Contents

Rev. 5/07

matko
ELECTRONIC DISPLAYS

Display Information

Viewing Distances (Ft.)

Model	W	X	H	X	D1	X	D2	Shipping Weight	Minimum	Optimum	Maximum
SBL-2	12.25		4.75		5.625		8.375	8 lbs.	2'	5-25'	75'
SBL-4	25.5		7.375		6.625		9.375	20 lbs.	10'	20-100'	150'
SBL4-SG	30		7.375		6.625		9.375	22 lbs.	10'	20-100'	150'
SBL-6	34.25		10.25		6.625		9.375	31 lbs.	15'	50-200'	250'
SBL-6SG	38.75		10.25		6.625		9.375	33 lbs.	15'	50-200'	250'

Mounting Dimensions

Model	W	H
SBL-2	4"	3"
SBL-4	4"	3"
SBL-6	8"	3"

.250" Bolt Holes
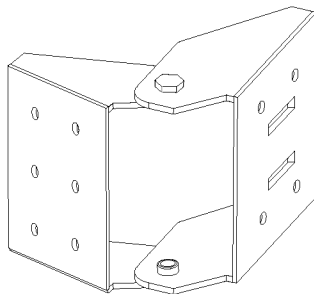
matko
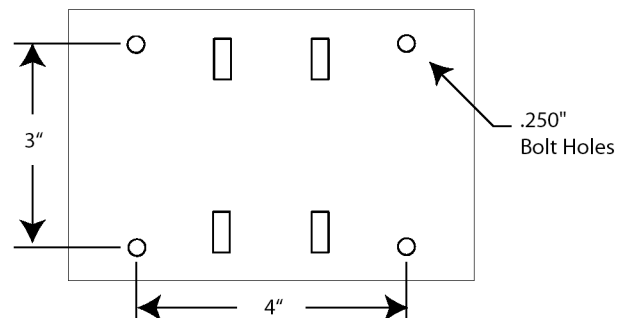
Mounting Options
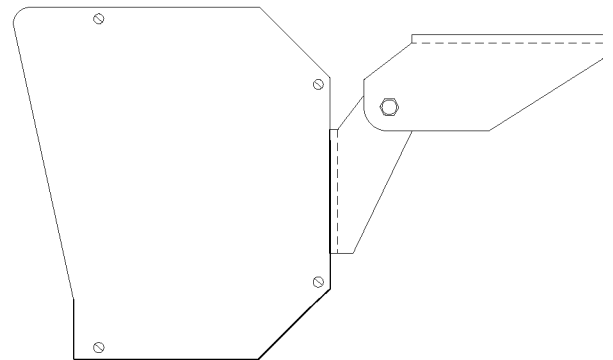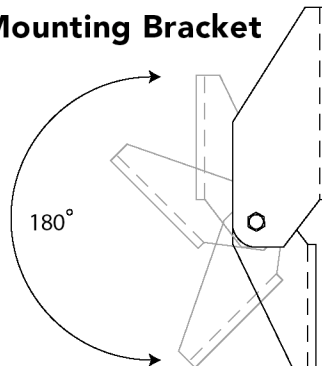
Roof Mount
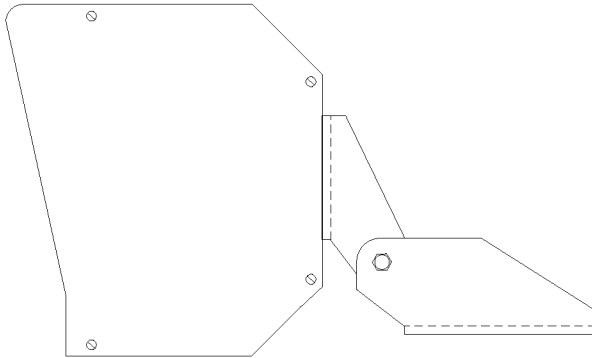
Wall Mount
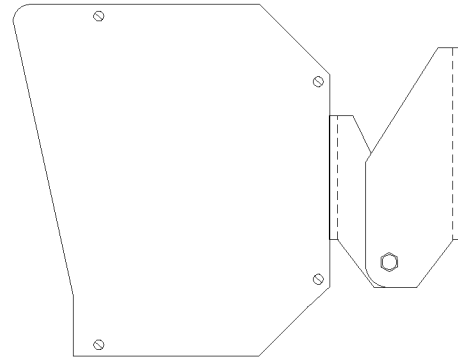
Side Mount

Eave Mount

Mounting Bracket

180°

Wiring Configuration

Connect the Scale indicator using the appropriate diagram.

