In response to the increasing demand for artificial intelligence (AI) in military applications, high-performance computing appliances (HPCAs) are designed for AI-driven autonomy in land, air, and maritime operations. These HPCAs provide the necessary computing power for AI applications while minimizing latency, implementing the latest technologies in high-speed data centers, input/output, networking, and storage to operate in harsh environments. They meet stringent MIL-SPEC requirements for shock and vibration, redundancy, operating temperature range, height range, and uninterruptible power supply, ensuring reliable performance in critical scenarios. These platforms must function in space-constrained environments, making it essential to minimize the size, weight, and power (SWaP) of the systems.

Ruggedized design
- Shock and vibration resistance & extended temperature range
- Aluminum / composite enclosure and retention bars for GPUs
- In-house engineering & testing
- Variable power supply via AC/DC & DC/DC

Remote management (U-BMC)
- Configuration, user management, updates, data logging, remote access
- Resource monitoring, alerts, performance data collection
- Remote and hardware control, access restriction, automation

Liquid and immersion cooling
- Direct-to-chip cooling option
- Single phase immersion
- Two phase immersion
- Hybrid solution available

State-of-the-art PCIe / GPU standards
- Available with PCI Express standards Gen 5 and higher
- Support for the latest GPU models (e.g., NVIDIA® RTX or Quadro®)
- Comprehensive NVIDIA® solutions and SDKs for AI applications
Our Services - Committing to Excellence

Consulting service
- Individual consultation and solution finding
- State-of-the-art solutions
- Product presentation and lending service
- Industry and technology experts
- Via phone, video call, or on-site

Built-to-order systems
- Designing, developing, and manufacturing customized systems
  - Hardware and software development
  - Prototyping and validation
  - Quality control and testing
  - Documentation and certification
  - Production and supply chain management
  - Service and maintenance

OEM / production services
- System engineering, specification, detailed design and regulatory compliance (commercial, medical, aerospace, and military)
- Optimized for expedited build of short-run, high-spec, difficult to test items, and prototypes
- Integration with client supply chain strategies (supplier-managed inventory, hot-spares, etc.)
- Expertise in extreme temperature ranges for systems with challenging heat generating components using advanced thermal design for air & liquid solutions

Testing & certification
- Comprehensive validation and certification services
  - Competitively-priced with extraordinary quality (ISO 9001/ AS9100:D process)
  - 12 to 48 hours stress tests
  - Generation of test reports
  - Providing certification documents
  - Support for certifications and regulatory challenges

Lifecycle management
- Professional lifecycle management service for reliable system and component availability
  - Product Change Management
  - Ensured availabilities (beyond market availability)
  - End-of-Life Monitoring

RMA services
- Return, repair, and replacement of malfunctioning hardware under warranty inspection
  - Fault analysis and diagnosis
  - Repair and replacement
  - Warranty inspection and processing
  - Firmware and software updates
  - Data backup and recovery
  - Logistics and return management

AS9100 & ISO 9001:2015 certification
Manufacturer One Stop Systems has received ISO 9001:2015 and AS9100D certification from SAI Global. This covers the following scope of certification: design, manufacture and supply of industrial computers for the media and entertainment, financial, oil and gas, medical, aerospace, defense and other industries requiring similar products and services worldwide.

AS9100 is a quality management system developed to fill the gaps that aerospace companies have identified in the ISO 9001 standard in terms of how they conduct business for their customers. It was originally approved in 1999 and has since undergone four revisions, culminating in our current version, AS9100D.

A quality system is a formal system that documents procedures and processes to meet customer requirements. When you have a quality system, your customers know that you have a complete system in place to produce the product or service you provide in a high-quality, repeatable manner while meeting all regulatory requirements. Through the risk and opportunity assessment conducted as part of the AS9100 process, there are always opportunities to improve your business or enhance your customers’ experience.

What do the MIL-STD standards mean?

<table>
<thead>
<tr>
<th>Standard</th>
<th>Meaning and scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-STD-810</td>
<td>A set of standardized test methods for the U.S. military, defining, among others, the compatibility of equipment in dealing with high temperature fluctuations, atmospheric pressure, humidity, vibration, or solar radiation.</td>
</tr>
<tr>
<td>MIL-STD-461</td>
<td>Specification of electromagnetic compatibility requirements for military products and solutions.</td>
</tr>
<tr>
<td>MIL-STD-464</td>
<td>Establish environmental electromagnetic interface requirements and test criteria for air, sea, space, and ground systems, including associated ordnance.</td>
</tr>
<tr>
<td>MIL-STD-704</td>
<td>Ensure compatibility between the aircraft electrical system, external power supply, and airborne equipment.</td>
</tr>
</tbody>
</table>

Chairperson: John Doe
Chairperson: Mary Smith
Our advanced solutions enable the seamless processing of vast volumes of unstructured text data, unlocking valuable insights from intelligence reports, open-source intelligence, and communications intercepted in various languages. By efficiently analyzing and understanding this linguistic data, military analysts can derive actionable intelligence, identify emerging threats, and forecast enemy activities with unprecedented precision.

