# IEI Edge AI Solution Accelerates Your AI Initiative

IEI's AI hardware ready system is ideal for deep learning inference computing and can help you get faster, deeper insights into your customers and your business. IEI's AI inference systems support Intel® VPU accelerator cards, NVIDIA graphics cards, and Google TPU. Additional computational power plus end-to-end solution are provided to run your tasks more efficiently. With the Intel® OpenVINO toolkit, NVIDIA TensorRT and Google Tensorflow Lite, IEI's AI-ready systems can help you deploy your solutions faster than ever.
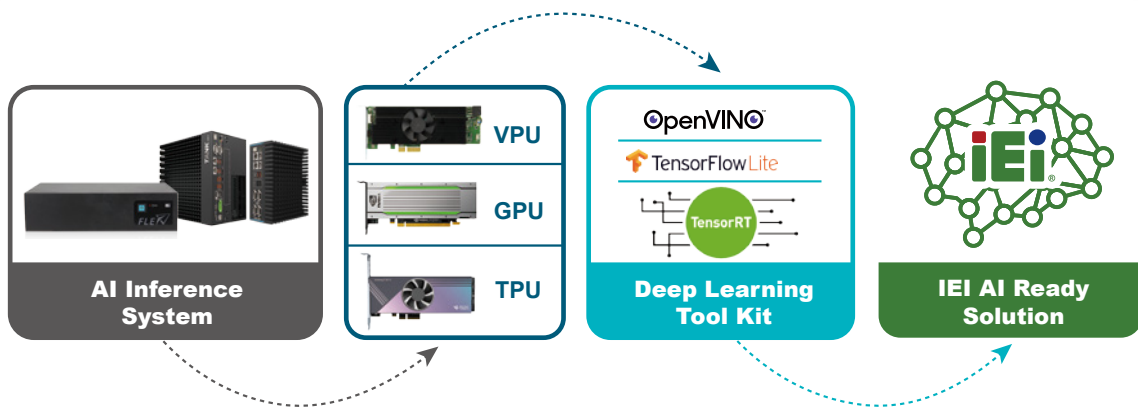
Deep learning and inference

Deep learning is part of the machine learning method. It allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction. Deep neural network and recurrent neural network architectures have been used in applications such as object recognition, object detection, feature segmentation, text-to-speech, speech-to-text, translation, etc. In some cases the performance of deep learning algorithms can be even more accurate than human judgement.
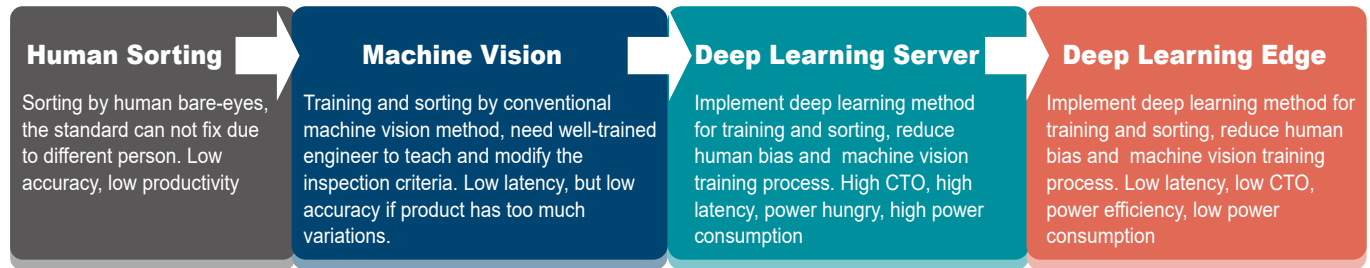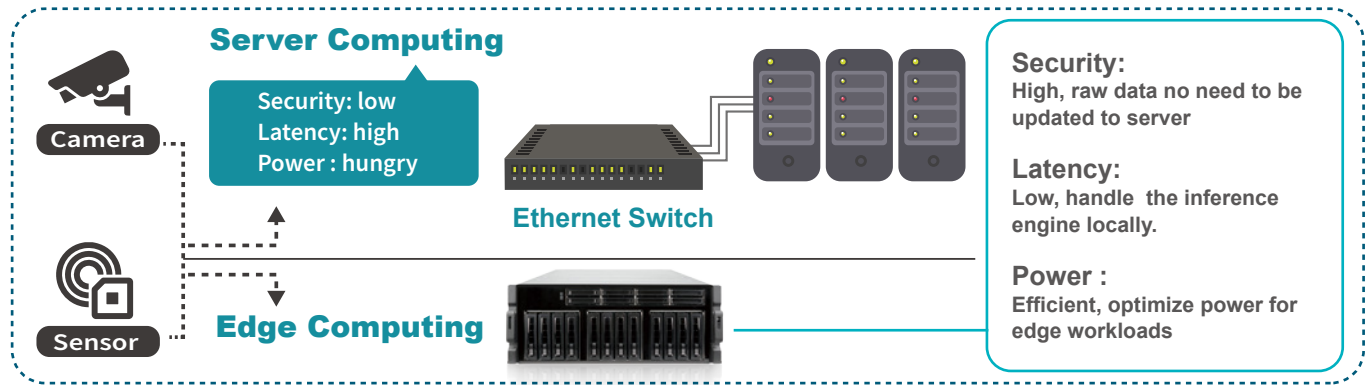
In the past, machine learning required researchers and domain experts knowledge to design filters that extracted the raw data into feature vectors. However, with the contributions of deep learning accelerators and algorithms, trained models can be applied to the raw data, which could be utilized to recognize new input data in inference.
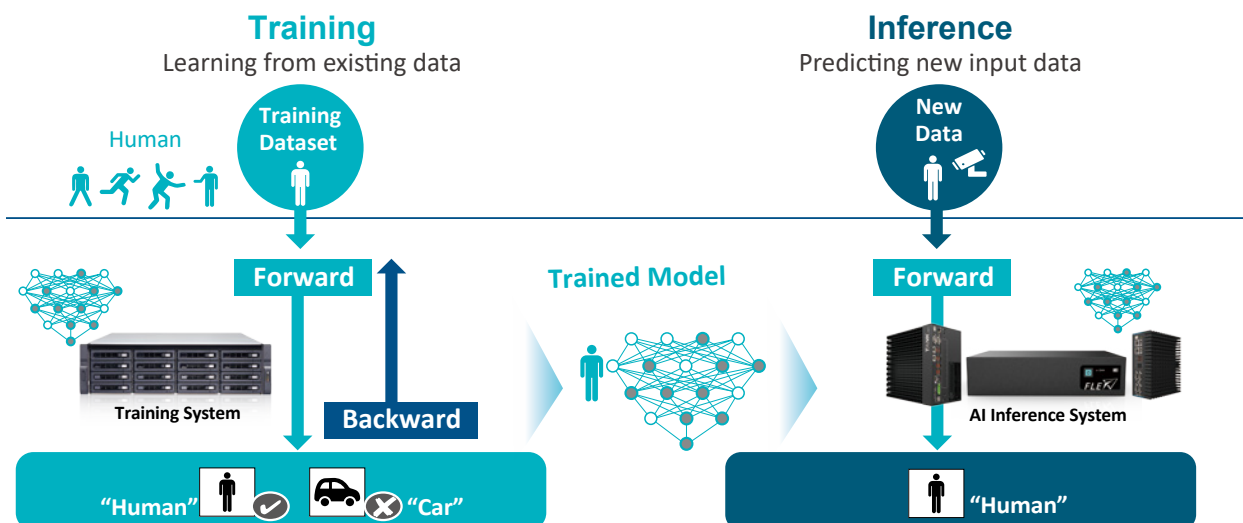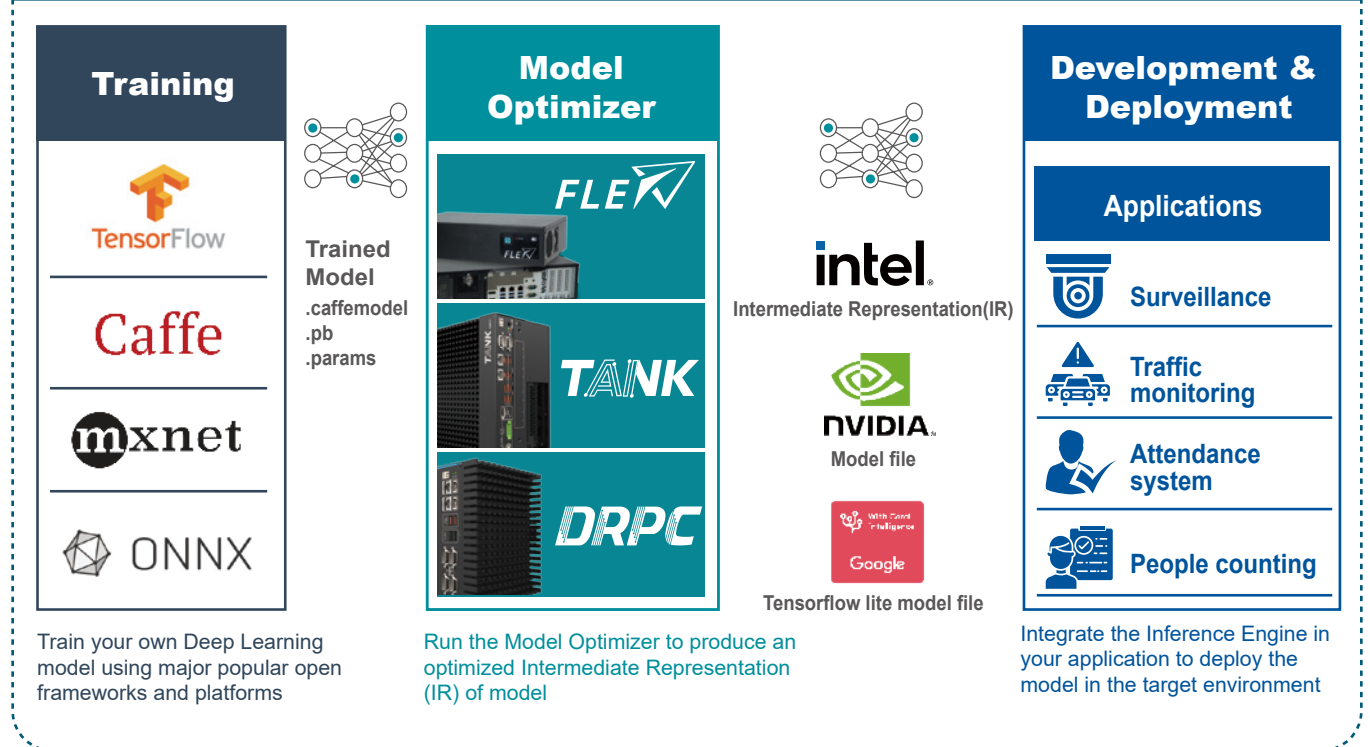
» Edge Computing

The advantages of edge computing:

● Reduce data center loading, transmit less data, reduce network traffic bottlenecks.

● Real-time applications, the data is analyzed locally, no need long distant data center.

● Lower costs, no need to implement sever grade machine to achieve non complex applications.

Server Computing

Camera

Security: low
Latency: high
Power : hungry

Sensor

Edge Computing

Ethernet Switch

Security:
High, raw data no need to be updated to server

Latency:
Low, handle the inference engine locally.

Power :
Efficient, optimize power for edge workloads

Human Sorting	Machine Vision	Deep Learning Server	Deep Learning Edge
Sorting by human bare-eyes, the standard can not fix due to different person. Low accuracy, low productivity	Training and sorting by conventional machine vision method, need well-trained engineer to teach and modify the inspection criteria. Low latency, but low accuracy if product has too much variations.	Implement deep learning method for training and sorting, reduce human bias and machine vision training process. High CTO, high latency, power hungry, high power consumption	Implement deep learning method for training and sorting, reduce human bias and machine vision training process. Low latency, low CTO, power efficiency, low power consumption

Deployment Workflow

Training

TensorFlow

Caffe

mxnet

ONNX

Train your own Deep Learning model using major popular open frameworks and platforms

Trained Model
.caffemodel
.pb
.params

Model Optimizer

FLEX

TANK

DRPC

Run the Model Optimizer to produce an optimized Intermediate Representation (IR) of model

intel.
Intermediate Representation(IR)

NVIDIA.
Model file

Google
Tensorflow lite model file

Development & Deployment

Applications

Surveillance

Traffic monitoring

Attendance system

People counting

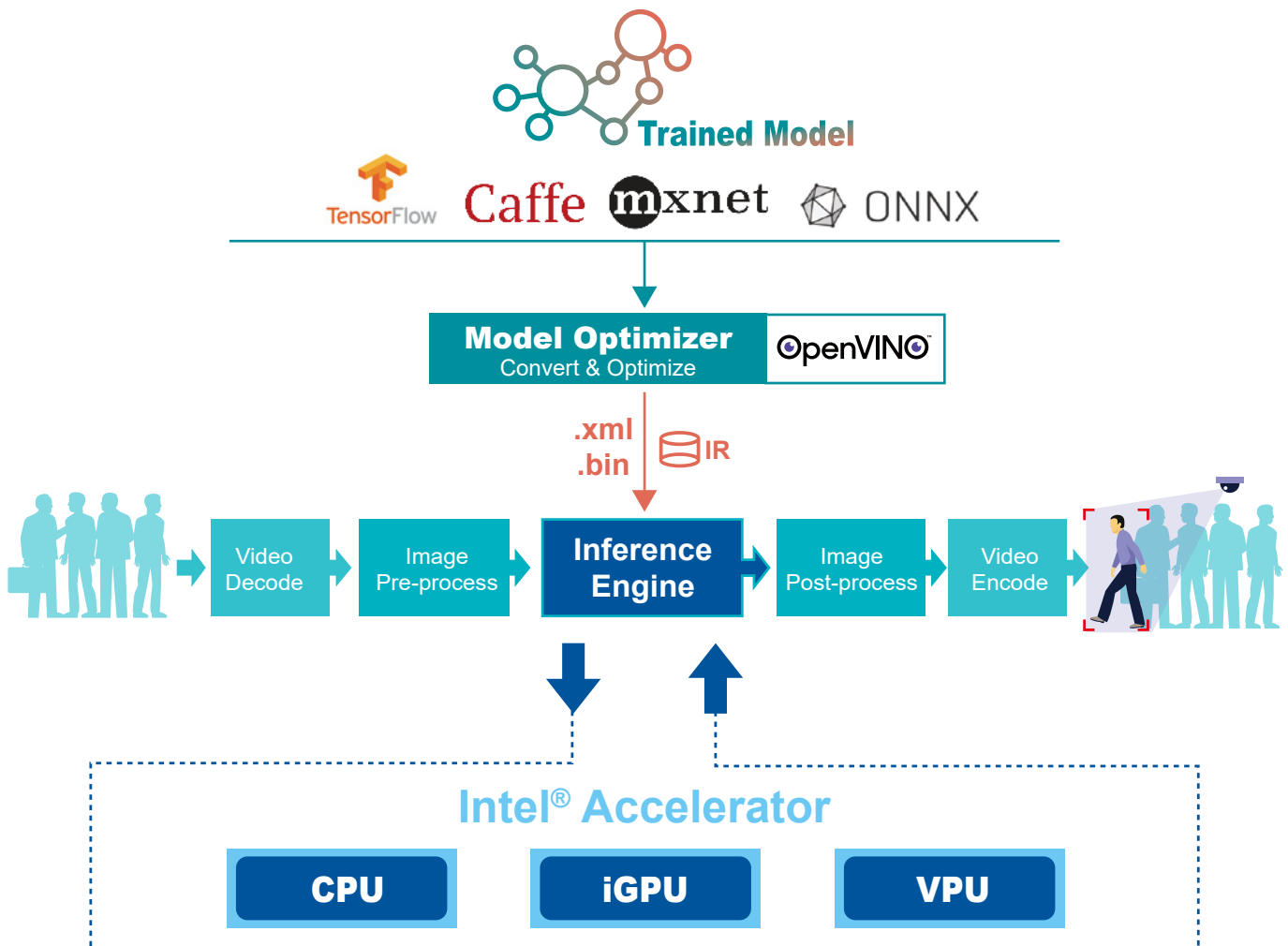Integrate the Inference Engine in your application to deploy the model in the target environment

Edge AI Software SDK

• Intel® Distribution of OpenVINO™ toolkit

Intel® Distribution of OpenVINO™ toolkit is based on convolutional neural networks (CNN), the toolkit extends workloads across multiple types of Intel® platforms and maximizes performance.

It can optimize pre-trained deep learning models such as Caffe, MXNET, and ONNX Tensorflow. The tool suite includes more than 20 pre-trained models, and supports 100+ public and custom models (includes Caffe*, MXNet, TensorFlow*, ONNX*, Kaldi*) for easier deployments across Intel® silicon products (CPU, GPU/Intel®Processor Graphics, FPGA, VPU).

Trained Model

TensorFlow   Caffe   mxnet   ONNX

Model Optimizer
Convert & Optimize   OpenVINO

.xml
.bin   IR

Video Decode → Image Pre-process → **Inference Engine** → Image Post-process → Video Encode

Intel® Accelerator

CPU   iGPU   VPU
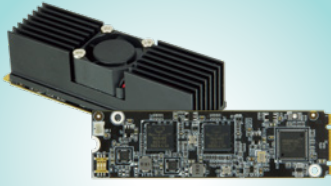
• Intel® Vision Accelerator Design

Mustang-V100-MX8
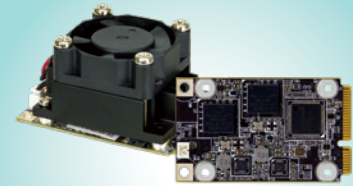Eight Intel® Movidius™ Myriad™
X MA2485 VPU

Mustang-V100-MX4
Intel® Movidius™ Myriad™ X
MA2485 VPU
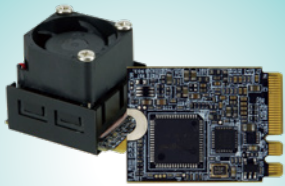
Mustang-M2AE-MX1
Intel® Movidius™ Myriad™ X
MA2485 VPU

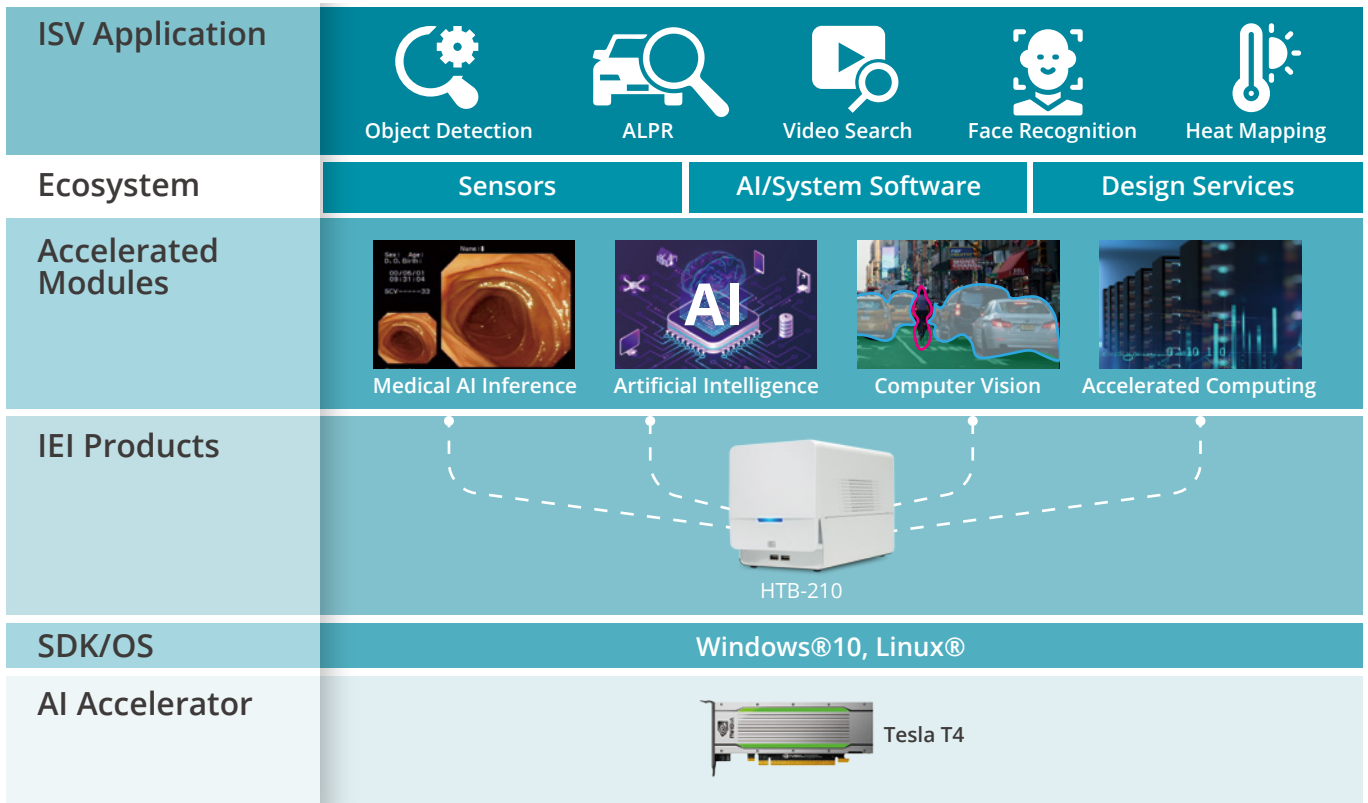**Mustang-M2BM-MX2**
Intel® Movidius™ Myriad™ X
MA2485 VPU

