

# A193

## GPGPU Based Rugged RediBuilt™ HPEC



Embedded Computing  
without Compromise



A193 GPGPU subsystem is a true rugged COTS High Performance Embedded Computer (HPEC). Assembled, tested, and qualified, the A193's integrated Intel® Xeon® SBC and NVIDIA GPGPU provides an out-of-the-box solution to meet many of today's military and airborne computing requirements. Designed using proven Aitech technology, this GPGPU subsystem is a fully integrated product, requiring no NRE or any additional development. Just set the Ethernet address, load your application and go...!

Rugged **GP GPU** is Aitech

- GPGPU Based Rugged High Performance Embedded Computer (HPEC)
- 8<sup>th</sup> Gen E-2176M Intel® Xeon® CPU, 6 Cores/12Threads @ 2.7 GHz
- NVIDIA® GeForce® GTX 1050 GPU
  - ▶ Pascal Architecture
  - ▶ 1.73 TFLOPS
  - ▶ 640 CUDA Cores @ 1354 MHz
  - ▶ 4 GB GDDR5
  - ▶ CUDA, PhysX, OpenCL, OpenGL, DirectX 12
- I/O
  - ▶ Gigabit Ethernet
  - ▶ UART Serial
  - ▶ USB 2.0
  - ▶ DVI/RGB Outputs
- Up to 32 GB DDR4 w/ECC
- Up to 1 TB On-board SSD
- Windows®, Linux® Support
- Fully Integrated and Ready to Use
- D38999 I/O and Power Connectors
- Compact and Lightweight
- Internally Conduction-Cooled 3U VPX
- Fully Sealed Faraday Cage
- EMI/RFI Filtering
- Environmentally Sealed (IP65)
- Fanless/no moving parts



[www.rugged.com](http://www.rugged.com)

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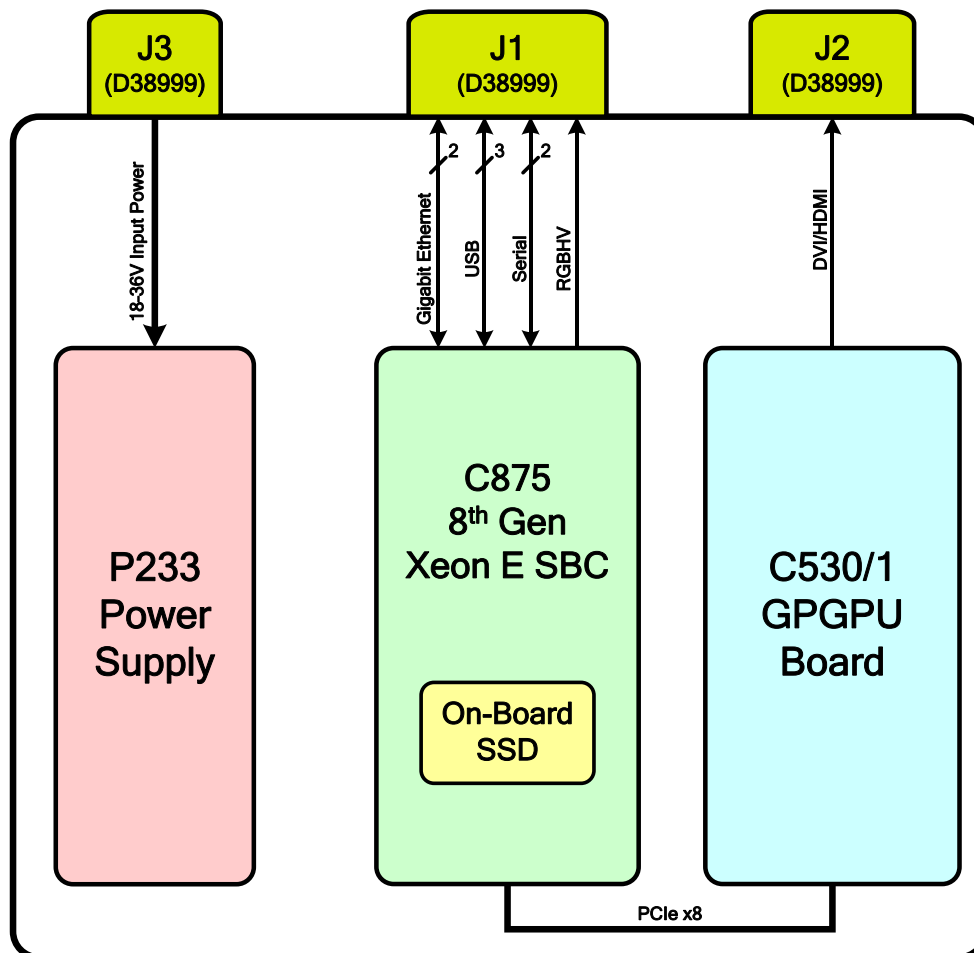
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Modern, high-performance GPUs have tremendous processing potential. Utilizing this processing capability for non-graphical applications is known as GPGPU (General Purpose GPU) processing.

Aitech's A193 RediBuilt™ provides GPGPU processing in a fully integrated, ready-to-use system.

The A193 is based on the Aitech's C875 SBC and C530/1 GPGPU Board.

These boards are packaged in an Aitech enclosure along with a high-efficiency power supply, providing a complete High Performance Embedded Computer (HPEC) system in an extremely rugged and compact form factor.



