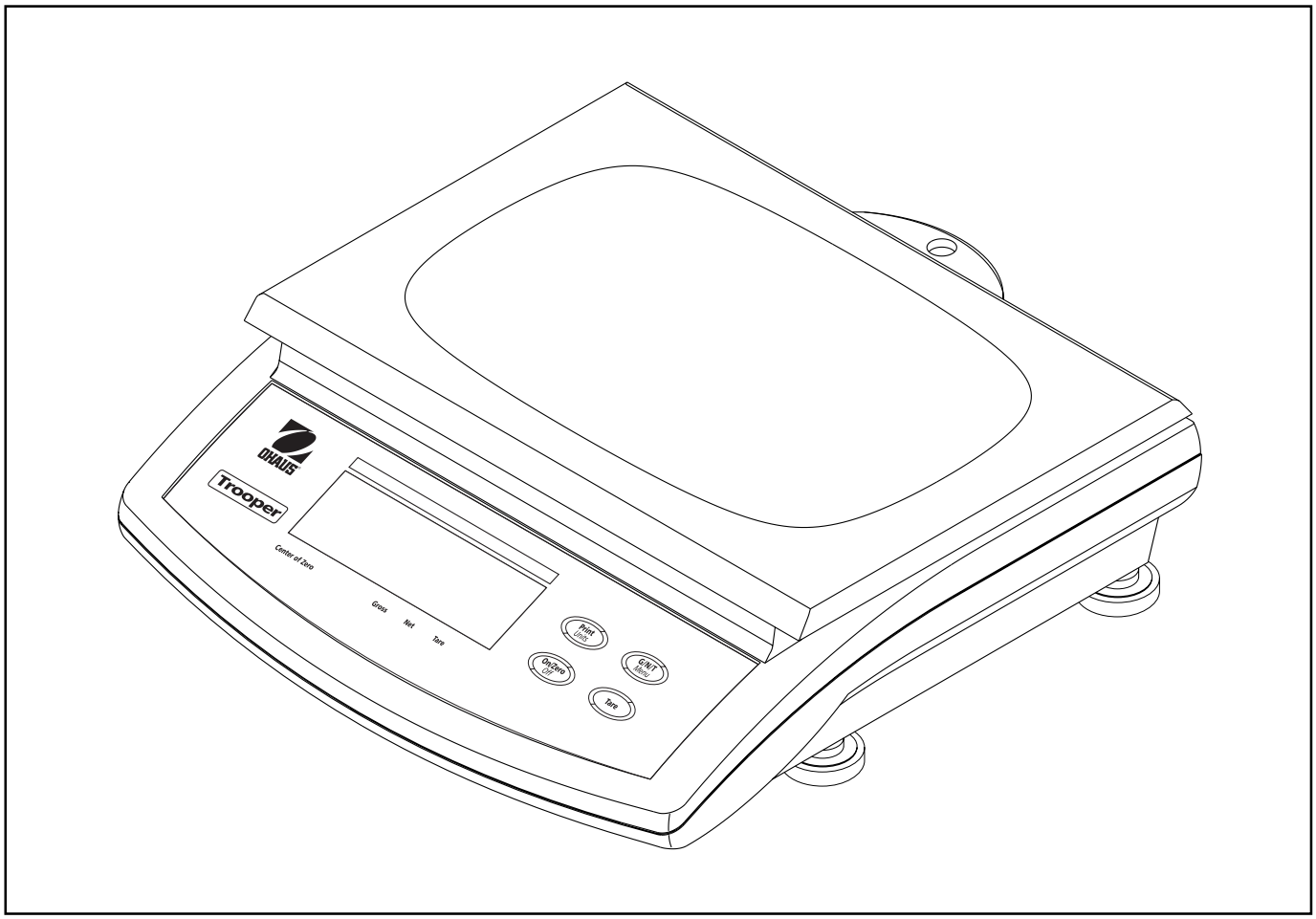
INSTRUCTION MANUAL

Trooper Scale



Declaration of Conformity

The undersigned, representing the following manufacturer

Ohaus Corporation
19A Chapin Road
P.O. Box 2033
Pine Brook, NJ 07058
USA

hereby declares that the following products are in conformity with the EEC directives listed below (including any and all modifications).

Scale models: TR****

Marking	Directive	Standard
CE	73/23/EEC Electrical equipment for use within specified voltage limits	EN61558-1: 1997 + A1: 1998 Safety of power transformers, power supply units and similiar Part 1: General requirements and tests EN61558-2-6: 1997 Safety of power transformers, power supply units and similiar Part 2-6: Particular requirements for safety isolating transformers for general use
	89/336/EEC Electromagnetic compatibilty	EN61326: 1997 + A1: 1998 Electrical equipment for measurements, control and laboratory use
CE T6028	90/384/EEC Non automatic weighing instruments	EN45501: 1992 Metrological aspects of non-automatic weighing instruments

Ted Xia
President
Ohaus Corporation

FCC NOTE: 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.

This class A digital apparatus complies with Canadian ICES-003.

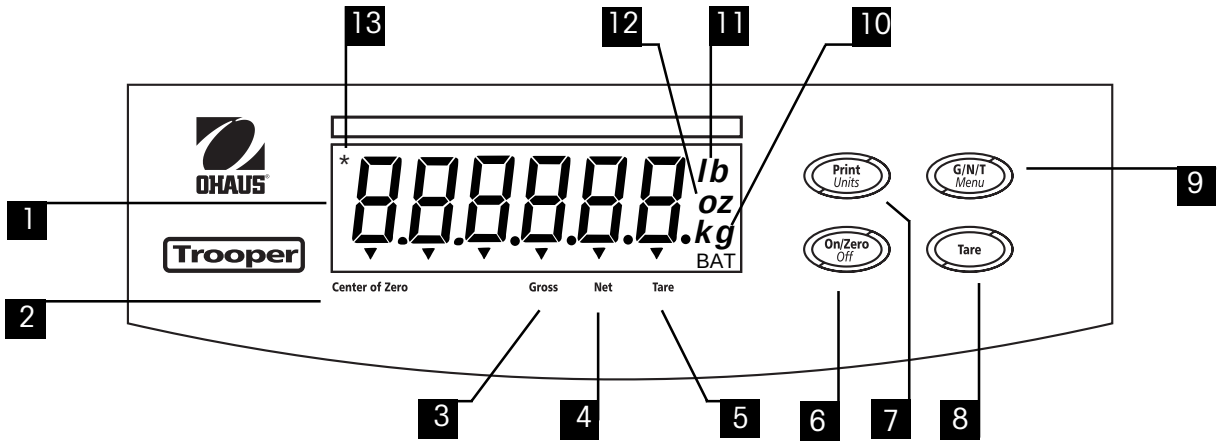
Cet appariel numérique de la classe A est conforme à la norme NMB-003 du Canada.

