

Nano102/112 CMSIS BSP Guide

Directory Introduction for 32-bit NuMicro® Family

Directory Information

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

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1 Document

CMSIS.html	Document of CMSIS version 4.5.0.
NuMicro Nano102_112 Series Driver Reference Guide.html	This document describes the usage of drivers in Nano102/112 BSP.
NuMicro Nano102_112 Series CMSIS BSP Revision History.pdf	This document shows the revision history of Nano102/112 BSP.

2 Library

CMSIS	Cortex® Microcontroller Software Interface Standard (CMSIS) V4.5.0 definitions by Arm® Corp.
Device	CMSIS compliant device header file.
LCDLib	Library for controlling LCD module.
SmartcardLib	Smartcard library binary and header file.
StdDriver	All peripheral driver header and source files.

3 SampleCode

Hard_Fault_Sample	Show hard fault information when hard fault happened.
ISP	ISP firmware samples.
Nu-LB-NANO112	Sample codes for Nano112 Learning Board
NUTINY-EVB-NANO112	Sample codes for Nano112 Tiny Board
PowerDown_Chk	Sample code which implements a function to test system state before entering power-down mode. If a system consumes more power than expected in power-down mode, this function can be used to check if there is any system setting that may cause power leakage.
Semihost	Show how to print and get character through IDE console window.
StdDriver	Demonstrate the usage of Nano102/112 series MCU peripheral driver APIs.
Template	A project template for Nano102/112 series MCU.

4 SampleCode\ISP

ISP_I2C	In-System-Programming sample code through I ² C interface.
ISP_RS485	In-System-Programming sample code through RS485 interface.
ISP_SPI	In-System-Programming sample code through SPI interface.
ISP_UART	In-System-Programming sample code through UART interface.

5 SampleCode\Nu-LB-NANO112

COMMON	Common files for Learning Board sample code.
StartKit	This sample code displays 'NANO' on LCD.

6 SampleCode\NUTINY-EVB-NANO112

COMMON	Common files for Tiny Board sample code.
LCD_DEMO	Demonstrate how to display RTC time on a LCD panel.
PWRDWN_DEMO	Demonstrate how to keep LCD display while system enters Power-down mode.
PWRDWN_LCD_RTC_DEMO	Demonstrate how to keep LCD display while system enters Power-down mode and wake up system periodically with RTC interrupt.
PWRDWN_RTC_DEMO	Demonstrate how to wake up system periodically with RTC Interrupt.

7 SampleCode\StdDriver

System Manager (SYS)

SYS_Control	Demonstrate how to change different PLL settings for the system clock source, and output system clock to CLKO (PB.12) pin with the system clock / 4 frequency.
SYS_PLLClockOutput	Change system clock to different PLL frequency and output system clock from CLKO pin.
SYS_PowerDown_MinCurrent	Demonstrate how to minimize power consumption when entering power down mode.
SYS_TrimIRC	Demonstrate how to use LXT to trim HIRC.

Flash Memory Controller (FMC)

FMC_IAP	Demonstrate IAP (In-Application Programming) function. To run this sample, the boot mode must be "Boot from APROM with IAP".
FMC_RW	Show FMC read Flash IDs, erase, read, and write function.

General Purpose I/O (GPIO)

GPIO_IOTest	Use GPIO driver to control the GPIO pin direction and the high/low state, and show how to use GPIO interrupts.
GPIO_PowerDown	Demonstrate how to wake system up from Power-down mode by GPIO interrupt.

PDMA Controller (PDMA)

PDMA_Memory	Use PDMA channel 2 to demonstrate memory to memory transfer.
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Timer Controller (TIMER)

Timer_Delay	Demonstrate the usage of TIMER_Delay() API to generate a 1 second delay.
Timer_EventCounter	Use the pin PB.8 to demonstrate timer event counter function.
Timer_FreeCountingMode	Use the timer pin PD.11 to demonstrate timer free counting mode function. Also display the measured input frequency to UART console.
Timer_InterTimerTriggerMode	Use the timer pin PB.8 to demonstrate inter timer trigger mode function. Also display the measured input frequency to UART console.
Timer_Periodic	Use the timer periodic mode to generate timer interrupt every 1 second.
Timer_ToggleOut	Demonstrate the timer 0 toggle out function on pin PB.8.
Timer_TriggerCountingMode	Use the timer pin PD.11 to demonstrate timer trigger counting mode function. And displays the measured input frequency to UART console.
Timer_Wakeup	Use timer to wake up system from Power-down mode periodically.

