

RVS-8200

MobileMule™ 8 Channel AI DVR



Instruction Manual



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1 Specifications

Operating Ssystem	Linux
Operating interface	Graphical menu operation interface (OSD)
Video input	8 x 1080P analog high definition
CVBS output	1CH 6pin aviation connector output PAL/NTSC
Video display mode	Single/Split/Triple/Quad/8 Cam/9 Cam/13 Cam/ Black Screen display
Video standard	PAL: 25fps, NTSC: 30fps
Compression	H.264 main profile
Audio input	8 channels
Audio output	2 channels
Record format	Synchronized video & audio recording
Audio compression	ADPCM
Image resolution	Max 8 x 1080P(1920 x 1080)
Video bitrate	64kbps~4Mbps/channel
Storage efficiency	56~1800MB/(channel/hour)
Audio bitrate	32kbps
Storage Type	SD card (512GB, SDHC, SDXC) x 1, SSD x 1 (up to 2TB)
Alarm input	6 channels
Alarm output	2 channels, 1 buzzer
Motion detection	High/Low/Off sensitivity adjustable
IR	1 channel
RS232	1 channel
RS485	1 channel
CAN	2 channels
RJ45	1 channel
USB2.0	1 channel

3G / 4G Connectivity	Optional
Wi-Fi	Optional
Wi-Fi hotspot / AP	Optional
GPS	Optional
G-Sensor/Gyroscope - 3 axis sensor	Yes
Windows client	Yes
iOS client	Yes
Web portal	Available
Power input	10~32V
Power output	12V@5A
Max power consumption	60W
Standby power consumption	100mW
Operating temp. / humidity	-20°C ~ +70°C / <80%
Super capacitor	10~32V
Power output	Yes
Clock	Built-in clock, Calendar
Algorithm	DMS/ADAS/BSD/AVM
Waterproof grade	IP69K
Anti-vibration grade	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 to "On".
- 2) G-Sensor recording is recommended to set to "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 it could boot normally or not.
- 4) Should: ACC wire should be connected to the ignition wire, two VCC wires to the positive pole of the battery and two ground wires to the negative pole. Shouldn't: ACC and two VCC wires should not be connected to the ignition wire and two ground wires should not be connected to the negative pole of the battery, otherwise it may lead to the damage of the disk and the recording files. Prohibit: ACC and two VCC wires are prohibited to be connected to the positive pole of the battery and two ground wires to the negative pole. In this case, the battery would be run out quickly.
- 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 would not work properly.
- 10) GPS antenna, 3G/4G antenna, Wi-Fi antenna must be connected correctly and tightened up.
- 11) If DVR does not have GPS, WIFI and 4G, the time cannot be automatically calibrated, for which the DVR's time will vary by 10 minutes from the actual time.
- 12) Users need to calibrate time manually if accurate time is required.

3 Main Features

Controlled by touch screen

- All settings and operations could be done through a touch-control monitor.

Video and Audio

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

Recording

- 8CH 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 detection 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 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 simultaneous playback of audio and video for either a single channel or 4 channels.
- Support searching recording files by dates and recording types.
- Support dragging the time slider during video playback.
- Indicating recording status, alarm status and etc.

Storage Types

- Support 1 x SSD (2TB) and 1 x SD card (512GB, SDHC, SDXC).
- SSD is preferred. SD card could be put into use if there is no SSD connected/detected.
- SD card can be easily removed from DVR.

Backup

- Support USB disk or USB hard disk to backup the recording files.

Network

- Support LAN, Wi-Fi, and 3G / 4G.
- LAN, Wi-Fi and 3G / 4G have the sequence priority of connections. They are automatically switched to save the data once LAN, Wi-Fi or 3G/4G is connected.
- Recording files could be uploaded to the server. Files are able to be searched/downloaded by CMS Client.
- 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 upload of alarm recording files, alarm information, log information and GPS.trajectory, which is convenient to analyze any abnormal conditions of the vehicle and track the vehicle.
- Support remote configuration and remote upgrading.
- Support PC Windows Client, mobile iOS and Android apps. Users could remotely monitor vehicles by computers or mobile phones.

Alarm

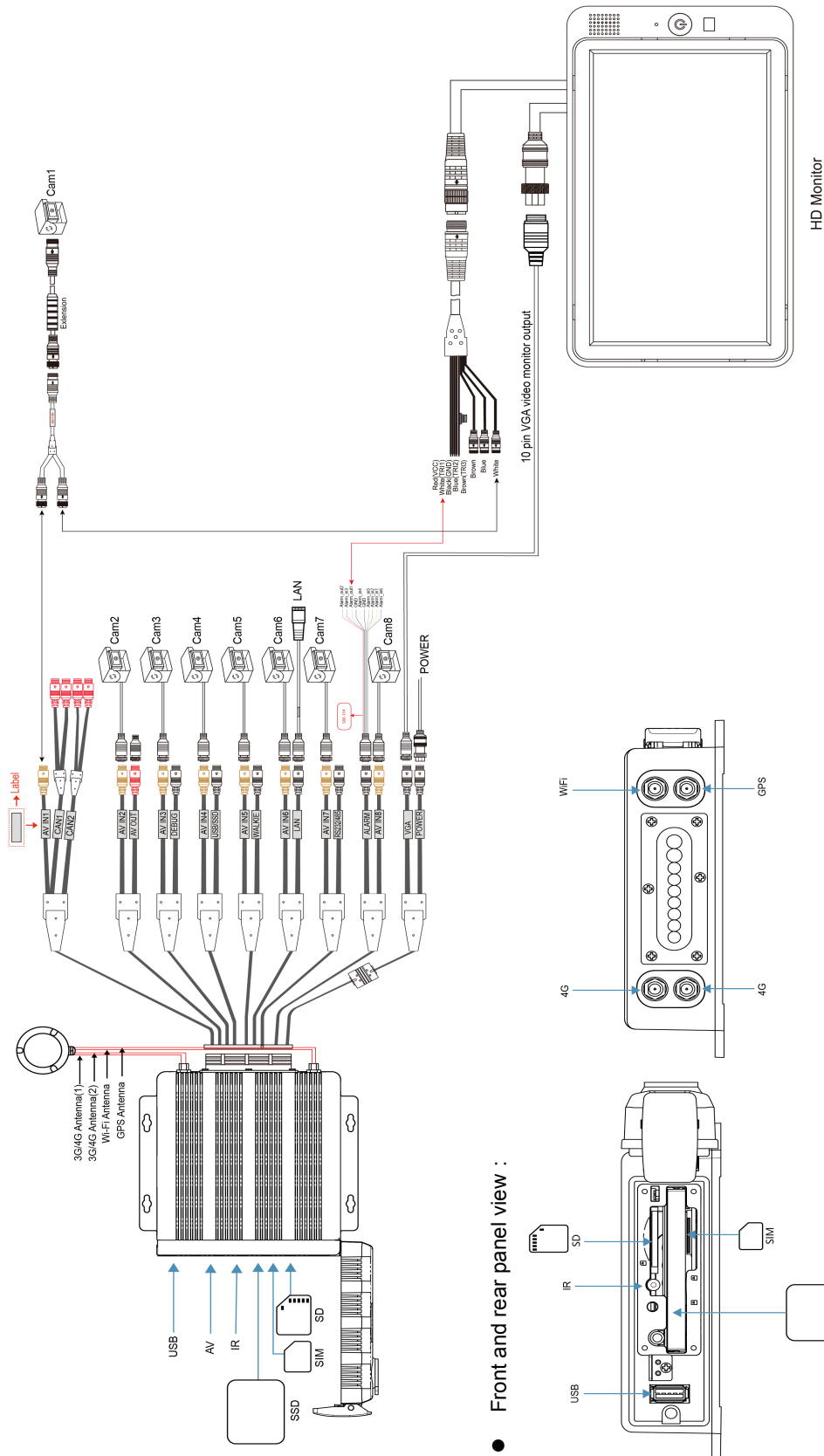
- 6 channels of alarm inputs, 1 channel of buzzer output and 2 channels of alarm outputs.
- Overspeed alarm.
- Motion detection alarm.
- G-Sensor alarm.
- Panic button alarm.
- DMS detection alarm(no driver, fatigue, distraction, phone call, smoking, no mask, noseatbelt, sunglass).
- ADAS Alarm(Forward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

Security

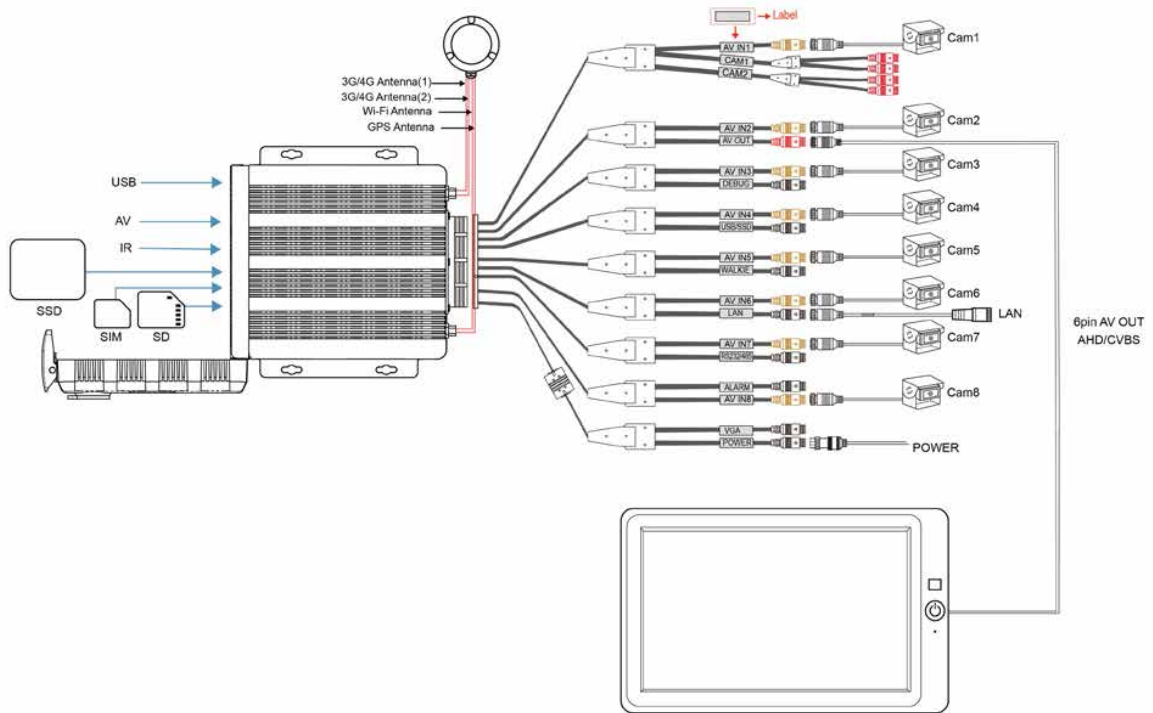
- Users' password protection. The device could not be accessed without password.
- Support account management.

4 Wiring Diagram

- Output wiring the method of VGA/AHD display :



- Output wiring the method of CVBS/AHD display :



5 Connection - Front Panel



5.1 Mechanical Lock

- Close the front cover, lock the buckle, and 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, the red light is always on and the green light is flashing.
- When upgrading 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	
Useless - reserved	POWER	
Switch to ch1~8 for single channel display	1~8	
Switch to an eight-segment display	0	
Enter menu	MENU	
Move up	Up	
Move to left	Left	
Enter submenu to set and confirm	ENTER	
Useless - reserved	REC	
Move down	Down	
Exit	ESC	
Move to right	Right	
Useless - reserved	MULTI	
Clear input	CLEAR	

5.4 SSD Slot

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

5.5 SD Card Slot

- 1x SD (Max. 512GB).
- 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 3G/4G antenna 1

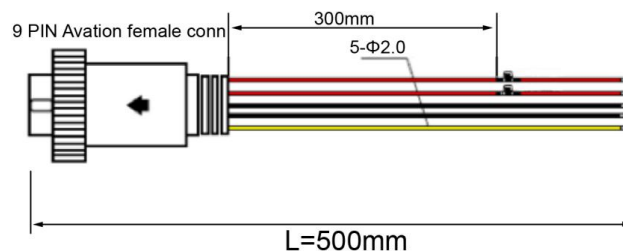
③ W i-Fi antenna

② 3G/4G antenna 2

④ GPS antenna

6.1 Power

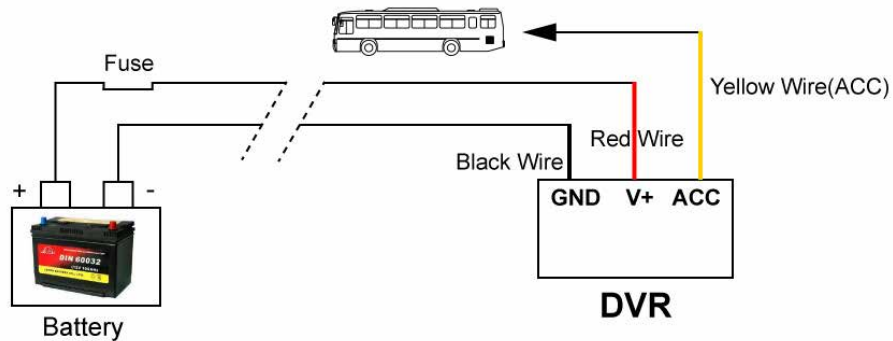
- Power Input



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

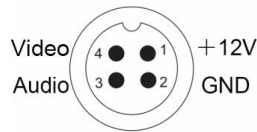
- Connection Method

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



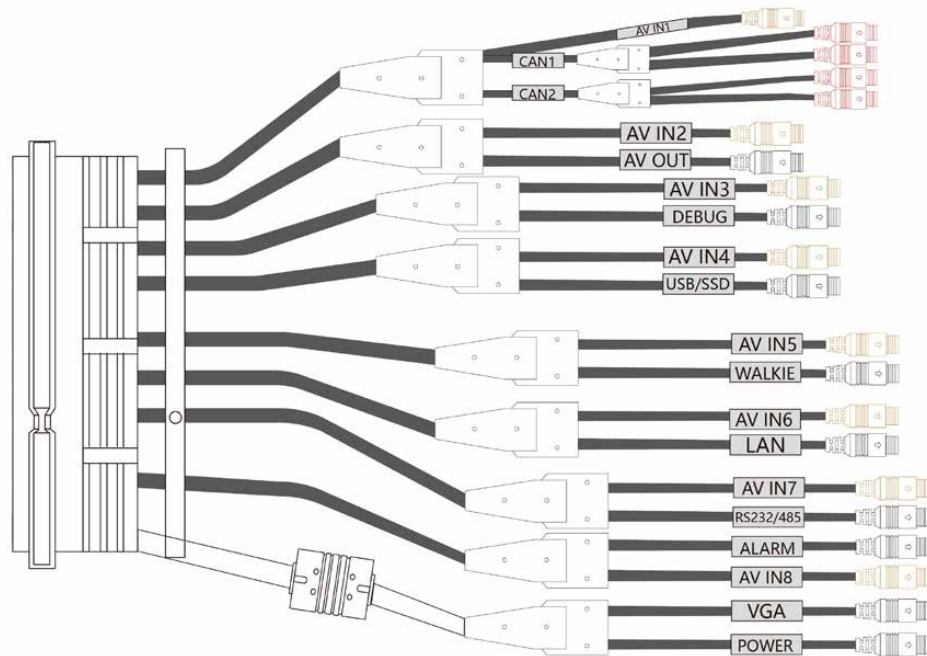
6.2 Cameras (AVIN 1~8)

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



- How to Connect Cameras

Connect 8 cameras on below cable which connects to the back plate of DVR.



