



## AI Connected Dashcam

### DC-204-AI Series



**DC-204-AI(UK/EU)(7477)**

**DC-204-AI(NA)(7487)**

## Installation and Operation Guide

Please refer to [www.brigade-electronics.com](http://www.brigade-electronics.com) for the latest version of this document



## Table of Contents

1	Introduction to DC-204-AI Series	3
1.1	Product Features	4
2	Kit Contents	4
2.1	DC-204-AI(XXXXX)	4
2.2	Accessories	4
3	Hardware Installation	5
3.1	Product Perspectives	5
3.2	DC-204-AI(XXXXX) Connection diagram	5
3.3	Micro-SD Card and SIM Card Installation	6
3.4	Installation of DC-204-AI	7
3.4.1	Preparation	7
3.4.2	Selection of Dashcam Installation Area	8
3.5	Installation of Dashcam Bracket	9
3.6	Installation of Dashcam	10
3.7	Calibration	11
3.7.1	Critical Measurements	11
3.7.2	Testing Left and Right Indicators Connections	12
3.7.3	Auto-Calibration	13
4	Dashcam Settings and Parameters (Preference)	14
4.1	Basic Setup	14
4.1.1	Regist Info	14
4.1.2	Time Setup	14
4.1.3	Startup	15
4.1.4	User Setup	17
4.1.5	Network	18
4.1.6	Application	21
4.1.7	Voice Setup	22
4.1.8	FaceCompare	22
4.2	Surveillance	22
4.2.1	Live View	22
4.2.2	Record	22
4.2.3	IPC Setup	26
4.2.4	Camera Setup	26
4.3	Collection	26
4.3.1	General	26
4.3.2	Snap Setting	28
4.4	Alarms	29
4.4.1	Base	29
4.4.2	Video	32
4.4.3	Advanced	34
4.4.4	AI App	35
5	Other Operations	39
5.1	Upgrade	39
6	Appendices	39
6.1	Button Usage	39
6.2	Storage Calculator	40
6.3	Audio Alerts Content	40
7	Approvals	41
8	Glossary	42
9	Disclaimer	43

# 1 Introduction to DC-204-AI Series

Brigade's DC-204-AI Series are AI Connected Dashcams designed to record and playback various channels. Two channels are built into the dashcam: the road facing Advance Driving Assistance System (ADAS) camera and the driver facing Driver Safety Cockpit (DSC) camera.

The system uses Analog High Definition (AHD) television system. The resolution can be CIF, WCIF, HD1, WHD1, D1, WD1, 720P, 960P, 1080P or 1920P. 1920P is for the road facing ADAS camera only. Information related to recording parameters, alarms and trigger status can be recorded along with speed, location, and G-Force data. In addition, data related to the unit itself such as voltage are recorded and plotted graphically in MDR Software (MDR-Dashboard and MDR-Player). This information is called metadata.

Recordings can be searched, viewed, and exported (clipped and saved locally) using MDR-Dashboard software. This allows users to access all the vehicle's travel information, including route tracking. Recordings can be easily exported in three different formats:

1. **MP4** format: in this format the file is playable by consumer media players.
2. **Standard** format: when the footage is clipped, a folder structure is created which contains the video files in the original native proprietary format clips which can only be viewed using MDR-Dashboard/MDR-Player.
3. **Export** format: This creates a password protected executable (.exe) file with MDR-Player embedded in it.

The storage units for the AI connected dashcam are two micro-SD (Secure Digital) cards. They are set in the loop recording mode as default which means that both micro-SD cards record as mainstream and there is no back-up however, they have more storage capacity than if the recording mode were to be set to mirror recording mode. The mirror recording mode can also be set for the micro-SD cards, in this mode one micro-SD card is used for mainstream and the other for sub-stream recording. Mainstream is the main storage micro-SD card (slot 1 at the top see section 3.3) and sub-stream micro-SD card (slot 2 at the bottom, see section 3.3) acts as a back-up just in case something goes wrong with the main storage (mainstream) micro-SD card but mirror recording mode does not have as much storage capacity as the loop recording mode because the recordings are duplicated, see section 4.2.2.1 for details. The SD card stores video data and frame information only in chosen image resolution and frame rate. The standard micro-SD card availability that comes with the AI connected dashcam is 2x 128GB, however, 2x 256GB are available as optional parts.

**Note: Only micro-SD cards supplied by Brigade Electronics PLC are to be used.**

Mobile network and Wi-Fi settings found in this manual relate to all models currently available.

AI Connected Dashcams require connection to the server through mobile network therefore users are advised to subscribe to the Brigade Electronics BRIDGE Services to have access to the full capability of the device and benefit from seamless over the air firmware updates and unlimited access and monitoring of vehicle to which the dashcam is installed. The device comes with a SIM pack which details how to connect to BRIDGE Services.

Firmware upgrades and video exports can all be done through wireless connection to the MDR-Dashboard in server mode.

It is imperative that Brigade AI connected Dashcams are fitted and commissioned by competent and trained technicians. The installers are responsible for the correct setup of the overall system and must adhere to relevant regulations and legislation.

Table 1: Description of DC-204-AI Series Models

#	MODEL	NUMBER OF CHANNELS	MAINSTREAM CAPACITY	SUBSTREAM CAPACITY	GPS	MOB. NET	WI-FI
(1)	DC-204-AI(UK/EU)	2	128GB	128GB	✓	✓	✓
(2)	DC-204-AI(NA)	2	128GB	128GB	✓	✓	✓

**Warning: Prior to attempting the system setup, please ensure the DC-204-AI Series Installation & Operation Guide is thoroughly read and understood. Brigade Electronics PLC are not responsible for any failures due to incorrect installation or operation.**

**Ensure your anti-virus software has exclusions in place to allow the MDR software package to function properly.**

There is the need to download and install the MDR SmartController app on the installer's mobile device because this app is needed to calibrate the dashcam and the vehicle will need to be moved for the calibration process to be completed. See section 0 for detailed information.

## 1.1 Product Features

- Ultra-wide 140° Diagonal Field of View (DFOV) road facing ADAS lens, supporting up to 1920P HD video recording.
- Ultra-wide 170° DFOV driver facing DSC lens, supporting up to 1080P HD video recording.
- 2x 128GB dual-Micro SD card storage, supporting the simultaneous storage of mainstreams and sub-streams.
- Built-in Wi-Fi, 4G communication module, and inertial navigation positioning module.
- AES256 encryption for video/audio data, encryption protocol TLS1.3 for data transmission.
- 4-channel IO input and 1-channel RS232.
- Compact design, not affecting the driver's sight regardless of vehicle size.
- Built-in ADAS function, supporting lane departure warning (LDW), forward collision warning (FCW), and headway monitoring warning (HMW).
- Built-in DSC function, supporting the detection of unsafe driving behaviours.
- Individual channel configurations for recording resolution, frame rate and quality.
- Operation log files for troubleshooting.
- Built-in 6-axis G-Sensor.
- Pre-alarm recording 1 to 60 minutes and post-alarm recording 1 to 30 minutes.
- Video quality selectable at 8 different levels for recording.
- Video/Audio compression H.264/H.265/ADPCM/G711U/G711A/G726.
- Normal, Alarm or Timer recording modes.
- Alarm recordings configurable for trigger, speed, G-Force, video loss, blind detection, panic button and AI alerts.
- Low voltage protection with shut-down delay and minimum restart voltage.
- Ignition (shutdown) delay configurable from 0 seconds to 24 hours.
- Operating Voltage 9V-36V.
- Power Consumption
  - standby mode:13.5V@5.67mA, 27V@3.39mA
  - sleep mode (4G and MCU powered):13.5V@62~124mA, 27V@32~61mA
  - Typical power consumption (with dual SD cards installed and SIM card for dialling): 7.56W

## 2 Kit Contents

### 2.1 DC-204-AI(XXXXX)



4ch 1080P Connected AI Dash Camera  
(UK/EU / North America)

### 2.2 Accessories



2 x128 GB Micro SD Card  
DC-204-AI-128GB-MSD



Power Lead  
DC-204-AI-PL-01



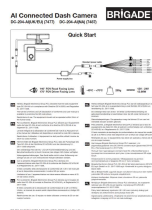
Bracket Assembly  
DC-204-AI-B-01



Power Box with cable  
DC-204-AI-PB-01



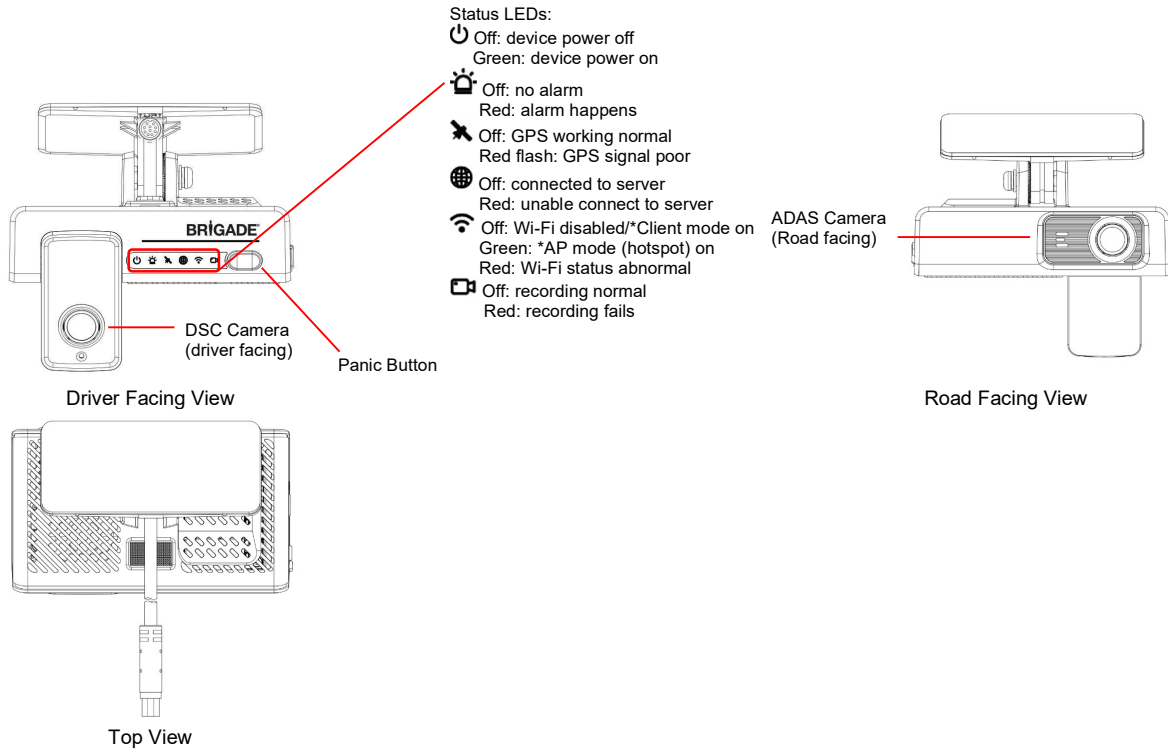
Torx Driver (T6)  
DC-204-AI-TD



DC-204-AI-QSG Link Card  
QR-QSG

### 3 Hardware Installation

#### 3.1 Product Perspectives



\*Note: See Section 4.1.5.3 for detailed description of Wi-Fi's Client mode and AP Mode.

#### 3.2 DC-204-AI(XXXXX) Connection diagram

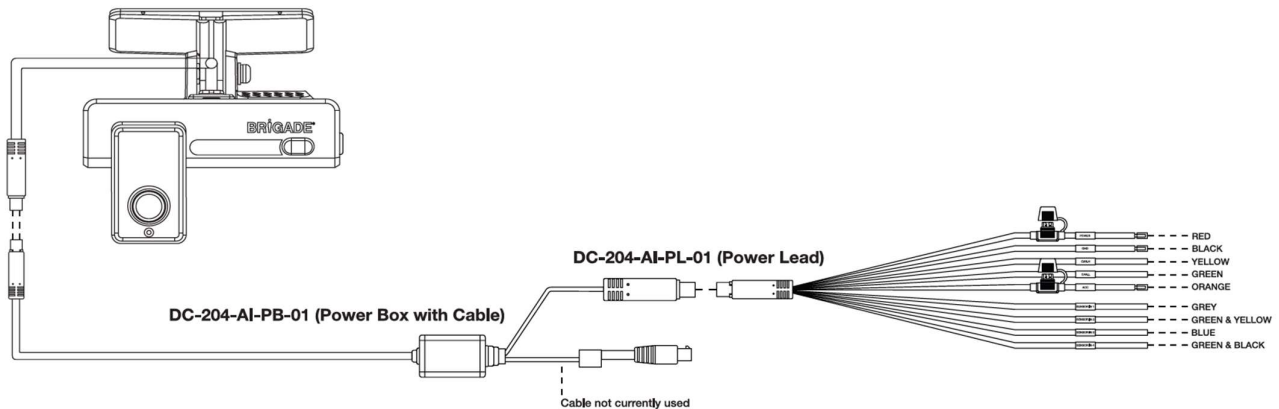


Table 2: Description of Power Lead wires

No.	Colour	Signal Name	Description
(1)	Red	Power	Vehicle power suitable for +12V/+24V vehicles.
(2)	Black	GND	0V - vehicle ground
(3)	Yellow	CANH	For future use when CAN functionality is available and should be electrically isolated.
(4)	Green	CANL	For future use when CAN functionality is available and should be electrically isolated.
(5)	Orange	ACC	Ignition
(6)	Grey	Sensor 1	Trigger input typically for left indicator signal
(7)	Green & Yellow	Sensor 2	Trigger input typically for right indicator signal
(8)	Blue	*Sensor 3	Trigger input: can be used for reverse or **privacy feature
(9)	Green & Black	*Sensor 4	Trigger input: can be used for reverse or **privacy feature

**Notes:**

- \*If not in use, isolate electrically.
- \*\*See section 4.4.2.3 for details.

### 3.3 Micro-SD Card and SIM Card Installation

*Note: It is strongly recommended that the Micro-SD cards and the SIM card be inserted into the dashcam before the unit is powered and before installation of dashcam to vehicle.*



- Step 1: turn off the device.
- Step 2: use torx driver loosen the screw.
- Step 3: Open the latch.



#### Micro SD Card Installation:

Note 1: Install micro-SD card into the slot. Each device supports two micro-SD cards.

Note 2: Ensure that you insert the micro-SD cards in the direction depicted for each slot. Push the micro-SD cards into the slots and wait for the "click" sound which indicates that they are inserted properly.



#### SIM Card Installation:

Note 1: Ensure that you insert the SIM card in the direction depicted beside it slot.

Note 2: Device must be turned off before installing the sim card, else it will be unable to dial up.

**Micro-SD Card and SIM Card Installation Figure 3**

## 3.4 Installation of DC-204-AI

### 3.4.1 Preparation

It is recommended that the installer reads and understands this installation and operation guide before commencing the installation process. This will ensure that the dashcam is installed in the correct position during the first attempt to fit the dashcam to the vehicle. The Dashcam fits to the windshield using an adhesive tape which could be difficult to remove if the dashcam is positioned wrongly. **It is strongly recommended that the installer adheres to the positioning requirements recommended in section 3.4.2.**

#### 3.4.1.1 Kit and Tools

The AI Connected Dashcam kit content mentioned in section 2 is needed. The device requires connection from the power lead to vehicle battery for power, to ignition with the ACC wire and to left indicator and right indicator signals with sensor 1 and sensor 2 wires respectively. These connections require standard installer tools and a smart mobile device such as tablet or smart phone. The standard installer tools include but are not limited to screwdriver kit, cable ties, steel measuring tape to measure some dimensions required to calibrate the forward facing ADAS camera, multi-meter to locate vehicle power supply, non-permanent marker for marking out the location to which the dashcam will be connected etc.

A mobile device is listed as one of the requirements because the installer needs the SmartController app to successfully install and calibrate the AI connected dashcam. The installer can download the SmartController app from the iOS or Android App store. The app is available for both Apple and Android devices, see section 3.4.2 for details on the appearance and usage of the SmartController app.

It is recommended that the AI connected dashcam be fitted by an installer who has read the Installation guide before attempting to fit the device. This is because the dashcam needs to be installed in the recommended position stated in section 3.4.2. It is advised that the installer follows the recommendations stated in this installation and operation guide.

Also, it is recommended that the micro-SD card and SIM card be inserted in the dashcam before installation, see section 3.3 for detailed instruction on how to insert them.

#### 3.4.1.2 Location of Installation

Ensure that the vehicle to which the dashcam is to be installed is parked on a levelled / horizontal surface. This will be useful when checking the dashcam positioning is correct before permanently fitting it to the windshield and is also useful during calibration.

#### 3.4.1.3 Dashcam Cable Wiring

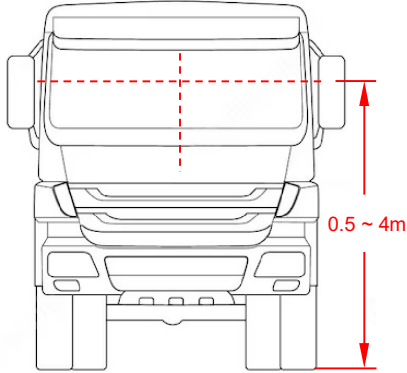
It is recommended that the installer carry out a pre-installation survey of the vehicle to which the dashcam is to be installed prior to installation to get familiar with the location of the vehicle power and other signals to make the installation go smoothly and prevent damage to the vehicle during installation and assess the position to which the dashcam is to be installed.

The power lead of the dashcam consist of wires which when connected to the vehicle provides power and other signals that are required for the dashcam to function correctly. The power lead connects to the power box which in turn connects to the dashcam as shown in the connection diagram in section 3.2. The red power wire which consists of a 3A fuse connects to the vehicle power (+12V or +24V) while the black wire connects to vehicle ground. The orange wire (ACC) which also consist of a 3A fuse connects to ignition signal, the grey wire (sensor 1) and the green and yellow wire (sensor 2) connect to left indicator and right indicator signals respectively.

### 3.4.2 Selection of Dashcam Installation Area

The device must be installed inside the vehicle cabin on the windshield. The device must be installed in a position such that the road facing ADAS camera and the driver facing DSC camera can capture correct targets; Lane lines and vehicles in front for the ADAS camera and driver's face and hand gestures for the DSC camera. Therefore, the device needs to be powered during the installation process after the cable wirings have been completed (see section 3.4.1.3) so that the installer will be able to check camera images to confirm if position is acceptable. For checking viewing images, please download Brigade SmartController App from app store first. It is available on both iOS and Android devices.

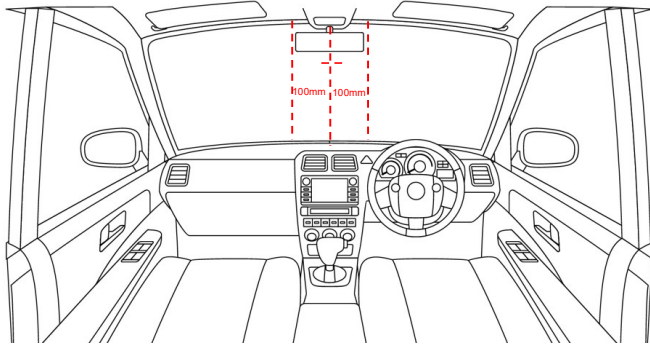
How to locate the most suitable position for the device see illustrations below:



Road facing ADAS camera positioning requirements Figure 4

For road facing ADAS camera, the position needs to follow rules below:

- 1) The dashcam must be in the centre of the windshield. Left or right 100mm offset is acceptable; this means that the distance between the centre of the front facing lens and centre of windshield must not exceed 100mm.
- 2) The height from the camera lens to the ground must within 0.5 - 4m range.
- 3) The device must be within the windshield wipers swept area to guarantee the view are always clear.



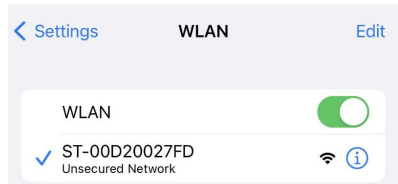
Driver facing DSC camera positioning requirements Figure 5

For driver-facing DSC camera, the position needs to follow rules below:

- 1) The camera lens must be in the centre of the windshield. Left or right 100mm offset is acceptable.
- 2) The camera view must be able to capture the driver's face and both eyes. For optimal performance the distance between camera and driver's face is recommended to be within 0.5 – 1m.
- 3) The driver's face must be in a good proportion in the camera view, not too high up which may lead to failure to detect eyes and mouth movement; not too low down which the device may obstruct drivers' view.

To confirm the position is appropriate, power on the device to check the live view on mobile devices.

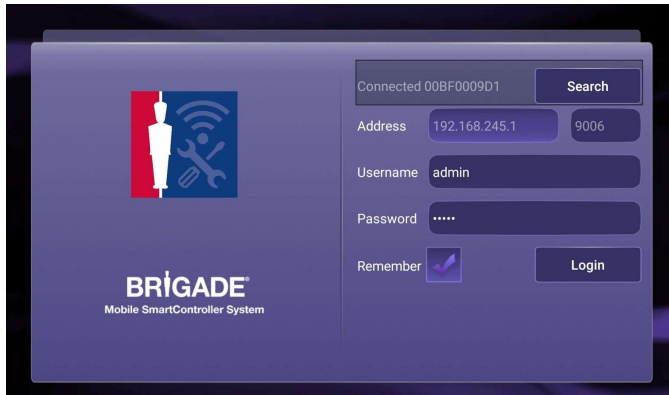
After the device is powered on, the first 3 minutes it generates a Wi-Fi hotspot which smart mobile devices can search out in WLAN interface. The Wi-Fi signal named after the device serial number. If installer cannot find the Wi-Fi signal or missed the first 3 minutes, installers can quickly press the panic button on the front panel of the device twice to force it into AP mode, which gives Wi-Fi hotspot for connecting the SmartController app to the device.