	Indicator	Pin	Display		Connector Pin Out	
Indicators with Active 20 mA Output	+20mA	6	CL (+)		1	VCC
	−20mA	5	CL (−)		2	GND
					3	232 RXD
					4	232 TXD
Indicators with Passive 20 mA Output	+20mA	1	VCC		5	CL(-)
		2	GND ⎤		6	CL(+)
		5	CL(−) ⎦ JUMP		7	RX 422A
	−20mA	6	CL(+)		8	RX 422B
					9	TX CL(-)
Indicators with RS232 Output	TXD	3	232 RXD		10	TX CL(+)
	GND	2	GND		11	TX 422A
					12	TX 422B
					13	13 GREEN
Indicators with RS422 Output	TX 422A (+)	7	RX 422A		14	14 RED
	TX 422B (−)	8	RX 422B			

The corresponding green LED will blink when the following three requirements are satisfied.

1. The display is powered on.
2. The indicator's port is enabled to transmit continuously.
3. The wires are connected to the terminal block as previously described.

The display will learn "automatically configure" to the transmitting device when the **LEARN** button is pressed at the end of startup. It will display the BAUD rate and then display the weight. Pressing LEFT or RIGHT will move the displayed stream accordingly until the desired data can be seen on the display.

Section 3:
Quick Setup Procedures

If possible place a weight on the scale. Wire up the display according to Section 2 and configure the transmitting device to output continuously. Press and release the RESET button on the display. While the display is counting down from 9 to 0 hold the LEARN button. At the end of countdown the display will flash a "LEARN" then the BAUD rate such as 1200 and then the weight. Shift the data using the LEFT and RIGHT buttons until the desired weight is in view.

SBL Series Specs

Power

117 VAC or 12 VDC
2 Amp max
12 Watt (AVG)
26 Watt (MAX)

Interface

RS 232
20 mA Current Loop Active/Passive
RS 422

Protocol

8 Data bits No Parity
7 Data bits Odd Parity
7 Data bits Even Parity
300 to 19200 Baud

The SBL Series has an echo feature which will take the received data stream and echo it out to further displays via RS 232, Current Loop or RS 422.
(To transmit RS 422 remove the 8 pin DS 75176 in socket U5 and place it in U8)

The echo feature transmits every other data stream unless option 4 is enabled.
See Section 6 for more details.

Changing Intensity

To change the display's intensity:

Press and release the **RESET** button

Hold the **RIGHT** button during countdown

At the end of countdown the **RIGHT** button will toggle between displaying "high" and "low"
(on 7 segment displays "lo" is displayed)

Select the desired intensity and press **LEARN** to save changes

Factory default is "low"

Option Summary

To enter into the options hold the **LEFT** button during power up. At the end of the countdown the display will display "OPTION". Once in options, **LEFT** will cycle through the option numbers 0 through 20. The **RIGHT** button will toggle between On/Off for some options and will enter into an advanced menu for more complicated options. See specific options in Section 6 for more advanced option descriptions. Pressing **LEARN** at any time will save the settings and reset the display. To restore to factory default, press both the **LEFT** and **RIGHT** button simultaneously.

#	Name	Description for "ON" Value
0	Reset	Resets all settings to factory defaults
1	Future Op	- - - - -
2	Toledo / Fairbanks	Decodes Toledo / Fairbanks status bytes
3	Timeout Length	Maximum time allowed between data transmissions Default = 5 seconds
4	On Demand	Updates display when a Print button is pressed Turn ON if transmissions are more than 2 sec. apart
5	No Data	Set to display "nodata", to blank or to retain the last value when not receiving data
6	Fixed Decimal	Sets a fixed decimal point position
7	No Count Down	Does not count down on startup
8	No 0 Suppression	Does not suppress leading 0's
9	Alpha	Will display alpha and numeric characters
10	Mirror	Displays data to be seen in a rearview mirror
11	Addressable	Makes the display addressable
12	No Auto Shift	Disable auto shifting while learning
13	Fixed Shift	Set a fixed shift amount
14	Fixed Baud	Sets a fixed baud rate
15	Fixed End Character	Sets a fixed end character
16	Minimum Weight	Sets the minimum weight to display
17	Maximum Weight	Sets the maximum weight to display
18	Blank Out Character	Sets a character to cause the scoreboard to blank
19	Test Mode	Used for testing the display's digits or for customer demo
20	Version	Displays the current software version
21	Red Stoplight	See Section 7
22	Green Stoplight	See Section 7
23	Grams/Ounces	Display annunciators for grams and ounces
24	Fairbanks Addressable	Addressable for Fairbanks 40–41

0: Restore Factory Defaults

Option 0 resets the display to factory default. It erases all data stored in non-volatile RAM including shift amount, baud rate, end character, and sets all options to off.

