

## Release Notes for SPC1168 Standard Peripherals Library Drivers

**V3.0.0/ 13- Mar -2026**

### Main Change

#### 1. Bug Fix

- clock.h/.c
  - Add CLOCK\_GetSystemClock0Source
  - Add CLOCK\_GetSystemClock1Source
  - Add CLOCK\_GetWDT0ClockSource
  - Add CLOCK\_GetWDT1ClockSource
  - Add CLOCK\_UpdateInfo
  - Modify CLOCK\_Init
  - Modify CLOCK\_InitWithRCO
  - Modify CLOCK\_InitWithXO
  - Modify CLOCK\_GetModuleClock
- system\_spc2168.h/.c
  - Modify SysInfoStruct

#### 2. Other Change

- adc.c
  - Modify ADC\_Init
  - Add Optimization level restrictions
- aes.c
  - Add Optimization level restrictions
- clock.c
  - Modify CLOCK\_Init
  - Modify CLOCK\_InitWithRCO
  - Modify CLOCK\_InitWithXO
  - Modify CLOCK\_ConfigurePLL
  - Modify CLOCK\_ConfigurePLLWithRCO
  - Add Optimization level restrictions
- comp.c
  - Add Optimization level restrictions
- crc.h/.c
  - Modify CRC\_CalculateWithInitValueIsNotZero
  - Add Optimization level restrictions
- ecap.c
  - Add Optimization level restrictions
- epwr.c
  - Add Optimization level restrictions
- flash.c
  - Modify FLASH\_Read

- Modify FLASH\_ProgramWord
- Modify FLASH\_Program
- Modify FLASH\_EraseSector
- Modify FLASH\_EraseBlock
- Modify FLASH\_EraseChip
- Add Optimization level restrictions
- gpio.h/.c
  - Add GPIO\_SetOpenDrainOutputHigh
  - Add GPIO\_SetOpenDrainOutputLow
  - Add Optimization level restrictions
- i2c.h/.c
  - Add I2C\_SetHighSpeedMasterCode
  - Modify I2C\_SlaveWrite
  - Modify I2C\_SlaveBulkWrite
  - Add Optimization level restrictions
- pga.c
  - Add Optimization level restrictions
- power.c
  - Add Optimization level restrictions
- pwm.c
  - Modify PWM\_ComplementaryPairChannelInit
  - Modify PWM\_SingleChannelInit
  - Add Optimization level restrictions
- ssp.c
  - Modify SSP\_Send
  - Modify SSP\_MasterTransceive
  - Add Optimization level restrictions
- system.c
  - Add Optimization level restrictions
- timer.c
  - Modify TIMER\_Init
  - Add Optimization level restrictions
- uart.c
  - Add Optimization level restrictions
- wdt.c
  - Add Optimization level restrictions
- delay.c
  - Add Optimization level restrictions
- Example Code
  - Add I2C\_Master\_High\_Speed\_Mode\_Polling\_TxRx
  - Add I2C\_Slave\_High\_Speed\_Mode\_Polling\_TxRx
  - Add SECURITY\_Config/EWARM
  - Modify ADC\_Continuous\_Mode/main.c

- Modify ADC\_Conversion\_Priority/main.c
- Modify ADC\_Differential\_Trim\_Result/main.c
- Modify ADC\_SHA\_Open\_Detect/main.c
- Modify ADC\_SHA\_PPU/main.c
- Modify ADC\_SHA\_Short\_Detect/main.c
- Modify ADC\_Sequential\_Mode/main.c
- Modify ADC\_Simultaneous/main.c
- Modify ADC\_Single\_End\_Result/main.c
- Modify ADC\_With\_PGA/main.c
- Modify CRC\_Calculate/main.c
- Modify DAC/main.c
- Modify ECAP\_Continue\_Absolute/main.c
- Modify ECAP\_Continue\_Delta/main.c
- Modify ECAP\_Oneshot\_Absolute/main.c
- Modify Flash\_With\_INT/main.c
- Modify GPIO\_Edge\_Detect/main.c
- Modify GTimer\_Extren\_Gpio\_Input\_Clk/main.c
- Modify GTimer\_Extren\_Gpio\_Input\_Enable/main.c
- Modify GTimer\_INT/main.c
- Modify I2C\_Master\_Bulk\_Polling\_TxRx/main.c
- Modify I2C\_Master\_Polling\_TxRx/main.c
- Modify I2C\_Slave\_Bulk\_Polling\_TxRx/main.c
- Modify I2C\_Slave\_Polling\_TxRx/main.c
- Modify LIN\_Demo/lin.c
- Modify PWM\_Current\_Protect\_Trigger\_TZ/main.c
- Modify PWM\_GPIO\_Trigger\_Trip\_Zone/main.c
- Modify PWM\_Global\_Timer\_SYNC/main.c
- Modify PWM\_Independent\_Trigger\_TZ/main.c
- Modify PWM\_PPU\_Trigger\_TZ/main.c
- Modify PWM\_Trigger\_ADC\_Sample/main.c
- Modify SECURITY\_Config/configwords.c
- Modify SSP\_Master\_TxRx\_INT/main.c
- Modify SSP\_Slave\_TxRx\_Polling/main.c
- Modify UART\_Auto\_Baudrate/main.c
- Modify UART\_RX\_INT/main.c
- Modify UART\_RX\_Indefinite\_Length/main.c
- Modify WDT1\_Feed\_DOG/main.c
- Modify WDT1\_Rset\_SYS/main.c

#### ■ 1\_Application

- Add Math\_Lib/Project.sct
- Add Math\_Lib/iar\_cortexM4If\_math.a
- Modify Math\_Lib/Project.uvprojx
- Modify Math\_Lib/Project.ewp
- Modify Math\_Lib/Project.icf

- Modify IAP\_Modem/MDK-ARM/Project.sct
- Modify IAP\_UART/IAP\_Loader/main.c

**V2.2.0/ 13- Sep -2024****Main Change****1. Bug Fix**

- ecap.h
  - Modify ECAP\_SetEventTriggeredOnRisingEdge
  - Modify ECAP\_SetEventTriggeredOnFallingEdge
- clock.c/h
  - Modify CLOCK\_ModuleEnum

**2. Other Change**

- adc.h
  - Modify ADC\_SetSOCDelayCapture
  - Modify ADC\_EnablePPU
  - Modify ADC\_DisablePPU
  - Modify ADC\_EnablePPUInt
  - Modify ADC\_DisablePPUInt
  - Modify ADC\_EnablePPUTripEvent
  - Modify ADC\_DisablePPUTripEvent
  - Modify ADC\_ClearPPUInt
  - Modify ADC\_ClearPPUGlobalInt
  - Modify ADC\_GetPPUIntFlag
  - Modify ADC\_GetPPUGlobalIntFlag
  - Modify ADC\_SetPPURef
  - Modify ADC\_SetPPUTooHighThreshold
  - Modify ADC\_SetPPUTooLowThreshold
- aes.c/h
  - Modify ADC\_SetSOCDelayCapture
  - Modify AES\_EncryptData
- crc.c/h
  - Add CRC\_CalculateWithInitValuelsNotZero
- ecap.h
  - Modify ECAP\_SetEventDiv
  - Modify ECAP\_EnableEventResetCounter
  - Modify ECAP\_DisableEventResetCounter
- epwr.h
  - Modify EPWR\_ClearTripEventStatus
- gpio.h
  - Modify GPIO\_SetPinChannel
  - Modify GPIO\_SetOutStrength
  - Modify GPIO\_EnablePullUp
  - Modify GPIO\_DisablePullUp
  - Modify GPIO\_EnablePullDown
  - Modify GPIO\_DisablePullDown

- Modify \_\_GPIO\_OUTPUT\_REG\_ADDR
- Modify GPIO\_WritePin
- pwm.c/h
  - Modify PWM\_SetDBCTLLoadTiming
  - Modify PWM\_SetDBREDLoadTiming
  - Modify PWM\_SetDBFEDLoadTiming
  - Modify PWM\_SetOneShotTripEvent
  - Modify PWM\_SetCBCTripEvent
- uart.c/h
  - Add UART\_GetFIFOModule
  - Add UART\_WriteTextSafe
  - Modify UART\_Write
- Rename File
  - Rename spd1158\_hv\_bitfield.h to spc1158\_hv\_bitfield.h
  - Rename spd1158\_hv.c/h to spc1158\_hv.c/h
- Example Code
  - CRC\_Calculate/main.c
  - Flash\_With\_INT/main.c
- 1\_Application
  - UART\_RX\_and\_SentBack/main.c
  - IAP\_UART/IAP\_App/main.c
  - IAP\_UART/IAP\_Loader/main.c

