

# LaserLT-60 and LaserLT-100

Large-Display Weight Indicators  
Firmware Version: 8.05

## Technical Manual



LaserLT-60



LaserLT-100

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## Revision History

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This section tracks and describes the current and previous manual revisions for awareness of major updates and when the updates took place.

Revision	Date	Description
A	1/27/2021	Initial manual release with the launch of the product; firmware version 8.05
B	11/1/21	Updated wording in section 3.3 Updated part number of available firmware
C	03/24/2022	Added installation information

*Table i. Revision Letter History*



Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at [www.ricelake.com/training](http://www.ricelake.com/training) or obtained by calling 715-234-9171 and asking for the training department.

# Contents

<b>1.0</b>	<b>Introduction</b>	<b>1</b>
1.1	Safety	1
1.2	Product Dimensions	2
1.3	Product Displays	3
<b>2.0</b>	<b>Installation</b>	<b>4</b>
2.1	Electrical Precautionary Measures	4
2.2	Maximum Cable Length	4
2.3	Grounding the System	4
2.4	Wiring Schematic	5
2.5	Connection to the Load Cell	6
2.5.1	Input/Output Wiring	7
2.6	Basic Operation	7
2.6.1	Power Supply	7
2.7	Legal-for-Trade	8
2.7.1	LED Modification	8
2.7.2	Sealing	8
<b>3.0</b>	<b>Operation</b>	<b>10</b>
3.1	Power On	10
3.2	Standby	10
3.3	Power Off	10
3.4	Zero	10
3.5	Tare	10
3.5.1	Semiautomatic Tare	10
3.5.2	Manual Tare	10
3.5.3	Cancel a Tare	11
3.5.4	Locked or Unlocked Tare	11
3.6	Multi-Range Function	11
3.7	Display Configuration Data	12
3.8	Selecting the Channel to be Displayed	12
3.9	Simultaneous Transmitter Mode	13
3.10	Selecting Printing Functions	13
3.11	Selecting the Operating Mode	14
3.11.1	Conversion	14
3.11.2	Alibi Memory	14
3.11.3	Sensitivity Times Ten	15
3.11.4	Peak Hold Weight Detection	16
<b>4.0</b>	<b>Setup Mode</b>	<b>17</b>
4.1	Menu Navigation	17
4.2	Quick Setup Menu	18
4.2.1	Default Factory Calibration	18
4.2.2	Quick Scale Setup	19
4.2.3	Input Functions	19
4.2.4	Output Functions	19
4.3	Setup Mode Menu	20
4.3.1	Type Parameters	21



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4.3.2	F.Mode Parameters	21
4.3.3	Setup Parameters	22
4.3.4	Diagnostic Menu	23
4.4	Configuration Menu	24
4.4.1	Filter Parameters	26
4.5	Input/Output Functions	27
4.5.1	Inputs Functions	27
4.5.2	Output Functions	28
4.6	Audit Menu	30
4.6.1	Access the Audit Menu	31
<b>5.0</b>	<b>Calibration</b>	<b>32</b>
5.1	Calibration Menu	32
5.1.1	Calibration Parameters	33
5.2	Scale Configuration	34
5.3	Calibration Single Channel (Known Weight)	34
5.4	Calibration Multi Channel (Known Weight)	35
5.5	Calibration With Linearization Points	35
5.5.1	Dependent Channels	35
5.5.2	Independent Channels	36
5.6	Theoretical Calibration	37
5.6.1	Independent Channels	37
5.6.2	Dependent Channels	37
5.7	Gravity Setting	39
5.8	Zero Dead Load A/D Counts	39
<b>6.0</b>	<b>Communications</b>	<b>40</b>
6.1	Serial Outputs	40
6.1.1	COM1 Serial Port	40
6.1.2	COM2 Serial Port	40
6.2	Serial Port Transmission Modes	41
6.2.1	PC Port Selection	41
6.2.2	PRN PORT	42
6.2.3	PC PORT	43
6.3	Serial Commands Format	44
6.4	Transmission Protocols	49
6.4.1	Standard String	49
6.4.2	Extended String	49
6.4.3	Multi-Scale String	50
6.4.4	Secondary Mode Strings	50
6.5	Connection to a Remote Display	51
<b>7.0</b>	<b>Troubleshooting</b>	<b>52</b>
<b>8.0</b>	<b>Specifications</b>	<b>53</b>
8.0	FCC Compliance	53



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# 1.0 Introduction

The purpose of this manual is to help the technician understand the LaserLT-60 and LaserLT-100 Large-Display Weight Indicator functioning modes, key functions, display indications, setup and configuration. Configuration and calibration of the indicator can be accomplished by pressing the indicator front panel keys, the serial command set or the RLTools utility. The LaserLT-60 and LaserLT-100 Large-Display Weight Indicators are designed to work with up to 4 load cells in either a dependent or independent channel mode.



Note

*The LaserLT-60 and LaserLT-100 require firmware version 8.05 to operate as a weight indicator. Firmware can be downloaded from the product page at [www.ricelake.com](http://www.ricelake.com) and a replacement board (PN 206796) is also available with the weight indicator firmware version 8.05 already installed.*



Manuals and additional resources are available from Rice Lake Weighing Systems at [www.ricelake.com/manuals](http://www.ricelake.com/manuals)

Warranty information can be found on the website at [www.ricelake.com/warranties](http://www.ricelake.com/warranties)

## 1.1 Safety

### Safety Signal Definitions:



**DANGER**

*Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. Includes hazards that are exposed when guards are removed.*



**WARNING**

*Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.*



**CAUTION**

*Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.*



**IMPORTANT**

*Indicates information about procedures that, if not observed, could result in damage to equipment or corruption to and loss of data.*

### General Safety



*Do not operate or work on this equipment unless this manual has been read and all instructions are understood. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Rice Lake Weighing Systems dealer for replacement manuals.*



*Failure to heed could result in serious injury or death.*

#### **Electric shock hazard!**

*There are no user serviceable parts. Refer to qualified service personnel for service.*

*The unit has no power switch, to completely remove power from the unit, disconnect the power source.*

*For pluggable equipment the socket outlet must be installed near the equipment and must be easily accessible.*

*Always disconnect from main power before performing any work on the device.*

*Do not allow minors (children) or inexperienced persons to operate this unit.*

*Do not operate without all shields and guards in place.*

*Do not use for purposes other than weighing applications.*

*Do not place fingers into slots or possible pinch points.*

*Do not use this product if any of the components are cracked.*

*Do not make alterations or modifications to the unit.*

*Do not remove or obscure warning labels.*

*Do not use near water, avoid contact with excessive moisture.*

## 1.2 Product Dimensions

Product	Dimensions
LaserLT-60	
LaserLT-100	
Standard Mounting Bracket for LaserLT-60 and LaserLT-100	
Optional Side Mount Bracket for LaserLT-100	

Table 1-1. Product Dimensions



### 1.3 Product Displays

The front panel of the LaserLT-60 Weight Indicator has a six digit display that is 2.4" high, six LED annunciators and five function keys.

The front panel of the LaserLT-100 Weight Indicator has a six digit display that is 3.9" high, six LED annunciators and five function keys.

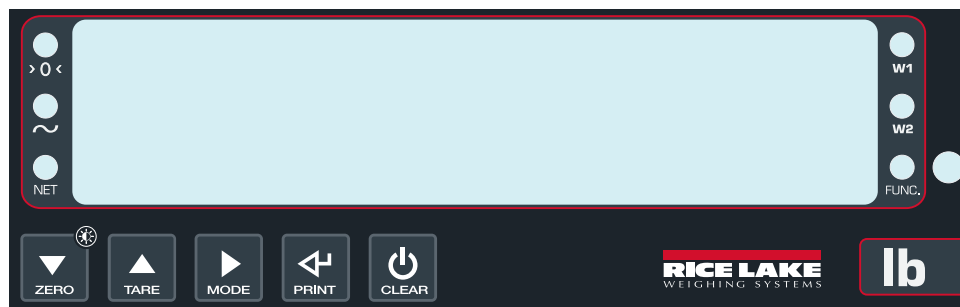


Figure 1-1. LaserLT-60 Weight Indicator Front Panel

The following table describes the function keys:

Key	Description
ZERO	Zero – Clears the displayed gross weight of up to $\pm 2\%$ of the total capacity; Cancels tare; At power up – Momentary press during startup displays current settings (Section 3.1 on page 10); In setup – Scroll through parameters; In numeric input – Decreases the digit to be modified; To modify display intensity press and hold until $LINT \ 01$ (Lint 01) displays then press again to increment the display intensity from $LINT \ 01 - LINT \ 05$ (Lint 01 – Lint 05)
TARE	Tare – Momentary press executes semiautomatic tare; Cancels tare; At power up – Momentary press during startup displays <b>Setup</b> mode (Section 4.1 on page 17); Long press allows for entering a manual tare from the keyboard; In setup – Scroll through the parameters; In numeric input – Increases the digit to be modified
MODE	Mode – Executes a specific function (set in the <b>Setup</b> mode) (Section 3.11 on page 14); Long press allows for toggling the displayed channel (if configured in <b>Independent Channels</b> mode ( $IND \ CH$ )); At power up – Momentary press during startup displays quick <b>Setup</b> menu (Section 4.2 on page 18); In setup – Enter into a parameter or to confirm a setting; In numeric input – Confirms the entry made
PRINT	Print – Executes a specific function (set in the <b>Setup</b> mode) (Section 4.4.1 on page 26); Executes a printout or transmission of data from the serial port dedicated to the printer; In setup – Enter into a parameter or to confirm a setting; In numeric input – Confirms the entry made
CLEAR	Clear (Power On/Off) – Turns the instrument on and off; In setup – Press multiple times to display <b>SRUP</b> and/or press to exit a step without confirming the setting; In numeric input – Momentary press clears the present value; Long press beyond $OFF$ – Displays information of the scale (capacity, division, minimum weight for each configured range, gravitational acceleration value, number of configured channels)

