

NUC230/NUC240 BSP Directory

Directory Introduction for 32-bit NuMicro® Family

Directory Information

Document	Driver reference manual and revision history.
Library	Driver header and source files.
SampleCode	Driver sample code.

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1 Document Information

Revision History.pdf	Show all the revision history about specific BSP.
NuMicro NUC230_240 Series Driver Reference Guide.chm	Describe the definition, input and output of each API.

2 Library Information

CMSIS	CMSIS definitions by ARM® Corp.
Device	CMSIS compliant device header file.
StdDriver	All peripheral driver header and source files.
NuEdu	Library for NuEdu board.

3 Sample Code Information

CardReader	CCID ^[1] Smart Card reader Sample Code.
Hard_Fault_Sample	Show hard fault information when hard fault happened.
Template	Software Development Template.
Semihost	A sample code to show how to debug with semihost message print.
RegBased	The sample codes which access control registers directly.
NuEdu	Sample code for NUC230/NUC240 NuEdu Evaluation Board.
StdDriver	NUC230/NUC240 Series Driver Samples

1. Circuit card interface device (CCID) is a USB device that interfaces with integrated circuit cards.

4 \SampleCode\NuEdu

Smpl_Advance02_CAN_NormalMode_TxRx	Implement CAN transfer by CAN Driver.
Smpl_Advance02_RS485_Master	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Slave.
Smpl_Advance02_RS485_Slave	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Master.
Smpl_Basic01_7_Segment	Demonstrate how to set GPIO pin mode and use pin data output control 7 Segment.
Smpl_Basic01_ACMP	Demonstrate how ACMP[1] works with internal band-gap voltage.
Smpl_Basic01_ADC_Knob	Demonstrate how to use ADC to measure variable resistor and change the LED brightness with PWM according to the ADC conversion results.
Smpl_Basic01_Button	Demonstrate how to set GPIO pin mode and detect pin input signal.
Smpl_Basic01_Buzzer	Demonstrate how to use PWM Channel Waveform to control buzzer.
Smpl_Basic01_ClkOut	Demonstrate how to change system clock to different PLL frequency and output system clock from CLKO pin.
Smpl_Basic01_DM512	Demonstrate how to transmit and receive DM512 data in UART mode.
Smpl_Basic01_EEPROM	Demonstrate how to access EEPROM through a I ² C interface and print the test results on PC via NUCOM1 port of the NuEdu-Basic01 board.
Smpl_Basic01_FMC_IAP	Demonstrate a simple IAP function to show three independent programs including main routine, independent interrupt handler and updating or switching to another program with IAP function.

Smpl_Basic01_FMC_ISP	Demonstrate LDROM updated through ISP function by branching to LDROM by software reset, and show debug messages via UART.
Smpl_Basic01_Interrupt	Demonstrate how to use GPIO interrupt function.
Smpl_Basic01_IrDA_NEC	Demonstrate the remote control function based on NEC IR protocol and changes LED display via NuEdu-EVB-NUC240 and NuEdu-Basci01 boards when system receives data of NEC IR.
Smpl_Basic01_LED	Demonstrate how to set GPIO pin mode and use pin data output control LED.
Smpl_Basic01_Modbus_UART	Demonstrate how to transmit and receive Modbus data in UART mode.
Smpl_Basic01_PWM_Capture	Demonstrate PWM Capture function by using PWM0 channel 2 to capture the output of PWM0 channel 0.
Smpl_Basic01_PWMDAC	Demonstrate PWM function to simulate a DAC output.
Smpl_Basic01_RGBLED	Demonstrate how to set GPIO pin mode and use pin data output control RGBLED.
Smpl_Basic01_RTC	Demonstrate RTC application and wake-up function.
Smpl_Basic01_SPI_Flash	Demonstrate how to access SPI Flash through a SPI interface and print the test results on both 7-Segments and PC via NUCOM1 port of NuEdu-Basic01 board.
Smpl_Basic01_SPI_Flash_w_PDMA	Demonstrate how to access SPI Flash through a SPI interface with combing PDMA function and print the test results on both 7-Segments and PC via NUCOM1 port of the NuEdu-Basic01 board.
Smpl_Basic01_StartKit	Demonstrate functions of NuEdu-Basic01 via NuEdu-EVB-NUC240.
Smpl_Basic01_Timer	Demonstrate the timer periodic mode application and increase the number display on 7-segments from 0 to 99 via NuEdu-EVB-NUC240 and NuEdu-Basci01

