

# DHI-IVS-GS8000-TS2-HW

## Dahua Comprehensive Analysis Intelligent Server



### Series Overview

Dahua Comprehensive Analysis Intelligent Server is a back-end comprehensive analysis and comparison intelligent server. It is compatible with a wide range of analysis and comparison software, and extracts features and attributes from images and videos of the faces and bodies of humans and of motor and non-motor vehicles. It also provides functions such as face detection, face arming and search by image.

### Functions

#### Target Classification

Classify targets including human, motor vehicles and non-motor vehicles. Generate intelligent structured analysis on the live video, history video (when using with the platform), and the video files that were uploaded offline, and then extract structured information on the moving targets.

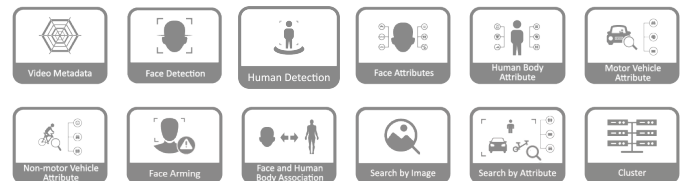
#### Motor Vehicle Detection

Detects motor vehicles by a wide range of attributes such as type, color, brand and plate number. It also detects both driver and co-driver behaviors. For drivers, it detects when they are not wearing their seatbelt, calling while driving and smoking. For co-drivers, it detects when they are not wearing their seatbelt and carrying a baby. With its advanced algorithm, it can also detect tissue boxes, sunshields, pendants, perfume, cards and permits.

#### Pedestrian Detection

Detects pedestrians by a wide range of attributes such as gender, age, hair style, the color of their top and bottom clothes, whether they are wearing a hat and items belonging to them such as umbrellas, backpacks and handbags.

- Adopts advanced deep learning algorithms and fully utilizes the parallel computing and processing capability of the GPU to analyze and compare faces, vehicles, and the metadata in videos and images.
- AIX5200-A intelligence analysis card with strong computing power.
- Performs intelligent analysis and compares massive data from faces, vehicles and metadata services.
- Performs intelligent analysis and compares hundreds of millions of pieces of massive data from faces, vehicles and metadata services.
- Arms the blacklist database, which can contain millions of pieces of face data.
- Designed as a rack-mount server with multiple built-in slots and a modular architecture, facilitating easy hardware replacement.
- Through its distributed video cloud architecture, the system supports cluster deployment and enhancing the performance of clusters.



#### Non-motor Vehicle Detection

Detects non-motor vehicles by a wide range of attributes such as type and color. It can also detect the attributes of drivers such as gender, age, hair style, the color of their top clothes, whether they are wearing a hat and items belonging to them such as umbrellas, backpacks and handbags.

#### Face Detection

Detects and analyzes face image streams by gender, age, expression, glasses, mustache, face mask, opened and closed eyes, and opened and closed mouths.

#### Face Modeling

Supports extracting attributes from face images.

#### Search by Image

Images can be used to search for information, and the search results can be filtered by time and channel. The results are compared with data on humans, motor vehicles and non-motor vehicles in the database, and the matches are displayed based on their similarity level.

## Technical Specification

| System           |  |
|------------------|--|
| Main Processor   | Two 16 C/32 T X86 processors, 2.4 GHz  |
| GPU              | GPU cards are sold separately. The device supports six AIX5200-A intelligent analysis cards. The following functions are available with the intelligent analysis card and relevant software license. |
| Operating System | Linux OS   |
| Memory           | Four 32 GB DDR4 memory modules with up to 32 slots   |
| Disk             | Two 2.5" 480 GB SSD and four 3.5" 6 TB HDD with up to 8 slots.   |

## Face Analytics Function

|  |   |
|--|---|
| Face Detection                         | Detects and analyzes face image streams by gender, age, expression, glasses, mustache, face mask, opened and closed eyes, and opened and closed mouths.   |
| Face Modeling                          | Supports extracting attributes from face images.  |
| Face Arm                               | Compares the face snapshot against a designated face database to get information on the first person that exceeds the arming threshold.   |
| History Alarm Records Query            | Quickly search for history records on arming alarms to review information on alarms that were previously triggered.   |
| Management of Registered Database      | Manage and use multiple types of registration databases such as the blocklist database, and static database. You can add, delete and modify these databases and their members.  |
| Search in Registered Database          | Quickly search for members in the registration database by name, gender and date of birth.  |
| Search by Image in Registered Database | Images can be used to search for information. The results are compared with data on humans in the registration database, and the matches are displayed based on their similarity level.   |
| Search in Snapshot Database            | Conveniently search for history records of passing persons in the snapshot database.  |
| Search by Image in Snapshot Database   | Images can be used to search for information, and the search results can be filtered by time and channel. The results are compared with data on humans in the snapshot database, and the matches are displayed based on their similarity level. |
| 1V1                                    | Supports 1V1 face comparison, and returns similarity result.  |
| Cluster                                | Supports clusters (when it is set to work with the video cloud platform)  |

