ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

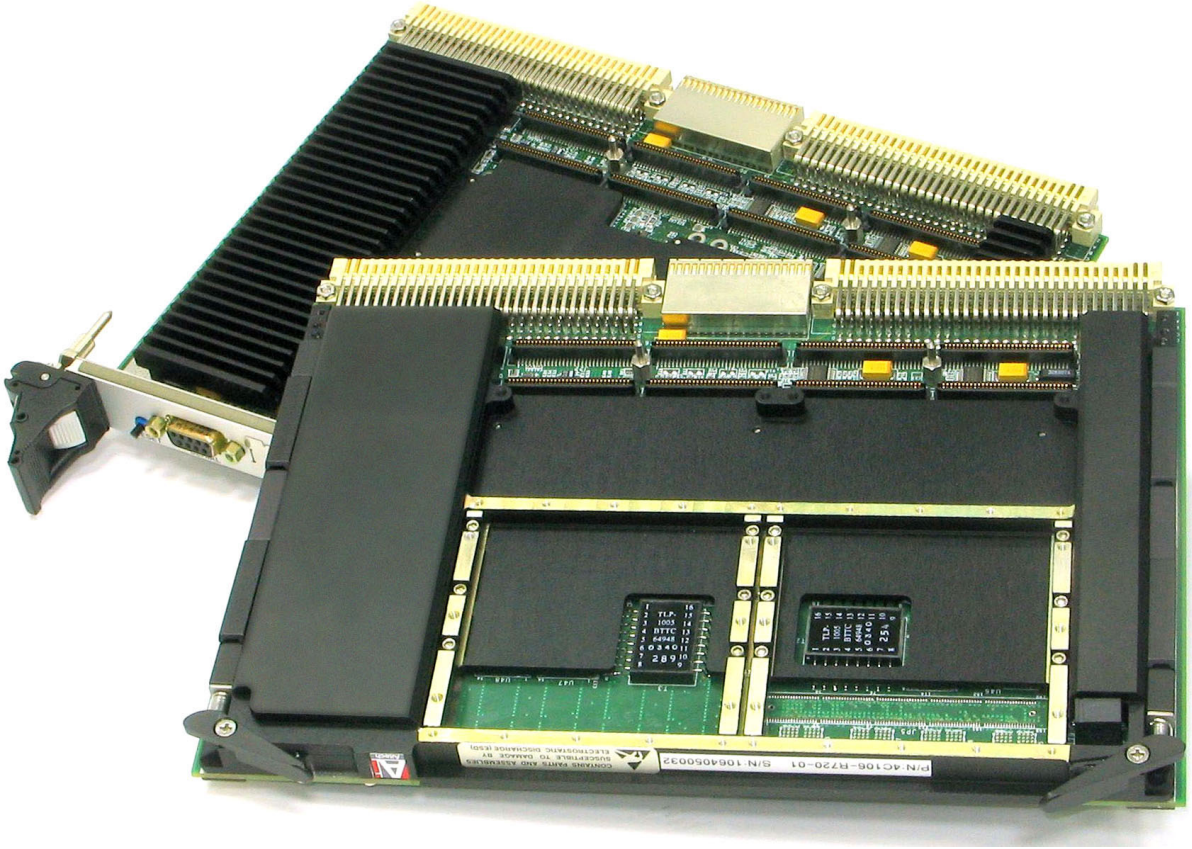
Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Aitech Defense Systems C106* at our website: ***Click HERE***

C106

PowerPC® 7447A SBC with PCI on P0



- Rugged 6U VME Single-Slot SBC
- 64-bit 33 MHz PCI Expansion on P0
- VME64x Compliant
- G4+ PowerPC® MPC7447A Processor @ 1.4 GHz and 1 GHz (low power)
- 32 kB L1 and 512 kB L2 Caches
- Up to 1 GB of SDRAM with ECC
- 64 MB Boot Flash Memory
- 256 MB User Flash Memory
- Up to 4 GB Flash File Memory
- 256 kB NVRAM
- Three 10/100 Ethernet Ports
- Two USB 2.0 Ports
- Two MIL-STD-1553B Ports
- Ten Serial Ports Supporting RS-232/422/485
- 5 Discrete GND/Open inputs
- 2 Discrete GND/Open outputs
- 8 Single Ended TTL or 4 Differential RS-422 Discrete I/O Lines
- Two PMC Slots
- Eight 32-bit Timers
- Watchdog Timer
- Real Time Clock
- 8 High Performance DMA Engines
- Two Temperature Sensors
- Conduction and Air Cooled Versions
- RTOS Support:
  - WindRiver - VxWorks®
  - Green Hills® - INTEGRITY®
  - Green Hills® - INTEGRITY-178B

Aitech Defense Systems, Inc.
A member of the Ai-Rugged Group
9301 Oakdale Ave, Chatsworth, Ca 91311
Tel: (888) Aitech-8 (248-3248) Fax: (818) 718-9787 e-mail: sales@rugged.com web: www.rugged.com

C106 Powerful Processing Combined with Extensive I/O

The C106 is a member of Aitech's C10x VME SBC family. It is designed for harsh environment applications and targeted for very high performance, low power and multiple I/O capabilities.