1: Future Op

Option 1 is reserved for a future option.

2: Toledo

When Option 2 is set to 1 the unit will decode standard Toledo Style Data Stream. When Option 2 is set to 2 the unit will decode the extended Toledo Format Stream. It decodes Status Bytes A and B to determine if the weight is negative or positive, in range or over capacity, and placement of the decimal point. When the unit learns it will attempt to detect a Toledo Style stream and will set this option if detected. The unit will flash either "Toledo" or Tol 2" before displaying the weight.

Decimal Position	Status Byte A				Status Byte B	
	Bit 2	Bit 1	Bit 0		Function	Bit
X	0	1	0		Gross / Net, Net = 1	0
0.X	0	1	1		Under Zero, Negative = 1	1
0.0X	1	0	0		Overcapacity = 1	2
0.00X	1	0	1		Motion = 1	3
					Lb / Kg, kg = 1	4

3: Timeout Length

Option 3 is used to set the timeout length. The timeout length is the maximum amount of time expected between data streams before communication is considered interrupted. The default (0/Off) acts as a 5 second timeout, all other values represent the number of seconds the display will wait for a new data stream. The display will then do one of three things after the timeout depending on how Option 5 is set. The maximum timeout allowed to be set is 255 seconds. While in setup for the time out option **LEFT** decrements the value and **RIGHT** increments.

4: Display on Demand

Option 4 sets the display for On Demand mode. It is recommended to be turned on when connected to the print button of an indicator or when data is only sent once every 2 or more seconds. While in On Demand mode the display will wait for and display every data stream. While in the default (off) the display uses every other data stream to ensure data integrity.

5: No Data

Option 5 sets the display to do one of three things after a data stream time out. The default is to display "NoData". The other two options are "Clear" (blank the display) and "Hold" (keep the last weight sent). The time out length can be specified with Option 3. **RIGHT** toggles between the three choices, "NoData", "Clear", and "Hold"

6: Fixed Decimal Point

Option 6 will set the display to illuminate a decimal point when it is not present in the data stream. Default (off) will show a decimal point only where it is located in the data stream. All other values represent the digit to attach a decimal point to, starting from right to left.

Value	Decimal Placement
0	Default
1	######
2	#####.#
3	####.##
4	###.###
5	##.####
6	#.#####

7: No Count Down

Option 7 will disable the display from counting down from 9 to 0 when powered up.

8: No Zero Suppression

Option 8 will disable the display's ability to suppress leading "0"s with spaces. The default (off) will display a space for all leading "0"s up to the final two in the 1s and 10s column or up to a "0" immediately in front of a decimal point. For example when the option is off the stream "000000" will become " 00" and the stream "0000.00" will become "   0.00".

9: Display Alpha Characters

Option 9 will enable the unit to display both alpha and numeric characters. The default (off) will replace all non-numerics with spaces. A 7 segment display is limited by the alpha characters it can display. For example it can not display characters such as "x", "q", "k", "!" or "?".

Option Details Cont.

10: Mirror
Option 10 enables a display to be read in a rear view mirror. The default (off) is for direct viewing.

11: Addressable
Option 11 will set the display to be addressable. The display will ignore any characters until the addressable character is received, then display the data immediately following it. The addressable character can be set to any character from 1 to 255. The number selected represents the decimal equivalent of the desired character. For example if an "A" is at the beginning of the data stream then you would set the address to 65. **LEFT** decrements the character value and **RIGHT** increments the character value. See Section 9 for ASCII character values. If the indicator is sending 7 data bits even or odd parity then the parity bit may change the decimal value of the character by adding 128 to it. We recommend setting the indicator to 8 data bits no parity for convenience. Default (off) uses standard data stream.

12: No Auto Shift
Option 12 will cause the scoreboard to display the first 6 characters of the data stream when it is learned. When this option is off the scoreboard will attempt to shift the weight into view when learned.

