



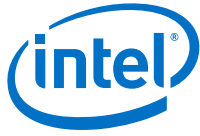
# Intel<sup>®</sup> Quark<sup>™</sup> SoC X1000 Software

Package Version: 1.2

Release Notes

---

*September 2015*



You may not use or facilitate the use of this document in connection with any infringement or other legal analysis concerning Intel products described herein. You agree to grant Intel a non-exclusive, royalty-free license to any patent claim thereafter drafted which includes subject matter disclosed herein  
No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest Intel product specifications and roadmaps.

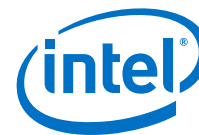
The products described may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Copies of documents which have an order number and are referenced in this document may be obtained by calling 1-800-548-4725 or by visiting: <http://www.intel.com/design/literature.htm>

Intel, Intel® Quark™ and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

\*Other names and brands may be claimed as the property of others.

Copyright © 2015, Intel Corporation. All rights reserved.



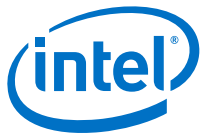
## Contents

---

<b>1.0</b>	<b>Description of Release</b>	6
1.1	New Features in Release 1.2	6
1.1.1	BIOS/Firmware	6
1.1.2	Linux* Operating System (OS)	6
1.1.3	Tools	6
1.2	Features	7
1.2.1	BIOS/Firmware	7
1.2.2	Bootloader	7
1.2.3	Linux* Operating System (OS)	8
1.2.4	OpenOCD	9
1.3	Limitations	9
1.4	Unplanned Functionality	9
1.5	Component Versions	10
1.5.1	Packages	10
1.6	Related Documentation	10
1.7	Licensing	10
<b>2.0</b>	<b>Known Issues</b>	12
<b>3.0</b>	<b>Resolved Issues</b>	14

## Tables

1	Related Documentation	10
2	Licensing	11
3	Known Issue Summary	12
4	Resolved Issue Summary	14

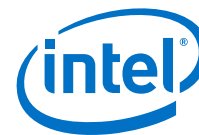


## Revision History

---

Date	Revision	Description
September 2015	004	General updates for software release 1.2.0 in the following sections: <ul style="list-style-type: none"><li>• <a href="#">Section 1.1, "New Features in Release 1.2" on page 5.</a></li><li>• <a href="#">Section 1.2, "Features" on page 6.</a></li><li>• <a href="#">Section 1.2.1, "BIOS/Firmware" on page 6.</a></li><li>• <a href="#">Section 1.2.3, "Linux* Operating System (OS)" on page 7.</a></li><li>• <a href="#">Section 1.3, "Limitations" on page 8.</a></li><li>• <a href="#">Section 1.5.1, "Packages" on page 9.</a></li><li>• <a href="#">Section 1.6, "Related Documentation" on page 9.</a></li><li>• <a href="#">Section 1.7, "Licensing" on page 9.</a></li><li>• <a href="#">Section 2.0, "Known Issues" on page 11.</a></li><li>• <a href="#">Section 3.0, "Resolved Issues" on page 22.</a></li></ul>
February 2015	003	General updates for software release 1.1.0 in the following sections: <ul style="list-style-type: none"><li>• <a href="#">Section 1.1, "New Features in Release 1.2" on page 5.</a></li><li>• <a href="#">Section 1.2.2, "Bootloader" on page 6.</a></li><li>• <a href="#">Section 1.3, "Limitations" on page 8.</a></li><li>• <a href="#">Section 1.7, "Licensing" on page 9.</a></li><li>• <a href="#">Section 2.0, "Known Issues" on page 11.</a></li><li>• <a href="#">Section 3.0, "Resolved Issues" on page 22.</a></li></ul>
22 May 2014	002	General updates for software release 1.0.1 in the following sections: <ul style="list-style-type: none"><li>• <a href="#">Section 1.1, "New Features in Release 1.2" on page 5.</a></li><li>• <a href="#">Section 1.3, "Limitations" on page 8.</a></li><li>• <a href="#">Section 1.7, "Licensing" on page 9.</a></li><li>• <a href="#">Section 2.0, "Known Issues" on page 11.</a></li><li>• <a href="#">Section 3.0, "Resolved Issues" on page 22.</a></li></ul>
04 March 2014	001	First public release of document.

S



## 1.0 Description of Release

---

This document describes extensions and deviations from the release functionality described in the documentation for the Intel® Quark™ SoC X1000 (formerly code named Clanton).

This release is called: Package Version: 1.2.0

Intel® Quark™ SoC X1000 Software supports the following Form Factor Reference Design boards (FFRDs):

- Customer Reference Boards:
  - Galileo Customer Reference Board (CRB), Fab D with blue PCB
  - Galileo (Gen 2) Customer Reference Board (CRB), Gen 2 marking
- Intel® Quark™ SoC X1000 Industrial/Energy Reference Design, "Cross Hill"
- Intel® Quark™ SoC X1000 Transportation Reference Design, "Clanton Hill"
- Intel-only System Validation Platform (SVP), "Clanton Peak"

For instructions on building and running the release software, see the Intel® Quark™ SoC X1000 Board Support Package (BSP) Build and Software User Guide (see [Table 1](#)).

These release notes also include known issues with third-party or reference platform components that affect the operation of the software.

