UTILITY SERVICES

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PUBLIC SAFETY

GMS
APPLIED TECHNOLOGY GROUP

GENERAL MICRO SYSTEMS, INC.
POWERING THE EMBEDDED MARKET SINCE 1979

RUGGED SMART DISPLAYS
2014-2015

TOLL FREE (800) 307-4863
www.gms4sbc.com

ABOUT GMS

Since its inception in 1979, General Micro Systems, Inc. (GMS) has been true to its Mission Statement:
"To Become the World's Leading *Technology Independent* Supplier of Computing Engines, while Providing the Best *Price/Performance*, Quality and Customer Support, Demanded by Our Current and Our Future Customers."

But what does "Technology Independent" mean? And how do you measure "Price /Performance"?
These are two of the questions often asked by our customers.

To be Technology Independent, GMS has an operational model that requires utilization of the best CPU technology available from ANY supplier in the market. Unlike most other computer manufactures, GMS does not make commitments to a given processor company. Since 1979, GMS has deployed over 40 different CPU technologies, from the very first Intel® 4004/8008 microprocessor, to the Rockwell® PPS-4/8, Rockwell/MOS Technology® 6502, Zilog® Z80, Motorola® 6800/6810/6820/6830/6840/6860, Sun Microsystems SPARC®, Motorola Power PC® and currently the Atom™, Core™ i7 and Xeon® processors from Intel®. The criteria used to select the CPU are based on a simple formula: The "Bang"-per-Watt. The "Bang"-per-Watt is defined as the processor's aggregate performance divided by product of the "real estate" and power it requires. Using this metric allows GMS' system engineers to optimize our Computing Engine designs to be the most "efficient" processing sub-systems in the embedded computing market. For some systems, this approach results in the lowest power-consuming product, and for others the highest performance. However, the primary objective is not necessarily to be the lowest power or the highest performance, but rather to be the most "efficient" engine that can be produced with the current technology.

Once the processor technology is selected, the challenge is to maximize the Computing Engine's performance while achieving the lowest cost available in the market. For over 30 years GMS has been the Price/Performance champions of the market. GMS has broken nearly every price barrier established by the "Big Boys" and has demonstrated that a quality product can be produced in the USA at an affordable price without cutting corners, and with outstanding customer support. Furthermore, GMS does not compete with its customers, because GMS provides only the Engine to power the final solution.

This unparalleled commitment to technology and innovation has earned GMS the highest level of respect from our customers, the media, and even the competition. GMS has been recognized by the media for its innovations and has been awarded more 'Product of the Year' awards than all competitors COMBINED. A few noteworthy GMS innovations are: The Mezzanine concepts of the Special Application Module (SAM™) I/O, CPU Carriers, VME Interface silicon, Intel® processors on VME, MicroSparc, and Multiple CPUs on an SBC, as well as the latest product offering - the SB1002-MD "Golden-Eyes", where two independent domains are housed in one system to allow Multiple Independent Levels of Security (MILS) and compliance to High Assurance Platform (HAP).

Not only has GMS demonstrated superiority in hardware design, but also in software support. GMS software engineers are experts in a wide variety of languages and operating systems, as well as experts in software development for embedded microprocessors and microcontrollers and system BIOS development. Over the past three and a half decades, GMS systems have included support for over 30 operating systems and associated custom drivers, including the unique VME/IP, which provides TCP/IP over VME to eliminate the "Endian Issue" and Real-time Asynchronous Multi Processing (RAMP), which allows several processors in a VME card cage to work simultaneously on a single task. Today, GMS products supports all the major OSs, such as Windows®, Linux® and VMware®. In addition, the system BIOS for all GMS products is generated and maintained in-house, as are all Linux®, Windows® and VMware® Board Support Packages (BSP), thus providing consistency and uniformity across all platforms. This level of control over BIOS, boot loaders and operating system drivers allows GMS to provide our customers with the option of customizing software and firmware elements of our products to meet their specific needs, with minimal cost and minimum time to market.

With this level of knowledge and expertise, GMS is able to own its own technology from the hardware to the software, which is what truly distinguishes GMS from the competition.

General Micro Systems is in its 35th year in the embedded computing market and is the oldest supplier of embedded computers in the world. GMS is proud to be able to continue to outpace the market with innovations and products that have left their mark on the industry, and will for years to come. Furthermore, GMS will always strive to provide customers with the solutions they need to stay ahead of their competition - at the lowest possible price without compromising on quality or customer service!
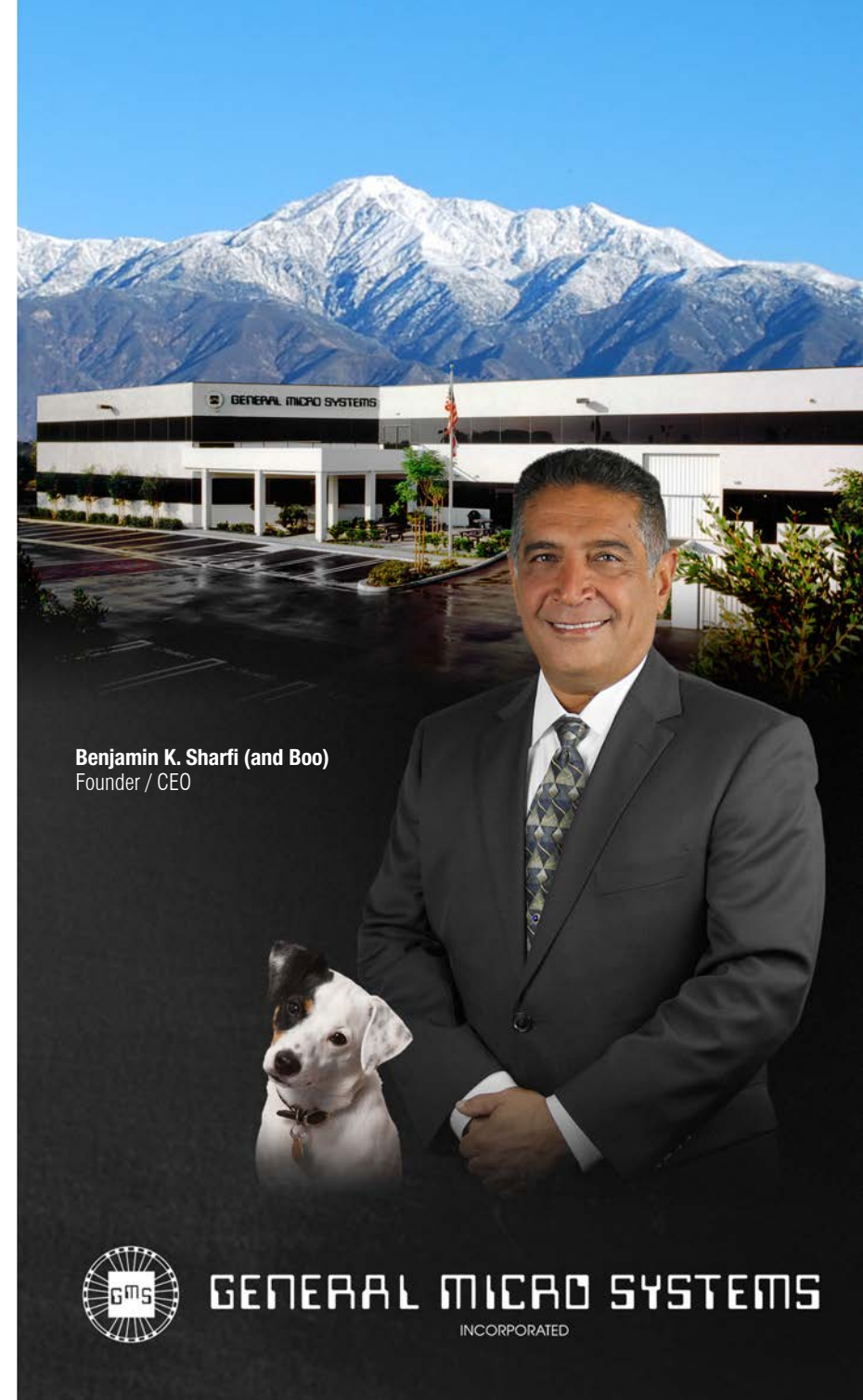
Benjamin K. Sharfi (and Boo)
Founder / CEO

GENERAL MICRO SYSTEMS
INCORPORATED

SMART DISPLAYS

GMS' RuggedView™ smart displays are the most advanced smart displays on the market. They provide exceptional ruggedness, functionality, and performance at a price point that has never before been reached. GMS smart displays utilize GMS SBC technology, unlike other smart display manufacturers who incorporate low-end PC SBC modules, such as COMExpress and PC-104.

The unique advantage of owning the core SBC technology allows GMS to fully integrate the display interface with the SBC to significantly lower cost, and provide an extremely low profile system (less than 2 inches thick), while allowing maximum flexibility for selection of CPU performance.
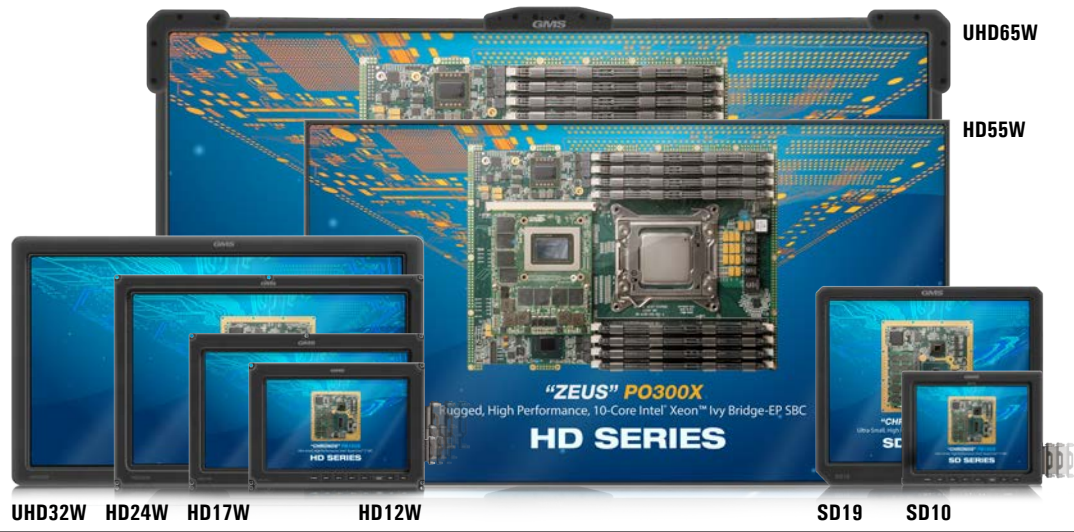
GMS smart display technology is not limited to a few sizes or formats. A full range of display sizes from 10" to 65" diagonal are offered. Options include 4:3 and 16:9 formats, resistive and capacitive touch screens, special coatings, such as anti-reflection (AR) and anti-glare (AG), and optional "boot kick" protective glass for extreme rugged applications.

In addition, GMS' RuggedView™ displays are fully configurable, encouraging the selection of display size, display features/enhancements, and ruggedization levels per customer requirement. With GMS' proprietary Flex I/O™, the customer may select what SBC I/O is provided on the display and fully customize the bezel with function keys. In short, GMS develops tailor-made Smart Display solutions to customer specifications, making the options virtually unlimited.

Another unique feature of GMS' RuggedView™ displays is the upgradable CPU subsystem. GMS RuggedView™ utilizes GMS' core Blue Engines for Standard Definition (SD) and High Definition (HD) displays and Blue or Orange Engines for Ultra-High Definition (UHD) systems. Every Smart Display we offer can be upgraded to the latest CPU and I/O technology to allow improved CPU functionality after several years without replacing the display. This is the same approach GMS has been employing as a proven technology on its VME SBCs and system products for the last 19 years. This practice has provided our customers with significant cost savings during " tech- refresh" cycles.

RuggedView™ displays may be ordered without the CPU subsystem, allowing them to function as slaves to another smart display (which then acts as a host for multi-display configurations). Unique display expansion interfaces are also available from GMS, such as SDI (SMTPE 259/292), which allows slave displays to operate over 100 meters away from the host, and for ultra-high resolution displays, the DisplayPort, which can be repeated as many times as needed.

Contact a GMS representative for more information or visit our website at www.gms4sbc.com.

UHD65W

HD55W

"ZEUS" PO300X
Rugged, High Performance, 10-Core Intel™ Xeon™ Ivy Bridge-EP SBC

HD SERIES

UHD32W HD24W HD17W HD12W SD19 SD10

RUGGEDIZATION LEVELS

In an effort to optimize customer satisfaction and the COTS availability of our products, GMS has defined five levels of ruggedization (R1-R5). These ruggedization levels are based on four characteristics: Shock rating, vibration rating, temperature range, and ingress protection (IP). These ruggedization levels are distinct from our packaging options. In other words, these R1-R5 levels can be used in conjunction with various levels of packaging that range from fully sealed for submersion to commercial interconnects for less expensive solutions.

Rugged Level I (R1)
R1 represents the commercial level of ruggedization. R1 systems are designed for applications that require a rugged computer, but cannot do with just any off-the-shelf ruggedized display. This rugged level offers the lowest levels of shock, vibration, temperature, IP and cost.

Rugged Level II (R2)
R2 represents the next level up from the commercial level of ruggedization. R2 systems are designed for applications that require a little more shock, vibe, and IP, and also an extension of the low temperature specification. The deployment of these systems is often implemented such that they are located inside another more rugged enclosure.

Rugged Level III (R3)
R3 represents the "middle-of-the-road" option for ruggedness. R3 systems are designed for applications that require a rugged computer, but the full ruggedization is either unnecessary or cost prohibitive. R3 offers an optimized price-point for system ruggedization.

Rugged Level IV (R4)
R4 represents one level down from a fully ruggedized system. R4 systems are designed for applications that essentially need maximum ruggedization, but for which the cost of full ruggedization is prohibitive. The only differences between R4 and R5 are vibration and IP levels.

Rugged Level V (R5)
R5 represents the highest level of ruggedization that GMS has to offer. R5 provides the highest levels of shock, vibration, and temperature range, in a fully sealed submersible package.

Rugged Levels	R1	R2	R3	R4	R5
Shock	20g	20g	52g	100g	100g
* Vibrations	.0001g2/Hz	.0008g2/Hz	.03g2/Hz	.03g2/Hz	.1125g2/Hz
Temperature	0°C to +55°C	-20°C to +55°C	-20°C to +75°C	-40°C to +80°C	-40°C to +80°C
IP Levels	54	64	64	66	67

* Vibration frequency for systems not including drives are tested between 5Hz and 2000Hz

QUALITY STATEMENT

General Micro Systems, Inc. promises innovative, quality products and excellent customer service, as reflected in our Quality Policy:

"We at GMS are fully committed to providing products that conform to our customers' requirements the first time, every time, all the time by continuously maintaining a quality improvement process that achieves total customer satisfaction."

In order to do this we have embedded an awareness of quality in our organizational processes at all levels, per total quality management (TQM). Through management review of our quality management systems, we continually improve our processes, products and services to satisfy our customers' changing needs.

To conform to our customers' requirements for product longevity, both availability and support, GMS designs our computing engines using mobile and low power processor technologies from Intel® ISG (Intelligent Systems Group) , and server processor technologies from Intel® DCG (Data Center Group). These processors technologies come with guaranteed availability of a minimum of seven years.