Table 1-2. Front Panel Key Descriptions

The following table describes the function LEDs:

Annunciator	Description
>0<	Illuminates when the weighing system is within $\pm 1/4$ division of zero
~	Illuminates when the weight is unstable
Net	Illuminates when a tare is established, measuring net weight
W1	Indicates the activation of the first output (Sp1)
W2	Indicates the activation of the second output (Sp2)
Func	Illuminates: <ul style="list-style-type: none"> <li>When the specification function of the instrument is active (set in <math>F \ 10dE \rightarrow \ FUNC</math> parameter)</li> <li>When a key is pressed</li> </ul> Turns off: <ul style="list-style-type: none"> <li>When the specification function of the instrument is disabled with an active function</li> <li>Blinking indicates instrument function is active for five seconds</li> </ul>

Table 1-3. LED Annunciator Descriptions



**Note** Net, W1 and W2 require setting values in  $RdU \ 1Ed$ . The labeled default unit of measurement is pound. A kilogram sticker label is provided with the unit to indicate a change in units of measurement. Stickers for unit of measurement are provided to replace W1 and W2 function LED labels.

## 2.0 Installation

This section provides an overview of LaserLT-60 and LaserLT-100 Weight Indicator installation.

Install the instrument on a stable, vibration free, flat surface. Disconnect from power source to completely power off the instrument. The back mounting bracket is for vertical mounting. An optional side mount for horizontal surfaces is available for the LaserLT-100.

**IMPORTANT** Remove protective film from the overlay as it may become difficult to remove if exposed to heat or sunlight.

### 2.1 Electrical Precautionary Measures

**IMPORTANT** The following electrical precautionary measures must be considered when installing this equipment:

- Main power supply must be maintained within  $\pm 10\%$  of the rated voltage
- Electrical best practices must be observed by the installing technician
- Follow recommended minimal separation distances given for cable categories, See [Section 2.2](#)
- The extension leads of the load cells, or signal amplifiers connecting to the serial ports and analog output, must be within stated maximum lengths, See [Section 2.2](#)
- It is recommended that load cell cables are shielded and run in conduit at an acceptable distance from power transmission lines to avoid signal interference and signal noise
- All cable not in conduit or otherwise shielded should be of minimal length and terminated as close to conduit exit as possible to avoid extraneous signal noise
- Install RC filters on the contact coils, solenoid valves and all devices producing electric fields
- It is recommended to leave the instrument powered on at all times to avoid condensation forming on the inside of the instrument

### 2.2 Maximum Cable Length

#### Load Cell Cable

The maximum length of a standard load cell cable with sense wires is:

- 150 ft (45.72 m) at 30#AWG
- 300 ft (91.44 m) at 24#AWG

#### RS-232 Cable

The maximum length of the RS-232 cable is 50' with a maximum baud rate of 19200.

#### RS-485 Cable

The maximum RS-485 cable length is 4000'.

#### Analog Output Cable

The maximum length of the analog current output cable at 4-20mA is 300'.

The maximum length of the analog voltage output cable at 0-10VDC is 150'.

### 2.3 Grounding the System

A centrally located, single point ground, such as the ground bar of the electric panel, must be created and/or identified for proper grounding and functioning of the system. The ground must be sized so that the total resistance of grounding is lower than 1 $\Omega$ . Connect grounding points of all instrumentation, load cells and weighing structure to this single point ground.

## 2.4 Wiring Schematic

For proper device wiring, refer to Figure 2-1 and Table 2-1.

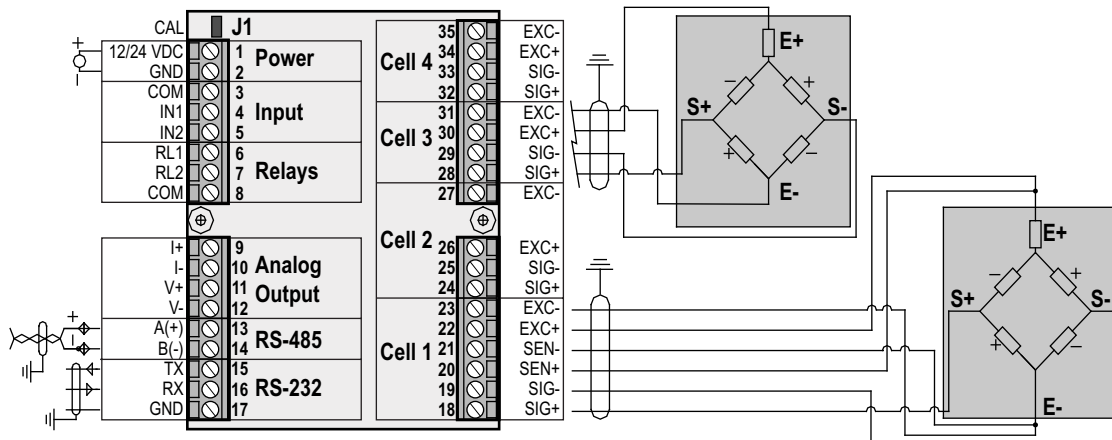


Figure 2-1. Wiring Schematic

Pin Number	Label	Description	Pin Number	Label	Description	Pin Number	Label	Description	Pin Number	Label	Description
<b>VE 12-24 VDC Power Supply</b>											
1	+VDC	+12-24 VDC									
2	GND	0VDC (GND)									
<b>Inputs and Outputs</b>											
Optoisolated Inputs Positive Logic (12-24VDC, 5-20mA max)											
3	COM	Common Output									
4	IN1	Input 1									
5	IN 2	Input 2									
<b>Relays</b>											
6	RL1	Relay 1									
7	RL2	Relay 2									
8	COM	Common Relay									
<b>Analog Output</b>											
Voltage											
9	I+	+20mA									
10	I-	-0mA (GND)									
Current											
11	V+	+10V									
12	V-	0V (GND)									
<b>Serial Port</b>											
<b>RS-485</b>											
13	(A) 485 + Line										
14	(B) 485 - Line										
<b>RS-232</b>											
15	TX	Transmission									
16	RX	Reception									
17	GND	Ground									
<b>Load Cell 1</b>											
18	SIG+	Signal +									
19	SIG-	Signal -									
20	SEN+	Sense +									
21	SEN-	Sense -									
22	EXC+	Excitation +									
23	EXC-	Excitation -									
<b>Load Cell 2</b>											
24	SIG+	Signal +									
25	SIG-	Signal -									
26	EXC+	Excitation +									
27	EXC-	Excitation -									
<b>Load Cell 3</b>											
28	SIG+	Signal +									
29	SIG-	Signal -									
30	EXC+	Excitation +									
31	EXC-	Excitation -									
<b>Load Cell 4</b>											
32	SIG+	Signal +									
33	SIG-	Signal -									
34	EXC+	Excitation +									
35	EXC-	Excitation -									

Table 2-1. LaserLT-60 and LaserLT-100 Wiring Schematic



**Note** The maximum resistance applicable on the output current is 350 Ω and the minimum resistance applicable on the output voltage is 10 kΩ.

## 2.5 Connection to the Load Cell

The load cell 1 terminal board of the LaserLT-60 and LaserLT-100 must be connected to the 6-wire load cell; if using a 4-wire load in the load cell 1 terminal board, cell excitation must jumper to sense, see Figure 2-2. Load cells 2, 3, and 4 must be connected to 4-wire load cells, see Figure 2-3.

