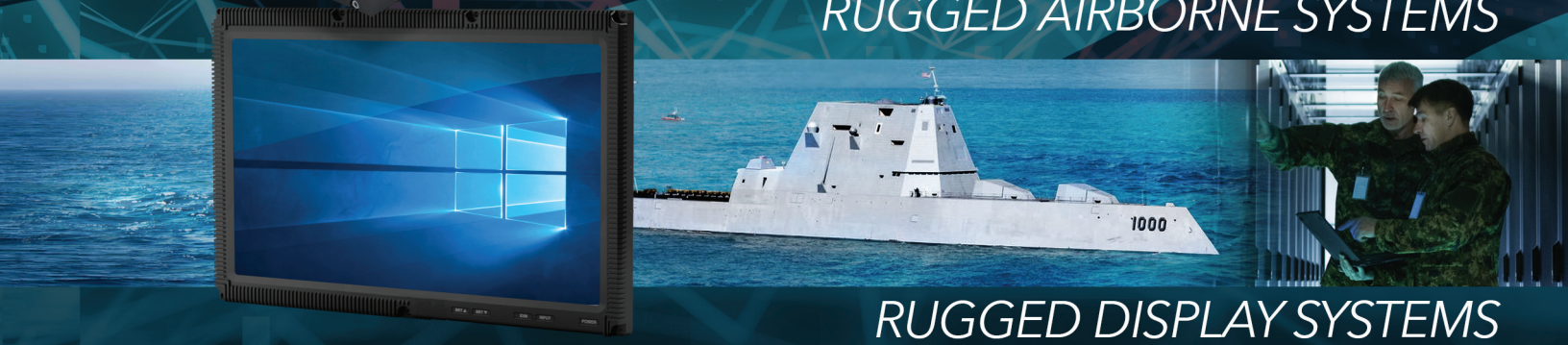
GENERAL MICRO SYSTEMS, INC.

MISSION COMPUTING

ONE COMPANY FOR ALL YOUR RUGGED COMPUTING NEEDS

RUGGED MISSION SYSTEMS

RUGGED AIRBORNE SYSTEMS



RUGGED DISPLAY SYSTEMS

ALL GENERAL MICRO SYSTEMS, INC. PRODUCTS ARE PROUDLY DESIGNED AND MANUFACTURED AND ASSEMBLED IN THE U.S.A

GMS

GENERAL MICRO SYSTEMS, INC.

TRUSTED AND DEPLOYED SINCE 1979

(800) 307-4863 / GMS4SBC.COM

RUGGED AIRBORNE COMPUTING SYSTEMS

Flight certified airborne mission computers

PEACOCK S1202-GPU

Mission Computer with Intel® Xeon E3 Processor,
Universal Power, Dual GPGPU and Removable Storage

- Intel® Xeon® E3 (Kaby Lake) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 1x U.2 SSD (SATA/NVMe)
- 2x 10 GigE, 3x 1 GigE
- 5x PCIe sites, 2x MXM, 2x Express Mini, 1x M.2
- Universal Power 110/220 VAC (60/400Hz) or 28V DC

Size: 10" x 5.4" x 2.6" (140 cu.inch)
Weight: As low as 7 lbs.
MIL-STD: 810G, 1275D/704F/704, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

SEAHAWK S1202-FS

Mission File Server with Intel® Xeon E3 Processor and
Up to 64TB of Removable Storage in Fully-Sealed Canister

- Intel® Xeon® E3 (Kaby Lake) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 4x SSD (in fully-sealed removable canister)
- Rugged Interconnect withstands ~10,000 insertion cycles
- 2x 10 GigE, 1x 1 GigE
- 3x PCIe sites, 1 M.2, 2x Express Mini

Size: 5.2" x 9.2" x 4.25" (203 cu.inch)
Weight: As low as 7 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

HUMMINGBIRD S1202-LP

Low Profile, Mission Computer with Intel® Xeon E3 Processor,
High Speed I/O and Removable Storage

- Intel® Xeon® E3 (Kaby Lake) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 1x U.2 SSD (SATA/NVMe)
- 2x 10 GigE, 3x 1 GigE
- 3x PCIe sites, 1 M.2, 2x Express Mini
- Available with DZUS™ mount or Flange mount

