2020

AI Ready Solution

iEi®

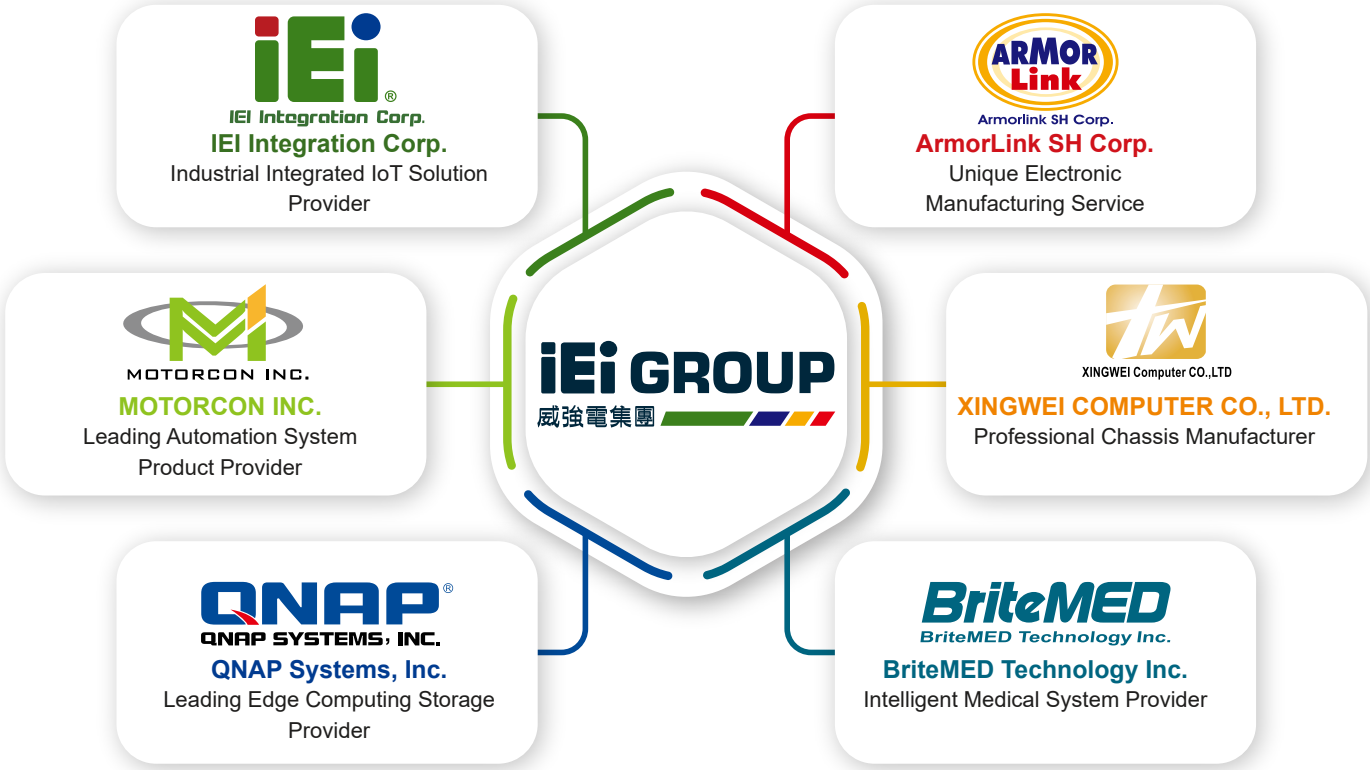
intel IoT Solutions Alliance

www.ieiworld.com

INDEX

IEI Group

IEI Group has 20 offices in 14 countries. IEI is alliance with Intel, Microsoft, Wind River, SAP and Amazon to offer a complete intelligent system with various options, including kinds of hardware devices supporting different operating systems, multiple applications, private/hybrid/public cloud computing and data storage/security for developing integrated solutions, collaborating new applications and expanding the markets.



About IEI Integration Corp.

IEI Integration Corp. builds up the business as a leading industrial computer provider, and turns to artificial intelligence and networking edge computing. IEI's products are applied in computer-based applications such as factory automation, computer telephony integration, networking appliances, security, systems, and in fields like AI, IoT (Internet of Things), national defense, police administration, transportation, communication base stations and medical instruments. IEI continues to promote its brand products as well as serving ODM vertical markets to offer complete and professional services. IEI strives to achieve the ultimate aim of IoT and AI, and to create comfortable and convenient living spaces for human beings by using advanced technologies.

IEI Global Service

B2B/B2C online shops and RMA service are open 24 hours a day.

Company Awards

Red Dot Design Award


UPC-F12C-ULT3


AFL3-W19C-ULT3


HTDB-100F


POC-W22A-H81


MODAT-531

Taiwan Excellence Award


Smart Mobile Nursing Solution


MODAT-531

iF Product Design Award


POCm-W24C-ULT3

ICT Month Innovative Elite

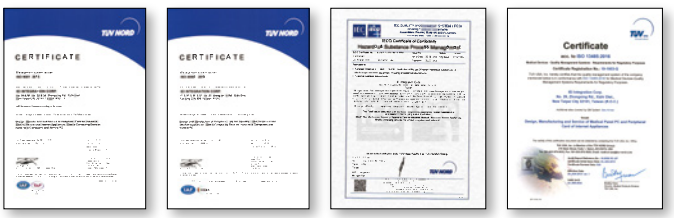

POC-W22A-H81

Golden Pin Design Award


MODAT-531

Certificates

ISO 9001 2015
ISO 14001 2015
ISO 13485 2016
ISO 28000 2007
ISO 27001 2013
QC 080000 2012
ISO 45001 2018



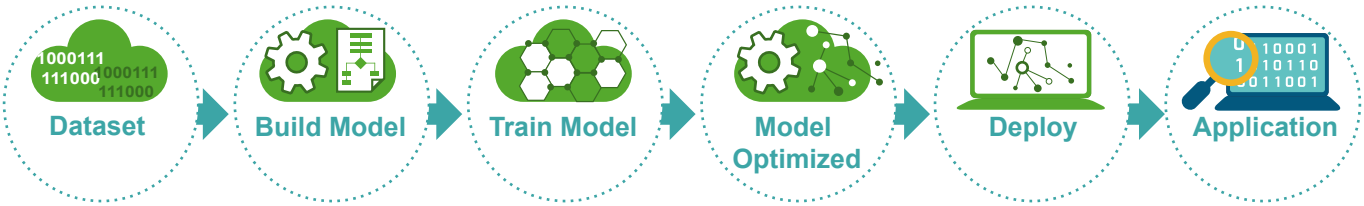
IEI AI Ready Solutions

Artificial Intelligence, AI, is changing our lives from the past to the future. It enables machine learning by using a variety of training models to simulate and infer the status or appearance of objects. For example, the inference system with the video analysis model can perform face and vehicle license plate analysis for safety and security purposes.
Today, most of AI technology still rely on the data center to execute the inference, which will increase the risk of real-time application for applications such as traffic monitoring, security CCTV, etc. Therefore, it's crucial to implement a low-latency. real-time edge computing platform.

Traffic Monitoring

Security CCTV

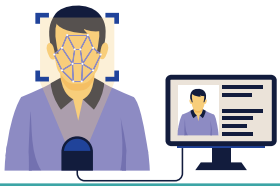
Face recognition



Training

ONNX mxnet TensorFlow Caffe

Images
Annotations
Model



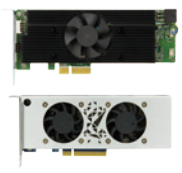
Inferencing

OpenVINO

New Image
Model
Predict Result

AI Training Server

AI Inference System

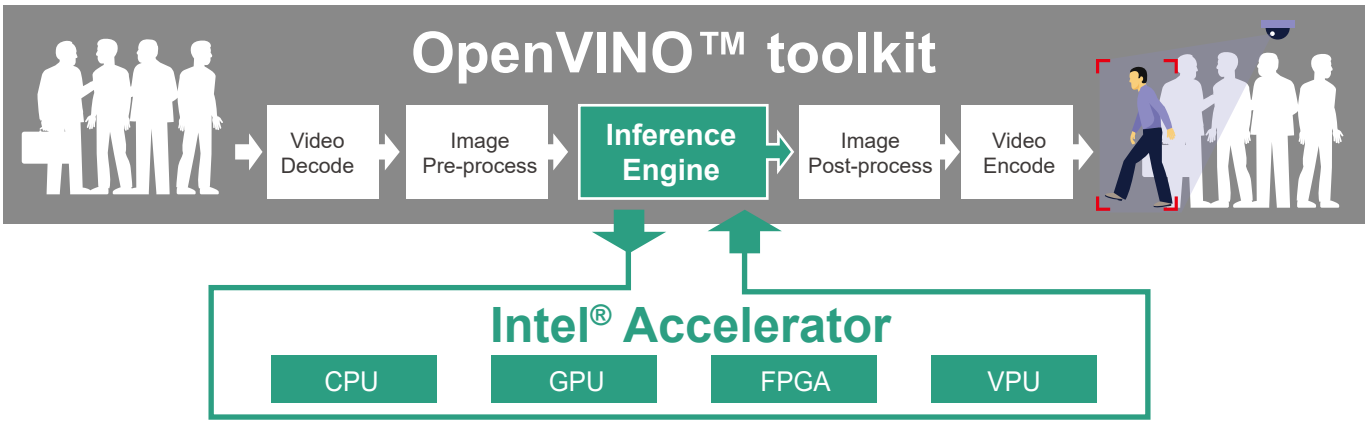


Accelerator Card

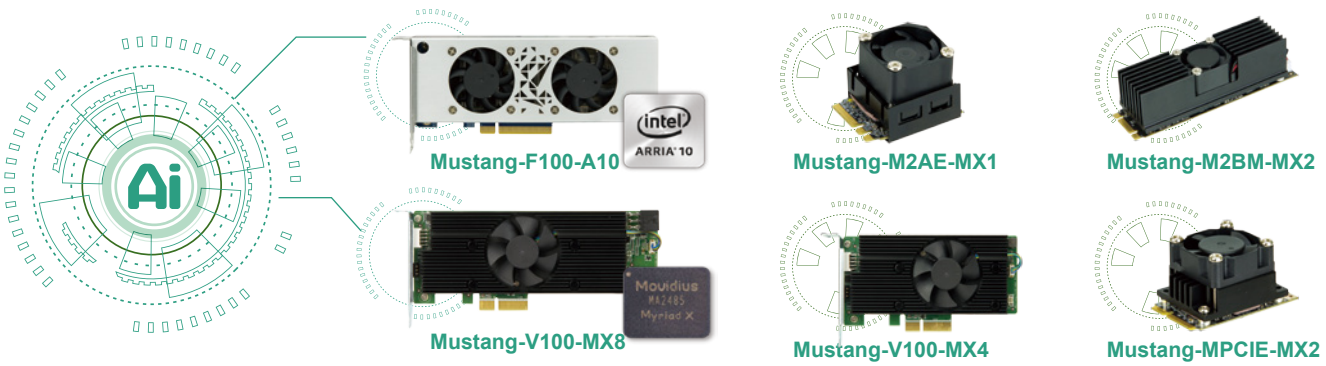
AI Modular Panel PC

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).

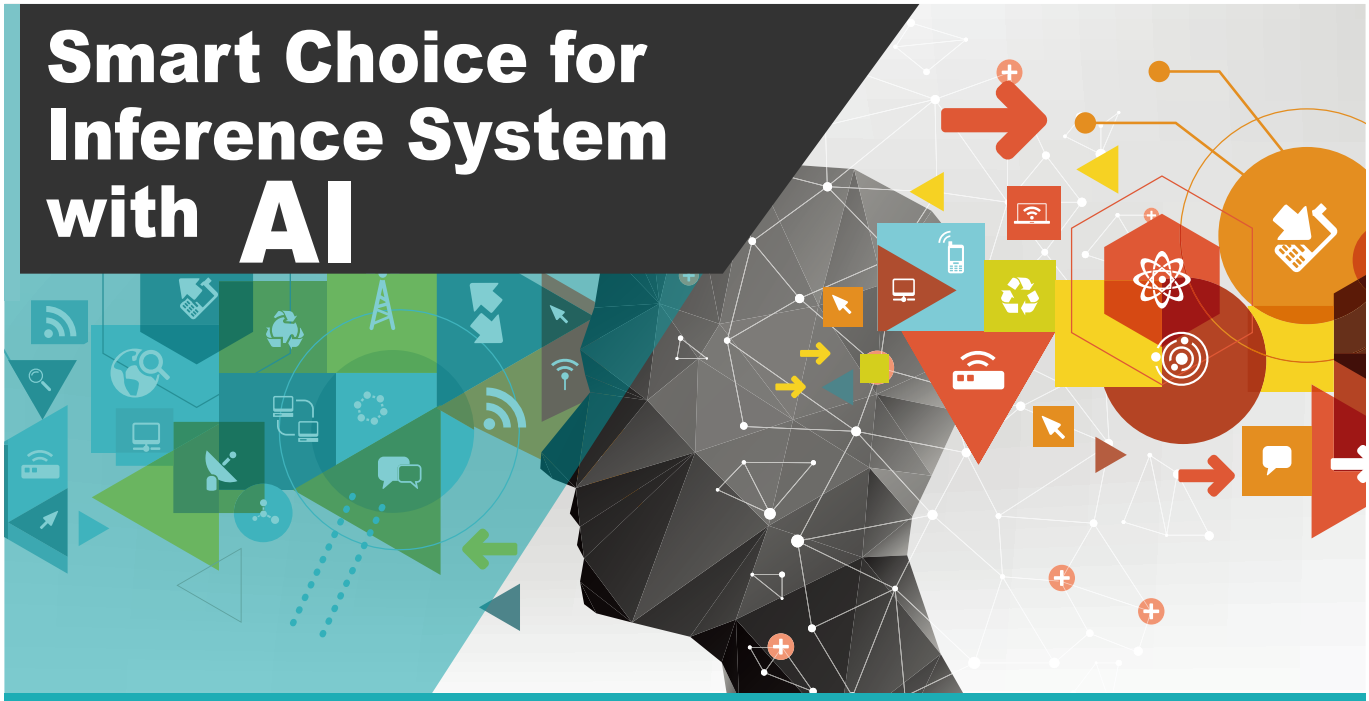


IEI accelerators Systems for Mustang Accelerators



Accelerator / Platform	Mustang-F100-A10 PCIe Gen3x8	Mustang-V100-MX8 PCIe Gen2x4	Mustang-V100-MX4 PCIe Gen2x2	Mustang-MPCIe-MX2 minipcie	Mustang-M2BM-MX2 M.2 B+M
TANK AIoT Dev. Kit Intel® SkyLake AI Dev. Kit	x2	x2			
FLEX-BX-200-Q370 Intel® Coffee Lake AI Modular Box PC		x4	x4		
RACK-500AI Intel® Coffee Lake AI Modular PC		x2	x2		
PAC-400AI Intel® SkyLake AI Modular PC		x2	x2		
ITG-100AI Intel® Atom™x5-E3930					

Smart Choice for Inference System with AI



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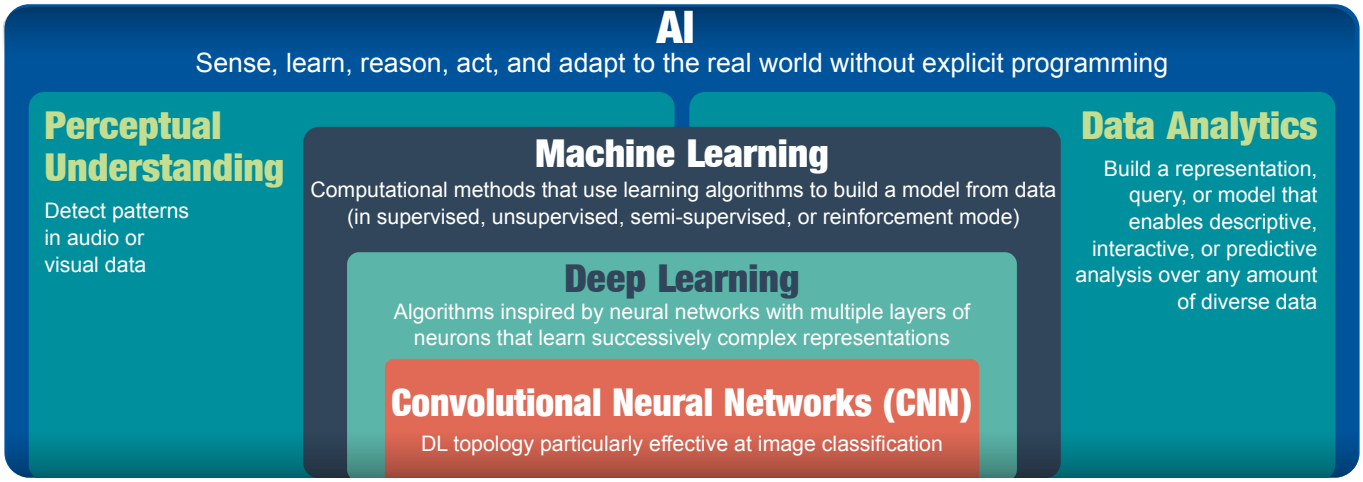
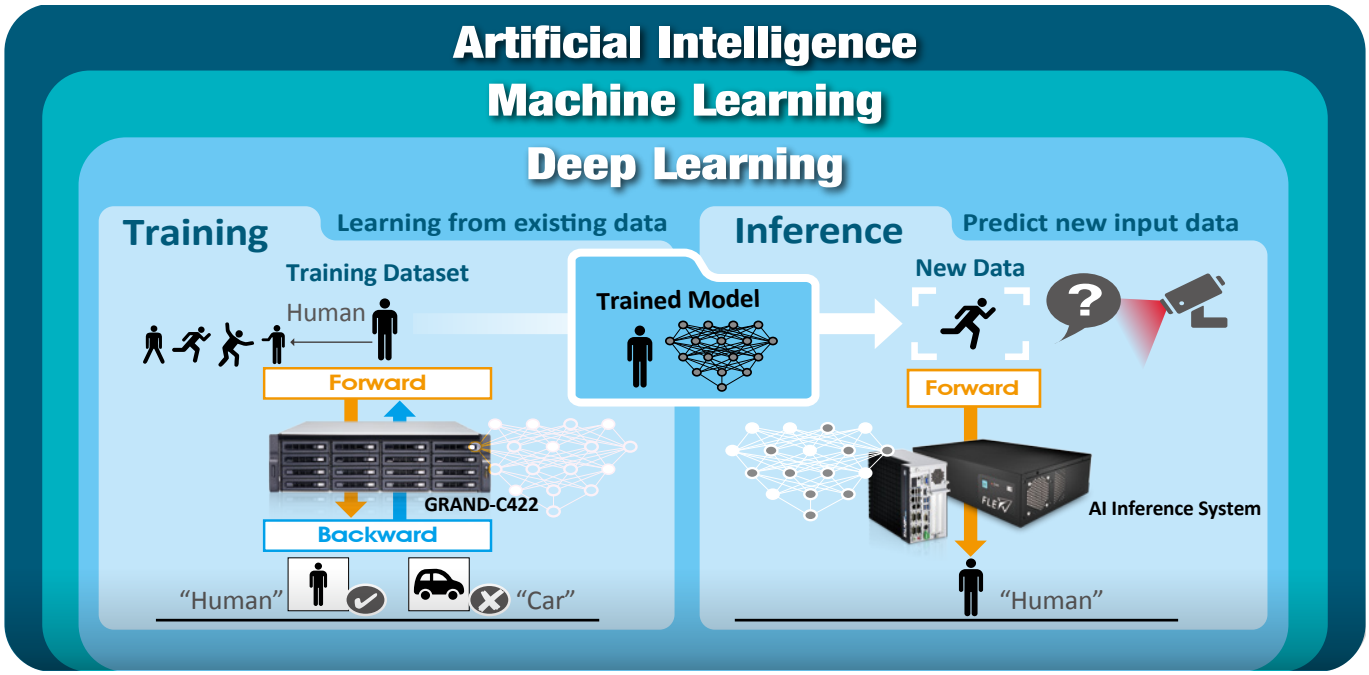
Deep learning and inference

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.



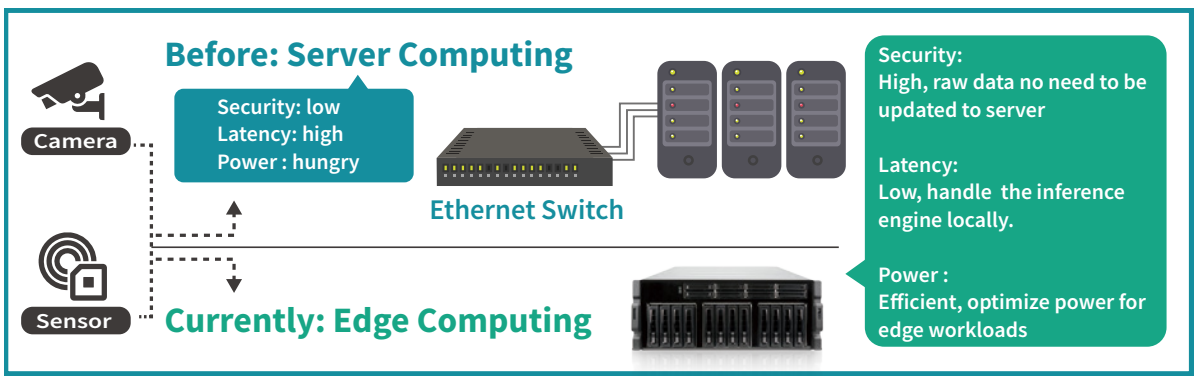
In the past, machine learning required researchers and domain experts knowledge to design filters that extracted the raw data into feature vectors. However, with the contributions of deep learning accelerators and algorithms, trained models can be applied to the raw data, which could be utilized to recognize new input data in inference.



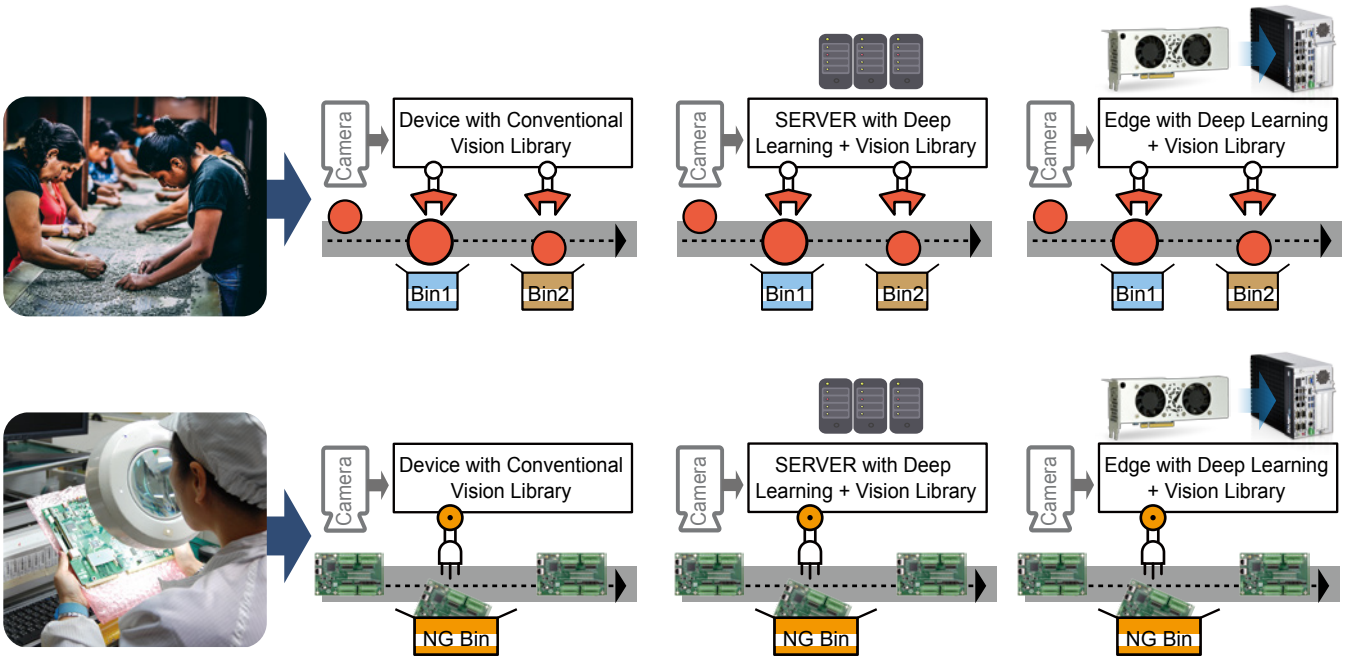
Edge Computing

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.



