



MV-PD-030001-03

**Portable Under Vehicle  
Surveillance System (UVSS)**

User Manual

## User Manual

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This user manual is intended for users of the model: MV-PD-030001-03.

It includes instructions on how to use the Product. The software embodied in the Product is governed by the user license agreement covering that product.

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# 1. Product Overview

## 1.1 Introduction

To deal with smuggling and suicide bombings, HikRobot, a division of Hikvision, designs a series of products integrated with advanced digital video technology. Our MV-PD-030001-03 Portable Under Vehicle Surveillance System provides protection to many international conferences and ceremonies.

HikRobot's MV-PD-030001-03 is used to detect threats or dangerous goods hidden underneath vehicles by scanning and capturing undercarriage images of the vehicle automatically.

## 1.2 Features and Components

### 1.2.1 Key Features

- Professional HD optical lens and linear array CMOS sensor provides high-quality pictures
- Supports 170° field of view to detect the entire vehicle bottom
- 2 million pixel image output (maximum 2048 x 12,000) supports tiled display
- Professional speed detection system precisely scans vehicles at high, medium, or low speed
- Illumination LED with high brightness, high stability, and quick response
- Modular design for easy upgrade and maintenance
- Highly integrated, compact, and portable
- IP66 rated
- Working temperature: -25° to 70° C (-13° to 158° F)
- Supports linkage with license plate information, easy access to third-party platform or apps

### 1.2.2 Components

The Hikvision MV-PD-030001-03 is mobile, with a lightweight design. It is composed of a control case and a portable under vehicle surveillance device.



Figure 1, MV-PD-030001-03 Appearance

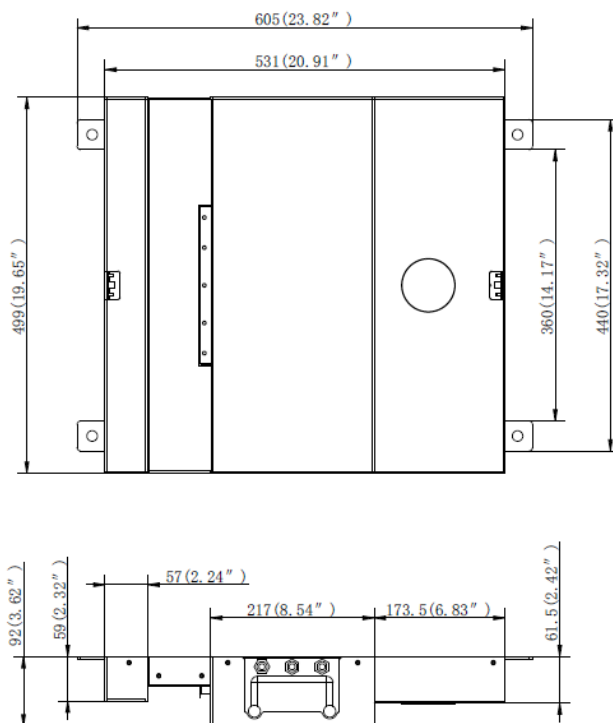


Figure 2, MV-PD-030001-03 Dimensions



Figure 3, Control Case Appearance

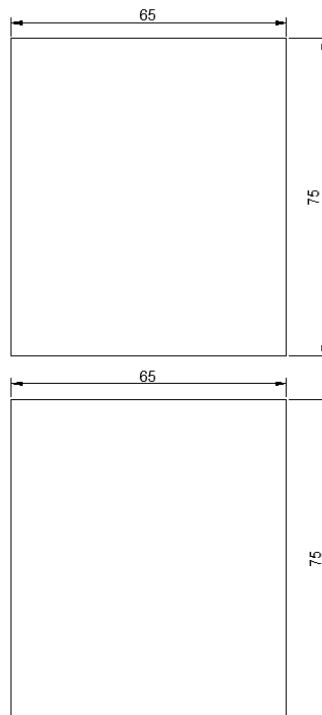


Figure 4, Control Case Dimensions (cm)

The device contains the following:

- **Trigger Module (x2):** The trigger model adopts an IR photoelectric switch and sensitivity adjustable adjuster. It is IP67 rated. The reaction time is less than 2 ms, and precision is less than 1 mm.
- **Speed Detection Module (x1):** The speed detection module is equipped with a built-in camera and lamp cup and outputs the frequency pulse signal, which is proportional to the speed, by detecting the vehicle speed via the image feature points. It can automatically match the vehicle speed lower than 30 km/h. Also, the device can be customized for high speed applications.

