

  
**OpenVINO™**



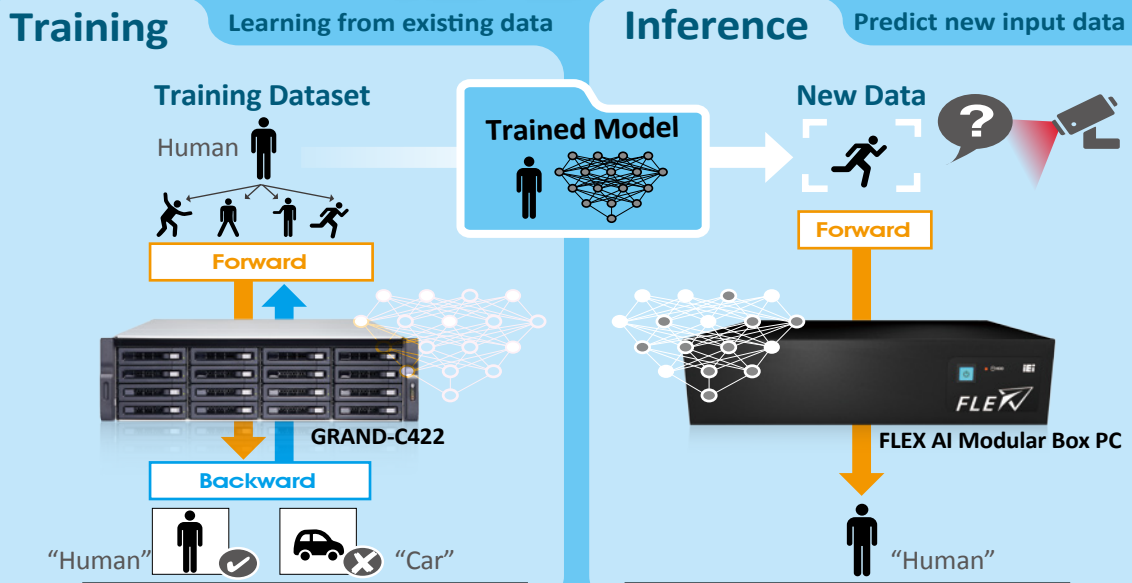
# FLEX SERIES

IEI AI Ready Modular Box PC Based on Intel® OpenVINO™ Toolkit

# ARTIFICIAL INTELLIGENCE

## MACHINE LEARNING

### DEEP LEARNING



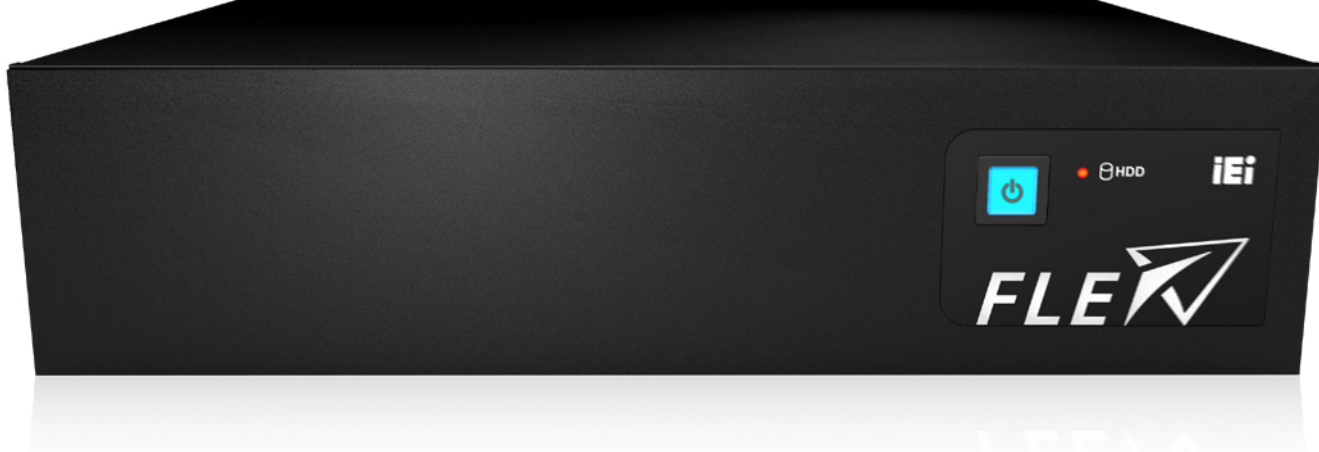
## ➡ How Does Deep Learning Work?

Deep learning is a machine learning technique that can learn useful representations of features directly from images, text and sound. There are two phases in, training and inference. The training servers which is designed for AI creates patterns and algorithms from the dataset, and each layer of data is assigned some random weights and your classifier runs a forward pass through the data, predicting the class labels and scores using those weights, after the training model is built, that will be applied into systems that are able to predict the result, this is what inference systems do.

## ➡ Achieving AI with IEI Deep Learning Solution

The most likely markets to adopt AI technologies, will be medicine, biology, media, security, defense and transportation. Each market faces a variety of challenges for example, in transportation traffic flow prediction, heavily depends on historical and real-time traffic data collected from various sensor sources, including inductive loops, radars, cameras, etc. It is difficult to find a safe and reliable hardware for the kind of harsh and strict environments.

Therefore, IEI introduces the FLEX series which is specifically designed for edge learning inference computation and features modularized, rich interconnectivity, and powerful computing capability. With desktop-class Intel® Q370 chipset and cutting edge technology, the FLEX series supports multiple PCIe 3.0 slots and four hot-swappable hard disk drive bays. By applying modularized design, the FLEX series will help to accelerate development schedules to reduce total cost of operation. In addition, various input/output interfaces are provided for customers to integrate cameras, sensors and motion control equipment to fast respond to accidental event.



## ➡ Critical Success Factors for Edge Inference Systems

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



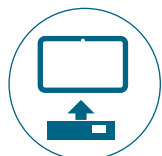
### Industrial grade

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.



### 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



### 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.



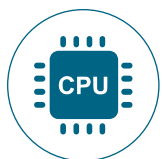
### High volume RAID 0/1/5/10 storage capacity

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.



### 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.

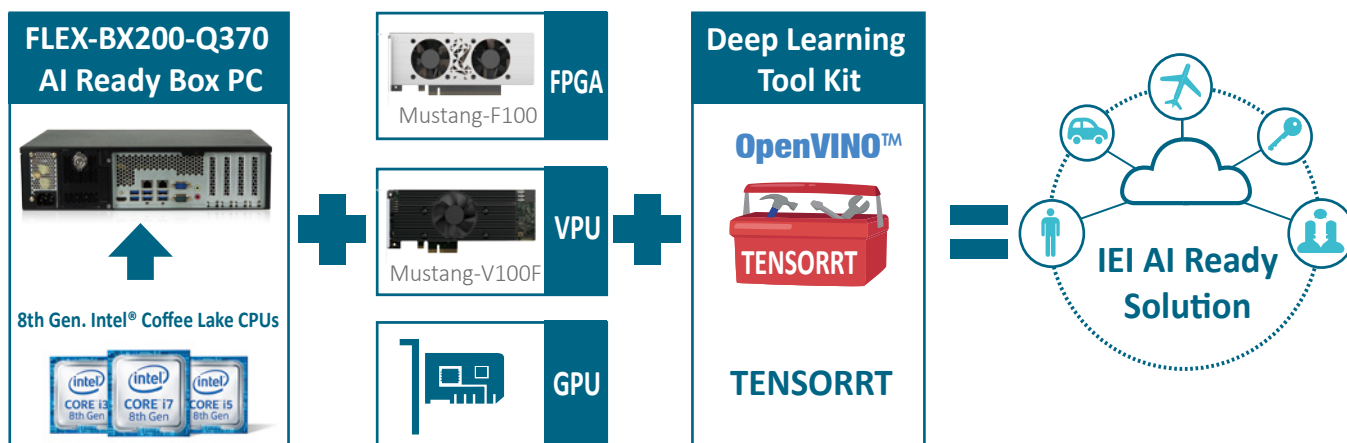


### 8th Generation Intel® Core™ Desktop Processors

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

## ➡ IEI AI Ready Solution Accelerates Your AI Initiative

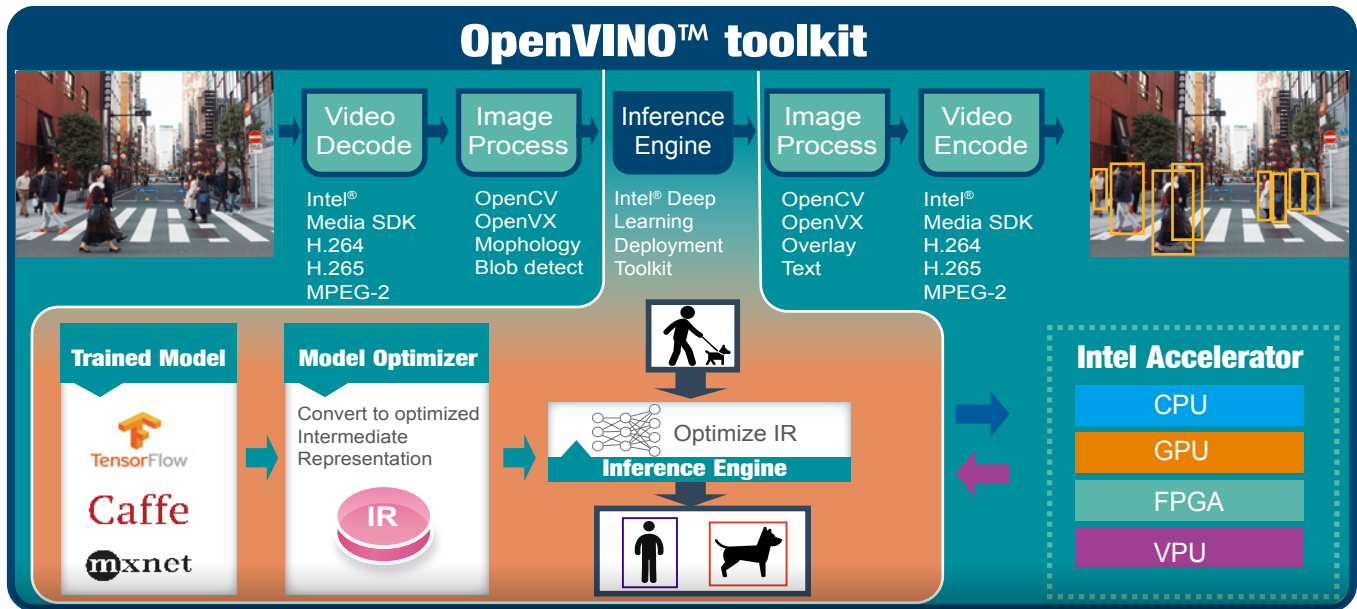
The FLEX-BX200 is an AI hardware ready system ideal for deep learning inference computing to help you get faster, deeper insights into your customers and your business. IEI's FLEX-BX200 supports graphics cards, Intel FPGA acceleration cards, and Intel VPU acceleration cards, and provides additional computational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





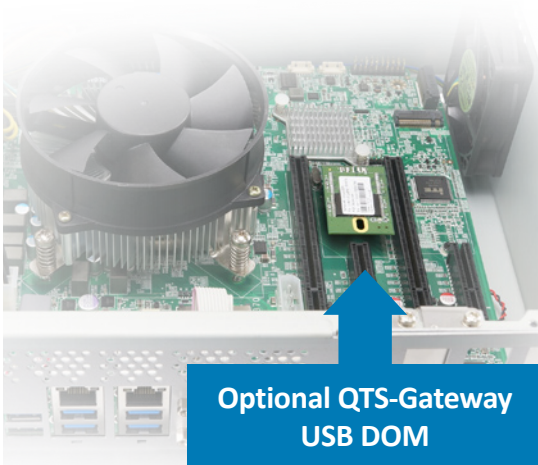
## ► OpenVINO™ Toolkit

"Open Visual Inference & Neural Network Optimization (OpenVINO™) toolkit" allows users to easily deploy open source deep learning frameworks for Intel® architecture to realize the concept of one SDK for Intel®-based accelerators: CPUs, CPUs with integrated graphics, FPGAs, VPUs, and IPUs. OpenVINO™ toolkit can optimize pre-trained deep learning model such as Caffe, MXNET, Tensorflow into IR binary file then run the inference engine in FPGA acceleration card platforms.



## ► QTS-Gateway for Cloud-based IPC Solution

QTS Gateway is an operating system designed specifically for IEI IPCs and fully integrated the QNAP NAS operating system (QTS), breaking through the stereotype of IPCs of not having operating systems and saving unnecessary costs for installing servers and computers. QTS Gateway not only allows easy monitoring of computer status through its visualized interface, it also allows the use of many free application programs, making it multifunctional while challenging the values of traditional IPCs.

