



ESS8 Mobile 8-Channel Digital Video Recorder

USER GUIDE

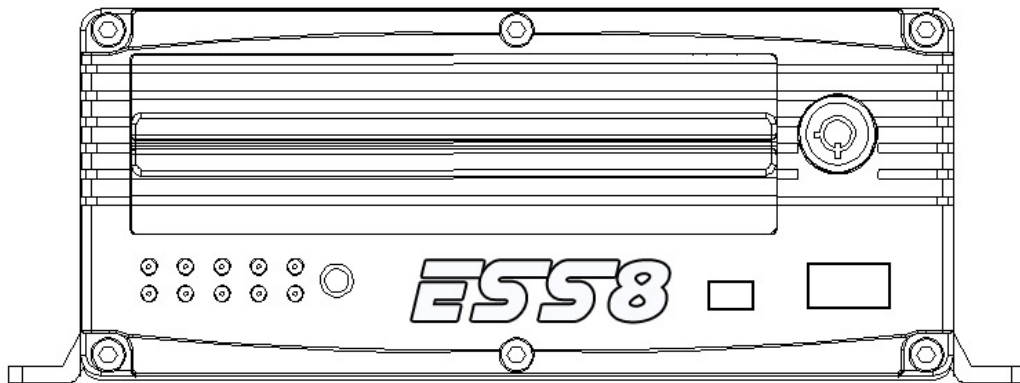


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1.0 Introduction

- To protect your rights, please carefully read and understand the contents of this manual.
- This products is intended for vehicle interior use only. To prevent the risk of electric shock or damage to the product, install and use only in dry areas.
- Discontinue use and disconnect the product in the event of any liquid or foreign substance being introduced into the product.
- This product has no user-serviceable components. Please refer to your dealer for service.

1.1 Installation Environment

- 8-36 VDC power supply. Do not exceed this range for proper operation, and to avoid damage to the unit.
- If the DVR will not be in use for an extended period, please disconnect.
- Install in a dry area that has sufficient air circulation to avoid overheating.
- Do not install in a location of excessive temperature.

Please note that all specifications and features are subject to change. Please check with the factory to ensure that you have the most up-to-date information about this product.

2.0 Product Overview

This 8-channel Digital Video Recorder is designed for vehicle monitoring. It uses an embedded processor and operating system, combined with state-of-the-art video and audio compression technology. The system records to a removable hard drive, supporting a storage capacity of up to 2 terabytes. The hard drive system incorporates an integral shock-mounting system to provide optimal reliability.

3.0 Basic Functions

3.1 Audio/Video Compression Format

Video compression adopts the latest ISO14496-10 (H.264) technology, to ensure the best image quality to storage ratio. Audio is compressed using the ADPCM method to best reduce voice distortion.

3.2 Audio/video Recording Mode

- The audio/video data are stored with special files, encrypted to prevent data loss in the event of frequent power interruptions (as experienced on vehicle).
- Compression stream includes eight levels of user-settable image quality.
- 8-channel 960H, 12 Channel D1 (192Kbps – 2Mbps/channel).
- Storage: 2.5 inch SATA hard drive, 2TB maximum.

3.3 Image Quality During Recording, Playback, Monitoring

- Resolution:
 - 8 Channel 960H: 704*576/Ch.
- All modes are 30 fps (NTSC) or 25fps (PAL).
- Horizontal resolution for monitoring:
 - 8-Ch 960H: 704*576 / 960*576/Ch.
- Horizontal resolution for playback:
 - 8-Ch 960H: 704*576 / 960*576/Ch.

3.4 Total Resources

- 8-Ch 960H
 - Supports 8 channels D1(704*576), 960H(960*576) simultaneous recording @ 120fps.
 - Supports 8 channels D1(704*576), 960H(960*576) simultaneous playback @ 120fps.
-

3.5 Audio Video Synchronous Recording

Record & Playback the audio/video/GPS data simultaneously. All data can be viewed with our CMS software.

3.6 Signal-loss Alarm Function

If a camera's video signal is lost, the DVR will send an alarm signal (also via internet, if 3G-equipped). Only active channels that are not in full-screen mode will report signal loss.

