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## ASF: Release ASF-3.15

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-3.15**

## 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
  - SAM4CP
  - SAM4E
  - SAM4L
  - SAM4L8
  - SAM4N
  - SAM4S
  - SAM D20

- SAM D21
- SAM G51
- SAM G53

## 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 6.50
- 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`).
- 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)
- SAM4E support for IAR requires the add-on installer `EWARM_6.40_SAM4E_addon_vx.x.zip` [http://www.atmel.com/images/Atmel-42145-AT03088-Getting-Started-with-SAM4E-ewarm-add-on-%20v0.1.1\\_Application-Note.zip](http://www.atmel.com/images/Atmel-42145-AT03088-Getting-Started-with-SAM4E-ewarm-add-on-%20v0.1.1_Application-Note.zip)
- 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).
- SAM4N support for IAR requires the add-on installer `IAR-EWARM-SAM4N-ADDON-V1.0.zip` [http://www.atmel.com/images/Atmel-42169-AT03758-Getting-Started-with-SAM4N\\_Application-Note.zip](http://www.atmel.com/images/Atmel-42169-AT03758-Getting-Started-with-SAM4N_Application-Note.zip)
- SAM4C support for IAR requires the add-on installer `EWARM_SAM4C_addon_V0.6.zip`
- SAMG support for IAR requires the add-on installer `IAR-EWARM-SAMG53N19-ADDON-V0.8.zip`
- SAMG support for Atmel Studio requires the part pack to support the devices

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>.

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## New and Noteworthy

### 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, DAC, 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, switches, 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-4044:** SAM4CP - Add SAM4CP16B and SAM4CP16BMB support in ASF.

Add SAM4CP devices and SAM4CP-EK support in ASF:

- Support devices: SAM4CP16B
- Drivers: AES, ADC, CHIPID, EFC, GPBR, ICM, MATRIX, PDC, PIO, PMC, PWM, RSTC, RTC, RTT, SLCDC, SPI, SUPC, TC, TRNG, TWI, UART, USART, WDT
- Services: clock, delay, ioport, serial, sleepmgr, spi, twi, flash\_etc
- Components: eeprom, c42364a(slcdd)
- Third party: CMSIS, freertos, prime
- Applications: Getting-started, sam\_low\_power, prime\_service\_node, prime\_lite\_base\_node

- **Issue #ASFP-4060:** Add SAM4E-XPRO board files.

Folders added:

common/applications/xplained\_pro\_user\_application/sam4e16e\_sam4e\_xplained\_pro/  
sam/boards/sam4e\_xplained\_pro/

File modified:

common/boards/board.h

- **Issue #ASFP-4061:** Add low power demo on SAM4E-XPRO.

File modified:

sam/applications/sam\_low\_power/main.c

Folder added:

sam/applications/sam\_low\_power/sam4e16e\_sam4e\_xplained\_pro/

- **Issue #ASFP-4062:** Add Ethernet examples on SAM4E-XPRO.

Folders added:

sam/drivers/gmac/gmac\_example/sam4e16e\_sam4e\_xplained\_pro  
sam/drivers/gmac/unit\_tests/sam4e16e\_sam4e\_xplained\_pro  
thirdparty/lwip/example/sam4e16e\_sam4e\_xplained\_pro

- **Issue #ASFP-4063:** Add external SRAM example on SAM4E-XPRO.

Files modified:

sam/boards/sam4e\_xplained\_pro/init.c  
sam/boards/sam4e\_xplained\_pro/sam4e\_xplained\_pro.h  
sam/boards/sam4s\_xplained/sam4s\_xplained.h  
sam/drivers/ebi/smc/smc\_sram\_example/smc\_sram\_example.c

Folder added:

sam/drivers/ebi/smc/smc\_sram\_example/sam4e16e\_sam4e\_xplained\_pro/

- **Issue #ASFP-4064:** Add USB support on SAM4E-XPRO.

