ASF: Release ASF-3.16

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).

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 -:
    - 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
- 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
- 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.
- 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
- SAM4C support for IAR requires the add-on installer EWARM_SAM4C_addon_V0.6.zip
- SAMG support for IAR requires the add-on installe IAR-EWARM-SAMG53N19-ADDON-V0.8.zip
- SAMG support for Atmel Studio requires the part pack to support the devices

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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 ASF3.16 (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, 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, 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-4073:** SAM4C - Add CMCC driver support in ASF.

  Update CMCC driver in ASF, add support for sam4c
  Modified Files:
  - sam/drivers/cmcc/asf.xml
  - sam/drivers/cmcc/cmcc.c
  - sam/drivers/cmcc/cmcc.h
  - sam/drivers/cmcc/example/asf.xml
  - sam/drivers/cmcc/example/cmcc_example.c
  - sam/drivers/cmcc/unit_tests/asf.xml
  - sam/drivers/cmcc/unit_tests/unit_tests.c
  Add Folders:
  - sam/drivers/cmcc/example/sam4c16c_sam4c_ek
  - sam/drivers/cmcc/unit_tests/sam4c16c_sam4c_ek

- **Issue #ASFP-4304:** Add lwIP 1.4.1 and Ethernet Xplained Pro extension support for SAMD20 (Micrel KSZ8851SNL).

  Add lwIP 1.4.1 with examples for Netconn and Raw APIs on the SAM4E and SAM4S (Micrel PHY)
  Add Ethernet Xplained Pro extension support for SAM D20 (using the Micrel KSZ8851SNL PHY)

- **Issue #ASFP-4482:** SAM D20: Modify DMA driver to expose base descriptors.

  SAM D20: Modify DMA driver to expose base descriptors
  Modified files:
  sam0/drivers/dma/dma.h
  sam0/drivers/dma/dma.c

- **Issue #ASFP-4493:** dbg_print does not support SAM D21, also missing specifier for quick start page.

  The dbg_print service does not support the new SERCOM interface, i.e., SYNCBUSY register, introduced with SAM D21. Also, the module does not specify the location of its quick start guide list.
  Changed files:
  common/services/freertos/dbg_print/asf.xml
  common/services/freertos/dbg_print/dbg_print.c

- **Issue #ASFP-4520:** SAMD21 - Add more drivers and examples for SAMD21 in ASF.

  Add more drivers and examples for SAMD21 in ASF:
  - Add USB device class support: composite, HID, PHDC
  - Add applications: getting-started, i2c_slave_bootloader
  - Add fault detect for TCC module
  - Add SD/MMC support with SPI interface
  - Add interrupt hook for EVENT driver
  - Add 10-bit addressing and high speed for SERCOM I2C driver
  - Documentation update (USB, TCC, DMA etc.)

- **Issue #ASFP-4522:** SAM - A warning about 'fmr_backup' in PMC driver.

  Remove 'fmr_backup' warning in PMC driver.
  Modified file:
  sam\drivers\pmc\pmc.c

- **Issue #ASFP-4524:** spi_master_vec should allow user to discard received bytes.

The spi_master_vec driver should be capable of discarding received bytes (dummy reads) and not
require that all bytes from slave are read into allocated buffers.
Changed files:
sam0/drivers/sercom/spi_master_vec/spi_master_vec.c
sam0/drivers/sercom/spi_master_vec/spi_master_vec.h
sam0/drivers/sercom/spi_master_vec/quick_start_basic/qs_spi_master_vec_basic.c
sam0/drivers/sercom/spi_master_vec/quick_start_basic/qs_spi_master_vec_basic.h

- **Issue #ASFP-4526:** SERCOM SYNCBUSY code should depend on a common define for scheme selection.

