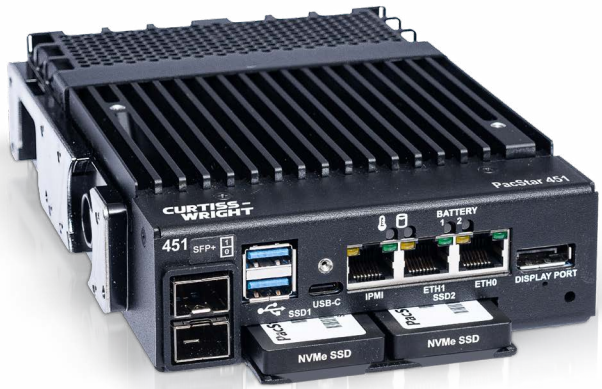
CURTISS-WRIGHT



PacStar 451

Modular Tactical Compute for the Edge

Key Features

- Part of PacStar 400-Series ecosystem: build mission-tailored solutions combining PacStar 451 with modular edge compute, route, switch, comms modules
- Workstation and server-grade x86 Intel processor options to right-size compute (from Atom to Xeon D)
- Up to 10 GbE networking for rapid transport of ISR data, video, virtualization traffic, and AI workloads
- Power IP cameras, phones, and more with PoE options
- Integrated TPM 2.0 built for cybersecurity / STIG requirements
- Mission data protection with removable encrypted storage options to simplify data handling, security compliance
- Ready for AI at the tactical edge: Intel AVX-512 VNNI acceleration, highperformance NVMe storage, virtualization application hosting
- Rugged MIL-810/461 qualified design
- Compact, snap-together design enables quick expansion

Applications

- Tactical Command Posts
- Joint All-Domain Operations (JADO)
- Mission Command Systems
- Executive Communications
- Edge AI / Tactical Cloud Infrastructure
- Vehicle-Mounted Deployments
- Emergency Response Networks

PacStar® 451 Small Server Module is a high-performance edge workstation and server platform that delivers mission-critical compute, virtualization, AI/ML processing and application hosting anywhere—from vehicles and command posts to forward operating bases—in a low-SWaP, modular form factor for tactical edge deployments.

Trusted for its reliability, quick set-up, modularity, and performance, PacStar 451 supports rapidly changing missions with maximum processing and networking capabilities in the smallest rugged form factor. Designed for in-theater computing, executive communications, vehicle-mount, early entry or forward operating base, or remote deployments for military, homeland security, first responders, and commercial/enterprise users, PacStar 451 can be paired with PacStar 400-Series ecosystem router, switch, radio, and gateway modules and packaging solutions to create integrated solutions for the toughest tasks at the tactical edge.

PacStar 451 configurations are available with choice of edge server-grade (Intel® Xeon D®) or edge workstation-class processors (Intel Xeon E, Core® i7 and Atom®) with generous memory, removable storage, network connectivity and I/O capabilities. PacStar 451's footprint offers the best in small size, flexible power, and environmental ruggedness. Sized to fit in a single-slot of a PacStar Smart Chassis, PacStar 451 can be powered from vehicle battery, generator, tactical radio batteries, or through its patented snap-together connector that provides DC passthrough to another PacStar 400-Series module. Auxiliary power output is also provided for external comms devices, such as a KG-250/XS encryptor.

To maximize performance, PacStar 451 Xeon D server options include high-speed removable NVMe® SSDs, 10 GbE SFP+ network interfaces, as well as IPMI remote and out-of-band management capabilities. Workstation-class options feature integrated Intel 3D graphics and higher 1GBaseT port density, including PoE support. A wide array of system packaging options are available for PacStar 400-Series modules, including briefcase, transit case, 19-inch rack mount, vehicle-mount, and backpack style.

