

Tutoriels MAX7219 avec matrice 8X8



Liens web tuto MAX7219

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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.

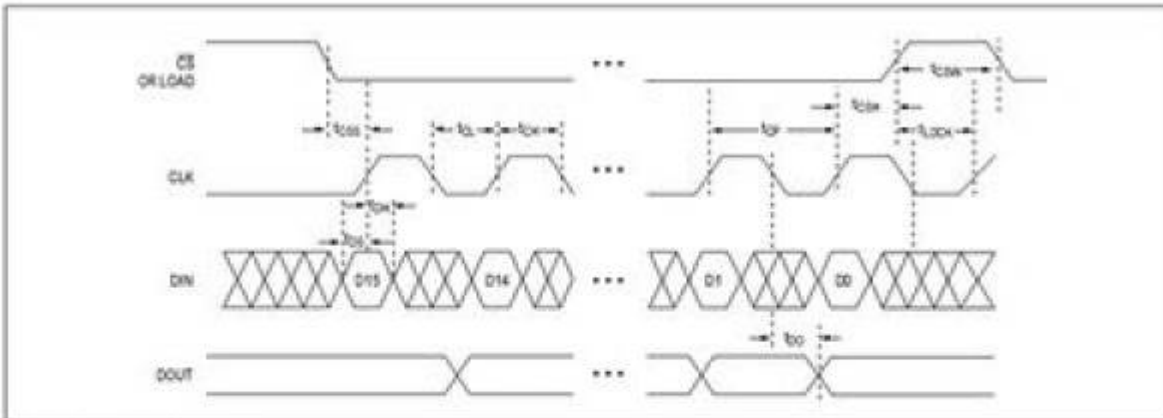


Figure 1. Timing Diagram

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%, RSET = 9.53kΩ ± 1%, TA = TMIN to TMAX, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
LOGIC INPUTS						
Input Current DIN, CLK, LOAD, CS	I_{IH}, I_{IL}	$V_{IH} = 0V$ 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, $I_{SENK} = 1.6mA$			0.4	V
Hysteresis Voltage	ΔV_I	DIN, CLK, LOAD, 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
CS Fall to SCLK Rise Setup Time (MAX7221 only)	t_{CSS}		25			ns
CLK Rise to 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_{DCK}		50			ns
Minimum CS or LOAD Pulse High	t_{CSW}		50			ns
Data-to-Segment Delay	t_{DSIO}				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 displ[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_f79uc7xhkcyjmgv.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 8x8 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.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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Last update: **2025/07/24 16:21**