In addition to the large on board I/O capabilities the C106 is equipped with two on-board PMC sites and 64-bit 33 MHz PCI bus on P0. The C106 may be expanded to manage multiple PMC cards through its on board PMC sites or via PMC carrier board(s) through the PCI expansion bus available at its P0 connector.

This powerful single board computer combines an enhanced processing engine with versatile and flexible I/O. Powered by Freescale's advanced PowerPC® G4+ MPC7447A microprocessor at 1.4 GHz with its integrated on-chip L1 and L2 caches, the C106 provides unmatched processing capability.

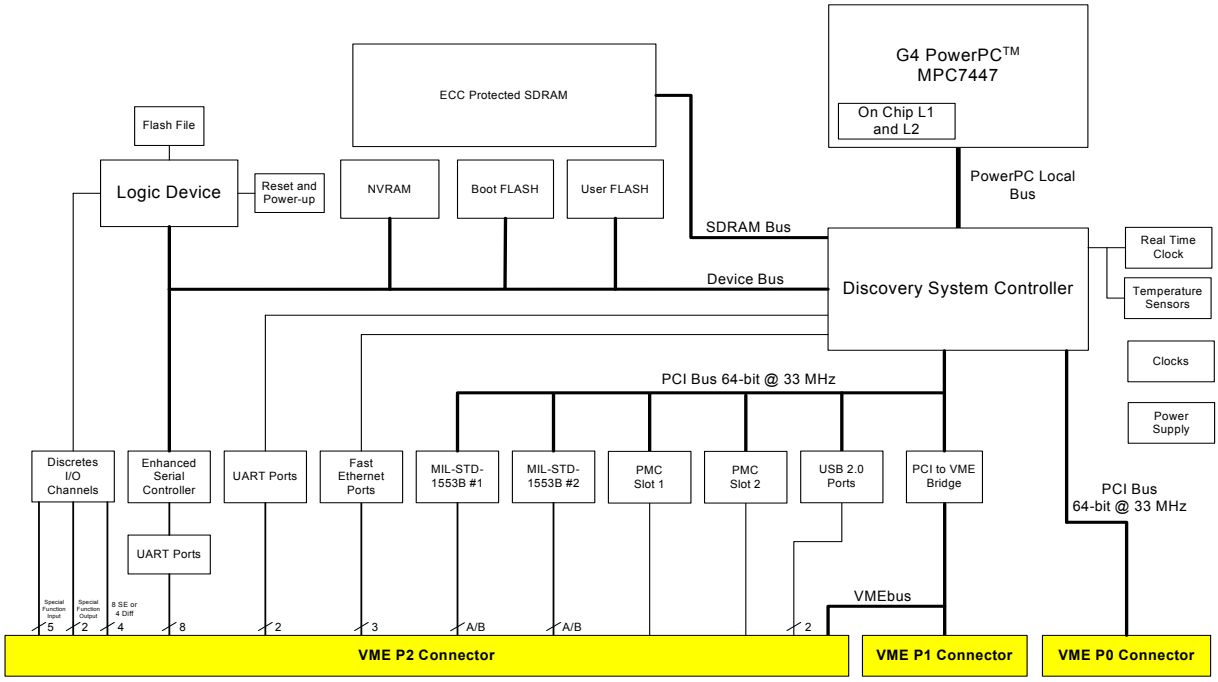
A large and fast SDRAM array is provided with additional memory arrays, such as Flash for user application storage, high-density Flash File for mass storage purposes and NVRAM for user/application specific parameters storage.

In addition to its high performance processor architecture, the C106 provides unparalleled I/O capabilities, all integrated on board. I/O interfaces include three fast Ethernet ports, two dual redundant MIL-STD-1553B interfaces, two USB 2.0 ports, ten standard UART serial ports, and several types of discrete I/O channels.

