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SmartyCam HD/GP HD
Rev.2.1
USER GUIDE 1.02



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SmartyCam HD/GP HD Rev.2.1

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1. SmartyCam HD in a few words

What is SmartyCam HD?

SmartyCam HD is the video recorder AiM developed for motorsport environments. It automatically overlays the vehicle data to an HD video using graphical items.

Components specifically designed to fit the needs of motorsport environments, like special lenses and CMOS sensor, reliability under vibrations, connectivity to the vehicle data and automatic video recording start/stop are among your available features.

What data does it show?

Overlaid data come from your vehicle ECU, from the internal accelerometers, from GPS and from datalogger analog/digital inputs. It also displays the map of the track and personal images (i.e. logos)

Is it possible to configure the graphical overlays?

Of course you can and you can choose from a wide library of graphical overlays as well as place them where you want on the video. End of scales can be defined using Race Studio 3 software included in the kit.

Can I connect SmartyCam HD to other AiM systems?

Of course; through the AiM CAN network you can connect SmartyCam HD to all AiM loggers, to say all MX series, EVO series, MyChron5, Solo series and ECU bridge.

Does it also work in a standalone mode?

Yes. SmartyCam HD has an internal battery and can work also without being connected to the AiM CAN network.

In this last case, of course, only lateral acceleration coming from SmartyCam HD internal sensor can be shown in overlay. If a GPS receiver is connected, SmartyCam HD can show also the position on the track, speed and lap times.

Is it possible to connect more SmartyCam HD cameras on the same CAN network?

Yes. Each SmartyCam HD has its own configuration and automatically retrieves the data it needs from the network, without interfering with the others.

Is it possible to synchronize video and data recorded by the loggers?

Yes. Race Studio 3 software automatically synchronizes video and data and show them on the same dedicated view.

Which video format does SmartyCam HD generate?

SmartyCam HD generates ".mov" files with H264 compression codec. You can choose among three different

compression level: low, medium and high as well as among three different frame rates: 15, 25 and 30 frames per second.

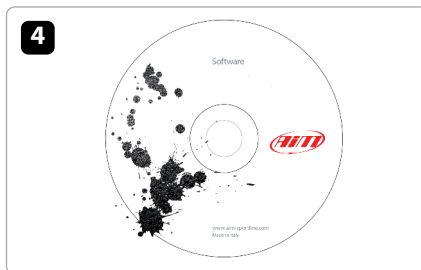
Does SmartyCam HD start and stop automatically?

Yes. SmartyCam HD offers different logics for starting and stopping video recording. Acceleration or speed can be used to trigger when to start/stop. You can set your preferences using SmartyCam HD keyboard.



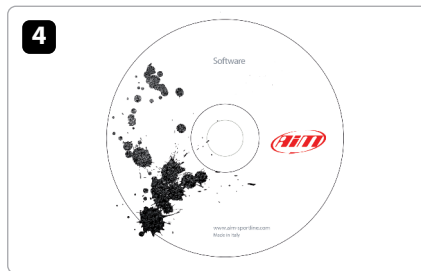
SmartyCam HD kit includes:

- 1** - SmartyCam HD
- 2** - External CAN Cable or
- 3** External power cable
- 4** - 110/220v Battery Charger with AC power adapter
- Software RaceStudio2 CD



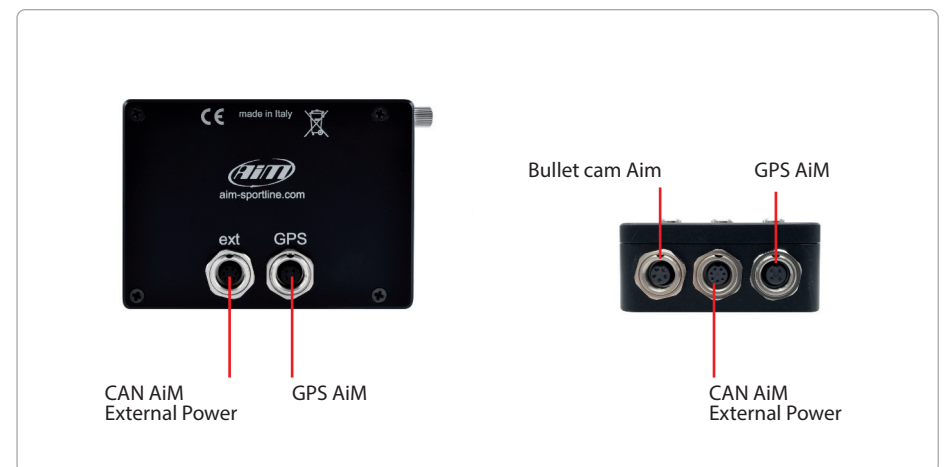
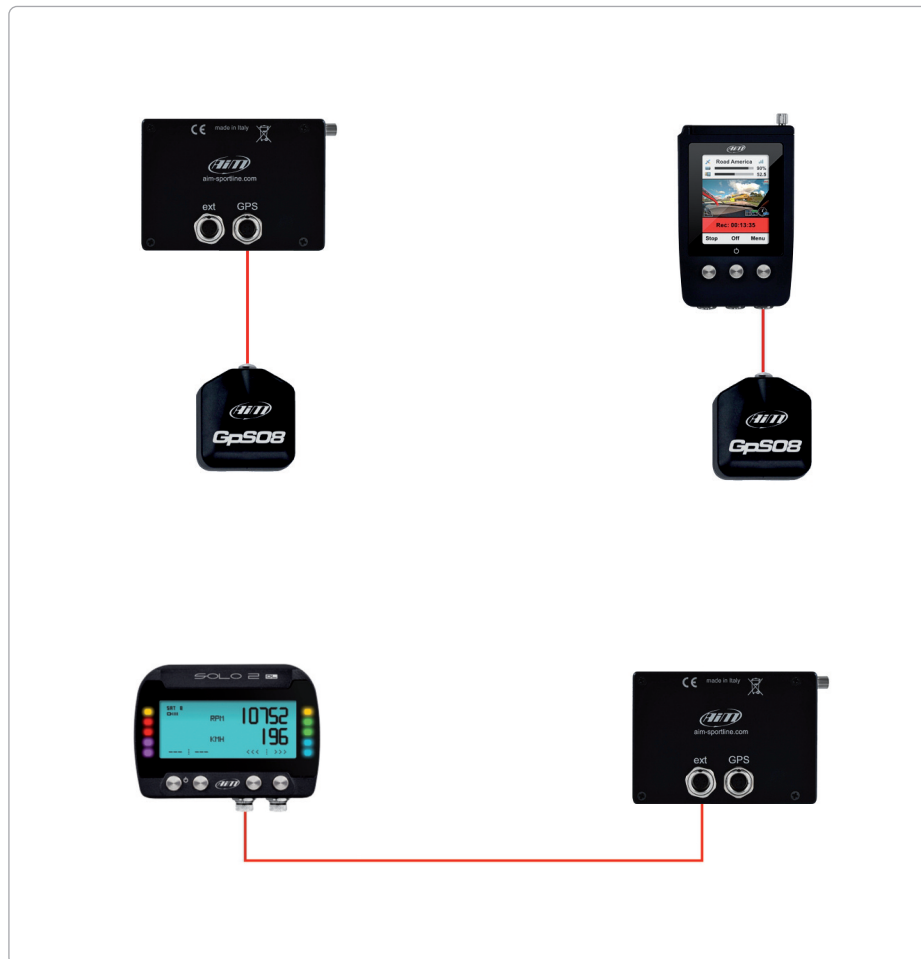
SmartyCam GP HD kit includes:

- 1** - SmartyCam HD
- 2** - External CAN Cable or
- 3** External power cable
 - 110/220v Battery Charger with AC power adapter
- 4** - Software RaceStudio2 CD
- 5** - Bullet



2. SmartyCam HD connections

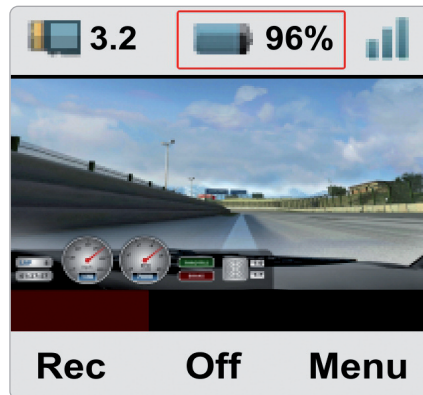
In addition to AiM GPS you find in SmartyCam HD kit, the video recorder can be connected to an AiM CAN network using one or more Data Hub. The images below show some examples of connection.



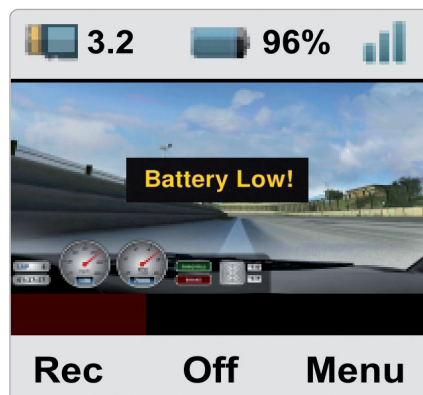
3. SmartyCam HD powering, battery charge, ON/OFF

SmartyCam HD and GP HD can be powered by the internal Lithium ion battery or by an external power source using one of the cables indicated in the kit.

The internal lithium ion battery duration changes according to the version you bought. SmartyCam HD can record up to 1.5h while SmartyCam GP HD can record up to 1h and the battery level is always shown on the display.



When battery level is too low a warning message appears for a few seconds on the display, the video itself closes and SmartyCam HD shuts down.



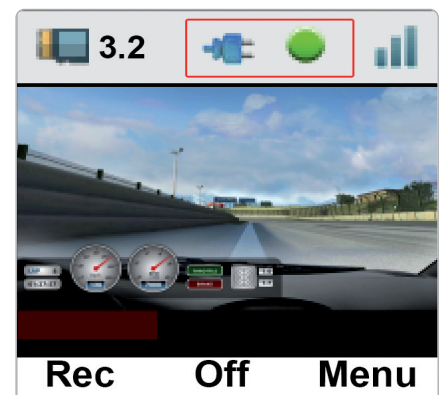
Once your session is over, please remember to always charge the battery using the battery charger you find in the kit.



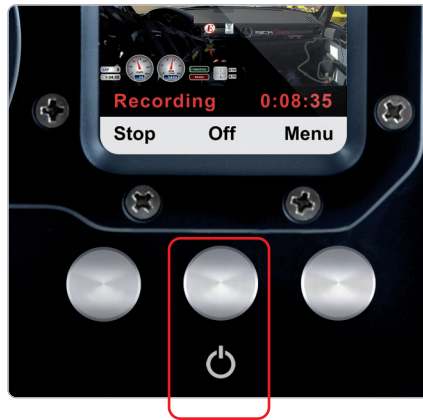
Battery can also be charged through the PC USB port plugging the USB connector you find in the kit in SmartyCam HD USB port. and in the PC one The LED you find right of the USB plug is red when battery is charging and turns green when the battery is fully charged.



If SmartyCam HD is powered by an external 12V power source or by AiM CAN network a plug icon is shown on the display and the video recorder works in a fully automatic way switching ON/OFF with the external power. Meanwhile the internal battery too is charged and the bubble right of the plug changes its colour according to the battery charge level. When the battery is fully charged the bubble comes green.



SmartyCam can be switched ON/OFF using the central button. The system asks for confirmation.



It is also possible to set an automatic shut down after a period of inactivity.

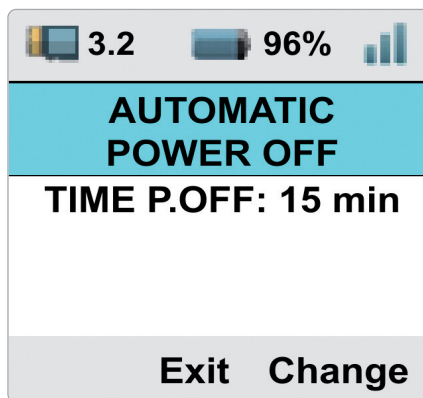
To do so follow this path:

“MENU>>Settings>> AUTO PWR OFF”

Available options are:

- 5 min
- 15 min
- 30 min (default value)
- h
- 2 h
- 3 h

Please note: ONLY in case the recorder locks up you can switch it off pressing the central button for 10 seconds.



4. SD card management

SmartyCam HD comes can support up to 128 GB SD card.

Its housing is closed by a metal screw you need to carefully screw after insertion.

Moreover, SmartyCam HD features an useful microswitch that detects when the slot is open and automatically closes the video in less than one second, allowing you to safely remove the SD card.



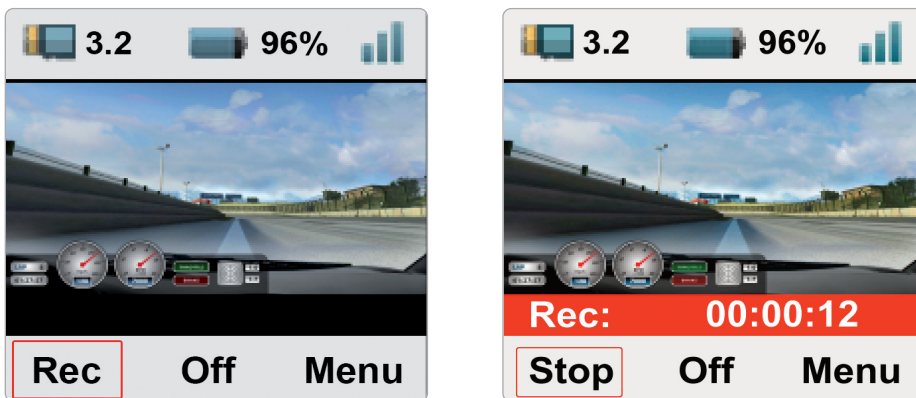
5. SmartyCam HD Start/Stop recording

SmartyCam can start/stop recording in three ways:

- manually
- automatically in standalone mode
- automatically in slave mode

5.1 Manual Start/Stop recording

To manually start recording press SmartyCam HD left button. It will turn to "Stop": press it to stop recording.