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### System Architecture

<b>CPU (C875 SBC)</b>	Xeon E-2176M – 6 core/12 threads (Hyper-Threading) @ 2.7 GHz, 4.4 GHz Turbo Boost, 12 MB Cache		
<b>GPU (C530/1 GPGPU)</b>	NVIDIA® GeForce® GTX 1050		
	<ul style="list-style-type: none"><li>• Pascal Architecture</li><li>• GP107 Graphics Processor</li><li>• 1.73 TFLOPS</li><li>• 640 CUDA Cores</li><li>• 1354 MHz GPU Clock</li></ul>	<ul style="list-style-type: none"><li>• 4 GB GDDR5</li><li>• 128-bit Memory Interface Width</li><li>• OpenGL 4.5</li><li>• OpenCL 1.1</li><li>• DirectX 12, Shader 5.0</li></ul>	<ul style="list-style-type: none"><li>• CUDA, PhysX</li><li>• &lt; 5W Idle, 50W Max Power</li><li>• Optimus Technology</li><li>• Dynamic clock frequency scaling support</li></ul>
<b>System Resources</b>	<ul style="list-style-type: none"><li>• Windowed Watchdog Timer</li><li>• Temperature Sensors</li></ul>	<ul style="list-style-type: none"><li>• Elapsed Time Recorder</li><li>• Real Time Clock</li></ul>	<ul style="list-style-type: none"><li>• Dynamic clock frequency scaling support</li></ul>
<b>VPX Fabric</b>	PCIe x8 backplane link between SBC and GPGPU board		

### Memory Resources

<b>RAM</b>	16/32 GB of DDR4 SDRAM in dual channels with ECC, operating at 2133 MT/s
<b>Flash Mass Storage</b>	Up to 1 TB Flash SSD on the SBC
<b>BIOS Flash</b>	Dual BIOS Flash devices (Primary device for normal operation, Alternate device for system maintenance)

### I/O Interfaces

<b>SBC / CPU</b>	C875 (8 <sup>th</sup> Gen E-2176M Intel® Xeon® CPU)	
<b>GPGPU Board / GPU</b>	C530/1 (NVIDIA GeForce GTX 1050)	
<b>Video Outputs</b>	<b>DVI</b>	1
	<b>RGB</b>	1
<b>Gigabit Ethernet Ports</b> 10/100/1000Base-T		2
<b>UART Serial Ports</b> Software/BIOS configurable as RS-232/422/485		2
<b>USB 2.0 Ports</b>		3

### Software

- Supported operating systems
  - Windows 10
  - Linux
- Available with or without supported operating systems pre-installed

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<b>Passive Convection Cooling</b>	Heat passively dissipated to surrounding air via convection & radiation cooling of the sidewall fins.
<b>Cold Plate-Cooling</b>	Sidewalls conduct heat to enclosure base for cooling via the cold plate. Cold plate cooling is supplemented with convective cooling via sidewall fins.
<b>I/O Routing and Connectors</b>	All variants of the A193 are equipped with front panel D38999 I/O and power connectors.

### Mechanical

Enclosure Type	Dimensions (max. including handle)			Weight
	Depth	Width	Height	
Convection-Cooled	261 mm (10.28")	181 mm (7.13")	140 mm (5.5")	<6.8 kg (15 lbs)
Cold Plate-Cooled	261 mm (10.28")	156 mm (6.15")		

<b>Input Power</b>	<ul style="list-style-type: none"><li>• 85% Typical Efficiency Internal Power Supply</li><li>• 18 – 36 V<sub>DC</sub> Input Range</li><li>• EMI/RFI Input Filter</li></ul>	<ul style="list-style-type: none"><li>• Input Transient Protection</li><li>• Input Reverse Polarity Protection</li><li>• MIL-STD-704D/E Compliance</li></ul>
<b>Power Consumption</b>	110W Max. Power consumption is dependent on system configuration	

<b>Operating Temp.</b>	<b>Min</b>	-40 °C
	<b>Max</b>	Convection-cooled: +55 °C ambient air Cold plate-cooled: +55 °C cold plate
<b>Non-Operating Temp.</b>	-55 to +105 °C	
<b>Vibration</b>	V3 per VITA 47	
<b>Operating Shock</b>	OS2 per VITA 47	
<b>Altitude</b>	-1,500 to +60,000 ft. <sup>(1)</sup>	
<b>Relative Humidity</b>	0 – 100%	
<b>Ingress Protection</b>	IP65	
<b>Rain</b>	MIL-STD-810F, Method 506.4, Procedure III	
<b>Dust</b>	MIL-STD-810F, Method 510.4, Procedure I & II	
<b>Salt Fog</b>	MIL-STD-810F, Method 509.4	
<b>Bench Handling</b>	MIL-STD-810F, Method 516.5, Procedure VI	
<b>Fungus</b>	Fungus Resistant	
<b>EMI/RFI</b>	MIL-STD-461	

Notes: (1) Depending on temperature and system power dissipation

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### Ordering Information

**Cooling Configuration**  
 1 = Convection -Cooled  
 2 = Cold Plate -Cooled

**SDRAM**  
 C = 16 GB  
 D = 32 GB

**Reserved**

**Operating System**  
 0 = None  
 2 = Windows 10 64-bit  
 3 = Linux

**Configuration No.**  
 To be assigned by Aitech

**Example:** 2A193-2SDM003200-00

**Rugged GPGPU is Aitech**

### Optional Accessories

<b>MCS193-1-00</b>	Set of Front Panel Mating Connectors
<b>TC193-J1-00</b>	J1 I/O Breakout Cable
<b>TC193-J2-00</b>	J2 I/O Breakout Cable
<b>TC193-J3-00</b>	J3 Power Cable
<b>PS233-00</b>	28 V <sub>DC</sub> /150 W External Power Supply (100 - 240 V <sub>AC</sub> input)



### Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A193 and additional software support.

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