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# Hikvision Solution for School Buses

Keeping students safe on their journeys to school and home

**HIKVISION**

# Background

Ensuring student safety at school is of paramount importance to every principle, parent, and school administrator. All of these stakeholders understand that kids spend most of their daytime hours at school – and they need to be properly looked after.

But the bus ride is where many children’s school day begins. For administrators, it’s imperative to know that the journey is secure and their bus fleet is on the right track. For parents, it’s also natural to know that their child boards the bus on time and arrives at school safely.

To keep children as safe as possible between home and school, Hikvision utilizes smart capabilities, such as video security, artificial intelligence, to help protect students and bus operators. Read on to learn more about how Hikvision can ensure that your students, drivers, and vehicles remain safe at all times.

## Pain Points

## Hikvision’s Solutions

### Home

Parents worry about whether their kids are actually attending school or just using the excuse to go outside and play.

ID via Mifare or facial rec. as students board. Attendance information captured and uploaded. Message sent to parent.

### Pick Up Route

Children run and play around the school bus, and accidents with passing vehicles can happen.

When the school bus stops to allow pupils to board, a stop arm ANPR capture camera activates to capture violators.

## Pain Points

## Hikvision’s Solutions

### Turn in Driving

Vehicles have blind spots, and in complex traffic conditions the risk of an accident goes up significantly.

Minimizing blind zone risks using video security and providing evidence for follow-up when needed.

### In Transit

Operators have difficulty acquiring a school bus’s real-time location and identifying infractions such as speeding or route changes.

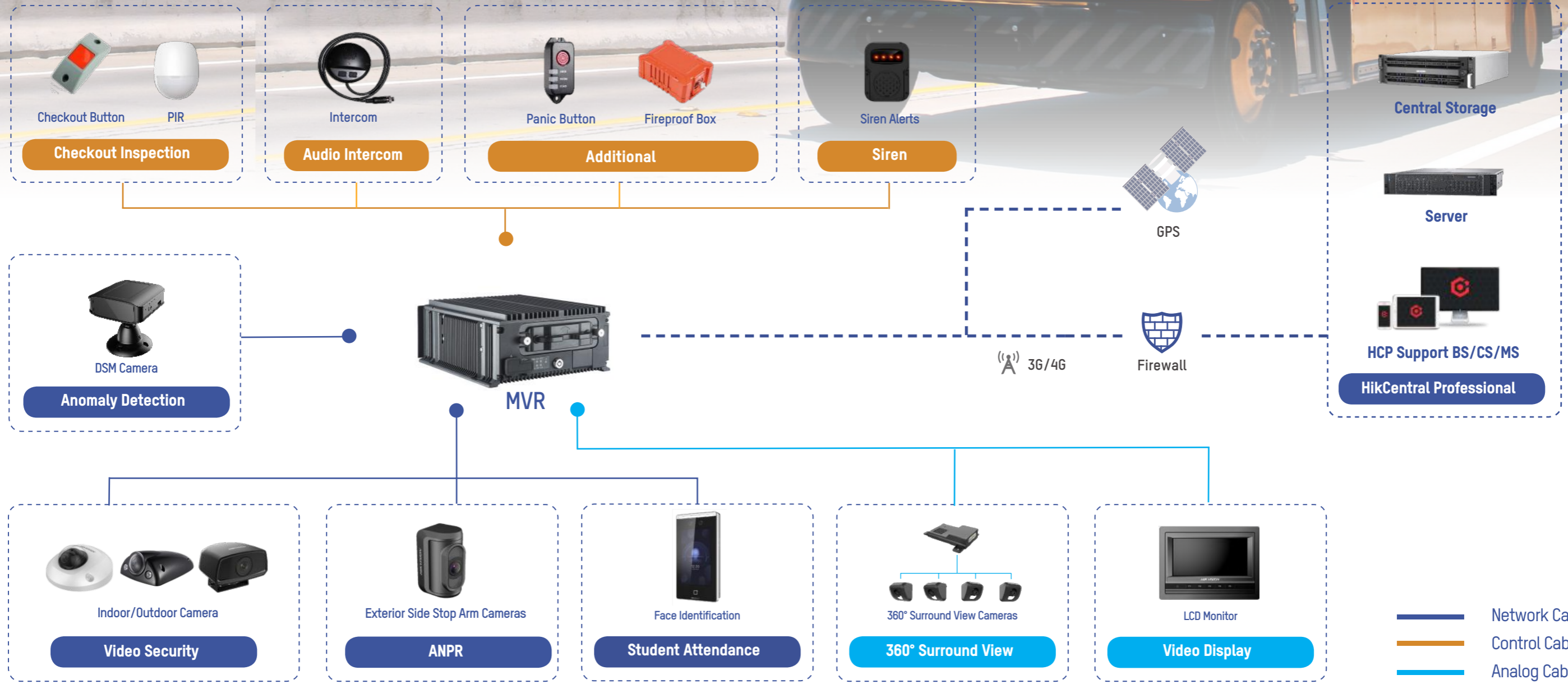
Support for route planning in advance. Anomaly detections and instant alarms boost safety for drivers and passengers.

