FLEX-BX210-Q470

2U Modular PC with 10/11 th Generation LGA1200 Intel® Core™ i7/i5/i3, Pentium® Processor

Features

» Supported CPUs:

Intel® Core™ i3-10320 3.8 GHz (up to 4.6 GHz, quad-core, 65W TDP)

Intel® Core™ i5-10500TE 2.3 GHz (up to 3.7 GHz, 6-core, 35W TDP)

Intel® Core™ i7-10700TE 2.0 GHz (up to 4.4 GHz, 8-core, 35W TDP)

» Four hot-swappable HDD/SSD bays with RAID 0/1/5/10 support

» Equipped with PCIe 3.0 x4 slots and PCIe 3.0 x8 slots

» M.2 2280 PCIe Gen 3 x4 supporting NVMe

» Support IEI Mustang accelerator cards

Specifications

Form factor	
SBC Form Factor	CPU:
	10/11 th Gen Intel® Core™ CPU 35/65W
	Intel® Core™ i3-10320 3.8 GHz (up to 4.6 GHz, quad-core, 65W TDP)
	Intel® Core™ i5-10500TE 2.3 GHz (up to 3.7 GHz, 6-core, 35W TDP)
	Intel® Core™ i7-10700TE 2.0 GHz (up to 4.4 GHz, 8-core, 35W TDP)
	Chipset:
	Q470/Q470E
	System Memory:
	2 x 288-pin 2933/2666 MHz dual-channel DDR4 unbuffered DIMM supporting up to 64GB
	Power:
	ATX power supply, AC input
	350W power input
I/O Interface	
I/O Ports	USB:
	6 x USB 3.2 Gen 1
	Ethernet:
	3 x 2.5GbE LAN
	COM Port:
	2 x RS-232
	Display:
	1 x HDMI
	1 x DP
	Audio:
	1 x Line out
	1 x Mic in
	TPM:
	Support Intel PTT
	Watchdog Timer:
	Programmable 1 ~ 255 sec/min
Expansion Slots	
Expansion Slots	M.2:

	1 x M.2 B-Key 3042/52 socket
	(with SIM card slot, supporting 5G/LTE; supports PCIe 3.0 x1 & USB 3.2 Gen 1)
	1 x M.2 M-Key 2280 socket (supports PCIe 3.0 x4)
	1 x M.2 A-Key 2230 (supports PCIe 3.0 x1 & USB 2.0)
	Expansion Slots:
	2 x PCIe 3.0 x8
	2 x PCIe 3.0 x4
System	
Cooling method / System Fan	3 x System fan, 1 x CPU fan
Drive Bays	4 hot-swappable 2.5" HDD/SSD SATA 6Gb/s bays (support RAID 0/1/5/10), with LED indicators
Indicator&Buttons	
Buttons	1 x Power button
	1 x Reset button
	1 x AT/ATX switch
Indicators	1 x Power LED (blue)
	1 x HDD LED
Physical Characteristics	
Construction	Metal
Color	
Color	Black
Dimensions	
Dimensions	357 x 230 x 88
Weight	
Weight	4.1 kg/7.2 kg
Environment	
Operating Temperature	-10°C ~ 50°C
Humidity	5% ~ 95%, non-condensing
Operating Vibration	5~17Hz, 0.1 double amplitude displacement 17 ~ 640Hz 1.5G acceleration peak to peak
Operating Shock	10G acceleration part to part (11ms)
Safety & EMC	CE/FCC compliant
OS Support	
OS Support	Microsoft Windows 10 / Windows 11, Linux