Before plugging in the Scale, make sure that the voltage of the power adapter and plug match.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

OVERVIEW OF CONTROLS AND DISPLAY FUNCTIONS



No.	Designation	Function
1	Display	LCD display, indicates weight, modes and setup information.
2	Center of Zero	LCD indicator prompt, indicates center of zero when within +/- 0.25d.
3	Gross	LCD indicator prompt, indicates gross weight.
4	Net	LCD indicator prompt indicates net weight.
5	Tare	LCD indicator prompt indicates tare weight.
6	ON/ZERO/OFF button	Turns Scale on or off. Secondary use, provides zero function.
7	Print/Units button	Short press, prints data which is displayed on the Scale. Long press, changes unit of measure. When in menus, each press advances horizontally through the menus. Finalizes a menu selection.
8	Tare button	When pressed, enters tare value into memory.
9	G/N/T/Menu button	Recalls Gross/Net/Tare. Long press allows entry into menus. When in menus, advances through individual menu items.
10	kg g	LCD indicator, when lit, indicates weight in kilograms. LCD indicator, when lit, indicates weight in grams.
11	lb	LCD indicator, when lit, indicates weight in pounds.
12	oz	LCD indicator, when lit, indicates weight in ounces.
13	*	Stability indicator, when lit, indicates stable weight.

1. GETTING TO KNOW YOUR TROOPER SCALE

1.1 Introduction

Thank you for deciding to purchase a Trooper Scale from Ohaus. The Ohaus Trooper Scale is a rugged, reliable, electronic scale designed for easy operation.

The Trooper Scale operates from AC power and can also be powered by six Alkaline "C" batteries internally. A six digit LCD display is 1.0 inches/2.5 centimeters in height provides easy visibility when working at distances from the Scale. Four buttons mounted on the front panel enable simple set up procedures. A menu lockout switch can be set to lock out various functions of the Scale to prevent settings from being changed. An RS232 Interface is built in.

Behind your instrument stands OHAUS, a leading manufacturer of precision Indicators, Scales and Balances. An After-market Department with trained instrument technicians is dedicated to providing you with the fastest service possible in the event your instrument requires servicing. OHAUS also has a Customer Service Department to answer any inquiries regarding applications and accessories.

To ensure you make full use of the possibilities offered by your Trooper Scale, please read the manual completely before installation and operation.

1.1.1 Features

Major features include:

- 6 digits, 7-segments, 25 mm Numeric LCD display
- Durable ABS housing
- 4 membrane switches
- Push-button Tare/Clear
- Flexible unit switching-lb/kg/oz/g
- Enhanced digital filtering
- Overload/Underzero display indication
- RS232 Serial Communication in Ohaus RS-Interface
- Up to 100 hours continuous battery operation
- AC & DC power supply
- Low - BAT warning comes on 20 minutes prior to low power point
- Auto shut off for power saving

2. INSTALLATION

2.1 Unpacking and Checking

Open the package and remove the instrument and the accessories. Check the completeness of the delivery. The following accessories are part of the standard equipment of your new Scale.

Remove packing material from the instrument.

Check the instrument for transport damage. Immediately inform your Ohaus dealer if you have complaints or parts are missing. Your Trooper Scale package should contain:

- Trooper Scale
- Warranty card
- AC power adapter
- Instruction Manual
- Lead seal for weights and measures sealing

Store all parts of the packaging. This packaging guarantees the best possible protection for the transport of your instrument.
NOTE: Remove the two shipping screws if present on top of the unit.

2.2 Selecting the Location

The Scale should be used in an environment which is free from corrosives, vibration or temperature extremes. These factors will affect displayed weight readings. The Scale should be located on a stable level surface and kept away from vibrating sources such as large machinery. Maximum accuracy will be achieved when the area is clean and vibration free.

2.3 Connecting Power

2.3.1 Battery Installation

Remove battery cover and insert 6 Alkaline C-type batteries into the battery holder making sure that the batteries are properly orientated (correct polarity).

NOTE: It is recommended that when the Trooper Scale is operated from batteries, the Auto-Off Timer feature be turned on to extend battery life. When setting up the Scale, refer to Intial Setup, Readout menu, paragraph 4.4.4.

2.3.2 AC Power

Connect the AC power cord from the Scale and plug into a convenient power outlet.

NOTICE:
The socket/outlet must be installed near the equipment and shall be easily accessible.

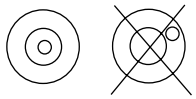
2. INSTALLATION (Cont.)

2.3.3 Leveling the Scale

Exact horizontal positioning and stable installation are prerequisites for repeatable results. To compensate small irregularities or inclinations at the location, the instrument can be leveled.

For exact horizontal positioning, the Scale is equipped with a level indicator located at the rear.

Adjust the leveling feet until the air bubble in the indicator is centered.



NOTE: The instrument should be leveled each time its location is changed.

2.3.4 Stabilization

Before initially using the Scale, allow time for it to adjust to its new environment. Recommended warm up period is five (5) minutes.

3. OPERATION

The Trooper Scale has been factory calibrated and is ready for operation. You can operate the scale at this point using the factory default settings. You can check the default menu settings on page 9. All bolded items on the menu are the factory default settings. The scale will operate in the default mode. If you want to change the settings, continue with Section 4, Setup.

When the Scale is positioned for operation, follow the operational procedure outlined next.

3. OPERATION (Cont.)

3.1 Turning On Scale

Press and hold **ON/ZERO/*OFF*** button until the LCD display appears, then release **ON/ZERO/*OFF*** button. The display momentarily displays segment check, the software revision of the Scale and then goes into a weighing mode.

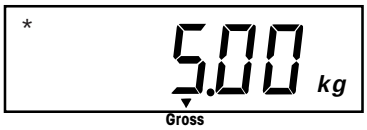
3.2 Turning Off Scale

To turn the Scale off, press the **ON/ZERO/*OFF*** button until OFF is displayed.

3.3 Zero Operation

Using a *short* duration press, press **ON/ZERO/*OFF*** button to zero the Scale. The display acknowledges by indicating the selected measuring unit followed by a zeroed display.

NOTE: Stable cursor must be lit to accept zero operation.



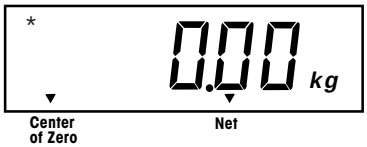
Place item to be weighed on the scale platform. The display indicates a sample of 5kg, gross weight.

3.4 Tare Operation

When weighing material or objects that must be held in a container, taring stores the container weight in the Indicator's memory. To store the container weight, proceed as follows:

Place the container on the scale. Sample shown is 2kg.

Press **TARE** button. Scale is tared and shows Net weight.



3. OPERATION (Cont.)

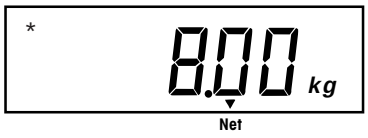
3.5 Gross/Net/Tare Recall Operation

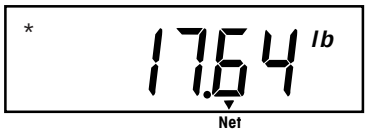
When a container has been placed on the platform and tared, it's weight is stored in memory. Adding material to the container is shown as NET weight. The gross weight is a combination of the tared weight and the material. The **G/N/T/*MENU*** button allows switching between GROSS, NET and TARE weights.

Repeatedly press (short presses) the **G/N/T/*MENU*** button to cycle through Gross, Tare and Net readings. The sample illustrations indicate a tare weight of 2kg simulating a container, a net weight of 8kg which would be the material in a container and a gross weight of 10kg which is the total weight of the container and material. After 3 seconds, display returns to Net weight.

3.6 Unit Switch Operation

To switch measuring units, proceed as follows:





Press and hold **PRINT/*UNITS*** button until display changes to selected measuring unit. Depending on which units are enabled in the menu, you have a choice of g, lb, kg or oz. The display sample indicates 8kg load changed to lbs shown as a net weight because a tared weight of 2kg was used and stored in memory.

