ASF: Release ASF-3.8

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
  • SAM4E
  • SAM4L
  • SAM4S

Supported Tools

• Atmel Studio 6.1 using GCC compiler - Visit www.atmel.com/atmelstudio -:
  • ARM version 4.6.1
• 32-bit AVR version 4.4.3 (AVR_32_bit_GNU_Toolchain_3.3.1_304)
• 8-bit AVR version 4.5.1 (AVR_8_bit_GNU_Toolchain_3.3.1_444)
• Atmel AVR32 Studio version 2.6
• Atmel AVR Studio 4.18 SP3
• IAR EWAVR32 version 3.30
• IAR EWAVR version 6.12
• IAR EWARM version 6.40
• WinAVR version 20100110

Note:

• 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.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.x.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.b4 or higher). Visit www.atmel.com/atmelstudio.

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Documentation

• ASF on-line documentation: http://asf.atmel.com/.
• Atmel Studio 6 installer (includes ASF): www.atmel.com/atmelstudio
• 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 AT91® (SAM users) at http://www.at91.com.
New and Noteworthy

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.

Previous 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: USBART, 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

Previous release ASF3.6 (Internal, Jan 2013)

• Added SAM4E support: WDT, TC, EEFC, PMC, clock, ioprt, 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.

Previous 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, PDC, 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-2463**: MAC Symbol counter implementation for ATmega128RFA1.

  MAC symbol counter is a 32-bit Timer/Counter in ATmega128RFA1 and ATmegaxxRFR family used for stack timing in Atmel IEEE 802.15.4 MAC stack.

  Files modified:
  \\mega\drivers\macsc\macsc_megarf.c
  \\mega\drivers\macsc\macsc_megarf.h
  \\mega\drivers\macsc\example1\macsc_megarf_example1.c
  \\mega\drivers\macsc\example1\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\macsc\example1\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\macsc\example1\atmega128rfa1_stk600-rc128x_rfx\conf_example.h
  \\mega\drivers\macsc\example1\atmega256rfr2_atmega256rfr2_xplained_pro\conf_board.h
  \\mega\drivers\macsc\example1\atmega256rfr2_atmega256rfr2_xplained_pro\conf_clock.h
  \\mega\drivers\macsc\example1\atmega256rfr2_atmega256rfr2_xplained_pro\conf_example.h
  \\mega\drivers\macsc\example2\macsc_megarf_example2.c
  \\mega\drivers\macsc\example2\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\macsc\example2\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\macsc\example2\atmega128rfa1_stk600-rc128x_rfx\conf_macsc.h
  \\mega\drivers\macsc\example2\atmega128rfa1_stk600-rc128x_rfx\conf_test.h
  \\mega\drivers\macsc\example2\atmega128rfa1_stk600-rc128x_rfx\conf_usart_serial.h
  \\mega\drivers\macsc\unit_tests\unit_tests.c
  \\mega\drivers\macsc\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\macsc\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\macsc\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_macsc.h
  \\mega\drivers\macsc\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_test.h
  \\mega\drivers\macsc\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_usart_serial.h
  \\mega\drivers\macsc\unit_tests\atmega256rfr2_atmega256rfr2_xplained_pro\conf_board.h

• **Issue #ASFP-2464**: TWI driver implementation for MegaRF in ASF.

