





# MXG 1.2 Strada **MXP** Strada MXS 1.2 Strada USER GUIDE 1.00

4.2

van

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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 Lun	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 leading ECUs					
External Modules	GPS Module, Channel Expansion, TC Hub, Lambda Controlle SmartyCam HD					
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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G 50%

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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.

Syste	em Info
Logger Serial N	MXS 1.2 Strada 4202523
Fw Version	02.27.03
Boot Version	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.

· RaceStud	io3 3.24.02										
*	<b>2</b> EB	12 1	6 4		*8 🖨						<u> </u>
AI MXS	1.2 ×		_								
Save	Save A	As	Close	Tra	ansmit						
Channels	ECU Stream	CAN2 Str	eam CAN	I Expa	Insions Math Channels	Status Variables Parameter	s Shift Lights and Alarms	Trigger C	Commands	Icons Manager Display SmartyCam	Stream CAN Output
			ID		Name	Function	Sensor	Unit	Freq	Parameters	
			RPM		RPM	Engine RPM	RPM Sensor	rpm	20 Hz	max: 16000 ; factor: /1 ;	
					Speed1	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
					Speed2	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
					Speed3	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
					Speed4	Vehicle Spd	Speed Sensor	km/h 0.1	20 Hz	wheel: 1600 ; pulses: 1 ;	
					Channel01	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel02	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel03	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel04	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel05	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel06	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel07	Voltage	Generic 0-5 V	mV	20 Hz		
					Channel08	Voltage	Generic 0-5 V	mV	20 Hz		
				•	InlineAcc	Inline Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
				•	LateralAcc	Lateral Accel	AIM Internal Accelerometer	g 0.01	50 Hz		
				•	VerticalAcc	Vertical Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
					RollRate	Roll Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
					PitchRate	Pitch Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
				•	YawRate	Yaw Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
				•	GPS Accuracy	GPS Accuracy	AIM GPS	mm	10 Hz		
											f

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														
* 🐲 🖽 🕻	3 🖆 🚣 🎋	i 🔿										8		an
All MXS 1.2 Strada ×														
Save Save As	Close Trans	mit												
Channels ECU Stream C	AN2 Stream CAN Expansi	ons Math Channels	Status Variables	Parameters	Shift Light	s and Alarms	Trigger C	commands I	cons Manager	Display	SmartyCam Strea	m CAN Ou	tput	
	ID 🔽 N	ame	Function	Sen	ISOF		Unit	Freq	Parameters					
	Channel Settings					Channel Se	ettings				×			
	Name	Speed			ensor	Name		Channel02				1		
	Eurotion	Vebicle Sod			Sensor	- Hume		Analogi		0	linital			
	runcion	Venicle Spu		•	c 0-5 V	Euroction		Voltage	<u> </u>	0.		1		
					c 0-5 V	- One bon		voitage			•	1		
	Sensor	Speed Sensor		\$	c 0-5 V									
	Sampling Frequency	20 Hz		\$	c 0-5 V	Sensor		Generic 0-5	V		\$	ļ		
	Unit of Measure	km/h		\$	c 0-5 V	Sampling F	requency	20 Hz			\$			1
	Display Precision	1 decimal place		\$	c 0-5 V	Unit of Mea	sure	mV			:			
					c 0-5 V									
	- Speed Parameters-				c 0-5 V	1								
	Wheel circumf	erence [mm]	1600		s	1								
	Pulse per whe	el revolution	1		s									
					s									
					-									
			0.000	0	-					0	0			
			Save	Gancer					_	oave	Cancer			