3. OPERATION (Cont.)

3.7 RS232 Commands

All communication is accomplished using standard ASCII format. Characters shown in the following table are acknowledged by the Scale. Invalid command response "ES" error indicates the Scale has not recognized the command. Commands sent to the Scale must be terminated with a carriage return (CR) or carriage return-line feed (CRLF). Data output by the Scale is always terminated with a carriage return-line feed (CRLF).

3.7.1 Output Formats

Data output can be initiated in one of two ways; 1) By pressing **PRINT/*UNITS*** button, 2) Sending a print command ("P") from a computer or a PLC.

The output format is illustrated in the RS232 command table which follows.

RS232 COMMAND TABLE

Command Character	Description
?	Print current mode: kg, g, lb., oz.
P	Same as pressing PRINT button..
T	Same as pressing TARE button.
Z	same as pressing ZERO button.
xS	Print Stable only. Where x=0 Off, and x=1 On
AS	Automatically send data when stable after motion.
xxxxS	Send at interval. Where xxxx=1 to 3600 seconds.
CS	Send as fast as possible (continuous print)
M	Increment to next enabled unit

To turn auto printing, interval printing or continuous printing off, send P to reset normal printing mode.

3.8 Printing Data

Printing data to an external computer or printer requires that the communications parameters in the Print menu, be set first. Refer to paragraph 4.4.5 Print Menu for proper set up.

To print data, press **PRINT/*UNITS*** button with a short press. The display acknowledges by momentarily blinking off.

NOTE: If you hold this button down too long, the display will advance to another measuring unit.

3.8.1 RS-232 Pin Out.

1 N/C
2 Data In (RXD)
3 Data Out (TXD)
4 N/C
5 Ground
6, 7, 8, 9 N/C

4. SETUP

For first time setup, step through all menus and set the parameters as desired.

4.1 Setup Protection

The Trooper Scale is equipped with menus which permit certain functions to be locked out (not changed) during operation. If you intend to lock out changes to the setup selections you make, you will need to access the Lock Switch located on the main PC circuit board following the setup procedure.

The Scale has five menus; CAL, SETUP, READ, PRINT and LOCSW which are entered by pressing and holding the **G/N/T/*MENU*** button until MENU is displayed, then releasing it. The display then switches to SETUP. To access the rest of the menus, the **PRINT/*UNITS*** button is repeatedly pressed until the desired menu is reached.

4.4.1 Control Functions

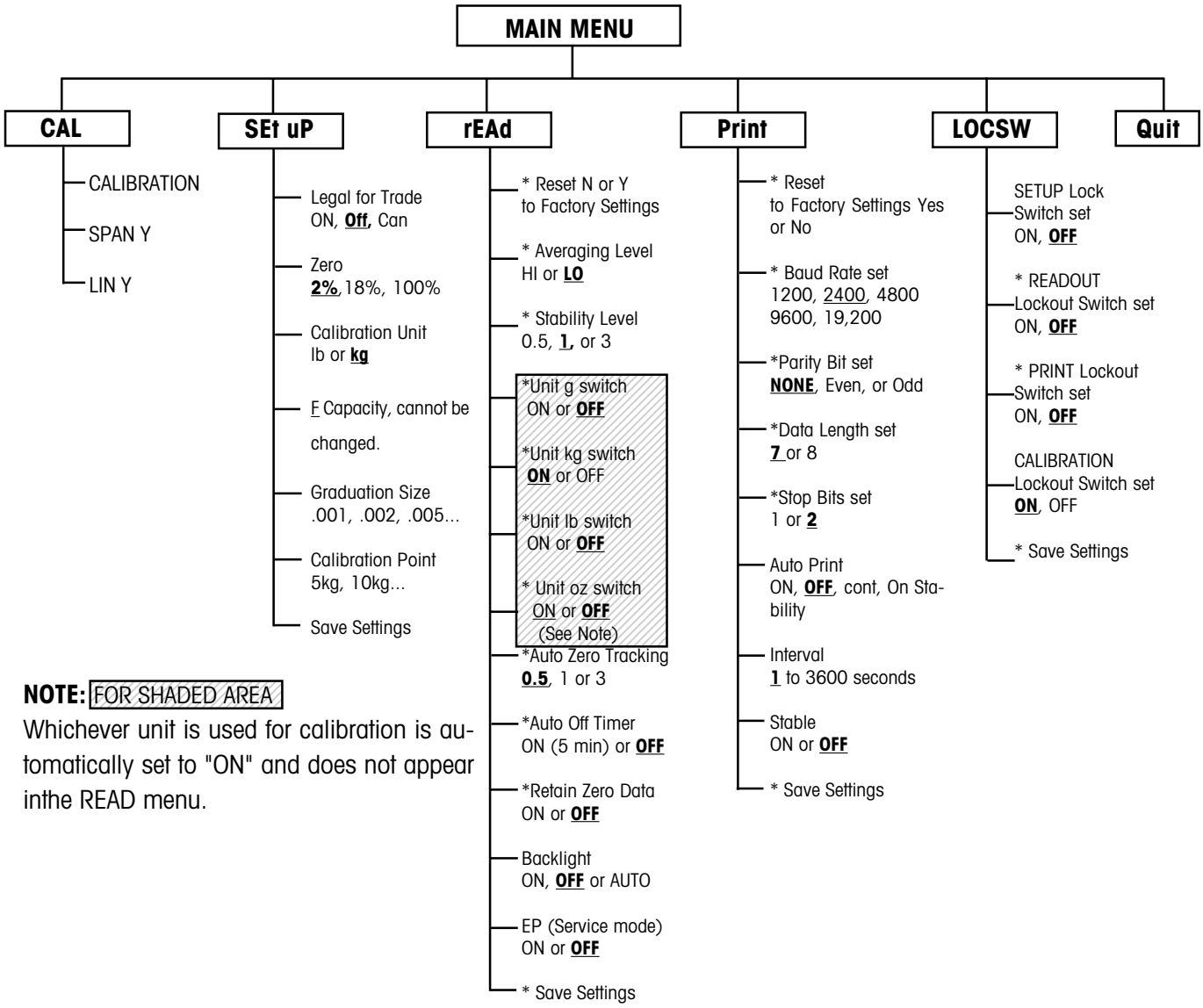
During setup, only the **PRINT/*UNITS*** and **G/N/T/*MENU*** buttons are used.

PRINT/*UNITS* Button
Change between menus horizontally or change sub-menu parameters.

G/N/T/*MENU* Button
Press and hold to enter menu. Enters menu and steps through sub-menus vertically.

4.4.2 Menu Structure

The following table illustrates the menu structure in the Trooper Scale.



NOTE: FOR SHADED AREA
Whichever unit is used for calibration is automatically set to "ON" and does not appear inthe READ menu.

Press **(G/N/T/*MENU*)** to enter the display submenu or select a displayed setting.

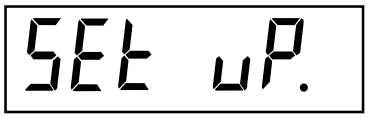
Press **(PRINT/*UNITS*)** to change the displayed submenu or setting.

Factory default settings are shown in **underlined and boldface** type.

When CAL switch on the circuit board is in the LFT position, all of the menus can be reached except CALIBRATION Menu, but only the submenus which are marked '*' can be setup, see menu structure.

