# SD Card to SD Card Data Transfer without PC

Mrinal Mendon[1], Rahul Mayanak[2], Gaurav Baraskar[3], Mayuri Waghmode[4] & Prof. Sonali Pakhmode[5]

[1,2,3,4]B.E Student [5]Assistant Professor

[1,2,3,4,5]Department Of Information Technology Engineering, PVPPCOE Sion, Mumbai 400022.

*Abstract: SD-to-SD direct data transfer will be implemented using a microcontroller which will have two SD card controllers for two SD cards which have data to be transferred. The SD host controller manages both SD memory card standards and SDIO card standards. This simplifies host system and driver designs by using a standardized implementation that reduces product development time.*

## 1. Introduction

SD-to-SD direct data transfer defines a standard register set to control SD memory card and SDIO card standards. It also provides a sophisticated direct memory access function to achieve high-performance data transfers between SD standard host systems and memory cards. Largely because of hardware control, SD transfers data without having to rely on the CPU specifications. In addition, there will be a LCD to display the operations taking place and keypad for providing input as well as a battery for providing power source. Hence this is a portable and an efficient way to transfer data between two SD cards as there is no need of redundant transfer applications or soft wares. Note that the file system for SD cards is FAT32. Also note that at a given point of time, 2GB of data can be transferred because file system being used is FAT32. With the help of this project we can not only transfer the data but also we can see the transfer of the particular file which we want to send by using LCD display. In our project we will be transferring the data between SD cards without using any PC or laptops so that further users can insert these SD cards into their mobile phones and get data transferred from another SD card without the need of Bluetooth connection or even Wi fi-tethering.

## 2. Existing System

Nowadays we store large amount of data in pen drives, SD-cards and portable hard drives. To access such data we often need a laptop or a personal computer. Also mobile phones have a SD-Card slot there is a need of a laptop or personal computer, so that we can view the data and select the data to be transferred. In mobile phones data transfers from SD-Card to SD-Card can take place but it doesn't take place simultaneously as the mobile phones are equipped with only one SD-Card Slot. So there is a need of a laptop or personal computer whenever there arises a transfer of data between two SD-Cards or Pen drives. Data transfer needs a Laptop or a personal Computer. Privacy is not maintained in Data Transfer. One mobile phone does not contain 2 SD-Cards.

## 3. Proposed System

To overcome the use of a laptop or a personal computer for Data transfer, we are building a portable device which can handle Data transfer between SD-Cards and Pen drives. This device is a handy device which can handle data transfer from SD-Cards as well as Pen drives with high data transfer rate up to 2GB. The device we are building is efficient and cheap as compared to cost of laptop or a personal computer. This device is operated by a battery so it's portable and can long last for up to 3 days when fully charged. Also it can also be used as a Power Bank or a Portable charger to charge mobile phones.

## 4. Components

- **Raspberry pi**

The Pi features a system-on-a-chip setup built around the Broadcom BCM2835 processor (a tiny but fairly powerful mobile processor commonly used in cell phones) that includes a CPU, GPU, audio/video processing, and other functionality all on a low-power chip. The original Raspberry Pi is based on the Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 700 MHz processor, Video Core IV GPU, and was originally shipped with 256 megabytes of RAM, later upgraded (models B and B+) to 512 MB. The system has Secure Digital (SD) (models A and B) or Micro SD (models A+ and B+) sockets for boot media and persistent storage.

- **SD Card**

An SD Card (Secure Digital Card) is an ultra-small flash memory card designed to provide high-capacity memory in a small size. SD cards are used in many small portable devices such as digital video camcorders, digital cameras, handheld computers, audio players and mobile phones. An SD card is about the size of a postage stamp and weighs approximately two grams. It is similar in size to a Multimedia Card, but smaller than older memory card types such as the Smart Media card and the Compact Flash card. Both MMC and SD cards provide encryption capabilities for protected content to ensure secure distribution of copyrighted material, such as digital music, video, and eBooks. SD cards are available with storage capacities as high as 4 gigabytes.

