
ASF: Release ASF-3.30

The Atmel® Software Framework (ASF, 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). 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. 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).



**8/32-bits Atmel
Microcontrollers**

Release ASF-3.30

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 D09
- SAM D10
- SAM D11
- SAM D20
- SAM D21
- SAM G51
- SAM G53
- SAM G54
- SAM G55
- SAM L21
- SAM L22
- SAM R21
- SAM DA
- SAM C20
- SAM C21
- SAM V71
- SAM V70
- SAM S70
- SAM E70
- SAM B11

Supported Tools

- Atmel Studio 6.2/7.0 using GCC compiler - Visit www.atmel.com/atmelstudio -:
- Atmel AVR32 Studio version 2.6
- Atmel AVR Studio 4.18 SP3
- IAR EWAVR32 version 4.30
- IAR EWAVR version 6.12
- IAR EWARM version 7.40
- WinAVR version 20100110

Note:

- Atmel Studio 6.0 version is not supported since ASF-3.6 extension.
- 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.
- SAM D21 B&L series and SAMD21G17AU/SAMD21G17AU/SAMD21E15BU/SAMD21E16BU devices support for Atmel Studio 6 requires the related Part Pack.
- SAM C20/C21 devices support for Atmel Studio 6 requires the related Part Pack.
- SAM L22 devices support for Atmel Studio 6 requires the related Part Pack.
- SAM B11 devices support only for Atmel Studio 7 and requires the related Part Pack.

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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
- Atmel Studio 6 videos: 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 ASF3.30 (Feb 2016)

- Add BluSDK Smart 5.0
- Update BluSDK5.0
- SAM L22 application examples:
 - CPU usage demonstration using DMAC
 - Smart card example
 - Low power application
 - TCC features example
- SAM4S XPRO examples:
 - NAND flash examples
 - SD/MMC examples
- SAM-BA use USB interface on SAM D21 and L22 XPRO board
- ADP: SAM4S and SAM L21 XPRO board support

Release ASF3.29 (Dec 2015)

- Add SAM L22 RevB support
- Add SAM E70 full support
 - Service: USB HID/CDC/MSC/PHDC/Vendor device, GFX
 - Component: Wifi WINC1500, MXT112S, AT30tse75x
 - Third party: FreeRTOS 8.2.3, Sensor BON055,
- Add Atmega 48PB,88PB,168PB devices and 168PB XMINI board support
- Add SAMD11D14A-UUT device support
- Add ATSAMR21ZLL-EK board support
- Add ATSAMR21B18-MZ210PA and ATSAMR21G18-MR210UA module support
- Add BluSDK4.0 (BLE 4.1) support
- Add WINC3400 support and updating WINC1500 firmware to 19.4.4
- Add WILC1000/3000 support

Release ASF3.28 (Nov 2015)

- Add SAM B11 device and Xplained Pro board support
- Add SAM E70 XPLD board and examples support
- Add ATmega328PB device and XMINI board support
- Add SAM4ECB device support
- TAL and Performance Analyzer application support for RF215v3(Rev. D)

Release ASF3.27.3 (Sep 2015)

- BluSDK3.0 Beta (BLE 4.1) support
- Add Module config file for Performance analyzer application component

Release ASF3.27 (Sep 2015)

- Add SAM L22 device and Xplained Pro kit support
- Add SAM D09 device support
- Add more modules support for SAM V70/V71/E70/S70

- Drivers: MCAN, USBHS
- Service: USB
- Component: s25flxx, sd_mmc, ili9488, wm8904, is42s16100e
- Third party: FreeRTOS, lwip, fatfs, CMSIS
- Add ADP service and example on SAM D21 Xplained Pro kit

Release ASF3.26 (Aug 2015)

- Add SAML21 revB device support
- Add SAMR21E19 device support
- Add SAMD21GxL device support
- Add MEGA328P XMINI board support
- Add more modules support for SAM V70/V71/E70/S70
 - Drivers: XDMA, GMAC, USART
 - Component: at24macxx, ksz8061rnb
- Support for Proximity Cloud solution in SmartConnect 6LoWPAN Stack
- WINC1500 driver update to rev 19.3.0

