

AI Pedestrian Detection Camera

Installation and Programming Manual

SHB-20XXOT Series



AI Pedestrian Detection Camera

Installation and Programming Manual

Disclaimer

Stortech Electronics does its best to ensure the integrity and accuracy of the contents in this document and cannot guarantee this. The outcome of using this document shall be entirely the user's own responsibility. Stortech Electronics reserves the right to change the contents of this document without prior notice.

- Design and specifications are subject to change without prior notice.
- The default login is Admin, there is no password set when logging in for the first time. It is important that a password is then created.
- It is the responsibility of the user to ensure the security and management of the password.

Important Safety Instructions

1. Read, keep, and follow these instructions.
2. Only use the power supplies that are recommended in the manual, failure to do so could result in damaging the product.
3. When cleaning the product's surface use a soft, dry cloth or a damp cloth. Do not use detergent or products that contain alcohol, solvents or surfactants or oil constituents, they may damage the product. Especially the viewing bubble/window)
4. Do not use excessive force when installing the product, the camera may be damaged and fail to work. If the warranty seal is damaged, the warrantee will be void.
5. Install or uninstall the product as described in the manual, failure to do so may damage the product, affect the functions and performance that could invalidate the warrantee.
6. Install the product by referring to "Installation & connection" in the user manual.

Operating Precautions

1. The working voltage of the camera is 10 ~ 32V DC. The camera will stop working if the voltage drops below 7V DC. An incorrect voltage may cause the device to be damaged.
2. Make sure all the cables are connected correctly, including polarity. If the unit is not going to be used, please disconnect the cables.

Warning!



1. High voltage is present within the device. The opening of the case should be by professionals.
2. Do not rely too much on this device while driving.

Special Notice!

Do not try to repair the device yourself. In the event of a problem, turn off the device and notify the System Integrator, or qualified engineer. Any disassembly or modification may lead to damage and void the warrantee.

Maintenance

- Disconnect all cable connections from the device before cleaning.
- Clean with a slightly damp soft cloth and a mild household detergent.
- Never use a strong solvent, such as a thinner. This may cause damage to the finish of the device.

	Caution	
	Risk of electric shock Do not open	
Caution: to reduce the risk of electric shock, Do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.		



This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure. That may be of sufficient magnitude to constitute a risk of an electric shock to a person.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature associated with the device.



This symbol is intended to alert the user not to dispose of electrical and electronic equipment.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your warranty and necessitate expensive repairs.

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Overview

Product Features

- 3 x Options, vertical side view camera, narrow angle horizontal view camera and wide-angle horizontal view camera.
- Artificial Intelligence used to detect pedestrians in a region of interest.
- External Wi-Fi communications and LAN connection for device calibration and setup.
- Max. 2megapixel (1920 x 1080) resolution @ 25ips
- 2.3mm & 6mm lens options
- Detection range 0.5 ~ 20m (6mm) / 0.5 ~ 12m (2.3mm)
- Warning acoustic signal output
- Metal /Black
- IP69K

Packaging List

- Camera x 1
- Instruction manual x 1 (Via QR Code)
- Hex-key x 1
- Video output cable. Options
 - Without alarm signal cable
 - With alarm signal cable

Optional

- External extension cable, 8 pin mini din male to 8 Pin mini din female.
 - With alarm signal cable or
 - Without alarm signal cable
 - External WOFi module (reusable)
 - Note: Wi-Fi module comes with USB converter cable.
 - AHD Monitor

