SBI-100

User Instructions

AWT 35-501281
Issue AA

Table of Contents

1 General Information and Warnings

1.1 About this Manual

This manual is divided into chapters by the chapter number and the large text at the top of a page. Subsections are labeled as shown by the 1 and 1.1 headings shown above. The names of the chapter and the next subsection level appear at the top of alternating pages of the manual to remind you of where you are in the manual. The manual name and page numbers appear at the bottom of the pages.

1.1.1 Special Messages

Examples of special messages you will see in this manual are defined below. The signal words have specific meanings to alert you to additional information or the relative level of hazard.

CAUTION!
This is a Caution symbol.
Cautions give information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.

ELECTRICAL WARNING!
THIS IS AN ELECTRICAL WARNING SYMBOL.
ELECTRICAL WARNINGS MEAN THAT FAILURE TO FOLLOW SPECIFIC PRACTICES OR PROCEDURES MAY RESULT IN ELECTROCUTION, ARC BURNS, EXPLOSIONS OR OTHER HAZARDS THAT MAY CAUSE INJURY OR DEATH.

NOTE: This is a Note symbol. Notes give additional and important information, hints and tips that help you to use your product.

1.2 Warnings

Avoid lengthy exposure to extreme heat or cold. Your scale works best when operated at normal room temperature. Always allow the scale to acclimate to a normal room temperature before use.

CAUTION!
THE EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.

Installation and maintenance of the equipment must only be carried out by trained and authorised personnel.

1.2.1 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.

1.2.2 Routine Maintenance

IMPORTANT: This equipment must be routinely checked for proper operation and calibration.
Application and usage will determine the frequency of calibration required for safe operation.

ELECTRICAL WARNING!
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.

1.3 Safe Use

Do not use sharp objects such as screwdrivers or long fingernails to operate the keys.

1.3.1 Cleaning the Indicator / Weigh Head

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.**

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

The outside of products waterproofed to IP65, IP66 and IP67 may be washed down with water containing a small amount of proprietary detergent.

1.3.2 Training

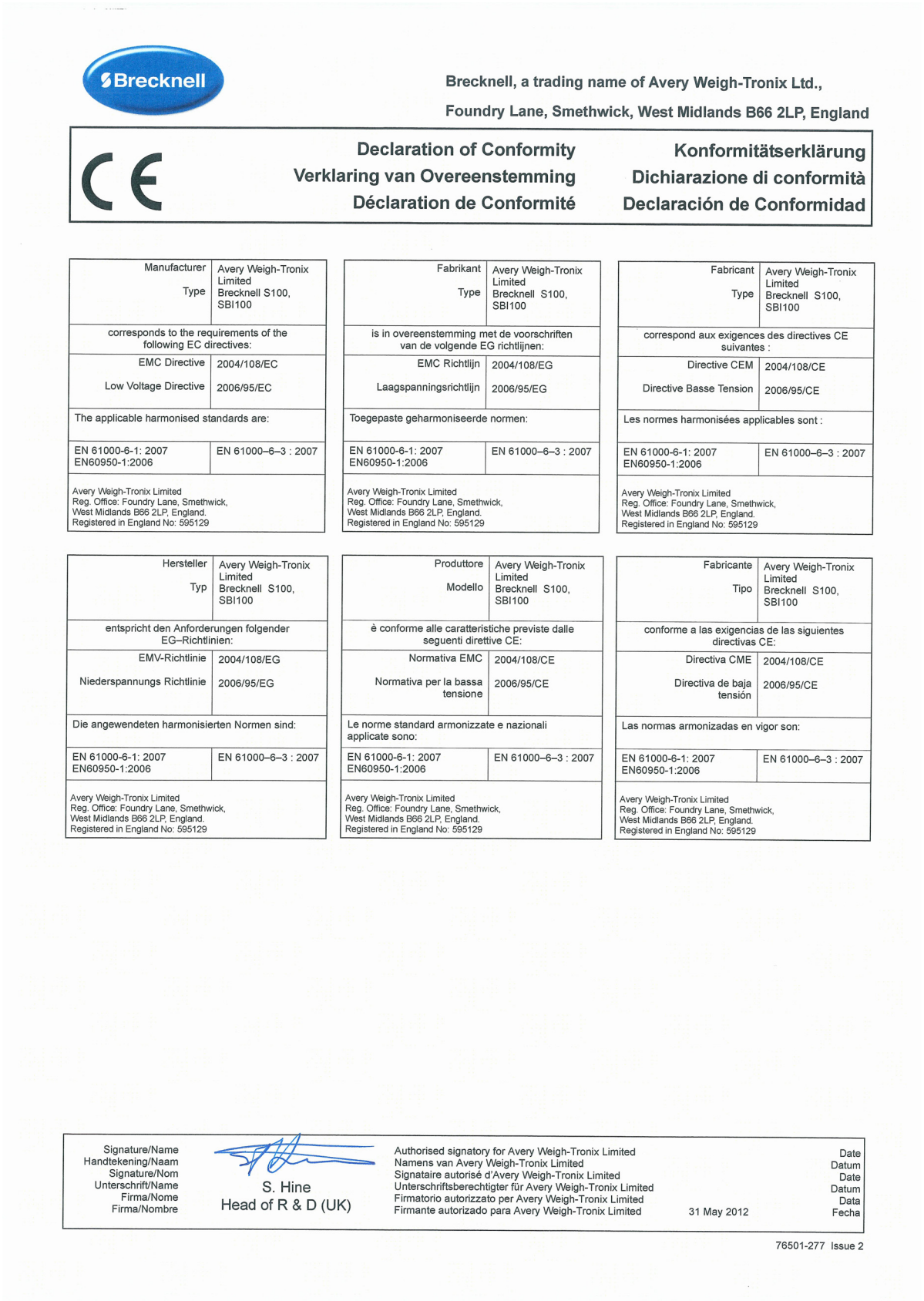
Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual.

