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## ASF: Release ASF-3.19

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-3.19**

## Installation Instructions

### Device Support

This release supports the following devices:

- AVR UC3
  - AVR UC3 A0/A1 (revision H and later)
  - AVR UC3 A3/A4 (revision E and later)
  - AVR UC3 A3xS/A4xS (revision E and later)
  - AVR UC3 B (revision F and later)
  - AVR UC3 C (revision D and later)
  - AVR UC3 D
  - AVR UC3 L
- AVR XMEGA
  - 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
  - ATmega2560
  - ATmega48/88/168/328
  - ATmega16/32
  - ATmega169/329
  - ATmega64/128
  - ATmega324/644/1284
  - ATmegaxRF
- SAM
  - SAM3N
  - SAM3S
  - SAM3U
  - SAM3X
  - SAM4C
  - SAM4CM
  - SAM4CP
  - SAM4E
  - SAM4L
  - SAM4L8
  - SAM4N
  - SAM4S

- SAM D10
- SAM D11
- SAM D20
- SAM D21
- SAM G51
- SAM G53
- SAM G54
- SAM R21

## Supported Tools

- Atmel Studio 6.2 using GCC compiler - Visit [www.atmel.com/atmelstudio](http://www.atmel.com/atmelstudio) -:
  - Atmel ARM GNU Toolchain - 4.7.4.217
  - Atmel AVR (32 bit) GNU Toolchain - 3.4.2.435
  - Atmel AVR (8 bit) GNU Toolchain - 3.4.3.1072
- 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 7.10
- WinAVR version 20100110

Note:

- Atmel Studio 6.0 version is not supported since ASF3.6 extension.
- 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`).
- 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 installer (includes ASF): [www.atmel.com/atmelstudio](http://www.atmel.com/atmelstudio)
- Atmel Studio 6 videos: [http://www.atmel.com/microsite/atmel\\_studio6/videos.aspx](http://www.atmel.com/microsite/atmel_studio6/videos.aspx)
- Atmel Gallery: <http://gallery.atmel.com/>

## 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 <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

### Release ASF3.19 (Aug 2014)

- SAM D10, SAM D11 device family and SAMD11-XPRO support
- USB quick start documentation
- SAM4 ASF drivers quick start documentation
- PLC and PRIME support to SAM4C/SAM4CP16/SAM4CMP/SAM4CMS kits
- LwIP RAW HTTP example with AJAX support
- SAM D21 DMAC Demo Application - Data Logger
- Add Xmega A1U-XPRO board support to ASF

### Release ASF3.18.1 (Jul 2014)

- PRIME stack support for SAM4C family

### Release ASF3.18 (Jun 2014)

- SAM4CM32 new device support
- SAM4C32E USB support
- SAM4C IPC support
- FreeRTOS 8.0.1 support
- OLED support for SAM4L-XPRO
- Demo for TWI information interface of EDBG
- Device series maintain of SAMD20/D21/R21