Size: 5.4" x 6" x 2" (65 cu.inch)
Weight: As low as 5 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

FALCON-X

Low Cost Mission Computer with Intel® 8th Gen NUC,
High Speed I/O and Removable Storage

- Intel® i7 (Coffee Lake) up to 4.8GHz
- 64GB DDR4 ECC DRAM
- 1x SATA SSD
- 3x 1 GigE, 1x USB4-TB (USB type C)
- 2x PCIe sites, 2x M.2
- 2x 4K HDMI video output

Size: 5" x 9" x 1.75" (79 cu.inch)
Weight: As low as 5 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

RUGGED MISSION COMPUTING SYSTEMS

Battlefield tested mission computers

GOLDEN-EYE S1202-HS

Low Profile Mission Computer with Intel® Xeon E3 Processor, High Speed I/O and Removable Storage

- Intel® Xeon® E3 (Kaby Lake) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 1x U.2 SSD (SATA/NVMe)
- 2x 10 GigE, 1x 1 GigE
- 3x PCIe sites, 1 M.2, 2x Express Mini
- Dual HD/SDI video output (optional)

Size: 5.4" x 6.5" x 2.25" (80 cu.inch)
Weight: As low as 6 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

GOLDEN-EYE S1202-R5

Low Profile Mission Computer with Intel® Xeon E3 Processor, High Speed I/O and 5 Individual Removable Storage

- Intel® Xeon® E3 (Kaby Lake) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 5x U.2 SSD (SATA/NVMe) behind fully-sealed door
- 2x 10 GigE, 1x 1 GigE
- 3x PCIe sites, 1 M.2, 2x Express Mini

Size: 5.4" x 6.5" x 2.25" (80 cu.inch)
Weight: As low as 6 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

MARLIN S502

Ultra-Small, Low Power Mission Computer with Intel® Quad Core Atom™ Processor and High Speed I/O

- Intel® Atom™ (Quad Core) up to 1.9GHz
- 8GB DDR3 ECC DRAM
- 1x SATA SSD
- 1x 1 GigE (POE optional)
- 1x PCIe site, 1x Express Mini
- 4x USB, 5x GPIO
- Full HD Audio and HD Graphics

Size: 3.75" x 6" x 1" (23 cu.inch)
Weight: As low as 1.5 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

FALCON

Low Cost Mission Computer with Intel® 8th Gen NUC, High Speed I/O and Removable Storage

- Intel® i7 (Coffee Lake) up to 4.8GHz
- 64GB DDR4 ECC DRAM
- 1x SATA SSD
- 3x 1 GigE, 1x USB4-TB (USB type C)
- 2x PCIe sites, 2x M.2
- 2x 4K HDMI video output
- Universal Power 110/220 VAC (60/400Hz) or 28V DC

Size: 5" x 9" x 1.75" (79 cu.inch)
Weight: As low as 5 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: -20° C to +65° C (Optional -40° C to +85° C)

RUGGED PANEL PC COMPUTING SYSTEMS

U.S. Army/Navy Battlefiled Deployed. *(Also available as passive displays w/out CPU)*

SMARTVIEW SD24

High Definition, Daylight Viewable, Rugged 24" Smart Display with Intel® Xeon E3 Processor and Removable Storage

- Intel® Xeon® E3 (Kaby Lake, 7th Gen. Core™) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 24" diagonal, 16:9 aspect, 1920x1080 native resolution (HD1080p)
- Full daylight viewable screen greater than 600 nits (typ.)
- 2x 10 GigE, 1x 1 GigE, Video In/Out (HDMI/HDSDI),
- 3x PCIe sites, 1 (E), 2 (F)

Size: 23" x 15.6" x 2.1"
Weight: As low as 20 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: 0° C to +55° C (Optional -20° C to +75° C)

SMARTVIEW SD19S

Standard Definition, Daylight Viewable, Rugged 19" Smart Display with Intel® Xeon E3 Processor and Removable Storage

- Intel® Xeon® E3 (Kaby Lake, 7th Gen. Core™) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 19" diagonal, 5:4 aspect, 1280x1024 native resolution
- Full daylight viewable screen greater than 1000 nits (typ.)
- 2x 10 GigE, 1x 1 GigE, Video In/Out (HDMI/HDSDI),
- 3x PCIe sites, 1 (E), 2 (F)

