

BSP for Microsoft Windows* 7 (WIN7, WES7 & POSReady 7) 32 and 64 bit for Intel® Atom™ Processor E3800 Product Family

Release Notes & User Guide

September 2014

Revision 4.0

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Revision History

Revision Number	Description	Revision Date
4.0	Updated for Windows 7 Maintenance Release 1 (MR1)	September 2014
3.0	Added Windows Embedded POSReady 7	May 2014
2.0	Update USB3 BKM and known issues for Gold 2 release	Mar 2014
1.0	Update release for Windows 7 Gold 1.0 release	Jan 2014



1 Introduction

1.1 Scope of document

This document includes release notes and a user guide describing the Intel-developed GPIO, I²C, SPI, HS-UART, and USB3.0 XHCI driver for Microsoft Windows* 7, Windows Embedded Standard 7 and Windows Embedded POSReady* 7. This document also includes information about Windows 7 Inbox drivers that have been validated on Intel® Atom™ Processor E3800.

In the release notes section, the driver interfaces, limitations, errata, closed issues and known issues are covered. In the user guide section you will find the steps to build the Windows BSP, plus platform and driver software best known methods.

This document is intended for OEMs and ODMs that are enabling Win7 and WES7 drivers with Intel® Atom™ Processor E3800, Intel® Celeron® Processor N2XXX and Intel® Celeron® Processor J1XXX.

Note: To update the GPIO, I²C, and SPI drivers on structure definition in the public driver header file from beta driver to gold driver, recompile your applications with the latest public driver header.

1.2 System Requirements

The following operating systems are supported:

- Windows 7 Operating System (32-bit and 64-bit versions)
- Windows Embedded Standard 7 Operating System (32-bit and 64-bit versions)
- Windows Embedded POSReady 7 Operating System (32-bit and 64-bit versions)

1.3 Acronyms and Terminology

Term	Description
BSOD	Blue Screen of Death (Stop Error)
GPIO	General Purpose Input/output
I ² C	Inter-Integrated Circuit
HS-UART	High Speed Universal Asynchronous Receiver/Transmitter
SPI	Serial Peripheral Interface
SUT	System Under Test



2 Release Summary

2.1 Release Details

Driver Version: 1.1.6.1030

Released on September, 2014.

2.2 Release Contents

This release includes:

- Intel® Processor Win7 IO Drivers 32Bit and 64Bit Driver Installer.
“Intel Processor Win7 IO Drivers 32Bit.msi” and “Intel Processor Win7 IO Drivers 64Bit.msi” installer will install the following drivers on your system:
 - Intel® Atom™/Celeron®/Pentium® Processor UART Host Controller
 - Intel® Atom™/Celeron®/Pentium® Processor I²C Controller
 - Intel® Atom™/Celeron®/Pentium® Processor SPI Controller
 - Intel® Atom™/Celeron®/Pentium® Processor GPIO Controller
 - Intel® Atom™/Celeron®/Pentium® Processor Low Power Subsystem DMA Device
 - Intel® Atom™/Celeron®/Pentium® Processor SD Host Controller
- Intel® Processor Win7 IO Drivers
 - Headers Files for GPIO, I²C, and SPI
 - Software Developer’s Manual for Windows 7 IO Drivers
- Intel® Processor Win7 IO Drivers Release Notes & User Guide (this document)
- Intel® Software License Agreement



2.3 Best Known Configurations

Hardware Configuration		
Category	Description	Rev/Type/Source
CRB	Bayley Bay	FAB 3 REV03
	Bakersport	FAB B
SOC	Intel® Atom™ Processor E3800	D0-I : Z8XA
Display	VGA	
Memory	Bayley Bay: 4 GB DDR3 (2x2GB)	
	Bakersport: 2 GB DDR3 (1x2GB with ECC)	
Firmware Configuration		
CRB BIOS	BYTICRB_IA32_R_SPI_0092_30_SeC_Enable (Stitched with vBIOS v3777)	Refer to BIOS release
KSC	v03.13	Refer to BIOS release
Driver/OS Configuration		
Operating System	Windows 7 SP1	MSDN
	Windows Embedded Standard 7 SP1	
	Windows Embedded POSReady 7 SP1	
Graphics Driver	PC 15_0_1091	EMGD
GPIO Driver	1.1.6.1030	Intel
I ² C Driver	1.1.6.1030	Intel
SPI Driver	1.1.6.1030	Intel
HS-UART Driver	1.1.6.1030	Intel
SD2 Driver	1.1.6.1030	Intel
Chipset INF	10.0.13	Intel
USB 3.0 Driver	3.0.0.34 (32bit and 64bit)	Intel