Overview: Server Configurations

Edge Server-Class

- Intel Xeon D
- Up to 10 cores
- Up to 128 GB ECC memory
- Dual 10 GbE (SFP+)
- Dual NVMe storage
- IPMI management

Edge Workstation-Class

- Intel Core i7, Xeon E or Atom
- Up to 14 cores
- Up to 96 GB ECC memory
- Integrated Intel graphics
- PoE support
- Up to 5x 1GBaseT Ethernet
- Low-power, fanless options

For GPU or storage-intensive mission requirements, server-class PacStar 451 processors are also available in multi-slot server options with an integrated NVIDIA GPU card (see PacStar 453 or PacStar 454) or higher capacity NVMe network attached storage configurations (see PacStar 452 or PacStar 455).

PacStar 451 is available with a wide variety of pre-loaded, pre-secured, and pre-qualified software applications or virtualized appliances appropriate for use in tactical C5ISR/EW applications. These include, but are not limited to:

- Virtualized and software defined networking and WAN, routing, switching
- VPN, TLS encryption, PKI
- Cybersecurity: firewalls, IDS, threat analytics, SIEM, NetFlow
- Unified communications
- Video encoding, transcoding and analytics
- Tactical cloud deployment
- Mobile device and wireless network management
- Hyperconvergence and storage
- General-purpose application hosting

Specifications and Standards

Processor Variant Specifications

- Intel Xeon D (“Ice Lake” D-1700 Series):
  - D-1746TER (10-core / 20-thread, 67 W TDP) with 64 GB / 128 GB DDR-ECC memory
    - Special order: 8-core D-1732TE, 52 W TDP / 4-core D-1715TER, 50 W TDP
  - Network and I/O:
    - (2) two SFP+ 10 G ports
    - (3) three RJ45 GbE ports, including IPMI port
    - (2) two USB-A ports
    - (1) one locking USB-C
    - (1) one DisplayPort
    - (1) one Serial over LAN for IPMI
  - Baseboard Management Controller (BMC) with IPMI management (dedicated IPMI with KVM over IP display and Serial over LAN support)
  - NVMe storage: Two (2) independent, removable, 1.3 in NVMe SSD drive cartridges (up to ~8 TB per SSD, ~16 TB total), up to 6x faster than SATA
  - Boot Drive: optional internal, serviceable SSD boot drive (240 GB / 480 GB capacity)
  - Integrated TPM 2.0 security
- Intel Core i7 (Gen 13 “Raptor Lake”)
  - CPU: i7-13800HRE (14-core - 6P+8E/ 20-thread, 45W TDP)
  - Memory: 64 GB / 96 GB DDR5-ECC
  - Network and I/O:
    - (5) five RJ45 GbE ports (2 support PoE)
    - (2) two USB ports (1 USB-A, 1 Micro-USB)
    - (1) one Mini-DisplayPort
    - (1) one RS-232 RJ45 console
  - SATA storage: One (1) removable 2.5 in SATA 6 Gbps SSD, up to ~15 TB
  - Integrated TPM 2.0 security
- Intel Xeon E (9th Gen “Coffee Lake”):
  - CPU: E-2254ML (4-core/8-thread, 25W TDP), E-2276ME (6-core/12-thread, 45W TDP)
  - Memory: 64 GB / 96 GB DDR4-ECC
  - Network and I/O (two variant options)
    - Variant A:
      - (5) five RJ45 GbE ports (2 support PoE)
      - (2) two USB ports (1 USB-A, 1 Micro-USB)
      - (1) one Mini-DisplayPort
      - (1) one RS-232 RJ45 console
    - Variant B:
      - (3) three RJ45 GbE ports
      - (4) four USB-A ports (including 2 USB 3.1)
      - (1) one DisplayPort
      - (1) one RS-232 RJ45 console
  - SATA storage: One (1) removable 2.5 in SATA 6 Gbps SSD, up to ~15 TB
  - Integrated TPM 2.0 security
- Intel Atom (Elkhart Lake):
  - CPU: x6425RE (4-core/4-thread, 15W TDP)
  - Memory: 32 GB DDR4-ECC
  - Network and I/O:
    - (5) five RJ45 GbE ports (2 support PoE)
    - (2) two USB-A
    - (1) one Micro-USB
    - (1) one Mini-DisplayPort
    - (1) one RS-232 RJ45 console
  - SATA storage: One (1) removable 2.5 in SATA 6 Gbps SSD, up to ~15 TB
  - Integrated TPM 2.0 security

