

Overview

This Host FatFs example supports UFI and SCSI U-disk device.

The application prints the attached device information when U-disk device is attached. The application executes some FatFs APIs to test the attached device.

System Requirement

Hardware requirements

- Mini/micro USB cable
- USB A to micro AB cable
- Hardware (Tower module/base board, and so on) for a specific device
- Personal Computer (PC)

Software requirements

- The project path is:
`<MCUXpresso_SDK_Install>/boards/<board>/usb_examples/usb_host_msdfatfs/<rtos>/<toolchain>.`

Note

The <rtos> is Bare Metal or FreeRTOS OS.

Getting Started

Hardware Settings

- Jumper settings for REV B:
J17 1-2 and 3-5. Besides, two 33ohm resistors (R225 and R227) have to be populated on nets K21_MICRO_USB_DP and K21_MICRO_USB_DN and two 33ohm resistors (R224 and R226) on nets USB0_DP and USB0_DN have to be removed for using micro USB connector. 1-2 and 3-5. Besides, two 33ohm resistors (R224 and R226) have to be populated on nets USB0_DP and USB0_DN and two 33ohm resistors (R225 and R227) on nets K21_MICRO_USB_DP and K21_MICRO_USB_DN have to be removed for using TWR-SER board's mini USB connector.
- The Jumper settings REV C:
J17 1-2 and 3-5, J24 1-2 for micro USB connector. 1-2, J24 2-3 for using TWR-SER mini USB connector.

Note

Set the hardware jumpers (Tower system/base module) to default settings.

Prepare the example

1. Download the program to the target board.
2. Power off the target board and power on again.
3. Connect devices to the board.

Note

For detailed instructions, see the appropriate board User's Guide.

Run the example

1. Connect the board UART to the PC and open the COM port in a terminal tool.
2. Plug in a HUB or a U-disk device to the board. The attached information prints out in the terminal.
3. The test information prints in the terminal. The "success" message prints when a FatFs API succeeds. The "fail" message prints when a FatFs API fails. The test completes when either the FatFs API fails or all the tests are done.

The following figure is an example for attaching one U-disk device.

```

host init done
mass storage device attached:pid=0x312bvid=0x125f address=1
.....fatfs test.....
fatfs mount as logiacal driver 1.....success
test f_mkfs.....success
test f_getfree:
    FAT type = FAT32
    bytes per cluster = 32768; number of clusters=474069
    The free size: 15170176KB, the total size:15170208KB
directory operation:
list root directory:

create directory "dir_1".....success
create directory "dir_2".....success
create sub directory "dir_2/sub_1".....success
list root directory:
    dir - ____ - DIR_1 - 0Bytes - 2015-1-1 0:0:0
    dir - ____ - DIR_2 - 0Bytes - 2015-1-1 0:0:0
list directory "dir_1":
    dir - ____ - SUB_1 - 0Bytes - 2015-1-1 0:0:0
rename directory "dir_1/sub_1" to "dir_1/sub_2".....success
delete directory "dir_1/sub_2".....success
get directory "dir_1" information:
    dir - ____ - DIR_1 - 0Bytes - 2015-1-1 0:0:0
change "dir_1" timestamp to 2015.10.1, 12:30:0.....success
get directory "dir_1" information:
    dir - ____ - DIR_1 - 0Bytes - 2015-10-1 12:30:0
file operation:
create file "f_1.dat".....success
test f_write.....success
test f_printf.....success
test f_puts.....success
test f_putc.....success
test f_seek.....success
test f_gets.....ABCDEFGH
test f_read.....JKLMNOPQRS
test f_truncate.....success
test f_close.....success
get file "f_1.dat" information:
    fil - ____ - F_1.DAT - 19Bytes - 2015-1-1 0:0:0
change "f_1.dat" timestamp to 2015.10.1, 12:30:0.....success
change "f_1.dat" to readonly.....success
get file "f_1.dat" information:
    fil - R__ - F_1.DAT - 19Bytes - 2015-10-1 12:30:0
remove "f_1.dat" readonly attribute.....success
get file "f_1.dat" information:
    fil - ____ - F_1.DAT - 19Bytes - 2015-10-1 12:30:0
rename "f_1.dat" to "f_2.dat".....success
delete "f_2.dat".....success
.....test done.....

```

Figure 1: Attach U-disk device

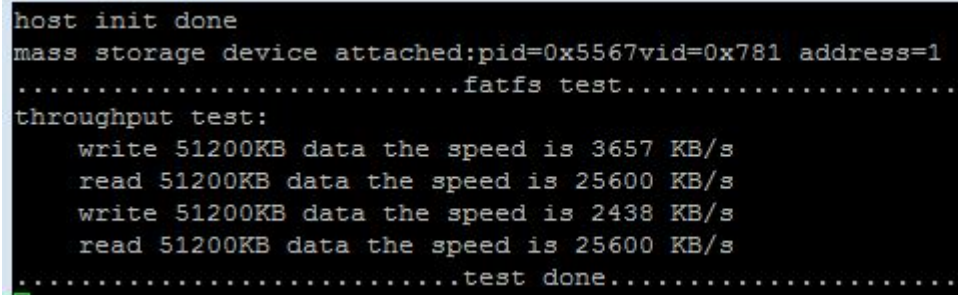
4. To test the throughput, set the MSD_FATFS_THROUGHPUT_TEST_ENABLE to (1) in the file host_msd_fatfs.h. An additional 64 K RAM is required to test the throughput. The macro is only supported on TWR-K65F180M Tower System module and IAR IDE.

The throughput test process is as follows:

- Enable MSD_FATFS_THROUGHPUT_TEST_ENABLE.

- Format the U-disk in the PC. Select the "Allocation unit size" 32 K.
- Insert the U-disk. The throughput test starts.

The following image shows an example.



```
host init done
mass storage device attached:pid=0x5567vid=0x781 address=1
.....fatfs test.....
throughput test:
  write 51200KB data the speed is 3657 KB/s
  read 51200KB data the speed is 25600 KB/s
  write 51200KB data the speed is 2438 KB/s
  read 51200KB data the speed is 25600 KB/s
.....test done.....
```

Figure 2: Throughput test

Note

The throughput test only supports the TWR-K65F180M Tower System module.