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## ASF: Release ASF-3.5

The Atmel® Software Framework (ASF, [www.atmel.com/asf](http://www.atmel.com/asf)) is a compilation of embedded software for Atmel flash MCUs: megaAVR®, AVR XMEGA®, AVR UC3 and SAM devices. It has been designed to help develop and glue together the different components of a software design. It can easily integrate into an operating system (OS) or run as a stand-alone product.

The ASF is included in Atmel Studio® 6 ([www.atmel.com/atmelstudio](http://www.atmel.com/atmelstudio)). A separate package is available for megaAVR, AVR XMEGA, AVR UC3 and SAM users for IAR™, Atmel AVR Studio 4 and AVR32 Studio on [www.atmel.com/asf](http://www.atmel.com/asf). Atmel Studio users do not need this package as the ASF is integrated in Atmel Studio.

This document describes the supported devices, supported tools, and changes since last ASF release (enhancements, bugs fixes and known issues).



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**8/32-bits Atmel  
Microcontrollers**

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**Release ASF-3.5**

## Installation Instructions

### Device Support

This release supports the following devices:

- AVR UC3 A0/A1 (revision H and later)
- AVR UC3 B (revision F and later)
- AVR UC3 A3/A4 (revision E and later)
- AVR UC3 A3xS/A4xS (revision E and later)
- AVR UC3 C (revision D and later)
- AVR UC3 D
- AVR UC3 L0 (revision D and later)
- AVR XMEGA A1
- AVR XMEGA A1U
- AVR XMEGA A3
- AVR XMEGA A3B
- AVR XMEGA A3U
- AVR XMEGA A3BU
- AVR XMEGA A4U
- AVR XMEGA A4
- AVR XMEGA B
- AVR XMEGA C
- AVR XMEGA D3
- AVR XMEGA D4
- AVR XMEGA E
- megaAVR: ATmega1284P
- megaAVR: ATmega2560
- megaAVR: ATmega48/88/168/328
- megaAVR: ATmega16/32
- megaAVR: ATmega169/329
- megaAVR: ATmega64/128
- megaAVR: ATmega324/644/1284
- SAM3N
- SAM3S
- SAM3U
- SAM3X
- SAM4L
- SAM4S

### Supported Tools

- Atmel Studio 6 using GCC compiler:
  - ARM version 4.6.1
  - 32-bit AVR version 4.4.3 (AVR\_32\_bit\_GNU\_Toolchain\_3.3.1\_304)
  - 8-bit AVR version 4.5.1 (AVR\_8\_bit\_GNU\_Toolchain\_3.3.1\_444)
- Atmel AVR32 Studio version 2.6
- Atmel AVR Studio 4.18 SP3
- IAR EWAVR32 version 3.30
- IAR EWAVR version 6.12

- IAR EWARM version 6.40
- WinAVR version 20100110

Note:

- IAR EWAVR32 requires updated header files for the UC3 A3 and UC3 A3xS, UC3C C revision C, UC3 L series (unzip the avr32/utils/header\_files/avr32-headers.zip under /Embedded Workbench x.x/avr32/inc/). WinAVR requires updated header files (refer toxmega/utils/header\_files/readme.txt).
- SAM4L support for Atmel Studio 6 requires the Atmel Studio 6 Service Pack 1 installed (6.0sp1 or later). Visit [www.atmel.com/atmelstudio](http://www.atmel.com/atmelstudio)
- SAM4L support for IAR requires the add-on installer EWARM\_6.40\_SAM4L\_addon\_vx.x.zip) from [www.atmel.com/tools/SAM4L-EK.aspx](http://www.atmel.com/tools/SAM4L-EK.aspx)
- XMEGA E support for Atmel Studio 6 requires the Atmel Studio 6 Part Pack for ATxmega32E5 installed and an updated AVR GCC toolchain (3.4.0.84 or higher). Visit [www.atmel.com/atmelstudio](http://www.atmel.com/atmelstudio).

Note: DataFlash®, QT™, QTouch®, STK® are Atmel trademarks: [www2.atmel.com/About/trademark\\_usage.aspx](http://www2.atmel.com/About/trademark_usage.aspx).

## Documentation

- ASF getting started and reference manual: <http://www.atmel.com/asf/>.
- ASF on-line documentation: <http://asf.atmel.com/>.
- Atmel Studio 6 videos: [http://www.atmel.com/microsite/atmel\\_studio6/videos.aspx](http://www.atmel.com/microsite/atmel_studio6/videos.aspx)

## Community Information

These forums can be used to have an open discussion about usage, development, bugs, fixes, improvements, etc.

- ASF forum on AVRFreaks® (AVR users) at [www.avrfreaks.net/index.php?name=PNphpBB2&file=viewforum&f=21](http://www.avrfreaks.net/index.php?name=PNphpBB2&file=viewforum&f=21).
- ASF forum on AT91® (SAM users) at <http://www.at91.com>.

## New and Noteworthy

- Added XMEGA E (STK600) support, added new XCL driver demo
- Added XMEGA-C3 Xplained board support
- Added SAM4SD32 and SAM4S-EK2 support
- SD stack for SAM, UC3, XMEGA ready, with SPI and MMC interface. With file system example.
- SAM4L: added AST, EIC, USB device HID, BPM, PDCA, TC, DACC, Flashcaldw, LCDCA, C42364
- Updated CMSIS for SAM from v2.1 to 3.0
- FatFs is now available in Atmel Studio ASF wizard
- Added USB Host vendor class
- megaRF: added GPIO and clock driver

## New features added

- **Issue #ASFP-1531:** Add common SD/MMC card stack.

Add a common SD/MMC/SDIO stack which supports AVR, UC3 and SAM device through SPI, MCI or HSMCI drivers.

Added folder: common/components/memory/sd\_mmc/

Modified files:

```
avr32\boards\evk1100\evk1100.h
avr32\boards\evk1100\init.c
avr32\boards\evk1101\evk1101.h
avr32\boards\evk1101\init.c
avr32\boards\evk1104\evk1104.h
avr32\boards\evk1104\init.c
avr32\boards\evk1105\evk1105.h
avr32\boards\evk1105\init.c
avr32\boards\uc3c_ek\init.c
avr32\boards\uc3c_ek\uc3c_ek.h
sam\boards\sam3n_ek\init.c
sam\boards\sam3n_ek\sam3n_ek.h
sam\boards\sam3s_ek\init.c
sam\boards\sam3s_ek\sam3s_ek.h
sam\boards\sam3s_ek2\init.c
sam\boards\sam3s_ek2\sam3s_ek2.h
sam\boards\sam3u_ek\init.c
sam\boards\sam3u_ek\sam3u_ek.h
sam\boards\sam3x_ek\init.c
sam\boards\sam3x_ek\sam3x_ek.h
sam\boards\sam4s_ek\init.c
sam\boards\sam4s_ek\sam4s_ek.h
```

- **Issue #ASFP-1769:** Add XMEGA E devices in device map.

Added ATxmega32E5 and ATxmega16E5 ASF support.

- **Issue #ASFP-1770:** Add XMEGA E support in parts.h.

Updated /common/utils/parts.h to support ATxmega32E5 and ATxmega16E5.

- **Issue #ASFP-1771:** Update XMEGA nvm drivers for XMEGA E parts.

Added XMEGA E nvm drivers support, examples and unit tests.

Added \xmega\drivers\nvm\example1\atxmega32e5\_stk600-rc032x, \xmega\drivers\nvm\example2\atxmega32e5\_stk600-rc032x, \xmega\drivers\nvm\example3\atxmega32e5\_stk600-rc032x, \xmega\drivers\nvm\example4\atxmega32e5\_stk600-rc032x, \xmega\drivers\nvm\example5\atxmega32e5\_stk600-rc032x and \xmega\drivers\nvm\unit\_tests\atxmega32e5\_stk600-rc032x

- **Issue #ASFP-1772:** XMEGA E family modules drivers (std XMEGA) support.

Added XMEGAE drivers support for AC, CRC, DAC, IOPORT, PMIC, SPI and WDT and associated examples.