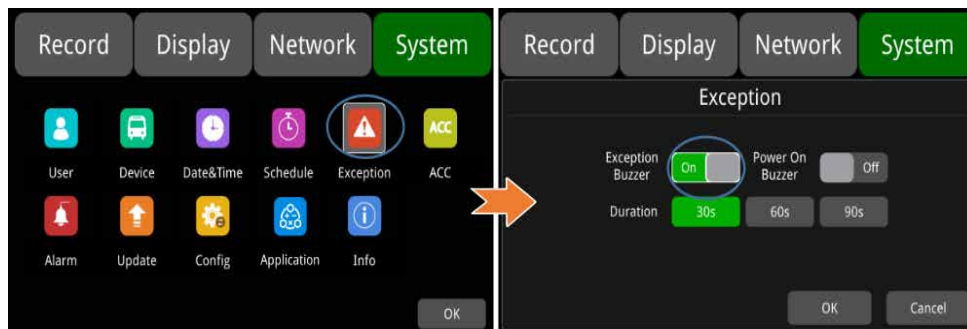
6.4 Buzzer

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 functions are 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 OFF, there would be no alarm even if any event is triggered.



- Power On Buzzer: Power-on beep. When set to "On", DVR will beep 15 times continuously when powered on; when set to "Off", there will be no beep when powered on.

If the buzzer beeps intermittently, it means that the device is unable to record.

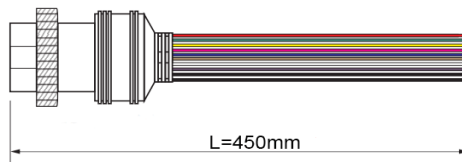
Different beeping modes stand for different working status as below:

- 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

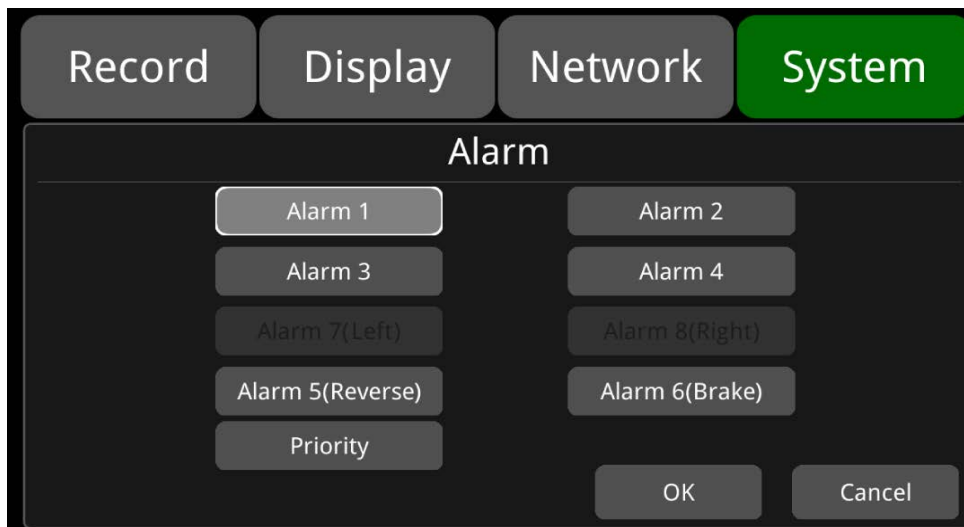
See the figure below.



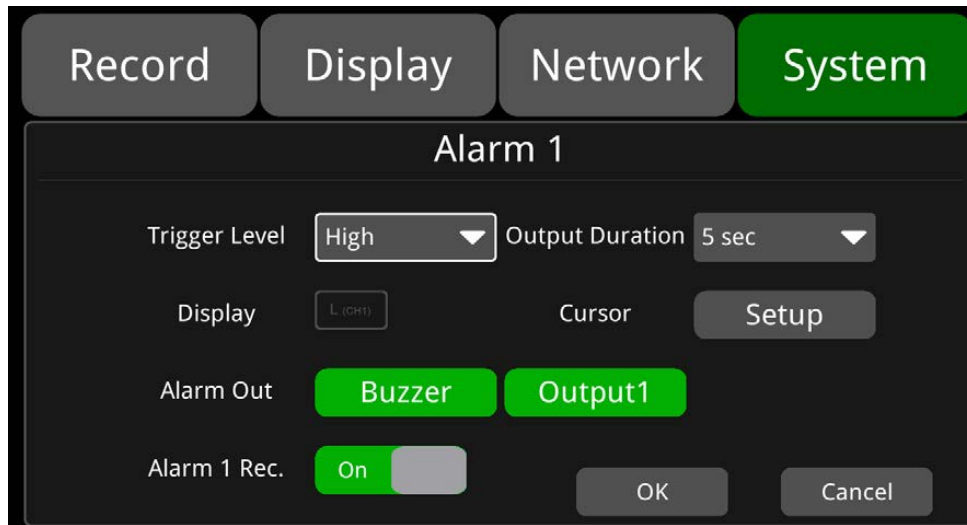
● Pin Definition:

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. The cursor will be displayed when the alarm input channel is working. The first 4 ones can be self-defined by the user.



- 2) The voltage of Alarm output 1 is 12V by default, which can be used as a trigger and needs to work 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.



6.6 Panic Button (Optional - Sold Separately)

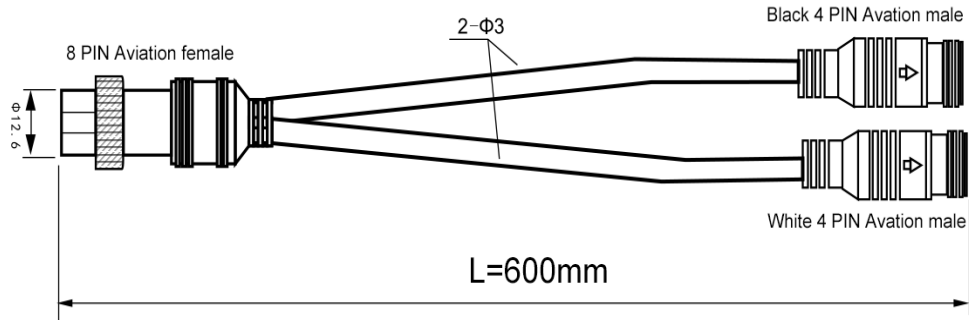
- Overview

The LEDs are used to show the working status of the device. But when the device is installed in the vehicle, it is not easy to check the LED on the front panel. Each LED indicates the corresponding status of the device. Furthermore, the panic button makes it easier to trigger alarms and recording for emergencies by pushing a single button.

The panic button has four main features including LED indicators, an emergency button, buzzer alarms and infrared functions.



- Pin Definition



Connect the 8PIN aviation connector of the above cable to the 8PIN aviation connector on DVR(RS232 and RS485).

- LED

LED	Color	ON	OFF
VLoss	Yellow	Go to [Setting]-[Record]-[Record Channel] to see if any camera is missing. In case any camera is chosen but not connected, LED would show yellow	Normal operation
Rec	Green	Starts to record	No recording
GPS	Yellow	GPS signal is lost	Normal operation
Mem	Red	Storage damage or NO storage	Normal operation
Comm	Yellow	Device is not connected to the server	Normal operation or device is not connected to the server if this feature is disabled
Power	Green	Power is connected	NO power
Error	Red	Error with device	Normal operation
Event	Reserve	Reserve	Reserve

- Panic Button

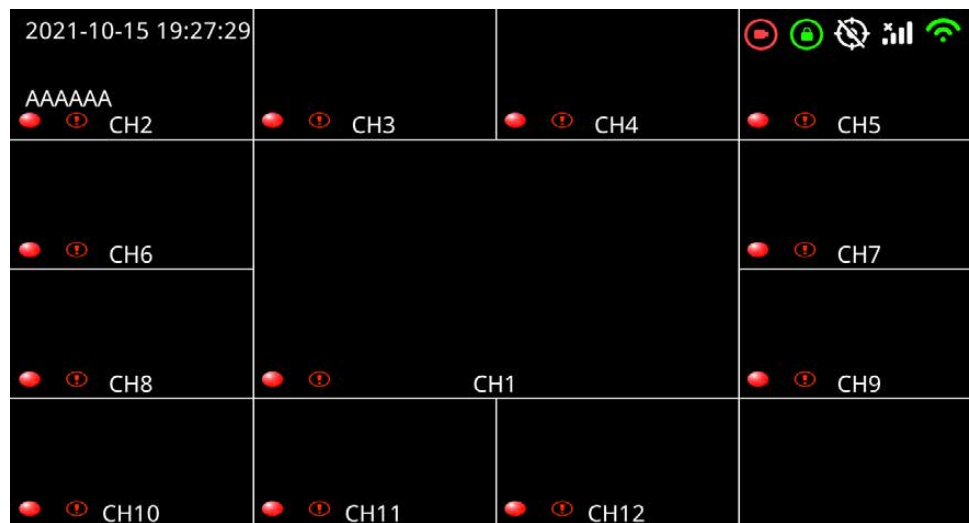
Panic button is labeled as "Bookmark".

1) When the bookmark button is pressed, an emergency event recording will be triggered.

If alarm recording cannot be triggered by pressing the button, please check if the Event Rec. is set to ON as shown below:



If the alarm recording was triggered, there will be an alarm sign on the screen, as shown below:



- IR Receiver

When the remote control aims to the IR on panic button, it has the same effect of aiming to that on the device. Sometimes the recorder will be installed in a relatively hidden place in the vehicle, which is not possible for users to directly control the device by remote control. So it will be more convenient for users to operate with the panic button.

- The Buzzer

The alarm from the buzzer in the panic button is convenient for checking the status of the device.

In System->Exception, if Power On Buzzer is set to On, the alarm buzzer of panic button beeps 15times continuously when DVR is powered on; If set to off, DVR power on, alarm buzzer of panic button will not beep when DVR is powered on.

In System->Exception, if Exception Buzzer is set to On, the alarm buzzer of panic button beeps with a long frequency when alarms are triggered.

In System->Exception, if Exception Buzzer is set to Off, the alarm buzzer of panic button will not beep with a long frequency.

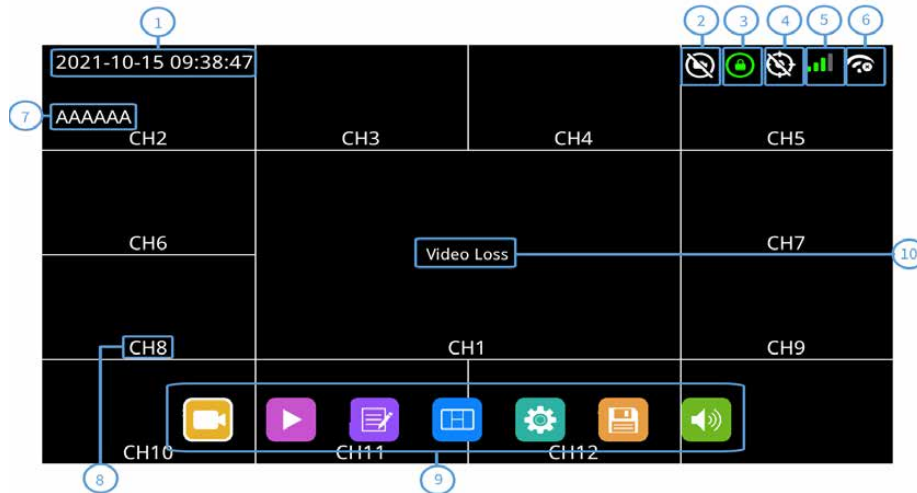
6.7 Four-in-one Antenna (GPS, 3G/4G, Wi-Fi)



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.

- It flashes in connection process, and when connected, the indicator is always on.

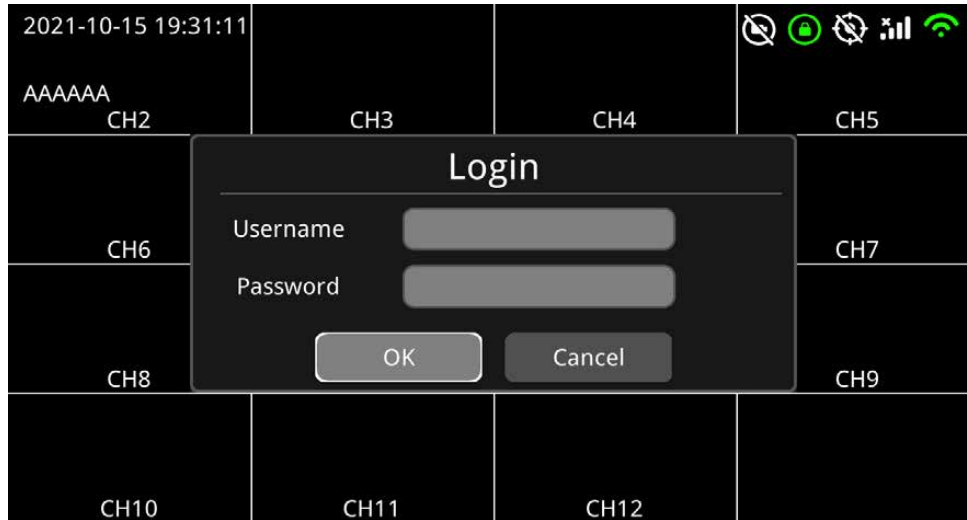
⑤ 3G/4G.

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.

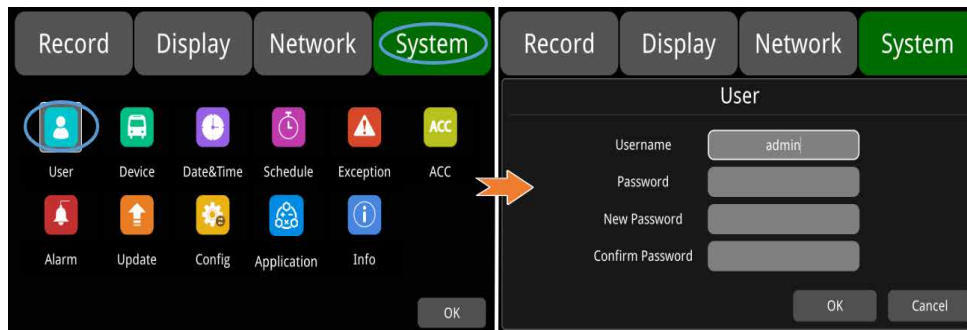
7.2 Menu Lock



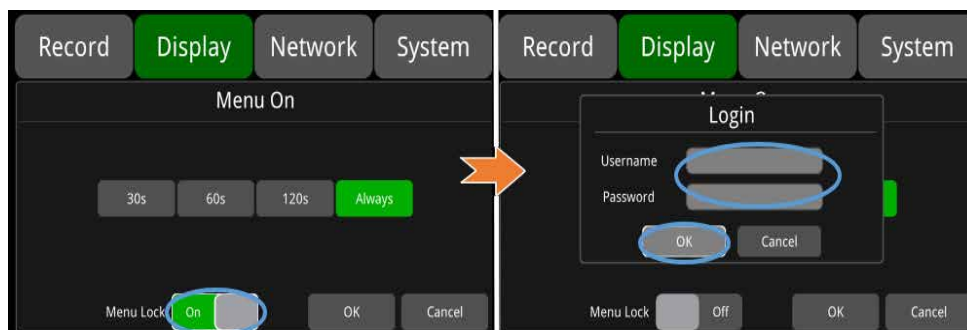
- The device/recorder supports two kinds of permissions: admin permission and guest permission.
- Users' account list.

