

# MXK10 for Kawasaki Ninja ZX-10R Kawasaki Ninja ZX-10R SE Kawasaki Racing Kit compatible

User Manual 1.05



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# MXK10 for Kawasaki Ninja ZX-10R Kawasaki Ninja ZX-10R SE Kawasaki Racing Kit compatible

User Manual 1.04



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MIDDLE	2 KLCM	TRACK KECS	L	FRONT			REC		
345 <mark>km</mark>	102	234 <mark>km</mark>				13	.45AM		
		(		)					



### 1. MXK10 in a few words

MXK10 is an AiM dash-logger designed to be installed on Kawasaki Ninja ZX-10R produced in the years 2016-2019 also if connected to Kawasaki Racing kit.

It is a full Plug and Play dash, completely compatible with the original connector and wit the fixing points of the original bracket of your bike.

It features:

■ CAN connection for getting all the data coming from the bike stock ECU (ECU logged channels are specified in Appendix 1)

■ 6 alarm LEDs

■ 10 RGB LEDs to help you shifting the gear.

The dash-logger has an internal memory to record sampled data and comes with AiM GPS Module for Kawasaki that automatically gets lap times and a lot of important information you will find very useful if using your bike on the track.









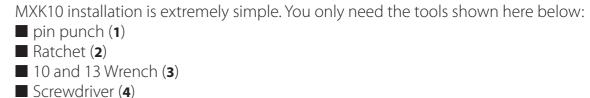


### 2. What is in the kit?

MXK10 kit (part number: **XA2MXS12A05R0KN**) includes:

MXK10 dash logger (1) ■ Washers and screws to fix MXK10 (2)  $\blacksquare$  GPS Module roof version (3) GPS bracket with screws (4)

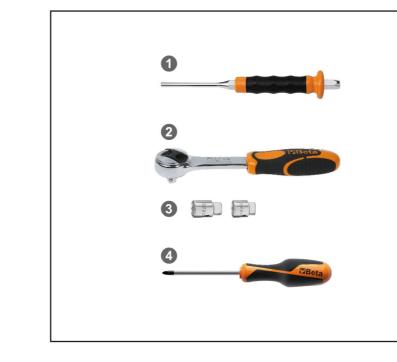
### 3. Installation





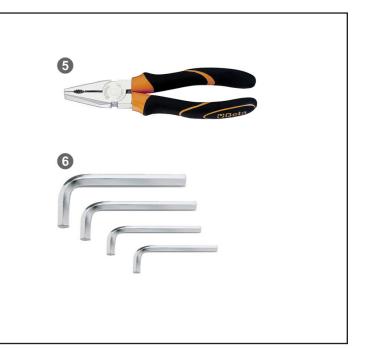
■ 3, 4, 5 and 6 Allen keys (6)

At this link https://www.youtube.com/watch?v=TmP4SQzS2n8&feature=youtu.be a tutorial video that shows how to remove Kawasaki Ninja stock dash and install **MXK10** dash logger is available.





### **CHAPTER 2-3**



### 4. MXK10 Main features

First of all, we have to say that MXK10 has two different working modes: Road Mode and Track Mode. You may swap between the two modes entering "Display" option of "Preferences" Menu (paragraph 5.2.1).

**Track Mode** is intended to be used when you are riding on a track. The GPS Module is enabled, in order to automatically get Lap Times; data are automatically recorded, TFT page is swapped in Track Mode and Lap pushbutton may be disabled in order to avoid confusion between the GPS Signal and the pushbutton one.

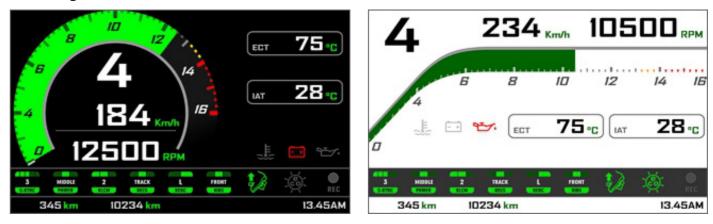
In **Road Mode** TFT page is swapped in Road Mode, the data are by default not recorded, GPS Module is disabled. The dash offers different pages, freely selectable through the bike keyboard entering "Preferences" menu.





Images here below show some examples of possible pages layout.

Road usage.



Track usage



In road pages ECT or Engine Coolant Temperature (Water Temperature) and IAT or intake air temperature (Air Temperature) are shown while in track pages also Lap Time and Lap number are shown.



### 4.1 Lap Times

MXK10 calculates and shows lap times. This can be made in two ways:

- Manually pushing "Lap" on the bike left keyboard
- Automatically using GPS Module you find in the kit; the Module includes most of the world tracks.

When you switch the bike on near a track the Module automatically recognizes it, loads the start/finish coordinates and calculates lap times when these coordinates are crossed. If your track is not in the database you may always create and load it in the database using Race Studio 3 software, freely downloadable from AiM website at: https://www.aim-sportline.com/en/sw-fw-download.htm





As said MXK10 features two working modes: road and track. In track mode the lap pushbutton can be disabled (see paragraphs 5.2.1 and 5.2.3) to avoid confusion between GPS signal and Lap button one while in road mode Lap button is always enabled and GPS Module is always disabled.

# 4.2 lcons

Thanks to the wide number of icons available on its display, the dash-logger shows a good amount of information. Here follows explanation of their meaning and working mode.



Water Temperature It turns on when water temperature gets over a customized value (default value 105°C)



Battery It turns on when battery voltage is lower than 10V



Oil pressure It turns on when the bike engine detects a problem with oil pressure.



Traction control (S-KTRC) Working range: 0 (OFF)-5 (Max)



Power Mode Working range: Low-Middle-Full



Working range: L



Launch Control Level Working range: from 1 (min) to 3 (max)

### **CHAPTER 4**



Electronic suspensions (KECS) Working modes: Manual, Road and Track



Engine Brake (KEBC) Available options: Low, OFF



Intelligent Braking System (KIBS) Available options: ON, FRONT/REAR, OFF



Quick Shift Available options: Up (shown here on the left), Down, Up&Down, OFF



Economy It turns ON when: RPM is lower than 6500 and throttle position is <5%



REC It turns on when the dash logger is recording.

# 4.3 LEDs

With reference to the image here below MXK10 features 6 solid LEDs that gives you these information.

- Turn Light (**2**)
- High beam (**3**)
- Engine problem (4)
- Fuel level low (5)
- ABS off/problems (6)
- Traction control intervention warning (7)



In the upper part of the dash logger are 10 LED customizable shift lights (1): when all lights are on it is suggested to shift gear.

**Please note:** to set the shift lights you need AiM Race Studio 3 software (from Race Studio 3.29.47 onwards) you can freely download from www.aim-sportline.com.

# 4.4 The bike keyboard

Kawasaki Ninja features five buttons: four on the left handlebar and one on the right one, used to manage MXK10 dash logger:

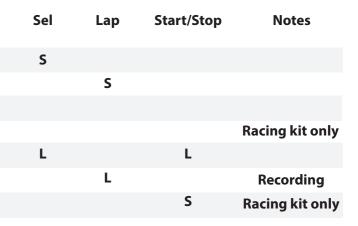




Differently pushed they perform different actions on MXK10 display pages. With reference to the following table: **S** stays for short (less than half of a second) pressure, **L** for long pressure (from half of a second).

Function	Up	Down
Access Menu		
Access Data Recall		
Change S-KTRC (traction control) settings	L	L
Change S-KTRC (traction control) settings	S	S
Activate Launch control		
Laptime		
Power mode		

**Please note:** as a general rule "UP" and "DOWN" pushbuttons scroll the options, "SEL" pushbutton select an option and "LAP" pushbutton exit a menu.



### 4.5 Parameters setting at start up or while riding

Traction Control (S-KTRC) can be set while riding:

- press (using a Long pressure) UP and DOWN buttons with the stock ECU.
- press (using a Short pressing) UP and DOWN buttons with Kawasaki Racing kit.

If you power the bike off with Traction Control disabled it will be automatically enabled and set on Level 1 at the following power on.



### 5. Menu

Push **SEL** to enter MXK10 settings "Menu" and set some parameters.

Please note: this is possible only if the bike is not moving.

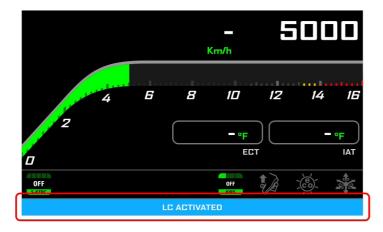
**Launch Control Level** allows to depart from a standstill with the power completely open. It can be set:

- only at start up with the bike in FULL POWER mode (see paragraph 5.1.1) with the stock ECU
- only at start up in any power mode with Kawasaki Racing Kit

To activate it press START/STOP and SEL at one time. A message with blue background appears bottom of the display and remains until one of the following conditions occurs:

■ the bike reaches 150 km/h

- the third gear is engaged
- the bike is turned off



Use "UP" and "DOWN" buttons to scroll option and "SEL" to select the desired option. The icons stays for.





