

SC1602Pro 16x 2 Characters Serial LCD Module User's Manual (Rev 1.1)



SC1602Pro-YG



SC1602Pro-B

Features

- 16 x 2 Characters
- RS485 Serial Interface
- Programmable Device Address
- Programmable Baud Rate (4800 or 9600 bps)
- Simple Serial Command
- 1 General Purpose transistor output
- 1 General Purpose TTL Input
- Programmable Startup Screen
- 100 bytes Receive Buffer eliminates delay requirement
- 8 User's Defined Characters.
- Backlight Control, On/Off/Flash
- Addressing and broadcast mode support
- 5V Operation.
- Mounting Kits and IP65 Enclosure Available

Communication

RS485 Serial Link
Data Format 8,N,1 (8 Data Bits, No Parity , 1 Stop Bit)
Baud Rate : 4800 or 9600 Programmable

Factory Default : 9600

Maximum Cable Length : 1000 m

Maximum Device on bus : 32

Device address range : 101 to 132

Factory Default : 101

Baud rate and Device Address is display for 3 s
Upon power up.

Serial Command

To initiate communication with SC1602Pro, send START BYTE and Device ID

START BYTE is defined as 0xEF (239 in decimal)

Example : [0xEF] [0x65] if the device address is 101.

LCD will response with [0xEE] [0x65]

The LCD is then ready to accept command or characters to be displayed.

Example : Sending " SC1602 Test " string to has this displayed on the LCD.

STOP BYTE must be send to end the session with currently connected LCD. Stop byte is 0xEA (234)
LCD will also response with [0xEE] [UID] when STOP BYTE is received.

Supported ASCII characters is listed below :

Start Up Screen

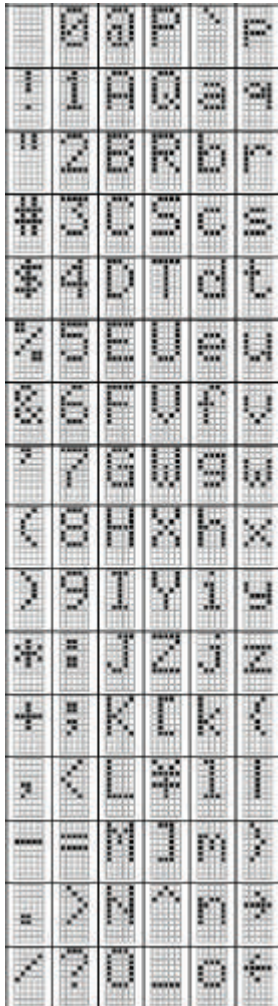
This screen of 16 x 2 characters is displayed after the baud rate and device address is displayed.

The screen is set as

" SILICON CRAFT "
" SC1602-RS485 "

This can be changed and stored in the non volatile memory.

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Supported ASCII characters

Function	Code (in Decimal)
Insert Custom Character	0 to 7
Send Cursor Home	11
Move Cursor to the Next Row	12
Clear LCD and Send Cursor Home	13
Turn On Underline Cursor	254,1
Turn On Blinking Cursor	254,2
Hide Cursor	254,3
Initialize LCD for Horizontal Graph	254,4
Turn On LCD Backlight	254,6
Turn Off LCD Backlight	254,7
Blink LCD Backlight	254,11
Load User's Defined Characters	254,8
Turn On Open Collector Output	254,12
Turn Off Open Collector Output	254,13
Read Input Status	254,14
Display Default Screen	254,20
Set LCD baud rate to 9600bps	254,30
Set LCD baud rate to 4800bps	254,31
Draw Left to Right Graph	254,43,length
Draw Right to left Graph	254,44,length
Clear Row	254,45,row
Clear Column	254,46,column
Set UID (RS485 address)	254,48,UID
Set Cursor Position	254,50,row,column
Define Default Screen	254,200, [32 ASCII Characters]
Define Custom Characters	254,100, [64 Bytes Bitmap]