### 1.1 New Features in Release 1.2

#### 1.1.1 BIOS/Firmware

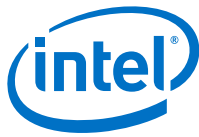
- Integrated TPM Feature

#### 1.1.2 Linux\* Operating System (OS)

- Updated to Linux 3.14 kernel
- Updated to Yocto version 1.7
- Enabled 6LoWPAN support
- Implemented UART DMA on receive path

#### 1.1.3 Tools

- Clanton Hill: CAN firmware upgrade tool
- The Platform data tool now has the ability to produce an independent platform data binary



## 1.2 Features

Features supported in this release are listed in the following subsections.

### 1.2.1 BIOS/Firmware

- Added TPM1.2 Measured Boot
- GCC 4.3 support is obsolete
- EDKII code base upgraded to UDK2014.SP1.P1
- Fixed various compilation warnings reported by community
- Increase size for EDKII Stage1 Image 1 and Stage1 Image 2 is removed. This change requires additional steps in Capsule Update. Refer to BSP build guide Section 13 for details.
- I2C Ppi and Protocol access is merged to be I2C library.
- Recovery:
  - Force recovery support (jumper/strap to force the system into recovery mode)
  - Secure recovery support (recovery capsules must be validly signed for Secure SKUs)
- Update:
  - Secure update support (update capsules must be validly signed for Secure SKUs)
- Secure Lock Down build support for secure SKUs. Includes `-DSECURE_LD` build option for creating image for secure SKUs. This restricts the boot options from EDKII (USB/SD/UEFI Shell boot are not allowed).
- Security features:
  - Protected BIOS Range registers, thus protecting more SPI flash regions.
  - SMI protection of SPI flash (secure SKUs only). Prevents non-EDKII code from updating SPI flash.
- ECC scrubbing (memory patrol scrubbing) disabled regardless of fuse setting
- Switch from SPI flash mapped platform data to ACPI objects for platform ID, MAC addresses, and serial number
- Secure boot using Root Of Trust ROM when using a secure SKU Intel® Quark™ SoC X1000
- Boot device selection:
  - SD boot
  - USB (OHCI/EHCI) boot
  - Payload boot (application in legacy SPI flash)
  - EFI Shell
- ACPI 5.0

### 1.2.2 Bootloader

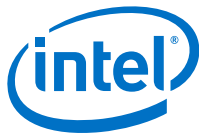
- Secure boot Root of Trust when using a secure SKU Intel® Quark™ SoC X1000
- Isolated Memory Region (IMR) protection of compressed Linux\* kernel before executing kernel
- Bootloader executed as payload from SPI flash



- Ability to load kernel and root-filessystem from SPI flash

### 1.2.3 Linux\* Operating System (OS)

- IsADC (including calibration) optional plug-in for timer-based sampling trigger
- Drivers for Transportation Reference Design (Clanton Hill)
  - STMicroelectronics\* LIS331DLH Accelerometer Driver
  - Audio Subsystem Driver
  - Analog AD7298 ADC Driver
- Thermal Driver
- HE910 3G Driver
- WiFi Driver:
  - Intel® Centrino® Wireless-N 135 (also provides Bluetooth via USB)
  - Intel® Centrino® Advanced-N 6205 (Dual Band WiFi, 2.4 and 5 GHz)
- I<sup>2</sup>C\* interface
- IMR protection of kernel, text, and data sections
- Kernel logic to parse platform data specific to Clanton Peak, Industrial/Energy Reference Design (Cross Hill), Transportation Reference Design (Clanton Hill), Galileo Customer Reference Board and Galileo GEN2 Customer Reference Board
- Ethernet
  - Two Ethernet interfaces: Clanton Peak, Industrial/Energy Reference Design (Cross Hill), and Transportation Reference Design (Clanton Hill)
- GPIOs fully programmable as input or output from kernel gpiolib
- HS-UART interface x 2
- SPI master interface x 2
- USB OHCI/EHCI port x 2
- USB device
- SD master interface
- Small embedded user-space busybox based system < 2 megabytes compressed
- ACPI S3 support
- XSLCAN (channel multiplexing over single Serial Line CAN)
- Clanton Hill: J1708 protocol support
- Clanton Hill: J1939 protocol support
- Clanton Hill: support for dual channel SLCAN (1 high-speed, 1 low-speed channel)
- Cross Hill: adds interrupt support to Maxim 78M6610+LMU Energy Measurement Processor
- Adds driver for Texas Instruments ADC1x8S102 ADC device
- 6LoWPAN
  - Support Yanzi IoT dongle (IoT-U10) as serial radio
  - Support CoAP, OMA LWM2M, IPSO Smart Object, DTLS



#### 1.2.4 OpenOCD

- OpenOCD support is available with OpenOCD source
- GDB\* server and Telnet\* server support
- Halt/Step/Resume CPU
- CPU register access
- Memory access
- I/O Access (via OpenOCD command tool, not via GDB)

### 1.3 Limitations

The software package has the following limitations:

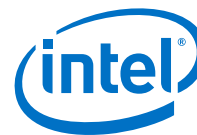
- Support for multiple keys is not included in this release.
- 1588 time-stamping protocol not supported in this release
- Watchdog timer not enabled
- UART limitations:
  - Flow control should be enabled for baud rate > 115200bps.
- No software flow control in DMA mode
- Versioning information is not supported for individual SPI Flash assets.
- MFH SPI Flash version record is inaccurate if Manufacture SPI Flash Binary is built with EDKII standalone build and nonexistent if firmware update capsule is built using EDKII standalone build environment
- CAN limitations:
  - Bitrate limitation: 10 kbps is not supported due to a hardware limitation of the MB91520 Fujitsu CAN controller.
  - Timestamps are not currently added by the IOC firmware prior to sending CAN messages over the UART to the Intel® Quark™ SoC X1000.