Ordering Information

FLEX-BX210-Q470-i9D-R20	2U Modular box PC, Intel® 10th Generation Core™ i9-10900TE 1.8GHz (up to 4.5GHz, 10-core, TDP 35W), 16GB DDR4 pre-installed memory, TPM 2.0, 350W PSU, R20
FLEX-BX210-Q470-i7D-R20	2U Modular box PC, Intel® 10th Generation Core™ i7-10700TE 2.0GHz (up to 4.4GHz, 8-core, TDP 35W), 16GB DDR4 pre-installed memory, TPM 2.0, 350W PSU, R20
FLEX-BX210-Q470-i5C-R20	2U Modular box PC, Intel® 10th Generation Core™ i5-10500TE 2.3GHz (up to 3.7GHz, 6-core, TDP 35W), 8GB DDR4 pre-installed memory, TPM 2.0, 350W PSU, R20
FLEX-BX210-Q470-i3C-R20	2U Modular box PC, Intel® 10th Generation Core™ i3-10320 3.8GHz (up to 4.6GHz, 4-core, TDP 65W), 8GB DDR4 pre-installed memory,TPM 2.0, 350W PSU,R20
FLEX-BX210-Q470/35-R20	Barebone, 2U AI Modular BOX PC, Intel® COMET Lake, Q470 chipset, 2xPCIex4 and 2xPCIex8 slots, 4x HDD bay, w/o CPU, 350W PSU, R20

Packing List

1 x mounting kit	1 x power cord

FLEX-BX210-Q470

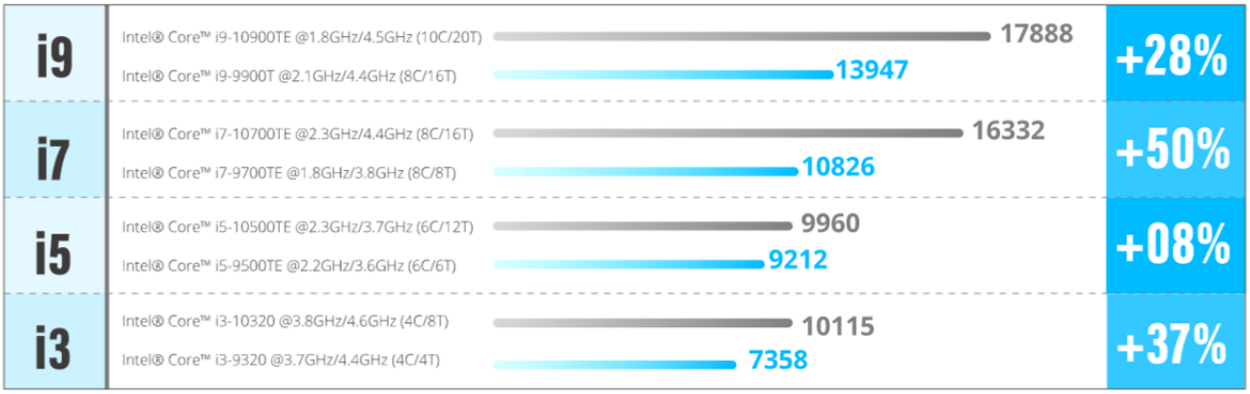
2U AI Edge Inference Computer with up to 4 Low Profile Expansion Slots

The FLEX-BX210 is a 2U rackmount computer engineered with the latest processing technology that supports up to 10-core, 20-thread Core i9 CPU and 16GB dual-channel DDR4. With high-end PCIe slots for AI accelerators and M.2 slot for NVMe storage, the FLEX-BX210 is capable of processing large volumes of complex data to drive AI functions at the edge such as face identification, vehicle recognition and traffic analysis. Additionally, it equips four SSD bays offering RAID 0, 1, 5 & 10 functions to ensure security of data and efficiency of performance in handling AI computation and edge computing.

Up to 10 Cores 4.5GHz with DDR4-2933

The FLEX-BX210 is powered by 10th Gen Intel® Core™ processors ranging from 4 to 10 cores, and is pre-installed up to 16GB DDR4-2933 dual-channel memory. With up to 50% better integer multi-tasking compute performance than previous gen, the FLEX-BX210 is able to deliver the performance required to rapidly consolidate diverse workloads.