  Files modified:
  \\mega\drivers\twi\twi_megarf.c
  \\mega\drivers\twi\twi_megarf.h
  \\mega\drivers\twi\master_example\twim_example.c
  \\mega\drivers\twi\master_example\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\twi\master_example\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\twi\master_example\atmega128rfa1_stk600-rc128x_rfx\conf_twi.h
  \\mega\drivers\twi\master_example\atmega256rfr2_atmega256rfr2_xplained_pro\conf_clock.h
  \\mega\drivers\twi\master_example\atmega256rfr2_atmega256rfr2_xplained_pro\conf_twi.h
  \\mega\drivers\twi\master_example\atmega256rfr2_atmega256rfr2_xplained_pro\conf_board.h
  \\mega\drivers\twi\slave_example\twis_example.c
  \\mega\drivers\twi\slave_example\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\twi\slave_example\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\twi\slave_example\atmega128rfa1_stk600-rc128x_rfx\conf_twi.h
  \\mega\drivers\twi\unit_tests\unit_tests.c
  \\mega\drivers\twi\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_clock.h
  \\mega\drivers\twi\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_twi.h
  \\mega\drivers\twi\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_board.h
  \\mega\drivers\twi\unit_tests\atmega128rfa1_stk600-rc128x_rfx\conf_test.h
  \\mega\drivers\twi\unit_tests\atmega256rfr2_atmega256rfr2_xplained_pro\conf_usart_serial.h
  \\mega\drivers\twi\unit_tests\atmega256rfr2_atmega256rfr2_xplained_pro\conf_clock.h
• **Issue #ASFP-2468:** WDT driver implementation for MegaRF.
  Added Files:
  \mega\drivers\wdt\wdt_megarf.c
  \mega\drivers\wdt\wdt_megarf.h
  \mega\drivers\wdt\wdt_example\wdt_example.c
  \mega\drivers\wdt\example\atmega128rf1a1_stk600-rc128x_rfx\conf_board.h
  \mega\drivers\wdt\example\atmega128rf1a1_stk600-rc128x_rfx\conf_clock.h
  \mega\drivers\wdt\example\atmega256rf2_atmega256rfr2_xplained_pro\conf_board.h
  \mega\drivers\wdt\example\atmega256rf2_atmega256rfr2_xplained_pro\conf_clock.h
  \mega\drivers\wdt\unit_tests\unit_tests.c
  \mega\drivers\wdt\unit_tests\atmega128rf1a1_stk600-rc128x_rfx\conf_board.h
  \mega\drivers\wdt\unit_tests\atmega128rf1a1_stk600-rc128x_rfx\conf_clock.h
  \mega\drivers\wdt\unit_tests\atmega256rf2_atmega256rfr2_xplained_pro\conf_board.h
  \mega\drivers\wdt\unit_tests\atmega256rf2_atmega256rfr2_xplained_pro\conf_clock.h
  \mega\drivers\wdt\unit_tests\atmega256rf2_atmega256rfr2_xplained_pro\conf_test.h
  \mega\drivers\wdt\unit_tests\atmega256rf2_atmega256rfr2_xplained_pro\conf_usart_serial.h

  Modified files:
  \mega\drivers\cpu\mega_reset_cause.h

• **Issue #ASFP-3046:** SAM4L-Add example of usage of flash security bits functions in the flashcalw example1.
  Modified file:
  sam\drivers\flashcalw\flash_example1\flashcalw_example1.c

• **Issue #ASFP-3425:** SAM4E - Add USB composite device support.
  Add composite examples for SAM4E.
  Folders added:
  common\services\usb\class\composite\device\example1\sam4e16e_sam4e_ek
  common\services\usb\class\composite\device\example2\sam4e16e_sam4e_ek
  common\services\usb\class\composite\device\example3\sam4e16e_sam4e_ek
  common\services\usb\class\composite\device\example4\sam4e16e_sam4e_ek

• **Issue #ASFP-3429:** SAM4E - Add lwIP service support in ASF.
  Add LwIP support for SAM4E. A standalone example is added.
  Modified files:
  sam/boards/sam3x_ek/sam3x_ek.h
thirdparty/lwip/example/network/ethernet_sam.c
thirdparty/lwip/example/standalone_lwip_demo_sam.c

Added files:
thirdparty/lwip/lwip-port-1.3.2/sam/netif/ethernetif_sam4.c
thirdparty/lwip/lwip-port-1.4.0/sam/netif/ethernetif_sam4.c

