

# IBOX-601-TVI8 Series Product Introduction

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24-Aug-2026



Edge AI Applied Computing  
**SINTRONES**

Ver. 0.1

# AI-Powered 8-Channel Analog Video Computing Platform

NVIDIA® Jetson Orin™ NX 16GB 40W | 8 × TVI/AHD | 9–60VDC | In-vehicle Edge AI



## POWERED BY NVIDIA® JETSON ORIN™ NX 16GB

- 157 TOPS (Sparse) AI Performance
- 1024 CUDA Cores
- 32 Tensor Cores
- 2 x NVDLA v2



## 8-CHANNEL ANALOG CAMERA

- 8 x TVI/AHD/CVI for analog camera
- Supports 1080P / 720P @ 25/30 Hz



## INDUSTRIAL CONNECTIVITY

- 2.5GbE + GbE
- 2 x USB 3.2
- CAN FD / COM / DIO



## WIDE VOLTAGE INPUT

- 9–60VDC
- Smart Power Management & Protection
- 12V / 24V / 48V Vehicle Systems



## POWER OUTPUT

- 12VDC / 1A
- Power supply to peripherals or cameras



## FLEXIBLE EXPANSION

- 1 x M.2 3042/3052 Key B (Nano SIM Card)
- 1 x M.2 2230 Key E



## INDUSTRIAL OPERATING TEMPERATURE

- -25°C ~ 65°C (-13°F ~ 149°F) with 0.6m/s airflow



## RUGGED & RELIABLE DESIGN

- Fanless Aluminum Alloy Design
- 244 x 135 x 69 mm
- IP30 Protection



9–60VDC  
Power Input



2.5GbE



GbE



2 x USB 3.2



HDMI



COM  
RS-232 /422/485



CAN FD



4 x DI  
4 x DO



8 x TVI/AHD  
Analog Camera



12VDC / 1A  
Power Output

# Specifications

| Specifications     | Feature Descriptions                                                                                                                               | Remark                                                                                                                                                             |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module             | NVIDIA® Jetson Orin™ NX 16GB 40W<br>1024 CUDA cores + 8-core ARM Cortex-A78AE CPU + 32 Tensor cores + 16 GB LPDDR5<br><a href="#">2 x NVDLA v2</a> | 157 TOPS (Sparse)<br>78 TOPS (Dense)                                                                                                                               |
|                    | NVIDIA® Jetson Orin™ Nano 8GB 25W<br>1024 CUDA cores + 6-core ARM Cortex-A78AE CPU + 32 Tensor cores + 8 GB LPDDR5                                 | 67 TOPS (Sparse)<br>33 TOPS (Dense)                                                                                                                                |
| Storage            | 1 x M.2 2280 Key M for NVMe SSD, pre-installed System BSP                                                                                          |                                                                                                                                                                    |
| Ethernet           | <a href="#">1 x Intel® 2.5GbE</a> , 1 x GbE                                                                                                        |                                                                                                                                                                    |
| USB                | 2 x USB 3.2                                                                                                                                        |                                                                                                                                                                    |
| I/O Port           | 1 x COM, 4 x DI, 4 x DO (12VDC/100mA)                                                                                                              |                                                                                                                                                                    |
| CAN                | 1 x CAN FD                                                                                                                                         |                                                                                                                                                                    |
| Camera             | <a href="#">8 x TVI/AHD/CVI</a> for analog camera                                                                                                  | Supports 1080P/720P@ 25/30Hz                                                                                                                                       |
| Expansion          | 1 x M.2 3042/3052 Key B supporting <a href="#">nano SIM</a> Card<br>1 x M.2 2230 Key E                                                             |                                                                                                                                                                    |
| Video Output       | 1 x HDMI                                                                                                                                           | At front side                                                                                                                                                      |
| Power Input        | <a href="#">9-60VDC with Smart Power Management and Protection for 12V/24V/48V system</a>                                                          |                                                                                                                                                                    |
| Power Output       | <a href="#">12VDC/1A</a> for power supply to peripherals or cameras                                                                                |                                                                                                                                                                    |
| Power Consumption  | ~80W                                                                                                                                               |                                                                                                                                                                    |
| Operating Temp.    | -25°C ~ 65°C (-13°F ~ 149°F) with 0.6m/s airflow for NX 16GB*<br>-25°C ~ 70°C (-13°F ~ 158°F) with 0.6m/s airflow for Nano 8GB                     | Based on JetPack 6.2 BSP<br><a href="#">*The Orin NX 16 GB's performance could decline at 65°C when running in 40W power mode. 60°C is recommended for NX 16GB</a> |
| Mechanism          | 244 mm x 135 mm x 69 mm (9.7" x 5.4" x 2.8")                                                                                                       |                                                                                                                                                                    |
| Ingress Protection | <a href="#">IP30</a>                                                                                                                               |                                                                                                                                                                    |

