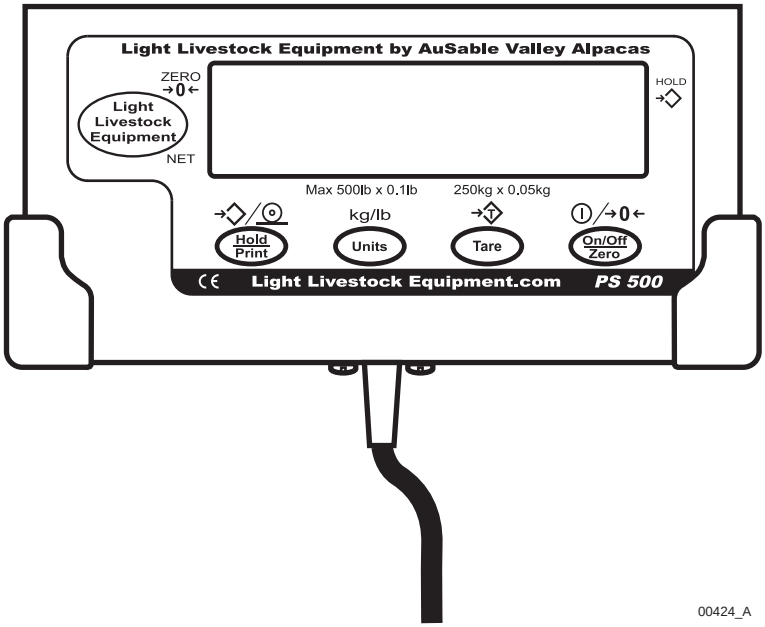
LIGHT LIVESTOCK
EQUIPMENT & SUPPLY

By AuSable Valley Alpacas



PS-500 Series Scale

User Instructions

AWT35-000413 Issue AA April 2009

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Warnings and cautions

Safe installation

WARNING: THE EQUIPMENT CONTAINS NO USER-SERVICEABLE COMPONENTS.
Only authorised and trained personnel must maintain the equipment.

WARNING: 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, and so on.)
IF IN DOUBT SEEK ADVICE FROM A QUALIFIED ELECTRICIAN.

WARNING: 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 you do 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.

Safe use

Caution – Cleaning the indicator and weigh head

You must not use harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions, such as washing soda, especially on the display windows. Never wipe the inside of the machine. You can wipe down the outside of standard products with a clean cloth, moistened with water containing a small amount of washing up liquid.

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.

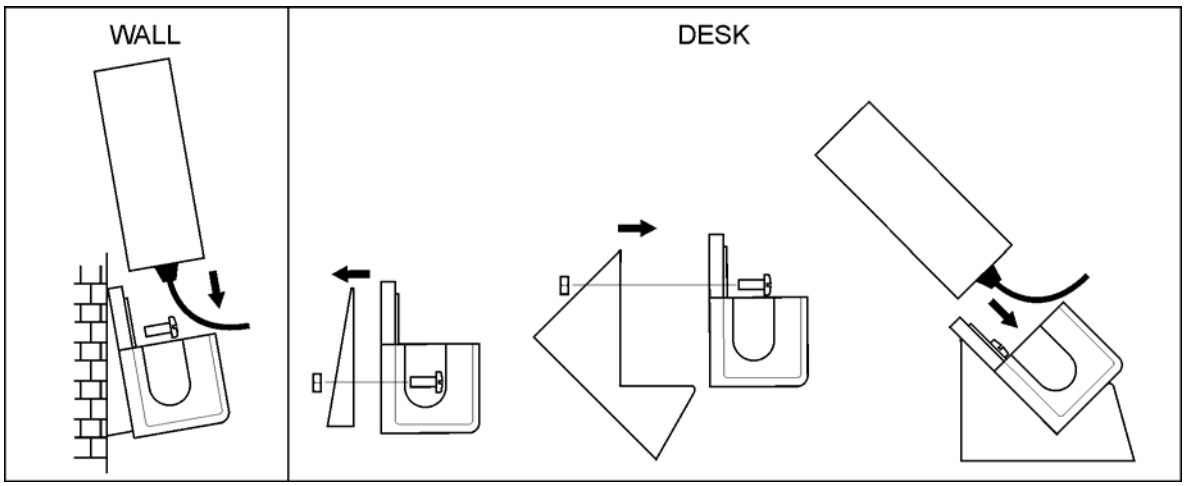
Specifications

Power:	Four alkaline batteries AAA size. AC adaptor 6 VDC, 500 mA with centre negative.
Operating temperature:	+14 F to +122 F (-10 C to +50 C)
Stored temperature:	-4 F to +140 F (-20 C to +60 C)