- **LCD**

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD.

- **USB to SD Card Converter**

A USB to SD converter is a device for accessing the data on a memory card such as a CompactFlash (CF), Secure Digital (SD) or MultiMediaCard (MMC). Most converters also offer write capability, and together with the card, this can function as a pen drive. Some printers and personal computers have a built-in converter. A multi card converter is used for communication with more than one type of flash memory card. Multi card converters do not have built-in memory capacity, but are able to accept multiple types and styles of memory cards. The number of compatible memory cards varies from converter to converter and can include more than 20 different types. There are three categories of converters sorted by the type and quantity of the card slots: single card reader (e.g. 1x SD-only), multi card reader (e.g. 9-in-1) and series card reader (e.g. 4x SD only).

- **PCB Mountable Buttons**

A push-button (also spelled pushbutton or PCB-mountable buttons) or simply button is a simple switch mechanism for controlling some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed. Buttons are most often biased switches, though even many un-biased buttons (due to their physical nature) require a spring to return to their un-pushed state. Different people use different terms for the "pushing" of the button, such as press, depress, mash, and punch.

## 5. Design

The Efficient Data Transfer System designing included the top down approach. First we analyzed the problem, then we divide the system into five parts, viz user interface, Raspberry Pi (Hardware), Display unit, SD cards (Source and Destination SD-Card).
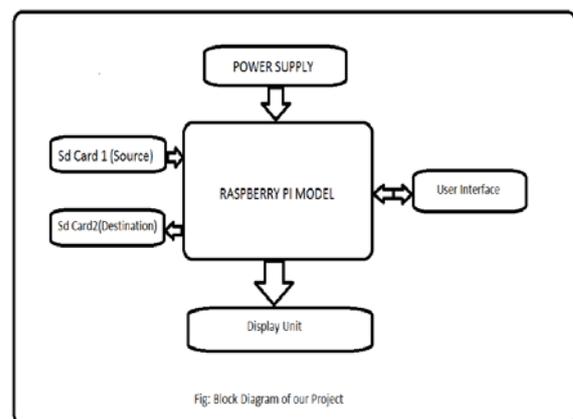
- **Block Diagram**



Fig: Block Diagram of our Project

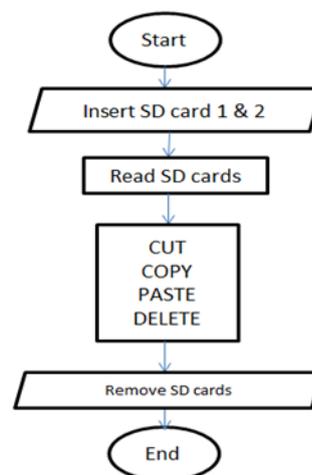**Figure 1: Block Diagram**

- **Dataflow Diagram**



**Figure 2: Data Flow Diagram**

## 6. Implementation of SD Card to SD Card Data transfer Without PC

- **Installing Raspbian OS on Raspberry pi**

Download the Raspbian OS. Extract the Downloaded file and we get a raspbian.img (i.e .img extension) file. For writing the .img file on the SD card download the Win32DiskImager Software. Open the Win32DiskImager S/W and select the Memory card which you are going to insert in the Raspberry Pi Model and write the .img file on the same. Insert the SD-Card with Rasbian OS in the Raspberry Pi and it is ready First boot. Connect the keyboard mouse and power supply and you are ready for the First Boot.
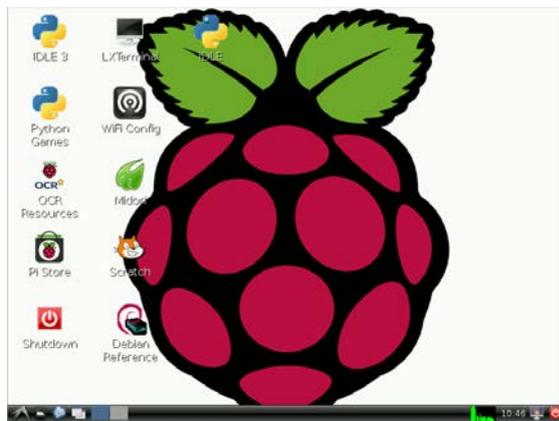