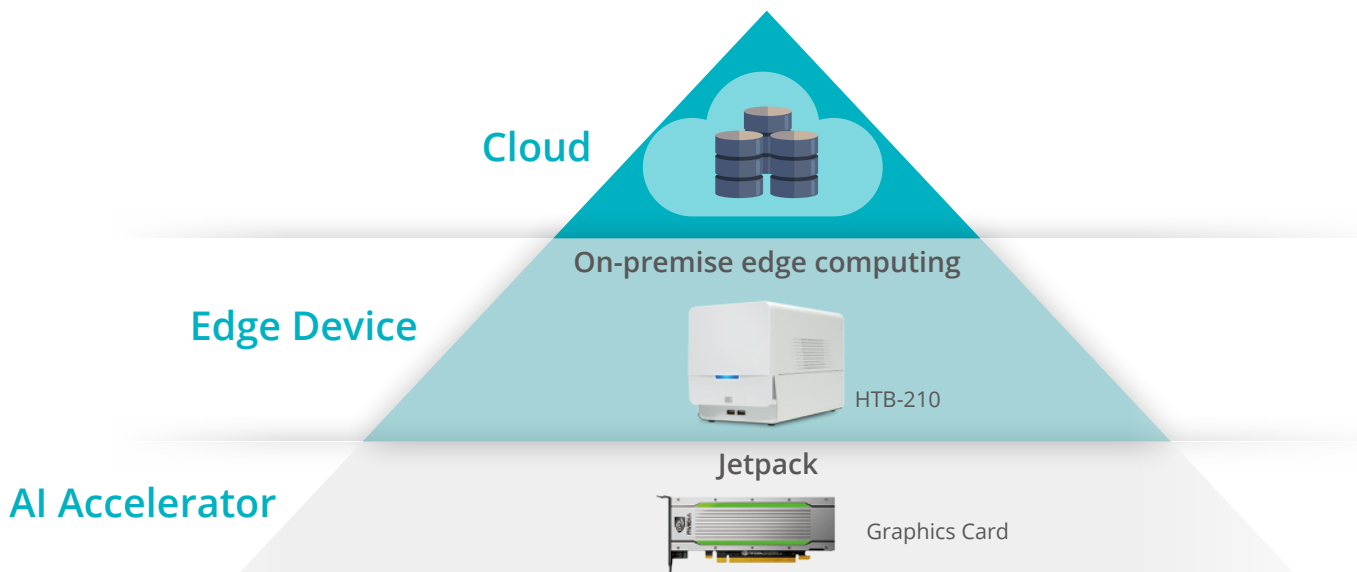**Mustang-MPCIE-MX2**
Intel® Movidius™ Myriad™ X
MA2485 VPU

• Intel® Certified Developer Kit

FLEX

TANK

DRPC

⟫ NVIDIA TensorRT

ISV Application	Object Detection	ALPR	Video Search	Face Recognition	Heat Mapping
Ecosystem	Sensors		AI/System Software		Design Services
Accelerated Modules	Medical AI Inference	Artificial Intelligence	Computer Vision		Accelerated Computing
IEI Products			HTB-210		
SDK/OS	Windows®10, Linux®				
AI Accelerator			Tesla T4		

- **IEI AI Edge Computing - Faster and Less Power**

Cloud

On-premise edge computing

Edge Device

HTB-210

Jetpack

AI Accelerator

Graphics Card

Coral Edge TPU

• Mustang-T100-T5

IEI Mustang-T100-T5 leverages the power of Google Coral edge TPU. It integrates five Coral TPU modules into one half-height, half-length, single slot PCIe card, and can provide up to 20 TOPS. It is an ideal compact PCIe accelerator for multiple AI applications.
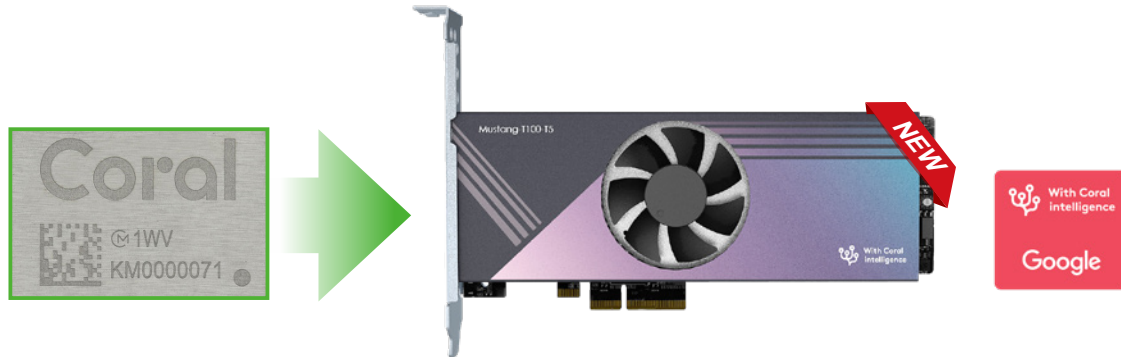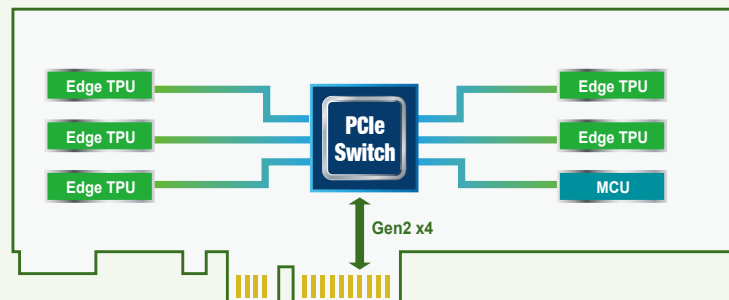
Feature

- 5 x Google Edge TPU ML accelerator
- 20 TOPS peak performance (int8)
- Host interface PCIe Gen2 x4
- Low-profile PCIe form factor
- Approximate 15W
- RoHS compliants
- Support Multiple card
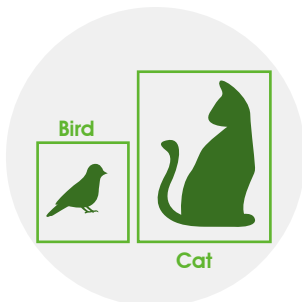
System Requirements

- Linux:
  64-bit version of Debian 10 or Ubuntu 16.04 (or newer)
- Windows:
  64-bit version of Windows 10

Mustang-T100-T5 Block Diagram

IEI provides series of system to support Mustang-T100-T5 accelerator such as TANK-870AI & FLEX-BX200AI.

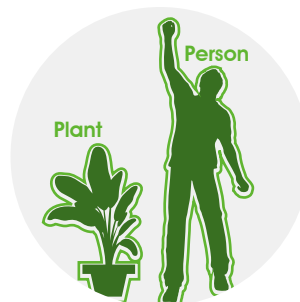## • Solutions for on-device intelligence

Object detection

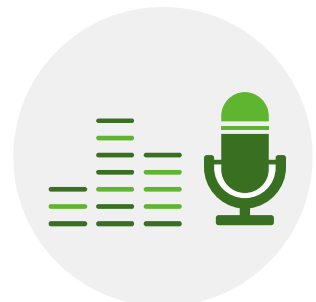Draw a square around the location of various recognized objects in an image

Pose estimation

Estimate the poses of people in an image by identifying various body joints.

Image segmentation

Identify various objects in an image and their location on a pixel-by-pixel basis.

Key phrase detection

Listen to audio samples and quickly recognize known words and phrases.

Source: https://coral.ai/

AI Use Cases

• Industrial

• Intel® AIoT Edge Insights Solution with Splunk

Intel® Edge Insights for industrial and Splunk cloud data collection and analysis services: Edge Insights for Industrial helps to address various industrial and manufacturing usages, which include data collection, storage, and analytics on a variety of hardware nodes across the factory floor. Splunk is a software platform to search, analyze and visualize the machine-generated data gathered from the websites, applications, sensors, devices, etc., which make up your IT infrastructure and business.

This solution can provide complete and convenient from data collection, storage, computing, etc. Simplify the data processing time and developing period effectively.
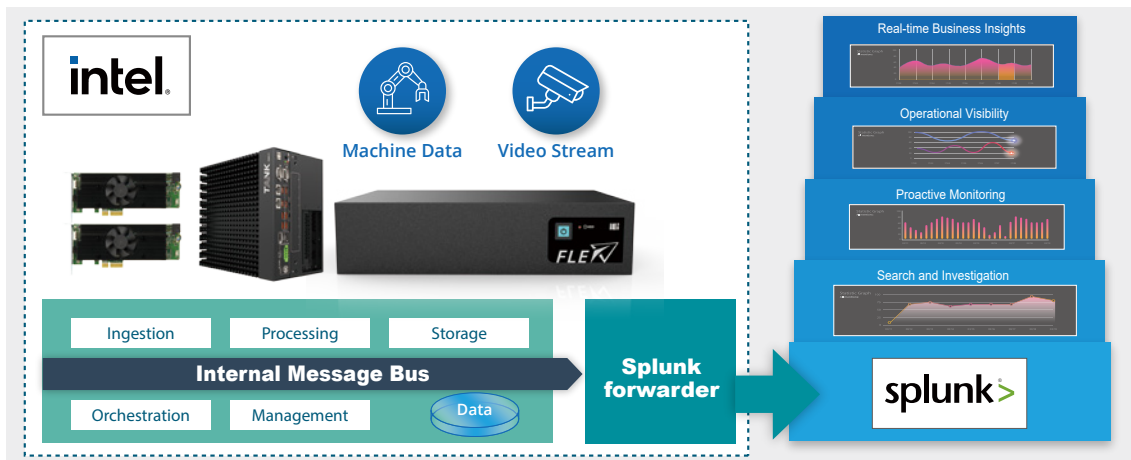
• Machine Vision for Sorting and Grading of Agricultural Products

Agricultural products are valued by their appearance. The color indicates parameters like ripeness, defects, etc. The quality decisions vary among the graders and often inconsistent. Machine vision technology offers the solution for all these problems.

The FLEX series designed for machine vision market has four PCIe 3.0 expansion slots for installing motion controller cards, GP GPU/FPGA/VPU cards and the PoE Ethernet card which is developed by IEI and has four GbE Power over Ethernet (PoE) ports compliant with IEEE 802.3af for direct connection to CCTV cameras without needing separate power.
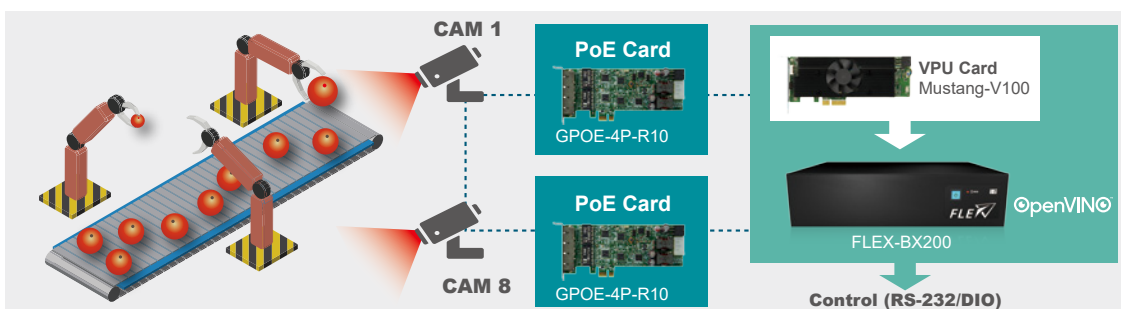
• Retail

• Social Distance Monitoring

Use the DRPC-240AI to detect crowd congestion in indoor environment for COVID-19 prevention. It can be deployed in retail hotel office and restaurant. Also, data can be sync to your remote devices.

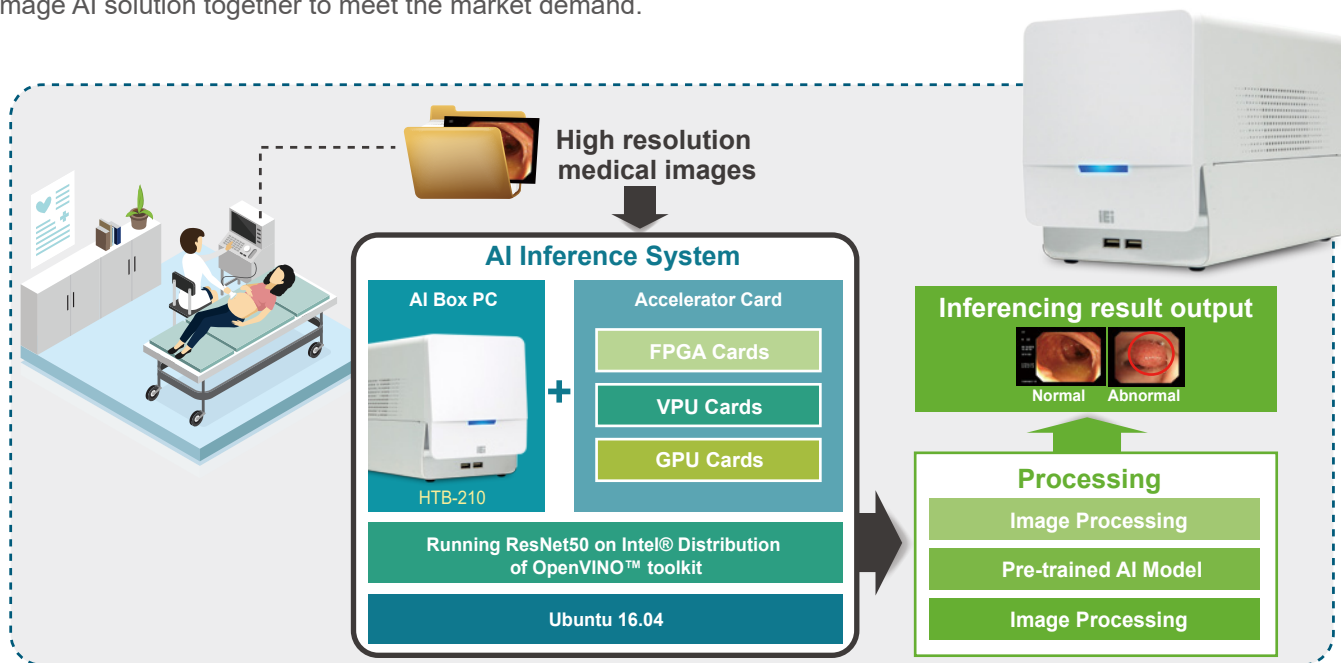| Indoor People Counting | Social Distancing | Mask/ Gender Recognition | Real Time Data Display /Sync |
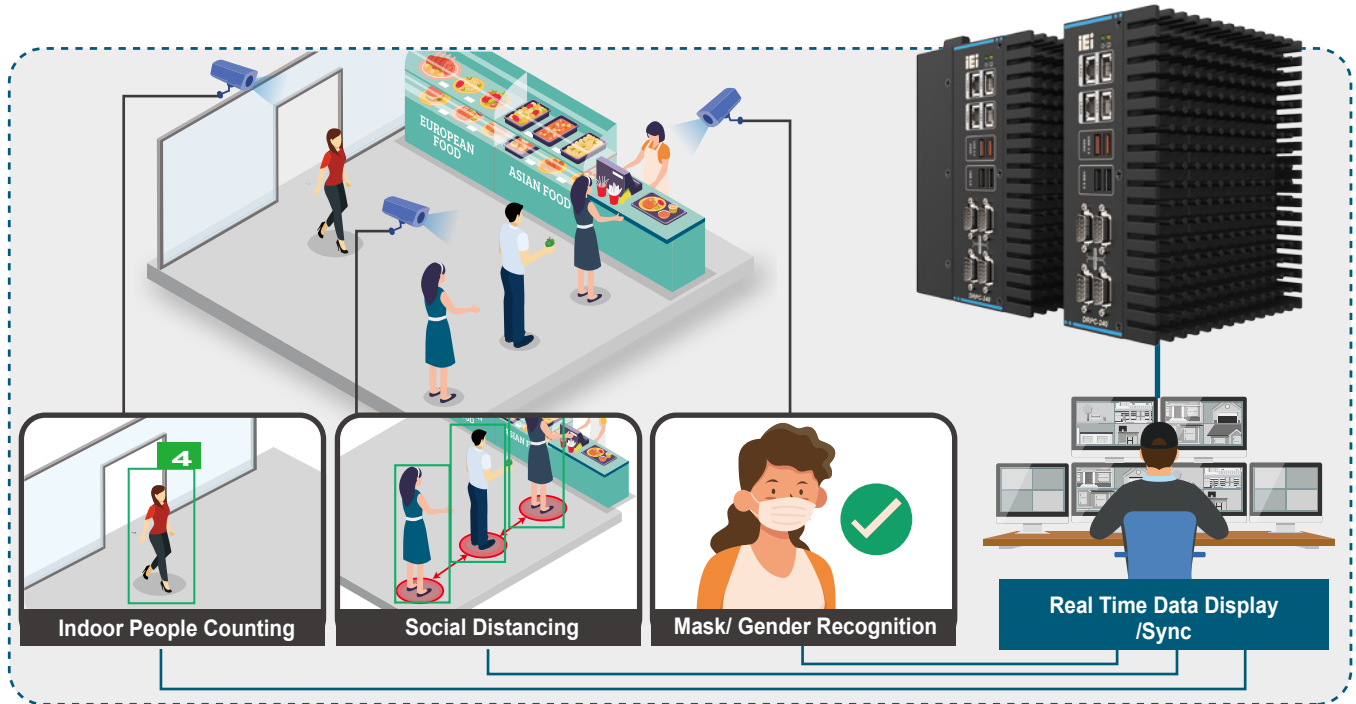
• Shopping Mall Surveillance

AI surveillance systems can be installed in shopping malls for monitoring numbers of visitor and detecting suspicious person inside the mall. With TANK-870 AIoT dev. Kit and Mustang-V10-MX8, you can expand more camera channels in shopping malls.