DC-204-AI Wi-Fi Hotspot (AP Mode) Figure 6



SmartController



SmartController app login page Figure 7

Open the SmartController app, login with default username and password which are:

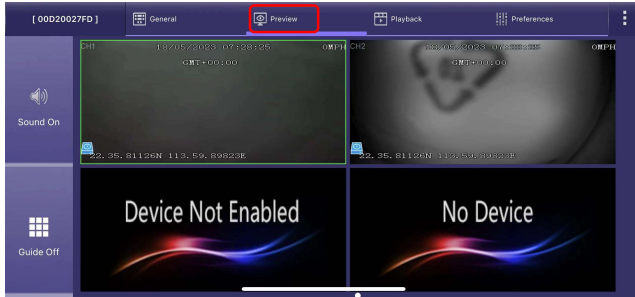
Username: *admin*

Password: *admin*

Note: it is highly recommended that the user changes the password at first login for security purposes and ensure that the new password is only distributed on a need-to-know basis. User should also make note of the new password as Brigade Electronics PLC does not have access to this information.

Enter Preview tab to check if both cameras are in the right position (CH1 is ADAS – road facing camera; CH2 is DSC – driver facing camera).





**SmartController app preview page Figure 8**

### 3.5 Installation of Dashcam Bracket

Installer must ensure that section 3.4.2 has been read and understood before installing the dashcam bracket. It is essential that the installer uses the guidelines stated in that section to determine the location of the dashcam bracket. Do not remove the adhesive protective sheet, or permanently secure bracket, until the correct position has been confirmed. See section 3.4.2 for detailed outline of the installation location requirements. It is also advised that the installer check the live view of the camera whilst carrying out this exercise to ensure correct fitting of the bracket when the protective sleeve is later removed.



**DC-204-AI-B-01 Bracket Figure 9**

After confirmation of the correct installation position:

1. Ensure that the vehicle is parked on a horizontal/levelled surface.
2. Use the alcohol wipe to clean inside and outside of the installation area.
3. Make sure the "UP" inscription and arrows are pointing to the top of the cabin.
4. Take out the bracket from the kit and peel off the 3M protective sleeve.
5. Stick the bracket (using the adhesive 3M pad surface) to the windshield in the confirmed installation area.
6. Install the bracket horizontally in the confirmed installation area such that the upper edge of the bracket is parallel to the upper edge of the windshield.
7. Press the bracket to the windshield for 10s to ensure good contact between the bracket and the windshield and that air bubbles does not form between the windshield and the bracket.

### 3.6 Installation of Dashcam

The installer should ensure that the following has been done before installing the dashcam on bracket:

1. Start the vehicle to power up the dashcam.
2. Connect to the SmartController app as stated in section 3.4.2

The dashcam is fitted to the bracket with the front side of the dashcam with LEDs and button facing inward so that the lens of the DSC camera is facing the driver – driver facing and the ADAS camera lens is facing the road – road facing.



Driver facing lens of the DSC camera should be facing the driver.

**DC-204-AI Front view showing LEDs and button and driver facing lens of DSC camera Figure 10**



Road facing lens of the ADAS camera should be facing the road (close to the windshield)

**DC-204-AI Rear view showing the road facing lens of the ADAS camera Figure 11**



**Picture showing the fixing screw, angle of rotation of DC-204-AI Figure 12**

It is important to ensure that the bracket is firmly fitted to the windshield so that it can carry the weight of the dashcam and the dashcam is securely fastened to the bracket using the supplied screw.

Install the device onto the bracket, using the black screw and washers provided in the AI connected dashcam kit and the corresponding screwdriver that would fix the screw appropriately.

The screw should be fastened in such a way that it is possible to adjust the dashcam.

The device is adjustable. The installer can adjust it into the correct angle based on observation from the SmartController live view.

Once the correct position is confirmed, the installer should fasten the screw to ensure that the dashcam is fixed in the correct position confirmed by the live view on the SmartController app.

Note: Please pay attention to the driver facing and road facing lenses, they are used for different purposes. If the direction is correct, the touching surface between the device and the bracket are teathed.



**Picture Showing the right positioning of the Dashcam Figure 13**

When fixing the dashcam in place, ensure that the following criteria are met when looking at the live view footage from the SmartController app:

1. The centre of the cab is in the middle of the screen.
2. The cab is levelled (horizontal).
3. The steering wheel is visible at the bottom left /right corner of the screen.

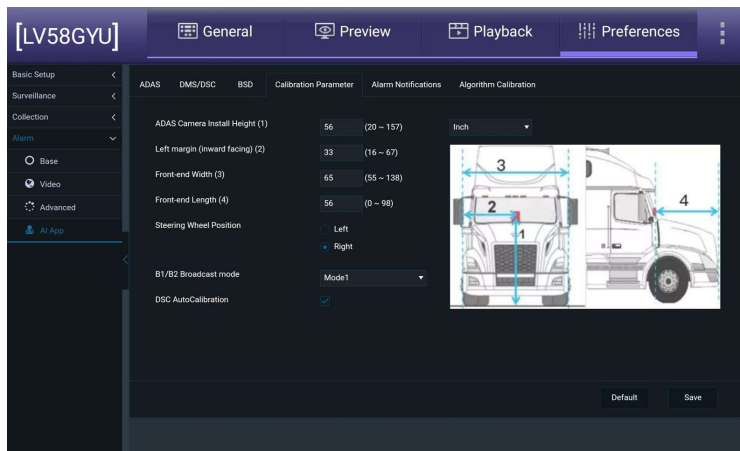
### 3.7 Calibration

Every device must be calibrated during installation, or it may not work as expected; it may give too many or too few AI alerts. The dashcam calibrates automatically during driving however, the instructions detailed in the sub-sections below **must** be followed before the calibration drive for the device to function correctly.

#### 3.7.1 Critical Measurements

After the device is properly installed on the windshield, the installer needs to take some critical measurement and input them into the calibration parameter settings of the dashcam using the SmartController app. These measurements are important to the ADAS and DSC features functioning as designed. These parameters are not going to change when importing configuration files from one device to another therefore the values need to be inputted manually for each vehicle. Each measurement is depicted in AI Calibration Parameter Figure 14 and explained in the notes on the right-hand side of the figure.

Inputting the parameters into the dashcam settings require that the device is turned on. This can be achieved by switching the vehicle's ignition on or starting the vehicle on which the dashcam is installed. Once the dashcam is on and the Wi-Fi LED is green to indicate Wi-Fi hotspot mode, connect the SmartController app to the dashcam as explained in section 3.4.2. The tab where the measured values need to be inputted is known as the **Calibration Parameter** tab. To find the tab on the SmartController app go to: *SmartController app -> Preference -> Alarm -> AI App -> Calibration Parameter.*



**AI Calibration Parameter Figure 14**

**ADAS Camera Install Height (1):** this is the height from the middle of the ADAS camera lens to the ground.

**Left margin (inward facing) (2):** this is the horizontal distance between the device and the left end of the vehicle body.

**Front-end Width (3):** this is the vehicle body width.

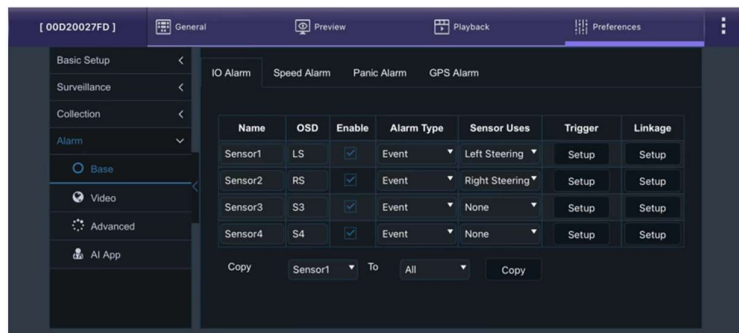
**Front-end Length (4):** this is the distance between the device and the front end of the vehicle, which is the distance between the ADAS camera lens and the license plate of the vehicle.

**Steering Wheel Position:** this is the position of the steering wheel, the driver's side of the vehicle. Please select as appropriate for the vehicle to which the dashcam is installed.

**DSC AutoCalibration:** this ensures that the DSC camera autocalibrates when it is enabled. Autocalibration is currently the only option available for the DSC camera therefore it is important to keep it **enabled**. DSC Autocalibration is enabled by **default**.

### 3.7.2 Testing Left and Right Indicators Connections

Ensure that the left and right indicator signals are connected to sensor 1 and sensor 2 respectively as stated in section 3.4.1.3. Ensure that there is still power to the dashcam and the mobile device on which the SmartController app is being used.

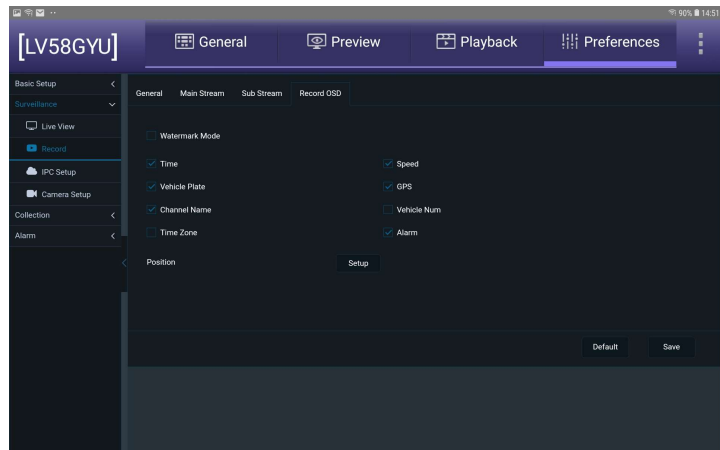


SmartController App IO Alarm Figure 15

Go to the IO Alarm settings on the SmartController app which is: *SmartController app* → *Preference* → *Alarm* → *Base* → *IO Alarm*.

See section 4.4.1.1 for detailed description of the IO alarms settings and see figure 16 for the required settings for testing the indicator signals are connected correctly and are functional. Remember to save these setting before exiting the menu for the changes to take effect.

Please note that the signals of interest here are sensor 1 and sensor 2.



SmartController app Record OSD tab Figure 16

Once the IO Alarm settings have been changed to match SmartController app IO Alarm Figure 15; go to the Record OSD tab: *SmartController app* → *preferences* → *Surveillance* → *Record* → *Record OSD*

Ensure that the alarm option is enabled (blue tick) as shown in SmartController app Record OSD tab Figure 16. Remember to save these setting before exiting the menu for the changes to take effect.

For details about the functionality and usage of record OSD please see section 4.2.2.4



Left Indicator Signal Triggered Figure 17

Carryout the following steps to test the indicator signals

- Go to the preview page: *SmartController app* → *Preview*.
- Tap channel 1 footage twice to make it full screen.
- Switch on the left indicator
- Observe footage on channel 1 and check that S1 shows up on the screen.
- Switch on the right indicator
- Observe footage on channel 1 and check that S2 shows up on the screen.

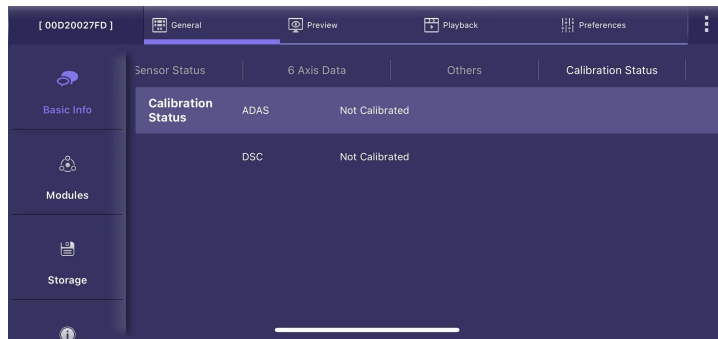


**Right Indicator Signal Triggered Figure 18**

If the sensors are connected wrongly i.e left indicator signal to sensor 2 and right indicator signal to sensor 1. Carryout the following to correct the connection error:

- Switch off power to the vehicle.
- Swap the left indicator signal connections from sensor 2 to sensor 1 and vice versa.
- Repeat the left and right indicator signal connection test to verify that the signals are connected as instructed.

### 3.7.3 Auto-Calibration



**Auto-Calibration Status Figure 19**

The ADAS auto-calibration will start when the vehicle speed reaches 10mph (15km/h) with a vehicle in front which is between 10 – 40 metres away. The auto-calibration can take up to 4 minutes depending on road and environment condition.

The DSM auto-calibration will start when the vehicle speed reaches 12mph (20km/h) and it will be completed after the driver's face has been detected for approximately 5 minutes.

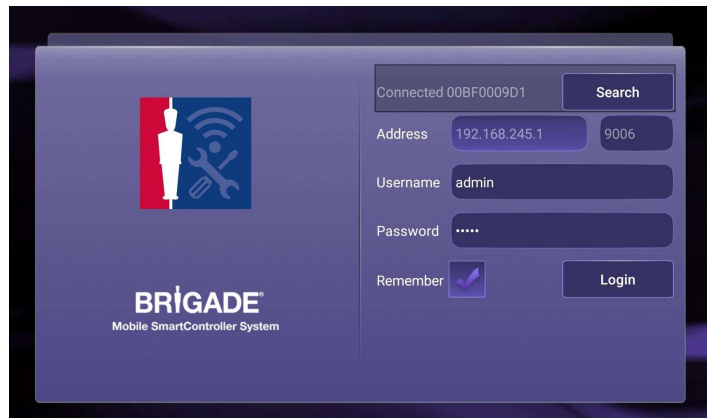
The calibration will only happen once unless there are changes to the Calibration Parameters. In this case the calibration will re-start automatically.

The calibration status can be checked using the SmartController App: *SmartController General - Basic Info – Calibration Status menu.*

## 4 Dashcam Settings and Parameters (Preference)

The dashcam needs to be configured using the SmartController apps.

All settings are under Preference, other tabs in the app please refer to SmartController manual for usage explanations.



SmartController Login Screen Figure 20

### 4.1 Basic Setup

#### 4.1.1 Regist Info

This area is for capturing device and vehicle related information.

**Device Info** contains:

**Serial Number** which is a 10-digits unique identifier for each device. It is automatically generated and unchangeable.

**Device ID** is for users to have customised marker on each device for differentiation purposes.

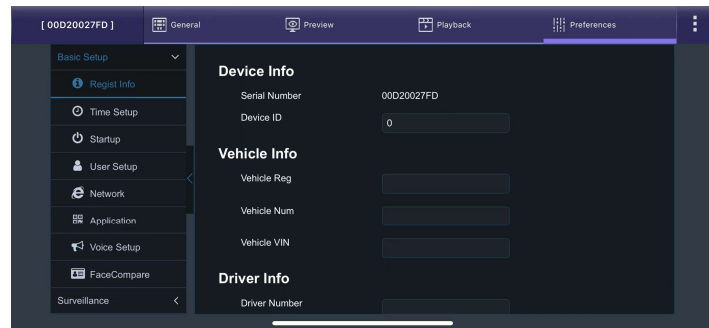
**Vehicle Info** contains:

**Vehicle Reg** to input the current vehicle registration number of the vehicle to which the dashcam is installed.

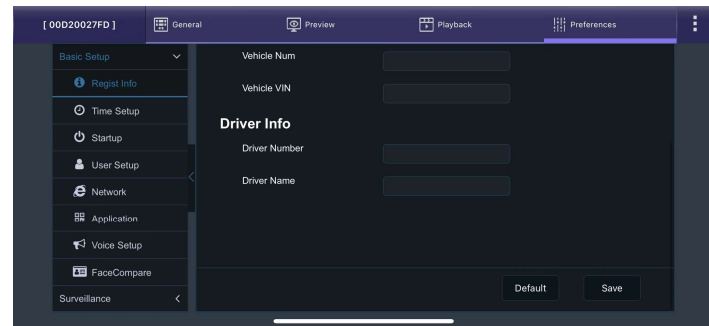
**Vehicle Num** and **Vehicle VIN** are typically used in fleet/bus applications. These can be captured in this field to assist in identifying the vehicle.

**Driver Info** is also area to store driver related information for fleet/bus applications.

Only **Serial Number** and **Vehicle Reg** will be transmitted to server and displays in MDR-Dashboard live view interface. Everything else is kept in device.



Regist Info - 1 Figure 21



Regist Info - 2 Figure 22

#### 4.1.2 Time Setup

##### 4.1.2.1 General

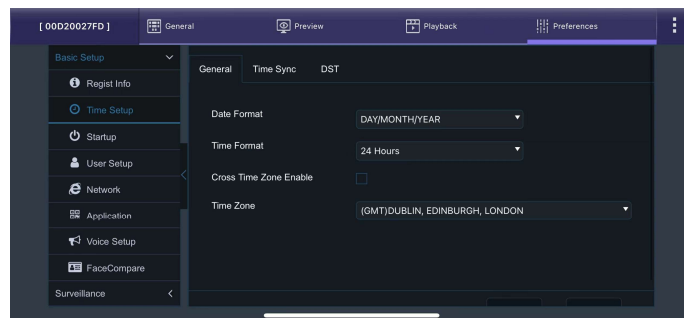
**Date Format** can be set to either DAY/MONTH/YEAR, YEAR-MONTH-DAY or MONTH/DAY/YEAR. By default, it is set to DAY/MONTH/YEAR.

**Time Format** can be either 24 Hours or 12 Hours. By default, it is set to 24 Hours.

**Time Zone** includes worldwide time zone options. By default, this is set to (GMT) DUBLIN, EDINBURGH, LONDON.

**Cross Time Zone Enable** currently not in use.

**Default** is found on most settings pages. This allows you to easily restore the factory settings.



Time Setup - General Figure 23

#### 4.1.2.2 Time Sync

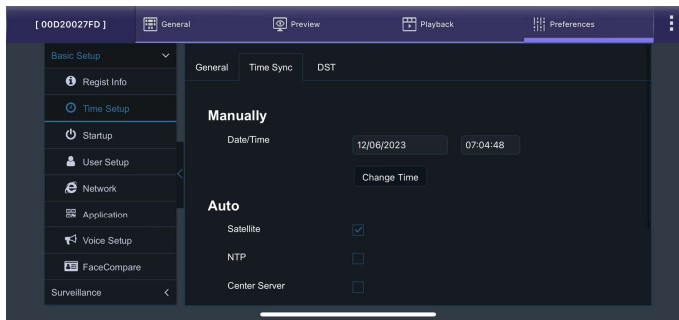
**Date/Time** can be entered manually here.

**Satellite** should be ticked by default. The device is embedded with a GPS module and antenna, therefore can obtain speed and location easily. This is the simplest and most reliable option.

**NTP** refers to network time protocol that is used to synchronise time with NTP Server PC time. By ticking the box, a list will be available for users to choose NTP servers from or user can input a different server address, if the one required is not on the list provided. This should only be used when mobile network or Wi-Fi enabled.

**Center Server** allows device to synchronize the time with current connected MDR servers.

Note: When Satellite, NTP and Center Server are enabled simultaneously, Satellite takes the highest priority. The priority between them is Satellite>NTP>Center Server.



Time Setup – Time Sync Figure 24

#### 4.1.2.3 DST

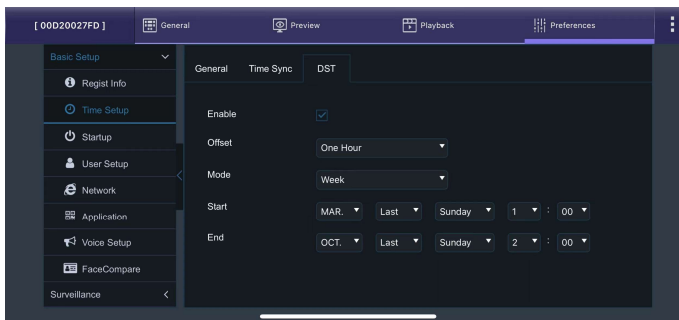
DST (Daylight Saving Time) allows users to enter the date and time in which the Daylight-Saving Time will be activated. In the U.K, it starts on the last Sunday of March at 1:00 AM and ends on the last Sunday of October at 2:00 AM. Enter the correct time and date of the country in which the vehicle will be utilised. Whenever **DST** is not in use, turn this option to off.

**Enable** is enabled by default. This setting determines whether daylight savings time is active.

**Offset** is to determine how many hours to be forward / backward when reaching DST. **One Hour** or **Two Hours** optional.

**Start** represents the month, day and time at which DST begins. By default, this is set to UK DST. If the time zone has been changed to another country, other than the UK, then the DST settings will need to be amended to reflect the selected country.

**End** represents the month, day and time at which DST finishes.



Time Setup - DST Figure 25

#### 4.1.3 Startup

##### 4.1.3.1 ON/OFF

**ON/OFF Mode** only supports one mode – **Ignition**. It means the device will power up when receiving vehicle ignition signal (orange wire).

