IEI Networking, Storage and Server Solutions
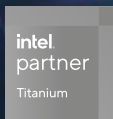
Empower Your Enterprise with Seamless Integration, Unparalleled Speed, and Edge-to-Core Innovation

HCI

MEC

Cybersecurity

24/7 High-Availabilities

Fast and Reliable Connection

Boost Performance

intel partner
Titanium

www.ieiworld.com

Why IEI

Empowering You with Cutting-Edge Networking Technologies

IEI stands as your premier hardware partner, distinguished by our application-focused design and tailored customization options crafted to meet your exacting standards. Our portfolio boasts an extensive range of products powered by the industry's leading processors from Intel, AMD, and Marvell®. This ensures that no matter what your project's requirements are, we have the technology to drive it forward.

At IEI, we are more than just a provider; we are a group company that capitalizes on supply chain efficiency, expansive manufacturing scale, and comprehensive solutions that span from networking to cutting-edge Edge AI technologies. Our commitment to innovation is unwavering, and we continuously unveil groundbreaking products that set new standards in the industry.

Our experienced design team leads the way in harnessing cutting-edge technology to create solutions that drive our clients towards unmatched success. At IEI, we offer more than just services; we provide a partnership committed to excellence and surpassing expectations. Rely on our expertise to guide you through the intricacies of the current technological environment, ensuring your projects not only achieve but exceed their objectives.

White-Box Solutions

From entry to advanced models fitting a wide range of applications

OEM/ODM Services

Tailored to vertical markets

Seamless Scalability

1GbE/10GbE/40GbE/100GbE fiber and copper Ethernet ports

What's Inside

Networking

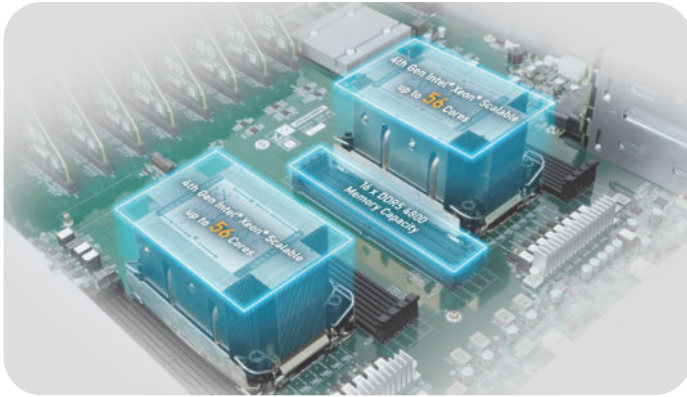## Storage

Quick Product Selection

Engineering the Future of Connectivity

Pioneering Advanced Network Solutions with Cutting-Edge Technology


Dual-Socket High-Performance Edge Computing

High-end applications drive computing performance. IEI boasts extensive experience in designing high-end appliances and addresses the pain points customers encounter during product expansion and upgrades, such as heat dissipation in limited spaces, system integration, and performance optimization.

Remote Edge Monitoring & Control

IEI is revolutionizing the management of widespread network platforms by offering an extensive array of remote management interfaces. Our suite includes the in-band iRM (IEI Remote Management) and the out-of-band BMC management module, iRIS2, establishing a new standard in network oversight. This breakthrough provides unparalleled monitoring capabilities and instant alert notifications upon system failures, ensuring reliability and efficiency across appliances.
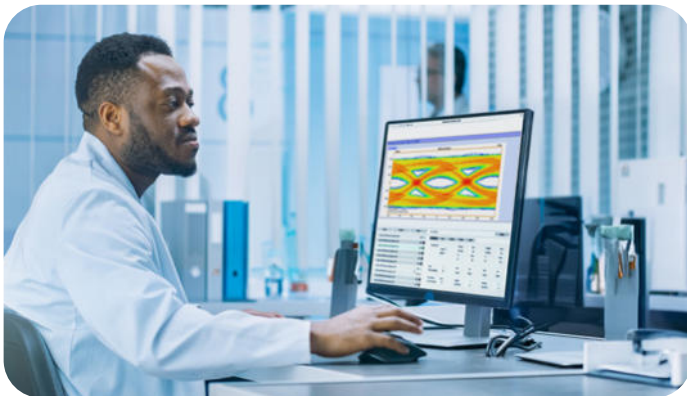
Expertise in SI/PI for Unmatched Network Performance

Our expertise in Signal Integrity (SI) and Power Integrity (PI) guarantees unparalleled data transfer quality across technologies such as DDR5, PCIe Gen4/5, USB 4.0, and 100GbE. Early simulations help detect design issues, minimizing chip defects and boosting network performance with energy-efficient, reliable solutions.

Cutting-edge RF Design and Verification

IEI's rigorous Wi-Fi/LTE/5G signal verification and system optimization processes ensure robust and high-speed wireless connectivity. Our advanced RF design and verification techniques guarantee superior performance and reliability in wireless communications.

Network Acceleration Technologies

For certain network applications, the presence of a specialized acceleration engine for packet processing is paramount in boosting overall system performance. IEI excels in the integration and validation of Intel QAT technology, among other acceleration solutions, setting a benchmark for network efficiency.


Innovative Firmware and Software Development

At IEI, our extensive research and development teams specialize in a wide array of firmware and software innovations, including CPLD, FPGA, MCU, BIOS, Linux kernel drivers, and AI algorithms. Our expertise also extends to developing system and application software, providing robust support for embedded systems on platforms such as Ubuntu, OpenWrt, and BMC.

Guaranteed High Availability

IEI's intelligent network platform is engineered for maximum service uptime, incorporating features such as LAN bypass, RAID storage, hot-swappable fans, dual BIOS, PSU redundancy, and more. These technologies ensure uninterrupted service and enhanced reliability.
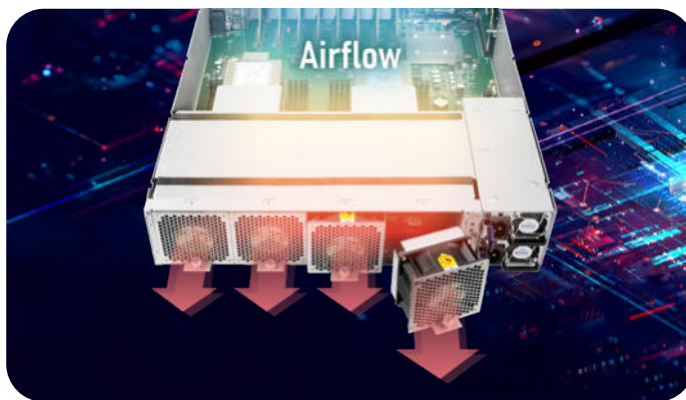
Superior Thermal Design for Optimizing Performance

Our expertise in thermal management enhances system performance and energy efficiency through detailed simulations of thermal distribution and airflow. Innovative designs, precise material selection, and rigorous prototyping and validation strategies underscore our commitment to providing cost-effective, thermally optimized networking solutions, affirming our leadership in the field.

Star and New Product Highlights

Enterprise Server	Premium Network Appliance	Performance Network Appliance
	NEW	**NEW**
PUZZLE-9040	**PUZZLE-7050**	**PUZZLE-5050**
• Dual 4th Gen Intel® Xeon® Scalable processors • DDR5 4800 MHz ECC RDIMM • 1 x PCIe Gen4 x16 FHFL • 8 x OCP 3.0 slots (6 x PCIe Gen5 x16, 2 x PCIe Gen4 x16) • 2 x 10GbE SFP+ & 2 x 1GbE RJ45 • BMC management port • 2 x U.2 slots with removable tray • 1 x 2280 NVMe SSD Slot • CRPS redundant power supply	• Single Gen AMD EPYC™ 8004 Series Processor • 12 x DDR5 ECC RDIMM slots (up to 4800 MHz) • 1 x PCIe Gen4 x16 FHFL • 2 x OCP 3.0 slots (PCIe Gen4 x16) • BMC management port • 2 x U.2 slots with removable tray • 2 x 2280 NVMe SSD Slots • 2 x 1GbE RJ45 • CRPS redundant power supply	• 13th Gen Intel® Core™ Processors • 4 x DDR4 3200 MHz UDIMM • 2 x IEI Proprietary Network Module (PCIe Gen3 x8) • 10 x 1GbE RJ45 • BMC management port • 2 x USB 3.0 • 2 x U.2 slots with removable tray • CRPS redundant power supply

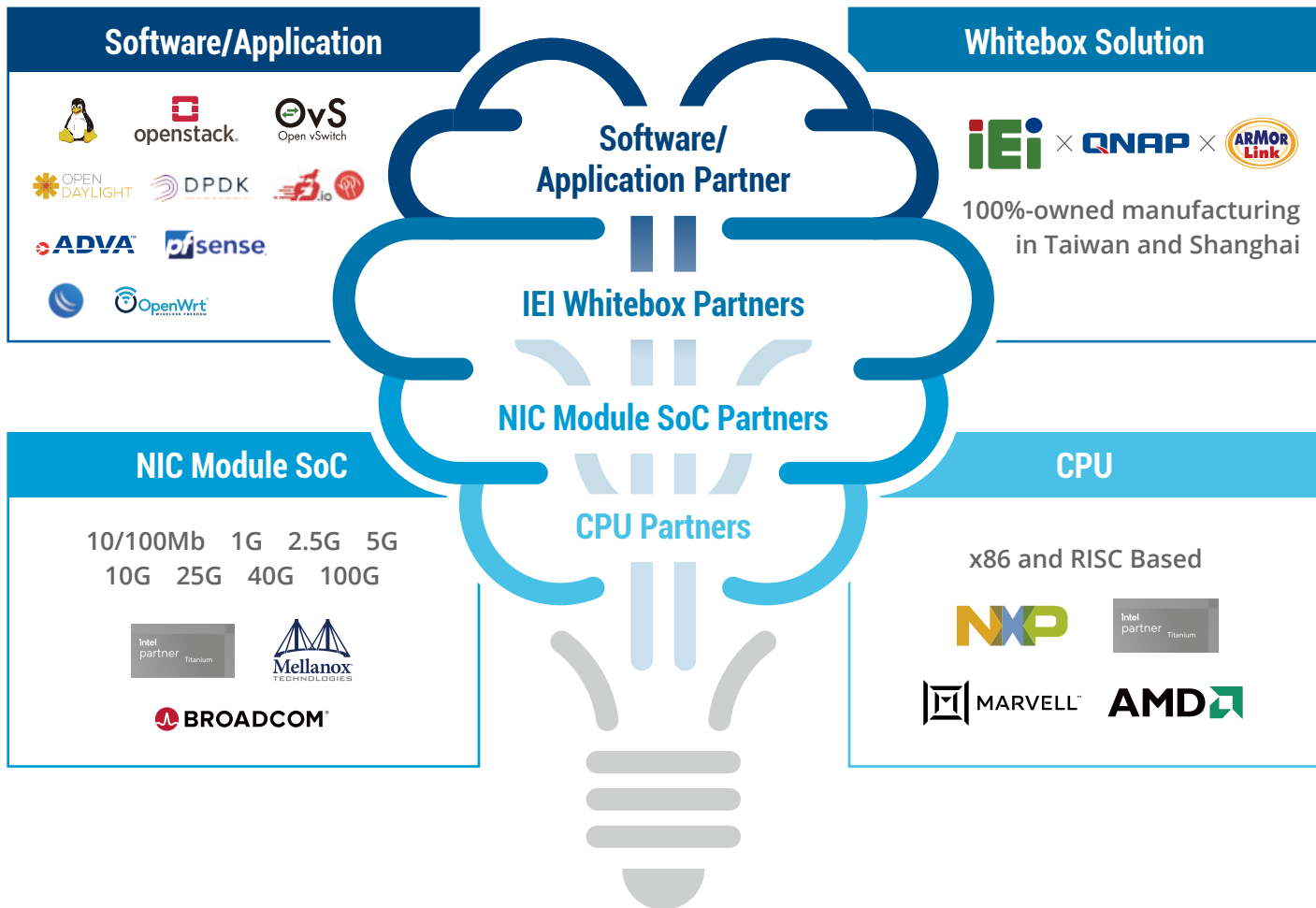| Performance Network Appliance	Performance Network Appliance	Entry Level Network Appliance
NEW		**NEW**
PUZZLE-5060	**PUZZLE-5030**	**PUZZLE-1100**
• AMD Ryzen™ 8000 Series • 4 x DDR5 4800MHz UDIMM • 2x U.2 2.5" NVMe SSD • 8 x 1GbE RJ45	• 11th Gen Intel® Xeon® E Processor • 4 x DDR4 3200MHz ECC/non-ECC UDIMM • 8 x 2.5 Gbps RJ45 LAN ports & 2 pairs LAN bypass • 1 x PCIe x4, 1 x PCIe x8 • 2 x PulM network module • 2 x 2.5" SATA HDD/SSD • 1 x M.2 M key 2260/2280	• Intel® Amston® Processor • 1 x DDR5 4800MHz DIMM Slots • 4 x 1GbE RJ45 LAN ports • 1 x 1GbE RJ45 BMC port • 1 x 3042/3052 B-key M2 slot 5G/LTE (USB 3.2 Gen2 x1) + SIM card socket for 5G/LTE card • 1 x 3050 PCIe Mini for Wi-Fi 6/6E 2.4G or 5G • 1 x USB Type-C console, 2 x USB 3.0 • 1 x IEI iRIS4 connector IPMI 2.0 module • SATA DOM, 128GB eMMC

Entry Level Network Appliance	ARM-Based Network Appliance	ARM-Based Network Appliance
	NEW	
PUZZLE-3034	**PUZZLE-200**	**PUZZLE-100**
• Intel® Atom® C3758R 8C/8T • 2 x DDR4 2400MHz Non-ECC UDIMM • 8 x 2.5GbE RJ45 LAN ports, 4 x 10GbE SFP+ • 1 x RJ45 console, 2 x USB 3.0 • SATA DOM, 64GB eMMC	• Marvell® CN10208 8 cores 2.1GHz • Fanless design • 1 x DDR5 SO-DIMM • 6 x 1GbE RJ45, 2 x 2.5GbE RJ45, 2 x 10GbE SFP+ • Support DIN mount	• Compact size • Fanless design • Network: 5 x 1GbE LAN; 1 x 1GbE WAN • USB Type-C console port • USB 3.0 Port • LED Indicator: Power, Network, Information • Anti-theft hole

Ecosystem Partners and Interoperability

Leveraging strategic alliances with leading processor and networking vendors, IEI is uniquely positioned to expedite your time to market, ensuring you stay ahead in the rapidly evolving SDN and NFV deployment landscape. The seamless integration of hardware and software from diverse providers is pivotal in delivering efficient network services and solutions, facilitated by our strong network of technology partnerships. These collaborations are essential not only for navigating the shift towards SDN/NFV technologies but also for extending your products' lifecycle. At IEI, our dedication to fostering a robust ecosystem of partners equips us to offer cutting-edge solutions, guiding our clients to unparalleled success in this dynamic environment.

