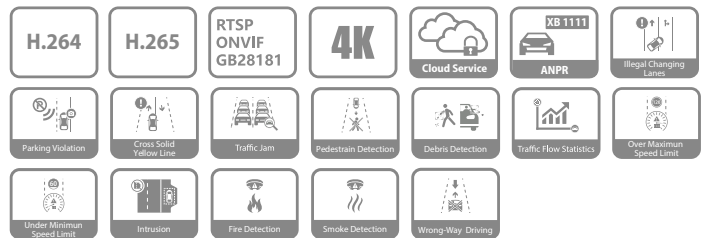


# DHI-IVS-TB8000-A

## Traffic Event Detection Server



- Adopt ASIC intelligent computing card researched and developed by Dahua, with low power consumption and high performance.
- Adopt deep learning algorithms for advanced metadata and behavior analysis, and reach the world-class target detection rate and behavior analysis accuracy.
- Support dynamic loading of algorithm and chip-level separation to enhance system robustness.
- Adopt universal server with PCIE slot design, and make use of old servers to reduce costs.
- Based on video cloud architecture, support standalone and clustered deployment, and meet customers' requirements to expand capacity.
- The all-in-one server (includes software and hardware) can be sold separately, and it supports connecting to third-party devices



### System Overview

Based on Dahua Video Cloud Architecture, traffic event detection server adopts self-developed AI analysis card, and integrates traditional algorithm with deep learning algorithm.

The server supports to connect real-time video stream from cameras, and outputs abnormal event alarms and traffic parameters after smart analysis rules are configured. Abnormal event detection includes traffic congestion, parking violation, wrong-way detection, overspeed, underspeed, fire, smoke, illegal lane change, cross solid yellow line, debris, intrusion and pedestrian detection. Traffic parameters include number plate, vehicle type, special vehicle, bilateral traffic flow analysis, average speed, time occupancy rate, space occupancy rate, space headway, time headway and queue length.

This server integrates multiple intelligent algorithms, supports large-scale clusters, and dedicates to smooth traffic and security of bridges, tunnels, highways, railways and urban roads.

### Functions

#### Illegal Lane Change

1. Detect vehicles that cross the lane lines (solid yellow lines or solid white lines) for a duration exceeding the set value.
- 1) Configure lane number.
- 2) Output the device, channel, event time, event name, event type, lane number and plate number.

#### Wrong-way Detection

1. Detect vehicles that drive against the specified direction for a duration exceeding the set value. Vehicles cannot stride over lanes.
- 1) Configure lane number and minimum duration.
- 2) Output the device, channel, event time, event name, event type, lane number and plate number.

#### Parking Detection

1. Detect vehicles that stop movement on the road for a duration exceeding the set value.
- 1) Configure detection area, allowed parking time and congestion parking threshold.
- 2) Output the device, channel, event time, event name, event type and plate number.

#### Cross Solid Yellow Line

1. An alarm is triggered when a vehicle is detected driving on the solid yellow line for certain duration.
- 1) Configure lane number.
- 2) Output the device, channel, event time, event name, event type, lane number and plate number.

#### Traffic Congestion

1. Detect vehicles whose queuing length/lane length ratio exceeds the set value for a duration exceeding the set value.
- 1) Configure lane number, lane occupancy rate, alarm delay, report interval and sensitivity.
- 2) Output the device, channel, event time, event name, event type, lane number and queue length percentage.

### **Pedestrian Detection**

1. Detect pedestrians who enter the motor vehicle lane or unallowed areas for a duration exceeding the set value.
  - 1) Configure minimum duration.
  - 2) Output the detection area, device, channel, event time, event name and event type.

### **Debris Detection**

1. Detect debris that is left on the road by vehicles or pedestrians, and disturbs vehicle passage for a duration exceeding the set value.
  - 1) Configure detection zone.
  - 2) Output the device, channel, event time, event name and event type.

### **Traffic Flow Statistics**

Make a statistics of vehicles that pass the trigger line of a lane within the specified cycle. Make a statistics of average speed, time occupancy rate, space occupation rate, space headway, time headway and queue length. Unit time can be configured, and reset according to the cycle.

- 1) Configure lane number and statistical cycle.
- 2) Output (OSD) lane number, total number, average speed, time occupancy rate, space occupation rate, space headway, time headway and queue length.
- 3) Search and display the traffic flow and average speed data with line charts.

### **Overspeed Detection**

1. Detect vehicles whose driving speed exceeds the set value for a duration exceeding the set value.
  - 1) Configure lane number, maximum speed and minimum duration.
  - 2) Output the device, channel, event time, event name, event type, lane number, minimum speed, plate number and speed

### **Underspeed Detection**

1. Detect vehicles whose driving speed is lower than the set value for a duration exceeding the set value.
  - 1) Configure lane number, minimum speed and minimum duration.
  - 2) Output the device, channel, event time, event name, event type, lane number, minimum speed, plate number and speed

### **Fire Detection**

1. Detect fire in the detection area for a duration exceeding the set value.
  - 1) Configure minimum duration and sensitivity.
  - 2) Output the device, channel, event time, event name and event type.