Modified files:

```
xmega\drivers\dac\dac.h
xmega\drivers\dac\example1\dac_example1.c
xmega\drivers\dac\example2\dac_example2.c
Added files:
xmega\drivers\pmic\example\pmic_example_xmegae.c
Added folders:
xmega\drivers\ac\example2
xmega\drivers\ac\example3
xmega\drivers\crc\example1\atxmega32e5_stk600-rc032x
xmega\drivers\dac\example1\atxmega32e5_stk600-rc032x
xmega\drivers\dac\example2\atxmega32e5_stk600-rc032x
xmega\drivers\pmic\example\atxmega32e5_stk600-rc032x
xmega\drivers\wdt\example\atxmega32e5_stk600-rc032x
```

- **Issue #ASFP-1773:** Add entry for new XMEGA E in \common\applications\user\_application\user\_board. Add support of STK600 ATXmega32E5 in Atmel Studio -> New Project.

- **Issue #ASFP-1775:** Update common services support for XMEGA E family.

Added XMEGA E device support for reset\_cause, stdio and sleepmgr common services and their related examples.

Added folders:

```
common\services\cpu\reset_cause_example\atxmega32e5_stk600-rc032x\
common\services\ioport\example1\atxmega32e5_stk600-rc032x\
common\services\ioport\example2\atxmega32e5_stk600-rc032x\
common\services\ioport\example3\atxmega32e5_stk600-rc032x\
common\services\sleepmgr\example\atxmega32e5_stk600-rc032x\
common\utils\stdio\stdio_serial\stdio_serial_example\atxmega32e5_stk600-rc032x\
```

Modified file:

```
common\services\ioport\xmega\ioport_compat.h
```

- **Issue #ASFP-1776:** Create stk600-rc032x board entry for ATXmega32E5.

Added ATXmega32E5 STK600 board support with RC032X routing card support.

Added folder:

```
xmega\boards\stk600/rc032x
```

Modified file:

```
common\boards\board.h
```

- **Issue #ASFP-1942:** Add USB host Mass Storage examples for SAM3X-EK and Arduino Due/X boards.

Add USB Host Mass Storage examples for SAM3X-EK and Arduino Due/X boards.

Folders added: common/services/usb/class/msc/host/example2/.

- **Issue #ASFP-1943:** Add USB host composite MSC/HID examples for SAM boards.

Add USB host composite MSC/HID example for SAM3X.

Folder added: common/services/usb/class/composite/host/example2.

- **Issue #ASFP-2353:** Add XMEGA-C3 Xplained board.

Add the XMEGA-C3 Xplained board.

Modified file:

```
common\boards\board.h
```

Added folder:

xmega\boards\xmega\_c3\_xplained\

- **Issue #ASFP-2416:** Add a common SD/MMC card example with FatFS.

Use FatFs module to mount the SD/MMC card and to write a file on it.

Folder added:

\common\components\memory\sd\_mmc\example2\

- **Issue #ASFP-2421:** Add SAM4SD32 support.

Add SAM4SD32 support

- **Issue #ASFP-2426:** Add SAM HSMCI driver.

Add HSMCI driver for SAM compliance with the common SD/MMC/SDIO stack (see bug# 1512).

Added folder: sam/drivers/hsmci/

- **Issue #ASFP-2427:** Add a basic R/W SD/MMC/SDIO card example.

Execute basic read and write block access to an SD/MMC/SDIO card. This example can be reused to start a specific development on a SDIO card or on a SD/MMC card without a file system.

Folder added:

\common\components\memory\sd\_mmc\example1\

- **Issue #ASFP-2428:** Add basic SD/MMC/SDIO card unit tests.

Install and execute a basic read and write block access to an external SD/MMC/SDIO card through common SD/MMC stack on SAM and AVR32 boards.

Folder added:

\common\components\memory\sd\_mmc\unit-tests\

- **Issue #ASFP-2430:** Update USB Device MSC examples and unit tests with the common SD/MMC stack support.

Update USB Device MSC examples and unit tests with the common SD/MMC stack support.

Modified folders:

common\services\usb\class\msc\device\example\

common\services\usb\class\msc\device\example\_freertos\

common\services\usb\class\msc\device\unit\_tests\

- **Issue #ASFP-2447:** SAM: Add Nand Flash support to USB Device MSC examples.

Add Nand Flash support to SAM3S, SAM3U and SAM3X USB MSC examples.

Files added: common/services/usb/class/msc/device/example/sam3s4c\_sam3s\_ek/conf\_nf.h, sam3sd8c\_sam3s\_ek2/conf\_nf.h, sam3u4e\_sam3u\_ek/conf\_nf.h, sam3x8h\_sam3x\_ek/conf\_nf.h.

File removed: common/services/usb/class/msc/device/example/sam3s4c\_sam3s\_ek/conf\_virtual\_mem.h.

Files modified: common/services/usb/class/msc/device/example/sam3s4c\_sam3s\_ek/conf\_access.h, conf\_board.h, common/services/usb/class/msc/device/example/sam3sd8c\_sam3s\_ek2/conf\_access.h, conf\_board.h, common/services/usb/class/msc/device/example/sam3u4e\_sam3u\_ek/conf\_access.h, conf\_board.h, common/services/usb/class/msc/device/example/sam3x8h\_sam3x\_ek/conf\_access.h, conf\_board.h,

common/services/usb/class/msc/device/example/sam4s16c\_sam4s\_ek/conf\_access.h, conf\_board.h, common/services/usb/class/msc/device/example/memories\_initialization\_sam.c, common/services/usb/class/msc/device/udi\_msc.c.

- **Issue #ASFP-2460:** Clock driver for MegaRF.  
Clock driver for MegaRF
- **Issue #ASFP-2461:** Add USB host vendor example for SAM3X-EK.  
Add USB host vendor driver and example for SAM3X-EK.  
Folder added:  
common/services/usb/class/vendor/host/example/.
- **Issue #ASFP-2462:** GPIO driver for megaRF.  
GPIO driver for megaRF. Added file: common/services/ioport/mega/ioport.h
- **Issue #ASFP-2465:** Interrupt implementation for MegaRF in ASF.  
Interrupt implementation for MegaRF in ASF
- **Issue #ASFP-2535:** Update clock service for XMEGA E.  
Updated common system clock service for XMEGA E specific features.  
New internal RC8MHz oscillator, new modules power reduction registers.  
Modified files:  
common/services/clock/xmega/osc.h  
common/services/clock/xmega/sysclk.c  
common/services/clock/xmega/sysclk.h
- **Issue #ASFP-2543:** Set PHY as configurable in SAM.  
Update the PHY component as configurable. The EMAC driver can select different PHY depending on the HW design.
- **Issue #ASFP-2549:** Add led chaser application for XMEGA E (ATxmega32E5).  
Added ATxmega32E5 led chaser examples.  
Added folder: common/applications/led\_chaser/atxmega32e5\_stk600.
- **Issue #ASFP-2569:** Add a USB host vendor class.  
Add USB host vendor class.  
Files added:  
common/services/usb/class/vendor/host/uhi\_vendor.h .c.
- **Issue #ASFP-2597:** Add sam/drivers/tc support for SAM4L.  
New folder and files added:  
sam/drivers/tc/tc\_capture\_waveform\_example/sam4lc4c\_sam4l\_ek  
sam/drivers/tc/tc\_capture\_waveform\_example/sam4lc4c\_sam4l\_ek/conf\_board.h  
sam/drivers/tc/tc\_capture\_waveform\_example/sam4lc4c\_sam4l\_ek/conf\_clock.h  
sam/drivers/tc/tc\_capture\_waveform\_example/sam4lc4c\_sam4l\_ek/conf\_uart\_serial.h  
Files modified:  
sam/drivers/spi/example/tc\_capture\_waveform\_example.c  
sam/drivers/tc.c  
sam/drivers/tc.h  
sam/utils/cmsis/sam4l/include/sam4l\_patch\_asf.h
- **Issue #ASFP-2598:** Add sam/drivers/spi support for SAM4L.



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Add sam/drivers/spi support for SAM4L.

New folder and files added:

sam/drivers/spi/example/sam4lc4c\_sam4l\_ek  
sam/drivers/spi/example/sam4lc4c\_sam4l\_ek/asf.xml  
sam/drivers/spi/example/sam4lc4c\_sam4l\_ek/conf\_board.h  
sam/drivers/spi/example/sam4lc4c\_sam4l\_ek/conf\_clock.h  
sam/drivers/spi/example/sam4lc4c\_sam4l\_ek/conf\_spi\_example.h  
sam/drivers/spi/example/sam4lc4c\_sam4l\_ek/conf\_uart\_serial.h

Files modified:

sam/boards/sam4l\_ek/init.c  
sam/drivers/spi/example/asf.xml  
sam/drivers/spi/example/spi\_example.c  
sam/drivers/spi.c  
sam/drivers/spi.h

- **Issue #ASFP-2664:** Update CMSIS for SAM from v2.1 to v3.00.

