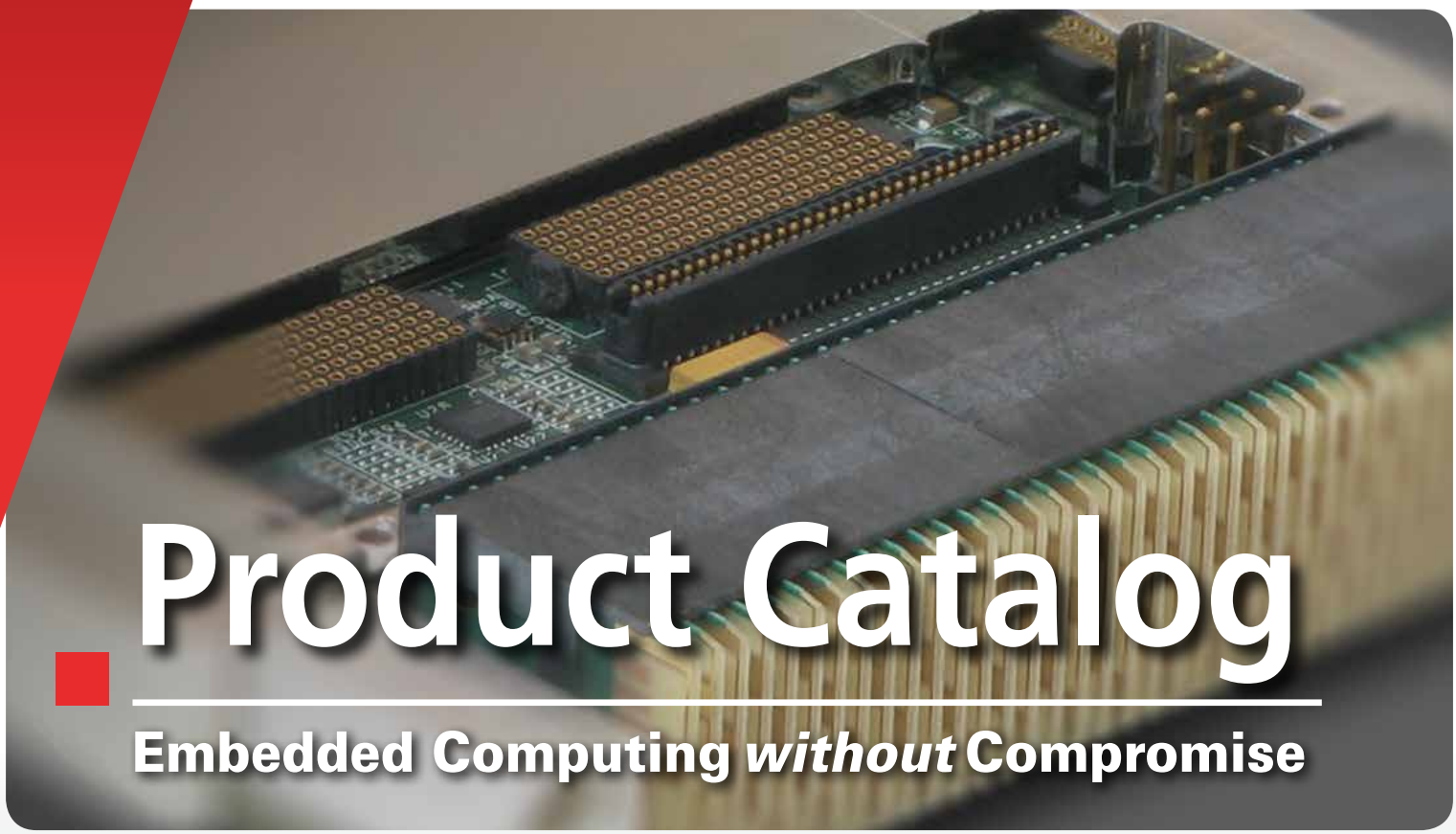
Aitech



Product Catalog

Embedded Computing *without* Compromise

Land Sea Air Space

A history of success

Established in 1983 and serving the high reliability, military and critical embedded computing markets for over 35 years, Aitech has been building a reputation as a provider of rugged and full military and aerospace embedded computing solutions for a long list of high-profile projects, including many world-wide defense industry and space programs.

And in the time since we introduced the world's first conduction-cooled, full Mil-Spec VMEbus boards in 1985, we have grown far beyond basic off-the-shelf VME, VPX and CompactPCI boards, mezzanine cards, power supplies, enclosures and fully integrated harsh environment, integrated computer sub-systems. We have pioneered the way in developing multiple COTS (Commercial Off-The-Shelf) products and capabilities that no one else has, such as:

- The only defense COTS supplier with up to Mil-Spec -55°C to +85°C operating temperature range
- Proven heritage of rugged and mil products and services for Defense and Space applications
- ReadyBuilt™ range of COTS subsystems offering integrated solution at competitive cost and short delivery times
- Space-qualified, radiation-tolerant COTS CompactPCI and VMEbus boards and switches
- Optimized SWaP (Size, Weight and Power) systems in industry-standard or custom form-factors
- The most on-board functionality & highest MIPS/watt processor boards
- Best in class Single Board Computers based on the latest processors from NXP, Intel and Arm
- GPGPU and processor sets enabling enhanced processing capabilities for graphics, radar and sonar applications
- Multi-gigabyte Flash-based mass memory with memory- management and file-management software
- Radiation-tolerant, Layer-2 Gigabit Ethernet switch for Space applications
- High-speed Gigabit Ethernet, SpaceWire, FireWire and serial communications boards
- Advanced XMCs and PMCs for graphics, PMC telemetry and various video capabilities
- A/D, D/A, R/D, D/R Servo Control I/O
- A range of rugged control unit (RCU™), data concentrators and remote interface units
- New VPX and OpenVPX products to support High Speed Serial (HSS) fabric architectures
- DO178B and DO254 – have supplied Level A systems and boards
- New VITA 62 power supplies

Aitech offers a full spectrum of **technical support** for its customers, including:

- Pre-sales technical support (systems definition and configuration consultation, including rugged and space qualification and EEE parts consultation levels)
- No added cost technical support for standard products including direct access to design and development engineers, without the overhead of a "request and grant" escalation process
- Product customization and modification
- Program management for customized LRU and development systems
- Customized test and CM services
- Our experienced hardware and software engineers resolve issues and keep development, test and production on schedule.

For integration issues that go beyond Aitech standard product support, our systems expertise is available on a time and material services basis.

Aitech provides a broad array of **customer support** services to ensure a successful solution is delivered on time to the end user.

- Field application and system engineers are available in the systems definition phase to find solutions for computing, communication and storage requirements
- Participation in the selection of standard product to meet environmental and space qualification requirements and determine options for requirements that cannot be met by COTS
- Where customer requirements cannot be met completely by our COTS products, our product customization, modification and project management services are available

Aitech provides complete program management - from systems definition and design to production. Aitech program customers can tailor functional and environmental testing to meet their specific needs.
Extended availability of supply parts and system configuration management are provided with Aitech's unique COTSLifecycle+™ program to ensure the end user is supported from development through the entire program life-cycle.

Aitech Product Catalog

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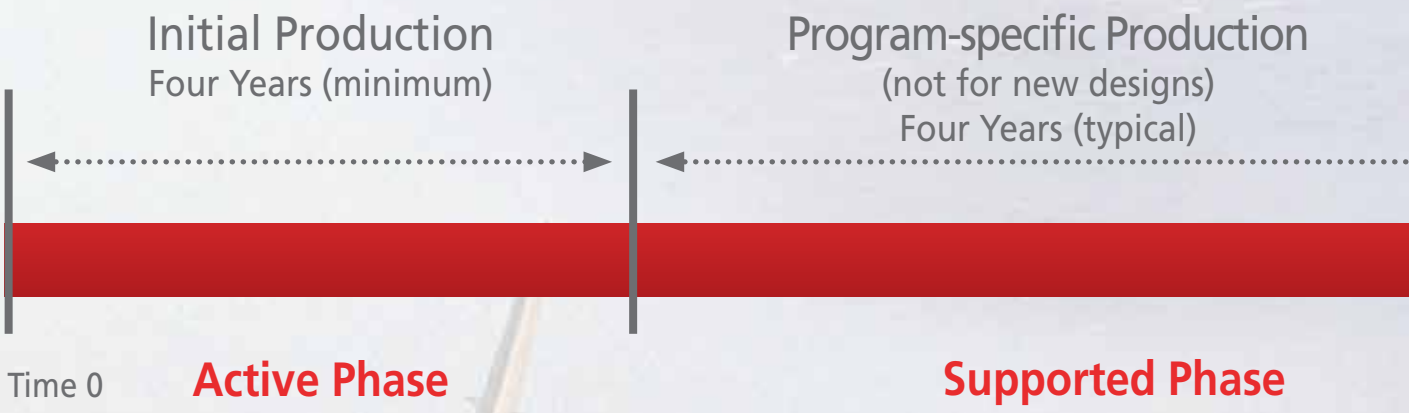
Aitech's Unique COTS Lifecycle+™ Program

Minimum 12-year Support

from Product Introduction



Program and lifecycle configuration management

Aitech fully understands that in the military and aerospace industries, reliability is everything... the reliability of our technology and the reliability of our support. And Aitech has earned a global reputation for delivering both. We not only design and build the most advanced and reliable single board computers; I/O, memory and graphics boards; PMC/XMCs and sub-system enclosures, but we effectively support those products throughout the lifecycle of a specific production program. Our unrivaled experience and total program and lifecycle support services ensure that our products meet the functional, environmental and operating requirements as defined by our customers' specifications, as well as all testing, quality assurance and logistics requirements.

At Aitech, the lifecycle of each COTS product is managed according to our COTS Lifecycle+™ Program which is comprised of three unique, four+ year program phases: Active Phase, Supported Phase and Extended Support Phase; or for a minimum lifetime of 12 years from product introduction.

- **Active Phase**
Aitech guarantees that its COTS products will be available to customers and fully supported during the Active Phase of the product lifecycle. This phase starts with initial production and extends for a minimum of four years, typically longer.

- **Supported Phase**
At the end of the Active Phase of its lifecycle, a COTS product enters the Supported Phase. In this phase, the product is still fully supported and repairable, can be re-ordered by current customers and are typically not recommended for new designs. The Supported Phase extends for a period of four years from the end of the Active Phase.

- **Extended Support Phase**
Aitech is committed to support a product during an Extended Support Phase, beyond the standard Supported Phase and typically through special arrangement with the customer. Adequate logistic planning and component investments are

required to ensure that a product can be fully supported during the Extended Support Phase. This phase typically extends another four years after the Supported Phase ends, for a total of a minimum of 12 years lifecycle support.

Component obsolescence management

Managing component obsolescence is one of the key factors to successful product lifecycle management. Aitech has the policies necessary to ensure that obsolescence issues are properly handled. Component obsolescence is managed through an Obsolescence Awareness Program, which uses a combination of periodic reviews and automated component lifecycle databases to track the status of all components needed for Aitech's products.

All Aitech products are designed to take full advantage of technology upgrades as they occur. This enables programs to benefit from device and packaging advances, and to minimize obsolescence problems through a carefully managed technology insertion program. This technology insertion process has enabled our customers to significantly upgrade their computing capabilities through multiple generations of processors as easily as changing a board and without major alterations to their application software or other system hardware. The time, cost and performance benefits of this easy upgrade capability are enormous.

Aitech also provides a comprehensive suite of optional lifecycle support services. We can also operate as the repair depot for our products as we specialize in obsolescence management from the initial design to out-year spare and repair support. Whatever it takes to keep your program at peak performance, Aitech makes it happen. Ask for a copy of our COTS Lifecycle+™ Program.

Where COTS was born...*and grew up!*

There are a few things that you might not know...but need to know...about Aitech. First...we were first! That's right, Aitech built the world's first conduction-cooled mil-spec VME boards...years before there was NDI or COTS! And we are still way ahead of the pack in the COTS developments that matter most.

We have COTS...complete!
From advanced boards, enclosures/chassis, and OS and BIT firmware to fully integrated sub-systems and support services, including lifecycle and program management. For all COTS applications...land, sea, air... even space with 6U VME, 3U/6U CompactPCI, 3U/6U VPX and custom form factors!

We have COTS...unique.
Aitech has COTS products and capabilities that no one else has, including the highest MIPS/watt processor boards in the business; space-qualified, rad-tolerant COTS boards, multi-gigabyte mass Flash memory on a single board, high speed Ethernet boards, PMCs for PCM telemetry, A/D, D/A, Servos, and so much more...including AS9100 certification!

We're global...and local.
With world headquarters in California, multi-continental manufacturing facilities, and skilled representatives, tech support and agents throughout the world, Aitech can give you unsurpassed support and attention.

We're ready when you are!
There's a lot more about Aitech that you'd find very interesting. Give us a call or visit our web site. If you want COTS, get it from the company that invented it and still leads the way!

From boards to sub-systems…
we leave the systems integration to
those who do it best – our customers.

Ai
Aitech

Single Board Computers (SBC)

Whatever your mission, chances are Aitech makes the SBC you need.

Intel and PowerPC processing platforms. VME, VPX, and CompactPCI bus architectures. 3U and 6U form factors. Air-cooled and conduction-cooled formats.

Designed from the ground up to be rugged, Aitech SBCs provide maximum reliable single-slot functionality in challenging industrial, military, aerospace, and space environments. Integral mechanical and thermal features ensure that they work when you need and where you need.

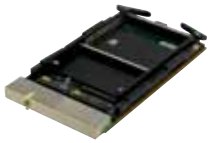
Aitech SBCs offer more on-board I/O than any other rugged SBCs on the market today. More types of I/O and more channels. Many Aitech SBCs also offer large on-board solid-state Flash disks providing reliable low-power mass storage for application software and data.

Aitech SBCs are supported with BSPs and drivers for popular operating systems including VxWorks®, Windows®, various flavors of Linux®, INTEGRITY® and QNX®.

Single Board Computers (SBC)

	C114	C112	C111
Form Factor	6U	6U	6U
Backplane Fabric	VME	VPX: XAUI, PCIe, SRIO	VME
Processor	T2081/T1042	T4240/T4160/T4080	T4240/T4160/T4080
SIMD Instruction Set	AltiVec™ (T2081)	AltiVec™	AltiVec™
Number of Cores	4 Dual Thread/4	12/8/4 Dual Thread	12/8/4 Dual Thread
Processor Speed	1.8/1.4 GHz	1.5 GHz	1.5 GHz
Cache	T2081: L1: 32 + 32 kB; L2: 2MB shared; L3: 512KB shared T1042: L1: 32 + 32 kB; L2:256 kB; L3:256KB shared	L1: 32 kB + 32 kB per core L2: 2 MB shared per cluster (4 cores)	L1: 32 kB + 32 kB per core L2: 2 MB shared per cluster (4 cores)
System Bus Speed	600M Platform Clock	800/666/400	800/666/400
Chipset/ System Controller	T2081/T1042	T4240/T4160/T4080	T4240/T4160/T4080
Boot/Bios Flash	64 MB	64 MB	64 MB
User Flash	192 MB	192 MB	192 MB
Mass Storage [2]	Up to 64G eMMC	16 GB SATA SSD	16 GB SATA SSD
NVRAM	512 kB	512 kB	512 kB
SDRAM (max)	8 GB	16 GB	16 GB
SDRAM Speed	DDR3L-1600M	DDR3-1600	DDR3-1600
Gigabit/Fast Ethernet	4/0	6/0	4/0
10 Gigabit Ethernet	N/A	XAUI x 4	N/A
SATA II	N/A	1	1
USB 2.0 Ports	2	2	2
USB 3.0 Ports	N/A	N/A	N/A
Standard Serial RS-232/422/485	10	4/6	4/6
Discrete I/O (SE/Diff)	16/8	16/8	16/8
Graphics Outputs	N/A	N/A	N/A
High Definition Audio	N/A	N/A	N/A
Dual Redundant 1553B	2	2	2
CANbus 2.0B	1	N/A	N/A
Timers [4]	8	8	8
PMC/XMC Sites	PMC1, PMC2/XMC2	2 x PMC or XMC	2 x PMC or XMC
Transition Module	TM102/TM100/TM106	TM112	TM102
PMC/XMC Expansion Carrier	N/A	N/A	N/A
RTOS Support [1]	VxWorks® Linux® INTEGRITY®	VxWorks® Linux® INTEGRITY®	VxWorks® Linux® INTEGRITY®
Power (Typical)	C114L: 18 W C114S: 26 W	48/40/33 W	50/42/35 W
Additional Features [2]	RTC, WDT, WWDT, ETR, TS	RTC, WWDT, ETR, TS, REDI	RTC, WWDT, ETR, TS

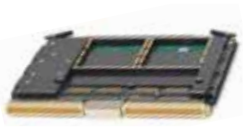
[1] Additional operating systems available upon request. [2] SSD = Solid State (Flash) Disk; RTC = Real Time Clock; WDT = Watchdog Timer(s); WWDT = Windowed (avionics style) Watchdog Timer; ETR = Elapsed Time Recorder; TS = Temperature Sensor(s); TPM = Trusted Platform Module; IPMI = Intelligent Platform Management Interface. [3] Available with VPX REDI covers to support two level maintenance per VITA 48. [4] GP = General Purpose.