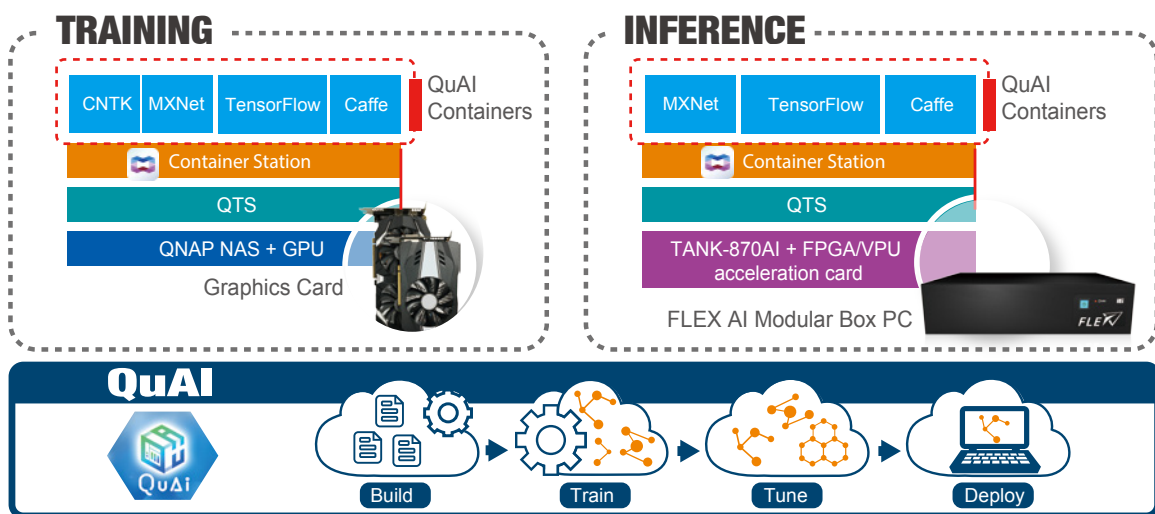


	Traditional IPC	Cloud-based FLEX System
Remote System Visualization	No	Yes
OS	No	Built-in VM virtual application
Remote Device Management	No	Free Apps: Qcenter, QRM+
Data Backup	No	Hybrid Backup Sync
myQNAPcloud Management	No	Yes, supports system update through a cloud
Video Surveillance	No	Free software: Surveillance Station
RAID Data Storage	No	RAID 0, RAID1
Support for Mobile Device	No	Free Apps Qfile, Qmanager



## ► QuAI Empowers Your AI-related Computing Needs

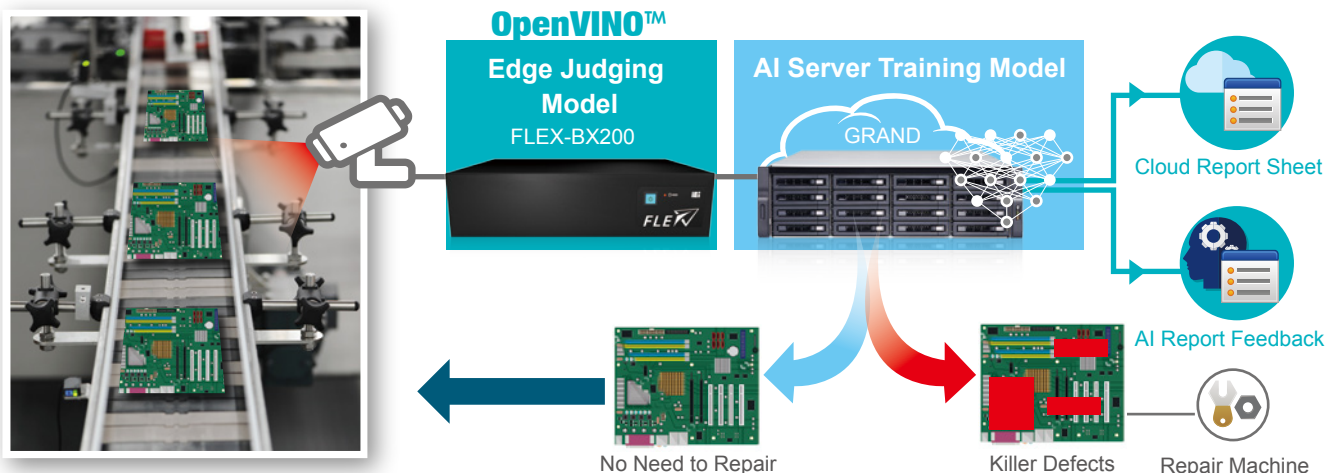
While the FLEX system is bundled with QTS Gateway system, AI developers can adopt IEI's QuAI toolkit to enable data scientists and developers to quickly build, train, optimize, and deploy machine-learning models with high-performance machine-learning algorithms that come with a wide range of supported AI frameworks. QuAI is an integrated platform to empower your AI-related computing needs. IEI's FLEX series with QTS Gateway system now supports graphics cards, Intel FPGA acceleration card, and Intel VPU acceleration card; from training to edge computing, it provides additional computational power and end-to-end solution to help run your tasks more efficiently. On top of that, software enhancements are also provided to help you deploy your solutions faster than ever. Major frameworks and libraries are supported through Container Station (1.8 and later), such as Caffe, MXNet, TensorFlow, CNTK and NVIDIA CUDA. You can easily migrate existing containerized solutions to the QuAI platform, or start a new one with QuAI, to fully realize benefits of cognitive technologies.



## ► Explore AI Solutions

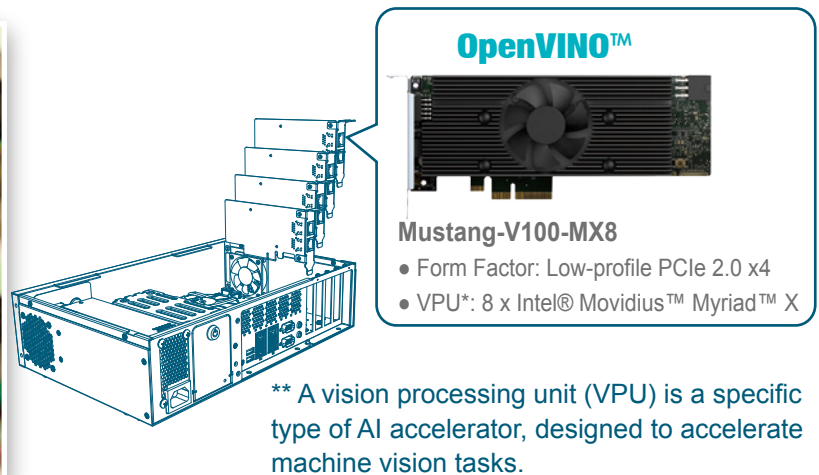
### ► AOI Defect Classification

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.



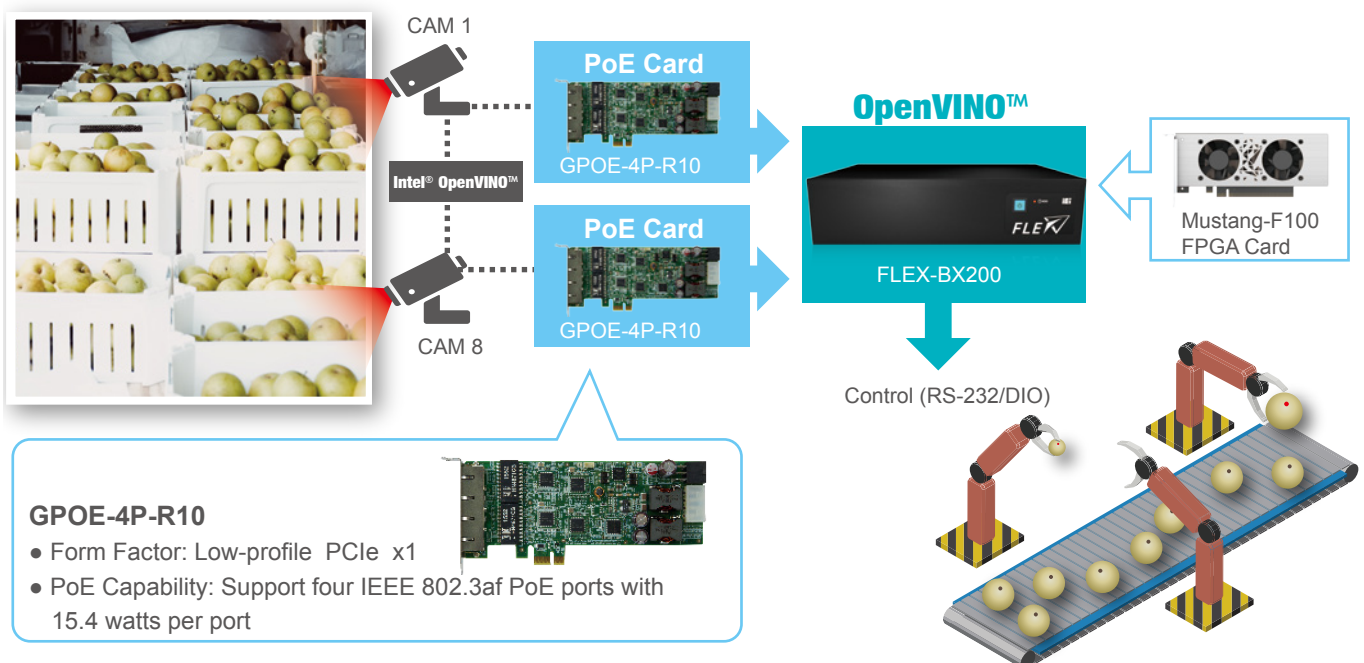
## ► Facial Recognition at Retail

Retail stores with facial recognition systems can spot convicted or admitted shoplifters in about the time. As soon as he walked in, the store's loss prevention associate approached him, addressed him by full name, and asked him to leave. Moreover, the system can send alerts when the system detects cashiers failing to scan products.



## ► Vision Sorting and Grading Agricultural Products

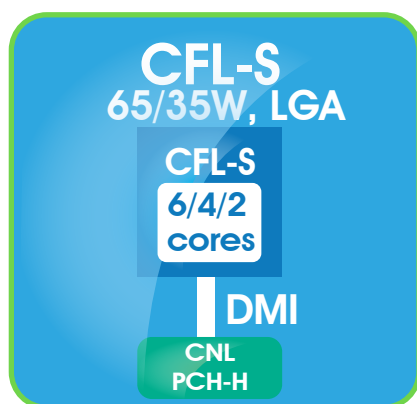
Agricultural products are valued by their appearance. The color indicates parameters like ripeness, defects, etc. The quality decisions vary among the graders and often inconsistent. Machine vision technology offers the solution for all these problems. The FLEX series designed for machine vision market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



## ➡ 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.

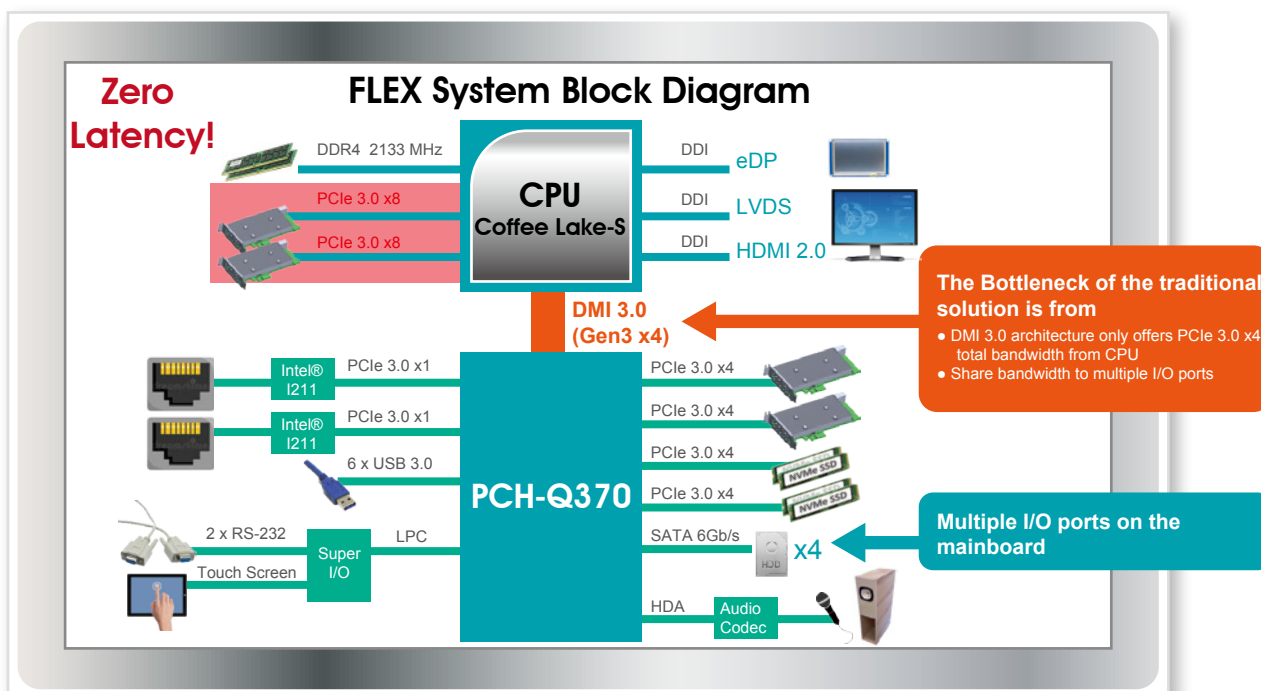
IEI FLEX series adopts the 8th Generation Intel® Core™ desktop processor, of which the Core i7 is moving to six cores with HyperThreading, Core i5 is moving to six cores, and Core i3 is moving to four core. The equipped LGA 1151 socket supports a wide range of performance options up to 65W TDP processors. 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.







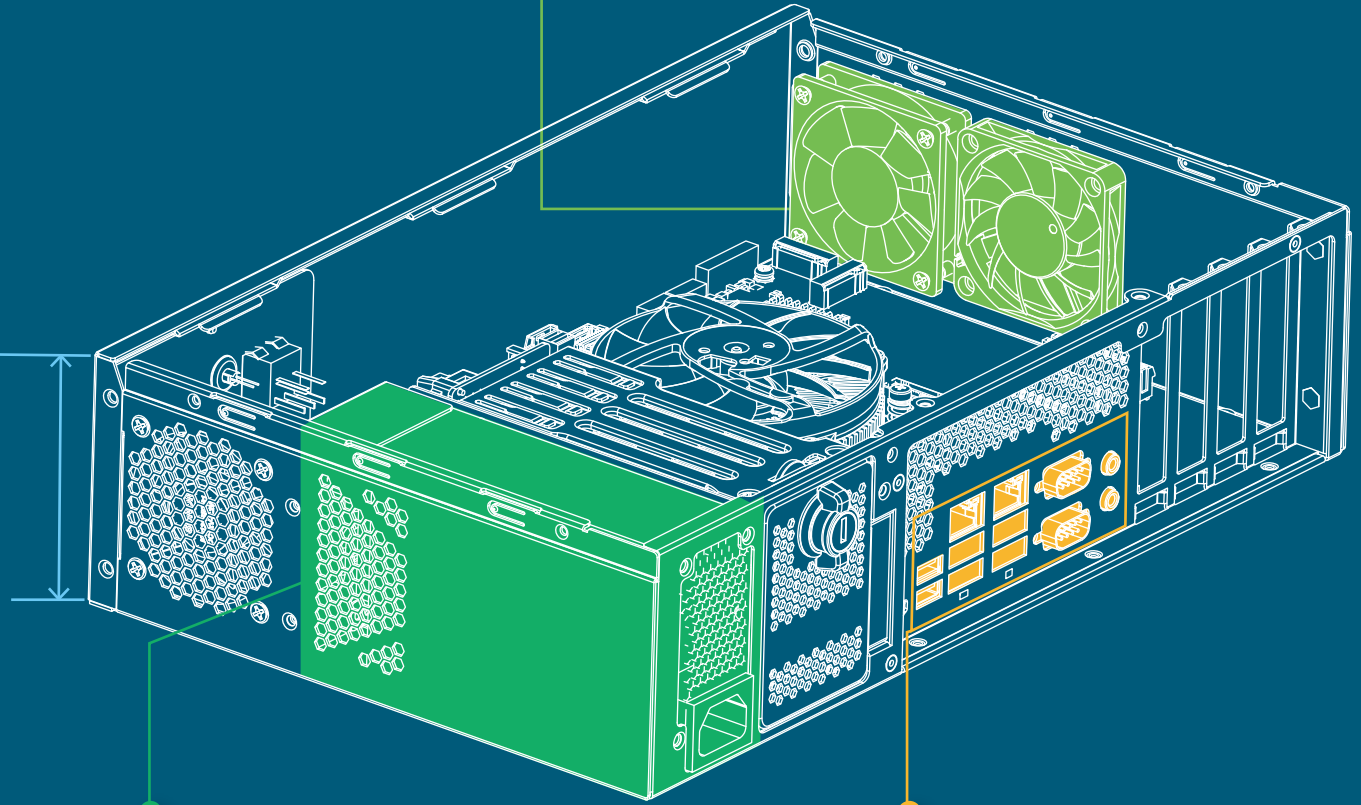
# FLEX-BX200 Hardware Features

## Compact 2U System

- Compatible to standard server rack cabinet
- Optional rack mount and wall mount kit

## Smart Fan for Quiet Operation

CPU and system fan can be configured separately, which allows the FLEX to be quieter during operation while extending the fan's lifespan, and enhances system stability and durability.



