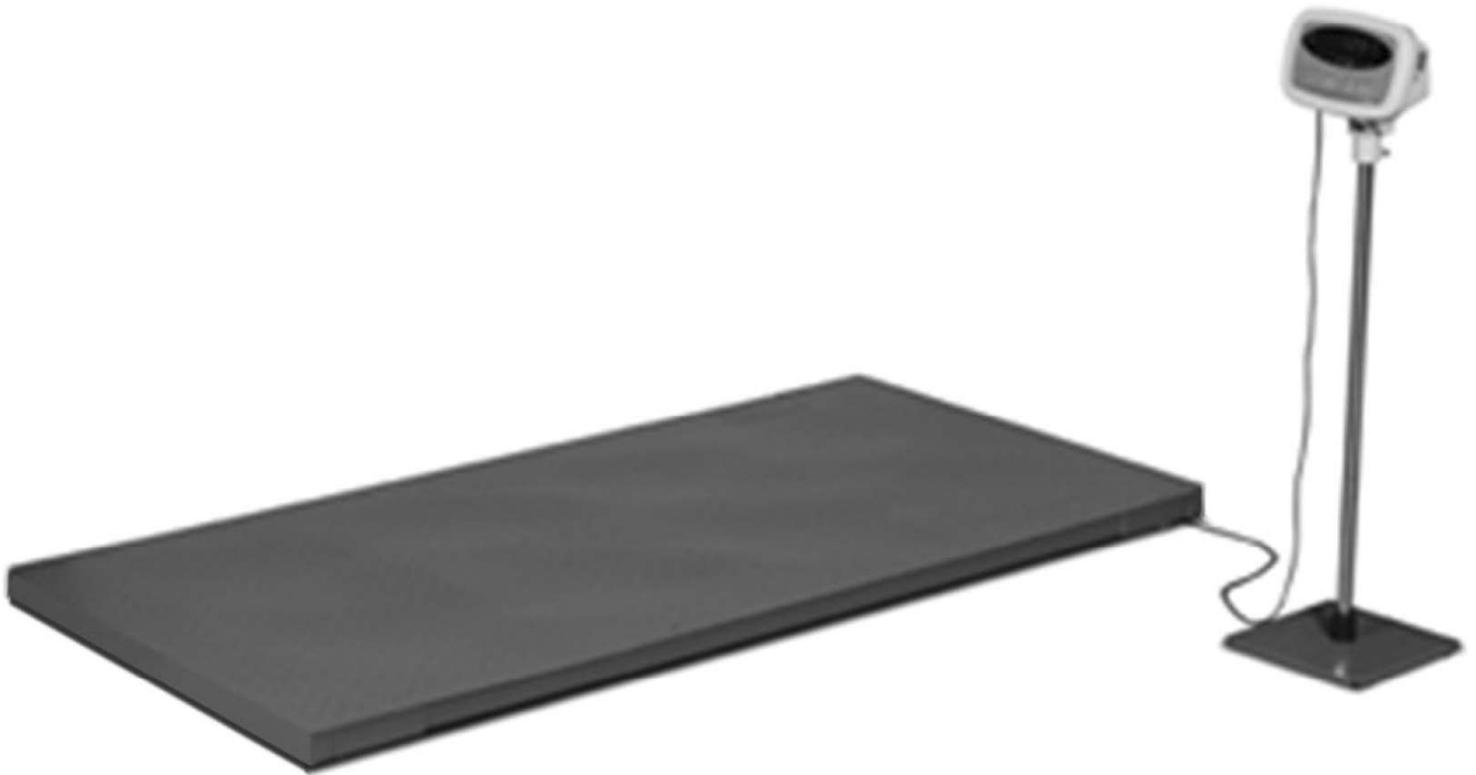# Equine Digital Floor Scale

Model PS3000 with SBI-100 Indicator

Operation Manual

Safety and Warnings

Installation and service

THE EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.
Installation and maintenance of the equipment must only be carried out by trained and authorised personnel.

Electrical installation
The mains lead must be connected to a supply outlet with a protective earth contact. The electrical supply at the socket outlet must provide over current protection of an appropriate rating.

For your protection, all mains (110V or 230V) equipment used out of doors or in wet or damp conditions, should be supplied from a correctly fused source and protected by an approved ground fault protection device (RCD, GFCI etc.)

IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

Pluggable equipment must be installed near an easily accessible socket outlet.

Routine maintenance
To avoid the possibility of electric shock or damage to the machine, always switch off the machine and isolate from the power supply before carrying out any routine maintenance.

To avoid the risk of the machine falling, where applicable, ensure that it is placed securely on a flat and level surface.

Cleaning the machine

The outside of standard products may be wiped down with a clean cloth, moistened with water containing a small amount of mild detergent.

Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions, such as washing soda, should not be used, especially on the display windows. Under no circumstances should you attempt to wipe the inside of the machine.

Do not spray any liquid directly onto the display windows. If you are using a proprietary cleaning fluid ensure you spray the cloth and not the display.