4.4.3 Setup Menu

The Setup Menu is used to set up the Scale for the first time.



Procedure

With the Scale ON, press and hold the **G/N/T/*MENU*** button until MENU is displayed. When you release **G/N/T/*MENU*** button, SETUP is displayed when the CALIBRATION Lock Switch (software) is in the locked position. When the CALIBRATION Lock Switch is locked, the Scale **will not** permit calibration.

Press **PRINT/*UNITS*** button, SETuP is displayed.

Press **G/N/T/*MENU*** button, LFTOFF is displayed. Legal for trade selections are:

'LFT ON' - LFT is ON
'LFTOFF' - LFT is OFF
'LFTCAn' - LFT is set for Canada

Press **PRINT/*UNITS*** button and select either ON, OFF or Canada.

Press **G/N/T/*MENU*** button, 0 2 is displayed. This is the Zero 2%, 18% or 100% setting. 2% - zero operation range is - 2% to + 2%. 18% - zero operating range is - 2% to +18%, 100% - zero operation range is -2% to +100%.
NOTE: If LFT is ON, only 2% and 18% are available.

Press **PRINT/*UNITS*** button, and select either 2%, 18% or 100%.

Press **G/N/T/*MENU*** button, CAL Un kg is displayed. This is the calibration unit setting. Selections are:

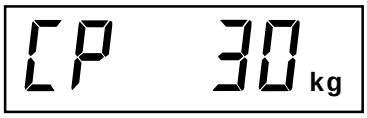
'lb' - calibration unit is lb
'kg' - calibration unit is kg.

Press **PRINT/*UNITS*** button, and select either kg or lb.

NOTE: The Scale is factory calibrated. After changing the calibration unit, the Scale must be recalibrated befoe using!

4.4.3 Setup Menu (Cont.)

Press **G/N/T/*MENU*** button, Gd 0.1 is displayed. This is the graduation size. For available selections, press **PRINT/*UNITS*** button until desired graduation value is reached.



Press **G/N/T/*MENU*** button, CP 30 kg is displayed. This is the full scale calibration point setting. Default is approximately 2/3 full scale capacity and can be selected depending upon the model.

Press **PRINT/*UNITS*** button until desired calibration value is reached.

Press **G/N/T/*MENU*** button to end this block, SAVE is displayed.

Press **G/N/T/*MENU*** button, rEAD is displayed which is the next menu or press **PRINT/*UNITS*** button to return to Setup menu.

4.4.4 Readout Menu

The Readout menu is used to adapt the Scale to environmental conditions, set measuring units on/off, auto zero tracking, timer on/off, retain zero data and backlighting. Review all of the settings available before proceeding.

Procedure

To select any of the items in the Readout menu, proceed as follows: **NOTE:** If you have entered from the preceeding menu, disregard the first step.

With the Scale ON, press and hold the **G/N/T/*MENU*** button until MENU is displayed. When you releasethe **G/N/T/*MENU*** button, CAL is displayed, then press **PRINT/*UNITS*** button, until rEAd is displayed.

Press **G/N/T/*MENU*** button, rESETn is displayed. This allows resetting the readout menu to factory defaults. rESETn = no and does not reset settings. rESETy= yes and will reset the entire readout menu as follows: AL Lo, StAb 1, Un Off g, Un On kg, Un On lb, Un Off oz, AZt 0.5, Aot Off, rZd Off and Backlight Off.

Press **PRINT/*UNITS*** button,and select N or Y.

AVERAGING LEVEL

Averaging level compensates for vibration or excessive air currents on the scale platform. During operation, the Scale continually takes weight readings from the load cell. Successive readings are then digitally processed to achieve a stabilized display. Using this feature, you specify how much processing you need.

HI and LO settings are available.
HI setting:
More processing, greater stability and slower stabilization time.

LO setting:
Less processing, less stability and faster stabilization time.

4.4.4 Readout Menu (Cont.)

Procedure

AVERAGING LEVEL (Cont.)

Press **G/N/T/*MENU*** button, AL LO is displayed. This is averaging level settings. Selections are:

'Lo' - Averaging level is low
'Hi' - Averaging level is high.

Press **PRINT/*UNITS*** button,and select LO or HI.

STABILITY

The stability range specifies the weighing results and must be within a preset tolerance limit for a certain time to turn the stability indicator ON. When a displayed weight changes beyond the allowable range, the stability indicator turns OFF, indicating an unstable condition. Factory default setting is shown in bold type.

.5d Smallest range: stability indicator is ON only when displayed weight is within .5 divisions.
1d Normal setting. - Fixed for LFT
3d More stable course

Press **G/N/T/*MENU*** button, StAb1 is displayed.The stability range specifies the weighing results and must b e within a preset tolerance limit for a certain time to turn the stability indicator ON. When a displayed weight changes beyond the allowable range, the stability indicator turns OFF, indicating an unstable condition. 0.5 d smallest range, stability indicator is ON only when displayed weight is stable within 0.5 divisions. 1 d-stable within 1 division. 3 d-largest range, stability indicator is ON even though displayed weight changes 3 divisions. Factory default setting is 1.

Press **PRINT/*UNITS*** button,and select 0.5, 1, or 3. Normal 1d stability is default/recommended.

4.4.4 Readout Menu (Cont.)

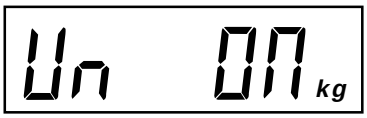
Procedure

UNITS SELECTION

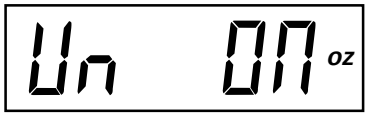
Press **G/N/T/*MENU*** button, Un OFF g is displayed.

Press **PRINT/*UNITS*** button, and select ON or OFF. OFF is the default setting.

Press **G/N/T/*MENU*** button, Un ON lb is displayed. This is unit pounds which can be turned ON or OFF. This will be displayed when CAL UNIT kg was selected. When lb was selected as calibration unit, kg will display.



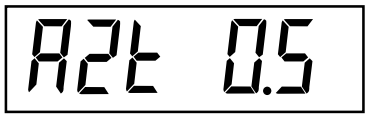
Press **PRINT/*UNITS*** button,and select ON or OFF. ON is the default setting.



Press **G/N/T/*MENU*** button, Un OFF oz is displayed. This unit is ounces which can be turned ON or OFF. Default setting is OFF.

Press **PRINT/*UNITS*** button,and select ON or OFF.

NOTE: If CAL Unit is kg, then UNIT kg is fixed to ON menu not shown. The same if CAL Unit is set to lb.



AUTO ZERO

Press **G/N/T/*MENU*** button, AZt 0.5 is displayed. This is the Auto Zero Threshold setting. Auto Zero minimizes the effects of temperature changes and small disturbances on the zero reading. The Scale maintains the zero display until the threshold is exceeded. Settings are shown as follows:

OFF
0.5d Sets threshold to 0.5 divisions. - Fixed in LFT
1d Sets threshold to 1 division.
3d Sets threshold to 3 divisions.
Factory default setting is 0.5d.

Press **PRINT/*UNITS*** button,and select either 0.5, 1 or 3.

