

1. Wifi Configuration

1.1 Introduction

WiFi connectivity is **disabled** by default in your AiM device, and must be enabled via a USB connection, or on the device menu.

Your AiM device can be configured for WiFi communication in one of two ways:

1) as an Access Point (AP)

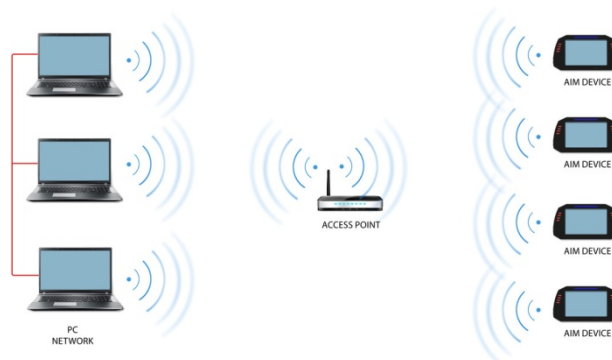
Ideal when you have one device and one computer



In this configuration, your AiM device creates its own WiFi network acting as an Access Point to which you can connect with your PC.

2) to join an existing Wireless Local Area Network (WLAN).

This is more complex and requires an external Access Point, but is more flexible and powerful. In this way you can communicate with more than one device and with more than one PC, on the same network.



In this configuration, both your AiM device and your PC have to join a preexisting WiFi network, called a WLAN, in order to communicate with one another. The network is now created by a network device which is acting as an external Access Point by permitting the device connectivity.

When an AiM device is working in WLAN mode, there are two layers of security available:

- Network Authentication: the network password.
- Device Authentication: a unique device password.

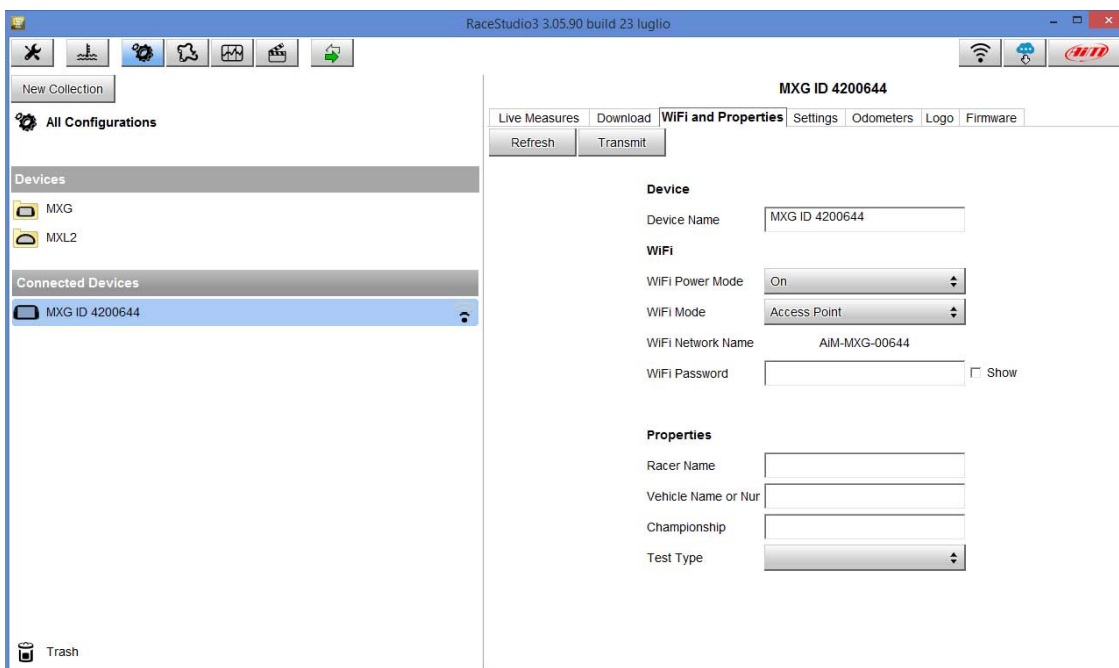
Using both network and device authentication allows for various security strategies where multiple persons, PC's, and AiM devices are involved. For example, a PC on a WLAN may see several AiM devices, but can only communicate with the AiM devices for which it has the password.