- **Under Vehicle Scan Module (x1):** The under-vehicle scan module has a black and white (colorful) line-scan camera with 2K resolution. It is IP68 rated.
- **LED Module (x1 Group):** Linear array LED lights, with power consumption <72 W.

**NOTE:**

The MV-PD-030001-03 can support ten tons and is IP66 rated. The working temperature for the device is from -25° to 70° C [-13° to 158° F].

- **Control Case (x1):** The control case contains the following components:
  - 1 Power Supply (12 V/2 A)
  - 1 Power Supply (48 VDC/5 A/240 W)
  - 1 Visual Controller
  - 1 1000 Mbps Switch
  - 1 Supplement Light Drive Assembly
  - 1 Monitor
  - 1 Wireless Mouse
  - 1 Capture Camera and Bracket
  - 1 Image Management Software
  - 1 USB Security Dongle

## 1.3 Parameters

- **Camera:** Line-Scan Camera with 2,048 Resolution
- **Image Format:** BMP/JPEG
- **Resolution:** Maximum resolution of 2,048 x 12,000
- **Field of View:** 170°
- **Vehicle Chassis Width (supported):** ≤4000 mm
- **Vehicle Chassis Height (supported):** ≥100 mm
- **Vehicle Speed:** ≤30 km/h (supports matching the real-time vehicle speed)
- **Image Capture:** Automatically triggered
- **Operating System:** Windows XP/7/8
- **Working Temperature:** -25° to +70° C (-13° to 158° F)
- **Protection Level:** IP66
- **Bearing Capacity:** 10 tons
- **GigE Vision:** Supported
- **Third-Party System or App:** Supported

## 1.4 Working Process

The MV-PD-030001-03 supports one-way detection for one vehicle.

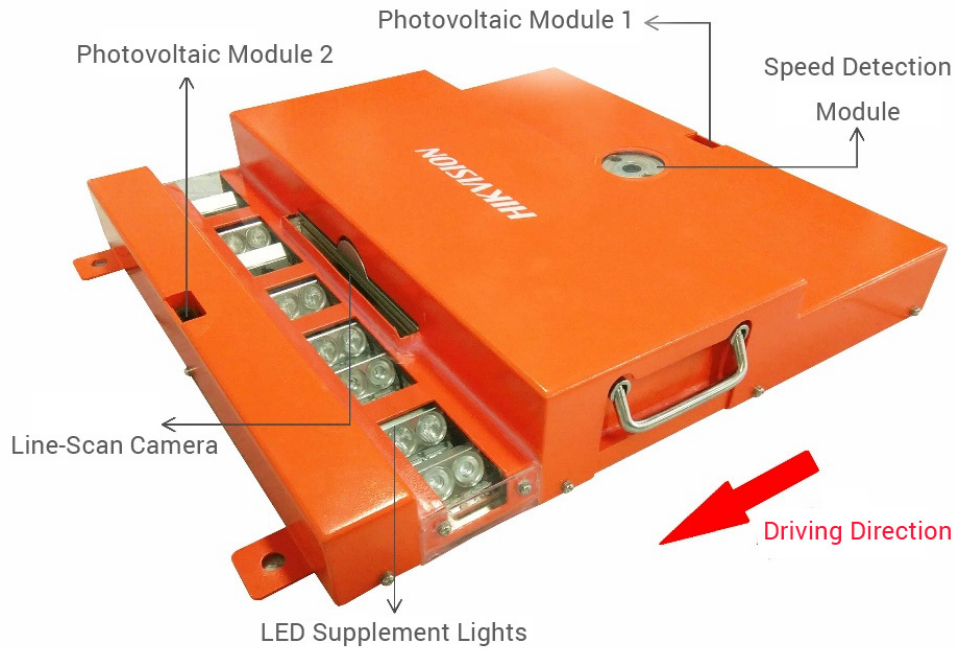


Figure 5, Driving Direction



Figure 6, Actual Scenario

When a vehicle arrives above the MV-PD-030001-03, the photovoltaic module 1 is triggered, and the speed detection module stands by, waiting to send the capture commands to the line-scan camera after detecting that the vehicle is moving. The speed detection module can detect the real-time vehicle speed, so as to adjust the frequency of the line-scan camera. In this way, it can reduce image distortion.



