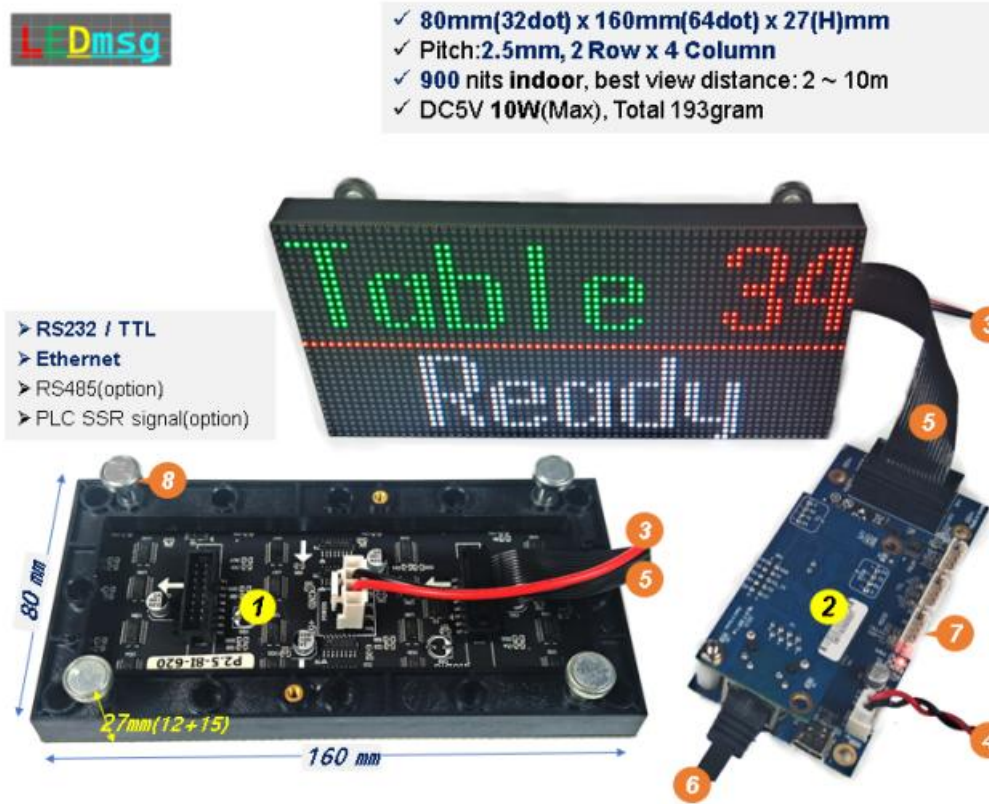


1. Application

- This kit is to display the LED text message for your "Robot, PLC, PC, IoT, Embedded system, network server, etc."
- You can insert this kit to your custom case (or equipment) with [power supply\(DC5V-3A\)](#).
- If you need a different size of the screen, please contact us after referring to www.LEDmsg.com.

2. Product



- ① LED module(LMD-P2.5-2R4C)
- ② LMD controller(LMD-C1-1E)
- ③ Power cable to LED module(50cm)
- ④ Power cable to Controller(50cm)
- ⑤ Data cables(16P,18cm)
- ⑥ Ethernet port(RJ45)
- ⑦ RS232 port (TX-RX-GND) with cable
- ⑧ Support(M3-12mm magnet, 4pcs)

This product includes the above items(①~⑧) while the case and power supply are not included.
The controller and LED module can be purchased separately in a bundle(MOQ: 10 pcs).
Optional parts below can be ordered in addition.

- 1. [TTL to RS485 converter](#) (+ \$9)
- 2. [PLC SSR Signal IO board](#) (+ \$16)
- 3. [GPS time receiver](#) (+ \$28)
- 4. [Temp./Humidity sensor](#) (+ \$19)
- 5. [Relay board](#) (2 channels, + \$9)
- 6. [Auto brightness control cell](#) (+ \$9)