1.2 configure your Aim Device as an Access Point

Follow these steps to create an Access Point allowing you to connect your PC to your AiM device via WiFi.

This is the most simple and direct WiFi connection method, and is ideal when you wish to communicate with only one AiM device using one PC.

To configure your AiM device as an Access Point, simply connect it to your PC via USB, open RaceStudio3, click on your device in the left column, go to the WiFi Config Page, and set the Mode as Access Point



When initially configured as an Access Point, your AiM device creates a network without a password that is accessible to everyone. It is therefore recommended that you create a unique password to secure your device/network immediately. With the use of a password, the communication is secure and encrypted using the WPA2-PSK standard.

The name of this Access Point, or SSID, is unique to your device.

An example name is:

"AiM-MXG-054321"

Whereas:

- "AiM-" is the prefix for all AiM devices,
- "MXG-" is type of system identifier, and
- "054321" is a unique serial number for your device assigned at the factory.

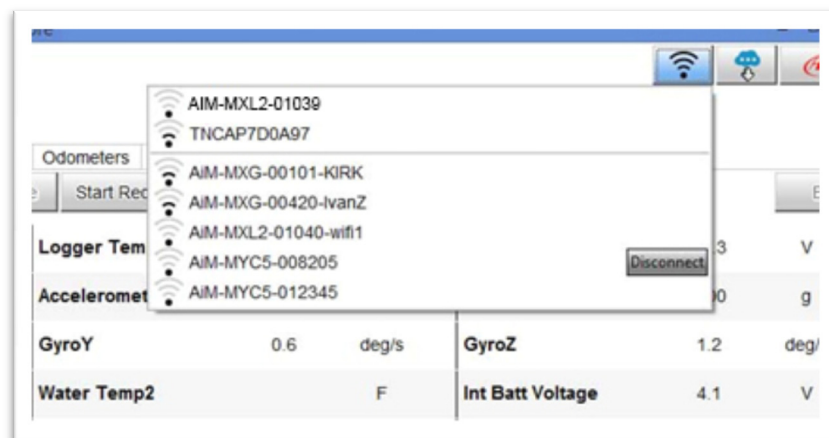
To make your device more recognizable, you can append a friendly name to the SSID. There is a limit of 8 characters.

For example, if you add the driver's name, Tom Wolf, the resulting network name (SSID) will be:

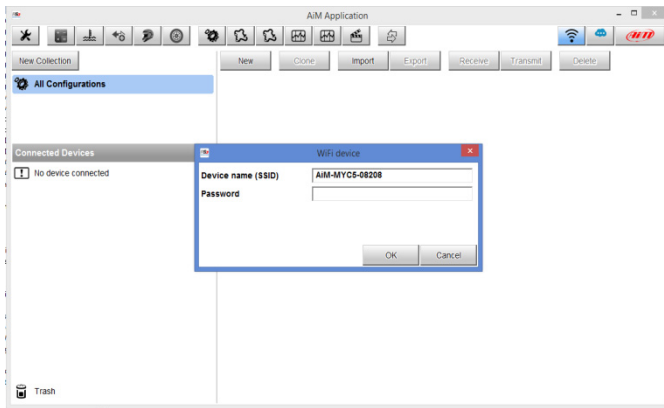
AiM-MXG-054321-Tom Wolf

After having set all the parameters, click the Transmit and Restart button. Your AiM device will restart and be configured with the new parameters.

To connect to your AiM device, simply choose your device's name from the dropdown list of available WiFi connections from within RaceStudio3.