	C912	C920
Form Factor	3U	3U
Backplane Fabric	VPX: XAUI, PCIe	CPCI
Processor	T4160/T4080	MPC8349E PowerQUICC II Pro
SIMD Instruction Set	AltiVec™	N/A
Number of Cores	8/4 (Dual Thread)	1
Processor Speed	1.5 GHz	400 MHz
Cache	L1: 32 + 32 kB Per Core L2: 2 MB Per Cluster (4 cores)	L1: 32 + 32 kB
System Bus Speed	800/666/400	133 MHz (csb)
Chipset/ System Controller	T4160/T4080	PowerQUICC II Pro
Boot/Bios Flash	64 MB	16 MB
User Flash	64 MB	128 MB + 16 MB
Mass Storage [2]	16 GB SATA SSD	N/A
NVRAM	512 kB	512 KB MRAM
SDRAM (max)	16 GB	128 MB
SDRAM Speed	DDR3-1600	DDR2-266
Gigabit/Fast Ethernet	4/0	0/2
10 Gigabit Ethernet	XAUI x 2	N/A
SATA II	2	N/A
USB 2.0 Ports	2	N/A
USB 3.0 Ports	N/A	N/A
High Speed/Standard Serial RS-232/422/485	0/4	0/1
Discrete I/O (SE/Diff)	8/4	SE: 3 In / 3 Out
Graphics Outputs	N/A	N/A
High Definition Audio	N/A	N/A
Dual Redundant 1553B	N/A	N/A
CANbus 2.0B	N/A	N/A
Timers [4]	8	4
PMC/XMC Sites	N/A	1 x PMC
Transition Module	TM912	N/A
PMC/XMC Expansion Carrier	CM870	N/A
RTOS Support [1]	VxWorks® Linux® INTEGRITY®	VxWorks® QNX®
Power (Typical)	30/35 W	< 5 W
Additional Features [2]	RTC, WWDT, ETR, TS, REDI,	RTC, WDT, DO-254 certifiable to DAL A

[1] Additional operating systems available upon request. [2] SSD = Solid State (Flash) Disk; RTC = Real Time Clock; WDT = Watchdog Timer(s); WWDT = Windowed (avionics style) Watchdog Timer; ETR = Elapsed Time Recorder; TS = Temperature Sensor(s); TPM = Trusted Platform Module; IPMI = Intelligent Platform Management Interface. [3] Available with VPX REDI covers to support two level maintenance per VITA 48. [4] GP = General Purpose.

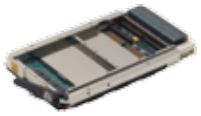
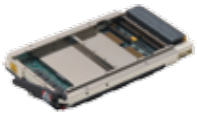
Single Board Computers (SBC)



	C164	C163	C162
Form Factor	6U	6U	6U
Backplane Fabric	VME	VME	VME
Processor	5th Gen. Intel® Core™ i7 i7-5850EQ	4th Gen. Intel® Core™ i7 i7-4700EQ	Intel® Core™ i7 610E/620LE/620UE
SIMD Instruction Set	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2
Number of Cores	4-cores/8-thread	4-cores/8-thread	2 Dual Thread
Processor Speed	2.7 GHz	2.4 GHz	2.53/2.0/1.33 GHz
Cache	6MB Last Level Cache	6MB Last Level Cache	L1: 32 + 32 kB per core L2: 256 kB per core L3: 4 MB shared
GPU	Iris™ Pro Graphics 6200	Intel® HD Graphics 4600	Intel® HD Graphics
System Bus Speed	N/A	N/A	4.8 GT/s (QPI)
Chipset/ System Controller	PCH QM87 Intel	PCH QM87 Intel	Calpella QM57 PCH
Boot/Bios Flash	16 MB	16 MB	4 MB
User Flash / Mass Storage [2]	128 GB SATA SSD	128 GB SATA SSD	128 GB SATA SSD
NVRAM	N/A	N/A	N/A
SDRAM (max)	16 GB	16 GB	8 GB
SDRAM Speed	DDR3L-1600MT/s	DDR3L-1600MT/s	DDR3-1066
Gigabit/Fast Ethernet	4/0	4/0	4/0
10 Gigabit Ethernet	N/A	N/A	N/A
SATA II	2	2	2
USB 2.0 Ports	7	7	7
USB 3.0 Ports	1	1	N/A
High Speed/Standard Serial RS-232/422/485	0/4	0/4	0/4
Discrete I/O (SE/Diff)	8/4	8/4	8/4
Graphics Outputs	1 x RGB I 2 x DVI	1 x RGB I 2 x DVI	1 x RGB I 2 x DVI
High Definition Audio	1 x Input 1 x Output	1 x Input 1 x Output	1 x Input 1 x Output
Dual Redundant 1553B	N/A	N/A	N/A
CANbus 2.0B	2	2	2
Timers [4]	8	8	8
PMC/XMC Sites	2 x PMC or XMC	2 x PMC or XMC	2 x PMC or XMC
Transition Module	TM162	TM162	TM162
PMC/XMC Expansion Carrier	N/A	N/A	N/A
RTOS Support [1]	VxWorks® Windows® Linux®	VxWorks® Windows® Linux®	VxWorks® Windows® Linux®
Power (Typical)	26W (Typ) 56W (Max)	26W (Typ) 56W (Max)	47/36/26 W
Additional Features [2]	RTC, WDT, WWDT, ETR, TS	RTC, WDT, WWDT, ETR, TS	RTC, WDT, WWDT, ETR, TS

[1] Additional operating systems available upon request. [2] SSD = Solid State (Flash) Disk; RTC = Real Time Clock; WDT = Watchdog Timer(s); WWDT = Windowed (avionics style) Watchdog Timer; ETR = Elapsed Time Recorder; TS = Temperature Sensor(s); TPM = Trusted Platform Module; IPMI = Intelligent Platform Management Interface. [3] Available with VPX REDI covers to support two level maintenance per VITA 48. [4] GP = General Purpose.

Single Board Computers (SBC)

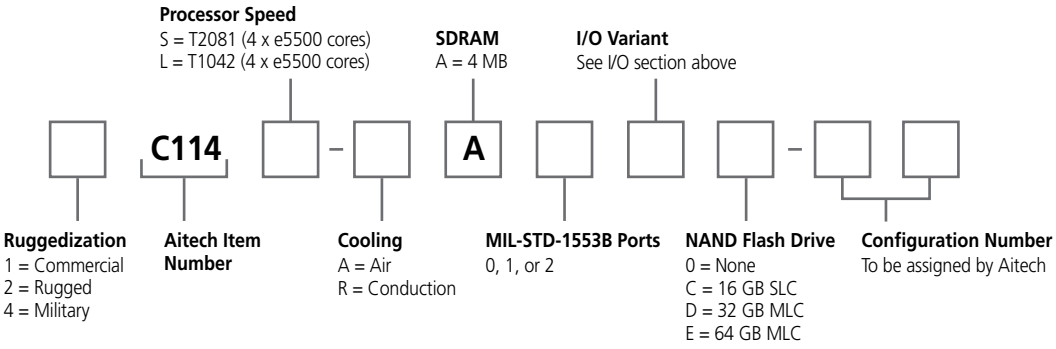



	C877	C874	C873	C802
Form Factor	3U	3U	3U	3U
Backplane Fabric	VPX: PCIe	VPX: PCIe	VPX: PCIe	CPCI
Processor	Intel® Xeon® Processor D-1559	5th Gen. Intel® Core™ i7-5850EQ	4th Gen. Intel® Core™ i7-4700EQ	Intel® Core™ i7 610E/620LE/620UE
SIMD Instruction Set	YES	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	SSE4.2
Number of Cores	12-cores/24-thread	4-cores/8-thread	4-cores/8-thread	2-cores/4-thread
Processor Speed	1.50 GHz	2.7 GHz	2.4 GHz	2.53/2.0/1.33 GHz
Cache	18M	6MB Last level Cache	6MB Last level Cache	L1: 32 + 32 kB per core L2: 256 kB per core L3: 4 MB shared
GPU	N/A	Iris™ Pro Graphics 6200	Intel® HD Graphics 4600	Intel® HD Graphics for 5th Generation
System Bus Speed	N/A	5 GT/s DMI	5 GT/s DMI	4.8 GT/s (QPI)
Chipset/ System Controller	N/A	PCH QM87 Intel	PCH QM87 Intel	PCH QM87 Intel
Boot/Bios Flash	16 MB	16 MB	16 MB	4 MB
User Flash / Mass Storage [2]	512 GB SATA SSD	512 GB SATA SSD	512 GB SATA SSD	64 GB SATA SSD
NVRAM	N/A	N/A	N/A	N/A
SDRAM (max)	16 GB	16 GB	16 GB	4 GB
SDRAM Speed	DDR4-2133 MT/s	DDR3L-1600MT/s	DDR3L-1600MT/s	DDR3-1066
Gigabit/Fast Ethernet	2/0	4/0	4/0	2/0
10 Gigabit Ethernet	4 x 10GBASE-KR	N/A	N/A	N/A
SATA II	2 x SATA III	2	2	1
USB 2.0 Ports	4	4	4	2
USB 3.0 Ports	2	1	1	N/A
High Speed/Standard Serial RS-232/422/485	0/2	0/2	0/2	0/2
Discrete I/O (SE/Diff)	8/4	8/4	8/4	8/4
Graphics Outputs	N/A	1 x RGB + 1 x DVI	1 x RGB + 1 x DVI	1 x RGB + 1 x DVI
High Definition Audio	N/A	1 x Input 1 x Output	1 x Input 1 x Output	1 x Input or Output
Dual Redundant 1553B	N/A	N/A	N/A	N/A
CANbus 2.0B	N/A	N/A	N/A	N/A
Timers [4]	YES	8	8	8
PMC/XMC Sites	XMC (PCIe Gen3 x8 lanes)	1/1	1/1	1 x PMC or XMC
Transition Module	TM877	TM870	TM873	TM800
PMC/XMC Expansion Carrier	N/A	CM870	CM870	CM900
RTOS Support [1]	VxWorks® Windows® Linux®	VxWorks® Windows® Linux®	VxWorks® Windows® Linux®	VxWorks® Windows® Linux®
Power (Typical)	58 W max (estimated)	56 W Max	56 W Max	45/34/26 W
Additional Features [2]	Xilinx Zynq UltraScale + MPSoC FPGA with high secure capacity, Anti-tamper & data security, trusted platform management Secure interfaces: - Two (2) 10GBase-KR - One USB 3.0 Port - One SATA III Port	RTC, WDT, WWDT, ETR, TS	RTC, WDT, WWDT, ETR, TS	RTC, WDT, WWDT, ETR, TS, TPM, IPMI

[1] Additional operating systems available upon request. [2] SSD = Solid State (Flash) Disk; RTC = Real Time Clock; WDT = Watchdog Timer(s); WWDT = Windowed (avionics style) Watchdog Timer; ETR = Elapsed Time Recorder; TS = Temperature Sensor(s); TPM = Trusted Platform Module; IPMI = Intelligent Platform Management Interface. [3] Available with VPX REDI covers to support two level maintenance per VITA 48. [4] GP = General Purpose.

Ordering Information

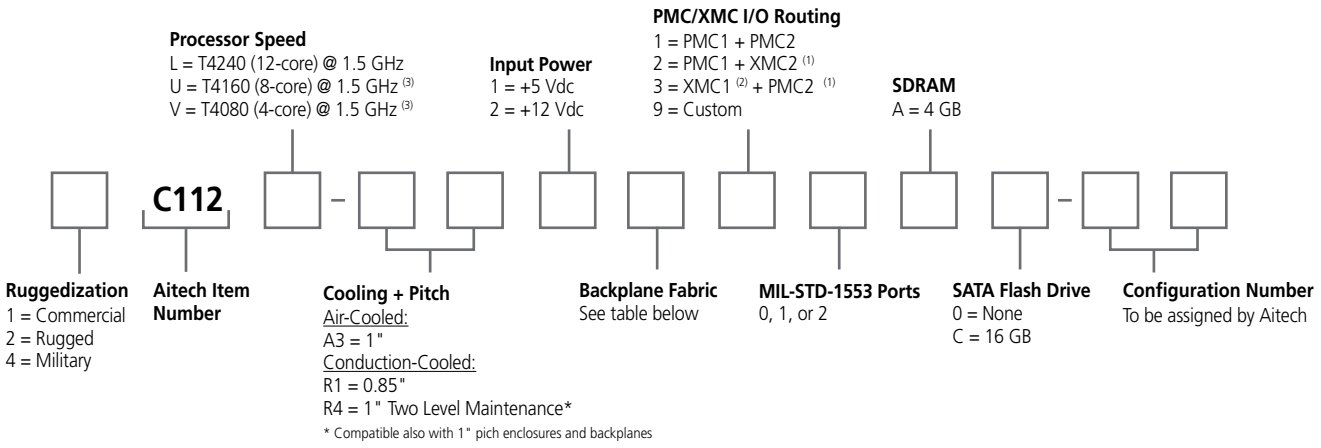
Single Board Computers (SBC)



Example: 4C114S-RA11C-00

PMC / XMC		PMC1 + XMC2	PMC1 + XMC2	PMC1 + PMC2	PMC1 + PMC2
USB 2.0		2 (3)	2 (3)	2 (3)	2 (3)
Ethernet	Gigabit (10/100/1000Base-T)	2 (4)	4 (4)	1	N/A
Fast (10/100Base-TX)	N/A	N/A	2 (4)	3 (4)	
Serial Ports	RS-232/422	2 (5)	2 (5)	2 (5)	4 (5)
RS-232/422/485	N/A	6	6	6	
Discrete I/O Lines Individually software configurable as input (with optional interrupts) or output and as SE (1 line per channel) or DIFF RS-422 (2 lines per channel)		8	16	16	8
Discrete I/O GND/Open Lines		N/A	N/A	N/A	5 IN + 2 OUT
CANbus		N/A	1	1	N/A
MIL-STD-1553B BC or Multi RT operation with Concurrent Bus Monitor with DMA support		Up to 2 – see Ordering Information			

(1) C114 I/O Variants offer different combinations/quantities of board I/O and PMC/XMC site configurations via factory configuration; additional options may be available per customer request, contact an Aitech representative for more information
(2) The C106 compatible variant does not include the P0 PCI bus interface
(3) In air-cooled boards, one of these ports is routed by factory configuration to the Front Panel instead of to the Backplane
(4) In air-cooled boards, two of these ports can be routed to the Backplane or to the Front Panel via user firmware configuration
(5) In air-cooled boards, two of these ports are routed to both the Front Panel and Backplane, ports at the front panel support RS-232 only



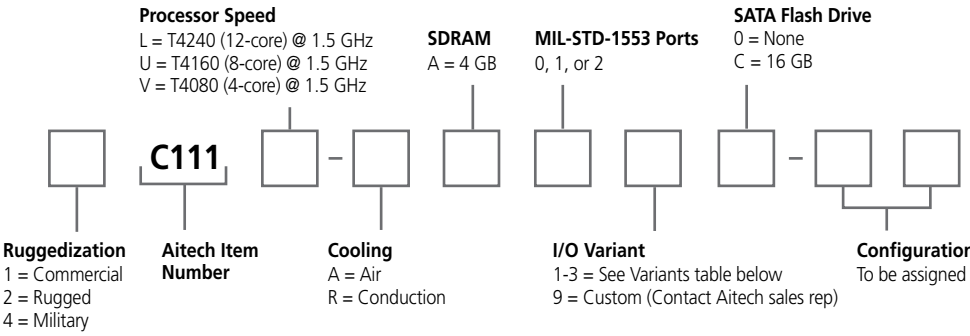
Example: 4C112L-R41132AC-00

Option #	P1 (Data Plane)				P2 (Extansion Plane)	P4 (Control Plane)				P4/P6 (I/O)	VITA 65 Profile name
	4-lane	4-lane	4-lane	4-lane		1000Base-KX		1000BaseT			
	DP1	DP2	DP3	DP4		CPutp1	CPutp2	CPutp1	CPutp2	Gb Port	
1	XAUI	XAUI	XAUI (3)	XAUI	4 PCIe x 4	Up to two ports in any combination				0	MOD6-PAY-4F1Q2U--12.2.1-8
2	PCIe/ SRIO	PCIe (3)	0	0	4 PCIe x 4	1	1	1	1	2	MOD6-PAY-2F2U2T-12.2.5-n
9	Custom										

(1) All XMC2 I/O is routed to the backplane except for XMC2 A/B/D/E17 and A/B/D/E19 (pins are used for GLAN3)
(2) All XMC1 I/O is routed to the backplane except for XMC1 A17 and B17 (pins are used for SP7 differential clock lines)
(3) When choosing T4160 or T4080 QorIQ SoC, these interfaces will not be available.