### School Arrival

It remains unclear whether the pupils’ continued stranding on the bus puts them at risk.

If drivers press the checkout button and miss a student, a PIR alarm will be triggered for double check.

# System Topology



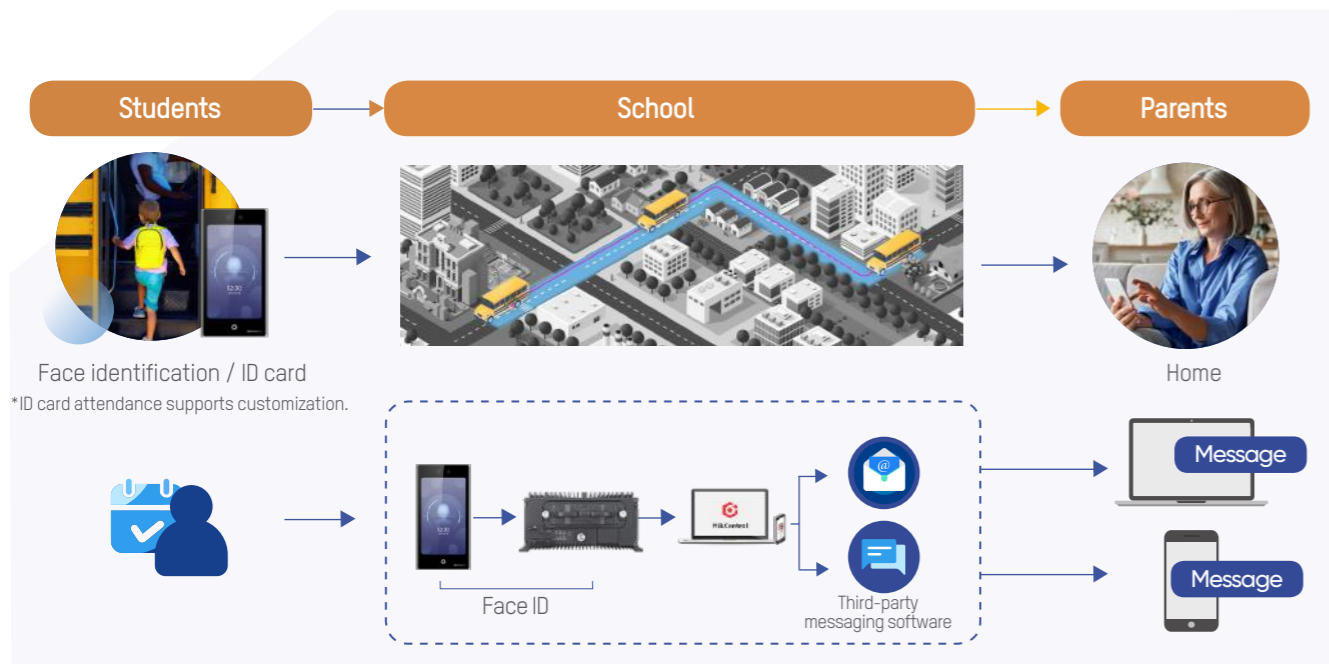
— Network Cable  
— Control Cable  
— Analog Cable

# Solution Functions

## Student Attendance

Hikvision's solution for school buses offers innovative on-board attendance capabilities. When students get on the bus, they can swipe their ID cards\* or use a simple face terminal. The record gets uploaded to the security system's central platform right away.