# Front Side Interface

## CAN

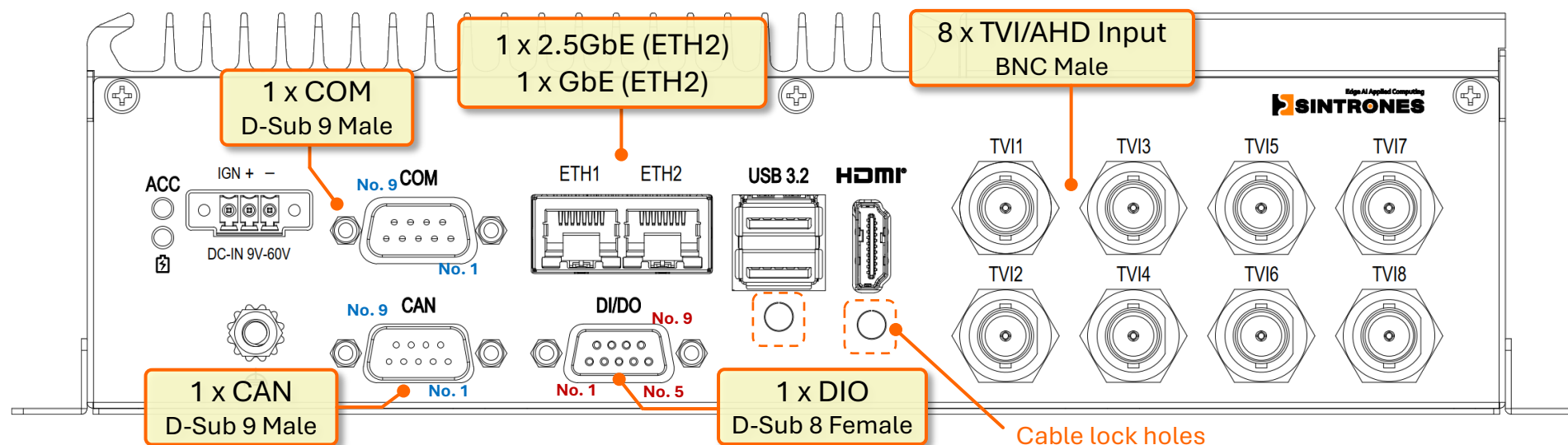
| Pin No. | CAN FD |
|---------|--------|
| 1       | N/C    |
| 2       | CAN_L  |
| 3       | GND    |
| 4       | N/C    |
| 5       | N/C    |
| 6       | GND    |
| 7       | CAN_H  |
| 8       | N/C    |
| 9       | N/C    |

## COM

| Pin No. | RS232   | RS422 | RS485     |
|---------|---------|-------|-----------|
| 1       | COM_DCD | TXD-  | TXD-/RXD- |
| 2       | COM_RXD | TXD+  | TXD+/RXD+ |
| 3       | COM_TXD | RXD+  | N/C       |
| 4       | COM_DTR | RXD-  | N/C       |
| 5       | GND     | GND   | GND       |
| 6       | N/C     | N/C   | N/C       |
| 7       | COM_RTS | N/C   | N/C       |
| 8       | COM_CTS | N/C   | N/C       |
| 9       | N/C     | N/C   | N/C       |