### Release ASF3.17 (May 2014)

- SAM R21: added support for SAM R21 device series and SAMR21-XPRO support; added drivers support for AC, ADC, BOD, DMA, EVENTS, EXTINT, NVM, PAC, PORT, RTC, SERCOM(SPI, USART, I2C), System(clock, interrupt, pinmux), TC, TCC, USB, WDT, serial\_flash, ssd1306, virtual\_mem, sdmmc; added services support for delay, gfx\_mono, ctrl\_access, USB device (CDC, Composite, HID, MSC, PHDC, Vendor); added third party support for CMSIS, FATFS, freertos, added applications support for getting-started, i2c\_slave\_bootloader, led\_toggle, sleepwalking\_adc, tictactoe, xosc32k\_failure\_detector.
- SAM G54: added support for SAMG54 device series; added drivers support for adc, chipid, i2sc, pdm, pmc, rstc, spi, supc, twi, twihs, uart, usart; added services support for clock, freertos peripheral control, ioport, sleep manager, twi; added third party support for CMSIS, freertos.
- SAM4CM: Add SAM4CM device series and SAM4CMP-DB/SAM4CMS-DB support; added drivers support for AES, ADC, CHIPID, SMC, EFC, GPBR, ICM, MATRIX, PDC, PIO, PMC, PWM, RSTC, RTC, RTT, SLCD, SPI, SUPC, TC, TRNG, TWI, UART, USART, WDT; added services support for clock, delay, ioport, serial, sleepmgr, spi, storage/ctrl\_access, twi, flash\_etc, smart\_card; added component support for serial\_flash, eeprom, at30ts75, added third party support for CMSIS, freertos, FATFS.
- SLCD-XPRO: added example for SAM4L-XPRO
- SAM D21: added USB MSC bootloader
- SAM4CP: added support for SAM4CP16B and ATPL230; added ATPL230AMB board ( SAM4S + ATPL230) support; added service support for PLC; added third party support for Prime Phy Layer.
- 802.15.4 MAC: added device support for SAM R21/D21, SAM4S and SAM4E.
- Performance Analyzer Application: added device support for SAM R21/D21, SAM4S and SAM4E; componentization of Performance Analyzer.
- RF4Control: added device support for SAM R21; added Joystick Demo Application for ZID; added Sleep support in Single button ctrl application.

- LWMesh: added device support for SAM R21/D21, SAM4S and SAM4E; added EDDemo and Peer2Peer support, SecurityMode0(HW Security) support, identify commands feature support for WSNDemo application; componentization of WSNDemo app.

### **Release ASF3.16 (Apr 2014)**

- SAM4C: Add CMCC driver support
- SAM D21: Add additional drivers and examples (USB device class support: composite/HID/PDHC, SD/MMC support, getting started and i2c slave applications)
- Add lwIP 1.4.1 and Ethernet Xplained Pro extension support for SAM D20

### **Release ASF3.15 (Feb 2014)**

- SAM D21: added support for SAM D21 device series and SAMD21-XPRO support; added drivers support for AC, ADC, BOD, DAC, DMA, EVENTS, EXTINT, I2S, NVM, PAC, PORT, RTC, SERCOM(SPI, USART, I2C), System(clock, interrupt, pinmux), TC, TCC, USB, WDT, serial\_flash, at30ts75, ssd1306, virtual\_mem ; added services support for eeprom, delay, gfx\_mono, ctrl\_access, USB host (HID, CDC, MSC, Vendor, composite), USB device (HID, CDC, MSC, Vendor); added third party support for CMSIS, freertos, added applications support for dac\_sound\_player, led\_toggle, osc8\_calib, sleepwalking\_adc, tictactoe, xosc32k\_failure\_detector.
- SAM4CP: added SAM4CP device series support.
- SAM4E-XPRO: added SAM4E-XPRO kit support with examples.
- LWMesh Stack: supported MCU SAMD20,SAM4L,MegaRF,XmegaA3; supported Transceivers: AT86RF212, AT86RF212B, AT86RF231, AT86RF233, ATMEGARFA1, ATMEGARFR2.
- ZID Stack: supported MCU Family : MegaRF,XmegaA3U; Supported Transceivers : AT86RF233,ATMEGARFR2.

### **Release ASF3.14 (Dec 2013)**

- SAMG: added support for SAMG51 and SAMG53 device series and SAMG53-XPRO support; added drivers support for adc, chipid, efc, gpbr, i2sc, matrix, mem2mem, pdc, pdm, pio, pmc, rtc, rtt, spi, supc, tc, twi, twihs, uart, usart, wdt; added services support for clock, delay, ioport, serial, sleep manager, flash\_efc, twi; added third party support for CMSIS, freertos, added applications support for getting-started and low-power.
- SAM4C: added SAM4C32 device series support.
- SAM4E: added SAM4ExC device series support.
- IEEE 802.15.4 MAC GTS feature support for SAM D20.
- Note: SAMG projects require a part support package for Atmel Studio 6.1

### **Release ASF3.13 (Nov 2013)**

- IEEE 802.15.4 MAC Support Addition for Atmega2564RFR2 Device
- SAM D20: various bug fixes for EEPROM, DFLL, ADC, SERCOM
- Note: SAM4C projects require a part support package for Atmel Studio 6.1
- Note: Removed ASF versions ASF-3.3.0, ASF-3.4.0, ASF-3.5.0 and ASF-3.5.1 in order to improve performance in Atmel Studio. DO NOT upgrade to this ASF release if you are using the removed versions and need the ASF Wizard. If you do upgrade, you will have to upgrade your project to a newer ASF version in order for the ASF Wizard to work.