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

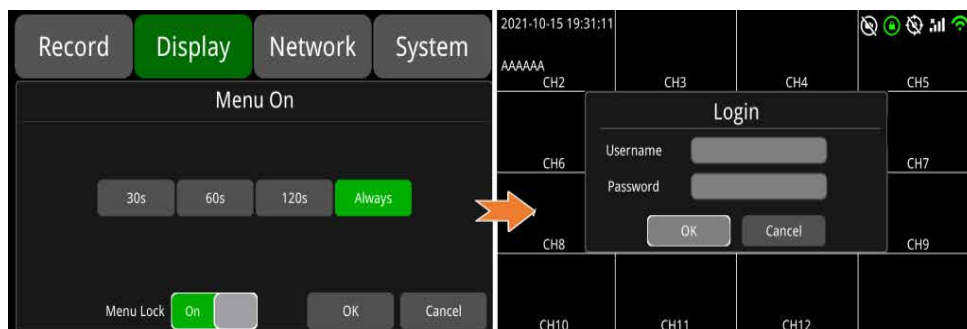
- Users' name could not be changed, but users' password is changeable. The guests do not have permission to enter the setup menu, so the password cannot be changed. (See the following instructions to change the password.).



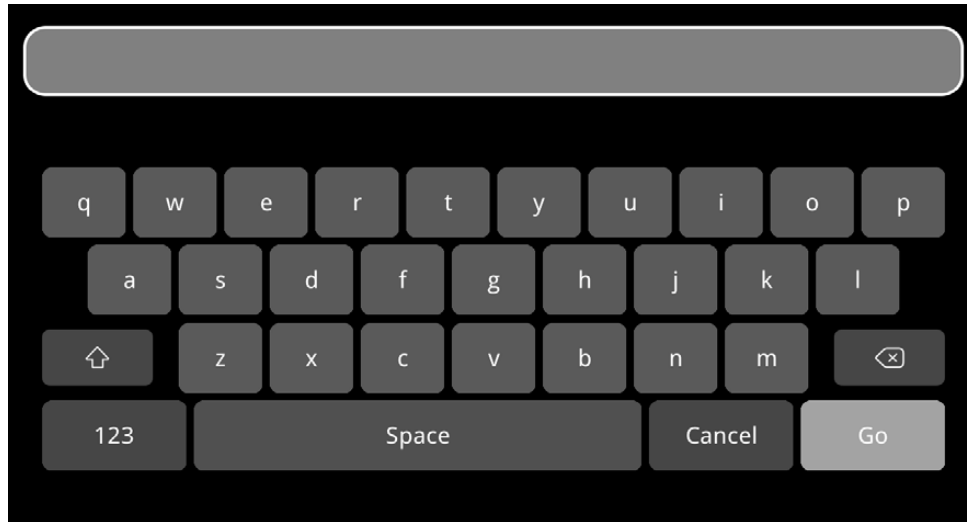
- Only the administrator could change the status of Menu lock. The following picture shows how to change the Menu Lock status from ON to OFF.

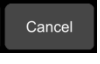
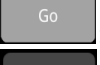
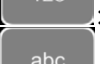


- When the menu lock status is "ON", you need to enter the user name "admin" and password to enter the "recording", "play", "log", "settings", "disk" "layer switching" and "volume adjustment" and other menus. If you use the user name "guest" and password, you can only enter the "play", "layer switching" 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.

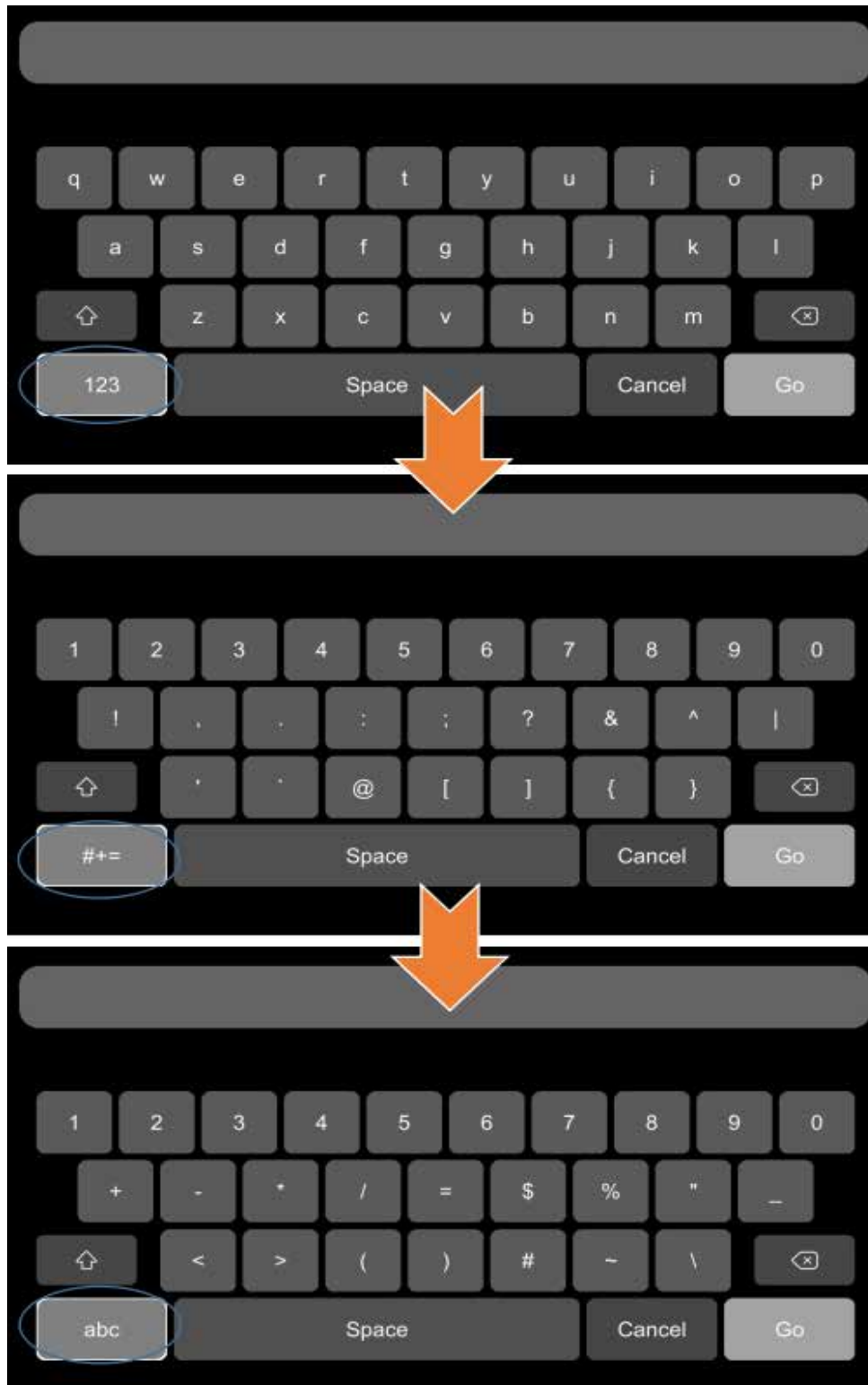


7.3 Keyboard Operation Instruction



- : 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 or start recording.

7.5 Playback

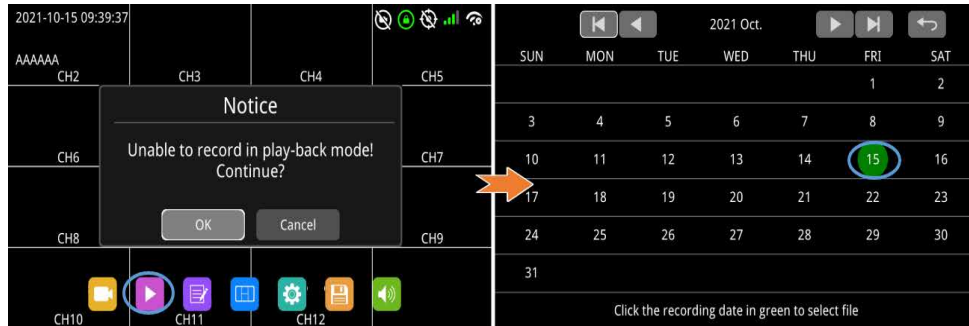


Video playback button: Touch this icon to enter the calendar menu.

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 you can be shift to the next or the previous one. Specific operation as below.

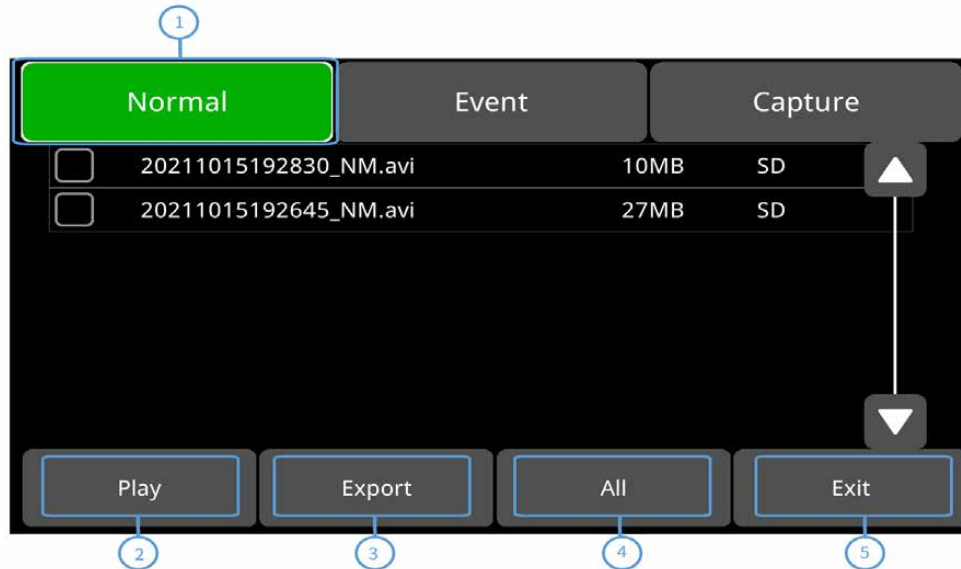
- Calendar Interface



◀ ▶ : Search by month.

⏮ ⏭ : Search by 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
DMS alarm recording	Event recording setup time	Normal list
FCW alarm recording	Event recording setup time	Normal list
LANE departure alarm recording	Event recording setup time	Normal list
PDS alarm recording	Event recording setup time	Normal list
BSD alarm recording	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)

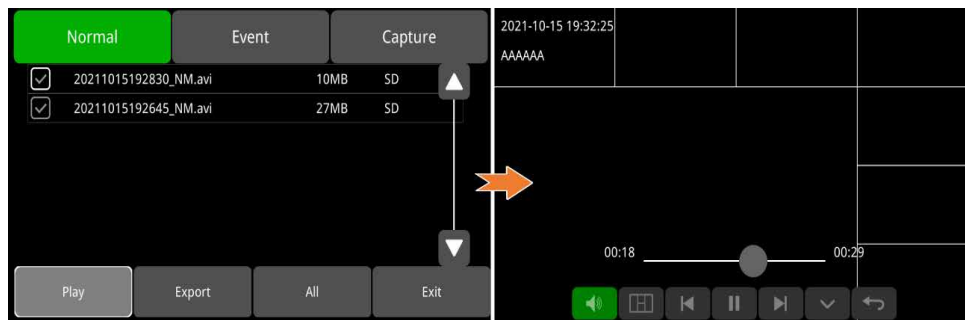
There is an abbreviation of record type in the file name, from which you can get the record type of this file. Only .NM video files are generated in the local playback files, and the abbreviations of other video types can be viewed in the client.

The abbreviations of recording types are as follows:

NM	Normal recording	TI	Scheduled recording
MO	Motion detection recording	SP	Speed recording (the speed source is GPS)
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:



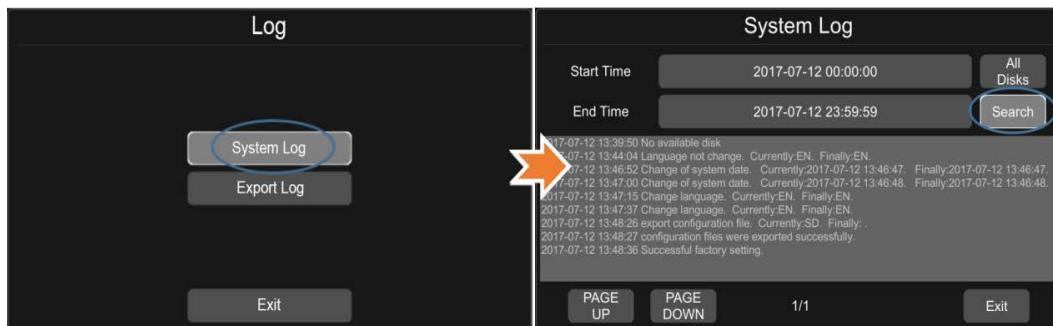
-  : Volume control.
-  : Select the playback view modes.
-  : Play the previous/next video file.
-  : Pause/Resume playing.
-  : Hide the menu. Press [Area 1] to display.

 : Exit Play.

7.6 Log



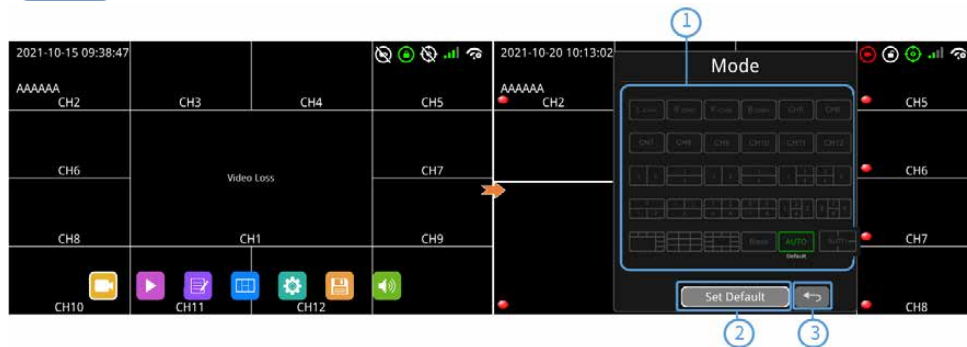
System Log query and export.



7.7 Display Mode Switching



Display mode switch: Press the icon to display.