Update CMSIS for SAM from V2.1 to V3.00.

- **Issue #ASFP-2690:** New UC3 MCI driver.

The new UC3 MCI driver is compliant with the common SD/MMC/SDIO stack (see bug#1512).

New files added in avr32\drivers\mci\.

The old driver is kept, but moved in the sub folder avr32\drivers\mci\asf\_v1\ and hidden in Atmel Studio ASF wizard.

- **Issue #ASFP-2705:** Component at45dbx does not support multi SPI slave.

3 fixes:

- the SPI state is checked before enabling it to avoid a configuration reset from another component connected to the the same SPI.
- The clock/mode/... setup is done when a SPI select is requested when the SPI driver have only one register configuration for all slaves.
- The support of multiple DataFlash is fixed.

Modified files:

common/components/memory/data\_flash/at45dbx/at45dbx.c  
common/components/memory/data\_flash/at45dbx/at45dbx\_hal\_spi.h

- **Issue #ASFP-2707:** Interrupt based UART with circular buffer.

Implements a simple UART to fill a circular buffer using an interrupt. APIs are provided to enqueue and dequeue data to/from this circular buffer.

- **Issue #ASFP-2717:** Update XMEGA USART drivers to support XMEGA E new features.

Updated XMEGA USART driver to support XMEGA E USART new features (variable frame length, start frame detection and XCL encoding/decoding).

Added files: xmega/drivers/usart/usart\_xmegae.c/h.

Added folders:

xmega/drivers/usart/example/atxmega32e5\_stk600-rc032x/  
xmega/drivers/usart/example2/, xmega/drivers/usart/example3/  
xmega/drivers/usart/example4/, xmega/drivers/usart/example5/.

- **Issue #ASFP-2728:** Add AST support for SAM4L series.

Add AST support for SAM4L series

Folder added:  
sam\drivers\ast

- **Issue #ASFP-2732:** Add SAM4L support in common/services/spi/sam\_spi.

Add SAM4L support in common/services/spi/sam\_spi.

Added folder and files:

/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek  
/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek/asf.xml  
/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek/conf\_board.h  
/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek/conf\_clock.h  
/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek/conf\_spi\_master.h  
/common/services/spi/master\_example/sam4lc4c\_sam4l\_ek/conf\_spi\_master\_example.h

Modified files:

/common/services/spi/master\_example/asf.xml  
/common/services/spi/sam\_spi/spi\_master.c  
/common/services/spi/master\_example/spi\_master\_example\_sam3.c

- **Issue #ASFP-2733:** Add SAM4L support in common/services/twi.

Add SAM4L support to common/services/twi

- **Issue #ASFP-2736:** Add LCDCA driver for SAM4L series .

Add LCDCA driver for SAM4L series.

Added files:

sam/drivers/lcdca/asf.xml  
sam/drivers/lcdca/lcdca.c  
sam/drivers/lcdca/lcdca.h  
sam/drivers/lcdca/module\_config/conf\_lcdca.h

Added folders:

sam/drivers/lcdca/example  
sam/drivers/lcdca/unit\_tests

- **Issue #ASFP-2740:** Create XMEGA E XCL drivers, quick starts and examples.

Added XMEGA E XCL module drivers, examples and documentation.

Added folder /xmega/drivers/xcl/

- **Issue #ASFP-2746:** Update RTC module driver to support XMEGA E.

Added XMEGA E RTC drivers support and updated drivers to support calibration feature.

Updated XMEGA timeout service to support XMEGA E.

Modified files:

xmega/drivers/rtc/rtc.h rtc.c

Added folders:

xmega/drivers/rtc/example/atxmega32e5\_stk600-rc032x  
xmega/services/timeout/timeout\_example1/atxmega32e5\_stk600-rc032x  
xmega/services/timeout/timeout\_example2/atxmega32e5\_stk600-rc032x

- **Issue #ASFP-2771:** Add basic USB device support for SAM4L.

Add USBC USB device driver for SAM4L USB device stack support. Folder added: sam\drivers\usbc.

- **Issue #ASFP-2772:** Add USB device HID examples for SAM4L.

Add USB device HID examples for SAM4L. Folder added: common\services\usb\class\hid\device\mouse\example\sam4lc4c\_sam4l\_ek, common\services\usb\class\hid\device\kbd\example\sam4lc4c\_sam4l\_ek, common\services\usb\class\hid\device\generic\example\sam4lc4c\_sam4l\_ek.

- **Issue #ASFP-2779:** Add USB device HID unit-tests for SAM4L.

Add USB device HID unit-tests for SAM4L. Added folder: common\services\usb\class\hid\device\mouse\unit\_tests\sam4lc4c\_sam4l\_ek, common\services\usb\class\hid\device\kbd\unit\_tests\sam4lc4c\_sam4l\_ek.

- **Issue #ASFP-2784:** Add common\services\clock\example3 for SAM4L and fix DFLL bug.

Added common\services\clock\example3 for SAM4L

Fixed DFLL bug (added missing RANGE initialization for dfll\_config\_init\_open\_loop\_mode() and dfll\_config\_tune\_for\_target\_hz)

Cleanup:

. dfll\_set\_frequency\_range() is now private and becomes dfll\_priv\_set\_frequency\_range()

. dfll\_config\_init\_closed\_loop\_mode() is now calling dfll\_priv\_set\_frequency\_range()

Modified files:

common/services/clock/sam4l/module\_config/conf\_clock.h

common/services/clock/sam4l/sysclk.h

common/services/clock/sam4l/dfll.c

common/services/clock/sam4l/dfll.h

common/services/clock/example3/asf.xml

Added files:

common/services/clock/example3/clock\_example3\_sam4l.c

common/services/clock/example3/sam4lc4c\_sam4l\_ek

common/services/clock/example3/sam4lc4c\_sam4l\_ek/asf.xml

common/services/clock/example3/sam4lc4c\_sam4l\_ek/conf\_board.h

common/services/clock/example3/sam4lc4c\_sam4l\_ek/conf\_clock.h

common/services/clock/example3/sam4lc4c\_sam4l\_ek/conf\_example3.h

- **Issue #ASFP-2795:** Add usart example for SAM4L.

Add usart rs485 and serial examples for SAM4L.

Files modified:

sam/drivers/usart/usart.h

sam/drivers/usart/usart\_hard\_handshaking\_example/usart\_hard\_handshaking\_example.c

sam/drivers/usart/usart\_irda\_example/usart\_irda\_example.c

sam/drivers/usart/usart\_iso7816\_example/usart\_iso7816\_example.c

sam/drivers/usart/usart\_synchronous\_example/usart\_synchronous\_example.c

Files deleted:

sam/drivers/usart/usart\_rs485\_example/usart\_rs485\_example.c

sam/drivers/usart/usart\_serial\_example/usart\_serial\_example.c

Files added:

sam/drivers/usart/usart\_rs485\_example/usart\_rs485\_example\_pdc.c

sam/drivers/usart/usart\_rs485\_example/usart\_rs485\_example\_pdca.c

sam/drivers/usart/usart\_serial\_example/usart\_serial\_example\_pdc.c

sam/drivers/usart/usart\_serial\_example/usart\_serial\_example\_pdca.c

Folder added:

sam/drivers/usart/usart\_rs485\_example/sam4lc4c\_sam4l\_ek

sam/drivers/usart/usart\_serial\_example/sam4lc4c\_sam4l\_ek

- **Issue #ASFP-2819:** Add unit-test for SAM4L BPM driver.

Add unit-tests for BPM driver. Added folder: sam\drivers\bpm\unit\_tests.

- **Issue #ASFP-2831:** Improve performance on SAM SPI driver and service.

Improve performance on SAM SPI driver and service.

Modified files:

common/services/spi/sam\_spi/spi\_master.h  
sam/drivers/spi/spi.c  
sam/drivers/spi/spi.h

- **Issue #ASFP-2852:** Add legacy UC3 kit LCD support to the common graphics service.

Added support to the common graphics service for the ET024006DHU display panel when connected over the EBI of a UC3 device, as used on the EVK1104, EVK1105 and UC3C-EK boards.

