

## SenseNebula AIE

### Product Specifications

Document Number: Nebula-PMO-PS001

Document Version No.: 20240520

Product Name: SenseNebula AIE LT-A

Product Models:

ST-SNMA-SX04MV

ST-SNMA-SX08MV

System Version: V2.4.0

# Contents

---

1.	Product Overview .....	6
1.1.	Product Models.....	6
1.2.	Appearance .....	6
1.3.	Product Highlights.....	7
1.3.1.	Lightweight, reliable and easy to use.....	7
1.3.2.	Flexible Access Modes.....	7
1.3.3.	Superior Processing Performance.....	7
1.3.4.	Simple APIs.....	7
1.3.5.	Excellent AI Algorithms.....	8
1.3.6.	Data Secure and Reliable.....	8
1.4.	Product Functions.....	8
1.4.1.	Video Access .....	8
1.4.2.	Image Access.....	8
1.4.3.	Multi-algorithm scheduling.....	8
1.4.4.	Personnel Profile .....	10
1.4.5.	Signal Linkage.....	10
1.4.6.	Data Security.....	10
1.4.7.	System Management.....	11
2.	Application Scenarios.....	11
2.1.	Smart Community.....	11
2.1.1.	Application Scenarios .....	11
2.1.2.	Functions.....	11
2.1.3.	Typical Topology .....	11
2.2.	Smart Building .....	12
2.2.1.	Application Scenarios .....	12
2.2.2.	Functions.....	12
2.2.3.	Typical Topology .....	12
2.3.	Smart Campus.....	13
2.3.1.	Application Scenario.....	13

2.3.2.	Functions.....	13
2.3.3.	Typical Topology .....	13
2.4.	Banking Outlets .....	14
2.4.1.	Application Scenario.....	14
2.4.2.	Functions.....	14
2.4.3.	Typical Topology .....	14
3.	Specifications .....	16
3.1.	Basic Parameters .....	16
3.2.	Performance Parameters.....	16
3.2.1.	Storage Capacity.....	16
3.2.2.	Algorithm Performance.....	17
3.3.	System Specifications.....	18
3.4.	Computing power calculation.....	19
3.5.	Environmental Specifications.....	20
3.6.	Ports .....	20
3.7.	Dimensions .....	21
3.8.	Packing List .....	22
	Appendix: Supported capture cameras.....	23

# About this Guide

---

## Overview

This document is applicable to SenseNebula AIE LT-A (hereinafter referred to as SenseNebula AIE) and contains the following parts: Product Overview, Application Scenarios, and Specifications.

## Intended Audience

This guide is intended for the following audience:

- Pre-sales engineers
- Technical support engineers

## Copyright Statement

Nabla Works Corp. and its affiliates (hereinafter referred to as "Nabla Works" or the "Company") have copyrights on all content issued or co-published with partner companies, including but not limited to products or services, and such rights are protected by law.

No organization or individual may use, copy, modify, transcribe, distribute, or publish any part of the aforementioned products, services, information, and materials or bundle them with other products for use or sale in any form (including manual, electronic, or mechanical means such as photocopying, recording, digital voice recorders, or information collection systems) or for any reason without the written permission of Nabla Works. If any party has been authorized to use the relevant content, it is compulsory to use the content within the authorized scope and indicate the source of the relevant content. Nabla Works reserves the right to investigate the legal liability of anyone who infringes on the intellectual property rights of the Company.

## Trademarks and Permissions

Trademarks such as "Nabla Works" are registered trademarks of Nabla Works Corp. and its affiliates (hereinafter referred to as the "Company"), which are protected by law. All rights reserved.

No organization or individual may use, copy, modify, or distribute such trademarks or bundle the trademark with other products for use or sale in any form or for any reason without the written permission of Nabla Works. Nabla Works reserves the right to investigate the legal liability of anyone who infringes on the trademarks of the Company.