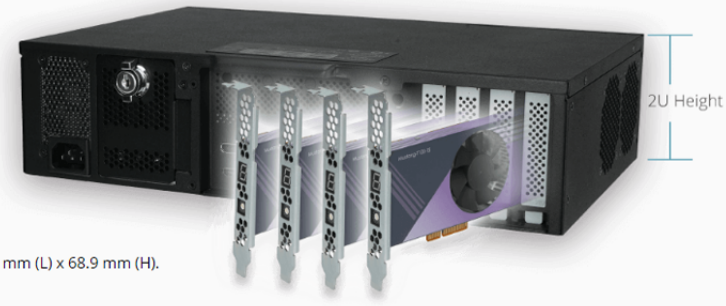
Average CPU Mark



Ability to Scale via 4 Low-profile PCIe Gen3 Expansion Slots

The FLEX series supports multiple PCI Express slots including two PCIe x8 and two PCIe x4 slots. All of the four expansion slots of the FLEX series support PCIe Gen3, which doubles the speed per lane from 500MB/s to 1GB/s compared to PCIe Gen2. These high-speed PCIe Gen3 slots are compatible with standard low profile add-on cards such as:

- Network card: 10GbE card or fiber network card
- I/O card: serial port card, USB card or LAN card
- AI accelerator card: VPU card, FPGA or GPU card
- Wireless card: Wi-Fi card or mobile wireless card
- Storage card



NOTE: The maximum size of a card that fits in the FLEX series is 167.65 mm (L) x 68.9 mm (H).

AI Ready Solution to Accelerate Your AI Initiative

The FLEX-BX210 is an AI hardware ready system ideal for machine learning inference to help you get faster, deeper insights into your customers and your business. IEI's FLEX-BX210 supports Mustang accelerators and graphics cards to provide additional computational power plus end-to-end solution to run your tasks more efficiently and to help you deploy your solutions faster than ever.

Reliable RAID Storage Secures Data Processing

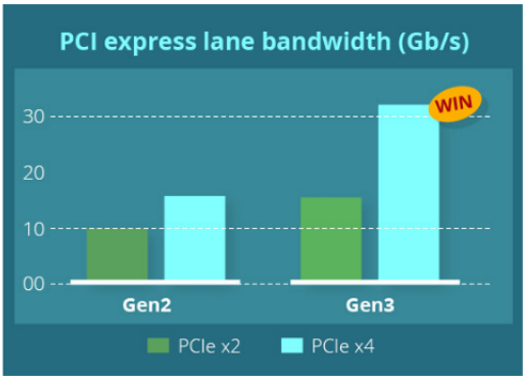
The FLEX series offers four 2.5" SSD bays via SATA 6Gb/s interfaces to expand storage capacity and enable fast data transfer. The equipped Intel Q470 chipset provides reliable and high performance hardware RAID protection to back-up your media and critical information. You can configure through different RAID levels (RAID 0, 1, 5 and 10) to increase performance and/or provide automatic protection against data loss from drive failure.

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

M.2 M-key for PCIe Gen3 NVMe SSD

It is safe to have NVMe SSD installed in the system internally to protect it against theft and OS crash caused by unplugging the storage accidentally. The FLEX-BX210 has one M.2 M-key slot to provide high transfer speed and reliability of storage. It is complaint with PCIe x4 M.2 2280 NVMe SSDs with 32Gb/s transfer rate.