GMS has been registered and certified to internationally recognized ISO 9001:2008 since 1999. With our growing involvement in military and aerospace programs, our quality system exemplifies the highest standard of AS-9100C, assuring that we maintain consistently high standards that allow General Micro Systems' products to meet and exceed the growing quality requirements of the aerospace, medical and military markets. For example, we provide separate product lines for RoHS and non-RoHS to support different customers' requirements. Because our ultimate goal is customer satisfaction, their requirements come first. We believe that quality starts and ends with our customers and we strive to always satisfy their needs. This is reflected in our business flexibility as individuals and as a company.

To engage the TQM philosophy, quality originates with our staff commitment to the best products and best customer service – always. Through an active mentoring and training system, we make sure the staff has the knowledge and skills necessary to be effective. Our employees are empowered to take responsibility for their actions, which contributes to better total quality and success of the company. The built-in quality in our products allows GMS' products to be more competitive and our fast growing company is the best proof.

In fact, we build special relationships every day with our customers, as well as, our suppliers. GMS customers, suppliers and employees work together as a team, and the combined effort ultimately benefits everyone.

Udi Levin
President

Walt Otto
VP of Engineering

RUGGEDCOOL™ TECHNOLOGY

All General Micro Systems' products are equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry. This one-of-a-kind cooling technology is the only 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, as is done by all other rugged computer system manufacturers, 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 system's 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. This shock absorber prevents shock from being transferred from the enclosure to the FCBGA (Flip Chip Ball Grid Array), thus saving the CPU from micro-fractures, which in time cause the CPU to fail. This added thermal valve for GMS cooling allows any GMS system to operate at higher shock and vibration specifications than any other system manufacturer. This unique cooling system results in the best thermal and shock/vibration specification in the industry. The US Army has deployed thousands of units of the Golden-Eye III in vehicles for the Army's Warfighter Information Network – Tactical (WIN-T).

Conduction Cooled From the Ground Up

Another distinct element of GMS' cooling approach is that each electronics module in the system is designed from the ground up to be conduction cooled and to meet rugged MIL standards, such as MIL-STD-810G, MIL-S-901D, MIL-STD-1275E, MIL-STD-461F and DO-160D, to mention a few. All other manufacturers take commercial hardware, such as PC-104® and COM Express®, and add cooling plates in order to produce conduction-cooled systems. This results in poor cooling and poor ruggedness performance. In this approach, heat-producing devices other than the CPU are cooled by the CPU's thermal conduction path. This is in direct opposition to the desired goal of drawing heat away from the CPU! Also, all GMS products include printed circuit boards that utilize multiple power and ground planes, with specific design techniques for optimizing the heat flow from the CPU and other high-power dissipation devices to the system's enclosure. For more information about how this technology works, contact a GMS representative and request a demonstration.
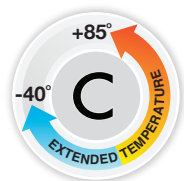
SMART DISPLAY MATRIX

Display Type			CPU Options												
Product	Resolution	Aspect	CPU	USB 2.0	USB 3.0	GigE	10GigE Opt.	MIL STD 1553	Wi-Fi	GPS	CANBus	GPIO	Video Capture (NTSC)	COM Port	Drive	Power
SD10-1002	1024 x 768	4:3	Core™ i7	2	1	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	1x nDrive™	MIL-STD-1275 24VDC
HD12W-1002	1280 x 800	16:10	Core™ i7	2	1	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	1x nDrive™	MIL-STD-1275 24VDC
HD17W-1002	1920 x 1080	16:9	Core™ i7	2	1	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	1x nDrive™	MIL-STD-1275 24VDC
SD19-1002	1280 x 1024	5:4	Core™ i7	2	1	2	1	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	1x nDrive™	110/220VAC
HD24W-1002	1920 x 1080	16:9	Core™ i7	2	1	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	1x nDrive™	MIL-STD-1275 24VDC
UHD32W-1002	3840 x 2160	16:9	Core™ i7	2	2	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	2x nDrive™	24VDC
HD55W-1002	1600 x 1200	16:9	Core™ i7/ Xeon®	2	2	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	2x nDrive™	110/220VAC
UHD65W-1002	3840 x 2160	16:9	Core™ i7/ Xeon®	2	2	2	2	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	Yes (optional)	2	2x nDrive™	110/220VAC

Display Type			Video Options								
Product	Resolution	Aspect	Native Video Out	Type	Native Video In	Type	MXM Video Option	MXM Video Out	Type	MXM Video In	Type
SD10-1002	1024 x 768	4:3	1	DVI	1	DVI	No	N/A	N/A	N/A	N/A
HD12W-1002	1280 x 800	16:10	1	DVI	1	DVI	No	N/A	N/A	N/A	N/A
HD17W-1002	1920 x 1080	16:9	1	DVI	1	DVI	No	N/A	N/A	N/A	N/A
SD19-1002	1280 x 1024	5:4	1	DVI	1	DVI	No	N/A	N/A	N/A	N/A
HD24W-1002	1920 x 1080	16:9	1	DVI	1	DVI	No	N/A	N/A	N/A	N/A
UHD32W-1002	3840 x 2160	16:9	3	1-VGA 2-DP/HDMI 4K	7	2-HDMI/DP 1-VGA 4- SDI	Yes	3	1-VGA 2-DP/HDMI 4K	8	4-HDMI or 4-DP/ 4- SDI
HD55W-1002	1600 x 1200	16:9	3 (Core™ i7) 0 (Xeon®)	1-VGA 2-DP/HDMI 4K	7	2-HDMI/DP 1-VGA 4- SDI	Yes (x2 Optional)	3	1-VGA 2-DP/HDMI 4K	8	4-HDMI or 4-DP/ 4- SDI
UHD65W-1002	3840 x 2160	16:9	3 (Core™ i7) 0 (Xeon®)	1-VGA 2-DP/HDMI 4K	7	2-HDMI/DP 1-VGA 4- SDI	Yes (x2 Optional)	3	1-VGA 2-DP/HDMI 4K	8	4-HDMI or 4-DP/ 4- SDI

Display Type			Packaging Options								
Product	Resolution	Aspect	Rugged Level	Touch Screen	Type	NVIS	Boot Kick (Opt)	AR/AG	Brightness	Bezel Keys	Weight	Mounting Type
SD10-1002	1024 x 768	4:3	3-5	Yes	Resisitive/Capacitive	Yes	Yes	Yes	700 nits	Single / Dual	10lb	VESA / Panel
HD12W-1002	1280 x 800	16:10	3-5	Yes	Resisitive/Capacitive	Yes	Yes	Yes	1200 nits	Single / Dual	13lb	VESA / Panel
HD17W-1002	1920 x 1080	16:9	3-5	Yes	Resisitive/Capacitive	Yes	Yes	Yes	800 nits	Single / Dual	17lb	VESA / Panel
SD19-1002	1280 x 1024	5:4	3-5	Yes	Resisitive/Capacitive	Yes	Yes	Yes	700 nits	Single / Dual	18lb	VESA / Panel
HD24W-1002	1920 x 1080	16:9	3-5	Yes	Resisitive/Capacitive	Yes	Yes	Yes	800 nits	Single / Dual	21lb	VESA / Panel
UHD32W-1002	3840 x 2160	16:9	1-3	Yes	Capactive/ IR up to 10 Pt.	No	No	Yes	450 nits	Single Row R or L	28lb	VESA / Panel
HD55W-1002	1600 x 1200	16:9	1-3	Yes	Capactive/ IR up to 10 Pt.	No	No	Yes	700 nits	Single Row R or L	100lb	VESA / Panel
UHD65W-1002	3840 x 2160	16:9	1-3	Yes	Capactive/ IR up to 10 Pt.	No	No	Yes	350 nits	Single Row R or L	180lb	VESA / Panel
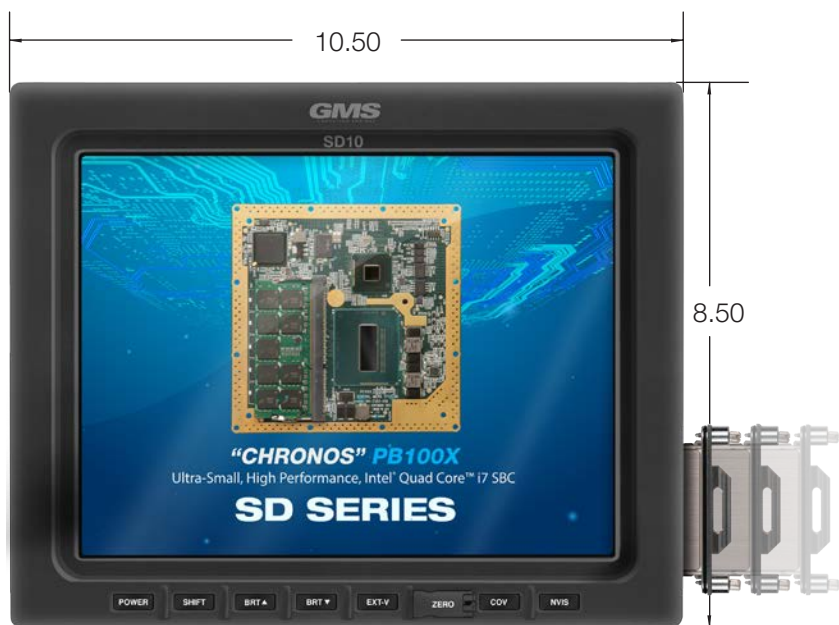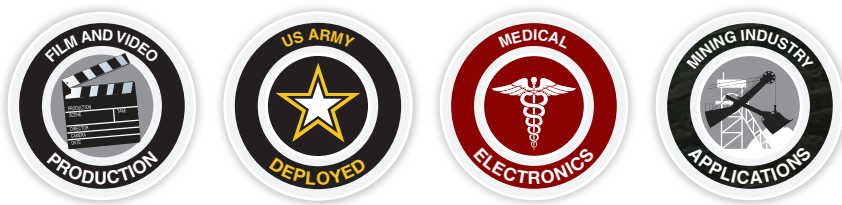
RUGGEDVIEW™ SD10-1002
Rugged, Standard Definition Smart Display with Removable Drive

Diagram labels:

- Bezel Buttons (Optional)
- 5 or 8-Wire Resistive or Capacitive Touch Screen (Optional)
- Standard Definition (1024x768, 4:3) 10.4" Rugged Display with NVIS/ "Bootkick" (Optional)
- mSATA (OS Boot) (SAM™ I/O)
- Keypad/ Pointer Control
- 8MB (x2) BIOS Flash
- 2Kb EEPROM
- Voltage & Temp. Monitors
- Power Control Logic
- Trusted Platform Module (Optional)
- Display Interface Module
- Point of Load Power Supplies CPU Core, GTL, 2.5V, 1.2V &1.5V
- Intel® System & I/O Controllers
- Intel® Quad Core Haswell CPU
- 1600MHz
- Up to 32GB DDR3 ECC SDRAM
- BK0 / BK1
- X1-PCIe, SATA, USB, USB, SPI, SMBus, LPC Bus, USB, USB, eDP, FDI, DMI
- USB 3.0, X1-PCIe, USB, LPC Bus, X1-PCIe, USB, X1-PCIe, SATA, X1-PCIe, USB 2.0, HD-Audio, DP
- SAM™ I/O (Optional)
- CPLD
- SAM™ I/O (Optional)
- Dual Com Port
- HD Audio CODEC
- Display Port To DVI
- Power Supply/ Power Monitor
- RTC Batt
- PWR/ RST
- +5V, +3.3V, + 12V, +5VSTB, +3.3VSTB
- GPIO Buff.
- Dual GigE or Dual 10GigE (Optional)
- Removable Sealed nDrive™ SSD
- RS232/422/ 485 Buffers
- Power Cond (MIL-1275)
- 16-36 VDC
- RST/ On/Off
- USB 3.0
- ANT
- Digital I/O x8 (Optional)
- ANT
- Enet 1
- Enet 2
- COM 1-2
- USB 2.0
- Head Ph
- Mic/ Ln In
- Video In/Out
- DC-In/Power Control
- USB 3.0
- SSMA
- SAM I/O
- SSMA
- ENET
- ENET
- Dual COM
- Audio/USB
- DVI Out /DVI In
- Power Connector

Device dimensions: 10.50 x 8.50

"CHRONOS" PB100X — Ultra-Small, High Performance, Intel® Quad Core™ i7 SBC — SD SERIES

- Ultra-rugged 10.4 inch diagonal screen in 4:3 format with 1024x768 native resolution
- Full daylight viewable screen with optional Night Vision Imaging System (NVIS)
- Ultra-rugged "boot-kick" glass for a virtually unbreakable screen (optional)
- Ultra-small and lightweight frame, less than 2 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coatings for crisp display in any light
- Resistive touch with glove and/or stylus operation with EMI shielding (capacitive optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Up to 2.4GHz Intel® Quad Core™ i7 Haswell processor with 6MB of L2 Cache

- Up to 32GB of 1600MHz DDR3 memory with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- One fully sealed removable nDrive™ up to 1TB with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- One USB 3.0, one USB 2.0 port and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)
- Full HD-Audio support with onboard 1W mono amplifier
- One DVI output or DVI video input selected via bezel key

- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Power, Blackout, Zero, Brightness, NVIS, Video Source, and Shift bezel keys
- Fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67
- Operates up to -20°C to +80°C (no heater) or up to -40°C to +80°C (with heater)
- Available in ruggedization levels R3-R5

General Description

The RuggedView™ SD10-1002 integrates the most rugged, crisp 10.4 inch diagonal display with a fourth-generation Core™ i7 processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright display and Night Vision Imaging System (NVIS). The RuggedView™ SD10-1002 is targeted for applications where a vigorous computer with a rugged display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 2 inches thick!

The RuggedView™ SD10-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The SD10-1002 is offered with several screen options in 4:3 format, with or without touchscreen and bezel keys. The display for the SD10-1002 screen is protected with the most rugged glass available in the market, which can withstand a direct "boot kick" without damaging the display or the touch screen. The SD10-1002 supports Standard Definition (SD) of 1024x768 resolution in standard format. It is viewable with up to 700 nits of brightness and supports anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The display also supports NVIS for applications where night vision glasses are used to reduce stress on the viewer. The RuggedView™ SD10-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points.