## Disclaimer of Warranty

All materials, information, products, software, programs, and services are provided "as is" without warranty or guarantee of any kind. To the maximum extent permitted by applicable law, Nabla Works Corp. and its affiliates (hereinafter referred to as the "Company") clearly disclaim all express, implied, statutory, and other warranties, guarantees, declarations, or commitments, including but not limited to warranties of merchantability and fitness for a particular purpose as well as non-infringement of ownership and intellectual property. Without any limitation, the Company does not guarantee that this document is up-to-date, secure, or error-free.

## Revisions

Document Version	System Version	Release Date	Description
01	V2.0.0	2019-12-20	First official release
02	V2.0.1	2020-01-20	Modified based on software version V2.0.1.
03	V2.0.2	2020-04-30	Modified based on software version V2.0.2.
04	V2.1.0	2020-06-23	Modified based on software version V2.1.0.
05	V2.1.0	2020-07-31	Modified based on software version V2.1.0.
06	V2.1.1	2020-11-06	Modified based on software version V2.1.1.
07	V2.1.2	2021-03-05	Modified based on software version V2.1.2. Add stranger clustering, wandering alarm analysis, network relay and so on.
08	V2.1.3	2021-04-20	Modified based on software version V2.1.3. Add storage mode for portrait database and bugfix for V2.1.2.
09	V2.1.6	2021-08-21	Modified based on software version V2.1.6. Add non-motor vehicle recognition and comply with privacy and security regulation.
10	V2.2.0	2021-10-31	Modified based on software version V2.2.0. Add liveness detection.
11	V2.2.2	2021-12-17	Modified based on software version V2.2.2. Bug fixed edition.
12	V2.2.5	2022-01-26	Modified based on software version V2.2.5. Bug fixed edition.
13	V2.3.0	2022-05-25	Modified based on software version V2.3.0. Add pedestrian intrusion, crowd density, fence armed, staff leaving their post.
14	V2.4.0	2022-06-17	Modified based on software version V2.4.0. Add access to SenseLink Standard.

# 1. Product Overview

SenseNebula AIE LT-A is an embedded product integrating software and hardware based on world's top level AI algorithms and technology intermediate platform. SenseNebula AIE supports access by diverse collection devices, such as IP cameras, capture cameras and access control devices. It supports the analysis and free scheduling of multiple algorithms such as identity verification, body analysis, vehicle recognition, non-motor vehicle recognition, liveness detection and abnormal actions analysis. It has the ability of data aggregation, edge autonomy and cloud edge collaboration. It provides industry solution providers, integrators, and agents with intelligent products and solutions applicable to diverse scenarios.

## 1.1. Product Models

**Product Name: SenseNebula AIE LT-A**

**Product Series: SenseNebula AIE**

Model no.	Description	Video streams / Image streams	Functions
ST-SNMA-WX04MV	standard edition	8 ch / 16 ch	<b>Face recognition</b> <b>Body detection</b>
ST-SNMA-WX08MV		16 ch / 32 ch	<b>Attribute analysis</b> <b>Event push</b>

## 1.2. Appearance



Figure 1-1 SenseNebula AIE(front view)



Figure 1-2 SenseNebula AIE (rear view)

## 1.3. Product Highlights

### 1.3.1. Lightweight, reliable and easy to use

- Lightweight design, low power consumption, and easy installation, no need for a specialized equipment room
- Industrial-grade, long-term stable operation at high and low temperatures
- Rich web-based functions to meet requirement of AI application scenarios quickly
- POE or power supply, flexible and easy to use

### 1.3.2. Flexible Access Modes

- Access by the IP cameras and capture cameras
- Secondary development of access by capture devices

### 1.3.3. Superior Processing Performance

- Deep learning algorithms based on edge computing GPU
- Single device supports up to 16 video streams or up to 32 image streams
- Supports for blocklist or allowlist databases with a maximum of 300,000 entries