At the same time, a notification can be pushed to parents' mobile phones, informing them that their children are safely on the bus. The best solutions of this type also generate attendance reports for school administrators to give them a granular view of student attendance.

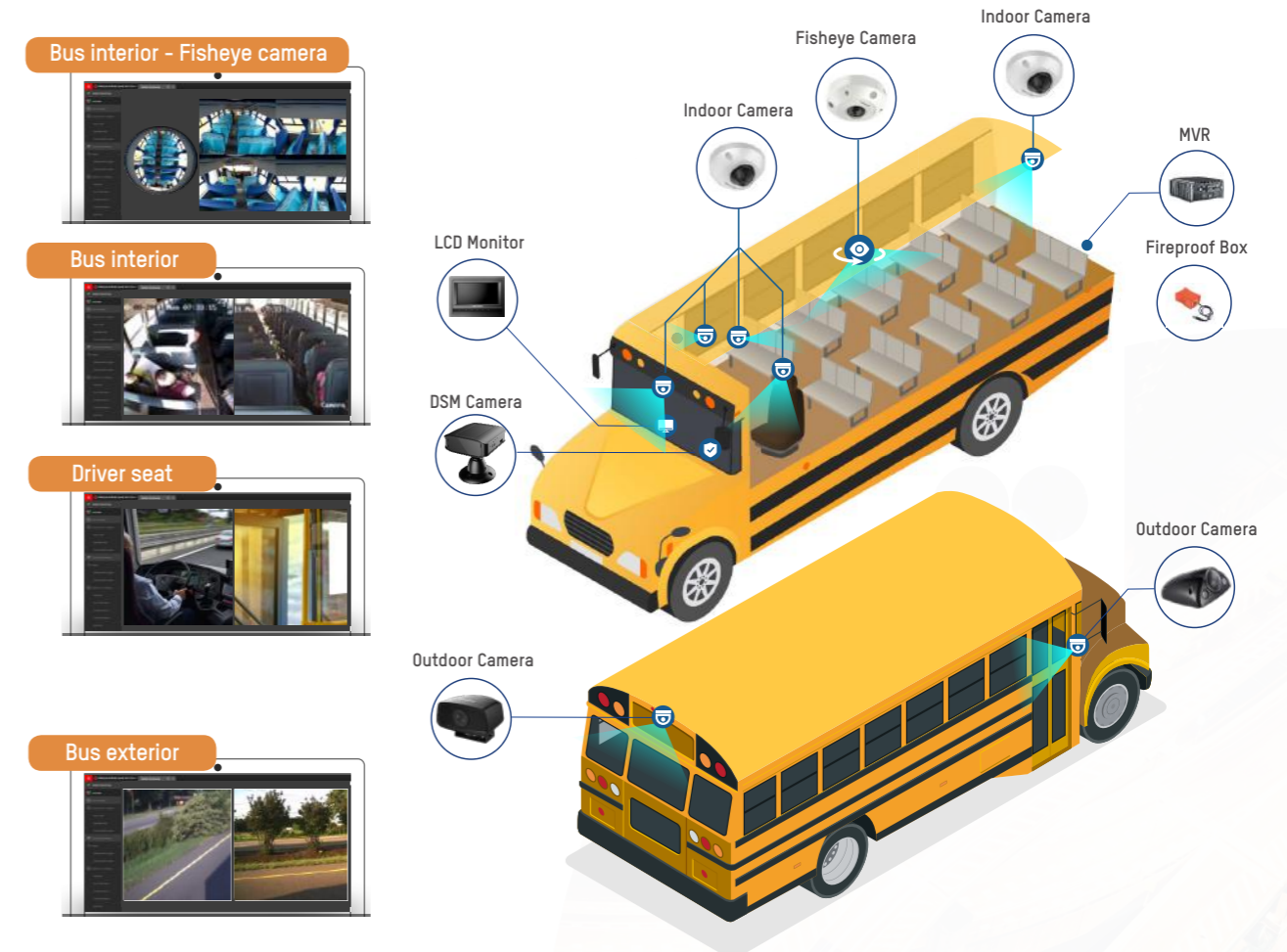


## Safe Journeys

All stakeholders are primarily concerned with safety. Hikvision's solution here can help operators facilitate all-around security with intelligent algorithms, multidimensional perception, anomaly detections, and emergency alarms – securing the whole journey and ensuring safe and well-maintained buses at all times.