Add HID class support:

common/services/usb/class/hid/device/generic/example/sam4e16e\_sam4e\_xplained\_pro/  
common/services/usb/class/hid/device/kbd/example/sam4e16e\_sam4e\_xplained\_pro/  
common/services/usb/class/hid/device/kbd/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/  
common/services/usb/class/hid/device/mouse/example/sam4e16e\_sam4e\_xplained\_pro/  
common/services/usb/class/hid/device/mouse/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/

Add Vendor example:

common/services/usb/class/vendor/device/example/sam4e16e\_sam4e\_xplained\_pro/



Add PHDC class support:

common/services/usb/class/phdc/device/example/sam4e16e\_sam4e\_xplained\_pro/

Add MSC device support:

common/services/usb/class/msc/device/example/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/msc/device/example\_freertos/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/msc/device/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/

Add CDC device support:

common/services/usb/class/cdc/device/example/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/cdc/device/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/

Add composite device support:

common/services/usb/class/composite/device/example1/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/composite/device/example2/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/composite/device/example3/sam4e16e\_sam4e\_xplained\_pro/

common/services/usb/class/composite/device/example4/sam4e16e\_sam4e\_xplained\_pro/

- **Issue #ASFP-4065:** Add SD card support on SAM4E-XPRO.

Folders added:

common/components/memory/sd\_mmc/example1/sam4e16e\_sam4e\_ek\_xplained\_pro/

common/components/memory/sd\_mmc/example2/sam4e16e\_sam4e\_ek\_xplained\_pro/

common/components/memory/sd\_mmc/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/

- **Issue #ASFP-4067:** Add NAND support on SAM4E-XPRO.

Folders added:

common/components/memory/nand\_flash/nand\_flash\_ebi/example1/sam4e16e\_sam4e\_xplained\_pro/

common/components/memory/nand\_flash/nand\_flash\_ebi/example2/sam4e16e\_sam4e\_xplained\_pro/

common/components/memory/nand\_flash/nand\_flash\_ebi/unit\_tests/sam4e16e\_sam4e\_xplained\_pro/

- **Issue #ASFP-4246:** SAMD21 - Add SAMD21 and SAMD21 Xplained Pro support in ASF.

Add SAM D21 devices and SAM D21 Xplained Pro support in ASF:

- Drivers: AC, ADC, BOD, DAC, DMA, EVENTS, EXTINT, I2S, NVM, PAC, PORT, RTC, SERCOM(SPI, USART, I2C), System(clock, interrupt, pinmux), TC, TCC, USB, WDT

- Services: eeprom, delay, gfx\_mono, ctrl\_access, USB host (HID, CDC, MSC, Vendor, composite), USB device (HID, CDC, MSC, Vendor)

- Components: serial\_flash, at30ts75, ssd1306, virtual\_mem

- Third party: CMSIS, freertos

- Applications: dac\_sound\_player, led\_toggle, osc8\_calib, sleepwalking\_adc, tictactoe, xosc32k\_failure\_detector

- **Issue #ASFP-4292:** Wrong Flash Mode register setting (EEFC\_FMR) for SAM4C/N/S/E and SAMG.

Modified file:

sam/drivers/efc/efc.c

sam/drivers/efc/efc.h

sam/utils/cmsis/sam4e/source/templates/system\_sam4e.c

sam/utils/cmsis/sam4n/source/templates/system\_sam4n.c

sam/utils/cmsis/sam4s/source/templates/system\_sam4s.c

sam/utils/cmsis/samg/samg51/source/templates/system\_samg51.c

sam/utils/cmsis/samg/samg53/source/templates/system\_samg53.c

sam/utils/cmsis/sam4cp/source/templates/system\_sam4cp.c

- **Issue #ASFP-4411:** spi\_master\_vec requires callback-mode of SERCOM SPI, incompatible with polled.

spi\_master\_vec requires callback-mode of SERCOM SPI, incompatible with polled  
Files modified:

- \* sam0/drivers/sercom/spi\_master\_vec/spi\_master\_vec.c
- \* sam0/drivers/sercom/spi\_master\_vec/spi\_master\_vec.h

- **Issue #ASFP-4427:** Inclusion of LWMesh and ZID Stack into ASF/Wireless.

Inclusion of Light Weight Mesh(LWMesh) and ZID Wireless Stacks into ASF:

Lightweight Mesh Features :

An easy to use proprietary low power wireless mesh network protocol .

Simplicity in configuration and Use.

WSNDemo Application added as demo app for the stack.

