

Template: Open407I-C User Manual

From Waveshare Wiki

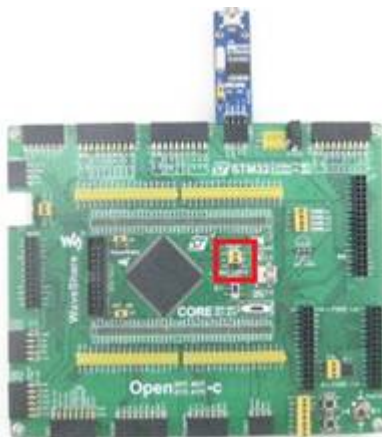
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Open407I-C Testing Guide

Basic settings of the test

- ProgrammingInterface: SWD
- Serial port settings: Select aproper COM port, configure as follows:
 - Baud rate: 115200;
 - Data bits: 8;
 - Stop bits : 1;
 - Parity bits : None;
 - Flow control : None
- Powersupply: 5V power supply is required.
- Hardware Connection: For the tests that require the serial port converter for debugging,please connect the converter to the board via pin headers, and then connect itto the PC via USB cable; and open the two jumpers PA9and VBUS.

As shown in thefigure below:



(/wiki/File:Open407I-C-User-Manual-1.jpg)

ADC+DMA

Overview

ADC analog voltage acquisition ADC

Hardware Connection

- Connect theserial port converter to the board via UART1 interface.
- Connect theAnalog Test Board to the board via SPI1 interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-2.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant as adjusting the resistor on the module.

CAN1 TO CAN2-Normal

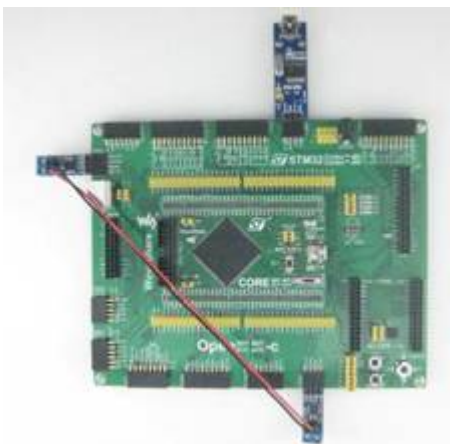
Overview

CAN1 TO CAN2-Normal demo

Hardware Connection

- Connect the serial port converter to the board via UART1 interface.
- Two "SN65HVD230 CAN Board" are required for this test.
- Connect the two "CAN Board" to the board CAN1, CAN2 interface respectively.
- Connect the two "CAN Board" by using jumper wires (CANH <-> CANH, CANL <-> CANL).

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-3.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Press USER key and check the results on the serial debugging assistant.

DAC

Overview

DAC output demo

Hardware Connection

- Connect the Analog Test Board to the board via SPI1 interface.
- Connect the 5V pin headers on both the main board and the Analog Test Board via jumper wire.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-4.jpg)

Operation and Result

There will be a sound of triangular waveform from the Analog Test Board.

DCMI_OV7670

Overview

OV7670 Digital camera data acquisition and display on the LCD

Hardware Connection

- Connect the OV7670 Camera Board to the board via DCMI interface.
- Connect the serial port converter to the board via UART1 interface.
- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-5.jpg)

Operation and Result

Images acquired from the camera will be displayed on the LCD.

DCMI_OV9655

Overview

OV9655 Digital camera data acquisition and display on the LCD

Hardware Connection

- Connect the OV9655 Camera Board to the board via DCMI interface.
- Connect the serial port converter to the board via UART1 interface.
- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-6.jpg)

Operation and Result

Images acquired from the camera will be displayed on the LCD.