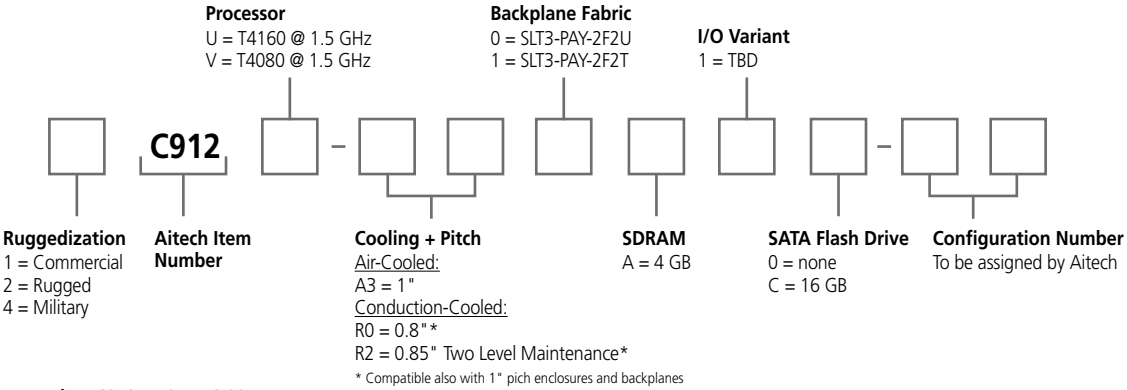
Ordering Information

Single Board Computers (SBC)

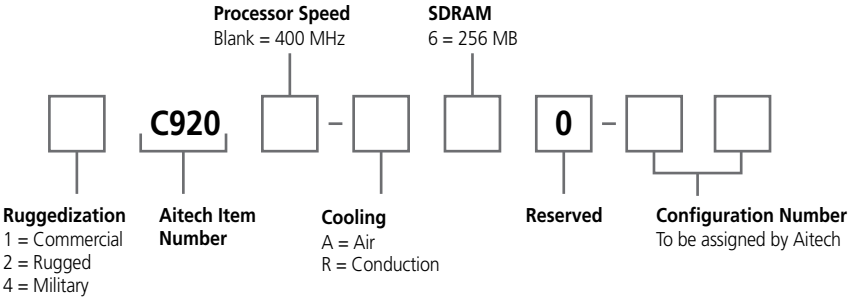


Example: 4C111L-RA12C-00

Ressource	I/O Variant		
	1 **PMC1 +** **PMC2 +** **On-Board I/O**	**2** **PMC1 +** **XMC2 +** **Partial On-Board I/O**	**3** **XMC1 +** **XMC2 +** **On-Board I/O**
Ethernet Ports (Gbe+Fast)	4+0	1+1	4+0
SATA	1	1	1
USB	2	1 (No Vcc)	2
Serial Ports (High-speed+UART)	4+6	1+4	4+6
MIL-STD-1553B	Up to 2 (see Ordering information above)		
Descrete I/O Lines	16	2	16
PMC 1 I/O Pins	40	64	N/A
PMC 2 I/O Pins	38	N/A	N/A
XMC 1 I/O Pins (Diff Pairs + SE)	N/A	N/A	8+24
XMC 2 I/O Pins (Diff Pairs + SE)	N/A	20+38	6+26



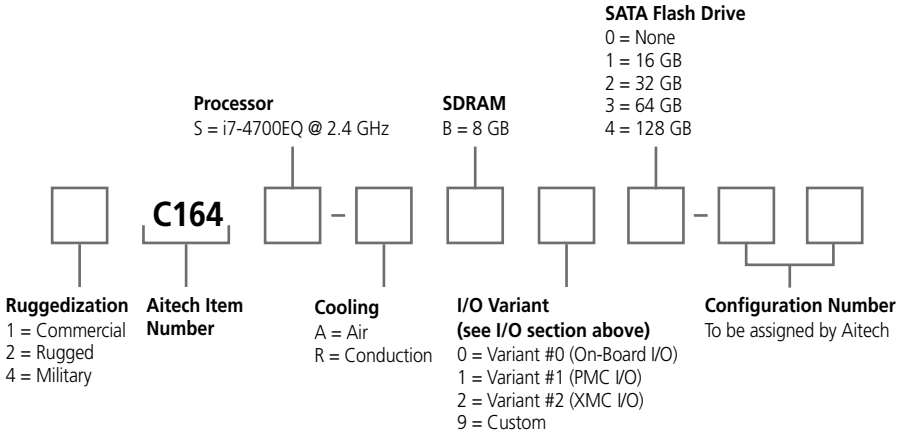
Example: 4C912U-R01A1C-00



Example: 2C920-R60-00

Ordering Information

Single Board Computers (SBC)



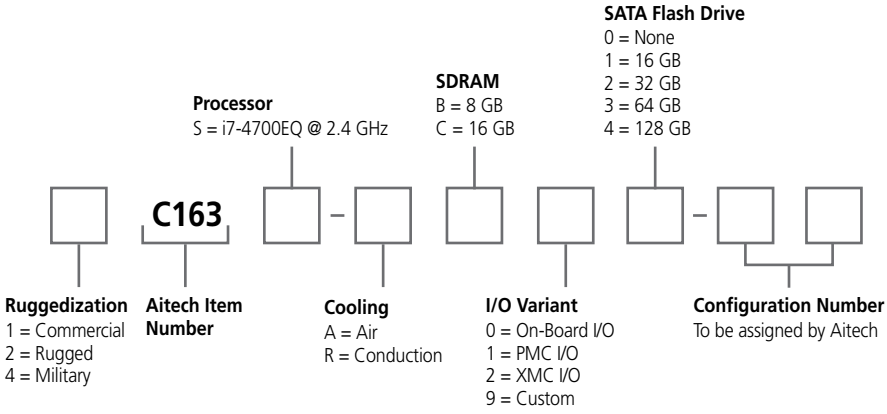
Example: 4C164G-RB02-00

	I/O Variant (1)		
	Variant #0 On-board I/O	**Variant #1 PMC I/O**	**Variant #2 XMC I/O**
Gigabit Ethernet - 10Base-T/100Base-TX/1000Base-T	4 (2)	2 (3)	1 (3)
USB 2.0	7	2	2
USB 3.0	1 (4)	1 (4)	1 (4)
SATA 2.0	2	2	2
Serial Ports Software configurable as RS-232/422/485	4	4	1
Discrete I/O Lines Individually software configurable as input (with optional interrupts) or output, and as SE (1 line per channel) or DIFF RS-422 (2 lines per channel)	4	8	8
CANbus	2	0	0
Audio - Stereo	1 In + 1 Out	1 In + 1 Out	0
DVI/HDMI Output	2 (5)	1 (4)	1 (4)
RGBHV Output	1 (6)	1 (6)	1 (6)
PMC 1 I/O	55	64	0
PMC 2 I/O	22	64	0
XMC 1 I/O: Diff Pairs + SE	0	0	20 + 38
XMC 2 I/O: Diff Pairs + SE	0	0	20 + 38

(1) C164 I/O Variants offer different combinations/quantities of on-board and PMC/XMC I/O via factory configuration; additional I/O routing options may be available per customer request, contact an Aitech representative for more information
(2) Front panel/backplane routing of one port is software configurable
(3) One additional port is available at the front panel of air-cooled versions
(4) Available only in air-cooled versions at the front panel
(5) One additional DVI/HDMI output channel is provided at the front panel of air-cooled versions, a maximum of two DVI/HDMI outputs can be used simultaneously
(6) The RGBHV output is routed by factory configuration to the backplane (in conduction-cooled versions) or to the front panel (in air-cooled versions)

Ordering Information

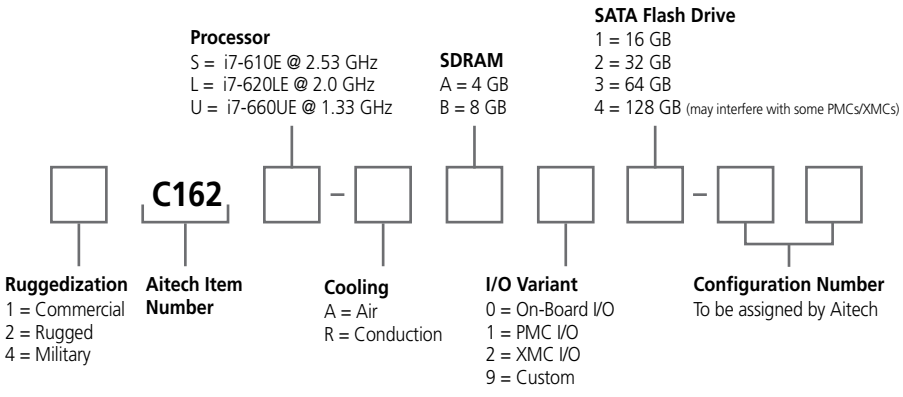
Single Board Computers (SBC)



Example: 4C163S-RB02-00

Variant	Variant #0 On-board I/O	Variant #1 PMC I/O	Variant #2 XMC I/O
GbE	4	2	1
DVI	2	N/A	N/A
RGBHV	1	1	1
Discrete	4	8	8
Serial	4	4	1
CANbus	2	N/A	N/A
USB 2.0	7 *	2 *	2 *
SATA	2	2	2
Audio	In and Out	In and Out	N/A
PMC #1 I/O	55	64	N/A
PMC #2 I/O	22	64	N/A
XMC #1 I/O	N/A	N/A	Diff 20, SE 38
XMC #2 I/O	N/A	N/A	Diff 20, SE 38

* Air-cooled versions of the C163 include one additional USB 2.0+3.0 port, available only at the front panel



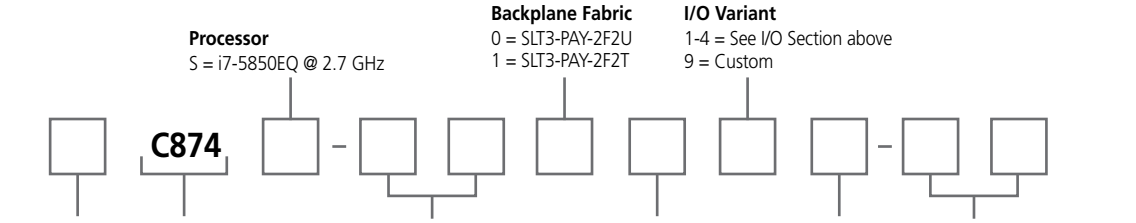
Example: 4C162L-RB02-00

Variant	Variant #0 On-board I/O	Variant #1 PMC I/O	Variant #2 XMC I/O
GbE	4	2	1
DVI	2	N/A	N/A
RGBHV	1	1	1
Discrete	4	8	8
Serial	4	4	1
CANbus	2	N/A	N/A
USB 2.0	7 *	2 *	2 *
SATA	2	2	2
Audio	In and Out	In and Out	N/A
PMC #1 I/O	55	64	N/A
PMC #2 I/O	22	64	N/A
XMC #1 I/O	N/A	N/A	Diff 20, SE 38
XMC #2 I/O	N/A	N/A	Diff 20, SE 38

* Air-cooled versions of the C162 include one additional USB 2.0 port, available only at the front panel

Ordering Information

Single Board Computers (SBC)



Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Aitech Item Number

Processor
S = i7-5850EQ @ 2.7 GHz

Cooling + Pitch
Air-Cooled:
A3 = 1"
Conduction-Cooled:
R0 = 0.8"
R2 = 0.85"*
R3 = 1"**
* Compatible also with 1" pich enclosures and backplanes
** Only with large SATA Flash Drive (64 GB and above)

Backplane Fabric
0 = SLT3-PAY-2F2U
1 = SLT3-PAY-2F2T

SDRAM
B = 8 GB
C = 16 GB

I/O Variant
1-4 = See I/O Section above
9 = Custom

SATA Flash Drive
0 = none
1 = 16 GB
2 = 32 GB
3 = 64 GB*
4 = 128 GB*
5 = 256 GB*
E = 256 GB (SLC) + 32 GB (SLC)*
F = 512 GB (MLC) + 32 GB (SLC)*
* Compatible only with 1" pich (A3 and R3)

Configuration Number
To be assigned by Aitech

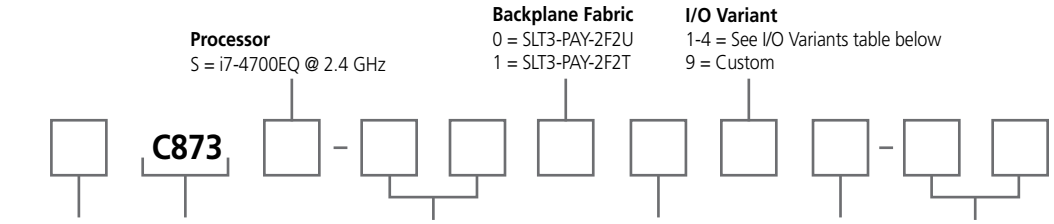
Example: 4C874G-R01B22-00

	I/O Variant (1)			
	Variant #1	**Variant #2**	**Variant #3**	**Variant #4**
USB 2.0	4		3	
SATA II	2		1	
GbE Ports: 1000Base-T+1000Base-BX/KX	2+0 (2) or 2+2 (3)		2+0 (2) or 1+2 (3)	
Audio - Stereo	1 In + 1 Out		0	
RGBHV Out	1		1	
DVI/HDMI Out	1		0	
Serial Ports (RS-232/422/485) Software configurable as RS-232/422/485	2		1	
Discrete I/O Lines/Serial Ports (RS-422/485) Discretes are individually software configurable as input (with optional interrupts) or output, and as SE (1 line per channel) or DIFF RS-422 (2 lines per channel). Four Discrete I/O lines can also be software configured as one RS-422/485 serial port.	8/2		4/1	
PMC I/O Routed per VITA 46.9 pattern P64s	35 (2) or 27 (3)	N/A	64	N/A
XMC I/O: Diff Pairs+SE Routed per VITA 46.9 pattern X24s+X8d+X12d	N/A	7+21 (2) or 3+21 (3)	N/A	20+24

(1) C874 I/O Variants offer different combinations/quantities of on-board and PMC/XMC I/O via factory configuration; additional I/O routing options may be available per customer request, contact an Aitech representative for more information
(2) In slot profile SLT3-PAY-2F2T
(3) In slot profile SLT3-PAY-2F2U

Ordering Information

Single Board Computers (SBC)



Processor
S = i7-4700EQ @ 2.4 GHz

Backplane Fabric
0 = SLT3-PAY-2F2U
1 = SLT3-PAY-2F2T

I/O Variant
1-4 = See I/O Variants table below
9 = Custom

Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Aitech Item Number

Cooling + Pitch
Air-Cooled:
A3 = 1"
Conduction-Cooled:
R0 = 0.8"
R2 = 0.85" (Two Level Maintenance)*
R3 = 1"**
* Compatible also with 1" pich enclosures and backplanes
** Only with large SATA Flash Drive (64 GB and above)

SDRAM
B = 8 GB
C = 16 GB

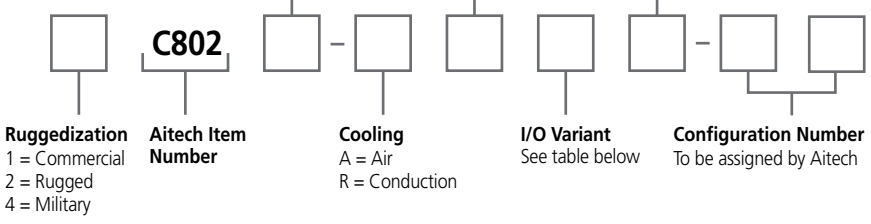
SATA Flash Drive
0 = none
1 = 16 GB
2 = 32 GB
3 = 64 GB*
4 = 128 GB*
5 = 256 GB*
E = 256 GB (SLC) + 32 GB (SLC)*
F = 512 GB (MLC) + 32 GB (SLC)*
* Compatible only with 1" pich (A3 and R3)

Configuration Number
To be assigned by Aitech

Example: 4C873S-R01B22-00

Resource	Variant 1	2	3	4
USB 2.0	4	4	3	3
SATA II	2	2	1	1
GbE Ports: 1000Base-T+1000Base-KX/BX	2+0 (1) or 2+2 (2)	2+0 (1) or 2+2 (2)	2+0 (1) or 1+2 (2)	2+0 (1) or 1+2 (2)
Audio In	1	1	0	0
Audio Out	1	1	0	0
RGBHV	1	1	1	1
DVI/HDMI	1	1	0	0
Serial ports (RS-232/422/485)	2	2	1	1
Discrete I/O Lines/Serial Ports (RS-422/485) (3)	8/2	8/2	4/1	4/1
PMC I/O	35 (1) or 27 (2)	N/A	64	N/A
XMC I/O: Diff Pairs+SE	N/A	7+21 (1) or 3+21 (2)	N/A	20+24

(1) In slot profile SLT3-PAY-2F2T
(2) In slot profile SLT3-PAY-2F2U
(3) Four discrete I/O lines can be configured as an RS-422/485 serial port



Processor
S = i7-610E @ 2.53 GHz
L = i7-620LE @ 2.0 GHz
U = i7-660UE @ 1.33 GHz

SDRAM
9 = 2 GB
A = 4 GB

SATA Flash Drive
1 = 16 GB
2 = 32 GB
3 = 64 GB*
* May interfere with some PMCs/XMCs

Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Aitech Item Number

Cooling
A = Air
R = Conduction

I/O Variant
See table below

Configuration Number
To be assigned by Aitech

(1) Variants 4 & 8 operate as peripheral boards only.
(2) May interfere with some PMCs/XMCs

Example: 4C802L-R961-00

Variant I/O Routed to J2	PMC 1	2	3	4*	XMC 5	6	7	8*
GB Ethernet	2	1	0	1	2	1	0	1
Fast Ethernet	0	0	2	0	0	0	2	0
USB 2.0 Port	2	2	2	2	2	2	2	2
Serial Ports	2	1	2	1	2	1	2	1
Discrete I/O Channels	8	4	4	4	8	4	4	4
RGBHV Interface	1	0	0	0	1	0	0	0
DVI Interface	1	0	0	0	1	0	0	0
Audio Interface	1	0	0	0	1	0	0	0
SATA II	1	1	0	1	1	1	0	1
PMC/XMC I/O Pins	12	49	49	64	12	49	49	64

* Variants 4 & 8 operate as a peripheral boards only

GP GPU

GPGPU boards (General Purpose Graphics Processing Unit) offer parallel processing capabilities for computationally intensive, non-graphics applications. Operating as a peripheral board with a compatible x86 VPX host SBC or as a standalone SoM (System on Module), Aitech's GPGPU family of products provide high-performance graphic rendering capabilities and multiple video output channels.

