Installation User Manual
MC904

Contents

Introduction

The device is an intelligent terminal product that combines various advanced features such as GPS / BDS positioning monitoring, local SD card recording, 4G remote real-time video surveillance, IP-Camera, DMS / ADAS / BSD, and more. It seamlessly integrates real-time monitoring, production operation management, command dispatch, and other functionalities. It is a cost-effective and highly expanded device specifically developed for vehicle video surveillance and remote monitoring.

It utilizes a high-speed processor, embedded Linux operating system, and incorporates state-of-the-art technologies including H.265 video compression / decompression, network technology, and GPS / BDS positioning. It supports up to 4 channels of high-definition video surveillance recording and playback (with 4 channels of real-time 1080P AHD high-definition input), and optional IP-cameras can be added to achieve 5-channel recording and playback. It also features 1 video output (1 video output, 1 VGA output).

The device employs an exclusive pre-allocated car-specific file system technology to address issues such as file fragmentation caused by repeated erasures, storage system crashes, data loss, inability to locate storage and file corruption, ensuring stable and complete data.

It records vehicle driving information and supports wireless data uploads. When used with central software, it enables central monitoring, remote management, and playback analysis based on a centralized database, with alarm integration capabilities. The product features a sleek design, strong vibration resistance, flexible and convenient installation, powerful functionality, and high reliability.

Notice

In order to ensure the safe use of the device and extend the service life of the equipment, the user should fully consider the following factors during installation:

1) After receiving the product, please check the packages of the device and accessories in time. If you find any parts are missing, please contact the dealer in time.

2) When installing and operating the equipment, comply with the specifications of relevant

electronic products and the requirements of vehicles and other connected equipment.

3) The installation and construction shall comply with the specifications, which can refer to the relevant national or local standards.

4) Please check the connected power supply voltage, which should fall within the range of 9V - 36V. To prevent equipment abnormalities due to voltage mismatch, it is recommended to use an operating voltage of 12V or 24V.

5) To receive best positioning signal, ensure that the receiving surface of the GPS antenna faces upward without any metal objects above it. The antenna's bottom should be kept flat, with an inclination angle not exceeding 30 degrees. It is recommended to position the GPS antenna at the junction of the dashboard and windshield for optimal performance.

6) The MDVR device should operate within the temperature and humidity range specified by the technical indicators.

7) The external wires of the devices should have sufficient intervals and the protection of the jacket flame-retardant tube to ensure that the wires will not cause electric leakage due to wear or aging.

1. Product Specifications

Item		Parameters
OS	Language	English
	OS	Linux
	Operation Interface	Graphic Menu Operation Interface (OSD Menu), Character Superposition Function
	GUI	Support Mouse and Remote Control Operation to Set System Parameters
Processor & CPU	CPU	ARM Cortex CA9 Dual-Core +NPU@0.7
	Memory	DDR 512M SD Card (Max. 512G)*2
Video System	Video Input	4CH CVBS, 1.0Vp-p, 75Ω
	Video Output	1CH VGA, 1CH CVBS, 1.0Vp-p, 75Ω, Support Full Screen and 4 / 5

		Channels Segmentation
	Video Standard	PAL Standard, NTSC Standard
	Video Compression Format	H.264 / H.265 Compressed Format
	Preview Function	Single Channel, Support Multiple Channels Preview, Support Manual / Event Triggered Full Screen Display Function
	Video Resolution	Options: 1080P / 720P / D1 / HD1 / CIF Total 1080P at 60 fps
	Video Quality	Level 1 to 8 (Best level 1, Lowest Level 8)
	Video Rate	PAL: 100 frame/s , CCIR625 line,50 NTSC: 120frame/s, CCIR525 line,60 CIF: 256Kbps ~ 1.5Mbps, Multi Level Image Quality HD1: 600Kbps ~ 2.5Mbps, Multi Level Image Quality D1: 800Kbps ~ 3Mbps, Multi Level Image Quality 720P: 1Mbps ~ 4Mbps, Multi Level Image Quality 1080P: 1Mbps ~ 8Mbps, Multi Level Image Quality
	Video Recording Mode	Default Automatic Recording, Support Ignition Recording, Alarm Recording, etc.
Audio System	Audio Input	4 Channels Analog Audio
	Audio Output	1 Channel with Built-in Power Amplifier (Internal and External Options Available)
	Compressed Format	G.711A
	Recording Mode	Simultaneous Recording of Audio and Video
Alarm Input		4-CH Input, 1 Panic Button
Alarm Output		1-CH Output
Communication Interface		1* USB Interface
		2* RS232 Interface or 1* RS232 Interface or 1* RS485 Interface
Extension Interface		1* Voice Intercom Interface

