



Windows Embedded CE 6.0 TI ARM-A8 BSP for
AM35xx/OMAP35xx/AM37xx/DM37xx

Version 01.01.00.PATCH_01

Release Notes

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1. Trademarks

Windows and Microsoft are registered trademarks of Microsoft Corporation. All other trademarks are property of their respective owners.

2. Introduction

This document provides information for TI ARM_A8 WINCE 6.0 BSP release.

TI ARM_A8 BSP is designed for TI AM35x processor family, OMAP35x processor family and AM/DM37x processor family.

It supports two platforms: the AM35x BSP, compatible with the LogicPD AM3517 eXperimenter Kit, and the OMAP35x BSP, compatible with OMAP 35x EVM Board(for both OMAP35x processor family and AM/DM37x processor family).

OMAP35x processors and AM/DM37x processors share the same BSP, hence the same image can run on both processor families.

The BSP release contains the following packages:

- ARM_A8 WINCE BSP for AM35x and OMAP35x EVM.
- DVSDK 01.11.00 release binaries
- PowerVR 3D Graphics 01.01.00 release binaries
- Prebuilt images , Tools and Documentation

For more information, please refer to the '*BSP_WINCE_ARM A8_User_Guide.pdf*' file included in this release.

3. New Features

3.1. Rel 01_01_00 Patch 01

This release addresses multiple issues related to the installer/un-installer. There is no change to the source code and the binaries when compared to Rel 01_01_00

Following bugs have been fixed in this release:

ID	Headline
SDOCM00079752	(BSP_WINCE_ARM_A8)Previous version installed with no bump of ver num, uninstall will remove all versions of product

SDOCM00079749	(BSP_WINCE_ARM_A8) Uninstall of any one (BSP or GFX or DVSDK) will result in uninstalling all three
SDOCM00079547	BSP uninstall script incorrectly removes entire parent directory regardless of whether directory is empty or not

3.2. Rel 01_01_00

Following features have been added to this release:

1. Support for new hardware
 - a. AM/DM3730 ES 1.2 silicon (Rev D)
 - b. Power Module TPS65950A3 (Rev D)
 - c. Zoom XAM3517AZCN (PG1.1)
 - d. Application Board 1015189 Rev C
2. Enabled Smart Reflex for AM/DM37X ES 1.2 Silicon when the characterization data is available.
3. Support for NAND ECC modes – BCH 4-bit and BCH 8-bit. See BSP Limitations section for additional info.
4. Integrated ISP resizer into display driver for OMAP35x and OMAP37x devices so that h/w downscaling is performed even for resolutions such as 720p for which DSS cannot handle h/w downscaling.
5. Support for 720p codecs. Note that this is added for DM3730 devices only and one needs to have DVSDK 01.11.00 release to validate this.

In addition, following bugs have been fixed in this release

<u>ID</u>	<u>Headline</u>
SDOCM00078172	On enabling and executing transcriber app, it complains that the 'Touch.dll' name in the registry is not Transcriber's DLL
SDOCM00078077	July monthly CE update fixes co-proc save/restore reg bug highlighted in SDOCM00069239; No need for NEON workaround
SDOCM00078074	VRFB (Virtual Rotated Frame Buffer) is not compatible with the some video codecs provided by Microsoft.
SDOCM00078071	Unable to set GPIO debounce time from touch driver
SDOCM00078069	KITL over USB RNDIS doesnt work with OTG port on TPS65930 (but works on ISP1507 on TI EVM)
SDOCM00078061	Adding 4bit and 8bit ECC support for NAND device
SDOCM00077424	hwcodecapi.h contains invalid characters resulting in compile error in some countries
SDOCM00077423	bug in the unified BSP - prcm_clock.c
SDOCM00077422	TWL access bug in TWL_XXX functions in OAL

SDOCM00077417	256M memory support should be added in AM35x BSP
SDOCM00074515	OAL retail msgs to be enabled and network settings->kitl to be disabled by default in SD eboot
SDOCM00074514	Ethernet coming up is slow on am3517
SDOCM00074513	Load NK.bin to NAND through SD boot
SDOCM00074219	BSP_NOVRFB variable needs to be removed from AM35x batch file
SDOCM00072602	DO.EXE Shell Extension failure