### 1.3.4. Simple APIs

- RESTful APIs facilitate secondary development by third parties
- Complete interface function supports multi-scenario applications
- Support multiple data push methods such as Http, Https, WebSocket, GAT 1400

### 1.3.5. Excellent AI Algorithms

- Supports face, body, vehicle and non-motor vehicle attributes analysis
- Supports free scheduling for multiple algorithms including identity verification, body analysis, vehicle recognition, non-motor vehicle recognition, and liveness detection
- Intelligent algorithms with a high capture rate, high accuracy, and a low false positive rate
- Enhanced multi-scenario adaptability with improved recognition range, recognition angle, and recognition quantity

### 1.3.6. Data Secure and Reliable

- Hardware design & data storage with encryption feature
- Web-based Https security access, API call and secure data push through Https
- Customizable storage period, automatically remind and deleted when it expires
- Display of sensitive information requires secondary verification for viewing, editing and exporting

## 1.4. Product Functions

### 1.4.1. Video Access

- Supports standard protocols of IP camera , such as ONVIF、RTSP、GB28181、VCN
- H.264 video codec, 1080P maximum video resolution, 25fps
- Region of interest (ROI) setting
- Supports Minimum and Maximum setting for face pixel
- Supports for three capture modes: realtime mode, accurate mode, and timing mode
- Supports real-time video preview in one screen and four screens

### 1.4.2. Multi-algorithm scheduling

#### Multi-algorithm scheduling

Single camera equipment can support flexible scheduling of several algorithms which are identity verification, body analysis, vehicle recognition, non-motor vehicle recognition, liveness detection and abnormal analysis. Body analysis includes four subtasks: pedestrian intrusion, staff leaving posts, crowd density, fence armed.



## Face Functions

- Supports addition, edition, and deletion operations for the blacklist and allowlist databases, and import, edition, and deletion operations for portrait images
- Identity verification, capture; display, retrieval (criteria-based), and export of capture records and alarm records
- Support identity verification for people wearing respirators and identity verification accurate rate is larger than 90%.
- 1:1, 1:N and M:N face comparison, with returned results that contain similarity data
- Information push, including portraits, scene images, quality scores, and attributes
- Division of attributes by multiple dimensions, such as age group, gender, respirator, glasses and hat
- Support Min. interval between repeated alarms for portrait database

## Body Functions

- Body verification, capture; display, retrieval (criteria-based), and export of capture records
- Division of body attributes by multiple dimensions, orientation, age group, gender, hat, hair, tops, bottoms, shoes, umbrella, bag and pedestrian status
- Subtask (Pedestrian intrusion): support single irregular polygon ROI, intrusion time, Min. interval between repeated alarms
- Subtask (Staff leave their posts): support single irregular polygon ROI, off-duty time, number threshold of people on-duty, Min. interval between repeated alarms
- Subtask (Crowd density): support single irregular polygon ROI, number threshold of people, Min. interval between repeated alarms
- Subtask (Fence armed): support single line for crossing, direction of crossline (A to B, B to A, bidirectional line crossing)

## Liveness detection

- Liveness detection, tagging the capture picture and alarm picture
- Threshold setting for liveness detection



### 1.4.3. Personnel Profile

- Support deduplication for blacklist, allowlist portrait and stranger
- Support stranger deduplication and clustering
- Support frequency analysis and wandering alarm

### 1.4.4. Signal Linkage

- Signal linkage control of correlated network relays

### 1.4.5. Data Security

- Hardware design & data storage with encryption feature
- Web-based Https security access
- API call through Https
- Two encryption methods switch: AES128/AES256
- Supports for secure data push through Https
- Pictures in portrait library can be stored/not stored, features are encrypted and stored
- Pictures and features in Snapshot/Alarm Picture can be encrypted stored/not stored
- Customizable storage period of the portrait library and snapshot/Alarm
- The portrait library will be automatically deleted when it expires
- Display of sensitive information requires secondary verification for viewing, editing and exporting
- Prompt privacy policy when logging in for the first time
- 