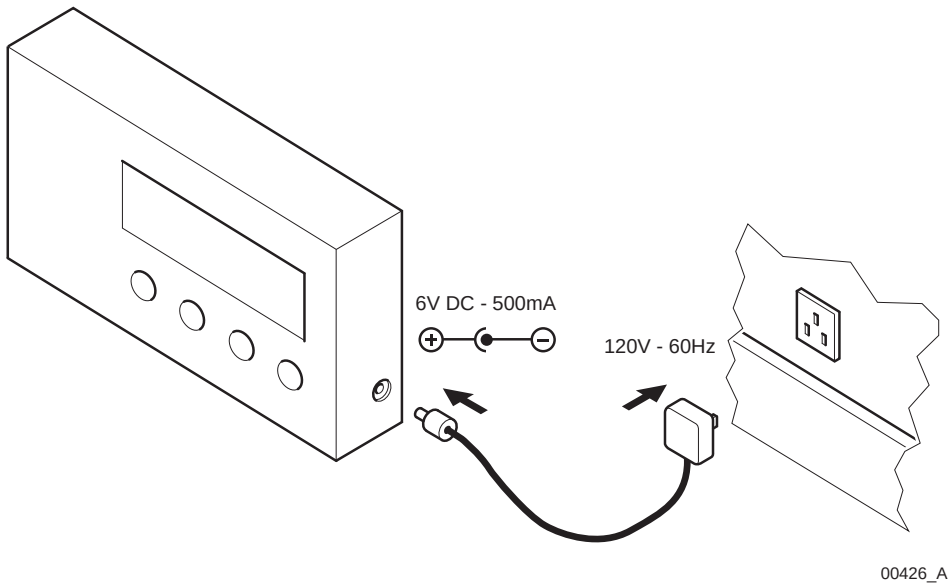
Setup instructions

Desk or wall bracket

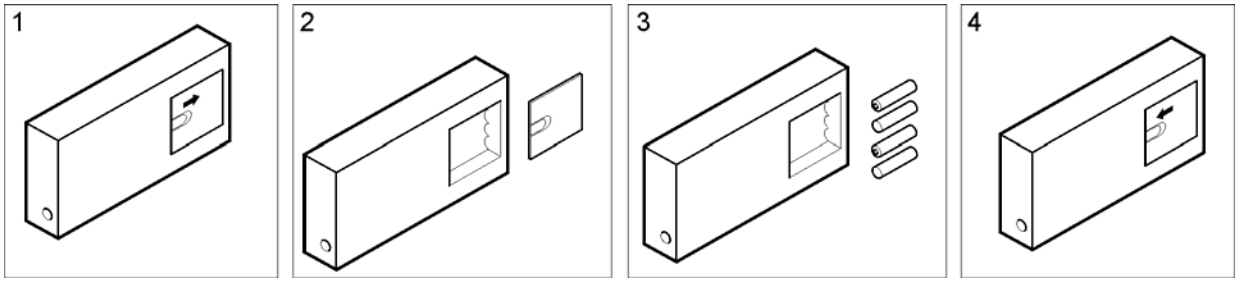
If you want to convert the indicator bracket into a wall-mounting bracket you can change the angle blocks as shown in the diagram below.