4. Distribution Contents

The BSP release installation file - BSP_WINCE_ARM_A8_01_01_00_Patch_01_Source.exe contains the following files:

- Docs\BSP_WinCE_ARM_A8_User_Guide.pdf
 - User Guide for the BSP
- Docs\BSP_WinCE_ARM_A8_Quick_Start_Guide.pdf
 - Quick Start Guide for the BSP
- Docs\BSP_WINCE_ARM_A8_Demo_Manifest.pdf
 - BSP demo package Manifest
- Docs\BSP_WINCE_ARM_A8_Manifest.pdf
 - BSP Manifest
- Docs\BSP_WINCE_ARM_A8_Demo_Package_License_Agreement.pdf
 - Software License Agreement for the BSP demo package
- Docs\BSP_WinCE_ARM_A8_SLA.pdf
 - Software License Agreement for the BSP
- Sources*
 - BSP source files, OS Design , DVSDK and Graphics binaries
- Misc*
 - DVSDK and Graphics demo files
- Tools*
 - SD card and NAND flash utilities

5. Installation Instructions

The BSP release installation file will install the source code and release documents to directory C:\TI\BSP_WINCE_ARM_A8_01_01_00_Patch_01\ by default. If the “install to _WINCEROOT” option is selected during installation, then the Sources folder is installed under _WINCEROOT (ex: C:\WINCE600) and docs/misc/tools folder are installed under C:\TI\BSP_WINCE_ARM_A8_01_01_00_Patch_01.

The Quick Start Guide contains full details of how to install, build and run the BSP for the respective processor.

6. Requirements

6.1. Required QFE's and Updates

- Windows Embedded CE 6.0 Product Update Rollup, December 31, 2006
- Windows Embedded CE 6.0 Product Update Rollup, December 31, 2007
- Windows Embedded CE 6.0 Product Update Rollup, December 31, 2008
- Windows Embedded CE 6.0 R3
- Windows Embedded CE 6.0 Product Update Rollup, December 31, 2009
- Windows Embedded CE 6.0 Monthly Update January 2010
- Windows Embedded CE 6.0 Monthly Update February 2010
- Windows Embedded CE 6.0 Monthly Update March 2010
- Windows Embedded CE 6.0 Monthly Update April 2010
- Windows Embedded CE 6.0 Monthly Update May 2010
- Windows Embedded CE 6.0 Monthly Update June 2010
- Windows Embedded CE 6.0 Monthly Update July 2010
- Windows Embedded CE 6.0 Monthly Update August 2010
- Windows Embedded CE 6.0 Monthly Update September 2010
- Windows Embedded CE 6.0 Monthly Update October 2010
- Windows Embedded CE 6.0 Monthly Update November 2010

6.2. Hardware Requirement

- For AM35x processor family:
 - AM3517 SOM-M2 processor board
 - eXperimenter Baseboard from LogicPD(<http://www.logicpd.com/>)
 - Application board from LogicPD
- For OMAP35x processor family
 - OMAP3530 EVM (Rev G)^{Note} from Mistral(<http://www.mistralsolutions.com/>)
 - Power Module from Mistral
 - OMAP35x processor Card from Mistral

Note: OMAP3530 EVM1 is not tested and is not officially supported in the BSP.

- For AM/DM processor family
 - Mistral OMAP3530 EVM (Rev G) from Mistral (same as above)
 - Power Module from Mistral (same as above)

- AM/DM37x processor Card (Rev C) from Mistral

7. Feature Summary

The User Guide contains full details of the BSP functionality.

A summary of the features supported in this BSP release is available from http://processors.wiki.ti.com/index.php/WinCE-TIBSP_Feature_List

8. Test Summary

The BSP has been tested using a combination of Microsoft CETK, functional test and custom test utilities.

The BSP has been through the full system test and validation process to validate all the BSP functionality. Details of the Known Issues are available in Section 9 below.