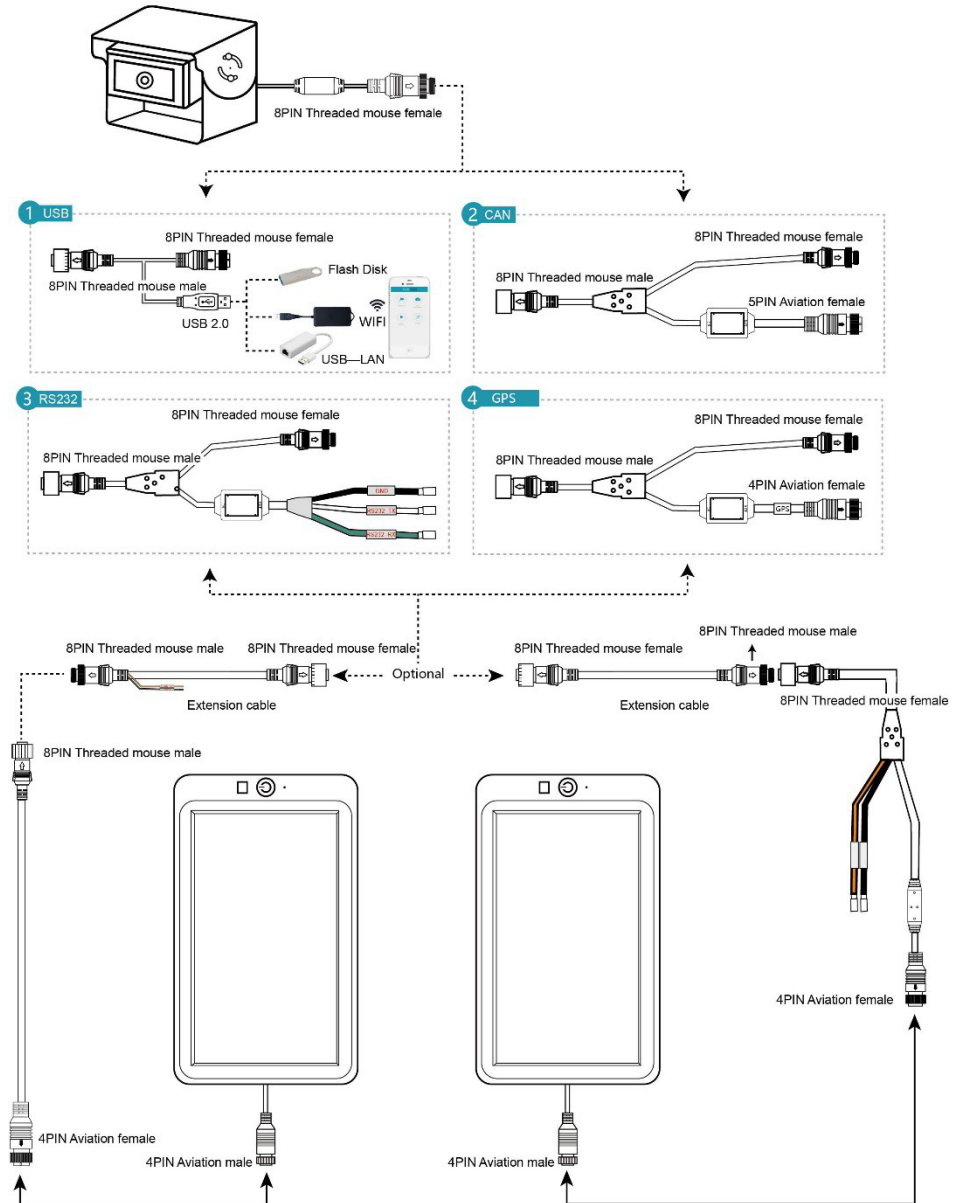
Installation

System Connection

The connection options for the pedestrian detection system are shown Right. The monitor can be used to power the camera and display the real-time images.

Options:

1. **USB cable:** The USB interface can be connected with the Wi-Fi module (for calibration and setting), a USB dick (for device upgrading), or USB LAN converter (to get access to the webpage setting and RTSP stream by a network cable).
2. **CAN cable:** Support CAN communication protocol.
3. **RS-232 cable:** Support communication protocol and can connect with an external buzzer.
4. **GPS cable:** Support an external GPS module.

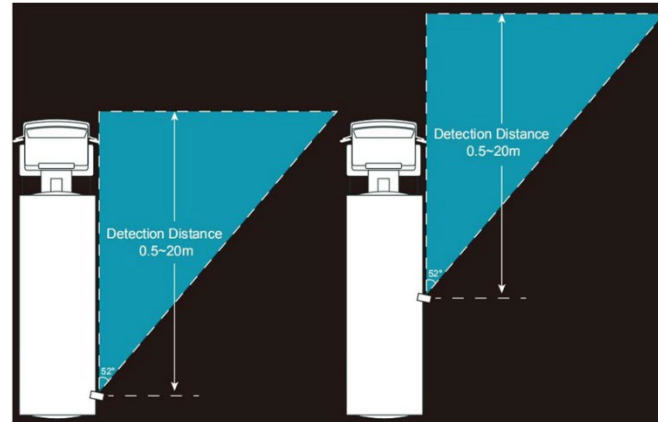


Camera Positioning

Locate and fix the camera to the position of the vehicle once the monitor displays the Field-of-View (FoV) required by the driver. It is recommended that the camera's mounting height be between 1.0 ~ 1.6m.