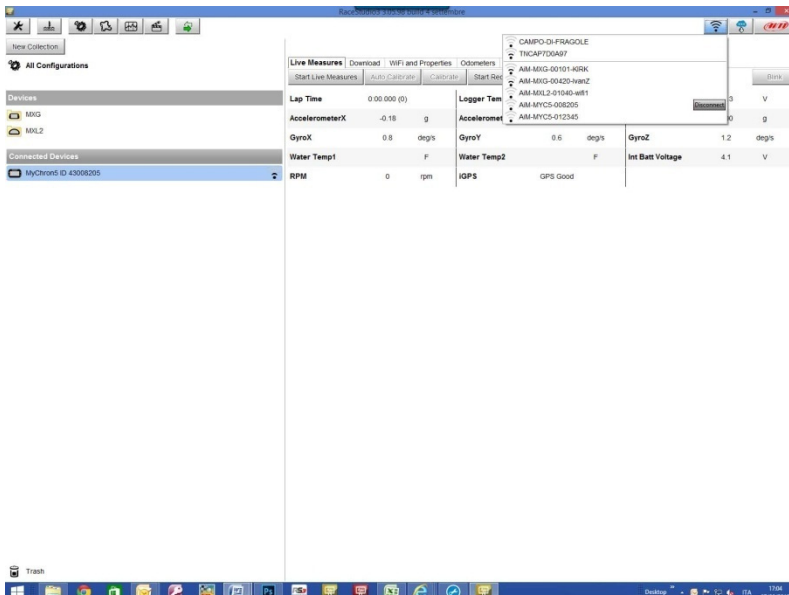


If your AiM device is protected by a password, as recommended, RaceStudio3 will then require that password to authenticate.



Please note that it is also possible to make the same WiFi connection using the WiFi tools of your operating system.

Once the WiFi authentication with the device has been established, users can interact with the device by clicking on it.



1.3 AiM Device Joining an Existing Network

In this scenario both your AiM device and PC join an existing WiFi network (WLAN).

This scenario is ideal for a race team with multiple drivers and crew members and it is desired to communicate with one or more AiM devices using the same PC network.

Note again that that each AiM device can have a unique password, which is in addition to the network password, thus adding an additional layer of privacy and security.

RaceStudio3 will display any and all AiM devices connected to the same network as the PC. Connected devices can be seen under the Connected Devices header, just as if they were connected by USB.

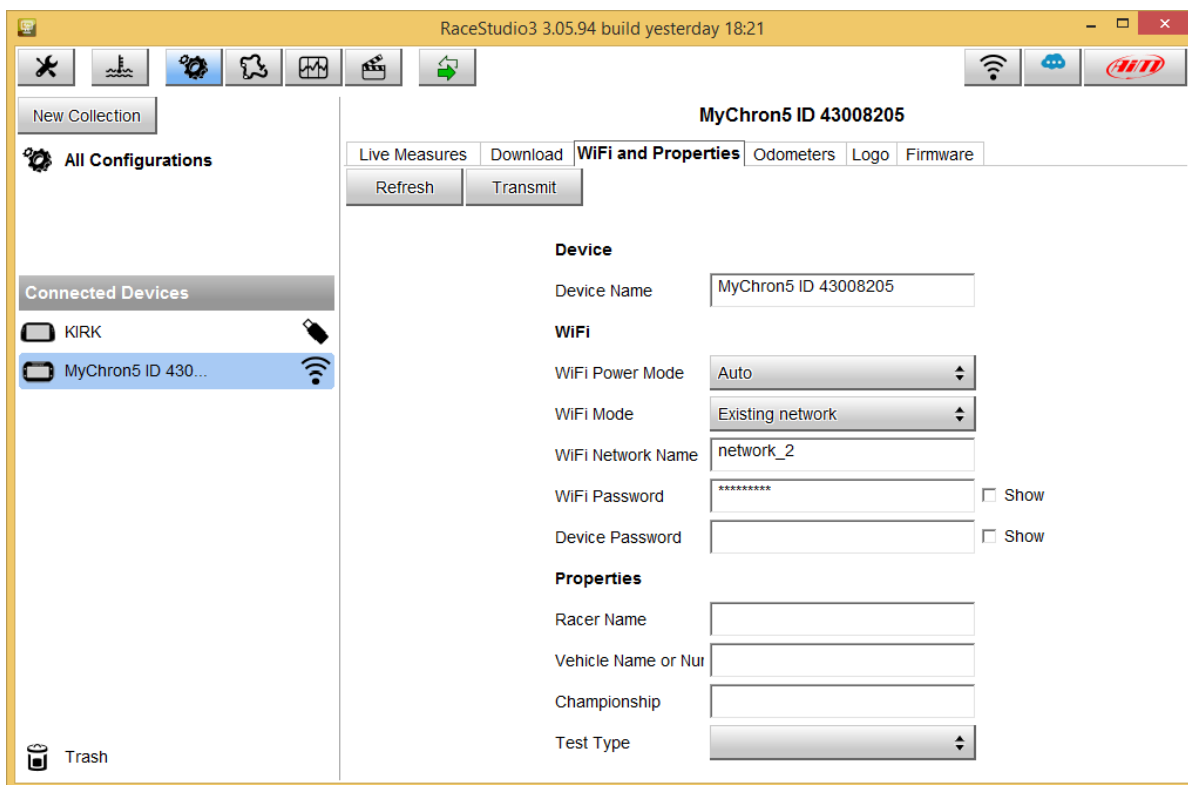
To configure your AiM device to join an existing wireless network, first connect your device to your PC via USB. In RaceStudio3, click on your device in the left pane under Connected Devices. Go to the WiFi Config tab, and set the Mode as **Existing Network**. Then enter the network password and the device password, should you choose to add one, in the appropriate fields

