

STD1602H

Product Manual

Version:1.0

2012-06-26

Update History

Version	Date	Description
1.0	2012-06-26	Preliminary version.

Contents

1.Feature.....	4
2.Mechanical Characteristics.....	4
2.1Mechanical Characteristics Summary.....	4
2.2 Structural drawings.....	5
3 Pin Description.....	6
3.1Power and Communication interface	6
3.2Keypad Scan Interface.....	6
4.DC Electrical Characteristics.....	6
5 Applications.....	7
6 Keypad Scan.....	7
7 Communications.....	8
8 Commands.....	8
8.1Commands Table.....	8
8.2Commands Description.....	8
9 Custom character.....	9
9.1 Load custom character.....	9
8.2 Display custom character.....	9
10 Product ordering information.....	10

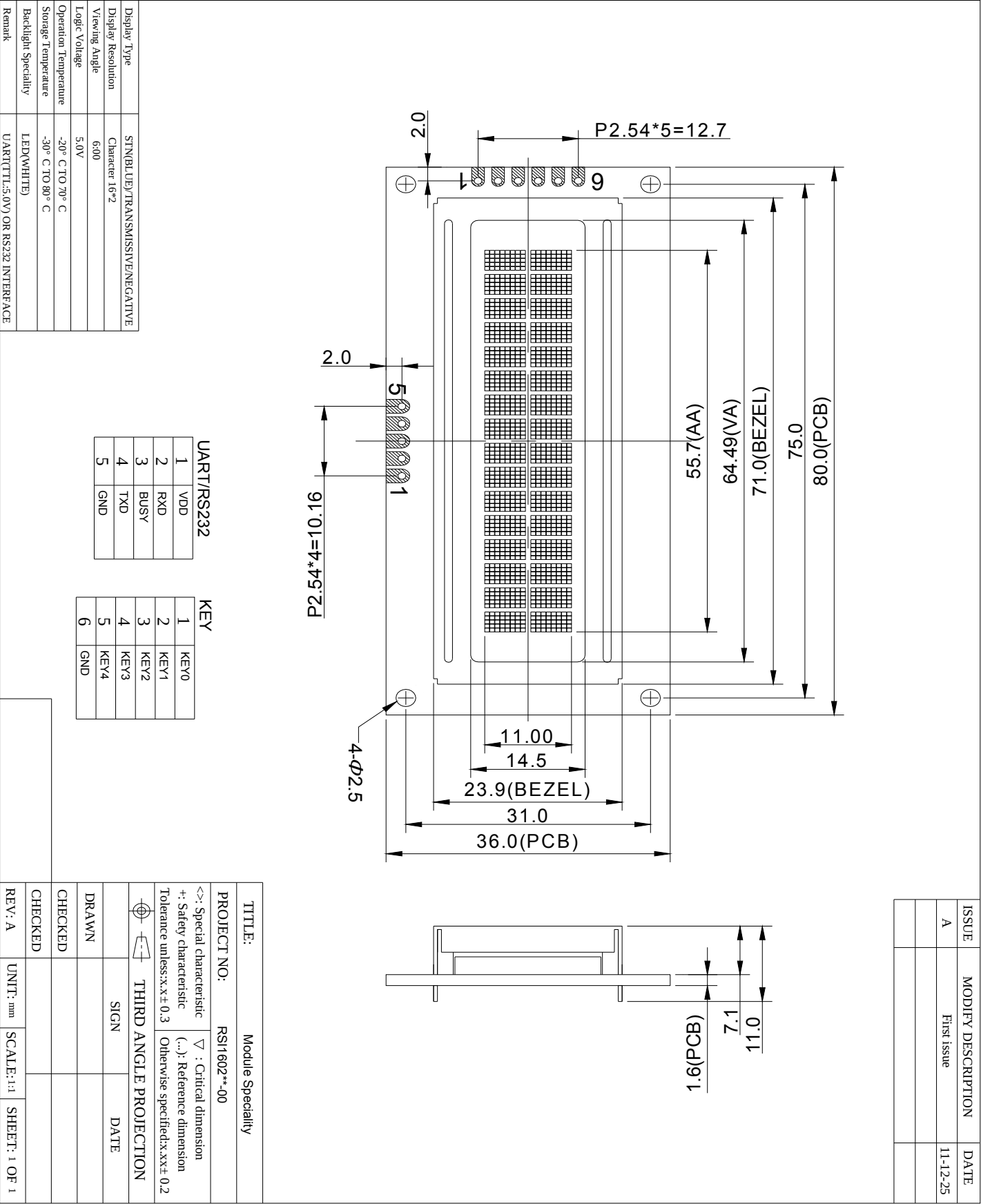
1. Feature

- 16 column by 2 line text display
- Yellow-Green(STN YG)/White LED (STN Grey or Blue)backlights
- Built-in ASCII fonts and CGRAM for users to customize characters
- Supports Software controlled brightness
- Supports 5 keys keypad-scan
- Serial Interface:UART(RS232/TTL:5.0V)
- Operating Voltage: 5.0 ± 0.1
- Operating Temperature:-20~70℃
- Storage Temperature: -30~80℃

2. .Mechanical Characteristics**2.1Mechanical Characteristics Summary**