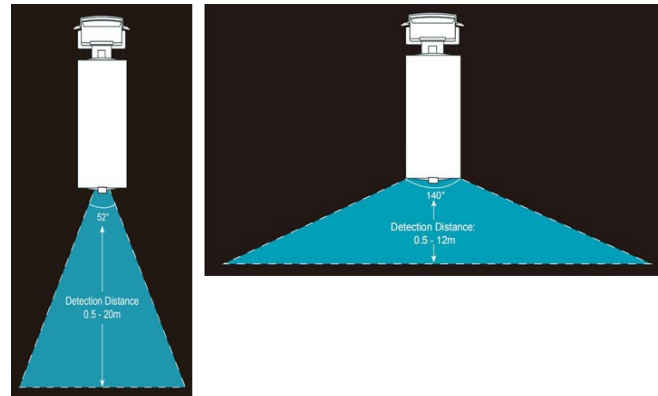
1. Vertical side-view camera

- As shown Right, the side-view camera can be installed on the side of the vehicle.
- The horizontal viewing angle of the camera is 52° and the detection distance up to 20m.



2. Horizontal view camera

- The horizontal viewing cameras can be mounted on the front or rear of the vehicle as shown Right.
- The horizontal viewing angle of the narrow angle (6mm) camera is 52° and the detection distance up to 20m.
- The horizontal viewing angle of the wide-angle (2.3mm) camera is 140° and the detection distance up to 12m.



Boot Screen Description

1. Vertical side-view camera

- After the camera has powered up, the image displayed on the monitor will appear as show Right. There are:
 - 3- vertical Detection Zones, shaded in either red, yellow, and green.
 - Coloured vertical outlines that identify the Target Frame.
 - Each with a 1 ~ 1,000 confidence level (person or not).
 - The Wi-Fi SSID (Service Set identifier).

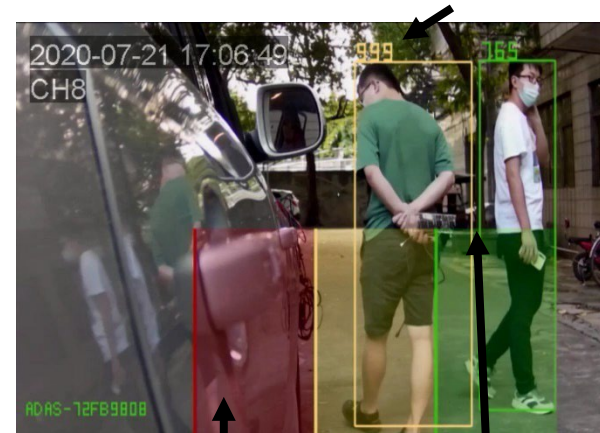
2. Horizontal view camera

- After the camera has powered up, the image displayed on the monitor will appear as show Right. There are:
 - 3- horizontal Detection Zones, shaded in either red, yellow, and green.
 - Coloured horizontal outlines that identify the Target Frame.
 - Each with a 1 ~ 1,000 confidence level (person or not).
 - The Wi-Fi SSID (Service Set identifier).

Note:

1. The Wi-Fi name and version number on power up will display in the lower left corner in a blue font. After about 10 sec. the version number will disappear, and the Wi-Fi name turns from a blue font to a green one. If there is no Wi-Fi module connected, the green Wi-Fi SSID will also disappear.
2. The Detection Zones, Target Frames and Confidence level display can be turned On/Off via the Web Settings.

Confidence Display



Detection Zone

Target Frames

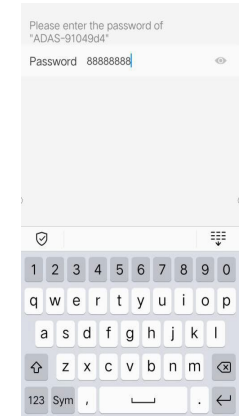
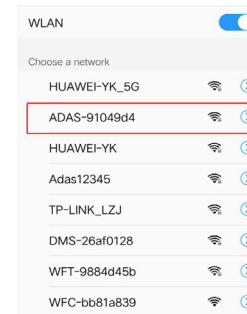


Wi-Fi SSID

Wi-Fi Connection

1. Locate the Wi-Fi SSID corresponding to the device through your smart mobile phone.

- Confirm that the Wi-Fi module is connected, and the green Wi-Fi SSID is displayed in the lower left corner of the monitor's screen.
- Connect using the default Wi-Fi password "88888888" as seen Right.