Size: 16.9" x 14.8" x 3.4"
Weight: As low as 17 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: 0° C to +55° C (Optional -20° C to +75° C)

SMARTVIEW SD17

High Definition, Daylight Viewable, Rugged 17" Smart Display with Intel® Xeon E3 Processor and Removable Storage

- Intel® Xeon® E3 (Kaby Lake, 7th Gen. Core™) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 17.3" diagonal, 16:9 aspect, 1920x1080 native resolution (HD1080p)
- Full daylight viewable screen greater than 800 nits (typ.)
- 2x 10 GigE, 1x 1 GigE, Video In/Out (HDMI/HDSDI),
- 3x PCIe sites, 1 (E), 2 (F)

Size: 17.4" x 11.3" x 2"
Weight: As low as 14 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: 0° C to +55° C (Optional -20° C to +75° C)

SMARTVIEW SD12

High Definition, Daylight Viewable, Rugged 12" Smart Display with Intel® Xeon E3 Processor and Removable Storage

- Intel® Xeon® E3 (Kaby Lake, 7th Gen. Core™) up to 4.0GHz
- 64GB DDR4 ECC DRAM
- 12.1" diagonal, 16:10 aspect, 1280x800 native resolution (HD720p)
- Full daylight viewable screen greater than 1000 nits (typ.)
- 2x 10 GigE, 1x 1 GigE, Video In/Out (HDMI/HDSDI),
- 3x PCIe sites, 1 (E), 2 (F)

Size: 13" x 9" x 1.76"
Weight: As low as 10 lbs.
MIL-STD: 810G, 1275D/704F, 461E, MIL-S-901D, DO-160D, IP66
Temperature: 0° C to +55° C (Optional -20° C to +75° C)

PATENTED RUGGED COOL™

Our one-of-a-kind cooling technology is the only cooling method that allows systems using Intel-based CPUs with a TjMax of 105°C to operate in an industrial temperature environment (-40°C to +85°C) at full operational load without throttling the CPU!

Instead of using thermal gap pads to conduct heat from the CPU to the system's interface to the cold plate, GMS uses an exclusive technology that employs a corrugated alloy slug with an extremely low thermal resistance to act as a heat spreader at the processor die. Once the heat is spread over a much larger area, a liquid silver compound in a sealed chamber is used to transfer the heat from the spreader to the systems' enclosure. This approach yields a temperature delta of less than 10°C from the CPU core to the cold plate, compared with more than 25°C for other manufacturers' systems.

SHOCK AND VIBRATION

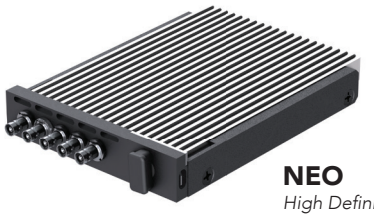
Another advantage of RuggedCool™ technology is its effect on shock and vibration. With this technology, the CPU die does not make direct contact with the system enclosure, but rather connects via a liquid silver chamber which acts as a shock absorber to cushion the ball grid array (BGA), thus saving the CPU from fracture.

The added thermal value for GMS cooling allows any GMS system to operate at higher shock and vibration specifications than any other system manufacturer in the industry.

B-DRIVE™

Rugged, Sealed, Removable Conduction Cooled U.2 I/O Expansion with NVMe Interface Supporting four lanes PCIe Gen 3.

B-Drives are a direct replacement for any standard 15mm NVMe U.2 storage device.