Release ASF3.25 (Jul 2015)

- Add SAMC20/SAMC21 device and SAMC21 Xplained Pro kit support in ASF:
 - Drivers: AC, ADC, BOD, CAN, CCL, DAC, DIVAS, DMA, EVENTS, EXTINT, NVM, PAC, PORT, RTC, SDADC, SERCOM(SPI, USART, I2C), System(clock, interrupt, pinmux, power, reset), TC, TCC, WDT
 - Services: eeprom, delay
 - Third party: CMSIS, freertos, fatfs
 - Applications: led_toggle, getting-started, dac_sound_player, sleepwalking_adc, xosc32k_failure_detector
- SAM V70/V71/E70/S70 devices and SAMV71-ULTR board support
 - Drivers: AFEC, ACC, CHIPID, AES, DAC, EFC, GPBR, ICM, MATRIX, PIO, PMC, PWM, RSTC, RTC, RTT, SMC, SSC, SUPC, SPI, TC, TRNG, TWIHS, UART, USART, WDT
 - Services: flash_etc, delay, clock, ioport, serial, sleepmgr
 - Applications: xplained_pro_user_application, getting-started
- SAM D21 Analog Comparator modes example
- WINC1500 driver update to rev 19.2.1 and add IoT sensor/cloud demos

Release ASF3.24 (May 2015)

- SAM DA devices support
- Update SAM D20 SPI Master bootloader to use SD card
- Advanced Features of SAMD21 Timer/Counter for Control Applications
- DAC Examples - Waveform Generator & WAV audio player
- SmartConnect 6Lowpan Reassembly feature
- WINC1500 driver update to rev 18.3.0

Release ASF3.23 (Apr 2015)

- SAM4C/CM 256k devices support
- SAML21 - Low power application
- USB MultiTouch HID Example
- BLE SDK Support
- SmartConnect 6Lowpan stack support
- TAL Support For RF215 and Performance Analyzer Application

- WINC1500 driver update to rev 18.1.1

Release ASF3.22 (Mar 2015)

- SAMD21 B&L series support in drivers, service and thirdparty.
- SAMD21G17AU/SAMD21G18AU/SAMD21E15BU/SAMD21E16BU devices support
- SAML21 fix and maintenance
- SAMD10-Xmini board support
- SAMW25 and WINC1500 support

Release ASF3.21 (Dec 2014)

- SAM L21 device family and SAML21-XPRO support : added drivers support for Clock ,AES, CCL, OPAMP, TRNG, RWW, HSDAC, AC, ADC, BOD, DAC, DMA, Event, EXTINT, I2S, NVM, PAC, PORT, RTC, SERCOM, TC, TCC, USB, WDT, added services support for EEPROM, USB host/device, gfx_mono, delay, ctrl_access, added components support for serial_flash, at30ts75, ssd1306, added Thirdparty support for CMSIS, FreeRTOS, FATFS
- SAM G55 device family and SAMG55-XPRO support : USB OHCI host stack support, Full set of drivers support of adc, chipid, cmcc, crccu, efc, flexcom, gpbr, i2sc, matrix, mem2mem, pdc, pdm, pio, pmc, rstc, rtc, rtt, spi, supc, tc, twi, udp, uhp, usart, wdt, added applications of xplained_pro_user_application, getting-started, sam_low_power, starter_kit_bootloader_demo, added services support for flash_efc, clock, delay, ioport, serial, sleepmgr, spi, twi, usb, added components support for ssd1306, at30tse75x, sd_mmc, added Thirdparty support for CMSIS DSP lib, FreeRTOS.
- Performance Analyzer Firmware : Support for Remote Node Configuration Feature

Release ASF3.20 (Oct 2014)

- SAMD1x family ASF Quick Start documentation
- USB Stack Quick Start documentation updates
- SAMD11 USB MSC/TCC examples
- SAMD1x 32 bit TC support
- AVR2025MAC, LWMesh support for SAMD21-XPRO, SAMR21 IAR support for AVR2025/AVR2102

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_efc, 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, rt, 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, rt, 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-4303:** SAM4L WDT driver can include more functions in ASF.