Training

Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual. To avoid the risk of RSI (repetitive Strain Injury) it is important to ensure that the machine is placed on a surface which is ergonomically satisfactory to the user. It is recommended that frequent breaks are taken during prolonged use.
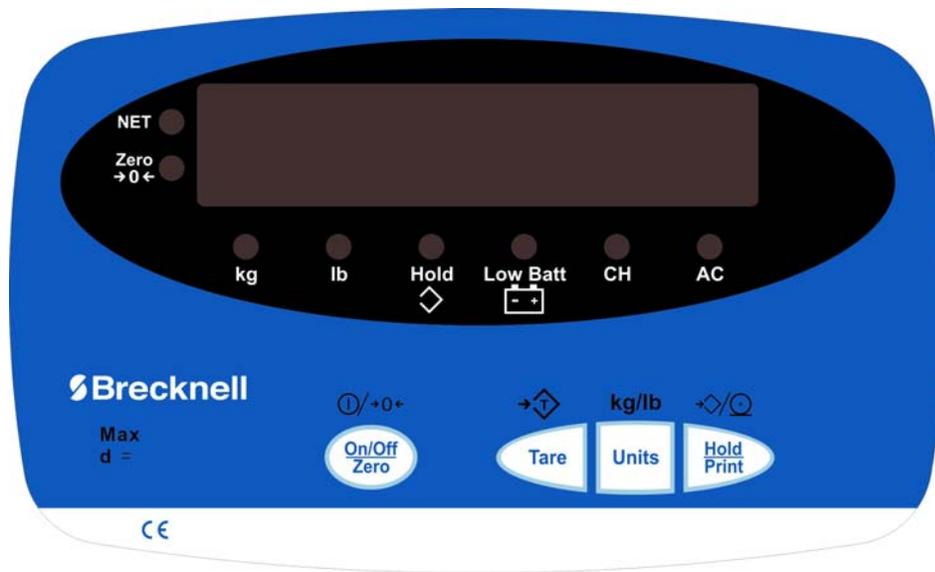
Sharp Objects

Do not use sharp objects (screw drivers, long fingernails, etc.) to operate the keys.

EMC compliance

The following may be applicable to your machine.

WARNING: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
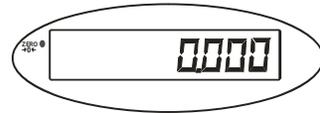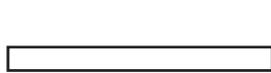
Display and Keypad

Function Keys	Annunicators
→⟨T⟩ **Tare** Tare	Zero → 0 ← ● **Weight is zero**
①/→0← **On/Off Zero** On/Off/Zero	● ● kg lb **Unit of measure (Flashing LED means that the weight reading is not stable.)**
kg/lb **Units** Unit of measurement	NET ● **Tare is activated**
⟨⟩/⊙ **Hold Print** Hold/Print	● CH **Battery is charging.**
	● AC **Adapter is plugged in, the indicator is receiving power.**
	● Hold ◇ **Hold is activated**
	● Low Batt ▬ **Battery is low.**

Manual symbols

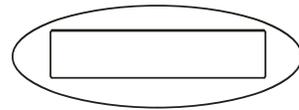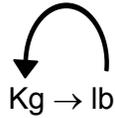Short Key Press   Multiple Key Press   Long key press

Scale Operation

Turning On and Zeroing the Scale

On/Off
Zero

0.000

Turning off the scale

On/Off
Zero

Selecting Unit of Measure

Units

Kg → lb

0.000

Using the Tare

1.

1.707

2.

Tare

0.000

3.

7.700

4.

- 1.707

Removing the Tare

On/Off
Zero

`0.000`
ZERO →0←
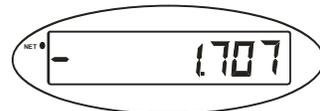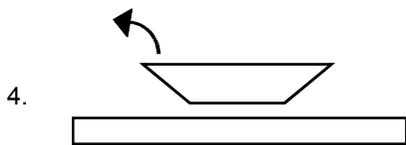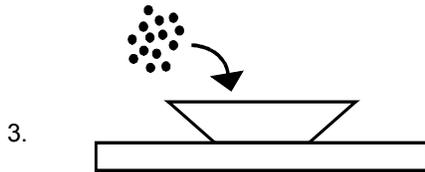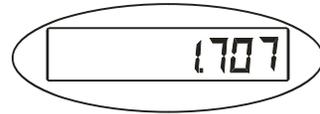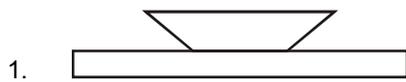
Hold function with automatic zero on next weigh.

1. Hold
Print

`0.000`
Hold

2.

`32.45`
Hold

➜

`32.45`
Hold

3.

`32.45`
Hold

4.