Power supply

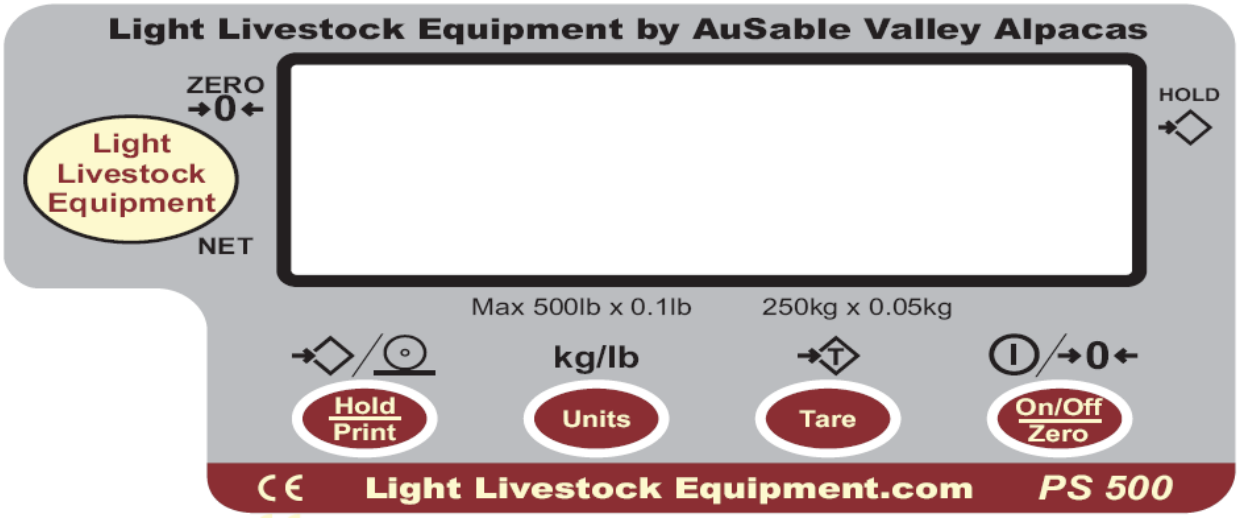


Installing batteries



General operating instructions

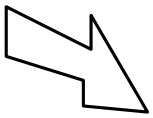
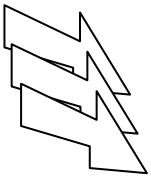
Display



Function Keys		Annunciators	
On/Off Zero	On/Off/Zero	Zero →0←	Centre of zero
Tare	Activate the tare	Net	Net weight displayed
kg/lb Units	Select unit	Hold	Hold activated
		kg, lb, oz	Active unit of measure
Hold Print	Hold/Print	kg	Scale in motion

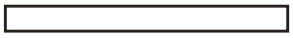
Symbols used in this document

We use the following symbols in this document to represent different types of key presses.

Short key press	Multiple key press	Long key press
		

Operating the indicator

Turning on and zeroing the indicator

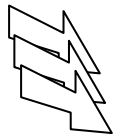
1. 

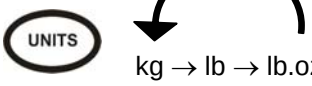
NOTE: *This diagram shows an unloaded scale.*

2.

Turning off the indicator

Selecting the unit of measure



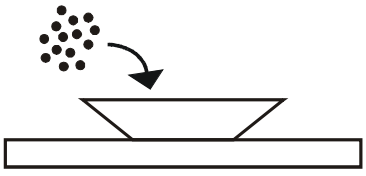


Using the tare

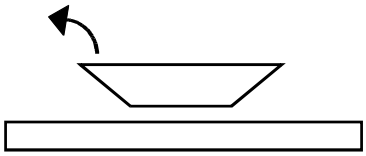
1.

2.

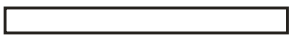
3.

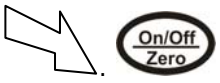


4.