**IMPORTANT**

*Sense is always enabled and, when not using 6-wire load cell, the sense terminals must be jumpered to the same polarity excitation wires.*



**Note**

*Sense compensates for drops in voltage along the cable that connects the instrument to the load cell. Voltage is lost when the instrument and the load cell are greater than 30 ft apart. A cable is typically provided with a load cell. When exceeding the length of the provided load cell cable, six wires must be used to compensate for voltage drop. It is recommended to never cut or shorten the load cell cable.*

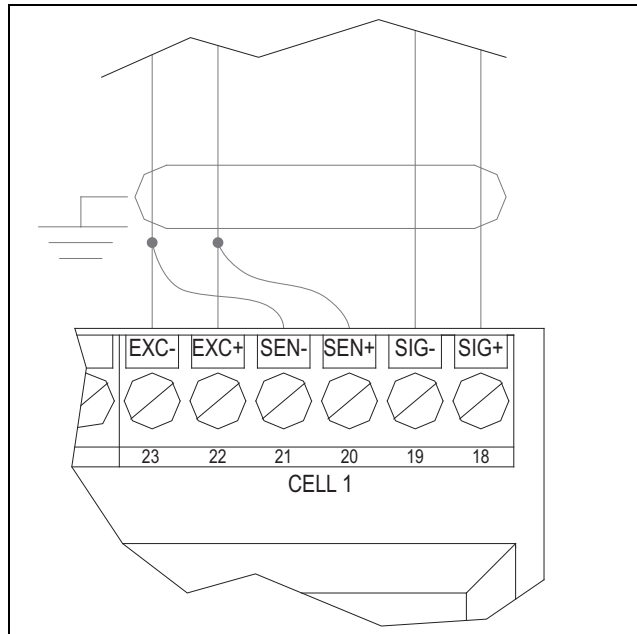


Figure 2-2. Jumpered 6-Wire Connect

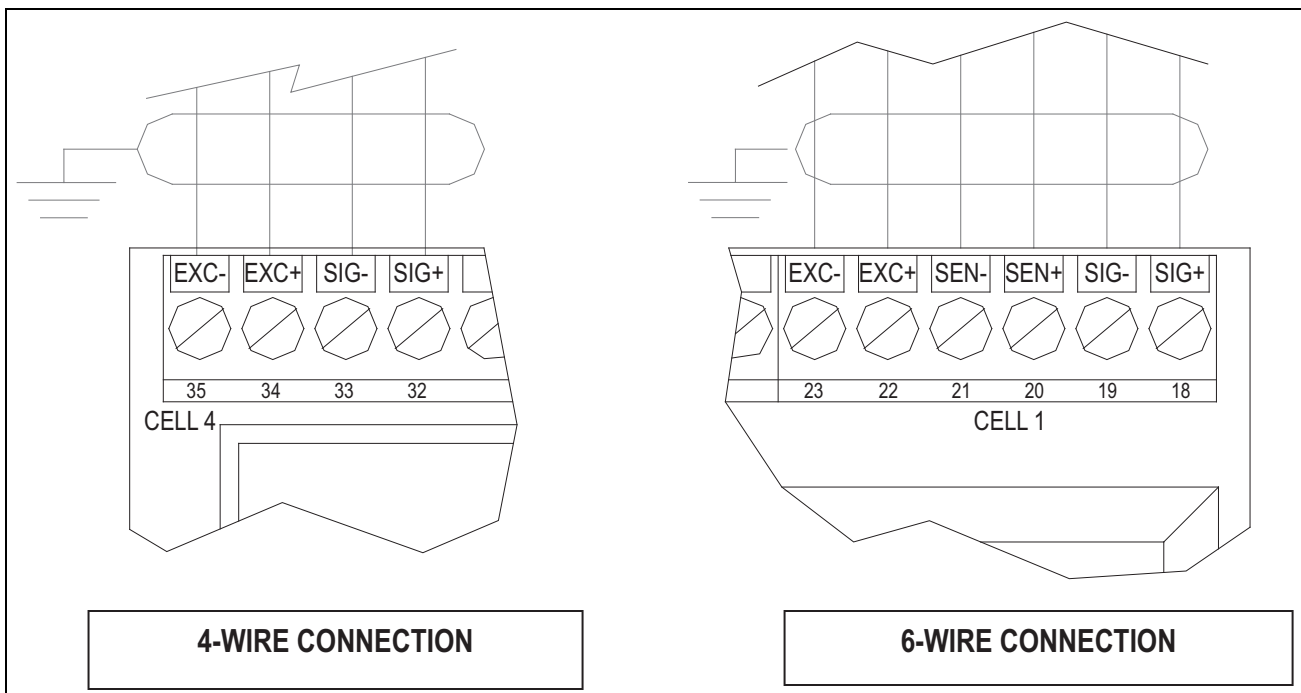


Figure 2-3. 4- and 6-Wire Connections

## 2.5.1 Input/Output Wiring

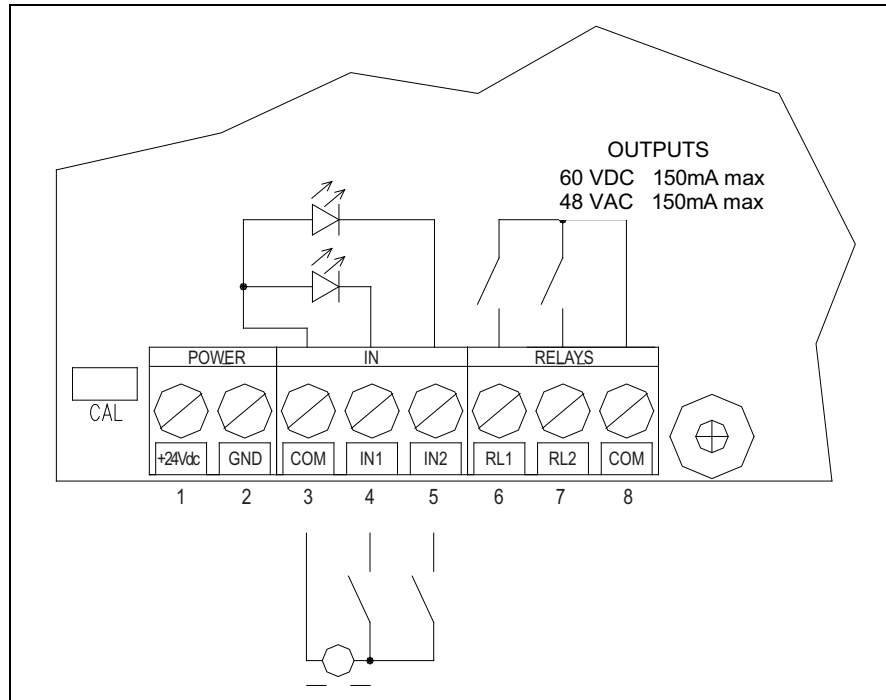


Figure 2-4. Input/Output Wiring

- Output power: 48 VAC, 150 mA max (or 60 VDC, 150 mA max)
- Input voltage: 12 VDC - 24 VDC max
- Input current: 5 mA min - 20 mA max

## 2.6 Basic Operation

Power must be provided to the LaserLT through an external AC/DC charger that supplies a stabilized voltage of 12 VDC to 24 VDC while connected to an appropriately rated AC power supply. Connect the two power supply wires to the appropriate terminals on the side of the instrument.

### 2.6.1 Power Supply

The instrument is supplied with an AC power cord, connected to an internal AC/DC power adapter. To power the instrument with 12 VDC or 24 VDC, connect the power supply cable directly to the terminal strip on the CPU board, see J1 in [Figure 2-1 on page 5](#). This input is for static DC, not for an automotive source.

The maximum power of the outputs 48 VAC 0.15A max (or 60 VDC 0.15 A max), the maximum voltage applicable to the inputs is between 12 VDC and 24 VDC with current from minimum 5 mA to maximum 20 mA.

## 2.7 Legal-for-Trade

In Legal-for-Trade applications, it is necessary to modify and seal the unit.

### 2.7.1 LED Modification

Cover the lower LED of each decimal separator with black epoxy or equivalent.



**Note**

**Do not cover or block the upper LED. Each digit must show a period.**

**If any digit displays a coma while powered on the device is not Legal-for-Trade.**

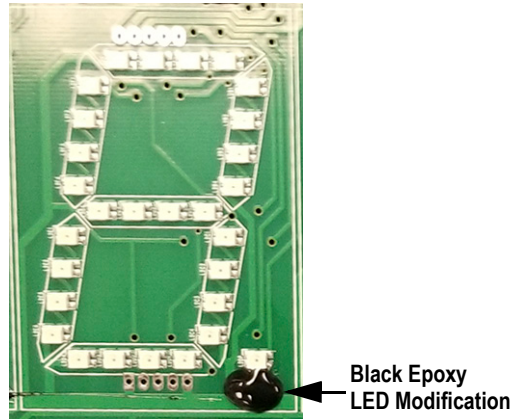


Figure 2-5. Black Epoxy LED Modification

### 2.7.2 Sealing

In certain Legal-for-Trade applications, it is necessary to seal the unit to restrict access.

Seal the LaserLT-60 and LaserLT-100 Weight Indicators as shown below:



**Note**

**For proper sealing, four standoff screws (PN 202259) (not provided) are required.**

1. Remove the four corner screws of the unit.
2. Install four standoff screws (PN 202259) (not provided) where the four corner screws have been removed in [Step 1](#).
3. Feed sealing wire through two standoff screws located on the same side of the unit.
4. Crimp the sealing wire for proper sealing.
5. Repeat for the other side of the unit.

