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**BRIGADE**®

# 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 for the latest version of this manual**

Table of Contents

# 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 and two additional channels (1x AHD and 1x IPC) can be added using an optional video Input /Output cable. 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 ways: as a simple audio/video MP4 file playable by consumer media players; as native proprietary format clips or as a password protected .exe file with an embedded MDR-Player.

The storage units for the AI connected dashcam are two micro-SD (Secure Digital) cards, one is used for mainstream and the other for sub stream recording. The SD card stores video data and frame information only in chosen image resolution and frame rate. The sub-stream micro-SD card acts as a back-up just in case something goes wrong with the main storage micro-SD card when used in the mirror recording mode however it can also be configured in loop recording mode to increase the storage capacity of the dashcam. The standard micro-SD card availability that comes with the AI connected dashcam is 2x 128GB, however, 2x 256GB capacity are available as optional parts.

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

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 x 2 | 128GB | ✓ | ✓ | ✓ |
| (2) | DC-204-AI(NA) | 2 | 128GB x 2 | 128GB | ✓ | ✓ | ✓ |

**Warning: Prior to attempting the system setup, please ensure the DC-204-AI Series Installation & Operation Guide is thoroughly read and understood. Brigade will not be 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.**

## 1.1 Product Features

- Ultra-wide 140° 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
- Support up to 4-channel video recording
- H.264/H.265 encoding
- 2x 128GB dual-Micro SD card storage, supporting the simultaneous storage of main streams 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, 1-channel CAN 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
- Anti-tampering feature – using digital code
- 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
- Shut-down delay configurable from 0 seconds to 24 hours
- 9-36V Power Input

## 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
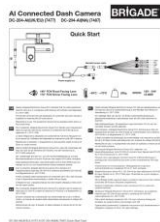DC-204-AI-128GB-MSD



Power Lead
DC-204-AI-PL-01



Bracket Assembly
DC-204-AI-B-01



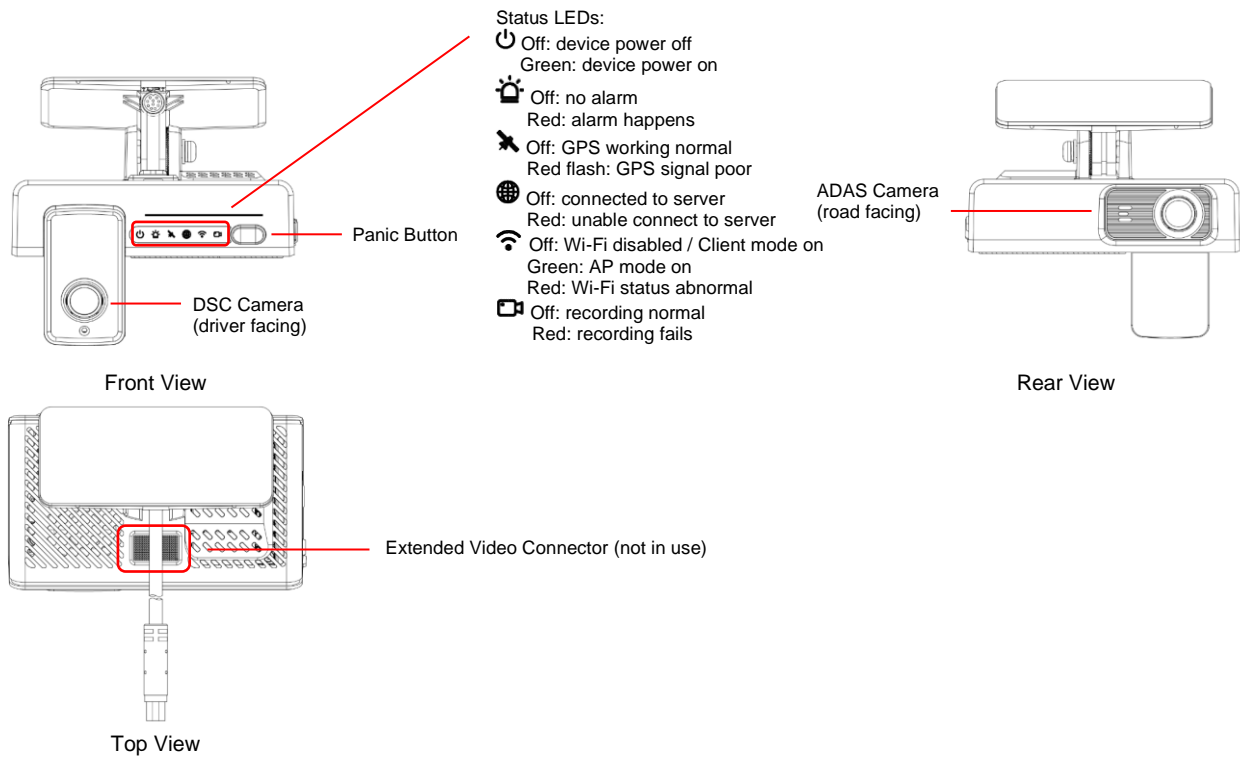Power Box with cable
DC-204-AI-PB-01



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



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

# 3 Hardware Installation

## 3.1 Product Perspectives

Status LEDs:

⏻ Off: device power off
Green: device power on

🚨 Off: no alarm
Red: alarm happens

✈ Off: GPS working normal
Red flash: GPS signal poor

🌐 Off: connected to server
Red: unable connect to server

📶 Off: Wi-Fi disabled / Client mode on
Green: AP mode on
Red: Wi-Fi status abnormal

📹 Off: recording normal
Red: recording fails

Panic Button

DSC Camera
(driver facing)

**Front View**

ADAS Camera
(road facing)

**Rear View**

Extended Video Connector (not in use)

**Top View**

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

Standard power cable

POWER
GND
CAN.H
CAN.L
ACC

SENSOR 1
SENSOR 2
SENSOR 3
SENSOR 4

Power supply box
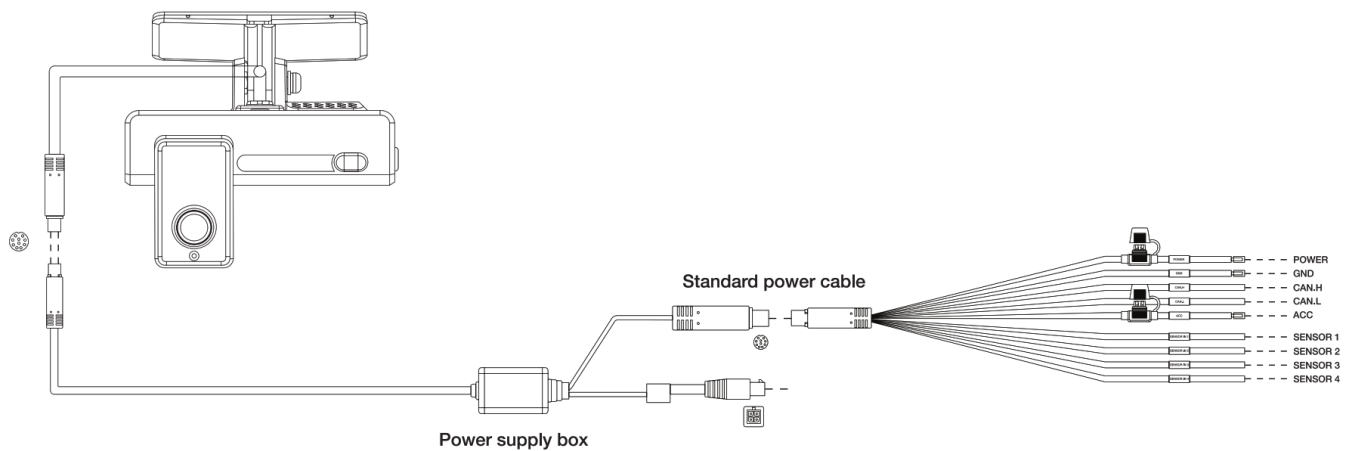
*DC-204-AI Connection Diagram Figure 1*

## 3.3 Micro-SD Card and SIM Card Installation

Step 1: turn off the device.

Step 2: use torx driver loosen the screw.

Micro SD Card Installation:

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

Note 2: Be aware of the position, push-in and hear a "click" represents they are successfully installed.

SIM Card Installation:

Note 1: Be aware of the card position before insert.

Note 2: Device must be turn off before install the sim card, or it will be unable to dial up.

## 3.4 Installation of DC-204-AI

### 3.4.1 Preparation

Please bring the whole kit to the installation to guarantee all tools you needed. The kit includes device itself; power cables; torx driver, cleaning wipes, bracket and fixings. Furthermore, please also prepare other installation tools such as marker (for marking the installation position on windshield) screw drivers, cable ties, duck tapes, wire cutters etc.

### 3.4.2 Selection of Dashcam Installation Area

The device must be installed inside the vehicle cabin on the windshield. The installation position of the device must consider the front and rear cameras can capture correct targets; therefore, the installer needs to power on the device while installation to be able to check camera images to confirm if current 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:
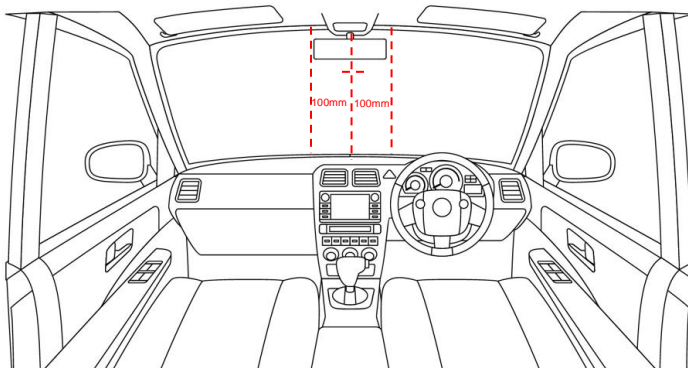
For internal-facing DSC camera, the position needs to follow rules below:

1) 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. The linear disctance between camera and driver's face must 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 fail to detect eyes and mouth movement; not too low down which the device may obstruct drivers' view.
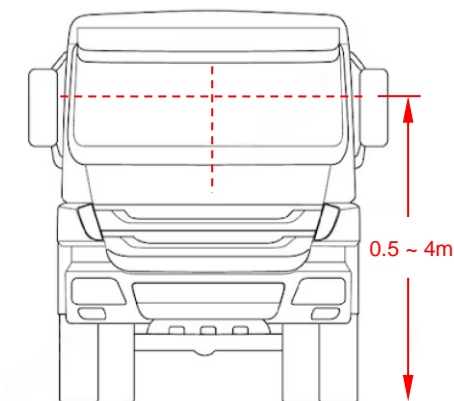
For forward facing ADAS camera, the position needs to follow rules below:

1) Must be in the centre of the windshield. Left or right 100mm offset is acceptable.

2) The distance from the camera to the ground must within 0.5 - 4m range.

3) Must be within the windshield wipers range to guarantee the view are always clear.
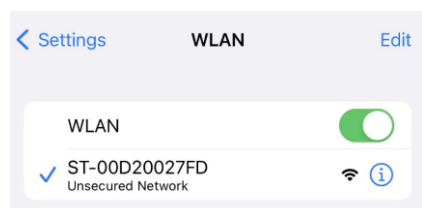


*DC-204-AI Wi-Fi Hotspot (AP Mode) Figure 2*

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

After the device powered on, the first 3 minutes it generates a Wi-Fi hotspot which phones/tablets can search out in WLAN interface. The Wi-Fi signal named after the device serial number. If can not find the Wi-Fi signal or missed the first 3 minutes, installers can quick press the panic button on the front panel of the device to force it into AP mode, which also gives Wi-Fi hotspot for setting up purpose.
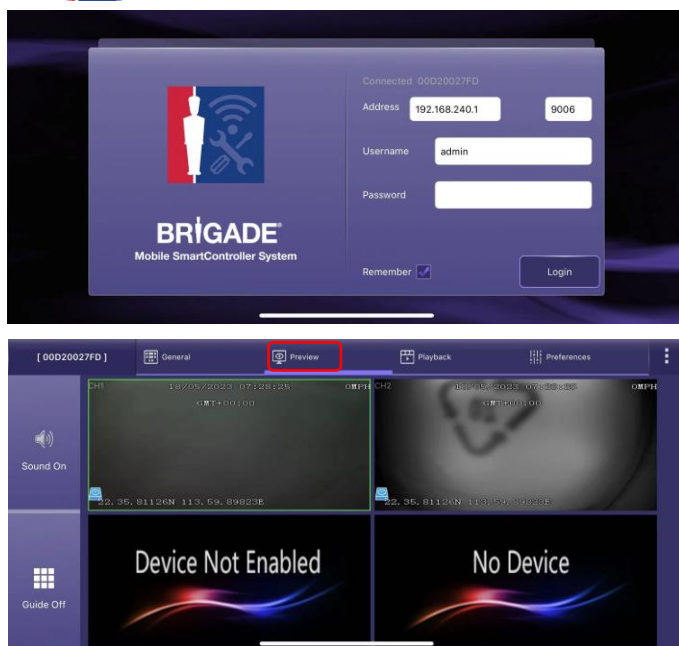


## SmartController



Open the SmartController app, login with default username and password which is *admin/admin*.

Note: Highly recommend to change the password when the first time login for security purposes.

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



## 3.5   Installation of Dashcam Bracket and Cable Wiring



After confirms the install position, take out the bracket from the kit and peel off the 3M protect sleeve, stick it on the windshield. Make sure the "UP" and arrows are pointing to the top of the cabin.

Make sure the bracket is stably sticked on the glass. Then install the device onto the bracket, use the kit provided screw to fix it.

The device is rotatable from 20° - 95° forward and backward. The installer can adjust it into the right angle based on observation from the SmartController live view.

Note: Please pay attention to the camera front and rear side, they are in different uses. If the direction is correct, the touching surface between the device and the bracket are jagged.
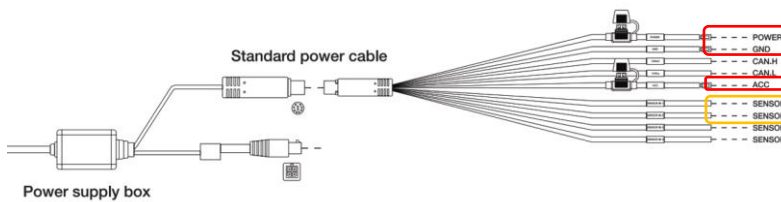


Connecting the device with power supply box and power cable. Power and ACC wires need to connect to vehicle power (12V or 24V) and ignition signal respectively.
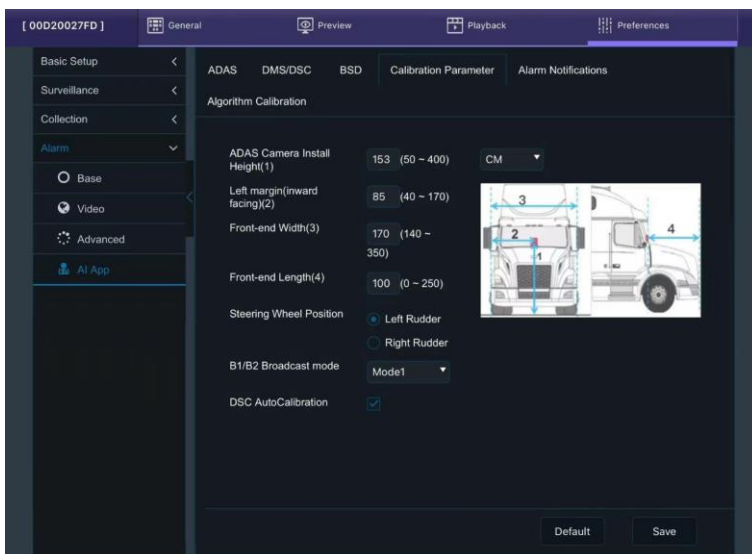
Sensor 1 connects to vehicle left indicator signal and Sensor 2 to right indicator signal.