The I/O subsystem for the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet ports or an optional two 10Gigabit Ethernet ports with TCP/IP Offloading Engine (TOE), one USB 3.0 and one USB 2.0 port, two COM ports with RS-232/422/485 options, eight buffered digital I/O lines (optional), one removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). Additional standard I/O included are audio in/out for headset use and DVI output from the CPU or DVI input from an external source, which can be displayed on the SD10-1002 screen (bezel key selectable). Up to 16 bezel keys are provided for screen control such as Brightness up/down, NVIS, Blackout, Zero, Power, Video Source and Shift, which can be used as multi-function keys for custom applications. The RuggedView™ SD10-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ SD10-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The SD10-1002 is fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67 optionally.
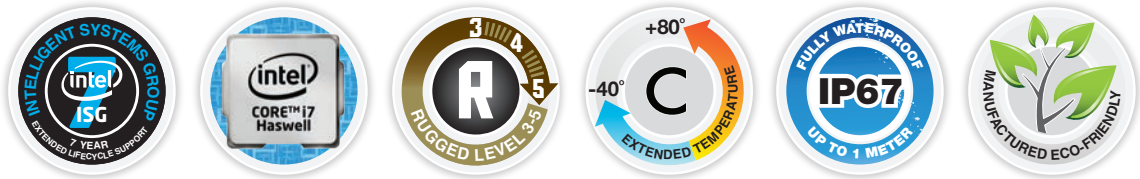
Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. Another major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, dependent on application necessity. The computing engine within the RuggedView™ is upgradeable and is field serviceable.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -40°C to +80°C at full load (-20°C to +75°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R3-R5. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The SD series is also available with less rugged glass and packaging.
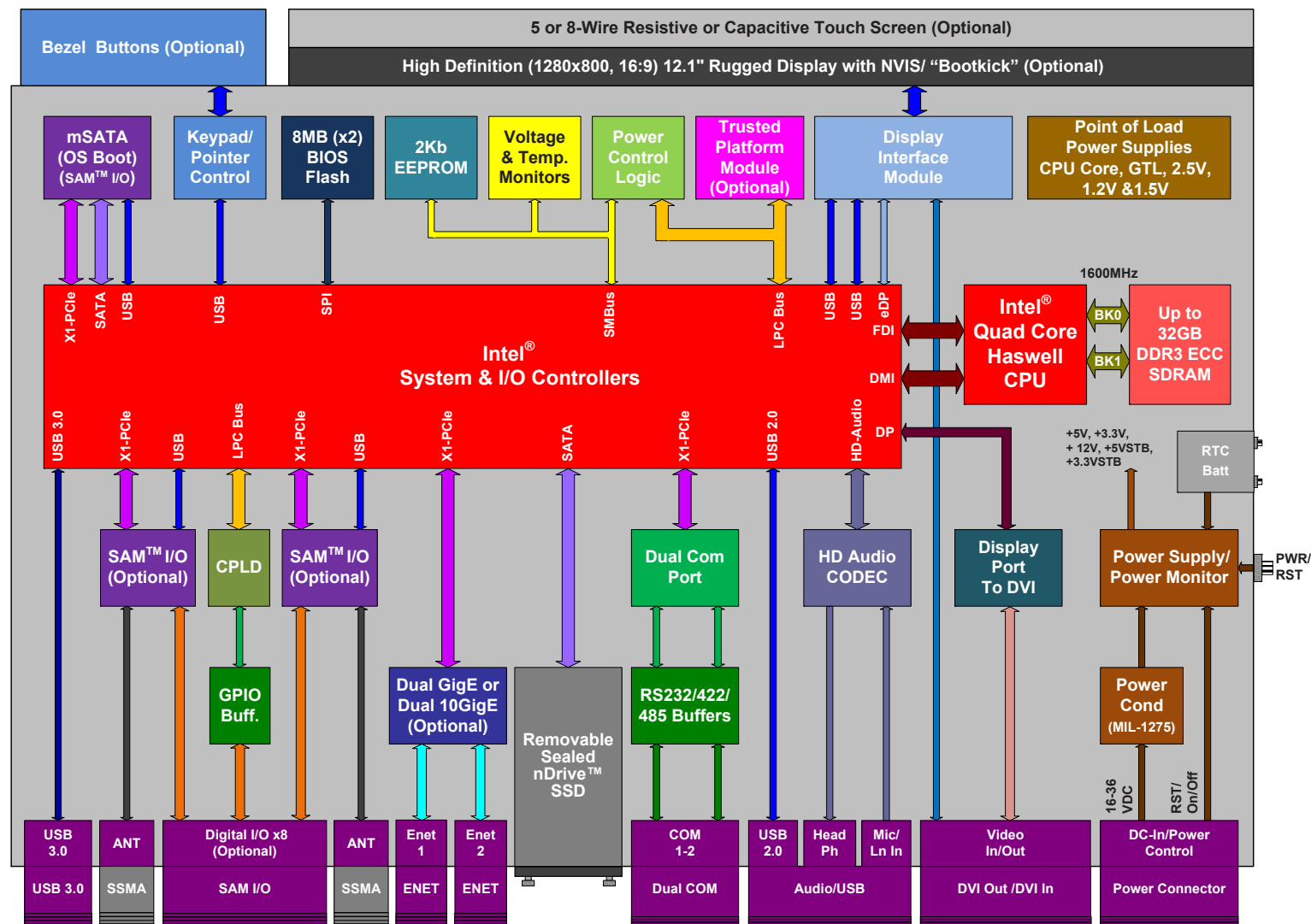
Bezel Buttons (Optional)

5 or 8-Wire Resistive or Capacitive Touch Screen (Optional)

High Definition (1280x800, 16:9) 12.1" Rugged Display with NVIS/ "Bootkick" (Optional)

mSATA (OS Boot) (SAM™ I/O)

Keypad/ Pointer Control

8MB (x2) BIOS Flash

2Kb EEPROM

Voltage & Temp. Monitors

Power Control Logic

Trusted Platform Module (Optional)

Display Interface Module

Point of Load Power Supplies CPU Core, GTL, 2.5V, 1.2V &1.5V

Intel® System & I/O Controllers

1600MHz

Intel® Quad Core Haswell CPU

BK0 / BK1

Up to 32GB DDR3 ECC SDRAM

X1-PCIe · SATA · USB · USB · SPI · SMBus · LPC Bus · USB · USB · eDP · FDI · DMI

USB 3.0 · X1-PCIe · USB · LPC Bus · X1-PCIe · USB · X1-PCIe · SATA · X1-PCIe · USB 2.0 · HD-Audio · DP

+5V, +3.3V, + 12V, +5VSTB, +3.3VSTB

RTC Batt

SAM™ I/O (Optional)

CPLD

SAM™ I/O (Optional)

Dual Com Port

HD Audio CODEC

Display Port To DVI

Power Supply/ Power Monitor

PWR/ RST

GPIO Buff.

Dual GigE or Dual 10GigE (Optional)

Removable Sealed nDrive™ SSD

RS232/422/ 485 Buffers

Power Cond (MIL-1275)

16-36 VDC · RST/ On/Off

USB 3.0

ANT

Digital I/O x8 (Optional)

ANT

Enet 1

Enet 2

COM 1-2

USB 2.0

Head Ph

Mic/ Ln In

Video In/Out

DC-In/Power Control

USB 3.0 | SSMA | SAM I/O | SSMA | ENET | ENET | Dual COM | Audio/USB | DVI Out /DVI In | Power Connector

13.00

9.00

GMS

"CHRONOS" PB100X
Ultra-Small, High Performance, Intel Quad Core™ i7 SBC

HD SERIES

HD12W

POWER · SHIFT · BRT▲ · BRT▼ · EXT-V · ZERO · IDIM · NVIS

RUGGEDVIEW™ HD12W-1002
Rugged, Standard Definition Smart Display with Removable Drive

- Ultra-rugged 12.1 inch diagonal screen in 16:10 format with 1280x800 native resolution
- Full daylight viewable screen with optional Night Vision Imaging System (NVIS)
- Ultra-rugged "boot-kick" glass for a virtually unbreakable screen (optional)
- Ultra-small and lightweight frame, less than 2 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coatings for crisp display in any light
- Resistive touch with glove and/or stylus operation with EMI shielding (capacitive optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Up to 2.4GHz Intel® Quad Core™ i7 Haswell processor with 6MB of L2 Cache

- Up to 32GB of 1600MHz DDR3 memory with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- One fully sealed removable nDrive™ up to 1TB with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- One USB 3.0, one USB 2.0 port and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO etc.)
- Full HD-Audio support with onboard 1W mono amplifier
- One DVI output or DVI video input selected via bezel key

- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Power, Blackout, Zero, Brightness, NVIS, Video Source, and Shift bezel keys
- Fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67
- Operates up to -20°C to +80°C (no heater) or up to -40°C to +80°C (with heater)
- Available in ruggedization levels R3-R5

General Description

The RuggedView™ HD12W-1002 integrates the most rugged, crisp 12.1 inch diagonal display with a fourth-generation Core™ i7 processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright display and Night Vision Imaging System (NVIS). The RuggedView™ HD12W-1002 is targeted for applications where a vigorous computer with a rugged display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 2 inches thick!

The RuggedView™ HD12W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The HD12W-1002 is offered with several screen options in 16:10 format, with or without touchscreen and bezel keys. The display for the HD12W-1002 screen is protected with the most rugged glass available in the market, which can withstand a direct "boot kick" without damaging the display or the touch screen. The HD12W-1002 supports High Definition (HD) of 1280x800 resolution in widescreen format. It is viewable with up to 1200 nits of brightness and supports anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The display also supports NVIS for applications where night vision glasses are used to reduce stress on the viewer. The RuggedView™ HD12W-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points.

The I/O subsystem for the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet ports or an optional two 10Gigabit Ethernet ports with TCP/IP Offloading Engine (TOE), one USB 3.0 and one USB 2.0 port (2 optional, but lose Audio), two COM ports with RS-232/422/485 options, eight buffered digital I/O lines (optional), one removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). Additional standard I/O included are audio in/out for headset use and DVI output from the CPU or DVI input from an external source, which can be displayed on the HD12W-1002 screen (bezel key selectable). Up to 16 bezel keys are provided for screen control such as Brightness up/down, NVIS, Blackout, Zero, Power, Video Source and Shift, which can also be used as multi-function keys for custom applications. The RuggedView™ HD12W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ HD12W-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The HD12W-1002 is fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/IP67 optionally.

Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, dependent on application necessity. The computing engine within the RuggedView™ is upgradeable and is field-serviceable.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -40°C to +80°C at full load (-20°C to +75°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R3-R5. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The HD series is also available with less robust glass and packaging.
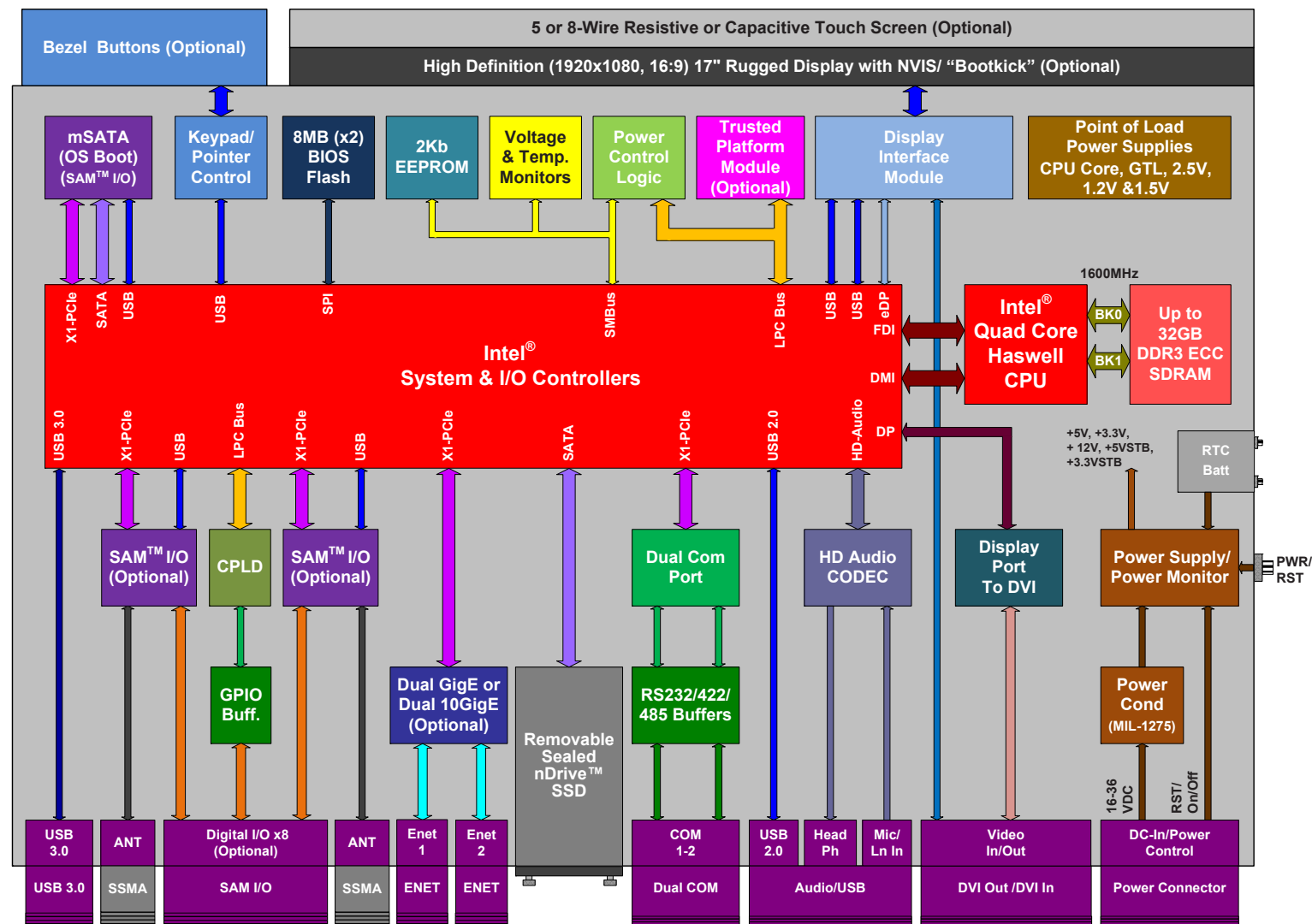
RUGGEDVIEW™ HD17W-1002
Rugged, High Definition Smart Display with Removable Drive

Block diagram labels:

Bezel Buttons (Optional) · 5 or 8-Wire Resistive or Capacitive Touch Screen (Optional) · High Definition (1920x1080, 16:9) 17" Rugged Display with NVIS/ "Bootkick" (Optional)

mSATA (OS Boot) (SAM™ I/O) · Keypad/Pointer Control · 8MB (x2) BIOS Flash · 2Kb EEPROM · Voltage & Temp. Monitors · Power Control Logic · Trusted Platform Module (Optional) · Display Interface Module · Point of Load Power Supplies CPU Core, GTL, 2.5V, 1.2V & 1.5V

Intel® System & I/O Controllers

Intel® Quad Core Haswell CPU · 1600MHz · BK0 · BK1 · Up to 32GB DDR3 ECC SDRAM

X1-PCIe · SATA · USB · USB · SPI · SMBus · LPC Bus · USB · USB · eDP · FDI · DMI

USB 3.0 · X1-PCIe · USB · LPC Bus · X1-PCIe · USB · X1-PCIe · SATA · X1-PCIe · USB 2.0 · HD-Audio · DP

+5V, +3.3V, +12V, +5VSTB, +3.3VSTB · RTC Batt · PWR/RST

SAM™ I/O (Optional) · CPLD · SAM™ I/O (Optional) · Dual Com Port · HD Audio CODEC · Display Port To DVI · Power Supply/Power Monitor

GPIO Buff. · Dual GigE or Dual 10GigE (Optional) · Removable Sealed nDrive™ SSD · RS232/422/485 Buffers · Power Cond (MIL-1275)

16-36 VDC · RST/On/Off

USB 3.0 · ANT · Digital I/O x8 (Optional) · ANT · Enet 1 · Enet 2 · COM 1-2 · USB 2.0 · Head Ph · Mic/Ln In · Video In/Out · DC-In/Power Control

USB 3.0 · SSMA · SAM I/O · SSMA · ENET · ENET · Dual COM · Audio/USB · DVI Out /DVI In · Power Connector

Display image labels: GMS · "CHRONOS" PB100X · Ultra-Small, High Performance, Intel Quad Core™ i7 SBC · HD SERIES · HD17W · POWER · SHIFT · BRT▲ · BRT▼ · EXT-I · ZERO · DIM · NVIS

17.38 · 11.25

- Ultra-rugged 17 inch diagonal screen in 16:9 format with 1920x1080 native resolution
- Full daylight viewable screen with optional Night Vision Imaging System (NVIS)
- Ultra-rugged "boot-kick" glass for a virtually unbreakable screen (optional)
- Ultra-small and lightweight frame, less than 2 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coating for crisp display in any light
- Resistive touch with glove and/or stylus operation with EMI shielding (capacitive optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Up to 2.4GHz Intel® Quad Core™ i7 Haswell processor with 6MB of L2 Cache

- Up to 32GB of 1600MHz DDR3 memory with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/Wwrite Pprotect (optional)
- One fully sealed removable nDrive™ up to 1TB with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- One USB 3.0, one USB 2.0 port and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL- STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)
- Full HD-Audio support with onboard 1W mono amplifier
- One DVI output or DVI video input selected via bezel key

- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Power, Blackout, Zero, Brightness, NVIS, Video Source, and Shift bezel keys
- Fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67
- Operates up to -20°C to +80°C (no heater) or up to -40°C to +80°C (with heater)
- Available in ruggedization levels R3-R5

General Description

The RuggedView™ HD17W-1002 integrates the most rugged, crisp 17 inch diagonal widescreen display with a fourth-generation Core™ i7 processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright display and Night Vision Imaging System (NVIS). The RuggedView™ HD17W-1002 is targeted for applications where a vigorous computer with a rugged display is needed to provide the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 2 inches thick!