	boards when timer interrupt occurs.
Smpl_Basic01_TIMER_CAP	Demonstrate how to use timer2 capture event to capture timer2 counter value.
Smpl_Basic01_UART_printf	Demonstrate a simple printf function to replace the standard printf library for reducing the code size issue.
Smpl_Basic01_USBD_HID_Mouse	Demonstrate how to implement a USB mouse device. The button on NuEdu-Basic01 can control the cursor when the mouse device is connected to PC by USB.
Smpl_Basic01_WDT_WWDT	Demonstrate the WDT and WWDT application via NuEdu-EVB-NUC240 and NuEdu-Basci01 boards. The buzzer will beep when WDT interrupt or WWDT interrupt occurs.

5 \SampleCode\RegBased

ACMP	Demonstrate how ACMP ^[1] works with internal band-gap voltage.
ACMP_Wakeup	Show how to wake up MCU from Power-down mode by ACMP wake-up function.
ADC_ContinuousScanMode	Demonstrate how to use continuous scan mode and finishes two cycles of conversion for the specified channels.
ADC_PwmTrigger	Demonstrate how to trigger ADC by PWM.
ADC_ResultMonitor	Demonstrate how to use the digital compare function to monitor the conversion result of channel 2.
ADC_SingleCycleScanMode	Demonstrate how to use single cycle scan mode and finishes one cycle of conversion for the specified channels.
ADC_SingleMode	Demonstrate how to use single mode and finishes the conversion of the specified channel.
CAN_Set_MaskFilter	Demonstrate how to use MaskFilter to receive message in Normal mode. The sample code needs to work with CAN_Test_MaskFilter.
CAN_Test_MaskFilter	Demonstrate how to use message object No.1 to send message objects (ID=0x700~0x70F). The sample code needs to work with CAN_Set_MaskFilter.
CRC_8	Perform CRC-8 operation and get the CRC checksum result.
CRC_CCITT	Perform CRC_CCITT operation and get the CRC checksum result.
EBI_NOR	Configure EBI interface to access W39L040P (NOR Flash) on the EBI interface.
EBI_SRAM	Configure EBI interface to access BS616LV4017 (SRAM) with PDMA transfer on the EBI interface.
FMC_RW	Demonstrate how to read/program embedded flash by ISP function.

GPIO_EINTAndDebounce	Demonstrate how to use GPIO external interrupt function and de-bounce function.
GPIO_INT	Demonstrate how to use GPIO interrupt function.
GPIO_OutputInput	Demonstrate how to set GPIO pin mode and use pin data input/output control.
GPIO_PowerDown	Demonstrate how to wake up form Power-down mode by GPIO interrupt.
I2C_EEPROM	Demonstrate how to access EEPROM through a I ² C interface.
I2C_GCMode_MASTER	Demonstrate how a Master uses I ² C address 0x0 to write data to I ² C Slave. This sample code needs to work with I2C_GCMode_SLAVE.
I2C_GCMode_SLAVE	Demonstrate how to receive Master data in GC (General Call) mode. This sample code needs to work with I2C_GCMode_MASTER.
I2C_MASTER	Demonstrate how a Master access Slave. This sample code needs to work with I2C_SLAVE.
I2C_SLAVE	Demonstrate how to set I ² C in slave mode to receive the data of a Master. This sample code needs to work with I2C_MASTER.
I2C_Wakeup_Master	Demonstrate how to wake up MCU from Power-down mode. This sample code needs to work with I2C_Wakeup_Slave.
I2C_Wakeup_Slave	Demonstrate how to set I ² C to wake up MCU from Power-down mode. This sample code needs to work with I2C_Wakeup_Master.
I2S_Master	Demonstrate how I ² S works in Master mode. This sample code needs to work with I2S_Slave.
I2S_PDMA	Demonstrate how I ² S works with PDMA in Master mode. Both TX PDMA function and RX PDMA function will be enabled.

