

# SOLO 2 DL

User Manual 1.02





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SOLO 2 DL

1.02







# 1. Solo 2 DL in a few words

#### What is Solo 2 DL?

Solo 2 is the new AiM GPS log-timer (laptimer with internal data logger) that combines small dimensions, usability and logging capability.

### Why Solo 2DL?

- Because it features:
- ECU connection
- up to 8 configurable display pages.

This in addition to all Solo 2 features, to say:

- integrated GPS + Glonass receiver
- a huge tracks database that Solo 2 DL manages to automatically select the track you are racing on
- a powerful and comfortable Wi-Fi connection
- different type of races: speed and performance
   10 RGB LEDs that clearly show if you are
- improving or not
- a huge amount of internal memory (four gigabytes) capable of recording a lot of

### tests

### What about ECU connection?

Solo 2 DL manages all the hardware ECU connections as well as all the communication lines: CAN, K-Line, RS232. Its huge database includes more than 1500 protocols you can load in your Solo 2 DL.

### If the vehicle does not have an ECU?

In case your vehicle does not have an ECU, you can anyway connect Solo 2 DL to an RPM wave to synchronize RPM to the position on the track thanks to the RPM power cable.

### Anything else?

Of course yes: Solo2 DL can receive up to 10 configurations









# **CHAPTER 2**

# 2. What is in the kit?

### Solo2 DL kit includes:

### Solo2 DL

- Solo2 cable to choose among:
   CAN/K-Line/External power cable with OBDII connector
   CAN/RS232 External power cable
   RPM/External power cable (if your vehicle has no ECU)

Solo2 DL battery charger, available in four versions with Australian, UK, USA and European adaptor
 Solo2 DL mounting bracket with screws
 Race Studio 3 software installation CD
 AiM sticker and Racing Guide

# 3 Installation, powering and accessories

Thanks to its small dimensions and to the different accessories available for installation, Solo 2 DL can be installed on almost any kind of motorsport vehicle. Solo 2 DL is powered by the vehicle battery and it switches off with the vehicle engine. AiM provides different installation accessories, to say:

### support for roll-bar: **X46KSTG00**



### support for generic tube: **X46KSTP00**



### support for suction cup: **X46KSVS00**



# **4** What is multiple configurations feature?

Solo 2 DL can receive up to 10 configurations, that need to be transmitted at one time, allowing you to select the one you need in each situation. This is also very helpful for a team manager, that can customize the configuration(s) for each racer.

Multiple configurations can be transmitted to Solo 2 DL and selected using Solo 2 DL keyboard as explained in paragraph 7.3

### 5 At power on

When switched on Solo 2 DL shows two pages: Solo2 DL Settings and satellite page.

SOLO2 DL SETTINGS		
Type of Racing Speed		
Circuit Type	Closed	
NO NEARBY CLOSED TRACKS		
DATE TIME	02/09/2019 10:11	

To optimize the display management, the keyboards disappears when not necessary. Please simply press one of the pushbuttons for making it show up again.

### **CHAPTERS 3-4-5**



# 6 What you can do via keyboard

Solo 2 DL is mainly configurable using Race Studio 3 software but some functions are settable via keyboard as explained here on the right. Press "MENU" and this page shows up.

The icons are to manage:



Type of racing Track management

Backlight

-111





Wi-Fi

System settings

6.1 Type of racing

Solo 2 DL features two different type of races, each of them with different options:

- speed (left image below)
- performance (right image below)

Race	Mode
Type of Racing:	Speed
Circuit Type:	Closed
Predictive Ref:	Best Lap of Test
Auto OFF:	10 min
Lap Summary:	Enabled
PREV NEXT	CHANGE EXIT

#### Speed racing

Solo 2 DL automatically selects the track in which you are performing. After having found the proper track, it may calculate show and set:

Circuit type: closed or open

Predictive Reference lap: the time at the end of the current lap is computed looking at the actual speed, compared with a reference lap. The reference lap can be:

- the best lap of the test or
- the best lap of today

■ "Auto OFF": a time period of inactivity that switches your Solo 2 DL off. Available options are: 🔳 10 min

- 20 min
- 30 min

■ "Lap summary": at the end of the test Solo 2 DL shows lap summary page. See chapter 9 "Data Recall" chapter for further information about it. Available options are: enabled (default) or disabled.

#### Performance racing:

This racing mode shows you different performance options according to the measure unit you set in "System settings" -> "Unit of measure" menu:

using **imperial** unit of measure (mph) the available performance options are:

- 0-60 mph
- 60-0 mph
- 1/8 miles 1/4 miles
- using **decimal** unit of measure (km/h) the available options are:
  - 0-100 km/h
  - 0-160 km/h
  - 100 m
  - 🔳 150 m
  - 400 m 1000 m
- "Auto OFF": a time period of inactivity that switches your Solo 2 DL off. Available options are:
  - 10 min
  - 20 min
  - 30 min



# 6.2 Track management

Solo 2 DL built in GPS receiver is used for:

■ Lap time calculation

- Speed calculation
- Predictive lap time calculation
- Position on the track in Analysis.

To calculate these data the system needs to know the Start/Finish line coordinates.

Solo 2 DL comes with a long list of the world main tracks, list that is constantly updated by our technicians and is downloaded on your PC when you run our Analysis software and an Internet connection is available. Solo 2 DL provides two track selection modes: automatic and manual.

#### Automatic:

The system automatically recognizes the track you are running on, loads start/finish line and calculates lap times. This is the best mode in most cases.

### Manual:

Allows you to manually select the track from the internal database.

This mode is to be preferred when multiple track configurations are available nearby. In this case Solo 2 DL would anyway recognize the track but would need at least one complete track lap.

To be ready from the first lap manual mode would be helpful.

Both track modes provide three track list type:

- nearest: shows only tracks in a 10 km distance with max 50 tracks shown
- all tracks: shows all tracks stored in the system in alphabetical order
- custom: shows only the tracks you have previously created (learning mode)

Track Management		
<u>Mode:</u> Track List Type: No tracks in this a	AUTOMATIC Closed Nearest area	
Create New Track PREV NEXT	CHANGE EXIT	

# Track Management

Mode: MANUAL Track List Type: Closed Nearest No tracks in this area

Create No	ew Track		
PREV	NEXT	CHANGE	EXIT

# 6.2.1 Track creation with Solo 2 DL

If you are running in a track NOT included in Solo 2 DL database you can create it. According to the circuit type you set in "Type of racing" (paragraph 6.1) you can create a closed (in automatic or in manual mode) or an open (in manual mode only) circuit.

### Creating a closed circuit automatically

To create a closed circuit in automatic mode:

- type of racing is to be "Speed" (paragraph 6.1)
- circuit type is to be "Closed"

From Solo 2 DL main page press any key and the bottom keyboard shows up: press "TRACK"

Press "CREATE".

Select "AUTOMATIC CREATION" and press "ENABLE". When GPS signal is good Solo 2 DL starts recording each track point. When it detects it is crossing the same point for the second time it defines a temporary start/finish line in order to show lap times.

Solo 2 automatically creates a track. As soon as the session is over the new track layout is displayed; start/finish line can be changed and a track name can be added using the device keyboard.



### Creating a closed circuit manually

To create a closed circuit in manual mode:

- type of racing is to be "Speed" (paragraph 6.1)
- circuit type is to be "Closed"

From Solo 2 DL main page press any key and the bottom keyboard shows up: press "TRACK"

Press "CREATE".

Select "ADD START LINE" and Press "ENABLE"

Go to the start/finish line and press "OK".









The track has been created. Its name is track date and time

### Creating an open circuit (only manually)

To create an open circuit:

- type of racing is to be "Speed" (paragraph 6.1)
- circuit type is to be "Open"

From Solo 2 DL main page press any key and the bottom keyboard shows up: press "TRACK"

Press "CREATE".

Select "ADD START/FINISH LINE" and Press "ENTER"



Solo 2 DL allows the user to create a temporary track:

- "Yes": Solo 2 DL creates a track that will be available until the following Tuesday
- "No": Solo 2 DL creates a track that will be saved in the device memory permanently

Ensure that GPS signal is "GOOD", go to the start line and press "OK"

To acquire the track shape press "YES".

