User Manual

SmartyCam 3 Sport
Release 1.00

AiM

INDEX

1 – SmartyCam 3 topics

Wide Global Shutter CMOS sensor
The best way for avoiding wave effects when vibrations are strong

Standard action camera

Full HD image
1920 x 1080 resolution, at 30 fps

Completely waterproof
Designed for being used in the hardest environments: water, dust, temperatures are not a problem.

Sapphire frontal glass
The strongest glass for facing all the high-speed impacts with pebbles, insects, dust that usually happen in a race

A lot of graphic controls
Choose your preferred layout for keeping your data under control

Auto start/stop recording
Avoid thinking at the camera while ready at the starting line

Automatic track selection
SmartyCam 3 automatically receives the track selected by the AiM logger to which is connected, or selects the right track in its database, if not connected to any AiM device, in order to easily draw it and calculate lap number, lap times and rolling times.

Video and data in the same file
Your video and the most important data in the same MP4 file

Automatic data and video synchronization
In case the data in the MP4 are not enough for your analysis, simply import the video file and the data from your AiM logger, and the software will automatically synchronize them: Position on the track, video frame and data on the graph will be perfectly correlated
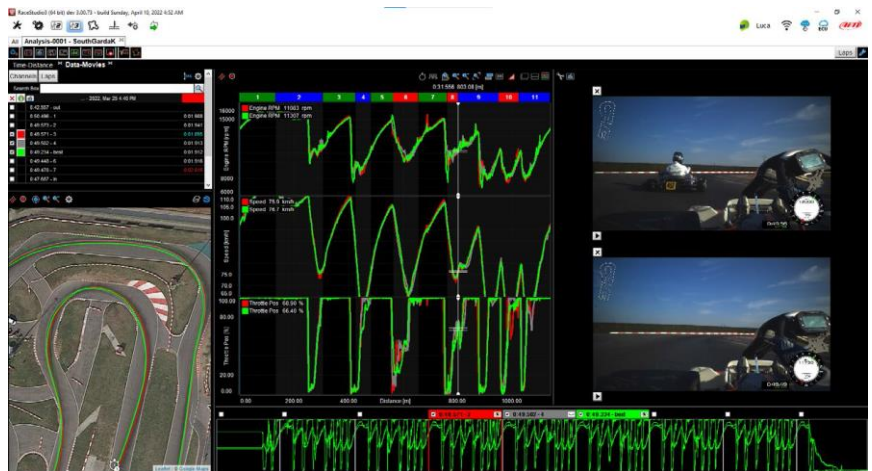
2 – SmartyCam 3 connections

The SmartyCam 3 has an internal battery that may keep the system alive for around 20 minutes. It is important to provide an external 12 Volt battery, directly or through an AiM logger, using the 5 pins connector placed on the back of the camera, as shown in the pictures below.

To connect The SmartyCam 3 to a GPS Module (optional) use the 5 pin Binder 712 female connector located on the back of the camera and connect it to the 2 port Data Hub. The SmartyCam 3 can also be connected to AiM Dashes and loggers through the AiM CAN network. The images below show some examples of connections

Cable labelled "CAN Exp"
of 37 pins Deutsch
male connector harness

To the external power
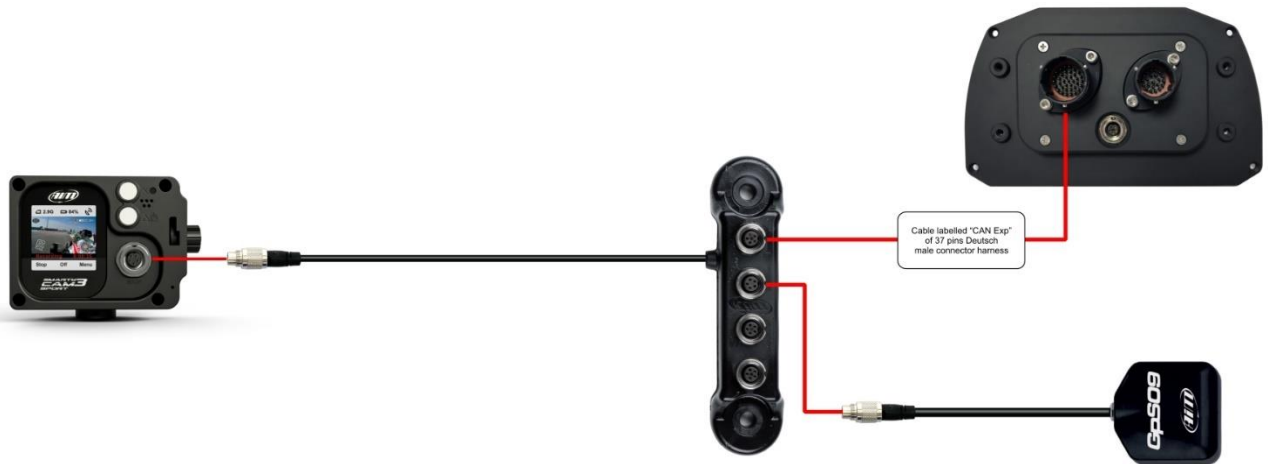
3 – SmartyCam 3 Pushbuttons and Power ON/OFF

3.1 – Pushbuttons

The SmartyCam 3 features two pushbuttons, each of which manage two different features, shown in the lower line of the display.

The upper pushbutton manages the features indicated with the icons:

X   short pressure
●   long pressure

While the lower pushbutton manages the features indicated with the icons:

△   short pressure
●   Turn OFF: long pressure

3.2 – Power ON/OFF

The SmartyCam 3 powers ON when:

- You push the lower pushbutton

- An external power turns ON

It turns itself OFF after a period of inactivity, that you can set up in the menu as below:

"MENU>>SETTINGS>>AUTO POWER OFF

Available options are:

- 5 min
- 15 min
- 30 min
- 1 hour

To charge the SmartyCam 3 internal battery plug the battery charger into the rear 712 connector. This charger is included in the kit

4 – SD card management

The SmartyCam 3 supports up to 2 TB MicroSD cards. The MicroSD is used not only to store video recorded by the camera but also to load the configuration and the firmware (see paragraph 6.4 for further information).
The housing is closed by a plastic thumb screw. To open it press and turn the plastic thumb screw clockwise as written on the camera and shown here below. To close the door, firmly shut the door and press in the thumbscrew then turn counterclockwise. If The SmartyCam is powered a steady red light is shown when the door is open

5 –SmartyCam 3 Start/Stop recording

The SmartyCam 3 can start/stop recording in manual or in automatic mode.

When the SmartyCam 3 is recording the display becomes all red and after a minute the display switches off.
Please note: it is always possible to start/stop recoding in manual mode by pressing the "Rec" button. "Rec" turns to "stop" and press again to stop. (show in left and central image below).

It is possible to enable the Automatic Start Recording, following this path:
* "MENU >>SETTINGS >>AUTO START REC". Default setting is "Auto" press change to turn to "Manual" (image below on the right).

To set automatic stop recording follow this path: "MENU –>SETTINGS –>AUTO STOP REC"

Available options are:
* 5 sec
* 20 sec (default)
* 1 min
* 2 min
* 5 min

Please note: refer to chapter 7 "SmartyCam 3 and the PC" to know how to set the parameters for automatic start/stop recording.

6 – SmartyCam 3 Menu

The SmartyCam 3 settings can be changed by use of the two buttons. Pressing "MENU" this page shows up:

Available options are:
- **GPS STATUS**: status of the connected GPS
- **TRACKS**: to show the list
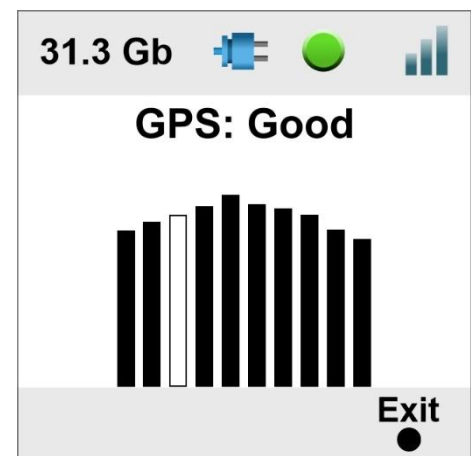- **SETTINGS**
- **UPDATE**
- **VIDEO FILE**

In any situation use:
- "Down" (**X**) button to scroll the options
- "Sel" (△) to select and
- "Exit" (●) to quit and save (long press)

6.1 – GPS Status

Shows the number of connected satellites with the related signal level.