1.3.3 EMC Compliance

Do not attempt to carry out any procedure on a machine unless you have received the appropriate training or read the Instruction Manual.

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.

1.4 Declaration of Compliance



Brecknell, a trading name of Avery Weigh-Tronix Ltd.,
Foundry Lane, Smethwick, West Midlands B66 2LP, England

CE

Declaration of Conformity | **Konformitätserklärung**
Verklaring van Overeenstemming | **Dichiarazione di conformità**
Déclaration de Conformité | **Declaración de Conformidad**

Manufacturer	Avery Weigh-Tronix Limited
Type	Brecknell S100, SBI100
corresponds to the requirements of the following EC directives:	
EMC Directive	2004/108/EC
Low Voltage Directive	2006/95/EC
The applicable harmonised standards are:	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Fabrikant	Avery Weigh-Tronix Limited
Type	Brecknell S100, SBI100
is in overeenstemming met de voorschriften van de volgende EG richtlijnen:	
EMC Richtlijn	2004/108/EG
Laagspanningsrichtlijn	2006/95/EG
Toegepaste geharmoniseerde normen:	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Fabricant	Avery Weigh-Tronix Limited
Type	Brecknell S100, SBI100
correspond aux exigences des directives CE suivantes :	
Directive CEM	2004/108/CE
Directive Basse Tension	2006/95/CE
Les normes harmonisées applicables sont :	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Hersteller	Avery Weigh-Tronix Limited
Typ	Brecknell S100, SBI100
entspricht den Anforderungen folgender EG–Richtlinien:	
EMV-Richtlinie	2004/108/EG
Niederspannungs Richtlinie	2006/95/EG
Die angewendeten harmonisierten Normen sind:	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Produttore	Avery Weigh-Tronix Limited
Modello	Brecknell S100, SBI100
è conforme alle caratteristiche previste dalle seguenti direttive CE:	
Normativa EMC	2004/108/CE
Normativa per la bassa tensione	2006/95/CE
Le norme standard armonizzate e nazionali applicate sono:	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Fabricante	Avery Weigh-Tronix Limited
Tipo	Brecknell S100, SBI100
conforme a las exigencias de las siguientes directivas CE:	
Directiva CME	2004/108/CE
Directiva de baja tensión	2006/95/CE
Las normas armonizadas en vigor son:	
EN 61000-6-1: 2007 EN60950-1:2006	EN 61000–6–3 : 2007
Avery Weigh-Tronix Limited Reg. Office: Foundry Lane, Smethwick, West Midlands B66 2LP, England. Registered in England No: 595129	

