思拓系统
CITOPS

Product introduction

M52H series is a high-performance and highly extensible product specially developed for vehicle-mounted video monitoring and remote video monitoring. It adopts a self-pop-up structure design of hard disk, high-speed processor NT98323 and embedded operating system, and integrates IT cutting-edge field H.264/H.265 video compression/decompression, 4G network, GPS/BD positioning and other technologies. It has the characteristics of strong earthquake resistance, simple appearance, flexible and convenient installation, comprehensive function and high reliability. Suitable for public security police, financial escort, long-distance passenger transport, road administration inspection and other vehicle movement monitoring fields
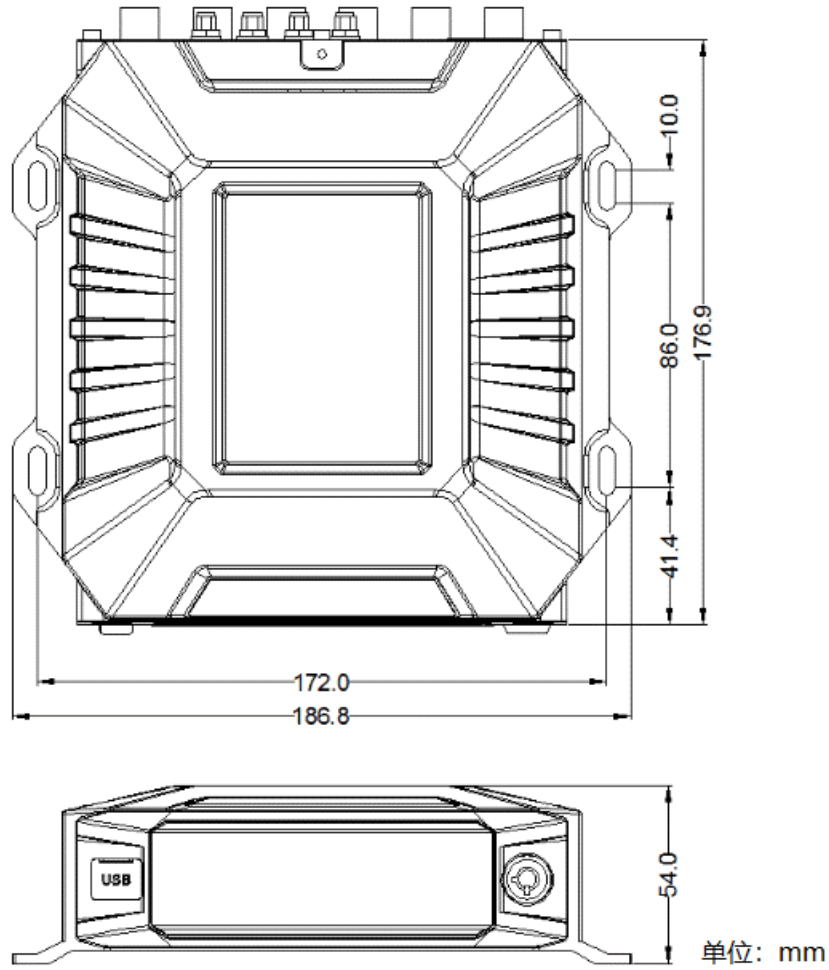
Product Advantage

- The interface can operate reliably and stably in complex environments
- Video encoding H.265, H.264 is optional
- Support 4G WIFI and GPS functional modules
- Supports a 2.5-inch optional SSD/HDD hard disk
- Supports one SD card
- Rich peripheral interfaces
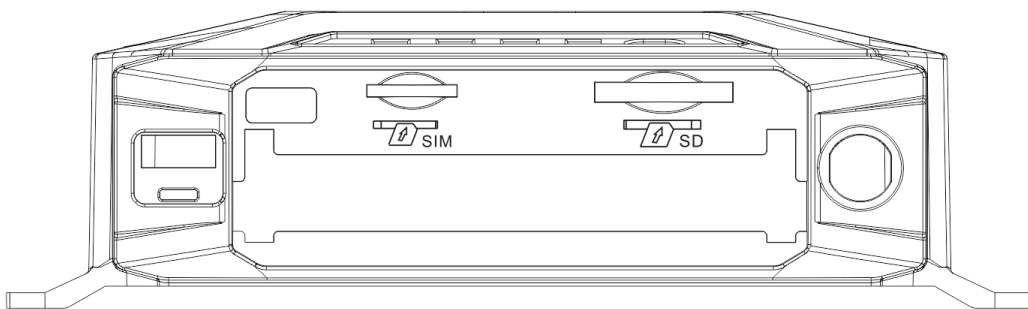- Support external UPS battery life
  High scalability

