

08 Data Diode Systems

In highly secure network environments, information security isolation and unidirectional data transfer are critical requirements for ensuring the stable operation of core systems. Traditional bidirectional firewalls or network gateways can implement access control at the logical level but still carry potential risks of being bypassed or compromised.

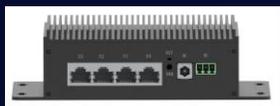
The xDataDiode series of unidirectional data transfer gateways, launched by Raymax Technology, adopts a physically irreversible unidirectional link design and a dual FPGA chip board processing architecture. This hardware-level approach completely blocks reverse channels, ensuring that data is transmitted strictly in the preset direction. The devices perform integrity verification and security filtering during data transmission, effectively preventing threats such as malicious code backflow and attack command penetration.

The xDataDiode product series offers flexible electrical/optical interface options, multi-port expansion capabilities, and highly reliable caching mechanisms. It meets the security compliance requirements of key industries—such as power dispatching, financial transactions, national defense and classified operations, and industrial control—for scenarios including data collection, log export, and cross-network information exchange.

The xDataDiode series includes models with 2, 4, and 8 ports, supporting bandwidth configurations ranging from Gigabit to 100-Gigabit, catering to diverse needs from small industrial control scenarios to large-scale critical information systems. With hardware-level security protection and a highly reliable architecture, the product can be widely applied in critical industries such as power, finance, government, and military, meeting national standards for cybersecurity classification protection, critical information infrastructure protection, and cryptographic requirements.

Unidirectional or bidirectional network gateways/optical gateways based on domestically developed FPGA hardware.

- Two FPGA boards achieve hardware-level isolation between internal and external networks.
- The external network supports switching and routing between network interfaces.
- Supports MAC binding and data flow filtering, with line-speed packet filtering capability, processing data up to 100 times faster than CPU-based solutions.
- Physically Unidirectional: Uses fiber optic/cable connections between two boards, with no light-emitting components or uplink circuits on the transmitting end, eliminating reverse transmission channels at the hardware level.
- Encrypted Transmission: Custom protocol for data transmission between boards, with encryption support.
- Policy Filtering: Line-speed quintuple matching, supporting whitelist restrictions for ports/network segments/protocols.
- Firmware Signing: Only signed firmware can be loaded.
- Security Hardening and Trusted Boot: Startup and configuration require correct key verification.
- High Reliability and Security Functions: The device does not rely on general-purpose CPUs internally, inherently immune to attacks targeting CPU architectures.
- Built-in management module, supporting remote monitoring and upgrades.
- A series of models covering various scenarios.



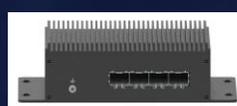
IPSafe-40-4E2F



IPSafe-400-8F



IPSafe-20-E



IPSafe-20-2EF



IPSafe-10-EF





IPSafe Hardware-Level IP Security Protection



IPSafe is an FPGA-based nanosecond-level IP security protection gateway that achieves high-speed, anonymous, and secure network communication through hardware-level address masquerading and encrypted forwarding.

In high-security network environments, the security of terminal IP addresses directly determines the stability of the network protection perimeter. Addressing the performance bottlenecks and security shortcomings of traditional firewalls in IP concealment and behavioral protection, Ruiwen Technology introduces the IPSafe series of IP security protection devices.

The IPSafe series is built on an FPGA hardware-accelerated architecture, featuring nanosecond-level data processing and forwarding capabilities. It performs IP address masquerading, filtering, and forwarding operations with extremely low latency. Through hardware-level address mapping and flow table management mechanisms, the series conceals and replaces the real IP addresses of terminals, fundamentally blocking IP-based behavioral tracking and targeted attacks, and effectively defending against risks such as DDoS, scanning and positioning, and privacy theft.

The system incorporates whitelist verification, content filtering, and integrity verification engines, which detect abnormal communications in real-time as each data packet passes through the FPGA, preventing malicious data infiltration and link hijacking. Combined with encrypted transmission, dynamic node hopping, and traffic rate-limiting policies, it establishes a high-security, low-latency anonymous communication channel, balancing privacy protection and network communication security.

The IPSafe series supports flexible configurations for electrical/optical interfaces, multi-port concurrent expansion, and high-reliability caching mechanisms, maintaining nanosecond-level response and stable throughput even under complex, high-load scenarios. The product is widely applicable in various fields, including government offices, financial transactions, industrial internet, enterprise data centers, and personal privacy protection.

Available in models with 1, 2, or 4 ports, the series supports multiple bandwidth configurations from Gigabit to 100-Gigabit, meeting multi-level security needs from small and medium-sized network nodes to large-scale critical information systems.