Sensor 3 and 4 can be used for other purposes if needed. If not, leave them unconnected.

## 3.6    Calibration

Every device must be calibrated during installation, or it may work unexpectedly to give too many or too less AI alerts.

After the device is properly installed on the windshield, the installer needs to measure required dimensions and input into the system. These dimensions are not going with device config file therefore it needs to be input manually for each vehicle.



*Calibration Parameter Figure 3*

The setting locates on SmartController app –> *Preference –> Alarm –> AI App –> Calibration Parameter.*

Each measurement is illustrated on the right drawing. Further explanation sees below:

**ADAS Camera Install Height(1)**: the height of the device from the ground.

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

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

**Front-end Length(4)**: the distance between the device and the front end of the vehicle.

Please select the steering wheel position and leave the DSC AutoCalibration enabled.

Remember to save these setting before exit the menu.

Since the product support auto-calibration, there is no further setup action required.
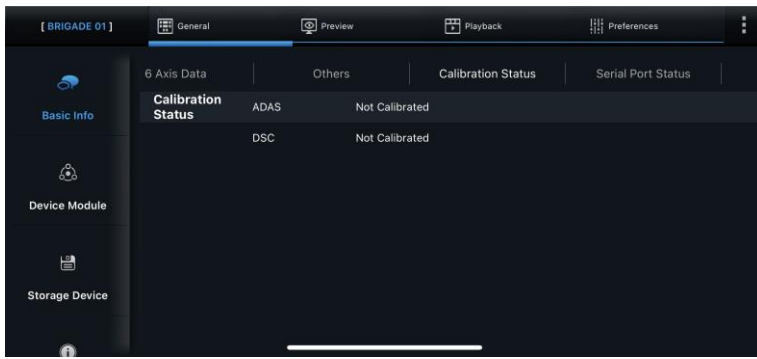
*Auto-Calibration Status Figure 4*

The ADAS auto-calibration will start when vehicle speed reaches 10mph (15km/h) and have a front vehicle which is around 10 – 40 meters away. The auto-calibration will be done after 2 seconds – 4 minutes based on actual road and environment condition.

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

The calibration will only happen once. Next time if the driver changes the Calibration Parameters, the calibration will re-start automatically.

Users can check the calibration status in SmartController General - Basic Info – Calibration Status menu.

# 4    Dashcam Settings and Parameters (Preference)

To config the Dashcam need to through SmartController apps. To obtain apps please visit App Store or Google Play store.

All the configurations are under Preference, other tabs please refer to different chapters in this manual.
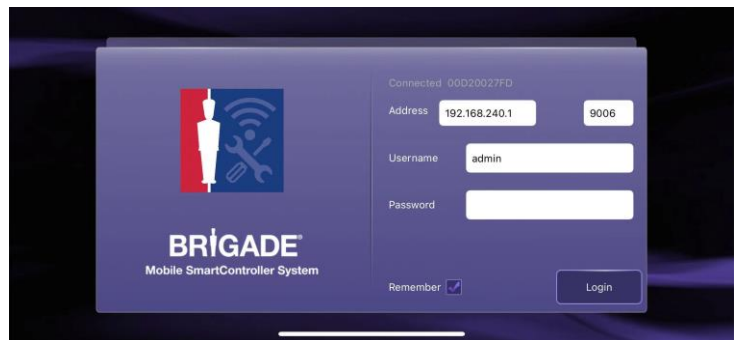

*SmartController Login Screen Figure 5*

## 4.1    Basic Setup

### 4.1.1    Regist Info

This area is to capture device and vehicle related information.

**Device Info** contains 1) **Serial Number** which is a 10-digits unique identifier for each Dashcam. It is automatically generated and unchangeable. 2) **Device ID** is for users to have customised marker on each device for differentiation purposes.

**Vehicle Info** contains:

**Vehicle Plate** to input current vehicle registration number.

**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.

All above input data, only **Serial Number** and **Vehicle Plate** will be transmit to server and displays in MDR-Dashboard live view interface. Others are only kept in device.
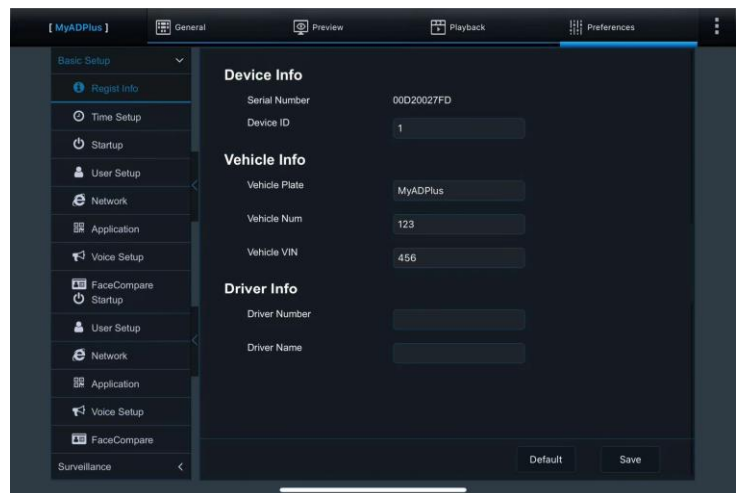

*Regist Info Figure 6*
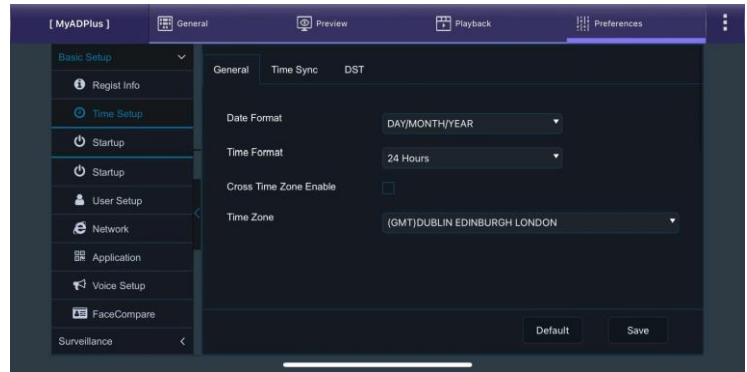
### 4.1.2 Time Setup

#### 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 for those settings


*Time Setup - General Figure 7*

#### 4.1.2.2 Time Sync

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

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

**NTP** refers to network time protocol that is used to synchronize time with NTP Server PC time. By ticking the box, a list will be available for users to choose NTP servers from or self-define the server address as needed. This should only be used when mobile network or Wi-Fi enabled.

**Center Server** allows 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.
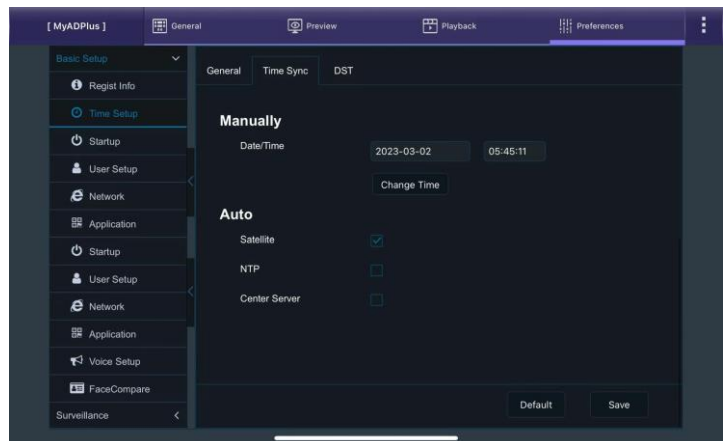

*Time Setup – Time Sync Figure 8*

#### 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.


*Time Setup - DST Figure 9*

**Start** represents the month, date, 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, date, day and time at which DST finishes.
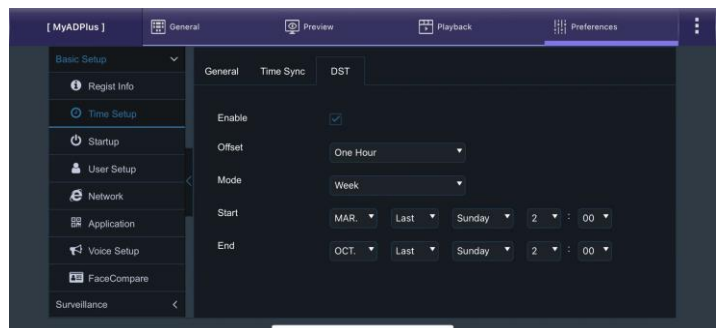
### 4.1.3 Startup

#### 4.1.3.1 ON/OFF
**ON/OFF Mode** supports one mode – **Ignition**. It means the device will power up when receiving vehicle ignition signal (yellow 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 turn off the ignition right after turn of the device and the Ignition Delay set to less than 6 minutes. The device will shutdown after around (6min + Ignition Delay) time. Because the device has a 5-minute circuit protection time when boot up to guarantee its
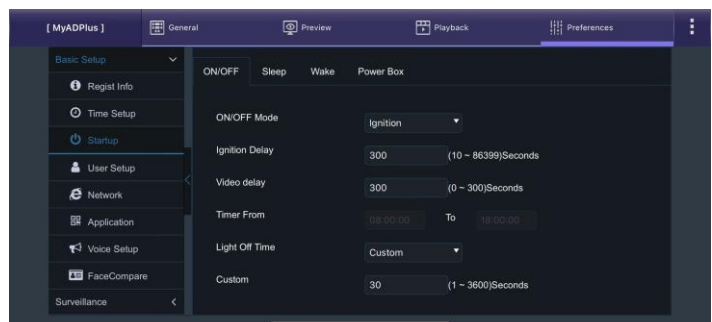
circuit and modules not damaged due to abrupt power loss. If the Ignition Delay is longer than 6 minutes, the device will counting down the exact Ignition Delay value.

**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**.

**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.

### 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 off.

By default, this feature set to **No consumption standby** which means the device will completely off after turning off the ignition for protecting 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. Remain those features is for the platform and mobile phone be able to remotely wake it up for operating purpose or Auto-Download tasks. For how to wake up the device, please refer to next chapter.

**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 your 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 to11.5V. If power supply voltage is lower than the set value, device will wait for 600 milliseconds to observe if it is a random dip, or an unrecoverable voltage drop down situation. After times up, if the voltage still not come back to normal operating voltage, it will start the low voltage protection process.

**Voltage Startup** refers to the minimum voltage the MDR 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 is a requirement for this feature. Once the MDR 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 5 minutes (default). This interval time is customisable between 5 minutes to 1440 minutes. The reason of putting the interval sparse is for reducing data and power consumption during **Sleep** mode and saving the vehicle battery.

*Startup – ON/OFF Figure 10*
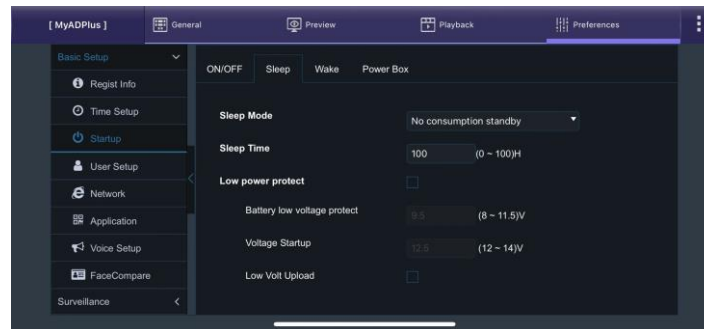


*Startup - 1 – Sleep Figure 11*
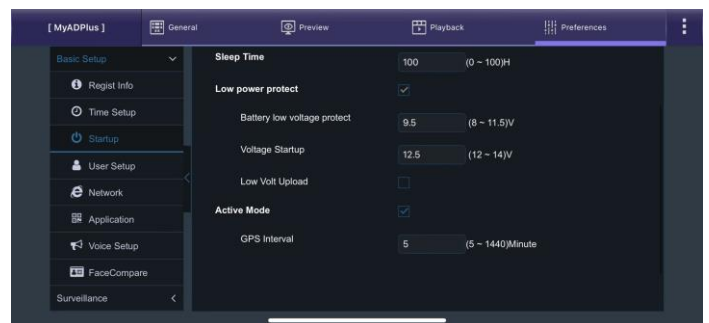


*Startup - 2 – Sleep Figure 12*

### 4.1.3.3 Wake

**Wake** is to boot up the device when it is under Low consumption standby mode. Usually used when users have the needs to urgently checking device videos or ask the device to start auto-download tasks assigned from the platform.

It supports various methods to wake up the device.

**IO Wake** is wake up the device when any enabled IO alarm/event triggers.

**G-Sensor Wake** is for when device detecting impact or acceleration which exceeds the set threshold, the device will wake up and start functioning.

**Remote Wake** is not supported currently.

**Telephone Wake** and **Sms Wake** requires define acceptable wake up call/SMS from which number in advance. After numbers being filled in, when the device is under **Low Consumption Standby** status, a call or a "WAKEUP" content message send from dedicated numbers will activate the device and put it back to fully ON mode.

**Note:** after the device wake 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.

### 4.1.3.4 Power Box

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

This Power Box hardware has embedded with internal G-Sensor and micro-processors. By accumulate the data, it can make the call that when below conditions are satisfied, the device should be shutting down.

**Note:** these settings 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 meters (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 $1m/s^2$.

### 4.1.4 User Setup

**Language** currently only support 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.

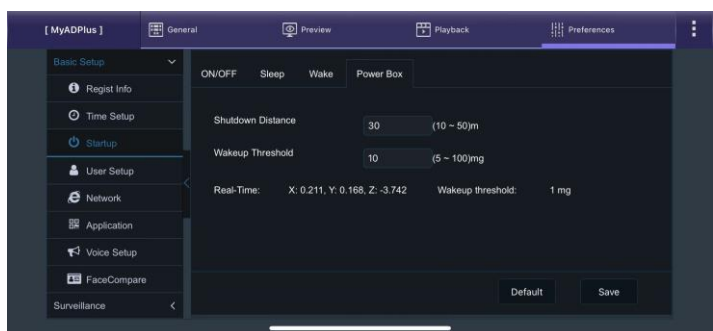**Setup** is used to change existing user account details.

