

**Arm® Cortex®-M0**  
**32-bit Microcontroller**

# **NUC121/NUC125 Series CMSIS BSP**

## **Revision History**

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### Revision 3.01.013 (Released 2026-08-19)

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- Add SBOM.
- CMSIS upgrades to 6.3.0.
- Sample code
  - ISP samples: Fix flash select setting in flash download of Keil project.
  - ISP\_DFU: Remove dfu-util.
- Tool
  - HIDTransferTest
    - Move from USB\_D sample codes.
    - Add Control transfer.

### Revision 3.01.012 (Released 2025-11-06)

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- Standard driver
  - SPI: SPI\_DISABLE\_3WIRE\_MODE and SPI\_ENABLE\_3WIRE\_MODE add.
- Sample code
  - BPWM\_DoubleBuffer\_PeriodLoadingMode, PWM\_DeadZone, PWM\_DoubleBuffer\_PeriodLoadingMode: IRQ handler clears interrupt flag at first.
  - ISP\_I2C and ISP\_SPI: Fix potential command failure.
  - VS Code projects upgrade to use GCC 14.3.1.

### Revision 3.01.011 (Released 2025-02-21)

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- Standard driver
  - I2C: Add STOP bit check for I2C transmission completely.
- Sample code
  - Add VS Code projects with AC6/GCC toolchain.
    - VS Code requires NuLink2 Pro ICE.
  - USB\_D\_HID\_Mouse2: Fix host not sleep issue.

### Revision 3.01.010 (Released 2024-10-09)

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- CMSIS: Upgrade to v6.1.0.
- Keil startup\_NUC121.c: Instead of ASM code.
- Sample code
  - IAR projects: Upgrade for IAR v8.
  - Keil projects: Upgrade for CMSIS v6.1.0 and Arm Compiler v6.
    - Reference: [Arm Keil Application Note 298](#)
  - USCI\_I2C\_Wakeup\_Master: Remove.

### Revision 3.01.009 (Released 2024-03-21)

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- Library

- retarget.c: Fix \_\_ARM\_use\_no\_argv multiple definition issue in newer KEIL versions.
- BPWM: BPWM\_ConfigOutputChannel fixes duty issue.
- CLK
  - CLK\_PowerDown clears CPU deep sleep mode select after wakeup.
  - CLK\_SysTickDelay Improve robustness.
- LDROM.icf and LDROM.sct: Fix LDROM address.
- PWM: PWM\_ConfigOutputChannel fixes duty issue.
- Sample code
  - BPWM\_SwitchDuty, PWM\_SwitchDuty: Fix 100% duty issue.
  - ISP samples: Fix LDROM download failure in IAR and KEIL.
  - ISP\_DFU: Update Windows driver with Nuvoton vendor name.
  - SYS\_PowerDown\_MinCurrent: Remove LVR disable setting.
  - USB samples
    - Remove EP1 stall while setup error occurs.
    - Remove LPM support.
  - USB HID samples: Support LED status.

#### Revision 3.01.008 (Released 2023-02-13)

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- Standard driver
  - retarget.c: Fix print issue with IAR EWARM V8 and above
- Sample code
  - I2C samples: Improve error handling.
  - ISP\_DFU, ISP\_HID, and ISP\_MSC: Enable USB trim function.
  - ISP\_SPI: Add GCC project.
  - ISP samples
    - Add IAR projects.
    - Add scatter file to check image size.
    - Enable function section linking and image size optimization in KEIL projects.
  - SYS\_PowerDown\_MinCurrent: Add.
  - USB\_HID\_Mouse2: Avoid wakeup failure.

#### Revision 3.01.007 (Released 2022-01-26)

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- Standard driver
  - Improve infinite loop prevention with timeout counter and error code.
  - TIMER: TIMER\_Delay adds return value.