3.7 Alarm Linkage

The system supports 4 alarm inputs (8-36VDC to trigger), 1 output (open relay contacts, max 500mA).

- When the alarm has been triggered, audio recording will be started automatically (30-330s, adjustable). Alarm-out relay will close for 5-330s (adjustable), with response in less than 1 second.

3.8 Alarm Pre-recording

In alarm mode, a minimum of 5 seconds will be pre-recorded.

3.9 Full Duplex

Under full-load status, users can index and playback recorded data with no frame loss.

3.10 Malfunction Alarming

If the DVR fails to function, the alarm relay will close for a minimum of 5 minutes.

3.11 Self-test Status and Self-recovery

When the system is in working status, the "RUN" indicator flashes constantly. A system crash will recover automatically within 3 minutes.

3.12 Networking

If your DVR is equipped with the 3G option, then the vehicle can be monitored remotely, by using our CMS software.

3.13 Data Backup

Hard drive data can be backed up via:

- The Hard Drive card reader.
- Remotely via network (with 3G option).
- HDD data can be converted to .avi files for standard media players.

3.14 Authority, Encryption and Data Safety

Only authorized users are permitted to change the operating parameters of the system. That authorization is granted upon entry of a valid password. The factory default password is: **6666**. All data is encrypted, to ensure proper chain-of-custody.

3.15 Log Function

The hard drive contains a log file of all system status and activity. That log file can be reviewed on your computer, using our CMS software.

4.0 Features

4.1 Operating System

- Embedded Linux for high stability, free from viruses.
- Graphical user interface.
- Multi-language support (English is default).

4.2 Compression Format

H.264 for excellent frame rate, quality image output.

4.3 Index and Playback

- Index and Playback by time.
- Supports simultaneous record / monitoring / playback (multiplex).

4.3 HDD Storage and Data Backup

- Supports 2.5 SATA drive, max 2TB.
- Backup via PC software.
- Backup via USB.

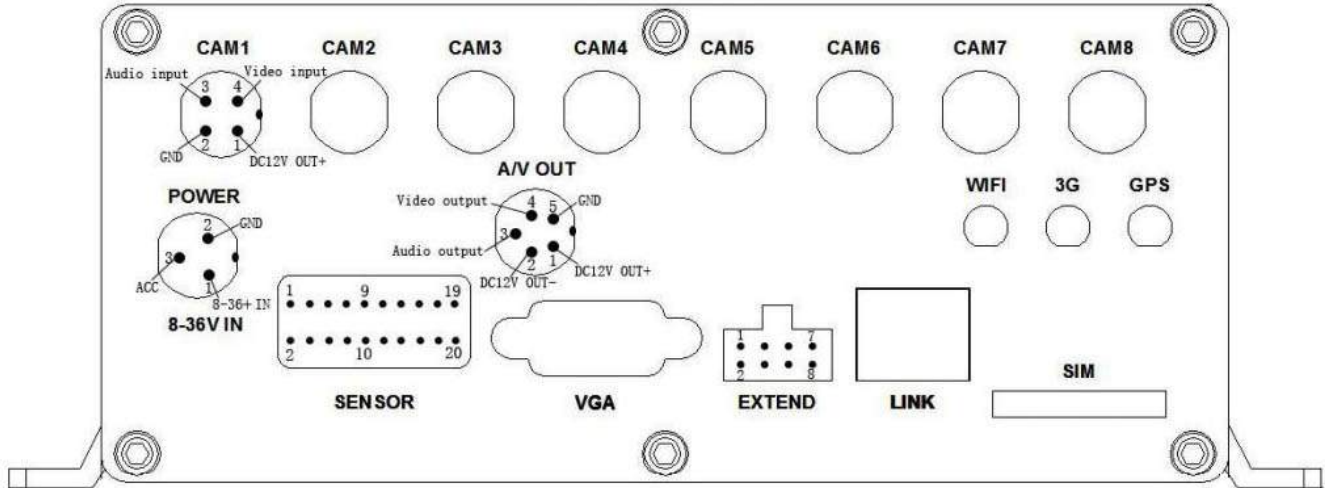
4.4 Control

- Dual MCU control, to ensure stability.
- Infrared remote control for setup and security.