File modified:

sam/drivers/wdt/example/sam4lc4c_sam4l_ek/conf_example.h
sam/drivers/wdt/example/sam4lc4c_sam4l_xplained_pro/conf_example.h
sam/drivers/wdt/example/sam4lc8c_sam4l8_xplained_pro/conf_example.h
sam/drivers/wdt/example/wdt_example_sam4l.c
sam/drivers/wdt/wdt_sam4l.c
sam/drivers/wdt/wdt_sam4l.h

- **Issue #ASFP-4477:** Macros in compiler.h for changing endianness are inconsistent.

Files modified:

sam/utils/compiler.h
sam0/utils/compiler.h

- **Issue #ASFP-5072:** SAM4S xplained pro - NAND Flash Example (EBI) project - missing.

Files modified:

sam/boards/sam4s_xplained_pro/init.c
sam/boards/sam4s_xplained_pro/sam4s_xplained_pro.h

Folders added:

common/components/memory/nand_flash/nand_flash_ebi/example1/sam4sd32c_sam4s_xplained_pro
common/components/memory/nand_flash/nand_flash_ebi/example2/sam4sd32c_sam4s_xplained_pro
common/components/memory/nand_flash/nand_flash_ebi/unit_tests/sam4sd32c_sam4s_xplained_pro

- **Issue #ASFP-5391:** Add I2C and SPI light sensor example on SAM4S XPRO board.

Add folder:

common/services/adp/example/sam
common/services/adp/example/xplained_pro_sam4s_spi
common/services/adp/example/xplained_pro_sam4s_twi
common/services/adp/sam

File modified:

common/services/adp/example/adp_example.c
common/services/adp/example/adp_example_tc.h
common/services/adp/example/adp_window.c
common/services/adp/example/asf.xml
common/services/adp/sam0/adp_interface_spi.c
common/services/adp/sam0/adp_interface_twi.c
common/services/adp/adp.c
common/services/adp/adp.h
common/services/adp/adp_interface.h
common/services/adp/asf.xml
common/services/spi/sam_spi/spi_master.c
common/services/spi/sam_spi/spi_master.h

- **Issue #ASFP-5522:** Add ATmega324PB device and XPRO board support.

Folders added:

common/applications/user_application/atmega324pb_xplained_pro
mega/applications/mega_led_example/atmega324pb_xplained_pro

mega/applications/mega_remorse_example/atmega324pb_xplained_pro
 mega/boards/atmega324pb_xplained_pro

Files modified:

common/boards/board.h

common/services/clock/mega/sysclk.h

common/utils/parts.h

mega/applications/mega_led_example/mega_led_example.c

mega/applications/mega_remorse_example/mega_remorse_example.c

mega/drivers/usart/usart_mega.h

- **Issue #ASFP-5539:** Flash programming examples should mention that Studio/Segger caches flash, causing the result to not always be visible.

Changed the following file:

sam/services/flash_efc/flash_program_example/flash_program_example.c

- **Issue #ASFP-5582:** Remove obsolete "CONF_SPI_TIMEOUT" in conf_spi.h.

Delete the defined "CONF_SPI_TIMEOUT" in the all "conf spi. h" of ASF.

- **Issue #ASFP-5752:** SAML21 CDC STDIO composite device not enabled.

Change configuration file in

common/utils/stdio/stdio_usb

- **Issue #ASFP-5771:** SAML22 TCC Features Example.

Folder added:

sam0/applications/tcc_features_example/saml22_xplained_pro

- **Issue #ASFP-5775:** SAML22 - Add low power application.

Add L22 low power application

Folder added:

sam0/applications/low_power/saml22_low_power

- **Issue #ASFP-5789:** Add three TCC timers to SAM C20 rev C.

Update the SAM C20 header files.

- **Issue #ASFP-5793:** Add the smart card example for SAM L22 Xplained Pro.

Folder added:

sam0/components/smart_card/quick_start/saml22_xplained_pro_b

Files modified:

sam0/components/smart_card/iso7816.c

sam0/components/smart_card/iso7816.h

sam0/components/smart_card/quick_start/qs_smart_card.c

sam0/components/smart_card/quick_start/saml22_xplained_pro/conf_iso7816.h

sam0/components/smart_card/quick_start/saml22_xplained_pro_b/conf_iso7816.h

- **Issue #ASFP-5801:** Add I2C and SPI light sensor example on SAM L21 XPRO board.