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

am CAN2 Skoom	CANENDO	nsing Halk Channels	Statue Variables Decemate	and Carl	Lig	le and Alarma Triag	or Commande	leane Man	naor Display SmartyCo	CAN Output
Name	nel Settings	Channel04				Name	Channel0	4		
Wallie		Analogic	Digital		sor	Name	O Analog	ic .	Digital	
Functio	on	Digital Status	0 -		nsor	Function	Digital Sta	itus	0.1	
					-5 V					
Sensor	r	Status			-5 V	Sensor	Status			
					-5 V					_
Active	when signal	is: Oclose to ground	O close to VBatt	P	-5 V	Active when signal is:	O close t	o ground	Close to VBa	att
		Active CON	Not active	— B	-5 V		Active [	ON	Not active	vn
		Monostable	Bietable	- E	-0 V		label L	etable	Bietable	
			0	,	-5 V			ed	0	
					-				-	
			Save Can	ncel					Save Car	ncel
Alt	•	Altitude	Altitude	AIM GPS	_	m	10 Hz			
040		Odometer	Odometer Total	AIM ODO		km 0.1	1 Hz			
Oub		1	Delablaces	AiM Lumin			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 <sup>34</sup>	
Save Save As Close Transmit	
Channels ECU Stream CAN2 Stream CAN Expansions Math Channels Sta	atus Variables Parameters Shift Lights and Alarms Trigger Commands Icons Manager Display SmartyCam Stream CAN Output
ECU: Click I	Click here to view protocols updates history.
The Choose ECU Protocol	Change ECU 1
Manufacturer	Model
None	PADDLESHIFT
BOSCH	
BRIGHTWATER	
HEWLAND	
KMP	
MEGALINE	
NEMESIS	
SEAT_Sport	-
STACK	
TEVES	
TIRE WATCH	
WIRELESS MOTORSPORT	
	-
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	OK Cancel

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MXS 1.2 Strada <sup>34</sup> MXS 1.2 Strada Model <sup>34</sup>							
Save Save As Close Transm	nit						
hannels ECU Stream CAN2 Stream CAN Expansio	ons Math Channels	Status Variables Parameters	Shift Lights and Alarms	Trigger Comma	nds Icons Manager	Display SmartyCam Stream	CAN Output
	ECU: FO	ORD - MUSTANG 2010		Change ECU	: 3		
			Enable the CAN	Bus 120 Ohm Res	istor		
	E		Cilent on CAN Ru				
	Enabled C	nanneis (Max. 120) 30730		•			
	ID	✓ Name	Function	Unit	Freq		
	CC08	RPM	Engine RPM	rpm	10 Hz		
	CC09	SpeedVeh	Vehicle Spd	km/h 0.1	10 Hz		
	CC13	SpeedFL	Wheel Spd	km/h 0.1	10 Hz		
	CC14	SpeedFR	Wheel Spd	km/h 0.1	10 Hz		
	CC15	SpeedRL	Wheel Spd	km/h 0.1	10 Hz		
	CC16	SpeedRR	Wheel Spd	km/h 0.1	10 Hz		
	CC17	Gear	Gear	gear	10 Hz		
	CC25	✓ WaterTemp	Water Temp	F 0.1	10 Hz		
	CC04	✓ TurboBoost	Number		10 Hz		
	CC21	TCSBrakeEvent	Number		10 Hz		
	CC22	TCSEngEvent	Number		10 Hz		
	CC23	StabCtrlTeltal	Number		10 Hz		
	CC24	StabCtrIMTXT	Number		10 Hz		
	CC34	✓ TyreRyMile	Number		10 Hz		
	CC31	Fuell evelMean	Percent	\$6.0.01	10 Hz		
	CC32	Eucliget1	Percent	6.0.01	10.65		
	CC32		Provent		4015		
	CC33	ruennst2	Percent	70 0.01	10 M2		

# 5.2.3 CAN2 Stream configuration

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

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

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

5.2.4 CAN Expansions config	guration
-----------------------------	----------

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:

RaceStudio3 3.25.02	
* 🐲 🖽 ዄ 🖆 🚣 🄝 🕾	
MXS 1.2 Strada <sup>34</sup>	
Save Save As Close Transmit	
hannels FCU Stream CAN2 Stream CAN Expansions Math Channels Stat	atus Variables Darameters Shift Links and Alarms Trinner Commands Irons Mananer Disniau SmartyCam Stream CAN Output
ECO. Cilck bi	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	
TER WATCH	
WIRELESS MOTOPSPORT	4
Mildebog_ino Fordar okt	
· •	
	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

	dio3 dev b	uild giu 27							
*	0	B I E	<u></u> +∂ ≙	2					<b>?</b>
All MX	S 1.2 Stra	ada 🏁							
Save	S	ave As Close	Transmit						
Channel	s ECU S	Stream CAN2 Stream	CAN Expansions M	ath Channels Status Variab	les Parame	eters Shift Ligh	nts and Alarms Trigger Commands Icons Man	ager Display Smar	tyCam Stream CAN Output
N	lew Expan	nsion							
All CH	хо × то								
Au Ch	10								
	18	Expansion N	lame ( 6 characters max.)	) LCC0	Get S.N.	from			
18		Expansion S	erial Number ( S.N. )	0	Expans	ted			
	Multiplier	r to calculate AFR (A/F	) from lambda (AFR = A	Ir Fuel Ratio = pounds of air /	pound of fuel	)	🜁 Lambda Multiplier Manager		
		14.57	- Gasoline	Add Custom	Value		Multiplier Lambda Values	New Value	Label for New Value
	6.	40 - Methanol				l i	C 40 Mathemati	14.57	Gasoline
	9.0	00 - Ethanol					6.40 - Methanol		Add or Modify Gurrent Item
	14.	.57 - Gasoline					9.00 - Ethanol		, so o mostly continues
	14.	.60 - Diesel					14.57 - Gasoline		Remove Current Item
		50 - LDG (Pronane)					14.60 - Diesel		Restore Default Values
	15.	ou - Er a (riopane)							
	15. 17.	20 - CNG					15.50 - LPG (Propane)	-	
	15.	20 - CNG					10.00 - LPG (Propane) 17.20 - CNG	-	
ID	15. 17.	20 - CNG Name	Function	Sensor	Unit	Freq	15.50 - LPG (Propane) 17.20 - CNG		
ID Lmd	15. 17.	20 - CNG Name 0LCC_Lambda	Function	Sensor AIM LCU-One Lambda	Unit 3.0.01	Freq 10 Hz	15.00 - LPG (Propane) 17.20 - CNG		01
ID Lmd AFR	15. 17. V	20 - CNG Name 0LCC_Lambda 0LCC_AFR	Function Lambda AFR	Sensor All LCU-One Lambda All LCU-One AFR	Unit	Freq 10 Hz 10 Hz	15.30 - LPG (Propane) 17.20 - CNG		OK Cance
ID Lmd AFR LTm	15. 17. V	20 - CNG Name 0LCC_Lambda 0LCC_AFR 0LCC_LmdTmp	Function Lambda AFR Lambda Temp	Sensor AM LCU-One Lambda AM LCU-One AFR AM LCU-One Temp	Unit A0.01 AF 0.01 C 0.1	Freq 10 Hz 10 Hz 10 Hz	15.50 - LPG (Propane) 17.20 - CNG		OK Cance

**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

MXS 1.2 S Save annels ECI	Strada <sup>24</sup> Save As Close	Transmit						<u> ?</u> ?
MXS 1.2 S Save annels ECI	Save As Close	Transmit					-	•
Save annels ECI	Save As Close	Transmit						
annels ECI	U Stream CAN2 Stream C							
New Exp	pansion	AN Expansions Math C	hannels Status Varia	bles Param	eters Shift Lights	and Alarms Trigger Comm	nands Icons Manager Display SmartyCam Stream CAN Or	utput
	CHX1 ×					Channel Settings		
-						Name	1CHX_Channel03	
C	Expansion Name Expansion Serial	e ( 6 characters max. ) I Number ( S.N. )	CHX1 0	Get S.N a conne Expan	from ected sion	Function	Voltage \$	
	✓ Name	Function	Sensor	Unit	Freq	Sensor	Generic 0-5 V 🗘	
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12	ICHX_Channel02	Voltage	Generic 0-5 V	mV	20 Hz	Unit of Measure	mV 🗘	
13	✓ 1CHX_Channel03	Voltage	Generic 0-5 V	mV	20 Hz			
4	ICHX_Channel04	Voltage	Generic 0-5 V	W	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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T03	TTCH_TC03	Temperature	K type thermocouple	C 0.1	20 Hz		Linit of Measure	0							
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Close															
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**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.