Supported MCU Family : SAMD20,SAM4L,MegaRF,XmegaA3

Supported Transceivers :

AT86RF212,AT86RF212B,AT86RF231,AT86RF233,ATMEGARFA1,ATMEGARFR2

ZigBee Input Device(ZID) Features:

ZID Profiles(ZID Device) support to send the HID Keyboard, mice, multitouch report over air to the ZID  
HID Adaptor.

USB ZID Adaptor (HID) which will act as ZID Adaptor and creates the transport layer, receives the  
reports from the air, send it to PC via USB or Serial Port.

Supported MCU Family : MegaRF,XmegaA3U

Supported Transceivers : AT86RF233,ATMEGARFR2

## Notable bugs fixed

- **Issue #ASFP-3701:** The data reception (RX) can fail on USB Host CDC module when a specific CDC Device is used.

Now the USB CDC Host supports all USB CDC Devices behaviours, and avoid to break the reception  
of data from Device.

Modified file:

common\services\usb\class\cdc\host\uhi\_cdc.c

- **Issue #ASFP-3984:** Update LCD driver with ILI9341 driver support.

Folder Added:

sam\components\display\ili93xx\example\sam4sd32c\_sam4s\_ek2

sam\components\display\ili93xx\unit\_tests\sam4sd32c\_sam4s\_ek2

Files Modified:

sam\boards\sam4s\_ek2\init.c

sam\components\display\ili93xx\example\sam4e16e\_sam4e\_ek\conf\_board.h

sam\components\display\ili93xx\unit\_tests\sam4e16e\_sam4e\_ek\conf\_board.h

sam\boards\sam4s\_ek2\sam4s\_ek2.h

- **Issue #ASFP-4034:** Add full duplex SERCOM SPI driver with vectored I/O for SAM D20.

Add SERCOM SPI Master driver for SAM D20 that does vectored I/O, i.e., can transfer data to/from  
any number of buffers with arbitrary memory locations.

- **Issue #ASFP-4274:** D20 NVM driver does not clear STATUS flags correctly.

Fixed the SAM D20 NVM driver which attempts to clear flags in the NVM by clearing the register bits,  
while the datasheet specifies that they should be ORed to clear them.

Modified files:

sam0/drivers/nvm/nvm.c

- **Issue #ASFP-4275:** SAM D20(D21?): ADC pin scan.

SAM D20: adc\_read will return STATUS\_ERR\_OVERFLOW if result register is in overrun state

File modified:

\* sam0/drivers/adc/adc.h

- **Issue #ASFP-4277:** ADC interrupt handler triggers one too many conversions.

SAM D20: Fixed adc\_read\_buffer\_job to read the correct number of samples.

File modified:

\* sam0/drivers/adc/adc\_callback.c

- **Issue #ASFP-4301:** SAM D20 ASF code does not enter into standby sleep mode for the first time.

Fixed default state for setting CONF\_CLOCK\_CPU\_CLOCK\_FAILURE\_DETECT from true to false.

Files modified:

\* common2/applications/user\_application/user\_board/config/conf\_clocks.h

\* common2/applications/xplained\_pro\_user\_application/samd20j18\_samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/components/display/ssd1306/example/samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/components/memory/data\_flash/at45dbx/example/samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/components/memory/serial\_flash/at25dfx/quick\_start\_basic/samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/components/memory/serial\_flash/at25dfx/unit\_tests/samd20\_xplained\_pro\_polled\_spi/config/conf\_clocks.h

\* /components/memory/serial\_flash/at25dfx/unit\_tests/samd20\_xplained\_pro\_vectored\_master\_spi/config/conf\_clocks.h

\* common2/services/delay/example/samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/services/gfx\_mono/example\_spinctrl/samd20\_xplained\_pro/config/conf\_clocks.h