Files Changed:

```
=====
avr32/components/display/et024006dhu/et024006dhu.c
avr32/components/display/et024006dhu/et024006dhu.h
common/services/gfx/asf.xml
common/services/gfx/example1/at32uc3a0512_evk1105/asf.xml
common/services/gfx/example1/at32uc3a3256_evk1104/asf.xml
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/asf.xml
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/atmel_logo.h
common/services/gfx/gfx.h
common/services/gfx/gfx_et024006dhu_tft.c
common/services/gfx/gfx_et024006dhu_tft.h
common/services/gfx/gfx_hx8347a_et024006dhu.c
common/services/gfx/gfx_hx8347a_et024006dhu.h
common/services/gfx/gfx_hx8347a_et024006dhu_ebi.c
common/services/gfx/gfx_hx8347a_et024006dhu_ebi.h
common/services/gfx/example1/at32uc3a0512_evk1105
common/services/gfx/example1/at32uc3a0512_evk1105/atmel_logo.h
common/services/gfx/example1/at32uc3a0512_evk1105/conf_board.h
common/services/gfx/example1/at32uc3a0512_evk1105/conf_clock.h
common/services/gfx/example1/at32uc3a0512_evk1105/conf_ebi.h
common/services/gfx/example1/at32uc3a0512_evk1105/conf_et024006dhu.h
common/services/gfx/example1/at32uc3a0512_evk1105/conf_sysfont.h
common/services/gfx/example1/at32uc3a0512_evk1105/smiley.h
common/services/gfx/example1/at32uc3a3256_evk1104
common/services/gfx/example1/at32uc3a3256_evk1104/atmel_logo.h
common/services/gfx/example1/at32uc3a3256_evk1104/conf_board.h
common/services/gfx/example1/at32uc3a3256_evk1104/conf_clock.h
common/services/gfx/example1/at32uc3a3256_evk1104/conf_ebi.h
common/services/gfx/example1/at32uc3a3256_evk1104/conf_et024006dhu.h
common/services/gfx/example1/at32uc3a3256_evk1104/conf_sysfont.h
common/services/gfx/example1/at32uc3a3256_evk1104/smiley.h
common/services/gfx/example1/at32uc3c0512c_uc3c_ek
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/conf_board.h
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/conf_clock.h
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/conf_ebi.h
common/services/gfx/example1/at32uc3c0512c_uc3c_ek/conf_et024006dhu.h
```

---

common/services/gfx/example1/at32uc3c0512c\_uc3c\_ek/conf\_sysfont.h  
 common/services/gfx/example1/at32uc3c0512c\_uc3c\_ek/smiley.h  
 common/services/gfx/tools/create\_image.py

- **Issue #ASFP-2904:** In USB host composite examples, improve ui\_usb\_connection\_event() routines.

Improve sub routine called by the callback implement for UHC\_CONNECTION\_EVENT(dev,is\_present).

Modified files:

common/services/usb/class/composite/host/example1/at32uc3a0512\_evk1100/ui.c,  
 common/services/usb/class/composite/host/example1/at32uc3a3256\_evk1104/ui.c,  
 common/services/usb/class/composite/host/example1/at32uc3b0256\_evk1101/ui.c,  
 common/services/usb/class/composite/host/example1/at32uc3c0512c\_uc3c\_ek/ui.c,  
 common/services/usb/class/composite/host/example1/main.c,  
 common/services/usb/class/composite/host/example1/ui.h.

- **Issue #ASFP-3014:** Add possibility to redefine the XMEGA ISR() macro.

Allow the redefinition of XMEGA ISR() macro through a custom file defined in project, like this:

```
-D ISR_CUSTOM_H="my_isr.h"
```

Modified file:

common\utils\interrupt\interrupt\_avr8.h

- **Issue #ASFP-3015:** Add USB Device MSC example on XMEGA-C3 Xplained.

Add USB Device MSC example on XMEGA-C3 Xplained with the SD/MMC connection.

Added folder:

common\services\usb\class\msc\device\example\xmega\_c3\_xplained\

## Notable bugs fixed

- **Issue #ASFP-184:** AT42QT1060 driver - use of EIC hardcoded for EVK1105 only.

AT42QT1060 component is not supported by the AT32UC3A0 and AT32UC3A1 device family.

- **Issue #ASFP-198:** PolarSSL needs to be updated to version 1.0.0 to solve build error.

Header file "openssl.h" from polarssl version 0.14.0 has some wrong function definition that creates build error. Update to version 0.99 will solve the issue

- **Issue #ASFP-340:** Add H&D Wi-Fi stack SPB firmware download application.

Added folder: thirdparty/hd/example/spbfw\_download/.

- **Issue #ASFP-674:** common/components/memory/data\_flash/at45dbx is not listed for any devices in AVR Studio 5 ASF menu.

Some AT45DBX definitions are missing in board definition causing module errors when using it in AVR Studio 5 with those boards. Modified file : avr32/boards/uc3\_a3\_xplained/uc3\_a3\_xplained.h ,xmega/boards/xmega\_a1\_xplained/xmega\_a1\_xplained.h

- **Issue #ASFP-881:** XMEGA NVM driver does not support XMEGA A3 rev B errata.

XMEGA NVM driver does not support XMEGA A3 rev B errata.

- **Issue #ASFP-882:** Sensor library fails compilation if not using a board in the 'Xplained' series of boards.

Sensor library fails compilation if not using an board in the "Xplained" series of boards.

- **Issue #ASFP-2170:** SAM: Wrong function of setting and cleaning wake-up inputs.  
Fix fast wake-up setup function, and fast rc disable function. Files modified: sam/drivers/pmc/pmc.c, pmc.h.
- **Issue #ASFP-2185:** SAM3X UOTGHS driver should use WAIT mode for suspend.  
Adjust UOTGHS driver, to save more power in USB suspend mode. Modified sam/drivers/uotghs/uotghs\_device.c, uotghs\_host.c, uotghs\_host.h, uotghs\_otg.h.
- **Issue #ASFP-2213:** When CAN Bus do not work correct can init stuck at while command.  
Modified files:  
avr32/services/network/can/can.c  
avr32/services/network/can/can.h  
avr32/applications/uc3c\_ek-can-lin-loopbacks-demo/conf/conf\_can.h  
avr32/services/network/can/example1/can\_example1.c  
avr32/services/network/can/example1/conf/conf\_can.h  
avr32/services/network/can/example1/conf/conf\_clock.h  
avr32/services/network/can/example2/can\_example2.c  
avr32/services/network/can/example2/conf/conf\_can.h  
avr32/services/network/can/example2/conf/conf\_clock.h
- **Issue #ASFP-2312:** can\_tx does not work with different dlc.  
Add CANIF\_mob\_clr\_dlc() call before setting CANIF\_mob\_set\_dlc() when setting up a mob in transmission.  
Modified files:  
avr32/services/network/can/can.c
- **Issue #ASFP-2380:** SAM ISR may happen before clocks restore from wait mode.  
Add wait mode wakeup check in USB and PIO ISR so that interrupts can be handled after clocks restored. Files modified: sam/drivers/pio/pio\_handler.c, sam/drivers/pmc/sleep.h, sam/drivers/udp/udp\_device.c, sam/drivers/udphs/udphs\_device.c, sam/drivers/uotghs/uotghs\_device.c, sam/drivers/uotghs/uotghs\_host.c.
- **Issue #ASFP-2381:** GCC may optimize 'g\_interrupt\_enabled' and cause problem.  
Define g\_interrupt\_enabled as volatile to avoid optimization by GCC. Modified files: common/utils/interrupt/interrupt\_sam\_nvic.c, interrupt\_sam\_nvic.h.
- **Issue #ASFP-2382:** SAM UDP driver should use WAIT mode for suspend.  
Apply sleepmgr WAIT mode to UDP to achieve low suspend current. Modified files: sam/drivers/pmc/sleep.h, sam/drivers/udp/udp\_device.c, udp\_device.h.
- **Issue #ASFP-2384:** In SAM3X HID dual/host example, RESUME button should not be initialized in ui\_init.  
Remove button initialize in ui\_init, it should be initialized when host/device is suspended. Modified files: common\services\usb\class\hid\dual\mouse\example\sam3x8h\_sam3x\_ek\ui.c, common\services\usb\class\hid\host\mouse\example\sam3x8h\_sam3x\_ek\ui.c.
- **Issue #ASFP-2409:** On first initialize of UOTGHS host driver, interrupt without statuses generated.  
Ignore very first UOTGHS interrupt without any status change. Modified files: sam\drivers\uotghs\uotghs\_host.c, uotghs\_host.h.
- **Issue #ASFP-2415:** SAM UOTGHS host driver should support endpoints that have no DMA.

