



Windows Embedded CE 6.0 iMX32ADS BSP Release Notes

Version: WCE600-14

07-5497-RN-TX30

October 18, 2007

This document contains important information about the package contents, supported features, and known issues/limitations for this release.

1. Release Contents

1.1. Documentation Package

The documentation provided with this release is packaged in the following ZIP file:

`WCE600-14-DOCKIT.zip`

The following documents are included within this documentation package:

- ❑ *Windows Embedded CE 6.0 iMX32ADS BSP Release Notes*
- ❑ *Windows Embedded CE 6.0 BSP for MCIMX32 (i.MX32) ADS User's Guide*

1.2. BSP Package

The BSP source code and support files provided with this release are packaged in the following Microsoft installer file:

`WCE600-14-BSP.msi`

Refer to installation instructions in the *Windows Embedded CE 6.0 for iMX32ADS User's Guide*.

2. System Requirements

2.1. Windows Embedded CE 6.0

- Microsoft Windows Embedded CE 6.0
Refer to Windows Embedded CE 6.0 release notes for additional requirements.
- Windows Embedded CE 6.0 Updates
Review the following site for a complete list of updates:
<http://msdn2.microsoft.com/en-us/embedded/aa731256.aspx>

The following updates for Visual Studio 2005 should be installed for use with this release.

Visual Studio 2005 Service Pack 1 (SP1)

<http://msdn2.microsoft.com/en-us/vstudio/bb265237.aspx>

The following updates for Windows Embedded CE 6.0 should be installed for use with this release. These updates should be installed in the order shown below.

Yearly Updated Full Update Package through December 2006

<http://www.microsoft.com/downloads/details.aspx?familyid=5733c26c-168b-474d-8a27-59b30b769402&displaylang=en>

January 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=71b39842-ca77-42f5-a076-f1fd8bbe79d4&displaylang=en>

February 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=431b0a72-060b-4df0-b5bc-5179303ae8d1&displaylang=en>

March 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=021f5cfd-95fe-4bcf-aed2-15c0296370da&displaylang=en>

April 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=32f71c04-85fc-4024-8a39-83b6bdbcf35&displaylang=en>

Windows Embedded CE 6.0 Platform Builder Service Pack 1

<http://www.microsoft.com/downloads/details.aspx?familyid=BF0DC0E3-8575-4860-A8E3-290ADF242678&displaylang=en>

June 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=69744a54-ec71-49d2-a211-c2bdec2f5f5b&displaylang=en>

2.2. RealView Tools

- RealView ICE Kit
The kit includes RVI unit, power supply, Ethernet cable, LVDS probe and cable.
- RealView ICE firmware build #182 or greater
- RealView Debugger version 1.7 or greater
This is a component of RealView Developer Suite v2.1.

2.3. iMX32ADS Kit

ADS Kit Component	Revision
ADS base board	REV 3.0
CPU board	REV 3.0
Supported CPU Mask Revisions	M41K2
MC13783 board	Assembly Number: 700-20540 REV B
Epson Smart Display	
Sharp QVGA Display	
ADS Keypad	
ADS Power Supply	
Ethernet Cable	
Serial cable	

3. BSP Supported Features

The following table describes the features that are supported in this BSP.

