

# • LAP TIMERS • LOGGERS • CAMERAS • DASHES • SENSORS • AND MORE

# SHOP NOW



MXG 1.2 Strada MXP Strada MXS 1.2 Strada

**USER GUIDE 1.00** 









SOFTWARE DOWNLOADS

FIRMWARE UPDATES PRODUCT DOCUMENTATION

1 – MX STRADA SERIES IN A FEW WORDS	04
2 – WHAT IS IN THE KIT?	06
3 – POWERING	10
4 – WHAT YOU CAN DO VIA KEYBOARD	11
4.1 – SET DATE/TIME	13
4.2 – SET BACKLIGHT	13
4.3 – SET VIDEO INPUT	14
4.4 – COUNTERS MANAGEMENT	15
4.5 – GPS & TRACKS MANAGEMENT	16
4.6 – SYSTEM INFORMATION	17
5 – MX STRADA SERIES AND THE PC	18
5.1 - CONNECTION TO THE PC	18
5.2 – CONFIGURATION OF MX STRADA SERIES	18
5.2.1 – CHANNELS CONFIGURATION	20
5.2.2 – ECU CONNECTION AND CONFIGURATION	24
5.2.3 – CAN2 STREAM CONFIGURATION	26
5.2.4 – CAN EXPANSIONS CONFIGURATION	27
5.2.5 – MATH CHANNELS CONFIGURATION	31
5.2.6 – STATUS VARIABLES CONFIGURATION	32
5.2.7 – PARAMETERS CONFIGURATION	34
5.2.8 – SHIFT LIGHTS AND ALARMS CONFIGURATION	36
5.2.9 – TRIGGER COMMANDS CONFIGURATION	41
5.2.10 – ICONS MANAGER CONFIGURATION	44
5.2.11 – DISPLAY CONFIGURATION	47
5.2.12 – SMARTYCAM STREAM SETTING	49
5.2.13 – CAN OUTPUT CONFIGURATION	50
5.3 – MANAGING A TRACK ON MX STRADA SERIES WITH RACE STUDIO 3	52
5.4 – ECU DRIVER BUILDER	56
5.5 – THE DEVICE WINDOW	58
5.5.1 – LIVE MEASURES LAYER	59
5.5.2 – ONLINE VALUE FORCING	59
6 – ON THE TRACK	61
7 – DATA RECALL	61
8 – NEW FIRMWARE UPGRADE	63
9 – RPM	64
9.1 – RPM FROM ECU	64
9.2 – RPM VIA A 5-50V SQUARE WAVE OR COIL (150-400V)	64
10 – CONNECTION WITH THE EXPANSIONS	66
10.1 – REAR CAMERAS CONNECTION AND MANAGEMENT	67
11 – TECHNICAL SPECIFICATIONS AND DRAWINGS	70

### 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 Lu	imen	
Ambient Light Sensor	Yes		
Alarm Display Icons	Yes, freely configura	able	
Alarm RGB LEDs	8 configurable	5 configurable	6 configurable
Shift Lights	10 configurable RGI	B LEDs	
CAN Connection	2		
ECU Connection	CAN, RS232 or K-Lin	e to 1.000 + industry lea	ding ECUs
External Modules	GPS Module, Char SmartyCam HD	nnel Expansion, TC Hu	ib, Lambda Controller,
Analog Inputs	8 fully configurable,	max 1.000 Hz each	
Digital Inputs	1 speed input, coil F	RPM input	
Digital outputs	1 (1A each)		
Second CAN	Yes		
Body	Anodized Aluminiu	m	
Pushbuttons	Metallic		
Connectors	2 AMP connectors+	1Binder connector	
Dimensions	237*127.6*26 mm	189.6*106.4*24.9	169.4*97*23 mm
Weight	950g	640g	480g
Power Consumption	400mA		
Waterproof	IP65		

### 2. What is in the kit?

MX Strada series kit includes:

- MX Strada series standard version or with street icons as shown here below
- USB cable

14 pins connector harness for ECU connection and power; it is available in two versions:
 standard for ECUs communicating through CAN/RS232 protocol or
 with the OBDII connector for ECUs communicating with CAN/RS232 and K-Line.

- 23 pins AMP female connector with pins
- CD for software installation













### **3** Powering

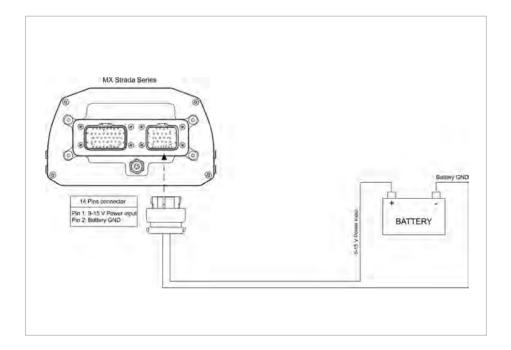
The power is managed by two pins of the 14 pins connector:

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

They must be connected as shown in the following diagram.



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





additional

rear camera)

Video in (optional

Counters

5.0 Km 1:13.13 2.4 Km

> GPS and Tracks

System Info

### 4.1 Set Date/Time



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%



#### Here you can:

set time zone

enable/disable Daylight saving time set time and date format

4.2 Set backlight

Bottom of the page current time and date are shown.

### 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")

Brightness:

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.

N E

x

н

Ν

G

х

т

NTSC

50% E

50%

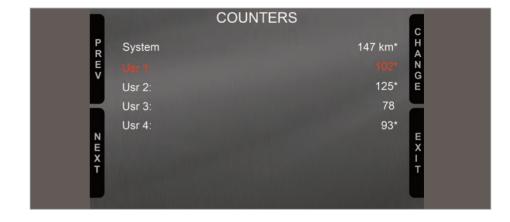
### 4.4 Counters management

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").

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

VIDEO IN P Input R Format:





### 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.

A second	System Info		ſ
Logger Serial N.: Fw Version Boot Version		MXS 1.2 Strada 4202523 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.

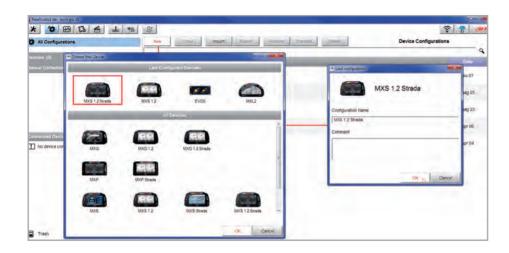
### 5.1 Connection to the PC

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.