13: Fixed Shift Value
Option 13 is used to set a fixed shift amount. Turning this option on will prevent the display from resetting the shift value when the display goes through the **LEARN** process. It will also disable the **LEFT** and **RIGHT** buttons from shifting the stream. The shift value can be set to any amount between 1 and 255, however due to data stream length limitations any number over 50 is saved as 50. **LEFT** decrements the value and **RIGHT** increments the value.

14: Fixed Baud Rate
Option 14 disables the auto-learn's ability to detect the baud rate of the data stream and instead configures the baud rate to the set amount. Default (off) will allow the unit to learn on power up when **LEARN** is pressed for the correct baud rate. **RIGHT** cycles through the baud rate possibilities of 300, 600, 1200, 2400, 4800, 9600, and 19200.

Option Details Cont.

15: Fixed End Character

Option 15 disables the auto-learn's ability to detect a data stream's end character. It instead uses only a specific end character. Default (off) will allow the unit to learn on power up when **LEARN** is pressed for the correct end character. Possible end characters accepted in default mode include an end of text(ETX), line feed(LF), and carriage return(CR), which have the decimal values of 03, 10, and 13 respectively. Turning on the fixed end character will set the end character into any character. Set the display to the decimal equivalent of the desired character. **LEFT** decrements the character value and **RIGHT** increments the character value. Any character from 1 to 255 can be selected. See Section 9 for ASCII character values. If the indicator is sending 7 data bits even or odd parity then the parity bit may change the decimal value of the character by adding 128 to it. We recommend setting the indicator to 8 data bits no parity for convenience.

16: Minimum Weight

Option 16 sets the minimum weight that the unit will display. **LEFT** will change the value of the selected digit and **RIGHT** will change which digit is selected. For example if you set the minimum weight to "000030" and the indicator is sending "000000" then the display will go **BLANK** until the threshold value is exceeded.

17: Maximum Weight

Option 17 sets the maximum weight that the unit will display. **LEFT** will change the value of the selected digit and **RIGHT** will change which digit is selected. For example if you set the maximum weight to "100000" and the indicator is sending "120000" then the display will go **BLANK** until the weight drops below the threshold value.

18: Blank Out Character

Option 18 sets a character in the data stream to look for to blank the display. For example if you want the display to blank when over capacity and the indicator sends an "O", set option 18 to 79.

19: Test Mode

Option 19 sets the display in test mode. While in test mode, the display will cycle through several weights and output those weights through the serial ports. Test mode can be used to test the digits, test the unit's ability to output and to quickly demonstrate the unit's appearance of different characters to an end user.

20: **Version**
Option 20 displays the software version of the display. The unit will display the month, followed by the year. This option is only used for trouble shooting purposes.

21: **Red Stoplight**
See section 7.

22: **Green Stoplight**
See section 7.

23: **Grams / Ounces**
Annunciator will display according to the following chart when the designated character is in the data stream.

Character	Display	Designator for
"G" or "g"	"G"	Gross Weight
"N" or "n"	"N"	Net Weight
"L" or "l"	"L"	Pounds
"K" or "k"	"kg"	kilograms
"M" or "m"	"gr"	grams
"Z" or "z"	"oz"	Ounces

24: **Fairbanks Addressable**
Set option 24 only if the Fairbanks indicator is sending out multiple streams, ie. gross and tare weights. Set the option according to the chart.

Value	Addressable for	Value	Addressable for
1	40 with 7 data bits odd parity	7	42 with 7 data bits even parity
2	41 with 7 data bits odd parity	8	43 with 7 data bits even parity
3	42 with 7 data bits odd parity	9	40 with 8 data bits no parity
4	43 with 7 data bits odd parity	10	41 with 8 data bits no parity
5	40 with 7 data bits even parity	11	42 with 8 data bits no parity
6	41 with 7 data bits even parity	12	43 with 8 data bits no parity

The Stoplight Requires that options 21 and 22 be set for the desired configuration*
Pin 2 (GND) can be shared with the Stoplight and RS232 Signal Ground.

Switch
Option 21 = 1
Option 22 = 1
Connect a dry contact switch between pins 13 and pin 2 (GND).
Circuit Logic:
Open = Red, Closed = Green

Single Line TTL
Option 21 = 1
Option 22 = 1
Connect a TTL Output to Pin 13 and reference a common Ground from the transmitting device to Pin 2 (GND).
Circuit Logic TTL:
High = Red, Low = Green

Dual Line TTL
Option 21 = 2
Option 22 = 2
Connect TTL Green Control Line to pin 13
Connect TTL Red Control Line to pin 14
Reference a common Ground between the display and outputting device.

