IJASRM

International Journal of Advanced Scientific Research and Management, Vol. 2 Issue 7, July 2017.

www.ijasrm.com

ISSN 2455-6378

Wireless Data Transfer Of USB Devices Using Wifi Technology

Rohan Kulashresta[1], Rajeev Ranjan[2],Shreyas Barati[3] , Rakesh M[4], Vibha T G[5]

[1,2,3,4] Department of Electronics and Communication, Dayananda Sagar college of Engineering, Bengaluru-560078, Karnataka, INDIA

[5]Assistant Professor, Department of Electronics and Communication, Dayananda Sagar college of Engineering-560078, Bengaluru, Karnataka, INDIA

Abstract

USB flash drive is one of the commonly used memory storage device by all the people. The main reason for this is because of its compatibility and user friendly memory storage device. It can able to store data of any kind. The data stored in the USB flash drive can be erased, edited, formatted. The amount of data that can be stored depends upon the size allocated for the USB flash drive. Memory spaces commonly used are 2GB, 4GB, 8GB, 16GB and 32GB. The cost of the USB device varies depending upon the memory space of the flash drive. The USB flash drive can be operated by connecting it to the PC or laptop. With diversification of systems and their operating environment, sometimes it becomes difficult to transfer data from one system to another. Due to this limitation the need is felt of transferring data wireless between the two systems not having proper channel for communications. This can be done by using a Wireless USB device. Generally, we used to transfer data by connecting the pen drives or hard disks to the computers, laptops or sometimes mobile phones but here proposed a model to transfer the data between the storage device and computer systems using Wi-Fi technology i.e. without establishing a physical connection between them. With that make the old USBs and hard Drives can be made wireless as well. Four devices can be connected at a time. Data reading and writing in USB flash devices is only possible by using USB cables and USB ports of PC. This work explains an idea of Wireless means of data transfer for USB devices without using USB cables and ports of PC. So, by this device we can easily transfer our data directly from pen drive to computer systems or smart phones and vice versa.

***Keywords*—**USB device,WIFI technology.LINKIT-DUO 7688.

1. Introduction

The Wireless USB Flash Devices are almost same as that of normal USB Flash Devices but some additional features are added to support the Wireless data transmission and reception. Nowadays to connect storage devices to the computer systems is done using USB slots by using USB cable. USB was initially designed to be an interface for communicating with many types of peripherals.Every recent PC includes USB ports that can connect to standard peripherals such as keyboards, mouse, scanners, cameras, printers, and storage drives. It is a very useful protocol designed for a computer to communicate with almost any type of peripheral.

.

Several data and application are developed daily which common computer user has to transfer from one USB Flash device into another with the minimum wastage of time. Previously, a USB had to be connected to a system and transfer the data and it had removed and connected to another system and so on. It is not necessary that all of these devices are supported by the computer and the operating system and their device drivers are available and installed.

The project is designed with a board called Linkit Duo 7688 which has in-built microprocessor as well as microcontroller. The board also has the Wi-Fi module, SD card slot and OTG slots to connect power and external USB devices. Hence a model is designed for transferring data to and fro from USB drive to computer systems or smart phones without establishing the physical connection.

IJASRM

International Journal of Advanced Scientific Research and Management, Vol. 2 Issue 7, July 2017.

www.ijasrm.com

ISSN 2455-6378

2. Conventional Methods

- Previously USB had to be connected to the USB slots and then the data had to be transferred.
- The data from mobile had to be transferred to USB via OTG cable.
- Only one-to-one connection was possible.
- Use of cables.

Issues with the Conventional Methods:

- Sometimes if all ports of the computer systems are busy or in some devices like mobile phone or Tablets where port for direct connection is absent, then external circuitry or cables are required to establish the connection.
- More than one device cannot access the data at one instance.

  Therefore a wireless connection would be preferable for a hassle-free transfer of data.

3. Literature Survey

1. To do the transfer how the data is transferred via Bluetooth between two devices was studied from the paper [1]'A concept of data transfer via Bluetooth in pendrive'.

   This idea included a flash drive of 1GB capable of transmitting and receiving data wirelessly between itself and other devices. Infrared, Bluetooth and satellite communication was used for this objective. But due to very less range of operation of infrared and expensive satellite communication, Bluetooth was used for the wireless data transmission.