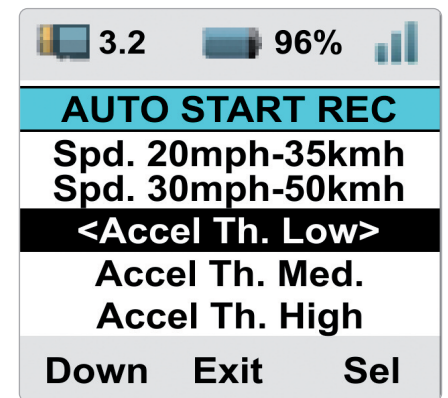
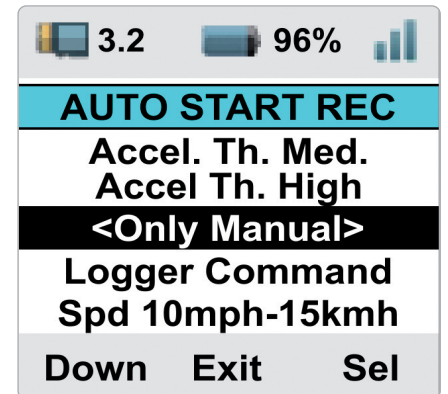
In case you want this start/stop recording mode to be set as permanent – to say also if SmartyCam HD is connected to an external power source – set it following this path:

"MENU ->SETTINGS ->AUTO START REC ->Only Manual".

5.2 Automatic Start recording in standalone mode

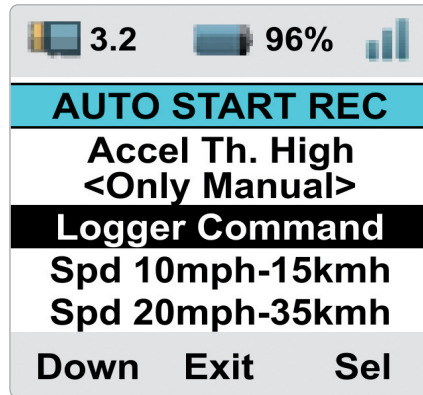
If SmartyCam HD works in standalone mode, you can use its internal three axis accelerometer to set start/stop recording function. This way you can make SmartyCam HD start recording according to set speed and acceleration threshold (Th.) values. Follow this path: "MENU ->SETTINGS ->AUTO START REC" and select among these options:

- Spd 10mph-15kmh
- Spd 20mph-35kmh
- Speed 30mph-50kmh
- Accel Th. Low
- Accel Th. Med
- Accel Th. High



5.3. Automatic start in slave mode

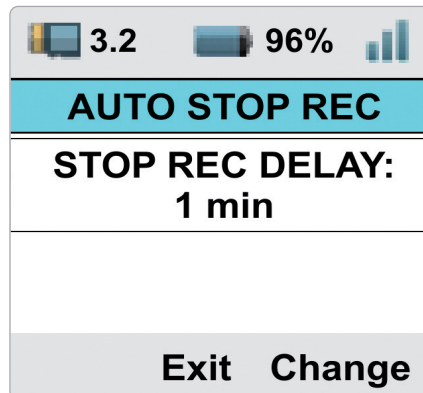
If SmartyCam HD works in slave mode (connected to an AiM logger) you can set it to start recording when the logger gives the signal. Follow this path: "MENU ->SETTINGS ->AUTO START REC -> Logger Command". This is default setting.



5.4. Automatic Stop in standalone/slave mode

Setting SmartyCam HD start recording as automatic, stop recording is automatic too. This way SmartyCam HD stops recording after a fixed time of inactivity (standalone mode) or after a fixed time period from logger "Stop recording" command. Follow this path: "MENU ->SETTINGS ->AUTO STOP" and select among these options:

- 5 sec
- 10 sec
- 1 min
- 2 min
- 5 min

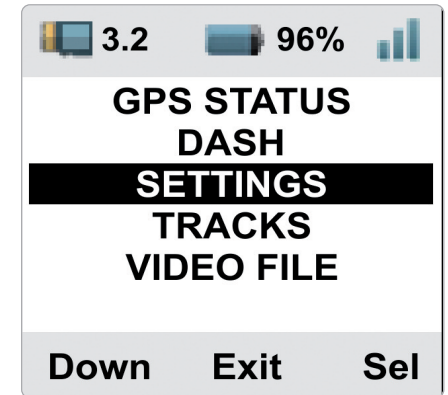


6. SmartyCam HD MENU

SmartyCam HD can be set mainly via the bottom keyboard. Pressing "MENU" you reach this page:

Available options are:

- GPS STATUS
- DASH
- SETTINGS
- TRACKS
- VIDEO FILE



6.1. GPS Status

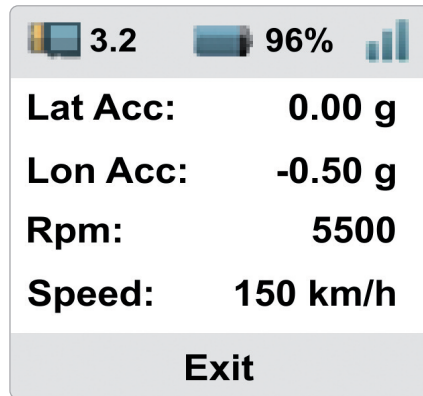
Shows the number of connected satellites with the related signal level.



6.2. Dash

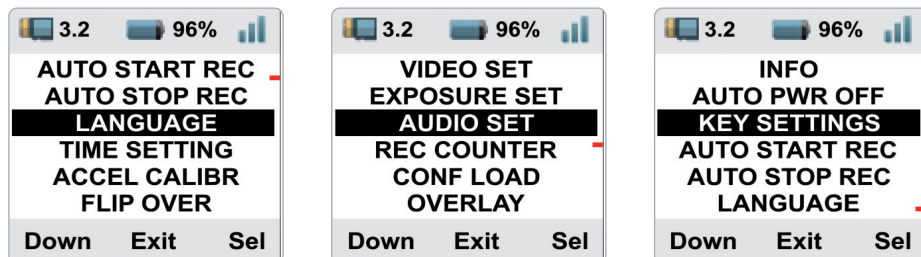
It shows:

- Lateral acceleration
- Longitudinal acceleration
- RPM value
- Speed value



6.3. Settings

This option takes you in a page with multiple options that allows you to set some parameters, select some settings etc.. The list is shown in a circular way.