**V2.1.0/ 25- Feb -2024****Main Change****1. Bug Fix****2. Other Change**

- aes.c
  - Modify AES\_EncryptData
  - Modify AES\_DecryptData
- i2c.c/h
  - Modify I2C\_MasterWrite
  - Modify I2C\_MasterRead
  - Modify I2C\_SlaveWrite
  - Modify I2C\_MasterBulkWrite
  - Modify I2C\_MasterBulkRead
  - Modify I2C\_SlaveBulkWrite
- clock.c/h
  - Modify CLOCK\_TrimPLL
  - Modify CLOCK\_Init
  - Modify CLOCK\_InitWithRCO
  - Modify CLOCK\_InitWithXO
  - Modify CLOCK\_ConfigurePLL
  - Modify CLOCK\_ConfigurePLLWithRCO
- flash.c/h
  - Modify FLASH\_Read
  - Modify FLASH\_ProgramWord
  - Modify FLASH\_Program
  - Modify FLASH\_EraseSector
  - Modify FLASH\_EraseBlock
  - Modify FLASH\_EraseChip
- ssp.c/h
  - Modify SSP\_Send
  - Modify SSP\_MasterTransceive
  - Modify SSP\_MasterB2BTransceive

**V2.0.0/ 8- Dec -2023****Main Change****1. Bug fix**

- clock.c
  - Modify CLOCK\_ConfigurePLL()
- comp.c
  - Modify COMP\_SetFilterWindowTimeNs()
- i2c.c/h
  - Modify I2C\_MasterWrite()
  - Modify I2C\_MasterRead()
  - Modify I2C\_MasterBulkWrite()
  - Modify I2C\_MasterBulkRead()
  - Modify I2C\_SpeedInit()
- ssp.c/h
  - Delete SSP\_EnableRxTimeoutInt()
  - Delete SSP\_DisableRxTimeoutInt()
  - Modify SSP\_GetRxFIFOLevel()
- spc1168\_reg.h
  - Modify SSPCTL1\_REG
- spc1168\_bitfield.h
  - Delete SSPCTL1.RXTOIE bit related codes
  - Delete SSPCTL1.RXONLY bit related codes
- SPC1168.svd
  - Delete SSPCTL1.RXTOIE bit related codes
  - Delete SSPCTL1.RXONLY bit related codes
- SPC1168.SFR
  - Delete SSPCTL1.RXTOIE bit related codes
  - Delete SSPCTL1.RXONLY bit related codes
- pwm.h
  - Modify PWM\_ClearOneShotTripInt()
  - Modify PWM\_ClearCBCTripInt()
  - Modify PWM\_ClearDCAEVT0TripInt()
  - Modify PWM\_ClearDCAEVT1TripInt()
  - Modify PWM\_ClearDCBEVT0TripInt()
  - Modify PWM\_ClearDCBEVT1TripInt()
  - Modify PWM\_ClearTripGlobalInt()
- wtd.h
  - Modify WDT\_FeedDog()
- 1\_Application
  - Modify AT24C02\_EEPROM/at24c02.c
  - Modify AT24C02\_EEPROM/at24c02.h
  - Modify AT24C02\_EEPROM/main.c
  - Modify AT24C02\_EEPROM/isr.h



## 2. Other Change

- `adc.c/h`
  - Add `ADC_SH_PositiveInputEnum`
  - Add `ADC_SH_NegativeInputEnum`
  - Modify `ADC_CalculateTemperature()`
  - Modify `ADC_PowerUp()`
  - Modify `ADC_CalculatePreciseTemperature()`
  - Add `ADC_Init()`
- `clock.c/h`
  - Add `CLOCK_InitWithXO()`
  - Modify `CLOCK_InitWithRCO()`
  - Modify `CLOCK_Init()`
  - Modify `CLOCK_GetModuleClock()`
- `comp.c`
  - Modify `COMP_Init()`
- `epwr.c`
  - Modify `EPWR_SetFilterWindowTimeNs()`
- `gpio.h`
  - Add `GPIO_SetHigh()`
  - Add `GPIO_SetLow()`
- `i2c.c/h`
  - Add `I2C_SpeedModeEnum`
  - Modify `I2C_MasterInit()`
  - Modify `I2C_SlaveInit()`
- Add `License.txt` file
- `pwm.h`
  - Add `PWM_TimeBaseEventEnum`
  - Add `PWM_GetTimeBaseEventFlag()`
  - Add `PWM_ClearTimeBaseEventFlag()`
  - Modify `PWM_LoadTimingEnum`
  - Delete `PWM_SyncEventEnum`
  - Add `PWM_SyncOutputEventEnum`
  - Modify `PWM_SetOneShotTripEvent()`
- `system_spc1168.c/h`
  - Delete `SystemCoreClock`
  - Delete `SystemCoreClockUpdate()`
  - Modify `SystemInit()`
  - Initialize `SysInfo`
- `spc1168_bitfield.h`
  - Modify `TBCTL_BIT_SYNCOSEL`
- `SPC1168.svd`
  - Modify `SYNCI_AND_FRCSYNC` to `SYNCI_OR_FRCSYNC`
- `SPC1168.SFR`
  - Modify `SYNCI_AND_FRCSYNC` to `SYNCI_OR_FRCSYNC`

- spc1168.h
  - Modify WRITE\_FIELD()
  - Modify ErrorStatus
- ssp.c/h
  - Modify SSP\_Init()
  - Modify SSP\_Send()
  - Modify SSP\_MasterTransceive()
  - Add SSP\_HalfDuplexTx()
  - Add SSP\_HalfDuplexRx()
  - Add SSP\_FullDuplexTransceive()
- Example Code
  - Modify ADC\_Calibration
  - Modify ADC\_Continuous\_Mode
  - Modify ADC\_Conversion\_Priority
  - Modify ADC\_Differential\_Trim\_Result
  - Modify ADC\_Sequential\_Mode
  - Modify ADC\_SHA\_Open\_Detect
  - Modify ADC\_SHA\_PPU
  - Modify ADC\_SHA\_Short\_Detect
  - Modify ADC\_Simultaneous
  - Modify ADC\_Single\_End\_Result
  - Modify ADC\_With\_PGA
  - Modify AES
  - Modify Comparator
  - Add Compare\_Trigger\_TZ
  - Modify CRC\_Calculate
  - Modify DAC
  - Add ECAP\_APWM\_Function
  - Modify ECAP\_Continue\_Absolute
  - Modify ECAP\_Continue\_Delta
  - Modify ECAP\_Oneshot\_Absolute
  - Modify Flash\_EEPROM\_Emulation
  - Modify Flash\_Frequency\_Reduction
  - Modify Flash\_M\_Access\_User
  - Modify Flash\_Operation
  - Modify Flash\_Sector\_Protect
  - Modify Flash\_User\_FuncWrap
  - Modify Flash\_With\_INT
  - Modify GPIO\_Edge\_Detect
  - Modify GPIO\_Level\_Test
  - Add GTimer\_Extren\_Gpio\_Input\_Clk
  - Add GTimer\_Extren\_Gpio\_Input\_Enable
  - Modify GTimer\_INT
  - Modify I2C\_Master\_Bulk\_Polling\_TxRx

- Add I2C\_Master\_INT\_TxRx
- Modify I2C\_Master\_Polling\_TxRx
- Modify I2C\_Slave\_Bulk\_Polling\_TxRx
- Add I2C\_Slave\_INT\_TxRx
- Modify I2C\_Slave\_Polling\_TxRx
- Modify LIN\_Demo
- Modify PGA\_Calibration
- Modify PWM\_Complementary\_Pair\_Channel
- Modify PWM\_Current\_Protect\_Trigger\_TZ
- Modify PWM\_Force\_SYNC
- Modify PWM\_Global\_GPIO\_SYNC
- Modify PWM\_Global\_Software\_Force\_SYNC
- Modify PWM\_Global\_Timer\_SYNC
- Modify PWM\_GPIO\_Trigger\_Trip\_Zone
- Add PWM\_Independent\_Trigger\_TZ
- Add PWM\_PPU\_Trigger\_TZ
- Modify PWM\_Single\_Output\_With\_Down\_Counting\_Mode
- Modify PWM\_Single\_Output\_With\_Up\_Counting\_Mode
- Modify PWM\_Single\_Output\_With\_Up\_Down\_Counting\_Mode
- Modify PWM\_TBCNT\_0\_SYNC
- Delete PWM\_TBCNT\_CMPD\_SYNC
- Add PWM\_TBCNT\_CMPD\_SYNC
- Modify PWM\_Trigger\_ADC\_Sample
- Modify PWM\_TriPhase\_Waveform
- Modify SECURITY\_Config
- Modify SSP\_Master\_B2B\_TxRx\_Polling
- Modify SSP\_Master\_TxRx\_INT
- Modify SSP\_Master\_TxRx\_Polling
- Modify SSP\_Slave\_B2B\_TxRx\_Polling
- Modify SSP\_Slave\_TxRx\_INT
- Modify SSP\_Slave\_TxRx\_Polling
- Modify Template
- Add UART\_Auto\_Baudrate
- Modify UART\_RX\_and\_SentBack
- Add UART\_RX\_Indefinite\_Length
- Modify UART\_RX\_INT
- Modify UART\_TX\_and\_CheckRX
- Modify WDT0\_INT
- Modify WDT1\_Feed\_DOG
- Modify WDT1\_Rset\_SYS
- Delete I2C\_Master\_INT\_Rx
- Delete IAP\_Modem