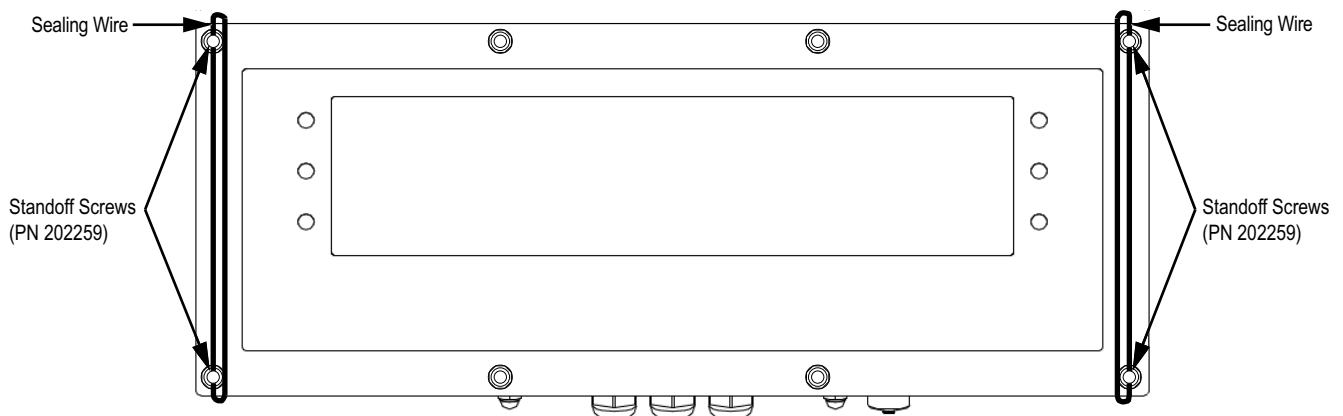


Figure 2-6. LaserLT-60 Weight Indicator Four-Point Sealing Method

Seal the LaserLT-100 Weight Indicator as shown below:

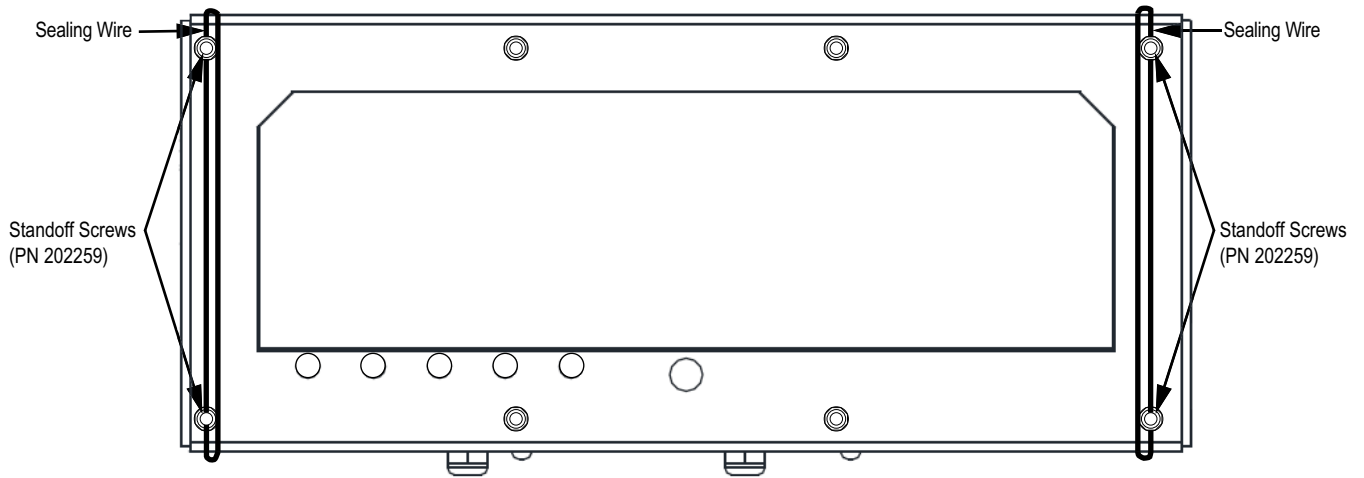


Figure 2-7. LaserLT-100 Weight Indicator Four-Point Sealing Method

## 3.0 Operation

This section provides an overview of LaserLT-60 and LaserLT-100 Weight Indicator operation.

### 3.1 Power On


Press  until the unit powers on. The unit executes a start up procedure and displays the installed software version.

An auto zero function zeros the instrument at startup if the weight detected on the scale is  $\pm 10\%$  of the capacity. If the weight is not within this tolerance the instrument displays  $ZE-0$  and, after 10 seconds, the current weight is displayed.



**Note** *The auto zero function at startup can be disabled in the Setup mode.*

See  $SEtUP \rightarrow CONF \rightarrow PRAN \rightarrow Auto-0$  in [Table 4-6 on page 24](#).

To view the following settings momentarily press  while the display self-check is running:

- $HH.YY-HH$  – The software release and  $YY$  is the sub release
- $HH.YY-HH$  – Indicates the type of instrument,  $YY$  indicates the software version
- $HH.YY.ZZ$  – The installed software version
- $HHHHHH$  – The name of the installed software
- $HHH.HHH$  – Capacity and division of channel 1
- $h.rE5$  – Displayed together with the gravitational acceleration value of the area of use

The instrument then executes a self-check.


### 3.2 Standby

Press then hold  until  $OFF$  displays. The LED at the left of the display remains on.

### 3.3 Power Off


To completely power off the unit, remove the power supplied voltage.

### 3.4 Zero

Press  to zero a gross weight within  $\pm 2\%$  of the total capacity (or as set). Weight value displays as 0 and the relative annunciators illuminate.






### 3.5 Tare

#### 3.5.1 Semiautomatic Tare

Press  to tare the weight value on the scale.  $TR-E$  displays momentarily then 0 displays (net weight). The relative annunciators illuminate.

#### 3.5.2 Manual Tare

Press  for a few seconds.  $-EN-$  displays and then  $000000$ . Enter the desired tare value with the following keys:

-  selects the digit to be modified (moves left to right, selected digit blinks)
-  decreases the blinking digit
-  increases the blinking digit
-  momentary press clears the present value, long press returns to the **Weigh** mode without saving changes
-  confirms the entered tare value

The tare value is subtracted from the weight on the scale and the relative annunciators illuminate.






**Note** *The entered tare will be rounded off to the nearest division.*



### 3.5.3 Cancel a Tare











A tare value can be manually canceled in multiple ways:

- Unload the scale and press  or 
- Press  without unloading the scale
- Enter a manual tare equal to zero

### 3.5.4 Locked or Unlocked Tare

When a tare value is entered manually, automatically or from storage the tare value displays with a negative sign when the scale is unloaded. This is known as a locked tare. An unlocked tare is automatically canceled each time the scale is unloaded.

To set the tare type:

1. Turn on the instrument and press  while the firmware version displays. *F.10dE* displays.
2. Press  to enter the menu.
3. Press  or  until *LR-E* displays. Press  to select.
4. Press  or  to scroll through options.
  - *LoEH* – Locked tare
  - *unLoEH* – Unlocked tare
  - *dLSAb* – Disable tare
5. Press  to confirm selection.
6. Slowly press  multiple times until *SAVEP* displays.
  - Press  to confirm and store to the instrument memory
  - Press any other key to cancel and exit without saving

## 3.6 Multi-Range Function

The multi-range function allows for subdividing the scale capacity in two, each up to 3000 divisions.

*Example: With a 10 kg cell platform it is possible to approve the weighing system with:*

*Single Range: 6 kg capacity and 2 g division (3000 div.)*

*Dual Range: 6/3 kg capacity and 2/1 g division (3000 + 3000 div.)*



**Note**

**Multi-range functioning is indicated by illumination of the relative LED identifying the operating range. When the weight on the scale enters into the second range, the division of the second range is enabled. The first range division is restored only when the weight on the scale goes below the gross zero of the scale.**

**The selection of the range number with multi-range functioning is made during the instrument's calibration (Section 5.0 on page 32).**

### 3.7 Display Configuration Data

The  $\text{INF}$  function makes it possible to view the configuration data:

- First range capacity, first range minimum weight, first range division
- Second range capacity, second range minimum weight, second range division (if set)
- Gravitational Acceleration Value









**Note**

*The minimum weight corresponds to 20 net weight divisions.*


*The data of the second range appears only if a range is configured.*

To view the configuration data:

1. Press and hold  until  $\text{INF}$  displays.
2. Release . The capacity value of the first range displays. Press  or  to scroll forward or back through the following data.
  - First range capacity (CH 1.PRH)
  - First range minimum weight (CH 1.N W)
  - First range division (CH 1.E)
  - Second range division (CH 2.PRH)
  - Second range minimum weight (CH 2.N W)
  - Second range division (CH 2.E)
  - Gravitational Acceleration Value (GRAV. V)
  - Number of Configured Channels (CONF. CH)
3. Press  to return to the **Weigh** mode.


Pressing  when information of the currently active channel is displayed allows for the data of the other configured channels to be viewed. This selects and pauses the information for each channel, otherwise the information automatically cycles through all channels.