People counting & Face recognition
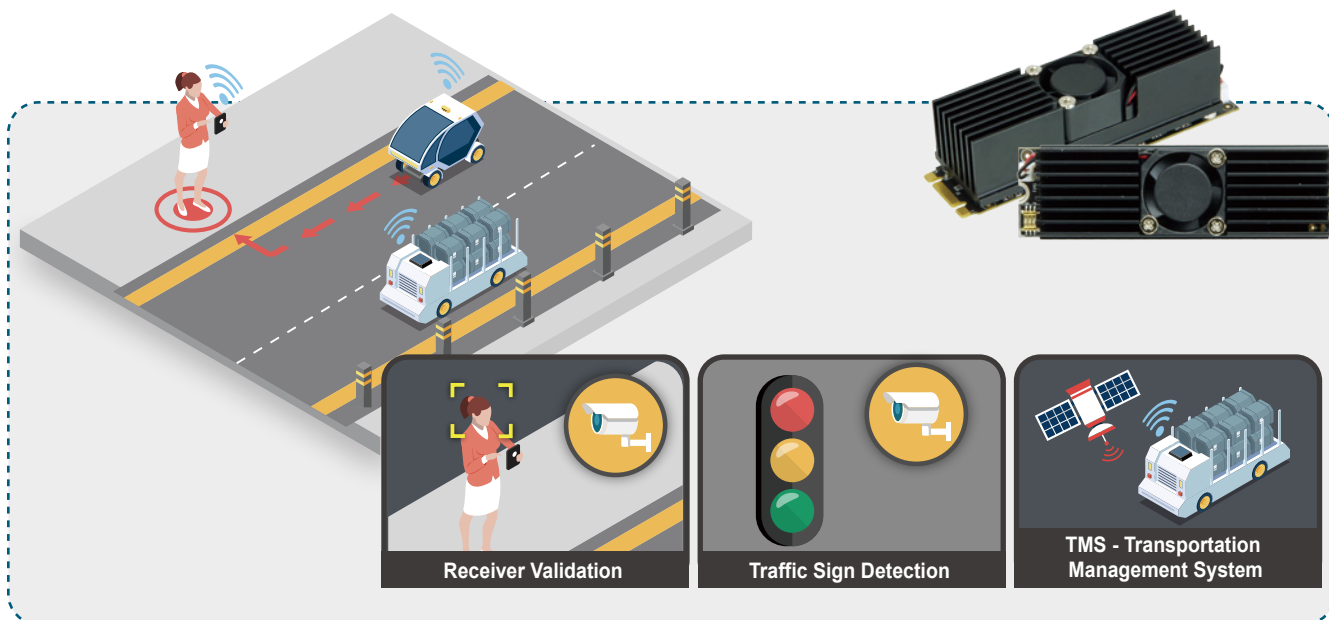
Real Time Data Display /Sync
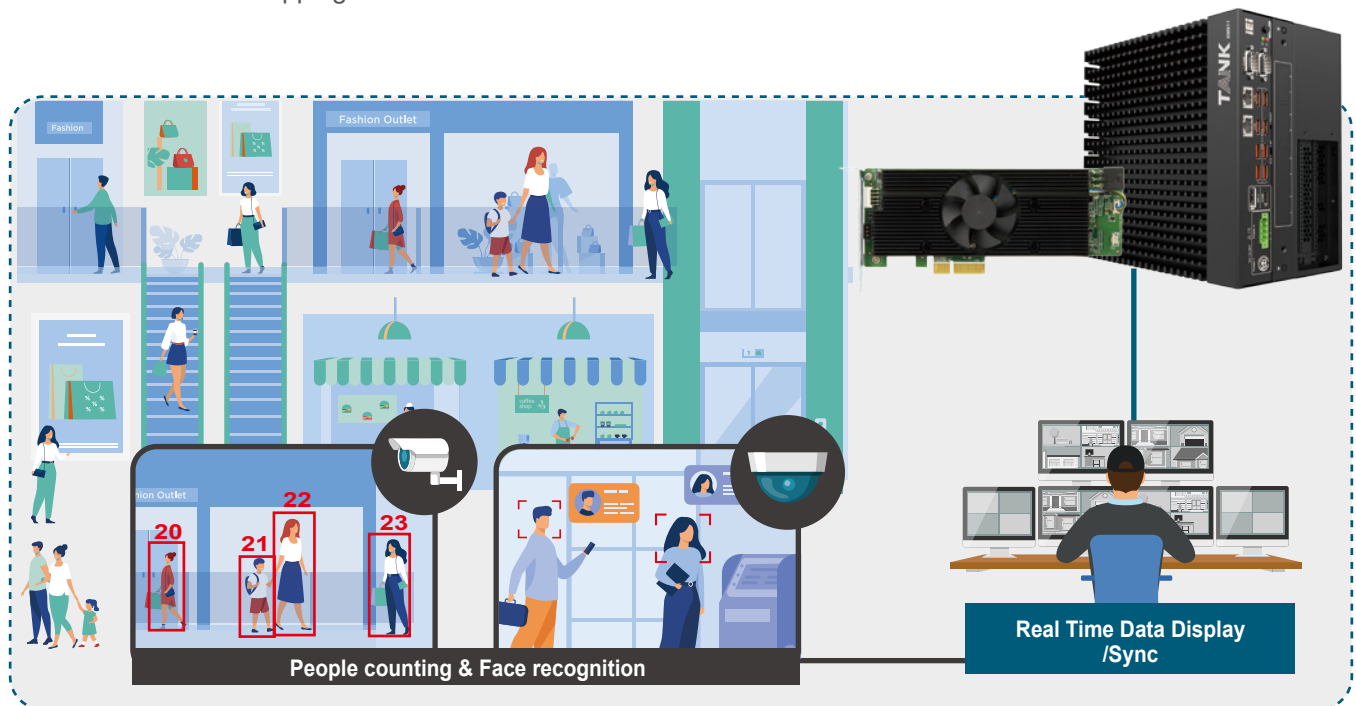
• Medical

The colon cancer could occur everywhere in the large intestine, the medical personnel need to be very cautious when doing colonoscopy. This application assists the doctor to pay more attention when inflammation, infections, ulcers, polyps or any other abnormal tissues are detected in a gastrointestinal tract inspection. We try to reduce the human error resulting from fatigue or distraction in the daily clinical work. IEI and aetherAI roll out the medical image AI solution together to meet the market demand.
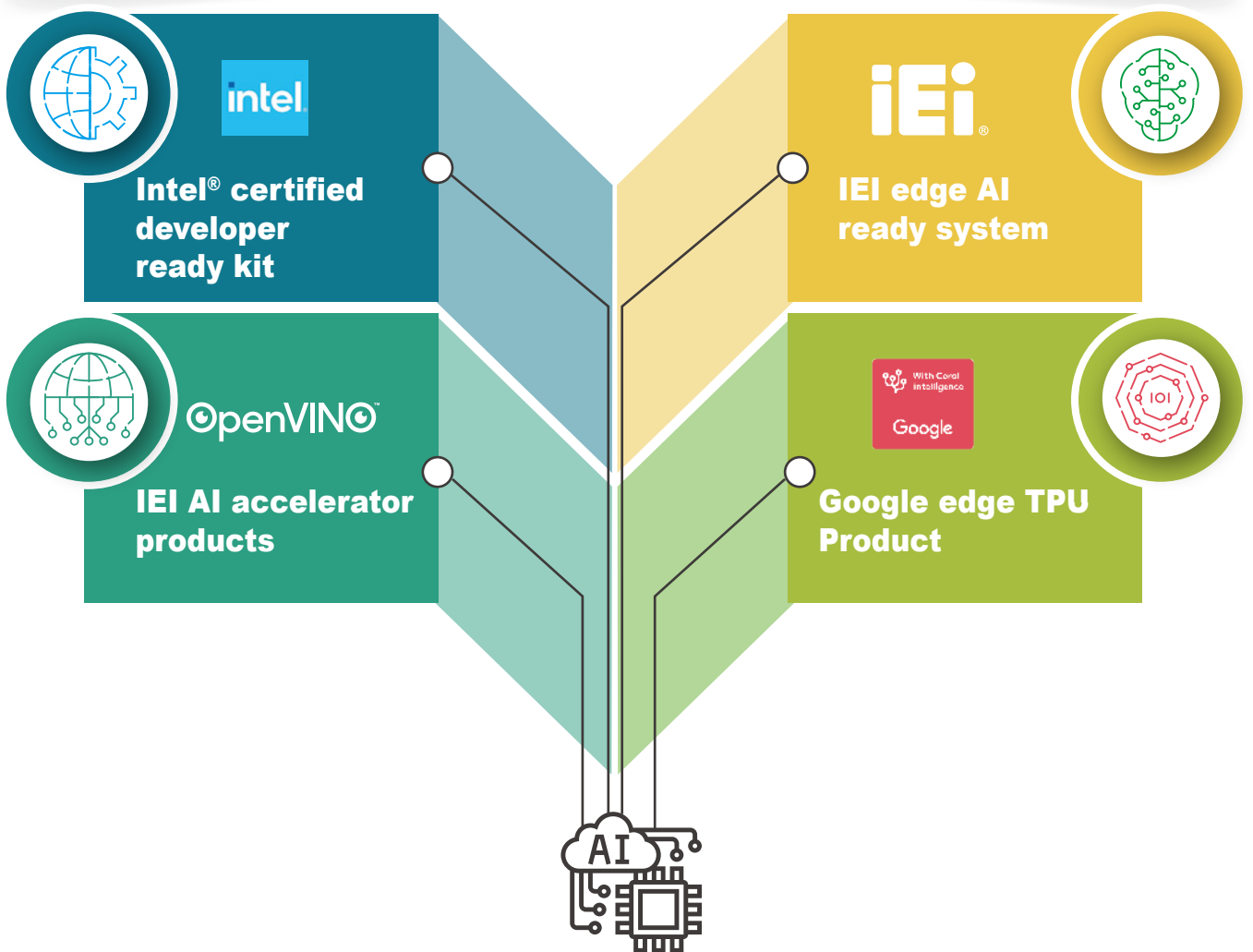
High resolution medical images

AI Inference System

AI Box PC

HTB-210

Accelerator Card

- FPGA Cards
- VPU Cards
- GPU Cards

Running ResNet50 on Intel® Distribution of OpenVINO™ toolkit

Ubuntu 16.04

Inferencing result output

Normal　Abnormal

Processing

- Image Processing
- Pre-trained AI Model
- Image Processing

• Transportation

AI Computer Vision for Electric Unmanned Delivery Vehicle

The AI computer vision can help detect and analyze image data with color information, such as traffic light or sign. And in the delivery vehicle, AI computer vision technology helps to detect receiver information to identify ID when customers are picking up their goods. Thus, computer vision AI is one of the key components in unmanned vehicle.

Receiver Validation

Traffic Sign Detection

TMS - Transportation Management System

Smart Choice for Inference System with **AI**

Intel® certified developer ready kit

IEI edge AI ready system

IEI AI accelerator products

Google edge TPU Product

OpenVINO™

With Coral Intelligence

Google

AI

TANK-XM811 AIoT Dev. Kit

NEW

Feature

- 12th Gen Intel® Core™ i5-12500TE
- Dual 2.5 GbE LAN ports
- Multiple USB 3.2 Gen 2 (10Gb/s) & COM ports
- Modulized flexible expansion chassis and backplane
- Support Mustang AI accelerator card

intel partner
Titanium

Specifications

Model		TANK-XM811 AIoT Dev. Kit
Form Factor	Color	Black C
	Dimensions (W x D x H)	137.9 x 255.4 x 230.6 mm
	System Fan	Yes
	Chassis Construction	Extruded aluminum alloys
Motherboard	CPU	Intel® Core™ i5-12500TE 1.9GHz (up to 4.3GHz, 6-Core, TDP 35W)
	Chipset	Intel® R680E
	System Memory	2 x SO-DIMM DDR4 3200MHz (2 x 8GB non-ECC pre-installed, up to 64GB, support ECC SKU)
Storage	Hard Drive	1 x 2.5" SSD bay (256GB SSD pre-installed)
I/O Interfaces	Ethernet	2 x RJ-45: 1 x Intel® I225LM 2.5GbE 1 x Intel® I225V 2.5GbE
	USB 3.2 Gen2(10Gb/s)	8
	COM	2 x RS-232/422/485 4 x RS-232
	Digital I/O	12-bit (6-in/6-out)
	Display	1 x DP++ (up to 4096 x 2160@60Hz) 1 x HDMI (up to 4096 x 2160@30Hz)
Expansion Slots	M.2	1 x 2230 A-key (PCIe x1/ USB 2.0, support Intel® vPro) 1 x 2280 M-key (PCIe x4)
	Backplane	2 x PCIe x8 slot (total power up to 75W, support FHHL card)
Power	Power Input	DC Jack: 12V ~ 28V DC Terminal Block: 12V ~ 28V DC
	Remote Power	Terminal Block: 2-pin
Reliability	Mounting	Wall mount
	Operating Temperature	-20°C ~ 60°C with air flow (SSD), 10% ~ 95% non-condensing
	Storage Temperature	-40°C ~ 80°C, 10% ~ 95%, non-condensing
	Operating Shock	Half-sine wave shock 5G, 11ms, 100 shocks per axis (SSD)
	Operation Vibration	MIL-STD-810G 514.6C-1 (with SSD)
	Weight (Net/Gross)	4.6 kg/5.6 kg
	Safety / EMC	CE/FCC
	Watchdog Timer	Programmable 1 ~ 255 sec/min
OS	Supported OS	Windows® 10 IoT Enterprise/ Linux

Ordering Information

| Part No.	Description
TANK-XM811AI-i5AD/2A-R10	Ruggedized embedded system with Intel® Core™ i5-12500TE 1.9GHz (up to 4.3 GHz, 6-Core, TDP 35W), 2 x 8GB DDR4 pre-installed, 2 x PCIe x8 expansion, 2.5" 256MB SSD, 12~28V DC, 180W AC DC power adapter, RoHS

AI Accelerator Card Options

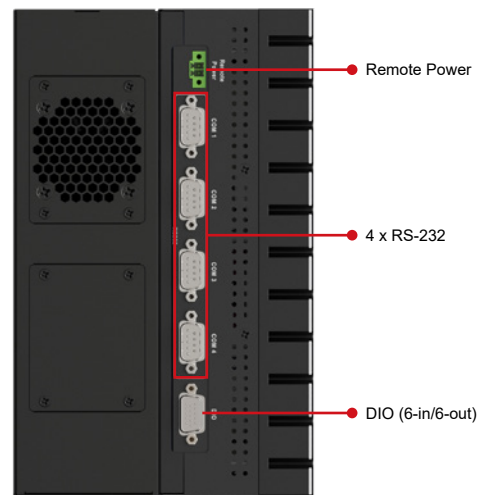| Part No.	Description
Mustang-V100-MX8-R20	Computing Accelerator Card with 8 x Intel® Movidius™ Myriad™ X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

Packing List

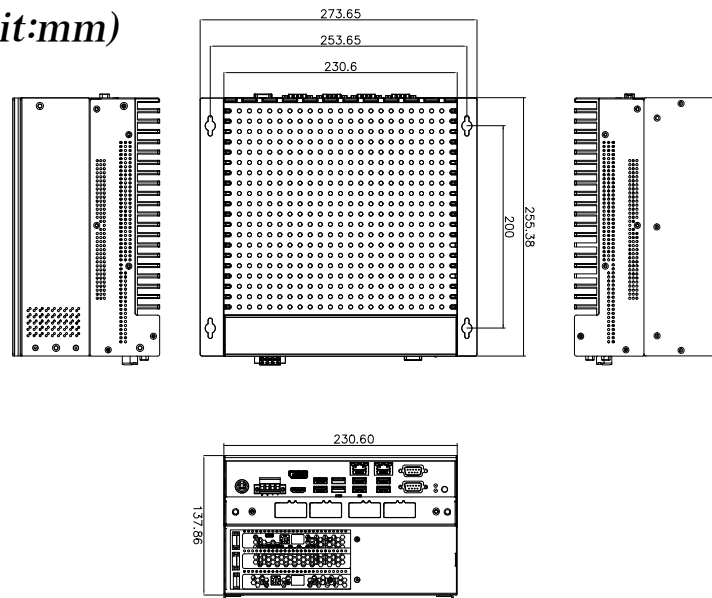| 1 x Mounting Screw	1 x Wall Mounting Kit	1 x QSG
1 x 180W Adapter	1 x Power Cord	

Fully Integrated I/O

Top View
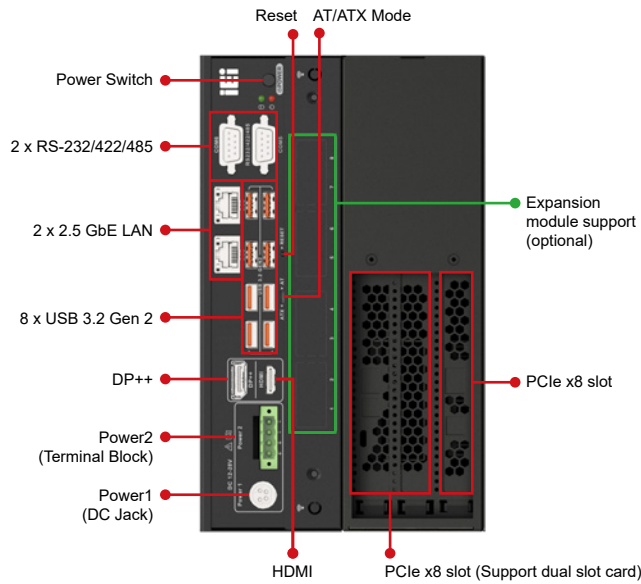
Front View

Dimensions (Unit:mm)

TANK AIoT Developer Kit

Feature

- 6th/7th Gen Intel® Core™/Xeon® processor platform with Intel® Q170/C236 chipset and DDR4 memory
- Dual independent display with high resolution support
- Rich high-speed I/O interfaces on one side for easy installation
- On-board internal power connector for providing power to add-on cards
- Great flexibility for hardware expansion
- Pre-installed Ubuntu 16.04 LTS
- Pre-installed Intel® Distribution of Open Visual Inference & Neural Network Optimization (OpenVINO™) toolkit, Intel® Media SDK, Intel® System Studio and Arduino® Create

intel partner Titanium

Specifications

Model	TANK AIoT Dev. Kit
Chassis	
Color	Black C + Silver
Dimensions (WxDxH)	121.5 x 255.2 x 205 mm (4.7" x 10" x 8")
System Fan	Yes
Chassis Construction	Extruded aluminum alloys
Weight (Net/Gross)	4.2 kg (9.26 lbs)/ 6.3 kg (13.89 lbs)
Motherboard	
CPU	Intel® Xeon® E3-1268LV5 2.4GHz (up to 3.4 GHz, Quad Core, TDP 35W) Intel® Core™ i7-7700T 2.9GHz (up to 3.8 GHz, Quad Core, TDP 35W) Intel® Core™ i5-7500T 2.7GHz (up to 3.3 GHz, Quad Core, TDP 35W) Intel® Core™ i7-6700TE 2.4 GHz (up to 3.4GHz, quad-core, TDP 35W) Intel® Core™ i5-6500TE 2.3 GHz (up to 3.3GHz, quad-core, TDP 35W)
Chipset	Intel® Q170/C236 with Xeon® E3 only
System Memory	2 x 260-pin DDR4 SO-DIMM, 8 GB pre-installed (for i5/i5KBL/i7 sku) 16 GB pre-installed (for i7KBL sku) 32 GB pre-installed (for E3 sku)
Storage	
Hard Drive	2 x 2.5'' SATA 6Gb/s HDD/SSD bay, RAID 0/1 support (1x 2.5" 1TB HDD pre-installed)
I/O Interfaces	
USB 3.2 Gen 1	4
USB 2.0	4
Ethernet	2 x RJ-45 LAN1: Intel® I219LM PCIe controller with Intel® vPro™ support LAN2 (iRIS): Intel® I210 PCIe controller
COM Port	4 x RS-232 (2 x RJ-45, 2 x DB-9 w/2.5KV isolation protection) 2 x RS-232/422/485 (DB-9)

Digital I/O	8-bit digital I/O, 4-bit input / 4-bit output
Display	1 x VGA 1 x HDMI/DP 1 x iDP (optional)
Resolution	VGA: Up to 1920 x 1200@60Hz HDMI/DP: Up to 3840x2160@30Hz / 4096×2304@60Hz
Audio	1 x Line-out, 1 x Mic-in
TPM	1x Infineon TPM 2.0 Module
Expansions	
Backplane	2 x PCIe x8
PCIe Mini	1 x Half-size PCIe Mini slot 1 x Full-size PCIe Mini slot (supports mSATA, colay with SATA)
Power	
Power Input	DC Jack: 9 V~36 V DC Terminal Block: 9 V~36 V DC
Power Consumption	19 V@3.68 A (Intel® Core™ i7-6700TE with 8 GB memory)
Internal Power output	5V@3A or 12V@3A
Reliability	
Mounting	Wall mount
Operating Temperature	E3-1268LV5 -20°C ~ 60°C with air flow (SSD), 10% ~ 95%, non-condensing i7-7700T -20°C ~ 35°C with air flow (SSD), 10% ~ 95%, non-condensing i5-7500T -20°C ~ 45°C with air flow (SSD), 10% ~ 95%, non-condensing i7-6700TE -20°C ~ 45°C with air flow (SSD), 10% ~ 95%, non-condensing i5-6500TE -20°C ~ 60°C with air flow (SSD), 10% ~ 95%, non-condensing
Operating Vibration	MIL-STD-810G 514.6 C-1 (with SSD)
Safety/EMC	CE/FCC/RoHS
OS	
Supported OS	Win10/Linux Ubuntu 16.04 LTS

Warning: DO NOT install the add-on card into the TANK AIoT Dev. Kit before shipment. It is recommended to ship them with their original boxes to prevent the add-on card from being damaged.