### 1.4.6. System Management

- Supports time settings, network settings, system information, software upgrade, and multi-language setting (English, Simplified Chinese, Traditional Chinese and Japanese)
- Supports user management, storage management, security management, and log management

## 2. Application Scenarios

### 2.1. Smart Community

#### 2.1.1. Application Scenarios

Security protection for residential areas, personnel and vehicle management at entries and exits

#### 2.1.2. Functions

- Smart access for residents and tenants
- Special personnel, stranger's identification, liveness detection and stranger clustering
- Image retrieval, frequency analysis, wandering alarm and alarm data analysis
- Vehicle license plate recognition, occupying-road vehicle analysis
- Non-motor vehicle verification, occupying-road non-motor vehicle analysis
- Pedestrian intrusion, fence armed, crowd density verification, staff leaving posts

#### 2.1.3. Typical Topology

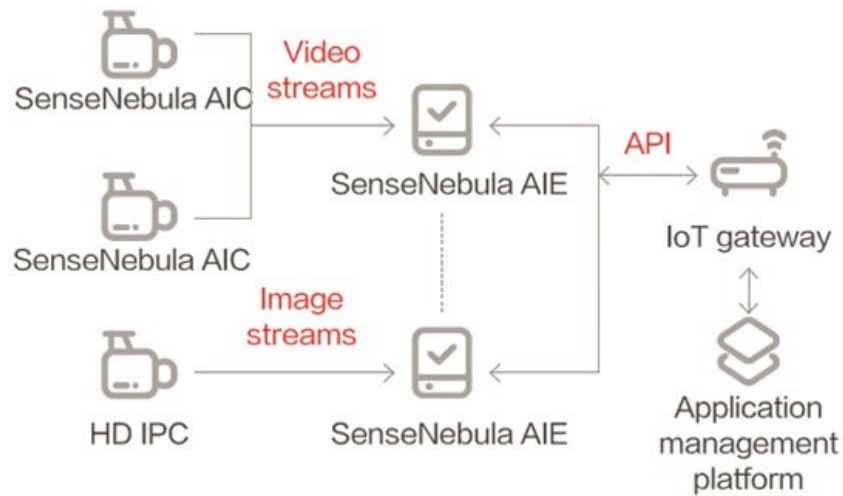


Figure 2-1 Application scenarios in smart community

## 2.2. Smart Building

### 2.2.1. Application Scenarios

Security protection for buildings and venues

### 2.2.2. Functions

- Special personnel identification, stranger identification, and stranger clustering
- Liveness detection of authorized personnel, unconscious pass
- Image retrieval, frequency analysis, wandering alarm and alarm data analysis
- Pedestrian intrusion, fence armed, crowd density verification, staff leaving posts