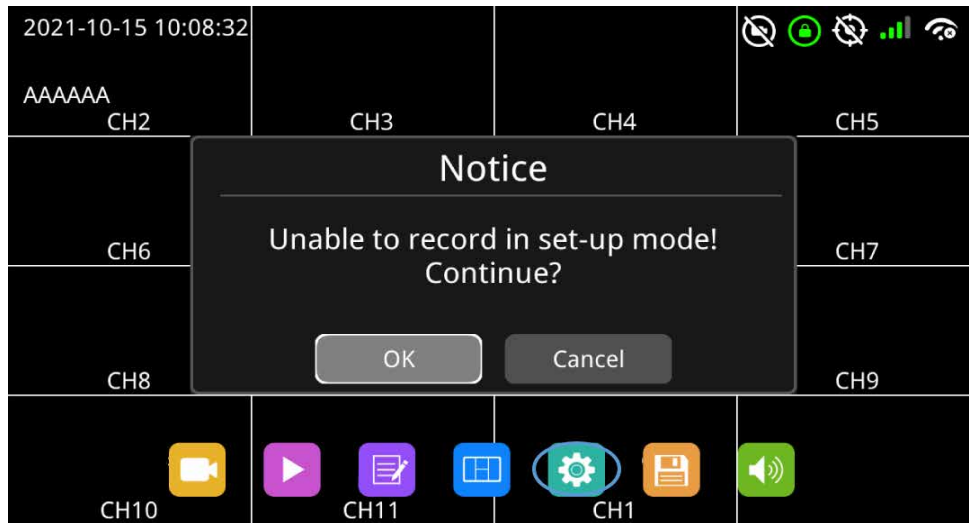
Play multiple types of mode. The default mode is automatic view.

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

7.8 System



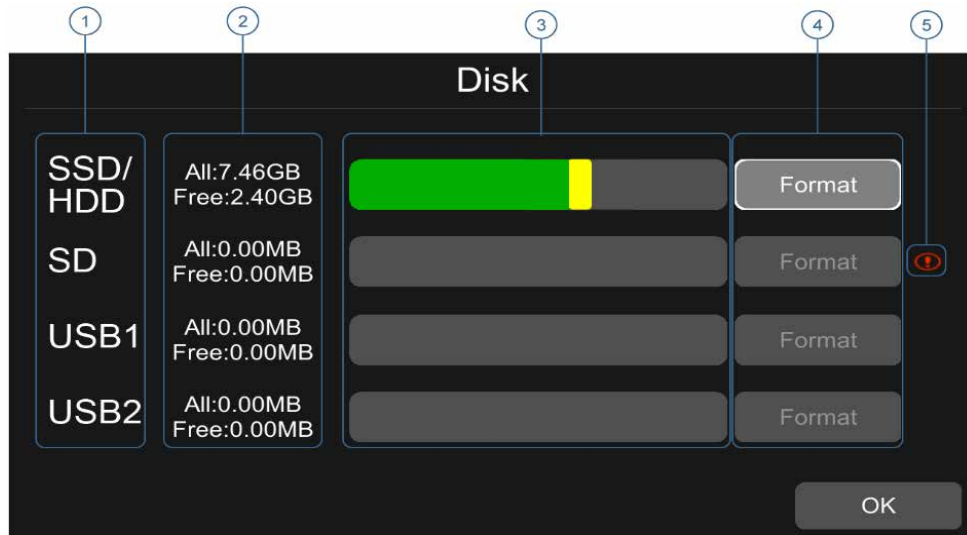
System settings: Touch the icon to enter the setup menu. A window notice of "Unable to record in set-up mode! Continue?" will be popped up, and touch OK to enter.



7.9 Disk



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



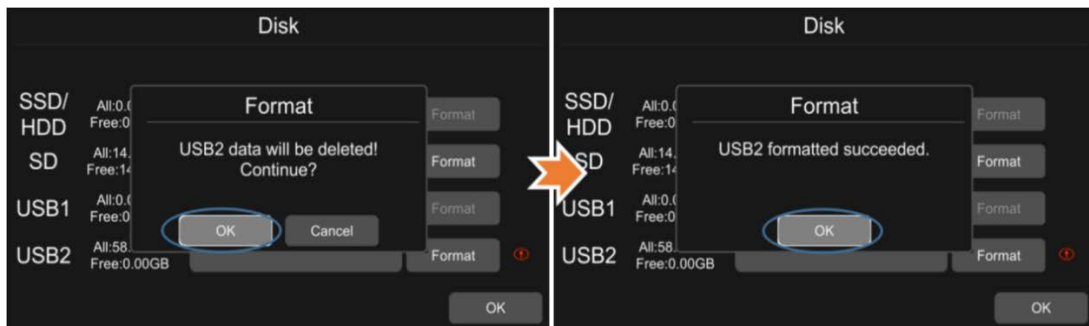
- ① Disk types.
- ② Disk capacity.
 - All: The total capacity of individual disk.
 - Free: The remaining capacity of disk.
 - If All shows 0.00MB, it means that DVR does not have access to this type of disk.
- ③ Disk capacity bar.

- The green bar shows the size of all video files in the "Normal" list.
- The yellow bar shows the size of all other files except the above files.

④ Touch to format the disk.

- A window notice of "Disk data will be deleted! Continue?" will be popped up. Press OK to start formatting the disk.

The following figure is an example of formatting USB2.



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

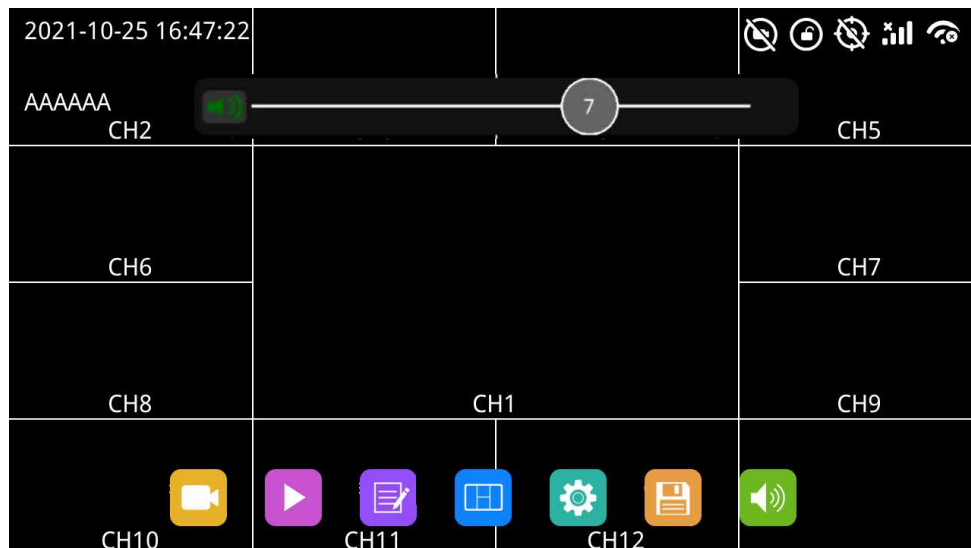
⑤ It shows that the disk needs to be formatted before application.

Usually, all new disks must be formatted before application.

7.10 Volume



Volume: 0~10. The default value is 7.



Function	Min.	Max.	Default
Volume	0	10	7

8 Record Setup

8.1 Power On Rec

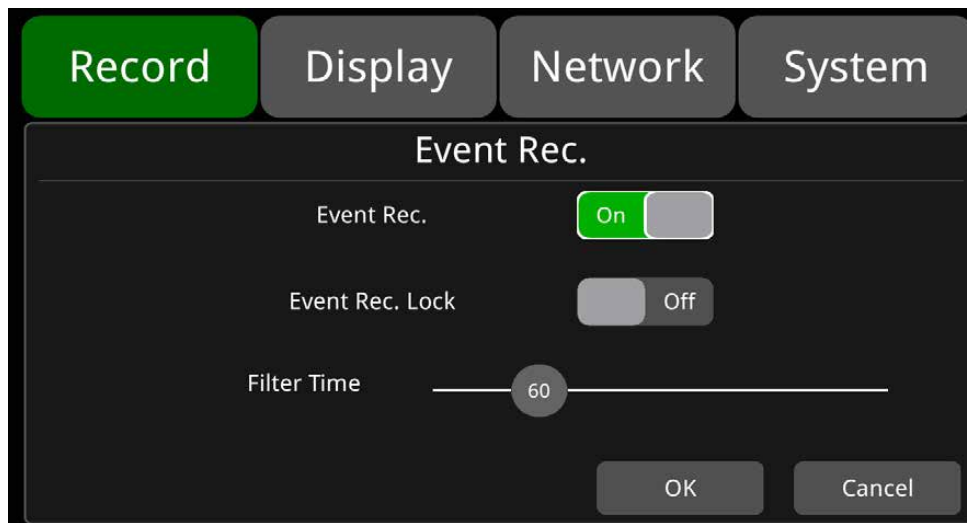
When “Power On Rec” is set to ON, the device will start recording once it’s powered on. Default setting is ON.

8.2 Cyclic Rec

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

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

8.3 Event Rec

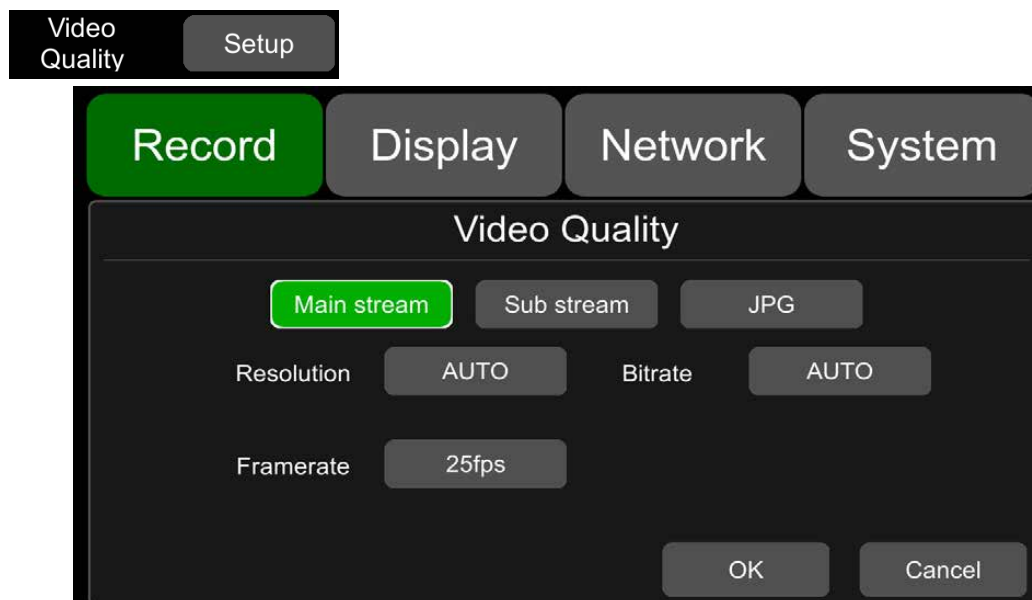


Event Rec.: Event recording refers to the alarm recording triggered by events including motion detection, G-Sensor, alarm 1 ~ 6, panic button and over speed, FCW alarm, DMS detection alarm, LANE departure alarm. If the Event Rec is set to ON and corresponding alarm parameters are set, event recording 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, every 60s the DVR generates an alarm message and checks whether a new alarm recording is generated every 60s. When the DVR is connected to the Internet, the alarm information will be sent to the server. The minimum value of Filter Time is 1s and the maximum can be set to 300s, with the default value of 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), and 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 size of it. 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 bit rate to choose from in the main stream menu, 4Mbps, 2Mbps, 1Mbps, 512Kbps, 256Kbps, 128Kbps, 64Kbps, and AUTO; in the sub stream menu, there are 6 levels of bitrate to choose from, 1Mbps, 512Kbps, 256Kbps, 128Kbps, 64Kbps and AUTO. The higher the bitrate, the clearer the image and the larger the video file. Therefore, all factors should be considered in the options of Bitrate.

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

Bitrate		
	Main stream	Sub stream
AUTO	If a 1080P camera is connected, the bitrate 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 framerates in Main stream and Sub stream menu: 30fps (NTSC) , 28fps (NTSC) , 25fps, 20fps, 15fps, 14fps, 10fps and 5fps. The higher the frame rate, the smoother the recording, and the larger the video file. (Note: mixed connection of cameras with different frame rates is not allowed.)

SSD / SD Capacity	Video Quality	File Length
2TB	8 x 1080P / 4Mbps	≈149h
	8 x 720P / 2Mbps	≈298h
	8 x D1 / 1Mbps	≈596h
	1 x 1080P / 4Mbps	≈1193h
	1 x 720P / 2Mbps	≈2386h
	1 x D1 / 1Mbps	≈4772h
512GB	8 x 1080P / 4Mbps	≈38h
	8 x 720P / 2Mbps	≈75h
	8 x D1 / 1Mbps	≈150h
	1 x 1080P / 4Mbps	≈298h
	1 x 720P / 2Mbps	≈596h
	1 x D1 / 1Mbps	≈1193h

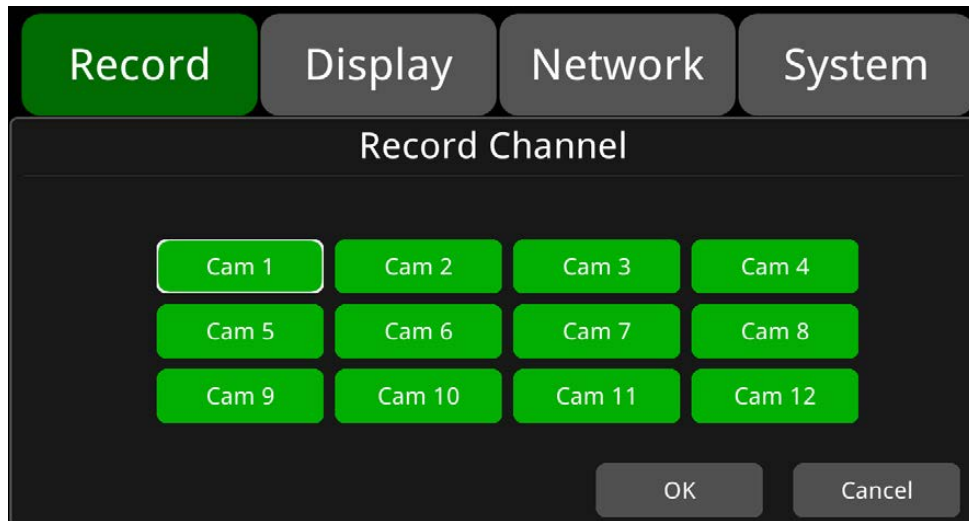
④ JPG

JPG Framerate is available in Excellent, High, Mid, and Low. The meanings of these four values are 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 per picture.
Mid	The rate of uploading pictures to the client is 3 second per picture.
Low	The rate of uploading pictures to the client is 5 second per picture.

8.5 Record Channel





The default configuration is shown above.

Select the record channel. When recording is turned on (including all types of recording), all channels will be recorded; this version forces recording, Even if the record channel is turned off, correspondingly it will still be recorded.

AUTO: AUTO is OFF by default. When it is turned 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.

Host IP	192.168.88.1			
Cam 5	192.168.88.25	●	Clear	Add
Cam 6	192.168.88.49	●	Clear	Add
Cam 7	Not connected	●	Clear	Add
Cam 8	Not connected	●	Clear	Add

Clear all Fast Setup ☒ AUTO OK

● : Indicate that the IPC has been connected successfully.

● : Indicate that no IPC is connected.

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

Add Add: Button for entering the IPC-adding interface.

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

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

AUTO ☒ AUTO: Automatically connect to the detected IPC. When AUTO is set to "On", Clear, Add, Clear All, and Fast Setup settings cannot be operated. AUTO is off by default.

OK OK: Save the interface and exit.

Add Add: IPC-adding interface.