2.4 The Ready Feature

Area	Feature	Source	Ready*
SIO	General SIO feature	Win7 Inbox driver	Yes
USB	General USB 2.0 feature	Win7 Inbox driver	Yes
	General USB 3.0 feature	Intel USB 3.0	Yes
	USB2.0 Boot	Win7 Inbox driver	Yes
SATA	General SATA feature	Win7 Inbox driver	Yes
PCIe	General PCIe feature	Win7 Inbox driver	Yes
EMGD gfx driver	General graphics feature	Intel	Yes
High Definition Audio	General HD Audio feature	Win7 Inbox driver	Yes
	HDMI Audio	Integrated in EMGD driver	Yes
Power Management	Power Mgmt S0 and S5	N/A	Yes
	Power Mgmt Sleep S3	Intel	Yes
	Power Mgmt Hibernate S4	Intel	Yes
GPIO Driver[†]	Direction Setting	Intel	Yes
	Multiplexing Setting		Yes
	Level Value Setting		Yes
	Pin Setting Query		Yes



I²C Driver [†]	Standard Mode (100Kbps)	Intel	Yes
	Fast Mode (400Kbps)		Yes
SPI Driver [†]	SPI Mode 0,1,2,3	Intel	Yes
	Transfer rate from 100Kbps up to 15 Mbps		Yes
HS-UART Driver [†]	Baud rate support up to 4000000	Intel	Yes
	Data size 5, 6, 7, 8-bit		Yes
	Odd, even, none parity		Yes
	1, 1.5, and 2 stop bits		Yes
	Hardware & No flow control & Software flow control		Yes
DMA Feature [†] (I²C, SPI, HS-UART)	DMA support for I ² C, SPI and HS-UART	Intel	Yes
SD2 Driver	SD and SDHC cards	Intel	Yes
	Class 2,4,6, and 10		Yes
	1-bit and 4-bit bus mode		Yes
	FAT32, exFAT filesystem		Yes
	ADMA Transfer mode		Yes

[†] Refer to the next section for the limitations of the GPIO/I²C/SPI/HS-UART/DMA feature.



3 Release Notes

3.1 GPIO Driver

The GPIO Driver interface is exposed by a series of IOCTLS. A separate C header file provides the definition of the IOCTLS and a separate programming guide provides how to program with the IOCTLS.

Driver Binary Package:

- iaio gpio.inf
- iaio gpio.sys
- iaio gpio.cat

Driver Interface Header: GPIOPublic.h

Enabled Features:

- Support GPIO multiplexing setting.
- Support GPIO setting query, query multiplexing information of GPIO pin.
- Support GPIO direction setting, configure selected GPIO pin as input or output pin.
- Support GPIO read pin, read pin's level value when GPIO pin is configured as input pin.
- Support GPIO write pin, configure pin level to high or low when it is configured as output pin.

Limitations:

- No known limitation



3.2 I²C Driver

The I²C Driver interface is exposed by a series of IOCTLs. A separate C header file provides the definition of the IOCTLs and a programming guide shows how to program with the IOCTLs.

There are a total of seven I²C controllers on Intel® Atom™ E3000 Processor, Intel® Celeron® Processor N2XXX and Intel® Celeron® Processor J1XXX, which share the same DMA engine. Hence, transferring a large amount of data will cause one I²C controller to occupy the DMA engine for a long duration.

Applications can use multiple single transfers or the IOCTL_I2C_EXECUTE_SEQUENCE interface to transfer big data.

By default, the I²C driver uses DMA to copy data between peripheral and system memory, but can set the Windows registry to disable the DMA feature and copy data in PIO mode. Refer to the BKM section for information about setting the registry.

Driver Binary Package:

- iaioi2c.inf
- iaioi2c.sys
- iaioi2c.cat

Driver Interface Header: I2CPublic.h

Enabled Features:

- Support 7-bit address Mode
- Support Standard Mode (100Kbps)
- Support Fast Mode (400Kbps)
- Support polling of IO data transfer

Limitations:

- The maximum single transfer size is limited to 64Kbytes. Multiple transfers are required for data sizes of more than 64KB.



3.3 SPI Driver

The SPI Driver interface is exposed by a series of IOCTLs. A separate C header file provides the definition of the IOCTLs and a programming guide explains how to program with the IOCTLs.

Driver Binary Package:

- iaioapi.inf
- iaioapi.sys
- iaioapi.cat

Driver Interface Header: SPIPublic.h

Enabled Features:

- Support SPI mode 0,1,2,3
- Support transfer rate at the minimum of 100 kbps and at maximum rate 15 Mbps
- Support polling of IO data transfer (Read/Write)
- DMA data transfer

Limitations:

- No known limitation



3.4 HS-UART Driver

The HS-UART Driver interface is exposed by the standard Windows Serial Communication interface. For further information, see the Serial Communications in Win32 in MSDN:

<http://msdn.microsoft.com/en-us/library/ms810467.aspx>

The following APIs for serial communication in Win32 are supported in the MR1 driver release:

- [SetCommMask](#)
- [WaitCommEvent](#)
- [GetCommMask](#)

Remark: The serial series masks "SERIAL_EV_PERR, SERIAL_EV_RX80FULL, SERIAL_EV_EVENT1, SERIAL_EV_EVENT2" used in above three functions are not supported. Others are supported.

