SBI-505 Indicator

USER MANUAL

Rev. A

⚠ **Safety Instruction**

For safety operation please follow the safety instruction.

⚡ **WARNING**
Settings, Calibration, Inspection and Maintenance should only be done by a trained person or staff.

⚡ **WARNING**
Please make sure the indicator has sufficient grounding.

ATTENTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES	⚡ **WARNING**
	The indicator is a static sensitive piece of equipment. Cut off the power during electrical connections and internal components touched by hand are prohibited. Please take all measure of anti-static protection.

Instruction

This indicator is designed for basic weighing function.

Main function

Weighing function:

Zero, tare, G.W, N.W, accumulation, printing, animal -weighing.

kg/lb conversion.

Print format: S.N. G.W N.W Tare. Date, Time

Options:

Pinter

RS232/RS485 serial interface or second display

Technical parameter

|		
Accuracy class	6000 e	
Resolution	display: 30, 000	ADC: 2,000,000
Zero stability error	$TK_0 < 0.1\mu V//K$	
Span stability error	$TK_{spn} < \pm 6$ ppm//K	
Sensitivity (internal)	0. 3 μV /d	
Input voltage	-30~30mV DC	
Excitation circuit	5 VDC, 4 wire connection,	
	Maximum connect 6 load cell of 350Ω	
AC power	AC100~250V	
Operation temperature	- 10 °C ~ + 40 °C	
Operation humidity	≤90%RH	
Storage temperature	- 40 °C ~ + 70 °C	

Installation and calibration

Power supply connection

 The indicator is powered by A/C adapter that plugs directly into the "DC" pin at the bottom of the indicator.
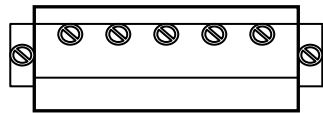
Connection of load cell and indicator

The indicator can be connected up to 6 load cell of 350Ω, 4 wire or 6 wire load cell both ok.
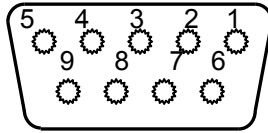
Quick disconnect, as below:
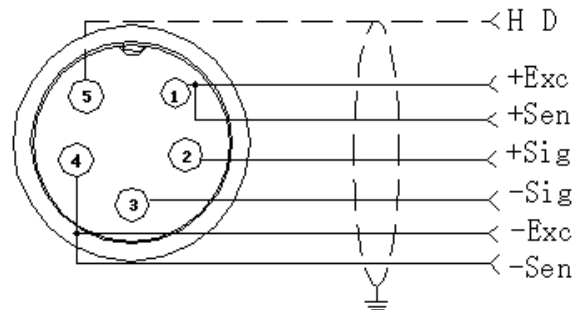
PC Board connection

-EXC -IN GND +IN +EXC -EXC

Communication interface

RS232 : DB9 Pin

DB9 definition

Pin function and definition as bellows:

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

Note: if RS485, The connection pin is 2 and 5 pin.

Basic operation

Power on & off

Press 2 seconds to power on or off the indicator. After self test it will go to the weighing mode.

Zero operation

1. Initial zero setting

During power up if the weight on the scale is within the initial zero tolerance, indicator show zero automatically.

2. Manually Zero setting

When the scale is stable and not the negative weight you can zero the

weight within tolerance by press key.

Tare operation

During "TARE" operation when gross weight is tared the indicator will show the Net weight. The "Net" "tared" status light is on. In tare mode, Press" TARE" key to clear the tare weight and the indicator will show the gross weight.

Accumulation operation

With Zero on the Display load weight, Press [total] goes to accumulation mode, "Total" light is on, display" n 001", and then the display goes back to the loaded weight; unload the weight , Display shows zero, load the second weight again. Press [total] display"n002" then display the second loaded weight. Repeat it again and again for a maximum 999 times.

Check the accumulation

Press "TOTAL "key and hold it then press "ON/OFF" key, display "n**", (it is the accumulating times) then show total weight. 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 4 digits is"0012", the last 4 digits is"34,56" It means the actual weight is "1234.56"

EXIT the accumulation function

When the indicator show the last 4 digits, Press [total] hold it, the indicator show " clr n", it means don't clear the total Weight, Press "PRINT" key to exit it; if you want to clear total weight Press "ZERO" or "TARE" key, "clrn" change to "clry" it means clear total weight? Then Press "PRINT" to clear the total weight and exit accumulating mode.