Go through the track towards the finish line to set it.

**Please note:** Start and finish line distance has to be at least 10m.

Once this distance reached the display of Solo 2 DL shows an additional bottom line and "OK" button shows up: press it.



💷 14.0¥	GPS GOOD
GO TO THE START LINE PRESS OK TO SET IT	SAT N.12
	EXIT







The track is created named as date and time of the creation.

The display shows its shape.

For further information about track creation with Solo 2 DL refer to FAQ section, Solo 2, Lap Functions of www.aim-sportline.com.

# 6.3 Backlight

You can set Solo 2 DL backlight as "ON" (default setting) or "OFF" as well as choose among eight different colours: white, purple, red, green, yellow, blue, magenta and cyan.





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# 6.4 Wi-Fi

Here you can manage Wi-Fi as well as reset its configuration. Wi-Fi modes are:

- ON
- Auto: switches Wi-Fi on when the vehicle is stopped and automatically switches it off when Solo 2 DL starts recording (according to "Memo" trigger setting) OFF

"Wi-Fi Reset CFG" allows you to reset Wi-Fi configuration and is very useful if you do not remember Wi-Fi password.

WiFi		
Wifi Mode: Select Channel: Wifi Reset CFG	ZO AUTO	
WiFi: SSID:	BUSY 504310	
PREV	CHANGE EXIT	

3

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# 6.5.1 Configurations

Here you can manage Solo 2 DL wake up mode as well as its configuration(s) as shown here below on the left. In case you transmitted multiple configurations (max allowed number of configuration is 10 and they have to be transmitted at the same time - see paragraph 7.3) this page shows the one currently in use. To change it:

- press "CHANGE"
- use "PREV" and "NEXT" button to select the configuration to set and press "EXIT" (image here below on the right)

Wake up from ECU (signal). Use "Change" button to change this setting.

Name		Solo 2 DI 01
Wake up	from ECU:	Solo 2 DL 01 Enabled

■ The system asks for confirmation: press "CHANGE"

# 6.5.2 Unit of measure

You can set the measure unit of:

- speed: km/h or mph: please remember that the measure unit you set here will make you see different options in "Type of Race" menu if selecting "Performance" type (refer to paragraph 6.1 for further information)
- temperature: Celsius/Fahrenheit
- pressure: bar/PSI

# **6.5 System settings**

Selecting this icon you enter this page:







# 6.5.3 Date Time

Here you can set the time zone of your Solo 2 DL as well as enable/disable "Daylight Saving time" option. Time zone is always set manually. Date and time can be shown in different format.

Use "ENTER" button to enter and set options and "CHANGE" button to enable/disable "Daylight Saving Time" option.

Time is automatically synchronized as Solo 2 DL receives the GPS signal.

### 6.5.4 Language

You can set Solo 2 DL language. Default setting is English. At present available languages are (in this order):

- English
- Italian
- German
- Spanish
- French
- Dutch
- Danish
- Portuguese
- Japanese
- Czech

# 6.5.5 System info

This page shows serial number, firmware and boot version as well as hardware revision of your Solo 2 DL.

System	Info
Logger:	SOLO2 DL
Serial N.:	6504310
Fw Version:	02.30.10
Boot Version:	02.22.20
Hw Revision:	Rev01
	EXIT

Date Time		
Time Zone:	0: Londor	
Daylight Saving Time:	OFF	
Time Format:	24H	
Date Format:	DD/MM/YY	
Now: 12:27:33	06/09/2019	
PREY NEXT ENTER	EXIT	

Ver.00

P

# 7 Solo 2 DL and the PC

Using AiM Race Studio 3 software you can configure Solo 2 DL, manage its tracks as well as check other device functions using the device window.

# 7.1 Connection to the PC

Solo 2 DL can be connected to the PC only via Wi-Fi. To do it:

- check that Solo 2 DL Wi-Fi is set on "AUTO" or on "ON"
- read your Solo 2 DL name mid of Solo 2 DL home page bottom line – or look for it in "System Information" page.

Click Race Studio3 Wi-Fi icon and select your Solo 2 DL

# **CHAPTERS 6-7**



	<b>?</b>
AiM AiM_Guest	
AiM_Guest	
WiFi-AlM-Timenet	
? network_2	
AiM-MXG12-000070	
AiM-MXS12-000078	
AIM-SOLO2DL-504310	Connect
WiFi Settings	Li Contra da Contra d La contra da

# 7.1.1 Wi-Fi configuration

Solo 2 DL configuration can be made only using Race Studio 3 software. Two possible Wi-Fi modes are available.

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

This is the ideal configuration if you have one only device and one only computer. In this situation your Solo 2 DL creates a Wi-Fi network and works as an Access Point you can connect your PC 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 you to communicate with more than one device and with more than one computer in the same network. Solo 2 DL 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 Solo 2 DL has two available security levels:

- network authentication: network password
- device authentication: Solo 2 DL password

Both levels allow you to use different strategies. A PC in WLAN, for example, can see several AiM devices but can communicate only with those he knows the password of.

If you forget the password you can reset Wi-Fi configuration from Solo 2 DL menu as explained before (see paragraph 6.4)

# 7.1.2 Configuring Solo 2 DL as an access point (AP)

This is Solo 2 DL default configuration and is the easiest and most direct connection mode, ideal if you want to communicate with one Solo 2 DL 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 enabledread your Solo 2 DL Name

■ 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 your device/your 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.

* ReceStudio? 1.29.48		
* * * * *		?
All Configurations		Solo 2 DL ID 6504310
	Live Measures Download WiFi and Properties Setting	gs Tracks Counters Logo Firmware
Devices (8)	Refresh Transmit	
Manual Collections	Cevice Device Name WiFi WiFi Power Mode WiFi Mode WiFi Mode WiFi Password WiFi Password Properties Racer Name Vehicle Name or Number Championship	Solo 2 DL ID 6504310 On Access Point AllA-SOL02DL-04310 Click to shoosehow to set Wifi mode
Connected Devices	Venue Type	1
<b>Golo 2 DL ID 6804310</b>	<u> </u>	
Trash		

This AP or SSID name is unique for your device. An example of name is:" AiM-Solo2DL-00103" where:

- "AiM" is the prefix of all AiM devices
- "Solo2DL" is the device identifier

■ "04310" is your device serial number assigned by the factory.

To make your device more recognizable you can add a name to the SSID. The limit is of eight characters. Allowed characters are all letters, capital too, all digits and these characters: '+ - \_ () [] {}!.

* RaceStudio7 129.48				
* * * * *				<u>?</u> • 💭 🐠
All Configurations			Solo 2 DL ID 6504310	
	Live Measures	S Download WiFi and Properties Settings Tra	acks Counters Logo Firmware	
Devices (8)	Refresh	Transmit		
Manual Collections	>			
		Device		
		Device Name	Tom Wolf	
		WIFI		
		WIFi Power Mode	Dn	•
		WiFi Mode	Access Point	*
		WiFi Network Name	AIM-SOLO2DL-04310	
		New WIFT Network Name	AM-SOLO2DL-04310-Tom Wolf	
		WIFI Password		□ Show
		Properties	11.	
		Racer Name		
		Vehicle Name or Number	5	
		Championship		1
Connected Devices		Venue Type		*
	1			
	63			
Ŭ 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 you can communicate with it using Race Studio 3.

# 7.1.3 Adding Solo 2 DL 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 Solo 2 DL can have its password that adds another security and privacy level to the network.

Race Studio 3 will show all Solo 2 DL connected to the same network under "Connected devices" label, bottom left of the software page: click your device.

Enter "Wi-Fi and properties" tab and set it on "Existing

- "Space" type can be used provided that it is not the first one because it can cause incomprehension in some Windows<sup>™</sup> versions.
- If, for example you add the driver's name, Tom Wolf, the network name (SSID) becomes:
- "AiM-Solo2DL-04310-TomWolf"
- Once all parameters set click "Transmit". Solo 2 DL reboots and is configured with the new parameters. If Solo 2 DL is protected by a password, as recommended, Race Studio 3 will ask that password to authenticate.