Serial Command Summary

User's Defined Characters

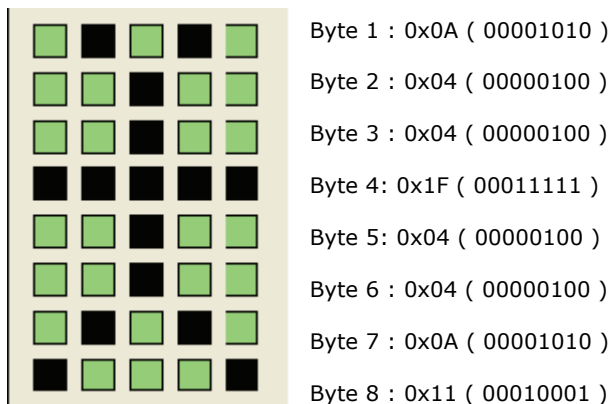
Apart from the ASCII characters listed on the left, user can define additional 8 characters.

Defined characters can be displayed by sending 0 to 7 (Decimal)

Example : Sending "0x00" or 0 to display user's defined character 1 on the current cursor position.

Character Bitmap

Each character consist of 8 bytes bitmap



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To define the characters send command

[0xFE] [0x64] [0x0A] [0x04] [0x04] [0x1F] [0x04] [0x04] [0x0A] [0x11]

Followed by the remained 56 bytes bitmap for user's defined character 2 to 8.

The bitmap is saved onto the non volatile memory.

User's needs to load the bitmap onto the LCD RAM before you can utilize this characters. This is done by sending command

[0xFE] [0x08]

Note: User's Defined Characters is unavailable when Graph Draw Command is in use.

Backlight Control

After power up, the backlight is turned on.

To turn off send command [0xFE] [0x07]

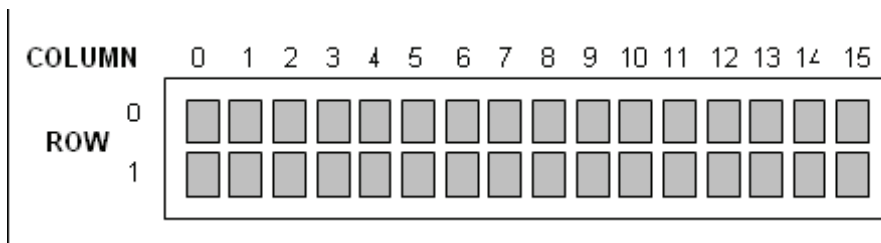
To turn back on send command [0xFE] [0x06]

The backlight can be made to flash too. This is done using command [0xFE] [0x0B]

Sending turn off or turn on command stops the flashes.

Cursor Control

Cursor position can be moved by command [0xFE] [0x32] [row position] [column position]



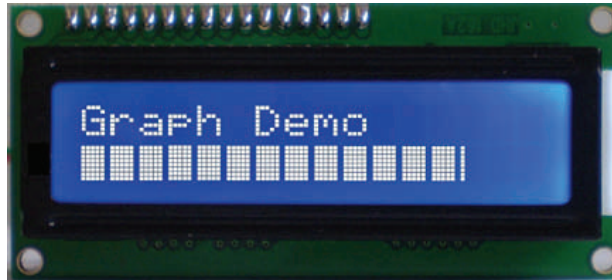
Broadcasting Command

Broadcast command enable all the LCD on the RS485 bus to receive the command.

When broadcasting command replace UID with 100 when sending command.

Note : LCD will not response with [0xEE] [UID] when broadcasting command is use.

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Drawing Bar Graph

Draw graph command is available to easily draw a horizontal bar graph onto the LCD screen.

The graph can be at any starting point and can be left to right or right to left.