Aitech is proud to be part of NVIDIA Embedded Computing Jetson Ecosystem. NVIDIA are leaders in the GPU arena and the cooperation between our companies has produced the first and smallest, extremely low power consuming, rugged GPGPU Super Computer on the market today. Whether you are looking for hardware for your AI application, an autonomous vehicle, or a smart city solution we invite you to explore our rugged GPGPU offering and contact us with any inquiries you may have. The possibilities are only limited by your imagination. Rugged GPGPU is Aitech!

Rugged GPGPU is Aitech

	C530 GPGPU 3U VPX Board
Form Factor	3U
PMC/XMC	VPX
GPU	NVIDIA® GeForce® GTX 965M
Memory	4 GB GDDR5
Memory Speed	up to 1600 MHz
Shader Processors	1024 CUDA Cores
PCI Fabric	PCIe 8 lanes Gen. 2.0
Video Outputs	DVI/HDMI RGBHV
Video Inputs	N/A
Front Panel Video	N/A
I/O connector	P2
Transition Module	TM530
OS Support	Linux® Windows®
Enhanced Graphics & Video	OpenGL OpenCL CUDA, PhysX DX11, Shader
2D/3D Support	Yes
Compliance	MXM standard: MXM 3.1 Type B; VPX: ANSI/VITA 46.0; Conduction-cooled REDI: VITA 48.2 Compatible with OpenVPX VITA 65.0
Power (typical)	up to 50 W
Maximum Performance	3DMark®11 score of 5152
Additional Features	CUDA® Support

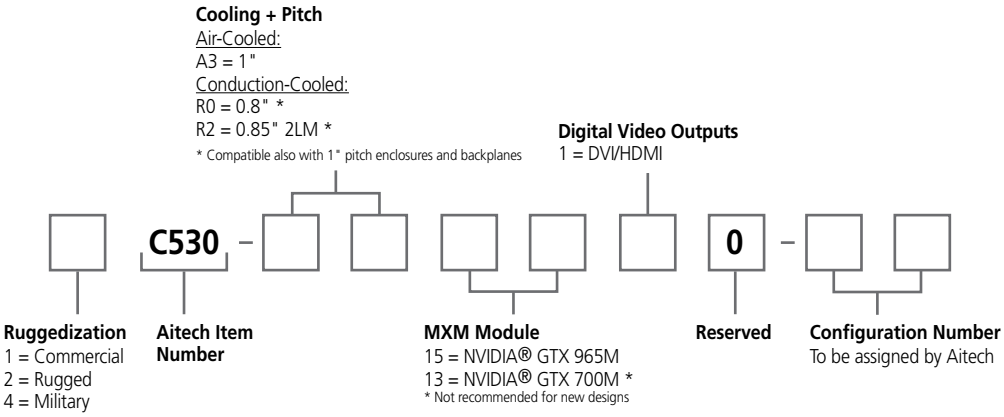
	C535 Typhoon GPGPU 3U VPX Supercomputer Board
Form Factor	3U
Backplane Fabric	VPX
Processor	NVIDIA® Jetson™ TX2 SoM • ARM® Cortex® + • NVIDIA® Denver
SIMD Instruction Set	Yes
Number of Cores	6 Cores • NVIDIA® Denver 2 Dual-Core Single thread • ARM® Cortex® A57 Quad-Core Single thread
Processor Speed	2 GHz
Cache	• NVIDIA® Denver - 128 kB L1 Instruction Cache + 64 kB L1 data cache per core, 2 MB L2 Unified Cache • ARM® Cortex® - 48 kB L1 Instruction Cache + 32 kB L1 data cache per core, 2 MB L2 Unified Cache
GPU	NVIDIA® Pascal™ GPU Architecture • 256 Shaders/CUDA cores • OpenGL ES Shader Performance up to 1024 GFLOPS (fp16)
Boot/Bios Flash	eMMC boot
User Flash	eMMC SSD
Mass Storage	32 GB eMMC + 128 GB mSATA SSD
SDRAM (max)	8GB LPDDR4
SDRAM Speed	1866 MHz
Gigabit/Fast Ethernet	2
USB 2.0 Ports	2
High Speed/Standard Serial RS-232/422/485	2
Single Ended GPIO	TX2 - 4 TX1 - 8
Graphics Outputs	1 x DVI
Video Inputs	1 x HD-SDI video input 8 x Composite (PAL/NTSC) video inputs
Dual Redundant 1553B	2
Transition Module	TM535
Mini PCIe Expansion Carrier	2
OS Support	Linux®
Power (typical)	10 W
Additional Features [1]	RTC, WWDT, ETR, TS, REDI

[1] RTC = Real Time Clock; WWDT = Windowed (avionics style) Watchdog Timer; ETR = Elapsed Time Recorder; TS = Temperature Sensor(s).

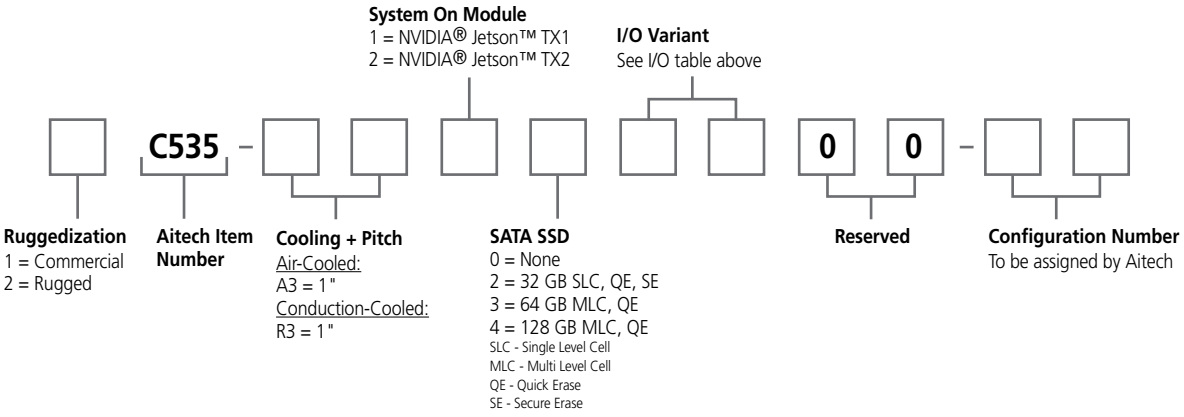
Ordering Information

GP GPU

Aitech



Example: 4C530-R01510-00



Example: 2C535-R3120300-00

		Variant			
		00	01	02	03
Expansion Card Options	**Composite Frame Grabber**	-	✓	-	✓
	SDI Frame Grabber	-	-	✓	✓
Composite Input RS-170A (NTSC)/PAL, supports simultaneous capture of all channels at full frame rates		-	8	-	8
SDI Input 60/480i, 50/576i, 60/720p, 60/1080i, 30/1080p, dedicated H.264 encoder		-	-	1	1
DVI (single-link) / HDMI Output 1		1			
USB 2.0		2			
Gigabit Ethernet (10/100/1000Base-T)		2			
Serial Ports (RS-232 UART)		2			
Discrete I/O (Single-Ended)		8 (w/TX1) or 4 (w/TX2)			

GPGPU Fanless Small FF RediBuilt™ Supercomputer

A176 Cyclone

- SWaP Optimized Rugged HPEC
- Ultra Small Form Factor – 129 mm [5.1"] square, < 1 kg [2.2 lbs.]
- NVIDIA® Jetson™ TX1/TX2 Options
  - TX1 – Maxwell™ GPU w/256 CUDA® cores, ARM® Cortex® A57 Quad-Core CPU, 4 GB LPDDR4, 16 GB eMMC
  - TX2 – Pascal™ GPU w/256 CUDA® cores, NVIDIA® Denver 2 Dual-Core ARM® CPU + Cortex® A57 Quad-Core ARM® CPU, 8 GB LPDDR4, 32 GB eMMC
  - 1 TFLOPS
  - H.264/H.265 HW Encoder
  - Best Available Performance per Watt – 60 GFLOPS/W
- SATA SSD with Quick Erase & Secure Erase
- 4 GB LPDDR4
- Video Capture
  - SDI (SD/HD) w/dedicated H.264 encoder
  - Composite (RS-170A [NTSC]/PAL), 8 channels available simultaneously
- I/O Interfaces
  - Gigabit Ethernet
  - UART Serial
  - USB 2.0
  - Discretes
  - DVI/HDMI Output
  - Composite Input
  - SDI Input
- CUDA®, OpenGL, OpenGL ES, EGL
- Linux® OS
- Low Power Consumption
- Development Platforms Available

Development System for A176 Cyclone

EV176

- NVIDIA® Jetson™ TX1 System on Module
  - NVIDIA® Pascal™ Architecture GPU, with 256 CUDA cores
  - NVIDIA® Denver 2 Dual-Core ARM® CPU +
  - ARM® Cortex® A57 Quad-Core CPU
  - 1 TFLOPS
  - H.264/H.265 HW Encoder
- Best Available Performance per Watt – 60 GFLOPS/W
- 8 GB LPDDR4
- 32 GB eMMC Flash + SD Card Slot
- Video Capture
  - SDI (SD/HD) w/dedicated H.264 encoder
  - Composite (RS-170A [NTSC]/PAL), 8 channels available simultaneously
- I/O Interfaces
  - Gigabit Ethernet
  - UART Serial
  - USB 2.0
  - SATA
  - Discretes
  - DVI/HDMI Output
  - Composite Input
  - SDI Input
- CUDA®, OpenGL, OpenGL ES, EGL
- Linux® OS
- 8-10 W Typical, 17 W Max

Rugged GP GPU is Aitech

coming soon
Aitech

Rugged Reduced SWaP PC

A173

- Flexible Configuration Options
  - CPU
  - Memory
  - Mass Storage
  - OS
- I/O Interfaces
  - Gigabit Ethernet
  - Serial Ports
  - USB 2.0
  - Stereo Audio Line IN + Line OUT
  - Discrete I/O
  - DVI Outputs
  - CANbus
  - RS170A Out
- Mini PCIe Slot for I/O Expansion
- GPU – Nvidia GTX1050
- Wide Input Voltage Range
- MIL-STD-704 and MIL-STD-1275 Compliant
- Modular Design
- D38999 I/O and Power Connectors
- Windows® and Linux® Support
- Environmentally Sealed (IP65)
- Natural Convection Cooled
- Compact and Lightweight

Rugged RediBuilt™ HPEC and GPGPU

A191

- 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 Options
  - Gigabit Ethernet
  - UART Serial
  - USB 2.0
  - Discrete I/O
  - DVI/HDMI Output
  - RGBHV Output
  - Composite Input
  - SDI Input
- Up to 16 GB DDR3L with ECC
- SATA Flash SSD Mass Storage
- Windows® and Linux® 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 (both options fanless/no moving parts)
  - Passive Convection & Radiation-Cooling
  - Cold Plate-Cooling

TMs and Carriers

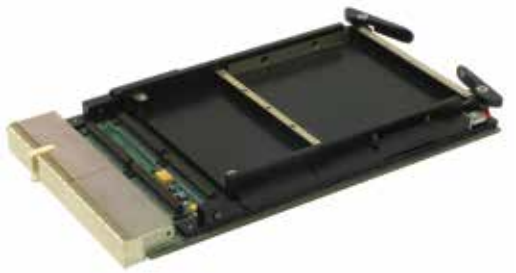
To support our COTS products Aitech has developed auxiliary products to simplify the transition from evaluation to full line production and to facilitate integration with our customers' systems. For this purpose Aitech offers a full line of transition modules and carrier boards.

As the processing power of SBCs continues to increase, expanding system functionality by means of PMCs and XMCs is frequently the method of choice for maximizing performance while minimizing system size, power consumption and cost (SWaP). To expand beyond the PMC/XMC sites on SBCs, Aitech has developed a line of PMC/XMC carriers. The carrier resides on the system PCI/PCIe bus for control by the host SBC CPU.

Transition Modules

	Description	Format
	**TM112** Transition Module for the C112 VPX SBC	6U VPX
	**TM162** Transition Module for the C162 VME SBC	6U VME
	**TM530** 3U VPX RTM for Aitech Graphics Products	3U VPX
	**TM660** RTM for the C660 6U CompactPCI Switch	6U cPCI
	**TM670** RTM for the C670 6U VPX Switch	6U VPX
	**TM680** Transition Module for the C680 3U VPX Switch	3U VPX
	**TM870** Transition Module for the C87X 3U VPX SBC	3U VPX
	**TM912** 3U VPX RTM for C912 SBC	3U VPX

Carrier Boards



3U PMC Carrier CompactPCI Board

CM900

Size	3U
Backplane Fabric	PMC: CompactPCI
BUS Architecture	PCI 32-bit / 66 MHz
PMC/XMC Support	PMC - PCI 32-bit / 66MHz
I/O Routing	64 PMC I/O Signals

3U VPX PMC/XMC Carrier Board

CM870

Size	3U
Backplane Fabric	VPX: PCIe
BUS Architecture	PCIe Gen. 2.0 - Four PCIe x 4
PMC/XMC Support	PMC - PCI-X up to 64-bit / 133 MHz XMC - PCIe x 8
I/O Routing	64 PMC I/O Signals, 35 Single Ended and 20 Differential XMC I/O Signals

Memory Boards

For applications that need a lot of memory, Aitech offers PMC, XMC, and VME variants of high speed Flash memory boards to complement any host SBC and provide high reliability solid state mass storage. Drivers for various operating systems provide memory management and hard disk emulation for multiple storage uses. The boards are vibration and shock resistant and available in conduction-cooled and air-cooled versions.

Mass Storage PMC/XMC

M224

Size & Format	PMC/XMC
Memory Size	Up to 512 GB (MLC) and 256 GB (SLC)
Architecture	N/A
Storage Media	NAND Flash
RAID	RAID 0, 1 and JBOD
BUS Configuration	PCIe x1 Lane (XMC) PCI/PCI-X 64-bit @ 33/66/100/133 MHz (PMC)
R/W Speed	WR = Up to 120 MB/s RD = Up to 170 MB/s
SW Support	VxWorks® Windows® Linux®

High Density Flash Memory PMC

M222

Size & Format	PMC
Memory Size	Up to 256 GB
Architecture	Two arrays
Storage Media	NAND Flash
RAID	No
BUS Configuration	PCI 64-bit @ 66 MHz
R/W Speed	WR = Up to 130 MB/s RD = Up to 120 MB/s
SW Support	VxWorks® INTEGRITY® Aitech's FMM

Ordering Information

Memory Boards

Cooling
A = Air
R = Conduction

M222 – [ ] [ ] [ ] – [ ] [ ]

Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Aitech Item Number

Flash Memory Size
008 = 8 GB
016 = 16 GB
032 = 32 GB
064 = 64 GB
128 = 128 GB
256 = 256 GB

Configuration Number
To be assigned by Aitech

Example: 2M222-R064-00

Cooling
A = Air
R = Conduction

Flash Technology
S = SLC
M = MLC

Bus Configuration
1 = PCI/PCI-X (PMC)
2 = PCIe (XMC)

M224 – [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Ruggedization
1 = Commercial
2 = Rugged
4 = Military

Aitech Item Number

Flash Memory Size
032 = 32 GB
064 = 64 GB
128 = 128 GB
256 = 256 GB
512 = 512 GB (MLC Flash only)

RAID Configuration
0 = RAID 0
1 = RAID 1
2 = JBOD

Configuration Number
To be assigned by Aitech

Example: 2M224-R128S02-00

I/O Boards

Multitasking applications often require more I/O than the system SBC can provide. System I/O types and channel counts can easily be expanded by adding one or more I/O boards.