*Example: If channels 2 and 3 are configured, for the maximum capacity of the 1st range:*

*1st range capacity channel 1 (1 CH 1.PRH). Press . 1st range capacity channel 2 (CH 2.PRH).*

*Press . 1st range capacity channel 3 (CH 3.PRH).*

### 3.8 Selecting the Channel to be Displayed

When indicator has multiple scale channels configured in  $\text{LRAN}$  type mode or  $\text{IND. CH}$  type mode, it is possible to select the channel to be displayed using . See [Section 4.3.1 on page 21](#) for configuring type parameters. See [Section 4.4 on page 24](#) for configuring the number of channels.

1. Press and hold . The currently selected channel displays first followed by  $\text{CHRN}$  momentarily. A menu of available channels displays.
2. Select the channel to be displayed. Press  to confirm.






### 3.9 Simultaneous Transmitter Mode

The **Transmitter** mode makes it possible to have simultaneous transmission of the values on each single channel via the serial line. In addition, through the optional alibi memory board, the transmitted weight values can be stored in a computer for data processing and/or integration. The filed values can then be recalled from the PC serial line or directly on the instrument's display. See [Section 4.3.1 on page 21](#) for configuring type parameters and [Section 4.4 on page 24](#) for configuring the number of channels.




**Note** In this mode the zero tracking and the scale keys ,  and  are disabled. It is not possible to set functioning modes and the Aibi mode is set automatically.

To set the **Transmitter** mode:


1. Power on the instrument and press  while firmware version displays. *TYPE* displays.
2. Press  to enter the menu.
3. Navigate until *TRAN* displays. Press  to select.
4. Press  multiple times until *SAVEP* displays. Press  to confirm.

#### Operation

In the simultaneous **Transmitter** mode it is possible to view the weighing information. See [Section 3.11.2 on page 14](#) regarding Reviewing Stored Weigh Information.












- Press  to switch channels, if the scale is configured as multichannel
- Only functions which can be enabled through serial commands can be performed; Not all serial commands can be performed ([Section 6.3 on page 44](#)); It is not possible to carry out other operations in simultaneous **Transmitter** mode
- The list of usable serial commands includes: **PID, ALRD, ALDL, VER, REXT, REXTA, READ, MVOL, RAZF, CGCHN, ECHO, DISP, DINT, PCOK, STAT, KEYP, KEYR, KEYEE, KEYED**



**Note** Pressing simulation of the scale keys through the **KEYP** and **KEYR** commands allows for management of the functions linked to .

### 3.10 Selecting Printing Functions







Use the following procedure below to set printing functions ([Section 4.3.2 on page 21](#)):

1. Turn on the instrument and press  while the firmware version displays. *F. ModE* displays.
2. Press  to enter the menu.
3. Press  or  until *REACT* displays. Press  to enter the menu.
4. Press  or  to scroll through the options.
  - *ZERO* – Rearms print at zero; Only prints after rearming
  - *STB* – Rearms print when weight becomes stable
  - *ALWAYS* – Prints when  is pressed, regardless of condition
5. Press  to confirm.
6. Slowly press  multiple times until *SAVEP* displays.
  - Press  to confirm and store to the instrument memory
  - Press any other key to cancel and exit without saving

## 3.11 Selecting the Operating Mode




In addition to the **Standard Weighing** mode, the instrument can be set to carry out four alternative operational functions. Each operating mode activates certain LEDs.

To set the operating mode:

1. Turn on the instrument and press  when firmware version displays then *F. ModE* displays.
2. Press  to enter the menu.
3. Navigate to *Funct.* Press  to enter the menu.
4. Select operating mode:
  - *CONVERT* – Convert displayed value to a calculated value (Section 3.11.1)
  - *ALIBI* – Alibi memory (Section 3.11.2)
  - *US5* – Sensitivity times ten (Section 3.11.3 on page 15)
  - *PEAK* – Peak hold detector (Section 3.11.4 on page 16)
5. Press  to confirm selection.
6. Slowly press  multiple times until *SLEEP* displays.
  - Press  to confirm and store to the instrument memory
  - Press any other key to cancel and exit without saving

### 3.11.1 Conversion


This function toggles the displayed weight between the scale unit of measure and an alternative unit measure.

- Long press  to set the conversion factor
- Short press  to toggle between the unit of measures
- Press  to save the conversion value

### 3.11.2 Alibi Memory

The alibi memory allows for transmitted weight values to be filed in the PC for data processing and/or integration.

The filed values can then be recalled from the PC serial line or directly on the instrument's display for a following check.

Storage of a weight value occurs following the reception of the serial command or by pressing . The instrument transmits the gross and tare weights and an ID on the serial port.







The ID has the format: <Rewriting number>-<Weigh number>

- The rewriting number is a five digit number from 00000-00255; It indicates the number of complete rewritings of the alibi memory
- Weigh number is a six digit number from 000000-131072; It indicates the weigh number in the current rewriting of the alibi memory; The weigh number is increased by 000001 with each weigh storage; Once the value reaches 131072, it restarts from 000000

The storage of a weigh value occurs only if the gross weight is greater than or equal to zero, it is stable and valid (not in under-load or overload). Depending on how *F. ModE* → *FACT* has been configured in the technical set up, the storage of a weight by pressing a key is possible only if the condition is met (weight exceeds zero, weight instability or always).


## Reviewing Stored Weigh Information

To review stored information:

1. Press . *rEH . id* displays.
2. Enter the rewriting number (from 00000-00255).
3. Press . *id* displays.
4. Enter the weigh number (from 000000-131072).
5. Press . The weigh information displays.
6. Press  or  to view the weigh information.
  - *ch . H-H* is the scale number (from 1-4)
  - *un YY-YY* is the unit of measure (*Lb, FG, G*)
  - *Gross* momentarily displays and then the gross weight value
  - *TARE* or *TAREPT* (manual tare) momentarily displays and then the tare weight value
7. Press  to return to the **Weigh** mode.











### Note

If the alibi memory is empty and  is pressed, *EMPTY* displays momentarily and the instrument returns to the **Weigh** mode. If the entered ID is not valid, *no id* displays and the instrument returns to the **Weigh** mode.

## Clearing the Alibi Memory

The alibi memory can be cleared directly on the instrument in the *SEtUP* → *in .AL* parameter.

1. Turn on the instrument and press  while the firmware version displays. *F .ModE* displays.
2. Press  until *SEtUP* displays. Press  to enter the menu.
3. Press  or  until *in .AL* displays. Press . *.AL ib .P* displays.
4. Press  to clear the alibi memory or any other key to cancel.
  - *AL .OF* displays if the operation is successful
  - *AL .Err* displays if the memory was not successfully cleared (repeat procedure)
5. Press  to return to the **Weigh** mode.




### Note

It is not possible to clear an individual weigh record.

### 3.11.3 Sensitivity Times Ten

This mode converts the weight to sensitivity times ten for display and is used for testing during calibration.



Press  to toggle the weight display between standard sensitivity and sensitivity times ten. The last digit on the right of the display has a sensitivity equal to the scale's division divided by 10.

### 3.11.4 Peak Hold Weight Detection

This mode can be used to store the maximum (peak) weight value measured during the weighment.

#### Operation

If Peak Hold Weight Detection has been set as the functioning mode, the following functions are enabled while in **Weigh** mode:

1. Press  to enable the peak weight detection. **-PEEH-** displays alternately with the maximum weight value reached up to that point.
2. Press  again to terminate the peak weight detection. Peak weight detection also terminates if the weight surpasses the maximum capacity of the instrument. In both cases, **PEEH .OF** displays and then the current weight on the scale displays. The detected weight value will be:
  - The maximum before a rapid decrease of the weight (measurement of the highest weight)
  - The maximum and persistent weight detected on the scale







#### Note

Exit the Peak mode to toggle from one scale to another when multiple scales are connected to the instrument.

#### Setting Sampling Time

To set the minimum sample time of the peak weight detection while in **Weigh** mode:

1. Press and hold .
2. Select **P .LT .ELT**. **-LP-** displays followed by a number which corresponds to the minimum time length of the impulse expressed in hundredths of seconds.
3. Press  or  until the desired value displays. See [Table 3-1](#) for a list of settable values.
4. Press  to confirm. The instrument returns to the **Weigh** mode.

Time in 1/100 sec	Sample per Second	Acquired Values	Mediated Values
1	400	1	1
2	200	1	1
3	100	1	1
4	100	4	2
5	50	4	2
10	25	4	2
20	12	4	2
50	6	4	2
100	6	8	2
127	6	12	2

Table 3-1. Sample Times in Peak Weight Detection

The peak detection function sensitivity is dependent on the parameter set. The higher the number of samplings, the greater the sensitivity. If an unexpected peak is detected immediately, decrease the sensitivity.

*Example: If 0.000 lb is on the load cell of 20 lb (350 Ω), and the sampling time is equal to 1, when the peak function is enabled, 0.005 lb displays.*



## 4.0 Setup Mode

The **Setup** mode is used to set the functioning parameters of the instrument.

There are two setup menus in the LaserLT-60 and LaserLT-100 Weight Indicator:



### Quick Setup Menu

The **Quick Setup** menu is a limited menu that includes settings essential to basic scale configuration such as quick calibration and communication. See [Section 4.2 on page 18](#) for more information on the **Quick Setup** menu

- To enter the **Quick Setup** menu, press  to turn the instrument on then press  as the firmware version displays

### Setup Mode Menu

The **Setup Mode** menu is a more in-depth menu that incorporates all configuration settings. See [Section 4.3 on page 20](#) for more information on the **Setup Mode** menu.