To commit the network settings to your device, click the Transmit and Restart button on this same tab. Your device will restart and join the network you specified. Connect your PC to the same network, and you will see your device under Connected Devices just as when connected via USB.

If the Aim Device is connected to your PC using a WLAN, it is possible to have TWO different passwords: the Device password, already described, and the Network Password.

Please, note that only passwords following the WPA2-PSK code are admitted.

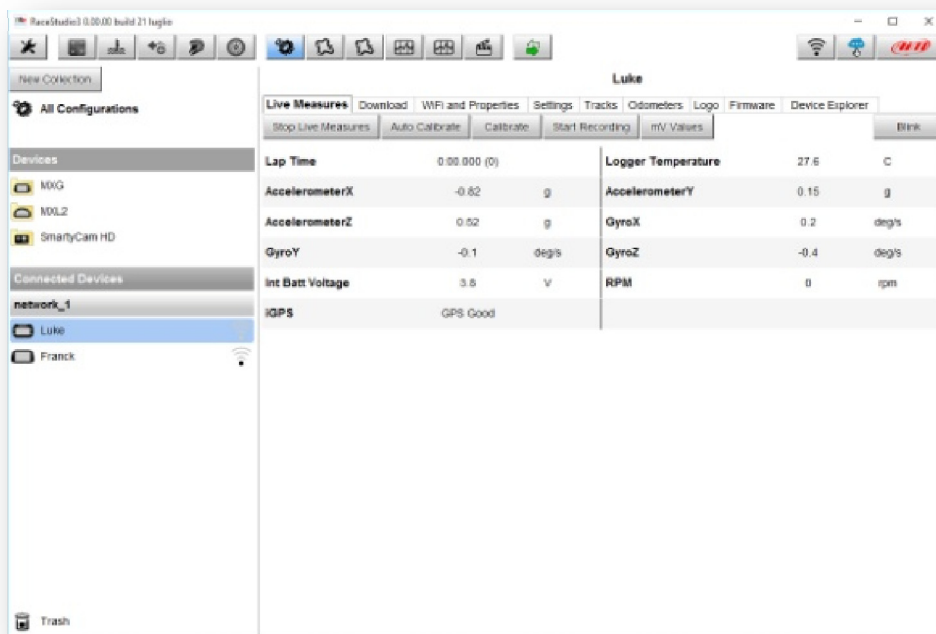
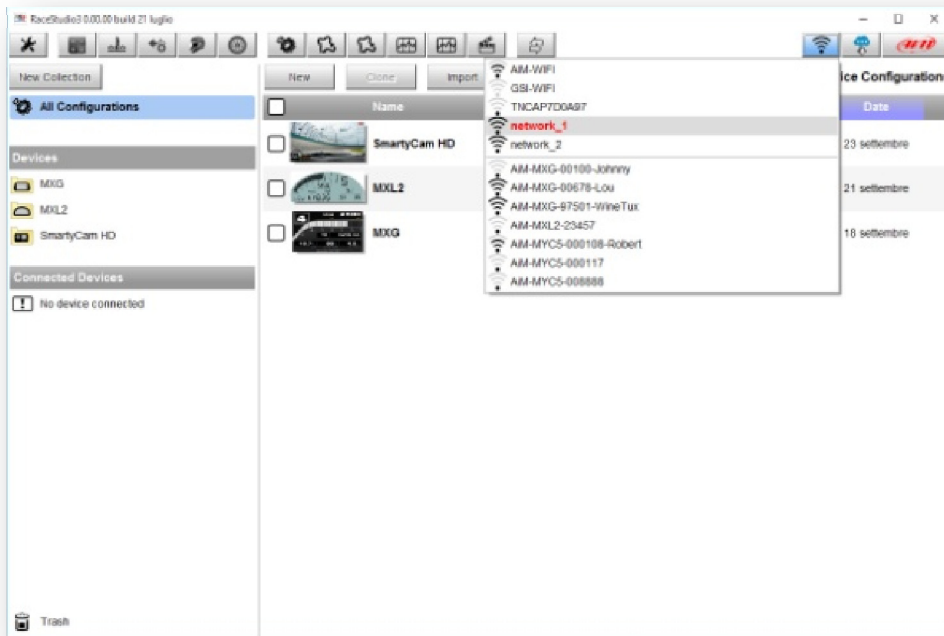
In order to accomplish these tasks, RS3 has to be used as reported in the following figure.