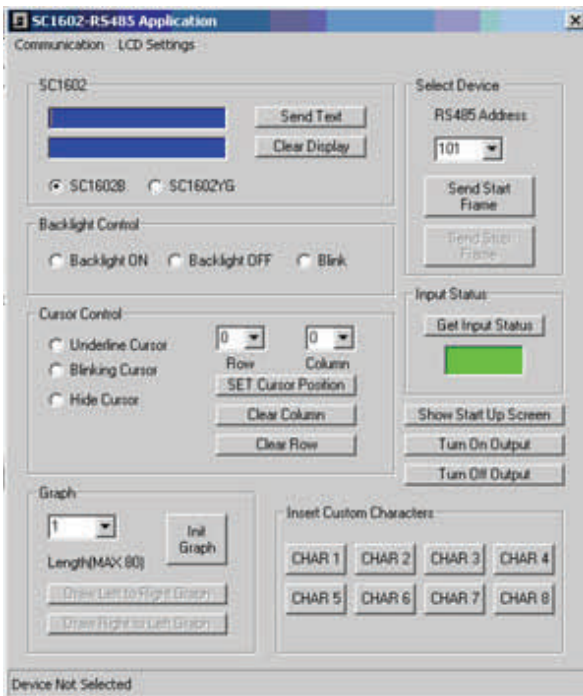
Example to display screen above.

1. Send ASCII string "Graph Demo"
2. Init Graph by sending command [0xFE][0x04]
3. Set cursor position at row 1 column 0 , [0xFE][0x32][0x01][0x00]
4. Draw the graph of length 66 . [0xFE][0x2B][0x42]

SC1602Pro Software

This software is use to test and configure SC1602Pro LCD module.

Available for download at www.siliconcraft.net/download.htm



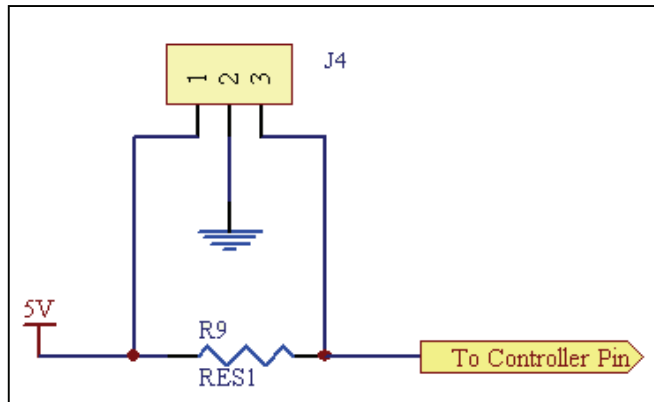
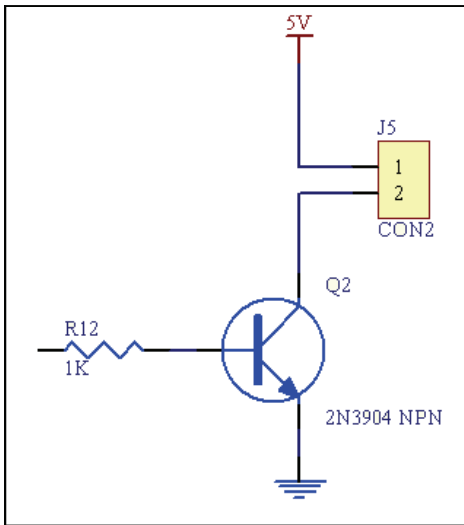
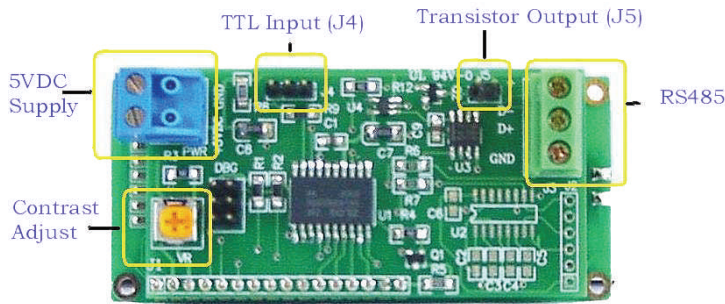
Support Windows XP, 2000 , Vista.