### 2.2.3. Typical Topology

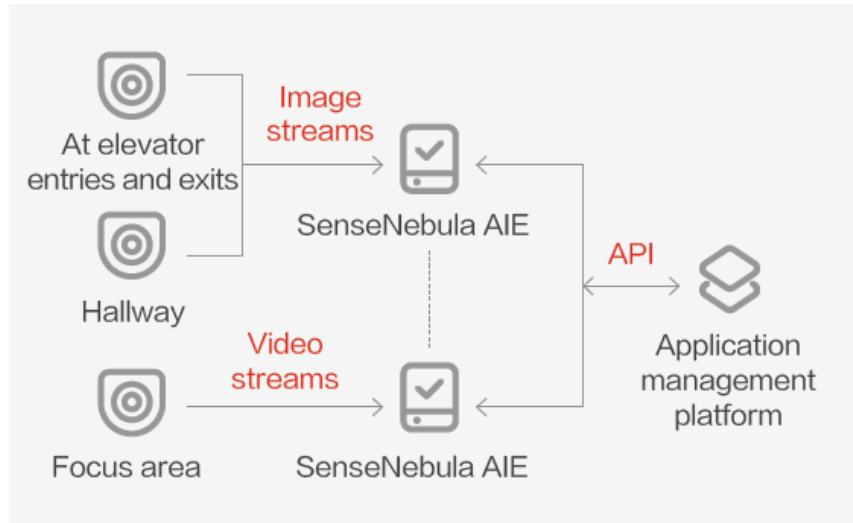


Figure 2-2 Application scenarios in smart building

## 2.3. Smart Campus

### 2.3.1. Application Scenario

- Attendance check and security protection on campuses and in classes
- Vehicle management at entries and exits
- Non-motor vehicle management

### 2.3.2. Functions

- Access by dome FHD network cameras, along with a identity verification algorithm optimized for the class environment to ensure accuracy
- Automatic attendance in classes and exception alarm
- Stranger clustering, image retrieval, frequency analysis and wandering alarm
- Vehicle license plate recognition
- Pedestrian intrusion, fence armed, crowd density verification, staff leaving posts

### 2.3.3. Typical Topology

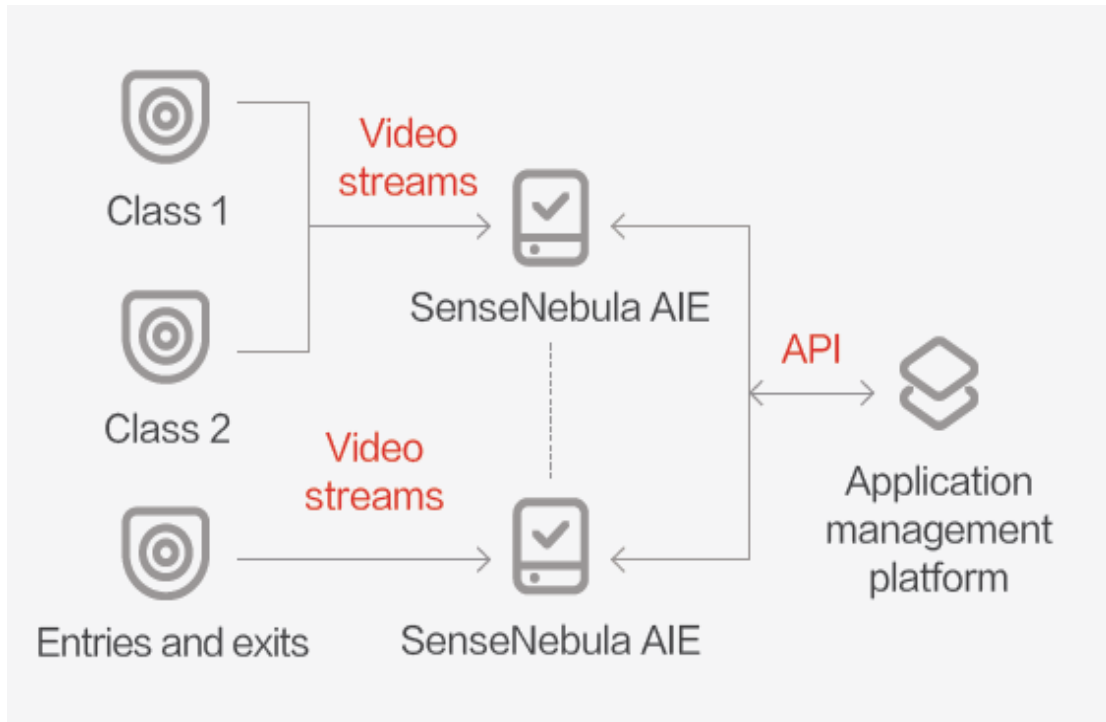


Figure 2-3 Application scenarios on smart campus

## 2.4. Banking Outlets

### 2.4.1. Application Scenario

Security protection and personnel management at bank branches

### 2.4.2. Functions

- Special personnel identification
- VIP identification, visitor recording, and customer flow statistics
- Stranger clustering, image retrieval, frequency analysis and wandering alarm
- Pedestrian intrusion, fence armed, crowd density verification, staff leaving posts