Print

If the weight is stable, press" PRINT" you can print the weight.

COUNT

1.In weighing mode, load the Pieces on the platform scales, Press" Count" the indicator show" PCS 0" press" Zero" key in the quantity, press" Print" to confirm it

2. Load the goods on the platform scales, the indicator will show the quantity.

1.   Press" Count" to return to weighing mode.
2.   If you want to weigh different goods, at weighing mode, put the sample on the platform scales, press" Count" the indicator show"0" Press "Count" hold it and then press "ON/OFF" the indicator show" PCS 0", press "Zero" input the sample quantity, press "Print" to confirm it. Then repeat the step 2 and 3.

Calibration and Parameter setting

Enter setting

There have two methods to enter the setting menu:

1. when the switch " CAL" is off, press the "PRINT" hold it and then press" Total" this enters the C08-39 settings.

2. Take out the sealing screw on the back of indicator, move the sealing switch to second position. Press "PRINT" hold it and then press "Total" key this enters C01-C39 settings.
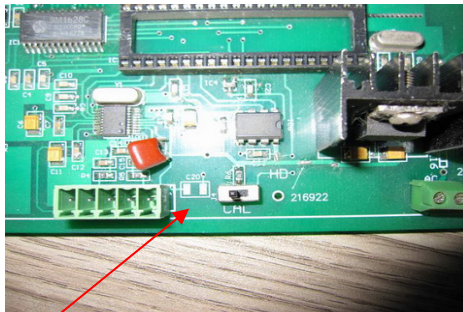
Inside View, Calibration Switch

The key functions in setting：
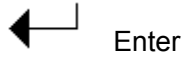
← Enter

↑ Up

↓ Down

← Left

⏻ Power switch, exit setting without saving, "Count" exit with saving changes.

Calibration operation:

According to the second method which can enter setting menu, C01-C39

step	Method of operation	display	Remark
1		[C01　　]	After you enter calibration mode, it display [C01　　]
2	press←	[C01　1]	Calibration Weight option：1=kg 　　　　2=lb
3	press← press← press↑ or↓	[C02　　] [C02　0] [C02　2]	Set decimal position option：0/1/2/3/4 Select decimal digit example：two decimal point over：[C02　2]

4	press◀⏎ press◀⏎ press↑ or↓	[C03　　] [C03　　1] [C03　　5]	Set graduation option：1/2/5/10/20/50 Select required graduation example :graduation 5 :[C03　5]
5	press◀⏎ press◀⏎ press↑ or↓/◀	[C04　　] [0100.00] [0100.00]	Max capacity example : max weighing 100kg: 　　　[0100.00]
6	press◀⏎ press◀⏎ press↑ press◀⏎	[C05　　] [C05　　0] [C05　　1] [CAL　　9] ○○○○○○ [0000.00]	Zero calibration Option 0=no need zero calibration 1=need zero calibration calibration zero please choose 1 and ensure scale is empty and "stable" light is on Ensure zero calibration, countdown. Till show[0.00](example for two decimal point)。
7	press◀⏎ press◀⏎ press↑ or↓ press◀⏎ press↑ or↓ press◀⏎	[C06　　] [C06　　0] [C06　　1] [SPAN　] [0100.00] [0080.00] [CAL　　9] ……	calibration option: 0=No need calibration 1= need calibration Load weights on scales according to max. capacity. Suggest close to the max capacity,　at least 10% of max. capacity. For example: the weights is 80kg

		[0080.00] [CAL End]	As bellows: Input the 0080.00, count down , then indicator shows 0080.00 , calibration is over. If you want to set application function parameter. Press "PRINT" if you want to exit press "Count"
8	press◄—┘ press◄—┘ press↑ or↓	[C07] [07 0] [07 1]	Default parameters setting option:0=non-restore default parameters 1=restore default parameters Note: after the above parameters setting finish, please do not select 1 to avoid losing new setting parameters.

Application function parameters setting chart

Function	Setting Item	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= close power saving setting

		3= close display if no change within 3min. 5= close display if no change within 5 min. LCD Version: 0=Close he backlight 1= backlight when the weight change or press the keyboard 2=constant backlight

Hold function
N.A
SBI-505
	C11
	Hold mode
		option：0=close hold function
		
		      1=Peak hold /2=Data Hold
		Instruction:
		Peak-hold: it shows the max. data,
		      mainly application for materials testing,
		      such as tension and pulling force.
		Date-hold: it shows current weight value.
		      Mainly application for animal weighing.

