SBI-505 Indicator
User Instructions

AWT35-500827
Rev. AA

1.1 Contents

1.2 Introduction

For safe operation please read and follow all safety information and instructions.

WARNING: Settings, calibration, inspection and maintenance should only be done by trained personnel.

WARNING: This indicator is a static sensitive device. Remove power before making any electrical connections. Do not touch any internal components.

Please take all anti-static precautions.

This indicator is designed for basic weighing function. This includes:

- Zero
- Tare
- Gross weight
- Net weight
- Accumulation
- Printing
- Animal weighing

Both kg and lb units of measure are available.

The default print format contains the following information:

- S.N. (serial number)
- Gross weight
- Net weight
- Tare weight
- Date
- Time

1.2.1 Options:

- Printer
- RS232 serial interface or second display (remote)

1.2.2 Specifications:

Accuracy class:	6000 e
Resolution display:	30, 000
	ADC: 2,000,000
Zero stability error:	TK_0< 0.1μV//K
Span stability error:	TK_{spn}< ± 6 ppm//K
Sensitivity (internal):	0. 3V /d input voltage -30 ~ 30μmV DC
Input voltage:	9-13.8 VDC: 0.3 amps (center terminal positive)
Excitation circuit:	5 VDC, 4 wire connection
	maximum of 6 - 350Ω load cells
AC power adapter:	AC100/240V: 50-60Hz, 1.6 amp
	center positive 9 VDC@1.2 amps
Maximum power source:	12VDC
Operation temperature:	- 10 °C ~ + 40 °C
Operation humidity:	≤90%RH
Storage temperature:	- 40 °C ~ + 70 °C

1.3 Installation

1.3.1 Power Supply Connection

The indicator is powered by an A/C adapter that plugs directly into the DC pin at the bottom of the indicator. The indicator accepts 9 - 12 VDC center positive adapter.

1.3.2 Connection of Loadcell and Indicator

The indicator can be connected up to 6 - 350Ω load cells. 4 wire or 6 wire loadcells are acceptable.

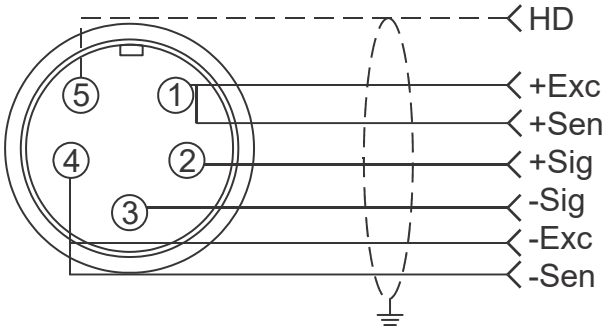


Figure 1.1 Quick Disconnect

If using interface cable p/n AWT05-505848 (optional):

red = + exc., green = +sig, white = -sig, black = -exc.

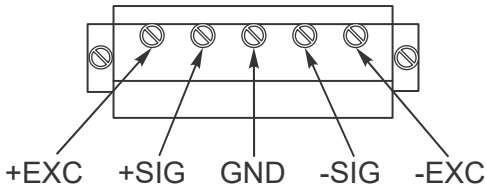
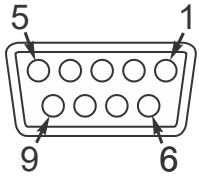


Figure 1.2 PC Board Connection

1.3.3 Communication interface

Below is the RS232 DB9 pin:



Pin assignments are shown below:

DB9 joint	Definition	Function
2	TXD	Sending data
3	RXD	Receiving data
5	GND	Ground interface

1.4 Basic Operation

1.4.1 Power

Press and hold the **ON/OFF** key, shown below, for two seconds to power on or off the indicator. After a self-test, normal weighing mode will be accessed.

1.4.2 Zero Operation

Initial Zero Setting

During power up, if the weight on the scale is within the initial zero tolerance, the indicator will show zero automatically. The center of zero and stable annunciators will be lit.