* * * * *	36	1 +8 2						
AS MXS 1.2 20								
Save Save As	Close	Transmit						
Channels ECU Stream C	AN2 Stream	CAN Expansions Math Channel	s Status Variables Para	meters Shift Lights and Alarms	s. Trigger	Commands	Icons Manager Display SmartyCan	Stream CAN Output
	10	E Flame	Function	Sansor	Unit	Freis	Paramieters	
	HERE A	( Plu	Erigine RPM	RPM Densor	44	20 Hz	max 18000; factor if ;	
	Sector	Speed1	Vetacle Spd	Speed Sensor	I stok 2 t	20 Hz	wheel 1000 pulses 1 ;	
	Spell	Speed2	Vehicle Spd	Speed Bensor	imh 0.1	20 Hz	wheel 1000 : pulses: 1 :	
	Specia	Speed3	Value Epd	Speed Sensor	kmh á 1	20 HC	wheet 1500 ; pulges: 1 ;	
	Speld	Speed4	Venicle Spd	Speed Sensor	xmh 0.7	20 Hz	wheet 1000 ; pulses 1 :	
	CHOT	Channel01	voitage	Generic 0-5 V	inv	20 Hz		
	0102	Channel02	Votage	Generic 0-5 V	int/	20 Hz		
	0443	Channel03	vistage	Generic 0-5 V	1997	20 Hz		
	Ch04	Channel04	Votage	Generic 0-5 V	mit	29 Hz		
	CMPS	Channel05	Voltage	Generic 0-5 V	1000	20 Hz		
	CMM	Channel06	Votage -	Generic 0-5 V	mij	29 Hz		
	0.07	Chancel07	Votage .	General 0-5 V	1007	20 Hz		
	<b>Original</b>	Channel08	Veltage	Genetic 0-5 V	- 1994	29 Hz		
	44.11	InlineAcc	Intine Accel	AM Internal Accelerometer	00.01	50 Hz		
	Are?	LateralAcc	Lateral Accel	Add Internal Accelerometer	g 0.01	50 Hz		
	Ales	VerticalAcc	Vertical Accel	Abl Internal Acceleromater	00.01	50 Hz		
	Gyrt	RollRate	Rot Rate	Auto Internal Garo	degis 0.1	50 HC		1
	Gpt	PitchRate	Film Rate	AM Internal G(r0	04010.1	50 Hz		
	Gyro	YawRate	Yaw Rate	Adul Indernal Gyro	deps 0.1	50 Hz		
	Arrist	GPS Acculacy	GPS Accuracy	AM GPS	-	10 Hz		
	1000	Carl cont count	Linkson Mark	and the	Lunada	- union		11

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.

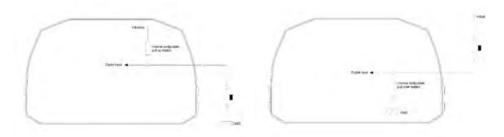
and the second se	tares .		insor	Linn	Freq Paramet	inte	
Channel Settings			ensor	Channel Settings	<u> </u>		× *
fiame	Speed		Sensor	1iamit.	Channel02	-	
Function	Vehicle Spd			1	Analogic	0	
			c 0-5 V	Function	Voltage		
Sensor	Speed Sensor	:		1			-
Sampling Frequency	20 Hz:	:		Sensor	Generic (44 V		\$
Unit of Measure	Am/Tr			Sampling Frequency	20 Hz		+
Display Precision	t decimal place			Unit of Measure	mV		
			c0-≬¥				
Speed Parameters			CD-EV				
Wheel circum Pulse per who		1600	8				
esase per wor	eel revolution	0.	4				
		and the second second	0				-
		Save Cancel	insing a Ry	-		Save	Cancel

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

Dame Name	inde	Channel04			Name-	Channel04	1.5.2	
Function		0	Digit	u)	-	O	Digital	
					v		-	
Sensor		Sime-			Sensor	200		
Active when	signal		und O close		Gente munti fellen ib.	00	Close to VBatt	
		Adve ON	Not active	077 24		Active ION	Not active OFF	-
		Monostable				Monostable	O	-
		Logged		23	V	Logged		
			Save	Carce			Save Cancel	
A4		Altitude	Abbudy	AMOPS	10	10 Hz		
Check	100	Odometer	Odometer Total	AM DDO	4950.1	1Hs		
Lance		Luminosity	Bighmest	AM Lumina	19	1H2		

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

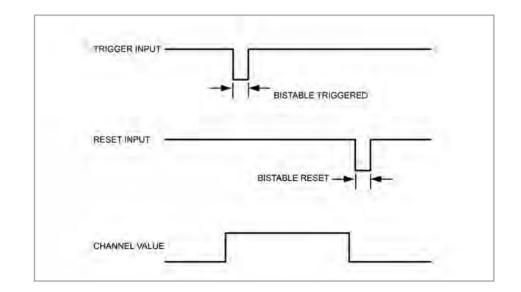
- The pushbutton closes to ground (with or without pull up resistor left image below)
- The pushbutton closes to VBattery (with or without pull down resistor – right image below)



■ 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.

	Click button to select a ECU protocol	Click here till væve protocolls updates filotory	
St Choose FCU Protocci		Charge ECU 2	
Manufacturer	Model		
None	PADDLESHFT		
BOSCH			
BRIGHTWATER			
HEWLAND			
KMP			
MEGALINE			
NEMESIS			
SEAT_Sport			
STACK			
TEVES			
TEXYS:			
TIRE_WATCH			
WIRELESS_MOTORSPORT			

* * **	61					
Internet Internets (Internet-Internet	4					2 100
Al MOS 1.2 Strada <sup>34</sup> MX\$ 1.2 Strada Model <sup>34</sup> Save Save As Crose Transmit	1					
				-	nands Icons Manager Display SmartyCan	
channels ECU Stream CAN2 Stream CAN Expansions		ORD - MUSTANG 2010	Shift Lights and Alarms	Change ECU		Stream CAN Output
	P00. 1		-			
			Enable the CAN B		every	
	Enabled C	hannels (Max. 120) 35/35	Silent on CAN Bu	-		
	10	Varie Name	Function	Uret	Freq	
	a cant	RPM	Engine RPM	(ipri	40 Hz	
	( 00)	SpeedVeh	Vehicle Spid	Kmith 0.1	10 Hz	
	0005	SpeedFL	Wheel Spd	kimith D 1	10 Hz	
	0014	SpeedFR	Wheel Spé	kmitt 0.1	10 Hz	
	0016	SpeedRL	Wheel Spd	Kimelle 0.1	10 Hz. 0	
	0.016	SpeedRR	Wheel Spd	kmith 0,1	10 H2	
	CG17	Gear	Gear	gear	10 Hz	
	(325)	WaterTemp	Water Temp	F21	10 Hz	
	004	TurboBoost	Number		10 Hz	
	0021	TCSBrakeEvent	Number		10 Hz	
	+6.22	TCSEngEvent	Number		13 H2	
	(62)	StabCtrlTeltal	Number		10 Hz.	
	0(24	StateContent	Number		10 Hz	
	0034	TyreRyMile	Number.	10	10 Hz	
	10.00	FuelLevelliese	Percent	9,0.01	13 HE	
	6630	Foelinet	Percent	94.0.09	(12 Hz.	
	00.00	Fuelinst2	Percent	N 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.

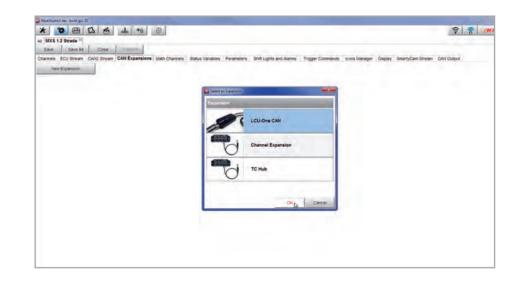
Choose ECU Protocol Manufacturer		Second Street Comp			
	Model		Change ECU	: 0	
and a state of the					
None	PADOLESHET				
BOSCH					
BRIGHTWATER					
HEWLAND					
KU/SP					
MEGALINE					
NEMESIS					
SEAT_Sport					
STACK					
TEVES					
TEXYS					
TIRE_WATCH					
WRELESS_MOTORSPORT					