Feature	Supported?	Comments
Tools		
-W4 Compiler Setting	Y	All BSP code compiles cleanly with –W4 compiler warning level. –W4 is default warning level
PreFast for Drivers (v8.0)	Y	Using Microsoft recommended filter, all BSP code compiles cleanly with PreFast v8.0
OEM Adaptation Layer (OAL)		
X-Loader	Y	Initial program loaded when booting from NAND flash memory. Additional Information: - This release supports boot from MLC NAND module. - This release does not support boot from SLC NAND module.
Ethernet Bootloader	Y	Supports image download over ethernet. The ethernet bootloader can run from NOR flash or MLC NAND. Additional Information: - This release supports bootloader residing in NOR flash. - This release supports boot from MLC NAND. - This This release does not support boot from SLC NAND or SD/MMC.
Serial Bootloader	N	Supports image download and flashing over serial. Support boot from NOR, NAND and SD/MMC. See User's Manual for additional details.
PQOAL	Y	Conforms to Production Quality OAL (PQOAL) coding standards. Additional Information: - The following OAL CETK tests have one or more failures: Interrupt ioctls-Kernel Mode, Processor Info ioctl, and GTC verify Get Idle Time. - The OAL real time clock CETK test 1260 fails. The test requires the RTC to support 100 year time span. The MC13783 is limited to approximately 88 years.
KITL (Ethernet)	Y	Kernel Independent Transport Layer (KITL) supported via Ethernet between Platform Builder and the target.
KITL (Serial)	N	Kernel Independent Transport Layer (KITL) supported via serial connection between Platform Builder and the target.
Serial Debug Port	Y	Debug message support provided via internal UART1.
Kernel Profiler	Y	Supported using GPT.
MX32 RTC	Y	PQOAL time-of-day support with MX32 RTC.
MC13783 RTC	Y	PQOAL time-of-day support with MC13783 RTC.
EPIT1	Y	PQOAL system timer support.
AVIC	Y	PQOAL interrupt controller support.
WDOG	Y	PQOAL watchdog supports system reset.
Random Number Generator	Y	Hardware acceleration for random number generation
L2 Cache	Y	Option to use Write-back, Write-through or disable.
Drivers		
IPU SDC	Y	Sharp TFT LQ035Q2DD54 240x320 support. NEC TFT NL6448BC20 640x480 support. Color space conversion and resizing operations are performed within the display driver.
IPU ADC	Y	Epson LSFxxxxT00 QVGA Smart LCD support
IPU Image Sensor	N	

Feature	Supported?	Comments
(Camera)		
VFP	N	Freescall VFP library
Video Processing Unit (VPU)	Y	The VPU driver provides API for DMO or Filter to decode VC-1 Main Profile at medium level, MPEG-4 Simple Profile at Level 5, H.263 Profile 3 at Level 3 and H.264 Baseline Profile at Level 3. Supports resolutions up to D1. VPU Firmware Version: 1.0.9
Post Filtering	Y	MPEG-4 deblock and dering H.264 deblock
CSPI 1, CSPI3	Y	Bus driver for CSPI interface.
CSPI 2	Y	Interface for MC13783 PMIC.
EPIT2	Y	Used for touch panel sampling.
Serial	Y	Supports baud rates up to 1.875 Mbps Additional Information: CETK stress tests 1000-1003 fail. These tests pass if the timeout values are changed to the same value used by the performance test.
IrDA (SIR)	N	
FIR	N	
GPT	Y	Profiling support.
EMI – NANDFC	Y	Support for boot from NAND and NAND file system. Additional Information: - Boot from MLC NAND is supported. - Boot from SLC NAND is not supported. - MLC NAND FMD is provided, but not functional. WindowsCE does not support MLC NAND, - SLC NAND FMD is not supported. - Data transfers using SDMA is not supported.
EMI – WEIM	Y	EBOOT programming of AMD Spansion NOR flash is supported. NOR boot and XIP is supported.
One Wire	Y	
Audio	Y	Playback using MC13783 codec/DAC. Additional Information: Audio record is not supported.
MMC/SD/SDIO	Y	SD/MMC Memory and SDIO WiFi support. CE6 OS does not support High Capacity
USB	Y	Support for USBOTG (ID pin detect) high-speed device. USBOTG (ID pin detect) high-speed, USB HOST1 full-speed, USB HOST2 high-speed. Additional Information: Full port to Windows CE 6.0 OTG not supported
ATA	Y	Hitachi 1.8 20G ATA HDD Additional Information: The Device_Block_Driver_API CETK tests 4006, 4007, 4012, 4013 and 4021 are skipped. Contact Freescale for workaround information and refer to change request ENGR00046821.
SIM	Y	
I2C	Y	I2C1 is a bus driver for camera and USB transceiver.
PWM	Y	
Ethernet (NDIS)	Y	CS8900 NDIS support.
DPTC/DVFS (DVFC)	Y	Supports four frequency/voltage set points that can be used to reduce system power consumption. Refer to the User's Manual and Reference Guide for more information.