Result
High turns Light On, Low turns Light Off

ASCII Control
Option 21 = Any ASCII character from 03(ETX) to 127(DEL) for the Red light.
Option 22 = Any ASCII character from 03(ETX) to 127(DEL) for the Green light.

Result
When the character set in option 21 is in the data stream the Red light will be on.
If the character is not in the data stream then the Red light will be off.
When the character set in option 22 is in the data stream the Green light will be on.
If the character is not in the data stream then the Green light will be off.

*When option 2 is set to 2 the stoplight will be controlled by the appropriate status byte.
Setting options 21 and 22 will over ride the Toledo option byte.

Trouble Shooting

The red LED is on and the display reads "NoData".
Communication was lost.

Suggestions:
Make sure the unit is powered on.
Make sure the indicator port is enabled to transmit data continuously.
Make sure the wiring is correct. (The corresponding green LED should blink with every data transmission).

If data delay between data streams is greater than 2 seconds, turn on option 4.

The unit displays the incorrect digits.

Suggestions:
Try shifting the data to the right or left.
Lower the BAUD rate.

Rice lake indicators:

Suggestions:
Set End of Line Delay (EOL Delay) to 250 ms or higher.
Do not set to 0 ms.

Display updates slowly.

Suggestions:
Increase the frequency of data transmission.
Turn on option 4.

General Purpose Solution:
Set the transmitting device to 1200 BAUD; 8 data bits; no parity. Make sure the data stream contains 6 weight characters followed by a carriage return, line feed or end of text. Set the display to factory default and re-learn the display.

ASCII Table

Dec	Hex	Char		Dec	Hex	Char	Dec	Hex	Char
0	0	NUL	null	43	2B	+	86	56	V
1	1	SOH	start of heading	44	2C	,	87	57	W
2	2	STX	start of text	45	2D	-	88	58	X
3	3	ETX	end of text	46	2E	.	89	59	Y
4	4	EOT	end of transmission	47	2F	/	90	5A	Z
5	5	ENQ	enquiry	48	30	0	91	5B	[
6	6	ACK	acknowledge	49	31	1	92	5C	\
7	7	BEL	bell	50	32	2	93	5D	]
8	8	BS	backspace	51	33	3	94	5E	^
9	9	TAB	horizontal tab	52	34	4	95	5F	_
10	A	LF	line feed	53	35	5	96	60	`
11	B	VT	vertical tab	54	36	6	97	61	a
12	C	FF	form feed, new page	55	37	7	98	62	b
13	D	CR	carriage return	56	38	8	99	63	c
14	E	SO	shift out	57	39	9	100	64	d
15	F	SI	shift in	58	3A	:	101	65	e
16	10	DLE	data link escape	59	3B	;	102	66	f
17	11	DC1	device control 1	60	3C	<	103	67	g
18	12	DC2	device control 2	61	3D	=	104	68	h
19	13	DC3	device control 3	62	3E	>	105	69	i
20	14	DC4	device control 4	63	3F	?	106	6A	j
21	15	NAK	negative acknowledge	64	40	@	107	6B	k
22	16	SYN	synchronous idle	65	41	A	108	6C	l
23	17	ETB	end of trans. block	66	42	B	109	6D	m
24	18	CAN	cancel	67	43	C	110	6E	n
25	19	EM	end of medium	68	44	D	111	6F	o
26	1A	SUB	substitute	69	45	E	112	70	p
27	1B	ESC	escape	70	46	F	113	71	q
28	1C	FS	file separator	71	47	G	114	72	r
29	1D	GS	group separator	72	48	H	115	73	s
30	1E	RS	record separator	73	49	I	116	74	t
31	1F	US	unit separator	74	4A	J	117	75	u
32	20	Space		75	4B	K	118	76	v
33	21	!		76	4C	L	119	77	w
34	22	"		77	4D	M	120	78	x
35	23	#		78	4E	N	121	79	y
36	24	$		79	4F	O	122	7A	z
37	25	%		80	50	P	123	7B	{
38	26	&		81	51	Q	124	7C		
39	27	'		82	52	R	125	7D	}
40	28	(		83	53	S	126	7E	~
41	29	)		84	54	T	127	7F	DEL
42	2A	*		85	55	U			