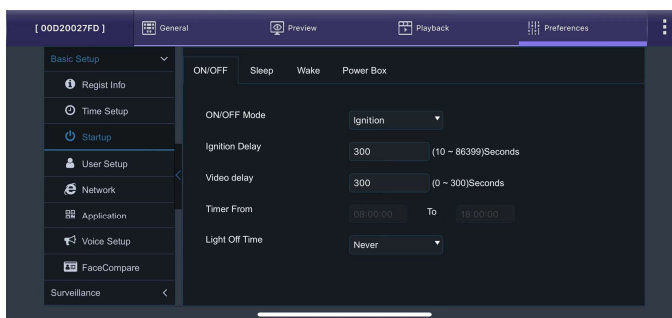
**Ignition Delay** refers to the period the device will remain on and recording once the Ignition has been turned off. The range is 0 to 86399 seconds (24 hours). By default, this is 300 seconds (5 minutes).

Note: If the ignition is turned off right after the device is powered on and the ignition delay is set to less than 6 minutes, the device will shutdown after about 6 minutes + ignition delay. This is because the device has a circuit protection time of 5 minutes after boot-up to ensure that its electronics are not damaged due to abrupt power loss during start-up. If the ignition delay is longer than 6 minutes, the device will count down the exact ignition delay value.

**Video Delay** allows device to stop recording before reaching the end of the **Ignition Delay** period for better utilise storage space. The range is between 0 to the value user set for **Ignition Delay**.

**Timer From** currently not in use.

**Light Off Time** to define video output duration. When this is enabled, the video out can be used with external monitors to display live view images. Options are **Custom** which can choose from 1 – 3600 seconds or **Never** which will have constant signal output to the monitor.



Startup – ON/OFF Figure 26

#### 4.1.3.2 Sleep

**Sleep** is a standby status which enables the device to use minimum electrical current to maintain activity of core system after vehicle ignition is switched off.

By default, this feature set to **No consumption standby** which means the device will be completely off after turning off the ignition to protect the vehicle battery. Another option is **Low consumption standby** which will let the device enter sleep mode after turning off ignition.

During the **Sleep mode**, the device will shut down all the functions except online reporting, GPS reporting and mobile network connectivity. These features that are left functioning so that the platform or mobile phone can remotely wake-up the device for normal operation or Auto-Download tasks. For how to wake up the device, please refer to section 4.1.3.3.

**Sleep Time** is the duration of the device stays in sleep mode.

**Low power protect** is off by default. This feature is important to use to protect the vehicle's battery from damage.

**Battery low voltage protect** is the voltage level which is dangerously low for vehicles. For a 24V vehicle, the limits are from 20V to 23.5V. For a 12V vehicle, the limits are from 8V to 11.5V. If power supply voltage is lower than the set value, the device will wait for 600 milliseconds to observe if it is a random dip, or an unrecoverable voltage drop situation. After the waiting period, if the voltage does not return to normal operating voltage, the device will shut down to protect itself from low voltage.

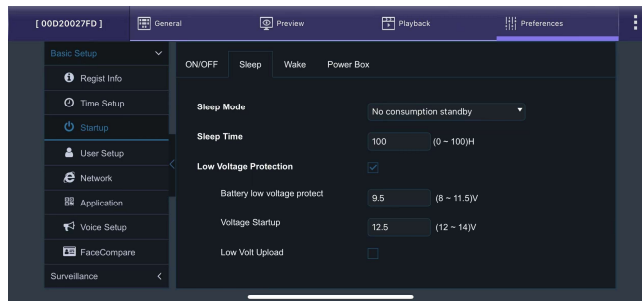
**Voltage Startup** refers to the minimum voltage the device must receive before powering on. For a 24V vehicle, the limits are 24V to 26V. For a 12V vehicle, the limits are 12V to 14V. If the device last shutdown is because of low voltage, the next time supply voltage must higher than the Voltage Startup value, or it will not boot up.

**Low Volt Upload** can only be used if mobile network or Wi-Fi is enabled. MDR Server software has a requirement for this feature. Once the device detects a low voltage level, it will send this data back to the MDR Server where it gets stored.

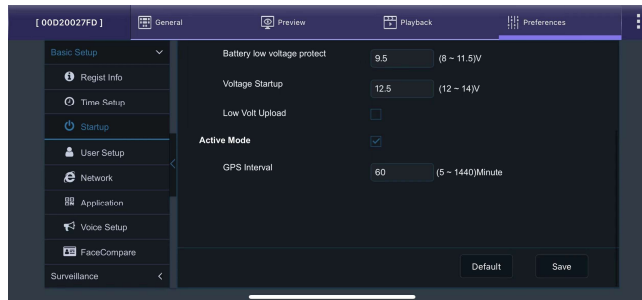
Proposed Low Voltage Protection Settings for lead-acid batteries (Note: Please check if these are suitable for your vehicle):

12V Vehicles	24V Vehicles
Low Voltage:9.5V	Low Voltage:21V
Voltage of Start:12.5V	Voltage of Start:24.5V

**Active Mode - GPS Interval** defines when the device under Sleep status, it should report its GPS location to the platform every 60 minutes (default). This interval time is customisable between 5 minutes to 1440 minutes. The reason this setting is 60 minutes rather than the default of 10 seconds is to reduce data and power consumption during **Sleep** mode.



Startup – Sleep - 1 Figure 27



Startup – Sleep - 2 Figure 28



#### 4.1.3.3 Wake

**Wake** is used to boot up the device when it is under **Low consumption standby** mode. This feature is often used when the user needs to urgently check video footage or ask the device to start auto-download task assigned from the server.

It supports various methods to wake up the device.

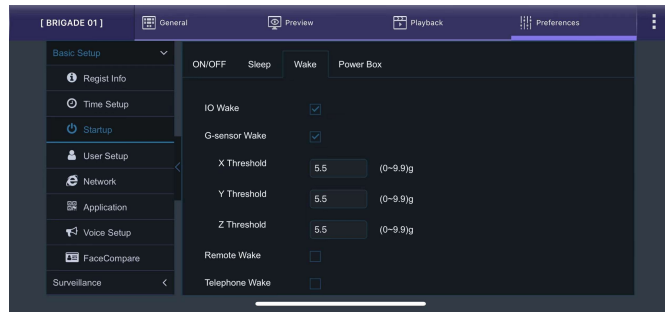
**IO Wake** is waking up the device when an enabled IO alarm/event triggered.

**G-Sensor Wake** the device wakes up and start functioning when it detects impact or acceleration that exceeds the set threshold.

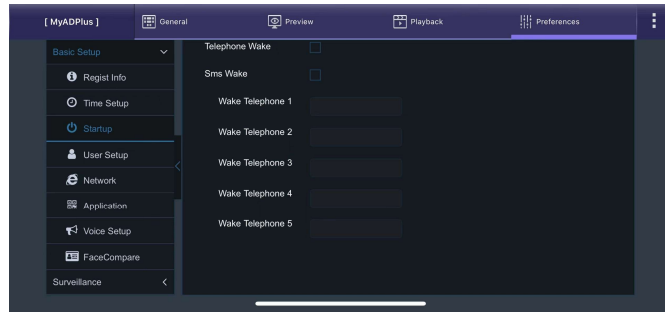
**Remote Wake** is currently not supported.

**Telephone Wake** and **Sms Wake** requires pre-defining the acceptable wake telephone numbers from which SMS or call would trigger the device to wake up, prior to the using the feature (**Wake Telephone 1 - 5**). After numbers being filled in, when the device is under **Low Consumption Standby** status, a call or a "WAKEUP" content message sent from the predefined numbers which will activate the device and put it back to fully ON mode.

*Note: after the device wakes up, it will use vehicle battery power and keep running, and it starts to count down the **Ignition Delay** users defined previously. After the count down time completed, the device will go back to **Sleep** mode again.*



Startup – Wake 1 Figure 29



Startup – Wake 2 Figure 30

#### 4.1.3.4 Power Box

**Power Box** is the hardware part on the device power cable.

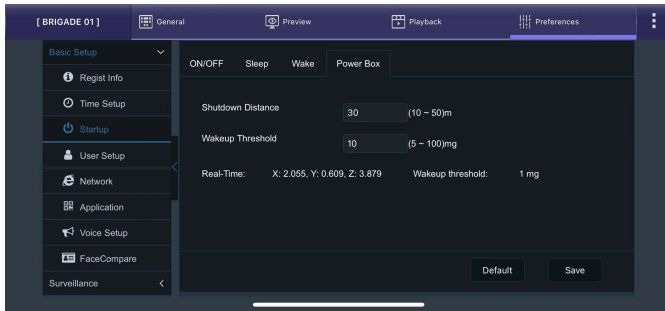


This Power Box hardware has its own internal G-Sensor and microcontroller with which it accumulates data and has the ability to make the decision to shut down the device if the conditions below are met.

*Note: these settings will only be valid if using OBD connector power cable. It won't work if the power cable tail has been used.*

**Shutdown Distance** is to define if, within 1 minute, the vehicle movement distance is no greater than 30 metres (default), the device will be prepared to shut down.

**Wakeup Threshold** is if the acceleration it received no greater than 10mg (default), the device should be prepared to shut down. 1g equals to 9.8m/s<sup>2</sup>.



Startup – Power Box Figure 31

#### 4.1.4 User Setup

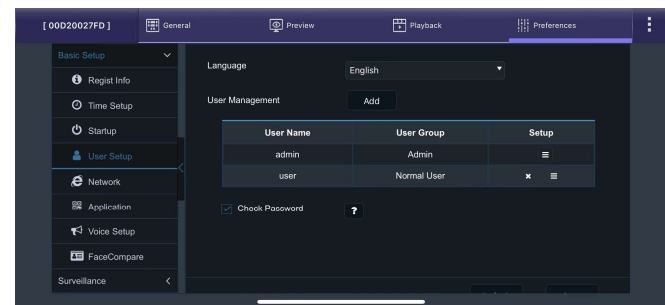
**Language** currently only supports English.

**User Management – Add** is used to create additional user accounts. A maximum of three user accounts can exist.

**Username** is the name you use to log onto the MDR. By default, there are two usernames: **admin** and **user**.

**User Group** represents the level of access to the OSD. There are only two types: Admin and Normal User. Admin has access to all settings and features. Normal User has restricted access to view device status such as module status, storage, version info, live view and playback; but unable to do any actions like export logs, upgrading device or changing configurations etc.

**Setup** is used to change existing user account details.



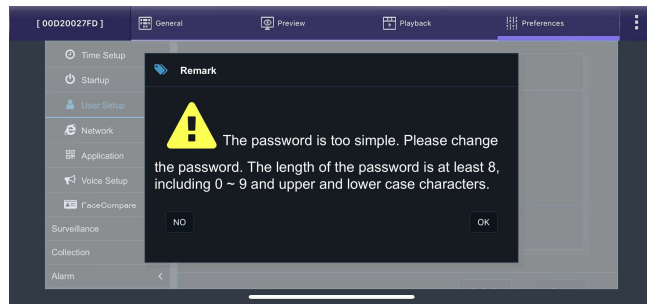
User Setup Figure 32

To remove any password requirements, save the user account with a blank password.

**Check Password** is used to allow the device to check the login password complexity. When the user is changing the password, if it is default or weak, a notification window will pop up to notify the user to adopt a more complex combination. By default, it is on.

After saving the configuration, the user needs to re-login into the SmartController App to continue additional operations.

Please be aware that it is the responsibility of the user of the device to make note of the saved password as Brigade PLC does not store the device password.



**User Setup – Password Notification Figure 33**

## 4.1.5 Network

### 4.1.5.1 Server Setup

The device is able to support report to a maximum of 4 servers simultaneously.

**+** adds another centre server, a new blank page is displayed with a new number.

**x** removes the currently displayed centre server.

**ON** enables the current centre server.

**Protocol Type** refers to the protocol used by the unit to send its data (video and metadata) to the Server. By default, this is set to **MDR6**. Another option is **808** which currently not in use.

**TSL Enable** is a feature reserved for the future, currently unused.

**Enable Network** refers to the network method used to communicate with the Server. The options are:

**Ethernet** – Ethernet cable connected method (hardly used);

**Wi-Fi** – through Wi-Fi connection;

**Mob Net** – through SIM card data;

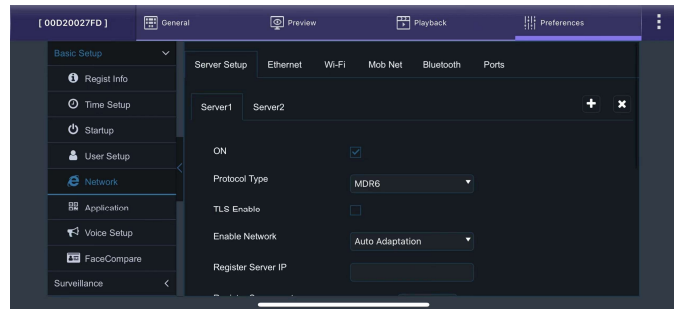
**Auto Adaptation** – Auto-adapts to the three network methods above, if it has internet access. The select priority is Wi-Fi>Ethernet>Mob Net.

**Register Server IP** Public IP address of the firewall which forwards any traffic to the server PC. (IP address and Domain name supported)

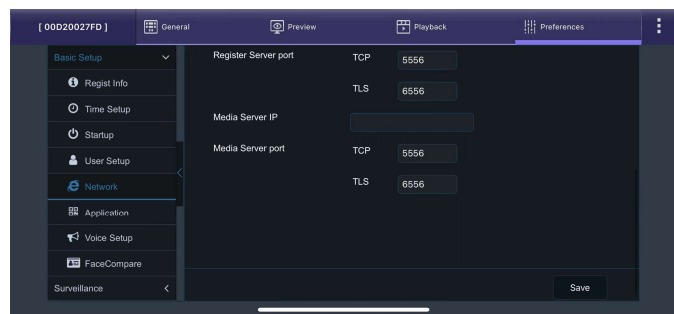
**Register Server Port** is used for device access to server. By default, is 5556.

**Media Server IP** should be the same as Register Server IP.

**Media Server Port** should be the same as Register Server Port. By default, is 5556.



**Server 1 - 1 Figure 34**



**Server 1 - 2 Figure 35**

### 4.1.5.2 Ethernet

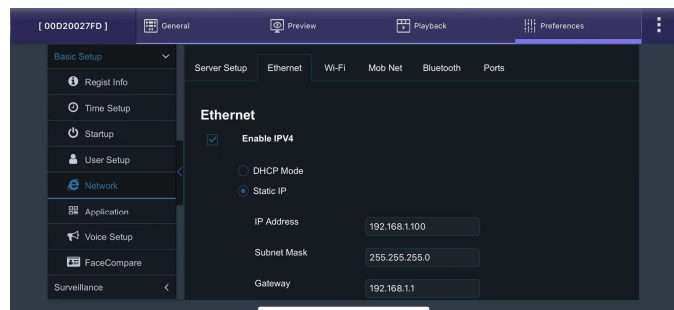
By default, the device is using IPv4. There are two modes available for Ethernet adaptor addressing, DHCP and Static.

**DHCP Mode** refers to the Ethernet adaptor of the device obtaining an IP address automatically from the network.

**Static IP** is used to specify the exact network details you would like the device adaptor to use.

**IP Address** refers to the internet protocol address of the Ethernet adaptor. This address is used to access the device setting menu via LAN cable. Recommended to use SmartController app (Wi-Fi) to access, the LAN cable solution requires an adapter cable and additional computer operations. If having difficulties, please ask your internal IT for information and assistance.

**Subnet Mask** is used to identify network address of an IP address. By default, this is 255.255.255.0.



**Ethernet - 1 Figure 36**

**Gateway** helps route the network traffic. By default, this is 192.168.1.1.

**Auto Get DNS** refers to the domain name system. A DNS server takes the website addresses that you type in and converts them into the actual IP address of the site. While the device attempts to get an IP address from the DHCP server, it will simultaneously attempt to resolve address.

**Use Following DNS** the device will use these DNS addresses regardless of what the DHCP server is using.

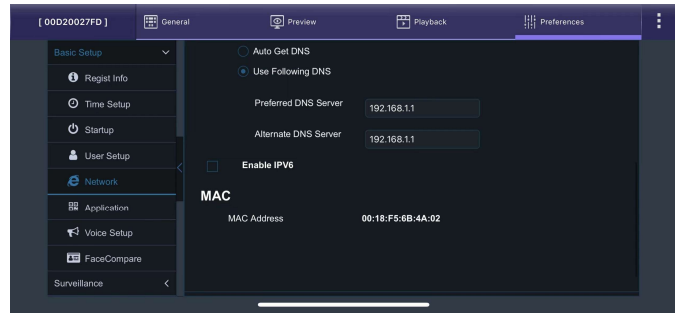
**Preferred DNS Server** by default, this is 192.168.1.1.

**Alternate DNS Server** by default, this is 192.168.1.1.

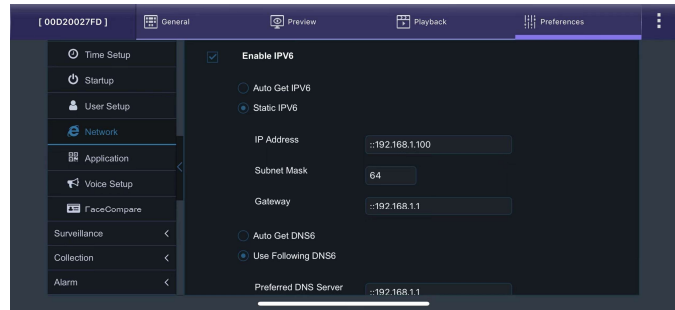
The device is also support IPv6. When using IPv6 address, tick the **Enable IPv6** box to expand setting menu.

The parameters under IPv6 are the same as for IPv4, recommend consulting with IT department before making any changes.

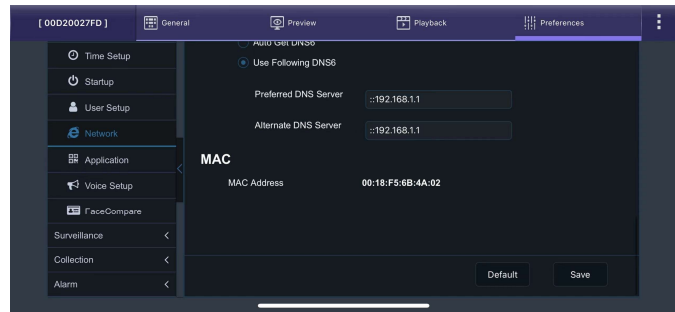
**MAC Address** refers to media access control address which is a unique identifier. This is assigned to network interfaces for communications at the data link layer of a network segment. This consists of 12 alphanumeric characters.



Ethernet - 2 Figure 37



Ethernet - 3 Figure 38



Ethernet - 4 Figure 39

#### 4.1.5.3 Wi-Fi

By default, the device is on Wi-Fi Client mode.

**Lock** can fix the Wi-Fi settings and parameters below, and not let it be overwritten when user imports config files.

*Note: this **Lock** status is saved on the device and does not go into the config file. This means if a user turned this Lock on, the device would not overwrite any Wi-Fi parameters in the future by importing config files. It can only be able to change by manually change those parameters or manually disable **Lock** to allow it to be able to accept config files again.*

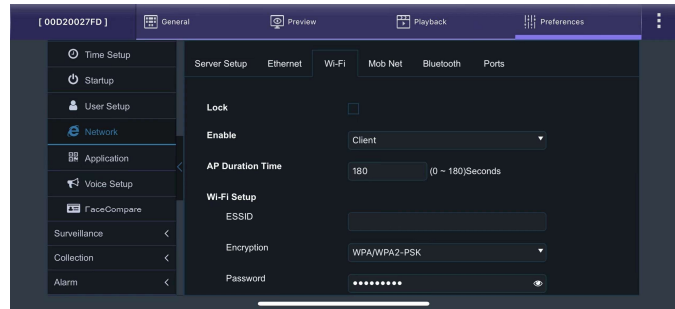
**Enable** is used to turn the Wi-Fi module to one of 3 different statuses, Disable, Client and AP. Once chosen Client or AP, the settings found below will become active.

**Enable (Client)** activates the Wi-Fi module and enter client mode. Afterwards the device will have the ability to connect to an external Wi-Fi signal for data transmission.

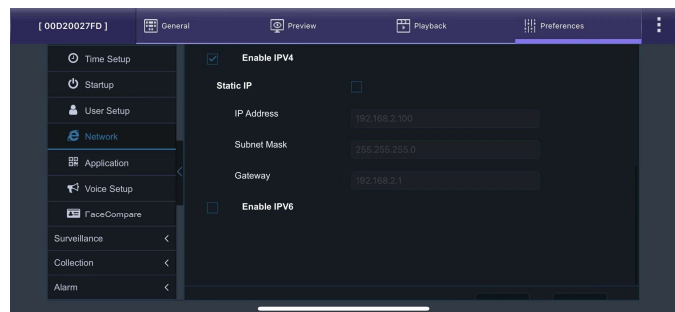
**Enable (AP)** activates the Wi-Fi module and enter AP mode which will make the device create a Wi-Fi hotspot for any mobile device to connect to it. Once activated, users can use mobile phones to connect to the Wi-Fi hotspot and access setup menus via the SmartController App.

