Experiment – 1

Title: Interfacing of thumbwheel & seven segment display to 8051 microcontroller

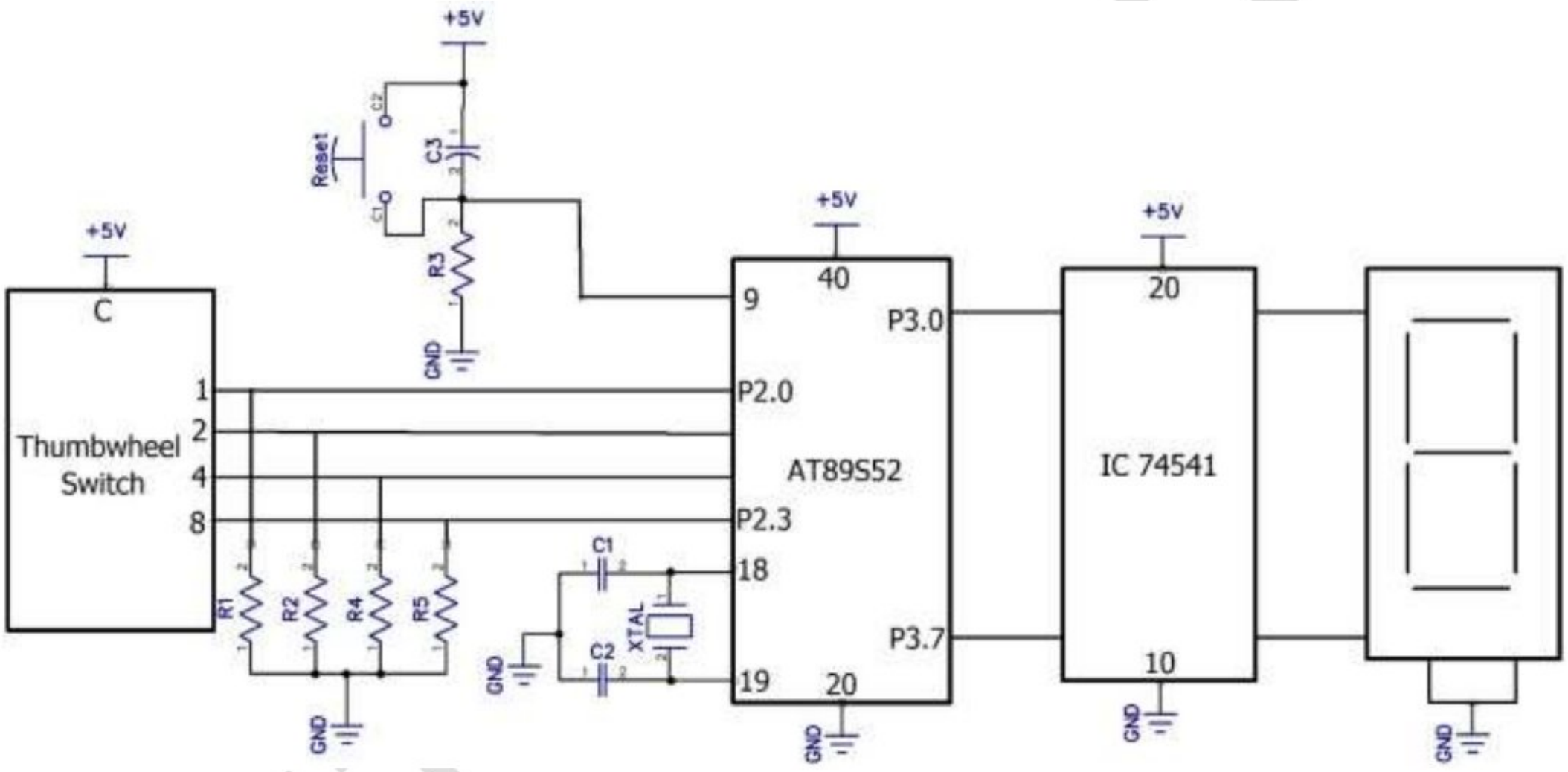
Aim: To study and understand Interfacing of thumbwheel & seven segment display to 8051 microcontroller.

Objectives:

- To understand the concept of thumbwheel switch interfacing.
- To study interfacing of thumbwheel switch to Arduino.
- To study Keil IDE software.

Software Used: Keil uVision IDE

Circuit Diagram:



Theory:

Thumbwheel Switch: Digital computers, microprocessors, and other digital systems are binary operated. The data is processed in the form of '0's and '1's. However, we communicate in the form of decimal numbers and alphabetic characters only. Therefore, the need arias for interfacing between digital systems and human operators. To demonstrate this task, we would use Thumbwheel switch as input device, and seven-segment display as output device. The process of converting familiar code to is known as encoding. The reverse process of converting binary to familiar code known as decoding.

Numbers can be represented in large variety of codes. Computers and other digital circuits are required to handle data, which may be numerics, alphabets or special characters are to be converted into binary form. For convenience binary code is always grouped into three bit groups (octal code), four bit group (BCD or Hexadecimal code). Unfortunately, different number systems are not much popular

except decimal number system. Decimal number is most popular today for setting time angle, counts in digit system. Thumb wheel switch converts decimal number into BCD form, which could be further processed by the systems and result is displayed once again in decimal form. We can provide decimal number using thumb – wheel switch.

Procedure:

- Connect DC power adaptor to the MGTechSolution 8051 Target board.
- Start Keil IDE and follow the steps mention in the "Steps to use of Keil IDE software".
- Compile the written program, if there are no errors connect the PC to the programmer placed on the MGTechSolution 8051 Target board; by using USB cable.
- Follow the procedure mention in the "Steps to use of WLPRO software". Upload the program.
- Connect the Thumbwheel switch and SSD as shown in the circuit diagram.
- Observe the output on SSD.

Program:

```
#include<reg51.h>
void delay();
char arr[10]={0x3f,0x06,0x5b,0x4f,0x66,0x6d,0x7d,0x07,0x7f,0x6f};
void main()
{
unsigned char count = 0;
P3=0X00;
P2=0X0F;
while(1)
{
count = P2;
count = count & 0X0F;
P3=arr[count];
delay();
delay();
}
}
void delay()
{
```

```
int i;
for(i=0;i<=30000;i++);
}
```

Applications of Thumbwheel Switch: ***(Student can search & write application here)***

Result: Interfacing of Thumbwheel Switch with 8051 is successfully studied, tested and observe the output.

Teacher's Sign.

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