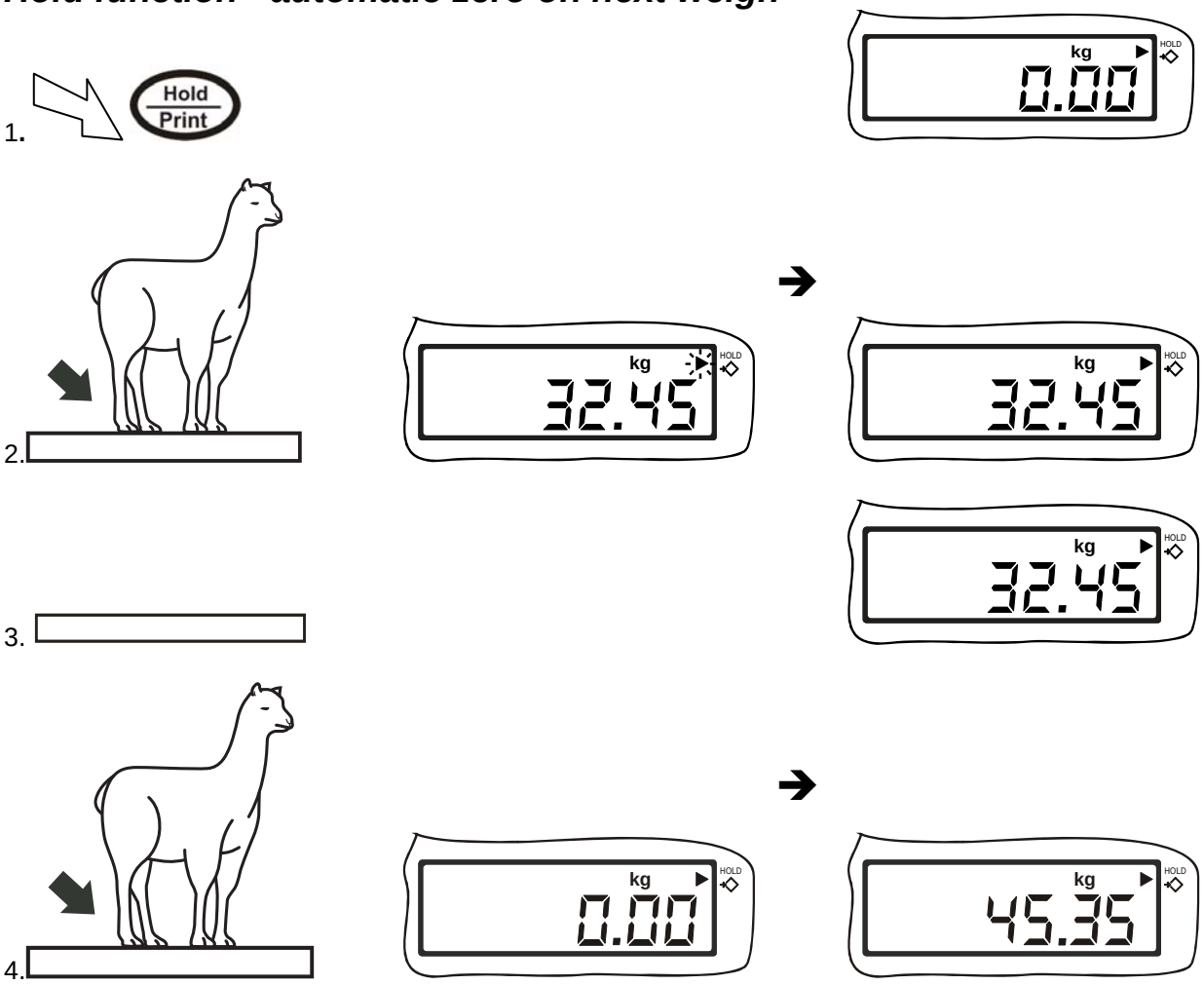


Removing the tare



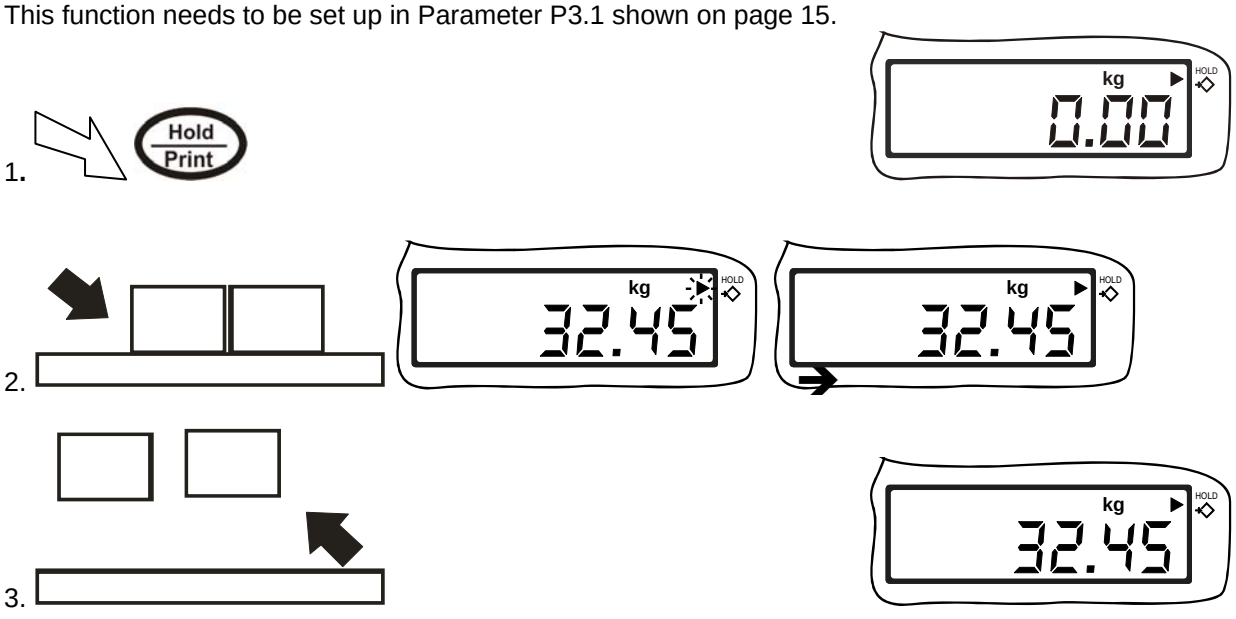


Hold function - automatic zero on next weigh



Hold function - manual release

This function needs to be set up in Parameter P3.1 shown on page 15.



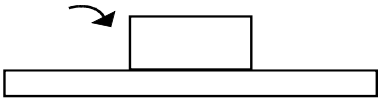
Removing hold

1.

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.



2.

3. Print

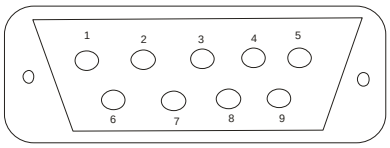
Gross: 45.00kg
Tare: 1.45kg
Net: 43.65kg

Serial interface settings

RS232 serial interface wiring:

Communication Function/xxxxxx/xxxxx/xxxx/

2	(TXD)
3	(RXD)
4	(DSR)
5	(GND)
6	(DTR)
7	(CTS)
8	(RTS)



Error messages

Error Message	Definition	Required Solution
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. A greater capacity scale may be needed.
CAL-Er:	Calibration error.	Restart calibration.
Lo.bAt:	Low battery.	Replace the battery.

Displaying the ADC code or input working voltage

1. Make sure that the indicator is in the normal weighing mode.

2. Press and hold down the **On/Off/Zero** key and the **Hold/Print** key for more than three seconds.

   The display shows “code” and then it shows the firmware version in a **xx.xx.xx** format. This code means that you are in the Display Inner Code mode and you can now check the inner working voltage, the stability of the weighing system and the variety value of Analog/Digital (A/D) data that is based on the loaded weight of the scale.