### 1.4 Unplanned Functionality

Support for the following items is not plan of record (POR):

- Network boot
- Legacy OS boot
- ECC scrubbing (also called memory patrolling)





## 1.5 Component Versions

### 1.5.1 Packages

```
Board_Support_Package_Sources_for_Intel_Quark_v1.2.0:
  grub-legacy_5775f32a+v1.2.0.tar.gz
  meta-clanton_v1.2.0.tar.gz
  Quark_EDKII_v1.2.0.tar.gz
  quark_linux_v3.14+v1.2.0.tar.gz
  release.txt
  spi-flash-tools_v1.2.0.tar.gz
  sysimage_v1.2.0.tar.gz
  xSLCAN_Firmware_for_Intel_Quark_v1.2.0.zip (selected customers only)
```

## 1.6 Related Documentation

The documents in [Table 1](#) provide more information about the software in this release.

**Table 1. Related Documentation**

Document Name	Reference Number
Intel® Quark™ SoC X1000 Software Release Notes (this document)	330232
Intel® Quark™ SoC X1000 Board Support Package (BSP) Build and Software User Guide	329687
Intel® Quark™ SoC X1000 Software Developer's Manual for Linux*	330235
Intel® Quark™ SoC X1000 Secure Boot Programmer's Reference Manual	330234
Intel® Quark™ SoC X1000 UEFI Firmware Writer's Guide	330236
Intel® Galileo Board User Guide	330237
Source Level Debug using OpenOCD/GDB/Eclipse on Intel® Quark SoC X1000 Application Note <a href="https://communities.intel.com/docs/DOC-22203">https://communities.intel.com/docs/DOC-22203</a>	330015
Intel® Quark™ SoC X1000 Datasheet <a href="https://communities.intel.com/docs/DOC-21828">https://communities.intel.com/docs/DOC-21828</a>	329676
Intel® Quark™ SoC X1000 Core Developer's Manual <a href="https://communities.intel.com/docs/DOC-21826">https://communities.intel.com/docs/DOC-21826</a>	329679
Intel® Quark™ SoC X1000 Core Hardware Reference Manual <a href="https://communities.intel.com/docs/DOC-21825">https://communities.intel.com/docs/DOC-21825</a>	329678
Clanton Hill and CAN Getting Started Guide This document is provided to selected customers only; contact your Intel representative.	545350
6LoWPAN Support on Intel® Galileo - User Guide - Revision 1.0	559445

## 1.7 Licensing

This package contains source code licensed under one or more open source licenses. Consult the COPYING, README, or LICENSE files in the appropriate subdirectory. Intel does not make any representations or warranties, express or implied, including without limitation, any warranty of fitness for any purpose, merchantability or non-infringement.



The package also includes executable binaries provided under Intel Proprietary License (IPL) as listed in [Table 2](#). The IPL license file is in the same directories as the binaries in the package.

**Table 2. Licensing**

Location	Description
...\Quark_EDKII_v1.2.0\QuarkSocPkg\QuarkNorthCluster\Binary\QuarkMicrocode\RMU.bin	Microcode for the Intel® Quark™ SoC X1000. (RMU: Remote Management Unit)
...\Quark_EDKII_v1.2.0\QuarkSocPkg\QuarkNorthCluster\Binary\Quark2Microcode\RMU.bin	Microcode for a future generation Quark SoC.
xSLCAN_Firmware_for_Intel_Quark_v1.2.0\ioc_combined_image_clanton.mhx	xSLCAN firmware to be programmed to the Fujitsu xLSCAN controller on a Clanton Hill FFRD.

§

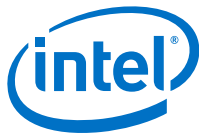


## 2.0 Known Issues

Known issues in the current release are listed in the following tables.

**Table 3. Known Issue Summary**

38292 - Cannot force MMC into 4-bit mode due to kernel bug .....	12
45539 - SDMediaDevice.efi is setting older 25 MHz cards to 50 MHz .....	12
53037 - Linux kernel has some debug settings enabled by default .....	12
57071 - Galileo board is unavailable after host computer sleeps .....	12
58381 - Attempting to unload a Linux driver which is in use causes console to freeze .....	12
60003 - Legacy RTC 'Valid' time bit is set even though RTC contains invalid time .....	13
60147 - Quark enumerates incorrect device class as a USB CDC ACM device .....	13
60803 - BIOS error when using 2G MMC card .....	13
63520 - SMBIOS fields are currently incorrect for the Quark reference platforms .....	13
64263 - Error detecting Western Digital USB 3.0 hard drive .....	14
65706 - Hot plug of USB key intermittently fails .....	14
65952 - USB Errors seen with Sandisk Cruzer 4GB Flash Drive .....	14
66053 - Poor USB write performance caused by automounter .....	14
66218 - Nonfunctional USB key may break the detection for other functional USB keys on Clanton Hill .....	14
69965 - Quark EDKII default exception handler entry point is not valid .....	15
75161 - Boot log error: memory range cannot be reserved .....	15
75172 - Clanton Hill: USB Error messages reported when booting debug build of EDKII .....	15
76832 - Error returned when booting from external media .....	15
78550 - Some USB keys not recognized by Quark EDKII recovery on Galileo and Galileo Gen2 .....	15
82890 - PWM is unable to turn off under certain conditions .....	16
83572 - I2C driver can lock up the system .....	16
89664/118224 - SD card may be unavailable on S3 resume .....	16
94926 - USB device descriptor error .....	16
95013 - USB does not automount when using SD image but does when using SPI image .....	17
96268 - System fails to boot in 8259 (PIC) mode .....	17
96922 - UART software flow control not working when UART operates in DMA mode .....	17
107859 - SD device is not booting when USB device without boot image is connected to the system .....	18
113082 - UART performance at high baud rates .....	18
113400 - Bluetooth stress test failed on concurrent testing (WIFI +BT) .....	18
114515 - Intermittent failure of large data transfer while waking up from S3 state .....	18
115790 - LS-ADC read fails on Clanton-Hill .....	19
117031 - SLCAN issues .....	19
117220 - Your debugger may have limited support for Dwarf Version 4 symbol information .....	19
118349 - Use of libpthread, libasound or libstdc++ may trigger an illegal instruction exception .....	20
118545 - GPIO access using the Arduino interface may cause the sketch to crash .....	20
120516 - ACPI Tables indicates that TPM is present on platforms that have no TPM present .....	21