Signature/Name Handtekening/Naam Signature/Nom Unterschrift/Name Firma/Nome Firma/Nombre	S. Hine Head of R & D (UK)	Authorised signatory for Avery Weigh-Tronix Limited Namens van Avery Weigh-Tronix Limited Signataire autorisé d'Avery Weigh-Tronix Limited Unterschriftsberechtigter für Avery Weigh-Tronix Limited Firmatorio autorizzato per Avery Weigh-Tronix Limited Firmante autorizado para Avery Weigh-Tronix Limited	31 May 2012	Date Datum Date Datum Data Fecha

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2 Introduction

2.1 Product Identification

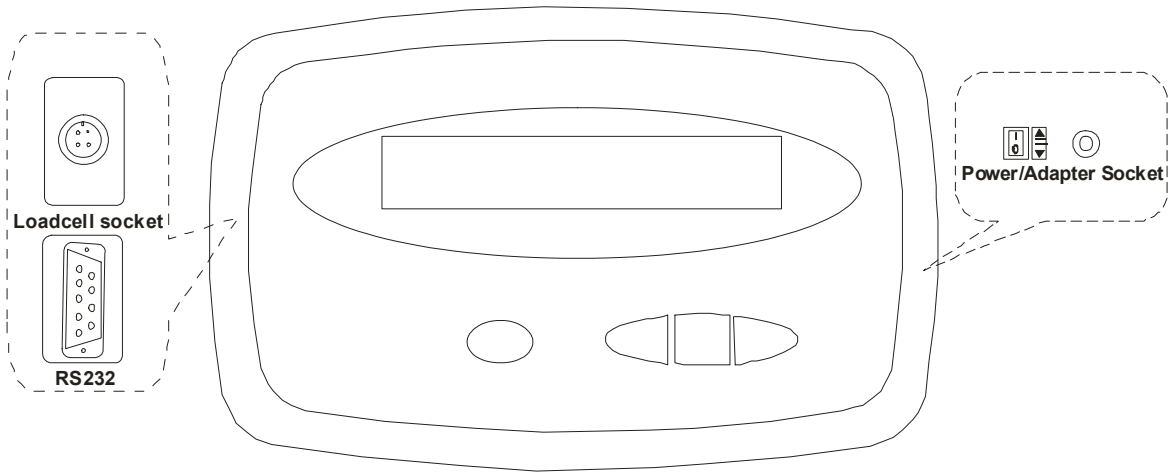
Part Number	Capacity	Region	Power Supply (s)
816965001620	75 kg x 0.01kg / 150lb x 0.02lb	North America	US Version, UL
816965001637	150 kg x 0.02kg / 300lb x 0.05lb	North America	US Version, UL
816965001644	300 kg x 0.05kg / 600lb x 0.1lb.	North America	US Version, UL
816965002160	75 kg x 0.01kg / 150lb x 0.02lb.	UK/EU	3 pin UK & 3 pin EU,CE approved
816965002177	150 kg x 0.02kg / 300lb x 0.05lb.	UK/EU	3 pin UK & 3 pin EU,CE approved
816965002184	300 kg x 0.05kg / 600lb x 0.1lb.	UK/EU	3 pin UK & 3 pin EU,CE approved
816965002719	75 kg x 0.01kg / 150lb x 0.02lb.	AUS/SA	3-pin Australia C-Tick approved, 3 pin South Africa
816965002726	150 kg x 0.02kg / 300lb x 0.05lb.	AUS/SA	3-pin Australia C-Tick approved, 3 pin South Africa
816965002733	300 kg x 0.05kg / 600lb x 0.1lb.	AUS/SA	3-pin Australia C-Tick approved, 3 pin South Africa

