00	
	Firmware				
	🚥 🖌 E'	WO4S	01.26.14	01.26.08	
	🚥 🗹 E'	VO5	01.26.14	01.26.08	
	🚥 🖌 M	IXG	01.26.14	01.26.08	8
	🚥 🖌 M	IXL2	01.26.14	01.26.08	
	🚥 🖌 M	IXS	01.26.14	01.26.08	
	🚥 🖌 M	IXS Strada	01.26.14	01.26.08	
	🚥 🖌 M	lyChron 5	01.24.62	01.24.64	
	Sr	martyCam HD	01.03.64	01.03.64	

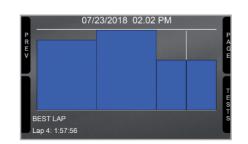
Once the new firmware has been downloaded connect the device to the PC using the USB cable included in the kit or via Wi-Fi to perform a firmware upgrade. In a few seconds the device is ready.

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.



TODAY: COTA Austin

9 Laps

B 1.53.46

B 1.55.56

B 1.54.14

B 1.55.16

# 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

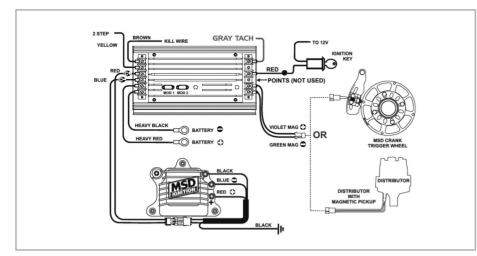
To get the RPM from the ECU just connect MX Strada series dash to the ECU and it will automatically sample that value.

**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)

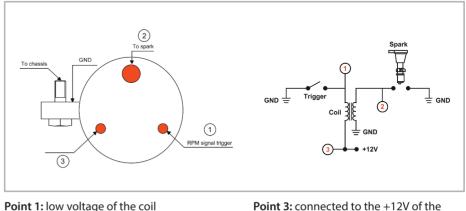
If the vehicle has no ECU connect the wire labelled "RPM" (corresponding to pin 21) of the device 23 pins connector harness to the ignition system. This way MX Strada series can read the signal from the low voltage of the coil (whose peak can be from 150 to 400 V) or from a possible square wave (the 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 2:** connected to the spark plug

Point 3: connected to the +12V of the battery

Channels     CAVE Stream     CAVE Expansion     Math Channels     Statu Variables     Parameters     Shift Lights and Alarma     Trigger Communds     Exos Manager     Dapping     Emary Can     CAVE       Image: Communication of the status     Image: Communication of	output
Antil     PPU     Expres RPU     APU Sensor     rpn     20 Hz     main 15001     both r1       System     Y     Speed Sensor     Innh 5 1     20 Hz     main 15001     both r1       CH0     Y     Function     Function     Function     Function     Function       CH0     Y     Ottlemportatione     Function     Engrise APM     Function       CH0     V     Ottlemportatione     Function     Engrise APM     Function       CH0     V     Department     Function     Function     Function       CH0     V     Department     Function     Function     Function       CH01     V     Department     Sensor     RPM Sensor     Function	
Spell         Values Spd         Speed Bensor         Imh 8.1         20 Hz         whet 1500; poles: 1;           CAD         Call center         FaelLevel         Call center         FaelLevel         Call center         FaelLevel         Call center         FaelLevel         FaelLevel <td< td=""><td></td></td<>	
Codi         Ø         Feel Level         Othere Settings         Image           Cx02         Ø         Offeneperature         Name         APM         APM           Cx03         Ø         Offeneperature         Purction         Engine RPM         APM           Cx03         Ø         Brakehressure         Purction         Engine RPM         APM           Cx03         Ø         Brakehressure         Sensor         APM         APM	
Clofi         O         Final Level         Final Control           Clofi         O         Olfermperature         Name         RPM           Clofi         O         Olfermperature         Function         Engine RPM           Clofi         O         Olfermperature         Sensor         Engine RPM           Clofi         Channel/5         Sensor         RPM Sensor         Engine RPM	
CM02         ✓         OUTEmperature         Function         Engine RPM           CM03         ✓         BrakeResure         Function         Engine RPM           CM03         ✓         BrakeResure         Function         Engine RPM           CM03         ✓         BrakeResure         Sensor         RPM Sensor	
Clob         Old Preduce           Clob         Baskerbauru           Clob         Danaelió           Clob         Clob	
Chos Channellos Sensor RPM Sensor	
Chos Channello Sampling Frequency 20 Hz	
Ch07 Channel07 Unit of Measure rpm	
Chose Channelle L	
Accu GPS Accuracy	
Spd GPS Speed RPM Parameters	
Att C Althoude A RPM Max 16000 \$	
OdD 🗹 Odometer c RPM Factor /1 C	
Luma V Luminosity	