Kg/lb conversion	**C12** Kg/lb conversion	C12=0 stop kg/lb conversion C12=1 kg/lb conversion is ok
Upper/lower limit alarm	**C13** Upper limit alarm value	You can set it within the max. capacity limit
	C14 Lower limit alarm value	
Inner Code display	**C15** Check inner code	enter C15 to check the inner code

	C16 Date	Enter C16, you can set the date, from left to right: year/month/day
Date and time	C17 Time	Enter C17, you can set the time from left to right: hour/min./sec.

		option :0= Close serial interface data output 1=Continuous sending, connect big display 2=Print method, connect printer. 3=Command request method , connect computer. 4=PC continues sending format, connect computer. 5=PC/ big display continuous sending format.
Communication setting	**C18** Serial interface data output method	
	C19 Baud rate	option : 0=1200/1=2400/2=4800/3=9600 Fixed 8,none & 1 stop bit
Zero range	**C20** Manually zero range	Option: 0= close manually zero setting 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= no initial zero setting 1=±1% max capacity 2=±1% max capacity 5=±1% max capacity 10=±1% max capacity 20=±1% max capacity

Zero tracking	**C22**
	Automatically zero tracking range
		Options:
		0= close 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 can not bigger than manual zero range.

	C23 Automatically zero tracking time	Options: 0= close 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 display	**C25**
	Negative display range
		Option：0=-9d
		
		    10=10% max. capacity
		    20=20% max. capacity
		    50=50% max. capacity
		    100=100% max. capacity

Standstill time	**C26** Standstill time	Option: 0= quick 1= medium 2= slow

	C27 Standstill range	Option: 1= 1d 2=2d 5=5d 10=10d D= division
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= close 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 ：Pls setting dynamic filter strength carefully, the No. is bigger, more stable. if the loaded weight shake not too much. The setting is less than 3
	C29 Noise filter	option：0=close 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
Analog output setting NA SBI-505	C31 output type	C31=0 0~5Vouput C31=1 4~20mA output

4~20mA current calibrate NA SBI-505	C32 calibrate current	Refer to 2.5
Relay output setting NA SBI-505	C33 Relay output	C33=0 close relay output C33=1 Open relay output function 1 C3=2 Open relay output function2 C33=3 Preserved menu
Muti communication add. NA SBI-505	C34 Communication add.	C34= 0~99 Add. Code
Wireless communication NA SBI-505	C35	C35=0~99 signal
Gravity of calibration location	C36	C36=9.7000~9.9999
Gravity of destination	C37	C37=9.7000~9.9999
Version No.	C38	
Preserved menu	C39	

Output format

Big display continuous sending format

Output continuous format																		
STX	SWA	SWB	SWC	X	X	X	X	X	X	X	X	X	X	X	X	X	CR	CKS
1	2			3						4							5	6

State A			
Bits0,1,2			
0	1	2	Decimal point position
1	0	0	XXXXXX0
0	1	0	XXXXXXX
1	1	0	XXXXX . X
0	0	1	XXXX . XX
1	0	1	XXX . XXX
Bits3,4			Division
0		1	X1
1		0	X2

State B	
BitsS	function
Bits0	gross=0, net=1
Bits1	Symbol: positive =0,negative =1
Bits2	Overload(or under zero)=1
Bits3	dynamic=1

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Bits4	unit : lb=0, kg=1
Bits5	Constant 1
Bits6	Constant 0

State C			
Bit2	Bit1	Bit0	unit
0	0	0	Kg or lb
0	0	1	g
0	1	0	t
Bit 3			printing=1
Bit 4			Extend display=1
Bit 5			Constant 1
Bit 6			Constant 0

Computer continuous sending format


S 1 **S 2** **S 3** **Data** **S 4**
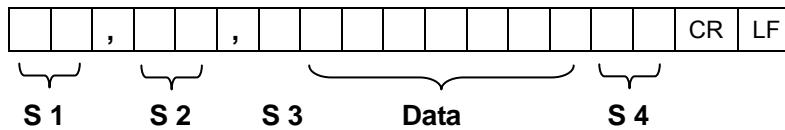
S1: weight status, ST= standstill, US= not standstill, OL= overload

S2: weight mode, GS=gross mode, NT=net mode

S3: weight of positive and negative, "+" or " –"

S4: "kg" or "lb"

Data: weight value, including decimal point

CR: carriage return

LF: line feed

Serial interface reception command：

RS232COM serial interface can receive simple ASCII command.
Command word and role as follows:

Command	NAME	Function
T	TARE	Save and clear tare
Z	ZERO	Zero gross weight
P	PRINT	Print the weight
R	G.W/N.W	Read gross weight or net weight
C	Kg/lb	Kg/lb conversion
G	G.W	Check gross weight at net weight mode

R command receive data format
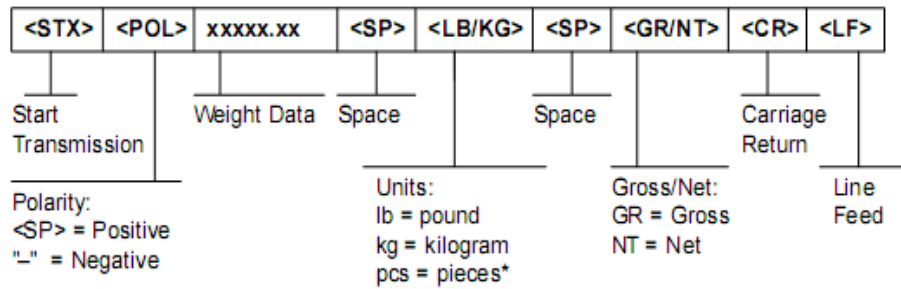
Print format

ID.NO.   004   (Serial No.)

Date: XX.XX. XX   (yy.mm.dd)
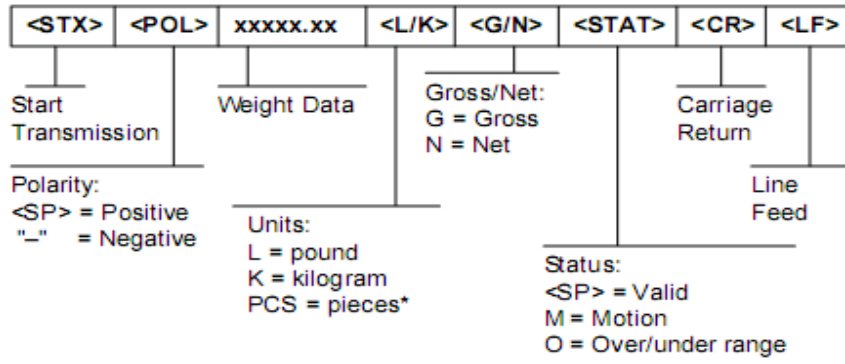Time: XX.XX.XX   (hh.mm.ss)
GROSS   8.88kg   (gross weight)

TARE   2.88kg   (tare)

NET   6.00kg   (net weight)

PC or Big display continuous sending format

| <STX> | <POL> | xxxxx.xx | <L/K> | <G/N> | <STAT> | <CR> | <LF> |

Start Transmission — <STX>

Weight Data — xxxxx.xx

Gross/Net:
G = Gross
N = Net

Carriage Return — <CR>

Line Feed — <LF>

Polarity:
<SP> = Positive
"–"   = Negative

Units:
L = pound
K = kilogram
PCS = pieces*

Status:
<SP> = Valid
M = Motion
O = Over/under range

6. Maintenance

6.1 Regular error and solution

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 0R input and output resistance to judge it 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 0R 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

Default parameters

Parameter	instruction	Default
C01	Calibration	1
C02	Decimal digits	0
C03	Resolution	1
C04	Max. capacity	10000
C05	Empty calibration	0
C06	Capacity calibration	0
C07	Restore default	0
C08	Warning tone	1
C09	Power-off automatically	0
C10	Power saving mode	0
C11	Hold function	0
C12	Prohibit kg/lb conversion	1
C13	Upper limit alarm	000000
C14	Under limit alarm	000000
C15	Inner code	

C16	Date setting	
C17	Time setting	
C18	Serial interface data output	0
C19	Serial interface Baud rate	3（9600）
C20	Zero manually	10
C21	Initial zero	10
C22	Zero tracking range	0 . 5
C23	Zero tracking time	1
C24	Overload range	9
C25	Negative range	10
C26	Standstill time	1
C27	Standstill range	2
C28	Dynamic filter	0
C29	Noisy filter	2
C30	Print format	0
C31	Analog signal options	1
C32	4~20mA testing	4
C33	Relay output setting	1
C34	Muti PC communication add.	0
C35	Wireless communication channel	6
C36	Calibration location gravity	9.7936
C37	Destination gravity	9.7936
C38	Version No. check	
C39	Reserved menu	