User Manual

MXK10-Gen4 for
Kawasaki Ninja ZX-10R – Gen4
(2011-2015)

Release 1.00

INDEX

1 – MXK10-Gen4 in a few words

MXK10-Gen4 is an AiM dash-logger designed to be installed on Kawasaki Ninja ZX-10R produced in the years 2011-2015 also if connected to Kawasaki Racing kit.

It is a full Plug and Play dash, completely compatible with the original connector and with 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 icons
- 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-Gen4 kit (part number: **XA2MXS12A05R0KN1**) includes:
- MXK10-Gen4 dash-logger (**1**)
- washers and screws to fix MXK10-Gen4 (**2**)
- GPS Module (**3**)
- GPS bracket with screws (**4**)

3 – Installation

MXK10-Gen4 installation is extremely simple. You only need the tools shown here below:
- pin punch (**1**)
- ratchet (**2**)
- 10 and 13 Wrench (**3**)
- screwdriver (**4**)
- universal pliers (**5**)
- 3, 4, 5 and 6 Allen keys (**6**)

4 – MXK10-Gen4 Main features

First of all, we have to say that MXK10-Gen4 has two different working modes: Road and Track . 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.
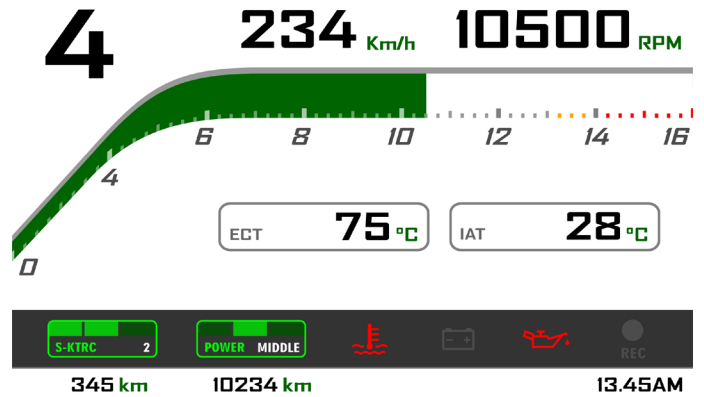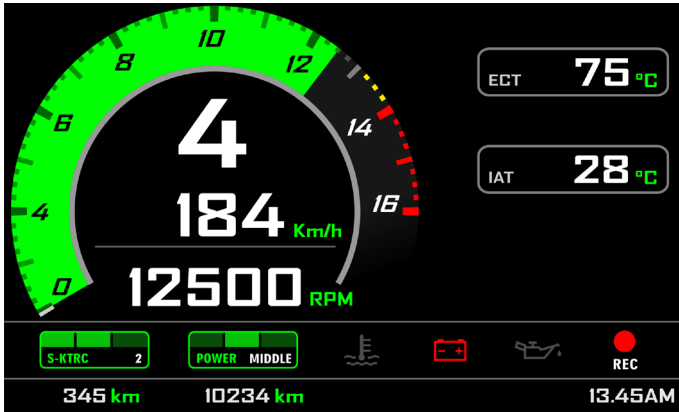
Track usage
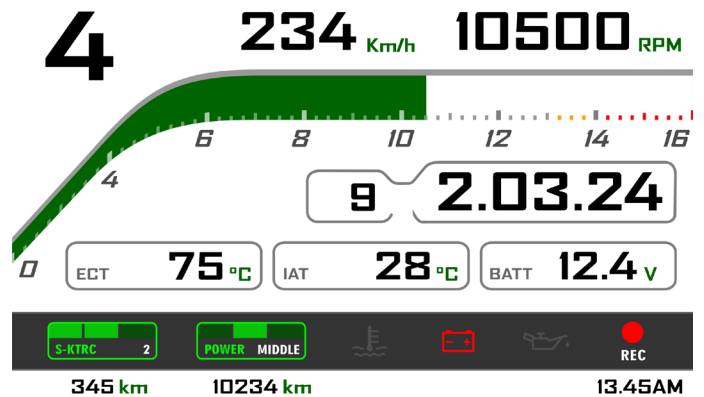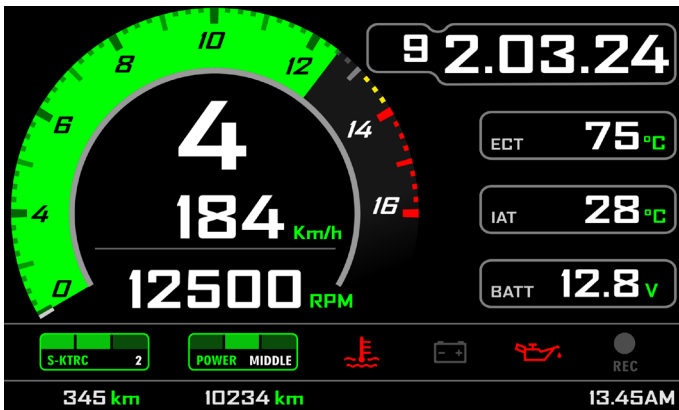
In road pages ECT or Engine Coolant Temperature (Water Temperature) and IAT or intake air temperature (Air Temperature) are shown while in track pages also Lap Time and Lap number are shown.
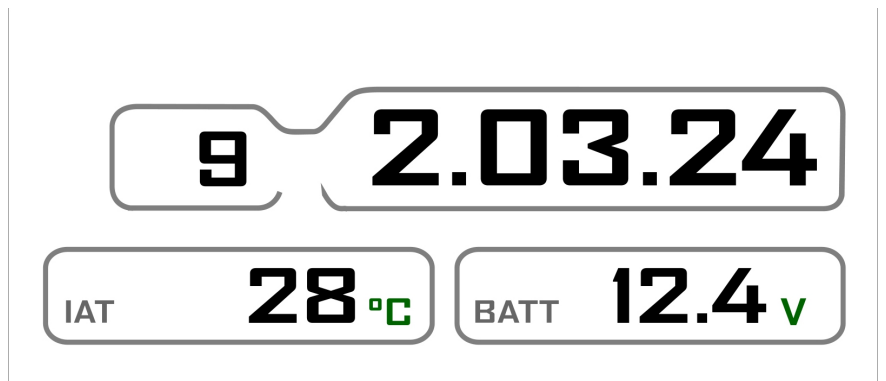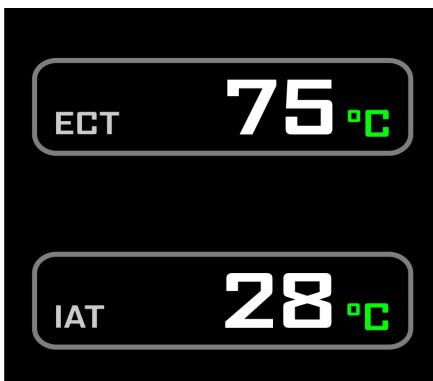
4.1 – Lap Times

MXK10-Gen4 calculates and shows lap times. This can be made in two ways:

- **manually** through main beam flash button 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-Gen4 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 – Icons

Thanks to the 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.

REC
It turns on when the dash-logger is recording.

4.3 – LEDs and pushbuttons

With reference to the image here below MXK10-Gen4 features 6 LEDs icons 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**)
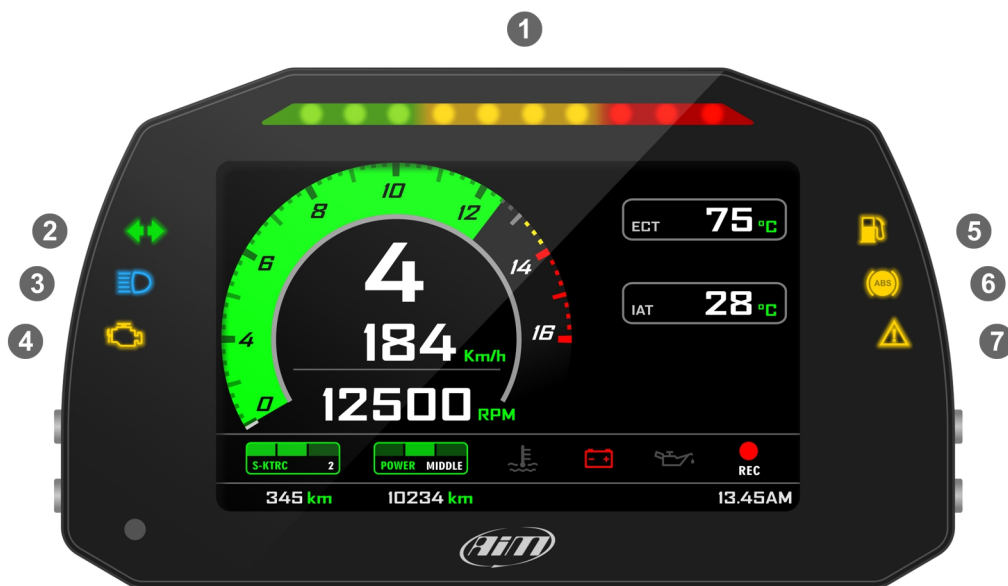
In the upper part of the dash logger are 10 LED customizable shift lights (**1**): when all lights are on it is suggested to shift gear.
Please note: to set the shift lights you need AiM Race Studio 3 software (from Race Studio 3 release 3.30.00 onwards) you can freely download from www.aim-sportline.com.

4.4 – The bike keyboard

Kawasaki Ninja buttons to be used for managing MXK10 Gen4 are shown here below:

* POWER (**1**): to change power mode (see paragraph 5.1.2 for further information)
* S-KTRC (**2**): to change S-KTRC Mode (see paragraph 5.1.1. for further information)
* Main flash beam (**3**) to activate Lap time
* START/STOP (**4**)

4.5 – Traction control setting at start up or while riding

Traction Control (S-KTRC) can be set while riding: press it to change the setting.

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.


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-Gen4 is recording the related icon appears (REC)

5 – Menu

Push **SEL** to enter MXK10-Gen4 settings "Menu" and set some parameters. **Please note**: this is possible only if the bike is not moving.
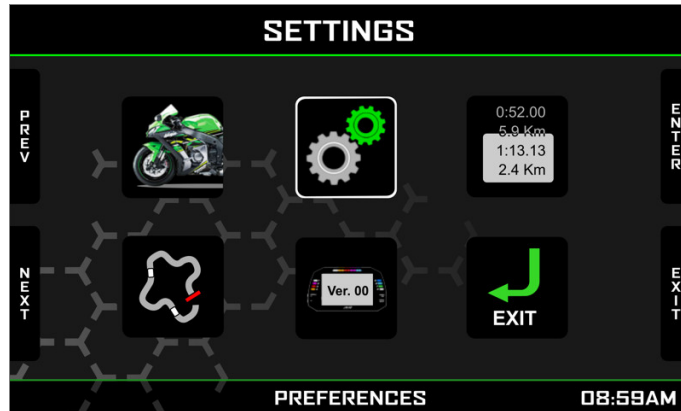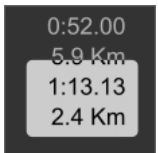

Use "**PREV**" and "**NEXT**" buttons to scroll option and "SEL" to select the desired option. The icons stays for.

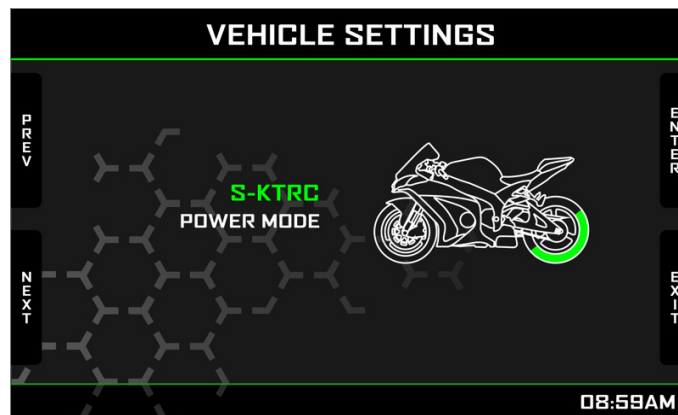 Vehicle settings

 Preferences

 Trip

 Track Manager

 System

 Exit

5.1 – Vehicle settings

To configure the functionalities of the bike navigate through the icons with "**PREV**" and "**NEXT**" buttons, select the icon here above and press "**ENTER**" to change the selected parameters.

The parameters you may set are:
• S-KTRC: Traction control settings
• Power Mode: Full, Middle or Low

5.1.1 – S-KTRC (Traction Control) Settings

Use "**ENTER**" button to enter S-KTRC setting page, "**CHANGE**" button to set it and "**EXIT**" to save and exit. It is also possible to use "**S-TKRC**" button to set this parameter. Available range is: 0-3.
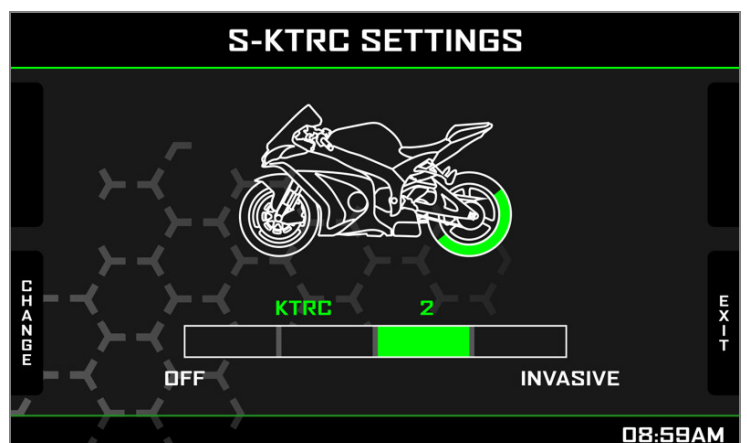
If you switch the bike off with Traction control disabled when you power it on again traction control is enabled and set on "1"

5.1.2 – Power Mode setting

Power Mode can be Full, Middle or Low. Use "**ENTER**" button to enter "Power mode" setting page, "**CHANGE**" button to set it and "**EXIT**" to save and exit.