6.3.1 Language

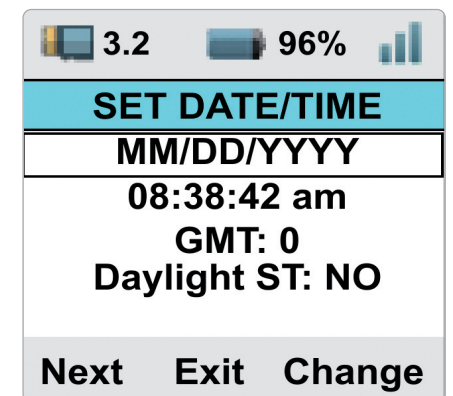
Is the first option to set at very first start. Available options are:

- English (default setting)
- Italian
- French
- Spanish
- German
- Portuguese
- Dutch
- Japanese

6.3.2 Time Setting

Here you can set SmartyCam HD Date and Time format as well as GMT option; you can also enable/disable Daylight saving time option.

Use "CHANGE" button to switch among the option of each function and "Next" button to scroll the functions.



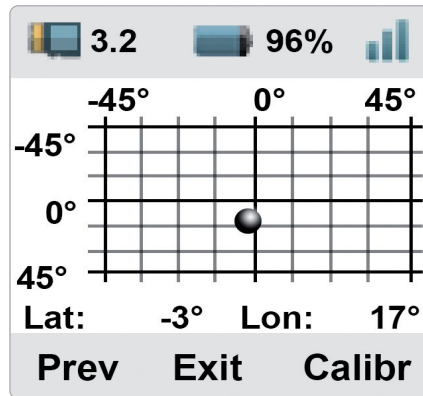
6.3.3 Accel Calibr

Allows you to set the internal three axis accelerometer.

Please note: the three axis accelerometer is internal to SmartyCam HD while in SmartyCam GP HD is in the bullet cam.

To calibrate the accelerometer:

- installl SmartyCam HD and the bullet if the case
- fix it in the position you prefer
- switch it on
- reach this page and press "Calibr".



6.3.4 Flip over

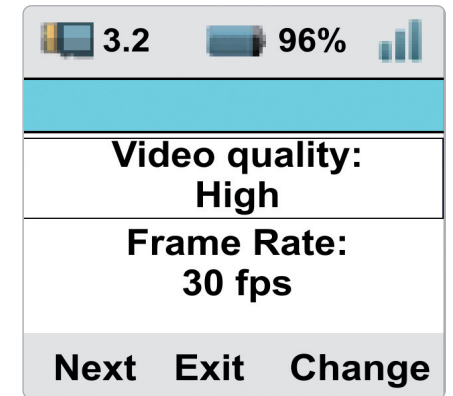
This option allows you to flip over the video and is very useful in case SmartyCam HD is installed upside down on a roll bar; available options are:

- normal
- reverse

6.3.5 Video set

Her you can set SmartyCam Video output:

- Video quality: High (default), low, normal
- Frame rate: 30 (default), 25 or 15 fps (frames per second)



6.3.6 Exposure set

This option is very useful in case SmartyCam HD is installed in a closed vehicle.

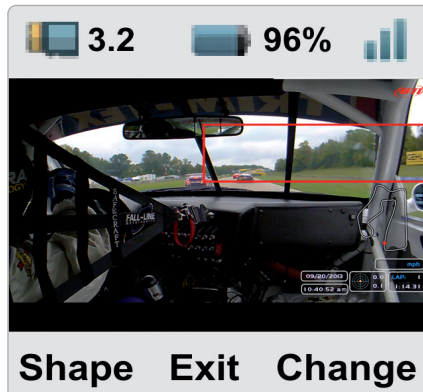
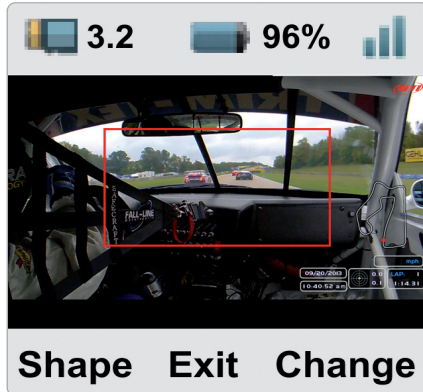
Available options are:

- Open Cockpit vehicle (default)
- Close Cockpit Vehicle.

Setting **Open cockpit** vehicle no further setting is needed.

Setting **“Close Cockpit Vehicle”** you can decide which part of the shot is to be used as reference to set video light exposure. With reference to the images below:

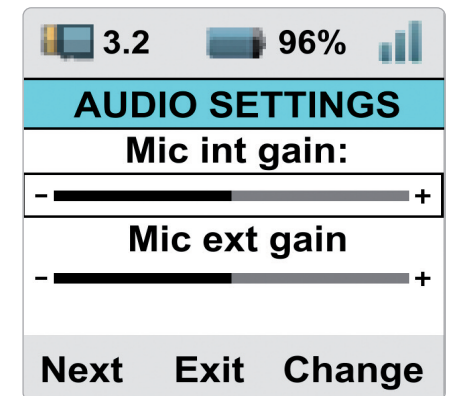
- use “Shape” button to resize the part of shot to be used (red rectangle in the images below)
- use “Change” button to displace the red rectangle
- use “Exit” button to save and exit



6.3.7 Audio set

SmartyCam HD comes with an internal microphone but you can buy an optional external one. This page allows you to set both microphones.

- Use “Change” button to set the gain
- Use “Next” button to switch between internal and external microphone
- use “Exit” button to save and exit



6.3.8 Rec Counter

This page shows you the number of recording of your SmartyCam HD. Press reset to reset it.

6.3.9 Conf Load

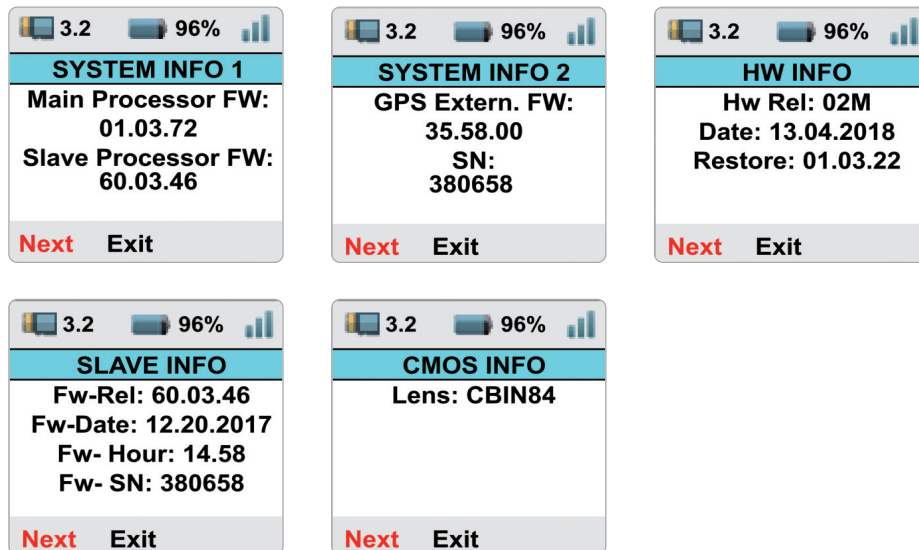
Here you find a list of all the configurations you transmitted to SmartyCam HD and you can load the one you prefer.