Powered by the unparalleled capabilities of our ruggedized HPC servers and storage expansions, these advanced systems serve as the backbone of AI-driven technology in autonomous vehicles, enabling them to process massive amounts of data from specialized sensors like video, radar, and LiDAR. From unmanned surface ships travelling thousands of nautical miles without a crew to autonomous underwater vehicles (AUVs) undertaking mine countermeasures, our HPC appliances play a pivotal role in ensuring seamless operations and mission success.

Our high-end solutions redefine the landscape of intelligence gathering and analysis, empowering military agencies to efficiently intercept, collect, and analyze vast amounts of complex signals data from various sources. With lightning-fast processing capabilities, our HPC appliances enable real-time signal detection, identification, and decryption, providing critical insights into adversaries’ communications and activities. The integration of advanced algorithms and machine learning techniques enhances the accuracy and speed of SIGINT analysis, revealing hidden patterns and uncovering potential threats.

OSS supercomputers reframe the landscape of military training and preparedness, enabling realistic and immersive simulations of complex scenarios. With massive computational power and high-speed data processing, our rugged HPC appliances can run large-scale simulations involving multiple entities, such as ground forces, aircraft, and naval fleets, replicating real-world environments with unprecedented accuracy. These simulations facilitate tactical training, mission planning, and decision-making exercises for soldiers and staff, focusing critical skills and enhancing operational readiness.

Our state-of-the-art HPC systems greatly expand the boundaries of electronic dominance, enabling unparalleled capabilities in jamming, deception, and electronic countermeasures. Supporting advanced signal processing and machine learning algorithms, our appliances swiftly analyze vast volumes of electronic signals, detecting and identifying enemy radars, communication systems, and other electronic threats.

OSS supercomputers reformulate the landscape of military training and preparedness, enabling realistic and immersive simulations of complex scenarios. With massive computational power and high-speed data processing, our rugged HPC appliances can run large-scale simulations involving multiple entities, such as ground forces, aircraft, and naval fleets, replicating real-world environments with unprecedented accuracy. These simulations facilitate tactical training, mission planning, and decision-making exercises for soldiers and staff, focusing critical skills and enhancing operational readiness.
Air Force

- Aerospace prime contractor developing an AI-based threat detection system aboard U.S. Navy aircraft
- Civilian "connected aircraft" that use on-board AI and SATCOM or 5G wireless links to collect data on aircraft operational performance and process it on the spot

Navy

- AI-based marine monitoring and analysis systems onboard ships to automate the detection of faulty systems for maintenance purposes
- Embedded AI capabilities in shipboard defensive and offensive mission systems designed for rapid awareness and reaction to threats

Army

- Automated targeting systems using advanced sensors, machine-learning algorithms and touchscreen displays to enable army tank crews to detect and respond to incoming threats faster than ever before
- Truck-mounted mobile radar systems provide ISR (Intelligence, Surveillance and Reconnaissance)

Cybersecurity and Drone Control

- AI cybersecurity applications monitor real-time access to industrial assets at manufacturers and utilities, track authorized access, and detect patterns indicative of cyberattacks
- Enabling cooperative behavior between aerial or land drones (military or civilian)

AI “in the Field”

- Portable military command centers that use AI "in the field" — i.e., in close proximity to the battle — to quickly process a flood of tactical information into a comprehensive and intelligible picture of the battlefield
- Specialized high performance edge computing equipment tied to a myriad of video, radar and LiDAR sensors, high capacity and low latency storage subsystems for fast decision-making

Cernis & Donati - Army AI program application example

- 360° Situational Awareness with PCIe Interconnect
- Sensor Concentrator & AI Applications for manned and unmanned army vehicles
- 6-times higher bandwidth than 10Gbps Ethernet (64GB)
- PCIe Network to reduce latency 800x versus Ethernet (150ns)
Rugged PCIe Gen 5 Short Depth Server for AI applications and data logging

- Rugged server design
  - Size and weight optimized aluminum chassis with a depth of 50.8cm / 20”
  - Resilient frame-in-frame design
  - MIL-STD-810G certified

- Hot-swap storage
  - Removable hot-swap storage canisters
  - Up to 16x SATA / SAS / NVMe drives
  - Up to 1 petabyte NVMe storage with 64 GB/s (16x 64 TB NVMe)

