

OEMTech

*Excellence  
Through  
Innovation*

## TVG Sentinel

### Product & Installation Guide



Document ID: G0037– TVG Sentinel PG v1.2

Read guide fully before commencing installation.  
This guide must be present during time of install.  
This guide is to be used in conjunction with training.

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## Document Change Control

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25/03/2025	V1.1	A. Barker	M. Blackburn	Updated to include TCO button
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## General Notices

- Before starting installation, please read the documentation fully as the performance of the device is dependent on correct installation.
- This device is designed for automotive use only. It must not be used in situations where human life is dependent on its performance.
- Installation of this device may conflict with some countries regulations, or the vehicle manufacturers instructions. Compliance with these regulations shall solely be the customers responsibility. Improper installation may invalidate the vehicle warranty.
- Prior to the commencement of any work, the correct PPE should be worn and a risk assessment should be conducted in accordance with your company policies.
- Ensure manufacturers guidance is followed during the installation.
- The device must be installed by a suitably qualified and experienced professional skilled in automotive electronics.
- Misuse, physical damage and incorrect installation will invalidate the warranty of this device or systems using this device.
- Vehicle batteries should be isolated before working on any electrical systems.
- If using the OEM body builders module to gain CANbus information, ensure the module is correctly configured by the manufacturer.
- Do not secure the device in a way where it will interfere with the vehicles control systems. E.g. steering column, brake pedals etc.
- Other people may install equipment after you, so your work must be firmly secured in place, this includes devices and cabling.
- Connecting the power supply and ground should be done as per OEM specifications. Once any jointing or crimping has been completed, testing should be conducted to ensure the joint is compliant with the crimp specifications and all other relevant standards.
- We do not recommend drilling through vinyl (vehicle decals etc) as this will lead to blistering from the heat generated. Hole should be fitted with a grommet and sealed with appropriate sealant.
- Any alteration to metal must be de-burred and all sharp edges removed. Exposed bare metal must be treated with appropriate anti-corrosion solution in accordance with manufacturers recommendations. Any swarf produced must be collected by placing a magnet or catchment device under the area of modification. No swarf is to be left on or in a vehicle.
- We recommend using flexible polyurethane sealants. Any sealed areas must be sealed to a minimum of IP65 and must comply with the vehicle manufacturers recommendations.
- Any serial / key numbers from the equipment being installed must be logged against the vehicle identity for future reference.

## Introduction

The UK transport and logistics sector continues to grapple with freight crime, with it costing the economy around £428 million in 2021. The ramifications of these thefts extend beyond financial losses, they also disrupt supply chains, inflate insurance premiums and pose safety risks to drivers. As the industry seeks more robust solutions to safeguard against these threats, TVG remain at the forefront with our new Sentinel system.

## TVG Sentinel

TVG Sentinel is our new security system designed to guard your vehicle, keeping watch using our state of the art automotive surveillance technology, along with advanced Artificial Intelligence (AI) technology. TVG Sentinel will identify a person next to your parked vehicle and issue a audible alert, warning them to move away. Should they remain in the area it will sound an alarm along with a 2nd stage warning. It will also take a snapshot of footage and can send an alert to fleet management systems.

## How Does It Work?

When the driver parks up for the night they activate TVG Sentinel via a button on the dashboard. After 45 seconds the system will give an audible message “system start-up” informing the driver that the system is now live. TVG Oculux cameras and the AI will silently watch over your vehicle, only alerting when they detect a human in the preprogrammed zone. If someone enters the yellow (outer) zone, the monitor will turn on and show the person with a yellow box around them, but no alerts will sound. Should a person move into the red (inner) zone, the system will give an audible alert to move away via our CVAS external speaker, the monitor will show them with a red box around them. If after 3 alerts they still stay in the area, TVG Sentinel will sound an alarm and play a 2nd level warning message. They will shown on the monitor with a red box around them, and if fitted, an alert can be sent to fleet management software. The system will record 20 seconds of footage alerts on the inbuilt SD card. To de-activate TVG Sentinel, the driver simply pushes the button on the dashboard.

The system also includes a Timer Cut-Off (TCO) button. The TCO button is designed to silence the external CVAS speaker during silent hours. Should the system alarm, the driver can press the TCO button and the external speaker will silence, and will not reactivate until the zones are clear of people. Once the zones are clear, the external speaker will reactivate and will sound should it be triggered.

## TVG Sentinel - Protection Zones

To monitor activity around the vehicle, TVG Sentinel uses yellow, and red zones. These zones can be customised on installation according to customer requirement.