`0.000`
Hold

➜

`45.35`
Hold
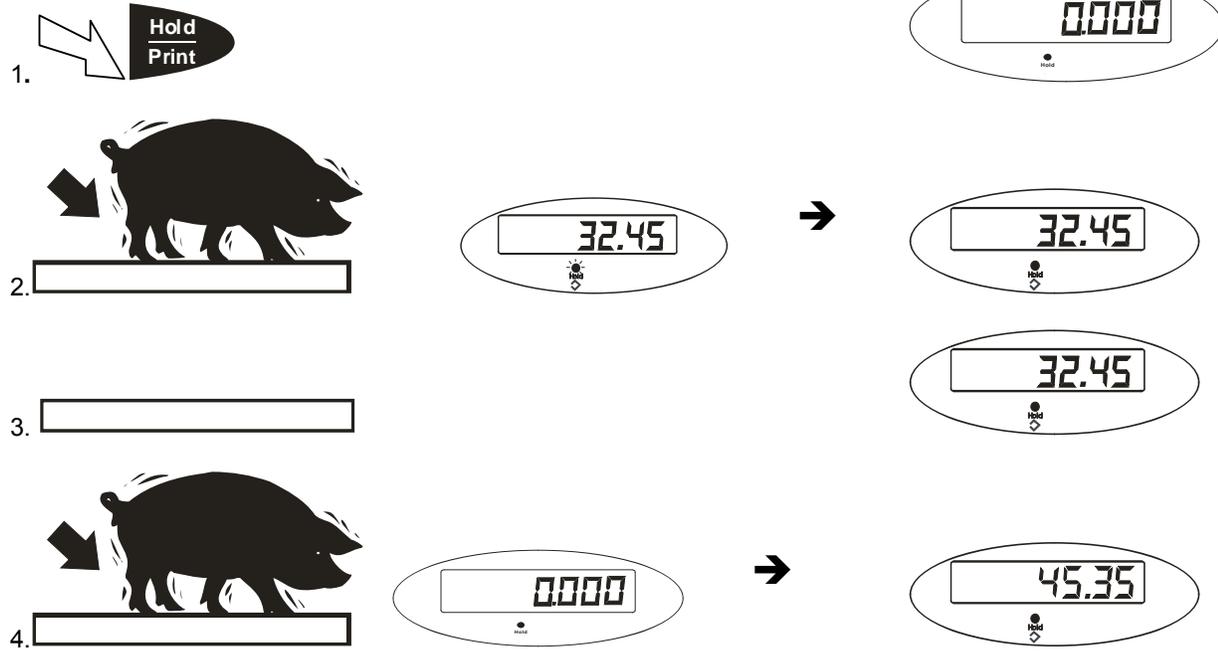
Hold function with manual release.

This function needs to be setup in Parameter P3.1 shown on page 10

1. Hold
Print

`0.000`
Hold

2.

`32.45`
Hold

➜

`32.45`
Hold

3.

`32.45`
Hold

Removing Hold
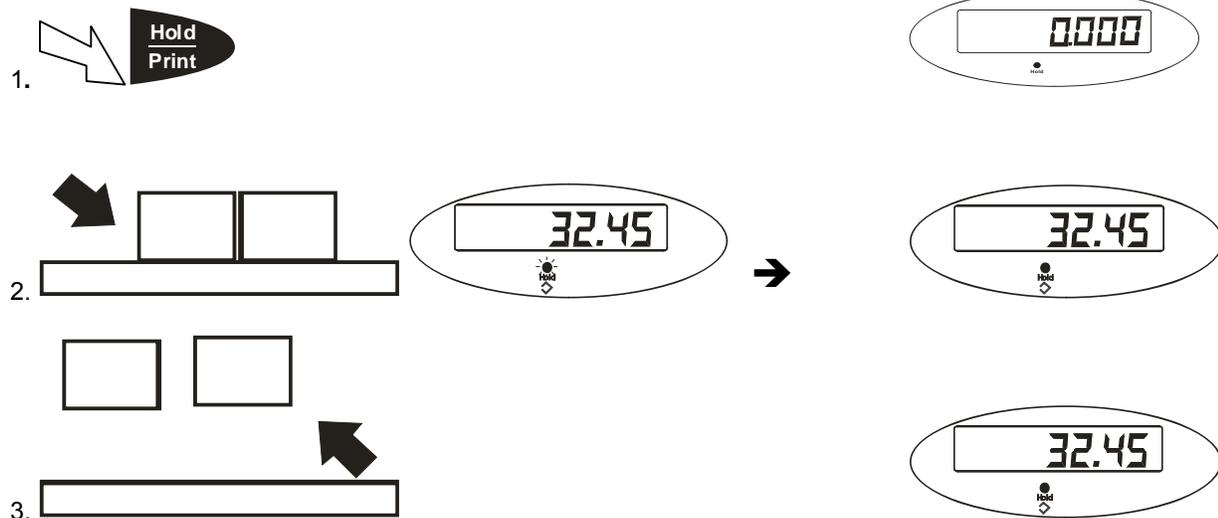
Hold / Print	0.000 (Hold)

Print Function

For communications to a printer or PC, the indicator has to be set up in the following parameters P2, P4, P5 and P6.