### 1. Video security

The primary issue that school bus drivers deal with is discipline on the road. Profanity, bullying, and other inappropriate conduct can distract the driver and seriously jeopardize general safety. Hikvision offers thorough video security for bus interiors and exteriors to safeguard students and drivers, mitigating dangers and keeping bus fleets on the right track.



**Driver**  
Assists drivers in preventing incidents in transit

- Blind Spot Side Camera
- Rear Camera

**Security**  
Routine checks & status checks for alarms

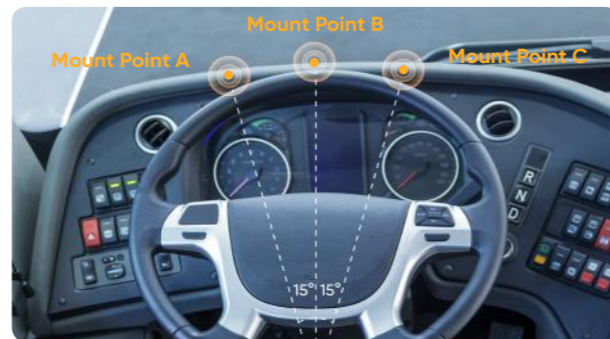
- Cab Region Camera
- Front Camera

**Manager**  
Video evidence for liability identification.

- Front Camera
- Rear Camera
- Cab Region Camera
- Side Camera

## 2. Anomaly detection

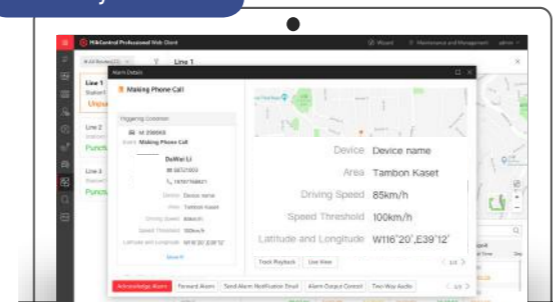
Even the greatest drivers experience bumps in the road, so to speak, occasionally resulting in a dangerous situation that jeopardizes the safety of both the driver and the students on the bus. Hikvision's solution intelligently conducts anomaly detection with its DSM Camera, detecting fatigue and drowsiness. When such anomalies are found, an alert is immediately transmitted to the operation center, enabling security personnel to speak with drivers through two-way audio, keeping them navigating with optimal awareness.



### Operation Statistics

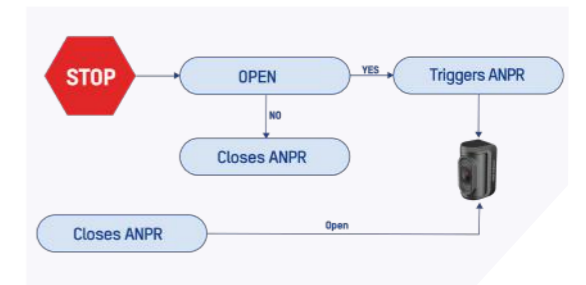


### Anomaly Detection



## Stop Arm Violation Detection

Drivers are required by law to yield to school buses. When a school bus driver extends the stop sign arm to drop off or pick up pupils, nearby drivers must stop. But many drivers prefer to continue on as swiftly as they can, without pause. In order to safeguard students, Hikvision's mobile ANPR camera can assist with detecting and recording vehicle details for evidence collection and follow-up.

