4 bit 7 segment digital tube display module experiment

Introduction of 4 bit 7 section digital tube module

It consists of a 12-pin 4-bit 7-segment common anode digital tube and a control chip TM1637.The module adopts the process of gold sinking, which makes the appearance more beautiful, and adopts the anti-plug and reverse interface, which makes the operation more safe. The capital letter I on one side of the socket indicates that the module adopts IIC protocol communication, and the icon symbol of digital tube is on the other side.This product can be used in time display, stopwatch display and other devices that need to display Numbers.
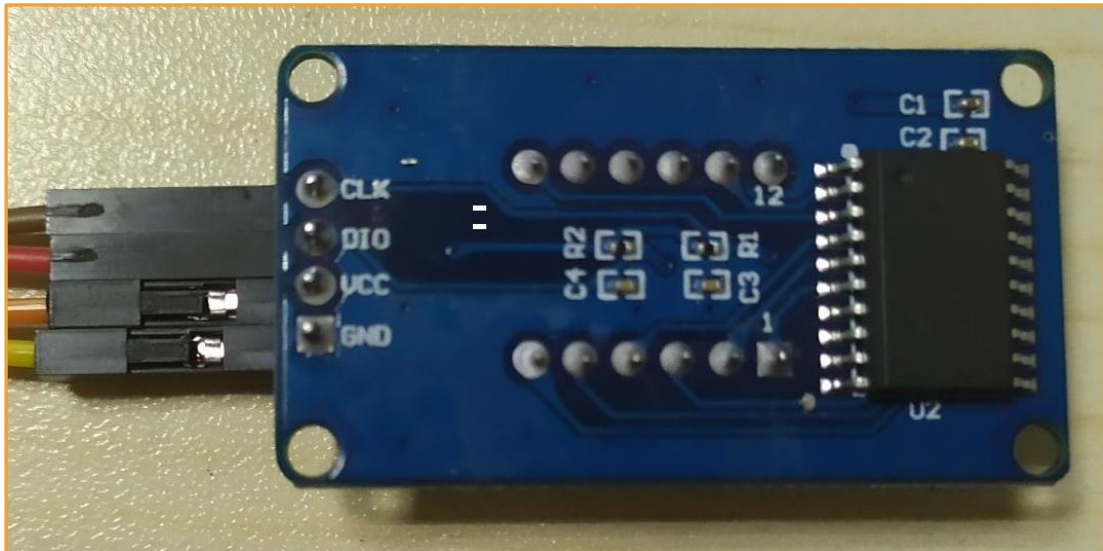
specification

- Working voltage: +5v
- Size: 45mm x 25mm
- Weight: 8g
- Communication protocol: IIC

The module has four pins, meaning as follows:

- GND: power negative
- VCC: positive pole of power supply, +5V
- DIO: data IO port, can connect any digital pin
- CLK: clock pin, can be connected to any number of **pins**

Experimental principle

The most important purpose of this program is how to dynamically scan four digital tubes.In fact, through previous single-digit tube display experiments, four digital tube display is quite easy.Due to its common anode tube, first of all, we are going to D1, D2, D3, D4 is set to the low level, all leds turn out, and then we will be "adbcdefg" truth table output to the corresponding gpio port, select a pin and constantly scanning, now only need to use a TM1637 chip, through the i2c control can automatically complete the scanning of the above.

Experimental purpose

● The purpose of experiment 1 is to display the four characters of "1234" by dynamic scanning of the 4-bit 7-segment display