4.4.4 Readout Menu (Cont.)

AUTO POWER OFF

Press **G/N/T/*MENU*** button, AOtOFF is displayed. This is the Auto Off Timer. When set ON, the Scale will shut off automatically after 5 minutes has elapsed based on the condition that no button is pressed and the scale platform is stable during that period.

Press **G/N/T/*MENU*** button,and select ON or OFF. OFF is the default setting.

RETAIN ZERO DATA

Press **G/N/T/*MENU*** button, Un rZdOFFis displayed. This is Retain Zero Data which can be turned on or off. When set On, the Scale stores the current zero point and restores it on the power-up.

Press **PRINT/*UNITS*** button, and select ON or OFF. OFF is the default setting.

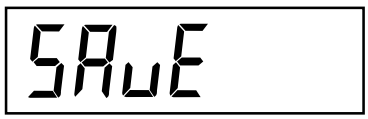
LCD BACK LIGHT

Press **G/N/T/*MENU*** button, bLAutOis displayed. You can select to have the LCD backlight either on contiuously, off or in an automatic mode which turns off the display in 5 seconds.

Press **PRINT/*UNITS*** button, and either select ON, OFF or Auto. Auto is the default setting.

EP

This is service function and is not a user operated command. OFF is the default setting.



SAVE

Press **G/N/T/*MENU*** button to end this block, SAVE is displayed. All settings are retained.

Press **G/N/T/*MENU*** button, setting are saved and PRINT is displayed which is the next menu or press **PRINT/*UNITS*** button to go back to Setup menu without saving.

NOTE: (If initial setup, go to the next paragraph. To exit from the Setup, press **PRINT/*UNITS*** button to skip to PRINT then to LOCKSW, then QUIT. Press **G/N/T/*MENU*** button to go back to the weighing mode).

4.4.5 Print Menu

The Print menu provides data communication settings which can be entered. It contains 9 submenus: Reset, Baud rate, Parity Bit, Data Length, Stop Bits, Auto Print, Interval, Stable and Save.

Procedure

PRINT

To select any of the items in the Print menu, proceed as follows: **NOTE:** If you have entered from the preceeding menu, disregard the first step.

With the Scale ON, press and hold the **G/N/T/*MENU*** button until MENU is displayed. When you release the **G/N/T/*MENU*** button, CAL is displayed, then press **PRINT/*UNITS*** button, until Print is displayed.

RESET

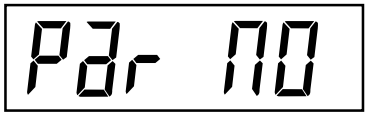
Press **G/N/T/*MENU*** button, rESEtn is displayed. This allows resetting the Print menu to factory defaults.
rESETn = no does not reset settings. rESETy = yes will reset the entire Print menu as follows:
Baud rate =2400, parity =none, data length=7,
stop bit=2.

Press **PRINT/*UNITS*** button, and select N or Y.

BAUD RATE

Press **G/N/T/*MENU*** button, bd2400 displayed.

Press **PRINT/*UNITS*** button, and select desired baud rate. Baud rate selections are: 1200, 2400, 4800 9600 and 19200. 2400 is the default setting.



PARITY

Press **G/N/T/*MENU*** button, PAr NO is displayed. This is the parity bit.

Press **PRINT/*UNITS*** button, and select desired parity of NO=none, Odd=odd, E=even. Default setting is none.

4.4.5 Print Menu

Procedure (Cont.)

DATA

Press **G/N/T/*MENU*** button, dAtA 7 is displayed. This is the data length.

Press **PRINT/*UNITS*** button, and select desired data length of 7 or 8. Default setting is 7.

STOP BITS

Press **G/N/T/*MENU*** button, StOP 2 is displayed. This is the stop bit.

Press **PRINT/*UNITS*** button, and select desired stop bit of 1 or 2. Default setting is 2.

AUTO PRINT

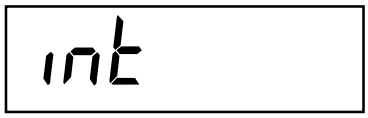
Auto print has settings which enables data to a printer or PC to be set Off, run continuously, at selected preset intervals or on stability. On stability will print first stable non-zero value after each change in weighing value.

Press **G/N/T/*MENU*** button, AP OFF is displayed.

Press **PRINT/*UNITS*** button, and select either Off, Continous, Interval or On Stability. Default setting is OFF.

INTERVAL - PRINTING

When interval has been selected in the previous step, you may now set an interval from 1 to 3600 seconds. If Interval was not selected, ignore these steps.



Press **G/N/T/*MENU*** button, int is displayed, after a few seconds, a second display appears which allows you to set in the time in seconds.

Pressing the **PRINT/*UNITS*** button advances the zero from left to right. Sample at left indicates 10 seconds.

NOTE: 0000 not valid.

4.4.5 Print Menu

INTERVAL - PRINTING (Cont.)

Pressing the **TARE** button increments the digit from 1 to 0. When the desired number of seconds have been entered, press the **G/N/T/*MENU*** button. Stb OFF is displayed.

STABLE

When set ON, allows only stable weight values to be printed. When set OFF, prints immediate value with an indication of stability. In LFT, fixed to ON.

With Stb OFF displayed, press **PRINT/*UNITS*** button, and select ON or OFF. Default setting is OFF.

SAVE

Press **G/N/T/*MENU*** button to end this block, SAVE is displayed. All settings are retained.

Press **G/N/T/*MENU*** button to save settings, LOCSW is displayed which is the next menu or press **PRINT/*UNITS*** button to go back to Read menu without saving.

NOTE: (If initial setup, go to the next paragraph. To exit from the Setup, press **PRINT/*UNITS*** button to skip to LOCKSW, then QUIT. Press **G/N/T/*MENU*** button to go back to the weighing mode).

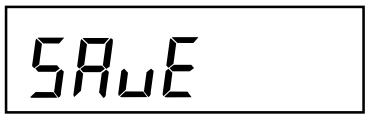
4.4.6 Lockout Switch Menu

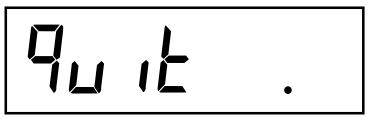
Lockout Switch menu (LOCSW) is a software controlled option which can lock the settings in the Calibration, Setup, Readout, and Print menus to prevent tampering. When used in conjunction with the Lock Switch on the printed circuit board, the Calibration, Setup, Readout and Print menus can be read only and not changed by an operator or the switch can be left in place and the LOCSW menu is used to prevent accidental changes..

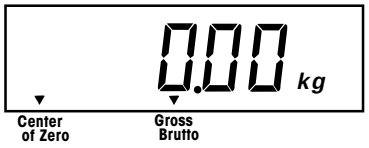
Procedure

To select any of the items in the Lockswitch menu, proceed as follows: **NOTE:** If you have entered from the preceeding menu, disregard the first step.

4.4.6 Lockout Switch Menu (Cont.)







Procedure (Cont.)

With the Scale ON, press and hold the **G/N/T/*MENU*** button until MENU is displayed. When you release the **G/N/T/*MENU*** button, CAL is displayed, then press **PRINT/*UNITS*** button, until LOCSW is displayed.

Press **G/N/T/*MENU*** button, LSTOFF is displayed. This permits locking the Setup menu. OFF is unlocked, ON is read only (locked). This menu is hidden if the CAL jumper is off.

Press **PRINT/*UNITS*** button, and select ON or OFF.