Vehicle settings

Preferences

### 4.6 Data Recording

In **Road Mode** data recording is disabled. To enable it push START/STOP for 5 seconds and push it again for 5 seconds to disable it.

In **Track Mode** data recording is automatically enabled and activates when RPM reaches 2000 and speed is higher than 20 km/h. When MXK10 is recording the related icon appears (



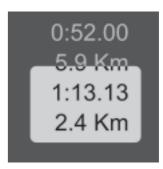


System

Exit

### **CHAPTER 5**





Trip



Track Manager

# **5.1 Vehicle settings**



# 5.1.2 KQS UP (Quick shift)

Quick shift parameters are related to Up and Down shift. It is possible to enable/disable UP and Down modes. The selected setting is shown by an icon in MXK10 bottom row.





Down

# 5.1.3 KLCM (Launch Control Level)

Once the bike in Full power mode with the stock ECU or ir any power mode with Kawasaki Racing Kit (see paragraph 5.1.1) press START/STOP and SEL buttons at one time to activate Launch Control Level. Its working range is from 1 (min) to 3 (max)

A message with blue background appears bottom of the display and remains until one of the following conditions occurs:

■ the bike reaches 150 km/h ■ the third gear is engaged

■ the bike is turned off

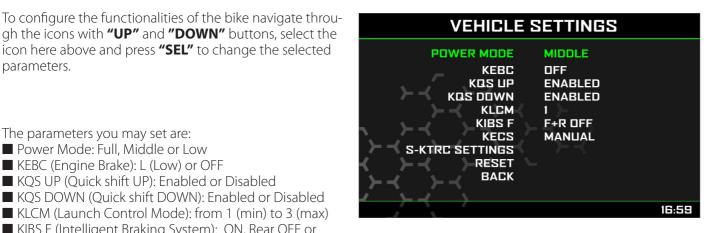
# 5.1.4 KIBS (Intelligent braking system)

ABS Management (with ABS dongle connected only); available options are ■ F+R OFF: both off R OFF: front on rear off

gh the icons with **"UP"** and **"DOWN"** buttons, select the icon here above and press "SEL" to change the selected parameters.

The parameters you may set are:

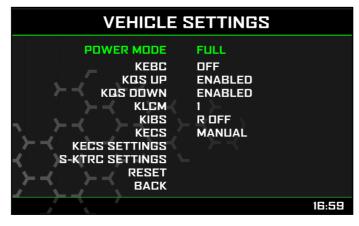
- Power Mode: Full, Middle or Low
- KEBC (Engine Brake): L (Low) or OFF
- KQS UP (Quick shift UP): Enabled or Disabled
- KQS DOWN (Quick shift DOWN): Enabled or Disabled
- KLCM (Launch Control Mode): from 1 (min) to 3 (max)
- KIBS F (Intelligent Braking System): ON, Rear OFF or OFF with ABS dongle connected only
- KECS (Electronic Suspensions Settings): Manual, Track or Road; only with KECS unit (Kawasaki ZX10R SE)
- S-KTRC SETTINGS: Traction control settings



### 5.1.1 Power Mode setting

Power Mode can be Full, Middle or Low. As explained in paragraph 4.5 this feature is mandatory to set Launch Control Mode on a Kawasaki bike with stock ECU. Power mode is to be:

- Full Power Mode with stock ECU
- Any Power Mode with Kawasaki Racing kit

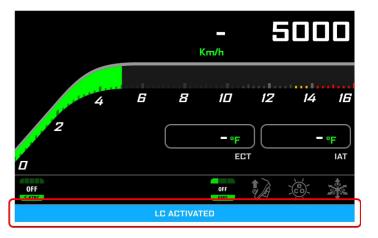


### **CHAPTER 5**



Up&Down





# 5.1.5 KECS (electronic suspensions with KECS unit only)

Electronic suspensions working range; available options are:

- Road
- Track
- Manua

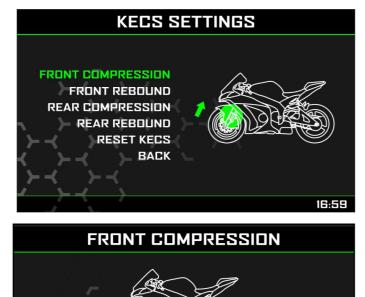
# 5.1.6 KECS settings

When KECS is in Manual Mode you may freely set the suspensions entering KECS Settings MENU.

You may:

- set the parameters related to:
- Front compression
- Front rebound
- Rear Compression
- Rear Rebound
- Reset KECS
- Back (exit)

Use "UP" and "DOWN" buttons to select the desired setting and "SEL" button to confirm the setting. Here on the right is front compression setting page.

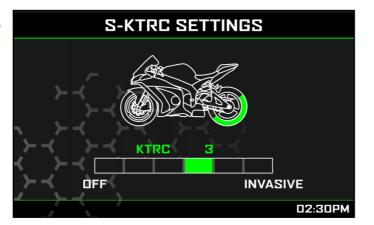


# 5.1.7 S-KTRC (Traction Control) Settings

Scroll to this option and press "SEL" in "Vehicle settings" page to set this parameter.

- To change this parameter.
- Press "Up" and "Down" buttons for one second (long pressure) with Kawasaki stock ECU
- Press "Up" and "Down" buttons for less than one second (short pressure) with Kawasaki Racing Kit

If you switch the bike off with Traction control disabled when you power it on again traction control is enabled and set on "1"



FAST

16:59

SLOW

# **5.2 Preferences**

In "Menu" page navigate through the icons with **"UP"** and **"DOWN"** buttons, select the icon you see here above and press **"SEL"**. **Please note:** if your bike is set in road mode Lap switch option is not available.

Here you can define:

- Display layout
- Alarms threshold settings
- Lap Switch (only if Riding Mode is Track): enabled or disabled
- Unit of measure: km/h or mph
- Date Time
- Brightness
- 📕 Wi-Fi

Back: comes back to Menu page

There is not much to explain about Unit of Measure or Date Time setting. Here follow some notes about the other parameters.

# 5.2.1 Display

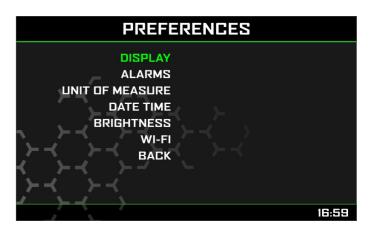
Here you can select MXK10 display layout.

You may choose among two different layouts: Analog or digital.



Analog layout







Digital layout

Each of them shows also the lap time if you set "Track" mode.



#### Analog layout in Track mode

#### Digital layout in Track mode

And finally, for each of the layouts there is a "Night" mode (black background) and a "Day" mode (White background) for improving the visibility in any light condition.



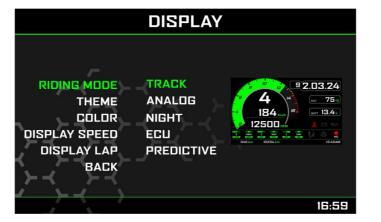
Analog Track layout in Day mode

For setting the layout preferences you have the menu.

Please note: "Color" option is available only if Brightness is in "Manual" mode (paragraph 5.2.4)

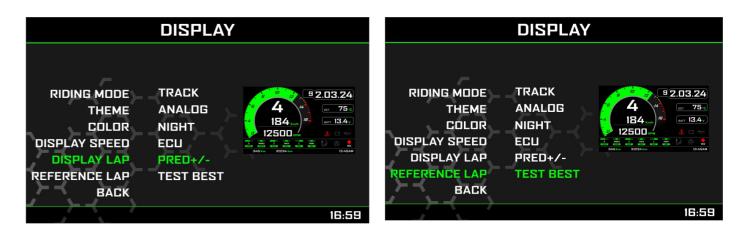


**Digital Track** layout in **Day** mode



Scrolling "Display" page options you can set laptime display mode (**Display Lap**). Available options are:

- **Rolling**: displays rolling lap time until start/finish line is crossed; than lap time is displayed for a while before starting rolling again
- **Static**: shows last lap time until a new one is performed
- (left image below); scrolling to the next line you can choose the reference lap among Test best and Day best



### 5.2.2 Alarms

Here you can set the alarms threshold values; when the alarm is active the corresponding icon switches on. Available alarms are:

- Water Temperature: it turns on when water temperature gets over a customized value (default value 105°C)

5.2.3 Lap switch

As said this option is only available if riding mode is "Track" while if riding mode is "Road" the pushbutton is always enabled.

To avoid undesired lap signals a 5 seconds time period is needed between one push and the following of "Lap" pushbutton.

To use it in "Track" riding mode "Lap switch" needs to be set "Enabled".

Please note: also with GPS Module connected and enabled there is no override between the two signals.