NEO

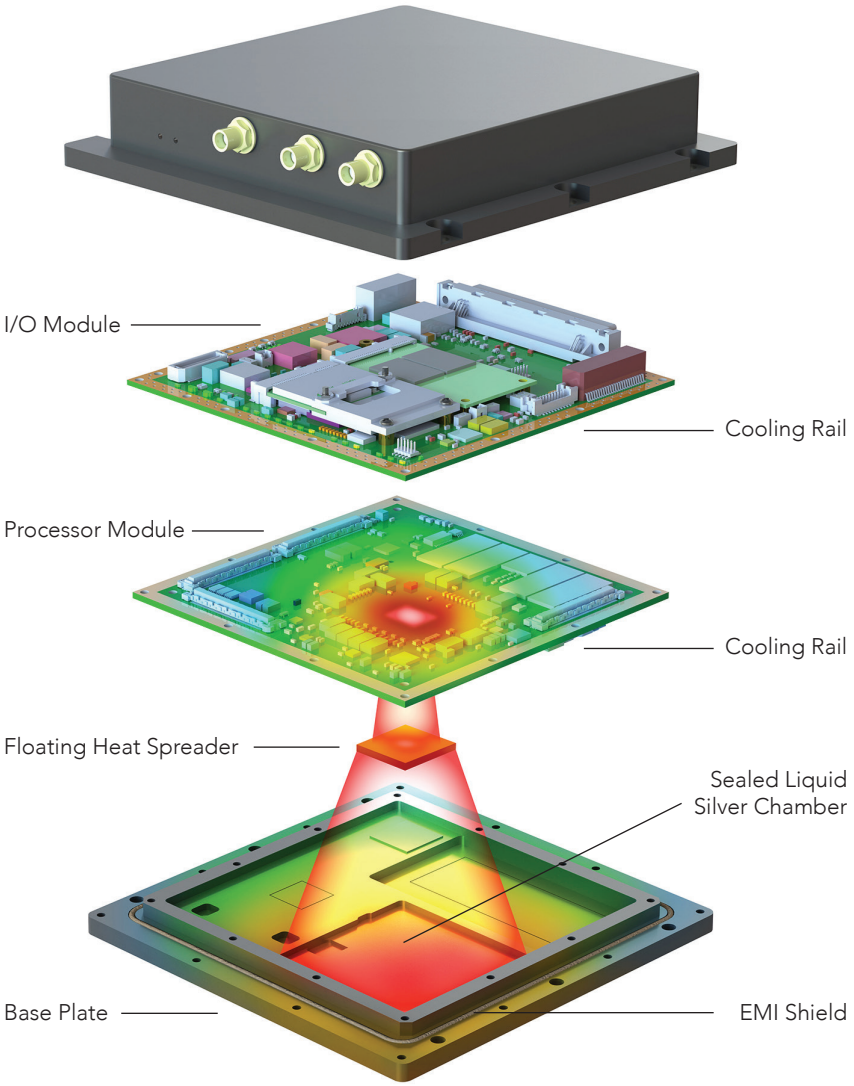
High Definition Programmable Frame Grabber Module with HD-SDI, HDMI and NTSC Video Input Options

MATRIX

Thunderbolt™ 3 via USB-C, M.2 and SAM I/O

MORPHEUS

Dual SFP+ Sockets, Ethernet MAC, and PCIe Gen 3



FACTORY INSTALLED AND SUPPORTED I/O

These modules have been qualified and can be pre-installed to order

Function	Model No.	Type
Co-Processor/Video	Nvidia P1000 / P3000	MXM
	AMD E8860	MXM
	CM313BW (SDI Frame Grabber) PCIe-Mini	Express Mini
	Magewell (Pro Capture Mini-SDI) PCIe-Mini	Express Mini
	EPIX CameraLink Frame Grabber PIXCI EB1mini	Express Mini
B-Drive	U.2-TB3	U.2
	U.2-SFP+	U.2
	U.2-FPGA	U.2
SAM I/O	MIL-STD-1553 (dual and dual-dual redundant)	Express Mini
	CANBus	Express Mini
	Profibus	Express Mini
	A to D Converter	Express Mini
	Dual Gigabit ENET	Express Mini
	RS-170 (8-channel)	Express Mini
	ARINC-429	Express Mini
	GPS	Express Mini
	WiFi/BT	Express Mini
	Brandywine IRIG-B (Mini PCIe Syncclock32)	Express Mini
Storage	2.5" SATA SSD (120GB to 8TB) (Optional FIPS-140-2)	U.2
	2.5" NVMe SSD (120GB to 8TB) (Optional FIPS-140-2)	U.2
Other	PCIe Re-timers	MXM

CYBER SECURITY: SYSTEMS AND PROCESS

GMS cyber security features primarily fall into three categories: System hardening, Data hardening and Supply chain control.

