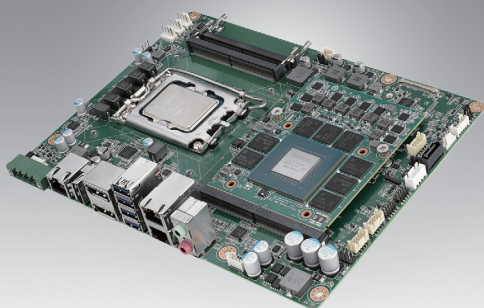


# AIMB-292

## 12/13/14th Gen Intel® Core™ Processor Nvidia MXM GPU Integration



### Features

- 12/13/14<sup>th</sup> Gen Intel® Core™ Desktop Processors, max. 24Core, support Q670E chipset
- Integrated NVIDIA MXM Graphics
- Up to 96GB DDR5 5600 MT/s with two SO-DIMM
- Quadruple displays with 3 DP and 1 LVDS (or eDP), up to 4K
- Abundant Expansion: 1 M.2 M-key & 1 M.2 E-key (B-key by option), 4 USB 3.2 Gen2x1, 2 USB 2.0, 1 SATA III
- Qualified for Edge AI SDK of WISE-DeviceOn and Embedded Software APIs

#### Software APIs:



SMBus

H/W Monitor

Watchdog

#### Utilities:



BIOS flash

Monitoring



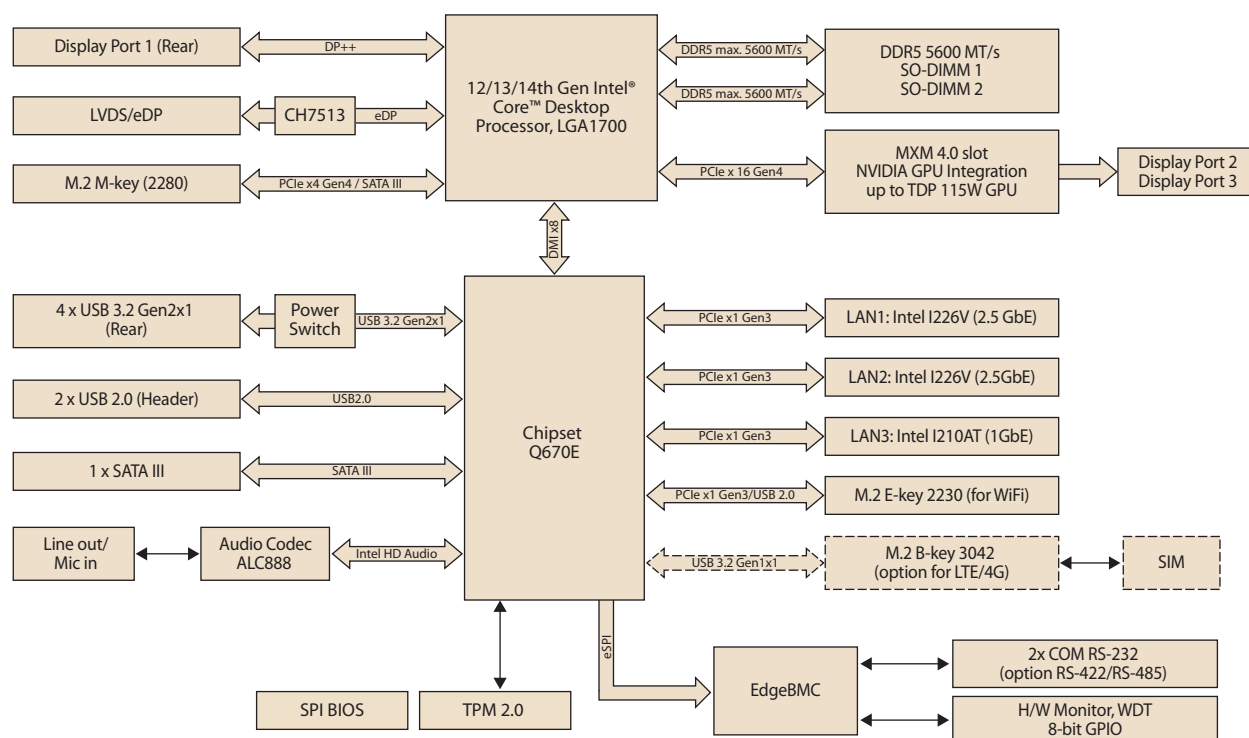
### Specifications

|                            |                      |                                                                                                                             |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|----------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|------------|----------------------|-------------------|----------------------------|------------|----------------------|----------------------|------------|-----------|--------|---------|
| 14th Generation Processors | CPU                  | i9-14900                                                                                                                    | i9-14900T  | i7-14700             | i7-14700T         | i5-14500                   | i5-14500T  | i5-14400             | i5-14400T            | i3-14100   | i3-14100T |        |         |
|                            | Core Number          | 24                                                                                                                          | 24         | 20                   | 20                | 14                         | 14         | 10                   | 10                   | 4          | 4         |        |         |
|                            | Base frequency (GHz) | 2.0/1.5                                                                                                                     | 1.1/0.8    | 2.1/1.5              | 1.3/0.9           | 2.6/1.9                    | 1.7/1.2    | 2.5/1.8              | 1.5/1.1              | 3.5/NA     | 2.7/NA    |        |         |
|                            | Max Speed (GHz)      | 5.8/4.3                                                                                                                     | 5.5/4.0    | 5.4/4.2              | 5.2/3.7           | 5.0/3.7                    | 4.8/3.4    | 4.7/3.5              | 4.5/3.2              | 4.7/NA     | 4.4/NA    |        |         |
|                            | Smart cache (MB)     | 36                                                                                                                          | 36         | 33                   | 33                | 24                         | 24         | 20                   | 20                   | 12         | 12        |        |         |
|                            | TDP (W)              | 65                                                                                                                          | 35         | 65                   | 35                | 65                         | 35         | 65                   | 35                   | 60         | 35        |        |         |
| 13th Generation Processors | CPU                  | i9-13900E / i9-13900                                                                                                        | i9-13900TE | i7-13700E / i7-13700 | i7-13700TE        | i5-13500E / i5-13500       | i5-13500TE | i5-13400E / i5-13400 | i3-13100E / i3-13100 | i3-13100TE |           |        |         |
|                            | Core Number          | 24                                                                                                                          | 24         | 16                   | 16                | 14                         | 14         | 10                   | 4                    | 4          |           |        |         |
|                            | Base frequency (GHz) | 1.8/2.0                                                                                                                     | 1          | 1.9/2.1              | 0.8               | 2.4/2.6                    | 1.3        | 2.4/2.5              | 3.3/3.4              | 2.4        |           |        |         |