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



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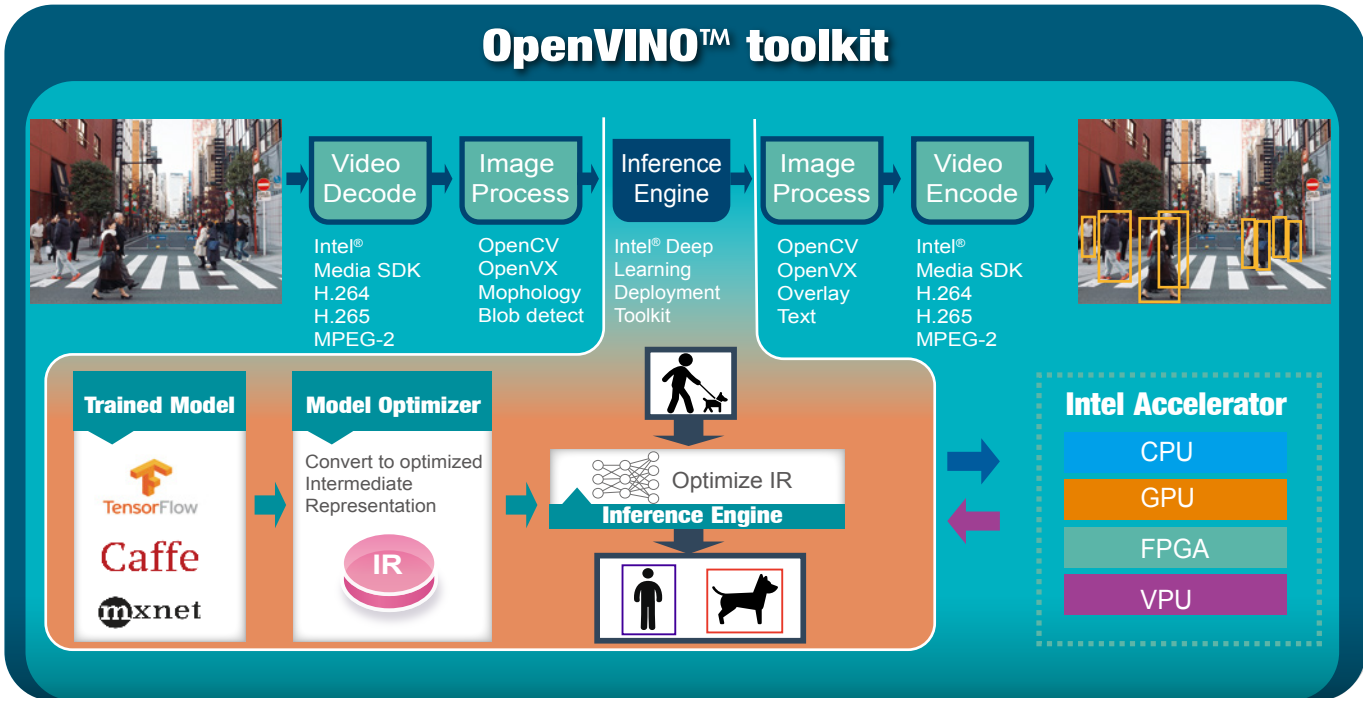
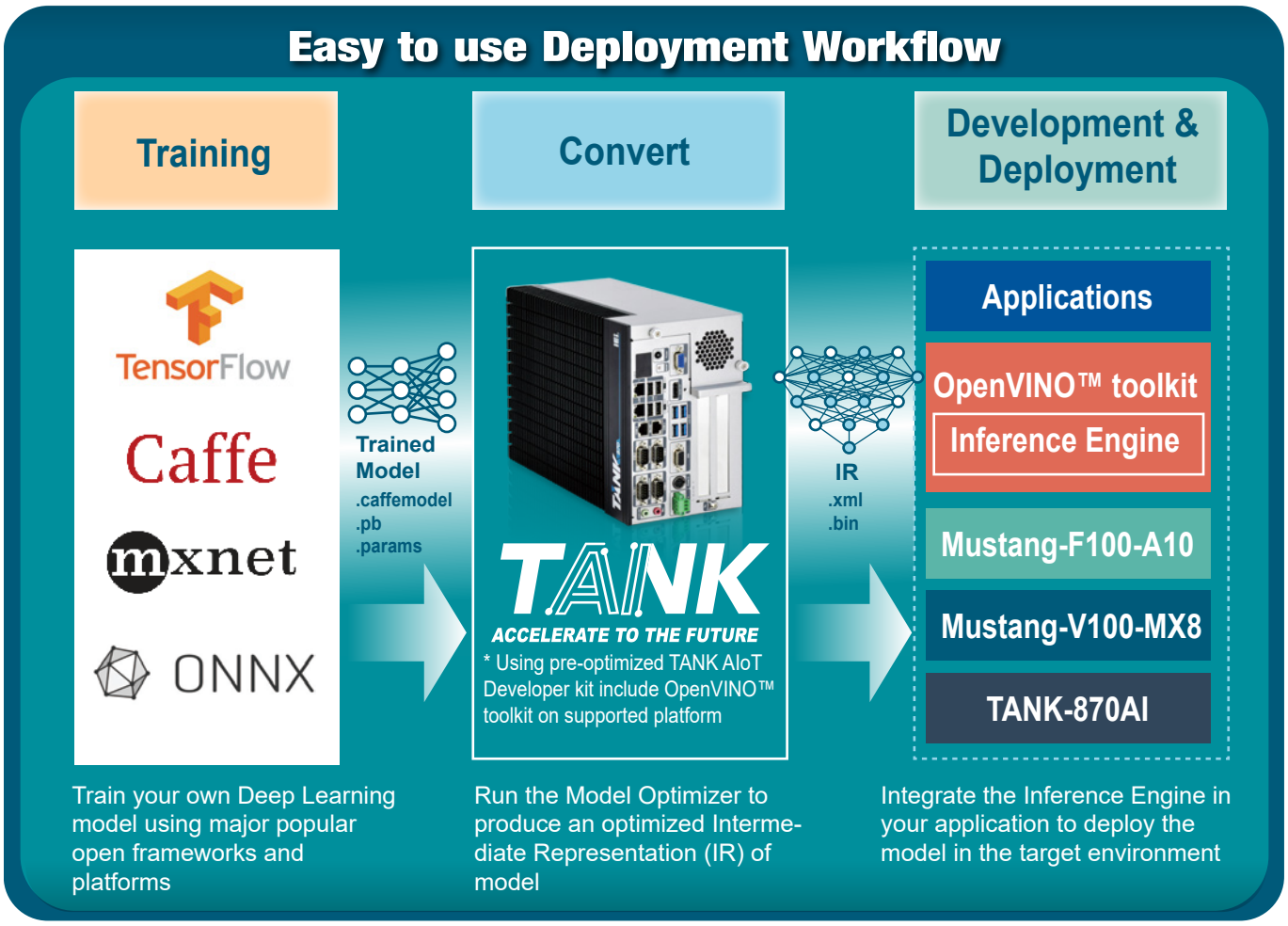


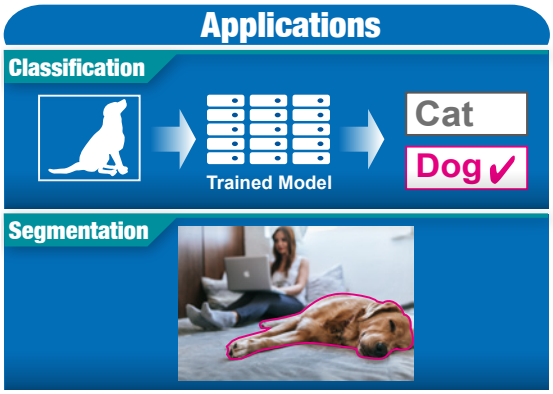
Software

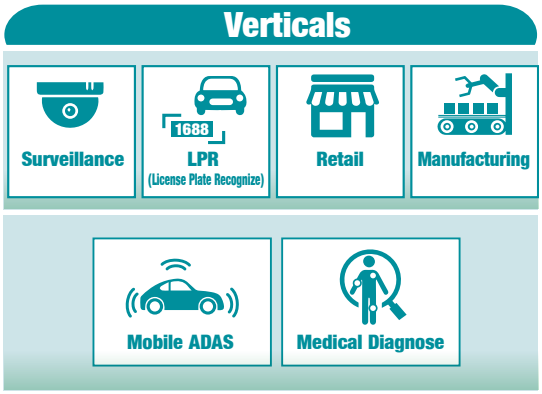


- **Operating Systems**
  Ubuntu 16.04.3 LTS 64bit, CentOS 7.4 64bit, Windows 10 64bit
- **OpenVINO™ toolkit**
  – Intel® Deep Learning Deployment Toolkit
    • Model Optimizer
    • Inference Engine
  – Optimized computer vision libraries
  – Intel® Media SDK
  – Current Supported Topologies: AlexNet, GoogleNet V1/V2/V4, Yolo Tiny V1/V2, Yolo V2/V3, SSD300,SSD512, ResNet-18/50/101/152, DenseNet121/161/169/201, SqueezeNet 1.0/1.1, VGG16/19, MobileNet-SSD, Inception-ResNet-v2,Inception-V1/V2/V3/V4,SSD-MobileNet-V2-coco, MobileNet-V1-0.25-128, MobileNet-V1-0.50-160, MobileNet-V1-1.0-224, MobileNet-V1/V2, Faster-RCNN

* 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

- **High flexibility, develop on OpenVINO™ toolkit structure which allows trained data such as Caffe, TensorFlow, and MXNet to execute on it after convert to optimized IR.**





Accelerator / Platform	Mustang-F100-A10 PCIe Gen3x8	Mustang-V100-MX8 PCIe Gen2x4	Mustang-V100-MX4 PCIe Gen2x2	Mustang-MPCIe-MX2 minipcie	Mustang-M2BM-MX2 M.2 B+M
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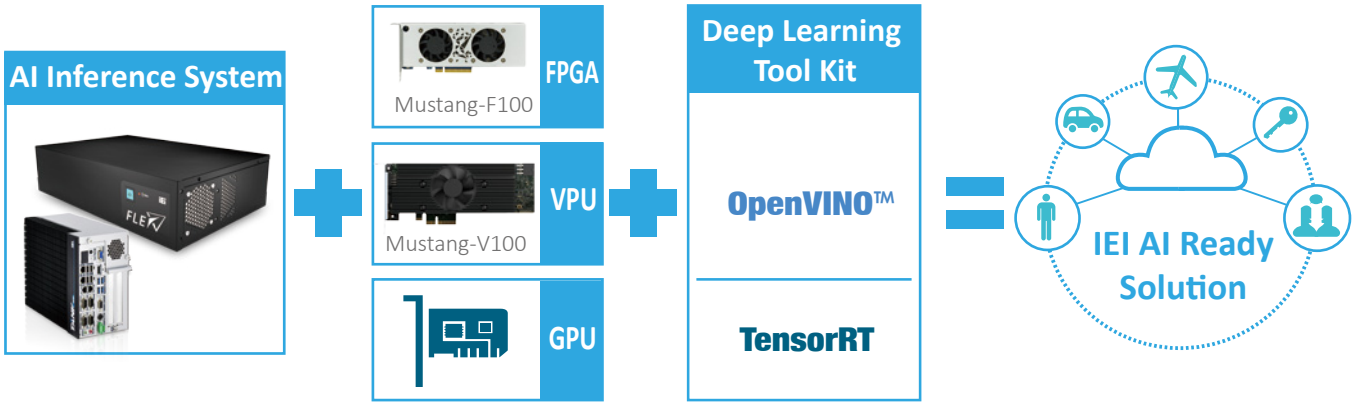
FLEX-BX-200-Q370 Intel® Coffee Lake AI Modular Box PC		x4	x4		
RACK-500AI Intel® Coffee Lake AI Modular PC		x2	x2		
PAC-400AI Intel® SkyLake AI Modular PC		x2	x2		
ITG-100AI Intel® Atom™x5-E3930					

IEI AI Ready Solution Accelerates Your AI Initiative

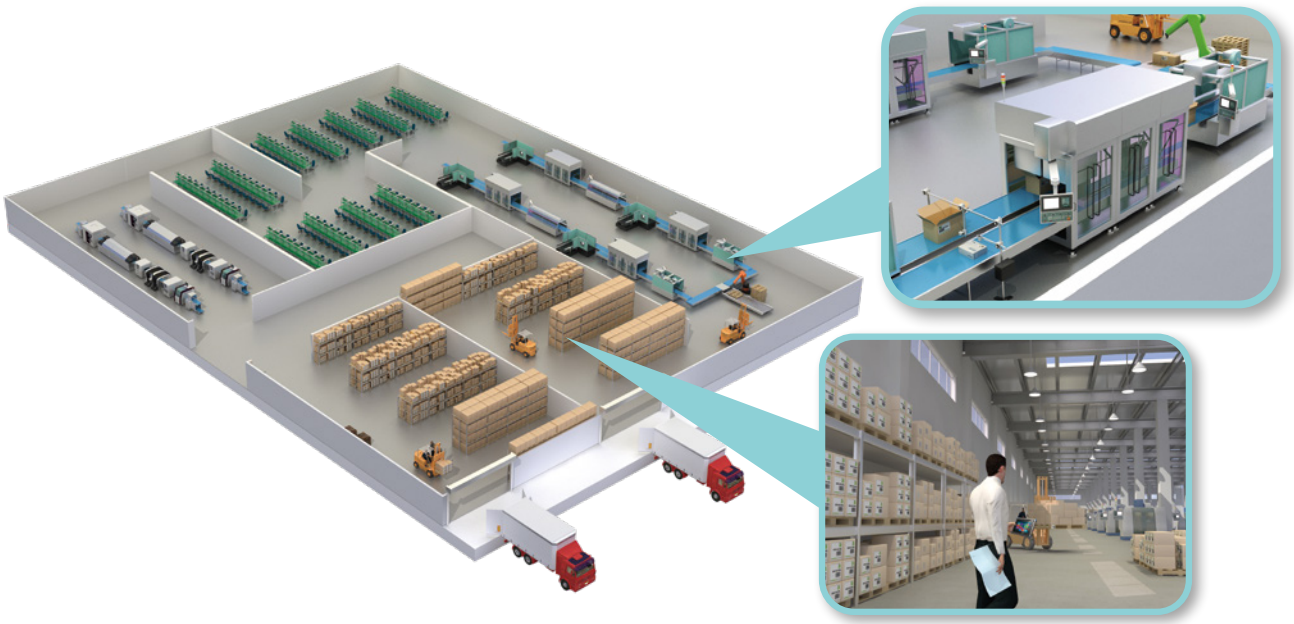
The FLEX-BX200 and TANK-870AI dev. kit are AI hardware ready system ideal for deep learning inference computing to help you get faster, deeper insights into your customers and your business. IEI's FLEX-BX200 and TANK-870AI dev. support graphics cards, Intel® FPGA acceleration cards, and Intel® VPU acceleration cards, and provides additional computational power plus end-to-end solution to run your tasks more efficiently. With the Intel® OpenVINO toolkit and NVIDIA TensorRT, it can help you deploy your solutions faster than ever.



Industrial Manufacturing

• Industrial automation

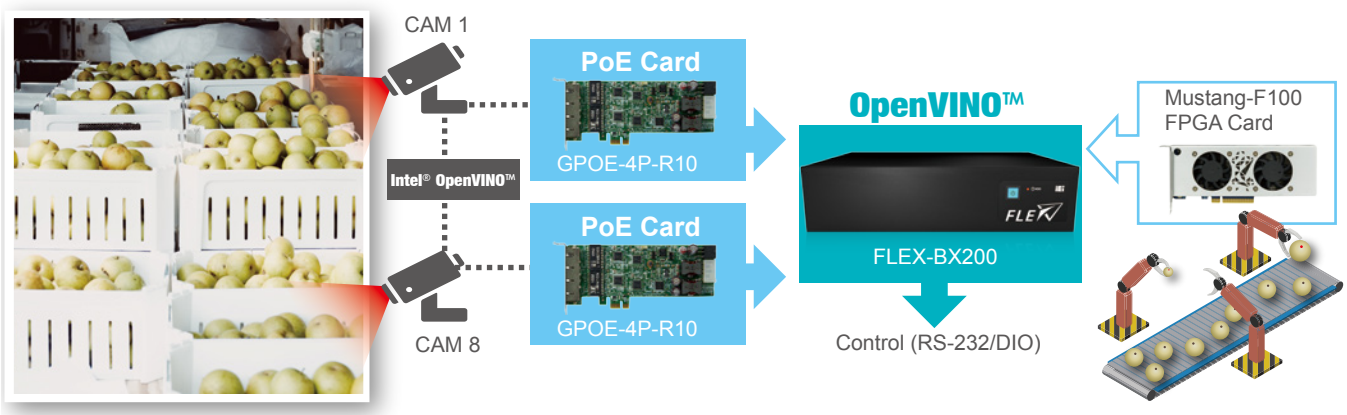
Mustang series solutions help enable intelligent factories to be more efficient on work order schedule arrangements. In today's production line, sticking to manufacturing schedules is becoming more and more important for business efficiency. From raw material storage to fabrication and complete products, all information from factory such as manufacturing equipment process time and warehouse storage status are essential to achieve production goals. Solutions based on AI technology can produce more detailed, accurate, and meaningful digital models of equipment and processes for product management.



• 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.

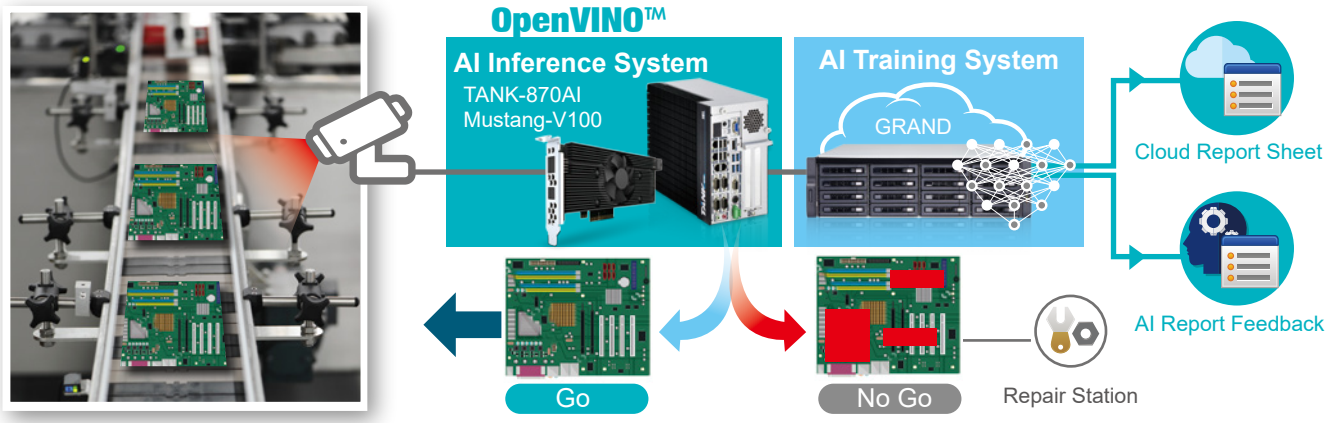
The FLEX series designed for machine vision market has four PCIe 3.0 expansion slots for installing motion controller cards, GP GPU/FPGA/VPU cards and the PoE Ethernet card which is developed by IEI and has four GbE Power over Ethernet (PoE) ports compliant with IEEE 802.3af for direct connection to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



• AOI Defect Classification

During the manufacturing process, defects could be introduced and harmful to the quality. It is necessary to classify the defects detected by AOI machine appropriately especially killer defects. The higher accuracy to classify defects, the less cost spent on review and repair station.

The TANK AIoT Dev. Kit features rich I/O and dual PCIe x8 signals to support add-ons like the Acceleration cards (Mustang-F100-A10 & Mustang-V100-MX8) or the PoE to enhance the defects detected performance.



Retail

• Smart Retail

Using the Mustang series for computer vision solutions at the edge of retail sites can quickly recognize the gender and age of the customers and provide relevant product information through digital signage display to improve product sales and inventory control. Self-checkout can reduce human resource cost so that retail owners can spend more resources on promoting products and understanding business patterns.

In addition, it can help to analyze customer's in-store behavior, and provide customer information based on gender and age to facilitate product positioning. Quickly converting the business intelligence gained and help build better business practices and increase profitability.

Self-checkout

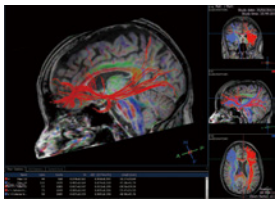
Smart Retail

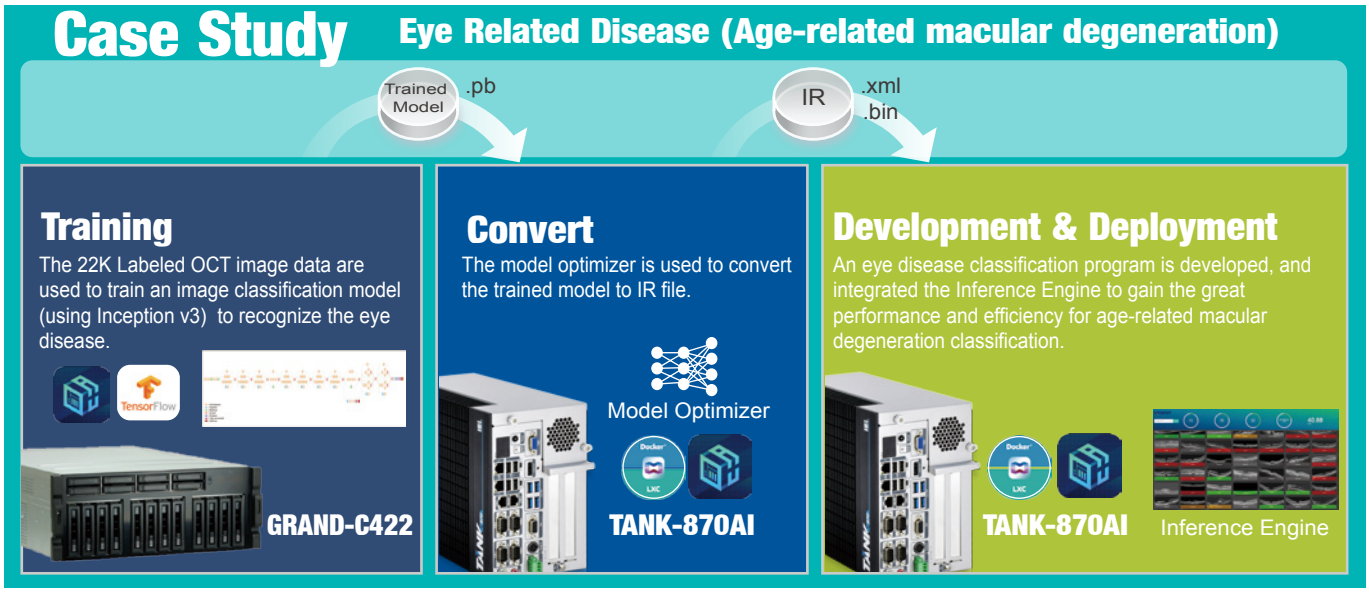

Interactive digital signage

Medical

• Medical Diagnostics

With AI based technology, healthcare and medical centers can diagnose, locate and identify suspicious areas such as tumors and other abnormalities more quickly and accurately. Using segmentation technology and trained models on the Mustang series can be used to locate and identify abnormalities with a high degree of accuracy helping doctors and researchers quickly serve the patient.





Transportation

• Numerous Vehicle License Plate Analysis

Efficient road tolling and parking reduces fraud related to non-payment, makes charging effective, and reduces required manpower to process. Vehicle license plate analysis can be deployed on highways for electronic toll collection, and can be implemented as a method of cataloguing the movement of traffic as well as provide enhanced security by establishing data on suspicious vehicles in a more efficient way.

Traffic management

LPR

TANK
ACCELERATE TO THE FUTURE

AIoT Dev. Kit

The TANK AIoT Dev. Kit features rich I/O and dual PCIe x8 signals to support add-ons like the Acceleration cards (Mustang-F100-A10 & Mustang-V100-MX8) or the PoE card to enhance performance and function for various applications.

