



SBLM-4 and SBLM-6 User's Guide

⚠ CAUTION	
	ALWAYS REMOVE POWER AND WAIT AT LEAST 30 SECONDS BEFORE CONNECTING OR DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING PARTS. FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE UNIT OR BODILY HARM

WARNING	
	THIS UNIT MUST BE PROPERLY GROUNDED DO NOT REMOVE THE GROUND PRONG

WARNING	
	ONLY QUALIFIED PERSONELL SHOULD SERVICE AND MAINTAIN THIS EQUIPMENT.

Read this Manual before installing
and operating this equipment.

Save this manual for future reference

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General

The SBLM Series remote displays can be set up to display data based on one of three configurations

1. Display a message from a serial device, either on demand or continuous.
2. Display 1 of 7 messages in memory based on a series of switches or a rotary switch.
3. Rotate/Cycle through up to 8 messages in internal memory

The Matko Message Center Software is not needed for standard applications, but is provided to allow for easier setup as well as more advanced functionality. Most options can be set by using the buttons inside the display. See the “Options Settings Tab” section and “Option Details” section for further details.

Message Signs

Part Number	Description
SBLM-4-1x4	4 full alpha numeric characters with 4-inch height
SBLM-4-1x4SG	4 full alpha numeric characters with 4-inch height and traffic light
SBLM-4-1x8	8 full alpha numeric characters with 4-inch height
SBLM-4-1x8SG	8 full alpha numeric characters with 4-inch height and traffic light
SBLM-4-1x12	12 full alpha numeric characters with 4-inch height
SBLM-4-1x12SG	12 full alpha numeric characters with 4-inch height and traffic light
SBLM-4-1x16	16 full alpha numeric characters with 4-inch height
SBLM-4-1x16SG	16 full alpha numeric characters with 4-inch height and traffic light
SBLM-6-1x4	4 full alpha numeric characters with 6-inch height
SBLM-6-1x8	8 full alpha numeric characters with 6-inch height
SBLM-6-1x12	12 full alpha numeric characters with 6-inch height
SBLM-6-1x16	16 full alpha numeric characters with 6-inch height

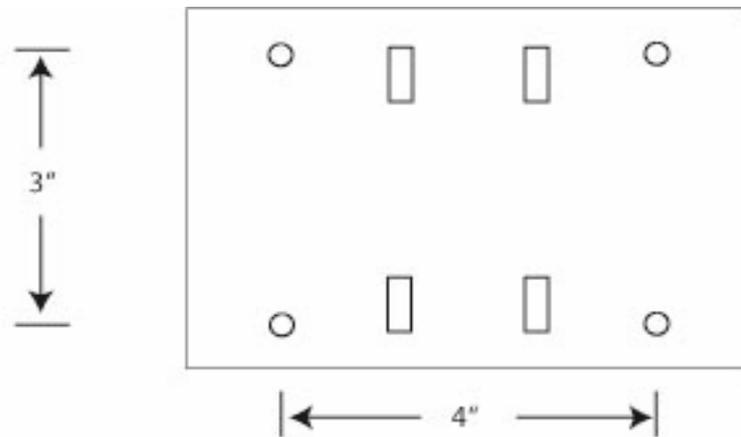
Wiring and Mounting

Wiring

	Indicator	Pin	Display	Connector Pin Out
Indicators with Active 20 mA Output	+20mA	6	CL (+)	<div style="border: 1px solid black; padding: 5px;"> 1 VCC 2 GND 3 232 RXD 4 232 TXD 5 CL(-) 6 CL(+) 7 RX 422A 8 RX 422B 9 TX CL(-) 10 TX CL(+) 11 TX 422A 12 TX 422B 13 13 GREEN 14 14 RED </div>
	-20mA	5	CL (-)	
Indicators with Passive 20 mA Output	+20mA	1	VCC	
		2	GND	
	-20mA	5	CL(-) } JUMP	
		6	CL(+)	
Indicators with RS232 Output	TXD	3	232 RXD	
	GND	2	GND	
Indicators with RS422 Output	TX 422A (+)	7	RX 422A	
	TX 422B (-)	8	RX 422B	