## 2.1 38292 - Cannot force MMC into 4-bit mode due to kernel bug

Title	Cannot force MMC into 4-bit mode due to kernel bug
Id	38292
Implication	There is a kernel bug that is seen when forcing MMC into 4-bit mode. If you use the command: modprobe sdhci debug_quirks=0x400000 Only one bit is set: SDHCI_QUIRK_FORCE_1_BIT_DATA, bit 22 The board fails to initialize; returning these errors: - 110 timeout - 5 I/O error
Workaround	Use the command: modprobe sdhci debug_quirks=0x8400000 This sets: SDHCI_QUIRK_FORCE_1_BIT_DATA, bit 22 SDHCI_QUIRK_MISSING_CAPS, bit 27

## 2.2 45539 - SDMediaDevice.efi is setting older 25 MHz cards to 50 MHz

Title	SDMediaDevice.efi is setting older 25 MHz cards to 50 MHz
Id	45539
Implication	25MHz SD cards will not be recognized or usable.
Workaround	Use 'Fast' 50MHz capable SD cards.

## 2.3 53037 - Linux kernel has some debug settings enabled by default

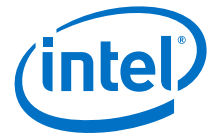
Title	Linux kernel has some debug settings enabled by default
Id	53037
Implication	The Quark kernel default configuration has some debug configuration settings enabled (e.g. in SPI subsystem and memory management). This results in an increased kernel footprint and may have a performance impact.
Workaround	Disable the unwanted debug settings in the relevant Yocto meta-intel-quark configurations and then rebuild.

## 2.4 57071 - Galileo board is unavailable after host computer sleeps

Title	Galileo board is unavailable after host computer sleeps
Id	57071
Implication	When the Galileo board is connected to a host computer that enters sleep mode, and the host is woken, the Galileo board will be unavailable on USB. This behavior is caused by the Gadget Serial driver and is seen on all OSes (Linux, Windows, Mac OS).
Workaround	There is no workaround, you must reboot the Galileo board.

## 2.5 58381 - Attempting to unload a Linux driver which is in use causes console to freeze

Title	Attempting to unload a Linux driver which is in use causes console to freeze
Id	58381



Implication	When a driver is in use (like for instance SD/MMC mass storage device when an SD card is mounted) and user tries to remove it using 'modprobe -r mmc_block' then existing console hangs. Existing console is not usable until board rebooted or mass storage device unmounted from other console.
Workaround	Make sure the driver is not use before trying to unload. For instance unmount mass storage device first, then unload mmc_block driver.

## 2.6 60003 - Legacy RTC 'Valid' time bit is set even though RTC contains invalid time

Title	Legacy RTC 'Valid' time bit is set even though RTC contains invalid time
Id	60003
Implication	Legacy RTC 'Valid' time bit is set even though RTC contains invalid time. Any software that trusts the 'Valid' bit without any sanity checks on the time/date may be using a corrupt date/time.
Workaround	None.

## 2.7 60147 - Quark enumerates incorrect device class as a USB CDC ACM device

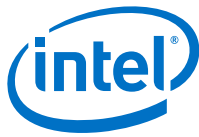
Title	Quark enumerates incorrect device class as a USB CDC ACM device
Id	60147
Implication	As a USB CDC ACM device, the Quark SoC enumerates a USB Device descriptor with Class, SubClass and DeviceProtocol 02, 00, and 00 respectively. This is incorrect given that the Quark CDC ACM setup uses Interface Association Descriptors. The USB specification recommends different values in the device descriptor when using IADs, consequently, Windows may generate errors. The values in the device descriptor should be EFh, 02h, 11h, respectively. Workaround
Workaround	NA

## 2.8 60803 - BIOS error when using 2G MMC card

Title	BIOS error when using 2G MMC card
Id	60803
Implication	2G Transcend MMC card (TS2GMMC4) is not recognised or is unusable.
Workaround	Use alternative MMC card.

## 2.9 63520 - SMBIOS fields are currently incorrect for the Quark reference platforms

Title	SMBIOS fields are currently incorrect for the Quark reference platforms
Id	63520
Implication	Only SMBIOS Type0 and Type2 fields have been validated to be correct. Software using any other SMBIOS entries may be using incorrect information.
Workaround	Only use validated SMIOS table entries.