- Network"; fill in network name, network password and device password.
- Transmit the network settings to your device clicking "Transmit": your device reboots and joins that network.
- **Please note:** the only admitted password are those following WPA2-PSK standard.

P ReceStudio7 7,29,48				
* 🕲 🖽 🖾 🍝 📥 🕫 🍣			100 C 10 C	?
2 All Configurations			Solo 2 DL ID 6504310	
Devices (5)	Contraction Contraction Contraction	s Download WiFi and Properties Settings Track	ks Counters Logo Firmware	
Research and a second	Refreste	Transint		
Manual Collections	0	Device		
		Device Name	Solo 2 DL ID 6504310	
		WIFI		
		WiFi Power Mode	On	=
		WiFi Mode	Existing network	•
		WiFi Network Name	network_2	
		WiFi Password		IT Show
		Device Password		F Show
		Properties		
		Racer Name		
		Vehicle Name or Number	1	
		Championship		
Connected Devices		Venue Type		•
Solo 2 DL ID 6504310	1			
-				
9 mm				
D Trash				

Here belowe you see a device "Solo2 DL-04310" that switched from Access Point to 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.

Restudo 229.48			_ = ×
* 2 E C E + * *	New Clone Import Export Receive Transmit	Image: Second state         Image: Second state	
Devices (5)-	0113 viame	WIFI-AIM-Timenet	<b>9</b> (
Manual Collections	0	Connect S	
	Solo 2 DL 02	AIM-SOLO2DL-504310 Connected	set 06
		WIFI Settings	
Connected Devices			
Selo 2 DL ID 6504310	(i-		
Trash			

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 "AiM" WLAN.

* * * * * *	ô 🖨			? ? @
All Configurations			Solo 2 DL ID 6504310	
1	Live Measur	res Download WiFi and Properties Setting	s Tracks Counters Logo Firmware	
evices	Refresh	Transmit		
anual Collections	0			
		Device		
		Device Name	Solo 2 DL ID 6504310	
		WiFi		
		WiFI Power Mode	On	\$
		WiFI Mode	Existing network	\$
		WiFi Network Name	network_2	
		WiFi Password	A185262	☐ Show
		Device Password		☐ Show
		Properties		
onnected Devices		Racer Name		
IM		Vehicle Name or Number		
MXG-105	8	Championship		
	((- ((-	Venue Type		\$
Solo2-DL ID 7	<b>?</b>			
Solo 2 DL ID 6504310	÷.			
Trash				

# 7.1.4 Wi-Fi network settings

In this chapter you find a short description of how to configure a WLAN including AiM devices and a PC. Here below is an example of configuration.

		t your PC's network settings to	nterface. I access th
Router IP Address :	192.168.0.1		
Subnet Mask :	255.255.255.0		
Device Name :	Network_2		
Local Domain Name :		(optio	nal)
Enable DNS Relay :			
Ise this section to configure the built-i our network. Enable DHCP Server :	n DHCP Server to		nputers or
Jse this section to configure the built-i our network. Enable DHCP Server :			nputers or
DHCP IP Address Range :	192.168.0.2	to 192.168.0.6	nputers or
Jse this section to configure the built-i our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time :	✓ 192.168.0.2 10080 (minute	to 192.168.0.6	nputers or
Jse this section to configure the built- our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast :	<ul> <li>192.168.0.2</li> <li>10080 (minute</li> <li>(compatibility f</li> </ul>	to 192.168.0.6	nputers or
Ise this section to configure the built- our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement :	✓ 192.168.0.2 10080 (minute	to 192.168.0.6	nputers or
Ise this section to configure the built- our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement :	<ul> <li>192.168.0.2</li> <li>10080 (minute</li> <li>(compatibility f</li> </ul>	to 192.168.0.6 es) for some DHCP Clients)	nputers or
Ise this section to configure the built- our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN :	<ul> <li>192.168.0.2</li> <li>10080 (minute</li> <li>(compatibility f</li> </ul>	to 192.168.0.6 es) for some DHCP Clients) (optional)	]
Ise this section to configure the built- our network. Enable DHCP Server : DHCP IP Address Range : DHCP Lease Time : Always Broadcast : NetBIOS announcement : Learn NetBIOS from WAN : NetBIOS Scope :	192.168.0.2     10080 (minute     (compatibility f     Broadcast only	to 192.168.0.6 es) for some DHCP Clients)	]

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, you should not allow the Internet 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\_2." 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 you see 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.

IP address range:
192.168.0.1 – 254
192.168.0.1 – 126
192.168.0.1 – 62
192.168.0.1 – 30
192.168.0.1 – 14
192.168.0.1 – 6

# 7.1.5 The Internet connectivity

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

You can of course allow the Internet access on your network but this would degrade the communication. This slightly slower speed can be suitable for your needs but you can also have a second Wi-Fi connection using an additional hardware (NIC).

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.

# **CHAPTER 7**

### Number of devices:

# 7.1.6 Connection issues

It can occur that Solo 2 DL 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<sup>™</sup> 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.

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

Race Studio 3 only works on Windows<sup>™</sup> operative systems; Mac users can use a virtualized Windows<sup>™</sup> 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...".



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

	Windows B	1 - Hardware	
o 🍪 🛲 🔑			Description of the
Semeral Options Hardware Semanly			Sourch
Soot Order	Some of the settings	s on this page cannot be changed until the	virtual machine
Video	is shut down.	on this page cannot be changed until th	e vircour machine
The Mouse & Keyboard			
🚔 Print		Connected	
Floppy Disk			
CD/DVD 1	NIC Type:	Intel(R) PRO/1000 MT	0
Hard Disk 1	Time	- WE C	0
Network 1	lype:	i≔ Wi-Fi	
Sound	MAC address	00:1C:42:56:7E:FD Generate	
USB & Bluetooth			
	DHCP Server:	Auto	8
* -			

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:	Automatic		~	
Wi-Fi Connected	-	Status:	Connected	Turn Wi-Fi	Off
FT232B UART Not Configured	1		Wi-Fi is connected has the IP address		10 and
RNDIS/Gadget	<->	Network Name:	AiM-SOLO2DL-04	4310	0
Bluetooth PAN	8		Ask to join new	v networks	
Nos Connecteo	⇔ ⇔ ⇔			ili be joined automs s are available, you a network.	
	7	Show Wi-Fi status	in menu bar	Advanc	ed
			Assist me	Report	2

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

- press Wi-Fi icon 🗐
- select "Wi-Fi Settings" icon



enable the checkbox shown here below.



# 7.1.8 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 work as an Access Point allowing more external devices to connect to its network. Solo 2 Wi-Fi configuration is to be set on Existing Network as explained before.

# 7.2 Configuration of Solo 2 DL

Once Solo 2 DL connected to the PC

- click "Configurations" icon and configurations page appears
- click "New" and new configuration panel appears: select "Solo 2-DL" and press "OK".