Mounting

The remote display can be mounted using four 1/4" bolts or two 1/2" Wide hose clamps



Communications

***By default the remote display will be expecting a data stream at 1200 baud with the last character in the stream being a <LF> (Line Feed) at 8 data bits no parity. These units do not *auto learn* to baud rate as the SBL Numeric remote series.**

The remote can display any section of the data stream by shifting to the left or right, or the remote can be told to perform special effects such as scrolling, flashing, inverting, invert scrolling, or invert flashing by setting the first character according to the below chart. By default the display will hold the last message sent. Setting Option 4 will cause the display to look for the corresponding address character at the start of the data stream before accepting any message. When the first character after the optional address character is set to one of the 6 specialty characters then the second character is used to determine the speed for either scrolling flashing ... "0" (decimal 48) is the fastest possible speed. Do not use a continuous serial stream when scrolling or flashing is desired as each new stream will restart the process, not allowing the full message to be displayed

ASCII Character	Decimal Value	Effect
:	58	Hold
;	59	Scroll from right to left
<	60	Flash
=	61	Invert
?	63	Invert Scroll from right to left
@	64	Invert Flash

Examples

- 1) Display the word "HELLO" either from a 1 time burst or continuously
HELLO<LF> => [No Specialty characters, so hold]
: 0 HELLO<LF>
┌┐▶ [Character 2 = 0 = Fastest Speed]
└┘▶ [Character 1 = : = Hold]
- 2) Scroll "Come Inside" at the fastest speed
; 0 Come Inside<LF>
┌┐▶ [Character 2 = 0 = Fastest Speed]
└┘▶ [Character 1 = ; = Scroll]
- 3) Flash "Pull Forward" at a medium speed
< 5 Pull Forward<LF>
┌┐▶ [Character 2 = 5 = Medium Speed]
└┘▶ [Character 1 = < = Flash]

Option Details

To enter the options from within the remote display without using the Message Sign Software, press and release the **RESET** button and press the **LEFT** button during countdown until “OPTION” is displayed.

LEFT will increment through the option numbers*

RIGHT will increment the value of that option.

LEARN will save the settings and exit Option selections.

*For many of the options that have more selections than ON and OFF as options such as the addressable and end character options, **LEFT** will decrement the value.

Option 0: Factory Default

Resets the unit to Factory defaults of all options OFF. This option has the same effect as holding both LEFT and RIGHT during countdown. It sets default messages for both rotating and switch based messages.

Switch/Rotating Message #1	All Blank
Switch/Rotating Message #2	“Pull Forward”
Switch/Rotating Message #3	“Come Inside”
Switch/Rotating Message #4	“Welcome”
Switch/Rotating Message #5	scroll “Closed Weekends and Holidays!!!”
Switch/Rotating Message #6	“Enter Scale”
Switch/Rotating Message #7	“ OPEN “
Switch/Rotating Message #8	“ CLOSED ”

Option 1: Version

Displays the firmware version.

Option 2: BAUD

Selects the BAUD rate at which the remote display will communicate both for messages and for communicating with the Matko Message Center software. Selectable options are 300-19200. 1200 baud is the default.

Option 3: End Character

Set a specified end character that will be the last character in the data stream. When left blank the software will default to a <LF> which is the same as setting the unit to decimal 10. Consult the ASCII Table (page 21) to find the corresponding decimal value for the desired character. Some common values are decimal 3 for <ETX>, decimal 10 for <LF> and decimal 13 for <CR>.

Option 4: Addressable

The addressable option is used when multiple data streams are transmitted along the same data line and each stream is used by different pieces of equipment. Set a specified address character that will be the first character in the data stream. When left blank the software will take any data stream. Consult the ASCII Table (page 21) to find the corresponding decimal value for the desired character. The most common value is decimal 2 for <STX>.