### **Release ASF3.12 (Oct 2013)**

- SAM4C: added support for new device series and SAM4C Evaluation kit; added drivers support for aes, adc, chipid, smc, efc, gpbr, icm, matrix, pdc, pio, pmc, pwm, rstc, rtc, rtt, slcdc, spi, supc, tc, trng, twi, uart, usart,wdt;

added services support for clock, ioport, serial, sleep manager, flash\_efc, twi; added component support for serial\_flash, eeprom, at30ts75 and c42364a\_slcdc; added third party support for CMSIS, freertos and fatfs, added applications support for getting-started and low-power.

- SAM4S: added support for SAM4S4 and SAM4S2.
- SAM D20: maintenance and improvements to API.
- Note: SAM4C projects require a part support package for Atmel Studio 6.1

## Release ASF3.11 (July 2013)

- SAM4N new device and SAM4N Xplained pro kit support in ASF.
- Performance Analyzer supports the kits supported in Wireless Library 1.0 Release.
- SAM4L: Add USB device PHDC example, add TWIM PDC transfer example.

## Release ASF3.10 (July 2013)

- SAM4L8 new device and SAM4L/SAM4L8 Xplained pro kit support in ASF, with all existing drivers, services, third parties from SAM4L4.
- Feature Enhancement in Performance Analyzer v2.1 firmware to support Wireless Composer-2.0
- SAM D20: maintenance and improvements to API

## Release ASF3.9 (June 2013)

- Added SAM D20 Drivers (AC, ADC, BOD, DAC, Events, External Interrupts, NVM, PAC, PORT, RTC, SERCOM USART/SPI/I2C, TC and WDT).
- Added SAM D20 Services (GFX\_mono, Delay, Dataflash, FreeRTOS)
- Added SAM D20 applications (DAC sound player, SPI/I2C bootloader, Led toggle and OSC8 calibration, FreeRTOS demo)

## Release ASF3.8 (April 2013)

- mega128RFA1 new drivers: MAC symbol counter and TWI.
- SAM4E: USB stack, lwIP demo, new drivers (AFE, DACC, MATRIX, ACC, CHIPID, USART, PIO, AFEC), QTouch library, low power and getting started demo, FreeRTOS demo.

## Release ASF3.7 (Feb 2013)

- SAM4L new drivers: AESA, IISC, ACIFC, PEVC, USB device composite, USB host, picoUART, ABDACB, FREQM, ADCIFE, GLOC, FatFS,
- SAM4E new drivers: FPU, SPI, DMA, USB HID, TC, AT25 flash, WDT, EBI SMC, RTT, CAN, RTC, GPBR, SUPC, PDC, USART, GMAC, PWM
- megaRF, megaRFR2 new drivers: USART, STDIO, clock, interrupt, TWI
- XMEGA E new drivers: XCL, EDMA, QDEC. New ADC demo for XMEGA-E5 Xplained board
- SAM4S and SAM4L Xplained Pro demo: low power and sleep modes
- Added supports Performance analyzer application for Xplained Pro Boards compatible with Wireless Analyzer in Atmel Studio. Supports MAC demo applications for Beacon, No Beacon and No Beacon Sleep Application. Supports RF4CE demo applications for Button controller, Single button controller and Terminal target. Platforms supported are: Atmega256RFR2 Xplained Pro, ZigBit ATmegaRFR2, ZigBit ATRF233 XMEGA, ZigBit ATRF212B XMEGA, USB stick with ZigBit ATRF233 XMEGA, USB stick with ZigBit ATRF212B XMEGA, SAM4L Xplained Pro with ZigBit ATmegaRFR2, SAM4L Xplained Pro with ZigBit ATRF233 XMEGA, SAM4L Xplained Pro with ZigBit ATRF212B XMEGA, XMEGA-A3BU Xplained, RZ600