6.3.10 Overlay

In this page you can enable/disable the overlay of your SmartyCam HD configuration. Default setting is enabled.

6.3.11 Info

Here you find 5 pages showing all info about your SmartyCam HD processors and GPS Firmware, Hardware, CMOS etcetera. Press “next” to switch from one page to the other. They are shown in loop mode.



6.3.12 Auto Power off

See SmartyCam HD power, battery charge, ON/OFF chapter (chapter 3).

6.3.13 Key Settings

Here you can decide whether disabling (default setting) or not SmartyCam HD keyboard during recording. Use “Change” button to enable/disable.

6.3.14 Auto Start REC and Auto Stop REC delay

See SmartyCam HD Start/Stop recording chapter (chapter 5).

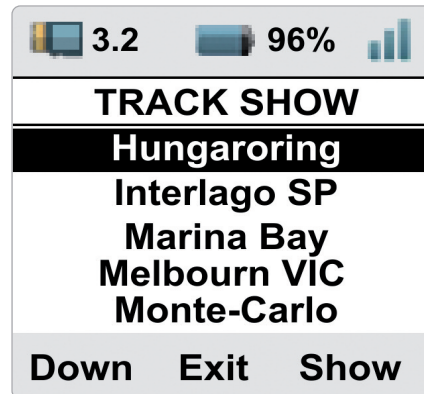
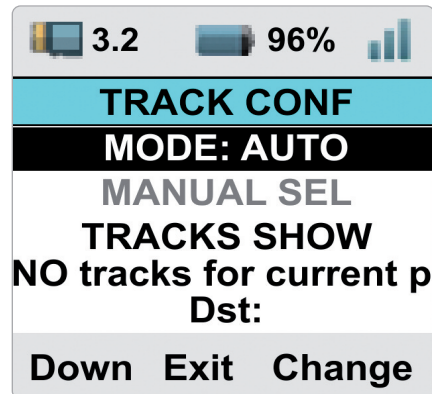
6.4 Tracks

SmartyCam HD can manage tracks in two ways: automatic (default) and manual. Using “Change” button you can switch between the two options.

In **AUTO** mode SmartyCam HD can detect if a known track is available in a 10 km area, shows its name and the distance from current position (Dst)

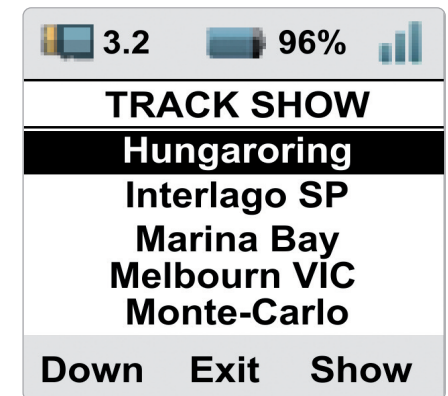
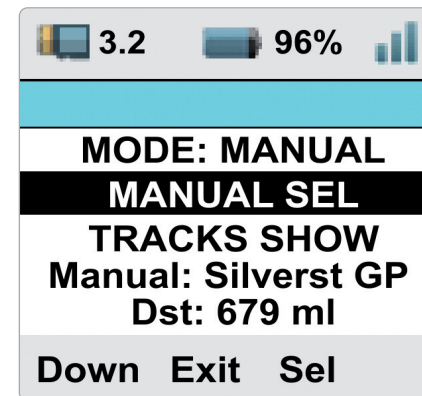
In case no track is available this message will be shown on SmartyCam HD screen: “NO track for current position, download it” (left image below).

Using “Down” button you can reach “TRACK SHOW” option; “Change” button will then switch to “Sel” and pressing it all Tracks transmitted to SmartyCam HD will be shown (right image below). Pressing “Show” button the track map is shown; pressing it again tracks start/finish line coordinates are shown.



To switch to **MANUAL** mode press “Change” in Auto mode and “MANUAL SEL” enables. If a track has been selected it will be shown with the related distance from current position (Silverstone GP, 679 miles away in the left image below). To select another track press “Sel” and the list of all track loaded in your SmartyCam HD will be shown.

Scrolling to “TRACKS SHOW” and pressing “Sel” the list of all tracks loaded in SmartyCam HD is shown; pressing “Show” the track map of the selected track (Silverstone in the example) is shown; pressing it again start/finish coordinates of the track are shown.



6.5 Video file

This page shows the list of video file stored in SmartyCam HD SD card. Press “Del” to delete them.

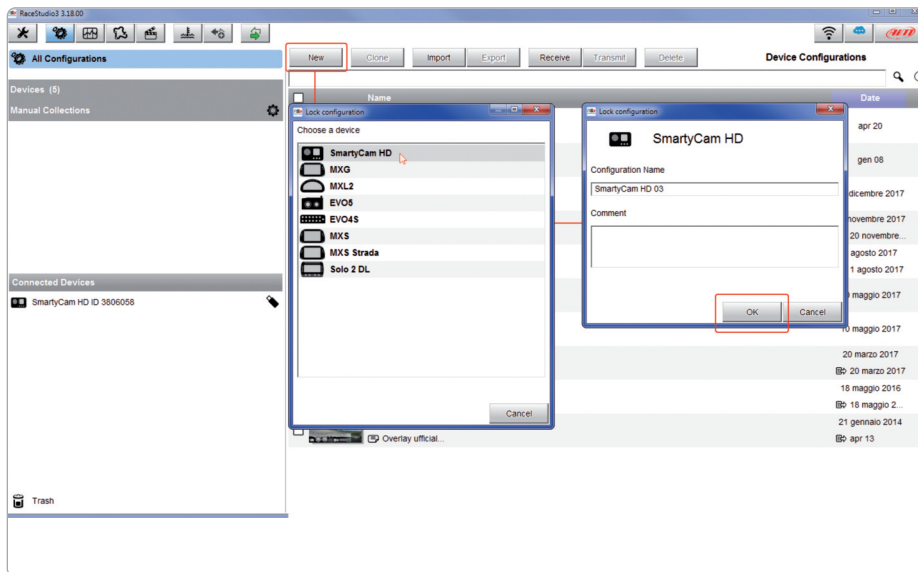
7. SmartyCam HD and the PC

Using AiM Race Studio 3 software you can configure your SmartyCam HD overlay, see SmartyCam Video and check other device functions.

7.1 SmartyCam HD configuration

To configure SmartyCam HD:

- run Race Studio 3 software
- select an existing configuration to modify it or press “NEW” to create a new one
- “New configuration” panel appears
- select “SmartyCam HD”
- SmartyCam HD configuration panel appears: fill in configuration name and press OK



The software comes to SmartyCam HD configuration page. Here you can decide which graphic items you want to place on the video. On **the right of the page** they are grouped by sets. Just drag and drop them in the preview window left of the page.