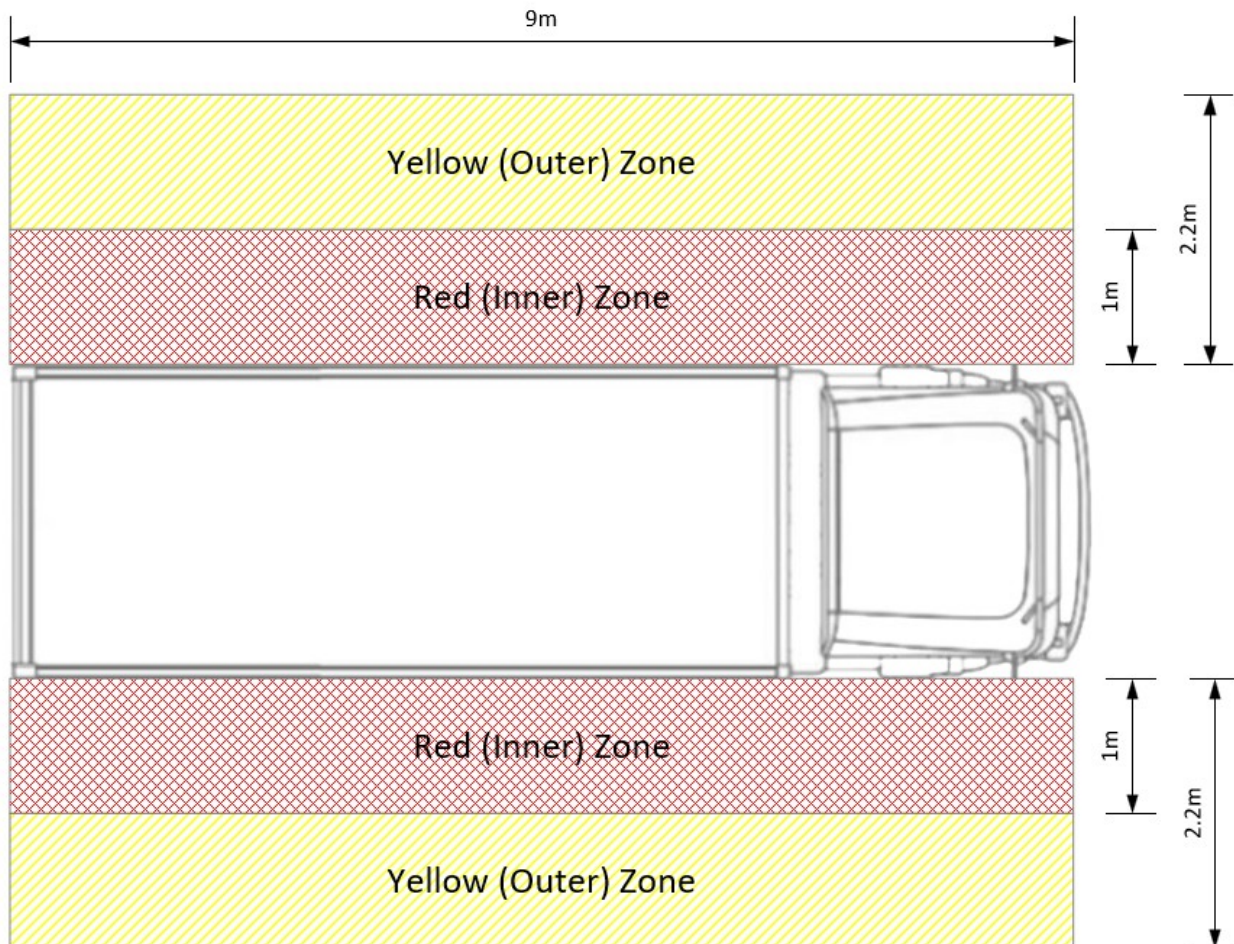


Fig 1 - Sentinel zones

## TVG Sentinel - Protection Zones

### Yellow (Outer) Zone

The yellow zone acts as an outer cordon, when a person enters this zone the system will display them on the monitor with a yellow box around them but no alerts or warnings are given.

### Red (Inner) Zone

Should a person enter the red inner zone the system will do the following:

- Display the person on the monitor with a red box around them.
- Play the message “Warning, protected by security system, please stand back” via a CVAS external speaker. This message will repeat 3 times.
- Activate the internal beeper until they leave the red zone.
- Record a 20 second video of the alert the event on the SD card.

If the person does not leave the red zone after 3 messages, TVG Sentinel will go to stage 2:

- Display the person on the monitor with a red box around them.
- Play the message “Warning, security has been alerted” along with a high pitch alarm via the external CVAS speaker.
- Activate the internal beeper until they leave the red zone.
- Record a 20 second video of the alert on the SD card.
- An notification can be sent via the vehicle telematics system.
- The stage 2 alert will repeat 3 times then silence, but the internal display unit will continue to beep while someone remains in the area.

If the person leaves, then re-enters the area the system will start again with the stage 1 alert.

During any alert from the CVAS speaker, the TCO button can be pressed to silence the speaker until the zones are clear.

All audible messages can be configured at the customers request.

## Technical Information

### Electrical and Environmental

Operational Voltage	10-32 Volts DC
Current	1.5A
Working Temperature range	-20 to +70°C
Storage Temperature range	-30 to +85°C
Humidity, no condensation	10-95%

### Power & Signals connections

Power IN + Red (Fused)	12 or 24v DC
Power IN - Black (Fused)	0v (Ground)
Ignition (Acc.) Yellow	12 or 24v DC
Left Turn signal Blue	Input 12 or 24v DC
Park brake signal Violet	Input 12 or 24v DC

### Other Connections

12v OUT + Blue	+12v OUT DC
12v OUT - Black	0v OUT
GPS Antenna 2-Pin	
Camera VIN1 4-Pin	
Camera VIN2 4-Pin	
Monitor 4-Pin	
Display and beeper 4-Pin	
Speaker 4-Pin	
Micro SD card slot. Maximum card size 512GB	

### Dimensions & Weight

Display Dimensions	42x24x110mm
Display Weight	100g
Controller Dimensions	127x75x46mm
Controller Weight	375g

## TVG Sentinel - Camera Location

We use our top of the range Oculux® cameras to ensure the images sent to the AI control unit are the best possible quality. The cameras are installed high on the vehicle cab, the image below demonstrates the camera position and view.

