SC1602MBS is a MODBUS slave device that receives data from a Master MODBUS device and displays them on the LCD panel.

The LCD is 16 x 2 characters in size and each character place has an unique MODBUS registers address. Writing ASCII text to these registers will cause the text to be displayed on the LCD.

In addition, it has 2 data fields that can be defined on each of the two rows of the LCD screen. These data fields display 16 bits signed or unsigned integers values as it ASCII representation on the LCD screen.

SC1602MBS is available in RS485 or RS232 version.

**Features**
- 16x2 Characters
- RS485 or RS232 communication port
- MODBUS RTU protocol
- 6 memory spaces for user’s define messages
- 1 Transistor Output Port
- 2 Data Fields for 16 bits Signed/Unsigned Integer or 4 Digits BCD Numbers.
- Programmable fixed decimal point for the data fields (ddd.d , ddd.dd , dd.ddd, d.dddd )
- Programmable Slave Address
- Programmable baud rate ( 9.6, 19.2 , 38.4 )
- LCD backlight control.
- Programmable start screen.
- 5 V Input Supply
- MODBUS function code 5,6 and 16

**Display Option**
- SC1602MBS-YG
- SC1602MBS-B
- SC1602MBS-LC-YG

**Standard Size**  
**Large Character Size**
Connecting the LCD

SC1602MBS—16x2 Characters MODBUS RTU Slave LCD
User’s Manual

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Connecting the LCD

Configuration Jumper—J4
Transistor Output Header, J5

5V
GND

RS485 Port

SC1602MBS-YG / B Back View

RS232 Header

J2

TXD (TTL)
RXD (TTL)
TXD (RS232)
RXD (RS232)
GND
5V

SC1602MBS-LC-YG Back View

RS485 Port
Configuration Jumper, J4

GND
5V

Transistor Output Header, J5

LCD Contrast Adjust

SC1602MBS-YG / B Back View

SC1602MBS-LC-YG Back View
Configure the LCD

You need to download the software MODBUSSlaveLCD from our website at [www.siliconcraft.net/download.htm](http://www.siliconcraft.net/download.htm) in order to configure the LCD. This software is also a MODBUS master simulator which you can test the LCD by sending the MODBUS command to it.

At the configuration window, you can set the LCD address, the baud rate, the start page and the data fields parameters.

To configure the LCD, install MODBUSSlaveLCD software, close J4 jumper on the back of the LCD, connect the power and the communication port to the Computer running MODBUSSlave software.

When you turn on the power to the LCD, the first row should display “**SETTING MODE**”.

Select SC1602MBS and the correct COM port number, then click on “Connect” button.

Then, click on “Configure LCD” menu to open the configuration window.
At the configuration window, set your desire parameters and click “Send Config Data” to send the configuration data to the LCD.

If this is done correctly, LCD should display “**SETTING DONE**” Message on the second row.

Turn off the power and remove jumper on J4.

The LCD should has the new setting.

**Modbus Command 05 (Force Single Coil)**

Use MODBUS command 5 to

- Turn on or off the LCD backlight
- Turn on or off the transistor output at header J5

<table>
<thead>
<tr>
<th>Register Address</th>
<th>Data Value</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0000</td>
<td>0x0000</td>
<td>Turn Off LCD Backlight</td>
</tr>
<tr>
<td>0x0000</td>
<td>0xFF00</td>
<td>Turn On LCD Backlight</td>
</tr>
<tr>
<td>0x0001</td>
<td>0x0000</td>
<td>Turn Off Output</td>
</tr>
<tr>
<td>0x0001</td>
<td>0xFF00</td>
<td>Turn On Output</td>
</tr>
</tbody>
</table>

Maximum Sink Current : 200mA
Modbus Command 06 (Preset Single Register)

Data Field is the area where the LCD will display the integer or BCD data it received. One data field is available on each row. Users can configure the width of the data field, its start location on each row, and the decimal point location.

Data width of the data field is the maximum digit to be displayed. For example, if the data field width is set to 3 and the received data is 1024, then only “024” is displayed.

Start location is the column number where the most significant digit to be displayed. 0 is the leftmost column.

Decimal point will be inserted is configured. For example, if decimal point is set to 1 and received data is 100 then 10.0 is displayed.

Trailing zeros will be automatically blanked off.

There are a total of 2 data fields on each row.

Displaying ASCII Text

Holding registers 40001 to 40016 hold the ASCII characters to be displayed. Each register holds two ASCII characters.

| Register 4001 holds the first two characters, writing data 0x3132 will displays “12” |
| Register 40016 holds the last two characters |

Modbus Command Example, display “12” at the first two locations.

Query
[Slave ID] [ 0x06 ] [ 0x00 ] [ 0x00 ] [ 0x31 ] [ 0x32 ] [ CRC Hi ] [ CRC Lo ]

Response
[Slave ID] [ 0x06 ] [ 0x00 ] [ 0x00 ] [ 0x31 ] [ 0x32 ] [ CRC Hi ] [ CRC Lo ]
Display Integer/BCD Number

Registers 40017 to 40018 hold the Unsigned integer value for data field 1 to 2. Writing integer data to these registers will resulted the data to be displayed.

Signed integer is held in registers 40019 to 40020. The “ - “ sign is inserted at the most significant digits if the value is negative

4 Digits BCD data is held in registers 40021 to 40022

<table>
<thead>
<tr>
<th>Register Address</th>
<th>Data Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0010 ( 40017)</td>
<td>row 0—Unsigned Integer</td>
</tr>
<tr>
<td>0x001A ( 40018)</td>
<td>row 1—Unsigned Integer</td>
</tr>
<tr>
<td>0x001B ( 40019)</td>
<td>row 0—Signed Integer</td>
</tr>
<tr>
<td>0x001C ( 40020)</td>
<td>row 1—Signed Integer</td>
</tr>
<tr>
<td>0x001D ( 40021)</td>
<td>row 0—BCD</td>
</tr>
<tr>
<td>0x001E ( 40022)</td>
<td>row 1—BCD</td>
</tr>
</tbody>
</table>

Display “16442” ( 0x403A ) on data field row 0 command example.