LED lights activate when the camera captures the image, which increases the vehicle chassis brightness.

When the rear part of the vehicle passes the photovoltaic module 2, a command to stop capturing will be sent to the device.

The software will merge captured images, and the merged image will be cached to the visual controller.

## 2. Hardware Installation

### 2.1 Control Overview

The control case contains three layers. The following images is an overview of the control case.



Figure 7, Overview of Open Control Case

### 2.1.1 First Layer



Figure 8, First Layer of Control Case (Display and Interaction Layer)

The components in the first layer of the control case are shown in the table below:

1	Monitor
2	Wireless Mouse
3	Wireless Keyboard

### 2.1.2 Second Layer

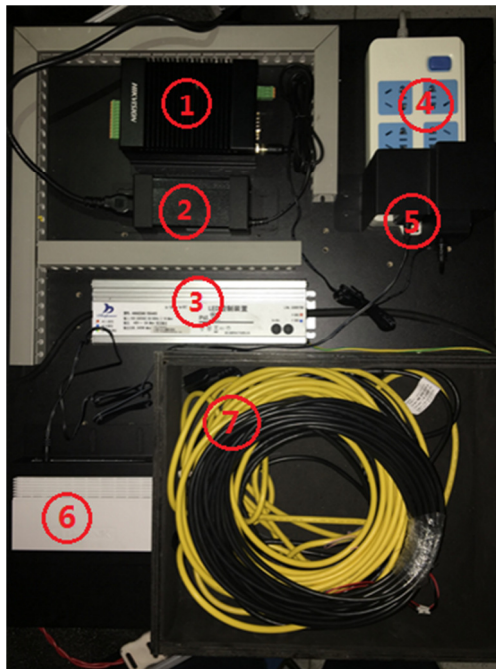


Figure 9, Second Layer of Control Case (Control and Power Supply Layer)

The components in the second layer of the control case are shown in the table below:

1	Visual Controller
2	Visual Controller Power Adapter
3	LED Controller
4	Power Supply Unit
5	Power Adapter for Line-Scan Camera and Speed Detection Module
6	Switch
7	Wire Box

### 2.1.3 Third Layer



Figure 10, Third Layer of Control Case (Capture Camera)

The components in the third layer of the control case are shown in the table below:

1	Capture Camera
2	Bracket

### 2.1.1 Forth Layer

The forth layer of the control box is used to store the under vehicle surveillance device.



Figure 11, Forth Layer of Control Case (Under Vehicle Surveillance Device)

## 2.2 Wiring Description

When using the under vehicle surveillance device, you need only to connect the signal lines, the network cable, and the power cable to the aviation plugs on the device.



Figure 12, Aviation Plugs on Control Case



Figure 13, Aviation Plugs on Device

The fool-proof design and the aviation plug usage avoid wrong wiring.

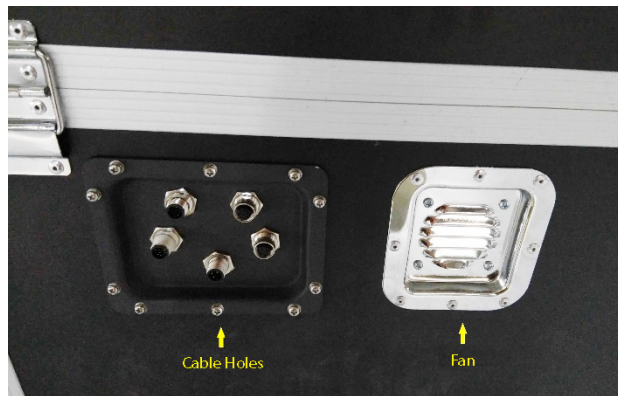


Figure 14, Cable Outlet Holes and Exhaust Fan

The control case contains cable outlet holes and an air exhaust fan.

### 3. Client Configuration

The MV-PD-030001-03 client software supports Windows XP/7/8 (32-/64-bit).

