ELECTRONIC ASSEMBLY
new display design

LCD-Modul 2x8 - 5.01mm

INCL. CONTROLLER ST7066

no more mounting required

Dimension 40 x 20 mm

FEATURES

* SUPER SMALL LCD MODULE
* HIGH CONTRAST LCD-SUPERTWIST DISPLAY (BLUE/NEUTRAL)
* OPTIONAL LED-BACKLIGHT YELLOW/GREEN
* HD 44780 COMPATIBLE
* 4- OR 8-BIT DATA BUS INTERFACE
* ASCII CHARACTER SET BUILT IN
* ALSO AVAILABLE: 1x8 LCD WITH SAME DIMENSIONS
* POWER SUPPLY +5V OR ±2.7V OR ±3.3V @2mA and 50mA for LED-B/L (5V)
* OPERATING TEMPERATURE RANGE EA DIPS082: -20…+70°C
* OPERATING TEMPERATURE RANGE EA 8081-A3N: 0…+50°C
* NO MORE MOUNTING REQUIRED: SIMPLY PLUG INTO PCB

ORDERING INFORMATION

LCD-MODULE 2x8 - 5.01mm	**EA DIPS082-HN**
WITH LED BACKLIGHT YELLOW/GREEN	**EA DIPS082-HNLED**
LCD-MODULE 1x8 - 7.15 mm	**EA 8081-A3N**

Pinout

Pin	Symbol	Level	Function
1	VSS	L	Power Supply 0V (GND)
2	VDD	H	Power Supply +5V
3	VEE	-	Contrast (about 0.3V / 1.2V)
4	RS	H / L	H=Data / L=Command
5	R/W	H / L	H=Read / L=Write
6	E	H	Enable (falling edge)
7	D0	H / L	Display Data / Anode LED-B/L

Pin	Symbol	Level	Function
8	D1	H / L	Display Data
9	D2	H / L	Display Data
10	D3	H / L	Display Data
11	D4 (D0)	H / L	Display Data
12	D5 (D1)	H / L	Display Data
13	D6 (D2)	H / L	Display Data
14	D7 (D3)	H / L	Display Data, MSB

Contrast setting

5V

VEE 4k7 Ω

GND

3.3V

VEE 4k7 Ω

-3.3V
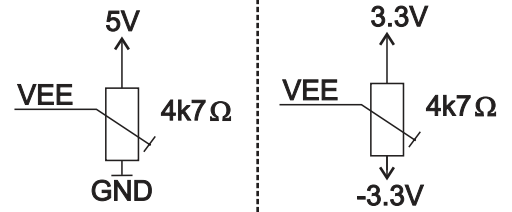
LED Backlight

Standard display EA DIPS082-HN is reflective, non-backlighted version. Module with part number EA DIPS082-HNLED comes with yellow/green LED backlight. Power consumption for backlight is 50mA typ. and 80mA max. Backlight is permanent switched on. Supply voltage with backlight is 5V only.
For individual use LED backlight can be switched on and off after doing the following modification:
Remove series resistor R5 and change resistor from R6 to R7. Now a positive voltage at pin 7 (D0) powers Anode of backlight direct. To limit LED-current an external series resistor is required ($R_{Ext.}$= 0,8V / I_{LED}). Please note that in this case display interface is 4-bit mode only !

Table of commands

Instruction	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description	Execute Time (max.)
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 (N) 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.	-
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

Character set

Below shown character set is already built in. Additionally 8 self defined characters can be attached.

