

# XC3746 8x16 Matrix

## Hardware

The XC3746 LED Matrix module uses a **AIP1640** I2C chip to communicate with a controller, such as the UNO, ESP series, or Raspberry Pi.

The module comes with a 4 pin cable, labelled as such:

## Pinout connections

<i>Uno or I2C compatible Device</i>	<i>XC3746 LED module</i>
5V	VCC
Ground	GND
A4 (SDA)	SDA
A5 (SCL)	SCL

It should also support bit-banging and software implementations of I2C. Both are included below. If you are not sure, use Hardware I2C.

## Hardware I2C (UNO compatible code)

```
#include <Wire.h>

unsigned char data_line = 0;
unsigned char delay_count = 0;

unsigned char table[2][16] = {
  {0x00, 0x00, 0x00, 0x00, 0x26, 0x41, 0x86, 0x80,0x80, 0x80, 0x86, 0x41, 0x26, 0x00, 0x00, 0x00},
  {0x00, 0x00, 0x00, 0x00, 0x00, 0x1C, 0x22, 0x42, 0x84, 0x42, 0x22, 0x1C, 0x00, 0x00, 0x00, 0x00}
};

void setup()
{
}
void loop()
{
  Wire.beginTransmission(0x40);

  for (int i = 0; i < 16; i++) {
    Wire.write( table[data_line][i] )
  }
  Wire.write(0x8A); //brightness

  Wire.endTransmission();

  delay_count++;

  if (delay_count > 10){
    data_line++;
    data_line %= 2;
    delay_count = 0;
  }
  delay(100);
}
```

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## Bit-banged / Software I2C

```
//data display from right to left, from bottom to top, HIGH level display.
#define IIC_SCL A5
#define IIC_SDA A4

unsigned char data_line = 0;
unsigned char delay_count = 0;

void IIC_start();
void IIC_send(unsigned char send_data);
void IIC_end();

unsigned char table[4][16] = {
  {0x00, 0x00, 0x00, 0x00, 0x26, 0x41, 0x86, 0x80, 0x80, 0x80, 0x86, 0x41, 0x26, 0x00, 0x00, 0x00},
  {0x00, 0x00, 0x00, 0x00, 0x00, 0x1C, 0x22, 0x42, 0x84, 0x42, 0x22, 0x1C, 0x00, 0x00, 0x00, 0x00},
  {0x00, 0x00, 0x00, 0x00, 0x20, 0x44, 0x42, 0x84, 0x80, 0x84, 0x42, 0x44, 0x20, 0x00, 0x00, 0x00},
  {0x00, 0x00, 0x00, 0x00, 0xC0, 0x40, 0xF8, 0xD8, 0x7E, 0xFF, 0xC0, 0x00, 0x00, 0x00, 0x00, 0x00}
};
void setup()
{
  pinMode(IIC_SCL, OUTPUT);
  pinMode(IIC_SDA, OUTPUT);
  digitalWrite(IIC_SCL, LOW);
  digitalWrite(IIC_SDA, LOW);
}
/*-----*/
void loop()
{
  /******set the address plus 1******/
  IIC_start();
  IIC_send(0x40);// set the address plus 1 automatically
  IIC_end();
  /******end the process of address plus 1 ******/
  /******set the data display******/
  IIC_start();
  IIC_send(0xc0);// set the initial address as 0
  for (char i = 0; i < 16; i++)
  {
    IIC_send(table[data_line][i]);// send the display data
  }
  if (++delay_count >= 10)
  {
    delay_count = 0;
    data_line++;
    if (data_line >= 4)
    {
      data_line = 0;
    }
  }
  IIC_end();
  /******end the data display******/
  /******set the brightness display******/
  IIC_start();
  IIC_send(0x8A);// set the brightness display
  IIC_end();
  /******end the brightness display******/
  delay(100);
}
/*-----*/
void IIC_start()
{
  digitalWrite(IIC_SCL, LOW);
  delayMicroseconds(3);
  digitalWrite(IIC_SDA, HIGH);
  delayMicroseconds(3);
  digitalWrite(IIC_SCL, HIGH);
  delayMicroseconds(3);
  digitalWrite(IIC_SDA, LOW);
  delayMicroseconds(3);
}
void IIC_send(unsigned char send_data)
{
  for (char i = 0; i < 8; i++)
```

Australia  
[www.jaycar.com.au](http://www.jaycar.com.au)  
[techstore@jaycar.com.au](mailto:techstore@jaycar.com.au)  
 1800 022 888

New Zealand  
[www.jaycar.co.nz](http://www.jaycar.co.nz)  
[techstore@jaycar.co.nz](mailto:techstore@jaycar.co.nz)  
 0800 452 922



# XC3746 8x16 Matrix

```
{
  digitalWrite(IIC_SCL, LOW);
  delayMicroseconds(3);
  if (send_data & 0x01)
  {
    digitalWrite(IIC_SDA, HIGH);
  }
  else
  {
    digitalWrite(IIC_SDA, LOW);
  }
  delayMicroseconds(3);
  digitalWrite(IIC_SCL, HIGH);
  delayMicroseconds(3);
  send_data = send_data >> 1;
}
}
void IIC_end()
{
  digitalWrite(IIC_SCL, LOW);
  delayMicroseconds(3);
  digitalWrite(IIC_SDA, LOW);
  delayMicroseconds(3);
  digitalWrite(IIC_SCL, HIGH);
  delayMicroseconds(3);
  digitalWrite(IIC_SDA, HIGH);
  delayMicroseconds(3);
}
}
```

Australia  
[www.jaycar.com.au](http://www.jaycar.com.au)  
[techstore@jaycar.com.au](mailto:techstore@jaycar.com.au)  
1800 022 888

New Zealand  
[www.jaycar.co.nz](http://www.jaycar.co.nz)  
[techstore@jaycar.co.nz](mailto:techstore@jaycar.co.nz)  
0800 452 922