**Note:**

The device driver is integrated into the client software.  
Refer to [www.hikvision.com](http://www.hikvision.com) for more details.

## 3.1 Turn off Firewall

Turn off the client software firewall and image transmission before starting the client software.

1. Enable the firewall.
  - **Windows XP** – Click **Start > Control Panel > Security Center > Firewall**.
  - **Windows 7** – Click **Start > Control Panel > Windows Firewall**.
  - **Windows 8** – Click **Setting > Control Panel > System and Security > Firewall**.
2. Click **Turn Windows Firewall on or off**.
3. Select **Turn off Windows Firewall (not recommended)**.
4. Click **OK**.

## 3.2 Interface Description

The under vehicle surveillance software needs to start up with the USB security dongle inserted into the USB 2.0 port on the controller.



Figure 15, Security Dongle

The main interface is shown below.

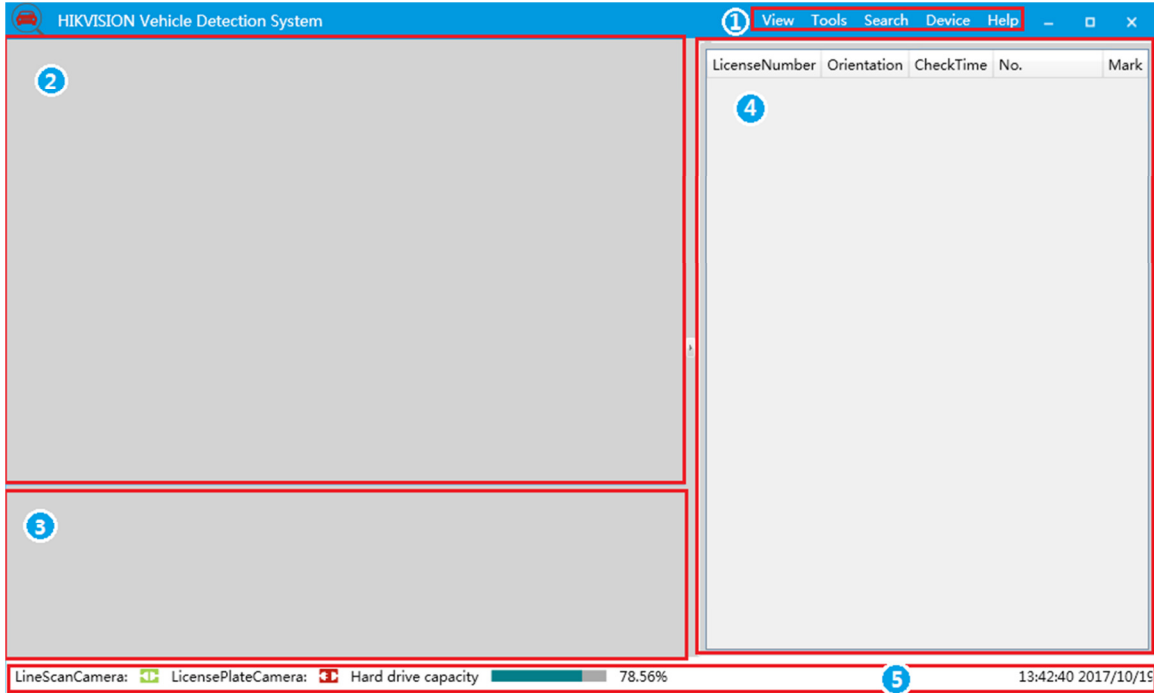


Figure 16, Main Interface

No.	Name	Description
1	Menu	View and configure software functions.
2	Main Display Area	Double-click to display/hide thumbnail. Zoom in and out by dragging.
3	Thumbnail Preview Area	List the thumbnails in order of: body picture, plate picture, and undercarriage picture.
4	Real-Time Passing Record	Click the button on the left to display/hide the real-time passing record.
5	Statistics	Click the buttons to add vehicle to the blacklist/whitelist.
6	Status	Display the connection status, storage status, and system time.

