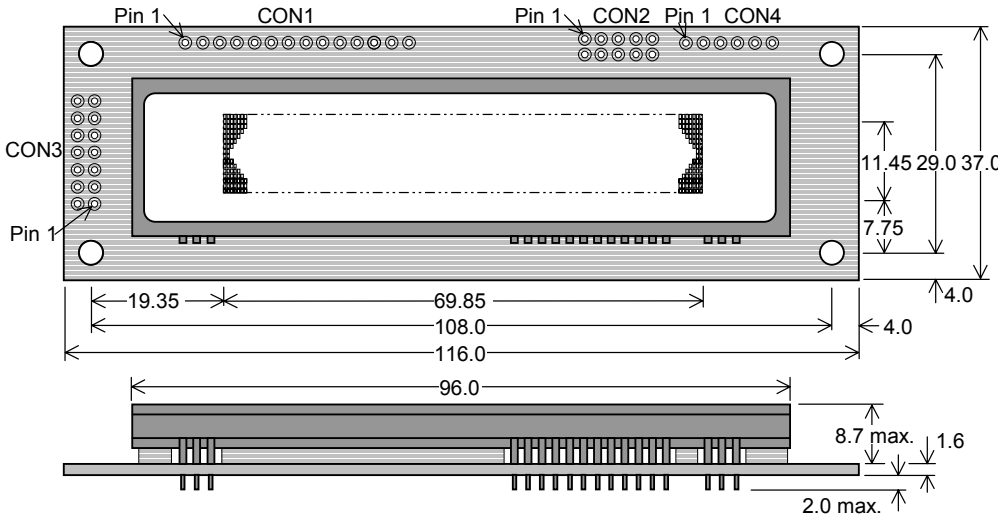


# Dot Graphic VFD Module

# GU140x16G-7806

- ❑ 140x16 Dot Graphic (2x20 characters)
- ❑ Single 5V Supply
- ❑ High Brightness Blue Green Display
- ❑ Operating Temp -40°C to +85°C
- ❑ 3 Multi Sized Fonts
- ❑ 4/8 Bit Parallel LCD & Serial Interfaces

The module includes the Vacuum Fluorescent Display glass, VF drivers and micro-controller ICs with refresh RAM, character generator and interface logic. The 4/8 bit parallel & serial bi-directional interfaces are 5V TTL/CMOS compatible. The command set is LCD compatible with extended graphic functions.



### SERIAL INTERFACE-CON2

Pin	Async	SPI
1	5V	5V
2	NC	SCK
3	RXD	/SS
4	NC	SIN
5	0V	0V
6	NC	SOUT
7	TXD	NC
8	/RES	/RES
9	MB	MB
10	HB	HB

Dimensions in mm & subject to tolerances. Mounting holes 3.2mm dia.

NC = Do Not Connect

### PARALLEL INTERFACE - CON1

Pin	Sig	Pin	Sig
1	GND	2	VCC
3	NC*	4	RS
5	R/W (W/R)	6	E (R/D)
7	D0	8	D1
9	D2	10	D3
11	D4	12	D5
13	D6	14	D7

\* /RESET = Jumper J6.1 & J6.2  
BUSY = Jumper J6.2 & J6.3

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Condition
Power Supply Voltage	VCC	5.0VDC +/- 5%	GND=0V
Power Supply Current	ICC	250mADC typ.	VCC=5V
Logic High Input	VIH	0.8VDC min. Vcc max.	VCC=5V
Logic Low Input	VIL	0VDC min 0.6VDC max.	VCC=5V
Logic High Output	VOH	3.5VDC min. Vcc max.	IOH=-10uA
Logic Low Output	VOL	0VDC min 0.6VDC max.	IOL =4mA

### OPTICAL and ENVIRONMENTAL SPECIFICATIONS

Parameter	Value
Display Area (XxY mm)	69.85 x 11.45
Dot Size/Pitch (XxY mm)	0.35 x 0.575 / 0.5 x 0.725
Luminance	700 cd/m <sup>2</sup> Typ.
Colour of Illumination	Blue-Green (Filter for colours)
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Operating Humidity (non condensing)	20 to 80% RH @ 25°C

### SOFTWARE COMMANDS

Instruction	R/W	RS	D0-D7
Clear Display	L	L	01H
Cursor Return Home	L	L	02H
Entry Mode Set	L	L	04H-07H
Display ON/OFF	L	L	08H-0FH
Cursor Shift Left	L	L	10H
Cursor Shift Right	L	L	14H
Display Shift Left	L	L	18H
Display Shift Right	L	L	1CH
Select 4 bit interface	L	L	20H + optional luminance data
Select 8 bit interface	L	L	30H + optional luminance data
Set CG RAM Addr.	L	L	40H-7FH
Set DD RAM Addr.	L	L	80H-E7H
Read BUSY/Addr.	H	L	00H-FFH D7 Busy = High
Read Data from RAM	H	H	00H-FFH
Set Graphic Cursor	L	L	F0H + xpos + ypos
Set Area Commands	L	L	F1H + x1 + y1 + x2 + y2 + cmd
	L	H	where cmd 49H = Invert Area
	L	H	46H = Fill Area
	L	H	43H = Clear Area
	L	H	4FH = Set Outline Box
	L	H	6FH = Clear Outline Box
	L	H	+ others for graphic data write
Set Font / Spacing	L	L	F2H + font style
Set RS Low			0FH Serial Comms. only
Read Data			FEH Serial Comms. only
Read Cursor Position			FFH Serial Comms. only

### CHARACTER SET

5x7 & 10x14 Font	LCD Font	International Font
00	00	00
01	01	01
02	02	02
03	03	03
04	04	04
05	05	05
06	06	06
07	07	07
08	08	08
09	09	09
0A	0A	0A
0B	0B	0B
0C	0C	0C
0D	0D	0D
0E	0E	0E
0F	0F	0F

### Mini Font

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F

The default font can be changed by J3. Other fonts can then be selected by software command.

### FONT SELECTION

J3	Font
Open	LCD (default)
Link	International

### SERIAL/PARALLEL SELECTION

J8	Interface
Open	Parallel (default)
Link	Serial

### SERIAL MODE

J9	J10	Configuration
O	O	SPI / Clock Serial (def)
L	O	Async 9600,N,8,1
O	L	Async 19200,N,8,1
L	L	Async 38400,N,8,1

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Subject to change without notice.  
 IUK Doc Ref:04113 Iss:2 19Nov02

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