## Face Analytics Performance

|                                  |   |
|----------------------------------|---|
| 1V1                              | One AIX5200-A card supports processing data up to 75 times/sec.   |
| Image Stream Analysis Capability | One AIX5200-A card supports processing up to 200 face images/sec.   |
| Blocklist Database Arm           | AIX5200-A card (The following information is for a single card) <ul style="list-style-type: none"> <li>Supports processing a blocklist database with up to 5 million pieces of data, and can trigger real-time alarms for 240 face attributes/sec.</li> </ul> |

|                        |   |
|------------------------|---|
| Blocklist Database Arm | <ul style="list-style-type: none"> <li>Supports processing a blocklist database with up to 10 million pieces of data, and can trigger real-time alarms for 180 face attributes per second.</li> <li>Supports processing a blocklist database with up to 30 million pieces of data, and can trigger real-time alarms for 100 face attributes per second.</li> <li>Supports processing a blocklist database with up to 50 million pieces of data, and can trigger real-time alarms for 80 face attributes per second.</li> <li>The arming threshold is higher than 80%.</li> </ul>  |
| Search by Image        | <p>When performing search by image in the face database, each server has the ability to process up to 100 million pieces of data in seconds when it is working with the video cloud platform and the hardware resources of one server. Of this 100 million, 30 million are allocated for the registration database and 70 million for the snapshot database.</p> <p>When performing search by image in the face database, each AIX5200-A card has the ability to process up to 100 million pieces of data in seconds. Of this 100 million, 30 million are allocated for the registration database and 70 million for the snapshot database.</p> |

## Vehicle Analytics

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| Image Stream Analysis Capability | One AIX5200-A card supports processing up to 3 million images/day in 2 MP to 9 MP.  |
| Vehicle Recognition Mode         | Recognizes the front and back of vehicles. Supports recognition of license plates from Brazil and the Middle East, and configuring license plate recognition for other countries.   |
| License Plate Color Recognition  | White, black, yellow, blue, and green   |
| Vehicle Color Recognition        | Recognizes a variety of colors such as white, orange, pink, black, red, yellow, gray, blue, green, silver, brown and purple   |
| Vehicle Type Recognition         | Supports large bus, heavy truck, medium truck, sedan, van, truck, medium bus, SUV, MPV and pickup   |
| Vehicle Attributes Recognition   | Recognizes vehicle attributes such as tissue boxes, sunshields, pendants, perfume, cards and permits.   |
| Safe Driving Behavior Detection  | For drivers, it detects when they are not wearing their seatbelt, calling while driving and smoking. For co-drivers, it detects when they are not wearing their seatbelt and carrying a baby.   |
| Target Detection                 | Supports vehicle recognition of incomplete snapshot   |
| Vehicle Brand/Logo Recognition   | 147 kinds   |
| License Plate Recognition        | License plate recognition with a minimum of 50 x 13 pixels is supported.  |
| License Plate Recognition Rate   | The license plate is clear and distinguishable when the width of the resolution is $\geq 120$ and the environment has normal lighting in the daytime and a fill light at night. License plate recognition accuracy: $\geq 96\%$ . This figure is subject to actual testing. |
| Vehicle Type Recognition Rate    | The vehicle type is clear and distinguishable when the resolution is $\geq 240 \times 240$ and the environment has normal lighting in the daytime and a fill light at night. Vehicle type recognition accuracy: $\geq 92\%$ . This figure is subject to actual testing.     |

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| Vehicle Color Recognition Rate                         | The vehicle color is clear and distinguishable when the resolution is $\geq 240 \times 240$ and the environment has normal lighting in the daytime and a fill light at night. Vehicle color recognition accuracy: $\geq 95\%$ . This figure is subject to actual testing. |
| Safety Belts Recognition Rate                          | When the vehicle glass is clear, the recognition rate for safety belts is $\geq 85\%$ . This figure is subject to actual testing.   |
| Recognition Rate of Driver and Passenger Phone Calling | When the vehicle glass is clear, recognition rate of driver and passenger phone calling is $\geq 85\%$ . This figure is subject to actual testing.  |
| Search by Vehicle Picture                              | Images can be used to search for information, and the search results can be filtered by time and channel. The results are compared with data on motor vehicles in the database, and the matches are displayed based on their similarity level.                            |