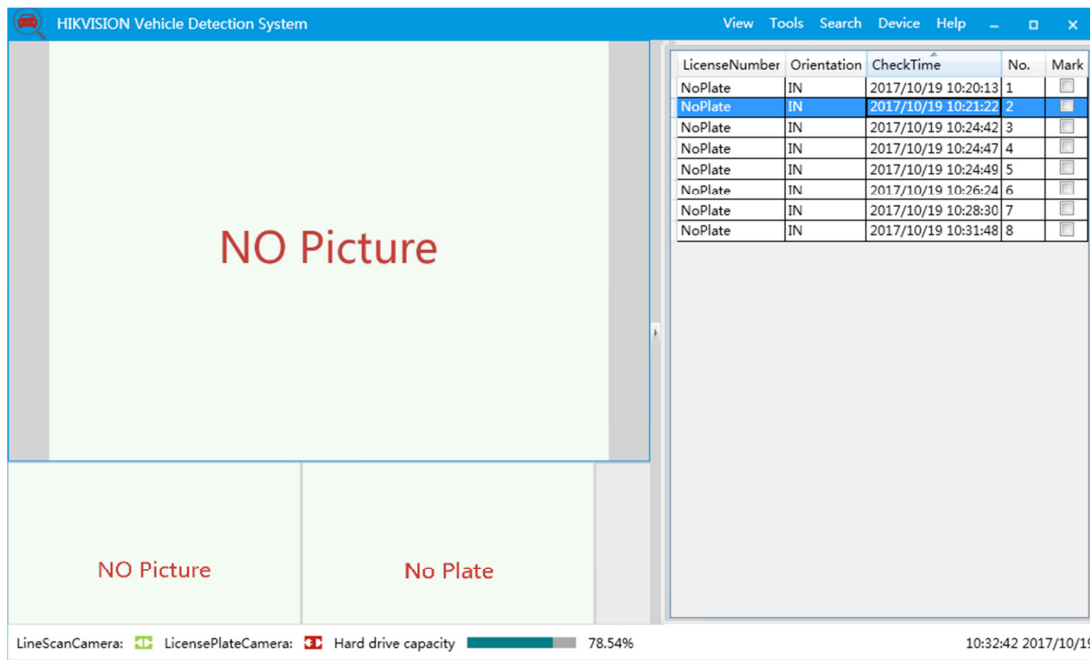


Figure 17, Main Interface

### 3.3 Menu Bar

The menu bar contains all the under vehicle surveillance software control interfaces.



Figure 18, Menu

#### 3.3.1 View

View provides three display modes: **Uniform** (Self-Adaptive), **UniformToFill** (Self-Adaptive Full Screen), and **Fill** (Full Screen).

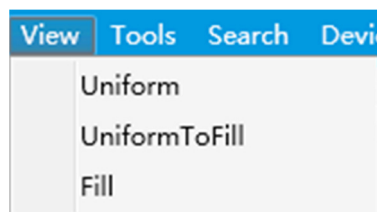


Figure 19, View

#### 3.3.2 Tools

Tools contains **Settings** (Parameter Configuration), **Image** (Processing), and **Print**.

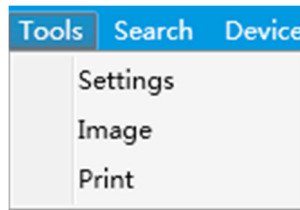


Figure 20, Tools

1. Click **Settings** to enter the parameter configuration interface.

- **Save Picture**

User can set the picture storage path. The software needs other assistant software to open the pictures, so the storage path should contain no spaces.

- **Database**

User can set the IP address of the database server, Name, User Name, and Password. Don't change the database structure parameters unless necessary.

- **Data Capacity**

Data capacity is used to manage the disk capacity and database record. Set the prompt percentage for the hard drive cleaning (e.g., 90%). When the picture memory exceeds the preset percentage, it will display a warning message on the Status Bar to prompt the user to clean the pictures.

- **Available Capacity for Automatic Cleaning (File Purging)**

Set the available capacity value for automatic purging to recover storage space for new pictures. The number should be between 100 MB and 1 GB. When the available capacity is less than the preset value, the software will purge the pictures by day automatically, until the available memory reaches the prompt percentage for hard drive purging (e.g., 90%).

- **Manual Cleaning (File Purging)**

Set the available memory percentage, and click **Clear**. The software will clean up the pictures by days until the available memory reaches the preset percentage.

