

BONGSHIN[®]



OPERATIONAL MANUAL



BS-32

DIGITAL INDICATOR

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1. INTRODUCTION

Thank you very much for your purchasing BONGSHIN Digital Weighing Indicator of **BS-32**.

This Instruction Manual will lead you to use **BS-32** with top reliability, High speed, high accuracy.

BS-32 is Digital Weighing Indicator amplifying the analog output from a load Cell, converting the analog signal to digital data and then displaying this data

As a weight reading and is designed for flawless performance in your demanding

Before using, It is recommended that you read this manual carefully so you may use this device to its full potential.

2. PRECAUTIONS

- Place the indicator on a flat and stable surface.
- Do not severely press because the light pressing of keys can incite the operation.
- Do not subject the scale to sudden temperature changes.
Operating temperature : $-10^{\circ}\text{C}\sim+40^{\circ}\text{C}$
- Keep the scale away from strong EMI noises may cause incorrect weight readings.
- Keep the main body from rain and keep in dry area.
- Do not use inflammable materials in cleaning.

FEATURES

1. Features

- Appropriate for weight and measurement system.
- Easy operation and various options.
- Simple full digital calibration.
- Watchdog circuitry (system restoration)
- Weight Back-up (power on actual weight)

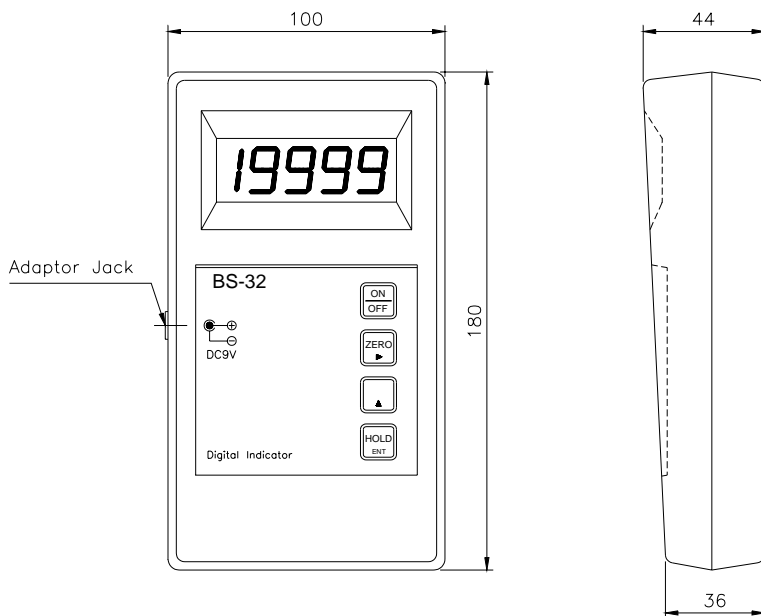
2. Main Function

- RS-232C Option
- User can set the max. weight which users want to and division at one's disposal.

TECHNICAL SPECIFICATION

Analog signal Input range	0mV ~ 20mV
Non-linearity	0.01% F.S. max.
Max. Display resolution	1/10,000
Min. Input sensitivity	0.3 μ V/Digit
Temperature Drift	Zero drift : $\pm 0.2 \mu$ V/ $^{\circ}$ C RTI max. Span drift : 20ppm/ $^{\circ}$ C max.
Load cell Excitation	DC 5V, 350ohm x 1 load cell
Input Noise	$\pm 0.3 \mu$ V p.p or less
Input Impedance	10 $M\Omega$ (Min.)
A/D converter	24bit Sigma-Delta system
A/D internal resolution	Approximately 200,000 counts
A/D conversion speed	10 times/sec
Display	7 Segment LCD, 4 1/2 Digits, 17.8mm(Height)
Polarity indication(-)	"-" minus sign
Display increments	1, 2, 5, 10, 20, 50 selectable
Decimal Points	Selectable to any points
Operating Voltage	Alkaline battery x 4 or Power adaptor
Power consumption	Approx. 5 VA
Operating temperature	-10 $^{\circ}$ C ~ +40 $^{\circ}$ C
Output	RS-232C serial output
Weight	Approx. 410g