Core parameters

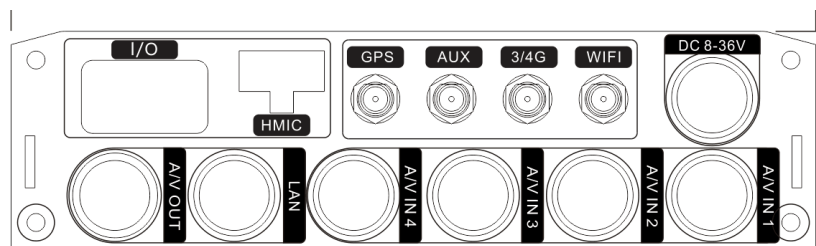| project		parameter specification
Audio and Video Inputs	video input	AHD：8ch 1080/25fps IPC：Scalable 1-8ch
	audio input	4ch audio iuput
Audio and Video outputs	video output	Default 1-way CVBS output (VGA output optional)
	speech output	1ch audio output
Audio and video parameter coding	video coding	H.264 Main Profile/H.265
	Resolution	1080P/720P/D1 optional
	audio coding	Default G.726,G.711A optional
storage space	HDD	1 2.5-inch optional: SSD/HDD hard disk
	SD	Support 1 SD card
wireless network	4G	Supports 1 SIM card, optional: all major communication modules in the world
	WIFI	2.4/5.8G optional
locate mode	BD/GPS	Support for mixed positioning, speed detection, time synchronization
interface	USB	USB2.0 interface, support export data, external engineering treasure
	serial port	Support 2 RS232, 1 RS485, can be connected with external sensor
	I/O	4 level inputs, 2 analog inputs, 2 alarm outputs
	network interface	Support external IPC, support hybrid NVR function
	Intercom	1 special intercom handheld mark interface
Physical Specifications	size	176.9mm（L）*186.8mm（W）*54mm（H）
	weight	NW：1.4kg GW：2kg（M51H-DGNE1-L as a standard）
work environment	operating temperature	-20〜+70℃
	operating humidity	8%〜90%（No condensation）
Other	operator schema	remote control、APP、WEB
	Gravity sensor	Built-in G-Sensor
	Configurable AI algorithms	Face recognition,eople Counting

Size

10.0
176.9
86.0
41.4
172.0
186.8

USB

54.0

单位：mm

Panel&interface

front panel

SIM   SD

rear panel

I/O   GPS   AUX   3/4G   WIFI   DC 8-36V

HMIC

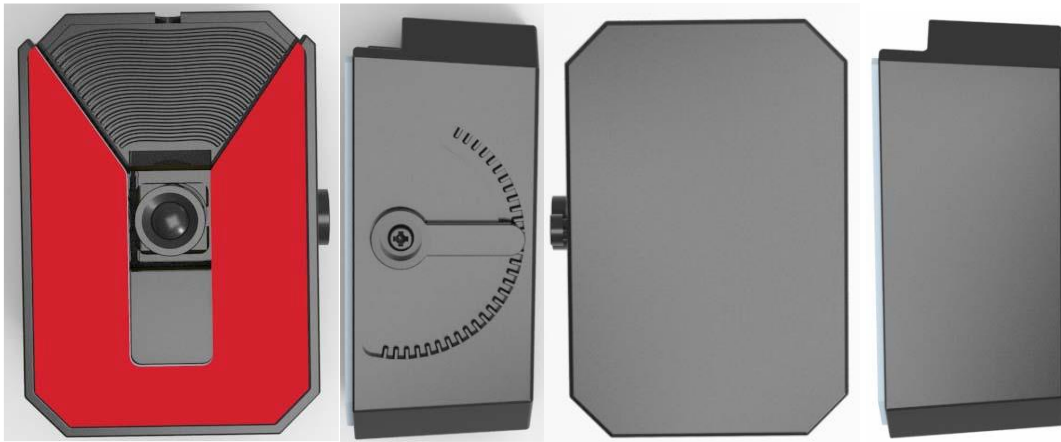A/V OUT   LAN   A/V IN 4   A/V IN 3   A/V IN 2   A/V IN 1

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Active safety driving assistance system parameters

ADAS camera

Model：MX-ADASH-830A-NNP-025V,6mm

Functions and features

1. Adopting two million pixel progressive scan CMOS to capture moving images without aliasing

2. Supports coaxial HD output, the image is clear and delicate, the resolution is up to 1080p, and 720P output is supported.

