

# LED display Communication Protocol

## Basic frame format

Length of each frame is uncertain, Data of the frame are compose of data packet. One frame may contain several data packet, but the first datum of the frame must be the screen number characteristic data packet. And you need add one “0” to the last data packet to represent one frame data conclusion. Refers to the following:

Data Packet 1	Data Packet 2	.....	Data Packet n	0
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## A. Communication parameter.

Baud Rate: 2400

Data Bits: 8

Stop Bits: 1

Parity: None

Support 128 LED Screen networking . Each LED Screen’s screen number is depend on the switch which in the mainboard , and the scope is 0~127.

### a. Data packet format

The data packet is divided into 12 classes. One frame can contain several data packets. The length of each data packet cannot over 8190 bytes (1FFE). And each frame must contain a basal data packet at least ----- screen number data packet.. Further more , this packet must be the first packet of the frame. Besides this packet, other kinds of data packet is :

File data packet;

Special file data packet;

Reports time data packet;

Report time in integral point data packet;

Fixed time starting data packet

Fixed time closing data packet

System time checkout data packet;

Image data packet;

Control data packet;

List of screen number data packet.

The introduction as below:

### (1) Screen number data packet

The symbol of screen number data packet is 0,.This data packet mainly is used for providing screen number comparison. Moreover, this data packet also contains an clean

symbol, for judging whether to clear up the original data of the screen before transmit new data.

0	Screen number character	Clear flag
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**Screen number:** Occupies 2 bytes, 16 bits in all , each bit corresponds with a screen number, Each screen compare its own screen number with the correspond bit when comparing,and judge whether the bit is 1. For example, Number 0 screen must compare with the bit0,number 1 screen have to compare with bit1, and so on. Low bit in front, high bit in back..

**Clear Flag: The number “1” meaning clear up the content in the screen.. other number meaning do nothing.**

In the \*128 strip screen networking situation, setting the screen number as FFFFH, Transmit a List of screen number data packet after this data packet.

## (2) File data packet

In English screen data uses the file format, you can edit 100 file at most. Each file may contain many screens. A file data packet is uses for transmitting one or several filesdata packet structures.

1	File name	File data
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**File name:** Two bytes, express two decimal base filename' 00' ~' 99' by two ASCII character' 0' ~' 9'. If the first character is "\*" means this document is a special file, such as '\*6' expresses special file '6'.

**file data:** There are two kinds of file data. One is the ordinary file data; Another is the special file data. The first define how to display all kinds of information on the LED Screen .The last define how to display the information on sequence in a fixed time. The length of ordinary file data format is long, remains for later introduce . The format of special file is as follows :

Filename	Space	Filename	Space	.....	Filename	OFFH
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**The filename is the purport arrangement in the demonstration sequence ordinary filename, like' 01'; Between the filename separates with the blank space; A special file takes “OFFH” as end symbol.**

With the file data packet transmission special file, cannot assign the fixed time demonstration characteristic of the special file, only can use for transmit the file that

needn't to assign the movement date and the time limit. You can use the special file data packet to transmit the special file.

### (3) Special file data packet

The special file data packet is a file that definite several combination files in a fixed time and circulate display.

2	Special filename	Movement date	Starts time	Closure time	Special document data
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**Special file data :** One ASCII character '0' ~ '9'.

**Movement date:** Low seven bit correspond separately with a week seven day, bit0 expresses Sunday, bit1 expresses Monday, .....

**Start time:** Assigns the time in some day to start the LED Screen, with four ASCII character '0' ~ '9' expressed separately when and the minute, like 8:30 will be '0830'.

**Close time:** Reference the "Start time".

**Special file data:** Assign the sequence of filename which need display in the special file. This file data's format is not the same as File Data.

Filename	Filename	.....	Filename	0FFH
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**The filename is assigns the file which must display in the special file, scope is '00' ~ '99'. No blank space Between the filename. Filename sequence end by 0FFH.**

### (4) Report time data packet

Display current time in fixed time and alarm.

4	Report frequency	report interval	0FFH
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**Report frequency:**One byte 0~255 expressions report time times.

**Report interval:** One byte 0~255 expressions interval of two times reports, unit is minute.

### (5) Report time in integral point data packet

5	integral point report flag	0FFH
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**\*Flag of report time in integral point:** One byte, '0' expression close report, other expression open report function.

### (6) Fixed time starting data packet

6	Fixed time time	0FFH
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**Time of fixed time:** The order is Hour,Minute,Second, separately uses two ASCII character `0' ~ `9' to indicate.

### (7) Fixed time closing the data packet

7	Fixed time	0FFH
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**Time of fixed time:** The order is Hour,Minute,Second, separately uses two ASCII character `0' ~ `9' to indicate.

### (8) System time checkout data packet

8	week	Hour Type	Current time	0FFH
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**Week:** One ASCII character `0' ~ `6' expressions Sunday ~ Saturday.

**Hour Type:** "0" is 24 hours patterns, non-0 is 12 hours patterns.

**Current time:** Order for year, month, date, hour, minute, second, separately uses two ASCII character `0' ~ `9' to indicate.

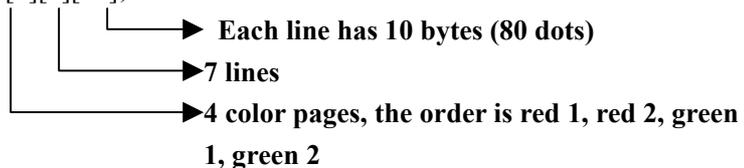
### (9) Image data packet

9	Image serial number	Image lattice data
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**Image serial number:** 1 ASCII character

**Image lattice data:** 280 byte four color page 7×80 lattice graph lattice data, the similar data format is:

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char Graphics[4][7][10];
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### (10) Control data packet①

10	Control command	0FFH
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**Control command: 1 byte**

**01H:** Test, the entire screen display red, green, and yellow, each color display 5 seconds.

**(11)List of Screen number data packet②**

11	Screen number list	0FFH
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Screen number list: The variable length, each byte corresponds with one screen number.

The original screen number data packet only can support 16 screen networking correspondence, the number of data packet should be increased in order to support 128 screen networking correspondence.

128 screen networking method: In the screen number data packet, the screen number supposes is FFFFH namely all screens; transmits this data packet after screen number data packet.

**B. File data format**

Display mode	Attribute	.....	English character	.....	Attribute	.....	Display mode	.....
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**00H~18H :** Display mode (24 kinds), when correspondence is 01H~18H, namely 1~24

**20H~EDH :** English character.

**EFH :** Attribute control byte, expression the follow one is attribute byte.

**FFH :** One screen finished, continual two FFH expression an end of the file. Usually set the display mode at the beginning of new screen.

**Attribute byte significance:**

**60H~7DH :** 30 pre-definition mark (SYMBOLS).

**80H :** Insert time.

**81H :** Insert date.

**90H~97H :** 8 cartoon ways (ANIM n).

**A0H~A5H** : 6 kinds of font (FONTS).

**B0H~BFH** : 16 kinds of color (COLORS).

**C0H~C7H** : 8 levels of speed (SPEED n).

**C8H~CFH** : 8 level of resident times (PAUSE n).

**D0H~DFH** : 8 kinds of definition graphs and 8 kinds pre-definition graphs (GET GRAPHICS).

**E0H~E2H** : 3 kinds of bell (BEEP n).

**Attention:** When correspondence, All data less than 20H (blank space character) is minus 1, when receiving data, if the data is smaller than 20H(is generally display mode), before the transmission must add 1. For instance the display mode is 00H~18H, when the transmission transmits 01H~19H, namely 1~25.

## C. Communication example

### (1) File transmit example

Transmits the following data stream, right side is the annotation

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0,0xff,0xff,1	; The screen number data packet, the screen number is 0xff,0xff,Namely is effective to all screens, 1 instruction must clear up the original content of the LED Screen.
1,'01'	; Start of A file packet , the filename assigns is '01' .
1,0xef,0xb0,'SDV111 User\'s Guide',0xff	;The first screen content of File '01'; Assigns the display mode is 1(CYCLIC), color is bright red (0xef,0xb0).
8,0xef,0xb5,'easy to use',0xff	;The second screen content of file '01'
15,0xef,0xb5,'give you power',0xff	;The third screen content of file '01'.
20,0xef,0xb5,'moving sign',0xff	;The fourth screen content of file '01'.
5,0xef,0xb7,'Your wise choice',0xff	;The last screen content of file '01' .
0xff	;End of file'01'.
0	;End of data.

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### (2) Transmits the special file example with the file data packet

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0,0xff,0xff,1	; Screen number data packet
1,'01',0xef,0xb0,'FILE 01',0xff,0xff	; File data packet 1
1,'02',0xef,0xb5,'FILE 02',0xff,0xff	; File data packet 2
1,'03',0xef,0xb7,'FILE 03',0xff,0xff	; File data packet 3
1,'*0', '01 02 03',0xff,0xff	; Use file data packet transmit special file 'S0'
0	; End of data

---

This example first transmits three ordinary file '01', '02' and '03', then transmission special file 'S0'. File 'S0' contains the sequence of file '01', '02' and '03', circulation display this three file.

#### D. Special file packet of example

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0,0xff,0xff,1	; Screen number data packet
1,'01',0xef,0xb0,'FILE 01',0xff,0xff	; File data packet 1
1,'02',0xef,0xb5,'FILE 02',0xff,0xff	; File data packet 2
1,'03',0xef,0xb7,'FILE 03',0xff,0xff	; File data packet 3
2,'0',0x3e,'0800', '1759', '010203',0xff	; Special file data packet.'0' expressed special filename 'S0', 0x3e expressed from Monday to Friday, '0800' expressions from 08:00 start, '1759' expressed to 17:59 close, '010203' expression display file sequence is '01', '02', '03'; End of data

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**E.** This example first transmits three file '01', '02' and '03', then transmits special file 'S0' in the stipulation time date (each week from Monday to Friday, early morning 8:00 to afternoon 17:59) display file sequence '01', '02' and '03'.

#### F. Report time data packet of example

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0,0xff,0xff,0	; Screen number data packet
4,255,1,0xff	; Report time data packet, stipulated report time the number of times is 255 , report interval is 1 minute
0	; End of data

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#### G. Report time in integral point data packet of example

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0,0xff,0xff,0	; Screen number data packet
8,'5',1,'980313085950',0xff	; The transmission time, the date were on March 13, 1998, 8:59:50, Friday, 12 hours

5,1,0xff	patterns ;Report time in integral point data packet, opens the integral point to report time the function
0	; End of data

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## H. System time checkout packet of example

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0,0xff,0xff,1	;Screen number data packet
8,'5',0,'980313173000',0xff	; The timing packet,' 5' expression week, 0 expressed 24 hours type, `980313173000' expressed on March 13, 1998 17:30:00
0	; End of data

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