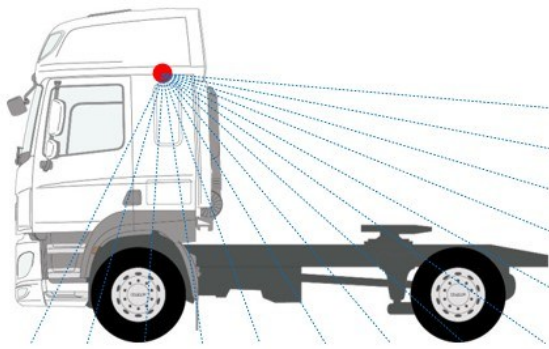


Fig 3 - Left side camera

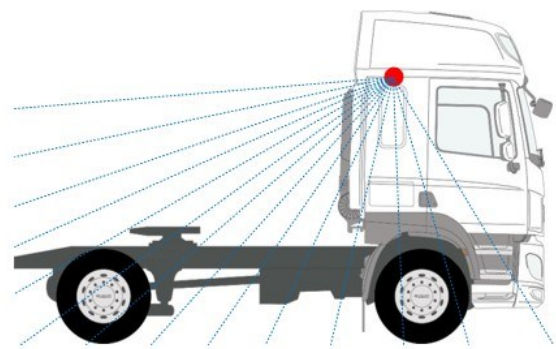


Fig 3 - right side camera

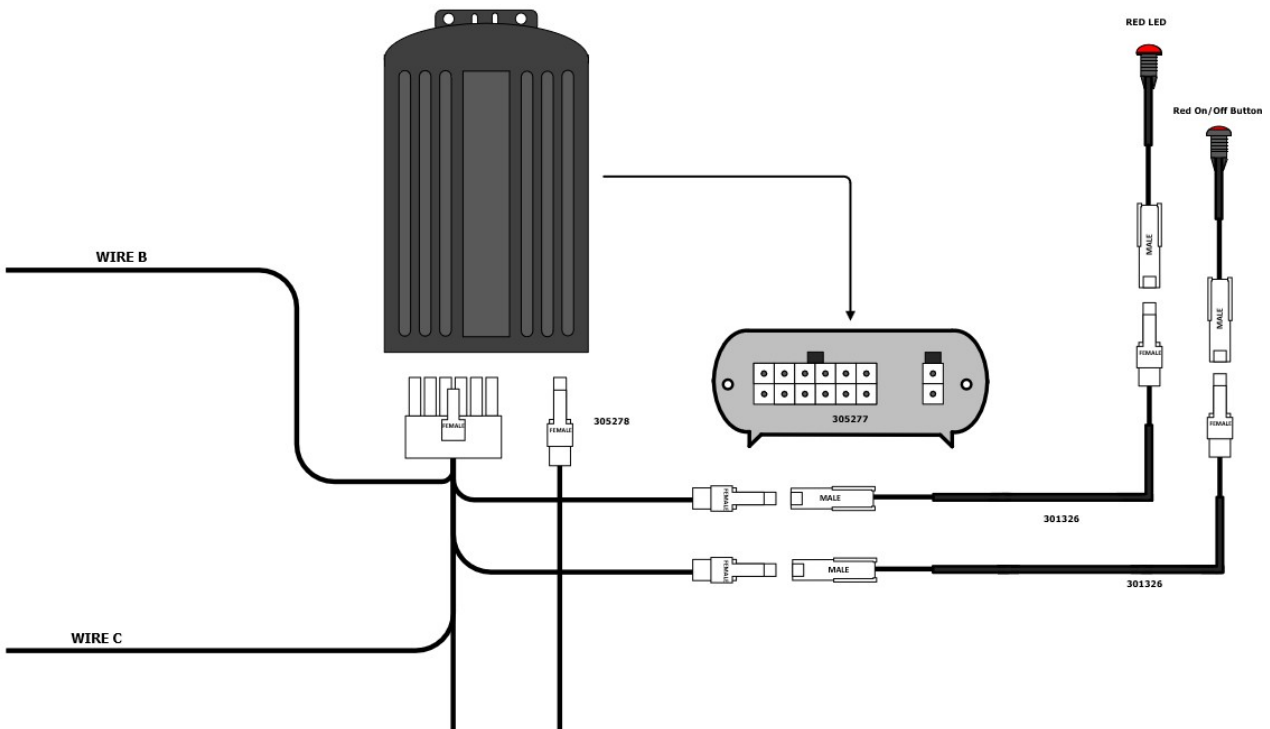
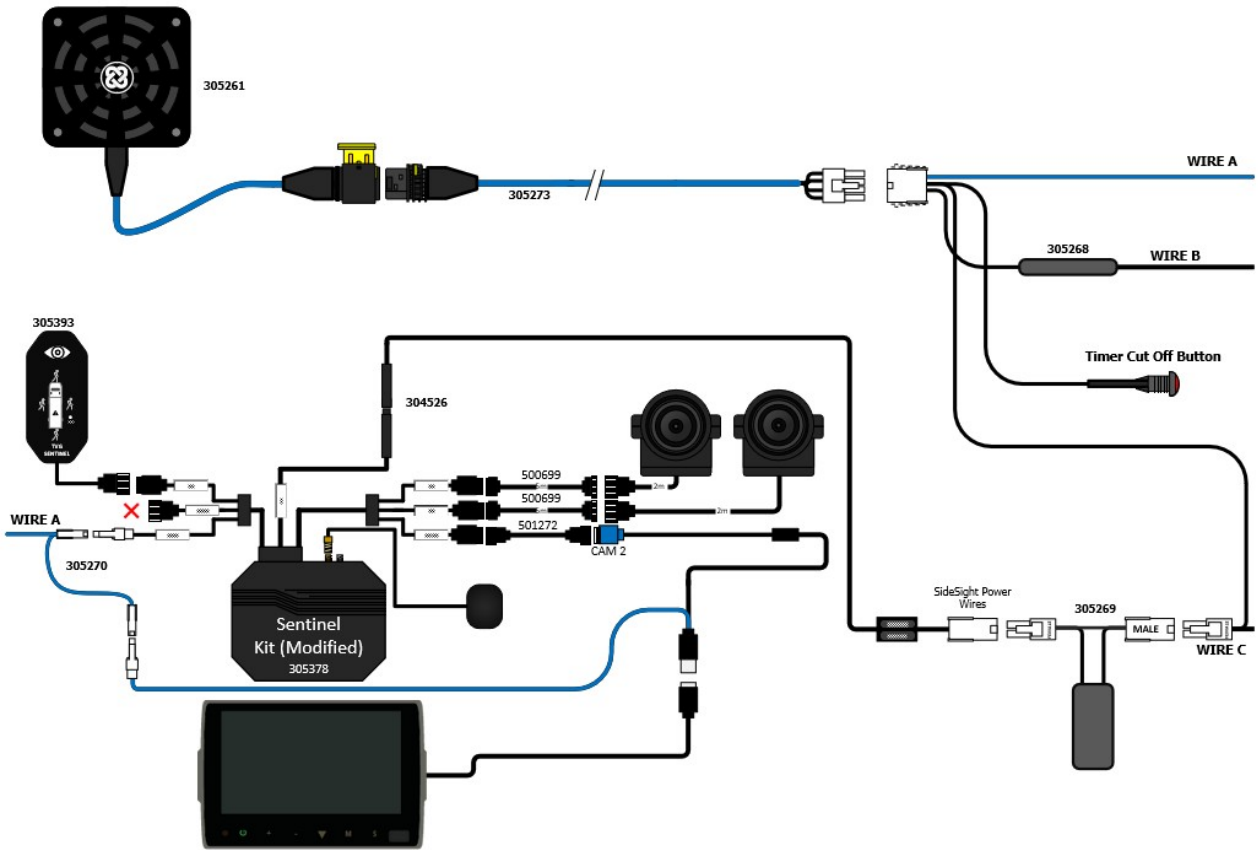
## TVG Sentinel - Display Location

We advise that the beeper for the Sentinel system is fitted in the bed area of the cab, it can however be fitted elsewhere depending on customers requirements.



Fig 4 - Sentinel Display & Beeper

Example System Schematic



ECU Power wires are left as flying leads. These are to be pinned by the engineer

## TVG Sentinel - Firmware Update - Micro SD card.

### Update using a micro SD card

Using a windows computer, navigate to [www.tvg.uk/downloads](http://www.tvg.uk/downloads) and log in using your account details. Select “SideSight Downloads”, and then select the “SideSight Full SD Firmware” option. The Firmware version on the live website may differ from the image below.

It is important that the AI control unit is up to date with the appropriate firmware.

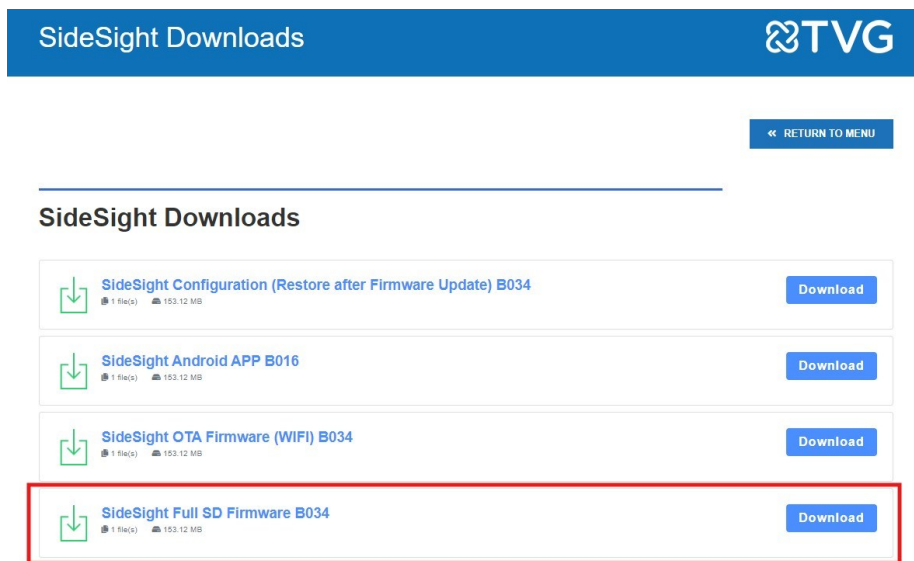


Fig 5 - Downloads Page

Remove the micro SD card from the AI control unit and connect it to the windows laptop using a suitable adaptor. Erase the all files & folders on the micro SD card. Unzip the SideSight firmware you just downloaded into a new file, then copy all files from that folder to the micro SD card.