The RuggedView™ HD17W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The HD17W-1002 is offered with several screen options in 16:9 format, with or without touchscreen and bezel keys. The display for the HD17W-1002 screen is protected with the most rugged glass available in the market, which can withstand a direct "boot kick" without damaging the display or the touch screen. The HD17W-1002 supports High Definition (HD) of 1920x1080 resolution in widescreen format. It is viewable with up to 800 nits of brightness and supports anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The display also supports NVIS for applications where night vision glasses are used to reduce stress on the viewer. The RuggedView™ HD17W-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points.

The I/O subsystem for the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet ports or an optional two 10Gigabit Ethernet ports with TCP/IP Offloading Engine (TOE), one USB 3.0 and one USB 2.0 port, two COM ports with RS-232/422/485 options, eight buffered digital I/O lines (optional), one removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). Additional standard I/O included are audio in/out for headset use and DVI output from the CPU or DVI input from an external source, which can be displayed on the HD17W-1002 screen (bezel key selectable). Up to 16 bezel keys are provided for screen control such as Brightness up/down, NVIS, Blackout, Zero, Power, Video Source and Shift, which can be used as multi-function keys for custom applications. The RuggedView™ HD17W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ HD17W-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The HD17W-1002 is fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66 and IP67 optionally.

Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, dependent on application necessity. The computing engine within the RuggedView™ is upgradeable and is field serviceable.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -20°C to +80°C at full load (-20°C to +75°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R3-R5. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The HD series is also available with less robust glass and packaging.
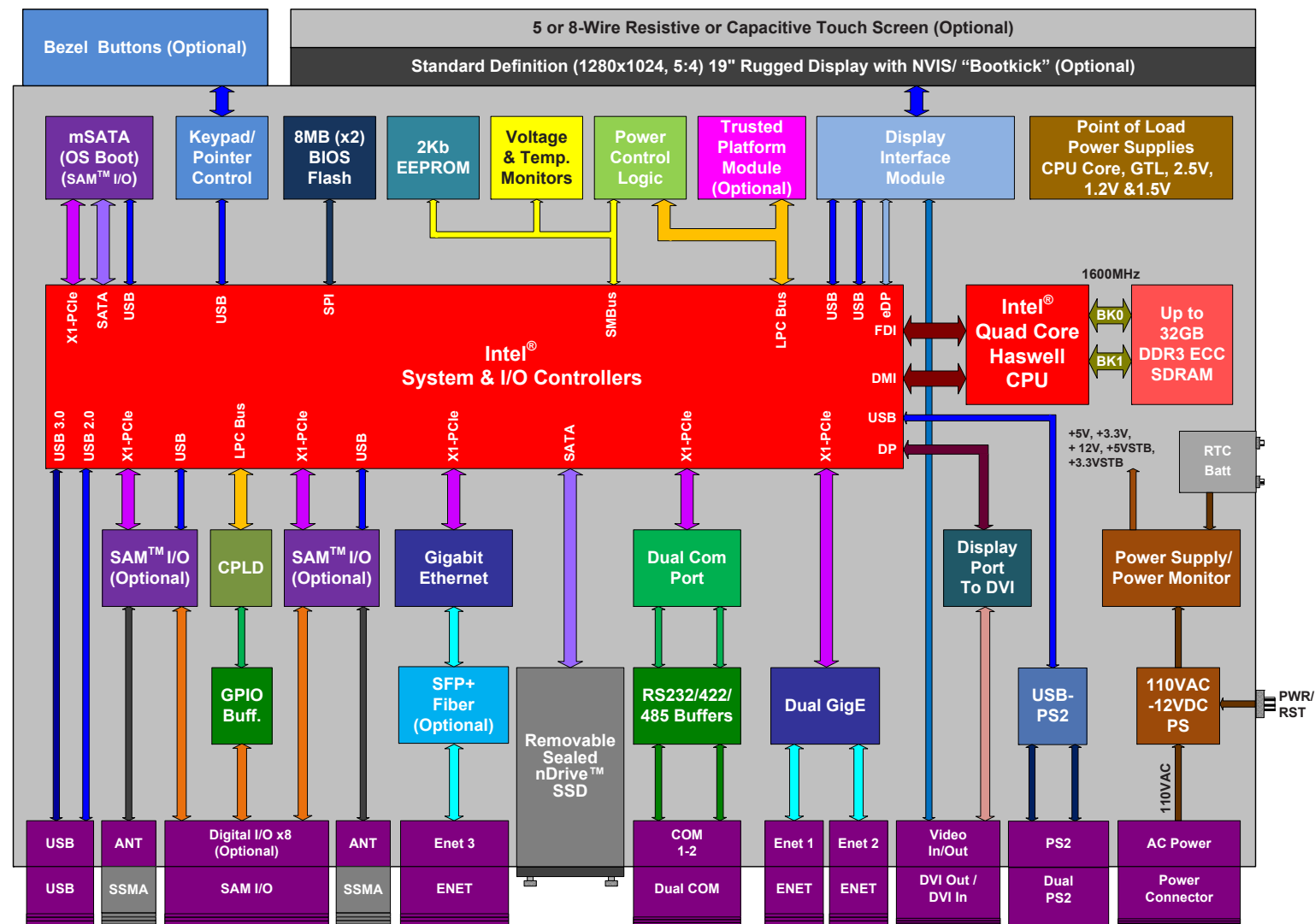
RUGGEDVIEW™ SD19-1002
Rugged, Standard Definition Smart Display with Removable Drive

- Ultra-rugged 19 inch diagonal screen in 5:4 format with 1280x1024 native resolution
- Full daylight viewable screen with optional Night Vision Imaging System (NVIS)
- Ultra rugged "boot-kick" glass for virtually unbreakable screen (optional)
- Ultra-small and lightweight frame, less than 3 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coating for crisp display in any light
- Resistive touch with glove and/or stylus operation with EMI shielding (capacitive optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Up to 2.4GHz Intel® Quad Core™ i7 Haswell processor with 6MB of L2 Cache

- Up to 32GB of 1600MHz DDR3 memory with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- One fully sealed removable nDrive™ up to 1TB with secure erase/write protect (optional)
- One CompactFlash socket for external storage device
- One Fiber Gigabit Ethernet port with TCP/IP Offloading Engine (TOE) (optional)
- Two Copper Gigabit Ethernet ports with TCP/IP Offloading Engine (TOE)
- One USB 3.0 or one USB 2.0 port and two COM ports with RS-232/422/485 options
- Two PS2 ports for legacy keyboard/mouse/trackball support

- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)
- One DVI output or DVI video input selected via bezel key
- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- Power, Blackout, Zero, Brightness, NVIS, Video Source, and Shift bezel keys
- Fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67
- Operates up to -20°C to +80°C (no heater) or up to -40°C to +80°C (with heater)
- Available in ruggedization levels R3-R5

General Description

The RuggedView™ SD19-1002 integrates the most rugged, crisp 19 inch diagonal display with a fourth-generation Core™ i7 processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright display and Night Vision Imaging System (NVIS). The RuggedView™ SD19-1002 is targeted for applications where a vigorous computer with a rugged display is needed to provide the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 3.25 inches thick.

The RuggedView™ SD19-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The SD19-1002 is offered with several screen options in 5:4 format, with or without touchscreen and bezel keys. The display for the SD19-1002 screen is protected with the most rugged glass available in the market, which can withstand a direct "boot kick" without damaging the display or the touch screen. The SD19-1002 supports Standard Definition (SD) of 1280x1024 resolution in standard format. It is viewable with up to 700 nits of brightness and supports anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The display also supports NVIS for applications where night vision glasses are used to reduce stress on the viewer. The RuggedView™ SD19-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points.

The I/O subsystem for the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet ports and one Fiber Gigabit Ethernet port with TCP/IP Offloading Engine (TOE), one USB 3.0 or one USB 2.0 port, two COM ports with RS-232/422/485 options, two PS2 ports, eight buffered digital I/O lines (optional), one removable sealed nDrive™ SSD (optional), one CompactFlash socket, and one internal fixed SSD, (each with capacities of up to 1TB and with secure-erase and write-protect options). Additional standard I/O included are DVI output from the CPU or DVI input from an external source, which can be displayed on the SD19-1002 screen (bezel key selectable). Up to 16 bezel keys are provided for screen control such as Brightness up/down, NVIS, Blackout, Zero, Power, Video Source and Shift, which can be used as multi-function keys for custom applications. The RuggedView™ SD19-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ SD19-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The SD19-1002 is fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67 optionally.

Technology Used

RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, based on application. The computing engine within the RuggedView™ is upgradeable and is field serviceable.

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The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -40°C to +80°C at full load (-20°C to +75°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R3-R5. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The SD series is also available with less robust glass and packaging.
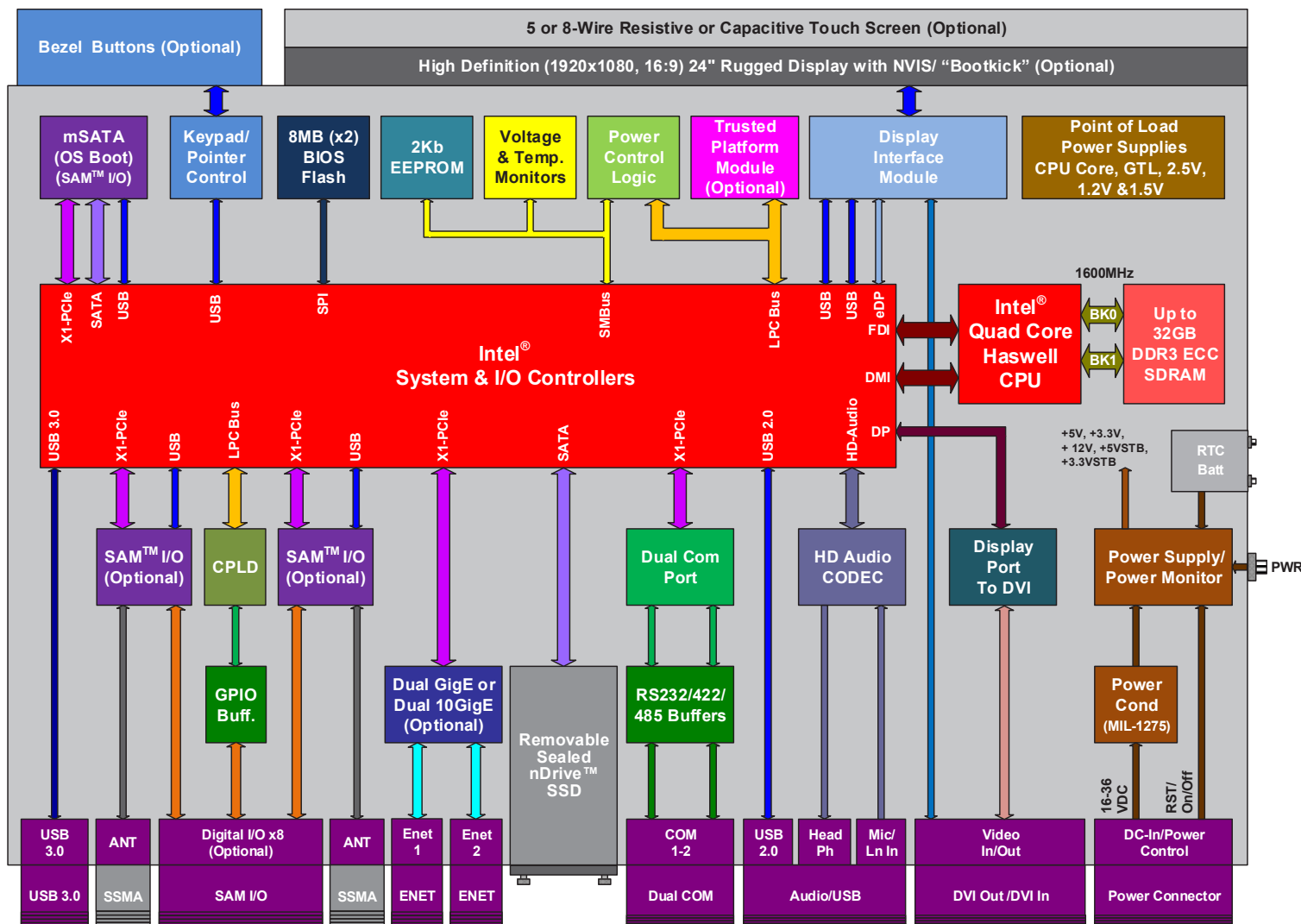
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RUGGEDVIEW™ HD24W-1002
Rugged, High Definition Smart Display with Removable Drive

- Ultra rugged 24 inch diagonal screen in 16:9 format with 1920x1080 native resolution
- Full daylight viewable screen with optional Night Vision Imaging System (NVIS)
- Ultra-rugged "boot-kick" glass for virtually unbreakable screen (optional)
- Ultra-small and lightweight frame, less than 2 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coating for crisp display in any light
- Resistive touch with glove and/or stylus operation with EMI shielding (capacitive optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Up to 2.4GHz Intel® Quad Core™ i7 Haswell processor with 6MB of L2 Cache

- Up to 32GB of 1600MHz DDR3 memory with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- One sealed removable nDrive™ up to 1TB with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- One USB 3.0, one USB 2.0 port and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)
- Full HD-Audio support with onboard 1W mono amplifier
- One DVI output or DVI video input selected via bezel key

- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Power, Blackout, Zero, Brightness, NVIS, Video Source, and Shift bezel keys
- Fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67
- Operates up to -20°C to +80°C (no heater) or up to -40°C to +80°C (with heater)
- Available in ruggedization levels R3-R5

General Description

The RuggedView™ HD24W-1002 integrates the most rugged, crisp 24 inch diagonal widescreen display with a fourth-generation Core™ i7 processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright display and Night Vision Imaging System (NVIS). The RuggedView™ HD24W-1002 is targeted for applications where a vigorous computer with a rugged display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 2 inches thick!