1. ➔ 4365

2. Hold / Print

3. Print

Gross: 45.00kg
Tare: 1.35kg
Net: 43.65kg
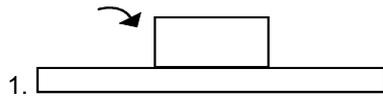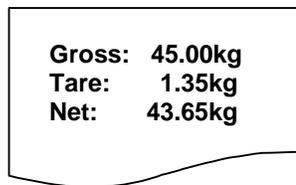
USER CONFIGURATION SETTINGS

Setup Controls

Hold Print

P2.1

Moves flashing digit

Units

1

Change flashed digits

Tare

P1. → P2.1

Saves data and moves down to next Parameter setting

On/Off Zero

Exits setup mode

Entering setup

On/Off Zero + **Units**
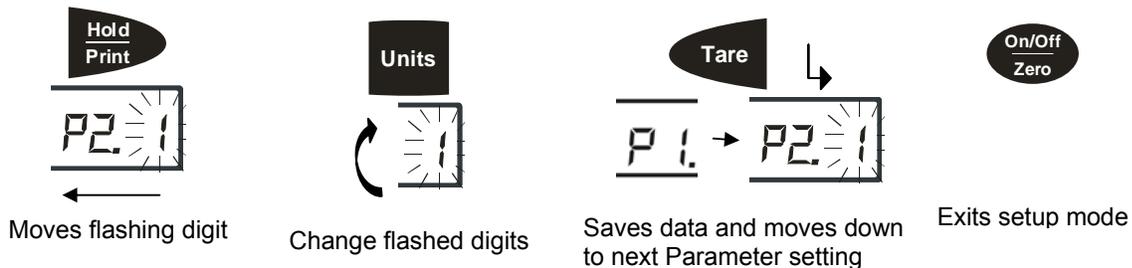
SEt UP

Selecting parameter

P1.05 → **Tare**

P2. 0

Changing data within the parameter

P2. 0 → **Units**

P2.1

Saving data

Tare

P3. 2

Exiting setup

On/Off Zero

0.000

User Configuration Settings

Parameter	Setting	Default settings in bold
P1.xy	**Auto shut down timer (in minutes)** *Set up time for the auto-off function.* (00 = 0ff, 01-15 = time in minutes)	P1.00 P1.01 – P1.15, **P1.5 = 5 minutes**
P2.x	**Hold and print key functionality** *Setup button function* 0 = Press button once to activate hold 1 = Press button once to print 2 = Press button to print / Press and hold button to activate hold.	**P2.0= Hold** P2.1 = Print P2.2 = Print & Hold
P3.xy	**Hold Function Settings** 0 = <u>No hold function active</u> 1 = <u>Averaging hold with manual push button release</u> The weight reading will be held on the display until a higher weight is applied; this will automatically release the held weight and re-hold it at the new higher weight reading. 2 = <u>Averaging hold with automatic release and re-hold</u> As above but the weight reading will be held on the display until the platform is emptied and the next weight reading over 10divisions is applied. 3-50 = <u>Selectable hold window from +/- 3 to 50 divisions</u> Will hold the display reading once stable within a selectable weight range. To release, the hold button must be repressed.	P3.0 P3.1 **P3.2** P3.3 to 50

P4.x	**RS232 – Serial Interface**
	Settings for serial interface
	0 = No RS232 output
	
	1 = Print the displayed data once stable and when print key is
	    pressed
	
	2 = Print gross, tare and net weight once stable and when print
	    key is pressed
	
	3 = Continuously output gross weight
	
	4 = Continuously output gross, tare and net weight
	
	5 = Print the displayed data once stable, once only.
	
	6 = Print gross, tare and net weight once stable, once only.
	
	7 = Bidirectional - RS232, SBI protocol
		P4.0
		P4.1
		P4.2
		P4.3
		P4.4
		P4.5
		P4.6
		P4.7

P5.x	**RS232 Baud Rate**	P5.0= 1200 **P5.3= 9600** P5.1= 2400 P5.4= 19200 P5.2= 4800
P6.x	**RS232 Data Format** 0 = 8 bits, no parity, 1 start bit, 1 stop bit 1 = 7 bits, 1 even, 1 start bit , 1 stop bit 2 = 7 bits, 1 odd, 1 start bit, 1 stop bit	**P6. 0** P6. 1 P6. 2
P7-P19 .x	**SERVICE CONFIGURATIONS ONLY** *Any adjustment to these settings could seriously affect the indicators performance.* *Seek advice from a service engineer before changing.*	

RS-232 Data Commands for SBI Protocol

The RS232 can be set so a bidirectional connection can be established between the indicator and the host. To establish this connection, set parameter P4 to 7 and configure setting P5 (baud) and P6 (parity) to host device. Commands can then be sent from the host to the indicator using the following commands (ensure the letters entered are in CAPS) (<CR> - Enter)