Software/Application

Linux, openstack, OvS Open vSwitch, OPEN DAYLIGHT, DPDK, .io, ADVA, pfsense, OpenWrt

Whitebox Solution

iEi × QNAP × ARMOR Link

100%-owned manufacturing in Taiwan and Shanghai

Software/Application Partner

IEI Whitebox Partners

NIC Module SoC Partners

CPU Partners

NIC Module SoC

10/100Mb   1G   2.5G   5G
10G   25G   40G   100G

intel partner Titanium, Mellanox TECHNOLOGIES, BROADCOM

CPU

x86 and RISC Based

NXP, intel partner Titanium, MARVELL, AMD

IEI Group Companies

Leveraging the collective strength of our group companies, we've established a technology-driven ecosystem. Our collaboration harnesses diverse expertise, ensuring readiness to deliver comprehensive Edge AI solutions. The IEI Group's key subsidiaries - QNAP Systems Inc., BriteMED Technology Inc., Xingwei Computer Co., Ltd., and Armorlink SH Corp. - specialize in cutting-edge offerings, including edge computing storage, intelligent medical systems, and advanced edge AI computing products and services. This synergy positions us at the forefront of innovation, ready to meet the evolving demands of our clients.

BriteMED Technology Inc.
Intelligent Medical System Provider

ArmorLink SH Corp.
Unique Electronic Manufacturing Service

XINGWEI COMPUTER CO., LTD.
Professional Chassis Manufacturer

QNAP Systems, Inc.
Leading Edge Computing Storage Provider

Founded in Taiwan 1997

Around 27 years world-class Leading Company

A pioneer since 1997, our Taiwan-based company excels in computing technologies with a formidable 1,000+ R&D team, dedicated to quality and longevity in product support, catering to dynamic client requirements.

27-YEAR	1,000 + R&D	100%	>3 YEARS
Expertise in Advanced Computing Solutions	Exceptional Engineering Excellence	In-House Manufacturing	Product Life Cycle Support

Manufacturing Excellence Across Borders

We stand at the forefront of innovation and quality in the manufacturing sector, with our roots deeply embedded in the technological powerhouses of Taiwan and China. Our dual manufacturing hubs are not just geographical locations; they represent our commitment to delivering unparalleled quality and cutting-edge solutions to our global clientele.
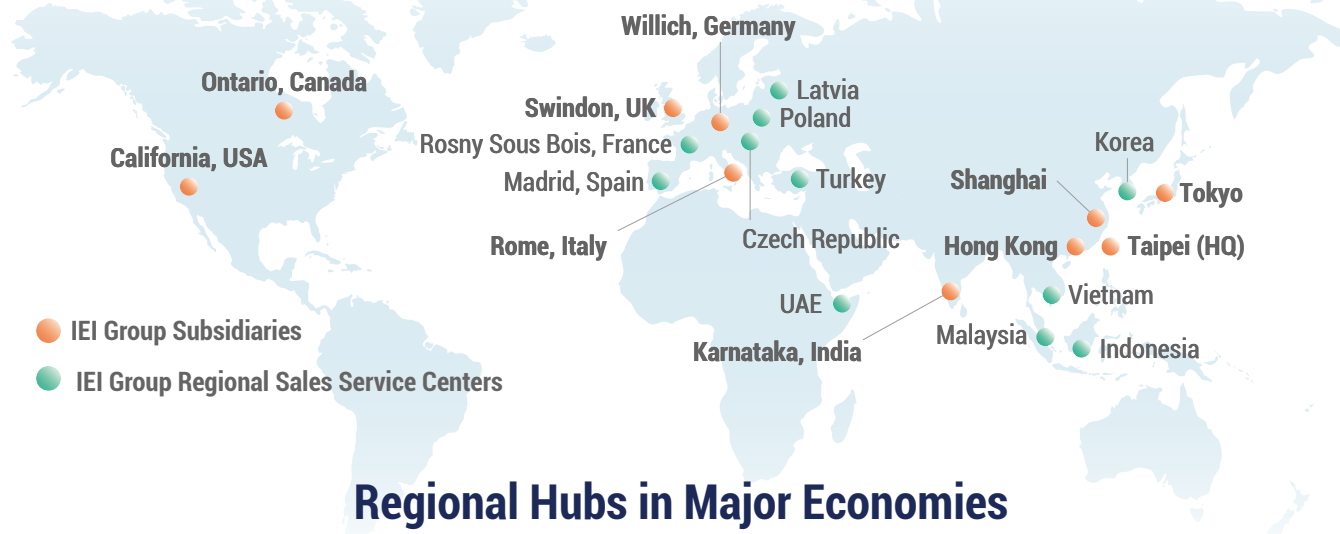
IEI Group Global Footprint

3 *Manufacturing Sites* **5** *Logistics Centers* **24** *Countries*

Willich, Germany

Ontario, Canada

Swindon, UK
Rosny Sous Bois, France
Madrid, Spain

Latvia
Poland

California, USA

Rome, Italy

Turkey

Czech Republic

Korea

Shanghai

Tokyo

Hong Kong

Taipei (HQ)

UAE

Vietnam

Karnataka, India

Malaysia

Indonesia

● IEI Group Subsidiaries

● IEI Group Regional Sales Service Centers

Regional Hubs in Major Economies

HQ, Taiwan

• ODM / OEM
• RD Center
• Manufacturing
• Logistics & RMA

China (Shanghai)

• ODM / OEM
• RD Center
• Manufacturing
• Logistics & RMA

USA (Los Angeles)

• ODM / OEM
• Logistics & RMA
• Technical Support

Japan (Tokyo)

• Technical Support

Germany (Willich)

• Logistics & RMA
• Technical Support

United Kingdom

• Logistics & RMA
• Technical Support

Seamless Warranty and Global Logistics Support

IEI provides a limited warranty with complimentary repairs and paid RMA for out-of-warranty items, based on condition and availability. The RMA system allows for RMA status tracking and repair reports.

Global Logistics Support

Leveraging IEI Group's expansive global footprint, we ensure swift local delivery and comprehensive customer support. Our mission extends beyond design and manufacturing; we prioritize accelerated distribution through our international logistics and regional service network, delivering your products rapidly to meet customer demands.

Commitment to ESG and International Quality Standards

Our Quality System, compliant with ISO 9001, encompasses all facets of our operation—from product design and component selection to manufacturing and customer service. This system, coupled with our certifications in ISO 13485, ISO 14001, ISO 45001, IECQ QC 080000, and ISO 14064, exemplifies our holistic commitment to quality and sustainability.

Tailored Design Service

**One Stop Networking OEM/ODM/EMS Partner:
Pioneering Quality, Innovation, and Efficiency**

1 Design

- Customized network appliance/server designed to meet specific feature requirements
- Customizable form factors
- Customizable NIC & peripheral modules
- Run-In customer's test kit

3 Services

- Tailored branding, packing & logistics
- Extended warranty service
- Longevity service
- Strict revision control
- Configure-to-order and design-to-order service

As a premier provider for top-tier networking and security service customers, we deliver customized design solutions encompassing Hardware, Software, Mechanical Engineering, Industrial Design, Validation, Certification, and Manufacturing. We are committed to providing a one-stop solution and empowering our clients with the most innovative designs and world-class product quality, ensuring every product we touch is destined for success.

2 *Faster Integration*

- Desired enclosure, mechanical and ID design
- Application specific performance optimization
- Customized BIOS/OS/software
- System engineering expert group

4 *Advanced Manufacturing*

- High-mix, low-volume (HMLV) production
- In-house state of the art SMT, DIP, assembly and testing facilities
- 3D X-Ray CT inspection
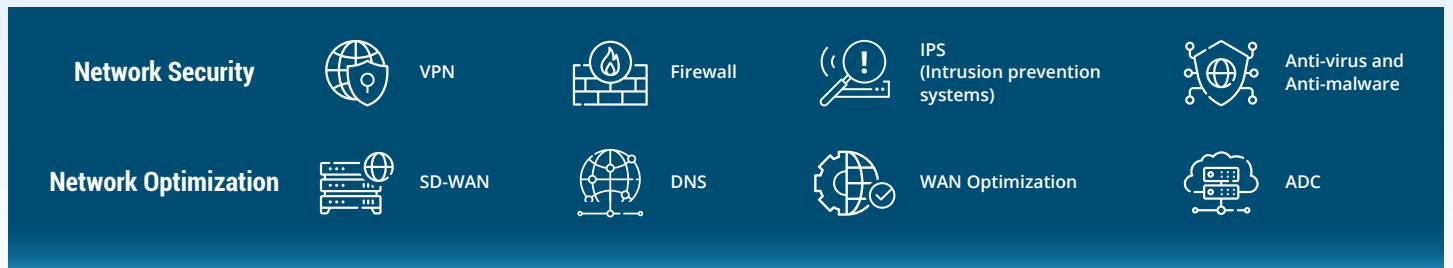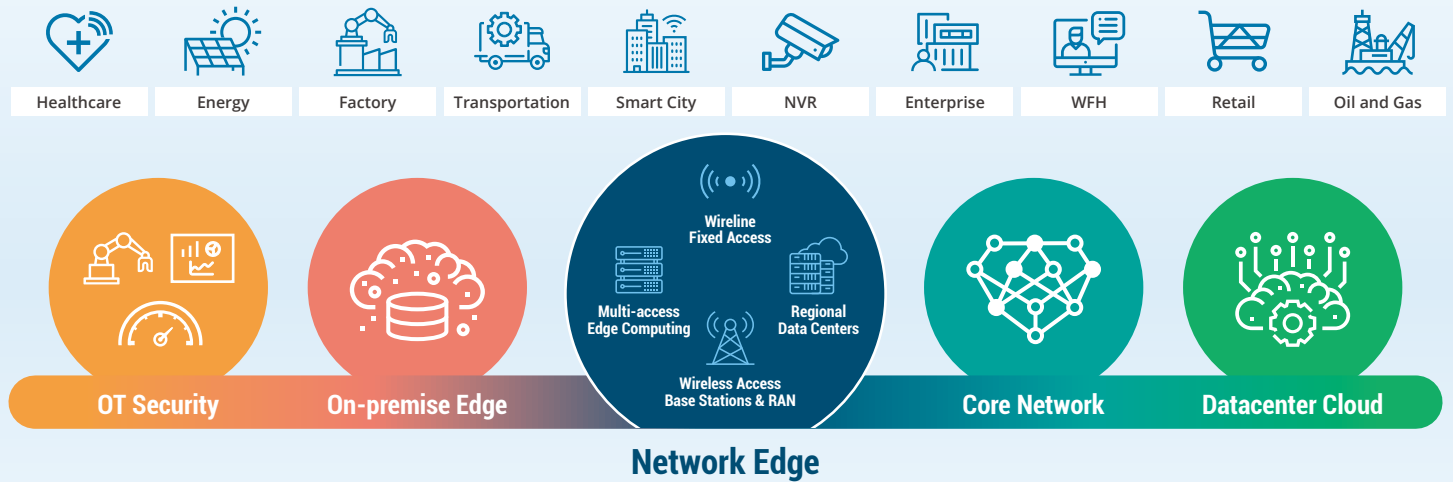- Double side auto-optical inspection

IEI Universal CPE Solutions

In today's digital age, the convergence of operational, informational, and communications technologies, propelled by application virtualization, is leading to the creation of an AI-driven, software-defined network infrastructure. This infrastructure promises unparalleled agility and configurability. IEI Network Appliances provide a robust and open foundation for both service providers and enterprises, enabling them to deploy agile and secure network services that move beyond traditional, rigid architectures.

Our scalable solutions, from edge to cloud, incorporate the latest in computing and networking technologies. These platforms are optimized for widespread deployment, supporting popular solutions like SD-WAN, SASE, security, and uCPE software from leading partners in the ecosystem. We are committed to building an open infrastructure poised to support microservices that can scale efficiently, from small branch offices to medium-sized businesses, all the way up to large enterprises and service provider networks. This ensures that our clients can enjoy a future-proof network that adapts to their evolving needs.

Empowering Next-Gen Networks: IEI's Advanced uCPE Appliance Solutions

IEI's uCPE network appliance range offers a versatile and powerful solution tailored for modern network environments, built on power-efficient ARM-based and x86 processors ranging from 2 to over 100 cores, enabling maximum throughputs of up to 800+ Gbps. With its feature flexibility and multiple configurations across various price points, these appliances support optional networking modules for a broad range of WAN connectivity, including hybrid 5G, 4G LTE, WiFi 6/6E/7, and scalable NIC module options for network bandwidth. Security is enhanced through Intel® Quick Assist Technology on Intel® platforms. High-end platforms are designed for high-availability networks, featuring fail-safe redundancy and advanced remote management features, providing a robust, scalable, and secure networking solution for any enterprise need.