6.2 – Tracks

The SmartyCam 3 can show the map of the circuit if loaded in its configuration (see paragraph 7.1.2 for further information) as well as the position of the vehicle on the track.

The SmartyCam 3 can be installed in two ways:
- connected to an AiM logger, such as : MyChron5, Solo 2 DL, MX* logger, SW4, PDMs and EVOs; in this case the maps are loaded onto the AiM logger, that automatically selects the track you are racing on and transmits the same map the dash/logger to the SmartyCam 3 Sport, The track map then shows in the video, and in the position you defined during the configuration (please refer to paragraph7.1.2 for further information).
- Connected to a GPS Module; in this last case you need to load the track maps directly to The SmartyCam 3 using its microSD.

At the very first power on, the camera shows that there are no tracks (image below): this is not a problem if The SmartyCam 3 is connected to any AiM logger. If the SmartyCam3 is connected to a GPS Module, you need to load the tracks on it using the microSD.
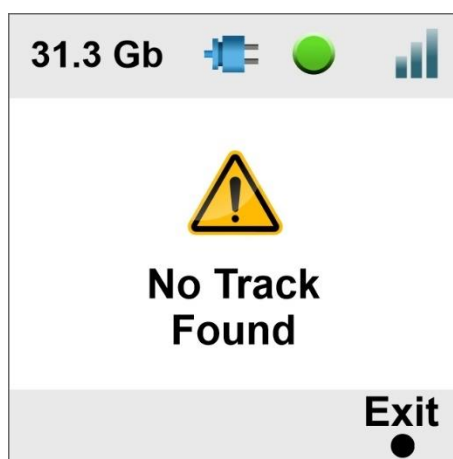
6.2.1 – Loading tracks to the SmartyCam 3

To load tracks on The SmartyCam 3, perform these operations:
- place the microSD into the SmartyCam3 and power on to format the card correctly, and then into the PC
- run Race Studio3 software and load the tracks on the microSD (refer to paragraph 7.5 for further information)
- insert the microSD in The SmartyCam 3 and follow this path: MENU >> UPDATE >> TRACKS
- press "Sel"
- in a few seconds The SmartyCam 3 loads the tracks.
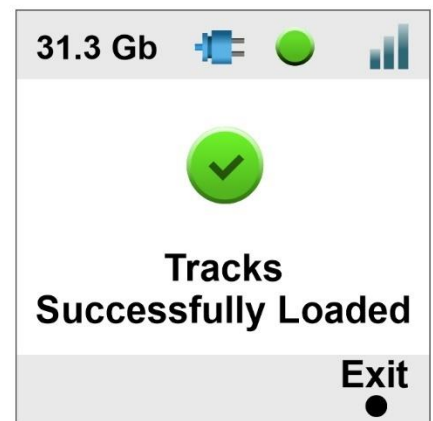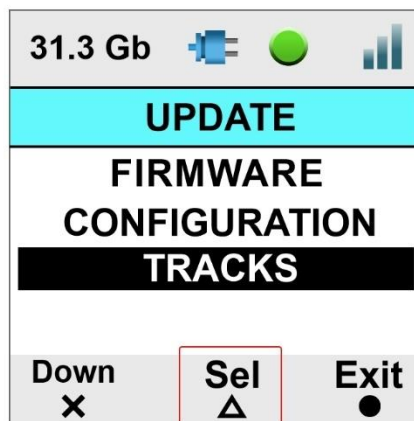
6.2.2 – Managing tracks on the SmartyCam 3 Sport

If the SmartyCam 3 is not connected to any AiM logger but only to AiM GPS09 Module, track selection can be managed in two ways: automatic (default) and manual.
In **AUTO** mode The SmartyCam 3 recognizes and selects the map of the circuit you are racing on.
in **MANUAL** mode you need to select the track yourself. To **manually set a track** on The SmartyCam 3 Sport:
- set **MANUAL MODE**
- scroll and locate your track
- press: "Prev"
- press "Sel"
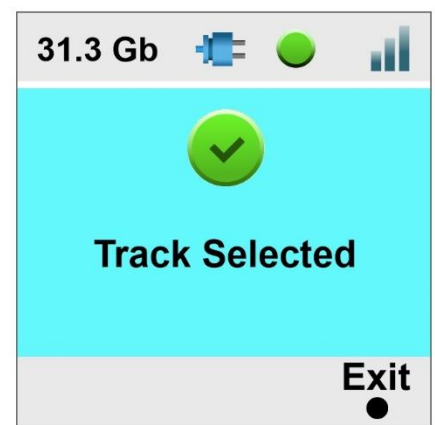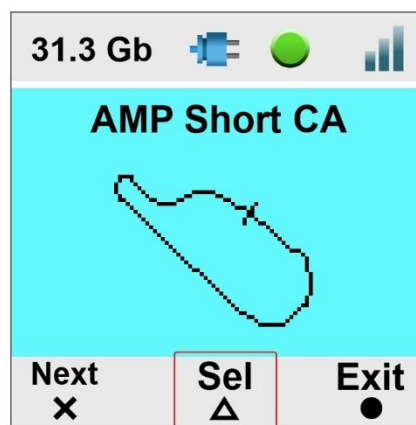
The "tracks" menu allows you to see a preview of the track and other GPS related information. This is very useful if you need to select a specific track configuration among other configurations of the same track, as shown here below:
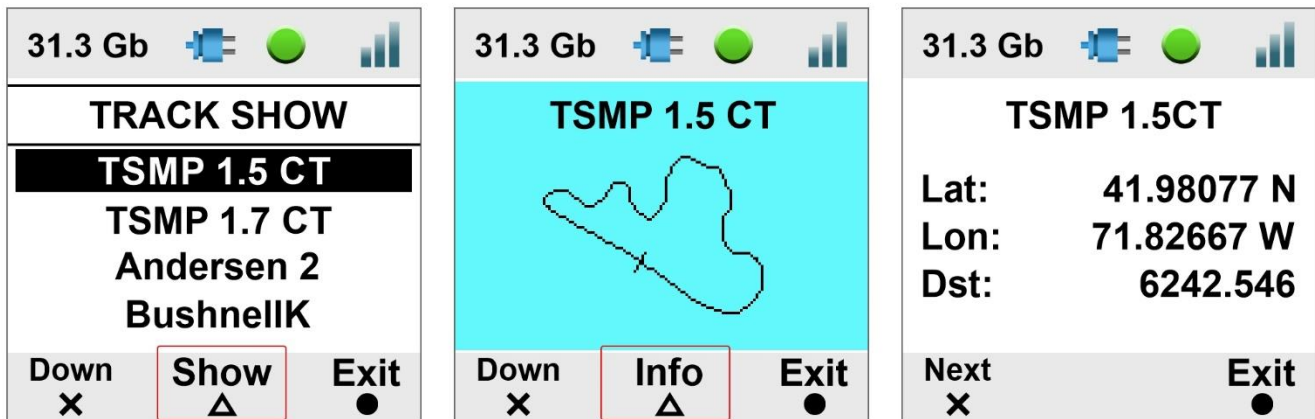
6.3 – Settings

Setting Menu is used for:
- Auto start rec
- Auto stop rec
- Auto power off
- Exposure set
- Audio set
- Upside-down
- Overlay
- System time
- Rec counter
- Log files export
- Info
- Factory reset
- Clear tracks

6.3.1 – Auto Start Rec

SmartyCam 3 is enabled to automatically start and stop the video recording. This happens in two different ways:
- if connected to an AiM Logger it starts/stops recording when the logger starts/stops recording
- if connected to a GPS 09 Module it starts recording according to the conditions set in the configuration. As default, it starts recording when the speed is greater than 10 km/h.

6.3.2 – Auto Stop Rec

Auto stop record is a delay to stop the recording after the recording threshold is no longer met. Whether the SmartyCam3 is standalone or connected to a dash or logger.

6.3.3 – Auto Power Off

SmartyCam 3 turns off automatically after a time period defined in the menu setting after no function is used.