Press G/N/T/*MENU* button, LrdOFF displayed. This permits locking the Readout menu. OFF is unlocked, ON is read only (locked).

Press **PRINT/*UNITS*** button, and select ON or OFF.

Press **G/N/T/*MENU*** button, LPtOFF is displayed. This permits locking the Print menu. OFF is unlocked, ON is read only (locked).

Press **PRINT/*UNITS*** button, and select ON or OFF.

Press **G/N/T/*MENU*** button, LCLON is displayed. This permits locking the Calibration menu. OFF is un locked, ON is read only (locked). This menu ishidden if the LFT switch is in the LFT position.

Press **PRINT/*UNITS*** button, and select ON or OFF.

Press **G/N/T/*MENU*** button to end this block, SAVE is displayed.

Press **G/N/T/*MENU***, Quit is displayed.

Press **PRINT/*UNITS*** button to go to CAL or press **G/N/T/*MENU*** button, Scale returns to a weighing mode.

NOTE: At this point, the Lock Switch must be set in order to lock out the menus.

5. CALIBRATION AND SEALING

Span calibration ensures that the Scale reads correctly within specifications. For best results, calibrate at full capacity. Calibration unit can be set to either kg or lb.

NOTE: When the Scale is used in Legal for trade applications, the calibration menu is locked out and is not accessable. This is to prevent unauthorized personnel from changing calibration.

IMPORTANT:

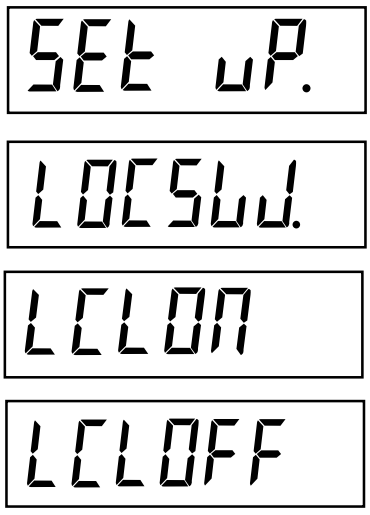
Before beginning calibration, make sure masses are available. If you begin calibration and realize calibration masses are not available, exit the menu. The Scale will retain previously stored calibration data. Calibration should be performed as necessary to ensure accurate weighing. You have a choice of either span or linearity calibration. Span calibration checks zero and full span calibration points. Linearity calibration checks zero, mid span and full span points.

Before calibrating the scale, first determine if a recalibration is really needed. Place the available calibration masses onto the platform. As each mass is added, the scale display should show the correct weight to within +/- 1 scale division. If the scale is within the tolerance, there is no need to recalibrate the scale.

If it is determined that the scale must be recalibrated **do not continue until you are certain that you have suitable calibration masses.**

If calibration masses are available you must select the correct calibration units (pound masses or kilogram masses) before calibrating the scale. The desired unit can be chosen in the setup menu on page 10.

After the desired calibration unit has been chosen, advance to the LOCSW menu to turn the calibration lock switch off. This software lock is in place to prevent accidental calibration.



Procedure

TURNING CALIBRATION LOCK SWITCH OFF

To turn the software lock off:

Press and hold the **G/N/T/*MENU*** button until MENU appears. Release it and SETuP appears. (if already in the main menu, skip to the next step).

Repeatedly press the **PRINT/*UNITS*** button until LOCSW is displayed.

Repeatedly press the **G/N/T/*MENU*** button until LCL ON is displayed.

Press the **PRINT/*UNITS*** button to scroll through the choices until LCLOFF appears.

Press the **G/N/T/*MENU*** button repeatedly until the scale returns to weighing

Before calibrating, make sure that you have the correct masses available:

5. CALIBRATION AND SEALING (Cont.)

Procedure (Cont.)
TURNING SOFTWARE LOCK OFF

Cal in kg:	Span cal choices	Linearity cal (fixed)
TR3RS	1, **2**, 3kg	2 & 3 kg
TR6RS	2, **4**, 6kg	4 & 6 kg
TR15RS	5, **10**, 15kg	10 & 15 kg
TR30RS	10, **20**, 30kg	20 & 30 kg
Cal in lb:	**Span cal choices**	**Linearity cal (fixed)**
TR3RS	2, **4**, 6 lb	4 & 6 lb
TR6RS	5, **10**, 15 lb	10 & 15 lb
TR15RS	10, **20**, 30 lb	20 & 30 lb
TR30RS	20, **40**, 60 lb	40 & 60 lb

For span calibration, there are a number of choices for calibration. The highlighted number is the default.

To change the span calibration value read the setup section of the menu on page 10. In the Setup menu, change the CP selection to the desired value.

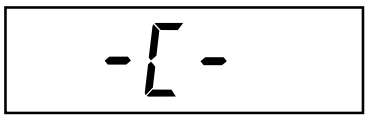
When the desired selection has been chosen and the masses are available, you are ready to begin the calibration routine.

Procedure

SPAN CALIBRATION

With the Scale ON, press and hold the **G/N/T/*MENU*** button until MENU is displayed. When you release t h e **G/N/T/*MENU*** button, CAL is displayed. If the display shows SETuP, read the section on turning off the Calibration Lock Switch or check the settings for legal for trade.

Press **G/N/T/*MENU*** button, SPAN Y is displayed.



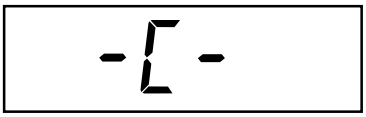
Press **G/N/T/*MENU*** button, -C- is displayed. The scale MUST be stable during this period and is establishing a zero point. After a few seconds, the requested weight value is displayed.

5. CALIBRATION AND SEALING (Cont.)

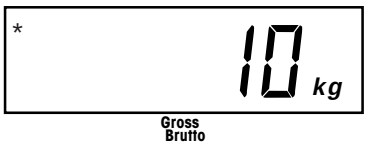
Procedure (Cont.)
SPAN CALIBRATION

Place the indicated mass on the platform. Keep the platform stable during this period. The sample illustration indicates a 15kg scale.

If at this point you are uncertain of the process or if the correct weights are not available, the calibration routine can be aborted by pressing the **PRINT/*UNITS*** button, or by turning the scale off by pressing and holding the **ON/ZERO/*OFF*** button.



Press **G/N/T/*MENU*** button, -C- is displayed while the Scale stores the reading and then displays the weight of the mass.



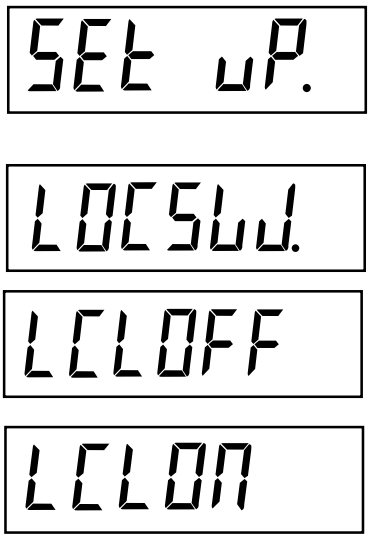
If the calibration was successful, the calibration mass is displayed and the calibration data is saved automatically. If unsuccessful, refer to the troubleshooting section.

Remove calibration masses from platform.