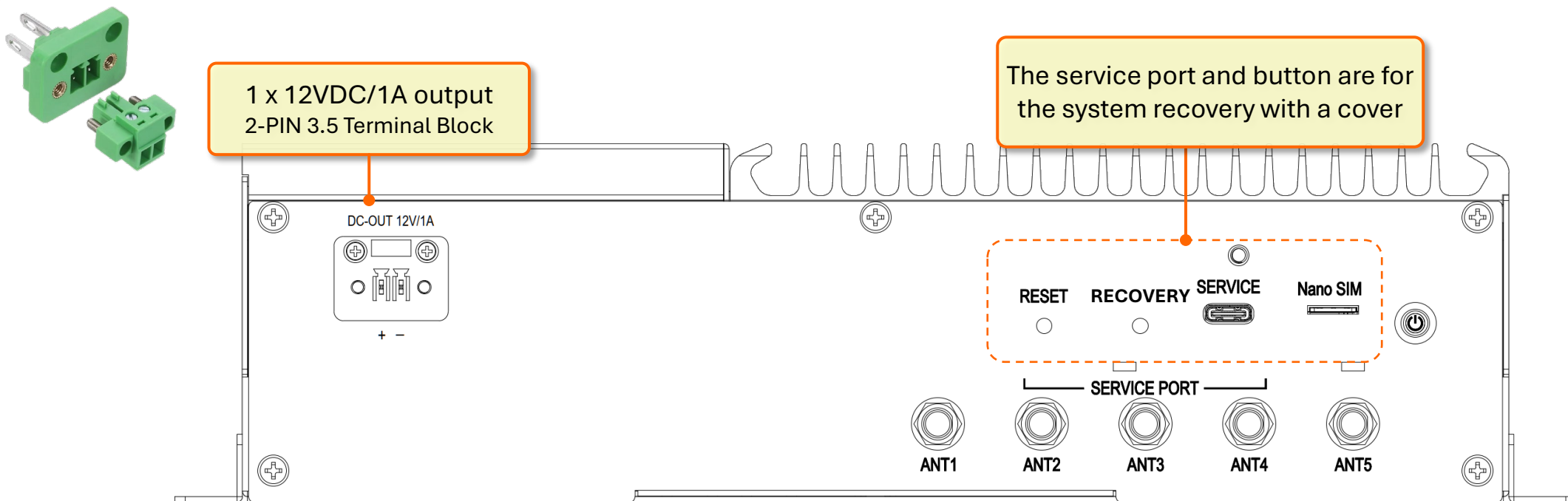
## DIO

| Pin No. | Signal         | Pin No. | Signal         |
|---------|----------------|---------|----------------|
| 1       | GND            | 2       | DI_4 (5V~60V ) |
| 3       | DI_3 (5V~60V ) | 4       | DI_2 (5V~60V ) |
| 5       | DI_1 (5V~60V ) | 6       | DO_4 (12V)     |
| 7       | DO_3 (12V)     | 8       | DO_2 (12V)     |
| 9       | DO_1 (12V)     |         |                |



# Rear Side Interface

The IBOX-601 can deliver only 1A at 12 VDC. If the total power consumption for all cameras used on this device exceeds 1A, we strongly recommend using external power for each camera.



\* An individual external power adapter for each camera can protect the system if a camera power short occurs.

\*\* The color of the connector could differ from this slide.