The RuggedView™ HD24W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The HD24W-1002 is offered with several screen options in 16:9 format, with or without touchscreen and bezel keys. The display for the HD24W-1002 screen is protected with the most rugged glass available in the market, which can withstand a direct "boot kick" without damaging the display or the touch screen. The HD24W-1002 supports High Definition (HD) of 1920x1080 resolution in widescreen format. It is viewable with up to 800 nits of brightness and supports anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The display also supports NVIS for applications where night vision glasses are used to reduce stress on the viewer. The RuggedView™ HD24W-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points.

The I/O subsystem for the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet ports or an optional two 10Gigabit Ethernet ports with TCP/IP Offloading Engine (TOE), one USB 3.0 and one USB 2.0 port, two COM ports with RS-232/422/485 options, eight buffered digital I/O lines (optional), one removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). Additional standard I/O included are audio in/out for headset use and DVI output from the CPU or DVI input from an external source that can be displayed on the HD24W-1002 screen (bezel key selectable). Up to 16 bezel keys are provided for screen control such as Brightness up/down, NVIS, Blackout, Zero, Power, Video Source and Shift, which can be used as multi-function keys for custom applications. The RuggedView™ HD24W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ HD24W-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The HD24W-1002 is fully compliant to MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66/67 optionally.
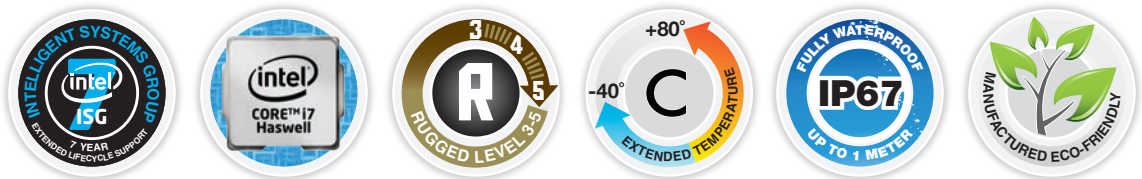
Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, dependent on application necessity. The computing engine within the RuggedView™ is upgradeable and is field serviceable.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -40°C to +80°C at full load (-20°C to +75°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R3-R5. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The HD series is also available with less robust glass and packaging.

Bezel Buttons (Optional)

Up to 10 Point Capacitive or Infrared Touch Screen (Optional)

Ultra High Definition (3840x2160, 16:9) 32" Rugged Display

mSATA (OS Boot) (SAM™ I/O) · Keypad/Pointer Control · 8MB (x2) BIOS Flash · 2Kb EEPROM · Voltage & Temp. Monitors · Power Control Logic · Trusted Platform Module (Optional) · Display Interface Module

CNT · eDP · SDI 1-4 · DP 1-4

X1-PCIe · SATA · USB · USB · SPI · SMBus · LPC Bus · USB · USB · eDP · SATA

Intel® Quad Core i7 CPU with up to 32GB RAM

SATA

USB 3.0 · X1-PCIe · USB · LPC Bus · X1-PCIe · USB · X1-PCIe · X1-PCIe · USB 2.0 · HD-Audio · RGB · DP1 · DP2 · X8-PCIe

Dual Removable Sealed nDrive™ SSD

Point of Load Power Supplies
+5V, +3.3V, +12V, +5VSTB, +3.3VSTB

12VDC

RTC Batt

DC/AC Power Supply

PWR/RST

SAM™ I/O (Optional) · CPLD · SAM™ I/O (Optional) · Dual Com Port · HD Audio CODEC · nVidia GPU (Optional) · PCIe · eDP

DP1 · DP2 · RGB

GPIO Buff. · Dual GigE or Dual 10GigE (Optional) · RS232/422/485 Buffers · HD-SDI

USB 3.0 x2 · ANT · Digital I/O x8 (Optional) · ANT · Enet 1 · Enet 2 · COM 1-2 · USB 2.0x2 · Mic/HPH · VGA1 · DP1 · DP2 · DP3 · DP4 · VGA2 · SDI1 SDI2 SDI3 SDI4 · SDI1 SDI2 SDI3 SDI4 · DP1 DP2 DP3 DP4 · 24 VDC

USB 3.0 · SSMA · SAM I/O · SSMA · ENET · ENET · Dual COM · Audio/USB · Video Outputs · Video Inputs · Power Connector

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"CHRONOS" PB100X
Ultra-Small, High Performance, Intel® Quad Core™ i7 SBC
UHD SERIES

RUGGEDVIEW™ UHD32W-1002
Rugged, Ultra High Definition Smart Display with Removable Drives

- Ultra-rugged 32 inch diagonal screen in 16:9 format with 3840x2160 (4K) native resolution
- Ultra-bright and sharp screen with up to 450 nits of brightness
- Versatile video I/O: quad DP/HDMI, HD-SDI and dual RGB video
- Ultra-small and lightweight frame, less than 3 inches thick!
- Anti-glare (AG) and anti-reflective (AR) coating for crisp display in any light
- Up to 10-point capacitive/IR touch screen with gestures (optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- 2.4GHz Intel® Quad Core™ i7 CPU with 32GB of 1600MHZ DDR3 RAM with ECC
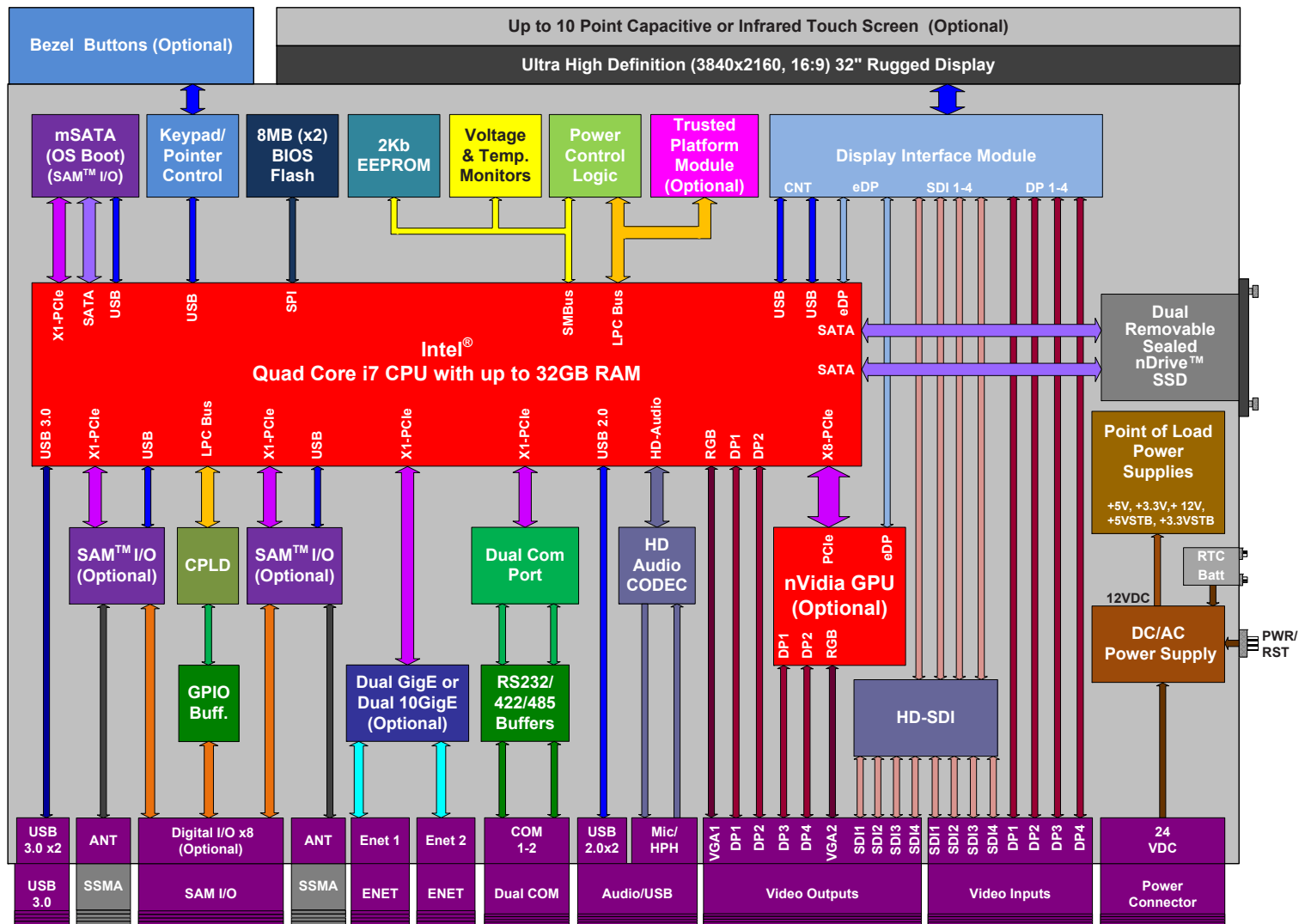
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- Two sealed removable nDrive™ SSDs up to 1TB each with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- Two USB 3.0, two USB 2.0 ports and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)
- Embedded Haswell Core™ i7 HD4600 graphics *or* AMD GPU with 240 CUDA cores and 2GB GDDR5 RAM (optional)
- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)

- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Operates from standard standard 24VDC power input
- Power, Zero, Brightness, Video Source, and Shift bezel keys
- VESA or panel mounting options
- Fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66
- Operates up to -20°C to +75°C (no heater) or up to -40°C to +75°C (with heater)
- Available in ruggedization levels R1-R3

General Description

The RuggedView™ UHD32W-1002 integrates the most rugged, crisp 32 inch diagonal 4K display with a fourth-generation Core™ i7 processor, resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright, 4K display. The RuggedView™ UHD32W-1002 is targeted for applications where an ultra-rugged computer with a high performance display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects, to provide a fully sealed smart display system that is less than 3 inches thick!

The RuggedView™ UHD32W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The UHD32W-1002 is offered with several screen options in 16:9 4K format, with or without touchscreen and bezel keys. The display for the UHD32W-1002 supports UHD 4K standards of 3840x2160 resolution and is viewable with up to 450 nits of brightness with anti-reflective (AR) and anti-glare (AG) coating for crisp graphics. The RuggedView™ UHD32W-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points. The UHD32W-1002 supports a wide range of graphics engines and video I/O. With the i7 CPU the user may utilize the embedded graphics in the i7 to support three external displays. Two of the video outputs support DisplayPort/HDMI with 4K graphics and one VGA port. Additionally a SAMVideo™ module may be installed to support two additional DisplayPort/HDMI with 4K resolutions and one additional VGA. For video input, the UHD32W-1002 supports up to four DisplayPort/HDMI with 4K support, and HD-SDI with pass-through for long distance cabling of up to 100 meters. The UHD32W-1002 also supports picture-in-picture (PIP) and up to 16 bezel keys for screen control such as Brightness up/down, Power, Video Source and Shift key, which can be used as multi-function keys for custom applications

The I/O subsystem of the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet or 10Gigabit Ethernet (optional) ports each with a TCP/IP Offloading Engine (TOE), two USB 3.0 and two USB 2.0 port, two COM ports with RS-232/422/485 options, two removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). RuggedView™ UHD32W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively.   Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided. The UHD32W-1002 is powered via 110/220VAC or external 28VDC dirty power with MIL-STD-1275D protection.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for broadcasting, defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ UHD32W-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The UHD32W-1002 is fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66.

Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, based on application. The computing engine within the RuggedView™ is upgradeable and field serviceable.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -20°C to +75°C at full load (0°C to +55°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R1-R3. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The UHD series is also available with less robust glass and packaging.
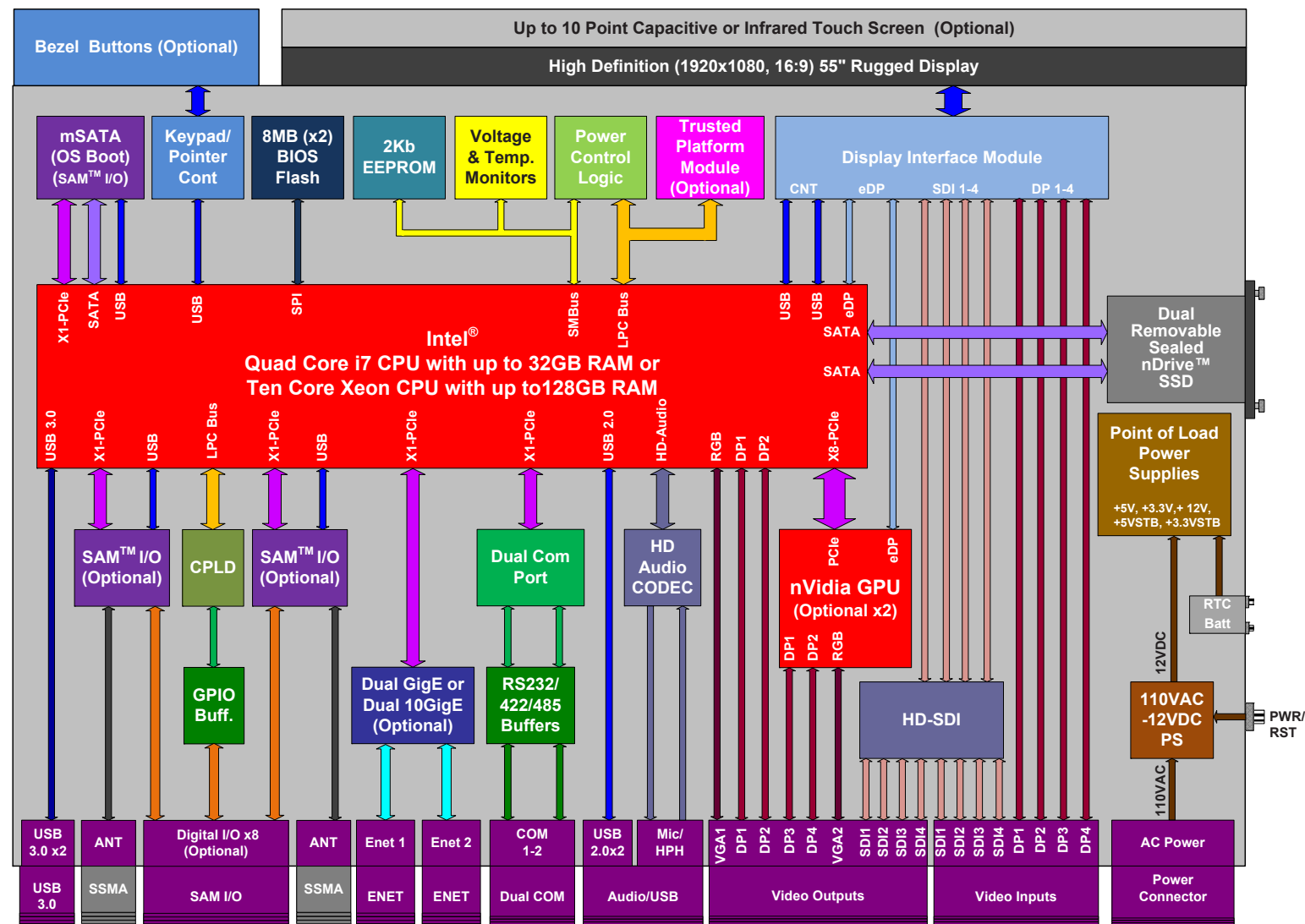
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RUGGEDVIEW™ HD55W-1002
Rugged, High Definition Smart Display with Removable Drives

Block diagram labels:

Bezel Buttons (Optional)

Up to 10 Point Capacitive or Infrared Touch Screen (Optional)

High Definition (1920x1080, 16:9) 55" Rugged Display

mSATA (OS Boot) (SAM™ I/O) | Keypad/Pointer Cont | 8MB (x2) BIOS Flash | 2Kb EEPROM | Voltage & Temp. Monitors | Power Control Logic | Trusted Platform Module (Optional) | Display Interface Module

CNT | eDP | SDI 1-4 | DP 1-4

Intel®
Quad Core i7 CPU with up to 32GB RAM or
Ten Core Xeon CPU with up to128GB RAM

X1-PCIe | SATA | USB | USB | SPI | SMBus | LPC Bus | USB | USB | eDP | SATA | SATA

USB 3.0 | X1-PCIe | USB | LPC Bus | X1-PCIe | USB | X1-PCIe | X1-PCIe | USB 2.0 | HD-Audio | RGB | DP1 | DP2 | X8-PCIe

Dual Removable Sealed nDrive™ SSD

Point of Load Power Supplies
+5V, +3.3V,+ 12V, +5VSTB, +3.3VSTB

SAM™ I/O (Optional) | CPLD | SAM™ I/O (Optional) | Dual Com Port | HD Audio CODEC | nVidia GPU (Optional x2)

PCIe | eDP | DP1 | DP2 | RGB

GPIO Buff.

