ABOX-5221(P)(G)

Intel® Core™ Processors (14th Gen) with Discrete GPU Options and High-Bandwidth 10GbE Edge AI Computer

- Intel® Core™ Processor (14th Gen)
- NVIDIA RTX™ Embedded and Intel® Arc™ GPU Options for Scalable AI Accelerating Solution
- 2 x Marvell 10GbE for High-Bandwidth Uplink and Aggregated Downlink Connection
- 4 x 2.5GbE with PoE+ Option Provides Simplified Connection to Edge Devices
- Front Removeable RTC Battery Design for Easy Maintenance

Specifications

System

Processor
- Intel® Core™ (14th gen) i9-14900T 24C/32T processor
- Intel® Core™ (14th gen) i7-14700T 20C/28T processor
- Intel® Core™ (14th gen) i5-14500T 14C/20T processor

Graphics
- Processor-integrated GPU - Intel® UHD Graphics 770
- Optional discrete GPU - NVIDIA RTX™ Embedded 2000 Ada / 3500 Ada / 5000 Ada Intel® Arc™ A370E

Chipset
- R680E

Memory
- 2 x DDR5-5600 SO-DIMM up to 96GB (ECC support with ECC DRAM)

Security
- TPM 2.0, dTPM

Watchdog
- Auto reset for unresponsive system (custom 1-255 sec/min settings in BIOS)

Interface

Video
- Without discrete GPU - 2 x HDMI® up to 3840 x 2160 @ 60Hz as specified in HDMI 2.0b
- With discrete GPU - Additional 2 x DP++ up to 7680 x 4320 @ 60Hz

Audio
- 1 x Line-out, 1 x Line-in, 1 x Mic-in

Ethernet
- 2 x 10GbE (Marvell AQC113) via RJ-45 (optional M12 X-code)
- 4 x 2.5GbE (Intel I226) via RJ-45 (optional PoE+ and M12 X-code)

* ETH3 supports Intel® AMT
** All Ethernet ports support PXE boot and Wake-on-LAN
*** PoE supports 25.5W per port with total power budget: 120W

USB
- 8 x USB 3.2 Gen 2

DIO
- 8 x DI (DC 5-60V), 8 x DO (DC 5V/100mA)

COM
- 2 × RS-232/422/485

Internal Expansion

M.2
- 1 x M.2 3042/3052 Key B for WWAN with dual SIM support
- 1 x M.2 2230 Key E for Wi-Fi/BT

* Thermal solution is required for M.2 5G module

Mini PCIe
- 2 x Mini PCIe (full-size)

Storage

Type
- 1 x M.2 2280 Key M for NVMe/SATA SSD
- 2 x M.2 2280 Key M for NVMe SSD
- 2 x Removable tray for 2.5" SATA SSD

* RAID 0/1/5 support via Intel® VMD.

Power

Power Input
- DC 9-60V input (nominal power input DC 12V/24V/48V) via 5-pin terminal block

* Nominal power input of DC 24V or above is required for system with discrete GPU and PoE

Power Protection
- OCP, OVP, surge protection, reversed polarity protection

Power Management
- Ignition detection, Smart Power Management

RTC Battery
- Front removeable tray for RTC coin cell battery

Battey Backup Unit (BBU)
- Optional battery kit for up to 10 minutes emergency backup time (Battery charging Temp. 0°C~45°C and discharging Temp. -10°C~60°C)

* BBU backup time varies depending on actual overall system power consumption and battery is required to be charged before being used for system power backup
** Operating temperature will be limited within -10°C and 60°C with the battery kit installed. Patent No.: M447854 (Built-in battery)

Software

Operating System
- Windows 11 IoT Enterprise LTSC
- Ubuntu 22.04 LTS

Environmental

Operating Temp.
- -40°C ~ 70°C (-40°F ~ 158°F) with 0.6 m/s airflow

* Operating temperature varies by accessories installed.

Storage Temp.
- -40°C ~ 85°C (-40°F ~ 176°F)

Relative Humidity
- 10% RH ~ 90% RH (non-condensing)

Vibration
- IEC 60068-2-64, random, 2.5G (Z) 0.21G (Y) 0.76 (Z)@5~500Hz, 1hr/axis
- MIL-STD-810H, Method 514.8, Category 4
- EN 61373:2010, Clause 8