I2S_Slave	Demonstrate how I ² S works in Slave mode. This sample code needs to work with I2S_Master.
PDMA	Demonstrate how to use PDMA channel 6 to transfer data from memory to memory.
PS2	Demonstrate how to control PS/2 mouse movement on the screen.
PWM_Capture	Demonstrate how to use PWMB Channel 2 captures PWMB Channel 1 Waveform.
PWM_DeadZone	Demonstrate how to use PWM Dead Zone function.
PWM_DoubleBuffer	Use PWM Double Buffer function to change duty cycle and period of output waveform.
RTC_PowerDown	Demonstrate how to use RTC alarm interrupt event to wake up system.
RTC_TimeAndTick	Demonstrate how to get the current RTC data/time per tick.
SCUART_TxRx	Demonstrate how to use smartcard interface UART mode to print "Hello World!"
SPI_Loopback	Implement SPI Master loop back transfer. This sample code needs to connect SPI0_MISO0 pin and SPI0_MOSI0 pin together. It will compare the received data with transmitted data.
SPI_MasterFifoMode	Demonstrate how to communicate with an off-chip SPI slave device with FIFO mode. This sample code needs to work with SPI_SlaveFifoMode.
SPI_PDMA_Loopback	Demonstrate SPI data transfer with PDMA. SPI0 will be configured as Master mode and SPI1 will be configured as Slave mode. Both TX PDMA function and RX PDMA function will be enabled.
SPI_SlaveFifoMode	Demonstrate how to communicate with an off-chip SPI master device with FIFO mode. This sample code needs to work with SPI_MasterFifoMode.
SYS	Demonstrate how to change system clock to different PLL

	frequency and output system clock from CLK0 pin.
TIMER_Capture	Demonstrate how to use timer2 capture event to capture timer2 counter value.
TIMER_Counter	Demonstrate how to use timer1 counter input function to count the input event.
TIMER_PeriodicINT	Demonstrate how to perform timer counting in periodic mode.
TIMER_PowerDown	Demonstrate how to use timer0 toggle-output interrupt event to wake up system.
UART_AutoFlow_Master	Demonstrate how to transmit and receive data with auto flow control. The sample code needs to work with UART_AutoFlow_Slave.
UART_AutoFlow_Slave	Demonstrate how to transmit and receive data with auto flow control. The sample code needs to work with UART_AutoFlow_Master.
UART_IrDA_Master	Demonstrate how to transmit and receive data in UART IrDA mode. The sample code needs to work with UART_IrDA_Slave.
UART_IrDA_Slave	Demonstrate how to transmit and receive data in UART IrDA mode. The sample code needs to work with UART_IrDA_Master.
UART_LIN	Demonstrate how to transmit LIN header and response.
UART_PDMA	Transmit and receive UART data with PDMA.
UART_RS485_Master	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Slave.
UART_RS485_Slave	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Master.
UART_TxRx_Function	Demonstrate how UART transmits and receives data from PC terminal through a RS232 interface.

UART_Wakeup	Show how to wake up system form Power-down mode by UART interrupt.
WDT_PowerDown	Demonstrate how to use WDT time-out interrupt event to wake up system.
WDT_TimeoutINT	Select one WDT time-out interval period time to generate time-out interrupt event.
WDT_TimeoutReset	Demonstrate how to cause WDT time-out reset system event while WDT time-out reset delay period expired.
WWDT_CompareINT	Select one WWDT window compare value to generate window compare match interrupt event.