2. The paper [2]'Pendrive to Pendrive and mobile data transfer using ARM' was referred to study the how the wireless transfer was done using ARM and what were the difficulties faced with that.
3. A core of Umax technologies from U.S.A. is doing their research on this project.
4. Also referred [4]'Wired and wireless transmission of data between pendrives and pendrives to computer using ARM'
5. [5]IEEE paper published by Ducloux, J, Petrashin, P, in 2011 titled by Embedded USB dual role system for communication with mobile devices.

By referring all the papers an idea of wireless data transfer for USB devices like pendrive,hard disks using Linkit Duo was derived.Linkit Duo has an inbuilt WiFi and makes any USB device connected to it wireless thus acking as a media for wireless data transfer.

4.Modern Technology Proposed

The USB storage device designed here wil be wireless. We just require to provide the supply of 3.3 V to 5 V. We will use micro SD card to provide the storage for our wireless USB. There are three major benefits of the model which we are designing of which the first is Data transfer and storage through wireless medium i.e. Wi-Fi. The second one is, the device will allow so many users to get connected to the device simultaneously or a particular time and the last and best is the device has capability to make the conventional USB storage Devices wireless.No external cable is required for the transfer of data.The Transfer rate does not depend on the type of port.PC is not required to transfer the data from one device to another.The connection is simple and the configuration is done automatically.

The steps followed are

1. Microprocessor is the backbone of the project as we are designing the Wireless USB drive, the microprocessor will act as storage USB and to make it wireless, a Wi-Fi module is required. So it is better to choose a microprocessor board which has in-built Wi-Fi module like Raspberry pi 3,orange pi, onion omega, Linkit Duo etc. For the project LinkitDuo 7688 board is chosen.
2. To provide storage for our Wireless USB, we require an external EEPROM.The board which we have chosen has in-built SD card slot. So to provide storage for the Wireless USB, we used 8 GB SD card.

3. Most of the microprocessor boards which are available in the market supports Linux based operating system and so the Linkit Duo 7688 does. All Linux based operating system supports EXT4 format of external memory whether it is SD card, Pendrive or hard disk instead of FAT32 format. So we need to convert SD card into EXT4 format.Wireless Data transfer of USB devices through Wi-Fi technology
4. After conversion of SD card file format, we can head towards the firmware part of the project. For the firmware part, we require an Openwrt to embed the instructions into the hardware board. Here we have used 'PuTTY for Windows' as Openwrt to provide the instructions to board to perform the required specific functions.
5. To add a special feature in the model, an extra slot is prvided to connect the USBs which most of the people are currently using to make them wireless too.

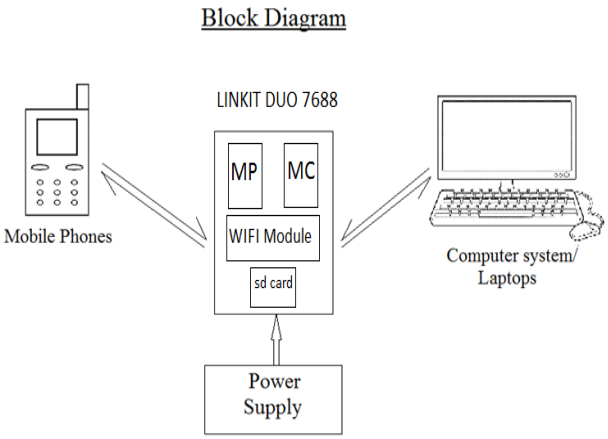
IJASRM

International Journal of Advanced Scientific Research and Management, Vol. 2 Issue 7, July 2017.