Feature	Supported?	Comments
		Support for Dynamic Voltage/Frequency Switching (DVFS) using hardware load tracking is not supported. Support for Dynamic Process and Temperature Control (DPTC) is not supported.
MC13783 Power Management IC (PMIC)	Y	Provides support for PMIC features including regulators, ADC, touch controller, backlight, battery, and charger. Additional Information: For testing PMIC, it is required to run the tux test suite in Kernel mode. In order to achieve this, copy 'ktux.dll' file from <i>Program Files\Microsoft Platform Builder\6.00\cepb\wcet\ddt\armv4i</i> folder onto the release directory and then run test suite using the command s tux -o -n -d pmictest.dll.
SDMA	Y	Supported as component of CSPDDK (DDK_SDMA)
GPIO	Y	Supported as component of CSPDDK (DDK_GPIO)
IOMUX	Y	Supported as component of CSPDDK (DDK_IOMUX)
Clock Control (CCM)	Y	Supported as component of CSPDDK (DDK_CLK)
Applications – End User		
WordPad	Y	
Etcha	Y	Free drawing on touch screen.
Tcal	Y	Console application to display system time information.
Camera Application	N	Freescalar provides sample camera application for Windows CE
Core OS Services		
Battery Driver	Y	Hardware support provided by MC13783 battery driver.
Power Manager	Y	Power Manager from Microsoft supported.
Notification LED Support	Y	Notifications provided by baseboard status LEDs.
Graphics and Multimedia Technologies		
Windows Media Player	Y	WMA and WMV playback Additional Information: When the screen is rotated to landscape orientation (pressing S2), DirectDraw overlays will not be used for play back of video using Windows Media Player. The player will revert to GDI, and the video will consequently play back with frequent frame drops and jittering.
DirectDraw	Y	IPU hardware support for page flipping, overlays, color keying, color space conversion, rotation, scaling and global alpha blend. Additional Information: - DirectDraw sample applications run properly. The sample applications are ddex1.exe, ddex2.exe, ddex3.exe, ddex4.exe and mosquito.exe. - When the screen is rotated to landscape orientation (pressing S2), DirectDraw overlays will not be used for play back of video using Windows Media Player. The player will revert to GDI, and the video will consequently play back with frequent frame drops and jittering.
Shell and User Interface		
Quarter VGA Resources – Portrait Mode	Y	
Soft Input Panel	Y	
Backlight	Y	Supported via IPU PWM or MC13783 backlight control.
Touch Screen	Y	Supported via MC13783 touch controller

Feature	Supported?	Comments
(Stylus)		Additional Information: Microsoft has confirmed that the CETK test for touch should not be used. Current recommendation is to test by performing calibration and verifying normal operation.
Keypad	Y	ADS Keypad Support

4. Known Problems

This section will cover known problems with this release.

4.1. Known Defects

The following table describes the known defects for this release and available workarounds. The defects are categorized as follows:

- ❑ *BSP – Defects related to the iMX32ADS BSP.*
- ❑ *ADS – Defects related to the iMX32ADS hardware.*
- ❑ *PB/CETK – Defects related to Windows CE Platform Builder or CETK.*

Identifier	Category	Description	Workaround
ENGR26934	BSP	The audio driver fails the following CETK tests: 3008: Capture Multiple Streams 6000: Playback Mixing 6001: Capture Mixing	No workaround is available.
ENGR50864	BSP	The Serial Driver fails the following CETK tests (non-DMA mode): 30-33,41-48,51-58	No workaround is available.
ENGR54009	BSP	DDGPE Display Driver functions must be overwritten to support rotation	No workaround is available.
ENGR48545	PB	After rotating the screen (pressing S2 on the MC13783 board), DirectDraw Overlays will not be used when attempting to play back a video file using Windows Media Player. The player will revert to GDI, and the video will consequently play back with frequent frame drops and jittering.	No workaround is available.
ENGR36495	PB	The Battery Driver fails the following CETK test: 1004 - BatteryGetLifeTimeInfo	No workaround is available. Suspect the Microsoft Public Code does not check the validity of the parameters correctly.
ENGR50595	BSP	Data transfers between the USB OTG port and a PC may not complete.	The workaround is to use a different USB port on the PC. Typically, better signal quality is available on USB connectors located on the back panel of the PC.
ENGR16448	BSP	USB Host 1 with serial transceiver will not support a Full Speed host	No workaround is available.