---

Add support to endpoints that have no DMA for SAM UOTGHS host driver.

Files modified:

sam/drivers/uotghs/uotghs\_host.c, uotghs\_host.h.

- **Issue #ASFP-2437:** The SAM SPI service includes a bug concerning baudrate frequency result. Now the spi\_master\_setup\_device() can not generate a baudrate higher than the value requested. Modified files:  
common/services/spi/sam\_spi/spi\_master.c  
sam/drivers/spi/spi.c  
sam/drivers/spi/spi.h
- **Issue #ASFP-2442:** FATFS diskio update for USB host MSC support. FATFS diskio improvement for USB host MSC support. Files modified: thirdparty\fatfs\fatfs-port-r0.09\diskio.c.
- **Issue #ASFP-2502:** Fix uhd\_pipes\_unfreeze in SAM UOTGHS host driver. Fix uhd\_pipes\_unfreeze definition in UOTGHS host driver. uhd\_pipes\_unfreeze variable should be uint16\_t instead of uint8\_t. File modified: sam\drivers\uotghs\uotghs\_host.c.
- **Issue #ASFP-2506:** Fix isochronous pipe management in SAM UOTGHS host driver. Fix isochronous pipe management in SAM UOTGHS host driver. Files modified:  
sam/drivers/uotghs/uotghs\_host.c, uotghs\_host.h.
- **Issue #ASFP-2518:** SAM: Nand Flash RAW SMC driver problem R/W unaligned buffer on 16b NAND. Update nand flash raw smc driver to handle unaligned inputs. Modified file: common/components/memory/nand\_flash/nand\_flash\_ebi/nand\_flash\_raw\_smc.c.
- **Issue #ASFP-2525:** SAM4 : Error in lowpower mode function from pmc driver. Files modified:  
/sam/drivers/pmc/sleep.h  
/sam/drivers/pmc/pmc.c
- **Issue #ASFP-2526:** FWS Number of Wait States are not correct on SAM4S based boards. FWS Number of Wait States are not correct on SAM4S based boards. Modified files:  
\sam\utils\cmsis\sam4s\source\templates\system\_sam4s.c
- **Issue #ASFP-2560:** canif.h CANIF\_mob\_get\_dir(ch,mob) has an incorrect mask reference. Fix CANIF\_mob\_get\_dir() function (using correct AVR32\_CANIF\_DIR\_MASK definition). Modified file:  
avr32/drivers/canif/canif.h
- **Issue #ASFP-2570:** sam.utils.makefile: incorrect reference to the Code Sourcery cs-rm binary. Replace the use of the cs-rm binary by the rm binary provided with the ARM Toolchain. File modified:  
sam/utils/make/Makefile.in
- **Issue #ASFP-2600:** INRQ fill macro error in SAM UOTGHS driver.

Fix IRQN fill macro in SAM UOTGHS driver.  
File modified: sam/drivers/uotghs/uotghs\_host.h.

- **Issue #ASFP-2601:** Add new SAM4S devices support to sam.utils.

Files added:

sam/utils/cmsis/sam4s/include/sam4sa16b.h  
sam/utils/cmsis/sam4s/include/sam4sa16c.h  
sam/utils/cmsis/sam4s/include/sam4sd16b.h  
sam/utils/cmsis/sam4s/include/sam4sd16c.h  
sam/utils/cmsis/sam4s/include/sam4sd32b.h  
sam/utils/cmsis/sam4s/include/sam4sd32c.h  
sam/utils/linker\_scripts/sam4s/sam4sa16/\*  
sam/utils/linker\_scripts/sam4s/sam4sd16/\*  
sam/utils/linker\_scripts/sam4s/sam4sd32/\*

- **Issue #ASFP-2602:** Add new SAM4S devices support to CMSIS DSP examples.

Folders added:

/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_class\_marks\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_convolution\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_dotproduct\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_fft\_bin\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_fir\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_graphic\_equalizer\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_linear\_interp\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_matrix\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_signal\_converge\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_sin\_cos\_example/sam4sd32c\_sam4s\_ek2  
/thirdparty/CMSIS/DSP\_Lib/Examples/arm\_variance\_example/sam4sd32c\_sam4s\_ek2

- **Issue #ASFP-2603:** Add SAM4S-EK2 support to SAM application examples.

Folders added:

/sam/applications/getting-started/sam4sd32c\_sam4s\_ek2  
/sam/applications/sam\_low\_power/sam4sd32c\_sam4s\_ek2

- **Issue #ASFP-2604:** Add SAM4S-EK2 support to sam.boards.

Folder added:

/sam/boards/sam4s\_ek2

- **Issue #ASFP-2605:** Add new SAM4S devices support to SAM drivers & driver examples.

Folders added:

/sam/drivers/adc/adc\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/adc/adc\_temp\_sensor\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/adc/adc\_threshold\_wakeup\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/acc/acc\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/chipid/chipid\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/dacc/sinewave\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/matrix/example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/pdc/pdc\_uart\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/pio/pio\_capture\_example/sam4sd32c\_sam4s\_ek2  
/sam/drivers/pmc/pmc\_clock\_failure\_detect\_example/sam4sd32c\_sam4s\_ek2



---

```
/sam/drivers/pmc/pmc_clock_switching_example/sam4sd32c_sam4s_ek2
/sam/drivers/pmc/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/pwm/pwm_led_example/sam4sd32c_sam4s_ek2
/sam/drivers/pwm/pwm_sync_example/sam4sd32c_sam4s_ek2
/sam/drivers/pwm/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/rstc/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/rtc/example/sam4sd32c_sam4s_ek2
/sam/drivers/rtt/example/sam4sd32c_sam4s_ek2
/sam/drivers/supc/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/tc/tc_capture_waveform_example/sam4sd32c_sam4s_ek2
/sam/drivers/crccu/crccu_example/sam4sd32c_sam4s_ek2
/sam/drivers/gpbr/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_hard_handshaking_example/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_irda_example/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_iso7816_example/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_rs485_example/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_serial_example/sam4sd32c_sam4s_ek2
/sam/drivers/usart/usart_synchronous_example/sam4sd32c_sam4s_ek2
/sam/drivers/twi/twi_slave_example/sam4sd32c_sam4s_ek2
/sam/drivers/spi/example/sam4sd32c_sam4s_ek2
/sam/drivers/spi/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/ssc/unit_tests/sam4sd32c_sam4s_ek2
/sam/drivers/wdt/example/sam4sd32c_sam4s_ek2
/sam/drivers/wdt/unit_tests/sam4sd32c_sam4s_ek2
Files modified:
/sam/drivers/adc/adc_threshold_wakeup_example/adc_threshold_wakeup_example.c
/sam/drivers/acc/acc_example/acc_example.c
/sam/drivers/chipid/chipid_example/chipid_example.c
/sam/drivers/pwm/unit_tests/unit_tests.c
/sam/drivers/pmc/unit_tests/unit_tests.c
/sam/drivers/pmc/pmc_clock_switching_example/pmc_clock_switching_example.c
/sam/drivers/rstc/unit_tests/unit_tests.c
/sam/drivers/supc/unit_tests/unit_tests.c
/sam/drivers/efc/efc.c
/sam/services/flash_efc/flash_efc.c
/sam/services/flash_efc/flash_efc.h
/sam/services/flash_efc/flash_program_example/flash_program_example.c
/sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_ek/conf_example.h
/sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_xplained/conf_example.h
/sam/services/flash_efc/flash_program_example/sam4sd32c_sam4s_ek2/conf_example.h
/sam/services/flash_efc/unit_tests/sam4s16c_sam4s_ek/conf_test.h
/sam/services/flash_efc/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
/sam/services/flash_efc/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
/sam/services/flash_efc/unit_tests/unit_tests.c
/sam/drivers/crccu/crccu_example/sam4s16c_sam4s_ek/conf_crccu_example.h
/sam/drivers/crccu/crccu_example/sam4s16c_sam4s_xplained/conf_crccu_example.h
/sam/drivers/crccu/crccu_example/sam4sd32c_sam4s_ek2/conf_crccu_example.h
/sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_ek/conf_test.h
/sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
/sam/drivers/gpbr/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
/sam/drivers/gpbr/unit_tests/unit_tests.c
```

```

/sam/drivers/gpbr/unit_tests/unit_tests.c
/sam/drivers/crccu/crccu_example/crccu_example.c
/sam/drivers/twi/twi_slave_example/twi_slave_example.c
/sam/drivers/twi/twi_slave_example/sam4s16c_sam4s_ek/conf_board.h
/sam/drivers/twi/twi_slave_example/sam4s16c_sam4s_ek/conf_twi_slave_example.h
/sam/drivers/spi/unit_tests/unit_tests.c
/sam/drivers/ssc/unit_tests/unit_tests.c
/sam/drivers/wdt/example/wdt_example.c
/sam/drivers/wdt/unit_tests/unit_tests.c

```

Files deleted:

```

/sam/drivers/chipid/chipid_example/sam3n4c_sam3n_ek/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam3s4c_sam3s_ek/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam3sd8c_sam3s_ek2/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam3u4e_sam3u_ek/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam3x8e_arduino_due_x/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam3x8h_sam3x_ek/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam4s16c_sam4s_ek/conf_chipid_example.h
/sam/drivers/chipid/chipid_example/sam4s16c_sam4s_xplained/conf_chipid_example.h

```

- **Issue #ASFP-2606:** Add SAM4S-EK2 support to SAM components.