The C106 internal architecture is based on two 64-bit wide PCI buses operating at 33 MHz. One of these buses is used to host all on-board PCI peripherals and the two PMC sites. The other is routed to P0 and provides a 64-bit/33 Mhz PCI bus expansion over the backplane through the P0 connector, enabling additional capabilities/features integration through a PCI expansion carrier board.

The C106 implements a fully compliant VME64x interface using Tundra's Universe II PCI to VME Bridge.

The C106 highly integrated design guarantees unmatched performance and versatility currently available on any rugged conduction or air-cooled PowerPC® VME SBC.



C106 Block Diagram

Functional Description

Processor and Bus Architecture

The C106 is a powerful processing platform combining a high performance processor and extensive supporting memory arrays. The board's architecture was designed to maximize utilization of all bus interfaces.

Processor

The C106 features the high performance MPC7447A PowerPC® G4+ processor. The MPC7447A is a 32-bit processor integrating both L1 (32 kB instruction/data) and L2 (512 kB) caches on chip to support its powerful processing core.

The MPC7447A Processor provides AltiVec support allowing the user to take advantage of the processor's vector processing capabilities.

Bus Architecture

In order to support the processing unit high performance and to provide a fast highway for data transfer, the C106 implements the advanced highly integrated Discovery™ device.

The Discovery™ is a system controller performing as both the memory controller for the processor and as its bridge to the PCI bus.

The Discovery™ is a system controller performing as both the memory controller for the processor and as its bridge to the PCI bus. The Discovery™ system controller interfaces the processor through the MPX bus at 133 MHz.

To maximize PCI bus utilization and allow different PCI bus configuration, the C106 architecture was designed with two separate and totally independent PCI buses, the local bus and the PCI on P0.

The local PCI bus operates at 33 MHz and supports all local PCI peripherals and the two on-board PMC sites.

PCI Expansion on P0

The PCI on P0 bus supports 64-bit at 33 Mhz operation and fully complies with PCI, Rev. 2.2.

The PCI expansion bus is capable of hosting up to two additional PCI agents providing bus arbitration and interrupt support.

Memory

The C106 is equipped with large memory arrays providing the user with extensive resources. These arrays include up to 1 GB fast SDRAM operating at 133 MHz, 64 MB linear Boot Flash, 256 MB linear User Flash and up to 4 GB Flash File for solid-state mass storage applications.

All SDRAM banks are ECC protected providing high data integrity.

In addition, the C106 provides 256 kB NVRAM (Non-Volatile RAM). This array is a fast Flash shadow type of RAM and does not require an external power supply to maintain its contents during power down.

Another Flash array is dedicated to Firmware storage freeing all the other arrays for user applications only.

VME

The C106 includes a Universe II PCI-VME Bridge device to allow interface between the local PCI architecture and the VME backplane.

The VME interface provides full master and slave capabilities and supports the following:

- A32/A24/A16 addressing modes
- MBLT/BLT/D64/D32/D16/D8 data transfer modes
- Interrupter and handler capability on all seven VME interrupt lines
- Four mailbox and four location monitors for in system board communication
- Full system controller functionality
- Flexible register set allowing manipulation of all VME options

The Universe II Bridge integrates large FIFOs for optimal usage of the two buses on which it resides (PCI and VME). In addition, it includes a DMA engine supporting high data rate transfer. The Bridge interconnects the PCI bus through a 64-bit at 33 MHz PCI bus interface.

I/O Interfaces

In addition to its superior processing power and the more traditional serial I/O capabilities such as the Ethernet ports and serial channels, the C106 offers advanced serial I/O interfaces such as USB. This enables the communication with hosts supporting these protocols and the attachment of advanced fast peripherals and storage devices.

MIL-STD-1553B

The C106 provides two on board dual redundant MIL-STD-1553B ports. These ports are implemented through two separate PCI controllers allowing 32-bit at 33 MHz PCI bus operation. Each of the MIL-STD-1553B ports is capable of BC, RT and MT operation.

The MIL-STD-1553B ports are routed to the VME P2 connector via transformer coupling (default) or direct coupling (optional).

Ethernet

The C106 provides three fast Ethernet ports supporting 10BaseT/100BaseTx.

The fast Ethernet Controllers are integrated in the Discovery™ device allowing fast access to the local SDRAM without loading any of the PCI buses.

Serial I/O

The C106 provides ten serial ports supporting UART operation mode with physical layer capable of RS-232/422/485 interface.