After the calibration routine is complete, check the scale again to see if the scale has been accurately calibrated. If so return to the lockout menu and restore the calibration software lock to "ON":

NOTE: If the Scale is to be used for legal for trade applications, it must be calibrated and the LFT Lock Switch must be set ON to lock out the menus. Refer to paragraph 5.1 for sealing for legal for trade use.

5. CALIBRATION AND SEALING (Cont.)



Procedure
TURNING CALIBRATION LOCK SWITCH ON
To turn the software lock on:

Press and hold the **G/N/T/*MENU*** button until MENU appears. Release it and SETuP appears. (if already in the main menu, skip to the next step).

Repeatedly press the **PRINT/*UNITS*** button until LOCSW is displayed.

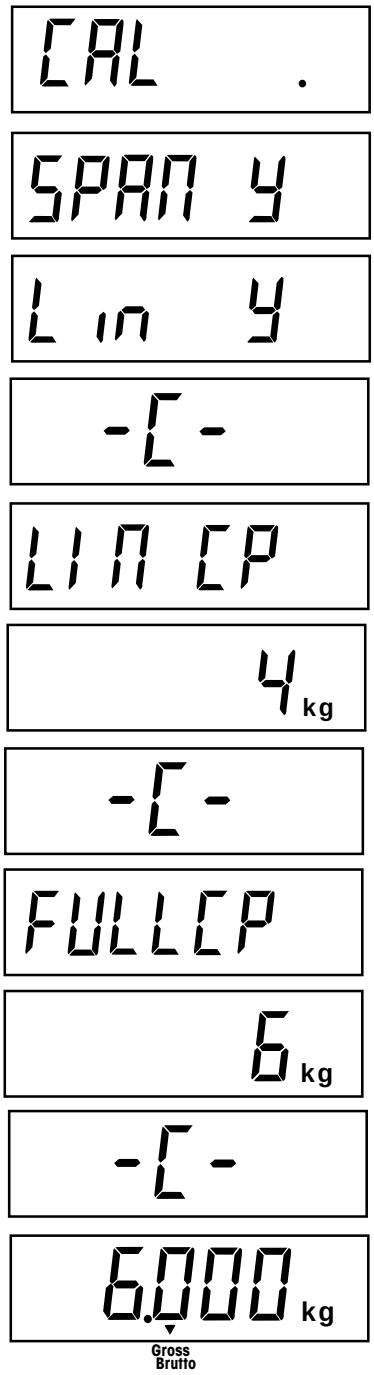
Repeatedly press the **G/N/T/*MENU*** button until LCL OFF is displayed.

Press the **PRINT/*UNITS*** button to scroll through the choices until LCLON appears.

Press the **G/N/T/*MENU*** button repeatedly until the scale returns to weighing

The scale is now ready for weighing.

5. CALIBRATION AND SEALING (Cont.)



Procedure

LINEARITY CALIBRATION

As with span calibration, confirm that calibration is really required. If required, refer to page 20 and turn the Calibration Lock Switch off.

With the Scale ON, press and hold the button **G/N/T/*MENU*** until MENU is displayed. When you release the **G/N/T/*MENU*** button, CAL is displayed.

Press **G/N/T/*MENU*** button, SPAN Y is displayed.

Press **PRINT/*UNITS*** button, Lin Y is displayed.

Press **G/N/T/*MENU*** button, -C- is displayed. The scale MUST be stable during this period and is establishing a zero point. After a few seconds, the display flashes LIN CP twice and the requested weight value is displayed. The sample illustration indicates a 4kg mid point for a 6kg scale. (Linearity calibration for Trooper is 0, 2/3 and full capacity).

Place the indicated mass on the platform. Keep the platform stable during this period.

Press **G/N/T/*MENU*** button, -C- is displayed. The scale MUST be stable during this period and is establishing a zero point. After a few seconds, the display flashes FULLCP and the requested weight value is displayed.

Place the indicated mass on the platform and press the **G/N/T/*MENU*** button -C- is displayed.

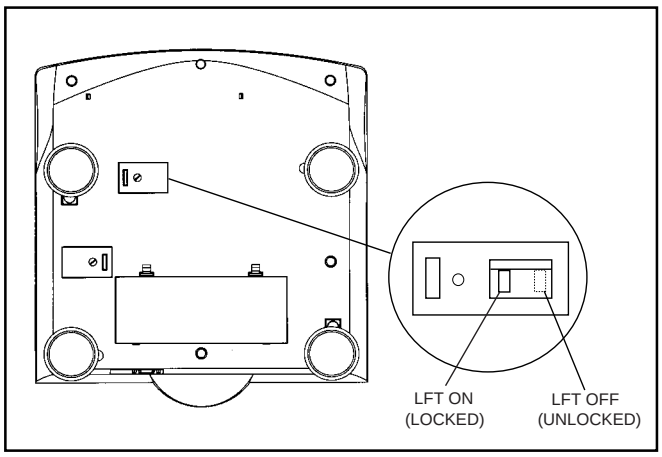
If linearity calibration was successful, the calibration mass is displayed and the calibration data is saved automatically. If unsuccessful, refer to the troubleshooting section.

Remove calibration masses from platform. After calibration, refer to page 19 and turn the Calibration Lock Switch On.

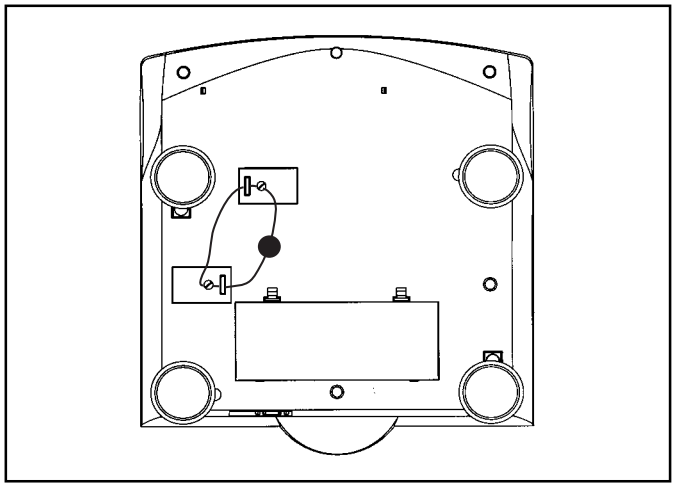
NOTE: If the Scale is to be used for legal for trade applications, it must be calibrated and the Lock Switch must be set to lock out the menus. Refer to paragraph 5.1 for sealing for legal for trade use.

5.1 Legal for Trade (LFT) Operation and LFT Sealing

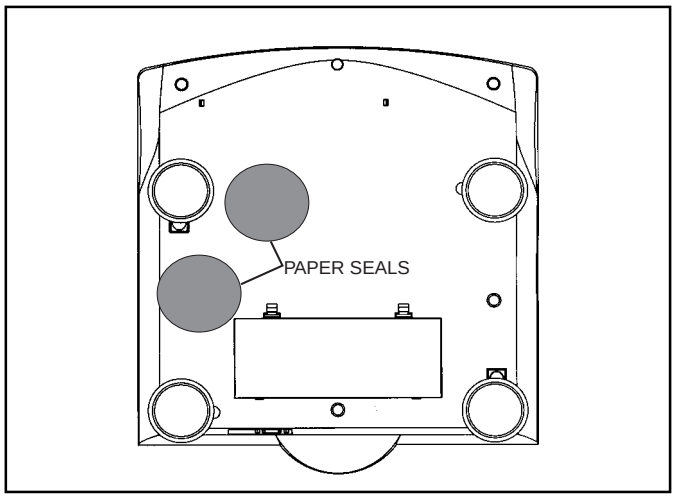
Legal for Trade (LFT) operation is possible through a LFT Lock Switch located on the PC board. The Scale must be calibrated prior to performing this proceedure.