- Sample code
  - I2C samples: Remove redundant code.
  - I2C and USCI\_I2C samples: Enable schmitt trigger of I<sup>2</sup>C pins.
  - ISP\_I2C, ISP\_RS485, and ISP\_UART: Add GCC project.
  - ISP\_MSC: Add.
  - USB\_D samples: Add software boundary of USB trim.
  - USB\_D HID samples: Unify INT\_IN interval.
  - USB\_D\_MassStorage\_CDROM: Fix Linux and Mac compatibility issue.

#### Revision 3.01.006 (Released 2020-05-21)

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- IAR startup\_NUC121.s: Fix build issue with IAR EWARM V7.5.
- Standard driver
  - UART: UART\_DisableInt and UART\_EnableInt remove NVIC IRQ control.
- Sample code
  - I2C\_PDMA\_TRX: Remove unused \_\_ALIGNED.
  - PDMA, PDMA\_Scatter\_Gather: Add word alignment.
  - UART samples: Add NVIC IRQ control.
  - USB\_D\_MassStorage\_CDROM: Remove 2KB file size limit.
  - USB\_D\_VCOM samples: Fix potential UART Tx FIFO overflow issue.
  - USB\_D\_VCOM\_DualPort: Fix wrong baudrate issue.
  - USCI\_SPI\_SlaveModeINT: Add.

#### Revision 3.01.005 (Released 2020-09-14)

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- Add Apache-2.0 license declaration.
- Standard driver
  - retarget.c
    - \_write and SendChar\_ToUART fix '\r' issue.
    - SendChar fixes uninitialized pointer.
  - SPI: SPI\_DISABLE\_TX\_RX\_PDMA and SPI\_TRIGGER\_TX\_RX\_PDMA add.
  - TIMER: TIMER\_SET\_OPMODE adds.
  - UART: UART\_PDMA\_DISABLE and UART\_PDMA\_ENABLE add.
- Sample code
  - I2C\_Wakeup\_Slave: Improve wakeup robustness.
  - UART samples and USCI\_UART\_TxRx\_Function: Fix '\r' issue.
  - USB\_D\_VCOM\_DualPort: Fix only one VCOM port in Linux.

### Revision 3.01.004 (Released 2019-10-02)

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- Standard driver
  - TIMER: TIMER\_Open fixes return value.
  - USCI\_SPI: USPI\_SET\_SS\_HIGH fixes implementation.
- Sample code
  - I2C\_PDMA\_TRX, ISP\_DFU, ISP\_I2C, ISP\_RS485, and ISP\_SPI: Add.
  - FMC\_ExecInSRAM: Add IAR and GCC projects.
  - UART\_TxRx\_Function: Fix data lost.

### Revision 3.01.003 (Released 2019-06-19)

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- Standard driver
  - I2C: Add error handling for new transfer.
  - TIMER: TIMER\_GetModuleClock uses correct PCLK.
  - USB\_D: Fix potential issue.
- Sample code
  - ISP samples: Add.
  - TIMER\_Delay: Use correct PCLK.
  - USB\_D samples: Fix potential issue.
  - USB\_D\_Audio\_NAU8822 and USB\_D\_Audio\_HID\_NAU8822: Clear FIFO before play / record.

### Revision 3.01.002 (Released 2018-12-28)

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- CMSIS: Upgrade to v5.1.1.
- Standard driver
  - CLK: CLK\_PowerDown requires HIRC / MIRC auto trim disabled.
  - PDMA: PDMA\_Open supports multiple open.
- Sample code
  - Keil projects use “NULink Debugger” instead of “Nuvoton Nu-Link Debugger”.
  - Semihost fixes build failure with GCC toolchain 7-2018-q2.
  - I2S\_PDMA\_PlayRecord: Fix race condition.
  - TIMER\_CaptureCounter: Fix array access overflow.
  - USB\_D\_VCOM samples: Fix UART baud rate calculation.
  - USB\_D\_VCOM\_And\_HID\_Transfer: Fix buffer overflow.

### Revision 3.01.001 (Released 2018-06-27)

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- NuMicro.h: Add.