4.5 Other

- System & feature upgrade through USB for easy maintenance.
- Password protected.
- Adjustable shutdown (default is 5 seconds).
- Anti-pulse and low-voltage protection.
- Real-time clock.
- Anti-shock mounting of internal components.
- Watchdog function to avoid system crash.

5.0 Rear Panel Layout



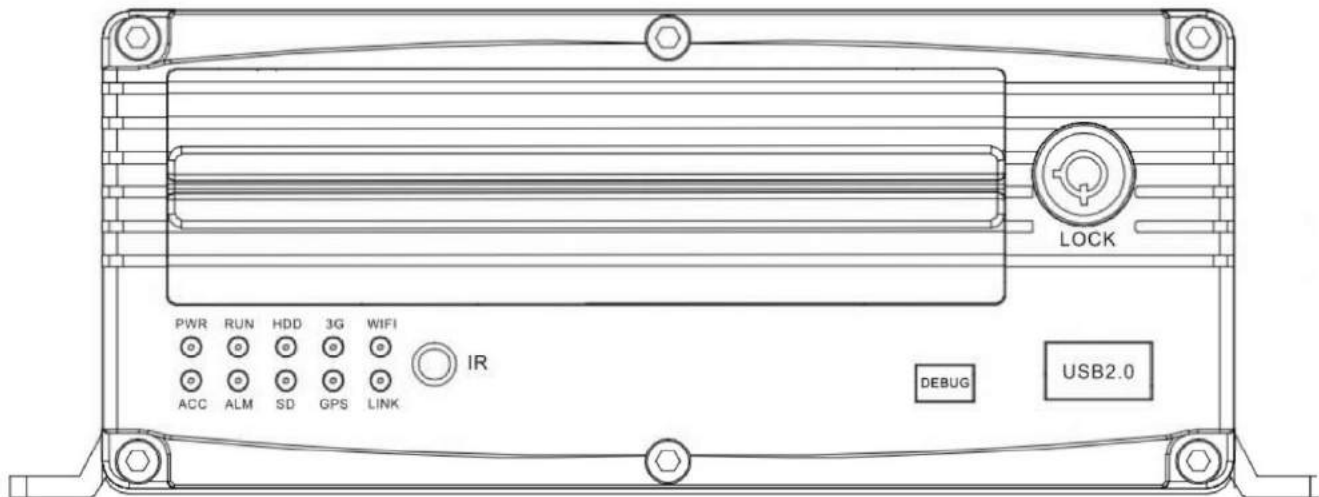
SENSOR Port Definitions

1	Canbus +	11	Alarm Input 1
2	Canbus -	12	Alarm Input 2
3	RS485 +	13	Alarm Input 3
4	RS485 -	14	Alarm Input 4
5	Alarm Output COM	15	Alarm Input GND
6	Alarm Output COM	16	Alarm Input GND
7	Alarm Output COM	17	Alarm Input 5
8	Alarm Output COM	18	Alarm Input 7
9	Alarm Input GND	19	Alarm Input 6
10	Alarm Input GND	20	Alarm Input 8