The BSP has been tested with the following software and hardware revisions:

- Zoom OMAP3517ZCN (PG1.0) EVM kit (1013686 Rev 5)
 - Processor card : 1013636 Rev 7
 - eXperimenter Baseboard: 1013702 Rev 4
 - Application Board: 1013690 Rev 4
 - 4.3" WQVGA LCD: 1012041 Rev C
- Zoom XAM3517ZCN (PG1.0) EVM kit (1014470 Rev D)
 - Processor card : 1014471 Rev D
 - eXperimenter Baseboard: 1014472 Rev B
 - Application Board: 1014473 Rev C
 - 4.3" WQVGA LCD: 1012041 Rev C
- Zoom XAM3517AZCN (PG1.1) EVM kit (1014470 Rev D)
 - Processor card : 1017100 Rev C
 - eXperimenter Baseboard: 1014472 Rev B
 - Application Board: 1015189 Rev C
 - 4.3" WQVGA LCD: 1012041 Rev C
- Mistral OMAP35x EVM kit
 - Main board: Rev G
 - Power Module: Rev D
 - OMAP35xx processor card: Rev C

- OMAP37xx(ES1.2) processor card: Rev D
- Windows CE 6.0 R3 with monthly updates to August 2010

In addition to functionality, performance was also measured, you can find out the performance data from the following link:

http://processors.wiki.ti.com/index.php/WinCE_Comparative_Benchmarks

9. Limitations

Due to hardware and software limitations, some of the feature may not work properly. See current list below. For an updated list, please visit http://processors.wiki.ti.com/index.php/WinCE_BSP_ARM-A8_Known_Limitations

9.1. BSP Limitations related to Hardware

This section lists issues in the ARM-A8 WinCE BSP due to TI EVM limitations. If a particular feature listed below is desired, then customers can modify their board design accordingly.

- **SDOCM00073563** - write protection is not working on slot 2 (AM3517). GPIO 176 is used by SDHC2 for its WP detect. This is also used by LCD module for PANEL_POWER. In case of LCD, this GPIO should be configured as output but for SDHC2, this should be configured as input. Its because of this pin mux conflict, WP is disabled for SDHC2. To enable the write protection, PAD configuration(bsp_padcfg.h) for MCSPI_CS2 needs to be added in MMC2_PADS and "CardWPGPIO" for slot 2 needs to be set in sdhc.reg.
- **SDOCM00074846** - warm reboot doesn't work when booting from SD card on AM3517. One would need to mod the board to achieve the right SYS_BOOT sequence to boot from MMC1 for warm boot.
- **SDOCM00075349** - CEStress fails on DM3730 after about 30 minutes - device is inactive. Issue appears to be an EVM issue as some boards work fine and some don't.
- **SDOCM00075381** - Prefetch abort error (or application hangs otherwise) on omap35xx after watchdog timer times out and app is coming up. Issue appears to be an EVM issue as some boards work fine & some don't.
- **SDOCM00076091** - Voltage drop on VDD2 for most of OPPs is not correct. The reading is much higher than expected. Again EVM limitation.
- **SDOCM00070568** - NOR XLDR doesn't boot (AM3517). The NAND_nCS line comes from the application board to the SOM and is equivalent to GPMC_nCS2 when BOOT_SRC is set properly. The problem is that the boot rom code does not setup GPMC_nCS2 and leaves the pad unused (it acts as unconnected) and therefore the presence of the application board or its absence doesn't change the behavior of this line during the boot rom code execution. As a result, accessing CS0 still accesses the NAND (and actually the NOR in parallel) and returns invalid data.
- **SDOCM00073565** - Cannot test low voltage MMC cards (AM3517). In order to test the lower voltage cards, you will have to move the R220 to R221 to switch the SD slot to the 1.8 V rail instead of the 3.3V rail. You will then have to change the slot's voltage capabilities flag to add the 1.8 V range to it.