6.3.4 – Exposure Set

This option allows the user to set the part of the shot to be used as a reference, as shown in the images below:
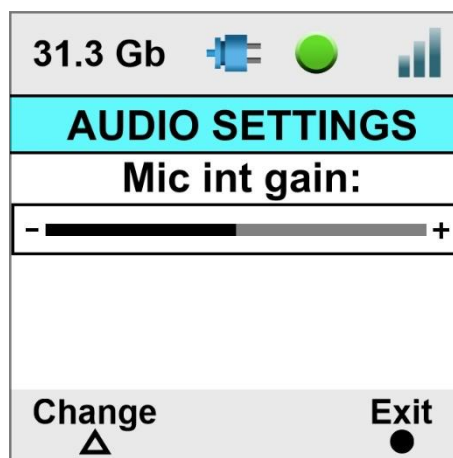- use the "Change" button to modify the area to be used for adjusting the light. It is shown through a red rectangle. Please,
- select the whole frame in case of installations in open cockpits.
- use "Exit" button to save and exit
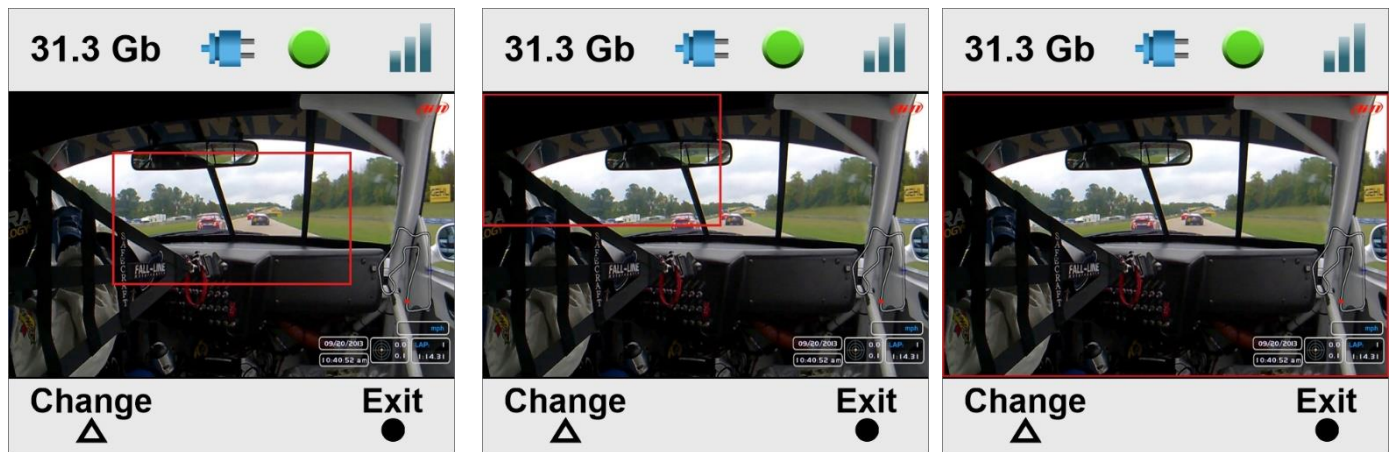
6.3.5 – Audio set

The SmartyCam 3 comes with an internal microphone. To set it.
- Use "Change" button to set the gain
- Use "Exit" button to save and exit

6.3.6 – Upside Down

SmartyCam 3 has a standard camera ¼ thread in its base that is used for mounting.
Sometimes, in closed cars, it is better to install the camera upside down. In this case, you have to flip over the video.

6.3.7 – Overlay

In case you wish to record a video without overlays, you may disable them in this menu.

6.3.8 – System time

SmartyCam 3 has an internal clock powered by a battery and is constantly updated by the external GPS09 Module. Please note that both time zone and Day Light Savings time are considered and automatically corrected.
In this menu you may define different date/time formats:

- 0-12 or 0-24
- DD/MM/YYYY or MM/DD/YYYY

6.1.4 – Rec Counter

This page shows the number of recorded videos of the SmartyCam 3. Press "Reset" to reset the counter.

6.3.11 – Log Files Export

Each time the SmartyCam3 records a video it creates a LOG file containing all of the information that can help understanding a possible problem. In case you need help from AiM Support team, please, export the log file to the microSD and send it to the team.

6.3.12 – Info

The information shown here is important if you need help from the AiM Support Team. The "Restore Info" page tells you which firmware release will be restored if you decide to perform a factory reset.

6.3.13 – Factory RST

Resets the SmartyCam 3 to its default values.

6.4 – Update

This allows you to update:
- Firmware version
- Configuration
- Tracks

All of these elements need to be exported to the microSD through AiM RaceStudio 3 software

Configuration is the overlay transmitted to the SmartyCam3 Sport (the camera can only load one configuration at a time).

6.4.1 – Firmup

To update the SmartyCam 3:
- Open Race Studio 3 and navigate to the top right "web updates" cloud icon
- If there is a new SmartyCam 3 Sport firmware, check mark it and then click "download"
- load it on the camera micro SD, by clicking "update device"
- replace the micro SD in its slot on the SmartyCam 3 and switch the camera on
- follow this path MENU >> FIRMUP
- the camera shows the available firmware releases
- Select the one you want to install and wait; in a few moments the camera will reboot and the new firmware is installed.
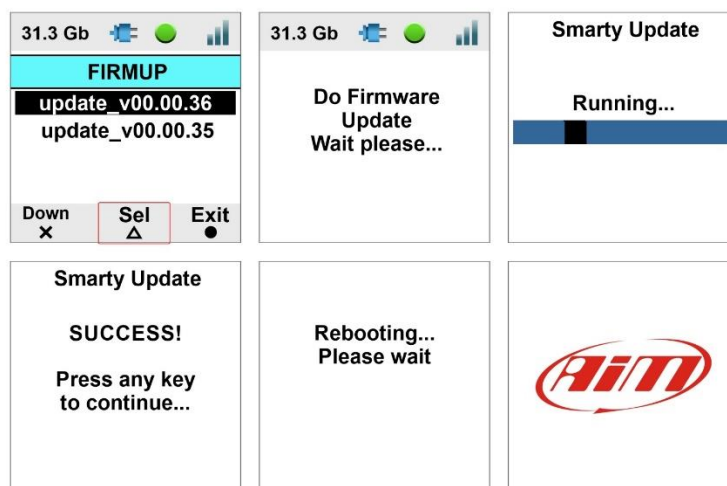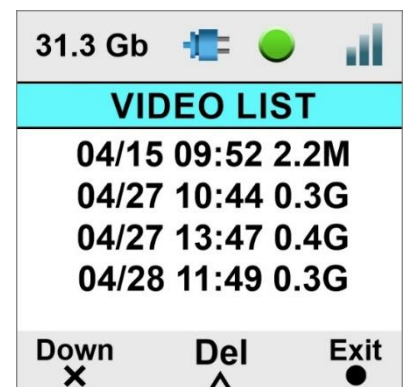
6.4.2 – Tracks update

Please refer to paragraph 7.5.

6.3 – Video file

This page shows the list of video files stored in the SmartyCam 3 SD card. Scroll the list and press "Del" to delete any video. The SmartyCam 3 asks for confirmation.
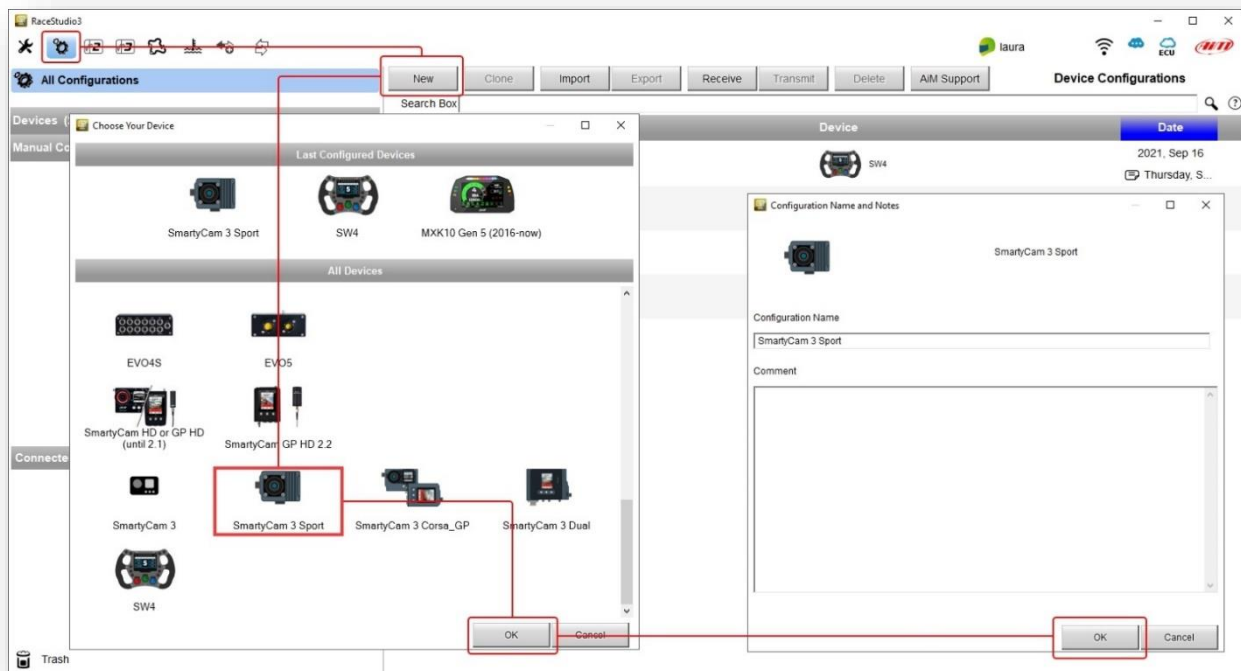
7 – SmartyCam 3 and the PC

7.1 – Creating the SmartyCam 3 configuration

To create the SmartyCam 3 configuration:
- Run Race Studio 3 software
- press "NEW" to create a new configuration
- "New configuration" panel appears
- select "SmartyCam 3 Sport"
- fill in the panel that is prompted and press "OK"

Race Studio 3 software enters directly in the SmartyCam 3 overlay layer. The layer layout changes according to the cameras working mode.