Intel has no plan to support following APIs for serial communication in Win32:

- [SetupComm](#)
- [SetCommBreak](#)
- [ClearCommBreak](#)
- [EscapeCommFunction](#) (no support for parameter set to SETBREAK and CLRBREAK)

Driver Binary Package:

- iaiousart.inf
- iaiousart.sys
- iaiousart.cat

Driver Interface Header: See MSDN link, above.

Enabled Features:

- Support baud rates: 300 – 921600, up to 3686400 by default as specified in the "Bay Trail-I SoC External Design Specification" document, Section 27.2.3, Baud Rate Generator. For setting baud rates of 1M, 2M, 3M, and 4M, see BKM section below.
- Support data size of 5,6,7, and 8-bit
- Support none, odd and even parity
- Support 1, 1.5, and 2 stop bits
- Support "Hardware" and "No" flow control and software flow control
- Support Serial Device Control Requests (IOCTLs) defined by MSFT for serial controllers in Windows. See Limitations below for the IOCTLs that will be enabled in the Gold release.



Limitations:

- HS-UART driver doesn't support DMA transfer with software flow control. When the application uses software flow control, the HS-UART will use PIO mode to copy data between peripheral and system memory.
- Software flow control only supports maximum baud rates of up to 115200. It is recommended to use hardware flow control for data transfer at high baud rates.
- When 1.5 stop bits is used, the data size can only be supported up to 5 bits.
- IOCTLs are not supported in driver:

IOCTL_SERIAL_XOFF_COUNTER

IOCTL_SERIAL_LSRMST_INSERT

IOCTL_SERIAL_SET_BREAK_ON

IOCTL_SERIAL_SET_BREAK_OFF

3.5 LPSS DMA Driver

LPSS DMA Driver is not exposed publicly and only the I²C, SPI, HS-UART driver are able to access the DMA driver interface.



3.6 SD2 Driver

The SD2 driver is not exposed publicly and will replace the Windows Inbox SD2 driver to provide SD2 storage capabilities on this Intel SoC platform.

Driver Binary Package:

- iaiosd.inf
- iaiosd.sys
- iaiosd.cat

Driver Interface Header: None

Enabled Features:

- Support SD and SDHC card specification.
- Support SD card class: 2, 4, 6, 10, and UHS-1.
- Support 1-bit and 4-bit bus mode.
- Support FAT32 and exFAT file system.
- Support Advanced Direct Memory Access (ADMA) transfer mode

Limitation:

- SD card read and write performance may be 10-20% lower in Win7/WES7 64 bit due to operating system limitation as the system only sends 64Kb package.



3.7 Errata, Closed Issues, Known Issues

3.7.1 Errata

Issue #	Description	Impact	Recommendation
4634746	SPI driver failed to read and write on <51Kbps	Low speed transfer	Use SPI with speed >100Kbps
4634789	IOTG BIOS does not support USB Legacy boot in xHCI mode.	OS Boot in xHCI mode	Perform OS Boot with USB in EHCI mode.
4634818	System re-enumeration and disconnect on HSIC device due to silicon issue.	File transfer fail on HSCI device when any plug/unplug on USB2.0 bottom port.	Do not plug/unplug on USB2.0 bottom port during file transfer on HSIC device.
4634792	One bit is wrong occasionally in SPI due to Bayley Bay Platform issue	One bit is wrong when perform continuous data transfer in SPI	Use Bakersport Fab A, Fab B, Bayley Bay Fab2 and Bayley bay Fab 3 light green boards.
4634816	System shutdown after BIOS stage when booting up with SD card plug in (Bayley Bay Platform issue)	User failed to boot up the system when connected with the SD card.	Use Bakersport Fab A, Fab B.
4634937	HS-UART COM number increases every time after uninstall/reinstall of UART driver	For those applications using COM ports of HSUART, user need to enable changing input parameter of COM number	Change the HS-UART COM ports in the application whenever the UART driver is reinstalled.
4634826	On top USB2.0 Port (Keyboard or mouse) is unable to wake the system from sleep and hibernate due to the HSIC chipset issue.	User failed to wake the system up by using on top USB2.0 port	Use other USB2.0/USB3.0 port to wake the system from S3 and S4 stage.