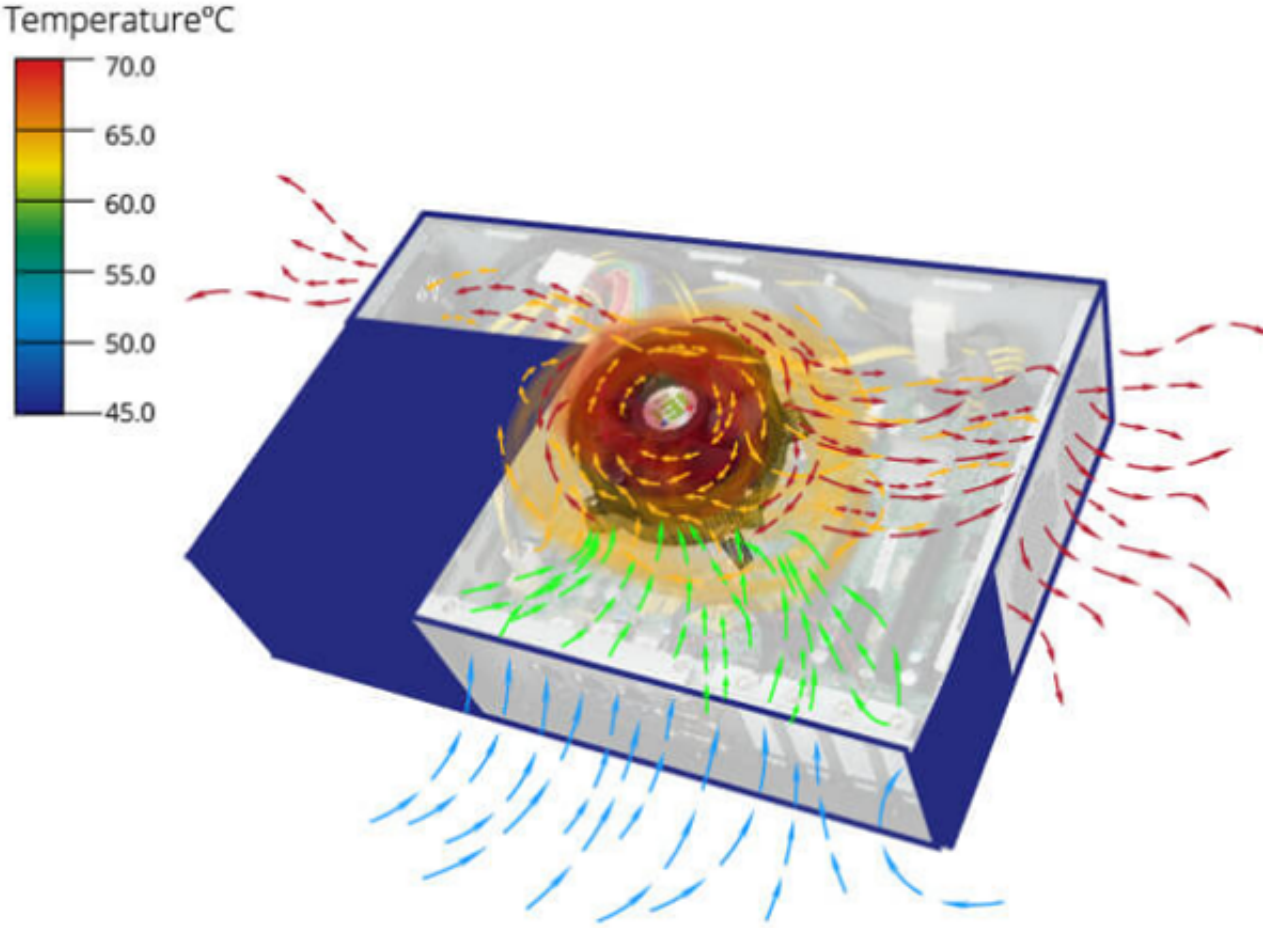
- NVMe reduces latency
- Delivers higher input/output per second (IOPS)



Rugged Design for Diverse Industrial Applications

-10°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-BX210 with unique ventilation design allows the system operating temperature to go as low as -10°C and up to 50°C. Traditional IPCs usually have insufficient airflow due to turbulence caused by multiple fans (system fan / CPU fan / PSU fan) and cables. IEI's FLEX series equipping with one CPU fan and three system cooling fans is designed with the best thermal solution to sustain low internal chassis temperature for CPU, PSU, and add-on cards for better system reliability.