Folders added:

```

/sam/components/display/ili9325/example/sam4sd32c_sam4s_ek2
/sam/components/display/ili9325/unit_tests/sam4sd32c_sam4s_ek2

```

Files modified:

```

/sam/components/display/ili9325/unit_tests/unit_tests.c

```

- **Issue #ASFP-2607:** Add SAM4S-EK2 support to SAM services.

Folders added:

```

/sam/services/flash_efc/flash_program_example/sam4sd32c_sam4s_ek2
/sam/services/flash_efc/unit_tests/sam4sd32c_sam4s_ek2
/sam/services/flash_efc/flash_read_unique_id_example/sam4sd32c_sam4s_ek2
/sam/services/resistive_touch/example/sam4sd32c_sam4s_ek2

```

Files modified:

```

/sam/services/flash_efc/unit_tests/unit_tests.c
/sam/drivers/efc/efc.c
/sam/services/flash_efc/flash_efc.c
/sam/services/flash_efc/flash_efc.h
/sam/services/flash_efc/flash_program_example/flash_program_example.c
/sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_ek/conf_example.h
/sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_xplained/conf_example.h
/sam/services/flash_efc/flash_program_example/sam4sd32c_sam4s_ek2/conf_example.h
/sam/services/flash_efc/unit_tests/sam4s16c_sam4s_ek/conf_test.h
/sam/services/flash_efc/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
/sam/services/flash_efc/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
/sam/services/flash_efc/unit_tests/unit_tests.c
/sam/services/resistive_touch/example/sam4s16c_sam4s_ek/conf_clock.h
/sam/services/resistive_touch/example/sam4s16c_sam4s_ek/resistive_touch_board.h

```

- **Issue #ASFP-2608:** Add SAM4S-EK2 support to common boards/parts/applications.

Folder added:

---

/common/applications/user\_application/sam4sd32c\_sam4s\_ek2

Files modified:

/common/boards/board.h

/common/utils/parts.h

- **Issue #ASFP-2609:** Add SAM4S-EK2 support to NAND Flash in common components.

Folders added:

/common/components/memory/nand\_flash/nand\_flash\_ebi/example1/sam4sd32c\_sam4s\_ek2

/common/components/memory/nand\_flash/nand\_flash\_ebi/example2/sam4sd32c\_sam4s\_ek2

/common/components/memory/nand\_flash/nand\_flash\_ebi/unit\_tests/sam4sd32c\_sam4s\_ek2

Files modified:

/common/components/memory/nand\_flash/nand\_flash\_ebi/nand\_flash\_raw\_smc.c

- **Issue #ASFP-2610:** Add SAM4S-EK2 support to common services examples.

Folders added:

/common/services/clock/example1/sam4sd32c\_sam4s\_ek2

/common/services/clock/example2/sam4sd32c\_sam4s\_ek2

/common/services/clock/example3/sam4sd32c\_sam4s\_ek2

/common/services/delay/example/sam4sd32c\_sam4s\_ek2

/common/services/ioport/example3/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/composite/device/example2/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/composite/device/example3/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/cdc/device/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/cdc/device/example2/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/cdc/device/unit\_tests/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/composite/device/example1/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/composite/device/example4/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/hid/device/generic/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/hid/device/kbd/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/hid/device/kbd/unit\_tests/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/hid/device/mouse/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/hid/device/mouse/unit\_tests/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/msc/device/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/msc/device/unit\_tests/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/vendor/device/example/sam4sd32c\_sam4s\_ek2

/common/services/usb/class/msc/device/example\_freertos/sam4sd32c\_sam4s\_ek2

Files modified:

/common/services/usb/class/msc/device/example\_freertos/memories\_initialization\_sam.c

/common/services/usb/class/cdc/device/example2/sam4s16c\_sam4s\_ek/ui.c

/common/services/clock/sam4s/genclk.h

- **Issue #ASFP-2611:** Add SAM4S-EK2 support to 3rd party examples.

Folders added:

/thirdparty/freertos/demo/sam\_example/sam4sd32c\_sam4s\_ek2

/thirdparty/qtouch/generic/sam/qtouch/examples/sam4sd32c\_sam4s\_ek2

/thirdparty/fatfs/example/sam4sd32c\_sam4s\_ek2

- **Issue #ASFP-2622:** Wrong core definition in sam4s\_ek.h.

File modified:

sam\boards\sam4s\_ek\sam4s\_ek.h

- **Issue #ASFP-2625:** In `virtual_mem.c`, the "#if" usage of `VMEM_ADDRESS` should be fixed.  
Fix `VMEM_ADDRESS` preprocessor usage in `virtual_mem.c`. Modified file: `common/components/memory/virtual_mem/virtual_mem.c`.
- **Issue #ASFP-2656:** Clean up lwip SAM device support.  
Set lwip restrict to SAM3X.
- **Issue #ASFP-2671:** SAM: In some case, first ISO/INT packet could be duplicated.  
Update UOTGHS host driver for ISO/INT OUT transfer.  
File modified: `sam/drivers/uotghs/uotghs_host.c`.
- **Issue #ASFP-2687:** `ili9225_draw_pixmap` function error.  
Correct refresh window area issue in the `lcd_draw_pixmap` functions.  
Modified file list:  
`/sam/components/display/hx8347a/hx8347a.c`  
`/sam/components/display/ili9225/ili9225.c`  
`/sam/components/display/ili9325/ili9325.c`
- **Issue #ASFP-2695:** FatFS available to ASF wizard of Atmel Studio 6.  
Make FatFS visible to the ASF wizard of Atmel Studio 6.
- **Issue #ASFP-2708:** Add `sam/drivers/pdca` support for SAM4L.  
Add `sam/drivers/pdca` support for SAM4L. New folder and files added:  
`sam/drivers/pdca`  
`sam/drivers/pdca/pdca.c`  
`sam/drivers/pdca/pdca.h`  
`sam/drivers/pdca/asf.xml`  
`sam/drivers/pdca/pdca_usart_example`  
`sam/drivers/pdca/pdca_usart_example/pdca_usart_example.c`  
`sam/drivers/pdca/pdca_usart_example/asf.xml`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/asf.xml`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/conf_board.h`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/conf_clock.h`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/conf_pdca_usart_example.h`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/conf_uart_serial.h`  
`sam/drivers/pdca/pdca_usart_example/sam4lc4c_sam4l_ek/conf_sleepmgr.h`  
`sam/drivers/pdca/unit_tests`  
`sam/drivers/pdca/unit_tests/unit_tests.c`  
`sam/drivers/pdca/unit_tests/asf.xml`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/asf.xml`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_board.h`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_clock.h`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_pdca.h`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_uart_serial.h`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_test.h`  
`sam/drivers/pdca/unit_tests/sam4lc4c_sam4l_ek/conf_sleepmgr.h`
- **Issue #ASFP-2712:** Warning on variable 'set but not used' in `pwm.c` (Release configuration only).

---

Fixed unused "num\_chan" variable warning in the XMEGA PWM service when built with asserts disabled.

Files Changed:

xmega/services/pwm/pwm.c

- **Issue #ASFP-2718:** Incomplete SPI service for XMEGA.

The following functions are added in XMEGA SPI service:

spi\_is\_tx\_empty(), spi\_is\_tx\_ready(), spi\_is\_rx\_ready(),  
usart\_spi\_is\_tx\_empty(), usart\_spi\_is\_rx\_ready(), usart\_spi\_is\_tx\_ready().