		Multi Function Control Panel can be Connected (Support 12V Power-supply and RS232 Communication)
Wireless Transmission		Built-in 4G Wireless Transmission Function, TDD - LTE, FDD - LTE
		Wi-Fi: Wireless 802.11b / g / n Communication Module
GPS Location		Support Built-in GPS / BDS Module
G-Sensor		Built-in 3-axis Accelerometer
HDD	SD Card	2 Large Capacity SD Card Video, Maximum Support 512G
	Upgrade Mode	Support U Disk Upgrade, SD Card Upgrade, FTP Remote Automatic Upgrade
	USB	Front USB Interface, U Disk can be used to Upgrade Backup Data; Support USB Mouse
	SIM Slot	1 SIM Slot
Video Replay	Video Search	Video Data can be Searched by Recording Time, Recording Method, etc.
	Replay	Support Multiple Playback Speed Forward or Backward
AI Functions	ADAS	Lane Departure, Pedestrian Detection, Vehicle Distance Detection, etc
	DMS	Fatigue Driving Test, Smoking, and Unsafe Driving Behavior Detection
	BSD	Left Blind Spot Detection, Right Blind Spot Detection
	360°	360-degree Panoramic View
Power Supply and Power Consumption	Power Management	Adaptive Wide Power Input, with Overload, Under Voltage, Short Circuit, Reverse Connection and other Protection Functions; Support Timing on-off, Delay Shutdown Function
	Input Voltage	DC: +9V ~ +36V
	Output Voltage	+12V@1A, +5V@1A
	Power Consumption	Normal Working State < 8W (Exclude External Sensor)

Work Environment	Temperature	-20℃ ~ +70℃
	Humidity	8% ~ 90%
Security Management	Password Access	Two Level Management of User Password and Administrator Password
Platform Protocol		JT/T808-2011, JT/T808-2019
		JT/T1076-2016, JT/T1078-2016
Appearance Size		120mm*120mm*46mm
Net Weight		450g

2. Definition of Accessories and Interfaces

2.1 Inspection of Products and Accessories

Before using this product, please check whether the product is damaged and whether the accessories are complete. If there is any missing, please contact your supplier. The lists of products and accessories are as follows:

NO	Items	Photos	Quantity
1	Main Device		1pcs
2	Power Cable		1pcs
3	20 Pin I/O Extension Cable		1pcs
4	WIFI Antenna		1pcs
5	4G Antenna		1pcs

6	BDS / GPS Antenna		1pcs
7	KEY		2pcs
8	Remote Control		1pcs
9	Mounting Screw		4pcs
10	AV-IN (4-PIN)		1pcs

2.2 Panel Introduction

Chart 1. Front

Chart 2. Back

2.3 Interface Definition

This paper mainly introduces the definition of power supply, I / O, audio and video interfaces, as follows:

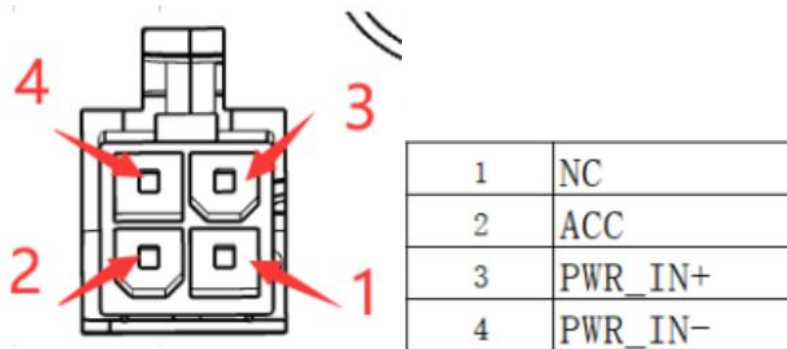1) Definition of Power Interface

1	NC
2	ACC
3	PWR_IN+
4	PWR_IN−

Chart 3.

2) I / O Interface Definitions

19 SENSOR_OUT	17 SENSOR_IN3	15 SENSOR_IN1	13 UART1_ 232TX	12 UART3_232RX / 485A	10 GND	8 SPEKER +	6 AOUT_MIC	4 GND	2 GND
20 ALM_IN	18 SENSOR_IN4	16 SENSOR_IN2	14 UART1_ 232RX	11 UART3_232TX /485B	9 GND	7 SPEKER -	5 MIC_IN	3 12V_OUT	1 5V_OUT

Chart 4.

3) Definition of Audio and Video Interface

AV-IN 1~4 Camera Interface   AV-OUT Display Interface

3. Installation Instructions

3.1 SD Card & SIM Card

To unlock and open the front panel cover, use the included key. The SIM card and SD

card interfaces are visible once they are opened.

SD Card and SIM Card Installation: Insert the SD card into the SD card slot with the connecting finger upward and the SIM card into the SIM card slot. Then lock on the cover.

3.2 Antenna Installation

Please correctly connect the 4G and GPS antennas. To achieve optimal positioning performance, the receiving surface of the GPS antenna must face upwards with no metallic objects above it. The bottom of the antenna should be flat, and its tilt angle should not exceed 30 degrees. Attempt to place the positioning antenna at the junction of the dashboard and windshield.

3.3 Debug Screen Connection

During the debugging process, the device requires an external display screen to assist in adjusting the camera angle and device's online parameters. The device supports signal output: CVBS.

3.4 Camera Connection

Connect channel 1 to 4 audio and video cameras.

ADAS / DMS Function: This function has an alarm function for fatigue driving, lane departure and other non-standard driving. When the driver is yawning, closing his eyes, smoking, playing with mobile phones, making phone calls and other non-standard driving, this function will alarm through voice and upload the alarm information.

3.5 ADAS / DMS Installation and Debugging

3.5.1 ADAS Installation

1) Installation Position: Take the center of the windshield as the axis, move up and down according to different vehicle types, and generally install at the lower point (Note: Do not affect the use of the wiper).

2) Installation Method: There is a circle of 3M tape on the camera, which can be directly pasted on the glass after tearing off the protective film;

3) The ADAS camera is installed in the center of the windshield and fixed with 3M tape (if the windshield is very inclined, it is installed in the position a little above the center. If it is a

vertical windshield, it should be installed at the position a little below the center.

4) The ADAS camera is an analog camera, which does not support hot swap. You need to connect the cable before powering on the main device. If the main device already powered, then connect it to the ADAS camera, whether it is power supply or data line power supply, then the ADAS camera will not work normally, and the display screen can not see the ADAS image. At this time, you need to restart the main device to return to normal.

3.5.2 DMS Installation

A. Installation Position: A-pillar of the cab

1) Installation Height Requirements: 10-15cm below the horizontal line of driver's eyes (the camera should have a slightly inclined upward angle to look up at the driver's eyes, which is better for fatigue detection).

2) Installation Distance Requirements: Within the range of 70cm-100cm from the driver's head.