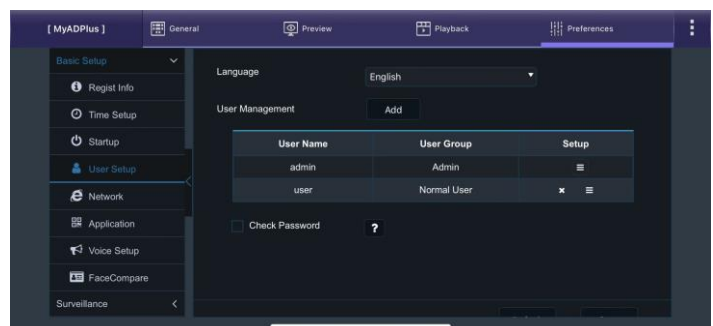To remove any password requirements, save the user account with a blank password.
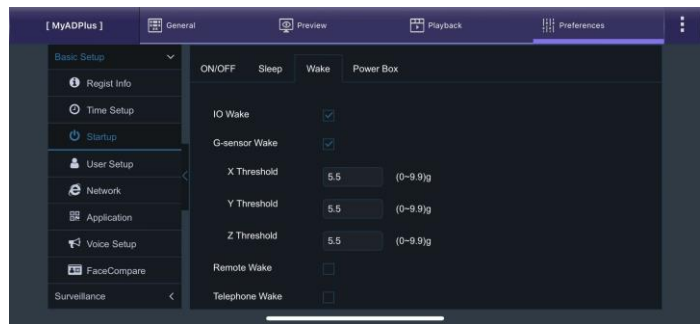

*Startup – Wake 1 Figure 13*


*Startup – Wake 2 Figure 14*


*Startup – Power Box Figure 15*


*User Setup Figure 16*

**Check Password** is used to allow the device to check the login password complexity. When the user 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 need to re-login the SmartController App to continue other operations.
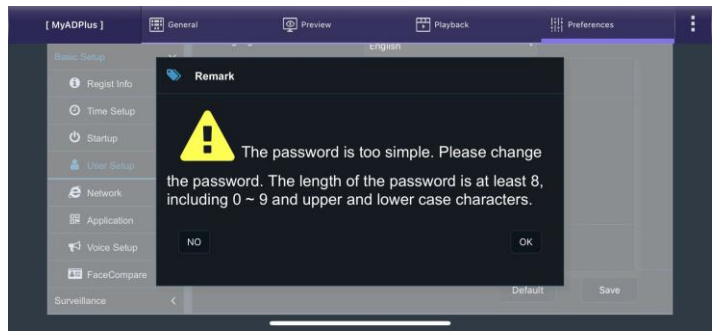

*User Setup – Password Notification Figure 17*

### 4.1.5    Network

#### 4.1.5.1    Server Setup

The device supports report to maximum 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 future, currently unused.

**Enable Network** refers to the network method used for to communicate with the Server. The options are:
**Local** – Ethernet cable connected method (hardly used);
**WIFI** – through Wi-Fi connection;
**Module 1** – through sim card data;
**Auto Adaptation** – either way if it has internet access. The select priority is WIFI>Local>Module 1.

**Register Server IP** Public IP address of the firewall which forwards any traffic to the server PC or IP address of the server PC hosting the Server. (Domain name also supported)
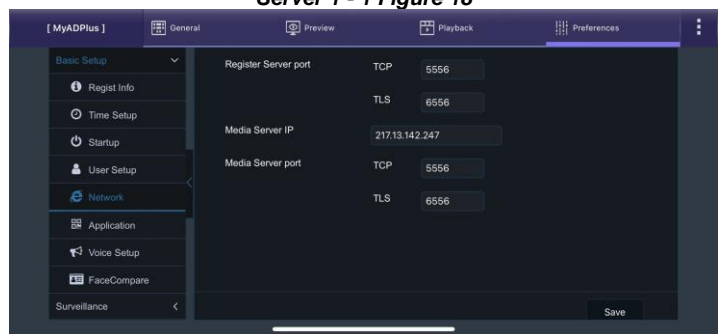
**Register Server Port** is used for device access to server. By default, is 5556.

**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.
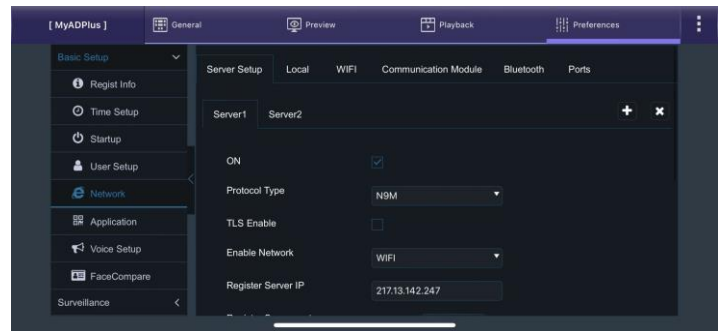

*Server 1 - 1 Figure 18*


*Server 1 - 2 Figure 19*

#### 4.1.5.2    Local

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 must, 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 255.255.255.000.

**Gateway** helps route the network traffic. By default, this is 192.168.001.001.
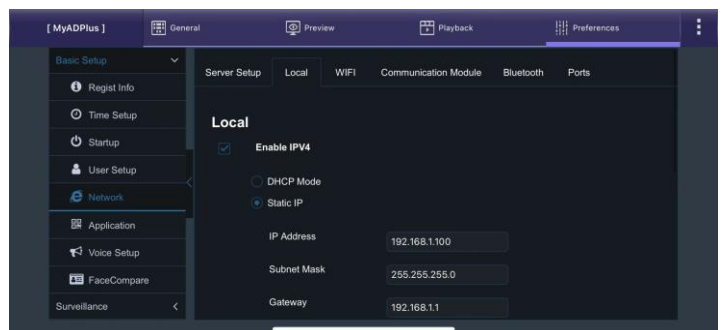

*Local - 1 Figure 20*

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

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

**Preferred DNS Server** by default, this is 008.008.008.008.

**Alternate DNS Server** by default, this is 008.008.004.004.

The device is also support IPv6. By using IPv6 address, tick the **Enable IPV6** box to expand setting menu.

The parameters under IPv6 are the same as which 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.
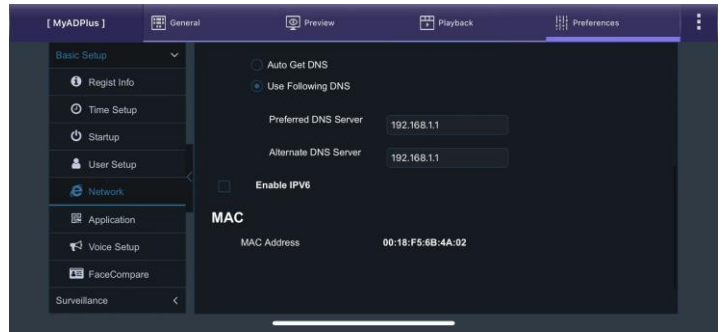

*Local - 2 Figure 21*
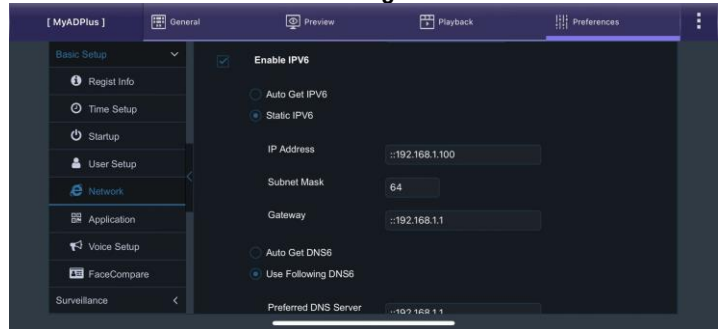

*Local - 3 Figure 22*


*Local - 4 Figure 23*

### 4.1.5.3    WIFI

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 import config files.

**Note:** this **Lock** status only saved on device and does not go into the config file, which means if user turned this Lock on, the device would not overwrite any Wi-Fi parameters in the future by importing config files. It will 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 3 different statuses, Disable, Client and AP. Once choose 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 a external Wi-Fi signal for data transmission.

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

By default, the device is set to **Disable** which means no Wi-Fi access at the beginning. To let users having access for configuration, the device will have two other ways to enter the AP mode:
1) By double clicking the button on the device front panel.
2) When the device boots up, the first 180 seconds (configurable) are in AP mode. Users can catch this time
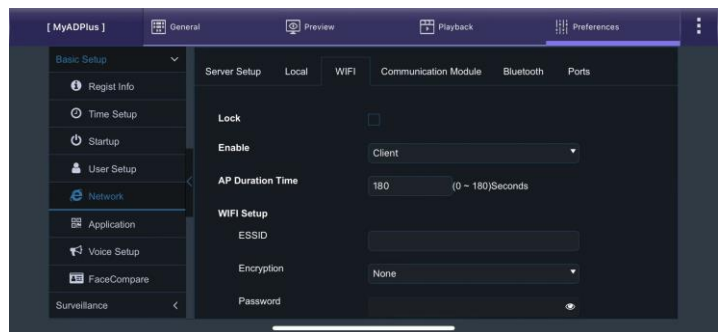

*WIFI - 1 Figure 24*


*WIFI - 2 Figure 25*

14
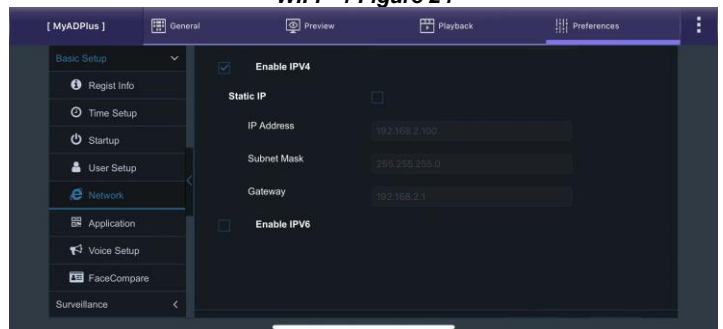
slot to connect to the hotspot and login the App. If the SmartController connection has not been built over this period, the AP mode will be switched off after time runs out. But if it's been connected by a mobile phone and logged in Apps, the signal will remain until the connection cut off.

**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 device can look for when it trying to connect. If leave it 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 IP address from the Wi-Fi network router.

Static IP allows users to manually define the IP address, but this is not recommended to do. The simplest way is to stick 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 255.255.255.000.

**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 IT department before making any changes.

### 4.1.5.4    Mob Net

**Lock** can fix the mobile network settings and parameters below, and not let it be overwritten when user import 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. It various from 3G and 4G, depends on current locating area network condition.

**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 don't want to input actual numbers.

**Certification** refers to the authentication mode, 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 a valid sim card has been installed. Another option is Phone/SMS and Sensor which can let the device stay under no connection status until certain phone call / message comes in or any sensor has been triggered.
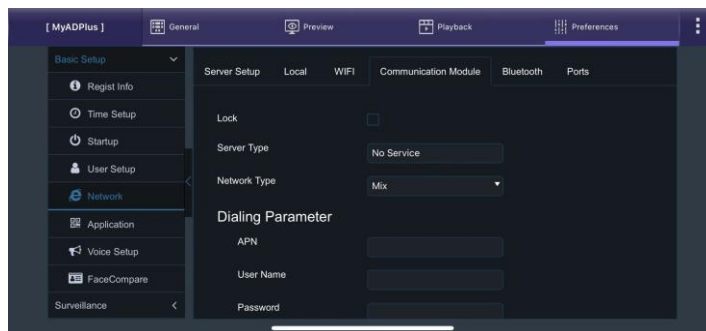

*Communication Module - 1 Figure 26*
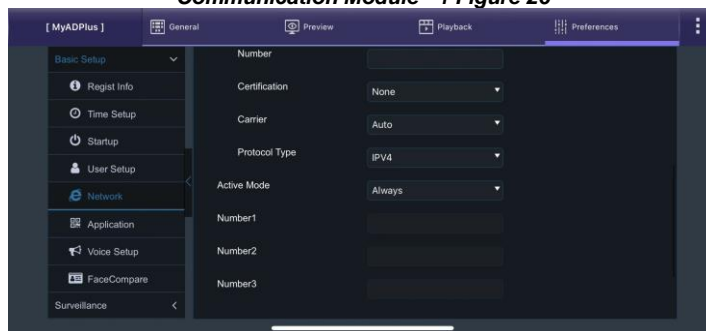

*Communication Module - 2 Figure 27*

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

### 4.1.5.5 Bluetooth

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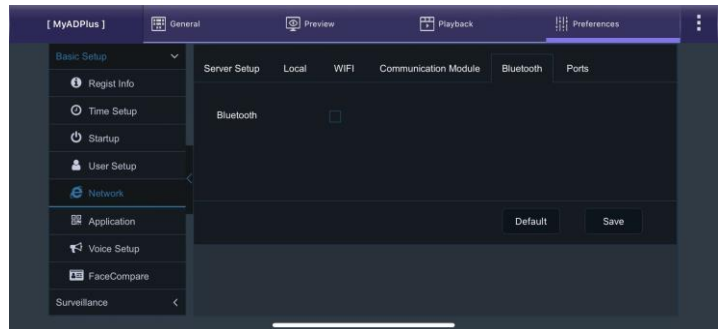


*Bluetooth Figure 28*

### 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
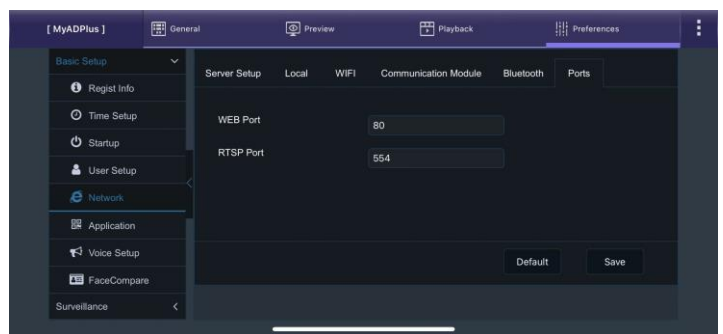


*Bluetooth Figure 29*

### 4.1.6 Application
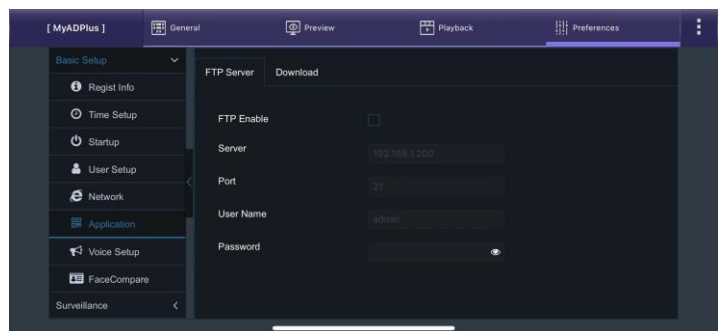
### 4.1.6.1 FTP Server

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

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

**Port** default is 21.

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

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



*FTP Server Figure 30*

### 4.1.6.2 Download

**Download** is for wake up the device which was under **Sleep** mode to complete the auto-download tasks assigned by the Server software.