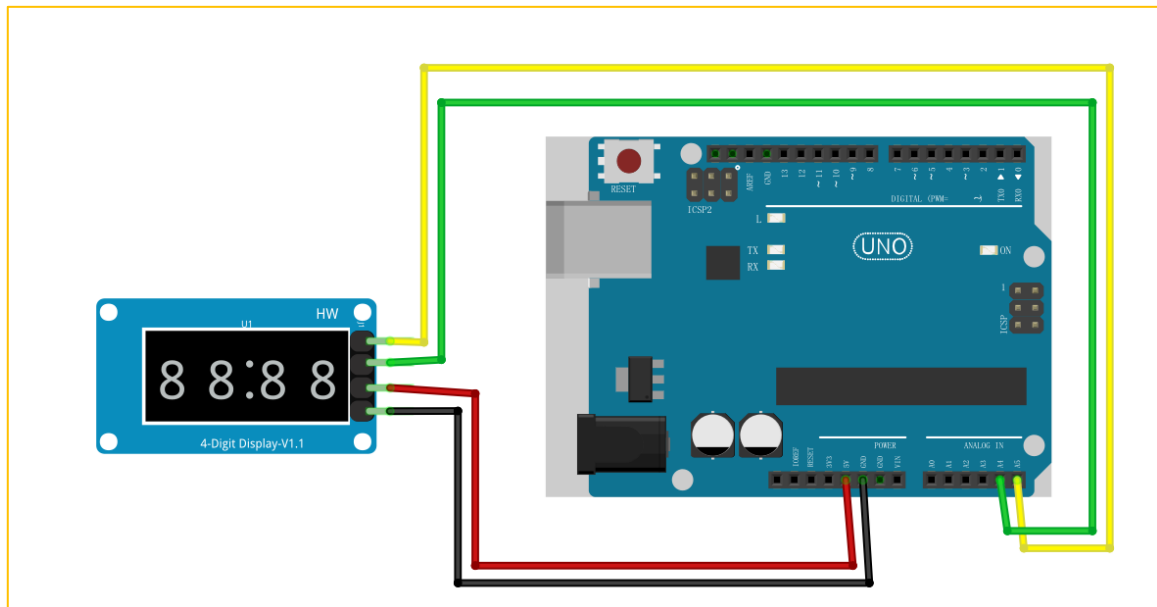● The purpose of experiment 2 is to start the clock at 12 o 'clock

The component list

● Keywish Arduino Uno R3 motherboard
● Breadboard
● USB cable
● 4 bit 7 segment digital tube module*1

Wiring the circuit

Arduino	4 bit 7 segment digital tube modul
GND	GND
5V	VCC

A4	DIO
A5	CLK

Code

Display character 1234 experimental procedures

```
#include "TM1637.h"
#define CLK A5//pins definitions for TM1637 and can be changed to other ports
#define DIO A4
int8_t Disp[] = {1, 2, 3, 4};
TM1637 _4Segment_Display(CLK, DIO);
void setup()
{
  _4Segment_Display.set();
  _4Segment_Display.init();
  _4Segment_Display.point(POINT_OFF);
}
void loop()
{
    _4Segment_Display.display(Disp);
    while(1);
}
```

12 o 'clock timing test procedures

```cpp
#include "TimerOne.h"
#include "TM1637.h"
#define ON 1
#define OFF 0
#define CLK A5//pins definitions for TM1637 and can be changed to other ports
#define DIO A4
int8_t TimeDisp[] = {0x00,0x00,0x00,0x00};
unsigned char ClockPoint = 1;
unsigned char Update;
unsigned char halfsecond = 0;
unsigned char second;
unsigned char minute = 0;
unsigned char hour = 12;
TM1637 tm1637(CLK,DIO);
void setup()
{
  tm1637.set();
  tm1637.init();
  Timer1.initialize(500000);//timing for 500ms
  Timer1.attachInterrupt(TimingISR);//declare the interrupt serve routine:TimingISR
}
void loop()
{
  if(Update == ON)
  {
    TimeUpdate();
    tm1637.display(TimeDisp);
  }
}
void TimingISR()
{
  halfsecond ++;
  Update = ON;
```
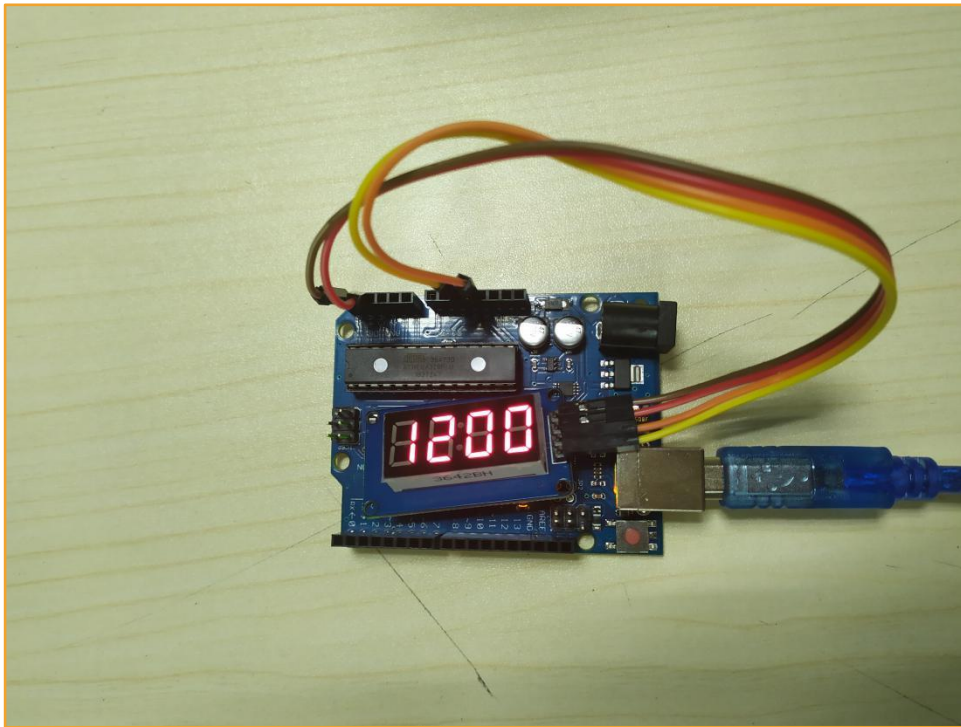
```
if(halfsecond == 2){
  second ++;
  if(second == 60)
  {
    minute ++;
    if(minute == 60)
    {
      hour ++;
      if(hour == 24)hour = 0;
      minute = 0;
    }
    second = 0;
  }
  halfsecond = 0;
  }
```