Pushbutton Zero

When the scale is stable and not showing a negative weight, you can zero the weight, within tolerance, by pressing the **Zero** key, shown below.

1.4.3 Tare Operation

When a gross weight is tared, the indicator will show the net weight. The *Net* and *Tare* annunciators will light.

In tare mode, press the **Tare** key to clear the tare weight and the indicator will show the gross weight.

1.4.4 Print

If the weight is stable, press the **Print** key to print the weight to a connected printer.

1.5 Counting Function

Follow these steps to count items of the same weight.

1.5.1 Getting a Piece Weight

1. While in the weighing mode, press the **Zero** key to clear weight from the scale.
2. Load pre-counted sample pieces of (5, 10, 20, 50, 100, 200, or 500) on the scale and press the **Count** key.

   PCS 0 is displayed.
3. Using the **Zero** key, select from the quantity choices (5, 10, 20, 50, 100, 200, 500).
4. Press the **Print** key to select the displayed choice.

   The quantity of items is shown.
5. Remove the sample pieces and zero the scale if necessary.
6. Load the items to be counted on the scale.

   The quantity of items is shown.
7. Press the **Count** key to return to weighing mode.

If you want to weigh items with a different piece weight you must turn the unit off and on again and then repeat steps 1 through 7.

1.6 Accumulation Operation

1. With **0** on the display, add the weight to the scale. Press the **Total** key to enter the accumulation mode.

   The *Total* annunciator turns on and the display shows ***n 001***, and then the display goes back to the loaded weight.

2. Unload the weight.

   The display shows ***0***.

3. Load the second weight and press the **Total** key.

   n 002 is displayed then the display goes back to the loaded weight.

4. Repeat the previous steps for a maximum 999 times.

Viewing the Accumulation

1. To view the values during accumulation, press and hold **Total** and **ON/OFF** keys.

   nnn is displayed and then the total accumulated weight is displayed. ***nnn*** is the number of accumulations included in the total weight.

2. If the total weight is beyond the display capability, it will show the first 4 digits then the last 4 digits. For example, the first four digits are ***0012*** and the last 4 digits are ***34.56***, the actual weight is ***1234.56***.

Clearing the Accumulated Weight

Follow these steps to exit the accumulation function:

1. While the display shows the last 4 digits of the accumulated weight, press and hold the **Total** key.

   clr n is displayed. This prompt means *Clear the accumulated weight? - No*.

2. Press **Zero** or **Tare** to toggle between ***clr n*** and ***clr y*** which means *Clear accumulated weight? - Yes*.

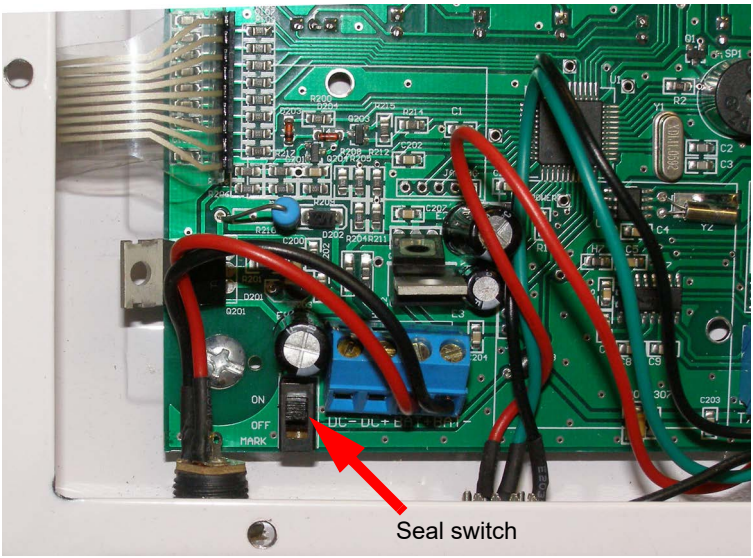
3. When the desired choice is displayed, press the **Print** key to accept that choice.