3. The camera has strong adaptability to the environment (-20~70℃ working temperature range)

4. Wide voltage design, effectively reducing the impact of voltage fluctuations on the equipment

5. With full glass lens, the angle is more suitable for vehicle, and the picture quality is clearer.

Parameter

model	name	ADAS camera
	model	MX-AHDM-820，6mm
Specifications	Sensor	GC2053
	Image Sensor	200W CMOS Sensor
	Image color	Color
	Focal Length	6 mm
	IR	NA
	View Angle	D=54° H=42° V=30°
	Signal Type	PAL
	FPS	25fps
Properties	Temperature	-20℃~70℃
	Humidity	≤ 90 %
	Voltage	9V~16V
	Cable Length	2.5m

DMS camera

model：MX-DSMM-838A-NNP-025H,3.91mm

Functions and features

1. Support coaxial HD output, the image is clear and delicate, the resolution is up to 720p
2. Use 1.3million pixel progressive scan CMOS to capture moving images without aliasing
3. The camera has strong adaptability to the environment (-20~70℃ working temperature range)
4. Wide voltage design, effectively reducing the impact of voltage fluctuations on the equipment
5. Using full glass lens, the angle is more suitable for vehicles, and the picture quality is clearer
6. Support effect debugging, matching various algorithms.

parameter：

Model	MX-DSMM-838A-NNP-025H,3.91mm
Sensor	GC1054
Image Sensor	130W CMOS Sensor
Image color	Black -White
Focal Length	3.91mm
IR	NA
View Angle	D=75° H=60° V=42°
Signal Type	PAL
FPS	25fps
Temperature	-20℃~70℃
Humidity	≤ 90 %
Voltage	9V~16V
Cable Length	2.5m

Side view camera

Model: MX-BSDH-701A-NNP，3.6mm

Product features:

1. Exquisite design, exquisite workmanship, precise lines and rigorous structure, reflecting the highest technology;

2. Wide Angle adjustable bracket, the Angle can be adjusted freely in the process of installation and fixation

3. Integrated structure, shockproof and loose-proof design;

4. Apply to all kinds of vehicle monitor environment

5. Color: black;

6. Appropriate aviation connector design;

Specifications:

Model	MX-BSDH-701A-NNP，3.6mm
Sensor	GC2053
Image Sensor	200W CMOS Sensor
Image color	Color
Focal Length	3.6 mm
LED	LED850*10
View Angle	D=110° H=90° V=46.5°
Signal Type	PAL
FPS	25fps
Temperature	-20℃~70℃
Humidity	≤ 90 %
Voltage	9V~16V
Cable Length	0.7m

Item	instruction
ADAS	It is applicable to the warning prompt of road conditions in front of vehicles. The following parameters are for reference. **1. Forward Collision Warning (FCW)** 1) Distance monitoring and warning, real-time monitoring of the distance between the vehicle and the vehicle in front, when the TTC is less than 2 seconds (default is 2s, configurable), the system will issue a warning; 2) Any vehicle posture, any Angle can be recognized; 3) Speed range: 30KM/H≤ speed ≤140KM/H (minimum speed can be configured, default is 30KM/H); 4) The interval for the next alarm can be configured, the default is 125 frames (5s); 5) Detection range: 150 meters during the day and 120 meters at night; 6) Average target recognition within 0.16 seconds; 7) Vehicle detection rate: within the ROI area, greater than 98% during the day and 90% at night; 8) Horizontal ranging accuracy: <0.5 m; 9) Longitudinal ranging accuracy: < 10% and the maximum of 2 meters. **2.lane Departure alarm (LDW)** 1) Lane departure warning, judged by lane line recognition algorithm, when the outer edge of the wheel approaches/crosses a certain distance from the lane line (configurable, the range is plus or minus 20cm, the default value is -20cm, that is, crossing the lane line 20cm), the alarm will be started; 2) When the driver has a lane change or turning tendency and turns on the turn signal in the right direction, it will not alarm in the same direction; 3) Lane lines support yellow and white lane lines, dotted line, solid line, dotted line; 4) When driving under normal road conditions, lane lines should be detected under light conditions such as day, night, dusk and dawn; 5) Working range of lane deviation warning: 40KM/H≤ speed ≤140KM/H (minimum speed can be configured, default is 40KM/H); 6) The interval for the next alarm can be configured, the default is 125 frames (5s); 7) Lane line detection distance: 80 meters; 8) Transverse distance error: <10cm; 9) Alarm accuracy >95%; 10) Support one-way lane line alarm. **3. Pedestrian Collision Warning (PCW)** 1) Pedestrian collision warning, pedestrian identification through the camera, when TTC is less than 2 seconds (default value, configurable), start the alarm; 2) No alarm is given when the brake pedal is pressed down; 3) Start detection at the speed of 1-50km /H, and start alarm within the speed of 7-50km /H;

| | 4) When steering Angle signal is greater than 60 degrees (> 60°, < -60°), turn off PCW alarm;

5) Detection range: 70 meters during the day and 50 meters at night;
6) Pedestrians standing, squatting, riding, wearing raincoats can be recognized;
7) Average target recognition within 0.16 seconds;
8) Pedestrian detection rate: greater than 90% in ROI;
9) Horizontal ranging accuracy: <0.5 m;
10) Longitudinal ranging accuracy: < 10% and the maximum of 2 meters.