EXTEND Interface Definition

1	DC 12V Out +
2	DC 12V Out -
3	Audio Input
4	Audio Output
5	RS232 (Rx)
6	Video Output
7	RS232 (Tx)
8	Video/Audio GND

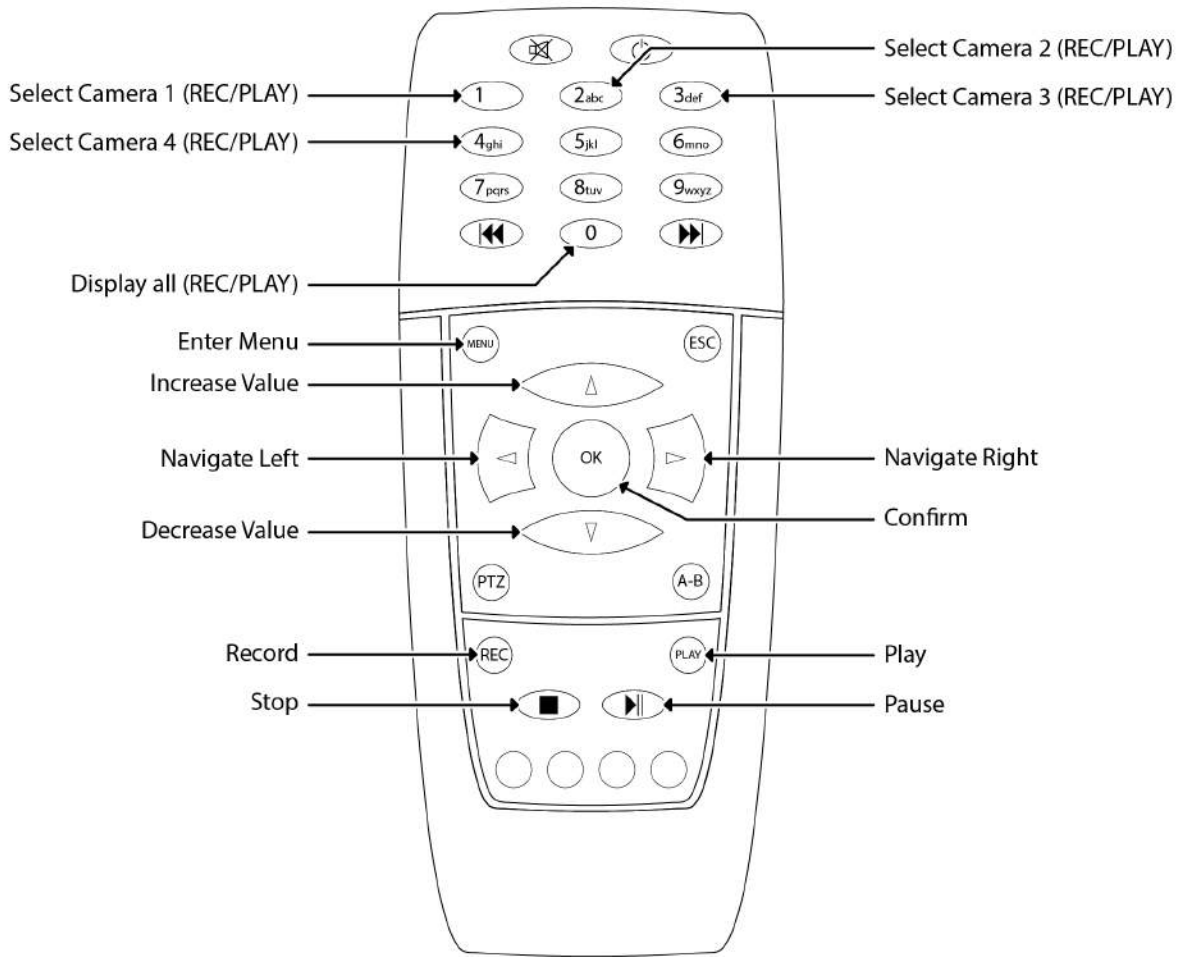
6.0 Front Panel Layout



LED Status Indicators	
PWR	Indicates that power is on.
RUN	Flashes when status is OK.
HDD	Flashes during backup, playback or recording
3G	Flashes when 3G link is active.
WIFI	Flashes when WiFi link is active.
ACC	Ignition is active.
ALM	Alarm is active.
SD	SD Card is inserted and active.
GPS	GPS link is established
LINK	Wired network is active

Additional Features	
DEBUG	Factory diagnostic port.
IR	Infrared-remote receiving window.
LOCK	Lock/Unlock hard drive. Must be locked to enable recording.
USB	Standard USB port for system upgrades, and image data backup.
NOTE: If unit is SD Card equipped, we recommend SanDisk Class 10, minimum 256K Capacity.	

7.0 Remote Control



8.0 Menus

To Enter the System Menu:

- Press Remote Control <**MENU**> button.
- Press <**DOWN**> key to enter the default password (**6666**).
- Press <**ENTER**>.