Ordering Information

Part No.	Description
TANK-870AI-E3/32G/2A-R11	Ruggedized embedded system with Intel® Xeon® E3-1268LV5 2.4GHz, (up to 3.4 GHz, Quad Core, TDP 35W), 32 GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD, TPM 2.0, 9~36V DC, 150W AC DC power adaptor, RoHS
TANK-870AI-i7KBL/16G/2A-R11	Ruggedized embedded system with Intel® Core™ i7-7700T 2.9GHz, (up to 3.8 GHz, Quad Core, TDP 35W), 16 GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD, TPM 2.0, 9~36V DC, 150W AC DC power adaptor, RoHS
TANK-870AI-i7KBL/16G/2A/V-R11	Ruggedized embedded system with Intel® Core i7-7700T 2.9GHz, (up to 3.8 GHz, Quad Core, TDP 35W), 16GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD, TPM 2.0, 9~36V DC, 150W AC DC power adaptor, Mustang-V100, RoHS
TANK-870AI-i5KBL/8G/2A-R11	Ruggedized embedded system with Intel® Core™ i5-7500T 2.7GHz, (up to 3.3 GHz, Quad Core, TDP 35W), 8 GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD, TPM 2.0, 9~36V DC, 150W AC DC power adaptor, RoHS
TANK-870AI-i5KBL/8G/2A/F-R11	Ruggedized embedded system with Intel® Core i5-7500T 2.7GHz, (up to 3.3 GHz, Quad Core, TDP 35W), 8 GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD , TPM 2.0, 9~36V DC, 150W AC DC power adaptor, Mustang-F100, RoHS
TANK-870AI-i5KBL/8G/2A/V-R11	Ruggedized embedded system with Intel® Core i5-7500T 2.7GHz, (up to 3.3 GHz, Quad Core, TDP 35W), 8 GB DDR4 pre-installed memory, 2 x PCIe by 8 expansion, 2.5" 1TB HDD, TPM 2.0, 9~36V DC, 150W AC DC power adaptor, Mustang-V100, RoHS

AI Accelerator Card Options

| Part No.	Description
Mustang-V100-MX8-R20	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

Peripheral Options

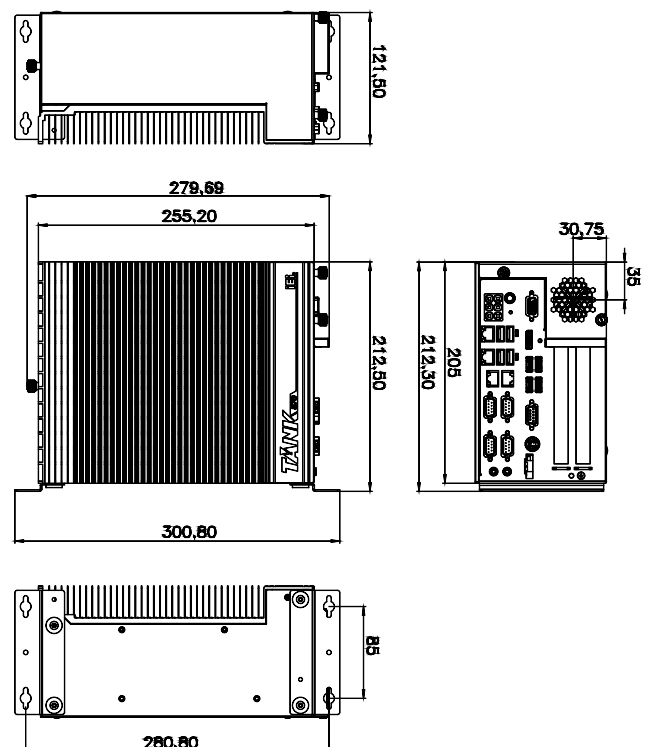| Part No.	Description
IPCIE-4POE-R10	PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3af compliant, RoHS
72213100-5010000-000-RS	2.5" HDD;WD;Caviar Blue;WD10SPZX;SATA3.0(6Gb/s, 600MB/s);1TB;128MB;5400 RPM;NoAssign;NoAssign;;CCL;RoHS

Packing List

1 x Chassis Screw	1 x 150W Adapter
1 x Mounting Bracket	1 x Power Cord
1 x QSG	

Fully Integrated I/O
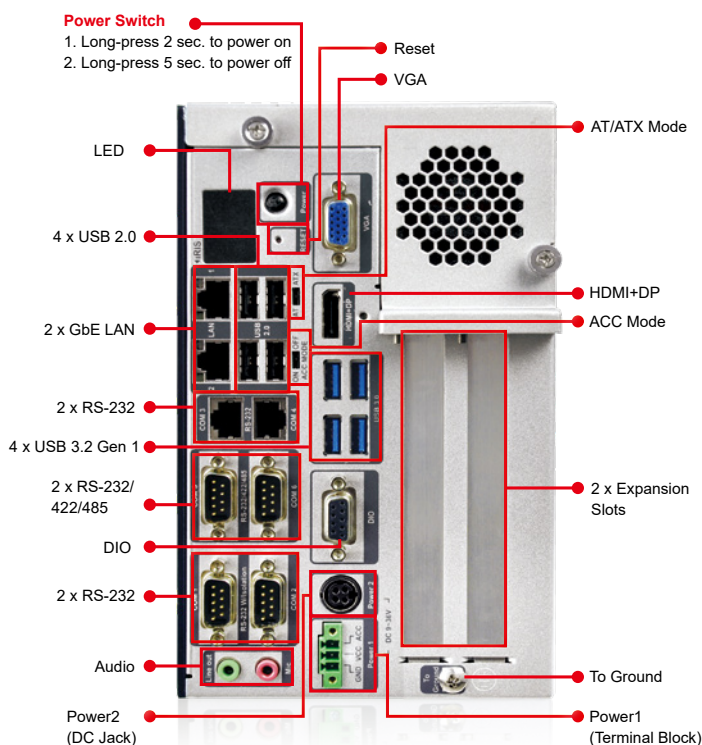
Dimensions (Unit:mm)

FLEX-BX200AI

2U AI Modular PC with 8th/9th Generation LGA 1151 Intel® Core™ i and Xeon® Processor

Feature

- 2U AI Modular PC with 8th/9th Generation LGA 1151 Intel® Core™/Xeon® processor with Intel® Q370/C246 chipset and DDR4 memory
- Four hot-swappable and accessible HDD drive bays, support RAID 0/1/5/10
- Support PCIe 3.0 by 4 and PCIe 3.0 by 8 slots
- M.2 2280 PCIe Gen 3.0 x4 NVMe™ SSD support
- Dual independent display with high resolution support
- Rich high-speed I/O interfaces on one side for easy installation
- Support for optional Mustang-V100-MX8 PCIe Accelerator Card for offloading AI/DL workloads
- Support Wi-FI 802.11 AC dual and Bluetooth V5.1 (pre-installed)

intel partner Titanium

Specifications

Model		FLEX-BX200AI Series
System	CPU	Intel® Xeon® E-2278GEL 2.0GHz (up to 3.9GHz, 8-core, TDP 35W) 9th Generation Intel® Core™ i7-9700TE 1.8GHz (up to 3.8GHz, 8-core, TDP 35W) 9th Generation Intel® Core™ i5-9500TE 2.2GHz (up to 3.6GHz, 6-core, TDP 35W) 8th Generation Intel® Core™ i5-8500 3.0GHz (up to 4.1GHz, 6-core, TDP 65W)
	Chipset	Intel® C240 Series Chipsets C246 (Coffee Lake) Intel® 300 Series Chipsets Q370 (Coffee Lake)
	Memory	2 x 288-pin 2666/2400 MHz dual-channel DDR4 unbuffered DIMM supporting up to 64GB
	Graphics Engine	Intel® HD Graphics Gen 9 Engines with 16 low-power execution units, supporting DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0
	Ethernet	LAN1: Intel® I219LM with Intel® AMT 11.0 supported LAN2: Intel® I210 PCIe controller
Storage		4 x Accessible 2.5" SATA 6Gb/s HDD/SSD bay (with RAID 0/1/5/10 support, LED indicator, pre-installed 1TB HDD) 1 x NGFF M.2 (2280) M-Key socket (supports NVMe SSD)
Wireless Communication	WLAN	Intel® Wireless-AC 9260 802.11ac, 2.4/5GHz (by M.2 2230)
	Bluetooth	Bluetooth V5.1
	WWAN and GNSS	M.2 3042 LTE (optional)
I/O Ports and Switches		2 x HDMI output 2 x GbE LAN (1x I219 support vPro, 1x I210) 6 x USB 3.2 Gen1 Type-A 2 x RS-232 DB-9 1 x Mic in 1 x Line out 1 x AC inlet 4 x SMA Power button with power LED (power on=Blue) AT/ATX mode switch Reset button
TPM		TPM 2.0
Expansion Slots		2 x PCIe 3.0 x8 1 x PCIe 3.0 x4 1 x M.2 B-Key 2242 socket (with SIM slot for 3G/LTE, supports PCIe 3.0 x1 & USB 3.2 Gen1) 1 x M.2 M-Key 2280 socket (supports PCIe 3.0 x4)
Thermal Solution		3 x System fan, 1 x CPU cooler
Power Supply		AC input ATX power supply - 350W power supply - Input: 90VAC~264VAC, 50/60Hz - Output (max.): 3.3V@14A, 5V@16A, 12V@29A, -12V@0.3A
Watchdog Timer		Software programmable support 1~255 sec. system reset
Construction	Chassis Construction	Metal housing
	Mounting	Wall/Rack mount
	Color	Black
	Dimensions (LxDxH) (mm)	357 x 230 x 88
	Net Weight	4 kg
Environmental	Operating Temperature	-10°C ~ 50°C
	Storage Temperature	-20°C ~ 60°C
	Operating Humidity	5% ~95%, non-condensing
	Vibration	5~17Hz, 0.1 double amplitude displacement 17~640Hz 1.5G acceleration peak to peak
	Shock	10G acceleration part to part (11ms)
	Safety/EMC	CE/FCC/RoHS

Ordering Information

Part No.	Description
FLEX-BX200AI-XER/32G-R10	2U AI Modular Box PC, 9th Gen Intel® Xeon® E-2278GEL 2.0GHz (Up to 3.9GHz, 8-core, TDP 35W), 32GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, R10
FLEX-BX200AI-XER/32G/V-R10	2U AI Modular Box PC, 9th Gen Intel® Xeon® E-2278GEL 2.0GHz (Up to 3.9GHz, 8-core, TDP 35W), 32GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, with Mustang-V100-MX8, R10
FLEX-BX200AI-i7R/16G-R10	2U AI Modular Box PC, 9th Gen Intel® Core™ i7-9700TE 1.8GHz (Up to 3.8GHz, 8-core, TDP 35W), 16GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, R10
FLEX-BX200AI-i7R/16G/V-R10	2U AI Modular Box PC, 9th Gen Intel® Core™ i7-9700TE 1.8GHz (Up to 3.8GHz, 8-core, TDP 35W), 16GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, with Mustang-V100-MX8, R10
FLEX-BX200AI-i5R/8G-R10	2U AI Modular Box PC, 9th Gen Intel® Core™ i5-9500TE 2.2GHz (Up to 3.6GHz, 6-core, TDP 35W), 8GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, R10
FLEX-BX200AI-i5R/8G/V-R10	2U AI Modular Box PC, 9th Gen Intel® Core™ i5-9500TE 2.2GHz (Up to 3.6GHz, 6-core, TDP 35W), 8GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, with Mustang-V100-MX8, R10
FLEX-BX200AI-i5/8G-R10	2U AI Modular Box PC, 8th Gen Intel® Core™ i5-8500 3.0GHz (Up to 4.1GHz, 6-core, TDP 65W), 8GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, R10
FLEX-BX200AI-i5/8G/V-R10	2U AI Modular Box PC, 8th Gen Intel® Core™ i5-8500 3.0GHz (Up to 4.1GHz, 6-core, TDP 65W), 8GB DDR4, 2.5" 1TB HDD , TPM 2.0, 350W PSU, with Mustang-V100-MX8, R10

Packing List

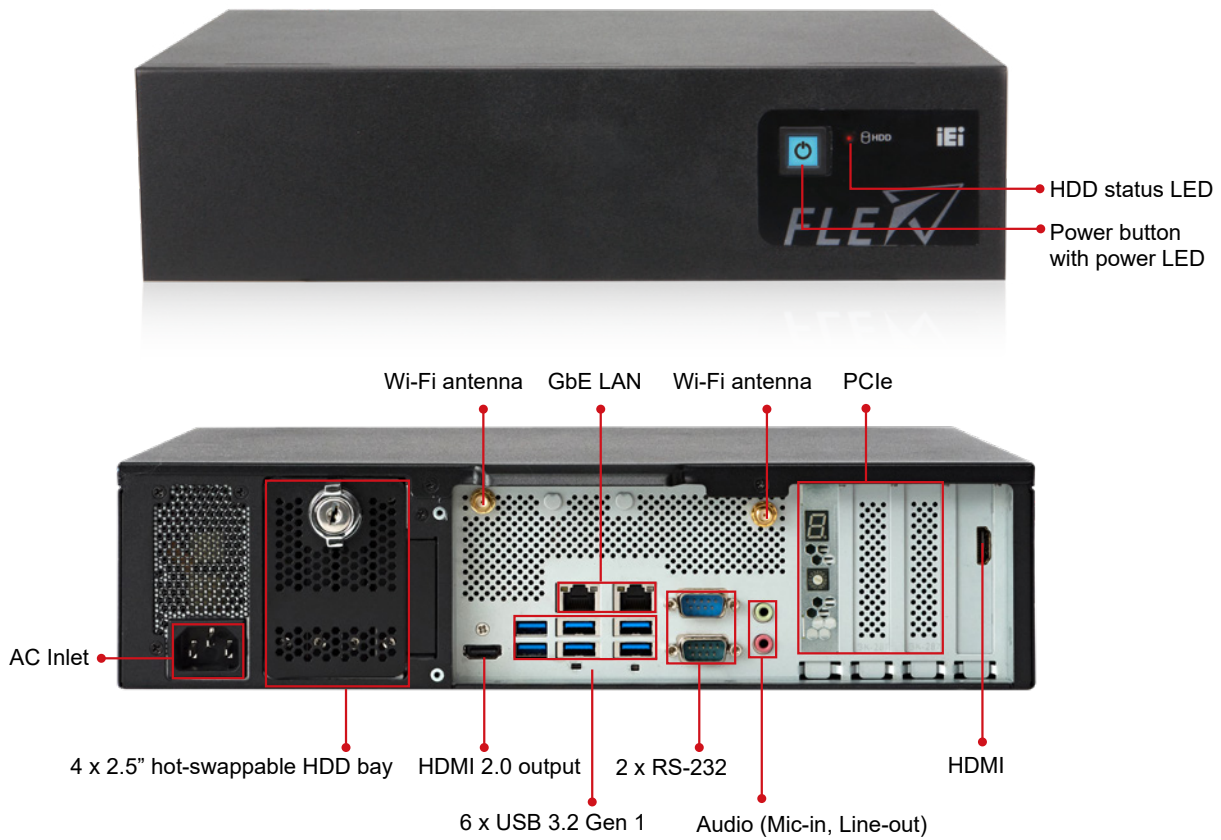| Item	Q'ty	Remark
32702-000200-100-RS	1	European power cord, 1830mm
41020-0521C2-00-RS	2	Wall mount kit, black
44035-040062-RS	4	M4*6 oval head screw for wall mount kit, black
	1	Key for HDD cover
	2	Wi-Fi antenna

Options

Part No.	Description
FLEX-BXRK-R10	Rack mount kit

I/O Interface

HDD status LED

Power button with power LED

Wi-Fi antenna   GbE LAN   Wi-Fi antenna   PCIe

AC Inlet

4 x 2.5" hot-swappable HDD bay   HDMI 2.0 output   2 x RS-232   HDMI

6 x USB 3.2 Gen 1   Audio (Mic-in, Line-out)

FLEX-BX200AI
Dimensions *(Unit: mm)*

374
357
R2.50
R5
100
230

95.40
88

239.68
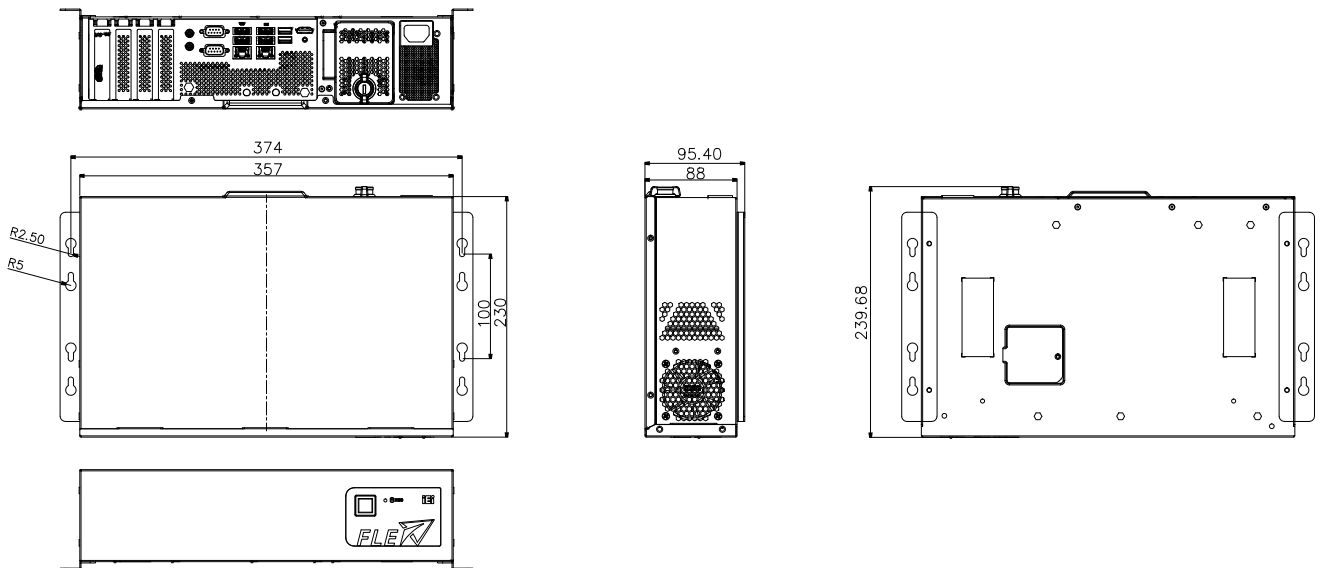
FLEX-BX210-Q470

Feature

- 2U AI PC with 10th Generation LGA 1200 Intel® Core™/Xeon® processor with Intel® Q470 chipset and DDR4 memory
- Four hot-swappable and accessible HDD drive bays support RAID 0/1/5/10
- Support PCIe 3.0 by 4 and PCIe 3.0 by 8 slots
- M.2 2280 PCIe 3.0 x4 NVMe™ SSD support
- Dual independent display with high resolution support
- TPM data protection and reliable authentication
- Support for optional Mustang series PCIe accelerator card for offloading AI/DL workloads

intel.
partner
Titanium

Specifications

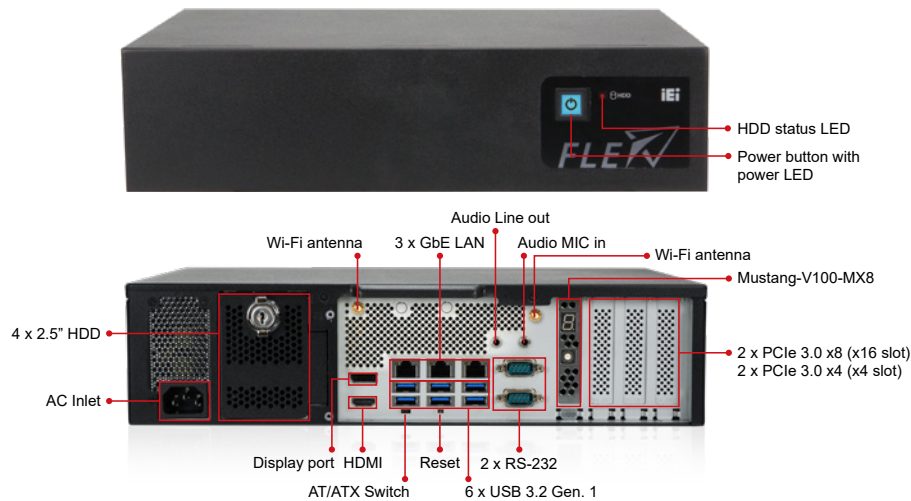| Model		FLEX-BX210-Q470
System	CPU	10th Generation Intel®Core™ i9-10900TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W) 10th Generation Intel®Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W)
	Chipset	Intel® 400 Series Chipsets (Comet Lake)
	Memory	2 x 288-pin 2933/2666 MHz dual-channel DDR4 unbuffered DIMM supporting up to 64GB Xeon W with 32GB RAM Pre-installed Core i9 with 16GB RAM Pre-installed Core i5 with 8GB RAM Pre-installed
	Graphics Engine	Intel® HD Graphics Gen 9.5 Engines with low power 16 execution unit, supports DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0
	Ethernet	LAN1: Intel® I219LM with Intel® AMT 11.0 supported LAN2/LAN3: Intel® I210 PCIe controller
	Storage	4 x Accessible 2.5" HDD/SSD SATA 6Gb/s bay (RAID 0/1/5/10 supported) with LED indicator 1 x NGFF M.2 (2280) M key socket (NVMe SSD supported), pre-installed one 2.5" 1TB HDD
Wireless Communication	WLAN	Intel® AC 9260 802.11ac, 2.5/5GHz, 2T/2R (by M.2 2230)
	Bluetooth	Bluetooth V5.1
	WWAN and GNSS	M.2 3042 LTE (optional)
I/O Ports and Switches	I/O Ports and Switches	1 x Display port output 4 x SMA 1 x HDMI output 6 x USB 3.2 Gen1 Type-A 1 x Line out 3 x GbE LAN (1 x I219 support vPro, 2 x I210) 1 x AC inlet Power button with power LED (power on=Blue) 2 x RS-232 DB-9 AT/ATX mode switch 1 x Mic in Reset button
	TPM	TPM 2.0 (pre-installed)
Expansion Slots		2 x PCIe 3.0 x8 2 x PCIe 3.0 x4 1 x M.2 B-Key 2242 socket (with SIM slot for 3G/LTE, supports PCIe 3.0 x1 & USB 3.2 Gen1) 1 x M.2 M-Key 2280 socket (supports PCIe 3.0 x4)
Thermal Solution		3 x System fan, 1 x CPU cooler
Power Supply		AC input ATX power supply - 350W power supply - Input: 90VAC~264VAC, 50/60Hz - Output (max.): 3.3V@14A, 5V@16A, 12V@29A, -12V@0.3A
Watchdog Timer		Software programmable support 1~255 sec. system reset
Construction	Chassis Construction	Metal housing
	Mounting	Wall/Rack mount
	Color	Black
	Dimensions (LxDxH) (mm)	357 x 230 x 88
	Net Weight	4 kgs
Environmental	Operating Temperature	-10°C ~ 50°C
	Storage Temperature	-20°C ~ 60°C
	Operating Humidity	5% ~95%, non-condensing
	Vibration	5~17Hz, 0.1 double amplitude displacement 17~640Hz 1.5G acceleration peak to peak
	Shock	10G acceleration part to part (11ms)
	Safety/EMC	CE/FCC/RoHS