- **SDOCM00075958** - Verify Get NLED Count fail on dm3730. EVM limitation. NLED driver for AM/DM37x is disabled. The Pinmux for PROC_ACT LED GPIO (GPIO8) conflicts with DSS_data23 on DM3730.
- **SDOCM00078379** - BCH 4bit ECC does not work on OMAP3530 , AM/DM 3730 PG1.0 and AM3517 PG1.0. Chip limitation. The issue is fixed in chip version AM/DM3730 PG1.1 and AM3517 PG1.1. OMAP3530 chip does not have the fix.
- **SDOCM00076456** - Video encode performance using capturetest app on omap3530 is lower than dm3730. Performance is expected to be lower on omap3530. This IR documents the information along with some numbers in comparison with performance on dm3730. Scenario: Codec H264 BitRate 4000000bps Resolution 720x480@30 Output written to RAM, VideoInput is AV
- **AM35X SD/MMC 2** - SD/MMC slot 2 can not be recognized on some AM3517 EVM. Signals of MMC2 are conflicting with wireless module.
- **DISPLAY ROTATION** - In DVI mode, when desktop is rotated by 90 degrees, multimedia playout cause corrupted video and audio playout

9.2. BSP Limitations related to Microsoft WinCE Kernel

This section describes issues in ARM-A8 BSP due to bugs identified in either WinCE private kernel code and/or CETK test case.

- **SDOCM00068743** - Partition Driver Test - CETK - fails for test ID 5103 - R/W and bounds check disk partition data
- **SDOCM00068741** - OAL Cache CETK test - OAL Data Cache Size Calculation test fails (test case ID 1008)
- **SDOCM00071488** - CETK:Storage Device Block Driver API Test - 4024 fail and Storage Block Driver Read/Write Test - Buffer Sizes: (8X) test fail. Tthe failure is due to a wrong error code (ERROR_INVALID_PARAMETER) which is returned by the WINCE private FAL code and not the NAND FMD layer.
- **SDOCM00072747** - Storage Block Driver Read/Write Test - Buffer Sizes: (8X) test fails - NANDFlash.

9.3. Other BSP Limitations

- **SDOCM00074296** - Capture driver supports only interlaced video input

10. Known Issues

Latest issues list can be tracked in the TI bug database

<https://cqweb.ext.ti.com/cqweb/main?command=GenerateMainFrame&service=CQ&schema=SDo-Web&contextid=SDOWP&entityDefName=IncidentReport&username=readonly&password=readonly&queryID=34403363>

Here is a brief note on what various states in this database mean:

- Open: Problem has been submitted recently but has not been looked at by Eng (may or may not be real issue)
- Accepted: Engineering has accepted the problem as an issue to look into

- Planned: Fix has been implemented but has not been released or verified by QA
- Fixed: Resolution implemented and fix verified independently by QA

ID	Headline	Targets
SDOCM00071258	CETK Touch Panel test 8007(Driver does not support TouchPanellInitializeCursor) fail	ALL
SDOCM00071359	CETK - NAND - File System Driver	ALL
SDOCM00074380	System hangs when not exiting an OpenGL application gracefully	ALL
SDOCM00074635	When running imaging codec cetk tests, certain exceptions in coredll.dll are printed on console	ALL
SDOCM00074643	Camera CETK failures	ALL
SDOCM00075370	With 1280x720 DVI resolution, output is disturbed on omap3530 and red on am3517, during image download	ALL
SDOCM00075671	Green band at bottom and blue line on rightmost end of capture window	ALL
SDOCM00075870	(Child) Enabling WaitforVsync in Display driver causes performance degradation	ALL
SDOCM00078776	BCH software decoder returns "-1" occasionally	ALL
SDOCM00071296	CAN - loopback feature in WinCE driver will enable testing low bit rates like 10K	AM3517
SDOCM00071352	CETK - DirectShow Playback and Latency	AM3517
SDOCM00071356	CETK - Image Codec	AM3517
SDOCM00071904	There is error messages when running CETK OAL interrupt IOCTL kernel tests	AM3517
SDOCM00072121	Provide way to stop refreshing WDT and way to set WDT timeout value instead of modifying source code	AM3517
SDOCM00072426	AIC23 in master mode is required to verify McBSP in slave mode functionality	AM3517
SDOCM00073165	CAN driver requirement - powerup and powerdown APIs are currently stubs - need to be implemented	AM3517
SDOCM00073296	DirectDraw CETK video test cases (ID 400 to 420) are skipping	AM3517
SDOCM00073446	USB-Forum Tests - When USB test mode environmental variable is enable, the build fails with an error.	AM3517
SDOCM00073452	Canbenchrx app - need clarifications and batch files to use this app	AM3517
SDOCM00073453	BUS_OFF error seen after dynamic baud rate change to 50000	AM3517
SDOCM00073493	USB-Audio Streaming - Streaming to/from USB speakers/microphone does not work.	AM3517
SDOCM00074632	Battery API test - one test fails on AM3517	AM3517