2.2 Technical Specifications

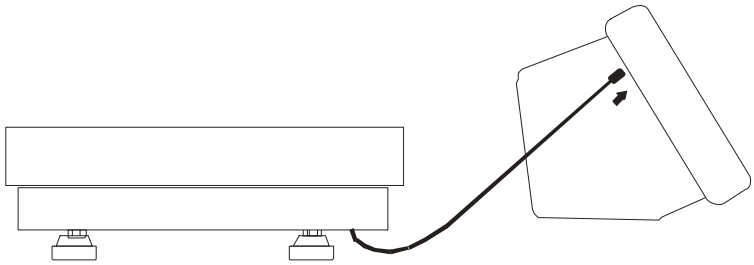
Scale Indicator	
Input signal range:	0mV ~ +30mV
Sensitivity:	>0.2µV/grad
Internal Resolution:	Approximately 520,000 counts
Display Resolution:	Can be selected between 500-100,000
System Linearity:	Within 0.01% of FS
Loadcell excitation Voltage:	+5 VDC (MAX current: 85mA)
Loadcell	
Sensitivity:	0.3mV/V --- 3mV/V (must be fit to >0.2µV/display grad.)
Input Resistor:	≥60 Ω
Output Resistor:	<10 KΩ
Temperature	
Operation:	5°C - 35°C
Storage:	10°C - 70°C

Humidity:	≤95%RH (no condensation)
Power	
Battery:	6V4AH lead acid battery, 30 hrs continuous use
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.	
AC Adapter:	
10.5-12VDC 600mA, with central positive, 5.7 VDC -9 VDC	

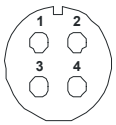
2.3 Setup the Indicator for Use



2.3.1 Connect the Indicator to the Platform

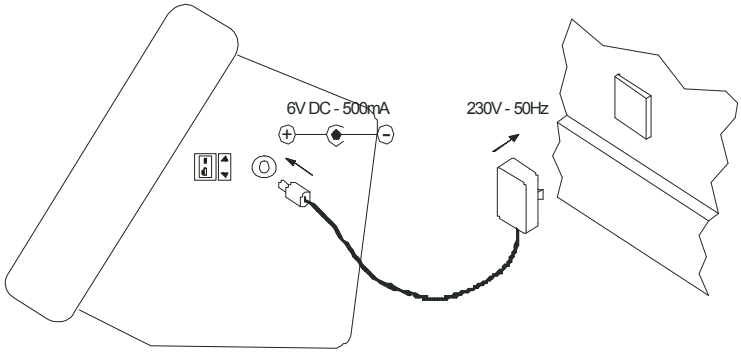


Wire the cable attached to the base as shown (if necessary)