- NUC121.h: Separate register declarations of each IP into distinct header files.
- Standard driver
  - USB: Fix USB Control-In packet with the same size as endpoint limit.
- Sample code
  - Add Eclipse projects with GCC toolchain.
  - ADC samples, CLK\_ClockDetector, HIRC\_Trim, and UART\_Wakeup\_LXT: Set analog pins as input mode and disable digital input function.
  - PDMA\_ScatterGather\_PingPongBuffer: Add PDMA error handling.
  - UART\_PDMA: Add UART error handling.
  - USCI\_I2C\_Monitor: Add.

### Revision 3.00.003 (Released 2017-12-13)

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- NUC121.h: TIMER\_CTL\_TRGDAC\_Pos and TIMER\_CTL\_TRGDAC\_Msk remove.
- Standard driver
  - I2C: I2C\_ReadByteTwoRegs, I2C\_ReadMultiBytesTwoRegs, I2C\_WriteByteTwoRegs, and I2C\_WriteMultiBytesTwoRegs fix high byte lost.
  - SPI: I2S\_Open improves I2S sample rate accuracy.
  - TIMER: TIMER\_TRG\_TO\_EADC is replaced by TIMER\_TRG\_TO\_ADC.
  - USB
    - USBD\_L1RESUME is replaced by USBD\_STATE\_L1RESUME.
    - USBD\_L1SUSPEND is replaced by USBD\_STATE\_L1SUSPEND.
  - USCI-I2C: UI2C\_ReadByteTwoRegs, UI2C\_ReadMultiBytesTwoRegs, UI2C\_WriteByteTwoRegs, and UI2C\_WriteMultiBytesTwoRegs fix high byte lost.
  - USCI-UART: UART\_Open and UART\_SetLine\_Config fix wrong baud rate.

### Revision 3.00.002 (Released 2017-03-09)

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- NUC121.h: BPWM0\_IRQn and BPWM1\_IRQn add.
- Standard driver
  - BPWM: BPWM\_ConfigOutputChannel fixes 100% duty issue.
  - CLK
    - CLK\_CLKSEL1\_ADCSEL\_HIRC\_DIV2 is replaced by CLK\_CLKSEL1\_ADCSEL\_HIRC.
    - GPIOA\_MODULE, GPIOB\_MODULE, GPIOC\_MODULE, GPIOD\_MODULE, GPIOE\_MODULE, and GPIOF\_MODULE fix.
  - I2C: I2C\_CLEAR\_WAKEUP\_WR\_STATUS removes.
  - PWM: PWM\_ConfigOutputChannel fixes 100% duty issue.

- SYS
  - SYS\_GPF\_MFPL\_PF0MFP\_XT1\_OUT, SYS\_GPF\_MFPL\_PF0MFP\_X32\_OUT, SYS\_GPF\_MFPL\_PF1MFP\_XT1\_IN, and SYS\_GPF\_MFPL\_PF1MFP\_X32\_IN add.
  - SYS\_GPD\_MFPL\_PD3MFP\_UART0\_CTS is replaced by SYS\_GPD\_MFPL\_PD3MFP\_UART0\_nCTS.
  - SYS\_GPD\_MFPL\_PD3MFP\_UART0\_RTS is replaced by SYS\_GPD\_MFPL\_PD3MFP\_UART0\_nRTS.

■ Sample code

- BPWM\_DutySwitch: Fix 100% duty issue.
- FMC\_IAP: Fix Wrong project setting.
- LED\_Toggle, UART\_Wakeup\_LXT: Add.
- PWM\_DutySwitch: Fix 100% duty issue.
- USB\_D\_Samples: Reply USB 2.1 version only if SUPPORT\_LPM defined.
- USB\_D\_Audio\_HID\_NAU8822: Fix PD11 issue.
- USCI\_UART\_TxRx\_Function: Fix compilation error.

**Revision 3.00.001** (Released 2016-10-07)

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- Initial release.

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