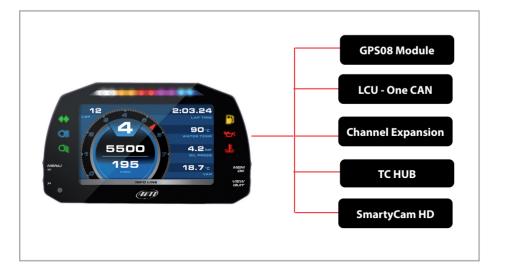
Once MX Strada series connected to RPM signal enable it and set its parameters in channels page of Race Studio 3 as explained in "Channels configuration" paragraph.

# **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 logger 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 has been 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"

P Resetutio3 325.00
* 🕲 🖽 💪 🚣 👈 🖨
All MXS1.2 - Model <sup>34</sup>
Save As Close Transmit
Channels ECU Stream CAN2 Stream Stream CAN2 Stream S
Events Alarms
padave 🗹 Water T
Modity Output Command
Description Park Assistance import Export
If All
Gear C+ + equal to R C+
then trigger the following action(s):
Then trigger the tollowing action(s).
First Camera Input
Save Cancel

To perform the command on the logger 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 logger 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.

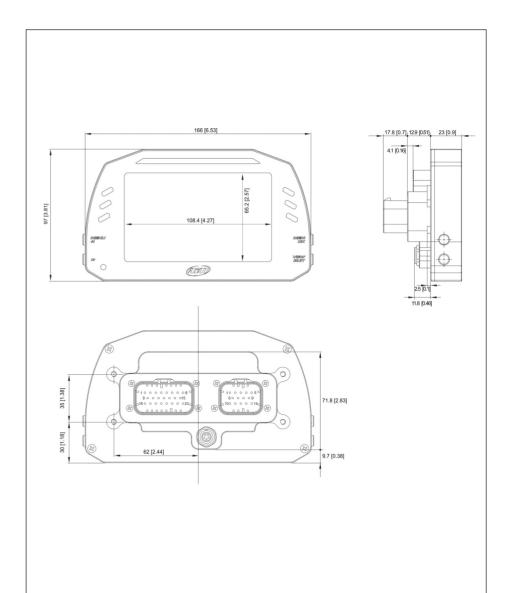




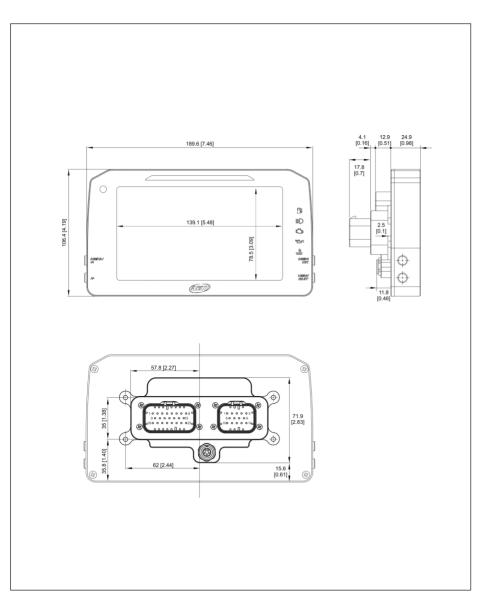
# 11 Technical specifications and drawings