**Auto Download Reconnect** is default off. After enabling it, the slept device will be wake up and try to connect to the server to start the download task. If the server reaches the maximum connection amount at the moment, the device will go back to **Sleep** status and wake up after 5 minutes (default) to re-try.
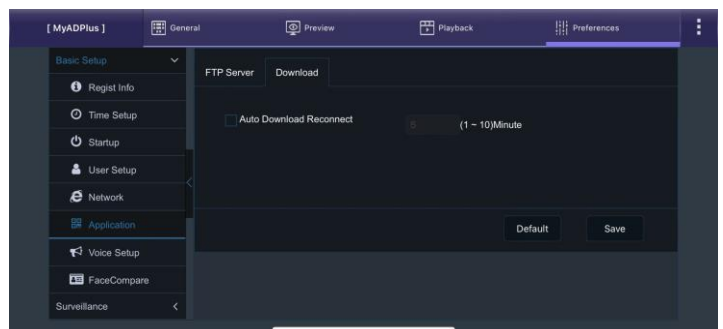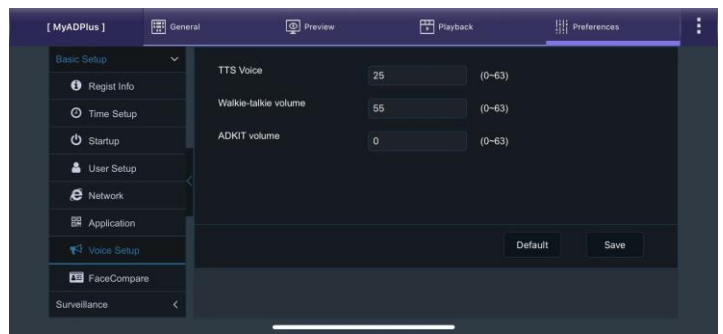


*Download Figure 31*

### 4.1.7 Voice Setup

**TTS Voice** by default is 55. This controls the volume of the broadcasting TTS messages such as AI alarm alerts and notification messages "AP Mode Enabled".
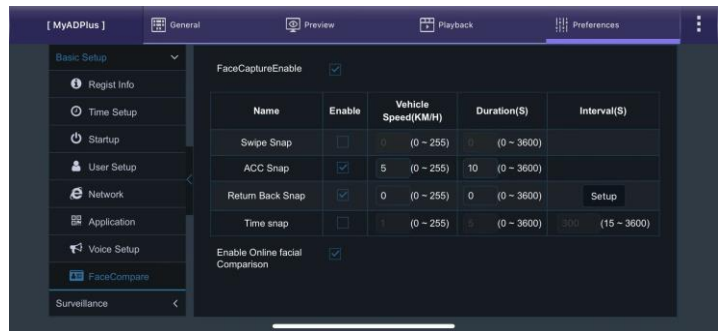
**Walkie-talkie volume** currently not in use.

**ADKIT Volume** currently not in use.


*Voice Setup Figure 32*

### 4.1.8 FaceCompare

**Face Compare** is under development, currently not in use.


*FaceCompare Figure 33*

## 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 that you want to view when boot up. If the Start-up Screen set to Quad, users can choose any 4 channels to display on the first page. This feature can help user to view wanted channels without operate the device all the time.
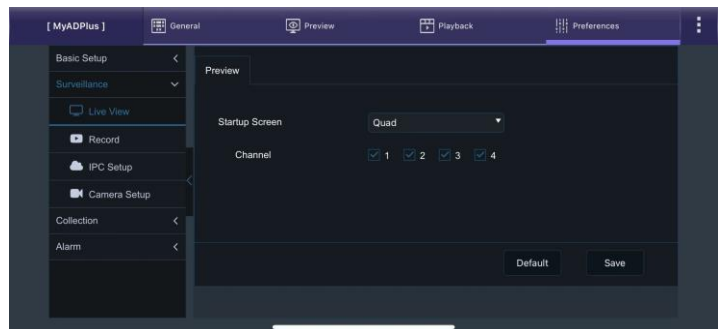

*Preview Figure 34*

### 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. The device will stop recording when the HDD reaches 1GB of free space. The user must either replace the storage or manually delete recordings.


*Record Figure 35*

**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
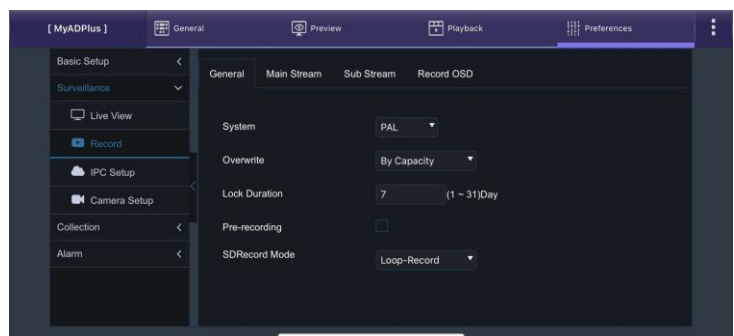
seconds, the alarm recording will begin at 3:50pm and will end after 4:08pm.

**SD Record Mode** is to define how to use the second SD card in the device. The device has 2 SD cards capability, the first one 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** let the SD card record video based on parameters set up in Sub Stream tab. It usually has a rather low resolution and framerates compare for the main stream.

**Mirror Record** mode will let the second SD card to record the same thing as the first SD card which 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 value lower than 80%, in case the data rate exceeds SD card writing speed and results in data loss.

Note: This value cannot reflect correct status if using a 3rd party 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 stored in the first 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 utilized 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).

**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, 15 for Channel 2.
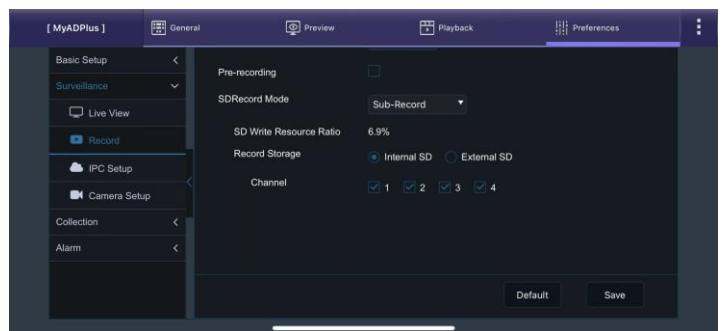
**Quality** has 8 levels. Level 1 is the best quality whereas level 8 is the lowest quality. **Quality** represents stream data bitrate based on current setting (**Resolution**, **Framerate**, **Quality**, **Encode Standard**). This value can help users to estimate the video file size.
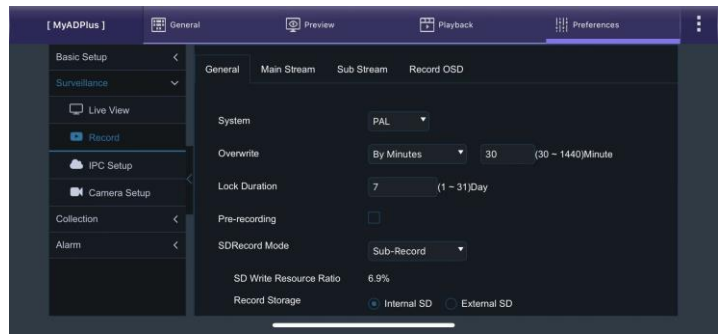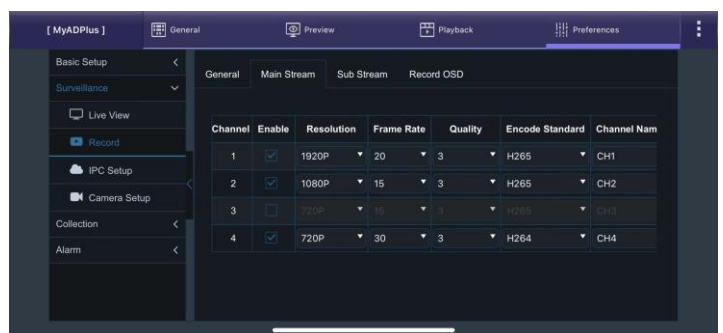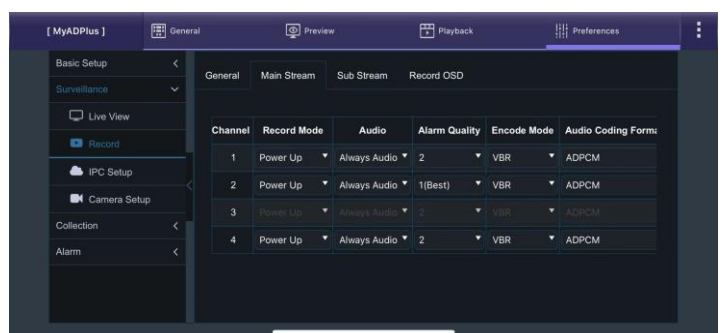

*Record – Overwrite by minutes Figure 36*
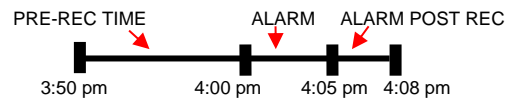

*Alarm Recording Consist of Figure 37*


*Record – Sub-Record Figure 38*


*Main Stream -1 Figure 39*


*Main Stream -2 Figure 40*

**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.

**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 IP camera has its own setting embedded, after connecting, the channel setting will automatically change to IP camera itself settings. Users may need to manually adjust the setting after connected.

**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 over speed, G-Force, Panic Button, etc.)
- **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 3 types of audio format: ADPCM, G711U, G711A and G726. By default, set to ADPCM.

**Audio Format Sub Type** works when choose 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 goes up to 100%.
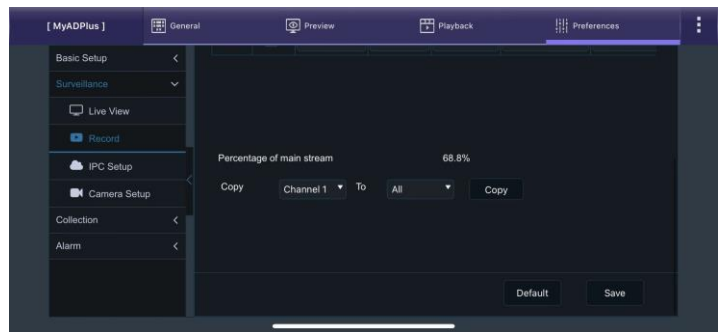
**Copy** can duplicate one channel's setting to every other channels.
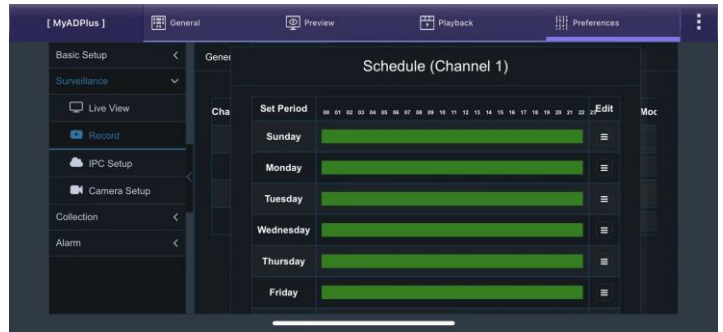


*Main Stream – Record Mode – Timer Schedule Figure 41*
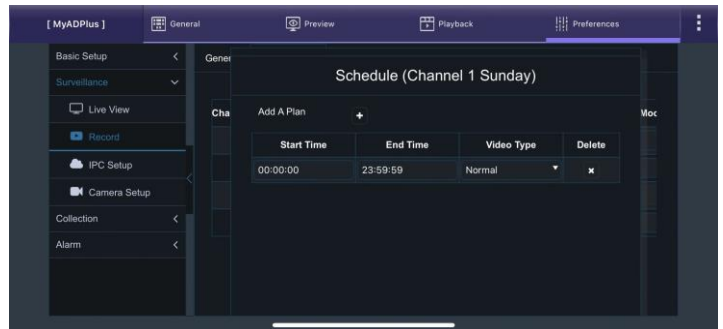


*Main Stream – Record Mode – Timer Setup Figure 42*



*Main Stream -3 Figure 43*

#### 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 or mirror recording, it will take main stream parameters.

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

**Enable** this controls which channels you would like 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.

**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.

**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 goes 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.
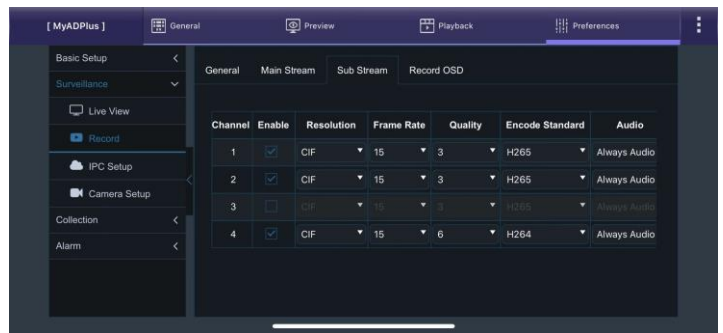

*Sub Stream - 1 Figure 44*
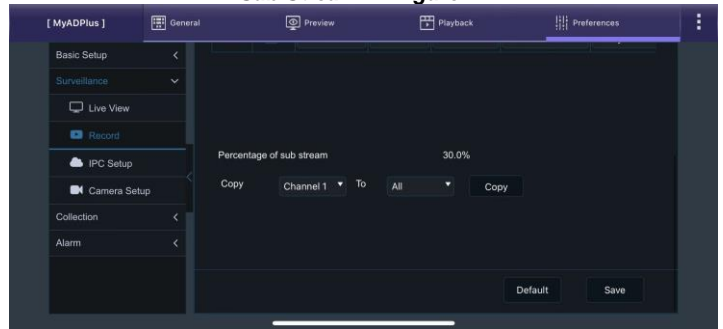

*Sub Stream - 2 Figure 45*

#### 4.2.2.4    Record OSD

**Record OSD** refers to information that will be "burned" onto the video image. This means that if AVI is used for the export option, 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 46*
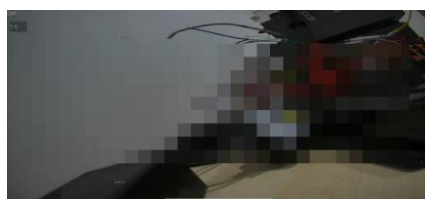

*Record OSD with Watermark Mode Figure 47*

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.


*Record OSD Figure 48*


*Record OSD Position Setup Figure 49*

### 4.2.3 IPC Setup

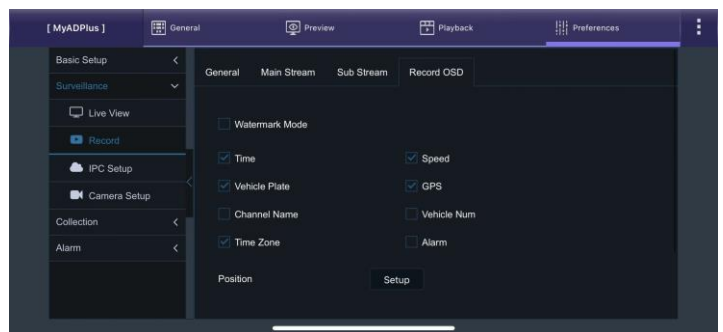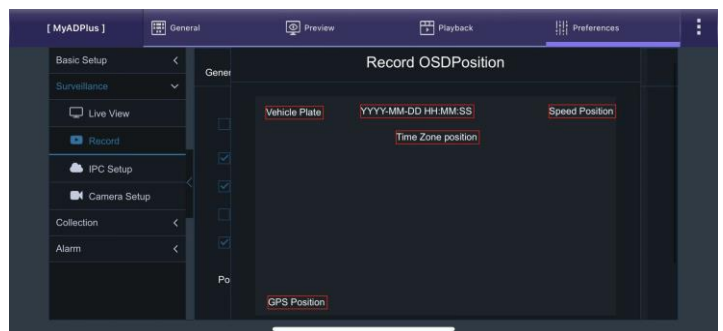The device supports direct connection with one IP camera via 6pin connector on the adapter cable.