As you can see by the picture previously reported, the device called "MyChron5 ID 43008208" is switched from AP mode to WLAN mode. The network name is "network_2" and it is not working in open authentication mode since protected by a network password.

In order to get the connectivity to the device, also the user's PC has to be authenticated to the same network as reported in the following figure.

Once the user PC is authenticated to the same network called "network_1", it can see the AIM device previously configured to get the access to the target network.



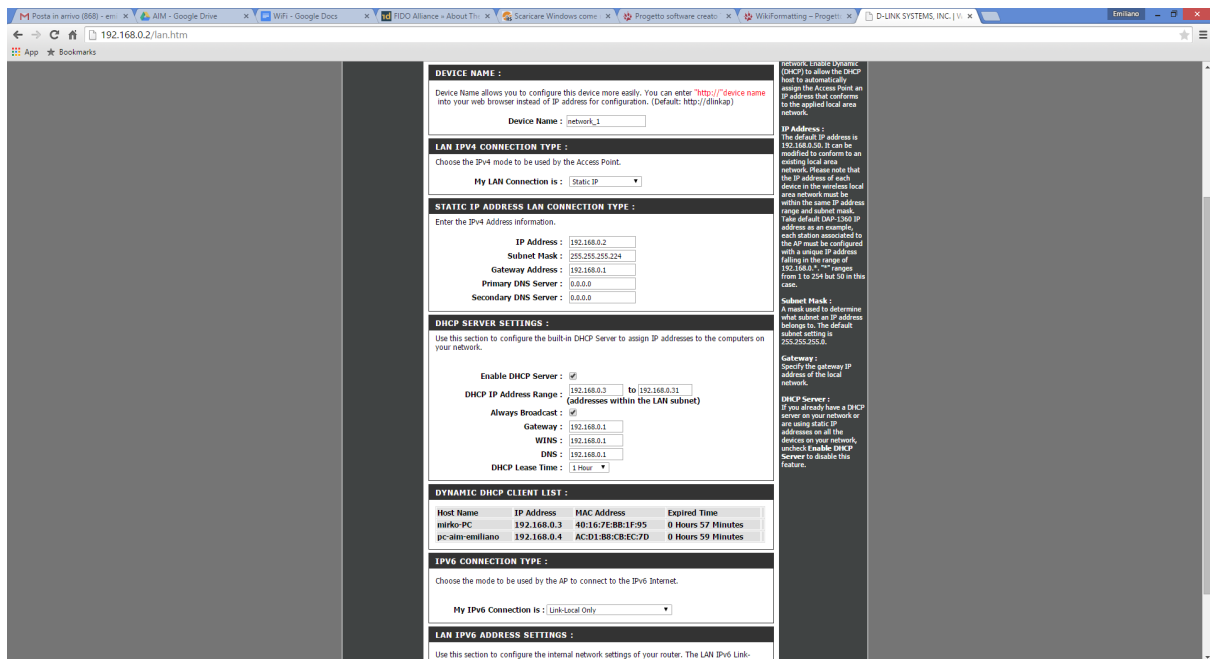
In the previous picture two AIM devices are connected to the WLAN **network_1**.

1.4. High Performance WLAN Setup

This chapter reports a basic description of one WLAN configuration having AIM devices and user's PC on it.

This paper suggests the use of Linksys AS3200 as network device in order to provide a WLAN. However, you can use any other network device having at least both one 3x3 MIMO and one DHCP server.

Moreover, in order to maximize the bandwidth, Internet should not be allowed through this WLAN. Hence, the DHCP server has to be configured without both DNS and Default Gateway addresses. A typical example of configuration is reported in Figure 10.