RaceStudio3 3.29.48	<b>*</b> ô 段	
All Configurations	New Clone Import	t Export Receive Transmit Delete
vices nual Collections	D Name	Date
	XL2 ^ /05 /04S	New Configuration   Solo2-DL  Configuration Name  Solo2-DL  Comment
Solo2-DL ID 600103	OK Cancel	OK Cancel

# 7.2.1 Channels configuration

"Channels" layer opens; all channels are enabled by default. Here you can set all Solo 2 DL channels.

	anianiii							
Channels ECU Stream CAN Expansions Math	Channets Para	Name	SmartyCam Stream CAN	Sensor	Unit	Freq	Parameters	
	FIFM	RPM	Engine RPM	RPM Sensor	ipm	20 Hz	max. 16000 ; factor. /1 ;	
	Acci	InlineAcc	Inline Accel	AiM Internal Accelerometer	g 0.01	50 Hz		
	Acct	✓ LateralAcc	Lateral Accel	All Internal Accelerometer	g 0.01	50 Hz	-	
	Acc1	VerticalAcc	Vartical Accel	AM Internal Accelerometer	g 0.01	50 Hz		
	Grit	RollRate	Roll Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
	Gyr2	PitchRate	Prich Rate	AiM Internal Gyro	deg/s 0.1	50 Hz		
	Gyr3	YawRate	Yaw Rate	AiM Internal Gyro	degis 0 1	50 Hz		
	Accu	GPS Accuracy	GPS Accuracy	AIM GPS	mm	10 Hz		
	Sipt	GPS Speed	Vehicle Spd	AM GPS	km/th G.1	10 Hz		
	An.	Altitude	Attitude	AIM GPS	m	10 Hz		

To set a channel just click on its line and the related panel shows up. You can name each channel and set its sampling frequency. Some channels allows you to set measure units, display precision or specific parameters. 31

# 7.2.2 ECU Connection and configuration

Solo 2 DL can be connected to your vehicle ECU. When possible documents explaining how to connect your Solo 2 DL to your vehicle ECU are published on our website www.aim-sportline.com. As explained, Solo 2 DL can communicate using all currently available communication lines: CAN, RS232, K-Line. To load the ECU protocol in Solo 2 DL configuration:

- enter "ECU Stream" tab
- press "Change ECU" button
- select ECU Manufacturer and ECU Model (in the example AUDI/ R8\_LMS\_GT3\_038)
- press OK

	4				·····
					100
1 1	1				
Save As Close Transmit					
CAN Expansions Math Channels	Parameters LED-Bars Display SmartyC	Cam Stream CAN Output			
_	ECU Click button to sele	ect a ECU protocol		Change ECU 💲 🕄	
- Choose ICU Protocol			- '0' ×		
Manufacturer	Model				
None	CAN_PQ35_P5	(v. 02.00.02)	(CAN)		
2D	E GROUP_2008	(v 02.00.01)	(CAN)		
AAA (CI	JSTOM CAN)R8_LMS	(v 02.00.01)	(CAN)		
ABIT	R8_LMS_GT3_038	(v. 00.01.02)	(CAN)		
ADAPTRONIC	R8_LMS_GT3_SMC	(v. 02.00.01)	(CAN)		
AEM	TTCUP_CAN1_2016	(v. 00.01.02)	(CAN)		
AIM					
ALFA ROMEO					
APRILIA			_		
ARCTIC_CAT					
	JSTOM CAN)				
AUDI					
AURION					
AUTRONIC					
BENTLEY					
BLACK_BOX					
BMW	-				
		OK	Cancel		
		OK	Cancel		

# 7.2.3 CAN Expansions setting (LCU-One CAN only)

Solo 2 DL can be connected to AiM LCU One CAN lambda controller plugging the 5 pins male Binder connector of LCU one in the female one bottom left of Solo 2 DL. Once the expansion connected you need to set it:

- enter "CAN Expansions" tab
- press "ADD" button; it switches to "Remove LCU-One CAN"
- name your 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"
- set the LCU One channels double clicking on each channel and setting the panel that shows up.



# **CHAPTER 7**

et SN from a connected expansion" to receive the serial xample "14.57 Gasoline") or add a custom value pressing I and setting the panel that shows up.

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ut	put			 	
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	0	Expans			
	Add Custom Va	lue	-		
	Add Custom Va	lue			
	Add Custom Va	lue			
	Add Custom Va				
	Add Custom Va	Unit	Freq		
			Freq 10 Hz		
	Sensor	Unit			
	Sensor AIM LCU-One Lambda	Unit A0.01	10 Hz		

# 7.2.4 Math Channels setting

To create math channels enter "Math Channels" tab and press "Add Channel" button. Available options are:

- Bias: considering a relation between two mutually compatible channels it computes which one is prevailing (typically used for suspensions or brakes);
- Bias with threshold: it needs the user to set a threshold value for the considered channels; once these threshold are both exceeded the system makes the calculation;
- Calculated gear: it calculates the gear position using engine RPM and vehicle speed
- Precalculated gear: it calculates the gear position using Load/Shaft ratio for each gear and for the vehicle axle too
- Linear correction: typically used when a channel is not available in the desired format or if it is wrongly tuned and cannot be tuned again.

Each option asks the user to fill in a proper panel.



# 7.2.5 Parameters settings

Parameters page is divided in two part.

on top **GPS Lap detection** parameters; mousing over the question marks a pop up message will explain you the working mode of:

- I hold lap time for: the time period for which lap time is shown on your Solo 2 DL display
- the track width: width that will be considered for any GPS point you set
- bottom Start data recording conditions;
  - standard conditions (default setting) make Solo 2 DL start recording when RPM is higher than 500 or speed is higher than 10 km/h
  - custom conditions: you can set two conditions and decide if making Solo 2 DL start recording when only one of them is reached ("ANY") or when both are satisfied ("ALL"); pressing the button shown here below it sets the condition

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olo 2 DL 36	1					
ave Save As Close Tran						
nels ECU Stream CAN Expansions Math Ch	annels Parameters LED-B	ars Display SmartyCam Stream C	CAN Output			
	-		100 March 100		_	
		GPS Lap Det				
		This is the width that will be cons of the start/finish line)	sidered for any GPS points set (i.	.e. the width		
	Indiana Internet					
	Hold lap time for 8	sec ②	De Cere de Cere			
		This is the width that will be cons of the start/finish line)	sidered for any GPS points set (i.	.e. the width		
	The second se					
	Track Width 10	m (?)				
	Track Width 10	i m Ó				
	Track Width 10	I m Ô	cording	_		
		Start Data Rec	cording	_	-	
	<ul> <li>Standard Condition</li> </ul>	Start Data Rec		) km/h	-	
	Standard Condition Recording starts when	Start Data Rec		) km/h	-	
Any	<ul> <li>Standard Condition</li> </ul>	Start Data Rec		) km/h	-	
	Standard Condition     Recording starts when     Custom Conditions	Start Data Rec		) km/h	-	
Any All	Standard Condition     Recording starts when     Custom Conditions	Start Data Rec ns IRPM is greater than 500 or speed (no lowing conditions are true:				
	Standard Condition     Recording starts when     Custom Conditions     If of the foll	Start Data Rec ns I RPM is greater than 500 or speed (no lowing conditions are true:	ot GPS) is greater than 10	00		

# 7.2.6 Led-Bars setting

Led bar page sets Solo 2 DL top led bar working mode. Available options are shift lights and predictive time. Use as gear shift lights (default)

To use the led bar as shift lights click the setting icon ( 🔹 ) and the related panel shows up. You can

- import/export shift lights setting using the proper buttons
- decide the sequence mode of the LEDs enabling the desired option:
  - a LED stays on if its threshold is exceeded
  - a LED stays on until another LED with higher threshold turns on or
- link the shift lights to the engaged gear enabling the related checkbox; in this last case you need to fill in max gear
- number and set LEDs colours and threshold values for each gear.

RecStudio3 32948
Save Save As Close Transmit
Channels ECU Stream CAN Expansions Math Channels Parameters LED-Bars Display SmartyCam Stream CAN Output
Use for predictive time 🔘 Use as gear shift lights
Gear Shift Light 1 2 3 4 5
All 8200 👩 8400 🧑 8600 🧑 8800 🧑 9000 👩 🗘 Choose a sequence mode of shift lights import. Shiftiights Export. Shiftiights
Colo 2 cm       C A LED stays on if it's threshold is exceeded         C A LED stays on until another LED with higher threshold is turned on
2 3 1 4 7 5 6 8 3 V Gear dependent shift lights Max gear number 6 €
1 Choose the gear channel: Gear ÷
Select colors and threshold values for shift lights:
Gear Shift Light 1 2 3 4 5
6 5500 🧑 6000 🧑 8000 🌅 9000 🐻 加
5 5500 🧑 6000 🧑 8000 🌍 8000 🐻 🚛
4 5500 🧔 6000 🧑 3000 🐻 🚛
3 5500 🚺 6000 🏹 7000 🌄 8000 🌉 JII
2 5500 🧕 5000 🧖 8000 🧧 9000 🐻 🚛
1 5500 🧑 6000 🧑 8000 🧑 9000 🐻 🚛
OK Cancel

#### Use for predictive time

To use the LED bar for predictive lap time enable the related option and press the setting icon ( You can

- import/export shift lights setting using the proper buttons
- decide the sequence mode of the LEDs enabling the desired option: a LED stays on if its threshold is exceeded

 a LED stays on until another LED with higher threshold turns on or
 fill in the predictive time increment of each LED. The LED value indicates the time gap to be assigned to each LED. Assuming you fill in "0.1" and your lap time is improving of 0.3 sec toward the reference lap, your Solo 2 DL will switch on 3 LEDs green; if, on the contrary, your lap time is worsening the LEDs will switch on red. The lap considered as reference is the one you set using Solo 2 DL keyboard in "Type of racing" (see paragraph 6.1).