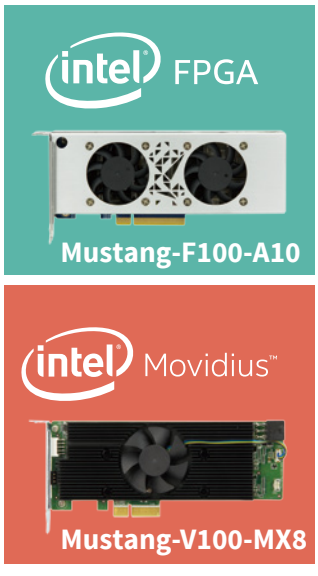
Integrate AI into IOT applications

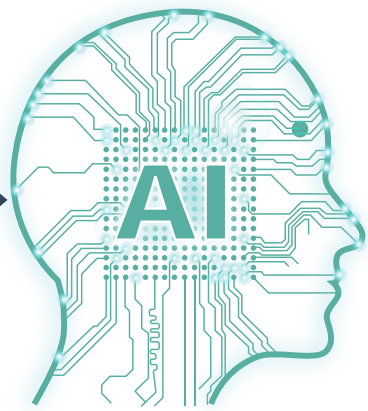
Open the door to faster deployments of Inference Systems with the TANK AIoT Dev. Kit via the Intel® Distribution of OpenVINO™ toolkit & Intel® Media SDK

TANK
ACCELERATE TO THE FUTURE

TANK-AIoT Dev. Kit

- 6th/7th Gen Intel® Core™/Xeon® processor platform with Intel® Q170/C236 chipset and DDR4 memory
- Pre-install OpenVINO™ toolkit for AI inference acceleration
- Support Intel® CPU、GPU、FPGA、VPU acceleration





TANK AIoT Developer Kit

NEW

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

Specifications

Model Name	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	Fan
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	Xeon® E3 -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-E3/32G/2A/F-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, Mustang-F100, RoHS
TANK-870AI-E3/32G/2A/V-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, Mustang-V100, 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/F-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-F100, 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-i7/8G/2A-R11	Ruggedized embedded system with Intel® Core™ i7-6700TE 2.4GHz, (up to 3.4 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-i7/8G/2A/F-R11	Ruggedized embedded system with Intel® Core i7-6700TE 2.4GHz, (up to 3.4 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-i7/8G/2A/V-R11	Ruggedized embedded system with Intel® Core i7-6700TE 2.4GHz, (up to 3.4 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
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
TANK-870AI-i5/8G/2A-R11	Ruggedized embedded system with Intel® Core™ i5-6500TE 2.3GHz, (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-i5/8G/2A/F-R11	Ruggedized embedded system with Intel® Core i5-6500TE 2.3GHz, (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-i5/8G/2A/V-R11	Ruggedized embedded system with Intel® Core i5-6500TE 2.3GHz, (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-F100-A10-R10	PCIe FPGA Highest Performance Accelerator Card with Arria 10 1150GX support DDR4 2400Hz 8GB, PCIe Gen3 x8 interface, RoHS
Mustang-V100-MX8-R11	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

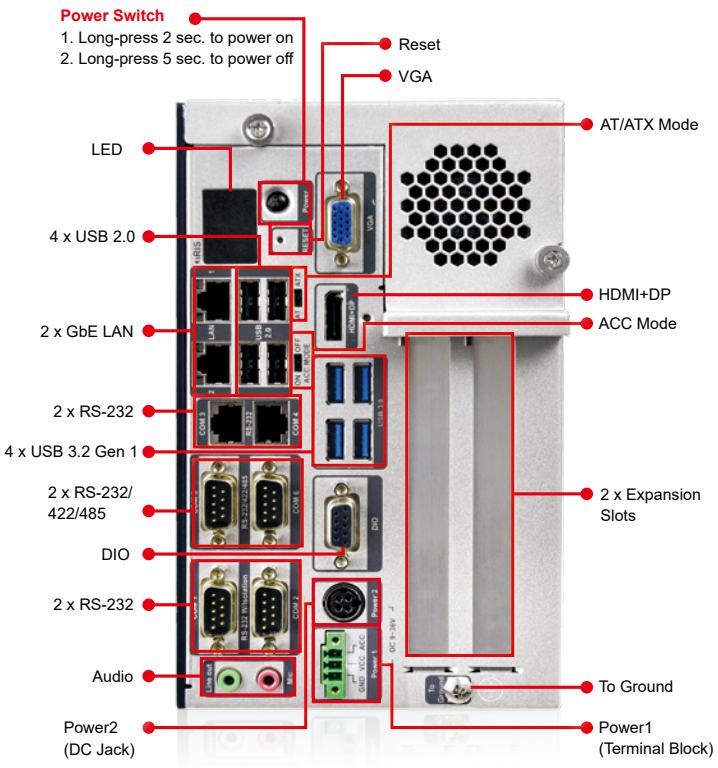
Peripheral Options

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

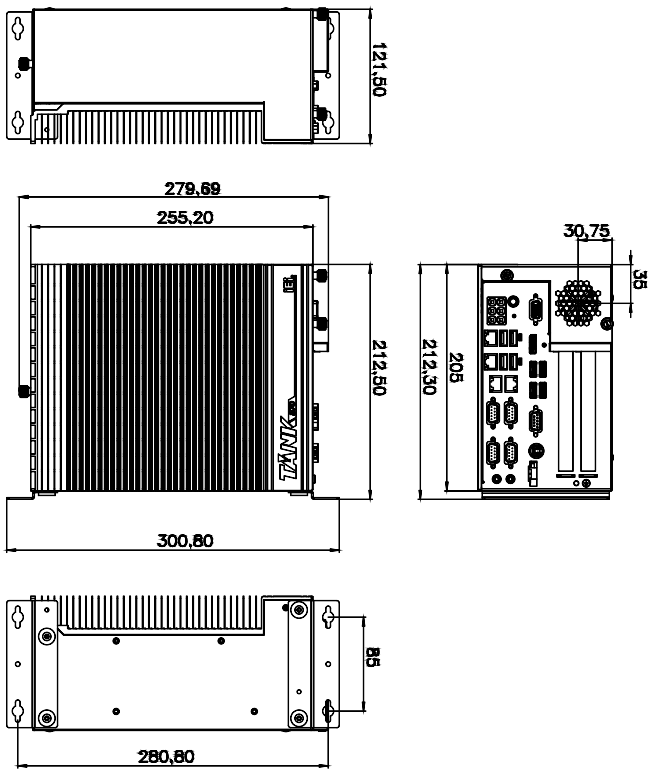
Packing List

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)



IEI AI Ready Modular Box PC

Critical Success Factors for Edge Inference Systems

The FLEX series offers six features to help AI developers to build diverse AI solutions.

Industrial grade

Meet MIL-810F vibration test and support extended operating temperature from -10°C~50°C to assure assures system reliability and endurance under the highest level in volatile, harsh and critical environments.

Flexible deployment

Compact 2U system for flexible deployment allows it to be installed everywhere by rack mounting, wall mounting, and even converted to an all-in-one panel PC.

Flexible expansion capability

Two PCIe x8 and two PCIe x4 expansion slots allow AI developers to install AI add-on-cards, like VPU, GPU, capture cards and I/O cards, to accelerate AI development.

Interconnectivity

IEI's FLEX series offer diverse I/O, including COM, USB, GbE LAN, HDMI and audio ports, highly interconnected with arrays of sensors and peripherals

High volume RAID 0/1/5/10 storage capacity

AI systems are highly dependent on enormous volumes of data. IEI's inference computing system, the FLEX series, is equipped with 4 hot-swappable HDDs and dual NVMe SSDs supporting massive storage capacity required for AI workloads.

8th Generation Intel® Core™ Desktop Processors

Equipped with a powerful CPU processor, IEI's FLEX system offers advanced computing and graphics performance for computationally intensive processes.

8th Generation Intel® Core™ Desktop Processors

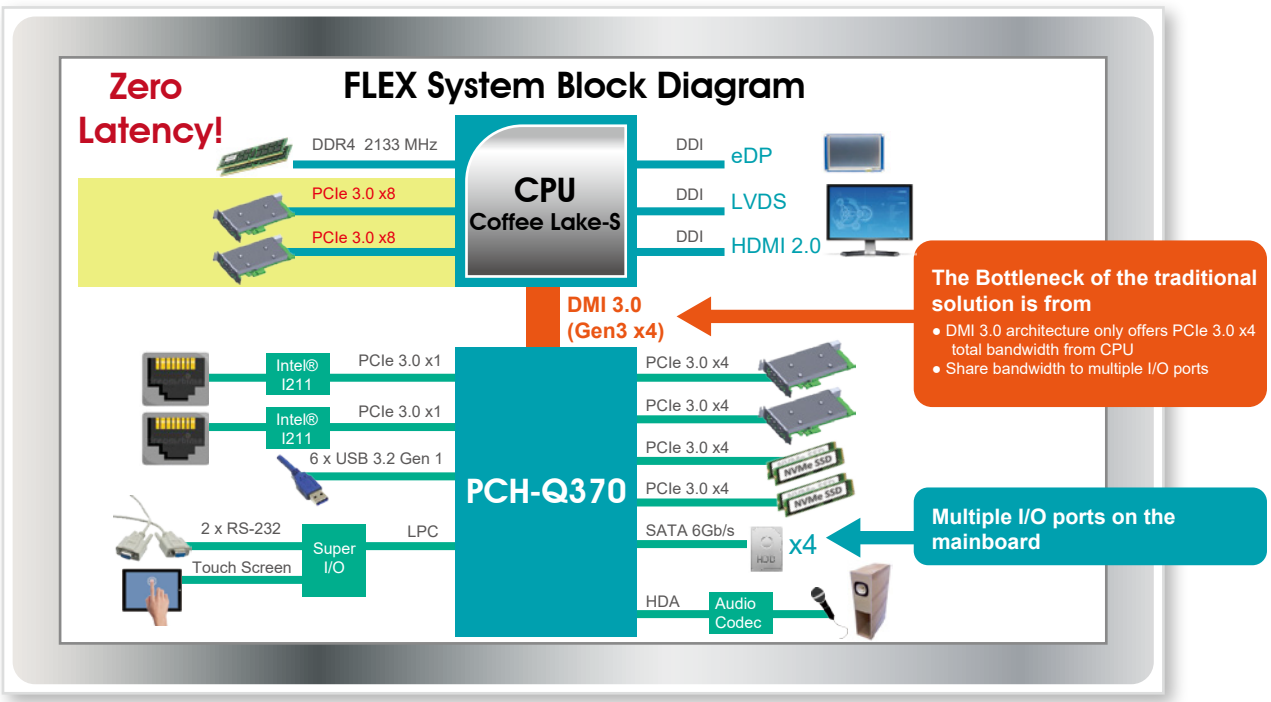
For applying inference prediction immediately based on trained model, how to select system components is a huge puzzle. The numbers of GPU, the cores of CPU and the size of the memory always matter. CPU is responsible mainly for data processing and communicating with GPU. Hence, the number of cores and threads per core are paramount. It is better to choose a multi-core processor to handle AI tasks.

IEI FLEX series adopts the 8th Generation Intel® Core™ desktop processor, of which the Core i7 is moving to six cores with HyperThreading, Core i5 is moving to six cores, and Core i3 is moving to four core. The equipped LGA 1151 socket supports a wide range of performance options up to 65W TDP processors. The dual DDR4 DIMM slot with more direct trace routes support up to 64GB of memory.

CPU Generation	P/N	Lithography	# of Cores	# of Threads	Frequency	TDP
8th Gen. Intel® Coffee Lake	i7-8700T	14nm	6	12	2.40GHz	35W
	i5-8500T	14nm	6	6	2.10GHz	35W
	i3-8100T	14nm	4	4	2.40GHz	35W
	P-G5400T	14nm	2	4	3.10GHz	35W
7th Gen. Intel® Kaby Lake	i7-7700T	14nm	4	8	2.90GHz	35W
	i5-7500T	14nm	4	4	2.70GHz	35W
	i3-7100T	14nm	2	4	3.40GHz	35W
	C-G4900T	14nm	2	2	2.9GHz	35W

Breakthrough the Bottleneck of DMI 3.0

The signal of the two PCIe 3.0 by 8 slots directly connect to CPU instead of DMI 3.0 channel. By doing this, the PCIe 3.0 x8 add-on cards can run with lower latency and achieve complete AI card performance.



PCIe 3.0 High Speed Expansion Slots

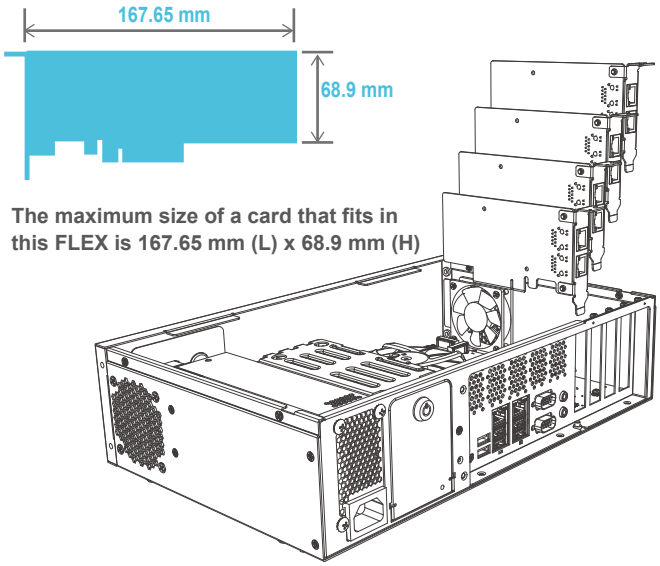
All of the expansion slots of the FLEX series support PCIe 3.0, which doubles the speed per lane from 500MB/s to 1GB/s compared to PCIe 2.0. The high-speed PCIe 3.0 can fulfill the bandwidth requirements of 10G Ethernet cards, USB 3.2 cards, even the high end graphics cards and PCIe NVMe SSDs.

Interface	Theory Bandwidth
PCIe 2.0 x1	5GT/s
PCIe 3.0 x1	8GT/s

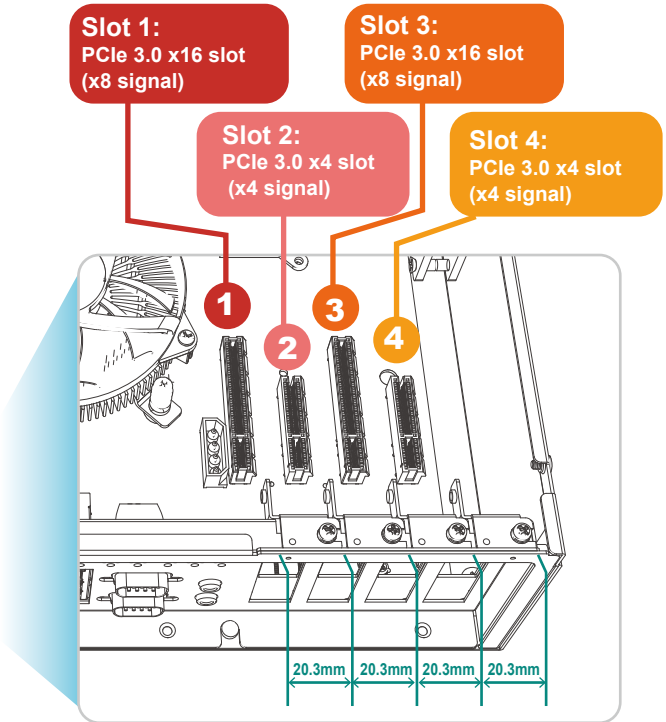
Four PCIe x4/x8 Low Profile Expansion Slots

The FLEX series supports multiple PCIe slots including two PCIe 3.0 x8 and two PCIe 3.0 x4 slots, which are compatible with standard low profile add-on cards, to meet different edge inference computing applications.

- High Speed: 10GbE card, fiber network card
- I/O card: Serial port card, USB card, LAN card, etc.
- AI accelerating card: VPU card, FPGA, GPU card, etc.
- Wireless card: Wi-Fi card, mobile wireless card, etc.
- Storage card



The maximum size of a card that fits in this FLEX is 167.65 mm (L) x 68.9 mm (H)



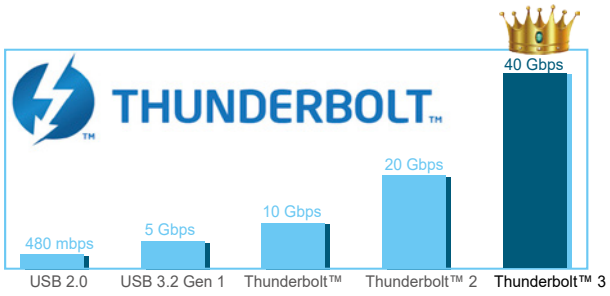
Thunderbolt™ 3 Dual Ports (optional)

The FLEX series can be built-in with IEI thunderbolt™ 3 card, the TB3-40GDP-R10, to support dual Thunderbolt 3 ports for connecting displays and USB devices and provide more speed.

P/N	TB3-40GDP-R10
Interface	PCIe 3.0 x4
I/O ports	2 x Thunderbolt 3 port (USB Type-C) 1 x mini-DisplayPort

How fast is it?

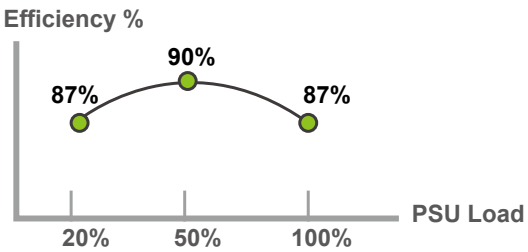
- 40Gpbs Thunderbolt, PCI Express Gen 3 and Display Port
- Double the speed of previous generation
- Four times the data and twice the vide bandwidth of any other cable



Only supported by the pcieX4_1 slot in the system

Built-in 80-Plus Gold Power Supply

The 80-plus Gold power supply is implemented into the FLEX series, which reduces power loss and increases efficiency during power transition. With the certified power supply, the power transition between AC source and DC source could maintain up to 87% efficiency, and the power loss is only 13% or less. For customers, the high efficiency of power transition could reduce not only cost but also heat loss. Furthermore, it could make an eco-friendly environment.



Parameters	Loading	Gold	Silver	Bronze	80 Plus
Efficiency	20%	87%	85%	82%	80%
	50%	90%	88%	85%	80%
	100%	87%	85%	82%	80%
Power Factor	50%	90% (across the full range)			90% (@100% Load)

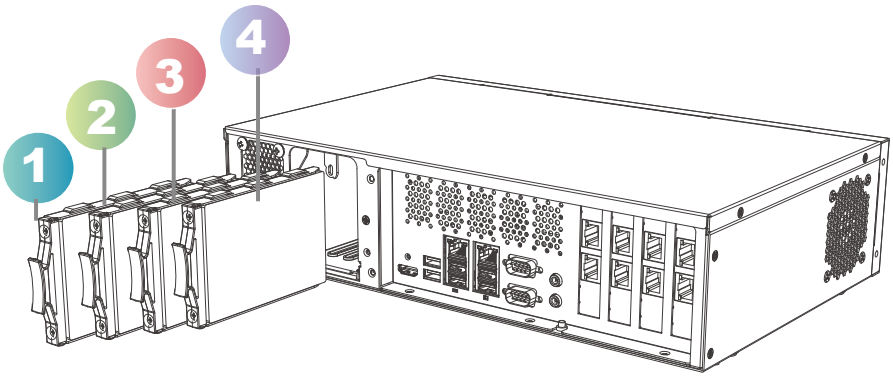
Dual M.2 M-Key NVMe PCIe 3.0 x4 SSD Support

The FLEX series provides higher transfer speed and reliability with support for two additional PCIe by 4 M.2 2280 NVMe SSDs with 32Gb/s high speed transfer rate. It is safer to have NVMe SSDs installed in the system internally, because users can install operating system in it to avoid OS crash caused by unplugging the storage accidentally, and to prevent the drive from being stolen.

- NVMe reduces latency
- Delivers higher input/output per second (IOPS)

4-Bay Hot Swappable HDD RAID 0/1/5/10 Protection

The FLEX series offers four 2.5”HDD bays with high speed SATA 6Gb/s interface that can expand storage capabilities and enable fast data transfers. The equipped Intel Q370 chipset provides reliable and high performance hardware RAID protection to back-up your media and critical information. You can configure the RAID 0/1/5/10 from the BIOS menu to increase performance and/or provide automatic protection against data loss from drive failure.



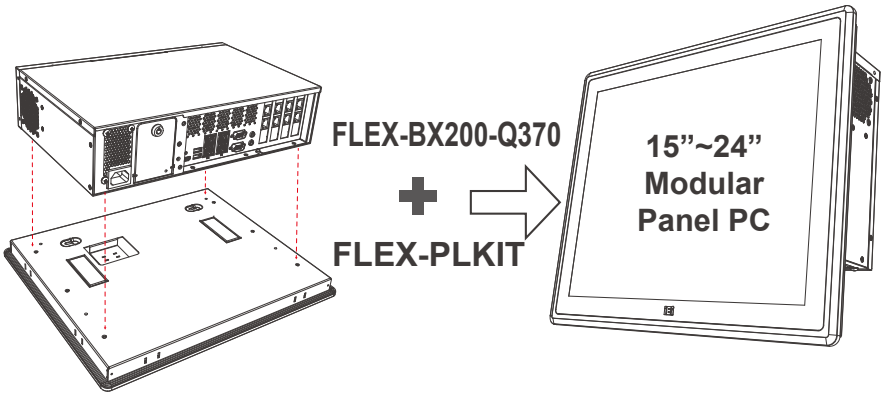
Secured and Strong HDD Bays

Flexible Deployment

All-in-One Panel PC

The FLEX series featuring a modular design can be fitted with different sizes of panel kits to expand its capabilities.

- Various monitor choices: 15"/15.6"/17"/18.5"/21.5"/23.8"
- PCAP touch screen
- Easy assembly and maintenance
- One stop shopping and build your own system to accelerates time to market



FLEX-BX100-ULT5

NEW

Feature

- Fanless embedded system with Intel® Whiskey Lake Intel® Core™ i5-8365U or Intel® Celeron® 4205U CPU
- Triple GbE LAN ports
- Support IEEE 802.3bt PoE PD power
- Support NVMe SSD

Specifications

Model	FLEX-BX100-ULT5
CPU	8th Genertion Intel® Core™ i5-8365U 4.10GHz 8th Genertion Intel® Celeron® 4205U 2.00GHz
Memory	2 x 260-pin 2400 MHz dual-channel DDR4 unbuffered SO-DIMM supporting up to 32GB
Graphics Engine	Intel® HD Graphics Gen 9 Engines with 16 low-power execution units, 4K codec decode
Ethernet	Intel® I211/I219 controller
Storage	2.5" HDD/SSD SATA 6Gb/s bay
I/O Ports and Switches	4 x USB 3.2 Gen 2 (10Gbps) 1 x HDMI output 1 x RS-232/422/485 1 x RS-232 3 x GbE LAN (2 for IEEE802.3 PoE PD GbE LAN) 1 x 12V DC jack 1 x Power switch with LED indicator (blue) 1 x AT/ATX switch 1 x Line-out 1 x Reset button
Expansion Slots	1 x NGFF M.2 2230 A Key (PCIe x1, USB signal) 1 x NGFF M.2 2280 M Key (support PCIe 3.0x4 NVMe) 2 x PoE PD module socket (by IEI pin definition)
Thermal Solution	Fanless
Watchdog Timer	Software programmable support 1~255 sec. system reset
Dimensions (mm) (W x H x D)	356.5 x 222 x 44
Net Weight (kgs)	3
Color	PANTONE 296 C
Front Frame	Aluminum
Rear Cover	Sheet Metal
Mouting	Wall mount
Operating Temp.	-10°C ~ 60°C (with air flow)
Storage Temp.	-20°C ~ 70°C
Humidity	10% ~ 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)
Power Input	12V DC input

Ordering Information

Part No.	Description
FLEX-BX100-ULT5-i5/4G-R10	Fanless embedded system with 8th generation 14nm Intel® Whiskey Lake Core™ i5-8365UE on-board processor (15W TDP, ULT), 4GB DDR4 RAM, 12V DC input, R10
FLEX-BX100-ULT5-C/4G-R10	Fanless embedded system with 8th generation 14nm Intel® Whiskey Lake Celeron® 4205UE on-board processor (15W TDP, ULT), 4GB DDR4 RAM, 12V DC input, R10

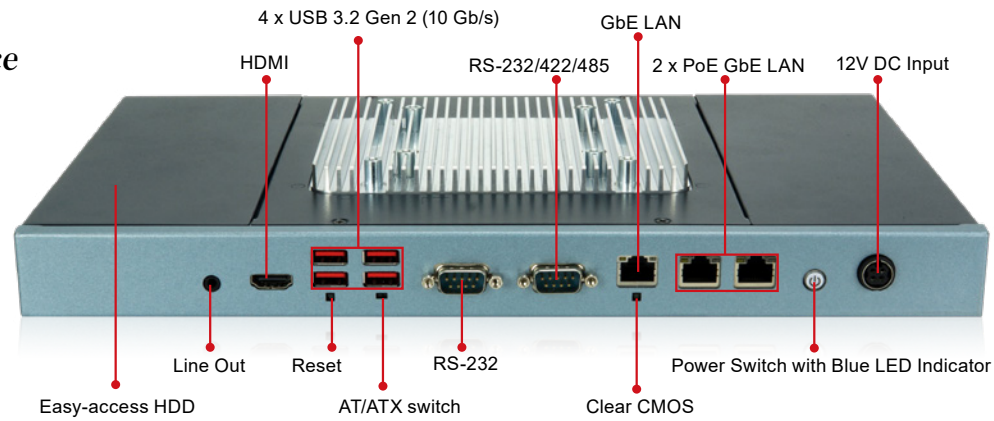
Packing List

Item	Q'ty	Remark
63040-010096-200-RS	1	AC power adapter
AC power cord	1	
Wall mount bracket	2	
Screws (M4*6)	4	for mounting bracket
Screws (M3*4)	4	for HDD installation

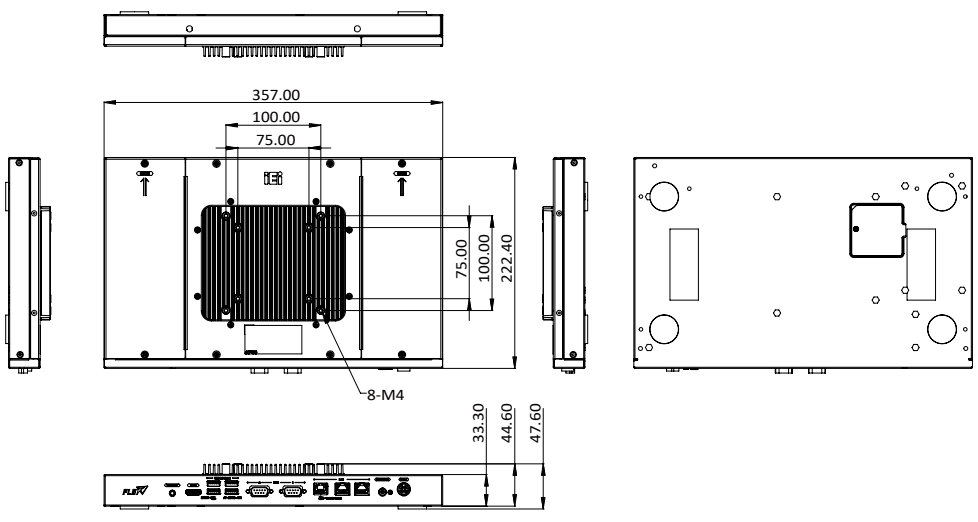
Options

Part No.	Description
PoE PD Kit	GPOE-PD-AT01-R10 (PoE IEEE802.3 af/at, 25.5W) GPOE-PD-BT01-R10 (PoE IEEE802.3 af/at/bt, 71W)
Wi-Fi Kit	EMB-WIFI-KIT03E-R10 (2T2R, 802.11ac/a/b/g/n and Bluetooth v4.1, NGFF 2230 Type A-E)

I/O Interface



FLEX-BX100-ULT5 Dimensions (Unit: mm)



FLEX-BX200

2U AI Modular PC with 8th Generation LGA 1151 Intel® Core™ i7/i5/i3, Pentium® and Xeon® Processor

Feature

- 2U AI Modular PC supports 8th Gen. LGA 1151 Intel® Core™ i7/i5/i3 and Pentium® processor with Intel® Q370 chipset, or Intel® Xeon® Processor with Intel® C246 chipset
- Four hot-swappable and accessible HDD drive bays, support RAID 0/1/5/10
- Two PCIe 3.0 by 4 and two PCIe 3.0 by 8 slots
- Dual M.2 2280 PCIe Gen 3.0 x4 NVMe™ SSD support
- QTS-Gateway support