System Menu

Setup Sub-Menu

- **Date Fmt:** Choose format as y/m/d, m/d/y, d/m/y.
- **Daylight:** Enable/Disable Daylight Saving Time Changeover.
- **Date:** Sets the date.
- **Time:** Sets the time.
- **GPS Timing (for GPS equipped):** Set UTC time zone (UTC-6, etc.).
- **Language:** Select English, Portuguese, Chinese or Russian.
- **Video Mode:** Sets the video standard (NTSC or PAL). Takes effect upon restart of the DVR. Must restart unit after setting.
- **Delay Time:** Sets the post-trip delay recording function. Default time is 5 seconds. Can be set to 5, 30, 60, 120, 300, 600, 1200, 1800, 3600 or 7200. Takes effect upon restart of the DVR.
- **Speed Unit:** Mph (USA) or Km/h (Canada/Mexico).
- **Zoom in CH:** Channel to display on power-up (Default is NONE).
- **Password:** To change the password, enter the original password, then OK.
- **New Psw:** Sets the new password.

PTZ Sub-Menu

Unused for Mobile Applications.

Sys Info Sub-Menu

- **Device ID:** Internal electronic serial number (read-only).
- **Software Version:** Operating system version (read-only).
- **IMEI (3G models):** 3G SIM Card ID.
- **3G Signal (3G models):** Strength of signal and status.
- **GPS Signal (GPS models):** AA-BB(AA: GPS no. / BB: Strength—max 3).
- **Reset Cfg:** Restore all settings to factory default (use caution).

Vehicle Sub-Menu

- **Car ID:** License plate number.
- **Line Num:** Route number.
- **Driver ID:** Driver ID number.

G-Sensor Sub-Menu

- **GSensor X:** 0000mg (default. This will change according to x-direction g-force).
- **GSensor Y:** 0000mg (default. This will change according to y-direction g-force).
- **GSensor Z:** 0000mg (default. This will change according to z-direction g-force).

Log Sub-Menu

- Historical listing of significant system activity (read-only). Includes Power status, record status, error events, etc.

Disk Menu

- **Disk Name:** Display the installed Hard Drive Name.
- **Total Size:** Display the total capacity of the Hard Drive.
- **Free Size:** Display the remaining free space of the Hard Drive.
- **Format:** Format the Hard Drive (wipes the Data Header).

Record Menu

- **Channel:** Select the channel on which to control the following settings (or all).
- **Resolution:** (left-local storage / right-network streaming): CIF/HD1/D1.
- **Frame:** (left-local storage / right-network streaming): 1-30 frames/sec.
- **Quality: Video Resolution** (left-local storage / right-network streaming) 8 Levels
- **Rec Mode:** Video / Audio+Video (A+V) / No Record (N).
- **File Len:** Length of created video files (300 to 3600 sec). Higher Num. = less fragments.
- **Save:** Saves setting changes (must restart DVR to take effect).

Playback Menu

- **Clip Listing by Date (select).**
- **Channel(s) to play back (ALL, 1-4).**
- **Play** Play selected clip to selected channel(s).
- **Copy** Backup selected clip to USB Disk.

Network Menu

LAN Sub-Menu

- **Net Type:** LAN or 3G-WIFI Options (auto-switch, with WiFi first priority).
- **DHCP:** Set 'ON' to enable, to auto-obtain IP Address.
- **Static IP:** Set a static IP address in LAN mode.
- **Net Mask:** Set network subnet mask in LAN mode.
- **Gateway:** Set network gateway in LAN mode.
- **DNS:** DNS address (required for Dynamic DNS of 3G Server).
- **Server IP:** IP address of the 3G server or parked DDNS address of server.
- **Server Port:** 3G use (default is usually OK).

3G Network Sub-Menu

- **APN:** Data access address of 3G provider.
- **Dial-up num.:** Access number for 3G provider.
- **User Name:** User name for login.
- **Password:** Password for login.