Watchdog Timer (WDT)

WDT_Polling	Use Polling mode to check WDT time-out state and reset WDT after time-out occurs.
WDT_Wakeup	Use WDT to wake up system from Power-down mode periodically.

Window Watchdog Timer (WWDT)

WWDT_Reload	Demonstrate the WWDT counter reload function.
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Real Timer Clock (RTC)

RTC_Alarm_Test	Demonstrate the RTC alarm function which sets an alarm 10 seconds after execution.
RTC_Time_Display	Demonstrate the RTC function and display the current time to the UART console.

PWM Generator and Capture Timer (PWM)

PWM_Capture	Demonstrate PWM Capture function by using PWM0 channel 2 to capture the output of PWM0 channel 0.
PWM_CapturePDMA	Demonstrate PWM Capture function by using PWM0 channel 2 to capture the output of PWM0 channel 0 and move captured data to SRAM with PDMA.
PWM_DeadZone	Demonstrate the dead-zone feature with PWM0.

UART Interface Controller (UART)

UART_AutoBaudRate	Demonstrate how to use auto baud rate detection function.
UART_FlowCtrl	Transmit and receive data using auto flow control.
UART_IrDA	Show how to transmit and receive UART data in UART IrDA mode.
UART_LIN	Demonstrate how to transmit LIN header and response.
UART_PDMA	Demonstrate UART transmit and receive function with PDMA.
UART_RS485_Receive	Demonstrate how to receive data in UART RS485 mode.
UART_RS485_Transmit	Demonstrate how to transmit data in UART RS485 mode.
UART_Rx_Wakeup	Demonstrate how to wake up system from Power-down mode by UART interrupt.
UART_TxRx_Function	Transmit and receive data from PC terminal through

RS232 interface.

Smartcard Host Interface (SC)

SC_ReadATR	Read the smartcard ATR from smartcard 0 interface.
SC_ReadSimPhoneBook	Demonstrate how to read phone book information in the SIM card.
SCUART_TxRx	Demonstrate smartcard UART mode by connecting PC.4 and PC.6 pins.

Serial Peripheral Interface (SPI)

SPI_FIFO_Flash	Access SPI Flash using FIFO mode.
SPI_LoopBack	Demonstrate SPI loop back transfer.
SPI_TxRxLoopback_PDMA	Demonstrate SPI loop back transfer with PDMA.

I²C Serial Interface Controller (I²C)

I2C_EEPROM	Read/write EEPROM via an I ² C interface.
I2C_Loopback	An I ² C master/slave demo by connecting I ² C0 and I ² C1 interface.
I2C_Wakeup	Demonstrate how to wake up system from Power-down mode by I ² C interrupt.

LCD Display Driver (LCD)

LCD_Blinking_Test	Demonstrate LCD blinking function on LCD panel of NuTiny-SDK-Nano112-LQFP_TNLCD board.
LCD_Pixel_OnOff_Test	Show how to control pixel on and off on LCD panel of NuTiny-SDK-Nano112-LQFP_TNLCD board.
LCD_Print_Text_Test	Show how to print text on LCD panel of NuTiny-SDK-Nano112-LQFP_TNLCD board.

CRC Controller (CRC)

CRC_CCITT	Calculate the CRC-CCITT checksum value by CRC DMA mode.
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Analog-to-Digital Converter (ADC)

ACMP_Sigma_Delta	Use Sigma-Delta mode to measure input voltage.
ACMP_Slope	Use ACMP slop mode to measure capacitor discharge time.
ADC_Compare	Demonstrate ADC conversion and comparison function by monitoring the conversion result of channel 0.
ADC_ContinuousScan	Convert ADC channel 0, 1, 2 in Continuous Scan mode and print conversion results.
ADC_PDMA	Use PDMA channel 1 to move ADC channel 0, 1, 2 converted data to SRAM.
ADC_PWMTrigger	Demonstrate PWM0 channel 0 trigger ADC function.
ADC_Single	Convert ADC channel 0 in Single mode and print conversion results.
ADC_SingleCycleScan	Convert ADC channel 0, 1, 2 in Single Cycle Scan mode and print conversion results.
ADC_TimerTrigger	Configure Timer0 to ADC and move converted data to SRAM using PDMA.

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