Aitech's range of I/O boards provides Ethernet, SATA II, USB, MIL-STD-1553B, ARINC-429, CANbus, Serial, Analog, Digital, Discrete, Synchro/Resolver, and other interfaces in PMC, XMC, 6U VME, and 6U VPX formats. Multiple standard configurations support a wide variety of applications.

With the advantage of low power consumption, Aitech I/O boards have little impact on system power consumption and heat dissipation.

Available drivers include VxWorks®, INTEGRITY®, Windows®, and Linux®.

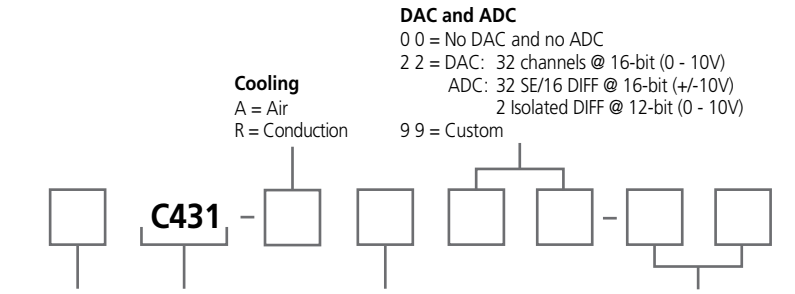
	C431 - A/D, D/A, and Digital I/O VME Board	C437 - ARINC-429, A/D, D/A, and Digital I/O VME Board
Size & Format	6U VME64x	6U VME64x
Analog In	Two Differential x 12-bit (Isolated) 16DIFF/32SE x 16-bit	Four isolated Differential 16-bit A/D Input Channels
Analog Out	Up to 32 x 14-bit, 8 x 16-bit	Four isolated Differential 16-bit D/A Output Channels
Discrete I/O (SE / Diff)	8 isolated common 5V GND/Open inputs 8 isolated common 28V GND/Open inputs 48 isolated factory configured as in/out (Out acts as a switch with output sink up to 1A. In = 28V/Open or GND/Open)	60 isolated Discrete Inputs (GND/Open, 28V/Open, 28V/GND) Two 5V Differential RS-422 Inputs 41 GND/OPEN Discrete Outputs
Ethernet	N/A	N/A
Serial	N/A	N/A
1553B	N/A	N/A
ARINC-429	N/A	16 Inputs, 8 outputs
Audio	N/A	Stereo audio output. Decodes MPEG 1 & 2, MP3+V, WAV and PCM files. Dedicated SRAM and Flash memory for file playback and storage
CANbus	N/A	N/A
BUS interface	VME64x Bus Slave Interface (A24/D32)	VME64x Bus Slave Interface (A24/D32)
Compliance	ANSI/VITA 1-1994, IEEE 1101.2	ANSI/VITA 1-1994, IEEE 1101.2
SW Support	Windows®, VxWorks® , Integrity®, Linux®, LynxOS®	VxWorks®, Integrity®




	M705 - Multi-I/O Communications PMC	M706 - Avionic Communications PMC	M611 - Quad Gigabit Ethernet XMC	M575 - HUD Controller PMC
Size & Format	PMC	PMC	XMC	PMC
Analog In	N/A	N/A	N/A	N/A
Analog Out	N/A	N/A	N/A	Analog HUD Controller
Discrete I/O (SE / Diff)	8 x GND/Open in	6 x GND/Open In/Out 2 x GND/Open in 2 x 28V GND/Open Out	N/A	N/A
Ethernet	N/A	N/A	4 x 10/100/1000 Base-T or 4 x 1000Base-BX/KX	N/A
Serial	6	12	N/A	N/A
1553B	5	2	N/A	N/A
ARINC-429	16 Inputs, 8 Outputs	16 Inputs, 8 Outputs	N/A	N/A
Audio	N/A	N/A	N/A	N/A
CANbus	N/A	2	N/A	N/A
BUS Interface	PCI 66MHz/32 bit	PCI 66MHz/32 bit	PCIe x4	PCI 66MHz/64 bit
Compliance	Air coolded : IEEE 1386-2001, Conduction cooled: ANSI/VITA 20-2001	Air coolded : IEEE 1386-2001, Conduction cooled: ANSI/VITA 20-2001	ANSI/VITA 42.0-2008	Air coolded : IEEE 1386-2001, Conduction cooled: ANSI/VITA 20-2001
SW Support	Windows®, Linux®, VxWorks®, Integrity®	Windows®, Linux®, VxWorks®, Integrity®	Windows®, Linux®, VxWorks®, Integrity®	VxWorks®

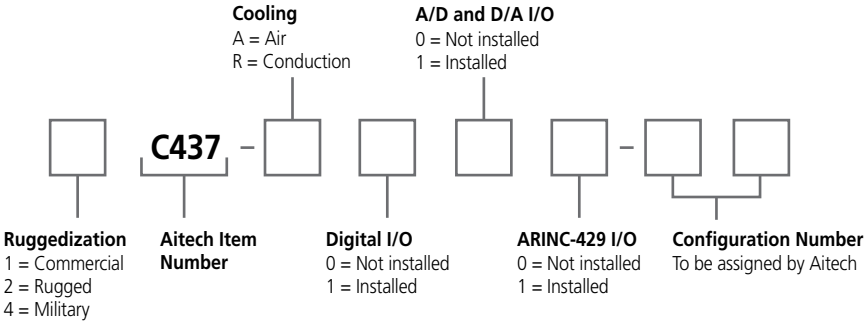
Ordering Information

I/O Boards



Example: 4C431-R322-00

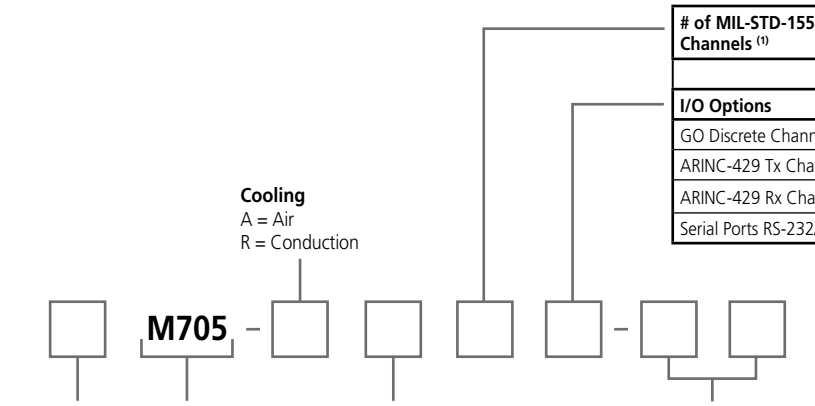
Note: Configuration options have been simplified relative to previous releases of this datasheet. Orders using legacy part numbers will be honored, but are not recommended for new designs.



Example: 2C437-R111-00

	1553B & ARINC	1553B & Serial	M703 Comp.(2)	Mix 1	Mix 2	Custom
# of MIL-STD-1553B Channels (1)	**0-4**	**0-5**	**0-2**	**0-4**	**0-4**	**0-5**
I/O Options	**1**	**2**	**3**	**4**	**5**	**0**
GO Discrete Channels	0	8	0	0	8	Contact Aitech Sales Rep
ARINC-429 Tx Channels	8	0	0	6	3	
ARINC-429 Rx Channels	16	0	0	6	4	
Serial Ports RS-232/422/485	0	6	4	6	6	

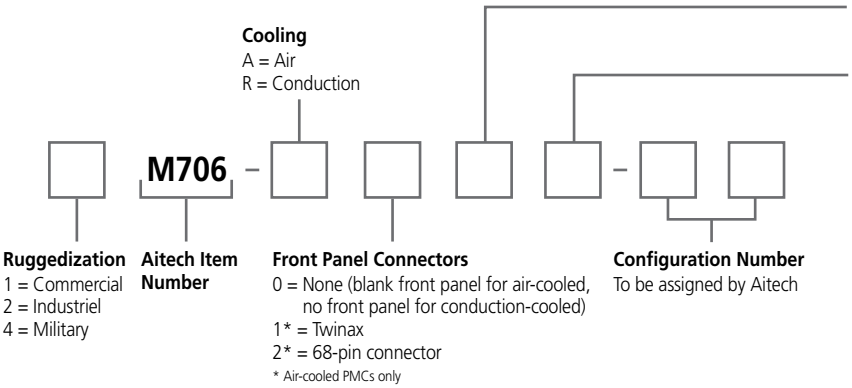
(1) By default, all channels are configured as transformer-coupled. Direct coupling is available as a custom configuration.
(2) This configuration must be selected for M705 backwards compliance with the M703.



Example: 4M705-R041-01

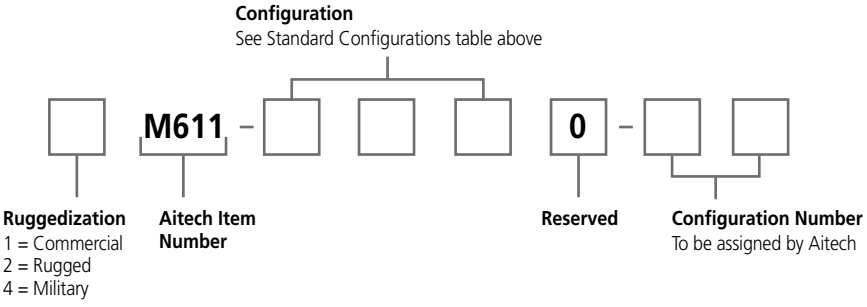
Ordering Information

I/O Boards



Example: 4M706-R011-00

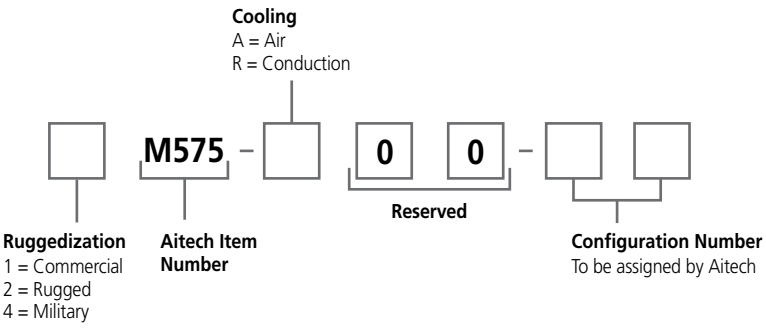
	Mix 1	Mix 2	Mix 3	Custom
# of MIL-STD-1553B Channels	**0-1**	**0-2**	**0-2**	**0-2**
I/O Options	**1**	**2**	**3**	**0**
Discrete I/O Channels	0	0	10	Contact Aitech Sales Rep
ARINC-429 Tx Channels	2	2	2	
ARINC-429 Rx Channels	2	2	4	
Serial Ports RS-232/422/485	12	11	6	
CANbus Interfaces	0	0	2	



Example: 4M611-R410-00

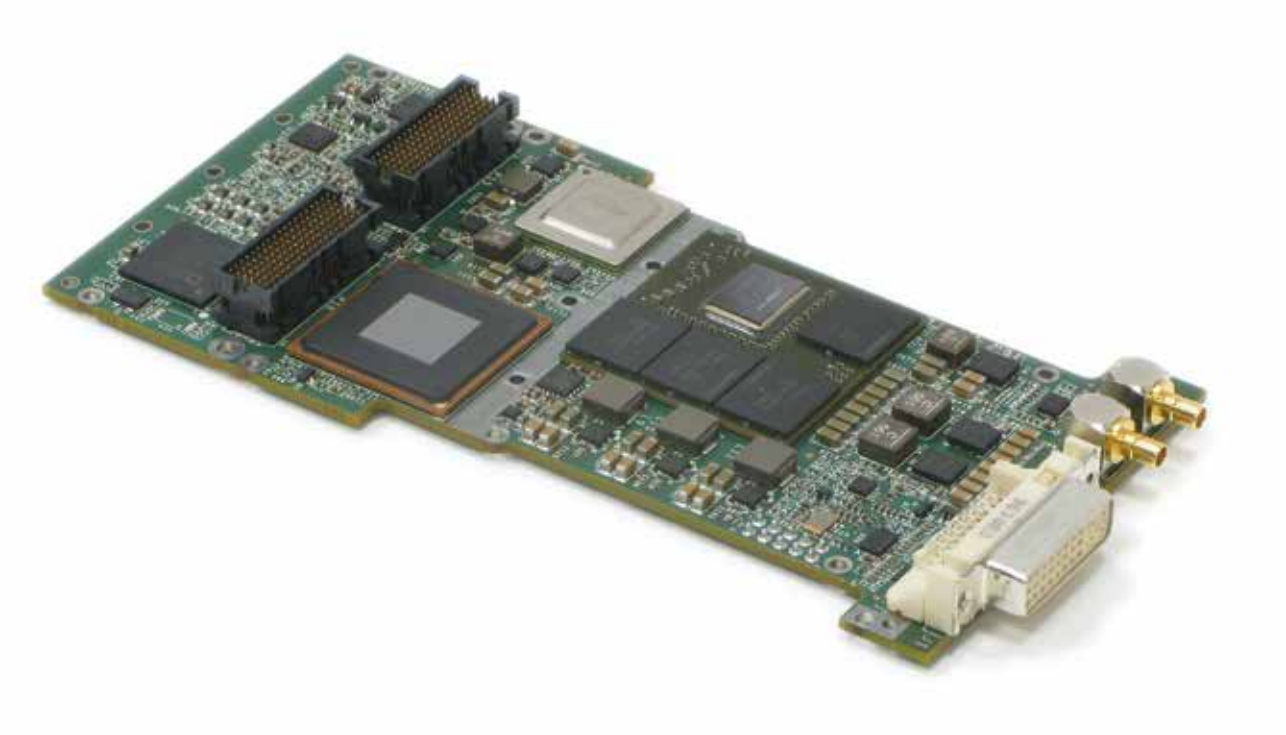
Variant	Cooling	Ethernet Ports	I/O Routing
A50	Air	4 x 1000Base-T	Front panel RJ45 connectors
R41	Conduction	4 x 1000Base-BX/KX	P16 XMC I/O connector
R51	Conduction	4 x 1000Base-T	P16 XMC I/O connector
R52	Conduction	4 x 1000Base-T	P14 PMC I/O connector

Note: Additional port configuration/routing options may be available per customer request, contact an Aitech representative for more information



Example: 4M575-R00-00

Video/Graphics Boards



Today's applications are becoming more and more video/graphics intensive, with glass cockpits, heads-up displays, map applications, and automatic target recognition becoming increasingly commonplace. Aitech's family of video/graphics PMCs/XMCs supports all of these and more.

Based on NVIDIA and AMD/ATI graphics processor, supplemented with custom Aitech FPGAs, these products provide a high level of video/graphics 2D/3D processing and overlay capabilities. Multiple video/graphics I/O formats and channels enable Aitech's video/graphics products to accept many different kinds of input signals and to drive nearly any kind of monitor.

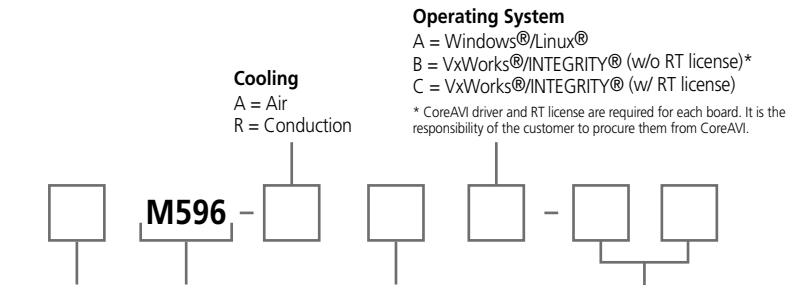
Aitech's Video and Graphics boards are supported with drivers for popular operating systems including VxWorks®, various flavors of Linux®, Windows®, INTEGRITY®, and QNX® and offer DO178B certifiable boards.