# Video Connector Type and Converter

## Standard BNC



## Camera Type 1

BNC Male to RCA Female Adapter



## Camera Type 2

BNC Male to Mini DIN Male Adapter



Dual Mini DIN Female Adapter



## Camera Type 3

BNC Male to GX12 Cable



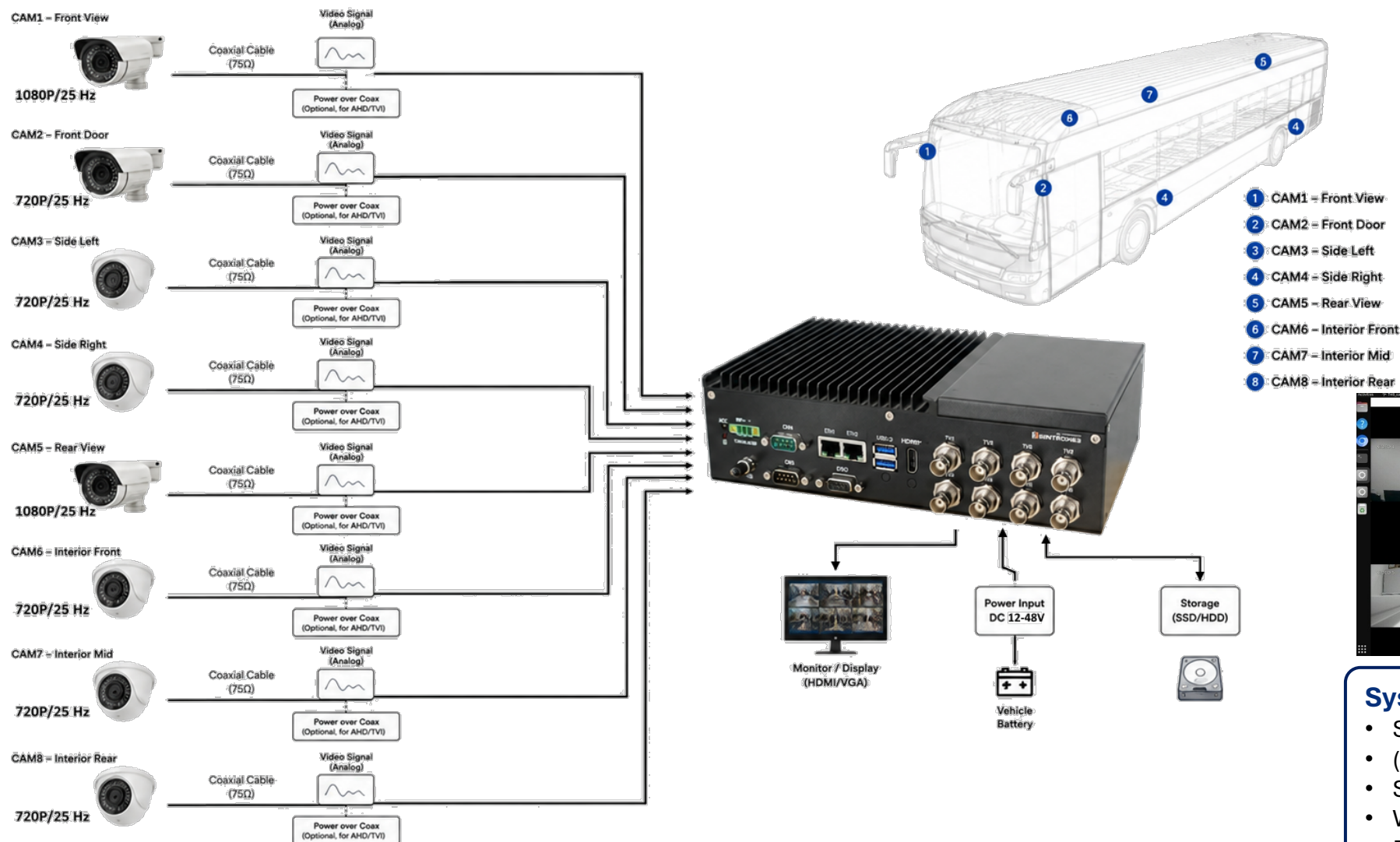
The 75 ohm impedance analog video cable can be easily found with a suitable converter or adapter on an online retailer or appliance store.

\* Resource: Amazon website



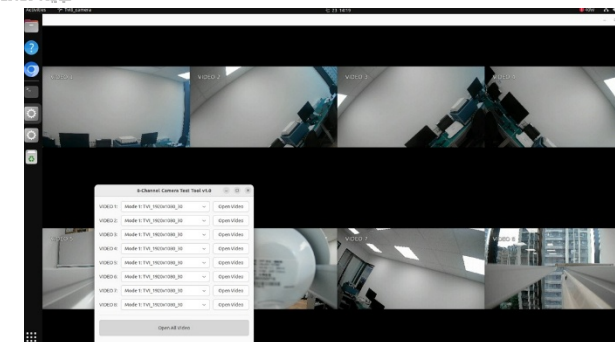
Different types of cameras can be used simultaneously

## 8- Channel Analog Camera Connection for Bus Application



### Supported Camera Type

- Video Format: AHD/TVI/CVI
- Resolution: 720P/1080P
- Frequency: 25Hz/30Hz



### System Features

- Supports up to 8-channel analog cameras
- (AHD/TVI)
- Supports 12VDC/1A power output
- Wide voltage input for vehicle environment
- Dual USB supports external storage.

# Ordering Information

## NVMe SSD

| Item                | Ordering P/N | Description                                                          | Remark     |
|---------------------|--------------|----------------------------------------------------------------------|------------|
| IBOX-601-TVI8-ONX16 | TBD          | NVIDIA Jetson Orin NX 16GB / VDB-102 / 8 x TVI / RJ-45 / FRONT HDMI  | ES         |
| IBOX-601-TVI8-ON8   | TBD          | NVIDIA Jetson Orin Nano 8GB / VDB-102 / 8 x TVI / RJ-45 / FRONT HDMI | ES         |
| M.2 2280 NVMe SSD   | 520600120524 | 1TB TS1TMTE712AI-VS1                                                 | Transcend  |
| M.2 2280 NVMe SSD   | 520651210525 | 512GB TS512GMTE712AI-VS1                                             | Transcend  |
| M.2 2280 NVMe SSD   | 520625610524 | 256GB TS256GMTE712AI-VS1                                             | Transcend  |
| M.2 2280 NVMe SSD   | 520600220520 | IM2P41B8-002TITB5 2TB PCIe Gen 4                                     | ADATA      |
| M.2 2280 NVMe SSD   | 520600120521 | IM2P41B8-001TITB5 1TB PCIe Gen 4                                     | ADATA      |
| M.2 2280 NVMe SSD   | 520651210521 | IM2P41B8-512GITB5 512GB PCIe Gen 4                                   | ADATA      |
| M.2 2280 NVMe SSD   | 520600120523 | 1TB TE1TN845KM42-W                                                   | Team Group |
| M.2 2280 NVMe SSD   | 520651210523 | 512GB TE512GN845KM42-W                                               | Team Group |
| M.2 2280 NVMe SSD   | 520625610523 | 256GB TE256GN845KM42-W                                               | Team Group |

\*The NVMe SSD is a mandatory accessory for this product.

\*The part number of the NVMe SSD may vary depending on the provider or market conditions. SINTRONES is subject to change with a suitable tested component.

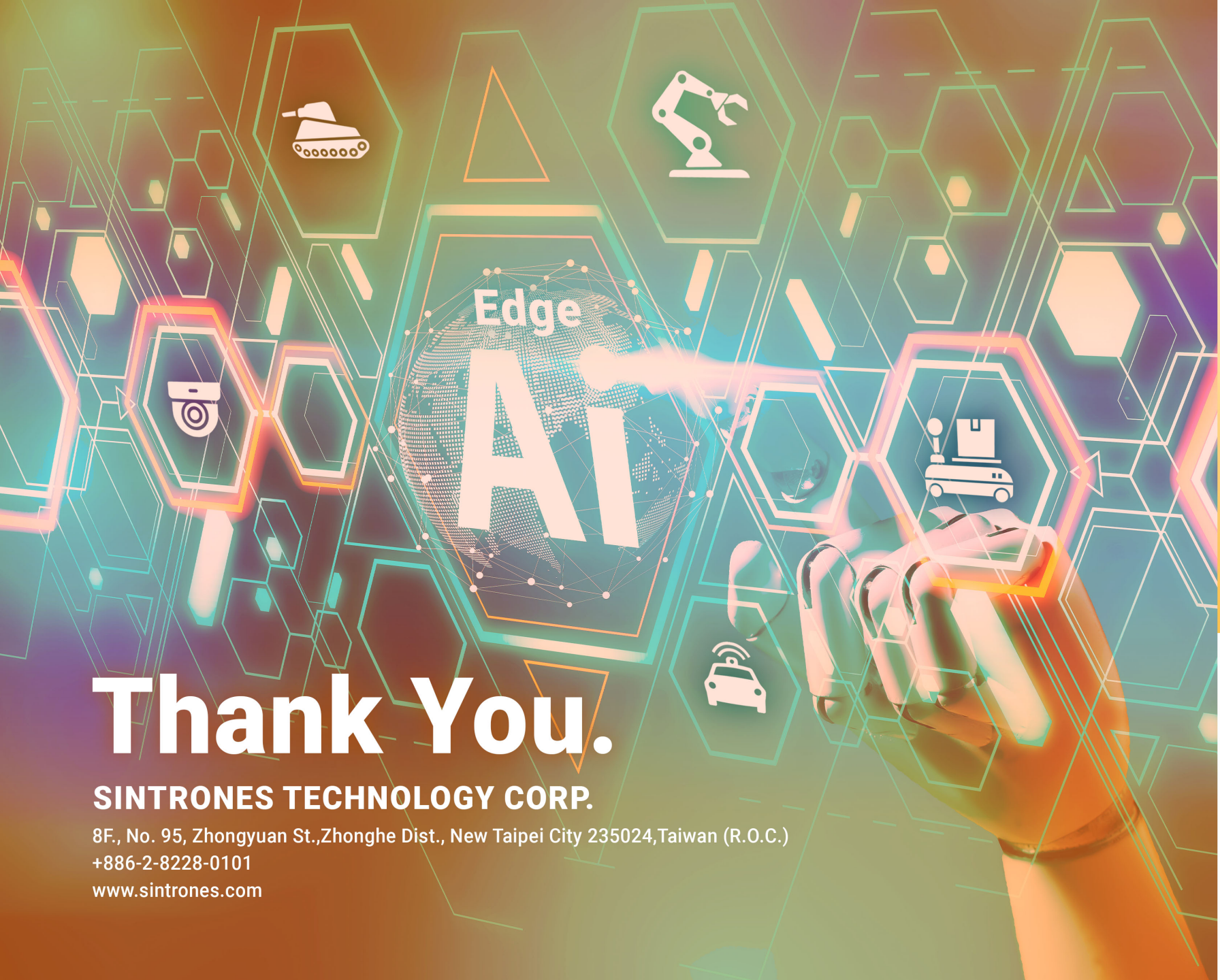
\*NVMe SSD performance could be limited according to the storage capacity. 480GB/512GB is a mainstream SSD product on the market.

# Ordering Information

## WWAN/WLAN/GPS

| Item      | Ordering P/N | Description                                                              | Remark                    |
|-----------|--------------|--------------------------------------------------------------------------|---------------------------|
| 5G Modem  | 580010040014 | FN990A40HP Kit w/ 4*ANT                                                  | 5G antenna included       |
| 5G Modem  | 580012040001 | 5G FN920C04 Kit 5G Antenna*2 pig tail F-F*3 Passive GPS Antenna *1       | 5G antenna included       |
| LTE Modem | 580009042002 | SIM7906G-M2 Kit w/ GPS ANT 4G Antenna*1 and GPS Antenna*1 pig tail F-F*2 | LTE/GNSS antenna included |
| LTE Modem | 580009040000 | EM7590 Kit4G Antenna*1 pig tail F-F*1                                    | LTE antenna included      |
| LTE Modem | 580009040004 | LN920A6-WW Telit Kit 4G Antenna*2 pig tail F-F*2                         | LTE antenna included      |
| Wi-Fi Kit | 580001042000 | AX210 Wi-Fi 6                                                            | Industrial SKU only       |
| Wi-Fi Kit | 580261090010 | WNFQ-261ACNI(BT)                                                         |                           |
| Wi-Fi kit | New          | WNFQ-268AXI(BT)                                                          |                           |
| GNSS      | 610811080100 | VDB-811DR-M2 Kit                                                         |                           |
| GNSS      | 600812080001 | VDB-812DR-M2                                                             |                           |

- Modules are verified for JetPack 6.2. (Ubuntu 22.04/Kernel 5.15)
- The latest compatible module list will be updated on the intranet. For more details about modules, please contact the sales representative.



# Thank You.

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