SDOCM00074846	warm reboot doesnt work when booting from SD card on AM3517	AM3517
SDOCM00074849	IMGNOCCLAIBRATION flag doesnt exist for AM35XX BSP	AM3517
SDOCM00074949	Camera Driver SelectXXX function not implemented properly	AM3517
SDOCM00075108	OAL CETK Test fails - Compare All Three Timers- Busy Sleep	AM3517
SDOCM00075941	Touchscreen becomes no response intermittently after suspend and resume	AM3517
SDOCM00078708	Ethernet link's disconnect status reporting time is longer than the connect status reporting time	AM3517
SDOCM00074300	CaptureTest application: High ARM utilization seen when preview is enabled and preview window is minimized	DM3730/OMAP3530
SDOCM00074639	Data abort seen when going into suspend state while WMP is playing video file from SD card (which uses DSP codec)	DM3730/OMAP3530
SDOCM00075872	(Child) With tvout and DVI enabled, starting media playback results in DVI screen blanking out for a second.	DM3730/OMAP3530
SDOCM00075809	Random Data Abort on GPTimer1 register access	AM/DM3730
SDOCM00072603	(Child) When BSP_XRPLUGIN_DDRA is turned on, XAML perf apps doesn't work (TTM Issue on OMAP 6.14 release)	AM/DM3730/OMAP3530
SDOCM00072605	(Child) When the device hangs, USB RNDIS KITL will not work until PC is re-booted (TTM Issue on OMAP 6.14 release)	AM/DM3730/OMAP3530
SDOCM00072810	Waveform Audio Driver - mixerOpen function fails on omap3530	AM/DM3730/OMAP3530
SDOCM00073009	Waveform Audio Loopback Test - OMAP3530 - cracks in output	AM/DM3730/OMAP3530
SDOCM00073366	USB-Forum OPT Tests: OMAP3530 Fails a significant number of tests	AM/DM3730/OMAP3530
SDOCM00075874	(Child) VBus Error seen occasionally causing OTG port not to function	AM/DM3730/OMAP3530
SDOCM00076382	(Child) Switching TVout (composite/S-Video) on/off doesn't work always while DVI is on	AM/DM3730/OMAP3530
SDOCM00076433	(Child) When tvout is enabled, GFX demos on DVI/LCD slow down significantly	AM/DM3730/OMAP3530
SDOCM00076438	(Child) Active Sync connection can't be established after reset through WARM_RST button when plugged into USB OTG port.	AM/DM3730/OMAP3530

11.Support

For technical support, please post to the TI e2e WinCE community forum

<http://e2e.ti.com/support/embedded/f/353.aspx>

Forum reported issues that are reproducible on the EVM will be entered into TI bug database and can be tracked here

<https://cqweb.ext.ti.com/cqweb/main?command=GenerateMainFrame&service=CQ&schema=SDo-Web&contextid=SDOWP&entityDefName=IncidentReport&username=readonly&password=readonly&queryID=34403363>

Note: If prompted for login/password, please close the browser and click on the link again.

For latest information on the BSP, please TI WINCE BSP wiki:

http://processors.wiki.ti.com/index.php/WinCE-TIBSP_Handbook

Users new to Windows Embedded CE6 can start from the following link:

<http://www.microsoft.com/windowseembedded/en-us/products/windowsce/default.mspx>