Added folder:
thirdparty/lwip/example/sam4e16e_sam4e_ek

• Issue #ASFP-3430: SAM4E - Add getting-started application in ASF.
  Added SAM4E-EK getting-started example.
  Folder added:
sam/applications/getting-started/sam4e16e_sam4e_ek/
  File modified:
sam/applications/getting-started/main.c
  sam/boards/arduino_due_x/init.c
  sam/boards/sam3n_ek/init.c
  sam/boards/sam3s_ek/init.c
  sam/boards/sam3s_ek2/init.c
  sam/boards/sam3x_ek/init.c
  sam/boards/sam4s_ek/init.c
  sam/boards/sam4s_ek2/init.c
  sam/boards/sam4s_xplained/init.c
  Files added:
common\applications\user_application\arduino_due_x\conf_clock.h
common\applications\user_application\sam3n4c_sam3n_ek\conf_clock.h
common\applications\user_application\sam3s4c_sam3s_ek\conf_clock.h
common\applications\user_application\sam3sd8c_sam3s_ek2\conf_clock.h
common\applications\user_application\sam3u4e_sam3u_ek\conf_clock.h
common\applications\user_application\sam3x8h_sam3x_ek\conf_clock.h
common\applications\user_application\sam4s16c_sam4s_ek\conf_clock.h
common\applications\user_application\sam4s16c_sam4s_xplained\conf_clock.h
common\applications\user_application\sam4s32c_sam4s_ek2\conf_clock.h
common\applications\user_application\sam3n4c_sam3n_ek\conf_clock.h
common\applications\user_application\sam3s4c_sam3s_ek\conf_clock.h
common\applications\user_application\sam3sd8c_sam3s_ek2\conf_clock.h
common\applications\user_application\sam3u4e_sam3u_ek\conf_clock.h
common\applications\user_application\sam3x8h_sam3x_ek\conf_clock.h
common\applications\user_application\sam3x8h_sam3x_ek\conf_clock.h
common\applications\user_application\sam4s16c_sam4s_ek\conf_clock.h
common\applications\user_application\sam4s16c_sam4s_xplained\conf_clock.h
common\applications\user_application\sam4s32c_sam4s_ek2\conf_clock.h
common\applications\user_application\sam3n4c_sam3n_ek\conf_clock.h
common\applications\user_application\sam3s4c_sam3s_ek\conf_clock.h
common\applications\user_application\sam3sd8c_sam3s_ek2\conf_clock.h
common\applications\user_application\sam3u4e_sam3u_ek\conf_clock.h
common\applications\user_application\sam3x8h_sam3x_ek\conf_clock.h
common\applications\user_application\sam3x8h_sam3x_ek\conf_clock.h
• **Issue #ASFP-3431**: SAM4E - Add AFE support in ASF.

Folder Added:
sam/drivers/afec

Files Modified:
sam/boards/sam4e_ek/sam4e_ek.h
sam/utils/cmsis/sam4e/include/component/afec.h
• **Issue #ASFP-3433**: SAM4E - Add CMSIS examples and DSP examples in ASF.
  Folder added:
  - sam/utils/cmsis/cm4_bit_banding_example/sam4e16e_sam4e_ek
  - sam/utils/cmsis/cm4_cmsis_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_class_marks_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_convolution_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_dotproduct_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_fft_bin_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_fir_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_graphic_equalizer_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_linear_interp_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_matrix_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_signal_converge_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_sin_cos_example/sam4e16e_sam4e_ek
  - thirdparty/CMSIS/DSP_Lib/Examples/arm_variance_example/sam4e16e_sam4e_ek

• **Issue #ASFP-3438**: SAM4E - Add DACC support in ASF.
  Add DACC support for SAM4E.
  Modified files:
  - sam/drivers/dacc/dacc.c
  - sam/drivers/dacc/dacc.h
  - sam/drivers/dacc/sinewave_example/sinewave_example.c
  Added folder:
  - sam/drivers/dacc/sinewave_example/sam4e16e_sam4e_ek

• **Issue #ASFP-3439**: SAM4E - Add QTouch component support in ASF.
  Add QTouch component support in ASF. This is a common interface for QTouch device with I2C interface.
  Added folder:
  - common/components/touch/qt
  Modified files:
  - sam/boards/sam4e_ek/init.c
  - sam/boards/sam4e_ek/sam4e_ek.h

• **Issue #ASFP-3440**: SAM4E - Add LCD touch support (ADS7843) in ASF.
  Add touch screen support.
  Add folder:
  - sam/services/resistive_touch/example/sam4e16e_sam4e_ek
  Modified files:
  - sam/boards/sam4e_ek/init.c
  - sam/boards/sam4e_ek/sam4e_ek.h
  - sam/components/resistive_touch/ads7843/ads7843.c
  - sam/components/resistive_touch/ads7843/ads7843.h
  - sam/services/resistive_touch/rtouch.c

• **Issue #ASFP-3441**: SAM4E - Add FATFS support in ASF.
  Folder added:
  - \thirdparty\fatfs\example\sam4e16e_sam4e_ek
  - \thirdparty\fatfs\unit_tests\sam4e16e_sam4e_ek
• **Issue #ASFP-3443:** SAM4E - Add low-power application in ASF.
  