### 5.2.4 CAN Expansions configuration

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

- LCU-One CAN
- Channel Expansions
- TC Hub

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



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

### **Setting LCU-One CAN**

#### To set an LCU-One CAN:

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

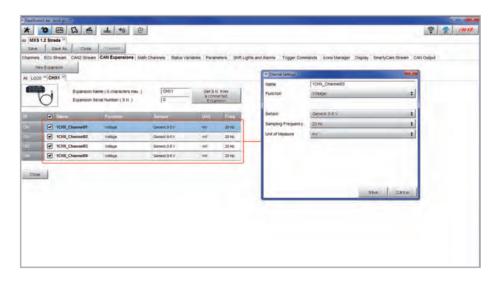
× MXS	2 EB 53 M							
Save	Save As Close	Transmit						
	ECU Stream CAN2 Stream	CAN Expansions 1/	tath Channels Status Vanal	ies Param	eters Shift Ligi	nts and Alarms Trigger Commands I kons Manager	Display Smarty	Cam Stream CAN Output
сн	TCHO H LCCO H							
-		iame ( 6 characters máx ierial Number ( 5 N )	0	Get S N. a conne Excan	kted kon	* Lambia Multiplier Manager		
		- Gasoline	Add Custon			Multiplier Lamüda Values	New Value	Label for New Value
	6.40 - Memanol	- Ordenine	+ NO0 COSIO	v proc		6.40 - Methanol	14.57	Gasoline
	9 00 - Ethanol						-1	Add or Modify Current litem
	14.57 - Garoner D					9.00 - Ethanol		
	14 00 - Diesel					14.57 - Gasoline		Remove Current Item
	15.50 - LPG (Propane)					14.60 - Diesel	-	Restore Default Values
	17.20 - CNG					15.50 - LPG (Propane)	-	
	V News	Function	Sensar	Unit	Freq	17.20 - CNG	14	
	OLCC_Lambda	Lamoda	AM LOU-One Lambda	ADDE	10 Hz			
	eLCC_AFR	AFR	AN LOU-One AFR	AF 0.01	10.40			OK CI
	DLCC LendTest	Lambda Terrip	AMI LOU-One Temp	C 0.1	10 Hz			

**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



**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

	D H CHX1 H TCH1 H							
000	Expansion	i Name ( 6 characters max Serial Number ( S.N. )		Get S.I a com Elica	weeting .	Charriel Settings	1104_1002	-
	I have	Function	lensor	Unit	Freq	Function	Temperature	
	11CH_1C01	Temperature	K tipe thermocouple	C01	20 Hz	Sensor	K type thermocouple	
R.	11CH_TC02	Temperature .	K type Thermocouple	C01	20.42	Sampling Frequency	20 Hz	
8	11CH_1C00	Temperature	K type Thermocouple	E01	20 Hz	Unit of Measure	6	
×	TICH_TOM	Tettperature.	K tipe thermocoople	C0.7	20.42	Display Precision	1 decimal place	
2405								ave Carcel

**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.

₩ EB ES es ± *8 8		(i)
K\$ 1.2 Strada 24		
re Save As Close Transmit		
els ECU Stream CAVI2 Stream CAVI Expansions Math Channels Sta		arms Trigger Commands Icons Manager Display SmartyCan Stream CAN Output
Add C	tiannei still availa	ble meth channels. 37
	The Select a Mathematical Channel	
	Seeit a Mathematical Channel	
	Channel	Description
	Blas	To caculate the bias of two channels . VALUE = CH1 / (CH1 + CH2)
	Bias with Thresholds	To calculate the bias of his channels only if they are greater than specified values VALUE = CH1 / (CH1 + CH2) (if both thresholds are exceeded, else 0)
	Calculated Gear	To calculate the gear position from engine rpm and vehicle speed
	Precalculated Gear	To carculate the gear position from engine rpm and vehicle speed, specifying the gear ratio for each gear and the arie ratio
	Linear Corrector	To multiply a measure by a factor then add an othet value $\forall ALUE = (a \uparrow CH) + 0$
		CH. CARCH

### 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.

Image: Save     Save     Save     Save     Close     Transmitter	8			<u>ş</u>	8
annels ECU Stream CAN2 Stream CAN Expansions	Math Chaonels Status Var	Add New Variable etil wala	ms Trigger Commands Kons Ma ole variables: 37	nager Display SmartyCam Stream CAN Output	
1.00	-				
	🗢 Create New Status Vargine			(maxim)	
	Name	Water Temp Alarm	3		
	Ereq	50. H2:	•		
		add to device togged channels			
	IS TRUE when Al	al the following conditions are thu			
	WaterTemp		C. 104.0	[+	
	ese o 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.

₩XS 1.2 Strada <sup>(2)</sup>			÷ .
Iaver Save Aa Close Transvir nnets ECU Stream CAV2 Stream CAV1 Expansions Math Channets Status Vari	ables Parameters Shift Lights and Alan	ns Trigger Co	
	Vialer Terrig Alarm	50 HZ	
	Add New Yanable and evaluation	ble variables: 36	add to device logged channels.
			WaterTemp greater than C 104.0
			ette is FALSE

### 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;

Uter bei gene skill types	· Integration
	Choose & legenme mode of and types
AB 8200 💽 8400 💽 8600 💽 8600 💽 900 💽 900 💽 900 💽 900 💽 900 💽 900 🚺 900 $0$	A LED Mays on PTV Eventoid & accessed     A LED Mays on one weather LED with lighter fixed to turned on
********	
LED 1 18 80.03.84 LED 4	Choose the angles, gas causes
LED B CALLED B	V Gesi dependent sint lights later peler number 6
180 3	Chuchen big gear chariner
195 18.7	Senici colori, and threadold values to junit lights
a Gilb	4   1200
in the second se	
Att free Alem all adulte same 21 ingentigen Egent Alem	2 1200 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400 2 1400
	2 8201 2 840 2 640
	× 0

#### Use for predictive time.

Click the icon ( 🌣 ) for setting the parameters. In this case the LEDs colour are fixed in:

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

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



#### Create and set MX Strada series alarm

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



#### To set the new alarm:

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

Cente Neu Alarra	Come Distraction Life Sta			-	O Use as gear shift lights	cons Manager Display SmartyCan Stream C	Anoupu
Descriptio			ingent	Export -	The land Dame		1000
· · · ·	of the following conditions are true				Source	Channel	
All Arty					CANZ	Water Temp Alarm	
eedi (	C . Le matter	1 Martin 1	10	Ŀ	Lap Channels GPS	1	
	- <del>-</del> -			-	A/D Channels		
in trigger the following	action(s):				Accelerometer		
nsage 🚯	anant message init			[*	Gyro Någnetometer		
spup Message limed	1				Ddometer	1	
splay Measure					viene		
ED .	2				Chamel Exp TC-HLB Exp		
					-LCILONE CALLER		
viput Signal	•				Water Temp Alarm		
0 1. con	ation no longer men						
	dition ino longer met						ok ca
	device is furned off						
	mon is pushed						

### 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)

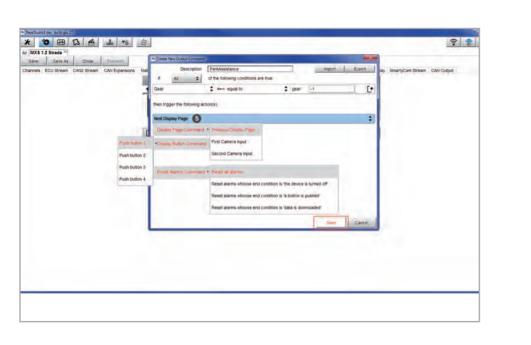
Other commands will be available in the next software/firmware releases.