	M596 Radeon™ E8860 (Adelaar) Video & Graphics XMC	M598 Radeon™ E8860 (Adelaar) Video & Graphics PMC
Form Factor	Single Slot Mezzanine	Single Slot Mezzanine
PMC/XMC	XMC	PMC
GPU	AMD Radeon E8860 (Adelaar)	AMD Radeon E8860 (Adelaar)
Memory	2GB GDDR5 @ 625/1125MHz	2GB GDDR5 @ 625/1125MHz
Number of Graphic Heads	6	6
Shader Processors	640	640
PCI Fabric	PCIe 8 lanes Gen. 2.0 (Gen. 3.0 capable)	PMC/ PCI-X 133 MHz/ 64 bit
Video Outputs	DVI/HDMI SD-SDI/HD-SDI Composite (RS-170A/NTSC/PAL) S-Video (NTSC/PAL) RGBHV Multi-Standard RGB (sup. STANAG 3350 B/C)	DVI/HDMI Composite (RS-170A/NTSC/PAL) S-Video (NTSC/PAL) RGBHV
Video Inputs	DVI/HDMI SD-SDI/HD-SDI Composite (RS-170A/NTSC/PAL) S-Video (NTSC/PAL) Multi-Standard RGB (sup. STANAG 3350 B/C)	DVI/HDMI Composite (RS-170A/NTSC/PAL) S-Video (NTSC/PAL) Multi-Standard RGB (sup. STANAG 3350 B/C)
Front Panel Video	DVI-I (DVI SL/DL, RGBHV) output Composite (RS-170A/NTSC/PAL) input Composite (RS-170A/NTSC/PAL) output	DVI-I (DVI SL/DL, RGBHV) output Composite (RS-170A/NTSC/PAL) input Composite (RS-170A/NTSC/PAL) output
I/O connector	P16	P4
Transition Module	TM596; TM530	TM530
OS Support	Linux® Windows® VxWorks® INTEGRITY®	Linux® Windows® VxWorks® INTEGRITY®
Enhanced Graphics & Video	OpenGL OpenGL ES OpenGL SC OpenCL DirectX Shader	OpenGL OpenGL ES OpenGL SC OpenCL DirectX Shader
Overlay Support	Yes	Yes
2D/3D Support	Yes	Yes
Compliance	ANSI/VITA 42.0-2008	Air-cooled : IEEE 1386-2001 Conduction cooled: ANSI/VITA 20-2001
Power (Typ.)	35 W	36 W
Maximum Performance	3DMark®11 score of 3023	3DMark®11 score of 3023
Additional Features	TS, VBIOS	TS, VBIOS

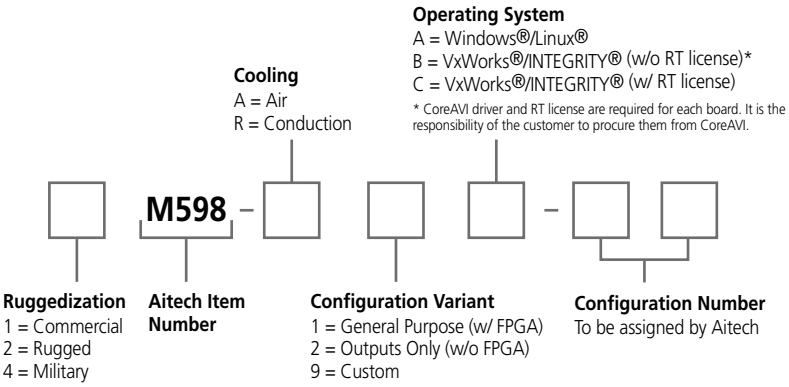
	M571 Frame Grabber XMC	M577 Multi-Channel Frame Grabber PMC	C530 GPGPU 3U VPX Board
Form Factor	Single Slot Mezzanine	Single Slot Mezzanine	3U
PMC/XMC	XMC	PMC	VPX
GPU	N/A	N/A	NVIDIA® GeForce® GTX 965M
Memory	N/A	N/A	4 GB GDDR5
Number of Graphic Heads	N/A	N/A	N/A
GPU/MEM speed	N/A	N/A	up to 1600 MHz
Shader Processors	N/A	N/A	1024 CUDA Cores
PCI Fabric	PCIe 1 lane Gen. 1.1	PMC/PCI-X 133 MHz/ 64 bit	PCIe 8 lanes Gen. 2.0
Video Outputs	N/A	N/A	DVI/HDMI/RGBHV
Video Inputs	Composite (RS-170A/NTSC/PAL)	Composite (RS-170A/NTSC/PAL) S-Video (NTSC/PAL) SD-SDI/HD-SDI	N/A
Front Panel Video	Composite (RS-170A/NTSC/PAL) input	Composite (RS-170A/NTSC/PAL) input	N/A
I/O connector	P16, P4	P4	P2
Transition Module	TM530	N/A	TM530
OS Support	Linux® Windows®	Windows® VxWorks®	Linux® Windows®
Enhanced Graphics & Video	N/A	N/A	OpenGL 4.5 OpenCL 1.1 CUDA, PhysX DX12, Shader 5.
Overlay Support	N/A	N/A	No
2D/3D Support	N/A	N/A	Yes
Compliance	ANSI/VITA 42.0-2008	Air-cooled: IEEE 1386-2001 Conduction cooled: ANSI/VITA 20-2001	MXM sandard: MXM 3.1 Type B; VPX: ANSI/VITA 46.0; Conduction-cooled REDI: VITA 48.2 Compatible with OpenVPX VITA 65.0
Power (Typ.)	1 W	5 W	up to 50W
Maximum Performance	N/A	N/A	3DMark®11 score of 5152
Additional Features	N/A	N/A	VBIOS

Ordering Information

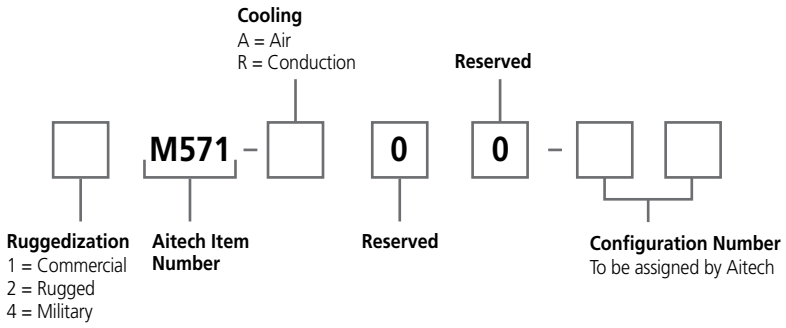
Video/Graphics Boards



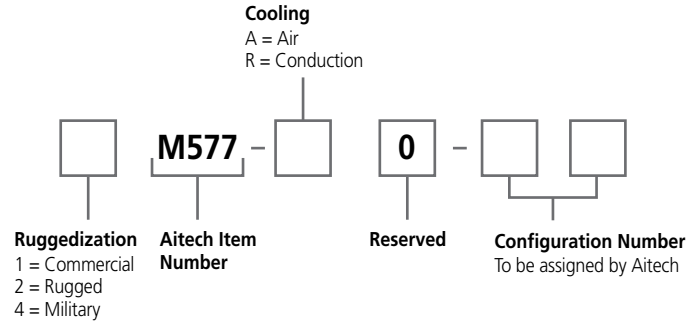
Example: 4M596-R1C-00



Example: 4M598-R1C-00



Example: 4M571-R00-00



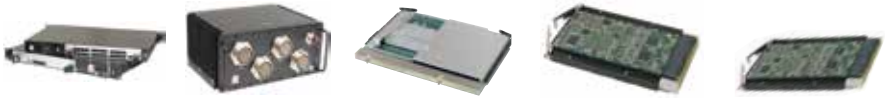
Example: 4M577-R0-00

* For ordering information for the C530 please refer to page 18

Ethernet Switches

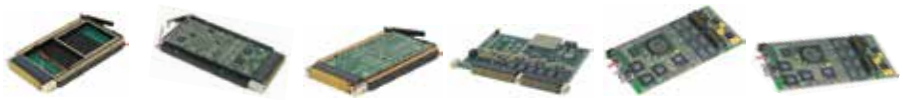
Aitech is addressing the growing demand for interconnecting computers over IP-based networking and systems by offering a series of Gigabit Ethernet switches. Aitech's switches focus on Gigabit and 10 Gigabit Ethernet Managed Layers 2/3 switching solutions. The form factors include: cPCI, VPX, PCIe and XMC as well as complete systems. The Gigabit Ethernet switches are based on Marvell's Bobcat Gigabit Ethernet Switch Controller and MTS Management Suite. The simplified user web interface is an intuitive management tool, enabling convenient use of the switches' comprehensive feature set for a more optimized network.

Switches are available in air-cooled and conduction-cooled formats, and in commercial as well as rugged and military versions, the latter two being vibration and shock resistant. Refer to the ruggedization table on the inside back cover for specifics.



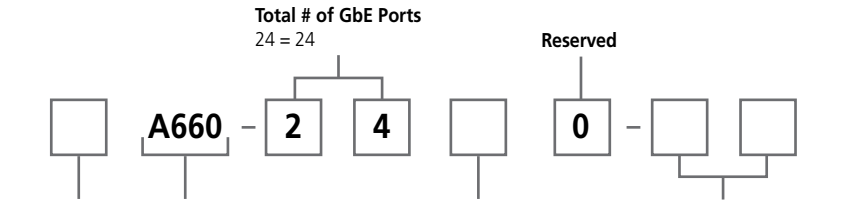
	SWITCH SYSTEMS		STAND ALONE SWITCHES		
	A660	**A661**	**C660**	**C680**	**C681**
Form Factor	Commercial 19" 1U	Rugged Compact	6U cPCI	3U VPX	3U VPX
10/100/1000Base-T	24	48	24 - 40 [1]	12 [2]	8[2]
SFP+ Support (air-cooled only)	4	N/A	4	N/A	N/A
1000Base-KX/1000Base-BX	N/A	N/A	N/A	24	24
1000Base-X	N/A	N/A	8	N/A	N/A
XAUI/1000Base-KX4	N/A	N/A	N/A	2	2
PCIe x 4 Ports	N	N	N	N	N
Layer 2 Support	Y	Y	Y	Y	N
Layer 3 Support	Y	Y	Y	Y	N
Debug Port (RS-232 and GLAN)	Y	Y	Y	Y	N
Policy Control List Engine	Y	Y	Y	Y	N
QoS Management	Y	Y	Y	Y	N
Multi-Tier Security Mechanisms	Y	Y	Y	Y	N
Jumbo Frame	Y	Y	Y	Y	Y
BIT	Y	Y	Y	Y	Y
IPMI Support	Y	Y	Y	Y	Y
Power Consumption	<60W	<80W	<33W	<20W	<8W

[1] With M620 XMC
[2] Or twice as many if limited to 10/100Base-T only

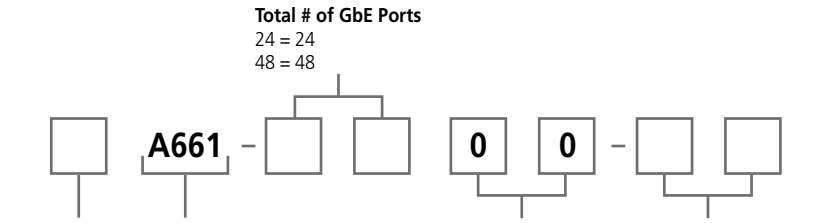


	STAND ALONE SWITCHES				EXTENSIONS SWITCHES	
	C695	**C690**	**C691**	**C670**	**M620**	**M640**
Form Factor	3U VPX	3U VPX	3U VPX	6U VPX	XMC	XMC
10/100/1000Base-T	N/A	1	1	24 - 32 [1]	8 [2]	8
SFP+ Support (air-cooled only)	N/A	N/A	N/A	4	N/A	N/A
1000Base-KX/1000Base-BX	N/A	8	8	8	16	10
1000Base-X	N/A	N/A	N/A	N/A	N/A	N/A
XAUI/1000Base-KX4	N/A	N/A	N/A	4	2	N/A
PCIe x 4 Ports	Up to 24	Up to 20	Up to 20	N	N	N
Layer 2 Support	N/A	Y	N	Y	Y	N
Layer 3 Support	N/A	Y	N	Y	Y	N
Debug Port (RS-232 and GLAN)	N/A	Y	N	Y	Y	N
Policy Control List Engine	N/A	Y	N	Y	Y	N
QoS Management	N/A	Y	N	Y	Y	N
Multi-Tier Security Mechanisms	N/A	Y	N	Y	Y	N
Jumbo Frame	N/A	Y	Y	Y	Y	Y
BIT	N/A	Y	Y	Y	Y	Y
IPMI Support	Y	Y	Y	Y	Y	Y
Power Consumption	5W	<23W	<16W	<33W	<15W	<8W

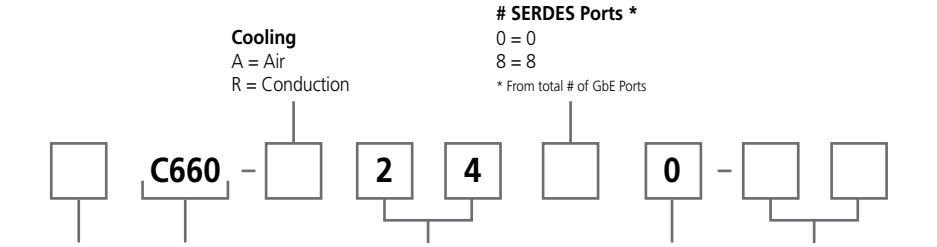
[1] With M620 XMC
[2] Or twice as many if limited to 10/100Base-T only



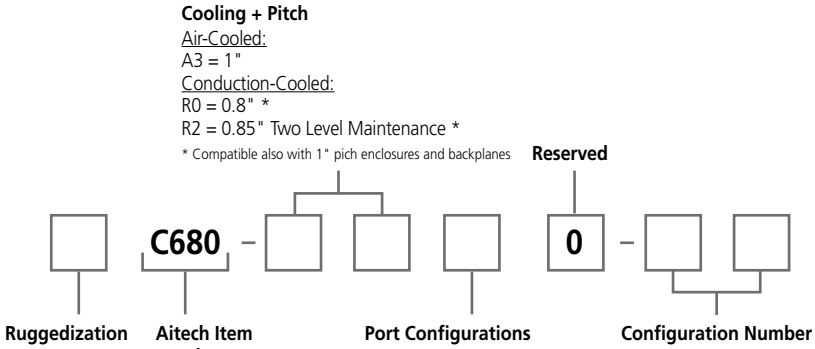
Example: 1A660-2400-00



Example: 2A661-4800-00



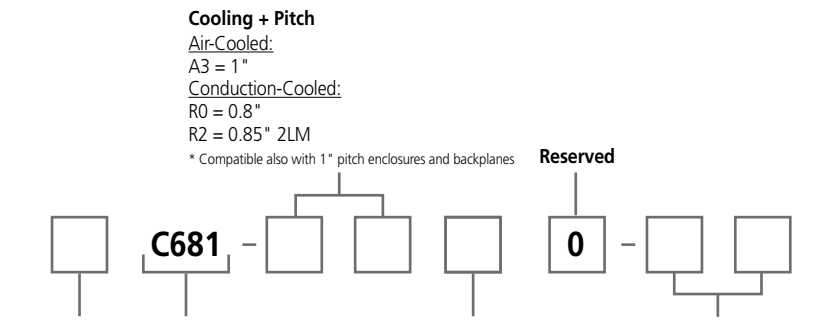
Example: 4C660-R2400-00



Example: 4C680-R000-00

Ordering Information

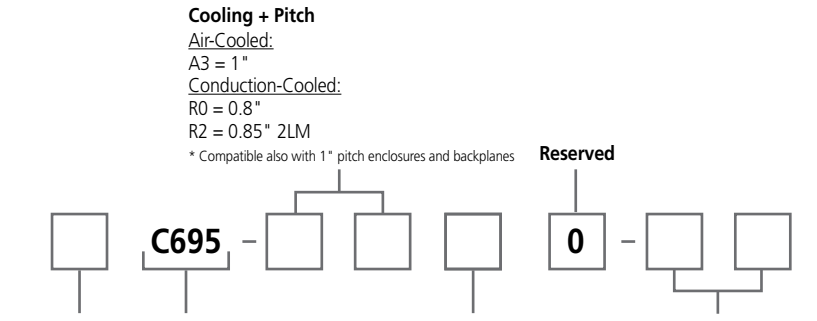
Ethernet Switches



Example: 4C681-R020-00

I/O Variant (1)	Cooling	Backplane I/O		Front Panel I/O
		1000Base-BX/KX	1000Base-T	1000Base-T
1	Conduction	10	-	-
	Air	9	-	1
2	Conduction	-	8	-
	Air	-	7	1