- **Clean Up the Database**

This setting cleans the passing record by setting the timing.

Click **Clear**, the software will clean up all the database passing records before the preset timing.



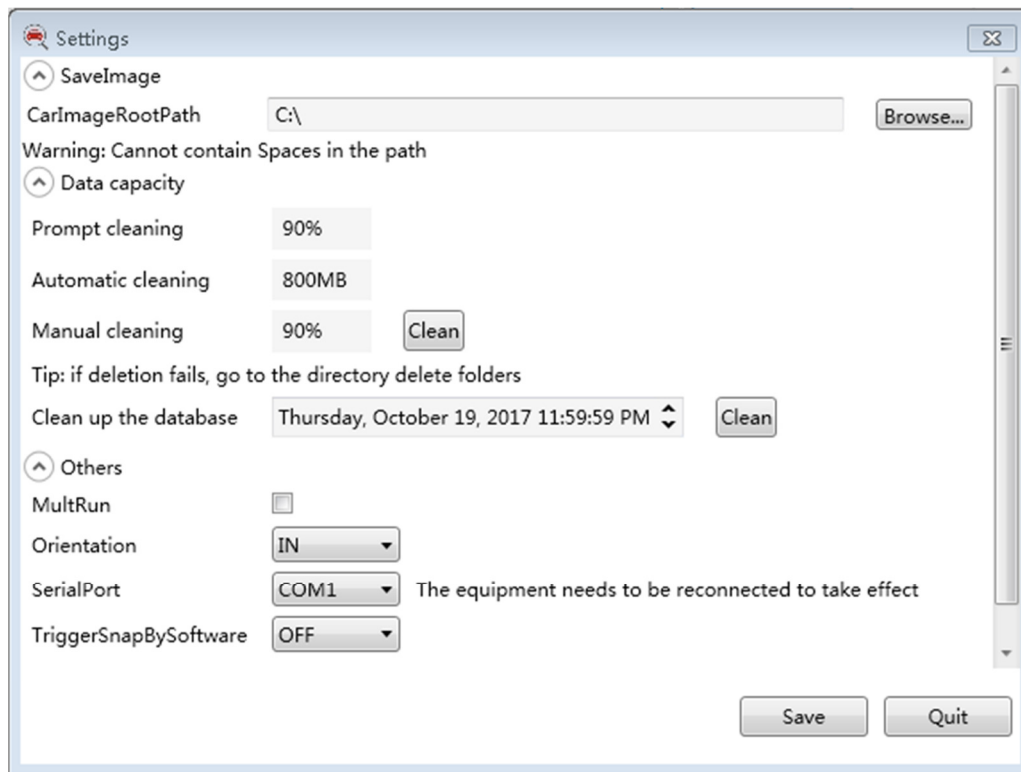


Figure 21, Parameters Configuration

- **Other**

**MultiRun Control.** The software doesn't allow multi-unit control by default. When needing to open multiple software, check the **MultiRun** checkbox, and exit the software. Copy the software to another directory. Then the user can open the software in different directories simultaneously.

**Orientation** is used to set the passing direction for the traffic. Set the passing direction in the software to the actual situation.

**Serial Port** is used to set the port number for the communication between the software and hardware speed measuring modules.

Users can turn on/off Triggering capture via software function according to the actual needs. (Optional)

### 3.3.3 Query

Query provides a historic record query and blacklist/whitelist query.

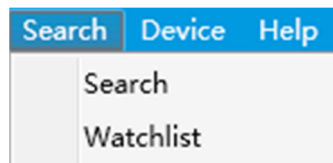


Figure 22, Query

### Historic Record Query

Users can set the starting and ending time of a historic record query.

Input the license plate number to get information of one specific license plate quickly.

The software supports keyword searches. For example, for the plate number of A12345, the user can input A123, A12345, etc. The query result is related to the keyword.

To find a specific license plate record quickly, set up in start-stop time the license plate number in the license plate number input box, and then click the query. Click a result to view pictures of the vehicle's undercarriage, body, and license plate.