Record		Display		Network		System	
No.	IP	User Name	Password	Status			
☐ 1.	192.168.70.127						
☐ 2.	192.168.88.233						
☐ 3.	192.168.70.175						
☐ 4.	192.168.88.192						
☐ Manual add							

IP: Indicate the IP of the relevant IPC searched by the DVR.

User Name: IPC user name.

Password: IPC password.

Status: The connection status of the searched IPC; the relevant status is explained as follows:



: Indicate that the IP network segment of the IPC is inconsistent with that of the DVR, which means the network segment is incorrect.



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



: Indicate that the IPC has been connected successfully.



: Indicate 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: If the filter is turned on, the screen will not display the IPC that the DVR has successfully connected to in this interface; when the filter is off, the screen displays all searched IPCs in this interface.

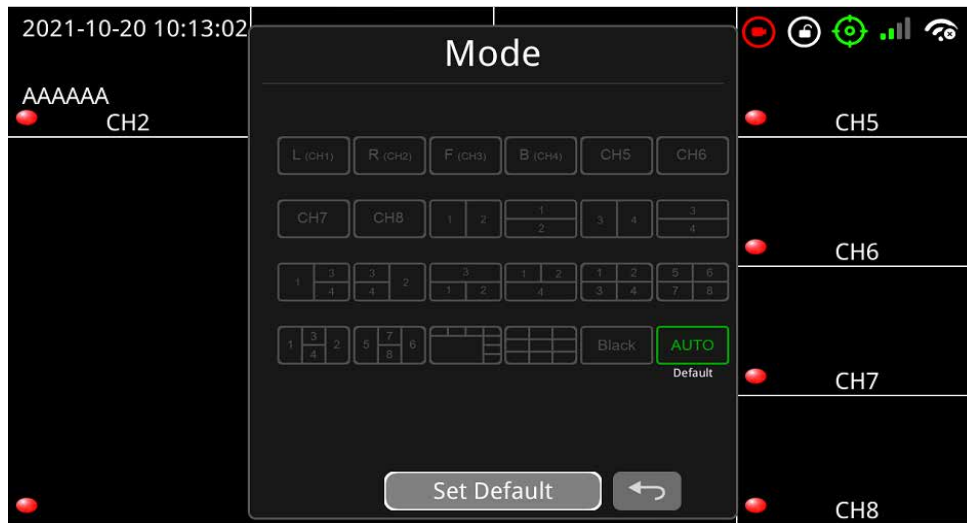
Refresh: If the IP connected to the IPC is not found in the interface shortly after booting, you can click this button to refresh the interface.

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 an eight-split display on the main and sub-screen after 1min of being connected to the IPC channel. If the IPC channel is not connected, the DVR automatically switches to a four-division display of CH1~CH4 after 1min; if you select other split modes other than AUTO as the Default setting, the DVR will display the chosen split mode upon restarting.

8.7 Event Duration



The default configuration is shown above.

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

8.8 File Length



The default video file length for AVI format is 5 min.

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

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

8.9 Motion Sensitivity



The default configuration is shown above.

Motion detection recording and sensitivity level setting: Motion detection recording will be triggered when an object moves and its movement exceeds the preset motion detection sensitivity level. For such kind of event recording, the pre-recording time is fixed as 10s and the post-recording time is configured by the Event Duration above.

Total video file length equals to the pre-recorded file length (fixed 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.

8.10 G-Sensor Sensitivity



The default configuration is shown above.

G-Sensor recording and the setting of sensitivity level: When the acceleration or gyroscope of the G-Sensor reaches the preset sensitivity value, G-Sensor recording will be triggered. For this kind of event recording, the pre-recording time will be fixed as 10s and the post-recording time is configured by the Event Duration above.

Total video file length equals to the pre-recorded file length (fixed 10s) plus the file length configured in Event Duration.

If G-Sensor trigger is turned off, event recording will not be triggered. G-Sensor sensitivity can be set to two levels, Low / High. G-Sensor triggered recording is on when Low / High is selected. G-Sensor triggered recording is off when OFF is selected.

8.11 File Type



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

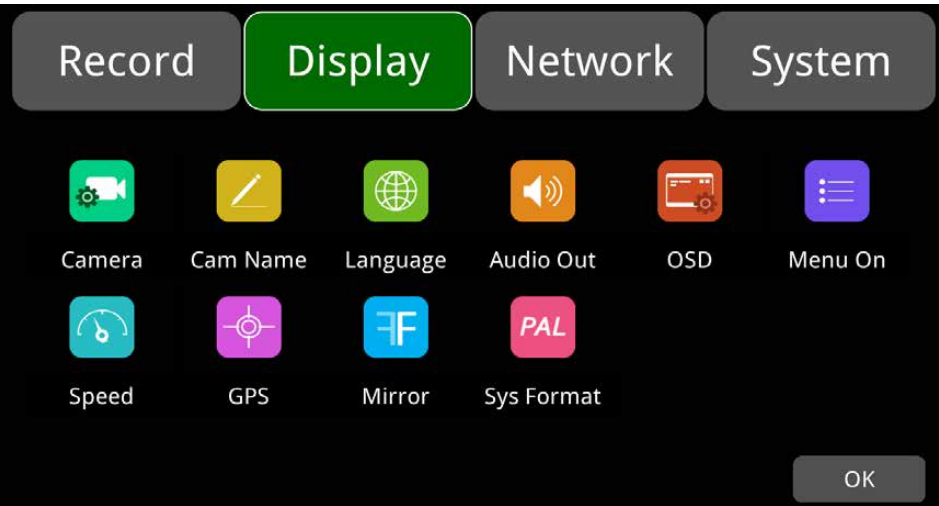
8.12 Record Audio



Set the recording audio of the channel. When a recording channel is selected, the audio from that channel will be included in the recording file. If a channel is not selected, there will be no audio recorded for the recording file of that particular 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 X” on the menu, a keyboard will pop up to input a new camera name.

Note: 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



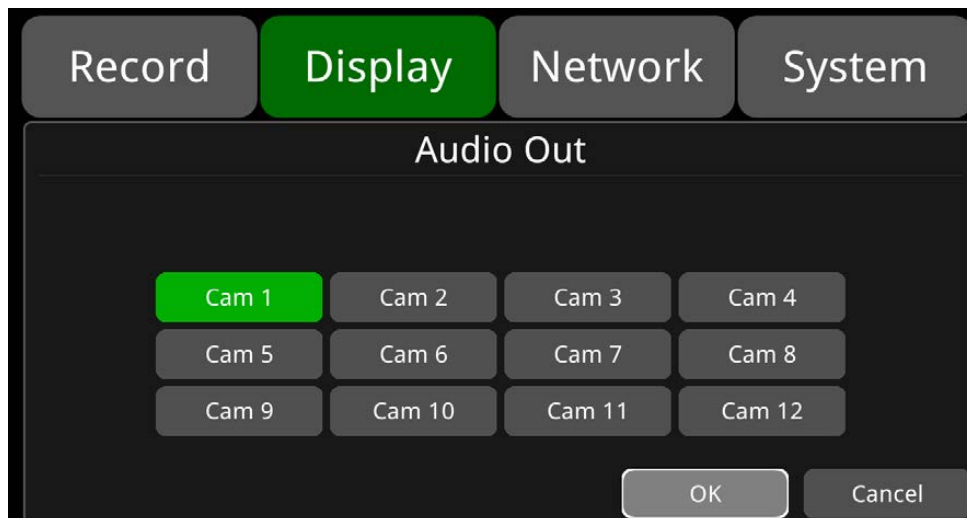
Menu languages: English, Russian, Turkish, Chinese, Japanese, Spanish, Portuguese, French. The default language is English.



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.

Record Display Network System

OSD

Time ☒ On

Camera Name ☒ On

License No. ☒ On

Speed ☐ Off

OK Cancel

9.6 Menu On



Setting of menu display duration. The default configuration is shown below.

Record Display Network System

Menu On

30s 60s 120s Always

Menu Lock ☒ On

OK Cancel

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 within 30s, 60s or 120s. When it is set to Always, the menu will always be there. Please note that the recording will stop when the menu is on. It is not suggested to set it 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.

The username “admin” and password are required if to change the status of the menu lock.

9.7 Speed



Speed setting: The data source of over speed comes from GPS. Speed unit is optional: Km/h or Mile/h.

Overspeed threshold can be set by users. Duration is the overspeed alarm time setting. Duration is the setting of the over speed alarm time. If the speed exceeds the over speed value for a time longer than duration, the overspeed alarm recording will be triggered.

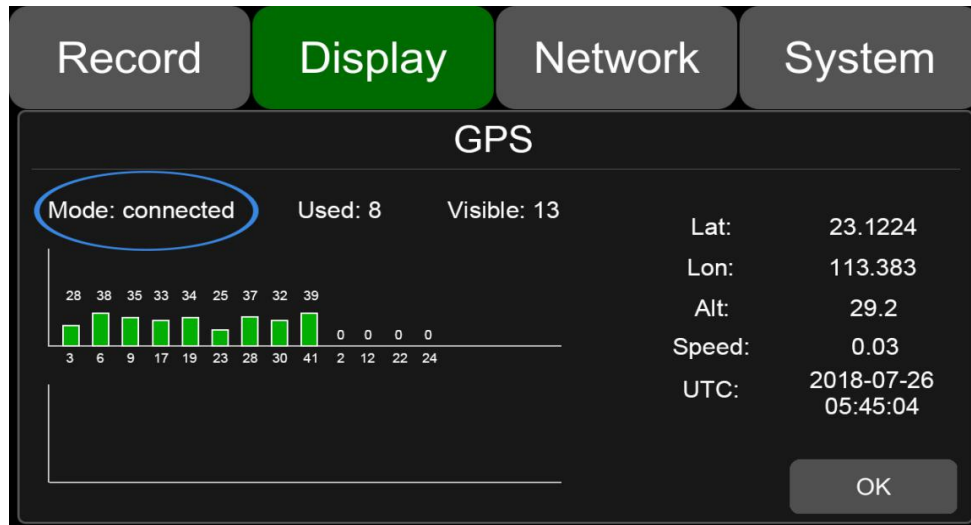
The alarm switch is to set the overspeed alarm recording ON and OFF. If it is ON, the overspeed alarm recording will be triggered when the vehicle is overspeed. If it is OFF, the overspeed alarm recording will not be triggered. The default configuration of each item is as follows.

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

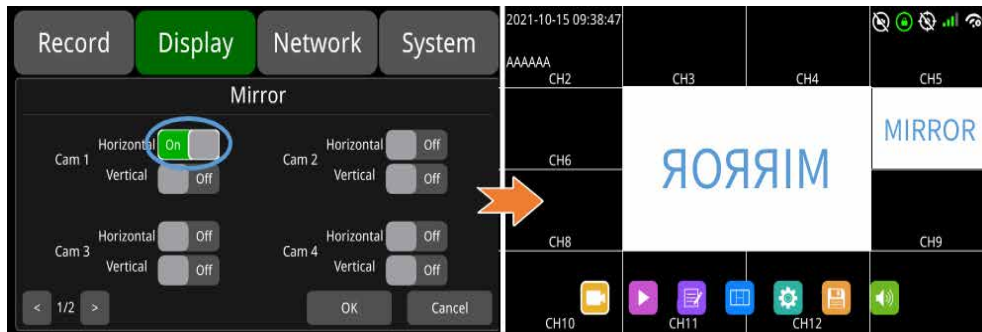


Horizontal and vertical flips of all channels are turned off by default.

Horizontal: When it is set to ON, the corresponding recording channel will flip horizontally; when it is set to OFF, no horizontal flip will be done.

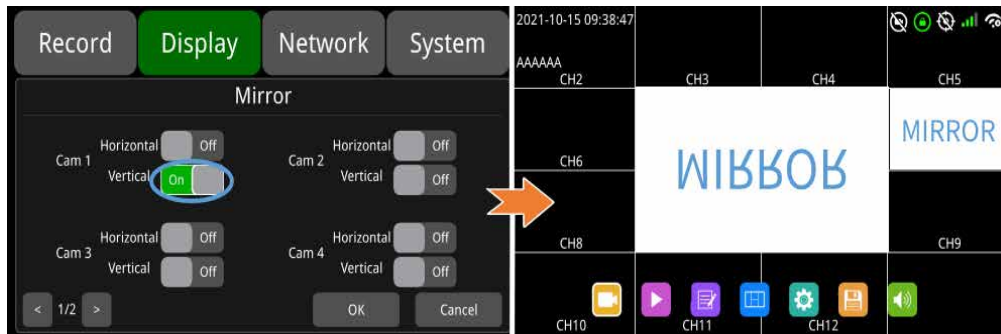
The setting steps are shown as follows:



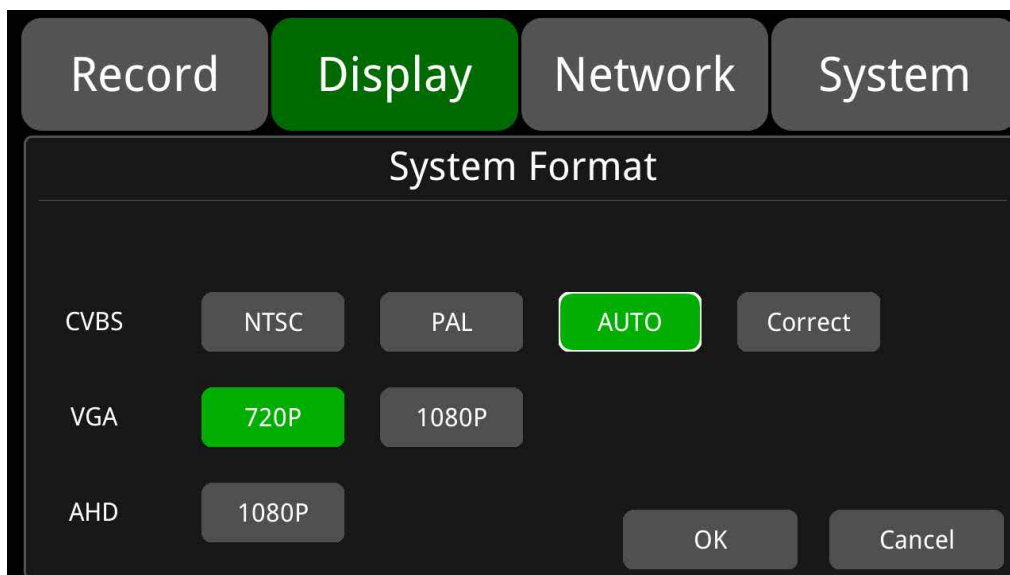


Vertical: When it is set to ON, the corresponding recording channel will flip vertically; when it is set to OFF, no vertical flip will be done.

The setting steps are shown as follows:



9.10 System Format Setting



The default configuration is shown above.

CVBS: Standard definition display.

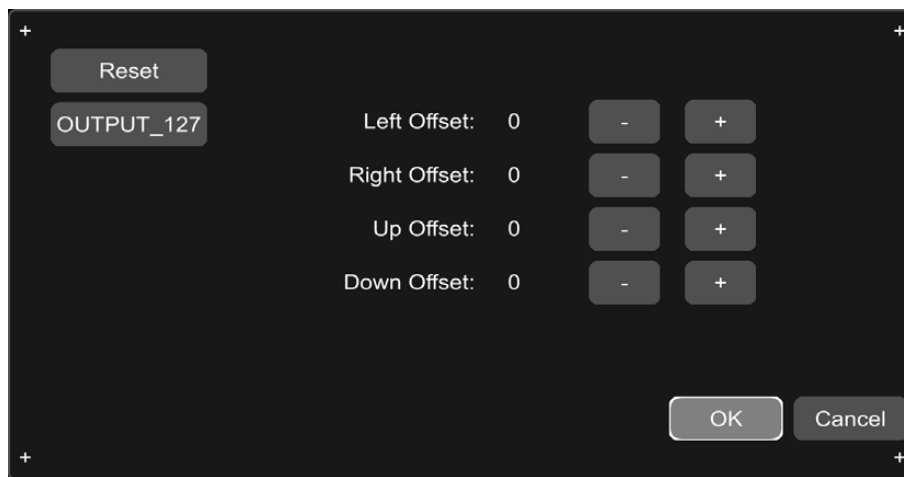
VGA: HD display.

