ANCYWICED008

WICED™ Studio 4
WICED Filesystem Demo Application Note

Associated Part Family: CYW20719B0

This document describes how to interface a Secure Digital (SD) memory card to a CYW9207x9WCDEVAL development board, using the Serial Peripheral Interface (SPI) transport, and how to access it using the WICED Studio "filesystem_demo_app" running on a CYW20719B0 device

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1 Introduction

This document provides information on how to use SD Cards with a WICED CYW9207x9WCDEVAL board, using the WICED Studio 20719 Bluetooth filesystem_demo_app.

2 IoT Resources

Cypress provides a wealth of data at http://www.cypress.com/internet-things-iot to help you to select the right IoT device for your design, and quickly and effectively integrate the device into your design. Cypress provides customer access to a wide range of information, including technical documentation, schematic diagrams, product bill of materials, PCB layout information, and software updates. Customers can acquire technical documentation and software from the Cypress Support Community website (http://community.cypress.com/).

3 Filesystem Support for SD Cards

If you have an application which requires audio, graphics, data logging, etc., in it, you will need an SD or MicroSD card storage option to store large amounts of data. The filesystem demo application included in WICED Studio demonstrates accessing an SD card from a CYW20719B0 device using the WICED filesystem APIs for reading from and writing to the SD card over the SPI transport.

The WICED filesystem APIs support FAT32 SDHC cards version V2.0 or later, and speeds of Class 6 or greater [1]. Examples include: 4GB Class 6, 8GB class 10 etc.

3.1 Connect the SD Card

The SPI lines used on the CYW9207x9WCDEVAL board are configured by the filesystem demo application, refer to the filesystem_demo.c and spi_block_init.c files in your WICED Studio installation under the WICED-Studio-4.0\20719-B0_Bluetooth\apps\filesystem_demo_app folder for the GPIO and SPI line mapping used by the application.

Use any SD card reader/adapter to interface the SD card to the CYW9207x9WCDEVAL board. Some examples of SD card readers are shown in Figure 1.

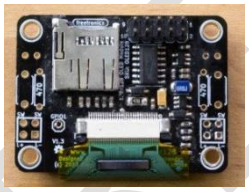
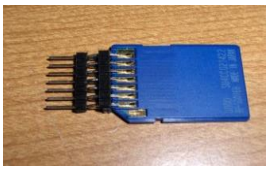
MicroSD card reader in Freetronics OLED Display Module.	Any SPI based SD card adapters with SPI lines brought out for easy connection	Solder pins on SD card adapters for laptops.
		

Figure 1: SD Card Reader Examples

Connect all the SPI lines (SCLK, CS, MISO, MOSI, VCC and GND) from the SD card reader to the CYW9207x9WCDEVAL board. Make sure connecting wires are thin and shorter length (< 5cm is good).

Connections between the CYW9207x9WCDEVAL and the Freetronics OLED module are shown in Figure 2.

Pins	CYW9207x9WCDEVAL	OLED Freetronics
MISO	P29 (J12/4)	5
MOSI	P28 (J12/3)	6
CS	P0 (J11/1)	3
SCLK	P34 (J12/6)	7
5V	VDD5(J8/5)	1
GND	J3/4	2

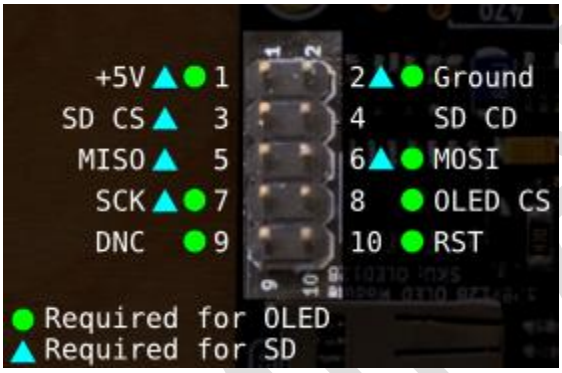


Figure 2: Freetronics OLED module

3.2 Using the Application

Follow the “Build and Load a Sample Application” procedure from the CYW20719 Quick Start Guide [2] to compile and download the filesystem_demo_app to the CYW20719B0 device. Once the download is complete, open any terminal application to see application traces on the UART2 (PUART) port to verify operation.