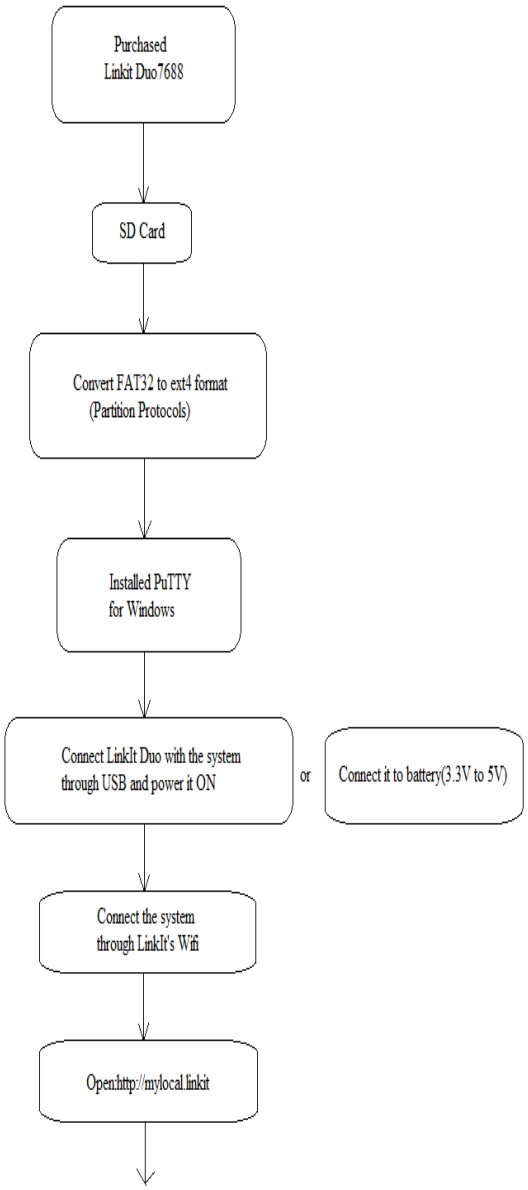
www.ijasrm.com

ISSN 2455-6378

5.Block Diagram



6.Flowchart

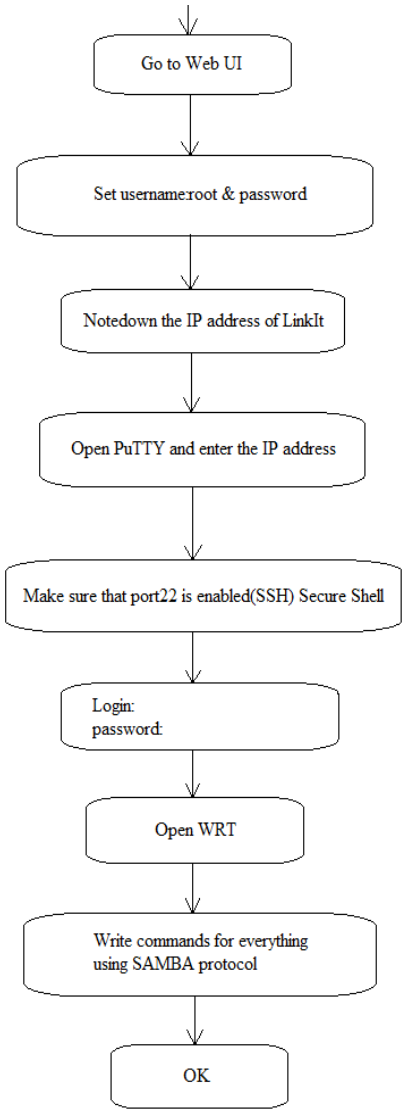


IJASRM

International Journal of Advanced Scientific Research and Management, Vol. 2 Issue 7, July 2017.

www.ijasrm.com

ISSN 2455-6378



7.Hardware Tools Used:

7.1Linkit Duo 7688 board (designed by Mediatek Labs and Seeed Studios): It is the microprocessor part of our model. It acts as a Wireless pendrive with storage provided by the SD card. It has in-built Wi-Fi module.LinkItTM Smart 7688 Duo (a compact controller board) is an open development board based on MT7688 (datasheet) and ATmega32u4. The board is compatible with Arduino Yun sketches and is based on the OpenWrt Linux distribution. The board is designed especially to enable prototyping of Rich Application IoT devices for smart home or office. As it is compatible well with Arduino, you can use different features from Arduino Yun and LinkIt Smart 7688 Duo. This will help you build rich applications based on various, robust and compiled Arduino Yun sketches. The board offers you the memory and packet storage to enable robust video processing. The platform also offers options to create device applications in Python, Node.js and C programming languages.LinkIt Smart 7688 duo is a co-design product by Seeed Studio and MediaTek. It brings together the parties' knowledge in open hardware and industry leading reference designs for IoT devices to create this powerful development board.

OTG to Female USB cable: For the interfacing of external USB device with the board.

USB storage device: To show the functioning of sending and receiving the data through wireless technology for old USB drives.

