4 Channel DVR
Black Box Recorder with WiFi

DV456

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1 Specifications

4CH HD DVR		
System	Operating system	Linux
	Operating interface	Graphical menu operation interface (OSD)
	Video permission	Administrator & user setting
Video	Video input	4 x 1080P analog high definition PAL cameras
	CVBS output	1CH 6pin aviation connector output PAL
	Video display mode	Single/Split/Triple/Quad
	Video standard	PAL: 25fps
	Compression	H.264 main profile
Audio	Audio input	4 channels
	Audio output	2 channels
	Record format	Synchronized video & audio recording
	Audio compression	ADPCM
Digital processing & storage	Image resolution	Max 4 x 1080P(1920 x 1080)
	Video bit rate	64kbps~4Mbps/channel
	Storage	56~1800MB/(channel/hour)
	Audio bit rate	32kbps
	Storage	SD card x 1, SSD x 1
Alarm	Alarm input	6 channels
	Alarm output	2 channels, 1 buzzer
	Motion detection	High/Low/Off sensitivity adjustable
Interface for communication	IR	1 channel
	USB2.0	1 channel
Wireless	2G / 3G / 4G	Only for LTE Models
	Wi-Fi	Optional
	Wi-Fi hotspot / AP	Optional

GPS	Optional	
G-Sensor /Gyroscope	3 axis sensor	Available
Software	Windows client	Available
	IOS client	Not available
	Web portal	Available
Power	Input	10~32V
	Output	12V@4A
	Max power consumption	48W
	Standby power consumption	100mW
Electrical	Operating temp. / humidity	-20℃ ~ +70℃ / <80%
	Super capacitor	Available
	Clock	Built-in clock, Calendar
	Algorithm	DMS/ADAS/BSD/AVM
Others	IP rating	IP69K
	Anti-vibration rating	MIL-STD-810G

2 Precautions

1）Motion detection function is set to OFF by default. Alarm files will be created When the motion detection is set ON.

2）G-Sensor recording is recommended to set ON during driving for emergency recording use. G-Sensor level is optional.

3）If the device could not boot up, try to remove all storage disks from the device, and then restart it to check whether device or storage disk is not functional, then check if device has power.

4）Yellow wire labelled as BAT+ should be connected to positive battery terminal. Red wire labelled as ACC+ should be connected to vehicle accessories wire. Black GND wire should be connected to the negative battery terminal. Note: Do not connect both yellow and red wires to permanent power as the device will not enter standby mode and will cause undue drain on vehicle battery.

5）All the disks must be formatted on the device before they are put into use.

6）The users' name could not be changed, while the password is editable.

7）All types of video files including event recording files are overwritten by default.

8）The corresponding types of SENSOR-IN1~6 on the trigger line are as follows:

SENSOR -IN1	SENSOR -IN2	SENSOR -IN3	SENSOR -IN4	SENSOR -IN5	SENSOR -IN6
ALARM INPUT 1~4				Reversal Input	Brake Input

9）The disk must be installed appropriately and well connected; otherwise the device will not work properly.

10）GPS antenna, 2G/3G/4G antenna (LTE models only), Wi-Fi antenna must be connected correctly and tighten.

11）If DVR does not have GPS, WIFI and 4G, the time cannot be automatically calibrated, and the difference will be about 10min in a year.

12）If more accurate time is required, user needs to manually perform time calibration.

3 Main Features

Controlled by touch screen.

- All settings and operations could be done through a touch-control monitor or using the remote control.

Video and Audio

- 4 x 1080P video inputs
- 4 x audio inputs
- 2 x audio outputs
- 2 video outputs (1 x CVBS -6pin, 1 x VGA-1080P)

Recording

- 4CH Video & Audio Recorder with image resolution up to 1920 x 1080, G-Sensor data and GPS data.
- Multiple recording modes: power on recording, normal recording, schedule recording and event recording (i.e., G-Sensor recording, Overspeed recording, Motion detection recording, Alarm recording 1~6 and Panic button recording, radar detection alarm recording, inappropriate drivers' action warning recording, driving safety risk recording FCW alarm, DMS detection alarm, Lane departure warning alarm, BSD detection alarm), Cyclic recording and 15 seconds pre-recording are also supported.
- Recording files are stored in the SSD/HDD or SD card.
- Real-time recording of license plate numbers, driving speed, G-Sensor/Gyroscope 3D accelerated speed, longitude and latitude, and GPS tracking.

Preview and Playback

- Support single channel or 4 channels audio and video playing back simultaneously.
- Support searching recording files by dates and recording types.
- Support to control the time during playing back.
- Indicating recording status, alarm status and etc.

Storage Types

- Support 1 x SSD/HDD (2TB) and 1 x SD card (128GB, SDHC, SDXC).
- SSD/HDD is preferred. SD card could be put into use if there is no SSD/HDD connected/detected.
- SD card can be easily removed from DVR.

Backup

- Support USB disk or USB hard disk to back up the recording files.

Network

- Support LAN, Wi-Fi, and 2G / 3G / 4G. (Cellular connectivity only on LTE models)
- LAN, Wi-Fi and 2G / 3G / 4G have the sequence priority of connections. They are automatically switched to save the data once LAN, Wi-Fi or 2G/3G/4G is connected.
- Files are able to be searched/downloaded by CMS Client. (Software available for LTE models with SIM card installed and configured)
- Wi-Fi supports STATION and AP mode. Wi-Fi AP mode enables mobile devices to be connected, and users could use mobile devices to preview and configure conveniently.
- Support remote real-time video streaming and previewing.
- Support automatic uploading of alarm recording files, alarm information, log information and GPS.trajectory, which is convenient to analyze any abnormal conditions of vehicles and track the vehicle.
- Support remote configuration and remote upgrading.
- Support PC Windows Client. Users could remotely monitor vehicles by computers or mobile phones.

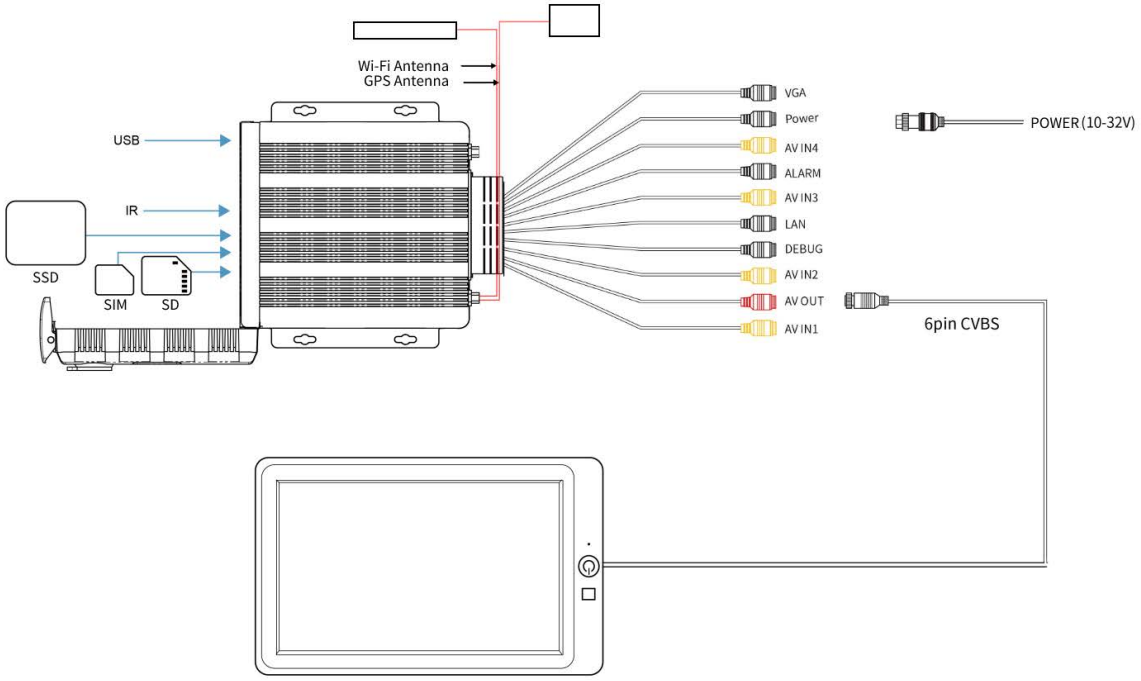
Alarm

- 6 channels of alarm inputs, 1 channel of buzzer output and 2 channels of alarm outputs.
- Overspeed alarm.
- Motion detection alarm.
- G-Sensor alarm.
- Panic button alarm.
- DMS alarm(no driver, fatigue, distraction, phone call, smoke, no mask, no-seatbelt, sunglass).
- ADAS Alarm (Forward collision warning, Pedestrian detection warning, Lane departure warning).
- BSD Alarm.

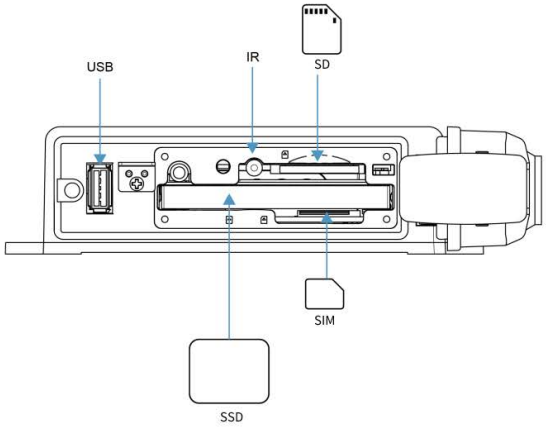
Security

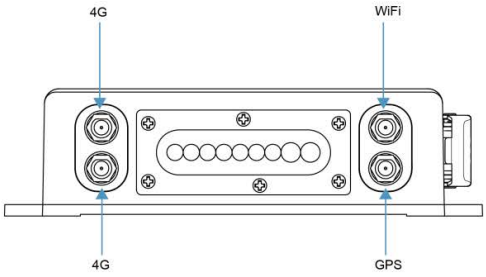
- Users’ password protection. The device could not be accessed without a password.
- Support account management.

4 Wiring Diagram

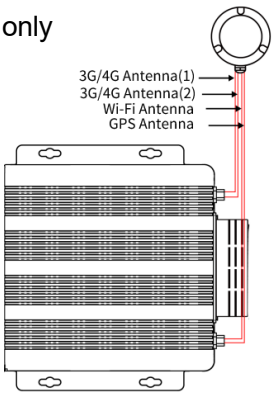


Note:
SIM Card slots and 4G antenna inputs are not active with non LTE models

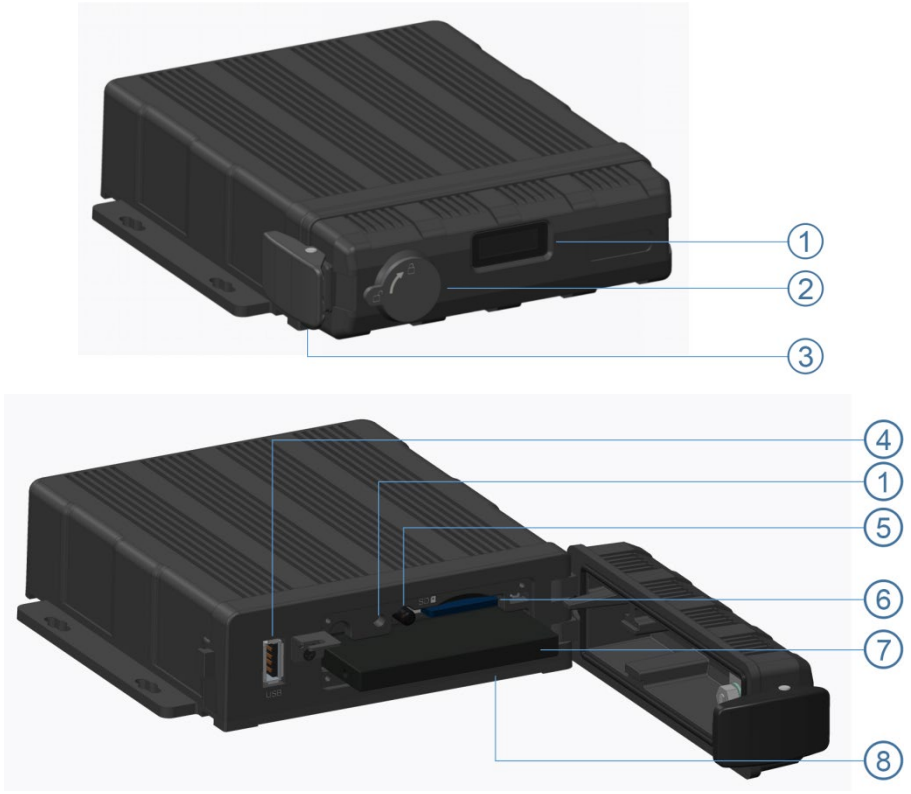




Antenna diagram below for LTE models only



5 Connection - Front Panel



① LED indicator

② Mechanical lock

③ SSD lock cover

④ USB2.0 port

⑤ IR receiver

⑥ SD Card Slot

⑦ SSD Slot

⑧ SIM Card Slot (LTE models)

5.1 Mechanical Lock

- Close the front cover and clip the buckle then lock the device with the key.
- The device will stop recording and the buzzer will beep when the front cover is open, If the front cover is still open or the electronic lock is not closed after 2 minutes, DVR will resume recording.

5.2 LED

- When DVR is working normally, status LED flashes Green /Red.
  When upgrades the DVR firmware, the red light is on and the green light is off.

5.3 Remote Controller

Use the remote controller closer enough to the IR Receiver, otherwise it may not work.

Description	Buttons
Power button disabled - unit is only powered off when vehicle is turned off	POWER
Switch to ch1~4 for single channel display	1~4
Switch to eight-segment display	0
Enter menu	MENU
Move up	Up
Move to left	Left
Enter submenu to set and confirm	ENTER
Not applicable	REC
Move down	Down
Exit	ESC
Move to right	Right
Not applicable	MULTI
Clear input	CLEAR

5.4 SSD/HDD Slot

- 1 x SSD/HDD (Max. 2TB).
- Size: 2.5 inches.

5.5 SD Card Slot

- 1x SD (Max. 256GB).
- Insert, remove the SD card.

Step 1: Use the key to unlock the device and open front cover.

Step 2: Insert SD card to SD card slot.

Step 3: Close the front cover and use the key to lock.

5.6 USB Slot

USB 2.0.

6 Connection - Back Panel

① 2G/3G/4G antenna 1 ③ Wi-Fi antenna

② 2G/3G/4G antenna 2 ④ GPS antenna

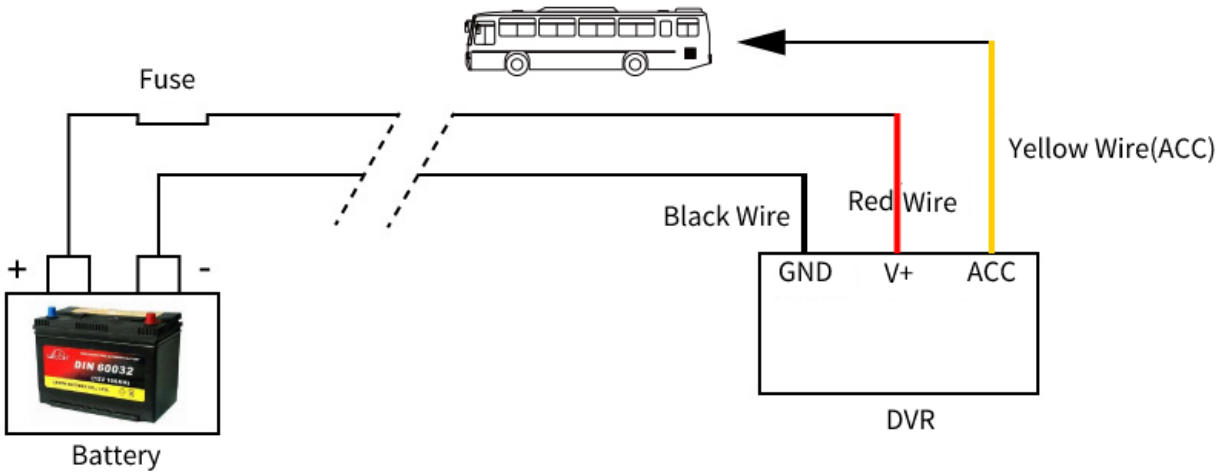
6.1 Power

- Power input

Connect the 9 PIN female to the 9 PIN male on the device.

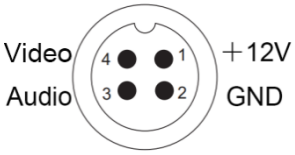
- Connection Method

Connect ignition wire to yellow ACC, battery Positive to V+ (Red wire) and Negative to GND (black wire).



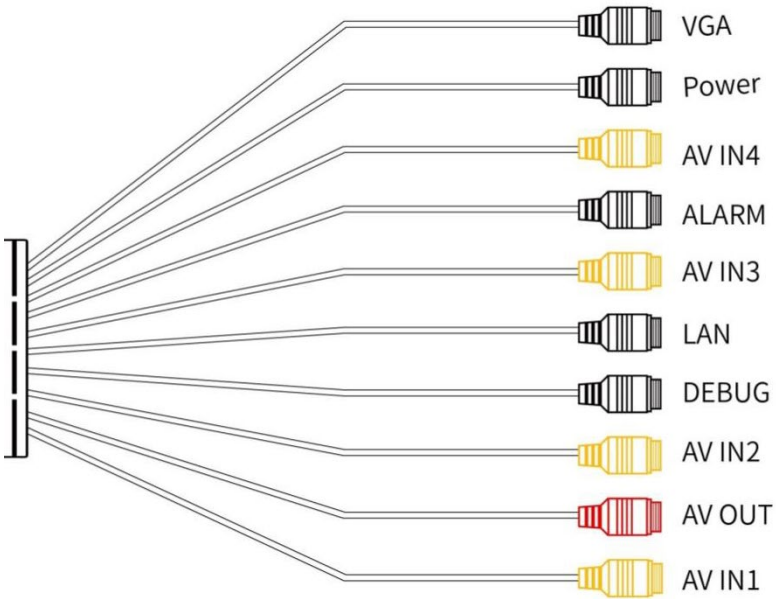
6.2 High Definition Cameras (AVIN 1~4)

- Below is the diagram of camera input (male).



- How To Connect Cameras

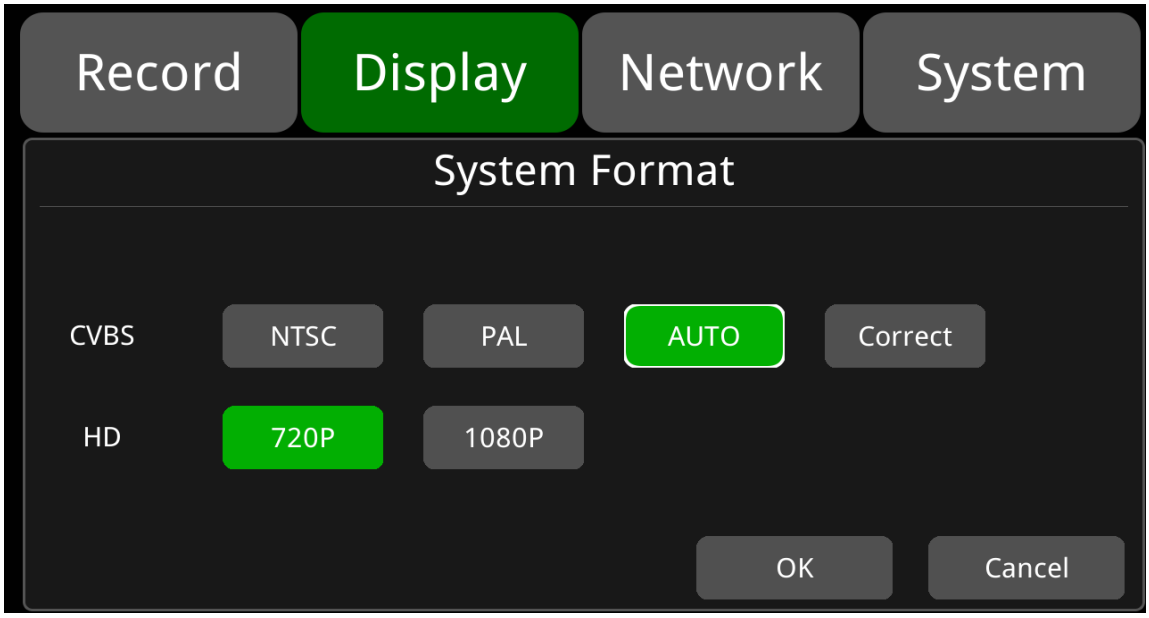
Connect upto 4 cameras into the yellow 4 pin aviation plugs from the rear of the unit.



6.3 LCD Monitor

- High definition monitors are recommended to work with the device as below.

- Output resolution of the LCD monitor can be selected. Settings are as follows.



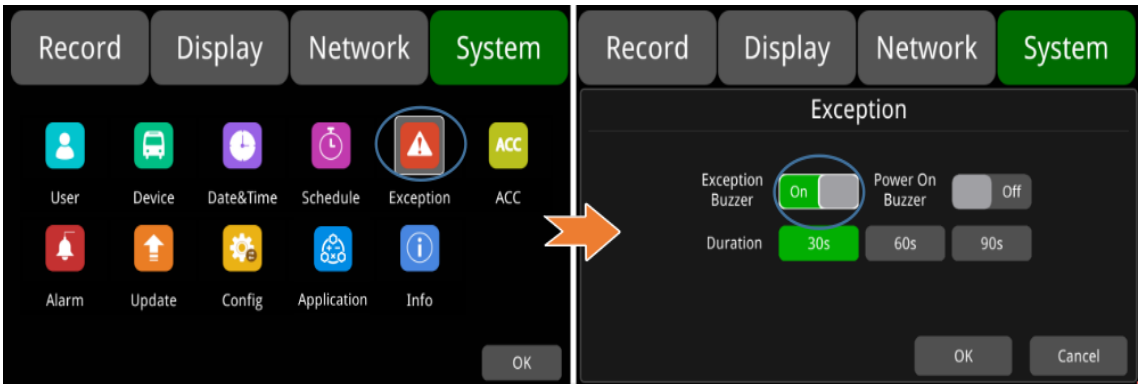
AUTO supports as below.

System Format		
	CVBS	HD
AUTO	NTSC/PAL	1080P/720P

6.4 Buzzer

If the device is not connected to a monitor, please check the recording status by the buzzer.
The buzzer would alarm if the device is not recording under Normal Mode which is set by default. To stop the buzzer from alarming, please make sure the device is working properly.
The buzzer warning function is as follows.

- The buzzer will keep beeping for a while for all types of alarm event recording.
- If the buzzer alarm is not needed, users can go to “System - Exception” page and set Buzzer from ON to OFF. And please note that if the Buzzer is set to be OFF, there would be no alarm even if any event is triggered.



- Power On Buzzer: DVR beeps, when it is set to ON. If the buzzer beeps intermittently, it means that the device is unable to record. Different beeping modes stand for different working status as below.

1) The front cover is open: one long beep and one short beep.
2) No disk: one long beep and two short beeps.
3) Abnormal disk system: one long beep and three short beeps.
4) If the disk is operating normally, the video file is full, and the Cyclic Rec. is off: two short beeps and one short beep.
5) No camera input: two short beeps, and two short beeps after a second.
6) If the disk is well connected but the device is not in recording: two short beeps and three short beeps.

6.5 Alarm, Speed Interface

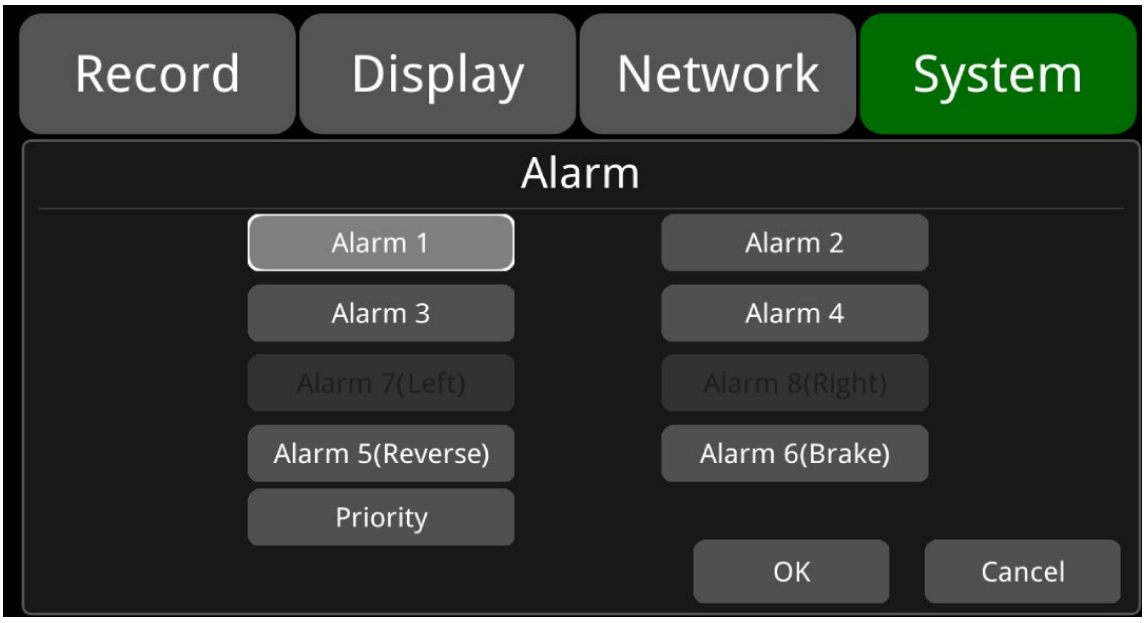
- Alarm, Speed Interface Cable

See the picture below.

- Pin Definition

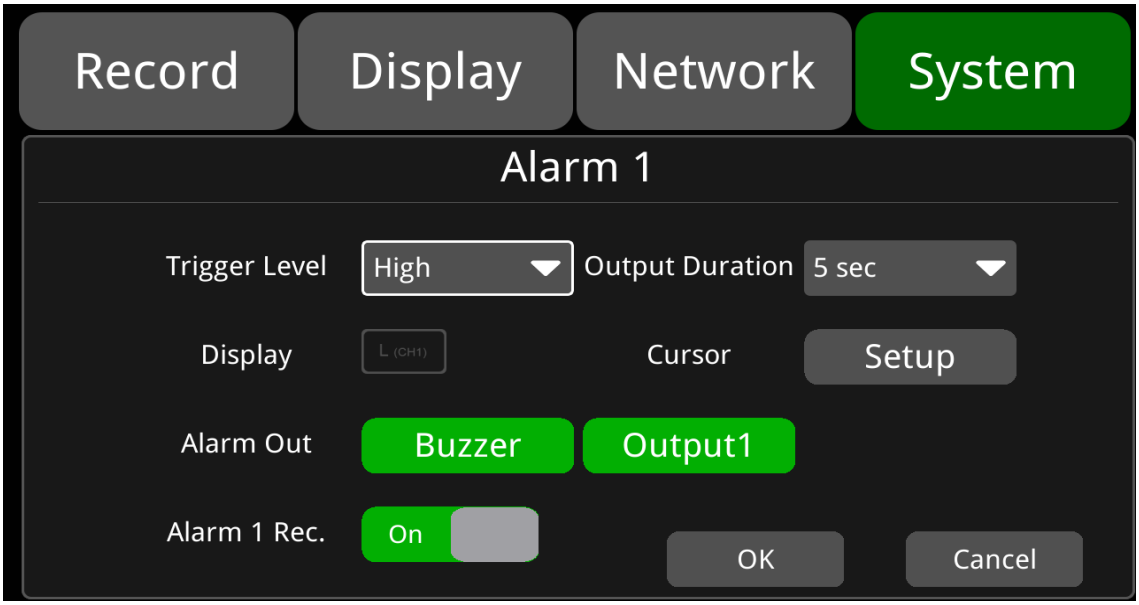
10 PIN	1	2	3	4	5	6	7	8	9	10
Color	Red	Pink	Blue	Grey	White	Purple	Green	Yellow	Black	Black
Definition	Alarm out2	Alarm out1	Alarm _in6	Alarm _in5	Alarm _in4	Alarm _in3	Alarm _in2	Alarm _in1	GND	GND
Definition	Alarm output2	Alarm output1	Alarm input6	Alarm input5	Alarm input4	Alarm input3	Alarm input2	Alarm input1	Ground	Ground

1) There are 6 alarm inputs including alarm inputs 1 ~ 4, reversal input, brake input, which can trigger the alarm recording. Cursor will be displayed when the alarm input channel is working. The first 4 ones can be self-defined by user.



2) Alarm output 1 are 12V by default, which can be used as a trigger and working together with alarm inputs. You can also set up the BUZZER as one output.

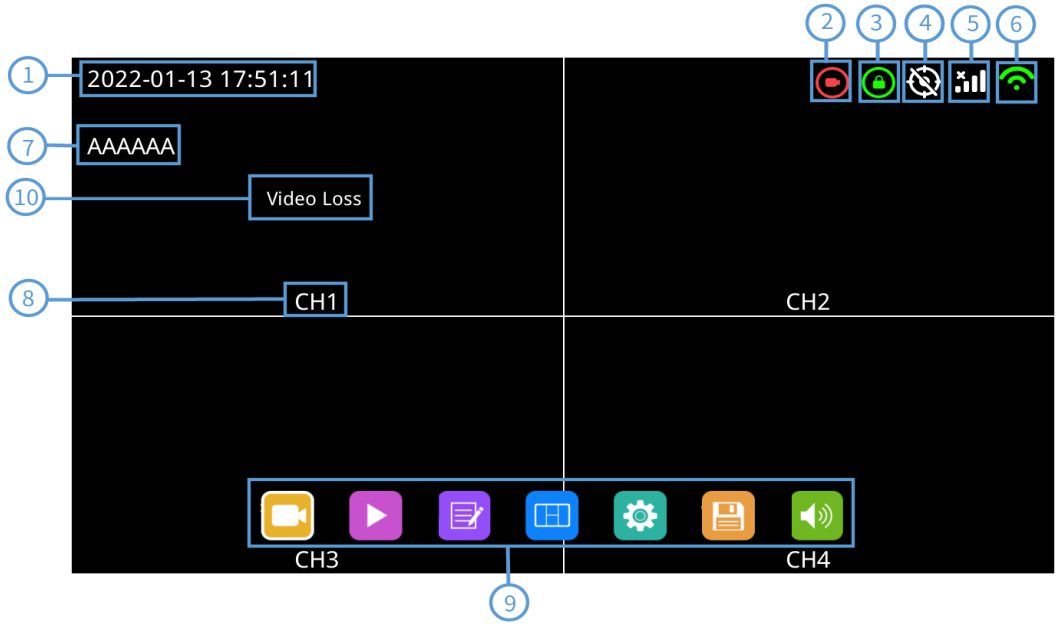
3) If Alarm input 1 is active and combined with Alarm output 1, the Alarm output 1 will output a high-level voltage to trigger other device.


Record
Display
Network
System
Alarm 1
Trigger Level
High
Output Duration
5 sec
Display
L (CH1)
Cursor
Setup
Alarm Out
Buzzer
Output1
Alarm 1 Rec.
On
OK
Cancel

7 The Menu

7.1 Menu Introduction

Press [MENU] on the remote control or touch the bottom area on a connected LCD screen, the Menu will be shown as below. Please log in before entering the menu.



① System time display

② recording

③ lock

- When the front cover is closed, the lock indicator turns green.
- Mechanical lock is different from menu lock.

④ GPS

- Icon is steady when connected, flashes when searching for connection.

⑤ 2G/3G/4G (LTE models)

⑥ Wi-Fi

⑦ License plate number display

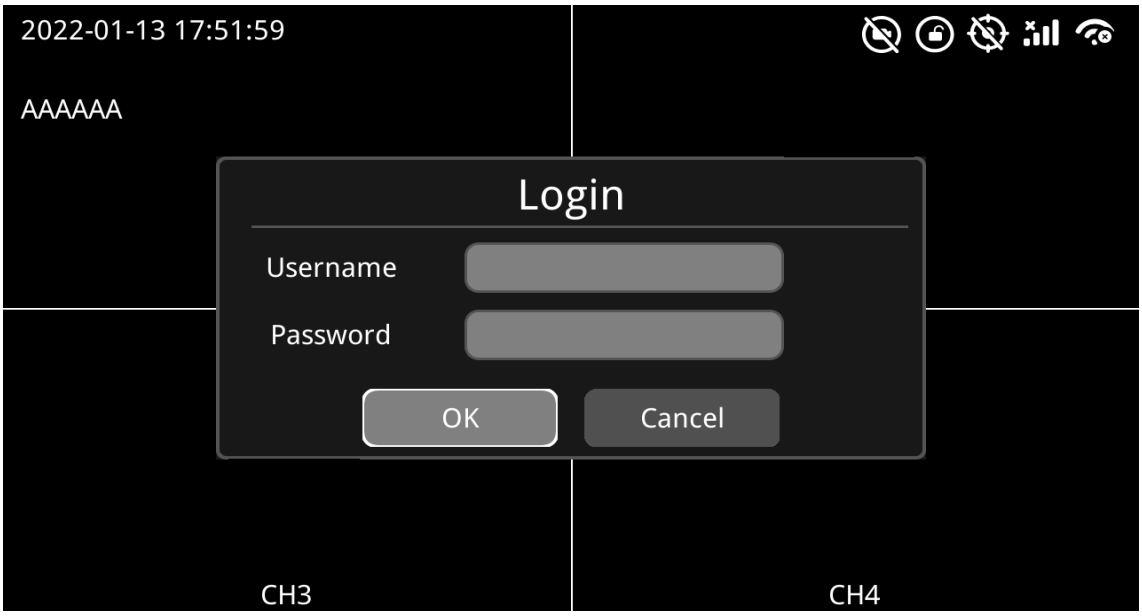
⑧ Channel name

⑨ menu

- Click the position of area 9 to display the menu icons.

⑩ video loss

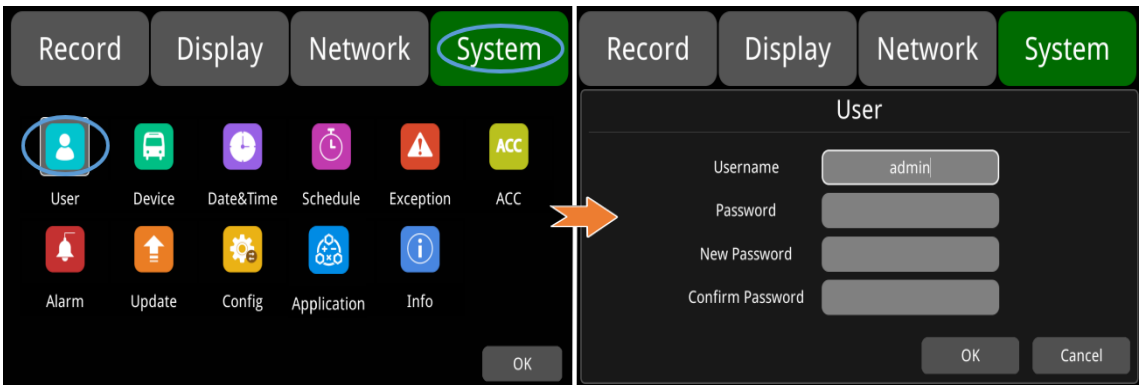
7.2 Menu Lock



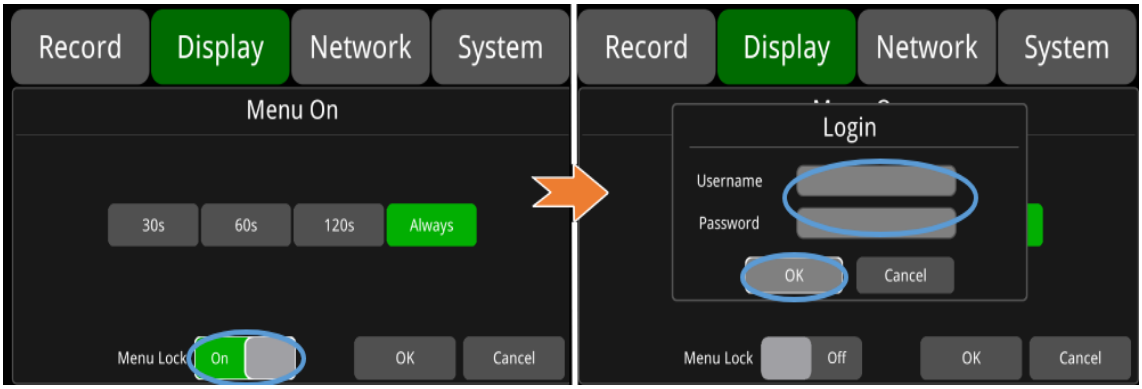
- The device/recorder supports two kinds of permissions: admin permission and guest permission.
- Users' account list.