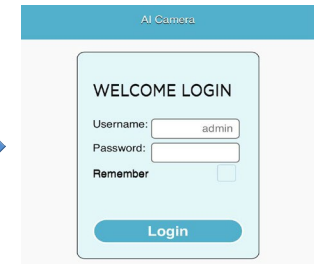
2. On connecting for the first time to the Wi-Fi hotspot, you may see a prompt message "CONNECT". Click this button to confirm a valid connection.



3. Enter the URL <http://192.168.60.1> in the Smart Mobile's web browser, (or scan the QR code Right).

- The browser will display the main menu as follows and see the "Preview" screen after clicking the "Login" display.
 1. The password is blank by default.
- Please note the effective Wi-Fi communication distancer is up to 7m.

4. Once connected, the camera can be calibrated. Including, the pedestrian detection alarm system or other operation settings.



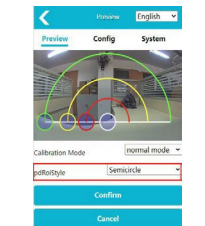
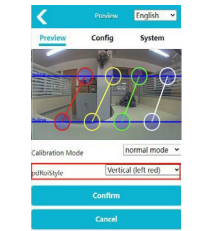
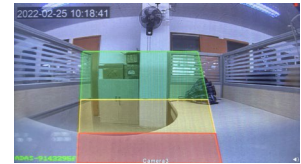
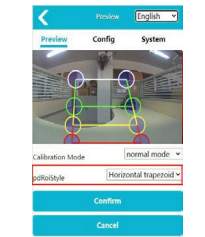
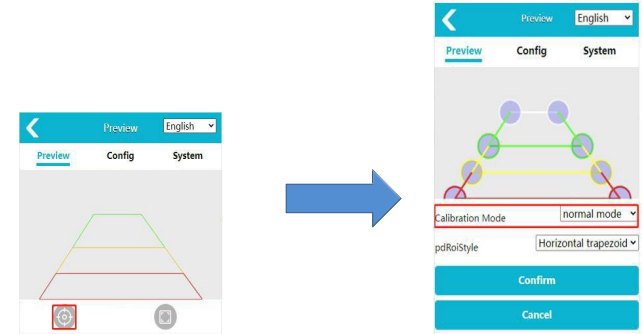
Calibrating the Detection Zone

1. Calibrating "Normal Mode"



- Click the Calibration button on the webpage and choose "normal mode". The area displayed on the phone's screen corresponds to the "Detection Zone" on the monitor.
- "pdRoiStyle" has 4-types of ROI options.
 1. Horizontal trapezoid.
 2. Vertical (red frame on left)
 3. Vertical (red frame on right)
 4. Semicircle
- After choosing the ROI style, manually modify the ROI area by dragging the line segments or points into position.
- Click the "Confirm" button and the calibration will take effect immediately as will the "Detection Zone" displayed on the monitor.

Connect using the default Wi-Fi password "88888888" as seen Right.



1. Vertical ROI

- "pdRoiStyle" is "Vertical (red left)" or "Vertical (red right)"

2. Horizontal trapezoid ROI

- "pdRoiStyle" is "Horizontal trapezoid".

3. Semicircle ROI

- "pdRoiStyle" is "Semicircle".

Calibrating Ranging Model

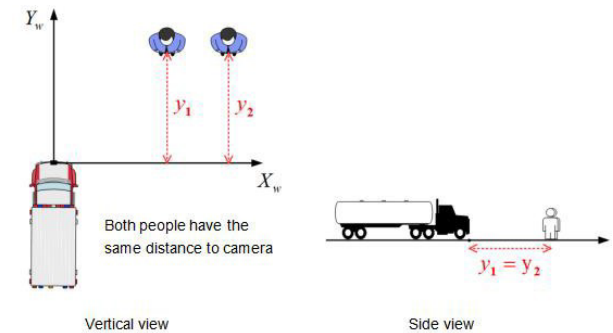
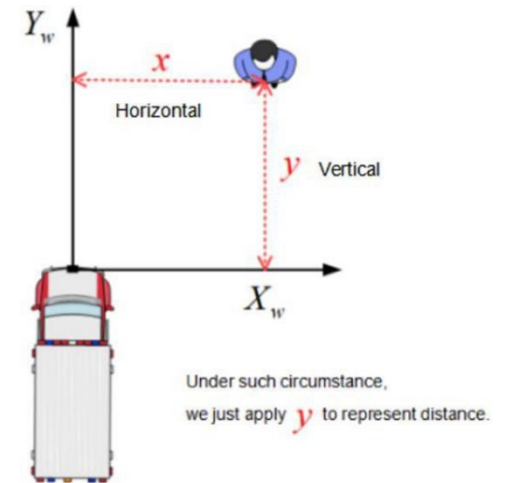
1. Two-dimensional code placement (QR code mats)

- Place 1 – QR code mat in each of the bottom left and right corners as show Right.