Identifier	Category	Description	Workaround
		port connected to High Speed hub with Low Speed device attached.	The hardware serial interface engine inserts an incorrect EOP after the PRE-PID for the LS communication, tearing down the hub's connection to the downstream port.
ENGR26152	BSP	Some card reader firmware is not supported by the Mass Storage class driver.	No workaround is available. Card readers which choose not to STALL the endpoint in cases of data residue, may fail to be properly handled by the Bulk-Only-Transport. (This is an optional implementation in the USB 2.0 specification).
ENGR5790	BSP	Some Full Speed card readers have issues when formatting large (>256 MB) Compact Flash cards via the Mass Storage class driver.	No workaround is available.
ENGR54281	BSP	Keypad keys do not resume the system from the suspend state.	The workaround is to use the S1 button on the MC13783 PMIC daughter card.
ENGR8801	CETK	Executing the CETK test for touch panel will cause a system hang.	No workaround is available. Microsoft has confirmed some of the GWES display manager APIs can not be accessed properly when the CETK test harness runs in kernel mode. Current recommendation is to test by performing calibration and verifying normal operation.
ENGR54430	CETK	May experience problems running the custom PMIC CETK test.	The workaround is to copy ktux.dll to the release directory and execute the test using the following command. s tux -o -n -d pmictest.dll
ENGR46691	BSP	Serial driver fails the CETK Serial Communications stress test (1000 – 1003).	The workaround is to change the timeout values in the stress test to match the timeout values of the performance test.
ENGR43607	BSP	Test cases for CETK OAL Interrupt-loctls-Kernal_Mode fails The CETK test cases that are failing (4000, 4100, 4200, 5000, 5100, and 5200) are all associated with testing the support for multiple IRQs that all map to a single SYSINTR.	No workaround is available. The BSP currently does not implement support for more than one IRQ per SYSINTR.
ENGR45860	ADS	The OAL real time clock CETK test 1260 fails.	No workaround is available. The test requires the RTC to support 100 year time span. The MC13783 is limited to approximately 88 years.
ENGR52501	BSP	When the TIMER32K has been added to the OSDesign, the system will fail the following CETK OAL timer tests: - Compare All Three Timers Drift Test with Busy Sleep (test case #3010)	WORKAROUNDS: 1) The BSP_OAL_TIMER32K is not part of the default workspace. The default OAL timer support does not fail the CETK tests. 2) The magnitude of the drift error is always 1 raw CKIL tick below the acceptable range. This is likely due to rounding error

Identifier	Category	Description	Workaround
		- Compare All Three Timers Drift Test with OS Sleep (test case #3020) - Compare All Three Timers Drift Test with OEMIdle Periodic (test case #3030) - Compare All Three Timers Drift Test with OEMIdle Random (test case #3040)	associated with converting 32768 Hz to msec. The CETK allows the drift bounds to be increased (default bound is zero) to allow for such conversion errors.

4.2. BSP Limitations/Issues

The following table describes the known issues/limitations of the BSP and available workarounds:

Limitation/Issue	Workaround
Special care should be taken when uninstalling the iMX32ADS BSP.	Follow the steps in the <i>Windows CE BSP for iMX32ADS User's Guide</i> to remove all residual BSP files.
Polled KITL mode may increase connection reliability.	To force polled KITL mode, define the KITL_USE_POLLING_MODE macro at the beginning of the PLATFORM\iMX32ADS\SRC\KITL\kitl.c source file.