AHD: HD display (Not available now).

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, it can be reduced in size. Each reduction unit equals two pixels, and a maximum of 64 units can be reduced.

When the interface is minimized, the DVR can only be operated using the remote control.

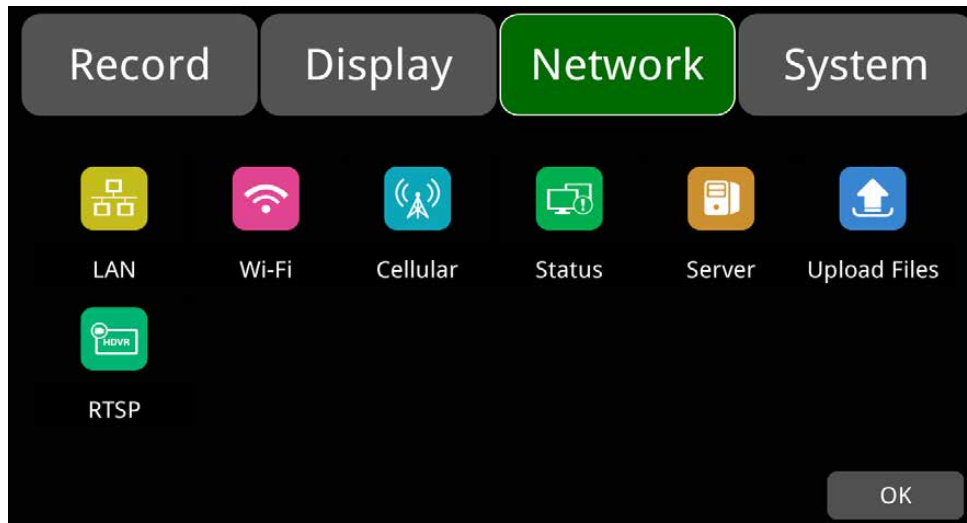


The default configuration is described in the following table:

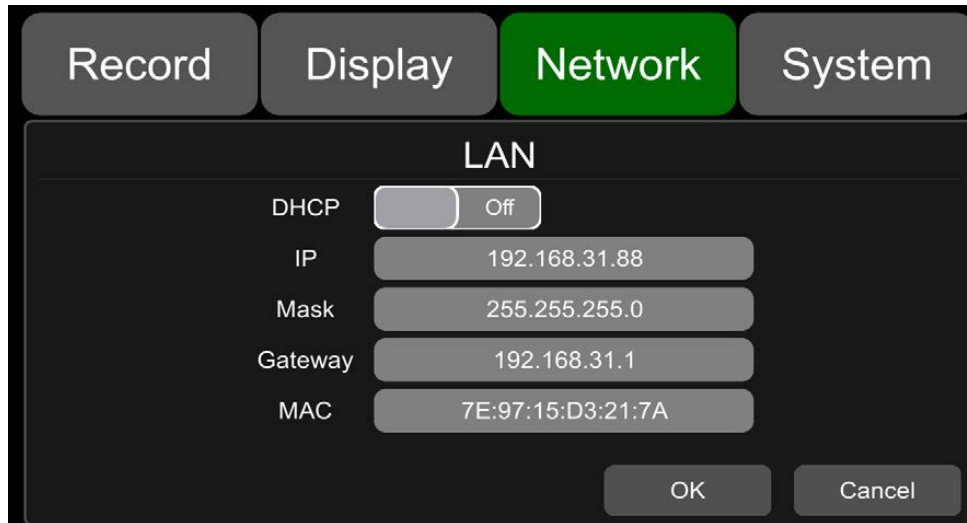
OUTPUT_127	Left Offset	Right Offset	Up Offset	Down Offset
Default	30	28	12	10

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



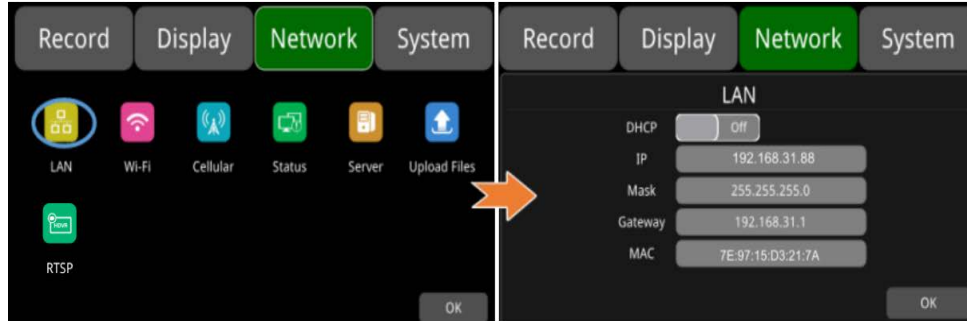
The default configuration is shown above.

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.

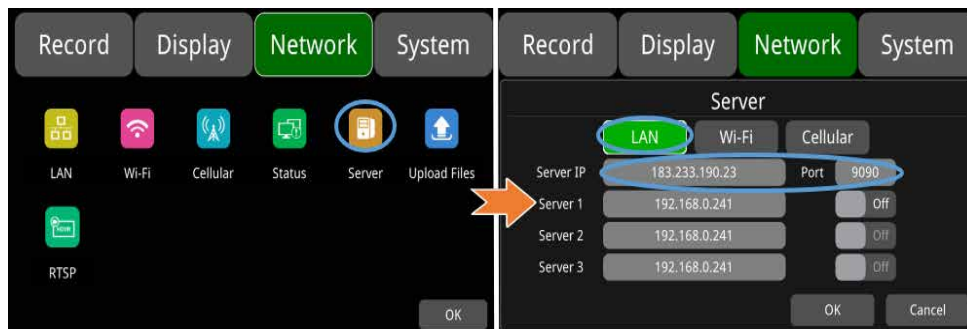
Step 2: Go to “Network - >LAN” page.



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.

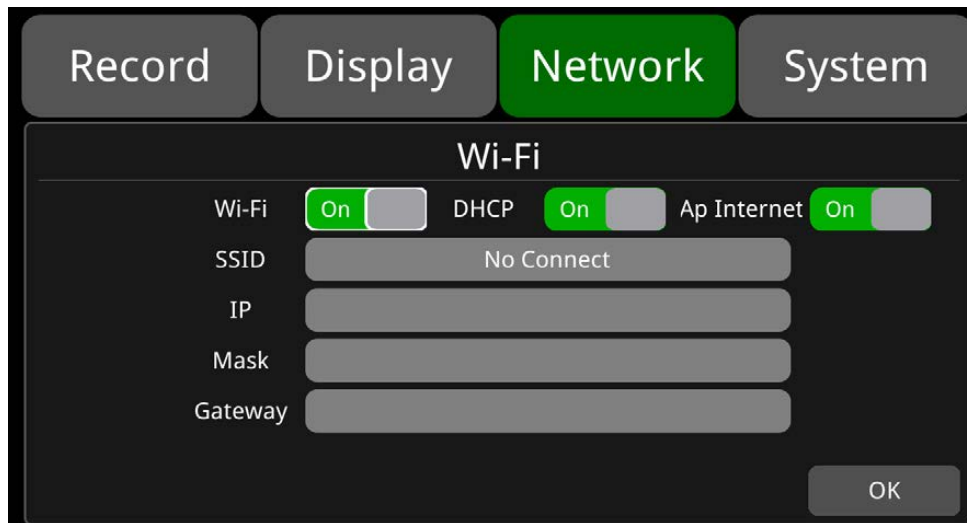
Step 5: Go to “Network - Server” page and touch the LAN icon.



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.

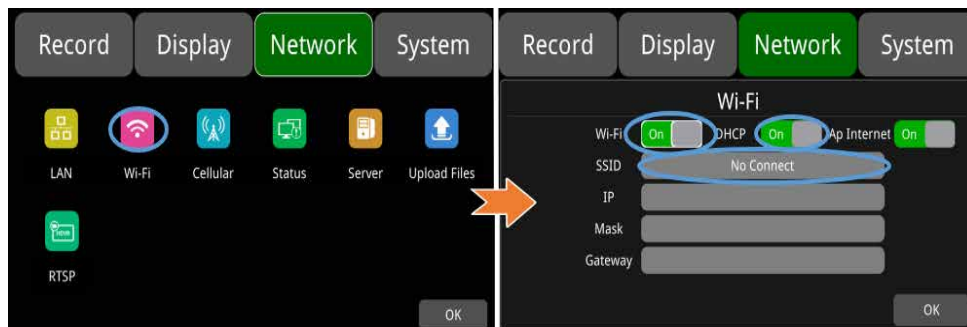
AP Internet: The hotspot of the device can be found on mobile phones when it is On.

- Wi-Fi connection

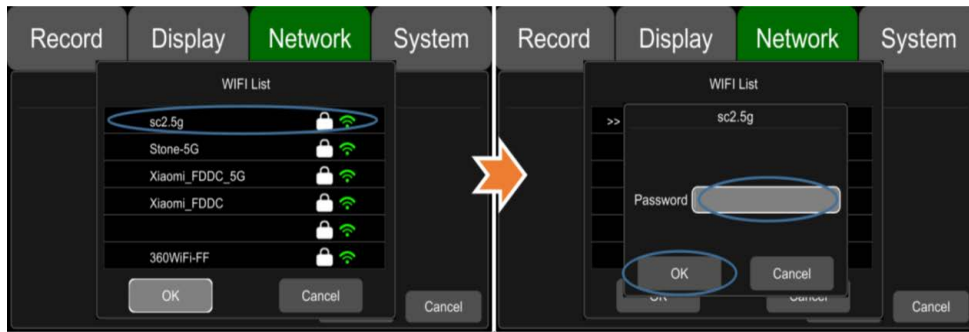
Step 1: Make sure Wi-Fi hot spot is available.

Step 2: Connect the Wi-Fi antenna to connector ③ of the rear panel of the device.

Step 3: Go to Wi-Fi setup interface, set Wi-Fi to ON and DHCP to ON.

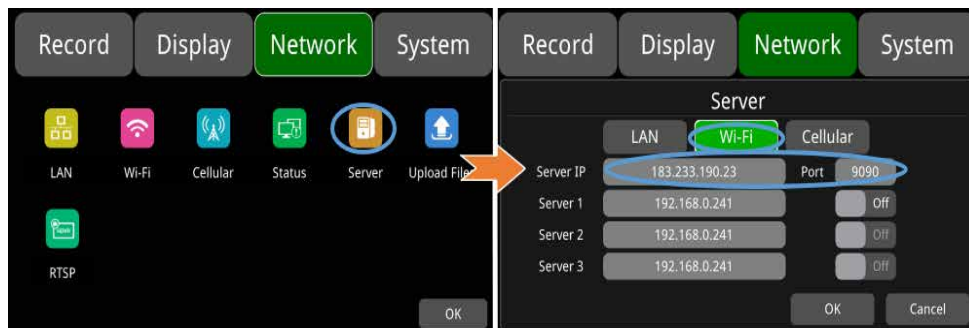


Step 4: Touch SSID sub-menu to select the hotspot and input the password.



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.

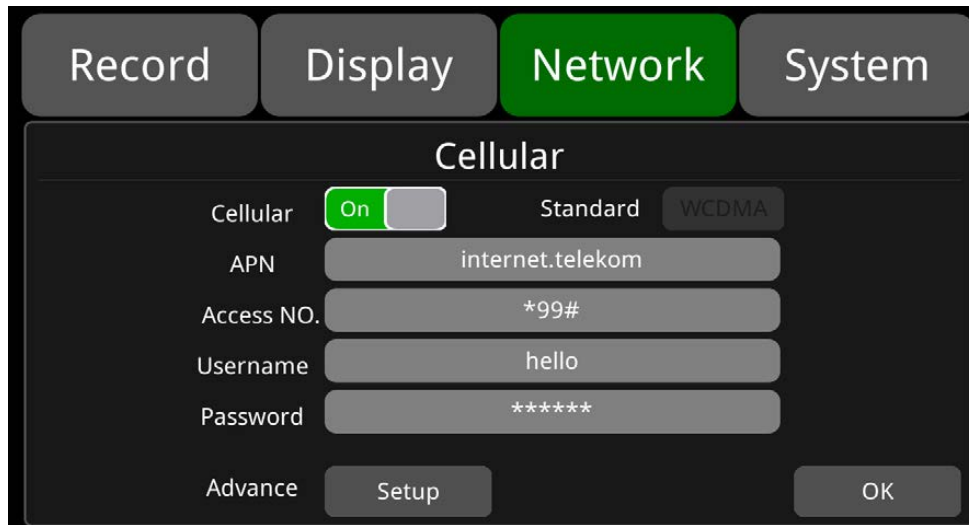


Step 7: Wi-Fi network status and server status can be checked on "Network ->Status". Wi-Fi Status shows "CONNECT SUCCESS" and the Server Status shows "Online".



10.3 3G/4G Control and Setup





The default configuration is shown above.

Cellular: If Cellular is ON, it means that 3G/4G is ON.

Network Standard: The default is WCDMA.

APN & Access No.: Normally, the default values for APN, Access number can be used, and the user name and password are not necessary. If the connection is not successful under the default settings, please consult your local network carrier.

Username & Password: Provided by carrier, contact them for needed information.

- 3G/4G Connection

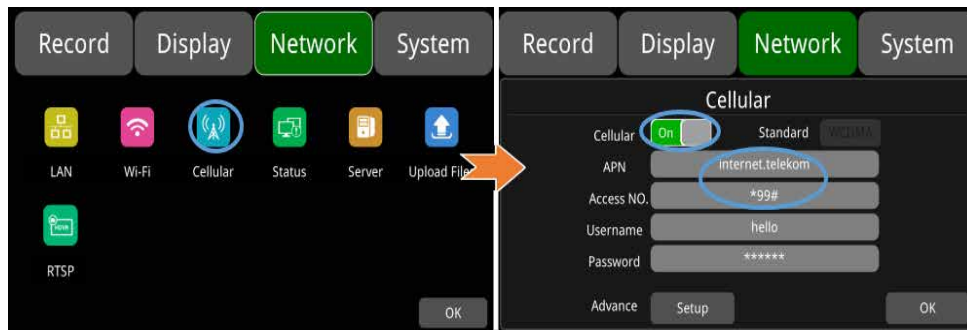
Step 1: DVR can search 3G/4G signals locally. Step

2: Connect the 3G/4G antenna to connector



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

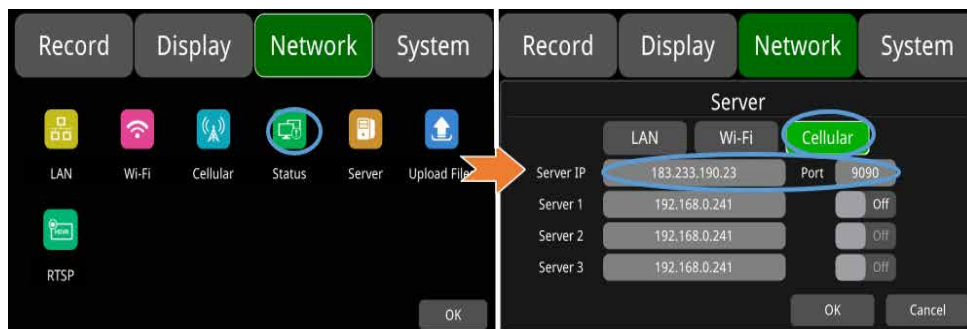
Step 4: Go to Cellular setup interface and set Cellular to ON.