* Add folder:

asf\common\services\adp\example\xplained_pro_saml21_spi

asf\common\services\adp\example\xplained_pro_saml21_twi

*File modified:

adp_example_adc.c
common/services/adp/asf.xml
common/services/adp/example/asf.xml
common/services/adp/asf.xml
common/services/ioport/asf.xml
common/services/ioport/ioport.h

- **Issue #ASFP-5812:** B11 Some peripherals' registers value is not the device default value.

Files modified:

sam0/drivers/timer/timer.c
sam0/drivers/dualtimer/dualtimertimer.c

- **Issue #ASFP-5813:** Fix WINC gain table and reset pin settings.

Files modified:

common/components/wifi/wilc/weather_concurrent_bt_demo/sam4sd32c_sam4s_xplained_pro/
conf_wilc.h
common/components/wifi/wilc/wilc3000_module_config/sam4s/conf_wilc.h

- **Issue #ASFP-5814:** Add SAM4S XPRO HSMCI/SD card example.

Files modified:

sam/boards/sam4s_xplained_pro/init.c
sam/boards/sam4s_xplained_pro/sam4s_xplained_pro.h

Folder added:

common/components/memory/sd_mmc/example1/sam4sd32c_sam4s_xplained_pro
common/components/memory/sd_mmc/example2/sam4sd32c_sam4s_xplained_pro
common/components/memory/sd_mmc/unit_tests/sam4sd32c_sam4s_xplained_pro

- **Issue #ASFP-5817:** AT10843: CPU Usage Demonstration Using DMAC of SAM L22.

Folder added:

sam0/applications/dmac_cpu_usage_demo/saml22_xplained_pro

File modified:

sam0/applications/dmac_cpu_usage_demo/adc_dmac_mem_mem_usart.c
sam0/applications/dmac_cpu_usage_demo/adc_dmac_usart.c
sam0/applications/dmac_cpu_usage_demo/adc_no_dmac_mem_mem_usart.c
sam0/applications/dmac_cpu_usage_demo/adc_no_dmac_usart.c
sam0/boards/samd11_xplained_pro/samd11_xplained_pro.h
sam0/boards/saml22_xplained_pro/saml22_xplained_pro.h
sam0/boards/saml22_xplained_pro_b/saml22_xplained_pro_b.h

- **Issue #ASFP-5841:** SAMBA - Add USB interface support in bootloader.

Modified files:

\\common\\services\\usb\\class\\cdc\\device\\udi_cdc.c
\\common\\services\\usb\\class\\cdc\\device\\udi_cdc.h
\\sam0\\applications\\samba_bootloader\\usart_sam_ba.c
\\sam0\\applications\\samba_bootloader\\usart_sam_ba.h
\\sam0\\applications\\samba_bootloader\\sam_ba_monitor.c
\\sam0\\applications\\samba_bootloader\\main.c
\\sam0\\applications\\samba_bootloader\\samd21_xplained_pro\\conf_bootloader.h
\\sam0\\applications\\samba_bootloader\\samd21_xplained_pro\\conf_clocks.h

\sam0\applications\samba_bootloader\saml22_xplained_pro\conf_bootloader.h
 \sam0\applications\samba_bootloader\saml22_xplained_pro\conf_clocks.h

Added files:

\sam0\applications\samba_bootloader\main.h
 \sam0\applications\samba_bootloader\samd21_xplained_pro\conf_extint.h
 \sam0\applications\samba_bootloader\samd21_xplained_pro\conf_sleepmgr.h
 \sam0\applications\samba_bootloader\samd21_xplained_pro\conf_usb.h
 \sam0\applications\samba_bootloader\saml22_xplained_pro\conf_extint.h
 \sam0\applications\samba_bootloader\saml22_xplained_pro\conf_sleepmgr.h
 \sam0\applications\samba_bootloader\saml22_xplained_pro\conf_usb.h

- **Issue #ASFP-5888:** deivce_endpoint_registered_callback_mask misspelt .