The SmartyCam 3 can be installed in two ways:
- connected to a **MASTER** (any **AiM Logger**): in this case, it must be configured in "**SLAVE MODE**" and will receive all the information to be shown from the logger
- **Standalone**: in this case, it is connected to the AiM GPS Module only, and will only show GPS data (position, speed, accelerations, lap number, lap time)
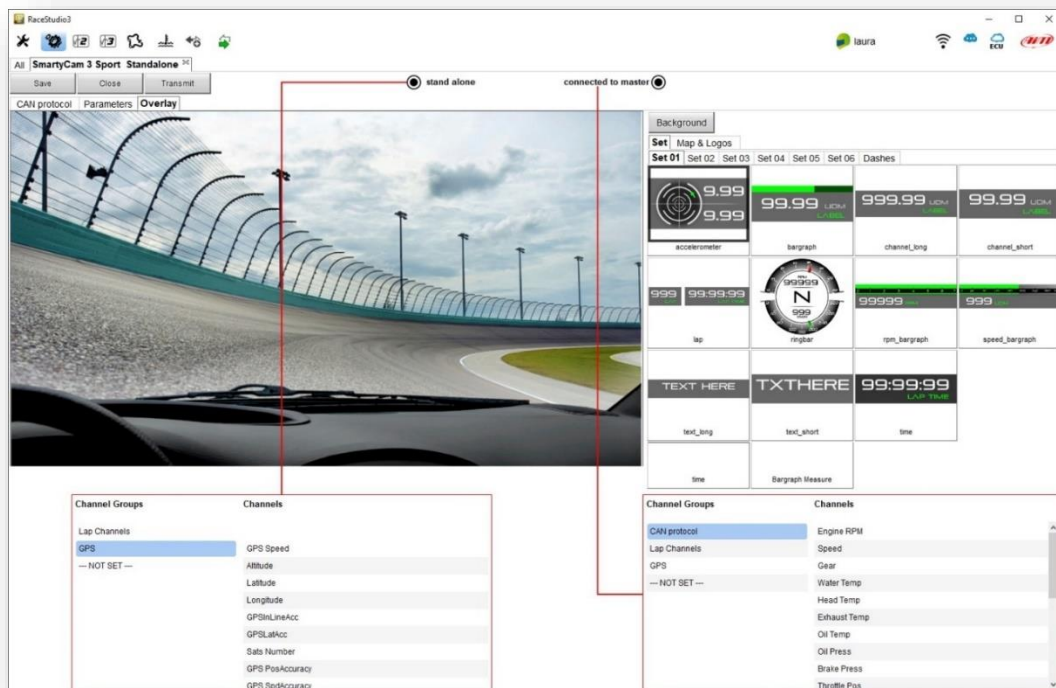
If the SmartyCam is **standalone**, you only need to set:
- "Overlay" tab
- "Parameters" tab

If the SmartyCam 3 is connected to a master, you also need to set the CAN Protocol tab.

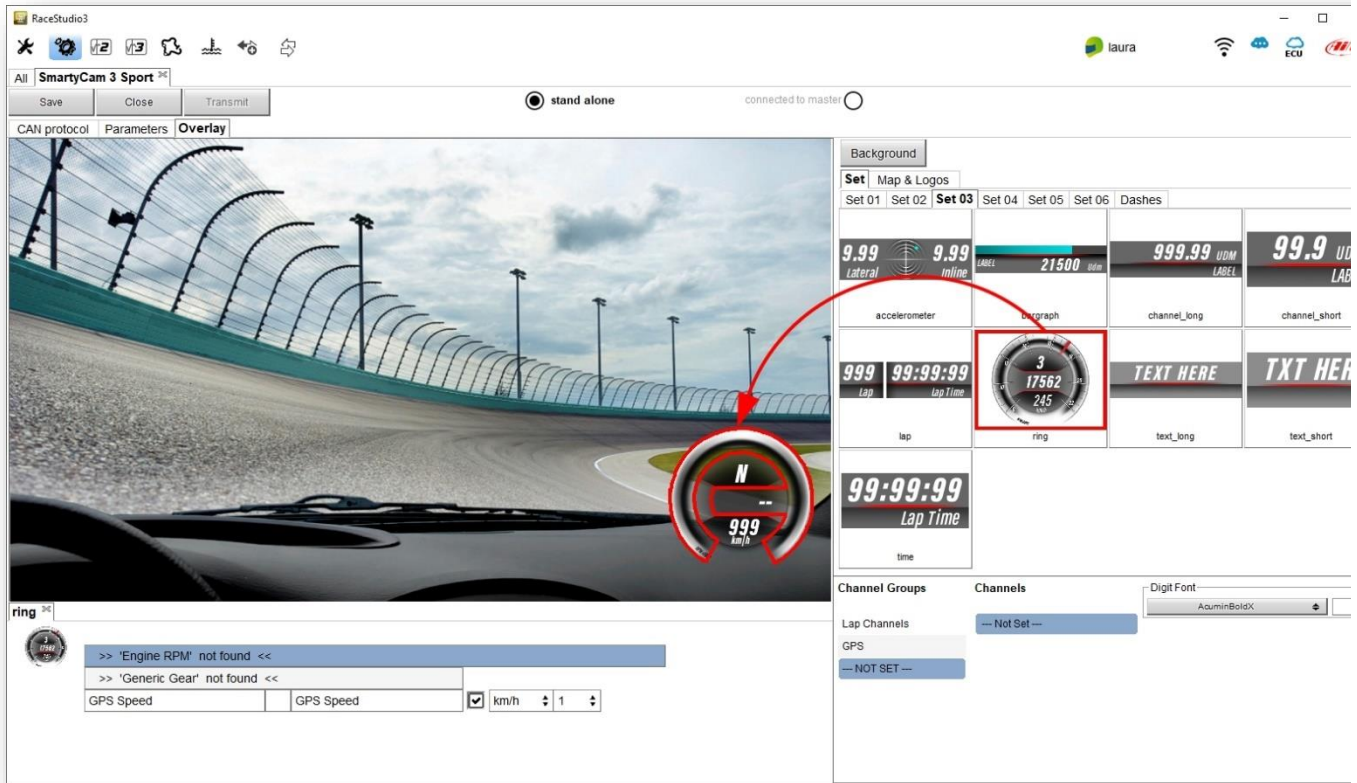## 7.1.1 – Configuring the SmartyCam 3 overlay

The overlays you may add to your video are:
- Graphical data
- Logo
- Track map

You may choose among a wide set of graphical overlays. Simply click on the one you prefer, drag and drop it to the desired position in the video itself.


