i.MX31 SOM-LV Windows Embedded CE 6.0 BSP Release Notes

BSP Documentation

Logic // Products
BSP Version: 1.0.0
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Revision History

REV	EDITOR	DESCRIPTION	BSP Version	APPROVAL	DATE
A	MAA	Initial release	1.0.0	MAA	06/04/09

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1 Release Contents

This release contains a documentation package and a software package for the BSP.

1.1 Documentation Package

Documentation provided for this software package release has been put into the following directory within the compressed file: imx31_wince600_bsp_1-0-0\Documentation\

The directory contains the following documents:

i.MX31 SOM-LV WINCE600 Files	Description
iMX31_wince600_Release_Notes_1-0-0.pdf	Release Notes
~~iMX31_wince600_Reference_Manual_1-0-0.pdf~~	~~Reference Manual~~
~~iMX31_wince600_User_Guide_1-0-0.pdf~~	~~User Guide~~
iMX31_wince600_Feature_Matrix_1-0-0.pdf	Summary of supported features

1.2 Software Package

All software files for this BSP software package release has been put into the following folders within the compressed file:

i.MX31 SOM-LV WINCE600 Files\Folders	Description
Platform\LPD_iMX31	Platform Specific BSP folder
Platform\ COMMON\SRC\SOC\MX31_LPD_V1	Platform Chip Specific BSP folder
OSDesigns\	Sample OS design projects
Binaries\	Sample OS binary files
Documentation\	BSP Documentation
SDK\	Sample SDK installer

NOTE: The iMX31_wince600_User_Guide.pdf document will provide instructions for these folders and files.

2 System Requirements

2.1 Windows CE 6.0 Installation

The Microsoft Windows Embedded CE 6.0 development software and tools must be purchased from a licensed Microsoft distributor; Logic does not provide these tools. Full function evaluations copies of Windows Embedded CE 6.0 and Visual Studio 2005 are available on Microsoft's Windows Embedded website.

The workstation must have the following components installed in this order:

1. Visual Studio 2005 (Purchase with Windows Embedded CE 6.0)
2. Windows Embedded CE 6.0 (This installs the Windows CE 6.0 source code and Platform Builder plug-in for Visual Studio 2005)
3. Visual Studio 2005 Team Suite Service Pack 1 (For Vista users, use the Vista specific update)
4. Windows Embedded CE 6.0 Platform Builder Service Pack 1

5. Windows Embedded CE 6.0 R2

NOTE: It is not recommended to use both Windows Embedded CE 5.0 and Windows Embedded CE 6.0 tools on the same workstation. If this is required, please follow instructions on the Microsoft Windows CE blogs for installation steps and possible known issues.

2.2 Window CE 6.0 Updates

The workstation should have the following Windows Embedded CE 6.0 QFE packages (updates) installed, and in the recommended order. These updates can be found on Microsoft's Embedded website.

1. Windows Embedded CE 6.0 2008 Yearly Update Rollup Package
2. Windows Embedded CE 6.0 Monthly Update (January 2009)
3. Windows Embedded CE 6.0 Monthly Update (February 2009)
4. Windows Embedded CE 6.0 Monthly Update (March 2009)
5. Windows Embedded CE 6.0 Monthly Update (April 2009)

NOTE: This release has been tested with QFEs (Monthly Updates) through April 2009

3 Supported Features

Note that a given document may include a series of headings in this section.

3.1 BSP

Feature	Description
OEM Adaptation Layer	
OAL	• 1ms tick system timer • OEMIdle supports a low power state • Interrupt timing (ILTiming) • Performance counter • LogicLoader boot parameters (exec …….) • Suspend puts the processor into a lower power state • Soft Reset is supported with IOCTL_HAL_REBOOT IOCTL • Installable Interrupts are supported which allows for installing ISRs for drivers. • RAM image build
Activity/Idle LED Notification	• The LV baseboard's D4 LED (labeled GPIO01) can be used as an indicator for activity versus idle for the kernel (OEMIdle). • This can be enabled with the boot parameters '**dbg_leds:1:**'.