Ordering Information

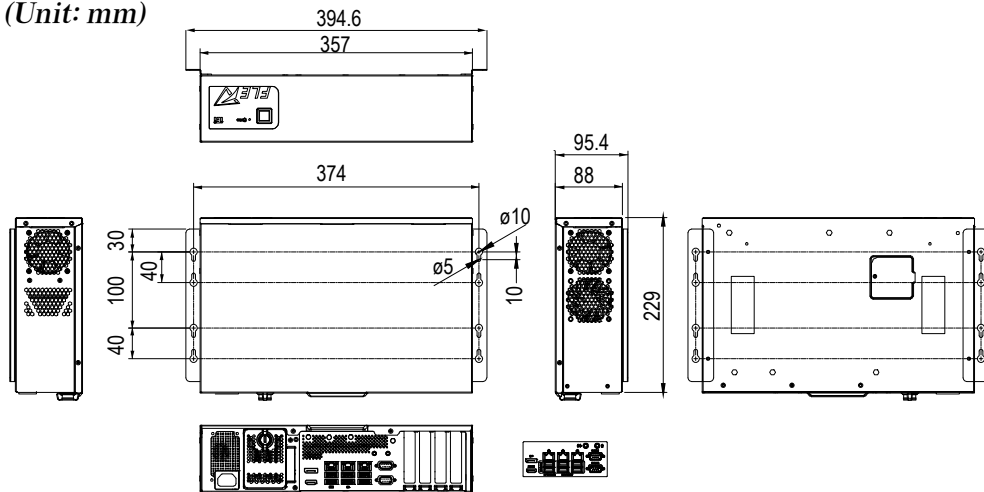| Part No.	Description
With Mustang-V100-MX8	
FLEX-BX210AI-i9/16G/V-R10	2U AI Modular box PC, Intel® 10th Generation Core™ i9-10900TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W), 16GB DDR4, 2.5" 1TB HDD, TPM 2.0, 350W PSU, with Mustang-V100-MX8, Wi-Fi 802.11ac, R10
FLEX-BX210AI-i5/8G/V-R10	2U AI Modular box PC, Intel® 10th Generation Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W), 8GB DDR4, 2.5" 1TB HDD, TPM 2.0, 350W PSU, with Mustang-V100-MX8, Wi-Fi 802.11ac, R10
Without Mustang-V100-MX8	
FLEX-BX210-Q470/35-R10	Barebone, 2U AI Modular BOX PC, Intel® COMET Lake, Q470 chipset, 2xPCIex4 and 2xPCIex8 slots, 4x HDD bay, w/o CPU, 350W PSU, R10
FLEX-BX210AI-i9/16G-R10	2U AI Modular box PC, Intel® 10th Generation Core™ i9-10900TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W), 16GB DDR4, 2.5" 1TB HDD, TPM 2.0, 350W PSU, Wi-Fi 802.11ac, R10
FLEX-BX210AI-i5/8G-R10	2U AI Modular box PC, Intel® 10th Generation Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W), 8GB DDR4, 2.5" 1TB HDD, TPM 2.0, 350W PSU, Wi-Fi 802.11ac, R10

Packing List

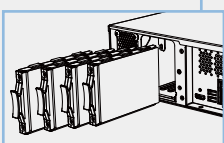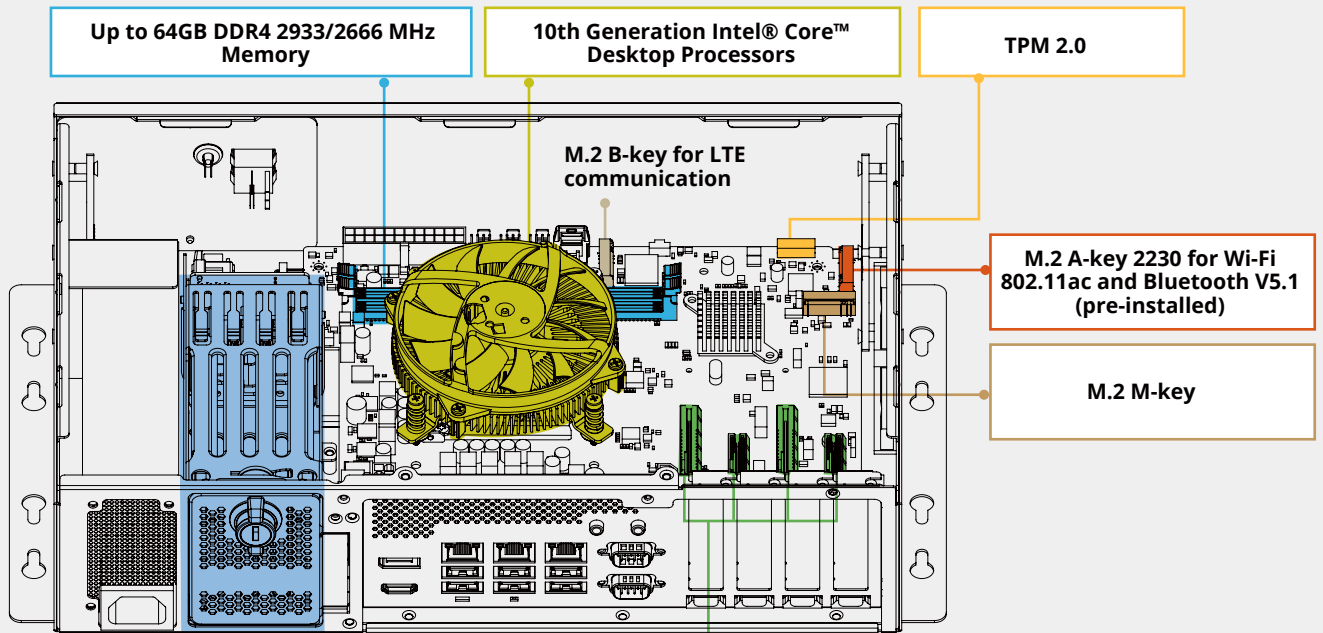| 1 x Mounting Bracket	2 x Wi-Fi Antennas
1 x Power Cord	1 x QSG

# I/O Interface

FLEX-BX210-Q470
Dimensions *(Unit: mm)*

Hardware Features

Smart Fan for Quiet Operation

LTE and GPS SMA Antenna Foreseen Holes

Compact 2U System

350W ATX Power Supply
- Active PFC (Power Factor Correction) circuit protection
- 80-Plus Gold high efficiency
- 350W PSU models is built to order

Rich I/O Interface
- 1 x Display port output
- 1 x HDMI output
- 6 x USB 3.2 Gen1 Type-A
- 2 x RS-232 DB-9
- AT/ATX mode switch
- 3 x GbE LAN (1x I219 support vPro, 2x I210)
- 1 x Mic in
- 1 x Line out
- 1 x AC inlet
- 4 x SMA
- Reset button

Wi-Fi 802.11ac and Bluetooth V5.1 SMA Antenna Connectors

Up to 64GB DDR4 2933/2666 MHz Memory

10th Generation Intel® Core™ Desktop Processors

TPM 2.0

M.2 B-key for LTE communication

M.2 A-key 2230 for Wi-Fi 802.11ac and Bluetooth V5.1 (pre-installed)

M.2 M-key

Four Hot-swappable HDD Bays (pre-installed with 1TB HDD)
- With security key lock
- Support RAID 0/1/5/10
- LEDs for drive activity
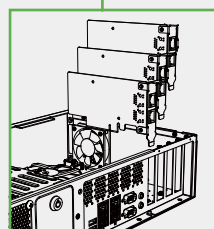
Four PCIe 3.0 Low Profile Expansion Slots
- Two PCIe by 4 and two PCIe by 8 with vertical heat dissipation, and the two PCIe by 8 provide zero latency
- Support AI accelerator cards, such as FPGA card, vision process card (VPU), etc

DRPC AIoT Dev. Kit

NEW

Features

- 11th Gen Intel® Core™ i5-1145G7E
- Four 2.5 GbE LAN ports
- Multiple USB 3.2 Gen 2 (10Gb/s)
- Multiple isolated COM ports
- Modulized flexible expansion
- Support Mustang AI accelerator card

intel.

Specifications

Model		DRPC AIoT Dev. Kit
Form Factor	Dimensions	190x150x81 mm (DRPC-240AI-i5CS) 190x150x126 mm (DRPC-240AI-i5C)
	System Fan	DRPC-240AI-i5CS: fanless DRPC-240AI-i5C: with fan
Motherboard	CPU	Intel® Core™ i5-1145G7E 1.5 GHz (up to 4.1 GHz, quad core, TDP 12 ~ 28W)
	Chipset	SoC
	System Memory	2 x SO-DIMM DDR4 3200MHz (8GB pre-installed)
Storage	Hard Drive	1 x 2.5'' SATA 6Gb/s HDD/SSD bay (256GB SSD pre-installed)
I/O Interfaces	USB	2 x USB 3.2 Gen 2 2 x USB 2.0
	Ethernet	1 x RJ-45 PCIe 2.5 GbE by Intel® I225LM 3 x RJ-45 PCIe 2.5 GbE by Intel® I225V (colay i225LM) (Optional PoE at power board)
	COM	2 x RS-232 (DB9 with 2.5KV isolation) 2 x DB9 RS-422/485 with AFC (DB9 with 2.5KV isolation)
	DIO	1 x 12-bit digital I/O (6-in/6-out) (pin header)
	Display	1 x Lockable HDMI (up to 3840 x 2160 @ 30Hz) 1 x DP++ (up to 4096 x 2160 @ 60Hz)
	TPM 2.0	Support Intel PTT
Expansion Slots	M.2	1 x 2230 A-key (PCIex1/USB 2.0) 1 x 3042/52/80 B-key (PCIex2/USB 3.2 Gen1/USB 2.0) with sim slot
	Backplane	1 x PCIe Gen3 x4 (DRPC-240AI-i5C only)
Others	Indicator	2 x LED (HDD, Power)
	Button	1 x Power button 1 x Reset button 1 x AT/ATX switch 1 x Remote power connector
Power	Power Input	3-pin terminal block: 12 ~ 28 VDC
	Remote Power	2-pin terminal block
Reliability	Mounting	DIN-Rail
	Operating Temperature	-20°C ~ 70°C with air flow (SSD)
	Storage Temperature	-40°C ~ 85°C
	Humidity	10% ~ 95%, non-condensing
	Operating Shock	Half-sine wave shock 5G, 11ms, 100 shocks per axis
	Operating Vibration	MIL-STD-810G 514.6C-1 (with SSD)
	Weight	1.5 kg/ 2.9 kg (DRPC-240AI-i5CS) 1.9 kg/ 3.3 kg (DRPC-240AI-i5C)
	Safety/EMC	CE/ FCC
OS	Supported OS	Windows 10, Linux

Ordering Information

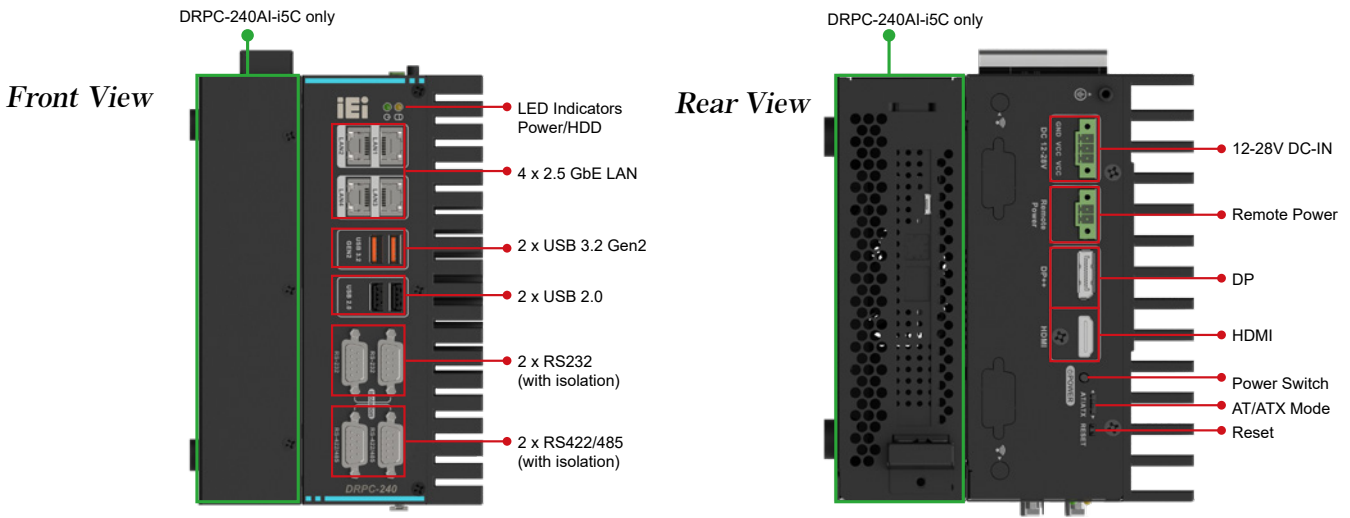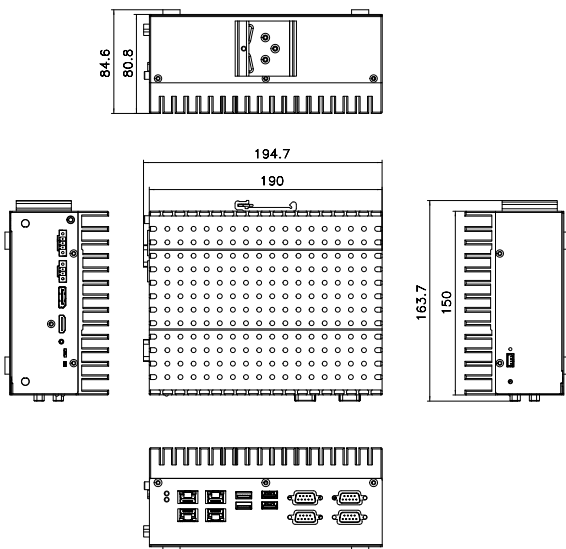| Part No.	Description
DRPC-240AI-i5C-R10	Fanless embedded system, Intel® Tiger Lake-U i5-1145G7E 1.5GHz (quad core), 8GB DDR4 pre-installed, HDMI/DP, 4 x 2.5GbE LAN, 4 x COM, DIO, 12~24VDC, 256GB SSD, 120W power adapter, PCIe x4 expansion layer, RoHS
DRPC-240AI-i5CS-R10	Fanless embedded system, Intel® Tiger Lake-U i5-1145G7E 1.5GHz (quad core), 8GB DDR4 pre-installed, HDMI/DP, 4 x 2.5GbE LAN, 4 x COM, DIO, 12~24VDC, 256GB SSD, 120W power adapter, RoHS

AI Accelerator Card Options

Part No.	Description
Mustang-V100-MX8-R10	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

Packing List

1 x Chassis Screw	1 x DIN-rail Mounting Kit	1 x QSG
1 x 120W Adapter	1 x Power Cord	

DRPC-240AI-i5C only

Front View

- LED Indicators Power/HDD
- 4 x 2.5 GbE LAN
- 2 x USB 3.2 Gen2
- 2 x USB 2.0
- 2 x RS232 (with isolation)
- 2 x RS422/485 (with isolation)

DRPC-240AI-i5C only

Rear View

- 12-28V DC-IN
- Remote Power
- DP
- HDMI
- Power Switch
- AT/ATX Mode
- Reset

DRPC-240AI-i5CS-R10 Dimensions *(Unit: mm)*

84.6
80.8
194.7
190
163.7
150

DRPC-240AI-i5C-R10 Dimensions *(Unit: mm)*

129.65
125.85
201
190
163.7
150
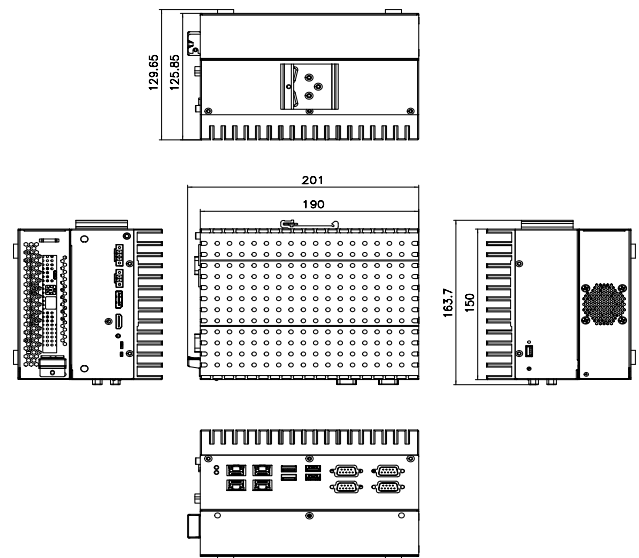
DRPC-230-ULT5

- **Fanless DIN-Rail Embedded System**
- **Whiskey Lake 8th Intel® CoreTM Solution (up to 4 cores)**

Features

- Intel® Core™ i5-8365UE/ Celeron™4205U
- Triple GbE LAN Ports
- Multiple USB 3.2 Gen 2 (10Gb/s)
- Multiple COM Ports
- Modulized Flexible Expansion