Items	Specification	Unit
Dimensions	80.0(L)*36.0(W)*11.0(H)	mm
Visual Area (VA)	64.49*14.5	mm
Active Area (AA)	55.7*1	mm
Pixel Size	0.54*0.6	mm
Pixel Pitch	0.05	mm
Weight	TBD	Grams

2.2 Structural drawings



3. Pin Description

3.1 Power and Communicate Interface

Pin No.	Symbol	I/O	Function Description
1	VDD	P	Power (+5.0V)
2	RXD	I	Receive data
3	BUSY	O	Busy Signal,High is busy.
4	TXD	O	Transmit data
5	GND	P	Ground

3.2 Keypad Scan Interface (Only supports keypad control products)

Pin NO.	Symbol	I/O	Function Description
1	KEY0	I	Keypad scan signal
2	KEY1	I	
3	KEY2	I	
4	KEY3	I	
5	KEY4	I	
6	GND	p	Ground

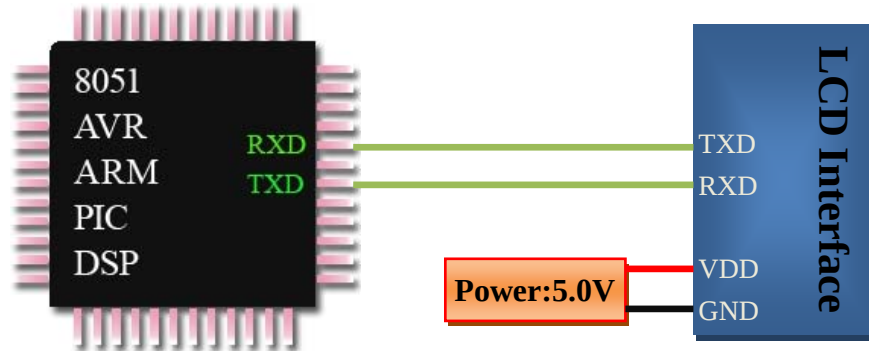
4. DCElectrical Characteristics(Ta= 25° C, VDD= 5.0V±5%, GND= 0V)

Item	Symbol	Conditon	Min.	Typ.	Max.	Unit
Supply Voltage	VDD	-	4.9	5.0	5.1	V
Supply Current	IDD	note1	12.0	-	50.0	mA
"H" Level input	Vih	UART(TTL)	0.8VDD	-	VDD	V
"L"Level input	Vil		0	-	0.25VDD	V
"H" Level output	Voh		0.8VDD	-	VDD	
"L"Level output	Vol		0	-	0.25VDD	
"H" Level input	Vih	RS232	-5	-	-12	v
"L"Level input	Vil		5	-	12	v
"H" Level input	Voh		-5	-	-12	
"L"Level input	Vol		5	-	12	