**2.10 64263 - Error detecting Western Digital USB 3.0 hard drive**

Title	Error detecting Western Digital USB 3.0 hard drive
Id	64263
Implication	Western Digital USB3.0 HDD not recognized or usable.
Workaround	Use alternative USB HDD.

**2.11 65706 - Hot plug of USB key intermittently fails**

Title	Hot plug of USB key intermittently fails
Id	65706
Implication	USB key is not recognized or is unusable.
Workaround	Disconnect and reconnect the USB key.

**2.12 65952 - USB Errors seen with Sandisk Cruzer 4GB Flash Drive**

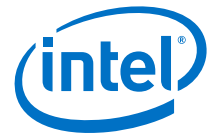
Title	USB Errors seen with Sandisk Cruzer 4GB Flash Drive
Id	65952
Implication	USB Key 'Sandisk Cruzer 4GB' is not recognized or is unusable in BIOS.
Workaround	Use alternative USB key.

**2.13 66053 - Poor USB write performance caused by automounter**

Title	Poor USB write performance caused by automounter
Id	66053
Implication	Automounting of USB memory is done with the '-o sync' flag by default. For VFAT filesystems (the default on USB and SD memory), there is a performance degradation which causes a typical write to take about 5 minutes.
Workaround	One workaround is to search and replace '-o sync' with '-o flush' in the /usr/bin/automount.sh file. However, the copy command will return before the write is complete. If the USB memory device is removed before the write is complete, the board may be in an unbootable state.

**2.14 66218 - Nonfunctional USB key may break the detection for other functional USB keys on Clanton Hill**

Title	Nonfunctional USB key may break the detection for other functional USB keys on Clanton Hill
Id	66218
Implication	This issue is seen only when non-functional USB key is connected to J1. Note that J12 (USB port0) and functional USB key connected to J10 (USB port1 via hub). Issue is not seen when positions are swapped.
Workaround	Only connect functional USB devices (USB devices that EDKII can function with without errors) to the system.



## 2.15 69965 - Quark EDKII default exception handler entry point is not valid

Title	Quark EDKII default exception handler entry point is not valid
Id	69965
Implication	If the system hits an exception (divide by zero for example) during Quark EDKII boot then the system will vector to the default exception handler at address 0xFFFFFFFF4. As there is no valid exception handler at this address, system behavior is undefined.
Workaround	None.

## 2.16 75161 - Boot log error: memory range cannot be reserved

Title	Boot log error: memory range cannot be reserved
Id	75161
Implication	When booting, the following error is displayed in boot logs: [ 0.996963] pnp: PnP ACPI init [ 0.996963] ACPI: bus type pnp registered [ 1.003633] system 00:00: [mem 0xe0000000-0xe1ffffff] has been reserved [ 1.011283] system 00:00: [mem 0xfed1c000-0xfed1ffff] has been reserved [ 1.018649] system 00:00: [mem 0x000c0000-0x000dffff] has been reserved [ 1.026093] system 00:00: [mem 0x000e0000-0x000ffffff] could not be reserved
Workaround	This error message will not affect board operation and can be ignored.

## 2.17 75172 - Clanton Hill: USB Error messages reported when booting debug build of EDKII

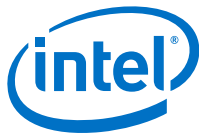
Title	Clanton Hill: USB Error messages reported when booting debug build of EDKII
Id	75172
Implication	The following error messages are reported during boot on Clanton Hill with a debug build of EDKII: Error Count : 3 EhcControlTransfer: error - Device Error, transfer - 2 However, no functional USB issues are observed and USB is working as expected. Issue is currently under investigation.
Workaround	None.

## 2.18 76832 - Error returned when booting from external media

Title	Error returned when booting from external media
Id	76832
Implication	When booting from external media that does contain a UEFI bootloader, the following error is returned: ERROR: C40000002: V3051002 I0 6D33944A-EC75-4855-A54D-809C75241F6C The boot manager reports this error if it finds bootable media that has no bootloader.
Workaround	Boot using media formatted as described in BSP Build and Software User's Guide.

## 2.19 78550 - Some USB keys not recognized by Quark EDKII recovery on Galileo and Galileo Gen2

Title	Some USB keys not recognized by Quark EDKII recovery on Galileo and Galileo Gen2
Id	78550



Implication	Recovery process will fail on Galileo and Galileo Gen2 with these USB keys. Currently the following USB keys have been seen to fail: 1) Sandisk cruzer 4GB 2) Transend 4GB
Workaround	Two potential workarounds have been identified: (1) Connect a USB hub to the Galileo Gen2 USB port and then connect the failing USB key(s) to the USB hub. The USB keys have been observed to pass in this configuration (2) Select a different USB key

## 2.20 82890 - PWM is unable to turn off under certain conditions

Title	PWM is unable to turn off under certain conditions
Id	82890
Implication	The PWM output may not be able to disable when there are other GPIO or PWM configurations in between the current PWM enable and disable sequence. The same I/O pin may still output PWM signals although it has been configured to GPIO mode.
Workaround	If the problem is encountered, run the 'turn on' and then follow by 'turn off' sequence when trying to disable PWM. Note that the PWM driver has an internal flag for current PWM state and it executes the 'turn on'/'turn off' only when there is a state change.