Also, the usart\_spi\_write\_single() and usart\_spi\_read\_single() has been fixed.

Modified files:

common/services/spi/xmega\_spi/spi\_master.h

common/services/spi/xmega\_usart\_spi/usart\_spi.h

- **Issue #ASFP-2766:** Add ioport service examples for SAM4L.

Add ioport service examples for SAM4L-EK. Files modified: common/services/ioport/example1/asf.xml, ioport\_example1.c; common/services/ioport/example2/ioport\_example2.c; common/services/ioport/example3/ioport\_example3.c. Folders added: common/services/ioport/example1/sam4lc4c\_sam4l\_ek, common/services/ioport/example2/sam4lc4c\_sam4l\_ek, common/services/ioport/example3/sam4lc4c\_sam4l\_ek.

- **Issue #ASFP-2767:** Add ioport service examples for SAM3X.

Add ioport service examples for SAM3X. Files modified: common/services/ioport/example1/ioport\_example1.c, common/services/ioport/example2/ioport\_example2.c, common/services/ioport/example3/ioport\_example3.c; Folders added: common/services/ioport/example1/sam3x8h\_sam3x\_ek, common/services/ioport/example2/sam3x8h\_sam3x\_ek, common/services/ioport/example3/sam3x8h\_sam3x\_ek.

- **Issue #ASFP-2782:** SAM4L - Add unit tests and quickstart for flashcalw driver.

Add unit tests and Quickstart page for FLASHCALW driver.

- **Issue #ASFP-2797:** ADC driver sets max clock speed to low for XMEGA B.

Updated the XMEGA ADC driver to use the correct upper limit clock speed assert for the XMEGA B series devices.

Files Changed:

xmega/drivers/adc/adc.h

- **Issue #ASFP-2801:** Clean up out of memory error code in WTK demos to use new string APIs.

Cleaned up the out of memory error message code in the Widget Toolkit demos, to use the newer text alignment APIs.

Files Changed:

common/applications/mxt143e\_xplained\_calculator\_demo/calculator.c

common/services/wtk/example1\_widgets/example1.c

common/services/wtk/example1\_icon/example2.c

common/services/wtk/example1\_plot/example3.c

- **Issue #ASFP-2807:** SAM4L - Add PicoCache support to the flashcalw driver and an example of usage.

Add PicoCache and unique id example for flashcalw. Update flashcalw example1 to match NDI.

- **Issue #ASFP-2809:** uc3\_i0\_xplained.h and uc3l-ek.h files wrongly define the OSC32K startup time. Fixed incorrect definitions for the OSC32\_STARTUP and BOARD\_OSC32\_STARTUP\_US macros in the UC3-L0 Xplained and UC3L-EK board header files. The previous startup time set was too low, which could cause instability in the DFLL module when a lock procedure was attempted before the external oscillator was properly stabilized.  
Files Changed:  
avr32/boards/uc3\_i0\_xplained/uc3\_i0\_xplained.h  
avr32/boards/uc3l\_ek/uc3l\_ek.h
- **Issue #ASFP-2811:** XMEGA QTouch library API does not compile on IAR.  
Fix "thirdparty/qtouch/generic/include/touch\_api.h" file to compile on IAREW 6.12.1.
- **Issue #ASFP-2813:** USART driver in mode SPI does not support switching SPI mode.  
Now, the XMEGA USART driver can be used to manage several SPI slave with different SPI mode (UCPHA, CPOL, DORD).  
Modified files:  
xmega/drivers/usart/usart.c
- **Issue #ASFP-2814:** Wrong ASSERT in fifo\_init() from common service fifo.  
Fixed a wrong 'Assert' in fifo\_init(), that was not correctly checking the size parameter.  
Modified file: common/service/fifo/fifo.c
- **Issue #ASFP-2826:** On XMEGA typedef U16 and typedef uint16\_t are not compatible on GCC and IAR.  
Improve definition of U16 in compiler.h to be compliant with uint16\_t from IAR and GCC compilers.  
Modified file: xmega/utils/compiler.h.
- **Issue #ASFP-2828:** Add mainpage for SAM4L-EK demo.  
Modified file:  
sam/applications/sam4l\_qtouch\_demo/main.c
- **Issue #ASFP-2830:** SAM4L - parameter type error in flashcalw\_get\_page\_region().  
Update flashcalw\_get\_page\_region() parameter type to signed int.
- **Issue #ASFP-2843:** Impossible to change the default stack size for ARM GCC projects.  
The SAM GCC linker scripts are updated to support the definition of the "\_\_stack\_size\_\_" define as a parameter of the gcc linker, eg: -Wl,--defsym,\_\_stack\_size\_\_=0x2000  
All flash.ld and sram.ld files in folder /sam/utils/linker\_scripts/ have been updated.  
Note: The default stack sizes are not changed.
- **Issue #ASFP-2844:** IISC driver: slave mode does not work for version 200 or more.  
Fixed wrong clocks initialization when using IISC in the slave mode.  
iisc\_enable\_master() becomes iisc\_enable\_clocks()  
iisc\_enable\_slave() becomes iisc\_disable\_clocks()  
Modified files: avr32/drivers/iisc
- **Issue #ASFP-2875:** Implementation of TWIM driver for SAM4L.  
Add SAM4L TWIM driver.  
Added folder: /sam/drivers/twim

- 
- **Issue #ASFP-2876:** Add sleep manager support to SAM4L TWIM driver.  
Add sleep manager support to SAM4L TWIM driver.  
Files modified:  
/sam/drivers/twim/twim.h  
/sam/drivers/twim/twim.c
  - **Issue #ASFP-2881:** Improve common/utils/interrupt implementation for SAM devices.  
Add implementation of irq\_register\_handler().  
Modified file:  
common/utils/interrupt/interrupt\_sam\_nvic.h
  - **Issue #ASFP-2882:** sysclk.h contains references to peripherals not available on the UC3C2 devices.  
Fixed invalid module references in the sysclk module for UC3C2 devices, causing compilation failures when this module was added to a user application on these devices.  
Files Changed: common/services/clock/uc3c/sysclk.h
  - **Issue #ASFP-2888:** Documentation of TWIM driver for SAM4L.  
Files modified:  
/sam/drivers/twim/twim.h
  - **Issue #ASFP-2902:** SAM sysclk\_get\_cpu\_hz() and sysclk\_get\_peripheral\_hz() implement error.  
Fix sysclk\_get\_cpu\_hz() and sysclk\_get\_peripheral\_hz() implements for SAM3N, SAM3S, SAM3U, SAM3X and SAM4S. Modified files: common\services\clock\sam3n\sysclk.h, common\services\clock\sam3s\sysclk.h, common\services\clock\sam3u\sysclk.h, common\services\clock\sam3x\sysclk.h, common\services\clock\sam4s\sysclk.h.
  - **Issue #ASFP-2903:** OSC32RDY flag is not cleared when disabling OSC32 for SAM4L series.  
Fix osc\_priv\_disable\_osc32() function related to SAM4L implementation.  
Modified files:  
common/services/clock/sam4l/osc.c  
common/services/clock/sam4l/osc.h
  - **Issue #ASFP-2906:** XMEGA switching SPI mode is impossible.  
Fixed an issue in the common SPI service (XMEGA native SPI configuration) where the SPI peripheral mode flags were not reset correctly between multiple initializations of the service.  
Files Changed:  
common/services/spi/xmega\_spi/spi\_master.c
  - **Issue #ASFP-2916:** XMEGA WDT example does not properly initialize sysclk.  
Update XMEGA WDT example to use the common delay service rather than a demo-implemented delay routine. Fix system clock service not being initialized correctly.  
Files Changed:  
xmega/drivers/wdt/example/wdt\_example.c
  - **Issue #ASFP-2926:** AST Unit Test issue in sam/drivers/ast on SAM4L.  
Bug fix in interrupt handler configuration in drivers. Missing using of configuration definitions.  
Modified files: sam/drivers/ast/ast.c, sam/drivers/ast/unit\_tests/sam4lc4c\_sam4l\_ek/conf\_ast.h
  - **Issue #ASFP-2929:** Several IAR and AS5 projects tags are missing in XMEGA projects.