Files modified:

sam0/drivers/usb/usb_sam_d_r/usb.c
 sam0/drivers/usb/usb_sam_l/usb.c
 sam0/drivers/usb/usb.h

- **Issue #ASFP-5889:** pwm_channel_update_leading_edge(): variable 'ul_mask' set but not used.

File modified:

sam/drivers/pwm/pwm.c

- **Issue #ASFP-5890:** no previous prototype for 'qspi_set_config'.

File modified:

sam/drivers/qspi/qspi.c

- **Issue #ASFP-5893:** SAMB11 Add SPI Flash Driver API.

Files modified:

\sam0\drivers\sercom\spi_flash\spi_flash.c
 \sam0\drivers\sercom\spi_flash\spi_flash.h

- **Issue #ASFP-5894:** B11 Improvement of AON GPIO wakeup support.

Files modified:

sam0/drivers/gpio/gpio.h
 sam0/drivers/gpio/gpio.c

Folder added:

sam0/drivers/gpio/quick_start_callback

- **Issue #ASFP-5906:** Add Blu_SDK_SMART v5.0 support.

BluSDK Smart Release features

BluSDK Smart 5.0 release supports the following profiles and services.

- Profiles

- o Alert Notification
- o Apple Alert Notification Center Service
- o Blood Pressure
- o Custom Serial Chat
- o Find Me Target
- o Heart Rate
- o HOGP (HID Over GATT Profile)
- o Health Thermometer

- o Phone Alert Status
- o Scan Parameters
- o Time
- Services Support
 - o Alert Notification Service
 - o BLE Manager-Common BLE Event framework
 - o Apple Alert Notification Service (ANCS)
 - o Battery Service (BAS)
 - o Current Time Service(CTS)
 - o Device Information Service (DIS)
 - o Immediate Alert Service (IAS)
 - o Link Loss Service (LLS)
 - o Scan Parameter Service (SPS)
 - o Tx Power Service (TXPS)
 - o HID Device (HOGP Service)
 - o Blood Pressure
 - o Custom Serial Chat Service
 - o Heart Rate Service
 - o Next DST Service
 - o Phone Alert Service
 - o Reference Time Service

Supported Hardware Platform:
SAMB11G18A Xplained Pro

Add folder:
thirdparty/wireless/ble_smart_sdk

- **Issue #ASFP-5907:** Add BluSDK5.0 (BLE 4.1) support.

Added below BluSDK ver4.0 BLE(4.1) - Profile's, Services, Applications:

New:

SAM4S XPlained Pro Platform support added.

Fix for BLE Profiles for PTS Qualification

SAM4S Support added for following BluSDK Profiles/Application:

Health Thermometer Profile,

Simple BTLC1000,

Battery,

Device Information Service,

Time Information Profile,

Observer,

Simple broadcaster,

custom serial chat,

HID - Keyboard,

HID - Mouse,

PXP-Reporter,

PXP-Monitor,

Alert Notification Profile,

Apple Notification Center Service (ANCS),

Direct Test Mode(DTM),

Blood Pressure(BLP),

Find me,

Heart Rate Profile(HRP),

Phone Alert Status(PAS),

Scan Parameter Service,
BLE-Startup Template.
Updated Getting Started Guide for All BluSDK Projects for SAM4S Platform
SAM4S Support for SIO2HOST
Supported Hardware Platform:
SAML21J18B Xplained Pro - (ATBTLC1000-XSTK)
SAMG55J19 Xplained Pro
SAMD21J18A Xplained Pro
BTLC1000 Xplained Pro
SAM4S Xplained Pro

Notable bugs fixed

- **Issue #ASFP-4850:** SAM PIO: Wrong function description.

Files modified:

sam/drivers/pio/pio.c

- **Issue #ASFP-4911:** component_tc.h contains wrong definitions for TC2XC2S.