  Folder added:
  
  sam/applications/sam_low_power/sam4e16e_sam4e_ek
  
  File changed:
  
  sam/applications/sam_low_power/main.c

• **Issue #ASFP-3444:** SAM4E - Add MATRIX support in ASF.
  
  Modified:
  
  sam/driver\matrix\matrix.c
  
  sam/driver\matrix\matrix.h
  
  Add:
  
  sam/driver\matrix\example\sam4e16e_sam4e_ek

• **Issue #ASFP-3445:** SAM4E - Add ACC support in ASF.
  
  Folder added:
  
  \sam\driver\acc\acc_example\sam4e16e_sam4e_ek
  
  Files added:
  
  \sam\driver\acc\acc_example\acc_example_sam4e.c
  
  Files modified:
  
  \sam\driver\acc\acc.c
  
  \sam\driver\acc\acc.h

• **Issue #ASFP-3446:** SAM4E - Add CHIPID support in ASF.
  
  File modified:
  
  sam/driver\chipid\chipid_example\chipid_example.c
  
  Folder added:
  
  sam/driver\chipid\chipid_example\sam4e16e_sam4e_ek

• **Issue #ASFP-3450:** SAM4E - Add PIO capture examples in ASF.
  
  Files modified:
  
  sam/driver\pio\pio.h
  
  sam/driver\pio\pio.c
  
  sam/driver\pio\pio_capture_example\pio_capture_example.c
  
  Folder added:
  
  sam/driver\pio\pio_capture_example\sam4e16e_sam4e_ek

• **Issue #ASFP-3452:** SAM4E - Add delay service in ASF.
  
  Folder added:
  
  common/services/delay/example/sam4e16e_sam4e_ek

• **Issue #ASFP-3453:** SAM4E - Add Nand Flash support in ASF.
  
  Files modified:
  
  common/components\memory\nand flash\nand flash_ebi\nand flash_ecc_sw.c
  
  common/components\memory\nand flash\nand flash_ebi\nand flash_raw_smc.c
  
  common/components\memory\nand flash\nand flash_ebi\ftl_lib\nand flash_mem.c
  
  Folders added:
  
  common/components\memory\nand flash\nand flash_ebi\example1\sam4e16e_sam4e_ek\common/components\memory\nand flash\nand flash_ebi\example2\sam4e16e_sam4e_ek\
• **Issue #ASFP-3454:** SAM4E - Add LCD display support in ASF.
  Add ili93xx display components support.
  Add folders:
  - sam/components/display/ili93xx
  Modified files:
  - sam/boards/sam4e_ek/init.c
  - sam/boards/sam4e_ek/sam4e_ek.h
  - sam/components/display/aat31xx/aat31xx.c

• **Issue #ASFP-3455:** SAM4E - Add FreeRTOS support in ASF.
  Add FreeRTOS support for SAM4E:
  1. LwIP example: The given example is an example using freeRTOS, the current lwIP stack and EMAC driver.
  2. The FreeRTOS example will help users how to use FreeRTOS in SAM-EK board. This basic application shows how to create task and get information of created task.
  Modified files:
  - thirdparty/freertos/demo/lwip_sam_example/main.c
  - thirdparty/freertos/demo/lwip_sam_example/network/ethernet.c
  - thirdparty/freertos/demo/lwip_sam_example/partest/ParTest.c
  - sam/boards/sam3x_ek/sam3x_ek.h
  Folders added:
  - thirdparty/freertos/demo/lwip_sam_example/sam4e16e.sam4e_ek

• **Issue #ASFP-3481:** Unit Test for megaRF USART driver.
  Files Added:
  - mega/drivers/uart/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_board.h
  - mega/drivers/uart/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_clock.h
  - mega/drivers/uart/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_test.h
  - mega/drivers/uart/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_board.h
  - mega/drivers/uart/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_clock.h
  - mega/drivers/uart/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_test.h
  - mega/drivers/uart/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_usart_serial.h
  - mega/drivers/uart/unit_tests/unit_tests.c