|                            | Max Speed (GHz)      | 5.2/5.6                                                                                                                     | 5          | 5.1/5.2              | 4.8               | 4.6/4.8                    | 4.5        | 4.6                  | 4.4/4.5              | 4.1        |           |        |         |
|                            | Smart cache (MB)     | 36                                                                                                                          | 36         | 30                   | 30                | 24                         | 24         | 20                   | 12                   | 12         |           |        |         |
|                            | TDP (W)              | 65                                                                                                                          | 35         | 65                   | 35                | 65                         | 35         | 65                   | 60                   | 35         |           |        |         |
| 12th Generation Processors | CPU                  | i9-12900E / i9-12900                                                                                                        | i9-12900TE | i7-12700E / i7-12700 | i7-12700TE        | i5-12500E / i5-12500/12400 | i5-12500TE | i3-12100E / i3-12100 | i3-12100TE           | G7400E     | G7400TE   | G6900E | G6900TE |
|                            | Core Number          | 16                                                                                                                          | 16         | 12                   | 12                | 6                          | 6          | 4                    | 4                    | 2          | 2         | 2      | 2       |
|                            | Base frequency (GHz) | 2.3/2.4                                                                                                                     | 1.1        | 2.1                  | 1.4               | 2.9/3.0/2.5                | 1.9        | 3.2                  | 2.1                  | 3.6        | 3         | 3      | 2.4     |
|                            | Max Speed (GHz)      | 5                                                                                                                           | 4.8        | 4.8                  | 4.7               | 4.5/4.6/4.4                | 4.3        | 4.2/4.3              | 4                    | NA         | NA        | NA     | NA      |
|                            | Smart cache (MB)     | 30                                                                                                                          | 30         | 25                   | 25                | 18                         | 18         | 12                   | 12                   | 6          | 6         | 4      | 4       |
|                            | TDP (W)              | 65                                                                                                                          | 35         | 65                   | 35                | 65                         | 35         | 60                   | 35                   | 46         | 35        | 46     | 35      |
| Processor System           | Chipset              | Q670E                                                                                                                       |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | BIOS                 | AMI EFI 256 Mbit SPI                                                                                                        |            |                      |                   |                            |            |                      |                      |            |           |        |         |
| Expansion Slot             | M.2                  | 1 x M-key (2280, for NVMe Storage)<br>1 x E-key (2230, for WiFi/BT) or 1 x B-key (3042, only for LTE) by option             |            |                      |                   |                            |            |                      |                      |            |           |        |         |