Specifications

	Model	DRPC-230-ULT5-i5/S	DRPC-230-ULT5-i5	DRPC-230-ULT5-CS
Chassis	Color	Black & Silver		
	Dimensions (WxDxH)	81 x 150 x 190	127 x 150 x 190	81 x 150 x 190
	System Fan	Fanless		
	Chassis Construction	Extruded aluminum alloy		
Motherboard	CPU	Intel® Core™ i5-8365UE 1.6 GHz (up to 4.1 GHz, quad-core, TDP 15W)		Intel® Celeron™ 4205U 1.8 GHz (dual-core, TDP 15W)
	Chipset	SoC		
	System Memory	2 x SO-DIMM DDR4 2400 (8GB pre-installed)		
Storage	Hard Drive	1 x 2.5'' SATA 6Gb/s HDD/SSD bay		
I/O Interfaces	USB	6 x USB 3.2 Gen2		4 x USB 3.2 Gen2 / 2 x USB 2.0
	Ethernet	3 x RJ-45: 1 x GbE by Intel® I219 / 2 x GbE by Intel® I210		
	COM Port	4 x RS232/422/485 with AFC (DB9) 2 x RS232 (RJ-45)		
	Digital I/O	8-bit Digital I/O (4-in/ 4-out) (pin header)		
	Display	1 x HDMI (up to 3840 x 2160@30Hz) 1 x DP (up to 4096 x 2304@60Hz)		
	Wireless	1 x 802.11a/b/g/n/ac (optional)		
	TPM	1 x TPM 2.0 (2 x 10 pin)(optional)		
	Other	1 x Power Button, 1 x Reset Button, 1 x AT/ATX Switch, 1 x LED for Power (Green), 1 x LED for HDD (Yellow)		
Expansions	PCIe Mini	1 x Full-size with SIM card slot (PCIe/USB 3.0/SATA)		
	M.2	1 x 2230 A-key (PCIe x 1/USB 2.0)		1 x 2230 A-key (PCIe x 1)
	Backplane	-	1 x PCIe Gen3 x 4, 1 x USB 2.0	-
Power	Power Input	Terminal block: 12 ~ 24V DC (Reserved internal 40W power with 12V DC output)		
	Power Consumption	12V @ 4.98A (Intel® CoreTM i5-8365UE with 8GB memory)		
Reliability	Mounting	DIN-Rail		
	Operating Temperature	-20°C ~ 70°C with air flow (SSD), 10% ~ 95% non-condensing*		
	Storage Temperature	-40°C ~ 85°C with air flow (SSD), 10% ~ 95% non-condensing		
	Operating Shock	Half-sine wave shock 5G, 11ms, 100 shocks per axis (SSD)		
	Operating Vibration	MIL-STD-810G 514.6C-1 (SSD)		
	Weight (Net/Gross)	2.9KG/ 3.2KG	3.2KG/ 3.5KG	2.9KG/ 3.2KG
	Safety/EMC	CE/ FCC		
	Watchdog Timer	Programmable 1 ~ 255 sec/min		
OS	Supported OS	Microsoft® Windows 10, Linux		

*CPU does not throttle under 60°C

Ordering Information

Part No.	Description
DRPC-230-ULT5-i5/8G/S-R11	Fanless embedded system, Intel® Whiskey Lake i5-8365UE 1.6GHz (quad core, TDP 15W), 8GB DDR4 pre-installed memory, HDMI/DP, 3 PCIe GbE, 6 COM, 12~24V DC and RoHS
DRPC-230-ULT5-i5/8G-R11	Fanless embedded system, Intel® Whiskey Lake i5-8365UE 1.6GHz (quad core, TDP 15W), 8GB DDR4 pre-installed memory, HDMI/DP, 3 PCIe GbE, 6 COM, 12~24V DC, PCIe x4 expansion layer and RoHS
DRPC-230-ULT5-C/8G/S-R11	Fanless embedded system, Intel® Whiskey Lake Celeron™ 4205U 1.8GHz (dual core, TDP 15W), 8GB DDR4 pre-installed memory, HDMI/DP, 3 PCIe GbE LAN, 6 COM, 12~24V DC and RoHS

Packing List

1 x Din-rail mounting kit	
1 x Screw kit	

Options

Item	Part No.	Description
Adapter[1]	63040-010060-211-RS	Adapter Power;FSP;FSP060-DHAN3;9NA0608097;;Vin:90~264VAC;60W;Dim:62.0*110*31.5mm;Plug=7.5mm;Cable=1200mm;Erp(NO LOAD 0.21W);Vout:12VDC;Φ2.5/Φ5.5/lock;CCL;RoHS
Adapter[1/2]	63040-010096-230-RS	Adapter Power;FSP;FSP096-AHAN3;9NA0961412 ;Active PFC;Vin:90~264VAC;96W;Dim:75.6 x 151.3 x 25.4mm;Plug=7.5mm;Cable=1500mm;Erp(NO LOAD 0.15W);Vout:12VDC;Φ2.5/Φ5.5/lock;CCL;RoHS
Power cable[1]	32102-026500-100-RS	WIRE CABLE;POWER CABLE;;2;200MM;18AWG;(A)DC JACK 5.5 x 2.5, NUT+WASHER;(B)TERMINAL BLOCK:3P P=3.5;SHANGHAI YING YU;RoHS
Power cord	32000-000002-RS	European power cord
RJ-45 to D-SUB cable	32005-004600-200-RS	ROUND CABLE;RS-232/422/485;RS-232 CABLE;2;300MM;26AWG;(A)D-SUB 9P MALE+4#40 Screw;(B)RJ-45 8P8C PLUG, Iron+Sheathed;Wins Precision;RoHS
Wifi module[3]	27319-000009-RS	Wireless Lan Module;Wireless LAN & Bluetooth M.2 Module;Sparklan;R9701810011;IEEE802.11a/b/g/n/ac;2.412GHz~2.4835GHz, 5.15GHz~5.85GHz;M.2 2230;.;3.3V;22 x 30 x 2.15mm;QCNFA364A;QCA6174A-5;2x2 MIMO;Dual Band;WCBN808A-Q2;CCL;CCL;RoHS
Antenna[3]	32505-000900-100-RS	External Antenna;WLAN;RG 178;108MM;TANK-700-QM67-R10;PEAK GAIN 2.0DBI;Exceltek;2.4-2.5GHz/5.15-5.85GHz;REVERSE SMA PLUG;RoHS
RF cable[3]	32501-004000-100-RS	RF;RF CABLE;LINE DIAMETER:0.81mm;250MM;50Ω;Sparklan;0-6GHz;VSWR≤1.3;I-PEX MHF-4 Plug;REVERSE SMA JACK;NUT x 1;WASHER x 1;RoHS
TPM Module	TPM-IN03-R10	20-pin Infineon SPI TPM 2.0 module, software mangement tool, firmware V7.63
System fan[4]	31100-000365-RS	FAN;+12V;4PIN;YEN SUN;40 x 40 x 10mm;6500RPM;TWO BALL BEARING;LINE LENGTH:150MM;3.4+/-0.1MM;FD124010HB;FD124010HB-NBG(2W7T);AXIAL FAN;WITH FRAME;6.599CFM;7~13.2V;29dB;75000hur; UL, CUL, TUV;CCL;RoHS
Accelerator cards[4]	Mustang-V100-MX8	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x 4 interface, RoHS
	Mustang-V100-MX4	Computing Accelerator Card with 4 x Intel® Movidius™ Myriad™ X MA2485 VPU, PCIe Gen2 x 2 interface, RoHS
OS: Windows Embedded 10	DRPC-230-ULT5-W10E64-V-R10	OS Image with Windows® Embedded Standard 10 E Value 64-bit 2019 for DRPC-230-ULT5 Series, with DVD-ROM, RoHS

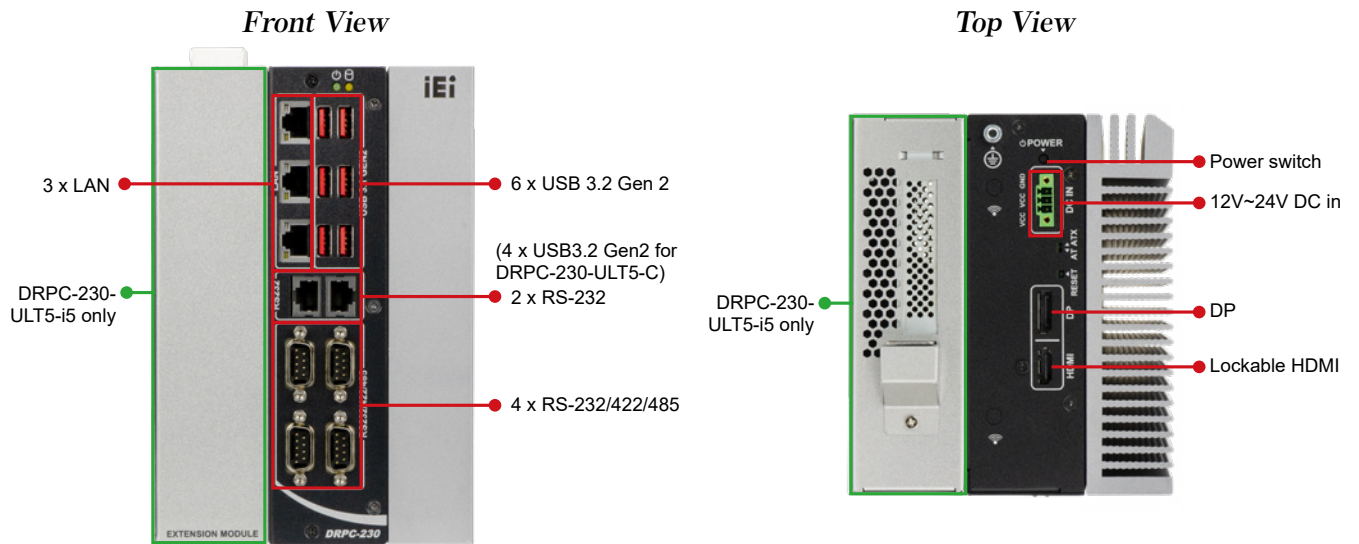[1] It is required to order Power Cable together with Adapter for power usage
[2] Please select 96W adapter if intend to add accelerator cards
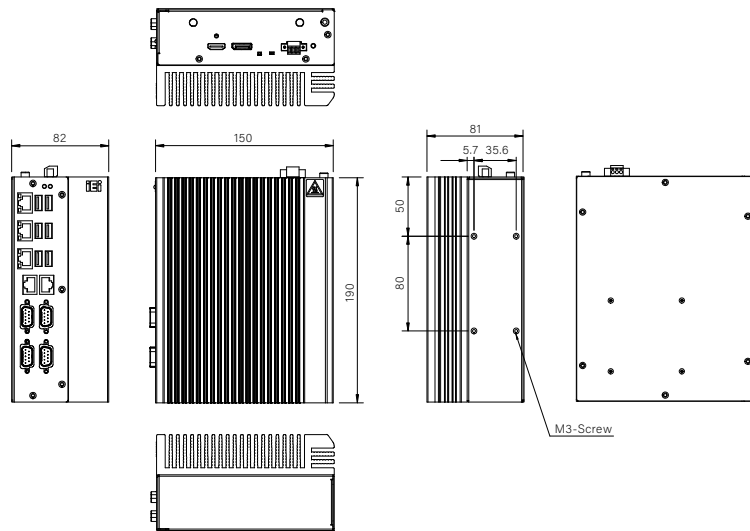[3] Each Wi-Fi module needs two antennas and two RF cables to fully support Wi-Fi function
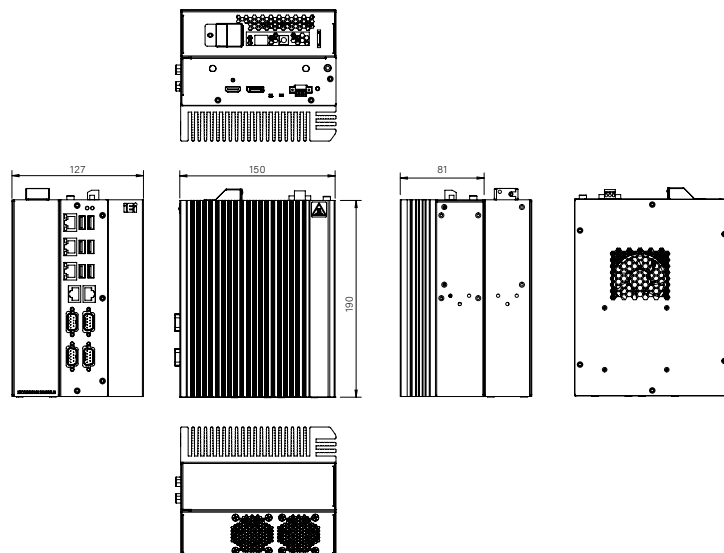[4] Only applicable for DRPC-230-ULT5-i5/8G-R10

Fully Integrated I/O

Front View

- 3 x LAN
- DRPC-230-ULT5-i5 only
- 6 x USB 3.2 Gen 2
- (4 x USB3.2 Gen2 for DRPC-230-ULT5-C)
- 2 x RS-232
- 4 x RS-232/422/485

EXTENSION MODULE   DRPC-230

Top View

- Power switch
- 12V~24V DC in
- DRPC-230-ULT5-i5 only
- DP
- Lockable HDMI

DRPC-230-ULT5-i5/S
DRPC-230-ULT5-C/S
Dimensions *(Unit: mm)*

82
150
81
5.7 35.6
50
80
190

M3-Screw

DRPC-230-ULT5-i5
Dimensions *(Unit: mm)*

127
150
81
190

RACK-500AI-C246

NEW

Feature

- Intel® Coffee Lake C246 chipset with Xeon® CPU
- 1 x Front-accessible 3.5" and 1 x 3.5" HDD drive capacity
- Integrated one PCIe x16 and one x4 Gen3 expansion slot
- Great flexibility hardware expansion

Intel® 8th/9th Xeon | 4K HDMI | ECC DDR4

Native PCIe Gen. 3 | Gigabit Ethernet DUAL GBE | SUPERSPEED USB 3.2 Gen1

intel.

Specifications

Model Name		RACK-500AI-C246
Chassis	Color	Navy blue and black
	Dimensions (WxDxH)	440.2 mm x 110.6 mm x 221.3 mm
	System Fan	System fan & CPU fan
	Chassis Construction	Heavy duty metal
Motherboard	CPU	Intel® Xeon® E-2176G CPU (3.70 GHz, 6-core, TDP 80W)
	Chipset	Intel® C246
	System Memory	Four 288-pin 2666MHz dual-channel DDR4 SDRAM unbuffered DIMMs support up to 64GB ECC & non-ECC (2 x 8GB pre-installed)
	Display Output	Dual display supported 1 x HDMI (up to 4096 x 2304@30Hz) 1 x Internal DisplayPort (up to 4096 x 2304@60Hz)
Storage	Hard Drive	1 x Removable 3.5" SATA 6Gb/s drive bay (hot-swappable)
	M.2	1 x 2280 M key (PCIe x4)
I/O interfaces	Ethernet	LAN1: Intel® I219LM PHY LAN2: Intel® I211-AT PCIe controller (co-lay I210-AT)
	USB 3.2	2 x Internal USB 3.2 Gen1 (2x10 pin)
	USB 2.0	6 (pin header)
	RS-232	3 (pin header)
	RS-422/485	1 (1x4 pin, p=2.0)
	Expansion	1 x PCIe Gen3 x16 slot 1 x PCIe Gen3 x4 slot *To install dual-slot PCIe add-on cards (max. length 338mm), the CPU cooler must be changed (P/N: 19100-000238-00-RS).
Power	Power Input	ATX power (350W)
	PCIe Expansion Card (GPU/Add-on Cards) Recommendation	Total maximum up to 150W (80W CPU with 16GB memory, 350W ATX power) Total maximum up to 180W (35W CPU with 16GB memory, 350W ATX power)
Reliability	Mounting	Rack mount
	Operating Temperature	-20°C~+50°C
	Storage Temperature	-30°C~+60°C
	Relative Humidity	10% ~ 95%, non-condensing
	Operating Shock	Half-sine wave shock 5G, 11ms, 100 shocks per axis
	Operation Vibration	MIL-STD-810G 514.6C-1
	Weight (Net/Gross)	8 kg/11 kg
	Safety/EMC	CE/FCC
OS	Supported OS	Microsoft Windows 10 / Windows 11, Linux

Ordering Information

Part No.	Description
RACK-500AI-C246-XE/16G/35-R10	5U AI System with Intel® Xeon® E-2176G CPU (3.70 GHz, 6-core, TDP 80W) with Intel® C246, pre-installed 16GB ECC DDR4 memory, HDMI, Dual Intel® PCIe GbE, USB 3.2, iAMT, w/ 1 PCIe x16/x4 Slot BP, w/ FSP350(350W), RoHS
RACK-500AI-C246-35-R10	5U AI System with Intel® C246, HDMI, Dual Intel® PCIe GbE, USB 3.2, iAMT, w/ 1 PCIe x16/x4 Slot BP, w/ FSP350, RoHS

Options

Part No.	Description
GPOE-2P-R20	PCI Express Power over Ethernet card, 2-port 1000 Base(T), 802.3at compliant, low profile, RoHS
GPOE-4P-R20	PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3at/af compliant, low profile, RoHS
IPCIE-4POE-R10	PCI Express Power over ethernet card, 4-port 1000 Base(T), 802.3af compliant, RoHS
Mustang-V100-MX4-R10	Computing Accelerator Card with 4 x Intel® Movidius™ Myriad™ X MA2485 VPU, PCIe Gen2 x2 interface, RoHS
Mustang-V100-MX8-R11	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe gen2 x4 interface, RoHS
Mustang-F100-A10-R10	PCIe FPGA Highest Performance Accelerator Card with Arria 10 1150GX support DDR4 2400Hz 8GB, PCIe Gen3 x8 interface
19800-000075-RS	PS/2 KB/MS cable with bracket, 220mm, P=2.0
32102-000100-200-RS	SATA power cable, MOLEX 5264-4P to SATA15P
AC-KIT-892HD-R10	7.1 channel HD Audio kit with Realtek ALC892 support dual audio streams
SAIDE-KIT01-R10	SATA to IDE/CF converter board
32102-000100-200-RS	SATA power cable, 150mm; (A) MOLEX 8981-4M p=5.08; (B) two SATA 15P 180°; RoHS
32102-044900-100-RS	PCIe power cable, 100mm; (A) two MOLEX 8981-04M p=5.08; (B) TKP:H6657R1-06-B-03 p=4.2; RoHS
32102-011500-100-RS	CPU cooler kit, 105 x 67 x 12.1 mm; fan: 77 x 75 x 15.4 mm; 12V, 4P, 5500RPM; RoHS
19100-000238-00-RS	Power cable, 150mm; (A) two MOLEX 8981-04P p=5.08; (B) MOLEX 8981-04M p=5.08; RoHS
CA-950GB-R10	19" Rackmount Carrier for Rack-500G/RACK-900G/RACK-500AI

Fully Integrated I/O

Hot-swappable 8 cm cooling fan

Power/HDD LED

Reset

2 x USB ports

Knockout for LPT

Knockout for COM

2 x USB 3.2 Gen 1

2 x LAN

HDMI

PCIe x4 expansion slot

PCIe x16 expansion slot

Flex ATX power supply

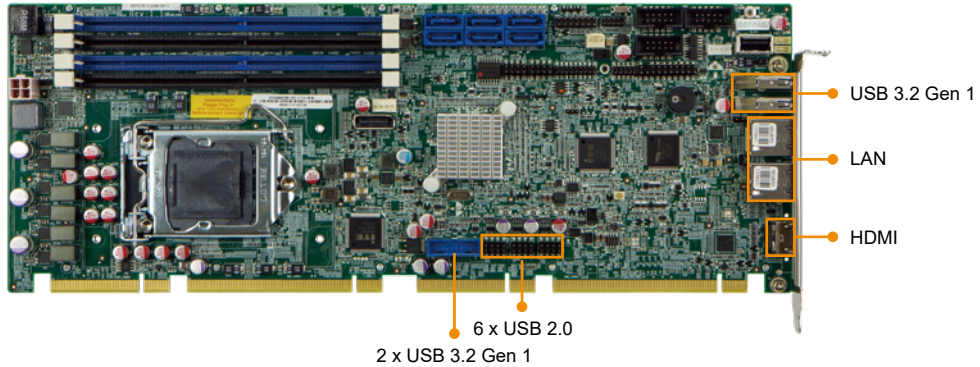**FDD and HDD are not included in package**

CA-950GB-R10

CA-950GB-R10
19" rack carrier can carry four RACK-500AI and fit into standard 19" width rack with 5U height.
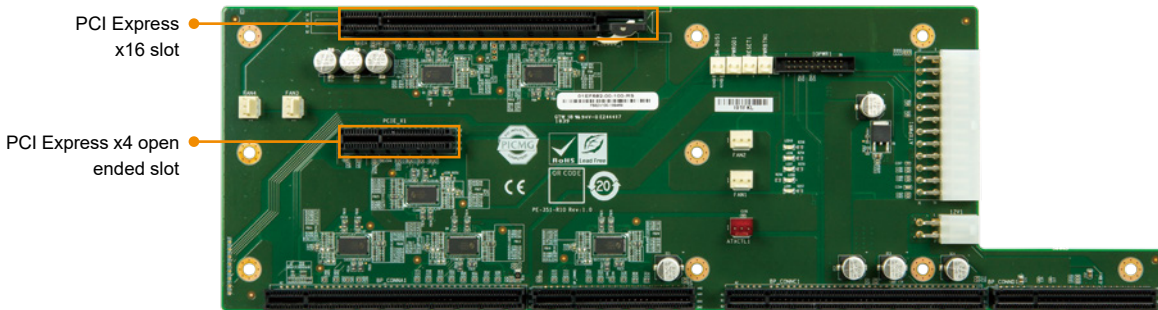
RACK-500AI-C246
Dimensions (Unit: mm)

221.3

96.4

110.6

75

31.35

440.2

110.6

221.3

211.5
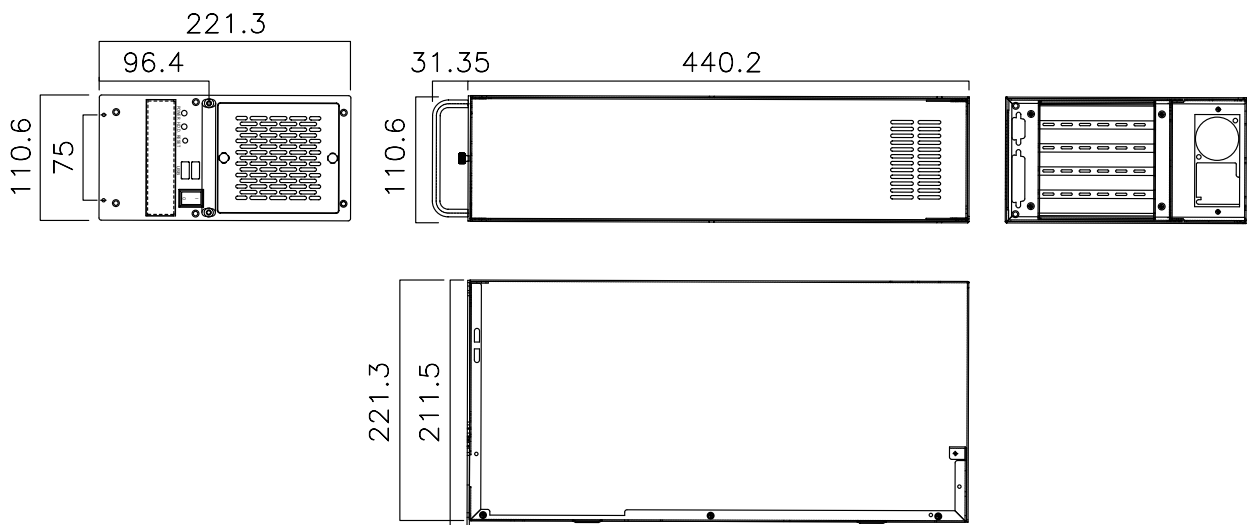
Single board computer in RACK-500AI (SPCIE-C246)

Full-size PICMG 1.3 CPU Card supports LGA1151 Intel® Xeon® E3, Core™ i9/i7/i5/i3/Pentium®/Celeron® CPU per Intel® C246, ECC & non-ECC DDR4, HDMI, DP, Dual Intel® PCIe GbE, USB 3.2, SATA 6Gb/s, M.2, HD Audio, iAMT and RoHS.