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

IP channels are also flexible compared to analogue channels. Users can manually allocate it to any other channel in the IPC Setup page. Recommend allocating the IP camera to Channel 4 as Channel 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.xxx.

For more IP camera setup and operation, please refer to *IP Camera Operational Guide*.
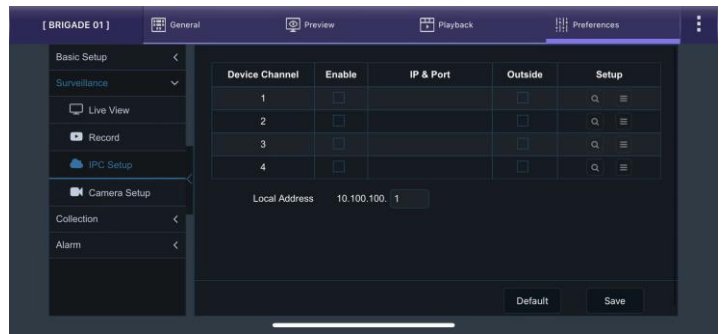

*IPC Setup Figure 50*
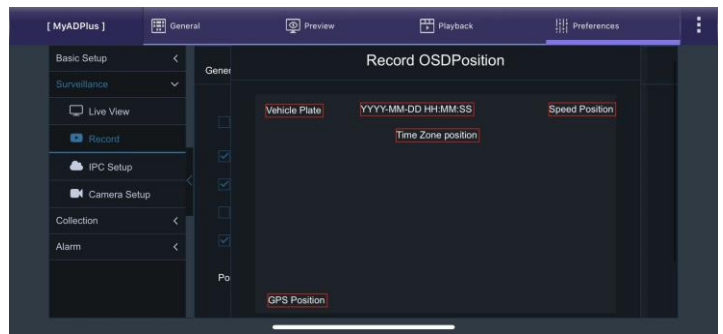

*Record OSD Position Setup Figure 51*

### 4.2.4 Camera Setup

This interface can set 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.
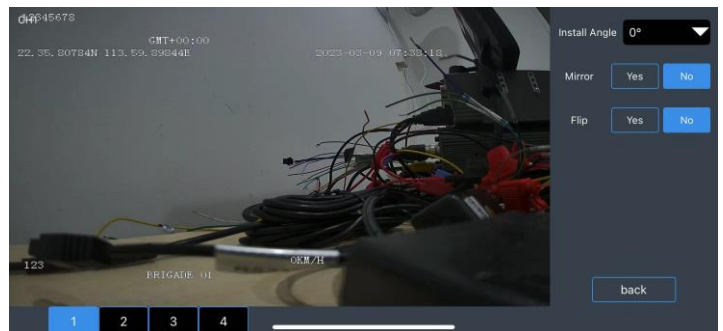

*Camera Setup Figure 52*

## 4.3 Collection

### 4.3.1 General

#### 4.3.1.1 Serial Port

The device supports 1x RS232 signal input which can be used for various accessories. Current recommendation is 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 53*
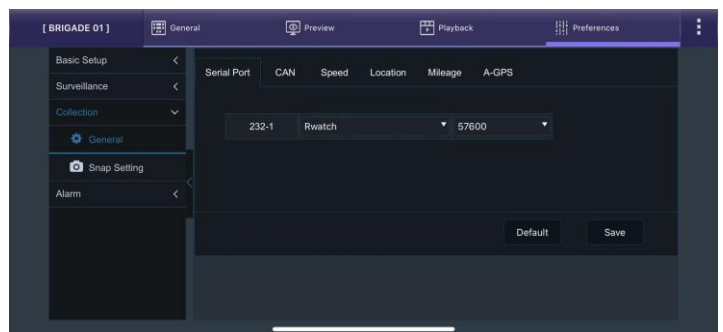

*Serial Port Figure 54*

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### 4.3.1.2 CAN

The device integrated ability for analysing CAN data which follows standard J1939. Including 15 types of messages:
1) Engine Speed;
2) Engine Coolant Temperature;
3) Engine Percent Load At Current Speed;
4) Gauge pressure of oil in engine lubrication system as provided by oil pump;
5) Amount of fuel consumed by engine per unit of time;
6) Current fuel economy at current vehicle velocity;
7) Total Vehicle Distance;
8) Engine Total Hours of Operation;
9) Total Fuel Used;
10) Brake Switch;
11) Parking Brake Switch;
12) Accelerator Pedal Position 1;
13) Clutch Switch;
14) Electrical potential measured at the input of the electronic control unit supplied through a switching device;
15) Wheel Base Vehicle Speed.


*CAN Figure 55*

Since each vehicle manufacturer has their own definition of CAN data format, the device only supports one data format analysis at a time, therefore, this feature needs to be pre-developed before using. Please contact Brigade with wanted CAN data format for customisation.

After enabled CAN functionality, all above data will be obtained and saved in main storage medium and can be viewed during playback via MDR-Dashboard software.

For obtaining CAN data from the vehicle, the CAN-H and CAN-L wires need to be connected correctly.

**Type** can choose between **Null** or **CAN BUS**.

**Baud Rate** can be configured manually, default value for J1939 is 250.
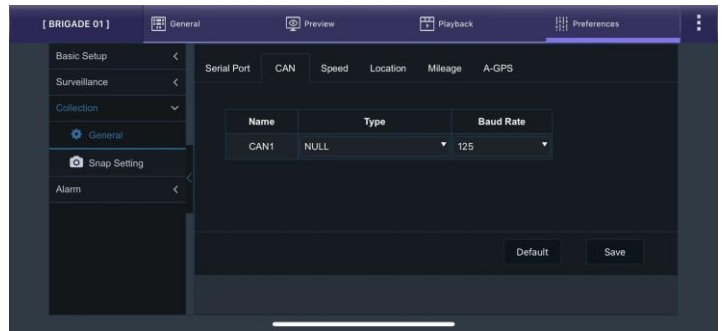
### 4.3.1.3 Speed

**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 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 for source.

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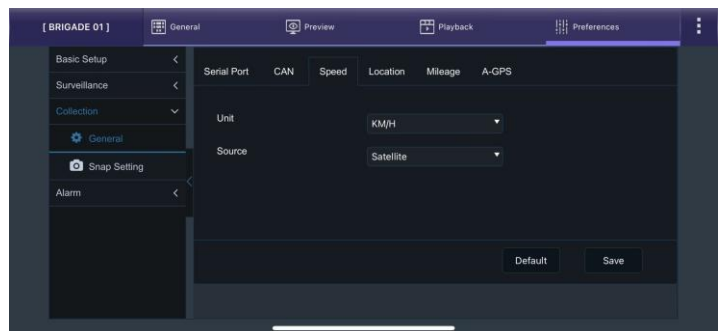

*Speed Figure 56*

### 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 available – **GPS**.

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


*Location – Constant Upload Mode Figure 57*

**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 while 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 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.


*Location – Variable Upload Mode Figure 58*

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

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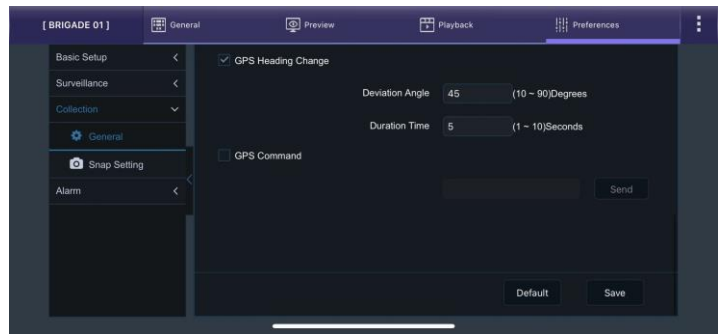
2) **Distance** defines how many miles/km to upload GPS info once.

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

**Moving Stop** follows the same logic as the **Moving Start**. Users need to define which condition can be judged as vehicle stop status and assign wanted upload rate to it.

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

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

### 4.3.1.5    Mileage

**Total** displays the total mileage 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 value mileage value once the device is installed.

**Operation** is used to submit the mileage value to the device memory, click Correct once you are happy with the value. Click clear to zero the total mileage value. Prompts will display to ask for user confirmation.
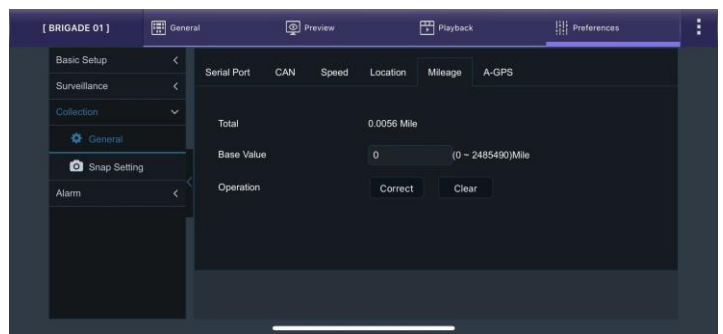
### 4.3.1.6    A-GPS

**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's enabled, users can input a A-GPS server address and port. Afterwards, the device will be able to connect to the A-GPS server and downloading GPS data while vehicle moving. There are a lot of public A-GPS service can choose from. Users can decide which one to use as needed.

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

If enables the A-GPS, the extra data consumption is less than 1MB/day.
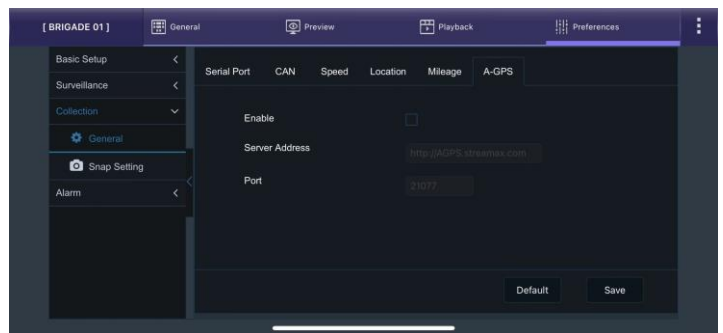
### 4.3.2    Snap Setting

### 4.3.2.1    Time Snap

**Time Snap** needs 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. You cannot delete entry 1.

[≡] **Snap Link Setup** is where the time snap is setup.



*Location – GPS Heading Change Figure 59*



*Mileage Figure 60*



*A-GPS Figure 61*
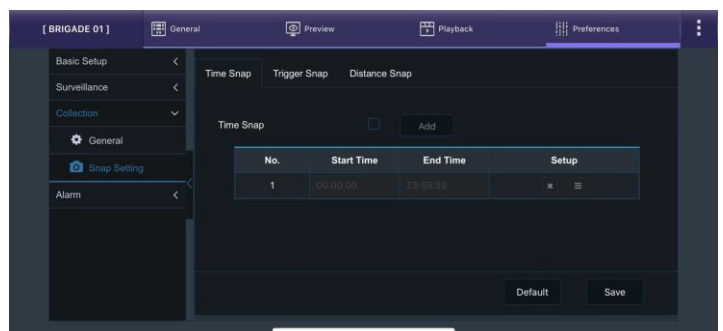


*Time Snap Figure 62*

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:\ADPLUS2.0\"vehicle registration"\"date"\picture will be created.

**Channel** is the channel that would like to setup a time snap for.

**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 best 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 currently not in use.

**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 1 Figure 63*


*Time Snap Setup 2 Figure 64*

### 4.3.2.2    Trigger Snap

**Alarm Snap** is used for taking snaps based on triggered alarms only. When any alarm enabled 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 last chapter for detailed explanations.


*Trigger Snap Figure 65*

### 4.3.2.3    Distance Snap

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

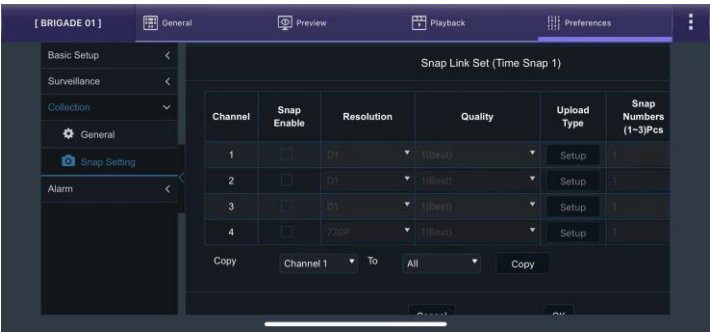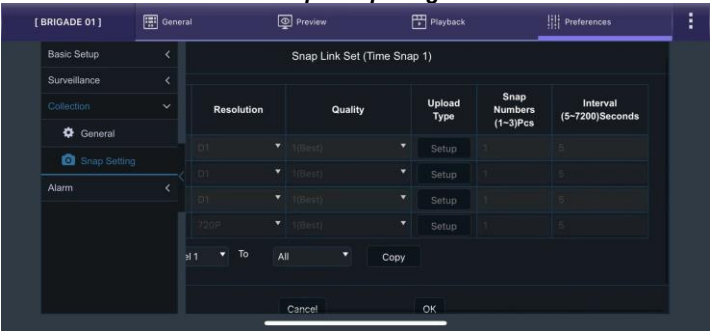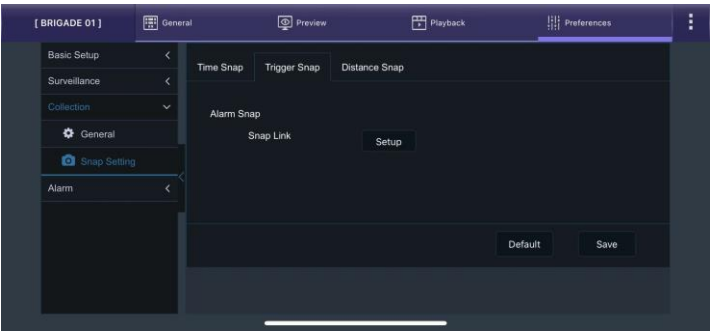**Distance Interval** to define how frequently the device will create snapshots once.

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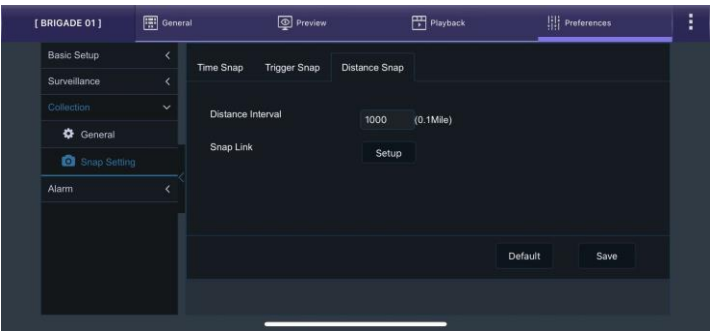

*Distance Snap Figure 66*

## 4.4 Alarms

### 4.4.1 Base

#### 4.4.1.1 IO alarm

By default, this alarm is off.