5.2 – Preferences

In "Menu" page navigate through the icons with "**PREV**" and "**NEXT**" buttons, select the icon you see here above and press "**ENTER**".
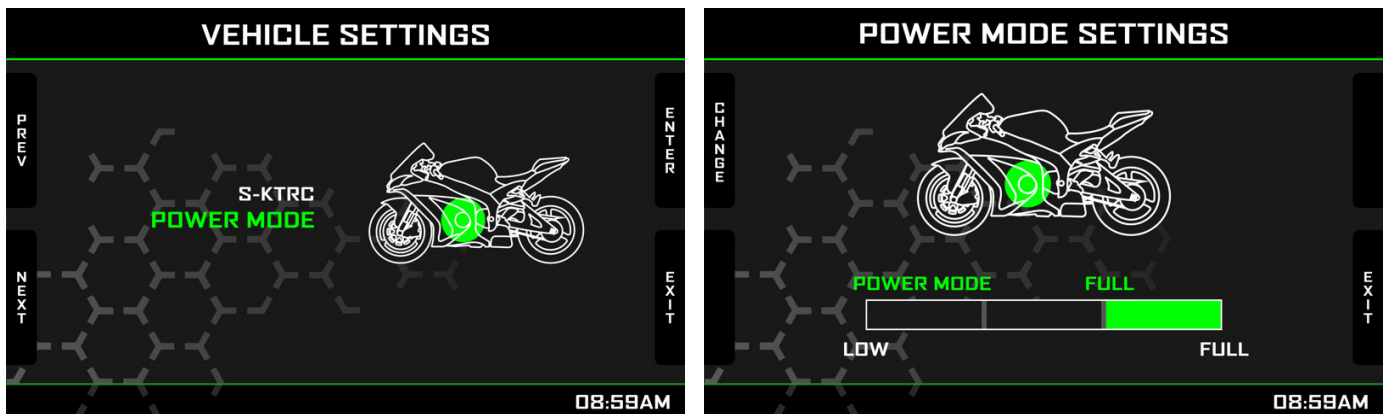**Please note**: if your bike is set in road mode Lap switch option is not available.
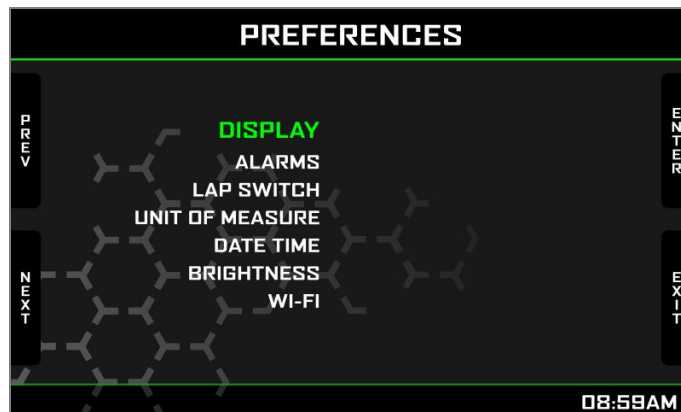
Here you can define:
- Display layout
- Alarms threshold settings
- Lap Switch (only if Riding Mode is Track): enabled or disabled
- Unit of measure: km/h or mph
- Date Time
- Brightness
- Wi-Fi

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

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5.2.1 – Display

Here you can select MXK10-Gen4 display layout.

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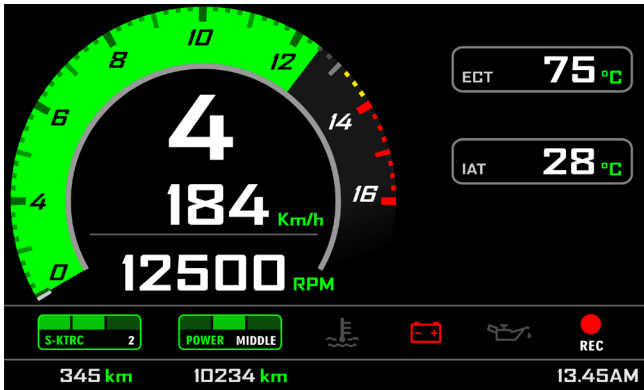
Analog layout

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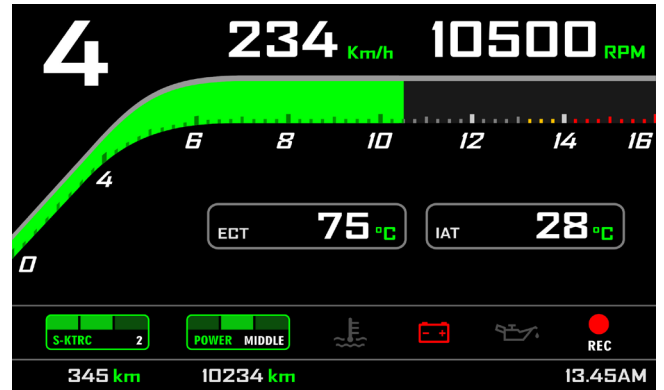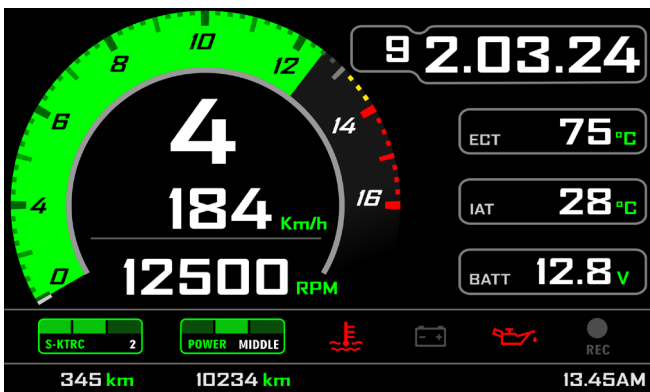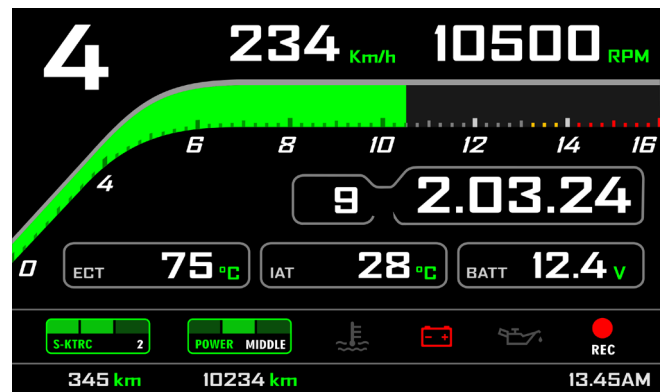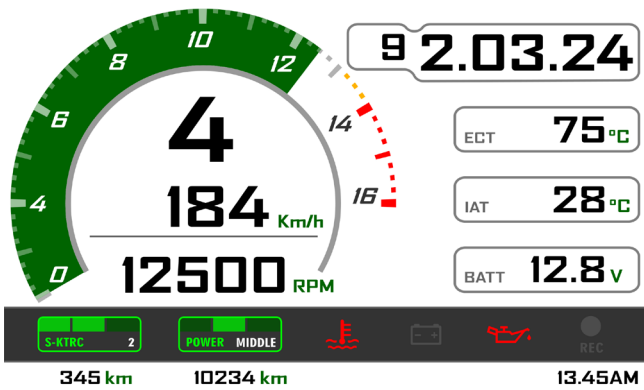

Analog Track layout in **Day** mode
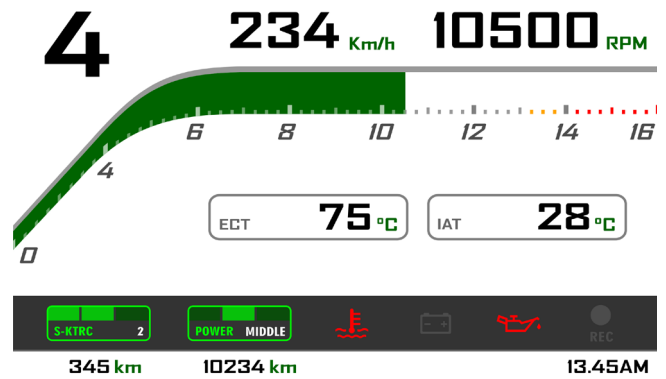
Digital Track layout in **Day** mode

For setting the layout preferences you have the menu.
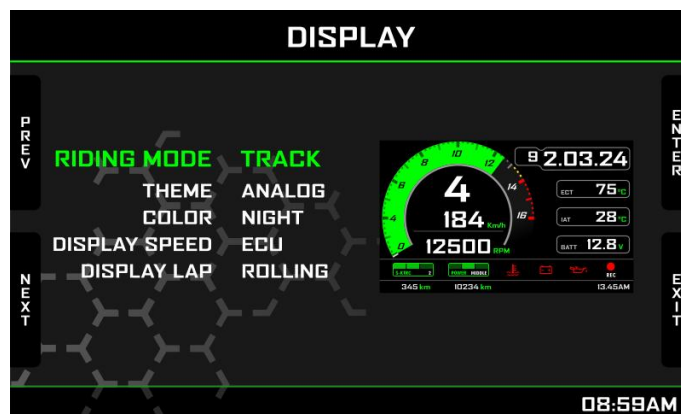
Scrolling "Display" page options you can set laptime display mode (**Display Lap**). Available options are:
- **Rolling**: displays rolling lap time until start/finish line is crossed; than lap time is displayed for a while before starting rolling again
- **Static**: shows last lap time until a new one is performed
- **Predictive**: shows predictive lap time; pressing **"ENTER"** pushbutton again you enter predictive lap time configuration (left image below); scrolling to the next line you can choose the reference lap among Test best and Day best (right image below).
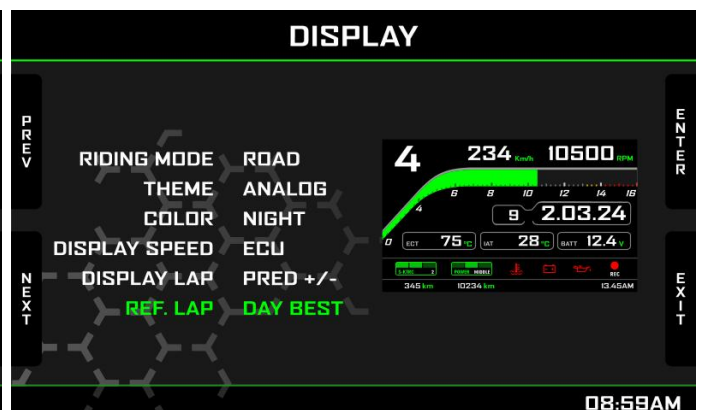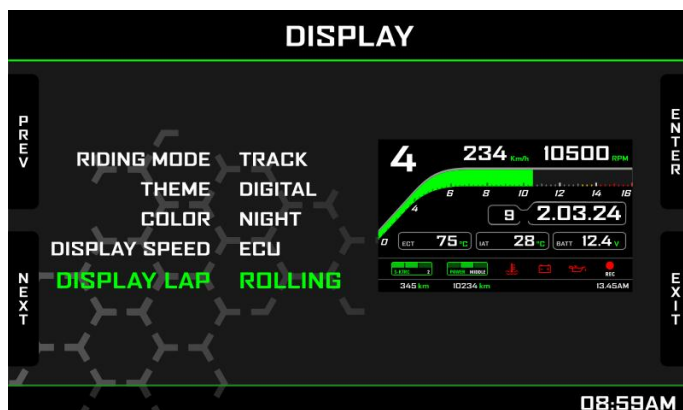
5.2.2 – Alarms

Here you can set the alarms threshold values; when the alarm is active the corresponding icon switches on. Available alarms are:
- Voltage (Battery): It turns on when battery voltage is lower than 10V and the corresponding digital value is displayed red.
- Engine Temperature (Water Temperature): it turns on when water temperature gets over a customized value (default value 105°C)

5.2.3 – Lap switch

This option is only available if riding mode is "Track" and it can be "Enabled" or "Disabled".
To avoid undesired lap signals a 5 seconds time period is needed between one push and the following of main beam flash button.
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.