Command	Action	Response
W<CR>	Takes a reading Over capacity - Under capacity - Zero point error - Reading (kg or lb)	 <LF>^^^^^^^^^u1u2<CR><LF>H1H2H3<CR><ETX> <LF>_____u1u2<CR><LF>H1H2H3<CR><ETX> <LF>----------u1u2<CR><LF>H1H2H3<CR><ETX> <LF><p>w1w2w3w4w5w6<dp>w7u1u2<CR><LF>H1H2H3<CR><ETX>
S<CR>	Prints status bytes	<LF>H1H2H3<CR><ETX>
Z<CR>	Zeros the scale	<LF>H1H2H3<CR><ETX>
T<CR>	Sets up a tare	<LF>H1H2H3<CR><ETX>
U<CR>	Changes the units	<LF>u1u2<CR><LF>H1H2H3<CR><ETX>
L<CR>	Activates the hold function	<LF>H1H2H3<CR><ETX>
X<CR>	Switches off the scale	Indicator switches off.
?	Unrecognised command	<LF>?<CR><ETX>

Key Symbols:

<LF>	Line feed
<CR>	Carriage return
<ETX>	End of text character
<SP>	Space
H1H2H3	3 status bytes
<p>	Polarity character, including minus sign for negative weigh, and a space character for positive
W1-W7	Weight data
<dp>	Decimal point
U1U2	Unit measure (kg, lb or oz)

Output Status Bit Meaning:

Bit	Byte 1	Byte 2	Byte 3
0	0 = Stable	0 = Not under capacity	00 = Not defined
	1 = Unstable	1 = Under capacity	01 = Normal working mode
1	0 = Not at zero point	0 = Not over capacity	10 = Hold working mode
	1 = At zero point	1 = Over capacity	11 = Not defined
2	Always 0	Always 0	0 = Gross weight 1 = Net weight
3	0 = eprom OK 1 = eprom error	Always 0	Always 0

4	Always 1	Always 1	Always 1
5	Always 1	Always 1	Always 1
6	Always 0	Always 1	Always 0
7	Parity	Parity	Parity

Other RS-232 Output Strings

P4-1 = Output Displayed data @ print key:

Format:
 <LF>< reading, minus, decimal point, weight unit><CR><EXT>

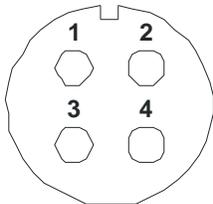**Example:**
xxxxx0.18lb

P4-2 = Output Gross, Tare, Net at print key

Format:
<LF><Gross: reading, minus, decimal point, unit><CR><EXT>
<LF> <Tare: reading, decimal point, unit><CR><EXT>
<LF> <Net: reading, minus, decimal point, unit><CR><EXT>

Example:
Gross: xxxxx0.36lb
Tare: xxxxxx0.18lb
Net: xxxxxxx0.18lb

RS232 Serial Interface Wiring

DE-9 Female Scale			DE-9 Male Host		
Pin	**Name**	**Direction**	**Pin**	**Name**	**Direction**
2.	TXD	Out	2.	RXD	In
3.	RXD	In	3.	TXD	Out
5.	SG	-	5.	Ground	-

Pins 1, 4, 6, 7, 8, 9 not used

Load cell cable interface wiring

1. Red Excitation +
2. Black Excitation -
3. Green Excitation -
4. White Signal +

Scale Calibration

Calibration Configuration Settings

The scale is configured from the factory to match the specified settings for each unit, as defined by the product specifications and sales brochure. Modification of the settings can be accomplished by altering user configuration settings P7-P10. **Caution:** Calibration and/or configuration of calibration settings of your scale should be carried out by a trained service technician, using certified weights, to ensure proper operation and accuracy. Calibration is not covered under warranty.
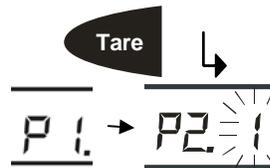
Setup Controls

Moves flashing digit   Changes flashing digits   Saves data and move down   Exits setup mode
                                                                to next Parameter setting
                                                                        .

Config Menu	Available Settings	Default	Definition	Detailed Setting
P7	00-31	**10**	Displayed Resolution	(00) = 500 (08) = 2400 (15) = 7000 (01) = 600 (09) = 2500 (16) = 7500 (02) = 750 (10) = 3000 (17) = 8000 (03) = 800 (11) = 3500 (18) = 10,000 (04) =1000 (12) = 4000 (19) = 12,000 (05) =1200 (13) = 5000 (20) = 15,000 (06) =1500 (14) = 6000 (21-31) = N/A (07) = 2000
P8	0, 1, 2	**0**	Division Increment	0 = 1 ; 1 = 2 ; 2 = 5
P9	0-5	**0**	Decimal Position	0 = 123456; 1 = 12345.6; 2 = 1234.56; 3 = 123.456; 4 = 12.3456; 5 = 1.23456
P10	0, 1	**1**	Calibration Weight	0 = KG ; 1 = LB

You may choose to configure your scale for a higher resolution. The factory does not recommend increasing the resolution above 3,000 divisions for a stable weight reading. Certain environments may cause the scale to be unstable at factory settings, reduce the number of division settings to increase your stability.