# **CHAPTER 5**

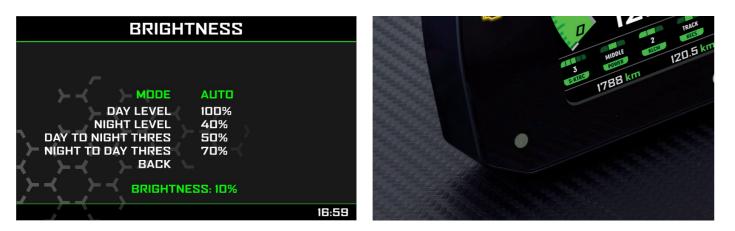
■ **Predictive**: shows predictive lap time; pressing "SEL" pushbutton again you enter predictive lap time configuration

Battery: It turns on when battery voltage is lower than 10V and the corresponding digital value is displayed red.

# 5.2.4 Brightness

MXK10 has two levels of brightness for day and night usage. A light sensor (shown below on the right) in the lower left side of the dash logger may help setting the desired brightness and the current display brightness is shown bottom of the page.

Available options are: Auto and Manual.



#### In Auto Mode you may:

- set the **Day Level**; at the desired threshold the dash logger commutes the display brightness and the display background colour
- set the **Night Level**: when the Light Sensor reads a brightness level higher than the threshold, the display is enlightened at the level defined in this parameter and the display background colour switches to white.
- set the Day to night threshold: at the desired threshold the dash logger commutes the display brightness and the display background colour switches to black;
- set the Night to day threshold: at the desired threshold the dash logger commutes the display brightness and the display background colour switches to white

"Night to day threshold" is to be always higher than "Day to Night threshold".

In **Manual** mode you simply set one level of brightness and this level is maintained independently from the external light conditions. This mode allows to set night/day display colour too.

### 5.2.5 Wi-Fi

MXK10 features a Wi-Fi module to communicate with the PC. It is mainly used to:

- configure MXK10 shift lights
- configure MXK10 expansion modules
- transmit data to the PC
- calibrate sensors (as explained at paragraph 6.4)
- download sampled data to the PC after the test

All these functionalities are explained in chapters 6 and 8.

Wi-Fi available Modes are:

- Auto: Wi-Fi is ON when the bike is stopped and OFF when the bike is moving
- ON: Wi-Fi is always on
- OFF: Wi-Fi is always OFF

"Wi-Fi Reset CFG" resets the Wi-Fi configuration and is very useful if you forget the password.

# 5.3 Trip

In Menu page navigate through the icons with "**UP**" and "**DOWN**" buttons, select the icon pushing "**SEL**". MXK10 offers five different odometers. One of them is not resettable while the others are. The first two odometers are used to show total and partial mileage. The others are mainly used in races.

### 5.4 Track Manager

Navigate through the icons using the pushbuttons **"UP"** and **"DOWN"**, and select the Tracks Icon pressing **"SEL"**. Track Management is intended for the driver that uses his bike on a track, both for races and track days. In order to take advantage from Track management, you have to install the GPS08 module, included in the kit. This is used for:

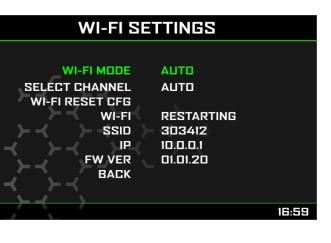
- Lap time calculation
- Speed calculation
- Predictive lap time calculation

To calculate these data the system needs to know the start/finish line coordinates of the racetrack you are racing on: MXK10 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 Wi-Fi connection is available. MXK10 provides two track selection modes:

- automatic
- manual

#### Automatic:

MXK10 automatically recognizes the track you are running on, loads the start/finish line and the possible splits coordinates and calculates lap and split times. This is the best mode in most cases.







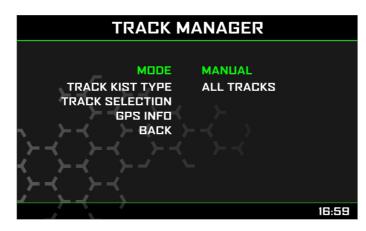
#### Manual:

In this mode you may select the track from the internal database. This mode is to prefer when multiple track configurations are available nearby. In this case MXK10 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:

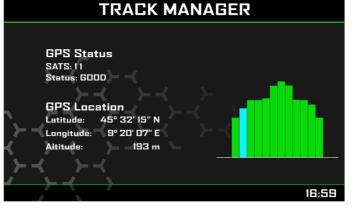
nearest: shows only tracks in a 10 km distance

- all: shows all tracks stored in the system in alphabetical order
- custom: shows only the tracks you have previously created (learning mode)



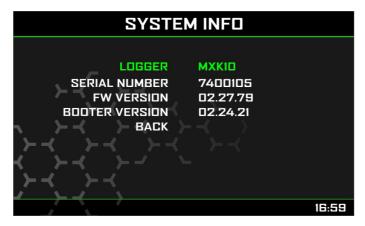
#### **GPS Info**

Selecting this page MXK10 shows the satellites signal status and current position.



### 5.5 System

This page shows serial number as well as firmware and booter version of your MXK10.



# **6 On track application**

If you are going to use your bike on a track, for track days or competition and wish to take the maximum advantage from MXK10, you will need to buy an AiM Data Hub (left image below) so to install a few sensors (suspension potentiometers, brake pressure..) and connect them to AiM Channel Expansion (right image below).



The steps to follow are:

- install Data Hub
- connect Channel Expansion
- connect MXK10 to your PC via Wi-Fi or through the USB port placed on the back of MXK10 with an optional USB cable (part number V02563030)
- configure MXK10 according to the sensors you have installed
- calibrate the sensors
- run your test

Ver. 00

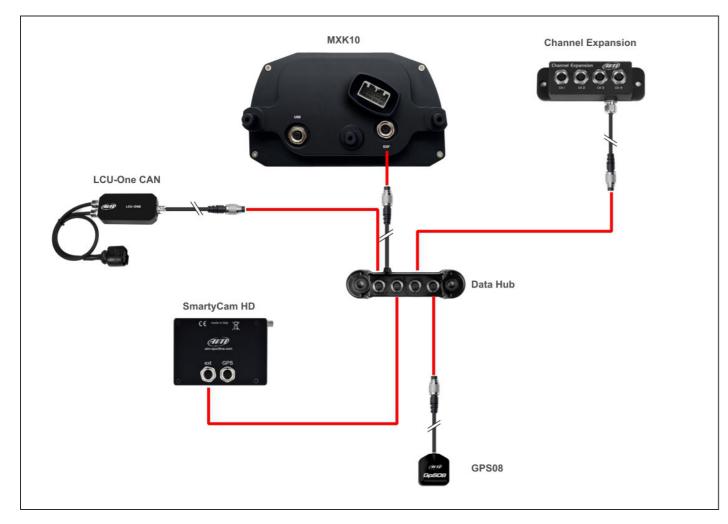
download the data, in order to analyse them

You may in any case have a quick review of your data on the display, without downloading them (**Data Recall**)



### 6.2 Configuration

MXK10 can be connected to various expansions as explained in paragraph 6.2. The image below shows an example of connection scheme.



### **6.1 Connection to the PC**

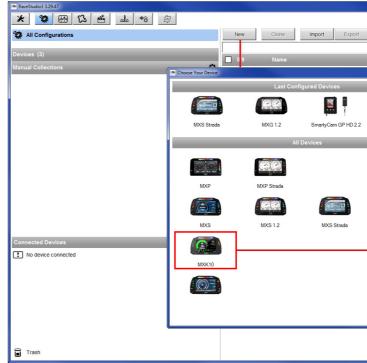
Using AiM Race Studio 3 software (from Race Studio 3.29.47) you can configure MXK10, manage its tracks database as well as check other device functions through Race Studio 3 device window. You may connect it to the PC via Wi-Fi or using an optional USB cable (part number V02563030):

using a Wi-Fi connection, please refer to chapter 9 where Wi-Fi configuration is explained

using an USB connection, plug the cable in the port labelled "USB" in the back of the dash logger.

Once MXK10 connected to the PC

click "Configurations" icon and configurations page appears ■ click "New" and new configuration panel appears: select an "MXK10" logger and press "OK"; when performing subsequent configurations "Select Configuration" panel shows on top the last four devices you configured.