2. Distance measurement

- Set up a Cartesian coordinate system on the ground, representing the position of a person by coordinates and y represents the ranging results.



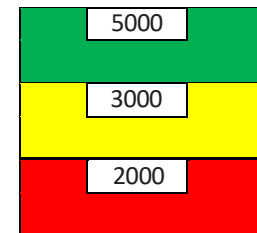
3. Operating Procedures



- Click the Calibration button on the webpage and choose “normal mode”. This ROI type uses the horizontal trapezoid.
- The first time the camera is calibrated using the 2-dimensional code, a prompt box will appear to remind you to calibrate the code.
- When calibrating the 2-dimensional code, two the 2-dimensional code calibration mats need to be placed to ensure that the camera can fully see them.
- Using the mouse drag the 2-rectangular frames on the WEBUI so that they completely cover the 2 x QR codes and click “Submit Calibration Board”. After the QR codes have been successfully calibrated the ROI area will be reconfigured to the default value and the distance will be automatically filled in to the red, yellow, and green areas shown Right.
- Modify the red, yellow, and green area values and click “Enter/Confirm”.
 - Red, yellow, and green area instructions:
 - In the Vertical direction, the green area shows the distance between the front green edge and the camera in mm. The yellow area shows the distance between the front yellow edge and the camera in mm. And the red area shows the distance between the front red edge and the camera in mm.
 - In the Horizontal direction, distance represents the distance (mm) from the left and right edges of each colour ROI region to the camera.
 - Click “Confirm” to save and exit the calibration setting.
 - In “**Measure Mode**”, the pedestrian detection frame will overlay the distance between the camera position and X/Y wheelbase. The CAN data transmission will be converted into XY wheelbase distance (M) of the detected pedestrian.



Rectangle frame dragging diagram.



Pedestrian Detection Functions

After the device powers up or reboots, a real-time video image will be displayed automatically. The device will enter the pedestrian detection mode. (only if the device has been set up and the pedestrian detection alarm system being calibrated.)

Function Description: When a pedestrian appears in the “Detection Zone”, the display will frame them with the corresponding colour green, yellow, or red. And a “Beeping” audible alarm sound with increased urgency (colour dependant) until the pedestrian exits the zones.

Note: The Vertical side-view and Horizontal view cameras have the same function. The images Right explain this in a graphical way.

1. **The Red Box Alarm** – When a pedestrian has been detected and a red box generated, it means that a pedestrian has entered the red Detection Zone area. The output alarm “ding, ding, ding” is sounded in a rapid frequency.

2. **The Yellow Box Alarm** - When a pedestrian has been detected and a yellow box generated, it means that a pedestrian has entered the yellow Detection Zone area. The output alarm “ding, ding” is sounded in a moderate frequency.

3. **The Green Box Alarm** - When a pedestrian has been detected and a green box generated, it means that a pedestrian has entered the green Detection Zone area. The output alarm a single continuous “ding” is sounded.

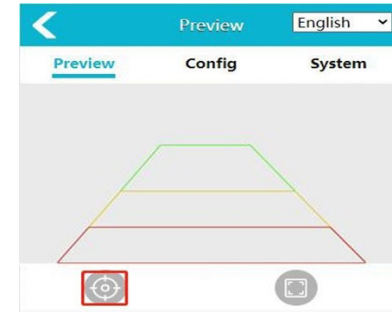
Note: If there are multiple boxes triggered, the priority sound alarm is the Red box (highest), Yellow box, (second highest), Green box (Lowest)