Specifications

Model		FLEX-BX200-Q370	FLEX-BX200-C246
System	CPU	8th Genertion Intel® Core™ i7/i5/i3 porcessors in the LGA 1151 package (Please choose the TDP of the the processor under 65W)	Intel® Xeon® E-2176G Processor in the LGA 1151 package
	Chipset	Intel® 300 Series Chipsets Q370 (Coffee Lake)	Intel® C240 Series Chipsets C246 (Coffee Lake)
	Memory	2 x 288-pin 2666/2400 MHz dual-channel DDR4 unbuffered DIMM supporting up to 64GB	2 x 288-pin 2666/2400 MHz dual-channel DDR4 SDRAM ECC and non-ECC unbuffered DIMMs support up to 64 GB
	Graphics Engine	Intel® HD Graphics Gen 9 Engines with Low power 16 execution unit, supports DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0	
	Ethernet	Intel® I211 controller	
Storage		4 x accessible 2.5" HDD/SSD SATA 6 Gb/s bay (with RAID 0/1/5/10 support) with LED indicator 2 x NGFF M.2(2280) M Key socket (support NVMe SSD)	
I/O Ports and Switches		1 x HDMI output 2 x GbE LAN 6 x USB 3.2 Gen 1 (5Gb/s) Type-A 2 x RS-232 DB-9 type 1 x Mic in1 x Line out 1 x AC Inlet	Power button with power LED (power on=Blue) AT/ATX mode switch Reset button
Expansion Slots		2 x PCIe 3.0 by 8 (by 16 slot) 2 x PCIe 3.0 by 4 (Maximum card size supported: 68 mm x 167 mm)	
Thermal Solution		System Fan x3, CPU Cooler x1	
Power supply		AC input ATX power supply 1. 250W power supply - Input: 115VAC~230VAC, 50/60Hz - Output (Max.): 3.3V@12A, 5V@14A, 12V@25A, -12V@0.3A,+5Vsb@3A 2. 350W power supply (Build to Order) - Input: 115VAC~264VAC, 50/60Hz - Output (Max.): 3.3V@14A, 5V@16A, 12V@29A, -12V@0.3A,+5Vsb@3A -Efficiency: Full load (100%) 87%, Typical load (50%) 90%, Light load (20%) 87%	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 -Efficiency: Full load (100%) 87%, Typical load (50%) 90%, Light load (20%) 87%
Watchdog Timer		Software Programmable support 1~255 sec. System reset	
Construction	Chassis Construction	Metal Housing	
	Mounting	Wall and Rack Mount	
	Color	Black	
	Dimensions (LxDxH) (mm)	357 x 230 x 88	
	Weight (kg) Net/Gross	4/6	
Environmental	Operating Temperature	-20°C ~ 50°C (with SSD and TDP 65W processor) -20°C ~ 40°C (with HDD or add-on cards without fan)	-20°C ~ 40°C (with SSD and TDP 80W processor)
	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)	

Ordering Information

Part No.	Description
FLEX-BX200AI-i5/35/V-R10	2U AI Modular BOX PC, Intel® Core™ i5-8500 Processor (6-core, 6-thread, 3.0 GHz) TDP 65W, 2xPCIex4 and 2xPCIex8 slots, 4x HDD bay, 350W PSU, Pre-installed one of Mustang-V100, R10
FLEX-BX200-C246-XE/35-R10	2U AI Modular BOX PC, Intel® Xeon® E-2176G Processor (6-core, 12-thread, 3.7 GHz), TDP 80W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 350W PSU, R10
FLEX-BX200-Q370-P/25-R10	2U AI Modular Box PC, Intel® Pentium® Gold G5400T Processor (2-core, 4-thread, 3.10 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 250W PSU, R10
FLEX-BX200-Q370-i3/25-R10	2U AI Modular Box PC, Intel® Core™ i3-8100T Processor (4-core, 4-thread, 3.10 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 250W PSU, R10
FLEX-BX200-Q370-i5/25-R10*	2U AI Modular Box PC, Intel® Core™ i5-8500T Processor (6-core, 6-thread, 2.1 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 250W PSU, R10
FLEX-BX200-Q370-i7/25-R10*	2U AI Modular Box PC, Intel® Core™ i7-8700T Processor (6-core,12-thread,2.4 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 250W PSU, R10
FLEX-BX200-Q370-P/35-R10*	2U AI Modular Box PC, Intel® Pentium® Gold G5400T Processor (2-core, 4-thread, 3.10 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 350W PSU, R10
FLEX-BX200-Q370-i3/35-R10*	2U AI Modular Box PC, Intel® Core™ i3-8100T Processor (4-core, 4-thread, 3.10 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 350W PSU, R10
FLEX-BX200-Q370-i5/35-R10*	2U AI Modular Box PC, Intel® Core™ i5-8500T Processor (6-core, 6-thread, 2.1 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 350W PSU, R10
FLEX-BX200-Q370-i7/35-R10*	2U AI Modular Box PC, Intel® Core™ i7-8700T Processor (6-core,12-thread,2.4 GHz) TDP 35W, two PCIe x4 and two PCIe x8 slots, four HDD bays, 350W PSU, R10

*Build to order

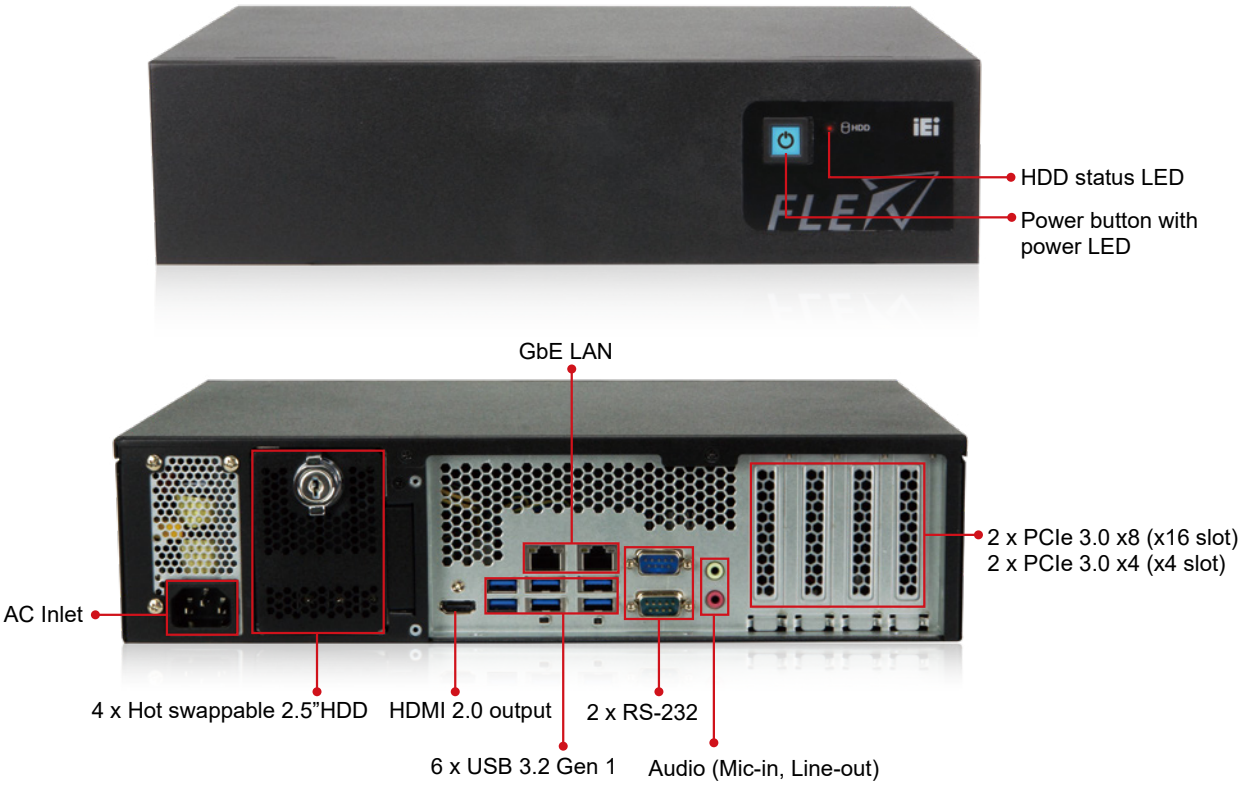
Packing List

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

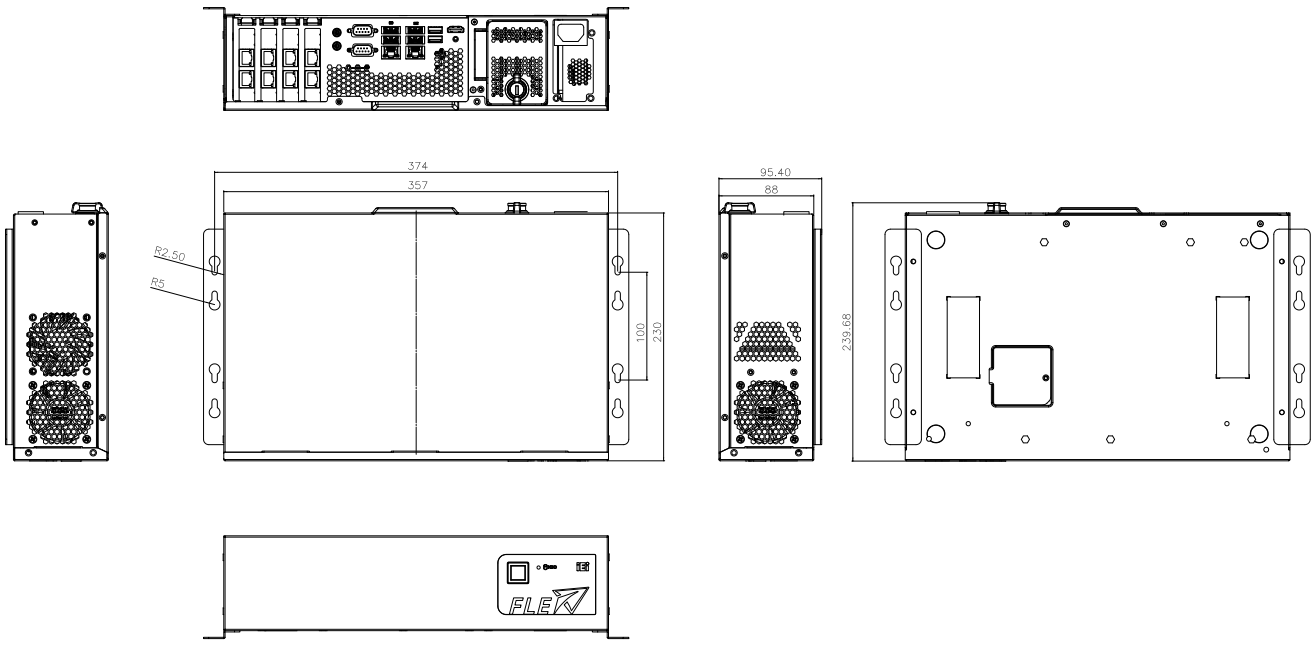
Options

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

I/O Interface



FLEX-BX200
Dimensions (Unit: mm)



Configurable Systems

Panel Kit Modules

Specifications

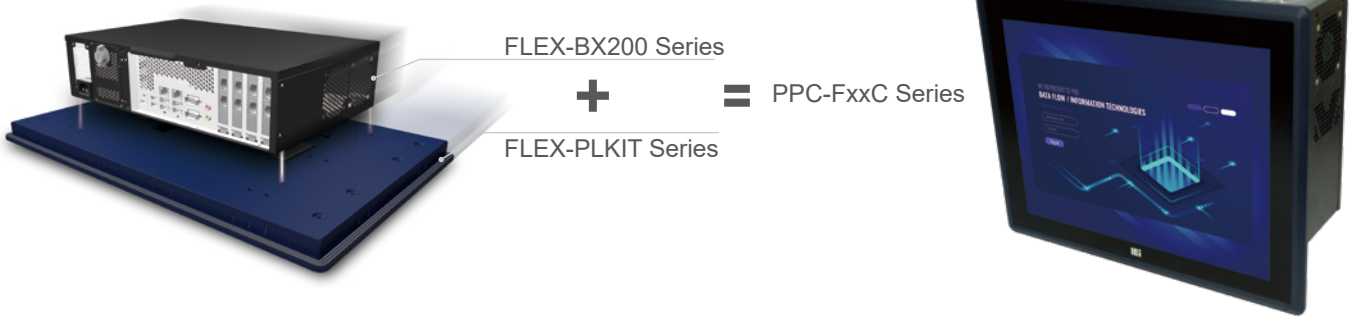
Model		FLEX-PLKIT-F15	FLEX-PLKIT-F17	FLEX-PLKIT-FW15	FLEX-PLKIT-FW19	FLEX-PLKIT-FW22	FLEX-PLKIT-FW24
TFT LCD	LCD Size	15”	17”	15.6"	18.5"	21.5”	23.8”
	Max. Resolution	1024x768	1280x1024	1366x768	1366x768	1920x1080	1920x1080
	Brightness (cd/m²)	450	350	400	400	250	250
	Contrast Ratio	800:1	1000:1	500:1	1000:1	1000:1	3000:1
	LCD Color	16.2M	16.7M	16.2M	16.7M	16.7M	16.7M
	Viewing Angle (H/V)	160°/150°	170°/160°	170°/160°	170°/160°	170°/160°	178°/178°
	Backlight MTBF (Hrs)	70,000	50,000	50,000	50,000	30,000	30,000
Touch Screen		PCAP touch with 10-point multitouch and anti-glare coating					
Video Interface		LVDS					
IP Rating		IP66-rated front panel					
Other		Support FLEX-BX200-Q370 only					

Ordering Information

Part No.	Description
FLEX-PLKIT-F15/PC-R10	15" 450cd/m² 1024 x768 FLEX modular resistive touch window/LCD kit, R10
FLEX-PLKIT-F17/PC-R10	17" 350cd/m² 1280 x 1024 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW15/PC-R10	15.6" 400cd/m² 1366 x 768 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW19/PC-R10	18.5" 400cd/m² 1366 x 768 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW22/PC-R10	21.5" 250cd/m² 1920 x 1080 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW24/PC-R10	23.8" 250cd/m² 1920 x 1080 FLEX modular PCAP touch window/LCD kit, R10

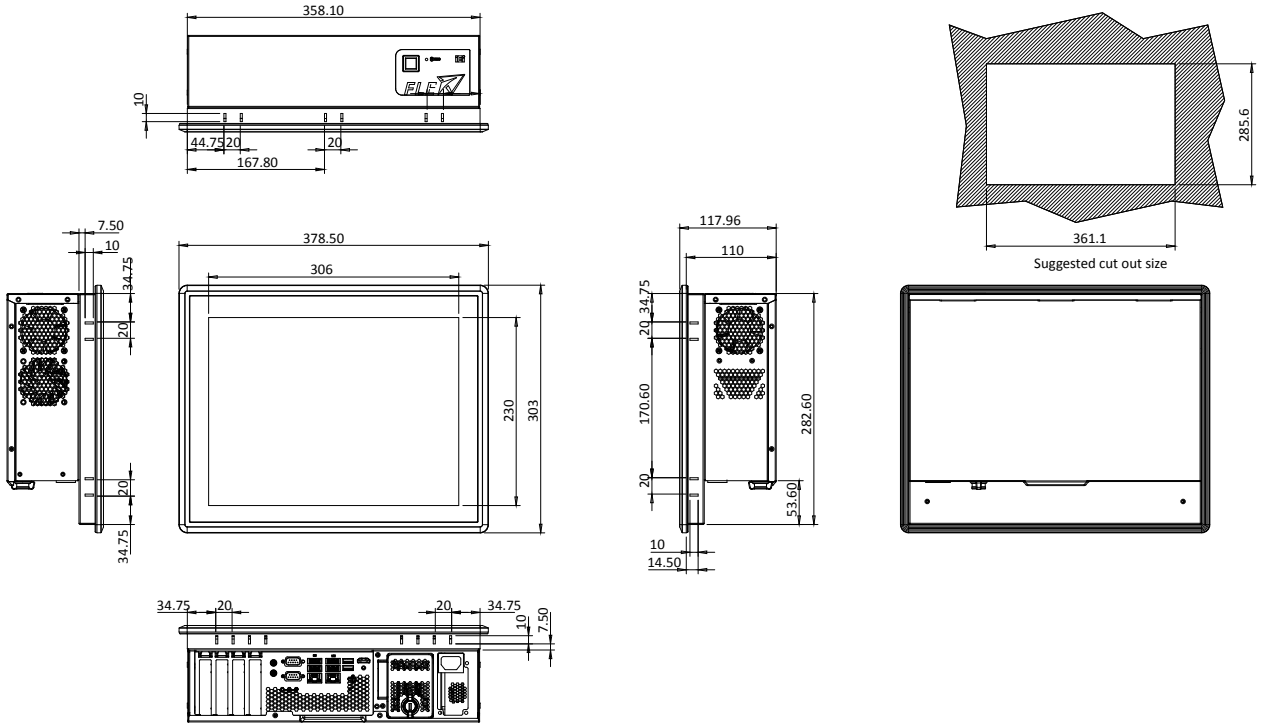
Options

Item	FLEX-PLKIT-F15	FLEX-PLKIT-FW15	FLEX-PLKIT-F17	FLEX-PLKIT-FW19	FLEX-PLKIT-FW22	FLEX-PLKIT-FW24
Panel Mount Kit	FPK-12-R10	FPK-14-R10	FPK-13-R10	FPK-13-R10	FPK-13-R10	FPK-14-R10
Rack Mount Kit	FRK15C-R10	FRKW15C-R10	FRK17C-R10	FRKW19C-R10	N.A.	N.A.

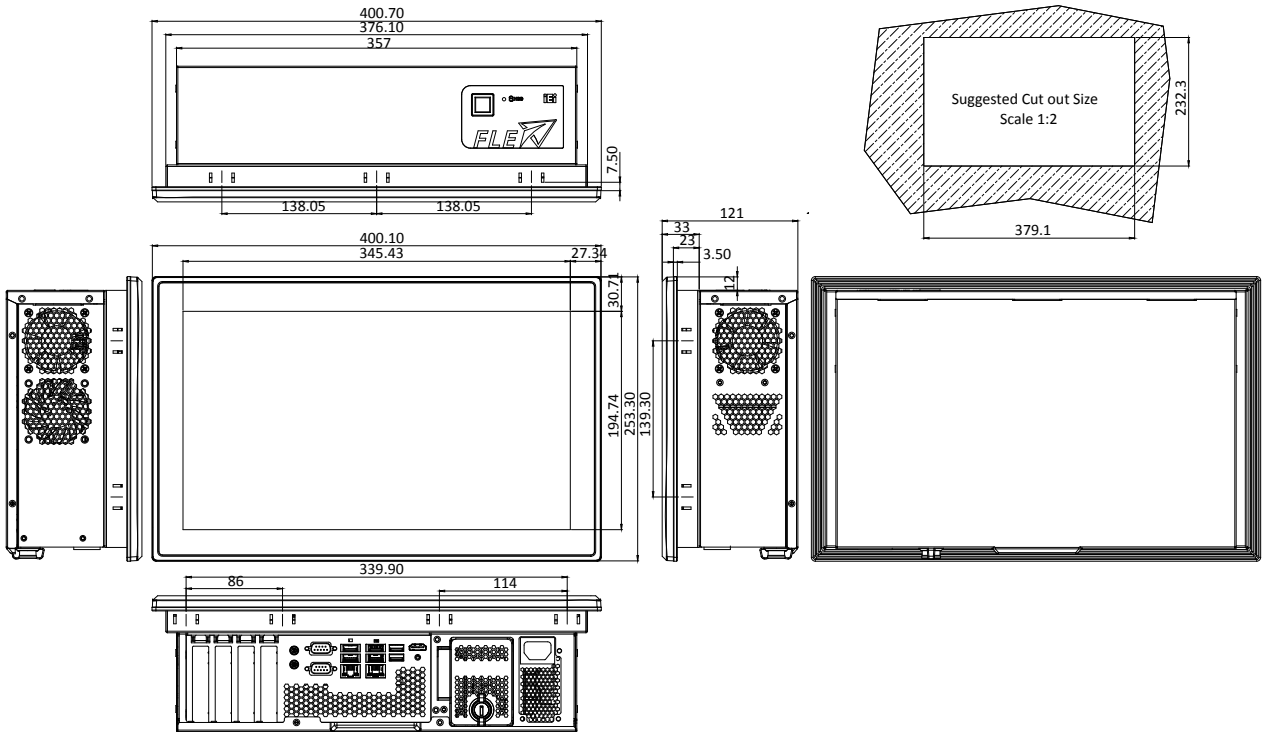


Configurable Systems

FLEX-PLKIT-F15 Dimensions (Unit: mm)

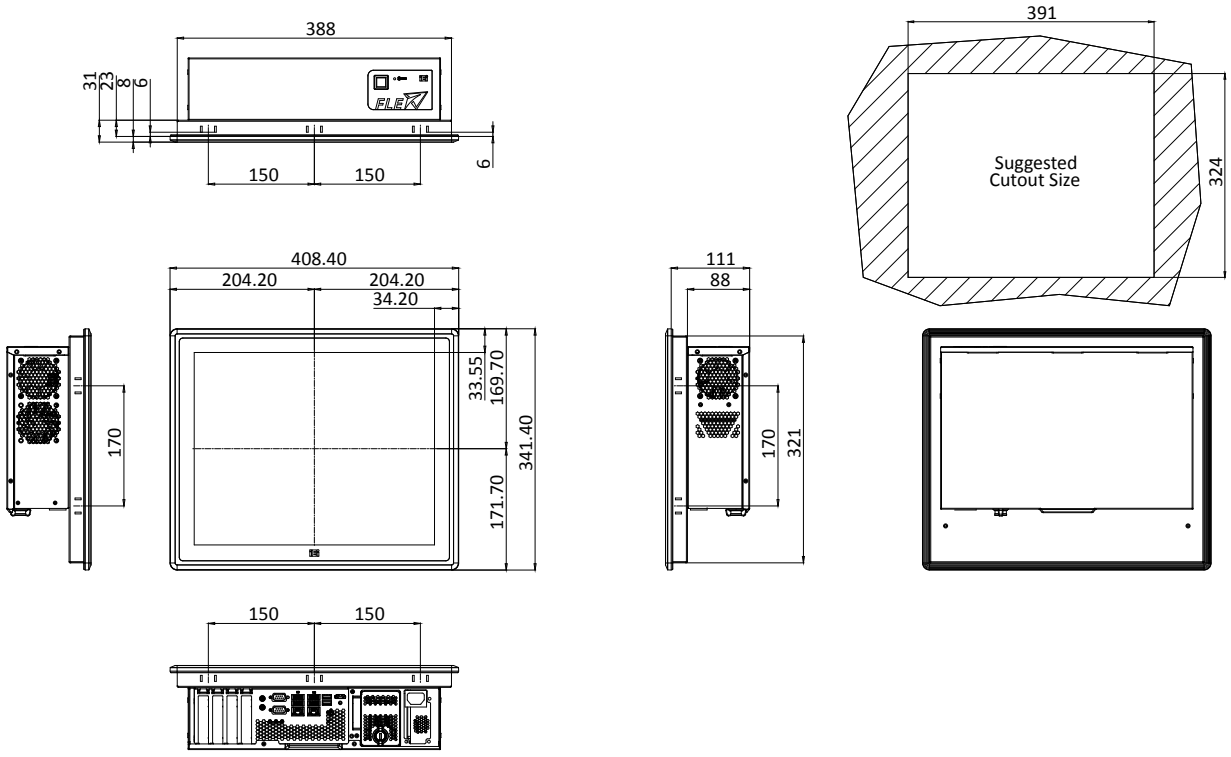


FLEX-PLKIT-FW15 Dimensions (Unit: mm)

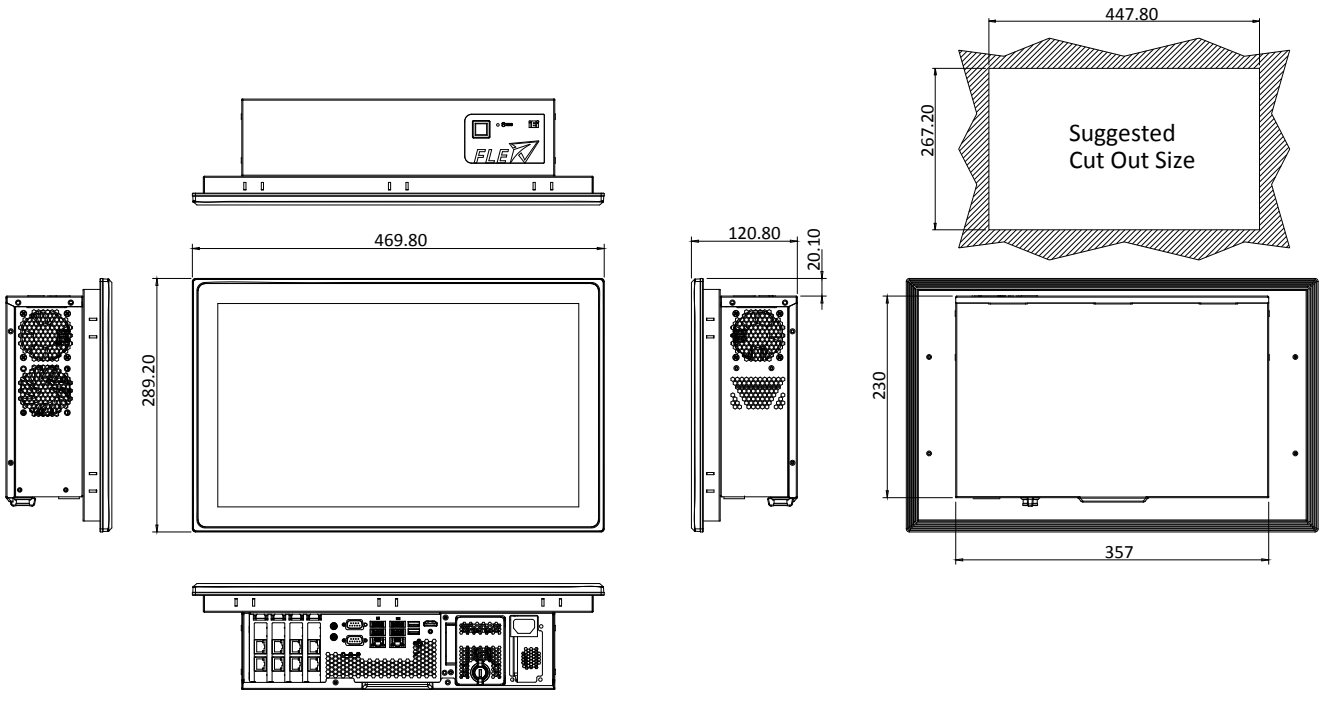


Configurable Systems

FLEX-PLKIT-F17 Dimensions (Unit: mm)

