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Find the *Aitech Defense Systems A195* at our website: ***Click HERE***

A195

GPGPU Based Rugged RediBuilt™ HPEC

Aitech
Embedded Computing *without* Compromise





Rugged GP GPU is Aitech

- GPGPU Based Rugged High Performance Embedded Computer (HPEC)
- 5th Gen. Intel® Core™ i7 CPU, Quad Core @ 2.7 GHz
- NVIDIA® GeForce® GTX 965M GPU
  - Maxwell Architecture
  - 1892 GFLOPS
  - 1024 CUDA Cores @ 950 MHz
  - 4 GB GDDR5 @ 1600 MHz
  - CUDA, PhysX, OpenCL, OpenGL, DirectX 12
- I/O
  - Gigabit Ethernet
  - UART Serial
  - USB 2.0
  - Discrete I/O
  - DVI/HDMI Output
  - RGBHV Output
  - Composite Input
  - SDI Input
  - Audio Output
  - 1553B
  - ARINC-429 Rx & Tx
- Up to 16 GB DDR3L with ECC
- SATA Flash SSD Mass Storage
- Gigabit Ethernet Switch (optional)
- Windows® Support
- Fully Integrated and Ready to Use
- D38999 I/O and Power Connectors
- Internally Conduction-Cooled 3U VPX
- Fully Sealed Faraday Cage
- EMI/RFI Filtering
- Environmentally Sealed (IP65)
- Two External Cooling Configurations
  - Forced Convection (Fan) Cooling
  - Cold Plate-Cooling



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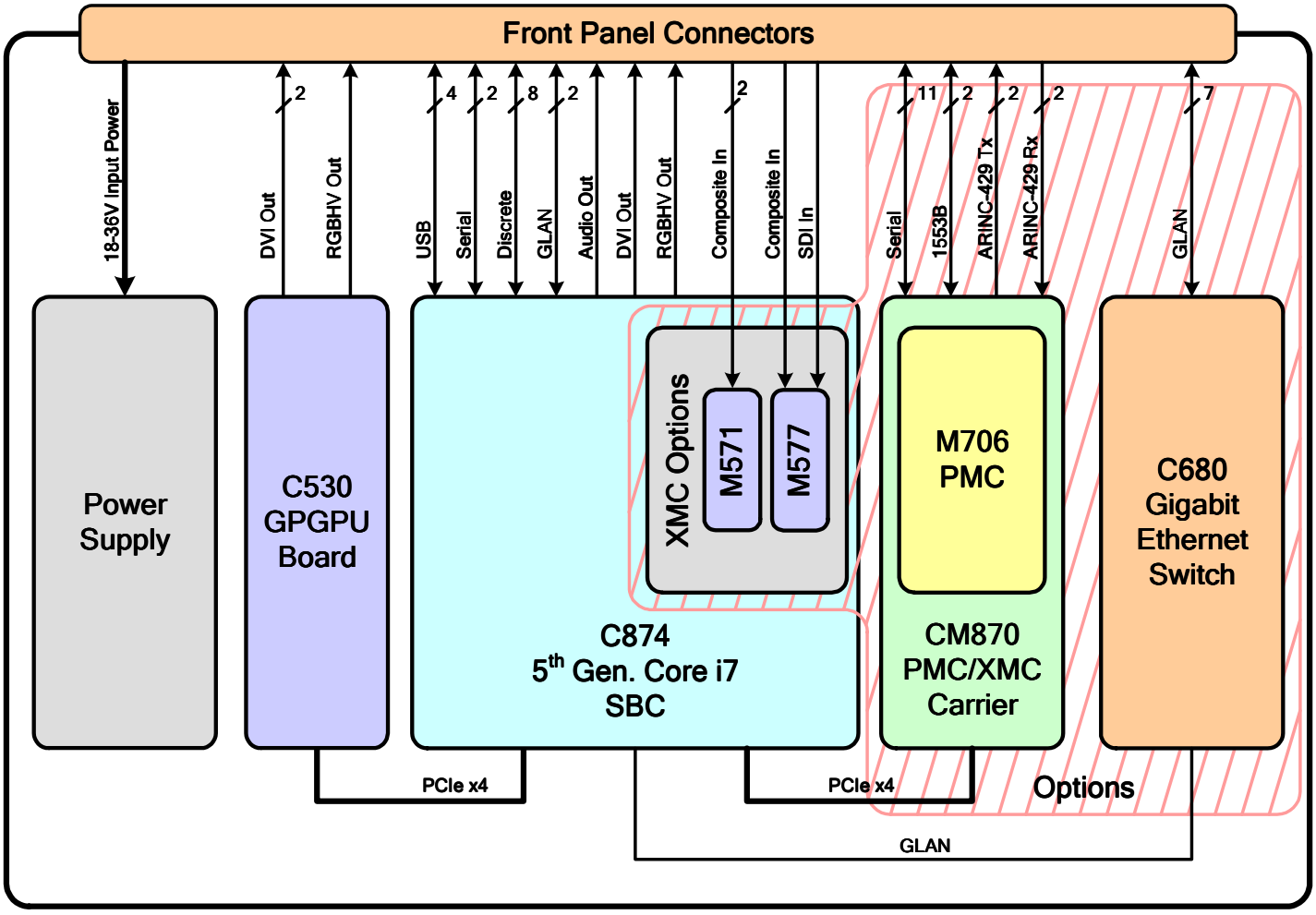
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Modern, high-performance GPUs have tremendous processing potential. Utilizing this processing capability for non-graphical applications is known as GPGPU (General Purpose GPU) processing.