You can also load track maps and logos (layer label in red in the image below)

As you place the graphic items on the window the related control panel appears **left bottom** the preview window allowing you to set all parameters.

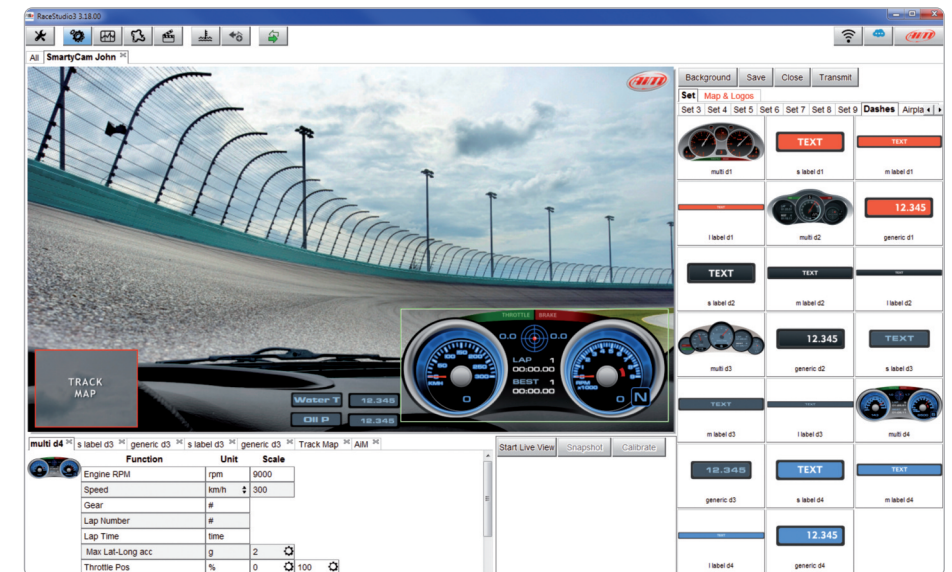
The **box right of the control panel** allows you to: start Live view of SmartyCam HD shot; once live view started you can

- take a snapshot of the screen
- calibrate SmartyCam HD accelerometers

To add maps and logos drag and drop map and logo graphic item from the related layer in the preview window; using “Add new Logo” button you can load your logo and then drag and drop it in the preview window.

Once all graphic items placed press “Transmit” button on the top right keyboard and the configuration is transmitted to SmartyCam HD.

Please note: if you are using SmartyCam HD in slave mode **remember** to match channels received by AiM logger with channels shown by SmartyCam HD overlay as explained in any AiM logger user manual.



7.2 Track Management

Track Manager is the Race Studio 3 section dedicated to tracks management. Here is possible to create and delete new tracks, modify the settings, transmit and receive them to/from the AiM devices. To access, press the "Tracks" icon on Race Studio 3 top left keyboard.



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, "SmartyCam HD ID 3806058")

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.

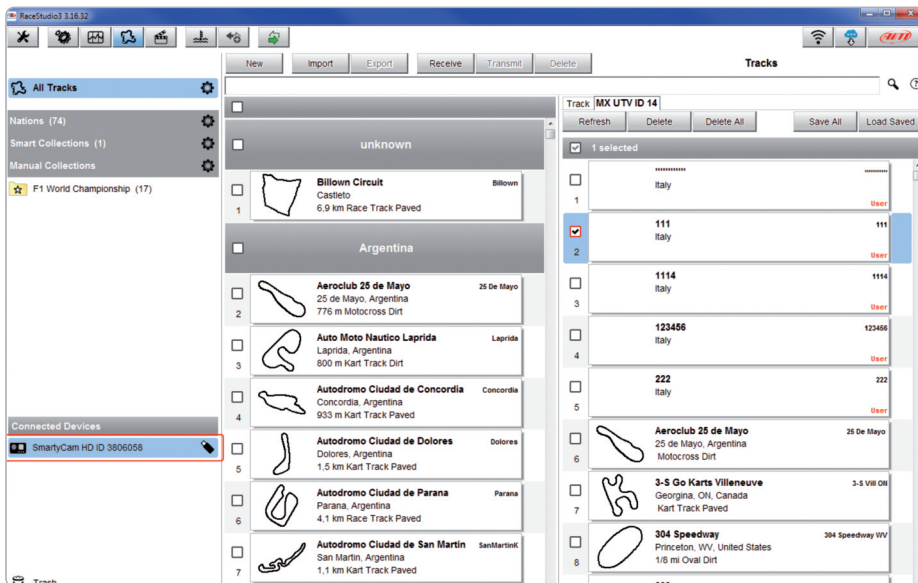
The column on the **Right** shows:

- the data sheet of the track you are mousing over.

When your SmartyCam HD 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 page keyboards are used to manage the tracks.

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



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

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



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

Please note: for further information about Race Studio 3 Track Management you can visit our website www.aim-sportline.com documentation area, software/firmware section where a Track Manager manual is available.

7.3 Video Management

Once your track session is over you can review SmartyCam HD video on your PC. They are recorded in “.mov” format with H264 compression codec. To view them on your PC:

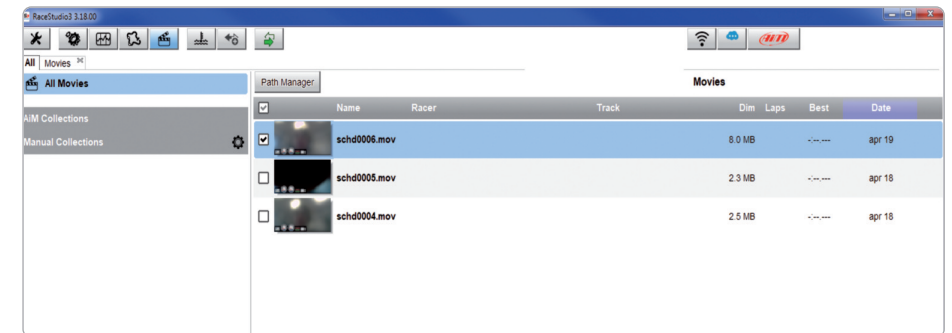
- remove SD card from SmartyCam HD
- place it in the PC SD Card slot and manage it as an USB peripheral
- press “Video” button on Race Studio 3 top left keyboard



In the page that shows up press “Path Manager” button and browse the PC to find your SD Card and load SmartyCam HD Videos.

