



Migrating to the Aitech's C108 PowerPC VME SBC

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Introduction

Aitech's C108 has been designed as a drop-in replacement for the C100, C101, C101L, and C103 boards. The basic functionality of all of these boards is the same, but the C108 has some additional features, like a CAN bus interface instead of the FireWire interface in the previous boards. The following list summarizes the changes implemented in the C108.

- Processor upgraded to MPC7448
- FireWire Interface removed
- CAN bus interface added
- USB Solid State Disk (SSD) added
- Temperature Sensors added
- Elapsed Time Meter added
- Power Monitor added
- Windowed (Avionic) Watchdog Timer added

These changes were made based on customer feedback and the up-to-date requirements of systems that are potential target applications for the C108. CAN bus interfaces are now being used in many new systems while the FireWire interface is seldom used in the C108's target applications. The SSD provides a convenient way to store large amounts of data and software on-board via a USB interface, in addition to the Flash memory banks from the previous generation of SBCs, which continue to be available on the new C108 (configurable item).

The MPC7448 processor provides higher performance than the MPC7457 used on the C100/1 SBCs while consuming less power.

In the case of the C103, moving to the C108 upgrades the PPC750GX processor to the MPC7448, which features higher performance and AltiVec™ functionality, which was not previously available on that board.

A number of parts obsolescence issues have also been addressed in the C108 design. The Gigabit Ethernet and Enhanced Serial Controller devices on the C100/1/3 SBCs are now obsolete and can no longer be procured. These have been replaced with new devices on the C108.

The C108 functionality and features are fully described in the C108 datasheet and User's Guide.



Upgrading to the C108

In many cases the C108 can replace Aitech's C100/1/3 SBCs in existing systems without any modification to the system whatsoever. The CAN bus interface uses the I/O pins previously assigned to the FireWire; systems that do not require the FireWire interface will be able to access the CAN bus interface via these same pins.

All other new resources are accessed via the VMEbus, requiring no new I/O pins.

Part numbering for the C108 is the same as for the C100/1/3, except that C108 part numbers have an additional character denoting SSD size (refer to the ordering information section of the C108 datasheet for complete ordering information). This makes it easy to determine the appropriate C108 part number when upgrading from a previous generation board. If the required functionality remains unchanged, the recommended upgrades are (s denotes SSD size):

From	To
C100-wxyz	C108-wxyzs
C101-wxyz	C108-wxyzs
C101L-wxyz	C108L-wxyzs
C103-wxyz	C108L-wxyzs

Board Support Package (BSP)

Application software written for the C100/1/3 may require some minor modifications when migrating to the C108. The API for the C108 is largely the same as the C100/1/3 API but some functions have changed in order to improve functionality and as the result of replacement of obsolete devices. In addition, new functions have been added to support new on-board resources. The following APIs are affected:

- Discrete I/O (improved API)
- PCI Interface (improved API)
- Serial I/O (due to new device)
- Temperature Sensors (new functionality)
- Power Monitor (new functionality)
- Elapsed Time Meter (new functionality)
- Watchdog Timer (improved API)
- Windowed Watchdog Timer (new functionality)
- Power Management (new functionality)
- VME (improved API - backwards compatible)



The memory map of the C108 also differs from the previous generation SBCs. The change is entirely transparent to the user, such that no changes to existing systems or application software are required. The C108 memory map and PCI maps are described in detail in the C108 User's Guide.

The C108 API is described in detail in the API Reference chapter of the C108 BSP Programmer's Guide. Changes that need to be made to existing C100/1/3 application software are described in a document to be provided to customers who wish to upgrade to the C108. The required changes are minor and straightforward, and Aitech will provide support to customers migrating to the new board.

Transition Module

To facilitate application software development Aitech offers the TM108 transition module. Similar to the TM100 that was used with C100/1/3 SBCs, the TM108 provides convenient connectivity to all I/O resources of the C108, including the CAN bus interface, when using the C108 in commercial air-cooled enclosures in the laboratory environment.

Conclusion

In most systems and applications the C108 is a drop-in direct replacement for the C100/1/3. Changes to the hardware interface only affect systems using the FireWire interface. Changes to the API are similarly minor and can be easily accomplished.