4635034	System unable to load into Windows after wake up from hibernate by hitting USBkeyboard and mouse when XHCI mode in BIOS is set to 'Auto' or 'Smart Auto'	User failed to resume the system back from hibernate when XHCI mode is set to "Auto" or smart Auto	Change XHCI mode to "Enable".
---------	--	--	-------------------------------

3.7.2 Closed Issues

Issue #	Description	Resolution
4634844	High CPU usage when transferring data with high speed through HS-UART	Maintenance Release 1 v1.1.6.1030
4634724	Added UART driver has support for IOCTL_SERIAL_SET_WAIT_MASK and IOCTL_SERIAL_WAIT_ON_MASK	Maintenance Release 1 v1.1.6.1030
4634938	HSUART data transfer is incomplete when timeout occurs	Maintenance Release 1 v1.1.6.1030
4635047	I2C unable to do read/write after unplugged and plug back to the port when DMA is on.	Maintenance Release 1 v1.1.6.1030
4634842	Intermittent first byte lost when perform I2C read on B3-M and B3-D	Maintenance Release 1 v1.1.6.1030

3.7.3 Known Issues

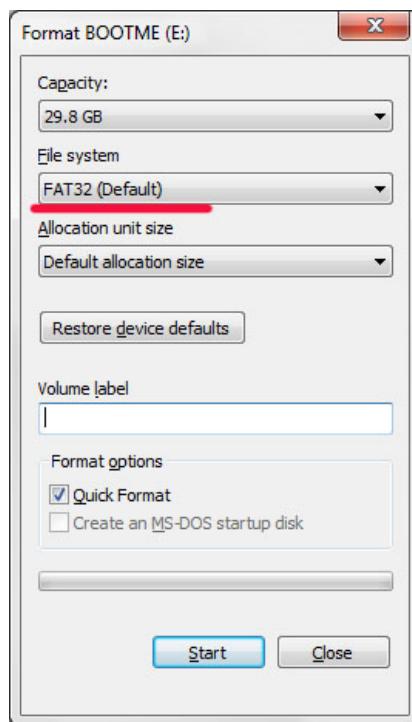
Issue #	Description	Impact	Recommendation
4994734	Super Speed USB 3.0 Pendrive Performance Drop in WES 7	WEC7 USB3.0 Super Speed thumb drive , for example Lexar JumpDrive* P10 USB 3.0 Flash Drive 32GB (up to 265MB/s read, 245MB/s write)	Use the standard USB3.0 Pen Drive, for example Corsair Voyager (up to 80MB/s read, 40MB/s write).

4 User Guide

4.1 Building Windows BSP

This section covers Windows 7, Windows Embedded Standard 7 and Windows Embedded POSReady 7.

1. Prepare the installation media
 - a. Use a thumb drive with a capacity of 8-32GB, and format it for FAT32.



- b. Extract all files from ISO image of WIN7/WES7/POSReady 7 to the thumb drive.

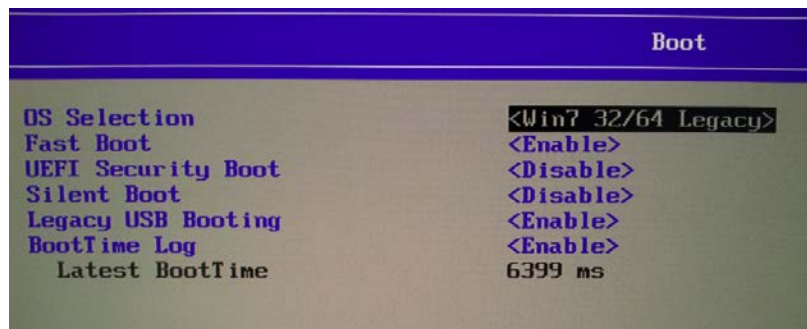


2. BIOS Setup for installation

- a. In BIOS settings, enter "Device Manager -> System Setup -> Boot, and set as follows:

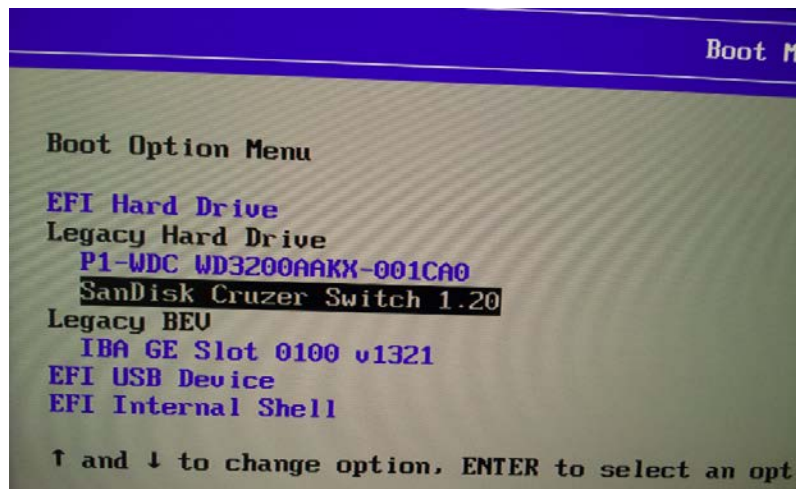
- OS Selection: Win7 32/64 Legacy
- Legacy USB Booting: Enable

Then press "F4" and commit changes and Exit.



