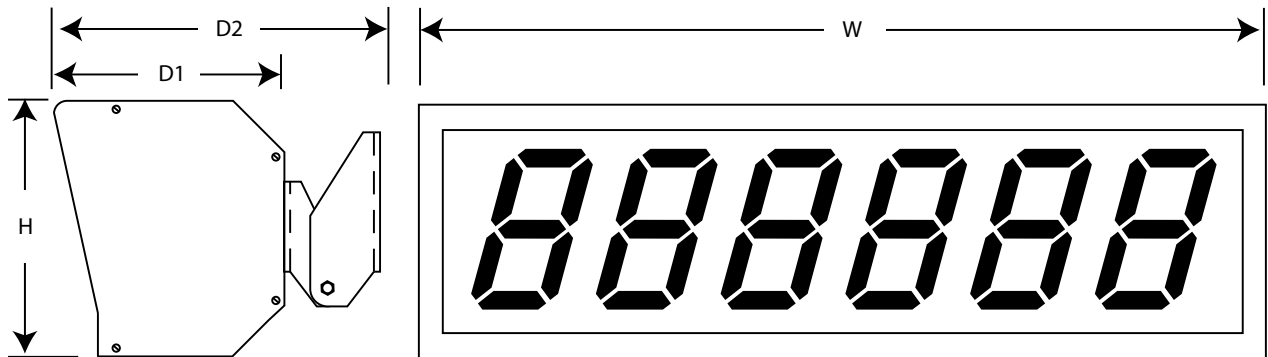


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# Section 1: Mounting Dimensions / Viewing



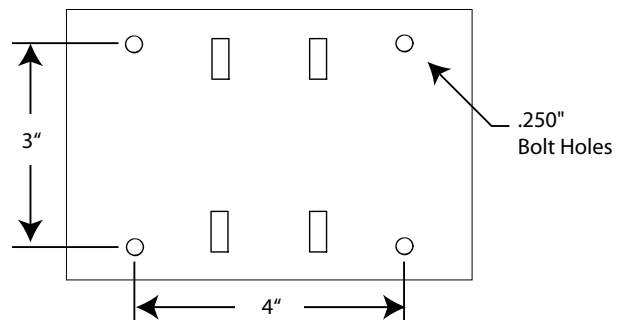
### Display Information

### 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	26		8.375		7		9.75	23 lbs.	10'	20-100'	150'
SBL4-SG	29.75		8.375		7		9.75	25 lbs.	10'	20-100'	150'
SBL-6	35.375		10.375		7		9.75	35 lbs.	15'	50-200'	250'
SBL-6SG	39.25		10.375		7		9.75	39 lbs.	15'	50-200'	250'

### Mounting Dimensions

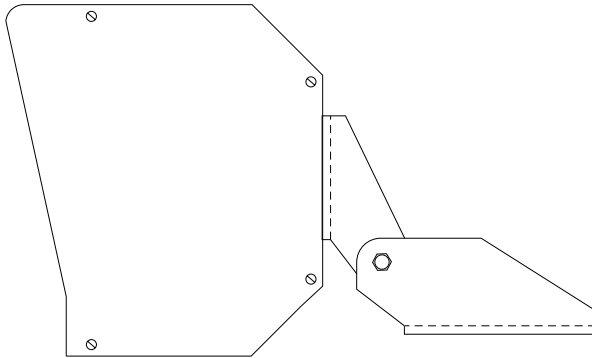
Model	W	H
SBL-2	4"	3"
SBL-4	4"	3"
SBL-6	8"	3"



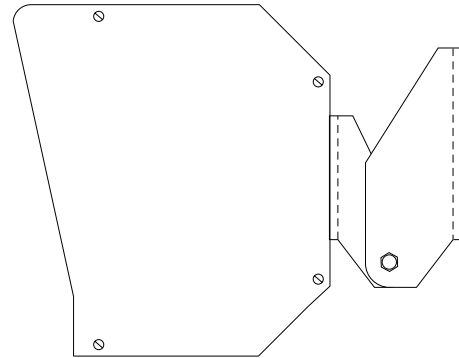
# Section 1: Mounting Options



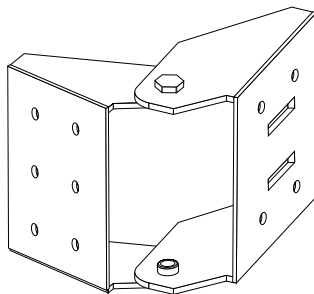
**Roof Mount**



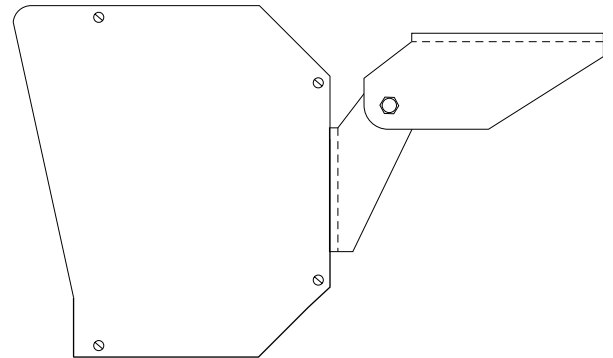
**Wall Mount**



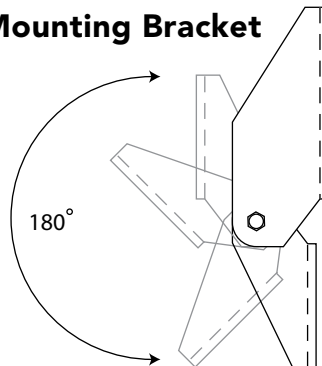
**Side Mount**



**Eave Mount**



**Mounting Bracket**



## Section 2: Wiring Configuration



Connect the Scale indicator using the appropriate diagram.