Calibration settings when configuring an SBI 100 Indicator to a remote base

If you are configuring the SBI 100 Indicator to be used with a scale other than the PS3000 base, you will need to alter the configuration setting in P7- P10 manually.

In order to configure the indicator, follow the steps defined below:

1. Determine the full capacity of your scale. **Example: 3000 pounds**
2. Determine the displayed division of your scale. **Example: 1 pound** (this is your P8, P9, and P10 setting)
3. Divide the capacity by the displayed division to determine the displayed resolution of your scale. **Example: 3000/1 = 3000** (this is your P7 setting)

You are now able to configure P7 – P10 as follows.

Primary Capacity	Displayed Resolution	Units Selectable Capacity	P7	P8	P9	P10
3000 x 1 lbs	3000	1500 x 0.5 kg	**10**	**0**	**0**	**1**

If primary capacity is 1500 x 0.5 kg, configure P7-P10 as follows:

| Primary Capacity	Displayed Resolution	Units Selectable Capacity	P7	P8	P9	P10
1500 x 0.5 kg	3000	3000 x1 lbs	**10**	**2**	**1**	**0**

Calibration Menu

Moves flashing digit

Change flashing digits

Saves data and move down to next Parameter setting
.

Exits setup mode

Calibration can be done with 10% to 100% of requested load and can be calibrated with 1 or 2 calibration points
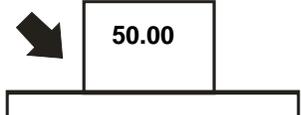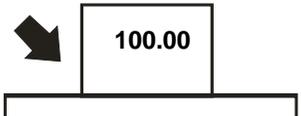
2. [Tare] → CAL.P0 | 00.00

3. [____] [Tare] → CAL.P1 | 40.00
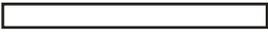
4. Enter in calibration weight from 5% to 100% full capacity

[50.00] → [Hold/Print] [Units] [Tare] → 50.00

5. Single point calibration, enter the same weight in again and move to number 7
   For 2 point calibration enter in the second calibration weight between 10% 100% full capacity.

[Tare] → CAL.P2 | 100.00

6. [100.00] → [Hold/Print] [Units] [Tare] → 100.00

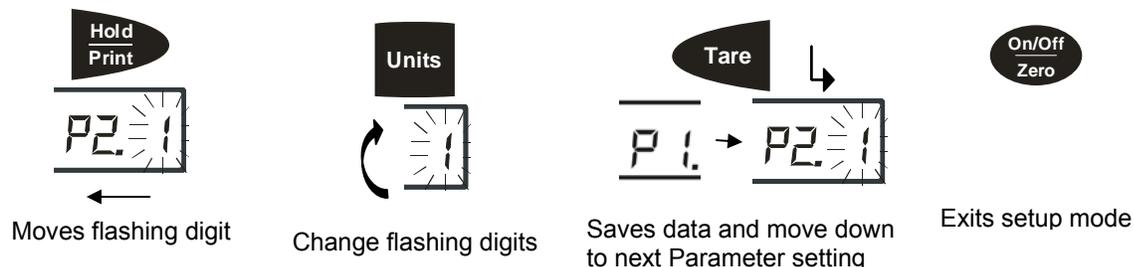7. [Tare] → CAL.P0 | 00.00

   00.00

8. [____]

   0.000

9. [Tare]

Service Configuration Settings

The scale is configured from the factory to match the specified settings for each unit, as defined by the product specifications and sales brochure. Modification of the settings can be accomplished by altering user configuration settings P11-P19. **Caution:** Configuration of the settings of your scale should be carried out by a trained service technician to ensure proper operation and accuracy. Configuration is not covered under warranty.

Setup Controls

Moves flashing digit   Change flashing digits   Saves data and move down to next Parameter setting   Exits setup mode