SD Card: To provide storage for Wireless Pendrive and root FS.

PuTTy for Windows: It is the open Wrt to access the Linkit Duo microprocessor board

Mini tool Partition Wizard: To change the file format of SD card and USB device from FAT32 to EXT4.

Total Commander Android App: To allow the network sharing in android device.

8.Possible Outcomes

- System is able to make any USB device connected to LinKit wireless.
- System is able to connect many devices simultaneously through wireless mode using Wi-Fi technology
- The system will facilitate the user by providing capability to make conventional storage devices wireless
- The system has made the data transfer into smartphone reliable.
- The system has provided the facility to transfer the data between devices with different operating systems (e.g. Laptops and mobile phones) in an easy and reliable manner.

9.Simulation And Results

- To present the Demonstration, we just need to provide power supply of 5 V to our device through the battery or household charging sockets.
- The green and red LEDs present on the device will glow together suddenly after providing power supply. The green light indicates whether the power supply is connected or not.
- The Red light will indicate the processes to turn ON the Wi-Fi in station mode of the device and Tethering in

IJASRM

International Journal of Advanced Scientific Research and Management, Vol. 2 Issue 7, July 2017.

www.ijasrm.com

ISSN 2455-6378

Access Point (AP) mode of the device. After tethering services begin, the red LED starts to blink.

- The blinking of red LED is the sign that tethering is ON now and the user can connect their devices through the Wi-Fi to the storage drive.
- The user's Computer system or smart phone will recognize the new network and will start showing the folder for storage present in the USB drives which we have designed.
- Now the user can Send, receive and delete data from the folder by the commands provided by the operating system.
- If user connects its own conventional USB drive, then network sharing window will show one more folder for external USB drives.

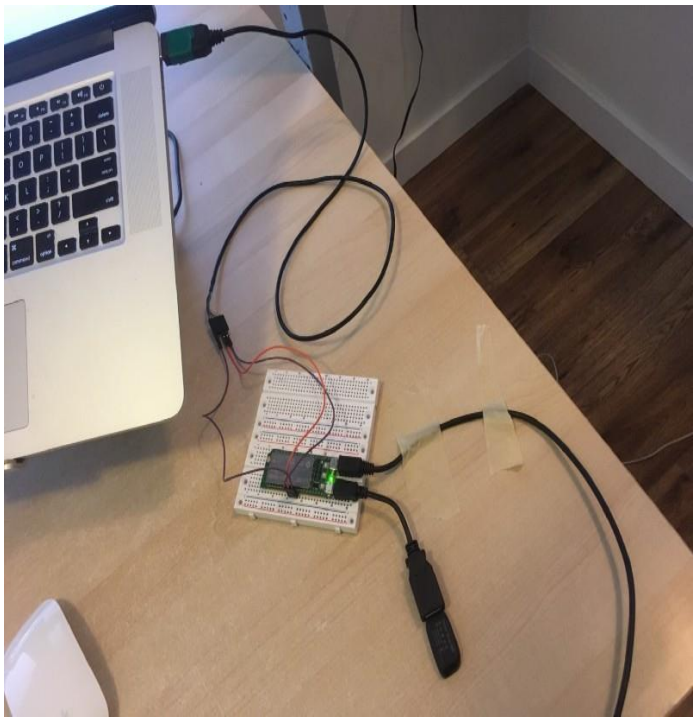


Fig1

Fig 1 shows the complete working model wherein a pendrive is connected to LinKit Duo and power supply is given to board through laptop and wireless data transfer from that pendrive can be shown happening with another lapatop.

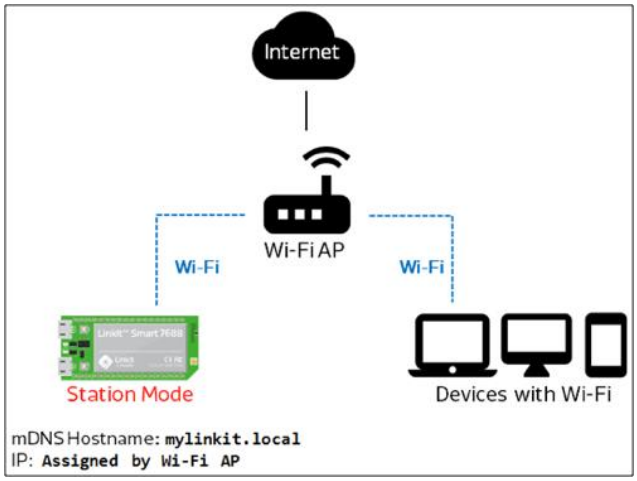


Fig 2

Fig 2 shows that wireless data transfer can take place between USB device and laptop or any mobile device with Wi-fi