Aitech's A195 RediBuilt™ provides GPGPU processing in a fully integrated, ready-to-use system.

The A195 is based on Aitech's C874 SBC and C530 GPGPU Board. System functionality is enhanced with the addition of optional boards including the M706 I/O PMC, C680 Gigabit Ethernet Switch, and M577 or M571 frame grabber XMCs.

These boards are packaged in a rugged Aitech enclosure along with a high-efficiency power supply, providing a complete ready-to-use High Performance Embedded Computer (HPEC) system.



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System Architecture

CPU (C874 SBC)	i7-5850EQ – 5th Gen. Intel® Core™ i7, Quad Core @ 2.7 GHz, Iris™ Pro Graphics 6200, 6 MB Last Level Cache Supports Hyper-Threading, Intel® Virtualization Technology (VT-x), SSE4.1/4.2, AVX 2.0
GPU (C530 GPGPU Board)	NVIDIA® GeForce® GTX 965M • Maxwell Architecture • GM204 Graphics Processor • 1892 GFLOPS • 1024 CUDA Cores • 950 MHz GPU Clock • 4 GB GDDR5 @ 1600 MHz • 128-bit Memory Interface Width • OpenGL 4.5 • OpenCL 1.1 • DirectX 12, Shader 5.0 • CUDA, PhysX • Optimus Technology
Additional System Board Options	• Two Frame Grabber XMC options (M571 or M577), provide different types/quantities of video input interfaces • I/O Board (M706 PMC mounted on VPX carrier), provides ARINC-429 Tx & Rx, 1553, additional serial ports • Gigabit Ethernet Switch, connected to SBC via backplane port, additional ports routed to system I/O connectors See the *Configuration Variants* section below for more information
System Resources	• Windowed Watchdog Timer • Temperature Sensors • Elapsed Time Recorder • Real Time Clock (optional backup battery) • Dynamic clock frequency scaling support
VPX Fabric	• PCIe x4 link between SBC and GPGPU board • PCIe x4 link between SBC and optional I/O board (I/O PMC mounted on VPX carrier) • Gigabit Ethernet link between SBC and optional Gigabit Ethernet Switch

Memory Resources

RAM	Up to 16 GB of DDR3L SDRAM in dual channels with ECC operates at 1600 MT/s
Flash Mass Storage	Up to 512 GB SATA SSD on-board the SBC SLC (Single-Level Cell) and MLC (Multi-Level Cell) options available as specified in *Ordering Information* below (additional options may be available per customer request, contact an Aitech representative for more information)
BIOS Flash	Dual BIOS Flash devices (Primary device for normal operation, Alternate device for system maintenance)

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Configuration Variants

		Variant (1) (2)				
		A	**B**	**C**	**D**	**E**
SBC / CPU		C874 (i7-5850EQ)				
GPGPU Board / GPU		C530 (NVIDIA GeForce GTX 965M)				
Frame Grabber XMC		M577	–	–	–	M571
I/O PMC		–	M706	–	M706	M706
Ethernet Switch		–	–	C680	C680	–
Gigabit Ethernet Ports (10/100/1000Base-T)		1	1	8 (3)	8 (3)	2
USB 2.0 Ports		4	4	4	4	2
UART Serial Ports (4)		2	13	2	13	5
Discrete I/O Lines (5)		8	8	8	8	–
Video Outputs	**DVI (single-link) / HDMI**	3 (6)	3 (6)	3 (6)	3 (6)	2 (7)
	RGBHV	2 (7)	2 (7)	2 (7)	2 (7)	–
Video Inputs	**SDI (480/60i, 576/50i)** (8)	1	–	–	–	–
	Composite (RS-170A [NTSC]/PAL)	1	–	–	–	2
Audio Output		1	1	1	1	–
ARINC-429 Tx		–	2	–	2	–
ARINC-429 Rx		–	2	–	2	–
1553B		–	0-2 (9)	–	0-2 (9)	–