#### ■ 1\_Application

- Add IAP\_Modem

- Modify IAP\_UART
- Add Math\_Lib
- Add RTT\_Printf

**V1.9.0/ 26- Aug -2022****Main Changes****1. Bug Fix****2. Other Change**

- system\_spc1168.h
  - Add #include "stdint.h"
- spc1168\_reg.h/spc1168\_bitfield.h/SPC1168.svd/SPC1168.SFR
  - Modify the note of GPIO34\_BIT\_MUXSEL
- Example Code
  - Modify ECAP\_Continue\_Absolute/main.c
  - Modify ECAP\_Continue\_Delta/main.c
  - Modify ECAP\_Oneshot\_Absolute/main.c
  - Modify Flash\_EEPROM\_Emulation

**V1.8.0/ 31- Dec -2021****Main Changes****3. Bug Fix**

- gpio.c
  - Modify GPIO\_ResetAllPin()
- comp.h/.c
  - Modify COMP\_Init(), add code to enable bandgap
  - Modify COMP\_EnableDAC(), add code to enable bandgap
  - Modify COMP\_DACBufferInit(), add code to enable bandgap
- adc.c
  - Modify ADC\_SetSampleAndConvertTime()
  - Modify ADC\_PowerUp(), add code to enable bandgap
- pga.c
  - Modify PGA\_DifferentialInit(), add code to enable bandgap
- clock.c
  - Modify CLOCK\_ConfigurePLL()
- timer.h
  - Delete TIMER\_EnableCounterHold() and TIMER\_DisableCounterHold()
- uart.h
  - Modify UART\_ClearRxFIFO() and UART\_ClearTxFIFO()
- spc1168\_reg.h/spc1168\_bitfield.h
  - Reserve TMRCTL.HOLD register bit-field
  - Modify the width of UARTFOR.BYTECNT register bit-field

**4. Other Change**

- pga.c
  - Add PGA\_EnableSensorMode() and PGA\_DisableSensorMode()
- flash.h/.c
  - Add FLASH\_EraseBlock()
  - Modify FLASH\_ProgramWord()
  - Add macro definition *FLASH\_CMD\_ERASE\_BLOCK*
- clock.c
  - Add note for CLOCK\_TrimPLL()
  - Modify CLOCK\_Init()
- adc.h/.c
  - Modify ADC\_CalculatePreciseTemperature() and ADC\_CalculateTemperature()
  - Add ADC\_EnableBandgap() and ADC\_DisableBandgap()
- spc1168\_reg.h/spc1168\_bitfield.h
  - Reserve XOCTL.FREQSEL register bit-field
  - Rename XOCTL.FEEDXOUT register bit-field to XOCTL.FEEDXIO
- crc.h
  - Modify CRC\_ModeEnum

- gpio.h
  - Modify the post-fix of const number
- Update SPC1168.svd, SPC1168.SFR, SPC1168.FLM and SPC1168\_NVR.FLM files
- iar/startup\_spc1168.s
  - Add code comment
- Example Code
  - Modify Flash\_M\_Access\_User
  - Modify Flash\_User\_FuncWrap
  - Modify AES/main.c
  - Modify IAP\_Modem/main.c

**V1.7.0/ 26-May-2021****Main Changes**

- spc1168.h
  - Add macro function READ\_BITS().
  - Add macro function WRITE\_FIELD(), READ\_FIELD() and CLEAR\_FIELD().
  - Add macro function POSITION\_VAL().
  - Add macro function UNUSED().
- spc1168\_bitfield.h
  - Update TZBCTL.DCBEVT1D bit-field macro definitions.
- flash.c
  - Update function FLASH\_SetTiming().
- i2c.c
  - Update function I2C\_MasterWrite(), I2C\_MasterRead(), I2C\_MasterBulkWrite() and I2C\_MasterBulkRead().
  - Update function I2C\_SlaveBulkWrite().
- clock.c
  - Update CLOCK\_Init(), CLOCK\_InitWithRCO(), CLOCK\_ConfigurePLL() and CLOCK\_ConfigurePLLWithRCO().
  - Update CLOCK\_HCLKSelEnum, CLOCK\_RefSelEnum definitions.
- comp.c
  - Update function COMP\_Init() and COMP\_SetFilterWindowTimeNs().
- delay.h/delay.c
  - Update Delay method control macros.
- ssp.c
  - Update function SSP\_MasterB2BTransceive() and SSP\_SlaveTransceive().
- ecap.c
  - Update function ECAP\_CaptureModeInit().
  - Rename and modify function ECAP\_SetInputPin() to ECAP\_SetInput().
- pwm.c
  - Update function PWM\_ComplementaryPairChannelInit() and PWM\_SingleChannelInit().
- IDE\_Support
  - Update SPC1168.svd and SPC1168.SFR files.
- Demo code
  - Update ECAP\_Continue\_Absolute/main.c
  - Update ECAP\_Continue\_Delta/main.c
  - Update ECAP\_Oneshot\_Absolute/main.c
  - Update UART\_TX\_and\_CheckRX/main.c
  - Update UART\_RX\_and\_SentBack/main.c
  - Update SSP\_Master\_B2B\_TxRx\_Polling/main.c
  - Update SSP\_Master\_TxRx\_INT/main.c
  - Update SSP\_Master\_TxRx\_Polling/main.c
  - Update SSP\_Slave\_B2B\_TxRx\_Polling/main.c
  - Update SSP\_Slave\_TxRx\_INT/main.c



- Update SSP\_Slave\_TxRx\_Polling/main.c
- Update PWM\_Trigger\_ADC\_Sample/main.c
- Update PWM\_Current\_Protect\_Trigger\_TZ/main.c
- Update PGA\_Calibration/main.c
- Update I2C\_Master\_Polling\_TxRx/main.c
- Update I2C\_Master\_Bulk\_Polling\_TxRx/main.c
- Update I2C\_Master\_INT\_Rx/main.c
- Update GPIO\_Edge\_Detect/main.c
- Update Flash\_With\_INT/main.c
- Update Flash\_EEPROM\_Emulation/EWARM/spc1168.icf
- Update Flash\_Frequency\_Reduction/EWARM/spc1168.icf
- Update Flash\_M\_Access\_User/EWARM/spc1168.icf
- Update Flash\_Operation/EWARM/spc1168.icf
- Update Flash\_Sector\_Protect/EWARM/spc1168.icf
- Update Flash\_User\_FuncWrap/EWARM/spc1168.icf
- Update Flash\_With\_INT/EWARM/spc1168.icf
- Update DAC/main.c

**V1.6.0/ 30-April-2020****Main Changes**

- **adc.h**
  - Update comments on `ADC_GetResult()`, `ADC_GetTrimResult1()` and `ADC_GetTrimResult2()`.
- **clock.h/clock.c**
  - Add macro definition `__RCO0_CLOCK` and `__RCO1_CLOCK` for RCO clocks.
  - Remove macro definition `__RCO_CLOCK` and `__XO_CLOCK`.
  - Update 3 functions `CLOCK_Init()`, `CLOCK_InitWithRCO()` and `CLOCK_GetModuleClock()` for configuring WDT clock.
- **comp.h**
  - Rename function `COMP_EnableOutputInvert()` to `COMP_SetOutputActiveLow()`.
  - Rename function `COMP_DisableOutputInvert()` to `COMP_SetOutputActiveHigh()`.
- **pwm.h**
  - Rename macro function `PWM_SetTimeEventTiming()` to `PWM_SetTimeEventIntTiming()`.
  - Rename macro function `PWM_SetTimeEventPeriod()` to `PWM_SetTimeEventIntPeriod()`.
  - Add member value `ON_SYNC_PERIOD` to definition `PWM_LoadTimingEnum`.
- **system\_spc1168.c**
  - Remove macro definition `__SYSTEM_CLOCK`.
- **timer.h**
  - Add macro function `TIMER_SetCounterValue()`.
- **wdt.c**
  - Update function `WDT_Init()` for enabling watchdog halted-run and lockup-run mode.

**V1.5.0/ 18-November-2019****Main Changes**

- **ecap.h**
  - Rename definition *ECAP\_EvtEnum* to *ECAP\_EventEnum*.
  - Update function *ECAP\_APWMSetDuty()*.
- **flash.c**
  - Update function *FLASH\_WriteProtect()*.
- **pwm.h**
  - Update macro function *PWM\_SetOneShotTripEvent()*.
  - Update macro function *PWM\_SetCBCTripEvent()*.
  - Update member values of definition *PWM\_TripActionEnum*.
- **system.h**
  - Rename definition *SYSTEM\_ResetEvtEnum* to *SYSTEM\_ResetEventEnum*.
- **wdt.h**
  - Rename macro function *WDT\_GetRawIntFlag()* to *WDT\_GetIntRawFlag()*.
- **spc1168\_bitfield.h**
  - Update *UARTISR.XMITIR* bit-field macro definitions.