As you can see by the picture, the network device configuration parameters are the following:

- Wireless Network Name: **network_1**
(It states that the network name belonging to the WLAN is "AiM-WLAN". Hence, one user's PC needs to be authenticated to this network in order to interact with any AIM devices lying on this network).
- Gateway Address: 192.168.0.1
Primary DNS server: 0.0.0.0
Secondary DNS server: 0.0.0.0
(These settings avoid the Internet connectivity through this WLAN).
- Subnet Mask: 255.255.255.224
Enable DHCP server: yes
DHCP IP Address range: 192.168.0.3 to 192.168.0.31
(These settings enable a DHCP server running on these WLAN, it gives IP addresses belonging to the range: 3-31. Hence, 29 network hosts are permitted on this network).

The number of network devices lying on one WLAN depends on the subnet mask. This paper suggests the use of the following network masks and IP address range:

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

The bold one is the configuration we suggest (if a greater number of devices is not needed) as it makes it easier and quicker for RS3 to identify devices on the network.

1.5. About Internet Connectivity

For optimal network speed for your AiM device(s) we have recommended not allowing an Internet connection on the same network, and have provided WLAN settings that prohibit an Internet connection.

Please know that it is certainly possible to allow Internet access on the same network as your AiM device(s), but doing so can degrade the performance AiM device communication. These slightly slower network speeds may be suitable for your needs.

Note too that it is possible to have a second WiFi connection by the means of additional hardware (NIC). Such a configuration would provide optimal data network speed for your AiM device(s) and simultaneously provide Internet access via the second NIC.

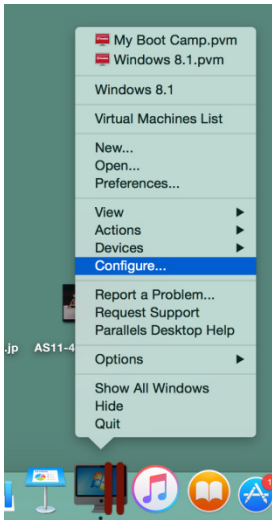
1.6. Working with Mac(™) OS and virtualized Windows(™)

Race Studio software runs exclusively on Windows operating systems, but also if the OS is virtualized on an Apple iMac OS.

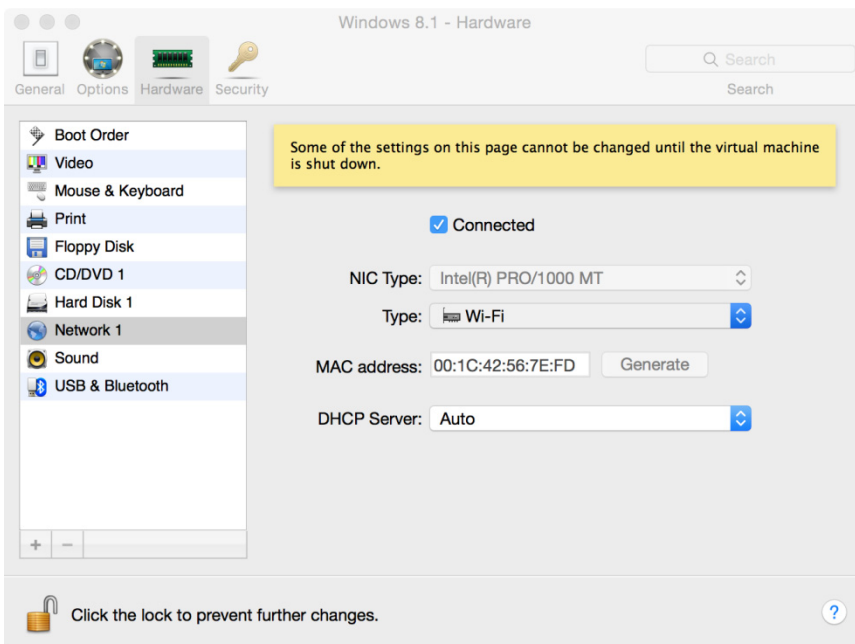
The main issue in this case is that the host OS (Mac) shares the WiFi interface with the virtualized OS (Windows) not as a WiFi interface but as a Ethernet interface.