## 250W ATX Power Supply

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

## Rich I/O Interface

- HDMI output
- 6 USB 3.0 ports
- 2 GbE LAN ports
- 2 RS-232 COM ports
- Microphone in and Line-out ports
- AT/ATX switch
- Reset button

## Power Button with Power LED

- ATX power button with 200,000 times life cycle
- The power LED flashes blue whenever the system is on



## HDD Status LED

The HDD LED indicates the state of the physical disk. The activity LED flashes in red whenever the drive is accessed and written

## Up to 64GB DDR4 2133MHz Memory

DDR4 offers greater range of clock speeds, timing, low power consumption and reduced latency to optimize system performance.

## 8th Generation Intel® Core™ Desktop Processors

With architecture optimizing, 8th Generation Intel® Core™ Processors are with intensely powerful 6-core and 12-thread in high end models. The CPU cache size is also increased. It improves performance by 15% compared to the previous generation.

## Dual M.2 PCIe NVMe SSD slots

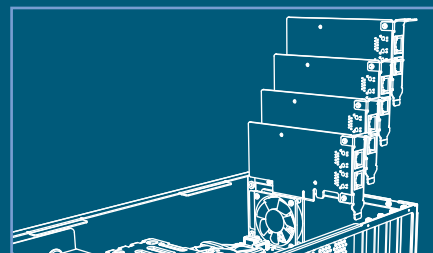
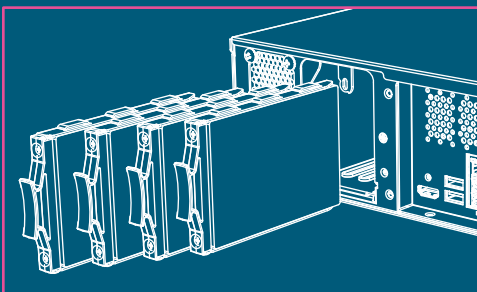
- M.2 2280 form factor
- High speed PCIe 3.0 by 4 signal

## Four Hot-swappable HDD Bays

- With security key lock
- Support RAID 0/1/5/10
- LEDs for drive activity

## Four PCIe 3.0 Low Profile Expansion Slots

- Two PCIe by 4 and two PCIe by 8 with vertical heat dissipation, and the two PCIe by 8 provide zero latency
- Support AI accelerator cards, such as FPGA card, vision process card (VPU), etc.



## ➡ 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 3.1 cards, even the high end graphics cards and PCIe NVMe SSDs.

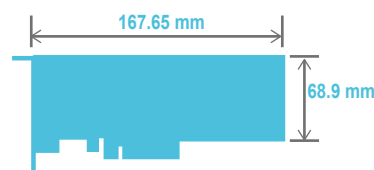


Interface	Theory Bandwidth
PCIe 2.0 x1	5Gt/s
PCIe 3.0 x1	8Gt/s

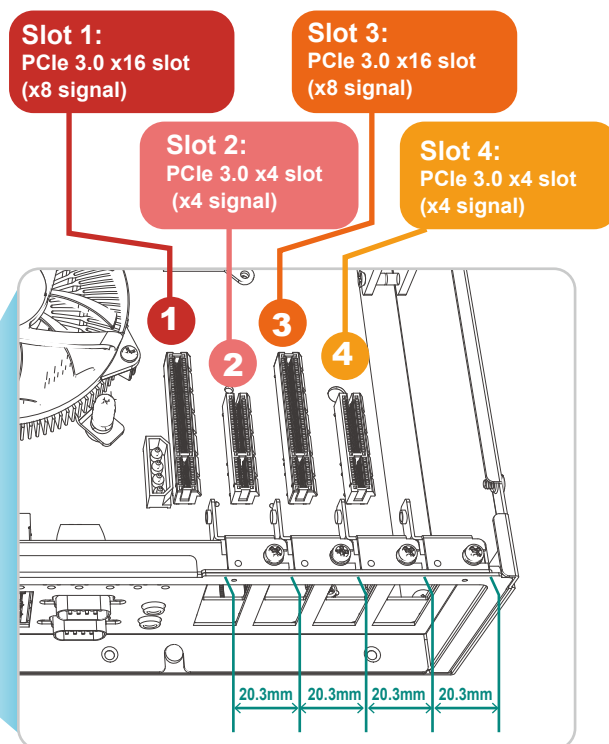
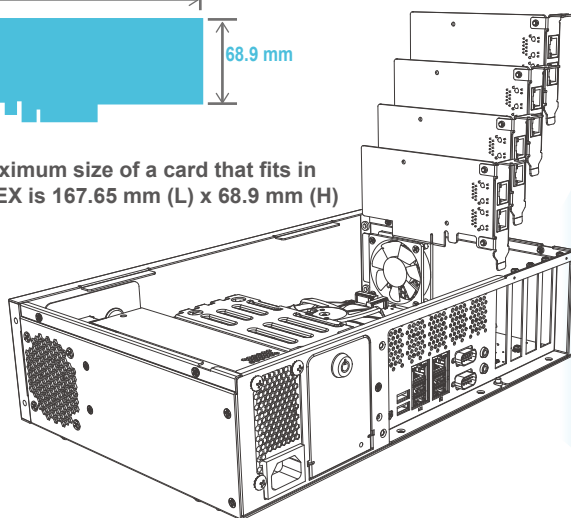
## ➡ Four PCIe x4/x8 Low Profile Expansion Slots

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)



### Supported Cards:

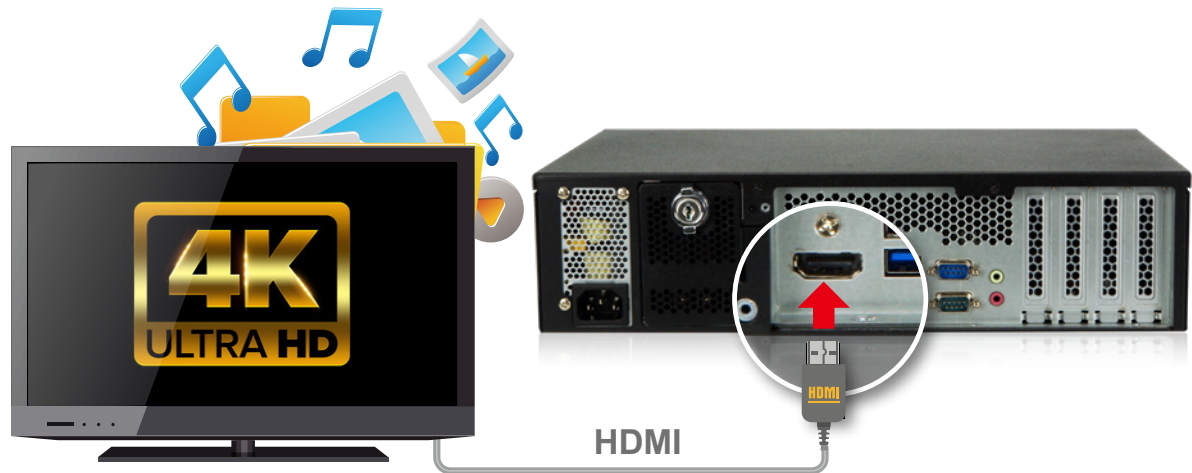


P/N	QNAP QM2-2P-384	QNAP LAN-10G2SF-MLX	IEI GPOE-4P-R10 IEI GPOE-2P-R10	IEI Mustang-V100-MX8	GP GPU	GT1030/GT1050
Description	Dual M.2 PCIe SSD expansion card	Dual-port 10GbE SFP+ network expansion card	4-port/2-port PoE Card	VPU card	Inferencing accelerator card	GPU card
Form Factor/Interface	Low-Profile PCIe 3.0 x8	Low-Profile PCIe 3.0 x8	Low-Profile PCIe x1	Low-Profile PCIe 2.0 x4	Low-Profile PCIe 3.0 x16	Low-Profile PCIe 3.0 x4



## ➡ HDMI 1.4 Output Delivers 4K High Definition Video and Audio

The FLEX-BX200 integrated with Intel® Coffee Lake Desktop processor supports HDMI 1.4 output port delivering 4K 24 Hz with amazing details. And a single HDMI cable carries both video and audio signals, which makes hookup particularly easy.



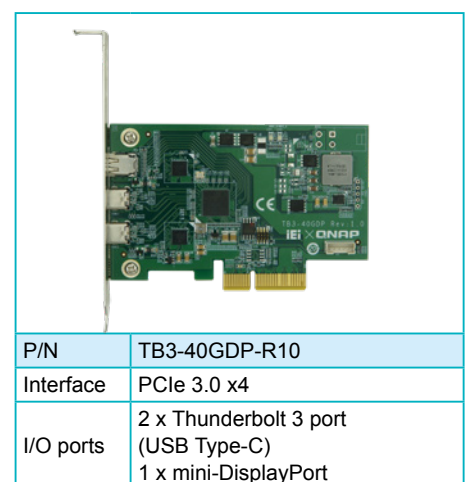
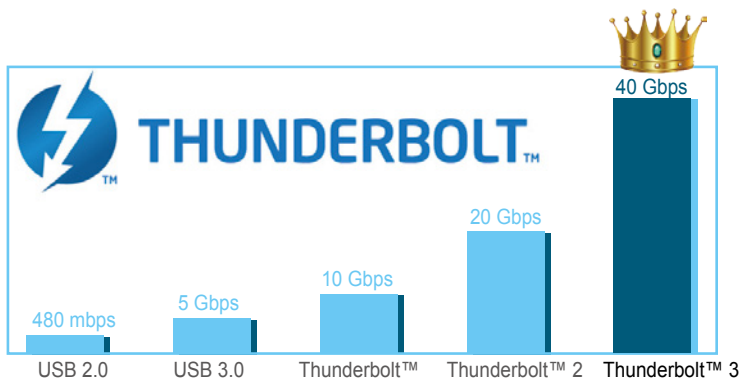
HDMI Version	1.4
Date initially released	6/5/09
Maximum Bandwidth (Gbps)	10.2
Maximum Resolution	4096 x 2160p24
Maximum LPCM Audio Channels	8 Channels
Maximum Audio Sampling Rate	768kHz

## ➡ 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.

### ► How fast is it?

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



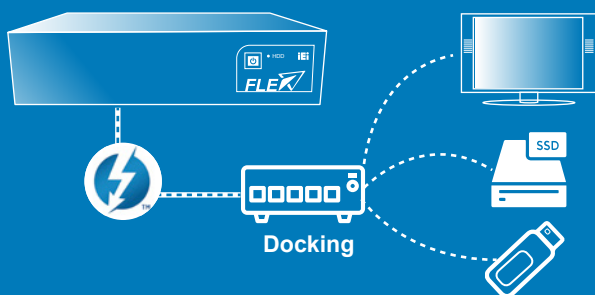
Only supported by the  
pcieX4\_1 slot in the system





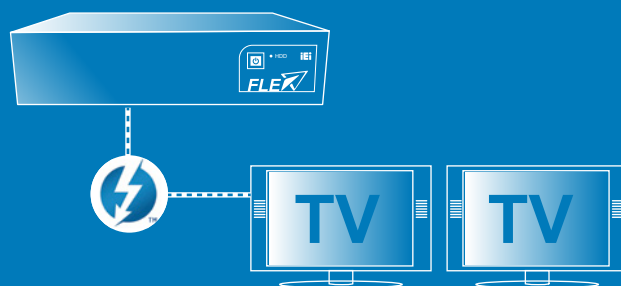
# What Can thunderbolt™ 3 do?

## Single-cable Docking



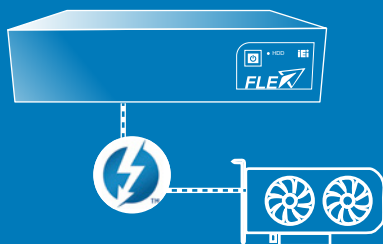
Now, one compact port provides Thunderbolt™ 3 data transfer, support for more peripherals connection, such as 4K monitor, SSD, pen drive, and so on.

## Full 4K Video



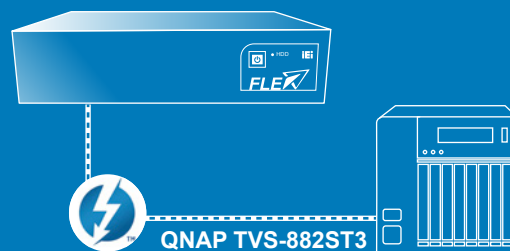
Connect multiple displays with astonishing resolution, contrast, and color depth to see surveillance photos, videos, AI applications with details.

## External Graphics



AI developers can now connect plug and play external graphics to the FLEX to deal with abundant of AI videos and graphics

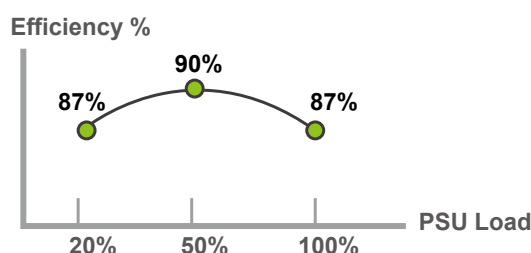
## 10GbE Networking



Designed to meet AI needs of video and graphics editing, Iei Thunderbolt™ 3 FLEX Box PC makes collaboration with QNAP Thunderbolt™ 3 NAS faster and simpler, greatly increasing productivity. It also features ultra-high transfer speed to tackle AI's challenges in fast-paced multi-workstation environments.