   If you choose ***clr n***, the indicator exits the accumulation mode without clearing the total weight. If you choose ***clr y***, the total weight is cleared and the indicator exits accumulation mode.

1.7 Calibration and Parameter Setting

The Parameter menu is divided into a calibration section and a parameter configuration section. To enter the parameter part of the menu, follow step 1 below. To enter the calibration plus the parameter section, follow step 2 below. You may need access to the Seal switch on the main board, shown in the photo below.

CAUTION: If you break the official seal to open the back of the indicator you may need to have the indicator recertified by local weights and measures officials. Open the back only if you are sure it is correct to do so.



1. For access to the parameter section only, the Seal switch must be in the OFF position. Press and hold the **Print** and **Total** keys.

   This accesses the menu section numbered C08-C39.

2. For access to both the calibration and parameter sections, the Seal switch must be in the ON position. Press and hold the **Print** and **Total** keys.

   This accesses the complete menu numbered C01-C39.

Be sure to return the seal switch to its original setting once you are finished with calibration and configuration.

The table below shows the name and symbol of each front panel key and their function while in the menu.

Function	Key	Symbol
Enter	**Print**	↵
Increase	**Zero**	▲
Decrease	**Tare**	▼
Left	**kg/lb**	◄
Right	**Gross**	►
Back	**Total**	↱
Exit Calibration	**Count**	⍐
Power	**ON/OFF**	⏻

1.7.1 Calibration Instructions

When initial installation or recalibration are necessary, locate the seal switch and place it in the ON position.

The SBI-505 requires a minimum of 10% of the configured scale capacity in dead weight to calibrate the indicator.

Follow the calibration steps. Press and hold the **Print** and **Total** keys to access the calibration menu. Below are the seven calibration parameters.

Step	Method of Operation	Display	Remark
1		[C01]	After you enter calibration mode, it displays [C01] (1 is blinking)
2	press ↵ press ▲ or ▼ to toggle choices	[C01 X]	Calibration Weight option: X=1=kg X=2=lb
3	press ↵ press ↵ press ▲ or ▼	[C02] [C02 0] [C02 2]	Set decimal position (2 is blinking) Option: 0/1/2/3/4 Select decimal digit example: two decimal places [C02 2]
4	press ↵ press ↵ press ▲ or ▼	[C03] [C03 1]	Set graduation (3 is blinking) Option:1/2/5/10/20/50 Select required graduation Example: graduation 5 = [C03 5]
5	press ↵ press ↵ press ▲ or ▼ / ◄	[C04] [XXXXXX]	Max capacity (4 is blinking) Current setting shown (default 10000) Example: max weighing 100kg = [0100.00]
6	press ↵ press ↵ press ▲ or ▼ press ↵	[C05] [C05 0] [C05 1] [CAL 9] [0000.00]	Zero calibration options (5 is blinking) 0=skip zero calibration (default) 1=zero calibration. Choose 1 and ensure scale is empty, then press ↵. Wait till display counts down to [0.00] (example for two decimal point). At 0 the zero calibration is complete.

Step	Method of Operation	Display	Remark
7	press ↵ press ↵ press ▲ or ▼ press ↵ press ▲ or ▼ / ◄ press ↵	[C06] [C06 0] [C06 1] [SPAN] [0100.00] [0800.00] [CAL 9] [0800.00] [CAL End]	Span calibration options (6 is blinking) 0= No span calibration 1= Span calibration Load weights on scales to 100% of capacity. Suggest close to the max capacity, at least 10% of max.capacity. Suggested minimum span weight is 10% of capacity. Enter actual weight applied. Example shown is 800.00. Press press ↵ and countdown begins. ***CAL End*** is displayed then 0800.00 when cal is complete. Press **Count** to exit calibration. Press **Print** to proceed to Parameter C07.

1.7.2 Reset Configuration Parameters to Defaults

To reset the indicator to its default configuration the Cal switch must be in the "ON" position.