5.2.4 – Brightness

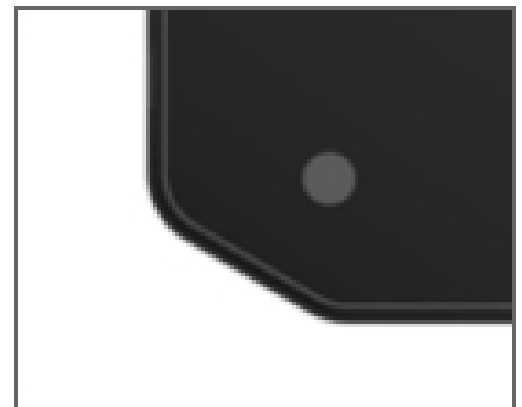MXK10-Gen4 has two levels of brightness for day and night usage. A light sensor (shown below on the right) in the lower left side of the dash logger may help setting the desired brightness and the current display brightness is shown bottom of the page.
Available options are: Auto and Manual.
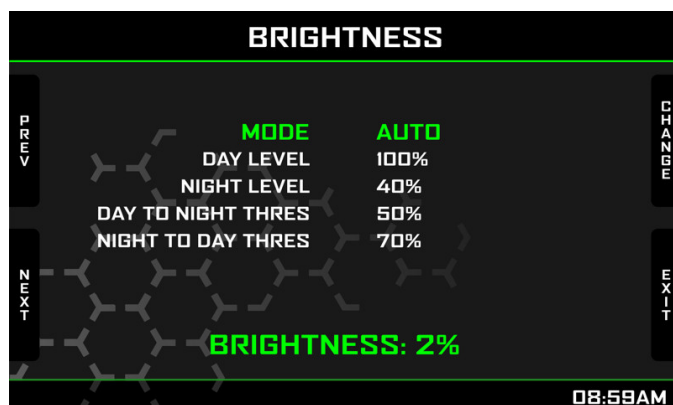
In **Auto** Mode you may:
- set the **Day Level**; at the desired threshold the dash logger commutes the display brightness and the display background colour
- set the **Night Level**: when the Light Sensor reads a brightness level higher than the threshold, the display is enlightened at the level defined 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-Gen4 features a Wi-Fi module to communicate with the PC. It is mainly used to:
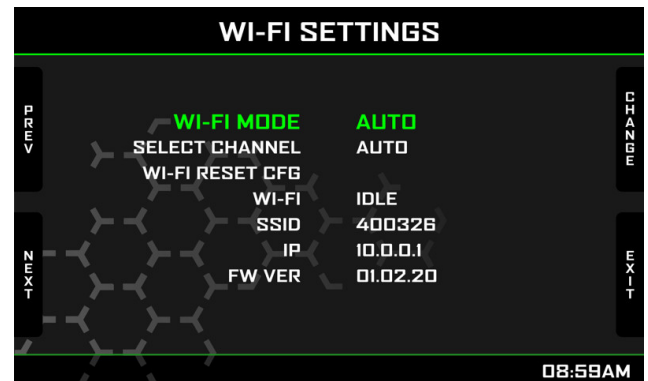
- configure MXK10-Gen4 shift lights
- configure MXK10-Gen4 expansion modules
- transmit data to the PC
- calibrate sensors (as explained at paragraph 6.4)
- download sampled data to the PC after the test
- update MXK10-Gen4 firmware

All these functionalities are explained in chapters 6, 8. and 10

WI-FI SETTINGS

WI-FI MODE	**AUTO**
SELECT CHANNEL	AUTO
WI-FI RESET CFG	
WI-FI	IDLE
SSID	400326
IP	10.0.0.1
FW VER	01.02.20

PREV — CHANGE — NEXT — EXIT

08:59AM

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 "**PREV**" and "**NEXT**" buttons, select the icon pushing "**ENTER**".
MXK10-Gen4 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 "**PREV"** and "**NEXT"**, and select the Tracks Icon pressing "**ENTER**".
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-Gen4 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-Gen4 provides two track selection modes:

- automatic
- manual

Automatic:
MXK10-Gen4 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-Gen4 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)
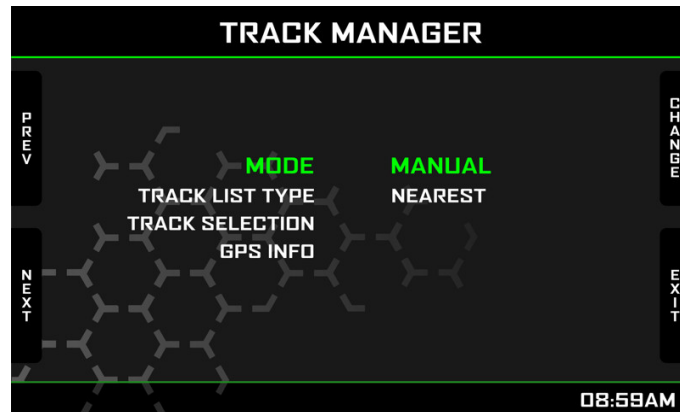
GPS Info

Selecting this page MXK10-Gen4 shows the satellites signal status and current position.
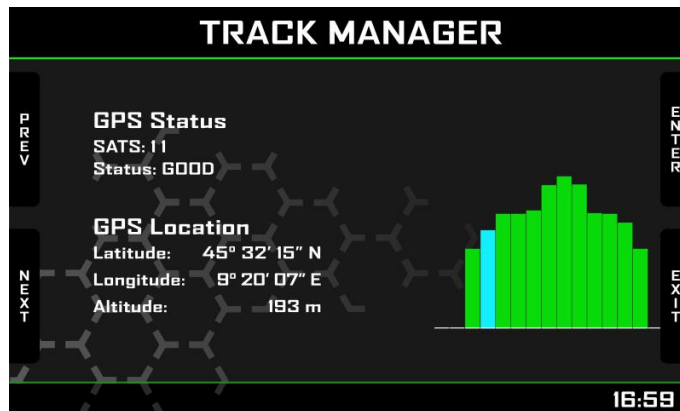
5.5 – System

This page shows serial number as well as firmware and booter version of your MXK10-Gen4.

Selecting "NET INFO" you enter Net Info page that shows which peripherals are connected to MXK10-Gen4 with serial number and firmware version.

6 – On track application

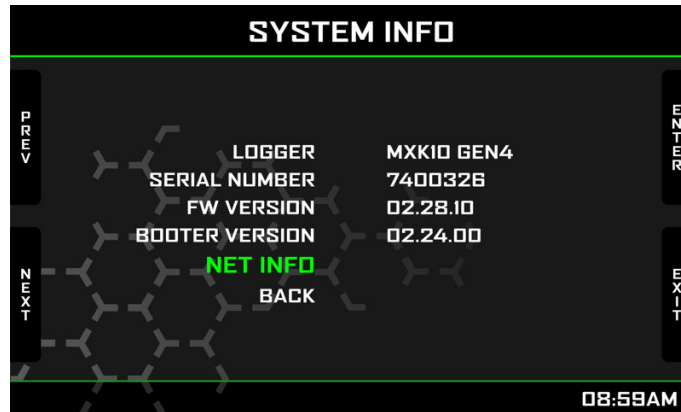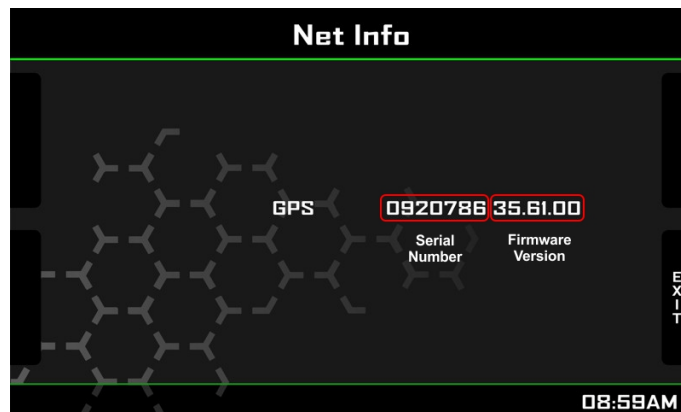If you are going to use your bike on a track, for track days or competition and wish to take the maximum advantage from MXK10-Gen4 you will need to buy an AiM Data Hub (left image below) so to install a few sensors (suspension potentiometers, brake pressure..) and connect them to AiM Channel Expansion (right image below).

The steps to follow are:
- install Data Hub
- connect Channel Expansion
- connect MXK10-Gen4 to your PC via Wi-Fi or through the USB port placed on the back of MXK10-Gen4 with an optional USB cable (part number **V02563030**)
- configure MXK10-Gen4 according to the sensors you have installed
- calibrate the sensors
- run your test
- 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 pressing the bottom right button of MXK10-Gen4 (**Data Recall**)

MXK10-Gen4 can be connected to various expansions as explained in paragraph 6.2. The image below shows an example of connection scheme.
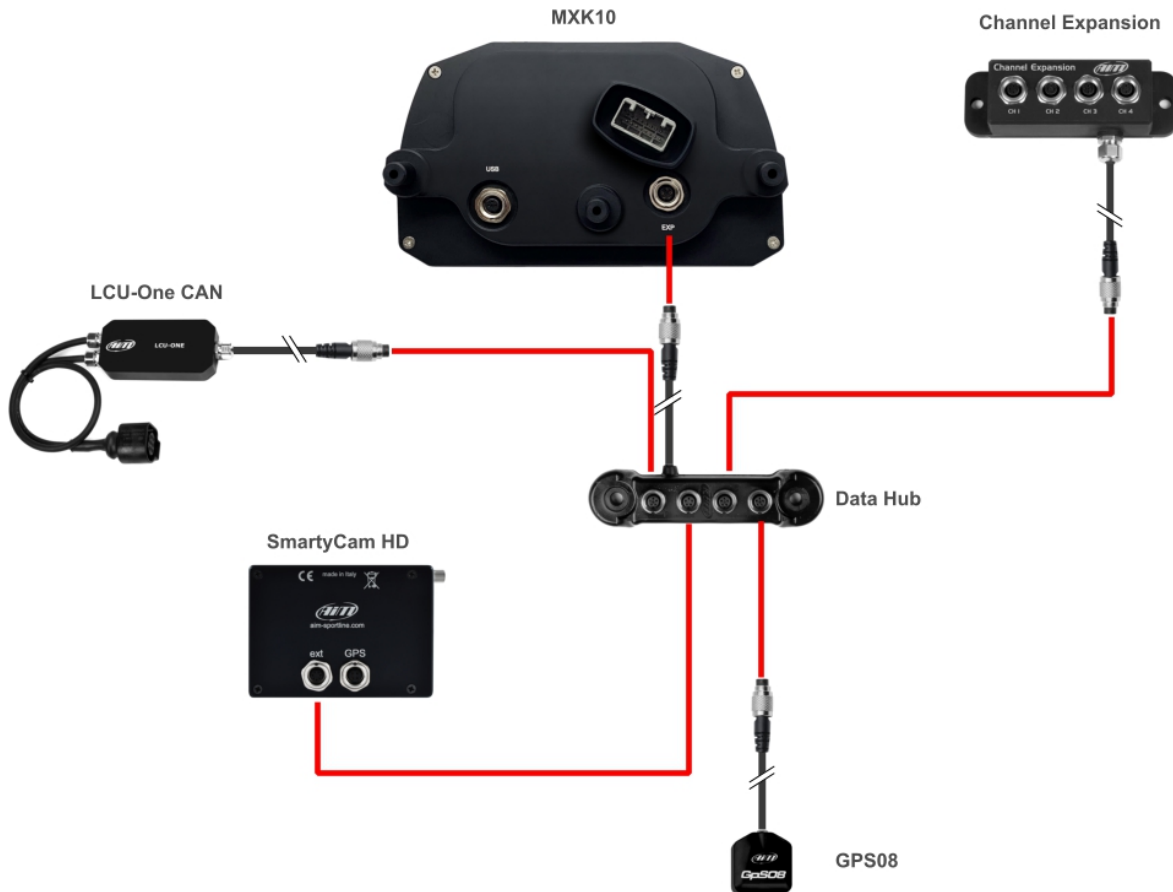
6.1 – Connection to the PC

Using AiM **Race Studio 3** software (from Race Studio 3.30.00) you can configure MXK10-Gen4, 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 (see chapter 9 for further information) or using an optional USB cable (part number **V02563030**) to be plugged in the port labelled USB rear of MXK10-Gen4.

6.2 – Configuration

Once MXK10-Gen4 connected to the PC
- click "Configurations" icon and configurations page appears
- click "New" and new configuration panel appears: select an "MXK10(11-15)" logger and press "OK"; when performing subsequent configurations "Select Configuration" panel shows on top the last four devices you configured.
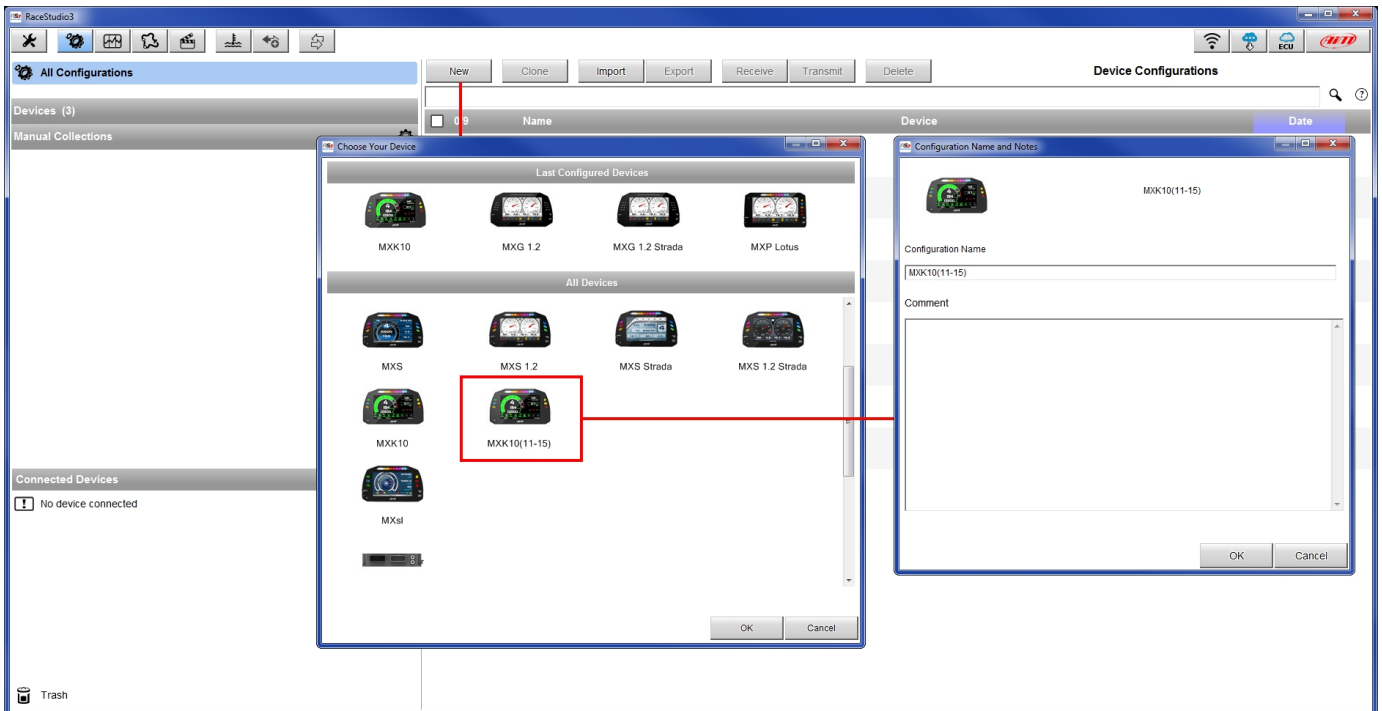
MXK10-Gen4 can only be connected to these AiM expansions:
- LCU-One CAN
- Channel Expansions