Configuring Parallels(™)

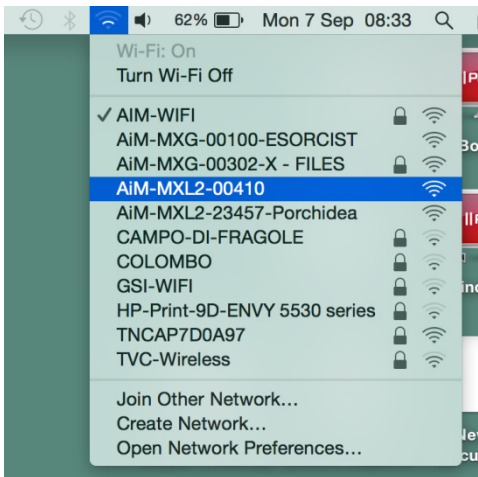
Choose the “Configure...” menu from Parallels icon.



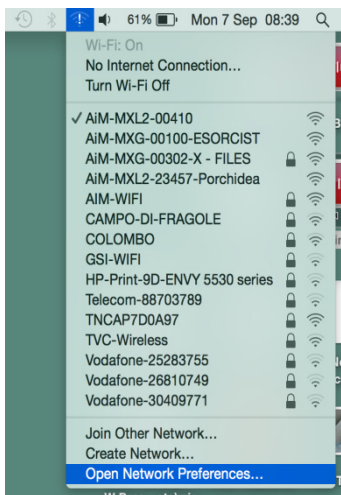
In the window you're prompted, choose the "Hardware" button at the top, then the "Network" line at the left. In the right configuration part, be sure to choose "Wi-Fi" in the "Type" field.



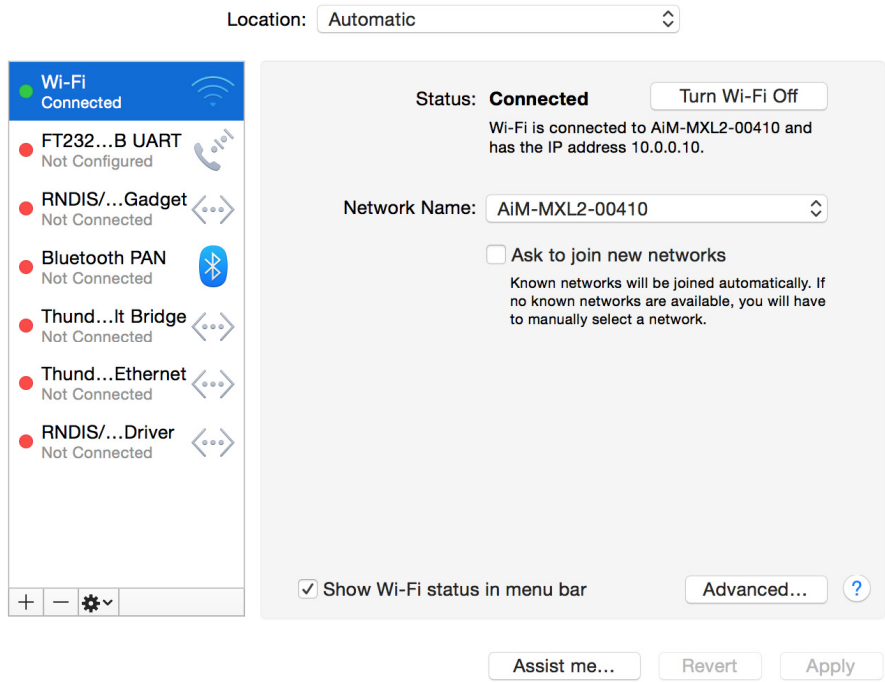
Then choose the device you want to communicate with.