   NOTES:
   - *The number values must be stable or you cannot finish the calibration.*
   - *If the display shows a negative value you cannot finish the calibration.*

3. When the indicator is in the Display Inner Code you can calculate the proper Analogue/Digital Converter (ADC) data at zero point by examining the A/D data for a loaded weight. If the ADC increase for full capacity is Not Full Scale (NFS), the **Z**ero **P**ower up range is set to **Zp**% Full Scale (FS) as shown in the P12 setting and the **Z**ero **K**ey range is set to **Zk**% FS as shown in the P13 setting. Then correct ADC data of zero point is larger than (Zp% + Zk%) x NFS or approximately +6000.

4. To do the ADC increment for a full capacity (NFS) you load a weight W on the platform, and the ADC increase for W weight is Nw. The ADC increase for a full capacity WFS is (NFS) = (Nw)x (WFS)/W.

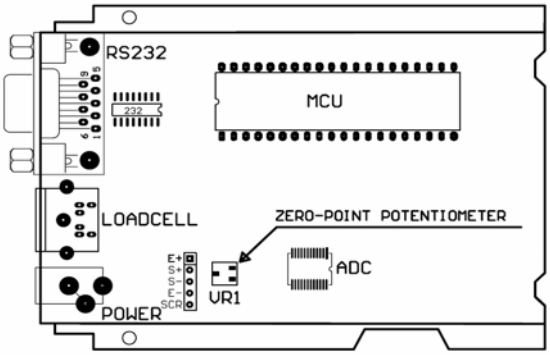
NOTE:
If the position of the zero-point potentiometer on the PCB is incorrect or if there is a bad connection to the loadcell, the indicator may display a negative value because the software can only deal with a positive value.

