



Frequently Asked Questions on Cactus Industrial-Grade Flash Storage Products

White Paper CTWP000

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1 I use an CompactFlash/PCMCIA to ATA adapter and the BIOS cannot detect the card as an IDE drive.

This may be caused by the following:

- A Your CF/PCMCIA to ATA adapter does not support DMA.

For CF/PCMCIA to ATA adapters to support DMA correctly, the signals DMARQ and DMACK# must be connected from the connector to the ATA interface. Please check with the manufacturer of your CF/PCMCIAATA adapter.

- B Your BIOS or firmware does not support Multiword DMA correctly.

Please contact your system vendor for updated BIOS / firmware that supports Multiword DMA. If the BIOS / firmware has option to disable DMA, disabling DMA is an interim measure. However, performance may be slower without DMA.

For older systems that have trouble operating with DMA enabled on the product, Cactus can provide nonDMA products for these systems. Their part numbers end in 2x2/4 to indicate standard PIO and DMA transfer modes.

- C Timing issue between the product and the host ATA bus. Sometimes adding a delay for detection may help.

2 The product's performance is slow. What can I do?

- A Make sure the card is running under TrueIDE mode. TrueIDE mode provides the highest performance with advanced PIO and DMA data transfer modes.

- B Make sure you use a good quality CF USB adapter or USB multi-card reader compliant to USB 2.0 (HighSpeed). USB 1.1 or 2.0 (Full Speed) adapters and hosts will limit the maximum transfer speed to 1000KB/s. We have observed some USB 2.0 (HighSpeed) multi-card reader limited our speed to approximately 2000KB/s for both read and write operations.

- C For PC Card flash cards and CF cards with CF/PCMCIA adapters, the maximum speed is limited by PCMCIA ATA specifications to 1200-1500 KB/s. Advanced data transfer modes are not supported under PCMCIA ATA modes.

3 What is Multiword DMA and how can I use that to enhance performance?

MultiWord DMA (MWDMA) alleviates processor loading by directly transferring data between the disk and the memory and data is transferred between the device and ATA bus in multiple 16-bit words. Cactus Technologies products supports MWDMA mode 0, 1 and 2 by default.

4 I cannot enable DMA mode under Microsoft Windows.

- A Make sure DMA mode is enabled under the BIOS.

Some BIOSes do not automatically enable DMA support and that may prevent Microsoft Windows from using fastest transfer mode to access the drive.

- B Force Microsoft Windows to re-detect the fastest DMA settings for each device on the ATA bus.

Microsoft Windows will fall back to PIO mode when 6 consecutive DMA CRC errors are encountered from the device. The only way to reset the fastest DMA mode is to remove the device from Windows, remove the device and reinstall the device.

The DMACHK utility forces Windows (NT, 2000 and XP) to redetect the highest available transfer mode on each device of each ATA channel. This utility is available from the following WWW address.

<http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/q191/7/74.asp&NoWebContent=1>

- C Make sure the ATA cables are of good condition.

We do not recommend using 3.5" to 2.5" adapter boards or long ATA cables for 2.5" SSD and DOM. Poor quality adapter boards or ATA cables introduce noise between the drive and the host ATA bus and causes read/write errors.

We strongly suggest the use of 80-pin ATA cables no longer than 18 inches to be used for systems with DMA operations with CF/PCMCIAATA adapters. We also recommend plugging 2.5" SSD and DOM to the host system connector directly without additional cabling.

To take advantage of MWDMA support on Cactus products, the host must support DMA in compliance to ATA specifications. Cactus PC Cards and 203 series CF Cards must also run in TrueIDE mode to enable DMA transfer modes. Cactus 303 series CF Cards support DMA operations in PC Card Modes also.

5 I removed the CF/PCMCIA card from the system during read/write access and now the card is not working. What can I do?

Try reformat the card with a CF/PCMCIA ATA adapter under TrueIDE mode. Sometimes the file system can be corrupted if the file system on the CF/PCMCIA card is still mounted by the operating system when the card is physically removed. FAT is particularly susceptible to this type of corruption.

If the card is no longer recognized by the system under BIOS or other ATA device enumeration mechanisms then the card may require a factory low-level format as the internal device data structures may be damaged by the accidental removal.

For product repair and warranty support, please contact your local Cactus sales representatives.

6 I want to install Microsoft Windows on a Cactus CompactFlash/PCMCIA card but at setup I received an error saying that no fixed disk is detected; what can I do?

Microsoft Windows (standard and embedded editions) can only be installed on disks and CF/PCMCIA cards that report to the BIOS as fixed disks. This is a Microsoft limitation unrelated to our products. To install Microsoft Windows on Cactus CF/PCMCIA cards, please order the products with the following part number:

CF KCXXXMF(I)203/303

PCMCIA KPXXXMF(I)203/303

The 2.5" SSD and DOM products always report to the system as fixed disks and are unaffected by this limitation.

7 Why does the PC Card run slowly under PCMCIA mode?

For PC Card and CF flash cards with CF/PCMCIA adapters, the maximum speed is limited by PCMCIA-ATA specifications to 1200-1500 KB/s. Advanced transfer modes are not available under PCMCIA-ATA mode.

8 CF card and 8-bit memory mapped mode access is returning garbage data!

For applications requiring 8-bit memory mapped mode access, Cactus has a special CF card built specifically for this purpose. Please contact your Cactus distributor for further information.

01**Support Information**

If you would like any additional information regarding data contained in this white paper feel free to contact a Cactus representative:

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