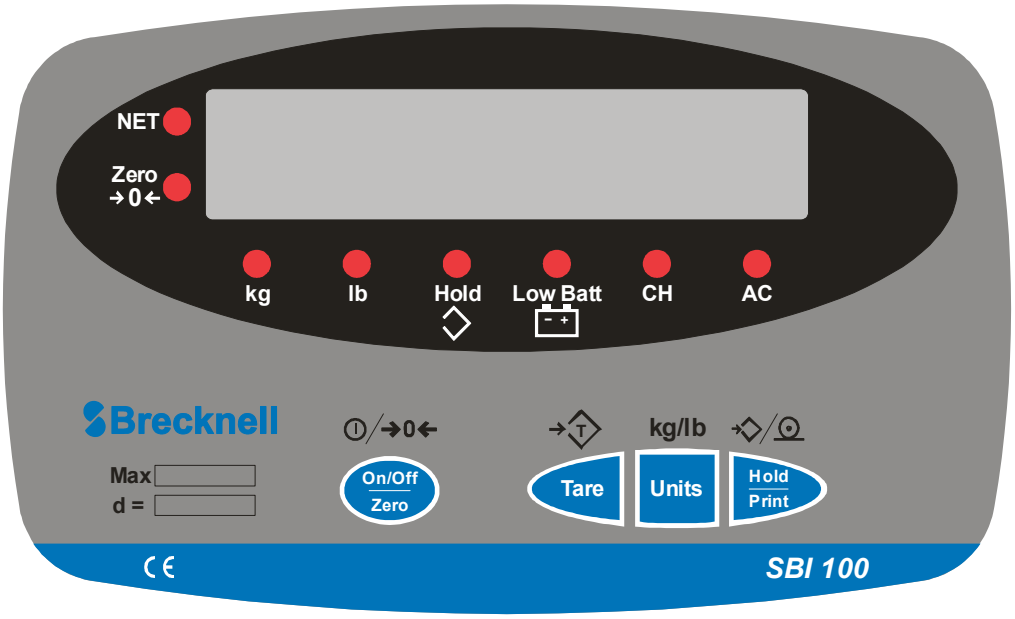


1. Red Excitation+
2. Black Excitation-
3. Green Signal-
4. White Signal+

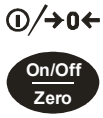
2.3.2 Power Supply



2.4 Display and Keypad



2.4.1 Function Keys

Key	Function
	Tare a gross weight
	Turn the indicator ON or OFF Zero an applied weight
	Select between units: kg or lb
	Hold a weight Print

2.4.2 Annunciators

Annunciator	Description
	Weight is zero
	Unit of measure (Flashing LED means that the weight reading is not stable.)

Annunciator	Description
NET ●	Tare is activated
● CH	Battery is charging
● AC	AC adapter is plugged in
● Hold ◇	Hold is activated
● Low Batt ■	Battery is low

3 Scale Operation

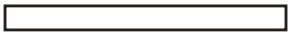
3.1 Keypress Symbols

short keypress

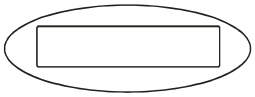
multiple keypress

long keypress

3.2 Turning on and Zeroing the Scale



3.3 Turning off the Scale

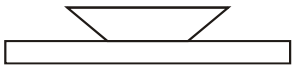


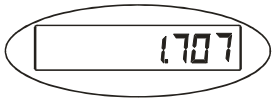
3.4 Select Unit of Measure

kg - lb

3.5 Using the Tare

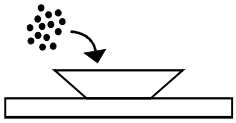
1.

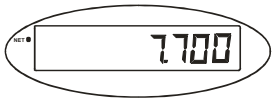




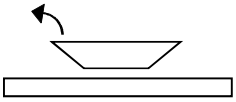
2.

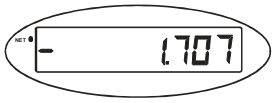
3.



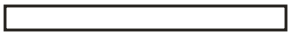


4.





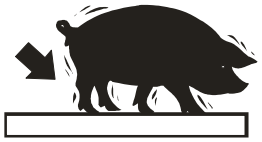
3.6 Remove the Tare



3.7 Hold Function with Automatic Zero on Next Weigh

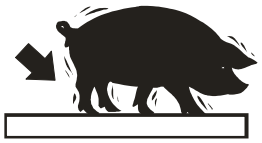
1.

2.




3.

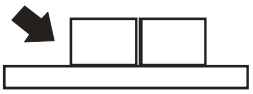

4.



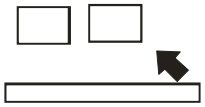

3.8 Hold Function with Manual Release

1.


2.




3.




3.9 Removing Hold

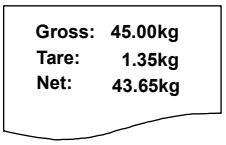
3.10 Print Function

For communications to a printer or PC, the indicator has to be setup in the following parameters P2, P4, P5 and P6. Refer to Chapter 4.

1.