6.2.1 – CAN expansions configuration

MXK10-Gen4 can be connected to LCU-One, Channel Expansions and SmartyCam. To configure LCU-One Expansion activate CAN expansions layer. At the very first MXK10-Gen4 connection this page shows up:
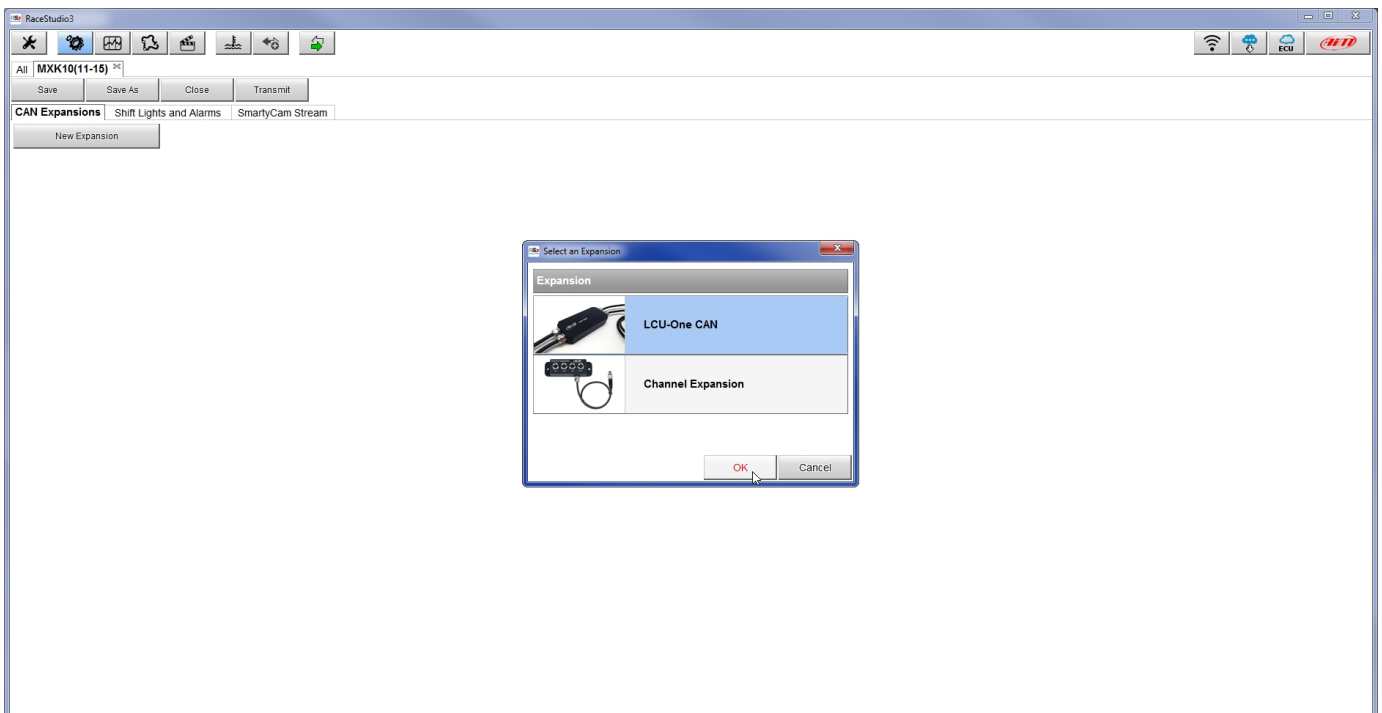
Select the CAN expansion to set and press "OK". Each expansion needs to be set filling in the related panel.

Setting LCU-One CAN

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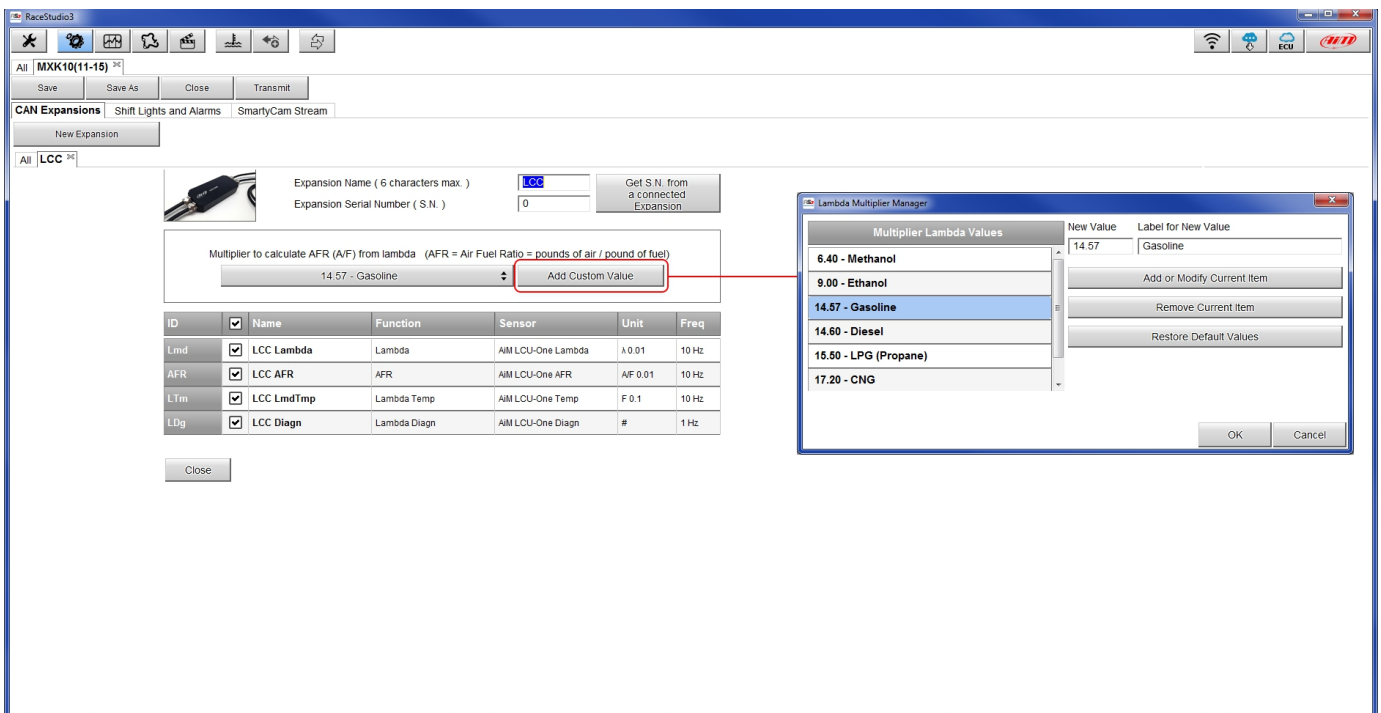
Setting Channel Expansion

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
- 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 it and setting the panel that shows up
- press "Close" to save and exit
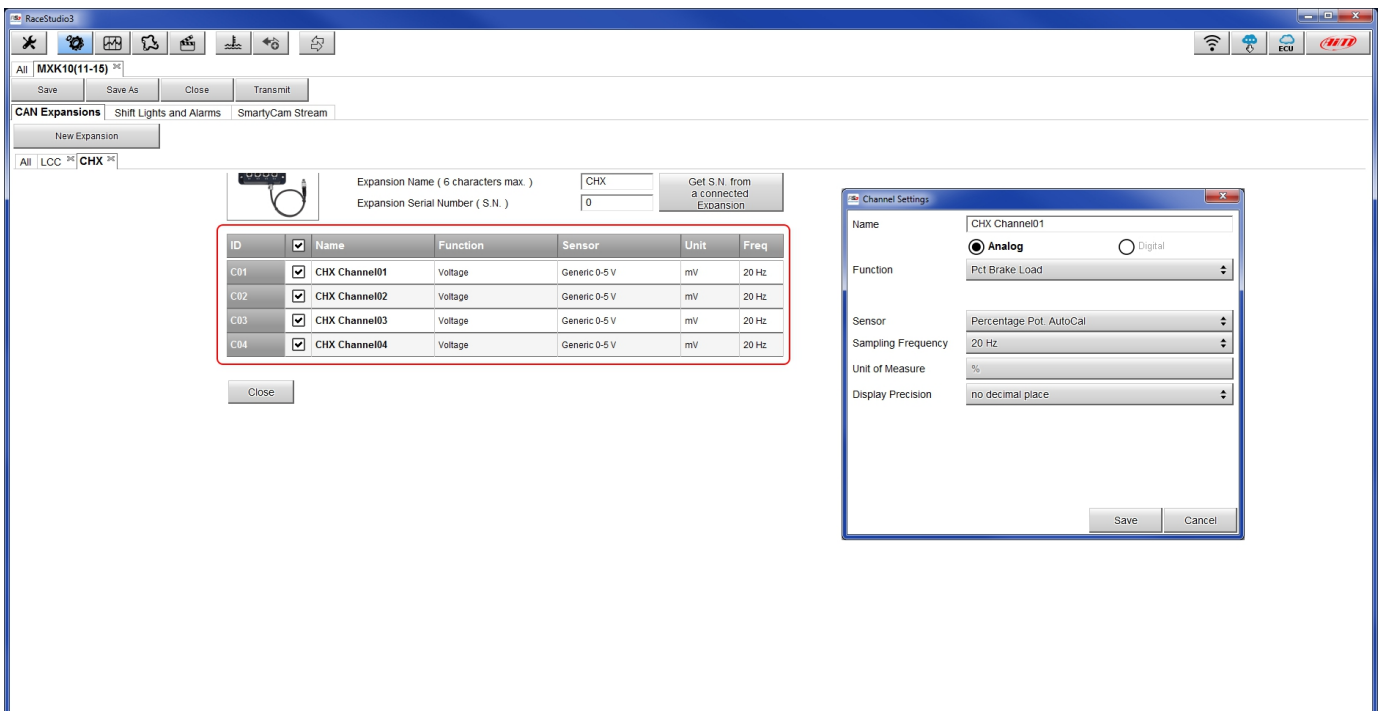
Please note: for any further information about AiM CAN Expansions refer to the related user manuals you can download from AiM website www.aim-sportline.com documentation area, products section.