Bottom of Trooper



Sealing the Scale with a Lead Seal



Sealing the Scale with a Paper Seal

Procedure

Set up Scale, and calibrate. After this is done, remove power from the Scale.

Turn the scale over in the position as shown and remove the Lock Switch cover plate.

Refer to the illustration at the left and notice the position of the LFT switch. To lock out the menus, slide the LFT switch to the position shown.

Replace the Lock Switch cover and housing screw cover. The two screws are cross drilled and can accept a wire seal.

NOTICE: The Trooper Scale has been tested and found to comply with Class III requirements of NIST Handbook 44.

After the Scale has been tested and found to comply with local applicable regulations by a local weights and measures official, it may be sealed as follows:

LEAD AND WIRE SEAL

See illustration atleft. Place wire seal through the holes in the screw and ribs as shown and compress the lead seal in place.

PAPER SEAL

If an audit trail or paper seal will be used, place a paper seal over both access covers.

6 CARE AND MAINTENANCE

To keep the Scale operating properly, the housing should be kept clean and free from foreign material. If necessary, a cloth dampened with a mild detergent may be used.

6.1 Troubleshooting

SYMPTOM	PROBABLE CAUSE(S)	REMEDY
Unit will not turn on.	Adapter not plugged in or properly connected.	Check power cord connections. Make sure adapter connector is plugged all the way into the Scale.
	Batteries dead or not properly installed.	Check battery connector. Check orientation of the batteries. Replace batteries.
	Membrane switch failure.	Check functions of membrane switch.
Cannot zero Scale, or will not zero when turned on.	Load on scale exceeds allowable zero % entered in ZERO parameter of Setup menu.	Remove load on scale to less than entered zero %. Change allowable zero % in ZERO parameter of Setup menu.
	Retain Zero Data is enabled in scale menu.	Normal operation when this feature is disabled.
Center of Zero display indicator erratic or does not appear with no load on scale platform.	Scale platform motion or disturbances exceed center of zero criteria.	Remove disturbances or reduce motion. Increase AZT level in readout menu. Increase averaging level in readout menu.

6 CARE AND MAINTENANCE (Cont.)

6.1 Troubleshooting (Cont.)

SYMPTOM	PROBABLE CAUSE(S)	REMEDY
Cannot display weight in desired weighing unit.	Desired unit not set to ON in Readout menu.	Enable desired unit in Readout menu. See paragraph 4.4.4 Conversion too large (typically in g).
RS232 not working.	RS232 communication parameters set up incorrectly. Improper or loose cable connections.	Verify communication parameters. Check cable connections.
Unable to calibrate unit.	Software Lockout switch set to ON and Lock Switch on the circuit board set to open position. Incorrect value for calibration mass.	Set LCL to OFF in the LocSW menu, and set Lock Switch on the circuit board to ON position. Refer to paragraph 4.4.6. Use correct calibration mass.

6.2 Error Codes List

The following list describes the various error codes which can appear on the display.

LoBat Is indicated when batteries are weak. Approximately 20 minutes of operating time remain.

Error 1 Indicates an overload condition.

Error 2 Indicates an underload condition.

Error 7 EEPROM data incorrect.

Error 14 Zero exceeds ZERO% and cannot be zeroed.

Err 21 Calibration data does not match current full scale, Grad and Cal Point settings. Settings must be restored or the Scale must be recalibrated using the current settings.

6.3 Service Information

If the Troubleshooting section does not resolve or describe your problem, you will need to contact an authorized Ohaus Service Agent. For Service assistance in the United States, please call Aftermarket, Ohaus Corporation toll-free at (800) 526-0659. An Ohaus Product Service Specialist will be available to help you.

6.4 Accessories

Description	Ohaus Part No.
RS232 Interface Cable/SF42 Printer	80500573
RS232 Interface Cable/PC 25 Pin	80500431
RS232 Interface Cable/PC 9 Pin	80500433
Printer	SF42

6.5 Technical Data

Materials

ABS Housing

Keypad/display overlay polyester

6.5 Technical Data (Cont.)

Standard Models	TR3RS	TR6RS	TR15RS	TR30RS
Default Capacity X Readability (lb)	6lb X 0.001lb	15lb X 0.002lb	30lb X 0.005lb	60lb X 0.01lb
Default Capacity X Readability (kg)	3kg X 0.0005kg	6kg X 0.001kg	15kg X 0.002kg	30kg X 0.005kg
Default Capacity X Readability (g)	3000g X 0.5g	6000g X 1g	15000g X 2g	30000g X 5g
Default Capacity X Readability (oz)	96oz X 0.02oz	240oz X 0.05oz	480oz X 0.1oz	960oz X 0.2oz
NTEP Capacity X Readability (lb)	6lb X 0.002lb	15lb X 0.005lb	30lb X 0.01lb	60lb X 0.02lb
NTEP Capacity X Readability (kg)	3kg X 0.001kg	6kg X 0.002kg	15kg X 0.005kg	30kg X 0.01kg
NTEP Capacity X Readability (g)	3000g X 1g	6000g X 2g	15000g X 5g	30000g X 10g
NTEP Capacity X Readability (oz)	96oz X 0.05oz	240oz X 0.1oz	480oz X 0.2oz	960oz X 0.5oz

General Specifications	
Platform Size (w x d) (in/cm)	13.5 X 9" / 34 X 23
Scale Dimensions (w x d x h) (in/cm)	13.5 X 14.5 X 4.5 / 34.3 X 36.8 X 11.4
Shipping Dimensions (w x d x h) (in/cm)	17 X 17 X 8.5 / 42.2 X 42.2 X 21.6
Weight (lb/kg)	8.6 / 3.9
Resolution NTEP	1:3000
Resolution Maximum	6,000 - 7,500 depending on model
Stabilization time	1 - 4 seconds depending upon filter selection
Keyboard	4 function membrane switches
Weighing units	lb, kg, g, oz
Display	Backlit LCD, 25.4mm, 1"
Power	AC Adapter or 6 alkaline C-type batteries
Typical Battery Life	Up to 100 hours
Span Calibration	1/3 to full capacity
Linearity Calibration (3-point calibration)	All models
Auto-zero tracking	Off, 0.5, 1, or 3 divisions
Construction	Stainless steel weighing pan, ABS plastic housing
Protection	IP43
Operating Temperature	41°F to 104°F / 5°C to 40°C
Storage Temperature	-40°F to 140°F / -40°C to 60°C

NOTE: All Trooper models meet the requirements of Approval Agencies: UL, FCC, CSA, CE. NTEP approval.

Ambient conditions

The technical data is valid under the following ambient conditions:

Ambient temperature 5°C to 40C / 41°F to104°F
Relative humidity 10%.....95%, noncondensing
Height above sea level up to 4000m

LIMITED WARRANTY

Ohaus products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period Ohaus will repair, or, at its option, replace any component (s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to Ohaus.

This warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than Ohaus. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by Ohaus Corporation. Ohaus Corporation shall not be liable for any consequential damages.

As warranty legislation differs from state to state and country to country, please contact Ohaus or your local Ohaus dealer for further details.