### **Release ASF3.6 (Internal, Jan 2013)**

- Added SAM4E support: WDT, TC, EEFC, PMC, clock, ioport, CMSIS, stdio, PIO, Flash, interrupt
- Added XMEGA C3 Xplained demos: LED, switchs, QTouch, OLED, USB, SD card
- Added megaRF drivers: interrupt, adc
- Added SAM4L drivers: GPIO for event and interrupt, Watchdog, USB Host HID class, HMATRIX, CRCCU, CMSIS DSPLib examples, FreeRTOS demo, Getting Started, IISC, improved TWIM with sleep manager support.
- Added SAM4S-EK2 demo (same as SAM4S-EK)
- Added examples for XMEGA-E5 Xplained board: XCL, USART
- USB Device PHDC class is now compliant with the USB command verified tool 2.0 v1.4.9.2.

### **Release ASF3.5 (Nov 2012)**

- 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
- Added new FreeRTOS specific driver for USART, SPI and TWI for SAM4S

## New features added

- **Issue #ASFP-4194:** SAMD1x - Add SAMD10/D11 ASF Support.

Added SAM D10 and D11 support in ASF, including the devices, drivers and SAMD11 Xplained Pro examples.

- **Issue #ASFP-4195:** SAMD1X - Support SAM D10/D11 in Project Generator.

Added SAM D10 and D11 devices support to project-generator.

- **Issue #ASFP-4394:** Add PS2 mode support in SAM4L-EK demo.

Add PS2 mode in the EK demo. Use button CS0 to change Power Scaling mode (circle from PS0 to PS2).

Modified files:

sam\applications\sam4l\_qtouch\_demo\app.c  
sam\applications\sam4l\_qtouch\_demo\event.c  
sam\applications\sam4l\_qtouch\_demo\main.c  
sam\applications\sam4l\_qtouch\_demo\ui.c  
sam\applications\sam4l\_qtouch\_demo\ui.h  
sam\boards\sam4l\_ek\board\_monitor.h

\*Note:\*

1. Board monitor version 1.4 or higher is need for correct status display.
2. PS2 mode is not supported by Engineering Samples.

- **Issue #ASFP-4540:** SAM D21 DMAC Demo Application - Data Logger.

Data Logger demo shows DMAC usage on SAMD21-XPRO kit:

Folder added:

\* sam0/applications/data\_logger

- **Issue #ASFP-4697:** FreeRTOS service: Add SPI full duplex transfers and fix issue in TWI.

FreeRTOS service: Add SPI full duplex transfers and fix issue in TWI

Files changed:

common/services/freertos/sam/freertos\_spi\_master.c  
common/services/freertos/sam/freertos\_spi\_master.h  
common/services/freertos/sam/freertos\_twi\_master.c  
common/services/freertos/sam/freertos\_twihs\_master.c

- **Issue #ASFP-4700:** USB Document - Add USB PDF generation source code.

Files added:

common/services/usb/class/cdc/device/udi\_cdc\_doc.h  
common/services/usb/class/cdc/host/uhi\_cdc\_doc.h  
common/services/usb/class/hid/device/generic/udi\_hid\_generic\_doc.h  
common/services/usb/class/hid/device/kbd/udi\_hid\_kbd\_doc.h  
common/services/usb/class/hid/device/mouse/udi\_hid\_mouse\_doc.h  
common/services/usb/class/hid/host/mouse/uhi\_hid\_mouse\_doc.h  
common/services/usb/class/msc/device/udi\_msc\_doc.h  
common/services/usb/class/msc/host/uhi\_msc\_doc.h  
common/services/usb/class/vendor/device/udi\_vendor\_doc.h  
common/services/usb/class/vendor/host/uhi\_vendor\_doc.h



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common/services/usb/udc/udc\_doc.h  
common/services/usb/uhc/uhc\_doc.h  
Folder added:  
common/services/usb/manual

- **Issue #ASFP-4704:** SAMD21/R21 - LWIP RAW HTTP example with AJAX support.