Functions of the Web Page & System Upgrade

1. Calibration

- a. See Calibration the Detection Zone chapter page 10

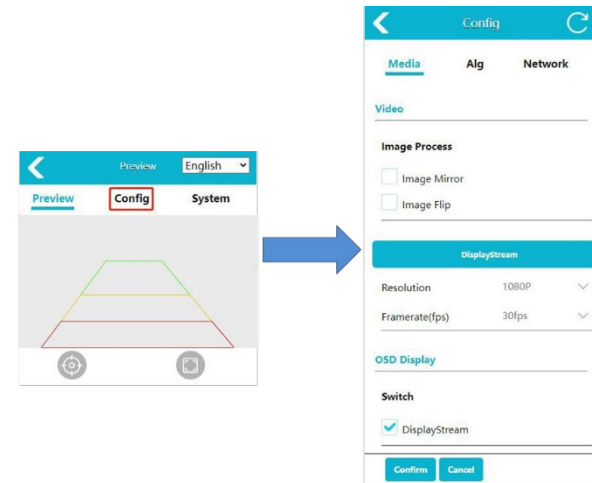


2. System Setting

Click "Config" button to enter the parameter setup interface. Shown Right

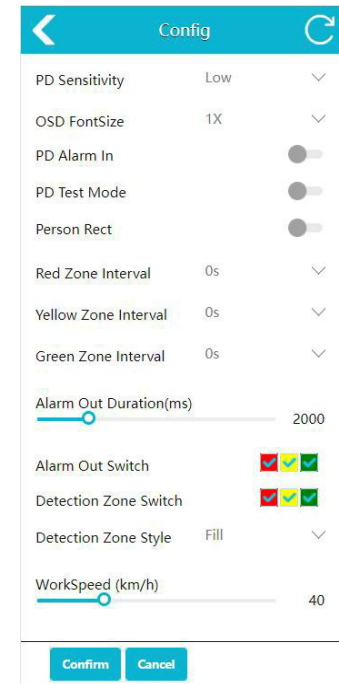
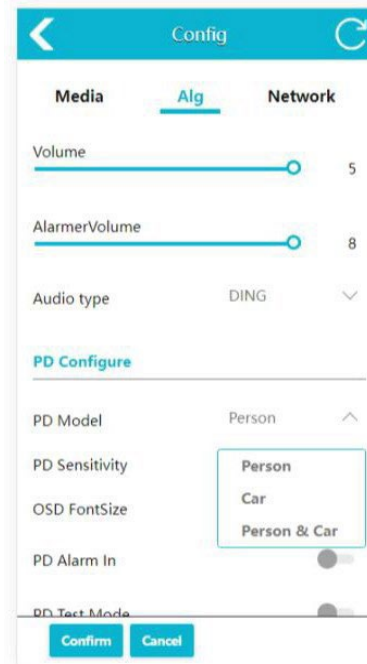
a. Media Config

Image Mirror	Switch control whether image mirror is enabled
Image Flip	Switch control whether image flip is enabled
Display Stream	Set the parameters of mainstream/sub-stream//pic-stream/display format.
OSD Display	OSD switch controls whether pic stream is enabled, or time/passage is displayed.



b. Algorithm Config

Volume	Set the alarm volume level between 0 ~ 5. The default level is 5(max.). Level 0 means no sound.
External Alarm Volume	Set audible and visual alarm volume. The default value is 8.
Audio type	Switch to 1 of 6 alarm sound tones. The default sounds 'Ding'.
PD Model	Set the algorithm model. Person : only detect pedestrians; Car : only detect vehicle: bus, car, truck, most type on road; Person & Car : detect both vehicles and pedestrians.
PD Sensitivity	The higher, the quicker the detection; the lower, the slower the detection (chances of missing detections).
OSD Font Size	Close 'Confidence' and adjust the font size.
PD Alarm In	Pedestrian detection trigger input. When enabled, the pedestrian detection algorithm will be enabled only when the multi-functional CAN wire or device with alarm input is connected, and the alarm in provides 12V voltage.
PD Test Mode	After turning on, when a pedestrian is detected outside a specific area, it will display within a blue box, and the 'Confidence' of the detected pedestrian will display.
Person Rectangle	Select whether to display pedestrian rectangle after detecting pedestrians.
Zone Interval	Set the lowest pedestrian interval between each ROI area alarm, alarm does not sound during the interval.
Alarm Out Duration	Set the duration of trigger line output. High-level after pedestrian is detected in the detection area, which is 2-Sec by default . When no additional pedestrians are detected, the high-level drops to a low-level after the 2-Sec.
Alarm Out Switch	Select whether the trigger line outputs high-level after the pedestrian is detected in the red / yellow / Green corresponding detection area.
Detection Zone Switch	Switches control whether the detection areas corresponding to Red/Yellow/Green are displayed. When you click to turn off, the detection area will not be displayed, and pedestrian detection will not be performed. It takes effect immediately once set.
Detection Zone Style	Fill background colour of Detection Zone and select colour of Box Line. Or select Hide, to disable the background colour display.
Work Speed	After the external GPS is connected, the algorithm will be activated when the driving speed is lower than the working speed.