### MXS Strada 1.2 dimensions in mm [inches]

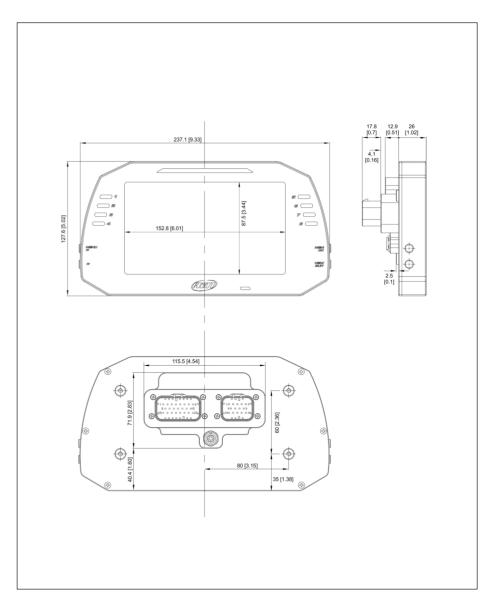
TFT display dimensions	5" (MXS 1.2 Strada) 6" (MXP Strada) 7" (MXG 1.2 Strada)
Display resolution	800x480 pixels
Contrast	600:1 (MXP Strada, MXS 1.2 Strada ) – 1000:1 (MXG 1.2 Strada)
Brightness	700cd/m² – 1,100 Lumen
Ambient light sensor	Yes
Alarm display icons	Yes, freely configurable
Alarm RGB LEDs	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 inputs, coil RPM input
Digital outputs	1 (1A max)
Backlight	Yes
Pushbuttons	Metallic
Connectors	2 AMP connectors + 1 Binder connector
Body	Anodized Aluminum
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



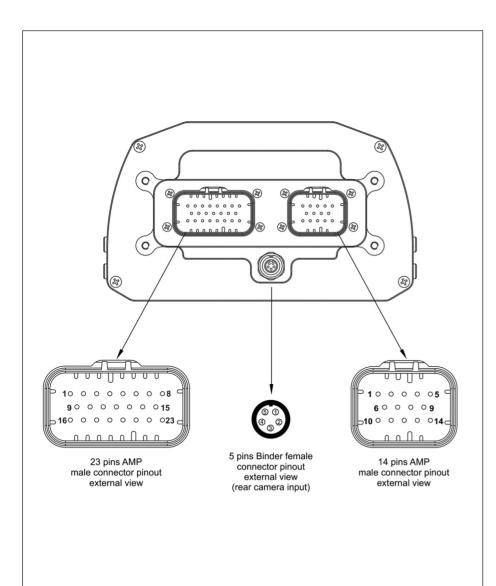
### MXP Strada dimensions in mm [inches]



### MXG 1.2 Strada dimensions in mm [inches]



### **MX Strada Series pinout**



Pin	Function	Pin	Function	Pin	Function
1 2 3 4 5 6 7 8 9 0 11 12 13 14 15 6 7 8 9 0 11 12 13 14 15 6 21 22 22 22	Analog input 1 Analog GND +Vb output +Vreference Analog input 2 Analog GND +Vb output +Vreference Analog input 4 Analog input 5 Analog GND +Vreference Analog input 6 Analog input 6 Analog input 7 +Vreference Analog input 8 Speed input GND Low Side output RPM input CAN 2+ CAN 2-	1 2 3 4 5	Video input 1 GND +Vb output camera GND Video input 2	1 2 3 4 5 6 7 8 9 10 11 12 13 14	9-15v Power input Battery GND CAN+ Exp GND +Vb out CAN CAN- Exp +Vb Ext CAN CAN1+/ECU RS232T CAN1-/ECU RS232R K Line ECU USB D+ USB D- USB GND Reserved