By default, the device is set to **Disable** which means no Wi-Fi access initially. To let users have access for configuration, the device will have two ways to enter the AP mode:

1) When the device boots up, the first 180 seconds



WIFI - 1 Figure 40



WIFI - 2 Figure 41

(configurable) are in AP mode. Users can use this time slot to connect to the hotspot and login the App. If the SmartController connection has not been built over this period, the AP mode will be switched off after time runs out. If it's been connected by a mobile phone and logged in Apps, the signal will remain until the connection cut off.

2) By double clicking the button on the device front panel.

**AP Duration Time** is to define how many seconds the boot up AP mode and button press AP mode should remain. By default, this set to 180 seconds.

**SSID** is the service set identifier.

**SSID (Client)** It is used to identify a wireless LAN and is usually unique to an area. This is where you will enter the name of the wireless network that the device will connect to.

**SSID (AP)** is to set the name of the MDR wireless network hotspot which mobile devices can look for when trying to connect. If left open, the default SSID follows this format "ST-Vehicle Registration Number".

**Encryption** refers to protocols used to protect your network.

**Encryption (Client)** supports WEP, WPA/WPA2-PSK and WPA2\_Enterprise. This is case-sensitive.

**Encryption (AP)** supports None, WEP and WPA/WPA2-PSK. None means no password needed when trying to connect to this hotspot. WEP and WPA/WPA2-PSK need minimum 8 characters password.

**Password** is the wireless network password; this should be entered carefully as it is case-sensitive.

**Static IP** is used to turn the Wi-Fi module off or on. Once enabled, the settings found below will become active.

**Enable IPv4** is to setup the Wi-Fi network address. By ticking this box means your device will automatically obtain an IP address from the Wi-Fi network router.

Static IP allows users to manually define the IP address, but this is not recommended. The simplest way is to stay on auto-get IP address.

**IP Address** refers to the internet protocol address of the Wireless module. This address is used to join the wireless network.

**Subnet Mask** is used to identify network address of an IP address. By default, this is 255.255.255.0.

**Gateway** helps route the network traffic.

Enable IPv6 is also supported by the device. Usually, IPv4 should be sufficient for daily use. If want to switch on IPv6, recommend consulting with the users' IT department before making any changes.

#### 4.1.5.4 Mob Net

**Lock** can fix the mobile network settings and parameters below and will not be overwritten when user imports config files.

**Server Type** is an auto-populated field, indicates the mobile network connection type.

**Network Type** is **Mix**, which means when a SIM card being inserted, the device will auto-adapt the strongest network signal for data transmission.

**APN** refers to Access Point Name. This information is dependent on your mobile carrier network.

**User Name** is obtained from your SIM card provider.

**Password** is obtained from your SIM card provider.

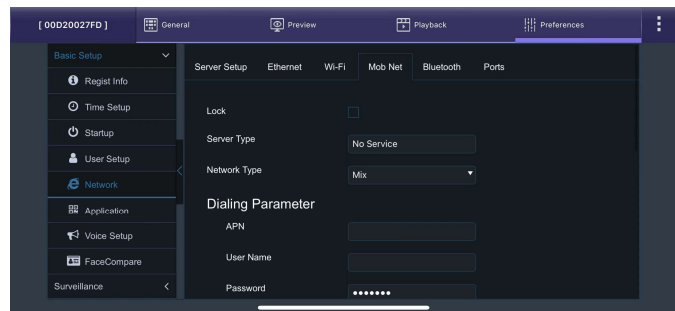
**Number** refers to the dial up phone number needed to connect to the network. Users can leave it as "\*99#" if not wanting to input actual numbers.

**Certification** refers to the authentication mode, this can be set to either None, CHAP (Challenge Handshake Authentication Protocol), PAP (Password Authentication Protocol) or Mix. This is chosen by the network operator.

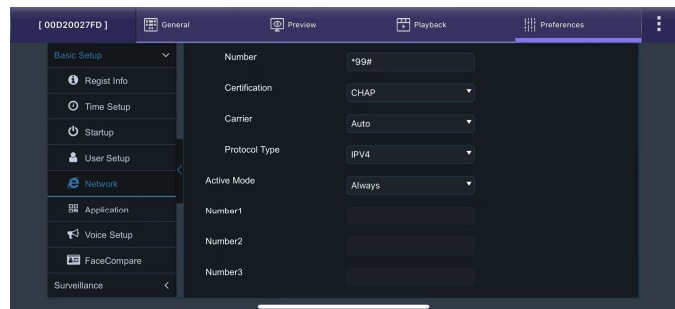
**Carrier** refers to the SIM card provider, which should be selected manually, or leave it as **Auto** which is compatible for all carrier types.

**Protocol Type** default is IPv4. This can be selected to IPv6 or IPv4/IPv6 according to actual usage.

**Active Mode** provides different connection type of mobile network. By default, the connection mode is Always which represents the device will immediately connecting to mobile network when a valid sim card has been installed. Other options are Phone/SMS and Sensor which can let the device stay no connection until certain phone call / message comes in or the dedicated



Communication Module - 1 Figure 42



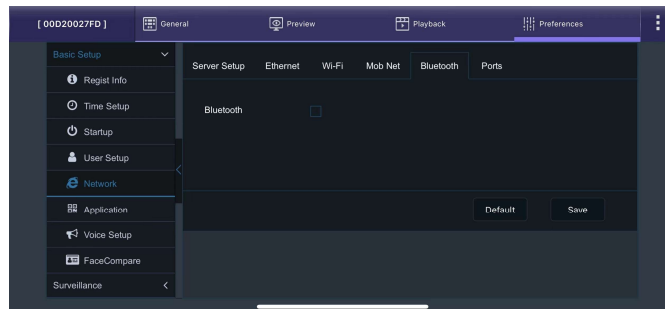
Communication Module - 2 Figure 43

usage sensor has been triggered (the sensor needs to be setup in advance).

**Number1/2/3** link with above Active mode. If chosen Phone/SMS in active mode, users can fill in 3 different mobile numbers here. When these number calls or send messages to the installed SIM card, the mobile network connection will be created, and the device can start using mobile data for online features.

#### 4.1.5.5 Bluetooth

**Bluetooth** is a reserved feature for future use, currently not in use.



Bluetooth Figure 44

#### 4.1.5.6 Ports

**Web Port** is used for when a PC is connecting to the device via Ethernet cable for accessing configuration menu. If this is incorrect, the web page will not open. By default, this is 80.

**RTSP Port** is used for Real Time Streaming feature. By default, this is 554.

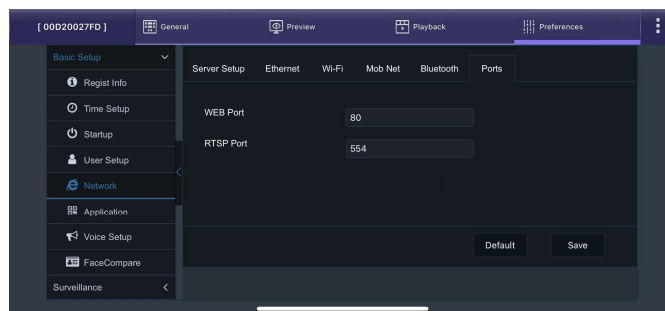
**RTSP** feature: if the device has a fixed Local IP address, the RTSP feature can be used for real-time live view via commands below:

Main streaming video:  
`rtsp://username:pwd@IP:554/mainstreamX`

Sub streaming video:  
`rtsp://username:pwd@IP:554/substreamX`

X represents for channel number, starts from zero.

Example (obtain live video from channel 1):  
`rtsp://admin:admin@192.168.1.100:554/mainstream0`



Bluetooth Figure 45

#### 4.1.6 Application

##### 4.1.6.1 FTP Server

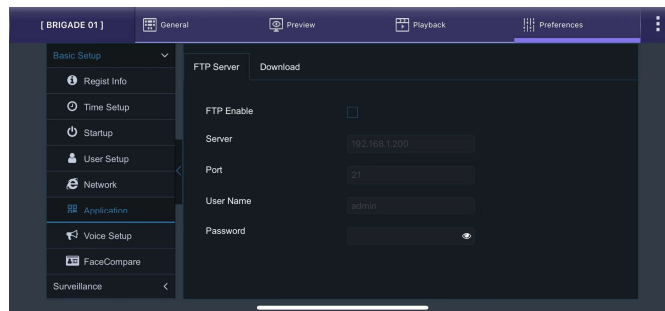
**FTP Enable** is for connecting to an FTP server for storing snapshots. By default, this is off, for reducing external connectivity for data protection.

**Server** to input existing FTP server address.

**Port** default is 21.

**User name** based on existing FTP server information.

**Password** based on existing FTP server information.

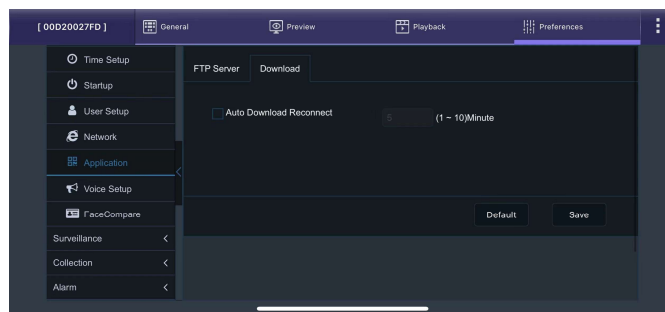


FTP Server Figure 46

##### 4.1.6.2 Download

**Download** is to wake up the device when in **Sleep** mode to complete the auto-download tasks assigned to it by the server software.

**Auto Download Reconnect** is by default off. After enabling it, the device in sleep mode will wake up and try to connect to the server to start the download task. If the server reaches the maximum connection amount currently, the device will go back to **Sleep** status and wake up after 5 minutes (default) before next try.



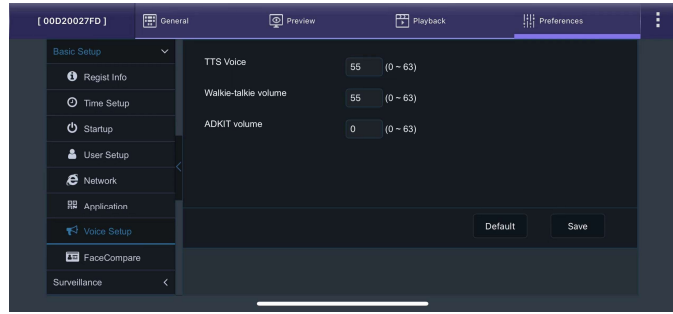
Download Figure 47

### 4.1.7 Voice Setup

**TTS Voice** by default is 55. This controls the volume of the broadcasting Text to speech (TTS) messages such as AI alarm alerts and notification messages "AP Mode Enabled".

**Walkie-talkie volume** currently not in use.

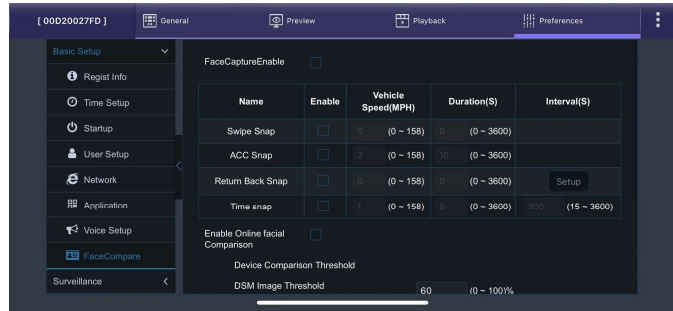
**ADKIT Volume** currently not in use.



Voice Setup Figure 48

### 4.1.8 FaceCompare

**FaceCompare** is under development, currently not in use.



FaceCompare Figure 49

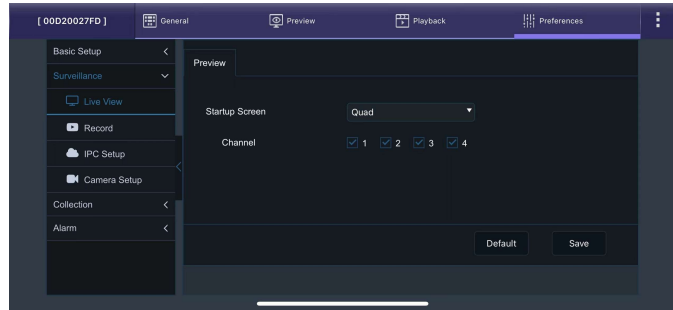
## 4.2 Surveillance

### 4.2.1 Live View

#### 4.2.1.1 Preview

**Start-up Screen** refers to the display once the device has fully booted up. The options are SINGLE, QUAD and 9-SPLIT. By default, it has quad view.

**Channel** controls which channels is visible at boot up. If the **Start-up Screen** set to **Single**, the user can choose which channels to display. The feature is useful for viewing the desired channel without accessing the device all the time.



Preview Figure 50

### 4.2.2 Record

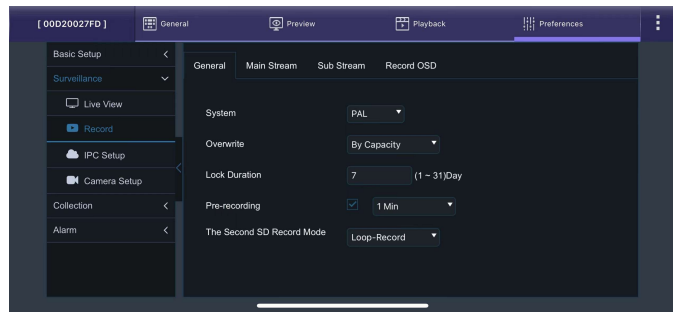
#### 4.2.2.1 General

**System** is used to choose the input/output video format. The options are PAL or NTSC. By default, PAL is chosen. This will be the same for all camera inputs.

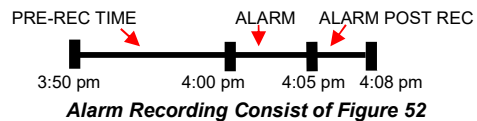
**Overwrite** refers to when internal SD cards will overwrite its stored data. The options are BY CAPACITY, BY DAYS, NEVER and BY MINUTES. By default, BY CAPACITY has been selected which means once the SD card has less than 1% of its storage space remaining, older recordings are erased and replaced by newer recordings except locked files. The NEVER option means the overwrite is deactivated.

**Locked Duration** This represents the length of time (in days) for which alarms cannot be overwritten by the MDR. When the retention expires, the locked files will automatically be unlocked and deleted.

**Pre-recording** This value specifies the length of time prior to an alarm recording. This will be added before the actual alarm. For example, if ALARM PRE-REC is set to 10 minutes and an alarm of 5 minutes is triggered at 4:00pm and ALARM POST REC is 180 seconds, the alarm recording will begin at 3:50pm and will end after 4:08pm.



Record Figure 51



Alarm Recording Consist of Figure 52

**SD Record Mode** is to define how to use the second SD card in the device. The device has 2 micro-SD cards capability, both will be used for Main Stream Recording.

SD Record Mode options are **Sub-Record**, **Mirror Record**, **Alarm Backup** and **Loop-Record**. By default, Loop-Record is chosen. Once the record mode has been chosen, tick the channel to be recorded to the SD card.

**Sub-Record** lets the SD card record video based on parameters set up in Sub Stream tab. It usually has a rather low resolution and framerates compared to the Main Stream.

**Mirror Record** mode will let the second SD card record the same thing as the first SD card, where the parameters are set up in the Main Stream tab.

**Alarm Backup** only the alarms will be recorded onto the second SD card.

**Loop-Record** let the second SD card to continue recording after the first one is full. This is recommended to use as it can prolong the recording data duration.

*Note: When SD cards are replaced, they must be formatted before using.*

**SD Write Resource Ratio** calculated by (Stream bitrate / SD card full write speed). Bitrate determined by resolution, framerates and quality; SD card full write speed is a fixed value of Brigade SD card (12Mbps). This is a reference value for user to see and configure settings accordingly. Recommend this is set to a value lower than 80%, if the data rate exceeds SD card writing speed and results in data loss.

*Note: This value cannot reflect correct status if using a 3<sup>rd</sup> party micro-SD card.*

**Record Storage** options are **Internal SD** or **External SD** (fireproof box). Currently the External SD is not in use.

**Channel** by default enables all available channels.

#### 4.2.2.2 Main Stream

These settings are used to set the resolution, frame rate and quality per channel independently for **Main Stream** which is stored on the SD card.

**Channel** is used to identify the channel. 1 and 2 channels are fixed for built-in camera for road monitoring and driver monitoring. Channel 3 for extra AHD/CVBS camera, Channel 4 for extra IP camera. By default, only channel 1 – 3 displays here. Channel 4 only show up when this channel being enabled in IPC Setup.

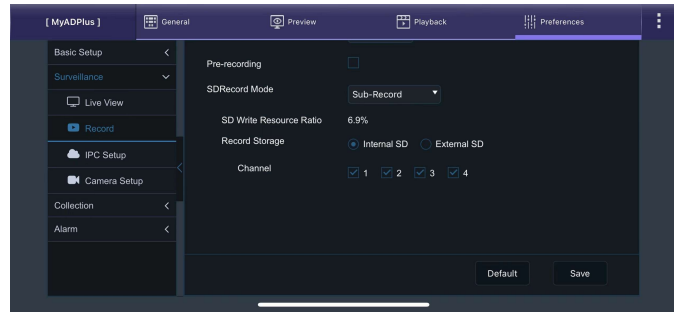
**Enable** allows the activation/deactivation of the camera channel. This should be used if not all camera channels are utilised to avoid video loss errors.

**Resolution** allows users to choose the resolution for each channel. The options auto adjust based on camera inputs. The options are CIF (lowest), WCIF, HD1, WHD1, D1, WD1 and AHD (720p, 960p, 1080p and 1920p) (highest). The recording resolution will not affect AI detecting accuracy.

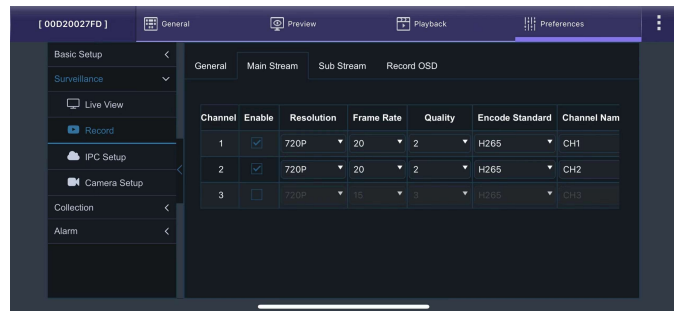
**Frame Rate** allows users to choose different frame rates for different channels depending on resolution settings. Options are 1 to 25 for PAL and 1 to 30 for NTSC. By default, it is 20 for Channel 1 and Channel 2.

**Quality** has 8 levels. Level 1 is the best quality whereas level 8 is the lowest quality. **Quality** represents stream data bitrate based on current setting (**Resolution, Framerate, Quality, Encode Standard**). This value can help users to estimate the video file size.

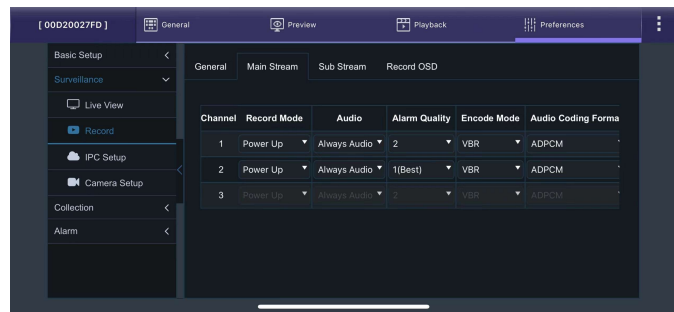
**Encode Standard** options are H.265 and H.264. By default, set to H.265 as it supports higher compression rate and able to reduce the recording file size.



Record – Sub-Record Figure 53



Main Stream -1 Figure 54



Main Stream -2 Figure 55

**Channel Name** is used for an 8-character name which each camera channel can be associated with. These can include lower/upper alphanumeric characters. This is displayed on the Live and Record OSD.

**Note:** For IP camera channels, since the IP camera has its own settings embedded, after connecting, the channel settings will automatically change to IP camera. Users may need to manually adjust the settings after connection.

**Record Mode** has three modes available – all modes require the **IGNITION** signal to be applied, or timer auto-boot to be set up:

- **Power Up** - allows continuous recording after powering up until the device shuts down.
- **ALARM** - allows users to record only when an alarm has been triggered. Alarms can be configured to be activated by triggers or other alarms (such as G-Force, Panic Alarm, see section 4.4 for details on alarms)
- **TIMER** - allows users to specify timeframes in which the recording will be activated.

**Record Mode - Timer - Schedule** allows users to choose schedules based on different days.

Click on the day and choose the desired day of the week. Then setup the **Start Time**, **End Time** and **Video Type**.

**Record Mode - Timer - Video Type** can be Normal or Alarm.

**Note:** This record mode timer will not prevent the device from turning off if ignition signal has been removed.

**Audio** activation allows users to enable/disable the audio recording from the camera channels individually. This setting depends on the utilised cameras having microphones. There are 2 options, **Always Audio** (Main Stream always has audio recorded) and **No Audio** (Main Stream recording has no audio).