Config Menu	Available Settings	Default	Definition	Detailed Setting
P11	0,1,2	**2**	Units key configuration	0 = KG only ; 1 = LB only ; 2 = units key active KG and LB
P12	0-7	7	Power-on zero range	0 = +/- 1% ; 1 = +/- 2% ; 2 = +/- 5% ; 3 = +/- 10% ; 4 = +/- 20% ; 5 = +/- 50% ; 6 = +/- 100% ; 7 = no limitation
P13	00 - 15	03	Zero button range	(00) = +/- 1% (06) = +/- 20% (12) = + 5% (01)= +/- 2% (07) = +/-no limit (13) = + 10% (02)= +/- 3% (08)= + 1% (14) = + 20% (03)= +/- 4% (09) = + 2% (25) = + no limit (04) =+/- 5% (10)= + 3% (05)= +/- 10% (11) = + 4%
P14	0, 1, 2	0	Signal within power on zero point range	0 = current weight ; 1 = calibration zero ; 2 = power off zero point
P15	0, 1, 2	1	Signal not within power on zero point	0 = current weight ; 1 = calibration zero ; 2 = power off zero point ; 3 = continuously display "0¯¯¯¯¯"
P16	0-8	6	Zero tracking	0 = 0d AZT off ; 1 = +/- 0.25d, 2 = +/- 0.5d ; 3 = +/- 1d; 4= +/- 1.5d ;5= +/- 2d ;6 = +/- 3d; 7= +/- 4d; 8 = +/- 5d
P17	0-3	3	Data Filter	0 = very weak; 1 = weak; 2 = standard; 3 = strong
P18	0 - 9	9	Weight stability	0 = +/- 0.5d ; 1= +/- 1d; 2= +/- 1.5d ; 3= +/- 2d; 4= +/- 3d ;5= +/- 4d ;6 = +/- 5d; 7= +/- 6d; 8 = +/- 7d; 9 = +/- 8d
P19	0-9	1	Overload range Full scale	0 = 0% ; 1 = +9d ; 2 = 101% ; 3 = 102% ; 4 = 405% ; 5 = 110% ; 6 = 120% ; 7 = 150%; 8 = 200%; 9 = no limitation

Technical Specifications

Scale Indicator:

Input signal range:	0mV ～ +30mV
Sensitivity:	>0.2uV/grad
Internal Resolution:	Approximately 520,000 counts
Display Resolution:	Can be selected between 500-100,000
System Linearity:	Within 0.01% of FS
Load Cell excitation Voltage:	+5 V_{DC} (MAX current: 85mA)

Load cells:
Quantity: 4 pcs
Capacity (per cell): 1000kg
Sensitivity: 2.5±0.5mV/V
Input resistant: 400±10Ω
Output resistant: 352±2Ω

Temperature:
Operation: 5°C - 35°C
Storage: 10°C - 70°C
Humidity: ≤95%RH (no condensation)