- b. Enter into "Boot Manager" -> then SELECT the option to boot from the drive or device which contains the OS image and hit ENTER.

Note: Please DO NOT use EFI USB boot since Win 7 is in Legacy mode.





3. Operating system installation:
 - a. Install the OS with Windows OS default installation steps.
 4. Intel IO drivers installation:
 - a. For Windows 7 64-bit or WES7 64-bit, install the Microsoft Hotfix KB2732471 (<http://support.microsoft.com/kb/2732471>)
Remark: This hotfix is only required for the SD driver. It is not needed for Win7/WES7 (64-bit) if the SD driver is not used.
 - b. Execute Intel Processor Win7 IO Drivers 32Bit.msi or Intel Processor Win7 IO Drivers 64-bit.msi.
- Note:** Run as administrator.
- c. Check the checkbox "Always trust software from Intel Technology Sdn.Bhd." and click **Install**.
5. Chipset INF installation
 - a. Execute the SetupChipset_10.0.13.exe installation package.

4.2 Platform BKM's

The following BKM's describe platform techniques to enable the supported Windows 7 IO drivers on Intel customer reference boards. Not all BKM's are included.

4.2.1 How to Rework Bakersport Fab B USB3.0 Port

By default, Bakersport Fab B has an issue with USB3.0 port. This port fails to read several types of USB3.0 thumb drive and couldn't achieve USB3.0 performance.

Remark: Patriot Memory 64GB and EDGE DiskGO* 32GB thumb drives are not recommended to be used in EHCI mode.

Affected Platform	Bakersport boards (PBA# G72250-200 Rev 02) (Fab B)
Rework Steps	1) Un-stuff choke on L8A2 2) Stuff R8A4 and R8A3 (0 ohms)

4.2.2 How to Rework Bakersport Fab B I²C Port 6

By default, Bakersport Fab B has an issue with I²C port 6. This port fails to read and write due to incorrect resistor connection.

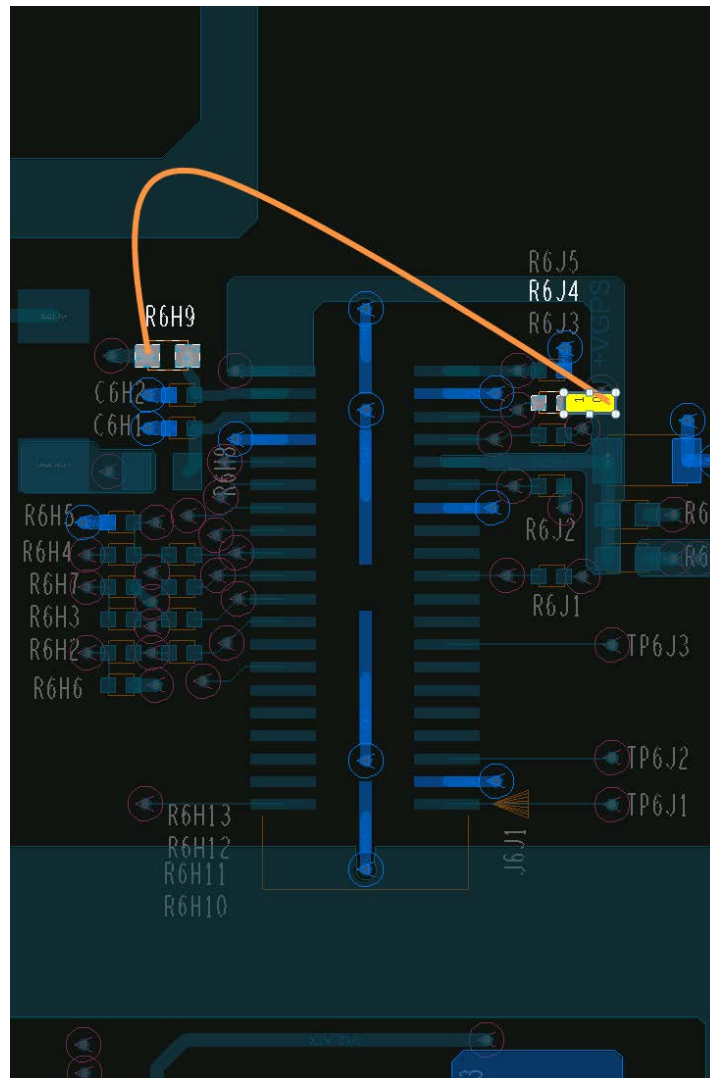


Affected Platform	Bakersport boards (PBA# G72250-200 Rev 02) (Fab B)
Rework Steps	1) UnStuff R5H9, R5H12, R5H8, R5H10 2) Stuff R5H4 (22 ohms) 3) Stuff R5H3 (22 ohms)

4.2.3 How to rework UART in Bakersport and Bayley Bay

By default, Bakersport Fab B has an issue with I²C port 6. This port fails to read and write due to incorrect resistor connection.