Fig 6 - SD Card access

## TVG Sentinel - Firmware Update - Micro SD card.

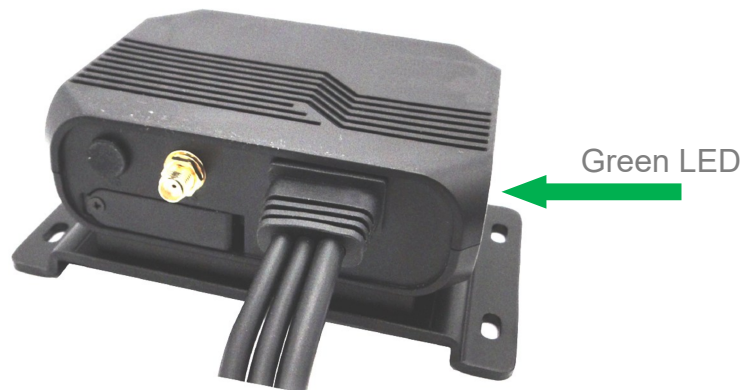


Fig 7 - AI Unit LEDs

1. To apply the firmware update first ensure the vehicle ignition is switched off.
2. Insert the micro SD card with the new firmware files on into the slot on the Ai control unit (marked TF).
3. You will need access to the micro SD card slot and can see the green LED on the side of the controller.
4. Insert a small pin (or similar) into the hole marked “D” (to the right of the micro SD card slot) and push the button in. Keep the button pressed in and turn on the ignition. The button should remain pressed for approximately 40 seconds, the status of the green LED during this time will determine the status of the update.
5. If the green LED illuminates during the 40 seconds, the system is booting and the update will fail. Remove the pin, turn off the ignition and wait 5 seconds. Turn the ignition back on and use the pin to press the reset (R) button next to the micro SD card slot. Turn off the ignition and restart the process from step 4.
6. If the green Led does not illuminate during the 40 seconds, release the button. Within 25 seconds the green LED should now illuminate to indicate the update is progressing. When the update is complete you will hear the audible message “Upgrade success”.
7. The system will now reboot and will be ready after approximately 45 seconds.
8. Replace the micro SD card slot cover and screw.

**Note:** After the firmware update the configuration settings will be returned to factory default.

## TVG Sentinel - Firmware Update - OTA

### Update using Over The Air (OTA)

Ensure you have an Android tablet with the AWAI app installed. Navigate to [www.tvg.uk/downloads](http://www.tvg.uk/downloads) and log in using your account details. Select "SideSight Downloads", then SideSight OTA Firmware (WIFI).

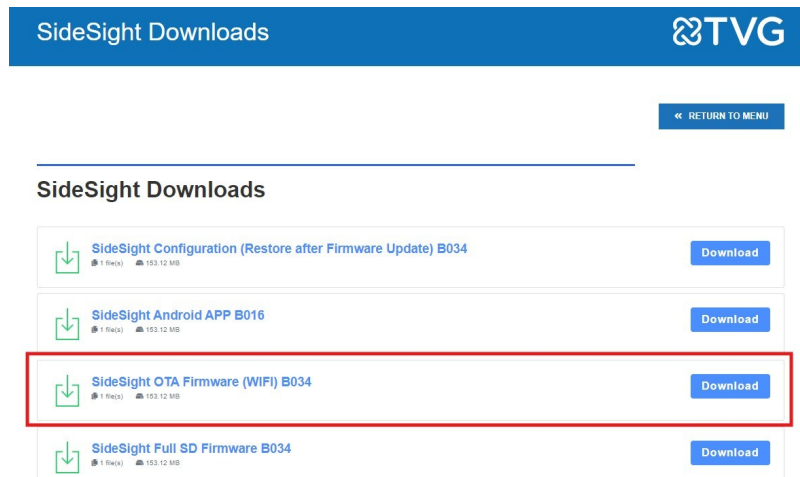


Fig 8 - OTA Downloads

On the next screen click to download the file name ending with OTA\_update.tar.gz

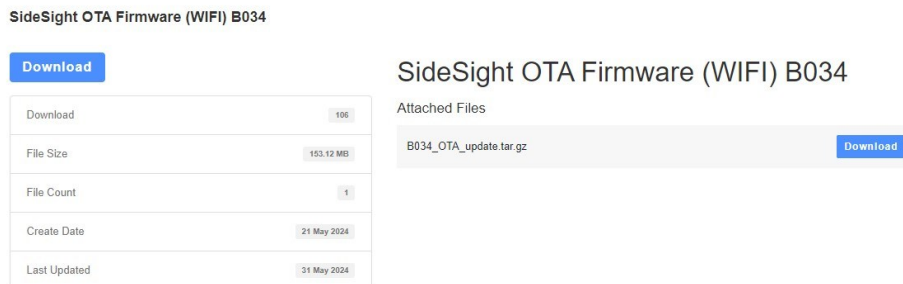


Fig 9 - OTA Firmware

Save the files in the download folder using the path "Download/SideSight/OTA".

## TVG Sentinel - Setting the Zones

Ensure the vehicle is parked on flat, level concrete or asphalt surface with sufficient room around the vehicle to set up the zones as per the fig 2 below.

- Cone 1 - Front left and right corners of the vehicle.
- Cone 2 - 1m out from the corner of the vehicle.
- Cone 3 - 2.2m out from the corner of the vehicle.
- Cone 4 - 9m rearwards, and 1m out from the corner of the vehicle.
- Cone 5 - 9m rearwards, and 2.2m out from the corner of the vehicle.

