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## RS-232C / 485 PROTOCOL FOR M500N-7X80RG2



### Communication Parameters:

- Baud rate: 2400 bits/s;
- Data: 8 bits;
- End code: 1 bit;
- Checksum: Nil;

P.S: Networking Capacity: Up to 128 nos. LED signs in maximum. Sign address is addressable at the controller card, ranging from 0 to 127 (lower 7 bits).

### Format For Transmitting Package

Each package has no restriction in length, and can contain different data groups. **But, the “Data 1” should be Sign Address, and the end code is “0”**. As follows;

“Data 1” + “Data 2” + “Data 3” - - - - “Data n” + “0”

### Protocol For Different Data Group:

There are 11 different data groups in total.

- I: Data for sign address
- II: Data for file
- III: Data for special file
- IV: Data for alarming
- V: Data for time alarming
- VI: Data for sign on
- VII: Data for sign off
- VIII: Data for date / time resetting
- IX: Data for custom graphic
- X: Data for testing
- XI: Data for signs' list

P.S: The length for each data group cannot exceed 8190 bytes (1FFE).

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## 1 Data For Sign Address

Format	"0" + "Sign Address" + "1"
<b>Code</b>	<b>Description</b>
"0"	Leading code for Sign Address
"Sign Address"	2 bytes (16 bits) e.g: sign 0 = bit 0; sign 1 = bit 1...etc. Remark: See examples in Appendix II
"1"	Clear all the previous messages Remark: Previous messages will be retained if the bit is not "1"

P.S: If there are 128 nos. LED signs linked together, sign address="FFFFH", and then followed by data group for signs' list

## 2 Data For File

Format	"1" + "File Name" + "Data For File"
<b>Code</b>	<b>Description</b>
"1"	Leading code
"File Name"	2 ASCII codes, "00"~"99" Remark: " *6 " means special file "6"
"Data Group For File"	Standard file: displays messages in various modes (see appendix I) Special file: displays different files according to scheduling e.g: "00" + space + "01" + space + " 11" + space....."37" + "0FFH" "00" = FILE 00; "01" = FILE 01; "11" = FILE 11; "37" = FILE 37; "0FFH" = End Code Remark: see example 2 in Appendix II

P.S: Each file can contain many frames, one file data or many files' data

## 3 Data For Special File

Format	"2" + "Special File Name" + "Running Date" + "On Time" + " Off Time" + " Data for special file"
<b>Code</b>	<b>Description</b>
"2"	Leading code
"Special File Name"	An ASCII code: "0"~"9"
"Running date"	"Bit0" = "Sunday" "Bit1" = "Monday" "Bit2" = "Tuesday" ..... "Bit7" = "Saturday"
"On Time"	4 ASCII codes e.g:"0830" = 8:30am
"Off Time"	As above

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Data for special file	Files' list e.g: "00" + "01" + " 11" + "37" + "0FFH"  "00" = FILE 00; "01" = FILE 01; "11" = FILE 11; "37" = FILE 37; "0FFH" = End Code Remark: see example 3 in Appendix II
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P.S: Special file includes many files' names, and displays these files according to its on/off time, repeatedly.

### 4 Data For Alarming

Format	"4" + "Nos. Of Alarming" + "Time Interval" + "0FFH"
<b>Code</b>	<b>Description</b>
"4"	Leading code
"Nos. Of Alarming"	1 byte, "0"~"255" Remark: " *6 " means special file "6"
"Time Interval"	1 byte, "0"~"255" Remark: time interval between two alarms; Unit: minutes Remark: see example 4 in Appendix II
"0FFH"	End code

### 5 Data For Time Alarming

Format	"5" + "Time Alarming" + "0FFH"
<b>Code</b>	<b>Description</b>
"5"	Leading code
"Time Alarming"	1 byte "0" = Alarm Off Remark: Alarm On if the bit <>"0" Remark: Example 4 in Appendix II
"0FFH"	End code

### 6 Data For Sign On

Format	"6" + "Time For Sign On" + "0FFH"
<b>Code</b>	<b>Description</b>
"6"	Leading code
"Time For Sign On"	2 ASCII codes, "0"~"9" e.g: "08", "30", "00" "08"= Hour "30"= Minute "00"= Second
"0FFH"	End code

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### 7 Data For Sign Off

Format	"7" + "Time For Sign Off" + "OFFH"
<b>Code</b>	<b>Description</b>
"7"	Leading code
"Time For Sign Off"	2 ASCII codes, "0"~"9" e.g: "18", "30", "00" "18"= Hour "30"= Minute "00"= Second
"OFFH"	End code

### 8 Data For Date / Time Resetting

Format	"8" + "Week" + "Hour Mode" + "Current Time" + "OFFH"
<b>Code</b>	<b>Description</b>
"8"	Leading code
"Week"	1 ASCII code "0" = Sunday; "1" = Monday; "2" = Tuesday; "3" = Wednesday; "4" = Thursday; "5" = Friday; "6" = Saturday
"Hour Mode"	"0" = 24-hrs mode Remark: if the bit <> "0", it represents 12-hrs mode
"Current Time"	2 ASCII codes "Year" + "Month" + "Day" + "Hour" + "Minute" + "Second" e.g: "98" + "03" + "13" + "08" + "59" + "50" Remark: see example 6 in Appendix II
"OFFH"	End code

### 9 Data For Custom Graphic

Format	"9" + "Graphic Number" + "Data For Graphic"
<b>Code</b>	<b>Description</b>
"9"	Leading code
"Graphic Number"	1 ASCII code
"Data For Graphic"	280 bytes e.g: char Graphic[4][7][10] [4]: Four color page, sequence in Red1, Red2, Green1 & Green2 [7]: Line 7th [10]: Each line contains 10 bytes (80 dots)

### 10 Data For Testing

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Format	"10" + "Testing Code" + "0FFH"
<b>Code</b>	<b>Description</b>
"10"	Leading code
"Testing Code"	Testing code = "01H" Phenomenon: All red, all green & all amber; 5 seconds delay for each color.
"0FFH"	End code

### 11 Data For Signs' List

Format	"11" + "Signs' List" + "0FFH"
<b>Code</b>	<b>Description</b>
"11"	Leading code
"Signs' List"	Variable length. Each byte represents one sign number. Remark: "FFFFH" for every signs
"0FFH"	End code

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## Appendix I

Format For Standard File	
Format	"Run Mode" + "Property" + - - - + "English Characters" + - - - + "Property" - - - "Run Mode" - - -
Code	Description
"Run Mode"	"00H" ~ "18H" (25 different kinds of running modes) In communication: use "01H"~"19H" instead of using "00H"~"18H"
"English Characters"	"20H"~"EDH"
"Property"	Property = "EFH" It means the next byte is for property only.
	Remark: "FFH" = End of a frame (Generally, next frame should be began with "Run Mode") "FFH" + "FFH" = End of standard file

### Properties:

"60H"~"7DH":	30 nos. pre-defined symbols (SYMBOLS)
"80H":	Insert clock
"81H":	Insert date
"90H~97H":	8 different kinds of animations (ANIM n)
"A0H~A5H":	6 different kinds of fonts (FONTS)
"B0H~BFH":	16 different kinds of colors (COLORS)
"C0H~C7H":	8 levels moving speeds (SPEED n)
"C8H~CFH":	8 levels pause time (PAUSE n)
"D0H~DFH":	8 nos. of custom graphics and 8 nos. of pre-defined graphics (GET GRAPHICS)
"E0H~E2H":	3 different kinds of beep sounds (BEEP n)

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## Appendix II

### Example 1: Data For File

Data	Item	Description
0, 0xff, 0xff, 1	0	Leading code for sign address
	0xff, 0xff	For every signs
	1	Clear ALL messages
1, '01'	1	Leading code for file
	01	File name = 01
1, 0xef, 0xb0, 'User\'s Guide', 0xff	1	Mode=1(CYCLIC)
	0xef, 0xb0	Color= bright red
8, 0xef, 0xb5, 'easy to use', 0xff		Frame 2
15, 0xef, 0xb5, 'give you power', 0xff		Frame 3
20, 0xef, 0xb5, 'moving sign', 0xff		Frame 4
5, 0xef, 0xb7, 'Your wise choice', 0xff		Last Frame
0xff		End of File 01
0		End code

### Example 2: Data For Files, Followed By Special File

Data	Item	Description
0, 0xff, 0xff, 1	0	Leading code for sign address
	0xff, 0xff	For every signs
	1	Clear ALL messages
1, '01', 0xef, 0xb0, 'FILE 01', 0xff, 0xff		File 1
1, '02', 0xef, 0xb5, 'FILE 02', 0xff, 0xff		File 2
1, '03', 0xef, 0xb7, 'FILE 03', 0xff, 0xff		File 3
1, '*0', '01 02 03', 0xff, 0xff		Special Package 'S0'
0		End code

### Example 3: Data for Special File

Data	Item	Description
0, 0xff, 0xff, 1		Sign address
1, '01', 0xef, 0xb0, 'FILE 01", 0xff, 0xff		File 1
1, '02', 0xef, 0xb5, 'FILE 02", 0xff, 0xff		File 2
1, '03', 0xef, 0xb7, 'FILE 03", 0xff, 0xff		File 3
2, '0', 0x3e, '0800', '1759', '010203', 0xff	0	Special Package 'S0'
	0x3e	Monday to Friday
	0800	On time
	1759	Off time
	010203	Sequence: File01, File02 & File03, repeatedly
0		End code

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### Example 4: Data For Alarming

Data	Item	Description
0, 0xff, 0xff, 0		Sign address
4, 255, 1, 0xff		Alarm 255 times One alarm per minute
0		End code

### Example 5: Data For Time Alarming

Data	Item	Description
0, 0xff, 0xff, 0		Sign address
8, '5', 1, '980313085950', 0xff	8	Data For Date / Clock Resetting
	'5'	Friday
	1	12-hour mode
	'980313085950'	Date: 1998.3.13 & Clock: 08:59:50
5, 1, 0xff		Data For Time Alarming
0		End code

### Example 6: Data For Date / Clock Resetting

Data	Item	Description
0, 0xff, 0xff, 1		Sign address
8, '5', 0, '980313173000', 0xff	8	Data For Date / Clock Resetting
	'5'	Friday
	0	24-hour mode
	'980313173000'	Date: 1998.3.13 & Clock: 17:30:00
0		End code