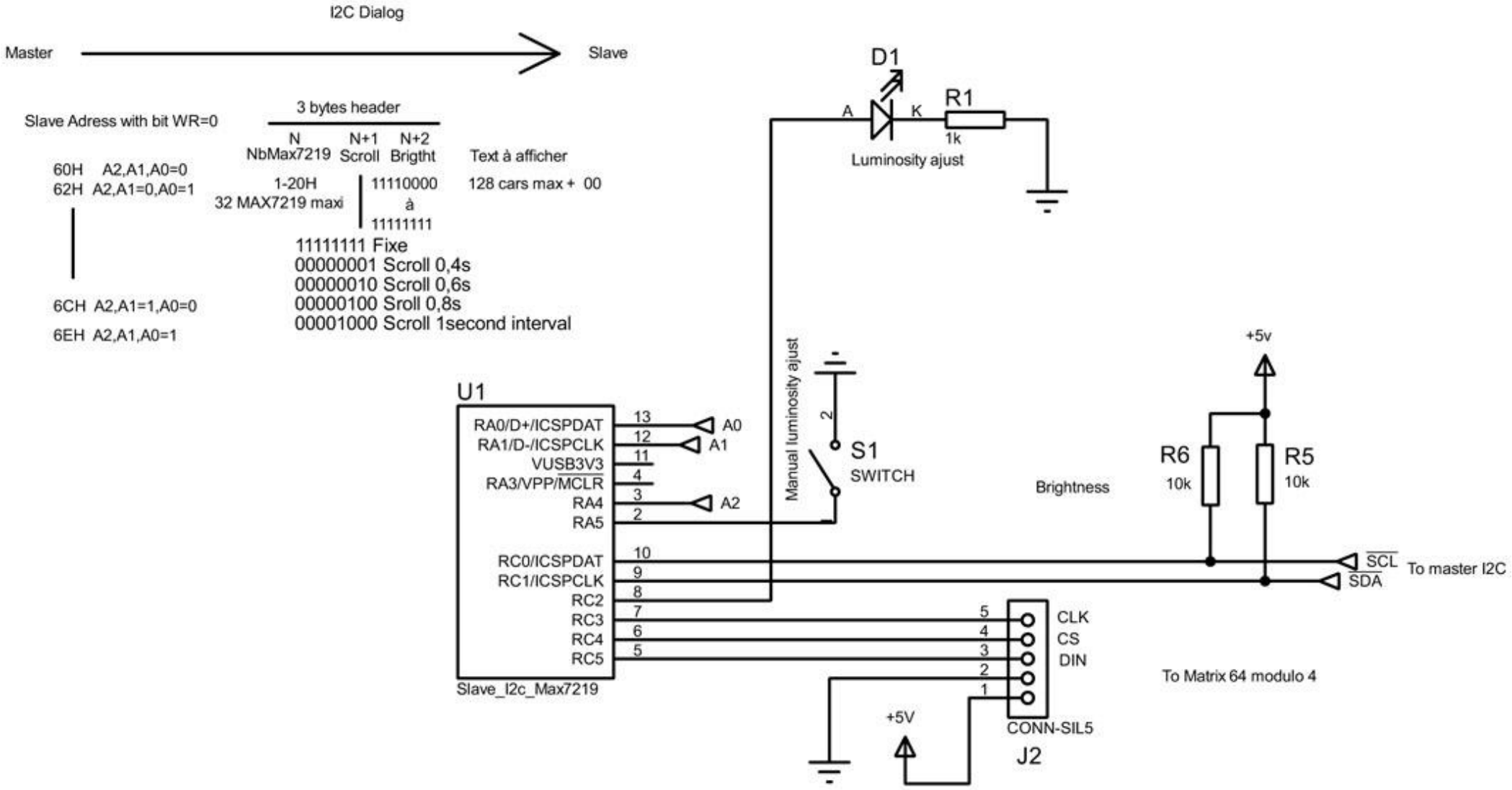
I2C slave circuit Led Matrix 64

The I2c slave circuit described in this document has been developed to manage 64-LED driven matrices
by circuit Max7219 connectable in series such as these :

It provides I2C reception of up to 128 ASCII characters and displays on a set of 8*8 matrices connected in series horizontally,
through a Max7219 circuit for each of them.
The display can be configured in fixed mode or in horizontal scrolling mode with four possible time delays.
The advantage of horizontal scrolling mode lies in the possibility of displaying text with a number of characters
greater than the number of 64 LED matrices.
The I2C frame sent by the master consists of start, a write circuit address,

three header bytes essential for configuring the display, then the text to display ending with the end byte 0x0, stop.



Adresses I2C

By assigning logic levels to A2 A1 A0, one of eight possible I2C addresses is assigned to the circuit.

By assigning each of them a different address, it is then possible to connect eight circuits on the same I2C bus in order to form a table of eight rows.

A2A1A0	Adresse écriture
000	0x60
001	0x62
010	0x64
011	0x66
100	0x68
101	0x6A
110	0x6C
111	0x6E

Header

The header is made up of three bytes allowing you to configure the operation of the display:
-1° byte: Number of matrices Max7219
For a set of four dies as shown in the image on the first page -> 4
The circuit firmware limits the number to 32, i.e. 1-32 possible values

-2° byte: Display mode

.0xFF: fixed display (Number of matrices>=length of text to display
If length of text to display > number of matrices, horizontal scrolling required:
.0x01:Horizontal Scrolling tempo 0.4 second
.0x02 :Horizontal Scrolling tempo 0,6 second
.0x04 :Horizontal Scrolling tempo 0,8 second
.0x08 :Horizontal Scrolling tempo 1 second

-3° byte: brightness adjustment
.0xF0 : mini
.0xFF: maximum, i.e. 16 possible values
It is essential to evaluate the consumption of LED matrices which can reach significant values depending on the number.

Pin	Fonction
1	VDD
2	Switch Adj Bright IN
3	A2 Input
4	NC
5	DIN Output
6	CS Output
7	CLK Output
8	LED Adj Britgh Output
9	SDA
10	SCL
11	NC

12	A1 Input
13	A0 Input
14	VSS GND

When powered up, the circuit displays Init I2C OK on the first four matrices for 300mS,
period during which the I2C bus is not taken into account.
Although the brightness is adjustable in the I2C frame, it is possible to modify it manually by pressing the S1 button.
Led D1 lights up during pressing.
Display management on the matrices is completely ensured by the I2c circuit in ASCII format.
Hardware limitations: 32 matrices 64 LEDs, 128 characters maximum in scrolling mode.
Consumption of the I2C circuit: <5mA under 5V (Microchip Nanowatt 16F technology).
I2C operation from 100Khz to 400Khz.

The SlaveI2C_Max7219 circuit is provided on a long-term basis by the company AIXIST.
https://aixist.fr/index.php?page=contact
Contact using the form
Technical information:
electro8051@yahoo.fr

Télécharger au format PDF