Method of Operation	Display	Remark
press ↵ press ↵ press ▲ or ▼	[C07] [C07 0] [C07 1]	Default parameters setting option 0=skip default parameters 1=restore default parameters Note: after the above parameters setting is finished, please do not select 1 to avoid losing new setting of parameters.

1.7.3 Application Function Parameters Setting Chart

From step 1 on page 11, parameter C08 will be displayed. Press ▲ or ▼ to find the parameter to be changed. See the table below for information on available parameters.

Function	Parameter	Parameters Setting and Instruction
Key tone	C08 Warning tone	Options: 0 = no key tone 1 = key tone
Automatic power off	C09 Automatic power off	Option: 0= close auto power off 10= power off automatically if no change within 10 minute. 30= power off automatically if no change within 30 minute. 60= power off automatically if no change within 60 minute.
Power saving setting	C10 Power saving setting	LED Version ONLY: Option: 0= continuous power on 3= power off if no scale or keyboard activity within 3min. 5= power off if no scale or keyboard activity within 5 min. LCD Version: 0= power off backlight 1= backlight when the weight changes or keyboard activity. 2= constant backlight
NA	C11 = NA	NA
Unit key	C12 Kg/lb conversion	C12=0 kg only C12=1 kg and lb both active
Upper/lower limit alarm	C13 Upper limit alarm value	Can be set to a value within the maximum capacity limit
	C14 Lower limit alarm value	
A/D Counts	C15 Raw counts	Enter C15 to check A/D counts

Function	Parameter	Parameters Setting and Instruction
Date and time	C16 Date	set the date, from left to right: year/month/ day
	C17 Time	set the time from left to right: 24hour/min/sec
RS-232 Communication setting	C18 Serial interface data strings	Output/Input options (*Output Format* on page 19): 0= Serial interface data output disable 1=Continuous transmit to remote display 2=Print key only 3=Command request method to a host device. See *Troubleshooting and Maintenance* on page 22 4= Indicator sends format continuously to a computer. 5= Indicator sends format continuously to a host device compatible with RD65 remote display from Brecknell.
	C19 Baud rate	Baud rate option: 0=1200/1=2400/2=4800/3=9600 Fixed 8,none & 1 stop bit
Zero range	C20 Manually zero range	Baud rate options: 0= Disable zero key 1=±1% max capacity 2=±2% max capacity 4=±4% max capacity 10=±10% max capacity 20=±20% max capacity 100=±100% max capacity
	C21 Initial zero range	Option: 0= Disables initial zero setting on power up 1=±1% max capacity 2=±1% max capacity 5=±1% max capacity 10=±1% max capacity 20=±1% max capacity

Function	Parameter	Parameters Setting and Instruction
AZT - Automatic Zero tracking	C22 Automatically zero tracking range	Options: 0= Disable zero tracking 0.5=±0.5d 1.0=±1.0d 2.0=±2.0d 3.0=±3.0d 4.0=±4.0d 5.0=±5.0d Note: 1. d = division 2. the zero tracking range cannot bigger than manual zero range, see C20.
	C23 Automatically zero tracking time	Options: 0= Disable zero tracking time 1= 1 second 2= 2 seconds 3= 3 seconds
Overload range	C24 Overload range	Option: 00= close overload range 01d~99d remark: d =division
Negative range	C25 Negative display range	Option: 0=-9d 10=10% max. capacity 20=20% max. capacity 50=50% max. capacity 100=100% max. capacity
Stability	C26 Stability time	Option: 0= quick 1= medium 2= slow
	C27 Stability range	Option: 1= 1d 2=2d 5=5d 10=10d D= division