5. If the position of zero-point potentiometer is incorrect, adjust it to make the ADC data a positive value and larger than (Zp%+ Zk%) x NFS or approximately +6000.

   NOTE:
   Normally the indicator is factory calibrated and you do not need this operation.

   The diagram below shows the position of the zero-point potentiometer on the PCB.

6. To decrease the ADC, data turn the potentiometer clockwise. To increase the ADC data turn the potentiometer counter-clockwise.



7. Either press the **Units** key to select the displaying weight inner code or input the inner working voltage value. When the display shows "**U x.xx**", the displayed digits show a voltage value and the unit is Volts (V).

   NOTE:
   The proper working power voltage is between 5 V and 8 V.

8. Press the **Tare** key to display either a filtered or an unfiltered weight A/D data.

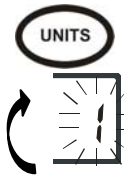
   When the indicator displays a ▶ symbol the data is filtered.

9. Press the **On/Off/Zero** key to exit the Display Inner Code mode and return to the Normal Weighing mode.

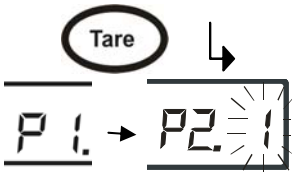
User configuration settings

Setup controls

Moves flashing digit



Change flashing digits



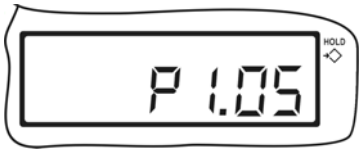
Saves data and move down to next parameter setting

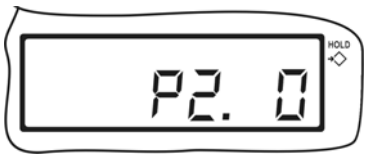
.

Exits setup mode

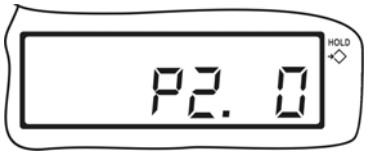
1. **Entering setup**

2. **Selecting parameter**

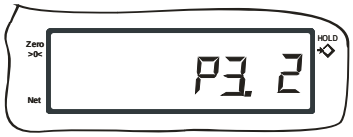




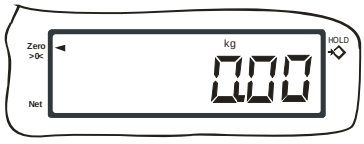
3. **Changing data within parameter**



4. **Saving data**



5. **Exiting setup**



Configuration settings

Parameter	Setting	Default settings in bold
P1.xx	**Auto shut-off timer in minutes** *Set up time for the auto-off function* (00 = 0ff, 01-15 = time in minutes)	P1.00 P1.01 – P1.15 **P1.05**
P2.x	**Hold and print key functionality** *Set up 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.xx	**Hold Function Settings** 0 = No hold function active. 1 = Animal averaging hold with manual push-button release. The weight reading is held on the display until a higher weight is applied. This automatically releases the held weight and re-holds it at the new higher weight reading. 2 = Animal averaging hold with automatic release and re-hold. As above, but the weight reading is 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. Once stable, holds display reading within a selectable weight range. Must be re-pressed to release the hold button.	P3.0 P3.1 **P3.2** P3.3 to 50
P4.x	**RS232 – Serial Interface** *Settings for serial interface* 0 = No RS232 output. 1 = Once stable, print displayed data when print key is pressed. 2 = Once stable, print gross, tare and net weight when print key is pressed. 3 = Continuously output gross weight. 4 = Continuously output gross, tare and net weight (compatible with NCI-SP1). 5 = Once stable, print displayed data one time only. 6 = Once stable, print gross, tare and net weight one time only. 7 = Bidirectional-RS232 (also compatible with NCI-SP1).	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 digits, no odd or even, 1 start bit, 1 stop bit 1 = 7 digits, 1 even, 1 start bit, 1 stop bit 2 = 7 digits, 1 odd, 1 start bit, 1 stop bit	**P6. 0** P6. 1 P6. 2
P7-P19 .x	**SERVICE CONFIGURATIONS ONLY (See page 17.)** ***CAUTION: Any adjustment to these settings could seriously affect the indicators performance. Ask for advice from a service engineer before you change any of the above settings.***	