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)

2 8 8 2	西上档白			🤶 😵 🧶
MXS 1.2 Strada				
	the literature literature			
	Address of the second se	India Variation Dariameters Doll 1	Tringer Commands	cons Manager Display SmartyCam Sheam CAN Output
2006-201 (cmc-0143	Eve	the state of the second state of the second state		
	the second se			
		1.20mm		1.
				۹.
	and the second se			
	C+ Applies C	contand shill available comar	di 34 Import Command	Export Command
				and a second second
Deate New Oritput Command	and the second		* lated Chevel	
Description		Import Export	Source	Channel
1 (2 AL 0) 0	the following conditions are true		ECU	A RPM
-		•	CAN 2	Speedven
Any		0	Lap Channels	SpeedFL.
12.2	1		GPS	SpeedFR
Speed1	ta iess man 🔅 imit	no [*	A/D Channels	SpeedRL
	greater than		Accelerometer	SpeedRR
	Le less than		Gyro	Dear -
	Hysteresis Up to Down		Magnetometer:	WaterTemp
	Hysteresis Down to Up		Odometer	TurboBoost
	+- Hgual to		Internal	TCSDrakeEvent
	++- edhe to		Channel Exp TC-HUB Exp	TCSEngEvent StasChiTettal
then trigger the following action			LCU-One CAN Exp	INANCHINTXT
and other one included action			THOUSE DAYEDD	a bao, marxi
Next Display Page		\$		
				OK Carcel

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.

nes ECU Steam CAU2 Steam CAU Expansion Path Dances Satha Vanites Parametes Shift Lotte and Aurons Trigger Commands Cons Manager Depay, BrieflyCem Steam CAU Cu Contained Commands Constanting Parameters Shift Lotte and Aurons Trigger Commands Cons Manager Depay, BrieflyCem Steam CAU Cu ParaManastance Prist Comman input Parameters Shift Lotte and Aurons Trigger Commands Cons Manager Depay, BrieflyCem Steam CAU Cu ParaManastance Prist Comman input Parameters Shift Lotte and Aurons Trigger Commands Constanting Parameters Shift Lotte and Aurons Trigger Commands Constanting Aurons Commands Constanting Constanting Constanting Commands Constanting Constanting Commands Con	Save Save As Close Transmit	
PostAssistance     Prof Cameria Input     Prof Cameria     Prof Cameria     Prof Cameria Input     Prof Cameria     Prof Ca	hannels ECU Stream CAN2 Stream CAN Expansions	
Part Lamer     Part Camera Input     Pa		
PeriAssistance Print Camera Input		T (2) Instance 1
Abo Hers Command     still available coments: 34     Proof Dommand     Export Command     Periode Command     Description     Au     Command     Section 24 and     Command     Description     Au     Command     Section 24 and     Command     Section 24 and     Section 24 an		ParkAssistance First Camera Input
Ceres Science Aan  Ceres Command  Still mailable commits: 34  Poor Command  Description  An  Ceres  Ceres Ceres  Ceres  Ceres Ceres Ceres Ceres Ceres Ceres Ceres Ceres Ceres Ceres  Ceres Ceres Ceres Ceres Ceres Ceres Ceres Ceres Cer		
Weaty Science         month         Minimize           U         As         pre-region         if an equation is are true         if an equation is are true           Idear         ©         #*** equation         ©         pre-region         if an equation         <		
Weaty Science         month         Minimize           U         As         pre-region         if an equation is are true         if an equation is are true           Idear         ©         #*** equation         ©         pre-region         if an equation         <		Ed. And Mary Command and a scholar summaries 14 Interest Commands Encod Commands
Description     Fait/Assistance     import     Export       if     Ai     to the flowing continue are true       Open     © #*** expandio     © geter     .1		
tf At ± of the facourag conditions are true Gear ♀ +++ equal to ♀ gear		
Geer 🗘 ++- epunto \$ peer 13		
then ingget the bolowing action(s)		
First Camera Ingut		First Camera input
Nov Control		

### 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

nanneis ECU Stream CAN2 Stream CAN Expansions Math Channeis Stat	us Variables 57		nd Alarma		er Commu	inas (lei	ons Mana	ger Das	Slaty Sime	artyCam 5	bream (	CAN CHIP	Ø			
	dt lieu kon	stil availed	lie kora 3	-	import	_	E	igort.				2	Pallec	lea		
Mangelan	in faint	i izen (j. staa		-												a (1)
flame	1	1	P	1	1	9	Ø	¢¢	P	P	和	1D	≣D	∎D	题	10
Select RPM : /- between values : rpm II 0	≣D	≣D.	*	森	IDDE	100	Q≢	0ŧ	+	+	+	+	++	++		
	0		BRAKE	BLAKE	0	0	Ł	1					25.	w.	Ø	Ø
Carcel	4	A	1	+	0	0	A	Δ	Ц	11	Ц	I	DPS- MAX	-045	DPS NED	-
	2015	2018	0	0	,	10	Θ	ø	0	a	0	0			ERAKE	-
		-		-	0	0	1	10				m	(		5	8
	8		2	2	1	1	0	0	~	60	(10)	(rc)	(1)	115		સા
		• Acia nesi	-		-	-		Cust	om Icons							
														-	-1	Carce

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 "Icons 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

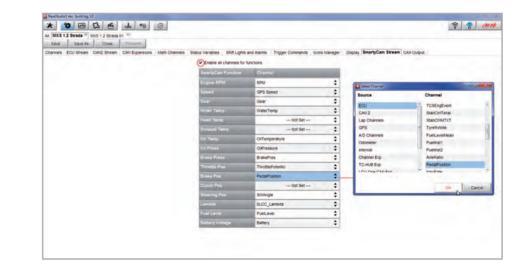


netholistictes have hig									acres of
	BE	1 +6	8						
MXS 1.2 Strada H	1								
Save Save As	Cicke	Timeret							
nnen ECU Stream	CAV2 Stream	CAN Expansions	Math Channels		shift Lights and Alarms Trigger C	onmandş i loons N	tanager Distriay	SmartyCam Stream CAN C	Divititive
				Itots name In	agen.				
				Automatic beams	#D		Name	Fuel low	
				Fuelos		0×	Show when		
					(1		PreLevel	🛊 🚥 equal to 🌻	1 4.0
				Add New Kom still evaluate ice	ne 20 import	Export			

### 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:

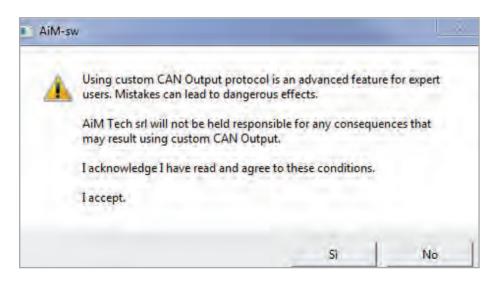
- on the left a panel that shows as many rows as the fields to be set
- on the right a panel that shows the channels group that can be set in that field and all the channels in it included; drag and drop the channel to set in the desired field or double click on it
- if more display pages have been added 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

ave As Close In Stream CAN2 Stream CAN	Expansions Math Co	anneis Status Va	anables Parameters Shift	Lights and Alarms	ingger Commands is	cons Manager Dis	iplay SmartyCam S	tream CAN Output
Bit Rate Protocol (bit/s)	-5054.859		is the property	intracio por secon	Carrol by changed	Name	•	
GAN (D (Nex)	Byte #	Byte	1 Bijle 2	Byte 3	Dyte 4	Byte 5	Вуте Б	Byte 7
	ort Neuralaciona R. may have 11	In number for CALE Dip to (remmal address) to ID CAN (free) DUC Byte Order	ejided. 29 bis (enerided address) 8 11 bis 3 Bryles Little Enclain Little Enclain	• - 0 bytes				
		Frequency	THE OK CA	1 Hz 2 Hz 5 Hz 10 Hz 20 Hz				