## 2.21 83572 - I<sup>2</sup>C driver can lock up the system

Title	I <sup>2</sup> C driver can lock up the system
Id	83572
Implication	This is a very rare occurrence.
Workaround	None

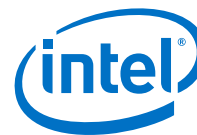
## 2.22 89664/118224 - SD card may be unavailable on S3 resume

Title	SD card may be unavailable on S3 resume
Id	89664/118224
Implication	The following error is reported when the error occurs "mmc0: error -110 (SD card was removed?) during S3 resume"
Workaround	Use another manufacturer's SD card.

## 2.23 94926 - USB device descriptor error

Title	USB device descriptor error
Id	94926
Implication	When warm boot with Telit HE910 module installed, occasionally a 'usb X-Y: device descriptor read/64, error -110' may be observed. Will need to wait for 1~2 min before having access to any USB devices. Once the problem is observed, it will occur every time the system is warm reboot. The problem is not observed without the Telit module installed.
Workaround	Perform a cold boot to recover.





## 2.24 95013 - USB does not automount when using SD image but does when using SPI image

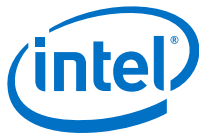
Title	USB does not automount when using SD image but does when using SPI image
Id	95013
Implication	SPI image running Yocto 1.6 uses initd which provides a hotplug mechanism. Yocto using initd uses /etc/init.d/mdev.sh to echo mdev to /proc/sys/kernel/hotplug. The SD image running Yocto 1.6 uses systemd (YP1.6.1 SD) has no /etc/init.d/mdev.sh so USB is not automounted as a result.
Workaround	Manually mount USB device using mount command. For example, mount /dev/sda1 /media/mountpoint

## 2.25 96268 - System fails to boot in 8259 (PIC) mode

Title	System fails to boot in 8259 (PIC) mode
Id	96268
Implication	If Linux is booted in legacy 8259 mode (by passing 'noapic nolapic' string in the kernel command line) the system will fail to boot, or result in unpredictable run-time behaviour. This is due to a driver being able to handle only APIC/MSI interrupt routing scheme.
Workaround	<p>In drivers/mfd/intel_qrk_gip_core.c, function intel_qrk_gip_probe(), identify the following block:</p> <pre> if (enable_msi) {     pci_set_master(pdev);     retval = pci_enable_msi(pdev);     if (retval)         goto err_release_drvdata; } </pre> <p>Delete the statements:</p> <pre> if (retval)     goto err_release_drvdata; </pre> <p>Rebuild the kernel.</p>

## 2.26 96922 - UART software flow control not working when UART operates in DMA mode

Title	UART software flow control not working when UART operates in DMA mode
Id	96922
Implication	When UART is in DMA mode, software-based flow control will not work. Note hardware flow control will work in both PIO and DMA mode.
Workaround	To use software flow control, switch the UART to PIO mode by using the intel_quark_hsuart_dma.uartX_dma module parameter. Refer to the Quark Linux Software Developers' Manual for more details



## 2.27 107859 - SD device is not booting when USB device without boot image is connected to the system

Title	SD device is not booting when USB device without boot image is connected to the system
Id	107859
Implication	The current Intel Quark SoC X100 bootloader is designed so that if a USB device is connected, priority will be given to boot from the USB device only. If boot/grub/grub.conf is not found on the USB device, it will proceed to boot according to the GRUB configuration stored in the SPI image. The SD will be skipped.
Workaround	1) If the intention is to boot from the SD, do not insert the USB device when the system is powered on or rebooted. Only insert the device after booting is completed. 2) Modify GRUB configuration that is in the SPI image to add an entry to boot the OS on the SD.

## 2.28 113082 - UART performance at high baud rates

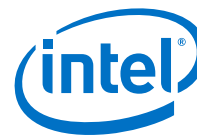
Title	UART performance at high baud rates
Id	113082
Implication	Due to X1000 SoC hardware limitations, the UART will not be able to operate at full throughput at baud rates above 115200 bps and will be subject to data overrun.
Workaround	1) Recommend to enable hardware flow control. 2) The UART driver if operated in PIO mode has improved performance at high baud rates, with a trade-off of higher CPU utilization.

## 2.29 113400 - Bluetooth stress test failed on concurrent testing (WIFI +BT)

Title	Bluetooth stress test failed on concurrent testing (WIFI +BT)
Id	118349
Implication	While WiFi and Bluetooth run concurrent repeatedly, bluetooth might fail to connect and return message "l2test[23760]: Can't connect: Software caused connection abort (103)"
Workaround	None

## 2.30 114515 - Intermittent failure of large data transfer while waking up from S3 state

Title	Intermittent failure of large data transfer while waking up from S3 state
Id	114515
Implication	Intermittently, if the system enters S3 state in the presence of heavy traffic the network driver doesn't function after resume from S3 state.
Workaround	Restart the network service. ifconfig <interface name> down ifconfig <interface name> up



### 2.31 115790 - LS-ADC read fails on Clanton-Hill

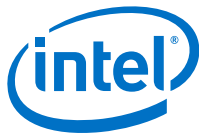
Title	LS-ADC read fails on Clanton-Hill
Id	115790
Implication	Occasionally after power-up, the sysfs path to read ADC values <code>"/sys/bus/iio/devices/iio:device0/in_voltageX_scale"</code> does not exist. Instead, they are found in another path <code>"/sys/bus/iio/devices/iio:device1/in_voltageX_scale"</code>
Workaround	Read ADC from <code>"/sys/bus/iio/devices/iio:device1/in_voltageX_scale"</code> instead of <code>"/sys/bus/iio/devices/iio:device0/in_voltageX_scale"</code> .