Then, insert the SD card into the card reader slot and press the reset button on the CYW9207x9WCDEVAL board to run the application. The filesystem_demo_app will have created sample files and folders on the SD card. To view the sample files and folders, remove the SD card from the board and insert it into a computer to view the files and folders in any OS (e.g.: Windows Explorer).

3.3 Formatting the SD Card

SD cards can be formatted before using, or with the filesystem demo application itself. Formatting options include:

1. Windows

From Windows Explorer format the SD card using FAT32. Note - Windows will not allow formatting 2GB SD cards as FAT32, so use cards with capacity greater than 2GB. The Quick-Format option can be used; it is faster, but it will not recover bad sectors. To completely recover the bad sectors, perform a full format; this is required if there are any mounting errors. Also see Option 2.

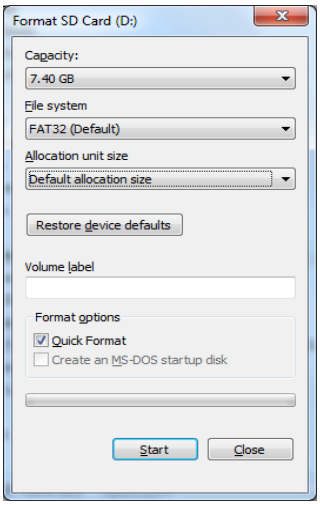


Figure 3: Windows Explorer Format Option

1. SD Card Formatter from the SD Association [3]

Download and run the SD Card Formatter application. Choose your SD drive, click Option and choose Format type as “Select Full (Over Write)”. This format takes some time, but will recover all bad sectors.

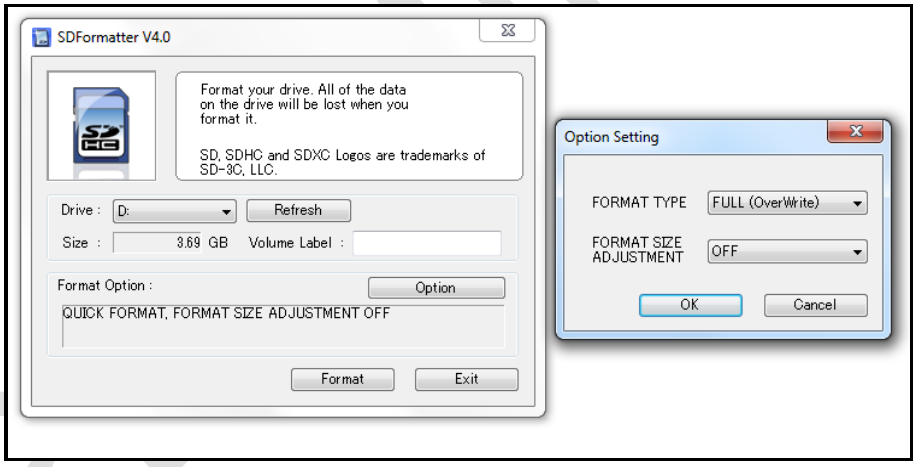


Figure 4: SD Card Formatter Option

2. From the filesystem_demo_app

The filesystem demo app can also format an SD card. Two options available can be used by changing the demo app’s source code as follows:

a. 256MB volatile RAM

Set

```
spi_block_device_init_data.volatile_and_requires_format_when_mounting = 1;
```

in function `install_spi_driver()`, in file `spi_block_init.c`

b. 256 MB RAM

Call:

```
wiced_filesystem_format( &spi_block_device, WICED_FILESYSTEM_HANDLE_FILEX);
```

after the call to `install_spi_driver( SPIFFY_BLOCK_2 )` in function `test_filesystem()`, in file `filesystem_demo.c`.

Note: This formatting option will take some time, as it is a full overwrite. Monitor the “Formatting ….” messages printed on the terminal UART2: when “….” messages stop, it means formatting is done and then the app will start mounting.

References

[1] SD Association Standards Overview (see https://www.sdcard.org/developers/overview/index.html)

[2] WICED Quick Start Guide for BT 20719 (ANCYWICED001)

[3] SD Association SD Card Formatter (https://www.sdcard.org/downloads/formatter_4/)

Document History

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Revision	Submission Date	Description of Change
**	11/14/2016	Initial release

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