Bit Rate Protocol (bit/s)	with the universit DOU pressed it learns	of contract and an interest of the sector of	bigmente	Name	
CAN ID (next) Byte 0	Byre 1 Byre 2		Byte 4 Byte	e û Byne si	Byte 7
@ 0x702	NO OUTPUT - THE STA	ATIC VALUE 101 THE			
F+ Add New Payload				Eurot.	mport
-					
t CAN Paplant Details	Select Dame			Set CAN Payload Details	
Anna Aldada A	Source	Channel		Charges Was	a la
Hol set +	ECU	. RPM	2	Charbel Wat	erfeno (C)
lead this value [D.	CAN 2	SpeedVeh			
	Lap Channels	SpeedFL.	0.0	thaterTerry' uses 1 beciming and the	Aptern 12 to manage at cipts
	GPS	speed#A		Muttplier (d) 1	
	A/D Channels	SpeedRL.		Offset (b) D	
Aum Dyten 2 bytes #	J Odometer	SpeedRR			2 bytes +
1 byte	Internation	Gear		1 byte	
2 bytes	Channel Exp	WaterTemp		2 bytes	
4 bytes	TC-HUB Exp	TurboBooM		4 bytes	

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



### 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:

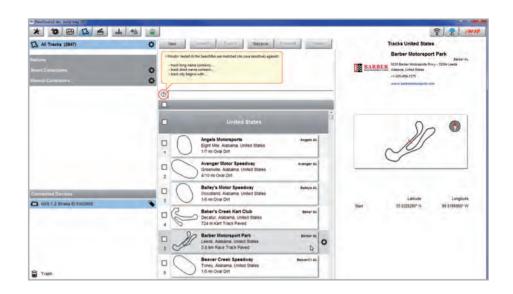
on top a fast search bar, that allows to select the tracks which satisfy your personal research criteria; pressing "?" a pop-up window explains research criteria (highlighted in red below), to say:

long name is the name in bold in each track box

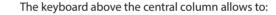
- short name is the track name shown on the display of MX Strada series and is the name shown top right of each track box
- track city is the name of the city the track is located in
- all the tracks listed in Race Studio 3 database. It automatically updates at start up if a connection to the Internet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

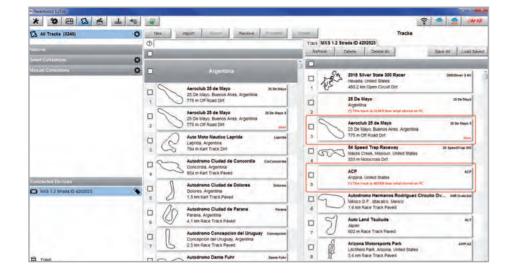
The column on the Right shows:

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.

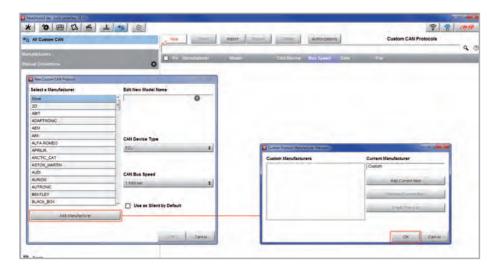
### 5.4 ECU Driver builder

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: 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

* 41 Custom CAN	New	Crime Inpot Paget	Sento Autorizations	Custom CAN Protocols
Manufadjurwin Kanual Collections	0 Pr Pa M		C-VI Device Box Speed Date File	4.0
		In the Conton CAN Protocol		
		Select a Manufacturer	Edit New Model Name	
		CITROEN	Custom	7
		CORVETTE		
		Oustom	CAN Device Type	
		DALLARA	ECU	
		DEUPHI		<b>a</b>
		DTA	ECV	
		DUCATI	Other CAN Device	
		DUCATI_ENERGIA	CAN Bus Speed	
		DIMO	s Motivet	(a)
		E-RACE	125 Kontiec	
		ECS	250 Kothed	
		ECU MASTER	300 Kbr/sec	
		EFI_EUROPE	1 Mbt/sec	
		EFLUSA	1 NOWYEC	1
		ELECTROMOTIVE	Use as Silent by Default	
		Add Manufacturer		
			ON Cana	

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

* Revelution 1.25.02						No. of Concession, Name				
* * * *	*8 🗃				()	• 🔒 <i>@##</i>				
All MXS 1 2 Strada Model 10										
All Configurations			MXS 1.2 S	trada ID 4202523						
		Properties Settings Tracks								
Devices (7)	Sto Live Measure	s Sorted by Channel Type	Auto Calibrate m// Values			Bink				
Manwal (Follections	0	Sort by Configuration Sort Alphabetically								
		Sort by Channel Type								
			Mast	er						
	Turning Lights	-90 deg	RL Wheel Pressur	-1.01 bar	Logger Temperature	901F				
	SteeringPos	-90 deg	RR Wheel Press	-1 01 bar	OilTemp.	-911F				
	FL Wheel Pressu	-1 01 ber	Oil Pressure	-1.01 bar	Luminosity	0%				
	FR Wheel Pressu	-1.02 bar	Speed	0.0 km/h	1000					
Connected Devices		ECU channels								
KXS 1 2 Strada (0 420262)	Fuelinst	-1	ClutchPedalSw		TyreSize					
	FuelInst2	-6	ESPEvent		RPM	- ( <b>p</b> n				
	FuelLevelMean	-5	ETCTelTal	-1	SpeedFL	-keth				
	PedalPosition	-6	FailSafeCool	-*	SpeedFR	krati				

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

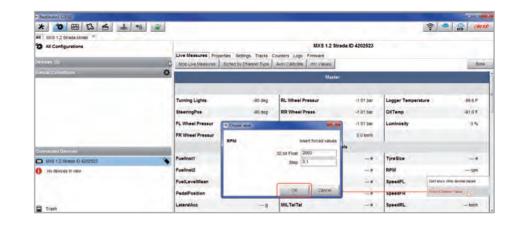
Once the configuration has been transmitted "Live Measures" page shows ECU Channels too and some operations can be performed, like start recording and stop live measures as well as making the device blinking pressing the button top right of the page. This last operation is the easiest and quickest way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

* * 8 8 4 * *							P 🗧 🔒 🦉	yn
All Configurations				MXS 1.2	Strada ID 4202523			
Devices (2)	Live Measures   Prop Stop Live Measures		ps Tracks Counters Logo annei Type Auto Calorate		Stop Forcing		1.0	ink.
Annani Eamedoane	SteeringPos	-90 deg	RR Wheel Pre	-1 01 ban	OliTemp	ator	RPM	•
	FL Wheel Pre_	-1.01 bar	Oil Pressure	-1.01 bar	Luminosity	05	2000 rpm	-
	FR Wheel Pre	-1.02 bar	Speed	0.0 8/10/0			WaterTemp	
			ECU chann	eis			104.0 F	-
	FuelInst1	-9	ClutchPedalSw	-	TyreSize			
	Fuelinst2		ESPEvent	-	RPM	2000 rpm		
	FuelLevelMean	-5	ETCTelTal		SpeedFL	km/h		
Connected Devices	PedalPosition	-5.	FallSafeCool		SpeedFR.	Amitt		
MXS 1.2 Strada ID 4202523	LateralAco	-9	MILTelTal	-+	SpeedRL	kmm		
	SWAngle	- deg	StabCtriMTX7		SpeedRR	- kmiti		
	YawRate	-deg/s	StabCtriTeital		SpeedVeh	km/h		
	ABSEvent	-+	TCSBrakeEv	-*	WaterTemp	104.0 F		
E Train	ARCTAITA		Trepatuant		Tenles	- tim	0	