| Memory                     | Technology           | Dual Channel DDR5, up to 5600 MT/s (non-ECC)                                                                                |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Max. Capacity        | 96GB (up to 48GB per DIMM)                                                                                                  |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Socket               | 2 x 262 pin DDR5 SO-DIMM                                                                                                    |            |                      |                   |                            |            |                      |                      |            |           |        |         |
| Graphics                   | Native GPU           | Intel® UHD Graphics 770                                                                                                     |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Discrete GPU         | Quadro® A4500                                                                                                               |            |                      | Quadro® 5000 Ada  |                            |            | Quadro® 3500 Ada     |                      |            |           |        |         |
|                            | Cores                | 5,888 CUDA® cores                                                                                                           |            |                      | 9,728 CUDA® cores |                            |            | 5,120 CUDA® cores    |                      |            |           |        |         |
|                            | FP32 Performance     | 17.66 (TFLOPS)                                                                                                              |            |                      | 41.15 (TFLOPS)    |                            |            | 23.05 (TFLOPS)       |                      |            |           |        |         |
|                            | Memory               | GDDR6 16GB                                                                                                                  |            |                      | GDDR6 16GB        |                            |            | GDDR6 12GB           |                      |            |           |        |         |
| Display                    | DP                   | 2 x DP from MXM Type-A/B/B+ module: DP 1.4a, up to 4K at 120Hz<br>1 x DP ++ from CPU: up to 4096 x 2160 @60 Hz              |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | LVDS or eDP          | 1 (by pass mode), LVDS up to 1920x1200@60Hz, eDP up to 1920x1080@60Hz                                                       |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Multi Displays       | Quadruple independent display.<br>Onboard: DP++/LVDS or eDP<br>Onboard + MXM Type-A/B/B+ module: DP++/LVDS or eDP + DP + DP |            |                      |                   |                            |            |                      |                      |            |           |        |         |
| Network                    | Ethernet             | 10/100/1000/2500 Mbps                                                                                                       |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Controller           | LAN1: 2.5 GbE Intel i226-V<br>LAN2: 2.5 GbE Intel i226-V<br>LAN3: 1 GbE Intel i210-AT                                       |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Connector            | 3 x RJ45                                                                                                                    |            |                      |                   |                            |            |                      |                      |            |           |        |         |
| Audio                      | Codec                | Realtek ALC888S, High Definition Audio (HD), Line-Out (default)                                                             |            |                      |                   |                            |            |                      |                      |            |           |        |         |
|                            | Amplifier            | Yes (Option, 3.2W)                                                                                                          |            |                      |                   |                            |            |                      |                      |            |           |        |         |