All Solo 2 DL <sup>34</sup> Save Save As Close Tra	rismit	
Use for predictive time Channel for LED-bars +/- Best Time	Channels         Parameters         LED-Bars         Display         SmartyCam Stress           Use as gear shift lights         Incremental Time per LED         0.10 sec         0.10 sec	eam CAN Output  Predictive Time Bar Options  Choose a sequence mode of shift lights import.Settings  Choose a sequence mode of shift lights  Choose a sequence mode of shift lights  Import.Settings  Choose a sequence mode of shift lights  Import.Settings  Choose a sequence mode of shift lights  Import.Settings  Impor
	2.56	Predictive Time Increment per LED 0.1 (sec )

# 7.2.7 Display settings

Solo 2 DL can have up to eight pages to be set via software. Each page can have from 1 to 4 fields and can be set as you prefer.

enter "Display" tab

a panel shows up where you can select the display page you prefer (in the example a four fields page has been chosen)

- select the page and press "OK"
- repeat the operation for the number of pages you want to set



When the page has been selected two setting panels appears bottom of the page:

- on the left a panel that shows as many rows as the fields to be set (in the example four fields) on the right a panel shows the channels group you can set in that field and all the channels in it included; you can
- drag and drop the channel you want to set in the desired field or double click on it



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if you added more display pages the one you are setting is indicated top of the tab as highlighted here below.

		(:-
	+ Add New Page	
Page 1 PT D.I n/h		
n/h		
n/h	_	
1/h Channel Groups	Channels	
	Channels GPS Speed	
Channel Groups		
Channel Groups ECU	GPS Speed	
Channel Groups ECU Lap Channels	GPS Speed Altitude	
Channel Groups ECU Lap Channels GPS	GPS Speed Altitude Latitude	
Channel Groups ECU Lap Channels GPS Accelerometer	GPS Speed Attitude Latitude Longitude	
Channel Groups ECU Lap Channels GPS Accelerometer Gyro	GPS Speed Attitude Latitude Longitude Sats Number	

# 7.2.8 SmartyCam stream setting

Solo 2 DL can be connected to AiM SmartyCam to show the data you wish on SmartyCam video. To set each channel:

- click on it and a setting panel shows up
- it shows all channels and/or sensors that fits the selected function
- in case you do not find the channel or the sensor in the list enable "Enable all channels for functions" checkbox and all channels/sensors will be shown
- once all channels set press "Transmit" on the page top keyboard.

ave	Save As	Close	Transmit	-					
	100000	and a set		nnels Daramete	ers LED-Bars Display Smarty	Cam Stream CAN Output			
ICIS	LCO Stream	CAN Expansio	ins wath ch	innels Faramete	Enable all channels for fu				
					<u> </u>				
					SmartyCam Function	Channel			
					Engine RPM	MS43_RPM	\$		
					Speed	GPS Speed	\$		
					Gear	MS43_GEAR	+		
					Water Temp	MS43_ECT	¢ 🔳	elect Channel	
					Head Temp	MS43_FUEL_T	\$ So	urce	Channel
					Exhaust Temp	MS43_EXH_T1	\$ EC	cu	MS43_EXH_T1
					Oil Temp	MS43_OIL_T	÷	- Not set	MS43_EXH_T2
					Oil Press	MS43_CRANK_P	\$		
		N			Brake Press	MS43_BRAKE_F_P	•		
		B			Throttle Pos	MS43_TPS	\$		
					Brake Pos	No available channel			
					Clutch Pos	No available channel			
					Steering Pos	MS43_STR_WHEEL_ANG	\$		
					Lambda	MS43_LAMBDA1	\$		
					Fuel Level	No available channel			OK Can
					Battery Voltage	Battery	+		

# 7.3 Transmitting multiple configurations

Once all parameters have been set you can transmit the configuration(s) to your Solo 2 DL selecting them and pressing transmit or in "drag and drop" mode. In "drag and drop" mode the software shows that you are transmitting multiple configurations.

* * * *	<u> </u>
2 All Configurations	New Clone Import Export
Devices	☑ Name
Manual Collections 🌼	Solo 2 DL 01
	B5: 42: Solo 2 DL
Connected Devices	
Solo 2 DL ID 6504310	

A time bar appears and at the end the software gives confirmation as shown in the image below.

		e x
	?	AID)
New Clone Import Export Receive Transmit Delete Device Configurat	ons	
Name Name	Date	۹
2 195 Solo 2 DL 01	apr 06	0
Solo 2 DL	apr 04	
Configuration(s) has been successfully transmitted.		
ОК		
	New     Clone     Import     Export     Receive     Transmit     Delete     Device Configuration       Import     Name     Import     Import     Export     Receive     Transmit     Delete     Device Configuration       Import     Name     Import     Import     Export     Receive     Transmit     Delete     Device Configuration       Import     Import     Solo 2 DL     Import     Import     Import     Import     Import       Import     Import     Export     Receive     Transmit     Delete     Device Configuration       Import     Import     Import     Export     Import     Import     Import       Import     Import     Export     Receive     Transmit     Import       Import     Import     Export     Import     Import     Import       Import     Import     Export     Import     Import     Import       Import     Import     Import     Import     Import     Imp	New Clone Import Export Receive Transmit Delete Device Configurations   Name Date   Name Date   Image: Solo 2 DL 01 apr 06   Image: Solo 2 DL apr 04

									×
						((:-		an	0
Receive	Transmit	Delete		De	vice Configu	rations			
								Q.	?
_	_	_	_	_	_	-	Date		
							apr 06		
							apr 04		
									_

# 7.4 Managing a track on Solo 2 DL with Race Studio 3

With "Track Manager" function of Race Studio 3 you can create, delete and modify tracks, transmit and receive them to/ from your Solo 2 DL. 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, "Solo 2-DL ID 6504310")

The column in the **middle** shows:

- on top a fast search bar, that allows to select the tracks which satisfy your personal research criteria;
- by pressing "?" a pop-up window shows research examples (highlighted in red below).
- 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 your Solo 2 DL is connected it is shown on the left bottom part of the page as said before. Clicking on it all the tracks it contains are shown in the right column of the page. The tracks you created are labelled "user" on the right of the track panel.



The keyboard you find above the central column allows you to:



**Refresh:** refresh the track list stored in your connected Solo 2 DL **Delete:** delete one or more tracks from your Solo 2 DL memory **Delete All**: delete all tracks stored in your Solo 2 DL memory **Save all:** save all the tracks stored in your connected Solo 2 DL; it creates a zip file you can load to another AiM device ■ Load Saved: load the tracks you previously saved in your connected Solo 2 DL memory

							*
Deiete		Deres		Tracks	((-	Ca (11)	n
	Track Solo 2	DL ID 6504310					
	Refresh	Delete	Delete All		Save	All Load Sa	wed
	1	· ·	_				
1		190905_12:3 Italy	26			190905_12:26	ŝ
25 De Mayo	1					User	
		190905_11:4 Italy	43			190905_11:43	
De Mayo S	2					User	
User	0	190905_11:3 Italy	34			190906_11:34	
Laprida	3	5.3				User	
		190905_11:3 Raty	33			190905_11:33	
Concordia	4					User	
	D J	Čeplje, Munk	Driving Centre cipality of Vransk Track Payed			AMZ5	
Dolores	5 0	995 m Race	Track Paved				
	- Co	Neuburg, Ge	g experience co ermany e Track Paved	enter Neuburg		AUDI Neuburg	
Parana	6 5	9					
	02		ysoke Myto Czech Republic			AVM	

Receive	Transmit	Delete
---------	----------	--------

Creating a track with Solo 2 DL at the end of the session you can connect the laptimer to the PC to add the track map to your PC database.