### 2.4.3. Typical Topology

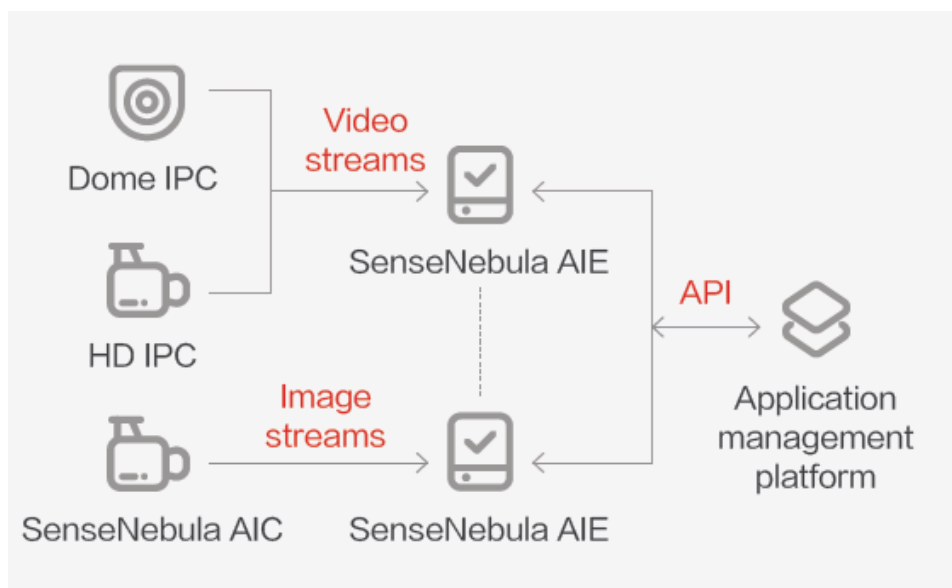


Figure 2-4 Application scenarios at banking branches





## 3. Specifications

### 3.1. Basic Parameters

<b>Item</b>	<b>Description</b>
Dimensions	169mm x 103.5mm x 33.8mm
Weight	0.85KG
Power consumption	15W
MTBF	>100,000 hrs
Deployment method	Standalone
Max Access capability	M2s: 4 channels of video streams or 8 channels of image streams M4s: 8 channels of video streams or 16 channels of image streams M8s: 16 channels of video streams or 32 channels of image streams
Processing performance	16 persons per second
Encryption mode	Software and hardware encryption

## 3.2. Performance Parameters

### 3.2.1. Storage Capacity

Item	Description
Total capacity of portrait databases	300,000 stored images
Number of portrait databases	50
Capacity of the live alert deployment database	300,000
Image size of the portrait database	< 100 KB (recommended, and the size of a single portrait couldn't exceed 5MB)
Image format of the portrait database	JPG, JPEG, PNG, BMP, and TIF
Capture storage capacity	8GB
Stranger list	4GB

### 3.2.2. Algorithm Performance

Item	Description
Respirator verification rate	>99%
Liveness detection rate	>95%
Identity verification accurate rate with respirator	>90%
Identity verification rate	≥ 99% (applicable to video streams)
False verification rate	< 1%
Identity verification angle	Yaw angle: -60° to +60° Pitch angle: -30° to +30° Roll angle: -45° to +45°
Identity verification angle	Yaw angle: -30° to +30° Pitch angle: -30° to +30° Roll angle: -30° to +30°
Face capture size	Face image > 30 x 30 pixels
Identity verification size	Face image > 30 x 30 pixels

### 3.3. System Specifications

Item	Description
Power supply	Method1: 100-240V AC, 12V/3.0A DC, input power adapter
	Method2: POE
CPU	ARM
GPU	Edge Computing GPU
Memory	8GB DDR4
Storage	64GB eMMC
Network port	Gbit Ethernet × 2 (including POE × 1)
Ports	RESET×1 COM×1, USB×2, HDMI×1, SD×1 (reserved but not supported currently)
Internet protocols	TCP/IP, Http, DNS, DHCP, etc.
Operating system	Linux
Software	For the latest software, please refer to the official release.