Add http examples using LWIP raw API for SAMD21 and SAMR21 with AJAX support.

Modified files:

sam0/components/ethernet\_phy/ksz8851snl/ksz8851snl.c  
sam0/components/ethernet\_phy/ksz8851snl/ksz8851snl.h  
thirdparty/lwip/lwip-port-1.4.1/sam/include/netif/samd20\_spi\_ksz8851snl.h  
thirdparty/lwip/lwip-port-1.4.1/sam/netif/samd20\_spi\_ksz8851snl.c  
thirdparty/lwip/raw\_http\_basic\_example/network/ethernet.c

Added folder:

thirdparty/lwip/raw\_http\_basic\_example\_ajax

- **Issue #ASFP-4718:** SAM - twi\_master\_read never returns if interrupted.

Files Modified:

\sam\drivers\twi\twi.c  
\sam\drivers\twi\twi.h  
\sam\drivers\twihs\twihs.c  
\sam\drivers\twihs\twihs.h

- **Issue #ASFP-4726:** Added GPIO documentation for SAM4.

Add quick start guide documentation for GPIO.

Files modified:

\* sam/drivers/gpio/example/gpio\_example.c  
\* sam/drivers/gpio/gpio.c  
\* sam/drivers/gpio/gpio.h

- **Issue #ASFP-4727:** Added ACC documentation for SAM4.

Add quick start guide documentation for ACC.

Files modified:

\* sam/drivers/acc/acc.c  
\* sam/drivers/acc/acc.h  
\* sam/drivers/acc/acc\_example/acc\_example.c  
\* sam/drivers/acc/acc\_example/acc\_example.h  
\* sam/drivers/acc/acc\_example/acc\_example\_sam4e.c

- **Issue #ASFP-4728:** Added ACIFC documentation for SAM4.

Add quick start guide documentation for ACIFC.

Files modified:

\* sam/drivers/acifc/acifc.c  
\* sam/drivers/acifc/acifc.h  
\* sam/drivers/acifc/acifc\_example/acifc\_example.c  
\* sam/drivers/acifc/acifc\_example/acifc\_example.h

- **Issue #ASFP-4730:** Add Xmega A1U-XPRO board support to ASF.

Added support for Xmega A1U Xplained PRO board, and added support in these examples:

- GFX mono example 1
- ADC example 1 with GFX mono
- USART example 1
- USB CDC example 1 (device)
- Clock example 2
- Clock example 3
- TWI unit test
- SPI unit tests
- RTC

- **Issue #ASFP-4747:** Added AES documentation for SAM4.

Add quick start guide documentation for AES.

Files modified:

- \* sam/drivers/aes/aes.c
- \* sam/drivers/aes/aes.h
- \* sam/drivers/aes/example/aes\_example.c
- \* sam/drivers/aes/example/aes\_example.h
- \* sam/drivers/aes/gcm\_example/gcm\_example.c
- \* sam/drivers/aes/gcm\_example/gcm\_example.h

- **Issue #ASFP-4748:** Added LCDCA documentation for SAM4.

Add quick start guide documentation for LCDCA.

Files modified:

- \* sam/drivers/lcdca/example/lcdca\_example.c
- \* sam/drivers/lcdca/example/lcdca\_example.h
- \* sam/drivers/lcdca/lcdca.c
- \* sam/drivers/lcdca/lcdca.h

- **Issue #ASFP-4749:** Added PARC documentation for SAM4.

Add quick start guide documentation for PARC.

Files modified:

- \* sam/drivers/parc/example/parc\_example.c
- \* sam/drivers/parc/example/parc\_example.h
- \* sam/drivers/parc/parc.c
- \* sam/drivers/parc/parc.h
- \* sam/drivers/parc/parc\_callback.c
- \* sam/drivers/parc/parc\_callback.h

- **Issue #ASFP-4750:** Added DMA documentation for SAM4.

Add quick start guide documentation for DMA.

Files modified:

- \* sam/drivers/dmac/dmac.c
- \* sam/drivers/dmac/dmac.h
- \* sam/drivers/dmac/example/dmac\_example.c
- \* sam/drivers/dmac/example/dmac\_example.h

- **Issue #ASFP-4751:** Added RSTC documentation for SAM4.