- click the device name bottom left of Race Studio 3 page

 select the track map and press "Receive": the track map is received;
 to edit it right click on setting icon top right of the page central column and select "temporarily show only user tracks option.

RaceStudio3 3.29.48					
X         Q         EM         L         %         #           L         All Tracks (3880 of 3886)         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q </th <th>_</th> <th>New Import Export Receive Transmit Delete</th> <th></th> <th>Tracks</th> <th></th>	_	New Import Export Receive Transmit Delete		Tracks	
Nations Smart Collections	0		Track S Refre	olo 2 DL ID 6504310 sh Deleté Delete All	Save All Load Saved
Smart Collections Manual Collections	-	Argentine Switch back to normal sorting	5	190905_12:26	190905_12.26
			1	Open Circuit Paved 190905_11:43	User 199905_11:43
		Autodromo de la Ciudad de Buenos Aires Buenos Ays 8 Buenos Aires, Argentina	2	Raly Kart Track Paved 190905_11:34	User 19008: 11:14
	2	3,39 km Race Track Paved      Kartodromo de Payahuaico     Payahuaico     San José, Argentina	3	italy Karl Track Paved	User
	3	990 m Kart Track Paved	□ 4	190905_11:33 Rahy Kart Track Paved	199906_11:33 User
	4	988 m Kart Track Paved	5	AMZS Safe Driving Centre Complex Čepije. Municipality of Vransko, Stovenia 995 m Race Track Paved	AMZS
Connected Devices	5	Río Cuarto, Río Cuarto Department, Argentina	0 /	Audi driving experience center Neuburg Neuburg, Germany	AUDI Neuburg
💭 Solo Z DL ID 6504310	6	Autódromo Rosendo Hernández shortí San Luis aht San Luis, Argentina 2,84 km Race Track Paved	6 (	2.17 km Race Track Paved Autodrom Vysoke Myto	AVM
		( / / / Gurrens, regenous	7	Vysoke Myto, Crech Republic 1.88 km Race Track Paved Autodrom Vysoke Myto	AVM long
	7	4.44 km Race Track Paved Autodromo Rosendo Hernández short San Luis ah San Luis, Argentina	8	Vyšoké Myto, Czech Republic 1.05 km Rače Track Paved	
	8	4.13 km Race Track Paved	9	Classic Race Aarhus Højbjerg, Denmark 2.64 km Race Track Paved	Aarhus
Trash		Zapala, Argentina			

■ All tracks created by the user are shown in the central column ■ select the track(s) to edit

■ right click on the setting icon of the track(s) you want to edit and select "Open selected track(s) for editing

RaceStudio3 3.29.48		
* * * * *		(r) · · · · · · · · · · · · · · · · · · ·
1 All Tracks (3880 of 3885)	New Import Export Receive Transmit Delete	Tracks
Nations	⑦         190905_12:26           ☑         1 selected 1.1 kBytes	80906_12.26
Smart Collections	taly taly	
Manual Collections	Argentina	
	Aeroclub 25 de Mayo         25 De Mayo 3           25 De Mayo 3         25 De Mayo 4           1         .75 m Off Road Dirt	
	🖸 taly 🙆 😋 😋	
	111 111 Italy 2 Off Road Paved User	) •
	Isoleos_1226     Isoleos_1228     I	*8
Connected Devices	Isosof 11:43     I	
AM_Guest: No devices in view	199906_11:34         199906_11:34           Raty         5         Kart Track Paved	V
	199905_11:33         199865_11:30           Italy         1           6         Kart Track Paved	Latitude Longitude
	United States	45 5376062' N 9 3353339' E 45 5377074' N 9 3353914' E
Trash	Alabama Custom ALCustom	

each selected track is open in a proper layer

190905_12:26 111 190905	<u>€</u> ± +8 ₿			
190900_12:26 111 190905	Track Name	190905_12:26	Close	Save
	Track Name for Device	190905_12:26		
	Country	taiv =		



### Each layer allows to add useful information. It may be useful to know that:

- "Track name for Device" is the name you will see on your device (1)
- Circuit type" and "Road surface", even if not necessary to set the track, are used by the research filters (2).



It is possible to change the start line position (move the cursor and set "Cursor Position") and to add split points in order to organize the track in different segments (**3**). This will be used in Data Analysis.

Press "Save" and the new track will appear in the list labelled "User".

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.

# 7.5 ECU Driver builder

If your vehicle ECU is not included in Race Studio 3 software you can use CAN Driver builder to create your own CAN protocol. Press CAN Protocols button shown here above and then "New". The panel shown below appears.

You can add a new ECU Manufacturer and/or a new ECU model.

**Please note:** this Race Studio function is for expert users only and a CAN Driver builder user manual can be freely downloaded from AiM website at www.aim-sportline.com, documentation area software/firmware section.



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**+**ô

Delete Authorizations	c	custom CAN F	rotocols	
CAN Device Bus Speed Date	File			q
CAN Device Das speed Date	, 112	_		
		×		
Edit New Model Nam	,	-		
E				
CAN Device Type				
ECU		•		
ECU Other CAN Device				
CAN Bus Speed				
1 Mbit/sec		•		
125 Kbit/sec				
250 Kbit/sec				
500 Kbit/sec 1 Mbit/sec				

# 7.6 The device window

RaceStudio3 3.29.48							
X 😵 🖽 🔂 🖆 📥 +6 🖨			Sole	o 2 DL ID 6504310			
	Live Measures Download WiFI a	nd Properties Settings	s Tracks Counters Logo Fin	mware			
Devices (3)	Stop Live Measures Sorted by Ch		ibrate mV Values			Start Recording Blink	
Manual Collections 🔷			- IN	laster			
	InlineAcc	-0 98 g	RollRate	-1.7 deg/s	Internal Battery	387	
	LateralAcc	0.00 g	PitchRate	0.2 deg/s	,		
	VerticalAcc	-0.04 g	YawRate	1.1 deg/s			
	ECU channels						
	RelAirCharge	-5	MAPBeT2	bar	AirTemp	-1	
	TPS	-5	OilPGauge	— bar	ExhaustGas1	- *	
	AccX	9	WaterPress	bar	ExhaustGas2	F	
	AccY	-9	BrakePress	— bar	Lambda Temp1	-F	
	IgnAngle	— deg	FuelPress1	— bar	Lambda Temp2	-F	
connected Devices	Yaw	— deg/s	FuelPress2	— bar	OilTemp	—F	
Gonneckes Devices	Gear	*	OilPress	bar	WaterTemp	— F	
	SwPosABS	-*	RPM	— rpm	InjTime1	— ms	
	TCActive	-#	Speed	km/h	InjTime2	ms	
	YawAcc	-*	SpeedFL	Km/ħ	FueUsed	-1	
	Baro	bar	SpeedFR	— km/h	AFR1	A/F	
	CrankPress	— bar	SpeedRL	— km/h	AFR2	— AF	
	MAPAFT1	bar	SpeedRR	— km/ħ	LambdaSetPoint	— AF	
Trash	MAPAFT2	- bar	FuelTemp	—F			

If you click your Solo 2 DL you enter the device window and have these options:

■ Live Measures: to check all Solo 2 DL channels;

- **Download**: to download data, see the related chapter;
- Wi-Fi and Properties: to manage the Wi-Fi configuration see the related paragraph;

#### **Settings** to:

- set date format
- enable/disable daylight time
- set time format and time zone
- set backlight colour
- enable/disable night vision
- **Tracks**: to manage the tracks stored in the device memory
- **Counters**: to set each "User" odometer decimal places as well as reset it
- Logo: transmit/receive the logo that shows up when switching Solo 2 DL on; supported image format are JPEG or BMP; always use the most recent Windows<sup>™</sup> versions (Windows8 or Windows10) whose graphic libraries are more updated
- **Firmware**: to check or update your Solo 2 DL firmware version.