4.3. Platform Builder Limitations/Issues

The following table describes the known issues/limitations of the Platform Builder tool and available workarounds:

Limitation/Issue	Workaround
Windows CE 6.0 Test Kit server occasionally drops KITL connection. This appears to occur more frequently with long CETK tests such as the Display Driver Test.	Refer to the <i>Microsoft Windows CE 6.0 Release Notes</i> for information on how to configure the CETK disconnect timeout using a registry setting.
Connection to Platform Builder Remote Tools may fail.	Network configuration for PC workstation may have MTU (Maximum Transmit Size) size set to less than 1500, which is not compatible with the KITL MTU size. Refer to http://logicpd.com/support/faq/faq.php?faq_id=104 for more details. There is also a known issue regarding the use of more than one of the Remote Tools using the current version of the Windows CE 6.0 shell. Please refer to the Windows Embedded CE 6.0 Release Notes under the heading "Known issues with the new shell" for more information.
The KITL thread priority may need to be raised if connection to development platform is dropped excessively.	The KITL support for the CS8900 is not tolerant of dropped packets and retransmissions. Raising the KITL thread priority can improve the reliability of the KITL interface. In the source file \WINCE600\PLATFORM\iMX32ADS\SRC\KITL\kitl.c, change the existing KITL_THREAD_HIGH_PRIORITY macro definition from the default value of 131 to 97.
Kernel debugger supports the display of data in linearly addressed memory. Using the kernel debugger to display contents of peripheral registers may result in system hang.	No workaround is available.

4.4. iMX32ADS Hardware Limitations/Issues

The following table describes the known issues/limitations of the iMX32ADS hardware and available workarounds:

Limitation/Issue	Workaround
ADS board power-on reset can cause HyperTerminal or other terminal emulation applications to hang.	Close and restart the terminal emulation application after power-on reset.
ADS board power-on reset can cause MC13783 board to detect a low-voltage condition and subsequently hold the system in reset. The EBOOT or OS image will not boot and most of the LEDs on the MC13783 board will turn off.	Press one of the ON buttons on the MC13783 board (S1, S2, or S3). You should see most of the MC13783 LEDs turn back on. Then press the MX32 CPU board reset (SW1). The MX32 device should then boot normally. Avoid using power-on reset between boots. Instead, use the MX32 CPU board reset (SW1).
EBOOT programming of NOR flash may fail after ADS power-on reset.	Always press the MX32 CPU board reset (SW1) after power-on reset before attempting to program NOR flash with EBOOT.
Images may fail to boot or exhibit random crashes/failures on some MX32 ADS boards. Crashes/failures may be more frequent during periods of peak CPU or bus utilization.	You can reduce the CPU and bus speed using SW3-5 and SW3-6 user switches located on the MX32 ADS base board. Refer to <i>SW3 – User Switches</i> in the <i>MX32 BSP User's Guide</i> .
Audio output has swapped left/right channels. The tip and ring connectors on the MC13783 daughter card are incorrectly connected to the left/right audio channels.	No workaround is needed. The audio driver does not compensate for this issue. Customer platforms should connect the left/right audio channels correctly.
ADS kit cannot be configured to power the MC13783 charging circuit.	To prevent a low-battery condition, use an external power supply connected to the MC13783 charging circuit. The default workspace includes the "MC13783 Fake Battery Charger" catalog item. This catalog item forces the battery driver to report a charger is connected and avoids the low-battery condition.
The USB host ports (OTG, H1 and H2) VBUS current is limited to 100mA.	Self powered hubs must be used with USB devices that require more than 100mA.
The MX32 ADS does not support MMC/SD/SDIO cards which require more than 3V.	Avoid using cards that require greater than 3V.
MMC cards are not supported.	Modifications to the ADS board are necessary to support MMC cards.
Simultaneous use of NAND and WEIM (e.g. NOR) is not supported.	The workaround is to not access NAND and WEIM peripherals at the same time. Support for NAND flash is removed from the build with IMGFLASH build environment variable is defined. This allows the OS to boot regardless of the catalog configuration.

5. Support

Questions concerning this release should be sent to your local sales/support representative or to the following email address:

imx-wince-support@freescale.com

Please include the BSP release version, chip version, board version, image type, and any other relevant information in the e-mail.