**V1.4.0/ 18-July-2019****Main Changes**

## ■ aes.h

- Rename function AES\_EnableInputFIFOFullInt() to AES\_EnableInputFullInt().
- Rename function AES\_DisableInputFIFOFullInt() to AES\_DisableInputFullInt().
- Rename function AES\_EnableOutputFIFOEmptyInt() to AES\_EnableOutputEmptyInt().
- Rename function AES\_DisableOutputFIFOEmptyInt() to AES\_DisableOutputEmptyInt().
- Rename function AES\_ClearInputFIFOFullInt() to AES\_ClearInputFullInt().
- Rename function AES\_ClearOutputFIFOEmptyInt() to AES\_ClearOutputEmptyInt().
- Rename function AES\_GetInputFIFOFullIntFlag() to AES\_GetInputFullIntFlag().
- Rename function AES\_GetOutputFIFOEmptyIntFlag() to AES\_GetOutputEmptyIntFlag().
- Rename function AES\_GetInputFIFOFullIntRawFlag() to AES\_GetInputFullIntRawFlag().
- Rename function AES\_GetOutputFIFOEmptyIntRawFlag() to AES\_GetOutputEmptyIntRawFlag().
- Rename function AES\_IsInputFIFOFull() to AES\_IsInputFull().
- Rename function AES\_IsOutputFIFOReady() to AES\_IsOutputReady().
- Rename function AES\_IsOutputFIFOEmpty() to AES\_IsOutputEmpty().

## ■ comp.h

- Rename function COMP\_SetFilterClkDiv() to COMP\_SetFilterClockDiv().

## ■ i2c.h

- Rename function I2C\_EnableRxFullInt() to I2C\_EnableRxDataAvailableInt().
- Rename function I2C\_DisableRxFullInt() to I2C\_DisableRxDataAvailableInt().
- Rename function I2C\_EnableTxEmptyInt() to I2C\_EnableTxDataRequestInt().
- Rename function I2C\_DisableTxEmptyInt() to I2C\_DisableTxDataRequestInt().
- Rename function I2C\_GetRxFullIntFlag() to I2C\_GetRxDataAvailableIntFlag().
- Rename function I2C\_GetTxEmptyIntFlag() to I2C\_GetTxDataRequestIntFlag().
- Rename function I2C\_GetRxFullIntRawFlag() to I2C\_GetRxDataAvailableIntRawFlag().
- Rename function I2C\_GetTxEmptyIntRawFlag() to I2C\_GetTxDataRequestIntRawFlag().
- Rename function I2C\_IsTxFIFONotFull() to I2C\_IsTxNotFull().
- Rename function I2C\_IsTxFIFOEmpty() to I2C\_IsTxEmpty().
- Rename function I2C\_IsRxFIFONotEmpty() to I2C\_IsRxNotEmpty().
- Rename function I2C\_IsRxFIFOFull() to I2C\_IsRxFull().

## ■ ssp.h

- Rename function SSP\_EnableRxFIFOOverflowInt() to SSP\_EnableRxOverflowInt().
- Rename function SSP\_DisableRxFIFOOverflowInt() to SSP\_DisableRxOverflowInt().
- Rename function SSP\_EnableTxFIFOUnderflowInt() to SSP\_EnableTxUnderflowInt().
- Rename function SSP\_DisableTxFIFOUnderflowInt() to SSP\_DisableTxUnderflowInt().
- Rename function SSP\_EnableTxFIFOEmptyInt() to SSP\_EnableTxDataRequestInt().
- Rename function SSP\_DisableTxFIFOEmptyInt() to SSP\_DisableTxDataRequestInt().
- Rename function SSP\_EnableRxFIFOFullInt() to SSP\_EnableRxDataAvailableInt().
- Rename function SSP\_DisableRxFIFOFullInt() to SSP\_DisableRxDataAvailableInt().
- Rename function SSP\_SetRxFIFOTriggerLevel() to SSP\_SetRxFIFOTriggerThreshold().
- Rename function SSP\_SetTxFIFOTriggerLevel() to SSP\_SetTxFIFOTriggerThreshold().
- Rename function SSP\_IsTxFIFONotFull() to SSP\_IsTxNotFull().

- Rename function `SSP_IsRxFIFONotEmpty()` to `SSP_IsRxNotEmpty()`.
- Rename function `SSP_IsTxFIFOServiceRequest()` to `SSP_IsTxServiceRequest()`.
- Rename function `SSP_IsRxFIFOServiceRequest()` to `SSP_IsRxServiceRequest()`.
- Rename function `SSP_IsRxFIFOOverflow()` to `SSP_IsRxOverflow()`.
- Rename function `SSP_IsTxFIFOUnderflow()` to `SSP_IsTxUnderflow()`.
- Rename function `SSP_IsTxFIFOHasOddSample()` to `SSP_IsTxHasOddSample()`.
- Rename function `SSP_IsRxFIFOHasOddSample()` to `SSP_IsRxHasOddSample()`.
- Rename function `SSP_ClearRxFIFOOverflowInt()` to `SSP_ClearRxOverflowInt()`.
- Rename function `SSP_ClearTxFIFOUnderflowInt()` to `SSP_ClearTxUnderflowInt()`.

#### ■ `uart.h/.c`

- Rename definition `UART_TxTriggerLevelEnum` to `UART_TxThresholdEnum`.
- Rename definition `UART_RxTriggerLevelEnum` to `UART_RxThresholdEnum`.
- Rename function `UART_ResetRxFIFO()` to `UART_ClearRxFIFO()`.
- Rename function `UART_ResetTxFIFO()` to `UART_ClearTxFIFO()`.
- Rename function `UART_IsTxFIFOEmpty()` to `UART_IsTxDone()`.
- Rename function `UART_IsBreakReceived()` to `UART_IsRxBreak()`.
- Rename function `UART_IsFrameError()` to `UART_IsRxFrameError()`.
- Rename function `UART_IsParityError()` to `UART_IsRxParityError()`.
- Rename function `UART_IsRxDataLost()` to `UART_IsRxOverflow()`.
- Rename function `UART_IsRxDataReady()` to `UART_IsRxNotEmpty()`.
- Rename function `UART_SetFIFOTriggerLevel()` to `UART_SetFIFOTriggerThreshold()`.

#### ■ `spc1168.h`

- Add 9 new functions
  - 2 new functions to set register bits: `SET_BIT()` and `SET_BITS()`.
  - 2 new functions to clear register bits: `CLEAR_BIT()` and `CLEAR_BITS()`.
  - 1 new function to read register bit value: `READ_BIT()`.
  - 1 new function to clear register: `CLEAR_REG()`.
  - 1 new function to write value to register: `WRITE_REG()`.
  - 1 new function to read register value: `READ_REG()`.
  - 1 new function to modify register value: `MODIFY_REG()`.

#### ■ `spc1168_reg.h/spc1168_bitfield.h`

- Rename bit definition `NRZE` to `NRZME` in `UARTIER` register.
- Rename bit definition `RSTRF` to `CLRRF` in `UARTFCR` register.
- Rename bit definition `RSTTF` to `CLRTF` in `UARTFCR` register.
- Rename bit definition `ITL` to `RXTH` in `UARTFCR` register.
- Rename bit definition `TIL` to `TXTH` in `UARTFCR` register.
- Rename bit definition `BUS` to `BUS32` in `UARTFCR` register.
- Rename bit definition `TXEMPTY` to `TXDONE` in `UARTLSR` register.
- Rename bit definition `RXFULL` to `RXDAV` in `I2CIF/I2CRAWIF/I2CIE` register.
- Rename bit definition `TXEMPTY` to `TXDREQ` in `I2CIF/I2CRAWIF/I2CIE` register.

#### ■ Add IAR for ARM project support for examples.

**V1.3.0/ 02-July-2019****Main Changes**

- **adc.h/.c**
  - Rename function ADC\_PowerUP() to ADC\_PowerUp().
  - Rename function ADC\_SetSampleAndConvTime() to ADC\_SetSampleAndConvertTime().
  - Rename function ADC\_SelectPinSingleEnd() to ADC\_SelectPinSingleEnded().
- **aes.h**
  - Rename function AES\_ClearInputFifo() to AES\_ClearInputFIFO().
  - Rename function AES\_ClearOutputFifo() to AES\_ClearOutputFIFO().
  - Rename function AES\_EnableInputFifoFullInt() to AES\_EnableInputFIFOFullInt().
  - Rename function AES\_DisableInputFifoFullInt() to AES\_DisableInputFIFOFullInt().
  - Rename function AES\_EnableOutputFifoEmptyInt() to AES\_EnableOutputFIFOEmptyInt().
  - Rename function AES\_DisableOutputFifoEmptyInt() to AES\_DisableOutputFIFOEmptyInt().
  - Rename function AES\_ClearInputFifoFullInt() to AES\_ClearInputFIFOFullInt().
  - Rename function AES\_ClearOutputFifoEmptyInt() to AES\_ClearOutputFIFOEmptyInt().
  - Rename function AES\_GetInputFifoFullIntFlag() to AES\_GetInputFIFOFullIntFlag().
  - Rename function AES\_GetOutputFifoEmptyIntFlag() to AES\_GetOutputFIFOEmptyIntFlag().
  - Rename function AES\_GetInputFifoFullIntRawFlag() to AES\_GetInputFIFOFullIntRawFlag().
  - Rename function AES\_GetOutputFifoEmptyIntRawFlag() to AES\_GetOutputFIFOEmptyIntRawFlag().
  - Rename function AES\_IsInputFifoFull() to AES\_IsInputFIFOFull().
  - Rename function AES\_IsOutputFifoReady() to AES\_IsOutputFIFOReady().
  - Rename function AES\_IsOutputFifoEmpty() to AES\_IsOutputFIFOEmpty().
- **clock.h/.c**
  - Add 1 new function declaration: CLOCK\_SetModuleDiv().
  - Rename macro function CLOCK\_NstoCounter() to CLOCK\_NsToCounter().
  - Rename function CLOCK\_PLLConfig() to CLOCK\_ConfigurePLL().
  - Rename function CLOCK\_PLLQuickConfigWithRCO() to CLOCK\_ConfigurePLLWithRCO().
  - Rename function CLOCK\_GetModuleClk() to CLOCK\_GetModuleClock().
- **comp.h**
  - Update function COMP\_ResetFilter().
  - Rename function COMP\_SetDACValueMV() to COMP\_SetDACVoltage().
- **ecap.h/.c**
  - Rename function ECAP\_APwmActiveHigh() to ECAP\_APWMSetActiveHigh().
  - Rename function ECAP\_APwmActiveLow() to ECAP\_APWMSetActiveLow().
  - Rename function ECAP\_CounterRun() to ECAP\_RunCounter().
  - Rename function ECAP\_CounterStop() to ECAP\_StopCounter().
  - Rename function ECAP\_EventTriggeredOnRisingEdge() to ECAP\_SetEventTriggeredOnRisingEdge().
  - Rename function ECAP\_EventTriggeredOnFallingEdge() to ECAP\_SetEventTriggeredOnFallingEdge().
  - Rename function ECAP\_SetCounterVal() to ECAP\_SetCounterValue().
  - Rename function ECAP\_EnableCntOverflowInt() to ECAP\_EnableCounterOverflowInt().