Data commands for bi-directional interface

The RS232 can be set so a bi-directional connection can be established between the indicator and the host. To establish this connection, set parameter P4 to 7, so it is compatible with the NCI-SP1. 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><sp>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	**<p>**	Polarity character including minus sign for negative weigh and space character for positive
<CR>	Carriage return	**W1-W7**	Weight data
<ETX>	End of text character	**<dp>**	Decimal point
<SP>	Space	**U1U2:**	Unit measure, kg, lb or oz
H1H2H3	3 status bytes		

Output status bit meaning			
Bit	**Byte 1**	**Byte 2**	**Byte 3**
0	0 = Stable 1 = Unstable	0 = Not Under Capacity 1 = Under Capacity	00 = Not defined 01 = Normal working mode
1	0 = Not at zero point 1 = At zero point	0 = Not over capacity 1 = Over capacity	0 = Hold working mode 1 = 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

Display, measurement and service settings

CAUTION! Any adjustment to these settings could seriously affect indicator performance. Seek advice from a service engineer before changing.

NOTE: *Some configuration changes erase the present calibration on the system.*

Scale setup and calibration

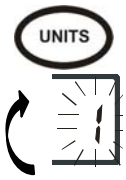
Before calibrating, the following parameter must be setup correctly:

P7	Scale resolution	(500 ~ 10000)
P8	Division size	(1, 2 or 5)
P9	Decimal place	(10 ~ 0.0001)
P10	Calibration unit of measure lb or kg	

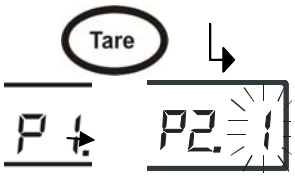
For scale calibration, see page 19.

Setup controls

Moves the flashing digit to the left.



Change flashing digit to increase the values of the digit.



Saves data and moves down to the next parameter setting

Exits the setup mode

For entering setup, refer to page 13.

Service settings

Parameter	Settings	Default settings in bold
P7.xx	**Displayed resolution in divisions** *Graduations - Specifies number of full-scale graduations.*	P7.00 = 500 P7.01 = 600 P7.02 = 750 P7.03 = 800 P7.04 =1000 P7.05 =1200 P7.06 =1500 P7.07 =2000 P7.08 =2400 P7.09 =2500 P7.10 =3000 P7.11 = 3500 P7.12 = 4000 **P7.13 = 5000** P7.14 = 6000 P7.15 = 7000 P7.16 = 7500 P7.17 = 8000 P7.18 = 10000 P7.19 = 12000 P7.20 = 15000 P7.21 = 20000 P7.22 = 25000 P7.23 = 30000 P7.24 = 35000 P7.25 = 40000 P7.26 = 50000 P7.27 = 60000 P7.28 = 70000 P7.29 = 75000 P7.30 = 80000 P7.31 = 100000
P8.x	**Displayed divisions size:** Multiples of: 1, 2 or 5	**P8.0 = 1** P8.1 = 2 P8.2 = 5
P9.x	**Decimal point position**	**P9.0 = 1** P9.1 = 0.1 P9.2 = 0.01 P9.3= 0.001 P9.4= 0.0001 P9.5= 10
P10.x	**Calibration unit of measure.** *Select the unit of measure the scale will be calibrated in.*	P10.0 = kg **P10.1 = lb**