## ➡ Built-in 250W/350W 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)

Interface	Transfer Rate
M.2 SATA 6Gb/s	Mainstream 6Gb/s
M.2 PCIe 2.0 x2	10Gb/s
M.2 PCIe 3.0 x2	16Gb/s
M.2 PCIe 2.0 x4	20Gb/s
M.2 PCIe 3.0 x4	Mainstream  32Gb/s

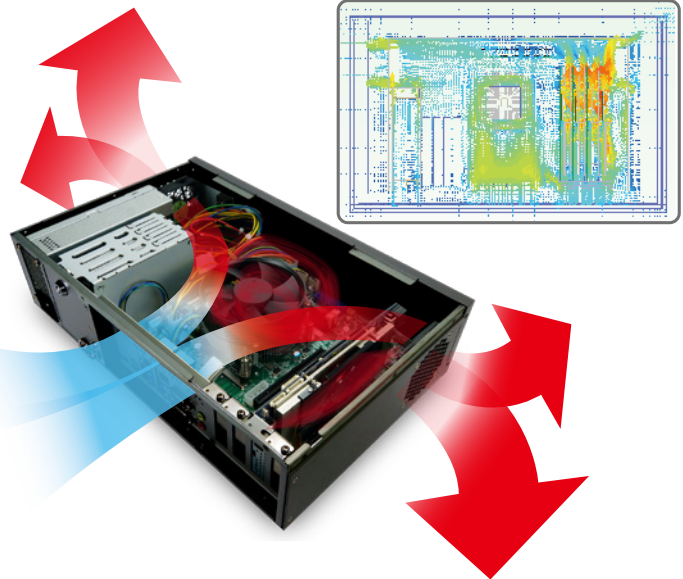




## ➡ -20°C to 50°C Wide Operating Temperature & Effective Thermal Design

AI system with heavy workload produces higher heat and noise. The main heat source usually comes from CPU, PSU and add-on cards. The FLEX series with unique ventilation thermal design allows system operating temperatures to go as low as -20°C and up to 50°C. Traditional IPC has insufficient air flow due to turbulence caused by multiple fans (system fan/ CPU fan/ PSU fan) and cables. IEI modular system, the FLEX series, is designed with system thermal concept to sustain low internal chassis temperature for CPU, PSU, and add-on cards for better system reliability.

### System Thermal Distribution Simulation

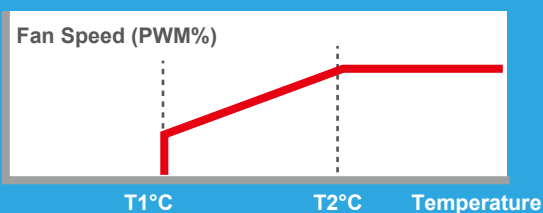


## ➡ Smart Fan Operation

Users can define CPU fan and system fan speed and temperature profile in the BIOS menu. When the system is in idle or running less demanding tasks, smart fan is able to bring down the level of noise produced by rotating fans. The adjustable settings allow the FLEX to be quieter during operation while extending the fan's lifespan, enhancing system stability and durability.

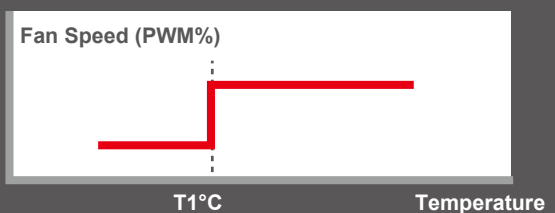
### FLEX Series:

With fan speed and temperature trigger settings set, the fan speed can change seamlessly according to temperature readings.



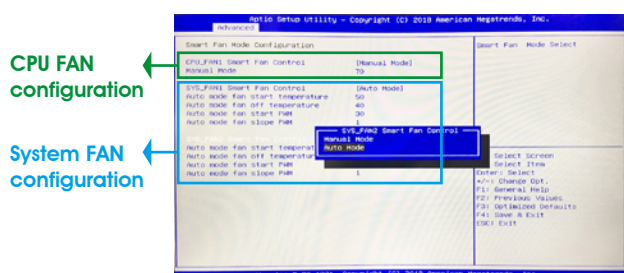
### Traditional System:

Traditional system fan operation is detected by system's ON (fan at full speed) and OFF statuses.



### BIOS Menu for Smart Fan Configuration

Enter "smart fan mode configuration" in the H/W monitor menu, and you can configure the parameters



CPU Fan



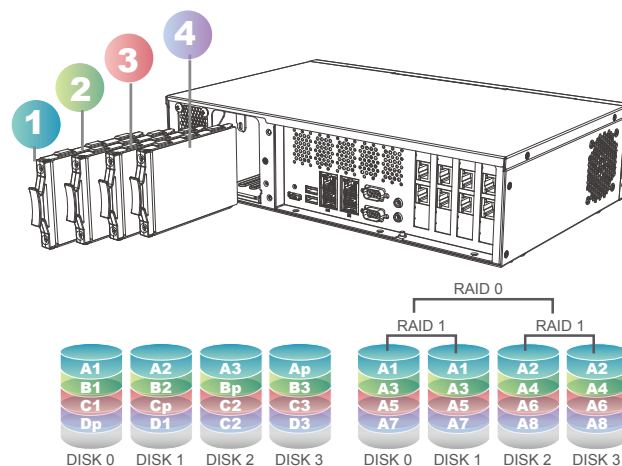
System Fan

## ➡ 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.

### ► What type of RAID do I need?

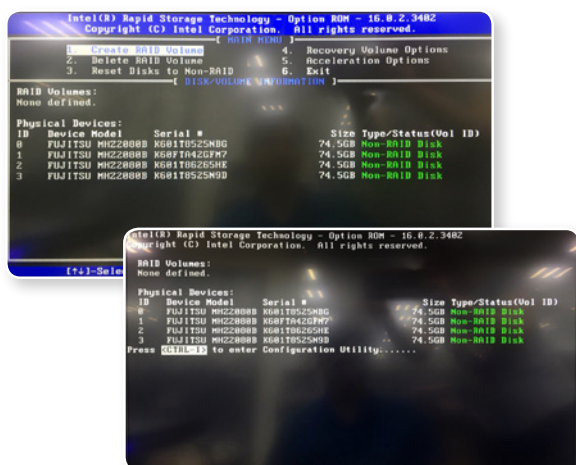
- RAID 0 (Striping) -The highest performing level
- RAID 1 (Mirroring) -Data safety
- RAID 5 (Distributed Parity)-offers both data safety and performance
- RAID 10 (combining mirroring and striping) data safety and big data volume



Features	RAID 0	RAID 1	RAID 5	RAID 10
Minimum # Drives	2	2	3	4
Data Protection	No	Single-drive failure	Single-drive failure	Up to one disk failure in each sub-array
Capacity Utilization	100%	50%	67%-94%	50%
Typical Application	High end workstations, data logging, real-time rendering, very transitory data	Operating system, Transaction database	Data warehousing, web serving, archiving	Fast databases, applictaion servers

## ➡ How to configure RAID on your System?

You will need to have two hard drive or more of equal size and capacity. And you will need to decide if you want to use RAID0, RAID1, RAID 5 or RAID 10 first.



### BIOS Configuration:

1. On Start Up you must press the Ctrl+I keys to enter the Intel RAID Option.
2. Select Create RAID Volume and press ENTER.
3. Enter a RAID volume name or accept the default and press ENTER.
4. For RAID0 select RAID0 (Stripe) and press ENTER or for RAID1 select RAID1 (Mirror) and press ENTER.
5. Select the two drives that will constitute the RAID configuration and press ENTER.
  - For RAID0 change the stripe size and press ENTER
  - For RAID1 skip this step.
6. Select the desired capacity for the volume and press ENTER.
7. Normally you would go with the default size as its maximum available size.
8. Press ENTER to create the volume.
9. Press the Y key to confirm creating the RAID volume.
10. Check that the correct volume configuration is displayed on the main Intel RAID Option ROM utility screen.
11. Select Exit and press ENTER.
12. Install the operating system.

## ➡ Secured and Strong HDD Bays



### STEP 1

Unlock the HDD cover with the secured key



### STEP 2

Open the HDD cover and you will see four drive trays



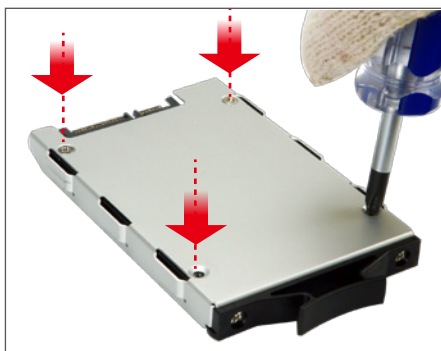
### STEP 3

Pull out one of the drive tray



### STEP 4

Mount the 2.5" SATA HDD /SSD on to the mounting bracket with 4 screws on the bottom of the drive enclosure



### STEP 5

Slide the hard drive together with the bracket till the drive is fully inserted into the SATA connector

The four HDDs strongly secured by printed circuit board internally and the FLEX passed military vibration standard, MIL-STD-810G, and can prevent from data loss and HDD crash during operation.



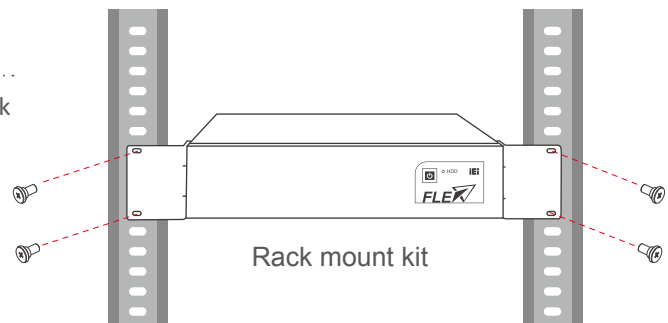
	Operating Random Vibration Mode (MIL-STD-810G)	Non Operating Sine Mode IEC-60068-2-0
514.5C-1	Axis: 3 axes / Vertical / Transverse / Longitudinal. 10-500 Hz, 60min/axis. Equivalent to Z:1.04 Grms X:0.204 Grms Y:0.74 Grms	Axis: 3 axes / Vertical / Transverse / Longitudinal. 0.003in. p-p, 10-55Hz, 0.003in 9.8m/s <sup>2</sup> 1g peak, 55-500Hz Swept Sine, 3 Swept per axis. 60 min/axis



## Flexible Deployment

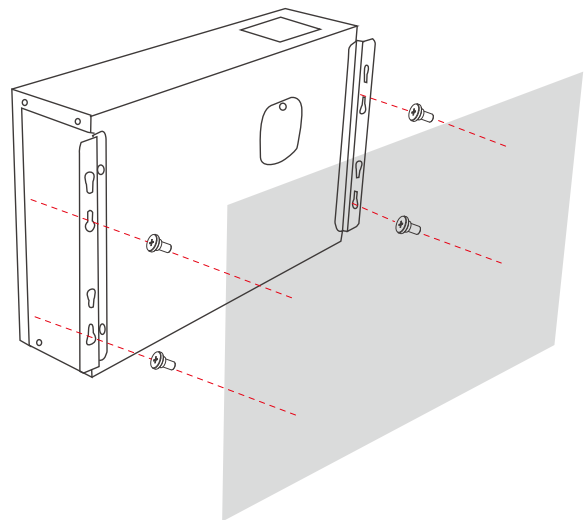
### ► Rack Mount

The FLEX-BX200-Q370 is designed in 2U height for easy and quick installation in control cabinets.



### ► Wall Mount

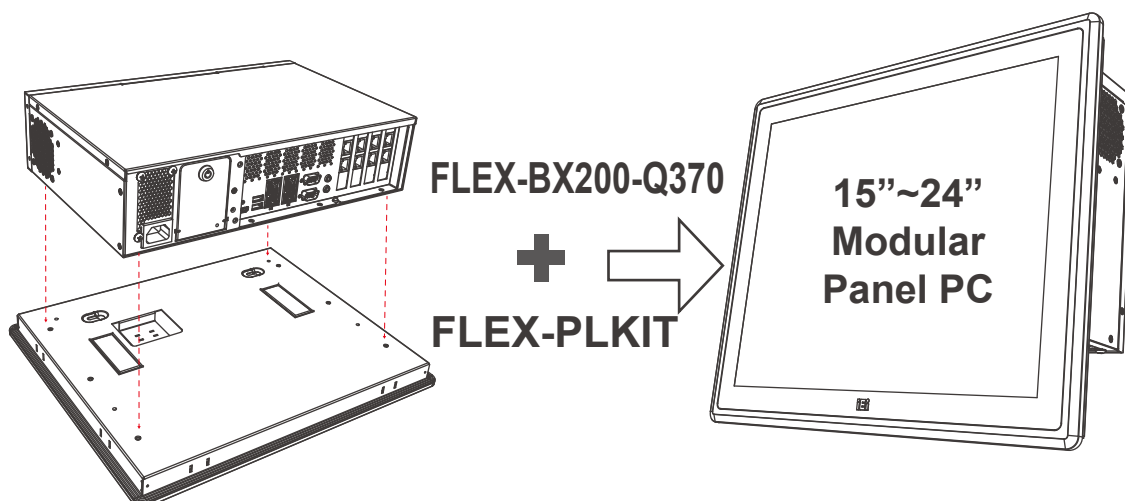
The FLEX-200-Q370 wall-mountable industrial box PC provides two-way direction for wall mounting, allowing users to orient the I/O panel upwards or downwards.