	Admin Permission	Guest Permission
Username	Admin	Guest
Password Modification	Yes	No
Initial Password	123	321
Permission	Enter all menus	Enter the menu of Playback, Display mode switching and Volume

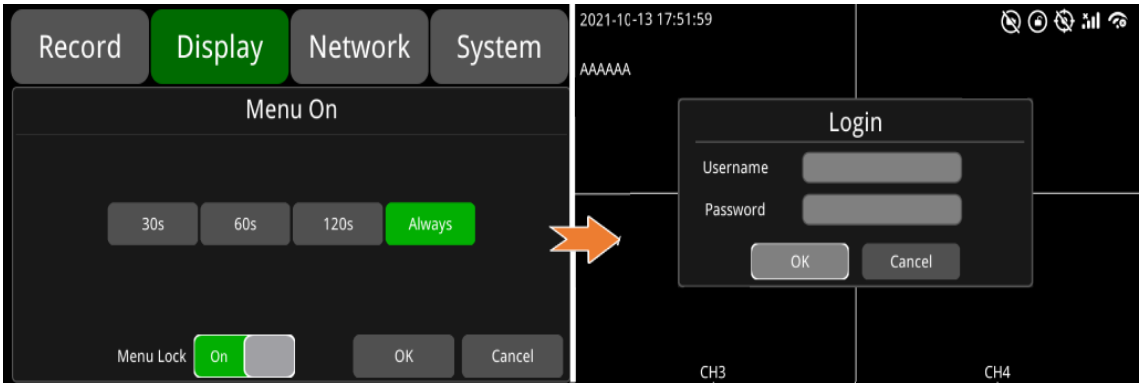
- Users' name could not be changed, but users' password is changeable. Guest does not have permission to enter the setup menu, so the password cannot be changed. (See the following instructions to change the password.)



- Only the administrator could change the status of Menu lock. The following picture shows how to change the Menu Lock status from ON to OFF.

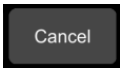


- When the menu lock status is "ON", you need to enter the user name “admin” and password to enter the "recording", "play", "log", "settings", "disk" "layer switching" and "volume adjustment" and other menus. If you use the user name “guest” and password, you can only enter the "play", "layer switching" and "volume adjustment" menu. When the menu lock status is "Off", you do not need to enter the user name and password to enter the menu.

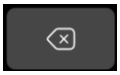


7.3 Keyboard Operation Instruction

: Switch letter case.

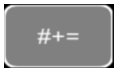
 : Exit without saving changes.

: Exit with saving changes.

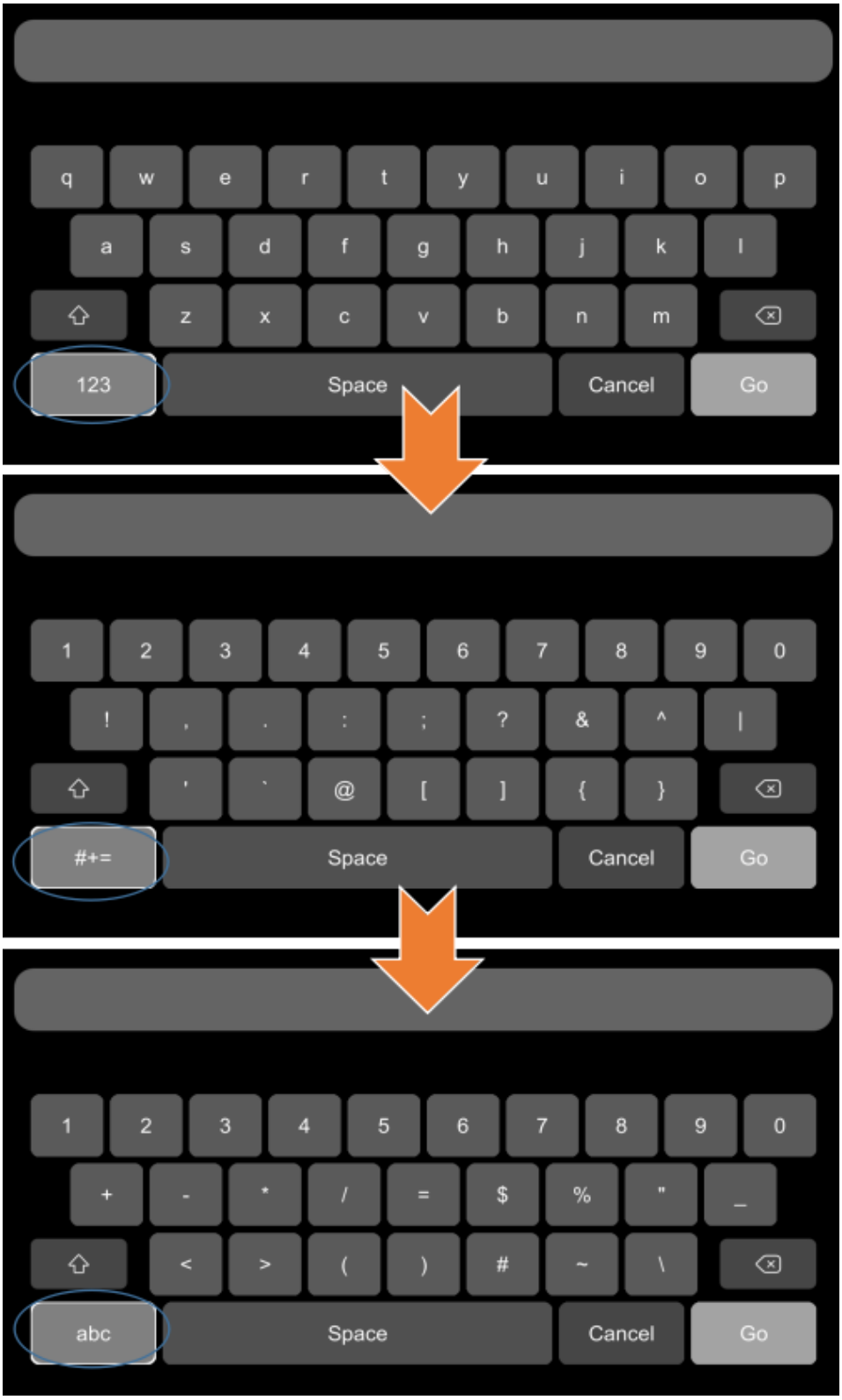
 : Clear input.

: Switch to the numeric interface.

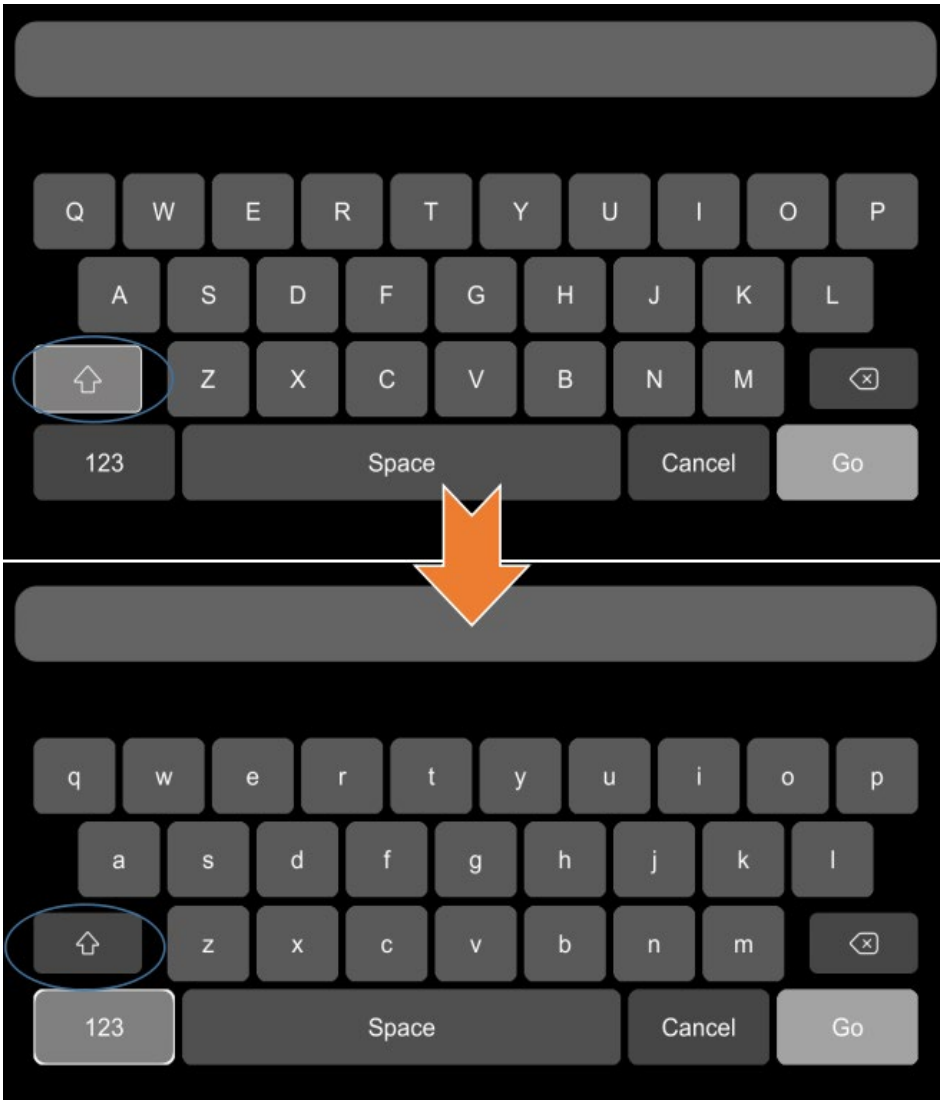
: Switch to the English alphabet interface.

 : Switch to the special character interface.

- Character Switching Introduction



- Letter Case Switching Introduction



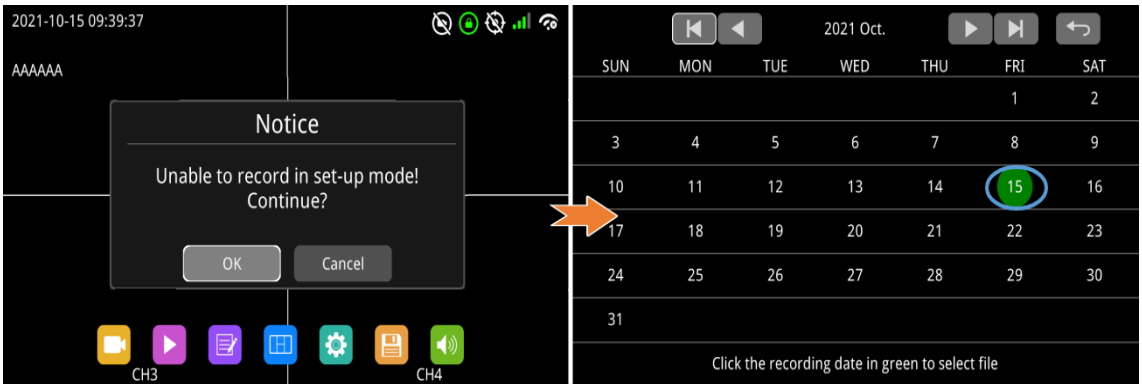
7.4 Manual Recording

Recording icon: This version is mandatory to record, so clicking this button can not close and open the record

7.5 Playback

Video Playback button: Touch this icon to enter the calendar menu.
Green marked date means it has recording files saved on that day. Select the date to enter the video file list, then select the file and touch Play icon to play video. You can select single or multiple videos at a time. Multiple videos can be played in sequence and can be shifted to the next or the previous one. Specific operation as below.

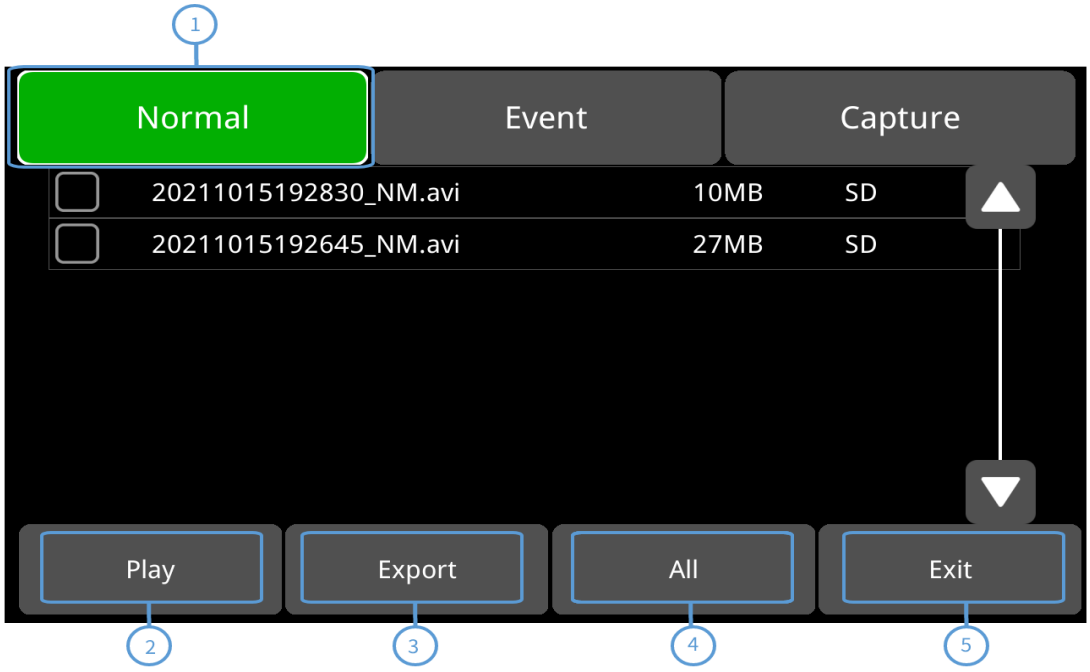
- Calendar Interface



: Search next or previous month

: Search next or previous year

- Record List Interface (1)



① Normal: Recording list, including normal recording, boot recording, timing recording, alarm recording 1~6, motion detection alarm recording, G-Sensor alarm recording, overspeed alarm recording, panic button manual recording alarm , FCW alarm, DMS detection Alarm, LANE departure detection alarm, PDS detection Alarm, BSD detection Alarm.

Type	Recording Time Control Mode	View Position
Normal recording	Manual control	Normal list

Power on recording	Manual control	Normal list
Schedule recording	Pre-setup time	Normal list
Alarm recording 1~6	Event recording setup time	Normal list
Motion detection recording	Event recording setup time	Normal list
G-Force recording	Event recording setup time	Normal list
Overspeed recording	Event recording setup time	Normal list
Panic button recording	Event recording setup time	Normal list
FCW alarm	Event recording setup time	Normal list
DMS detection alarm	Event recording setup time	Normal list
LANE departure alarm	Event recording setup time	Normal list
PDS departure alarm	Event recording setup time	Normal list
BSD departure alarm	Event recording setup time	Normal list

② Play: Play the selected video files.

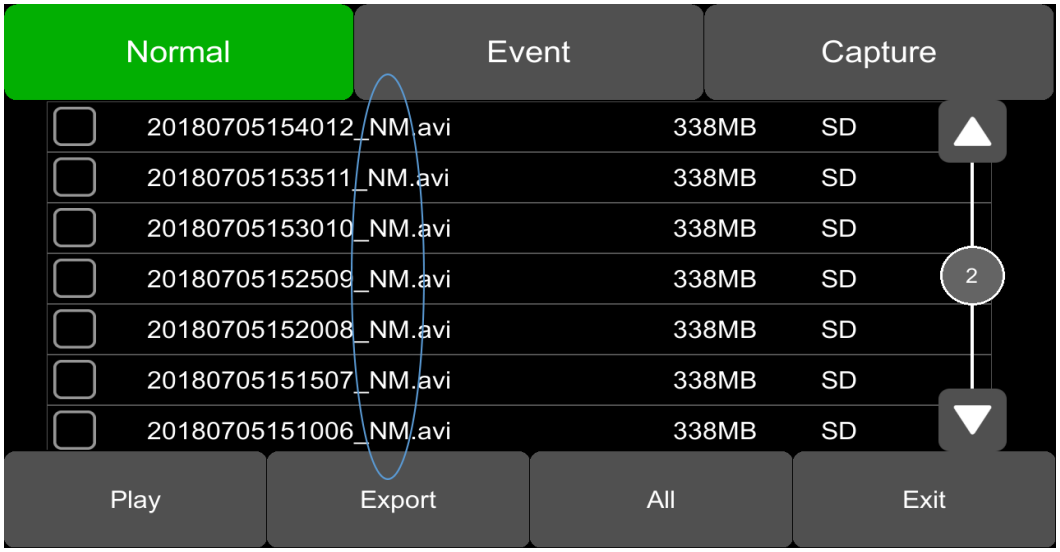
③ Export: Export selected video files to external USB devices.

④ All: Select all seven files on current page.

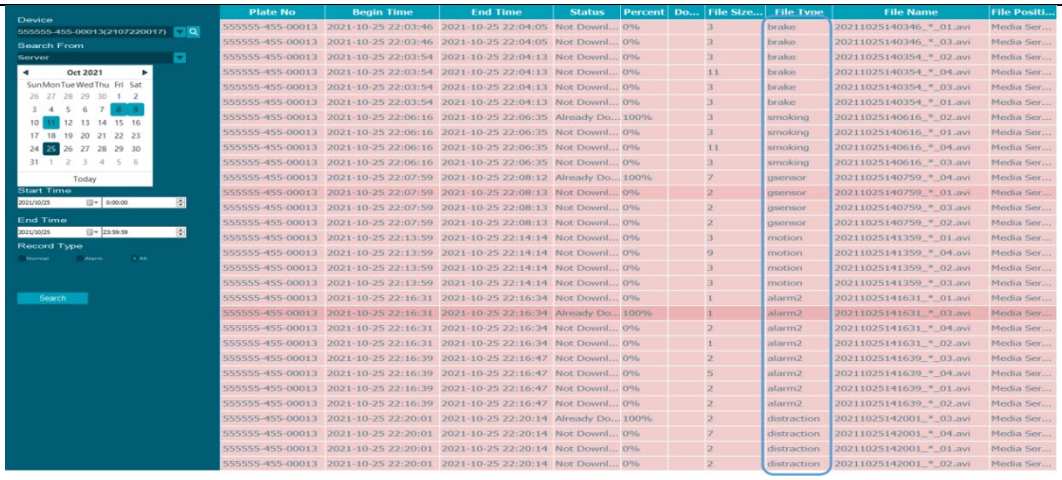
⑤ Exit: Exit

- Record List Interface (2)

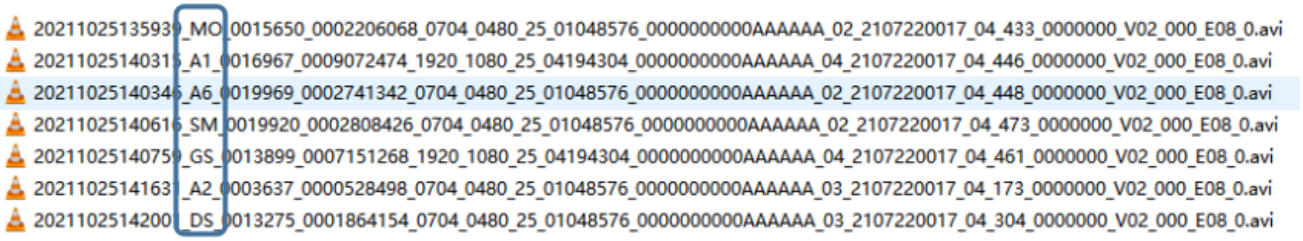
There is an abbreviation of record type in the file name, from which you can get the record type of this file. Only. NM video files are generated in the local playback files, and the abbreviations of other video types can be viewed in the client.



The alarm recording file uploaded to the client is shown in the figure below.



The alarm recording file downloaded from the client is shown in the figure below.



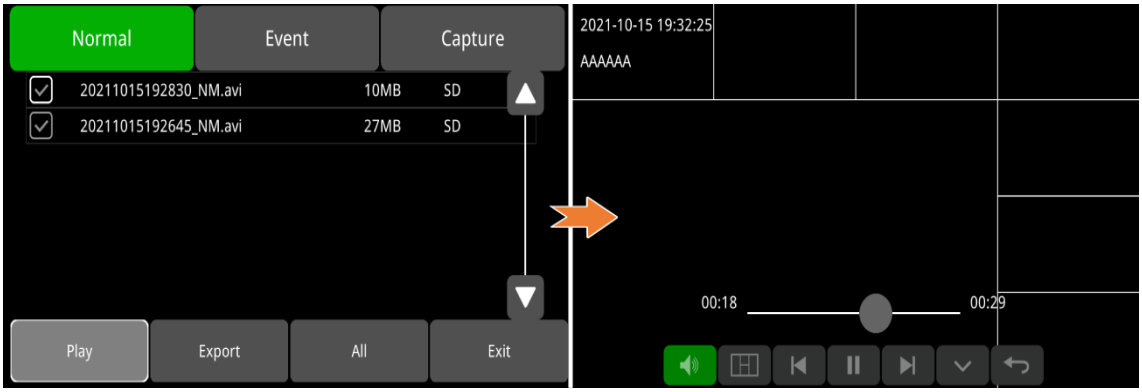
The abbreviations of recording types are as follows.

NM	Normal recording	TI	Scheduled recording
MO	Motion detection recording	SP	Speed recording
TP	Temperature recording	BT	Panic button recording
A1	Alarm 1 recording	A2	Alarm 2 recording
A3	Alarm 3 recording	A4	Alarm 4 recording
A5	Reverse recording	A6	Brake recording
PB	Pedestrian detection recording	CR	Collision alarm recording
SK	Lane deviation alarm recording	OS	Over speed recording (the speed source is ADAS)
GS	G-Sensor recording (easy mode)	ND	No driver alarm recording
FT	Fatigue alarm recording	DS	Distraction alarm recording

CA	Phone using alarm recording	SM	Smoking alarm recording

- Play Interface

After selecting files, press ”Play” button to play the files.



: Volume control.

: Select the playback view modes.

: Play the previous/next video file.

: Pause/Resume playing.

: Hide the menu. Press [Area 1] to display.

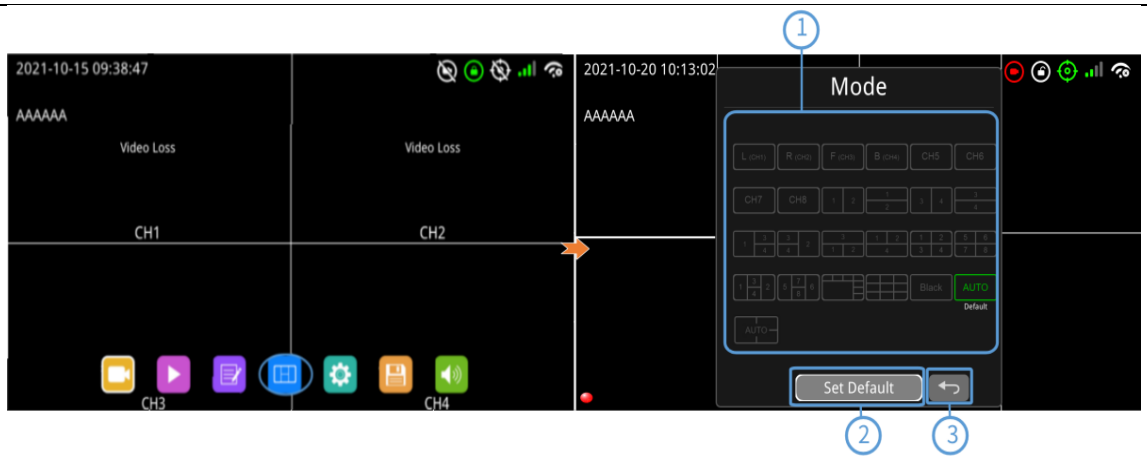
: Exit playing.

7.6 Log

System Log checking, Log export.

7.7 Display Mode Switching

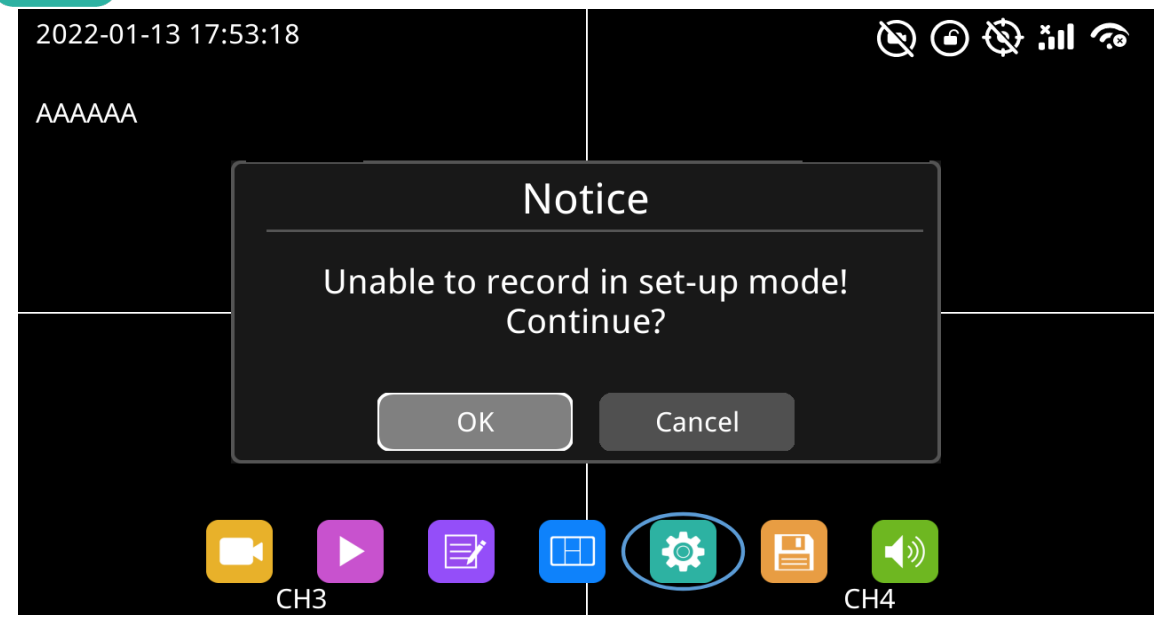
Display mode switch: Press the icon to display multiple types of mode. The default mode is automatic view.



① Display mode selection.
② Touch the icon to set up the default.
③ Exit.

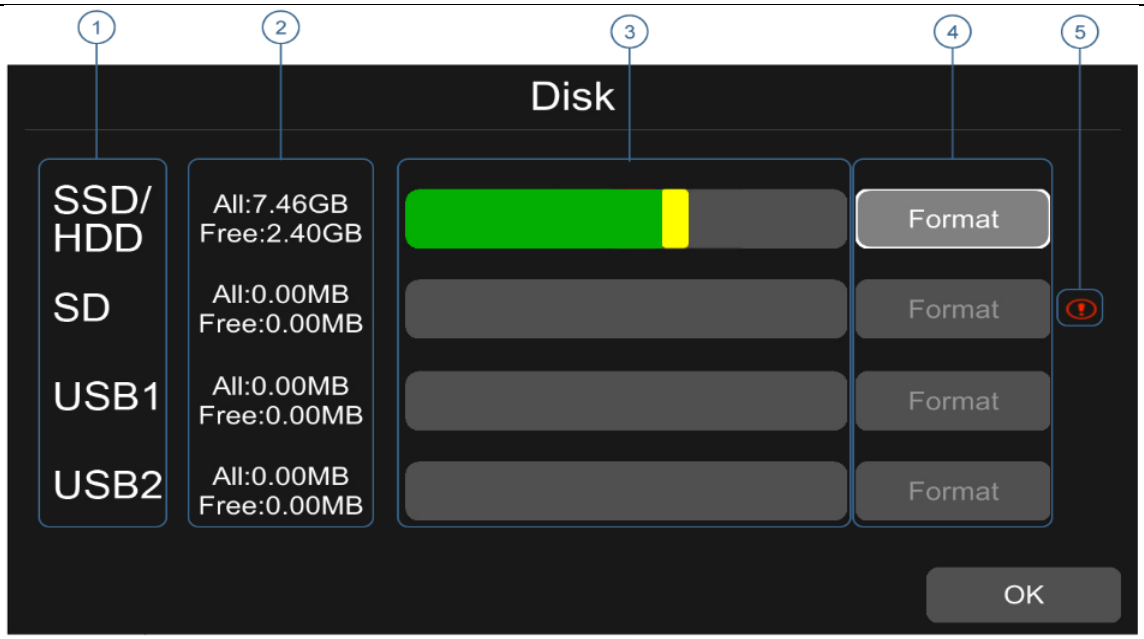
7.8 System

System settings: Touch the icon to enter the setup menu. A window warning of "Unable to record in set-up mode! Continue?"will be popped up, and touch OK to enter.



7.9 Disk

Disk management: Touch the icon, then you can view the status of SSD/HDD, SD card and USB storage as below.



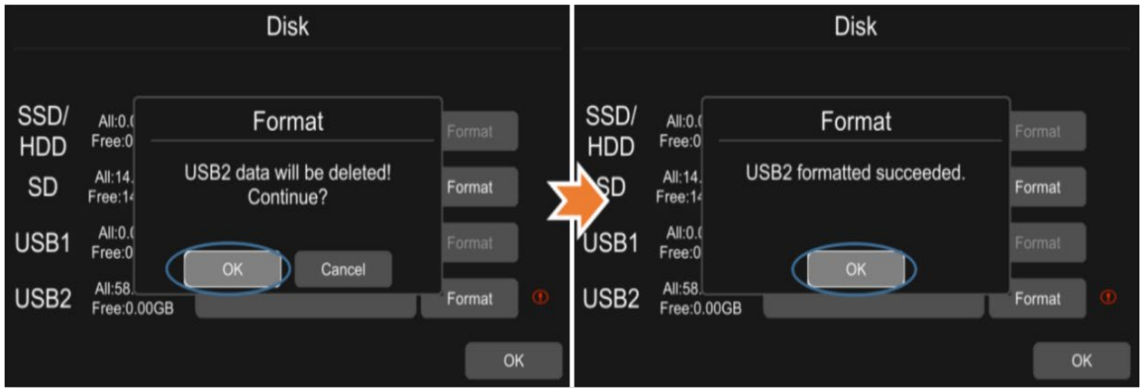
① Disk types.

② ALL: The total capacity of individual disk, free: The remaining capacity of disk.
If ALL shows 0.00MB, it means that DVR does not have access to this type of disk.

③ Disk capacity bar
Green shows the size of all video files in the "Normal" list.
Yellow shows the size of all other files except the above files.

④ Touch to format the disk.

A window text of “Disk data will be deleted! Continue?” will pop up. Press OK to start formatting the disk. The following picture is an example of formatting USB2.

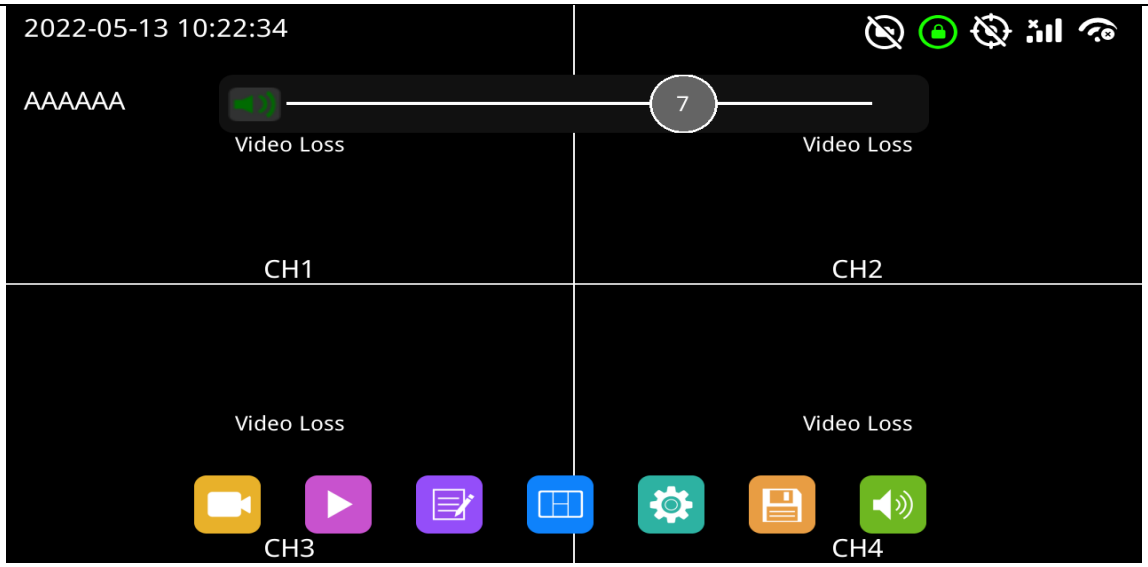


- If the disk could not be formatted, please check if there is a disk in the slot.

⑤ It shows that the disk needs to be formatted before application.
All new disks must be formatted before application.

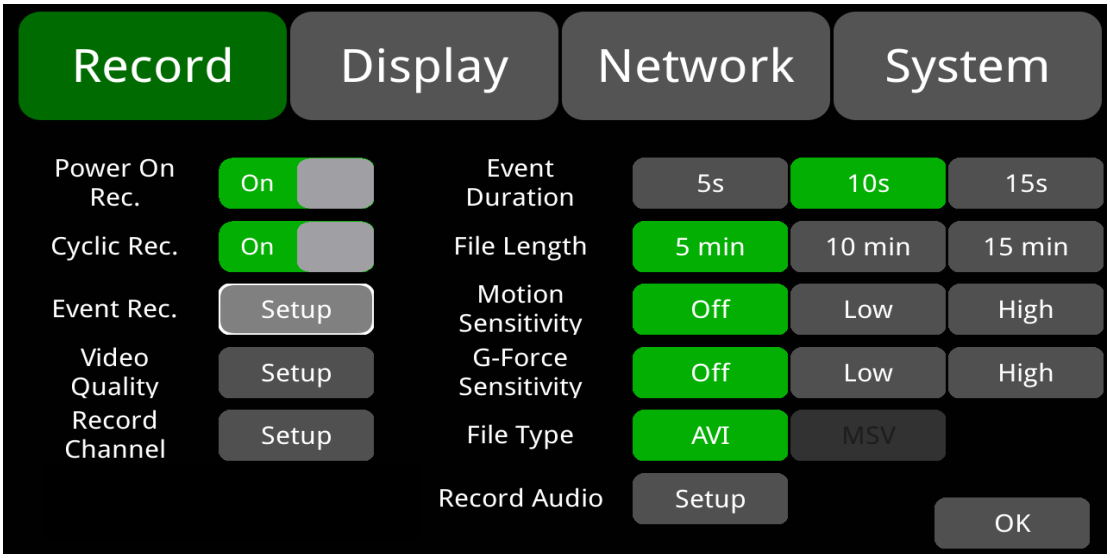
7.10 Volume

Volume : value 0~10, the default value is 7.