Service settings continued

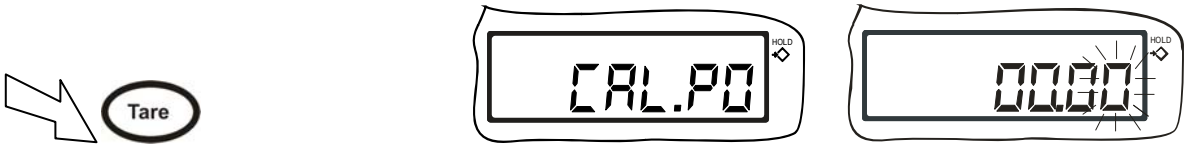
Parameter	Settings	Default settings in bold
P11.x	**Units of measure:** Selects the units of measure the scale will operate in from the unit's key.	P11.0 = only kg P11.1 = only lb P11.2 = only lb:oz P11.3 = kg or lb P11.4 = kg or lb:oz P11.5 = lb or lb:oz **P11.6 = kg, lb, or lb:oz**
P12.x	**Power up Zero range** Selects the Power up zero-point range based on the calibration zero point.	P12.0 = +1% P12.1 = +2% P12.2 = +5% P12.3 = +10% P12.4 = +20% P12.5 = +50% P12.6 = +100% **P12.7 = No limitation**
P13.x	**Zero button range** Selects the zero range the zero buttons can zero off.	P13.0 = ±1% P13.1 = ±2% P13.2 = ±5% P13.3 = ±10% **P13.4 = ±20%** P13.5 = ±50% P13.6 = ±100% P13.7 = No limitation P13.8 = +1% P13.9 = +2% P13.10 = +1%
P14.x	**Scale Power up when <u>inside</u> the power up zero range** Allows the scale to power up and zero from the following point. 0= Power up and zero at any weight. 1= Power up zero based off calibration zero-point. 2= Power up back at the zero-point the scale was powered off at and also display any active tare.	**P14.0** P14.1 P14.2
P15.x	**Scale Power up when <u>outside</u> the power up zero range** Allows the scale to power up and display the following: 0= Zero and display in current Gross weight. 1= Displays Gross weigh based off calibration zero point. 2= Displays Gross or Net weight based off the zero-point of when the scale was last powered Off. 3= Continuously display error message "0 "	P15.0 **P15.1** P15.2 P15.3
P16.x	**Zero tracking range**	P16.0 = off P16.1 = ±0.25d P16.2 = ±0.5d P16.3 = ±1d P16.4 = ±1.5d **P16.5 = ±2d** P16.6 = ±3d P16.7 = ±4d; P16.8 = ±5d
P17.x	**Data filter intensity**	P17.0 = very weak P17.1 = weak **P17.2 = middle** P17.3 = strong
P18.x	**Check weight stability range**	P18.0 = ± 0.5d; **P18.1 = ± 1d** P18.2 = ± 1.5d P18.3 = ± 2d P18.4 = ± 3d P18.5 = ± 4d P18.6 = ± 5d P18.7 = ± 6d P18.8 = ± 7d P18.9 = ± 8d
P19.x	**Overload limit range**	P19.0 = 0 P19.1 = + 9d P19.2 = 101% **P19.3 = 102%** P19.4 = 105 % P19.5 = 110% P19.6 = 120% P19.7 = 150% P19.8 = 200% P19.9 = No limitation

NOTE: *Default settings may vary depending on the platform configuration required.*

Recalibration of the scale

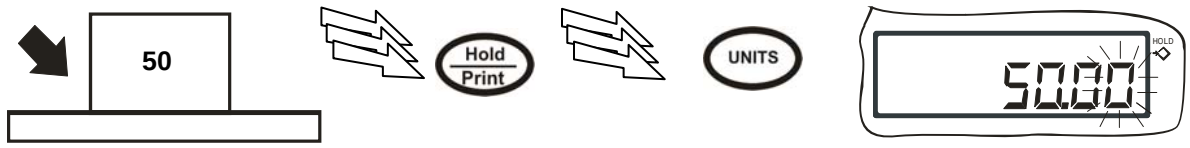
Calibration can be done with 25% to 100% of the full load and it can be calibrated with 1 or 2 calibration points.

1.

2. 

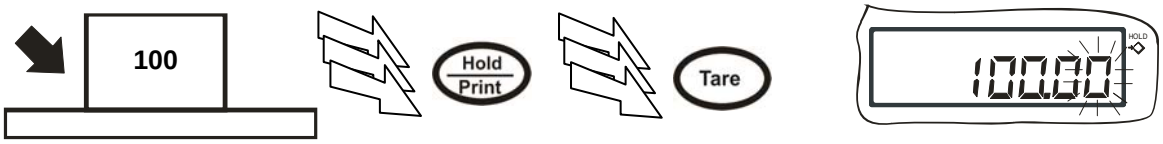
3.

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



5.

6. For 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 25% and 100% full capacity.



7.

8.

9.

Declarations of Compliance

United States

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This digital apparatus does not exceed the Class A limits for the radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.
Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique edicté par le ministère des Communications du Canada.

LIGHT LIVESTOCK
EQUIPMENT & SUPPLY

Light Livestock Equipment & Supply
697 Glen Road
Jay, NY 12941
Toll Free: (866) 999-AVA1(2821)
email: info@LightLivestockEquipment.com
website: www.LightLivestockEquipment.com