sercom.h should have a central define for which SYNCBUSY scheme is used based on the SERCOM
revision, instead of each mode-specific driver having its own define that is based on the project device.
Changed files:
common/services/freertos/dbg_print/dbg_print.c
sam0/drivers/sercom/i2c/i2c_common.h
sam0/drivers/sercom/i2c/i2c_master.h
sam0/drivers/sercom/i2c/i2c_slave.h
sam0/drivers/sercom/sercom.h
sam0/drivers/sercom/spi/spi.h
sam0/drivers/sercom/spi_master_vec/spi_master_vec.c
sam0/drivers/sercom/spi_master_vec/spi_master_vec.h
sam0/drivers/sercom/usart/usart.h
thirdparty/freertos/demo/oled1_tickless_xpro_example/demotasks.c
thirdparty/freertos/demo/oled1_xpro_example/demotasks.c

- **Issue #ASFP-4528:** USB - ZLP send.

Modified file:
common\services\usb\class\phdc\device\udi_phdc.c

- **Issue #ASFP-4539:** Add ILI9341 support in SAM4S-EK2 demo.

Files Added:
common\services\gfx\gfx_ili93xx.c
common\services\gfx\gfx_ili93xx.h
sam\applications\sam_toolkit_demo\sam4s16c_sam4s_ek\conf_ili93xx.h
sam\applications\sam_toolkit_demo\sam4sd32c_sam4s_ek2\conf_ili93xx.h
Files Deleted:
sam\applications\sam_toolkit_demo\sam4s16c_sam4s_ek\conf_ili9325.h
sam\applications\sam_toolkit_demo\sam4sd32c_sam4s_ek2\conf_ili9325.h
Files Modifed:
common\services\gfx\gfx.h
sam\applications\sam_toolkit_demo\rtouch_calibrate.c
sam\applications\sam_toolkit_demo\sam4sd32c_sam4s_ek2\conf_demo.h
sam\applications\sam_toolkit_demo\demo_draw_bmpfile.c
sam\applications\sam_toolkit_demo\sam4s16c_sam4s_ek\conf_demo.h
sam\components\display\ili93xx\ili93xx.c
sam\components\display\ili93xx\ili93xx.h
sam\boards\sam4s_ek\sam4s_ek.h

- **Issue #ASFP-4542:** Create example for PDM driver.

Added example for PDM driver on SAMG53-XPRO.

Folder added:
sam/drivers/pdm/example1/

Notable bugs fixed

- **Issue #ASFP-3953:** TWIS stops receiving bytes on a repeated start condition.
File modified:
avr32\drivers\twis\twis.c

- **Issue #ASFP-4114:** SERCOM I2C Master driver does not handle repeated starts correctly.
SERCOM I2C master driver does not process transfers correctly after repeated starts due to a missing
clearing of Master on Bus interrupt flag.
Changed files:
sam0/drivers/sercom/i2c/i2c_samd20/i2c_master_interrupt.c

- **Issue #ASFP-4117:** SERCOM I2C Master in callback mode returns wrong status when slave NACKs address.
SERCOM I2C Master driver does not detect address NACK in callback mode because RXNACK flag is
not checked when MB flag is set.
Changed files:
sam0/drivers/sercom/i2c/i2c_samd20/i2c_master_interrupt.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/conf_clocks.h
* common2/components/memory/data_flash/at45dbx/example/samd20_xplained_pro/conf_clocks.h
* common2/components/memory/serial_flash/at25dfx/quick_start_basic/samd20_xplained_pro/
conf_clocks.h
* common2/components/memory/serial_flash/at25dfx/unit_tests/samd20_xplained_pro_polled_spi/
conf_clocks.h
* /components/memory/serial_flash/at25dfx/unit_tests/samd20_xplained_pro_vectored_master_spi/
conf_clocks.h
* common2/services/delay/example/samd20_xplained_pro/conf_clocks.h
* common2/services/gfx_mono/example_spinctrl/samd20_xplained_pro/conf_clocks.h
* common2/services/gfx_mono/example_sysfont/samd20_xplained_pro/conf_clocks.h
* sam0/applications/dac_sound_player/samd20_xplained_pro/conf_clocks.h
* sam0/applications/i2c_slave_bootloader/samd20_xplained_pro/conf_clocks.h
* sam0/applications/led_toggle/samd20_xplained_pro/conf_clocks.h
* sam0/applications/osc8_calib/samd20_xplained_pro/conf_clocks.h
* sam0/applications/sleepwalking_adc/samd20_xplained_pro/conf_clocks.h
* sam0/applications/spi_master_bootloader/samd20_xplained_pro/conf_clocks.h
* sam0/applications/spi_slave_bootloader/samd20_xplained_pro/conf_clocks.h
* sam0/applications/tictactoe/samd20_xplained_pro/conf_clocks.h
* sam0/applications/xosc32k_failure_detector/samd20_xplained_pro/conf_clocks.h
* sam0/components/sensor/at30tse75x/quick_start/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/ac/quick_start/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/ac/quick_start_callback/samd20_xplained_pro/conf_clocks.h