Smart Fan Operation

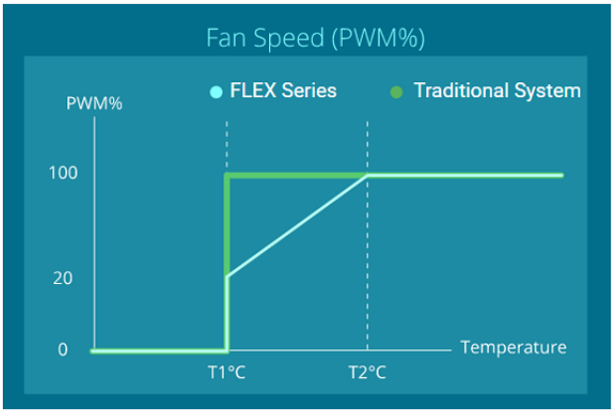
Users can define CPU fan and system fan speed and temperature profile in BIOS. When the system is in idle or running less demanding tasks, smart fan is able to bring down the level of noise produced by rotating fans. This feature not only allows the FLEX series to run quietly but extending the fan's lifespan and enhancing system durability.

FLEX Series:

With fan speed and temperature trigger settings, the fan speed of the FLEX series 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 status



The FLEX-BX210 has passed MIL-STD-810G military vibration standard. The four SSD slots are strongly secured on the printed circuit board internally to prevent data loss and disk crash.

Operating Random Vibration Mode (MIL-STD-810G)

Axis: 3 axes / Vertical / Transverse / Longitudinal.

10-500 Hz, 60min/axis.

Axis: 3 axes / Vertical / Transverse / Longitudinal.

Wired and Wireless Network Capability Simplifies IoT Deployment

5G/4G, WLAN & Bluetooth

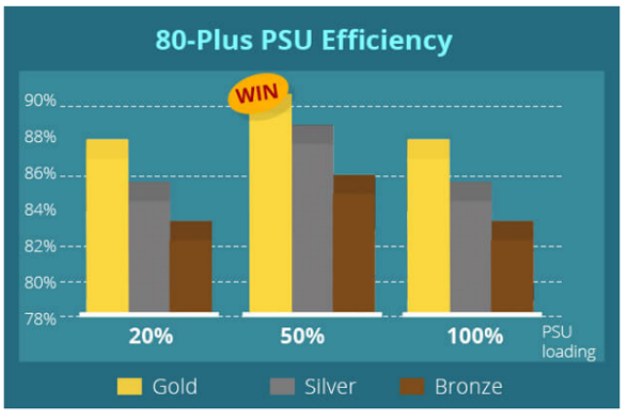
To enable IoT edge deployment, the FLEX-BX210 is designed with strong wireless network capability. 802.11ac wireless LAN and Bluetooth v5.1 is supported by the optional M.2 A-key module; 5G/4G connection is supported by the M.2 B-key modules. SMA antenna connectors for Wi-Fi, 5G/4G or GPS are reserved on the rear panel. Using SMA antennas can ensure secure wireless communications, enhance signal coverage and prevent inopportune signal loss, which is relatively important in most of industrial applications.

Three 2.5GbE for Bandwidth-Intensive Applications

The FLEX-BX210 equips three 2.5GbE RJ-45 ports to meet requirements of bandwidth-demanding applications, such as AI and data centers. Industry 4.0 can also be realized by using two LAN for operational technology (OT) and one for information technology (IT) to connect more field devices in industrial automation.

High-efficient 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 computer could maintain up to 87% efficiency with less than 13% power loss in AC to DC conversion. 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.



High Installation Flexibility

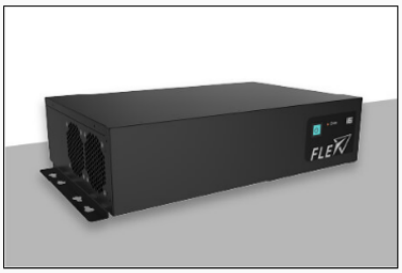
The FLEX-BX210 can be mounted on the rack, wall or desktop for quick deployment in most of industrial settings.