MXK10 can only be connected to these AiM expansions: LCU-One CAN

Channel Expansions

			_ <b>_</b> ×
		?	ECU (III)
Receive Transmit	Delete	Device Configurations	
			٩ ()
	Device		Date
	Configuration Name and Notes		
6		MXK10	
MXG	Configuration Name		
	MXK10		
	Comment		
			*
MXS 1.2 Strada			
	_		~
	1		
		ОК	Cancel
-	<u>.</u>		
OK Cancel			

## 6.2.1 CAN expansions configuration

MXK10 can be connected to LCU-One, Channel Expansions and SmartyCam. To configure LCU-One Expansion activate the related layer. At the very first MXK10 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
- number from the connected LCU-One
- "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

📽 RaceStudio3 3.29.47				1		1				
* 🐲 🖽 🕄	Æ	₽	<b>↔</b>							?
All MXK10 01 34										
Save Save As	Close		Transmit							
CAN Expansions Shift Light	ts and Alarms	Sn	martyCam Stream							
New Expansion										
All LCC 34										
			Expansion Name	e ( 6 characters max. )	LCC	Get S.N. f				
	12		Expansion Seria	al Number ( S.N. )	0	a connec Expansi	ted ion	💷 Lambda Multiplier Manager		
								Multiplier Lambda \		Label for New Value
	Mu	ultiplie	r to calculate AFR (A/F) fro	om lambda (AFR = Air Fue	el Ratio = pounds of air / po	ound of fuel)		6.40 - Methanol	14.57	Gasoline
			14.57 - Gá	asoline	Add Custom V	alue		9.00 - Ethanol		Add or Modify Current Item
						_	_	14.57 - Gasoline	E	Remove Current Item
	ID	_	Name	Function	Sensor	Unit	Freq	14.60 - Diesel		Restore Default Values
	Lmd	_	LCC Lambda	Lambda	AiM LCU-One Lambda	λ0.01	10 Hz	15.50 - LPG (Propane)		
	AFR	_	LCC AFR	AFR	AiM LCU-One AFR	A/F 0.01	10 Hz	17.20 - CNG	-	
	LTm	_	LCC LmdTmp	Lambda Temp	AIM LCU-One Temp	F 0.1	10 Hz			
	LDg		LCC Diagn	Lambda Diagn	AiM LCU-One Diagn	#	1 Hz			OK Cancel
	Close									

### **CHAPTER 6**

aname the LCU One and fill in its serial number or press "Get SN from a connected expansion" to receive the serial select the multiplier to calculate AFR from lambda (in the example "14.57 Gasoline") or add a custom value pressing

## 6.2.2 Shift Ligths configuration

#### **Setting Channel Expansion**

To set a Channel Expansion:

- press "New Expansion" button; if you have already set an LCU-One CAN Channel Expansion layer appears and no more expansions can be loaded.
- select "Channel Expansion" and press OK
- aname 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
- press "Close" to save and exit

🕋 RaceStudio3 3.29.47						
* 🍄 🕾 🖾 🖷	<u>→</u> *ô お					?
All MXK10 01 »						
Save Save As Close	Transmit					
CAN Expansions Shift Lights and Alarm	IS SmartyCam Stream					
New Expansion						
All LCC <sup>™</sup> CHX <sup>™</sup>						
	Expansion Name ( 6		Get S.N. from a connected			X
	Expansion Serial Nu	mber ( S.N. ) 0	Expansion	Channel Settings		
				Name	CHX Channel01	
		inction Sensor		Freq	Analog     Digital	
		Itage Generic 0-5 V	mV	20 Hz Function	Pct Brake Load	\$
	_	tage Generic 0-5 V	mV 3	20 Hz		
	C03 CHX Channel03 Vol	tage Generic 0-5 V	mV	20 Hz Sensor	Percentage Pot. AutoCal	÷
	C04 CHX Channel04 Vol	tage Generic 0-5 V	mV	20 Hz Sampling Frequency	20 Hz	\$
				Unit of Measure	%	
	Close			Display Precision	no decimal place	÷
					Save	Cancel

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

To configure MXK10 shift lights activate the related layer; this page shows up.

To use the LED bar as shift lights click this icon ( ) and the RPM value that switches the single LED on LED sequence enabling the desired option: a LED stays on if its threshold is exceeded a LED stays on until another LED with higher thress connect the shift lights to the engaged gear enabling "Geat <b>Note:</b> State S	<b>All MXK1001</b> Size       Size       Size       Training         All 5000       Size       Size       Size       Size         All 5000       Size       Size       Size       Size       Size         All 5000       Size       S	RaceStudio3 3.29.47	
To use the LED bar as shift lights click this icon ( ) and the RPM value that switches the single LED on LED sequence enabling the desired option: a LED stays on if its threshold is exceeded a LED stays on until another LED with higher thress connect the shift lights to the engaged gear enabling "Gea With the start of the start of the engaged gear enabling "Gea With the start of the start of the engaged gear enabling "Gea MIXKNOT TO THE Start of the engaged gear enabling "Gea MIXKNOT THE START OF THE START	To use the LED bar as shift lights click this icon ( ) and the RPM value that switches the single LED on LED sequence enabling the desired option: a LED stays on if its threshold is exceeded a LED stays on until another LED with higher thress connect the shift lights to the engaged gear enabling "Gea www.userstorestorestorestorestorestorestorest	X         X	Geer         Shift Light 1         2         3         4         5           All         5000         5100         5300         5400         5600         600
<ul> <li>RPM value that switches the single LED on</li> <li>LED sequence enabling the desired option:         <ul> <li>a LED stays on if its threshold is exceeded</li> <li>a LED stays on until another LED with higher thres</li> </ul> </li> <li>connect the shift lights to the engaged gear enabling "Geating the second state of the second state stat</li></ul>	RPM value that switches the single LED on LED sequence enabling the desired option: a LED stays on if its threshold is exceeded a LED stays on until another LED with higher threshold is exceeded a LED stays on until another LED with higher threshold is exceeded connect the shift lights to the engaged gear enabling "Gea Receluded 329.47 Save As Close Transmit CAVIE: Save As Close Transmit CAVIE		LED 2 LED 3 New 12500
<ul> <li>LED sequence enabling the desired option:         <ul> <li>a LED stays on if its threshold is exceeded</li> <li>a LED stays on until another LED with higher thres</li> </ul> </li> <li>connect the shift lights to the engaged gear enabling "Geal with the start of the engaged gear enabling "Geal with the start of the engaged gear enabling "Geal with the start of the st</li></ul>	LED sequence enabling the desired option: a LED stays on if its threshold is exceeded a LED stays on until another LED with higher thress connect the shift lights to the engaged gear enabling "Gea <b>Resolution 329.47</b> <b>Resolution 329.47</b>		
Save Save As Close Transmit CAVI Expansions Shift Lights and Alarms SmartyCam Stream Gear Shift Light 1 2 3 4 5 6 7 8 9 10 All 5000 5 5100 5 5300 5 5400 5 5600 5 5700 5 900 6 6100 6 7000 6 8000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Save Save As Close Transmit CAN Expansions Shift Lights and Alarms SmartyCam Stream Coar Shift Light 1 2 3 4 5 6 7 8 9 10 All 5000 5 510 5 500 5 500 5 500 5 500 5 500 5 610 7 00 8 8000 0 0 0 0 0 0 0 0 0 0 0 0 0	■ LED sequence enabling th ■ a LED stays on if it ■ a LED stays on unit ■ connect the shift lights to	he desired option: ts threshold is exceeded til another LED with higher thres o the engaged gear enabling "Geo
	LED 1 LED 2 LED 3 LED 3 LED 3 LED 3 LED 4 LED 4 LED 4 LED 5 LED 5 LED 6 Choose Jobs Barrier Ba	Save         Save As         Close         Transmit           CAN Expansions         Shift Lights and Alarms         Smarty-Can Stream           Gear         Shift Light 1         2         3         4           All         5000         5100         5000         5400         5600	5 6 7 8 9 10 0 5700 5900 6100 7000 8000 0

### **CHAPTERS 6**



setting panel shows up. Configure:

hold turns on or ar dependent shift lights" checkbox;