DS18B20

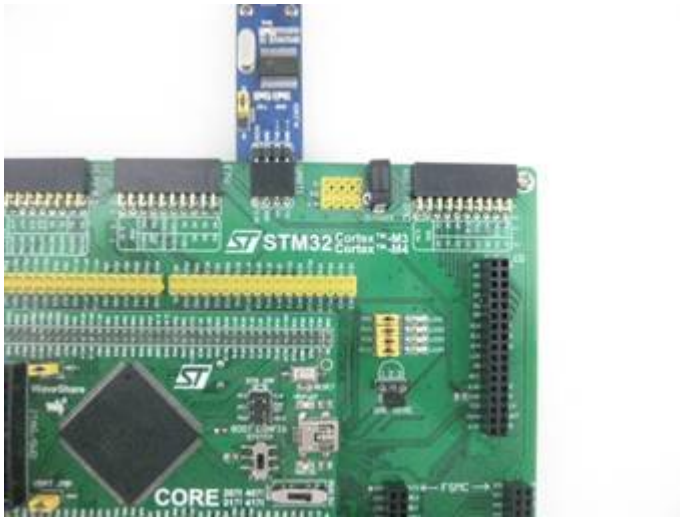
Overview

DS18B20 temperature measurement demo

Hardware Connection

- Insert the DS18B20+ to the ONE-WIRE Interface.
- Connect the serial port converter to the board via UART1.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-7.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

GPIO_Key_LED

Overview

LED, push button, joystick demo

Hardware Connection

- Short the LED jumpers on the board.
- Short the push button and joystick jumper on the board.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-8.jpg)

Operation and Result

Push the button or joystick; the LED status will keep changing accordingly.

I2C

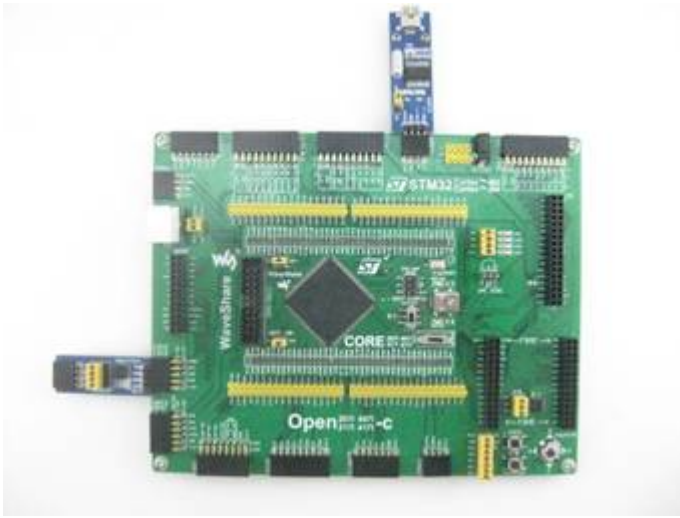
Overview

I2C EEPROM demo

Hardware Connection

- Connect the serial port converter to the board via UART1 interface.
- Connect the AT24CXX EEPROM Board to the board via I2Cx interface(I2C1 or I2C2, depending on the software configuration).

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-9.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

LCD-HY32D_FSMC

Overview

LCD display demo

Hardware Connection

- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD Interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-10.jpg)

Operation and Result

Information will be displayed on the LCD.

MCO_OUT

Overview

Clock signal output demo

Operation and Result

Output 8MHz external crystal signal on theMCO0 (PA8 pin)

Nand Flash_PCB0

Overview

NAND FLASH demo

Hardware Connection

- Connect the K9F1G08U0C NandFlash Board (K9F1G08U0CPCB0 onboard) to the board via 8BIT FSMC interface.
- Connect the serial port converter to the boardvia UART1 interface.

As shown in thefigure below:



(/wiki/File:Open407I-C-User-Manual-11.jpg)

Operation and Result

Launchthe serial debugging assistant, and configure it as described in chapter"Preparation".

Info/message will be displayed on the serialdebugging assistant.

Nand Flash_SCB0

Overview

NAND FLASH demo

Hardware Connection

- Connect the NandFlash Board (A) (K9F1G08U0D SCB0 onboard) to theboard via 8BIT FSMC interface.
- Connect the serial port converter to the board via UART1.