**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 6.0 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 Centre Server. Events are stored but do not get reported to the Centre Server.

**Sensor Uses** select Left or Right Steering when want 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 steering 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 time 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 appended 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.


*IO Alarm Figure 67*


*IO OSD shown on Playback Figure 68*
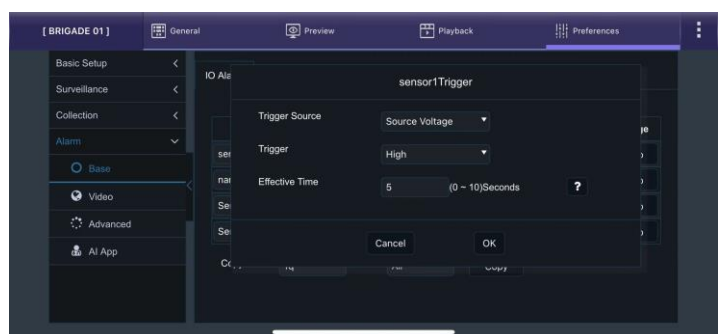

*IO Alarm Trigger Figure 69*
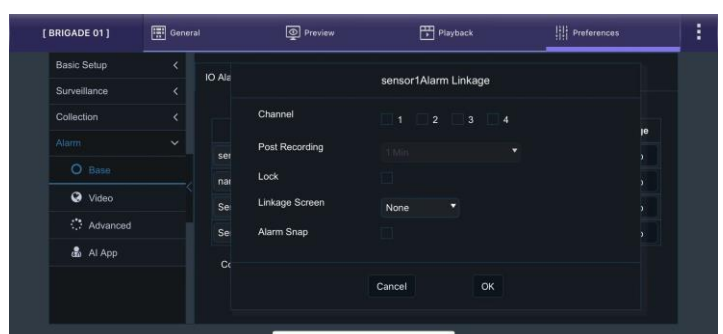

*IO Alarm Linkage Figure 70*

#### 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 Centre Server. Events are stored but do not get reported to the Centre Server.

For Triger:

**Preload Speed Difference** is an early warning for drivers to curb their speed. For example, if you set the speed to 100mph, and early difference is set to 10mph, then when your speed reaches 90mph, 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.
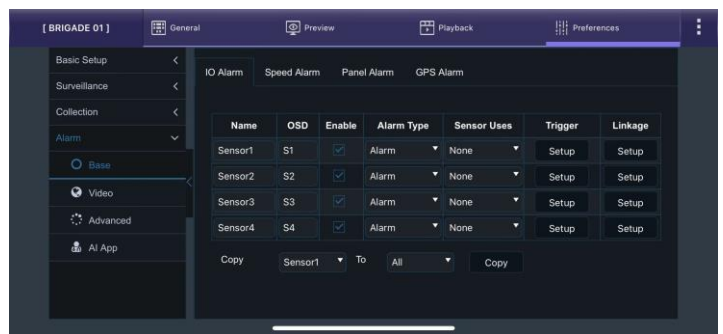
For Alarm Linkage:

**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).

**Post Recording** specifies the period of recording appended 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.

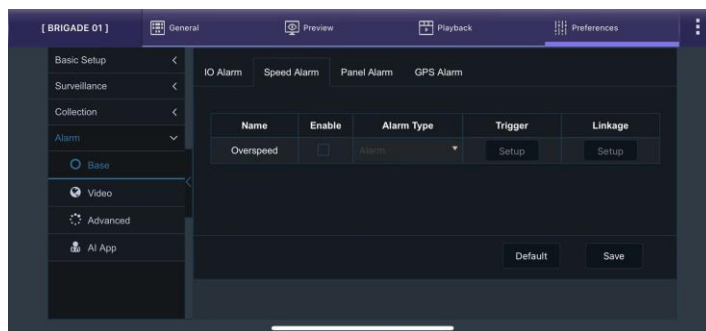**Alarm Snap** can be enabled, the settings are based on the Trigger Snap setup.

#### 4.4.1.3    Panel Alarm

By default, this alarm is off.

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

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

For Trigger:

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

**Effective Time** defines during this time 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 appended 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.
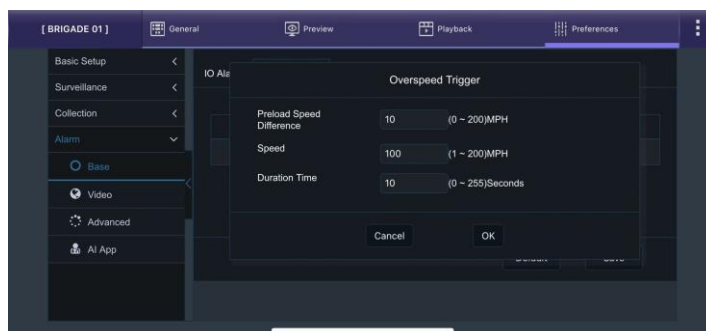


*Speed Alarm Figure 71*



*Speed Alarm Trigger Figure 72*



*Speed Alarm Linkage Figure 73*
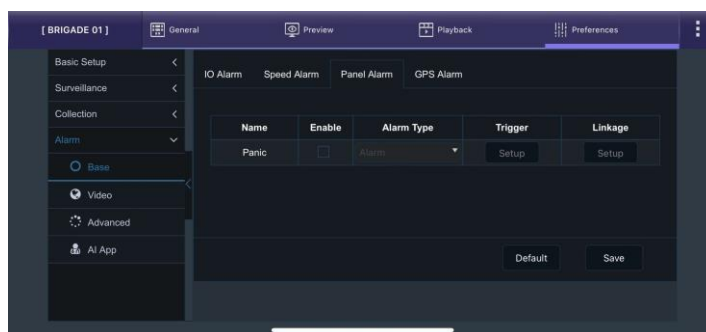


*Panic Alarm Figure 74*
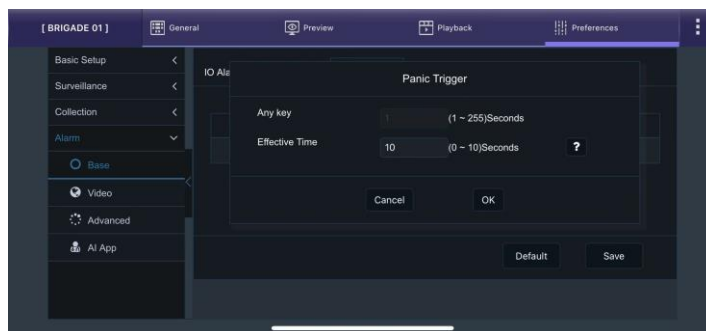


*Panic Alarm Trigger Figure 75*

**Lock** represents whether the alarm footage can be overwritten. When the retention expires, the locked files will automatically be unlocked and deleted.
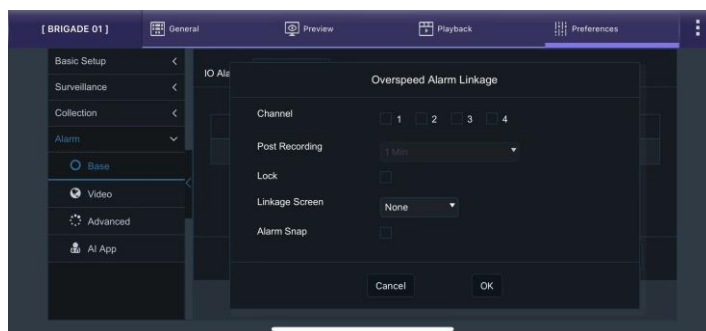
**Linkage Screen** currently not in use.

**PB Alarm Duration** 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.
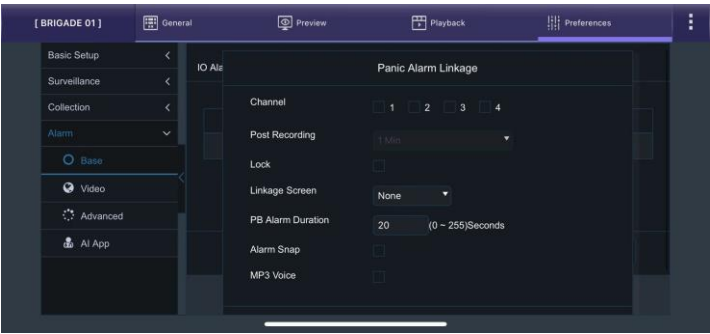


*Panic Alarm Linkage Figure 76*

### 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 Centre Server. Events are stored but do not get reported to the Centre Server.

For Trigger:

**Effective Time** defines during this time 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 appended 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.



*GPS Alarm Figure 77*
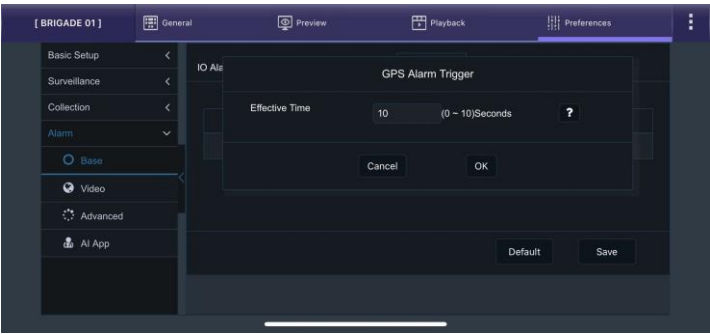


*GPS Alarm Trigger Figure 78*
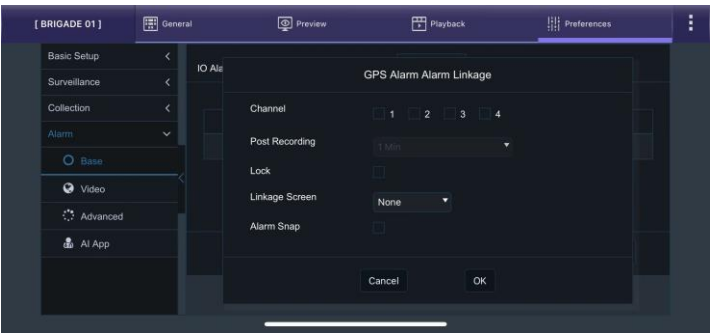


*GPS Alarm Linkage Figure 79*

### 4.4.2    Video

### 4.4.2.1    Video Loss

By default, this alarm is off.

**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 Centre Server. Events are stored but do not get reported to the Centre Server.

For Trigger:

**Channel** is used to choose which channels you would like the alarms to be triggered from. All channels ticked by default.
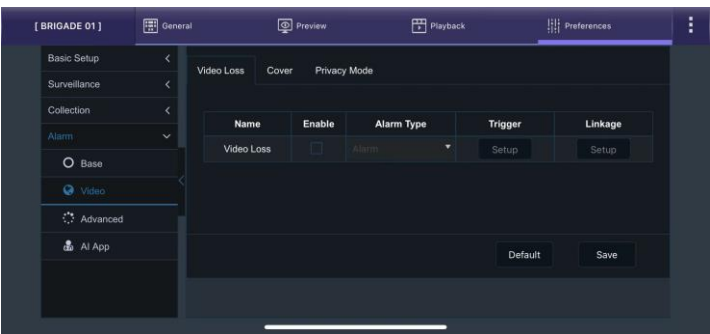


*Video Loss Alarm Figure 80*

**Effective Time defines during this time period, the device only allows this alarm to be triggered once.**
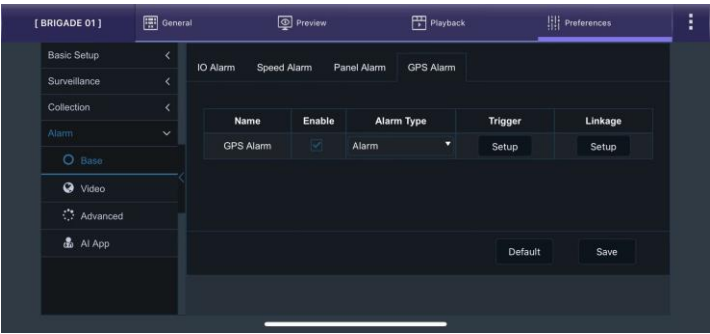
For Alarm Linkage:

**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 appended 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.



*GPS Alarm Trigger Figure 81*
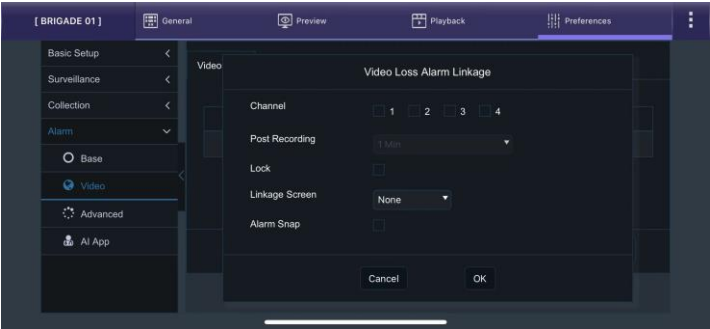


*GPS Alarm Linkage Figure 82*

### 4.4.2.2    Blind Detection

By default, this alarm is off.

**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 Centre Server. Events are stored but do not get reported to the Centre Server.

For Trigger:

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

**Sensitivity** has three options: High, Middle and 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.

**Effective Time defines during this time 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.
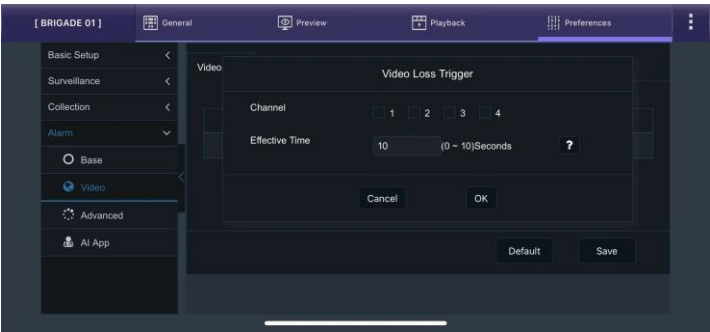
For Alarm Linkage:

**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 appended 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.
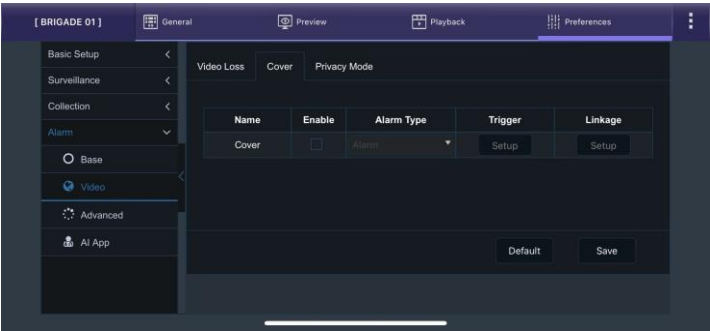


*Cover Alarm Figure 83*



*Cover Alarm Trigger Figure 84*



*Cover Alarm Linkage Figure 85*

**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 not wanted to be recorded.

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

For Trigger:

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

**Privacy Method** has two options: IO and ACC OFF. If select IO which means the driver can activate the privacy mode by trigger the dedicated IO (the Sensor Usage in IO alarm must be chose to "Privacy Mode").If select ACC OFF, the privacy mode will be activated when the ignition signal cut off.