Files Modified:

sam/drivers/adc/adc.c

sam/utils/cmsis/sam4s/include/component/component_adc.h

sam/utils/cmsis/sam4s/include/component/component_dacc.h

sam/utils/cmsis/sam4s/include/component/component_pmc.h

sam/utils/cmsis/sam4s/include/component/component_rtc.h

sam/utils/cmsis/sam4s/include/component/component_tc.h

sam/utils/cmsis/sam4s/include/instance/instance_adc.h

sam/utils/cmsis/sam4s/include/instance/instance_pmc.h

sam/utils/cmsis/sam3n/include/component/component_tc.h

sam/utils/cmsis/sam3u/include/component/component_tc.h

sam/utils/cmsis/sam4n/include/component/component_tc.h

- **Issue #ASFP-5070:** SAM4L: chipid defines missing in component_chipid.h.

File modified:

sam/utils/cmsis/sam4l/include/component/component_chipid.h

- **Issue #ASFP-5268:** SAM4E8C: Unnatural behaviour of AFEC callback implementation.

File modified:

sam/drivers/afec/afec.c

- **Issue #ASFP-5333:** SAMD21, power.h Workaround for errata which is fixed, still present in ASF.

Remove errata 13140 for SAMD21 as it's fixed for D21 from version D

File modified:

sam0\drivers\system\power\power_sam_d_r\power.h

- **Issue #ASFP-5352:** SAM4E : Remove the refresh period for DACC from the mode register.

File modified:

sam/applications/sam4e_ek_demo/task_dsp.c

sam/drivers/acc/acc_example/acc_example_sam4e.c

sam/drivers/dacc/sinewave_example/sinewave_example.c

sam/drivers/dacc/dacc.c
sam/drivers/dacc/dacc.h

- **Issue #ASFP-5496:** SAM G55 flash drivers restrict reading GPNVM bit 3-7.

File modified:
sam/services/flash_efc/flash_efc.c

- **Issue #ASFP-5612:** SAMG55 - Voltage regulator trimming is not added.

File modified:
bugfix/ASFP-5612-samg55-voltage-regulator-trimming

- **Issue #ASFP-5661:** spi_write_buffer_wait is not safe for transfers of odd lengths.

File modified:
sam0/drivers/sercom/spi/spi.c

- **Issue #ASFP-5675:** ASF Module SERCOM I2C master driver (callback).

File modified:
sam0/drivers/sercom/i2c/i2c_sam0/i2c_master_interrupt.c

- **Issue #ASFP-5680:** SAMC21 32bit timer incorrectly setup in tc.c.

File modified:
am0/drivers/tc/tc_sam_l_c/tc.c

- **Issue #ASFP-5693:** Error in tc.c prevents the slave TC from running & thus the 32bit timer .

File modified:
sam0/drivers/tc/tc_sam_l_c/tc.c

- **Issue #ASFP-5697:** SAM4L USB Host MSC Bootloader example: enable the pull up of push button.

Files modified:
sam/applications/sam4l_host_msc_aes_bootloader/bootloader/main.c

- **Issue #ASFP-5703:** Add I2SC_MR_IMCKDIV config option to I2SC for SAMG.

File modified:
sam/drivers/i2sc/i2sc.c
sam/drivers/i2sc/i2sc.h

- **Issue #ASFP-5710:** I2C master driver does not configure SCL to have a 2:1 ratio on LOW:HIGH in for high-speed.

File modified:
sam0/drivers/sercom/i2c/i2c_sam0/i2c_master.c

- **Issue #ASFP-5711:** I2C slave driver for SAM D21 does not work.

File modified:
sam0/drivers/sercom/i2c/i2c_common.h

- **Issue #ASFP-5726:** Typo in SAM0 DMA driver trigger actions.

File modified:

```

sam0/applications/low_power/saml_low_power/low_power_demo.c
sam0/applications/slcd_features_example/main.c
sam0/applications/tcc_advanced_features_example/ramp2_dma.c
sam0/drivers/adc/quick_start_dma/qs_adc_dma_use.c
sam0/drivers/aes/quick_start_dma/quick_start_dma.c
sam0/drivers/aes/unit_test/unit_test.c
sam0/drivers/dma/dma.c
sam0/drivers/dma/dma.h
sam0/drivers/i2s/quick_start_dma/qs_i2s_dma.c
sam0/drivers/rtc/quick_start_tamper_dma/qs_rtc_tamper_dma.c
sam0/drivers/sercom/i2c/quick_start_master_dma/qs_i2c_master_dma.c
sam0/drivers/sercom/i2c/quick_start_slave_dma/qs_i2c_slave_dma.c
sam0/drivers/sercom/spi/quick_start_dma/qs_spi_dma_use.c
sam0/drivers/sercom/usart/quick_start_dma/qs_usart_dma_use.c
sam0/drivers/slcd/quick_start/quick_start.c
sam0/drivers/tcc/quick_start_dma/qs_tcc_dma.c