\* common2/services/gfx\_mono/example\_sysfont/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/dac\_sound\_player/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/i2c\_slave\_bootloader/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/led\_toggle/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/osc8\_calib/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/sleepwalking\_adc/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/spi\_master\_bootloader/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/spi\_slave\_bootloader/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/tictactoe/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/applications/xosc32k\_failure\_detector/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/components/sensor/at30tse75x/quick\_start/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/ac/quick\_start/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/ac/unit\_test/samd20j18\_samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/adc/quick\_start/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/adc/quick\_start\_callback/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/adc/unit\_test/samd20j18\_samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/dac/quick\_start/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/events/quick\_start/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/events/unit\_test/samd20j18\_samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/extint/quick\_start\_callback/samd20\_xplained\_pro/config/conf\_clocks.h

\* sam0/drivers/extint/quick\_start\_polled/samd20\_xplained\_pro/config/conf\_clocks.h

- \* sam0/drivers/extint/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/nvm/quick\_start\_basic/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/nvm/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/pac/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/port/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/rtc/quick\_start\_calendar/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/rtc/quick\_start\_calendar\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/rtc/quick\_start\_count/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/rtc/quick\_start\_count\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/i2c/quick\_start\_master/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/i2c/quick\_start\_master\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/i2c/quick\_start\_slave/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/i2c/quick\_start\_slave\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi/quick\_start\_master/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi/quick\_start\_master\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi/quick\_start\_slave/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi/quick\_start\_slave\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/spi\_master\_vec/quick\_start\_basic/samd20\_xplained\_pro/config/conf\_clocks.h
- \* sam0/drivers/sercom/usart/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/usart/quick\_start\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/sercom/usart/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/system/clock/clock\_config\_check.h
- \* sam0/drivers/system/clock/module\_config/conf\_clocks.h
- \* sam0/drivers/system/clock/quick\_start\_clock/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/system/clock/quick\_start\_gclk/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/system/interrupt/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/system/pinmux/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/tc/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/tc/quick\_start\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/tc/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/wdt/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/wdt/quick\_start\_callback/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/drivers/wdt/unit\_tests/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/services/eeprom/emulator/quick\_start/samd20\_xplained\_pro/conf\_clocks.h
- \* sam0/services/eeprom/emulator/unit\_test/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* thirdparty/freertos/demo/oled1\_tickless\_xpro\_example/samd20\_xplained\_pro/conf\_clocks.h
- \* thirdparty/freertos/demo/oled1\_xpro\_example/samd20\_xplained\_pro/conf\_clocks.h
- \* thirdparty/wireless/addons/serial\_bridge/example/samd20j18\_samd20\_xplained\_pro/conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/beacon/coord/ncp/samd20\_reb233\_xpro/conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/beacon/coord/ncp/samd20\_xplained\_pro\_rf233/  
conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/beacon/dev/ncp/samd20\_reb233\_xpro/conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/beacon/dev/ncp/samd20\_xplained\_pro\_rf233/  
conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/no\_beacon/coord/ncp/samd20\_reb233\_xpro/  
conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/no\_beacon/coord/ncp/samd20\_xplained\_pro\_rf233/  
conf\_clocks.h
- \* thirdparty/wireless/avr2025\_mac/apps/mac/no\_beacon/dev/ncp/samd20\_reb233\_xpro/conf\_clocks.h

---

```
* thirdparty/wireless/avr2025_mac/apps/mac/no_beacon/dev/ncp/samd20_xplained_pro_rf233/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/bcn_ffd/ncp/samd20_reb233_xpro/conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/bcn_ffd/ncp/samd20_xplained_pro_rf233/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/bcn_rfd/ncp/samd20_reb233_xpro/conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/bcn_rfd/ncp/samd20_xplained_pro_rf233/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/no_bcn_ffd/ncp/samd20_reb233_xpro/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/no_bcn_ffd/ncp/samd20_xplained_pro_rf233/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/no_bcn_rfd/ncp/samd20_reb233_xpro/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/mac/serial_if/no_bcn_rfd/ncp/samd20_xplained_pro_rf233/
conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/tal/performance_analyzer/samd20_reb233_xpro/conf_clocks.h
* thirdparty/wireless/avr2025_mac/apps/tal/performance_analyzer/samd20_rf212b_zigbit_ext/
conf_clocks.h
```

- **Issue #ASFP-4311:** Multiple issues in SAM FreeRTOS TWI service.