* sam0/drivers/ac/unit_test/samd20j18_samd20_xplained_pro/conf_clocks.h
* sam0/drivers/adc/quick_start/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/adc/quick_start_callback/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/adc/unit_test/samd20j18_samd20_xplained_pro/conf_clocks.h
* sam0/drivers/dac/quick_start/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/events/quick_start/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/events/unit_test/samd20j18_samd20_xplained_pro/conf_clocks.h
* sam0/drivers/extint/quick_start_callback/samd20_xplained_pro/conf_clocks.h
* sam0/drivers/extint/quick_start_polled/samd20_xplained_pro/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

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* 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-4422:** EXTINT: Unable to get what channel triggered callback.
Add API to get interrupt channel id.
Files modified:
sam0/drivers/extint/extint_callback.h
sam0/drivers/extint/extint_callback.c

- **Issue #ASFP-4424:** SAM - pwm_stepper_motor_init() sets bits incorrectly.
Fix Bugzilla 3324.
File modified:
sam\drivers\pwm\pwm.c

- **Issue #ASFP-4430:** SAM - PWM channel init overwriting other channel config values.
Fix Bugzilla 3336.
File modified:
sam\drivers\pwm\pwm.c

- **Issue #ASFP-4431:** SAM - PWM fault output init is not correct.
Modified file:
sam\drivers\pwm\pwm.c

- **Issue #ASFP-4435:** SERCOM USART interrupt handler implements wrong data handling for 9-bit mode.
Files Modified:

sam0\drivers\sercom\usart\usart_interrupt.c

- **Issue #ASFP-4441:** Fixed the SD/MMC wizard issue; Improved the default conf_access file.
  Fixed the SD/MMC wizard issue;
  Improved the default conf_access file
  File modified:
  common/services/storage/ctrl_access/module_config/conf_access.h

- **Issue #ASFP-4454:** Class B demo for XMEGA A3BU does not build.
  Fix compiling error with latest XMEGA header file.
  File modified:
  xmega/applications/xmega_a3bu_xplained_classb_oven/classb_tests_cert/wdt/classb_wdt_test.h

- **Issue #ASFP-4469:** adc_configure_xxxx functions issue in adcife.h.
  Files Modified:
  sam\drivers\adcife\adcife.h

- **Issue #ASFP-4472:** SAM D20: Change DMA channel trigger and event set up.
  Improve DMA channel triggers and event API to allow multiple sources.
  Modified files:
  sam0/drivers/dma/dma.c
  sam0/drivers/dma/dma.h

- **Issue #ASFP-4475:** SAM - USB Host CDC example not working.
  USB bulk endpoint transfer timeout should not be zero, to avoid taking all USB non-periodic transfer bandwidth.
  Files modified:
  common\services\usb\class\cdc\host\uhi_cdc.c
  common\services\usb\uhc\uhd.h

- **Issue #ASFP-4481:** ADC pin scan pin settup.
  SAM D20/D21: Fixes the pin setup for when the ADC input scan method is used.
  File modified:
  * sam0/drivers/adc/adc.c