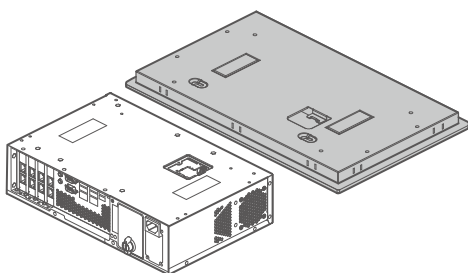
### ► All-in-One Panel PC

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

- More than 7 SKUs provided
- Various monitor choices: 15"/15.6"/17"/18.5"/22"/24"
- PCAP touch screen
- 250W or 350W AC power supply
- Easy assembly and maintenance
- One stop shopping and build your own system to accelerates time to market

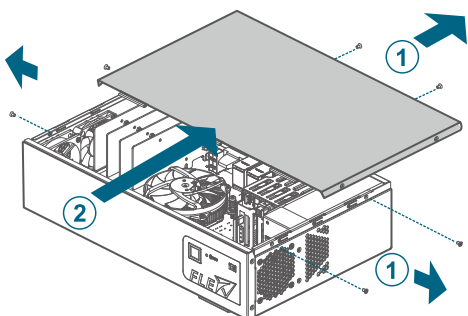


## ➡ Convert to an All-in-One Panel PC



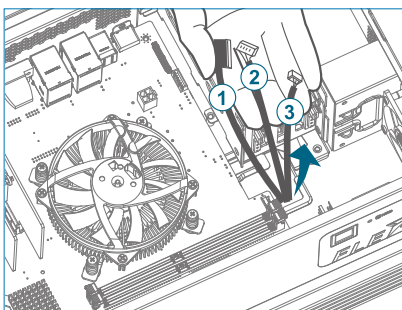
### ► STEP 1

Face the monitor panel down and place it onto a flat surface. Place the box PC on the side with the bottom panel facing up.



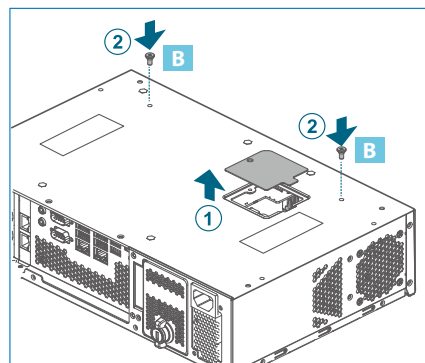
### ► STEP 3

- ① Turn the box PC over. Remove the six top cover retention screws.
- ② Slide the top cover towards the I/O panel, and then lift the top cover off the box PC.



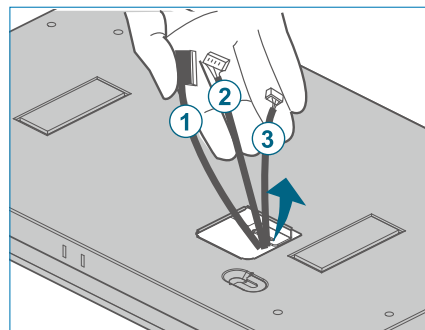
### ► STEP 5

Carefully feed the three cables into the box PC through the wiring connection hole on the bottom panel.



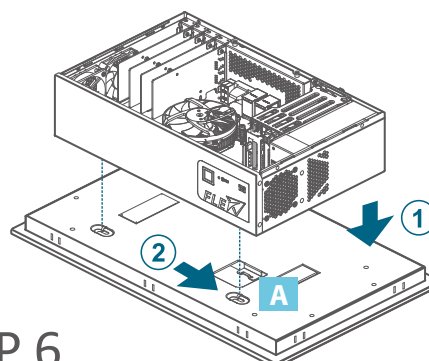
### ► STEP 2

- ① Loosen the cover retention screw located in the bottom panel of the box PC, and remove the cover to expose the wiring connection hole.
- ② Fasten two positioning screws onto the box PC as shown in the figure.



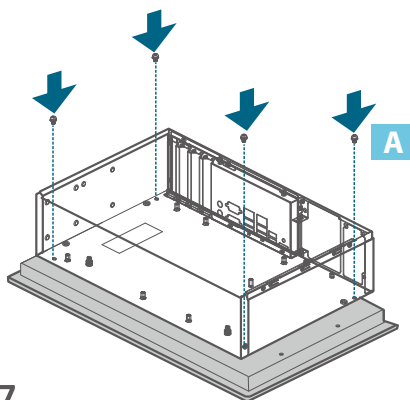
### ► STEP 4

Gently pull out the three cables from the rear of the panel kit



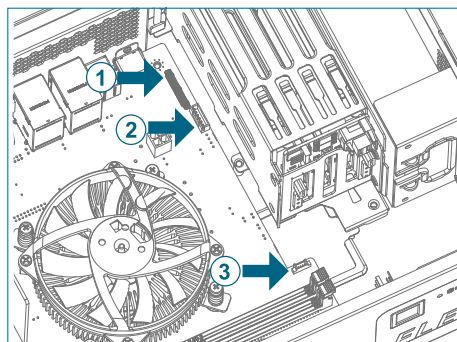
### ► STEP 6

Align the two positioning screws (M4\*6) fastened on the bottom panel of the box PC with the slotted holes located in the rear panel of the panel kit. Gently place the box PC onto the panel kit, while ensure the screws are inserted into the slotted holes. Push the box PC towards left to lock it into position.



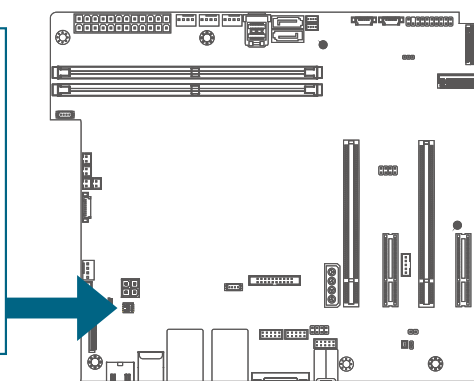
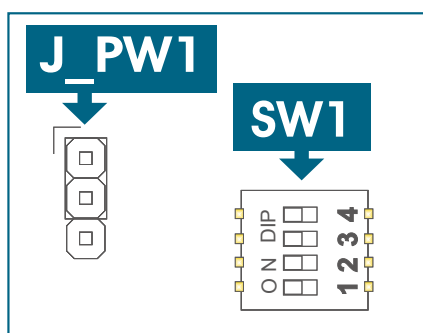
## ► STEP 7

Use four retention screws (M4\*7) to secure the box PC with the panel kit.















## ► STEP 8

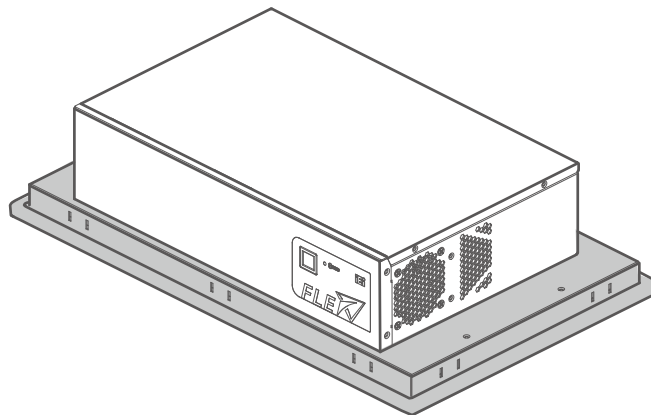
Connect the cables to the corresponding connectors (LVDS, inverter and touch) on the motherboard.



## ► STEP 9

Congure jumper and switch in box PC Locate the panel resolution switch (SW1) and the panel voltage jumper (J\_PW1) on the bottom left corner of the motherboard. Congure the switch and the jumper for the installed panel kit according to the description listed in the following table.

	Panel Resolution (SW1)	Panel Voltage (J_PW1)
<b>FLEX-PLKIT-F15</b>	ON-OFF-ON-ON 	Short 1-2 (+3.3V, default) 
<b>FLEX-PLKIT-FW15</b>	ON-ON-ON-OFF 	Short 2-3 (+5V) 
<b>FLEX-PLKIT-F17</b>	ON-OFF-OFF-ON 	Short 2-3 (+5V) 
<b>FLEX-PLKIT-FW19</b>	ON-ON-ON-OFF 	Short 2-3 (+5V) 
<b>FLEX-PLKIT-FW22</b>	ON-OFF-OFF-OFF 	Short 2-3 (+5V) 
<b>FLEX-PLKIT-FW24</b>	ON-OFF-OFF-OFF 	Short 2-3 (+5V) 



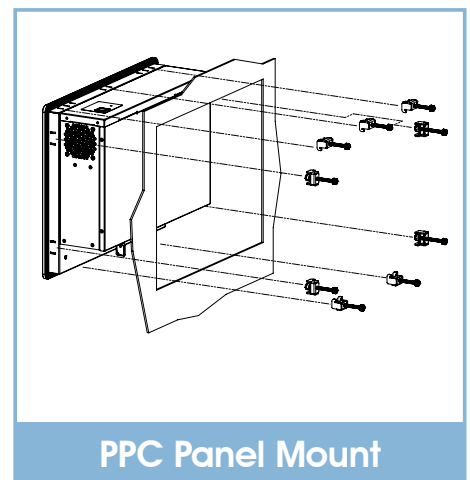
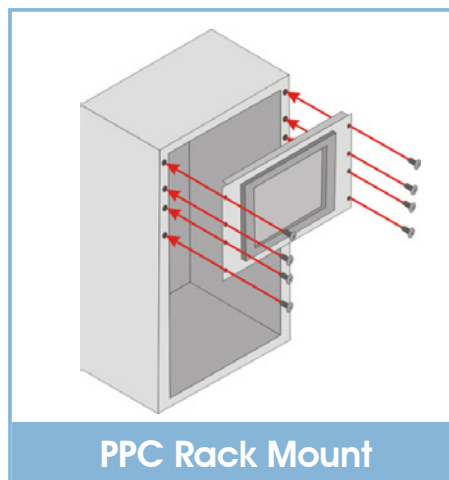
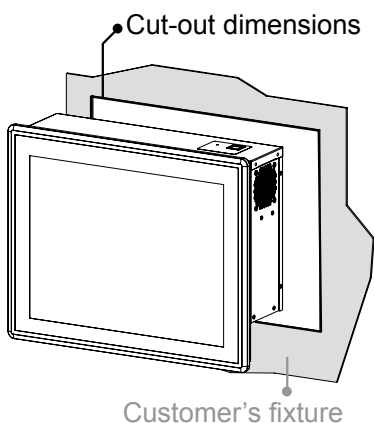
## ► STEP 10

Re-install the top cover of the box PC with the six retention screws previously removed.

## ➡ Backward-Compatibility Mechanism with PPC-F series

The cutout size of FLEX Panel PC series is backward compatible with PPC-F series while panel mounting. There is no need to build a new fixture to integrate the FLEX series and easy to upgrade the performance from 4th Gen Intel® Core™ to 8th Gen Intel® Core™ with existing fixture.

Panel mounting is the mounting way that mounts product into an opening of a customer's fixture from the front and secured from the rear. All user controls are located on the rear of the mechanism, making the panel mount displays a good choice for applications requiring a display with no external or exposed controls such as CNC equipment, gaming, casino system, ATM, and kiosk.





# FLEX-BX200

2U AI Modular PC with 8th Generation LGA1151  
Core™ i7/i5/i3 and Pentium® Processor