# 7.6.1 Online value forcing

Starting from Race Studio 3.24.02 Device page Live measures layer features a new and very useful option: online measure value forcing. This feature allows the user to simulate one or more channels value to test icons, alarms, power output and harnesses behaviour.

- With reference to the configuration we created it is possible to verify if the LED bar works.
- mouse over RPM value and click the setting icon
- a popup menu appears: select "Force Value" option and fill in the panel that appears
- click "OK" and the LED Bar blinks as set in the device configuration.

RaceStudio3 3 29.48				
* * 🖼 🖾 🛨 🍕 🖨				
All Solo 2 DL 20				
2 All Configurations				
Devices (3)	_		vnload WIFI and Properties	
A CARL BUT		Stop Live Measures	Sorted by Channel Type:	Auto
Manual Collections	0	6		
		InlineAcc		-0 98 g
		LateralAcc		-0 00 g
		VerticalAcc		-0.04 g
		PPS		5
		TPS		5
		TPS 2		*
		Acc X		9
		Acc Y		9
Connected Devices		Steer angle		deg
Solo 2 DL ID 6504310	(:-	Cut off		
		Mapping		*
		Lap Time	0.00.0	000 (0)
		LCC Diagn		

		- 1	
		((:-	
Solo 2 DL ID 6504	1310		
gs Tracks Counters Logo Firmware			
Calibrate mV Values		1	Start Recording Blink
Master			
Long to the second seco		Inc. alexandre	
RollRate	-1 5 deg/s	Internal Battery	3.7 V
PitchRate	0 1 deg/s		
YawRate	1.2 deg/s		
ECU channels			
Brake press F	bar	Speed fl	km/h
Brake press R	bar	Speed fr	km/h
Fuel press	bar	Speed ri	konvin
Rail press	bar	Speed rr	km/h
Rail press 2	bar	Water temp	F
Rail rel press	bar	Fuel cons	1
RPM	rpm 🗘	Gear	- gear
Speed		in't show other decimal places	
Calculated channels		vce Channel Volue	
iGPS (GPS Good)	0,1		
LCU-One CAN - Serial 19071	332		
LCC Lambda	×	l.	
Loo Lambua			

# 8 On the track

As shown in the image below, once the value has been forced it is shown right of the page hedged in red. With the two "+" and "-" lateral buttons it is possible to change the forced values.

RaceStudio3 3.29.48							Number of Street	J X
* * * * * *							?	nn
All Solo 2 DL ×								
All Configurations				Solo 2 DI	L ID 6504310			
	Live Measures Dow	nload WiFi and Propertie	s Settings Tracks Count	ers Logo Firmware				
Davices (3)		Sorted by Channel Type	Auto Calibrate mV Vali	ues Stop Forcing			Start Recording E	Blink.
Manual Collections			Mast	er			RPM	•
							9000 rpm	•
	InlineAcc	-0.98 g	RollRate	-1.5 deg/s	Internal Battery	37V		
	LateralAcc	0 00 g	PitchRate	0.1 deg/s				
	VerticalAcc	-0.04 g	YawRate	1.3 deg/s				
			ECU cha	nnels				
	PPS	%	Brake press F	bar	Speed fl	km/h		
	TPS	5	Brake press R	bar	Speed fr	kmitt		
	TPS 2	5	Fuel press	bar	Speed ri	km/h		
	Ace X	9	Rail press	bar	Speed rr	km/b	2	
	Acc Y	g	Rail press 2	bar	Water temp	E		
Connected Devices	Steer angle	deg	Rail rel press	bar	Fuel cons	1		
💭 Solo 2 DL ID 6504310 🛜	Cut off		RPM	9000 rpm	Gear	- gear		
	Mapping		Speed	km/h				
			Calculated	channels				
	Lap Time	0 00 000 (0)	iGPS (GPS Good)	0,1				
			LCU-One CAN - S	Gerial 19071332				
			line		1		1	
Trash	LCC Diagn	u	LCC Lambda	X			-	

Some Solo 2 pages are available for online visualization. To scroll them press "NEXT" ("Type of Race: Speed" only). Pages can change according to the device configuration. At switch on the setting summary page shows up and it can be recalled pressing first "MENU" and than "EXIT" button.

50L02 DL	SETTINGS
Type of Racing	Speed
Circuit Type	Open
TRACK MANUAL SEL	190905_12:26
DATE TIME	12/09/2019 09:33

# 8.1 Track page

After "Setting Summary Page" this page appears and can be recalled pressing "TRACK" button. When you start the engine of your car it goes away automatically. It shows:

- on the left the selected track; you can select a new one manually or automatically ("MENU"/ Track Management); in case of "Automatic" selection the track is selected according to the coordinates of your vehicle; in case the track you are running on is not included in your Solo 2 DL database you can create a new one as explained in paragraph 6.2.1;
- on the right the satellite bar (visible satellites and signal level of each

### **CHAPTERS 7-8**



# 8.2 Other pages

Other available pages are: Laptime Page, predictive Page and eight custom Pages. Use "NEXT" button to scroll them.

**Laptime page** is shown no matter which type of race you set your Solo 2 on. It shows the lap time.



SAT 12 💷	Static
	<b>BBB</b> TRACK NEXT

# 9.1 Data recall "Speed" mode

If you set "Type of Race – Speed" data recall shows these pages.

First is "Summary" page. Select the session you want to see and press "ENTER"

Once the session selected you see all tests in a box showing time of the test and best lap of the test. Select the test you want to see and press "ENTER".

### Predictive page:

shows the predicted current lap time in the format you set:

- +/- in relation to the Reference Lap
- Predicted lap time

Custom pages you may freely customize up to eight pages for showing all the information you wish. The pages needs to be created as explained in Display settings paragraph (7.2.7).

Here you see the three best lap of the test with max speed value of each lap. Press "PAGE".

# 9 Data recall

At the end of the test you can recall sampled data pressing "MEM". Data recall is different according to the race type you set on Solo 2 DL. This page is a histogram test summary. Moving the cursor left and right you can see all laps.

### **CHAPTERS 8-9**



	04/12/2015 04:	L5AM
Lap	Best Laps	mph
4	1:25.71	156.9
З	1:25.86	158.1
5	1:26.12	157.5
	PAC	JE TESTS



# 9.2 Data recall "Performance" mode

# If you set "Type of Race – Performance" data recall shows these pages.

If your test is max two hours old you are automatically forwarded to the "Test" page. This page shows:

- top right: the selected performance (1/8 mile in the example)
- on the right: the lap time and the speed (09.10 and 72.3 mph)
- on the left: a table showing length, time and speed at the end of the performance and in a set split press "TESTS"

You come to "Test sessions summary" page, that is the first one you see if your last test is more than 2 hours old. It shows all the sessions from the most recent backwards. Select the session you want to see and press "ENTER".

"Session page" shows you all the laps of the session from the most recent backwards. Press "ENTER" to enter "TEST" page.





Ŷ	ESTERD#	٩Y
03:02AM	03:01AM	02:58AM
0:09.10	0:09.37	0:10.03
02:56AM	02:51AM	02:47AM
0:14.63	0:14.90	0:09.20
PREV	EXT ENT	ER BACK

# 10 Data download

Once Solo 2 DL-PC connection is established activate "Download" tab to download sampled data.