• **Issue #ASFP-3493:** Unit test for megaRF interrupt driver.
  Added files:
  - mega/drivers/ext_int/unit_tests/unit_tests.c
  - mega/drivers/ext_int/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_board.h
  - mega/drivers/ext_int/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_clock.h
  - mega/drivers/ext_int/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_test.h
  - mega/drivers/ext_int/unit_tests/atmega1281fa1_stk600-rc128x_rfx/conf_usart_serial.h
  - mega/drivers/ext_int/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_board.h
  - mega/drivers/ext_int/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_clock.h
  - mega/drivers/ext_int/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_test.h
  - mega/drivers/ext_int/unit_tests/atmega2561fr2_atmega2561fr2_xplained_pro/conf_usart_serial.h
• **Issue #ASFP-3529**: SAM4E - Add USB MSC device within FreeRTOS example.
  Folder added:
  common\services\usb\class\msc\device\example_freetos\sam4e16e_sam4e_ek

• **Issue #ASFP-3598**: SAM4E - Add CMCC support in ASF.
  Add folder:
  sam\drivers\cmcc

• **Issue #ASFP-3614**: SAM4E - Add USART SPI service.
  Folder added:
  common\services\spi\uart_spi_master_example\sam4e16e_sam4e_ek/
  File modified:
  common\services\spi\uart_spi_master_example\uart_spi_master_example.c

• **Issue #ASFP-3624**: SAM4E - Uses IOPORT instead of GPIO in related drivers and examples.
  Files modified:
  sam\boards\sam3n_ek\init.c
  sam\boards\sam3n_ek\sam3n_ek.h
  sam\boards\sam3s_ek\init.c
  sam\boards\sam3s_ek\sam3s_ek.h
  sam\boards\sam3s_ek2\init.c
  sam\boards\sam3s_ek2\sam3s_ek2.h
  sam\boards\sam3u_ek\init.c
  sam\boards\sam3u_ek\sam3u_ek.h
  sam\boards\sam3x_ek\init.c
  sam\boards\sam3x_ek\sam3x_ek.h
  sam\boards\sam4e_ek\sam4e_ek.h
  sam\boards\sam4s_ek\init.c
  sam\boards\sam4s_ek\sam4s_ek.h
  sam\boards\sam4s_ek2\init.c
  sam\boards\sam4s_ek2\sam4s_ek2.h
  sam\boards\sam4s_xplained\init.c
  sam\boards\sam4s_xplained\sam4s_xplained.h
  sam\boards\arduino_due_x\arduino_due_x.h
  common\services\clock\example1\clock_example1_sam.c
  common\services\clock\example2\clock_example2_sam.c
  common\services\clock\example2\sam3n4c_sam3n_ek\conf_board.h
  common\services\clock\example2\sam3n4c_sam3n_ek\conf_example2.h
  common\services\clock\example2\sam3s4c_sam3s_ek\conf_board.h
  common\services\clock\example2\sam3s4c_sam3s_ek\conf_example2.h
  common\services\clock\example2\sam3sd8c_sam3s_ek\conf_board.h
  common\services\clock\example2\sam3sd8c_sam3s_ek\conf_example2.h
  common\services\clock\example2\sam3u4e_sam3u_ek\conf_board.h
  common\services\clock\example2\sam3u4e_sam3u_ek\conf_example2.h
  common\services\clock\example2\sam3x8e_arduino_due_x\conf_board.h
  common\services\clock\example2\sam3x8e_arduino_due_x\conf_example2.h
  common\services\clock\example2\sam3x8h_sam3x_ek\conf_board.h
  common\services\clock\example2\sam3x8h_sam3x_ek\conf_example2.h
  common\services\clock\example2\sam4e16e_sam4e_ek\conf_example2.h
  common\services\clock\example2\sam4s16c_sam4s_ek\conf_board.h
• **Issue #ASFP-3629**: Fix SSD1306 component to accept const string in ssd1306_write_text().