Function	Min.	Max.	Default
Volume	0	10	7

8 Record Setup



8.1 Power On Rec

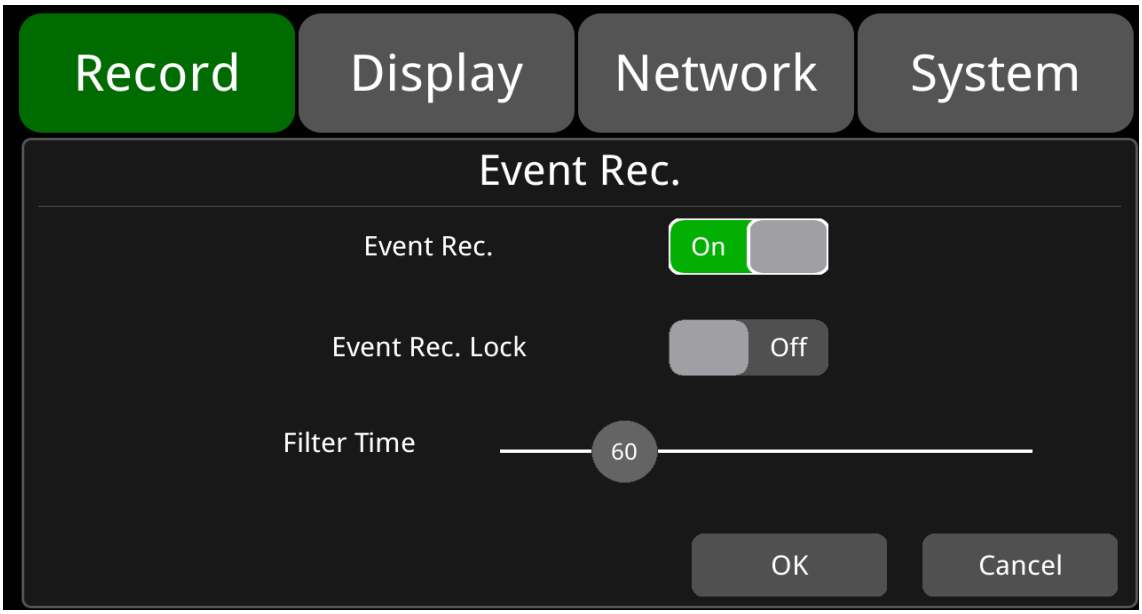
When “Power On Rec” is set to ON, the device will start recording once it’s powered on. Default setting is ON.

8.2 Cyclic Rec

When “Cyclic Rec” is set to ON, new recording files will overwrite the previous ones when the disk is full. Otherwise, it will stop recording when the disk is full.

This function is “ON” by default, and will overwrite all video files, including event video files.

8.3 Event Rec

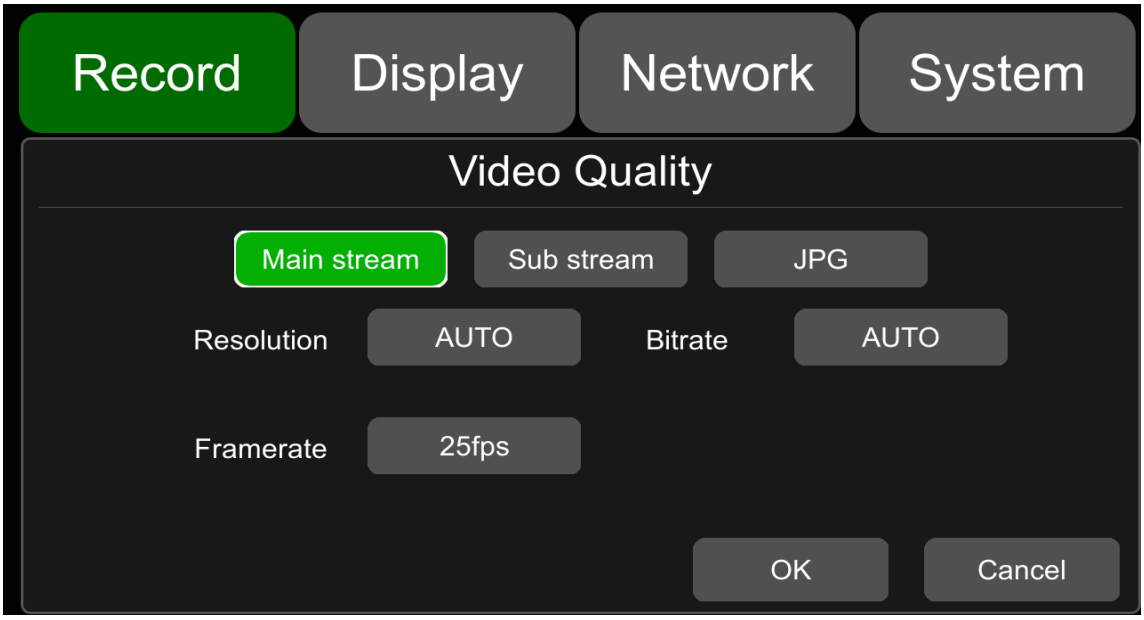


Event Rec.: Event recording refers to the alarm recording triggered by events including motion detection, G-Sensor, alarm 1 ~ 6, panic button and over speed, FCWalarm,DMSdeteciton alarm,LANEdeparture alarm. If the Event Rec is set to ON and corresponding alarm parameters are set, event recording will be activated when the events above are triggered. If the Event Rec is set to OFF, event recording will not be activated even if an alarm is triggered.This function is “ON” by default.

Event Rec. Lock: reserved.

Filter Time： Time filtering. As shown in the figure, if the same alarm is triggered continuously, the DVR generates an alarm message every 60s and checks whether a new alarm recording is generated every 60s. After the DVR is connected to the Internet, the alarm information will be sent to the server. Filter Time minimum setting 1s, the maximum can be set to 300s, the default value is 60s.

8.4 Video Quality



The main stream is used for video storage. The sub stream is used for network transmission.

The default configuration of main stream, sub stream and JPG are as follows.

	Main stream	Sub stream	JPG
Resolution	AUTO	CIF	None
Bitrate	AUTO	64Kbps	None
Framerate	25fps	25fps	Low

① Resolution

Here are 5 optional resolutions in the main stream menu, 1080P, 720P, D1 (PAL), D1 (NTSC), AUTO. The sub-stream menu defaults to CIF and it is not selectable. The higher the resolution, the better the quality of the video file and the larger the video file. Therefore, the file size should be considered during configuration.

In the options of Resolution, AUTO is defined as follows.

	Main stream
AUTO	DVR will recognize the camera format,and will record videos of that format.

② Bitrate

There are 8 levels of bitrate to choose from in the mainstream menu, 4Mbps, 2Mbps, 1Mbps, 512Kbps, 256Kbps, 128Kbps, 64Kbps, AUTO; in the sub stream menu, there are 6 levels of bit rate to choose from, 1Mbps, 512Kbps, 256Kbps, 128Kbps, 64Kbps and AUTO. The higher the bit rate, the clearer the image and the larger the video file. Therefore, all factors should be considered In the options of Bitrate, AUTO is defined as follows.

Bitrate		
	Mainstream	Sub stream
AUTO	If a 1080P camera is connected, the bit rate will be 4Mbps. For a 720P camera, it'll be 2Mbps. And for a D1 camera, it'll be 1Mbps.	Whatever cameras are connected, the bit rate will always be 64Kbps.

③ Framerate

There are 8 kinds of optional frame rates in Main stream and Sub stream menu: 30fps(NTSC), 28fps(NTSC),25fps, 20fps, 15fps, 14fps, 10fps and 5fps. The higher the frame rate is and the smoother the picture is, the larger the video file will be. (Note: mixed connection of camera with different framerates is not allowed.)

SSD/HDD / SD Capacity	Video Quality	File length
2TB	4 x 1080P / 4Mbps	≈298h
	4 x 720P / 2Mbps	≈596h
	4 x D1 / 1Mbps	≈1193h
	1 x 1080P / 4Mbps	≈1193h
	1 x 720P / 2Mbps	≈2387h
	1 x D1 / 1Mbps	≈4772h
512GB	4 x 1080P / 4Mbps	≈75h
	4 x 720P / 2Mbps	≈149h
	4 x D1 / 1Mbps	≈298h
	1 x 1080P / 4Mbps	≈298h
	1 x 720P / 2Mbps	≈596h

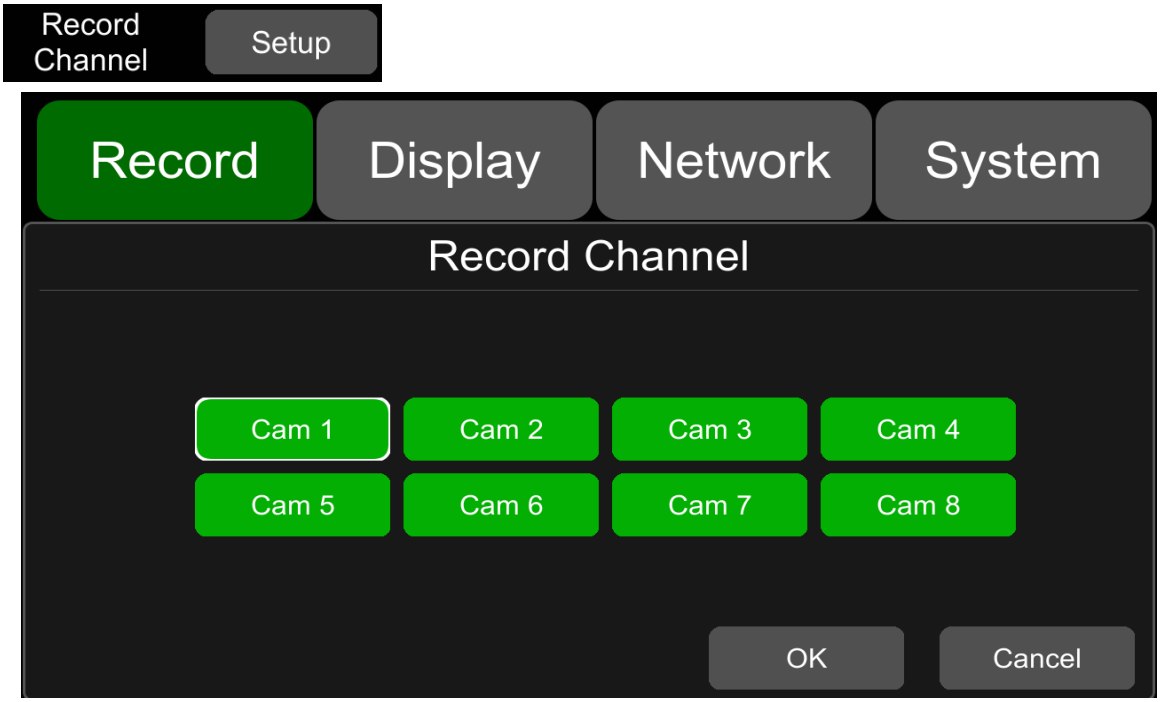
	1 x D1 / 1Mbps	≈1193h

④ JPG

JPG Frame rate optional Excellent，High，Mid，Low. The meaning of these four values is as follows.

Excellent	The rate of uploading pictures to the client is unlimited (the fastest), and the rendering effect is the smoothest
High	The rate of uploading pictures to the client is 1 second
Mid	The rate of uploading pictures to the client is 3 second
Low	The rate of uploading pictures to the client is 5 second

8.5 Record Channel



The default configuration is shown above.

Select the recording channel. When recording is turned on (including all types of recording), all channels will be recorded; this updated version resolves the issue with recording, and turning off the recording channel will no longer prevent the corresponding recording from occurring."

8.6 Event Duration

The default configuration is shown above.

When the “Event Rec” is set to ON, the video file length of event recordings can be set as 5s, 10s or 15s.

The video file length will be maximally 5 minutes if an alarm is continuously triggered.

8.7 File Length

The default video file length in AVI and MSV format is 5 min.

AVI format video file length can be set to 5 minutes, 10 minutes, 15 minutes. The length of the video file in MSV format can be set to 2 minutes, 3 minutes, 5 minutes.

File Format	File Length
AVI	5min,10min,15min

8.8 Motion Sensitivity

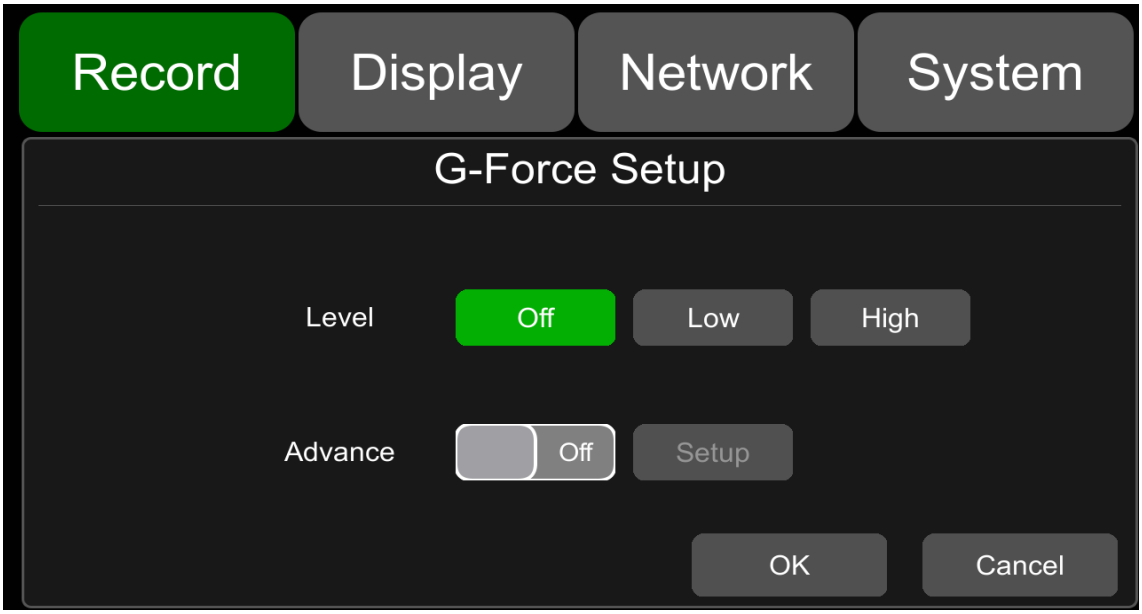
The default configuration is shown above.

Motion detection recording and sensitivity level setting: When there is an object moving and its movement amplitude exceeds the preset motion detection sensitivity level, then motion detection recording will be triggered. For such kind of event recording, the pre-recording time is set as 10s and the post-recording time is set according to the configuration in Event Duration above.

Total video file length equals to the pre-recording file length (default time 10s) plus the file length configured in Event Duration.

If motion detection is set to OFF, event recording will not be triggered. Motion detection sensitivity can be set to two levels, low or high. Motion detection recording will be on when Low / High is selected. And it will be off when OFF is selected.

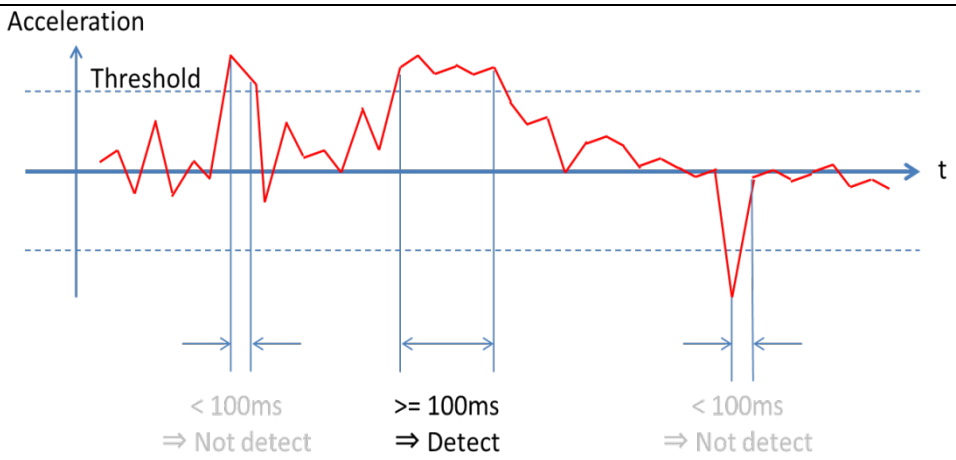
8.9 G-Sensor Sensitivity



The default configuration is shown above.
There are two optional setting modes for G-force, simple mode and advanced mode. It only requires setting the trigger level of G-force if the simple mode is selected. Detailed instruction is as follow.
When the acceleration or gyroscope of the device reaches the preset sensitivity level, G-force recording will be triggered. For such kind of event recording, the pre-record time will be set as 10s and the post-recording time is set according to the configuration in Event Duration above.
Total video file length equals to pre-recording file length (default time 10s) plus the file length configured in Event Duration.
If G-force triggered recording is off, event recording will not be triggered. G-force sensitivity can be set to two levels, Low / High. G-force triggered recording will be on when Low / High is selected. And it will be off when OFF is selected.
If the advanced mode is set to ON, the simple mode will automatically be disabled. Detailed instruction is as follow.

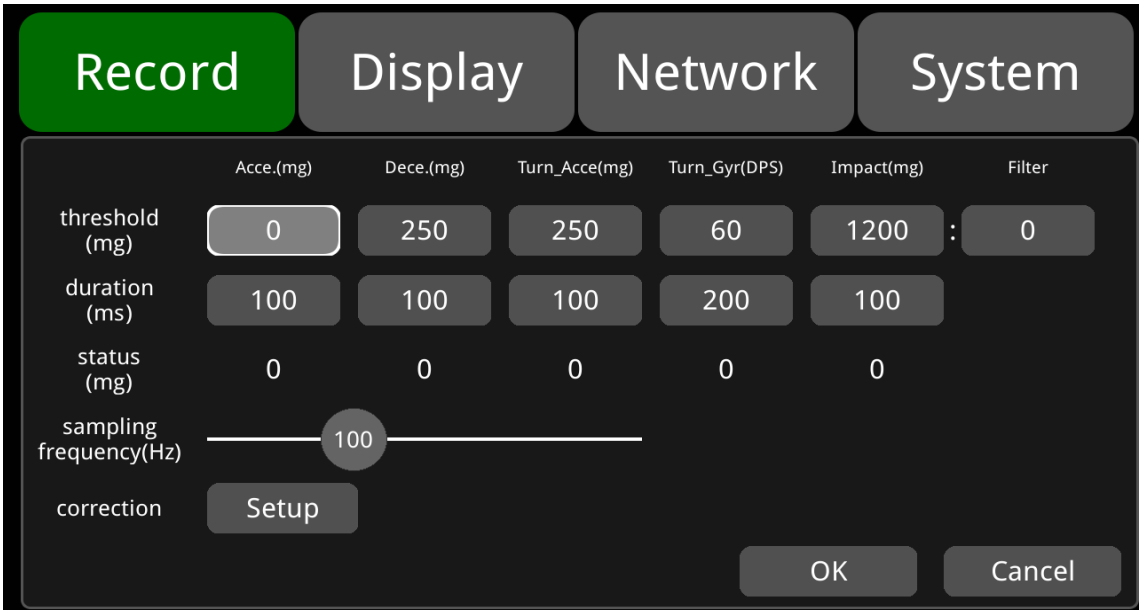
- Principle of G-force Alarm Triggering Detection

The device will measure and detect the acceleration and angular velocity via a nine-axis G-force (transmitting data includes acceleration and angular velocity) when the vehicle moves on or makes a turn. When the acceleration and angular velocity exceeds a certain threshold within a certain period of time, the corresponding alarm will be triggered and recorded. Then the detected data will be uploaded to the cloud (Detection principle is shown in Pic 1.1). For example, according to the detected data, if the acceleration when the vehicle moves on or makes a turn exceeds the certain threshold acceleration “a” during the period “T” (default setting 100ms), then the vehicle’s speed of accelerating or making a turn will be identified as too fast, which is prone to cause traffic accidents.



- Introduction to G-force Alarm Triggering Setting Interface

Enter the setting interface of the advanced mode of G-force under “Menu” -> “Record” -> “G-force Sensitivity” -> “Setup” -> “Advance” -> “ON”. The meanings of “Acce”, “Dece”, “Turn_Acce”, “Turn_Gyr”, “Impact” and “Filter” are as follow.



The meanings of “Acce”, “Dece”, “Turn_Acce”, “Turn_Gyr”, “Impact” and Filter”are as follow.

Items	Meanings
Acce.	The value of acceleration when the vehicle moves on (for detecting sudden acceleration)
	When the vehicle is accelerating, the value will be positive number. And when it is decelerating, the value will be zero.
	Unit: mg
Dece.	The value of deceleration when the vehicle moves on (for detecting sudden deceleration)
	When the vehicle is decelerating, the value will be positive number. And when it is accelerating, the value will be zero.
	Unit: mg
Turn_Acce	The value of acceleration when the vehicle makes a turn (for detecting sharp turn)
	When the vehicle is accelerating during left turn or decelerating during right turn, the value will be positive number. When the vehicle is decelerating during left turn or accelerating during right turn, the value will be negative number.
	Unit: mg
Turn_Gyr	Making turns and angular velocity of the vehicle (for detecting sharp turn and turning direction)
	When the vehicle turns left, the value will be positive number. When it turns right, the value will be negative number.
	DPS (Radian per Second)
Impact	Acceleration of vehicle collision (for detecting collision event)
	Positive number
	Unit: mg
Filter	Weight coefficient of acceleration on Z-axis of impact(collision)
	Positive number
	The calculation method and scale factor are shown in Table 1.3.

The meanings of “threshold”, “duration”, “status”, “correction” and “sampling frequency” are as follow.

Items	Meanings
threshold	Threshold setting for “Acce”, “Dece”, “Turn_Acce”, “Turn_Gyr”, “Impact” and “Filter”. When the detected value continuously exceeds threshold setting for “duration”, then the alarm recording will be triggered.
duration	Detection time setting for “Acce”, “Dece”, “Turn_Acce”, “Turn_Gyr”, “Impact” and “Filter”
status	Real-time detected value of the corresponding event
correction	Setting for device installation and G-force data correction
sampling frequency	Sampling frequency of the G-force

The threshold and detection duration of alarm triggering recording can be modified according to different application environment. The shorter the detection duration is set and the lower the threshold is set, the higher the sensitivity of alarm triggering will be. The unit of acceleration is mg. (1g≈9.8m/s², 1g=1000mg). The unit of angular velocity is Radian per Second (DPS).
The default values and ranges of thresholds and duration for G-force alarm triggering detection are shown in the table below.
The formula of calculating the acceleration of impact (collision) event is as follow.

	Default Values	Ranges
Acceleration Threshold	225 mg	101~999
Deceleration Threshold	250 mg	101~999
Turn_AcceThreshold	250 mg	250~999
Turn_Gyr Threshold	60 DPS	21~99
Impact Threshold	1200mg	101~19999
Filter	0	0~5
Acceleration Duration	100ms	1~4999
Deceleration Duration	100ms	1~4999
Turn_Acce Duration	100ms	1~4999
Turn_Gyr Duration	200ms	1~4999
Impact Duration	100ms	1~4999

The acceleration of impact events is calculated as follows.

abs(X) + abs(Y) + abs(Z)*Filter.

“abs(X)”, “abs(Y)” and “abs(Z)” are the data from the X, Y and Z axes of acceleration sensors in the vehicle. Filter is the coefficient from the Z axis of acceleration sensor.
Filter rate of Z axis:

Sensitivity Level	Filter Rate
0	100%
1	80%
2	60%
3	40%
4	20%
5	0%

Acceleration Sensitivity level and value from Z axis for collision detection (Default level: 0) as shown above.
E.g.: Threshold: 1200 mg; Interval: 100ms
1) Setting value: 5

Detection condition: abs(X) + abs(Y) + abs(Z) ≧ 1200mg

2) Setting value: 4

Detection condition: abs(X) + abs(Y) + abs(Z)×0.8 ≧ 1200mg

3) Setting value: 3

Detection condition: abs(X) + abs(Y) + abs(Z)×0.6 ≧ 1200mg

4) Setting value: 2

Detection condition: abs(X) + abs(Y) + abs(Z)×0.4 ≧ 1200mg

5) Setting value: 1

Detection condition: abs(X) + abs(Y) + abs(Z)×0.2 ≧ 1200mg

6) Setting value: 0

Detection condition: abs(X) + abs(Y) ≧ 1200mg

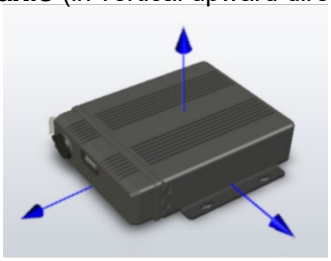
The default values are detected as follow.

(1) If the vehicle accelerates continuously in the positive direction of X axis and if the real-time value of Acce exceeds the threshold continuously for 100ms during driving, then the device will trigger an alarm of Acceleration.
(2) If the vehicle decelerates continuously (brakes suddenly) in the positive direction of X axis and if the real-time value of Dece exceeds the threshold continuously for 100ms during driving, then the device will trigger an alarm of Deceleration.
(3) If the vehicle quickly turns to the positive direction of Y axis and if the real-time value of Turn Acce exceeds the threshold continuously for 100ms during driving, then device will trigger an alarm of Turn Acce.
(4) If the vehicle quickly turns to the opposite direction of Y axis and if the real-time value of Turn Acce exceeds the threshold continuously for 100ms during driving, then device will trigger an alarm of Turn Acce.
(5) If the vehicle quickly turns to the positive or opposite direction of Y axis and if the real-time value of Turn Gyr exceeds the threshold continuously for 100ms during driving, then device will trigger an alarm of Turn Gyr.

- Introduction to Installation and Calibration of Device

There are various installation methods when the device is installed in the vehicle, because the device and the vehicle itself have different coordinate systems. The device coordinate system is shown in the picture below. The X axis refers to the front side of the device (the side with LED lights), the Y axis refers to the left side of the device (the side without lock). And the Z axis refers to the vertically upward direction when the device is installed.

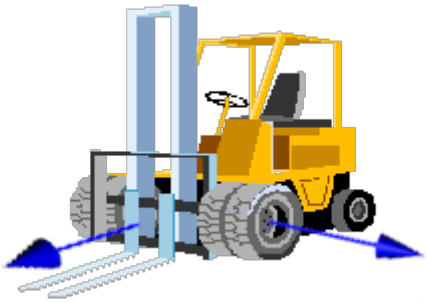
Z-axis (in vertical upward direction)



X-axis (the side with LED light)

Y-axis (the side without lock)

The vehicle coordinate system is shown in the picture below. In the coordinate system, the forward direction of vehicle is set as Forward axis and the left direction of vehicle is set as Left axis. There are multiple possible ways to install the device.



Forward Left

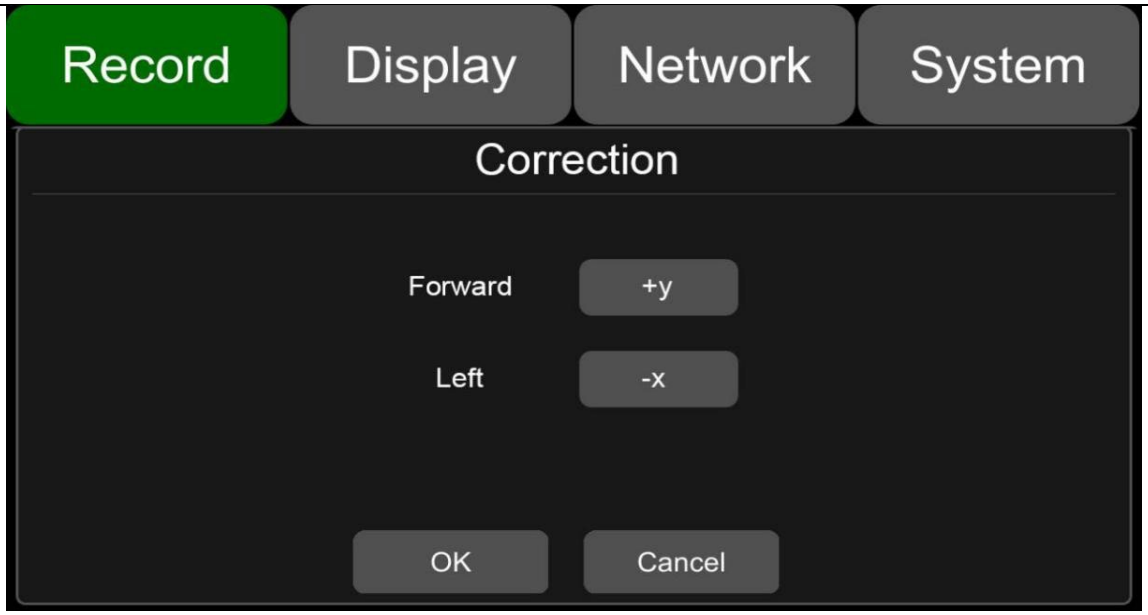
As shown below, there may be multiple installation positions for the device. In addition, there might be a slight tilt in the device installation process. So it requires calibration via the data from G-force.

- Device Installation Method Selection and Installation Correction

Forward and Left refer to the forward moving direction and the left moving direction of the vehicle. They help determine the directions of the vehicle with corresponding axes of the device, which is used to determine the installation method of the device.

Click the button “Forward” and “Left” to set the forward axis direction of the device relative to the vehicle. For example, if “Forward” is set to +X and “Left” is set to +Y, it means when the vehicle is moving forward, the forward direction of the device is the positive direction of the X-axis of the device. If “Forward” is set to -Z and “Left” is set to +Y, it means that when the vehicle is moving forward, the forward direction of the device is the opposite direction of the Z-axis and the positive Y–axis direction of the device is the left direction of the vehicle, that is to say, the device is vertically installed on the vehicle and its bottom is placed towards the front direction of the vehicle.

Installation Method Setting Interface as shown below.



When the setting is finished, click the button OK to exit the interface. Please ensure that the vehicle stays still for more than 1s after the setting is finished, so that the system can apply the calibration procedure. When the data of Status (real-time sensor data) is observed changed to close to 0, it means the calibration procedure is completed.

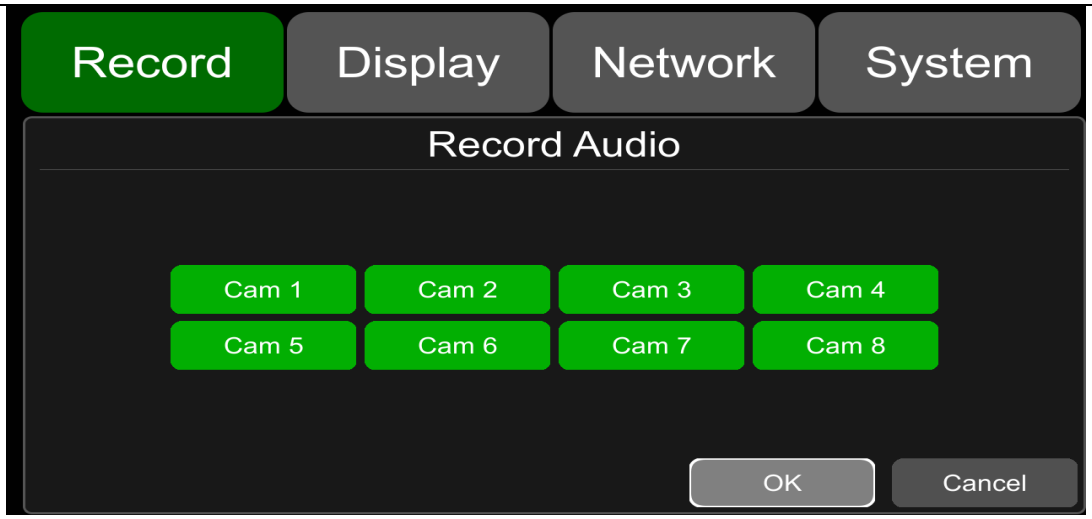
WARNING: The device installation must be calibrated before put into use. During the calibration process, the vehicle must be parked on a flat area in a static position and the calibration time shall not be less than 1s.
When the device is installed for the first time or re-installed and when the installation position changes obviously, the installation position should be re-selected and re-calibrated.

8.10 File Type

Set video format. Record video files in AVI format by default.

8.11 Record Audio

Set the recording audio of the channel. When the recording channel is selected, the audio of the channel will be recorded in the recording file. If this channel is not selected, there is no audio in the recording of this channel. The default configuration is shown below.

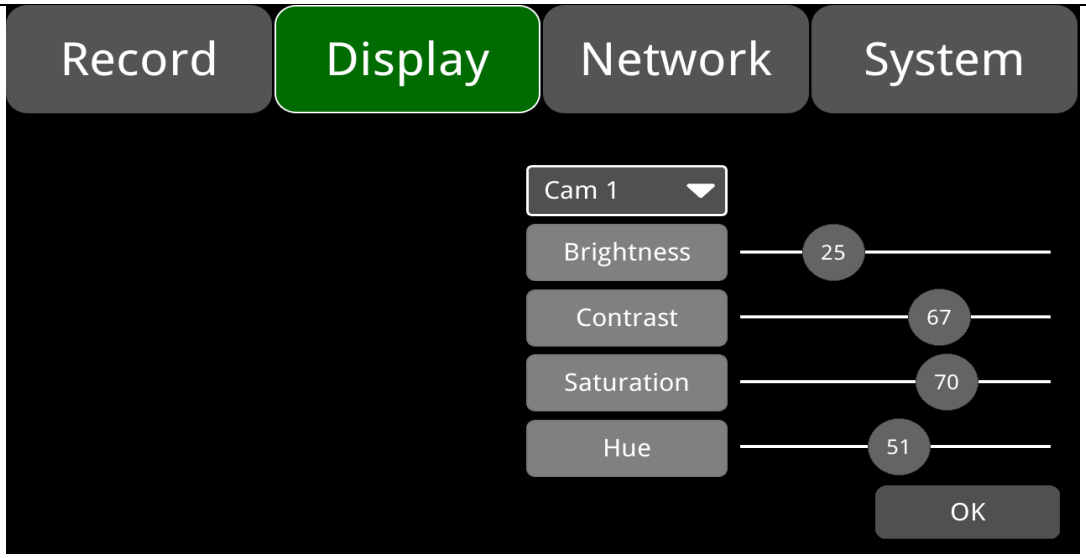


9 Display

9.1 Camera Display Setting

Camera parameter setting for each corresponding channel includes brightness, contrast, saturation and hue. The default values of brightness, contrast, saturation and hue of all channels are shown in the figure below.

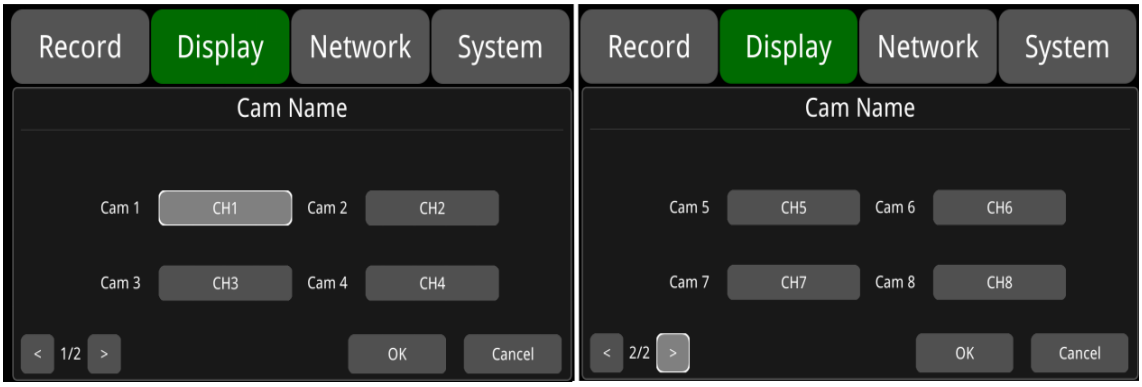
To change the value, drag the bar to left or right to decrease or increase.