## Specifications (Cont.)

|                          |                        |                                                                                                                 |
|--------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------|
| SATA                     | Max data transfer rate | 6.0 Gb/s                                                                                                        |
|                          | Channel                | 1 (SATA III)                                                                                                    |
| Rear I/O                 | DP                     | 3                                                                                                               |
|                          | Ethernet               | 3                                                                                                               |
|                          | USB                    | 4 x USB 3.2 Gen2x1                                                                                              |
|                          | Audio                  | 1 (Line out by default, Line in/Line out/Mic in programmable)                                                   |
|                          | Power Connector        | 1 x Terminal block (4P, Phoenix Contact)                                                                        |
| Internal Connector       | USB                    | 2 x USB 2.0                                                                                                     |
|                          | LVDS/eDP               | 1 (LVDS or eDP by pass mode)                                                                                    |
|                          | Serial                 | 2 (RS-232/422/485 with auto flow control)                                                                       |
|                          | SATA                   | 1                                                                                                               |
|                          | M.2                    | 1 x M-key (2280, for NVMe Storage)<br>1 x E-key (2230, for WiFi/BT) or 1 x B-key (3042, only for LTE) by option |
| Watchdog Timer           | Output                 | System reset                                                                                                    |
|                          | Interval               | Programmable 1 ~ 255 (second or minute)                                                                         |
| Power Requirements       | Input voltage          | 24V DC-in                                                                                                       |
|                          | Connector              | 4-pin Terminal block                                                                                            |
|                          | Configuration          | Intel® Core™ i9-14900, 2pcs 48 GB DDR5 5600 MT/s                                                                |
|                          | Power consumption      | Max. 100.2 W<br>Typical 62.5 W                                                                                  |
| Environment              | Temperature            | Operating Non-Operating                                                                                         |
|                          | Storage                | 0 ~ 55° C (32 ~ 131° F), depends on STD or THIN GPU cooler -40 ~ 85° C (-40 ~ 185° F)                           |
| Physical Characteristics | Dimensions             | 170 mm x 230 mm (6.69" x 9.06")                                                                                 |

## Block Diagram



## Ordering Information

| Part Number    | GPU              | DP | LVDS/<br>eDP | 2.5<br>GbE | GbE | COM | SATA III | USB 3.2 | USB 2.0 | M.2<br>M-key | M.2 E-key        | TPM 2.0 | AMP | Cooler<br>type | Temp.  |
|----------------|------------------|----|--------------|------------|-----|-----|----------|---------|---------|--------------|------------------|---------|-----|----------------|--------|
| AIMB-292Q-00A1 | Quadro® A4500    | 3  | 1            | 2          | 1   | 2   | 1        | 4       | 2       | 1            | 1 (option B-key) | 1       | 1   | Standard       | 0~55°C |
| AIMB-292Q-C0A1 | Quadro® A4500    | 3  | 1            | 2          | 1   | 2   | 1        | 4       | 2       | 1            | 1 (option B-key) | 1       | 1   | Thin           | 0~55°C |
| AIMB-292Q-C1A1 | Quadro® 5000 Ada | 3  | 1            | 2          | 1   | 2   | 1        | 4       | 2       | 1            | 1 (option B-key) | 1       | 1   | Thin           | 0~55°C |
| AIMB-292Q-C2A1 | Quadro® 3500 Ada | 3  | 1            | 2          | 1   | 2   | 1        | 4       | 2       | 1            | 1 (option B-key) | 1       | 1   | Thin           | 0~55°C |

\*() Supports by BOM options

### AIMB-292 Kit

| Part Number    | GPU           | CPU       | Memory | Storage   | DP | LVDS/<br>eDP | 2.5<br>GbE | GbE | COM | SATA III | USB<br>3.2 | USB<br>2.0 | M.2<br>M-key | M.2<br>E-key     | TPM<br>2.0 | AMP | Cooler<br>type | Temp.  |
|----------------|---------------|-----------|--------|-----------|----|--------------|------------|-----|-----|----------|------------|------------|--------------|------------------|------------|-----|----------------|--------|
| AIMB-292Q-K0A1 | Quadro® A4500 | i7-14700E | 32GB   | 512G NVMe | 3  | 1            | 2          | 1   | 2   | 1        | 4          | 2          | 1            | 1 (option B-key) | 1          | 1   | THIN cooler    | 0~55°C |