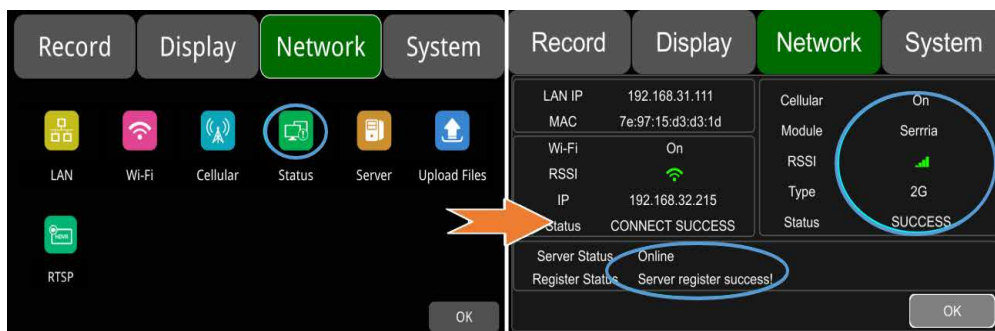
Step 5: Enter the correct APN and Access number. The latter is optional.

Step 6: Touch OK to save the settings and exit.

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



Step 8: Cellular network status and server status can be checked on "Network ->Status". Wi-Fi Status shows "CONNECT SUCCESS" and the Server Status shows "Online".

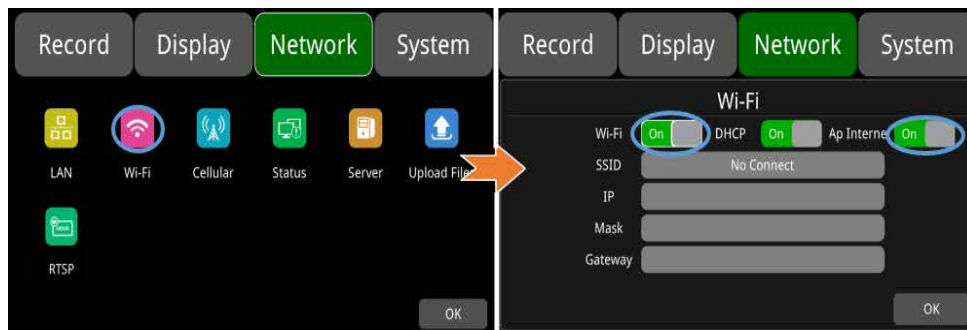


10.4 AP Internet Setup

- Steps to Connect AP Internet

Step 1: Connect the DVR to the internet through Wi-Fi or 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. The default password of the hotspot is ap12345678.

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. In addition, the user can verify that the network connection is successful.

Record	Display	Network	System
LAN IP	192.168.31.111	Cellular	On
MAC	7e:97:15:d3:d3:1d	Module	Serrria
Wi-Fi	On	RSSI	
RSSI		Type	2G
IP	192.168.32.215	Status	SUCCESS
Status	CONNECT SUCCESS		
Server Status	Online		
Register Status	Server register success!		
OK			

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 obtained automatically.

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

Cellular: Status indication.

Module: The Cellular module brand.

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

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

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

Description	Indication
Module initialization	The cellular module is initializing.
Module exception	The cellular module is in exception.
No SIM card	No SIM card is found in the DVR.
Cpin locked	Cpin is locked.
Signal abnormal	The signal is abnormal.
Networking failure	The network connection fails.
SUCCESS	The network connection is successful.

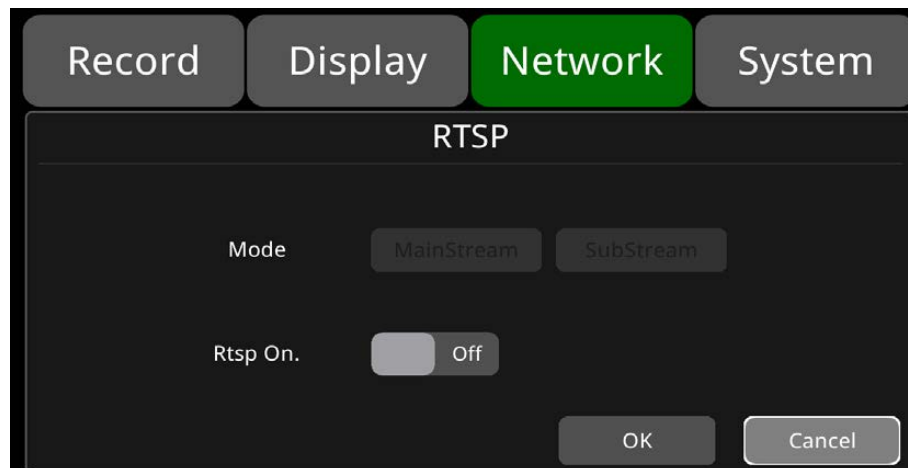
3G: Receive 3G signal.

4G: Receive 4G signal.

Server Status: Online / Offline.

Register status: Reasons for failed server connection.

10.8 RTSP Streaming



The default configuration is shown above.

RTSP On.: Set RTSP to ON / OFF.

Mode: Set MainStream & SubStream to ON / OFF.

Mode on/off Instructions: When set RTSP to “On”, make sure the streaming device and DVR are under the same local area network such as simply using DVR’s own hotspot AP, then images can be displayed. Or just 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).

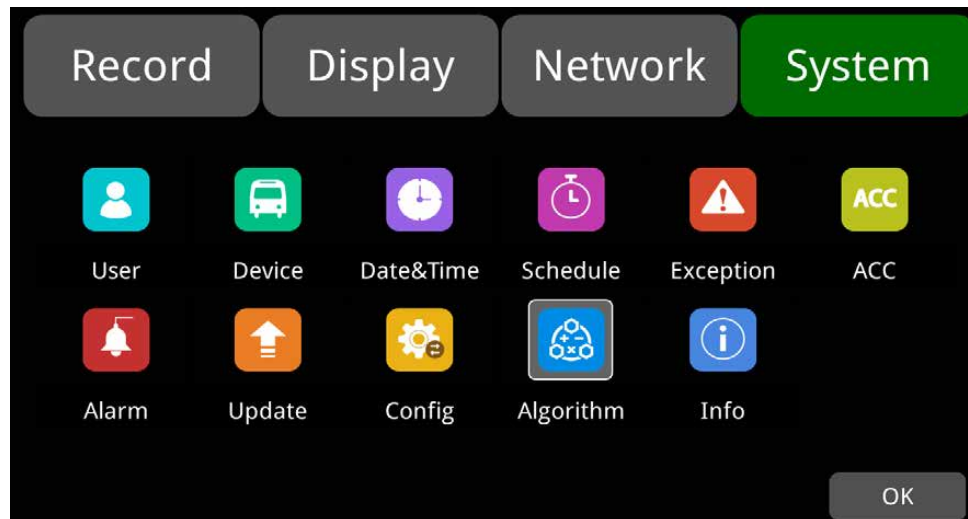
Open the network stream of the pull-streaming device, and enter the streaming address as the network URL. A total of 8 push-streams including 4 main-streams and 4 sub-streams. The formats of URL are as follows:

main-stream: rtsp://Ip Address/cam1/mainstream.

sub-stream: rtsp://Ip Addr/cam1/substream.

Once connected successfully, corresponding images will be played.

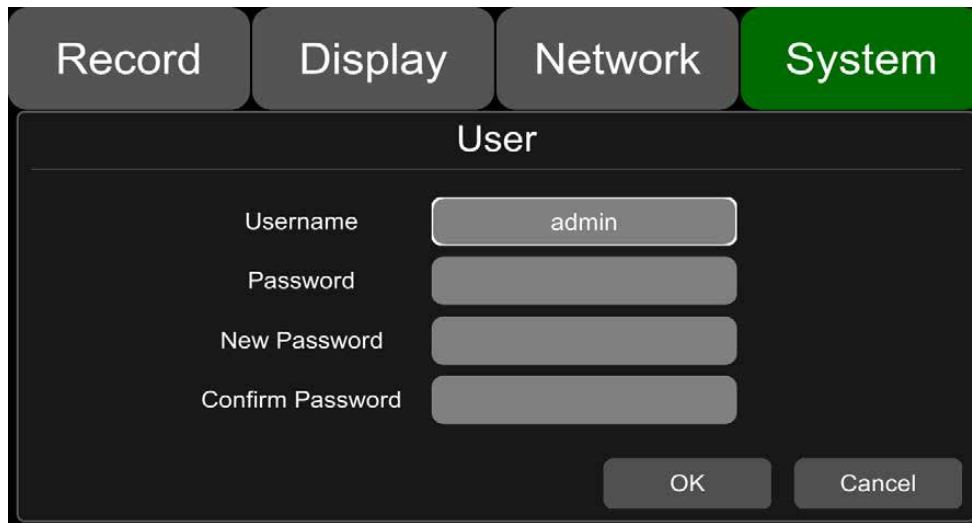
11 System



11.1 Log in Setup



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

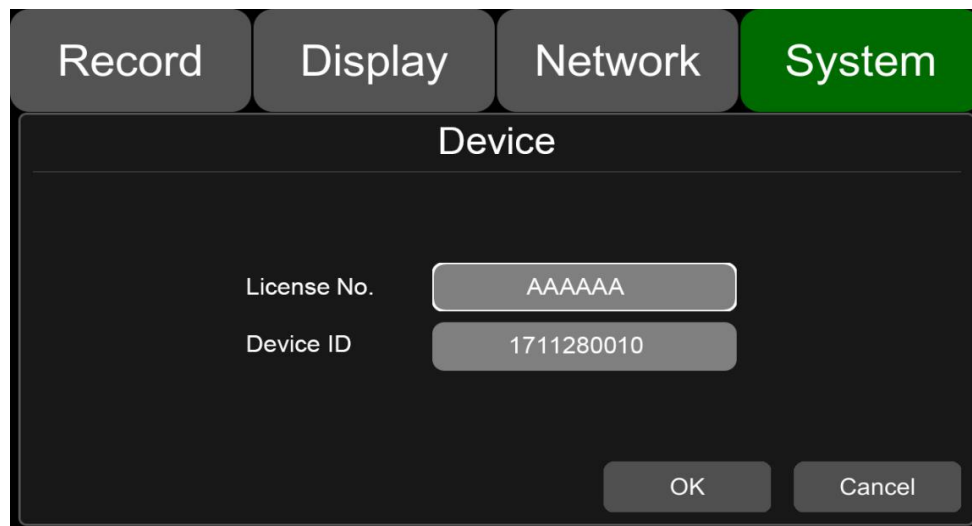


The screenshot shows a configuration interface with four tabs at the top: Record, Display, Network, and System. The System tab is highlighted in green. Below the tabs, the title 'User' is centered. The form contains four input fields: 'Username' with the value 'admin', 'Password', 'New Password', and 'Confirm Password'. At the bottom right are 'OK' and 'Cancel' buttons.

11.2 License Plate Number Setup



License No.: Input license plate number. The default configuration is shown below.



The screenshot shows the same configuration interface as before, but the title is 'Device'. It contains two input fields: 'License No.' with the value 'AAAAAA' and 'Device ID' with the value '1711280010'. 'OK' and 'Cancel' buttons are at the bottom right.

11.3 System Time Setup



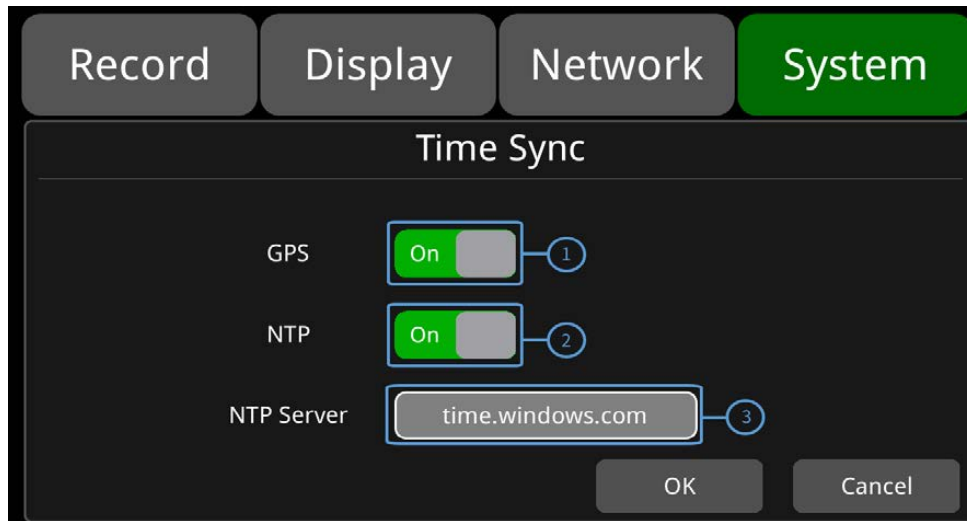
Format Setup: System time format setting.

The default configuration of "Format" is shown above.

Go to "System – >Date &Time - >Format->Setup" page.

- ① **Time Zone:** Time zone setting.
- ② **Date Format:** Date format setting.
- ③ **24 Hour:** If it is ON, time format will be displayed in the 24-hour system. If OFF, it will be displayed in the 12-hour system.
- ④ & ⑤ **Hour & Minute:** Time zone settings are accurate to the minute.

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



The default configuration of "Time Sync" is shown above.

Time Sync 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 & NTP: Off	Set the time zone and daylight saving time first, then set the date and time
GPS: On / NTP: On	Time zone and daylight saving time must be set, and 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 automatically adjust the system time to the default East 8 time zone, resulting in abnormal device time.

DST Setup:

The default configuration of “DST” is shown above.

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

- ① **Enable:** Set DST setting to ON/OFF.
- ② **Offset:** Adjust the offset to one or two hours after enabling DST.
- ③ **Mode:** Select the mode of DST (set DST according to week or date).
- ④ **Start:** Set the start time of DST.
- ⑤ **End:** Set the end time of DST.

11.4 Scheduled Recording



Schedule	Enable	Start	End	Weekday
Schedule 1	☐ Off	00:00	01:40	Setup
Schedule 2	☐ Off	00:00	01:40	Setup
Schedule 3	☐ Off	00:00	01:40	Setup
Schedule 4	☐ Off	00:00	01:40	Setup

The default configuration is shown above.

Enable: Set scheduled recording to ON/OFF.

Start: Set the start time of scheduled recording.

End: Set the end time of scheduled recording.

Weekday: Set up scheduled recordings by weekday. Select the weekdays to preset.

Scheduled Recording:

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

11.5 Exception



The default configuration is shown above.

Exception Buzzer: Exception Buzzer can be set to “On”/“Off”.

Power On Buzzer: Power On Buzzer can be set to “On”/“Off”.