stays on if is threahold is exceeded stays on until another LED with higher threahold is turned on engine rgm channel <u>PPU</u> pendent shift lights a and threahold values for shift lights: ift Light 1 2 3 4 5 6 7 9 10 0 6 5100 5 500 6 5400 5 5600 7700 5 560 6 10 0 7000 6 800 6 1 10 5 100 5 500 6 5400 5 560 7 70 8 560 6 10 0 7000 6 800 6 1 0 6 510 5 500 6 540 5 560 7 70 8 560 6 10 0 7000 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 7000 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 7000 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 5 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 7 70 8 560 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 570 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 6 500 6 500 6 570 6 500 6 570 6 500 6 570 6 500 6 10 0 700 6 800 6 1 0 7 10 7 10 7 10 7 10 7 10 7 10 7 10 7					
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Import Shift Lights         Expot Shift Lights         Expot Shift Lights           stays on xift another LED with higher threshold is turned on         engine rpm channel              •             •					
Import Shift Lights         Expot Shift Lights         Expot Shift Lights           stays on xift another LED with higher threshold is turned on         engine rpm channel              •             •					
Import Shift Lights         Export Shift Lights         Export Shift Lights           stays on rill's threshold is succeded stays on until another LED with higher threshold is turned on         •					
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Import Shift Lights         Export Shift Lights         Export Shift Lights           stays on rill's threshold is succeded stays on until another LED with higher threshold is turned on         •					
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stays on if ifs threshold is exceeded stays on unli another LED with higher threshold is turned on engine rpm channel engine rpm channel engine rpm channel EER 5 30 0 5 100 0 5300 0 5400 5600 5700 5 500 0 5100 0 7000 0 4000 0 11 11 10 0 5300 0 5400 5600 5700 5600 0 5100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 5700 0 5600 0 100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 00 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 5100 0 5300 0 5400 0 5600 0 7700 0 5600 0 100 0 7000 0 4000 0 11 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					
stars on until another LED with higher threshold is turned on         engine rpm channel	sequence mode of shift lights			Import Shift Lights	Export Shift Lights
engine rpm channel         PPU           pendert shift lights         Max gear number         6           gear channet:         CEAR         0           s and breshold values for shift lights         EGR         0           s and breshold values for shift lights         500         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         5800         6100         7000         6000         1           00         5100         5300         5400         5600         5700         <	D stays on if it's threshold is exceeded				
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and threshold values for shift lights:         sint Eight 1       2       3       4       5       6       7       8       9       10         00       5100       5300       5400       5500       5700       5500       6100       7000       8000       6       11         00       5100       5300       5400       5500       7700       5500       6100       7000       8000       6       11         00       5100       5300       5400       5600       5700       5800       6100       7000       8000       11         00       5100       5300       5400       5600       5700       5800       6100       7000       8000       11         00       5100       5300       5400       5600       5700       5800       6100       7000       8000       11         00       5100       5300       5400       5000       5700       5800       6100       7000       8000       11         00       5100       5300       5400       5000       5700       5800       6100       7000       8000       11         00       5100       5300       5400	ependent shift lights	Max gear numb	er 6		
init Light 1         2         3         4         5         6         7         8         9         10           00         5100         5300         5400         5600         5700         5800         5100         7000         8000         311           00         6         5100         5300         5400         5500         5700         5800         5100         8700         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100         8000         8100	ne gear channel:	GEAR	\$		
00 <ul> <li>5100</li> <li>5300</li> <li>5400</li> <li>5600</li> <li>5700</li> <li>5800</li> <li>5100</li> <li>5700</li> <li>5800</li> <li>5700</li> <li>5800</li> <li>5100</li> <li>5700</li> <li>5800</li> <li>5100</li> <li>5700</li> <li>5800</li> <li>5100</li> <li>500</li> <li>5100</li> <li>5100</li> <li>500</li></ul>	ors and threshold values for shift lights:				
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OK Cancel	5000 🚫 5100 🚫 5300	5400 🚫 5600 🚫	5700 🚫 5900 🚫	6100 🦲 7000 🦲	8000 🦲 📶
				0	K Cancel
					Guidel

# 6.2.3 SmartyCam configuration

MXK10 can be connected to SmartyCam HD and SmartyCam GP HD.

Normally no configuration is needed but if additional sensors have been installed it is possible to see specific channels on SmartyCam video; to do so:

- activate the related layer
- it shows all channel/sensors that satisfy the selected function
- if the desired channel is not in the list enable "Enable all channels for functions" checkbox and all channels/sensors are shown.

* 🍄 🖽 ዄ 📤 📥 🏫 谷			
MXK10 01 34			
Save Save As Close Transmit			
N Expansions Shift Lights and Alarms SmartyCam Stream			
	Enable all channels for fu	inctions	
	SmartyCam Function	Channel	
	Engine RPM	RPM	\$
	Speed	GPS Speed	\$
	Gear	GEAR	\$
	Water Temp	ECT	\$
	Head Temp	No available channel	
	Exhaust Temp	No available channel	
	Oil Temp	No available channel	
	Oil Press	No available channel	
	Brake Press	No available channel	
	Throttle Pos	TPS	\$
	Brake Pos	No available channel	
	Clutch Pos	No available channel	
	Steering Pos	No available channel	
	Lambda	LCC Lambda	\$
	Fuel Level	No available channel	
	Battery Voltage	Battery	<b>\$</b>

When the configuration is finished:

- press "Save" on the page top keyboard
- press "Transmit" to transmit the configuration to MXK10

-	0.1	01	Tranemit
save	Save As	Close	I ransmit

# 6.3 Managing a track on MXK10 with Race Studio 3

With Track Manager function of Race Studio 3 tracks can be created, deleted and modified, transmitted and received to/ from MXK10. Press "Tracks" icon.



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, "MXK10 ID 7400105")

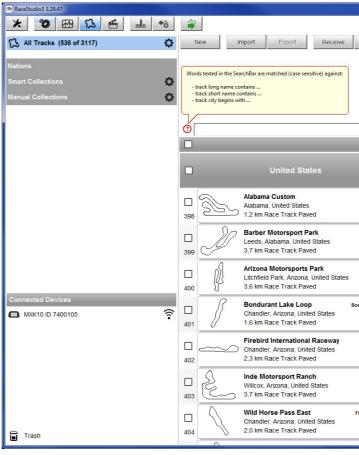
#### The column in **the middle** shows:

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

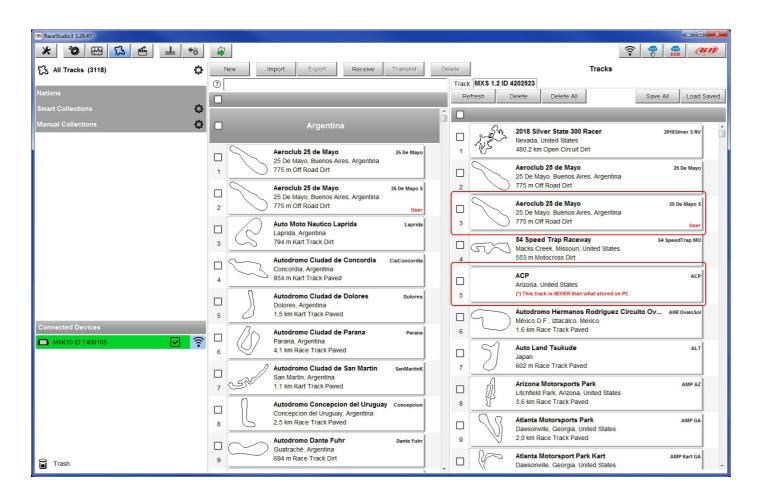
- long name is the name in bold in each track box
- short name is the track name shown on the display and is top right of each track box
- track city is the name of the city the track is located in

■ 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.



					- • ×
Transmit	Delete		Tracks		
			Barber Motorspo	rt Park	
			6030 Barber Motorsports Pi	Barber Al wy - 35094 Leeds	
			Alabama, United States		
			+1-205-699-7275		
			www.barbermotorsports.co	om	
		Г			
	*		~		
			(	$\mathbf{\nabla}$	
			\	10	
AL Custom			)	$\left \right\rangle$	
AL CUSION			/		
User					
			× /	/	
Barber AL					
		$\cap$			
AMP AZ					
		$\sim$			
durt Loop AZ					
Firebird AZ			Latitude	Longitude	
		Start	33.5325280° N	86.6196960° W	
INDE AZ					
rebirdEast AZ					



When MXK10 is connected it is shown on the left bottom part of the page. 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 MXK10 logger is different from the one stored in AiM database this is notified as shown here above. The page keyboards are used to manage the tracks.

The keyboard above the central column allows to:



- **New**: create a new track
- **Import**: import one or more tracks stored in the device or
- **Export**: export one or more tracks to a specific PC folder or
- **Receive:** receive from the connected device tracks user creations
- **Transmit**: transmit one or more tracks from the PC to the c is disabled)
- Delete: delete one or more tracks from Race Studio 3 data

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.

Receive	Transmit	Delete	
	pheral device ce is connected th	ne button is disabled connected the butto	
base			

## 6.4 The device page

RaceStudio3 3.29.47						
All Configurations			MXK1	0 ID 7400105		ECU ECU
	Live Measures Download	ViFi and Properties Tracks Co	ounters Logo Firmware			
evices (4)	Stop Live Measures Sorted	by Channel Type Auto Calibra	ate mV Values			Start Recording Blink
anual Collections	•		Maste	er		
	InlineAcc	-0.64 g	PitchRate	6.9 deg/s	LEFT	-21 mV
	LateralAcc	-0.01 g	YawRate	-5.0 deg/s	RIGHT	-16 mV
	VerticalAcc	-0.76 g	Logger Temperature	112.9 F	Luminosity	8 %
	RollRate	0.8 deg/s	FUEL	12080 mV	1	
			ECU char	nnels		
	GRIP POS	%	KIBS R ON	#	S KTRC SL	#
	TPS	%	KLCM ACT	#	WHLIE CRTL L	#
	LEAN ANG	deg	KLCM MOD	#	WHLIE CTR ACT	#
	WHLIE ANG	deg	KQS DW ACT	#	WHLIE CTR SL	#
	CLUTCH	#	KQS DW WK	#	RPM	rpm
MXK10 ID 7400105		#	KQS UP ACT	#	SPEED F	km/h
MAR 10 10 7400 103	FRONT COMP	#	KQS UP WK	#	SPEED R	km/h
	FRONT TEN	#	MAN KECS	#	IAT	C
	FUEL RAW	#	POW MODE	#	ЕСТ	C
	KEBC MOD	#	REAR COMP	#	SHIFTER	mV
	KEBC SL	#	REAR TEN	#	V BATT	V
	KECS MODE	#	S KTRC	#	GEAR	gear
Trash (1)	KIBS F ON	#	S KTRC ACT	#	FUEL CONS	Vhkm