Power:
Battery: 6V4AH lead acid battery, 30 hours continuous usage.
When the voltage of battery is below 5.7V, the "Low Bat" annunciator will be lighted, plug in AC adapter to charge the battery. When "Lo.bAt" and actual weight is displayed alternately, this indicates the voltage of battery is below 5.5V and the scale will be turned off in two minutes automatically.
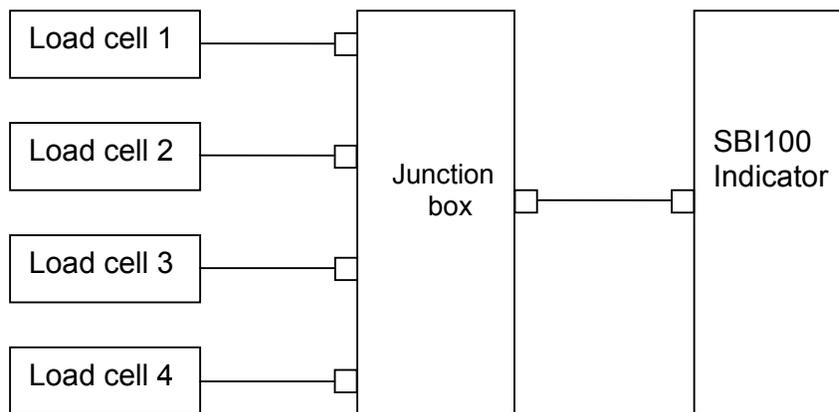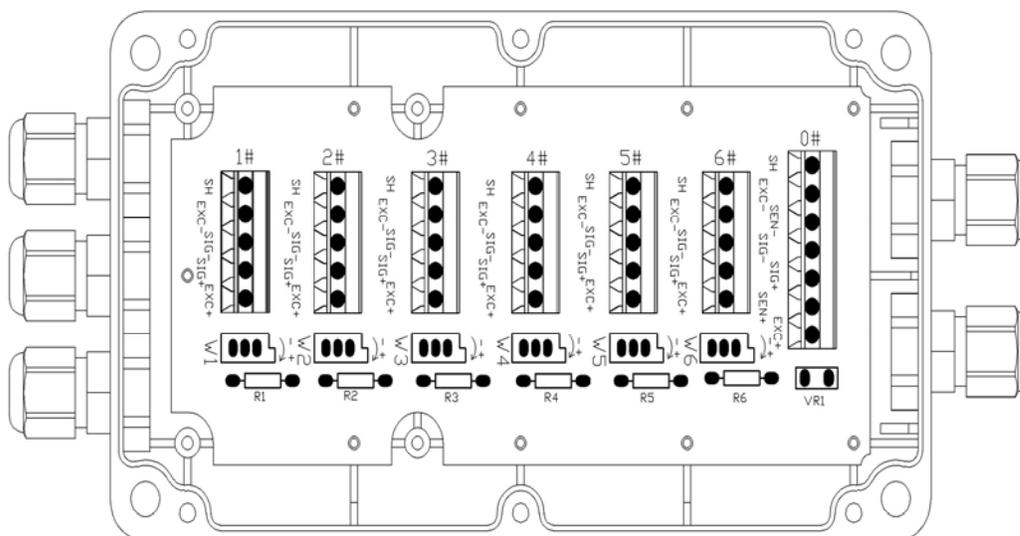
Connection Information
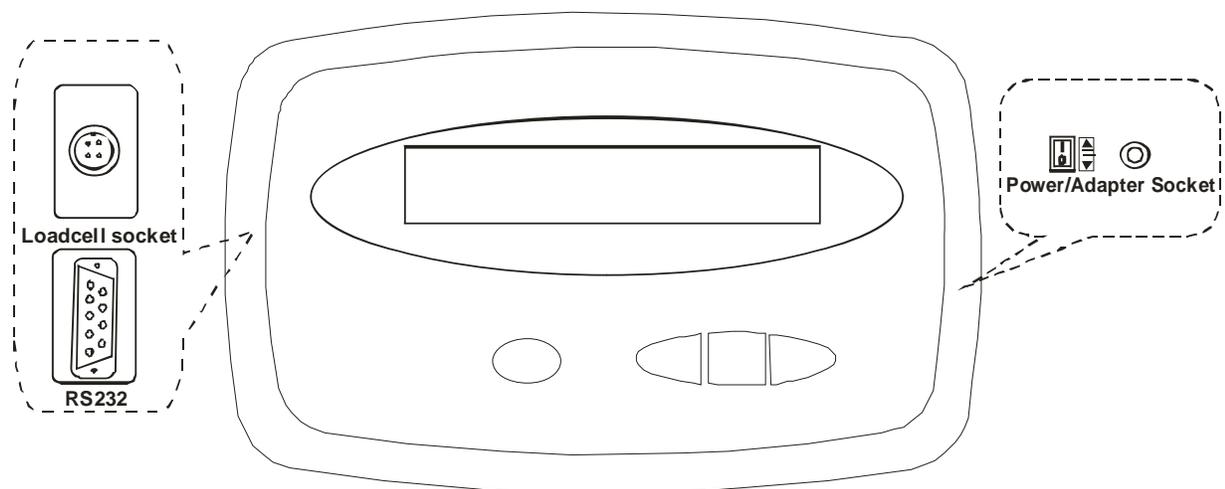
Power Supply
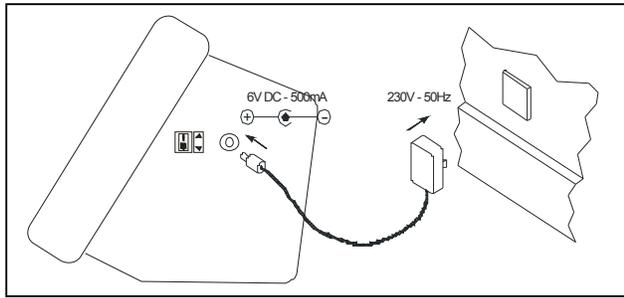
**Connecting:**

Junction Box:

1. W1-W4: to adjust 4 corner error, W5-W6: not used
2. W0: to adjust scale's zero-point balance
3. 1#-4# connector: connect to loadcell1---loadcell4, 5#-6#connector: not used
4. 0#connector: connect to indicator

5. Connector pins:
   SH---shield wire
   EXC+ --- Excitation +
   EXC- --- Excitation -
   SIG+ --- Signal +
   SIG- --- Signal -
   SEN+ --- Sense +, connect to EXC +
   SEN- --- Sense -, connect to EXC -

Platform material:
4mm chequered plate

Wire the cable attached to the indicator as shown
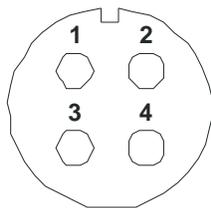
1. Red Excitation +
2. Black Excitation -
3. Green Excitation -
4. White Signal +

Error Messages

Error Message	Definition	Required Solution/Troubleshooting
0¯ ¯ ¯ ¯:	Weight above range for calibrated zero point.	Remove load before zeroing Or Recalibrate the scale.
0____:	Weight below range for calibrated zero point.	Put platform on scale (if it has been removed) Or Recalibrate the scale.
____:	Indicates an under range condition	Recalibrate the scale.
_ _ _ _:	Capacity exceeded	Remove the load or a scale with a larger capacity is required.
CAL-Er:	Calibration error	Restart calibration
Lo.bAt:	Low Battery	Recharge the battery. Upon initial use, it is recommended to charge battery for more than 8 hours prior to use.
EEP.E0	EEPROM can't be accessed	Replace S100 Indicator
EEP.E1	Configuration settings have changed and not been stored	Reconfigure and calibrate the scale to store settings
EEP.E2	Configuration settings exceed scale's normal range	Reconfigure and calibrate the scale to store settings