Notes:
(1) Configuration Variants specify the boards used in the A195 system, and determine the type of CPU and GPU, available I/O, and system power consumption
(2) Previous configuration options, with C873 i7-4700EQ SBC and NVIDIA GeForce GTX 770M, are also available but are not recommended for new designs
(3) 8 ports at system I/O connectors – 1 from SBC, 7 from Ethernet Switch (SBC and Switch are interconnected via an additional GbE link over the backplane)
(4) Software configurable as RS-232/422/485
(5) Groups of two lines are software configurable as two single-ended channels or one differential RS-422 channel
(6) One channel from SBC, two channels from GPGPU board
(7) One channel from SBC, one channel from GPGPU board
(8) Factory configured for 75 Ω single-ended SDI operation mode
(9) Number of 1553B channels specified in *Ordering Information*

Software

- Windows operating system supported
- Available with or without operating system pre-installed

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Enclosure Options

Forced Convection (Fan) Cooling	Heat conducted through aluminum sidewalls, dissipated by exterior heat exchanger to surrounding air by fan forced convection.
Cold Plate Cooling	Sidewalls conduct heat to enclosure base for cooling via the cold plate. Cold plate cooling is supplemented with convective cooling via sidewall fins.

Mechanical

Enclosure Type	Dimensions (max. including handle)			Weight
	Depth	Width	Height	
Forced Convection (Fan) Cooled	329 mm (12.96")	145 mm (5.71")	194 mm (7.64")	<11 kg (24.3 lbs.)
Cold Plate Cooled	242 mm (9.53")	164 mm (6.46")		

Power

Input Power	• 85% Typical Efficiency Internal Power Supply • 18 – 36 V_{DC} Input Range • EMI/RFI Input Filter	• Input Transient Protection • Input Reverse Polarity Protection • MIL-STD-704D/E Compliance
Power Consumption	Maximum power consumption is dependent on system configuration	

Environmental

Operating Temp.	**Min**	-40 °C
	Max	Dependent on system configuration and power dissipation
Non-Operating Temp.		-55 to +105 °C
Vibration		V3 per VITA 47
Operating Shock		OS2 per VITA 47
Altitude		-1,500 to +60,000 ft. (1)
Relative Humidity		0 – 100%
Ingress Protection		IP65
Rain		MIL-STD-810F, Method 506.4, Procedure III
Dust		MIL-STD-810F, Method 510.4, Procedure I & II
Salt Fog		MIL-STD-810F, Method 509.4
Bench Handling		MIL-STD-810F, Method 516.5, Procedure VI
Fungus		Fungus Resistant
EMI/RFI		MIL-STD-461

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

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Ordering Information

2 A195 - [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] 0 - [ ] [ ]

Ruggedization
2 = Rugged

Cooling Configuration
1 = Forced Convection (Fan) Cooled
2 = Cold Plate-Cooled

Mounting Options
0 = Standard ARINC-404A *
1 = Hard Mounting
* Relevant only to Forced Convection (fan) cooled option

Processor Speed
S = Standard

SDRAM
B = 8 GB
C = 16 GB

Flash Drive
3 = 64 GB SLC
4 = 128 GB SLC
5 = 256 GB SLC
E = 256 GB SLC + 32 GB SLC
F = 512 GB MLC + 32 GB SLC
SLC - Single-Level Cell
MLC - Multi-Level Cell

C530 GPU
15 = NVIDIA GeForce GTX 965M

Configuration Variant
See table above

Number of 1553B Ports *
0,1, or 2
* Relevant only to Configuration Variants specified in table above

Input Voltage
3 = 18-36 Vdc

Operating System
0 = None
1 = Windows 7 32-bit
2 = Windows 7 64-bit

RTC Battery
0 = None
1 = Include Battery

Reserved

Configuration No.
To be assigned by Aitech

Example: 2A195-11SCE15A03200-00

Rugged GPGPU is Aitech

Optional Accessories

MCS195-1-00	Set of Front Panel Mating Connectors
TC195-J1-00	J1 Power Cable
TC195-J2-*xx*	J2 I/O Breakout Cable
TC195-J3-*xx*	J3 I/O Breakout Cable
TC195-J4-*xx*	J4 I/O Breakout Cable
TC195-J5-*xx*	J5 I/O Breakout Cable
PS28-150-00	28 V_{DC}/150 W External Power Supply (100 - 240 V_{AC} input)



Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the A195 and additional software support.



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