USB 3.2 Gen 1
LAN
HDMI
6 x USB 2.0
2 x USB 3.2 Gen 1

Four 288-pin DDR4 SDRAM Supported

SATA 6Gb/s

RAID 0, 1, 5, 10 function compatible with six ports of SATA 6Gb/s

M.2 M Key

M.2 M key 2280 (PCIe x4)
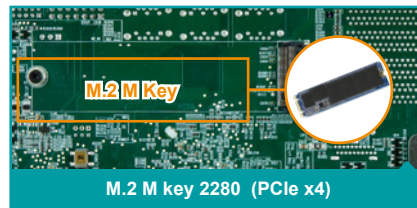
PCI Express Backplane in RACK-500AI (PE-3S1)

5-slot PICMG 1.3 backplane with one PCIe x16 slot and one PCIe x4 slot, RoHS

PCI Express x16 slot

PCI Express x4 open ended slot

PE-3S1
Dimensions *(Unit: mm)*

327.66
65.02
16.42 1.6
40.64
40.64
14.66
84.56
106.48
9.86
155.09
78.26
71.76
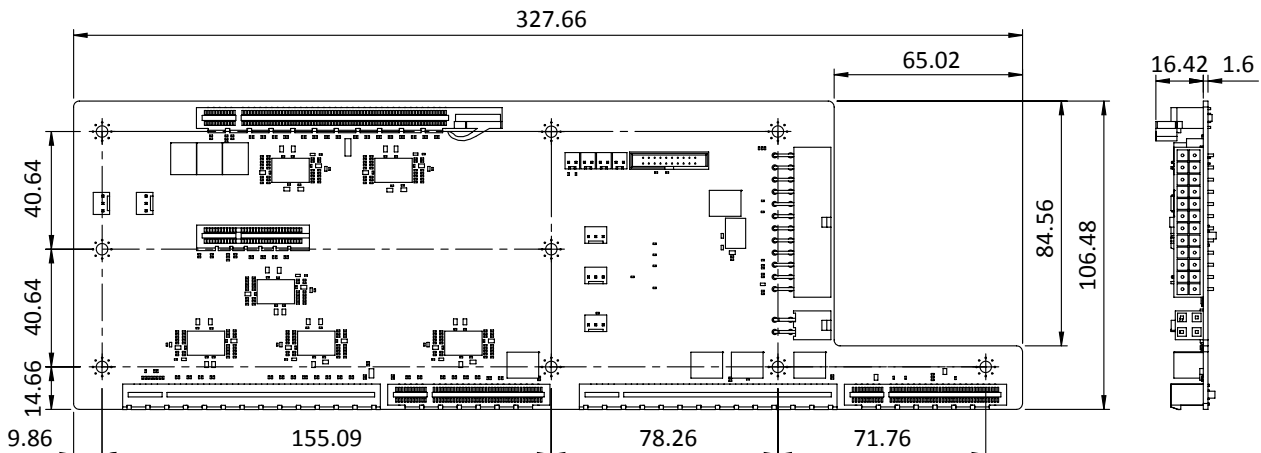
Mustang-V100-MX8

Feature

- Half-Height, Half-Length, Single-slot compact size
- Low power consumption ,approximate 25W
- Supported OpenVINO™ toolkit, AI edge computing ready device
- Eight Intel® Movidius™ Myriad™ X VPU can execute multiple topologies simultaneously.

Specifications

Model Name	Mustang-V100-MX8
Main Chip	Eight Intel® Movidius™ Myriad™ X MA2485 VPU
Operating Systems	Ubuntu 18.04.x 16.04.x LTS 64bit, CentOS 7.4 64bit, Windows® 10 64bit
Dataplane Interface	PCI Express x4
	Compliant with PCI Express Specification V2.0
Power Consumption	Approximate 25W
Operating Temperature	-20°C~60°C
Cooling	Active fan
Dimensions Standard	Half-Height, Half-Length, Single-slot PCIe
Operating Humidity	5% ~ 90%
Power Connector	*Preserved PCIe 6-pin 12V external power
Dip Switch/LED indicator	Identify card number
Support Topology	AlexNet, GoogleNetV1/V2, MobileNet SSD, MobileNetV1/V2, MTCNN, Squeezenet1.0/1.1, Tiny Yolo V1 & V2, Yolo V2, ResNet-18/50/101 * For more topologies support information please refer to Intel® OpenVINO™ Toolkit official website. [Supported Models] https://docs.openvinotoolkit.org/latest/_docs_IE_DG_Introduction.html#SupportedFW [Supported Framework Layers] https://docs.openvinotoolkit.org/latest/_docs_MO_DG_prepare_model_Supported_Frameworks_Layers.html

*TANK AIoT dev. kit PCIe slot provides 75W power, this feature is preserved for user in case of different system configuration.
Warning: DO NOT install the Mustang-V100-MX8 into the TANK AIoT Dev. Kit before shipment. It is recommended to ship them with their original boxes to prevent the Mustang-V100-MX8 from being damaged.

Ordering Information

Part No.	Description
Mustang-V100-MX8-R20	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

Packing List

1 X Full height bracket
1 x External power cable
1 x QIG
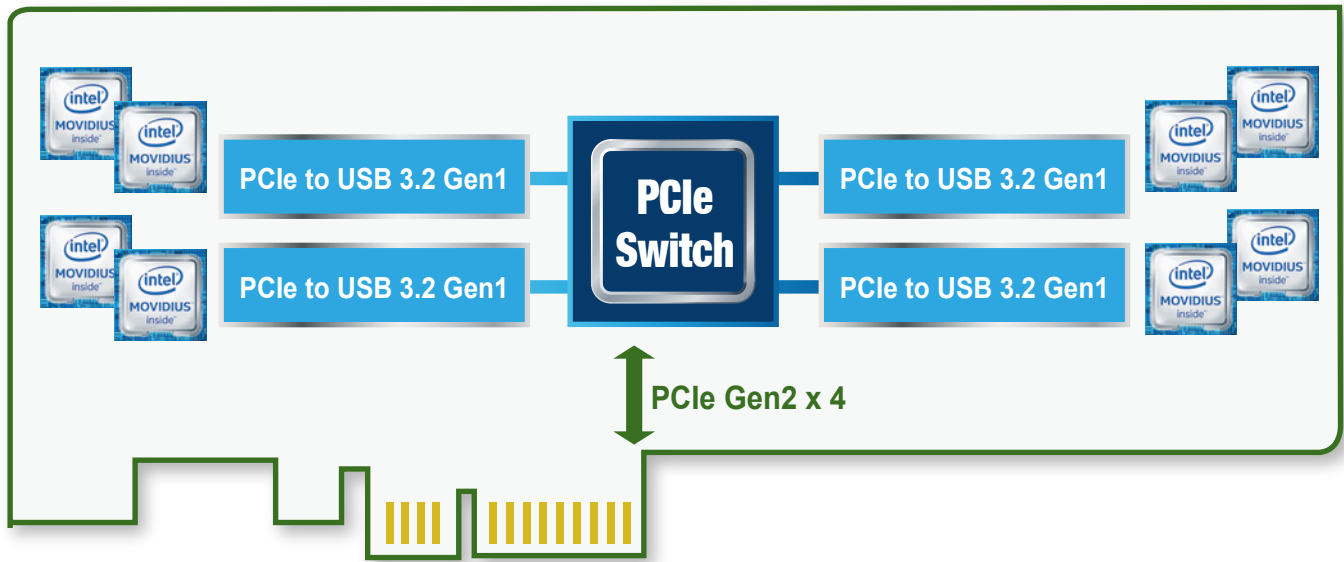
Mustang−V100−MX8 Block Diagram

● 8 Intel® Movidius™ Myriad™ X VPU delivering up to 8 TOPs of dedicated networks compute

● Interface: PCIe Gen2 x 4

● Form Factor: Standard Half-Height, Half-Length, Single-slot

● Cooling: Active fan.

● Operation Temperature: -20°C~60°C

● Operation Humidity : 5% to 90% relative humidity

● Power Consumption: Approximate 25W

● Power Connector: *Preserved PCIe 6-pin 12V external power

● DIP Switch/LED Indicator: Identify card number.

Mustang−V100−MX8 Dimensions *(Unit: mm)*
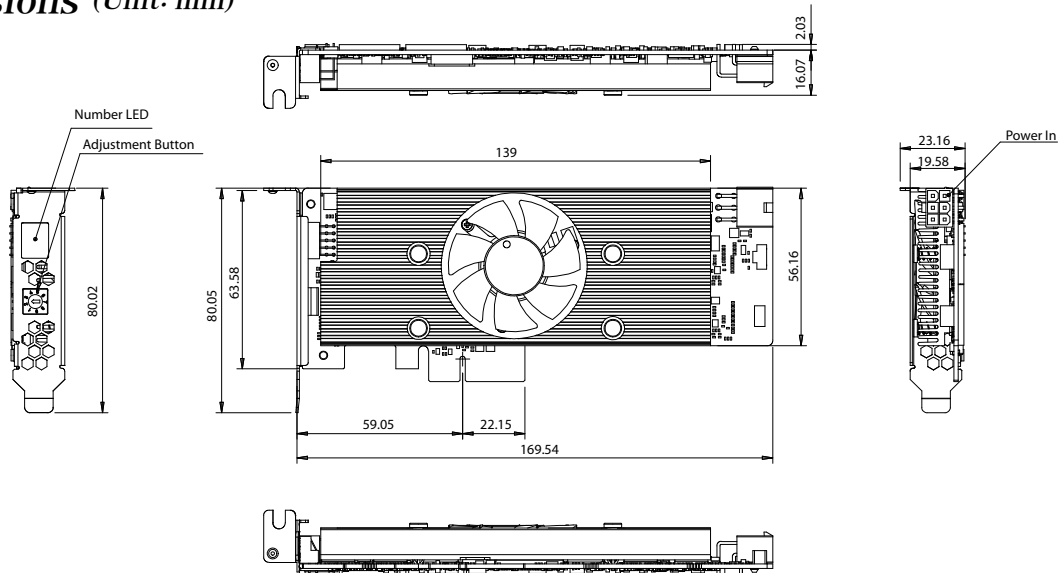
Mustang-V100-MX4

Feature

- PCIe Gen 2 x 2 form factor
- 4 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, Approximate 15W.
- Operating Temperature -20°C~60°C
- Powered by Intel's OpenVINO™ toolkit
- Multiple cards supported

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Introduction

The Mustang-V100-MX4 is a PCIe Gen 2 x 2 card included 4 Intel® Movidius™ Myriad™ X VPU, providing an flexible AI inference solution for compact size and embedded systems.

VPU is short for vision processing unit. It can run AI faster, and is well suited for low power consumption applications such as surveillance, retail, transportation. With the advantage of power efficiency and high performance to dedicate DNN topologies, it is perfect to be implemented in AI edge computing device to reduce total power usage, providing longer duty time for the rechargeable edge computing equipment.

Specifications

Model Name	Mustang-V100-MX4
Main Chip	4 x Intel® Movidius™ Myriad™ X MA2485 VPU
Operating Systems	Ubuntu 18.04.x 16.04.x LTS 64bit, CentOS 7.4 64bit, Windows® 10 64bit
Dataplane Interface	PCIe Gen 2 x 2
Power Consumption	Approximate 15W
Operating Temperature	-20°C~60°C
Cooling	Active fan
Dimensions	113 x 56 x 23 mm
Operating Humidity	5% ~ 90%
Dip Switch/LED indicator	Identify card number
Support Topology	AlexNet, GoogleNetV1/V2, MobileNet SSD, MobileNetV1/V2, MTCNN, Squeezenet1.0/1.1, Tiny Yolo V1 & V2, Yolo V2, ResNet-18/50/101 * For more topologies support information please refer to Intel® OpenVINO™ Toolkit official website. [Supported Models] https://docs.openvinotoolkit.org/latest/_docs_IE_DG_Introduction.html#SupportedFW [Supported Framework Layers] https://docs.openvinotoolkit.org/latest/_docs_MO_DG_prepare_model_Supported_Frameworks_Layers.html

Ordering Information

Part No.	Description
Mustang-V100-MX4-R10	Computing Accelerator Card with 4x Intel® Movidius™ Myriad™ X MA2485 VPU, PCIe Gen 2 x 2 interface, RoHS

Packing List

1 x Full height bracket

Key Features of Intel® Movidius™ Myriad™ X VPU:

- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance

10X Higher Performance

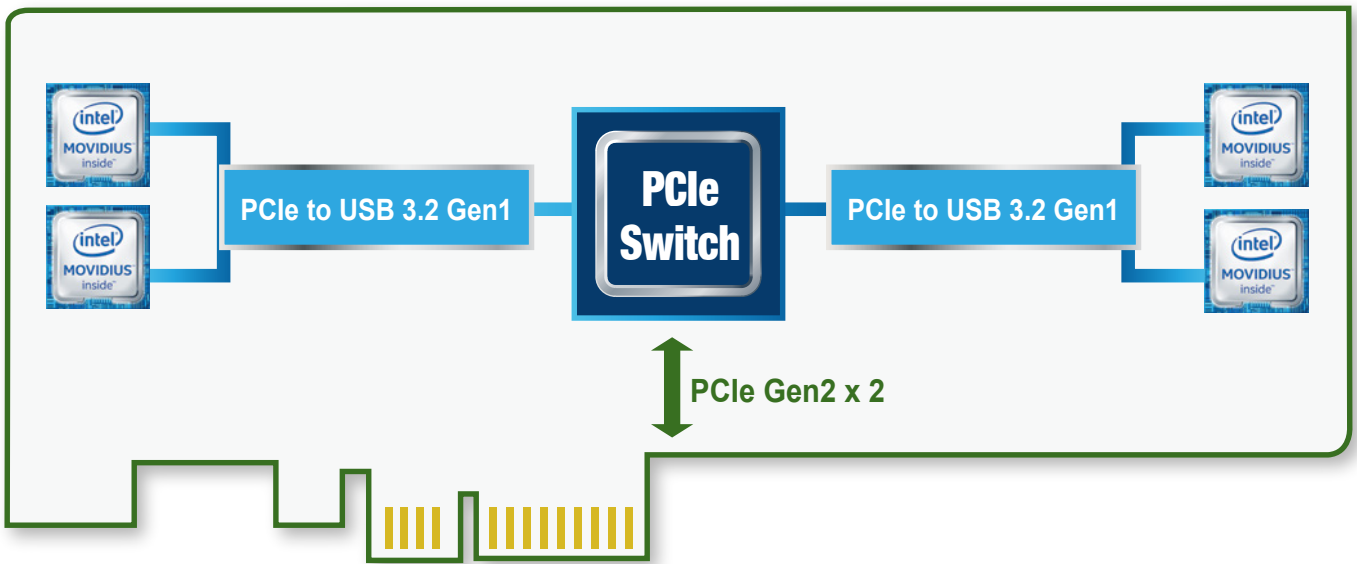1 Trillion operatioms per second

1 TOPS
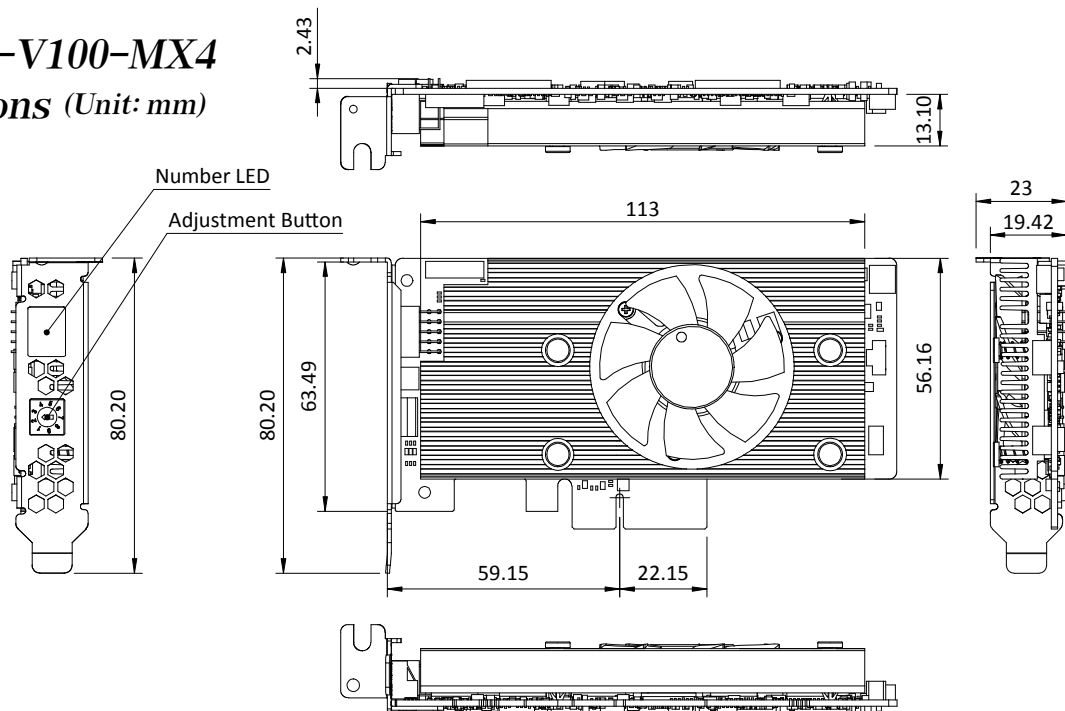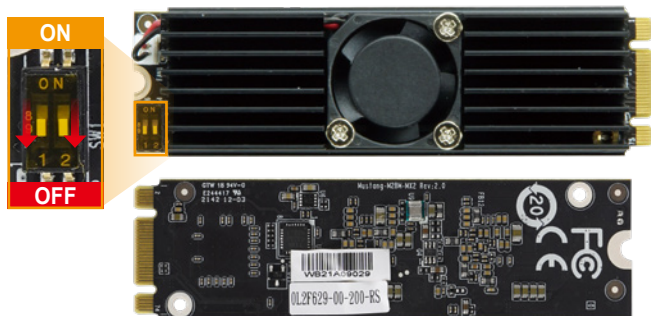1 Trillion operatioms per second of dedicated neural networks compute

Movidius
MA2485
Myriad X

ULTRA
Low power

Mustang−V100−MX4 Block Diagram

PCIe to USB 3.2 Gen1 — PCIe Switch — PCIe to USB 3.2 Gen1

PCIe Gen2 x 2

Mustang−V100−MX4 Dimensions *(Unit: mm)*

2.43

13.10

Number LED

Adjustment Button

113

23

19.42

80.20

80.20

63.49

56.16

59.15

22.15

Mustang-M2BM-MX2

Feature

- M.2 BM key form factor (22 x 80 mm)
- 2 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, approximate 7W
- Powered by Intel's OpenVINO™ toolkit

Introduction

The Mustang-M2BM-MX2 card included two Intel® Movidius™ Myriad™ X VPU, providing an flexible AI inference solution for compact size and embedded systems.
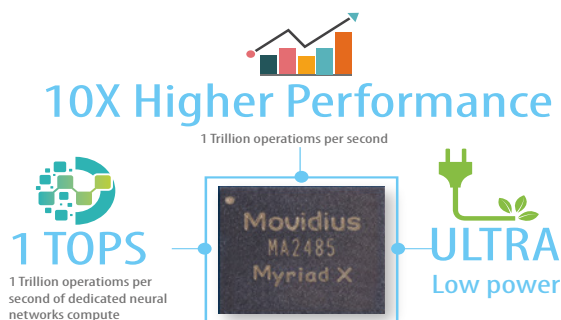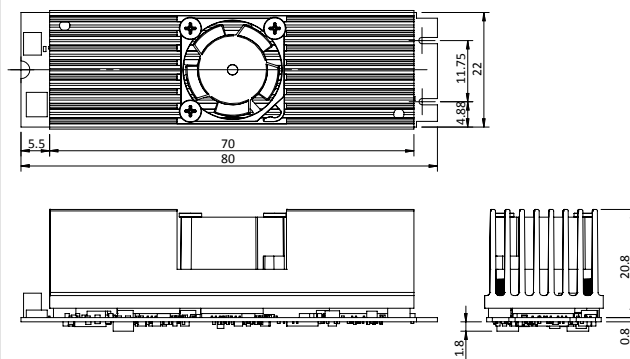
VPU is short for vision processing unit. It can run AI faster, and is well suited for low power consumption applications such as surveillance, retail, transportation. With the advantage of power efficiency and high performance to dedicate DNN topologies, it is perfect to be implemented in AI edge computing device to reduce total power usage, providing longer duty time for the rechargeable edge computing equipment.