- **Issue #ASFP-4484:** SAMD21 - USB CDC host baud rate issue.
  Fix USB CDC host baud rate issue.
  File modified:
  common/services/usb/class/cdc/host/example/uart_samd.c

- **Issue #ASFP-4485:** SAM D20 nvm_write_buffer() does not write data less than page size.
  nvm_write_buffer() should perform a manual NVM write when the length of data to be programmed is less than page size.
  File modified:
  sam0/drivers/nvm/nvm.c

- **Issue #ASFP-4487:** SAM D21, usb mass storage, asf wizard, host_mem.h not included.
  Update the USB MSC memory interface to V2 of the conf_access in module config.
  File modified:

common/services/storage/ctrl_access/module_config/conf_access.h

- **Issue #ASFP-4490:** Incorrect use of registered trademarked Cortex in the System Interrupts driver from SAM D20/D21.

Fixed missing registered trademark on Coretex and added ARM® as well.
File modified:
sam0/drivers/system/interrupt/system_interrupt.h

- **Issue #ASFP-4492:** Typo in API function name.

Fix typo in SAM RTC APIs.
Files Modified:
sam\drivers\rtc\example\rtc_example.c
sam\drivers\rtc\rtc.c
sam\drivers\rtc\rtc.h

- **Issue #ASFP-4501:** SAM USART QS update.

update the USART QS.
File modified:
sam/drivers/usart/usart.h

- **Issue #ASFP-4506:** SAMG PDM driver quickstart does not compile.

Update the PDM QS.
File modified:
sam/drivers/pdm/pdm.h

- **Issue #ASFP-4507:** SERCOM is not clocked again when waking from sleep if debugging.

Keep the SERCOM module active while the device is sleeping during debug.
Files modified:
common/services/freertos/dbg_print/dbg_print.c
* sam0/drivers/sercom/i2c/i2c_samd20/i2c_master.c
* sam0/drivers/sercom/i2c/i2c_samd20/i2c_slave.c
* sam0/drivers/sercom/i2c/i2c_samd21/i2c_master.c
* sam0/drivers/sercom/i2c/i2c_samd21/i2c_slave.c
* sam0/drivers/sercom/spi/spi.c
* sam0/drivers/sercom/spi_master_vec/spi_master_vec.c
* sam0/drivers/sercom/usart/usart.c
* sam0/drivers/system/system.h

- **Issue #ASFP-4510:** conf_usb.h has configuration settings in wrong format.

Update the comment style in conf_usb.h in usb cdc class
File Modified:
common/services/usb/class/cdc/device/module_config/conf_usb.h

- **Issue #ASFP-4518:** Wrong clock setup in USB driver for SAM D21 .

remove the unnecessary PB14 setting in USB driver
File modified:
sam0/drivers/usb/usb.c

- **Issue #ASFP-4519:** TCC driver does not support double buffering.

Add TCC double buffering, clean up QSGs and add more.
Folders added:
sam0/drivers/tc/quick_start_timer/
sam0/drivers/tcc/quick_start_timer/
sam0/drivers/tcc/quick_start_buffering/
Files moved:
sam0/drivers/tcc/quick_start/{samd21_xplained_pro →}/conf_quick_start.h
sam0/drivers/tcc/quick_start_callback/{samd21_xplained_pro →}/conf_quick_start_callback.h
Files modified:
sam0/drivers/tc/tc.h
sam0/drivers/tcc/quick_start/qs_tcc_basic.c
sam0/drivers/tcc/quick_start/qs_tcc_basic.h
sam0/drivers/tcc/quick_start_callback/qs_tcc_callback.c
sam0/drivers/tcc/quick_start_callback/qs_tcc_callback.h
sam0/drivers/tcc/quick_start_dma/qs_tcc_dma.c
sam0/drivers/tcc/quick_start_dma/qs_tcc_dma.h
sam0/drivers/tcc/quick_start_faultn/qs_tcc_faultn.h
sam0/drivers/tcc/quick_start_faultx/qs_tcc_faultx.h
sam0/drivers/tcc/quick_start_timer/samd21_xplained_pro/conf_board.h
sam0/drivers/tcc/quick_start_timer/samd21_xplained_pro/conf_clocks.h
sam0/drivers/tcc/tcc.c
sam0/drivers/tcc/tcc.h

- **Issue #ASFP-4527:** SERCOM interrupt flags are cleared incorreclty.