c. Network Config

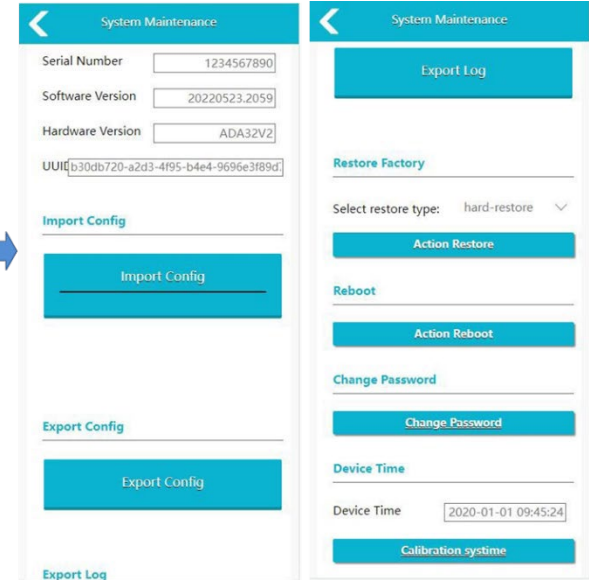
The device IP Address, Sub-net mask, gateway and other parameters can be manually set. When connected to the device through a network cable. Input <http://IP> to access the web page. This is equivalent to Section **XXX**. You can also connect RTSP streams over IP.

The screenshot shows a mobile application interface for configuring network settings. At the top, there is a blue header bar with a back arrow on the left, the word "Config" in the center, and a refresh icon on the right. Below the header, there are three tabs: "Media", "Alg", and "Network", with "Network" being the active tab. Under the "Network" tab, the word "Ethernet" is displayed in blue. Below this, there is a checkbox for "DHCP" which is currently unchecked. There are three input fields: "IP" with the value "192.168.66.126", "Subnet Mask" with the value "255.255.255.0", and "Gateway" with the value "192.168.66.1". At the bottom of the screen, there are two buttons: "Confirm" and "Cancel".

3. System Function

Click “System” button to enter the System page. This will display the Serial Number, Software version, Hardware version and UUID.

Import Config	Import configuration files. The imported configuration file must be a compressed package containing (config.xml, config_bak1.xml, config_bak2.xml).
Export Config	Export the device configuration file.
Export Log	Export device log files.
Restore Factory	Restore the device to factory settings and all parameters are restored to default values.
Reboot	Restart the device.
Change Password	Modify the device login Password.
Device Time	Manually synchronize device time.



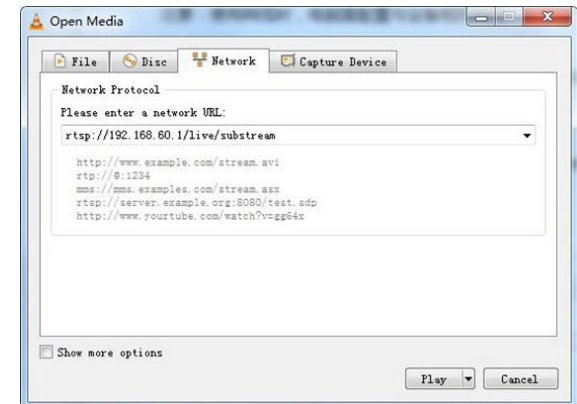
4. Protocol

The device currently supports 2-types if protocol RTSP & ONVIF

Note: When using the network cable, the computer needs to be configured in the same IP address range.