As shown in thefigure below:



(/wiki/File:Open407I-C-User-Manual-12.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

NorFlash

Overview

NorFlash demo

Hardware Connection

- Connect the NorFlashBoard (A) to the board via FSMC interface.
- Connect the serial port converter to the board via UART1.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-13.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

PS2

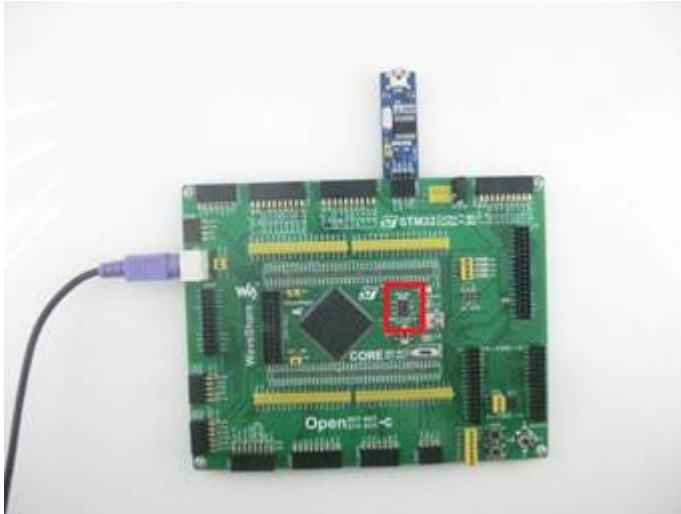
Overview

PS2 keyboard demo

Hardware Connection

- Connect the PS2 keyboard to the board via PS2 interface.
- Connect the serial port converter to the board via UART1 interface.
- Open the USB jumper.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-14.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

RTC

Overview

RTC demo

Hardware Connection

- Connect the serial port converter to the board via UART1 interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-15.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Follow the tips and input data,Info/message will be displayed on the serial debugging assistant.

SD_FatFS

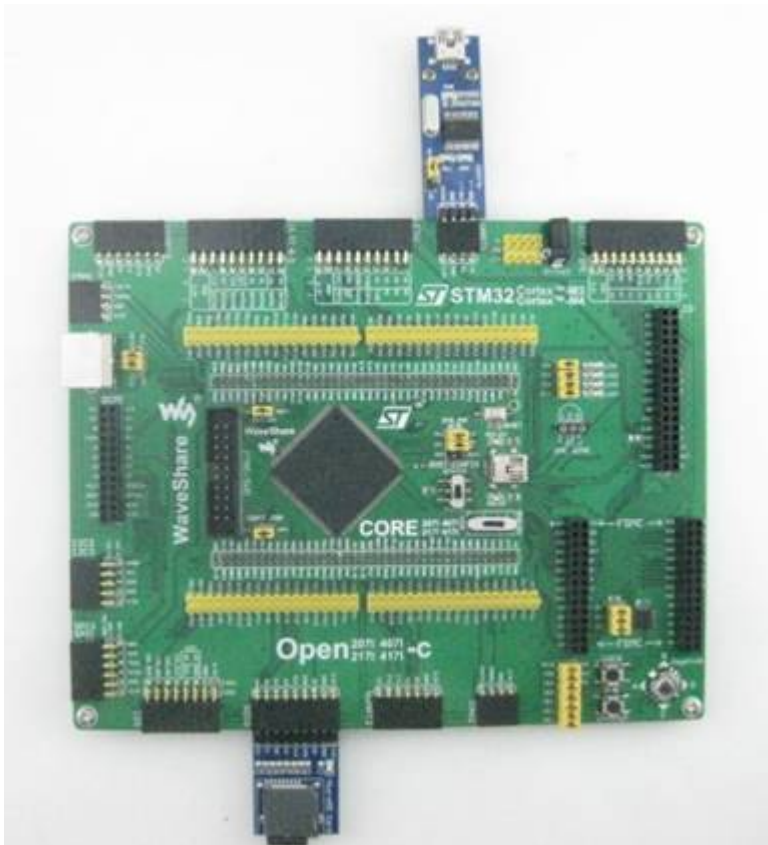
Overview

SDIO interface + FatFS demo

Hardware Connection

- Connect the Micro SD Storage Board (with SDcard) to the board via SDIO interface.
- Connect the serial port converter to theboard via UART1 interface.

