

C164

5th Gen. Intel Core™ i7 6U VME SBC



Embedded Computing
without Compromise



■ Rugged 6U VME Single-Slot SBC

■ 5th Generation Intel® Core™ i7 CPU

- ▶ Quad Core @ 2.7 GHz
- ▶ Iris™ Pro Graphics 6200

■ Up to 16 GB DDR3L with ECC

■ Up to 128GB On-Board SATA SSD, with Encryption, Quick Erase, and Secure Erase

■ AiSecure™ - Aitech Cyber Security Architecture

■ 2 PMC/XMC Slots

Versatile Board I/O

- ▶ USB 3.0 & 2.0
- ▶ Serial
- ▶ Audio In + Out
- ▶ SATA
- ▶ Discrete
- ▶ RGBHV Out
- ▶ GbE
- ▶ CANbus
- ▶ HDMI/DVI Out

■ WWDT, ETR, RTC, Temp. Sensors

■ Removable RTC backup battery

■ Windows®, Linux®, VxWorks®, Red Hawk™ real time Linux Support

■ Conduction and Air-Cooled Versions

■ Vibration and Shock Resistant



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Aitech's C164 is a high-performance 6U VME SBC for embedded and harsh environment applications. The heart of the C164 is Intel's Broadwell platform, featuring a 5th Generation Intel® Core™ i7 Quad Core processor with integrated Intel® Iris™ Pro Graphics 6200, coupled with a companion Lynx Point QM87 I/O Platform Controller Hub (PCH).

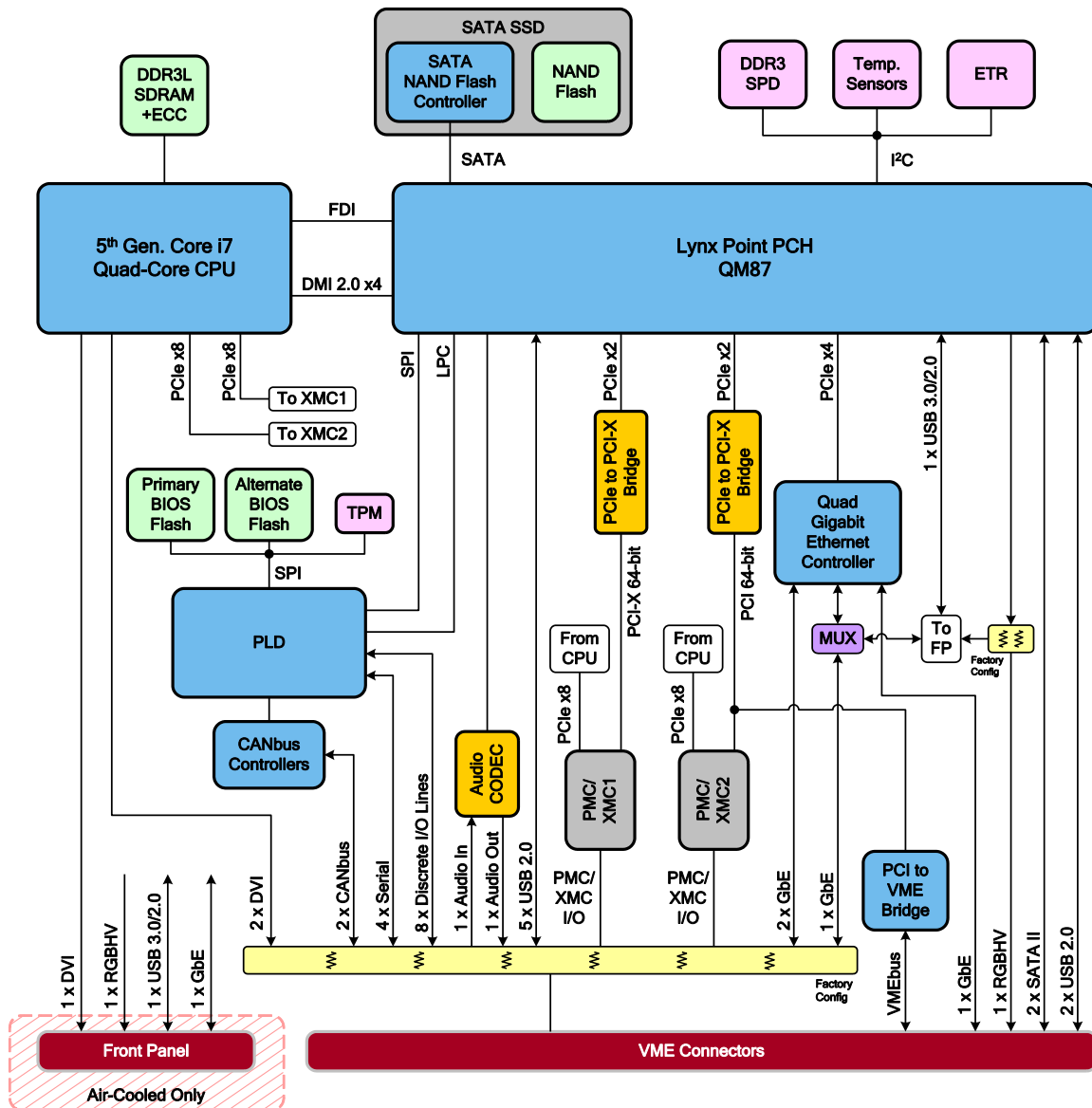
The processor's integrated 2D/3D graphics controller supports graphics and video processing and provides RGBHV and HDMI/DVI outputs.