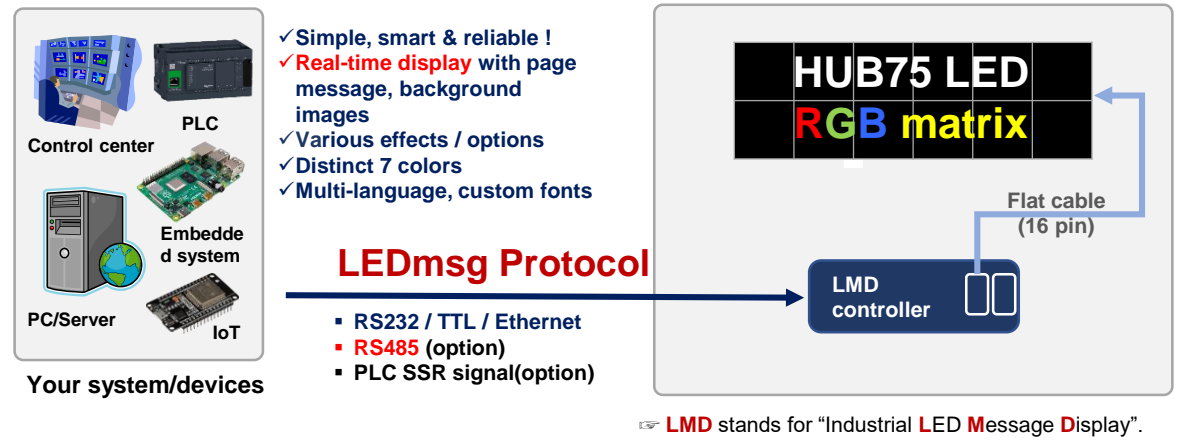
3. Demo video



4. Features

- LED text message displayer for **real-time** interface with your industrial systems/devices.
- Using "Simple, smart & reliable" **LEDmsg protocol**.
- Refined and distinct **7 colors** with **40 display effects**.
 - Red, green, yellow, blue, pink, sky-blue, white
- Korean, Chinese, Japanese, [European extended fonts](#) and custom font are supported.
- Displays **8** alpha-numeric characters, **4** language/special characters per line
- Displays over **120** characters with scrolling left effect
- RS232/TTL & Ethernet** as standard, **RS485** as an option
- Various useful optional parts such as converters, sensors, relays, GPS receiver, etc.
- Displays prestored **page messages** (up to 10) and **background images** (up to 255) together in an advanced way.
- Switch signals of the PLC/relay block can be interfaced to call a stored message(up to 255) by using Switch IO board.

5. LEDmsg Protocol ?



※ Structure of LEDmsg Protocol : ![abc ... !]

Start character	Address	Error check	Command type	Data	End character
![a	b	c	up to 208 byte	!]

※ Examples of real-time message command protocol (screen size : "2 Row x 6 Column" basis)



- ① ![000Hello world!]
 - ② ![000/C1Industrial /C2LED /C6sign /C7123!]
 - ③ ![000/F0103/C1123 /C2ようこそ /C3歓迎 /C75678!]
- ↳ Data consists of "display property" and "text message".
↳ /Cx : character color
/C1:red, /C2:green, /C3:yellow, /C6:skyBlue, /C7:white
↳ /Fxyy : character type and size

6. Protocol samples

	Message Protocol	Preview Image
1	![000hi LED~~~!]	hi LED~~~
2	![000/P0000/Y0004/B001/C2Table /C134!] //section 0 ![000/P0001/X0300/Y0408/C7Ready!] //section 1	Table 34 Ready
3	![000/P0000/Y0004/C5M/AC4N 2345!] //section 0 ![000/P0001/Y0408/E0606/S1000/C7Welcome visitors!] //section 1, long scrolling message	MUN 2345 Welcome visitors
4	![000/P0000/Y0004/B002/C2/U202 Fare!] //section 0 ![000/P0001/Y0408 /C1\$12.34!] //section 1	Ⓟ Fare \$12.34
5	![000/C11234/C2ABCD/C3/U049/U050/U065/U066!]	1234ABCD 12AB
6	![000/Y0206/U196/C1 23 /C2/U011!] //special character	♿ 23 →
7	![000/F0007/C7/U202/C123!] //large font	Ⓟ 23

- hi LED..... : Text message (Max. 208 byte), **One blank space gives an 8 pixel margin.**
 - /C1 /C2 ... : Text color (0: black 1: red, 2:green, 3:yellow, 4:blue, 5:pink, 6:skyBlue, C7:white)
 - /U049 /U050 ... : Identifier to call an User font(Special character/symbol)
 - /P0000 /P0001 ... : Section number for split screen (0000 ~ 0003)
 - /X1826 /Y0004 ... : X/Y area coordinates of the section by nibble (1 nibble = 4 pixels)
 - /E0606 /E4900... : Display effect code (1st two numbers:entry effect, 2nd two numbers: exit effect)
 - /S1000 /S9900... : 1st two numbers:effect speed, 2nd two numbers: Stay time)
 - /F0003 ... : Character encoding type and size
 - /AC4 ... : Identifier to call an [Extended ASCII code](#)
 - /B001 /B002 ... : This is to call up a prestored background image number(red/green lines) for the text message.
- The [Dabitche software](#) allows you to create a list (BGplaylist) containing background images of various types (text/graphics/animation) and upload them to the controller.

- When texts are displayed overlapping, send the screen initialization command "![00621!]".
- For details, refer to "[LMD sign protocol document\(chapter 5\)](#)", "[DabitChe Manual\(chapter 4, A-3\)](#)".

7. How to Simulate



1. Connect your PC to the LED display kit with RS232 cable, and supply the power(DC5V).
2. Download the [Protocol Simulator](#) to your PC(Window only), unzip it and run the simulator.
3. Click “**Special Function**” and set up the followings by referring to “[Simulator manual, 2. Preparation](#)”.
 - Communication method: [RS232/485](#) or [Ethernet](#)
 - [Screen size](#): Vertical-2, Horizontal-4, 3BPP, Array-Horizontal
 - [LED display signal type](#): **16D-P16D1S11, RGB**
4. Proceed the message simulation as follows for the above samples one by one:
 - ① Click “ASCII Message” tap.
 - ② Enter the message protocol (Ex. “![000Hello world!]”) in a text input box.
 - ③ Click “Save”.
 - ④ Click “Preview” to see the preview image on the pop-up screen.
 - ⑤ Click “Send”. Then the message will be displayed on the LED signboard.
5. Try to send various message protocol of “real time message” and “page messages” by referring to “[the simulator manual](#)” and “[LEDmsg protocol document](#)”.
If you want to display the message with various background images, refer to the “[DabitChe software manual](#)”.
6. Apply your final message protocol packet to your messaging system.

8. Controller Specifacaton ([LMD-C1-1S-2R](#), [LMD-S2E](#))



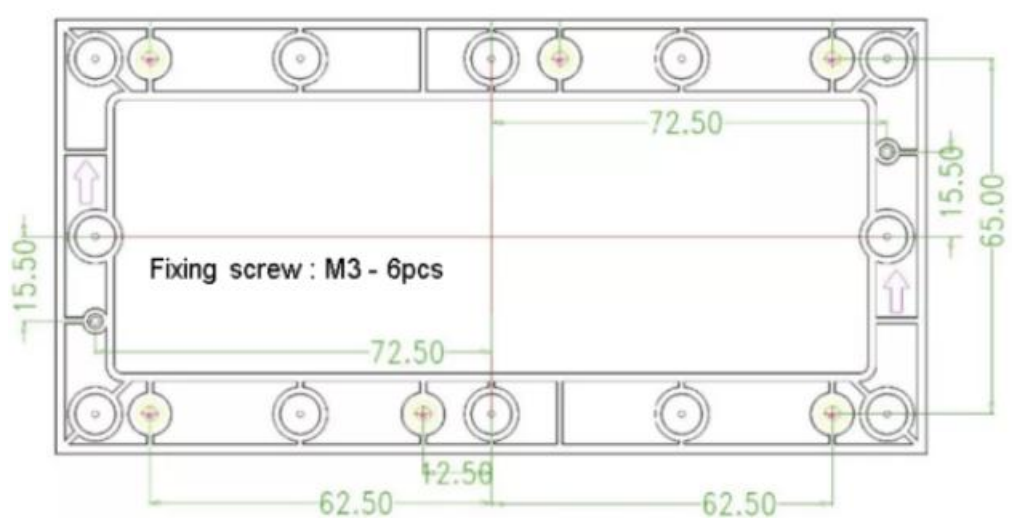
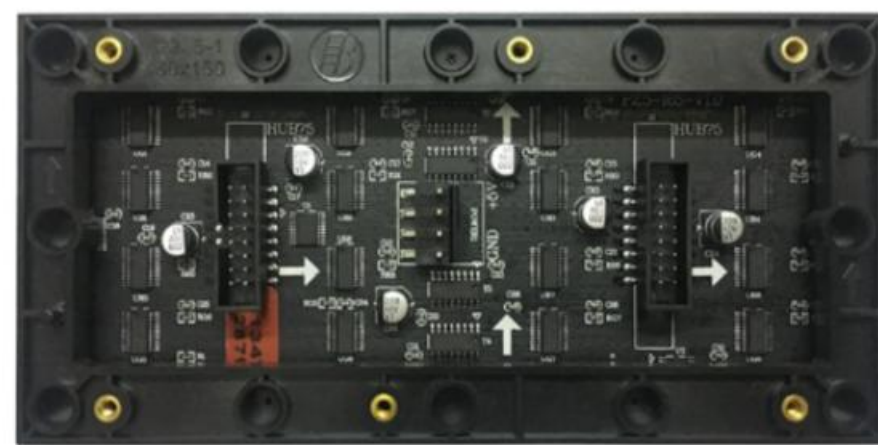
The controller “LMD-C1-1E” is a model that enables Ethernet communication by connecting the “BH1” ports of “LMD-S2E(Serial to Ethernet converter)” and “LMD-C1-1S(Serial only, controller)”.
For this application, the “J3” jumper must be inserted between “LAN” and “GND”.
The two products can be separated by removing the fixing bolts and nuts.

Port	Description	Port	Description
J1 (2-pin)	Power (DC5V, Max. 200mA)	BH1 (10-pin)	Port for Ethernet communication Insert “BH1(female)” of LMD-S2E” into “BH1(male)” of LMD-C1-1 S”, then secure with fixing bolt & nuts.
J2 (4-pin)	RS232 Port (5V-TX-RX-GND) GPS Time receiver is connected here.	HUB75-1 (16-pin)	These are the video signal output to LED screen • HUB75-1: Connect to the 1 st row • HUB75-2 : Connect to the 2 nd row
J3 (4-pin)	TTL Port (5V-TX-RX-GND)	JP (2/3-pin)	JP1(2pin) : Connect for the factory reset JP3(3pin, LAN-GND-RS485): - Connect “LAN-GND” when using “BH1” for Ethernet. - Connect “GND-RS485” when using “BH1” for RS485.
J4 (4-pin)	It is used for the following purposes. 1. Relay output (2-channel, 5V-D2-D1-GND) 2. CdS sensor(right 2 pins ONLY)	P1 (USB)	USB port(C type) to increase the memory when needed.
LED	PWR Red LED lights up when power is applied S1 Green LED blinks when CPU is normal S2 Green LED blinks when the video output signal is normal.	RJ45	Ethernet Connector The yellow LED on the left side of the connector turns on when the power is turned on, and the green LED on the right side blinks only when data is received.

- Model name : **LMD-C1-1E**
- Max. Screen Size(16x16 dot Matrix):
2-row x 16-column or 1-row x 32-columns, 4-row x 8-column(for special cases only)
- Display Image / Color: text, graphic and animation in **7 colors** (red, green, yellow, blue, pink, sky blue, white)
- Main Process : Xtensa® dual-core 32-bit LX7 microprocessor, up to 240 MHz
- Memory : 384 KB ROM, 512 KB SRAM, 8MByte Flash memory
- Scan rate : 1/32, 1/16, 1/8, 1/4
- Serial Port : RS-232 1, TTL 1, Ethernet 1, RS-485 1(option)
 - ☞ RS232/TTL default: **115,200bps, N(Parity check), 8(Data bit), 1(Stop bit)**
 - ☞ Ethernet default: IP-**192.168.0.202**, Gateway-192.168.0.1, Port-**5000**, **Server Mode**
- Working temp. : -40°C ~ 85°C
- Power Consumption : DC5V, 150mA(Max.)

9. LED module Specification

Model Name	LMD-P2.5-2R4C-16S
LED spec.	3 in 1 SMD2121, pitch 2.5mm
Size(Height x Width x Depth)	40 x 160 x 14.5mm
Pixels	32 x 64 dots
Density (dots/m ²)	160,000 dots/m ²
Weight (Kg)	0.160 kg
Brightness	800 cd/m ²
Connector type	HUB75, 16pin
Driving method	1/16duty Constant current method
View angle	Horizontal: ≥120 ° , Vertical: ≥120 °
Best view distance	2 ~ 10M
Color	R,G,B 4096Gray
Display color	4096*4096*4096
Life span	>8000 hours
Voltage	DC5V
Power consumption (Max.)	≤ 10 W/pc
Average power	≤ 3 W/pc (when displaying text only)
Power per 1m ² (Max.)	780 W/m ²
Average power per 1m ²	390 W/m ² (when displaying text only)
Working temperature	-10°C ~ 60°C
Working humidity	10% ~ 90%RH



Technical Matrials

1. [LEDmsg protocol Document](#)
2. LEDmsg protocol simulator: [User manual](#), [software](#)
3. Specification: [LMD-C1-1S-2R](#), [LMD-S2E](#), [LMD-P2.5-2R4C-16S](#)

For any question, please contact to Mr. **Dabit HEO** as below :
T.82-2-2272-5038, LEDmsg01@gmail.com,
 WeChat ID: **ledmsg**, WhatsApp **82-10-4568-5038**