a. RTSP

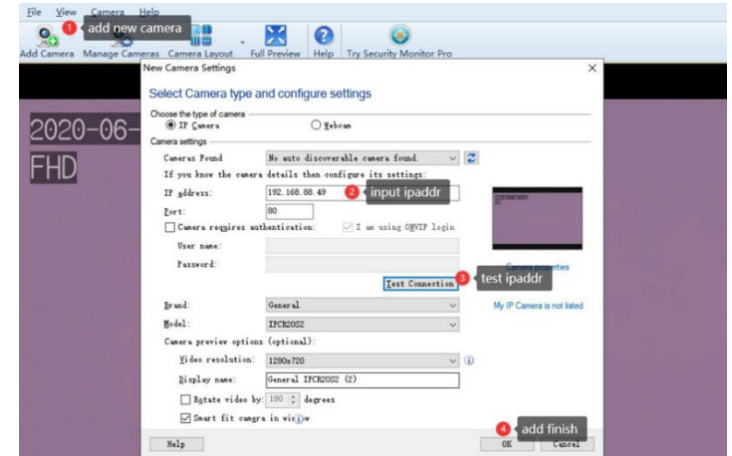
Use a video software to open the RTSP stream, such as VLC. Connect a network cable to the USB LAN Adapter. Open VLC, click “Media → Open Network Streaming → RTSP://IP/libe/mainstream (rtsp://192.168.60.1/live/mainstream if connected with the device’s Wi-Fi) → click “Play”.



a. ONVIF

Use an IP camera Viewer or other software that supports ONVIF protocol. The next actions are determined by the IP camera Viewer.

Make sure that the network is connected, follow the steps such as: "Add New camera" → "Input IP Address" → "test IP Address" → "Ok". Note Port number is set to Port 80 by default.



5. Protocol

The device can be upgraded via a "Flash Disk".

- Format the disk as a Fat32 file system.
- Place the upgrade package named "ADA32V2_upgrade_XXXXXXXX.XXXX.bin" on the flash disk, connect the flash disk to the device, restart the device, and wait for a few minutes to complete the upgrade. If you want to realize batch upgrade without automatically deleting the upgrade package after upgrade, you can rename the update report as
- "ADA32V2_upgrade_fixed_XXXXXXXX.XXXX_bin".
- After the upgrade, the software version number of the device will also change synchronously. Check
- the version number in the lower left corner of the monitor when the device is turned on. Or view the version number in the "System"->"Software Version" on the web page.

SNB-20XXOT**VIDEO**

Imaging Device	1/2.9" Colour CMOS Sensor
Resolution	2MP AHD
Min. Illumination	Colour: 0.01 Lux @ F1.2 / Monochrome 0.0Lux
Video Output	1 V pk-pk 75Ω (AHD)
Frame Rate	25fps (PAL)/30fps (NTSC)
Gain	Auto
White Balance	Auto
BLC	Yes
Wide Dynamic Range	120db
S/N Ratio	>50db (AGC off)

LENS

Focal Length	2.3mm & 6mm Options
Angular Field of View	2.3mm: 140(H) / 6mm: 52°(H)
Lens / Mount Type	Fixed iris / Board-in type

Alarm Settings

Audible alarm	Output, external speaker supported, 6 optional tones Level 0 - 5
Audible volume	1 external output, selectable 2Sec default
Alarm Output	Pedestrian & Cyclist
Detection	0.5 – 20m adjustable (V) / 0.5 – 12m (S & L)
Detection range	Adjustable colour zones (image overlay, red, yellow, green)
Detection Zones	Output, external speaker supported, 6 optional tones
Audible alarm	Level 0 - 5

NETWORK – Via Wi-Fi / Network cable adapter

IP Address	Web UI: 192.168.60.1:8080 / 192.168.66.126 IP Address
Supported Protocols	ONVIF RTSP / rtsp://IP/live/mainstream (rtsp://192.168.60.1/live/mainstream if connect with device's Wi-Fi)
Port No	8080, 80

ENVIRONMENTAL

Operating Temp /Hum	-20°C ~ +70°C /10-95% RH
Storage Temp	-30°C ~ +80°C
Ingress Protection / Vandal Resistance	IP69K / IK10

ELECTRICAL

Power	10 ~32V DC
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MECHANICAL

Colour / Material	Black / Metal
Dimensions (WxH)	97.5 x 67.3 x 66.5mm (Vertical camera), 97.5 x 75.3 x 72mm (Horizontal Cameras)
Weight	355g (Vertical camera), 470g (Horizontal Cameras)

PROBLEM	SOLUTION
No picture, no sound	Improper connection of automobile adapter. The power supply of the device is wrong, check whether the power indicator is normal. The volume is set "0 " by mobile phone.
Can not login the web page	Confirm that the external Wi-Fi module is connected to the USB interface. Choose "CONNECT" when popping out dialog box of confirming the current Wi-Fi is unavailable. Confirm whether it is connected to the Wi-Fi successfully.
Upgrade failure	Remove the extension cable connection and upgrade again.



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