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

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

## Section 4: **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"

**\*Intensity may also be adjusted using Option 27**

# Section 5: 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	Version	Displays the current software version
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	Shift	Set or view the shift value
14	Baud Rate	Set or view the baud rate
15	End Character	Set or view the end character
16	Minimum Weight	Sets the minimum weight to display
17	Maximum Weight	Sets the maximum weight to display
18	Blank Out Character 1	Sets a character to cause the scoreboard to blank
19	Blank Out Character 2	Sets a character to cause the scoreboard to blank
20	Blank Out Character 3	Sets a character to cause the scoreboard to blank
21	Red Stoplight	See Section 7
22	Green Stoplight	See Section 7
23	Toledo High Speed	Display annunciators for grams and ounces
24	Fairbanks Addressable	Addressable for Fairbanks 40-41
25	Fixed Annunciators	Choose the LB/KB and GR/NT annunciators indicated regardless of data stream
26	Demo Mode	Cycle through different weights as a demo
27	Intensity	Set the intensity low (off) or high (on)

# Section 6: Option Details



## 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. Will display On when the unit has already been learned.

## 1: Version

Option 1 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.

## 2: Toledo

When Option 2 is set to 1 or 3 the unit will decode standard Toledo Style Data Stream. When Option 2 is set to 2 or 4 the unit will decode extended Toledo Format Stream. Settings 1 and 2 will spell annunciators for the SBL-4A and SBL-6A, while settings 3 and 4 will decode LB/KG GR/NT for standard Matko units with annunciator dots.

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.



## Option Details Cont.



### 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-numeric 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: Shift Value

Option 13 is used to set or view the shift amount. **LEFT** decrements the value and **RIGHT** increments the value. Has the same effect as shifting Left and Right during normal operation.

### 14: Baud Rate

Option 14 is used to set or view the Baud rate. **RIGHT** will cycle through the options. 0/Off indicates the units has not been set, 1=300, 2=600, 3=1200, 4=2400, 5=4800, 6=9600 and 7=19200.

## Option Details Cont.



### 15: End Character

Option 15 is used to set or view the end character. When in learn mode the unit will look for an end of text(ETX), line feed(LF) and a carriage return(CR), which have decimal values of 3, 10, and 13 respectively. Any character may be manually selected through this option by setting it to the desired decimal equivalent of the desired character. **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 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 1

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: Blank Out Character 2

Option 19 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.

## Option Details Cont.



### 20: Blank Out Character 3

Option 20 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.

### 21: Red Stoplight

See section 7.

### 22: Green Stoplight

See section 7.

### 23: Mettler Toledo High Speed

Annunciators will display according to the following chart when the designated character is in the data stream using the Mettler Toledo high Speed data format.

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

# Option Details Cont.



## 25: Fixed Annunciators

Option 25 will disregard the characters in the data stream and force the annunciators on according to the following chart

Value	SBL-2	SBL-4 and SBL-6	SBL-4A and SBL-6A
0	Use data stream	Use data stream	Use data stream
1	LB - GR		lb - G
2	KG - GR		kg - G
3			gr - G
4			t - G
5			T - G
6			to - G
7		KG - NT	pw - G
8		LB - NT	oz - G
9	LB - NT		lb - N
10	KG - NT		kg - N
11			gr - N
12		LB - GR	t - N
13			T - N
14		KG - GR	to - N
15			pw - N
16			oz - N

## 26: Demo Mode

Option 26 is used to set the display to cycle through various weights for use as a demo unit without connecting to an indicator.

## 27: Intensity

Option 27 is used to set the LED intensity to low (OFF) or High (ON). See Section 4 for an alternative way to set the intensity.

## Section 7: Stoplight



**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 (Open On)**

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

---

### **Dual Line TTL (Closed On)**

Option 21 = 3

Option 22 = 3

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 Off, Low turns Light On

## Stoplight Cont.



### **Momentary Green**

Option 21 = 4

Option 22 = ####

Connect a switch between Ground and Pin 14. When pin 14 goes low the light will toggle from red to green and remain green for a certain number of data streams set with Option 22, then will go back to red.

### **Momentary Red**

Option 21 = 5

Option 22 = ###

Connect a switch between Ground and Pin 13. When pin 13 goes low the light will toggle from green to red and remain red for a certain number of data streams set with Option 22, then will go back to green.

### **ASCII Control**

Option 21 = Any ASCII character from 06(ACK) to 127(DEL) for the Red light.

Option 22 = Any ASCII character from 06(ACK) 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.**

## Section 8: 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.



# Section 9: 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			



# Section 11: Manual Revision History



Revision	Descriptions
05/07	Wiring diagram and expansions changed to reflect 4 LED interface as opposed to the 2 LED interface. Corrected Numbering for Option 24.
10/07	Adding setting 3 and 4 to Option 2 to correctly display annunciator dots with a Toledo data stream.
6/08	Option 1 changed to display the software version, previously located under option 20. Option 19 for test mode was removed and options 19 and 20 were added to perform the same way as option 18 to allow a total of 3 blank out characters.
10/10	Updated Enclosure dimension chart. Modified Options 13, 14, 15, and 23. Added Options 25-27. Expanded Stoplight options to allow for values 3-5. Added new Section for replacement parts.