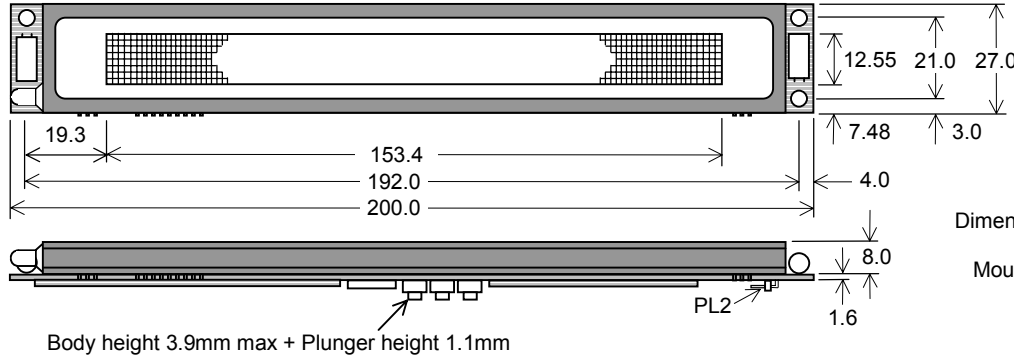


Dot Graphic VFD Module

GU96X8M-K611C5

- 96 x 8 High Brightness Dot Graphic Display
- Single 12V DC Supply
- Large 5x7 ASCII & European Font
- RS485 Asynchronous Serial Interface
- 64 Selectable Multi Drop Addresses
- Transformerless PSU (patent pending)
- Low Profile Construction

The module includes the VFD glass, VF drivers and microcontroller with refresh RAM, character generation, interface logic and patented transformerless DC/DC converter. The RS485 serial interface accepts 9600 or 19200 baud rates with optional parity bit. The module features a low profile design with numerous custom options available including special fonts and commands. Modules can be connected to a multi drop address system.



Dimensions in mm & subject to tolerances.
Mounting holes 3.5mm dia.

ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Condition |
|------------------|-----------------------------------|-----------------------|----------------------|
| Supply Voltage | V _{cc} | 12.0VDC -10% +20% | GND=0V |
| Supply Current | I _{cc} | 300 mA typ. | V _{cc} =12V |
| RS485 Diff Input | V _{IL} / V _{IH} | -0.2V min / +0.2V max | V _{cc} =12V |

OPTICAL & ENVIRONMENTAL SPECIFICATION

| Parameter | Value |
|-------------------------|----------------------------|
| Display Area (X xYmm) | 153.35 x 12.55 |
| Dot Size/Pitch (XxY mm) | 1.35 x 1.35 / 1.6 x 1.6 |
| Luminance | 800 cd/m ² Min. |
| Colour of Illumination | Blue-Green (505nm) |
| Operating Temperature | -20°C to +70°C |
| Storage Temperature | -40°C to +85°C |
| Operating Humidity | 20 to 80% RH @ 25°C |

Optical filters can provide violet, red, yellow, blue & green output.

SOFTWARE COMMANDS

| Hex | Command |
|-------------------------|---|
| 10 | Software Reset to power on state |
| 11 | Write Mode toggles overwrite / scroll |
| 12 | Write Direction toggles increment / decrement |
| 13 | Display On/Off. Data is retained |
| 14 | Display Invert. Toggle negative image |
| 15 + xx | Absolute Column Set from 00H – 7FH |
| 16 + xx | Relative Column Set by 00H - 7FH |
| 17 + len + data | Graphic Data Write 1 bytes per column, D7 top |
| 18 | Clear Character Buffer with 16 ASCII spaces |
| 19 + data | Write to Character Buffer for display effect |
| 1A + effect | Display Effect – fade, wipe, scroll, dissolve |
| 1C + macro + len + data | Store Macro E0H – FFH in EEPROM |
| 1D + delay | Delay Macro – pause for up to 3 seconds |
| 1E + 1E + 1E + FE | Clear Macros from EEPROM |
| 1E + 1E + 1E + FF | Stop Macro if in a loop |
| 1E + 1E + 1E + adr | Address Select 00H – 3FH for active module |
| 20 - DF | Character Write ASCII font. |
| E0 - FF | Run Macro – execute user defined macro |
| 60 + dh + dl | Send Hexadecimal code instead of binary |

The user can send non printable command codes 10H-1EH as hexadecimal. Prefix the code using character 60H. Example: '15'3F = Position column 64.

Macro E0 is run at power on.
The RS485 input has a 4K7ohm resistor load.
This can be adjusted to suit application requirements.

CHARACTER SET - 5X7 Font

| | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 0D | 0E | 0F |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 20 | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / | |
| 30 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 40 | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | |
| 50 | p | q | r | s | t | u | v | w | x | y | z | [| \ |] | ~ | |
| 60 | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 70 | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | |
| 80 | E | ° | f | l | o | r | á | e | ñ | θ | λ | π | τ | φ | ω | |
| 90 | Σ | Ω | × | ÷ | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° |
| A0 | À | Á | Â | Ã | Ä | Å | Æ | Ç | È | É | Ê | Ë | Ì | Í | Î | Ï |
| B0 | Ð | Ñ | Ò | Ó | Ô | Õ | Ö | × | Ø | Ù | Ú | Û | Ü | Ý | Þ | |
| C0 | à | á | â | ã | ä | å | æ | ç | è | é | ê | ë | ì | í | î | ï |
| D0 | ð | ñ | ò | ó | ô | õ | ö | ÷ | ø | ù | ú | û | ü | ý | þ | ÿ |

Character 60H is used as a hexadecimal prefix, but can be displayed with a repeat send.

Data is shown in hexadecimal and sent in binary. e.g. FF = 11111111 Bin Address 'adr' = 00 - 3F. Setting 'adr' to 00 activates all modules. Column position X = 00 – 7F.

The communication settings and address can be set using the three switches on the rear of the module. Default communication is 9600,n,8,1. The display effects command allows curtain, dissolve, scroll and fade. Software and font set are copyright Noritake Itron Corporation 2002

PL2

| Pin | Signal | Description |
|-----|--------|---------------------------------------|
| 1 | VCC | 12V Supply |
| 2 | A In | RS485 Receive |
| 3 | VCC | 12V output loop |
| 4 | B In | RS485 Receive |
| 5 | /RST | CMOS 5V level Reset Input. Active low |
| 6 | GND | 0V Supply |

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Detailed specification, software commands and interface timing are available on request. Subject to change without notice. IUK Doc. No. 03902 Iss.3 21 June 02