Duration: Set the duration time of the buzzer.

11.6 ACC Settings



Record Display Network **System**

ACC

Current Voltage 18.3 V

Shutdown Voltage 10 V

ACC Duration 0 hour 0 min 5 s

OK Cancel

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

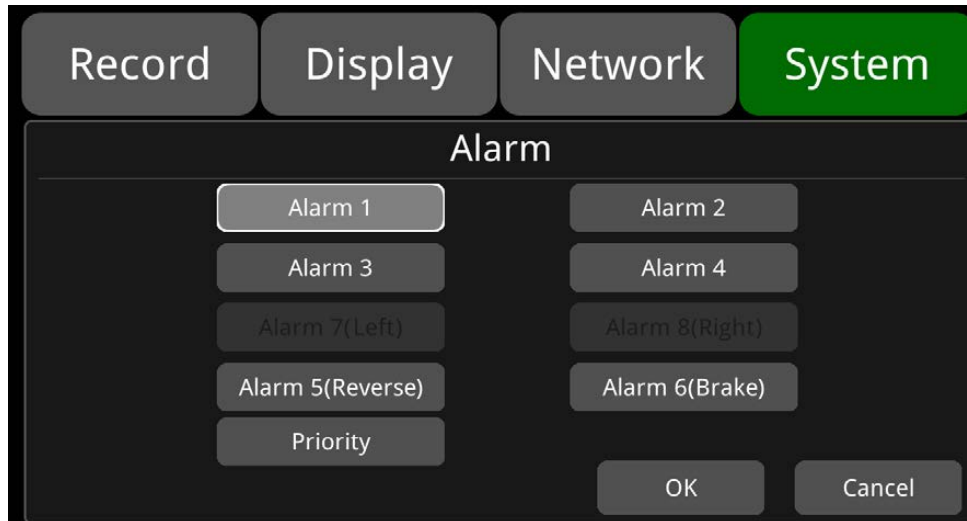
Current voltage: Voltage of the working DVR.

Shutdown voltage: The DVR automatically shuts down when the voltage of the current is lower than the Shutdown voltage and works properly or restarts only when the voltage is higher than the Shutdown voltage. 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 duration can be set to 5s~72h.

ACC	Min.	Max.	Default
Shutdown Voltage	9V	24V	10V
ACC Duration	5s	72h	5s

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, and Brake.

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



The default configuration of “Alarm 1” is shown above.

Trigger Level: There are 3 options of Trigger Level. The options “Low” and “High” are used for triggering alarms. “Low” is generally used for debugging while “High” is set to trigger alarms for on-road use. “Off” to disable trigger function.

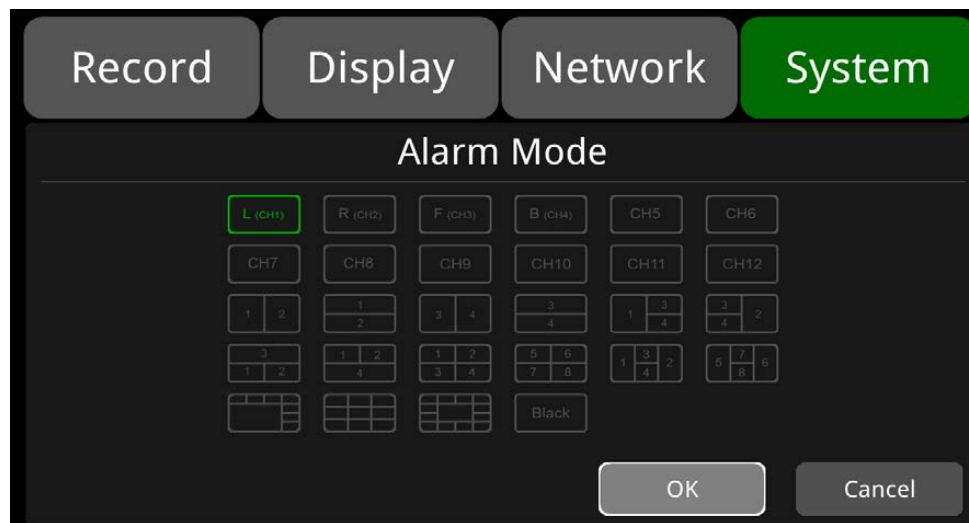
Output Duration: Duration of the "Display", "Cursor", and "Alarm Out". Output Duration can be selected from 0sec, 5sec, 10sec, 30sec, 60sec, 5min, 10min, 30min, 60min, Always.

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

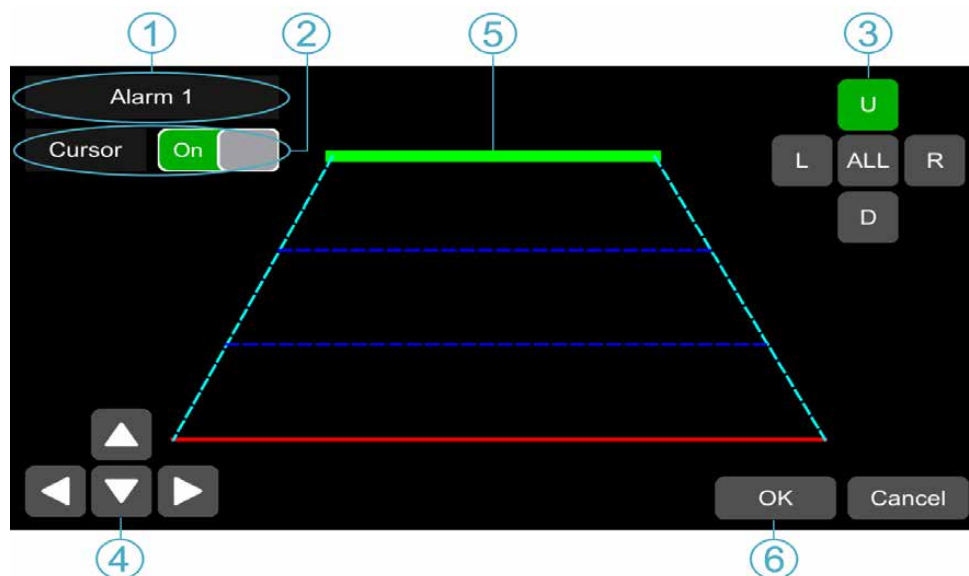
Alarm Out-Output1: Set it to ON, then 12V level output would come from the alarm wire of Output 1..

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: It is "OFF" by default. The figure below shows the "On" state.



- ① Camera name of the alarm-triggered channel.
- ② Touch this button to turn on/off the corresponding 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 quickly operate with “1, 2, 3, 4, 5” on the remote control.
- 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 as a whole with these direction buttons.
 If Line L or Line R is selected, the top point of the selected line can be moved to left or right with Direction Down or Direction Up, and the bottom point of the selected line can be moved to left or right with Direction Left or Direction Right.
 If ALL is selected, all the lines can be moved as a whole in these four directions.
- ⑤ Lines of cursor: The selected one will be thickened for three times. The middle two lines will not be processed.
- ⑥ 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 to increase the priority value of the selected alarm by 1. The bigger the value,, the lower the priority.

- : Press this button to decrease the priority value of the selected alarm by 1. The smaller the value , the higher the priority.

- Alarms with higher priority will be triggered first.
- 1 stands for the highest priority, and 6 the lowest.
- If two alarms A and B are both triggered at the same time, and A's priority is higher than B's, A will record first. Once A's recording is complete, if B is still being triggered, B will then record. If B is no longer being triggered, it will not be recorded.
- Suppose alarm B is triggered and is recording. When alarm A is triggered suddenly, although A has a higher priority than B, B will continue recording.

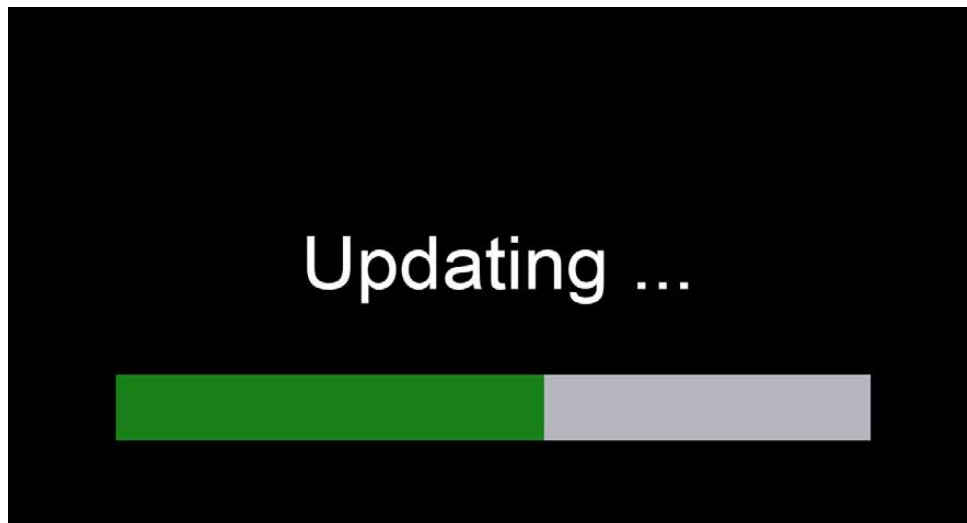
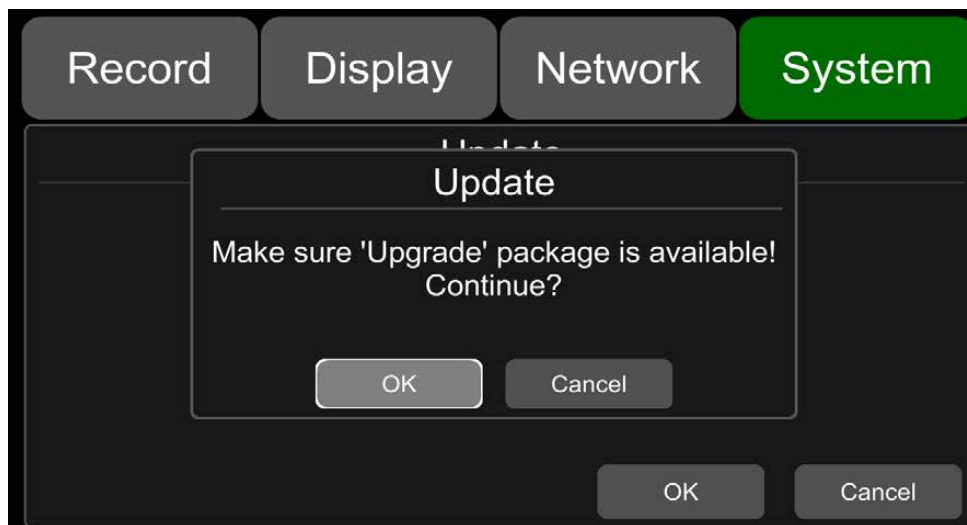
11.8 Update



- For Single Device

Step 1: Copy the files to the USB disk or the “/upgrade/package/local” directory of the SD card and 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 initiate an upgrade.



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

Update success!

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

Note: After the upgrade is completed, the "dvxxx_upgrade_201xxxxxxxxx_Rename" upgrade package in the USB disk or the SD card (upgrade/packet/local) will be deleted

- Remote Upgrade

Step 1: Connect the DVR to the 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 on it and select "Update" to access the Batch Upgrades interface. If you need to upgrade multiple devices, you can click the Add button to select additional devices. The selected ones will be displayed on the device list for upgrading. If you want to remove devices from the list, simply select them and click the Del button.

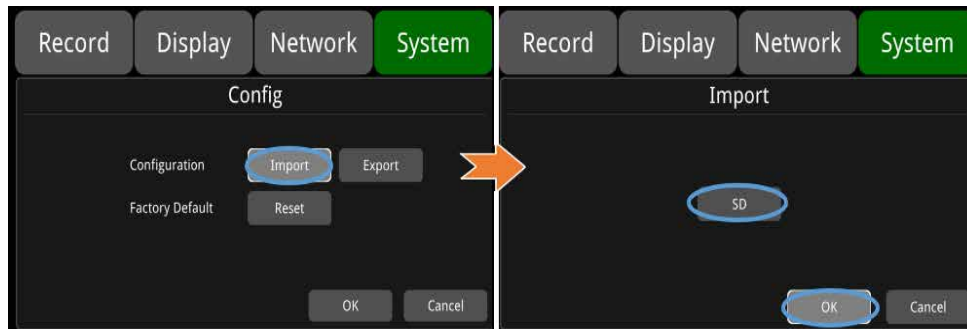
Step 4: Select the device to upgrade, and then click the Browser button to select the upgrade package "dvxxx_upgrade_201xxxxxxxxx_Rename".

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

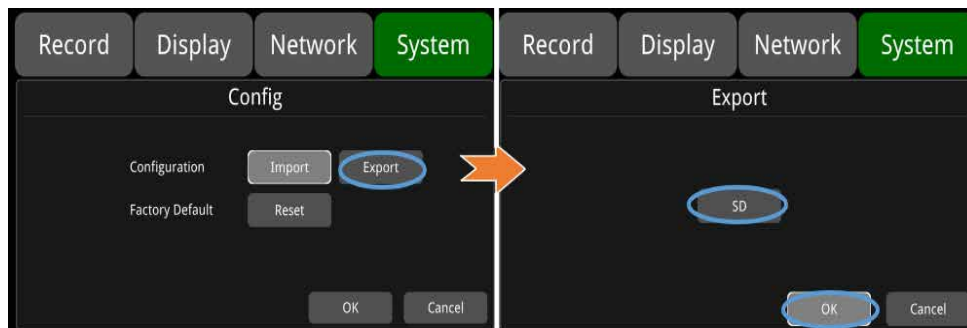
11.9 Configuration



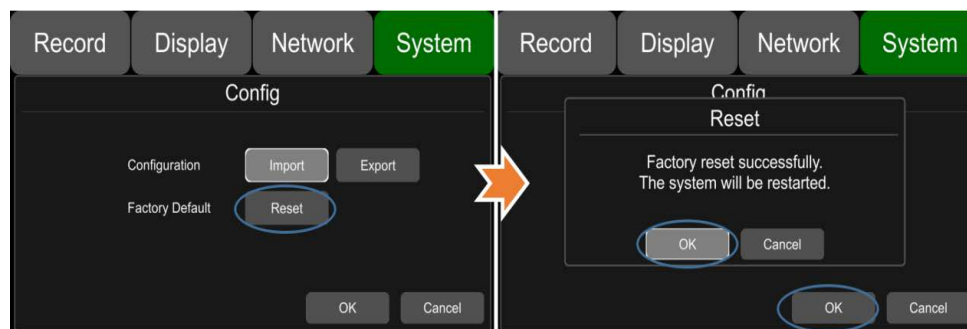
Configuration Import: Import the configuration information from the flash memory device, and place the configuration file in the sd/export_file/config directory.



Configuration Export: Export Log to flash memory devices.



Factory Default: Press the Reset button to restore factory settings.



APPENDIX III: Compatibility Storage List

SATA 3.0 SSD

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

SD Card

Item name	Description
32GB SD Card	32G, MLC, NCSXDAB-032G, Longsys, -25°C~+85°C
64GB SD Card	64G, MLC, NCSXJAB-064G, Longsys, -25°C~+85°C
128GB SD Card	128G, MLC, NCSXJAB-128G, Longsys, -25°C~+85°C
64GB micro SD Card	64G, MLC, NCIXJBB-064G



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