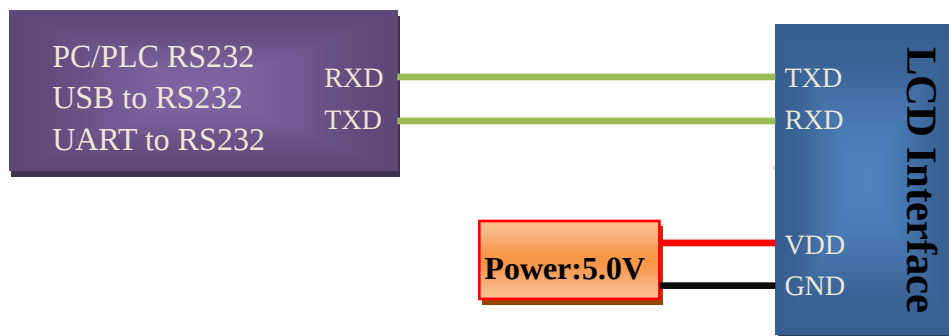
note1:Backlight brightness will affect the current size.

5. Applications

- UART(TTL:5.0V) ports,can communicate with the MCU.If the MCU operating vltage is 3.3V,Level conversion needs to be done.



- RS232 ports,can communicate with the PC or PLC.



6. Keypad Scan(Only support for keypad scanning products)

Refer to the figure-1,According to project requirements designed keyboard.When using the user presses a key,Module will automatically be sent keycode to the master.

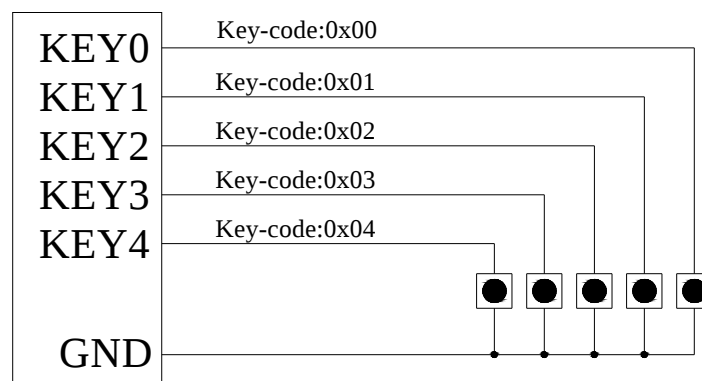


Figure-1 Keypad logic diagram

7. Communications

Type: UART(RS232/TTL:5.0V)

Band Rate: 9600b/S

Data bits: 8bit

Parity bits: None

Stop bits: 1bit

8. Commands

8.1 Commands Table

Items	Display product information	0XAA ,0X00	-
Product information	Display product information	0XAA ,0X00	-
Reset	Product reset	0XAA ,0X01	-
System	Clear display	0XAA ,0X10	-
	Display on	0XAA ,0X11	-
	Display off	0XAA ,0X12	-
	Set Brightness	0XAA ,0X13	n(0~0XFF)
Text	Set cursor position	0XAA ,0X20	row,column
	Cursor on	0XAA ,0X21	-
	Cursor off	0XAA ,0X22	-
	Cursor blink on	0XAA ,0X23	-
	Cursor blink off	0XAA ,0X24	-
	Writing Text to the Display	0XAA ,0X25	d0,d1,d2,d3.....0X0d
	Define custom character	0XAA ,0X26	n,d0~d7
keycode output	Output user presses the keycode	0XAA ,0X55	n (keycode:0X00~0X04)

8.2 Commands Description

8.2.1 Display product information (0XAA 0X00)

Display product information.

8.2.2 Reset(0XAA 0X01)

Product Reset,Back to the initial state.

8.2.3 Clear display(0XAA 0X10)

Clear display,Cursor return.

8.2.4 Display on(0XAA 0X11)

Display on,the default state.

8.2.5 Display off(0XAA 0X12)

Display off.

8.2.6 Adjust the backlight brightness (0XAA 0X13 n)

n(0~0XFF),Backlight off when n=0.

8.2.7 Cursor position(0XAA 0X20 l,r)

Set cursor position,l(0~1),r(0~0X0F).

8.2.8 Cursor display on (0XAA 0x21)

Cursor display on.

8.2.9 Cursor display off (0XAA 0X22)

Cursor display off.

8.2.10 Cursor blink on (0XAA ID 0X23)

Cursor position blink on.

8.2.11 Cursor blink off (0XAA ID 0X24)

The Cursor position blink off.