As shown in thefigure below:



(/wiki/File:Open407I-C-User-Manual-

16.jpg)

Operation and Result

Launchthe serial debugging assistant, and configure it as described in chapter"Preparation".

Info/message will be displayed on the serialdebugging assistant.

SDIO

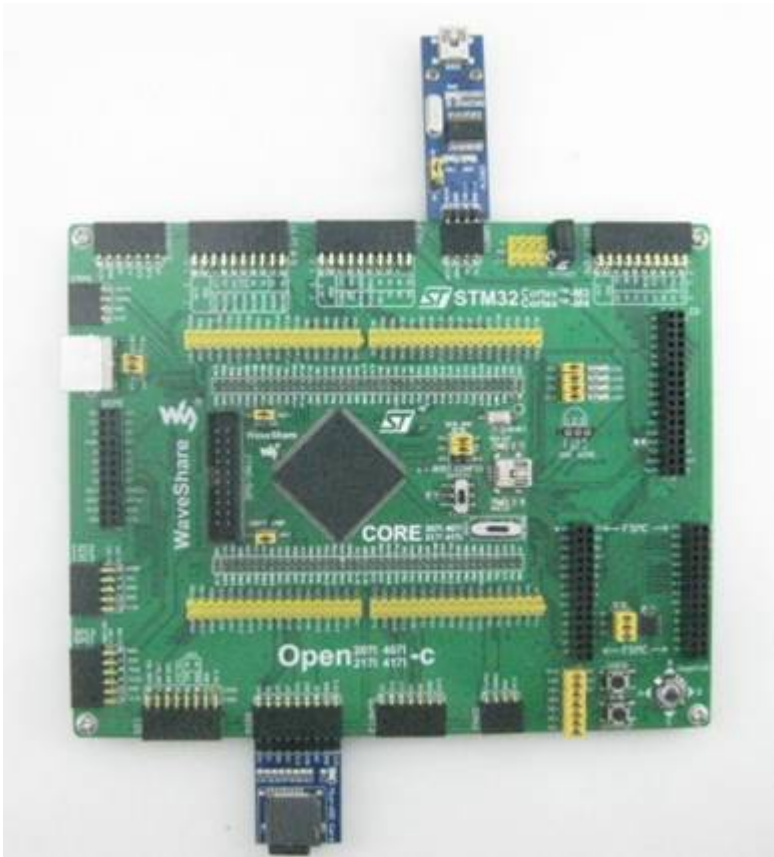
Overview

SDIO interface demo

Hardware Connection

- Connect the Micro SD Storage Board (with SDcard) to the board via SDIO interface.
- Connect the serial port converter to theboard via UART1.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-

17.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

SPI

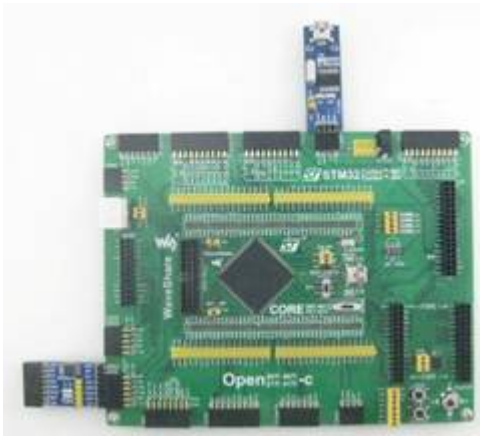
Overview

SPI Flash demo

Hardware Connection

- Connect the serial port converter to the board via UART1.
- Connect the AT45DBXX DataFlash Board to the board via SPIx interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-18.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

SRAM

Overview

SRAM demo

Hardware Connection

- Connect the IS62WV12816BLL SRAM Board to the board via FSMC interface.
- Connect the serial port converter to the board via UART1 interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-19.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the serial debugging assistant.