- Based on a domestically produced FPGA pure hardware-accelerated architecture, featuring nanosecond-level data processing and forwarding capabilities
- IP address masquerading, filtering, and forwarding operations; shields the device's real IP, prevents targeted IP-based attacks, protects internal data transmission security, and reduces the risk of business confidential leaks
- Blocks IP-based behavioral tracking and targeted attacks, effectively defending against risks such as DDoS, scanning and positioning, and privacy theft
- Enables switching and routing between network interfaces
- Supports MAC binding and data flow filtering, featuring wire-speed packet filtering capabilities, with processing speeds over 100 times faster than CPU-based solutions
- Policy filtering: Wire-speed quintuple matching, supports port/network segment/protocol whitelist restrictions
- Firmware signing: Only loads signed firmware
- Security hardening and trusted boot: Requires key verification for startup and configuration
- High reliability and security functions: The device does not rely on a general-purpose CPU internally, naturally immune to CPU architecture-related attacks
- Built-in management module, supports remote monitoring and upgrades
- Series models cover various scenarios



xDataDiode-20-E



xDataDiode-20-F



xDataDiode-100-F



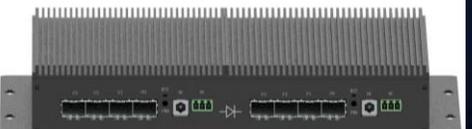
xDataDiode-40-EF



xDataDiode-40-E



xDataDiode-80-E



xDataDiode-800-F

10 xTesterServer

RAYMAX

锐文科技

Raymax Network Tester Series is a research and development (R&D) testing product launched by the company, targeting routers, switches, and other network forwarding devices of similar levels. It adopts a modular design, offering 2 or 6 slots that support flexible combinations of testing modules with various rates. It also supports GPS connectivity, B code, and clock synchronization. The 6-slot version is the xTesterServer, which allows for the free selection of xTester series modules.

Paired with Raymax Technology's new-generation testing software xTester, the xTesterServer series testers enable Layer 2-3 traffic testing and protocol simulation for network devices and systems. They provide comprehensive testing solutions in terms of functionality, performance, and security, meeting the testing requirements in R&D, experimentation, and quality control processes.



xTesterServer

Main Features

- Maximum of 6 test card slots per unit, supporting up to 10x100G ports
- supporting multiple rates including 100G/50G/40G/25G/10G/5G/2.5G/2.5GbE/1GbE
- FPGA-based line-rate traffic generation, statistics, and capture
- Supports hardware-level transmission and reception of up to 255 templates of Layer 2-3 Ethernet packets
- Supports FEC, AN, and LT
- Supports benchmark tests such as RFC2544

文件 测试套件 帮助文档

192.168.12.8 client-1

资源列表

- 全部端口
- 192.168.7.250/port1(online)
- 流生成器
- 抓包配置

< 端口 192.168.7.250/port1 启用配置

端口基本信息

IPv4地址	192.168.7.250	端口号	port1	在线状态	true
软件版本	0.5.2_20221118	光口速度	100	硬件版本	18.0.0_20230113
用户	192.168.12.8/IT000169/client-1				

FEC Type: ON | Line Speed: 100G | UnderSize: 64 | Oversize: 9600 | Jumbo: 1518

IP Csum TCP Csum UDP Csum
 IGMP Csum ICMP Csum CRC error

Auto Negotiation: 10G 25G 40G 50G 100G

流编辑模板

Active Name: stream_port1_2

Frame size (bytes)

fixed Size: 128
 increment Step: 1
 decrement Min: 128
 random Max: 256
 auto iMix: default
 iMix iMixEdit

Streamblock load option

Load mode: Percent(%)
 Frame/sec(fps):
 Inter-Burst Gap(bytes):
 Inter-Burst Gap(msec):
 Inter-Burst Gap(nsec):
 bps
 Kbps
 Mbps

Settings

Scheduling priority:
 Burst size:
 Start delay(bytes):
 Inter frame gap unit:
 Inter frame gap:

Packet

Payload fill constant(hex): 0000
 Payload fill type: Cycle
 Insert FCS
 Insert FCS error
 Include Signature Field
 High Speed Result Analysis
 Enable AnalyzerPreload

取消 确定

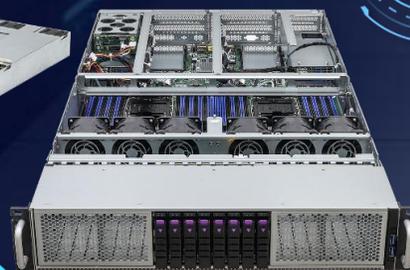
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xServerBox FPGA

FPGA Server

Performance and Features

- Highest density from 1U to 10U
- Pre-integrated with Ruiven xFast_FPGA cards
- Pre-integrated with Ruiven clock synchronization card and GPS
- Expandable chassis
- Rapid development and deployment platform, validation platform
- Low risk, low cost
- 3-year warranty



01

1U4FPGA

02

2U4FPGA

03

3U6FPGA

05

4U4FPGA

06

4U10FPGA

07

10U20FPGA

04

3U10FPGA

08

xFast_FPGA

11 xServerBox Manager Software

Choose the xServerBox FPGA server, and you will get a pre-configured and tested solution. This includes the setup and installation of your selected FPGA cards and related hardware, as well as your chosen operating system and development tools. It is ready to use upon arrival, allowing your team to focus more time on development and deployment.