**Figure 3: Raspbian OS**

- **Circuit Diagram**

The Raspberry Pi offers up its GPIO over a standard male header on the board. Over the years the header has expanded from 26 pins to 40 pins while maintaining the original pin out. There are (at least) two, different numbering schemes you may encounter when referencing Pi pin numbers: (1) Broadcom chip-specific pin numbers and (2) P1 physical pin numbers. You're usually free to use either number-system, but many programs require that you declare which scheme you're using at the very beginning of your program.

The first three pins provide power to the LCD module. Pin 1 is GND and should be grounded to the power supply. Pin 2 is VCC and should be connected to +5V power. Pin 3 is the LCD Display Bias. By adjusting the voltage or duty cycle of pin 3, the contrast of the display can be adjusted. Most character LCDs can achieve good display contrast with a voltage between 5V and 0V on pin 3. Note that greater contrast comes with lower voltage and you should never apply a VLCD higher than VCC. Some displays which are specially made to work over a large temperature range may require a negative voltage to achieve readable contrast. Pins 4,5, and 6 are the control lines for the LCD. These lines indicate what kind of transaction you are proposing to do over the data lines DB0-7. The state of RS indicates whether you wish to transfer commands or display data. The R/W line indicates whether you intend to read or write. Finally, the E line tells the display when you are actually ready to perform the transaction. The control lines RS, R/W, and E, along with the data lines DB0-7 are standard digital logic inputs or outputs. Remember than when performing reads you must set the port connected to DB0-7 to be input.
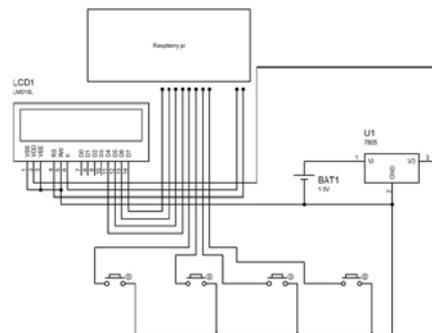


**Figure 4: Circuit Diagram of our System**

- **Working Of The device**

Insert two USB to SD card converter to the device. Once the device has read both the cards its will display a message Select source Press 1 or 2.

Once the button is pressed it will first display the button pressed and then display the content of the USB to SD card converter that was inserted with respect to the buttons. The first line displayed on the LCD is the pointer and the content that can be selected. On pressing of button 3 the device will copy the content to the other USB to SD card converter from the selected USB to SD card converter. Here are some pictures of the data transfer taking place.
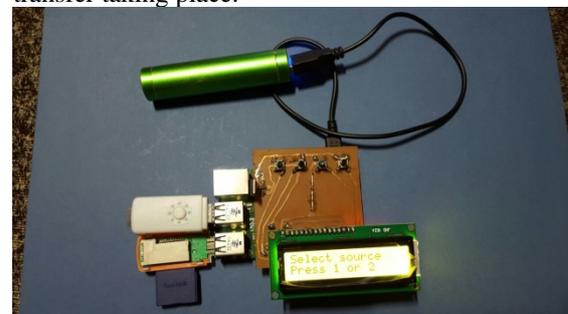


**Figure 5: Select Source**

**Figure 6: Select Content**



**Figure 7: Copying**

## 7. Conclusion

In this paper we discuss a way to build a SD card to SD card data transfer device and its implementation. We, therefore, suggest a group of methods for constructing a SD Card to SD card device, and show the result's quality. The quality of this approach shows a greater improvement in the speed of data transfer without a PC when actually being compared to a PC for data transfer operations.

## 8. Acknowledgement

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