Shock
- MIL-STD-810H, Method 516.8, 20G (11ms)
- EN 61373:2010, Clause 10

Certification / Compliance

- CE, FCC Class A, UKCA, E-Mark, EN 50155, EN 45545-2 (R25), IEC 62368-1

Mechanical

Construction
- Aluminum Alloy

Antenna
- 7 x SMA connector mounting hole

Mounting
- Wall mounting

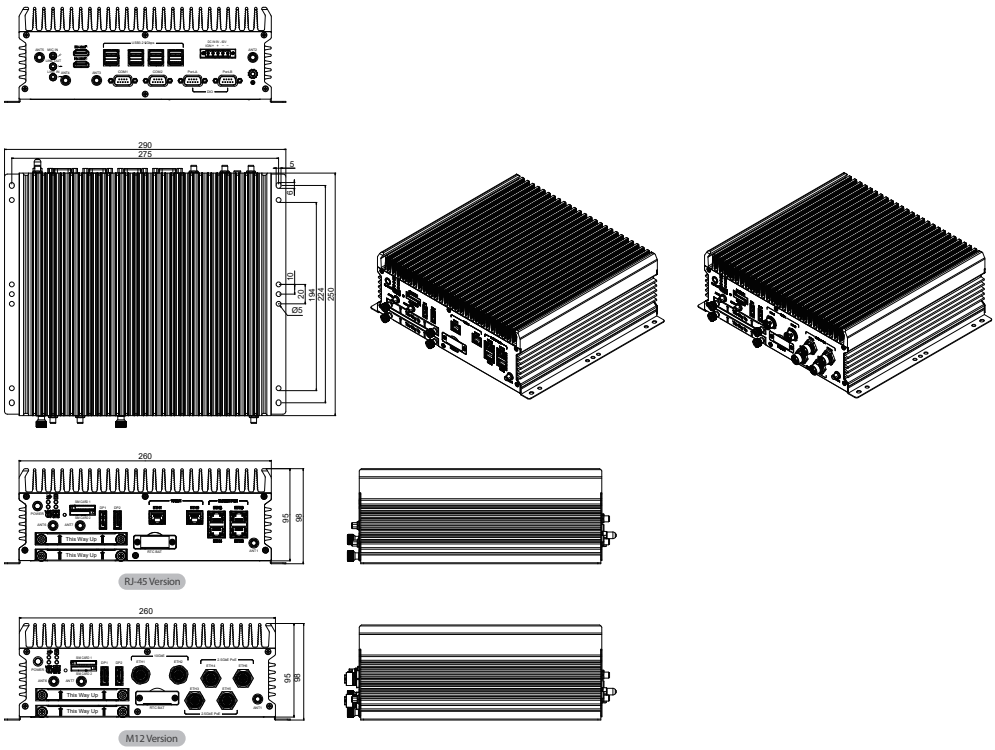
Net Weight
- 5.70 kg (12.57 lb)

Dimensions (L x W x H)
- 290 x 250 x 98 mm (11.42 x 9.84 x 3.86 in.) with mounting brackets

Ingress Protection
- IP40

Dimensions

Unit : mm



* Two DP ports on front panel are only available for SKUs with an optional discrete GPU.

Ordering Information

Model Number	ABOX-5221(P)(G)(-M12X)-zz (P= w/ PoE, G=w/ Discrete GPU, M12X=w/ M12 X-coded connectors, zz=i9=i9-14900T, zz=i7=i7-14700T, zz=i5=i5-14500T
Description	Intel® Core™ Processors (14th Gen) with Discrete GPU Options and High-Bandwidth 10GbE Edge AI Computer
State of Origin	Made in Taiwan

Optional Discrete GPU

Discrete GPU	Graphic Cores	Memory Type/Size	AI TOPS*	System Operating Temp.
NVIDIA RTX™ Embedded 5000 Ada Generation	9728 CUDA / 304 Tensor	GDDR6 16GB	682	0°C ~ 60°C
NVIDIA RTX™ Embedded 3500 Ada Generation	5120 CUDA / 160 Tensor	GDDR6 12GB	369	0°C ~ 60°C
NVIDIA RTX™ Embedded 2000 Ada Generation	3072 CUDA / 96 Tensor	GDDR6 8GB	232	0°C ~ 70°C
Intel® Arc™ A370E	8 X^e-cores / 128 Execution Units	GDDR6 4GB	56	0°C ~ 70°C

*AI TOPS Precision - FP8 for NVIDIA RTX™ Embedded Ada Generation, INT8 for Intel® Arc™.

Optional Accessories

Memory	DDR5-5600 SO-DIMM, 8GB to 48GB, -40°C ~ 85°C (ECC option available)
Storage	M.2 2280 Key M NVMe SSD w/ thermal kit, -40°C ~ 85°C M.2 2280 Key B-M SATA SSD w/ thermal kit, -40°C ~ 85°C 2.5" SATA SSD, -40°C ~ 85°C
Wi-Fi	M.2 2230 Key A-E Wi-Fi module, -40°C ~ 85°C
WWAN	M.2 3042/3052 Key B WWAN module w/ thermal kit, -40°C ~ 85°C
GNSS	M.2 2242 Key B GNSS module, -40°C ~ 85°C Mini PCIe GNSS module, -40°C ~ 85°C
CAN Bus	Mini PCIe CAN module, -40°C ~ 85°C
Battery (BBU)	BAT-5200 battery kit, charging Temp. 0°C ~ 45°C, discharging Temp. -10°C ~ 60°C
Power Adapter	AC/DC 100-240V/24V 280W C14 bare wire power adapter

All specifications are subject to change without notice.