Image: Same Same As       Color       Transmit         Same Same As       Color       Transmit         Channels       ECU Stream       CAL2 Stream       CAL2 Example         Add Channel       sall adde math channels       27         Image: ECU Stream       CAL2 Example       CAL2 Color         Image: ECU Stream       CAL2 Example       CAL2 Example	RaceStudio3 d	lev build giu 27													
Al MXS 12 Strate <sup>37</sup> See Save As Close Tranmit Channels ECU Stream CAVE Spansions Math Channels Status Variables. Parameters Shift Lights and Alarms Troger Commands. Kons Manager Display SmartyCam Stream CAV Output Add Channel III available math channels: 37	* 2	E E 1	13 e	<u></u> +∂	印									(î•	* 🧶
Save       Save As       Once       Transmit         Channels       ECU Stream       CAH Expansions       Math Channels       Status Variables       Parameters       Shift Lights and Alarms       Trigger Commands       Kons Manager       Display       SmartyCam Stream       CAH Output	All MXS 1.2	Strada ∞													
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## 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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	Create New Status Vanable
	Name Water Temp Alarm
	Freq 50 Hz e
	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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# 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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#### 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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#### 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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🕂 1 8200 🧑 8400 👩 8600 👩 8600 🧑 9000 🧑 9200 👩 9400 👩 9600 🐻 9600 🐻 10000 🐻 🗘	If All ¢ of the following conditions are true:
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LED 1 12 2:03.84 LED 4	then trigger the following action(s):
Add there Alarm still available alarms 37 Import Alarm Export Alarm	una constan no knyer net
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#### 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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The Create New Alarm	
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Any CAN 2 CAN 2 Water Temp Alarm	
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then trigger the following action(s): Accelerometer	
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ore the device is turned off	
A a button is pushed	
Par 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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Next Display Page 🗘	Салсе
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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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	then trigger the follo	lowing action(s):	
		•	
	First Camera Input	Ŧ	
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# 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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set hexadecimal nu It may have 11 bits	mber for CAN ID payload. Inormal address) or 29 bits (extended address)	4 bytes			
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		8 bytes			
L	Byte Order		_		
	Big Endian				
	Little Endian				
	Frequency 1 Hz • F	1 Hz			
		2 Hz			
	OK Cancel	5 Hz			
		10 Hz			
		20 HZ			

RaceStudio3 dev build yesterday 14:23		
* * * * * *		<u> </u>
All MXS 1.2 Strada 180717 34		
Save Save As Close Transmit		
Channels ECU Stream CAN2 Stream CAN Expansions Math Channels	Status Variables Parameters Shift Lights and Alarms Trigger Commands	i Icons Manager 🛕 Display SmartyCam Stream CAN Output
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 changed	Name
CAN ID (hex) Byte 0	Byte 1 Byte 2 Byte 3 Byte 4	Byte 5 Byte 6 Byte 7
✓ 0x702 NO OU	TPUT *HC STATIC VALUE: 10' *HC	
+ Add New Payload		Export import
Set CAN Payload Details	Select Channel	Set CAN Payload Details
	Source Channel	
Channel Not set \$	ECIL A ROM	WaterTemp (C)
Send this value 0	CAN 2 SpeedVeb	
	Lan Channels SpeedFi	WaterTemp' uses 1 decimals: set Hultipler+10 to manage all digits
	GPS SpeedFR	Multiplier (a) 1
	A/D Channels SpeedRL	Offset (b) 0
Num Bytes 2 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 Even * TCQBrekeEvent *	· · · · · · · · · · · · · · · · · · ·
OK Cancel		OK Cancel
	OK 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