Healthcare	Energy	Factory	Transportation	Smart City	NVR	Enterprise	WFH	Retail	Oil and Gas

OT Security | **On-premise Edge** | Wireline Fixed Access / Multi-access Edge Computing / Regional Data Centers / Wireless Access Base Stations & RAN | **Core Network** | **Datacenter Cloud**

Network Edge

Network Security	VPN	Firewall	IPS (Intrusion prevention systems)	Anti-virus and Anti-malware
Network Optimization	SD-WAN	DNS	WAN Optimization	ADC

IEI Universal CPE Platform

IEI Storage Server

ARM-Based Network Appliance	**Entry-Level Network Appliance**	**Performance Network Appliances**	**Premium Network Appliance**		**Universal Storage Server**
PUZZLE-100 series	PUZZLE-3000 series	PUZZLE-5000 series	PUZZLE-7000 series	PUZZLE-9030 series	Grand-GL series
PUZZLE-200 series	PUZZLE-IN003 series	PUZZLE-IN001 series	PUZZLE-IN004 series	PUZZLE-9040 series	Grand-RE series
PUZZLE-M series		PUZZLE-IN002 series	PUZZLE-IN005 series		

Maximizing Efficiency and Flexibility with uCPE Solutions

uCPE consists of virtual network functions (VNFs) running on a standard operating system hosted on an open server with NFV technology. Now with NFV technology, we can create several virtual machines and install these VNFs in a x86 or ARM based uCPE. VNFs could include popular software services such as a virtual firewall, virtual load-balancing, or other software-defined wide area network (SD-WAN) service. Besides, with NFV orchestration, uCPE could serve as an edge computing system or an AI inference computing system.

Lower Power Consumption

uCPE can run several VNFs to build up a network environment instead of running several physical network appliances. Running an uCPE can save energy.

Lower Capital and Operating Expenses

Minimize the consumption of both Capital Expenditures (CapEx) and Operating Expenses (OpEx), including management time and effort, maintenance, contracts, etc.

Various Solutions

The true value of openness comes from being able to combine a mix of open source and proprietary software components to deliver an innovative service.

Standard Hardware

Service providers simplify customer site deployments by using a panoply of dedicated appliances with VNFs running on a single universal platform.

Open Source Software

Open source software reduces time to market and the risk of vendor lock-in.

uCPE

Flexible

The uCPE helps service providers and their customers from suffering hardware vendor lock-in. It creates the flexibility of manageability through NFV.

Network Security Appliances

As technology evolves, so do cybersecurity trends, with data breaches, ransomware attacks, and hacks becoming increasingly commonplace. AI plays a crucial role in enhancing network security by analyzing data to identify threats, automating tasks, and providing real-time insights into global threats, thus strengthening defenses.

Our network appliance solutions, the IEI PUZZLE series, support digital transformation across various industries and environments, playing a key role in SD-WAN deployment, network security, edge computing, and data center operations. Our range includes versatile platforms, from budget-friendly, compact tabletop solutions to high-performance 1U rackmount servers and scalable 2U systems, meeting the needs of businesses and service providers of all sizes, and supporting critical applications from data center operations to edge computing.

Alliance Partners
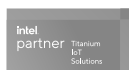
Typical Use Case

OT Cyber Security

Our solution enhances OT asset visibility, enabling improved management and reduction of cyber risks through strategic identification, prioritization, and collaboration between IT and OT security teams.
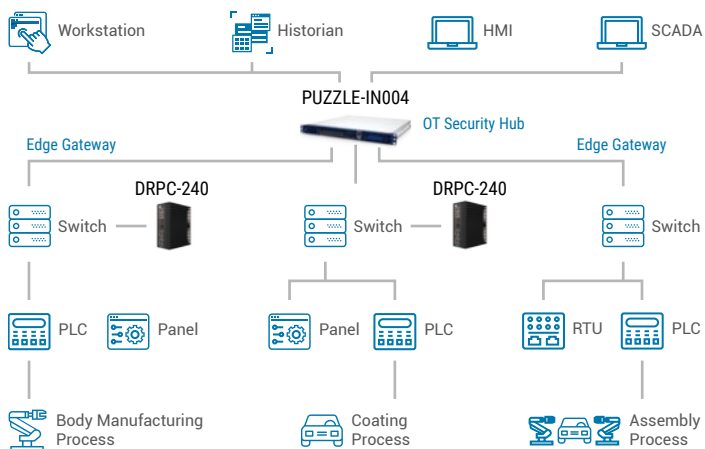
Next Generation Firewall (NGFW)

NGFWs and traditional firewalls both protect an organization's network and data. However, a crucial difference is that NGFWs offer deep packet inspection beyond simple port and protocol analysis by examining the data within network packets as well.
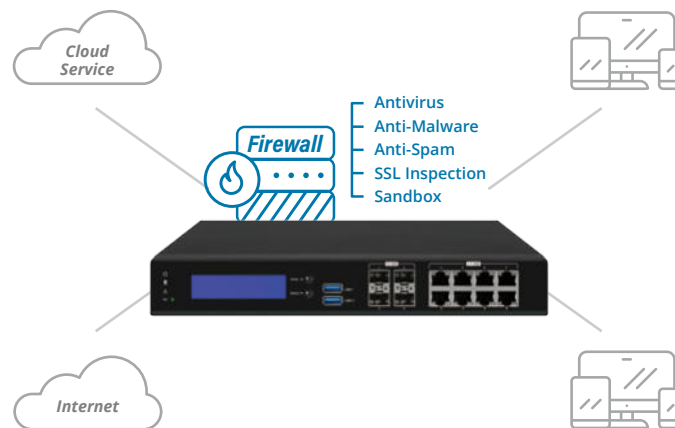
Virtualized High-Performance Computing (HPC)

The high-performance appliances enable the virtualization of HPC workloads on shared infrastructure, offering flexibility, efficiency, and high performance with their dual CPUs, high network capacity, and ample memory, facilitating cluster computing for enhanced resource utilization.
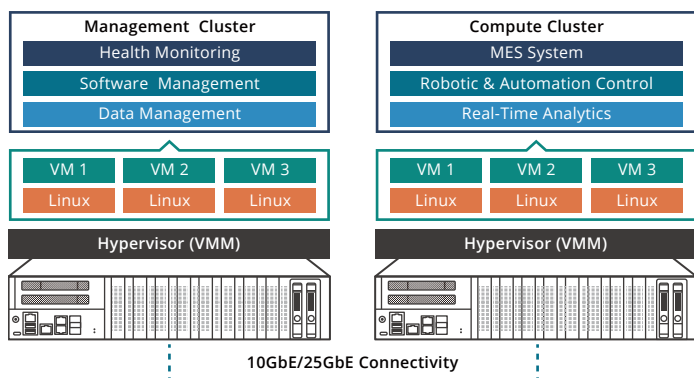
IDS & IPS

An IDS (Intrusion Detection System) monitors network traffic for suspicious activity and alerts administrators without taking any action. An IPS (Intrusion Prevention System), a subset of IDS, not only detects but also blocks potential threats to prevent attacks.
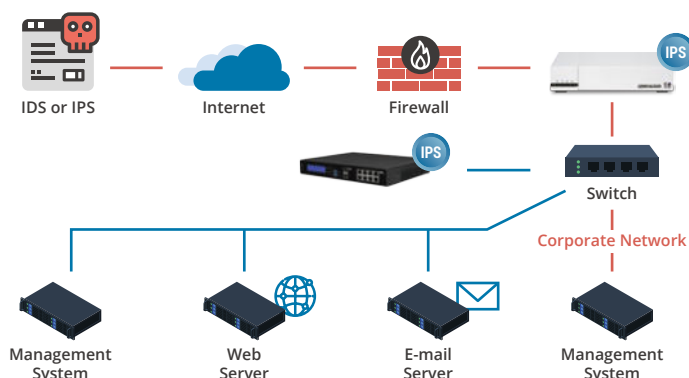
Enterprise Servers

The IEI PUZZLE-9000 series is a highly configurable and powerful solution that supports both AMD and Intel® Xeon® processors. It utilizes OCP 3.0 to enhance network bandwidth. Designed for compute-intensive HPC (High Performance Computing) and AI (Artificial Intelligence) use cases, it efficiently addresses complex IT challenges.

Applications Include:

- Virtualized high-performance computing (HPC)
- Hyperconverged infrastructure & MEC
- Machine learning (ML) & deep learning
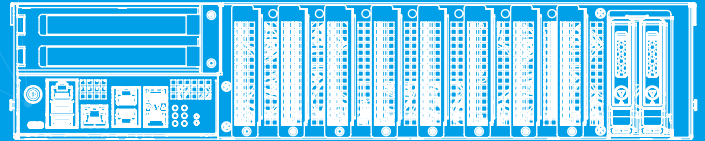
System Solutions

PUZZLE-9040

Dual 4th Gen Intel® Xeon® Scalable processors

PUZZLE-9030

Dual 3rd Gen AMD EPYC™ processors

Boost Performance

Dual socket servers merge cost-efficiency and high performance for data-intensive tasks, virtualization, and HPC, fitting up to 112 cores in a 2U design for advanced business needs.

Purpose-Built Modularity

Our modular design speeds up new model launches, offering TPM, BMC 2.0, and OCP 3.0 modules for flexible system configurations across different applications.

Easy-to-Manage

IEI's BMC module console, iRIS2, offers remote management, working independently from the OS to enable efficient service delivery across locations without on-site device management.
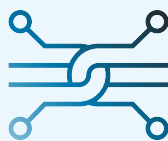
Fast and Reliable Connection

IEI's high-performance servers are meticulously designed to meet the needs of future technologies. They provide users with a fast and reliable connection, ensuring impeccable signal integrity for PCIe 5.0 in the networking bandwidth expansion.

High-Availabilities

Supports critical component failure, such as PSUs or fans, and hot-swappable FRUs, with remote updates via BMC (BMC v2.0) and KVM to minimize downtime, service disruptions, and loss of data, revenue, and customers.

Key Features

Expandable Network Bandwidth Compliant with OCP 3.0

A tool-less design featuring a clipping mechanism allows for quick NIC module installation. PCIe Gen5 slots offer up to 200 Gbps for high-speed, low-latency applications, and a smart NIC reduces CPU utilization and enhances responsiveness. Together, these improve system efficiency and scalability.
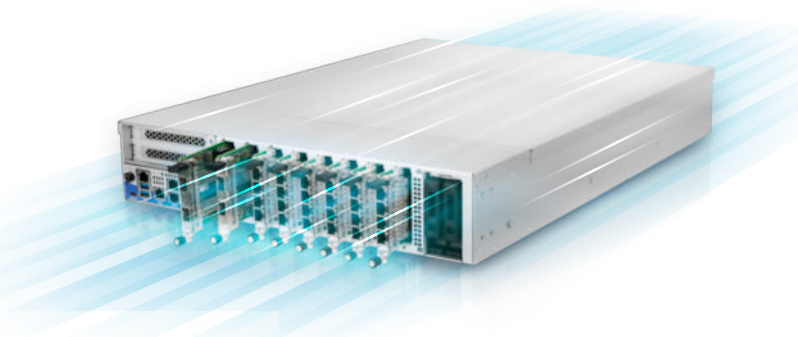
Boosting AI Workloads With Enhanced Performance

Our servers feature PCIe slots with PCIe x16 bandwidth, broadening the array of I/O, offloading, and acceleration options. This design capitalizes on GPU and FPGA cards, enhancing both cloud and on-premise data center capabilities.

Unlocking Ultra-Fast Data Transfer Speeds with PCIe 5.0 Technology

A PCIe 5.0 x16 slot can provide up to 128 GB/s of bandwidth, double that of a PCIe Gen4 x16 slot. For high-end networking, such as 400 Gb Ethernet solutions, PCIe 5.0 operates with full duplex transmissions and offers up to 128 GB/s in bandwidth.
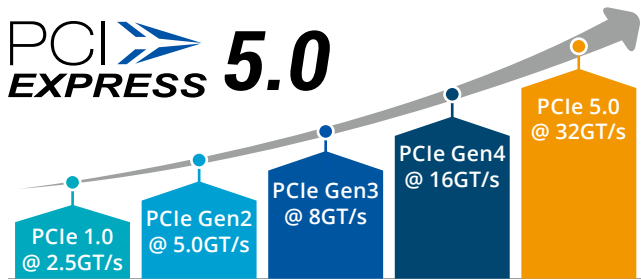
10GbE SFP+ Fast and Reliable Connectivity

Featuring 10GbE SFP+ ports, this appliance offers fast, low-latency connectivity and flexibility for diverse networking needs, ensuring efficient, reliable high-speed data transfer and communication.

