Tutoriels MAX7219 avec matrice 8X8



Liens web tuto MAX7219

- Montage Kit MAX7219 EN
- Montage Kstart:arduino:max7219:FRit MAX7219 FR
- Concevez des matrices de LED
- Tuto MAX7219 Arduino
- Matrice 8X8
- Tutoriel Arduino – MAX7219 Afficheur 8X8 LED
- MAX 7219
- LED Matrix Kit
- 64 LEDS et MAX7219
- MAX7219 avec 4 matrices de LEDS 8X8 en cascade
    - Matrice LEDS 5 fois 8x8
- LEDS 8X8 par internet
- Une Video

Programmes

Préparation Logiciels



Utiliser ou télécharger la dernière version de l'IDE Arduino

Le diagramme de synchronisation pour Max7219 et son format de données série sont joints ci-dessous avec ses caractéristiques électroniques.

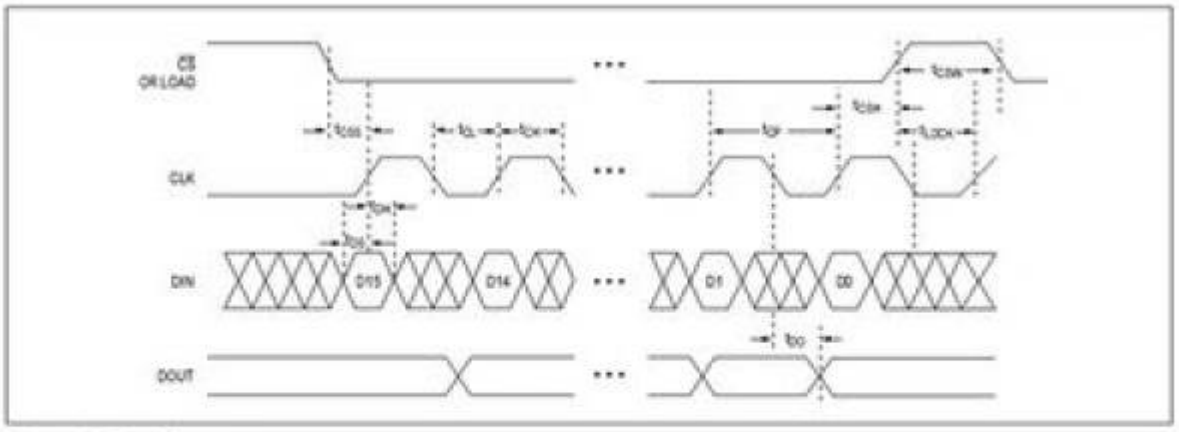


Figure 1. Timing Diagram

Table 1. Serial-Data Format (16 Bits)

D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
X	X	X	X	ADDRESS				MSB	DATA						LSB

ELECTRICAL CHARACTERISTICS (continued)

(V+ = 5V ±10%, R_{SET} = 9.53kΩ ±1%, T_A = T_{MIN} to T_{MAX}, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
LOGIC INPUTS						
Input Current DIN, CLK, LOAD, $\overline{CS}$	I_{IH}, I_{IL}	V_{IN} = 0V or V+	-1		1	µA
Logic High Input Voltage	V_{IH}		3.5			V
Logic Low Input Voltage	V_{IL}				0.8	V
Output High Voltage	V_{OH}	DOUT, I_{SOURCE} = -1mA	V+ - 1			V
Output Low Voltage	V_{OL}	DOUT, I_{SINK} = 1.6mA			0.4	V
Hysteresis Voltage	ΔV_H	DIN, CLK, LOAD, $\overline{CS}$		1		V
TIMING CHARACTERISTICS						
CLK Clock Period	t_{CP}		100			ns
CLK Pulse Width High	t_{CH}		50			ns
CLK Pulse Width Low	t_{CL}		50			ns
$\overline{CS}$ Fall to SCLK Rise Setup Time (MAX7221 only)	t_{CSS}		25			ns
CLK Rise to $\overline{CS}$ or LOAD Rise Hold Time	t_{CSH}		0			ns
DIN Setup Time	t_{DS}		25			ns
DIN Hold Time	t_{DH}		0			ns
Output Data Propagation Delay	t_{DO}	C_{LOAD} = 50pF			25	ns
Load-Rising Edge to Next Clock Rising Edge (MAX7219 only)	t_{LDCK}		50			ns
Minimum $\overline{CS}$ or LOAD Pulse High	t_{CSW}		50			ns
Data-to-Segment Delay	t_{DSPD}				2.25	ms