If a graphical control may show a range of possible information, you must select the appropriate channel. In the example below you are configuring an overlay that may show Lap Number, Lap Time, best Time, Predictive Time etc.: simply click on the desired information and you will set it.
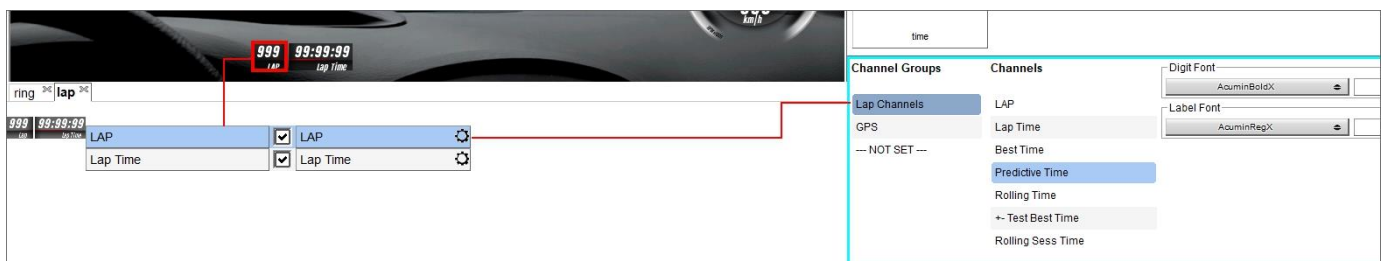
7.1.2 – Logo and MAP Setting

To add the map of the circuit or a logo to the video please click on Maps & Logos and drop the logo or the track mmmmap in the desired position. You can easily change the shape, dimension, and position.
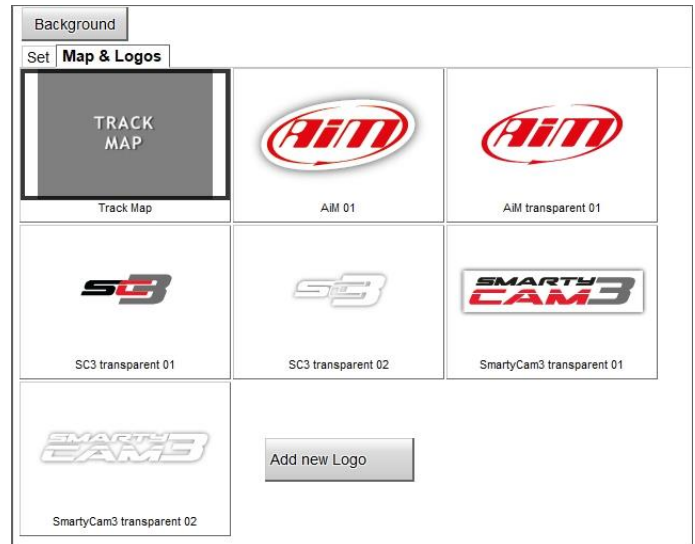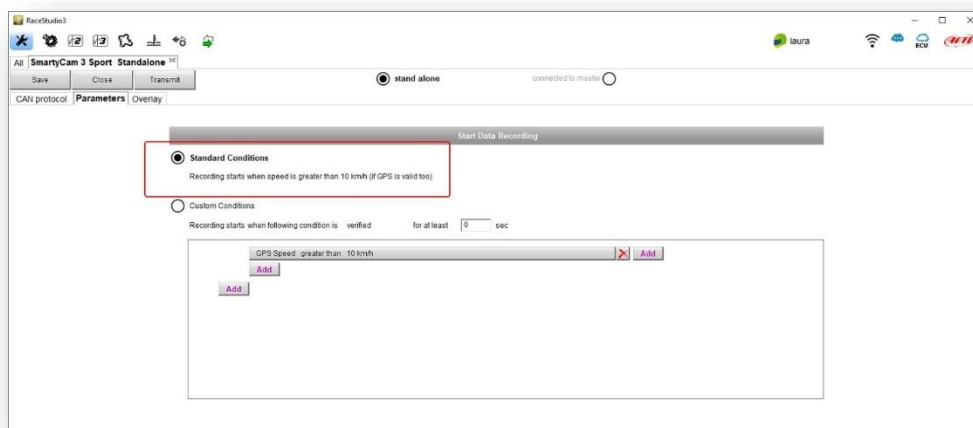
Please note that when configuring the SmartyCam 3, you only set the position and dimension of the track map while the shape of the circuit dynamically changes according to the circuit you are racing on.

7.1.3 – Configuring the SmartyCam 3 parameters

In case of a **Stand-Alone** installation, you must set the condition that enables the SmartyCam3 to start recording.

If the SmartyCam 3 is **connected to a master,** it starts recording when the master does.

7.1.4 –SmartyCam 3 connected to a master

The connection between any AiM Logger and the SmartyCam 3 is made through the CAN bus. The logger transmits data to the camera in two slightly different ways:

* AiM default Protocol
* Advanced Protocol

AiM Default Protocol transmits a limited range of information, enough for a wide range of installations. They are shown below:
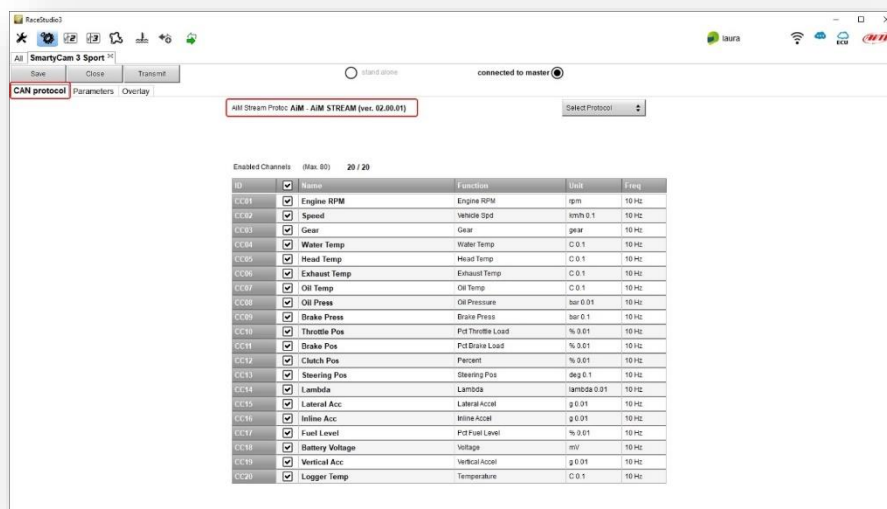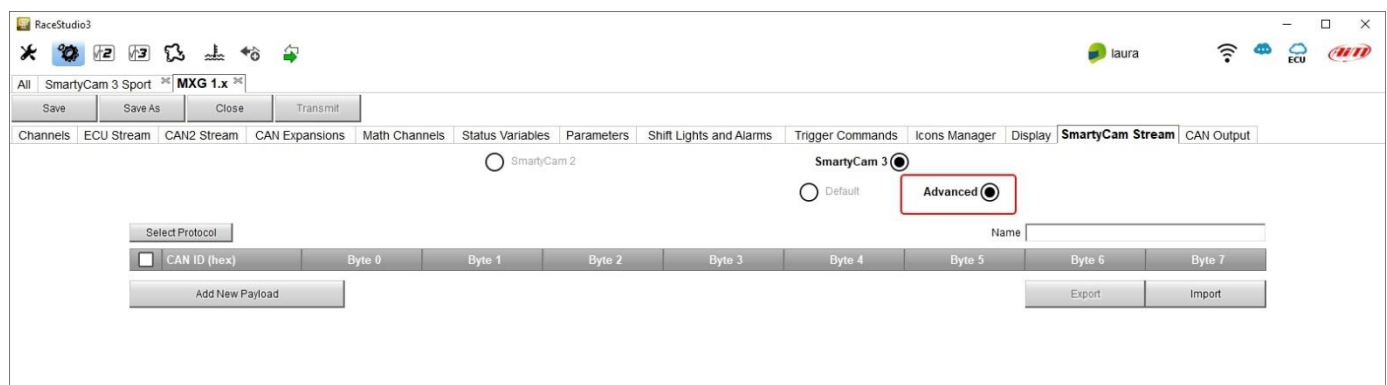

If you wish to transmit a different set of information, you can do this as follows:
* configure your Logger in order to transmit a different SmartyCam Stream.
* select the desired SmartyCam Stream in the SmartyCam configuration.

Follow the steps shown in the following figures:
* select "Advanced" option in the SmartyCam Stream tab when you configure the Logger.

- Create your desired stream, defining the required IDs and fields
- Name the protocol and save it
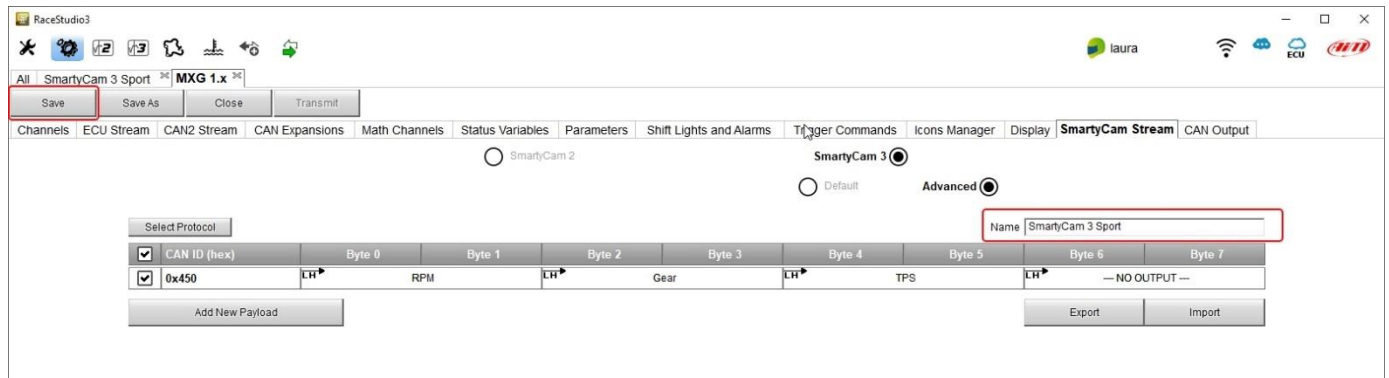
- Once the logger configuration is saved, you may import the protocol in the SmartyCam 3 configuration and use the channels as required

Please note that ALL data transmitted to the SmartyCam 3 are stored as metadata directly in the .mp4 file in order to be analysed by RaceStudio3 Analysis.