- PCIe Gen 5 standard
  - Up to 7x PCIe x16 slots
  - Up to 4x dual-slot GPUs
  - Up to 320 GB/s GPU computing power

- Customization
  - Configurable front and rear panels
  - Advanced power supply up to 400Hz AC
  - Immersion, liquid, or air cooling options available
  - Customized solutions as an option

- High performance GPUs
  - Integrate up to four 350W GPUs
  - State-of-the-art server-level GPU models
  - Comprehensive NVIDIA solutions and SDKs for AI applications

- Remote management (U-BMC)
  - Configuration, user management, updates, data logging, remote access and automation
  - Resource monitoring, alerts, performance data collection

- Air, liquid or immersion cooling
  - Air cooling: Ruggedized fan cooling
  - Liquid cooling: Direct-to-chip liquid cooling
  - Immersion cooling: Cooling by immersion in coolant (single- or two-phase)

- Gen 5 3U SDS dual drive packs
  - Data logging configuration with a focus on storage
  - Up to 2x 350W GPUs + standard NIC / RAID / FPGA I/O
  - Up to 16 NVMe / SATA drives (2x hot-swap canisters)

- Gen 5 3U SDS one drive packs
  - Balanced GPU / storage configuration
  - Up to 4x 350W GPUs + standard NIC / RAID / FPGA I/O
  - Up to 8 NVMe / SATA drives (1x hot-swap canister)

- Gen 5 3U SDS zero drive packs
  - Configuration with a focus on GPUs and inputs/outputs
  - Up to 4x 350W GPUs plus 75W per slot for I/O options
  - Two swappable NVMe / SATA / M.2 drives

www.onestopsystems.com
Cutting-edge high performance supercomputer supporting extreme airborne, marine, or terrestrial environments

**Air, liquid or immersion cooling**
- Air cooling: Ruggedized fan cooling
- Liquid cooling: Direct-to-chip liquid cooling
- Immersion cooling: Cooling by immersion in coolant (single- or two-phase)

Thermally and structurally optimized
- Ruggedized 4U, 1/2-width, 26-inch depth compact formfactor with lightweight aluminum frame design
- Thermal and structural optimized for transportable environments
- MIL-STD-810G / MIL-STD-461 to airborne prop aircraft
- -20 to 50°C operating temp. (-40 to 65°C with liquid immersion)

Remote management (U-BMC)
- Configuration, user management, updates, data logging, remote access and automation
- Resource monitoring, alerts, performance data collection

NVIDIA industrial edge certified
- For systems in vehicles, “at the data” or in industrial or rugged environments.
- The only 805m GPU based system to meet this qualification

**Cutting-edge high performance supercomputer supporting extreme airborne, marine, or terrestrial environments**

**Rigel Edge Supercomputer**

**Cernis and Donati**

MIL rugged scalable small form factor (SFF) AI compute system

The Cernis small form factor (SFF) NVIDIA® Jetson Orin™ with integrated PCIe Express 4.0 switch fabric is the cornerstone of an expandable edge AI mission computing system for high-end AI applications such as sensor fusion, natural language processing, autonomy, situational awareness, and signal intelligence, all in a SWaP optimized package.

While powerful on its own, Cernis capabilities are fully realized when paired with up to 24 Donati NVIDIA® Jetson Orin™ AGX mission computers using an OSS PCIe fabric. This combination forms a low-latency, high-speed mission compute system designed for demanding AI applications in harsh environments. With AI inference performance up to 6.6 PetaOPS, data fabric speeds over 150GB/s, and advanced PCIe switching, the Cernis/Donati scalable AI SFF compute system delivers datacenter power to the rugged edge.

**360° situational awareness (360SA) applications**

360° situational awareness applications (application example on page 9)

**NVIDIA® AGX Orin™ compute node with AI processor for embedded autonomy and AI**
- Low-power switch with embedded ARM / GPU Orin™ Nano management processor

**High performance, low-power**
- NVIDIA® AGX Orin™ compute node with AI processor for embedded autonomy and AI
- Low-power switch with embedded ARM / GPU Orin™ Nano management processor

Data written to main memory accessible by all endpoints via PCIe switch simultaneously
- Significantly reduced latency compared to several unicast writes
- OSS using Orin™ as root complex and endpoints for Cernis/Donati architecture

**Multicast**
- Data written to main memory accessible by all endpoints via PCIe switch simultaneously
- Significantly reduced latency compared to several unicast writes
- OSS using Orin™ as root complex and endpoints for Cernis/Donati architecture

**Real-time capability**
- Satisfies a variety of AI processing missions such as 360° situational awareness (1x Cernis and up to 8x Donatis)
- Deployment for serving real-time fused video and sensor data to ground forces