Camera Display	Min,	Max,	Default
Brightness	0	99	25
Contrast	0	99	67
Saturation	0	99	70
Hue	0	99	51

9.2 Camera Name Setting

Camera Names are displayed at the bottom of each channel. Touch the "Display->Camera Name->Cam*" on the menu, a keyboard will pop up to input a new camera name. Maximum 8 characters can be entered and the camera name must NOT be blank. The default configuration is shown below.

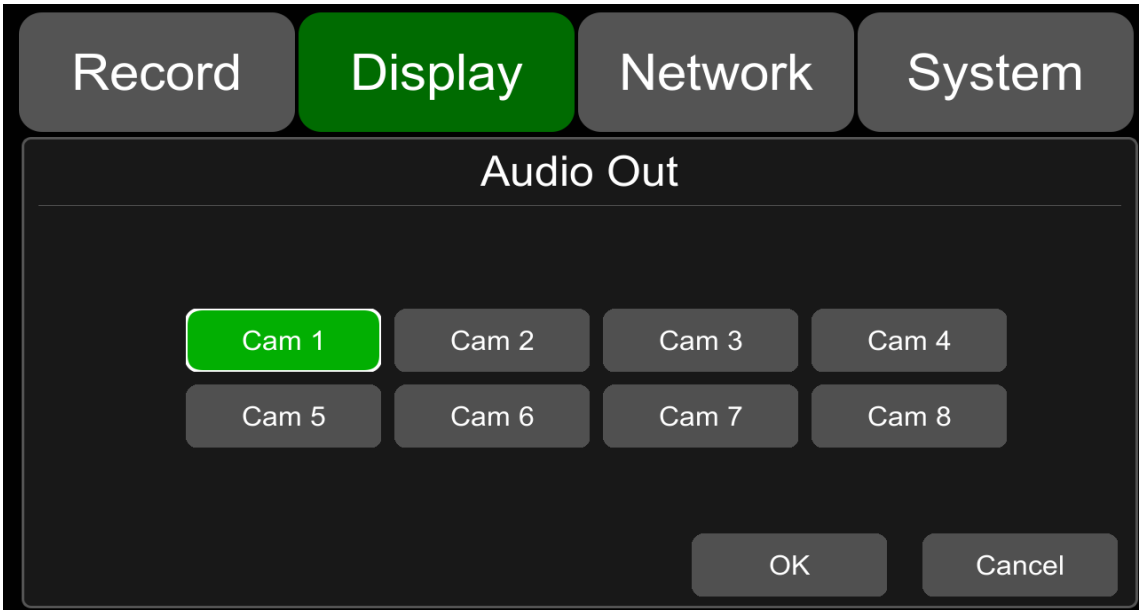


9.3 System Language Setting

Menu languages: English, Russian, Turkish, Chinese, Japanese, Spanish, Portuguese, French.The default language is English.

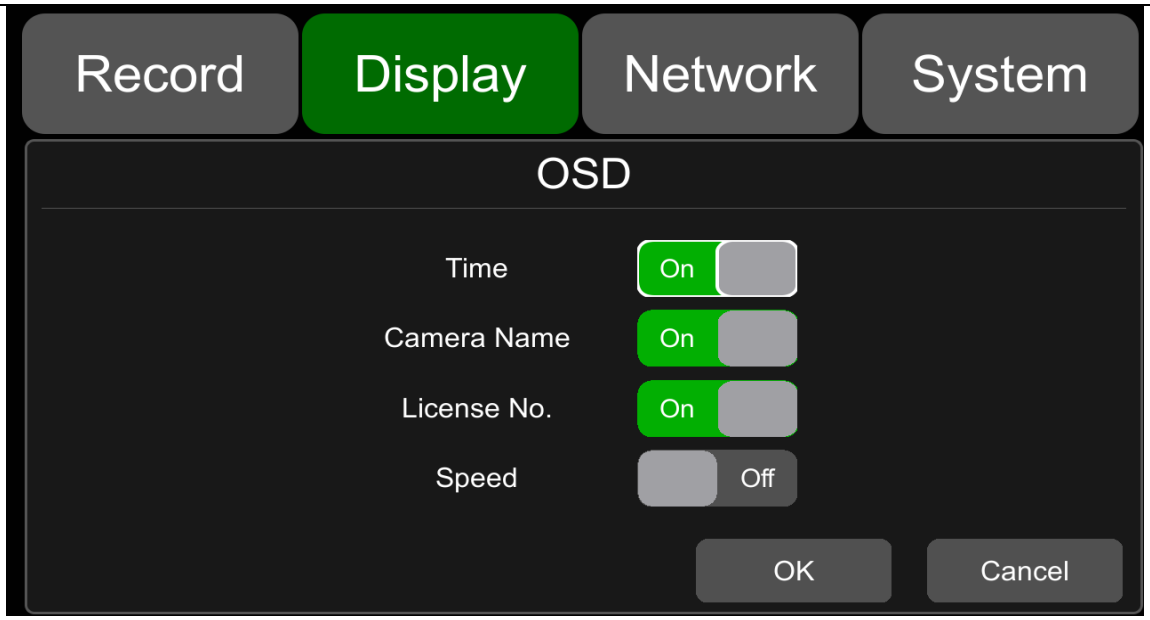
9.4 Audio Out

Select the audio output channel in multi-display mode.The default configuration is shown below.



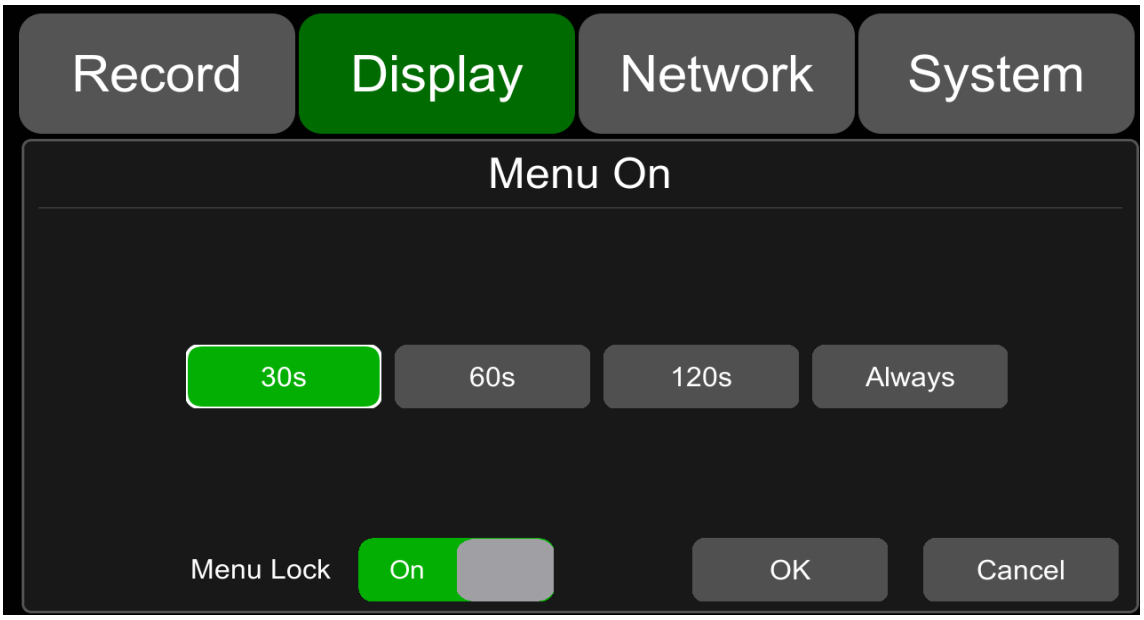
9.5 OSD Display Setting

Time, Camera name,License number and Speed can be selected whether to display or not. If it is on, the information will be shown in the live and the playback video.The default configuration is shown below.



9.6 Menu on

Set the menu display duration.The default configuration is shown below.



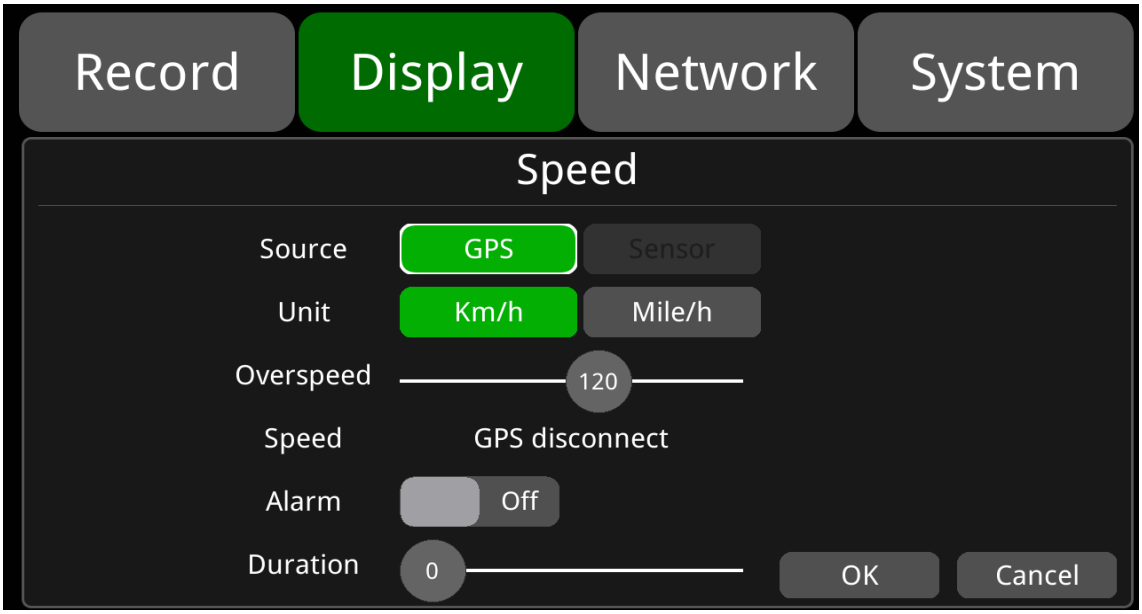
Menu on:Duration can be set to 30s, 60s, 120s and Always. When it is set to 30s, 60s, 120s, it means that the menu will disappear if there is no operation in 30s, 60s or 120s. When it is set to Always, the menu will always be there. Please be noted that the recording will stop when menu is on. It is not suggested to set the duration to Always in order not to affect the recording.

Menu lock:When it is On, permission is required to enter the menu.
When it is Off, no permission is required to enter the menu.
Username and password are required if to change the status of the menu lock.

9.7 Speed

Speed setting: The data source of overspeed comes from GPS. Speed unit is optional: Km/h or Mile/h. Overspeed threshold can be set by user. Speed refers to the current speed of the vehicle. If the Speed exceeds the vaule of the Overspeed, the overspeed alarm recording will be triggered.

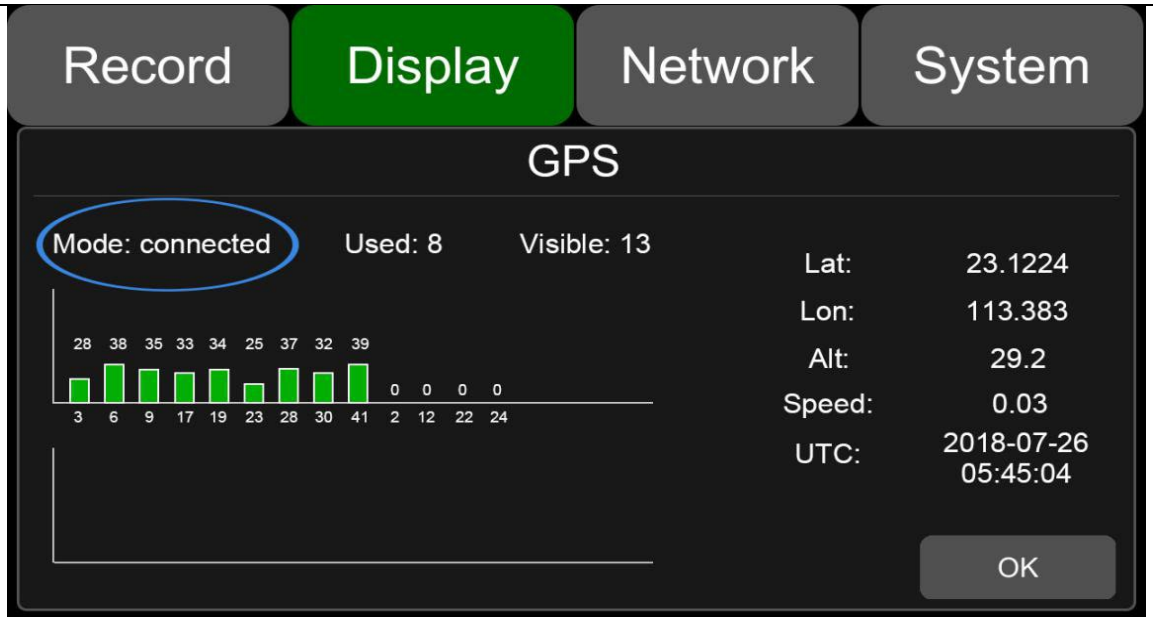
The alarm switch is to set the over-speed alarm recording ON and OFF. If it is ON, the overspeed alarm recording will be triggered when the vehicle is speeding. If it is OFF, the overspeed alarm recording will not be triggered. The default configuration of each item is as follows.



Overspeed	Min.	Max.	Default
Km/h	0	200	120
Mile/h	0	125	75

9.8 GPS

When the GPS antenna is properly installed, the latitude, longitude and speed will be recorded. The menu provides the GPS information including latitude, longitude, detectable satellites, and accessible satellites etc.

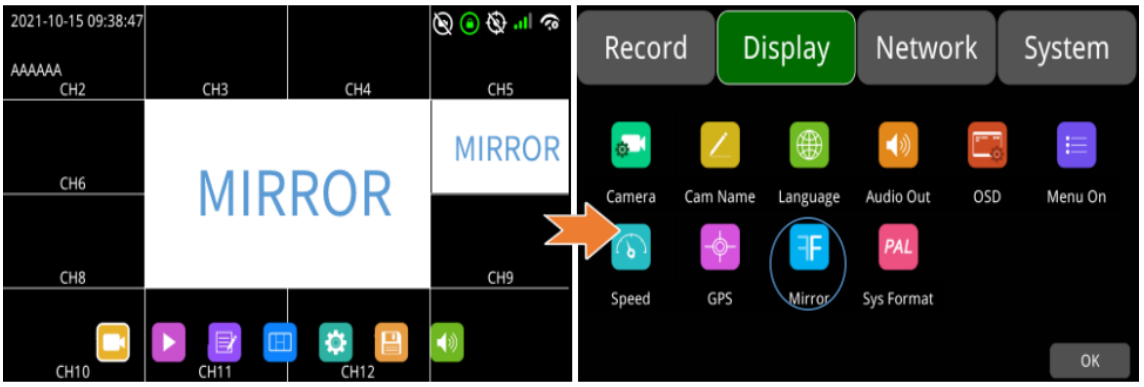


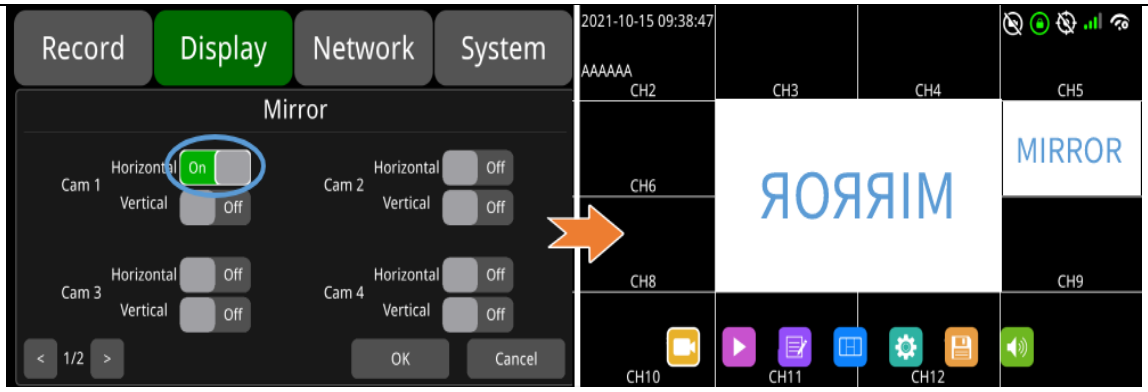
Mode: indicates the GPS connection status.
Used: indicates the number of available satellites.
Visible: indicates the number of searchable satellites.

9.9 Mirror

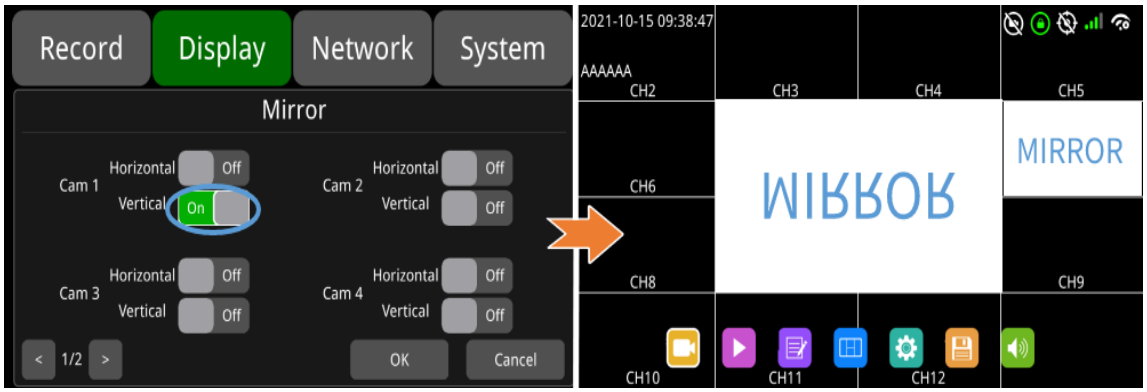
Horizontal and vertical flips of all channels are turned off by default.

Horizontal: when it is set to ON, the corresponding recording channel will flip horizontally; when it is set to OFF, no flip will be done.
The setting steps are show as follows



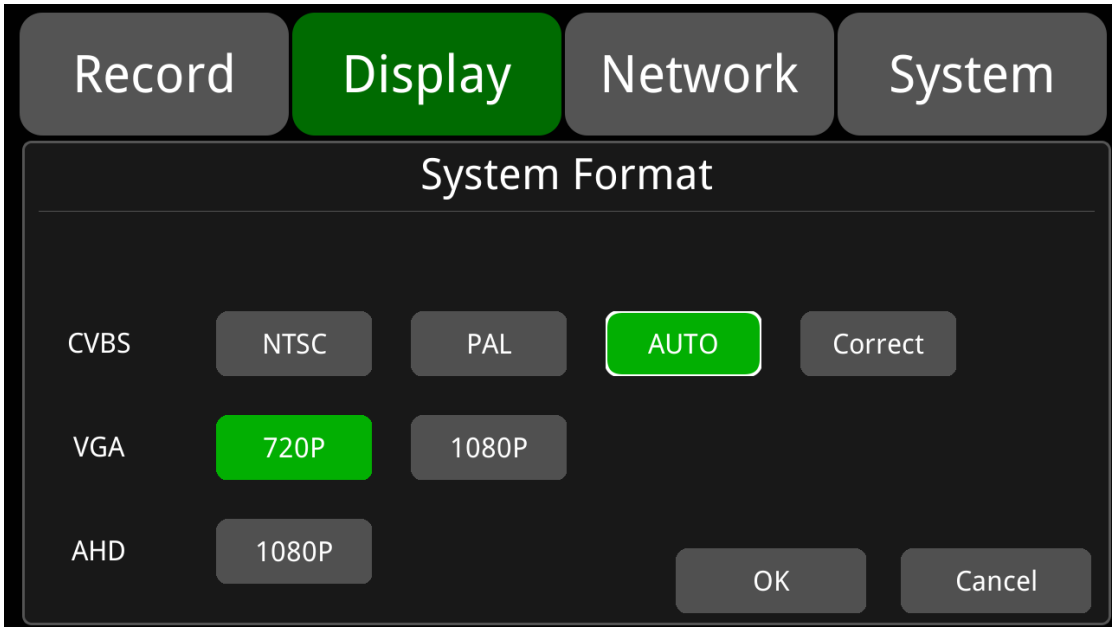


Vertical: when it is set to ON, the corresponding recording channel will flip vertically; when it is set to OFF, no vertical flip will be done.
The setting steps are show as follows.



9.10 System Format Setting

PAL



The default configuration is shown above.

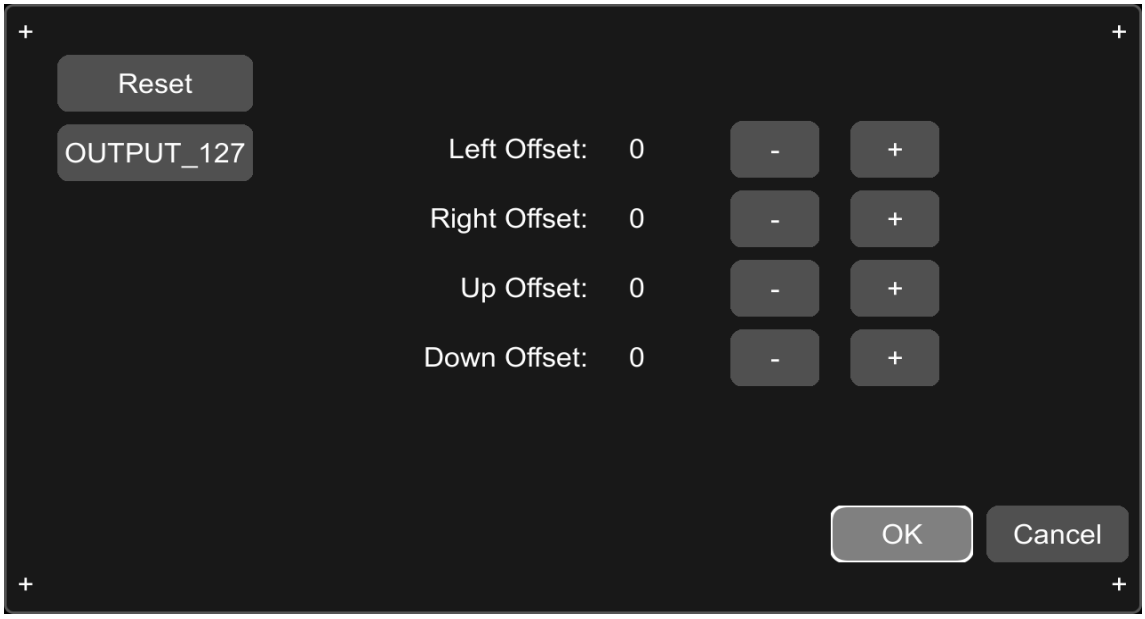
CVBS: Standard definition display.

VGA: HD display.

AHD： HD display

Note: CVBS/VGA can be displayed together, AHD cannot be displayed together with CVBS/VGA, and only one of them can be displayed.

Correct: When the interface of the standard definition display on the screen is not fully displayed, the display interface can be reduced. Each unit of reduction is two pixels, and the maximum can be reduced by 64 units. When the interface is reduced, the DVR can only be operated by the remote control.

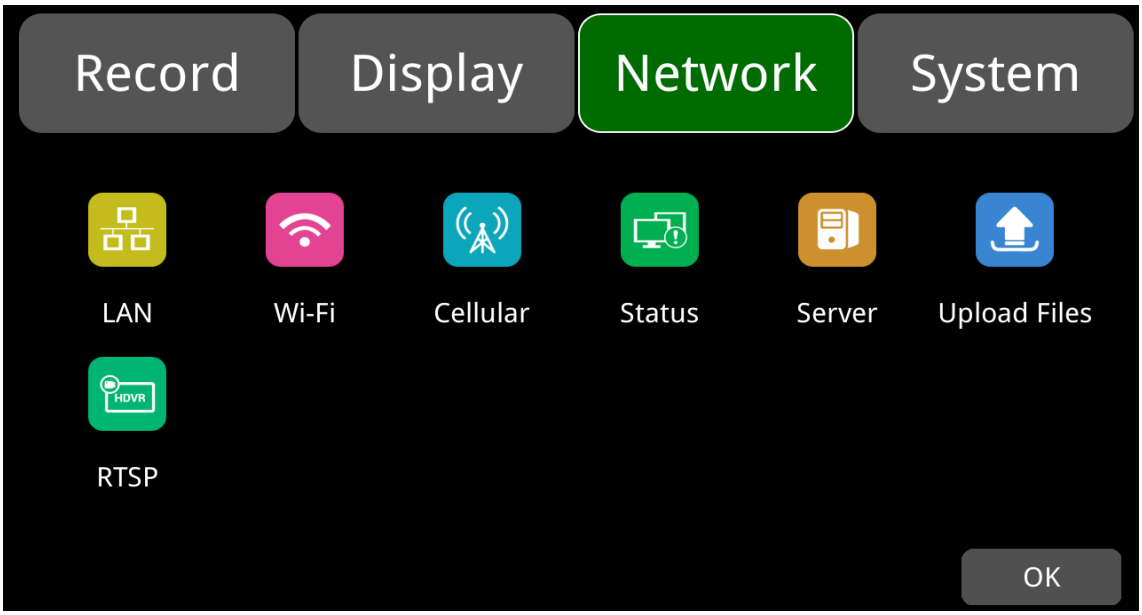


The default configuration is described in the following table.

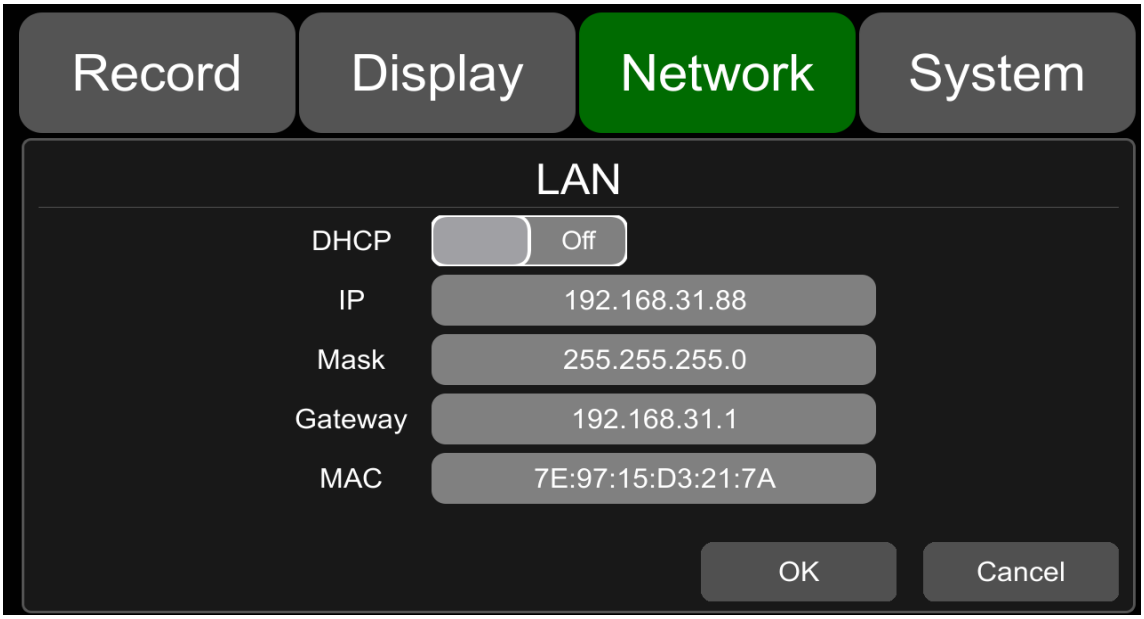
OUTPUT_127	Left Offset	Right Offset	Up Offset	Down Offset
Default	30	28	12	10

Correct	Min.	Max.	Default
Left Offset	0	64	0
Right Offset	0	64	0
Up Offset	0	64	0
Down Offset	0	64	0

10 Network



10.1 LAN and Server Setting



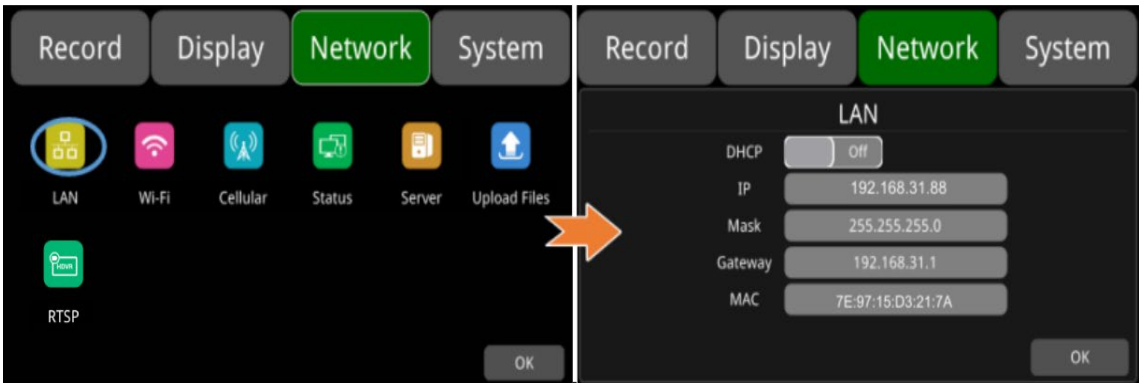
The default configuration is shown above.

- **DHCP**: Dynamic Host Configuration Protocol. Set On for dynamic IP and Off for static IP. Static IP must be manually input with IP address, mask and gateway. MAC address can be automatically assigned or revised.

- LAN connection

Step 1: Connect the LAN cable to the DVR.

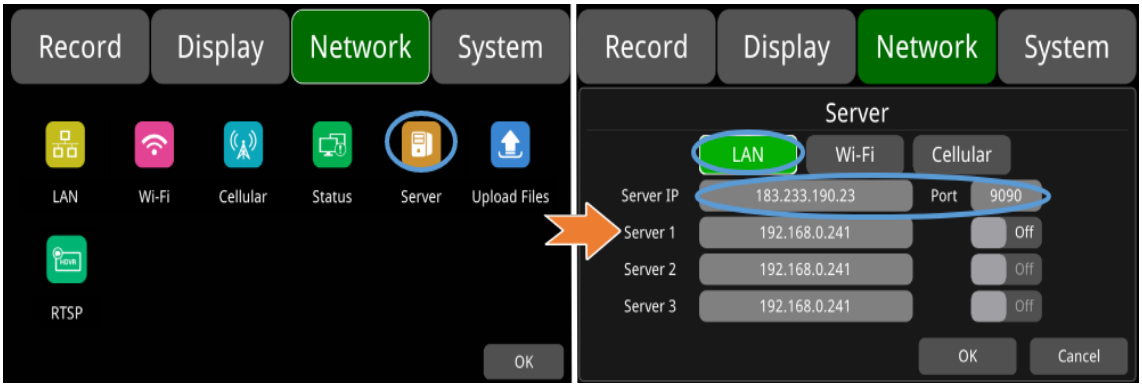
Step 2: Go to “Network - >LAN” page.



Step 3: If DHCP is set to ON, a dynamic IP will be automatically matched. If DHCP is set to Off, input the IP, mask, gateway and MAC manually.

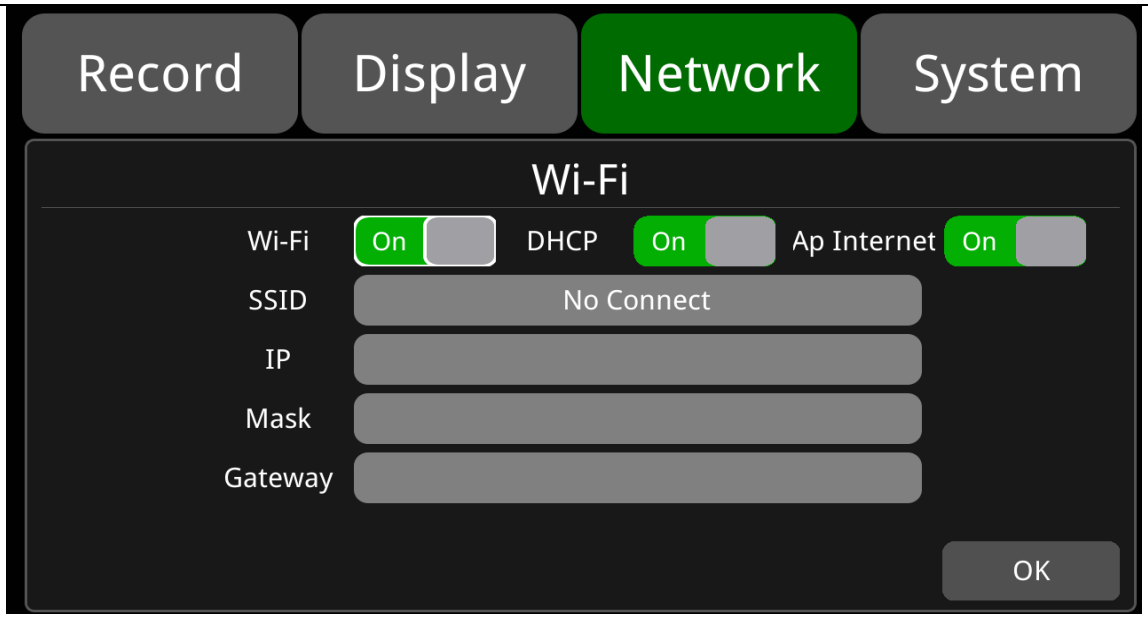
Step 4: Touch OK to exit.

Step 5: Go to “Network - Server” page and touch the LAN icon.



Step 6: Input LAN Server IP and Port. Touch OK to save the settings.

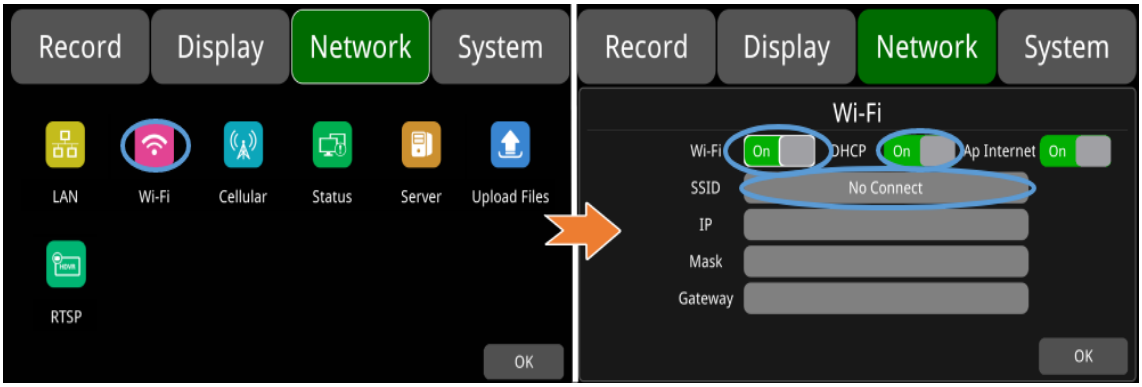
10.2 Wi-Fi Network Setup and Server Setup



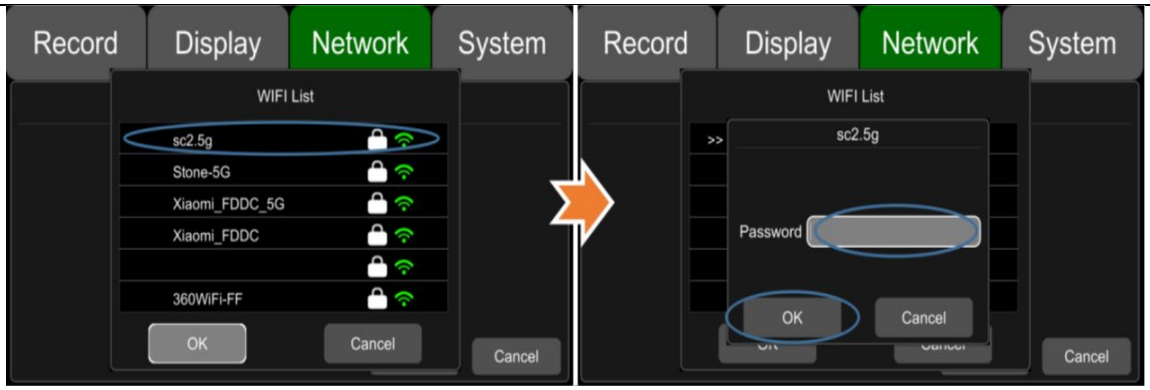
The default configuration is shown above.
Wi-Fi: ON/OFF
DHCP: Dynamic Host Configuration Protocol. Set On for dynamic IP and Off for static IP. Static IP must be manually input with IP address, mask and gateway.
SSID: Wi-Fi hotspot list.
AP Internet: The hotspot of the device can be found on mobile phones when it is On.