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

- Live Measures: to check the logger channels and force online values to:
  - start live measures
  - decide how to show the channels: as managed by the firmware (by configuration), in alphabetical order, by channel type (shown by device than by channel type and then by measure type)
  - calibrate the sensors that need it pressing the related button
  - show measure in Mv
- **Download**: download data stored in MXK10 memory
- WiFi and Properties: name the device, manage MXK10 WiFi and fill in racer name, vehicle name or number, championship and venue type (generic, gualifying, test, warm up, race, test type)
- **Tracks**: manage the tracks stored in the device memory
- **Counters**: to set/reset odometers
- **Logo**: transmit/receive the logo that shows up at switch on; supported image formats are JPEG or BMP; always use the most recent WindowsTM versione (Windows8 o Windows10) whose graphical libraries are more updated
- **Firmware**: to check or update MXK10 firmware.

### 6.5.1 Live measures page

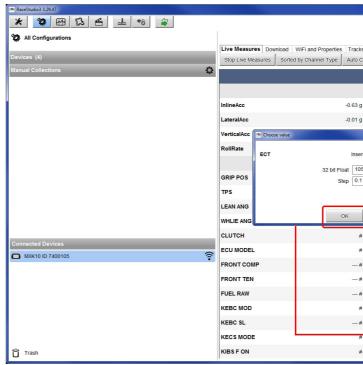
When the configuration has been transmitted "Live Measures" page shows ECU channels too and it is possible to perform some operations, like start recording, make MXK10 blink pressing "Blink" button top right. This operation is the most simple way to test PC-device communication.

# 6.5.2 Online value forcing

Live Measure layer of Device page offers a very useful function that allows you to simulate one or more channels to test icons, alarms, power output and harness behaviours. We can for example test water alarm.

To force this value:

- mouse over the value to force and click the setting icon
- a popup menu shows up: select "Force Channel Value" and fill in the panel that shows up
- click "OK" and the corresponding value becomes red.



				?
		MXK10 ID 7400105		
s Co	unters Logo Firmware			
Calibra	te mV Values			Start Recording Blink
		Master		^
,	PitchRate	6.9 deg/s	LEFT	-11 mV
9	YawRate	-5.1 deg/s	RIGHT	-5 mV
	mperature	115.3 F	Luminosity	8 %
rt force	ed values	12096 mV		E
5		ECU channels		
1	N	#	S KTRC SL	#
	т	#	WHLIE CRTL L	#
٦.	D	#	WHLIE CTR ACT	#
J (	CT	#	WHLIE CTR SL	#
¥	KQS DW WK	#	RPM	rpm
¥	KQS UP ACT	#	SPEED F	km/h
¥	KQS UP WK	#	SPEED R	km/h
¥	MAN KECS	#	ТАТ	C
¥	POW MODE	#	ECT	C
¥	REAR COMP	#	SHIFTER	Switch to F
¥	REAR TEN	#	V BATT	1 decimal places
ŧ	SKTRC	#	GEAR	Force Channel Value
¥	S KTRC ACT	#	FUEL CONS	I/hkm
			1	

Once forced the values are shown on the right of the page red boxed. Lateral "+" and "-" buttons allows to change the values used.

🛠 😗 🖽 🕄 🏝 🏍 🤿				MXK10	D 7400105		(î•	Ø
	Live Measures Dow	Inload WiFi and Properties	Tracks Counters Logo	Firmware				
evices (4)	Stop Live Measures	1 1	Auto Calibrate mV Value	1 1			Stop Recording	BI
anual Collections	0		Mas	ter			VBATT	-
							9.0 V	
	InlineAcc	-0.63 g	PitchRate	7.0 deg/s	LEFT	-11 mV	ECT	
	LateralAcc	-0.01 g	YawRate	-5.1 deg/s	RIGHT	-21 mV	105 C	
	VerticalAcc	-0.76 g	Logger Temperatu	114.9 F	Luminosity	8 %	100 0	_
	RollRate	1.0 deg/s	FUEL	12064 mV		E		
			ECU ch	annels				
	GRIP POS	%	KIBS R ON	#	S KTRC SL	#		
	TPS	%	KLCM ACT	#	WHLIE CRTL L	#		
	LEAN ANG	deg	KLCM MOD	#	WHLIE CTR ACT	#		
	WHLIE ANG	deg	KQS DW ACT	#	WHLIE CTR SL	#		
	CLUTCH	#	KQS DW WK	#	RPM	rpm		
nnected Devices MXK10 ID 7400105	ECU MODEL	#	KQS UP ACT	#	SPEED F	km/h		
MAK 10 10 7400103	FRONT COMP	#	KQS UP WK	#	SPEED R	km/h		
	FRONT TEN	#	MAN KECS	#	IAT	c		
	FUEL RAW	#	POW MODE	#	ЕСТ	105 C		
	KEBC MOD	#	REAR COMP	#	SHIFTER	mV		
	KEBC SL	#	REAR TEN	#	V BATT	9.0 V		
	KECS MODE	#	S KTRC	#	GEAR	gear		
Trash	KIBS F ON	#	S KTRC ACT	#	FUEL CONS	I/hkm		

# 7 Data recall

At the end of the test sampled data can be recalled pressing "LAP".

First is "Today" page. Press **"SEL"** 

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

Third is "Day 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 "SEL".

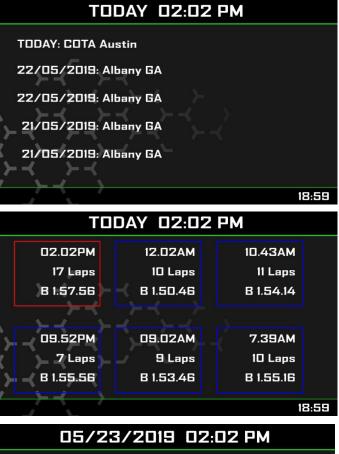
This page is a histogram test summary. Moving the cursor left and right all laps and their lap time are shown.

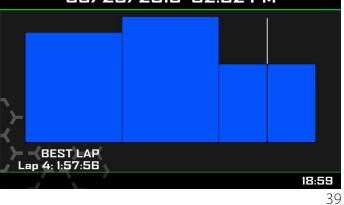
### **CHAPTER 7**

### TODAY 02:02 PM

	( RPM 0048		MAX SPEED 282		
Lap	Best Laps	RPM	Km/h		
4	1:57:56	10048 5592	280 73		
` <b>⊢ ⊣` "`</b> ≻	1:57:94	10100 5450	277 70		
≺ ≻ <sub>8</sub> ⊰ ≻⊰ ≻	1:58:02	10300 5700	278 69		

18:59





## 8 Data download and analysis

Once the test session is over it is possible to download data sampled on a PC. Connect MXK10 dash logger to a PC and click on it bottom left of the software page. Once reached the device page activate "Download" layer It shows all the information concerning the file stored in the logger: number of laps, best lap, date/time, file dimensions. Select the file(s) to download and press "Download" button.

🕋 RaceStudio3 3.29.47		
* * * * * *		?
🐲 All Configurations	MXK10 ID 7400107	
	Live Measures Download WiFi and Properties Settings Tracks Counters Logo Firmware	
Devices	Download Unhide Downloaded Delete	Refresh List 🔯
Manual Collections		
	✓ 5 selected 7.9 MBytes	
	Ott 20 07:54 10	0 0:48.139
	1 m 3 a_0284.xrz	z 458 kB
	ott 19 04:57 11	1 0:48.139
	2 () a_0334.xra	z 505 kB
	ott 19 04:48 14	4 0:48.139
Connected Devices	3 () a_0337.xm	z 649 kB
	ott 01 02:27 5	5 0:49.833
MXK10 ID 7400107	4 () a_0283.xm	z 222 kB
	v ott 01 02:24 6	6 0:48.858
	5 🔍 🕐 a_0301.xm	z 273 kB
Trash		
Trash		

After download press Analysis Icon ( 📟 ) and Race Studio Analysis software starts showing all the files available for analysis. Double clicking on the desired one it is possible to start analysing your performance.

### 9 Wi-Fi configuration

Two possible Wi-Fi connection modes are available.

#### 1 – As an access point (AP – default)

This is the ideal configuration for one only device and one only computer. In this situation MXK10 creates a Wi-Fi network and works as an Access Point the PC can be connected to.