Add quick start guide documentation for RSTC.

Files modified:

- \* sam/drivers/rstc/example1/rstc\_example1.c

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- \* sam/drivers/rstc/example1/rstc\_example1.h
- \* sam/drivers/rstc/example1/sam4n16c\_sam4n\_xplained\_pro/conf\_board.h
- \* sam/drivers/rstc/example1/sam4n16c\_sam4n\_xplained\_pro/conf\_clock.h
- \* sam/drivers/rstc/example1/sam4n16c\_sam4n\_xplained\_pro/conf\_uart\_serial.h
- \* sam/drivers/rstc/example1/sam4s16c\_sam4s\_xplained/conf\_board.h
- \* sam/drivers/rstc/example1/sam4s16c\_sam4s\_xplained/conf\_clock.h
- \* sam/drivers/rstc/example1/sam4s16c\_sam4s\_xplained/conf\_uart\_serial.h
- \* sam/drivers/rstc/rstc.c
- \* sam/drivers/rstc/rstc.h

- **Issue #ASFP-4752:** Added AST documentation for SAM4.

Add quick start guide documentation for AST.

Files modified:

- \* sam/drivers/ast/ast.c
- \* sam/drivers/ast/ast.h
- \* sam/drivers/ast/example1/ast\_example1.c
- \* sam/drivers/ast/example1/ast\_example1.h
- \* sam/drivers/ast/example2/ast\_example2.c
- \* sam/drivers/ast/example2/ast\_example2.h

- **Issue #ASFP-4753:** Added EIC documentation for SAM4.

Add quick start guide documentation for EIC.

Files modified:

- \* sam/drivers/eic/eic.c
- \* sam/drivers/eic/eic.h
- \* sam/drivers/eic/example/eic\_example.c

- **Issue #ASFP-4754:** Added TC documentation for SAM4.

Add quick start guide documentation for TC.

Files modified:

- \* sam/drivers/tc/tc.c
- \* sam/drivers/tc/tc.h
- \* sam/drivers/tc/tc\_capture\_waveform\_example/sam4e16e\_sam4e\_ek/conf\_board.h
- \* sam/drivers/tc/tc\_capture\_waveform\_example/tc\_capture\_waveform\_example.c
- \* sam/drivers/tc/tc\_capture\_waveform\_example/tc\_capture\_waveform\_example.h

- **Issue #ASFP-4757:** FreeRTOS 8.0 Event feature support.

Add use of Event Groups feature in OLED example

Folder added:

thirdparty/freertos/demo/oled1\_event\_groups\_xpro\_example/

- **Issue #ASFP-4761:** SAMDx - Add SPI/I2C master receive feature in ASF.

Modified Files:

- sam0/drivers/sercom/i2c/quick\_start\_master\_callback/qs\_i2c\_master\_callback.c
- sam0/drivers/sercom/spi/quick\_start\_master\_callback/qs\_spi\_master\_callback.c

- **Issue #ASFP-4766:** Added PDC documentation for SAM4.

Add quick start guide documentation for PDC.

Files modified:

- \* sam/drivers/pdc/pdc.c
- \* sam/drivers/pdc/pdc.h
- \* sam/drivers/pdc/pdc\_uart\_example/pdc\_uart\_example.c
- \* sam/drivers/pdc/pdc\_uart\_example/pdc\_uart\_example.h

- **Issue #ASFP-4767:** Added EVENTS documentation for SAM4.

Add quick start guide documentation for EVENTS.

Files modified:

- \* sam/drivers/events/events.c
- \* sam/drivers/events/events.h
- \* sam/drivers/events/example1/events\_example1.c
- \* sam/drivers/events/example1/events\_example1.h
- \* sam/drivers/events/example2/events\_example2.c
- \* sam/drivers/events/example2/events\_example2.h

- **Issue #ASFP-4779:** (Cortem-m0+ based)Enable newlib-nano Linker option by default to save code memory.  
(Cortem-m0+ based)Enable newlib-nano Linker option by default to save code memory

- **Issue #ASFP-4798:** gpio\_common\_handler() function for SAM4L device can be improved.