### 2.32 117031 - SLCAN issues

Title	SLCAN issues
Id	117031
Implication	If any SLCAN device (e.g. CAN USB) connect to xSLCAN enabled system, two SLCAN interfaces will be registered in system instead of one, and the last registered interface will not function correctly.
Workaround	NA

### 2.33 117220 - Your debugger may have limited support for Dwarf Version 4 symbol information

Title	Your debugger may have limited support for Dwarf Version 4 symbol information
Id	117220
Implication	Some debuggers (i.e. Intel System Debugger 2015) may have limited support for Dwarf Version 4 symbol information. If when debugging binaries, the line information and variable resolution in the debugger may be unsatisfactory i.e. unable to see local variables.
Workaround	Rebuild your project using the <code>-gdwarf-3</code> option instead of simply <code>-g</code>

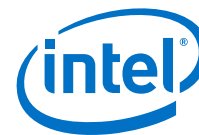


## 2.34 118349 - Use of libpthread, libasound or libstdc++ may trigger an illegal instruction exception

Title	Use of libpthread, libasound or libstdc++ may trigger an illegal instruction exception
Id	118349
Implication	<p>The uclibc library contains a unsupported instruction in the pthread_cond_timedwait() function.</p> <p>If a program calls this function it will trigger an illegal instruction exception.</p> <p>The problem is caused by the default config for uclibc was set as CONFIG_686, thus it sets HAVE_CMOV which leads to presence of the illegal instruction.</p> <p>Additionally the glibc libasound and libstdc++ libraries also contain illegal cmov instructions.</p>
Workaround	<p>As a workaround for the libpthread issue change the config so that CONFIG_586=y and CONFIG_SUBARCH="i586" to follow the quark architecture.</p> <ol style="list-style-type: none"><li>1. Go to the yocto folder</li><li>2. mkdir -p meta-intel-quark/recipes-core/uclibc</li><li>3. mkdir -p meta-intel-quark/recipes-core/uclibc/uclibc</li><li>4. Create a file meta-intel-quark/recipes-core/uclibc/uclibc_git.bbappend cat &gt; meta-intel-quark/recipes-core/uclibc/uclibc_git.bbappend FILESEXTRAPATHS_prepend := "\${THISDIR}/\${PN}:" SRC_URI += "file://i586-nlp.cfg/"</li><li>5. cat &gt; /meta-intel-quark/recipes-core/uclibc/uclibc/i586-nlp.cfg CONFIG_586=y CONFIG_SUBARCH="i586"</li><li>6. bitbake -f -c cleanall uclibc</li><li>7. bitbake image-spi</li></ol> <p>There is no workaround available for the libasound or libstdc++ issues.</p>

## 2.35 118545 - GPIO access using the Arduino interface may cause the sketch to crash

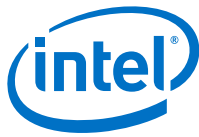
Title	GPIO access using the Arduino interface may cause the sketch to crash
Id	118545
Implication	<p>UIO access to the GPIO registers has been disabled by default as the interface is non-coherent with gpiolib. This non-coherency can result in a race condition during access to the GPIO registers.</p> <p>The Arduino application may use this UIO interface to enable faster GPIO access than using the sysfs interface of gpiolib. As the UIO interface has been disabled in the kernel by default, an Arduino sketch that is trying to use the UIO interface will crash with an error similar to that below.</p> <pre>[ 50.563706] traps: sketch.elf[518] general protection ip:804a44f sp:bfbda5b8 error:0 in sketch.elf[8048000+7000]</pre>
Workaround	<p>If the user is satisfied that there are no other applications that are accessing the GPIO registers (SPI for example will use gpiolib for chip select) then the UIO interface of the GPIO driver may be enabled.</p> <p>To do this, the user must modify the kernel configuration CONFIG_INTEL_QRK_GPIO_UIO to yes. This will enable the UIO interface on the GPIO drivers and allow the Arduino sketch to work.</p> <p>Note also that the GPIO drivers cannot be built into the kernel if you wish to also enable the UIO interface. This is due to the fact that the UIO driver is initialized after the GPIO drivers and will result in a kernel panic on boot if allowed.</p>



## 2.36 120516 - ACPI Tables indicates that TPM is present on platforms that have no TPM present.

Title	ACPI Tables indicates that TPM is present on platforms that have no TPM present.
Id	120516
Implication	During BIOS boot ACPI tables are populated with devices that are detected on the platform. Trusted Platform Model (TPM) is currently present on CrossHill platform only. There is an issue that the ACPI tables report that the TPM is available on other platforms that have no TPM present. On Windows systems a 'yellow bang' will be seen in the device manager. On Linux the device INT3493:00 will be seen in /sys/bus/acpi/devices.
Workaround	NA

§



## 3.0 Resolved Issues

This section contains issues resolved since package version 1.1.0.