# MX Strada series 14 pins AMP connector harness – standard version

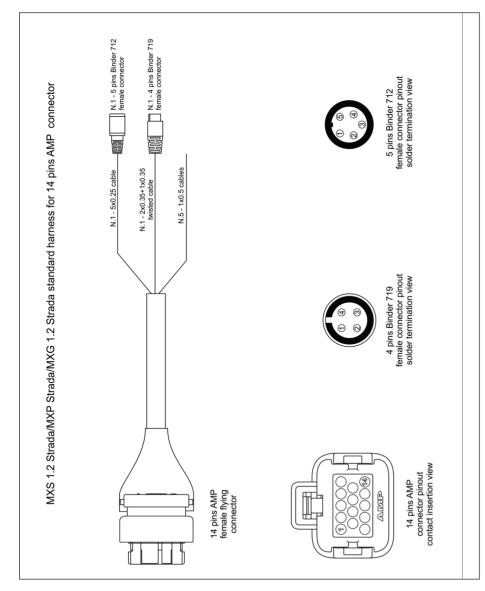
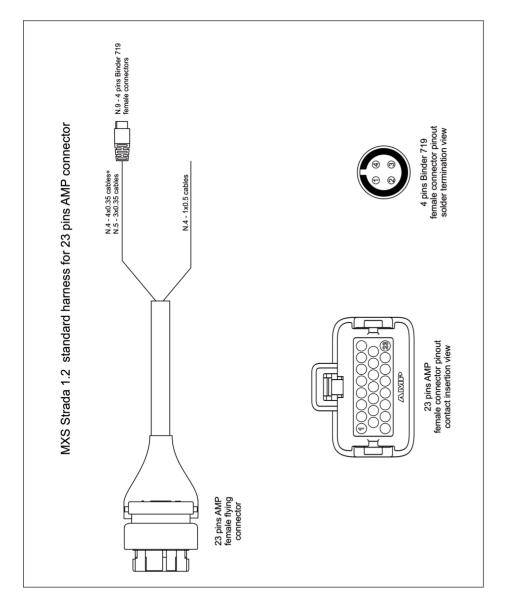


	Table of cables ending with 4 pins Binder 719 female connector
14 pins AMP Cable Destination connector colour connector pin Cable type Length Channel	Cable Destination Cable type Length Charged

14 pins AMP connector	Cable colour	Destination connector pin	Cable type	Length	Channel	Label	
3 4	White Black	1 2				CAN+ Exp GND	
5	Red Blue	3 4	5x0.25 mm <sup>2</sup>	350mm	Vb out CAN CAN- Exp	Exp	

Table of not cabled cables							
14 pins AMP connector	Cable colour	Cable type	Length	Label			
2 1	Black Red	1x0.5 mm² 1x0.5 mm²	550mm	Battery GND 9-15V Power input			
8 9	White Blue	1x0.5 mm² 1x0.5 mm²	550mm	CAN1+/ECU RS2321 CAN1-/ECU RS232R			
14	Yellow	1x0.5 mm²	550mm	RESERVED			

### MX Strada series 23 pins AMP connector harness



Та	ble of ca	bles ending wi	th 4 pins Bi	nder 719 f	emale 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	4x0.35mm²	340mm	+Analog channel 1 Analog GND +Vb output +Vreference	Channel 1
5 2 3 4	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 2 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35mm²	380mm	+Analog channel 5 Analog GND nc +Vreference	Channel 5
14 12 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35mm²	380mm	+Analog channel 6 Analog GND nc +Vreference	Channel 6
15 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35mm²	400mm	+Analog channel 7 Analog GND nc +Vreference	Channel 7
17 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35mm²	400mm	+Analog channel 8 Analog GND nc +Vreference	Channel 8
18 19 3	White Black n.c. Blue	1 2 3 4	3x0.35mm <sup>2</sup>	320mm	Speed 1 GND +Vb output nc	Speed