### 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.

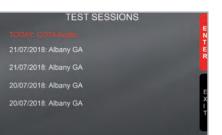
### 7 Data recall

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

First is "Today" page. Press "TESTS"

MA	X RPM 10048	MAX SPE	EED 282
Lap	Best Laps	RPM	Km/h
	1:57:56	10048 5592	280 73
	1:57:94	10100 5450	277 70
	1:58:02	10300 5700	278 69

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.

nnected Devices	Down	load	Install SW Export import Update Device			
			Name	On the web	On my PC	into
	Softw	vare		_	-	
	3		RaceStudio3	3.16.00	3.16.00	
	Firmy	vare				
	-		EVO4S	01.26.14	01.26.08	
	-		EVO5	01.26.14	01.26.08	
	-		MXG	01.26.14	01.26.08	
	-		MXL2	01.26.14	01.26.08	
	-		MXS	01.26.14	01.26.08	8
	-		MXS Strada	01.26.14	01.26.08	
	-		MyChron 5	01.24.62	01.24,64	
			SmartyCam HD	01.03.64	01.03.64	

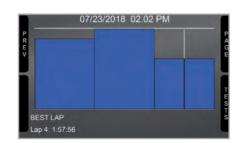
Once the new firmware has been downloaded connect the device to the PC using the USB cable included in the kit or via Wi-Fi to perform a firmware upgrade. In a few seconds the device is ready.

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 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

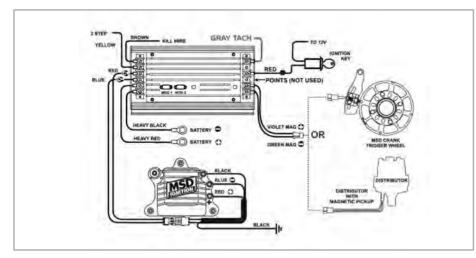
To get the RPM from the ECU just connect MX Strada series dash to the ECU and it will automatically sample that value.

**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)

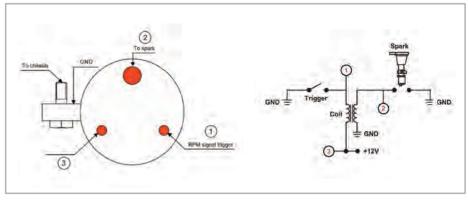
If the vehicle has no ECU connect the wire labelled "RPM" (corresponding to pin 21) of the device 23 pins connector harness to the ignition system. This way MX Strada series can read the signal from the low voltage of the coil (whose peak can be from 150 to 400 V) or from a possible square wave (the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

All MXS 1.2 Strada <sup>34</sup> Save Save As Close	Trans	na					
Channels ECU Stream CANZ Stream	n CANER	pansions Math Channels St	tus Variabres Parameters	Shift Lights and Alarms	Tripger Commanda its	ons Manager Display SmartyCam Stream	m CAN Output
	6	🖾 Marre					
	ion i	RPM	Engra RPM	RPU Sensor	1010 25 Hz	intax 16000 . faidur /1 :	
	1 topi	Speed1	Vehicle Spd	Speet Benklor	1mb 0.1 20 Hz	wheel 1000 pulses 1	
	C541	FuelLevel	Channel Lestings				
	C+02	OllTemperature	fiame-	RPM			
	Califo	OfPressure	Function	Engine RPti			
	(364	BrakePressure					
	(340)	Channel05	Sensor	RPM Seraor			
	Carlos	Channel05	Sampling Frequency	20 Hz			
	5-01	Channel07	Unit of Measure	inper			
	615	Chancel08		-			
	1	GPS Accuracy	_				
	and .	GPS Speed	RPM Parameters				
	Am	Attitude	RPM Max		r6000 ±		
	17001	Odometer	RPM Factor		e e		
	Carrier.	Luminosity					
	_						
					Save C	arcei	

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.

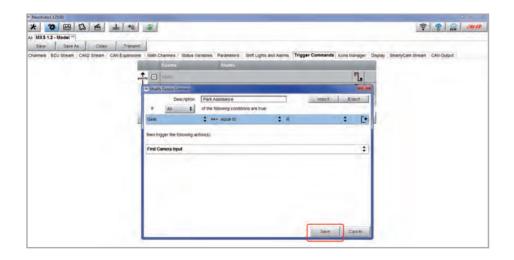
Please note: rear camera dimensions and MX Strada series camera input pinout are shown in chapter 11.

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"



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.

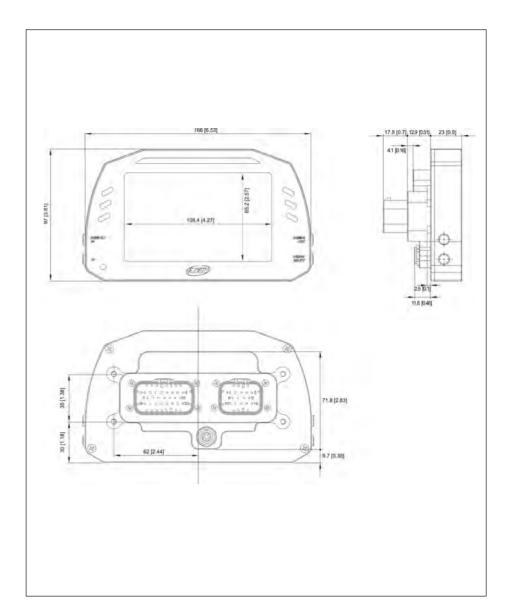




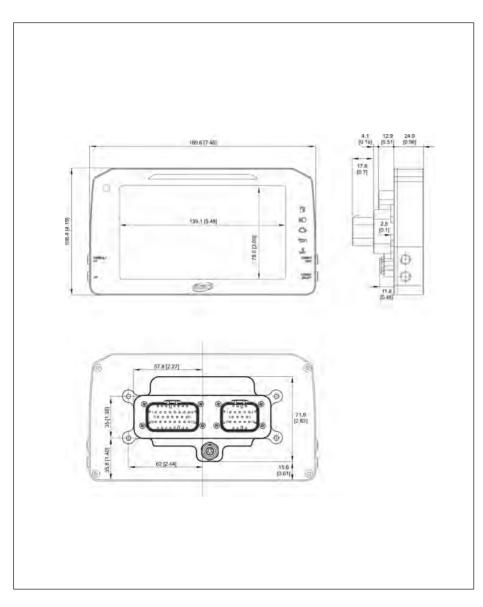
## 11 Technical specifications and drawings

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

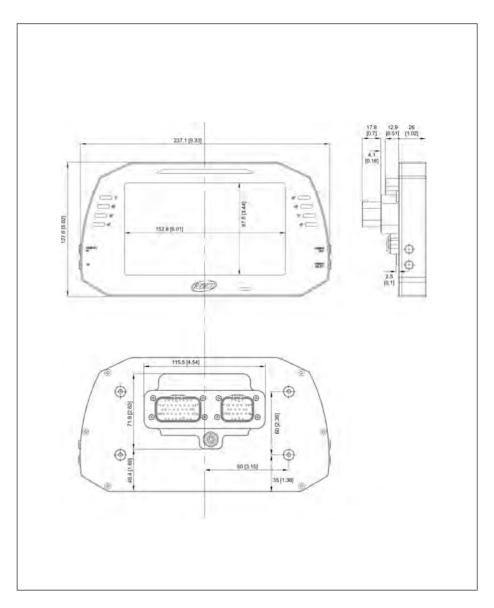
TFT display dimensions	5" (MXS 1.2 Strada) 6" (MXP Strada) 7" (MXG 1.2 Strada)
Display resolution	800x480 pixels
Contrast	600:1 (MXP Strada, MXS 1.2 Strada ) – 1000:1 (MXG 1.2 Strada)
Brightness	700cd/m² – 1,100 Lumen
Ambient light sensor	Yes
Alarm display icons	Yes, freely configurable
Alarm RGB LEDs	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