The C164 integrates large on-board RAM (DDR3L) and mass storage (SATA Flash disk) resources, and provides a variety of popular I/O interfaces to meet a wide range of system requirements. Expandability and further flexibility are provided by two industry standard PMC/XMC slots.

The C164 provides an enhanced Cyber Security platform – AiSecure™ (Aitech Cyber Security Architecture) comprising standard Intel CPU security features (TXT, AES-NI, etc.), as well as an on-board TPM 2.0, and SSD options with AES 256 Encryption, Quick Erase, and Secure Erase features.

The C164 is also pinout compatible with Aitech's C163 4th Gen. Core i7 (Haswell platform) SBC.

C164 mechanical and electrical designs guarantee operation over the full range of rugged application environments. It is available in industry standard conduction-cooled and air-cooled form factors.



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Board Architecture

| | | | |
|------------------------|---|--|---|
| Processor | i7-5850EQ – 5 th 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 | | |
| Chipset | Intel Lynx Point QM87 Platform Controller Hub | | |
| VMEbus | VME64 per ANSI/VITA 1 and VME64x per ANSI/VITA 1.1 | | |
| Board Resources | <ul style="list-style-type: none"> Watchdog Timers (Windowed + Standard) Removable RTC Battery – optional * | <ul style="list-style-type: none"> Temperature Sensors Elapsed Time Recorder | <ul style="list-style-type: none"> Real Time Clock |

* RTC battery is available as a special order option, contact an Aitech representative for more information

Aitech Cyber Security

| | | |
|----------------------------------|---|--|
| Intel & BIOS Security | <ul style="list-style-type: none"> Secure Boot based on Intel TXT, TPM 2.0 Trusted Platform | <ul style="list-style-type: none"> BIOS Modification Protection Boot Guard |
| On-board SSD Security | <ul style="list-style-type: none"> Secure Erase Disk Data Encryption utilizing AES 256 keys (Self Encrypted Disk), TCG OPAL 2.0 | <ul style="list-style-type: none"> Quick Erase |

Memory Resources

| | |
|-------------------|--|
| RAM | Up to 16 GB of DDR3L SDRAM with ECC, operating at 1600 MT/s |
| Flash Disk | Up to 128 GB on-board SATA SSD, SLC & MLC Flash options with AES 256 Encryption (Self Encrypted Disk), TCG OPAL 2.0, Quick Erase, and Secure Erase |
| Boot Flash | Dual BIOS Flash devices (Primary device for normal board operation, Alternate device for board maintenance) |

I/O

| | 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/XMC 2 I/O: Diff Pairs + SE | 0 | 0 | 20 + 38 |

Notes: (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)

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PMC/XMC Slots

| | |
|----------------------|---|
| PMC 1 | 64-bit PCI/PCI-X @ 133/66/33MHz, universal site supports 3.3 V and 5V PCI I/O signaling levels |
| PMC 2 | 64-bit PCI @ 33 MHz, supports 5 V PCI I/O signaling level |
| XMC 1 & 2 | For each site: PCIe x8 port supporting Gen2 and Gen1 speeds and port widths of x8/x4/x2/x1, 5 V VPWR supply |

Software

| | |
|--------------------------|--|
| Operating Systems | Windows®, WindRiver VxWorks®, Linux® and Red Hawk™ real time Linux are supported |
| Drivers | Operating system specific device drivers for board resources are available |
| BIT | Built-In Tests are available |

Mechanical

| | Form Factor & Dimensions | Weight |
|--------------------------|----------------------------------|---------------------|
| Air-Cooled | 6U VME per IEEE Std 1101.10-1996 | < 800 g (1.77 lbs) |
| Conduction-Cooled | 6U VME per IEEE Std 1101.2-1992 | < 1600 g (3.53 lbs) |