- To enter the **Setup Mode** menu, press  to turn the instrument on then press  as the firmware version displays

## 4.1 Menu Navigation

Use the keys on the front panel of the indicator to navigate through the menu options as follows:






Key	Function
	Scroll through parameters; In numeric input: Decreases the digit to be modified
	Scroll through the parameters; In numeric input: Increases the digit to be modified
	Quickly position at the first step of a menu; In numeric input: Selects the digit to be modified, from left to right
	Enter into a parameter or confirm a setting; In numeric input: Confirms the entry made
	Exit a step without confirming the setting; In setup: Press multiple times to display <i>SLEEP</i> prompt and/or press to exit a step without confirming the setting; In numeric input: Clears the present value

Table 4-1. Menu Navigation Key Functions

## 4.2 Quick Setup Menu

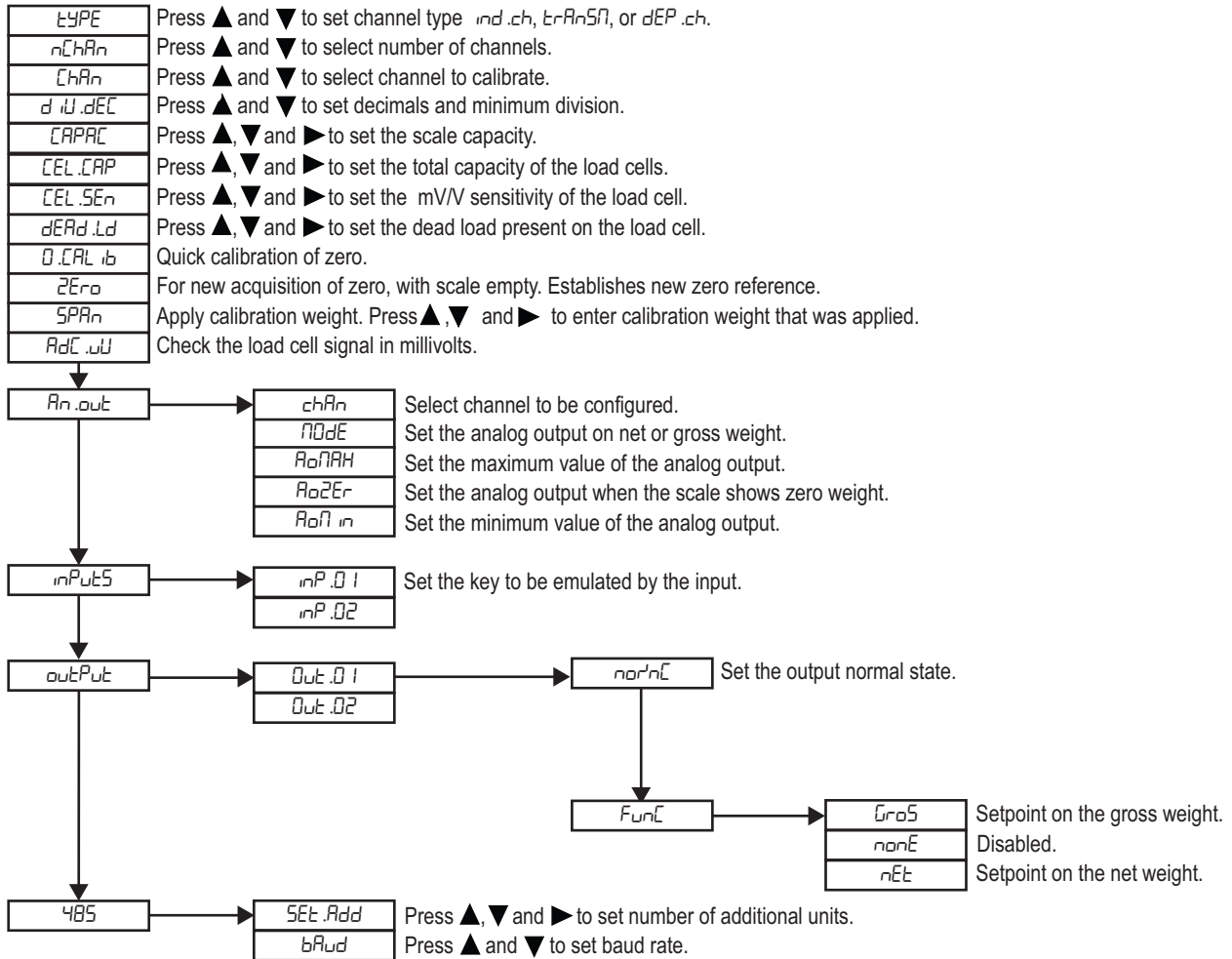




Figure 4-1. Quick Setup Menu



**Note** When settings are complete press  until the indicator displays *SAVE?*. Press  to save set up and return to Weigh mode. Pressing any other key exits the setup and discards changes.

### 4.2.1 Default Factory Calibration

The instrument is shipped with the following default calibration settings:

- Capacity – 10,000 lb
- Load cell sensitivity – 2.000 mV/V
- Division – 1



**Note** See [Table 4-4 on page 22](#) to return indicator to default settings.






















## 4.2.2 Quick Scale Setup

Use this procedure to set the scale. Cells may need to be rimmed and summed with a junction box if more than one is connected.



**Note** See [Section 5.0 on page 32](#) for full calibration procedures.

1. Restart indicator. Momentarily press  during startup to display **Quick Setup** menu. **TYPE** displays.  
Press  to set parameter.
2. Navigate to select desired channel type. Press . **CHRN** displays. Press  to set parameter.
3. Navigate to select number of channels to be used. Press . If multiple channels are chosen, **CHRN** displays.  
Press  to set parameter.
4. Navigate to select a channel to configure. Press . **CH.dEC** displays. Press  to set parameter.
5. Navigate to select decimal and minimum division settings. Press . **CAPAC** displays. Press  to set parameter.
6. Set the total capacity of the scale. Press  to confirm. **CEL.CAP** displays. Press  to set parameter.
7. Set the total capacity of the load cells. Press  to confirm. **CEL.SEN** displays. Press  to set parameter.
8. Set the mV/V sensitivity of the load cells. Press  to confirm. **DEAD.Ld** displays. Press  to set parameter.
9. Set the dead load. If unknown, enter all zeros. Press  to confirm.
10. If configuring multiple channels, navigate to return to **CHRN**. Repeat [Step 6](#) – [Step 12](#) for each channel to be configured.
11. Press  until the instrument displays **SAVE?**
12. Press  to confirm. **STORE** displays momentarily and the instrument reboots.

## 4.2.3 Input Functions

See [Section 4.5.1 on page 27](#) for **Inputs Functions** setup parameters.

## 4.2.4 Output Functions

See [Section 4.5.2 on page 28](#) for **Output Functions** setup parameters.