* * * *	) ~ 1			((1-	8 🥐	M
2 All Configurations	Live Measures Download W	Solo 2 DL ID 6504		ire		
	Download Unhide Downloade				Refresh List	¢
Devices (4)						
lanual Collections						
1	<u>م</u>	set 10 15:26	10	0:48.139		
		AB ⑦	a_0284.xrz	458 kB		
	□ <b>(</b> )	set 10 15:15 AB (?)	11 a 0334.xrz	0:48.139 505 kB		
		set 10 14:24	a_0004.112	0:48.139		
Connected Devices	3	AB (?)	a_0337.xrz	649 kB		
		set 09 15:23	5	0:49.833		
Solo2-DL ID 600103	4	AB (?)	a_0283.xrz	222 kB		
		set 09 14:22	6	0:48.858		
	5 🖳	AB (?)	a_0301.xrz	273 kB		

This page shows all information about the files stored in the system: number of laps, best lap, date/time and file dimensions.

Select one or more files and press "Download" to download and analyse them.

### **CHAPTERS 9-10**

# **11 Data Analysis**

When data have been downloaded press Analysis icon and Race Studio Analysis software will open showing this page.

and the second se	× Database delle prove										1	
Maure Gri Profilultente	Utilizza orteri di selezione											
	Incostacione circuito	Impostazione veicolo	Impostazione velcolo				imposta	invostazione linvostazione lino di pi				
	1 Lonato	Mostra tutti		Most	a tutti		🦉 Mostra tuto		Mostra tutti			
	Nome della prova	Data della	prova		. Tempo giro	. Pilota		Tipo di prova	Veicolo		Car	
	894 Marra_Lonato_201506_a_0003	Fri, 25 Sep, 2015-17:	01:27 1	1 1	1 00,29,71	2 Marra		Prove generiche	None		No	
	893 Marra_Lonato_201506_a_0002	Fri, 25 Sep, 2015 17:	:00:02	1 1 1 00.41.375 Marra			Prove generiche		None		No	
	892 Marra_Lonato_201506_a_0001	Fri, 25 Sep, 2015 16:						Prove generiche	None		No	
	891 Marra_Rozzano_201510_a_0023					1 Marra		Prove generiche	None		No	
	890 Marra_Rozzano_201510_a_0022					9 Marra		Prove generiche	None		N	
	889 Marra_Rozzano_201510_a_0021						Prove generiche	None		No		
	888 Marra_Rozzano_201510_a_0020					9 Marra		Prove generiche	None		No	
	887 Marra_Rozzano_201510_a_0019	Sat, 26 Sep, 2015 13:						Prove generiche	None		No	
	886 Marra_Rozzano_201510_a_0018	Sat, 26 Sep, 2015 12:						Prove generiche	None		No	
	885 Marra_Rozzano_201510_a_0017	Sat, 26 Sep, 2015 11:						Prove generiche	None		No	
	884 Marra_Rozzano_201510_a_0016 883 Marra_Rozzano_201510_a_0015	Sat, 26 Sep, 2015 11:						Prove generiche	None		No	
	883 Marra_Rozzano_201510_a_0015 882 Marra_Rozzano_201510_a_0014	Sat, 26 Sep, 2015 11:						Prove generiche	None		No	
	881 Marra Rozzano 201510 a 0024	Sat, 26 Sep, 2015 11: Sun, 27 Sep, 2015 13:						Prove generiche Prove generiche	None		No	
	880 emiliano 201504 a 0164	Fri, 30 Oct, 2015 08:				e Emiliano		Prove generiche	Barracuda		De	
	879 T_MC5_LdH_Thomas_106	Tue, 13 Oct, 2015 12:						Prove generiche	Birel Shifter TM		No	
	877 T MC5 LdH Simon 104	Tue, 13 Oct, 2015 12:				5 Simon Solgat		Prove generiche	Birel Shifter TM		No	
	876 MT MC5 IdH Thomas 103	Tue 13 Oct 2015 11				Thomas Mesch		Prove neneriche	Rirel Shifter TM		Nin	
	Apri prova	Childiamie	Propri	età prova		Importa pro	ova	Rimuovi prova		Esporta prova	-	
	Database delle prove										_	

Select your file double clicking on it and start analysing it. A lot of pages, graphs and images will help you analysing your data in the best way.



# 12 – New firmware upgrade

Our technicians and engineers are constantly working to improve both the firmware (the application that manages your device) and the software (the application you install on your 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.

* 🚣 🏍 🍄 🕄 🖽 🍝 😫	3				(1.	8 00
onnected Devices	Dow	vnload	I Install SW Export Import Update Device			
	-		Name	On the web	On my PC	Info
	Soft	ware				
			RaceStudio3	3.16.00	3.16.00	
	Firm	ware				
	NEW		EVO4S	01.26.14	01.26.08	
	NEW		EVO5	01.26.14	01.26.08	E
	NEW		MXG	01.26.14	01.26.08	
	NEW		MXL2	01.26.14	01.26.08	
	NEW		MXS	01.26.14	01.26.08	
	NEW		MXS Strada	01.26.14	01.26.08	
	NEW	•	Solo 2 DL	02.30.04	02.30.10	
			SmartyCam HD	01.03.64	01.03.64	

Once the new firmware has been downloaded connect your device to the PC via Wi-Fi to perform a firmware upgrade. In a few seconds the device is ready.

# **CHAPTERS 11-12**



# 13 RPM

As said Solo 2 DL is sold with different additional cables. To receive RPM value from the ECU you can use one of the available ECU connection cables.

If on the contrary your vehicle does not have an ECU you can sample RPM using the RPM+external power cable.

# 13.1 RPM from ECU

To get the RPM from the ECU you only need to connect your Solo 2 DL to the ECU and it will automatically sample that value.

# 13.2 RPM via a 5-50V square wave or coil (150-400V)

If your vehicle has no ECU you need to have the kit including RPM+external power cable to be connected to the 8 pins connector placed bottom right of Solo 2 DL. This way Solo 2 DL can read the signal form the low voltage of the coil (whose peak can be from 150 to 400 V) or from a possible square wave (the peak can be from 5 to 50 V). The image below shows an example of wiring of the ignition system.

The output labelled "GRAY TACH" gives a 5-50V output that can be directly sampled by Solo 2 DL. In case the vehicle ignition system has no output you need to connect Solo 2 DL to the low voltage of the coil as shown in the following images.

Point 1: low voltage of the coilPoint 2: connected to the spark plugPoint 3: connected to the +12V of the battery





GRAY TACH

00

EAVY BLACK

CO BATTERY C

Once Solo 2 DL connected to RPM signal you can set its parameters in channels layer of Race Studio 3.



# 14 Connection with SmartyCam and LCU-One

Your Solo 2 DL can be connected to AiM SmartyCam HD, SmartyCam GP HD and LCU-One CAN as shown in the images below.

**Please remember** that all channels transmitted by these AiM expansions have to be set in Race Studio 3 software as already explained in the related paragraphs ("LCU-One CAN setting" and "SmartyCam stream setting").

Moreover for further information concerning SmartCam HD, SmartyCam GP HD and LCU One refer to the related manuals you can download from "Documentation" area of AiM website www.aim-sportline.com.

To connect Solo 2 DL to SmartyCam HD use SmartyCam CAN cable and connect 5 pins Binder connector placed bottom left of Solo 2 DL to 7 pins Binder connector placed rear left of SmartyCam HD as shown here below.



### **CHAPTERS 13-14**

		<u> ?</u> ? <i>@D</i>
	Parameters	1
	max: 16000 ; factor: /1 ;	
:		
16000 \$		
/1 🛟		
Save Cancel		
		+





To connect Solo 2 DL to SmartyCam GP HD use SmartyCam CAN cable and connect 5 pins Binder connector placed

bottom left of Solo 2 DL to 7 pins central Binder connector of SmartyCam HD as shown here below.

To connect Solo 2 DL to LCU-One CAN connect 5 pins Binder connector placed bottom left of Solo 2 DL to 5 pins Binder connector of LCU-One as shown here below.

# **15 Technical specifications and drawings**



**Pinout Solo 2 DL** 



### **CHAPTERS 14-15**

Internal 3 axis  $\pm 5$ g accelerometer + 3 axis gyro+ 3 axis magnetometer

Race Studio Analysis freely downloadable



### CAN+RS232+External Power cable – 2m length

### CAN+K-Line+ power cable with OBDII connector – 2m length