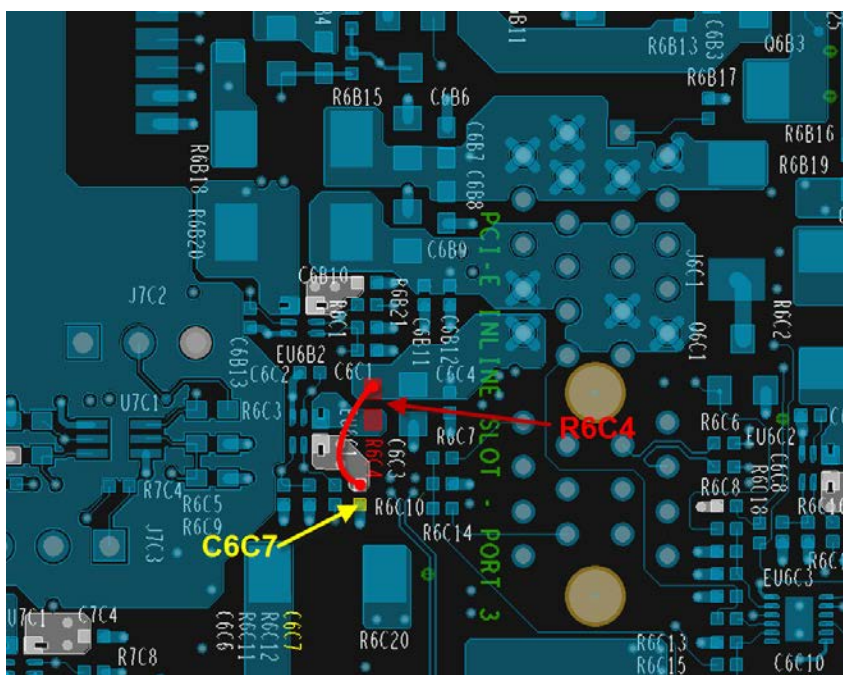
Rework Steps	1) Place a 10K resistor followed by a 28 AWG wire from R6J4 to R6H9 See below rework layout, yellow box is the 10K PU resistor followed by orange wire to R6H9
Affected Platform	Bakersport boards (PBA# G72250-200 Rev 02) (Fab B) Bayley Bay boards Fab 3 (IOTG configured) platforms only



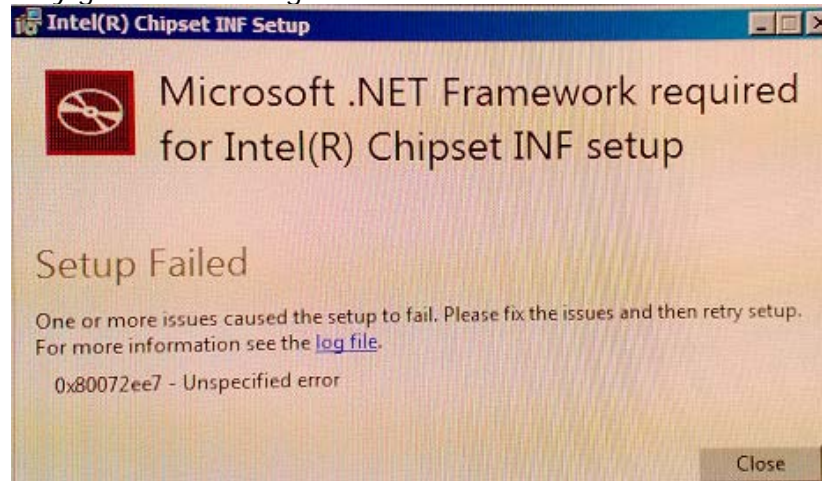
4.2.4 How to Rework Bayley Bay Fab 3 PCI-E INLI Slot-Port 3

By default, Bayley Bay Fab 03 has an issue with PCI-E Slot 3. This PCIe slot fails to detect the network card after shutdown followed by power up (without switching off the main power).

Affected Platform	Bayley Bay boards Fab 3 (IOTG configured) platforms only
Rework Steps	<ol style="list-style-type: none"> 1. Remove R6C4 2. Add jumper wire from C6C7 to R6C4 as shown below.
Reasons for the rework:	<p>NIC cards don't get recognized in Windows while the jumper block (J7C2) is configured to Desktop mode, pins [1–2].</p> <p>Failure mode occurs in PCIE Slot3</p>



1. Prepare the setup environment: Connect the USB Flash Device (on which you want to deploy the WES 7 image) to the USB port and connect the storage device that contains the WES 7 image.
2. Power up the system and boot into the WES 7 image.
3. Select **Build an Image**. Accept the license terms and conditions, select do not use a template, choose a language, and then click Next.
4. In the select the packages window to include in your image page, click "**Feature Packages**" to expand the branch, then click "**Embedded Enabling Features**", and then select "**Bootable Windows USB Stack**".
5. Add any other additional drivers/packages that you may need.
 - To install chipset INF, choose .NET when installing WES; otherwise you may get the following error:



6. Click on **Resolve Dependencies** and try to resolve all the dependency issues.

Note: If you are asked to choose between **Standard Windows USB Stack** and **Bootable Windows USB Stack**, be sure to only leave **Bootable Windows USB Stack** checked.