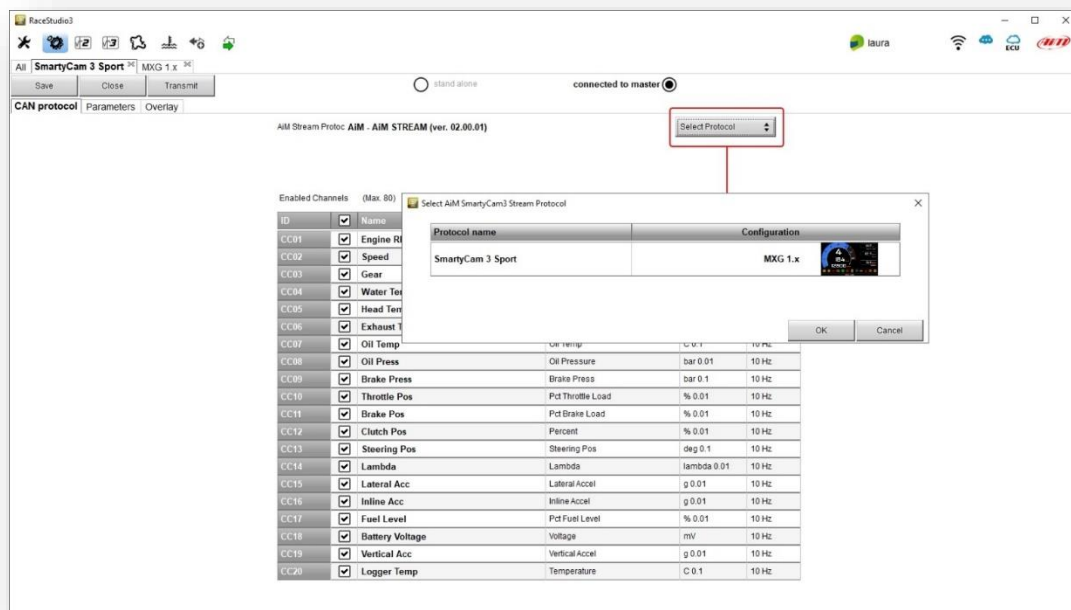## 7.4 – Loading the configuration to the SmartyCam 3

After having created the configuration, you must transmit it to the SmartyCam 3:

• press "Save" button at the top left of the page
• insert a microSD in the PC slot
• press the "Transmit" button. The software recognizes the microSD and sends the configuration to it
• remove the MicroSD from the PC slot
• insert the microSD into the SmartyCam 3 slot
• follow this path: MENU>>UPDATE>>CONF LOAD and load the configuration to the SmartyCam
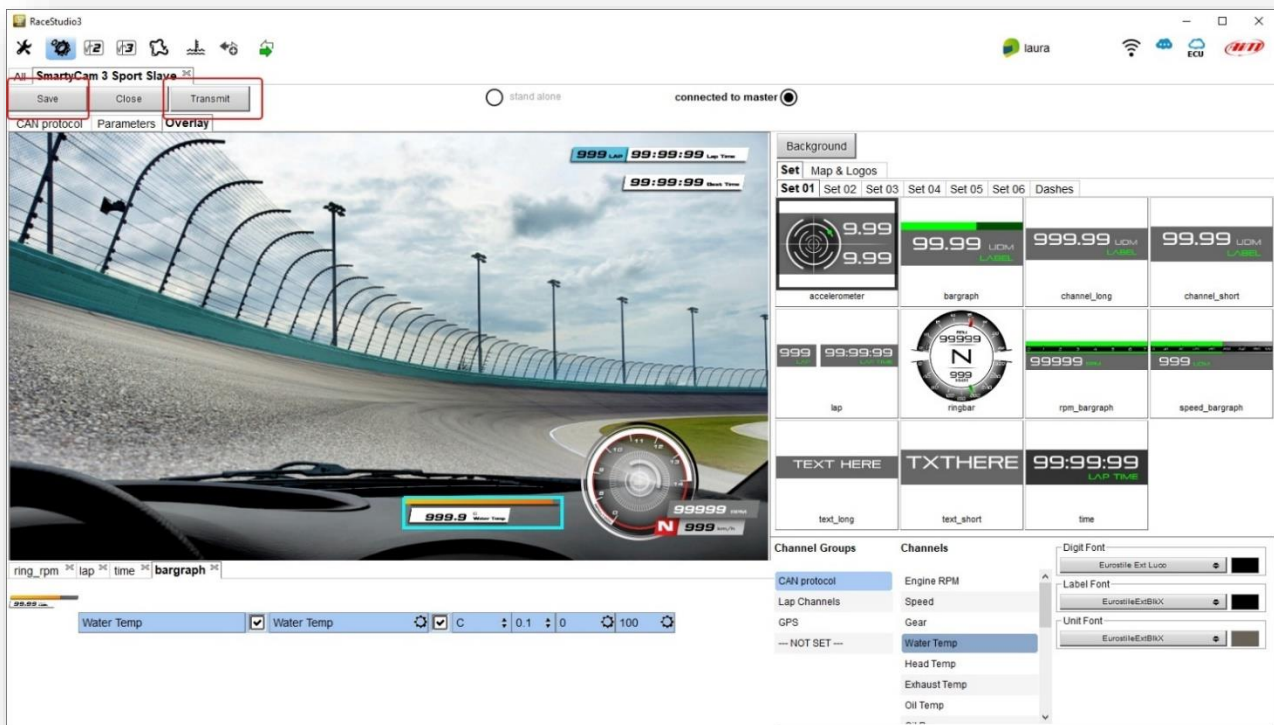
7.5 – Track Management

Track Manager is the Race Studio 3 section dedicated to tracks management. Here you can create and delete new tracks, modify the settings as well as load them to the SmartyCam 3 microSD. To access, select the "Tracks" icon on Race Studio 3 top left keyboard.
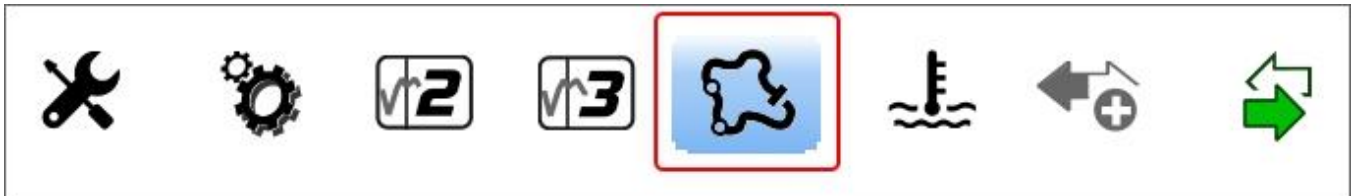
The main page is divided into three columns: on the **Left** you will see:
- at the top are the filters to collect the tracks. By default, all tracks are shown – "All Tracks (5327)" as in the image below. The filters are:
    - nations: select the nation you wish to see the tracks for
    - smart collections: clicking this setting brings up a panel that allows you to select continent, nation, circuit type and road surface; select the criteria you wish and name the collection, specifying the used filter if you are happy with your selection
    - manual: by clicking this setting icon, a new collection panel is prompted: you can name this and drag and drop your tracks in
- at the bottom you will find your connected devices as in the image the SmartyCam 3 microSD "SmartyCam 3 is listed

The column **in the middle** shows:
- at the top, a fast search bar that allows you to select your required tracks; pressing "?" brings up a tooltip explaining the research criteria (highlighted in red below); stating:
    - track long name contains….: long name is the name in bold in each track box
    - track short name contains…: short name is the track name shown top right of each track box
    - track city begins with…: is the name of the city the track is located in
- all tracks listed in Race Studio 3. Automatically updates at start up if a connection to the Internet is available.