**Exit Method** means how to deactivate the privacy mode.

If multiple method has been chosen here, then either one of them has been satisfied will deactivate the Privacy Mode.

**Enable AI MP3 Voice** since the AI alarm detection is still ongoing even if the device enter Privacy Mode, this will enable whether to 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 time 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 device's driving behaviour based on g-force values.

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

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 recommend leaving the value as default. By default, there are three sets of Offset values can be chosen from, 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 your specific vehicle.

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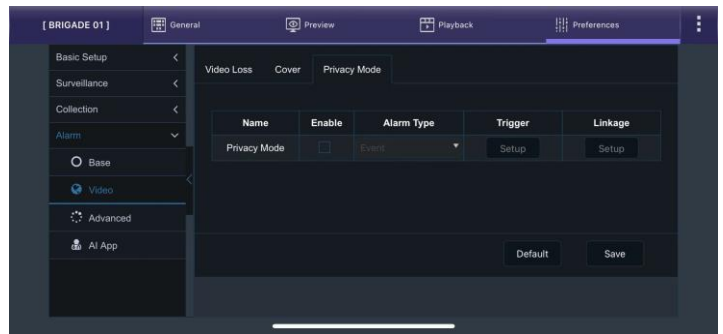

*Privacy Mode Figure 86*
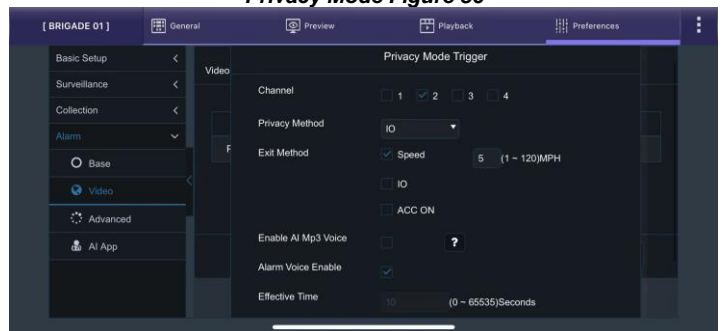

*Privacy Mode Trigger Figure 87*
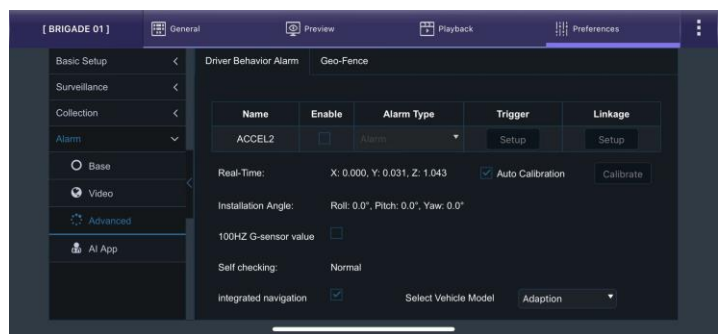

*G-Force Alarm Figure 88*
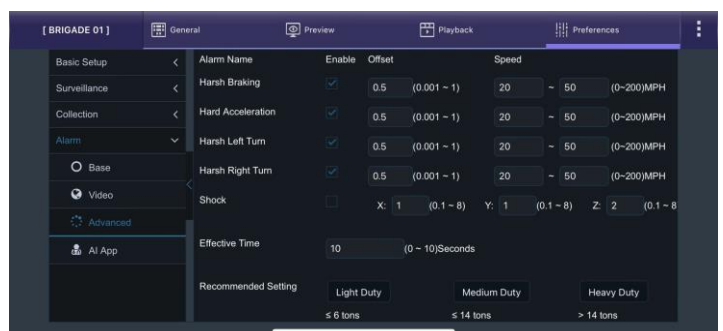

*G-Force Trigger Figure 89*

**Shock** represents collision warning. 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 time period, the device only allows this alarm to be triggered once.**
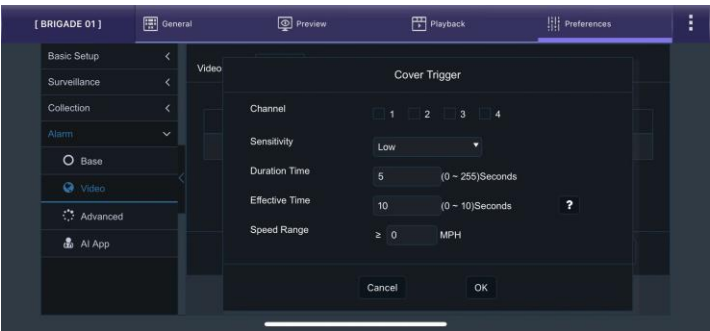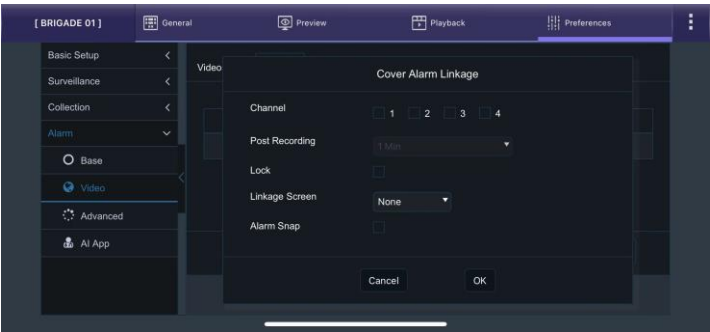
For Alarm Linkage:

**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 appended 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.

**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 default on, 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 working on maximum sampling rate. This will create G-Force data 100 piece per second, the accuracy got improved and the Blackbox data size increases drastically as well. Recommend disabling the feature in daily uses. 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 are generated by G-Sensor. However, in the device GPS, it supports inertial guidance module which can supplement 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** set to **Adaption** which works for all different vehicle types.
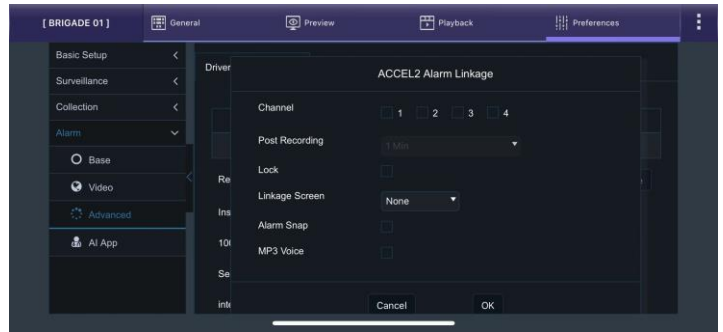


*G-Force Alarm Linkage Figure 90*
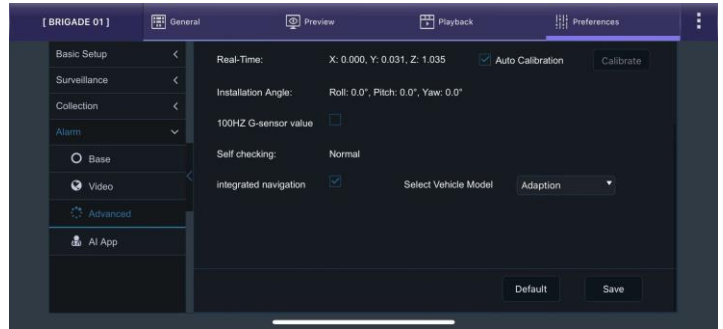


*G-Force Alarm Other Reading and Settings Figure 91*
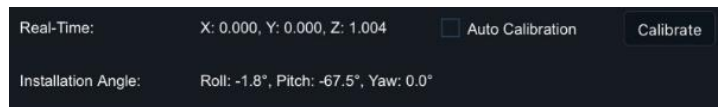


*G-Force Alarm Other Reading and Settings Figure 92*
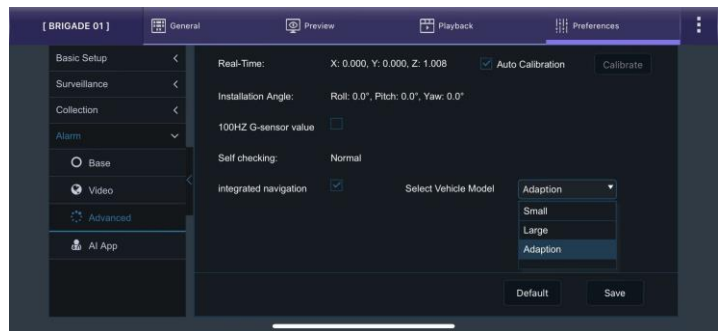


*G-Force Integrated Navigation Figure 93*

#### 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 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.
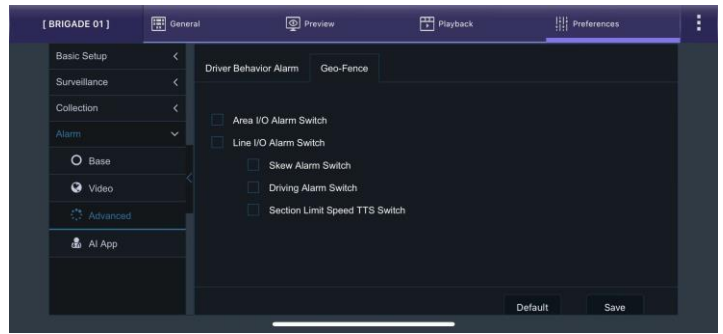


*Geo-Fence Alarm Figure 94*

### 4.4.4    AI App

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

Different AI alarm has different setup and warning methods. Most of AI alarms are having 2 levels of notification (**Lvl1** and **Lvl2**). The level 1 is less harm and mainly for notify 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 Centre Server. Events are stored but do not get reported to the Centre Server.

**Trigger** settings see table below
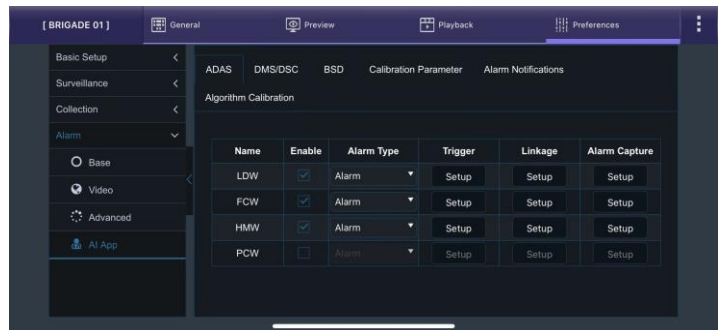


*AI App Figure 95*

| Alarm Type | LDW (Lane Departure Warning) | FCW (Forward Collision Warning) | HMW (Headway Monitoring Warning) | PCW (Pedestrian Collision Warning) |
|---|---|---|---|---|
| Lvl1 Speed Range | 50 – 80 MPH | 30 – 50 MPH | 30 – 50 MPH | 5 – 30 MPH |
| Lvl2 Speed Range | ⩾ 80 MPH | ⩾ 50 MPH | ⩾ 50 MPH | ⩾ 80 MPH |
| Sensitivity | Middle | | User-Defined (0.6s) | |
| Duration | | | 2 seconds | |
| Effective Time | 300 seconds | 0 seconds | 300 seconds | 0 seconds |

| | |
|---|---|
| **LDW** (Lane Departure Warning) by detecting road lanes and left/right turning signals to give alerts when it judges current lane departure is not intended. By default, this is on.<br><br>**Judgement:** vehicle is across lane without left/right turning signal enabled.<br><br>**Lvl1 alerts:** TTS broadcast "DING, Lane Departure."<br><br>**Lvl2 alerts:** short shriek "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.<br><br>**Judgement:** vehicle has great possible to crash within 2.7 seconds if front vehicle suddenly stops.<br><br>**Lvl1 alerts:** TTS broadcast "Collision warning, collision warning."<br><br>**Lvl2 alerts:** short shriek "beep beep". |
| **HMW** (Headway Monitoring Warning) by detecting the relative distance between the front vehicle and the driver, calculating with vehicle speed to give alerts. By default, this is on.<br><br>**Judgement:** vehicle has great possibility to crash within 0.6 seconds.<br><br>**Lvl1 alerts:** TTS broadcast "DING, unsafe following distance."<br><br>**Lvl2 alerts:** short shriek "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 want to change the sensitivity, it must be tested before using.

**Duration** 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.

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

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 appended 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 Capture** are settings enable camera creates 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*.
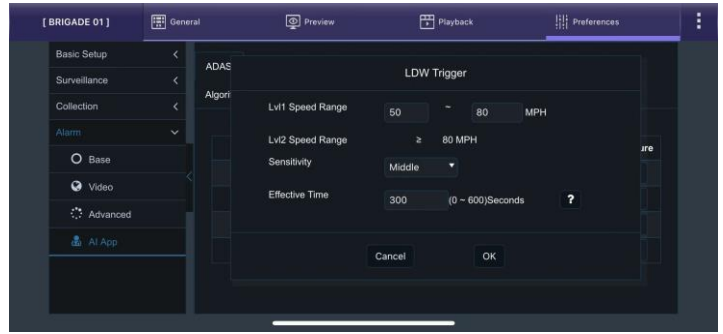

*ADAS Alarm Trigger Figure 96*
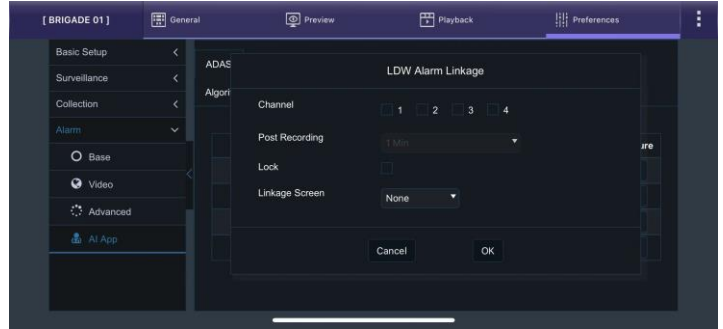

*AI Alarm Linkage Figure 97*
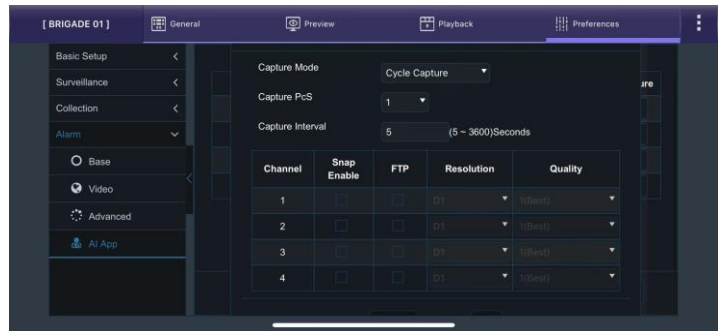

*AI Alarm Capture Figure 98*

### 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 Centre Server. Events are stored but do not get reported to the Centre Server.