**Note:**

If the 220V power supply is unstable, please use a voltage regulator or UPS.

## 3.4. Computing power calculation

For a single camera device, several algorithms of identity verification, body analysis, vehicle recognition, non-motor vehicle and liveness detection and abnormal actions analysis can be combined and scheduled. You can know how much computing power is scheduled for a certain device by “SenseNebula AIE Configuration Tool Table”.

Please allocate resources reasonably according to total computing power and how much computing power are occupied by different devices.

**Note:**

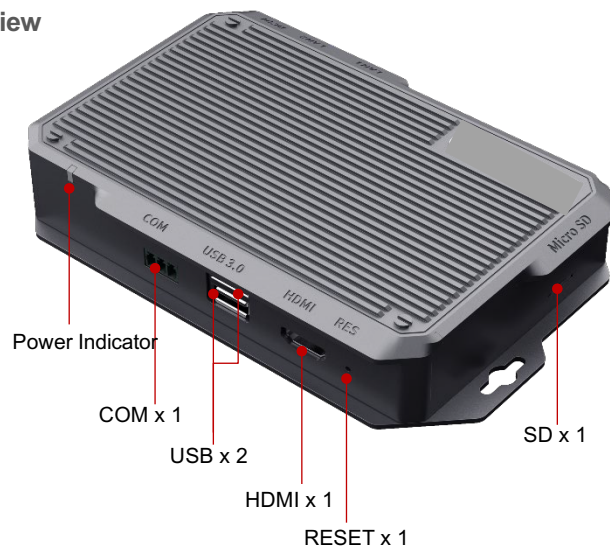
1. Switching on Stranger Clustering will occupy fixed computing power. For M4s it occupies 6 computing power, for M8s it occupy 12 computing power.
2. The max computing power of M4s is 16. The M4s supports up to 8 single algorithm video streams or 16 channel single algorithm picture streams.
3. The max computing power of M8s is 32. The M8s supports up to 16 single algorithm video streams or 32 channel single algorithm picture streams.
4. Liveness detection can be turned on only when identity verification is switched on.

### 3.5. Environmental Specifications

Item	Description
Operating temperature	-10°C ~50°C. The device may not function normally when operated at temperatures below or above the operating temperature range. Do not install the device directly above a heat source.
Storage temperature	-20°C~60°C
Operating humidity	5%~95% RH. Do not expose the device to rain or moisture. Water or moisture may damage internal components and cause the device to function abnormally.
Ventilation	The device must be installed in a well-ventilated area. Special care should be taken to protect the device against dust.
Installation method	Place the device horizontally or mount it on a wall and secure it with mounting ears. We recommend that M3×8 mm recessed pan head screws be used to secure the device on a wall.