PCI EXPRESS 5.0

- PCIe 1.0 @ 2.5GT/s
- PCIe Gen2 @ 5.0GT/s
- PCIe Gen3 @ 8GT/s
- PCIe Gen4 @ 16GT/s
- PCIe 5.0 @ 32GT/s

10GbE SFP+

2.5 GbE — 10 GbE

- Network Infrastructure
- Real-time Analytics
- Virtual Machines
- Data Center Administration
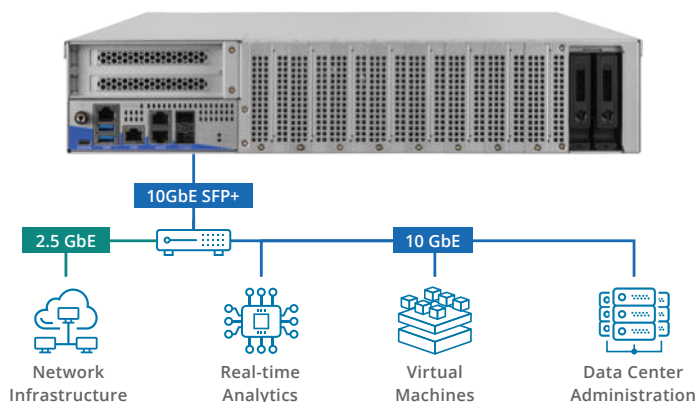
Ensuring Uninterrupted Operations with 1+1 Redundancy

A 1+1 redundant power supply ensures that if one power source fails, the other can immediately take over, maintaining continuous operation. This significantly reduces the risk of downtime.
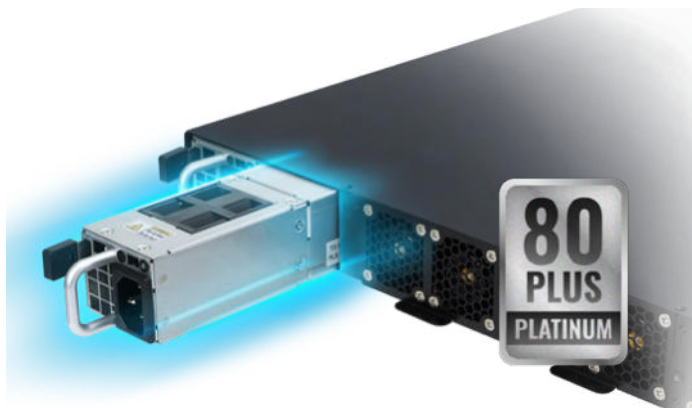
Hot-Swap Fan Modules Minimize Downtime

Hot-swap capability enables fan module replacement or maintenance without system shutdown, ensuring continuous operation and reduced downtime, crucial for mission-critical applications.

80 PLUS PLATINUM

Simplify Remote Server Management

Provides consistent systems management capabilities across heterogeneous infrastructure through multiple interfaces, including BMC, and a web-based user interface.

BMC can detect hardware status and events, perform server power operations and access server console via graphic/text mode with virtual media capability to make remote server management easy in a standard way.

iMAN Cloud Service Portal	IEI Out-Of-Band Remote Control Module	iRIS2 Connector

DDR4 256MB

Aspeed 2600

USB 2.0
PCIe
LPC
SMBUS
SPI

Ethernet

IEI Network Appliance

Health Status Monitoring

Device Monitoring

Alert Notification

Collecting Logs

Remote Control

Enforcement Shutdown/Reboot

Reboot & Power Cycling

Remote KVM

SOL (Serial-over-LAN)

Software Remote Update

Operating System Recovery

BIOS/ FW Update

Scalable Storage Solution

This server utilizes a scalable storage solution, offering maximum efficiency and flexibility for data centers. It supports industry-standard SATA/NVMe/U.2 interfaces, enhancing connectivity and security.

U.2 NVMe SSD
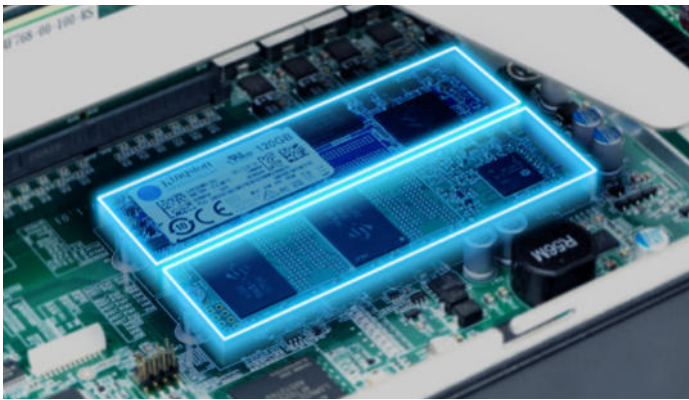
Application Note

AI Computing & Machine Learning (ML)

Data Analysis

Model Training

Data Processing

AI

Model Inference

System Requirements

- High-performance GPU server for data insights and smart management
- Reliable, stable operations

Why IEI Network Appliance

- Reliable networks to ensure non-stop operations
- Premium products and expert system design for industrial applications
- Provides product longevity, product support, worldwide logistics, and an extendable warranty for certain key components.

Premium Network Appliances

The premium-performance rackmount network appliances feature the latest server-grade Intel® Xeon® D and Intel® Xeon® Scalable processors, ideal for enterprise networks and cloud infrastructures. These appliances offer high expandability, scaling throughputs, and a variety of copper, fiber, and bypass Ethernet ports through optional 1GbE/10GbE/25GbE/100GbE NIC modules.

Applications Include:

- NGFW
- Telecom
- 5G MEC
- AI

System Solutions

PUZZLE-7050
NEW

4th Gen AMD EPYC™ Siena processors, 2 x GbE RJ45, 2 x OCP 3.0 NIC slots

PUZZLE-7030A

Intel® Xeon® D-1700 series, 8 x 2.5 GbE RJ45, 5 x 10GbE SFP+, 1 x OCP 3.0 NIC slot

PUZZLE-IN004

Intel® Xeon® D-2100NT series, 4 x 10Gbps SFP+, 8 x GbE RJ45

PUZZLE-IN005

Dual 3rd Gen Intel® Xeon® Scalable processors, 8 x NIC slots

Key Features

Intel® Xeon® D and Intel® Xeon® Scalable CPU

The solution features the latest server-grade processors, optimized to offer high throughputs and function as next-generation firewalls deployed in enterprise networks and cloud infrastructures.

Intel® Xeon® Scalable Processors | Intel® Xeon® D Processor | Intel® Atom® C3000 Processor

PERFORMANCE ← → LOW POWER

AMD EPYC™ 8004 Series

The latest 8004 series surpasses previous EPYC™ models in both performance per watt and performance per dollar, all while preserving hallmark EPYC™ functionalities such as multithreading capability, PCIe 5.0 support, and DDR5 memory support.

Model	Cores/Threads	Frequency (GHZ)	Boost Frequency (GHZ)
8534P	64/128	2.30	3.10
8434P	48/96	2.50	3.10
8324P	32/64	2.65	3.00
8224P	24/48	2.55	3.00
8124P	16/32	2.45	3.00
8024P	8/16	2.40	3.00

Hot-swappable SSD

High reliability design is a very important factor for network service. The hot-swap is desirable to change the configuration or repair a working system without interrupting its operation.

Reduced Deployment Risk with Pre-validation

IEI's certified uCPE platforms deliver optimized performance, avoid vendor lock-in, and ensure seamless integration, meeting modern network demands efficiently.

Performance Network Appliances

The low-profile 1U rackmount network appliances are ideally suited for deployment in various security applications, such as firewalls, VPNs, and UTMs, tailored for the needs of medium-sized enterprises. These appliances also boast additional redundancy features, including hot-swappable power supply units (PSUs) and LAN bypass, as well as multiple Network Module Slots (NMS) for flexible port configurations.

Applications Include:

- Cybersecurity
- Telecom
- 5G MEC
- AI

System Solutions

PUZZLE-5060

NEW

AMD Ryzen 8000 processor,
8 x 1GbE RJ45, 2 x NIC slots

PUZZLE-5050

NEW

13th Gen Intel® Core™ processors,
8 x 1GbE RJ45, 2 x NIC slots

PUZZLE-5030

Intel® Xeon® E processors,
8 x 2.5GbE RJ45, 2 x NIC slots

PUZZLE-IN002

9th Gen Intel® Core™ processors,
6 x 1GbE RJ45

PUZZLE-IN001A

Intel® Xeon® E/9th Gen Intel®
Core™ processors,
8 x 5GbE RJ45, 2 x NIC slots

PUZZLE-IN001

Intel® Xeon® E / 9th Gen Intel® Core™
processors, 8 x 1GbE RJ45,
2 x NIC slots

Key Features

Intel® Core™ and Xeon® CPU

Designed to redefine efficiency, these cutting-edge units are optimized to deliver exceptional throughputs, making them the perfect choice for next-generation firewalls in enterprise networks and cloud infrastructures.

AMD Ryzen™ 8000 Series CPU

The AMD Ryzen™ Embedded 8000 Series enhances AI industrial tasks with superior performance and integration, while AMD Ryzen™ processors (6-8 cores) boost efficiency and productivity across diverse workloads, from virtualization to big data.

LAN Bypass

As enterprise applications and server solutions require 24/7 year-round resilience and constant operation, reliability plays a key role in business-driven network. The PUZZLE-5030 comes with two pairs of LAN bypass that ensures fail-safe and uninterrupted network connection.
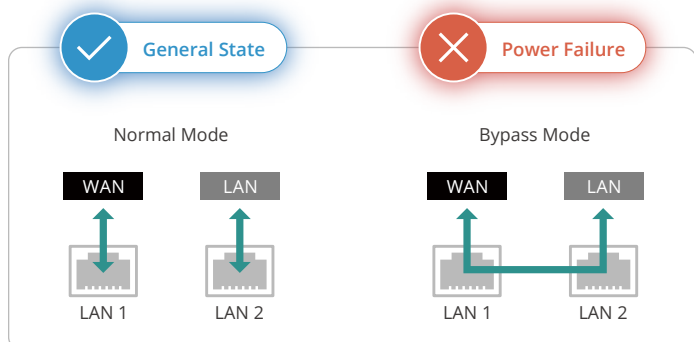
Bypass-enabled function allows two LAN ports to be linked together to shunt network traffic, hence important traffic flow where contains critical business data can continue without interruption when one of these LAN ports fails due to power outage or system failure.

1 GbE, 2.5 GbE and 10 GbE LAN ports with one pair bypass function
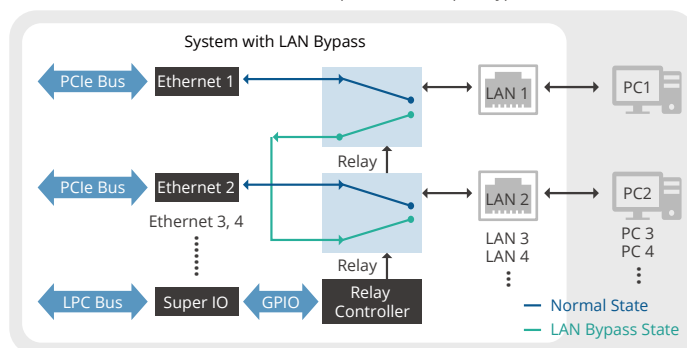
Open Source Software Supported

The PUZZLE-IN002 supports open-source software such as pfSense® and OPNsense®, making it an ideal choice for a wide range of network applications, including, but not limited to, unified threat management, firewall, router, and VPN appliance.

Scalable Network Bandwidth

Elevate network performance with IEI's PulM series modules, designed for advanced packet processing in DPI, IPS/IDS, and WAN optimization. Select from over 23 Ethernet modules, including RJ45, fiber, and bypass options, with speeds from 1GbE to 100GbE, to meet diverse network demands with professional-grade efficiency and reliability.

Application Note

Next Generation Firewall Enterprise Branch Secure SD-WAN

System Requirements

- Reliable networks to ensure non-stop operations
- Support for monitoring through a SCADA/HMI
- Compact enough to deploy into confined space

Why IEI Network Appliance

- Reliable networks to ensure non-stop operations
- Support for monitoring through a SCADA/HMI
- Provides product longevity product support, worldwide logistics, and an extendable warranty for certain key components
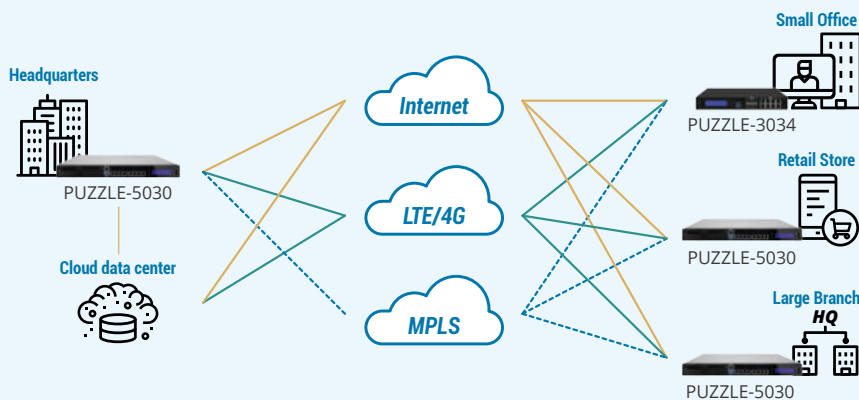
Entry Level Network Appliances

Engineered for optimal cost-performance value and eco-friendliness, our compact, fanless network devices excel in noise-sensitive and space-constrained environments.

Applications Include:

- Edge deployments, branch offices and retail settings
- Routers, firewalls, or wireless access points for home or small office

System Solutions

PUZZLE-3034

Intel® Atom® C3758R processor, 8 x 2.5GbE and 4 x 10GbE

PUZZLE-3032

Intel® Atom® C3558R processor, 8 x 2.5GbE and 2 x 10GbE

PUZZLE-IN003B

Intel® Atom® C3758/C3558 processor, 6 x 1GbE, 2 x 10GbE

PUZZLE-IN003A

Intel® Atom® C3558/C3336 processor, 8 x 1GbE onboard with 2 bypass segments

Key Features

Power Efficient Performance

IEI meets the demand for efficient, secure network edges with the latest Intel® Atom® processors, supplying security gateways/UTM/SD-WAN/uCPE for SMBs and branch networks.

Multi-Gigabit: 2.5GbE and 10GbE

Featuring 2.5GbE and 10GbE SFP+ ports, it delivers up to 10x the throughput of 1GbE, boosting network capabilities in virtualization environments.