8.2.12 Display character write(0XAA 0X25 d0,d1,d2...dn 0X0D)

Write the character to be displayed, d0~dn is character code(ASCII code),This command must be using 0X0D as terminator.

8.2.13 Load custom character(0XAA 0X26 n d0~d7)

n:(0~0x07),Custom character code, You can build 8 user-defined characters.

There is space for eight user - defined custom characters. This command loads the custom character into one of the eight locations. The custom character pattern is bit mapped into 8 data bytes. The bit map for Spanish character '¿' is shown in table below. To display the custom character, user has to enter the address of the character (d0 to d8).

bit	7	6	5	4	3	2	1	0	hex
d0	0	0	0	0	0	1	0	0	0X04
d1	0	0	0	0	0	0	0	0	0X00
d2	0	0	0	0	0	1	0	0	0X04
d3	0	0	0	0	1	0	0	0	0X08
d4	0	0	0	1	0	0	0	0	0X10
d5	0	0	0	1	0	0	0	1	0X11
d6	0	0	0	0	1	1	1	0	0X0E
d7	0	0	0	0	0	0	0	0	0X00

8.2.14 KEY-code output(0XAA 0X55 n) (Only support for keypad scanning products)

This instruction is output instruction,n(0~0x04)is key-code.When a key is pressed, automatically through TXD to master send the relevant key-code.

9.Custom character

Built in 64 bytes CGRAM,For users to customize 8 characters.

9.1 Load custom character

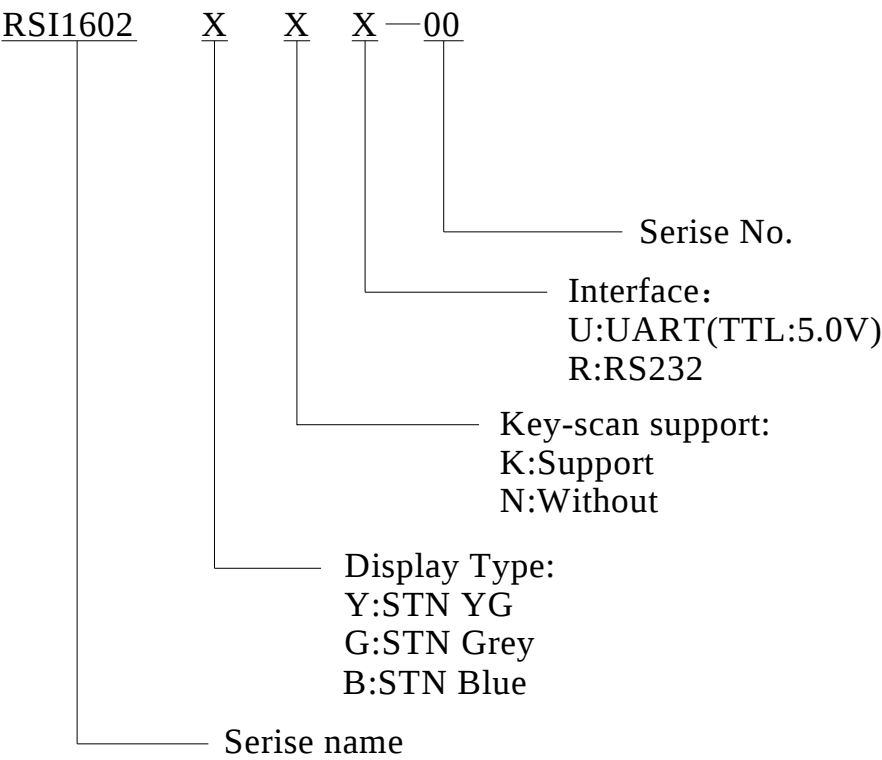
Reference command 8.2.13.

	b7	b6	b5	b4	b3	b2	b1	b0
d0				1	1	1	1	0
d1				1	0	0	0	1
d2				1	0	0	0	1
d3				1	1	1	1	0
d4	-	-	-	1	0	1	0	0
d5				1	0	0	1	0
d6				1	0	0	0	1
d7				0	0	0	0	0

9.2 Display custom character

The user can display custom characters using the command 8.2.12.The parameter d0,d1,d2.....rang is 0~0x07,you must load custom characters before the display.

10.Product ordering information



Note:if you have special needs,can provide customized services.