

Application Note PC



Personal Computer Requirements - Choosing the right PC for P7882, P7887, P7888, P7889 and MCA-3 Systems

The purpose of this application note is to help you select a PC for use with a PCI-based Multichannel Analyzer and P7882/P7887/P7888/P7889 TOF/Multiscaler.

Motherboard: We recommend ATX motherboards from **Supermicro, INTEL, ASUS, MSI, etc. with a BIOS that supports three or more PCI slots Version 2.1.**

Motherboards with a PCI-X slot: Supermicro

These motherboards are suited for scientific instrument applications as they enable the use of full length PCI PC boards. In some cases ISA slots are still necessary. Pentium 4 boards have usually no ISA slot, but there are still PC solutions with the latest processors that can provide ISA slots if needed.

Many other motherboards will work as well but there are several brand name computers that have „improved BIOS and PCI-bus timing“ - they significantly deviate from the PCI 2.1 standard and may or may not work well with our boards (for example Compaq, Dell, HP etc).

Processor: Pentium D or AMD Athlon 64 processor should be used. For the P7889SYS we strongly recommend to equip the PC with a Pentium D 9xx processor.

Hard Disk Drives with SATA II interface will give best results. RAID Controllers increase the data throughput, this should be taken into account if **list file writing** is important.

For MCA-3 and P788x with event rates < 15 million/s we recommend WD RAPTOR Series HDD disks. An even higher throughput is possible with a **64 bit PCI SCSI RAID** controller driving four or more SCSI harddisks. We have verified with a dual processor Supermicro motherboard to write list files with a sustainable data rate of 50 to 60 MB/s, corresponding to an event rate of 15 to 22 million/s. The architecture of the dual core processor with two separated PCI busses (32 bit and 64 bit) enhance the data rate.

Graphic boards have today a minimum of 128 MB RAM. The board should be a PCI-express version with two outputs to connect one or two LCD monitors.

Case: make sure there is sufficient air flow to keep our boards cool. We suggest adding a second fan. We recommend a 19" industrial case as it provides the best cooling and mechanical stability.

A standard powersupply of at least 300 Watt, 500 Watt for a P7889SYS is recommended.

Operating system: We recommend XP Professional or Windows 2000.

FAST ComTec will be glad to quote any size PC suitable for your requirements. We offer complete systems - like the P7889SYS pictured below with all components installed and performance tested in our factory prior to shipment.

The MCA-3, P7887 and P7888 Series Multiscalers are PCI Local Bus Version 2.1 compliant devices. As such the board contains the configuration space register organization as defined by the PCI Local Bus Specification. Among the functions of the configuration registers is the storage of unique identification values for our devices as well as storage of base address size requirements for correct operation specific to each of our products.

The host computer in which our products are installed is responsible for reading and writing to/from the PCI configuration registers to enable proper operation. This functionality is referred to as „Plug and Play“ (PnP). As such the host computer PnP BIOS must be capable of automatically identifying a PCI compliant device, determining the system resources required by the device, and assigning the necessary resources to the device. Failure of the host computer to execute any of these operations will prevent the use of the MCA-3, P7887 and P7888 Series Multiscalers in such a host computer system.

It has been determined that systems that implement PnP BIOS, and contain only fully compliant PnP boards and drivers, operate properly. However, systems that do not have a PnP BIOS installed, or contain hardware or software drivers, which are not PnP compatible, may not successfully perform a PnP initialization. This can render the MCA-3, P7887 and P7888 Series Multiscalers inoperable. It is beyond the ability of FAST ComTec's hardware or software to force a non-PnP BIOS system to operate the MCA-3, P7887 and P7888 Series Multiscalers.



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Important Information on Hardware Compatibility for PCI devices

Verify that the computer you intend to use is fully PCI Version 2.1 compliant (including the BIOS) by contacting the manufacturer.

If problems are encountered after installation of our boards in a fully compliant PC, check the device manager for conflicts (operating system dependent).

In such cases try to shuffle the installed boards in different PCI slots before you attempt to reconfigure your PC (deinstallation of all boards and re-installing the boards one-by-one starting with our board to see which of the other boards causes the conflict).

FAST ComTec uses AMCC S5933 PCI controllers. They are fully compliant to Rev.2.1 of the PCI standard. For more information contact the webpage of AMCC:

<http://www.amcc.com>

or the PCI Special Interest Group:

<http://www.pcisig.com>

Selected board sizes:

P7888 Series/P7887	PCI long card
P7889	PCI-X long card
MCA-3	PCI long card
MS-12	ISA ½ length

If you are experiencing problems with your PC:

1) If you are using a standard PC (without a modified BIOS) you should try to use WIN-XP or WIN 2000 as an operating system.

Put the P788x or MCA-3 in different slots and check if they now work.

If all this does not help, remove all other boards. If the P788x or MCA-3 now works, insert one board after the other until you see that the P788x or MCA-3 no longer works. Exchange the board that causes the problem with a different make.

Usually it is the Local Area Network board that is the culprit. If a RAID-controller is installed, please disable it - if possible.

2) Here is a list of motherboards our customers are presently using in their PC's (May 2006):

- Motherboards:
 - **Supermicro** (FAST ComTec recommendation)
 - ASUS
 - MSI
 - IBM (preferably the Chinese versions)
 - INTEL
 - GIGABYTE

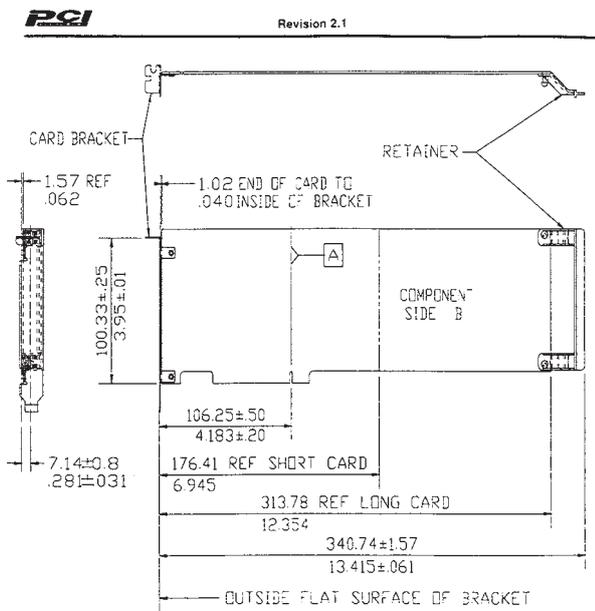
(Try not to use models with built-in graphics and RAID controller!!!)

Recommendations for P788x and MCA-3 boards:

- Processors : PENTIUM D, Athlon 64
- Hard Disks :
 - not limited
 - If list-mode is used, we suggest:
 - WD Raptor 74 GB and 150 GB
 - WD or SEAGATE 250 GB or higher (RAID Mode 0 would not be very helpful)
- Graphic board - any should do. Look for two outputs.
- Should more than one P788x or MCA-3's be installed, use extra fans for cooling.

Recommendations for P7889

- Processors : PENTIUM D 9xx
- Motherboard: Supermicro Model PDSGE



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