Table of hot 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

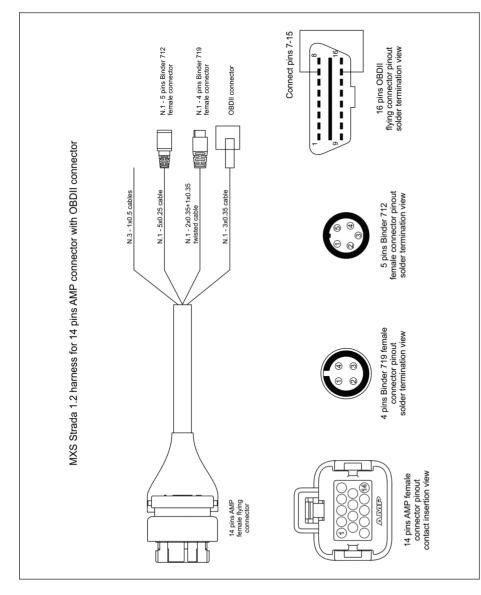
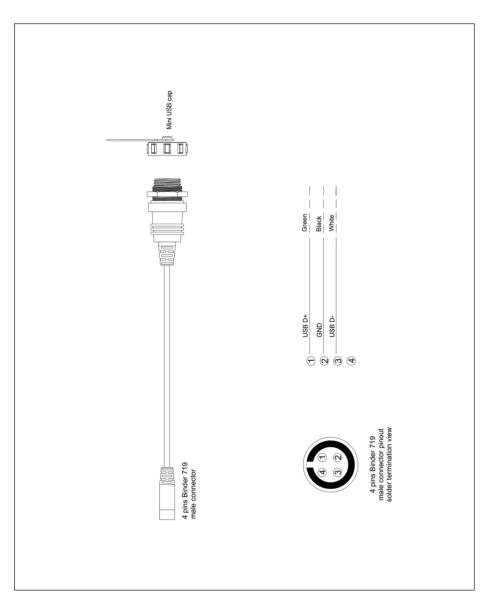


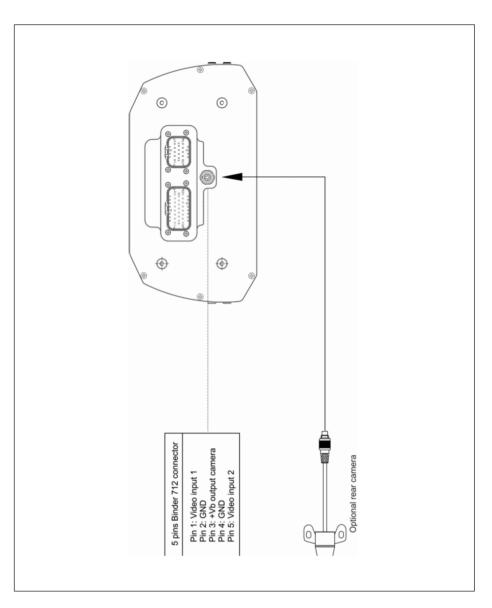
	Table of cable	s onding with 4	nine Bindor 710	) fomalo co	anactor	
	Table of cable	s ending with 4	pins Binder 719	9 female coi	nnector	
14 pins AMP connector pin	Table of cable Cable colour	s ending with 4 Destination connector pin	pins Binder 719 Cable type	9 female cor Length	nnector Channel	Labe
14 pins AMP connector pin	Cable colour	Destination			Channel	Labe
	Cable colour White twisted	Destination connector pin	Cable type	Length	Channel USB D+	
connector pin	Cable colour	Destination			Channel	Labe

14 pins AMP	Cable	Destination	Destination October transmission			
connector	colour	connector pin	Cable type	Length	Channel	Labe
3	White	1			CAN+ Exp	
4	Black	2			GND	
5	Red	3	5x0.25 mm <sup>2</sup>	350 mm	Vb out CAN	Exp
6	Blue	4			CAN- Exp	
7	Orange	5			Vb ext CAN	