### **Smoke Detection**

1. Detect smoke in the detection area for a duration exceeding the set value.
  - 1) Configure minimum duration and sensitivity.
  - 2) Output the device, channel, event time, event name and event type.

### **Intrusion**

1. Report when a motor vehicle comes into the detection area.
  - 1) Configure detection zone.
  - 2) Output the device, channel, event time, event name and event type.
  - 3) Support up to 30 targets in the image.

### **Automatic Number Plate Recognition (ANPR) of Violation Vehicles**

Recognize the number plate of vehicles that change lanes illegally, drive in the wrong direction, park illegally, cross solid yellow line, overspeed and underspeed. The number plate width shall be above 90 pixels, and the characters are clearly legible with naked eyes.

### **Report Generation and Export**

Export alarm information in Excel, including device, device IP address, channel name, event time, event name, event type, lane number, plate number and speed.

### **Video Channel Management**

1. Connection analysis of Dahua, Hikvision, GB28181 and ONVIF network cameras and network video recorders.
2. Connection analysis of H.264 and H.265 network cameras and network video recorders.
3. Acquire streams from RTSP platform, and make connection analysis.

### **Platform Supporting Functions**

Connect to DSS platform through NetSDK protocol, and upload the alarm information to the platform.

### **Arm Period Setting**

You can configure up to 6 arm periods each day.

## **Application**

Bridges, tunnels, highways, railways and urban roads.

## Technical Specification

### System

|                  |  |
|------------------|--|
| Main Processor   | One Intel Xeon E3-1275 V5, 3.6 GHz, 4C/8T  |
| Chip             | Intel C236   |
| Operating System | CentOS Linux release 7.4.1708 (Core)   |
| Intelligent Card | 1 Dahua DH-AIX3000 self-developed standard half-height intelligent card  |
| Memory           | Two 8GB DDR4 memory, maximum 4 slots.  |
| HDD              | One 3.5" 4T disk which can be extended to maximum 16T (each disk is 4T), and maximum 4 slots.<br>7.2K RPM SATA 6Gbps 512n 3.5" |

### Traffic Event Detection

|   |  |
|---|--|
| Multi-rules Application                   | Set and apply multiple rules.  |
| Detection Area and Exclusion Area Setting | Set max 1 detection area and 10 exclusion areas. The server will give an alarm about the events in the detection area and outside the exclusion area.  |
| Real-time Display                         | Display rule detection areas and target detection boxes in real-time video.<br>Rule and target detection boxes can flicker during real-time alarm.   |
| Illegal Lane Change                       | An alarm is triggered when a vehicle is detected changing from one lane to another lane.<br>Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate is 90%.<br>Front installation for distant view in tunnel: Target pixel is $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80%.<br>Side installation for distant view on bridges: Target pixel is $\geq 120 \times 120$ . The function is supported.  |
| Cross Solid Yellow Line                   | An alarm is triggered when a vehicle is detected driving on the solid yellow line for certain duration.<br>Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate is 90%.<br>Front installation for distant view in tunnel: Target pixel is $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80%.  |
| Wrong-way Detection                       | An alarm is triggered when a vehicle is detected driving against the specified direction on the lane for a duration exceeding the set value.<br>Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate 90%.<br>Front installation for distant view in tunnel: Target pixel is $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80%.<br>Side installation for distant view on bridges: Target pixel is $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80% without obstacles. |
| Parking Detection                         | An alarm is triggered when a vehicle is detected stopped on the road for a duration exceeding the set value.<br>Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate 90%.<br>Front installation for distant view in tunnel: Target pixel is $\geq 120 \times 120$ , detection rate is 80% and effective rate is 80%.<br>Side installation for distant view on bridges: Target pixel is $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80% without obstacles.                                 |

#### Traffic Congestion Detection

An alarm is triggered when vehicles' queuing length/lane length ratio exceeds the set value for a duration exceeding the set value.  
Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate 90%.  
Front installation for distant view in tunnel: Target pixel is  $\geq 120 \times 120$ , detection rate is 80% and effective rate is 80%.  
Side installation for distant view on bridges: Target pixel is  $\geq 120 \times 120$ , detection rate is 70% and effective rate is 80%.

#### Overspeed Detection

An alarm is triggered when a vehicle is detected driving at a speed exceeding the set value for a duration exceeding the set value.

#### Underspeed Detection

An alarm is triggered when a vehicle is detected driving at a speed lower than the set value for a duration exceeding the set value.

#### Pedestrian Detection

An alarm is triggered when a pedestrian is detected entering the prohibited area for a duration exceeding the set value.  
The target is not covered or interrupted during the period.  
Front installation for urban close view ANPR and e-police; detection rate is 90% and effective rate 90%.  
Front installation for distant view in tunnel: Target pixel is  $\geq 40 \times 80$ , detection rate is 90% and effective rate is 90%.  
Side installation for distant view on bridges: Target pixel is  $\geq 40 \times 80$ , detection rate is 80% and effective rate is 80%.