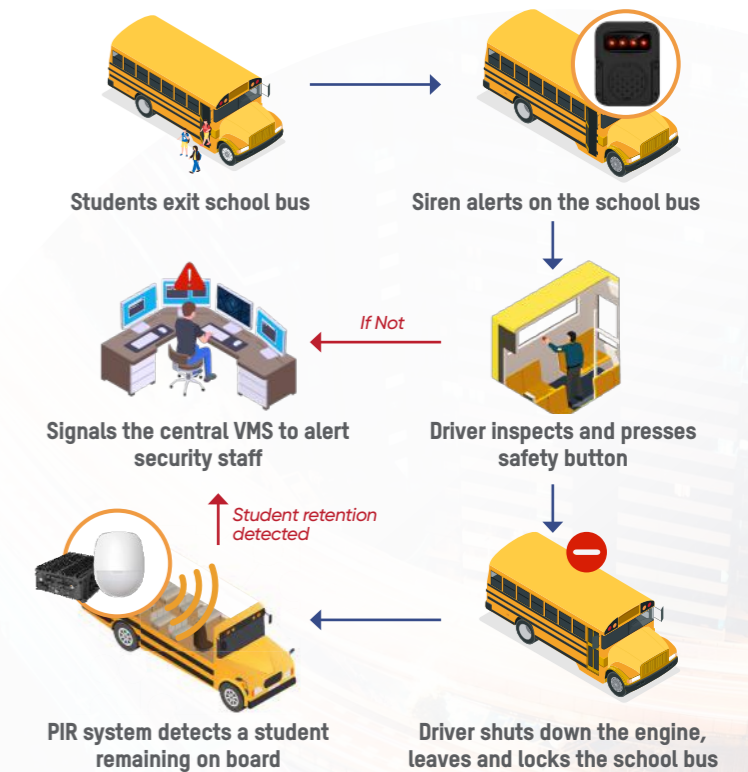


Cameras with built-in ANPR algorithm capture vehicles passing a school bus when the stop arm is extended.

## Student Retention

Hikvision's school bus solution also help operators double check whether students remain on the bus after the bus driver completes the route. A child who falls asleep can be locked in a bus during high daytime temperatures and exposed to significant health risks.

By combining smart video cameras with infrared technology, the bus cabinet situation can also be checked remotely, ensuring that children will be spotted even if drivers leave and lock the bus. In this way, these kinds of monitoring solutions support quick response times to minimize risks for children.



## School Bus Route Management

Bus operations can be challenged by numerous pauses and complex schedules. Efficiency can be increased considerably by using Hikvision's centralized solution to develop an integrated platform for monitoring and scheduling routes. Administration and visualizations are made possible by flexible editing, GIS connection, and specific arrival data, along with many more practical functions.

HikCentral Professional			
Line A		Schedule 1	Schedule 2
Stop 1	Arrive time	07:20	07:00
	Departure time	07:25	07:15
Stop 2	Arrive time	07:35	07:20
	Departure time	07:40	07:30
Stop 3	Arrive time	08:00	07:45
	Departure time	08:15	08:00
Stop 4	Arrive time	08:30	08:15
	Departure time	08:40	08:30
Stop 5	Arrive time	08:50	08:40
	Departure time	09:20	09:00

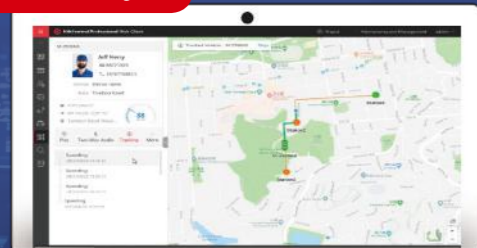
Single Route Monitoring



Multiple Route Monitoring



Bus Monitoring



Bus Scheduling



## Product Features

### Mobile NVR/DVR



#### Reliable Power Supply Design

- Power supply supports 8-36 VDC
- Electromagnetic immunity design conforms to the automobile ISO-7637 electromagnetic standard
- Suitable for all types of vehicles



#### No Break Power Design

- First to be utilized in the industry
- Ensures video is written to the hard drive at the moment of power failure



#### GPS Filtering

- Equipped with high-sensitivity antenna and GPS filtering algorithms, GPS Filtering resolves problems with fixed-point drift, velocity drift, and other abnormal data. Moreover, supporting data retransmission, the challenge of information loss without internet will be fixed properly.