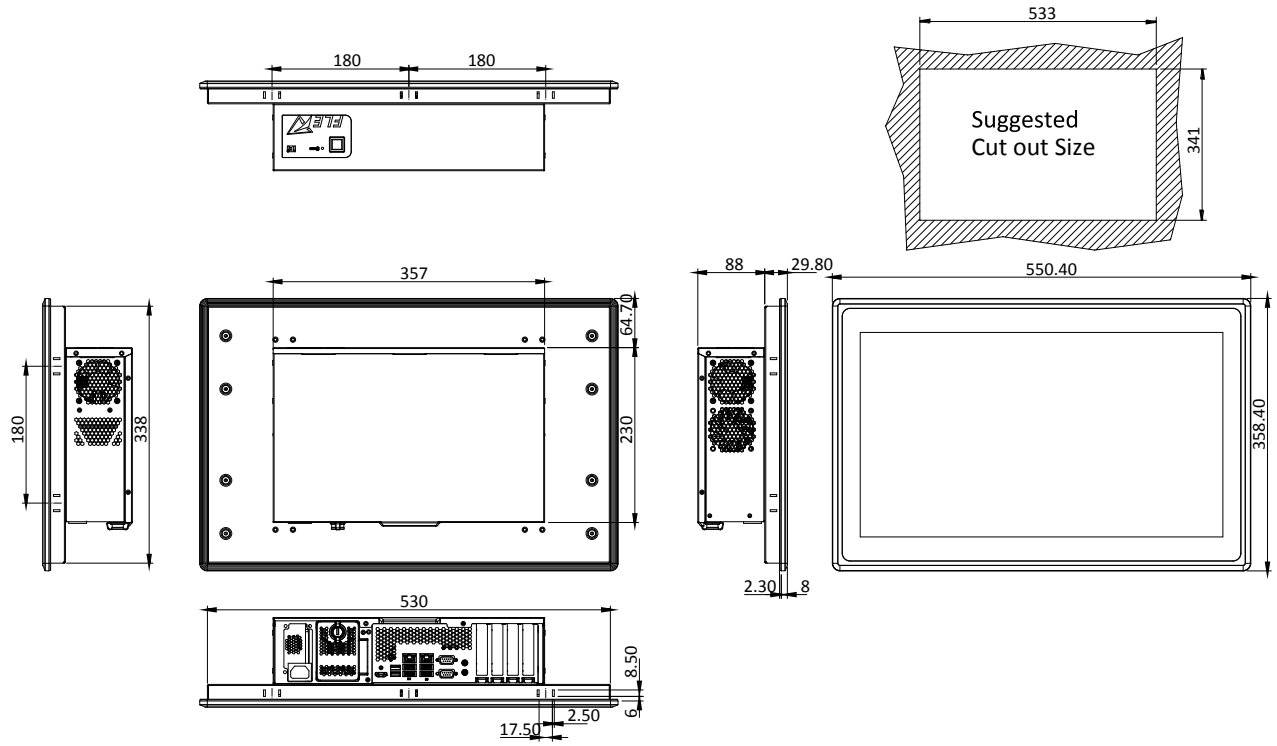


FLEX-PLKIT-F19 Dimensions (Unit: mm)

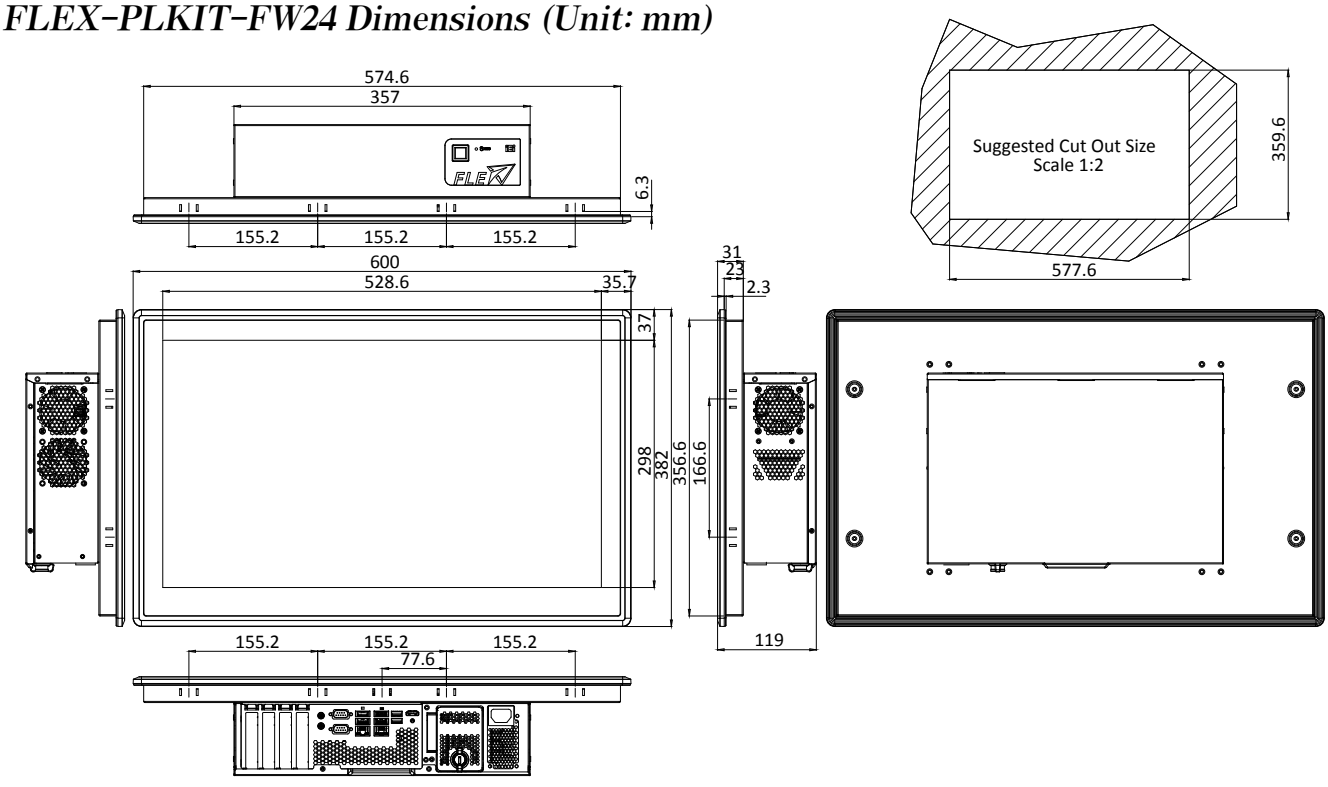


Configurable Systems

FLEX-PLKIT-FW22 Dimensions (Unit: mm)



FLEX-PLKIT-FW24 Dimensions (Unit: mm)



RACK-500AI-C246
PAC-400AI-C236
AI System Series

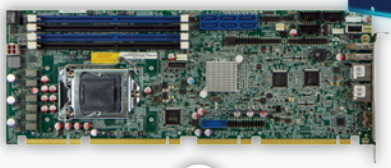
IEI AI Ready Compact Size System Introduction

RACK-500AI-C246 and PAC-400AI-C236 are suitable for factory automation, artificial intelligence(AI) computing and mechanical automation. They are integrated multiple features and can be added with multiple PCIe cards for expansion.

RACK-500AI

PAC-400AI

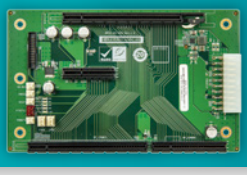
SPCIE-C246



PE-3S1

HPCIE-C236

HPE2-3S1



intel XEON inside

intel Movidius™

NVIDIA TESLA

intel FPGA

Verticals and Applications

Factory Automation

AI Computing System

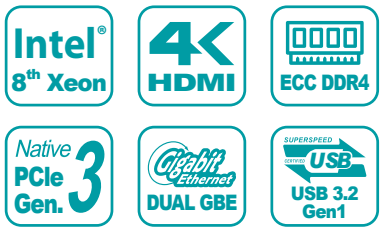
Machine Automation

RACK-500AI-C246

NEW

Feature

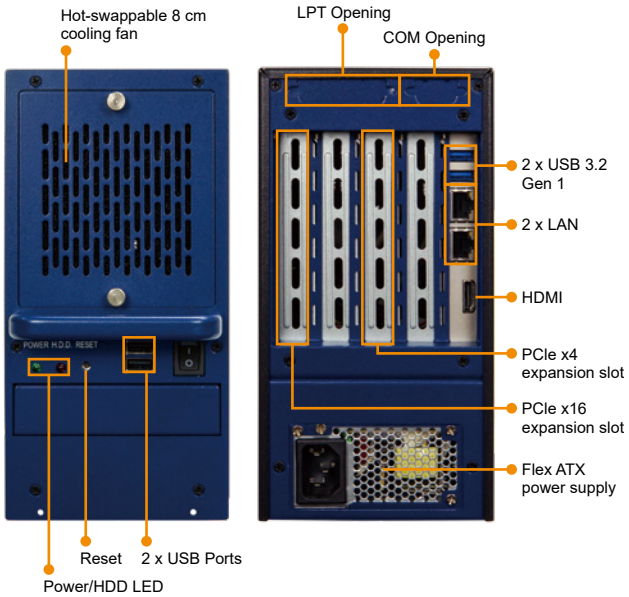
- Intel® Coffee Lake C246 chipset with Xeon® CPU
- 1 x Front-accessible 3.5” and 1 x 3.5” HDD drive capacity
- Integrated one PCIe x16 and one x4 Gen3 expansion slot
- Great flexibility hardware expansion



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, Hexa 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 8G 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	1x 3.5" 6 Gb/s SATA removable drive Bay (Hot swap)
	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)
	Expension	1 x PCIe Gen3 x16 slot 1 x PCIe Gen3 x4 slot **If use 2 slots capacity PCIe add-on Cards (maximum length 338mm) need to change cooler (P/N: 19100-000238-00-RS)
Power	Power Input	ATX Power (350W)
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, Linux

I/O Interface



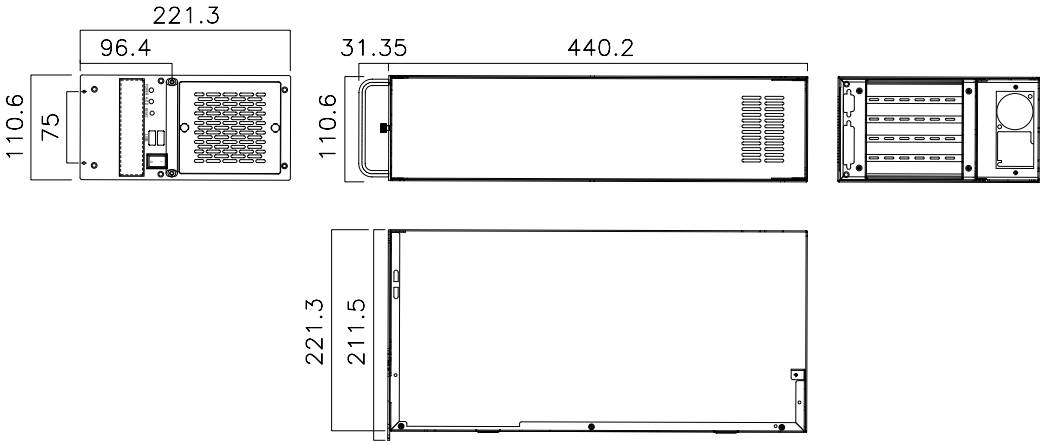
FDD and HDD are not included in package

CA-950GB-R10

CA-950GB-R10

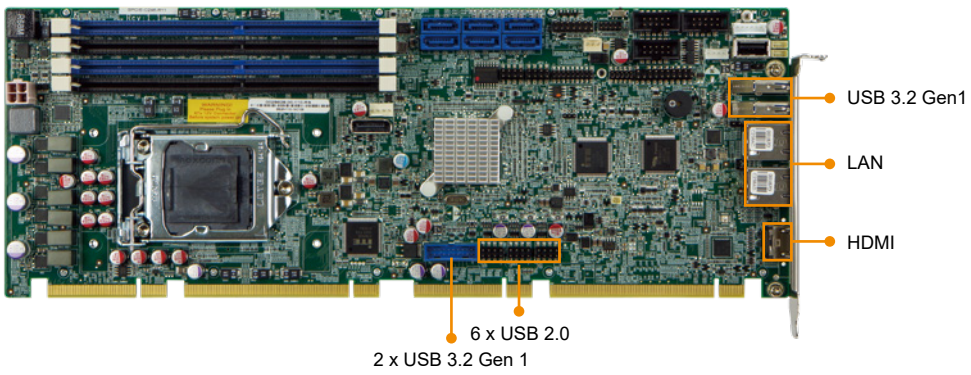
19” rack carrier can carry four RACK-500AI and fit into standard 19” width rack with 5U height.

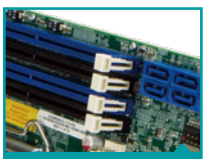
RACK-500AI-C246
Dimensions (Unit: mm)



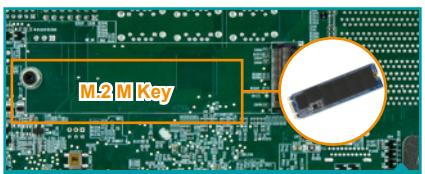
Single board computer in RACK-500AI (SPCIE-C246)

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.




Four 288-pin DDR4 SDRAM Supported

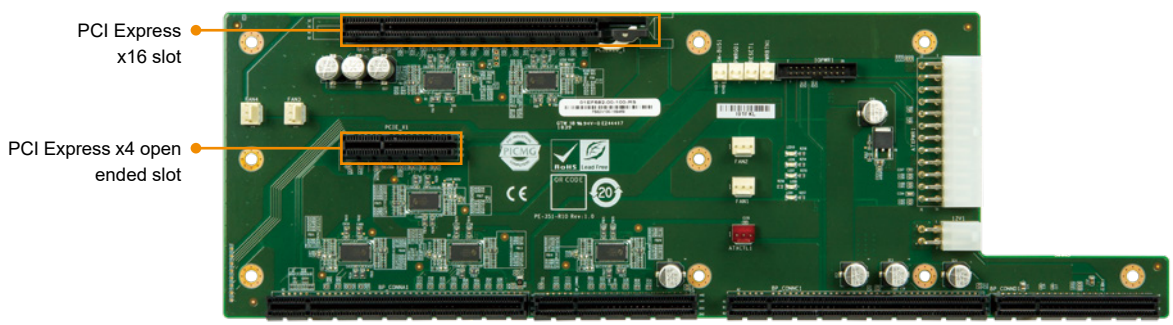
RAID 0, 1, 5, 10 function compatible with six ports of SATA 6Gb/s



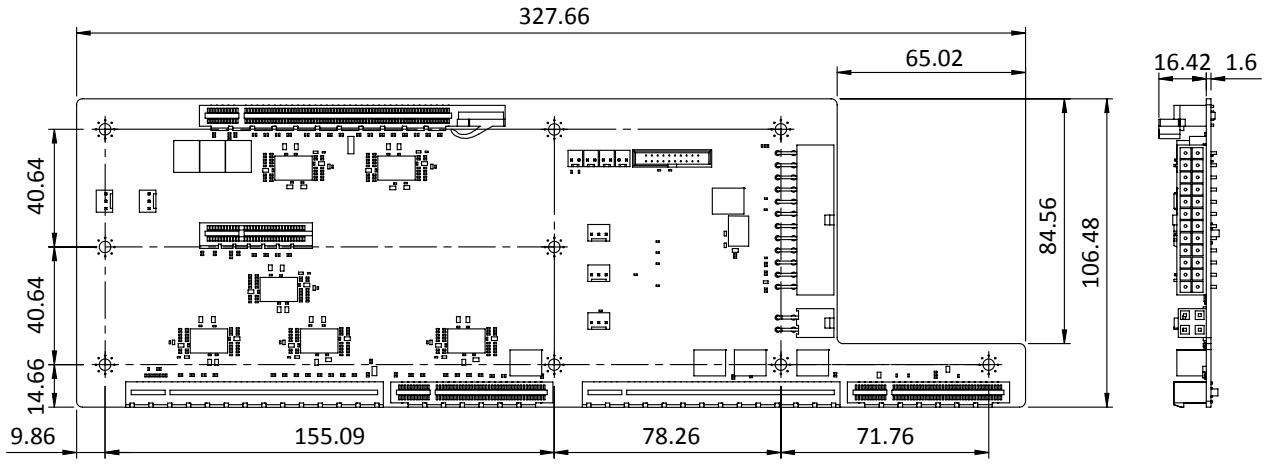
M.2 M key 2280 (PCIe x4)

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.



PE-3S1
Dimensions (Unit: mm)



Ordering Information

Part No.	Description
RACK-500AI-C246-XE/16G/35-R10	5U AI System with Intel® Xeon® E-2176G CPU (3.70 GHz, Hexa 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

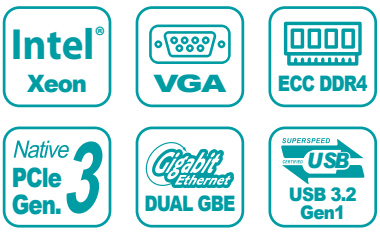
Part No.	Description
GPOE-2P-R20	PCI Express Power over Ethernet card, 2-port 1000 Base(T), 802.3at compliant, low profile, RoHS
GPOE-4P-R20	PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3at/af compliant, low profile, RoHS
IPCIE-4POE-R10	PCI Express Power over ethernet card, 4-port 1000 Base(T), 802.3af compliant, RoHS
Mustang-200-i7-1T/32G-R10	Computing Accelerator Card supports Two Intel® Core™ i7-7567U with Intel® 600P 1TB (512GB x2) SSD, 32GB (8GB x4) DDR4, PCIe x4 interface, QTS-Lite, and RoHS
Mustang-200-i5-1T/32G-R10	Computing Accelerator Card supports Two Intel® Core™ i5-7267U with Intel® 600P 1TB (512GB x2) SSD, 32GB (8GB x4) DDR4, PCIe x4 interface, QTS-Lite, and RoHS
Mustang-200-C-8G-R10	Computing Accelerator Card supports Two Intel® Celeron® 3865U with, 8GB (2GB x4) DDR4, PCIe x4 interface, QTS-Lite, and 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	WIRE CABLE; POWER CABLE; SERIAL ATA POWER CABLE; 3; 150MM; 18AWG; (A)MOLEX 8981-4M P=5.08; (B)SATA 15P 180° X2; ONE PCS PKG W/ LABEL; RoHS
32102-044900-100-RS	WIRE CABLE; POWER CABLE; PCIE power cable; 3; 100MM; 20AWG; (A)MOLEX 8981-04M P=5.08*2; (B)TKP:H6657R1-06-B-03 P=4.2;;;;;;;;;;; Polywell; RoHS
32102-011500-100-RS	WIRE CABLE; POWER CABLE; ; 3; 150MM; 18AWG; MOLEX 8981-04P P=5.08 X2; MOLEX 8981-04M P=5.08;;;;;;;;;;; Wins Precision; RoHS
19100-000238-00-RS	COOLER MODULE; HEATSINK:105*67*12.1mm; FAN:77*75*15.4mm; STANDARD; 00; HF-XFWD-00383-1710; DC FAN:12V, 4P, 5500RPM, TOW BALL; ; Everflow; B127515BU; CCL; RoHS
CA-950GB-R10	19" Rackmount Carrier for Rack-500G/RACK-900G/RACK-500AI

PAC-400AI-C236

NEW

Feature

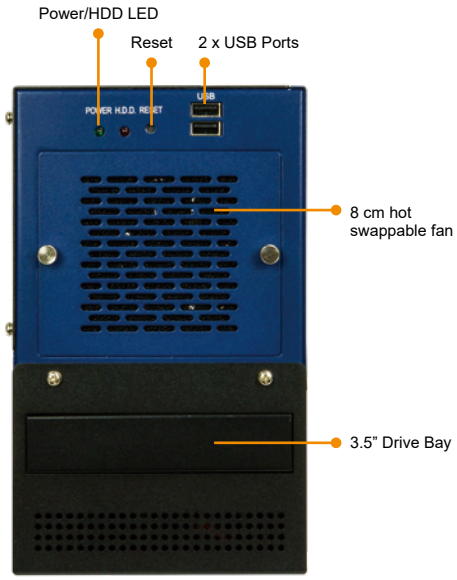
- Intel® Skylake C236 chipset with Xeon® CPU
- One 8 cm hot swappable fan
- Integrated one PCIe x16 and one x4 Gen3 expansion slot
- Great flexibility hardware expansion

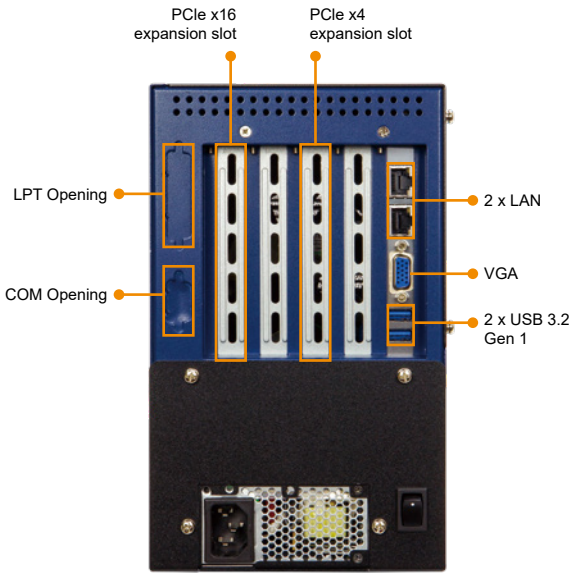


Specifications

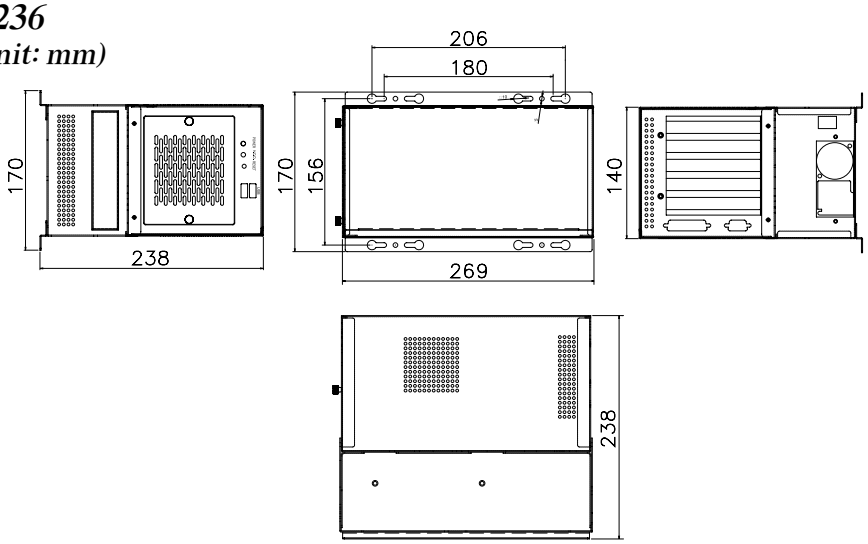
Model Name		PAC-400AI-C236
Chassis	Color	NAVY BLUE & BLACK
	Dimensions (WxDxH)	268.7mm x 140mm x 230.3mm
	System Fan	System Fan & CPU Fan
	Chassis Construction	Heavy duty metal
Motherboard	CPU	Intel® Xeon® E3-1275 v5 CPU (3.60 GHz, Quad Core, TDP 80W)
	Chipset	Intel® C236
	System Memory	Two 260-pin 1600/2133 MHz dual-channel DDR4 ECC and non-ECC unbuffered SODIMMssupport up to 32 GB (2 x 8GB Pre-installed)
	Display Output	1 x VGA (up to 1920x1200@60 Hz) 1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 3840x2160@60 Hz)
Storage	Hard Drive	1x 3.5" 6 Gb/s SATA removable drive Bay (Hot swap)
	MSATA	1
I/O interfaces	Ethernet	LAN1: Intel® I219LM Clarkville-V with Intel® AMT 11.0 support LAN2: Intel® I211 PCIe controller
	KB/MS	1 x (1x6 pin)
	USB 3.2	2 x USB 3.2 Gen1
	USB 2.0	2 x USB 2.0
	Expension	1 x PCIe Gen3 x16 slot 1 x PCIe Gen3 x4 slot **PCIe Half Size Cards length support to maximum 169mm
Power	Power Input	ATX Power (250W)
Reliability	Mounting	Wall mount
	Operating Temperature	0°C~+50°C
	Storage Temperature	0°C~+60°C
	Relative Humidity	10% ~ 95%, non-condensing
	Weight (Net/ Gross)	6 kg/7.8 kg
	Safety/EMC	CE/FCC
OS	Supported OS	Microsoft® Windows® 10, Linux

I/O Interface



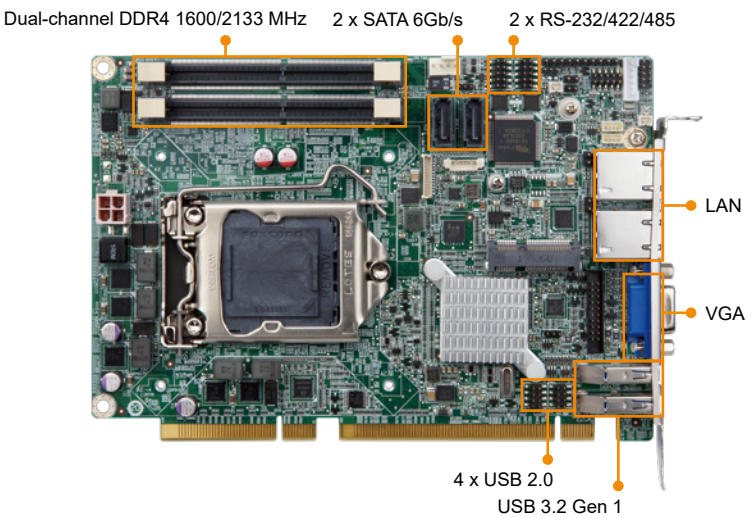


PAC-400AI-C236
Dimensions (Unit: mm)

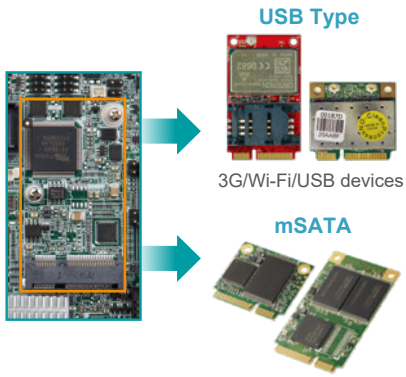


Single board computer in PAC-400AI (HPCIE-C236)

Half-size PICMG 1.3 CPU Card supports LGA 1151 Intel® Xeon® E3, Core™ i3/Pentium®/Celeron® CPU with Intel® C236, ECC & non-ECC DDR4 SO-DIMM, VGA, iDP, Dual Intel® PCIe GbE, USB 3.2 Gen 1 (5Gb/s), SATA 6Gb/s, mSATA, HD Audio, Intel® AMT and RoHS.