Fixed the following bugs in FreeRTOS TWI master driver:

- \* Do not use PDC for reads less than 3 bytes
- \* Set stop bit at same time as start bit for reads of 1 byte
- \* When stop PDC transfer when slave nacks address
- \* Do not send stop when slave sends NACK - handled by hardware
- \* Do not release semaphore before txcomp flag is set

Added support to use the driver without internal addressing

Files modified:

- \* common/services/freertos/sam/freertos\_twi\_master.c

- **Issue #ASFP-4312:** SAM twi\_master\_read does not handle packet lengths of 1 correctly.

Updated driver to send STOP condition as specified in datasheet.

Modified files:

- sam/drivers/twi/twi.c

- **Issue #ASFP-4356:** Change default BOD level setting in SAM D20 BOD driver.

SAM D20 BOD driver uses 0x12 as default level for BOD33 using get\_config\_defaults() function.

But the latest datasheet does not shows up any threshold voltage level corresponding to 0x12 but for other values.

Fix the driver to use default value from anyone of the available values from datasheet.

File modified:

- \* sam0/drivers/bod/bod.h

- **Issue #ASFP-4359:** SAM - Fix user board templates for some SAM4C, SAMG familiy.

Add user board application templates for SAMG/SAM4C series:

```
atsam4c16c_0
atsam4c16c_1
atsam4c32c_0
atsam4c32c_1
```

atsam4c32e\_0  
atsam4c32e\_1  
atsam4c8c\_0  
atsam4c8c\_1  
atsamg51g18  
atsamg53g19  
atsamg53n19

- **Issue #ASFP-4368:** Debug print service for FreeRTOS.

Add Debug print service for FreeRTOS.

Files Modified:

- \* common/services/freertos/dbg\_print/asf.xml
- \* common/services/freertos/dbg\_print/dbg\_print.c
- \* common/services/freertos/dbg\_print/dbg\_print.h
- \* common/services/freertos/dbg\_print/module-config/conf\_dbg\_print.h
- \* common/services/freertos/dbg\_print/quick\_start\_basic/asf.xml
- \* common/services/freertos/dbg\_print/quick\_start\_basic/conf\_dbg\_print.h
- \* common/services/freertos/dbg\_print/quick\_start\_basic/qs\_dbg\_print\_basic.c
- \* common/services/freertos/dbg\_print/quick\_start\_basic/qs\_dbg\_print\_basic.h
- \* common/services/freertos/dbg\_print/quick\_start\_basic/samd20\_xplained\_pro/FreeRTOSConfig.h
- \* common/services/freertos/dbg\_print/quick\_start\_basic/samd20\_xplained\_pro/asf.xml
- \* common/services/freertos/dbg\_print/quick\_start\_basic/samd20\_xplained\_pro/conf\_board.h
- \* common/services/freertos/dbg\_print/quick\_start\_basic/samd20\_xplained\_pro/conf\_clocks.h
- \* thirdparty/freertos/freertos-7.0.0/asf.xml
- \* thirdparty/freertos/freertos-7.3.0/asf.xml
- \* thirdparty/freertos/freertos-7.4.2/asf.xml
- \* thirdparty/freertos/freertos-7.5.2/asf.xml

- **Issue #ASFP-4382:** SAM4L-EK Low Power and QTouch Demo example is no more consistent with the User Guide.

Fixed wrong PS mode display at startup for SAM4L Qtouch demo.

Modified files:

sam\applications\sam4l\_qtouch\_demo\app.c  
sam\applications\sam4l\_qtouch\_demo\ui.c

- **Issue #ASFP-4383:** The use of User Signature does not work in Flash\_efc service.

Fix the "flash\_read\_user\_signature" and "flash\_write\_user\_signature" which do not follow the process explained in datasheet section.

Modified file:

common\drivers\nvm\sam\sam\_nvm.c  
sam\services\flash\_efc\flash\_efc.c

- **Issue #ASFP-4384:** SAM4L fails to enumerate device in CDC host mode.

Fixed the issue in USB CDC host mode enumeration.

Files modified:

common/services/usb/class/cdc/host/uhi\_cdc.c

- **Issue #ASFP-4386:** Code problem with RTC backup mode.

Strict code execution after entering backup mode.

Modified files:

---

sam\drivers\pmc\pmc.c  
sam\drivers\supc\supc.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.



## 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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