```

- **Issue #ASFP-5740:** Example Project Search string doesnt match : SAM4E Xplained Pro.
Change the string to match the search.
- **Issue #ASFP-5745:** system_clock_source_get_hz() neglects DPLL output prescaler on SAML/C.
File modified:
sam0/drivers/system/clock/clock_samc20_c21/clock.c
sam0/drivers/system/clock/clock_samc20_c21/clock_feature.h
sam0/drivers/system/clock/clock_saml21/clock.c
sam0/drivers/system/clock/clock_saml21/clock_feature.h
sam0/drivers/system/clock/clock_saml22/clock.c
sam0/drivers/system/clock/clock_saml22/clock_feature.h
- **Issue #ASFP-5747:** I2C master driver does not nack on master_read when data_length is 1.
File modified:
sam0/drivers/sercom/i2c/i2c_sam0/i2c_master.c
sam0/drivers/sercom/i2c/i2c_sam0/i2c_master_interrupt.c
- **Issue #ASFP-5791:** LWIP example with SAM V7 has timing issues.
Fix LWIP example issue.
Files modified:
sam\drivers\gmac\gmac.h
thirdparty\lwip\lwip-port-1.4.1\sam\netif\sam70_gmac.c
thirdparty\lwip\lwip-port-1.4.1\sam\netif\samv71_gmac.c
- **Issue #ASFP-5803:** Missing I/O Driver Register definition in SAM device.
Files modified:
sam/utils/cmsis/samg/samg55/include/instance/pioa.h
sam/utils/cmsis/samg/samg55/include/instance/piob.h
sam/utils/cmsis/same70/include/instance/pioa.h
sam/utils/cmsis/same70/include/instance/piob.h
sam/utils/cmsis/same70/include/instance/pioc.h
sam/utils/cmsis/same70/include/instance/piod.h
sam/utils/cmsis/same70/include/instance/pioe.h

sam/utils/cmsis/sams70/include/instance/pioa.h
sam/utils/cmsis/sams70/include/instance/piob.h
sam/utils/cmsis/sams70/include/instance/pioc.h
sam/utils/cmsis/sams70/include/instance/piod.h
sam/utils/cmsis/sams70/include/instance/pioe.h
sam/utils/cmsis/samv70/include/instance/pioa.h
sam/utils/cmsis/samv70/include/instance/piob.h
sam/utils/cmsis/samv70/include/instance/pioc.h
sam/utils/cmsis/samv70/include/instance/piod.h
sam/utils/cmsis/samv70/include/instance/pioe.h
sam/utils/cmsis/samv71/include/instance/pioa.h
sam/utils/cmsis/samv71/include/instance/piob.h
sam/utils/cmsis/samv71/include/instance/pioc.h
sam/utils/cmsis/samv71/include/instance/piod.h
sam/utils/cmsis/samv71/include/instance/pioe.h

- **Issue #ASFP-5804:** XMEGA: USB Stack Data Toggle Issue Fix.

File modified:

xmega/drivers/usb/usb_device.c

- **Issue #ASFP-5815:** SAMD21 : Error in TCC driver for callback unregistration.

Fix TCC driver issue.

File modified:

sam0/drivers/tcc/tcc_callback.c

- **Issue #ASFP-5836:** SAM L22 device: Check all examples about the CPU clock setting for it's maximum speed is 32MHz.

Change the CPU clock divider from 1 to 2.

- **Issue #ASFP-5842:** tcc_get_count_value() SYNC issue in tcc.c.

File modified:

sam0/drivers/tcc/tcc.c

- **Issue #ASFP-5849:** WM8904 example / SAMV71Xplained ultra.

Files Modified:

sam/components/audio/codec/wm8904/example/wm8904_example.c

sam/drivers/ssc/ssc.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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