#### Rich Interfaces

- Highly-functional hardware interfaces – such as Standard M12-D Code, RJ45, and other signals – meet a multitude of application requirements and scenarios

### Mobile Camera



#### HD Video Security

- All-round cameras with high definition, including 2MP, 5MP, 6MP, and 12MP, can provide better recording, tracking, and deterrence



#### Intelligent Heating Control

- Outdoor Cameras, like XM65 series, come up with heating module, which operate based on outdoor temperatures, and best in ambient temperatures from -40° to 70°C



#### Anti-seismic Design

- Top-rated shockproof hard drives employed
- Patented metal air bag damping technology



#### Perfect Video Recording

- Supports a variety of storage media
- Supports SD card redundancy recording when if hard drive is damaged
- Supports fire box storage / redundancy recording



#### Aviation Gyroscope

- Built-in G-sensor & gyroscope sensor provide emergency response to collision and rollover accidents to restrict or eliminate dangerous driving habits such as rapid acceleration, deceleration, or braking, and turning too sharply



#### Dual System Backup

- Dual system firmware is built in the vehicle host to ensure normal operation of the device after restarting



#### IK10+ Impact Protection

- Protected against 20-joule impacts
- Equivalent to impact of a 5 kg mass
- Dropped from 400 mm above impacted surface



#### IP68 Waterproof Rating

- Water pressure: 400 KPa
- Water flow: 100L/min
- Depth: 2.5 – 4 m
- Test duration: >3 mins

# Product Introduction



MVR

## 4-Channel MVR

- 4-ch SMP PoE IPC + 4-ch SMP via PoE switch
- Pluggable anti-vibration HDD box , 2\*2.5 inch HDD/SSD (2TB for each) , 1 x SD card
- 3G/4G, 5.8G WiFi, GPS, H.265
- Full load consumption ≤ 45 W
- 206 × 219 × 60 mm (8.1 × 8.62 × 2.36 inch)
- 1.6 kg (3.5 lb)
- CE, FCC, EN50155, EN45545, EN50121, E-mark, CB, RoHS, WEEE



MVR

## 8-Channel MVR

- 8-ch SMP PoE IPC
- Pluggable anti-vibration HDD box , 2\*2.5 inch HDD/SSD( 2TB for each) , 1 x SD card
- 3G/4G, 5.8G WIFI, GPS, H.265
- Full load consumption ≤ 99 W
- 202 × 267.6 × 93.9 mm (7.95 × 10.5 × 3.7 inch)
- 3.66 kg (8.07 lb)
- CE, FCC, EN50155, EN45545, EN50121, E-mark, CB, RoHS, WEEE, MIL-STD 810G



Indoor Camera

## DS-2XM63 Series

- 6MP resolution, 3072 × 2048 @25fps
- 12MP resolution, 4000 × 3000 @ 20fps
- 2 Built-in microphones
- H.265+, IP66, IK10
- 24 VDC, 0.4 A, max. 12 W or PoE (802.3af, 36V to 57V), 0.30 A to 0.22 A, max: 12W
- Approx. 600 g (1.32 lb.)
- CE, FCC, UL, E-Mark, EN50155, EN45545, EN50121, KC, IC, REACH, RoHS, R118, WEEE, BIS, IK, IP



Indoor Camera

## DS-2XM67 Series

- Resolution 2MP, 1920 × 1080 @25/30fps and 5MP, 2560 x 1920 @25/30fps
- 2mm/2.8mm/4mm/6mm/8mm fixed lens
- H.265+, IP67, IK10
- 24 VDC, 0.3 A, max. 7.5 W or PoE (802.3af, 36V to 57V), 0.30 A to 0.20 A, max: 7.5W
- Approx. 460 g (1 lb.)
- CE, FCC, UL, E-Mark, EN50155, EN45545, EN50121, KC, REACH, RoHS, R118, WEEE, BIS, IK, IP



Outdoor Camera

## DS-2XM6222G1

- 2MP resolution, 1920 × 1080 @25fps
- 2.8mm/4mm/6mm fixed lens
- H.265+, IP67, IK10
- 24 VDC, 0.22 A, max. 5.2 W or PoE (802.3af, 36 V to 57 V), 0.14 A to 0.09 A, max. 5.2 W
- Approx. 330 g (0.7 lb.)
- CE, FCC, UL, E-Mark, EN50155, EN45545, EN50121, KC, RoHS, R118, WEEE, BIS, IK, IP