- Rename function ECAP\_DisableCntOverflowInt() to ECAP\_DisableCounterOverflowInt().
- Rename function ECAP\_EnableCntEqualPrdInt() to ECAP\_EnableCounterEqualPRDInt().
- Rename function ECAP\_DisableCntEqualPrdInt() to ECAP\_DisableCounterEqualPRDInt().
- Rename function ECAP\_EnableCntEqualCmplInt() to ECAP\_EnableCounterEqualCMPInt().
- Rename function ECAP\_DisableCntEqualCmplInt() to ECAP\_DisableCounterEqualCMPInt().
- Rename function ECAP\_GetCntOverflowIntFlag() to ECAP\_GetCounterOverflowIntFlag().
- Rename function ECAP\_GetCntEqualPrdIntFlag() to ECAP\_GetCounterEqualPRDIntFlag().
- Rename function ECAP\_GetCntEqualCmplIntFlag() to ECAP\_GetCounterEqualCMPIntFlag().
- Rename function ECAP\_ForceCntOverflowInt() to ECAP\_ForceCounterOverflowInt().
- Rename function ECAP\_ForceCntEqualPrdInt() to ECAP\_ForceCounterEqualPRDInt().
- Rename function ECAP\_ForceCntEqualCmplInt() to ECAP\_ForceCounterEqualCMPInt().
- Rename function ECAP\_ClearCntOverflowInt() to ECAP\_ClearCounterOverflowInt().
- Rename function ECAP\_ClearCntEqualPrdInt() to ECAP\_ClearCounterEqualPRDInt().
- Rename function ECAP\_ClearCntEqualCmplInt() to ECAP\_ClearCounterEqualCMPInt().
- Rename function ECAP\_APwmModelInit() to ECAP\_APWMModelInit().
- Rename function ECAP\_APwmSetDuty() to ECAP\_APWMSetDuty().

#### ■ gpio.h

- Rename macro function GpioPinPort() to \_\_GPIO\_PIN\_PORT().
- Rename macro function GpioPinIndex() to \_\_GPIO\_PIN\_INDEX().
- Rename macro function GPIO\_OUTPUT\_REG\_ADDR() to \_\_GPIO\_OUTPUT\_REG\_ADDR().
- Rename macro function GpioGplrAddr() to \_\_GPIO\_GPLR\_ADDR().
- Rename function GPIO\_LevelIntActiveHigh() to GPIO\_SetLevelIntActiveHigh().
- Rename function GPIO\_LevelIntActiveLow() to GPIO\_SetLevelIntActiveLow().

#### ■ i2c.h/.c

- Rename function I2C\_IsTxFifoNotFull() to I2C\_IsTxFIFONotFull().
- Rename function I2C\_IsTxFifoEmpty() to I2C\_IsTxFIFOEmpty().
- Rename function I2C\_IsRxFifoNotEmpty() to I2C\_IsRxFIFONotEmpty().
- Rename function I2C\_IsRxFifoFull() to I2C\_IsRxFIFOFull().
- Rename function I2C\_SetTxFifoThreshold() to I2C\_SetTxFIFOThreshold().
- Rename function I2C\_SetRxFifoThreshold() to I2C\_SetRxFIFOThreshold().
- Rename function I2C\_GetTxFifoLevel() to I2C\_GetTxFIFOLevel().
- Rename function I2C\_GetRxFifoLevel() to I2C\_GetRxFIFOLevel().
- Update 3 functions: I2C\_SpeedInit(), I2C\_MasterInit() and I2C\_SlaveInit().
- Remove definition *I2C\_SpeedModeEnum*.

#### ■ pga.h/.c

- Rename function PGA\_DiffInit() to PGA\_DifferentialInit().
- Rename function PGA\_SelecPositiveCHAsComInput() to PGA\_SelectPositiveChannelAsCommonInput().
- Rename function PGA\_SelecNegativeCHAsComInput() to PGA\_SelectNegativeChannelAsCommonInput().

#### ■ pwm.h/.c

- Rename function PWM\_GetPeriodValue() to PWM\_GetPRD().
- Rename function PWM\_SetPeriodValue() to PWM\_SetPRD().
- Rename function PWM\_EnableSyncFromTimer0() to PWM\_EnableSyncFromTIMER0().

- Rename function PWM\_EnableSyncFromTimer1() to PWM\_EnableSyncFromTIMER1().
- Rename function PWM\_EnableSyncFromTimer2() to PWM\_EnableSyncFromTIMER2().
- Rename function PWM\_DisableSyncFromTimer0() to PWM\_DisableSyncFromTIMER0().
- Rename function PWM\_DisableSyncFromTimer1() to PWM\_DisableSyncFromTIMER1().
- Rename function PWM\_DisableSyncFromTimer2() to PWM\_DisableSyncFromTIMER2().
- Rename function PWM\_CalSyncReloadValue() to PWM\_CalculateSyncReloadValue().

#### ■ ssp.h/.c

- Rename function SSP\_EnableFifoPackMode() to SSP\_EnableFIFOPackMode().
- Rename function SSP\_DisableFifoPackMode() to SSP\_DisableFIFOPackMode().
- Rename function SSP\_EnableRxFifoOverflowInt() to SSP\_EnableRxFIFOOverflowInt().
- Rename function SSP\_DisableRxFifoOverflowInt() to SSP\_DisableRxFIFOOverflowInt().
- Rename function SSP\_EnableTxFifoUnderflowInt() to SSP\_EnableTxFIFOUnderflowInt().
- Rename function SSP\_DisableTxFifoUnderflowInt() to SSP\_DisableTxFIFOUnderflowInt().
- Rename function SSP\_EnableTxFifoEmptyInt() to SSP\_EnableTxFIFOEmptyInt().
- Rename function SSP\_DisableTxFifoEmptyInt() to SSP\_DisableTxFIFOEmptyInt().
- Rename function SSP\_EnableRxFifoFullInt() to SSP\_EnableRxFIFOFullInt().
- Rename function SSP\_DisableRxFifoFullInt() to SSP\_DisableRxFIFOFullInt().
- Rename function SSP\_GetTxFifoLevel() to SSP\_GetTxFIFOLevel().
- Rename function SSP\_GetRxFifoLevel() to SSP\_GetRxFIFOLevel().
- Rename function SSP\_SetRxFifoTriggerLevel() to SSP\_SetRxFIFOTriggerLevel().
- Rename function SSP\_SetTxFifoTriggerLevel() to SSP\_SetTxFIFOTriggerLevel().
- Rename function SSP\_IsTxFifoNotFull() to SSP\_IsTxFIFONotFull().
- Rename function SSP\_IsRxFifoNotEmpty() to SSP\_IsRxFIFONotEmpty().
- Rename function SSP\_IsTxFifoServiceRequest() to SSP\_IsTxFIFOServiceRequest().
- Rename function SSP\_IsRxFifoServiceRequest() to SSP\_IsRxFIFOServiceRequest().
- Rename function SSP\_IsRxFifoOverflow() to SSP\_IsRxFIFOOverflow().
- Rename function SSP\_IsTxFifoUnderflow() to SSP\_IsTxFIFOUnderflow().
- Rename function SSP\_IsBusySyncSlaveClk() to SSP\_IsBusySyncSlaveClock().
- Rename function SSP\_IsTxFifoHasOddSample() to SSP\_IsTxFIFOHasOddSample().
- Rename function SSP\_IsRxFifoHasOddSample() to SSP\_IsRxFIFOHasOddSample().
- Rename function SSP\_ClearRxFifoOverflowInt() to SSP\_ClearRxFIFOOverflowInt().
- Rename function SSP\_ClearTxFifoUnderflowInt() to SSP\_ClearTxFIFOUnderflowInt().
- Update 2 functions: SSP\_Init() and SSP\_MasterB2BTransceive().