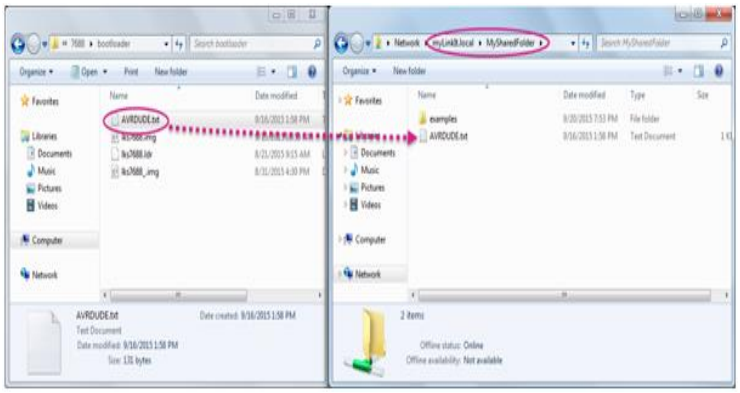


Fig 3

- Fig 3 shows the file transfer taking place using WiFi technology using Linkit Duo as the media which makes the data transfer through the pendriive/storage device wirelesss.

10.Conclusion

This paper describes how to send and receive data from one USB flash device to Other PCs or mobile devices without using the USB cables and USB ports of PC. At the same time security is provided to the data in the device as this device can exchange data only with authorized persons or authorized PCs. The project undertaken satisfies the needs of the current generation that requires portable means of carrying data transfers. We can easily find the USB and its applications everywhere around us. The applications of the USB are computer peripherals such as keyboard, pointing devices, digital cameras, printers, portable media players, disk drives

and network adapter, both to communicate and to supply electric power. It has become common place on other devices, such as smart phones, PDAs and video game consoles. USB has effectively replaced a variety of earlier interfaces, such as serial and parallel ports, as well as separate power chargers for portable devices. Carrying a computer or a laptop just for the sake of data transfer is not affordable these days in the age when people want all devices to be handy. To implement this Pen drive to mobile or PC data transfer we use LinkitTM Smart 7688 Duo. It is an open development board based on MT7688 and ATmega 32u4 and also we use WIFI for wireless transmission of data ,and also we convert the FAT32 file system to EXT4 file system format included hardwired on the host controller to avoid complication in microprocessor code to decode it. A dedicated USB Host controller from Mediatek was found- LinkIt smart 7688 Duo. During synchronization of data, only the authorized PC user should access the USB flash drive. Hence, a solution has been found for this problem. We can use a secure USB flash drive i.e. a USB flash drive with secure code can be used. It has a keypad with a numbers from 0 to 9. Unless the correct combination of the code is pressed, the USB flash drive is inaccessible. Thus unauthorized members cannot access the USB flash drive. The user can access the USB flash drive by placing it at some distance from the PC. The cost of the USB device varies depending upon the memory space of the flash drive.

Finally we can conclude that the devices which don't have USB ports like cellular phones can directly transmit/receive data to/from these types of wireless USB flash devices.

References

[1]‘ A concept of data transfer via Bluetooth in pendrive’ of Global Research in Computer ScienceVolume 4, No. 4, April 2013

[2] ‘Pen Drive to Pen Drive and Mobile Data Transfer Using ARM’IOSR Journal of Electronics and Communication Engineering (IOSR-JECE)

[3]On the link EFY Times.com an innovation was published a title USB TO USB data transfer device by Mr.Shrnik Shikhare. Who have created a device which can transfer data from one USB to Another USB without using PC.

[4] ‘Wired and wireless transmission of data between pendrives and pendrives to computer using ARM’Intenational Journal Of Research in Engineering and Advanced Technology,Vol2 issue 2 April-May 2014.

[5] IEEE paper published by Ducloux J, Petrashin P, in 2012 titled by an Embedded USB dual role System Integrated for mobile devices.