Dual GigE or Dual 10GigE (Optional) | RS232/422/485 Buffers

HD-SDI

RTC Batt

110VAC -12VDC PS

PWR/RST

12VDC

110VAC

USB 3.0 x2 | ANT | Digital I/O x8 (Optional) | ANT | Enet 1 | Enet 2 | COM 1-2 | USB 2.0x2 | Mic/HPH | VGA1 | DP1 | DP2 | DP3 | DP4 | VGA2 | SDI1 | SDI2 | SDI3 | SDI4 | SDI1 | SDI2 | SDI3 | SDI4 | DP1 | DP2 | DP3 | DP4 | AC Power

USB 3.0 | SSMA | SAM I/O | SSMA | ENET | ENET | Dual COM | Audio/USB | Video Outputs | Video Inputs | Power Connector

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"ZEUS" PO300X
Rugged, High Performance, 10-Core Intel™ Xeon Ivy Bridge-EP SBC
HD SERIES

Features (left column):

- Ultra-rugged 55 inch diagonal screen in 16:9 format with 1920x1080 native resolution
- Ultra-bright and sharp screen with up to 700 nits of brightness
- Versatile video I/O: quad DP/HDMI, HD-SDI and dual RGB video
- Ultra-thin bezel at 0.135 inches and less than 4.5 inches total thickness!
- Anti-glare (AG) and anti-reflective (AR) coating for crisp display in any light
- Up to ten point capacitive or IR touch screen with gestures (optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Power, Zero, Brightness, Video Source, and Shift bezel keys

Features (center column):

- Most powerful processor, memory and graphics options:
  2.4GHz Intel® Quad Core™ i7 CPU with 32GB of 1600MHZ DDR3 RAM with ECC or
  2.4GHz Intel® 10 Core Xeon® Ivy Bridge-EP CPU with 128GB of DDR3 RAM with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- Two sealed removable nDrive™ SSDs up to 1TB each with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- Two USB 3.0, two USB 2.0 ports and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)

Features (right column):

- Embedded Haswell Core™ i7 HD4600 graphics *or*
  AMD GPU with 240 CUDA cores and 2GB GDDR5 RAM (dual optional)
- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- Operates from standard 110/220VAC
- Fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66
- Operates up to -20°C to +75°C (no heater) or up to -40°C to +75°C (with heater)
- Available in ruggedization levels R1-R3

Icons: FILM AND VIDEO PRODUCTION | MEDICAL ELECTRONICS | SECURITY APPLICATIONS | PUBLIC UTILITY APPLICATIONS

General Description

The RuggedView™ HD55W-1002 integrates the most rugged, crisp 55 inch diagonal 1920x1080 display with a fourth-generation Core™ i7 processor or Xeon® processor, resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system. The RuggedView™ HD55W-1002 is targeted for applications where an ultra-rugged computer with a high performance display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects, to provide a fully sealed smart display system that is less than 4.5 inches thick!

The RuggedView™ HD55W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The RuggedView™ HD55W-1002 may also be ordered with the Ivy Bridge-EP™ CPU, which is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This Xeon® class processor supports 10 physical CPU cores with Hyper-Threading for a total of 20 logical cores, each operating up to 2.4GHz with the ability to TurboBoost to 3.0GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 128GB of DDR3 RAM organized in four banks. Each RAM bank consists of two DDR3 DIMM arrays with ECC. The ECC RAM provides 2-bit error detection with 1-bit correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory.

The HD55W-1002 is offered with several screen options in 16:9 HD format, with or without touchscreen and an ultra-thin bezel at 0.135 inches. The display for the HD55W-1002 supports 1920x1080 resolution and is viewable with up to 700 nits of brightness with anti-reflective (AR) and anti-glare (AG) coating for crisp graphics even in direct sunlight. The RuggedView™ HD55W-1002 may optionally be purchased with less robust glass and other optional I/O to meet specific requirements and price points. The HD55W-1002 supports a wide range of graphics engines and video I/O. When the i7 CPU is used, the user may utilize the embedded graphics in the i7 to support three external displays. Two of the video outputs support DisplayPort/HDMI with 4K graphics and one VGA port. Additionally the HD55W-1002 can support dual SAMVideo™ modules that may be installed to support two additional DisplayPorts/HDMI with 4K resolutions and one additional VGA on each module. When the Ivy Bridge-EP™ CPU is used, a SamVideo™ module must be utilized, since there are no embedded graphics on the CPU innately; therefore, the second SAMVideo™ module is optional.

For input, the HD55W-1002 supports up to four DisplayPort/HDMI with 4K support, and HD-SDI with pass-through for long distance cabling of up to 100 meters. The HD55W-1002 also supports picture-in-picture (PIP) and up to 16 bezel keys for screen control such as Brightness up/down, Power, Video Source and Shift key, which can be used as multi-function keys for custom applications

The I/O subsystem of the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet or 10Gigabit Ethernet (optional) ports each with a TCP/IP Offloading Engine (TOE), two USB 3.0 and two USB 2.0 port, two COM ports with RS-232/422/485 options, eight buffered digital I/O lines (optional), two removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). RuggedView™ HD55W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided. The HD55W-1002 is powered via 110/220VAC.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for broadcasting, defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ HD55W-1002 may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The HD55W-1002 is fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66.

Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, based on application. The computing engine within the RuggedView™ is upgradeable and field serviceable.
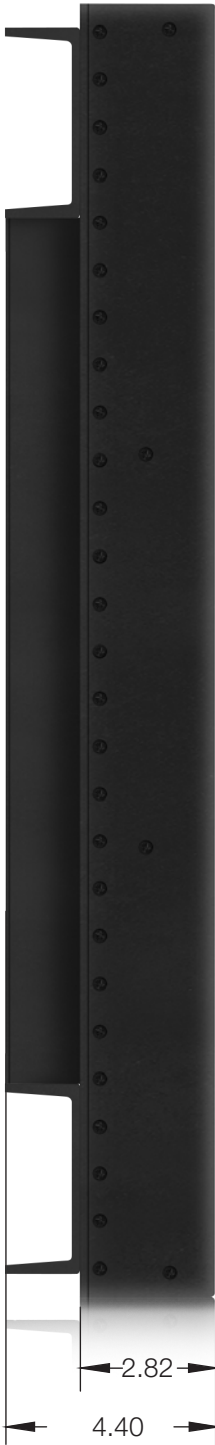
The RuggedView™ may also utilize the most powerful Xeon® processor from Intel®. The Ivy Bridge-EP CPU is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This CPU is the highest performance server-class CPU from Intel® with many added security functions, such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), Active Management Technology (AMT) for remote KVM functions, and Converged Platform Power Management (CPPM) for thermal management and power saving. The graphics engine is based around the most powerful AMD full-size embedded MXM GPU module for outstanding performance in 2D and 3D accelerations and is fully virtualized. Lower performance MXM modules are also available for lower cost and power consumption.

Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -20°C to +75°C at full load (0°C to +55°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R1-R3. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The HD series is also available with less robust glass and packaging.

2.82

4.40

RUGGEDVIEW™ UHD65W-1002
Rugged, Ultra High Definition Smart Display with Removable Drives

"ZEUS" PO300X
Rugged, High Performance, 10-Core Intel® Xeon Ivy Bridge-EP SBC
UHD SERIES

59.77
35.57

Bezel Buttons (Optional)

Up to 10 Point Capacitive or Infrared Touch Screen (Optional)

Ultra High Definition (3840x2160, 16:9) 65" Rugged Display

| mSATA (OS Boot) (SAM™ I/O) | Keypad/ Pointer Control | 8MB (x2) BIOS Flash | 2Kb EEPROM | Voltage & Temp. Monitors | Power Control Logic | Trusted Platform Module (Optional) | Display Interface Module |

CNT   eDP   SDI 1-4   DP 1-4

X1-PCIe   SATA   USB   USB   SPI   SMBus   LPC Bus   USB   USB   eDP   SATA   SATA

Intel®
Quad Core i7 CPU with up to 32GB RAM or
Ten Core Xeon CPU with up to128GB RAM

USB 3.0   X1-PCIe   USB   LPC Bus   X1-PCIe   USB   X1-PCIe   USB 2.0   HD-Audio   RGB   DP1   DP2   X8-PCIe

SAM™ I/O (Optional)   **CPLD**   **SAM™ I/O (Optional)**   **Dual Com Port**   **HD Audio CODEC**   **nVidia GPU (Optionalx2)**   PCIe   eDP

DP1 DP2 RGB

GPIO Buff.   **Dual GigE or Dual 10GigE (Optional)**   **RS232/ 422/485 Buffers**   **HD-SDI**

| USB 3.0 x2 | ANT | Digital I/O x8 (Optional) | ANT | Enet 1 | Enet 2 | COM 1-2 | USB 2.0x2 | Mic/ HPH | VGA1 DP1 DP2 DP3 DP4 VGA2 | SDI1 SDI2 SDI3 SDI4 | SDI1 SDI2 SDI3 SDI4 DP1 DP2 DP3 DP4 | AC Power |
| USB 3.0 | SSMA | SAM I/O | SSMA | ENET | ENET | Dual COM | Audio/USB | | Video Outputs | | Video Inputs | Power Connector |

Dual Removable Sealed nDrive™ SSD

Point of Load Power Supplies
+5V, +3.3V,+ 12V, +5VSTB, +3.3VSTB

RTC Batt

12VDC

110VAC -12VDC PS

PWR/ RST

110VAC

- Ultra-rugged 65 inch diagonal screen in 16:9 format with 3840x2160 (4K) native resolution
- Ultra-bright and sharp screen with up to 700 nits of brightness
- Versatile video I/O: quad DP/HDMI, HD-SDI and dual RGB video
- Ultra-small and lightweight frame, less than 4 inches thick!
- Anti-glare (AG) and anti- reflective (AR) coating for crisp display in any light
- Up to ten point capacitive/IR touch screen with gestures (optional)
- Up to 16 bezel keys for screen control and special functions (customizable and optional)
- Power, Zero, Brightness, Video Source, and Shift bezel keys
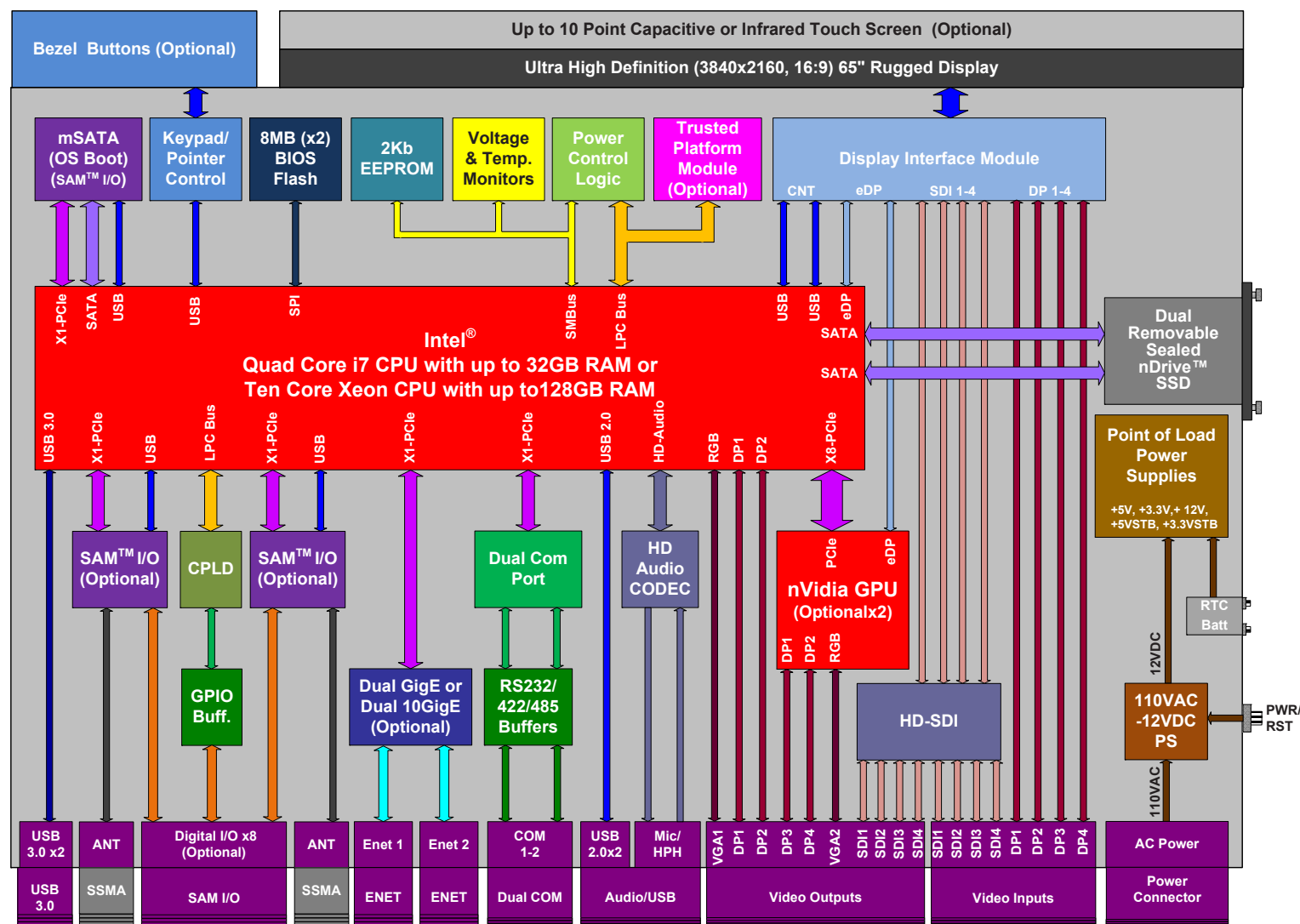
- Most powerful processor, memory and graphics options:
  2.4GHz Intel® Quad Core™ i7 CPU with 32GB of 1600MHZ DDR3 RAM with ECC or
  2.4GHz Intel® 10 Core Xeon® Ivy Bridge-EP CPU with 128GB of DDR3 RAM with ECC
- Up to 1TB of fixed SSD for OS boot with secure erase/write protect (optional)
- Two sealed removable nDrive™ SSDs up to 1TB with secure erase/write protect (optional)
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- Two USB 3.0, two USB 2.0 port and two COM ports with RS-232/422/485 options
- Two SAM™ sites for custom I/O (MIL- STD-1553, Wi-Fi/BT, GPS, CANBus, GPIO, etc.)