#### ■ uart.h/.c

- Rename function UART\_DisableFifo() to UART\_DisableFIFO().
- Rename function UART\_ResetRxFifo() to UART\_ResetRxFIFO().
- Rename function UART\_ResetTxFifo() to UART\_ResetTxFIFO().
- Rename function UART\_GetRxFifoLevel() to UART\_GetRxFIFOLevel().
- Rename function UART\_IsFifoError() to UART\_IsFIFOError().
- Rename function UART\_IsTxFifoEmpty() to UART\_IsTxFIFOEmpty().
- Rename function UART\_SetFifoTriggerLevel() to UART\_SetFIFOTriggerLevel().

#### ■ wdt.h

- Rename function WDT\_SetLoadVal() to WDT\_SetReloadValue().
- Rename function WDT\_GetLoadVal() to WDT\_GetReloadValue().



- Rename function WDT\_GetCounterVal() to WDT\_GetCounterValue().
- Add IAR for ARM tool-chain support.

## V1.2.0/ 15-April-2019

### Main Changes

#### ■ adc.h/.c

- Add 30 new functions
  - 1 new function to clear ADC interrupt overflow flag: `ADC_ClearOverflowInt()`.
  - 1 new function to get ADC interrupt overflow flag: `ADC_GetOverflowIntFlag()`.
  - 3 new functions controlling ADC interrupt trigger SOC: `ADC_EnableIntTriggerSOC()`, `ADC_DisableIntTriggerSOC()` and `ADC_SelectIntTriggerSOC()`.
  - 1 new function to set external SOC trigger: `ADC_SetExternalSOC()`.
  - 2 new functions controlling ADC SOC priority: `ADC_SetSOCPriority()` and `ADC_GetSOCPriority()`.
  - 1 new function to set the average counts for ADC result: `ADC_SetAverageCnt()`.
  - 1 new function to select S/H for SOC channel: `ADC_SetSOCSH()`.
  - 1 new function to get ADC result register value: `ADC_GetResult()`.
  - 1 new function to get ADC PPU result register value: `ADC_GetPPUResult()`.
  - 2 new functions controlling SOC delay capture: `ADC_SetSOCDelayCapture()` and `ADC_GetSOCDelay()`.
  - 4 new functions controlling ADC PPU unit: `ADC_PPUInit()`, `ADC_EnablePPU()`, `ADC_DisablePPU()` and `ADC_SetPPURef()`.
  - 6 new functions controlling ADC PPU interrupt: `ADC_EnablePPUInt()`, `ADC_DisablePPUInt()`, `ADC_ClearPPUInt()`, `ADC_ClearPPUGlobalInt()`, `ADC_GetPPUIntFlag()` and `ADC_GetPPUGlobalIntFlag()`.
  - 4 new functions controlling ADC PPU trip-zone event: `ADC_EnablePPUTripEvent()`, `ADC_DisablePPUTripEvent()`, `ADC_SetPPUTooHighThreshold()` and `ADC_SetPPUTooLowThreshold()`.
  - 2 new functions to get temperature using T-Sensor: `ADC_CalculateTemperature()` and `ADC_CalculatePreciseTemperature()`.
- `ADC_SetGainAndOffset()` function updated to support simultaneous sampling mode.
- Add new macro definition `TSENSOR_SLOPE` and `TSENSOR_OFFSET` for T-Sensor.
- Add new definition `ADC_SHSelEnum` for SOC S/H selection.
- Add new definition `ADC_PPUEnum`, `ADC_PPUEvtEnum` and `ADC_PPUPolEnum` for ADC PPU unit.
- The value of macro definition `ADC_DEFAULT_SAMPLE_TIME_NS` updated to 150.
- Remove 1 function
  - Remove function: `ADC_GetRawResult()`.

#### ■ aes.h/.c

- Add 6 new functions
  - 1 new function to set AES running mode: `AES_SetRunningMode()`.
  - 1 new function to set the counter modular of CTR mode: `AES_SetCTRModular()`.
  - 2 new functions controlling AES CCM MIC value output: `AES_EnableMICOutput()` and `AES_DisableMICOutput()`.
  - 2 new functions controlling AES stream output: `AES_EnableStreamOutput()` and `AES_DisableStreamOutput()`.
- `AES_EncryptData()` and `AES_DecryptData()` functions updated for removing `AES_Reset()` function.

- Remove 1 function
  - Remove function: AES\_Reset().

#### ■ clock.h/.c

- CLOCK\_PLLConfig() and CLOCK\_PLLQuickConfigWithRCO() functions updated to support all SPC1168 series.
- CLOCK\_Init() and CLOCK\_InitWithRCO() functions updated to change UART clock divider.
- Update definition *CLOCK\_HCLKSelEnum* and *CLOCK\_RefSelEnum*.

#### ■ comp.h/.c

- Add 11 new functions
  - 1 new function to disable comparator output invert: COMP\_DisableOutputInvert().
  - 2 new functions controlling PWMSYNC clearing latched filter output status: COMP\_EnablePWMSyncClearFilterOutputStatus() and COMP\_DisablePWMSyncClearFilterOutputStatus().
  - 1 new function to select the synchronous output from PWM: COMP\_SetSyncEvent().
  - 1 new function to clear latched filter output status: COMP\_ClearFilterOutputStatus().
  - 1 new function to disable DAC: COMP\_DisableDAC().
  - 1 new function to select the PWM synchronous output signal for DAC: COMP\_SetDACSyncEvent().
  - 1 new function to set DAC code loading mode: COMP\_SetDACCodeLoadTiming().
  - 3 new functions controlling DAC buffer: COMP\_DACBufferInit(), COMP\_EnableDACBuffer() and COMP\_DisableDACBuffer().
- Rename function COMP\_InvertOutput() to COMP\_EnableOutputInvert().
- Rename function COMP\_ClearAllLatchedOutputStatus() to COMP\_ClearAllFilterOutputStatus().
- Rename function COMP\_GetLatchedOutputStatus() to COMP\_GetFilterOutputStatus().
- Rename function COMP\_GetFilterOutputStatus() to COMP\_GetRawFilterOutputStatus().
- Rename function COMP\_SetFilterClkDIV() to COMP\_SetFilterClkDiv().
- COMP\_Init() function updated to set new value for filter window size and threshold.
- COMP\_SetFilterWindowTimeNs() function updated to make sure the filter threshold value is bigger than the half of window size.

#### ■ ecap.h/.c

- Add 14 new functions
  - 5 new functions controlling ECAP synchronization: ECAP\_EnableSync(), ECAP\_DisableSync(), ECAP\_SetSyncReloadValue(), ECAP\_ForceSync() and ECAP\_SetSyncFromGPIO().
  - 1 new function to enable on-shot re-arming: ECAP\_OneshotReArm().
  - 2 new functions controlling capture operating mode: ECAP\_EnableOneshotMode() and ECAP\_DisableOneshotMode().
  - 1 new function to set event filter prescale: ECAP\_SetEventDiv().
  - 2 new functions controlling counter reset on capture event: ECAP\_EnableEventResetCounter() and ECAP\_DisableEventResetCounter().
  - 2 new functions selecting capture event polarity: ECAP\_EventTriggeredOnRisingEdge() and ECAP\_EventTriggeredOnFallingEdge().
  - 5 new functions controlling capture event interrupt: ECAP\_EnableInt(), ECAP\_DisableInt(), ECAP\_GetIntFlag(), ECAP\_ForceInt() and ECAP\_ClearInt().
- ECAP\_SetInputPin() function updated to set input pin as GPIO input.