DIMENSIONS



Front Panel

4 1/2 Digit 17.8mm
-9999~19999 Display



"ON/OFF"
pushbutton

"ZERO"
pushbutton
Right button
in CAL modes

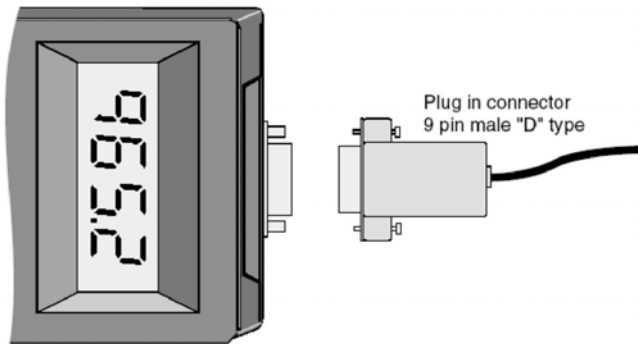
Up button
in CAL modes

"HOLD"
pushbutton
Enter button
in CAL modes

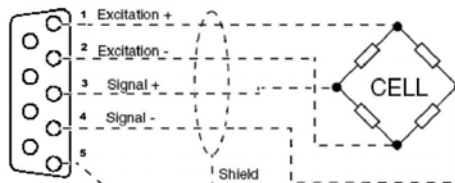
CONNECTION

■ LOAD CELL

Pin no.	SIGNAL	
1	E+	Load cell Input Voltage (+) : EXC+ (red)
2	E-	Load cell Input Voltage (-) : EXC- (white)
3	S+	Load cell output (+) : SIG+ (green)
4	S-	Load cell output (-) : SIG- (blue)
5	FG	SHIELD



Plug in connector
9 pin male "D" type



- **AC ADAPTER** : Port for DC power. (DC 9V adapter are available)
- **RS-232C PORT** : Serial interface port. (computer, printer)

BATTERY USAGE

1. Battery Specification

- MAKER : ROCKET
- MODEL : ALKALINE BATTERY
LR6 (DC 1.5V) x 4 ea

2. Low Battery Signal

- If you don't charge the battery, after "Lo.bt" display.
- Display is turned off 30 minutes later.

KEYBOARD



■ **ON/OFF key**

Turn the scale ON, OFF toggle action.



■ Returns the display to 0



■ No used



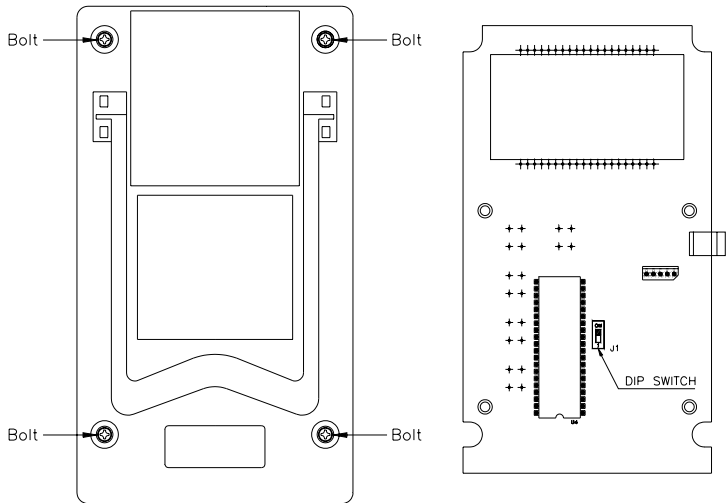
■ Instant Hold : The instant display value can now be held by pressing button.

Calibration mode

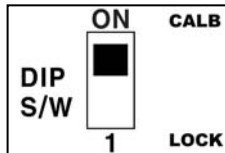
1. How to enter CAL mode



The CAL can be enabled or disabled via a DIP switch J1 located at the display end of the BS-32 circuit board.

To gain access to the DIP switch remove the four screws at the rear of the BS-32 case and remove the back.