**Table 4. Resolved Issue Summary**

53887 - Deadlock in bluetooth stack - inherited from upstream kernel .....	22
61236 - Real Time Clock update issue (sh: %4Y%2m%2d%2H%2M: bad number) .....	22
70961 - Clanton Hill: If ETH0 is disconnected, ETH1 will not automatically pick up an address from DHCP..	23
73848 - Spurious 'unmounting/media/realroot' error message .....	23
80408 - Boot stalls and needs UART serial console activity to continue .....	23
96194 - A suspend/resume cycle may result in very small memory leak .....	23
98436 - Inconsistent DMA numbering on UART devices .....	23
98616 - J1939 message errors .....	24
99141 - xSLCAN message error .....	24
99257 - Gadget serial data loss at end of transfer .....	24
99874 - Cannot unload Legacy GPIO driver module .....	24
104312 - Galileo sketch reset button is not working by default .....	24
103693 - Galileo services running on non-Galileo platforms when board is booted from SD card .....	25

### 3.1 53887 - Deadlock in bluetooth stack - inherited from upstream kernel

Title	Deadlock in bluetooth stack - inherited from upstream kernel
Id	53887
Implication	When using the bluetooth software stack, a potential deadlock message can be found in /var/log/messages. Could potentially cause a lock-up but this has yet to be shown.
Resolution	Fix with the latest upstream kernel code.

### 3.2 61236 - Real Time Clock update issue (sh: %4Y%2m%2d%2H%2M: bad number)

Title	Real Time Clock update issue (sh: %4Y%2m%2d%2H%2M: bad number)
Id	61236
Implication	The initscripts provided in poky release 1.4 do not support the simplified date program used by busybox. This shows an error in the boot log and may prevent Linux from reading time from the RTC clock and from saving time to it.
Resolution	Fix in Yocto meta layer.



### 3.3 70961 - Clanton Hill: If ETH0 is disconnected, ETH1 will not automatically pick up an address from DHCP

Title	Clanton Hill: If ETH0 is disconnected, ETH1 will not automatically pick up an address from DHCP
Id	70961
Implication	There are two PHYs on the Clanton Hill board. If ETH0 is disconnected and ETH1 is connected to the network with DHCP available, an address for ETH1 is not retrieved automatically.
Resolution	

### 3.4 73848 - Spurious 'unmounting/media/realroot' error message

Title	Spurious 'unmounting/media/realroot' error message
Id	73848
Implication	When booting from mass storage the following error is returned in the boot log: umount: can't umount /media/realroot: Device or resource busy This occurs for images booted from mass storage devices.
Resolution	This problem is resolved in the 1.2 release.

### 3.5 80408 - Boot stalls and needs UART serial console activity to continue

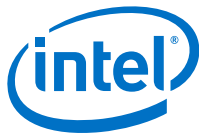
Title	Boot stalls and needs UART serial console activity to continue
Id	80408
Implication	Problem appears rarely and when it does boot can be progressed by hitting any key. Normal prompts to select recovery are not compromised by this workaround.
Resolution	This problem is resolved in the 1.2 release.

### 3.6 96194 - A suspend/resume cycle may result in very small memory leak

Title	A suspend/resume cycle may result in very small memory leak
Id	96194
Implication	Each suspend/resume cycle may result in very small <100byte memory leak
Resolution	This problem is resolved in the 1.2 release.

### 3.7 98436 - Inconsistent DMA numbering on UART devices

Title	Inconsistent DMA numbering on UART devices
Id	98436
Implication	The Quark HSUART driver enumerates DMA controllers starting from ID 1. This is inconsistent with the UART numbering, which starts from 0.  If UARTs are used in DMA mode (default), there is no implication. On the other hand, in order to switch off DMA on a UART instance, the user needs to bear this off-by-one issue in mind.
Resolution	This problem is resolved in the 1.2 release.



### 3.8 98616 - J1939 message errors

Title	J1939 message errors
Id	98616
Implication	Data errors can occur on J1939 message transfers
Resolution	Code fix in IOC FW and also xSLCAN

### 3.9 99141 - xSLCAN message error

Title	xSLCAN message error
Id	99141
Implication	Data errors can occur message on xSLCAN message transfers
Resolution	Code fix in IOC FW and also xSLCAN

### 3.10 99257 - Gadget serial data loss at end of transfer

Title	Gadget serial data loss at end of transfer
Id	99257
Implication	Raw data transfer over gadget serial can result in data loss
Resolution	Not a defect

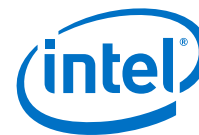
### 3.11 99874 - Cannot unload Legacy GPIO driver module

Title	Cannot unload Legacy GPIO driver module
Id	99874
Implication	The gpio-sch (legacy GPIO) driver has a bug in the module unloading routine which causes an invalid IRQ range to be freed up. Therefore, if the module is unloaded other drivers may lose interrupt delivery capability.
Resolution	In kernel 3.14, both the core and resume power well of the gpio-sch (Legacy GPIO) are combined. The handling of the IRQ range is continuous, and unloading the driver will free the correct range of IRQ.

### 3.12 104312 - Galileo sketch reset button is not working by default

Title	Galileo sketch reset button is not working by default
Id	104312
Implication	Software service for the sketch reset button on Galileo boards is not running by default. This means the service needs to be explicitly turned on in order to reset sketches from the board.
Resolution	This problem is resolved in the 1.2 release.





### 3.13 103693 - Galileo services running on non-Galileo platforms when board is booted from SD card

Title	Galileo services running on non-Galileo platforms when board is booted from SD card
Id	103693
Implication	<p>When a Quark board is booted from mass storage device, Galileo-specific services get executed regardless of the board type. The Galileo services reserve the USB gadget serial device which is then not accessible by applications.</p> <p>Note this only happens under mass storage boot, which uses systemd, as opposed to minimal SPI boot, which uses init.</p>
Resolution	This problem is resolved in the 1.2 release.

§