	CAT 5e	CAT 6	CAT 6A
1G	√	√	√
2.5G	√	√	√
5G	√	√	√
10G	X	√ 55m	√

10 GbE Connection

2.5 GbE Connection

Intel® QAT for Network Acceleration

Powered by Intel® QuickAssist Technology, it boosts encryption and compression, enhancing network device performance and efficiency, saving time, bandwidth, and CPU cycles.

Integrated Accelerator & PCH

Intel® QuickAssist Technology	USB 3
Crypto	SATA 3
Compression	GPIO
	SPI & eSPI
	x1 GbE
10 GbE/1 GbE Ports	SMBus
	Innovation Engine (IE)
	PCIe Gen3 Root

Multiple Expansion Options

Compact with one M.2 2242 and dual M.2 2280 NVMe SSD slots for speedy file access, efficient data processing, and storage expansion.
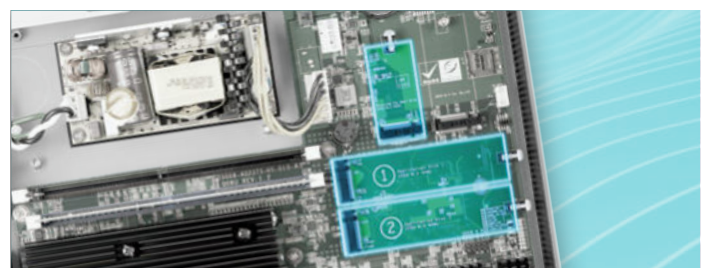
ARM-Based Network Appliances

Our ARM-based network security appliances, designed for SOHO, SMB, and virtualized networks, are both energy-efficient and cost-effective, offering sophisticated, customized solutions.

Applications Include:

- Security gateway
- Packet processing
- UTM

System Solutions

PUZZLE-200

NEW

Marvell® CN10208 processor

PUZZLE-100

Marvell® ARMADA® 7040 processor

PUZZLE-M901

Marvell® CN9130 processor, 6 x 2.5GbE RJ45

PUZZLE-M902

Marvell® CN9130 processor 3 x 10GbE RJ-45, 6 x 2.5GbE RJ45

PUZZLE-M801

Marvell® Armada® 8040 processor, 2 x 10GbE SFP+, 4 x GbE RJ45

Key Features

Energy Efficiency CPU Engine

IEI's Marvell® family appliances, featuring ARM-based architecture, enhance performance and efficiency across various applications such as firewalls, gateways, and SD-WANs. They offer high-bandwidth, low-latency solutions for modern, adaptable networking.

Compact Size, Easy for Deployment

Its compact design optimizes space, making it an appealing solution for small and medium-sized businesses (SMBs) with limited office space.

MARVELL™

Software-Ready Router Solution

The PUZZLE-M900 series come with OpenWrt, an OS primarily made for embedded networking devices. With OpenWrt, the PUZZLE-M900 series offer the ability to fully customize devices in ways not possible with other replacement router firmware.

Department Router Scenario
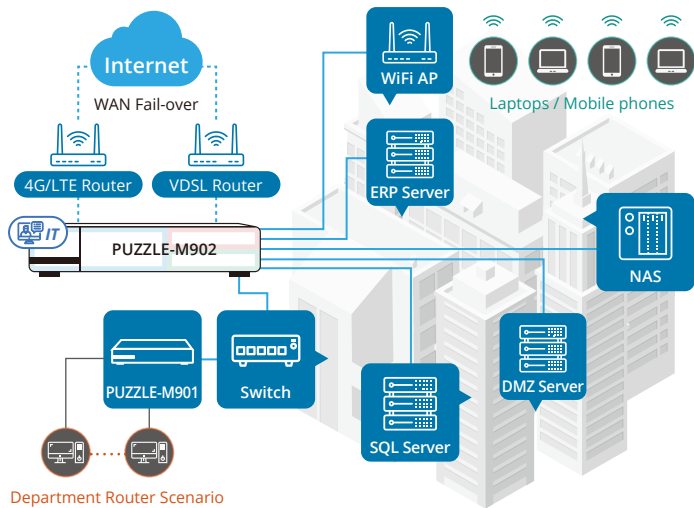
Pre-installed OpenWrt, Make Security Configuration Easier than Ever

Powered by OpenWrt, the PUZZLE-M900 series provide a user-friendly web interface, a clear dashboard and port indicators to help you handle daily network management tasks. Users can not only efficiently manage all connected wires through OpenWrt OS in real time, but also configure firewall, VPN, security and advanced network functions.
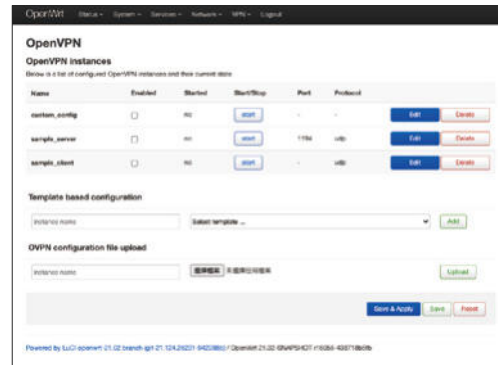
Application Note

## Next Generation Firewall Enterprise Branch Secure SD-WAN

Network Requirements

- Reliable networks to ensure non-stop operations
- Cost-efficient solution
- Compact enough to deploy into confined space

Why IEI Network Appliance

- High-quality products and technical expertise in industrial level system design
- Offer a custom solution co-validated with customers' products, including options for BIOS and logo customization, label integration, and EMC/safety testing.
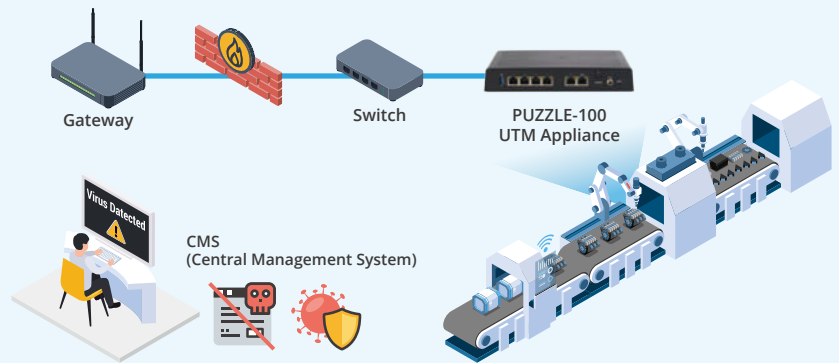
Network Expansion Modules

IEI offers a variety of Ethernet NIC modules from Intel and Mellanox, designed to meet various needs and bandwidths from 1 Gigabit Ethernet (1GbE) to 100 Gigabit Ethernet (100GbE), ensuring high-performance connectivity and acceleration in industrial and telecom settings.

• Networking – 1GbE, 10GbE, 25GbE, 40GbE/100GbE options
• Networking Interface - RJ45/SFP/SFP+/SFP28/QSFP+/QSFP28
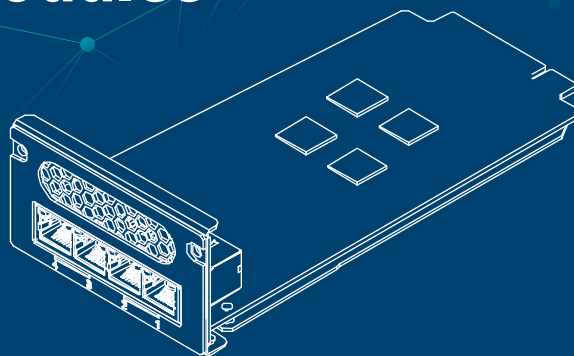
The NIC modules are named with the format "PuIM" followed by the bandwidth and model number, and some have additional identifiers like "SF" for single-fiber, "MLX" likely indicating Mellanox, and "BCM" for Broadcom modules. The network flow is visually represented, starting from the 100GbE module down to 1GbE, suggesting a hierarchy of network speeds or a potential pathway of data transmission through different network interface cards (NICs).

100GbE	40GbE	10GbE	1GbE
intel.	**intel.**	**intel.**	**intel.**
Intel	**Intel**	**Intel**	**Intel**
PuIM-100G2SF-E810	PuIM-40G2SF-XL710	PuIM-10G2SF-X710 PuIM-10G4SF-XL710 PuIM-10G4SF-XL710-BP	PuIM-1G4T-I350 PuIM-1G4T-I350-BP PuIM-1G8T-I350 PuIM-1G8T-I350-BP PuIM-1G4SF-I350 PuIM-1G8SF-I350

Key Features

Dual BIOS

Slot A   Slot B

CONSOLE   USB   Puzzle ∞   iEi

One PCIe x8 or
Two PCIe x4

CPU — DMI GEN3 x4 — PCH

Four PCIe x2 or
Two PCIe x4

Slot A
PCIe Configuration
x8
x4   x4

Slot B
PCIe Configuration
x2 x2 x2 x2
x4   x4

A   A32   A19

B   A32   A19

A19	A32	PCIe Config.	Slot
0	0	4x2	B
0	1	2x4	A & B
1	0	1x8	A

Uninterrupted Data Transmission - Bypass Function

✅ **General State**
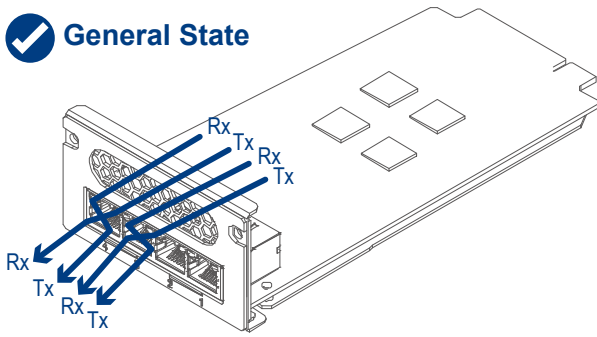
❌ **Power Failure or Shutdown**
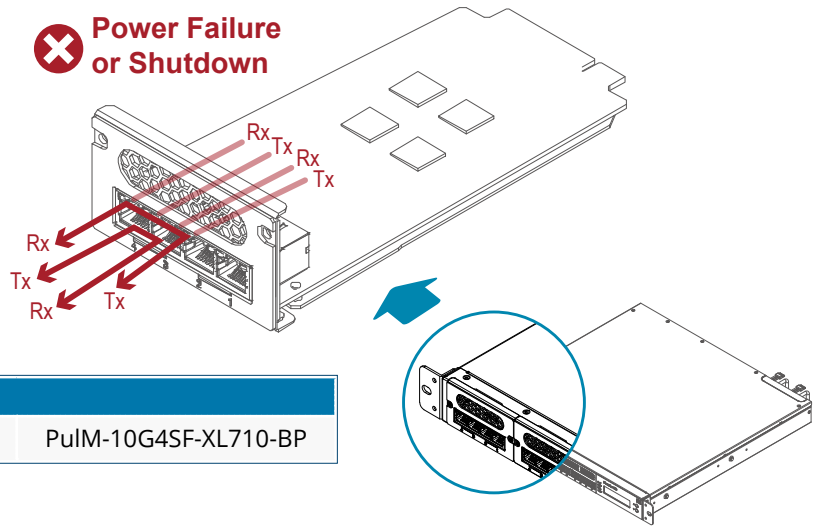
Supported NIC Modules		
PulM-1G4T-I350-BP	PulM-1G8T-I350-BP	PulM-10G4SF-XL710-BP

Bypass Configuration in BIOS

Some PulM modules support bypass. To enable/disable bypass function, configure the BIOS menu of the PUZZLE series as described below.

Step 1 Go to Chipset › PCH - I/O Configuration › NETWORK Configuration (Bypass Setting)

```
Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
 Chipset

PCH-IO Configuration                              Select AC power state
                                                  when power is re-
Auto Power Button Status      [Disable (ATX)]     applied after a power
Status                                            failure.
Restore AC Power Loss         [Last State]
                                                  --------------------
> PCI Express Configuration                       →←: Select Screen
> SATA And RST Configuration                      ↑↓: Select Item
> NETWORK Configuration (ByPass Setting)          Enter: Select
                                                  +/-: Change Opt.
M.2 B Key (M2_1)              [SATA]              F1:  General Help
Device selection                                  F2:  Previous Values
                                                  F3:  Optimized
Module B Configuration        [PCIEx4 x 2]        Defaults
                                                  F4:  Save & Exit
                                                  ESC: Exit

       Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Step 2 The Network ByPass Setting menu appears. The model names of the PulM module installed in the PUZZLE series are shown.

```
Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
 Chipset

Network ByPass setting                            Switch all ByPass Mode
                                                  to Enable/Disable
Slot_A Model Name             Not Installed       after power on.
Power_ON ByPass Mode          [Disabled]
Power_OFF ByPass Mode         [Enabled]
                                                  --------------------
Slot_B Model Name             PulM-1G4T-I211-BP   →←: Select Screen
Power_ON ByPass Mode          [Disabled]          ↑↓: Select Item
Power_OFF ByPass Mode         [Enabled]           Enter: Select
                                                  +/-: Change Opt.
                                                  F1:  General Help
                                                  F2:  Previous Values
                                                  F3:  Optimized
                                                  Defaults
                                                  F4:  Save & Exit
                                                  ESC: Exit

       Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Step 3 Configure the Power_ON ByPass Mode and the Power_OFF ByPass Mode BIOS options to enable/ disable bypass function of the installed PulM modules.