### 4.3 Setup Mode Menu

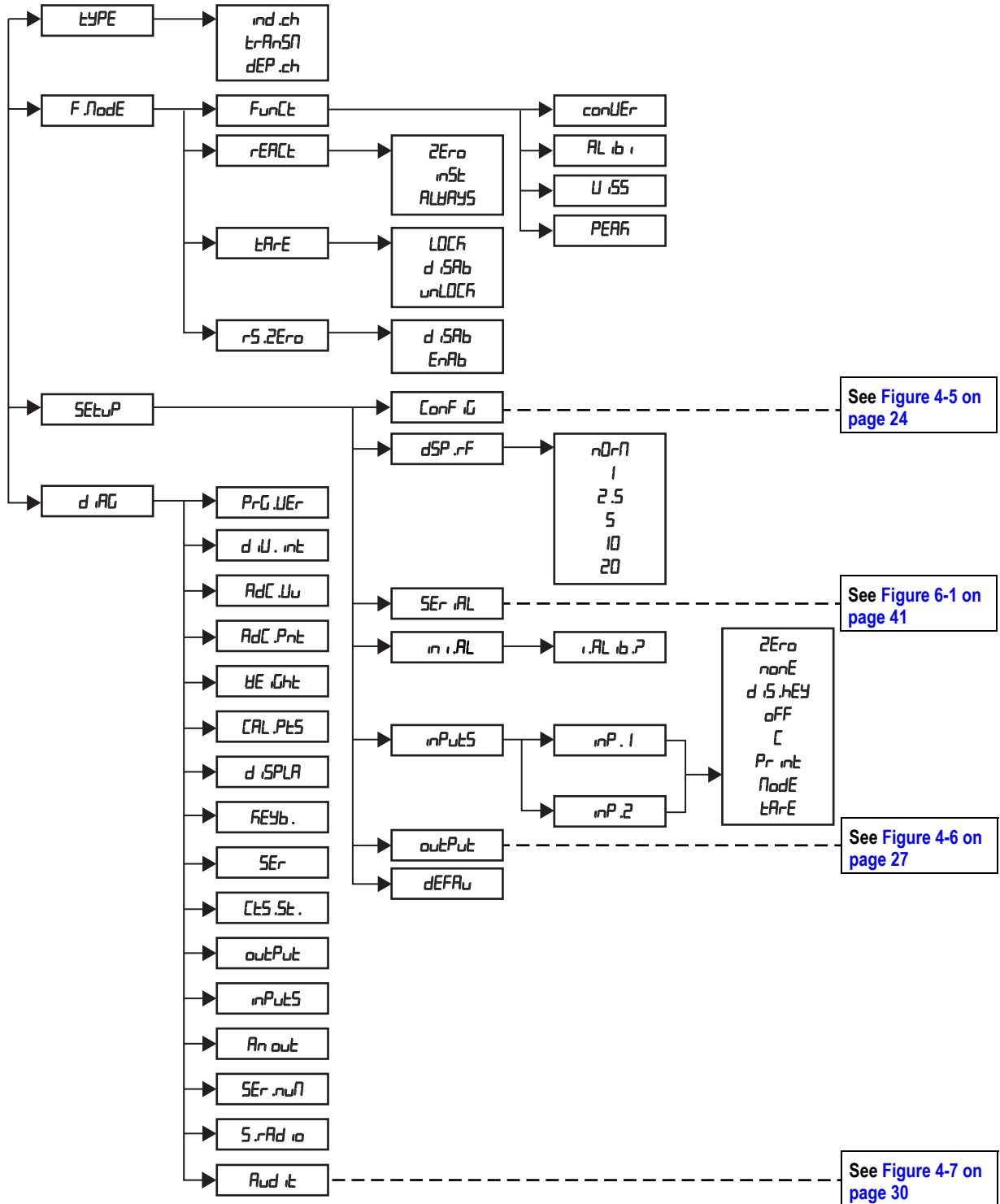


Figure 4-2. Setup Mode Menu

### 4.3.1 Type Parameters


Select the application type:

- An independent scale on each channel
- A scale with dependent channels summed
- Scales with independent channels simultaneously viewable on the PC

Settings	Description
<i>ind.Ch</i>	Instrument connected to 1, 2, 3 or 4 independent scales; To set channels ( <a href="#">Section 3.8 on page 12</a> )
<i>dEP.Ch</i>	Instrument connected to a scale with 2, 3, or 4 dependent load cells (could be digitally summed)
<i>ErRnSn</i>	Independent channel; Transmits values read by each channel through the serial line ( <a href="#">Section 3.9 on page 13</a> )

Table 4-2. Type Parameter

### 4.3.2 F.Mode Parameters

The *F.Mode* (**Function Mode**) parameters set the functionality of the scale. The **Function Mode** parameters set four operations that can be accessed by pressing . It also sets the functionality of printing, taring and zeroing.

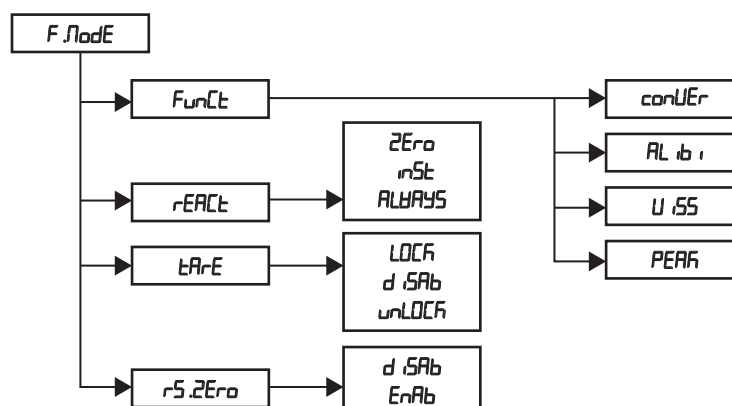


Figure 4-3. Function Mode Menu





Parameter	Settings	Description	
<i>FuncT</i> (Function)	Functioning Mode	<p><b>NOTE: See <a href="#">Section 3.11 on page 14</a> for the details of the operating modes. Once the functioning mode is selected, if a printer is configured, the printout is automatically enabled. This parameter is not displayed if <i>ErRnSn</i> is set in the <i>TYPE</i> parameter.</b></p>	
	<i>conUEr</i>		Convert – Converts the current displayed value to a calculated value; If  is pressed for 1 second, the conversion value can be edited ( <a href="#">Section 3.11.1 on page 14</a> )
	<i>ALib</i>		Alibi memory – See <a href="#">Section 3.11.2 on page 14</a>
	<i>U.SS</i>		Sensitivity times ten when  is pressed ( <a href="#">Section 3.11.3 on page 15</a> )
	<i>PEAK</i>		Peak hold detector displays PEAK and alternates with displaying the highest captured value after  is pressed ( <a href="#">Section 3.11.4 on page 16</a> )
<i>rEAct</i> (React)	Sets the re-enable function of printout based on this criteria: Rearm at zero, rearm when weight is unstable, or always print when the print button is pressed ( <a href="#">Section 3.10 on page 13</a> )		
	<i>zErO</i>	Rearms print function after weight returns to zero; Only prints once after rearming	
	<i>ALWAYS</i>	Always prints when  is pressed	
<i>tArE</i> (Tare)	When a tare value is entered manually, automatically or from storage the tare value displays with a negative sign when the scale is unloaded (this is known as a locked tare); An unlocked tare is automatically canceled each time the scale is unloaded ( <a href="#">Section 3.5 on page 10</a> )		
	<i>LoCF</i>	Retains tare value until manually cleared	
	<i>d.SAb</i>	Tare value cannot be entered	
	<i>unLoCF</i>	Tare value is automatically cleared when gross weight is zero	
<i>rS.ZErO</i> (Restore Zero)	Enables restoring the last captured zero after a power cycle		
	<i>d.SAb</i>	Disables restore zero after power cycle	
	<i>EnAb</i>	Enables restore zero after power cycle	
<b>NOTE: This parameter does not display if <i>ErRnSn</i> is selected in the <i>TYPE</i> parameter.</b>			

Table 4-3. Function Mode Parameter

### 4.3.3 Setup Parameters

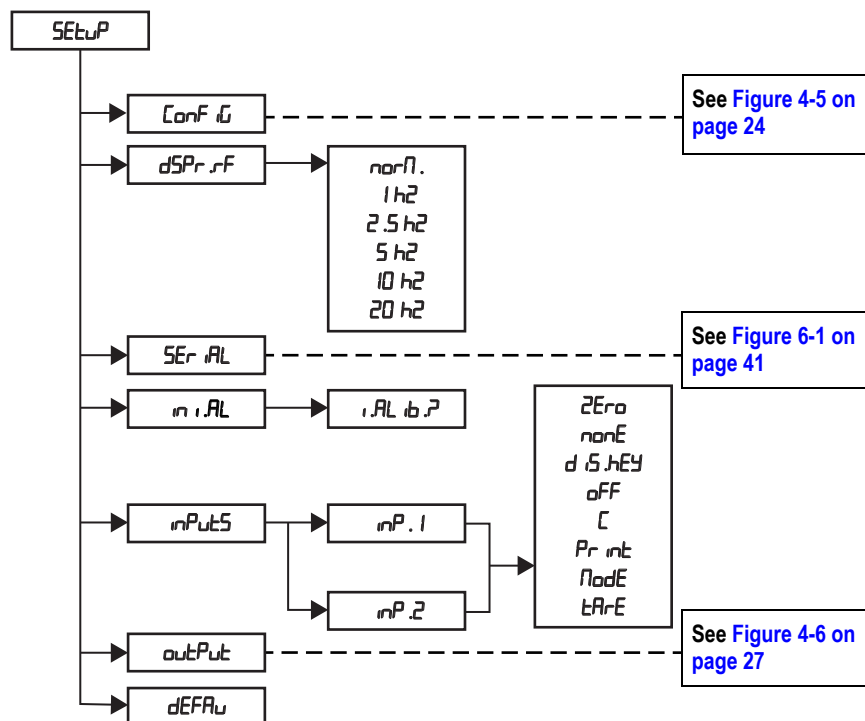


Figure 4-4. Setup Menu

Parameter	Settings	Description
ConF IG (Configuration)		Configuration (Table 4-6 on page 24)
dSP.rF (Display Refresh)	norOff	The function is disabled
	20 h2	20 display update / sec refresh rate
	10 h2	10 display update / sec refresh rate
	5 h2	5 display update / sec refresh rate
	2.5 h2	2.5 display update / sec refresh rate
	1 h2	1 display update / sec refresh rate
SErIAL (Serial)		Serial Communications Setup (Table 6-3 on page 42)
inIAL (Initialize)		Initialize Alibi Memory – The initialization cancels all the data stored in alibi memory; Press  to enter the operation then iALib.P displays; Press  again to confirm or any other key to cancel; AL.DF displays if the operation is successful; If not, AL.ERR displays; Parameter displays only if the <b>Alibi</b> mode is selected
inPuTS (Inputs)		Input Configuration – Sets the function of each input
outPut (Outputs)		Output Configuration (Table 4-9 on page 28)
Rn.out		Not applicable
dEFALU (Default)		Default settings – Restores instrument default settings; Press  ; dEFALU displays; Press  to confirm or exit by pressing another key <b>NOTE: Returning the instrument to default settings cancels the present calibration.</b>

Table 4-4. Setup Parameters

### 4.3.4 Diagnostic Menu

See the [Figure 4-2 on page 20](#) for the *d iRC (Diagnostic)* menu structure.





