Note: Contact Sales to discuss FIPS-140 / CSfC-certified storage solution options

Physical Specifications

- Dimensions (WxDxH): 5.3 in x 7.1 in x 1.7 in (fits in 1-slot of PacStar 400-Series Smart Chassis)
- Weight: 2.7 lb (approx.)
- Patented snap-together connector provides DC pass-through for powering additional PacStar 400-Series products
- Low-power processor variants feature fanless design for quiet operation, higher reliability, and extended battery life
- High-power processor variants maximize performance using two small fans, externally mounted to heat sink, so sealing boundaries are not violated
- Operational temperature range: -20 °C to 60 °C (128 GB variants: -20 °C to 50 °C)
- Extensive qualification testing: MIL-STD-810 (Environmental), MIL-STD-461 (EMI/EMC)

Power Specifications

- Wide range DC input, 10-35 V
- World-wide AC power input (with adapter cable)
- Hot-swap and continuous run-time support with battery snap-together connectors for 1-2 AN/PRC-152/148 radio batteries (up to 2+ hours runtime per battery)
- Regulated clean 12 V DC output @ 20 W for auxiliary devices (includes mounting holes to attach KG-250X/XS HAIPE crypto device)

Mission Software Support

- OS/Hypervisors/Cloud: Linux, Windows, ESXi, NFVIS, KVM, Azure Local, XEN, Hyper-V, and more
- Virtual Network Functions: Cisco, Palo Alto, Juniper, Aruba and more
- Cross Domain Solutions: BAE, Everfox, Owl
- IQ-Core® Software option to simplify, automate and unify deployment of tactical networks from a single pane of glass

Quality / Export Control

- Quality Management: Certified AS9100 including ISO9001 Quality Management System
- Export: Dual-Use EAR controlled (ITAR-free)

PacStar 451

Supported Software Appliances

Network Function Virtualization: Providing Routing, Switching, Network Optimization
Aruba Virtual Mobility Controller (Wireless Infrastructure Controller)
Cisco Cloud Services Router 1000v and Catalyst 8000v
Riverbed Virtual SteelHead (SATCOM/WAN performance optimization)
Viasat NETAGILITY™ NVR-1000

Cybersecurity: Firewall, VPN, Network Intrusion Detection, Threat Analytics, and Network Defense
Aruba ClearPass – Authentication
Cisco ASA and Firepower – Firewall, IDS, analytics, VPN
Cisco Stealthwatch - Cyber Analytics
Elastic - SIEM
Everfox NGFW – Firewall, IDS, VPN
Juniper vSRX – Firewall, IDS and VPN
IQ-Core Crypto Manager – PKI, Crypto and SIEM
Palo Alto Networks – Firewall, IDS and VPN
Red Hat Enterprise Linux with Certificate Services - PKI
Information Security Corp CertAgent - PKI
Microsoft Windows Server – Domain Control, Authentication, PKI

IP-Based Unified Communications: Voice, Video and Conferencing
Blackberry SecuSUITE – Complete UC suite
Cisco Unified Communications Manager
Haivision Kraken - Video transport, transcode, optimization
REDCOM Sigma® - Complete UC suite

General Purpose Application Hosting
DOD-specific mission command applications
Linux Services (host nearly unlimited array of apps)
Microsoft Windows Server and Microsoft Azure Local
Broadcom VMware ESXi, XEN, KVM, and Hyper-V Hypervisors

Hyper-Convergence and Large Scale Storage
Broadcom VMware vSAN
NetApp ONTAP Edge
Riverbed Virtual SteelFusion Edge
TrueNAS

Cross Domain Solutions
BAE XTS Guard
Everfox High Speed Guard, Trusted Gateway, Trusted Thin Client
Owl V2CDS

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