PUZZLE System	Power_ON Bypass Mode		Power_OFF Bypass Mode	
BIOS Setting	Disabled	Enabled	Disabled	Enabled
PulM Bypass Modules	Close	Open	Close	Open

```
Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
 Chipset

Network ByPass setting                            Switch all ByPass Mode
                                                  to Enable/Disable
Slot_A Model Name             PulM-10G4SF-XL710   after power on.
Power_ON ByPass Mode          [Disabled]
Power_OFF ByPass Mode         [Enabled]
                                                  --------------------
Slot_B Model Name        ┌─── Power_ON ByPass ───┐  →←: Select Screen
Power_ON ByPass Mode     │ Disabled              │  ↑↓: Select Item
Power_OFF ByPass Mode    │ Enabled               │  Enter: Select
                         └───────────────────────┘  +/-: Change Opt.
                                                  F1:  General Help
                                                  F2:  Previous Values
                                                  F3:  Optimized
                                                  Defaults
                                                  F4:  Save & Exit
                                                  ESC: Exit

       Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

Step 4 Press F4 to save and exit the BIOS menu. The PUZZLE series will reboot with the new settings.

Storage Servers

Perform High Reliability with Flexible Scalability

IEI provides high-reliability rackmount enterprise storage server systems that support multiple OS. Our storage server series, available in 1U and 2U form factors, accommodate 4 to 8 drive bays.

Applications Include:

- Software-defined Storage (SDS)
- Big Data
- Cloud Hosting Workloads
- Backup Server
- Multimedia Server

System Solutions

GRAND-GL

Intel® Celeron® N5105 processor,
1U 4-bay SATA

GRAND-RE

AMD Ryzen™ Embedded V1500B processor,
2U 8-bay SATA

2.5 GbE Network

No more bandwidth restriction by 1GbE interface! No more DIY to install the 2.5GbE driver to your system from other venders!! GRAND series is equipped with 2 independent 2.5GbE NICs for faster and smoother multi-device networking experience.

	CAT 5e	CAT 6	CAT 6A
100M	√	√	√
1G	√	√	√
2.5G	√	√	√
5G	√	√	√
10G	X	√ (55m)	√

Software RAID Support

It is a hardware independent and efficient way to use software RAID with OS support. Software RAID function is already built in Windows storage system and Windows 10. It is also easy to get open source support for Linux system. Additionally, there is no extra charge for RAID functionality and the data can be moved to upgraded system without any compatibility limitation between hardware RAID controller and Chipsets. Data can also be easily moved to the best and most current software controlling system with constantly upgraded software technology. The read/write speeds are highly relying on CPU performance and still fast on our latest and powerful storage server system.

Extend Functionality with a PCIe Card

The equipped PCIe expansion slot provides flexibility in extending storage server functionality and potential applications. Install a QNAP QM2 card to provide M.2 SSD caching/10GbE connectivity, or use the GRAND as a wireless access point by installing a compatible wireless network card, or boost the USB connectivity of the GRAND by installing a USB 3.2 Gen2 10Gbps card.

NEW

		PUZZLE-9040	PUZZLE-9030	PUZZLE-7050
Platform	Form Factor	2U	1U	1U rackmount
	CPU	2 x 4th Gen Intel® Xeon® Scalable processors (Code Name: Sapphire Rapids) Supporting TDP 350W	2 x AMD EPYC™ Milan Series	1 x 4th Gen AMD EPYC™ 8004 Series Processor
	Chipset	Intel® C741	Integrated in CPU	Integrated in CPU
Memory	Memory Technology	16 x DDR5 4800MHz ECC RDIMM Slot	ECC & Register DDR4 3200 MHz memory, up to 256GB per DIMM	12 x DDR5 up to 4800MHz ECC RDIMM Slots (6 channels)
	Memory Capacity	Based on DIMM capacity	RDIMM/LRDIMM: up to 4TB	Based on DIMM capacity
	Memory Socket	16 x 288-pin DDR5 DIMM	16 x 288-pin DIMM (8 DIMM/CPU) (8 channels)	12 x 288-pin DDR5 DIMM
Network and Security	Network Acceleration and Security Function	Next-gen Intel® Quick Assist Technology, DLB, AMX/TMUL, DSA, 5G ISA, BFloat16 SGX with Integrity, MKTME - 128 Keys, Platform Firmware Resilience (PFR) with Peripheral Device Attestation Hardware Enforced Execution Controls: Hypervisor-Managed Linear Address Translation (HLAT), Control Flow Enforcement Technology (CET), VM Denial of Service Prevention	N/A	N/A
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
BMC	BMC Solution	1 x M.2 Socket B Key support IEI iRIS2 BMC module, 1 x 1GbE RJ45 for BMC port	1 x AST2620	1 x M.2 Socket B Key support IEI iRIS2 BMC module, 1 x 1GbE RJ45 for BMC port (Optional)
Networking	Ethernet IC	Intel 10G Dual Port X710 Intel 1G Dual Port I350	Intel I210	2 x Intel 1G I210-AT
	Ethernet Port	2 x GbE RJ45 ports 1 x GbE RJ45 LOM/BMC port 2 x 10GbE SFP+	1 x GbE RJ45	2 x GbE RJ45 ports 1 x GbE RJ45 BMC port
	Network Module Slot	Support up to 8 x Standard OCP 3.0 Network Module	Support up to 4 x OCP 3.0 PulM Network Module (PulM-100G2SF-CX6)	Support up to 2 x Standard OCP 3.0 Network Module
Expansion Slot	PCIe Slot	1 x PCIe x16 FHFL	1x PCIe x16 FHHL	1 x PCIe x16 FHFL
	M.2	N/A	N/A	1 x B key for BMC module (support IEI iRIS2 BMC module)
Storage	Storage	2 x External 2.5" removable trays (Supports 2.5" U.2 PCIe x4 NVMe) 1 x 2280 M-Key (PCIe Gen4 x4)	2 x U.2 (PCIe Gen4 x4) 2.5" NVMe SSD or 2 x SATA 3.0 3.5" HDD 2 x M.2 M key 2280 (PCIe Gen4 x4)	2 x External 2.5" removable trays (Supports 2.5" U.2 PCIe x4 NVMe) 2 x M.2 2280 M-Key (PCIe Gen4 x4)
	USB	2 x USB 3.0 Type-A	2 x USB 3.1 Type A	2 x USB 3.0 Type-A
	Console	1x USB Type C and 1x RJ45 auto-switching console port	1 x RJ45	1 x USB Type C 1 x RJ45 auto-switching console port
Power and Mechanical	Power Switch	Rear: 1 x Power Button	N/A	Rear: 1 x Power Button
	Reset Button	Front: 1 x Reset Button	1 x Reset Button	Front: 1 x Reset Button
	Power Input	90 V ~ 264 V	AC Power Inlet on PSU, 100V ~ 240V AC @47~63Hz	90 V ~ 264 V
	Type/Watt	2000W CRPS redundant power	1300W redundant power, 90~264V AC	Dual CRPS redundant power
	Processor Cooling	2 x Passive CPU Heatsinks	2 x CPU Heatsinks	1 x Passive CPU Heatsink
	System Cooling	4 x System fans	6 x Individual hot-swappable cooling fans	3 x System fans, 1 x fan reserved
	Antenna Hole	N/A	N/A	N/A
Physical and Environmental	Storage Temperature	-10°C ~ 50°C	-10°C ~ 50°C	-10°C ~ 50°C
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	438 x 623 x 88.5	438 x 670 x 44.2	430 x 521 x 44.2
	Weight	< 25 kg	12.1 kg	< 10 kg
Certifications	Certification	By customer request	By customer request	By customer request
	Supported Operating System	Ubuntu, Linux based OS	Ubuntu, Linux based OS	Ubuntu, Linux based OS
Indicators	LCM	N/A	N/A	Optional
	LED	1 x Power LED, 1 x HDD Activity LED, 1 x Alert LED, 1 x PSU LED, 1 x Location LED 2 x PSU LED, 1 x Location LED	1 x Power LED 1 x Status LED 1 x Alert LED	1 x Power LED, 1 x Alert LED, 1 x Storage LED, 1 x Location LED, 2 x PSU LED

Selection Guide » Premium Network Appliances

		PUZZLE-7030A	PUZZLE-IN005	PUZZLE-IN004
Platform	Form Factor	1U	2U	1U
	CPU	Intel® Xeon® D-1700 Processor series	Intel® Ice-Lake LGA-4189 Xeon® Scalable Processor	Intel® Xeon® D-2145NT processor 8-core, 11M cache 1.90 GHz Intel® Xeon® D-2146NT processor 8-core, 11M cache, 2.30 GHz Intel® Xeon® D-2177NT Processor 14-core, 19.25M Cache, 1.90 GHz Intel® Xeon® D-2187NT processor 16-core, 22M cache, 2.00 GHz
	Chipset	Integrated in CPU	Intel® C627A	Integrated in CPU
Memory	Memory Technology	4 x DDR4 2400/2933 MHz ECC UDIMM/RDIMM	DDR4 3200 MHz ECC RDIMM / LRDIMM	DDR4 2133/2400 MHz ECC RDIMM/LRDIMM
	Memory Capacity	Based on DIMM capacity	Up to 1280GB (20 x 64GB)	RDIMM up to 256 GB LRDIMM up to 512 GB
	Memory Socket	4 x 288-pin DDR4 DIMM slots	20 x 288-pin DIMM	8 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	• Intel® AES New Instructions • Intel® QuickAssist Technology (Intel® QAT) • Intel® Virtualization Technology (Intel® VT) • Intel® Trusted Execution Technology (Intel® TXT)	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
BMC	BMC Solution	1 x M.2 Socket B Key support IEI iRIS2 BMC module, 1 x 1GbE RJ45 for BMC port	1 x iRIS-2600 module	N/A
Networking	Ethernet IC	Intel® I226V 2.5GbE	1GbE NIC: Intel® I210-AT with NCSI support 1GbE NIC: Intel® I219	1GbE NIC: Intel® I211-AT 10 GbE: Intel® X722 integrated in CPU
	Ethernet Port	8 x 2.5 GbE RJ45 LAN ports 5 x 10 GbE SFP+	2 x 1GbE RJ45 ports (1 x BMC LAN)	8 x 1GbE RJ45 LAN ports 4 x 10 GbE SFP+
	Network Module Slot	Support up to 1 x Standard OCP 3.0	8 x IEI PulM network module slots	1 x IEI PulM network module slot
Expansion Slot	PCIe Slot	1 x PCIe Gen4 x 8 or 2 x PCIe Gen4 x 4	1 x PCIe Gen4 x8 (FHHL) slot (single width)	1 x PCIe Gen3 x8 (FHHL) slot (double width)
	M.2	1 x B key for BMC module (support IEI iRIS2 BMC module)	N/A	N/A
Storage	Storage	2 x 2.5" SSD/HDD Bay: support SATA 3.0 (6 Gbps) 2 x M.2 2280 M-key (PCIe Gen3 x2)	4 x U.2 SSD drive bay support SATA 3.0 (6 Gbps) 2 x M.2 M key 2280 support PCIe Gen3 x4 NVMe	2 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps) 1 x M.2 M key 2260/2280 support PCIe Gen3 x4 NVMe
	USB	2 x USB 3.0	2 x USB 3.2 Gen 1 (5Gb/s) Type-A ports	1 x USB 2.0 1 x USB 3.2 Gen 1
	Console	1 x RJ45 1 x USB Type-C	1 x RJ45 1 x USB Type-C	1 x RJ45
Power and Mechanical	Power Switch	Rear: 1 x Power Button	1 x Power Switch	1 x Power switch
	Reset Button	Front: 1 x Reset Button	1 x Reset Button	1 x Reset button
	Power Input	90 V ~ 264 V	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	320W redundant power	1200W redundant power 90V~264V AC	300W redundant power
	Processor Cooling	1 x Passive CPU heatsink	2 x Active CPU cooler	1 x Passive CPU heatsink
	System Cooling	4 x System fans	5 x Smart cooling fans	4 x Smart cooling fans
	Antenna Hole	1 x Antenna hole	N/A	1 x Antenna hole
Physical and Environmental	Storage Temperature	-10°C ~ 50°C	-10°C ~ 50°C	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	436.2 x 454.3 x 44.2	438 x 650 x 88	430 x 426 x 44.2
	Weight	8 kg	23 kg	7 kg
Certifications	Certification	By customer request	CE / FCC / RoHS	CE / FCC / RoHS
	Supported Operating System	Ubuntu, Linux based OS	Linux 18.04 (CentOS, Red Hat, Ubuntu, etc.) Windows Server 2019	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10
Indicators	LCM	LCM, 2 buttons	N/A	LCM, 2 buttons
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

		PUZZLE-5060	PUZZLE-5050	PUZZLE-5030
Platform	Form Factor	1U rackmount	1U rackmount	1U