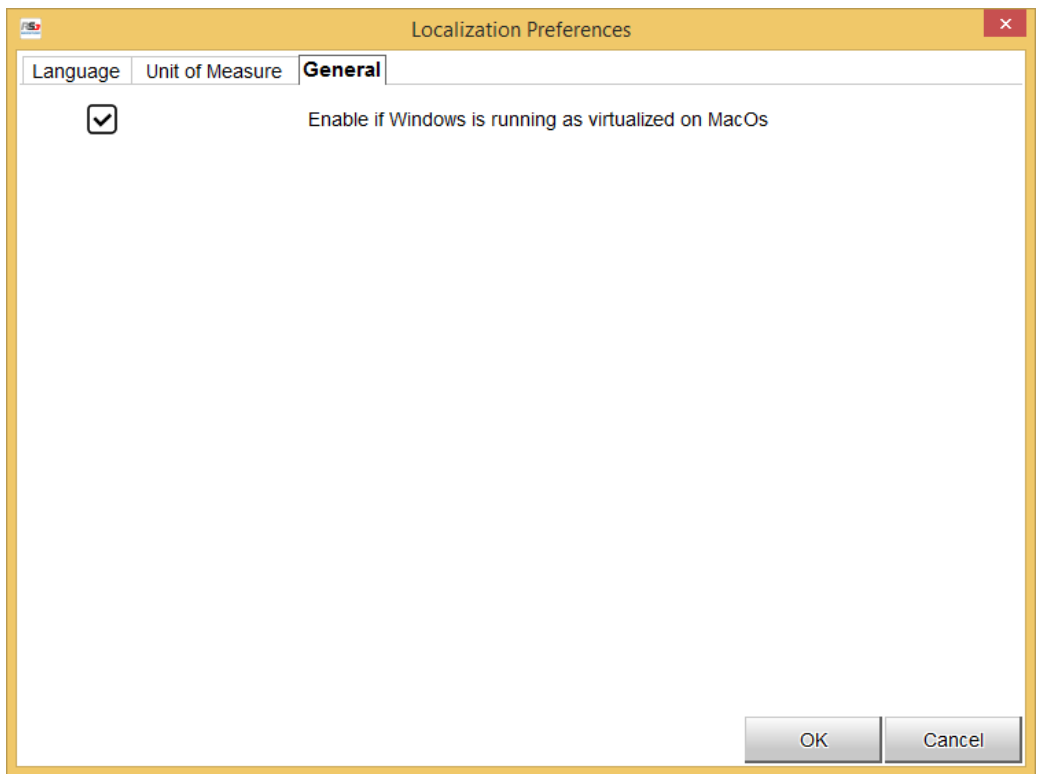
If you want to be sure the communication is working, choose the “Open Network Preferences...” menu.



In the window you’re prompted verify that the “Status” is “Connected” and that the given IP is like 10.0.0.10 (it could be 10.0.0.11, 10.0.0.12 or, generically 10.0.0.x).

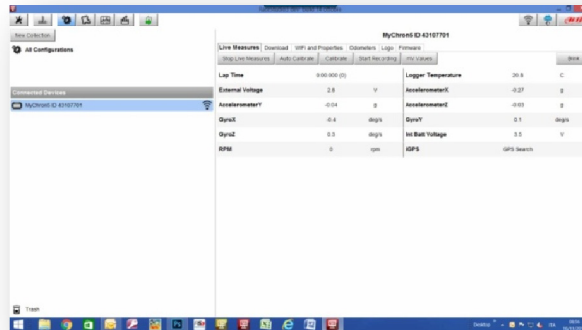


In RS3 flag the checkbox you find in Preferences.



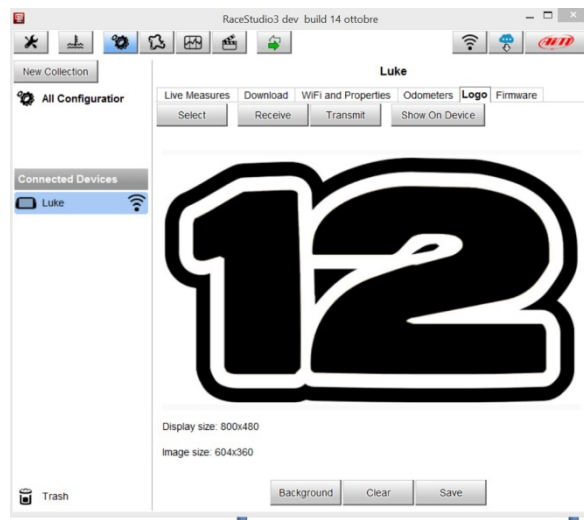
2. Logo Management

After having connected your device to the PC, the following options appear:



- OnLine
- Data Download
- Wifi and Properties
- Odometers Management
- Logo Management
- Firmware Information

Through Logo Management, you can change the logo that appears on the display when you turn your device on.



You can easily select a picture (JPEG or BMP) in your PC and transmit it to (or receive from) the device