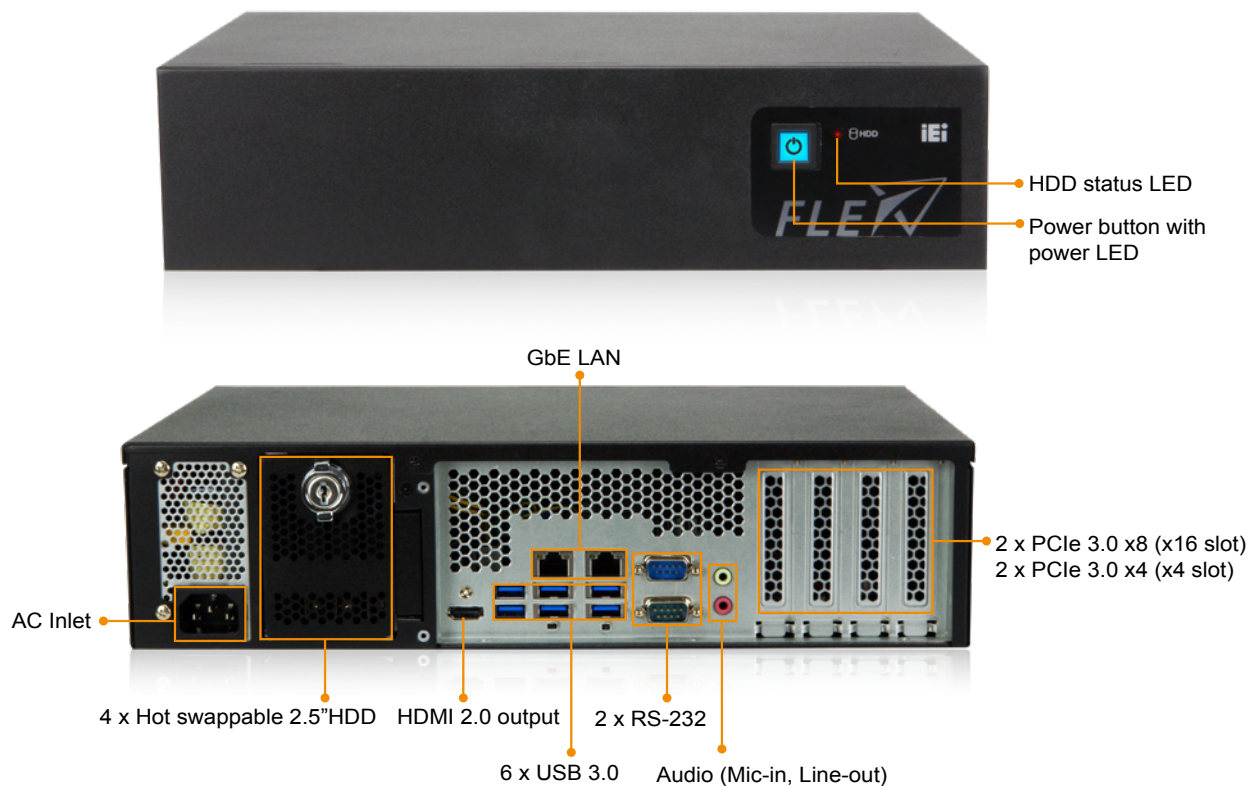
## Features

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

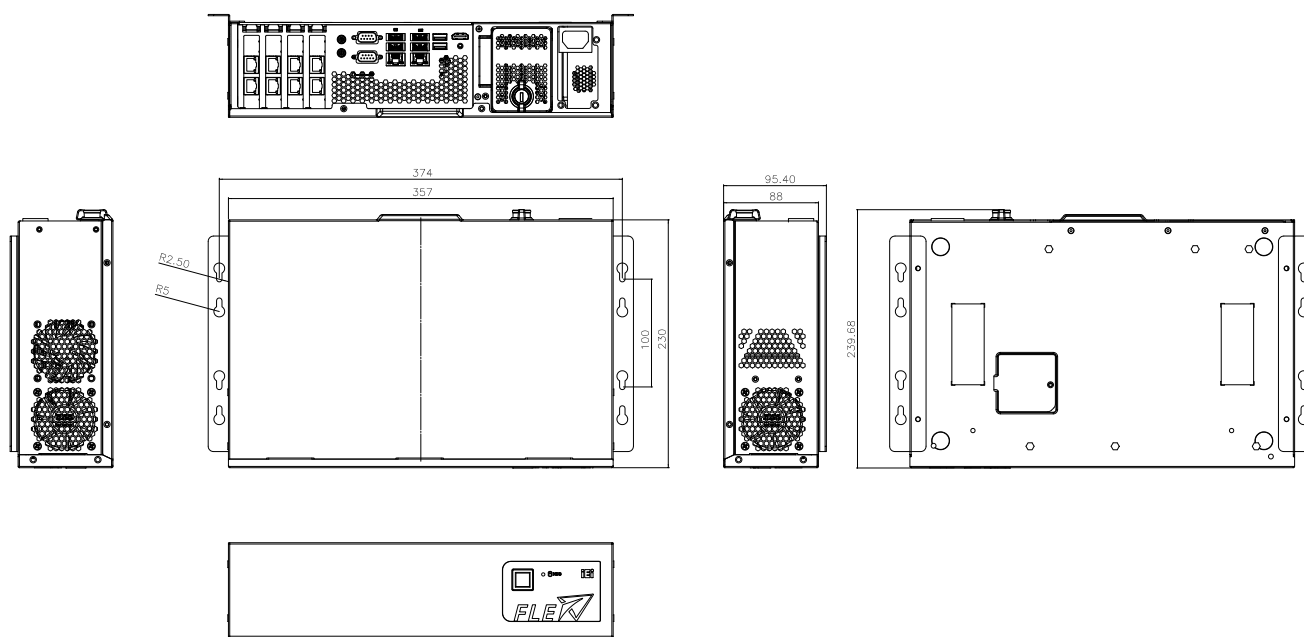
## Specifications

Model		FLEX-BX200-Q370
System	CPU	8th Generation Intel® Core™ i7/i5/i3 and Pentium® processor in the LGA 1151 package
	Chipset	Intel® Q370 Chipset
	Memory	2 x 288-pin 2666/2400 MHz dual-channel DDR4 unbuffered DIMM slot supporting up to 64GB
	Graphics Engine	Intel® HD Graphics Gen 9 Engines with 16 low-power execution units, supports DX2015, OpenGL 5.X and OpenCL 2 x, ES 2.0
	Ethernet	Intel® I211 controller
Storage		4 x Accessible 2.5" SATA 6Gb/s HDD/SSD bay (RAID 0/1/5/10 support) with LED indicator 2 x M.2 2280 PCIe Gen 3.0 x4 NVMe™ SSD socket
I/O Ports and Switches		<div> 1 x HDMI output 2 x GbE LAN 6 x USB 3.0 Type-A 2 x RS-232 DB-9 type 1 x Mic in </div> <div> 1 x Line out 1 x AC power in Inlet Power button with power LED (power on=Blue) AT/ATX mode switch Reset button </div>
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		Smart Fan
Power Supply		<b>AC input ATX power supply</b> <b>1. 250W power supply</b> - Input: 115VAC~230VAC, 50/60Hz - Output (max.): 3.3V@12A, 5V@14A, 12V@25A, -12V@0.3A,+5Vsb@3A <b>2. 350W power supply (Build to Order)</b> - 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%
Watchdog Timer		Software Programmable support 1~255 sec. system reset
Construction	Chassis Construction	Metal Housing
	Mounting	Wall and Rack Mount
	Color	Black C
	Dimensions (LxDxH) (mm)	357 x 230 x 88
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)
	Storage Temperature	-30°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)
Certificate		CE/FCC/CCC
Other		Support FLEX-PLKT-Fxx C series

## I/O Interface



## Dimensions (Unit: mm)



## Ordering Information

Part No.	Description
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
DDR4-LO-4GB	4GB DDR4 (288-pin)
DDR4-LO-8GB	8GB DDR4 (288-pin)
HDD-25-1TB	1TB 2.5" HDD

\*Build to order

## Options

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

## Packing List

Item	Q'ty	Description
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

## 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/m <sup>2</sup> )	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/m <sup>2</sup> 1024 x 768 FLEX modular resistive touch window/LCD kit, R10
FLEX-PLKIT-F17/PC-R10	17" 350cd/m <sup>2</sup> 1280 x 1024 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW15/PC-R10	15.6" 400cd/m <sup>2</sup> 1366 x 768 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW19/PC-R10	18.5" 400cd/m <sup>2</sup> 1366 x 768 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW22/PC-R10	21.5" 250cd/m <sup>2</sup> 1920 x 1080 FLEX modular PCAP touch window/LCD kit, R10
FLEX-PLKIT-FW24/PC-R10	23.8" 250cd/m <sup>2</sup> 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.



FLEX-BX200 Series



PPC-FxxC Series

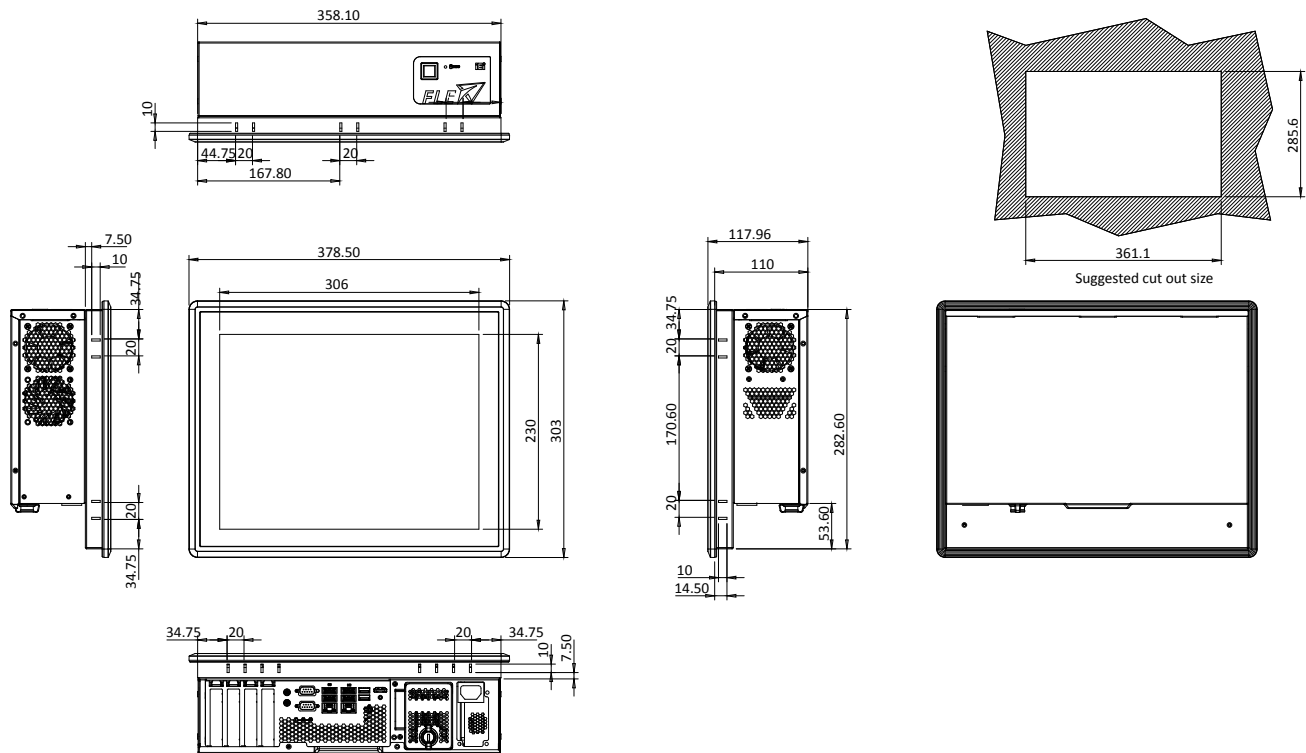
FLEX-PLKIT Series



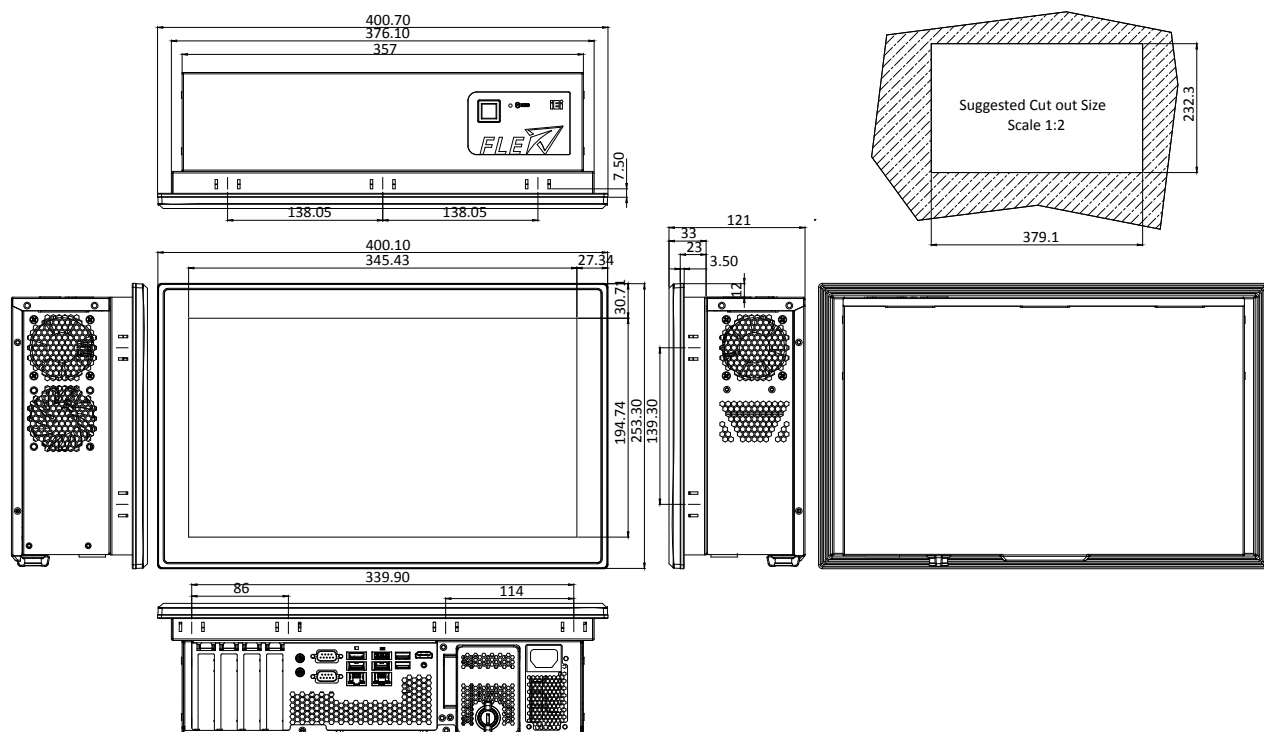


## Dimensions (Unit: mm)

### PPC-F15C-Q370 Dimensions (Unit: mm)

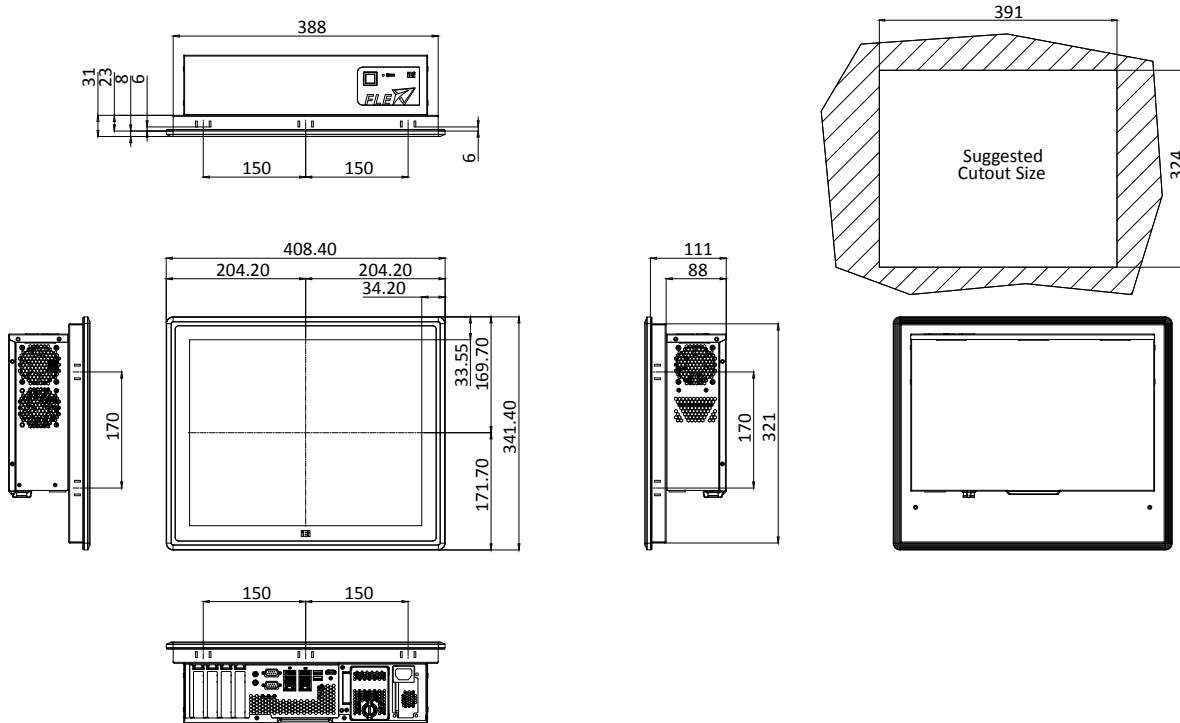


### PPC-FW15C-Q370 Dimensions (Unit: mm)

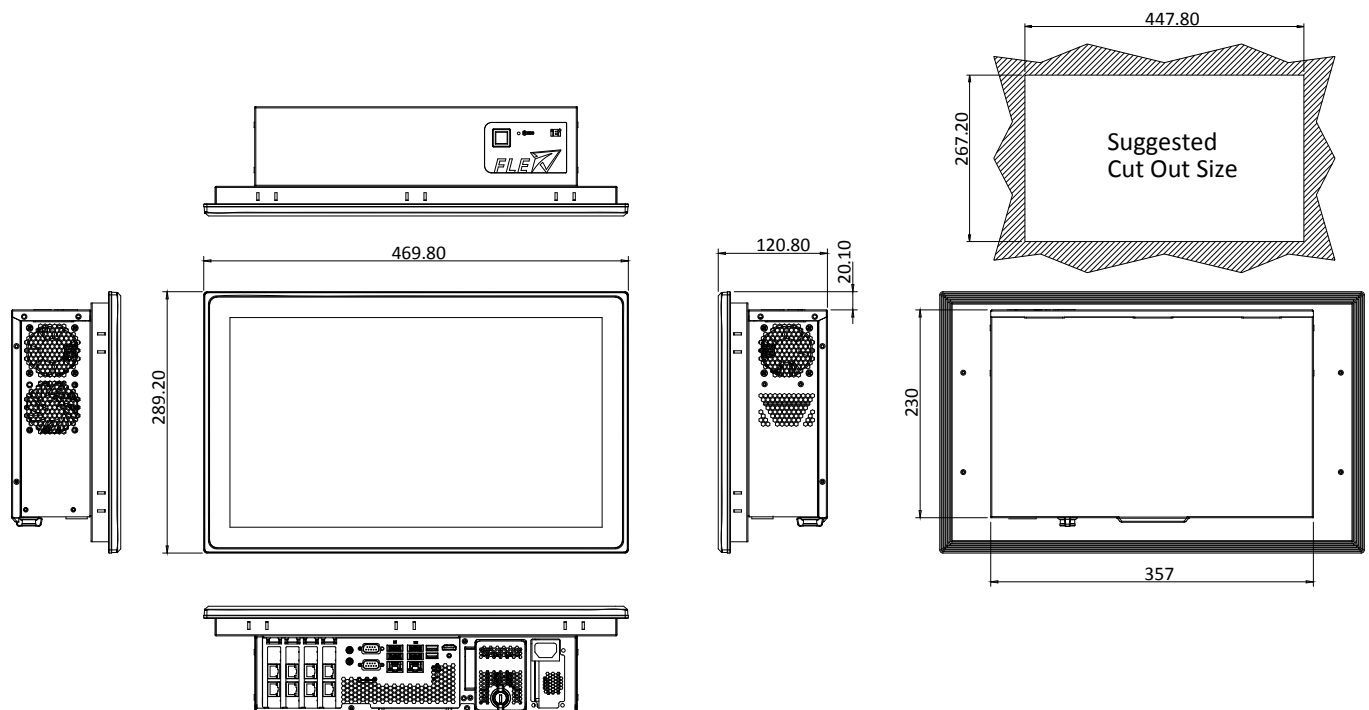


## Dimensions (Unit: mm)

### PPC-F17C-Q370 Dimensions (Unit: mm)

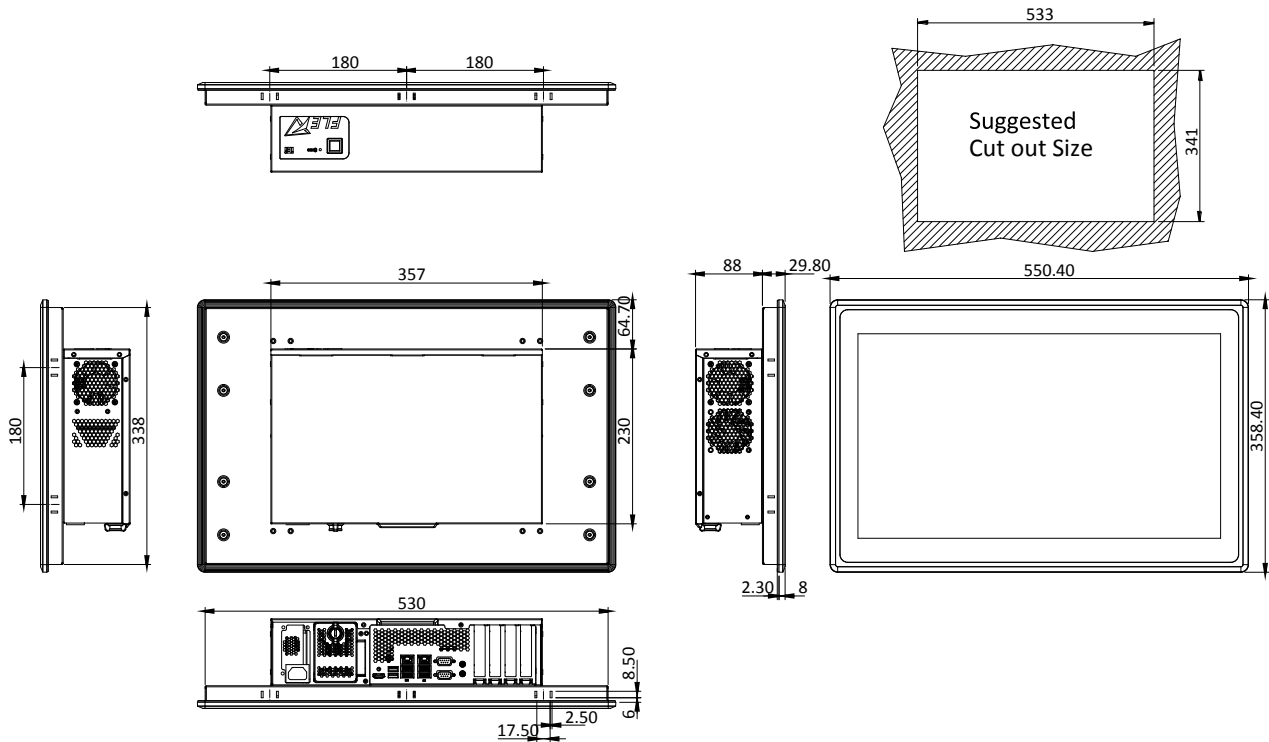


### PPC-FW19C-Q370 Dimensions (Unit: mm)

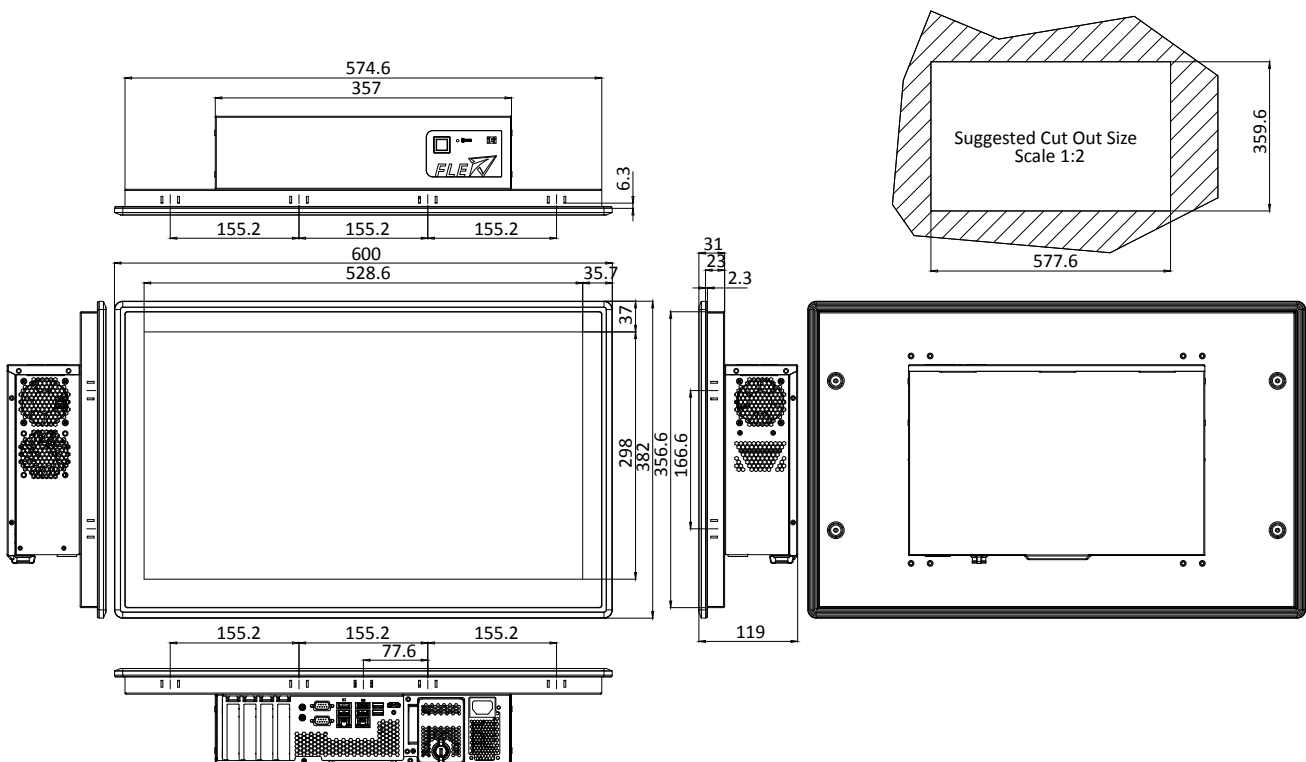


## Dimensions (Unit: mm)

### PPC-FW22C-Q370 Dimensions (Unit: mm)

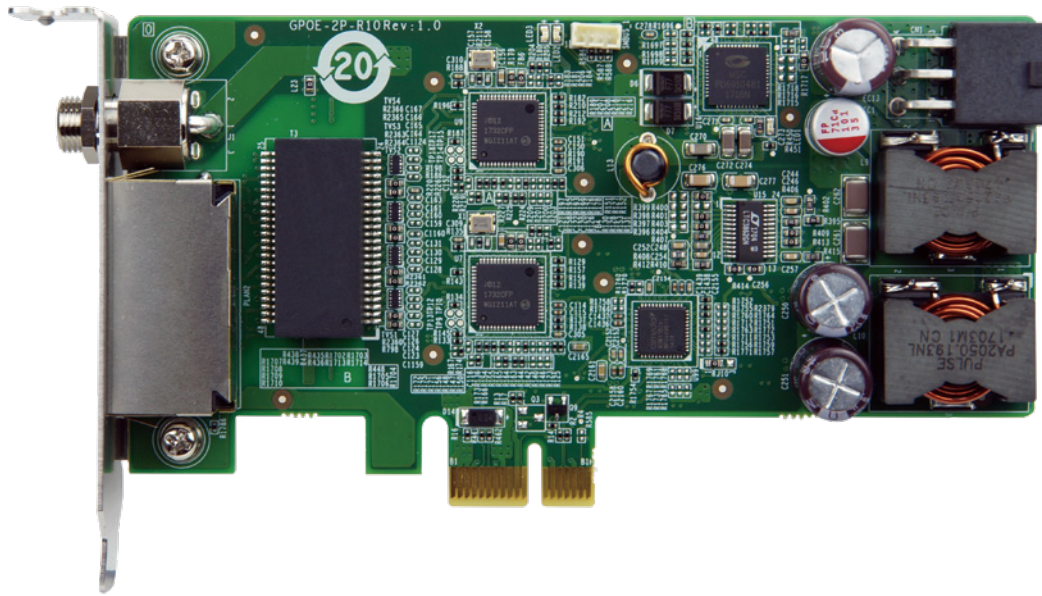


### PPC-FW24C-Q370 Dimensions (Unit: mm)



## GPOE-2P

PCI Express Power over Ethernet card, 2-port 1000 Base(T), 802.3at compliant, low profile, RoHS

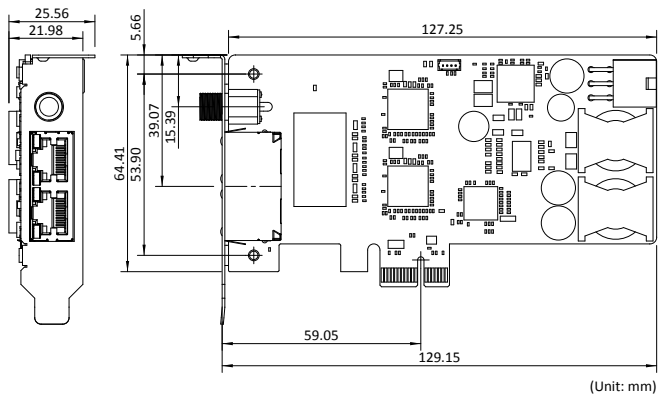


### Specifications

- ◆ Interface
  - PCI Express® x1
- ◆ Ethernet
  - Intel® I211AT controller
  - 9kB jumbo frame
  - IEEE 802.3az, IEEE1588
- ◆ Power Input
  - 12~24V DC input
  - 1 x Internal DC input (1x4 pin)
  - 1 x External DC Jack (Φ2.1/Φ5.5)
  - \*\*Caution! Choose one input only at a time**
- ◆ PoE Capability
  - IEEE 802.3at
  - 30W / 52V DC per port
- ◆ Operating Temperature
  - 0°C ~ 60°C
- ◆ Storage Temperature
  - 10°C ~ 70°C
- ◆ Operating Humidity
  - 5% ~ 95%, non-condensing
- ◆ Dimensions
  - 160 mm x 65 mm
- ◆ Weight: 110g
- ◆ CE/FCC compliant

### Features

- PCI Express® x1 compliant
- Support IEEE 802.3at for PoE (Power over Ethernet) with 30 watts per port
- Support link aggregation/jumbo frames (9 Kbyte)
- Supports 12V~24V DC input power



### Packing List

- |                                    |
|------------------------------------|
| 1 x GPOE-2P card                   |
| 1 x QIG (Quick Installation Guide) |

