

USB DMA issues on AM335x boards

The information in this document is relevant for all PHYTEC products populated with the Texas Instruments AM335x microcontroller and running with kernel version 3.2.

PHYTEC AM335x boards running with kernel version 3.2 may show USB issues when DMA is enabled.

The PHYTEC AM335x 3.2 kernel is based on the TI PSP 04.06.00.11 Release, which is also included in the Sitara SDK 6.00.00. Thus a description of this issue can also be found on the TI web side at:

http://processors.wiki.ti.com/index.php/Sitara_SDK_6.00.00_Release_Notes

"Devices which use the Mentor MUSB core currently disable the DMA due to instability issues. This will cause degradation from the expected USB throughput performance. The DMA support can be enabled in the kernel depending on your use case. The most commonly affected use cases are when the USB core is being used in host mode and there is both DMA and PIO traffic occurring at the same time. This has been observed with many USB WiFi adapters as well as when doing I/O operations to one device which inserting or removing another device. If you choose to enable DMA you should extensively test your use case to verify that no lockup occurs."

We could reproduce this issue on different boards, using a USB HUB and connecting 2 USB sticks. Reading and Writing on both sticks at the same time produced I/O errors.

This issue could not be reproduced when DMA is disabled.

Workaround :

We recommend to disable DMA or to at least test your use case extensively.

Disabling DMA in BSP:

1. Change into the BSP directory
2. Change kernel config like this:
ptxdist kernelconfig

Device Drivers --->

[*] USB support --->

[*] Disable DMA (always use PIO)

3. Exit and Save the kernelconfig
4. Rebuild the kernel with:
ptxdist targetinstall kernel

Please contact our support if you need any further information.

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