Option 5: Shift

Set the shift amount for the desired data stream. A shift of 0 will start showing the first character in the stream up to the amount of characters in the remote display. While displaying continuous data, the LEFT and RIGHT buttons can be used to adjust this value.

Option 6: No Count Down

This option ON will disable the remote from counting from all 9's to all 0's on power up.

Option 7: No Alpha Characters

This Option will blank any non numeric characters.

Option 8: 4 Digit Blocks

This option sets how many 4 digit blocks are on the message sign. *Set to 1 for a 4 digit remote.* 0 acts as the maximum size.

Option 9: Timeout

This option will set the amount of time in seconds that the remote display can go without receiving data before it considers communication lost. After communication is lost the remote display will do one of several things based on option 10.

Option 10: No Data Display

This option will control how the remote display operates after data communication is determined to be lost based on Option 9. Possible operations include:

0 → Holding the last value

1 → Blanking the remote

2 → Displaying “No Data”

3 → Displaying the user configurable message M101 under the Option Output tab

4 → Display messages based on switch settings. *See Switch Based Messages and Rotating Messages for further details.*

This option is useful to determine how the remote will operate in ON-Demand applications. Modifying message M101 is not available from within the remote display.

Option 11: Minimum Weight

This option will allow the remote to only display weight if it is equal to or greater than the minimum value set. Only the first 8 digits on any size remote are monitored and any non numerics including negative sign and decimal point should be entered as 0. When the weight is less than the set weight the unit can:

1 → Blank out

2 → Display message M201 under the Option Outputs Tab

When set from within the remote display the only available option is to blank the remote (1). Use the **LEFT** button to increment the current digit and **RIGHT** to move to the next digit. M201 is only accessible when the option is set through the Matko Message Center Software. Modifying message M201 is not available from within the remote display

Option 12: Maximum Weight

This option will allow the remote to only display weight if it is equal to or less than the maximum value set. Only the first 8 digits on any size remote are monitored and any non numerics including negative sign and decimal point should be entered as 0. When the weight is greater than the set weight the unit can:

1 → Blank out

2 → Display message M301 under the Option Outputs Tab

When set from within the remote display the only available option is to blank the remote (1). Use the LEFT button to increment the current digit and RIGHT to move to the next digit. M301 is only accessible when the option is set through the Matko Message Center Software.

Option 13: Monitor Message 1

This option will allow for the monitoring of a character or a group of up to eight characters in the data stream. When present message M3001 under the Option Outputs tab will be displayed. An optional masking byte of “~” (126) may be included to skip over certain bytes before checking bytes later in the stream. An example of “k~O” will accept “kGO” or “kNO” or any character between the “k” and “O”. The monitor stream may be modified from within the remote display, however the displayed message at M3001 may not be modified from within the remote.

Option 14: Monitor Message 2

This option will allow for the monitoring of a second character or a group of up to eight characters in the data stream. When present message M3101 under the Option Outputs tab will be displayed. An optional masking byte of “~” (126) may be included to skip over certain bytes before checking bytes later in the stream. An example of “k~O” will accept “kGO” or “kNO” or any character between the “k” and “O”. The monitor stream may be modified from within the remote display, however the displayed message at M3101 may not be modified from within the remote.

Option 15: Red Traffic Control

This option sets how the optional RED and GREEN traffic lights are controlled. Setting this value to (1), (2), or (3) will cause the remote display to monitor pins 13 and 14 on the remote display. Set Option 15 to (1) to monitor a single closed contact switch.

When the switch is open the light will be RED when the switch is closed the light will be GREEN. Set Option 15 to (2) to control the RED light with a switch where an open switch toggles the RED light on and a closed switch toggles the RED light off. Set Option 15 to (3) to trigger the RED light in the opposite polarity as (2). An open switch will toggle the RED light off and a closed switch will toggle the RED light on. Setting Option 15 to any value from (4) to “Z” (90) will monitor the data stream for that particular character and when present the light will be held on until a stream is received without that value. Do not set this to any value that might occur in the message in any other place including as an address or end character.