Power

| | +3.3 V ⁽⁴⁾ | +5.0 V | +12 V ⁽³⁾ | -12 V ⁽³⁾ | Total |
|--------------------------------|-----------------------|---------|----------------------|----------------------|--------|
| Typical^(1,5) | 0 A | 5.32 A | 0 A | 0 A | 26.6 W |
| Maximum^(2,5) | 0 A | 11.32 A | 0 A | 0 A | 56.6 W |

- Notes:
- (1) Typical power measured during Windows 7 idle condition
 - (2) Maximum power measured during PassMark® BurnInTest (CPU, memory, graphics)
 - (3) ±12V required for PMC/XMC only (not installed during test)
 - (4) In standard configurations of the C164, +3.3 V is generated on-board. The C164 can be factory configured to utilize the backplane +3.3 V supply as a special order option (to reduce required current from +5.0 V supply). Contact an Aitech representative for more information
 - (5) Actual power consumption depends on configuration and assembly options

Environmental

| Specs per VITA 47 | Air-Cooled | | | Conduction-Cooled | |
|--|----------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | Commercial | Rugged | Military | Rugged | Military |
| Operating Temp. | AC1 (0 to +55 °C) ⁽²⁾ | AC3 (-40 to +70 °C) ⁽²⁾ | AC4 (-40 to +85 °C) ^(1,2) | CC3 (-40 to +70 °C) ⁽³⁾ | CC4 (-40 to +85 °C) ^(1,3) |
| Non-Operating Temp. | C1 (-40 to +85 °C) | C3 (-50 to +100 °C) | C4 (-55 to +125 °C) | C3 (-50 to +100 °C) | C4 (-55 to +125 °C) |
| Vibration | V1 | V2 | V2 | V3 | V3 |
| Operating Shock | OS1 | OS1 | OS1 | OS2 | OS2 |
| Altitude | 15,000 ft. | 35,000 ft. | 70,000 ft. | 35,000 ft. | 70,000 ft. |
| Relative Humidity⁽⁴⁾ | 0 - 90% | | | 0 - 95% with Acrylic (Standard), | |
| Conformal Coating | N/A | | | 0 - 100% with Urethane (Optional) | |

- Notes:
- (1) -55 °C available, contact an Aitech representative for more information
 - (2) Operating ambient air temperature (with sufficient airflow)
 - (3) Operating card edge temperature
 - (4) Non-condensing

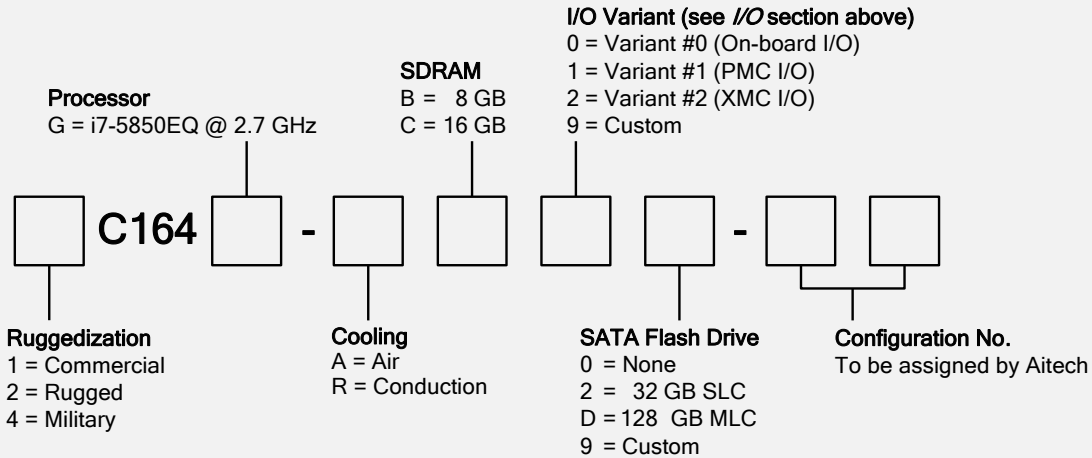
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Ordering Information



Example: 4C164G-RB03-00

Optional Accessories

TM162 Rear Transition Module (RTM) providing convenient access to C164 I/O interfaces via standard connectors and to all PMC/XMC I/O via headers. Supports both air and conduction-cooled C164 mounted in commercial air-cooled chassis. Refer to the TM162 datasheet for further information.

Contact Aitech

Contact your Aitech sales representative for additional product information, and for inquiries regarding customized configurations of the C164 and additional software support.

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