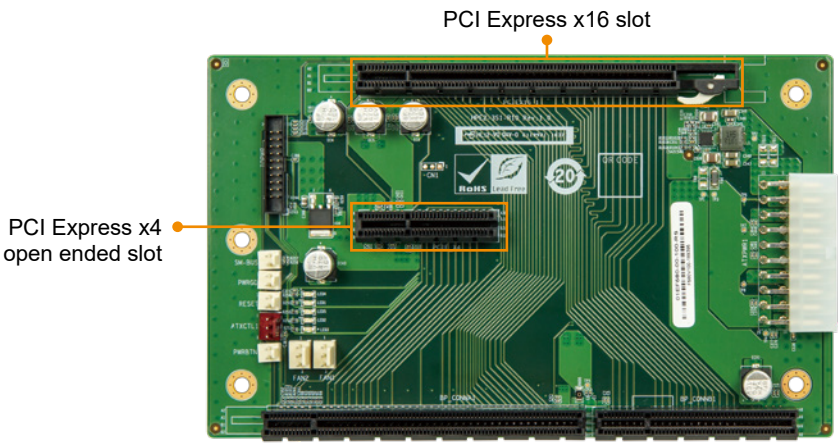


PCIe Mini slot provides mSATA and USB signal for full-size or half-size mSATA SSD and wireless LAN card.

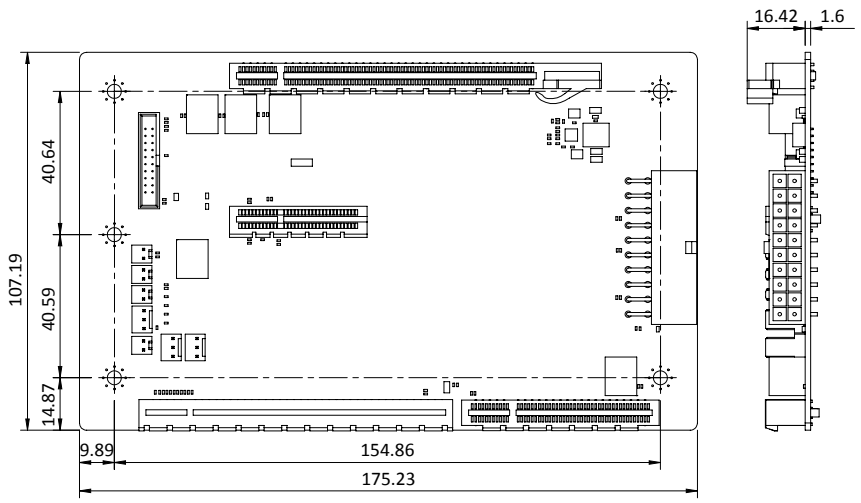


PCI Express Backplane in PAC-400AI (HPE2-3S1)

5-slot PICMG 1.3 backplane for half-size SBC, with one PCIe x16 Slot and one PCIe x4 Slot, RoHS.



HPE2-3S1
Dimensions (Unit: mm)



Ordering Information

Part No.	Description
PAC-400AI-C236-XE/16G/25-R10	Half-size AI System with Intel® Xeon® E3-1275 v5 CPU (3.60 GHz, Quad Core, TDP 80W) w/ Intel® C236, pre-installed 16GB ECC DDR4 SO-DIMM memory, VGA, Intel GbE, USB 3.2, PCIe Mini, w/ 1 PCIe x16/x4 Slot BP, w/ FSP250 (250W), RoHS
PAC-400AI-C236-25-R10	Half-size AI System with Intel® C236, VGA, Intel GbE, USB 3.2, PCIe Mini, w/ 1 PCIe x16/x4 Slot BP, w/ FSP250 (250W), RoHS

Options

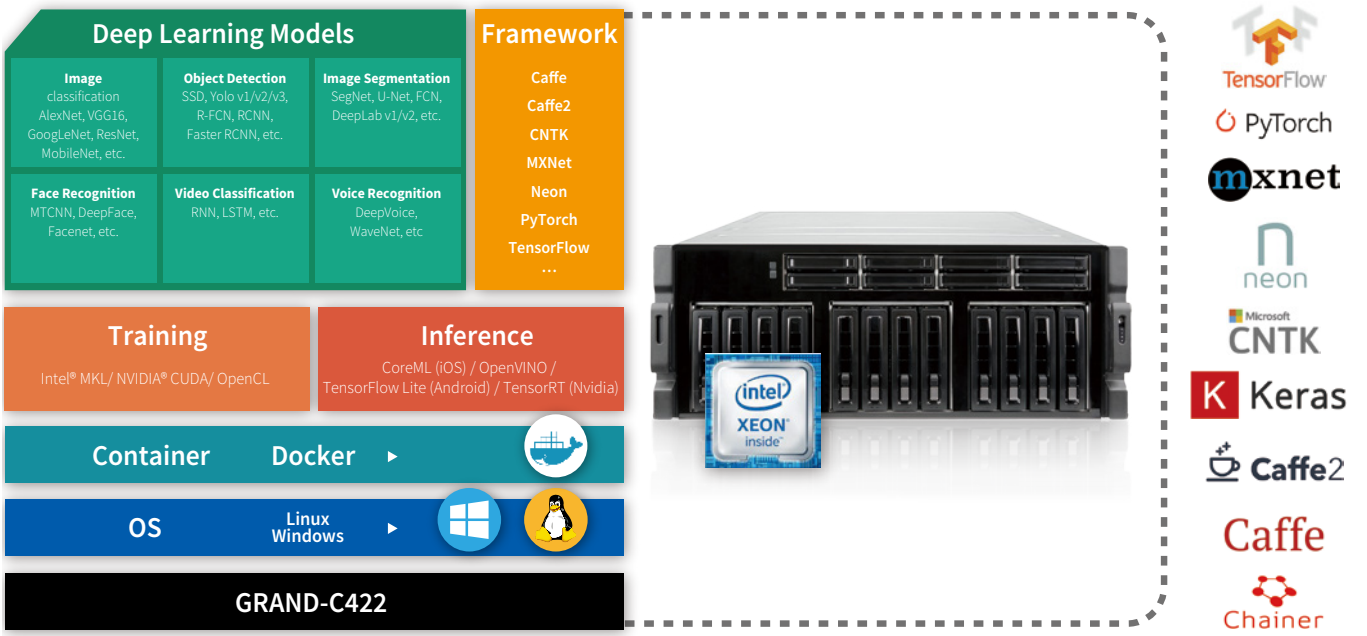
Part No.	Description
GPOE-2P-R20	PCI Express Power over Ethernet card, 2-port 1000 Base(T), 802.3at compliant, low profile, RoHS
GPOE-4P-R20	PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3at/af compliant, low profile, RoHS
IPCIE-4POE-R10	PCI Express Power over ethernet card, 4-port 1000 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	WIRE CABLE; POWER CABLE; SERIAL ATA POWER CABLE; 3; 150MM; 18AWG; (A)MOLEX 8981-4M P=5.08; (B)SATA 15P 180° X2; ONE PCS PKG W/ LABEL; RoHS
32102-044900-100-RS	WIRE CABLE; POWER CABLE; PCIE power cable; 3; 100MM; 20AWG; (A)MOLEX 8981-04M P=5.08*2; (B)TKP:H6657R1-06-B-03 P=4.2;;;;;;;;;;;; Polywell; RoHS
32102-011500-100-RS	WIRE CABLE; POWER CABLE; ; 3; 150MM; 18AWG; MOLEX 8981-04P P=5.08 X2; MOLEX 8981-04M P=5.08;;;;;;;;;;;; Wins Precision; RoHS
19100-000238-00-RS	COOLER MODULE; HEATSINK:105*67*12.1mm; FAN:77*75*15.4mm; STANDARD; 00; HF-XFWD-00383-1710; DC FAN:12V, 4P, 5500RPM, TOW BALL; ; Everflow; B127515BU; CCL; RoHS

IEI GRAND AI Training Server System

AI Training System

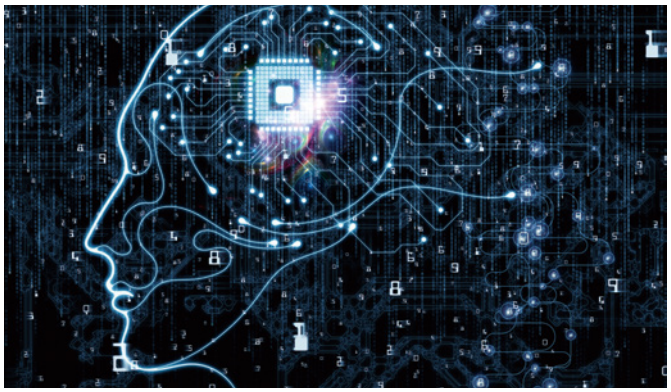
The AI training system GRAND-C442 is dedicated for these tasks because it offers a wide range of slots for storage expansion, acceleration cards and video capture, Thunderbolt™ or PoE add-on cards for unlimited data ac-quisition possibilities. In order to develop a useful training model, existing and widely used deep learning training frameworks such as Caffe, Tensor-Flow or Apache MXNet are recommended. These facilitate the definition of the apt architecture and algorithms for a distinct AI application.

Supported Software



Demand for AI computing is booming

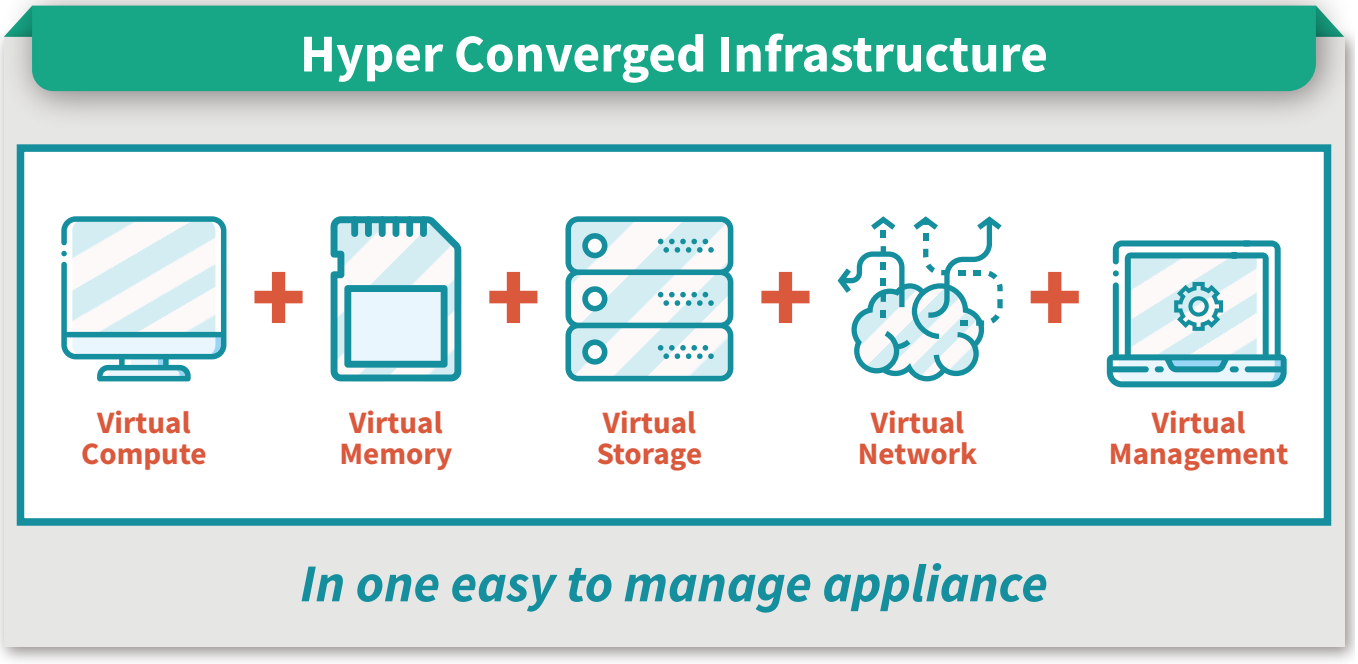
The application of AI computing is absolutely not enough through the CPU computing. With the decentralized architecture, the huge data is calculated to obtain the computing result. Therefore, we have developed a water-cooled chassis system with high expansion capability by adding multiple GPUs, FPGA or VPU acceleration cards for AI deep learning and inference.



Hyper converged infrastructure

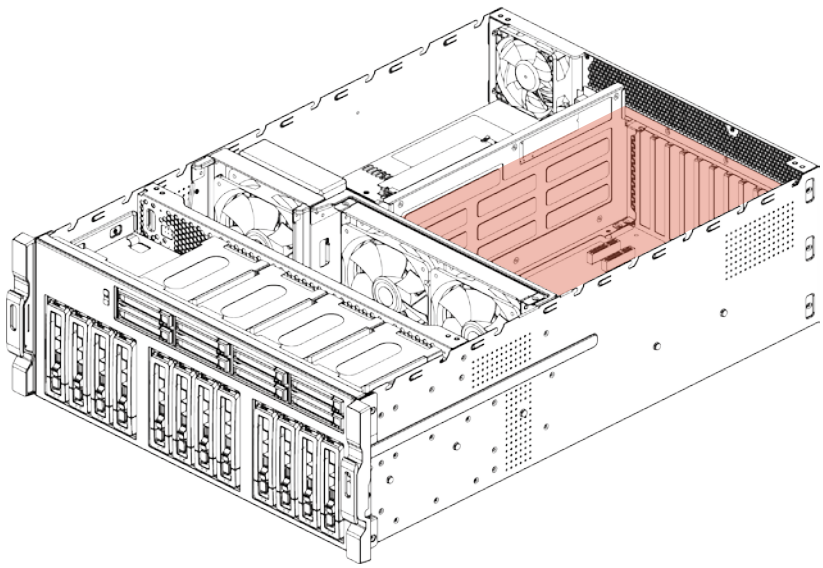
Hyper converged infrastructure (HCI) is scale-out software-defined infrastructure that converges core data services on flash-accelerated, industry-standard servers, delivering flexible and powerful building blocks under unified management.

Efficient, agile, flexible, and integrated, these systems allow for easy scale-out storage, cost-savings, and simplicity to manage your systems. To find out if hyperconverged is the best solution for your Data Center, consider the following.



Expandable to suit your needs

AI computing requires huge computing power, so our system can support up to 4 dual-width expansion slots (PCIe x8) and 2 single-width expansion slots (PCIe x4) for maximum expansion ability to meet computing needs.
All six of the backplane slots connect directly to the system host board. This is perfect for applications that require minimal latency.



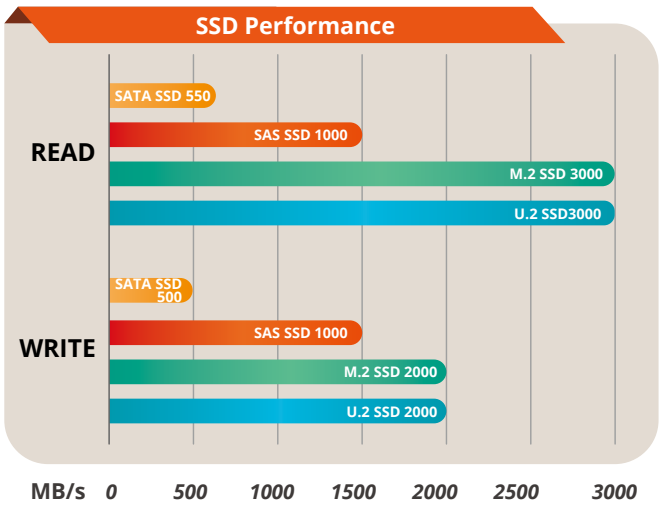
Model Name	PCIe	
GRAND-C422-20D-S1	6 Slots	4 PCIe Gen 3 x8
		2 PCIe Gen 3 x4
GRAND-C422-20D-H1	6 Slots	2 PCIe Gen 3 x16
		1 PCIe Gen 3 x8
		3 PCIe Gen 3 x4
GRAND-C422-20D-H2	7 Slots	5 PCIe Gen 3 x8
		2 PCIe Gen 3 x4

U.2 SSD (GRAND-C422-20D-S supported)

U.2 uses the same concept as a general hard disk. With a connection cable, a hard disk can be installed in the case without occupying the space of the motherboard. Therefore, M.2 and U.2 interfaces can be coexistence because they have different application environment. M.2 is more suitable for laptops or microcomputers, and U.2 is more suitable on a desktop or server. The U.2 interface features high-speed, low-latency, low-power, NVMe standard protocol, and PCIe 3.0 x4 channel. The theoretical transmission speed is up to 32Gbps, while SATA is only 6Gbps, which is 5 times faster than SATA.

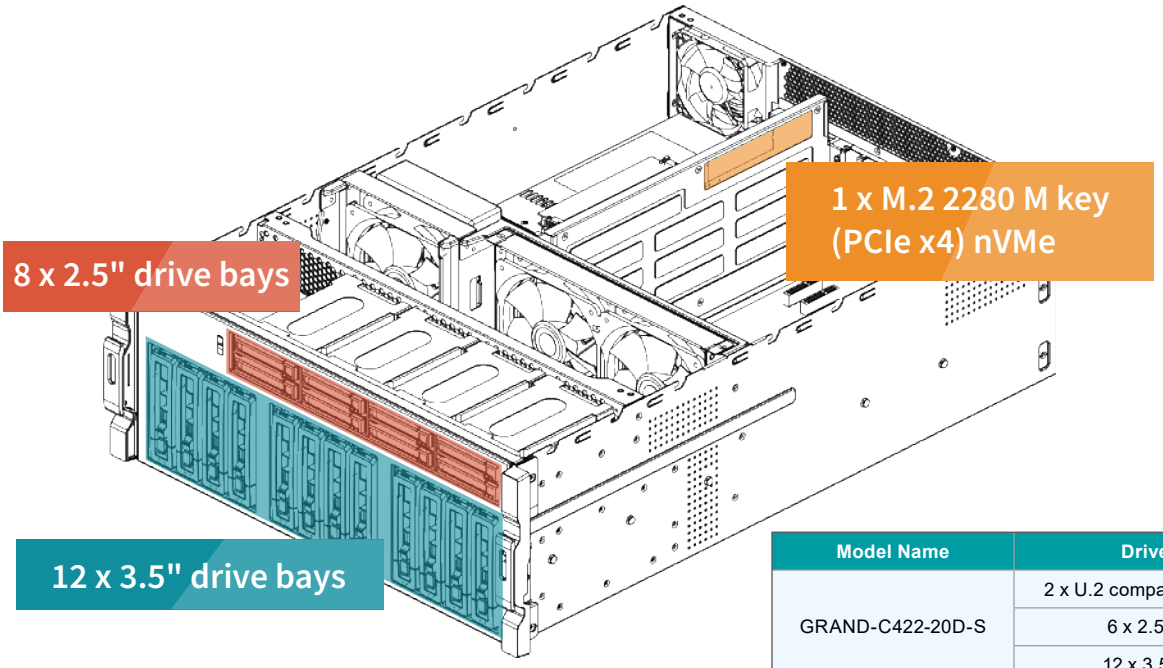
SAS HDD

15K SAS 12Gb HDD Compared to the conventional 7200 rpm speeds of SATA HDD, SAS HDD have disk speeds of up to 15,000 rpm, providing much higher read/write performance of up to 300MB/s. Although SAS 12Gb HDD cannot match the IOPS performance of SSD, its cost-per-gigabyte is more favorable. Enterprise-level SAS HDD also offers up to 2 million hours MTBF, providing dependable reliability. If an HDD failure occurs, the stored data may be recoverable, whereas if an SSD fails it can be harder (if not impossible) to recover data. With these considerations, SAS HDD remains the best choice for an enterprise to build a stable, efficient, and affordable storage medium.



Storage (M.2, SATA, SAS & U.2 by SKU)

The GRAND-C422-20D support M.2 2280 M key (PCIe x4) nVMe, SATA HDD/SSD, SAS HDD & U.2 SSD (by SKU). It has a built-in M.2 2280 M key (PCIe x4) nVMe port and 20 bays of HDD/SSD slots including two U.2 SDD slots. The GRAND-C422-20D supports M.2 solid-state disk which is the next-generation small-sized form factor introduced by Intel after mSATA. It has better performance than general SATA SSD but it is lighter and more power-saving.



Model Name	Drive Bay
GRAND-C422-20D-S	2 x U.2 compatiable to SATA
	6 x 2.5” SATA
	12 x 3.5” SATA
GRAND-C422-20D-H	8 x 2.5” SAS/SATA
	12 x 3.5” SAS/SATA

Water Cooling System for CPU

IEI uses the latest 14nm Intel Xeon Processor W family which uses the LGA2066 interface and Skylake-SP architecture with 4, 6, 8, 10, 14 and 18 core versions.
High performance means higher power consumption, therefore IEI designed water cooling system for CPU with smaller size, higher efficiency cooling system makes CPU cooler and keep the high performance, and it can support up to 250W TDP.

	Water Cooling	Air Cooling
		
Cooler Size	Small	Large
Working Noise	Small	Large
Cooling Efficiency	Better	Worse

GRAND-C422-20D-S

The GRAND-C422-20D is an AI training system which has maximum expansion ability to add in AI computing accelerator cards for AI model training or inference.