Option 16: Green Traffic Control

Option 16 behave the same as option 15 except it will toggle the GREEN light instead of the RED light. Typically if option 15 is set to (1), (2), or (3) then option 16 is set to the same value.

Option 17: Future Option

This options are reserved for future use.

Option 18: Future Option

This options are reserved for future use.

Option 19: Future Option

This options are reserved for future use.

Matko Message Sign Software

There are 6 tabs in the Matko Message Sign software that can be used to set up the display. Once all options and messages are set, verify the connection settings and update with the “Transmit All Messages and Settings” button.

Option Settings Tab

The screenshot shows the 'Option Settings' tab in the Matko Message Sign software. The interface is organized into several sections:

- Options:** A grid of 19 options, each with a value field and a label.

2 Baud	0 - Off (1200)	11 Min Weight	0 No Min	Min Value	100.00
3 End Character	<CR>	12 Max Weight	0 No Max	Max Value	99999999
4 Addressable		13 Monitor 1	0 No Monitor	Monitor For	M
5 Shift	0	14 Monitor 2	0 No Monitor	Monitor For	kg
6 No Count Down	0 Count Down	15 SG 1	<SOH>		
7 No Alpha	0 Allow Alpha	16 SG 2			
8 4 Digit Blocks	Unspecified	17 Future OP	0		
9 Timeout Seconds	0	18 Future OP	0		
10 No Data	0 Hold	19 Future OP	0		
- Notes:** A text box on the right states: "Options 10 through 14 have adjustable outputs that can be changed on the 'Option Outputs' Tab. All non numerics in the min and max values are considered 0".
- Buttons:** A "Transmit All Messages and Settings" button is located at the bottom left. A "Transmitting:" label is next to it.
- Checkbox:** An unchecked checkbox labeled "Options update verified" is located at the bottom right.

To set options 3, 4, 15, and 16 consult the ASCII Table to find the appropriate value. For example to set Option 3 to a carriage return type “<CR>” in the box next to option 3. To turn Option 15 ON (1) type <SOH>. ***Note brackets must be included.** See picture above. Standard Printable characters can be entered directly as the above shows for options 15 and 16. The remote will only accept 8 data bits no parity for these values. Some other common non printable characters are below.

Option Value	Text	Option Value	Text
2	<STX>	4	<EOT>
3	<ETX>	10	<LF>

See Option Details Section for further information on each option.

Option Outputs Tab

		Effect	Speed	update verified	
M 101	No Data	: No Effect	0(Fastest)	<input type="checkbox"/>	
M 201	Under	: No Effect	0(Fastest)	<input type="checkbox"/>	* Note Scrolling/Flashing is reset with every new data stream, so messages can't scroll while receiving continuous streams
M 301	Over	: No Effect	0(Fastest)	<input type="checkbox"/>	
M 3001	IN MOTION	: No Effect	0(Fastest)	<input type="checkbox"/>	
M 3101	Switch to pounds	: No Effect	0(Fastest)	<input type="checkbox"/>	

Transmit All Messages and Settings Transmitting:

M 101 sets the message to display when Option 10 is set to 4 and data communication is interrupted

M 201 sets the minimum weight message to display when Option 11 is set to 2 and the weight is under the specified min value

M 301 sets the maximum weight message to display when option 12 is set to 2 and weight is over the specified max value

M 3001 sets the message to display when Option 13 is set and there is a monitor 1 match

M 3101 sets the message to display when Option 13 is set and there is a monitor 2 match

****Note: Scrolling / flashing is reset with every new data stream, so messages can't scroll for continuous data streams.***