Files modified:
/common/components/display/sdd1306/ssd1306.c
/common/components/display/sdd1306/ssd1306.h

- **Issue #ASFP-3656**: SAM - Remove IAR warnings.
  Files modified:
  - common/services/clock/sam3n/genclk.h
  - common/services/clock/sam3n/osc.h
  - common/services/clock/sam3n/pll.h
  - common/services/clock/sam3n/sysclk.c
  - common/services/clock/sam3n/sysclk.h
  - common/services/clock/sam3s/genclk.h
  - common/services/clock/sam3s/osc.h
  - common/services/clock/sam3s/pll.h
  - common/services/clock/sam3s/sysclk.c
  - common/services/clock/sam3s/sysclk.h
  - common/services/clock/sam3u/genclk.h
  - common/services/clock/sam3u/osc.h
  - common/services/clock/sam3u/pll.h
  - common/services/clock/sam3u/sysclk.c
  - common/services/clock/sam3u/sysclk.h
  - common/services/clock/sam3x/genclk.h
  - common/services/clock/sam3x/osc.h
  - common/services/clock/sam3x/pll.h
  - common/services/clock/sam3x/sysclk.c
  - common/services/clock/sam3x/sysclk.h
  - common/services/clock/sam4e/genclk.h
  - common/services/clock/sam4e/sysclk.c
  - common/services/clock/sam4e/sysclk.h
  - common/services/clock/sam4s/genclk.h
  - common/services/clock/sam4s/osc.h
  - common/services/clock/sam4s/pll.h
  - common/services/clock/sam4s/sysclk.c
  - common/services/clock/sam4s/sysclk.h
  - sam/utils/fpu/fpu.h

- **Issue #ASFP-3680**: SAM - Fix some IAR warnings.
  Fix some IAR warnings.
  Modified files:
  - common/services/delay/sam/cycle_counter.c
  - common/services/serial/sam_uart/uart_serial.h

- **Issue #ASFP-3709**: SAM4E - Update header files from SOCK input.
  1. Header files modified and added in folder:
     - sam/utils/cmsis/sam4e/include
  2. Related drivers and examples files modified:
     - common/services/clock/sam4e/genclk.h
     - sam/drivers/gmac/gmac.c
     - sam/drivers/gmac/gmac.h
     - sam/drivers/pmc/pmc.h
     - sam/drivers/twi/twi_slave_example/twi_slave_example.c
     - sam/utils/cmsis/sam4e/source/templates/gcc/startup_sam4e.c
     - sam/utils/cmsis/sam4e/source/templates/iar/startup_sam4e.c
• **Issue #ASFP-3718**: SAM4E - Add FPU support for FreeRTOS.
   Added files:
   thirdparty/freertos/freertos-7.0.0/source/portable/gcc/sam_cm4f/port.c
   thirdparty/freertos/freertos-7.0.0/source/portable/gcc/sam_cm4f/portmacro.h
   thirdparty/freertos/freertos-7.0.0/source/portable/iar/sam_cm4f/port.c
   thirdparty/freertos/freertos-7.0.0/source/portable/iar/sam_cm4f/portasm.s
   thirdparty/freertos/freertos-7.0.0/source/portable/iar/sam_cm4f/portmacro.h

• **Issue #ASFP-3732**: SAM4E - Add PIO alternate function examples in ASF.
   File modified:
   sam/drivers/pio/pio_alternate_function_example/pio_alternate_function_example.c
   Folder added:
   sam/drivers/pio/pio_alternate_function_example/sam4e16e_sam4e_ek

• **Issue #ASFP-3734**: SAM4E - Adding AFEC examples.
   Folder Added:
   \sam\drivers\afec\example3
   \sam\drivers\afec\example4
   Files Modified:
   \sam\drivers\afec\afec.c

• **Issue #ASFP-3758**: Add SAM4SP support to project-generator.
  Add SAM4SP support to project-generator

**Notable bugs fixed**

• **Issue #ASFP-2479**: Add OmniVision OV7740 CMOS image sensor driver.
  Added folder:
  sam/components/cmos_image_sensor/ov7740

• **Issue #ASFP-3017**: In SAM3X EMAC example and unit-tests, RSTC should be restored after using user reset.
  Retore RSTC after user reset is used.
  Modified files:
  sam/drivers/emac/emac_example/emac_example.c
  sam/drivers/emac/unit_tests/unit_tests.c.