s Close	e Transmit
2	S Clos

# 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	Authorizations Custom CAN Protocols
		<b>9</b> (1)
Manufacturers		
Manual Collections	Pw Pw Manufacturer Model CAN Dev	vice Bus Speed Date File
manual conections		
	I New Custom CAN Protocol	
	Select a Manufacturer	Edit New Model Name
	CITROEN	* Custom
	CORVETTE	
	Custom	CAN Device Type
	DALLARA	E ECU A
	DELPHI	
	DTA	ECO
	DUCATI	Other CAN Device
	DUCATI_ENERGIA	CAN Bus Speed
	DYNO	1 Mbit/sec 🗘
	E-RACE	125 Kbit/sec
	ECS	250 Khiller
	ECU MASTER	500 Khitiser
	EFI_EUROPE	1 Mbiling
	EFI_USA	1 MDI/Sec
	ELECTROMOTIVE	Use as Silent by Default
	Arid Manufacturar	
	Add Malidiactorer	
		OK Cancel
C 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

ReceStudio3 3.25.02							
* * 🖽 🖏 🖆 📥 🄝 🖨						((**	
All MXS 1.2 Strada Model 36							
2 All Configurations				MXS 1.2 Stra	da ID 4202523		
	Live Measures	Properties Settings Tracks	Counters Logo	Firmware			
Devices (2)	Stop Live Measure	es Sorted by Channel Type	Auto Calibrate	mV Values			Blink
Manual Collections		Sort by Configuration					
		Sort Alphabetically					
		Sort by Channel Type					
				Master			
				master			
	Turning Lights	-90 deg	RL Wheel Pr	essur	-1.01 bar	Logger Temperature	99.1 F
	SteeringPos	-90 deg	RR Wheel Pr	ess	-1.01 bar	OilTemp	-91.1 F
	FL Wheel Pressu	r -1.01 bar	Oil Pressure		-1.01 bar	Luminosity	0 %
	FR Wheel Pressu	• -1.02 bar	Speed		0.0 km/h		
Connected Devices				ECU channe	els		
MXS 1.2 Strada ID 4202523	FuelInst1	%	ClutchPedal	Sw	#	TyreSize	#
	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

RaceStudio3 3.25.02							ار این اور	×
* * * * * *							?	A DE
All Configurations				MXS 1.2	Strada ID 4202523			
	Live Measures Pro	perties Settings	Tracks Counters Logo	Firmware				
	Stop Live Measures	Sorted by Chan	nel Type Auto Calibrate	mV Values	Stop Forcing		B	link
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	Ħ
		ECU channels						
							104.0 F	· ·
	Fuelinst1	%	ClutchPedalSw	#	TyreSize	#		
	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	StabCtrlMTXT	#	SpeedRR	km/h		
	YawRate	deg/s	StabCtriTeltal	#	SpeedVeh	km/h		
	ABSEvent	#	TCSBrakeEv	#	WaterTemp	104.0 F		
C Trach	1007-17-1				T			

## 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		ſ
M.	AX RPM 10048	MAX SPE	P A G	
Lap	Best Laps	RPM	Km/h	E
4	1:57:56	10048 5592	280 73	
	1:57:94	10100 5450	277 70	I
	1:58:02	10300 5700	278 69	S

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



values.

- 😤

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			
* 🚣 🏍 🍄 🔂 🖽 🕾 🛱			<u> ?</u>
Connected Devices	Download Install SW Export Import Update Device		
	Name	On the web	On my PC Info
	Software		
	RaceStudio3	3.16.00	3.16.00
	Firmware		
	EVO4S	01.26.14	01.26.08
	🚥 🖌 EVO5	01.26.14	01.26.08
	m MXG	01.26.14	01.26.08
	🚥 🖌 MXL2	01.26.14	01.26.08
	m MXS	01.26.14	01.26.08
	🚥 🖌 MXS Strada	01.26.14	01.26.08
	🚥 🔽 MyChron 5	01.24.62	01.24.64
	SmartyCam HD	01.03.64	01.03.64
	WXG           WXL2           WXS Strada           W MyChron 5           SmartyCam HD	01.26.14 01.26.14 01.26.14 01.26.14 01.26.14 01.24.62 01.03.64	01.26.08         Image: Constraint of the second secon

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 summar	v.