TouchPanel

Overview

LCD touch screen demo

Hardware Connection

- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-20.jpg)

Operation and Result

LCD touch screen function works, and allows writing and drawing on the LCD.

UcosII2.91+UCGUI3.90A

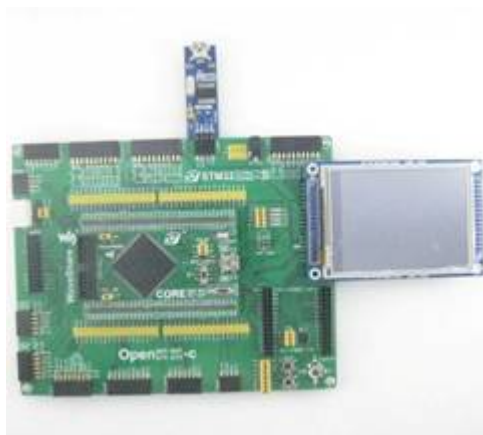
Overview

UcosII2.91+UCGUI3.90A DEMO

Hardware Connection

- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD Interface.
- Connect the serial port converter to the board via UART1.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-21.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the uCOSView-V310G and LCD.

USARTx_prinf

Overview

USART serial port demo

Hardware Connection

- Connect the serial port converter to the board via UART1 interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-15.jpg)

Operation and Result

Launch the serial debugging assistant, and configure it as described in chapter "Preparation".

Info/message will be displayed on the Serial debugging assistant.

VS1003B MP3 Board

Overview

VS1003B MP3 Board demo

Hardware Connection

- Connect VS1003B MP3 Board to the board via SPI interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-22.jpg)

Operation and Result

- Insert the headphone to the Line Out port.
- Connect the PC audio port and the VS1003B MP3 Board Line In port by audio cable.
- Play music on the PC side, then
- VS1003 (GPIO): P0 LED keeps blinking;
- VS1003 (line in): Music will be heard from PC;
- VS1003 (line out): Music will be heard from MCU FLASH;

- VS1003 (record): Sound can be heard from the Miconboard.

I2S

Overview

I2S demo

(1) MCU_FLASH

Hardware Connection

- Connect the UDA1380 Board to the board via I2S interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-23.jpg)

Operation and Result

Put the headset to the HEADPHONE jack, then will hear the music stored in the MCU FLASH.

(2) SD_FatFS

Hardware Connection

- Connect the UDA1380 Board to the board via I2S interface.
- Connect the Micro SD Storage Board (with SDCard) to the board via SDIO interface.
- Connect the serial port converter to the board via UART1.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-24.jpg)

Operation and Result

- Put the audio file named "Audio.wav" on SD card root directory.

- Put the headset to the HEADPHONE jack.
- SD card audio file information will be displayed on the serialdebugging assistant.
- Headset will output the music named Audio.wav on SD card root directory.

USB FS Example

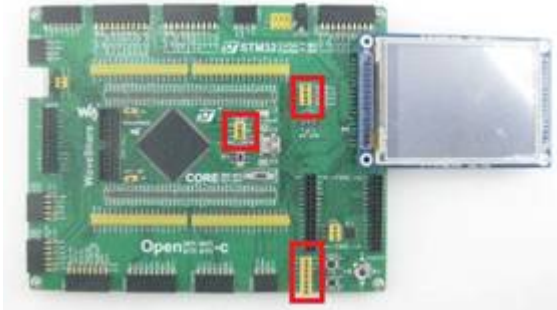
Overview

USB FS demo

Hardware Connection

- Short the 3 jumpers PC2-FLG, PC1-PWROUT, PA9-VBUS for the following test.
- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD interface.
- Short the Joystick, LED jumpers.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-25.jpg)

(1) USB_Device_Examples--HID

Hardware Connection

- Connect the PC and the Core board by USB Cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-26.jpg)