## Packing List

| Part Number    | Description                         | Quantity |
|----------------|-------------------------------------|----------|
| 1700003194-21  | SATA HDD cable                      | 1        |
| 1700018785     | SATA power cable (1 port, 35cm)     | 1        |
| 1700034404-02  | 1-to-1 serial port cable, 50cm      | 1        |
| 1960116131T001 | I/O port bracket                    | 1        |
| AIMB-292 Board | Assembly of AIMB-292 and MXM module | 1        |
| 1930005673-11  | M.2 screw (3x4.5L)                  | 2        |

## I/O View



## Optional Accessories

| Part Number       | Description                                                                               |
|-------------------|-------------------------------------------------------------------------------------------|
| 1970005349T001    | ADL-S CPU cooler, 78x78x55.4mm (for CPU TDP max. 65W)                                     |
| 96PSA-A330W24P4-3 | A/D 100-240V 330W 24V C14 TERMINAL BLOCK 4P                                               |
| THIN Cooler       | Thermal module of CPU & GPU Cooler (need pre-assemble, please contact local sales or FAE) |

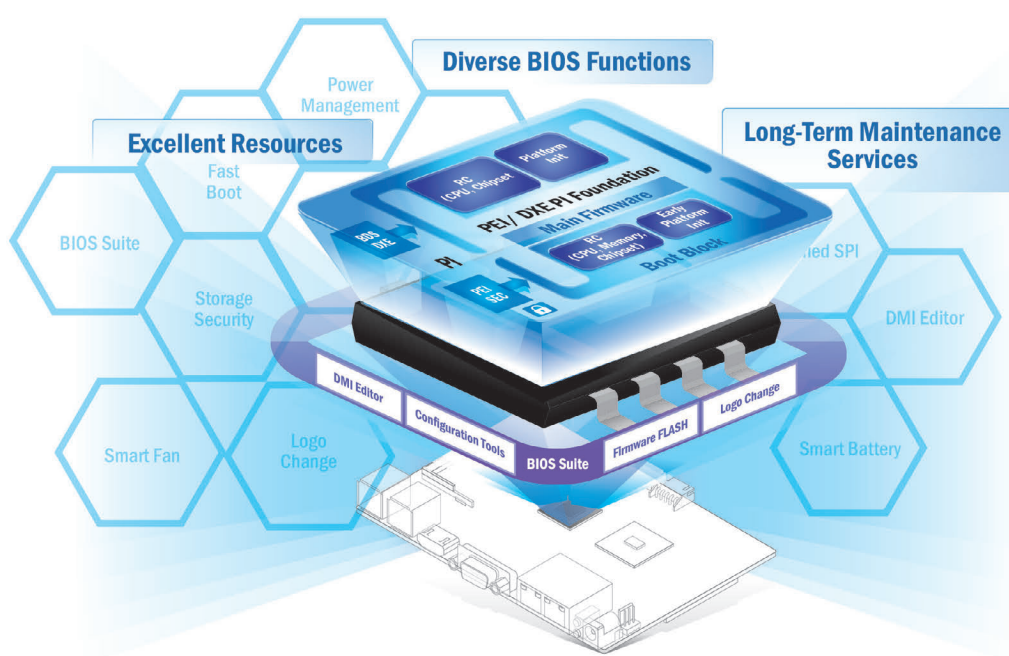
## Embedded OS/API

| OS/API       | Part Number    | 968 P/N        | Description                        |
|--------------|----------------|----------------|------------------------------------|
| Windows 11   | 20706WLE1S0044 | 968QW1124ELOXE | img W11 24EL AIMB-292 64b 24H2 ENU |
| Windows 11   | 20706WLH1S0044 | 968QW1124HLOXE | img W11 24HL AIMB-292 64b 24H2 ENU |
| Windows 11   | 20706WLV1S0044 | 968QW1124VLOXE | img W11 24VL AIMB-292 64b 24H2 ENU |
| Ubuntu 24.04 | 20706U24DS0001 | 968MOU204D     | img UbuntuD AIMB-292 64b 24.04 ENU |

# Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.