- Rename function `ECAP_SetCouterVal()` to `ECAP_SetCounterVal()`.
  - Remove function `ECAP_SetSyncInputPin()`.
  - Add `ECAP_EvtEnum` definition.
  - Add `ECAP_IntEnum` definition.
- `flash.h/.c`
- 1 new function to set Flash write protection: `FLASH_WriteProtect()`.
  - 5 functions updated to add Flash XIP module handling scheme: `FLASH_Read()`, `FLASH_ProgramWord()`, `FLASH_Program()`, `FLASH_EraseSector()` and `FLASH_EraseChip()`.
  - Remove 2 functions: `FLASH_PowerUp()` and `FLASH_PowerDown()`.
  - Remove macro definitions: `FLASH_CMD_POWER_UP`, `FLASH_CMD_VREAD0`, `FLASH_CMD_VREAD1`, `FLASH_CMD_PRE_PROG_WORD`, `FLASH_CMD_PRE_PROG_PAGE`, `FLASH_CMD_PROG_PAGE`, `FLASH_CMD_ERASE_BLOCK`, `FLASH_CMD_RECALL_READ`, `FLASH_CMD_SET_CONFIG` and `FLASH_CMD_POWER_DOWN`.
- `gpio.h`
- Add 3 new function
    - 1 new function to set Pin output strength: `GPIO_SetOutStrength()`.
    - 1 new function to get edge-triggered interrupt flag: `GPIO_GetGlobalEdgeIntStatus()`.
    - 1 new function to get level-triggered interrupt flag: `GPIO_GetGlobalLevelIntStatus()`.
  - Rename function `GPIO_ClearEdgeIntAll()` to `GPIO_ClearGlobalEdgeInt()`.
  - Rename function `GPIO_ClearLevelIntAll()` to `GPIO_ClearGlobalLevelInt()`.
  - Add new definition `GPIO_OutStrengthEnum` for selecting GPIO output strength.
- `i2c.h/.c`
- Add 9 new functions
    - 4 new functions controlling I2C master sending and receiving data: `I2C_MasterWrite()`, `I2C_MasterRead()`, `I2C_MasterBulkWrite()` and `I2C_MasterBulkRead()`.
    - 4 new functions controlling I2C slave sending and receiving data: `I2C_SlaveWrite()`, `I2C_SlaveRead()`, `I2C_SlaveBulkWrite()` and `I2C_SlaveBulkRead()`.
    - 1 new function to initialize I2C speed setting: `I2C_SpeedInit()`.
  - `I2C_MasterInit()` function updated to support multi-slave controlling.
  - Rename function `I2C_SendByte()` to `I2C_WriteByte()`.
  - Rename function `I2C_ReceiveByte()` to `I2C_ReadByte()`.
- `power.h/.c`
- Add 11 new functions
    - 6 new functions controlling BOD interrupt: `POWER_EnableBODInt()`, `POWER_DisableBODInt()`, `POWER_ClearBODInt()`, `POWER_ClearBODGlobalInt()`, `POWER_GetBODIntFlag()` and `POWER_GetBODGlobalIntFlag()`.
    - 3 new functions to initialize BOD for 1.2V power: `POWER_VDD12HBODInit()`, `POWER_VDD12LOBODInit()` and `POWER_VDD12LBODInit()`.
    - 2 new functions to initialize BOD for 3.3V power: `POWER_VDD33HBODInit()` and `POWER_VDD33LBODInit()`.
  - Remove BOD interrupt control functions:
    - `POWER_EnableVDD12TooLow0Int()`
    - `POWER_DisableVDD12TooLow0Int()`
    - `POWER_EnableVDD12TooLow1Int()`

- pwm.h/.c

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- PWM\_DisableDCAEVT1TripInt(),
  - PWM\_DisableDCBEVT0TripInt(),
  - PWM\_DisableDCBEVT1TripInt(),
  - PWM\_GetDCAEVT1TripIntFlag(),
  - PWM\_GetDCBEVT1TripIntFlag(),
  - PWM\_ClearDCAEVT1TripInt(),
  - PWM\_ClearDCBEVT1TripInt().
- PWM\_EnableDCBEVT0TripInt(),
  - PWM\_EnableDCBEVT1TripInt(),
  - PWM\_GetDCAEVT0TripIntFlag(),
  - PWM\_GetDCBEVT0TripIntFlag(),
  - PWM\_ClearDCAEVT0TripInt(),
  - PWM\_ClearDCBEVT0TripInt() and
- 1 new function to clear CBC trip interrupt flag by hardware: PWM\_ClearCBCTripIntByHardware().
- 8 new functions controlling Digital-Compare trip events: PWM\_EnableDCAHTripEvent(), PWM\_EnableDCALTripEvent(), PWM\_EnableDCBHTripEvent(), PWM\_EnableDCBLTripEvent(), PWM\_DisableDCAHTripEvent(), PWM\_DisableDCALTripEvent(), PWM\_DisableDCBHTripEvent() and PWM\_DisableDCBLTripEvent().
- 8 new functions setting Digital-Compare events: PWM\_SetRawDCAEVT0(), PWM\_SetRawDCAEVT1(), PWM\_SetRawDCBEVT0(), PWM\_SetRawDCBEVT1(), PWM\_SetDCAEVT0(), PWM\_SetDCAEVT1(), PWM\_SetDCBEVT0() and PWM\_SetDCBEVT1().
- 4 new functions controlling Digital-Compare events trigger synchronization: PWM\_EnableDCAEVT0TriggerSync(), PWM\_DisableDCAEVT0TriggerSync(), PWM\_EnableDCBEVT0TriggerSync() and PWM\_DisableDCBEVT0TriggerSync().
- 4 new functions controlling Digital-Compare events trigger ADC SOC: PWM\_EnableDCAEVT0TriggerSOC(), PWM\_DisableDCAEVT0TriggerSOC(), PWM\_EnableDCBEVT0TriggerSOC() and PWM\_DisableDCBEVT0TriggerSOC().
- 8 new functions controlling Digital Filter: PWM\_SetDCFilter(), PWM\_EnableDCFilterBlank(), PWM\_DisableDCFilterBlank(), PWM\_EnableDCFilterFromOtherPWM(), PWM\_DisableDCFilterFromOtherPWM(), PWM\_EnableDCFilterBlankInvert(), PWM\_DisableDCFilterBlankInvert() and PWM\_SetDCFilterBlankWindow().
- 6 new functions for clearing and getting SOC event flag: PWM\_ClearSOCAEvent(), PWM\_ClearSOCBEvent(), PWM\_ClearSOCCEvent(), PWM\_GetSOCAEventFlag(), PWM\_GetSOCBEventFlag() and PWM\_GetSOCCEventFlag().
- 1 new function to software force clock synchronization for all PWM modules: PWM\_ForceClockSync().
- 1 new function to software force PWM synchronization: PWM\_ForceSync().
- 3 new function controlling PWM synchronization by GPIO: PWM\_EnableSyncFromGPIO(), PWM\_DisableSyncFromGPIO() and PWM\_SetSyncFromGPIO().
- 6 new functions controlling PWM synchronization by Timers: PWM\_EnableSyncFromTimer0(), PWM\_EnableSyncFromTimer1(), PWM\_EnableSyncFromTimer2(), PWM\_DisableSyncFromTimer0(), PWM\_DisableSyncFromTimer1() and PWM\_DisableSyncFromTimer2().
- 5 new functions setting Trip-zone event from GPIO: PWM\_SetTZ0FromGPIO(), PWM\_SetTZ1FromGPIO(), PWM\_SetTZ2FromGPIO(), PWM\_SetTZ3FromGPIO() and PWM\_SetTZ4FromGPIO().
- 1 new function to calculate actual Time-Base Phase Register value: PWM\_CalSyncReloadValue().
- Rename function PWM\_EnableCMPALoad() to PWM\_UnlockCMPA().

- Rename function `PWM_EnableCMPBLoad()` to `PWM_UnlockCMPB()`.
- Rename function `PWM_EnableCMPCLoad()` to `PWM_UnlockCMPC()`.
- Rename function `PWM_EnableCMPDLoad()` to `PWM_UnlockCMPD()`.
- Rename function `PWM_DisableCMPALoad()` to `PWM_LockCMPA()`.
- Rename function `PWM_DisableCMPBLoad()` to `PWM_LockCMPB()`.
- Rename function `PWM_DisableCMPCLoad()` to `PWM_LockCMPC()`.
- Rename function `PWM_DisableCMPDLoad()` to `PWM_LockCMPD()`.
- Rename function `PWM_EnableAQCTLALoad()` to `PWM_UnlockAQCTLA()`.
- Rename function `PWM_EnableAQCTLBLoad()` to `PWM_UnlockAQCTLB()`.
- Rename function `PWM_DisableAQCTLALoad()` to `PWM_LockAQCTLA()`.
- Rename function `PWM_DisableAQCTLBLoad()` to `PWM_LockAQCTLB()`.
- Rename function `PWM_SetT0EventSource()` to `PWM_SetT0Event()`.
- Rename function `PWM_SetT1EventSource()` to `PWM_SetT1Event()`.
- Rename function `PWM_DeadBandRisingDelay()` to `PWM_SetDeadBandRisingDelay()`.
- Rename function `PWM_DeadBandFallingDelay()` to `PWM_SetDeadBandFallingDelay()`.
- Rename function `PWM_GetGlobalTripIntFlag()` to `PWM_GetTripGlobalIntFlag()`.
- Rename function `PWM_ClearGlobalTripInt()` to `PWM_ClearTripGlobalInt()`.
- Rename function `PWM_EnableSOCATrig()` to `PWM_EnableSOCA()`.
- Rename function `PWM_DisableSOCATrig()` to `PWM_DisableSOCA()`.
- Rename function `PWM_EnableSOCBTrig()` to `PWM_EnableSOCB()`.
- Rename function `PWM_DisableSOCBTrig()` to `PWM_DisableSOCB()`.
- Rename function `PWM_EnableSOCCTrig()` to `PWM_EnableSOCC()`.
- Rename function `PWM_DisableSOCCTrig()` to `PWM_DisableSOCC()`.
- Rename function `PWM_EnableTimeEvtINT()` to `PWM_EnableTimeEventInt()`.
- Rename function `PWM_DisableTimeEvtINT()` to `PWM_DisableTimeEventInt()`.
- Rename function `PWM_SetTimeEvtTiming()` to `PWM_SetTimeEventTiming()`.
- Rename function `PWM_SetTimeEvtPeriod()` to `PWM_SetTimeEventPeriod()`.
- Rename function `PWM_ClearTimeEvtInt()` to `PWM_ClearTimeEventInt()`.
- Rename function `PWM_GetTimeEvtIntFlag()` to `PWM_GetTimeEventIntFlag()`.
- Remove function `PWM_GetTripSelCompIndex()`.
- Remove function `PWM_SetOneshotTripFromExtPin()`.
- Remove function `PWM_EnableOneShotTripFromComp()`.
- Add definition `PWM_SelEnum` and `PWM_IncEnum` for selecting PWM modules.
- Add definition `PWM_TripEventEnum` for selecting trip events.
- Add definition `PWM_TripOutputEnum` for trip-zone output type.
- Add definition `PWM_DCTripEventEnum` for Digital-Compare trip events.
- Add definition `PWM_DCEventEnum` for Digital-Compare events.
- Add definition `PWM_RawDCEventEnum` for raw Digital-Compare events.
- Add definition `PWM_DCFilterInputEnum` for Digital-Compare filter input.
- Add definition `PWM_DCFilterAlignEnum` for Digital-Compare filter alignment.
- Add definition `PWM_SyncEventEnum` for synchronization events.
- Rename definition `PWM_TripZoneOutputEnum` to `PWM_TripActionEnum`.
- Update the member name in definition `PWM_TxEventEnum`.
- Remove definition `PWM_PWMOutputTripEnum`.