Experiment Result

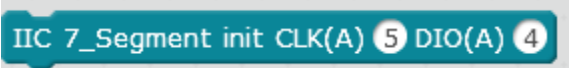### Display character 1234 experimental procedures
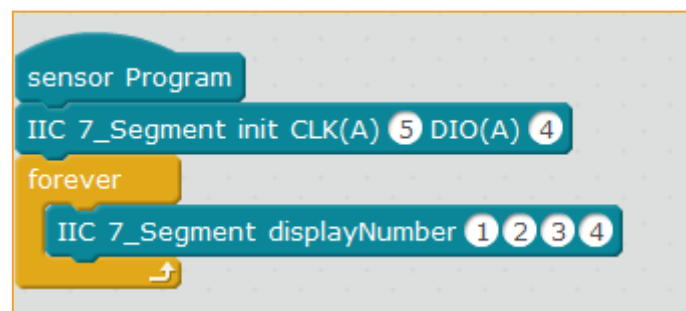
12 o 'clock timing test procedures

MBlock graphical programming program

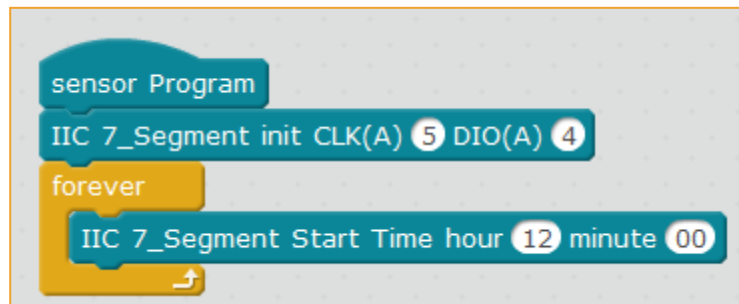MBlock writes digital tube program as shown in the figure below:

Display character 1234 experimental procedures

- -- The program block is initialized at first. By default, CLK connects to A5 pin and DIO connects to A4 pin;

- -- The program block is on our four-digit digital tube display module to be counted to display the word character 1234;

12 o 'clock timing test procedures

● IIC 7_Segment init CLK(A) ⑤ DIO(A) ④ -- Digital tube module initialization pin the first

parameter is always pin (CLK) and the second parameter is data pin (DIO)

● IIC 7_Segment Start Time hour ⑫ minute ⑩ -- Digital tube module starts timing block, the first

parameter is hours, the second minute.When the setup is complete, the timer starts at this time.

```
sensor Program
IIC 7_Segment init CLK(A) ⑤ DIO(A) ④
forever
    IIC 7_Segment Start Time hour ⑫ minute ⑩
```

Mixly graphical programming program

Mixly programmed the digital tube program as shown in the figure below:

Display character 1234 experiment

```
A5    A4
1   2   3   4
```
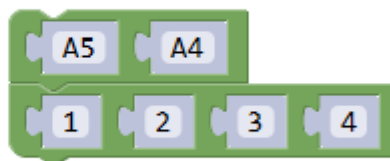
MagicBlcok graphical programming program