1. Analog Comparator (ACMP).

6 \SampleCode\StdDriver

ACMP	Demonstrate how ACMP works with internal band-gap voltage.
ACMP_Wakeup	Show how to wake up MCU from Power-down mode by ACMP wake-up function.
ADC_ContinuousScanMode	Demonstrate how to use continuous scan mode and finishes two cycles of conversion for the specified channels.
ADC_PwmTrigger	Demonstrate how to trigger ADC by PWM.
ADC_ResultMonitor	Demonstrate how to use the digital compare function to monitor the conversion result of channel 2.
ADC_SingleCycleScanMode	Demonstrate how to use single cycle scan mode and finishes one cycle of conversion for the specified channels.
ADC_SingleMode	Demonstrate how to use single mode and finishes the conversion of the specified channel.
CAN_BasicMode_Receive	Demonstrate how to receive message in Basic mode. The sample code needs to work with CAN_BasicMode_Transmit.
CAN_BasicMode_Transmit	Demonstrate how to transmit message in Basic mode. The sample code needs to work with CAN_BasicMode_Receive.
CAN_NormalMode_Receive	Demonstrate how to receive message in Normal mode. The sample code needs to work with CAN_NormalMode_Transmit.
CAN_NormalMode_Transmit	Demonstrate how to transmit message in Normal mode. The sample code needs to work with CAN_NormalMode_Receive.
CRC_8	Perform CRC-8 operation and get the CRC checksum result.
CRC_CCITT	Perform CRC_CCITT operation and get the CRC

	checksum result.
EBI_NOR	Configure EBI interface to access W39L040P (NOR Flash) on the EBI interface.
EBI_SRAM	Configure EBI interface to access BS616LV4017 (SRAM) with PDMA transfer on the EBI interface.
GPIO_EINTAndDebounce	Demonstrate how to use GPIO external interrupt function and de-bounce function.
GPIO_INT	Demonstrate how to use GPIO interrupt function.
GPIO_OutputInput	Demonstrate how to set GPIO pin mode and use pin data input/output control.
GPIO_PowerDown	Demonstrate how to wake up form Power-down mode by GPIO interrupt.
I2C_EEPROM	Demonstrate how to access EEPROM through a I ² C interface.
I2C_GCMode_MASTER	Demonstrate how a Master uses I ² C address 0x0 to write data to I ² C Slave. This sample code needs to work with I2C_GCMode_SLAVE.
I2C_GCMode_SLAVE	Demonstrate how to receive Master data in GC (General Call) mode. This sample code needs to work with I2C_GCMode_MASTER.
I2C_MASTER	Demonstrate how a Master access Slave. This sample code needs to work with I2C_SLAVE.
I2C_SLAVE	Demonstrate how to set I ² C in slave mode to receive the data of a Master. This sample code needs to work with I2C_MASTER.
I2C_Wakeup_Master	Demonstrate how to wake up MCU from Power-down mode. This sample code needs to work with I2C_Wakeup_Slave.
I2C_Wakeup_Slave	Demonstrate how to set I ² C to wake up MCU from Power-down mode. This sample code needs to work with I2C_Wakeup_Master.

I2S_Master	Demonstrate how I ² S works in Master mode. This sample code needs to work with I2S_Slave.
I2S_PDMA	Demonstrate how I ² S works with PDMA in Master mode. Both TX PDMA function and RX PDMA function will be enabled.
I2S_Slave	Demonstrate how I ² S works in Slave mode. This sample code needs to work with I2S_Master.
PDMA	Demonstrate how to use PDMA channel 6 to transfer data from memory to memory.
PS2	Demonstrate how to control PS/2 mouse movement on the screen.
PWM_Capture	Demonstrate how to use PWMB Channel 2 captures PWMB Channel 1 Waveform.
PWM_DeadZone	Demonstrate how to use PWM Dead Zone function.
PWM_DoubleBuffer	Use PWM Double Buffer function to change duty cycle and period of output waveform.
RTC_PowerDown	Demonstrate how to use RTC alarm interrupt event to wake up system.
RTC_TimeAndTick	Demonstrate how to get the current RTC data/time per tick.
SC_ReadATR	Demonstrate how to get smart card ATR data.
SCUART_TxRx	Demonstrate how to use smartcard interface UART mode to print "Hello World!"
SPI_Loopback	Implement SPI Master loop back transfer. This sample code needs to connect SPI0_MISO0 pin and SPI0_MOSI0 pin together. It will compare the received data with transmitted data.
SPI_MasterFifoMode	Configure SPI0 as Master mode and demonstrate how to communicate with an off-chip SPI Slave device with FIFO mode. This sample code needs to work with SPI_SlaveFifoMode.