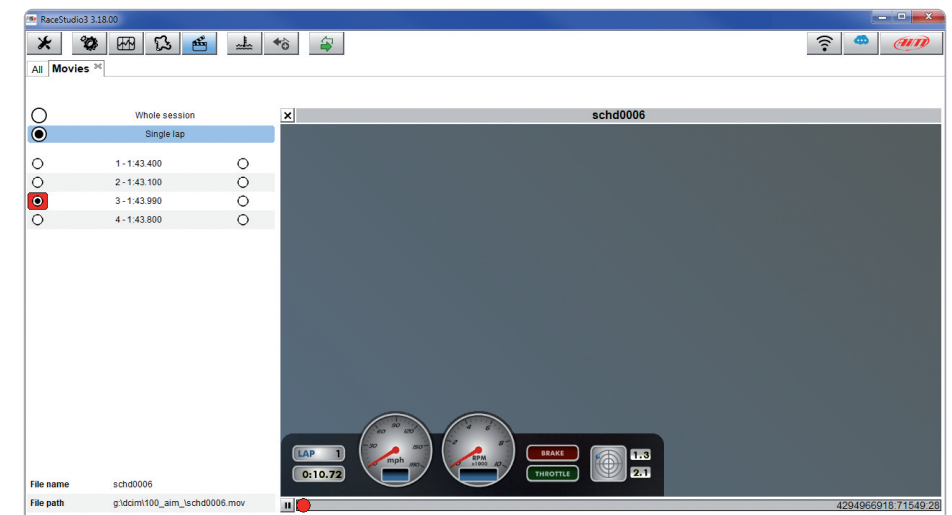


Video page shows up: select the video you want to see.



Once the video opens you can decide to see:

- whole session or
- one single lap as in the example below and then select the lap you want to see.



8. SmartyCam GP HD



If you have a Formula car or a bike or in any situation where SmartyCam is not so comfortable to install, here is the version with remoted bullet-cam: SmartyCam GP HD Rev. 2.1.

Same video quality, same connections to AiM Loggers, same features but a completely different look.

It is in black anodized aluminum, billet machined with a light, robust and really small bullet-Camera.



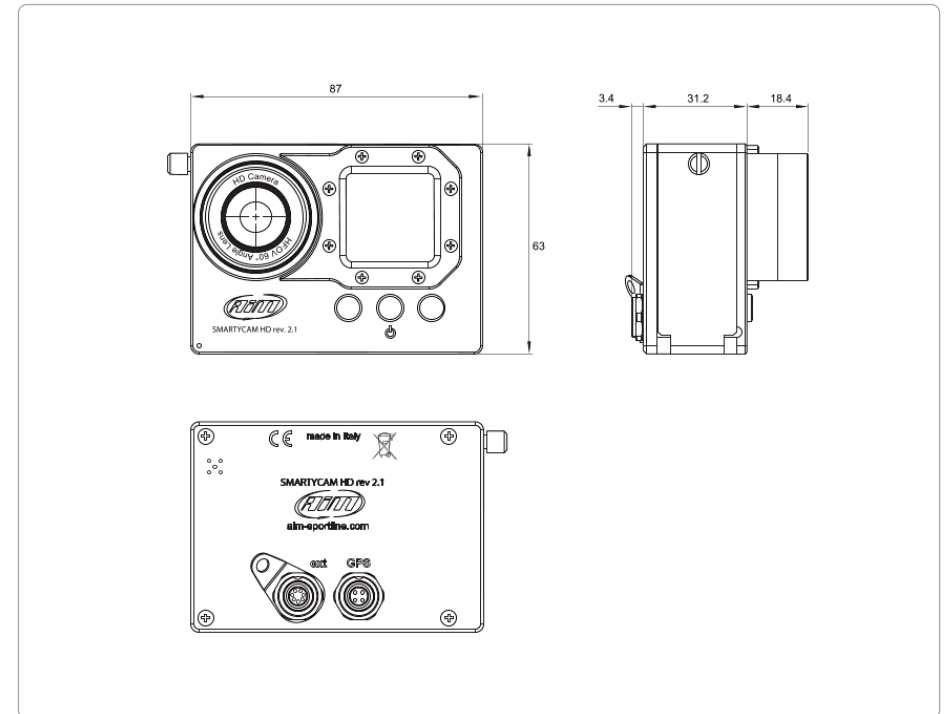
SmartyCam GP HD Rev. 2.1 is very flexible: you can add optional modules to fit your needs, like ECU Bridge to connect it to the Engine Control Unit, GPS, or the external microphone.



9. Technical specification and drawings

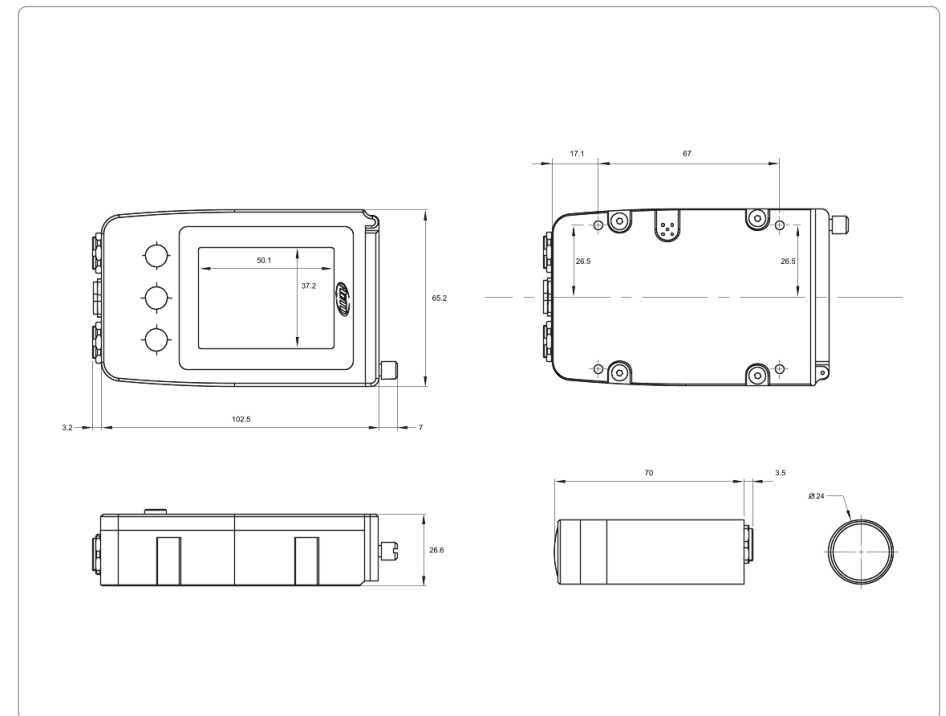
Smartycam HD rev. 2.1

| | |
|-----------------------------|---|
| - Video format | H.264 -1280 x 720 pixel @ 30fps |
| - Display resolution | 128x128 pixels |
| - Lens | Telecentric with 6 elements |
| - Field of view | 67° - 84° |
| - Internal battery | Rechargeable Lithium battery 1.950 mAh |
| - Battery charge | 700 mAh 12V |
| - Internal battery duration | 120 - 150 min. of recording |
| - External power | 9 -15 Volt |
| - Supported SD card | Up to 128 GB |
| - Memory required | 1.5 GB (1 hour low quality recording) 2 GB (1 hour medium quality recording) 4 GB (1 hour high quality recording) |
| - Accelerometer | Three-axial $\pm 5G$ |
| - Working temperature range | -10°C/+60°C |
| - Auto Power On/Off | Yes, if connected to an AiM logger |
| - Auto Power Off | Yes |
| - Auto Start/Stop Recording | Yes |
| - Body | Anodized Aluminum |
| - Dimensions | 87x63x49mm |
| - Weight | 280g battery included |
| - Waterproof | IP67 |