Switch Based Messages Tab

Rotating Messages		Switch Based Messages	Option Settings	Option Outputs	Connection Settings	Trigger Message
update verified	Switch #1	This Switch setting will cycle through all Rotating Messages			Effect	Speed
<input type="checkbox"/>	Switch #2	Pull Forward			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #3	Come Inside			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #4	Welcome			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #5	Closed			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #6	Enter Scale			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #7	OPEN			: No Effect	0(Fastest)
<input type="checkbox"/>	Switch #8				: No Effect	0(Fastest)

Transmitting:

When the remote display Option 10 is set to 4 then the remote display will monitor up to 8 lines via a series of switches or a rotary switch and will display the corresponding message under Switch based Messages. **Note Switched based message 1 is not editable as this switch setting is reserved to cycle through up to 8 messages under the Rotating Messages Tab.* While any other switch setting of 2 through 8 is set at the remote display the corresponding message will be repeatedly displayed until there is a change.

Rotating Messages Tab

update verified		Effect	Speed
<input type="checkbox"/>	Rotating #1	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #2	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #3	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #4	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #5	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #6	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #7	: No Effect	0(Fastest)
<input type="checkbox"/>	Rotating #8	: No Effect	0(Fastest)

Transmitting:

To rotate through all of the Rotating Messages, set Option 10 to 4 and jumper GND to Switch 1 at the remote display. Each message can be independently configured for various speeds and effects such as scrolling, flashing, inverting, invert scrolling, and invert flashing based on the drop down boxes selected. If it is desired to rotate through less than 8 messages, simply clear any data in the message box and that message will automatically be skipped.

Connection Settings Tab

Rotating Messages | Switch Based Messages | Option Settings | Option Outputs | **Connection Settings** | Trigger Message

Remote Display Settings

Connected Port: COM1

Expected Baud Option 2: 0 - Off (1)

Expected address (Option 4):

Expected End Character (Option 3): <CR>

Settings must match the current configuration of the remote display or updates may not be processed correctly

Auto Detect Remote

clear

System Messages and Data Received

Transmit All Messages and Settings

Transmitting:

This tab sets up the Message Center software to communicate with the remote display. Here you can set which Port the remote display is connected to along with the baud rate, address, and end character the remote display is expecting. Whenever an update takes place these values are updated from Options 2, 3, and 4. The auto detect will attempt to automatically determine the remote display settings on the selected Port. It will attempt to use defaults as well as using the set address and end characters under the Option Settings tab. All System Messages and any data received from the remote will display in the large text box on the right hand side. The Clear button will clear the message box and the transmit all Messages and Settings button will update the remote display with all the current values in the Message Sign Software. If the computer is set up for bidirectional communication, the Message box will show “VERIFIED after each section of data transmission. Also the verified check box next to each verified stream will be updated. If only one way communication is wired, then there will be a 2 second pause after every section. Total update may take up to 1 minute when there is no bi-directional communication.

Trigger Message Tab

One application for the Trigger Message Tab would be to allow the PC to monitor a data stream from an indicator or PC and pass that stream on in a usable format to the message sign. The software can also monitor the stream for a specific stream such as a weight of 0 pounds and when that stream is present the display can display the current time or cycle through the 8 messages under the Rotating Messages Tab .

The screenshot shows the 'Trigger Message' tab in the Matko Message Center software. The interface is divided into several sections:

- Monitor Trigger Stream:** A checkbox is currently unchecked. Below it is a text box explaining that when enabled, the input port is monitored and data matching the 'Last Received Stream' is echoed out, while non-matching data is not transmitted.
- Input Settings:** A sub-panel containing a 'Port' dropdown menu set to 'COM1' and a 'Baud' dropdown menu set to '1200'. Below these are 'Connect' and 'Disconnect' buttons.
- Trigger Input:** A section with a 'Stream' text box containing '<STX> 0.00lg<CR><LF>', a 'Set Trigger to Current' button, and a 'Last Received Stream' field. Below are two checkboxes: 'Add Address Character (OP4) to incoming stream before re-transmitting' and 'Add End Character (OP3) to incoming stream before re-transmitting', both currently unchecked.
- Trigger Output:** A section with three radio button options: 'No Transmission (Display based on Option 10)' (selected), 'Time', and 'Custom'. The 'Custom' option has a text box containing 'Match Received' and a label 'Trigger Output Stream'. Below are two checkboxes: 'Add Address Character (OP4) to selected output when there is a trigger event match' and 'Add End Character (OP3) to selected output when there is a trigger event match', both currently unchecked.
- Bottom Bar:** A 'Transmit All Messages and Settings' button and a 'Transmitting:' status indicator.

This tab allows the Matko Message Center software to monitor a data stream off of any com port and echo that data back out the same or a different com port with optional address and end characters added to the stream. When different com ports are used you may optionally even have different baud rates for both input and output. When the input stream matches a specified trigger stream, the software can interrupt the data out and either stop sending any data to allow the unit to use the rotating messages, send out the current time, or to send out any custom message. Special ASCII characters may be added or you may also add special custom transmit commands such as <TIME> or <DATELN>. See Custom Transmit Commands for more details. When you connect to a port the current stream will be displayed in the Last Received Stream field. You may set the Trigger Input Stream to the current stream by pressing the “Set Trigger to Current” button.

Example Scenarios

Scenario 1 Continuous Data

An indicator is transmitting <STX><8 weight characters><CR> at 9600 baud once every minute and you want to display and hold that weight.

Solution

Set option 2 to 9600 and Option 3 to a <CR> or 13.

Scenario 2 Multiple Remotes

An indicator is sending 2 weights to 2 remotes on the same serial line with the following stream format :

A<Weight1><LF>B<Weight2><LF>

Solution

Set remote 1 addressable to “A” or decimal 65 and remote 2 addressable to “B” or decimal 66.

Scenario 3 Timeout and Display a Message

An indicator is transmitting continuous weight. At the end of the day the indicator is switched off and after 1 minute the display should display a message with the operating hours.

Solution

Set Option 9 to 60 (1 minute), Option 10 to 3 for M101. Under the Option Outputs type “Open 8:00 am to 5:00 pm Monday through Friday” in M101 without the quotation marks. Then select scroll as the effect and 0 as the speed and update the remote

Scenario 4 Timeout and Display Multiple Messages

An indicator is transmitting continuous weight. At the end of the day the indicator is switched off and the remote rotates between 4 messages.

Solution

Set Option 10 to 4 to use switch based messages. Under the Rotating Messages Tab type the 4 messages with the desired effect and delete any messages in the other 4 messages. Place a jumper between ground and Switch 1 inside the remote

Scenario 5 Monitoring Characters

An indicator is transmitting:

<STX><Pol><weight><units><status><G/N><company name><LF>

When polarity is negative “-” then the remote should display “UNDERLOAD”, when the units accidentally get switched to kilograms “k” then the message “Switch to Pounds” should display. However there is a “k’ in the company name. The indicator is always in gross mode G”. Status may be one of several different characters.

Solution

Set option 13 to display M3001 and type “-” without the quotes in the monitor for field. Set option 14 to display M3101 and type “k~G” without the quotes in the monitor for field. Under the Option Outputs tab set M3001 to “UNDERLOAD” and M3101 to “ Switch to Pounds” both effects set to no effect.

Scenario 6 Switch Based Messages

The remote will cycle through several messages and an operator can use a rotary switch to direct traffic with messages like “PULL FORWARD” or “COME INSIDE”.

Solution

Set Option 10 to 4 (Switch Based) and set all the desired messages under the Switch Based Messages and Rotating Messages tabs. When the Rotary Switch closes on Switch 1 all the rotating messages will be displayed and the operator can put a specific message on the remote by placing the rotary switch on the corresponding position 2 to 8.