INTFLAG register was incorrectly cleared in SERCOM I2C slave interrupt handler, causing problems in certain conditions with higher priority interrupts interrupting the SERCOM handler.
Files modified:
* sam0/drivers/sercom/i2c/i2c_samd20/i2c_slave_interrupt.c
* sam0/drivers/sercom/i2c/i2c_samd21/i2c_slave_interrupt.c
* sam0/drivers/sercom/usart/usart_interrupt.c

- **Issue #ASFP-4529:** i2c_slave_get_direction function missing.

Removed i2c_slave_get_direction function declaration.
Modified file: sam0/drivers/sercom/i2c/i2c_slave.h

- **Issue #ASFP-4535:** Minor bug in GPIO.

Files Modified:
\sam\drivers\gpio\gpio.c

- **Issue #ASFP-4536:** SAM4L - TWIS driver is interrupt unsafe.

Fix for "SAM4L TWIS driver is interrupt unsafe".
Modified files:
sam/drivers/twis/twi_slave_example/twi_slave_example.c
sam/drivers/twis/twis.c

- **Issue #ASFP-4541:** SAMD21 - ADC unit test can not run sucessfully.

Fixed the SAM0 ADC interrupt handler issue; Add more range for the check ADC result in unit test.
Files modified:
sam0/drivers/adc/adc_callback.c

sam0/drivers/adc/unit_test/unit_test.c

- **Issue #ASFP-4543:** sam4e_xplained_pro.h: wrong definition for PIN_NF_RB_IDX.

Files Modified:
/sam/boards/sam4e_xplained_pro/sam4e_xplained_pro.h

- **Issue #ASFP-4555:** SAM4L - TWIM Master Example doesn't work in AS6.2.993 with "-O0".

TWIM: change the sequence of enable master and enable interrupt.
File modified:
sam/drivers/twim/twim.c

- **Issue #ASFP-4558:** SAM UART driver does not configure channel mode.

Remove the unnecessary "ul_chmode" in "sam_uart_opt" structure.
File modified:
sam/drivers/uart/uart.h

- **Issue #ASFP-4565:** "LAST_PAGE_ADDRESS" is not accurate.

Change the confuse name of "LAST_PAGE_ADDRESS".
Files modified:
common/drivers/nvm/unit_tests/sam4s16c_sam4s_ek/conf_test.h
sam/applications/starter_kit_bootloader_demo/main/main.c
sam/applications/starter_kit_bootloader_demo/main/sam4n16c_sam4n_xplained_pro/conf_example.h
sam/drivers/aes/unit_tests/sam4c16c_sam4c_ek/conf_test.h
sam/drivers/aes/unit_tests/sam4cp16b_sam4cp16bmb/conf_test.h
sam/drivers/aes/unit_tests/sam4e16e_sam4e_ek/conf_test.h
sam/drivers/cmcc/unit_tests/sam4c16c_sam4c_ek/conf_test.h
sam/drivers/cmcc/unit_tests/sam4e16e_sam4e_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam3n4c_sam3n_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam3s4c_sam3s_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam3sd8c_sam3s_ek2/conf_test.h
sam/drivers/gpbr/unit_tests/sam3u4e_sam3u_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam3x8e_arduino_due_x/conf_test.h
sam/drivers/gpbr/unit_tests/sam3x8h_sam3x_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam4c16c_sam4c_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam4cp16b_sam4cp16bmb/conf_test.h
sam/drivers/gpbr/unit_tests/sam4e16e_sam4e_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam4n16c_sam4n_xplained_pro/conf_test.h
sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_ek/conf_test.h
sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_wpir_rd/conf_test.h
sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
sam/drivers/gpbr/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
sam/drivers/gpbr/unit_tests/unit_tests.c
sam/drivers/pio/pio_alternate_function_example/pio_alternate_function_example.c
sam/drivers/pio/pio_alternate_function_example/sam3n4c_sam3n_ek/conf_example.h
sam/drivers/pio/pio_alternate_function_example/sam3s4c_sam3s_ek/conf_example.h
sam/drivers/pio/pio_alternate_function_example/sam3sd8c_sam3s_ek2/conf_example.h
sam/drivers/pio/pio_alternate_function_example/sam3x8h_sam3x_ek/conf_example.h
sam/drivers/pio/pio_alternate_function_example/sam4c16c_sam4c_ek/conf_example.h
sam/drivers/pio/pio_alternate_function_example/sam4e16e_sam4e_ek/conf_example.h
sam/drivers/rstc/unit_tests/sam3n4c_sam3n_ek/conf_test.h