Feature	Description
Serial Debug	• Supports UARTA of the i.MX31 SOM-LV (UART1 of i.MX31) as debug message port. Default operation is disabled. • To enable this debug port, use boot parameter '**dbg_serial:IMX31_UART:**'. • If this port is used for debug, the UART driver will not load the UARTA (COM1) instance.
Ethernet KITL	• Debug Ethernet and KITL are supported on the onboard LAN92xx device. This support is built into every build, but disabled by default. • To enable, use the boot parameters '**kitl:true:**' • Shared Ethernet VMINI port supported using boot parameter '**share_eth:1:**'
iMX31 RTC	• Real time clock support of the i.MX31's internal RTC. • This RTC is selected when boot parameter **'rtc:rtc_imx31:**' is used.
MC13783 RTC	• Real time clock support of the MC13783 PMIC. • This RTC is selected when boot parameter **'rtc:rtc_imx31_pmic:**' is used. This is the recommended rtc to use, as it can be back-up battery powered (coin-cell, etc) with proper circuitry on the baseboard.
WatchDog	• The i.MX31 internal WatchDog is supported in the OAL, it is disabled by default • To enable, the variable 'ENABLE_WATCH_DOG' must be set in the build, or in the LPD_iMX31.bat file. • IOCTL_HAL_REBOOT supported using the Watchdog to create a reset
	•
Drivers	•
Audio	• The native audio driver uses the MC13783's codec. The CODEC can only be used in one of two ways. Either stereo playback, but no record or Mono playback and mono record. This is selectable in the catalog. Audio output on the LV baseboard is found on J10, Audio input on LV baseboard J3. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Audio -> MC13783 Audio ….**'

Feature	Description
Backlight	• This driver controls the dedicated GPIO signal from the i.MX31 SOM-LV called 'LCD_BACKLIGHT_PWR'. This is GPIO 20 on Port 3 on the i.MX31 (MCU3_20) and has a 10k pull-down resistor on the SOM-LV. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Backlight Control -> i.MX31 LCD Backlight**' • The standard Windows CE component 'Battery Driver' is required for this Backlight driver. The battery driver for this BSP is not required. The standard battery driver catalog box is found under '**Core OS -> CEBASE -> Core OS Services -> Battery Driver**' or '**SYSGEN_BATTERY**' • This driver is required if LCD_BACKLIGHT_PWR signal is used for controlling the backlight, which is the case for all of Logic's display kits.
YAFFS	• This driver implements the YAFFS Flash File System on the NAND on the i.MX31 SOM-LV. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Block -> YAFFS for NAND Flash'** • The driver includes the Block interface to the NAND Flash, a partition driver, and the YAFFS File System. These can not be used individually. • This YAFFS implementation is the same as LogicLoader, which allows partitions and files to be shared between the two.
PCMCIA	• This is a Compact Flash driver for the i.MX31 PCMCIA interface. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> PCMCIA -> i.MX31 Compact Flash Card**'
CSPDDK	• This is a driver that exports API functions for the system clocks, GPIO, and DMA to a kernel mode driver. This driver is always included when the BSP is built.
Display	• The driver supports the i.MX31 internal IPU LCD controller, and can be configured for DirectDraw or GDI modes • Supports Logic's 3.6", 5.7", 6.4", 12.1", 10.4", and 3.5" display kits, and is also able to add new LCD panels through the registry or by pre-initialization in the bootloader (skiplcdcinit:1). • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Display -> i.MX31 IPU Display Driver**'