**Alarm Quality** has 8 levels. Level 1 is the best quality whereas level 8 is the lowest quality. Brigade recommends using a higher quality for Alarms for a higher level of image detail.

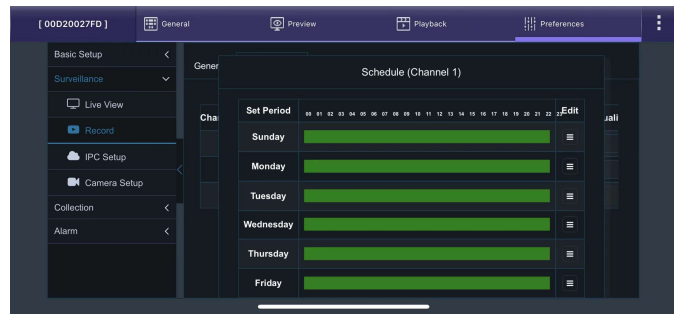
**Encode Mode** allows users to choose between Constant Bit Rate (**CBR**) and Variable Bit Rate (**VBR**). The difference is minimal as the Variable Bit Rate is not efficient as it involves more processing power and may introduce some visible artefacts due to higher compression rates.

**Audio Coding Format** support 4 types of audio format: ADPCM, G711U, G711A and G726. By default, it is set to ADPCM.

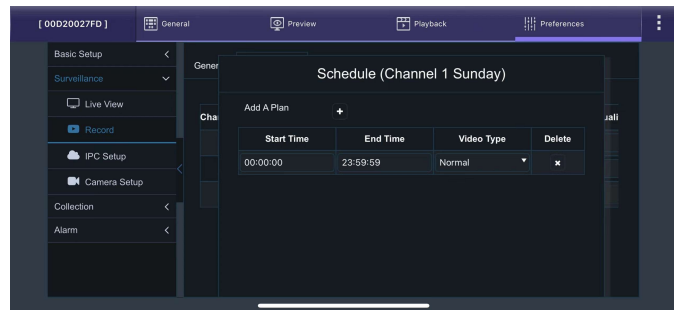
**Audio Format Sub Type** works when choosing **G726**. Available options are 16K, 32K, MEDIA\_16K and MEDIA\_32K. By default, set to 32K.

**Percentage of Main Stream** displays resource occupation which calculated based on each channel settings. Main Stream resource and Sub stream resource are calculated separately, each of them can go up to 100%.

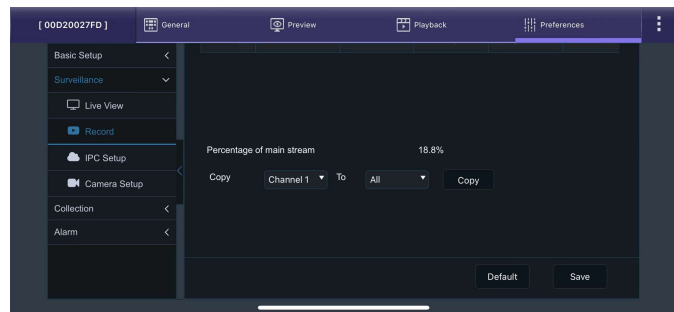
**Copy** can duplicate one channel's setting to every other channels.



**Main Stream – Record Mode – Timer Schedule Figure 56**



**Main Stream – Record Mode – Timer Setup Figure 57**



**Main Stream -3 Figure 58**



### 4.2.2.3 Sub Stream

These parameters define sub stream, which is typically used for the secondary SD card or online **Live View** via MDR-Dashboard 6.0. If the second SD card used for alarm recording, mirror recording or Loop-Record, it will take Main Stream parameters.

**Channel** is used to identify the channel.

**Enable** this controls which channels are to have sub-stream video and save to the second SD card.

**Resolution** can be setup per channel. Options are CIF, HD1, D1.

**Frame Rate** allows users to choose different frame rates for different channels depending on resolution settings. Options are 1 to 25 for PAL and 1 to 30 for NTSC. The default framerate is 20 for Main Stream and 10 for Sub Stream.

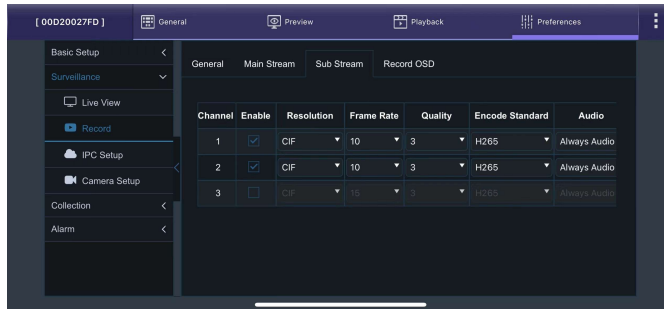
**Quality** has 8 levels. Level 1 is the best quality whereas level 8 is the lowest quality. **Quality** represents stream data bitrate based on current setting (**Resolution, Framerate, Quality, Encode Standard**). This value can help users to estimate the video file size.

**Encode Standard** options are H.265 and H.264. By default, set to H.265 as it supports a higher compression rate and is able to reduce the recording file size.

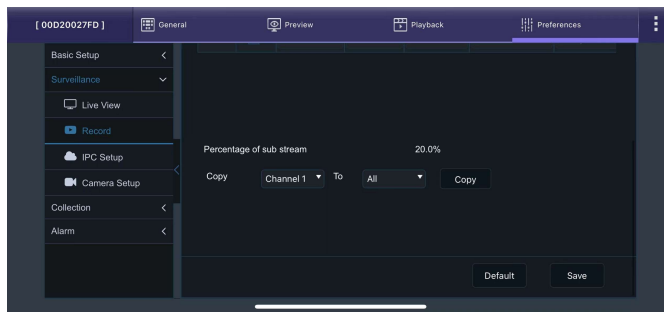
**Audio** activation allows users to enable/disable the audio recording from the camera channels individually. This setting depends on the utilised cameras having microphones. There are 2 options, **Always Audio** (Main Stream always has audio recorded) and **No Audio** (main Stream recording has no audio).

**Percentage of Sub Stream** displays resource occupation which calculated based on each channel settings. Main Stream resource and Sub Stream resource are calculated separately, each of them can go to 100%. If this value exceeds 100%, MDR will notify the user and the setting cannot be saved.

**Copy** can duplicate one channel's setting to every other channels.



Sub Stream - 1 Figure 59



Sub Stream - 2 Figure 60

### 4.2.2.4 Record OSD

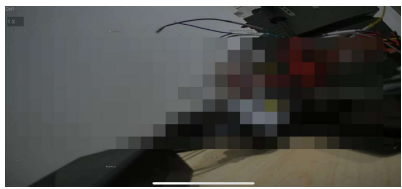
**Record OSD** refers to information that will be “burned” onto the video image. This means that if footage is exported as MP4, then the enabled information will be shown on the image.

The options are **Time, Vehicle Reg, Channel Name, Time Zone, Speed, GPS, Vehicle Num** and **Alarms**.

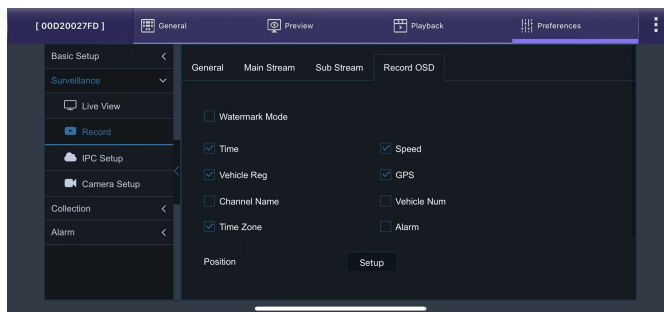
**Watermark Mode** can shrink the text size to minimum to avoid blocking video details.



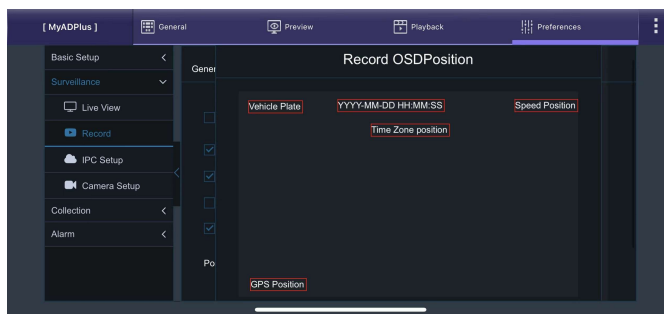
Record OSD without Watermark Mode Figure 61



Record OSD with Watermark Mode Figure 62



Record OSD Figure 63



Record OSD Position Setup Figure 64

You can change the position of each live OSD by using the **Setup** button.

By default, **TIME, VEHICLE REG, TIME ZONE, SPEED, GPS** are enabled.

### 4.2.3 IPC Setup

The device supports direct connection with one IP camera via 6pin connector on the adapter cable.

IP connection is plug-and-play. After connected, the image will appear on the screen after approx. 20s without extra operations required.

IP channels are also flexible compared to analogue channels. Users can manually allocate it to any other channel in the IPC Setup page. Brigade Electronics PLC recommend allocating the IP camera to Channel 4 as Channels 1 and 2 are for built-in cameras, Channel 3 usually reserved for AHD/CVBS cameras.

By default, the **LOCAL ADDRESS** for the device is 10.100.100.1. Therefore, the connected IP camera IP address range should within 10.100.100.x.

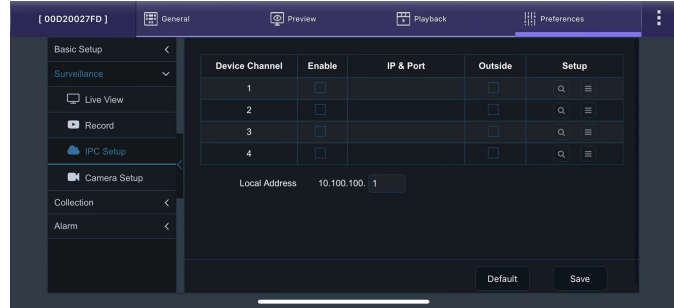
For more IP camera setup and operation, please refer to [IP Camera Operational Guide](#).

### 4.2.4 Camera Setup

This interface can be set as mirror, flip or rotating image for each channel. Those settings affects both live and recorded videos.

Install Angle can rotate the image to 0°, +90°, and -90°.

**Mirror** and **Flip** and switch the image direction horizontally or vertically.



IPC Setup Figure 65



Camera Setup Figure 66

## 4.3 Collection

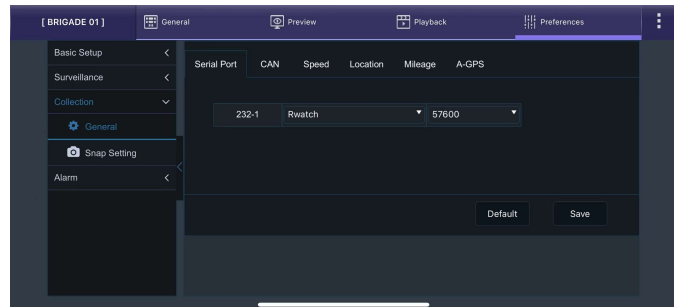
### 4.3.1 General

#### 4.3.1.1 Serial Port

This device supports 1x RS232 signal input which can be used for various accessories. Current recommendation is the Brigade Remote Panel which consists of 4 diagnostic LEDs, internal buzzer and a panic button. In a scenario where the device is installed away from the driver, the remote panel LEDs and buzzer will alert the driver to any hardware or software faults.



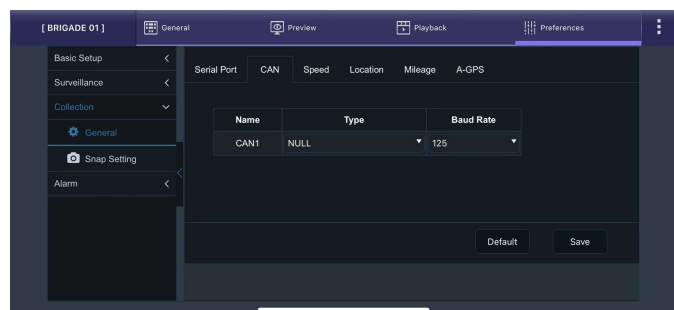
Remote Panel Figure 67



Serial Port Figure 68

#### 4.3.1.2 CAN

This feature is currently under development.



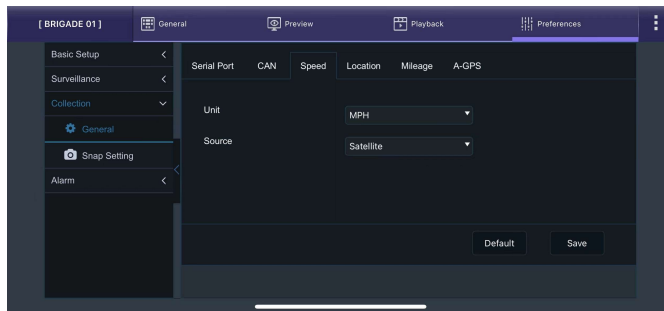
CAN Figure 69

### 4.3.1.3 Speed

**Unit** refers to the speed setting. This can either be in miles per hour (MPH) or kilometres per hour (km/h). By default, this is set to MPH.

**Source** has three options. Satellite (GPS), OBD, CAN or MIX. In the majority of applications GPS signal is the simplest to use. OBD option can be chosen when the device is installed with OBD connectors rather than cable wires. By default, Satellite is chosen as source.

**Note:** *this device does not support Speed Pulse.*



Speed Figure 70

### 4.3.1.4 Location

**Navigation Mode** refers to which method is used for uploading location information to the connected server. Currently only one method is available – **GPS**.

**Constant Upload Mode** means the GPS uploading rate is constant. It can be set either by **Timing** – every few seconds to upload once, or by **Distance**, every few miles/km the GPS will be upload once. Distance is selected by default.

**Note:** *Timing and Distance can be ticked at the same time. Whenever one of the condition meets, the GPS info will be generated and uploaded.*

**Variable Upload Mode** support more detailed tuning on the GPS upload rate. Users can set more frequent uploading while vehicle is driving, and less uploading when vehicle stops.

**Moving Start** can define when the vehicle is running, what GPS upload rate users need.

1) **Speed** is the first condition to define over which speed value can be identified as vehicle is moving.

2) **Duration** is the second condition to define how many seconds the vehicle is running can be marked as Moving status.

Both conditions must be satisfied simultaneously.

After above conditions are satisfied, users can define what upload rate they need.

1) **Timing** defines how many seconds to upload GPS info once.

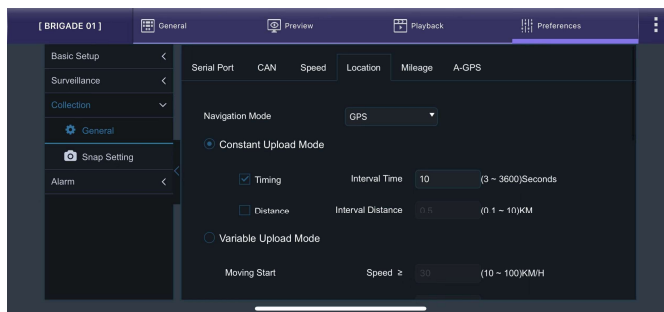
2) **Distance** defines how many miles/km to upload GPS info once.

**Note:** *Timing and distance can be ticked at the same time, if they both get ticked, the GPS info will be uploaded when both are satisfied.*

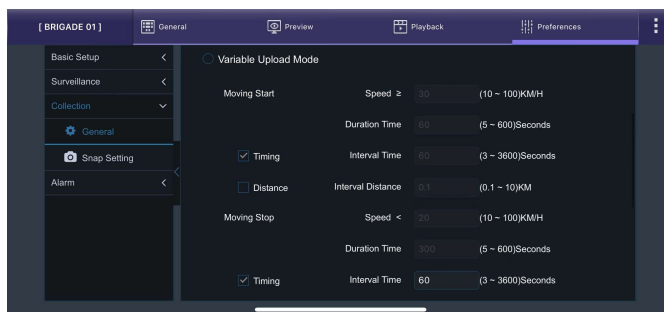
**Moving Stop** follows the same logic as the **Moving Start**. Users can set lower GPS upload rate here as frequent upload GPS is unnecessary when vehicle is in stop status.

**GPS Heading Change** is an additional condition to upload GPS info when device detects when the heading direction changed abruptly and significantly. By default, the Deviation Angle is set to 45 degrees and lasts for more than 5 seconds.

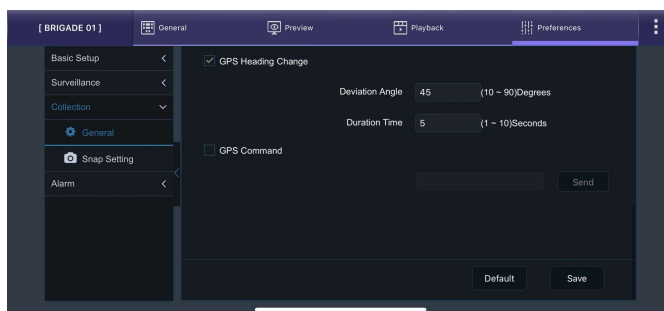
**GPS Command** supports a command of “log gpgsv” and “unlog gpgsv” for obtaining GPS raw data and save onto device storage medium for troubleshooting purposes. By default, it is off.



Location – Constant Upload Mode Figure 71



Location – Variable Upload Mode Figure 72



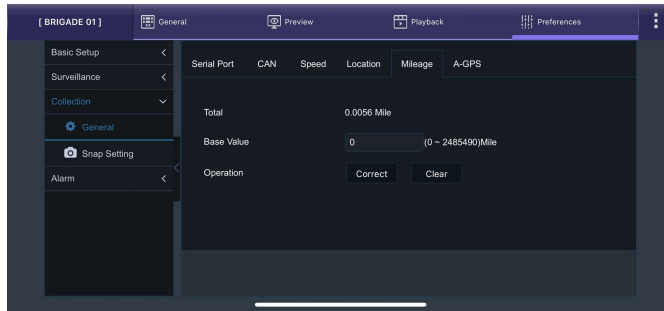
Location – GPS Heading Change Figure 73

#### 4.3.1.5 Mileage

**Total** displays the total distance travelled of the vehicle once it has been confirmed in mileage setup. The speed unit controls whether this value is displayed in miles or kilometres.

**Base Value** is a field that is manually entered. Type the current distance value once the device is installed.

**Operation** is used to submit the distance value to the device memory. Click **Correct** once you are happy with the value. Click **clear** to zero the total distance value. Prompts will display to ask for user's confirmation.



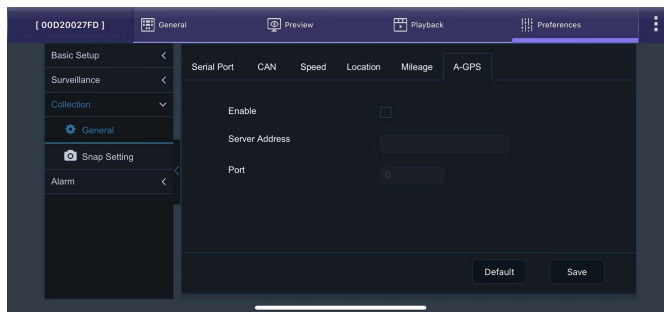
Mileage Figure 74

#### 4.3.1.6 A-GPS

**A-GPS** is a method to improve GPS transmission by connecting to a nearby mobile base station to download satellite data. Common satellite signal is only 50bit/s, with supports from mobile base station, the downloading speed can be drastically improved. After it is enabled, users can input an A-GPS server address and port. Afterwards, the device will be able to connect to the A-GPS server and downloading GPS data while the vehicle is moving. There are a lot of public A-GPS services that can be chosen. Users can decide which one to use as required.

**Note:** to use the A-GPS feature requires the mobile network enabled in the device.

If enabled the A-GPS, the additional data consumption is less than 1MB/day.



A-GPS Figure 75

### 4.3.2 Snap Setting

#### 4.3.2.1 Time Snap

**Time Snap** needs to be ticked to enable all the options. Users can have a maximum of 8 snap entries. By default, time snaps are disabled.

**Start time** refers to the time you would like time snaps to start.

**End time** refers to the time you would like time snaps to end.

**Delete** removes a time snap entry. Entry 1 cannot be deleted.

**Snap Link Setup** is where the time snap is setup.

There is no limitation of the number of snaps, but this uses the same storage limit as recordings. If the storage is full, then the oldest snap will be written over. Snaps are stored by vehicle registrations and time.

When exporting snaps to a USB flash drive. A folder named picture found in the following path F:\DC204AI\vehicle registration\date\picture will be created.

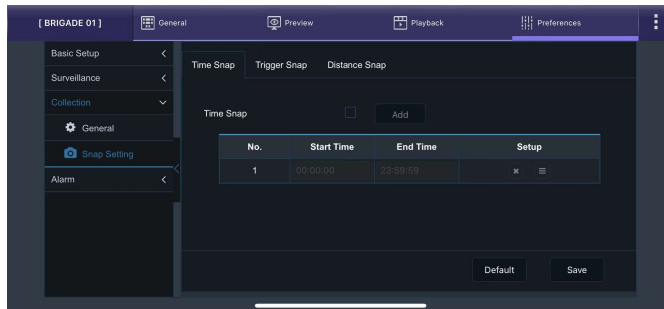
**Channel** is the channel option for which the user would like to set time snapshots.