- Wi-Fi connection

Step 1: Make sure Wi-Fi hotspot is available.
Step 2: Connect the Wi-Fi antenna to connector ③ of the device rear panel.
Step 3: Go to Wi-Fi setup interface, set Wi-Fi to ON and DHCP to ON.

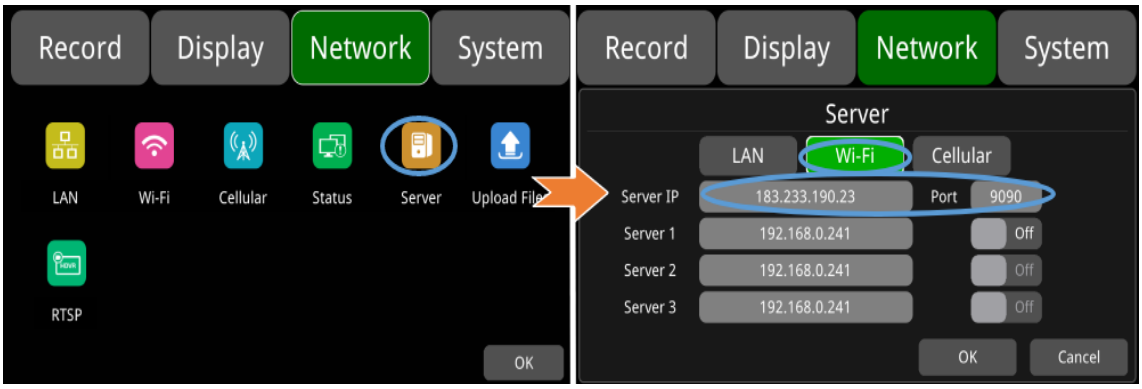


Step 4: Touch SSID sub-menu to select the hotspot and input the password.

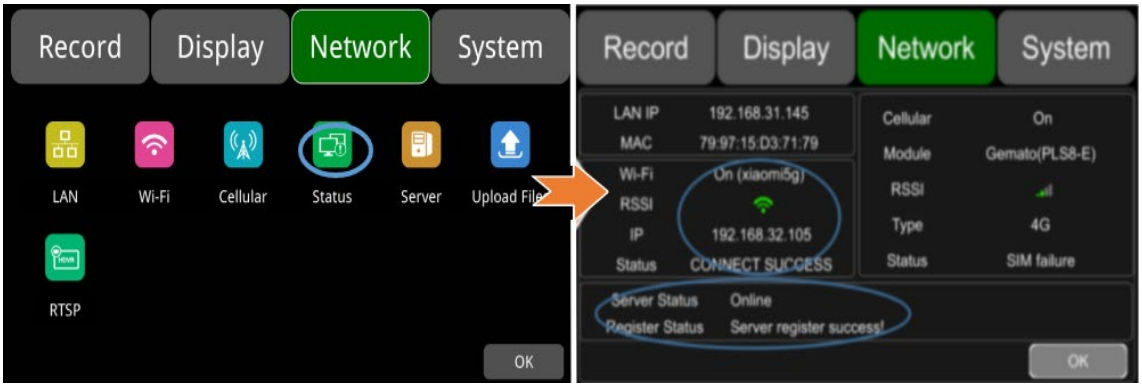


Step 5: Touch OK to exit.

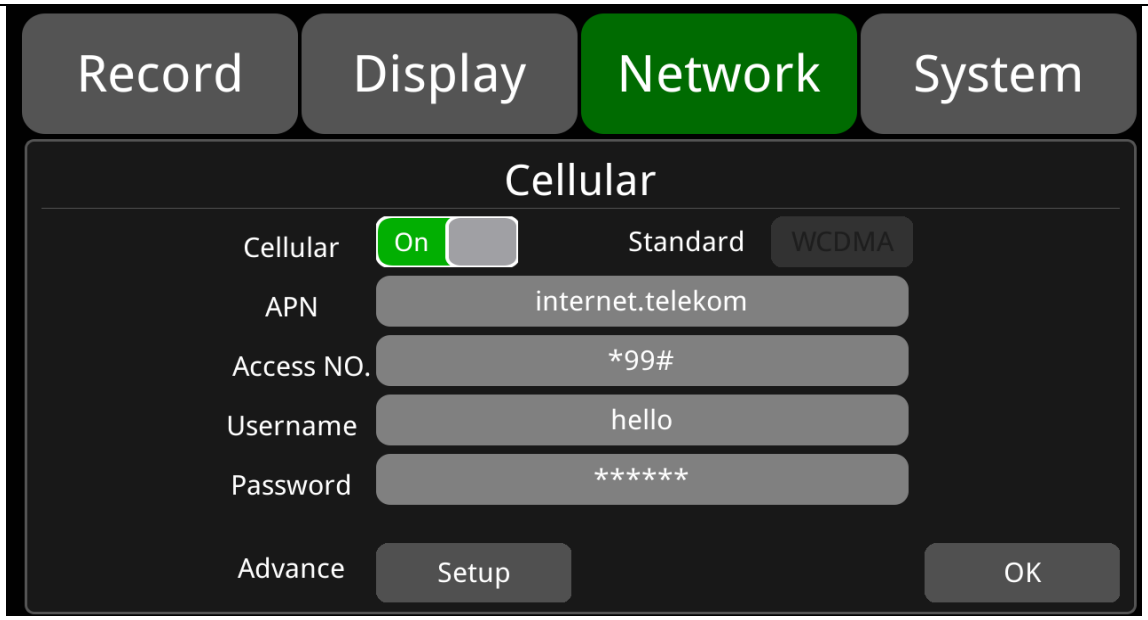
Step 6: Go to “Network -> Server” page to input Wi-Fi Server IP and Port. Touch OK to save the settings.



Step 7: Wi-Fi network status and server status can be checked on “Network - >Status”.



10.3 2G/3G/4G Control and Setup



The default configuration is shown above.

Cellular: Cellular is on, meaning that 2G/3G/4G is on.

APN & Access No.:Normally, the user doesn't need to input user name and password for APN and Access number,The default setting is available. If connection is not successful under the default settings, please consult your local network carrier.

OK: Save the settings and exit.

Cancel: Cancel the settings and exit.

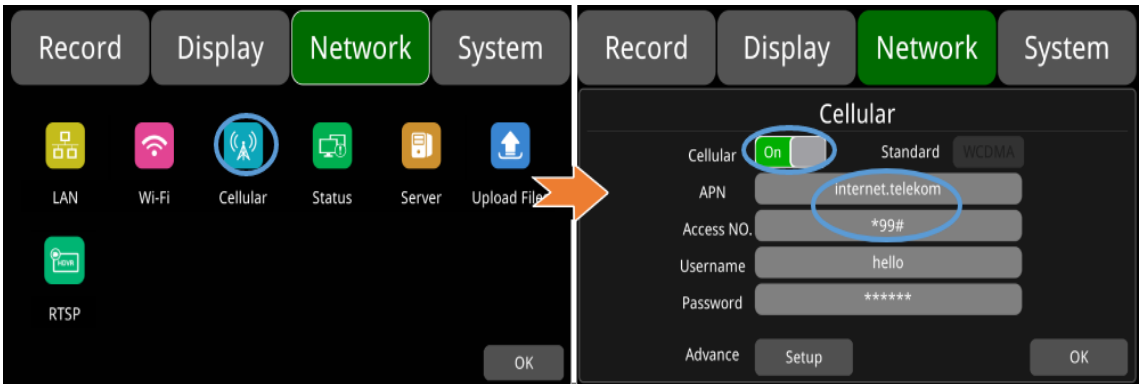
- 2G/3G/4G Connection

Step 1: DVR can search 2G/3G/4G signals locally.

Step 2: Connect the 2G/3G/4G antenna to connector ①&② of the device rear panel.

Step 3: Open the device front panel and insert the SIM card.

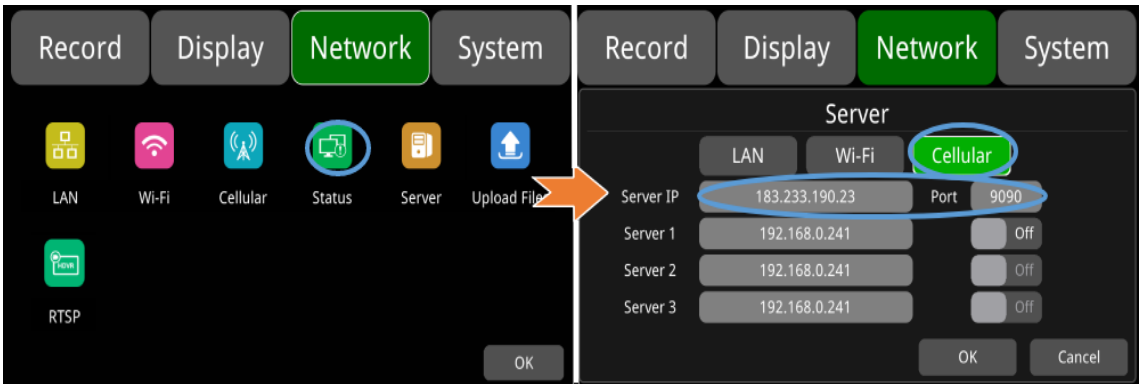
Step 4: Go to Cellular setup interface and set Cellular to ON.



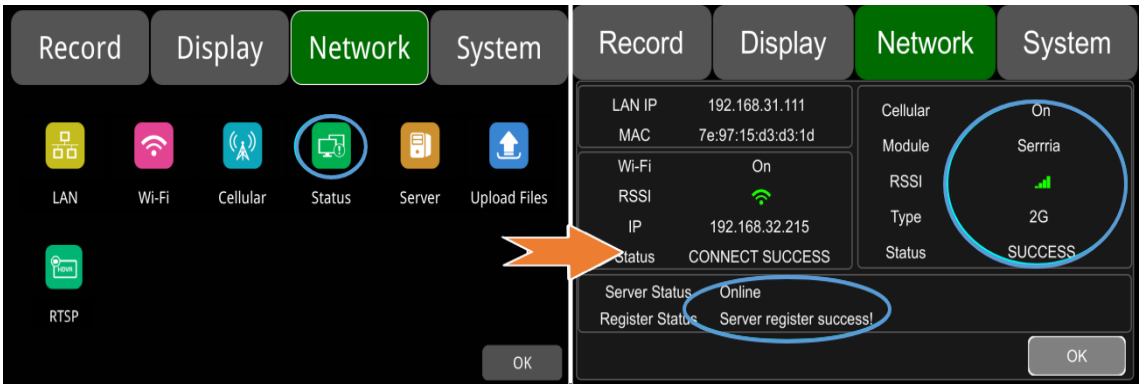
Step 5: Enter the correct APN.

Step 6: Touch OK to exit.

Step 7: Input the 2G/3G/4G Server IP and Port on “Network->Server”.



Step 8: Cellular network status and server status can be checked on “Network - >Status”.

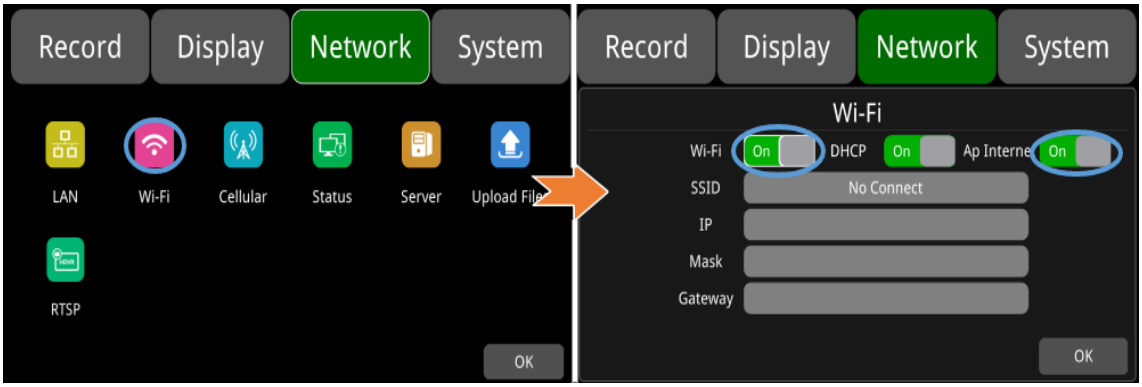


10.4 AP Internet Setup

- Steps To Connect AP Internet

Step 1: Connect the DVR to the internet through Wi-Fi or 2G/3G/4G. Please refer to Chapter 10.2 and 10.3 for connection.

Step 2: Set the “AP Internet” to ON.

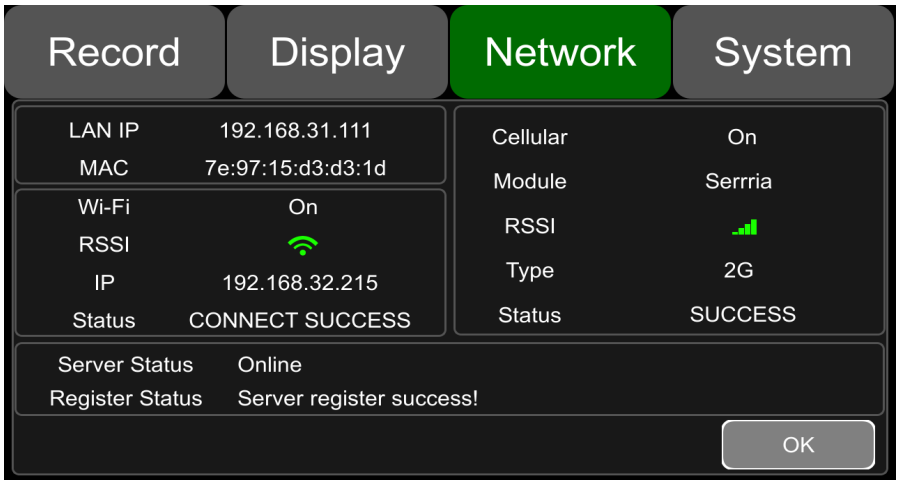


Step 3: Search and connect to the Wi-Fi hotspot of the DVR with other mobile devices. The SSID name of the hotspot is prefixed with “WFD-” and followed by the serial number of the device.“WFD-” default password is ap12345678.

Step 4: Enter the following IP address 192.168.100.140:8081 - In the login screen enter admin for username and 123 for the password. Live View will show. Click on the icons in the top right corner to enter setting screen.

10.5 Network Status

Network Status: LAN IP address, MAC address, Wi-Fi network status, Wi-Fi IP address, Wi-Fi signal strength, cellular network status, cellular signal strength and server status etc. can be checked.



LAN IP: The static IP set on “Network->LAN” page or the dynamic IP obtained automatically.

MAC: The static physical address set on Network-LAN page or the dynamic physical address obtained automatically.

Wi-Fi: Status indication.

Wi-Fi RSSI: Wi-Fi signal strength indication.

Wi-Fi IP: Static IP obtained from Network-Wi-Fi page or dynamic IP address.

Wi-Fi status: CONNECT SUCCESS or GET IP ERROR.

Cellular: Status indication.

Module: The Cellular module brand.

Cellular RSSI: 2G/3G/4G signal strength indication.

Cellular Type: 2G, 3G or 4G, indicating the actual signal received.

Cellular Status: please refer to the descriptions and indications below.

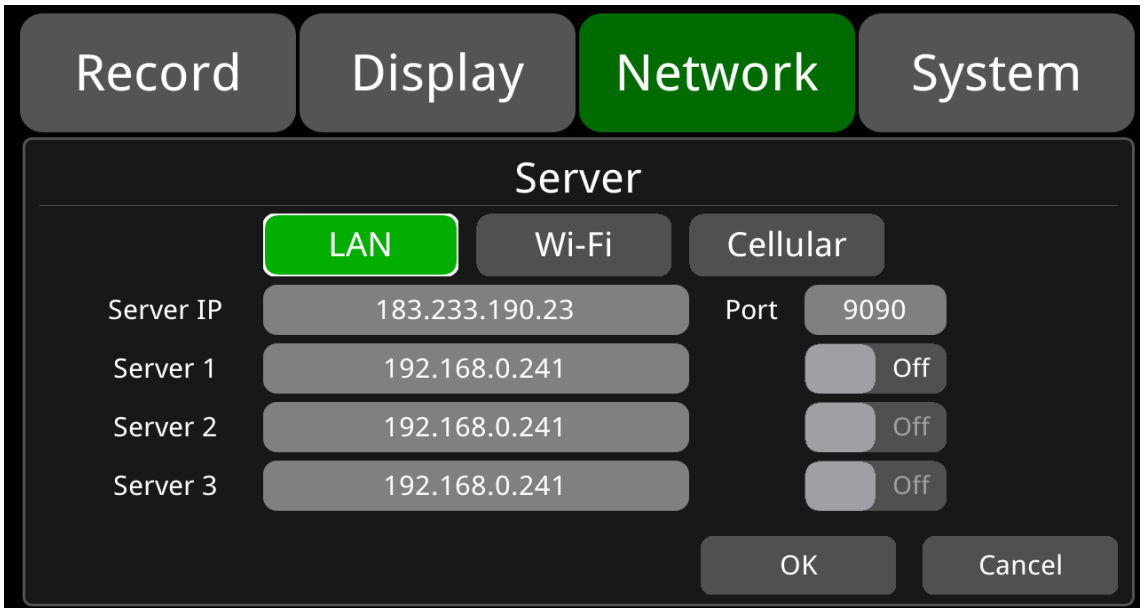
Description	Indication
Module initialization	Cellular module is initializing.
Module exception	Cellular module is in exception.
No SIM card	No SIM card is found in the DVR.
Cpin locked	Cpin is locked.
Signal abnormal	Signal is abnormal.
Networking failure	Network connection is failed.
SUCCESS	Network connection is successful.

Server Status: Online / Offline.

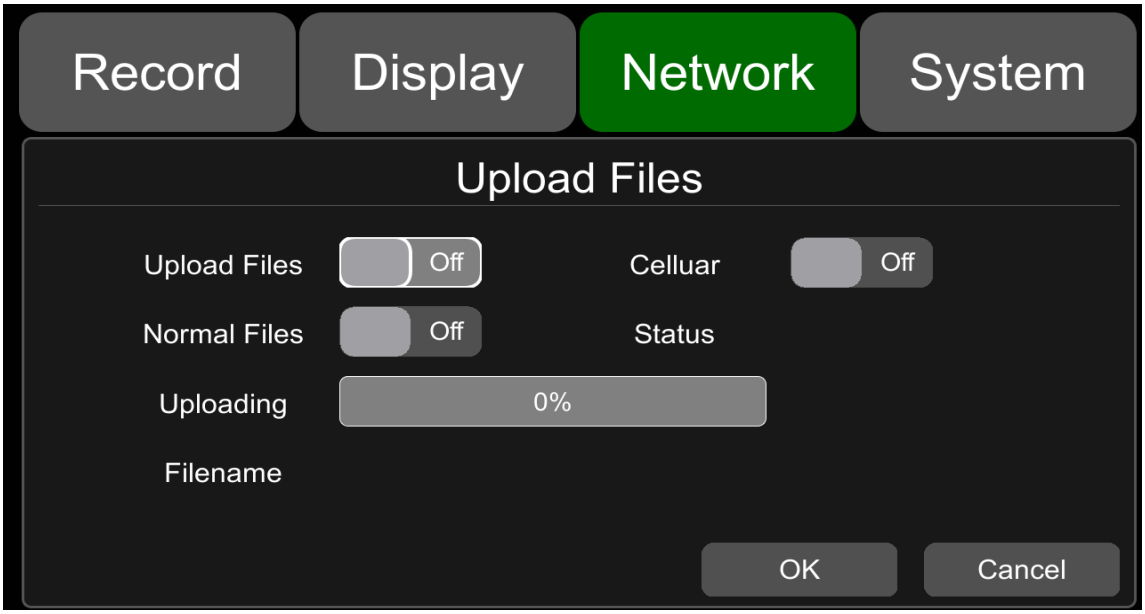
Register status: Reasons for failed server connection.

10.6 Server

The function of server setting is mentioned in Chapter 10.1, 10.2 and 10.3.LAN, The default server IP of LAN, Wi-Fi and Cellular are “183.233.190.23”, and the default port number is “9090”.



10.7 File Upload



“Upload Files” default configuration as shown above.

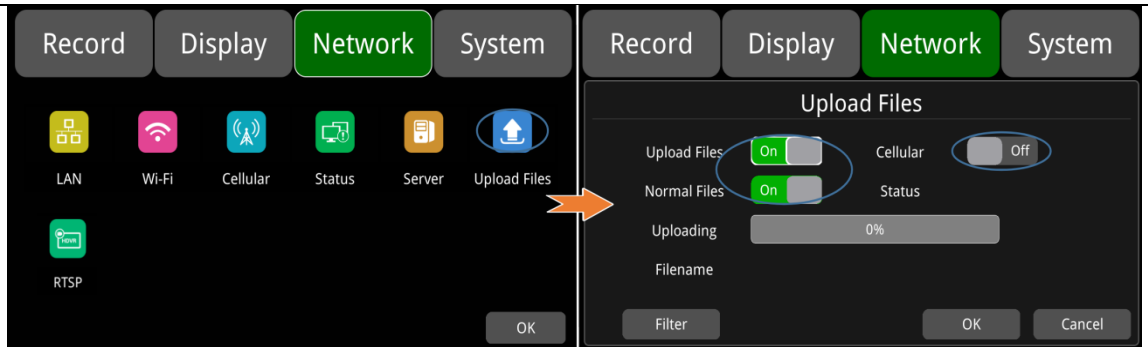
Upload Files: ON/OFF，when set to ON,as long as DVR triggers the alarm video file,the alarm video file will be uploaded to the server.When the value is set to OFF,DVR triggers the alarm video file and does not upload the alarm video file to the server.

Normal File: Two states, “OFF” and “ON”.

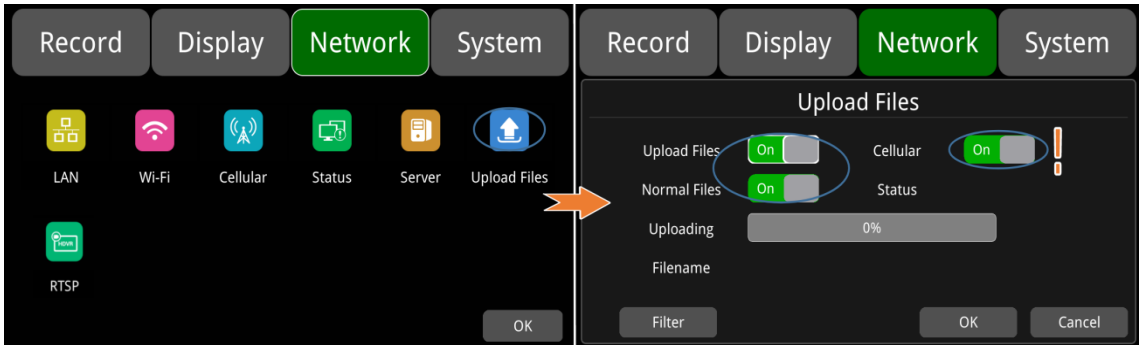
- OFF: Do not upload normal video files
- ON: Upload normal video files

Cellular: Two states,“OFF” and “ON”, When it is set to ON , as long as DVR triggers the alarm recording file and 2G/3G/4G is online, it will upload the alarm recording file to the server

- OFF: When using Cellular to connect to the server, it is not allowed to upload normal video files. For example, the setting in the figure below means that normal video files will only be uploaded when the server is connected to LAN or Wi-Fi. When Cellular is connected to the server, normal video files will not be uploaded.



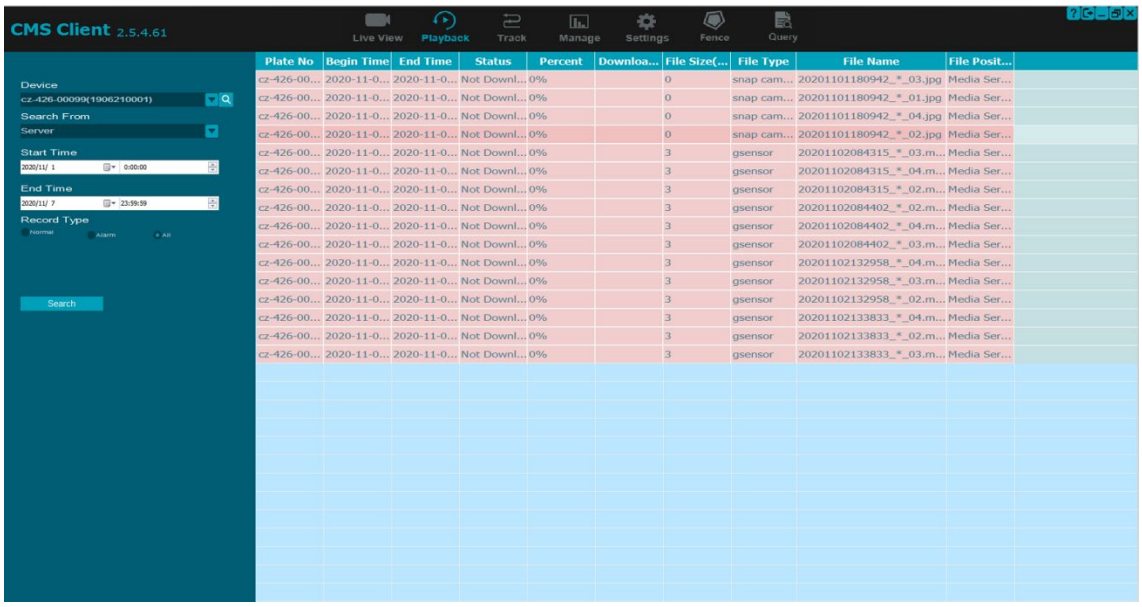
- ON: When using Cellular to connect to the server, uploading files is allowed. When the switch is turned on, a pop-up box will prompt "Network flow consuming, continue?" Click “OK” to confirm the opening, but after this feature is turned on, once Cellular connects to the server, it will upload the video file, which will consume a lot of cellular flow. So in order to save cellular flow, please set to “OFF”.
-



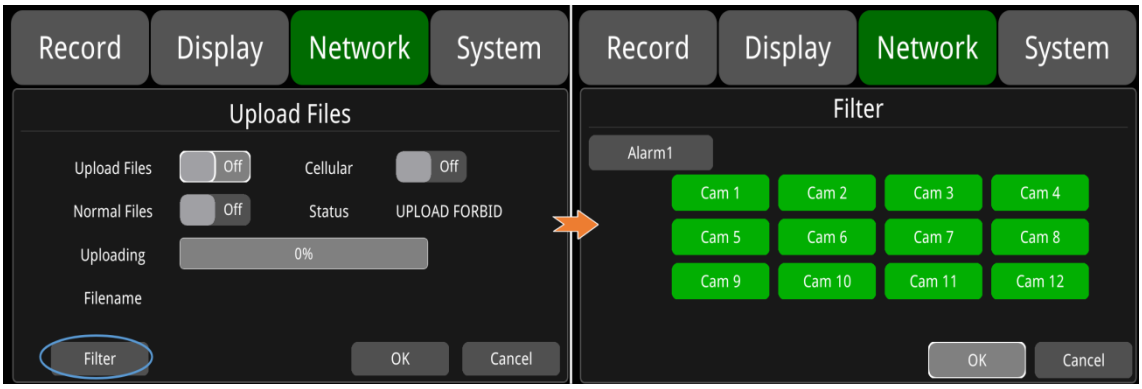
Uploading: Show progress bar of uploaded video file

Filename: Display the file name of the uploaded video file

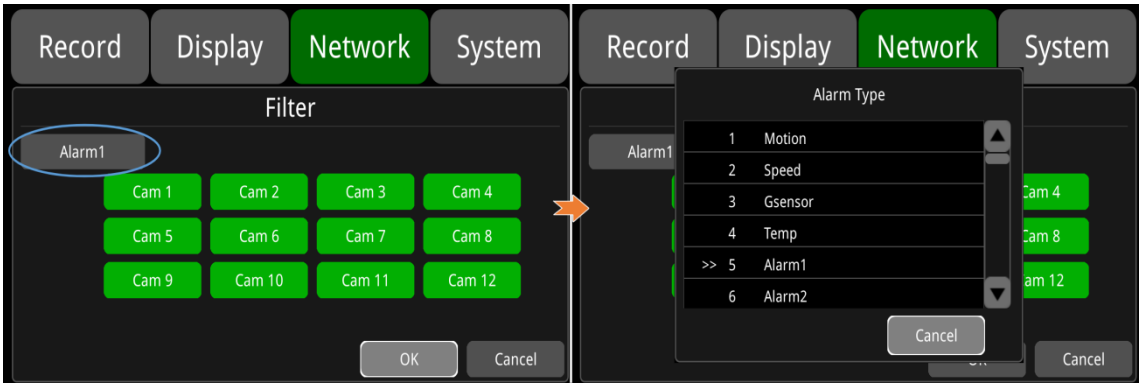
Status: Display the working status of FTP. Successfully uploaded video files can be found in the client interface below.



Filter: Alarm video type and upload channel selection, the default configuration is as follows.



Click the Alarm1 to select different alarm type settings, as shown below.

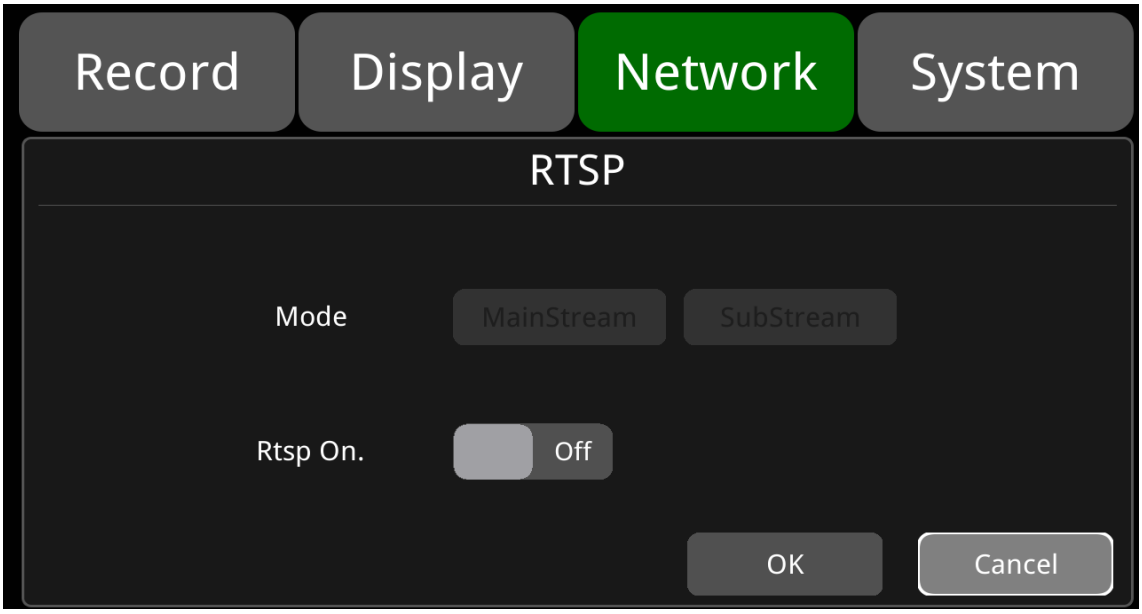


Alarm filter type:

Motion	Motion detection alarm	Speed	Overspeed alarm (velocity source: GPS)
Gsensor	G-Sensor alarm	Temp	Temperature alarm
Alarm1	Alarm 1 alarm	Alarm2	Alarm 2 alarm
Alarm3	Alarm 3 alarm	Alarm4	Alarm 4 alarm
Alarm5	Reverse alarm	Alarm6	Brake alarm
Alarm7	Alarm 7 alarm	Alarm8	Alarm 8 alarm
Button	Panic button alarm	Rfid	Rfid abnormity alarm
AccLe	Acceleration alarm	DeceLe	Deceleration alarm
AccTurn	Turning acceleration alarm	GyrTurn	Turning angular velocity alarm
Impact	Collision alarm	GyrTurnLeft	Turn left alarm
GyrTurnRight	Turn right alarm	GyrClipFile	Active clip alarm
Button1	Panic button 1 alarm	Button2	Panic button 2 alarm
Button3	Panic button 3 alarm	Button4	Panic button 4 alarm
Button5	Panic button 5 alarm	Button6	Panic button 6 alarm
Button7	Panic button 7 alarm	Button8	Panic button 8 alarm
Fatigue	Fatigue alarm	Distraction	Distraction alarm
NoDriver	No driver alarm	Smoking	Smoking alarm
Calling	Calling alarm	PasserBy	Pedestrian detection warning
Crash	Forward collision warning	Skewing	Lane departure warning
OverSpeed	Overspeed alarm (velocity source: ADAS)	Snapacm	Screenshot alarm
Radar	Radar alarm	Rfid ERR	Abnormal swiping alarm
Rfid Sameid	Abnormal card number alarm	Rfid Sum	Inconsistent passenger number alarm
Rm mem	Card off alarm	Yawn	Yawn alarm
FaceFail	Face recongniton failure alarm	No Mask	No mask alarm
Fatigue2	Second-time fatigue alarm	Over Temp	High temperature alarm
Less Temp	Low temperature alarm	OverReco Temp	High temperature recovery alarm
LessReco Temp	Low temperature recovery alarm	OpenDoor	Open door alarm
CloseDoor	Close door alarm	SABOTAGE	Sabotage alarm
BsdPasserby1	Channel 1 pedestrian detection alarm	BsdPasserby2	Channel 2 pedestrian detection alarm

BsdPasserby3	Channel 3 pedestrian detection alarm	BsdPasserby4	Channel 4 pedestrian detection alarm

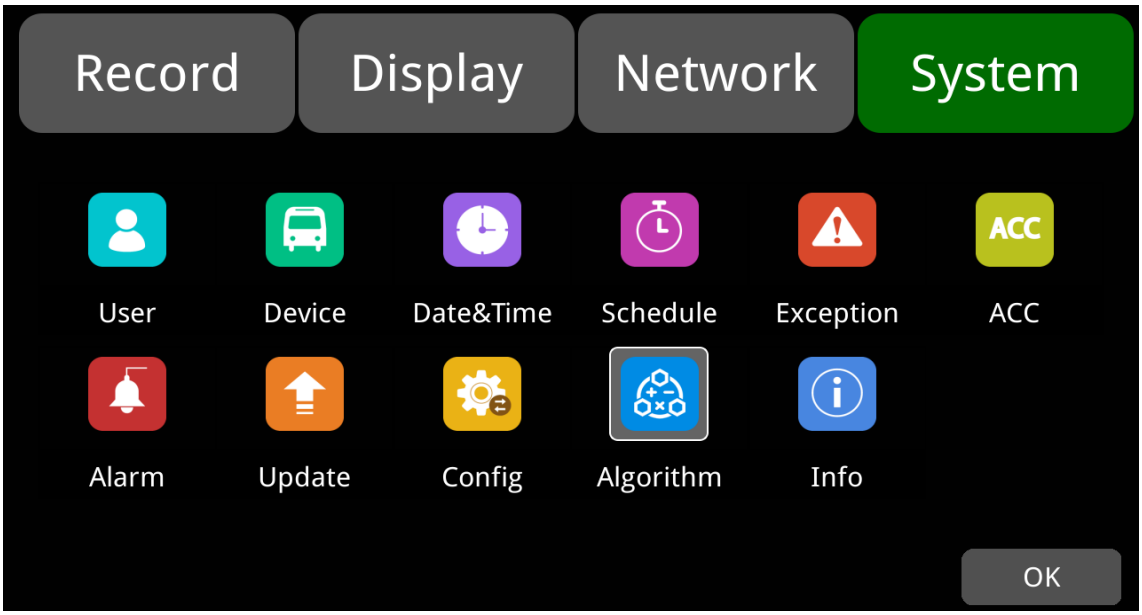
10.8 RTSP Streaming



The default configuration is shown above.