The following examples are available in Atmel Studio:

```
xmega\drivers\ebi\unit_tests\sram\atxmega128a1_xplain\
xmega\drivers\ebi\unit_tests\sram\atxmega128a1_stk600-rc100x\
xmega\drivers\nvm\unit_tests\atxmega128a1_xplain\
xmega\drivers\spi\unit_tests\atxmega128a1_xplain\
xmega\drivers\spi\unit_tests\atxmega128b1_xmega_b1_xplained\
xmega\drivers\spi\unit_tests\atxmega256a3bu_xmega_a3bu_xplained\
xmega\services\timeout\unit_tests\atxmega128a1_xmega_a1_xplained\
common\services\fifo\unit_tests\atxmega128a1_xplain\
```

The following IAR examples are available in ASF Standalone package:

```
xmega\drivers\crc\example1\atxmega128b1_xmega_b1_xplained\
xmega\drivers\crc\example1\atxmega256a3bu_xmega_a3bu_xplained\
xmega\drivers\crc\example1\atxmega384c3_stk600-rc064x\
xmega\drivers\crc\example2\atxmega256a3bu_xmega_a3bu_xplained\
xmega\drivers\crc\example3\atxmega256a3bu_xmega_a3bu_xplained\
xmega\drivers\crc\unit_tests\stk600_atxmega256a3u\
xmega\drivers\tc\simulator_example1\xmega_a1_simulator\
common\components\display\st7565r\example\atxmega256a3bu_xmega_a3bu_xplained\
common\services\gfx_mono\example1\atxmega256a3bu_xmega_a3bu_xplained\
common\services\gfx_mono\example_spinctrl\atxmega256a3bu_xmega_a3bu_xplained\
common\services\gfx_mono\example_sysfont\atxmega256a3bu_xmega_a3bu_xplained\
common\services\usb\class\cdc\device\example\atxmega128a4u_stk600-rc044x\
common\services\usb\class\hid\device\kbd\example\atxmega128a4u_stk600-rc044x\
common\services\usb\class\hid\device\mouse\example\atxmega128a4u_stk600-rc044x\
common\services\usb\class\msc\device\example\atxmega128a4u_stk600-rc044x\
```

- **Issue #ASFP-2935:** Remove pull-up configuration by default on PA02 for SAM4L-EK.

Keep default configuration for PA02. Modified file: sam/boards/sam4l\_ek/init.c

- **Issue #ASFP-2940:** Add support for mega/tinyAVR in device map and makefile.

Add megaAVR and tinyAVR devices that are supported by Atmel Studio to the device map, parts.h and GCC project generator. Also, add tinyAVR support to the megaAVR compiler and interrupt utilities.

Changed files:

```
asf.xml
common/utis/asf.xml
common/utis/interrupt.h
common/utis/interrupt/interrupt_avr8.h
common/utis/make/asf.xml
common/utis/parts.h
mega/utis/asf.xml
```

- **Issue #ASFP-2947:** Add SAM4L support common\components\memory\serial\_flash\at25dfx .

Add SAM4L support common\components\memory\serial\_flash\at25dfx.

Added folder and files:

```
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek/asf.xml
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek/conf_board.h
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek/conf_clock.h
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek/conf_spi_master.h
/common/components/memory/serial_flash/at25dfx/example/sam4lc4c_sam4l_ek/conf_at25dfx.h
```



---

```

/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/asf.xml
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_board.h
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_clock.h
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_spi_master.h
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_test.h
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_at25dfx.h
/common/components/memory/serial_flash/at25dfx/unit_tests/sam4lc4c_sam4l_ek/conf_uart_serial.h

```

Modified files:

```

/common/components/memory/serial_flash/at25dfx/example/asf.xml
/common/components/memory/serial_flash/at25dfx/example/at25dfx_example.c
/common/components/memory/serial_flash/at25dfx/unit_tests/asf.xml
/common/components/memory/serial_flash/at25dfx/unit_tests/sam3n4c_sam3n_ek/conf_test.h
/common/components/memory/serial_flash/at25dfx/unit_tests/unit_tests.c

```

- **Issue #ASFP-2963:** Add RAMFUNC in SAM compiler.h for ramfunction define.

Add RAMFUNC for ramfunctions definition in SAM compiler.h. Modified file: sam/utils/compiler.h.

- **Issue #ASFP-2966:** Icon and Radio Button WTK widgets ignore "selected" parameter when created.

Fixed an issue in the Widget Toolkit where the "selected" parameter for Icon Button and Radio Button widgets did not work correctly when the widgets were created.

Files Changed:

```

common/services/wtk/wtk_icon.c
common/services/wtk/wtk_radio_button.c

```

- **Issue #ASFP-2967:** Add C42364A LCD Display Component for SAM4L.

Add C42364A display component for SAM4L-EK custom glass

Files added:

```

sam\components\display\c42364a\asf.xml
sam\components\display\c42364a\c42364a.c
sam\components\display\c42364a\c42364a.h
sam\components\display\c42364a\module_config
sam\components\display\c42364a\module_config\conf_c42364a.h
sam\components\display\c42364a\example
sam\components\display\c42364a\example\asf.xml
sam\components\display\c42364a\example\c42364a_example.c
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\asf.xml
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_board.h
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_clock.h
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_lcdca.h
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_uart_serial.h
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_sleepmgr.h
sam\components\display\c42364a\example\sam4lc4c_sam4l_ek\conf_c42364a.h

```

- **Issue #ASFP-2968:** bpm\_configure\_power\_scaling() improvement.

Set bpm\_configure\_power\_scaling() to RAMFUNC. Modified files: sam/drivers/bpm/bpm.c, bpm.h.

- **Issue #ASFP-2991:** Fail to customize CSTACK and HEAP size in EWARM for SAM4L.

Enable customize of CSTACK and HEAP size for SAM4L. Modified files: tools/project\_generator/templates/iarewarm\_v600\_atsam4lc4c.ewp, sam/utils/linker\_scripts/sam4l/sam4l2/iar/flash.icf, sam/

utils/linker\_scripts/sam4l/sam4l2/iar/sram.icf, sam/utils/linker\_scripts/sam4l/sam4l4/iar/flash.icf, sam/utils/linker\_scripts/sam4l/sam4l4/iar/sram.icf.

- **Issue #ASFP-2994:** UPD driver for SAM4S does not stall the control request DEVICE\_QUALIFIER.  
Fix control endpoint stall action.  
Modified files:  
sam/drivers/udp/udp\_device.c.
- **Issue #ASFP-3030:** SAM4L - Add get unique ID example to the flashcalw example.  
Add get unique ID example to the flashcalw examples
- **Issue #ASFP-3045:** SAM4L: adding example of usage of flash lock functions in the flashcalw example1.  
Adding example of usage of flash lock functions in the flashcalw example1.
- **Issue #ASFP-3053:** "User Board - SAM4L" not listed when creating an empty project based on a User board in Atmel Studio.  
Add the "User Board - SAM4L" choice in the list of possibilities when creating an empty project based on a User board in Atmel Studio.
- **Issue #ASFP-3063:** Add two more PDCA APIs for get the size.  
Add two more PDCA APIs for get the size.  
Files changed:  
sam/drivers/pdca.h  
sam/drivers/pdca.c
- **Issue #ASFP-3066:** \_\_region\_ROM\_end\_\_ in sam/utils/linker\_scripts/sam4l/sam4l2/iar/flash.icf is incorrect.  
Fix \_\_region\_ROM\_end\_\_ in sam/utils/linker\_scripts/sam4l/sam4l2/iar/flash.icf to be equal to 0x0001FFFF.
- **Issue #ASFP-3079:** SAM: PMC unit-test for slow clock is not correct.  
Fix PMC slow clock unit-test. Modified file: sam/drivers/pmc/unit\_tests/unit\_tests.c.
- **Issue #ASFP-3080:** SAM: wrong use of pmc\_switch\_mainck\_to\_xtal() in PMC unit-tests.  
Use right configure value for pmc\_switch\_mainck\_to\_xtal() in PMC unit-tests. Modified file: sam/drivers/pmc/unit\_tests/unit\_tests.c.
- **Issue #ASFP-3081:** SAM: PMC unit-tests with output may cause unexpected results.  
Add configure for PCK output and disable output by default in PMC unit-tests. Modified file: sam/drivers/pmc/unit\_tests/unit\_tests.c, sam/drivers/pmc/unit\_tests/sam4s16c\_sam4s\_ek/conf\_test.h.

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## Contact Information

For more info about Atmel MCU visit <http://www.atmel.com/products/microcontrollers/default.aspx>, download application notes from the Application Notes page or contact support through the <http://support.atmel.no/> site. The support site also have a Frequently Asked Questions.

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