Scenario 7 Minimum and Maximum Weights

An indicator is sending 8 weight characters including a decimal point. XXXXX.XX Whenever the weight is under 100.00 the display should show “UNDER” and when the display is over 1000.00 the display should show “OVER”.

Solution

Set option 11 to use M201 and option 12 to use M301. In the Min Value field enter “100.00”. “100000” and “00100000” are also acceptable. From within the remote only the last option can be entered. In the Max Value field enter “1000.00”. “1000000” and “01000000” are also acceptable. From within the remote only the last option can be entered. Under the Option Outputs tab set M201 to “UNDER” and M301 as “OVER”. You may also add leading spaces to help center the message based on the number of characters the remote has.

Scenario 8 Trigger Input Monitoring

An indicator is sending continuous data and when the scale is sitting at zero you want to cycle through several messages.

Solution

Set up the remote display with the desired options and messages enabled. Wire the transmitting device to the PC and using the Trigger Message Tab, check the monitor Trigger Stream and connect to the appropriate port. The easiest way to set the trigger input is to press the Set Trigger to Current button, then modify it as necessary. If the transmitting device has a different end character than what the remote is set up for check the add end character box. Under Trigger Output select No transmission. You will need to place a jumper between Ground and Switch 1.

ASCII Table

Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0	000	NUL (null)	32	20	040	 	Space	64	40	100	@	@	96	60	140	`	`
1	1	001	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	EOT (end of transmission)	36	24	044	$	\$	68	44	104	D	D	100	64	144	d	d
5	5	005	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	BS (backspace)	40	28	050	((72	48	110	H	H	104	68	150	h	h
9	9	011	TAB (horizontal tab)	41	29	051))	73	49	111	I	I	105	69	151	i	i
10	A	012	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	ESC (escape)	59	3B	073	;	;	91	5B	133	[[123	7B	173	{	{
28	1C	034	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|	
29	1D	035	GS (group separator)	61	3D	075	=	=	93	5D	135]]	125	7D	175	}	}
30	1E	036	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177		DEL

Place non printable characters in angled brackets ie. <STX>, <ENQ>, . . .

Custom Transmit Commands

The following codes can be used in the Custom Trigger Output

Output Format

<TIMEAMPM> "01:23 PM"
 <TIME> "01:23"
 <TIMEMIL> "13:23"
 <DATESN> "01/25/16"
 <DATELN> "01/25/2016"
 <DATESA> "Jan 16"
 <DATELA> "Jan 25, 2016"

Replacement Parts

All SBLM-4 and SBLM-6 Message signs were redesigned starting in late 2015 and parts are not interchangeable. If the individual LED boards have exactly 12 columns use the top replacement parts list, if the LED boards have 24 columns for SBLM-4 or 8 columns for SBLM-6 use the bottom chart

Part #	Description
MSMB_SM	SBLM Motherboard (has four or more 2x5 gold headers)
MSLED4_SM	SBLM-4 LED board (12 columns)
MSLED6_SM	SBLM-6 LED board (12 columns)
PWR	110-220 switching power supply-PD65A for SBLM-4 Message Signs
PWR-24	110-220 switching power supply-PD65B for SBLM-6 Message Signs

Part #	Description
MSMB	SBLM Motherboard (has four 2x17 gold headers)
MSLED4	SBLM-4 LED board (24 columns)
MSDB4	SBLM-4 Driver board
MSLED6	SBLM-6 LED board (8 columns)
MSDB6	SBLM-6 Driver board
PWR	110-220 switching power supply-PD65A for SBLM-4 Message Signs
PWR-24	110-220 switching power supply-PD65B for SBLM-6 Message Signs

Revision History

Date	Revision	Description
06-2016	v.1.2	Updated Manual Cover, expanded replacement part list for revised Hardware
02-2010	v1.1	Updated replacement part numbers, added SBLM-6 part numbers
04-2008	v1.0	Initial Manual Release