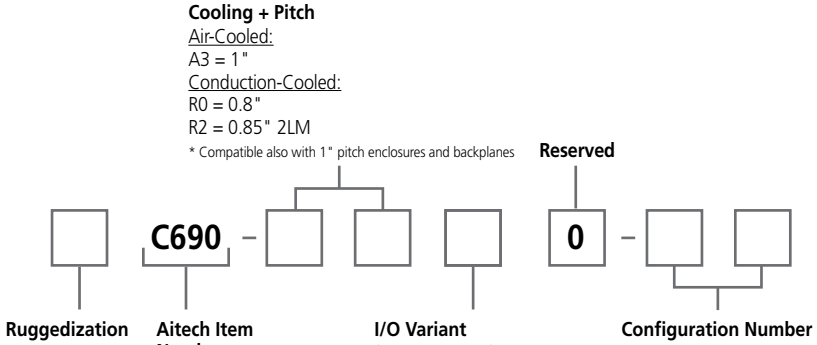
(1) C681 I/O Variants offer different Ethernet port interfaces/quantities via factory configuration (options are specified when ordering the C681 and are not user configurable); additional Ethernet port configuration options may be available per customer request, contact an Aitechrepresentative for more information



Example: 4C695-R020-00

	Variant 1 (1)	Variant 2 (1)
PCIe	Eight x4 Backplane Ports (2)	Six x4 Backplane Ports (3) + One x8 Port at XMC Site
XMC I/O	N/A	20 Differential Pairs + 2 Single-Ended

(1) C695 I/O Variants offer different I/O routing options via factory configuration (options are specified when ordering the C695 and are not user configurable); additional configuration options may be available per customer request, contact an Aitech representative for more information
(2) User configurable as up to 24 ports via on-board EEPROM device
(3) User configurable as up to 20 ports via on-board EEPROM device



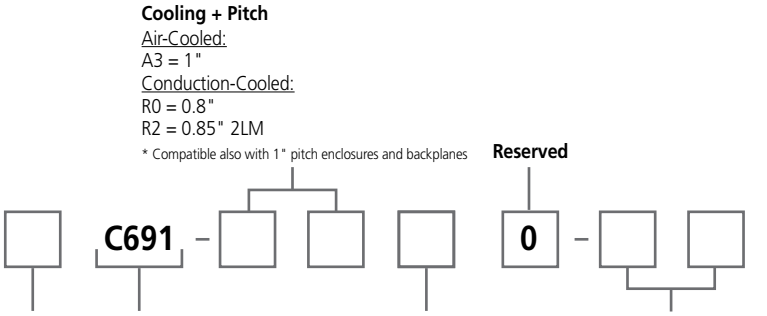
Example: 4C690-R020-00

	I/O Variant (1)		
	1	2	3
10/100/1000Base-T Marvell 88E1340 PHY devices and on-board GbE magnetics	0	2	5
1000Base-BX/KX Supports both backplane applications and external SFP modules	8	6	0
RS-232 Serial Ethernet switch management console port	1		
PCIe User configurable as up to 20 ports via on-board EEPROM device	Six x4 Ports		

(1) C690 I/O Variants offer different Ethernet port interfaces/ quantities ia factory configuration (options are specified when ordering the C690 and are not user configurable); additional Ethernet port configuration options may be available per customer request, contact an Aitech representative for more information

Ordering Information

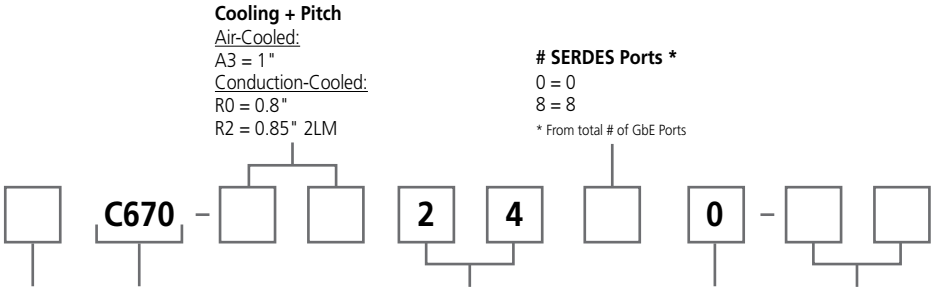
Ethernet Switches



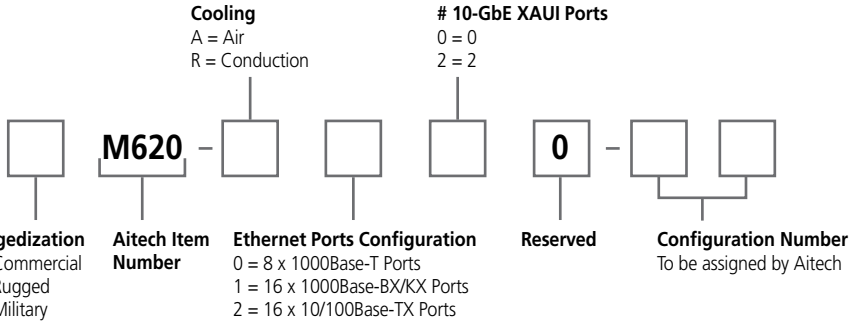
Example: 4C691-R020-00

	I/O Variant (1)		
	1	2	3
10/100/1000Base-T Marvell 88E1340 PHY devices and on-board GbE magnetics	0 (2)	2 (3)	5 (3)
1000Base-BX/KX Supports both backplane applications and external SFP modules	8	6	0
PCIe User configurable as up to 20 ports via on-board EEPROM device	Six x4 Ports		

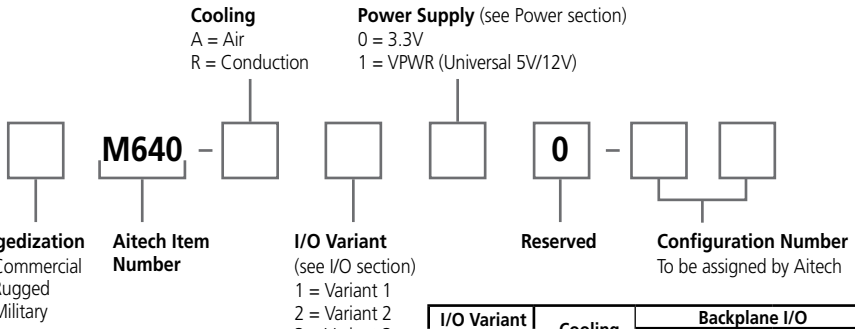
(1) C691 I/O Variants offer different Ethernet port interfaces/ quantities via factory configuration (options are specified when ordering the C691 and are not user configurable); additional Ethernet port configuration options may be available per customer request, contact an Aitech representative for more information
(2) One additional 1000Base-T port is provided at the front panel RJ45 connector of air-cooled versions



Example: 4C670-R12400-00



Example: 4M620-R120-00



Example: 4M640-R200-00

Power Supply Option (1)	Current	Power (2)
VPWR (Universal +5 V/+12 V)	1.2 A (+5 V) or 0.5 A (+12 V)	6 W
+3.3 V	1.8 A	6 W

(1) M640 is powered by a single XMC site power supply (+3.3 V or Universal VPWR) per factory configuration option specified when ordering the M640
(2) Total power consumption with all Ethernet ports active

I/O Variant (1)	Cooling	Backplane I/O		Front Panel I/O
		1000Base-BX/KX	1000Base-T	1000Base-T
1	Conduction	10	-	-
	Air	9	-	1
2	Conduction	6	2	-
	Air	6	2	1
3	Conduction	-	8	-
	Air	-	7	1

(1) M640 I/O Variants offer different Ethernet port interfaces/quantities via factory configuration (options are specified when ordering the M640 and are not user configurable); additional Ethernet port configuration options may be available per customer request, contact an Aitech representative for more information

Power Supplies

Designed for harsh environment applications, Aitech's power supplies offer reliable power in industry standard form factors. Their wide input voltage range and high efficiency operation make these power supplies ideal for many rugged applications.

Aitech's power supplies range from 140 W up to 400 W of combined output power and include input power filters along with input, output, and thermal protection to increase reliability and to protect other system elements. Several models also include on-board fan control circuitry for compatibility with fan-cooled enclosures.

3U Power Supply Boards



	P233	P230	P231
Size & Format	3U VITA62	3U	3U
Type	DC	DC	DC
Power	300W/ 500W	150W	100W
Input Voltage	18-32 Vdc	18-36 Vdc	9-36 Vdc
Input Protection	OV, UV, Polarity	Transient, Polarity	Transient, Polarity
EMI/RFI Filter	Yes	Yes	Yes
Output Protection	OV, UV, OC	OV, UV, SC	OV, UV, SC
Outputs:			
5V	30 A	20 A	13 A
3.3 V	20 A	10 A	10 A
12V	40 A	8 A	5.5 A
-12 V Aux	1 A	1 A	1 A
12 V Aux	1 A	N/A	N/A
3.3 V Aux	4 A	N/A	N/A
Standards	MIL-STD-704D/E	MIL-STD-704A/D	MIL STD 704 and MIL STD 1275
Holdup Time	50ms (with bank,300W)	4ms/50ms (with optional capacitor bank)	4ms/50ms (with optional capacitor bank)
Efficiency %	Typical 85	Typical 85	Typical 75 / Typical 85
Special Features	Sharing	N/A	N/A
IPMI	Yes	No	No

OV = Over Voltage **UV** = Under Voltage **OC** = Over Current **UD** = User Defined pins

6U Power Supply Boards

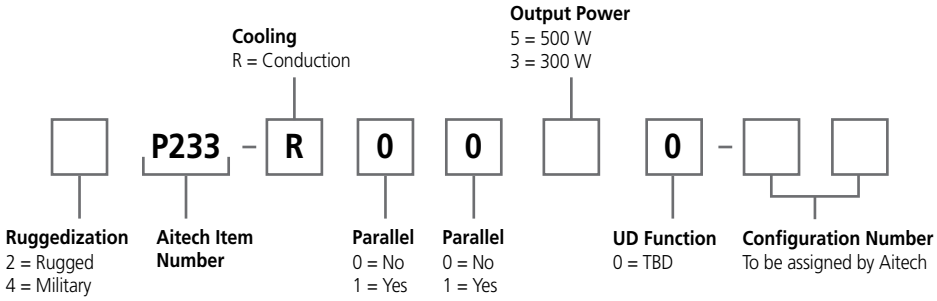


	P234	P221	P226
Size & Format	6A VITA62	6U	6U
Type	AC 115W/400Hz single phase	DC	DC
Power	100W	175 W	300 W
Input Voltage	104-122v	16-36 Vdc	16-36 Vdc
Input Protection	OV,UV	Transient, Polarity	Transient, Polarity
EMI/RFI Filter	Yes	Yes	Yes
Output Protection	OV, UV, OC	OV, UV, OC	OV, UV, OC
Outputs:			
5V	14 A	30 A	46 A
3.3 V	1 A	12 A	15 A
12V	1 A	1 A	1 A
-12 V Aux	1 A	1 A	1 A
Standards	MIL STD 704A	MIL STD 704A/D input compliance	MIL STD 704A/D input compliance
Holdup Time	100ms	50 ms	4 ms (50 ms with optional capacitor bank module)
Efficiency %	75	>75	85
Special Features	Includes Power Factor Correction	N/A	N/A
IPMI	Yes	N/A	N/A

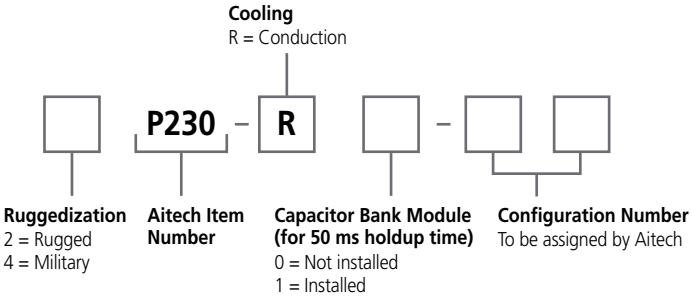
OV = Over Voltage **UV** = Under Voltage **OC** = Over Current **UD** = User Defined pins

Ordering Information

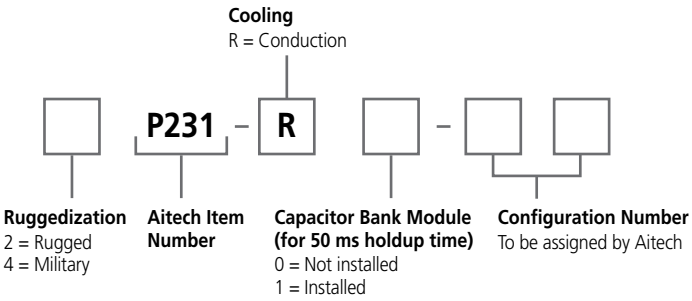
Power Supplies



Example: 4P233-R0030-00



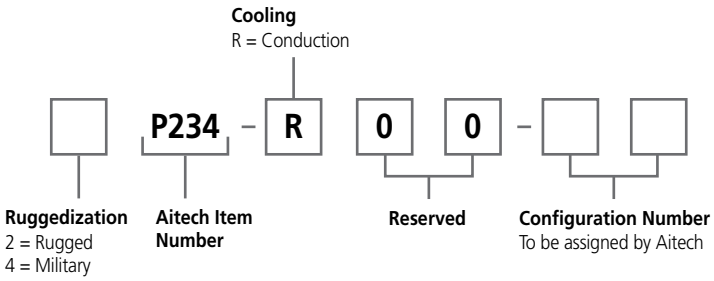
Example: 2P230-R0-00



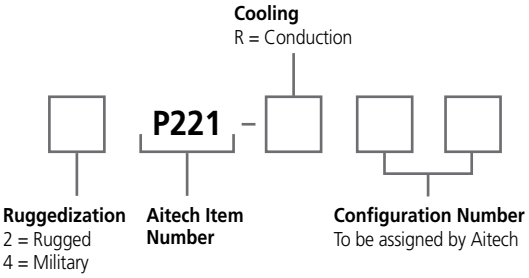
Example: 2P231-R0-00

Ordering Information

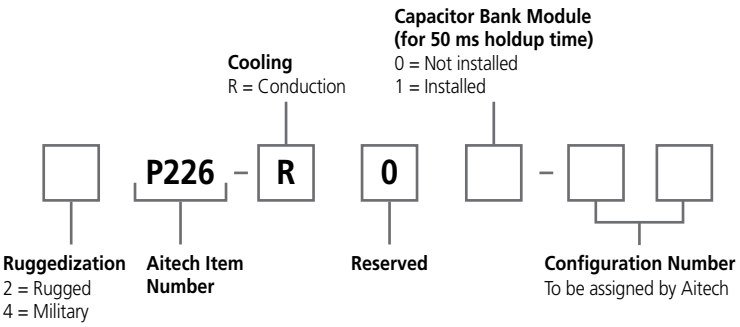
Power Supplies



Example: 4P234-R00-00



Example: 2P221-R00



Example: 2P226-R01-00

Enclosures

When faced with limited space and challenging cooling conditions, Aitech offers rugged enclosures in many sizes and footprints to accommodate up to twelve 3U and 6U VME, CompactPCI, and VPX conduction-cooled boards. External cooling configurations include natural convection cooling, forced-air (fan) cooling, and cold plate cooling.

All of our enclosures are supplied with Aitech power supplies and backplanes. I/O routing is provided by standard or custom harnessing, or Aitech proprietary solid state I/O transition modules. Input power line filters, together with a sealed Faraday cage design, provide EMI/RFI protection.

Aitech's high standards of manufacturing utilize aircraft grade aluminum with corrosion resistant stainless steel fasteners. Aitech's enclosures easily withstand extreme conditions of temperature, humidity, vibration, shock, altitude, chemical exposure, salt spray, and sand/dust for reliable operation in challenging industrial, military, and aerospace environments.