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

🕎 RaceStudio	3 dev build lug :	17											- 0 %
*		53 m		ô	- 🚑								🛜 😤 <i>卿</i>
All MXS 1	.2 Strada ≥												
Save	Save As	Close	Transmit										
Channels	ECU Stream	CAN2 Stream	CAN Expan	isions	Math Channels	Status Variables Parameters 8	Shift Lights and Alarms 1	Frigger Comm	ands Ic	ons Mana	ger Display SmartyCam St	tream CAN Outp	ut
			ID		Name	Function	Sensor	Unit	Freq	Par	ameters		
			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	whe	el: 1600 ; pulses: 1 ;		
			Ch01	•	FuelLevel	Channel Settings							
			Ch02	•	OilTemperature	Name	RPM			_			
			С 603	•	OilPressure	Function	Engine RPM						
			Ch04	•	BrakePressure	6							
			С 605		Channel05	Sensor	RPM Sensor	_					
			Ch06		Channel06	Sampling Frequency	20 Hz	_	_	\$			
			Сћ07		Channel07	V Unit of Measure	rpm						
			Ch08		Channel08								
			Accu	•	GPS Accuracy								
			Spd	•	GPS Speed	RPM Parameters							
			Alt	•	Altitude	RPM Max		16000	\$				
			OdD	•	Odometer	RPM Factor		/1	\$				
			Luma	•	Luminosity								
								Save	C	ancel			

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"

All MXS 1.2 - Model 32
Save As Close Transmit
Channels ECU Stream CAN2 Stream CAN Expansions Math Channels Status Variables Parameters Shift Lights and Alarms Trigger Commands Icons Manager Display SmartyCam Stream CAN Output
Events Alarms
μφτνγ 🖸 Water Τι
Modify Output Command
Description Park Assistance Import Export
If All C of the following conditions are true:
Gear C + equal to C R C +
then trigger the rollowing action(s):
First Camera Input
Save Carrel
Sare Calco

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)
	23/x12/.6x26mm (MXG 1.2 Strada)
Waterproof	1P65



### 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 11 12 13 4 15 6 7 8 9 20 11 12 21 22 23	Analog input 1 Analog GND +Vb output +Vreference Analog input 2 Analog input 3 Analog GND +Vb output +Vreference Analog input 4 Analog input 5 Analog GND +Vreference Analog input 6 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-		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



14 pins AMP connector         Cable connector pin         Cable type         Length         Channel
connector colour connector pin Cable type Length Channel
White twisted 1 LISB D+

14 pins AMP connector	Cable colour	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	350mm	CAN+ Exp GND Vb out CAN CAN- Exp Vb ext CAN	Ex

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 inp		
8 9	White Blue	1x0.5 mm² 1x0.5 mm²	550mm	CAN1+/ECU RS232 CAN1-/ECU RS232		
14	Yellow	1x0.5 mm <sup>2</sup>	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 ?
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	3x0.35mm <sup>2</sup>	320mm	Speed 1 GND +Vb output	Speed

	16	able of not ca	bled 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 ending with 4	pins Binder 71	9 female co	nnector	
14 pins AMP connector pin	Table of cable Cable colour	s ending with 4 Destination connector pin	pins Binder 71 Cable type	9 female con Length	nnector Channel	Labe
14 pins AMP connector pin	Table of cable	s ending with 4 Destination connector pin	pins Binder 71 Cable type	9 female con Length	Channel	Labe
14 pins AMP connector pin	Table of cable Cable colour	s ending with 4 Destination connector pin	pins Binder 71 Cable type	9 female co Length	Channel USB D+	Labe

connector	colour	Destination connector pin	Cable type	Length	Channel	L
3 4	White Black	1 2	5.0.05	050	CAN+ Exp GND	_
4 5	Black Red	2	5x0.25 mm <sup>2</sup>	350 mm	GND Vb out 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.