• **Issue #ASFP-3269**: common.services.ioport::SAM4L port: the implementation of arch_ioport_init() is incorrect.
  Fix wrong peripheral clock enable for GPIO module.
  Modified file:
  common/services/ioport/sam\ioport_gpio.h

• **Issue #ASFP-3293**: Add SAM4L support in QTtouch ASF Wizard.
  Make SAM4L QTtouch lib visible in ASF wizard.
  Modified file:
  thirdparty/qtouch/devspecific/sam4/sam4l/include/touch_api_sam4l.h
  Added file:
  thirdparty/qtouch/devspecific/sam4/sam4l/module_config/touch_config_sam4l.h

• **Issue #ASFP-3308**: Missing Ethernet PHY component for SAM3X/SAM3X-EK.
Enable DM9161A component in ASF wizard.

- **Issue #ASFP-3329**: SAM4L TWIM: uninitialized fields in configuration structure used in example.
  Initialize all fields in the struct twim_config.
  File modified:
  sam/drivers/twim/master_example/twim_example.c

- **Issue #ASFP-3382**: SAM3U - USB initialization will not allow MAINCK in bypass mode.
  Fix UPLL initialize for SAM3U.
  Files modified:
  sam\drivers\pmc\pmc.c
  sam\drivers\pmc\pmc.h
  common\services\clock\sam3u\genclk.h
  common\services\clock\sam3u\osc.h
  common\services\clock\sam3u\pll.h
  common\services\clock\sam3u\sysclk.c
  common\services\clock\sam3u\sysclk.h

- **Issue #ASFP-3484**: Implementation of AFEC driver for SAM4E.
  Folder Added:
  sam/drivers/afec

- **Issue #ASFP-3590**: SAM3U - Pressing USR-LEFT button cannot start/stop LED blinking in getting-started example.
  File modified:
  sam/applications/getting-started/main.c

- **Issue #ASFP-3601**: Implementation of ACC driver for SAM4E.
  Folder Added:
  \sam\drivers\acc\acc_example\sam4e16e_sam4e_ek
  Files Added:
  \sam\drivers\acc\acc_example\acc_example_sam4e.c
  Files Modified:
  \sam\drivers\acc\acc.c
  \sam\drivers\acc\acc.h

- **Issue #ASFP-3604**: SAM - Fix pio_handler_set_priority() to support multiple call on same PIO port and not lost previous configured interrupt on the PIO.
  Save interrupt masks before setting priority.
  File modified:
  sam/drivers/pio/pio_handler.c

- **Issue #ASFP-3613**: Cannot use PLL system clock from 32MHz RC with USB.
  Modified files:
  common\services\clock\xmega\pll.h
  common\services\clock\xmega\sysclk.c

- **Issue #ASFP-3615**: SAM - Add EEPROM reset to release TWI line.
  Add TWI EEPROM reset.
Files modified:
common/components/memory/eeprom/at24cxx/at24cxx.c
common/components/memory/eeprom/at24cxx/at24cxx.h
common/components/memory/eeprom/at24cxx/unit_tests/unit_tests.c
common/services/freertos/sam/unit_tests/freertos_twi_master/twi_unit_tests.c
sam/boards/sam3x_ek/sam3x_ek.h
sam/components/audio/codec/wm8731/unit_tests/unit_tests.c

• **Issue #ASFP-3616:** Resistive touch controller does not work-SPI problem.
The SPI CS pin connected with ADS7843 on SAM3U-EK is wrongly defined.
Files Modified:
sam/boards/sam3u_ek/init.c
sam/boards/sam3u_ek/sam3u_ek.h
sam/components/resistive_touch/ads7843/ads7843.c

• **Issue #ASFP-3617:** SAM4S Xplained Pro - Starter Kit Demo.
The Demo on "SAM4S Xplained Pro" board access to the file system (FatFs stack) of a SD/MMC
memory (Atmel SD/MMC stack).
Files modified:
/sam/applications/starter_kit_demo/main.c
/sam/applications/starter_kit_demo/sam4sd32c_sam4s_xplained_pro/conf_access.h
/sam/applications/starter_kit_demo/sam4sd32c_sam4s_xplained_pro/conf_fatfs.h

• **Issue #ASFP-3630:** Fix declaration of STDIO _write() function for SAM and AVR32 devices for GCC compiler.
Files modified:
/common/utils/stdio/write.c