	CPU	AMD Ryzen 8000	1 x 13th Gen Intel® Core™ i5 Processors (Code Name: Raptor Lake) Supporting TDP 65W	Intel® Xeon® E Processor (Codename: Rocket Lake)
	Chipset	AMD 600 series	Intel® Q670E	Intel® C256
Memory	Memory Technology	4 x DDR5 4800MHz DIMM Slots	4 x DDR4 3200MHz non-ECC UDIMM Slot	DDR4 3200 MHz ECC / non-ECC UDIMM
	Memory Capacity	Based on DIMM capacity	Based on DIMM capacity	Up to 128GB
	Memory Socket	4 x 288-pin DDR5 UDIMM	4 x 288-pin DDR4 UDIMM	4 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	N/A	N/A	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Virtualization Technology (Intel® VT) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® Trusted Execution Technology • Functionality depends on the CPU used.
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
BMC	BMC Solution	1 x M.2 Socket B Key support IEI iRIS2 BMC module, 1 x 1GbE RJ45 for BMC port	1 x M.2 Socket B Key support IEI iRIS2 BMC module (Optional), 1 x 1GbE RJ45 for BMC port	N/A
Networking	Ethernet IC	Intel® I210	Intel® I210-AT	Intel® I225V
	Ethernet Port	8 x 1GbE RJ45 ports	10 x GbE RJ45 ports	8 x 2.5 GbE RJ45 LAN ports, 2-pair bypass, Port 1 support WOL
	Network Module Slot	2 x IEI PulM network module slots	2 x IEI PulM network module slots	2 x IEI PulM network module slots
Expansion Slot	PCIe Slot	N/A	N/A	1x Standard PCIe Slot: PCIe Gen4 x8 (FHHL) 1x Standard PCIe Slot: PCIe Gen4 x4 (FHHL)
	M.2	1 x B key for BMC module (support IEI iRIS2 BMC module)	1 x B key for BMC module (support IEI iRIS2 BMC module)	1 x M.2: M key 2260/2280 support PCIe Gen4 x2 or SATA 6Gb/s
Storage	Storage	2 x U.2 2.5" NVMe SSD	2 x U.2 SATA SSD	2 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps)
	USB	2 x USB 3.0 Type-A	2 x USB 3.0 Type-A	2 x USB 3.0
	Console	1 x RJ45 console port	1 x RJ45 console port	1 x RJ45
Power and Mechanical	Power Switch	Rear: 1 x Power Button	Rear: 1 x Power Button	1 x Power Switch
	Reset Button	Front: 1 x Reset Button	Front: 1 x Reset Button	1 x Reset Button
	Power Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	Dual CRPS redundant power	300W CRPS redundant power	300W AC redundant PSU
	Processor Cooling	1 x Passive CPU Heatsink	1 x Passive CPU Heatsink	1 x Passive CPU Heatsink
	System Cooling	4 x System fans	4 x System fans	3 x Smart cooling fans 1 x System fan
	Antenna Hole	N/A	N/A	1 x Antenna hole (reserved)
Physical and Environmental	Storage Temperature	-10°C ~ 50°C	-10°C ~ 50°C	-10°C ~ 50°C
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 414.2 x 44.2	430 x 414.2 x 44.2	430 x 426 x 44.2
	Weight	<10 kg	6.3 kg	10 kg
Certifications	Certification	By customer request	By customer request	CE/FCC/RoHS
	Supported Operating System	Ubuntu Linux	Ubuntu Linux	Support Linux (CentOS, Ubuntu, etc.)
Indicators	LCM	N/A	N/A	16 x 2 character with 2 control buttons
	LED	1 x System LED, 1 x Storage LED	1 x System LED, 1 x Storage LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

Selection Guide » Performance Network Appliances

		PUZZLE-IN002	PUZZLE-IN001	PUZZLE-IN001A
Platform	Form Factor	1U	1U	1U
	CPU	8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz Intel® Pentium® Gold G5400T processor, 2C/4T, up to 3.10 GHz	Intel® Xeon® E-2136 processor, 6C/12T, up to 4.50 GHz 8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz	Intel® Xeon® E-2136 processor, 6C/12T, up to 4.50 GHz 8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz
	Chipset	Intel® H310	Intel® C246	Intel® C246
Memory	Memory Technology	2 x DDR4 2400 MHz Non-ECC UDIMM	2 x DDR4 2400 MHz ECC/Non-ECC UDIMM	4 x DDR4 2400 MHz ECC/Non-ECC UDIMM
	Memory Capacity	Up to 32GB	Up to 32GB	Up to 64GB
	Memory Socket	2 x 288-pin DIMM	2 x 288-pin DIMM	4 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
BMC	BMC Solution	N/A	N/A	N/A
Networking	Ethernet IC	1GbE RJ45: Intel® I211	1GbE NIC: Intel® I211-AT	8 x 5GbE NIC: AQC 111C
	Ethernet Port	6 x 1GbE RJ45 LAN ports	8 x 1GbE RJ45 LAN ports	8 x 5 GbE RJ45 LAN ports
	Network Module Slot	N/A	2 x IEI PulM network module slots	2 x IEI PulM network module slots
Expansion Slot	PCIe Slot	1 x PCIe Gen3 x16 (FHHL) slot (double width)	1 x PCIe Gen3 x8 (FHHL) slot, 1 x PCIe Gen3 x4 (FHHL) slots	1 x PCIe Gen3 x8 (FHHL) slot, 1 x PCIe Gen3 x4 (FHHL) slots
	M.2	1 x M.2 A key (Gen2 & USB 2.0)	1 x 3042/2260 M.2 B key (SATA 3.0 / USB 3.2 Gen 1) Support SATA SSD and 4G LTE module	1 x 3042/2260 M.2 B key (SATA 3.0 / USB 3.2 Gen 1) Support SATA SSD and 4G LTE module
Storage	Storage	2 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps)	2 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps) (RAID 0/1 support)	2 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps)
	USB	2 x USB 3.2 Gen 1 (5Gb/s)	2 x USB 3.2 Gen 1 (5Gb/s)	2 x USB 3.2 Gen 1 (5Gb/s)
	Console	1 x RJ45	1 x RJ45	1 x RJ45
Power and Mechanical	Power Switch	1 x Power switch	1 x Power Switch	1 x Power switch
	Reset Button	1 x Reset button	1 x Reset Button	1 x Reset button
	Power Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	ATX power 250W 90V~264V AC	300W redundant power, 90V~264V AC	300W redundant power, 90V ~ 264V AC
	Processor Cooling	1 x Passive CPU heatsink	1 x Passive CPU heatsink	1 x Passive CPU heatsink
	System Cooling	4 x Smart cooling fans	4 x Smart cooling fans	4 x Smart cooling fans
	Antenna Hole	1 x Antenna hole	1 x Antenna hole	1 x Antenna hole
Physical and Environmental	Storage Temperature	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 320 x 44.2	430 x 426 x 44.2	430 x 426 x 44.2
	Weight	5 kg	7 kg	7 kg
Certifications	Certification	CE / FCC / RoHS	CE / FCC / RoHS	CE / FCC / RoHS
	Supported Operating System	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10
Indicators	LCM	LCM, 2 buttons	LCM, 2 buttons	LCM, 2 buttons
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

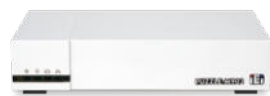|		**PUZZLE-1100**	**PUZZLE-3034**	**PUZZLE-3032**
Platform	Form Factor	Desktop	Desktop	Desktop
	CPU	1 x Intel® Amston® Lake processors supporting TDP 25W	Intel® Atom® C3758R 8C/8T (16M Cache, 2.4 GHz)	Intel® Atom® C3558R 4C/4T (8M cache, 2.4 GHz)
	Chipset	Integrated in CPU	Intel® Denverton-R	Intel® Denverton-R
Memory	Memory Technology	1 x DDR5 SO-DIMM Slot	2 x DDR4 2400 MHz Non-ECC UDIMM Default: 1 x UDIMM 8G	2 x DDR4 2400 MHz non-ECC UDIMM Default: 1 x UDIMM 8G
	Memory Capacity	Based on SO-DIMM capacity	Up to 64GB (based on DIMM capacity)	Up to 64GB (based on DIMM capacity)
	Memory Socket	1 x 260-pin DDR5 SO-DIMM	2 x 288-pin DIMM	2 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	N/A	• Intel® AES New Instructions • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology • Intel® QuickAssist Technology (Intel® QAT)	• Intel® AES New Instructions • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology • Intel® QuickAssist Technology (Intel® QAT)
	TPM	1 x TPM 2.0 pin header	N/A	N/A
BMC	BMC Solution	1 x IEI iRIS4 Connector IPMI 2.0 BMC module (Optional)	N/A	N/A
Networking	Ethernet IC	4 x Intel 1GbE I210-AT	Intel 2.5GbE KTI225V SLNMH	Intel 2.5GbE KTI225V SLNMH
	Ethernet Port	4 x GbE RJ45 ports 1 x GbE RJ45 BMC port	8 x 2.5GbE RJ45 LAN ports 4 x 10GbE, SFP+	8 x 2.5GbE RJ45 LAN ports 2 x 10GbE, SFP+
	Network Module Slot	N/A	N/A	N/A
Expansion Slot	PCIe Slot	N/A	N/A	N/A
	M.2	N/A	1 x 2242 B key slot for M.2 SATA 1 x 3052 B key slot + SIM card socket for 5G/LTE card	1 x 2242 B key slot for M.2 SATA 1 x 3052 B key slot + SIM card socket for 5G/LTE card
Storage	Storage	1 x 2240/2280 B-Key SATA SSD (PCIe Gen3 x1)	64GB eMMC 2 x 2280 M key slots for NVMe	64GB eMMC 2 x 2280 M key slots for NVMe
	USB	2 x USB 3.0 Type-A	2 x USB 3.0	2 x USB 3.0
	Console	1 x USB Type-C	1 x RJ45	1 x RJ45
Power and Mechanical	Power Switch	Rear: 1 x Power Button	1 x Power button	1 x Power button
	Reset Button	Rear: 1 x Reset Button	1 x Reset button	1 x Reset button
	Power Input	1 x 12V DC jack	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	12V/5A AC-DC power adaptor	Open-frame DPS-60AP-5 D; Vin: 90 ~ 264VAC; 70W	Open-frame DPS-60AP-5 D; Vin: 90 ~ 264VAC; 70W
	Processor Cooling	12W: fanless 25W: fan and heatsink	1 x Passive CPU heatsink	1 x Passive CPU heatsink
	System Cooling	N/A	2 x Cooling fans	2 x Cooling fans
	Antenna Hole	8 x Antenna hole (reserved)	3 x Antenna hole (reserved)	3 x Antenna hole (reserved)
Physical and Environmental	Storage Temperature	-10°C ~ 50°C	-10°C ~ 50°C	-10°C ~ 50°C
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	224.5 x 170 x 42.5	285 x 236.6 x 46.65	285 x 236.6 x 46.65
	Weight	3 kg	3.5 kg	3.5 kg
Certifications	Certification	By customer request	CE / FCC / RoHS	CE / FCC / RoHS
	Supported Operating System	Ubuntu Linux	Linux Ubuntu 18.04	Linux Ubuntu 18.04
Indicators	LCM	N/A	16 x 2 character with control keys	16 x 2 character with control keys
	LED	1 x Power LED, 1 x 5G LED, 1 x WiFi LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

Selection Guide » Entry Level Network Appliances

		PUZZLE-IN003A	PUZZLE-IN003B
Platform	Form Factor	Desktop	Desktop
	CPU	Intel® Atom® processor C3558 8M cache, up to 2.20 GHz	Intel® Atom® processor C3758 16M cache, up to 2.20 GHz
	Chipset	Integrated in CPU	Integrated in CPU
Memory	Memory Technology	DDR4 2133 MHz ECC (by CPU) or non-ECC UDIMM, support DDR4 RDIMM	DDR4 2133 MHz ECC (by CPU) or non-ECC UDIMM, support DDR4 RDIMM
	Memory Capacity	UDIMM up to 64GB / RDIMM up to 128GB	UDIMM up to 64GB / RDIMM up to 128GB
	Memory Socket	2 x 288-pin DIMM	4 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® QuickAssist Technology (Intel® QAT)	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® QuickAssist Technology (Intel® QAT)
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
BMC	BMC Solution	N/A	N/A
Networking	Ethernet IC	1GbE NIC: Intel® I211-AT 1GbE PHY: Marvell® 88E1543	1GbE NIC: Intel® I211-AT 1GbE PHY: Marvell® 88E1512 10 GbE: Intel® X553 integrated in CPU
	Ethernet Port	4 x GbE from Intel® I211-AT 4 x GbE from Marvell® 88E1543	4 x 1GbE from Intel® I211-AT 2 x 1GbE from Marvell® 88E1512 2 x 10 GbE SFP+
	Bypass	2 bypass segments	N/A
	Network Module Slot	N/A	N/A
Expansion Slot	PCIe Slot	N/A	N/A
	M.2	1 x M.2 A key (PCIe Gen3 & USB 2.0)	1 x M.2 A key (PCIe Gen3 & USB 2.0)
Storage	Storage	1 x SATA 3.0 + 1 x 5V power connector (for SATA DOM) 1 x M.2 M key 2260/2280 supporting PCIe Gen3 x4 NVMe	1 x SATA 3.0 + 1 x 5V power connector (for SATA DOM) 1 x M.2 M key 2260/2280 supporting PCIe Gen3 x4 NVMe
	USB	1 x USB 2.0 1 x USB 3.2 Gen 1	1 x USB 2.0 1 x USB 3.2 Gen 1
	Console	1 x RJ45	1 x RJ45
Power and Mechanical	Power Switch	1 x Power switch	1 x Power switch
	Reset Button	1 x Reset button	1 x Reset button
	Power Input	1 x DC jack	1 x DC jack
	Type/Watt	12 V DC-in, 60W	12 V DC-in, 60W