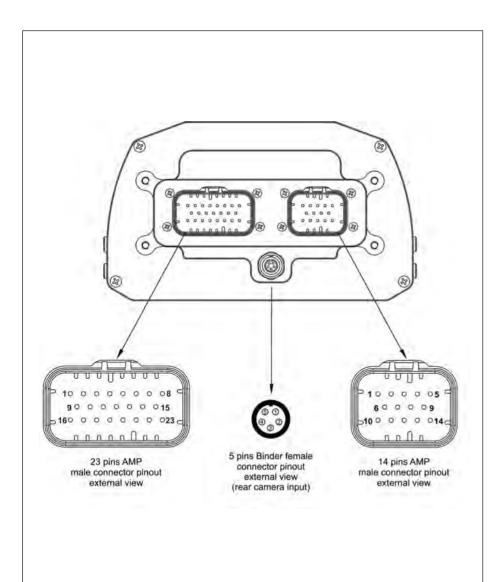
### MXP Strada dimensions in mm [inches]



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

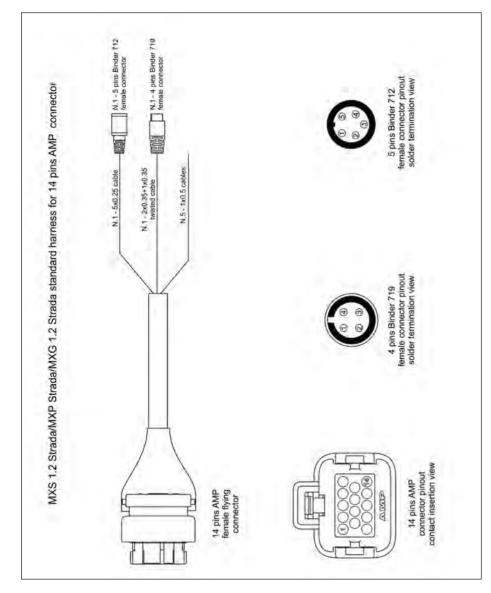


### **MX Strada Series pinout**



Pin	Function	Pin	Function	Pin	Function
1 2 3 4 5 6 7 8 9 10 1 12 3 4 5 6 7 8 9 10 11 12 3 4 5 6 7 8 9 10 11 12 13 14 15	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 5 Analog input 6 Analog input 7	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 RS232TX CAN1-/ECU RS232TX CAN1-/ECU RS232RX K Line ECU USB D- USB D- USB GND Reserved
16 17 18 19 20 21 22 23	+Vreference Analog input 8 Speed input GND Low Side output RPM input CAN 2+ CAN 2-				

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



14 pins AMP Cable Destination on the terms		Table of cab		4 pins Binder 719	) female con	nector	
connector colour connector pin Cable type Length Channel Labo	14 pins AMP		Destination	Cable type	Length	Channel	Labe
While twisted 1 USB D+							

14 pins AMP connector	Cable	Destination connector pin	Cable type	Length	Channel	Label
					513 51	-
3	White Black				GND GND	
5	Red	3	5x0 25 mm <sup>2</sup>	350mm	Vb out CAN	Exp
6	Blue	4	Shires min	350000	CAN- Exp	Fold
7	Orange	5	and the second second		Vb ext CAN	

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 RS232T) CAN1-/ECU RS232RX			
14	Yellow	1x0.5 mm²	550mm	RESERVED			

### MX Strada series 23 pins AMP connector harness

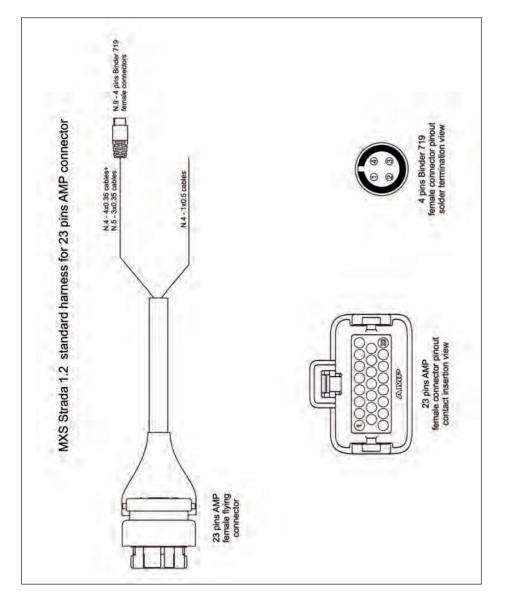
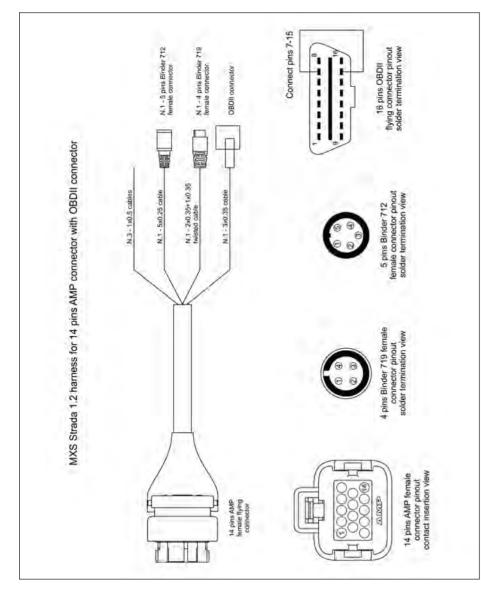


	Table of cal	bles ending v	with 4 pins	Bin	der 719	female connectors	
23 pins AMI Connettor pi		Destination connector pi	Cable ty	pe	Length	Channel	Label
1 2 3 4	White Black Red Blue	1 2 3 4	4x0.35m	m²	340mm	+Analog channel 1 Analog GND +Vb output +Vreference	Channel 1
5 2 3 4	White Black Red Blue	1 2 3 4	4x0.35m	m²	340mm	+Analog channel 2 Analog GND +Vb output +Vreference	Channel 2
6 7 8 9	White Black Red Blue	1 2 3 4	4x0.35m	m²	360mm	+Analog channel 3 Analog GND +Vb output +Vreference	Channel 3
10 7 8 9	White Black Red Blue	1 2 3 4	4x0.35m	m²	360mm	+Analog channel 4 Analog GND +Vb output +Vreference	Channel 4
11 2 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35m	m²	380mm	+Analog channel 5 Analog GND nc +Vreference	Channel 5
14 12 nc 13	White Black n.c. Blue	1 2 3 4	3x0.35m	m²	380mm	+Analog channel 6 Analog GND nc +Vreference	Channel 6
15 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35m	m²	400mm	+Analog channel 7 Analog GND nc +Vreference	Channel 7
17 12 nc 16	White Black n.c. Blue	1 2 3 4	3x0.35m	m²	400mm	+Analog channel 8 Analog GND nc +Vreference	Channel 8
18 19 3	White Black n.c. Blue	1 2 3 4	3x0.35m	m²	320mm	Speed 1 GND +Vb output nc	Speed
		Tabl	e of not ca	bled	cables		
0	23 pins AMP connector pin	Cable colour	Cable type	L	ength	Label	
	20 21 22 23	White White	1x0.5 mm <sup>2</sup> 1x0.5 mm <sup>2</sup> 1x0.5 mm <sup>2</sup> 1x0.5 mm <sup>2</sup>	5	50mm	Low Side digital outpu RPM Input CAN2+ CAN2-	E.

