OPALE-Rugged

DESIGNED & PRODUCED
IN FRANCE

2U Rugged Server

Compact. Robust. Mission-Ready.

The OPALE-Rugged Rugged Server is a high-performance military-grade computing platform designed for mission-critical applications in harsh and constrained environments. Tailored for defense, aerospace, industrial automation, and edge computing, it delivers exceptional reliability and processing power where conventional servers cannot operate.

Built around Intel® Xeon® Scalable processors, the OPALE-Rugged ensures consistent performance in the face of shock, vibration, dust, humidity, and extreme temperatures. This rugged server is ideal for deployment in tactical operations, airborne systems, naval platforms, and industrial field installations where ruggedization, environmental compliance, and secure remote management are essential.

As part of its commitment to excellence, Ecrin also offers a full range of value-added services with the OPALE-Rugged: customization options, dedicated technical support, and long-term lifecycle support, services widely recognized and valued by professionals in defense, aerospace, and industrial sectors.

Certifications & Standards
- MIL-STD-810G – Temperature, shock, vibration
- MIL-STD-461G – EMI/EMC compliance
- DO-160G, MIL-STD-1275E – Power input and environmental compliance

- 5th/4th Gen Intel® Xeon® Scalable
- Rugged 2U aluminum chassis – 18.9" (480 mm) depth
- 3U rack option for Full Height PCIe slot plus additional storage
- Shock and vibration-resistant, MIL-grade
- IP65-rated enclosure – dust-tight and protected against water jets
- Optimized ventilation system with reduced acoustic noise
- IPMI support for monitoring, remote control & system management
- Power supply: 28V DC input, DO-160G qualified with 20ms hold-up time
- I/O connectivity: MIL-GRADE connectors (customizable upon request)

ecrin SYSTEMS

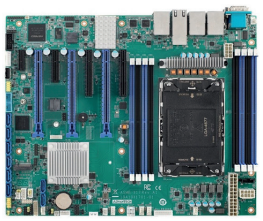
OPALE-Rugged

Rack specifications

Construction	Aluminum (fine sand casting), black anodized.
Dimensions (W x H x D)	19" / 2U with 18.9 inch depth (443x86x480mm)
Weight	18 kg (standard configuration)
Cooling	Cold plate: 5x 40x28 mm ball bearing fans, 19,7 CFM, IP68 Inside rack: 3x 40x28 mm ball bearing fans, 19,7 CFM
Power supply	1U form factor, conduction cooled
Drive bays	Alf 5.25" Drive bay width size
Expansion	6x Low Profile Half Length PCIe Slot
Front panel	IP65 front door, access to drive bays and front I/Os Service connectors (customizable) : VGA, 2x USB, IPMI (RJ45) Removable drive enclosure: 3 x 2.5" SATA-III & SAS-III SSD (up to 10 mm) Power button with indicator light Configurable connection area
Back panel	Centering pins (x2) Exhaust fans (x5) Configurable connector area MIL-DTL-38999 connectors: miniDP, 10GbE, USB-C, fiber optic mpo, pins, others ...
3U rack option	Dimension: 19" / 3U with 18.9 inch depth (443x132x480mm) Support Full Height Half Length PCIe Slot Three additional 3"1/2 front accessible drive bay, up to six SATA / NVMe drive Cold plate fans: 3x 80x25 mm ball bearing fans, 81,9 CFM, IP68

Motherboard specifications

Form factor	Industrial ATX Server Board (12" x 9.6")
Processor	5th/4th Gen Intel® Xeon® Scalable (socket LGA4677)
Chipset	Intel C741 chipset
Memory	Eight-channel DDR5 ECC-REG 4400/4800/5200 MHz RDIMM Up to 2TB (8 DIMMs)
Video	1x VGA (BMC Aspeed AST2600)
Ethernet	2x 10GbE (Intel® X710-AT2) via RJ45 2x GbE (Intel® I210AT) via RJ45 1x GbE dedicated LAN and 1x port shared LAN for IPMI
Disk	8x SATA 3 (6 Gb/s), support software RAID 0,1,5,10 (Intel® C741) 1x M.2 2280/22110 B+M key (SATA and PCIe)
USB	4x USB 3.2 Gen 1 - 8x USB 2.0 - 1x USB 2.0 vertical type A port
Watchdog timer	Programmable 1 ~ 255 sec/min, can generate system reset
Hardware monitor	CPU/System temperature, fan speed (x6) and onboard DC voltages
TPM	TPM socket (SPI)
I/O	Serial port: 2x RS-232, SMBus, audio, PS/2 KB/Mouse, 8x GPIO
Expansion slots	3x PCIe x16 slot (Gen5 x16 link), signal from CPU, CXL support - 2x PCIe x8 slot (Gen5 x8 link), signal from CPU 1x PCIe x4 slot (Gen5 x4 link), signal from CPU - 1x PCIe x1 slot (Gen3 x1 link), signal from PCH



Environmental specifications

Temperature	Operating: -20~50°C / Storage -40~71°C
Humidity	Operating: 95% non condensing
Altitude	0-5000m (0-16.000ft) operating, 0-12000m (0-40.000ft) non operating
Shock & vibration	Operating: 30G, 11ms 6 axis - Operating: 5~2000 Hz 4Grms
Ingress protection	IP65
Certification	MIL-STD-810G: Methods 500.5, 501.5, 502.5, 506.5, 507.5, 514.6, 516.6 MIL-STD-461G: CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103 MIL-STD-1275E CE Certification

System Monitoring and management

- IPMI 2.0 support: AST2600 BMC chip, Redfish API support
- KVM over IP: KVM over IP function allows BIOS level remote control

OEM Services

- Modified COTS customization:
  - Specific I/O on front panel / special connectors on rear panel
  - Specific H/W configurations
  - Specific S/W functionality

  Call us for more information ...

Standard configuration

Power Supply Unit	28Vdc (18~36Vdc) 500W, 12V@25A, 5V@20A, 3.3V@20A Holdup: 20mS, -40°C To 71°C RTCA DO-160G, MIL-STD 461G, MIL-STD-1275E AC/DC 600W, 85~264V, 12V@25A, 5V@25A, 3.3V@25A Efficiency: Up to 92%, holdup: 20mS, -40°C To 71°C MIL-STD 810G, MIL-STD 461F & MIL-STD 704F	Processor	- Xeon® Gold 6421N (32C/64T, 1.8GHz, 60MB Cache, DDR5-4400, 185W TDP) - Xeon® Silver 4510T (12C/24T, 2.0GHz, 30MB Cache, DDR5-4400, 115W TDP) - Xeon® Gold 6538N (32C/64T, 2.1GHz., 60MB Cache, DDR5-5200, 205W TDP) - Other SKU on demand (5th/4th Gen Intel® Xeon® Scalable)
Drives	3 x 2"1/2 SATA Removable Drive Enclosure	Memory	DDR5-5600, ECC Registered Wide Temperature: 16GB / 24GB / 32GB / 48GB
Front I/O (behind door)	VGA, 2x USB, IPMI (RJ45)	Disk	- SLC & 3D TLC Solid State Drive (32 Go ~ 8TB) - Up to 3x hot swap 2"1/2 SATA SSD with 2U rack - Up to 6x additional hot swap 2"1/2 SATA/NVMe SSD with 3U rack option)
Front I/O Rear I/O	On request		
MIL-DTL-38999 connectors	miniDP, 10GbE, USB-C, MPO fiber optic, pins, others ...	OS	- Microsoft® Windows 11 64-bit, Windows Server 2019 / 2022 - Linux 64-bit

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