7. On the drive-selection screen, select the partition you wish to install to.
8. Click next and wait for the installation to complete.



4.3.3 How to Disable the DMA Feature for I²C

There are seven I²C controllers in the Intel® Atom™ Processor E3800 and they use the Windows registry to control the DMA feature.

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\iaioi2c\Parameters]

"ForceDma"="0,0,0,0,0,0,0"
```

ForceDma is a string type and there are seven values mapped to the seven I²C controllers (device IDs are from 0F41 to 0F47h).

Value 0 will force DMA to disable, and I²C data will be read/write in PIO mode.

For a value other than 0, if data length is more than the specified value, I²C data will read/write in DMA mode; if data length is less than the specified value, I²C data will read/write in PIO mode.

By default, without any registry settings, I²C will use PIO mode.

4.3.4 How to Set the Baud Rates of HS-UART

1. The baud rate is calculated using the following method:

$$\text{Baud rate} = (\text{SourceClockFrequency}) / (16 * \text{divisor})$$

$$\text{Source Clock Frequency} = 50000000 * \text{PrescalerMValue} / \text{PrescalerNValue} * 2$$

For example, to set baud rate to 1M:

Set PrescalerMValue = 64

Set PrescalerNValue = 100

SourceClockFrequency = 64,000,000

You can customize the value of SourceClockFrequency, PrescalerMValue and PrescalerNValue from Windows registry. You will need to reboot the system after setting these values.

2. To support baud rates between 230,400 and 3,686,400, create and change the following registry setting:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\iaiouart\Parameters]

;High speed source clock, M and N prescalers

"HSUartSourceClockFrequency"=dword:01c1f8f8

"HSUartPrescalerMValue"=dword:00003fff

"HSUartPrescalerNValue"=dword:00006c80
```

3. To support baud rates between 300 and 115200, change the following registry settings.

For low-speed source clock, M and N prescalers:

```
"UartSourceClockFrequency"=dword:001c2000
```

```
"UartPrescalerMValue"=dword:0000025a
```

```
"UartPrescalerNValue"=dword:00007fff
```

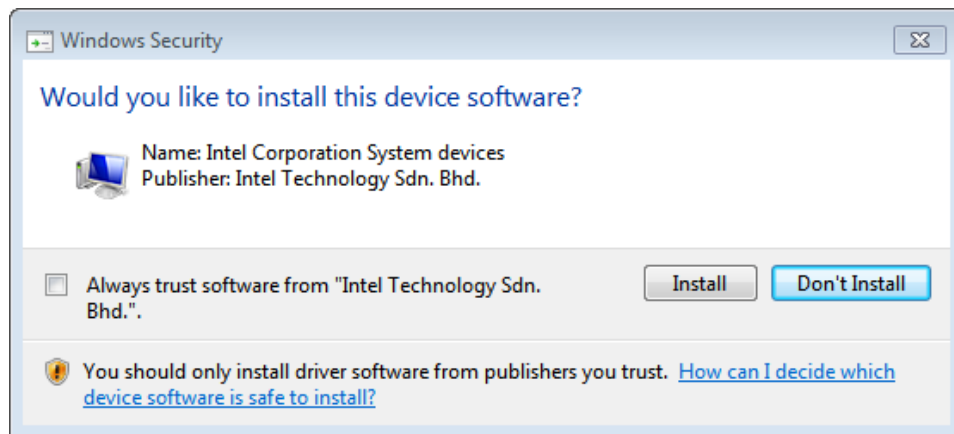
See Section 27.2.3, Baud Rate Generator, in the “Bay Trail-I SoC External Design Specification” for details.

4.3.5 How to Install I/O Driver Unattended in Windows 7

All operations mentioned below require **administrator privileges** in Windows 7 and Windows Embedded Standard 7 (WES7). You will need to write a Windows batch file to complete these steps.

Suppress the Windows Security prompt

1. This prompt will pop up every time during driver installation until user clicks the “Always trust software from...” click box.

