

Connecting Multiple PC with Single Arduino

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Abstract— This system is designed to connect multiple PCs with the single Arduino for the same functionality to be performed on different PCs using the wired connections. The system is built with Arduino Mega to send the data from the Arduino to the particular computer. Initially we are connecting Arduino which is acting as keyboard, joystick, or mouse with the multiple PCs.

Keywords: Multiple PC, Single Arduino

I. INTRODUCTION

Using multiple Arduino for the same functionality in the large projects will be costly. So, in this project we are using the single Arduino which is connected to multiple PCs and used as a keyboard to send the data from the host computer to the other computers. Also, we can use the same system if Arduino is acting as joystick, mouse and for other data sending operations. In this way we can reduce the number of Arduino and make our projects cost effective.

II. COMPONENT USED

- 1) USB
- 2) NPN Transistors
- 3) Arduino Mega
- 4) Female USB port
- 5) Jumper Wire
- 6) Arduino USB Serial cable
- 7) PCB plate

A. Arduino Mega

The Arduino Mega is based on ATmega2560 Microcontroller. The ATmega2560 is an 8-bit microcontroller. The Arduino Mega is organized using the Arduino (IDE), which can run on various platforms. Here, IDE stands for Integrated Development Environment. The functioning of the Arduino Mega is similar to other Arduino Boards. In this project we need Arduino Mega for using it as keyboard.

B. NPN Transistor

Transistor in which one p-type material is placed between two n-type materials is known as NPN transistor. The NPN transistor amplifies the weak signal enter into the base and produces strong amplify signals at the collector end. In this we are using the NPN transistor for switching,

of Arduino Microcontroller and PC. The working principle here is that we are using switching of USB Data Lines one at a time, that means we can connect one PC at a time and switch to another PC by disconnecting from previous PC, this will be achieved by transistor as a switch between the data lines of the USB. In this way all the PCs will be connected with USB cables in parallel to Arduino's USB serial connection in ideal state and we can choose to which PC we want the data to be transferred. Also, we can select particular or multiple PC at the same time and achieving the goal of connecting multiple PC with single Arduino.

The switching concept and how the transistor are working is such, that there are two types of transistors available one is PNP and NPN transistor. As we know that transistors can be used as a switch or can be used to amplify the signal that's why we are using transistor because we need switching in this Scenario. Here we need NPN transistor to work as a switch, because its emitter emits the signals and will be used as output, its collector will be used as an input and its base will be used to on and off the connection as base needs only small current to flow in it. In this way NPN seems the best transistor to assist our concept.

The main component of this project is USB and the way its wire is connected. The USB cable has four main wires in it VCC, GND, DATA + and DATA -. In this Vcc is used to power the connection, GND is used to complete the connection, (DATA +) is used to bring the data from the host and (DATA -) is used to send data from client device to host device. To control the data line connection between the host and the client we are using NPN transistor in (DATA +) line which will halt the connection and will be controlled by external Arduino output that will be sent to the base of the NPN transistor to complete the connection. Further, NPN's Collector will be connected to the incoming data from the HOST and NPN emitter will be connected to the USB female port's (DATA +) Pin and the Vcc of USB will be connected to female USB port's Vcc Pin and the ground wire of the USB will be connected to female port's Ground Pin and the (DATA -) wire of USB is connected to the USB female port's (DATA -) Pin. This Completes Wiring for USB for One PC, similarly we can connect as many USB's in Parallel to this connecting, including the Transistors. In this way our USB connection will be satiated and will be further commanded by our Arduino's OUTPUT.

III. WORKING METHODOLOGY

We can use single Arduino to connect multiple PC by using USB wires and NPN transistor connected in such a way that NPN transistor will work as a Switch between the connection

IV. CIRCUIT DIAGRAM

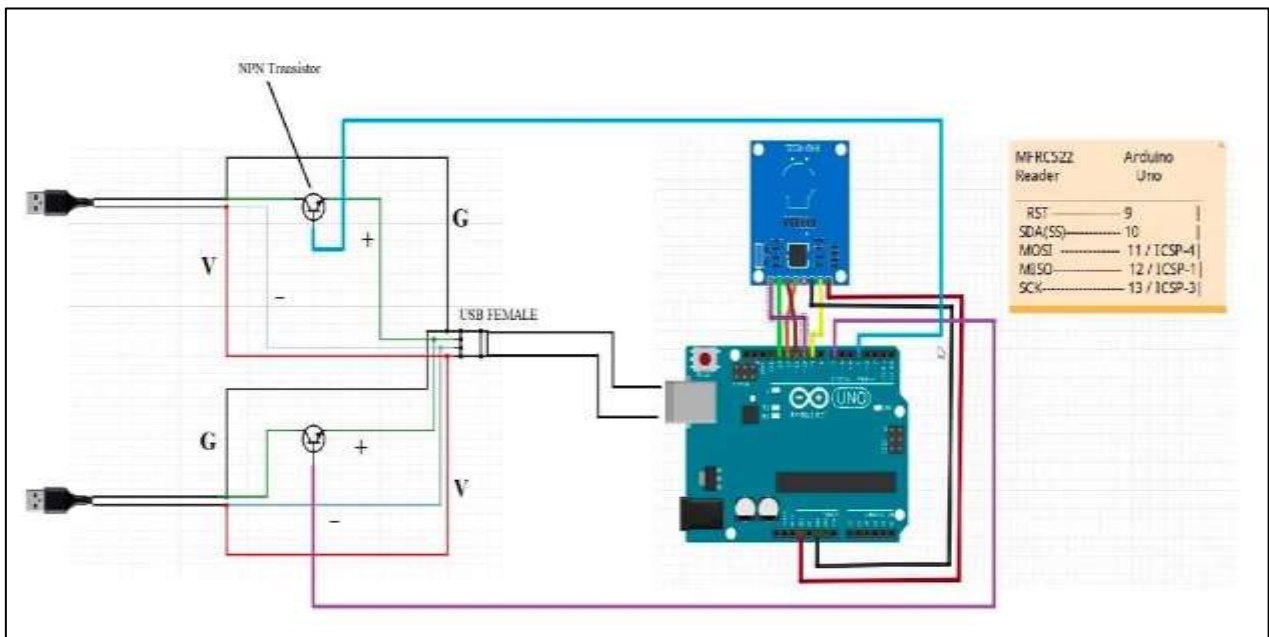


Fig. 4.1: Circuit Diagram

V. CONCLUSION AND SCOPE

This Method is very useful and can be used for multipurpose utility. A single Microcontroller can work efficiently to connect different PCs via USB. In this way we can use Arduino as a keyboard for sending inputs to particular PC or can be used as mouse for controlling PCS. Also, we can write program scripts in PC to invoke a particular action from Arduino signal to perform a specific task.

This will be helpful in establishing IOT connection with PCs, without much hassle and in secure wired way.

REFERENCES

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