6.2.2 – Shift Ligths configuration

To configure MXK10-Gen4 shift lights activate the related layer; this page shows up.
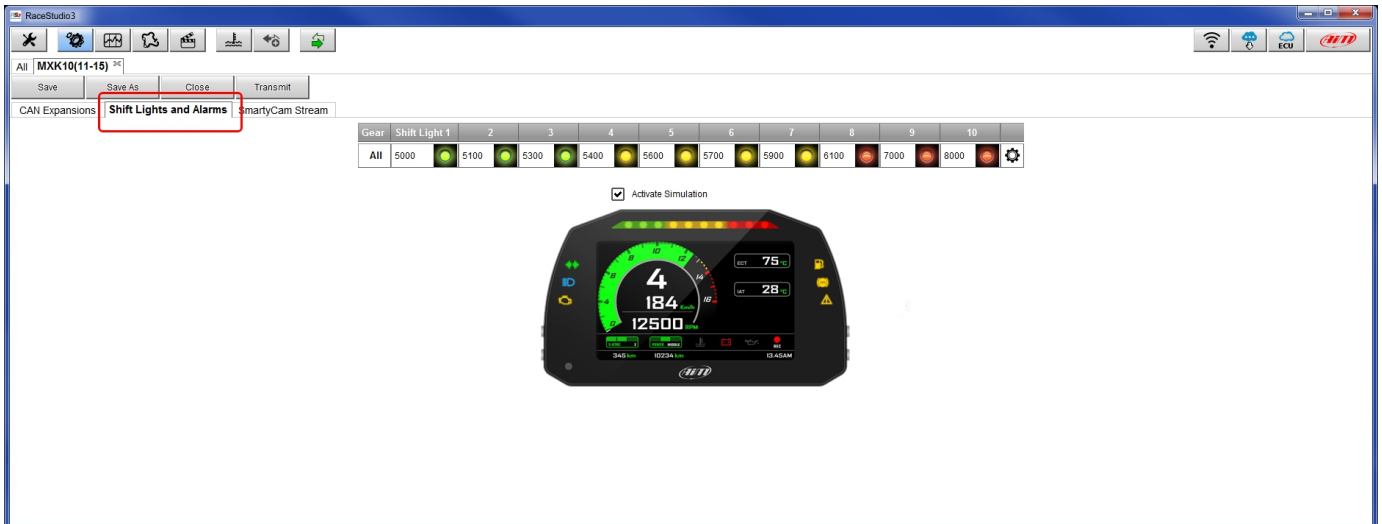
To use the LED bar as shift lights click this icon (⚙) and the setting panel shows up. Configure:
* RPM value that switches the single LED on
* LED sequence enabling the desired option:
    * a LED stays on if its threshold is exceeded
    * a LED stays on until another LED with higher threshold turns on or
* connect the shift lights to the engaged gear enabling "Gear dependent shift lights" checkbox;
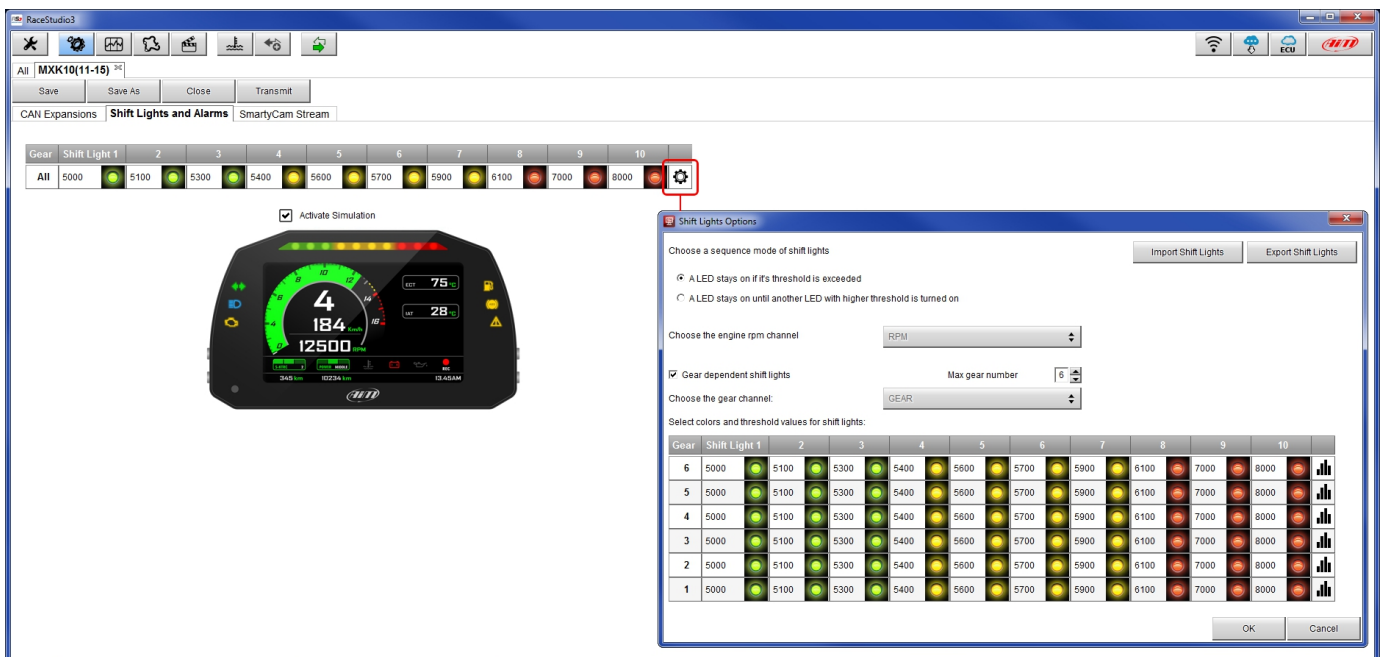
6.2.3 – SmartyCam configuration

MXK10-Gen4 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.
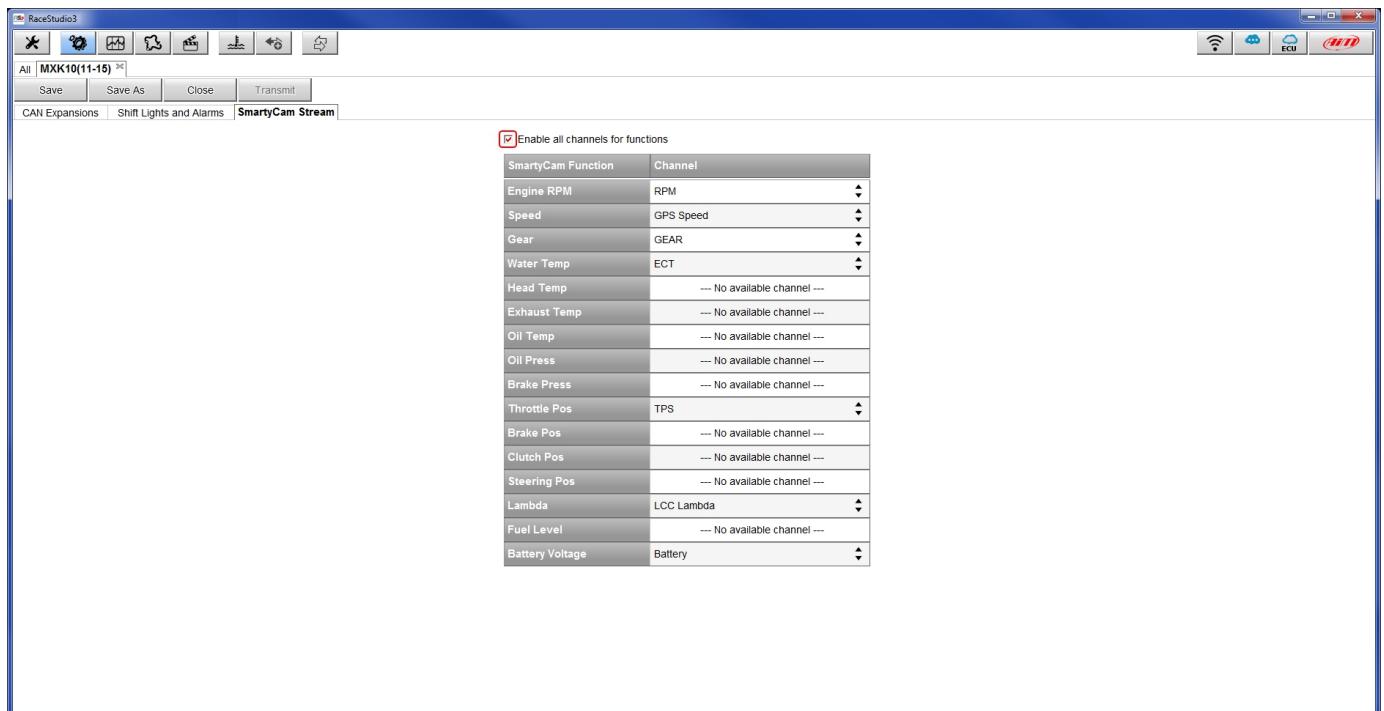
When the configuration is finished:

- press "Save" on the page top keyboard
- press "Transmit" to transmit the configuration to MXK10-Gen4
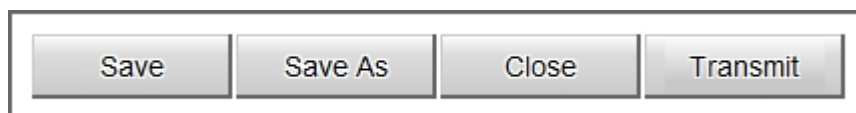
6.3 – Managing a track on MXK10-Gen4 with Race Studio 3

Track Manager function of Race Studio 3 allows to create, delete and modify, transmit and receive tracks to/from MXK10-Gen4. 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(11-15) ID 7400326")

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.
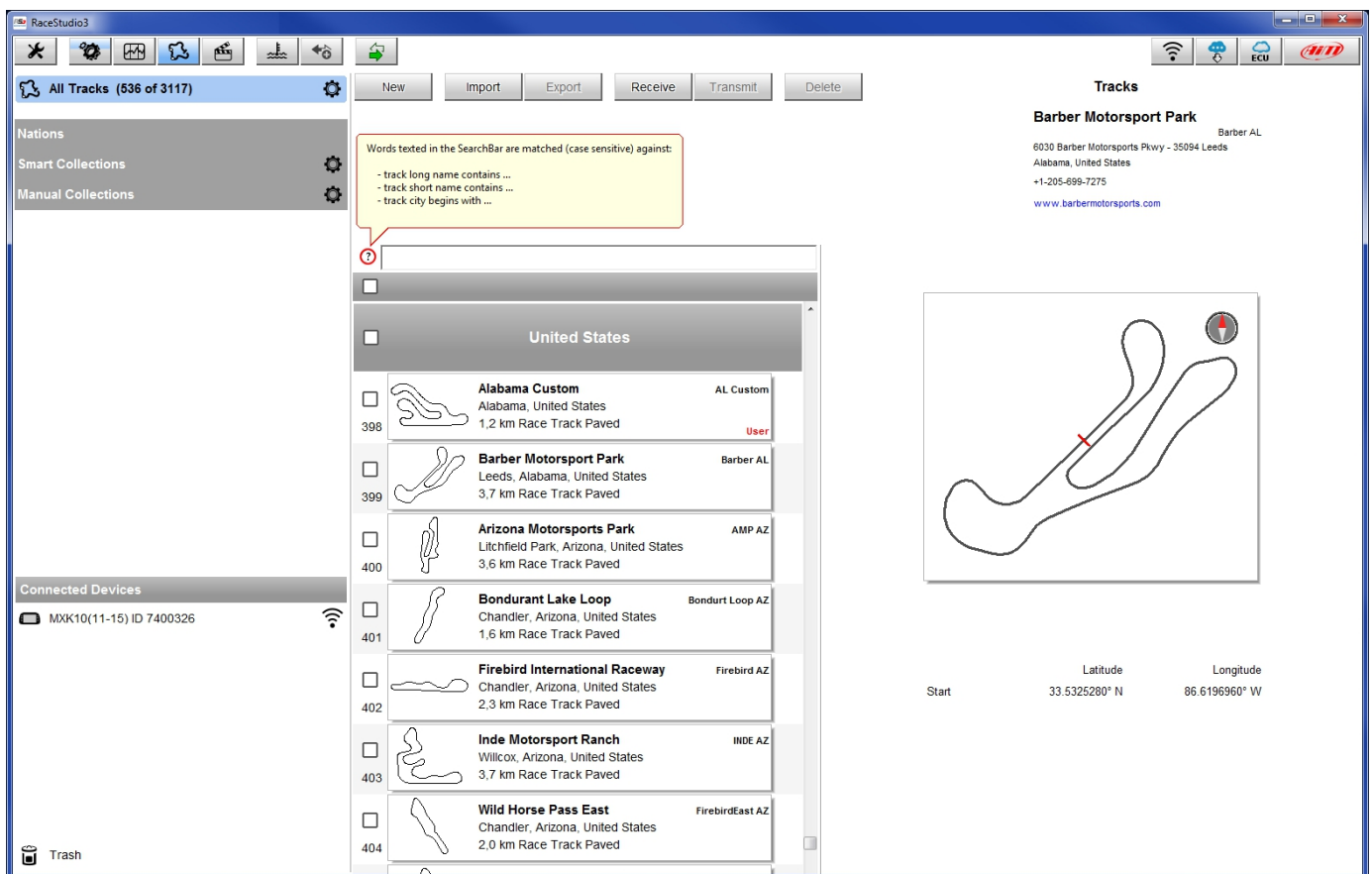
When MXK10-Gen4 is connected it is shown on the left bottom part of the page. Clicking on it all the tracks it contains are shown in the right column of the page.
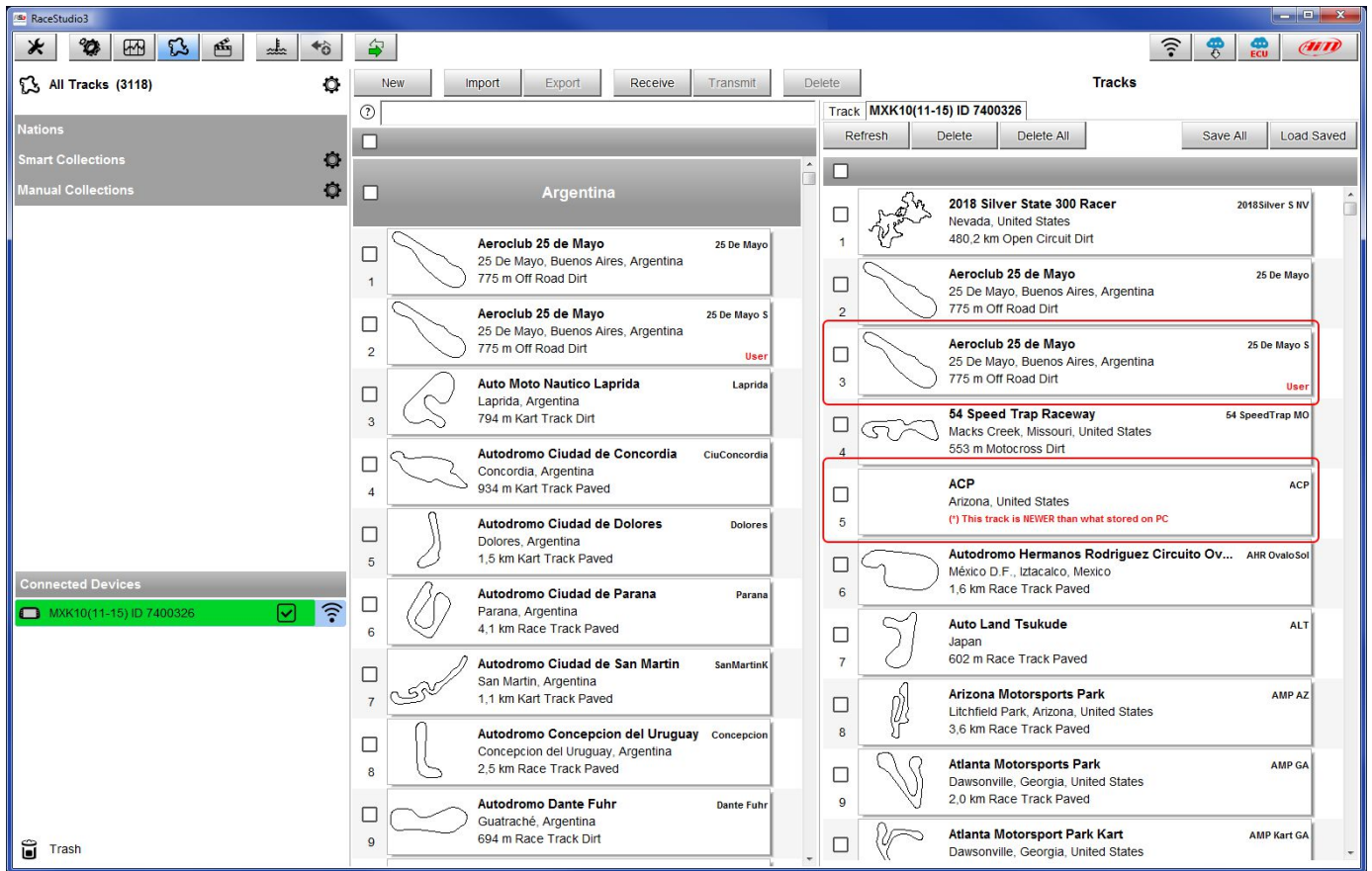
Tracks created by the user are labelled "User" and if the track stored in MXK10-Gen4 logger is different from the one stored in AiM database this is notified as shown here above.