- Embedded Haswell Core™ i7 HD4600 graphics *or*
  AMD GPU with 240 CUDA cores and 2GB GDDR5 RAM (dual optional)
- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- Operates from standard 110/220VAC power
- Fully compliant to MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66
- Operates up to -20°C to +75°C (no heater) or up to -40°C to +75°C (with heater)
- Available in ruggedization levels R1-R3

General Description

The RuggedView™ UHD65W-1002 integrates the most rugged, crisp 65 inch diagonal 4K display with a fourth-generation Core™ i7 processor or Xeon® processor resulting in the thinnest, most powerful and robust smart display on the market today. It is designed to provide the highest level of workstation performance possible in a fully ruggedized, conduction-cooled, fully sealed system with an ultra-bright, 4K display. The RuggedView™ UHD65W-1002 is targeted for applications where a vigorous computer with a high performance display is needed to deliver the best possible stand-alone-system, per dollar and per watt, while utilizing rugged interconnects to provide a fully sealed smart display system that is less than 4 inches thick!

The RuggedView™ UHD65W-1002 supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The RuggedView™ UHD65W-1002 may also be ordered with the Ivy Bridge-EP™ CPU, which is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This Xeon® class processor supports 10 physical CPU cores with Hyper-Threading for a total of 20 logical cores, each operating up to 2.4GHz with the ability to TurboBoost to 3.0GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 128GB of DDR3 RAM organized in four banks. Each RAM bank consists of two DDR3 DIMM arrays with ECC. The ECC RAM provides 2-bit error detection with 1-bit correction, and supports up to 1600 mega-transfers per second (MTS) between CPU and memory.

The UHD65W-1002 is offered with several screen options in 16:9 4K format, with or without touchscreen and bezel keys. The display for the UHD65W-1002 supports 4K standards of 3840x2160 resolution and is viewable with up to 350 nits of brightness with anti-reflective (AR) and anti-glare (AG) coating for crisp graphics. The RuggedView™ UHD65W-1002 may optionally be purchased with less rugged glass and other optional I/O to meet specific requirements and price points. The UHD65W-1002 support a wide range of graphics engines and video I/O. When the i7 CPU is used, the user may utilize the embedded graphics in the i7 to support three external displays. Two of the video outputs support DisplayPort/HDMI with 4K graphics and one VGA port. Additionally the UHD65W-1002 can support dual SAMVideo™ modules that may be installed to support two additional DisplayPorts/HDMI with 4K resolutions and one additional VGA on each module. When the Ivy Bridge-EP™ CPU is used, a SamVideo™ module must be utilized, since there are no embedded graphics on the CPU innately; therefore, the second SAMVideo™ module is optional.

For video input, the UHD65W-1002 supports up to four DisplayPorts/HDMI with 4K support, and HD-SDI with pass-through for long distance cabling up to 100 meters. The UHD65W-1002 also supports picture–in–picture (PIP) and up to 16 bezel keys for screen control such as Brightness up/down, Power, Video Source and Shift key, which can be used as multi-function keys for custom applications

The I/O subsystem of the RuggedView™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet or 10Gigabit Ethernet (optional) ports each with TCP/IP Offloading Engine (TOE), two USB 3.0 and two USB 2.0 port, two COM ports with RS-232/422/485 options, two removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure-erase and write-protect options). RuggedView™ UHD65W-1002 may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided. The UHD65W-1002 operates via 110/220VAC power.

Applications

The RuggedView™ is designed to provide the ultimate rugged computer with an ultra-rugged display for broadcasting, defense and industrial applications. The RuggedView™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedView™ UHD65W-1002may be ordered from the factory with operating systems such as Windows®, Linux® or VMware® pre-installed. The UHD65W-1002 is fully compliant MIL-STD 810G, MIL-S-901D, DO-160D, MIL-STD-461E and IP66.

Technology Used

The RuggedView™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, based on application. The computing engine of the RuggedView™ is upgradeable and is field serviceable.

The RuggedView™ may also utilize the most powerful Xeon® processor from Intel®. The Ivy Bridge-EP CPU is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This CPU is the highest performance server-class CPU from Intel® with many added security functions, such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), Active Management Technology (AMT) for remote KVM functions, and Converged Platform Power Management (CPPM) for thermal management and power saving. The graphics engine is based around the most powerful AMD full-size embedded MXM GPU module for outstanding performance in 2D and 3D accelerations and is fully virtualized. Lower performance MXM modules are also available for lower cost and power consumption.
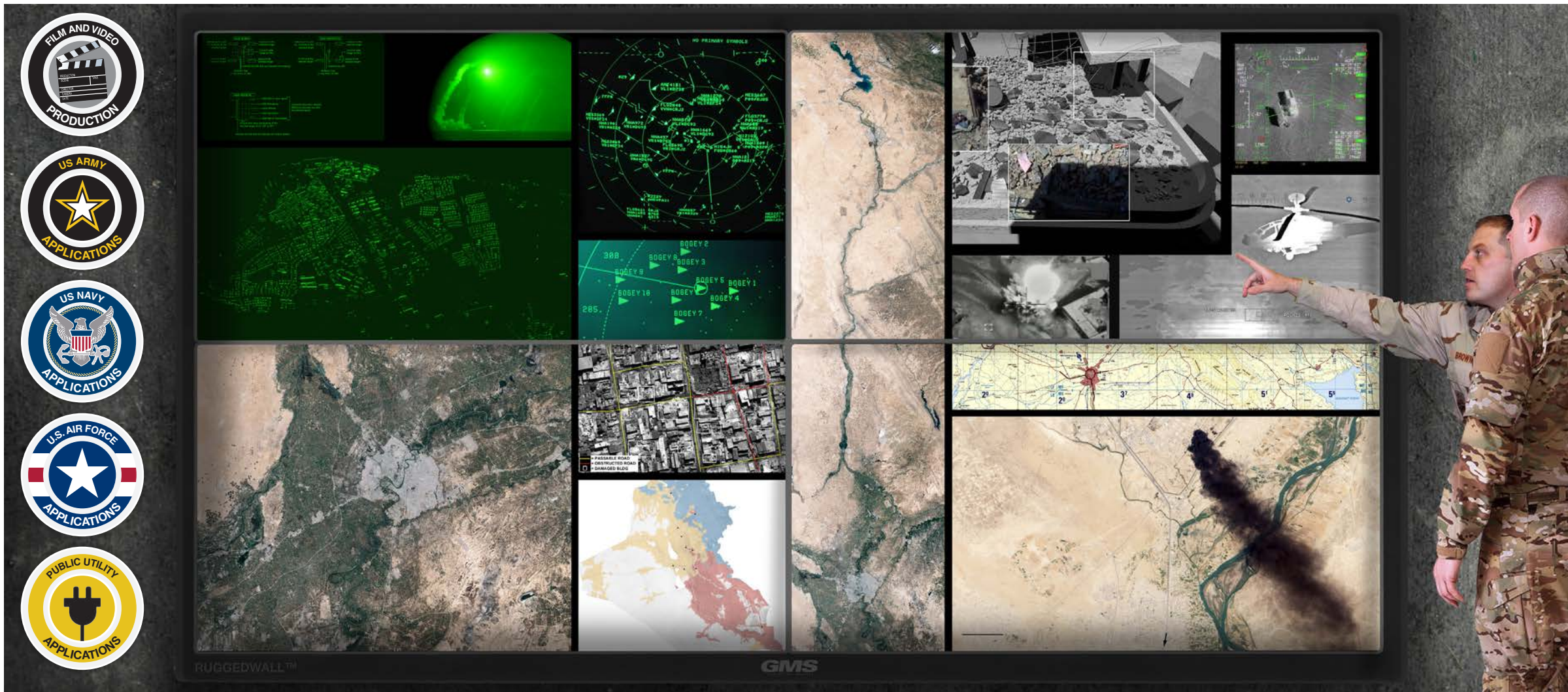
Cooling

The RuggedView™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -20°C to +75°C at full load (0°C to +55°C standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedView™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedView™ is available in ruggedization levels R1-R3. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The UHD series is also available with less robust glass and packaging.

2.50

3.80

RUGGEDWALL™
Rugged, Smart Display Wall with Removable Drives

- Quad 4K displays operating as four independent smart displays or as one large display
- Available in 55" or 65" in 16:9 format with screen resolutions of up to 3840 x 2160
- Ultra-thin frame, only 0.5 inch gap between displays and less than 4 inches thick!
- Anti-Glare (AG) and Anti-Reflective (AR) coating for crisp display in any light
- Up to 32 bezel keys for screen control and special functions (customizable and optional)
- Most powerful processor, memory and graphics options:
  2.4GHz Intel® Quad Core™ i7 CPU with 32GB of 1600MHZ DDR3 RAM with ECC or
  2.4GHz Intel® 10 Core Xeon® Ivy Bridge-EP CPU with 128GB of DDR3 RAM with ECC

- Up to 1TB of fixed SSD for OS boot
- Dual sealed nDrive™ removable SSD, up to 1TB each with secure erase/write protect
- Two Gigabit or 10Gigabit (optional) Ethernet ports with TCP/IP Offloading Engine (TOE)
- Two USB 3.0, four USB 2.0 port and two COM ports with RS-232/422/485 options
- AMD GPU with 240 CUDA cores and 2GB GDDR5 RAM (dual optional)
- Four SAM™ sites for custom I/O (MIL-STD-1553, Wi-Fi/BT, GPS, CANBus, etc.)
- Full HD-Audio support with onboard 1W mono amplifier
- Up to four ultra-high performance 4K Display Port video inputs/outputs

- Optional passive display (no CPU) for dual or triple displays
- Intel® Virtualization Technology (VT-x/VT-d2) and Trusted Execution Technology (TXT)
- Trusted Platform Module (TPM) for secure operation (optional)
- CPU temperature and voltage monitoring for safe operation
- Pass/Fail, Power, and user LED indicators and Power On/Off switch
- MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E, IP66 compliant
- Operates up to -20°C to +75°C (no heater) or up to -40°C to +75°C (with heater)
- Available in ruggedization levels R1-R3

General Description

The RuggedWall™ display system consists of four independent smart displays, (RuggedWall™) which can be used as independent systems. Each can display the native computer screen or may display any of the other three computer screens to allow one large image to be spanned across all four displays. The Ruggedwall™ integrates the most rugged, reliable, and crisp 4K displays with resolutions up to 3480x2160 in a 55 inch or 65 inch diagonal display. Each Ruggedwall™ display is equipped with a fourth-generation Core™ i7 or Xeon® Ivy Bridge-EP processor, ultra-rugged, lightweight computer system, resulting in the thinnest, most powerful smart display wall on the market today. It is designed to provide the highest level of flexibility and redundancy in a multi-screen video system with the best video performance possible in a completely ruggedized, conduction-cooled, fully sealed system. The RuggedWall™ is targeted for applications where an ultra-rugged tactical wall with a rugged display is needed to provide the best possible stand-alone-system per dollar and per watt while utilizing rugged interconnects in a fully sealed smart display system that is less than 4 inches thick!

The RuggedWall™ supports the latest, most power-efficient, Intel® Haswell Quad Core™ i7 processor with Hyper-Threading for a total of 8 logical cores, each operating up to 2.4GHz with the ability to TurboBoost up to 3.4GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 32GB of RAM organized in two banks that support error correcting code (ECC). The ECC RAM provides 2-bit error detection and 1-bit error correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory. The RuggedWall™ may also be ordered with the Ivy Bridge-EP™ CPU, which is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This Xeon® class processor supports 10 physical CPU cores with Hyper-Threading for a total of 20 logical cores, each operating up to 2.4GHz with the ability to TurboBoost to 3.0GHz. To harvest this incredible CPU performance, the CPU is coupled with up to 128GB of DDR3 RAM organized in four banks. Each RAM bank consists of two DDR3 DIMM arrays with ECC. The ECC RAM provides 2-bit error detection with 1-bit correction and supports up to 1600 mega-transfers per second (MTS) between CPU and memory.

RuggedWall™ is offered with several screen options in 16:9 4K format, with or without touchscreen and bezel keys. The display for the RuggedWall™ supports 4K standards of 3840x2160 resolution and is viewable with up to 700 nits of brightness with anti-reflective (AR) and anti-glare (AG) coating for crisp graphics. The RuggedWall™ may optionally be purchased with less rugged glass and other optional I/O to meet specific requirements and price points. This product can support a wide range of graphics engines and video I/O. When the i7 CPU is used, the user may utilize the embedded graphics in the i7 to support three external displays. Two of the video outputs support DisplayPort/HDMI with 4K graphics and one VGA port. Additionally the RuggedWall™ can support dual SAMVideo™ modules that may be installed to support two additional DisplayPorts/HDMI with 4K resolutions and one additional VGA on each module. When the Ivy Bridge-EP™ CPU is used, a SamVideo™ module must be utilized, since there are no embedded graphics on the CPU innately; therefore, the second SAMVideo™ module is optional. For video input, the RuggedWall™ supports up to four DisplayPorts/HDMI with 4K support, and HD-SDI with pass-through for long distance cabling up to 100 meters. The RuggedWall™ also supports picture–in-picture (PIP) and up to 16 bezel keys for screen control such as Brightness up/down, Power, Video Source and Shift key, which can be used as multi-function keys for custom applications

The I/O subsystem of the RuggedWall™ is designed to support a wide array of standard and custom I/O functions. The standard configuration supports two Gigabit Ethernet or 10Gigabit Ethernet (optional) ports each with TCP/IP Offloading Engine (TOE), two USB 3.0 and two USB 2.0 port, two COM ports with RS-232/422/485 options, two removable sealed nDrive™ SSD (optional) and one internal fixed SSD (each with capacities of up to 1TB and with secure erase and write protect options). RuggedWall™ may be highly customized via Flex I/O™ to supply additional I/O to connectors easily and cost effectively. Utilizing the two SAM™ sites, additional I/O functions, such as quad video capture, CANbus, MIL-STD-1553, Wi-Fi, Bluetooth, FireWire, GPS and many other I/O are optionally provided. The RuggedWall™ operates via 110/220VAC power.

Each smart display provides up to four Display Port inputs and four Display Port outputs. Each smart display is connected to the other three smart displays via a Display Port thus it may operate as the host for the other three displays, for a quad display system, or may operate as a target display for any of the other three smart displays. In this unique matrix, four independent operators may control the target applications, and each may display its video on all four displays for an incredible 130" diagonal display.