Feature

- Intel® Xeon® W family processor supported
- 6 x PCIe Slot, up to 4 dual width GPU cards
- Water cooling system on CPU
- Support two U.2 SSD
- Support one M.2 SSD M-key slot (NVMe PCIe 3.0 x4)
- Support 10GbE network
- IPMI remote management

Specifications

Model		GRAND-C422-20D-S
Chassis	Dimensions (H x W x D)	176.15 x 480.94 x 644 mm
	System Fan	2 x 120 mm, 12V DC
	Chassis Construction	4U, Rackmount
Motherboard	CPU	Intel® LGA-2066 Xeon® W Family processor
	Processor Cooling	Water cooling system
	Chipset	C422
	Memory	Total slot: 4 x DDR4 ECC RDIMM / LRDIMM Memory expandable up to:256GB (4 x 64GB)
Security	TPM	1 x TPM 2.0 Pin header
IPMI	IPMI Solution	IPMI LAN port, IPMI VGA display
Storage	Hard Drive	12 x 2.5" / 3.5" drive bay 8 x 2.5" drive bay
	M.2	1 x 2280 M key (PCIe x4) built in on SBC
	U.2	2 x U.2 SSD drive bay compatible to SATA
Networking	Ethernet IC	1 GbE NIC: Intel® i210-AT with NCSI support 10 GbE NIC: Aquantia AQC107
I/O Interface	USB 3.2 Gen 1	4
	USB 2.0	2
	Ethernet	1 x 1GbE RJ-45 combo LAN ports / IPMI 1 x 10GbE RJ-45 LAN port
	Display	1 x IPMI VGA display
	Buttons	Power button
Internal I/O	COM port	2 x RS-232 pin header
	USB 3.2 Gen 1	2 x USB 3.2 Gen 1 (5Gb/s) pin header
	USB 2.0	2 x USB 2.0 pin header, 1 x USB 2.0 type A
Indicator	LEDs	10 GbE, Status, LAN, Storage Expansion Port Status
	LCM	LCM, 2 buttons
Expansion	PCIe	4 x PCIe Gen 3 x8 2 x PCIe Gen 3 x4
Power	Power Input	100-240V AC, 47-63Hz
	Power Consumption	In Operation: 285W
	Type/Watt	Redundant Power 1200W
Reliability	Operating Temperature	0~40˚C
	Relative Humidity	5 to 95% non-condensing, wet bulb: 27˚C
	Weight	23.59 kg
	Certification	CE/FCC
OS	Support OS	Windows server 2016 Linux

Packing List

Flat head screws (for 2.5” HDD)	Flat head screws (for 3.5” HDD)
1 x Cat5e LAN cable	2 x Power cord
1 x Cat6A LAN cable	1 x QIG

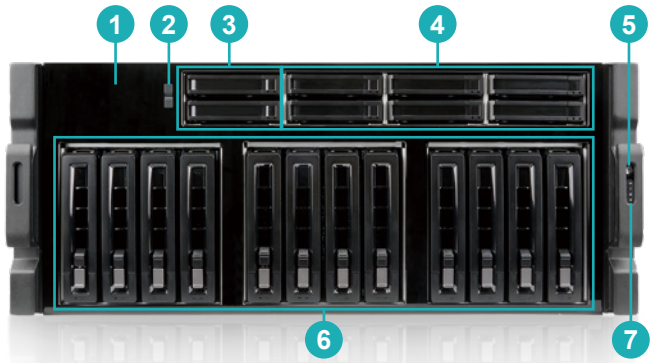
Options

Item	Part No.	Description
Slide Rail	RAIL-A02-90	Kingslide Rail kit, maximum load 90 kg

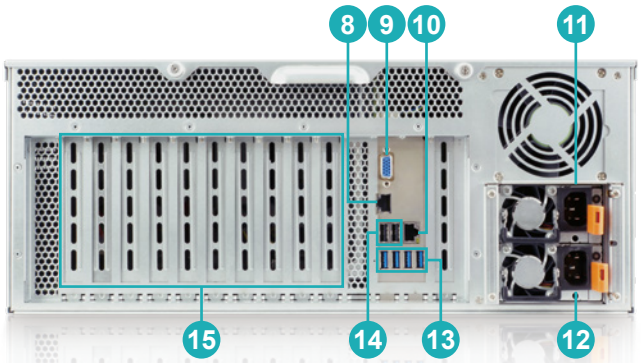
Ordering Information

Part No.	Description
GRAND-C422-20D-S1A1-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, Intel® Xeon® W-2123 with C422 chipset, 32G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-S1B2-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, Intel® Xeon® W-2133 with C422 chipset, 64G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-S1C3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, Intel® Xeon® W-2145 with C422 chipset, 128G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-S1D3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, Intel® Xeon® W-2155 with C422 chipset, 128G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-S1E4-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, Intel® Xeon® W-2195 with C422 chipset, 256G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS

I/O Interface

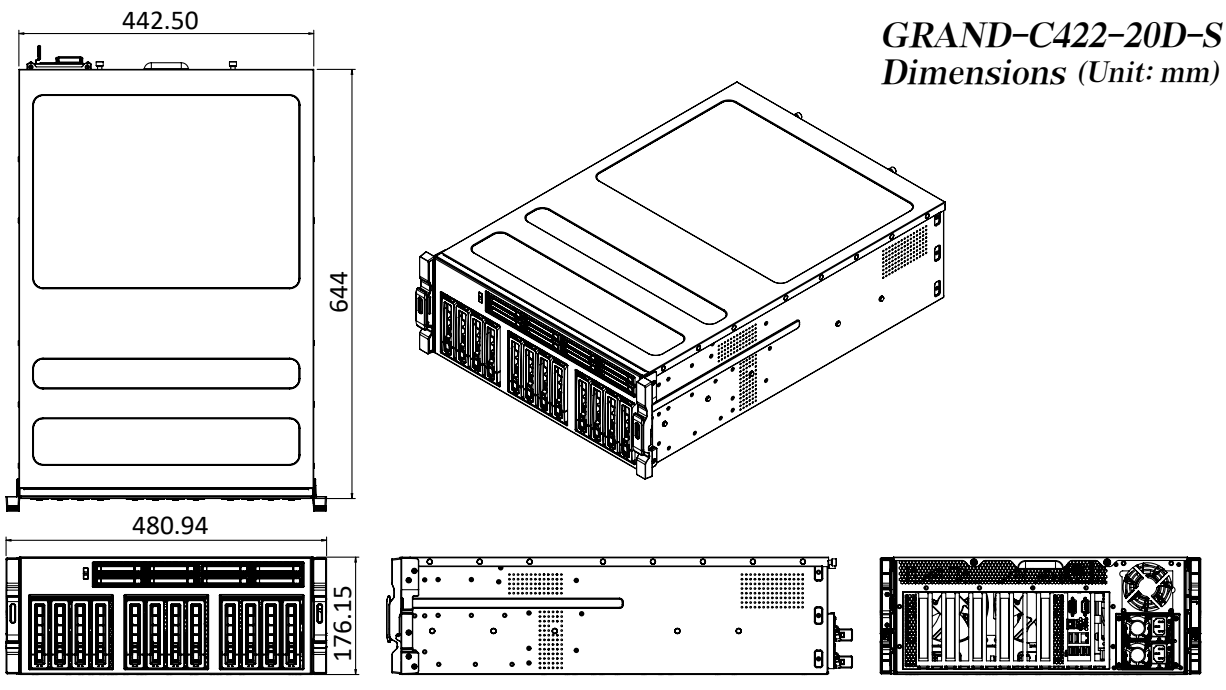


1. LCM
2. LCM control buttons
3. Two U.2 SSD drive bays compatible with SATA
4. Six 2.5” SATA 6Gb/s drive bays
5. Power button
6. Twelev 2.5”/3.5” SATA 6Gb/s drive bays
7. LED Indicator:
   - 10 10GbE
   - System status
   - LAN
   - Storage expansion port status



8. 10 Gigabit Ethernet port
9. IPMI VGA port
10. Gigabit Ethernet port with NCSI support
11. Power supply unit 1
12. Power supply unit 2
13. Four USB 3.1 Gen 1 ports
14. Two USB 2.0 ports
15. PCIe expansion slots

GRAND-C422-20D-S Dimensions (Unit: mm)



GRAND-C422-20D-H

NEW

The GRAND-C422-20D is an AI training system which has maximum expansion ability to add in AI computing accelerator cards for AI model training or inference.

Feature

- Intel® Xeon® W family processor supported
- Up to 7 x PCIe Slot, with dual width expansion card support
- Water cooling system on CPU
- Support SAS SSD
- Support one M.2 SSD M-key slot (NVMe PCIe 3.0 x4)
- Support 10GbE network
- Support Hardware RAID
- IPMI remote management

Specifications

Model		GRAND-C422-20D-H1	GRAND-C422-20D-H2
Chassis	Dimensions (H x W x D)	176.15 x 480.94 x 644 mm	
	System Fan	2 x 120 mm, 12V DC	
	Chassis Construction	4U, Rackmount	
Motherboard	CPU	Intel® LGA-2066 Xeon® W Family processor	
	Processor Cooling	Water cooling system	
	Chipset	C422	
	Memory	Total slot: 4 x DDR4 ECC RDIMM / LRDIMM Memory expandable up to:256GB (4 x 64GB)	
Security	TPM	1 x TPM 2.0 Pin header	
IPMI	IPMI Solution	IPMI LAN port, IPMI VGA display	
Storage	Hard Drive (need to install RAID card)	12 x 2.5" / 3.5" drive bay (support SAS /SATA) 8 x 2.5" drive bay (support SAS /SATA)	
	M.2	1 x M.2 (PCIe Gen 3 x4) built in on SBC	
	U.2	2 x U.2 SSD drive bay compatible to SATA	
Networking	Ethernet IC	1 GbE NIC: Intel® i210-AT with NCSI support 10 GbE NIC: Aquantia AQC107	
I/O Interface	USB 3.2 Gen 1	4	
	USB 2.0	2	
	Ethernet	1 x 1GbE RJ-45 combo LAN ports / IPMI 1 x 10GbE RJ-45 LAN port	
	Display	1 x IPMI VGA display	
	Buttons	Power button	
Internal I/O	COM port	2 x RS-232 pin header	
	USB 3.2 Gen 1	2 x USB 3.2 Gen 1 (5Gb/s) pin header	
	USB 2.0	2 x USB 2.0 pin header, 1 x USB 2.0 type A	
Indicator	LEDs	10 GbE, Status, LAN, Storage Expansion Port Status	
	LCM	LCM, 2 buttons	
Expansion	PCIe	2 PCIe Gen 3 x16 1 PCIe Gen 3 x8 3 PCIe Gen 3 x4	5 PCIe Gen 3 x8 2 PCIe Gen 3 x4
Power	Power Input	100-240V AC, 47-63Hz	
	Power Consumption	In Operation: 285W	
	Type/Watt	Redundant Power 1200W	
Reliability	Operating Temperature	0~40˚C	
	Relative Humidity	5 to 95% non-condensing, wet bulb: 27˚C	
	Weight	23.59 kg	
	Certification	CE/FCC	
OS	Support OS	Windows server 2016 / Linux	

Packing List

Flat head screws (for 2.5" HDD)	Flat head screws (for 3.5" HDD)
1 x Cat5e LAN cable	2 x Power cord
1 x Cat6A LAN cable	1 x QIG

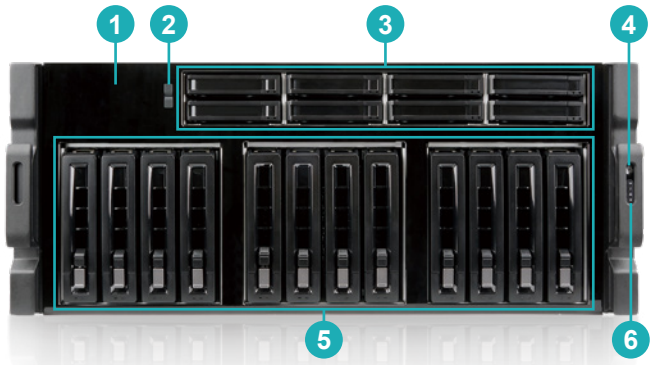
Options

Item	Part No.	Description
Slide Rail	RAIL-A02-90	Kingslide Rail kit, maximum load 90 kg
RAID Controller	7F200-SMARTRAID315424I-RS	Microsemi Adaptec SmartRAID 3154-24i

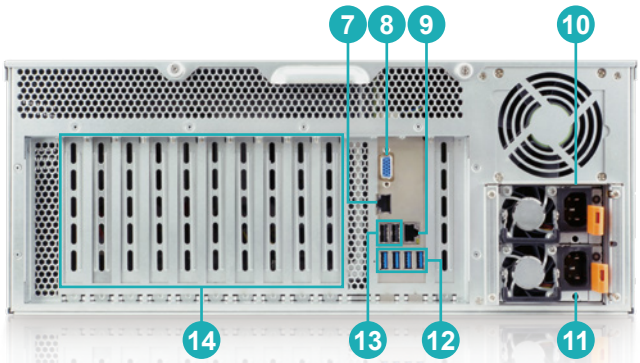
Ordering Information

Part No.	Description
GRAND-C422-20D-H1A1-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2123 with C422 chipset, 32G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H1B2-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2133 with C422 chipset, 64G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H1C3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2145 with C422 chipset, 128G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H1D3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2155 with C422 chipset, 128G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H1E4-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2195 with C422 chipset, 256G DDR4 w/ECC, 6 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H2A1-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2123 with C422 chipset, 32G DDR4 w/ECC, 7 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H2B2-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2133 with C422 chipset, 64G DDR4 w/ECC, 7 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H2C3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2145 with C422 chipset, 128G DDR4 w/ECC, 7 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H2D3-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2155 with C422 chipset, 128G DDR4 w/ECC, 7 x PCIe expansion slot, and 1200W redundant PSU, RoHS
GRAND-C422-20D-H2E4-R10	20-bay (12 x 3.5", 8 x 2.5") 4U Rackmount, support hardware RAID, Intel® Xeon® W-2195 with C422 chipset, 256G DDR4 w/ECC, 7 x PCIe expansion slot, and 1200W redundant PSU, RoHS

I/O Interface

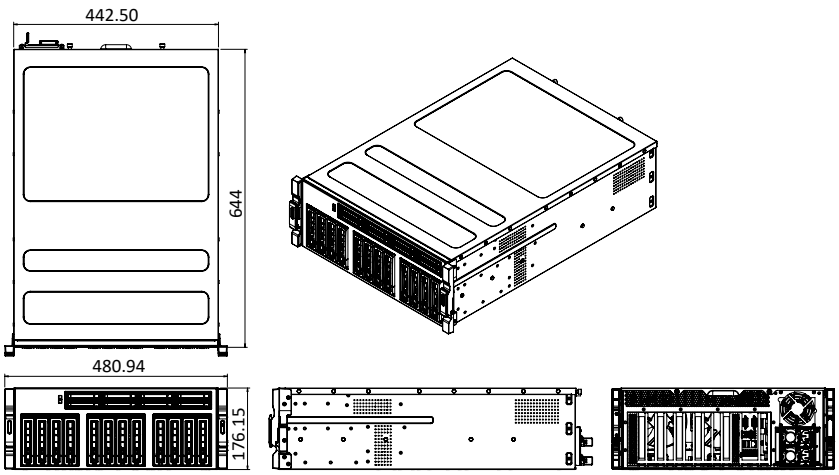


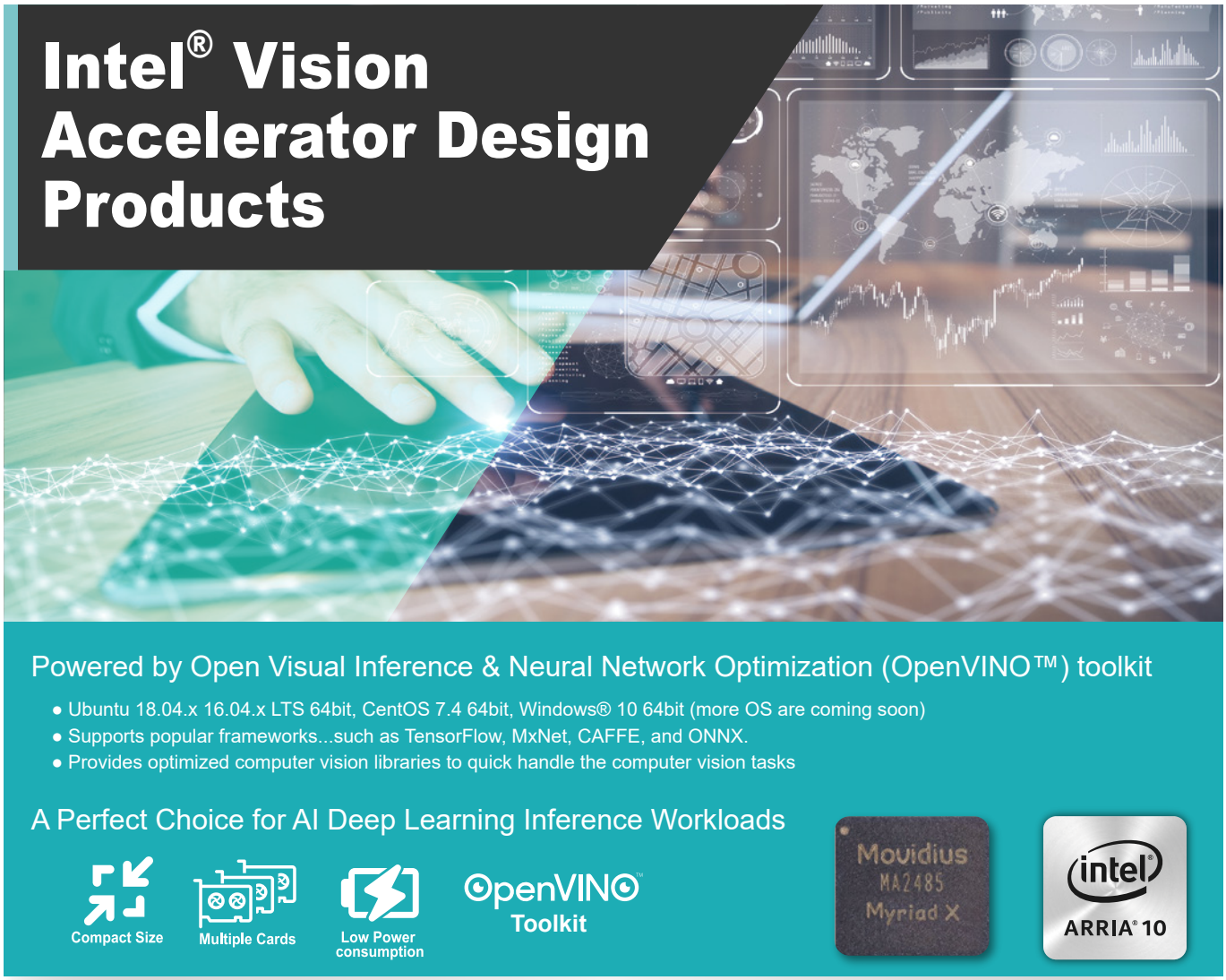
1. LCM
2. LCM control buttons
3. 2.5" SAS/SATA drive bays
4. Power button
5. Twelev 2.5"/3.5" SAS/SATA drive bays
6. LED Indicator:
   - 10 10GbE
   - i System status
   - LAN
   - Storage expansion port status



7. 10 Gigabit Ethernet port
8. IPMI VGA port
9. Gigabit Ethernet port with NCSI support
10. Power supply unit 1
11. Power supply unit 2
12. Four USB 3.1 Gen 1 ports
13. Two USB 2.0 ports
14. PCIe expansion slots

GRAND-C422-20D-H Dimensions (Unit: mm)





IEI Mustang Series Accelerators

In AI applications, training models are just half of the whole story. Designing a real-time edge device is a crucial task for today's deep learning applications.

FPGA is short for field programmable gate array, and VPU stands for vision processing unit. It can both run AI faster, and are well suited for real-time applications such as surveillance, retail, medical, and machine vision. With the advantage of low power consumption, 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. AI applications at the edge must be able to make judgements without relying on processing in the cloud due to bandwidth constraints, and data privacy concerns.Therefore, how to resolve AI task locally is becoming more important.

In the era of AI explosion, various computations rely on server or device which needs larger space and power budget to install accelerators to ensure enough computing performance.

In the past, solution providers have been upgrading hardware architecture to support modern applications, but this has not addressed the question on minimizing physical space. However, space may still be limited if the task cannot be processed on the edge device.

We are pleased to announce the launch of the Mustang-F100-A10 and Mustang-V100-MX8, features with small form factor, low power consumption. Perfect choice for AI deep learning inference workloads and compatible with IEI TANK-870AI compact IPC for those with limited space and power budget.

Mustang-200

Hardware Feature

- Dual 10Gbps network based x86 computing accelerator
- Decentralized computing architecture for independent tasks
- PCI Express x4 delivers scalable and flexible solution
- Two Intel® Core™ i7-7567U/i5-7267/Celeron® 3865U processors, up to 4.00 GHz
- Support high-end graphics engine - Intel® Iris™ Plus Graphics 650
- Pre-installed 32 GB DDR4 (max. 64 GB) and 1 TB NVMe (max. 2 TB)

Specifications

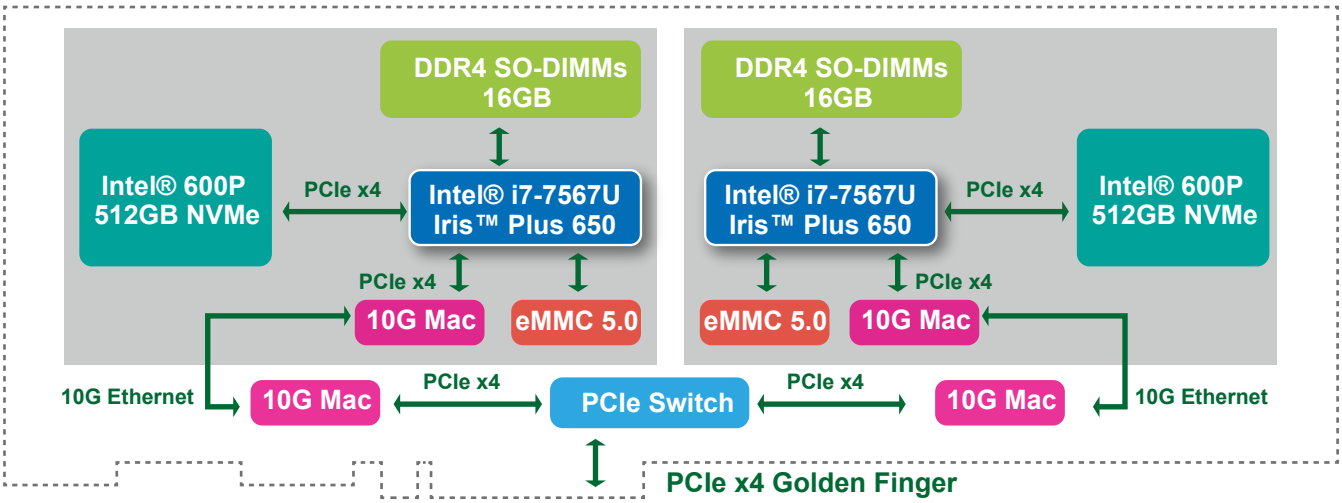
Model Name	Mustang-200
Main Chipset	Two (2) Intel Kabylake ULT CPU
	Intel® Core™ i7-7567U (28 W) (4M Cache, up to 4.00 GHz)
	Intel® Core™ i5-7267U (28 W) (4M Cache, up to 3.50 GHz)
	Intel® Celeron® 3865U (15W) (2M Cache, 1.80 GHz)
Processor Graphics	Intel® Core™ i7-7567U & i5-7267U support Iris™ Plus Graphics 650 (GT3e) •Graphics base frequency 300 MHz •Graphics max dynamic frequency: 1.05 GHz •Embedded graphics DRAM per GPU: 64 MB
	Intel® Celeron® 3865U supports Intel® HD Graphics 610 •Graphics base frequency 300 MHz •Graphics max dynamic frequency: 900 MHz
Hardware Video Decode	H.264, H.265/HEVC
	MPEG2, M/JPEG
	VC-1
	VP8(8 bit)/VP9(10 bit)
Hardware Video Encode	H.264, H.265/HEVC
	MPEG2, M/JPEG
	VC-1
	VP8 (8-bit)
Display Output	2 x Micro HDMI for debugging
USB 2.0	4 x USB 2.0 (pin header) for debugging
Memory	(2 SO-DIMMs per CPU) 4 x DDR4 8GB SO-DIMM (Core™ i7/i5 SKU) 4 x DDR4 2GB SO-DIMM (Celeron® 3865U SKU)
Storage	2 x Intel® SSD 600P series (Core™ i7/i5 SKU only) (512GB M.2 80mm PCIe 3.0 x4, 3D1, TLC)
Dataplane Interface	PCI Express x4
	Compliant with PCI Express Specification V2.0
	Compatible with PCI Express x4, x8, and x16 slots
External Interfaces	Reset button
	Power button
Indicator	Seven segment (indicate card number and debug code)
Power Input	12V PCIe 6-pin power input
Power Consumption	12V@7.41A (Intel® Core™ i7-7567U SKU)
Operating Temperature	0°C~40°C
Fan	Dual fan
Dimensions (DxWxH)	40mm x 210mm x 111mm
Operating Humidity	10% ~ 90%

Ordering Information

Part No.	Description
Mustang-200-i7-1T/32G-R10	Computing Accelerator Card supports Two Intel® Core™ i7-7567U with Intel® 600P 1TB (512GB x2) SSD, 32GB (8GB x4) DDR4, PCIe x4 interface, QTS-Lite, and RoHS
Mustang-200-i5-1T/32G-R10	Computing Accelerator Card supports Two Intel® Core™ i7-7267U with Intel® 600P 1TB (512GB x2) SSD, 32GB (8GB x4) DDR4, PCIe x4 interface, QTS-Lite, and RoHS
Mustang-200-C-8G-R10	Computing Accelerator Card supports Two Intel® Celeron® 3865U with 8GB (2GB x4) DDR4, PCIe x4 interface, QTS-Lite, and RoHS (without NVMe storage)
19B00-000396-00-RS	Mustang-200 dual-port USB cable

Packing List

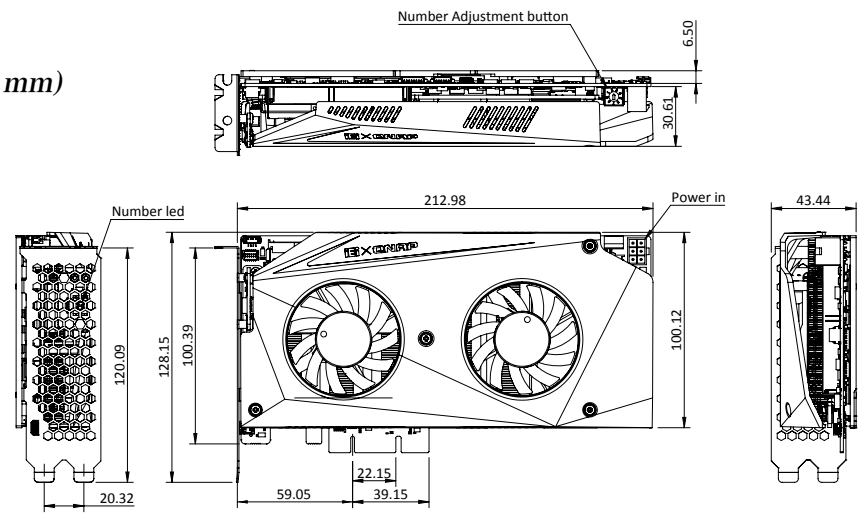
1 x Mustang-200
1 x QIG
1 x 4 pin to PCIe power cable



• Block Diagram

Every CPU on the Mustang-200 is accompanied with 16GB (2 x 8GB) RAM and an Intel® 600P series 512GB NVMe SSD. Once installed in a PCIe x4 slot, the host computer will be connected to both computing nodes on the Mustang-200 with 10GbE networks. The advantage of utilizing network-based structures is that no proprietary hardware is needed thus a lower cost is achieved. The computing nodes are powered by QTS-Lite, a lightweight version of QNAP's award-winning QTS operating system, and the eMMC component will serve as storage for QTS-Lite.

Mustang-200 Dimensions (Unit: mm)



Mustang-F100-A10

Feature

- Half-Height, Half-Length, Double-slot.
- Power-efficiency, low-latency.
- Supported OpenVINO™ toolkit, AI edge computing ready device.
- FPGAs can be optimized for different deep learning tasks.
- Intel® FPGAs supports multiple float-points and inference workloads.