Rackmount

2U height for easy and quick installation in control cabinets.

Wall Mount

Provides two-way direction for wall mounting, allowing to orient I/O upwards or downwards.



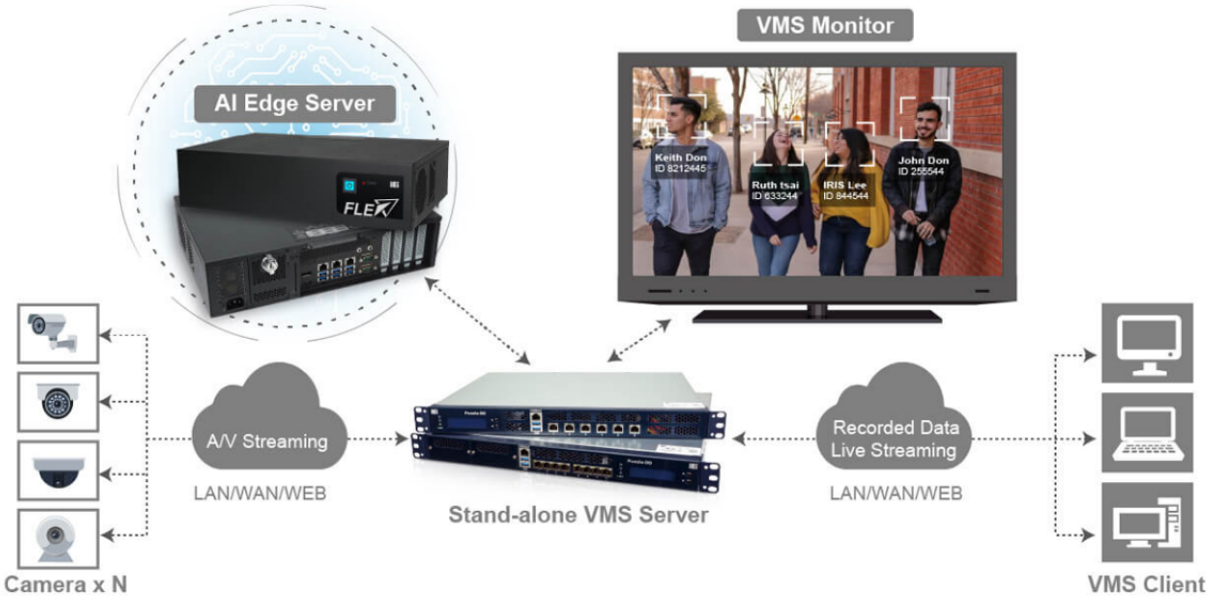
Desktop Mount

Easily place and secure the FLEX anywhere you'd like on a table or desk

Applications

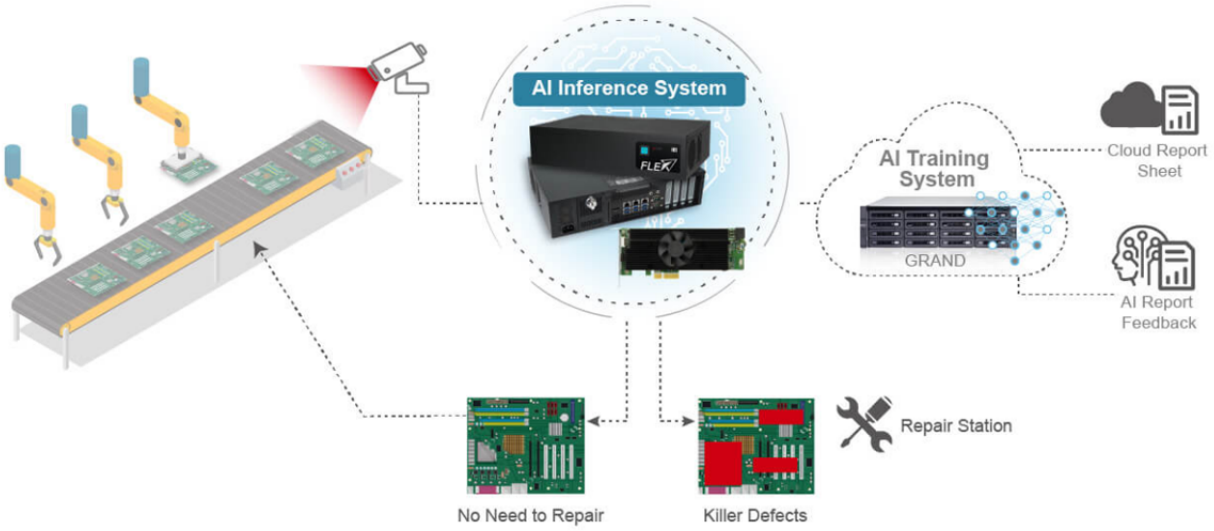
Intelligent NVR/VMS Solutions

The FLEX-BX210 is perfectly suited for deployment at most edge sites, for example, a traffic junction, telecommunication cabinet or security room. The FLEX-BX210 provides a variety of mounting options that allow it to also fit into existing sites. It has four PCIe slots supporting half-height and half-length (HHHL) cards such as GPUs, FPGAs, and VPUs. End users could