Outdoor Camera

## DS-2XM65 Series

- Max resolution 4MP @ 30 fps and 2MP @ 30 fps
- IP68, IK10+
- Max Horizontal FOV 90°
- IR range 10 m
- Build-in Heater
- Interface RJ45/M12
- 4mm/6mm/8mm/12mm fixed lens



360° Surround View Monitor Host

## AE-VE242A-A

- Support 4 channels of 720p TVI cameras
- 3D panoramic splice the front, rear, left and right images of the vehicle body
- 4-way HDTV input, 1-way HDTV output
- Can Bus interface
- TF card slot x1
- Mini USB interface x1



360° Surround View Camera

## AE-VA133T-A

- Lens (metal shell): 0.9mm fisheye lens
- H (transverse): 190 ° / V (longitudinal): 116 °
- Sensor type: 1 / 4 "1.3 Mega CMOS
- Minimum illumination: 0.1 lux @ (f1.2, AGC on)
- Protection grade: IP68
- Interface: 4-core BMW head interface



DSM Camera

## AE-VC1B11-ISF

- 720P@25fps
- 6 mm fixed lens
- 2 x 940nm LEDs
- Built in speaker
- 1 TF card, up to 256GB
- Consumption ≤ 7W
- Wide-range Input DC 9- 36V
- 92 x 90 x 106 mm (37.8 x 35.5 x 41.8 inch)



Face Recognition Terminal

## DS-K1T671M

- 7-inch LCD touch screen, 2 Mega pixel wide-angle lens
- Max.6000 faces capacity and Max.5000 fingerprints capacity (model with F), Max.6000 cards(M for Mifare)
- Face Recognition Accuracy Rate > 99%
- Face Recognition Duration(1:N) ≤ 0.2s



Intercom

## DS-1350HM

- 1-ch build-in speaker and 1-ch build-in MIC
- 12 VDC/30 mA
- 85mm \* 85mm \* 26mm
- Wiring length 6000mm



Fireproof Box

## DS-MP1431-64G

- Video mirror backup for data protection
- Fire resistance time:15 min@1100 °C, 20 min@950 °C, 120 min@260 °C
- Waterproof: 24 hour@100 m (10 ATM)
- High Speed Impact:100 Gs@50 ms (all directions)
- Static Squeeze:100 KN@5 min (all directions)
- Consumption: 0.5W
- 122 x 88 x 57 mm (4.8 x 3.5 x 2.2 inch)
- Approx.0.97 kg (2.1 lb)



Checkout Button

## AE-MW7101

- The alarm button is normally open.
- Compliance with RoHS2.0.
- All products are 100% tested for open circuit, short circuit and dislocation.
- Exquisite appearance, screw fixation, easy to mount



Onboard ANPR Camera

## AE-VC5831-I

- 2MP/5MP
- 12 mm /16 mm fixed lens
- IR 30m
- ANPR cover 2 lanes with 95% recognition rate
- PoE Power on
- 111 x 70 x 70 mm
- EN 50155/E-mark



LCD Monitor

## DS-MP1302

- 7 inch TFT-LCD
- 800 X 480 RGB
- 130° visual angle
- Manual switch or Auto switch
- 5 physical buttons
- 1-ch connect to the DVR, 1-ch connect to the rear camera
- 2-ch alarm input
- Working Voltage: 12 VDC



Panic Button

## DS-1530HMI

- Build-in Gyroscope and Sensor
- 5 VDC/30 mA
- 80mm \* 30mm \* 19mm
- 100ms sampling interval



Siren Alerts

## AE-MW7601

- Built-in 8Ω 5W speaker, the volume up to 110 dB
- Supports multiple alarm contents, configure by RS485 interface
- IP69K
- 5-Pin aviation connector
- 3.8"(L) × 1.7"(W) × 5.0"(H)
- 20°C to 70°C (-4°F to 158°F)
- 9V to 36VDC



PIR

## DS-PDP18-EG2

- Volumetric Coverage(Motion Detector): 85.9°
- 18m Detection Range
- Installation Height: 1.8m to 2.4m
- Velocity range: 0.3 ~ 2 m/s
- Indicator: Blue
- Sensitivity adjustment: High, Auto, Low
- Wide voltage: 9 to 16 VDC