	Processor Cooling	Passive CPU heatsink	Passive CPU heatsink
	System Cooling	Fanless	Two system fans
	Antenna Hole	2 x Antenna hole	2 x Antenna hole
Physical and Environmental	Storage Temperature	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	225 x 206 x 44.2	225 x 206 x 44.2
	Weight	2 kg	2 kg
Certifications	Certification	CE / FCC / RoHS	CE / FCC / RoHS
	Supported Operating System	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10	Linux Ubuntu 18.04.04 CentOS 7 / Red Hat / Fedora EPEL Microsoft Windows 10
Indicators	LCM	N/A	N/A
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

		PUZZLE-200	PUZZLE-100
Platform	Form Factor	Desktop	Desktop
	CPU	Marvell® CN10208 8 cores 2.1GHz	Marvell® A7K 88F7040 ARM v8 quad-core 1.4GHz
	Chipset	Integrated in CPU	Integrated in CPU
Memory	Memory Technology	1 x DDR5 SO-DIMM Slot	DDR4 1333MHz non-ECC
	Memory Capacity	Based on DIMM capacity	2GB
	Memory Socket	1 x 260-pin DDR5 SO-DIMM	On-board
Network and Security	Network Acceleration and Security Function	N/A	N/A
	TPM	N/A	N/A
BMC	BMC Solution	1 x IEI iRIS3 IPMI connector IPMI module (Optional), 1 x 1GbE RJ45 for IPMI port	N/A
Networking	Ethernet IC	Marvell® 88E6393X, 88E2111	Marvell® 88E6352, 88E1512
	Ethernet Port	6 x GbE RJ45 ports 2 x 2.5GbE RJ45 port 2 x 10GbE SFP+ port	LAN: 5 x GbE RJ45 ports WAN: 1 x GbE RJ45 port
	Network Module Slot	N/A	N/A
Expansion Slot	PCIe Slot	N/A	N/A
	M.2	N/A	N/A
Storage	Storage	1 x eMMC 32GB	1 x eMMC 4GB
	USB	1 x USB 3.0 Type-A	1 x USB 3.0 Type-A
	Console	1 x USB Type C	1 x USB Type C
Power and Mechanical	Power Switch	N/A	Rear: 1 x Power Button
	Reset Button	Side: 1 x Reset Button	Front: 1 x Reset Button
	Power Input	1 x 12V DC jack	1 x 12V DC jack
	Type/Watt	12V/6A AC-DC power adaptor	12V/3.3A AC-DC power adaptor
	Processor Cooling	Fanless	Fanless
	System Cooling	Fanless	Fanless
	Antenna Hole	N/A	N/A
Physical and Environmental	Storage Temperature	-10°C ~ 50°C	-10°C ~ 50°C
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	190 x 150 x 70	209.9 x 151.2 x 38.1
	Weight	TBD	0.6 kg
Certifications	Certification	By customer request	CE, FCC, VCCI, BSMI
	Supported Operating System	Ubuntu Linux	Ubuntu Linux
Indicators	LCM	N/A	N/A
	LED	Front: 1 x Power LED, 1 x Information LED	Front: 1 x Power LED, 1 x Network LED, 1 x Information LED

Selection Guide » ARM Based Network Appliances

		PUZZLE-M902	PUZZLE-M901	PUZZLE-M801
Platform	Form Factor	N/A	N/A	1U
	CPU	Marvell® CN9130 quad-core ARMv8 Cortex-A72 @ up to 2200 MHz	Marvell® CN9130 quad-core ARMv8 Cortex-A72 @ up to 2200 MHz	Marvell® ARMADA® 88F8040 quad-core System-on-Chip processor, 2.0GHz
	Chipset	Integrated in CPU	Integrated in CPU	Integrated in CPU
Memory	Memory Technology	N/A	N/A	DDR4 2400 MHz ECC/Non-ECC/RDIMM
	Memory Capacity	4GB	4GB	Up to 16GB
	Memory Socket	N/A	N/A	1 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	N/A	N/A	• Configurable packet processor • HW offload for networking • Acceleration engines for storage, networking and security • Public Key Processor (RSA/DH/ECC) • Secure Storage • Secure boot
Networking	Ethernet IC	Aquantia AQR112R Aquantia AQR113	Aquantia AQR112R Aquantia AQR112C Aquantia AQR112	1GbE PHY: Marvell® 88E1512P 10GbE PHY: SoC Marvell® 88F8040
	Ethernet Port	2 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112R 4 x 2.5GbE LAN via Marvell® 88F8215 (PHY: Aquantia AQR112R) 1 x 10GbE LAN integrated in CPU via PHY Aquantia AQR113 2 x 10GbE LAN via Marvell® 88F8215 (PHY: Aquantia AQR113)	1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112R 1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112C 1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112 1 x 2.5GbE LAN via Marvell® 88F8215 (PHY: Aquantia AQR112R) 1 x 2.5GbE LAN via Marvell® 88F8215 (PHY: Aquantia AQR112C) 1 x 2.5GbE LAN via Marvell® 88F8215 (PHY: Aquantia AQR112)	2 x 10 GbE SFP+, 4 x 1GbE RJ45 LAN ports
Expansion Slot	PCIe Slot	N/A	N/A	1 x PCIe x16 (FHHL) slot PCIe Gen3 x2 signal
	M.2	M.2 2242/2280 M key (PCIe Gen3 x1)	M.2 2242 M key (PCIe Gen3 x2)	1 x M.2 B Key (3042/2260) (SATA 3.0 and USB 3.2 Gen 1) Support SATA SSD or 4G LTE module (USB signal)
Storage	Storage	1 x 4GB eMMC	1 x 4GB eMMC	1 x 2.5" SATA HDD/SSD bay support SATA 3.0 (6 Gbps)
	USB	USB 3.2 Gen 1 (5Gb/s)	USB 3.2 Gen 1 (5Gb/s)	2 x USB 3.2 Gen 1 (5Gb/s)
	Console	N/A	N/A	1 x RJ45
Power and Mechanical	Power Switch	N/A	N/A	1 x Power switch
	Reset Button	1 x Reset to factory default	1 x Reset to factory default	1 x Reset button
	Power Input	12V DC	12V DC	100 V ~ 240 V
	Type/Watt	36W power adaptor	36W power adaptor	ATX Power 250W 90V~264V AC
	Processor Cooling	N/A	N/A	1 x Active CPU heatsink with fan
	System Cooling	1 x System fan	Active fan	2 x Smart cooling fans
	Antenna Hole	N/A	N/A	1 x Antenna hole
Physical and Environmental	Storage Temperature	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
	Operating Humidity	5% ~ 95% non-condensing, wet bulb: 27˚C	5% ~ 95% non-condensing, wet bulb: 27˚C	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	226 x140 x 50.5	166.4 x 145.7 x 34	430 x 320 x 44.2
	Weight	3.6 kg	3.6 kg	5 kg
Certifications	Certification	CE/FCC/BSMI (BSMI safety)/VCCI, LVD	CE/FCC/BSMI (BSMI safety)/VCCI, LVD	CE / FCC / RoHS
	Supported Operating System	OpenWrt	OpenWrt	Linux Ubuntu 16.04.04
Indicators	LED	Status/Power, WAN/LAN interface indicator	Status/Power, WAN/LAN interface indicator	1 x Power LED, 1 x Storage LED, 1 x Alert LED

	PulM-100G2SF-E810	PulM-10G2SF/T-X710	PulM-10G4SF/T-XL710
Chipset	Intel® E810	Intel® X710	Intel® XL710
Bypass	N/A	N/A	N/A
Host Interface	PCIe Gen4 x8	PCIe Gen3 x8	PCIe Gen3 x8
LAN Interface	QSFP28	SFP+	SFP+
Speed	1GbE / 10GbE / 25GbE / 50GbE / 100GbE	1GbE/10GbE	1GbE/10GbE
LAN Port Number	2	2	4
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

	PulM-10G4SF/T-XL710-BP	PulM-1G4SF/T-I350	PulM-1G8SF/T-I350
Chipset	Intel® XL710	Intel® I350-AM4	Intel® I350-AM4
Bypass	Two pairs	N/A	N/A
Host Interface	PCIe Gen3 x8	PCIe Gen2 x4	2 PCIe Gen2 x4
LAN Interface	SFP+	SFP	SFP
Speed	1GbE/10GbE	1GbE	1GbE
LAN Port Number	4	4	8
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

	PulM-1G4T/T-I350	PulM-1G4T/T-I350-BP	PulM-1G8T/T-I350	PulM-1G8T/T-I350-BP
Chipset	Intel® I350-AM4	Intel® I350-AM4	Intel® I350-AM4	Intel® I350-AM4
Bypass	N/A	Two pairs	N/A	Four pairs
Host Interface	PCIe Gen2 x4	PCIe Gen2 x4	2 PCIe Gen2 x4	2 PCIe Gen2 x4
LAN Interface	RJ45	RJ45	RJ45	RJ45
Speed	1GbE	1GbE	1GbE	1GbE
LAN Port Number	4	4	8	8
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

Selection Guide » Network Expansion Modules
(For 1U Rack Mount System)

	PuIM-100G2SF-CX6	PuIM-40G2SF-XL710
Chipset	Mellanox ConnectX-6	Intel® XL710
Bypass	N/A	N/A
Host Interface	PCIe Gen4 x16	PCIe Gen3 x8
LAN Interface	QSFP28	QSFP+
Speed	1GbE / 10GbE / 25GbE / 50GbE / 100GbE	1GbE/ 10GbE/ 40GbE
LAN Port Number	2	2
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	162.2 (L) x 74 (W) x 41.85 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

	PuIM-10G2SF-X710	PuIM-10G4SF-XL710	PuIM-10G4SF-XL710-BP
Chipset	Intel® X710	Intel® XL710	Intel® XL710
Bypass	N/A	N/A	Two pairs
Host Interface	PCIe Gen3 x8	PCIe Gen3 x8	PCIe Gen3 x8
LAN Interface	SFP+	SFP+	SFP+
Speed	1GbE/ 10GbE	1GbE/10GbE	1GbE/10GbE
LAN Port Number	2	4	4
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

	PuIM-1G4SF-I350	PuIM-1G8SF-I350
Chipset	Intel® I350-AM4	Intel® I350-AM4
Bypass	N/A	N/A
Host Interface	PCIe Gen2 x4	2 PCIe Gen2 x4
LAN Interface	SFP	SFP
Speed	GbE	GbE
LAN Port Number	4	8
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

» Network Expansion Modules
(For 1U Rack Mount System)

	PulM-1G4T-I350	PulM-1G4T-I350-BP	PulM-1G8T-I350
Chipset	Intel® I350-AM4	Intel® I350-AM4	Intel® I350-AM4
Bypass	N/A	two pairs	N/A
Host Interface	PCIe Gen2 x4	PCIe Gen2 x4	2 PCIe Gen2 x4
LAN Interface	RJ45	RJ45	RJ45
Speed	GbE	GbE	GbE
LAN Port Number	4	4	8
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

	PulM-1G8T-I350-BP	PulM-2P1M	PulM-M2-2S
Chipset	Intel® I350-AM4	Integrated in CPU	Integrated in CPU
Bypass	Four pairs	N/A	N/A
Host Interface	2 PCIe Gen2 x4	1 PCIe Gen3 x4	2 PCIe Gen3 x4
LAN Interface	RJ45	ASM1812 (PCIe Gen2 x4) FL1100EX (PCIe to USB 3.0, 4-port)	N/A
Speed	GbE	1 x 2230/2242 M.2 B key (PCIe Gen2, USB 3.2 Gen1) with SIM card slot	2 x M key 2260/2280/22110 (PCIe Gen3 x4/NVMe)
LAN Port Number	8	2 x PCIe Mini (PCIe Gen2, USB 2.0) with SIM card slot	N/A
Storage Temp.	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)	-20°C ~ 75°C (-4°F ~ 167°F)
Operating Temp.	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Humidity	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing	5% ~ 90% RH, non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)	165.50 (L) x 77.8 (W) x 44.2 (H)

Selection Guide » Storage Server

	GRAND-RE	GRAND-GL
CPU	AMD Ryzen™ Embedded V1500B quad-core 2.2 GHz processor	Intel® Celeron® N5095 4-core/4-thread processor, burst up to 2.9 GHz
Encryption Acceleration	AES-NI	AES-NI
Memory	2 x SO-DIMM DDR4 Maximum 64GB (2 x 32GB)	2 x SO-DIMM (Max. 8GB)
Drive Bay	8 x 3.5"/2.5" SATA 6Gb/s HDDs/SSDs	4 x 3.5"/2.5" SATA 6Gb/s HDDs/SSDs
LAN Port	2 x 2.5GbE LAN port	2 x 2.5GbE LAN
PCIe Slot	1 x PCIe Gen3 x8	N/A
USB Ports	1 x USB 3.2 Gen1 Type-A port 2 x USB 3.2 Gen2 Type-C port 1 x USB 3.2 Gen2 Type-A port	2 x External USB 2.0 2 x External USB 3.2 Gen2
HDMI™ Output	N/A, Optional via a PCIe graphics card	1 x HDMI™ 1.4b
LED Indicator	Status/Power, LAN, USB, Drive 1 - 8	Power/Status, LAN, USB, HDD1-4, M.2 SSD 1 - 2
Button	Power/Status, Reset	Power, Reset
Form Factor	2U Short Depth Rackmount	1U Short Depth Rackmount
Dimension (W x L x H) (mm)	432 x 297.4 x 88.6	430 x 292.1 x 43.3
Net Weight	9.15 kg	5.9 kg
Operating temperature& Relative Humidity	0°C ~ 40°C (32°F ~ 104°F)	0°C ~ 40°C (32°F ~ 104°F)
Relative Humidity	5% ~ 95% RH non-condensing, wet bulb: 27°C	5% to 95% non-condensing, wet bulb: 27°C
Power Supply	300W (x2), 100-240V AC, 50/60 Hz	100W PSU, 100-240V
Fan	3 x 60mm	3 x 40 mm

Headquarters
威强電工業電腦
IEI Integration Corp.

- No. 29, Zhongxing Rd., Xizhi Dist.,,
  New Taipei City 221, Taiwan
- TEL: +886-2-86916798
       +886-2-26902098
- FAX: +886-2-66160028
- sales@ieiworld.com
- www.ieiworld.com

America
IEI Technology USA Corp.

- 138 University Parkway, Pomona,
  CA 91768
- TEL: +1-909-595-2819
- FAX: +1-909-595-2816
- sales@usa.ieiworld.com
- usa.ieiworld.com

China
威强电工业电脑
IEI Integration (Shanghai) Corp.

- 515, Shen Fu Rd., Xin Zhuang Industrial
  Develop Zone, Shanghai, 201108, China
- TEL: +86-21-3116-7799
- FAX: +86-21-3462-7797
- sales@ieiworld.com.cn
- www.ieiworld.com.cn

* Specifications are subject to change without prior notice.