To prevent an attacker from physically gaining access into a system, system hardening features include mechanical anti-tamper switches and "defeat evident" labels. Hidden anti-tamper switches send an interrupt or can be programmed to work with GMS SecureDNA™ for system sanitization. Access to systems via other means—such as via LAN ports, maliciously installed viruses and rootkits—is mitigated by closing known exploit doors such as the Intel Management Engine, AMT and VPro™, and by restricting out-of-band remote ports such as a Baseboard Management Controller (BMC) and intelligent controllers.

GMS closely monitors cyber databases and routinely updates GMS-designed BIOS and other firmware. GMS licenses AMI® source code to create our own SourceSafe™ BIOS which not only adds performance features but shuts down exploits to minimize attack surfaces. Since we control the SourceSafe™ BIOS, future exploits can be mitigated as they arise.

Data hardening features in GMS systems use Opal, FIPS-140, and CSfC SSDs with our SecureDNA™. Data-at-rest security primarily relies on media selection (HDD, SSD, M.2) and GMS works closely with industry suppliers to implement COTS, DoD and specialty drive features such as Hardware Write Protect (WP) and NSA-approved Secure Erase (SE). GMS defines a standard drive pinout for keying and to assure specialty cyber features such as custom erasure algorithms, temperature or endurance.

The GMS SecureDNA™ sanitization suite relies on either a button press, digital signal (such as from an anti-tamper switch), or OS initiation. SecureDNA™ requires user authentication of intention, and then first erases all onboard media according to the chosen erasure algorithm. A second phase of SecureDNA™ erases all intelligent peripherals' local storage buffers (such as TPM, Ethernet controller, BMC and so on). Finally, the system's BIOS will erase itself using a GMS-copyrighted procedure entirely unique in the industry. Upon completion, the system is completely "bricked" and useless to an attacker.

Finally, cyber security also involves how the system is made starting with the entire supply chain. GMS is a US-based, AS9100 ITAR supplier that buys materials exclusively from authorized suppliers. Certificates of Conformance (C of C) and full traceability are standard, as is in-house logistics control of suppliers. GMS builds small prototype and quick-turn quantities in-house using 55,000 sq. ft. of modern facilities. For volume production, GMS-authorized manufacturers are DoD approved and GMS audited and accept contractual flow-down requirements. For DPAS and security-rated orders, GMS can segregate and/or bond our own, GFE or CFE inventory with full traceability.

SERVICES, SYSTEMS AND SUPPORT

GMS is a DoD prime contractor with the industry's most extensive board-level and system-level design expertise. We work closely with customers to ensure that our rugged products are optimized for the system, the program, and the entire lifecycle. Our rich, long-term relationship with Intel gives us unparalleled early access to new technology, so we can create customer-specific architectures that meet the most challenging program requirements.

ADVANTAGES:

- Prime contractor status allows direct buying from GMS, via GSA schedule, or via the PEO C3T CHS catalog (through a GMS partner)
- Complete system management includes kitting, tactical cables, chassis, software, and cooling solutions
- Customer pre-installed system software image is added prior to shipment
- Program-specific chassis coatings and OEM/customer labeling are available
- Value-engineering optimizes cost and performance for volume programs
- Sales, VARs, and technical support are available in North America, Europe, Asia, and Southeast Asia

GSA Schedule

PROUDLY DESIGNED & MANUFACTURED IN THE U.S.A.

GENERAL MICRO SYSTEMS, INC. AS9100C REGISTERED FIRM ISO 9001:2008 10002091

REG.#10002091 QM08
REG.#10002091 ASH09-1

DQS INC. UL REGISTERED FIRM GENERAL MICRO SYSTEMS, INC.

ISO 9001:2008
AS9100C:2009

NATIONAL SECURITY AGENCY SECURE ARCHITECTURE

US ARMY DEPLOYED

GMS COMPUTING ENGINES

GENERAL MICRO SYSTEMS, INC.
TRUSTED AND DEPLOYED SINCE 1979

TOLL FREE (800) 307-4863 / GMS4SBC.COM

All GMS products are proudly designed and manufactured in the U.S.A.