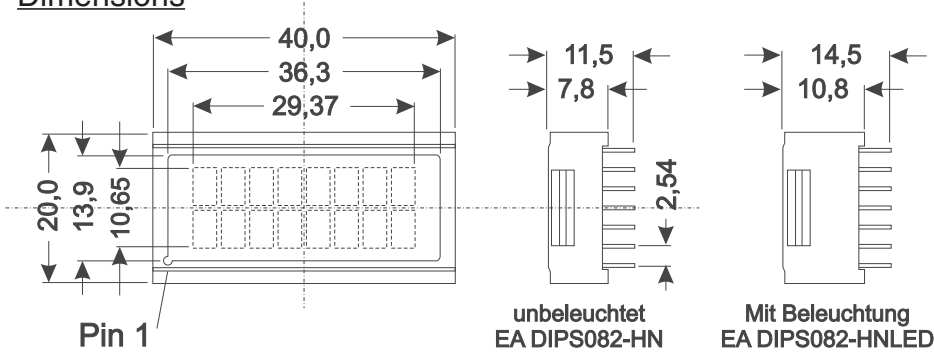| Lower 4 bit \ Upper 4 bit	0000 ($0x)	0010 ($2x)	0011 ($3x)	0100 ($4x)	0101 ($5x)	0110 ($6x)	0111 ($7x)	1010 ($Ax)	1011 ($Bx)	1100 ($Cx)	1101 ($Dx)	1110 ($Ex)	1111 ($Fx)
xxxx0000 ($x0)	CG RAM (0)		0	@	P	`	p		—	夕	ミ	α	p
xxxx0001 ($x1)	(1)	!	1	A	Q	a	q	。	ア	チ	ム	ä	q
xxxx0010 ($x2)	(2)	"	2	B	R	b	r	「	イ	ツ	メ	β	θ
xxxx0011 ($x3)	(3)	#	3	C	S	c	s	」	ウ	テ	モ	ε	∞
xxxx0100 ($x4)	(4)	$	4	D	T	d	t	、	エ	ト	ヤ	μ	Ω
xxxx0101 ($x5)	(5)	%	5	E	U	e	u	・	オ	ナ	ユ	σ	ü
xxxx0110 ($x6)	(6)	&	6	F	V	f	v	ヲ	カ	ニ	ヨ	ρ	Σ
xxxx0111 ($x7)	(7)	'	7	G	W	g	w	ア	キ	ヌ	ラ	g	π
xxxx1000 ($x8)	CG RAM (0)	(	8	H	X	h	x	イ	ク	ネ	リ	√	x̄
xxxx1001 ($x9)	(1)	)	9	I	Y	i	y	ウ	ケ	ノ	ル	⌐	y
xxxx1010 ($xA)	(2)	*	:	J	Z	j	z	エ	コ	ハ	レ	j	千
xxxx1011 ($xB)	(3)	+	;	K	[	k	{	オ	サ	ヒ	ロ	×	万
xxxx1100 ($xC)	(4)	,	<	L	¥	l	|	ヤ	シ	フ	ワ	¢	円
xxxx1101 ($xD)	(5)	-	=	M	]	m	}	ユ	ス	ヘ	ン	£	÷
xxxx1110 ($xE)	(6)	.	>	N	^	n	→	ヨ	セ	ホ	゛	ñ	
xxxx1111 ($xF)	(7)	/	?	O	_	o	←	ッ	ソ	マ	゜	ö	▓

CREATING YOUR OWN CHARACTERS

All character display modules offered in this catalogue, are able to create 8 own characters (ASCII Codes 0..7) in addition to the 192 ROM fixed codes.

1.) The command "CG RAM Address Set" defines the ASCII code (Bit 3,4,5) and the dot line (Bit 0,1,2) of the new character. Example demonstrates creating ASCII code $00.
2.) Doing 8 times the write command "Data Write" defines line by line the new character. 8th. byte stands for the cursor line.
3.) The new defined character can be used as a "normal" ASCII code (0..7); use with "DD RAM Address Set" and "Data Write".
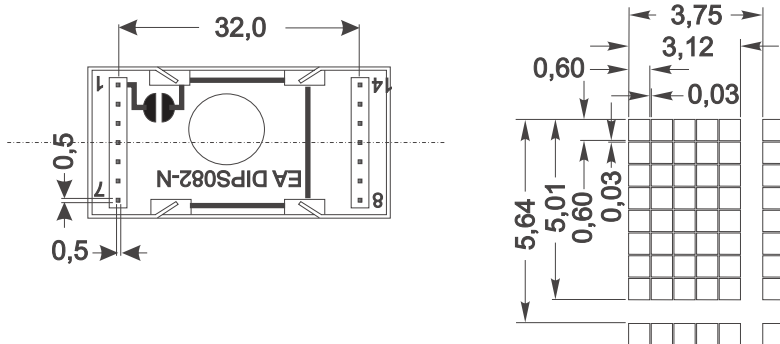
Adresse im CG RAM setzen