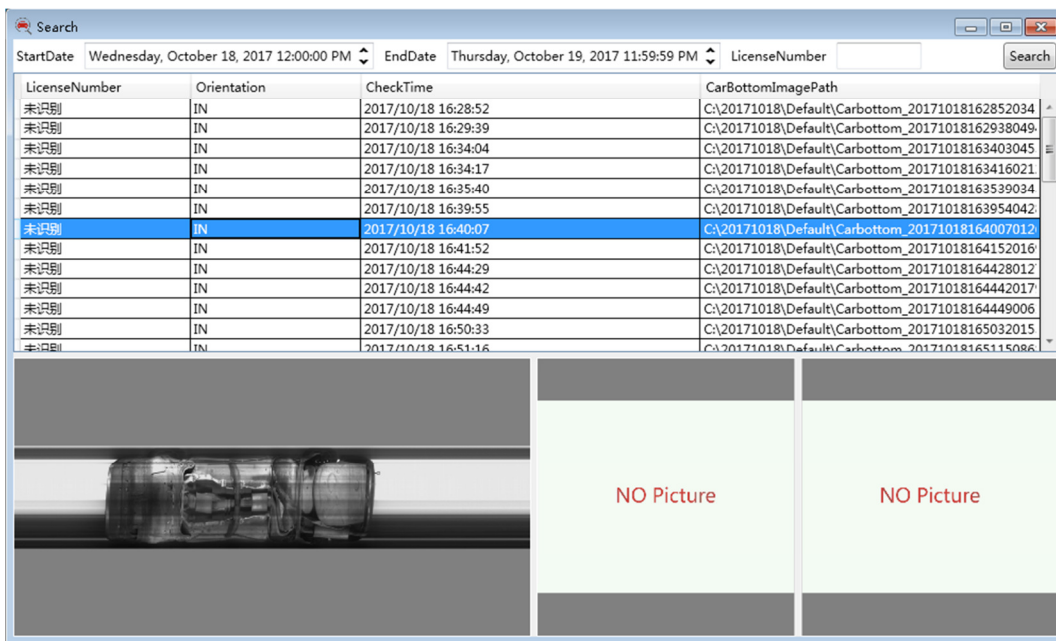


Figure 23, Query

### Blacklist and Whitelist

Use to view and edit the blacklist and whitelist.

Click **Edit > Import** to import blacklist and whitelist files. Currently, the software supports only .csv (comma separated value) files. Users can save a Microsoft Excel blacklist and whitelist file as .csv.

The license information in the database must be unique. A license plate can't appear multiple times on the blacklist and whitelist. Repeated license plate information may cause import failure.

Add vehicles to the blacklist and whitelist by selecting vehicles in the real-time traffic records list in the main interface.

Input the license plate number, then click **Import** to import the vehicle to the blacklist and whitelist one by one.

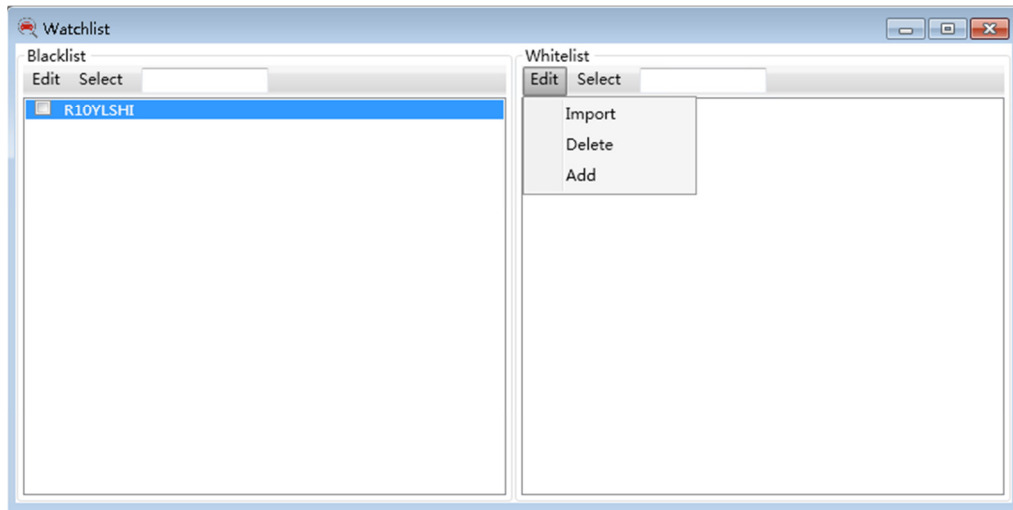


Figure 24, Blacklist and Whitelist Interface

Click the button to the left of the vehicle plate information to remove it from the blacklist or whitelist.