RS232 to RS485 converter is required.

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SC1602Pro Back View

Connector Position



IO Command

Turn on Transistor Output [0xFE] [0x0C]
 Turn off Transistor Output [0xFE] [0x0D]

Read Input Status [0xFE] [0x0E]
 Response [0xEE] [UID] [Status]

Electrical Specification

Power Supply : 4.8 - 5.5VDC
 Current Consumption : 10mA (Backlight Off) , 100mA (Backlight On)
 No transistor output load

Operation Temperature Range : 0° C to 50° C

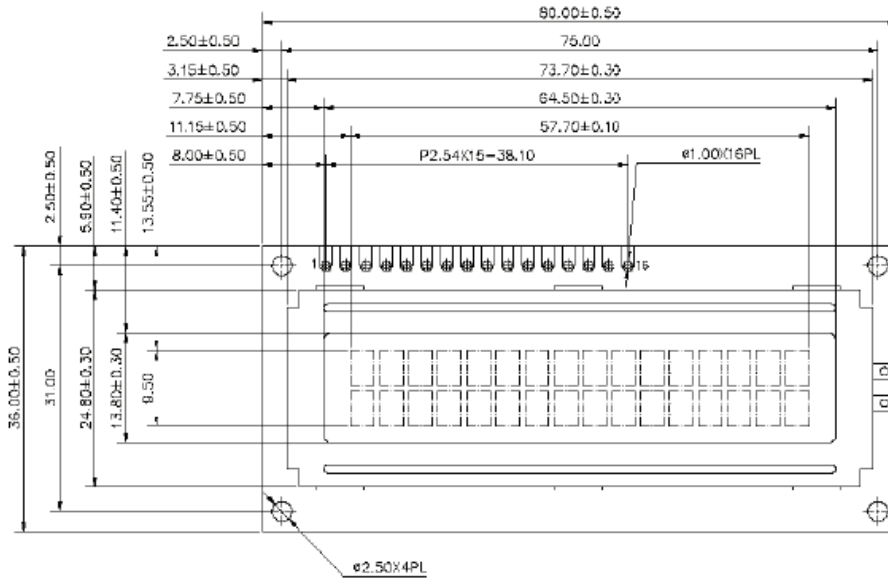
Storage Temperature Range : - 20° C to 60° C

Maximum transistor Q2 sink/source current : 200mA

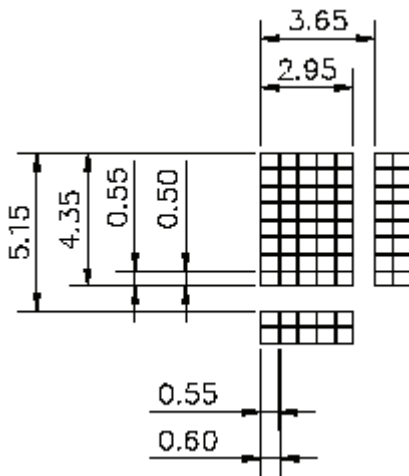
IMPORTANT : Ensure that the polarity of the power supply is correct before turning on the power.

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Mechanical Dimension

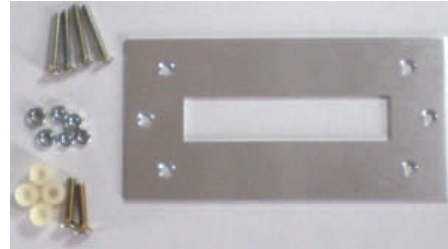
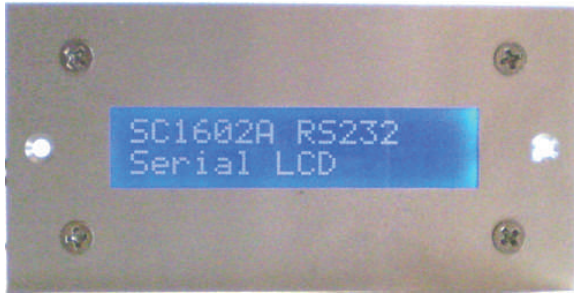