WiFi Sub-Menu

- **Net Type** Select 3G or WiFi when using LAN mode.
- **SSID** Router device key.
- **Password:** Password to access WiFi.
- **Certificate:** Select WPA or PSK.
- **Encryption:** Select CCMP and TKIP

Alarm Menu

- **Alarm REC:** Alarm-triggered video duration (30-330 sec)
- **GPS Interval (if equipped):** GPS data upload rate.
- **Alarm Out:** Alarm output duration (5-900 sec).
- **Over speed:** Sets the over-speed alarm value.
- **Motion Detect:** Enable/Disable motion detection. Disable for mobile use.
- **Det Area:** Not used in mobile application.

Video download

- Connect USB Flash Drive or USB HDD to USB interface in front of the DVR
- Shift to "Playback menu", select target video for download by Remote control, press "OK" to start copy.
- Repeat for each selection.

9.0 Playback From the ESS8

Even though the ESS8 is intended for viewing the recorded clips by using our software, the system has provision for navigating to, and playing back clips from the DVR directly.

Setup for Playback:

- Plug the ESS8 audio/video adapter cable into the A/V Out jack on the rear panel.
- Plug the adapter cable into the A/V (RCA) jacks on your monitor or TV.
- Make sure that your monitor/TV is set to the proper input source for your connection.

Steps to Playback:

- Use the remote control to enter the system menu, and select "Search/Playback."
- From the displayed list, select the desired clip by using the UP & DOWN arrows. The LEFT & RIGHT arrows can be used to navigate among multiple pages, if necessary.
- Press the OK button to play the selected clip.

10.0 Backing Up the Video

Method 1:

- Connect a USB drive (max 20G) to the ESS8 USB port on the front panel.
- Within the "Search / Playback" screen (see above), select "Backup"
- Press OK to backup.
- Wait for the "COPY END" message before removing the USB drive.

Method 2 (Preferred):

- Unlock and remove the hard drive from the ESS8.
- Connect the hard drive to your PC with a standard USB cable.
- Use our free ESS Viewer software to view, edit and save the clips.

11.0 Specifications

Name	Parameters
Operating System	Linux
Operating Interface	Graphical Interfaces
File System	Proprietary format for data security
System Privileges	User password access
Video Input	8ch 960H Independent Input: 1.0Vp-p 75Ω, Both B&W and Color Cameras
Video Output	1 Channel PAL/NTSC Output, 1.0Vp-p, 75Ω, Pin Aviation Connector
Video Display	1 or 8 Screen Display
Video Standard	NTSC:30 frames/sec / PAL: 25 frames/sec
System Resources	NTSC: 240 frames / PAL: 200 frames
Audio Input	8 Channels Independent Input @ 600Ω
Audio Output	1 Channel (selectable)
Basic Output Level	1.0—2.2V
Distortion Plus Noise	≤-30dB
Recording Mode	Sound And Image Synchronization
Audio Compression	G711u
Image Compression	H.264 Fixed Code Stream
Image Format	8*960H (960*576) / 8*D1 (704*576)
Video Stream	192K to 2.0Mbit/s
Video Consumption	85M-900MByte/hour
Playback Resolution	1 or 8 * 960H, 1 or 8 * D1
Audio Bitrate	4KByte / s / channel
Audio Consumption	14MByte / hour / channel
HDD Storage	Supports Max 2TB
Image Quality	Eight levels, user-selectable
Alarm in	8 Channels of independent input. High-level Trigger
Alarm out	2 Channels of independent output
Host Access	USB Disk Backup
Wired Data Access	RJ45 Ethernet Port
WiFi	Optional Wifi Module
3G	Optional WCDMA or CDMA2000 Module
GPS	Optional GPS Module
Intercom	Optional Intercom Module
G-Sensor	Optional G-Sensor Module
CANBUS	Optional CANBUS Module
Power Consumption	8 - 36VDC 5% ≤12W
Working Temperature	-4°F to + 185°F ≤80%
Clock	Built-In Clock, Calendar
Product Size	9.6" (L) x 7.5" (W) x 2.8" (H) (with bracket)
Product Weight	6.6 lbs (without HDD)