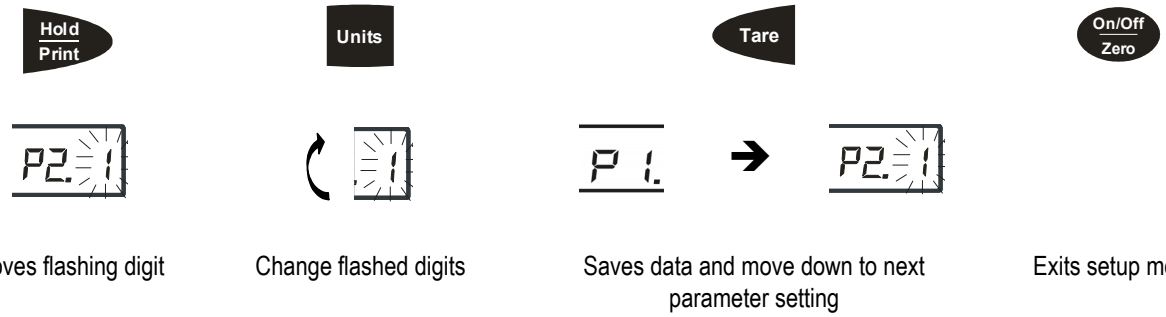
2.

3. Print



4 User Configuration Settings

4.1 Setup Controls



Moves flashing digit

Change flashed digits

Saves data and move down to next parameter setting

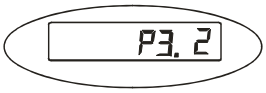
Exits setup mode

4.2 Entering Setup

4.2.1 Selecting a Parameter

4.2.2 Changing Parameter Data

4.2.3 Saving Data



4.2.4 Exiting Setup

4.3 User Configuration Settings

Parameter	Description	Settings (default in bold)
P1.xy	**Auto shutoff 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 = 15 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= No hold function active 1= Averaging hold with manual push button release 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= Averaging hold with automatic release and re-hold Same as above but the weight reading will be held on the display until the platform is emptied and the next weight reading over 10 divisions is applied. 3-50= Selectable hold window from +/- 3 to 50 divisions Will hold 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 displayed data once stable when print key is pressed 2= Print gross, tare and net weight once stable when print key is pressed 3= Continuously output gross weight 4= Continuously output gross, tare and net weight 5= Print displayed data once stable one time only. 6= Print gross, tare and net weight once stable, one time 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 P5.1= 2400 P5.2= 4800 **P5.3= 9600** P5.4= 19200
P6.x	**RS232 Data format** 0 = 8 digits, no odd or even, 1 start bit, nan1 stop bit 1 = 7 digits, 1 even, 1 start bit, 1 stop bit 2 = 7 digits, 1 odd, 1 start bit, 1 stop bit 3 = 8 digits, no parity, 1 start bit, 1 stop bit	P6. 0 P6. 1 P6. 2 **P6. 3**
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.***	

4.4 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)

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

Command	Action	Response
W<CR>	Takes a reading	
	over capacity	<LF>^^^^^^^^U1U2 U3U4U5<CR><LF> H1H2H3<CR><ETX>
	under capacity	<LF>_____U1U2<CR><LF> H1H2H3<CR><ETX>
	zero point error	<LF>-------- U1U2<CR><LF> H1H2H3<CR><ETX>
	reading (kg or lb)	<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>

4.4.1 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

4.4.2 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 @ 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: xxxxx0.18lb
Tare: xxxxxx0.18lb
Net: xxxxxxx0.18lb

4.4.3 RS-232 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					

5 Scale Calibration

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 accomplished by a trained service technician using certified weights to ensure proper operation and accuracy. Calibration is not covered under warranty.