### Search by Vehicle Picture Performance

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| Vehicle Search | When performing search by image in the snapshot database, each server has the ability to process up to 100 million pieces of data in seconds when it is working with the video cloud platform and the hardware resources of one server.<br>When performing search by image in the snapshot database, each AIX5200-A card has the ability to process up to 100 million pieces of data in seconds. |
|----------------|--|

### Metadata Analytics

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|-----------------------------|---|
| Search by Image             | Images can be used to search for information, and the search results can be filtered by time and channel. The results are compared with data on humans, motor vehicles and non-motor vehicles in the database, and the matches are displayed based on their similarity level.   |
| Target Classification       | Classifies targets including faces, bodies, motor vehicles, and non-motor vehicles. It generates metadata analyses for live videos and historical videos when used with the platform, as well as for video files uploaded offline. Additionally, it extracts metadata from moving targets. However, face images are generated without metadata. |
| Motor Vehicle Detection     | Detects motor vehicles by a wide range of attributes such as type, color, brand and plate number. Supports recognition of license plates from Brazil and the Middle East, and configuring license plate recognition for other countries. Detects sunshield, not wearing seatbelt, calling, and ornaments such as pendants and tissue boxes.     |
| Non-motor Vehicle Detection | Detects riders by a wide range of attributes such as gender, age, hair style, their top and bottom clothes and color, non-motor vehicle type and color wearing a hat, hat color, umbrella (canopy), umbrella (canopy) color, bag, bag color, shoe type and color, vest, mask color, raincoat, rearview mirror, truck, basket and direction.     |
| Pedestrian Detection        | Detects pedestrians by a wide range of attributes such as gender, age, hair style, their top and bottom clothes and color, wearing a hat, hat color, umbrella, umbrella color, bag, bag color, shoe type and color, vest, mask color, raincoat, cart, whether they are riding, and direction.   |
| Real-time Display           | Displays the analysis results in real time, and display humans, motor vehicles and non-motor vehicles in real time with tracking boxes.   |

|                           |   |
|---------------------------|---|
| Search by Attribute       | Intelligent search of human, motor vehicles and non-motor vehicles by their attributes.   |
| Video Recording Task      | Generates metadata analyses of historical videos when used with the platform. It extracts metadata on moving targets, and automatically accelerates the analysis tasks of video recordings. |
| Local Task                | Generates the metadata analysis of the local video files uploaded offline. It extracts metadata on moving targets, and automatically accelerates the analysis tasks of local videos.        |
| Display Tracks on the Map | Yes (when using with the platform)  |
| Computing Node Cluster    | Supports clusters (when it is set to work with the video cloud platform)  |

### Metadata Analytics Performance

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| Intelligent Video Stream                  | Supports real-time display of structured intelligent video streaming, including target attributes, and displays up to 5 items at the same time. Pedestrians (age, gender, top clothes and color, hat, umbrella and bag), vehicle (model, brand, license plate and color)   |
| Metadata Analytics Performance            | AIX5200-A card (The following information is for a single card)<br><ul style="list-style-type: none"> <li>Performs video analysis of moving targets through up to 80 channels in 1080p.</li> <li>In performing metadata analysis of targets, it can process up to 100 images/sec or 3 million images/day in 1080p.</li> </ul>  |
| Search by Image Performance               | When performing search by image in the snapshot database, each server has the ability to process up to 100 million pieces of data in seconds when it is working with the video cloud platform and the hardware resources of one server.<br>When performing search by image in the snapshot database, each AIX5200-A card has the ability to process up to 100 million pieces of data in seconds.   |
| Detection Rate of Moving Target           | The pedestrians and non-motor vehicles are clear and distinguishable when the resolution is $\geq 40 \times 80$ and the environment has normal lighting in the daytime and a fill light at night.<br><ul style="list-style-type: none"> <li>Detection rate of pedestrians: <math>\geq 95\%</math></li> <li>Detection rate of non-motor vehicles: <math>\geq 95\%</math></li> </ul> The motor vehicles are clear and distinguishable when the resolution is $\geq 120 \times 120$ and the environment has normal lighting in the daytime and a fill light at night.<br><ul style="list-style-type: none"> <li>Detection rate of motor vehicles: <math>\geq 95\%</math>.</li> </ul> These figures are subject to actual testing. |
| Pedestrian Recognition Accuracy           | The pedestrians are clear and distinguishable when the resolution is $\geq 80 \times 160$ and the environment has normal lighting in the daytime and a fill light at night.<br><ul style="list-style-type: none"> <li>Gender accuracy: <math>\geq 90\%</math></li> <li>Hair style accuracy: <math>\geq 90\%</math></li> <li>Clothes style and color accuracy: <math>\geq 90\%</math></li> <li>Wearing accuracy: <math>\geq 90\%</math></li> <li>Belongings accuracy: <math>\geq 90\%</math></li> </ul> These figures are subject to actual testing.  |
| Recognition Accuracy of Non-motor Vehicle | The non-motor vehicles are clear and distinguishable when the resolution is $\geq 80 \times 160$ and the environment has normal lighting in the daytime and a fill light at night.<br><ul style="list-style-type: none"> <li>Gender accuracy: <math>\geq 90\%</math></li> <li>Hair style accuracy: <math>\geq 90\%</math></li> <li>Clothes style and color accuracy: <math>\geq 90\%</math></li> <li>Wearing accuracy: <math>\geq 90\%</math></li> <li>Belongings accuracy: <math>\geq 90\%</math></li> <li>Non-motor vehicle type accuracy: <math>\geq 90\%</math></li> </ul> These figures are subject to actual testing.  |