4. Vehicle Distance Monitoring and Warning (HMW)
1) Distance monitoring and warning, real-time monitoring of the distance between the vehicle and the vehicle in front, when TTC is less than 0.8 seconds (default value, configurable), the system will issue a warning;
2) Any vehicle posture, any Angle can be recognized;
3) Vehicles can be identified at night;

4) Speed range: 30KM/H≤ speed ≤140KM/H (minimum speed can be configured, default is 30KM/H);
5) Detection distance: 110 m;
6) Average target recognition within 0.16 seconds;
7) Vehicle detection rate: within the ROI area, greater than 98% during the day and 90% at night;
8) Horizontal ranging accuracy: <0.5 m;
9) Longitudinal ranging accuracy: < 10% and the maximum of 2 meters. |
| DMS | Applicable to driver behavior analysis, the following parameters for reference.

1, fatigue driving warning
1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).
2) It can work normally when the driver wears a hat, glasses and sunglasses (penetrable).
3) When the vehicle is in the driving state, it can combine continuous squinting, continuous eye closing and yawning to conduct comprehensive identification analysis of fatigue driving and trigger the alarm.
4) Working principle: When eyes and mouth are not covered, squinting, eye closing (eyelid closure more than 90%) or wide opening (mouth opening more than 90%) will continue for more than 1s (configurable), triggering the alarm.
5) It does not trigger eye closing fatigue driving under the condition of head down.
6) Strong light reflected on the glasses will not trigger eye-closing fatigue driving under the condition of eye occlusion.
7) Performance index: the accuracy rate is more than 95%, and the total time delay of recognition and alarm is less than 2S.

2, distracted driving warning |

1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).

2) It can work normally when the driver wears a hat, glasses and sunglasses (penetrable).

3) When the vehicle is in the driving state, it can combine the comprehensive recognition analysis of face posture, such as looking left and right, looking up and lowering head, to trigger the alarm.

4) working principle: face posture relative to the front, left and right amplitude is greater than or equal to 25 degrees (configurable), or up and down amplitude is greater than or equal to 20 degrees (configurable), lasting more than 1s (configurable), trigger the alarm.

5) When facing forward and looking down more than 25 degrees, an alarm should be triggered;

6) It can distinguish when the vehicle is turning and reversing, and the driver will not generate an alarm when observing the rearview mirror. (Need to be calibrated in advance)

7) Performance index: the accuracy rate is more than 90%, and the total time delay of recognition and alarm is less than 1s.

3, abnormal driver warning

1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).

2) It can work normally when the driver wears a hat, glasses and sunglasses (penetrable).

3) When the vehicle is in the driving state, the driver is not in the driving position or deviates from the driving position and other states are comprehensively recognized and analyzed, triggering the alarm.

4) Working principle: when no face is detected or the face is far from the screen center for more than 2s (configurable), the alarm will be triggered.

5) Performance index: the accuracy rate is more than 95%, and the total time delay of recognition and alarm is less than 2S.

4,Smoking warning

1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).

2) It can work normally when the driver wears a hat, glasses and sunglasses (penetrable).

3) The system can be combined with cigarette items and smoking action comprehensive identification analysis, generate alarm.

4) Working principle: the driver holds the cigarette to the mouth no more than 5cm or holds the cigarette in his mouth. If the duration exceeds 1s (configurable), an alarm is triggered.

5) No alarm when a cigarette is held to one's ear.

6) Performance index: the accuracy rate is more than 95%, and the total time delay

of recognition and alarm is less than 2S.

5, call early warning

1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).

2) It can work normally when the driver wears a hat, glasses and sunglasses (penetrable).

3) When the vehicle is in the driving state, it can carry out comprehensive identification and analysis by combining the items of the hand-held phone and the action of receiving and making calls to generate an alarm.

4) Working principle: when the driver holds the phone to the ear or mouth, the minimum distance is no more than 5cm, and lasts for more than 1s (configurable), the alarm will be triggered.

5) Can distinguish between eating and drinking.