The column on the **Right** shows two tabs:
- the data sheet of the track
- the weather forecast if available
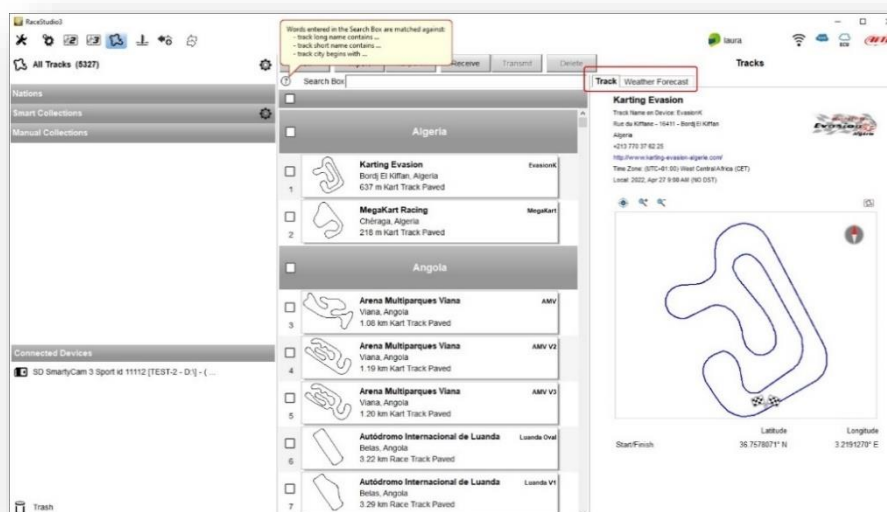
The SmartyCam 3 microSD is shown at the bottom left of the page; clicking it, the tracks it contains are shown on the right side of the page. Tracks created by the user are labelled "User" and any difference among tracks stored in the SmartyCam 3 and the same stored in AiM database are notified.
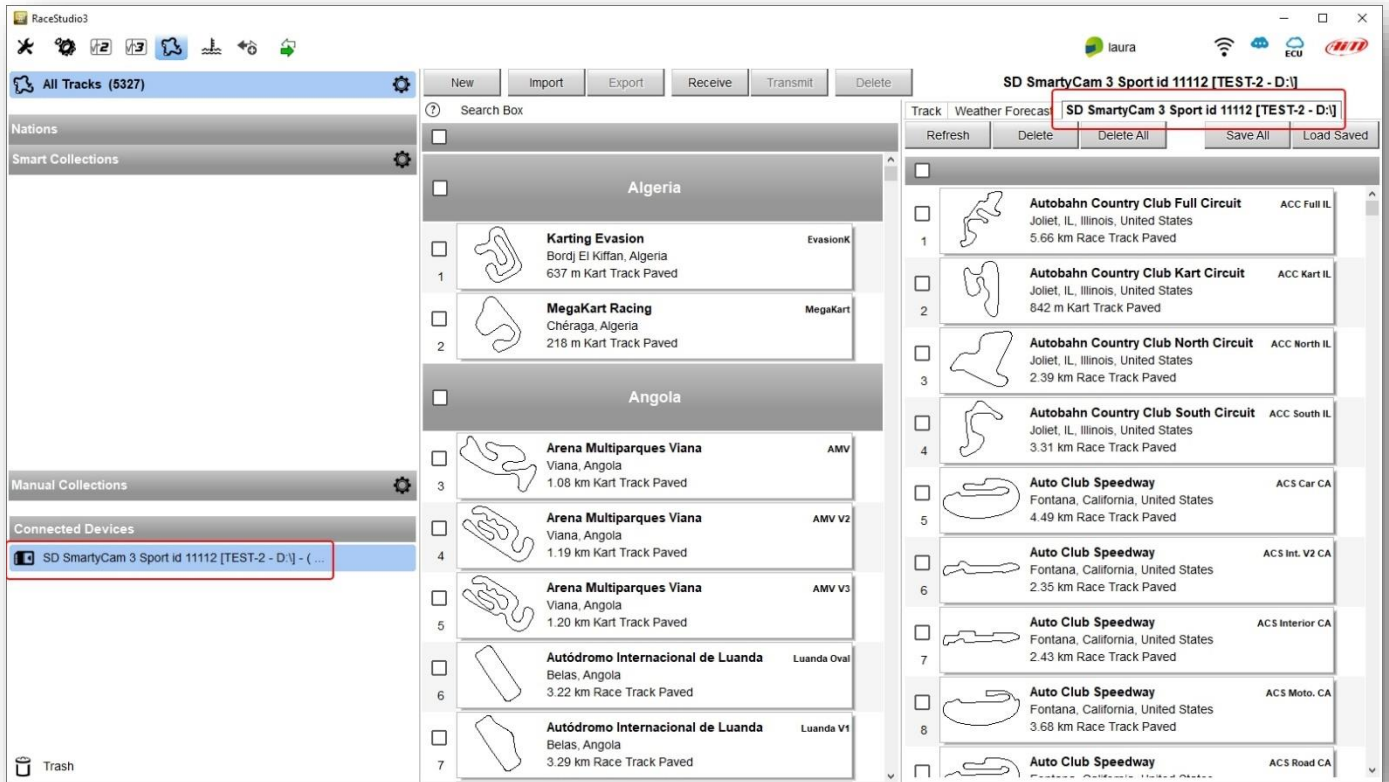
The page keyboards are for:

- **New**: create a new track
- **Import**: import one or more tracks stored in the SmartyCam 3 or on another external device
- **Export**: export one or more tracks to a specific PC folder or to another peripheral device
- **Receive:** receive from the SmartyCam 3 the tracks created by the user (if no device is connected the button is disabled)
- **Transmit:** transmit one or more tracks from the PC to the SmartyCam 3 (if no device is connected the button is disabled)
- **Delete:** delete one or more tracks from Race Studio 3 Database

- **Refresh**: refresh the track list stored in the SmartyCam 3
- **Delete**: delete one or more tracks from the SmartyCam 3 memory
- **Delete All**: delete all tracks stored in the SmartyCam 3 memory

- **Save all**: save all the tracks stored in the SmartyCam 3 Sport; it creates a zip file that can be loaded to another AiM device
- **Load Saved**: load the tracks previously saved in the SmartyCam 3 memory

Please note: for further information about Race Studio 3 Track Management visit www.aimshop.com, go to the documentation area, in the software/firmware section you will find a Track Manager manual.