■ Dip slide SW CALB. – CALIBRATION Mode



Pressing  the key while pressing the  key

and set mode start.

2. Key Usage



■ **CAL mode** : Switch to select one of the modes cycles.



■ **CAL mode** :

Change the digit of the set value.

Move to the right by 1 place.



■ **CAL mode** :

Available keys instead of numeric keys.

Change the set value

Increases the first place value to 1.



■ **CAL mode** : Store current condition and exit.

3. Calibration Menu (Step 1 ~ Step 7)

- Step 1 : Minimum Division Set
- Step 2 : Zero Calibration
- Step 3 : Decimal Point Adjustment
- Step 4 : Setting Weight in span calibration
- Step 5 : Maximum Capacity Set
- Step 6 : Overload Weight Set
- Step 7 : END

■ Step 1

– Function : **Minimum Division Set**

Range → 1, 2, 5, 10, 20, 50





A step to set up a division value.

"d" means "Division" and "xx" means a division capable of displaying.

Also this value will be displayed as 1–2–5–10–20–50 by each key.

A step to set up a Decimal point is Function mode.

So, it will be go to the next step recording the position.



Key	Display	Description
		1 kg (Decimal point : 0)
 increase		1 : 1,2,3,4,5… 2 : 2,4,6,8,10… 5 : 5,10,15,20,25… 10 : 10,20,30,40,50… 20 : 20,40,60,80,100… 50 : 50,100,150,200,250…
 Store and move into next menu		

☞ REF 1. The minimum division means the value of one division.

☞ REF 2. External resolution is obtained by division the min. division by the maximum capacity. Set the resolution to be within 1/10,000.

■ Step 2

– Function : **Zero Calibration**





Key	Display	Description
 <p>Zero calibration and move into next menu</p>		<p>Unload the tray and press “ENT”</p> <p>key Under zero calibration</p> <p>Zero calibration is completed.</p>

☞ REF 1. If zero calibration is done without any error, “18888” message is displayed and program moves into Step 3 automatically.

☞ REF 2. If the “ZERO” key is pressed, only zero calibration is completed and program moves SAVE & EXIT mode. Turn s/w off.

■ Step 3








– Function : **Decimal Point Adjustment**

Key	Display	Description
  : increase  : Store and move into next menu		<p>18888 : 0</p> <p>1888.8 : 0.0</p> <p>188.88 : 0.00</p> <p>18.888 : 0.000</p> <p>1.8888 : 0.0000</p>

■ Step 4

- Function : **Setting Weight In Span Calibration**

Range → 1~ 19,999kg

Key	Display	Description
  : Increase  : Shift of digit  : Store and move into next menu		Setting Weight 2000kg Load the weight which was set in and press "ENT" key. Under span calibration Example : 2000kg setting  12000kg setting 

☞ REF 1. The weight shall be within the range of 10%~100% of maximum weight.






☞ REF 2. The setting weight must be over the range of 10% of maximum weight.


☞ REF 3. The setting weight over the maximum capacity.

■ Step 5

– Function : **Maximum Capacity Set**

Range → 1 ~ 19,999kg






Key	Display	Description
  : Increase  : Shift of digit  : Store and move into next menu		Maximum capacity 2000kg

 REF 1. The maximum capacity means the maximum weight that scale can measure.

■ Step 6

– Function : **Overload weight Set**

Range → 1 ~ 19,999kg

Key	Display	Description
  : Increase  : Shift of digit  : Store and Move into Next menu		Overload capacity 2200kg



■ Step 7

– Function : **END**

The "Good" message is displayed in 7 step,
all span adjustment is end.

Press “ENT” key after put down of span standard weight on the platform.

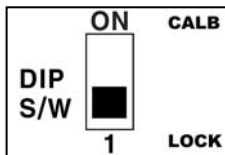
The indicator will enter into user's weighing mode.