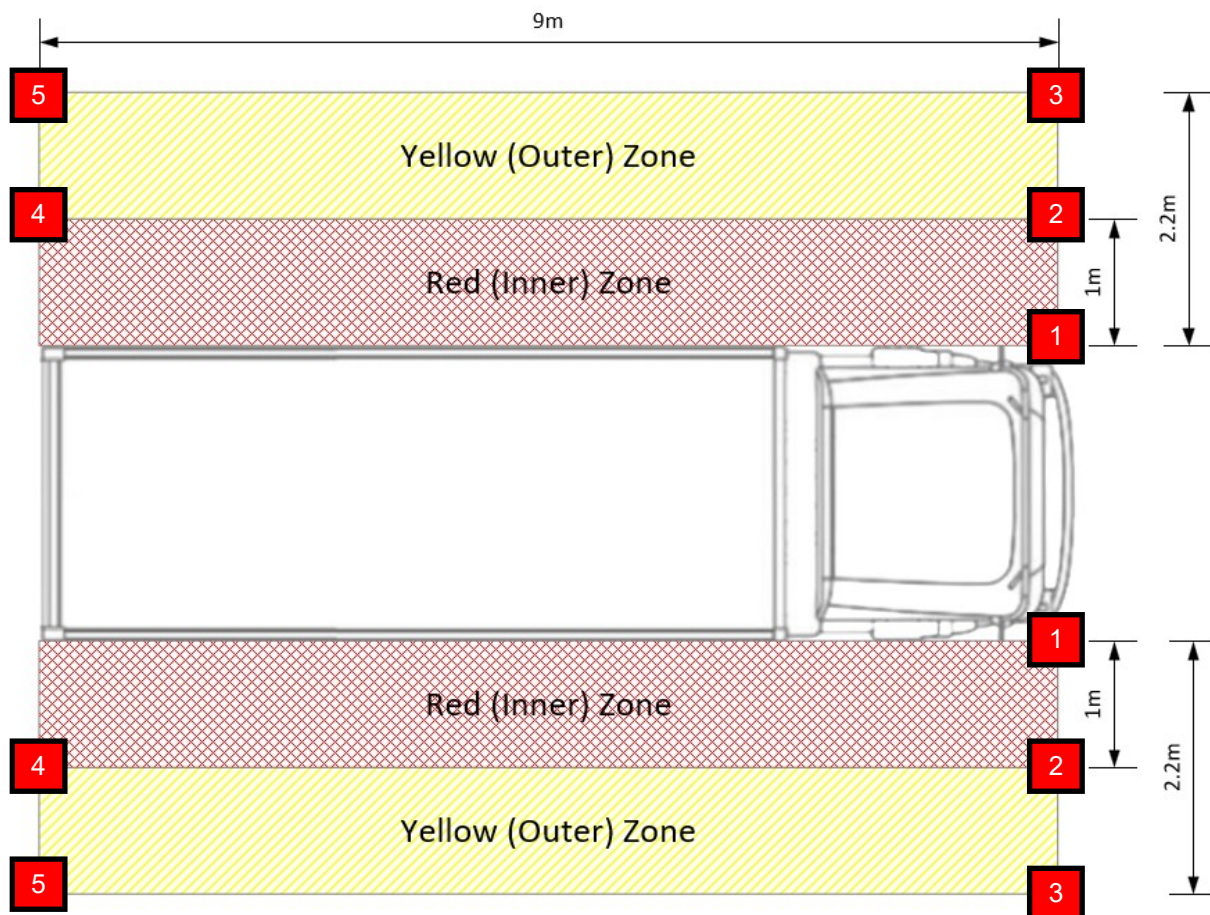


Fig 10 - Zone set up

## TVG Sentinel - App - Connections

We strongly recommend that the vehicle wheels are chocked before starting work.

Power up Sentinel via the switch on the dashboard. After it has carried out its self-checks and you hear the message “System Start-Up” you can search for the Wi-Fi signal on your tablet. The Wi-Fi signal ID will start with TTC-.

Join this Wi-Fi address and input the password TTC123456 then open the SideSight Android app.

Click on connect to gain access to the main option screen, then select “General” to check all connections are correct. When the option is connected, the icon will change from grey to red.

- **Heartbeat** - Indicates the system is running with no errors.
- **GPS** - Indicates the system has a GPS lock.
- **TF Card** - Indicates there is a working SD card installed.
- **Video Output** - Illuminates when the system is outputting video to the monitor.
- **VIN1** - Indicates the camera is working correctly, should always be the left side camera.
- **VIN2** - Indicates the camera is working correctly, should always be the right side camera.

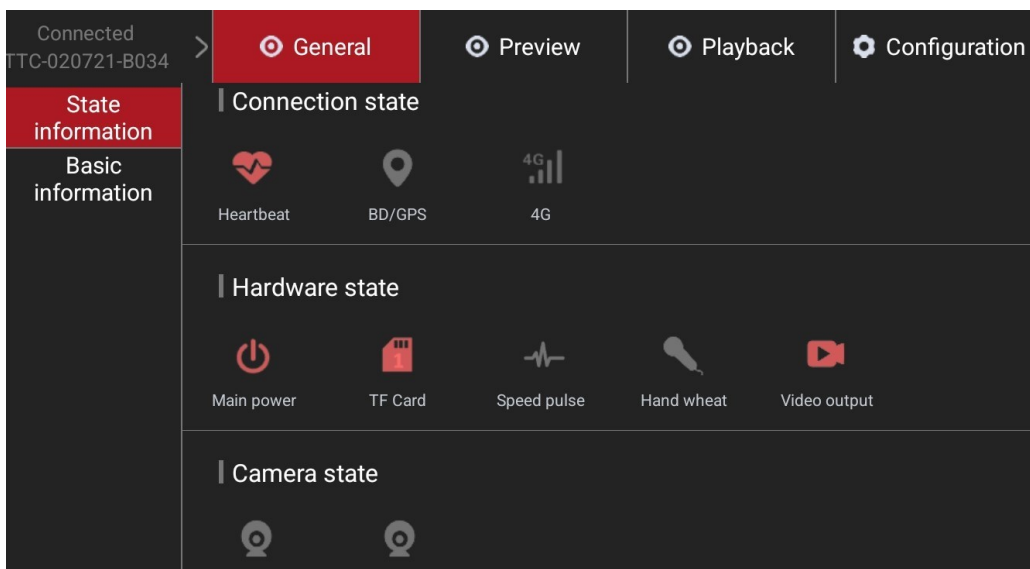


Fig 11 - Connections

## TVG Sentinel - App - Accessory Settings

Once you have checked the connections you should select “Configuration” from the top right of the screen, then scroll down and select “Accessory settings”.

The settings should be as below:

- External alarm - On
- Internal alarm - Off
- 2nd External alarm - Off
- Trigger output - On
- 2 arrow display - Off
- 4LED internal alarm - On

Connected TTC-271201-B034		General	Preview	Playback	Configuration
Accessories settings	Peripherals purpose	Enable switch	Signal source	Advanced setting	
Storage settings	External alarm	<input checked="" type="checkbox"/>	GPIO-39	ADVANCED	
Video Stream	Internal alarm	<input type="checkbox"/>	MCU-TTL	ADVANCED	
Alarm settings	2nd External alarm	<input type="checkbox"/>	12V OUT	ADVANCED	
Active safety alarm	Trigger output	<input checked="" type="checkbox"/>	12V OUT	ADVANCED	
Blind area alarm	2 arrow display	<input type="checkbox"/>	MCU-TTL	ADVANCED	
Other settings	4LED internal alarm	<input checked="" type="checkbox"/>	MCU-TTL	ADVANCED	
Others					
Test Mode					

Fig 12 - Accessory Settings

## TVG Sentinel - App - Accessory Settings

Select the ADVANCED settings for the 4LED internal alarm to open the next menu. On the advanced setting ensure the settings are as below:

MIX2 Alarm Interval - 0s

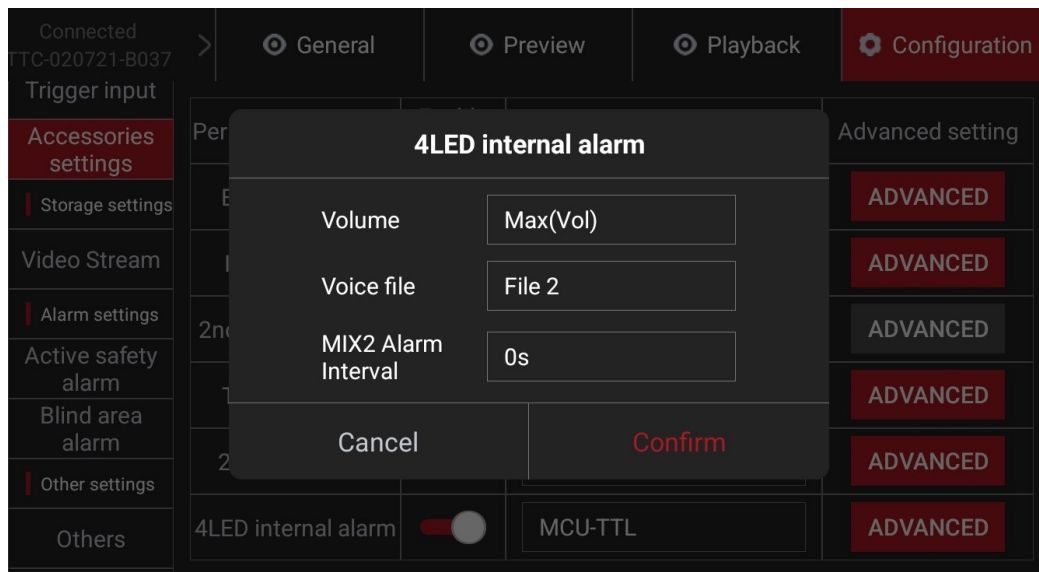


Fig 13 - 4LED internal alarm

Select "Confirm" to return to the previous screen, then when everything is set correctly, click on "Configuration", then select "Calibration".