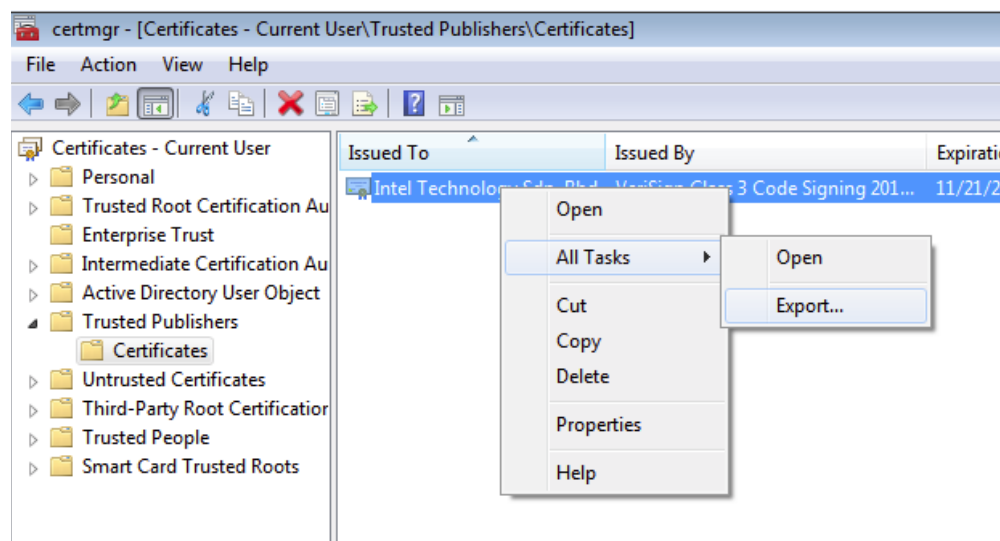


To suppress this prompt, you need to first add the “Intel Technology Sdn. Bhd.” as a trusted publisher.

- a) Manually install Intel IO driver on Windows 7 and select the “Always trust software from Intel Technology Sdn. Bhd.” click box.
- b) After installation, run Windows tool **certmgr.msc** and navigate to **Trusted Publishers** then **Certificates**.



- c) Export the certificate with the name "Intel Technology Sdn. Bhd." to your local disk with DER encoded binary X.509(.CER) format. For example, "Intel.cer"



- d) On your other Windows platform where you intend to install the driver unattended, add the exported certificate to the Windows Trusted Publisher. Run the following command with administrator privileges:
- `certmgr.exe -add intel.cer -c -s -r localMachine TrustedPublisher`
 - User can obtain *certmgr.exe* from Windows SDK. Refer to MSDN [Certificate Manager Tool](#)

Suppress the Windows Installer prompt

Intel IO driver package is in Windows Installer (MSI) format so you can use the *msiexec.exe* to install it in unattended mode. For example, run this command in administrator privileges:

```
msiexec /i "Intel Atom E3800 Win7 IO Drivers 32Bit.msi" /passive
```

To uninstall it:

```
msiexec /x "Intel Atom E3800 Win7 IO Drivers 32Bit.msi" /passive
```

Unattended uninstallation when .msi file is not present.

Create a bat file with following command. Run the bat file as administrator.

```
wmic product where name="xxxxxx" call uninstall
```



Note: "xxxxxx" refers to the application name. For example: Intel Atom E3800 Win7 IO Drivers 32bit.

4.3.6 How to Install I/O Driver Using INF or SYS File

By default, you can run the Intel driver .msi installer package to install the I/O drivers. Alternatively, you can also install by retrieving the raw driver package (the INF and SYS file) from the following folder after driver installation and install the driver using PnPUtil or Windows DP Installer.

For 64 bit driver: [Program Files]\Intel\Intel Atom E3800 Win7 IO Drivers 64bit

For 32 bit driver: [Program Files]\Intel\Intel Atom E3800 Win7 IO Drivers 32bit

Also, users can customize their own installation directly based on driver package files. For example:

- Use PnPUtil tool to install driver by inf file [http://msdn.microsoft.com/en-us/library/windows/hardware/ff550423\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/windows/hardware/ff550423(v=vs.85).aspx)
- Use Driver Package Installer (DPIInst) [http://msdn.microsoft.com/en-us/library/windows/hardware/ff544842\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/windows/hardware/ff544842(v=vs.85).aspx)

4.3.7 How to Install USB3.0 Driver into System

Note: For more details about USB 3.0, refer to the USB 3.0 "Bring up Guide.pdf", which is available for download in VIP.

1. Connect PS2/USB keyboard and mouse onto your system
2. Boot into Windows 7 with the below BIOS configuration:

Go to "Device Manager" -> System Setup -> Boot -> set OS selection to "Win7 32/64 Legacy" -> commit changes and exit

Go to "Device Manager" -> System Setup -> South Cluster Configuration -> USB Configuration -> Change XHCI mode to <smart Auto>

3. Boot the system into Windows and install the USB3.0 driver.
4. After the installation is completed, go to **Device Manager** to ensure that the below USB3.0 devices are shown under Universal Serial Bus Controllers. Note that the device should not have a yellow bang.

- Intel® USB 3.0 eXtensible Host Controller
- Intel® USB 3.0 Root Hub

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