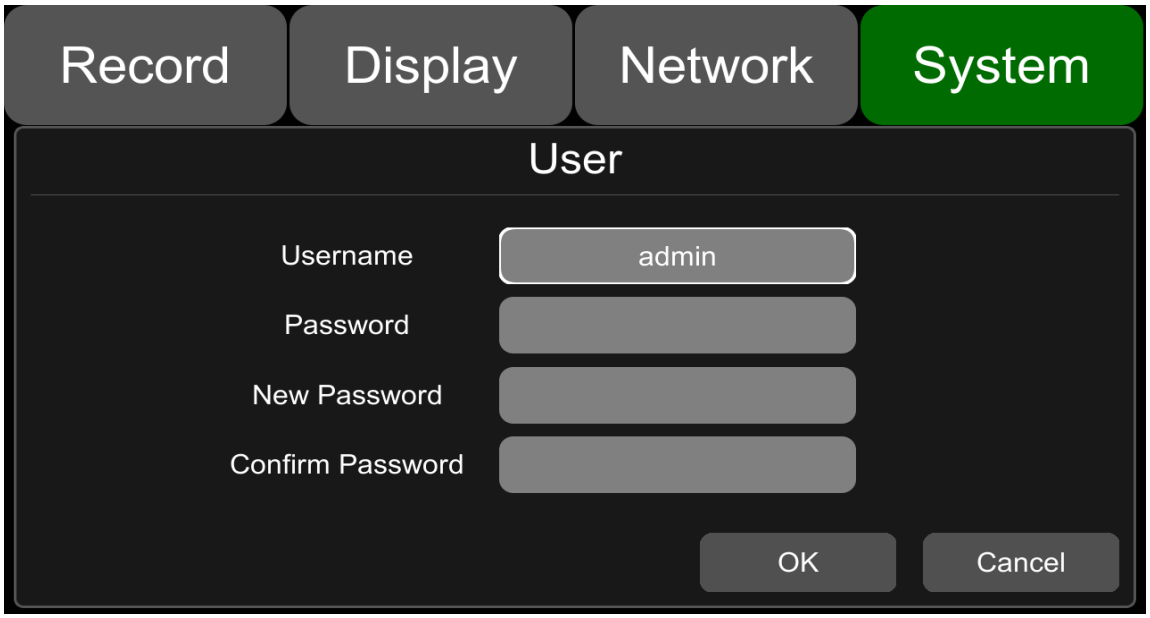
- **RTSP On**: Set RTSP on /off.
- **Mode**: Set MainStream & SubStream on/off.
- mode on/off Instructions: Set RTSP On, make sure the streaming device and DVR are under the same local area network, images can be displayed by using DVR's own hotspot AP. Or turn on RTSP On, connect the DVR and the device to the same route (Note: 192.168.100.140 is the fixed IP address of DVR's AP hotspot), open the network stream of the pull-streaming device, enter the streaming address under the network URL, 4 main-streams + 4 sub-streams, a total of 8 push-streams the formats are as follows:
  main-stream: rtsp://Ip Address/cam1/mainstream.
  sub-stream: rtsp://Ip Addr/cam1/substream.

11 System



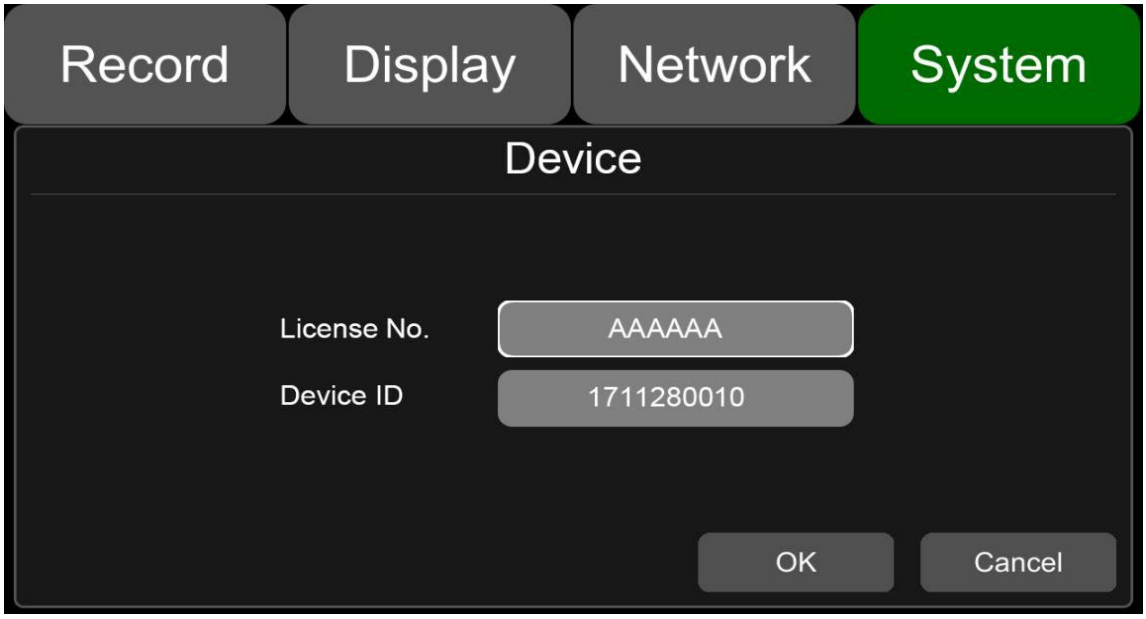
11.1 Log in Setup

Set user name and password for booting up. The initial password is 123.



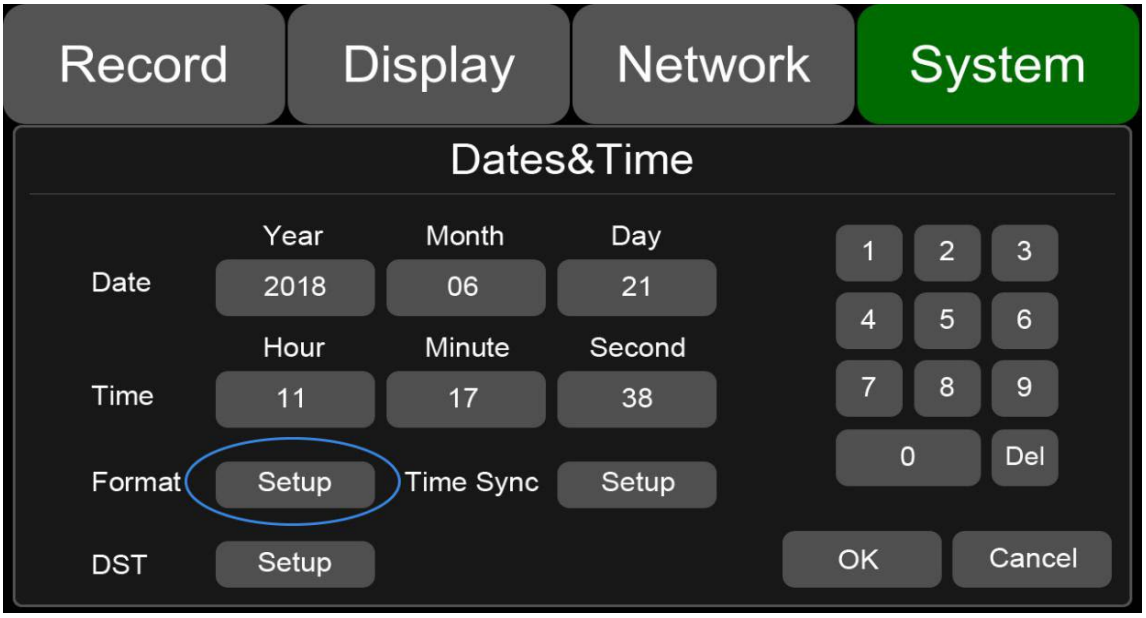
11.2 License Plate Number Setup

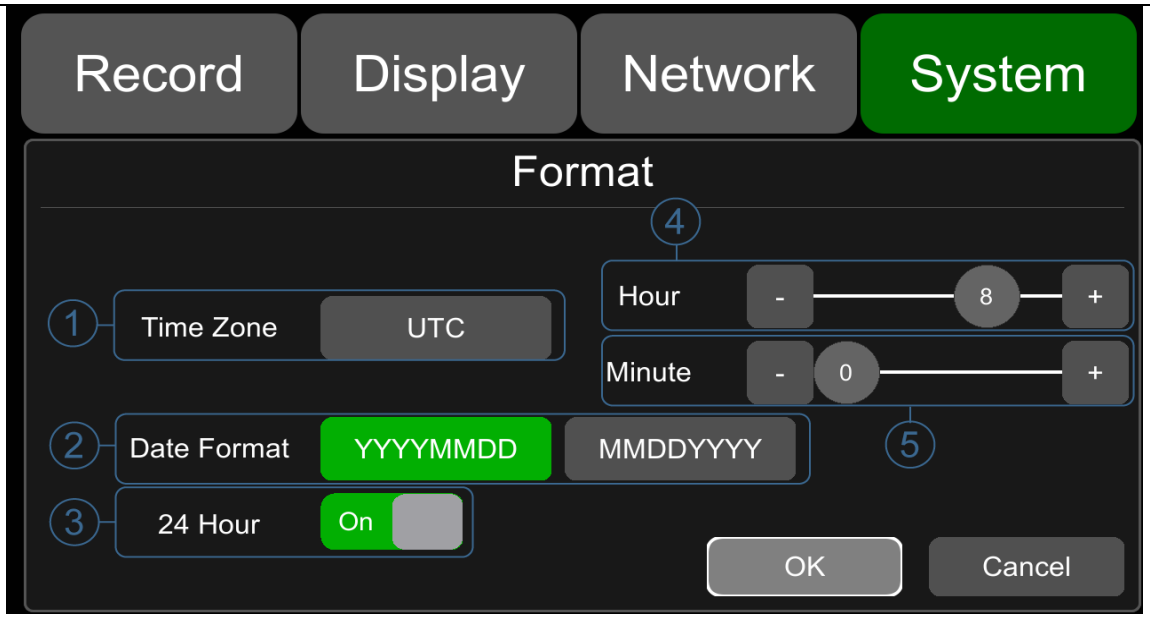
Input license plate number. The default configuration is shown below.



11.3 System Time Setup

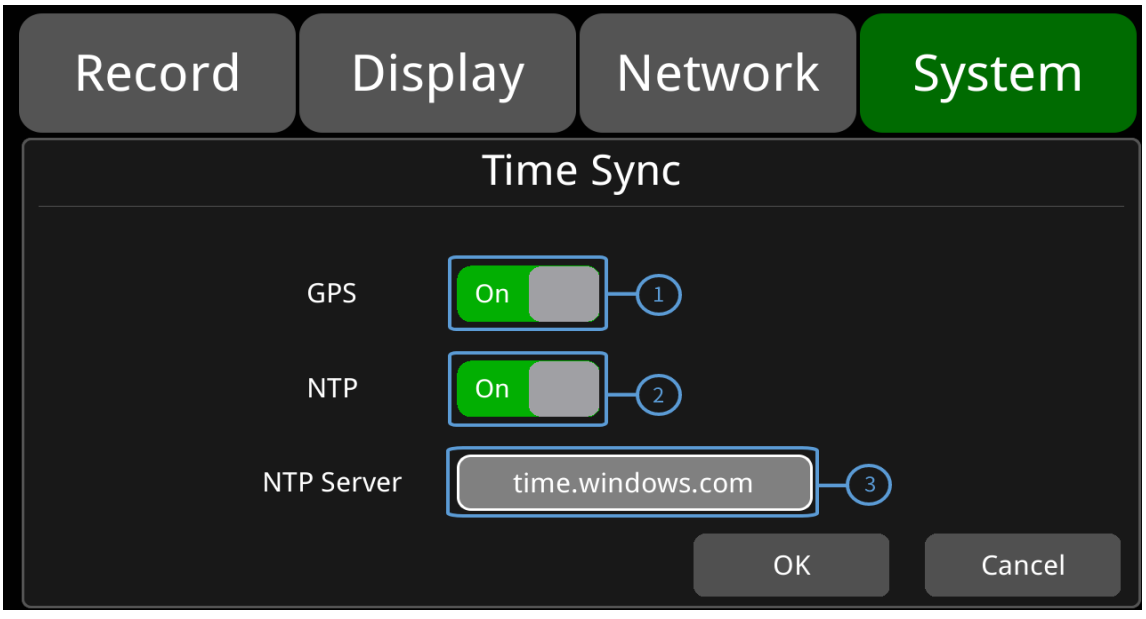
Format Setup: System time format setting





"Format" default configuration as shown above.
Go to “System – >Date &Time - >Format->Setup” page.
① Time Zone: Time zone setting.
② Date Format: Set the date format (year/month/date or month/day/year.
③ 24 Hour: If it is ON, time format will be displayed in 24-hour system. If OFF, time format will be displayed in 12-hour system.
④ & ⑤ Hour & Minute:Time zone setting accurate to minute.

Hour & Minute	Min.	Max.	Default
Hour	-12	14	8
Minute	0	59	0



"Time Sync" default configuration as shown above.

Time Snyc Setup:

Go to “System -> Date &Time ->Time Sync->Setup” page.

① GPS: Set GPS to ON/OFF.

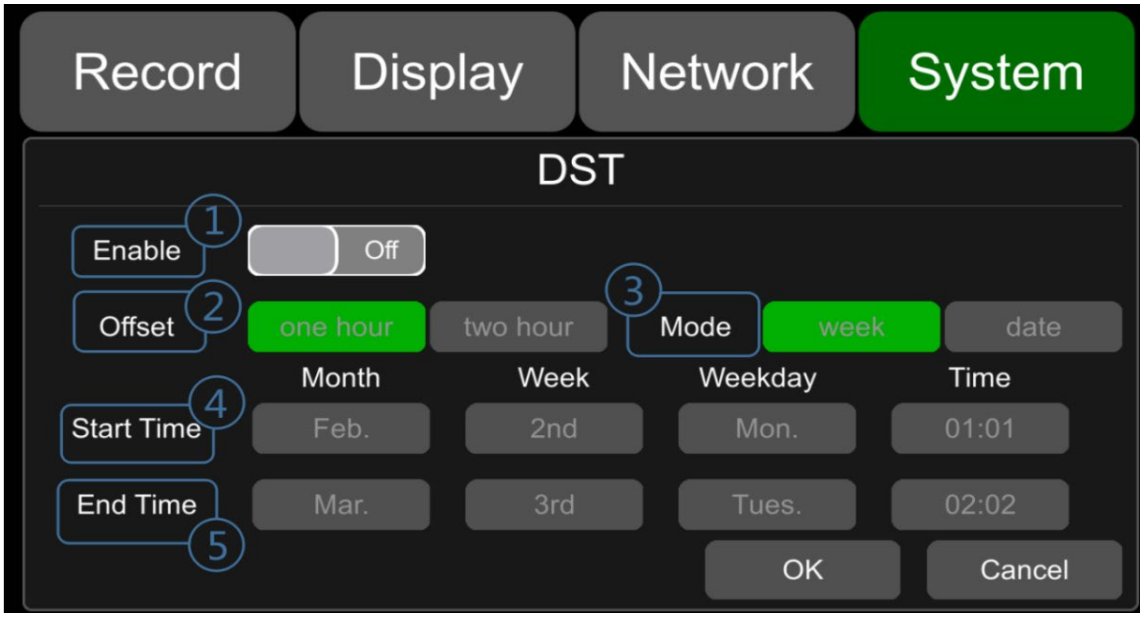
② NTP: Set NTP to ON/OFF.

③ NTP Server: Show the URL of the NTP Server.

Application scene	usage
GPS:Off and NTP:Off	Set the time zone and daylight saving time first, then set the date and time
GPS:On or NTP:On	Time zone and daylight saving time must be set, no need to set date and time

Note：when“Time Sync”->“GPS”or “Time Sync”->“NTP”is ON，the time zone and daylight saving time must be set; if the time zone is not set, GPS and NTP will change the system time to the default East 8 zone time, resulting in abnormal device time.

DST Setup:



“DST” default configuration as shown above.

Go to “System -> Date &Time -> DST-Setup” page.

① **Enable**: Set DST setting to ON/OFF.

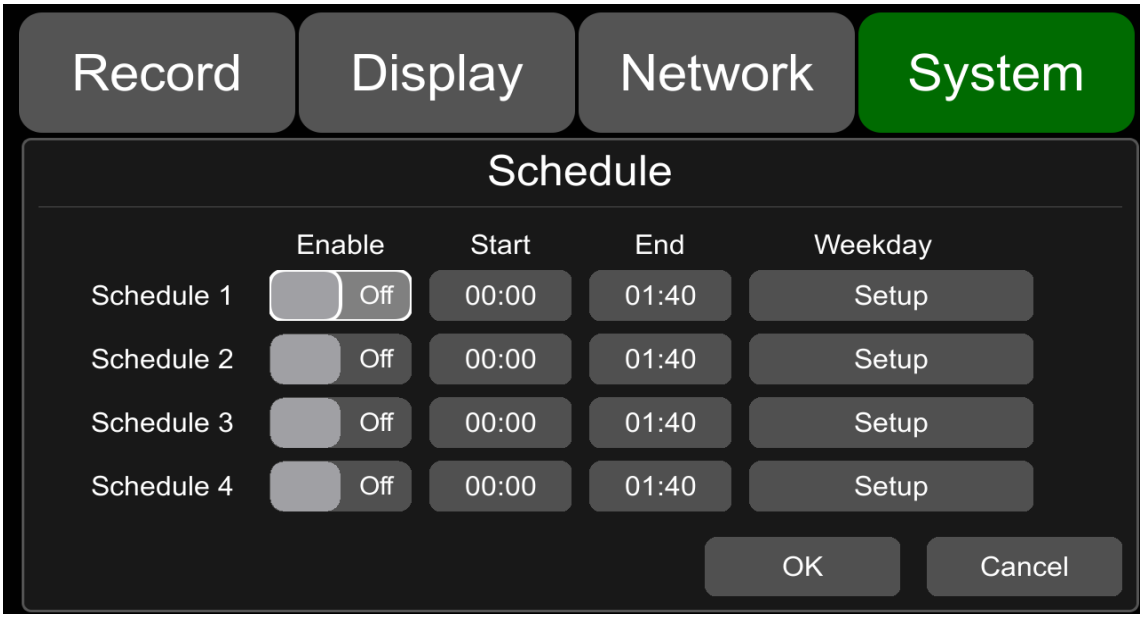
② **Offset**: Adjust the offset after enabling DST.

③ **Mode**: Select the mode of DST (setup DST according to week or date).

④ **Star**t: Set start time of DST.

⑤ **End**: Set end time of DST.

11.4 Scheduled Recording



The default configuration is shown above.

Enable: Set scheduled recording ON/OFF.

Start: Set start time of scheduled recording.

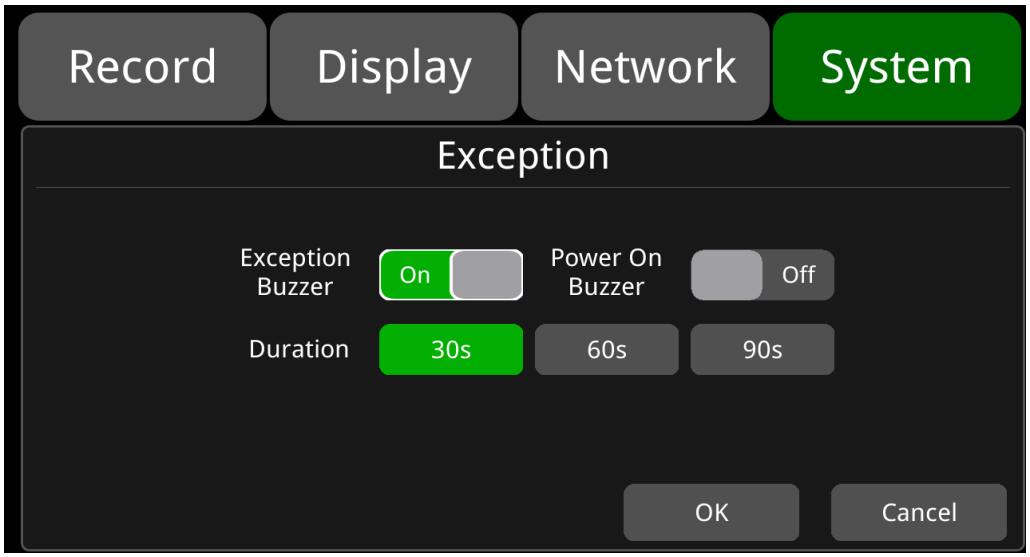
End: Set end time of scheduled recording.

Weekday: Set scheduled recording by weekdays. Select the weekdays to set preset.

Scheduled Recording:

- Support up to four appointed tasks. The recording duration is counted in minutes.
- Recording time can overlap.
- The start time of scheduled recording must be set ahead of the end time.

11.5 Exception



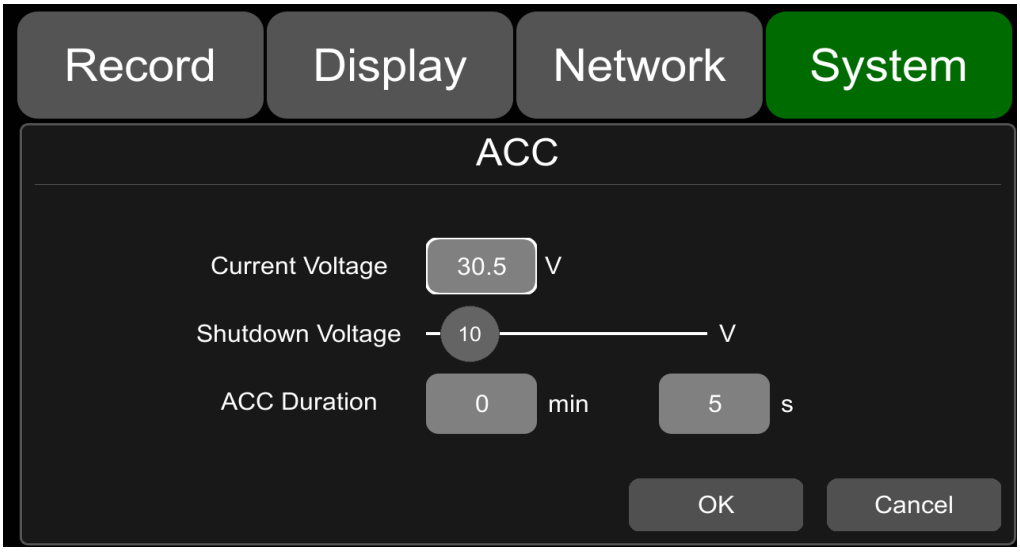
The default configuration is shown above.

Exception Buzzer: Set the exception buzzer to ON/OFF.

Power On Buzzer: Turn on the buzzer can be set to ON/OFF

Duration: Set the duration time of the buzzer.

11.6 ACC Settings



The default configuration of "Shutdown Voltage" and "ACC Duration" is shown above.

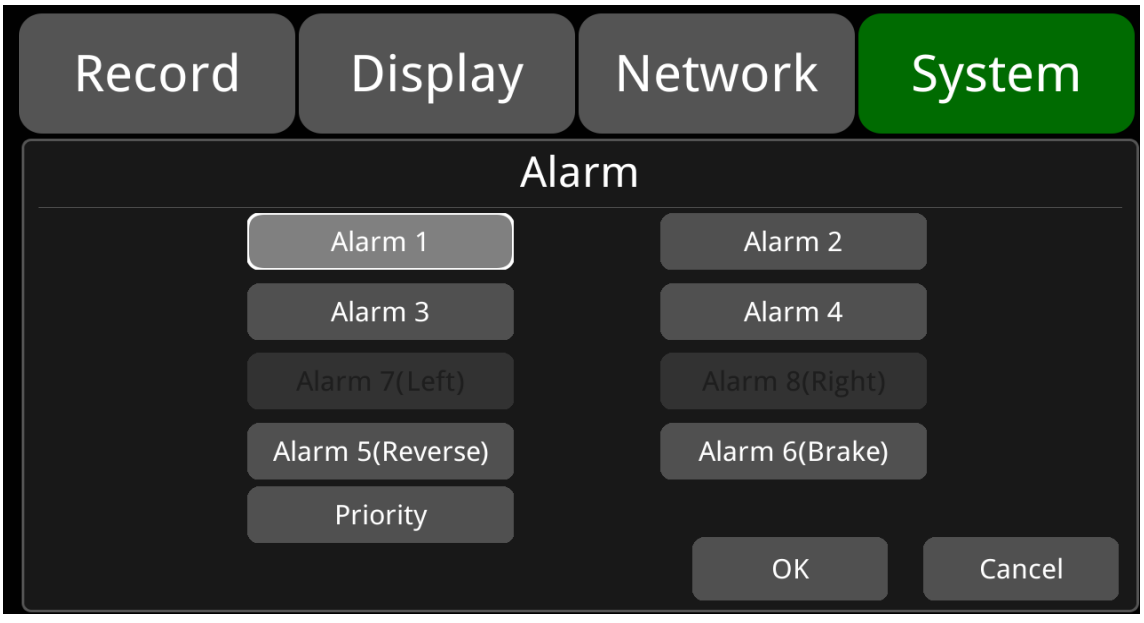
Current voltage: Voltage of the working DVR.

Shutdown voltage: When the current or voltage is lower than the shutdown voltage, the device will shut down automatically. When the current or voltage is higher than the shutdown voltage, the device would work properly. When the current or voltage is lower than shutdown voltage and the device is shut down, users could disconnect the VCC of the device for one minute, then the device will come back to work for one minute. During this time users can change the value of shutdown voltage.

ACC Duration: The device will continue recording for a few seconds after ACC is disconnected. ACC delay time can be set to be 5s to 60min.

ACC	Min.	Max.	Default
Shutdown Voltage(V)	9	24	10
ACC Duration(s)	5	360	5

11.7 Alarm Information Setting



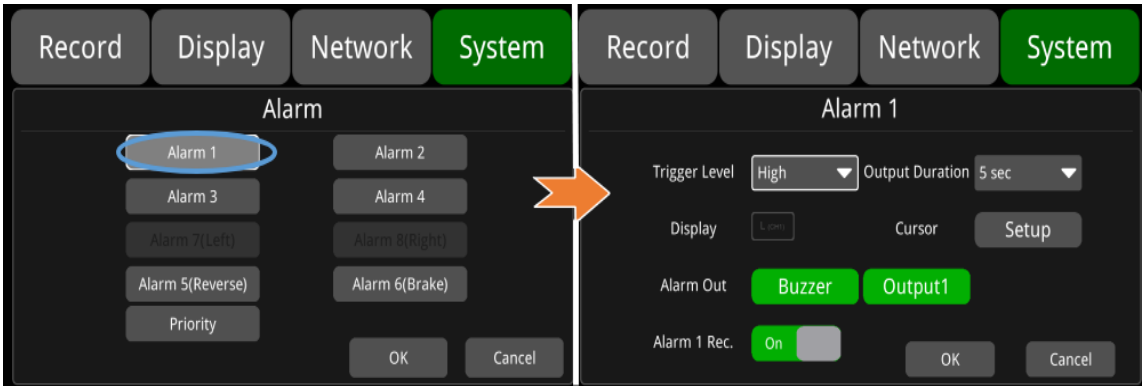
Alarm 1~Alarm 4: Customized alarm recording.

Reverse: Reversing alarm recording. .

Brake: Brake alarm recording.

Priority: Set priorities for Alarm1~Alarm4, Reverse, Brake.

When different types of alarm are triggered at the same time, alarms with the highest priority will be triggered.



“Alarm 1” default configuration as shown above.

Trigger Level: There are 3 options of Trigger Level. The options “Low” and “High” are used for turning on alarm function. “Low” is generally used for debugging while “High” will be selected to turn on alarm function for on-road use. “Off” means turning off alarm trigger function.

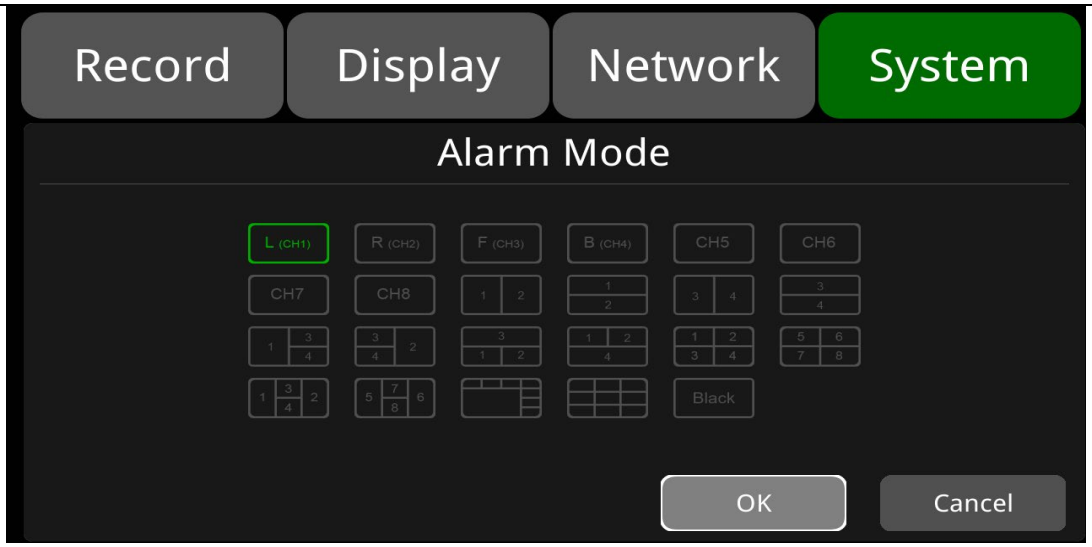
Output Duration: "Display" "Curser" "Alarm Out" effect duration. Output Duration the options are 0sec，5sec，10sec，30sec，60sec，5min，10min，30min，60min，Always.

Alarm Out-Buzzer: Switch ON or OFF of the Alarm Out-Buzzer. The default buzzer sounds for 5 seconds.

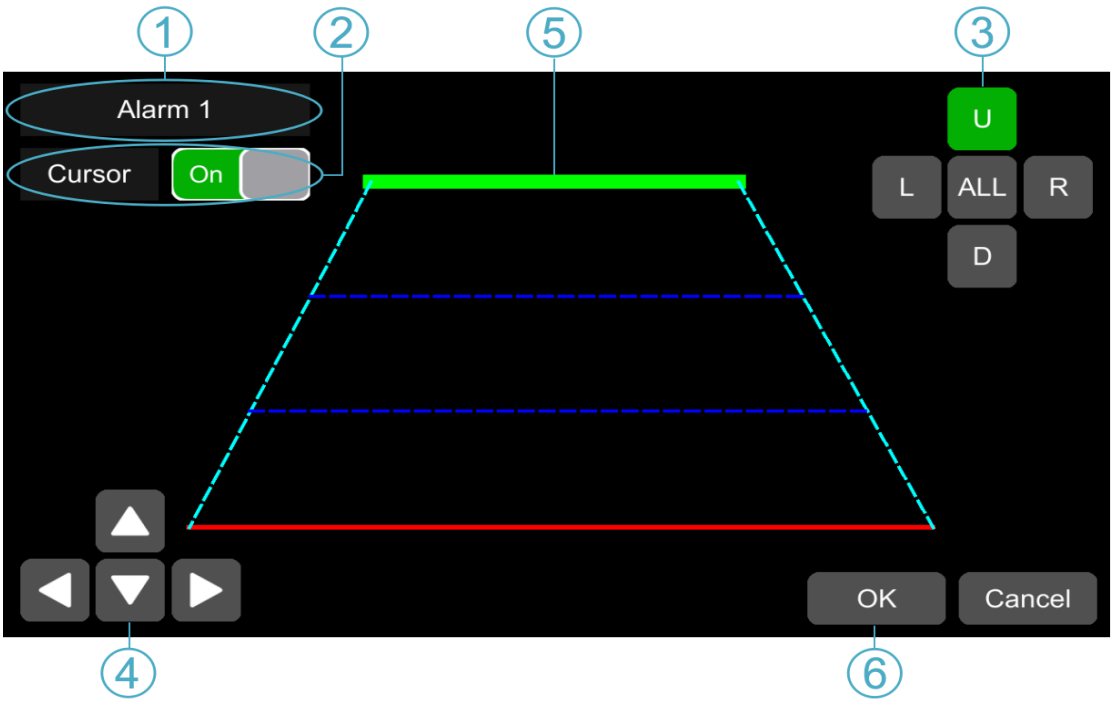
Alarm Out-Output1: Set it ON, then 12V level output would come from the alarm wire of Output 1.

Alarm 1 Rec.: Alarm 1 event recording switch, the recording duration is set in [System]-> [Record]-> [Event Duration].

Display: When the alarm is triggered, the selected split mode will be displayed; the available split modes are shown in the figure below.



Cursor (Reverse Guidelines) ： It is “OFF” by default. The picture below shows the open state.



① Camera name of the alarm-triggered channel.

Touch this button to turn on/off cursor. **(Reverse Guidelines)**

② Line selecting: There are five lines to be selected. Line U (up), Line D (down), Line L (left), Line R (right) and ALL. The button turns green if selected. You can use remote control to operate.

③ There are four directions to adjust the shape of the cursor, Up, Down, Left and Right.

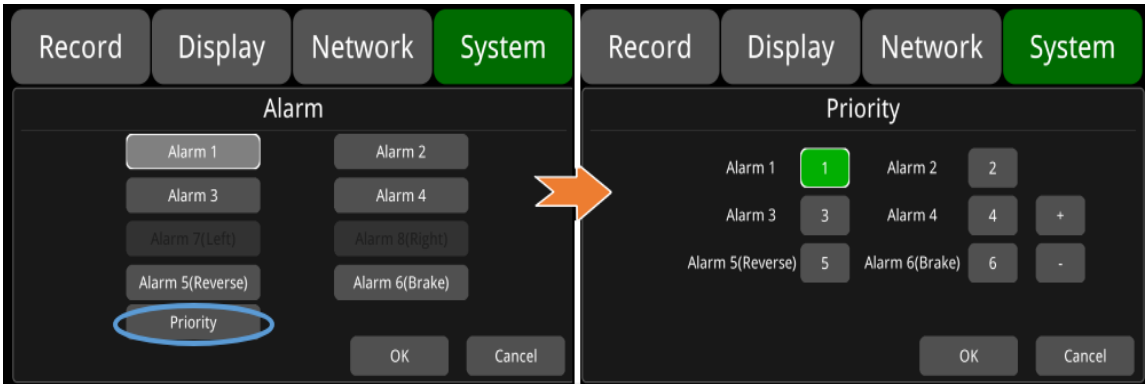
If Line U (the green one) or Line D (the red one) is selected, the selected line can be moved with these directions.