5.1 Setup Controls

Moves flashing digit

Change flashed digits

Saves data and move down to next parameter setting

Exits setup mode

5.2 User Configuration Settings

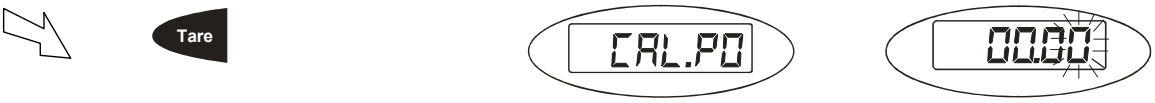
Config Menu	Avail. Settings	Definition	Detailed Setting		
P7	00-31	Displayed Resolution	(00) = 500 (01)= 600 (02)= 750 (03)= 800 (04) =1000 (05)=1200 (06) =1500 (07) = 2000	(08) = 2400 (09) = 2500 (10)= 3000 (11) = 3500 (12)= 4000 (13) = 5000 (14) = 6000	(15) = 7000 (16) = 7500 (17) = 8000 (18) = 10,000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

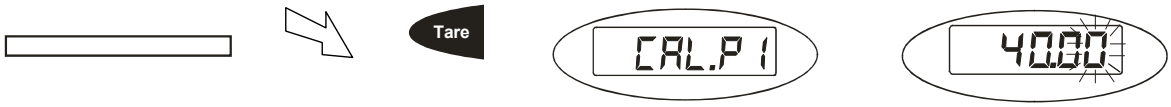
5.3 Calibrate Scale

You may choose to configure your scale for a higher resolution. The factory does not recommend increasing the resolution above 7,500 divisions for a stable weight reading. Certain environments may cause the scale to be unstable at factory settings, reduce the # of division settings to increase your stability.

Calibration can be done with 25% to 100% of requested load and can be calibrated with 1 or 2 calibration points

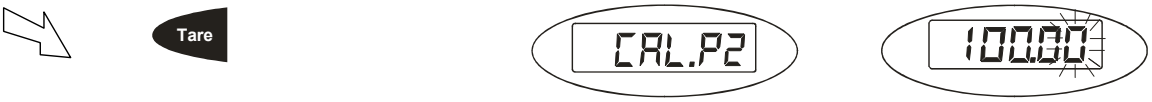
1. 

2. 

3. 

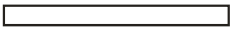
4. Enter in calibration weight from 25% to 100% of full capacity

5. Single point calibration, enter the same weight in again and move to step 7. For 2 point calibration enter in the second calibration weight between 25% 100% full capacity.



6. 

7. 

8. 

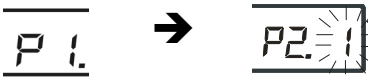

9. 

6 Service Configuration

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 setting can be accomplished by altering user configuration settings P11-P19.

CAUTION!
Calibration and/or configuration of calibration settings of your scale should be accomplished by a trained service technician using certified weights to ensure proper operation and accuracy. Calibration is not covered under warranty.

6.1 Setup Controls



Moves flashing digit

Change flashed digits

Saves data and move down to next parameter setting

Exits setup mode

6.2 Parameters and Settings

Config Menu	Avail. 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 (full scale)	0 = +/- 1% 1 = +/- 2% 2 = +/- 5% 3 = +/- 10% 4 = +/- 20% 5 = +/- 50% 6 = +/- 100% 7 = no limitation
P13	00 - 15	3	Zero button range (full scale)	(00) = +/- 1% (01)= +/- 2% (02)= +/- 3% (03)= +/- 4% (04) =+/- 5% (05)= +/- 10% (06) = +/- 20% (07) = +/-no limit (08)= + 1% (09) = + 2% (10)= + 3% (11) = + 4% (12) = + 5% (13) = + 10% (14) = + 20% (25) = + no limit
P14	0,1,2	0	Signal within power on zero point range	0 = current weight 1 = calibration zero 2 = power off zero point

Config Menu	Avail. Settings	Default	Definition	Detailed Setting
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	2	Data filter	0 = very weak 1 = weak 2 = standard 3 = strong
P18	0 - 9	1	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

7 Error Codes

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.	Remove load before zeroing Or Recalibrate the scale.
_____:	Indicates an under range condition	Remove all loads and zero the scale.
‾‾‾‾:	Capacity exceeded	Remove the load and try again. If the load is great than 6 kg 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 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	Calibrate the scale to store settings
EEP.E2	P7-P9 settings exceed scale's normal range	Reconfigure P7-P9 setting

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