- ssp.h/.c
  - Add 5 new functions
    - 2 new functions controlling FIFO pack mode: SSP\_EnableFifoPackMode() and SSP\_DisableFifoPackMode().
    - 2 new functions controlling SSP master full duplex transfer: SSP\_MasterTransceive() and SSP\_MasterB2BTransceive().
    - 1 new functions controlling SSP slave full duplex transfer: SSP\_SlaveTransceive().
  - SSP\_Send () function updated to support single frame mode.
  - Rename function SSP\_Recv() to SSP\_Receive().
  - Remove functions controlling Bit Count Error:
    - SSP\_EnableBitCountErrorInt()
    - SSP\_DisableBitCountErrorInt()
    - SSP\_IsBitCountError()
    - SSP\_ClearBitCountErrorInt().
- system.h/.c
  - Add 10 new functions
    - 4 new functions controlling memory error interrupt: SYSTEM\_EnableMemErrorInt(), SYSTEM\_DisableMemErrorInt(), SYSTEM\_ClearMemErrorInt() and SYSTEM\_GetMemErrorIntFlag().
    - 4 new functions controlling reset event: SYSTEM\_EnableAllResetEvent(), SYSTEM\_DisableAllResetEvent(), SYSTEM\_ClearResetEventStatus() and SYSTEM\_GetResetEventStatus().
    - 1 new function to get chip unique ID: SYSTEM\_GetUID().
    - 1 new function to get chip random number: SYSTEM\_GetRandomNum().
  - SYSTEM\_EnableResetEvent() function updated using macro define.
  - SYSTEM\_DisableResetEvent() function updated using macro define.
  - Rename function SYSTEM\_EnableMemErrorIntAll () to SYSTEM\_EnableAllMemErrorInt().
  - Rename function SYSTEM\_DisableMemErrorIntAll () to SYSTEM\_DisableAllMemErrorInt().
  - Rename function SYSTEM\_ClearMemErrorInt() to SYSTEM\_ClearMemErrorGlobalInt().
  - Rename function SYSTEM\_GetMemErrorIntFlag() to SYSTEM\_GetMemErrorGlobalIntFlag().
  - Rename function SYSTEM\_ClearResetOnWDTORSTEvent() to SYSTEM\_ClearWDTORResetStatus().
  - Rename function SYSTEM\_ClearResetOnWDT1RSTEvent() to SYSTEM\_ClearWDT1ResetStatus().
  - Rename function SYSTEM\_ClearResetOnSystemRSTEvent () to SYSTEM\_ClearSystemResetStatus().
  - Rename function SYSTEM\_IsResetTriggeredByWDTORSTEvent() to SYSTEM\_GetWDTORResetStatus().
  - Rename function SYSTEM\_IsResetTriggeredByWDT1RSTEvent() to SYSTEM\_GetWDT1ResetStatus().
  - Rename function SYSTEM\_IsResetTriggeredBySystemRSTEvent() to SYSTEM\_GetSystemResetStatus().
  - Remove some memory error controlling functions:
    - SYSTEM\_EnableROM1BitErrorInt()
    - SYSTEM\_DisableROM1BitErrorInt()
    - SYSTEM\_EnableROM2BitErrorInt()



- SYSTEM\_DisableROM2BitErrorInt()
- SYSTEM\_EnableFlash1BitErrorInt()
- SYSTEM\_DisableFlash1BitErrorInt()
- SYSTEM\_EnableFlash2BitErrorInt()
- SYSTEM\_DisableFlash2BitErrorInt()
- SYSTEM\_EnableIRAMErrorInt()
- SYSTEM\_DisableIRAMErrorInt()
- SYSTEM\_EnableDRAMErrorInt()
- SYSTEM\_DisableDRAMErrorInt()
- SYSTEM\_EnableSIOErrorInt()
- SYSTEM\_DisableSIOErrorInt()
- SYSTEM\_ClearROM1BitErrorInt()
- SYSTEM\_ClearROM2BitErrorInt()
- SYSTEM\_ClearFlash1BitErrorInt()
- SYSTEM\_ClearFlash2BitErrorInt()
- SYSTEM\_ClearIRAMErrorInt()
- SYSTEM\_ClearDRAMErrorInt()
- SYSTEM\_ClearSIOErrorInt()
- SYSTEM\_GetROM1BitErrorIntFlag()
- SYSTEM\_GetROM2BitErrorIntFlag()
- SYSTEM\_GetFlash1BitErrorIntFlag()
- SYSTEM\_GetFlash2BitErrorIntFlag()
- SYSTEM\_GetIRAMErrorIntFlag()
- SYSTEM\_GetDRAMErrorIntFlag()
- SYSTEM\_GetSIOErrorIntFlag()
- Remove some reset event controlling functions:
  - SYSTEM\_ClearResetOnROMError()
  - SYSTEM\_ClearResetOnFlashError()
  - SYSTEM\_ClearResetOnIRAMError()
  - SYSTEM\_ClearResetOnDRAMError()
  - SYSTEM\_ClearResetOnSIOError()
  - SYSTEM\_ClearResetOnVDD12L0()
  - SYSTEM\_ClearResetOnVDD12L1()
  - SYSTEM\_ClearResetOnVDD12H()
  - SYSTEM\_ClearResetOnVDD33L()
  - SYSTEM\_ClearResetOnVDD33H()
  - SYSTEM\_ClearResetOnPLLUnlock()
  - SYSTEM\_ClearResetOnClkDetectError()
  - SYSTEM\_IsResetTriggeredByROMError()
  - SYSTEM\_IsResetTriggeredByFlashError()
  - SYSTEM\_IsResetTriggeredByIRAMError()
  - SYSTEM\_IsResetTriggeredByDRAMError()
  - SYSTEM\_IsResetTriggeredBySIOError()
  - SYSTEM\_IsResetTriggeredByVDD12L0()

- SYSTEM\_IsResetTriggeredByVDD12L1()
  - SYSTEM\_IsResetTriggeredByVDD12H()
  - SYSTEM\_IsResetTriggeredByVDD33L()
  - SYSTEM\_IsResetTriggeredByVDD33H()
  - SYSTEM\_IsResetTriggeredByPLLUnlock()
  - SYSTEM\_IsResetTriggeredByClkDetectError()
- Add definition *SYSTEM\_MemErrorEnum* for memory error events.
- Update a member name from *RESET\_EVENT\_SIO\_ERROR* to *RESET\_EVENT\_SIOO\_ERROR* in definition *SYSTEM\_ResetEvtEnum*.
- timer.h
  - Add 6 new functions
    - 2 new functions controlling hold counter mode: *TIMER\_EnableCounterHold()* and *TIMER\_DisableCounterHold()*.
    - 2 new functions controlling ADC SOC generation: *TIMER\_EnableADCSOC()* and *TIMER\_DisableADCSOC()*.
    - 2 new functions controlling PWMSYNC signal generation: *TIMER\_EnablePWMSync()* and *TIMER\_DisablePWMSync()*.
- wdt.h
  - Add new functions
    - 1 new function to stop WDT counter: *WDT\_Stop()*.
    - 4 new functions controlling WDT running when core halted or lockup: *WDT\_EnableRunWhenCoreHalt()*, *WDT\_DisableRunWhenCoreHalt()*, *WDT\_EnableRunWhenCoreLockup()* and *WDT\_DisableRunWhenCoreLockup()*.
    - 1 new function to get WDT load register value: *WDT\_GetLoadVal()*.
    - 1 new function to get WDT current counter value: *WDT\_GetCounterVal()*.
- spc1168\_reg.h/spc1168\_bitfield.h
  - Rename bit definition CNTMOD to CTRMOD in AESCTL0 register.
  - Remove register AESCTL1.
  - Remove bit definition BITCNTERRIE in SSPCTL1 register.
  - Remove bit definition BITCNTERR in SSPSTS register.
  - Update TZDCSEL Bit-Filed macro definition in *spc1168\_bitfield.h*.