1/2 ATR Short VME Enclosure

E103

Size & Format	1/2 ATR Short VME64x
Slots	5
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Natural Convection and Radiation (fins)
Customization Options	Please refer to data sheet for additional information

1/2 ATR Short Cold Plate VME Enclosure

E104

Size & Format	1/2 ATR Short VME64x
Slots	5
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Conduction Cooling (cold plate)
Customization Options	Please refer to data sheet for additional information

1/2 ATR Short Fan-cooled VME Enclosure

E105

Size & Format	1/2 ATR Short VME64x
Slots	5
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Forced Air Cooling (fan)
Customization Options	Please refer to data sheet for additional information

1/2 ATR Short Fan-cooled High Power VME Enclosure

E106

Size & Format	1/2 ATR Short VME64x
Slots	3
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Forced Air Cooling (fan)
Customization Options	Please refer to data sheet for additional information

Fin Cooled 1/2 ATR Short VME Enclosure

E108

Size & Format	1/2 ATR Short VME64x
Slots	5
Power Supply	72 Vdc input, Multi-Output Removable VME 6U Power Supply
Cooling	Natural Convection and Radiation (fins)
Customization Options	Rugged Chassis for Locomotive Applications. Please refer to data sheet for additional information

Fin Cooled ATR Compact Short VME Enclosure

E110

Size & Format	1 ATR Short
Slots	6
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Natural Convection and Radiation (fins)
Customization Options	Please refer to data sheet for additional information

Fan Cooled ATR Compact Short VME Enclosure

E116

Size & Format	1 ATR Short VME
Slots	6
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Forced Air Cooling (fan)
Customization Options	Please refer to data sheet for additional information

Dual-Slot VME Enclosure

E119

Size & Format	Double-Slot VME
Slots	2
Power Supply	Multi-Output Removable 28 Vdc Input
Cooling	Natural Convection and Radiation (fins)
Customization Options	Please refer to data sheet for additional information

Fin Cooled CompactPCI/VPX Enclosure

E190

Size & Format	CompactPC VPX
Slots	2
Power Supply	Multi-Output Removable Power Supply
Cooling	Natural Convection and Radiation (fins) / Cold Plate
Customization Options	Please refer to data sheet for additional information

2 Slot 3U CompactPCI Enclosure

E191

Size & Format	3U CompactPCI
Slots	2
Power Supply	Multi-Output Removable Power Supply
Cooling	Natural Convection and Radiation (fins)
Customization Options	Please refer to data sheet for additional information

Rugged 3U CompactCPI Enclosure

E192

Size & Format	3U CompactPCI
Slots	2
Power Supply	Multi-Output Removable 28Vdc Input
Cooling	Conduction Cooling (cold plate)
Customization Options	Please refer to data sheet for additional information

1/2 ATR Short 3U VPX Enclosure

E195

Size & Format	3U VPX
Slots	4
Power Supply	Multi-Output Removable Power Supply
Cooling	Forced Air Cooling (fan)
Customization Options	Please refer to data sheet for additional information

3U CompactPCI Development Platform

E151

Size & Format	3U CompactPCI Development Platform
Slots	4
Power Supply	200 Watt Power Supply
Cooling	Fan-cooled
Customization Options	Please refer to data sheet for additional information

6U VME Development Platform

E152

Size & Format	6U VME Development Platform
Slots	4
Power Supply	200 Watt Power Supply
Cooling	Fan-cooled
Customization Options	Please refer to data sheet for additional information

3U VPX Development Platform

E153

Size & Format	3U VPX Development Platform
Slots	6
Power Supply	300 Watt Power Supply
Cooling	Fan-cooled
Customization Options	Please refer to data sheet for additional information

6U VPX Development Platform

E154

Size & Format	6U VPX Development Platform
Slots	3
Power Supply	460 Watt Power Supply
Cooling	Fan-cooled
Customization Options	Please refer to data sheet for additional information

Integrated COTS Computers

Based on many years of experience, Aitech has learned which features are most commonly required by our customers for their rugged computing needs. Combining this experience with our wide range of COTS products has led to a new line of fully integrated, off-the-shelf rugged computer systems. By carefully matching SBCs and PMCs/XMCs, and integrating them in compact rugged enclosures, Aitech offers out-of-the-box computer configurations featuring Core i7 and PowerPC processors, that target general purpose as well as processing, I/O, and video/graphics intensive applications.

Aitech's Integrated COTS Computers are available with BSPs and drivers for a variety of popular operating systems.

When an off-the-shelf computer just won't do, Aitech can still provide the solution. We are adept at modifying and customizing existing designs to give you exactly what you need.

RediBuilt™ GPGPU Based Rugged HPEC

A195

- GPGPU Based High Performance Embedded Computer (HPEC)
- 5th Gen. Intel® Core™ i7 CPU, Quad Core @ 2.4 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® and Linux® 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

Rugged RediBuilt™ HPEC and GPGPU

A196

- Rugged High Performance Embedded Computer (HPEC) and GPGPU
- Three Standard Configurations, x86 and PowerPC based options
  - CPU Options
    - Intel® 5th Gen. Core™ i7
    - NXP® QorIQ® T4080 SoC
  - GPU Options
    - NVIDIA® GeForce® GTX 965M
    - AMD Radeon™ E8860
  - Gigabit Ethernet Switch Option
- I/O Options
  - Gigabit Ethernet
  - UART Serial
  - USB 2.0
  - Discrete I/O
  - DVI/HDMI Output
  - RGBHV Output
  - Composite Input
  - SDI (SD/HD) Input
  - STANAG Input & Output
  - Audio Input & Output
  - 1553B
  - ARINC-429 Rx & Tx
- SATA Flash SSD Mass Storage
- PCIe VPX Backplane Fabric
- Windows® and Linux® 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

RediBuilt™ Integrated COTS Computer

A190

- Rugged Computer for Military and other Harsh Environment Applications
- Fully Integrated and Tested – Ready to Use
- Front Panel I/O board with MIL DTL 38999 Military Connectors
- CompactPCI or VPX Architecture
- Compact and Lightweight
- Internally Conduction-Cooled; External Convection and Radiation by Fins
- Fully Sealed Faraday Cage and Complete EMI/ RFI Filtering
- Environmentally Sealed
- 18 - 36 Vdc Input Power (MIL-STD-704)
- Choice of Processor - Core™ i7 or NXP T4 Series QorIQ SoC
- High Speed SDRAM
- SATA Flash SSD Mass Storage
- Powerful Graphics Capabilities
- Plentiful I/O
  - Gigabit Ethernet
  - Serial Ports
  - Discrete I/O
  - MIL-STD-1553B
  - USB
  - Video Outputs
  - Audio I/O
  - CANbus
  - ARINC-429
- RTOS Support
  - Windows®
  - VxWorks®
  - Linux®
  - INTEGRITY®

RediBuilt™ Multi-Role Computer

A180

- High Performance PowerPC Platform
- GPS Navigation Receiver
- Digital Map Functionality
- Internal Solid State Mass Storage
- Large Variety of I/O Interfaces
  - ARINC-429
  - ARINC-708
  - Analog In/Out
  - Digital In/Out
  - Ethernet
  - MIL-STD-1553B
  - Serial Communication
  - USB 2.0
  - Discrete I/O
  - Analog & Digital Video In/Out
  - Stereo Audio Output
- Supports Video with Graphics Overlay
- Full BIT Capability
- Rugged Small Form Factor Enclosure
- Light Weight System: < 7.5 kg
- Internally Conduction Cooled Externally Convection Cooled
- Modular 28 Vdc Power Supply
- EMI/RFI Protection
- RTOS Support
  - VxWorks®
  - INTEGRITY®

Rugged Compact PC (RCP)

A172

- Rugged Reduced SWaP PC
- Flexible Configuration Options
  - CPUs
  - Memory
  - Mass Storage
  - OS
- I/O Interfaces
  - Gigabit Ethernet
  - Serial Ports
  - USB 2.0
  - Stereo Audio Line IN + Line OUT
  - Discrete I/O
  - DVI Outputs
  - CANbus
  - Composite Video Inputs
- Mini PCIe Slot for I/O Expansion
- Enhanced Security Features:
  - Removable Mass Storage Offers Quick/Secure Erase (DoD 5220.22-M)
  - Unrecoverable Data Destruct
- D38999 I/O and Power Connectors
- Wide Input Voltage Range
- MIL-STD-704 and MIL-STD-1275 Compliant
- Modular Design
- Operating System Support
  - Windows® - VxWorks®
  - Linux®
- Environmentally Sealed (IP65)
- Natural Convection Cooled
- No Electrolytic Capacitors
- Compact and Lightweight

I/O Expansion Subsystem

A175

- Expands Avionics Computer I/O Capabilities
- MIL-STD-1553B Interface to Avionics Computer
- Powered from a standard 28V input per MIL-STD-704D
- Faraday Cage Enclosure
- EMI/RFI filtering of I/O signals per MIL-STD-461/2
- Large Variety of I/O Interfaces
  - ARINC-429 In/Out
  - Analog In/Out
  - Discrete In/Out
  - Serial Ports
  - Reference Voltages
- Onboard Temperature Sensor
- Elapsed Time Meter
- Compact and Lightweight
- Single Board High Reliability Design
- Extremely Low Power Consumption
- Environmentally Sealed
- Natural Convection Cooled

VideoPaC™ PowerPC with Video & Graphics VPX SBC

CB912

- Rugged 3U VPX Single-Slot SBC + Video/Graphics XMC combination
- NXP QorIQ Multicore SoC
  - 12/8/4 e6500 Dual Thread Cores (T4240/T4160/T4080)
  - AltiVec™ Unit
  - Secure Boot and Trust Architecture 2.0
- AMD Radeon E8860 (Adelaar) GPU
  - 6 Independent Graphic Heads
  - 2 GB GDDR5
  - 640 Shader Processing Units
- PCIe and 10G (XAUI) Fabric Options
- 4 GB DDR3L with ECC
- 128 MB NOR Flash Memory
- 16 GB SATA Flash Drive
- 512 kB NVRAM (MRAM)
- Versatile I/O
  - USB - Serial - GbE
  - SATA - Discrete
- Video Outputs
  - DVI/HDMI - RGBHV - Composite
  - S-Video - STANAG 3350
- Video Inputs
  - SDI (SD/HD) - Composite
  - S-Video - STANAG 3350
- WWDT, IPMI, ETR, RTC, Temp. Sensors
- VxWorks®, INTEGRITY® Support
- OpenVPX Compliant
- 2LM Option per VITA 48
- Conduction and Air-Cooled Versions
- Vibration and Shock Resistant

24 + 4 Port 19" Managed Ethernet Switch

A660

- Managed Gigabit Ethernet Switch
- 19" Single Slot (1U) Rack Mount Form Factor
- Layer 2 and Layer 3 Management
- 24 x 1000Base-T Ports
- Four 10-GbE Ports support SFP + Modules
- Option for Eight 1000BaseX SERDES Ports (factory configuration)
- Full Wire-speed Non-blocking Forwarding
- IP Routing Functionality
- Advanced Spanning Tree Algorithms (RSTP, MSTP)
- Access Control List (ACL) Support
- QoS Management
- IPv4/v6 Differentiated Services (DiffServ)/DSCP Traffic Prioritization
- WEB and CLI Configuration and Monitoring
- 802.1Q-based VLAN Support
- Port-level Security via 802.1X Authentication
- SNMP v1, v2c, v3
- Supports OSPF v3, PIM
- 4/8/16 Group LAG Support with Protocol (LACP)
- All types of Storm Control
- Port Mirroring for Noninvasive Monitoring of Switch Traffic
- Jumbo Frame Support (10 kB)
- IPMI Support
- Power Controller
- Elapsed Time Recorder
- Temperature Sensors
- Real Time Clock

2 x24-Port Rugged Managed Ethernet Switch

A661

- Managed Gigabit Ethernet Switch
- Rugged Cold Plate Cooled Enclosure
- Layer 2 and Layer 3 Management
- 2 x 24 1000Base-T Ports
- Full Wire-speed Non-blocking Forwarding
- IP Routing Functionality
- Advanced Spanning Tree Algorithms (RSTP, MSTP)
- Access Control List (ACL) Support
- QoS Management
- IPv4/v6 Differentiated Services (DiffServ)/DSCP Traffic Prioritization
- WEB and CLI Configuration and Monitoring
- 802.1Q-based VLAN Support
- Port-level Security via 802.1X Authentication
- SNMP v1, v2c, v3
- Supports OSPF v3, PIM
- 4/8/16 Group LAG Support with Protocol (LACP)
- All types of Storm Control
- Port Mirroring for Noninvasive Monitoring of Switch Traffic
- Jumbo Frame Support (10kB)
- Integral Rugged Power Supply
- Temperature Sensors

Space Products

Aitech is unique in that we design and manufacture radiation hardened and radiation-tolerant boards and sub-system products specifically for manned or unmanned, Earth-orbit and deep space environments. These products are specially designed and manufactured with a cost-effective parts selection process to meet specific space requirements with select space-qualified materials. They also feature mechanisms to mitigate the effects of ionizing radiation, including latch-up protection/circumventions and single event upset detection and protection. And Aitech actually performs radiation tests and characterizes each production lot of flight parts ourselves. We do this at fully qualified facilities with component lot- and date-code-traceability by card assembly to the most stringent NASA "Criticality-1" workmanship standards, ensuring the highest product quality.

Space Products

Product	Description
Space Single Board Computers (SBCs)	
S950	3U cPCI Radiation Tolerant PowerPC SBC
SP0	3U cPCI Radiation Tolerant PowerPC SBC
SP0-S	3U cPCI Radiation Tolerant PowerPC SBC - Recommended for new designs
Space I/O	
Ai-RIO™	Space-qualified Remote I/O Interface Unit with Mil & Aerospace Options
S703	MIL-STD-1553 PMC
S730	3 port, Spacewire and LVDS interface PMC
S740	Flexible FPGA-based, Multi-protocol Serial comms and discrete GPIO PMC
S910	3U cPCI dual or quad channel MIL-STD-1553 Card
S930	3U cPCI Analog I/O Card
S931/932	3U cPCI Analog I/O card with 64 RTD and POT inputs
S940	3U cPCI Digital I/O Card
Space Memory	
S990	3U cPCI Non-Volatile Memory Card
S992	3U cPCI Non-Volatile Memory Card
Space Switches	
S750	4 port, managed/unmanaged 1 GbE switch PMC
Space Enclosures	
E900	8-Slot 3U cPCI Enclosure with Radiation Tolerant Power Supply Modules
E901	5-Slot 3U cPCI Enclosure with Radiation Tolerant Power Supply Modules or 2P217
E902	2-Slot 3U cPCI Enclosure with 2P217
E903	3 slot, 3U cPCI enclosure with Radiation Tolerant Power Supply Modules
E905	3 slot, 3U cPCI 1/2 ATR format enclosure with Radiation Tolerant Power Supply Modules
Space Carriers, TMs, Misc	
TM950	3U CompactPCI S950 Transition Module
TMSP0	3U CompactPCI SP0 Transition Module
TM750	3U cPCI Transition module for S750
CM950	3U cPCI-PMC Bridged Carrier
CM951	3U cPCI-PMC Bridged Carrier with TTL Discretes and MIL-STD-1553B Interface
S950-EDK	S950 SBC Engineering Design Kit
SP0-EDK	SP0 / SP0-S Engineering Design Kit

Mighty. Small.

- 1 TFLOP of video and signal processing
- Rugged SWaP SFF
- Only 17 W max!

Rugged GPGPU *is* Aitech.

Aitech

Embedded Computing *without* Compromise

Ruggedization Levels

MECHANICAL FORMAT	AIR-COOLED [5]			CONDUCTION-COOLED [6]	
Ruggedization Level	**Series-100 Commercial**	**Series-200 Rugged**	**Series-400 Military**	**Series-200 Rugged**	**Series-400 Military**
Temperature (°C)					
VITA 47 Class	AC1	AC3	AC4	CC3	CC4
Storage	-40°C to +85°C	-50°C to +100°C	-55°C to +105°C	-50°C to +100°C	-55°C to +105°C
Operating	0°C to +55°C [2]	-40°C to +70°C [2]	-40°C to +85°C [1, 2]	-40°C to +70°C [3]	-40°C to +85°C [1, 3]
Vibration (all axes)					
VITA 47 Class	V1	V2		V3	
Random	5-100 Hz PSD = 0.04 g^2/Hz	5-100 Hz; PSD = +3 dB/oct 100-1000 Hz; PSD = 0.04 g^2/Hz 1000-2000 Hz; PSD = -6 dB/oct		5-100 Hz; PSD = +3 dB/oct 100-1000 Hz; PSD = 0.1 g^2/Hz 1000-2000 Hz; PSD = -6 dB/oct	
Shock (all axes)					
VITA 47 Class	OS1	OS1		OS2	
Half Sine/Sawtooth	20g / 11ms	20g / 11ms		40g / 11ms	
Altitude (ft)					
Operating Maximum	15,000	35,000	60,000	35,000	60,000
Relative Humidity					
Operating (non-condensing)	0-90%	0-100% [4]	0-100% [4]	0-100% [4]	0-100% [4]
Conformal Coating					
Acrylic	N/A	Yes	Yes	Yes	Yes
Silicone	N/A	Optional	Optional	Optional	Optional
Urethane	N/A	Optional	Optional	Optional	Optional

[1] **Extended temperature operation to -55 °C is available for select products. Please contact Aitech for additional information.**

[2] Operating ambient air temperature (with sufficient airflow).

[3] Operating card edge temperature.

[4] 100% with urethane or optional silicone conformal coating (limited to 95% with acrylic conformal coating).

[5] Air-cooled boards per ANSI/VITA 1-1994 (VME), ANSI/VITA 1.1-1997 (VME64x), ANSI/VITA 48/48.1 (VPX), or PICMG 2.0 Rev 3.0 (CompactPCI). Air-cooled PMCs per ANSI/IEEE 1386-2001. Air-cooled XMCs per ANSI/VITA 42.0.

[6] Conduction-cooled per ANSI/IEEE 1101.2-1992 (VME), ANSI/VITA 48/48.2 (VPX), or ANSI/VITA 30.1-2002 (CompactPCI). Conduction-cooled PMCs per ANSI/VITA 20-2001. Conduction-cooled XMCs per ANSI/VITA 42.0.

[7] Temperature cycling per ANSI/VITA 47 is an option that requires an underfill process, and is available upon special request. Contact your Aitech sales representative for details.

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