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Product Alert

Product Name: **FireBridge 82C814 PCI Bridge**

Title: **Software Support Issues**

Date: **April 16, 2001**

Scope

This document describes the support software required for application of the OPTi 82C814 Docking Controller as a PCI bridge for a multi-function PCI card. The version suitable for these applications is revision 1.2, identified by a four-digit code of "12UE" that is stamped on the top side of the chip.

Only support issues with Microsoft Windows are discussed in this document. Linux drivers and Apple Mac OS drivers for this product are not available or have not been evaluated as of the time of this writing. No 82C814 support is available under Win NT 4 and earlier.

Issue #1 – Enumeration

The 82C814 chip can experience enumeration failures when used under Windows 95 and Windows 98 Gold (first edition). Device Manager reports not having sufficient I/O resources.

This is a known problem. Updated Microsoft drivers to correct the problem are part of Win 98 SE. OPTi can distribute the updated drivers for Win 98 Gold and Win 95 separately for existing applications, but recommends that all new applications specify Win 98 SE.

Note: Numerous improvements were made in Microsoft USB support with Win 98 SE. Therefore, any multi-function board incorporating a USB host controller would also need to specify Win 98 SE or above for proper operation.

Issue #2 – Overlapping Resources

When there are multiple devices behind the 82C814 chip, it can be incorrectly assigned overlapping resources by Windows Me. The result can vary from misoperation to a system hang.

This is a known problem only under Win Me. An updated Microsoft driver to correct the problem is available directly from OPTi and is identified as shown. Refer also to Microsoft Knowledge Base article Q268452.

```
Date        Version   Size    File name
-----------------------------------------
08/30/2000  4.90.3001 120,845 CONFIGMG.VXD
```

Issue #3 – Deadlock

A PCI bus deadlock can occur when master devices on both sides of the 82C814 PCI bridge insist on completing their respective transfers before releasing the bus. This situation is seen primarily in systems that incorporate an additional PCI-PCI bridge, such as the Intel 810 chipset.

The 82C814 architecture incorporates a mechanism to automatically escape from a bus deadlock situation. However, this mechanism must be explicitly enabled through software on revision 1.2 silicon. Refer to OPTi Product Alert PA061 for hardware details of this issue.

This software enabling can be effected under Win 98 SE and Win Me as follows. Win 95 and Win 98 Gold operating systems must be upgraded at least to Win 98 SE before implementing this fix.

Win 98 SE, Win Me: Before installing the 82C814-based PCI card, edit the `PCMCIA.INF` file in the `WINDOWS\INF` directory as follows.

Immediately under the `[OPTICBReg]` line, insert the following text (all on a single line, no spaces):

```
HKR,,CBSSDevInit,3,02,00,5e,50,b0,02,00,00,
b0,02,00,00
```

If the card has been installed prior to making this change, it will be necessary to start Windows in Safe Mode and remove the 82C814 entry from Device Manager before this change will take effect.

Win 2000, Win XP: These operating systems do not offer an .INF file option for register settings. Updated Microsoft drivers to make the needed changes are available directly from OPTi.

```
Date        Version   Size    File name
-----------------------------------------
(details not available at time of writing)
```

Issue #4 – Multi-Level Rebalance

This problem can be seen only in Win 2000 and Win XP.

When attempting to enumerate multiple PCI devices behind the 82C814 bridge, some may fail to enumerate properly. Device manager reports not having sufficient I/O resources.

To see the failure, the PCI devices must be requesting a combined total of greater than 512 bytes of I/O addressing space. As long as the Base Address Registers do not require more than this amount, enumeration occurs properly. This problem can be seen on all CardBus-type controllers, not just the OPTi 82C814 part.

Win 2000 and Win XP currently lack a feature, known as multi-level rebalance, that was part of Win 95, Win 98, and Win Me. Multi-level rebalance would allow the operating system to dynamically, and without specific limit, assign I/O resources. Instead, Win 2000 and Win XP have a predefined I/O window of 512 bytes that cannot be exceeded.

While this feature is expected to be re-introduced in future versions of Microsoft Windows, at present there is no workaround. Therefore configurations requiring more than 512 bytes of I/O resources must be avoided in 82C814 designs.