## Embedded BIOS Solution Advantages

### Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

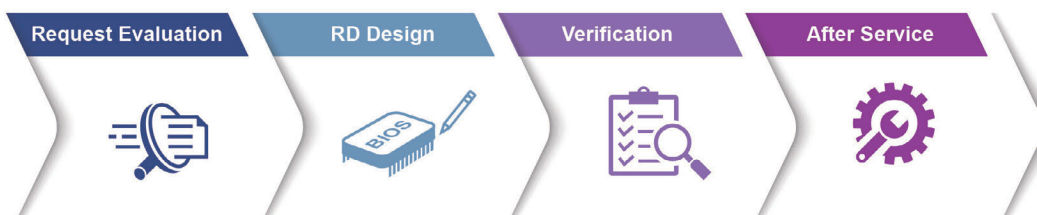
### Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

### Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

## Value-Added Customization Process



# WISE-DeviceOn

## Edge AI OTA and Container Management

### WISE-DeviceOn End-to-End Solution for Edge AI

Even if all datasets, algorithms, trainings, UI/UX, and more are functioning, how can you easily deploy an AI application to hundreds, or thousands, of inference devices in production? How can you efficiently manage AI models (software updates, CI/CD), in addition to all remote, hardware devices, such as sensors?



### Solution Advantages



#### Performance Booster

- Inference optimization
- Open Neural Network Compiler (ONNC)
- Save over 45% DRAM consumption



#### Fleet Management

- Remote batch control for power management, reboot, terminal and screenshot
- Real-time monitoring, diagnostics and notification
- Over 10,000 devices around the globe



#### Container and OTA

- Streamlined deployment process
- Docker container management
- Software OTA (over-the-air) updates



#### AI Security

- AI containers deployed via Azure Container Registry and Harbor
- Secured data connection (TLS/SSL)
- Integrity protection based on digital signature

👉 Find More Information about [WISE-DeviceOn End-to-End Solution for Edge AI](#)



# Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.



| 5x Performance Boost                                                                                                                | All-in-one Installation                                                                                                       | One Click AI Experience                                                                                                         | Plug-and-play Environment                                                                                                                     | Discover Cost-effective Hardware                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Integrated Intel® OpenVINO™ technology</li> <li>Boost AI using Advantech hardware</li> </ul> | <ul style="list-style-type: none"> <li>Build AI environment in under 5 minutes</li> <li>Ready-to-use configuration</li> </ul> | <ul style="list-style-type: none"> <li>User friendly configuration guidance</li> <li>One-click Benchmark acquisition</li> </ul> | <ul style="list-style-type: none"> <li>Easy access to 100+ AI inference extensions</li> <li>Software development package available</li> </ul> | <ul style="list-style-type: none"> <li>Diverse CPU/RAM options</li> <li>Find hardware solutions for AI development</li> </ul> |

# Embedded Linux Support and Design-in Services

## Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.



### Features

| Certified OS and BSP                                                                                                                    | Licensed Services                                                                                                                                                    | Numerous AI and Edge Resources                                                                                                                                          | Local Partner Alliance                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Platform compatibility tests</li> <li>Preloaded functional driver and software stacks</li> </ul> | <ul style="list-style-type: none"> <li>License authorized Canonical delivers 10-years of bug fixes and security updates</li> <li>In-house bundled service</li> </ul> | <ul style="list-style-type: none"> <li>Containerized technology for service provision and deployment</li> <li>AI resources from Caffe, TensorFlow, and mxnet</li> </ul> | <ul style="list-style-type: none"> <li>Embedded Linux and Android Alliance (ELAA)</li> </ul> |