Feature	Description
Ethernet	• This NDIS driver supports the SMSC LAN92xx Ethernet Controller • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Ethernet -> i.MX31 Ethernet LAN9117 Driver'**
I2C	• This stream interface driver supports the i.MX31 I2C1 and I2C2 ports • To select an instance of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> I2C Bus -> i.MX31 I2C #'**
PMIC – MC13783	• This driver supports all of the interfaces to the MC13783 PMIC chip. • This driver is not selected in the catalog, but is built and linked into the OS image if any driver that needs access to the PMIC selected (e.g. Audio, Touch, etc.)
SD/MMC	• This driver supports SD Slot 1 and SD Slot 2 of the i.MX31. SD Slot 1 is provided on the LV baseboard, connector J29. SD Slot 2 does not have a SD connector on the baseboard, but does come off the i.MX31 SOM-LV. • Only SD Storage cards have been tested with this driver • To select an instance of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> SD Host Controller -> i.MX31 SD Host Controller #'**
Timers – GPT	• The General Purpose Timers stream interface driver supports the i.MX31's GPT. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> General Purpose Timer -> i.MX31 General Purpose Timer '**
Touch	• This native Touch driver supports the Touch interface in the MC13783 PMIC. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Touch -> MC13783 Touch Driver'**

Feature	Description
Serial / UART	• This native serial driver supports UARTA (UART1), UARTB (UART2), UARTC (UART3) of the i.MX31 SOM-LV (i.MX31 processor). • To select an instance of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Serial -> i.MX31 UART# serial port (COM#)'** • Note: The Debug Serial port uses UARTA (UART1) and the UARTA driver will not load if Debug Serial is being used. • Note: Default COM# mapping is (specified in platform.reg): o UARTA -> COM1 o UARTB -> COM2 o UARTC -> COM3
USB HS OTG	• There are three options for the HS OTG port of the i.MX31 in this BSP. This port can be sit up for Full On-The-Go, Pure Client, or Pure Host. • To select the Full OTG version of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> USB -> USB High Speed OTG Device -> i.MX31 High Speed OTG Port Full OTG Driver'** • The following options do not operate individually at this time and it is recommended to use a Full OTG port, which can support Host or Function. • To select the Pure Client version of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> USB -> USB High Speed OTG Device -> i.MX31 High Speed OTG Port Pure Client Driver'** • To select the Pure Host version of this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> USB -> USB High Speed OTG Device -> i.MX31 High Speed OTG Port Pure Host Driver'**
USB HS Host	• This driver supports the i.MX31 USB Host2 port, a High Speed USB Host interface. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> USB -> USB Host Devices -> i.MX31 High Speed Host2'**

Feature	Description
Battery	• This stream interface driver uses the battery charging functionality of the MC13783 PMIC to measure the battery capacity level. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Battery -> MC13783 Battery Driver'** • Note: This driver has not been tested with actual hardware implementation. The i.MX31 SOM-LV by default is not populated with charging circuitry.
Power Button	• This is a sample stream interface driver that sets up the uP_nWAKEUP signal on the i.MX31 SOM-LV (i.MX31 GPIO MCU1_25) as an interrupt, driven by the push button S2 on the LV baseboard. This driver calls Suspend and wakes up the system from suspend • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Button -> i.MX31 GPIO Power Button'**
PWM	• This driver supports i.MX31 PWM0 Signal. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Device Drivers -> Pulse-width Modulator -> i.MX31 PWM'**
VFP	• This component is inserted as the FPCRT.dll into the OS Image. The driver supports the ARM11 VFPv2 Floating Point Unit in the i.MX31. All Floating Point math functions that run in the OS, drivers, and applications will call into this driver. • To select this driver, use the catalog and check the appropriate box under '**Third Party -> BSP -> LogicPD iMX31 LV-SOM -> Core Support -> Floating Point -> ARM11 VFPv2 Floating Point Component'** • When selected, this component will also set the SYSGEN_OEM_FPCRT sysgen variable. A full Clean and Sysgen is required when adding this component. • This component is created using ARM's VFP Library, found at: http://www.arm.com/products/os/windowsce.html, and the included license file in the BSP must be agreed to. License is located in **'PLATFORM\LPD_iMX31\PREBUILT\CSP\VFP\'**

4 Known Issues

List of items

Issue	Description	Workaround
MX31WCE600-43	The LCD screen will flicker for a short amount of time (less than a second) when using 'skiplcdcinit:1' at boot up	No work-around, this will be addressed in a future release.

Issue	Description	Workaround
MX31WCE600-38	OTG Client only driver does not work, nor does OTG Host only driver.	Use OTG Full mode driver, which will support either functionality.