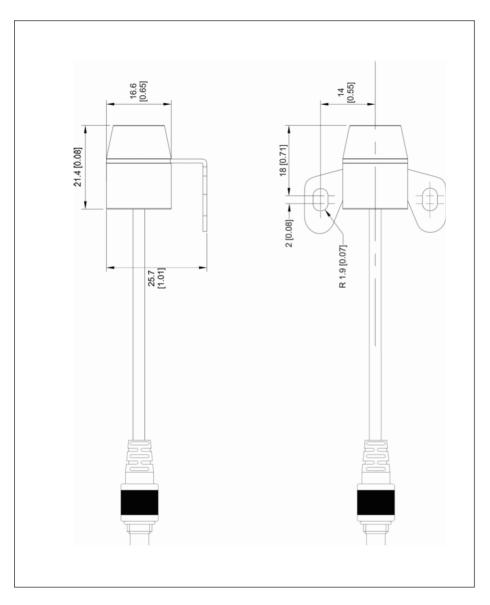
### MX Strada Series USB Cable



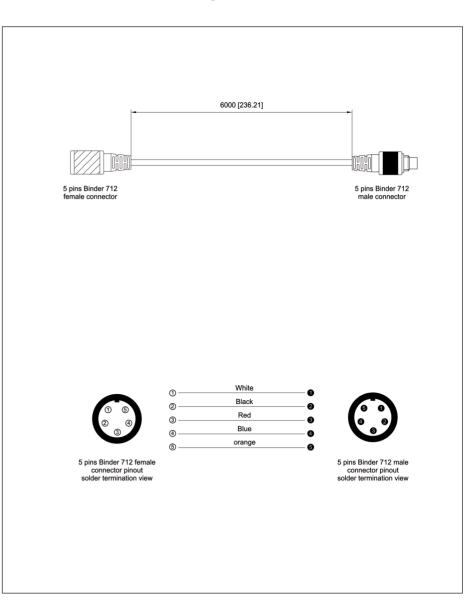
### MX Strada series mirror camera input



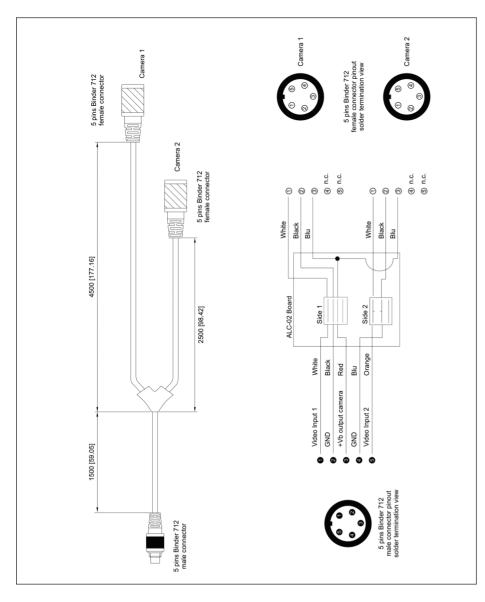
### Mirror camera dimensions in mm [inches]



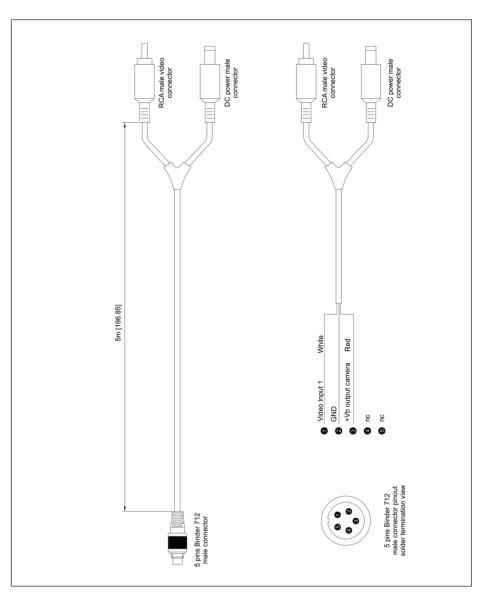
### MX Strada series cable for single AiM mirror camera



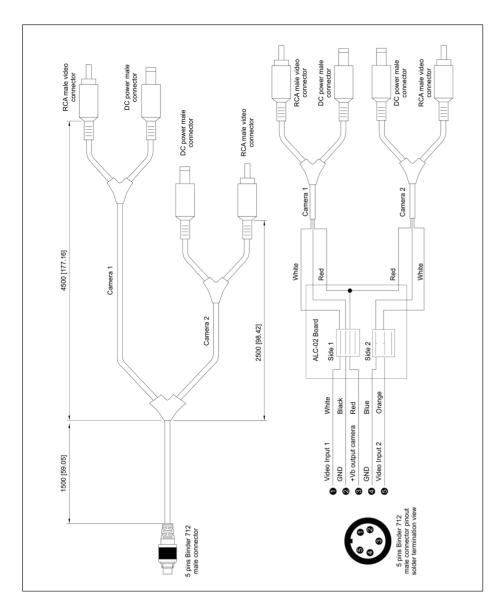
### MX Strada series cable for n.2 AiM mirror cameras



### MX Strada series cable for single non AiM mirror camera



### MX Strada series cable for n.2 non AiM mirror camera





Our web site **aim-sportline.com** is constantly updated.

Please, constantly check it and download the last versions of the firmware of your products.