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|------------------------------|--|
| Vehicle Recognition Accuracy | <p>The motor vehicles are clear and distinguishable when the resolution is <math>\geq 240 \times 240</math> and the environment has normal lighting in the daytime and a fill light at night.</p> <ul style="list-style-type: none"> <li>• Motor vehicle type accuracy: <math>\geq 92\%</math></li> <li>• Motor vehicle color accuracy: <math>\geq 90\%</math></li> <li>• Driver and passengers' safety belt accuracy: <math>\geq 85\%</math></li> <li>• Driver and passengers' phone call accuracy: <math>\geq 80\%</math></li> </ul> <p>The license plate is clear and distinguishable when the resolution width is <math>\geq 120</math> and the environment has normal lighting in the daytime and a fill light at night.</p> <ul style="list-style-type: none"> <li>• Plate accuracy: <math>\geq 96\%</math>;</li> <li>• Plate color accuracy: <math>\geq 90\%</math>.</li> </ul> <p>These figures are subject to actual testing.</p> |
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| Port         |  |
|--------------|--|
| Network Port | 4 × 1000 Mbps self-adaptive network ports        |
| USB          | 2 × front USB2.0 ports and 2 × rear USB3.0 ports |
| VGA          | 1 × VGA port                                     |
| Others       | 1 × RJ-45 management network port                |

| General               |   |
|-----------------------|---|
| Power Supply          | 100–127/200–240 VAC, 60/50 Hz, 12/8 A   |
| Power Redundancy      | Dual  |
| Power Consumption     | Working (all HDDs connected, with 6 AIX5200-A cards): $\leq 1,080$ W (3,685 BTU/hr) |
| Operating Temperature | +10 °C to +35 °C (+50 °F to +95 °F)   |
| Operating Humidity    | 20%–80% (RH), non-condensing  |
| Storage Temperature   | –40 °C to +60 °C (–40 °F to +140 °F)  |
| Storage Humidity      | 5%–95% (RH), non-condensing   |
| Gross Weight          | 28.3 kg (62.39 lb)  |
| Net Weight            | 22.25 kg (49.05 lb)   |
| Product Dimensions    | 794.0 mm × 446.0 mm × 87.8 mm (31.26" × 17.56" × 3.46") (D × W × H)                 |
| Packaging Dimensions  | 1000 mm × 600 mm × 260 mm (39.37" × 23.62" × 10.24") (D × W × H)                    |
| Installation          | Standard 19" rack installation with guide rail                                      |

|                |  |
|----------------|--|
| Certifications | <p>CE-EMC:</p> <ul style="list-style-type: none"> <li>• EN 55032:2015</li> <li>• EN 55032:2015/A11:2020</li> <li>• EN 55032:2015/A1:2020</li> <li>• EN 55035:2017</li> <li>• EN 55035:2017/A11:2020</li> <li>• EN 61000-3-3:2013/A2:2021</li> <li>• EN IEC 61000-3-2:2019/A1:2021</li> <li>• IEC 61000-4-2:2008</li> <li>• IEC 61000-4-3:2020</li> <li>• IEC 61000-4-4:2012</li> <li>• IEC 61000-4-5:2014/AMD1:2017</li> <li>• IEC 61000-4-6:2023</li> <li>• IEC 61000-4-8:2009</li> <li>• IEC 61000-4-11:2020/COR2:2022</li> </ul> <p>CE-LVD:</p> <ul style="list-style-type: none"> <li>• EN IEC 62368-1:2020+A11:2020</li> <li>• BS EN IEC 62368-1:2020+A11:2020</li> </ul> |
|----------------|--|

| Optional     |          |
|--------------|----------|
| Product Type | Hardware |

| Ordering Information                      |                       |   |
|---|-----------------------|---|
| Type                                      | Model                 | Description                                     |
| Comprehensive Analysis Intelligent Server | DHI-IVS-GS8000-TS2-HW | Dahua Comprehensive Analysis Intelligent Server |

## Dimensions (mm[inch])