## TVG Sentinel - App - Zone Calibration

Now we have the connections and the accessory settings correctly set up we need to create the red and yellow zones.

VIN1 will be the left side zone as shown in the fig 5 below.

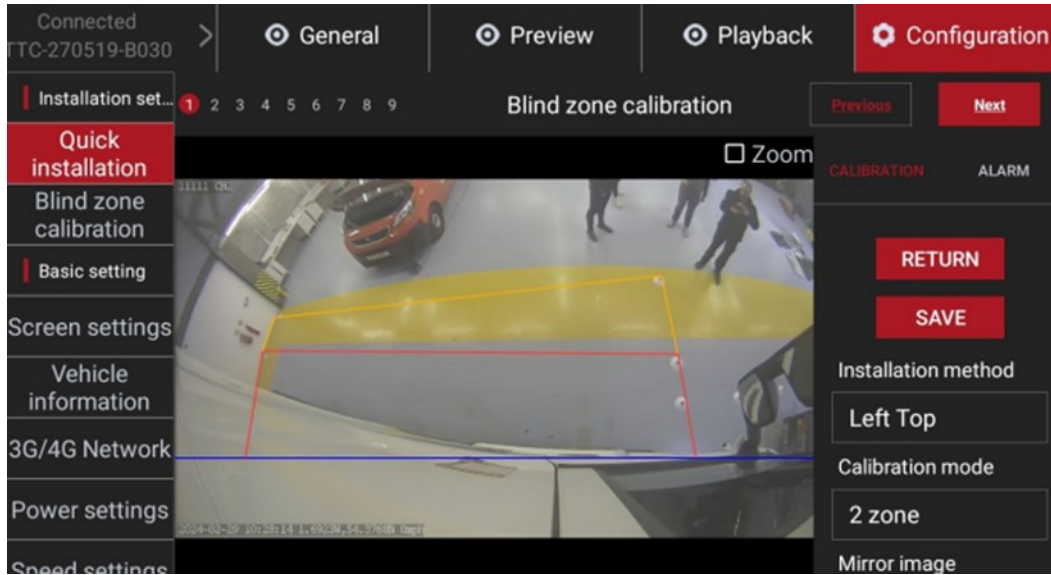


Fig 14 - VIN1 Left

Select “Installation method” on the right of the screen, then select the position of the camera. The left camera (VIN1) will be “Left Top”. The right camera (VIN2) will be “Right Top”.

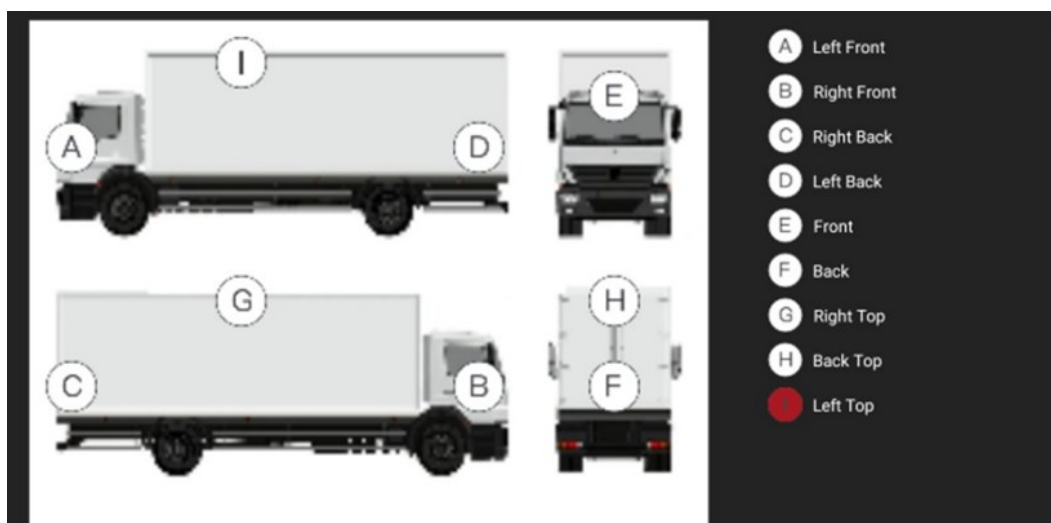


Fig 15 - Camera Position

## TVG Sentinel - App - Zone Calibration

Now use your finger (or the stylus) to move and size the zones.

Firstly set the blue baseline to the edge of the vehicle body, then adjust the red zone to the distance from the vehicle you wish the system to trigger. Anyone within this zone will be deemed as too close and will trigger the alerts. People in the yellow zone will still be shown on the monitor but no alerts will be triggered.

Note - The image may look like the edge of the camera image is in the end of the vehicle. This is not the case. You must use the cones marked out on the floor to set the zones or you could end up setting the zone too far away from the vehicle.



Fig 16 - Setting the zone dimensions

For reference the zones in fig 5 (pg 11) are set to our recommended dimensions of:

- **Red Zone** - 1m out from the vehicle, and 9m along the length.
- **Yellow Zone** - 2.2m out from the vehicle, and 9m along the length.

Once you have set the zones for the left (VIN1) camera, click “Save and Return” before calibrating the right (VIN2) camera in the same way.

Note: You will need to take a screenshot of each zone (as per fig 5) as these are required when commissioning the vehicle.

## TVG Sentinel - App - Configuration

To set the alert recording time select the Active safety alarm option from the Configuration menu. If this option is not available you must update the firmware to the latest version detailed on pages 11 - 13.

The Alarm Record Video option can be set from 3 to 20 seconds. By default this is set to 10 seconds. For Sentinel this must be set to 20 seconds.