3) Installation Method: Drill the base of the gimbals and fix it on the A-pillar, use screws to fix the lens on the gimbals, adjust the angle to the display screen and fix the lens with the inner hexagon (the gimbals can be adjusted up, down, left, and right, and the installation will be more convenient).

4) Installation Angle Requirements: Adjust the camera angle through the video to make the driver's face up and down in the middle of the entire video.

B. Installation Position: Car Dashboard

1) Installation Angle: Ensure the camera is within 30 degrees to the right of the driver's direct line of sight. The smaller the angle, the better.

2) Installation Distance: The distance between the camera and the driver's face should be within the range of 60 cm to 120 cm. It is recommended to install the camera at approximately 80 cm from the driver's face.

3) Other Requirements:

① Ensure the DMS camera does not obstruct the driver's view or interfere with their operations.

② Ensure there are no obstructions such as the steering wheel between the DMS camera

and the driver's face.

③The DMS camera must remain level horizontally and should not be tilted.

While meeting the above conditions, the angle deviation from the driver's face should be minimized. Ideally, the camera should face the driver directly.

3.6 Power Connection

1) Connect the power to the device according to the definition of power line interface. Before connecting, please check the connected power supply voltage, which should be in the range of 9V - 36V, The recommended operating voltage is 12V or 24V to prevent the equipment from abnormal due to voltage mismatch.

2) The red line (positive pole) of the power supply is connected to the positive pole of the vehicle main control power supply. The black (negative) of the power supply should be connected to the negative pole or ground of the vehicle power supply. When grounding, it is necessary to ensure the good conductivity of the ground.The power supply (ignition) shall be connected to the ignition control cable, which has power only when the vehicle is running.Please connect the red line and the orange line together to the positive pole of the power supply when debugging the product with the power adapter.

3.7 Product Installation Place Requirements

The device can be embedded into the dashboard of the car through the sleeve, and it can also be fixed. Please pay attention to the following points during installation:

1) Waterproof: You should choose a location that is not suitable for water to ensure that the terminal is dry, and pay attention to keeping away from the air outlet of the air conditioner to prevent condensation from accumulating inside the terminal when the temperature difference changes.

2) Earthquake Proof: the terminal cannot be suspended and installed in a position with large long-term vibration.

3) Anti Interference: The terminal should be kept away from single equipment such as audio-visual and intercom in the car to prevent conduction and radiation interference.

3.8 Product Firmware Upgrade

1) Put the upgrade software into SD card / U disk.

2) Insert SD card / U disk with upgrade file.

3) Enter the system menu "System Information" to view the application program and MCU version number.

4) The upgrade version number should be different from the device current version number, and the device will be upgraded automatically if the USB flash disk or SD card is inserted.

5) Do not power off or operate the device during the upgrade.

4. Infrared Remote Control Key Description

Button		Description	Remote Control
	Power	This machine has no remote control shutdown function.	
	Menu	Log in to the main page (operation of main menu interface)	
	REW	Fast back key when playing back image file.	
	FWD	Fast forward key when playing back video files.	
		Play history video, Pause play and stop playing.	
	PTZ, ZOOM- ZOOM+	Delete button, delete characters when editing, color adjustment value drops.	
	INFO	In the state of device information, you can go to the automatic test interface	
		Under the monitoring screen, it is used for switching between four screens and single screen; Press the "field" key to display 4 pictures; Press the number keys to switch to single screen CH1, CH2, CH3 and CH4	

		respectively.
		Arrow keys, up, down, left, right, cursor direction movement keys.
	Enter	Enter the menu
	Return	Return key: Return to the previous sub menu.
	Cancel	Delete characters
	【0-9】Number key	[0-9] key: in the setting state, the number input key is used to select numbers. When previewing, keys 1, 2, 3, 4, 5, 6, 7 and 8 are used to switch to single screen of channel 1-8. When channel 8 is pressed or channel 1 is pressed up, channel 9 is reached.
		Switch panel (only work for full video recorder Model)