Applications

The RuggedWall™ is designed to provide the ultimate rugged tactical wall with an ultra-rugged display for defense and industrial applications. The RuggedWall™ is ideal for outdoor applications where it may be fully exposed to rain, sun, dirt, and radiation. The RuggedWall™ may be ordered from the factory with operating systems such as Windows®, Linux® or VxWorks® pre-installed. The RuggedWall™ is fully compliant MIL-STD 810G, MIL-STD-1275D, MIL-S-901D, DO-160D, MIL-STD-461E and IP66.

Technology Used

The RuggedWall™ utilizes the Intel® Quad Core™ i7 Haswell CPU, which is the newest, most powerful, and efficient processor from Intel® with advanced thermal management and graphics. The Haswell Core™ i7 processor supports Hyper-Threading for a total of eight logical cores and supports 6MB of L2 cache shared among the cores. Haswell supports up to 32GB of DDR3 RAM with error correcting code (ECC) and 1600 mega-transfers per second (MTS) between the CPU and RAM. A major improvement of the Haswell processor over the Ivy Bridge Core™ i7 is the graphics performance. The Haswell processor provides three independent video outputs and greater-than-40% improvement in 3D acceleration. Haswell is also coupled with Lynx Point™ and is a fourth-generation Core™ i7 with a fully integrated memory controller for the best memory performance possible. This CPU is considered the workhorse of the workstation market with many added power-saving features and peak performance with controlled thermals, as well as security functions such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), and Active Management Technology (AMT) for remote KVM functions. The Haswell platform also supports PCIExpress Gen3, USB 3.0 and SATA 3 for the highest performance possible on a workstation platform. The glass used for the display is highly customizable in performance and ruggedness, based on application. The computing engine within the RuggedWall™ is upgradeable and field serviceable.

The RuggedWall™ may also utilize the most powerful Xeon® processor from Intel®. The Ivy Bridge-EP CPU is a second-generation Sandy-Bridge microarchitecture processor with a fully integrated memory controller for the best possible memory performance. This CPU is the highest performance server-class CPU from Intel® with many added security functions, such as Intel's second-generation Virtualization Technology VT-x, Trusted Execution Technology (TXT), Active Management Technology (AMT) for remote KVM functions, and Converged Platform Power Management (CPPM) for thermal management and power saving. The graphics engine is based around the most powerful AMD full-size embedded MXM GPU module for outstanding performance in 2D and 3D accelerations and is fully virtualized. Lower performance MXM modules are also available for lower cost and power consumption.

Cooling

The RuggedWall™ is equipped with GMS' patent pending RuggedCool™ technology, which is the most unique cooling system in the industry and is the only system that operates up to -40°C to +75°C with heater at full load (0°C to +55°C Standard)! This cooling approach provides the lowest thermal resistance to the case while providing the highest shock specifications known in the industry. The RuggedWall™ is a fan-less system for reliable operation and can be mounted directly to a metal surface or used as a stand-alone system.

Full Environmental Specs

The RuggedWall™ is available in ruggedization levels R1-R3. Additional information regarding the ruggedization levels and full environmental specifications for this product can be found on our website at www.gms4sbc.com. The UHD series is also available with less rugged glass and packaging.

SECURITY FEATURES

Over the last several years computer security has become a major concern for all users and manufacturers around the world. Sophisticated software has been written to penetrate corporate, government and military networks and servers in order to access proprietary and sensitive information, and to perform malicious and criminal attacks that compromise the integrity of the information and deny legitimate access to the information. Both internal and external attacks on data security are becoming more and more frequent, with the damage often being irreversible, and, in general, the traditional methods of protection such as firewalls and anti-virus/anti-malware software are no longer adequate. A "holistic" approach to security that ranges from user education / operational policies to containment after a breech is required to address the rapidly evolving computer security environment. For embedded computing, a "holistic" approach requires that security features at the hardware and firmware level are also present. In addition, for some defense and government agency customers, the required security features go beyond what is found in many embedded computing systems currently on the market. For these applications, additional measures have been, and are being, developed to address situations in which computers with sensitive information may fall into the hands of the enemy. These additional measures help to ensure that sensitive information is not obtained by the enemy.

As a result of these increased computer security threats, General Micro Systems has taken the lead in implementing improved security features - from the architectural level down to the hardware level. All GMS systems are designed from the ground up to provide for the most advanced security features possible. GMS's systems include security functions that protect against threats such as software attacks at system initialization, threats against the integrity of the system BIOS and related firmware, escalation of privilege attacks against the operating system, rootkits, physical tampering and unauthorized configuration changes, and compromise of data and mass storage devices. In addition, GMS provides architectural variants of the typical embedded computer system that provide for government approved compartmentalization of I/O resources for operation of virtual machines in computing environments with multiple security domains, and with multiple processing sub-systems in total isolation.

The security functions included in GMS systems are summarized in the paragraphs below.

Trusted Platform Module (TPM) and Trusted Execution Technology (TXT)
The primary purpose of the TPM is to provide a hardware mechanism for maintaining the integrity of a computer platform. It is a key element in protecting against stealthy malware such as rootkits and bootkits by providing hardware cryptographic capabilities that support authentication processes for low level elements of the system, including the BIOS, the boot sector and master-boot-record (MBR). Systems with TPM are capable of meeting NIST guidelines for trusted computing, which include "measurement" of firmware, software and configuration information before they are executed, then encrypted storage of the "measurements" in hardware, and then validation the "measurements" against a predefined expectation. The TPM is involved in all three of these steps, including the storage of the expected and current measurements. In addition to providing for "platform integrity", the TPM can be used for key protection for hard disk encryption, and for password authentication support, and therefore, has potential uses for operating systems and application software.

TXT is a computer hardware technology based in the processor and associated chipset that provides key elements for establishing a verifiable description of the system per the methodologies prescribed by the Trusted Computing Group (TCG). Key elements of TXT include extensions to the instruction set specifically for security operations, Authentication Code Modules (ACM), and features for supporting Launch Control Policies (LCP).

In summary, TXT and TPM together can be used to establish the "root of trust" and the "chain of trust" by providing hardware based encrypted identifiers for all software components involved in system initialization, and hardware based mechanisms for blocking the execution of software components that do not match approved versions. In addition, hardware mechanisms are provided for protecting residual secret data from memory snooping and reset attacks, and features are included to support local and remote attestation of the trustworthiness of the system.

Of course, usage of TXT and TPM implies system software (BIOS) and operating system involvement, and, indeed, support at both levels is required for the realization of a trusted computing system.
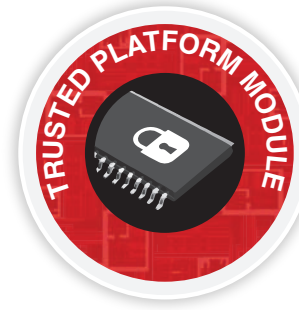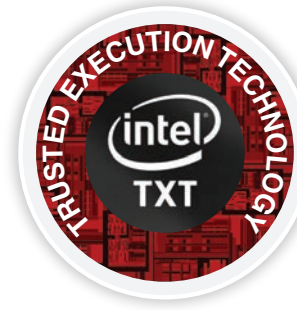
BIOS
GMS develops all system BIOS in-house. Although this approach increases development costs, it provides for superior software quality control and maximum flexibility to meet the unique needs of our customers, such as enhanced password protection, ultra-fast boot, and custom plasma screens. For consistency across GMS's product lines, American Megatrends, Inc. (AMI) BIOS cores are exclusively used. Also, the AMI BIOS cores provide key security related capabilities required for GMS products, most notably UEFI 2.3.1 compliance, and support for UEFI Secure Boot, NIST 800-147 BIOS Protection Guidelines, TPM 1.2 and 2.0, Intel V-Pro (including TXT), Intel VT-d, Intel Ant-Theft Technology, and password protection for BIOS setup and boot.

Other important features of the GMS system BIOS include:

- Storage of system parameters and configuration settings in the BIOS Flash instead of the standard battery-backed CMOS. This results in systems that can operate fully without the need of battery in a system.

- Hardware write protect (WP) for the BIOS flash. This feature, which includes a write protect signal at the system interconnect, can be used to eliminate inadvertent and unauthorized changes to the system BIOS and system configuration settings.

GMS welcomes custom BIOS needs which, in most cases, are provided for free to OEM customers.

Data Security
GMS products include functionality to provide for the security of data stored on internal and removable mass storage devices. These functions include support for software based full-disk encryption, and support for "in-line" hardware based disk encryption, as well as media with internal encryption capability (Self-Encrypting Drive). Also, GMS products may be configured with mass storage that has hardware based write protection, and with mass storage that has hardware based "secure erase" capability.

Software Based Full-Disk and File-System Encryption
The processors used in GMS products includes instruction set enhancements for AES FIPS Publication 197 data encryption and decryption. Key lengths of 128, 192, and 256 bits are supported. The Trusted Platform Module (TPM) included in GMS products can be used in conjunction with the disk encryption mechanism to provide encryption key storage. Various off-the-shelf software products that provide full-disk and file-system encryption make use of the processor's AES instructions, including BitLocker™, McAfee® Endpoint Encryption and Symantec™ PGP Whole Disk Encryption.

Hardware Full-Disk Encryption
Some GMS systems include the option for in-line hardware based full-disk encryption. This approach provides cryptographic processor between the root system's SATA ports and the mass storage devices. The cryptographic processor performs AES FIPS 140-2 certified encryption at a key length of 256 bits. The encryption and decryption are performed at "wire-speed" on the SATA interface, eliminating the processing overhead and performance considerations of software based disk encryption. This method is also operating system independent and allows for encryption of any mass storage device. Key token, password and TPM based key management are supported.

Self-Encrypting Drive (SED)

All GMS products with 2.5" internal or removable mass storage support self-encrypting drives (SED). SED are nominally compliant to the Trusted Computing Group's Opal SSC specification and use AES encryption with 256 bit key length. Encryption keys are stored internal to the drive, providing a security advantage over software based encryption. SEDs are readily available in the rotating media market, and are gaining support in the SSD market.

Secure-Erase (SE)

The specific meaning of Secure Erase in the context of disk drives is an ATA command defined by NIST Special Publication 800-88 (Guidelines for Media Sanitization) for a firmware based process for overwriting a hard drive. Virtually all hard disk drives and SSDs support in some fashion the Secure Erase ATA command. Because there may be some circumstances in which execution of the command via software is not possible, GMS offers, as an option on some products with internal or removable mass storage, a hardware mechanism for initiating the secure erase operation. This option allows the Secure Erase to be initiated when power is applied to the mass storage device, regardless of the operational state of the system - the system does not have to be functional, nor does any software need to be running. Specialized mass storage media is required for this feature.

GMS also offers, as an option, mass storage with specialized secure erase methods for defense and governmental agency related customers. These methods include DoD 5220.22-M, NSA 9-12, NSA 130-2, as well as Army, Air Force and Navy secure erase specifications. Secure erase for these methods is also triggered by ATA commands and, optionally, by a hardware mechanism. The secure erase, when triggered, cannot be stopped. If power is disconnected from the drive before the secure erase is complete, the secure erase will resume when power is re-applied. Some of the secure erase methods are destructive, such that the drive is not reusable after the erase is complete.

Write-Protect (WP)

GMS also offers, as an option on some products with internal or removable mass storage, a hardware mechanism for preventing any data writes to the mass storage device. This feature, which includes a write protect signal at the system interconnect, can be used to eliminate unauthorized or inadvertent changes to the content of the mass storage device, and is of interest to customers requiring that the operating system be "tamper proof". Specialized mass storage media is required for this feature.

Tamper-Proof (TAMP)

One possible security risk with computer systems that process confidential information is that unauthorized personnel may attempt to physically open the system in order to access data storage devices, including mass storage, non-volatile memory or even RAM, or to modify the system configuration such that the integrity of the system is compromised.

To prevent tampering such as this from being successful, some GMS products include a tamper sensor. This sensor, when activated, sends a signal to the internal and removable drives, as well as the PCH (Platform Controller Hub), which can be used to initiate various responses, such as halting operation, turning off power, disabling subsequent initialization, triggering secure erase of the drives, and triggering erasure of the system BIOS.

Secure Virtual Machine (SVM)

In a standard virtual machine (VM) environment, all of the root system's I/O resources, such as USB, Ethernet, Serial ports, etc., are effectively organized as a generic pool, and are assigned to a given virtual machine on a "as-needed" basis for a given application. In the GMS Secure Virtual Machine architecture, the system's I/O resources are predefined by the hardware topology to be in specific groupings. These groupings are the designated I/O for a set of virtual machines and for the supervisory portion of the system. The hardware topology of the GMS Secure Virtual Machine is the key to providing the necessary isolation, resulting in dedicated I/O resources at the hardware level for each virtual machine, and a dedicated hardware path to the processor/memory sub-system for every virtual machine. The GMS Secure Virtual Machine architecture, in conjunction with Intel VT-x and VT-d technologies, which provide for isolation at the memory, DMA, and interrupt levels, and along with an appropriate virtual-machine monitor (VMM), provides the highest level of security possible for virtualized operating systems.

The GMS Secure Virtual Machine architecture uses none of the system's centralized I/O resources for virtual machine I/O, while providing dedicated (un-shared) connections from the system's root complex to the discrete hardware elements designated for each virtual machine's I/O. This approach addresses security risks by allowing the native I/O device drivers to be resident in the protected virtual machine partitions rather than being emulated by the VMM, and by eliminating any hardware or software coupling between the I/O functions of the virtual machine instances. Thus, the I/O functions of one virtual machine cannot be monitored or interfered with by software running on another virtual machine or by software running on the VMM itself. An added benefit of this architecture is the inherent fault tolerance of dedicated I/O resources: Damage or malfunction of the hardware elements designated for one virtual machine does not affect the operation of any of the other virtual machines. For example, a typical embedded computer system has multi-port USB hubs connected to an EHCI USB host controller as part of its central resources. The assignment of these ports by the VMM may span, or even be shared by, more than one virtual machine. A failure or error on one of the ports may affect the hub or the host controller in such a way that communications on the other ports are degraded or compromised. For the GMS Secure Virtual Machine architecture, USB ports assigned to a given virtual machine are provided by host controllers that are dedicated to that specific virtual machine. While damage, malfunction or error at that host controller will affect the operation of the associated virtual machine, there should be no effect on any of the other virtual machines in the system.

Another important aspect of the GMS Secure Virtual Machine architecture is its inherent support for trusted computing. In addition to the Trusted Platform Module (TPM) and the TXT capabilities provided by the processor and chipset, VT-x and VT-d are integral elements of a trusted computing system that hosts virtual machine partitions. VT-d is utilized during both system initialization, and by the VMM during normal operation. During initialization, VT-d provides for protected memory regions (PMR) from which the "launch environment" itself, as well as elements of the VMM, may operate. VT-d is used in the creation and management of the trusted partitions for the virtual machine instantiations, protecting the virtual machine partitions and the VMM from each other, and during normal operation, the VMM may use VT-d to define protected regions for use by integrity monitoring functions.

Multi Domain Platform (MDP)

GMS's Multi-Domain Platform systems are targeted for applications where two different Security Domains need to co-exist in the same enclosure. For this situation, the GMS MDP architecture is "Share Nothing": ALL hardware for one domain is physically and electrically separated from ALL hardware for the other domain. It is basically two separate systems enclosed in the same box, with only the common element being the input power. All internal functions, including regulators, processor and memory, and I/O functions are fully isolated from each other such that the electrical coupling and RFI between the two domains is negligible. This is achieved via shielding one domain from another and filtering all I/O interconnects.

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