#### 2 – Existing network (to connect to an existing Wi-Fi network – WLAN)

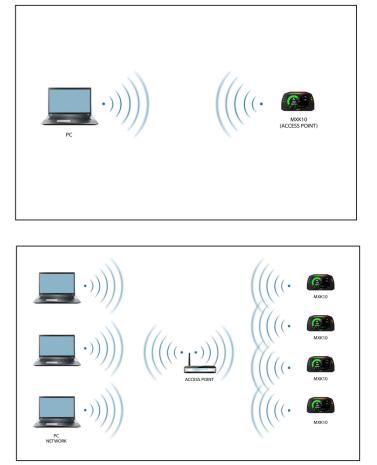
This mode is complex and implies an external access point (AP) but it is also more flexible and powerful because allows the communication among more than one device and more than one computer in the same network. MXK10 and the PC must connect to an existing Wi-Fi network made by a device that works as an external access point.

When working in WLAN mode MXK10 has two available security levels:

network authentication: network password device authentication: MXK10 password

Both levels allow you the use of different strategies. A PC in WLAN, for example, can see several AiM devices but can communicate only with those he knows the password of. Forgetting the password Wi-Fi configuration can be reset from MXK10 menu as explained in paragraph 5.2.5.

### **CHAPTER 8-9**



### 9.1 Configuring MXK10 dash-logger as an access point (AP)

This is MXK10 default configuration and is the easiest and most direct connection mode, ideal to communicate with one MXK10 logger using one PC.

It is free and so completely accessible by anyone. Please set an access password as soon as possible. To establish a Wi-Fi connection:

ensure that the Wi-Fi is enabled (set on Auto or on ON)

■ read MXK10 Name (7400107 in the image on the right)

#### SYSTEM INFO LOGGER MXK10 7400105 SERIAL N. 02.27.79 FW VERSION **BOOT VERSION** 02.24.21 BACK 16:59

To set other parameters create a unique password to protect the device/network. With a password the communication is safe and encrypted using WPA2-PSK standard. Characters allowed in the password are all letters, also capital, all digits and these characters: '+-\_()[]

{}\$£!?^#@\*\\\"=~.:;/%"

"Space" type can be used if it is not the first one because this could cause incomprehension in some Windows™ versions.

* 🍄 🖽 🖧 🖷	<u>↓</u> *ô	<b>a</b>			
All Configurations					
D		_	Live Measures	Download	WiFi and Prope
Devices (6)			Refresh	Transmit	
Manual Collections		¢		Devi	ce
				Devi	ce Name
				WiFi	
				WiFi	Power Mode
Connected Devices		_		WiFi	Mode
MXK10 ID 7400105		(;-		WiFi	Network Name
				WiFi	Password
				Prop	erties
				Race	er Name
				Vehic	cle Name or Numb
				Char	npionship
				Venu	е Туре
Trash					

- run Race Studio 3
- click Wi-Fi icon and select your device
- in a few seconds the connection is established

Connected
Connect

											- • ×
								((1-	Ş	ECU	am
			МХК	10 ID 7	400105						
s	Settings	Tracks	Counters	Logo	Firmware						
			MXK10 ID	740010	5						
			Auto						\$		
			Access Po	oint					\$		
					AiM	MXK10-001	105				
										Show	
				_	_	_		_	\$		

This AP or SSID name is unique for the device.

An example of name is:" AiM-MXK10-7400105" where:

■ "AiM" is the prefix of all AiM devices

■ "MXK10" is the device identifier

■ "0105" is device serial number assigned by the factory.

To make a device more recognizable a name can be added to the SSID with the limit of eight characters.

Allowed characters are all letters, capital too, all digits and these characters: '+ - \_ () [] {}!.

"Space" type can be used provided that it is not the first one because it can cause incomprehension in some Windows™ versions.

Adding, for example, the driver's name, Tom Wolf, the network name (SSID) becomes:

#### "AiM-MXK10-0105-TomWolf"

Once all parameters set click "Transmit". MXK10 logger reboots and is configured with the new parameters. If MXK10 logger is protected by a password, as recommended, Race Studio 3 will ask that password to authenticate.

RaceStudio3 3.29.47					
* * * * * *				(^-	
All Configurations			MXK10 ID 7400105		
	Live Measures Download WiFi and	Properties Settings Tracks	Counters Logo Firmware		
Devices (6)	Refresh Transmit				
Manual Collections					
	Device				1
	Device Name		Tom Wolf		
	WiFi				
	WiFi Power Mod	e	Auto	\$	
Connected Devices	WiFi Mode		Access Point	\$	
MXK10 ID 7400105	WiFi Network Na	me	AiM-MXK10-0105		
	New WiFi Netwo	rk Name	AiM-MXK10-0105-Tom Wolf		)
	WiFi Password		******		Show
	Properties				
	Racer Name				
	Vehicle Name o	Number			
	Championship				
	Venue Type			\$	
Trash					

**Please Note:** the same Wi-Fi connection can be created with the operative system tool. Once the device has been authenticated in the Wi-Fi network it can communicate using Race Studio 3.

### 9.2 Adding MXK10 loggers to an existing network

This situation is ideal for a team with multiple drivers and staff members and is desired to communicate with one or more AiM devices using the same PC network. Each MXK10 logger can have its password that adds another security and privacy level to the network.

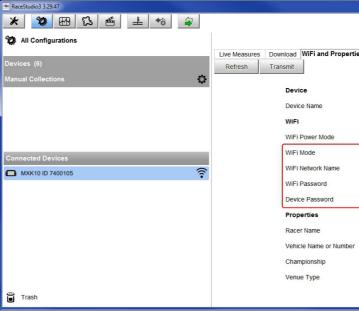
Race Studio 3 will show all MXK10 loggers connected to the same network under "Connected devices" label, bottom left of the software page: click the device.

Enter "Wi-Fi and properties" tab and set it on "Existing Network"; fill in network name, network password and device password.

Transmit the network settings to the device clicking "Transmit": it reboots and joins that network.

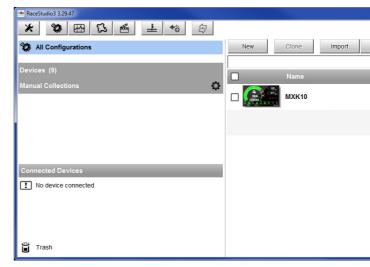
Please note: the only admitted password are those following WPA2-PSK standard.

To complete this procedure use Race Studio 3 software as here explained.



Here above is shown a device "MXK10 ID 74000105" that switched from AP to WLAN mode (Existing Network). Network name is "network\_2" and does not work with free access because is protected by a password.

To obtain connectivity on the device the PC has to be authenticated to the same network as shown here below.



	MXK10 ID 7400105	ECU
es Settings Tracks	Counters Logo Firmware	
	MXK10 ID 7400105	
	Auto 🗘	
	Existing network 🗘	
	network_2	
	A#A#A#######	Show
	*****	Show
		,
	÷	

		• ×
<u></u>	n and a second	(III)
	nfigurations	
		٩ ()
	Date	
WIFI-AIM-Timenet		
retwork_2	11:43	
AIM-MYC5-003512		
WiFi Settings		

When the PC is authenticated to the network called "network\_2" it can see all devices you configured to access the same network. In the image below three AiM devices are connected to the same "network\_2" WLAN.

📾 RaceStudio3 3.29.47			
* 🐲 🖽 ዄ 🕌 🚣 🄝 🖨		÷	
2 All Configurations		MXK10 ID 7400105	
	Live Measures Download WiFi and Properties Settings Tracks	Counters Logo Firmware	
Devices (9)	Refresh Transmit		
Manual Collections	Device		
	Device Name	MXK10 ID 7400105	-
	WiFi		
	WiFi Power Mode	On	
	WiFi Mode		·
	WiFi Network Name	network_2	
	WiFi Password		□ Show
	Device Password	1	□ Show
	Properties		
	Racer Name		-
	Vehicle Name or Number		
	Championship		
	Venue Type		:
Connected Devices			-
network_2			
MXP ID 5600189			
MXG 12 ID MAX_5			
MXK10 ID 7400105			
Trash			

### 9.3 Wi-Fi network settings

In this chapter is a short description of how to configure a WLAN including AiM devices and a PC.

Here below is an example of configuration.

Use this section to configure the inte configured here is the IP Address the you change the IP Address here, yo network again.	at you use
Router IP Address :	192.168
Subnet Mask :	255.25
Device Name :	Networ
Local Domain Name :	
Enable DNS Relay :	
Use this section to configure the bui your network. Enable DHCP Server :	it-in DHCF
your network. Enable DHCP Server :	
your network. Enable DHCP Server : DHCP IP Address Range :	192.168
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time :	192.168 10080
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (cor</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN : NetBIOS Scope :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> <li>●</li> <li>●</li> <li>Broa</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN : NetBIOS Scope :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> </ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN : NetBIOS from WAN : NetBIOS scope : NetBIOS node type :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> <li></li>     &lt;</ul>
your network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN : NetBIOS Scope :	<ul> <li>✓</li> <li>192.168</li> <li>10080</li> <li>✓ (con</li> <li>✓ (con</li> <li>○ Broa</li> <li>○ Point</li> <li>○ Mixe</li> </ul>

For better network performances we suggest the use of a network device equipped with a DHCP server and using 3x3 MIMO technology like, for example a Linksys AS3200.

