



Windows CE 5.0 MX31 BSP Release Notes

Version: WCE500-14

06-4755-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:

WCE500-14-DOCKIT.zip

The following documents are included within this documentation package:

- ❑ *Windows CE 5.0 MX31 BSP Release Notes*
- ❑ *Windows CE BSP for MX31 User's Guide*
- ❑ *Windows CE BSP Reference Guide*

1.2. BSP Package

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

WCE500-14-BSP.msi

Refer to installation instructions in the *Windows CE BSP for MX31 User's Guide*.

Note: The installation of the WindowsCE 5.0 April QFE is required. Failure to install this QFE will result in failure to build OS image.

2. System Requirements

2.1. Windows CE 5.0

- Microsoft Windows CE 5.0
Refer to Windows CE 5.0 release notes for additional requirements.
- Windows CE 5.0 Updates

Review the following site for a complete list of updates:

<http://msdn2.microsoft.com/en-us/embedded/aa731256.aspx>

The following updates for Platform Builder 5.0 should be installed for use with this release.

Yearly Updated Full Update Package through December 2005

<http://www.microsoft.com/downloads/details.aspx?familyid=6c69461e-89fa-40b0-8953-b4cc1adbc8d8&displaylang=en>

Yearly Updated Full Update Package through December 2006

<http://www.microsoft.com/downloads/details.aspx?familyid=881b658d-671a-4ab6-97be-9927341e0a0a&displaylang=en>

January 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=08347ca0-20c0-4015-8892-79110d0415b8&displaylang=en>

February 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=0a2a0387-09ff-4e21-95ee-9e20732da8fa&displaylang=en>

March 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=31b27925-0cf7-47f5-ace2-da478bf4f0bc&displaylang=en>

April 2007

Note: This QFE is required in order to successfully build an OS image.

<http://www.microsoft.com/downloads/details.aspx?familyid=104c8111-2156-4a50-b848-3d1d090931ab&displaylang=en>

May 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=19598819-a210-4b07-9f58-a921448ce428&displaylang=en>

June 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=6a21a035-c85e-4fc1-8d16-e3ad0216125a&displaylang=en>

July 2007

<http://www.microsoft.com/downloads/details.aspx?familyid=af7da540-c3b9-4591-b924-79543af2dc13&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. MX31 ADS Kit

ADS Kit Component	Revision
ADS base board	REV 3.0 or later
CPU board	REV 3.0 or later
Supported CPU Mask Revisions	M91E (TO2)
MC13783 board	REV H or later
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 (v2.1)	Y	Using Microsoft recommended filter, all BSP code compiles cleanly with PreFast v2.1
OEM Adaptation Layer (OAL)		
X-Loader	Y	Used to boot from SLC NAND connected to NAND flash controller.
Ethernet Bootloader	Y	See User's Manual for configuration options such as boot from NOR or NAND.
Serial Bootloader	Y	Support for image download and flashing over serial
PQOAL	Y	Conforms to Production Quality OAL (PQOAL) coding standards.
KITL (Ethernet)	Y	Kernel Independent Transport Layer (KITL) supported via Ethernet connection between Platform Builder and the target.
KITL (Serial)	Y	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.
MX31 RTC	Y	PQOAL time-of-day support with MX31 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. Focus 453 TV Encoder, PAL and NTSC Color space conversion and resizing operations are performed within the display driver.
IPU ADC	Y	Epson LSFxxxxT00 QVGA Smart LCD support
IPU Image Sensor (Camera)	Y	MagnaChip MC521DA
MBX Direct 3D Mobile/OpenGL ES	Y	Update to IMG Release 3.3 RC3. Includes Freescale VFP support. The MBX driver does not support the use of overlays.
VFP	Beta	Freescale VFP library. Disabled by default.
MPEG4/H.263 Encoder	Y	MPEG4/H.263 DirectShow filter
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
IrDA (SIR)	Y	
FIR	Y	
GPT	Y	Provides profiling support or can be supported via the BSP GPT driver.
EMI – NANDFC	Y	Support for NAND FMD. Support for NAND boot. Data transfers using SDMA is not supported.
EMI – WEIM	Y	EBOOT programming of AMD Spansion NOR flash is supported. NOR