Key Features of Intel® Movidius™ Myriad™ X VPU:

- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance

10X Higher Performance
1 Trillion operatioms per second

1 TOPS
1 Trillion operatioms per second of dedicated neural networks compute

ULTRA
Low power

Specifications

Model Name	Mustang-M2BM-MX2
Main Chip	2x Intel® Movidius™ Myriad™ X MA2485 VPU
Operating Systems	Ubuntu 18.04 LTS 64bit, CentOS 7.4 64bit, Windows® 10 64bit
Dataplane Interface	M.2 BM Key
Power Consumption	Approximate 7W
Operating Temperature	-20°C ~ 50°C (Tested in IEI FLEX-BX200)
Cooling	Active Heatsink
Dimensions	22 x 80 mm
Operating Humidity	5% ~ 90%
Support Topology	AlexNet, GoogleNetV1/V2, MobileNet SSD, MobileNetV1/V2, MTCNN, Squeezenet1.0/1.1, Tiny Yolo V1 & V2, Yolo V2, ResNet-18/50/101 * For more topologies support information please refer to Intel® OpenVINO™ Toolkit official website. [Supported Models] https://docs.openvinotoolkit.org/latest/_docs_IE_DG_Introduction.html#SupportedFW [Supported Framework Layers] https://docs.openvinotoolkit.org/latest/_docs_MO_DG_prepare_model_Supported_Frameworks_Layers.html

## Dimensions (Unit: mm)

Ordering Information

Part No.	Description
Mustang-M2BM-MX2-R20	Deep learning inference accelerating M.2 BM key card with 2 x Intel® Movidius™ Myriad™ X MA2485 VPU, M.2 interface 22mm x 80mm, RoHS
Mustang-M2BM-MX2-NC-R20	Deep learning inference accelerating M.2 BM key card with 2 x Intel® Movidius™ Myriad™ X MA2485 VPU, M.2 interface 22mmx80mm, RoHS, with no cooling module

Mustang-M2AE-MX1
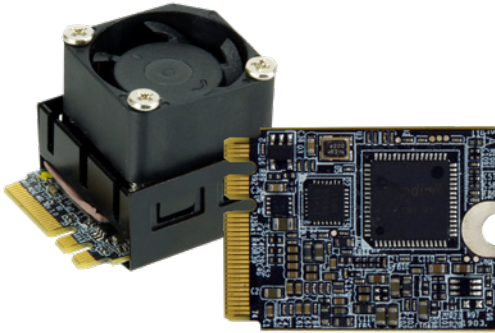
Feature

- M.2 AE key form factor (22 x 30 mm)
- 1 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, approximate 4.5W
- Operating Temperature -20°C to 60°C
- Powered by Intel's OpenVINO™ toolkit
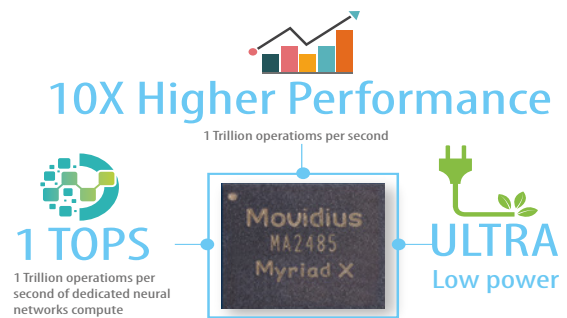

Introduction

The Mustang-M2AE-MX1M.2 AE-key card includes one Intel® Movidius™ Myriad™ X VPU, providing an flexible AI inference solution for compact size and embedded systems.

VPU is short for vision processing unit. It can run AI faster, and is well suited for low power consumption applications such as surveillance, retail, transportation. With the advantage of power efficiency and high performance to dedicate DNN topologies, it is perfect to be implemented in AI edge computing device to reduce total power usage, providing longer duty time for the rechargeable edge computing equipment.
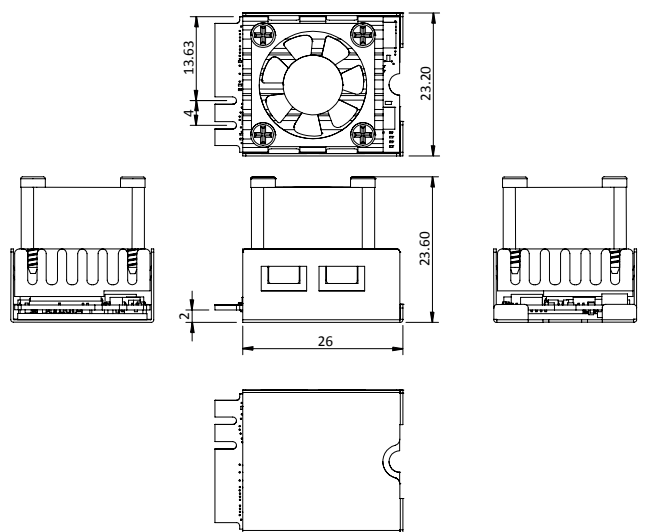
Key Features of Intel® Movidius™ Myriad™ X VPU:

- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance

10X Higher Performance

1 Trillion operatioms per second

1 TOPS
1 Trillion operatioms per second of dedicated neural networks compute

ULTRA
Low power

Specifications

Model Name	Mustang-M2AE-MX1
Main Chip	1 x Intel® Movidius™ Myriad™ X MA2485 VPU
Operating Systems	Ubuntu 18.04.x 16.04.x LTS 64bit, CentOS 7.4 64bit, Windows® 10 64bit
Dataplane Interface	M.2 AE Key
Power Consumption	Approximate 4.5W
Operating Temperature	-20°C to 60°C
Cooling	Active Heatsink
Dimensions	22 x 30 mm
Operating Humidity	5% ~ 90%
Support Topology	AlexNet, GoogleNetV1/V2, MobileNet SSD, MobileNetV1/V2, MTCNN, Squeezenet1.0/1.1, Tiny Yolo V1 & V2, Yolo V2, ResNet-18/50/101 * For more topologies support information please refer to Intel® OpenVINO™ Toolkit official website. [Supported Models] https://docs.openvinotoolkit.org/latest/_docs_IE_DG_Introduction.html#SupportedFW [Supported Framework Layers] https://docs.openvinotoolkit.org/latest/_docs_MO_DG_prepare_model_Supported_Frameworks_Layers.html

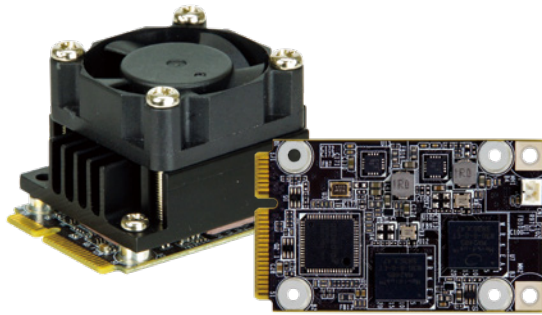## Dimensions *(Unit: mm)*

Ordering Information

Part No.	Description
Mustang-M2AE-MX1-R10	Computing Accelerator Card with 1 x Intel® Movidius™ Myriad™ X MA2485 VPU,M.2 AE key interface, 2230, RoHS

Mustang-MPCIE-MX2

Feature

- miniPCIe form factor (30 x 50 mm)
- 2 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, approximate 7.5W
- Operating Temperature -20°C~60°C
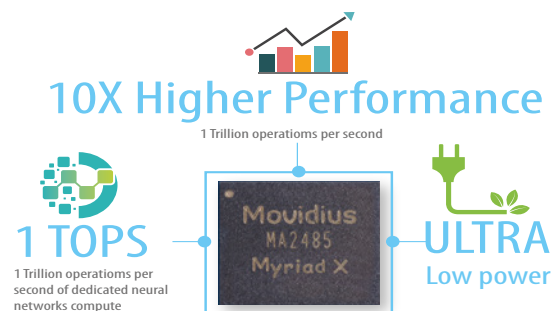- Powered by Intel's OpenVINO™ toolkit

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MOVIDIUS

Introduction

The Mustang-MPCIE-MX2 card includes two Intel® Movidius™ Myriad™ X VPU, providing an flexible AI inference solution for compact size and embedded systems.

VPU is short for vision processing unit. It can run AI faster, and is well suited for low power consumption applications such as surveillance, retail, transportation. With the advantage of power efficiency and high performance to dedicate DNN topologies, it is perfect to be implemented in AI edge computing device to reduce total power usage, providing longer duty time for the rechargeable edge computing equipment.
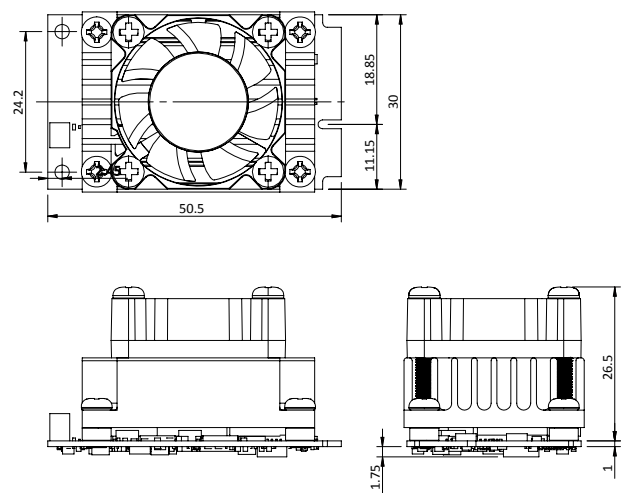
Key Features of Intel® Movidius™ Myriad™ X VPU:

- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance

10X Higher Performance

1 Trillion operatioms per second

1 TOPS
1 Trillion operatioms per second of dedicated neural networks compute

Movidius MA2485 Myriad X

ULTRA
Low power

Specifications

Model Name	Mustang-MPCIE-MX2
Main Chip	2 x Intel® Movidius™ Myriad™ X MA2485 VPU
Operating Systems	Ubuntu 16.04.3 LTS 64bit, CentOS 7.4 64bit, Windows® 10 64bit
Dataplane Interface	miniPCIe
Power Consumption	Approximate 7.5W
Operating Temperature	-20°C~60°C
Cooling	Active Heatsink
Dimensions	30 x 50 mm
Operating Humidity	5% ~ 90%
Support Topology	AlexNet, GoogleNetV1/V2, MobileNet SSD, MobileNetV1/V2, MTCNN, Squeezenet1.0/1.1, Tiny Yolo V1 & V2, Yolo V2, ResNet-18/50/101 * For more topologies support information please refer to Intel® OpenVINO™ Toolkit official website.

Dimensions *(Unit: mm)*

Ordering Information

Part No.	Description
Mustang-MPCIE-MX2-R10	Deep learning inference accelerating miniPCIe card with 2 x Intel® Movidius™ Myriad™ X MA2485 VPU, miniPCIe interface 30mm x 50mm, RoHS

Mustang-T100-T5

Feature

● 5 x Coral Edge TPU™ ML accelerator
● 20 TOPS peak performance (int8)
● Host interface PCIe Gen2 x4
● Low-profile PCIe form factor
● Support Multiple card
● Approximate 15W
● RoHS compliants

Specifications

Model Name	Mustang-T100-T5
Main Chip	Five Coral Edge TPU™ Accelerator Module
Operating Systems	Linux: 64-bit version of Debian 10 or Ubuntu 16.04 (or newer)
	Windows: 64-bit version of Windows 10
Dataplane Interface	PCI Express Gen2 x4
Power Consumption	Approximate 15W
Operating Temperature	-20°C~55°C
Cooling Solution	Active
Dimensions	Standard half-height, half-length, single-slot PCIe card
Dip Switch/LED indicator	Identify card number
Support Framwork	Tensorflow Lite
Precision	INT8

Ordering Information

Part No.	Description
Mustang-T100-T5-R10	TPU Accelerator Card with 5 x Coral edge TPU, PCIe Gen2 x4 interface, RoHS

Packing List

1 x Full height bracket
1 x QIG

❯ Scalable Infrastructure, Support Multiple Cards

You can install up to eight Mustang-T100 AI accelerator cards in one system to support additional AI workload and expand the AI computing capabilities in any requirement.

x8

❯ Multitasking or Pipelining, Select Your Inferencing Mode

For numerous AI applications at the edge, clients can select from two different modes to run your inferencing project depending on their needs.

Multitasking function to run each model in parallel

If you need to run multiple models, you can assign each model to a specific Edge TPU and run them in parallel at the same time for extreme computing performance.
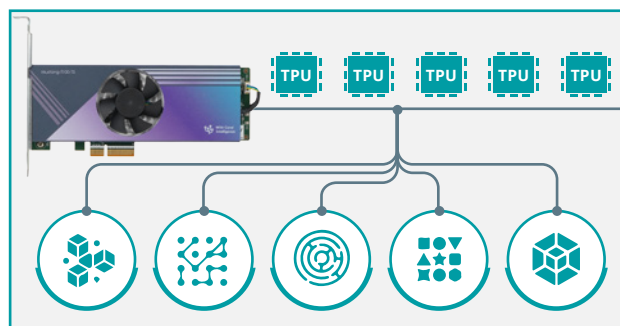
Model pipelining to get faster throughput and low latency

For other scenarios that require very fast throughput or large models, pipelining your model allows you to execute different segments of the same model on different Edge TPUs. This can improve throughput for high-speed applications and can reduce total latency for large models.
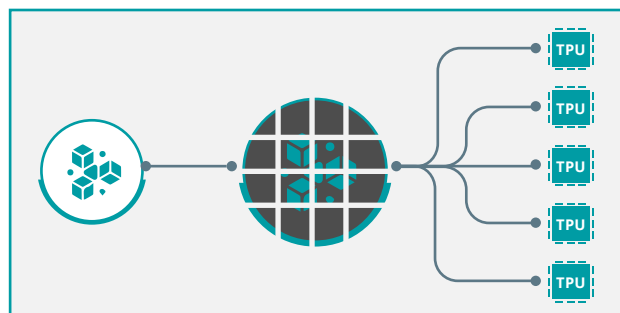
❯ High Compatibility From The Start

To support diverse needs from IT or AI developers, the Mustang-T100 can be implemented in various operating systems, such as Linux, X86, ARM, or small FF to accelerate and maximum edge AI performance. More, combined with TensorFlow Lite, no need to build ML training models from the ground up. TensorFlow Lite models can be compiled models to run on the Edge TPU completely.
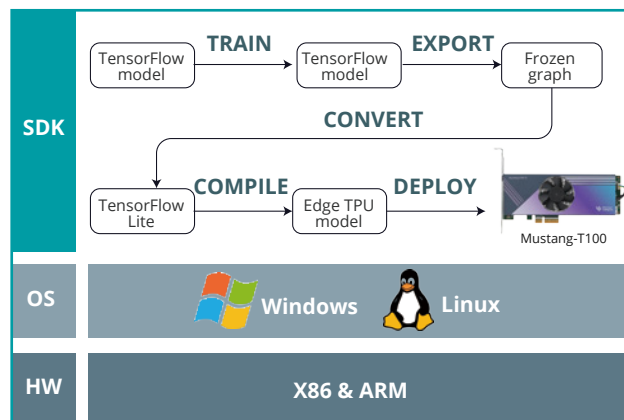
Accelerator Module datasheet

- Coral Edge TPU™ ML accelerator: 4 TOPS peak performance (int8) / 2 TOPS per watt
- Integrated power management
- PCIe Gen2 x1 or USB 2.0 interface
- Surface-mounted (LGA) module
- Size: 15.0 x 10.0 x 1.5 mm
- **Support ARM (Linux) & X86(Windows & Linux)**
- Weight: 0.67 g
- Operating temp: -20°C~55°C
- RoHS compliant

Introduction

Coral is a hardware and software platform for building intelligent devices with fast neural network inferencing.

At the heart of our devices is the Edge TPU coprocessor. This is a small ASIC built by Google that's specially-designed to execute state-of-the-art neural networks at high speed, with a low power cost.

The Edge TPU is capable of performing 4 trillion operations (tera-operations) per second (TOPS), using 0.5 watts for each TOPS (2 TOPS per watt).

Mustang−T100−T5 Block Diagram
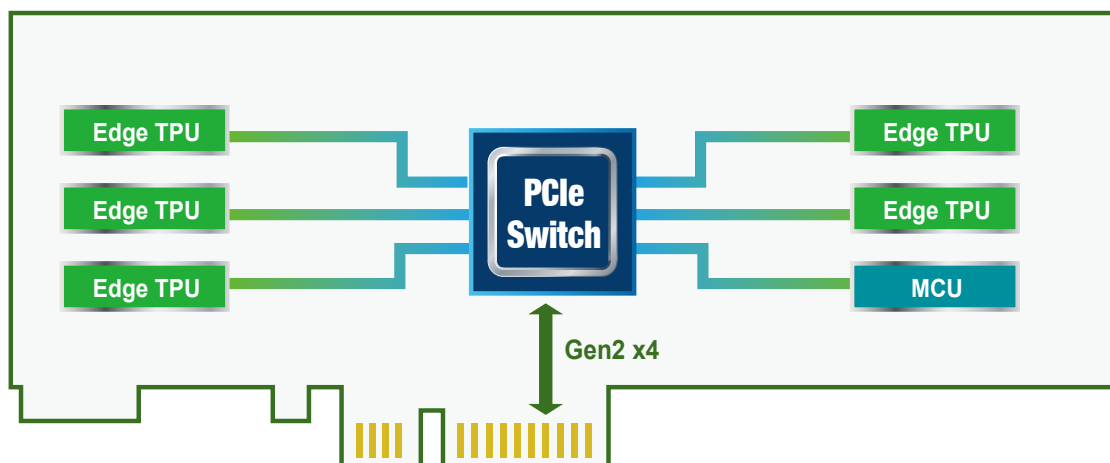
Mustang−T100−T5 Dimensions (Unit: mm)