If Line L or Line R is selected, the top point of the selected line can be moved to left or right with Direction Up and Direction Down, and the bottom point of the selected line can be moved to left or right with Direction Left and Direction Right.

④ Lines of cursor. The selected one will be thickened for three times. The two lines in the middle will not be processed.

⑤ Touch OK to save the settings and exit. Cancel to exit without saving any settings.

Priority: The default configuration is shown below.



: Press this button, then the priority value of the selected alarm will be added by 1. The bigger the value is, the lower the priority will be.

: Press this button, then the priority value of the selected alarm will be reduced by 1. The smaller the value is, the higher the priority will be.

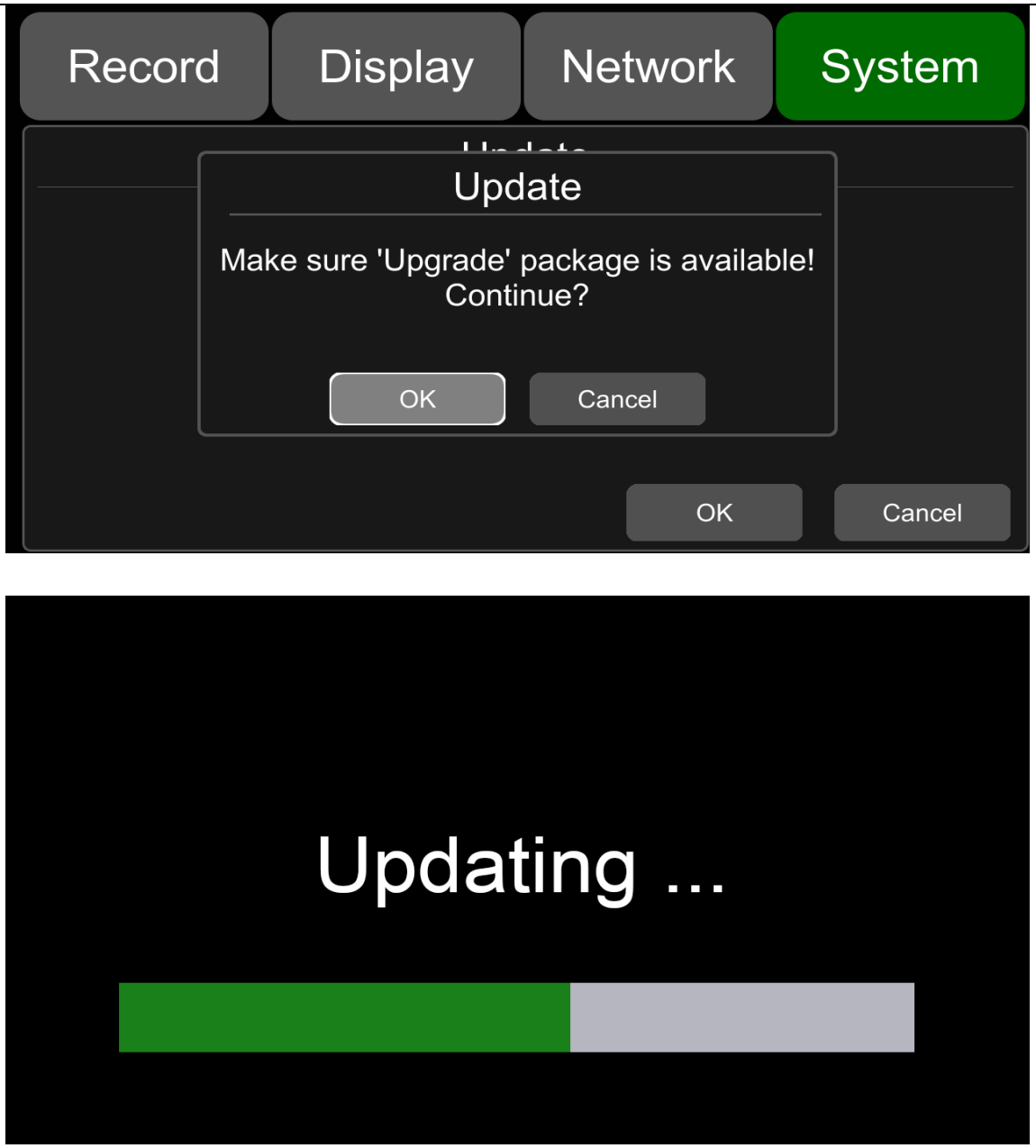
- Alarms with higher priority will be triggered first.
- 1 is the highest priority, and 6 is the lowest.
- If two alarms A and B are triggered at the same time, and A's priority is higher than B's, then A will record first. After A finishes the recording, if B is still being triggered, B will then record. However, if B is no longer being triggered, it will not record.
- If alarm B is triggered while recording, if alarm A, whose priority is higher than B, is triggered then, B will not stop recording.

11.8 Update

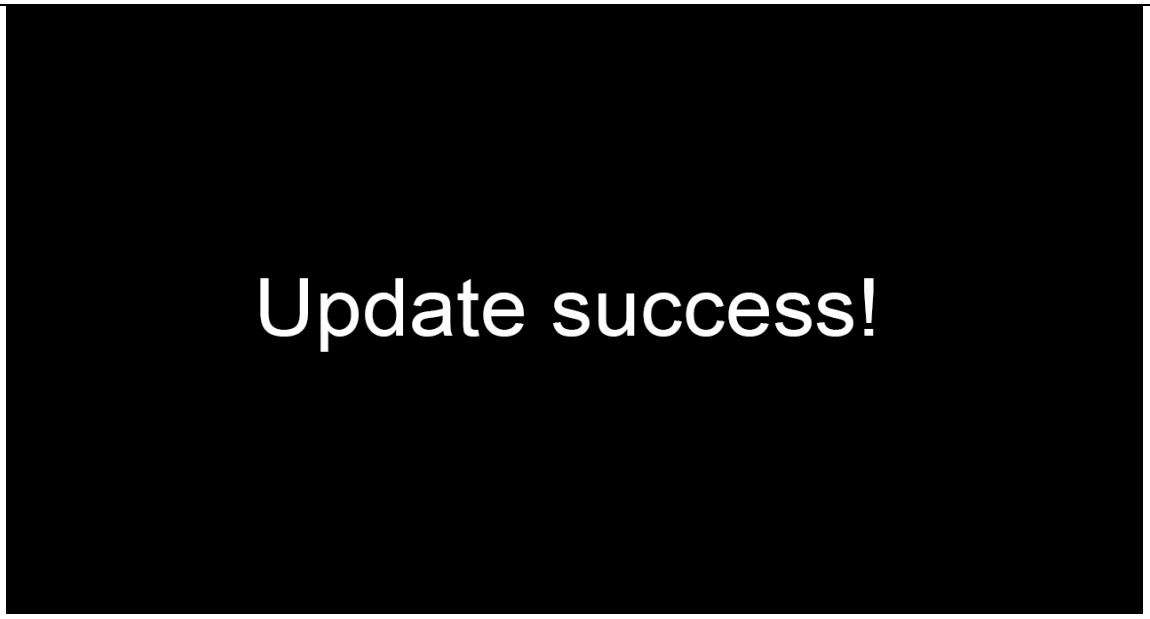
- For Single Device

Step 1: format the sd cards in dvr, it will get the correct format to recognized by DVR; Copy the files to the USB disk or SD card/upgrade/packet/local directory, ; insert the USB disk or SD card into the DVR.

Step 2: Power off the DVR and reboot it, then it will upgrade automatically. Or go to Menu -> System -> Update->Software, touch OK to confirm the upgrading. Both methods can start the upgrade process.



Step 3: When “Update success!” is shown on the display, the device will reboot automatically.



Step 4: After rebooting, please check if the version is the same as the one you copy into “upgrade” folder. Please go to Menu -> System -> Info to check it.

Note: After the upgrade is completed, the "dvxxx_upgrade_201xxxxxxxxx_Rename" upgrade package in the USB disk or SD card /upgrade/packet/local will be deleted. Change the file name prior to upgrade if installing in multiple units.

- Remote Upgrade

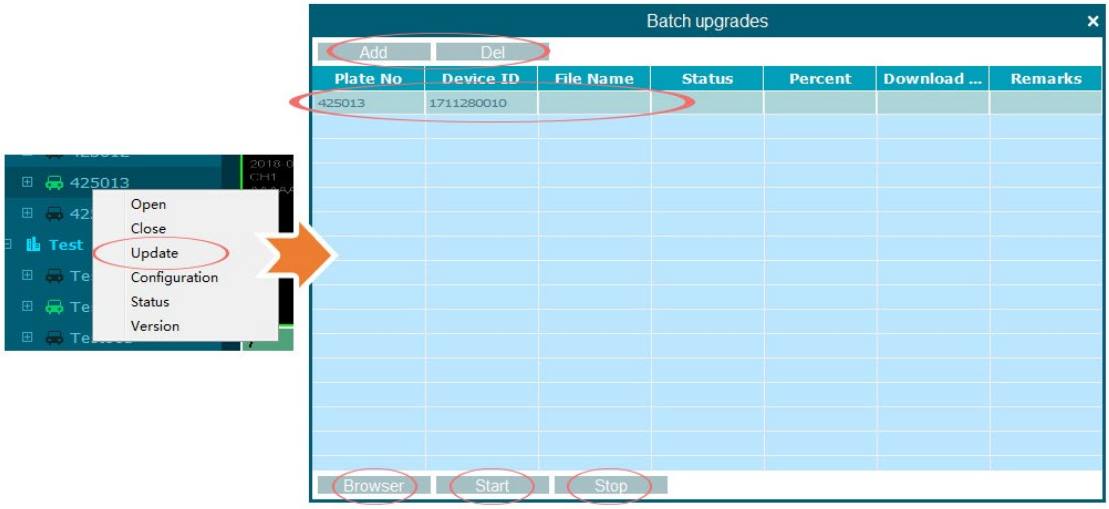
Step 1: The device connects to server.

Step 2: Open the Windows client and log in.

Step 3: Find the license number of the target device in the device list of the client, right click and select “Update” to open the Batch Upgrades interface. If you need to upgrade more than one device, you can click the Add button to select other devices. The selected ones will be displayed on the device list to upgrade. If you want to remove devices from the list, please select them and click the Del button.

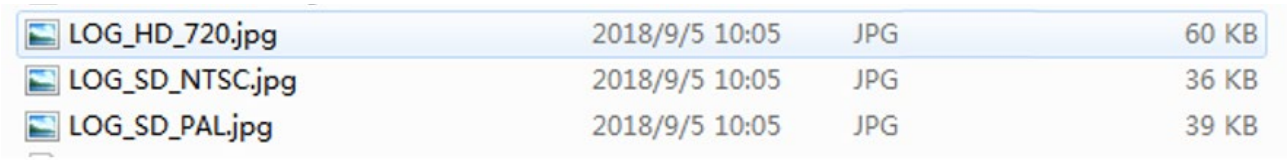
Step 4: Select the device to upgrade, and then click the Browser button to select the upgrade package “dvxxx_upgrade_201xxxxxxxxx_Rename”.

Step 5: Click the Start button to upload the upgrade package. When uploading is finished, the device will start upgrading automatically. If it failed to upload, the reason of failure will be displayed in the Remark column in the list.



- Logo Upgrade

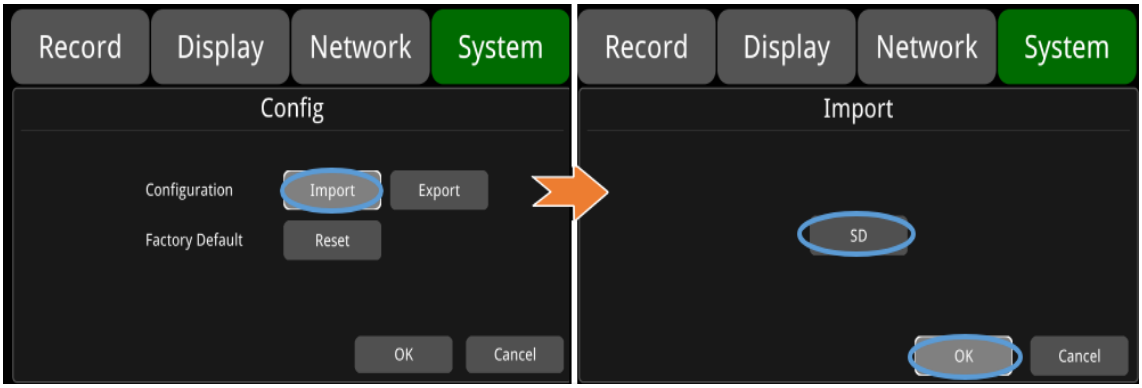
1) Make 3 logo pictures, the picture format is 720x576 named LOG_SD_PAL.jpg, the format is 720x480 named LOG_SD_NTSC.jpg, the format of 1280x720 is named LOG_HD_720.jpg, see the following picture for details:



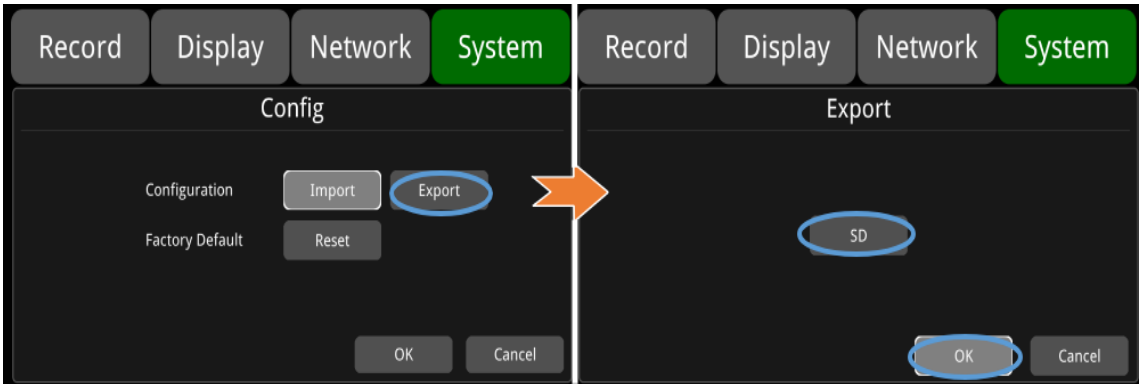
2) Put 3 logo pictures in the root directory of SD1 card or USB;
3) Insert the SD card or USB into DVR, click System->Update->Logo, then click "OK",will have a prompt message "Start to update the Logo, please wait..." will appear. When the update is successfully completed, a prompt message "Logo update successfully, restart DVR now?" will be displayed , click "OK", restart the device, and the new logo will work.

11.9 Configuration

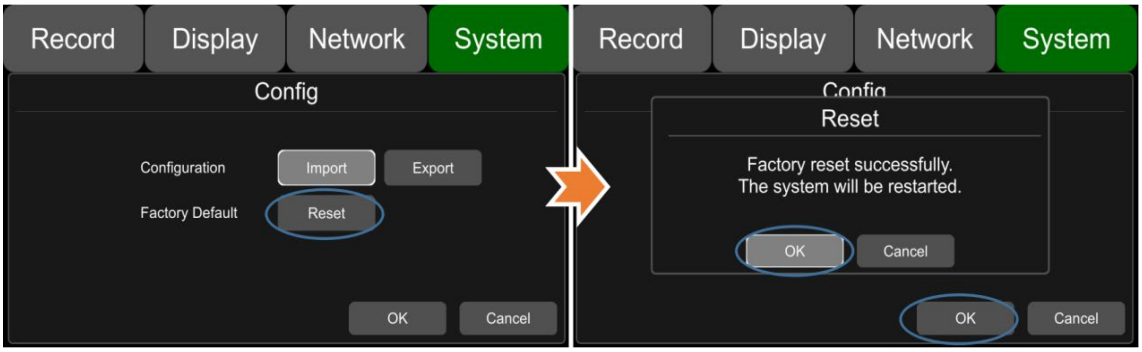
Configuration Import:Import the configuration information from the flash memory device, and place the configuration file in the sd/export_file/config directory.



Configuration Export: Export Log to SSD/HDD,SD card or USB memory flash devices.



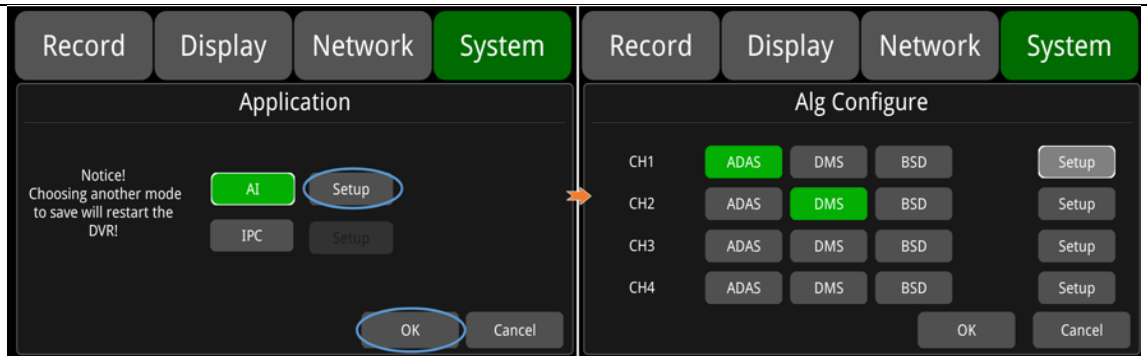
Factory Default: Press Reset to restore factory settings.



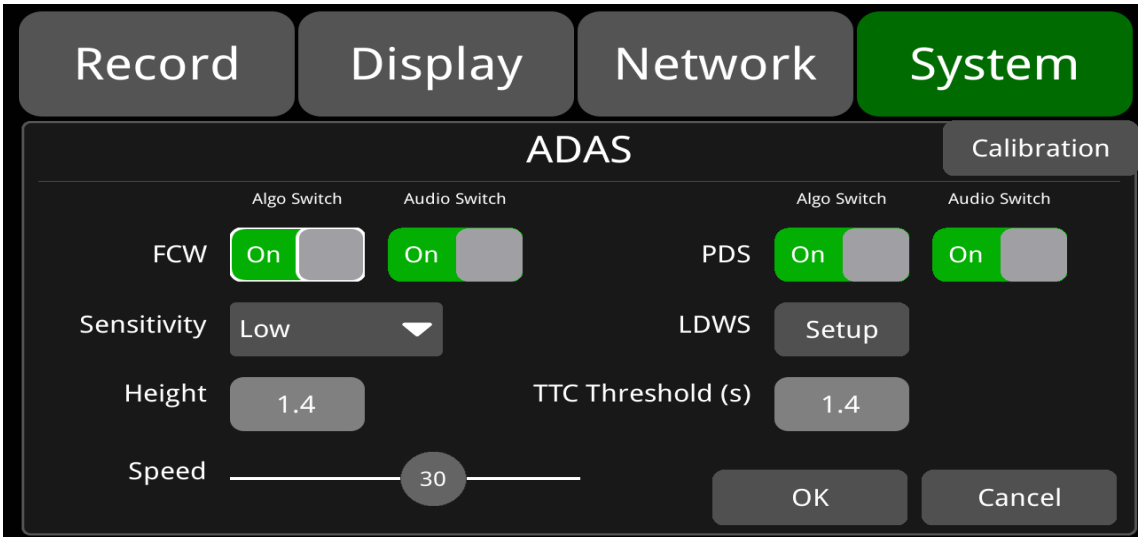
11.10 Application Setting

Application: Algorithm and IPC function are integrated. After selecting the function, the device will automatically restart, and the corresponding functions can be configured then.

AI: Algorithm function, the first channel is applied to display images with forward collision warning and lane departure warning, and the second channel is applied to display driver monitoring function. The third and fourth channel are optional and null by default.



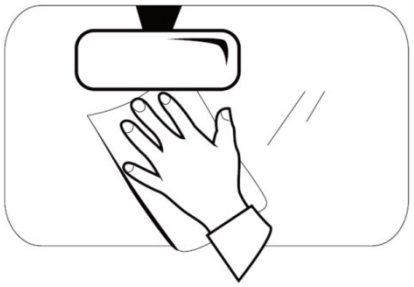
ADAS algorithm function: including FCW: forward collision warning algorithm, is displayed in the first channel; PDS: pedestrian detection, is displayed in the first channel. The following picture shows the default configuration interface:



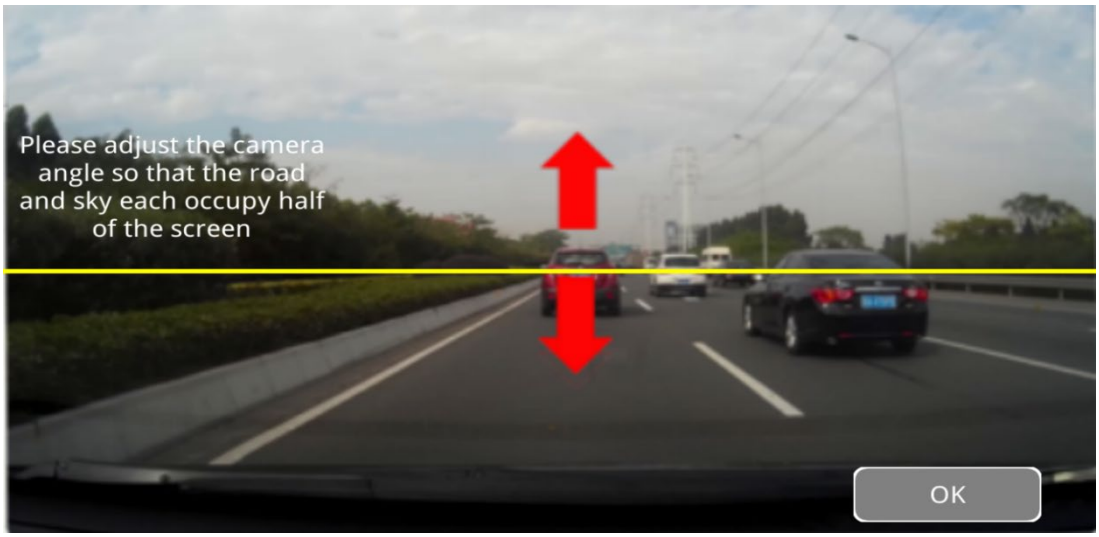
Algo Switch: If it is set On, when the expected collision time TTC Threshold(s) is less than the configured time, the forward collision alarm and blind spot pedestrian detection alarm will be triggered. If it set Off, the alarm will not be triggered if the expected collision time TTC Threshold(s) is less than the configured time.
Audio Switch: If it is set On, audio warning will be sent when forward collision alarm and blind spot pedestrian detection alarm are triggered; if it is set Off, no audio warning will be sent when forward collision alarm and blind spot pedestrian detection alarm are triggered.
TTC Threshold(s): Time-to-collision, the default configuration is 1.4.
Sensitivity: sensitivity level, there are three levels Low, Medium, High, the default is low.
Speed: Set the FCW working speed value. When it is set to 5, it indicates that the FCW can only start when the vehicle speed is greater than or equal to 5km/h. The default value is 30.
FCW installation: installed in front of the windshield, the installation height is about 1.4h.

FCW Installation Diagram:

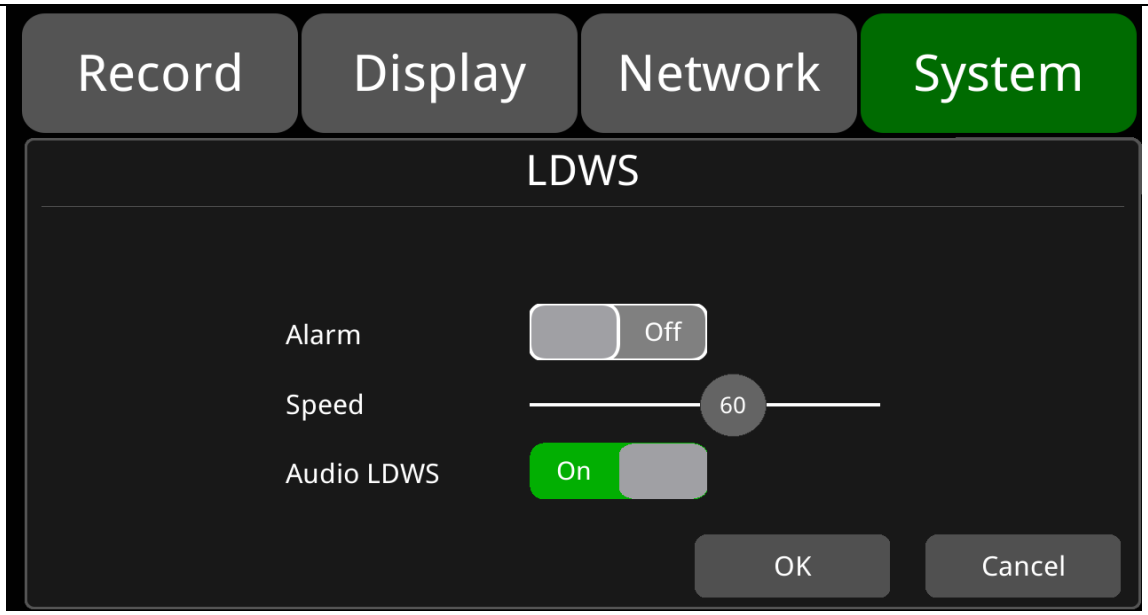
Referring to the following models, select the glass near the red dot as the installation location, and clean it with a duster. Then install the camera horizontally. Any obstruction within the wiper are subject to legal regulations. Ensure camera does not obstruct driver's view.



Calibration: parameter calibration. Adjust the camera position to the point that the road and the sky mainly occupy half of the screen, fix the camera position, as shown in the following picture:

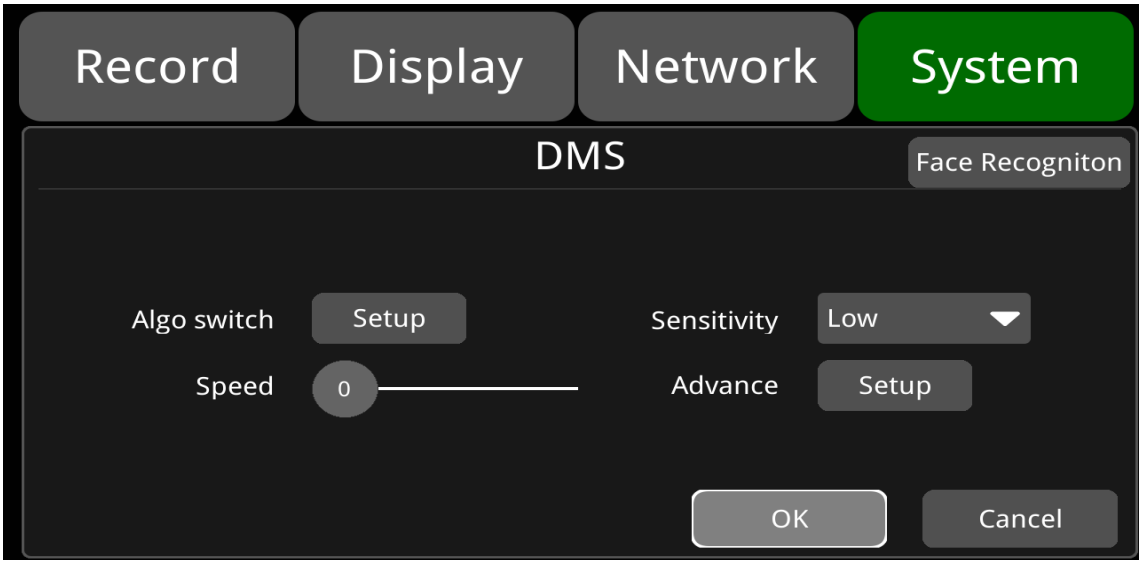


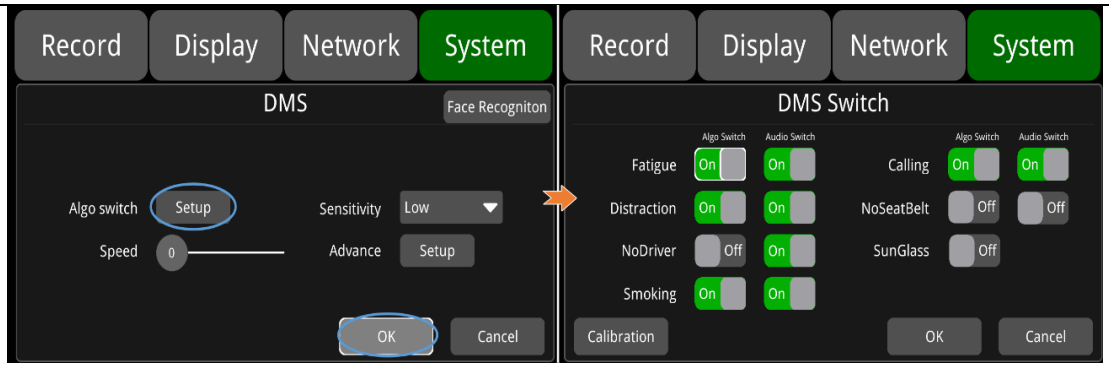
LDWS：Lane departure, the first channel is displayed. When Alarm is on, Lane departure alarm will be turned on. The following figure shows the default configuration interface：



Alarm: Set to On, when the current speed is greater than the set working speed and track deviation will trigger lane departure alarm recording; set to Off, when the current speed is greater than the set working speed and track deviation, the lane departure alarm recording will not be triggered.
Speed: Set the operating speed value of the Lane departure algorithm. When it is set to 60, the track offset algorithm can only be started when the vehicle speed is greater than or equal to 60km/h. The default is 60.
Audio LDWS: If it is set On, audio warning will be sent when lane deviation alarm is triggered; if it is set Off, no audio warning will be sent when lane deviation is triggered. It is On by default.

DMS: The second channel is to display DMS(driver fatigue monitoring), set the functions in the menu as below:





: DMS detection alarm type selection and default configuration.

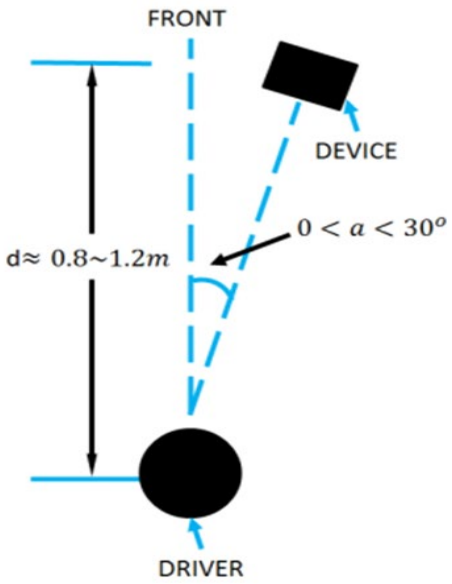
Alarm Type	To set ON	To set OFF
DMS_Fatigue	When the driver's fatigue behavior is detected,an alarm recording will be triggered,and there will be voice announcements.	Will not trigger fatigue alarm.
DMS_Distraction	When the driver's distracted behavior is detected, an alarm recording will be triggered, and there will be a voice announcement.	Will not trigger distraction alarms.
DMS_No Driver	When the driver's absence from the seat is detected, an alarm recording will be triggered, and there will be a voice announcement.	No driver alarm will be triggered.
DMS_Smoking	When the driver's smoking behavior is detected, an alarm recording will be triggered, and there will be a voice announcement.	Will not trigger a smoking alarm.
DMS_Calling	When the phone call behavior of the driver is detected, the alarm recording will be triggered, and there will be a voice announcement.	Will not trigger a phone call alarm.
DMS_NoSeatBelt	If it is set On, voice broadcast will be triggered when the driver is detected not wearing seat belt.	If it is set Off, no voice broadcast will be triggered when the driver is detected not wearing seat belt.
DMS_SunGlass	If it is set On, the alarm will be triggered when the driver is detected wearing sunglasses.	If it is set Off, no alarm will be triggered when the driver is detected wearing sunglasses.
Sensitivity	Sensitivity level, there are three levels Low, Medium, High, the default is low.	
Speed(km/h)	Set the DMS working speed value. When it is set to 60, the DMS algorithm can only be started when the vehicle speed is greater than or equal to 60. The default is 0.	

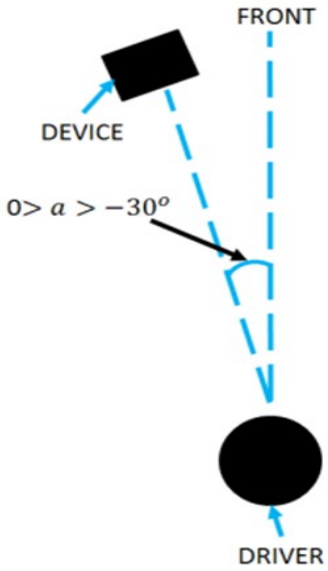
DMS The default values of the function parameters are as follows:

Alarm type	Default
DMS_Fatigue	On
DMS_Distraction	On
DMS_No Driver	Off
DMS_Smoking	On
DMS_Calling	On
DMS_NOSeatBelt	Off
DMS_SunGlass	Off
Sensitivity	Low
DMS Work Speed(km/h)	0
Audio Switch	On，DMS_NOSeatBelt 为 Off

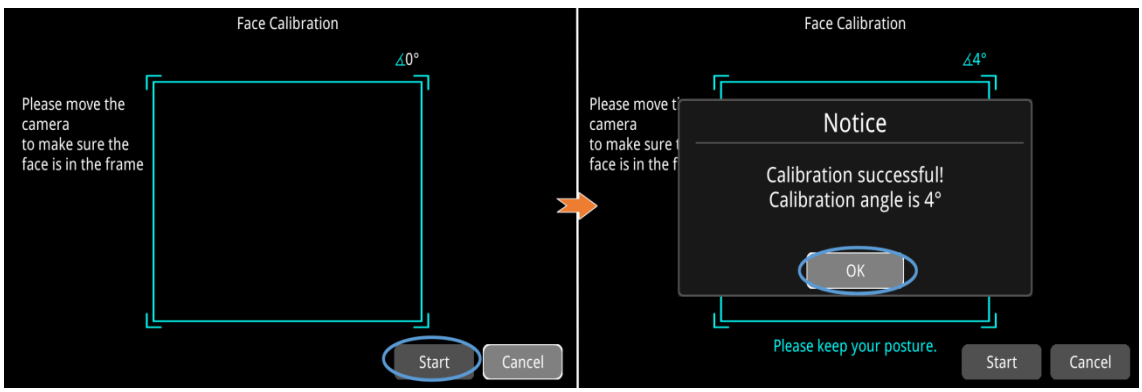
DMS Installation：

The DMS needs to be installed on the dashboard at a distance of 0.8~1.2M from the driver and the front angle of the driver is about +/-30 degrees, as shown in the figure below. To choose a suitable installation location on the dashboard, installation and calibration need to be carried out at the same time, so inquire or ask a professional service to help calibrating the equipment and guiding the driver to perform related actions.