Feature	Supported?	Comments
		boot and XIP is supported.
One Wire	Y	
Audio	Y	Record/playback using MC13783 codec/DAC. Additional Information: Audio record is not supported.
MMC/SD/SDIO	Y	SD/MMC Memory and SDIO WiFi support. Supports SD/MMC low capacity and SD High Capacity. The SD High Capacity support is limited to block addressing with bus speed limited to 25 MHz.
PCMCIA	Y	
USB	Y	USBOTG high-speed, USB HOST1 full-speed, USB HOST2 high-speed.
ATA	Y	Hitachi 1.8 20G ATA HDD
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	Voltage scaling and process/temperature compensation support using MC13783 regulators.
MC13783 Power Management IC (PMIC)	Y	Provides support for PMIC features including regulators, ADC, touch controller, backlight, battery, and charger.
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	Y	Freescall provides sample camera application for WindowsCE. Microsoft provides production camera application for Windows Mobile.
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
DirectDraw	Y	IPU hardware support for page flipping, overlays, color keying, color space conversion, rotation, and scaling.
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 (Stylus)	Y	Supported via MC13783 touch controller
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 MX31 BSP.*
- ❑ *ADS – Defects related to the MX31 ADS hardware.*
- ❑ *PB/CETK – Defects related to Windows CE Platform Builder or CETK.*

Identifier	Category	Description	Workaround
ENGR19696	BSP	CETK GDI test SetRop2 fails with random seed 359.	No workaround is available for WindowsCE CETK. This test passes with Mobile CETK.
ENGR17051	CETK	The following CETK DirectDraw tests fail: Overlay Blt: 1240, 1340	No workaround is available. Microsoft acknowledges that that this is a CETK issue.
ENGR20612	CETK	CETK GDI tests fail with some seed values in the StressShapeTest subtest.	No workaround is available. Microsoft acknowledges that that this is a CETK issue. See http://msdn.microsoft.com/newsgroups/default.aspx?dg=microsoft.public.windowsce.testtools&mid=55498abf-3e5c-4263-85e1-92efda9985b9
ENGR16448	BSP	MX31 USB Host 1 with serial transceiver will not support a Full Speed host port connected to High Speed hub with Low Speed device attached.	No workaround is available. 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. This applies to the current MX31 silicon revision
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.
ENGR23087	PB	Testing ActiveSync with debug build results in a DEBUGCHK.	Further investigation and testing with other platforms (PXA270 system) confirmed that these have the same issue. Testing ActiveSync under retail build is fine and files can be copied between the device and PC without any issues. This appears to be a DEBUGCHK issue in ActiveSync
ENGR50595	BSP	Data transfers between the USB	The workaround is to use a different USB

Identifier	Category	Description	Workaround
		OTG port and a PC may not complete.	port on the PC. Typically, better signal quality is available on USB connectors located on the back panel of the PC.
ENGR26347	BSP	Storage Device Block Driver CETK test case #4009 for 16bit PCMCIA CF/Storage card fails.	No workaround is available.
ENGR21270	CETK	The CETK Partition Driver Test #5103 fails for NAND FMD.	This is an expected failure. The test performs sector operations that are not compatible with raw NAND flash which is a block device. Workaround: Don't use this test case for NAND devices connected to the MX31 NAND Flash Controller.
ENGR8086	BSP/CETK	The CETK NAND Flash Memory Read/Write and Performance Test, test ID #1003 fails.	This failure was not present prior to installing Q4 2006 QFE updates. Workaround: Replace fal.lib and fal.pdb with the back up version located in \\WinCE\\Updates\\Backup\\061231_2006\\PUBLIC\\COMMON\\OAK\\LIB\\ARMV4\\RETAIL
ENGR12771 ENGR25682	ADS	SDIO Bluetooth cards are not supported.	No workaround is available. The MX31 ADS supports up to 3.0 volts to the SD/MMC card socket. SDIO Bluetooth cards requiring 3.0 volts or less have not been available for testing.
ENGR11251	BSP	May experience audio and video drop out when streaming video using SDIO Wi-Fi.	No workaround is available.
ENGR54537	PB	The April 2007 QFE did not include libraries for the SD high capacity support.	The workaround is build these libraries in the public directory prior to following the build instructions in the User's Guide. Perform the follow steps one time after installing the April 2007 QFE: 1) From the File View tab of the Platform builder, Browse to the WINCE500\\public\\common\\oak\\drivers\\sdcard folder. 2) Right click and select "Build and Sysgen Current Project".
ENGR4293	ADS/BSP	The MX31ADS does not recover from suspend if the camera application is active.	No workaround is available.
ENGR7935	BSP	Executing the CETK FIR port test #80 may result in a system hang.	No workaround is available.
ENGR18696	BSP/ADS	Using dering only mode for post filtering causes the system to hang.	No workaround is available. The "deblock only" and "deblock and dering" modes function properly.
ENGR39915	PB	The use of serial KITL will cause overflow messages to be displayed over the debug serial port.	No workaround is available. Suspect a problem with Platform Builder not honoring serial hardware flow control. The serial KITL transport is very slow due to retransmission of serial packets.