SPI_PDMA_Loopback	Demonstrate SPI data transfer with PDMA. SPI0 will be configured as Master mode and SPI1 will be configured as Slave mode. Both TX PDMA function and RX PDMA function will be enabled.
SPI_SlaveFifoMode	Configure SPI0 as Slave mode and demonstrate how to communicate with an off-chip SPI Master device with FIFO mode. This sample code needs to work with SPI_MasterFifoMode.
SYS	Demonstrate how to change system clock to different PLL frequency and output system clock from CLKO pin.
TIMER_Capture	Demonstrate how to use timer2 capture event to capture timer2 counter value.
TIMER_Counter	Demonstrate how to use timer1 counter input function to count the input event.
TIMER_PeriodicINT	Demonstrate how to perform timer counting in periodic mode.
TIMER_PowerDown	Demonstrate how to use timer0 toggle-output interrupt event to wake up system.
UART_AutoFlow_Master	Demonstrate how to transmit and receive data with auto flow control. The sample code needs to work with UART_AutoFlow_Slave.
UART_AutoFlow_Slave	Demonstrate how to transmit and receive data with auto flow control. The sample code needs to work with UART_AutoFlow_Master.
UART_IrDA_Master	Demonstrate how to transmit and receive data in UART IrDA mode. The sample code needs to work with UART_IrDA_Slave.
UART_IrDA_Slave	Demonstrate how to transmit and receive data in UART IrDA mode. The sample code needs to work with UART_IrDA_Master.
UART_LIN	Demonstrate how to transmit LIN header and response.

UART_PDMA	Transmit and receive UART data with PDMA.
UART_RS485_Master	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Slave.
UART_RS485_Slave	Demonstrate how to transmit and receive data in UART RS485 mode. The sample code needs to work with UART_RS485_Master.
UART_TxRx_Function	Demonstrate how UART transmits and receives data from PC terminal through a RS232 interface.
UART_Wakeup	Show how to wake up system form Power-down mode by UART interrupt.
USBD_Audio_NAU8822	Demonstrate how to implement a USB audio class device. NAU8822 is used in this sample code to play the audio data from Host. It also supports to record data from NAU8822 to Host.
USBD_HID_Keyboard	Demonstrate how to implement a USB keyboard device. It supports to use GPIO to simulate key input.
USBD_HID_Mouse	Demonstrate how to implement a USB mouse device. The mouse cursor will move automatically when this mouse device connecting to PC by USB.
USBD_HID_MouseKeyboard	Demonstrate how to implement a USB mouse function and a USB keyboard on the same USB device. The mouse cursor will move automatically when this mouse device connecting to PC. This sample code uses a GPIO to simulate key input.
USBD_HID_Transfer	Demonstrate how to transfer data between USB device and PC through a USB HID interface. A windows tool is also included in this sample code to connect with a USB device.
USBD_HID_Transfer_and_Keyboard	Demonstrate how to implement a composite device (HID Transfer and keyboard). Transfer data between USB device and PC through USB HID interface. A windows tool is also included in this sample code to connect with USB device.

USBD_HID_Transfer_and_MSC	Demonstrate how to implement a composite device (HID Transfer and Mass storage). Transfer data between USB device and PC through USB HID interface. A windows tool is also included in this sample code to connect with a USB device.
USBD_MassStorage_CDROM	Demonstrate how to simulate a USB CD-ROM device.
USBD_MassStorage_DataFlash	Demonstrate how to implement a USB Mass-Storage. It uses embedded data flash as storage.
USBD_Micro_Printer	Show how to implement a USB micro printer device.
USBD_Printer_and_HID_Transfer	Demonstrate how to implement a composite device (USB micro printer device and HID Transfer). Transfer data between USB device and PC through USB HID interface. A windows tool is also included in this sample code to connect with a USB device.
USBD_VCOM_and_HID_Keyboard	Implement a USB composite device with virtual COM port and keyboard functions.
USBD_VCOM_and_HID_Transfer	Demonstrate how to implement a composite device (VCOM and HID Transfer). It supports one virtual COM port and transfers data between USB device and PC through USB HID interface. A windows tool is also included in this sample code to connect with a USB device.
USBD_VCOM_and_MassStorage	Implement a USB composite device. It supports one virtual COM port and one USB Mass-Storage device.
USBD_VCOM_DualPort	Demonstrate how to implement a USB dual virtual COM port device.
USBD_VCOM_SinglePort	Implement a USB virtual COM port device. It supports one virtual COM port.

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