### 3.6. Ports

Front View



Rear View



Figure 3-1 Ports

### 3.7. Dimensions

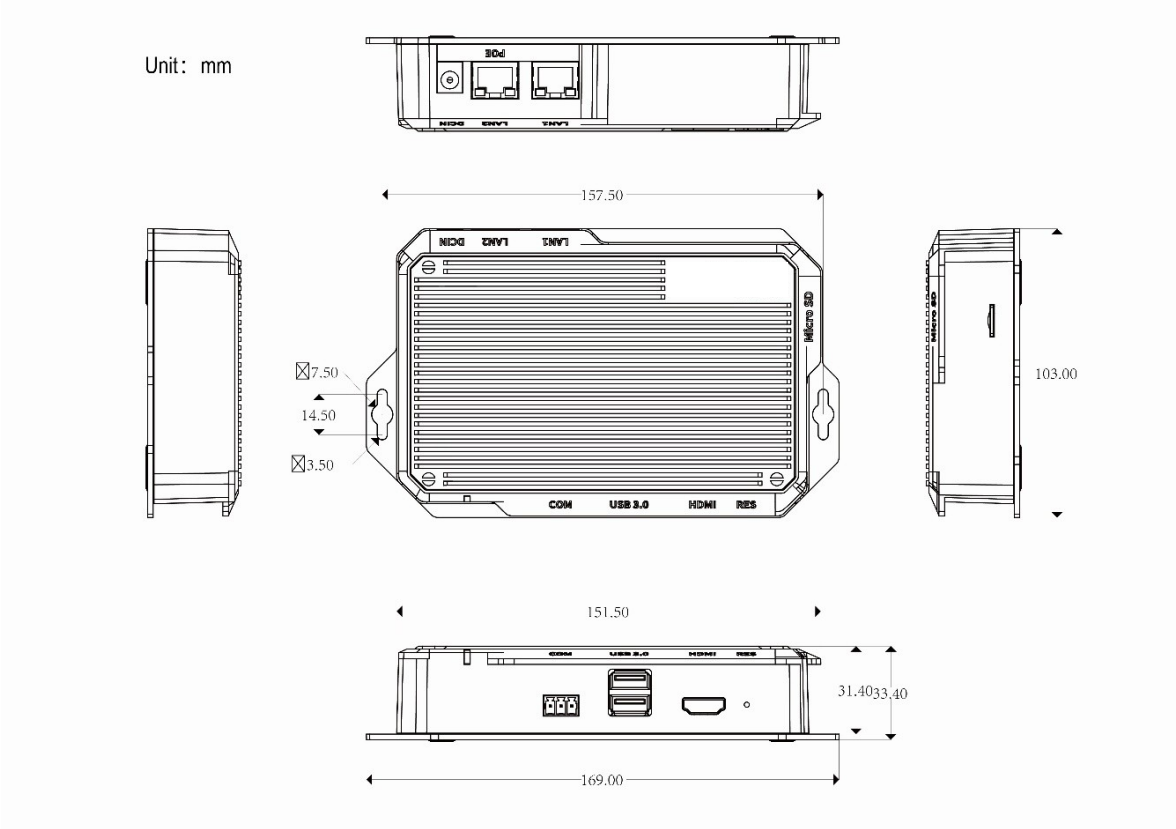


Figure 3-2 Dimensions



### 3.8. Packing List

No.	Item	Unit	Quantity
1	Main unit	-	1
2	Power supply adapter	-	1
3	Pan head screws (M3×8 mm)	-	4
4	Certificate of quality	-	1
5	Warranty card	-	1
6	Quick start guide	-	1

## Appendix: Supported capture cameras

Product Brand	Capture Camera Model/Series
SenseTime	SenseDLC-AA Series
	SenseDLC-11 Series
	SenseDLC-D Series
	SenseDLC-T Series
	ST-DLCC-2F24BFD-IR-J
	ST-DLCC-2E23BFD-IR-J
	ST-DLCC-2F24DFD-IR-J
ST-DLCC-2E23DFD-IR-J	
Hikvision	DS-2CD7127EWD-IZ
	DS-2CD74F5-ISH/F
	DS-2CD84F5-ISH/F
	DS-2CD7047EWD/E2-L
	Hikvision Shanghai landmark series
Dahua	8249 Series
	Dahua Shanghai landmark series

# **NABLA WORKS**

*Business Inquiries*  
03 – 6721 - 8000  
(Mon-Fri 09:30-18: 00)

*Business Partnership*  
info@nablaworks.co.jp

[www.nablaworks.co.jp](http://www.nablaworks.co.jp)