4.2. BSP Limitations/Issues

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

Limitation/Issue	Workaround
Existing MX31 BSP files in the WINCE500 tree may interfere with installation and builds of this BSP release.	Follow the steps in the <i>Windows CE BSP for MX31 User's Guide</i> to remove all residual BSP files.
Uninstalling the MX31 BSP using the Microsoft Windows Installer (msi) file will not remove intermediate build files/objects.	Follow the steps in the <i>Windows CE BSP for MX31 User's Guide</i> to remove all residual BSP files.
Adding MBX D3DM to the OS image requires a clean sysgen. The <i>MBX MX31 D3DM Core</i> catalog item configures SYSGEN variables which necessitates a sysgen to be performed. In addition, the D3DM support will not be properly integrated into the image unless intermediate files from a previous build are removed.	After adding the <i>MBX MX31 D3DM Core</i> catalog item to the OS design, perform a clean sysgen by enabling the Build OS → Clean Before Building menu option and then select the Build OS → Sysgen menu option.
Polled KITL mode may increase connection reliability.	To force polled KITL mode, modify OALKitlStart() in PLATFORM\MXC300-30ADS\SRC\KERNEL\OAL\kitl.c. The OAL_KITL_FLAGS_POLL flag should be set just before the call to OALKitlInit() as shown in the example below. <pre>// Force KITL to run in polled mode pArgs->flags = OAL_KITL_FLAGS_POLL; // Finally call KITL library. // rc = OALKitlInit(szDeviceId, pArgs, pKitlDevice);</pre>

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 5.0 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 5.0 Release Notes</i> for information on how to configure the CETK disconnect timeout using a registry setting.
You may experience issues with Windows CE 5.0 Platform Manager and target device connectivity after installing Windows Mobile 5.0	If you encounter target device connectivity issues, close Platform Builder to unload the Platform Manager connectivity services and then restart Platform Builder.
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.
The KITL thread priority may need to	The KITL support for the CS8900 is not tolerant of dropped packets

Limitation/Issue	Workaround
be raised if connection to development platform is dropped excessively.	and retransmissions. Raising the KITL thread priority can improve the reliability of the KITL interface. Make the following changes in <code>\Wince500\PLATFORM\MX31\src\kernel\OAL\kitl.c</code> to raise the KITL thread priority: 1. Add the following global declaration to the top of the file: <code>extern DWORD g_dwKITLThreadPriority;</code> 2. Set to the desired priority level within the <code>OALKitlStart</code> function prior to calling <code>OALKitlInit</code>: <code>g_dwKITLThreadPriority = 97;</code>
USB OTG mass storage performance decreases after installing May 2006 QFE	Workaround is to not install May 2006 QFE or any subsequent QFEs.
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. MX31 ADS Limitations/Issues

The following table describes the known issues/limitations of the MX31 ADS 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 MX31 CPU board reset (SW1). The MX31 device should then boot normally. Avoid using power-on reset between boots. Instead, use the MX31 CPU board reset (SW1).
EBOOT programming of NOR flash may fail after ADS power-on reset.	Always press the MX31 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 MX31 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 MX31 ADS base board. Refer to <i>SW3 – User Switches</i> in the <i>MX31 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.

Limitation/Issue	Workaround
The MX31 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.
MX31 CPU board revisions F and G do not support state retention (power off) state.	No workaround is available.
MX31 CPU boards of revision G or later do not support PCMCIA.	No workaround is available.
Early MX31 processor revisions do not support Dynamic Voltage and Frequency Scaling (DVFS) with DDR memory.	Use MX31 (TO2) processor with mask M91E. No workaround for processor masks: 2L38W, 3L38W and M45G

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.