**Snap Enable** controls whether time snaps are enabled for that channel. To activate the other menu options, snap enabled must be ticked.

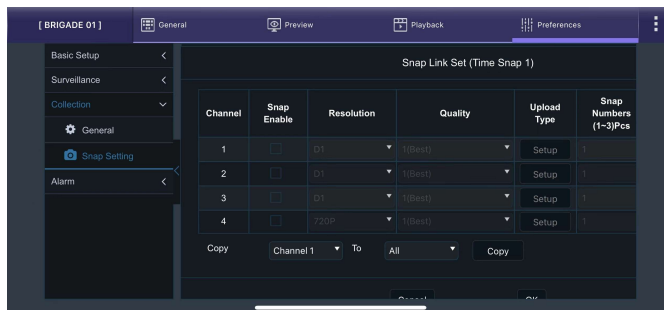
**Resolution** refers to the time snap resolution. The options are CIF, WCIF, HD1, WHD1, D1, WD1 and AHD (720p, 960p and 1080p). This is dependent on the input resolution of the cameras connected.

**Quality** represents the image quality of the snapshot. There are 8 levels. Level 1 is the highest quality whereas level 8 is the lowest quality. By default, this is 1.

**Upload Type** support to save snapshot to FTP server or HTTP server. FTP server has been defined in *Chapter 4.1.6.1 FTP Server*. HTTP server is currently not in use.



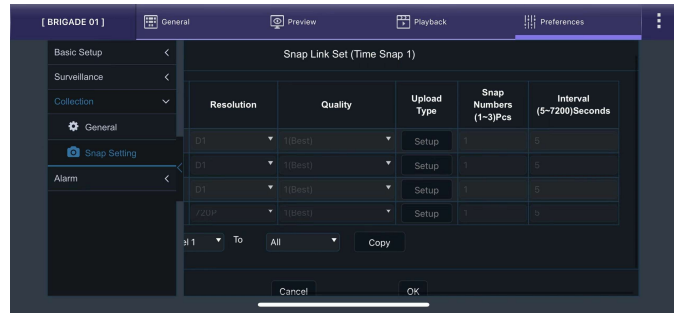
Time Snap Figure 76



Time Snap Setup 1 Figure 77

**Snap Numbers** refers to how many snaps will be taken. A maximum of 3 snaps can be taken for a minimum of 5 seconds. By default, this is 1.

**Interval** is the period between each snap which can be between 5 and 7200 seconds. By default, this is 5 seconds.

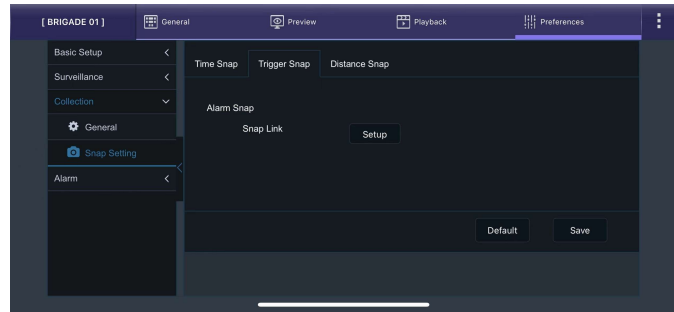


**Time Snap Setup 2 Figure 78**

#### 4.3.2.2 Trigger Snap

**Alarm Snap** is used for taking snaps based on triggered alarms only. When any alarm enabled as Alarm Snap on its setting, the device will take snapshots when that alarm triggered.

**Setup** follows the same interface and structure as above **Time Snap**, please refer to section 4.3.2.1 for detailed explanations.



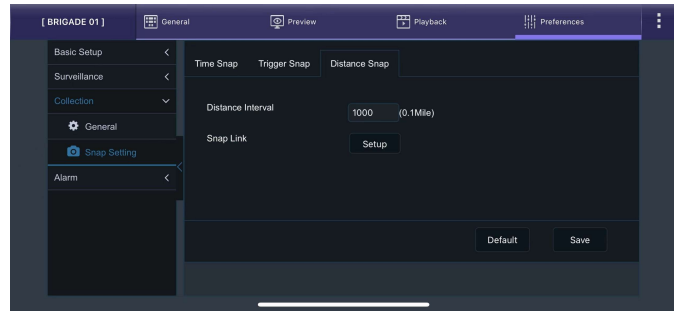
**Trigger Snap Figure 79**

#### 4.3.2.3 Distance Snap

**Distance Snap** is used for taking snaps based on vehicle driving distance.

**Distance Interval** to define how frequently the device will create a single snapshots.

**Setup** follows the same interface and structure as above **Time Snap**, please refer to section 4.3.2.1 for detailed explanations.



**Distance Snap Figure 80**

### 4.4 Alarms

#### 4.4.1 Base

##### 4.4.1.1 IO alarm

By default, this alarm is on.

**Name** is filled in for input sensor information. This is usually completed by the installer to aid in identifying an input trigger in the future. Up to 8 alphanumeric characters can be used. This is an important field to be filled in, it is displayed under alarm type in the event log within MDR-Dashboard software.

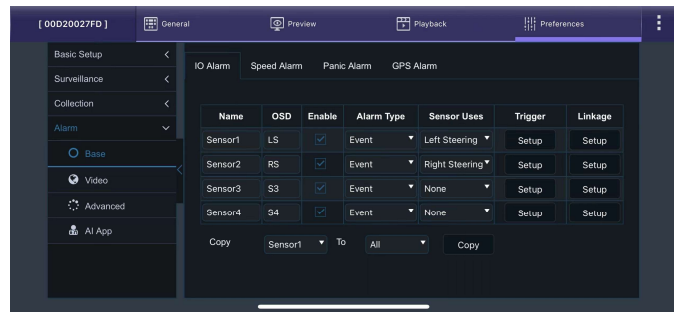
Time	Alarm Type
07:17:16 03-10-202	name2
07:17:03 03-10-202	name1

**OSD** is a 2-alphanumeric character identifier. This is an important field to be filled in as this information is then carried over to the MDR-Dashboard software. This is shown on the LIVE OSD and the RECORD OSD.

**IO Enable** allows users to set which trigger input wires are used. If a wire is not used, set enable to off.

For Trigger:

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.



**IO Alarm Figure 81**

**Sensor Uses** select Left or Right Steering when wanting to use AI features. Other options are currently not in use.

**Trigger Source** to define where the signal comes from. The user can choose between **Source Voltage** or **Source Pulse**. Under **Source Voltage**, high/low voltage level can trigger the sensor. Under **Source Pulse**, some pulse signal such as left / right indicators can trigger the sensor.

**Trigger** is a field that controls whether an input trigger will trigger on a low or high signal. Determines whether the trigger sensor is activated with a high or low voltage.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

For Alarm Linkage:

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

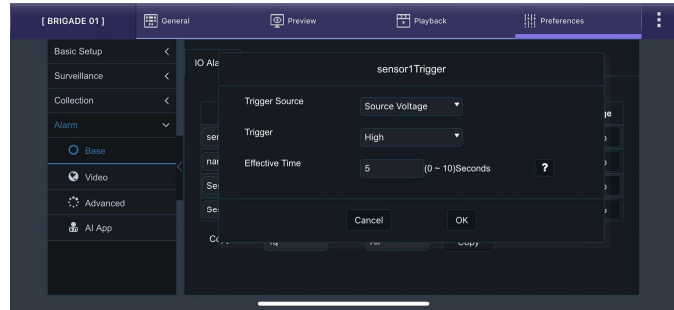
**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.

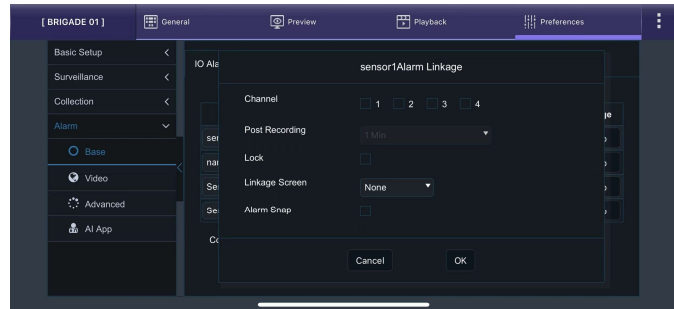
**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.



IO OSD shown on Playback Figure 82



IO Alarm Trigger Figure 83



IO Alarm Linkage Figure 84

#### 4.4.1.2 Speed Alarm

By default, this alarm is off.

**Overspeed Enable** is used to activate overspeed alarms or events.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Triger:

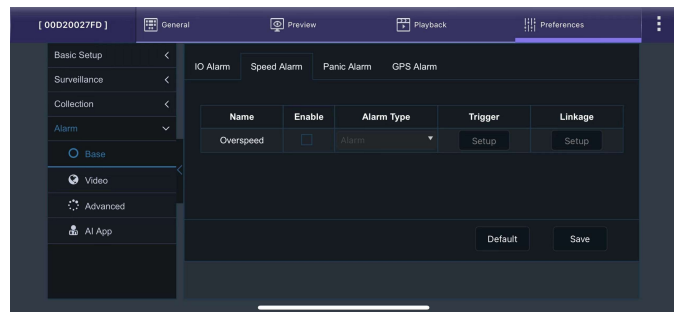
**Preload Speed Difference** is an early warning for drivers to curb their speed. For example, if you set the speed to 50mph, and early difference is set to 10mph, then when your speed reaches 40mph, the device will give a TTS voice message "Speed warning" to warn the driver. By default, early difference is set to 10 mph.

**Speed** refers to threshold value for which speed will be considered an overspeed and recorded as an alarm.

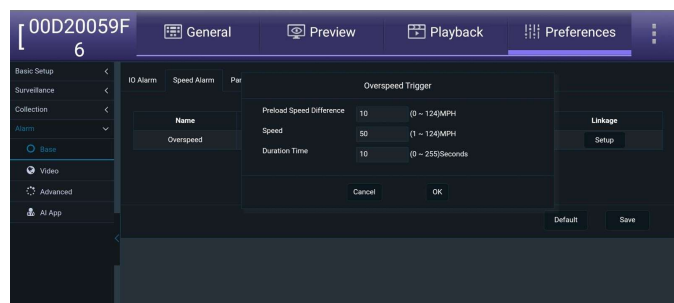
**Duration Time** specifies different lengths of time which allow for longer/shorter alarm durations. If the alarm duration is set to 30 seconds and a short 2 second alarm occurs, this would be treated as a 30 second alarm. Can be set between 0 to 255 seconds. By default, the duration time is 10 seconds.

For Alarm Linkage:

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).



Speed Alarm Figure 85



Speed Alarm Trigger Figure 86

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.

**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.

#### 4.4.1.3 Panic Alarm

By default, this alarm is on.

**Panic Enable** refers to the panic button found on the device, near to the LED indicators. After enabling this alarm, pressing the button once will trigger it.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Trigger:

**Any key** refers to how long the panic button needs to be pressed. This is fixed to 1 second.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

For Alarm Linkage:

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.

**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.

**MP3 Voice** enables when the alarm triggered, there will be a voice alert produced by the device to notify the driver.

#### 4.4.1.4 GPS Alarm

By default, this alarm is on.

**GPS Alarm Enable** is used to generate instant alarm when the device lost GPS signal.

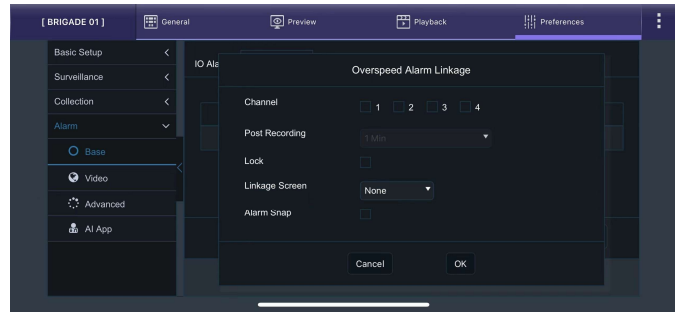
**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Trigger:

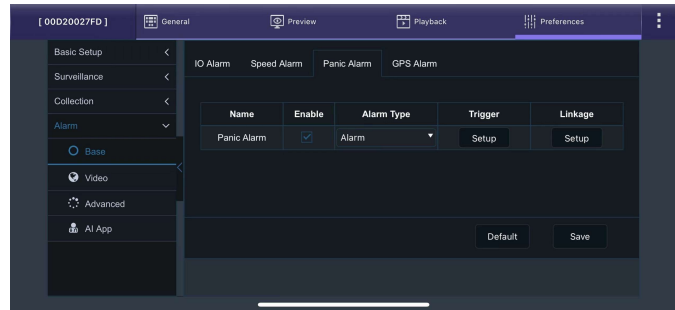
**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

For Alarm Linkage:

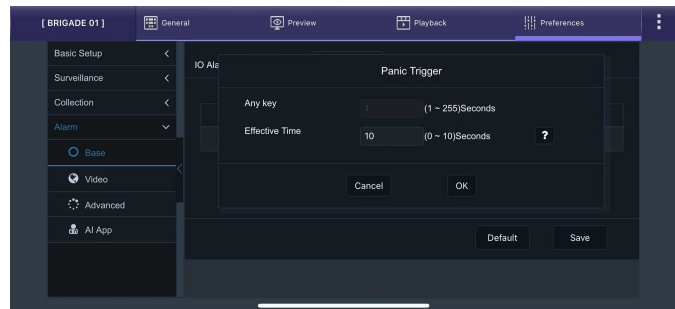
**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm



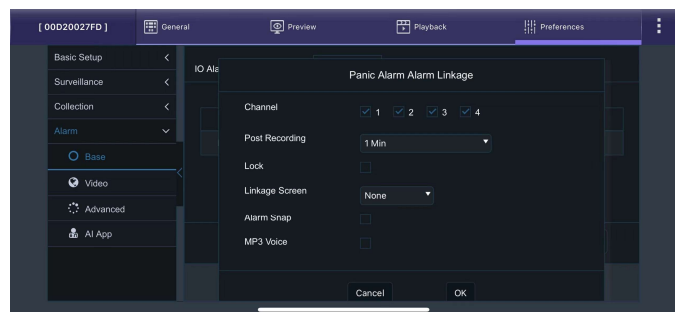
Speed Alarm Linkage Figure 87



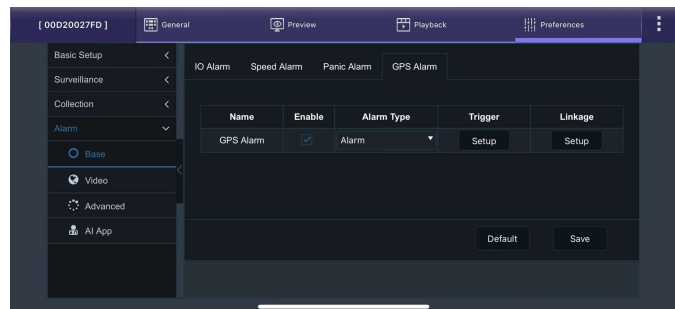
Panic Alarm Figure 88



Panic Alarm Trigger Figure 89



Panic Alarm Linkage Figure 90

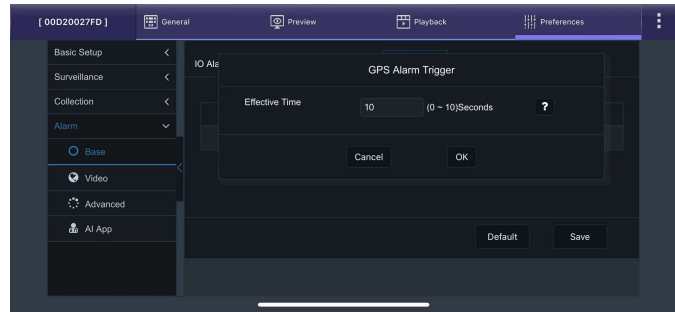


GPS Alarm Figure 91

recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

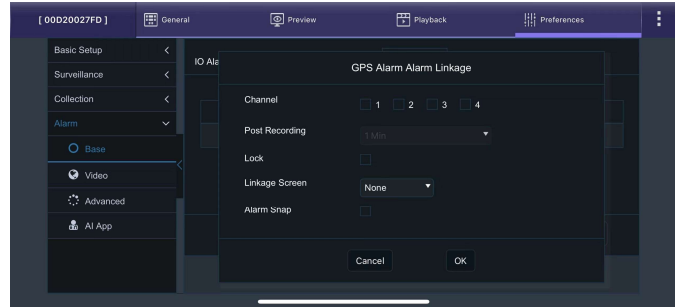
**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.



GPS Alarm Trigger Figure 92

**Linkage Screen** currently not in use.

**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.



GPS Alarm Linkage Figure 93

## 4.4.2 Video

### 4.4.2.1 Video Loss

By default, this alarm is on.

**Video Loss Enable** is used to alert users to a loss of video signal on any of the enabled camera input channels.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Trigger:

**Channel** is used to choose which channels the alarms are to be triggered from. Channels 1 and 2 ticked by default.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

For Alarm Linkage:

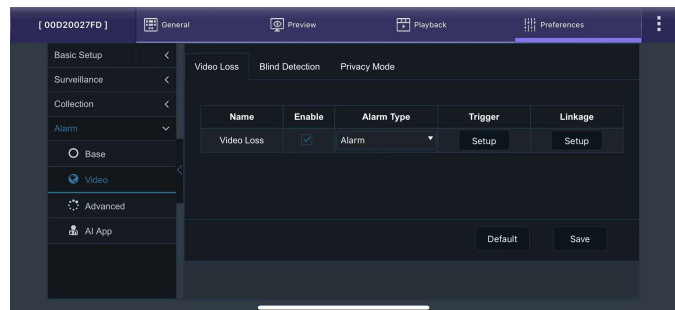
**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

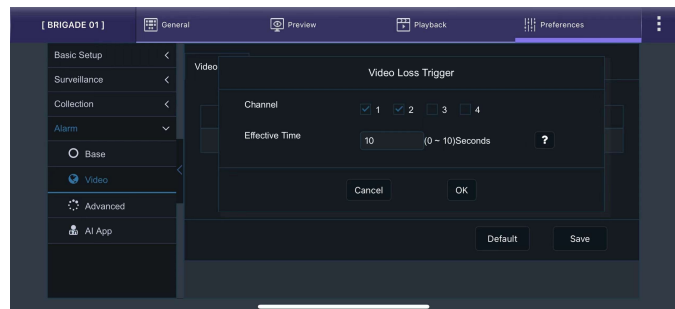
**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.

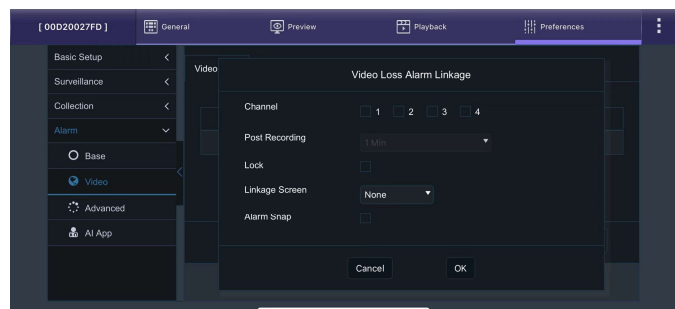
**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.



Video Loss Alarm Figure 94



GPS Alarm Trigger Figure 95



GPS Alarm Linkage Figure 96



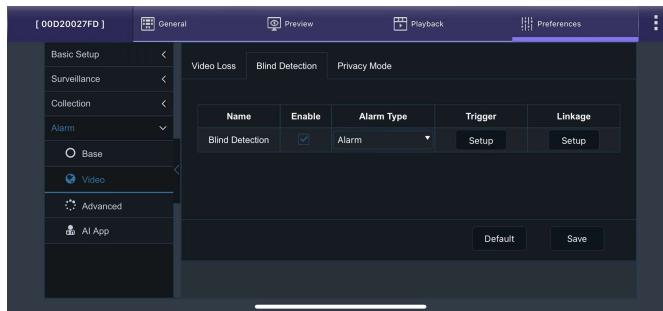
#### 4.4.2.2 Blind Detection

By default, this alarm is on.

**Blind Detection Enable** is used to analyse camera inputs for blind images. Blind detection occurs when a camera is obstructed by a large object or deliberately blocked the image. It is mostly used to tackle acts of vandalism.

*Note: Rapid light changes will also cause Blind Detection triggered, therefore, it is not recommended when using cameras with infrared illumination.*

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.



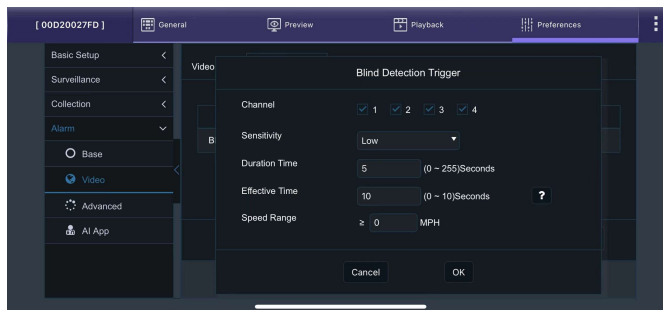
Cover Alarm Figure 97

For Trigger:

**Channel** is used to choose which channels you would like the alarms to be triggered.

**Sensitivity** has three options: **High**, **Middle** and **Low**. By default, this set to **Low**.

**Duration Time** specifies different lengths of time which allow for longer/shorter alarm durations. If the alarm duration is set to 30 seconds and a short 2-seconds alarm occurs, this would be treated as a 30 second alarm. Can be set between 0 to 255 seconds. By default, this is 5 seconds.