**Trigger** settings see table below
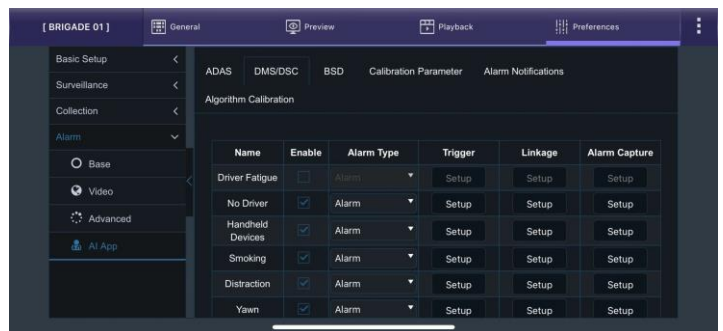

*DMS/DSC Figure 99*

| Alarm Type | Driver Fatigue | No Driver | Handheld Devices | Smoking |
|---|---|---|---|---|
| Lvl1 Speed Range | 30 – 50 MPH | ⩾ 30 MPH | 30 – 50 MPH | 30 – 50 MPH |
| Lvl2 Speed Range | ⩾ 50 MPH | | ⩾ 50 MPH | ⩾ 50 MPH |
| Sensitivity | User defined: 2000ms | User defined: 60s | User-Defined: 5s | User-Defined: 3s |
| Effective Time | 0 seconds | 300 | 30 seconds | 0 seconds |

| Alarm Type | Distraction | Yawn | Seatbelt | No Mask |
|---|---|---|---|---|
| Lvl1 Speed Range | 30 – 50 MPH | 30 – 50 MPH | 30 – 50 MPH | 20 – 50 MPH |
| Lvl2 Speed Range | ⩾ 50 MPH | ⩾ 50 MPH | ⩾ 50 MPH | ⩾ 50 MPH |
| Sensitivity | User defined L+R+Up+Down L+R: 5s Up+Down:3s | User defined: 2s | User-Defined: 60s | Middle |

| | Distraction Level: light | | | |
|---|---|---|---|---|
| Effective Time | 300 seconds | 0 | 30 seconds | 0 seconds |

| | |
|---|---|
| Alarm Type | Infrared block alarm |
| Lvl1 Speed Range | 20 – 50 MPH |
| Lvl2 Speed Range | ⩾ 50 MPH |
| Sensitivity | Middle |
| Effective Time | 0 seconds |

| | |
|---|---|
| **No Driver** by detecting driver face movements to determine if there's a driver existing. By default, this is off.<br><br>**Judgement:** No face has been detected.<br><br>**Lvl1 alerts:** TTS broadcast "DING, no driver detected." | **Handheld Devices** by detecting the moving object around drivers' face/ear.<br><br>**Judgement:** An object shape like a mobile phone has been detected close to drivers' ear.<br><br>**Lvl1 alerts:** TTS broadcast "DING, phone detected."<br><br>**Lvl2 alerts:** short shriek "beep beep". |
| **Smoking** by detecting the cigarette stick features and body gestures.<br><br>**Judgement:** A cigarette feature has been detected for a period of time.<br><br>**Lvl1 alerts:** TTS broadcast "DING, smoking detected."<br><br>**Lvl2 alerts:** short shriek "beep beep". | **Distraction** by detecting driver face and eye movement. Supports to custom moving condition: Left, Right, Up and Down.<br><br>**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).<br><br>**Lvl1 alerts:** TTS broadcast "DING, driver distraction."<br><br>**Lvl2 alerts:** short shriek "beep beep". |
| **Yawn** by detecting the position of the upper and lower lips and its opening amplitude value.<br><br>**Judgement:** when the amplitude value exceeds a certain threshold and lasts for the certain duration.<br><br>**Lvl1 alerts:** TTS broadcast "Yawning, please drive carefully."<br><br>**Lvl2 alerts:** short shriek "beep beep". | **Seatbelt** by detecting seatbelt shape across drivers' body.<br><br>**Judgement:** No seatbelt has been detected for a period of time.<br><br>**Lvl1 alerts:** TTS broadcast "DING, please fasten seatbelt."<br><br>**Lvl2 alerts:** short shriek "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 time 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 detecting for different conditions of left / right / up / down head movement. Each condition can define detecting periods.

**Distraction Level** refer 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.
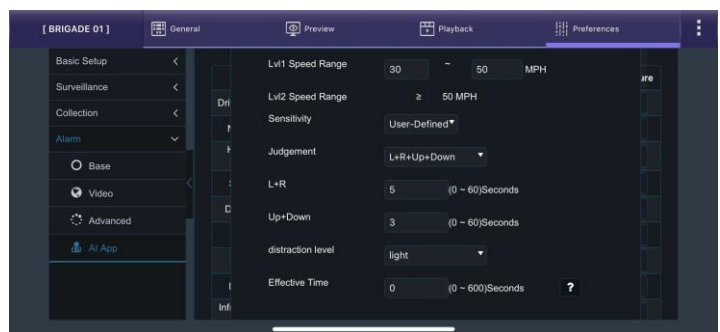


*DSM Alarm Trigger Figure 100*

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 appended 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.
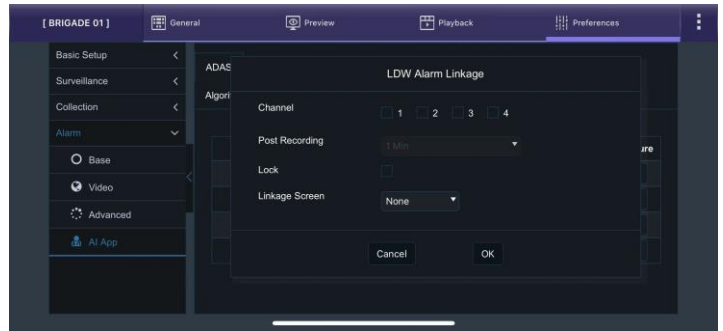
**Linkage Screen** currently not in use.



*AI Alarm Linkage Figure 101*

**Alarm Capture** are settings enable camera creates snapshots when certain alarm happens. This interface is the same for every ADAS alarms.
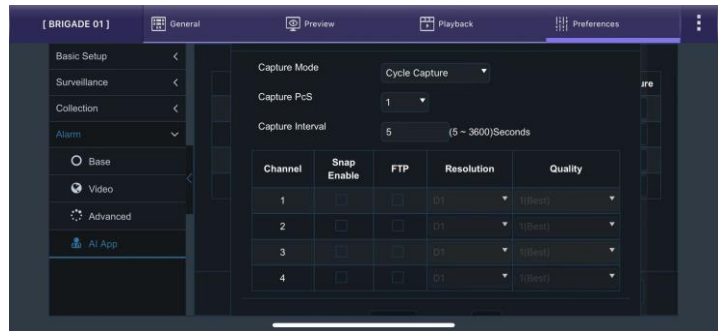
**Capture Mode** supports **Cycling Capture** and **Single Capture**. Cycling Capture to capture snapshots in every few seconds. Single Capture to only capture snapshots once after alarm happened.

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 Capture Figure 102*

#### 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 is incorrect, it will results 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 103*.

**Left Margin (2)** refer to the measurement from the left side vehicle to the device. Illustration refers to measurement 2 in *Calibration Parameter Figure 103*.

**Front-end Width (3)** refer to measurement 3 in *Calibration Parameter Figure 103*.

**Front-end Length (4)** refer to measurement 4 in *Calibration Parameter Figure 103*.

**Steering Wheel Position** to choose whether the vehicle is running on left steering (**Left Rudder**) or right steering (**Right Rudder**).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. After this has been enabled, users cannot do the manual calibration for DSC/DSM. Recommend keeping this feature on for saving effort and avoid human mistakes during calibration process.
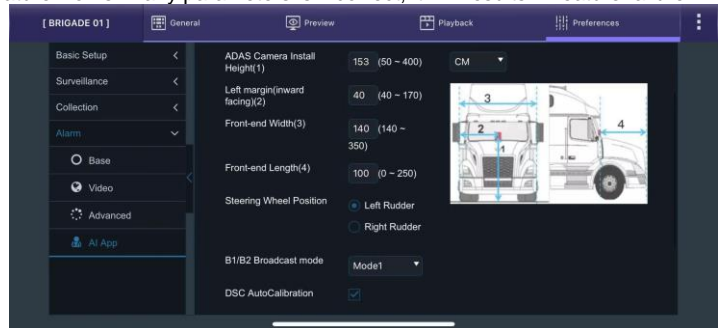


*Calibration Parameter Figure 103*

#### 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 no 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.
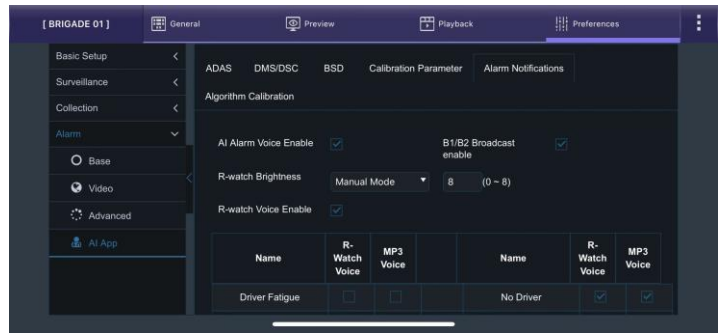

***Alarm Notification 1 Figure 104***
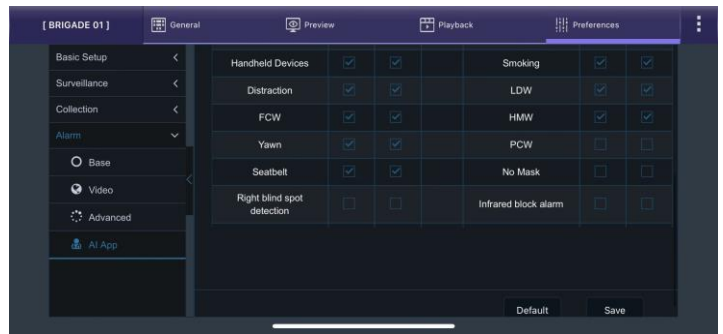

***Alarm Notification 2 Figure 105***

#### 4.4.4.6    Algorithm Calibration

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

Recommend not to change 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.
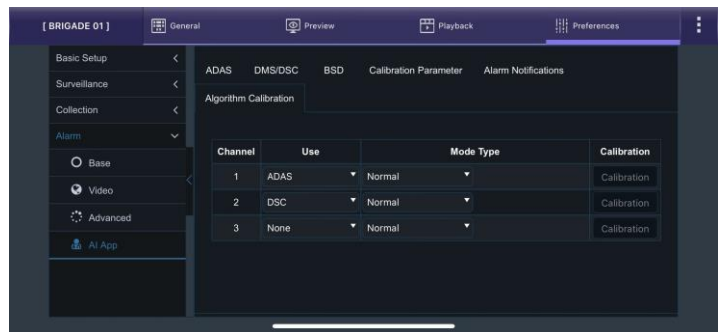

***Algorithm Calibration 1 Figure 106***

# 5    Appendices

## 5.1    Button Usage

The device equipped with a button on the driver facing panel. It has multiple usages:
1. Single click – activate Panic Alarm (if the alarm has been enabled)
2. Double click - enter AP mode for configuration purposes
3. Single press and hold for 2 seconds - enter Privacy Mode (if the Privacy Mode has been enabled)

## 5.2    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/.

## 5.3    Audio Alerts Content

The device 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 |
| --- | --- |
| Yawn | Yawning, please drive carefully |
| Distraction | DING, driver distraction |
| Handheld Devices | DING, phone detected |
| Smoking | DING, smoking detected |
| No Driver | DING, no driver |
| Seatbelt | DING, please fasten seatbelt |
| LDW | DING, lane departure |
| FCW | Collision warning, collision warning |
| HMW | DING, unsafe following distance |
| 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 |

# 6    Testing and Maintenance

## 6.1    Operator Instructions

This information is addressed to the operator of the vehicle where a Brigade MDR 600 Series System is installed:

1) The Brigade MDR 600 Series is intended to be used as a mobile digital recorder. Drivers and operators should not interact with the MDR setup menu. The remote control should be strictly used by technically trained operators when the vehicle is stationary.

2) Testing and inspection of the system should be carried out in accordance with this manual. The driver or operator is responsible for ensuring the Brigade MDR 600 Series System is working as intended.

3) Operators using this equipment are strongly recommended to check the system's operation at the beginning of every shift.

4) Improved safety can be achieved when used in conjunction with Brigade's camera-monitor systems. This may allow triggering camera views and providing additional vehicle information during manoeuvring. It is necessary to read, understand and follow all instructions received with the Brigade MDR 600 Series System.

5) The Brigade MDR 600 Series System for digital recording is intended for use on commercial vehicles and machinery equipment. Correct installation of the system requires a good understanding of vehicle electrical systems and procedures along with a proficiency in installation.

6) Keep these instructions in a safe place and refer to them when maintaining and/or reinstalling the product.

## 6.2    Maintenance and Testing

This information is addressed to the operator for maintenance and testing of a vehicle with the Brigade MDR 600 Series System installed. This is also to familiarise the operator with the features and behaviour of the system. More frequent inspections should be performed in cases where:

- The vehicle is operating in a particularly dirty or harsh environment.
- The operator has reason to suspect the system is not working or has been damaged.

Procedure:

1) Clean the camera lens and housing of any accumulation of dirt, mud, snow, ice or any other debris.

2) Visually inspect the cameras and MDR unit and verify that they are securely attached to the vehicle and are not damaged.

3) Visually inspect the system's cables and verify that they are properly secured and not damaged.

4) Ensure the area in front of the cameras is clear of obstacles and has the right coverage area to view objects.

If any of the following tests fail, follow the appropriate sections of this instruction guide or contact Brigade if still in doubt.

5) Activate the Brigade MDR 600 Series System and verify the LEDs (on the MDR unit front) are illuminated, it should take approximately 60 seconds for HDD recordings to start after a file-system check.

6) This test can only be performed when the MDR video output is displayed on a Brigade monitor. Ensure that both the SD card and HDD are recording. Recording is shown with an SD card symbol and HDD symbol.

7) Other tests can be performed depending on the configuration. For instance, if Video Loss is activated, any disconnected or malfunctioning camera is detected.

8) Sensor trigger activation can also be diagnosed. For instance, if a trigger is setup to turn a channel on full screen or set an alarm. This will be identified by the channel occupying the full screen or a red-letter A (if a Brigade monitor is connected).

9) GPS, G-Sensor, Supply Voltage and Heater functioning can be accessing SYS INFO using the mouse (if a Brigade monitor is connected).

# 7 Approvals

CE
UKCA
UNECE Regulation No. 10 Revision 5 ("E-marking")
FCC
IC

**FC** Brigade Electronics
DC-204-AI(XXXXX)
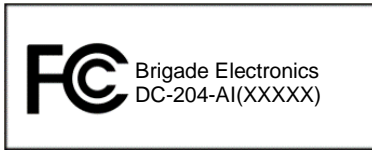
## FCC Statement:

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.

(2) 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 etla conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne surl'exposition et la conformité de rf.*

*Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ouémetteur. 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)
**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
**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
**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