Files Modified:

\sam\drivers\gpio\gpio.c

- **Issue #ASFP-4805:** SAMD20 - Add ATSAMD20G17U and ATSAMD20G18U device support in ASF.

Add ATSAMD20G17U and ATSAMD20G18U devices support in ASF.

Added files:

sam0\utils\cmsis\samd20\include\pio\samd20g17u.h  
sam0\utils\cmsis\samd20\include\pio\samd20g18u.h  
sam0\utils\cmsis\samd20\include\samd20g17u.h  
sam0\utils\cmsis\samd20\include\samd20g18u.h  
sam0\utils\linker\_scripts\samd20\gcc\samd20g17u\_flash.ld  
sam0\utils\linker\_scripts\samd20\gcc\samd20g17u\_sram.ld  
sam0\utils\linker\_scripts\samd20\gcc\samd20g18u\_flash.ld  
sam0\utils\linker\_scripts\samd20\gcc\samd20g18u\_sram.ld  
sam0\utils\linker\_scripts\samd20\iar\samd20g17u\_flash.icf  
sam0\utils\linker\_scripts\samd20\iar\samd20g17u\_sram.icf  
sam0\utils\linker\_scripts\samd20\iar\samd20g18u\_flash.icf  
sam0\utils\linker\_scripts\samd20\iar\samd20g18u\_sram.icf

Modified files:

common\utils\parts.h

## Notable bugs fixed

- **Issue #ASFP-4575:** SAM PIO driver does not handle interrupts safely.

Files Modified:

\sam\drivers\pio\pio\_handler.c

- **Issue #ASFP-4576:** SAM D20 \_sercom\_get\_async\_baud\_val checks wrong value.

File Modified:

\sam0\drivers\sercom\sercom.c

- **Issue #ASFP-4645:** Unable to create project with i2c master and i2c slave.  
Correct xml file of SERCOM I2C module to enable select master and slave mode at the same time.
- **Issue #ASFP-4660:** SAMD Enable user to define their own hardfault handler.  
Remove HardFault\_Handler() implementation in sam0/drivers/system/system.c to let user define their own.  
The weak HardFault\_Handler() implementation is in device startup file (e.g. for SAMD20, is in sam0/utlis/cmsis/samd20/source/gcc/startup\_samd20.c).
- **Issue #ASFP-4683:** Revise linkers scripts for SAM4CP16B\_1.  
Use ram2 memory to define ram region
- **Issue #ASFP-4684:** Revise coprocessor clock system initialization .  
Assert coprocessor reset and reset its peripheral in sysclk\_configure\_cpclk function
- **Issue #ASFP-4709:** Standard serial I/O driver keeps returning last character received.  
Modified File:  
- \common\services\serial\sam0\_usart\usart\_serial.h
- **Issue #ASFP-4712:** FreeRTOS Peripheral Control API: one UART issue in interrupt handler.  
freertos\_uart\_serial.c correction for sam chipsets with one UART.  
File modified:  
common\services\freertos\sam\freertos\_uart\_serial.c
- **Issue #ASFP-4729:** Display is not normal in sam4c-ek LCD example.  
Only 5 symbols available on SAM4C\_EK, not 6.  
Files Modified:  
sam\components\display\c42364a\c42364a\_font.h  
sam\components\display\c42364a\c42364a\_segmap.h  
sam\components\display\c42364a\c42364a\_slcdc.c
- **Issue #ASFP-4731:** SAM4L DFLL driver bug.  
Fix a bug in SAM4L DFLL driver: dfll\_enable\_config\_defaults().  
Modified file: common/services/clock/sam4l/dfll.c
- **Issue #ASFP-4763:** Several USB Device bug concerning udd\_ctrl\_request\_t.payload word align.  
Modified files:  
- common / services / usb / class / cdc / device / udi\_cdc.c  
- common / services / usb / class / hid / device / generic / udi\_hid\_generic.c  
- common / services / usb / class / hid / device / kbd / udi\_hid\_kbd.c  
- common / services / usb / class / hid / device / mouse / udi\_hid\_mouse.c  
- common / services / usb / class / phdc / device / udi\_phdc.c  
- common / services / usb / class / vendor / device / example / main.c  
- common / services / usb / udc / udd.h
- **Issue #ASFP-4770:** Quick start guide for the SAM USART module clock enable.  
Files Modified:  
\sam\drivers\usart\usart.h

- **Issue #ASFP-4771:** Wrong multiplication in temperature sensor project of SAM4S-EK and SAM4E .