The page keyboards are used to manage the tracks.

The keyboard above the central column allows to:

New	Import	Export	Receive	Transmit	Delete

- **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	Delete	Delete All	Save All	Load Saved
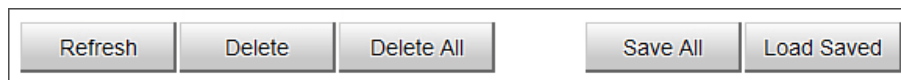
- **Refresh**: refresh the track list stored in the connected device
- **Delete**: delete one or more tracks from the device memory
- **Delete All**: delete all tracks stored in the device memory
- **Save all**: save all the tracks stored in the connected device; it creates a zip file that can be loaded 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.

6.4 – The device page

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

- **Live Measures**: to:
  - o check the logger channels and force online values
  - o start live measures
  - o 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)
  - o calibrate the sensors that need it pressing the related button
  - o show measure in Mv
- **Download**: download data stored in MXK10-Gen4 memory
- **WiFi and Properties**: name the device, manage MXK10-Gen4 WiFi and fill in racer name, vehicle name or number, championship and venue type (generic, qualifying, 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 Windows™ version (Windows8 or Windows10) whose graphical libraries are more updated
- **Firmware**: to check or update MXK10-Gen4 firmware.

6.4.1 – 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-Gen4 blink pressing "Blink" button top right. This operation is the most simple way to test PC-device communication.

*Please refer to Appendix 1 to know which ECU channels are sampled by MXK10-Gen4.

6.4.2 – 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.
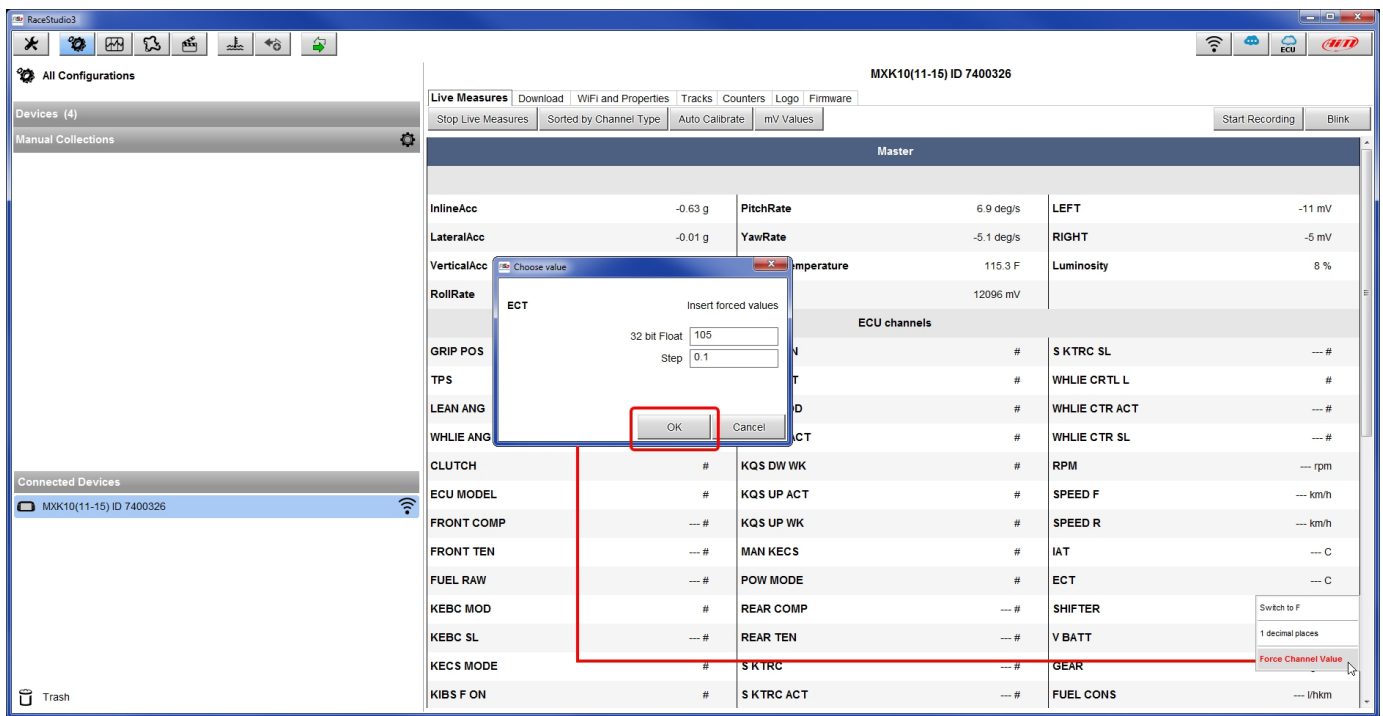
Once forced the values are shown on the right of the page red boxed. Lateral "+" and "-" buttons allows to change the values used.

7 – Data recall

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

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

TODAY 02:02 PM			
MAX RPM		MAX SPEED	
10048		282	
Lap	Best Laps	RPM	Km/h
4	1:57:56	10048 5592	280 73
11	1:57:94	10100 5450	277 70
8	1:58:02	10300 5700	278 69
			18:59

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

| TODAY 02:02 PM |
|---|
| TODAY: COTA Austin |
| 22/05/2019: Albany GA |
| 22/05/2019: Albany GA |
| 21/05/2019: Albany GA |
| 21/05/2019: Albany GA |
| 18:59 |

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 "**ENTER**".

| TODAY 02:02 PM		
02.02PM 17 Laps B 1.57.56	12.02AM 10 Laps B 1.50.46	10.43AM 11 Laps B 1.54.14
09.52PM 7 Laps B 1.55.56	09.02AM 9 Laps B 1.53.46	7.39AM 10 Laps B 1.55.16
		18:59

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

05/23/2019 02:02 PM

BEST LAP
Lap 4: 1:57:56

18:59
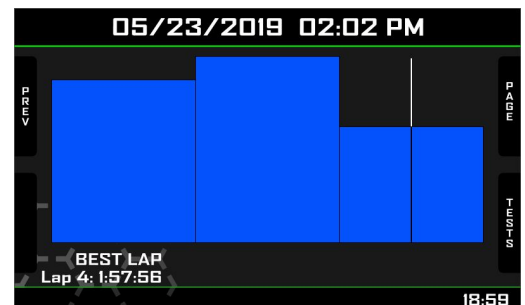
8 – Data download and analysis

Once the test session is over it is possible to download data sampled on a PC. In addition to lap and split times all data sampled by the logger ECU are downloadable. Please refer to Appendix 1 to know which ECU channels are sampled.

To download sampled data connect MXK10-Gen4 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.
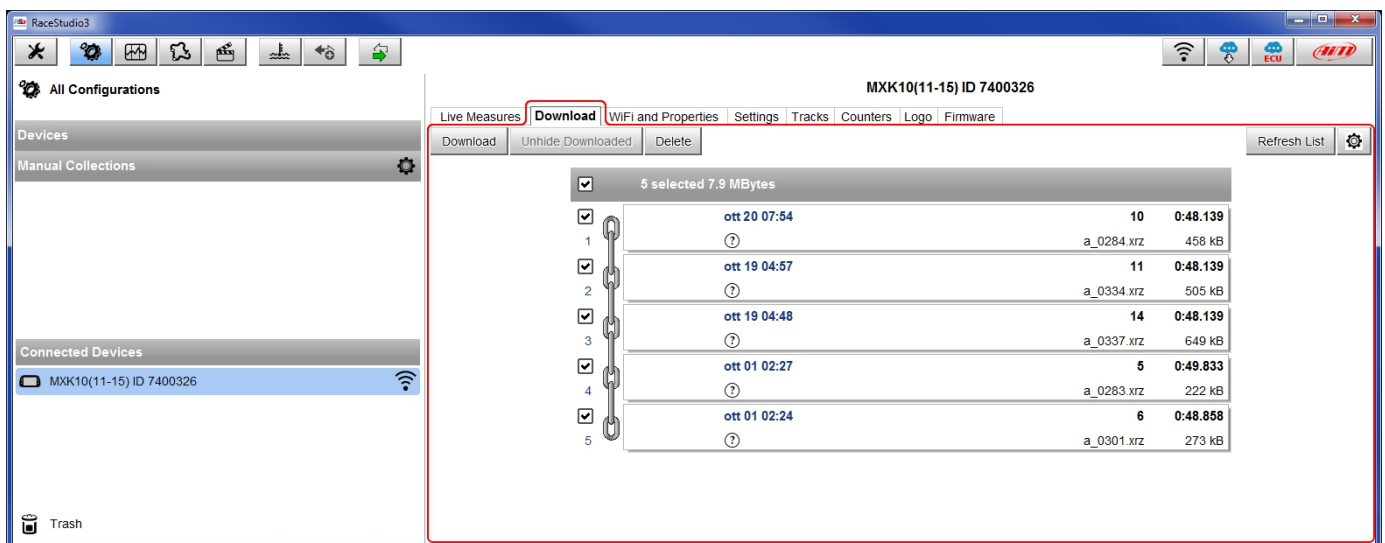
After download press Analysis Icon (⊞) and Race Studio Analysis software starts showing all the files available for analysis. Double clicking on the desired one it is possible to start analysing your performance.

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-Gen4 creates a Wi-Fi network and works as an Access Point the PC can be connected to.

PC

MXK10-Gen4
(ACCESS POINT)

2 – Existing network (to connect to an existing Wi-Fi network – WLAN)
This mode is more 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-Gen4 and the PC must connect to an existing Wi-Fi network made by a device that works as an external access point.
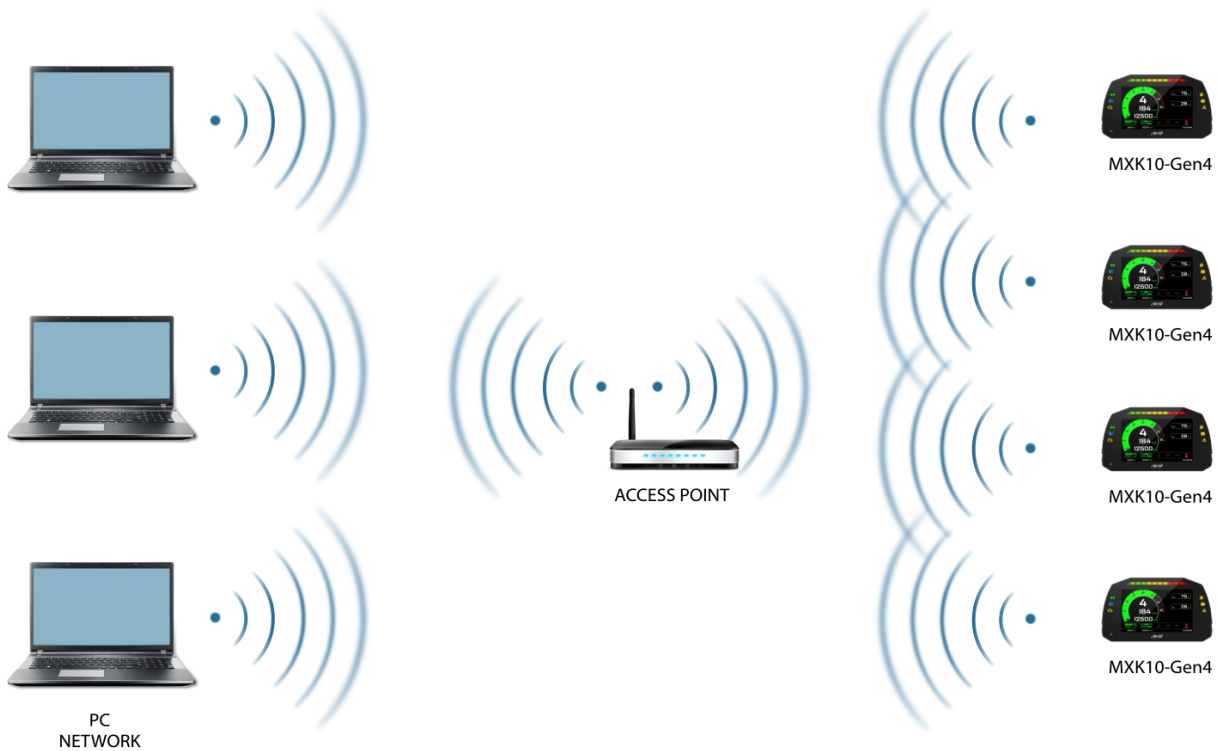
When working in WLAN mode MXK10-Gen4 has two available security levels:
- network authentication: network password
- device authentication: MXK10-Gen4 password

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-Gen4 menu as explained in paragraph 5.2.5.