For system management, it works with Raymax's software development kit to program the FPGA via PCIe, monitor the card's power consumption and temperature, and reprogram the onboard clock. You can also set up triggers to shut down the card if it becomes too hot, access JTAG, or use software tools remotely

FPGA开发板 | xFast-2000

固件烧录

基本信息

Device Name
XCVU3P_2FFVC1517

Logic	Memory	I/O	Integrated IP	Flash
System Logic Cells (K) 862	Max. Dist. RAM (Mb) 12.0	Max. Single-Ended HP I/Os 520	DSP Slices 2280	Flash Name MT28EW01GABA1LPC-0SIT
CLB Flip-Flops (K) 788	Total Block RAM (Mb) 25.3	GTY 32.75 Gb/s Transceivers 40	Peak INT8 DSP (TOP/s) 7.1	Size (Gb) 1
CLB LUTs (K) 394	UltraRAM (Mb) 90.0		PCIe® Gen3 x16 2	BandWidth x16
			150G Interliaken 3	
			100G Ethernet w/ KR4 RS-FEC 3	

RAYMAX 帮助文档

FPGA开发板

- 03:00:0 xFast-2000(XCVU3P_2F...
- 04:00:0 xFast-2000(XCVU3P_2F...
- 05:00:0 xFast-2000(XCVU3P_2F...
- 82:00:0 xFast-1000-X8V(XCVU3...
- 83:00:0 xFast-1000-X8V(XCVU3...
- 84:00:0 xFast-1000-X8V(XCVU3...

xServerBox Manager

操作日志

消息编号	操作对象	描述	操作时间
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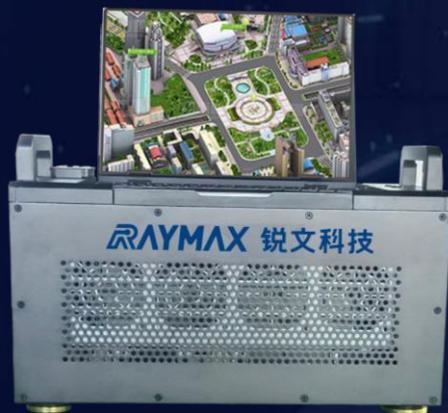
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xVisionBox

The Raymax xVisionBox multi-node cloud PC system adopts a built-in multi-node architecture, with each node independently developed based on Intel Core® processors. Each node supports one GPU acceleration card, delivering outstanding computational performance alongside exceptionally high space efficiency. Its compact and portable design allows it to be easily transported by plane, high-speed rail, or other means alongside project teams for on-site data collection. Once data is collected, it enables immediate and highly efficient data processing.



RW7U6NG



RW5U3NG

Chassis

5U/7U standard 19-inch rack-mount server chassis with custom logo support.

Power Supply

Optional hot-swappable power modules (2×800W) with 80 PLUS Platinum efficiency; Redundancy support is optional.

Cooling

Integrated temperature-controlled cooling modules inside each node.

Chassis Dimensions

438 × 260 × 237 mm (L × W × H)

Operating Temperature

5 °C to 30 °C during operation

Application Fields

- 3D Modeling
- Real-time Rendering
- Video Editing
- Research and Education
- Data Processing and Analysis
- AI Training and Edge computing
- High-Performance Computing and Simulation

Node

Independent physical nodes: *3 / *6

Processor

Control Node: Core i9-14900HX
 Compute Node: Core i9-14900HX (24 cores, 32 threads, up to 5.8 GHz Turbo frequency)

Motherboard

Customized dedicated motherboard

Memory

64 GB DDR5 5600 MHz per node

Storage

1 TB NVMe M.2 SSD per node

Graphics Card

RTX 4070 *3 / *6 (compute nodes)

Network Interface

Gigabit network card (1000/2500 Mbps), optional 10 Gigabit support

Management Interface

Built-in 2.5G switch, KVM over IP switch

External Interfaces

USB 3.0 × 3, USB 2.0 × 2, 10G SFP+ optical port × 1, 1G RJ45 × 1

Ambient Temperature

Operating: 5 °C – 30 °C
 Storage: –40 °C – 70 °C

Net Weight

18 kg-20kg

Operating System

Windows, Linux, etc