deploy AI into the existing NVR (Network Video Recorders) or VMS (Video Management System), and implement AI-enabled video analytics at the edge to take immediate actions to extract the most relevant information for making real-time business decisions.



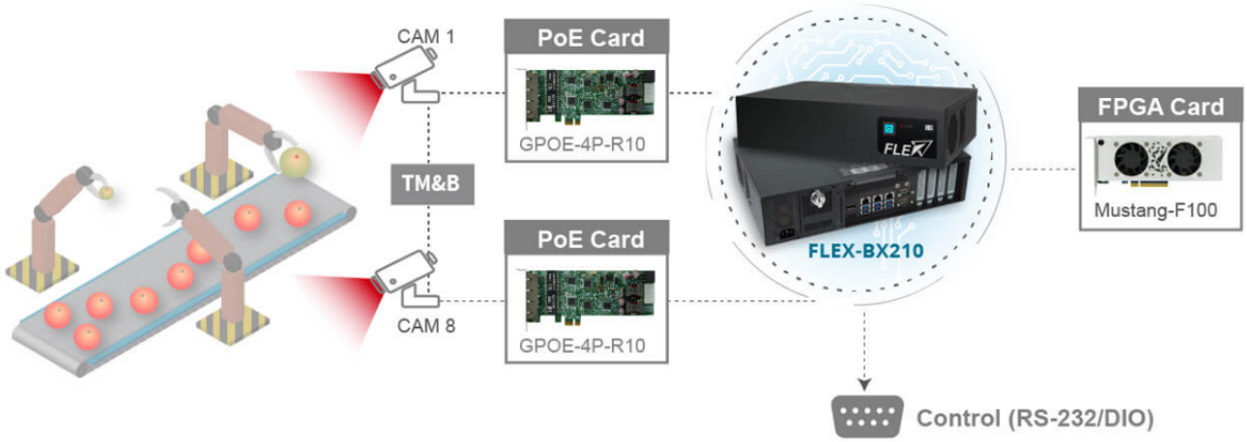
Defect Detection in Production Line

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



Computer Vision for Grading in Agriculture

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 Gen3 expansion slots for installing motion controller cards, GP GPU cards and the IEI-developed PoE Ethernet card. IEI PoE cards provide up to 6 GbE Power over Ethernet (PoE) ports compliant with IEEE 802.3at for direct connection to CCTV cameras without needing separate power.