USB

These USB protocol is another widely used interface supported by the C106. The board includes a USB Rev. 2.0 host controller (backward compliant with Rev. 1.0 and Rev. 1.1) providing two EHCI/OHCI Root hubs. The controller integrates the USB transceivers supporting high-speed, full-speed and low-speed signaling. The C106 is capable of providing power to down stream devices. The controller is a PCI device capable of high data transfer rates through the use of its internal FIFOs and DMA engine.

Discrete I/O

The C106 includes two groups of discrete I/O channels – standard channels capable of 8 single ended TTL or 4 differential RS-422 and 7 special channels supporting GND/Open interface.

Standard discrete channels may be configured as 8 single ended TTL channels or 4 differential RS-422 channels. Each channel may be independently configured as input or output.

Special discrete channels include 5 inputs and 2 outputs. These channels operate with GND as logical low (‘0’) and are high impedance when high.

Configured as input each of the discrete channels may be programmed to generate an interrupt on any level shift event.

PMC I/O Expansion

The C106 provides two PMC expansion slots for extended flexibility and integration of additional I/O to the board.

Both PMC slots reside on the C106 PCI system 1 which operates at 64-bit and 33 MHz.

Both PMC slots are capable of hosting IEEE1386/ 1386.1-2001 compliant air-cooled and VITA 20-2001 compliant conduction-cooled PMC modules.

Both PMC slots support 5.0V PCI signaling levels only. 3.3V only PMC may not be installed in this slot. Keying at these slots allows the insertion of PMC modules capable of 5.0V PCI signaling levels.

Special routing considerations are implemented in the PMC I/O signals routing. PMC I/O signals routed from the PMC cards P4 connectors (J14 and J24 at the C106) to the C106 P2 connector are twisted pair and characterized with differential impedance of 100Ω.

I/O Routing

All the I/O interfaces signals are available at the C106 P2 and P0 VME rear panel connectors. These I/O interfaces require more I/O than is available at the VME connectors; therefore some I/O configurations are available. For more information please contact an Aitech Systems representative.

On air-cooled versions, some of the I/O interfaces are available at the front panel. Refer to the front panel section for more information.

Timers

The C106 is equipped with eight 32-bit timers/counters. These timers provide high-resolution timing functionality as well as capability for long interval counting applications.

The C106 includes a Real-Time Clock (RTC) for time and date storage. The RTC is backed up by a large super-capacitor for long-term parameters storage.

A watchdog timer is also available on board the C106. This timer may be programmed for the required time out interval after which it will reset the board.

Front Panel Connectors and Switches

The air-cooled version of the board is provided with a front panel. The front panel includes the following:

- D-Type connector delivering 2 UART ports
- RJ-45 providing a single Ethernet port
- Reset Switch

Temperature Sensors

Two digital temperature sensors are integrated in the board design for thermal management and protection. The two sensors are located at the two edges of the board (the first is adjacent to the processor at one end and the other at the other end). These sensors are accessible by software (through an I^2C interface) and enable the software environment to monitor and take action as desired by the application software.

Software

Test and Diagnostic Features

The C106 is supplied with an extensive firmware package. This package includes startup firmware (boot software), AIMon monitor/debugger tool, AIDiag diagnostic tool, and BIT. BIT may be executed during power-up or at any time after the board has been booted.

The C106 provides a COP/JTAG interface to the processor for debugging and development purposes.

RTOS Support

A BSP (Board Support Package) for the C106 is available for several RTOS (Real-Time Operating Systems), including WindRiver VxWorks, Green Hills INTEGRITY® and INTEGRITY-178B.

Other RTOS BSP may be available upon request.

The BSP includes drivers for all on board resources allowing the user to take full advantage of the board's powerful features.

Mechanical Features

The C106 is available in two mechanical formats:

- Air-cooled per ANSI/VITA 1-1994
- Conduction cooled per IEEE 1101.2

Both mechanical formats are single slot 6U modules. Custom metal frame provides excellent rigidity and shock resistance. In addition, a custom metal frame provides an array of stiffeners to support rugged PMC boards.

Dimensions

- Air-cooled: per ANSI/VITA 1-1994
- Conduction cooled: per IEEE 1101.2

Standard Compliance:

IEEE 1101.2-1992 with wedgelocks and extractors

Weight

Air-cooled form factor:	< 625g (1.38 lbs)
Conduction-cooled form factor:	< 750g (1.65 lbs)

Thermal Management

A careful mechanical design including custom Heatsink modules combined with a metal frame allow optimal heat dissipation and relief of the board.

The C106 provides both primary and secondary thermal interfaces support for CCPMC (Conduction-Cooled PMC).