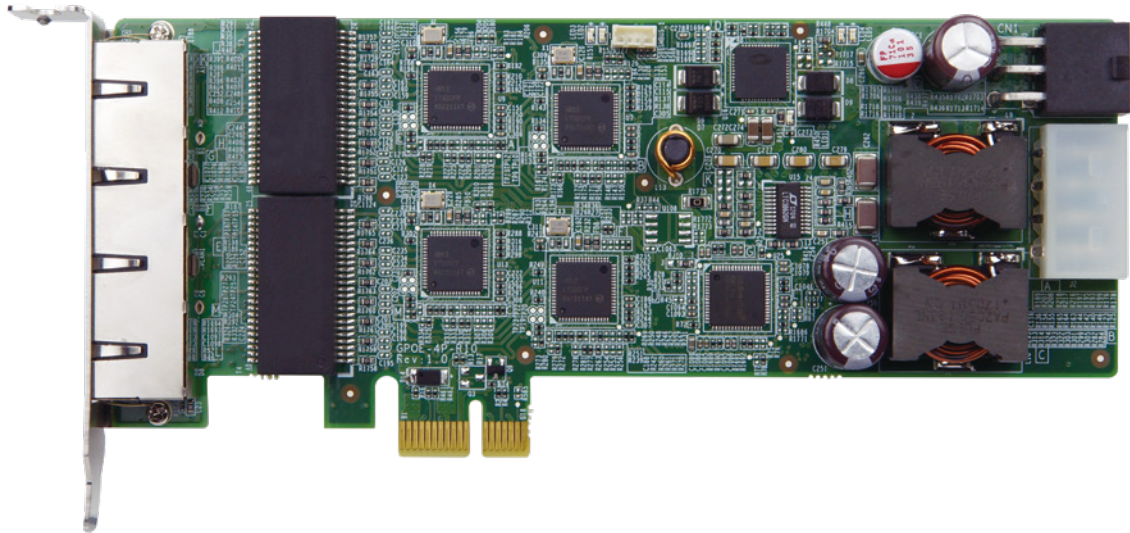
### Ordering Information

Part No.	Description
GPOE-2P-R10	PCI Express Power over Ethernet card, 2-port 1000 Base(T), 802.3af compliant, low profile, RoHS
63040-010090-120-RS	Power adapter, FSP, FSP090-DIEBN2, 9NA0904712, Vin:90~264VAC, 90W, Plug=7.5mm, Cable=1500mm, Erp (no load 0.5W), Vout:19VDC, Φ2.1/Φ5.5/lock, CCL, RoHS
63040-010065-200-RS	Power adapter, FSP, FSP065-REBN2, 9NA0654709, Vin:90~264VAC, 65W, Dim:46.3x108.3x30mm, Plug=7.5mm, Cable=1500mm, Erp (no load 0.1W), Vout:19VDC, Φ2.1/Φ5.5/lock, CCL, RoHS



## GPOE-4P

PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3at/af compliant, low profile, RoHS

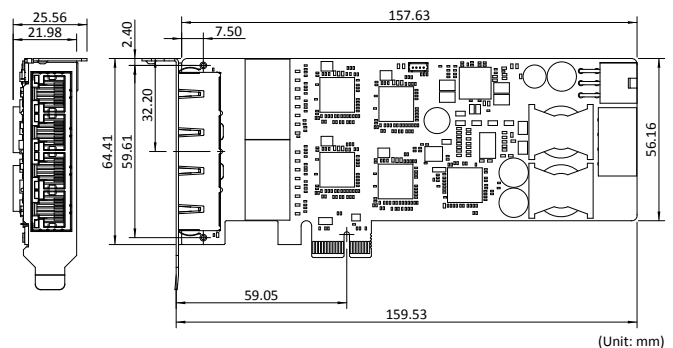


## Specifications

- ◆ Interface
  - PCI Express® x1
- ◆ Ethernet
  - Intel® I211-AT controller
  - 9kB jumbo frame
  - IEEE 802.3az, IEEE1588
- ◆ Power Input
  - 12~24V DC input
  - 1 x Internal DC input (1x4 pin)
  - 1 x Internal DC input (2x3 pin)
  - \*\*Caution! Choose one input only at a time**
- ◆ PoE Capability
  - Standard mode: IEEE 802.3af with 15.4W / 52V per port
  - Dual port mode: IEEE 802.3at with 30W / 52V per port
- ◆ Operating Temperature
  - 0°C ~ 60°C
- ◆ Storage Temperature
  - 10°C ~ 70°C
- ◆ Operating Humidity
  - 5% ~ 95%, non-condensing
- ◆ Dimensions
  - 160 mm x 65 mm
- ◆ Weight
  - 110g
- ◆ CE/FCC compliant

## Features

- PCI Express® x1 compliant
- Support for total 60 watts under full load
- Support link aggregation/jumbo frames (9 Kbyte)
- Supports 12V~24V DC input power



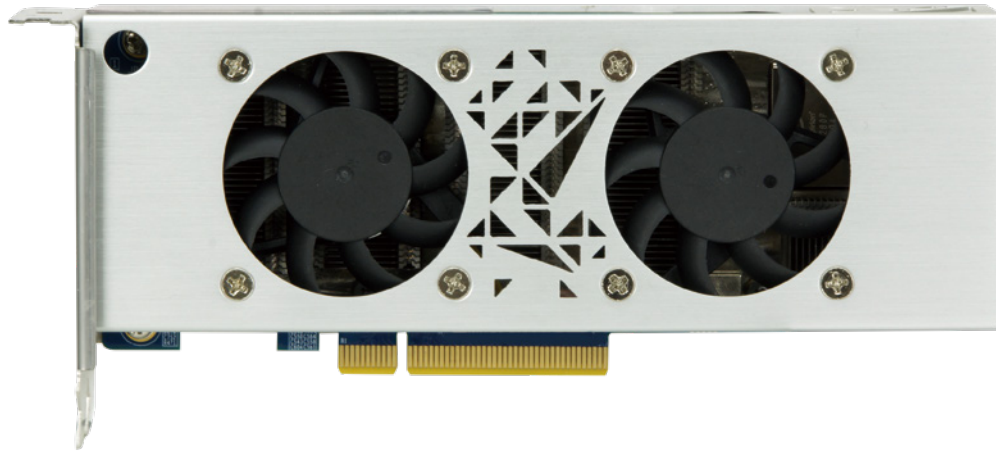
## Packing List

- |                                    |
|------------------------------------|
| 1 x GPOE-4P card                   |
| 1 x QIG (Quick Installation Guide) |

## Ordering Information

Part No.	Description
GPOE-4P-R10	PCI Express Power over Ethernet card, 4-port 1000 Base(T), 802.3af compliant, low profile, RoHS
32102-045800-100-RS	WIRE cable, power cable, 2, 300MM, 20AWG, (A) DC JACK 5.5*2.1+NUT+WASHER (Smcts:655-353), (B) TKP: H6657R1-06-B-03 P=4.2, Polywell, RoHS

## Mustang-F100-A10



### Features

- 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.

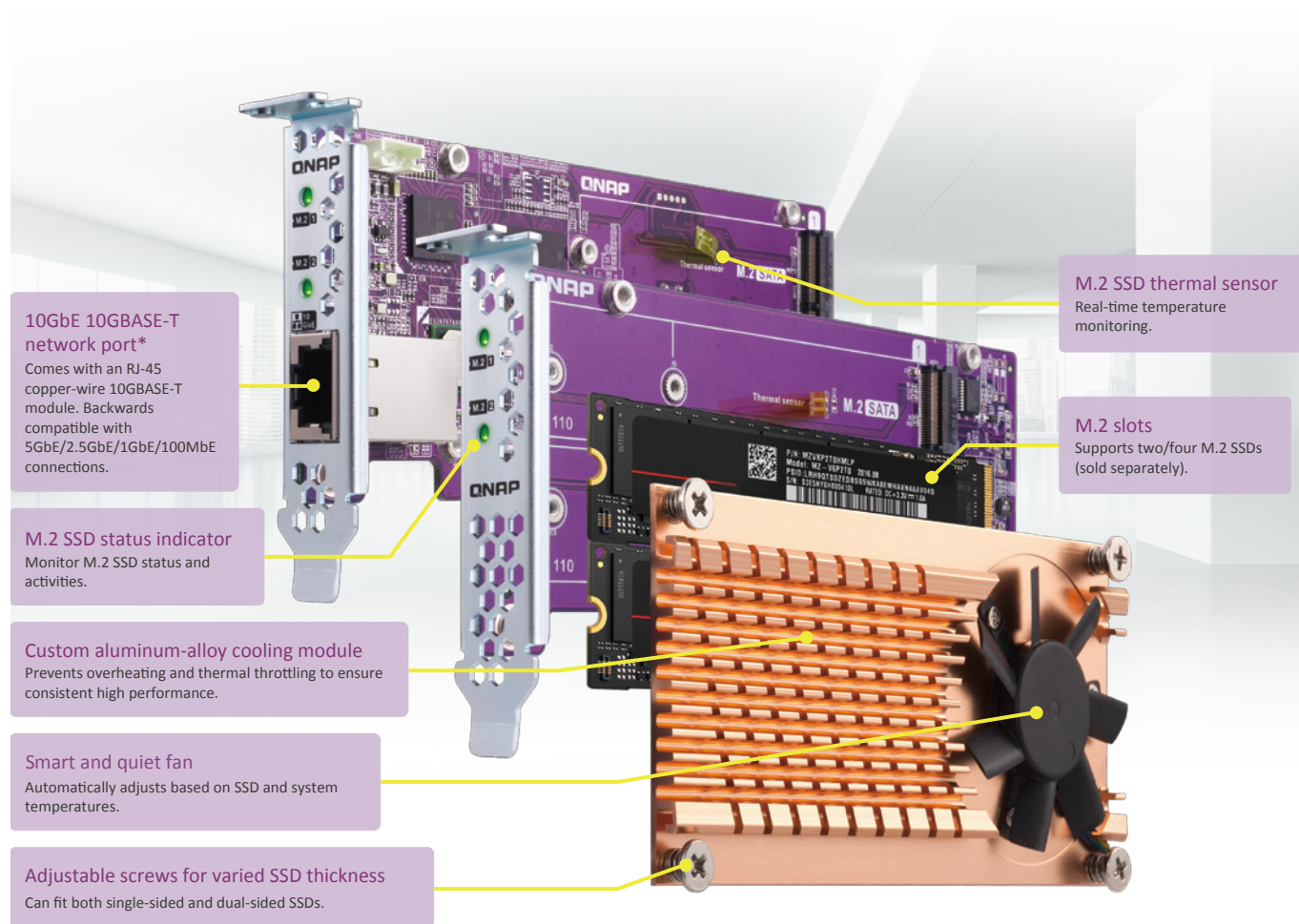
### Specifications

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 (Windows® & 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	<60W
Operating Temperature	5°C~60°C (ambient temperature)
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

\*Standard PCIe slot provides 75W power, this feature is preserved for user in case of different system configuration.

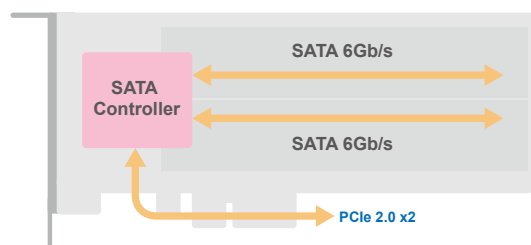
## QNAP® QM2 PCIe Cards

Flexible and versatile, boosts performance and functionality



## Hardware Specifications

### QM2-2S



Ordering SKU	QM2-2S
Interface	PCI Express 2.0 x2
Supported M.2 SSD Types	2 x M.2 2280/22110 SATA SSD
Connector	B+M Key
10GbE Support	N/A
Dimensions (Length x Width x Height)	157(L) x 68.9(W) x 20.6(H) mm; 6.18(L) x 2.71(W) x 0.81(H) inch

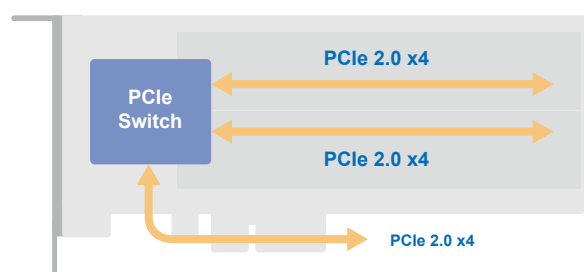
Ordering SKU	QM2-2S-220A
Interface	PCI Express 2.0 x2
Supported M.2 SSD Types	2 x M.2 2280/22110 SATA SSD
Connector	B+M Key
10GbE Support	N/A
Dimensions (Length x Width x Height)	147.15(L) x 68.9(W) x 20.6(H) mm; 5.79(L) x 2.71(W) x 0.81(H) inch

## QNAP® QM2 PCIe Cards

Flexible and versatile, boosts performance and functionality

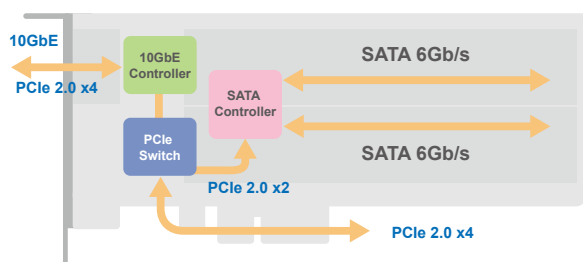
### Hardware Specifications

QM2-2P



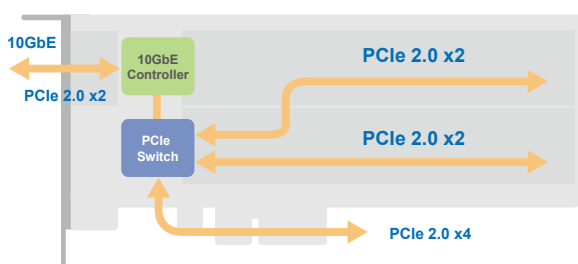
Ordering SKU	QM2-2P
Interface	PCI Express 2.0 x4
Supported M.2 SSD Types	2 x M.2 2280/22110 PCIe SSD
Connector	M Key
10GbE Support	N/A
Dimensions (Length x Width x Height)	157(L) x 68.9(W) x 20.6(H) mm; 6.18(L) x 2.71(W) x 0.81(H) inch

QM2-2S10G1T



Ordering SKU	QM2-2P-244A
Interface	PCI Express 2.0 x4
Supported M.2 SSD Types	2 x M.2 2280/22110 PCIe (2.0 x2) SSD
Connector	M Key
10GbE Support	N/A
Dimensions (Length x Width x Height)	147.15(L) x 68.9(W) x 20.6(H) mm; 5.79(L) x 2.71(W) x 0.81(H) inch

QM2-2P10G1T



Ordering SKU	QM2-2S10G1T
Interface	PCI Express 2.0 x4
Supported M.2 SSD Types	2 x M.2 2280 SATA SSD
Connector	B+M Key
10GbE Support	1 x 10GBASE-T 10GbE LAN support (backwards compatible with 5GbE/2.5GbE/1GbE/100MbE)
Dimensions (Length x Width x Height)	157(L) x 68.9(W) x 20.6(H) mm; 6.18(L) x 2.71(W) x 0.81(H) inch

Ordering SKU	QM2-2P10G1T
Interface	PCI Express 2.0 x4
Supported M.2 SSD Types	2 x M.2 2280 PCIe (2.0 x4) SSD
Connector	M Key
10GbE Support	1 x 10GBASE-T 10GbE LAN support (backwards compatible with 5GbE/2.5GbE/1GbE/100MbE)
Dimensions (Length x Width x Height)	157(L) x 68.9(W) x 20.6(H) mm; 6.18(L) x 2.71(W) x 0.81(H) inch



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