Un programme de test sans librairie à inclure

exemple_code_MAX7219.ino

```
unsigned char i;
unsigned char j;
```

```
/*Port Definitions*/
int Max7219_pinCLK = 10;
int Max7219_pinCS = 9;
int Max7219_pinDIN = 8;

unsigned char disp1[38][8]={
{0x3C,0x42,0x42,0x42,0x42,0x42,0x42,0x3C},//0
{0x10,0x18,0x14,0x10,0x10,0x10,0x10,0x10},//1
{0x7E,0x2,0x2,0x7E,0x40,0x40,0x40,0x7E},//2
{0x3E,0x2,0x2,0x3E,0x2,0x2,0x3E,0x0},//3
{0x8,0x18,0x28,0x48,0xFE,0x8,0x8,0x8},//4
{0x3C,0x20,0x20,0x3C,0x4,0x4,0x3C,0x0},//5
{0x3C,0x20,0x20,0x3C,0x24,0x24,0x3C,0x0},//6
{0x3E,0x22,0x4,0x8,0x8,0x8,0x8,0x8},//7
{0x0,0x3E,0x22,0x22,0x3E,0x22,0x22,0x3E},//8
{0x3E,0x22,0x22,0x3E,0x2,0x2,0x2,0x3E},//9
{0x8,0x14,0x22,0x3E,0x22,0x22,0x22,0x22},//A
{0x3C,0x22,0x22,0x3E,0x22,0x22,0x3C,0x0},//B
{0x3C,0x40,0x40,0x40,0x40,0x40,0x3C,0x0},//C
{0x7C,0x42,0x42,0x42,0x42,0x42,0x7C,0x0},//D
{0x7C,0x40,0x40,0x7C,0x40,0x40,0x40,0x7C},//E
{0x7C,0x40,0x40,0x7C,0x40,0x40,0x40,0x40},//F
{0x3C,0x40,0x40,0x40,0x40,0x44,0x44,0x3C},//G
{0x44,0x44,0x44,0x7C,0x44,0x44,0x44,0x44},//H
{0x7C,0x10,0x10,0x10,0x10,0x10,0x10,0x7C},//I
{0x3C,0x8,0x8,0x8,0x8,0x8,0x48,0x30},//J
{0x0,0x24,0x28,0x30,0x20,0x30,0x28,0x24},//K
{0x40,0x40,0x40,0x40,0x40,0x40,0x40,0x7C},//L
{0x81,0xC3,0xA5,0x99,0x81,0x81,0x81,0x81},//M
{0x0,0x42,0x62,0x52,0x4A,0x46,0x42,0x0},//N
{0x3C,0x42,0x42,0x42,0x42,0x42,0x42,0x3C},//O
{0x3C,0x22,0x22,0x22,0x3C,0x20,0x20,0x20},//P
{0x1C,0x22,0x22,0x22,0x22,0x26,0x22,0x1D},//Q
{0x3C,0x22,0x22,0x22,0x3C,0x24,0x22,0x21},//R
{0x0,0x1E,0x20,0x20,0x3E,0x2,0x2,0x3C},//S
{0x0,0x3E,0x8,0x8,0x8,0x8,0x8,0x8},//T
{0x42,0x42,0x42,0x42,0x42,0x42,0x22,0x1C},//U
{0x42,0x42,0x42,0x42,0x42,0x42,0x24,0x18},//V
{0x0,0x49,0x49,0x49,0x49,0x2A,0x1C,0x0},//W
{0x0,0x41,0x22,0x14,0x8,0x14,0x22,0x41},//X
{0x41,0x22,0x14,0x8,0x8,0x8,0x8,0x8},//Y
{0x0,0x7F,0x2,0x4,0x8,0x10,0x20,0x7F},//Z
};



void Write_Max7219_byte(unsigned char DATA)
{
            unsigned char i;
        digitalWrite(Max7219_pinCS,LOW);
        for(i=8;i>=1;i--)
```

```
          {
             digitalWrite(Max7219_pinCLK,LOW);
             digitalWrite(Max7219_pinDIN,DATA&0x80);// Extracting a bit
data
             DATA = DATA<<1;
             digitalWrite(Max7219_pinCLK,HIGH);
           }
}


void Write_Max7219(unsigned char address,unsigned char dat)
{
        digitalWrite(Max7219_pinCS,LOW);
        Write_Max7219_byte(address);           //address□code of LED
        Write_Max7219_byte(dat);               //data□figure on LED
        digitalWrite(Max7219_pinCS,HIGH);
}

void Init_MAX7219(void)
{
 Write_Max7219(0x09, 0x00);       //decoding □BCD
 Write_Max7219(0x0a, 0x03);       //brightness
 Write_Max7219(0x0b, 0x07);       //scanlimit□8 LEDs
 Write_Max7219(0x0c, 0x01);       //power-down mode□0□normal mode□1
 Write_Max7219(0x0f, 0x00);       //test display□1□EOT□display□0
}



void setup()
{

  pinMode(Max7219_pinCLK,OUTPUT);
  pinMode(Max7219_pinCS,OUTPUT);
  pinMode(Max7219_pinDIN,OUTPUT);
  delay(50);
  Init_MAX7219();
}


void loop()
{
   for(j=0;j<38;j++)
  {
   for(i=1;i<9;i++)
    Write_Max7219(i,disp1[j][i-1]);
   delay(500);
  }
}
```