• **Issue #ASFP-3631:** Update CHIPID module with SAM4S-WPIR-RD support.
Added folder:
sam/drivers/chipid/chipid_example/sam4s16c_sam4s_wpir_rd

• **Issue #ASFP-3632:** Update GPBR module with SAM4S-WPIR-RD support.
Added folder:
sam/drivers/gpbr/unit_tests/sam4s16c_sam4s_wpir_rd

• **Issue #ASFP-3633:** Update MATRIX module with SAM4S-WPIR-RD support.
Added folder:
sam/drivers/matrix/example/sam4s16c_sam4s_wpir_rd

• **Issue #ASFP-3634:** Update PDC module with SAM4S-WPIR-RD support.
Added folder:
sam/drivers/pdc/pdc_uart_example/sam4s16c_sam4s_wpir_rd

• **Issue #ASFP-3635:** Update RSTC module with SAM4S-WPIR-RD support.
Added folder:
sam/drivers/rstc/unit_tests/sam4s16c_sam4s_wpir_rd

• **Issue #ASFP-3636:** Update RTC module with SAM4S-WPIR-RD support.
• **Issue #ASFP-3637**: Update RTT module with SAM4S-WPIR-RD support.  
  Added folder:  
  `sam\drivers\rtt\example\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3638**: Update SPI module with SAM4S-WPIR-RD support.  
  Added folder:  
  `sam\drivers\spi\unit_tests\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3639**: Update WDT module with SAM4S-WPIR-RD support.  
  Added folder:  
  `sam\drivers\wdt\example\sam4s16c_sam4s_wpir_rd`
  `sam\drivers\wdt\unit_tests\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3640**: Update flash_efc module with SAM4S-WPIR-RD support.  
  Added folders:  
  `sam\services\flash_efc\flash_program_example\sam4s16c_sam4s_wpir_rd`
  `sam\services\flash_efc\flash_read_unique_id_example\sam4s16c_sam4s_wpir_rd`
  `sam\services\flash_efc\unit_tests\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3642**: Add SAM4S-WPIR-RD board support.  
  Add the SAM4S-WPIR-RD board to the supported ones.  
  Added folder:  
  `sam\boards\sam4s_wpir_rd`

• **Issue #ASFP-3643**: Fix declaration of STDIO_write which must use a "const char**" instead of "char**".  
  Added const keyword in _write syscall declaration.  
  Modified files:  
  `/common/utils/stdio/write.c`

• **Issue #ASFP-3648**: Add SAM4S-WPIR-RD User Application template.  
  Add the SAM4S-WPIR-RD User Application template.  
  files added:  
  `common\applications\user_application\sam4s_wpir_rd\conf_board.h`

• **Issue #ASFP-3649**: Update Clock service example1 with SAM4S-WPIR-RD support.  
  Added folder:  
  `common\services\clock\example1\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3650**: Update USB service Class Vendor Device example with SAM4S-WPIR-RD support.  
  Added folder:  
  `common\services\usb\class\vendor\device\example\sam4s16c_sam4s_wpir_rd`

• **Issue #ASFP-3655**: Add RE200B PIR driver.  
  Add RE200B PIR driver and example.  
  Added folder:
• **Issue #ASFP-3658**: SAM4 - common clock example3 clock switch fail in test round 2. Switch to slow clock before main clock switching to fast RC to avoid clock unstable. File modified: common/services/clock/example3/clock_example3_sam.c.

• **Issue #ASFP-3662**: XCL example 1 does not work on XMEGA E5 Xplained board. Modified file: xmega/boards/xmega_e5_xplained/init.c

• **Issue #ASFP-3664**: Add PIO Capture handler in sam/drivers/pio/pio_handler.*. Files modified: sam/drivers/pio/pio_handler.h sam/drivers/pio/pio_handler.c Files deleted: sam/drivers/pio/pio_capture_example/pio_handler_with_capture.h sam/drivers/pio/pio_capture_example/pio_handler_with_capture.c

• **Issue #ASFP-3712**: SAM - compile error: "BOARD_OSC_STARTUP_US" undeclared for user board when adding PMC driver via ASF wizard. Fix compile error of missing "BOARD_OSC_STARTUP_US" definition. Modified files: sam/drivers/pmc/sleep.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.

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