Remote management (U-BMC)
- Configuration, user management, updates, data logging, remote access and automation
- Resource monitoring, alerts, performance data collection

NVIDIA industrial edge certified
- For systems in vehicles, “at the data” or in industrial or rugged environments.
- The only 805m GPU based system to meet this qualification

**SwaP optimized design**
- MIL rugged scalable small form factor (SFF) with milled aluminum and flange mount (MIL-STD-810G certified)
- -40 to 85°C operating temperature at 10,000 ft altitude
- Shock ± 10 g, 11 msec, half-sine pulse, 3 shocks per axis
- Vibration 4.5 Grms, 10 to 2000 Hz

**High performance GPUs**
- 4x NVIDIA® HGX A100 80GB GPUs with 320GB GPU memory
- 2.4TB/s total GPU aggregated bandwidth
- 78 teraFLOPS of FP64 HPC performance

Significantly reduced latency compared to several unicast writes
- OSS using Orin™ as root complex and endpoints for Cernis/Donati architecture

www.onestopstystems.com
### Rugged compute systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Gen5 3U-SDS</th>
<th>Rigel Edge Supercomputer</th>
<th>Cernis &amp; Donati</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>AMD EPYC™ 7003 CPU</td>
<td>AMD EPYC™ 7003 CPU</td>
<td>6-core Arm® A50™ Cereals 4/6ME Cereals 2-core Arm® Cortex-A58 Rugged Computing</td>
</tr>
<tr>
<td>GPU</td>
<td>Full height, full length</td>
<td>4x NVIDIA® A100 SM GPUs 320 GB GPU storage</td>
<td>1024-core NVIDIA Ampere architecture GPU with 32 Tensor Cores (Cernis) 2048-core NVIDIA Ampere architecture GPU with 64 Tensor Cores (Cernis)</td>
</tr>
<tr>
<td>RAM</td>
<td>8x DDR5 4800-7680/4096-MDIMM slots per PCIe slot, up to 2x16 DDR5 memory</td>
<td>8x ECC DDR4, 2x16 DIMM (UDIMM slots (supports modules up to 128GB))</td>
<td>8GB 128-64 LPDDR5 (Cernis) 5GB 256-64 LPDDR5 (Ravel)</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>12GB SAS-3 or 6GB SATA-3 SFF</td>
<td>PCIe 6.0 x 16 NVMe M.2 slot</td>
<td>64GB eMMC 5.1</td>
</tr>
</tbody>
</table>

### PCIe and storage expansions

<table>
<thead>
<tr>
<th>Model</th>
<th>EB4400</th>
<th>Gen5 4U Pro</th>
<th>Centauri</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GPU</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RAM</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Use Cases

- **High-Speed Transportable Data Recorder / Logger**
  - Airborne, Naval or Ground-Based Transportable AI Applications
  - Situational Awareness, Sensor Fusion, Natural Language Processing, Autonomous Vehicles, ML, Rugged Computing
- **Transportable AI Applications**
  - Airborne, Naval or Ground-Based Transportable Semi-Rugged AI Applications
  - Entire AI Workflows at the Edge

### Technical Specifications

- **CPU**
  - AMD EPYC™ 7003 (Genoa) Series
  - Up to 400W TDP
- **GPU**
  - 4x NVIDIA® A100 SM GPUs
  - 320 GB GPU storage
- **RAM**
  - 8x DDR5 4800/4000 RDIMM slots per PCIe slot
- **Storage**
  - 12GB SAS-3 or 6GB SATA-3 SFF
  - PCIe 6.0 x 16 NVMe M.2 slot
- **Temperature**
  - Operation: -20°C ~ 50°C
  - Storage: -40°C ~ 70°C
- **Power Supply**
  - Single / Dual AC 1600W power supply
  - Dual 1600W redundant power supplies, 100-240VAC full range 48VDC
  - 100-240VAC full range 50/60Hz

### Dimensions

- **Height**
  - 3U: 177.8 x 127.1 x 508.0mm
  - 4U: 271.8 x 177.8 x 218.4mm
- **Weight**
  - 271.8 x 177.8 x 218.4mm
  - 49.5 x 177.8 x 218.4mm
  - 39.0 x 177.8 x 218.4mm

### Use Cases

- **Transportable Data Capturing, Mobile Storage Expansion**
EMEA
One Stop Systems GmbH
Industriestrasse 51
82194 Groebenzell
Germany
Phone: +49 8142 47284-70
E-Mail: emea@onestopsystems.com
Web: www.onestopsystems.com

USA
One Stop Systems Inc.
2235 Enterprise Street #110
Escondido, CA 92029, USA
Phone: +1 (877) 438-2724
Fax: +1 (760) 745-9824
E-Mail: sales@onestopsystems.com