Programmes avec librairies à inclure

- afficheur8x8.zip
- max7219_dot_matrix_scroll_text.ino.zip
- web-scroll-matrix-master.zip
- max7219_100.ino.tar.gz

Librairies

Différentes librairies à tester

- ledcontrol.zip
- ledcontrol-master.zip
- maxmatrix.zip

Une librairie pour les matrices en cascade (à essayer ...)

- ledcontrolms_f79uc7xhkcjmpgv.zip

Une autre librairie mais pour le Raspberry (A voir lors d'une autre soirée ...)

- luma.led_matrix-master_raspberry.zip
- On peut y voir une demo en image animée...

Pour la création de codes pour matrices de LEDS

Envoyer par Fernand

8x8 Matrix Character Creator

Pour la création de caractères 8×8 sur la matrice de LEDs

- Leds Matrice editor
- Le programme qui va avec :
- Programme pour matrice

Toujours envoyer par Fernand : un programme de test, ne pas oublier d'inclure les 2 librairies ci-dessous

Matrix 32x8 Max7219



- exemple 002 programme 32X8
  - Librairie Adafruit_gfx
  - Librairie Max72xx

exemple_002_code_max7219_32X8.ino

```
include SPI.h
#include Adafruit_GFX.h
#include Max72xxPanel.h

int pinCS = 10; // Attach CS to this pin, DIN to MOSI and CLK to SCK
(cf http://arduino•cc/en/Reference/SPI )
int numberOfHorizontalDisplays = 1;
int numberOfVerticalDisplays = 4;

Max72xxPanel matrix = Max72xxPanel(pinCS, numberOfHorizontalDisplays,
numberOfVerticalDisplays);

String tape = "Ayo belajar Arduino bersama DA Electronics";
int wait = 50; // In milliseconds

int spacer = 1;
int width = 5 + spacer; // The font width is 5 pixels

void setup() {

matrix.setIntensity(7); // Use a value between 0 and 15 for brightness

// Adjust to your own needs
matrix.setRotation(matrix.getRotation() + 1 ); // The first display is
position upside down
// matrix.setRotation(1, 1); // The first display is position upside
down
}

void loop() {

for ( int i = 0 ; i < width * tape.length() + matrix.width() - 1 -
spacer; i++ ) {
```

```
matrix.fillScreen(LOW);

int letter = i / width;
int x = (matrix.width() - 1) - i % width;
int y = (matrix.height() - 8) / 2; // center the text vertically

while ( x + width - spacer >= 0 && letter >= 0 ) {
if ( letter < tape.length() ) {
matrix.drawChar(x, y, tape[letter], HIGH, LOW, 1);
}

letter--;
x -= width;
}

matrix.write(); // Send bitmap to display

delay(wait);
}
}
```

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