Query

[Slave ID] [ 0x06] [ 0x00][ 0x10 ] [ 0x40 ] [ 0x3A ] [ CRC Hi ] [ CRC Lo ]

Response

[Slave ID] [ 0x06] [ 0x00][ 0x10 ] [ 0x40 ] [ 0x3A ] [ CRC Hi ] [ CRC Lo ]

Display “-453” ( 0xFE3B ) on data field row 1 command example.

Query

[Slave ID] [ 0x06] [ 0x00][ 0x1B ] [ 0xFE ] [ 0x3B ] [ CRC Hi ] [ CRC Lo ]

Response

[Slave ID] [ 0x06] [ 0x00][ 0x1B ] [ 0xFE ] [ 0x3B ] [ CRC Hi ] [ CRC Lo ]
Erasing the LCD Screen

Writing to register 40023 erase the LCD screen.

User’s Defined Messages

SC1602MBS provides 6 memory spaces, each 16 characters wide for storing user’s defined messages.

The messages is saved onto the EEPROM using MODBUSH SlaveLCD software

Modbus Command 16 (Preset Multiple Registers)

Use Modbus command 16 to send long ASCII string to the LCD.

Registers 40001 to 40016 holds the ASCII characters to be displayed.

The Start Screen

The saved messages can be made to be displayed at Power up using the configuration Software.

Registers Summary

<table>
<thead>
<tr>
<th>Register Address</th>
<th>Data Value</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0000 (40001)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 0-1</td>
</tr>
<tr>
<td>0x0001 (40002)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 2-3</td>
</tr>
<tr>
<td>0x0002 (40003)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 4-5</td>
</tr>
<tr>
<td>0x0003 (40004)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 6-7</td>
</tr>
<tr>
<td>0x0004 (40005)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 8-9</td>
</tr>
<tr>
<td>0x0005 (40006)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 10-11</td>
</tr>
<tr>
<td>0x0006 (40007)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 12-13</td>
</tr>
<tr>
<td>0x0007 (40008)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 0, column 14-15</td>
</tr>
<tr>
<td>0x0008 (40009)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 0-1</td>
</tr>
<tr>
<td>0x0009 (40010)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 2-3</td>
</tr>
<tr>
<td>0x000A (40011)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 4-5</td>
</tr>
<tr>
<td>0x000B (40012)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 6-7</td>
</tr>
<tr>
<td>0x000C (40013)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 8-9</td>
</tr>
<tr>
<td>0x000D (40014)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 10-11</td>
</tr>
<tr>
<td>0x000E (40015)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 12-13</td>
</tr>
<tr>
<td>0x000F (40016)</td>
<td>2 Bytes ASCII</td>
<td>LCD row 1, column 14-15</td>
</tr>
<tr>
<td>0x0010 (40017)</td>
<td>Unsigned Int.</td>
<td>Unsigned Integer at row 0</td>
</tr>
<tr>
<td>0x0011 (40018)</td>
<td>Unsigned Int.</td>
<td>Unsigned Integer at row 1</td>
</tr>
<tr>
<td>0x0012 (40019)</td>
<td>Signed Int.</td>
<td>Signed Integer at row 0</td>
</tr>
<tr>
<td>0x0013 (40020)</td>
<td>Signed Int.</td>
<td>Signed Integer at row 1</td>
</tr>
<tr>
<td>0x0014 (40021)</td>
<td>2 Bytes BCD</td>
<td>4 Digits BCD at row 0</td>
</tr>
<tr>
<td>0x0015 (40022)</td>
<td>2 Bytes BCD</td>
<td>4 Digits BCD at row 1</td>
</tr>
<tr>
<td>0x0016 (40023)</td>
<td>Any</td>
<td>Erase Screen</td>
</tr>
<tr>
<td>0x0017 (40024)</td>
<td>0 to 5</td>
<td>Predefine Message at row 0</td>
</tr>
<tr>
<td>0x0018 (40025)</td>
<td>0 to 5</td>
<td>Predefine Message at row 1</td>
</tr>
</tbody>
</table>
Mechanical Dimension (millimeter)

Standard Size Version

Large Characters Version
**Specification**

**Power Supply:** min 4.5VDC max 5.5VDC (5.0VDC nominal)

**Current Consumption:** 100mA typical (Standard Size Version)
250mA typical (Large Character Version)

**Operating Temperature:** 0ºC to 50ºC

**Connection:** Screw terminals accept 12 to 26 AWG

**Non Volatile Memory Write Cycle:** Min 100,000

**Non Volatile Memory Data Retention:** Min 100 years

**Output Maximum sink current:** 200mA

**LCD**

**View Angle:** 6 o’clock

**Characters:** 16 x 2

**View Area:** 64.5mm x 13.8mm (Standard Size Version)
99 mm x 24 mm (Large Character Version)

**Backlight:** Yellow Green or Blue LED

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**Available Accessories (Sold Separately)**

- Aluminum Front Panel Mounting Plate
- RS232 cable, DB9 Female to P1 Header
Optional Accessories (IP 65 Enclosure)

ABS IP65 Enclosure with mounting kits

Mounting holes

Waterproof Cable Gland

102mm
115mm

60mm 90mm

56mm

Mounting Plate for the LCD