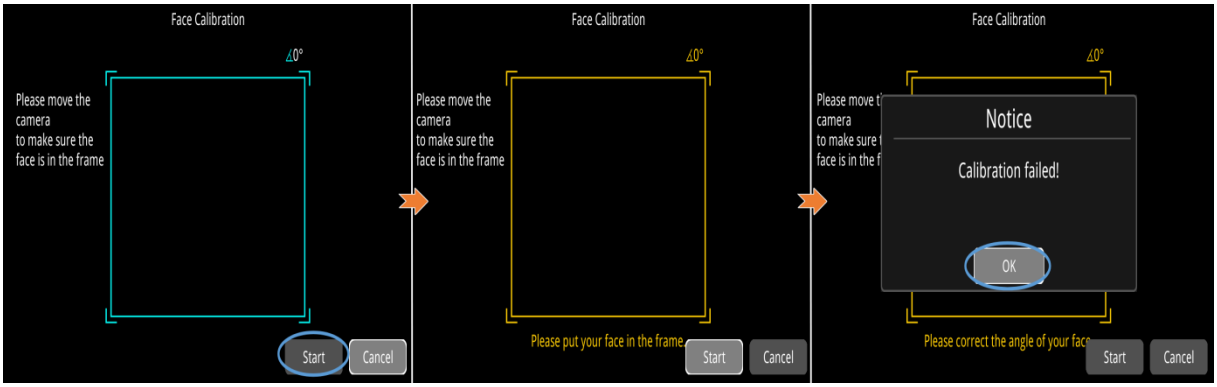




Calibration: parameter calibration. Align the face with the calibration frame to conduct calibration. The detection frame is square and blue by default. After the face is aligned with the calibration frame, a green frame will appear on the face. Click the Start button and out a message will pop out after 2-3s indicating successful calibration and accompanied by a voice message, click OK to exit the calibration interface. As shown in the below pictures:



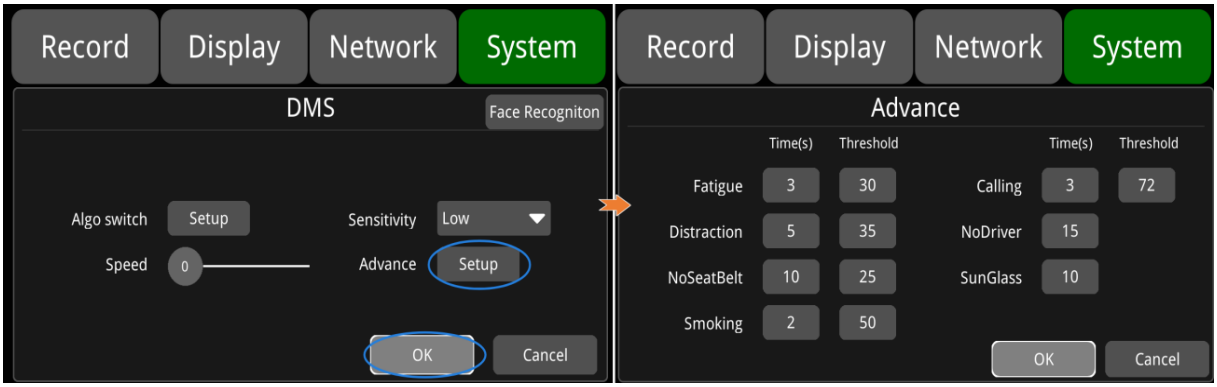
As shown in the following pictures: Hold the face to the calibration frame, click the Start button to begin calibration. If the face is moved out from the calibration frame during the process, the calibration frame will turn yellow, and after 2-3s a message will pop out indicating that the calibration is failed. Click OK to conduct the calibration again.



Align the face with the calibration frame, click the Start button to begin calibration. During the process, the face is required to turn left and right, when the angle exceeds the range of [-30, 30], the calibration frame turns red, and the voice indicating too left or too right, after 2-3s a message pop out indicating that the calibration is failed. Click OK to calibrate again. As shown below.

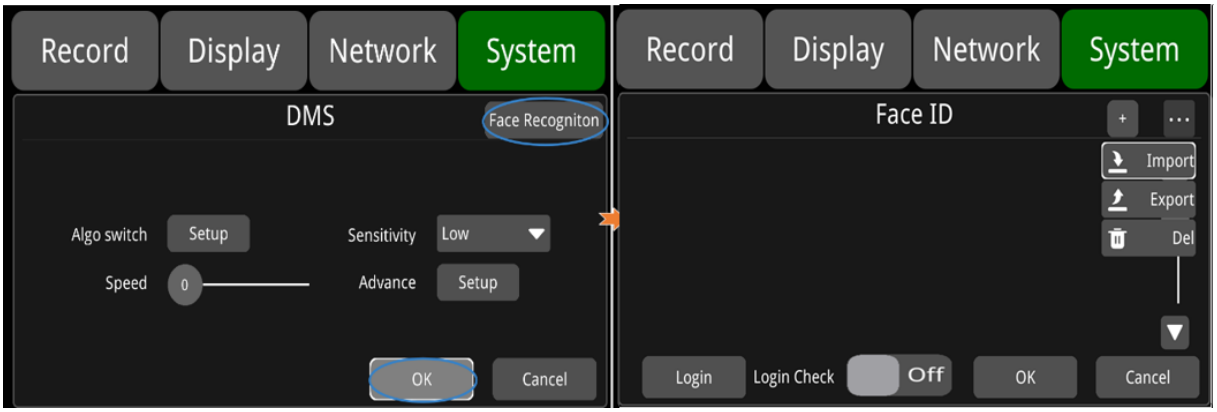
When the calibration fails, click start again to begin calibration.

: DMS alarm duration precision. The default value is as follows.

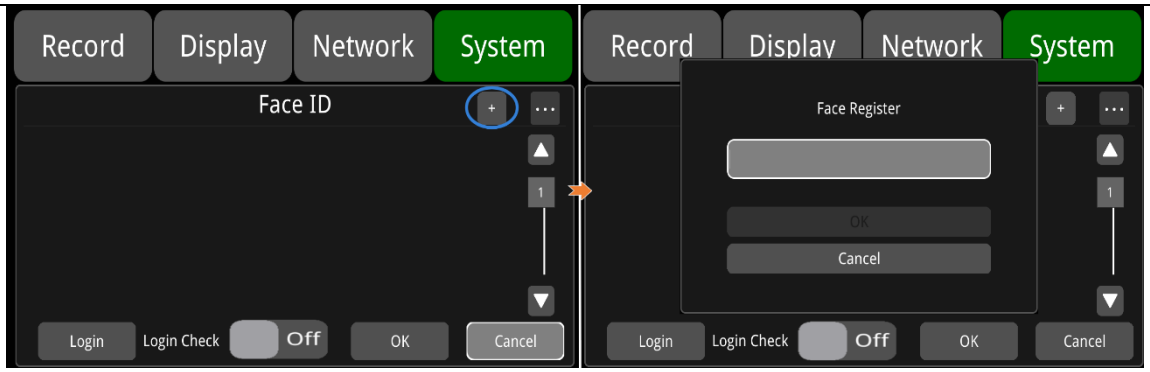


Alarm Type	Alarm Duration/ Threshold	Min.	Max.	Default
Fatigue	Time（s）	1	6	3
	Threshold	1	99	30
Distraction	Time（s）	1	9	5
	Threshold	1	99	35
NoSeatBelt	Time（s）	1	20	10
	Threshold	1	99	25
Smoking	Time（s）	1	5	2
	Threshold	1	99	50
Calling	Time（s）	1	5	3
	Threshold	1	99	72
NoDriver	Time（s）	1	30	15
	Threshold	/	/	/
SunGlass	Time（s）	1	20	10
	Threshold	/	/	/

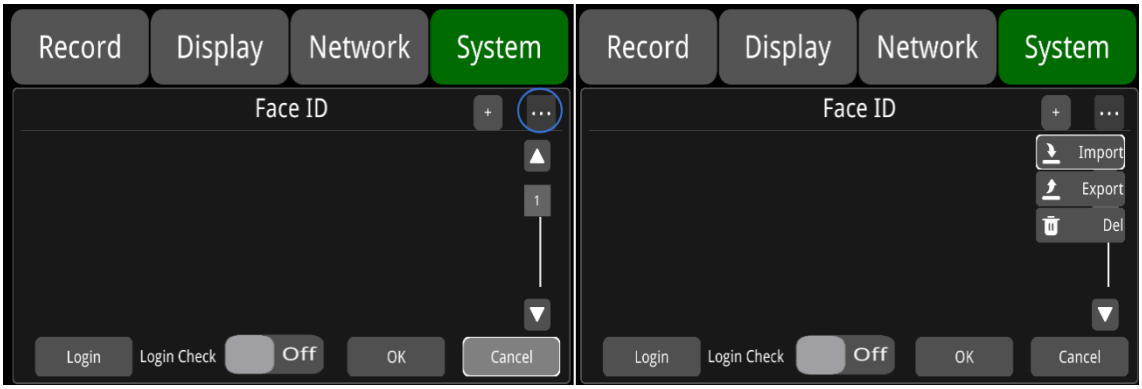
Face Recogniton: Face recognition



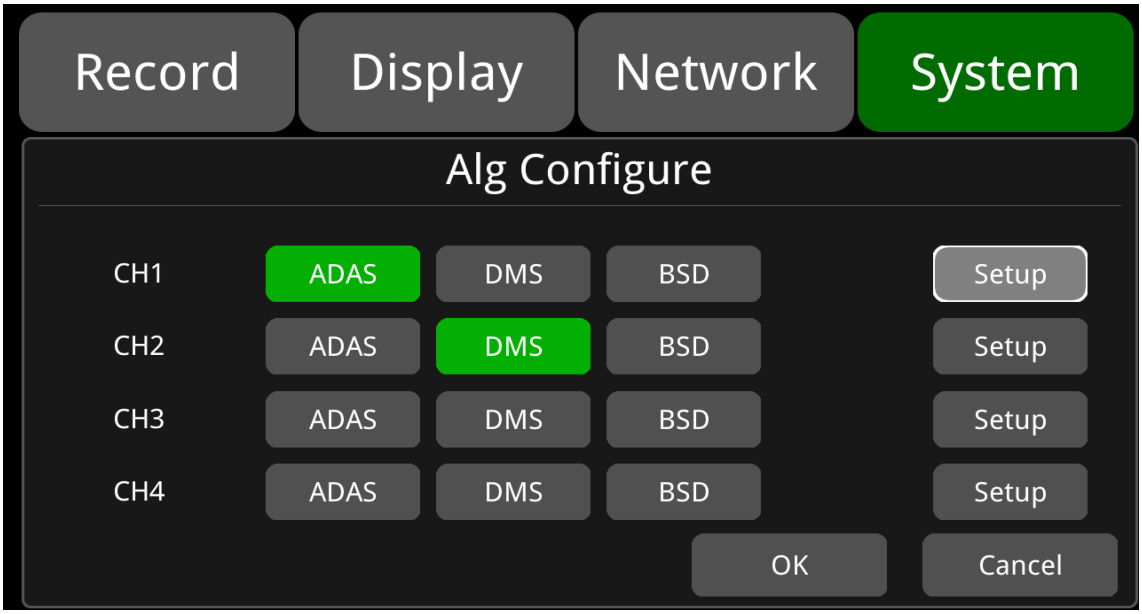
+: Add a human face, as shown in the picture below. Click OK after entering the name and aim your face at the camera. Click the Start button, move your face up, down, left and right to input the data, a window will pop up to notify the succeed or failed input with a voice message.



...: Import, export and delete functions. As shown in the figure below, check the imported face photo and click Import/Export/Del to import, export or delete the selected photo. The exported file is stored under the disk faceID path.

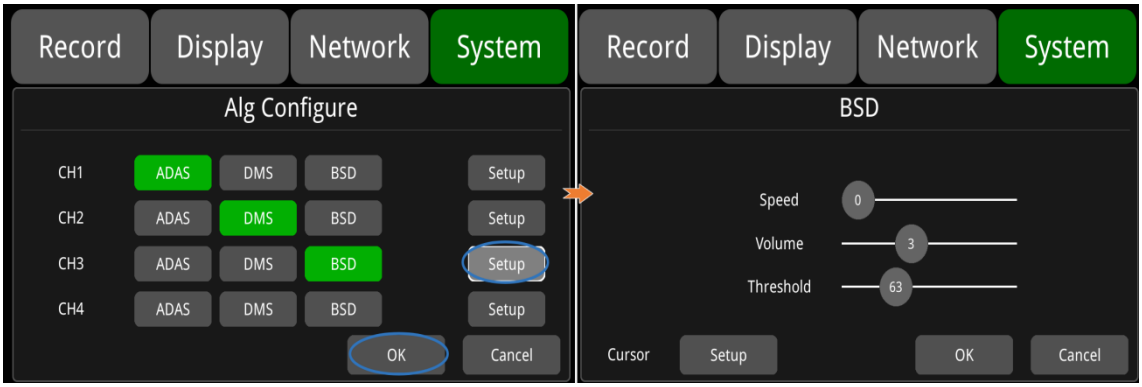


Login: Click to log in through face recognition.
Login Check: If it is set On, face recognition will be triggered upon each startup with a voice message of "again to login". A voice message will be sent to notify the login success when the face is successfully recognized. When no human face or inconsistent human face is detected, the message "login fail" will be sent. If it is set Off, face recognition will not be enabled. It is set Off by default.



Users can choose algorithm type for channel 3 and 4.

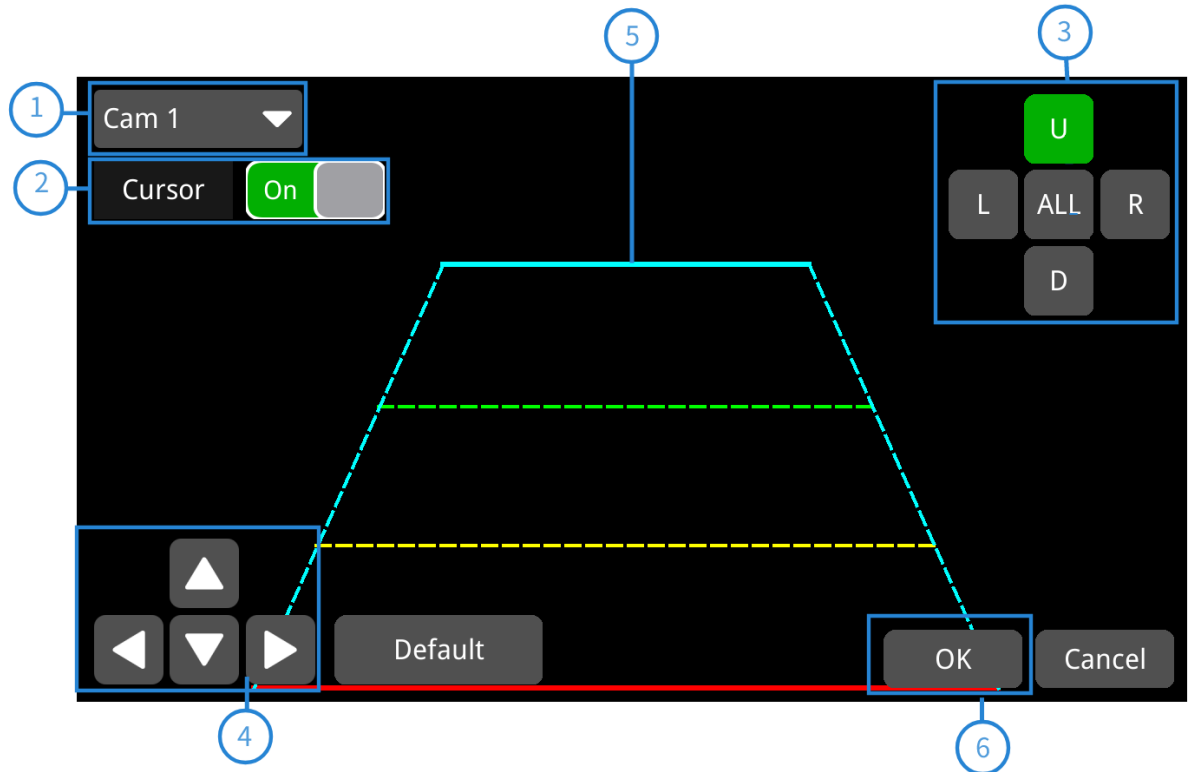
BSD settings are as shown in the figure below when it is chose.



Speed: Set the speed threshold for BSD function. When set to 5, the BSD algorithm can be enabled only when pedestrians are walking at 5km/h or above. The default value is 0.
Volume: Adjust the volume of the audible and visual alarm. The default value is 3.
Threshold: Pedestrian detection and alarm precision selection.

	Min.	Max.	Default
Speed	0	100	0
Volume	0	8	3
Threshold	50	99	63

Cursor: It is “OFF” by default. The picture below shows the open state.



① Camera name of the alarm-triggered channel.

② Touch this button to turn on/off cursor.

③ Line selecting: There are 5 lines to be selected. Line U (up), Line D (down), Line L (left), Line R (right) and ALL. The button turns green if selected. You can use remote control to operate.

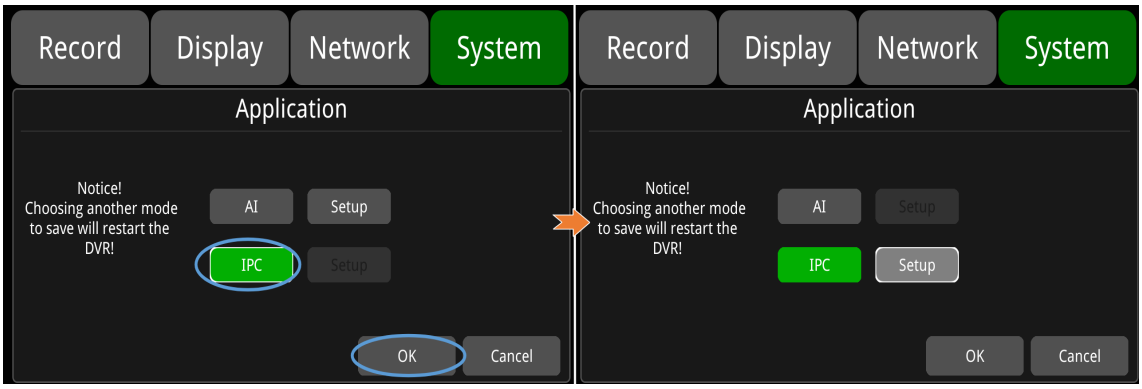
④ There are 4 directions to adjust the shape of the cursor, Up, Down, Left and Right.

If Line U (the green one) or Line D (the red one) is selected, the selected line can be moved with these directions.
If Line L or Line R is selected, the top point of the selected line can be moved to left or right with Direction Up and Direction Down, and the bottom point of the selected line can be moved to left or right with Direction Left and Direction Right.

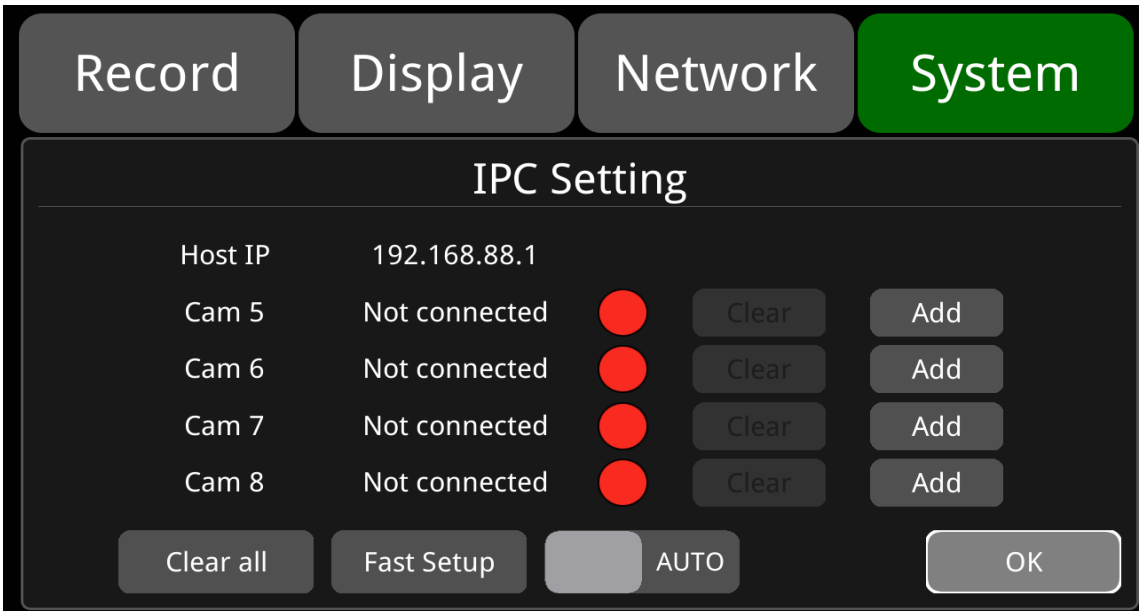
⑤ Lines of cursor: The selected one will be thickened for three times. The two lines in the middle will not be processed.

⑥ Touch OK to save the settings and exit. Cancel to exit without saving any settings.

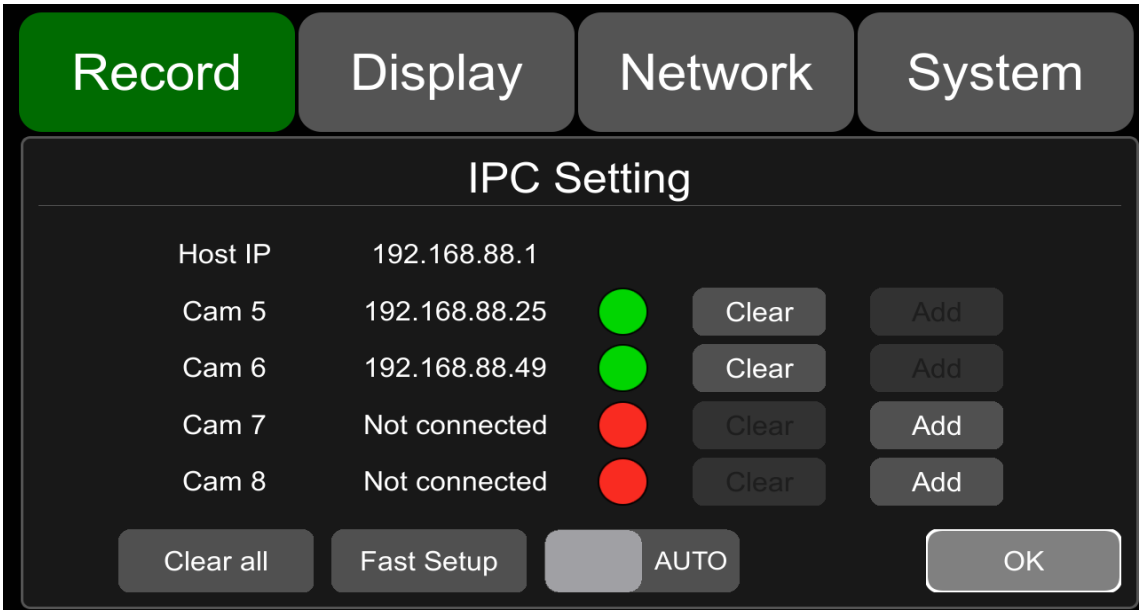
- IPC: Configure the IPC function interface. After selecting OK, the device will automatically restart and switch to the IPC function interface, as shown in the figure picture:
-



The default configuration is shown in the picture。

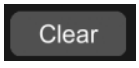


The default Host IP of the DVR is 192.168.88.1. The IPC can be applied when it is connected to the same network as the DVR. One DVR can connect up to 4 IPC channels.
AUTO: AUTO is closed by default. When it turns on, the detected IPC is automatically connected. When AUTO is set to ON, Clear, Add, Clear All, and Fast Setup settings all cannot be operated.

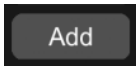


: Indicates that the IPC has been connected successfully.

: Indicates that no IPC is connected.

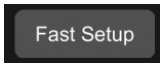


Clear: Press the button, the DVR will disconnect the IPC that has been successfully connected to the corresponding channel.



Add: Button for entering the IPC-adding interface.

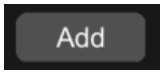
Clear All: Press the button, the DVR will disconnect all IPC channels that have been connected successfully.



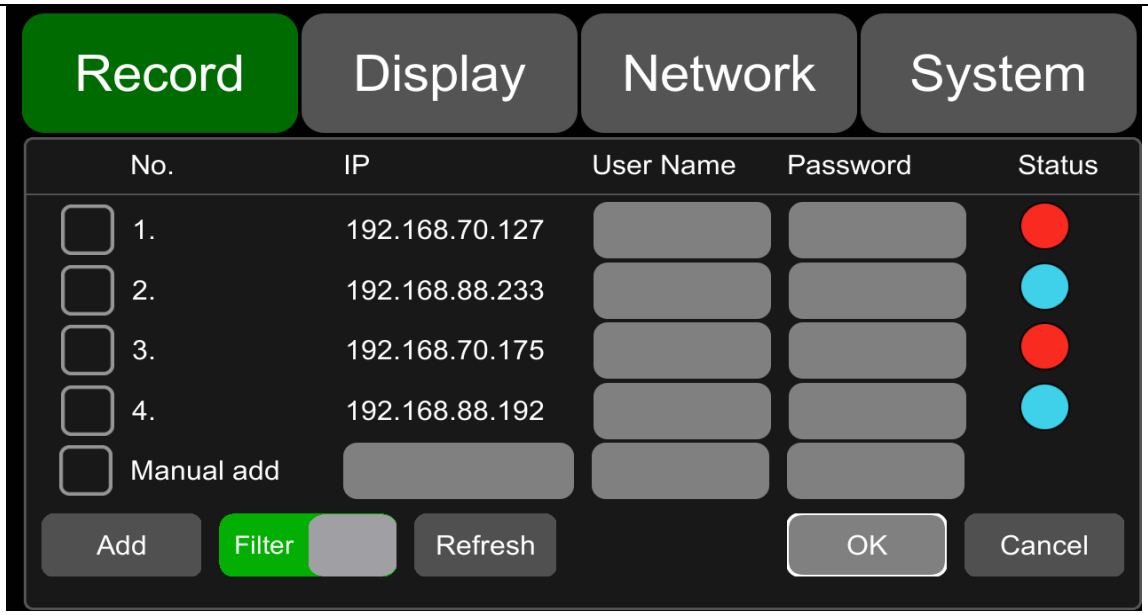
Fast Setup: Press the button, all IPCs are connected quickly.

AUTO: When AUTO is set to on, Clear, Add, Clear All, and Fast Setup settings cannot be operated on automatically connected IPC. AUTO is turned on by default.

OK: Save the interface and exit.



Add: IPC-adding interface.



IP: Indicates the IP of the relevant IPC searched by the DVR.
User Name: IPC user name.
Password: IPC password.
Status: The searched IPC connection status; the relevant status is explained as follows:

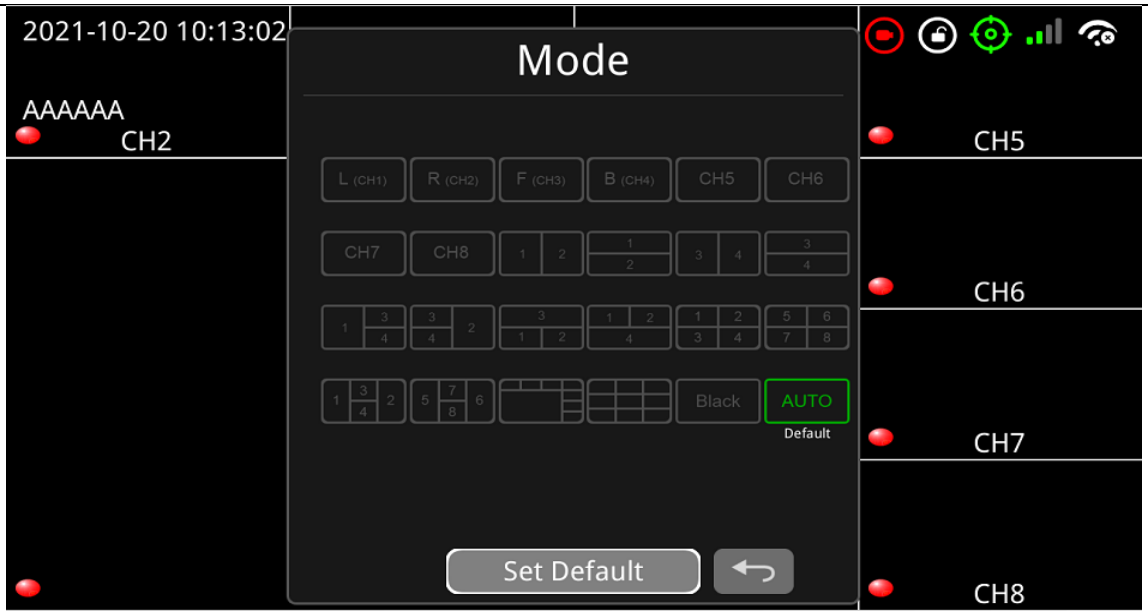
: Indicates that the IP network segment of the IPC is inconsistent with that of the DVR, the network segment is incorrect.

: Indicates that the IPC is normal and can be connected to the DVR.

: Indicates that the IPC has been connected successfully.

: Indicates that the IP format of the IPC is malformed.

Manual add: If the IP connected to the IPC is not found, you can add the IPC by manually entering the IP, User Name and Password of the IPC. If the IPC does not have a user name and password, you only need to enter the IP of the IPC.
Add: IPC- adding button, after pressing the Add button, the IP of the selected IPC will show that the connection is successful.
Filter: Turn on the filter, the screen does not display the IPC that the DVR has successfully connected to in this interface; turn off the filter, the screen displays all searched IPCs in this interface.
Refresh: If the IP connected to the IPC is not found in the interface shortly after booting, you can click this button to refresh the interface.
OK: Save the configuration and exit the interface.
Cancel: Do not save the configuration and exit the interface.
After the IPC connection is successful, you can view the IPC channel recording via the following interface.



When IPC AUTO is the default setting, the restarted DVR automatically switches to the main and sub-screen eight-split display after 1min once it connected to the IPC channel. If the IPC channel is not connected, the DVR automatically switches to CH1~CH4 four-division display after 1min; if you choose other split mode other than AUTO as the Default setting, other split mode will be displayed after restarting the DVR.

11.11 System Info

System Info: Software version number.

12 FAQ

1) The System Can’t Start up?

Check the power connection. Please follow the steps below to check the power connection:

① Check the input power: if the power wire is connected correctly, if the ground wire is connected to the battery, and if the fuse on the power wire is in good condition.

② Check if the voltage of the ACC signal wire is higher than 6V.

③ Check if the input voltage of the device is higher than the shutdown voltage set on the screen of the device.

2) The Device Keeps Restarting?

Please follow the steps below to check:

① Check if the supply voltage of DVR is insufficient. If it is lower than the start-up voltage, the device would restart repeatedly.

② Restart the device to see if it will work properly.

3) Unable to Recognize Disks?

① Check if the disk is in good condition and make sure that it is installed with good contact.

② The disk has been formatted by DVR.

③ Restart the device to see if it will work properly.

4) Unable to Recognize Cameras?

① Make sure the camera is good and the connection is correct.

② Reconnect all wires (e.g. extended wires) between cameras and the device.

③ Restart the device to see if it will work properly.

5) GPS Abnormal?

Check if the GPS antenna is properly installed.

13 APPENDIX

APPENDIX Ⅰ: Abbreviation & Description

Rec.	Record	LED	Light Emitting Diode
G-sensor	Accelerometer sensor	SD	Secure Digital Memory Card
GPS	Global Positioning System	USB	Universal Serial Bus
Wi-Fi	Wireless-Fidelity	ALM	Alarm
Cam	Camera	VLOSS	Video Loss
AVI	Audio Video Interleaved	COMM	Communication
OSD	On-Screen Display	ERR	Error
APN	Access Point Name	MEM	Memory
DHCP	Dynamic Host Configuration Protocol	MMSHOW	Media Player
SSID	Service Set Identifier	FTP	File Transfer Protocol
IP	Internet Protocol	DVR	Digital Video Recorder
MAC	Media Address Control	IR	Infrared Radiation
RSSI	Received Signal Strength Indication	SYS	System
SSD	Solid State Drive	DST	Daylight Saving Time

APPENDIX Ⅱ: Accessories

Standard Table:

Parts	Quantity	Description	Parts	Quantity	Description
	1.default	9 PIN power cable		1.default	Remote control
	1.default	DVR lock keys		1.default	6 PIN to 4 PIN
	1.default	10 PIN alarm wire		1.default	Antenna's GPS& Wi-Fi

Optional Accessories Table:

Parts	Quantity	Description
	1,optional	10-inch touch screen monitor

APPENDIX Ⅲ: Compatibility Storage List

SATA 3.0 SSD

Name	Description
SSD 32GB	MLC,TS32GSSD420I,-45℃~+85℃
SSD 64GB	MLC,TS64GSSD420I,-45℃~+85℃
SSD 128GB	MLC,TS128GSSD420I,-45℃~+85℃
SSD 256GB	MLC,TS256GSSD420I,-45℃~+85℃
SSD 512GB	MLC,TS512GSSD420I,-45℃~+85℃
SSD 1TB	MLC,TS1TSSD420I,-45℃~+85℃
SSD 128GB	3D TLC,TS128GSSD450K,0℃~+70℃
SSD 256GB	3D TLC,TS256GSSD450K,0℃~+70℃
SSD 512GB	3D TLC,TS512GSSD450K,0℃~+70℃
SSD 1TB	3D TLC,TS1TSSD450K,0℃~+70℃

SD Card

Item Name	Description
32GB SD Card	32G, MLC,NCSXDAB-032G,Longsys,-25℃~+85℃
64GB SD Card	64G, MLC,NCSXJAB-064G ,Longsys,-25℃~+85℃
128GB SD Card	128G, MLC,NCSXJAB-128G ,Longsys,-25℃~+85℃
64GB microSD Card	64G,MLC,NCIXJBB-064G

NOTES

NOTES

WARRANTY

Congratulations on your purchase of a quality Mobile Safety System! You're joining thousands of satisfied customers who enjoy & experience the benefits of the products we distribute. In the unlikely event that some technical difficulty arises with your purchase, be assured that we are most anxious to see that the problem is quickly rectified to your satisfaction. Please familiarise yourself with the following simple conditions of our warranty. This warranty covers faults through component failure or failure of the product to operate in accordance with published specifications. Product failure as a result of unreasonable environmental conditions, accident, misuse, improper installation, unauthorised repair, vehicle electrical or wiring faults or neglect etc, will not be covered by this warranty. Removal and installation costs, if any, would be paid by the owner as well as any freight or postage costs of transporting the product to Autobacs Australia PTY LTD shall not be liable or responsible for any loss of use of this product or any form of consequential loss.

CONSUMER WARRANTY

This product is warranted by Autobacs Australia PTY LTD to be free from defects in materials and workmanship under **NORMAL USE** for a period of **TWENTY FOUR MONTHS** from the date of purchase.

WITHIN 30 DAYS OF PURCHASE DATE:
Please return the unit for replacement to our National Service Centre or the Retailer from where you made the purchase. All accessories must be included. Proof of purchase date **must** accompany the products.

AFTER 30 DAYS OF PURCHASE DATE:
Warranty repair and service is carried out by our National Service Centre. Repair and service will be carried out at no cost to the owner if proof of ownership and the date of purchase can be verified to the satisfaction of the authorised centre concerned with this repair. This proof should take the form of either:
a) The warranty card accompanying this product, stamped and dated by the dealer.
b) A Tax Invoice or Receipt showing full details of original vendor, purchaser, model number and serial number.

COMMERCIAL WARRANTY

A product used in or associated with a commercial application will carry a limited TWELVE MONTHS warranty.
An abnormal commercial application is one where usage, dust, vibration, heat/cold and other environmental conditions exist at an extreme level.
Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Purchaser's Name: _____

Purchaser's Address: _____

_____

Model Number: _____ **Serial Number:** _____

Dealer Name: _____ **Date of Purchase:** / /

Dealer Address: _____

Invoice/Sales Docket no: _____

General Hints: To expedite service and prompt return of the equipment, please:

a) Clearly describe the fault in detail
b) Safely and securely pack the unit for transport
c) Include your return address
d) Provide proof of purchase date as outlined above

National Service Contacts:
AUTOBACS AUSTRALIA PTY LTD
Telephone: 1300 288 029
email: services@autobacs.com.au

Anything about cars. you find at AUTOBACS