Files Modified:

\sam\drivers\adc\adc\_temp\_sensor\_example\adc\_temp\_sensor\_example.c

- **Issue #ASFP-4773:** SAMD\_\_SYSTEM\_CLOCK wrongly defined in system\_samd20.c.

Modified file:

sam0\utils\cmsis\samd20\source\system\_samd20.c

- **Issue #ASFP-4781:** SAM4L - Power scaling management is wrong for USB and other module.

Fix the issue about USB/DFLL/PLL are not available in PS0 (PS1 also)

File modified:

common/services/clock/sam4l/sysclk.c

- **Issue #ASFP-4785:** Race condition in udi\_cdc.c.

Modified Files:

- common/services/usb/class/cdc/device/udi\_cdc.c

- **Issue #ASFP-4790:** SAMG53 8 Mhz (from 24 Mhz internal, prescaled by 3) device hang issue.

Fix the FWS issue in init.

Files modified:

common/services/clock/sam3n/sysclk.c

common/services/clock/sam3s/sysclk.c

common/services/clock/sam3u/sysclk.c

common/services/clock/sam3x/sysclk.c

common/services/clock/sam4c/sysclk.c

common/services/clock/sam4cm/sysclk.c

common/services/clock/sam4cp/sysclk.c

common/services/clock/sam4e/sysclk.c

common/services/clock/sam4n/sysclk.c

common/services/clock/sam4s/sysclk.c

common/services/clock/samg/sysclk.c

- **Issue #ASFP-4799:** Wrong Assert for configure\_interrupt\_controller() in freertos\_peripheral\_control.c.

Files Modified:

common/services/freertos\sam\freertos\_peripheral\_control.c

- **Issue #ASFP-4812:** SAM4L LCDCA source clock using RC32K issue .

SAM4L LCDCA source clock using RC32K issue .

File modified:

sam/drivers/lcdca/lcdca.c

## Known issues

- **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-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-3595:** ASF includes its own SAM header files set which is not synchronized with the latest header files from Atmel Studio 6.1 toolchain.  
The Atmel Studio 6.1beta header files set for SAM devices is not backward compatible with the Atmel Studio 6.0 header files set.  
ASF SAM drivers are using their own set of header files (from sam/utils/cmsis/sam\*/include) and are not compatible with the Atmel Studio 6.1beta header files.  
SAM drivers will be ported to the new Atmel Studio 6.1beta header files set in a later ASF release.
- **Issue #ASFP-4502:** Some standalone ASF applications in Application Builder do not work.  
The following ASF modules are not available as standalone in the "Select Drivers from the ASF" menu, but only as examples: XMEGA Sleep Manager and ADC driver, AVR UC3 USB Stack from ASF v1, ECC Hamming, TLV320AIC23B codec, FAT file system with play list support, Joystick interface (5-way), MEMORY - EBI SDRAM Controller, MEMORY - MCI - MultiMedia Card Interface, MEMORY - SD/MMC card access using MCI, MEMORY - SD/MMC card access using SPI, MEMORY - NAND Flash on EBI, MEMORY - AT45DBX DataFlash, TOUCH - AT42QT1060 QTouch 6-channel sensor, MEMS Sensors - Accelerometer LIS3L06AL, TIMING - CS2200 Clock Synthesizer, LodePNG, FreeRTOS minimal, lwIP, Micrium uC/OSII, H&D Wi-Fi SPB Firmware Download.

## 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.

ASF bug or enhancement requests can be reported in the ASF Bug Tracker at <http://asf.atmel.com/bugzilla/>.

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