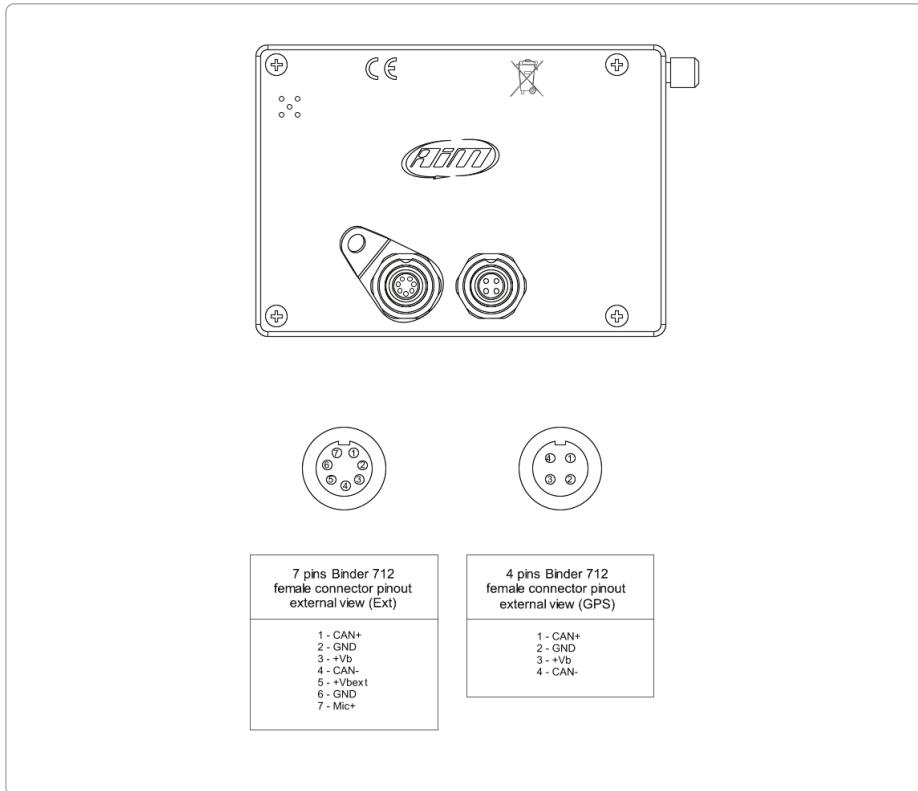


Smartycam GP HD rev. 2.1

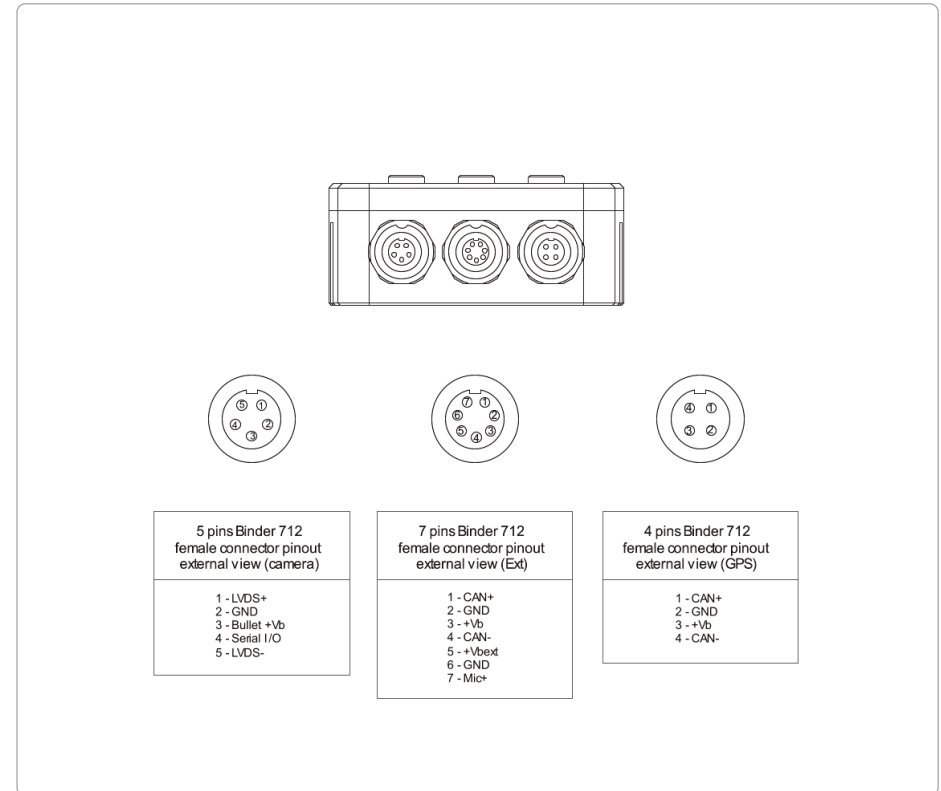
| | |
|-----------------------------|---|
| - Video format | H.264 -1280 x 720 pixel @ 30fps |
| - Display resolution | 2,4" 240x320 pixel |
| - Lens | Telecentric with 6 elements |
| - Field of view | 67° - 84° |
| - Internal battery | Rechargeable Lithium battery 1.040 mAh |
| - Battery charge | 700 mAh 12V |
| - Internal battery duration | 60 - 70 min. of recording |
| - External power | 9 -15 Volt |
| - Supported SD card | Up to 128 GB |
| - Memory required | 1.5 GB (1 hour low quality recording) 2 GB (1 hour medium quality recording) 4 GB (1 hour high quality recording) |
| - Accelerometer | Three-axial $\pm 5G$ |
| - Working temperature range | -10°C/+60°C |
| - Auto Power On/Off | Yes, if connected to an AiM logger |
| - Auto Power Off | Yes |
| - Auto Start/Stop Recording | Yes |
| - Body | Anodized Aluminum |
| - Dimensions | Main box: 102.5x65,2x26,5mm Bullet camera: 24mm - lenght 73,5mm |
| - Bullet cable | 0,5 - 1,0 - 1,5 - 2,0 m |
| - Weight | Main unit: 260g battery included - Bullet camera 55g |
| - Waterproof | IP67 |



Smartycam HD rev. 2.1 pinout



Smartycam GP HD rev. 2.1 pinout





Our web site aim-sportline.com is constantly updated.

Please, constantly check it and download the last versions of the firmware of your products.