Cover Alarm Trigger Figure 98

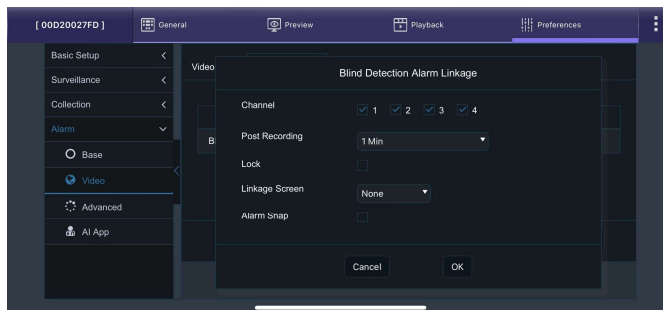
**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

**Speed Range** define this alarm will be able to trigger when the vehicle speed reaches certain value.

For Alarm Linkage:

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds. By default, this is 1 minute.



Cover Alarm Linkage Figure 99

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.

**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.

#### 4.4.2.3 Privacy Mode

By default, this alarm is off and set to Event rather than Alarm.

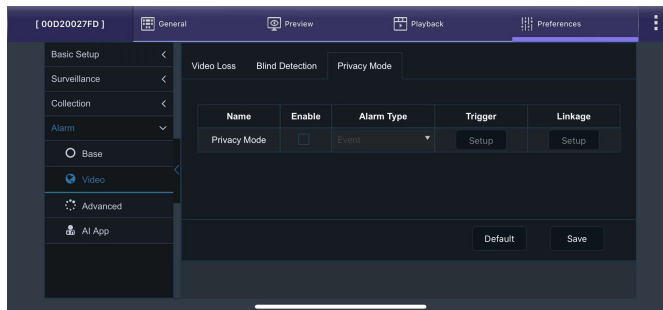
**Privacy Mode Enable** is used for closing camera and stop recording when the driver does not want to be recorded.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Trigger:

**Channel** is used to choose which channels will be shut down when the privacy mode is activated.

**Privacy Method** has two options: **IO** and **ACC OFF**. If **IO** is selected the driver can activate the privacy mode by triggering the dedicated IO (the Sensor Usage in IO alarm must be set to "Privacy Mode"). If **ACC OFF** is selected, the privacy mode will be activated when the ignition signal cuts off.



Privacy Mode Figure 100

**Exit Method** explains how to deactivate the privacy mode. If multiple methods have been chosen here, then if either one of them has been satisfied Privacy Mode will be deactivated.

**Enable AI MP3 Voice** since the AI alarm detection is still ongoing, even if the device enters Privacy Mode, the device will still give AI voice alerts to driver.

**Alarm Voice Enable** when the Privacy Mode activated or deactivated, there will be a voice alert produced by the device to notify the driver: "Privacy Mode Enable", "Privacy Mode Disable".

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

There is no Alarm Linkage for **Privacy Mode**.

#### 4.4.3 Advanced

##### 4.4.3.1 G-Force

By default, this alarm is off.

**G-Force Enable** is used to analyse the driving behaviour based on the G-Force values recorded by the device.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

For Trigger:

Based on the accumulated data obtained from built-in G-Sensor, the device can make a judgment and reports alarm on the driver's driving behaviour such as **Harsh Braking**, **Hard Acceleration**, **Harsh Left Turn** and **Harsh Right Turn**.

**Offset** is defined by complex algorithms and Brigade Electronics PLC recommend leaving the value as default. By default, there are three sets of Offset values that can be chosen, determined by vehicle's weight: **Light Duty**, **Medium Duty** and **Heavy Duty**. Users can select the setting based on their condition.

**Note:** The offset value can be increased or decreased if the alarm is too easy/hard to trigger. But the effect is not linear, it must be tested and determined for the users' specific vehicle.

**Speed** defines this alarm will be able to trigger when the vehicle speed reaches certain value.

**Shock** represents collision warning based on received G-Force data. The X, Y, Z values refer to the G value which will trigger the alarm. By default, all three values are 1G.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

For Alarm Linkage:

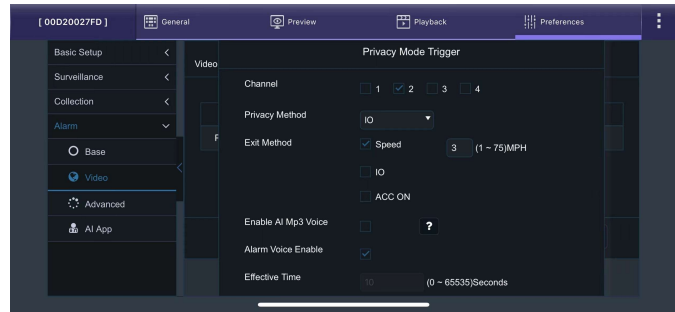
**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds. By default, this is 1 minute.

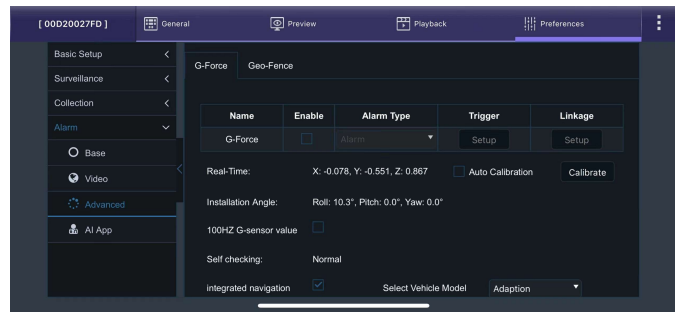
**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted.

**Linkage Screen** currently not in use.

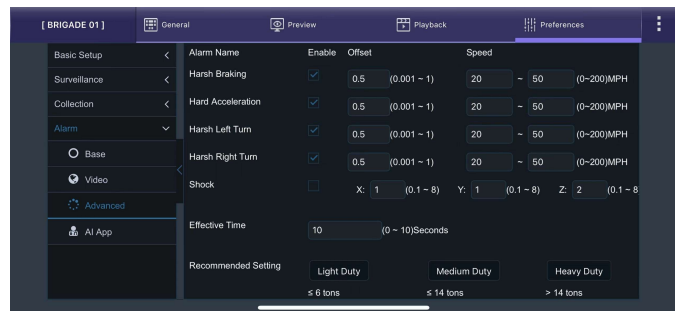
**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.



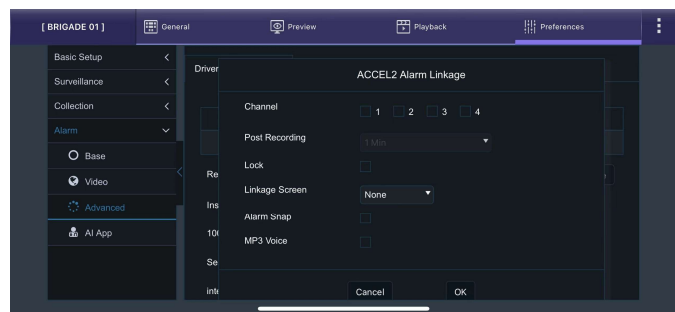
Privacy Mode Trigger Figure 101



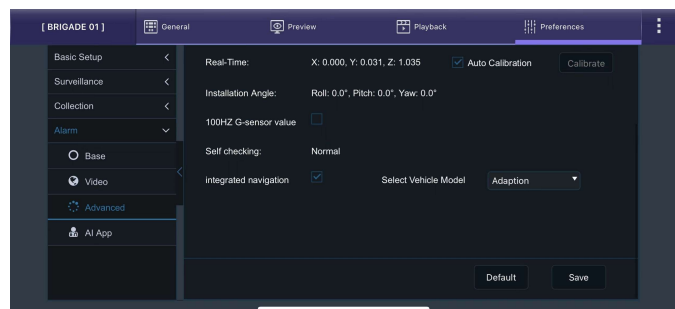
G-Force Alarm Figure 102



G-Force Trigger Figure 103



G-Force Alarm Linkage Figure 104



G-Force Alarm Other Reading and Settings Figure 105

**MP3 Voice** enables when the alarm triggered, there will be a voice alert produced by the device to notify the driver.

**Real-Time** displays current reading for X, Y, Z axis.

**Auto-Calibration** is on by default, the device will use accumulated G-Force data and internal algorithm to calibrate the value.

[Manual] **Calibration** is greyed out if Auto-Calibration is on. If Auto-Calibration is failed, users can disable it and use manual Calibration button to refresh the value.

**Installation Angle** displays the angle of the installed device. Roll-pitch-yaw angles obtained from internal 6-axis G-Sensor.

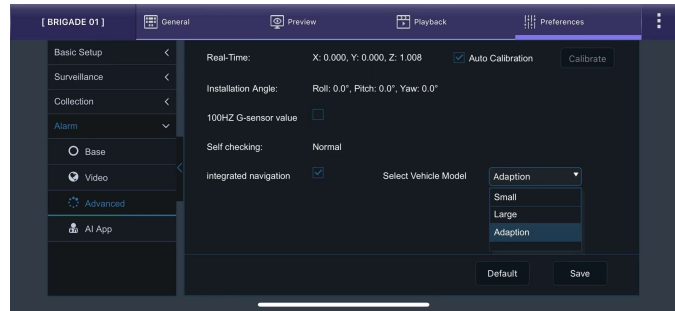
**100GZ G-sensor** value enabled to let the G-sensor work on maximum sampling rate. This will create G-Force data 100 piece per second, which improves the accuracy of the G-sensor greatly but also increased the size of the metadata drastically. It is recommended that this feature be disabled for everyday use. The default sampling rate is 10Hz.

**Self-checking** is to examine if the Auto-Calibration works well. Especially when the auto-calibration result is abnormal, the G-Sensor will check 6-axis data to make sure if it matches with the auto-calibration value.

**Integrated navigation** represents for inertial guidance module inside GPS module. Usually the G-Force data is generated by the G-Sensor. However, in the device GPS, it supports an inertial guidance module which can be supplemented for the G-Sensor. By enabling it, the device can receive data from both sensor/module and be able to make a more precise judgement of current driving status. By default, the **Select Vehicle Model** is set to **Adaption** which works for all different vehicle types.



**G-Force Alarm Other Reading and Settings Figure 106**



**G-Force Integrated Navigation Figure 107**

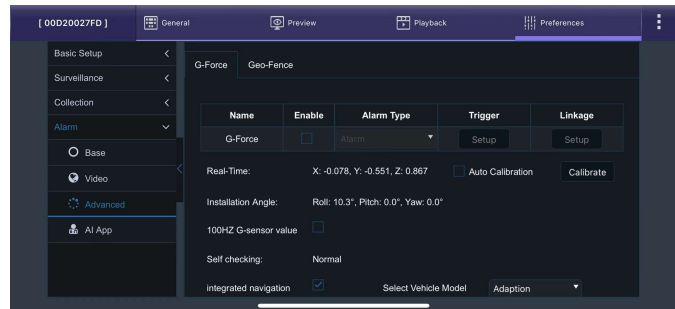
#### 4.4.3.2 Geo-Fence

**Geo-Fence Enable** is used to send an alarm if a vehicle leaves or enters a geographical region. This region is setup by the user in MDR-Dashboard software. Please refer to the MDR 600 Series Network Connectivity SW & Infrastructure Manual.

In **Geo-Fence Alarm** setup, different alarm conditions can be chosen from:

**Area I/O Alarm Switch:** trigger the alarm when vehicle in / out the region.

**Line I/O Alarm Switch:** trigger the alarm when vehicle enter / exit from the route. This is currently not in use.



**Geo-Fence Alarm Figure 108**

#### 4.4.4 AI App

The device has two built-in cameras, the road-facing camera is 1920P resolution for capturing front vehicle images and detecting road lanes. Another driver-facing camera is 1080P with infrared to monitor and detect driver behaviours. With infrared support, it adapts to day/night. glasses/sunglasses different conditions.

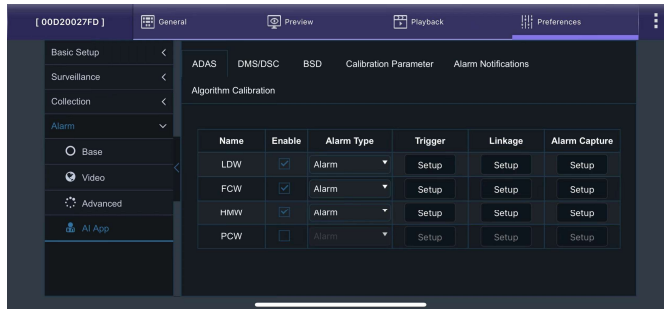
Different AI alarms have different setup and warning methods. Most AI alarms have 2 levels of notification (**Lvl1** and **Lvl2**). Level 1 is less harm and mainly for notifying the driver to be careful. Level 2 is more dangerous, and the alerts are harsher and more frequent. By using this device, the main notification is sound alerts and TTS broadcasts. Details will be explained below for each alarm type.

4.4.4.1 ADAS

**ADAS Enable** (Advance Driving Assistant System) supports various alarm/alerts by image analysing and processing from the front view camera.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

**Trigger** settings are different for each individual alarm.



AI App Figure 109

**LDW** (Lane Departure Warning) by detecting road lanes and left/right turning signals to give alerts when it detects current lane departure that is not intended. By default, this is on.

**Judgement:** vehicle is crossing lanes without left/right turning signal enabled.

**Lvl1 alerts:** TTS broadcast “Beep, Lane Departure.”

**Lvl2 alerts:** high pitch “beep beep”.

**FCW** (Forward Collision Warning) by detecting the distance between the front vehicle and the driver, calculating with the vehicle speed to give alerts. By default, this is on.

**Judgement:** vehicle has great possible to crash within seconds if vehicle in front brakes abruptly.

**Lvl1 alerts:** TTS broadcast “Collision warning, collision warning.”

**Lvl2 alerts:** high pitch “beep beep”.

**HMW** (Headway Monitoring Warning) by detecting the relative distance between the vehicle in front and the driver, calculating with vehicle speed to give alerts. By default, this is on.

**Judgement:** vehicle has great possibility to crash within seconds.

**Lvl1 alerts:** TTS broadcast “Beep, unsafe following distance.”

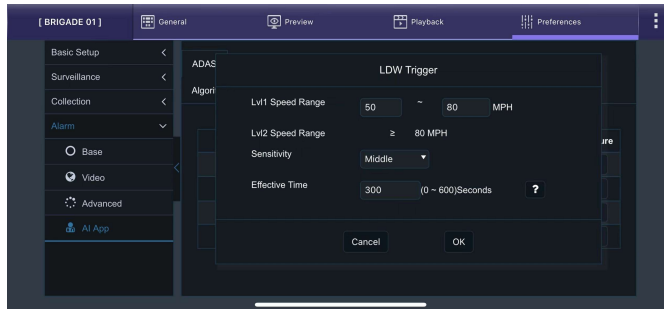
**Lvl2 alerts:** high pitch “beep beep”.

**PCW** (Pedestrian Collision Warning) currently not in use.

**Sensitivity** refers to how sensitive this alarm should be triggered. Options are High, Medium, Low and User-defined. Recommend keeping default settings and if wanting to change the sensitivity, it must be tested before using.

**Duration** specifies when to trigger this alarm after the detection fulfils for how many seconds. This setting only exists on HMW. If the dangerous following distance keeps on for 2 (default value) seconds, the HWM alarm will go off.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.



ADAS Alarm Trigger Figure 110

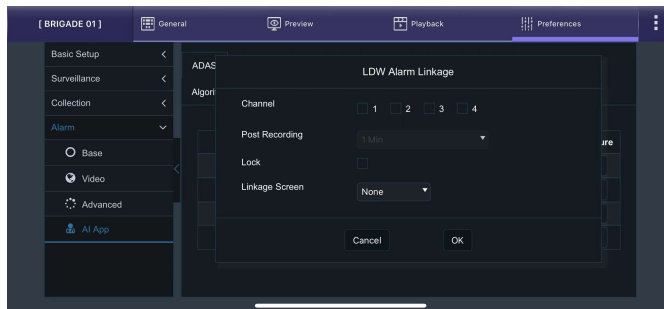
The **Alarm Linkage** interface are the same for every ADAS alarms.

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds.

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

**Linkage Screen** currently not in use.



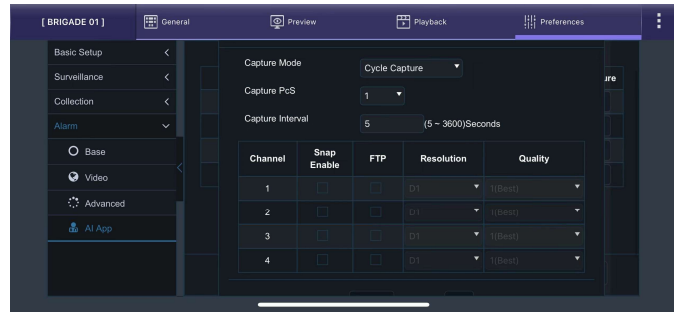
AI Alarm Linkage Figure 111

**Alarm Capture** are settings that enable the camera to create snapshots when certain alarm happens. This interface is the same for every ADAS alarms.

**Capture Mode** supports **Cycling Capture** and **Single Capture**. Cycling Capture to capture snapshots every few seconds. Single Capture to only capture snapshots once alarm has been activated.

The **Channel** table is to define which channel users want to get snapshots from, and for what resolution and Quality.

FTP only used when the device connected with an FTP server. For details, please refer to *Chapter 4.1.6.1*.



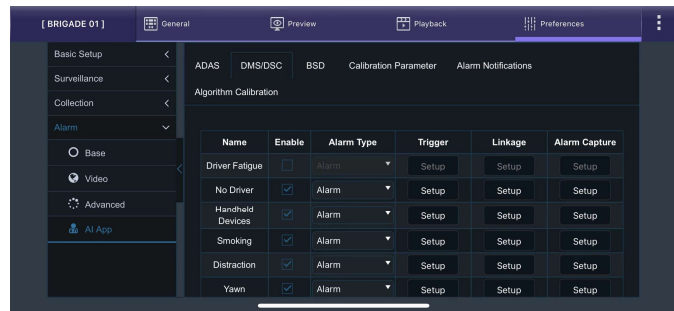
AI Alarm Capture Figure 112

#### 4.4.4.2 DMS/DSC

**DMS/DSC Enable** (Driver Monitoring System / Driving Safety Cockpit) supports various alarm/alerts by image analysing and processing from the driver facing camera.

**Alarm Type** can either be alarm or event. Alarms are reported to the Server Centre. Events are stored but do not get reported to the Server Centre.

**Trigger** settings are different for each individual alarm.



DMS/DSC Figure 113

**No Driver** by detecting driver face movements to determine if there's a driver seated at the driving seat. By default, this is on.

**Judgement:** No face has been detected.

**Lvl1 alerts:** TTS broadcast "Beep, no driver detected."

**Handheld Devices** by detecting the moving object around drivers' face/ear.

**Judgement:** An object shaped like a mobile phone has been detected close to drivers' ear or in hands.

**Lvl1 alerts:** TTS broadcast "Beep, phone detected."

**Lvl2 alerts:** high pitch "beep beep".

**Smoking** by detecting the cigarette stick features and body gestures.

**Judgement:** A cigarette feature has been detected for a period.

**Lvl1 alerts:** TTS broadcast "Beep, smoking detected."

**Lvl2 alerts:** high pitch "beep beep".

**Distraction** by detecting driver face and eyes movement. Supports to custom moving condition: Left, Right, Up and Down.

**Judgement:** certain movement has been detected and no left / right turning signal has been enabled (rule out the legal observation movement before turning the vehicle).

**Lvl1 alerts:** TTS broadcast "Beep, driver distraction."

**Lvl2 alerts:** high pitch "beep beep".

**Yawn** by detecting the position of the upper and lower lips and its opening amplitude value.

**Judgement:** when the amplitude value exceeds a certain threshold and lasts for the certain duration.

**Lvl1 alerts:** TTS broadcast "Yawning, please drive carefully."

**Lvl2 alerts:** high pitch "beep beep".

**Seatbelt** by detecting seatbelt shape across drivers' body.

**Judgement:** No seatbelt has been detected for a period.

**Lvl1 alerts:** TTS broadcast "Beep, please fasten seatbelt."

**Lvl2 alerts:** high pitch "beep beep".

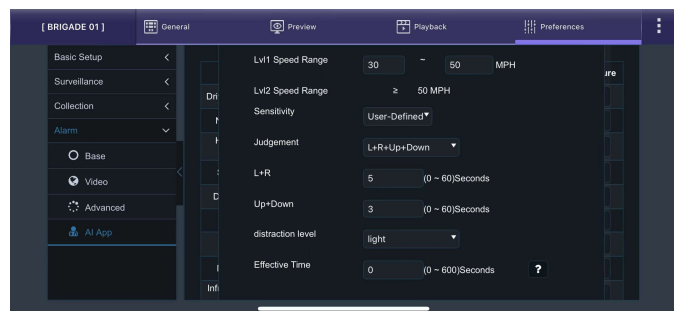
**Fatigue, No Mask** and **Infrared block alarm** are currently not in use.