9.1 – Configuring MXK10-Gen4 dash-logger as an access point (AP)

This is MXK10-Gen4 default configuration and is the easiest and most direct connection mode, ideal to communicate with one MXK10-Gen4 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-Gen4 Name (7400326 in the image below)
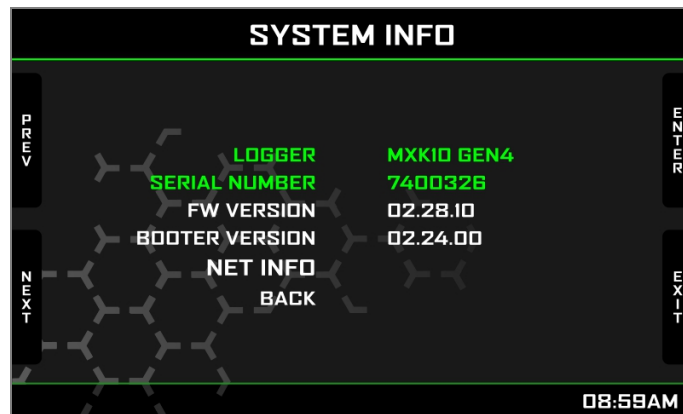
- run Race Studio 3
- click Wi-Fi icon and select your device
- in a few seconds the connection is established

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.
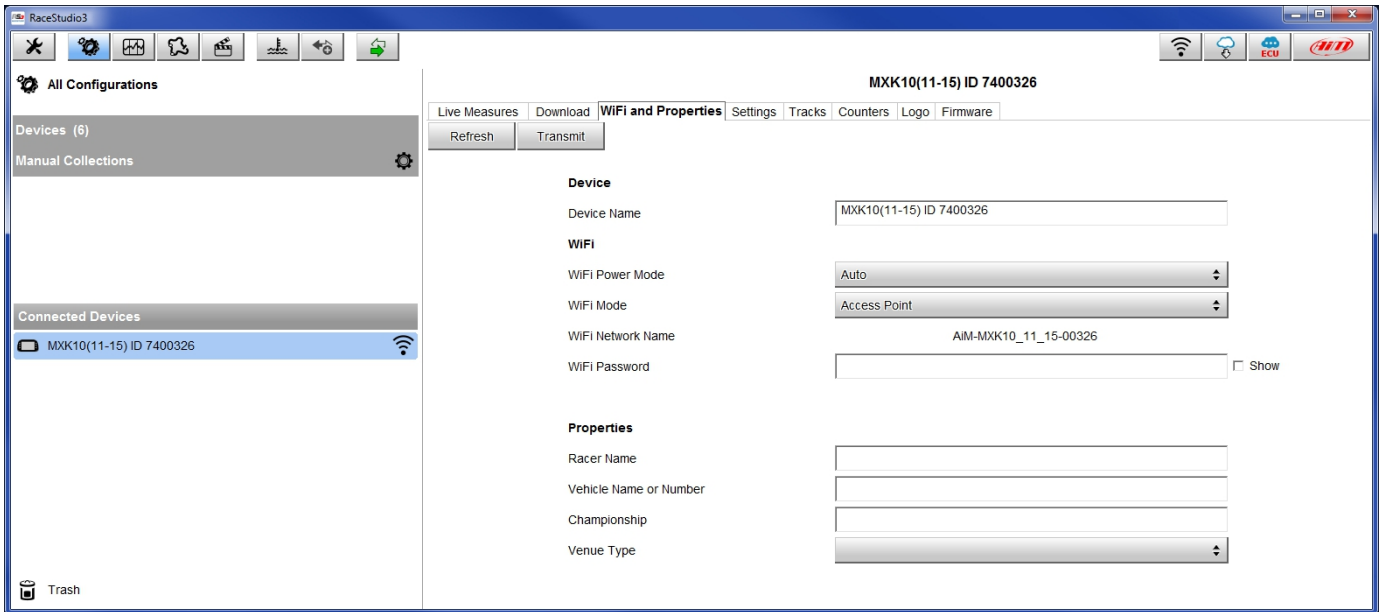
This AP or SSID name is unique for the device.
An example of name is:" AiM-MXK10_11_14-00326" where:

- "AiM" is the prefix of all AiM devices
- "MXK10_11_15-00326" is the device identifier and
- "0326" 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_11_15-00326-TomWolf"

Once all parameters set click "Transmit". MXK10-Gen4 reboots and is configured with the new parameters. If MXK10-Gen4 logger is protected by a password, as recommended, Race Studio 3 will ask that password to authenticate.
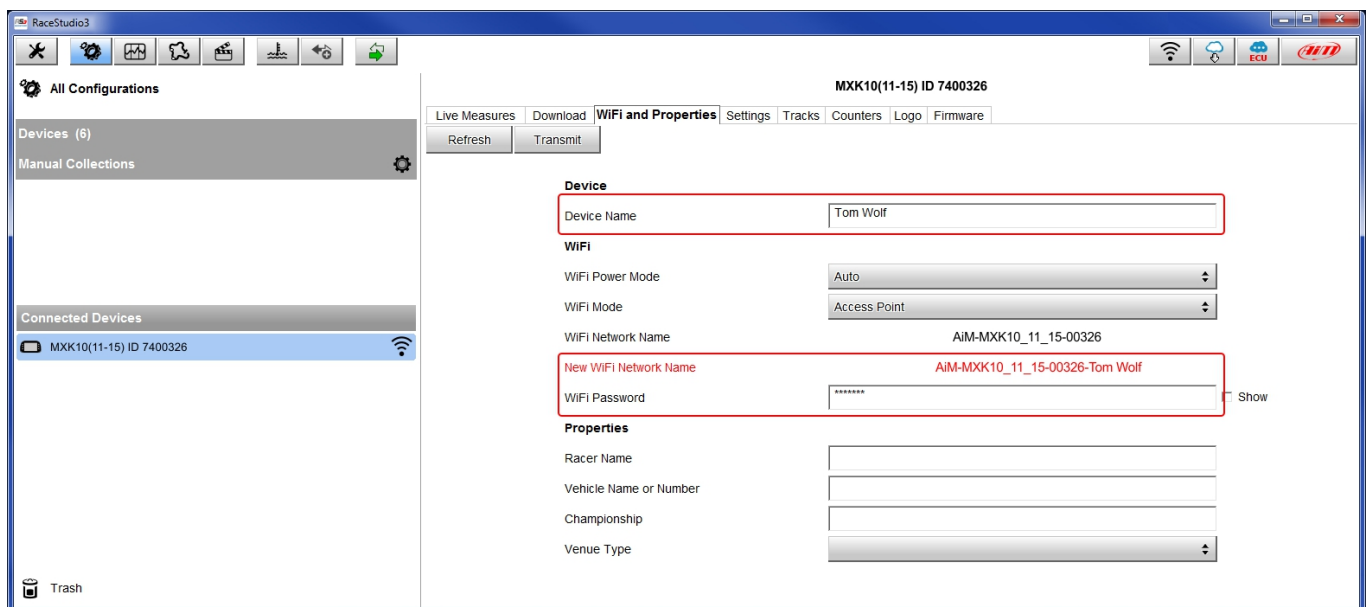
Please Note: the same Wi-Fi connection can be created with the operative system tool.
Once the device has been authenticated in the Wi-Fi network it can communicate using Race Studio 3.

9.2 – Adding MXK10-Gen4 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-Gen4 logger can have its password that adds another security and privacy level to the network.

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.
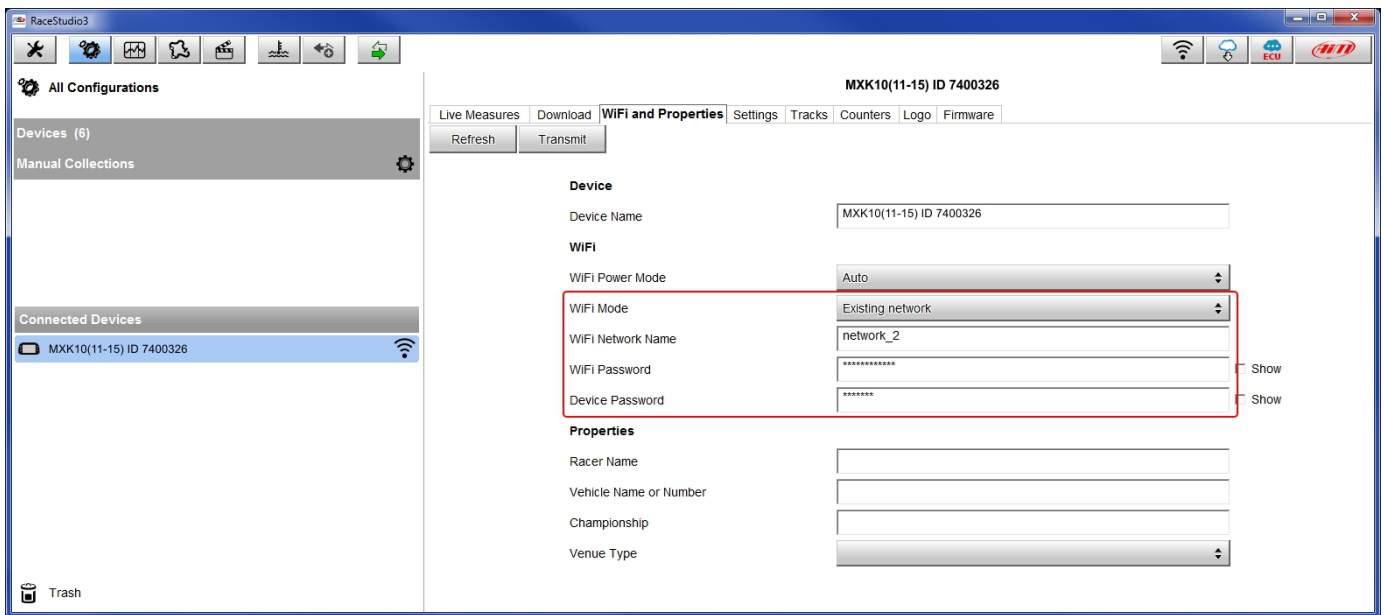
Here above is shown a device "MXK10(11-15) ID 7400326" that switched from AP to WLAN mode (Existing Network).

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.
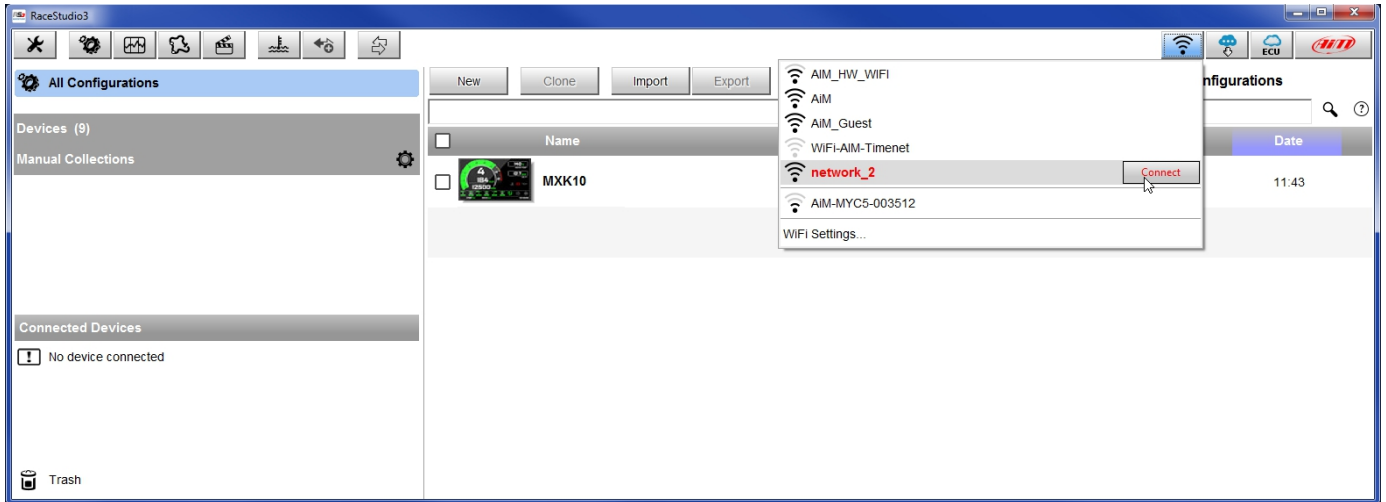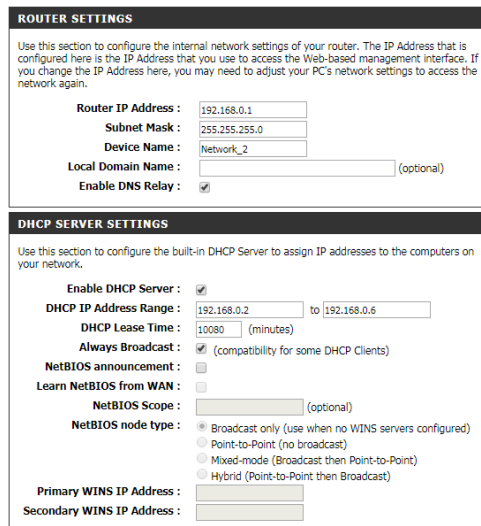