Operation and Result

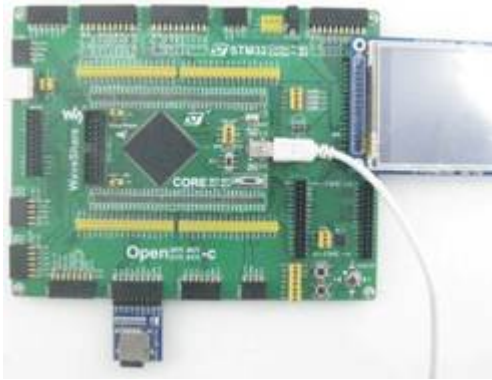
Message/info will be displayed on the LCD, and JOYSTICK can be used for simulating the mouse and controlling movement of the computer and mouse.

(2) USB_Device_Examples--MSC

Hardware Connection

- Connect the PC and the Core board by USB Cable.
- Connect the Micro SD Storage Board (with SDcard) to the board via SDIO interface.

As shown in the figure below



(/wiki/File:Open407I-C-User-Manual-27.jpg)

Operation and Result

- Message/info will be displayed on the LCD and SD card hard disk will be founded in the PC.

(3) USB_Device_Examples--VCP

Hardware Connection

- Connect the PC and the Core board by USB Cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-26.jpg)

Operation and Result

After install the driver, a USB VCP(Virtual Com Port) will be identified by the PC, short the RX TX pins of USART1 for self sending-receiving.

(4) USB_Host_Examples--MSC

Hardware Connection

- Connect the Core board and the USB Flash Drive by the USB OTG cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-28.jpg)

Operation and Result

The serial debugging assistant will display the file list in the USB flash drive, the example code will place a TXT file into the USB flash drive, and then the serial debugging assistant will display the picture.bmp message.

(5) USB_Host_Examples--HID

Hardware Connection

- Connect the Core board and the USB mouse / keyboard by the USB OTG cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-29.jpg)

Operation and Result

There will be information displayed on the LCD, and after follow the LCD tips, the mouse or keyboard will be identified:

- When identified as USB keyboard, the LCD will display the information input from the keyboard.
- When identified as USB mouse, the LCD will display the mouse current status.

(6) USB_Host_Examples_Examples--DRD

Hardware Connection

Device mode: Connect the Micro SD Storage Board (with SD card) to the board SDIO via interface; then connect the board and PC via USB cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-27.jpg)

Host mode: Connect the Core board and the USB Flash Drive by the USB OTG cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-28.jpg)

Operation and Result

Put the picture.bmp to the USB Flash Drive, and message will be displayed on the LCD

- When programming DEVICE DEMO, SD card hard disk will be founded in the PC.
- When programming HOST DEMO, press the joystick to read the picture.bmp in USB Flash Drive.

USB HS Example

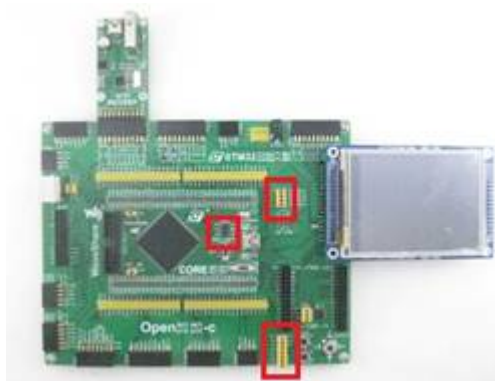
Overview

USB HS Examples

Hardware Connection

- Open the 3 jumpers PC2-FLG, PC1-PWROUT, PA9-VBUS for the following test.
- Connect the 3.2inch 320x240 Touch LCD (C) to the board via LCD interface.
- Short the Joystick, LED jumpers.
- Connect the USB3300 USB HS Board to the board via ULPI interface.