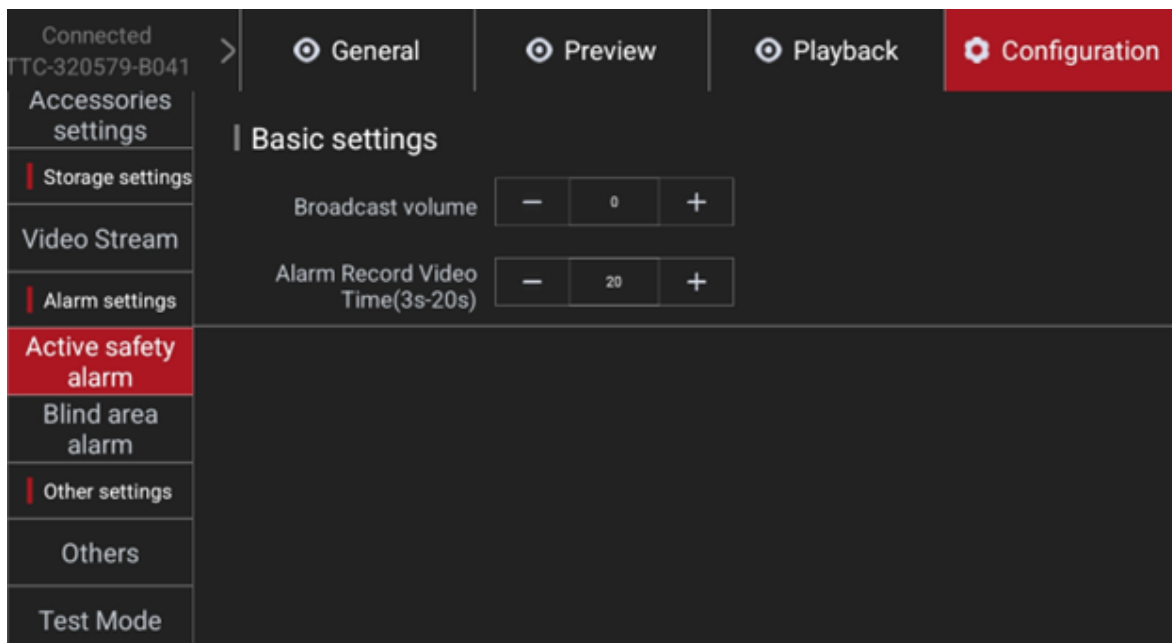


Fig 17 - Alarm Record Video

## TVG Sentinel - App - Configuration

Next from the Configuration page, select the “Blind area” option. Scroll down the screen and ensure all the settings below are correct for both VIN1 and VIN2.

- VIN1 & VIN2 - Mix model 2
- Vehicle type - Logis-Truck
- Trigger speed (VIN1) - Minimum speed:20;maximum speed:20
- Trigger speed (VIN2) - Minimum speed:10;maximum speed:10

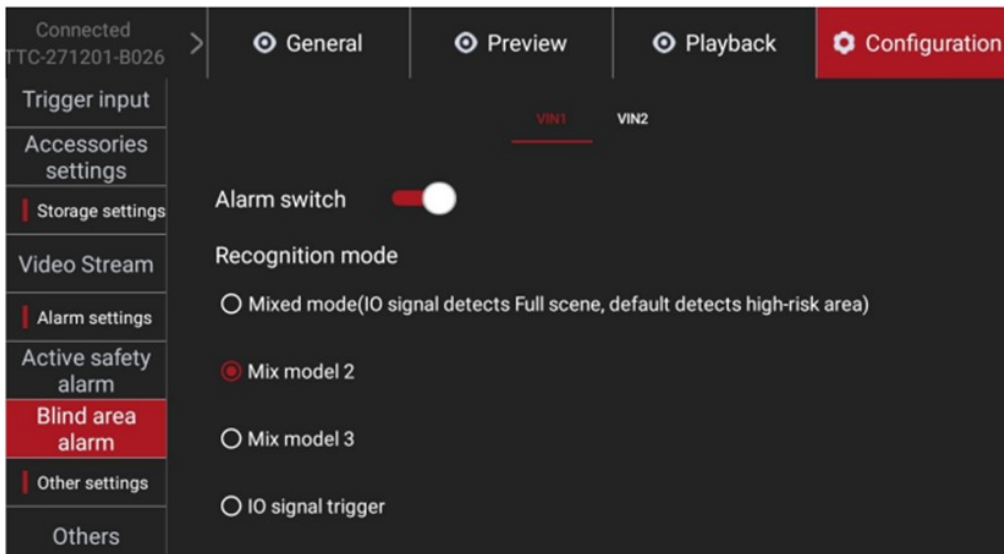


Fig 18 - Mix model

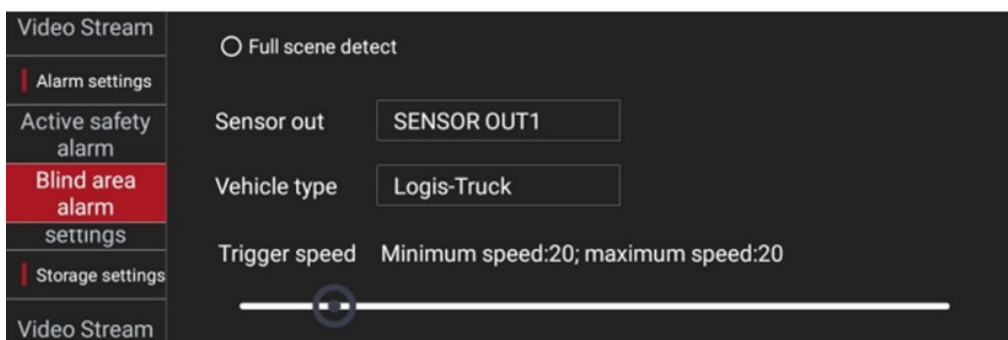


Fig 19 - Trigger speed

Important - To save and changes, scroll to he bottom of the screen and click the “Settings” button.

## TVG Sentinel - App - Screensaver

Next from the Configuration page, select the “Other settings” option. Set the two BSD switches as below.

- BSD calibration function switch - Off
- BSD detection function switch - On

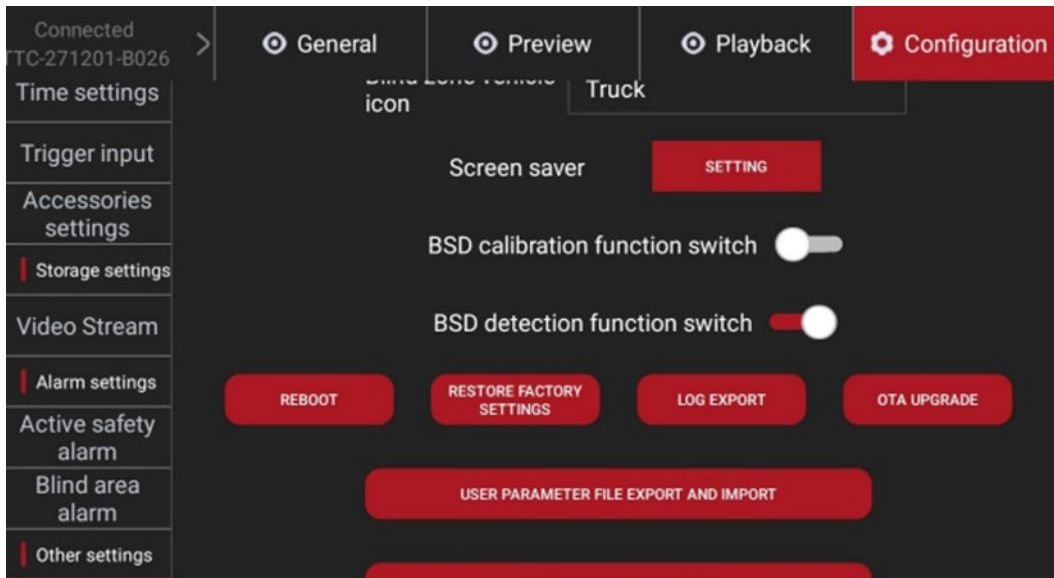


Fig 20 - BSD settings

## TVG Sentinel - App - Screensaver

Finally the screensaver needs to be switched off.

From the Configuration page, select “Other settings”, then “Screen Saver Setting”.

Input the password “222222” and click confirm to display the screen saver page. Ensure the settings are the same as below, then select Confirm.