Power Requirements

The C106 may be configured to receive all its power from the VME backplane +5.0V supply and generate +3.3V using on board power circuits or it may be configured to take the +3.3V also from the backplane supply as defined in the VME64x specification.

Total power consumption of the C106 depends on its configuration and assembly options.

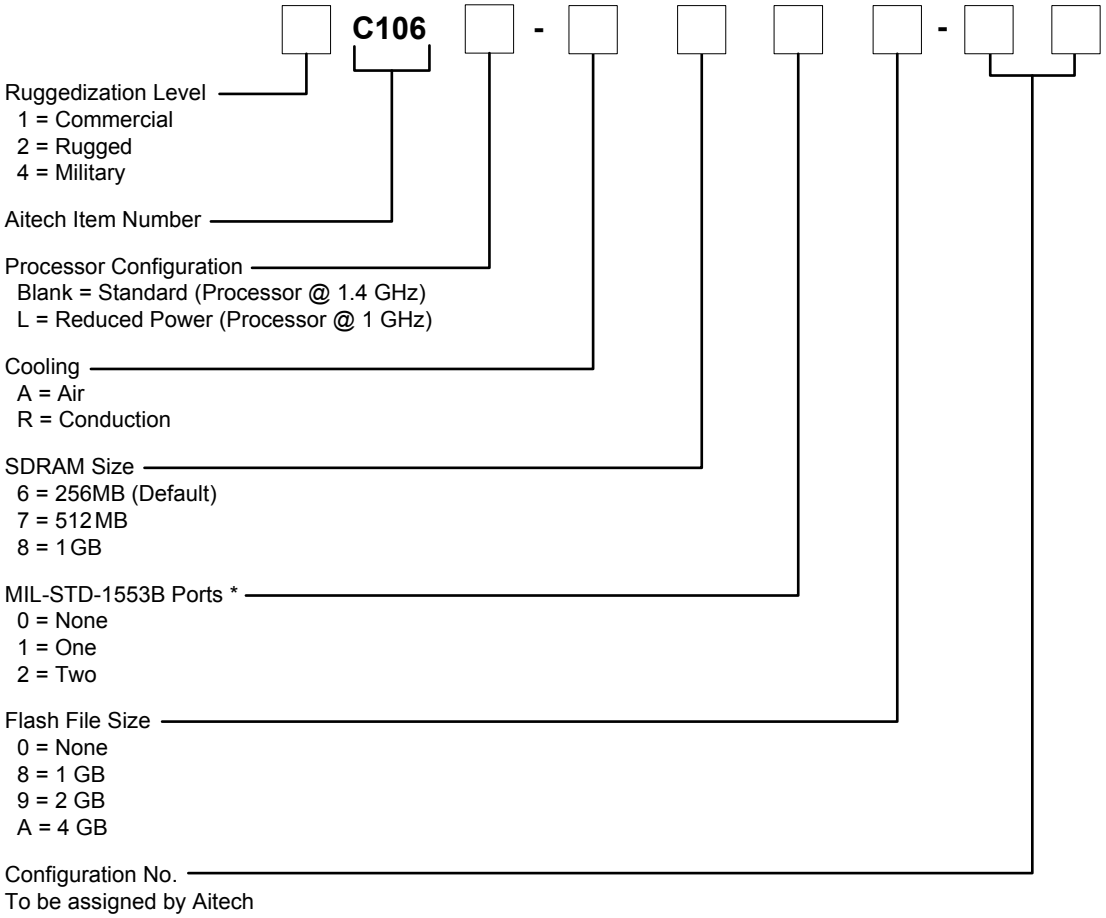
Fully featured and configured to operate from the +5.0V power supply alone, power consumption of the C106 is as follows:

+3.3V	(± 5%)	0A	
+5.0V	(± 5%)	4A (typ)	4.5A (max)
+12V	(± 10%)	0A	
–12V	(± 10%)	0A	

Environmental Features

Please Refer to the Aitech Ruggedization Datasheet.

Ordering Information for the C106



Example: 4C106L-R729-00

* Default configuration of MIL-STD-1553B controllers is transformer coupled. Direct coupling is optionally available.

For more information about the C106 or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

All names, products, and/or services mentioned are trademarks or registered trademarks of their respective holders.
All information contained herein is subject to change without notice.

Aitech Defense Systems, Inc.
A member of the Ai-Rugged Group
9301 Oakdale Ave, Chatsworth, Ca 91311
Tel: (888) Aitech-8 (248-3248) Fax: (818) 718-9787 e-mail: sales@rugged.com web: www.rugged.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP