

160° VIEWING ANGLE LOW POWER Typ. 15mA



EA 8162-XLG: 84x44x9,4mm

TECHNICAL DATA

- VERY LARGE VIEWING ANGLE: $\pm 80^\circ$ HORIZONTAL AND $\pm 80^\circ$ VERTICAL
- READABLE UNDER ANY ANGLE
- CONTRAST 1:100 (!) OR MORE
- VERY SLIM
- NO BACKLIGHT NEEDED
- VERY FAST DISPLAY EVEN BY LOW TEMPERATURES
- NO TEMPERATURE COMPENSATION CIRCUITS REQUIRED
- COMPATIBLE WITH OTHER POPULAR DISPLAYS (HD44780)
- * 4 & 8 BIT DATABUS, ENABLE, RS AND RW
- * 14 / 16 PIN CONNECTION
- * CHARACTER SET
- * CONTRAST CONTROL WITH RESISTOR
- ONLY SINGLE 5V SUPPLY REQUIRED
- VERY LOW OPERATING CURRENT: typ 15mA
- OPERATING TEMPERATURE $-20..+50^\circ\text{C}$ (Storage $-30 ..+70^\circ\text{C}$)

ORDERING INFORMATION

PLED DISPLAY 2x16 Char, GREEN CHAR
PLED DISPLAY 2x20 Char,
BEZEL FOR 2x16
BEZEL FOR 2x20
RS232 INTERFACE

EA 8162-XLG
EA 8202-XLG
EA 017-2UKE
EA 017-7UKE
EA 9707-V24S

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ABSOLUTE MAXIMUM RATINGS

Symbol		Min	typ	Max	Unit
VDD	Supply voltage for Logic	4.5	5.0	5.5	V
Topr	Operating temperature	-10	25	50	°C
Tstg	Storage temperature	-20		70	°C
Corrosive gas		not acceptable			
Humidity	Operating			+45°C 85% RH	Note 1)
	Storage			+45°C 85% RH	Note 1)
Note 1)	Damages of polarizer and adhesive are not considered				

ELECTRICAL CHARACTERISTICS

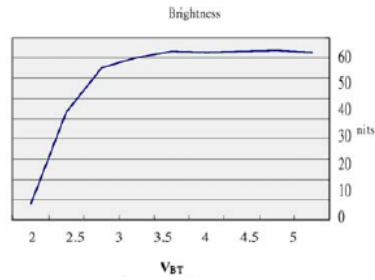
Symbol		Min	typ	Max	Unit
VDD	Supply voltage for Logic	4.5		5.5	V
IDD	Supply current: normal Text		16		mA
	all dots OFF		9		mA
	all dots ON		29		mA
Vih	Input voltage High	0.7 x VDD		VDD	V
Vil	Input voltage Low	-0.3		0.55	V
I	Leakage current	-1		1	µA

Current consumption depends on the number of ON-dots. Above values are measured in a 2x16 char module.

OPTICAL CHARACTERISTICS

Item	Condition	Min	typ	Min	Unit
Response Time	Rise	-	10	-	µs
	Fall	-	10	-	µs
Contrast ratio	100 lux	-	100	-	
Viewing angle	Top	-	80	-	deg
	Bottom	-	80	-	deg
	Left	-	80	-	deg
	Right	-	80	-	deg
Brightness		-	40	-	nits
Color		-	YG	-	

BRIGHTNESS



INSTRUCTION SET IDENTICAL WITH HD44780 CONTROLLER

Instruction	Code										Description	Execute Time (max.)
	RS	R/W	DB 7	DB 6	DB 5	DB 4	DB 3	DB 2	DB 1	DB 0		
Clear Display	0	0	0	0	0	0	0	0	0	1	Clears all display and returns the cursor to the home position (Address 0).	1.64ms
Cursor At Home	0	0	0	0	0	0	0	0	1	*	Returns the Cursor to the home position (Address 0). Also returns the display being shifted to the original position. DD RAM contents remain unchanged.	1.64ms
Entry Mode Set	0	0	0	0	0	0	0	1	I/D	S	Sets the Cursor move direction and specifies or not to shift the display. These operation are performed during data write and read.	40µs
Display On/Off Control	0	0	0	0	0	0	1	D	C	B	Sets ON/OFF of all display (D) cursor ON/OFF (C), and blink of cursor position character (B).	40µs
Cursor / Display Shift	0	0	0	0	0	1	S/C	R/L	*	*	Moves the Cursor and shifts the display without changing DD RAM contents.	40µs
Function Set	0	0	0	0	1	DL	N	F	*	*	Sets interface data length (DL) number of display lines (L) and character font (F).	40µs
CG RAM Address Set	0	0	0	1	ACG					Sets the CG RAM address. CG RAM data is sent and received after this setting.	40µs	
DD RAM Address Set	0	0	1	ADD					Sets the DD RAM address. DD RAM data is sent and received after this setting.	40µs		
Busy Flag / Address Read	0	1	BF	AC					Reads Busy flag (BF) indicating internal operation is being performed and reads address counter contents.	0		
CG RAM / DD RAM Data write	1	0	Write Data					Writes data into DD RAM or CG RAM	40µs			
CG RAM / DD RAM Data Read	1	1	Read Data					Reads data from DD RAM or CG RAM	40µs			

PLED SERIES LCD EA8162-XLG, EA8202-XLG

LOW POWER

The PLED module is ideal for applications that require low power consumption. Only a single +5V supply voltage is required. All other voltages are generated internally.

The current consumption with 'normal' text displayed and full contrast is around 15/20mA @ 5V for the 2x16 and 2x20 Char display. Each pixel highlighted uses around 20 μ A. Power consumption will drop even lower when the brightness is reduced. The life time of the display also increases when lowering the brightness. With full brightness (40cd/m²) the lifetime is 5-10.000 hours. When reduced to (20cd/m²) the lifetime is extended to 20.000 hours. For brightness of 20cd/m², VBT = 2.5V. For optimum lifetime and excellent brightness we recommend a contrast setting of VBT = 3V.

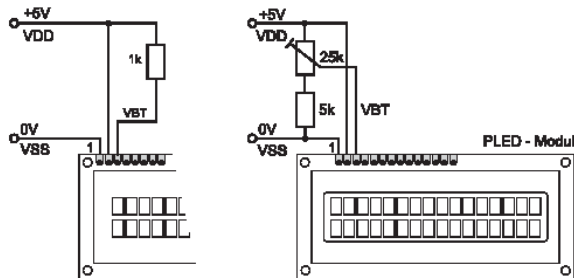
Note: Direct sunlight reduces readability

FUTURE DEVELOPMENTS

EA plans to design other PLED modules. Please visit the MMS-e website for further details.

BRIGHTNESS CONTROL

The brightness input VBT is a high impedance input and only a positive 5V and a resistor is required.



PINOUT

Pin	Symbol	Level	Description
1	VSS	L	GND
2	VDD	H	+5V
3	VBT	-	Brightness
4	RS	H/L	Register select
5	R/W	H/L	H:Read / L:Write
6	E	H	Enable
7	D0	H/L	Data 0 LSB
8	D1	H/L	Data 1
9	D2	H/L	Data 2
10	D3	H/L	Data 3
11	D4	H/L	Data 4
12	D5	H/L	Data 5
13	D6	H/L	Data 6
14	D7	H/L	Data 7 MSB
15*	NC	-	Do not connect
16*	NC	-	Do not connect