sam/drivers/rstc/unit_tests/sam3s4c_sam3s_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam3sd8c_sam3s_ek2/conf_test.h
sam/drivers/rstc/unit_tests/sam3u4e_sam3u_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam3x8e_arduino_due_x/conf_test.h
sam/drivers/rstc/unit_tests/sam3x8h_sam3x_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam4c16c_sam4c_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam4cp16b_sam4cp16bmb/conf_test.h
sam/drivers/rstc/unit_tests/sam4e16e_sam4e_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam4n16c_sam4n_xplained_pro/conf_test.h
sam/drivers/rstc/unit_tests/sam4s16c_sam4s_ek/conf_test.h
sam/drivers/rstc/unit_tests/sam4s16c_sam4s_wpir_rd/conf_test.h
sam/drivers/rstc/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
sam/drivers/rstc/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
sam/services/flash_efc/flash_program_example/flash_program_example.c
sam/services/flash_efc/flash_program_example/sam3n4c_sam3n_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam3s4c_sam3s_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam3sd8c_sam3s_ek2/conf_example.h
sam/services/flash_efc/flash_program_example/sam3u4e_sam3u_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam3x8e_arduino_due_x/conf_example.h
sam/services/flash_efc/flash_program_example/sam3x8h_sam3x_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam4c16c_sam4c_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam4cp16b_sam4cp16bmb/conf_example.h
sam/services/flash_efc/flash_program_example/sam4e16e_sam4e_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam4n16c_sam4n_xplained_pro/conf_example.h
sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_ek/conf_example.h
sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_wpir_rd/conf_example.h
sam/services/flash_efc/flash_program_example/sam4s16c_sam4s_xplained/conf_example.h
sam/services/flash_efc/flash_program_example/sam4sd32c_sam4s_ek2/conf_example.h
sam/services/flash_efc/flash_program_example/samg53n19_samg_xplained_pro/conf_example.h
sam/services/flash_efc/unit_tests/sam3n4c_sam3n_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam3s4c_sam3s_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam3sd8c_sam3s_ek2/conf_test.h
sam/services/flash_efc/unit_tests/sam3u4e_sam3u_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam3x8e_arduino_due_x/conf_test.h
sam/services/flash_efc/unit_tests/sam3x8h_sam3x_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam4c16c_sam4c_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam4cp16b_sam4cp16bmb/conf_test.h
sam/services/flash_efc/unit_tests/sam4e16e_sam4e_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam4n16c_sam4n_xplained_pro/conf_test.h
sam/services/flash_efc/unit_tests/sam4s16c_sam4s_ek/conf_test.h
sam/services/flash_efc/unit_tests/sam4s16c_sam4s_wpir_rd/conf_test.h
sam/services/flash_efc/unit_tests/sam4s16c_sam4s_xplained/conf_test.h
sam/services/flash_efc/unit_tests/sam4sd32c_sam4s_ek2/conf_test.h
sam/services/flash_efc/unit_tests/unit_tests.c

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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