- Screen saver on - Off
- Opening time of it - 0001 to 2359

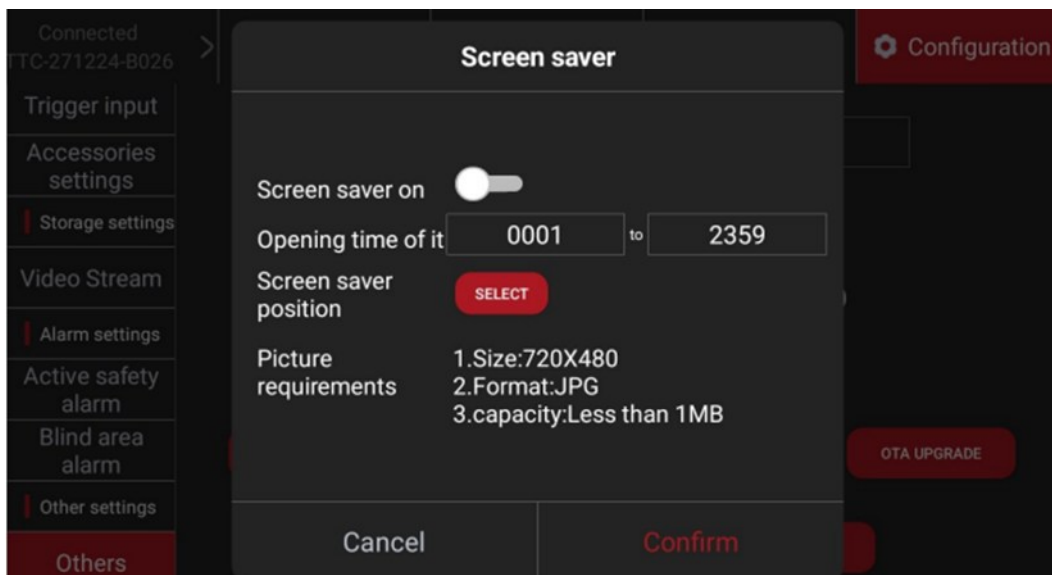


Fig 21 - Screen saver

## Footage Retrieval

To retrieve footage saved on the micro SD card you should follow the process below.

1. Retrieve the micro SD card from the AI control unit. The SD card location is show on page 9 of this document.
2. Insert the micro SD card into your computer (you may need to use a suitable card reader) and open the correct drive.
3. When you have the drive open you will see a group of folders like the image below, select the “alarm\_encode\_video” folder.

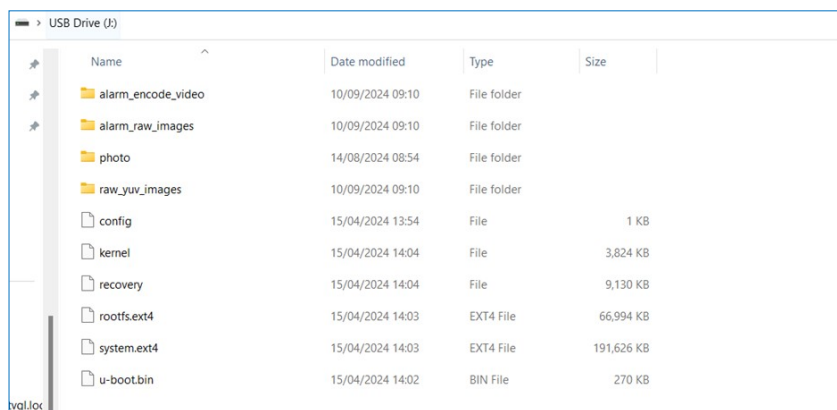


Fig 22 - USB Drive

4. With this folder you will find multiple folders. Using the “Date modified” column navigate to the folder with the date you need and open the folder.

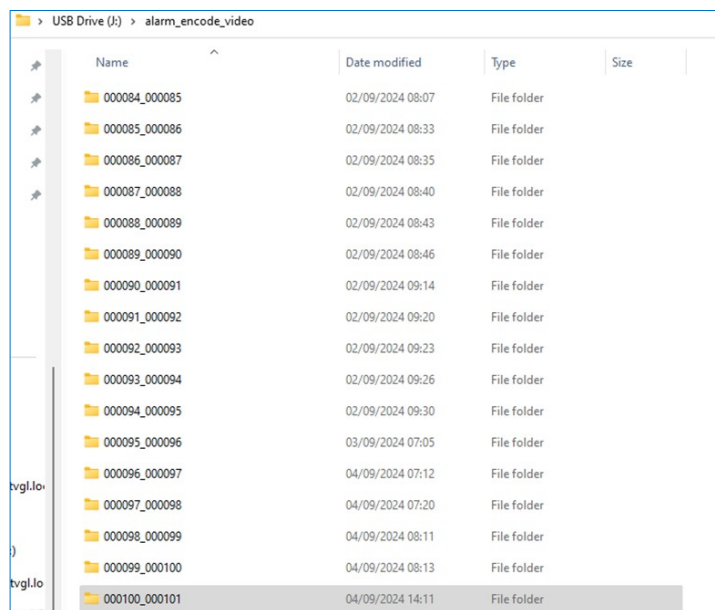


Fig 23 - Alarm Encode Video

## Footage Retrieval

- Once you have open the folder you will see all of the alert video clips from that date.

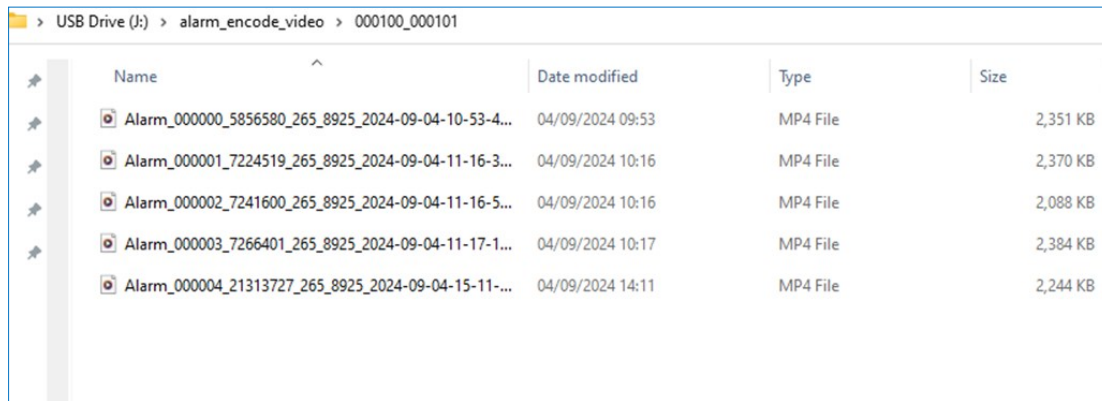


Fig 24 - Video Files

- The video clip will show 20 seconds of the recorded alert.

## About Us

The Vehicle Group Limited (TVG) is a leading manufacturer of high quality safety and security systems for commercial vehicles. Our facility in North Yorkshire, where we have circa 100 employees, is home to our design, manufacturing, engineering, and service centre. We are especially proud of our market leading, British engineered and manufactured CCTV solution Oculux®, which is used Worldwide.

Our technology's include:

- Oculux® Cameras.
- Automotive CCTV.
- CANbus Readers.
- Commercial Vehicle Announcement System (CVAS).
- Vehicle Solar Systems.
- Cable Harness Design & Manufacture.
- Electronic Design & Manufacture.
- Systems Development.

## Useful Contacts

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