#### Debris Detection

An alarm is triggered when debris appears in the detection area for a duration exceeding the set value. Target pixel is  $\geq 15 \times 15$ .

#### Traffic Flow Statistics

Make a statistics of vehicles that pass the trigger line of a lane within the specified cycle. Make a statistics of average speed, time occupancy rate, space occupation rate, space headway, time headway and queue length. For front installation scene, accuracy of traffic flow detection on dual lane is above 90%. Other functions are supported.

#### Intrusion

An alarm is triggered when a motor vehicle is detected entering the detection area. It applies to occupancy of emergency lanes and other scenes. Detection rate is 90%.

#### Fire Detection

An alarm is triggered when fire appears and continues for a duration.

#### Smoke Detection

An alarm is triggered when smoke appears and continues for a duration.

#### ANPR

Recognize the number plate of vehicles that park illegally, change lanes illegally, cross solid yellow line, drive in the wrong direction, and intrude the detection area. The number plate width shall be above 90 pixels.

#### Report Generation and Export

Export alarm information in Excel, including device, device IP address, channel name, event time, event name, event type, lane number, plate number and speed.

#### Alarm Search

Search alarm information by device, channel, event type and snapshot time.

### Traffic Event Detection

#### Scene Attribute

It is widely used in traffic management, operation and maintenance of highways, urban expressways, viaduct bridges, tunnels and sea-crossing bridges.

#### Camera Installation

Front installation (recommended) and side installation.

#### Camera Installation Height

3 to 6 meters are recommended.

#### Camera Installation Angle

Recommended angle of depression is 10 to 15°, and coverage distance is 50 to 100 meters, horizontal 2 or 3 lanes.

## Traffic Event Detection Performance

|                               |  |
|-------------------------------|--|
| Video Resolution              | 720P–4K is recommended.  |
| Camera Access                 | One server supports the access analysis of maximum 16-channel 4K cameras.  |
| Traffic Event Detection Type  | Parking, pedestrian, congestion, illegal lane change, cross solid yellow line, wrong-way detection, debris, smoke, fire, overspeed, underspeed and intrusion detection (for motor vehicles). |
| Traffic Parameters Collection | Traffic flow, average speed, time occupancy rate, space occupation rate, space headway, time headway and queue length.   |

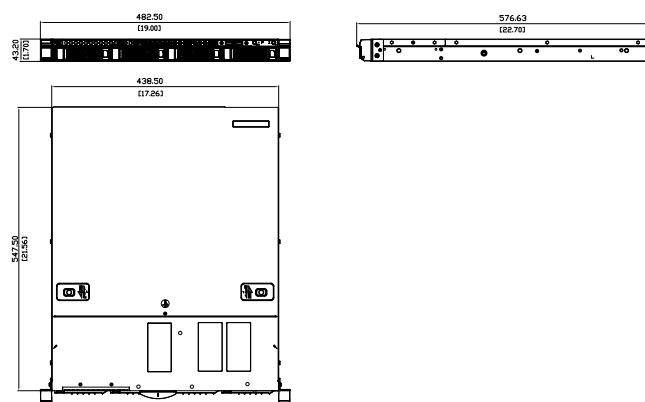
## Ports

|         |   |
|---------|---|
| Network | Two 1000M Ethernet ports  |
| USB     | 2 front USB2.0 ports, 2 rear USB3.0 ports and 2 rear USB2.0 ports |
| VGA     | 2 VGA ports   |
| DVI     | 1   |
| DP      | 2   |

## General

|                       |   |
|-----------------------|---|
| Power Supply          | 100–240V, 50–60Hz, 6A–3A  |
| Power Redundancy      | Single power supply   |
| Power Consumption     | ≤ 400W  |
| Operating Temperature | 10°C to 35°C (50°F to 95°F)   |
| Operating Humidity    | 10%–85% RH (29°C)   |
| Storage Temperature   | –20°C to 60°C (–4°F to 140°F)   |
| Storage Humidity      | 10%–95%RH (33°C)  |
| Gross Weight          | 16.00 kg (35.3 lb)  |
| Net Weight            | 8.50 kg (18.7 lb)   |
| Dimensions            | 43.20 mm × 438.50 mm × 576.63 mm<br>(1.70" × 17.26" × 22.70") (H × W × D)   |
| Box Dimensions        | 271.00 mm × 625.00 mm × 895.00 mm<br>(10.67" × 24.61" × 35.24") (H × W × D) |
| Installation          | Standard 19" rack installation with guide rail                              |

## Dimensions (mm[inch])



## Ordering Information

| Type                           | Model            | Description  |
|--------------------------------|------------------|--|
| Traffic Event Detection Server | DHI-IVS-TB8000-A | Traffic event detection server (E3 1275V5–8G×2–4Tx1–Card A×1–including dongle) |