To maximize the bandwidth the Internet should not be allowed on this WLAN; this means the DHCP server should be configured without any DNS address nor gateway by default.

ttings of your router. The IP Address that is cess the Web-based management interface. If djust your PC's network settings to access the
(optional)
r to assign IP addresses to the computers on
to 192.168.0.6
lity for some DHCP Clients)
(optional)
only (use when no WINS servers configured) int (no broadcast)
e (Broadcast then Point-to-Point)
nt-to-Point then Broadcast)

The parameters for the device network configuration in this example are:

#### Wireless network name: Network\_1

It means that the WLAN network name is "Network\_1." A PC has to be authenticated in this network to interact with any AiM device of this network.

Gateway address: 192.168.0.1 primary DNS server: 0.0.0.0 secondary DNS server: 0.0.0.0 (These settings prevent Internet connectivity on this WLAN.)

### Subnet mask: 255.255.255.248

Enable DHCP server: yes DHCP IP address range: 192.168.0.2 to 192.168.0.6

These settings enable a DHCP server running on this WLAN and provide an IP address in a 2-6 range. This means that this network allows 5 network hosts.

The number of devices on a WLAN network depends on the subnet mask. Here below are typical examples of network masks and IP addresses range.

The configuration in bold is the one we suggest (if a greater number of devices is not needed), being the one that makes it easier and quicker for Race Studio 3 the identification of the devices in the network.

Subnet mask:	IP address range:	Number of devices:
255.255.255.0	192.168.0.1 – 254	254
255.255.255.128	192.168.0.1 – 126	126
255.255.255.192	192.168.0.1 – 62	62
255.255.255.224	192.168.0.1 – 30	30
255.255.255.240	192.168.0.1 – 14	14
255.255.255.248	192.168.0.1 – 6	6

# 9.6 Working on Mac<sup>™</sup> with virtualized Windows<sup>™</sup>

Race Studio 3 only works on Windows™ operative systems; Mac users can use a virtualized Windows™ machine.

The main problem is that the host OS (Mac) must share its Wi-Fi interface with the virtualized operative system (Windows) as Ethernet interface and not as Wi-Fi interface.

#### Configuring Parallels(™)

Select "Menu -> Configure..." in Parallels.

Press "Hardware" – top on the page that shows up – and select "Network" in the drop-down menu on the left. Right on the configuration panel set "Type" field on "Wi-Fi".

# 9.4 The Internet connectivity

For an optimal speed of AiM device(s) it is recommended not to allow the Internet on the same network and to set the WLAN in the same way.

The Internet access can of course be allowed on the network but this would degrade the communication.

This slightly slower speed can be suitable but a second Wi-Fi connection through an additional hardware (NIC) is to be preferred.

This configuration would provide an optimal speed of the data network of your AiM device(s) and at the same time would provide an internet connectivity with the second NIC.

# 9.5 Connection issues

It can occur that MXK10 logger is correctly connected to Race Studio 3 via Wi-Fi but the user interface does not show it. This may be because Wi-Fi port setting is set with a static IP. To switch it to dynamic (DHCP):

■ open "Network and sharing centre" in the WindowsTM research engine

- right click on the Wi-Fi connection and a panel shows up
- select "Properties" option

■ double click on "Internet Protocol version 4 (TCP/IPv4)"

■ verify that option "Obtain an IP address" is active

For further information refer to FAQ section, Wi-Fi of www.aim-sportline.com.

Then select the device to communicate with.



	Windows 8.	1 - Hardware		
🔳 🌍 🛲 🔎			Q	
General Options Hardware Security				Search
🎐 Boot Order	Some of the settings	on this page cannot be ch	anged until the	virtual machine
Video	is shut down.	for this page cannot be cr	langed until the	in cour macrime
Mouse & Keyboard				
Hoppy Disk		Connected		
CD/DVD 1	NIC Type:	Intel(R) PRO/1000 MT		0
Hard Disk 1	Type:	ia Wi-Fi		
S Network 1	type.	Juli 111		×
Sound	MAC address:	00:1C:42:56:7E:FD	Generate	
USB & Bluetooth				
	DHCP Server:	Auto		٥
+ -				
Click the lock to prevent fur	ther changes.			?
-				



To ensure that the communication works select "Open Network preferences..." menu. Verify that the status in the window that shows up is "Connected" and that the IP address associated is, for example, 10.0.0.10 (could be 10.0.0.11, 10.0.0.12, or generically 10.0.0.x).

Location	a: Automatic		\$
Wi-Fi Connected	Status:	Connected	Turn Wi-Fi Off
FT232B UART		Wi-Fi is connected to has the IP address 10.	
RNDIS/Gadget	Network Name:	AiM-MXL2-00410	\$
Bluetooth PAN		Ask to join new r	networks
Not Connected			be joined automatically. If
ThundIt Bridge		to manually select a r	re available, you will have network.
ThundEthernet			
RNDIS/Driver			
- *-	✓ Show Wi-Fi status	in menu bar	Advanced
- *	Show Wi-Fi status	Assist me	Advanced

To enable Race Studio 3 correctly working on a Mac with virtualized WindowsTM.

- 🔳 press Wi-Fi icon
- select "Wi-Fi Settings" option

RaceStudio3 3.29.47			
* * * * * *			
🐲 All Configurations	New Clone Import Export		nfigurations
Devices (9)		AIM Guest	٩ ()
	Name Name	WIFI-AIM-Timenet	Date
Manual Collections	П 💮 🛱 МХК10	network_2     Connected	11:43
	ignize -	WiFi Settings.	
		- h3	
Connected Devices			
network_2			
MXP ID 5600189			
MXG 12 ID MAX_5			
MXK10 ID 7400105			
Trash			

enable the checkbox shown here below.

😬 WiFi Settings	
	Enable if Windows is runnin
	S shares the WiFi connection to the virtuant for AiM devices is normally disabled in F

### 9.7 Connected device visualization issues

It may occur that using Race Studio 3 on an iMac with virtualized Windows the device connected via Wi-Fi takes some time to be shown in the network or is not shown at all. This is why we always suggest using an Wi-Fi (WLAN) router. This router works as an Access Point allowing more external devices to connect to its network. MXK10 logger Wi-Fi configuration is to be set on Existing Network as explained before.



# **10 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 3.29.47		
* * * * * *		?
Connected Devices	Download Install SW Export Import Update Device	
MXK10 ID 7400105	Name	On the web On my PC Info
	Software	
	RaceStudio3	3.29.47 3.29.46
	Firmware	
	₩ I MXK10	02.27.79 02.27.78

Once the new firmware has been downloaded connect the device to the PC via Wi-Fi or using the optional USB cable (**part number V02563030**) to perform a firmware upgrade. In a few seconds the device is ready.

# Appendix 1 - ECU channels logged by MXK10

MXK10 sample and records the following channels supplied by the ECU of Kawasaki Ninja 2016-2019 bikes.

CHANNEL NAME	CHANNEL FUNCTION
RPM KIBS MODE ECT IAT GEAR CLUTCHClutch S KTRC MODE KEBC MODE KLCM ACT KQS UP ACT KQS DOWN ACT POW MODE KLCM MODE KIBS R ON KIBS F ON FRONT COMP FRONT TEN REAR COMP REAR TEN KECS MODE MAN KECS SPEED F SPEED R KQS UP WK KQS DOWN WK S KTRC WHLIE_CRTL_L V BATT GRIP POS TPS SHIFTER LEAN ANG WHLIE ANG S KTRC ACT S KTRC SL WHLIE CTR ACT WHLIE CTR ACT WHLIE CTR SL KEBC SL KEBC ECU MODEL FUEL CONS	Engine RPM KIBS mode Engine Coolant Temperature Intake Air Temperature Engaged Gear Switch S KTRC mode KEBC mode KLCM activation KQS UP activation RQS DOWN activation Power mode KLCM mode KIBS active on rear wheel KIBS active on front wheel Front Suspension Compression Front Suspension Rebound level KECS mode (ZX-10R SE only) Manual KECS setting mode Front wheel speed Rear wheel speed Rear wheel speed Rear wheel speed Rear wheel speed KQS UP working state KQS DOWN working state S KTRC working level ECU battery reading Grip position Throttle Position Shift sensor voltage Lean angle Wheelie angle S KTRC Active mode S KTRC setting level Wheelie control active mode Wheelie control setting level s KTRC setting level Wheelie control setting level S KTRC Setting level CU model Stock/Racing Kit Fuel consumption

### **CHAPTER 10**

#### SAMPLING FREQUENCY

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