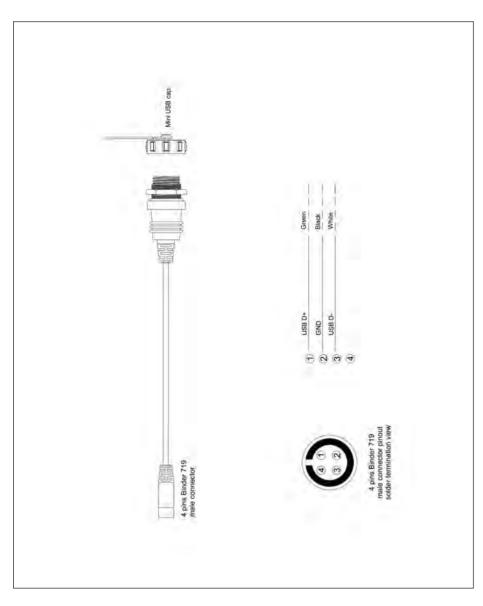
# MX Strada series 14 pins AMP connector harness with OBDII connector



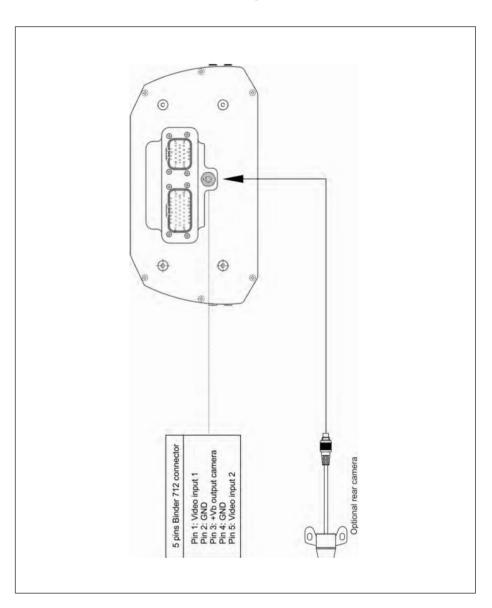
					and the second	
	Table of cables	s ending with 4	pins Binder 719	female cor	nector	
14 pins AMP connector pin	Cable colour	Destination connector pin	Cable type	Length	Channel	Labe
connector pin	colour		Cable type	Length		Labe
			Cable type 2x0.35+1x0,35 twisted	Length	Channel USB D+ USB GND USB D-	Labo

	And the first of the	1 0 100 1 1 7 <b>H</b> 1 1 1 0	a second the other second	Contraction of the	Contra a tap n	
14 pins AMP connector	Cable	Destination connector pin	Cable type	Length	Channel	Labe
3 4 5 6 7	White Black Red Blue Orange	1 2 3 4 5	5x0.25 mm²	350 mm	CAN+ Exp GND Vb oul CAN CAN- Exp Vb ext CAN	Exp

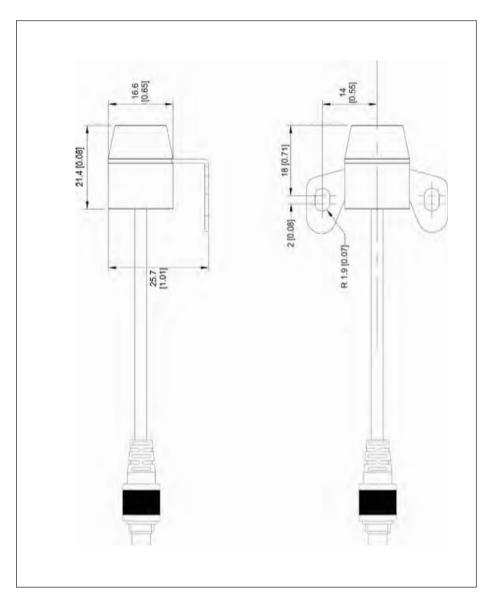
### MX Strada Series USB Cable



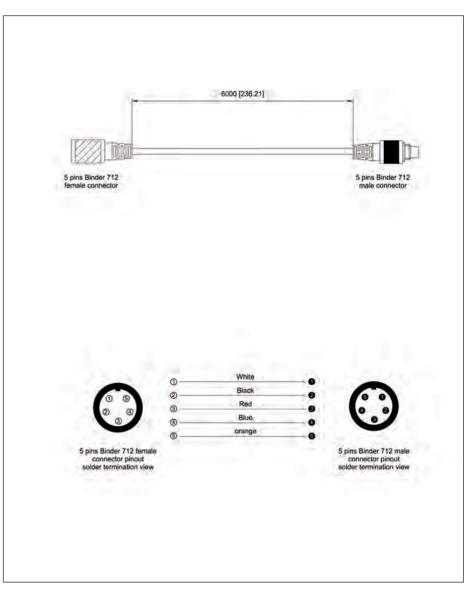
### MX Strada series mirror camera input



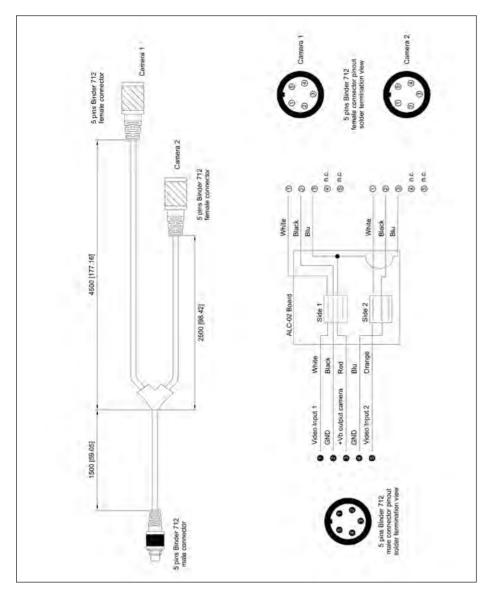
### Mirror camera dimensions in mm [inches]

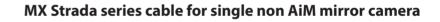


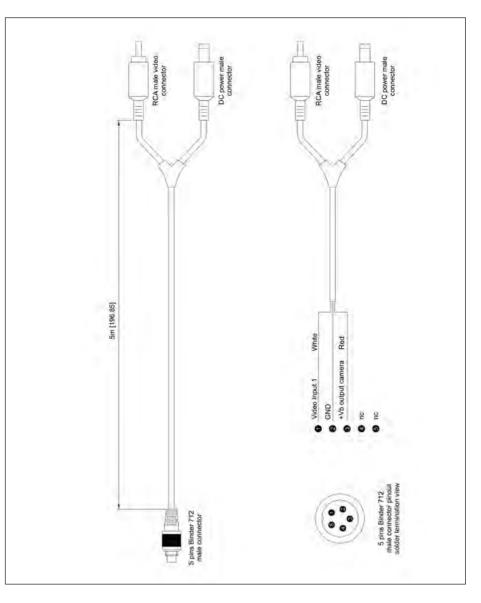
### MX Strada series cable for single AiM mirror camera



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







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