### 3.3.4 Device

When the device is not connected, the **Device** submenu displays **OpenDevice** and **Camera**.

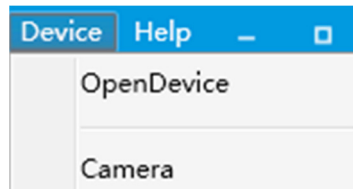


Figure 25, Device (Device Unconnected)

When the device is not connected, click **display** to open the device and open the camera Settings.

## 4. Matters Needing Attention

### 4.1 Transporting Device

The MV-PD-030001-03 needs vibration reduction during transportation to protect its optics.



Figure 26, Vibration Damper Diagram

The first layer of the control box is lined with sponge to avoid collision damage.

On the second layer (Power Supply layer), the components are affixed by bolts to avoid component dislocation.

On the third layer, the camera and holder are held in a foam sandwich structure to protect them from collision damage.

On the fourth layer (subject layer), the bottom is lined with sponge and mounted with a bolt to fix the four corners to avoid component dislocation and damage.

## 4.2 Device Mounting

**Note:**

Damage to the device or the user will occur if the device is not securely mounted in use.



Figure 27, Fixing

As the picture above shows, the device is equipped with mounting components. In use, it needs to be securely mounted by the foundation bolt or equivalent to avoid dislocation.



Figure 28, Storing Cables

## 4.3 Cable Storage

After use, organize the three cables and return them to the storage box within the control box for next use.

## 5. FAQ

FAQs mentioned here refer to easy and obvious issues. Users can check and resolve these issues according to our manual.

### 5.1 Camera Enumeration Failure

- 1) Check whether the MAC address is correct.
- 2) Check whether the wiring is correct.
- 3) Send device back to manufacturer if failure is caused by a manufacturing defect.

### 5.2 MvCarview Web Client Exception

**Clicking “run” prompts “Running failed.”**

- 1) Check whether the VC\_X86 is correctly installed.
- 2) Check whether the MVS version is the latest one.
- 3) Check that the camera’s physical address is configured correctly on the Web client.
- 4) Check whether MVS or other conflicting applications occupy the camera.

**In normal operation, but the MvCarview can’t capture picture.**

- 1) Start the camera via MVS, and check whether the parameters are correct and whether MVS can get an image.
- 2) Check that the serial port is configured correctly.
- 3) Check that there is data transmission via the serial port tools.
- 4) Check that the serial port tools of the PC occupy the port.
- 5) Check that the software is the latest version.

### 5.3 Picture Exception

**The captured picture is segmented or contains black segments.**

- 1) Check whether the IR photoelectric switch sensitivity on the trigger module is adjusted properly to capture a large vehicle passing.
- 2) Check if the vehicle stops during passing.

**The captured picture is distorted and missing a section of the undercarriage.**

- 1) Check that the drive direction of the vehicle is correct.
- 2) Check whether the detection module is installed correctly.
- 3) Check if the vehicle speed is under 30 km/h.

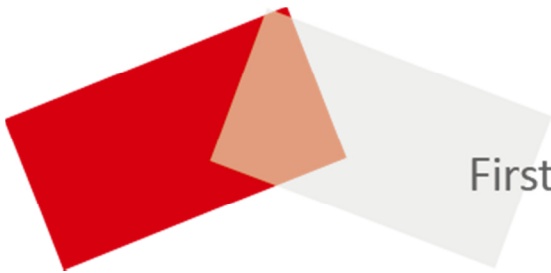
**The captured picture is slanted.**

- 1) The line-scan camera is installed with 90° deviation.  
Re-install the camera at a correct angle.

## 5.4 Hardware Exception

**The supplement light is not responsive when a vehicle passes.**

- 1) Check whether the supplement works once powered on.
- 2) Check that the supplement light in the speed detection module is normal when triggered.
- 3) Check if power is connected in the 12 V and 48 V control box.
- 4) Remove the device cover to check if the wiring is loose.
- 5) Check the wiring conductivity with a meter.



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