Specifications

Model Name	Mustang-F100-A10
Main FPGA	Intel® Arria® 10 GX1150 FPGA
Operating Systems	Ubuntu 16.04.3 LTS 64-bit, CentOS 7.4 64-bit Ubuntu 18.04.x 16.04.x LTS 64bit, CentOS 7.4 64bit, (Windows® 10 64bit & more OS are coming soon)
Voltage Regulator and Power Supply	Intel® Enpirion® Power Solutions
Memory	8G on board DDR4
Dataplane Interface	PCI Express x8
	Compliant with PCI Express Specification V3.0
Power Consumption	Approximate 40W
Operating Temperature	5°C~60°C
Cooling	Active fan
Dimensions	Standard Half-Height, Half-Length, Double-slot
Operating Humidity	5% ~ 90%
Power Connector	*Preserved PCIe 6-pin 12V external power
Dip Switch/LED indicator	Identify card number
Support Topology	AlexNet; DenseNet-121, -161, -169, -201; GoogLeNet v1, v2, v3, v4; Inception v1, v2, v3, v4; LSTM: CTPN MobileNet v1, v2; MobileNet SSD; MTCNN-o, -p, -r; ResNet-18, -50, -101, -152; ResNet v2-50, -101, -152 Sphereface; SqueezeNet v1.0, v1.1; SSD MobileNet v1, v2; SSD Inception v2, v3; SSD ResNet; SSD300 SSD512; U-Net; VGG16, VGG19; YoloTiny v1, v2, v3; Yolo v2, v3 * 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-F100-A10 into the TANK AIoT Dev. Kit before shipment. It is recommended to ship them with their original boxes to prevent the Mustang-F100-A10 from being damaged.

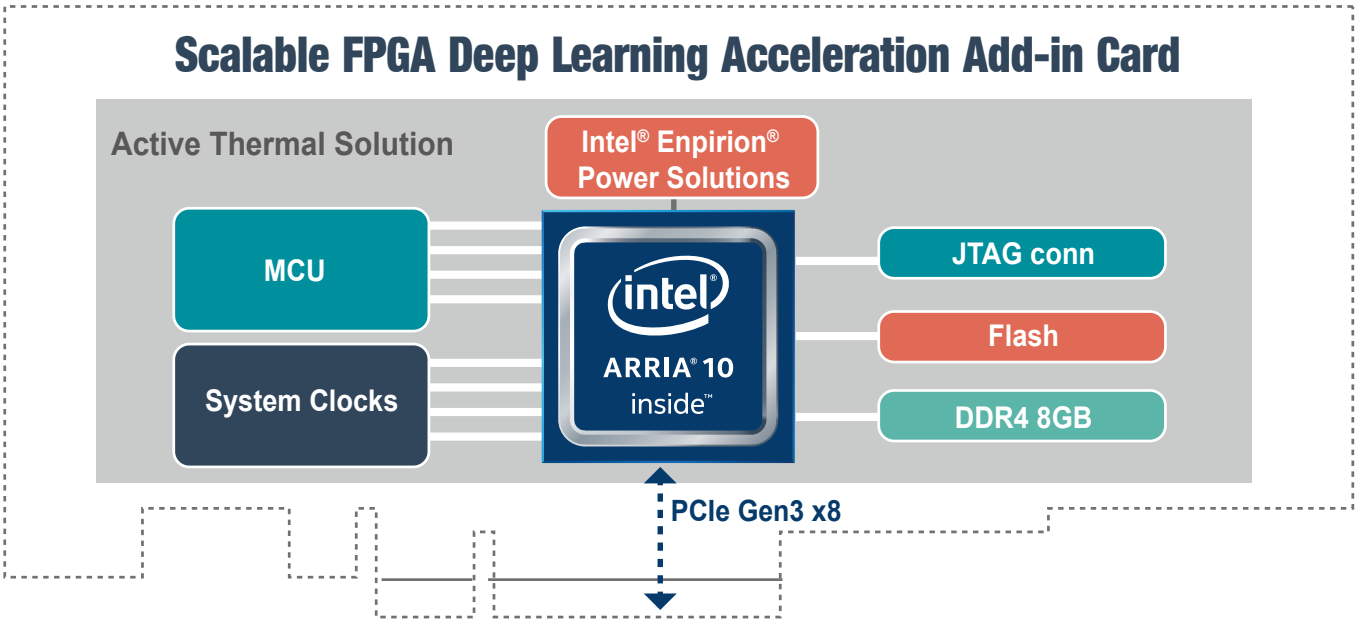
Ordering Information

Part No.	Description
Mustang-F100-A10-R10	PCIe FPGA Highest Performance Accelerator Card with Arria 10 1150GX support DDR4 2400Hz 8GB, PCIe Gen3 x8 interface
7Z000-00FPGA00	7Z0-OTHERS PERIPHERAL DEVICE;FPGA Download Cable; IEI USB DOWNLOAD CABLE;GALAXY;USB Download+USB CABLE+IDE CABLE+FPGA CABLE

*Due to the OpenVINO™ toolkit version is upgraded periodically, IEI strongly recommend users to purchase FPGA programmer kit (7Z000-00FPGA00) to upgrade the latest bitstreams to get best performance.
*If you would like to buy FPGA Download Cable kit(7Z000-00FPGA00), please email to online@ieiworld.com or place an order on IEI USA e-shop, thank you.

Packing List

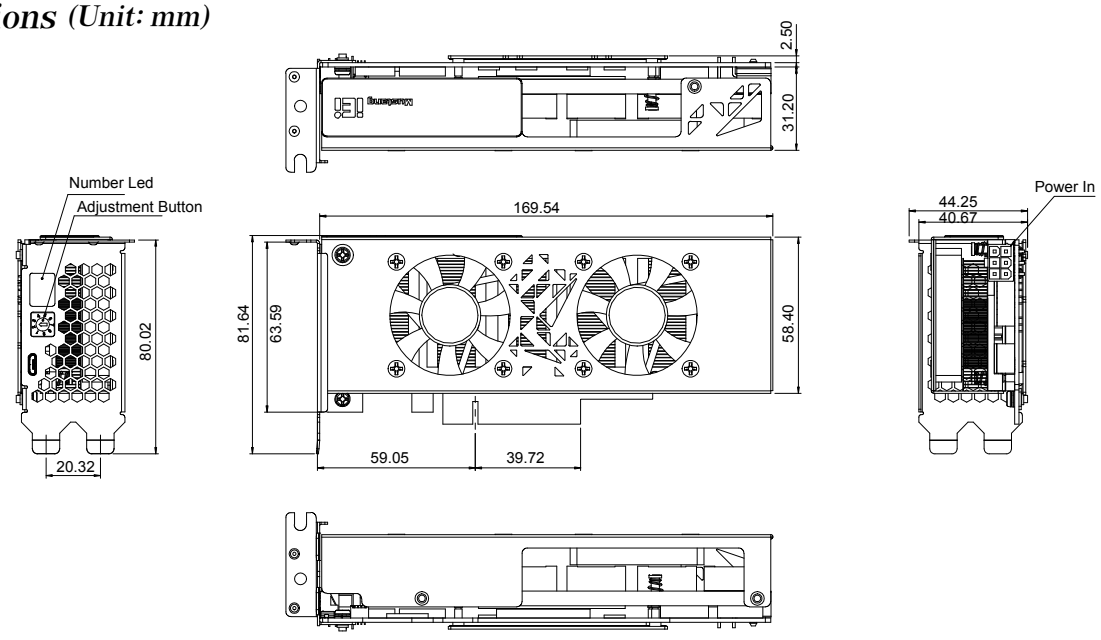
1 X Full height bracket
1 x External power cable
1 x QIG



Mustang-F100-A10 Block Diagram

- Intel® Arria® 10 1150 GX FPGAs delivering up to 1.5 TFLOPs
- Interface: PCIe Gen3 x 8
- Form Factor: Standard Half-Height, Half-Length, Double-slot
- Cooling: Active fan.
- Operation Temperature : 5°C~60°C
- Operation Humidity : 5% to 90% relative humidity
- Power Consumption: Approximate 40W
- Power Connector: *Preserved PCIe 6-pin 12V external power
- DIP Switch/LED Indicator: Identify card number.
- Voltage Regulator and Power Supply: Intel® Enpirion® Power Solutions

Mustang-F100-A10 Dimensions (Unit: mm)



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

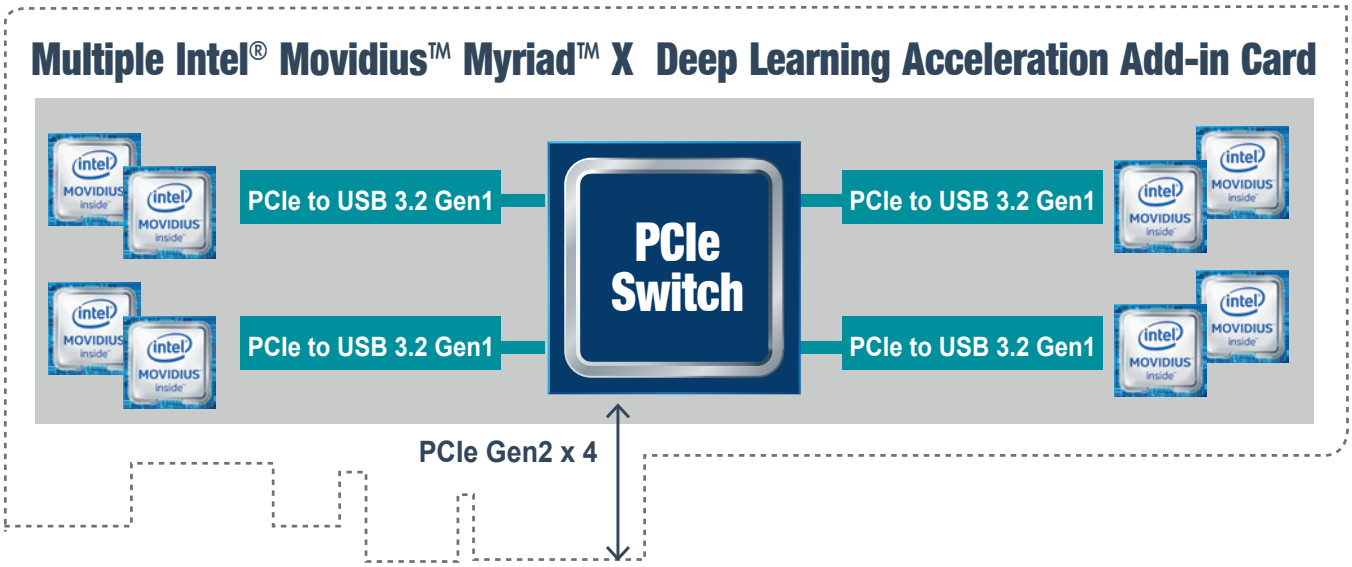
*TANK AIoT dev. kit PCIe slot provides 75W power, this feature is preserved for user in case of different system configuration.
Warning: DO NOT install the Mustang-V100-MX8 into the TANK AIoT Dev. Kit before shipment. It is recommended to ship them with their original boxes to prevent the Mustang-V100-MX8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

Ordering Information

Part No.	Description
Mustang-V100-MX8-R11	Computing Accelerator Card with 8 x Movidius Myriad X MA2485 VPU, PCIe Gen2 x4 interface, RoHS

Packing List

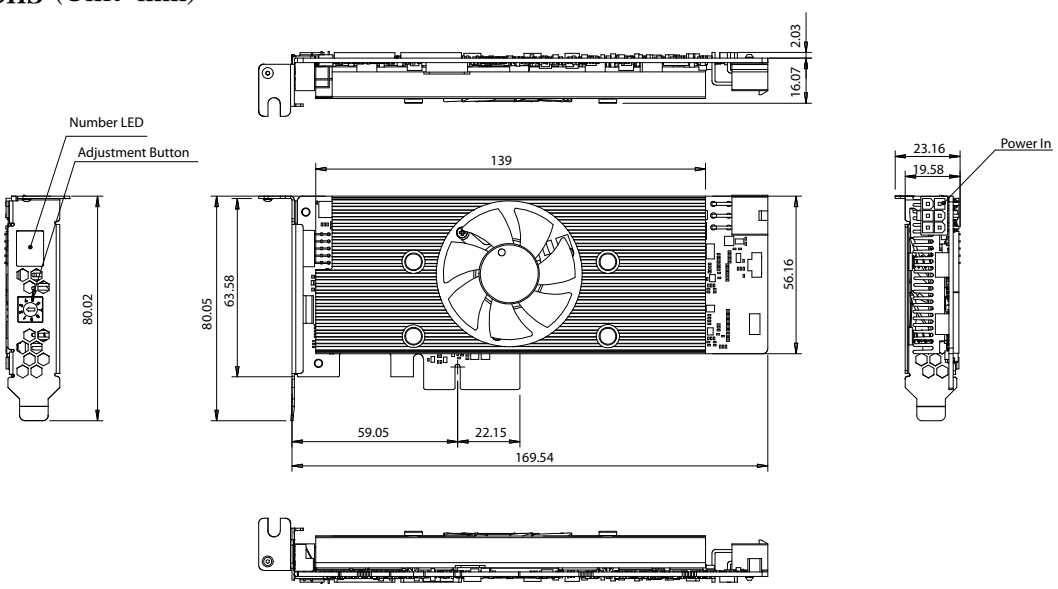
1 X Full height bracket
1 x External power cable
1 x QIG



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

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

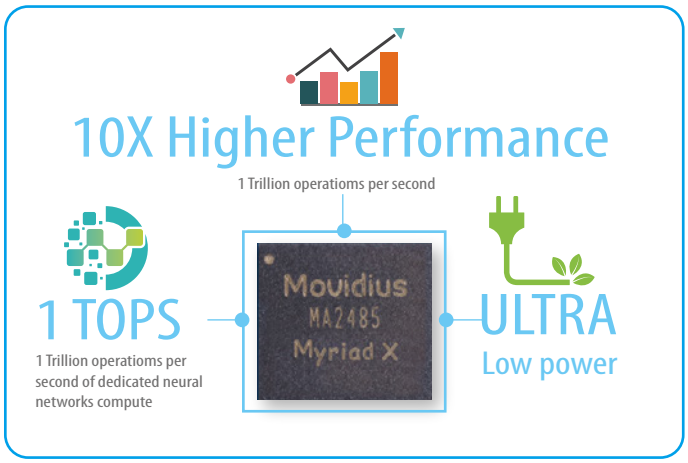
Part No.	Description
Mustang-V100-MX4-R10	Computing Accelerator Card with 4x Intel® Movidius™ Myriad™ X MA2485 VPU, PCIe Gen 2 x 2 interface, RoHS

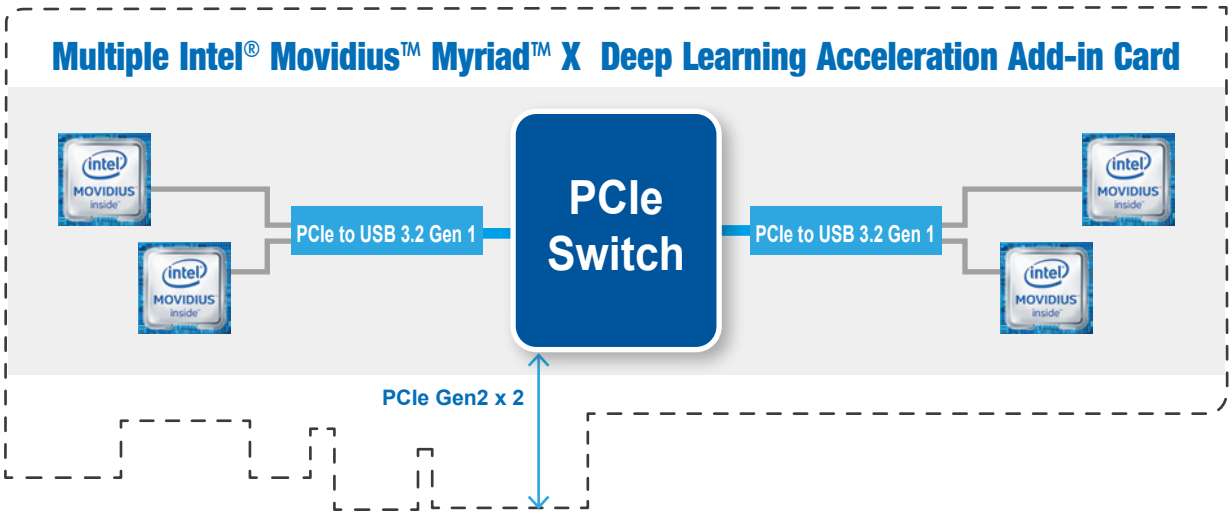
Packing List

1 x Full height bracket

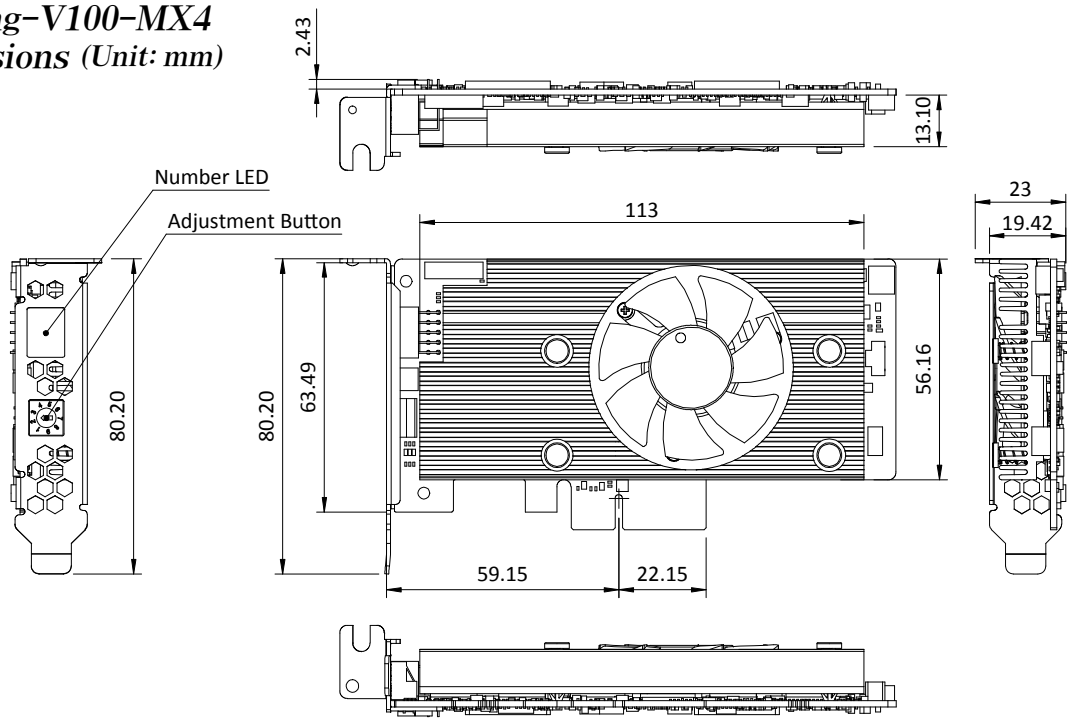
Key Features of Intel® Movidius™ Myriad™ X VPU:

- 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



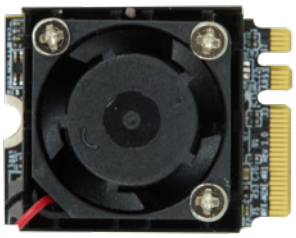


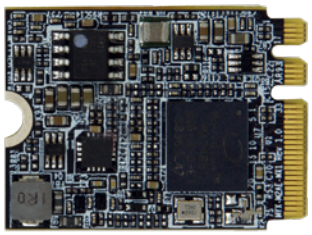
Mustang-V100-MX4 Dimensions (Unit: mm)



Mustang-M2AE-MX1

NEW





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

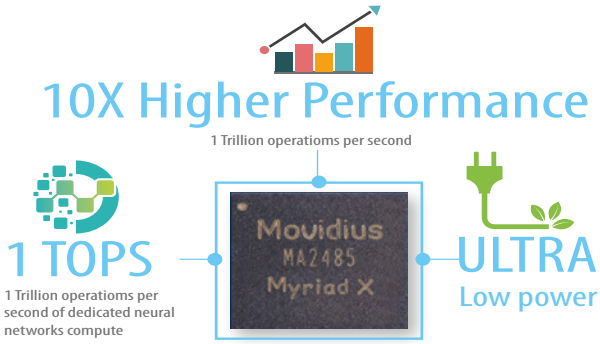
Introduction

The Mustang-M2AE-MX1M.2 AE-key card included 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:

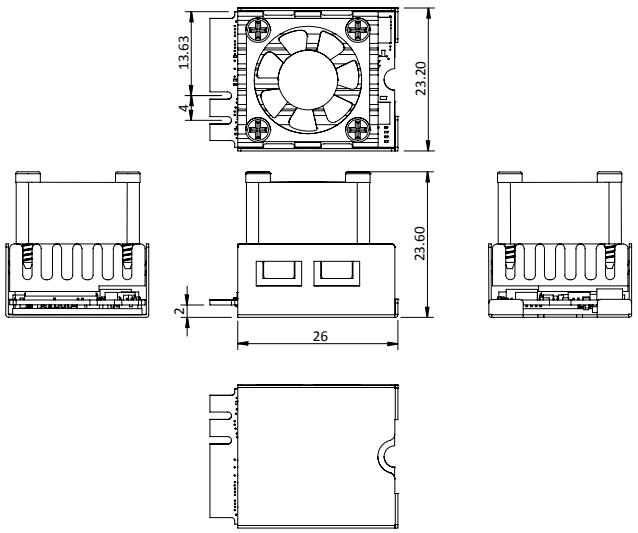
- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance



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)

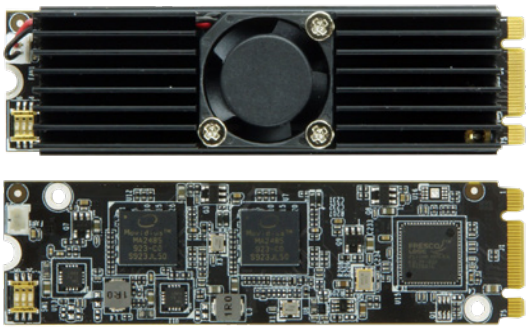


Ordering Information

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-M2BM-MX2

NEW



Feature

- M.2 BM key form factor (22 x 80 mm)
- 2 x Intel® Movidius™ Myriad™ X VPU MA2485
- Power efficiency, approximate 7W
- Operating Temperature -20°C~60°C
- Powered by Intel's OpenVINO™ toolkit

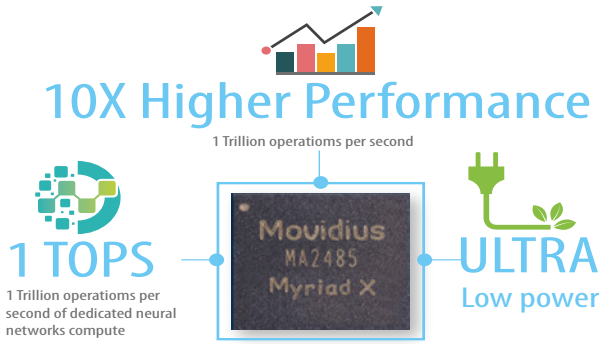
Introduction

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:

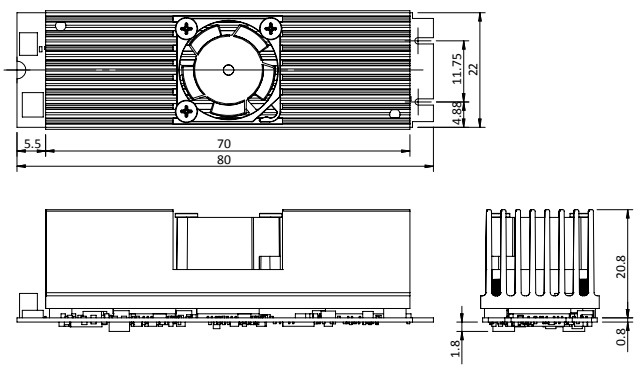
- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance



Specifications

Model Name	Mustang-M2BM-MX2
Main Chip	2x 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 BM Key
Power Consumption	Approximate 7W
Operating Temperature	-20°C~60°C
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)

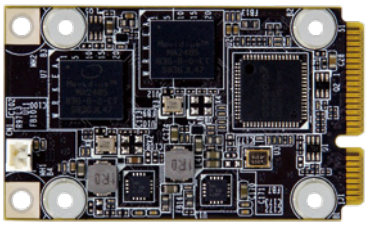


Ordering Information

Part No.	Description
Mustang-M2BM-MX2-R10	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-MPCIE-MX2

NEW



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

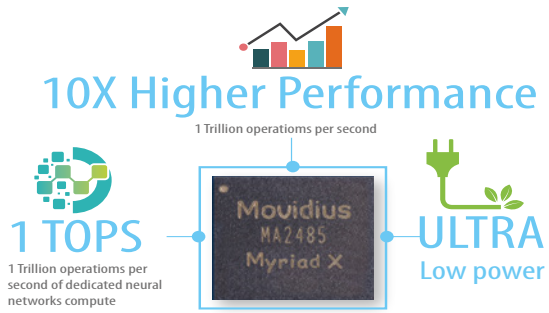
Introduction

The Mustang-MPCIE-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:

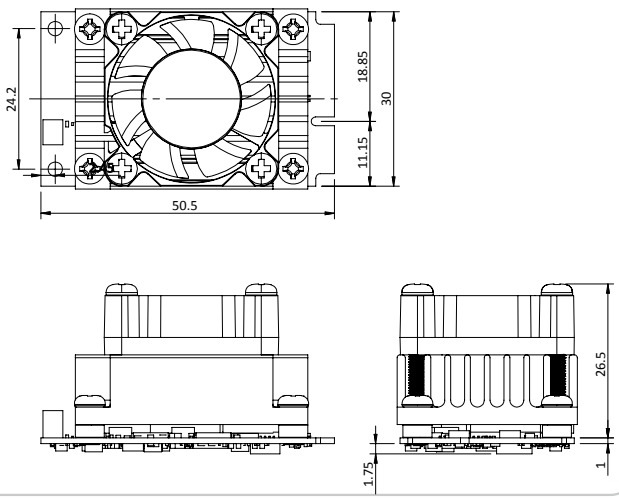
- Native FP16 support
- Rapidly port and deploy neural networks in Caffe and Tensorflow formats
- End-to-End acceleration for many common deep neural networks
- Industry-leading Inferences/S/Watt performance



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

*Specifications are subject to change without prior notice.

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