6) Can distinguish toothpick lollipop, such items do not alarm.

7) Performance index: the accuracy rate is more than 95%, and the total time delay of recognition and alarm is less than 1s.

6, driver identification warning

1) when the vehicle electric start to finish, the pilot card complete, drivers leave the pilot back again, change the pilot of the region monitoring, regular inspection and other cases, the system is able to take the initiative to capture driver positive images, and automatically compare identification and registered the driver photo, when inconsistent results than to trigger the alarm.

2) Performance index: the accuracy rate is more than 95%, and the total time delay of recognition and alarm is less than 2S.

7, cover camera warning

1) When the vehicle is running, the system can detect whether the camera is covered by image recognition and analysis. If the camera is covered for more than 5s (configurable), the alarm will be triggered.

2) Performance indicators: the accuracy rate is above 95%, and the total time delay of recognition and alarm is less than 5s.

8, infrared blocking failure warning

1) It can work normally under common working conditions (at least including day, night, side light, light, backlight, shade and sunlight flickering alternately, vehicle vibration, etc.).

2) When the vehicle is in the running state, it can realize comprehensive recognition and analysis of drivers' behaviors such as wearing infrared blocking sunglasses and generate an alarm.

3) Working principle: When the eyes are blocked by impenetrable objects (such as: infrared blocking sunglasses, brim, etc.) for more than 2s (configurable), the alarm will be triggered.

4) Performance index: the accuracy rate is more than 95%, and the total time delay of recognition and alarm is less than 2S.

BSD	The following parameters are for reference. **1, the right blind area warning** 1) Real-time detection of pedestrians and non-motor vehicles (bicycles, motorcycles, battery cars, tricycles and other exposed traffic participants) on the right side of the vehicle, including front, side and back; 2) When the target is on the curb/barrier/outside the green belt, no alarm will be given; 3) It can be associated with the right turn signal to trigger the alarm. This configuration item can set the switch. When the switch is on, the right turn signal + right BSD alarm will output the alarm signal; When the switch is not open, the right BSD directly output alarm; 4) Overall, it is a four-point demarcated area alarm strategy, supporting three-level area alarm at most, and the one closest to the car body is the first-level alarm, and so on, when the target in the area triggers the alarm; 5) Support to set up different alarm areas according to vehicles going straight and vehicles turning right; (The right turn is generally 3 meters outside the car horizontally, and the longitudinal camera position is 15 meters forward; The straight level is 1 meters outside the vehicle horizontally, and the longitudinal camera is 15 meters forward.) 6) Support to set different working ranges of speed according to going straight and turning right. When the speed is between the lowest speed and the highest speed (including the lowest and highest speed), the system will automatically send an alarm when the alarm conditions are met: Line driving: The default minimum speed is 1KM/H, and the maximum speed is 50KM/H. The default speed is 0KM/H, and 50KM/H. 7) Support different alarm levels prompt different alarm sounds, the car alarm default level 1 alarm prompt sound: "beep beep"; There is a separate switch output (Alarm Out2) for the external alarm. The default level 1 alarm prompt sound is "pedestrians on the right side, please pay attention". There is no prompt sound for secondary and tertiary alarm by default; 8) Lighting (>10 Lux) can work normally;

	9) Alarm accuracy >96%. **2, the front blind area warning** 1) Real-time detection of pedestrians and non-motor vehicles (bicycles, motorcycles, battery cars, tricycles and other exposed traffic participants) in front of the vehicle, including front, side and back; 2) As a whole, it is a four-point demarcated area alarm strategy, which triggers the alarm when the target is in the area; 3) Three level regional alarm is supported at most, the one closest to the car body is level 1 alarm, and so on, default only level 1 alarm; (General area is a rectangular area extending 50cm to the left and right of the body and 2.5m to the front of the body) 4) When the target is on the curb/barrier/outside the green belt, no alarm will be given; 5) There is no minimum speed limit for the front blind zone alarm, that is, the system will trigger the alarm when the vehicle is stationary and the alarm conditions are met; 6) Support different alarm levels prompt different alarm sounds; The car alarm default level 1 alarm prompt sound: "beep beep"; There is a separate switch output (Alarm Out1) for the alarm outside the vehicle. The default level 1 alarm prompt sound is: "Pedestrians ahead, please pay attention"; 7) The minimum working speed and maximum working speed of the vehicle can be set. The default minimum working speed is 0, and the default maximum working speed is 20km/h. When the speed is between the minimum speed and maximum speed (including the minimum and maximum speed), the system will automatically send an alarm when the alarm conditions are met. 8) Lighting (>10 Lux) can work normally; 9) Alarm accuracy >96%.