7.6 – Video Management

Once a track session is over it is possible to review the SmartyCam 3 video on a PC:
- remove microSD card from the camera
- place it in the PC slot and manage it as a USB peripheral
- run Race Studio3 software
- click on the microSD bottom left of the page
- the list of the videos stored in the microSD is prompted on the right of the page
- press the "Download" button on the top keyboard
- fill in the panel that is prompted
- select "OK"
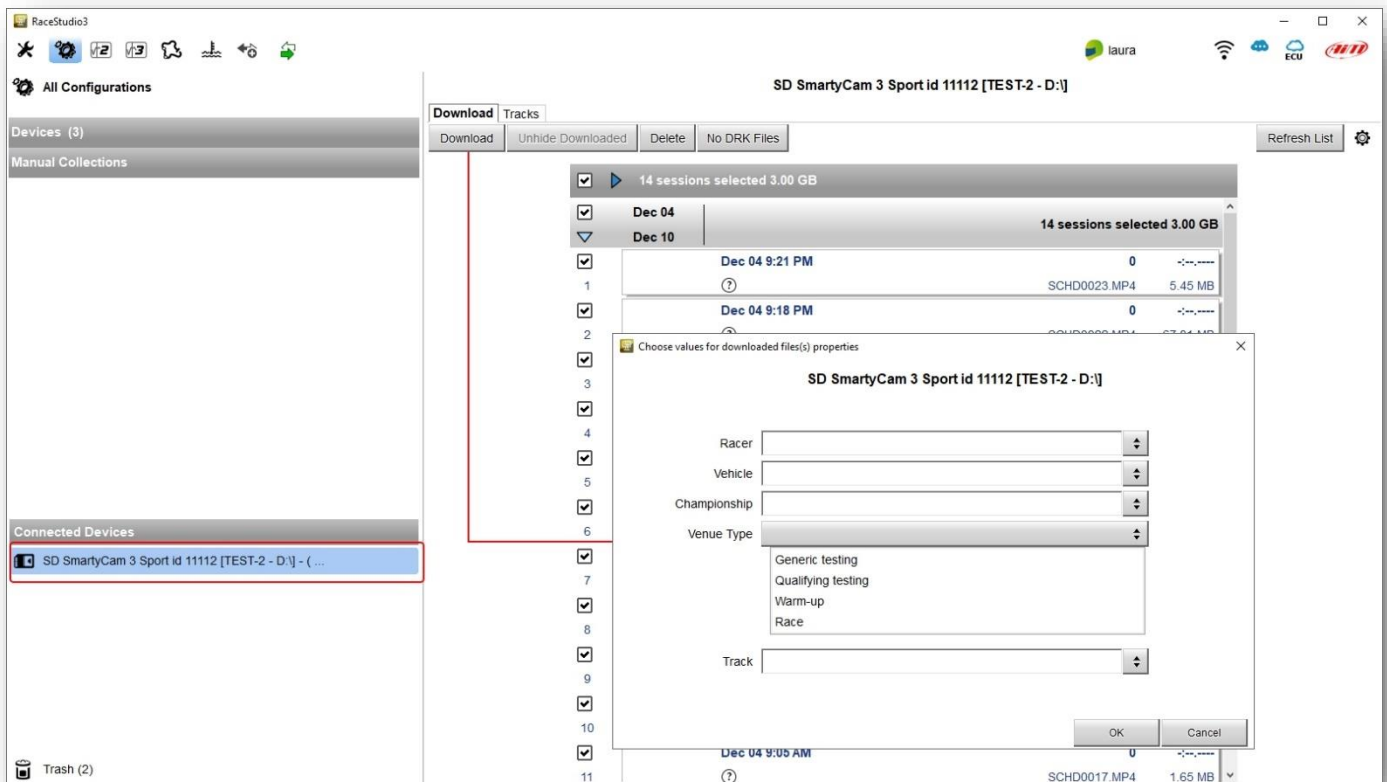
Video download starts.
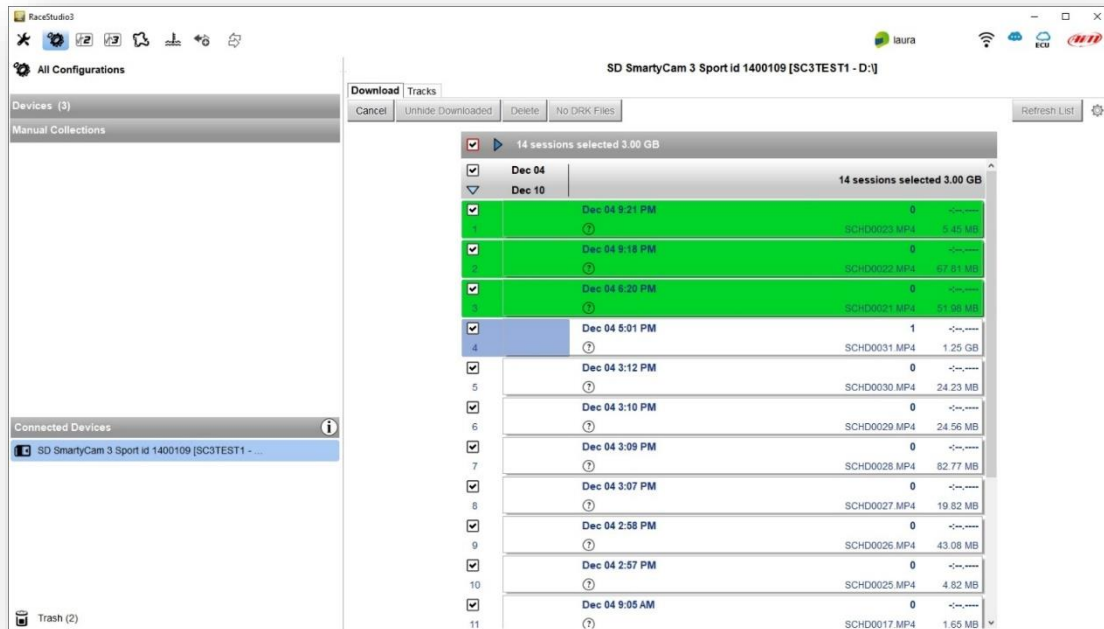
When all files have been downloaded, run the Race Studio3 Analysis icon and the video just downloaded is prompted in the central column of the page. Click on any video to start watching it.

Please refer to RaceStudio3 Analysis user manual for any further information concerning the software working mode.
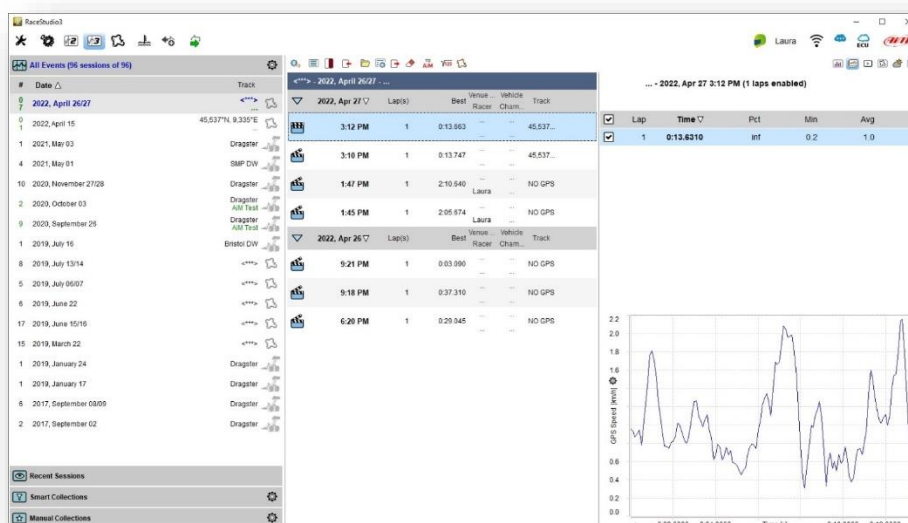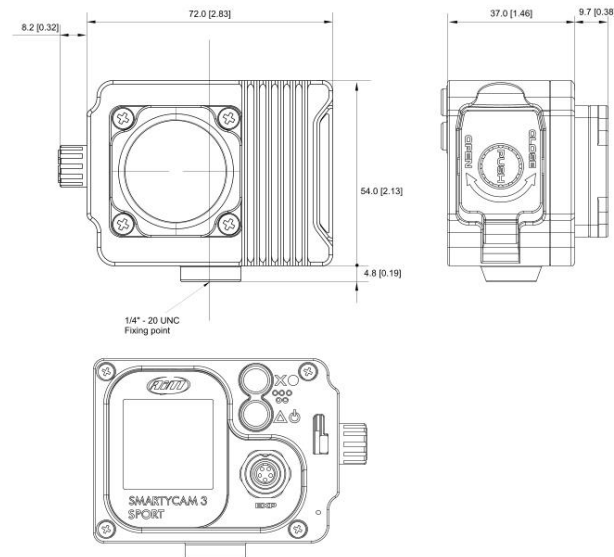
8 – Technical specifications and drawings

Video format	H264 – 1920x1080 pixels at 30 fps
Display resolution	128x128 pixels
Lens	Low distortion camera lens
CMOS sensor	Global shutter
Field of view	67° or 84°
External power	9-15V
Supported microSD card (not included)	up to 2Tb
Connector	1 Binder 712 female
Working temperature range	-10°C/+50°C
Auto power ON	Yes
Auto power OFF	Yes
Auto Start/Stop recording	Yes
Body	Nylon fiberglass charged and coated aluminium
Dimensions	79.9x54x46.5
Weight	200g battery included
Waterproof	IP65

SmartyCam 3 Sport dimensions in mm [inches]

SmartyCam 3 Sport pinout

Micro SD card

5 pins Binder 712
female connector pinout
external view
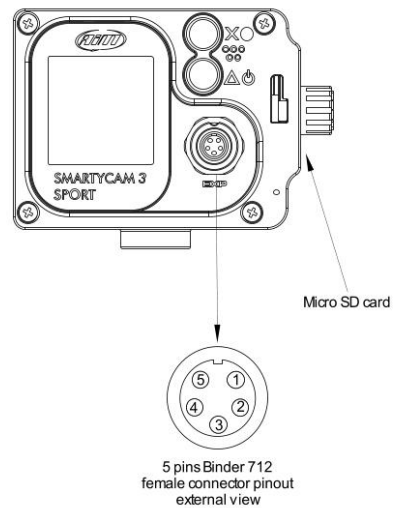
EXP	
1	CAN+
2	GND
3	+Vb out
4	CAN-
5	+Vb ext