Function	Parameter	Parameters Setting and Instruction
Digital filter	C28 Dynamic filter Instruction: Dynamic filter is collecting the data filter before loaded weight stable. When loaded weight easily shaking (for example animal), you can set this filter to make weight display more stable	Option: 0= Disable dynamic filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength 4=4 digital filter strength 5=5 digital filter strength 6=6 digital filter strength Note: Do not over filter. The bigger the number, the more aggressive the filtering. Try less than 3.
	C29 Noise filter	Option: 0=Disable noise filter 1=1 digital filter strength 2=2 digital filter strength 3=3 digital filter strength
	C30 Print time and date	C30=0 yy.mm.dd C30=1 mm.dd.yy C30=2 dd.mm.yy C30=3 yy.mm.dd
NA	C31 NA	NA
NA	C32 NA	NA
NA	C33 NA	NA
NA	C34 NA	NA
NA	C35 NA	NA
Gravity of calibration location	C36	C36=9.7000~9.9999
Gravity of destination Version No.	C37 C38	C37=9.7000~9.9999
NA	C39 NA	NA

1.8 Output Format

1.8.1 Option 1 - Not Available

1.8.2 Option 2 - PRINT key only

By default, if you press the **Print** key while in net weighing mode, the following format will be sent to a peripheral device. In gross mode the first two lines will be left out of the format.

```
NET       xxxxxx lb
TARE      xxxxxx lb
GROSS     xxxxxx lb
Time:     HH:MM:SS
Date:     YY.MM.DD
```

NET spsp	Fixed 4sp	Weight 6 digits	Unit	CR	LF
TARE sp	Fixed 4sp	Weight 6 digits	Unit	CR	LF
GROSS	Fixed 4sp	Weight 6 digits	Unit	CR	LF
Time:	Fixed 4sp	24HR:MIN:SEC	CR	LF	
Date:	Fixed 4sp	YR.MO.DAY	CR	LF	

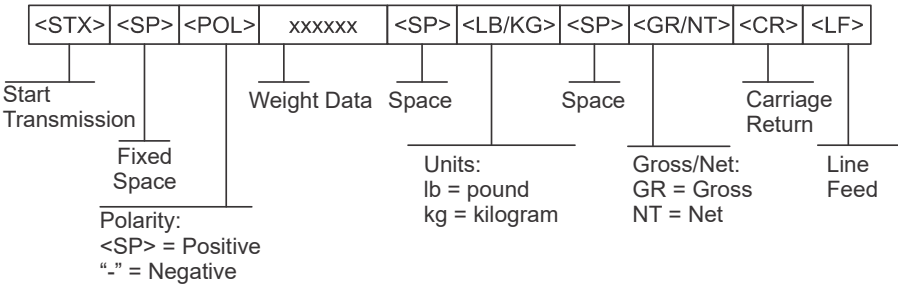
1.8.3 Option 3 - Host commands

When the indicator receives one of the commands shown in the table below, the indicator responds with a corresponding format. An example for the R command is shown below.

Command word and role as follows:

ASCII Command	NAME	Function
T	TARE	Save and clear tare
Z	ZERO	Zero gross weight
P	PRINT	Print the weight when stable
R	G.W/N.W	Read gross weight or net weight w/motion
C	Kg/lb	Kg/lb conversion

Example: R command receive data format

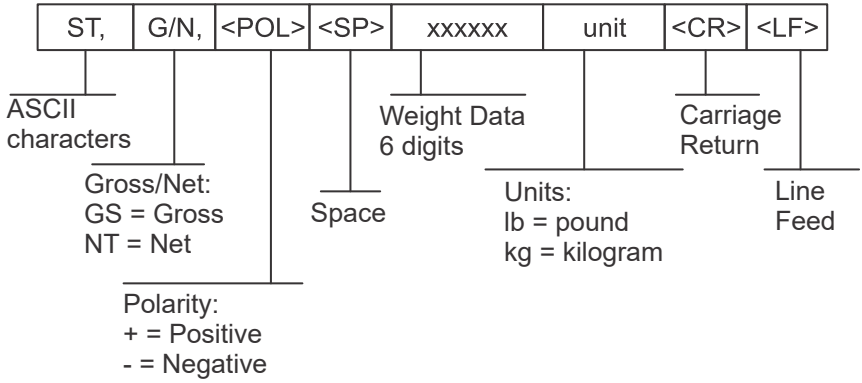


Print format for R command

```
NET     XXXXXX(unit)

TARE    XXXXXX(unit)

GROSS   XXXXXX(unit)

Time:   24hr.mn.ss

Date:   yy.mm.dd
```