Dimension in millimeter

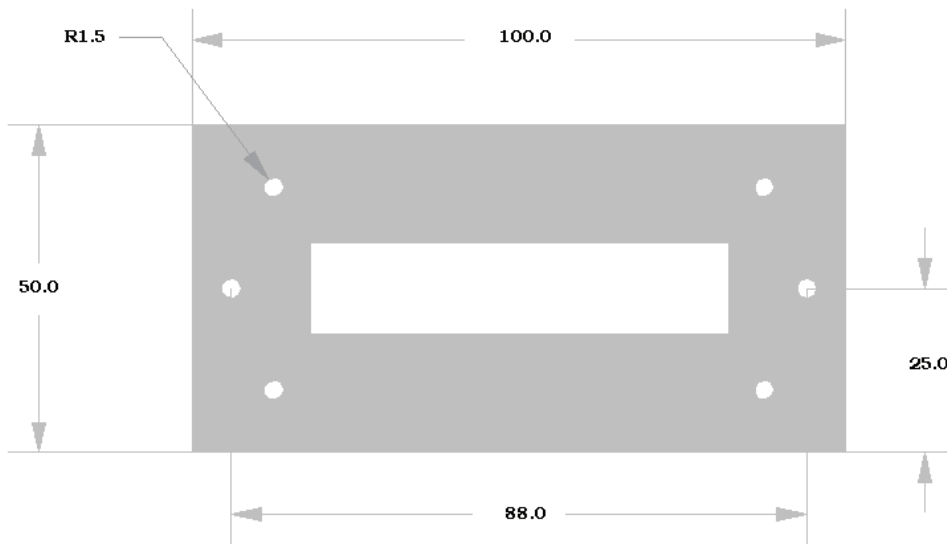


Character Dimension

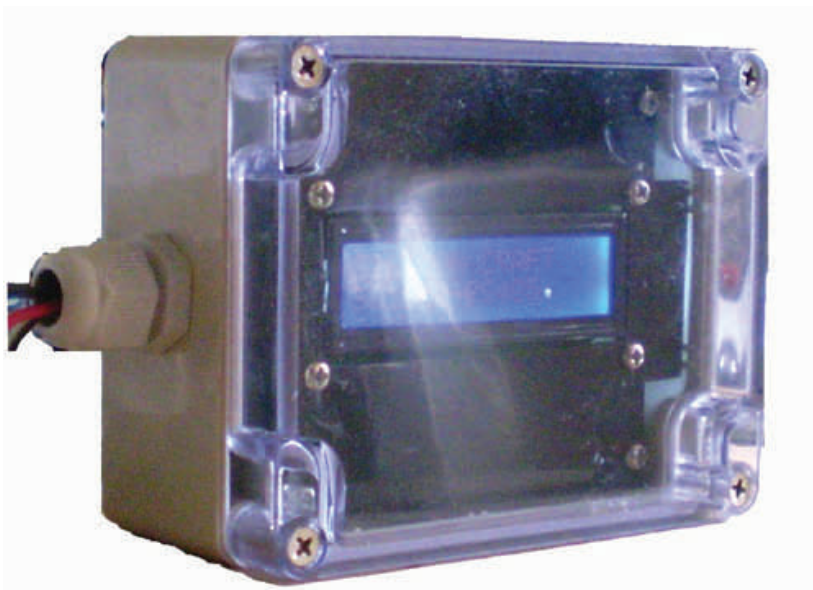
Available Accessories



Aluminum Mounting Kit



Mounting Kit Dimension (mm)
Thickness 1.5mm



IP 65 Rated Enclosure
with LCD mounting
plate.

Material :
Top : Acrylic (Clear)
Bottom: ABS (Grey)