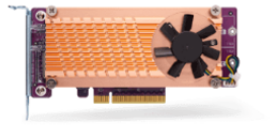


System Overview

01. Power button with power LED
02. HDD status LED
03. AC inlet
04. 4 x 2.5" HDD
05. Antenna knockouts
06. Antenna knockouts
07. DisplayPort
08. HDMI
09. 3 x GbE LAN
10. Audio line-out
11. Audio mic-in
12. 6 x USB 3.2 Gen 1
13. 2 x RS-232
14. AT/ATX switch
15. Reset button
16. 2 x PCIe 3.0 x8 (x16 slot)
    2 x PCIe 3.0 x4 (x4 slot)

Supported Expansion Cards

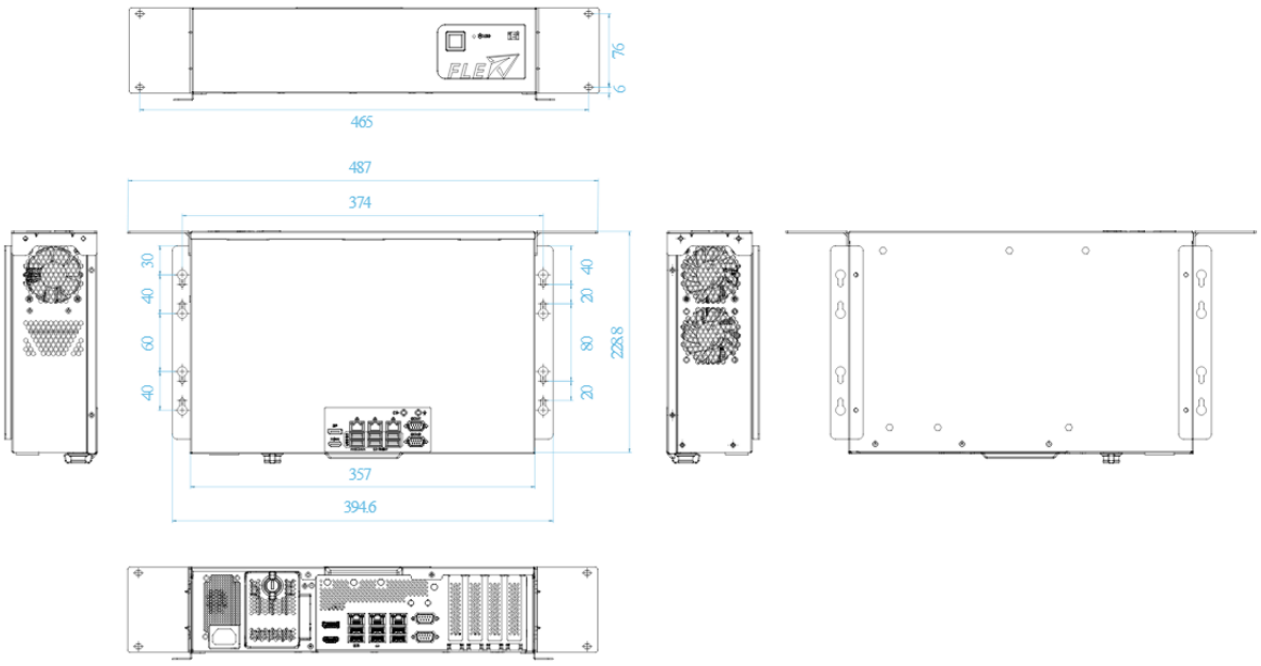
IEI Group provides diverse expansion cards for you to add functionalities and capabilities to your FLEX series.



QNAP QM2-2P-384
Dual M.2 PCIe SSD Expansion Card

QNAP LAN-10G2SF-MLX
Dual-port 10GbE SFP+ Network Expansion Card

IEI GPOE-4P/2P-R20
4-port/2-port PoE Card

IEI Mustang-V100-MX8
Accelerator with 8 Intel® Movidius™ Myriad™ X MA2485 VPUs

Dimensions