As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-30.jpg)

(1) USB_Device_Examples--DualCore

Hardware Connection

- Part 1: Connect the PC and USB3300 USB HS Board OTG receptacle by USB cable, and then connect the Micro SD

Storage Board (with SD card) to the board via SDIO interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-31.jpg)

- Part 2: Connect the core board (FS USB interface) and PC by USB cable; Short the 3 jumpers PC2-FLG, PC1-PWROUT, PA9-VBUS. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-26.jpg)

Operation and Result

- Part 1: Message/info will be displayed on the LCD; SD card hard disk will be founded in the PC.
- Part 2: Message/info will be displayed on the LCD, and JOYSTICK can be used for simulating the mouse and controlling movement of the computer and mouse.

(2) USB_Device_Examples--HID

Hardware Connection

- Connect the PC and USB3300 USB HS Board OTGreceptacle by USB cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-32.jpg)

Operation and Result

Control the computer cursor by joystick.

(3) USB_Device_Examples--MSC

Hardware Connection

- Connect the PC and USB3300 USB HS Board OTGreceptacle by USB cable, and connect the Micro SD Storage Board (with SD card)to the onboard SDIO interface. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-31.jpg)

Operation and Result

Message will be displayed on the LCD; SDcard hard disk will be founded in the PC.

(4) USB_Device_Examples--VCP

Hardware Connection

- Connect the PC and USB3300 USB HS Board OTGreceptacle by USB cable. As shown in the figure below:



(/wiki/File:Open407I-C-User-Manual-32.jpg)

Operation and Result

A USB VCP (Virtual Com Port) exists on thePC, short the RX TX pins of USART1 for self sending-receiving.

(5) USB_Device_Examples--MSC

Hardware Connection

Connect a USBflash drive to the USB3300 USB HS Board HOST receptacle.

As shown in thefigure below:

[[File:Open407I-C-User-Manual-33.jpg" align=leftspace=12>**Operationand Result**

The LCD will display the file list in theUSB flash drive, the example code will place a TXT file into the USB flashdrive, and then the LCD will display the picture.bmp.

(6) USB_Host_Examples--DualCore

Hardware Connection

- Part 1: Connect a USB flash drive to the USB3300 USB HS Board HOSTreceptacle. As shown in thefigure below:

echotool /p tcp /s, press the onboard USER KEY, there will be response from the PC.

(4) STM32F4x7_ETH_LwIP_V1.0.0—Standalone—tcp_echo_server

Operation and Result

Open a Command Prompt Window (cmd.exe),enter C:\>echotool IP_address /p tcp /r 7 /n 15 /t 2 /d
Testing LwIP TCPEcho server, press the onboard USER KEY, there will be response from the PC.

(5) STM32F4x7_ETH_LwIP_V1.0.0—Standalone—tftpserver

Operation and Result

Refer to "LwIP TCPIP stack demonstration for STM32F407microcontrollers.pdf" Page 41.

(6) STM32F4x7_ETH_LwIP_V1.0.0—Standalone—udp_echo_client

Operation and Result

Open a Command Prompt Window (cmd.exe),enter C:\>echotool /p udp /s, press the onboard USER KEY, there will be response from the PC.

(7) STM32F4x7_ETH_LwIP_V1.0.0—Standalone—udp_echo_server

Operation and Result

Open a Command Prompt Window (cmd.exe),enter C:\>echotool IP_address /p udp /r 7 /l 7 /n 15 /t 2 /d
Testing LwIPUDP echo server, press the ENTER key, there will be response from the PC.

(8) STM32F4x7_ETH_LwIP_V1.0.0—FreeRTOS--httpserver_netconn

Operation and Result

Enter 192.168.1.10 on the Internet Explorer;you'll see the demo page.

(9) STM32F4x7_ETH_LwIP_V1.0.0—FreeRTOS--httpserver_socket

Operation and Result

Enter 192.168.1.10 on the Internet Explorer;you'll see the demo page.

(10) STM32F4x7_ETH_LwIP_V1.0.0—FreeRTOS--udptcp_echo_server_netconn

Operation and Result

Enter 192.168.1.10 on the Internet Explorer;you'll see the demo page.

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