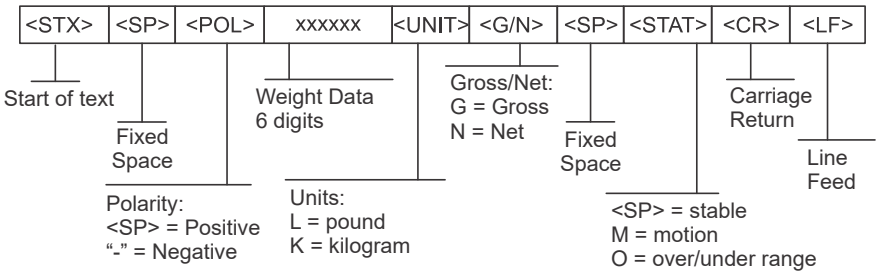
1.8.4 Option 4 - Continuous Send

Option 4 is a continuous sending string. The output is shown below:



1.8.5 Option 5 - Host Device/Remote Display (RD65)

Option 5 is compatible with the Brecknell RD65 remote display or host devices that can use the following output format:



1.9 Troubleshooting and Maintenance

ERROR	REASON	SOLUTION
UUUUUU	1. Overload 2. Wrong connection with load cell 3. Load cell has problem.	1. Reduce the weight 2. Check load cell connection 3. Inspect load cell. Check the input and output voltage OR input and output resistance to judge if loadcell is good or not.
nnnnnnn	1. Under load 2. LC connection 3. Load cell has problem	1. Check platform if it is level or not. 2. Check load cell connection. 3. Check load cell: Check the input and output voltage OR input and output resistance to judge it is good or not.
ERR1	During calibration, no input of weights or the weight is overload	Input the correct weights.
ERR2	During calibration, the weights is below than Min. required weights	The calibration weights Minimum is 10% of Max. cap. Recommend 60% - 80% of Max. Cap.
ERR3	During calibration, the input signal is negative	1. Check the connection is correct. 2. Check load cell.
ERR4	During calibration, the signal is unstable	After the platform is stable, start calibration.
ERR5		Change PCB.
ERR6		No load cells signal.

Default parameters

Parameter	instruction	Default
C01	Calibration	1
C02	Decimal digits	0
C03	Graduation	1
C04	Max. capacity	10000
C05	Zero calibration	0
C06	Span calibration	0
C07	Restore default configurations	0

Parameter	instruction	Default
C08	Warning tone (key stroke)	1
C09	Automatic power-off	0
C10	Auto off	0
C11	NA	NA
C12	UNIT key	1
C13	Upper limit alarm	000000
C14	Lower limit alarm	000000
C15	A to D counts	Random number
C16	Date setting	YYMMDD
C17	Time setting	24Hr.min.sec
C18	Serial interface data	0
C19	Serial interface Baud rate	3 (9600)
C20	Zero range	10
C21	Initial zero	10
C22	AZT tracking range	0.5
C23	AZT tracking time	1
C24	Overload range	9
C25	Negative range	10
C26	Stability time	1
C27	Stability range	2
C28	Dynamic filter	0
C29	Noise filter	1
C30	Date format	0
C31	NA	1
C32	NA	4
C33	NA	1
C34	NA	NA
C35	NA	NA
C36	Calibration location gravity	9.7936
C37	Destination gravity	9.7936
C38	Operating Software Rev. #	
C39	NA	

Brecknell
1000 Armstrong Dr., Fairmont, MN 56031
Toll free: 800-637-0529, Tel: 507-238-8702
Fax: 507-238-8271
Email: sales@brecknellscales.com
www.brecknellscales.com

Brecknell
Foundry Lane
Smethwick, West Midlands B66 2LP
Tel: +44 (0) 845 246 6717
Fax: +44 (0) 845 246 6718
Email: sales@brecknellscales.co.uk
www.brecknellscales.co.uk