When the PC is authenticated to the network called "network_2" it can see all devices you configured to access the same network. In the image below three AiM devices are connected to the same "network_2" WLAN.
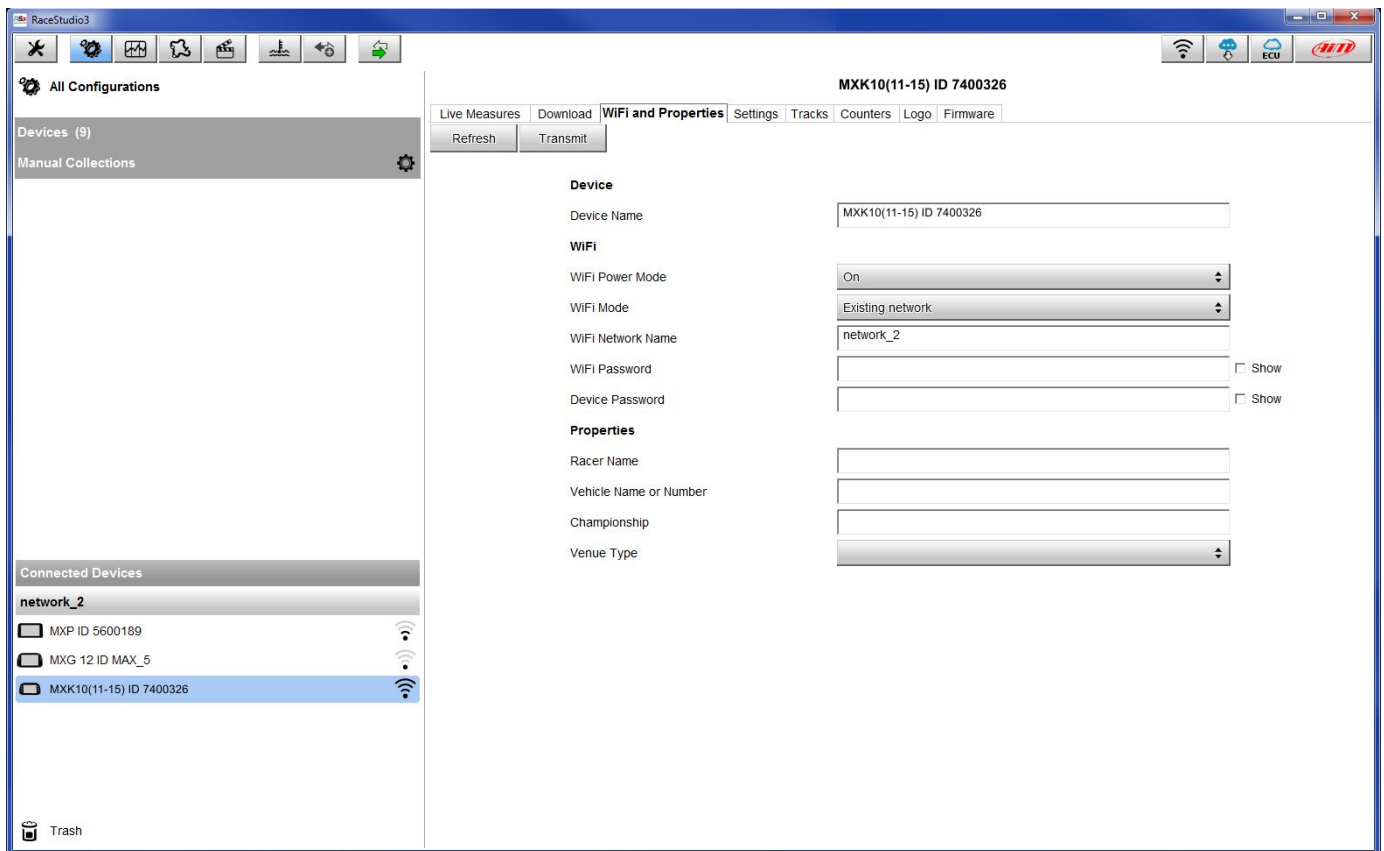
9.3 – Wi-Fi network settings

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.

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.

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

- **Wireless network name: Network_2**
  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**

9.4 – 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-Gen4 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 Windows™ 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.

## 9.6 – Working on Mac™ with virtualized Windows™

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.
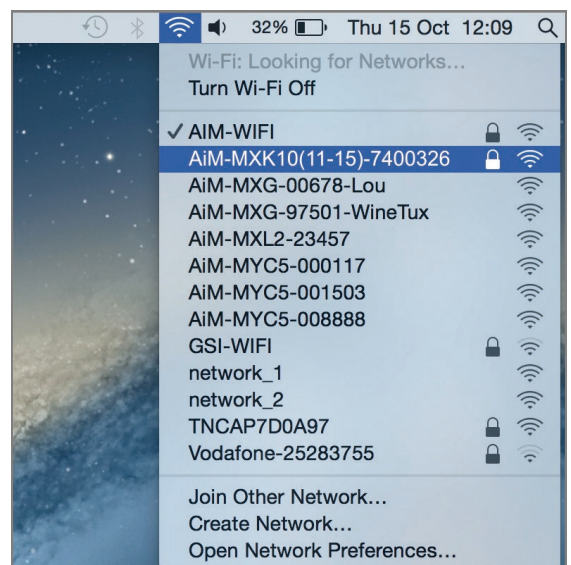
Configuring Parallels(™)
Select "Menu –> Configure…" in Parallels.

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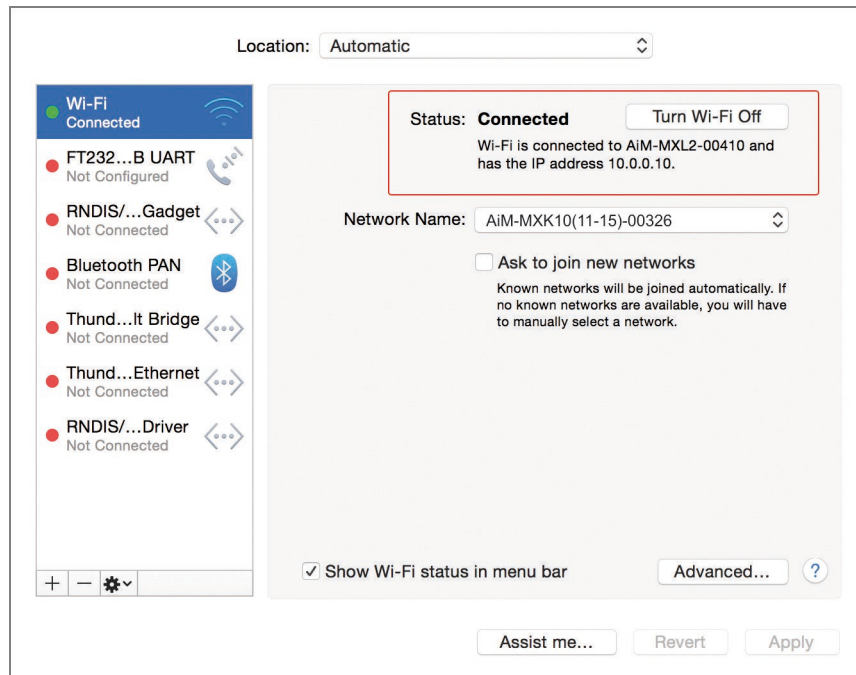Right on the configuration panel set "Type" field on "Wi-Fi".
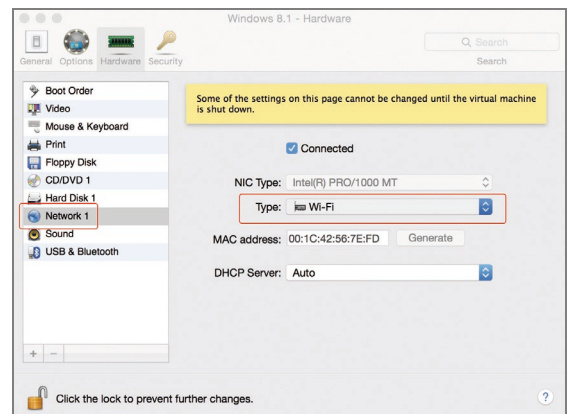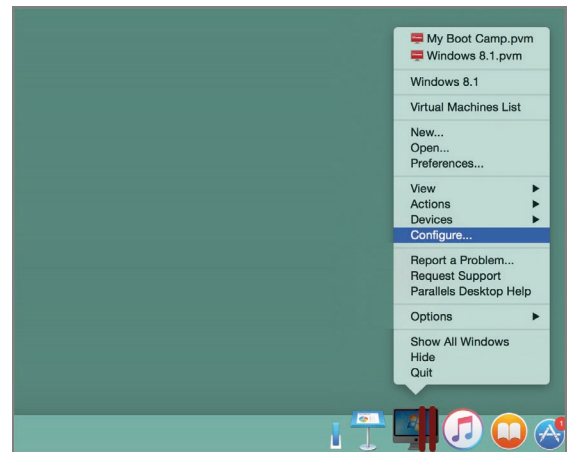
Then select the device to communicate with.

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).

To enable Race Studio 3 correctly working on a Mac with virtualized Windows™.
- press Wi-Fi icon
- select "Wi-Fi Settings" option
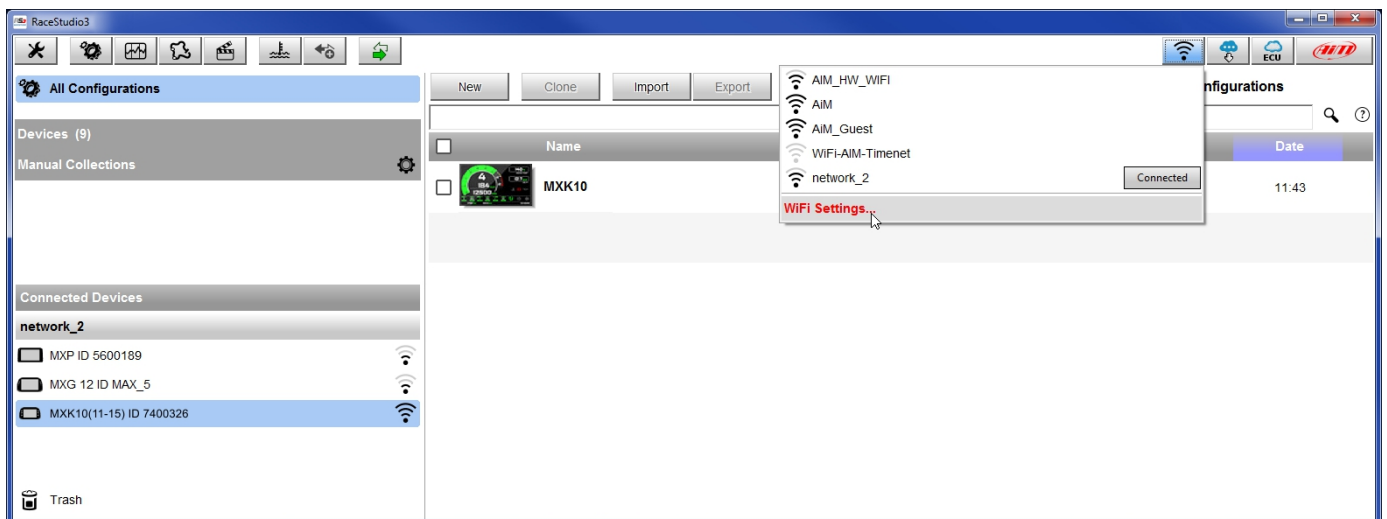
- enable the checkbox shown here below.

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-Gen4 logger Wi-Fi configuration is to be set on Existing Network as explained before.
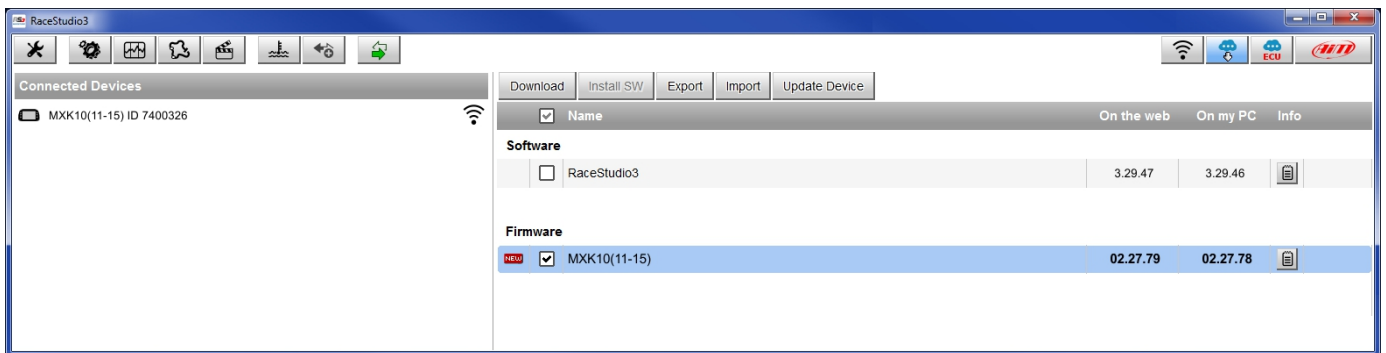
10 – New firmware upgrade

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.

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-Gen4

MXK10-Gen4 sample and records the following channels supplied by the ECU of Kawasaki Ninja 2011-2015 bikes.

CHANNEL NAME	CHANNEL FUNCTION	SAMPLING FREQUENCY
ZX_RPM	Engine RPM	20
ZX_TPS	Throttle Position Sensor	50
ZX_ECT	Engine Coolant Temperature	10
ZX_IAT	Intake Air Temperature	10
ZX_GEAR	Engaged Gear	10
ZX_CLUTCH	Clutch switch	10
ZX_POW_MODE	Power Mode	10
ZX_TC_MODE	Traction Control mode	10
ZX_TC_SELECT	Traction Control selected mode	10
ZX_SPEED_F	Front wheel speed sensor	10
ZX_SPEED_R	Rear wheel speed sensor	10
ZX_SHIFTER	Shifter sensor voltage	50
ZX_PIT_ROAD	Pit lane speed limiter	10
ZX_DIAG_CODE_1	Diagnostics code 1	10
ZX_DIAG_CODE_2	Diagnostics code 2	10
ZX_DIAG_CODE_3	Diagnostics code 3	10
ZX_V_BATT	ECU Battery voltage Reading	10