**Sensitivity** refers to how sensitive this alarm should be triggered. Options are High, Medium, Low and User-defined. Recommend keeping default settings and if want to change the sensitivity, it must be tested before using.

**Effective Time** defines during this period, the device only allows this alarm to be triggered once.

**Judgement** (available on Distraction) has options **L+R**, **Up+Down** and **L+R+Up+Down**. They refer to different conditions of left / right / up / down head movement. Each condition can define detecting periods.

**Distraction Level** refers to the tuning degrees of drivers' head. Putting to **light** will trigger the alarm when head slightly turned. Putting to **medium** or **high** can allow larger tuning angle without triggering the alarm. This is used to avoid false alarms triggered by normal head movement.



DSM Alarm Trigger Figure 114

The **Alarm Linkage** interface are the same for every ADAS alarms.

**Channel** is used to choose which channels users would like to mark as alarm recordings. (Alarm recordings will show as red on playback time bar on both OSD and MDR-Dashboard software).

**Post Recording** specifies the period of recording added at the end of an alarm. For instance, if a sensor is triggered for 1 sec and the effective time is 30 seconds and the post recording is 15 seconds, the total amount of recording time will be 45 seconds. By default, this is 1 minute.

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted. See section 4.2.2.1 for details on lock duration.

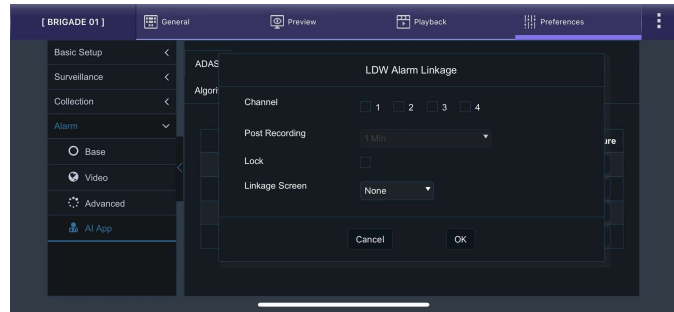
**Linkage Screen** currently not in use.

**Alarm Capture** are settings that enables the camera to create snapshots when certain alarm happens. This interface is the same for every ADAS alarms.

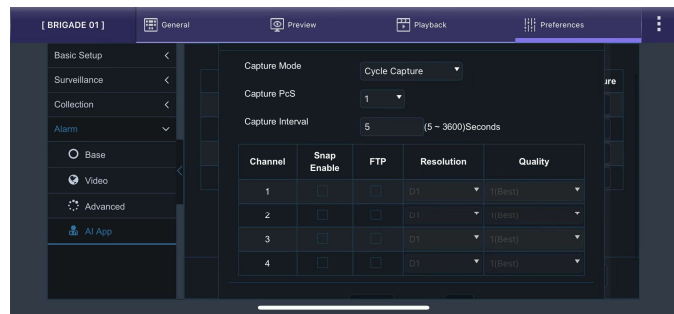
**Capture Mode** supports **Cycling Capture** and **Single Capture**. Cycling Capture to capture snapshots in every few seconds. Single Capture to only capture snapshots once after alarm happened.

The **Channel** table is to define which channel users want to get snapshots from, and for what resolution and Quality.

FTP only used when the device connected with an FTP server. For details, please refer to *Chapter 4.1.6.1*.



AI Alarm Linkage Figure 115



AI Alarm Capture Figure 116

#### 4.4.4.3 BSD

**BSD** (Blind Spot Detection) requires dedicated cameras to support, currently this feature is not in use.

#### 4.4.4.4 Calibration Parameter

This section is required to fill in before using AI features. Please make sure all measurements are accurate because the system will use these values to run algorithms on and do auto-calibration to make the AI feature works. If any parameters are incorrect, it will result in feature failure.

**ADAS Camera Install Height (1)** for filling in the device installation height, values can be in **CM** or **Inch**. Illustration refers to measurement 1 in *Calibration Parameter Figure 117*.

**Left Margin (2)** refer to the measurement from the left side vehicle to the device. Illustration refers to measurement 2 in *Calibration Parameter Figure 117*.

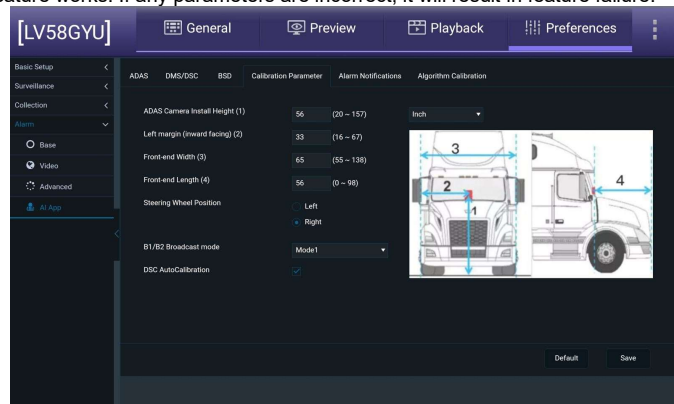
**Front-end Width (3)** refer to measurement 3 in *Calibration Parameter Figure 117*.

**Front-end Length (4)** refer to measurement 4 in *Calibration Parameter Figure 117*.

**Steering Wheel Position** to choose whether the vehicle is running on left steering (**Left**) or right steering (**Right**). This will be used for DSM/DSC feature working on the right detection area.

**B1/B2 Broadcast mode** currently not in use.

**DSC AutoCalibration** by default is enabled. This will allow the device to calibrate the DSC/DSM features automatically. Brigade Electronics PLC recommend keeping this feature on for less effort and avoiding human mistakes during calibration process.



Calibration Parameter Figure 117

#### 4.4.4.5 Alarm Notification

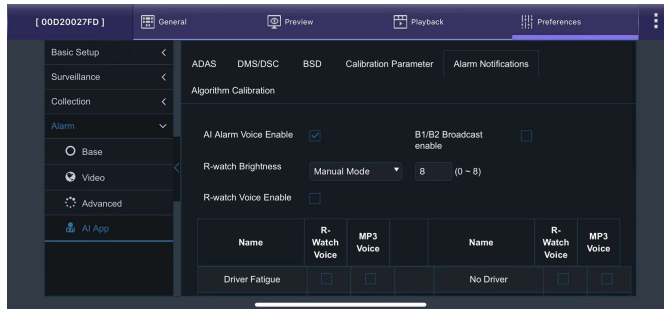
**AI Alarm Voice Enable** is audio main switch to allow the device to make TTS broadcast and audio alerts for AI alarms.

**B1/B2 Broadcast** currently not in use.

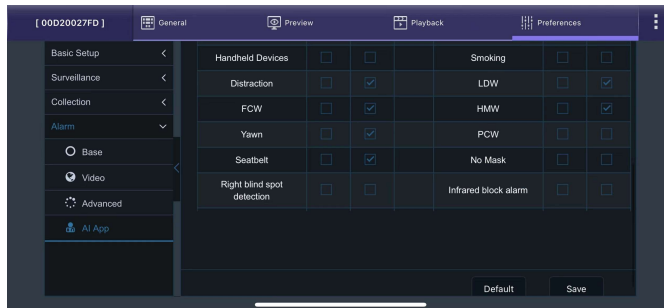
**R-Watch Brightness** currently not in use.

**R-Watch Voice Enable** currently not in use.

Voice Setting table below can detailed manage whether to voice alert and TTS broadcast for each AI alarm type.



Alarm Notification 1 Figure 118

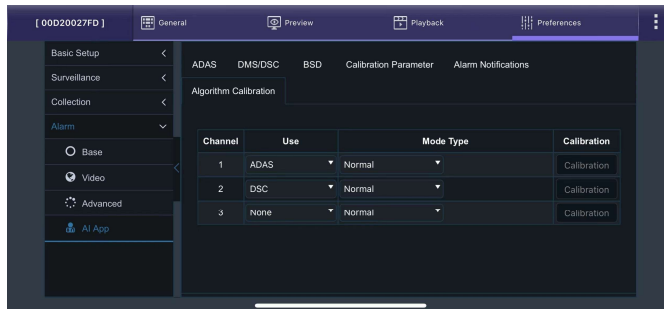


Alarm Notification 2 Figure 119

#### 4.4.4.6 Algorithm Calibration

This page defines each channel's usage. By default, Channel 1 is used for ADAS feature and Channel 2 is used for DSC feature.

Brigade Electronics PLC recommend not changing the setting as the system will run auto-calibration according to this setup. If channels have been assigned to incorrect usage, it will result AI feature failure.



Algorithm Calibration 1 Figure 120

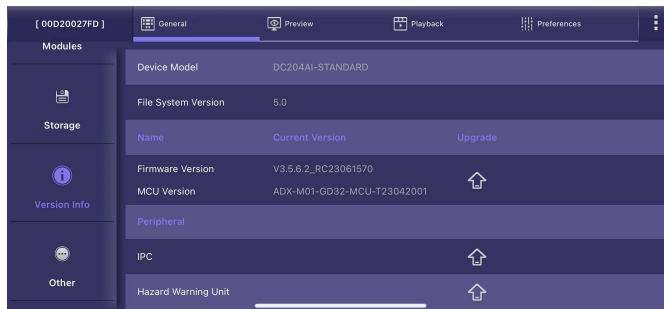
## 5 Other Operations

The SmartController App supports live view, Playback and status checking for connected devices. Please refer to *MDR SmartController Installation & Operation Guide - v1.0 – ENG* on Brigade Electronics website for further details. Below will introduce one of the essential features often used.

### 5.1 Upgrade

**General** contains various Status tabs for displaying device information. **Version Info** is the most used.

This interface contains multiple firmware and can be upgraded, such as device **Firmware**, **IPC** firmware, **GPS** firmware, **Power Box** firmware. To upgrade them, the user needs to create a folder in a flash drive root directory and name the folder "upgrade". Copy firmware files into the "upgrade folder", then connect the flash drive with the device USB port. Click on the Upgrade button on this interface will start the upgrade process.



Upgrade 1 Figure 121

## 6 Appendices

### 6.1 Button Usage

The device is equipped with a button on the driver facing panel. It has multiple usages:

1. Single press – activate Panic Alarm (if the alarm has been enabled)
2. Double press - enter AP mode for configuration purposes
3. Single press and hold for 2 seconds - enter Privacy Mode (if the Privacy Mode has been enabled)

## 6.2 Storage Calculator

For typical recording sizes for a one-hour duration and HDD recording times in hours versus storage capacity, please use the MDR storage calculator: <https://brigade-electronics.com/mdr-hub/>.

## 6.3 Audio Alerts Content

The device is embedded with a speaker which can produce audio alerts for notifying users under certain circumstances. Details listed in table below:

Table 1: audio alerts when alarm has been triggered.

Alarm Type	Audio Alert Content (Level 1)	Audio Alert Content (Level 2)	
Yawn	Yawning, please drive carefully	Beep, beep (high pitch)	
Distraction	Beep, driver distraction		
Handheld Devices	Beep, phone detected		
Smoking	Beep, smoking detected		
Seatbelt	Beep, please fasten seatbelt		
LDW	Beep, lane departure		
FCW	Collision warning, collision warning		
HMW	Beep, unsafe following distance		
No Driver	Beep, no driver		N/A
Overspeed	Speed warning (pre-warn)		
	Overspeed warning (official-warn)		
Privacy Mode (enable)	Privacy mode enabled		
Privacy Mode (disable)	Privacy mode disabled		
Panic Alarm	Panic alarm		
G-Force	Harsh Acceleration		
	Harsh Braking		
	Harsh cornering		

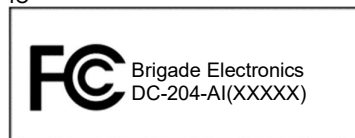
Table 2 audio alerts for normal operations.

Operation	Audio Alert Content
AP mode	AP mode enabled
	AP mode disabled
Privacy Mode	Privacy mode enabled
	Privacy mode disabled



## 7 Approvals

CE  
UKCA  
UNECE Regulation No. 10 Revision 06 ("E-marking")  
FCC  
IC



### FCC Statement:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

### ISED Statement:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.

This device must accept any interference, including interference that may cause undesired operation of the device.

*L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :*

- 1) *L'appareil ne doit pas produire de brouillage;*
- 2) *L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. *Cet émetteur ne doit pas être colocalisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur.*

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS-102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

*Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.*

*Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.*

## 8 Glossary

- 3G** – Third Generation  
**4G** – Fourth Generation  
**AC** – Adaptor Cable  
**ADPCM** – Adaptive Differential Pulse-code Modulation  
**G711U** – Narrowband audio codec  
**G711A** – Narrowband audio codec  
**Alarms** – An “EVENT” that has been configured (in the MDR unit settings) to be an alarm. Alarms are identified as orange video channel data on the playback timeline. These are displayed in the real-time alarm log in the MDR-Dashboard and MDR Mobile Apps. Alarms can generate email alerts and trigger automatic downloads (dependant on MDR-Dashboard configuration).  
**AHD** – Analog High Definition  
**Automatic Download** – A download that is set up in the MDR-Dashboard to automatically download data related to an occurring “Alarm” or “Event” between user-defined times. Configured under Download in MDR-Dashboard.  
**APN** – Access Point Name  
**AVI** – Audio Video Interleaved  
**BD** – Blind Detection  
**CBR** – Constant Bit Rate  
**CE** – Conformité Européenne  
**CH** – Channel  
**CHAP** – Challenge Handshake Authentication Protocol  
**CIF** – Common Intermediate Format (¼ D1 format)  
**CPU** – Central Processing Unit  
**CU** – Control Unit  
**D1** – D1 is full standard resolution for 25FPS (PAL) and 30FPS (NTSC)  
**DFOV** – Diagonal Field of View  
**DHCP** – Dynamic host configuration protocol  
**DNS** – Domain Name Server  
**DS** – Docking Station  
**DST** – Daylight Saving Time  
**EDGE** – Enhanced Data GSM Environment  
**EIA** – Electronic Industries Alliance  
**Events** – An activation of an input e.g., Sensor input (trigger 1-8), G Sensor, Over speed etc. Events are identified as red vertical lines on the playback timeline. These are not shown in the real-time alarm log.  
**EXP** – Expansion  
**FCC** – Federal Communications Commission  
**FTP** – File Transfer Protocol  
**FPB** – Fireproof box  
**GB** – Gigabyte  
**GHz** – Gigahertz  
**GND** – Ground  
**GPIO** – General Purpose Input/output  
**GPRS** – General Packet Radio Service  
**GPS** – Global Positioning System  
**GSC** – G-sensor Cable  
**G-Sensor** - measure of acceleration/shock of the vehicle  
**GSM** – Global System for Mobile Communications  
**GUI** - Graphical user interfaces  
**H.264** – Video compression standard  
**H.265** - Video compression standard  
**HD1** – Half Definition compared to Full Definition (See D1)  
**HD** – High Definition  
**HDD** – Hard Disk Drive  
**HSDPA** – High Speed Downlink Packet Access  
**HSPA** – High Speed Packet Access  
**HSUPA** – High Speed Uplink Packet Access  
**IC** – Industry Canada  
**ID** – Identification  
**IO** – Input/output  
**iOS** – iPhone Operating System (Apple Inc.)  
**IP** – Internet Protocol  
**IR** – Infra-red  
**IT** – Information technology  
**Km/h** – Kilometres per hour  
**LAN** – Local Area Network  
**LED** – Light Emitting Diode  
**MAC** – Media Access Control  
**MB** – Megabyte  
**MCU** – Mobile Caddy Unit  
**MD** – Motion Detection  
**MDR** – Mobile Digital Recorder  
**MHz** – Megahertz  
**MPH** – Miles per hour  
**NET** – Network  
**NTSC** – National Television System Committee  
**OSD** – On-screen Display  
**PAL** – Phase Alternating Line  
**PAP** – Password Authentication Protocol  
**PC** – Personal Computer  
**PN** – Part Number  
**PTZ** – Pan, Tilt and Zoom  
**PWR** – Power  
**REC** – Record  
**RES** – Resolution  
**RP** – Remote Panel  
**RPC** – Remote Panel Cable  
**S/N** – Serial Number  
**Scheduled Download** – A download that is manually setup from in the MDR-Dashboard (to be downloaded when the selected MDR connects to the server). Configured under Server in MDR-Dashboard.  
**SD** – Secure Digital  
**SIM** – Subscriber Identity Module  
**SMTP** – Simple Mail Transfer Protocol  
**SPD** – Speed  
**SQL** – Structured Query Language  
**SSL** – Secure Sockets Layer  
**TB** – Terabyte  
**TIA** – Telecommunications Industry Association  
**TRIG** – Trigger  
**TTS** – Text to Speech  
**UKCA** - UK Conformity Assessed  
**UNECE** – United Nations Economic Commission for Europe  
**USB** – Universal Serial Bus  
**V** – Voltage  
**VBR** – Variable Bit Rate  
**VGA** – Video Graphics Array  
**VIC** – Video Input Cable  
**VL** – Video Loss  
**VOC** – Video Output Cable  
**W** – Watt, standard unit of power  
**WCDMA** – Wide Code Division Multiple Access  
**Wi-Fi** – Wireless Fidelity  
**WEP** - Wired Equivalent Privacy  
**WPA** - Wi-Fi Protected Access  
**WPA2-PSK** - Wi-Fi Protected Access II  
**WPA2-Enterprise** - Wi-Fi Protected Access II Enterprise

## 9 Disclaimer

Mobile digital recorder systems are an invaluable driver aid but do not exempt the driver from taking every normal precaution when conducting a manoeuvre. No liability arising out of the use or failure of the product can in any way be attached to Brigade or to the distributor.

### Dénégation

Les enregistreurs numériques portables sont une aide précieuse pour le conducteur, mais celui-ci doit toutefois prendre toutes les précautions nécessaires pendant les manœuvres. Brigade ou ses distributeurs n'assument aucune responsabilité résultant de l'utilisation ou d'un défaut du produit.

### Haftungsausschluss

Mobile Datenaufzeichnung Systeme sind für den Fahrer eine unschätzbare Hilfe, ersetzen aber beim Manövrieren keinesfalls die üblichen Vorsichtsmaßnahmen. Für Schäden aufgrund der Verwendung oder eines Defekts dieses Produkts übernehmen Brigade oder der Vertriebshändler keinerlei Haftung.

### Condizioni di Utilizzo

I sistemi di registrazione digitale mobile costituiscono un prezioso ausilio alla guida, ma il conducente deve comunque assicurarsi di prendere tutte le normali precauzioni quando esegue una manovra. Né Brigade né il suo distributore saranno responsabili per eventuali danni di qualsiasi natura causati dall'utilizzo o dal mancato utilizzo del prodotto.

### Aviso legal

Sistemas móviles grabadora digital son una ayuda inestimable driver pero no exime al conductor de tomar todas las precauciones normales al realizar una maniobra. Ninguna responsabilidad que surja del uso o fallo del producto puede de alguna manera acoplarse a la brigada o al distribuidor.

### Declinação de responsabilidade

Celular gravador digital de sistemas são uma inestimável driver de auxílio, mas não isentam o driver de tomar todas normal precaução ao realizar uma manobra. Nenhuma responsabilidade decorrente da utilização ou falha do produto pode de qualquer maneira ser anexado ao de bombeiros ou para o distribuidor.

Specifications subject to change. Sous réserve de modifications techniques. Änderungen der technischen Daten vorbehalten. Specifiche soggette a variazioni. Las especificaciones están sujetas a cambios. Wijzigingen in specificaties voorbehouden. As especificações estão sujeitas a alterações. Спецификация может изменяться. Brigade Electronics belirttiği özellikleri haber vermeksizin istediği zaman değiştirebilir. Specyfikacja techniczna może ulec zmianie.

### Verwerping

Mobiele digitale recorder systemen zijn een waardevolle hulp voor de bestuurder, maar stelt de bestuurder niet vrij van de normale voorzorgsmaatregelen bij het uitvoeren van een manoeuvre. Geen aansprakelijkheid voortvloeiend uit het gebruik of falen van het product kan op één of andere manier aan Brigade of aan de distributeur worden toegekend.

### Отказ от обязательств

Системы видеорегистрации оказывают водителю неоценимую помощь при маневрировании, но не освобождают его от обязанности соблюдения обычных мер предосторожности. В ином случае компания Brigade или дистрибьютор не несет ответственность, возникающую в ходе использования или по причине неисправности данного продукта.

### Hatırlatma

Mobil Sayısal Kayıt Cihazları sürücünün önemli bir yardımcısı olmakla birlikte, manevra esnasında sürücü bir kaza olmaması için her türlü önlemi almalıdır. Brigade veya bölgesel dağıtıcıları yapılacak yanlış bir uygulama ve sonucunda oluşabilecek maddi ve/veya manevi kayıplardan sorumlu tutulamaz.

### Uwaga

Systemy mobilnych cyfrowych rejestratorów są niezastąpioną pomocą dla kierowcy, ale jego posiadanie nie zwalnia kierowcy z zachowania szczególnej ostrożności podczas manewrów. Żadna kolizja drogowa ani jej skutki nie mogą obciążać producenta urządzenia oraz jego dystrybutorów.