Adresse			Hex
0 1 0 0 0	0 0 0		$40
	0 0 1		$41
	0 1 0		$42
	0 1 1		$43
	1 0 0		$44
	1 0 1		$45
	1 1 0		$46
	1 1 1		$47

Daten des Zeichens

Bit 7 6 5 4 3 2 1 0	Hex
X X X 0 0 1 0 0	$04
0 0 1 0 0	$04
0 0 1 0 0	$04
0 0 1 0 0	$04
1 0 1 0 1	$15
0 1 1 1 0	$0E
0 0 1 0 0	$04
0 0 0 0 0	$00

INITIALISATION FOR A 2 LINE DISPLAY / 8-BIT MODE

Command	RS	R/	DB	DB	DB	DB	DB	DB	DB	DB	Remark
Function Set	0	0	0	0	1	1	1	0	0	0	8-Bit Data Length, 2/4 lines, 5x7 Font
Display ON/OFF	0	0	0	0	0	0	1	1	1	1	Display on, Cursor visible, Cursor blink
Clear Display	0	0	0	0	0	0	0	0	0	1	Clear Display, Cursor Home
Entry Mode Set	0	0	0	0	0	0	0	1	1	0	Cursor Auto-Increment

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2x8 - 5.01mm

Dimensions

40,0
36,3
29,37
20,0
13,9
10,65

Pin 1

11,5
7,8
2,54

unbeleuchtet
EA DIPS082-HN

14,5
10,8

Mit Beleuchtung
EA DIPS082-HNLED

ATTENTION

handling precautions!

all dimensions are in mm

32,0
0,5
0,5
EA DIPS082-N

3,75
3,12
0,60
0,03
5,64
5,01
0,60
0,03
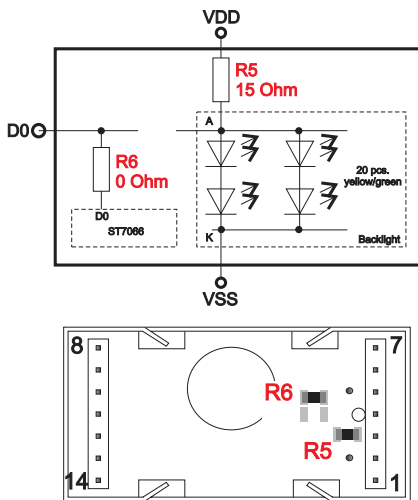
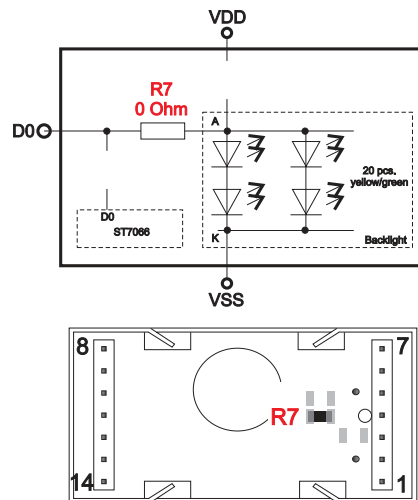*Note:*
LC-displays are not suited for wave soldering or reflow soldering. Temperatures above +80°C may damage lcd-module.

LED intern / extern

VDD
R5
15 Ohm
D0
R6
0 Ohm
D0
ST7066
A
K
20 pcs.
yellow/green
Backlight
VSS

VDD
R7
0 Ohm
D0
D0
ST7066
A
K
20 pcs.
yellow/green
Backlight
VSS

8   7
R6
R5
14   1

Delivery state
Intern, LED permanent on

8   7
R7
14   1

Extern, LED controllable,
only possible in 4-bit mode

1-line Display EA 8081-A3N

40,0
36,3
27,8
20,0
13,9
7,15

Pin 1

11,5
7,8
2,54

32,0
0,5
0,5
EA 8081-A3N

3,55
2,95
0,55
0,05
7,15
5,55
0,55
0,05