Key	Display	Description
 : Store and move into weighing mode		END

4. How to enter Weighing mode

Slid switch usage

■ Dip slide SW LOCK – Weighing Mode

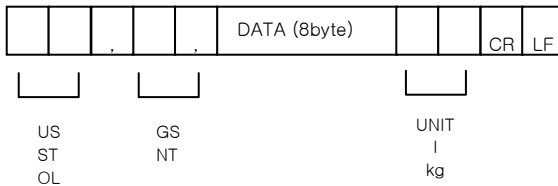


Serial Interface (RS-232C)

► Signal Format

- Type : EIA-RS-232C
- Method : Full-Duplex , Asynchronous, Bi-direction
- Baud rate : 2400bps (Baud-Rate)
- Format :
 - ① Data Bit : 7
 - ② Start/Stop : 1 bit
 - ③ Parity Bit : 1 (Even)
 - ④ Code : ASCII

■ Data Format



① Header 1

- US : WEIGHT UNSTABLE
- ST : WEIGHT STABLE
- OL : OVER LOAD

② Header 2

- GS : GROSS WEIGHT MODE
- NT : NET WEIGHT MODE

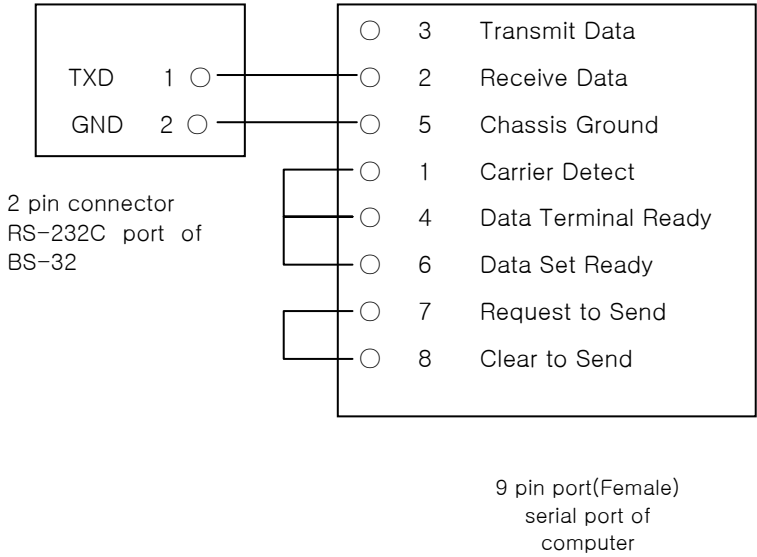
③ WEIGHT (8 byte)

- SIGNAL (+ or -)
- WEIGHT (Included Decimal point)
 - 100.0 kg : '0', '0', '0', '1', '0', '0', '.', '0'
 - 150.5 kg : '0', '0', '0', '1', '5', '0', '.', '5'
 - 165.3 kg : '-', '0', '0', '1', '6', '5', '.', '3'

Each ASCII code of weight transmitted by 8 byte.('0' : 0 x 20)

④ Unit

- kg : Unit of kilogram

► RS-232C port connection

Error Message and Trouble Shooting

ERROR	CAUSE	A/S	Reference.
Waving a weight Value. Appear "no.LC"	① Load cell damage ② Insulation resistance badness of load cell. ③ Weighing part error	① Checking for Input, Output of load cell. Resistance Value. ② Checking Insulation Resistance value of Load cell.	① Input resistance : about 1130Ω ② Output resistance : about 1000Ω ③ Insulation Resistance : over100MΩ
A. Changing a Weight value, B. Not return to ZERO Appear "Ovr " (OVER LOAD)	① Load cell damage.	① Checking Insulation Resistance value of Load cell. (Normal Max 100MΩ or -OL-appear)	
	① Disconnected to Load Cell.	① Confirm a connect of Load cell ② Checking a single wire Of load cell cable	
Weight (-) changed Appear "-Ovr " (OVER LOAD)	① Load cell output (SIG+,SIG-)changed.	① Load cell connector	
Appear "Ovr " or "-Ovr "	① Load cell damage ② Connection Error	① Load cell damage ② Load cell connector	
	① Excess Max weight	① Remove excess weight	