Settings	Description
PrG.UEr	Press  to display the software version
d iU.int	Press  to display the calibration internal divisions; The parameter displays only in a primary instrument
RdC.uu	Press  to display the microvolts relative to the weight on the scale; Use  or  to display the microvolts for each configured channel of the scale; In the <i>dEP.Ch</i> mode it is also possible to view the sum of the microvolts of the configured channels; <i>Suñ</i> displays briefly; If the unit displays the message <i>ErrOr</i> check the connection of the LaserLT to the junction box and load cells; The parameter displays only in a primary instrument <b>NOTE: The maximum input voltage the instrument accepts is 30 mV (30000 µV). The scale system is powered by the instrument at 5 VDC; in a properly operating system there will be less than 30000 µV with full capacity on the scale system.</b>
RdC.Pnt	Press  to display the A/D converter points relative to the weight on the scale; Press  or  to display the A/D converter points for each configured channel; In the <i>dEP.Ch</i> mode the sum of the microvolts of the configured channels can be viewed ( <i>Suñ</i> displays momentarily)
WE.iGht	Press  to display the weight on the scale; Press  or  to view the weight on each connected scale
CAL.PtS	Press  to alternately display the A/D converter points and the corresponding weight value; Use  or  to switch the display to each calibration point and relative weight value
d iSPLA	Display Test – Press  to turn on display segments one at a time; continue pressing  ; The instrument turns on the display segments, one at a time, then exits automatically from this step
KEYb	Keyboard Test – Press  , then 0000 displays; Press the keys on the keyboard, one at a time, to display related codes; Press any key three times to exit
SEr	RS-232 Serial Port Test – Press  then 5 HY;H displays, in which Y indicates the status of the PC serial port <ul style="list-style-type: none"> <li>• 0 – Serial port is not working</li> <li>• 1 – Serial port is working</li> </ul> Press  or  to change the status of the serial port
CTS.St	CTS Status Test – Press  to view the CTS signal status of the printer connected to the PRN serial port
outPut	Output Test – Press  then rEL.1 displays and output 1 is enabled; Press  or  to enable the other outputs
inPutS	Input Status – Press  then 1.bH-Y;H displays, in which Y indicates the input status <ul style="list-style-type: none"> <li>• 0 – Disabled</li> <li>• 1 – Enabled</li> </ul> Press  or  to change the input status
RnOut	Not applicable
SEr.nuñ	Serial Number – Displays the instrument's serial number
S.rAd io	Press  to select the desired radio channel; 0F displays if the configuration is successful, ErrOr displays if not successful
Rud it	See <a href="#">Section 4.6 on page 30</a>

Table 4-5. Diagnostics Menu

## 4.4 Configuration Menu

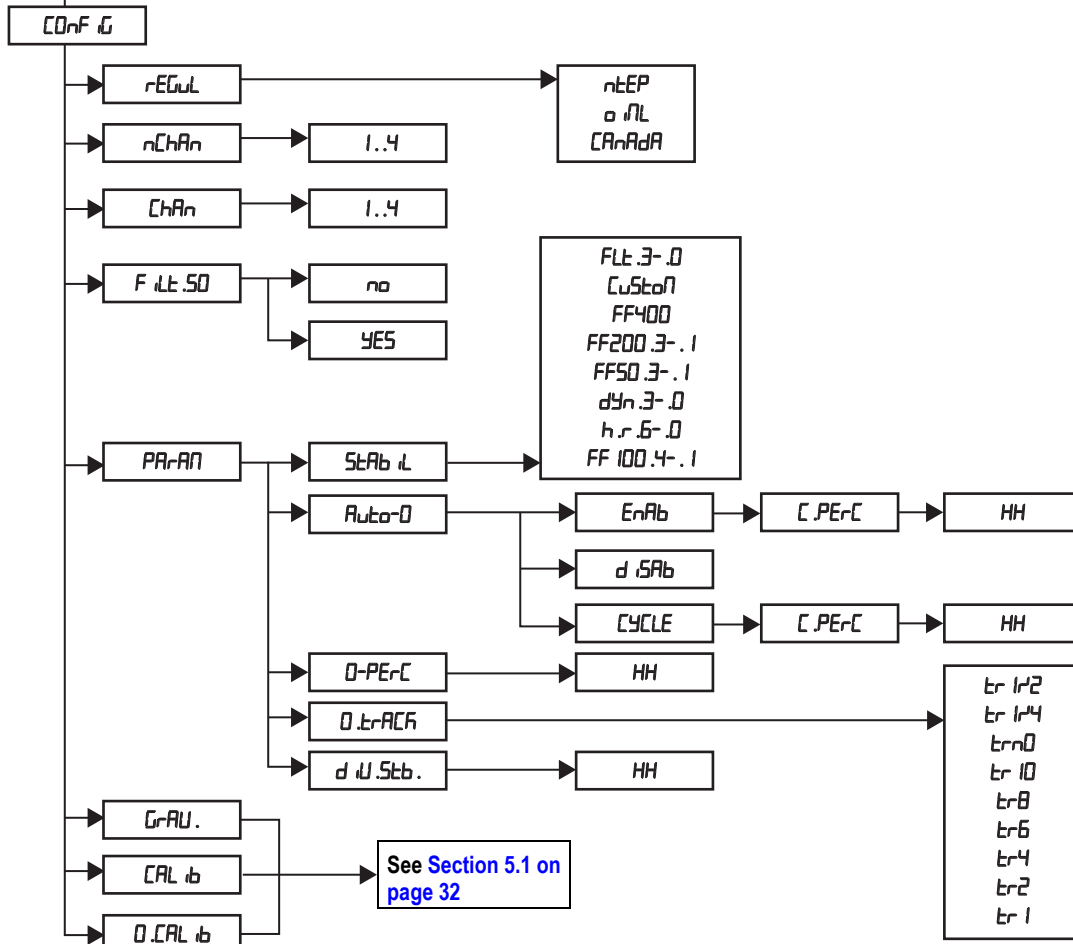


Figure 4-5. Configuration Menu

Parameter	Settings	Description
rEGUL (Regulation)	nTEP oIML CANADA	Selection of regulatory body NTEP OIML Measurement Canada
nChAn (Number of Channels)	Ch.1 Ch.2 Ch.3 Ch.4	Selection of number of channels to be utilized
ChAn (Channel)	Ch.1 Ch.2 Ch.3 Ch.4	Selection of active channel; 1 to 4 in scales with non dependent channels functioning mode (ind.Ch/trAn5n) <b>NOTE: The parameter is not displayed if dEP.Ch is set in the TYPE parameter or in the event of a single channel application, SETUP → CONF ID → nChAn.</b>
Filt.50 (Filter 50 Hz)	no = disable YES = enable	Enable or disable the 50 Hz filter

Table 4-6. Config Menu Parameters and Settings



Parameter	Settings	Description
PARAM (Parameters)	Metrologic parameters	
	SEAb IL	Select and set the type and degree of filtering ( <a href="#">Section 4.4.1 on page 26</a> ) FLE 0-3 – Filter for simple weighing CUSTOM – Customizable filter for manufacturer use FF .200 . 1-3 – Filter at 200 Hz FF .50 . 1-3 – Filter at 50 Hz dYN .0-3 – Filter for crane scale hr .0-6 – Filter for high resolution FF . 100 . 1-4 – Filter at 100 Hz FF .400 – Filter at 400 Hz <b>NOTE: F.F .200 . 1-3 and F.F .400 filters cannot be used in the dEP.Ch 2, 3 and 4 channel functioning modes.</b>
	Auto-0	Automatic acquisition of the gross zero at startup (default is 2% of capacity) d,SRb – Disabled EnAb – Enabled on scale 1 CYCLE – Executed cyclically on all the present scales; This parameter is not visible if there is only one scale <b>NOTE: If auto zero parameter is enabled, 0.PERC displays and a value between 1 and 50 as a percentage of the capacity of the auto zero must be set.</b>
	0-PERC	Zero capacity – This menu allows to set (0-50%) of capacity that can be zeroed by pressing  ; Entering 0% disables 
	0.TRACK	Zero tracking – This menu allows setting the zero tracking (compensation parameter of the scale's thermal drift); The set value corresponds to the number of divisions tracked off in 1 second tr 1/2 ± half division tr 1/4 ± one fourth of a division tr no ± tracking disabled tr 10 ± ten divisions tr 8 ± eight divisions tr 6 ± six divisions tr 4 ± four divisions tr 2 ± two divisions tr 1 ± one division
d.u.Stb	Divisions by stability – Enter the number of divisions by which the instrument detects the weight stability; A higher number of divisions makes stability more easily detected; Settable values are 0 (weight always stable) to 99	
GRAV. (Gravity)	--	Gravity acceleration – See <a href="#">Section 5.7 on page 39</a>
CALib (Calibration)	--	Scale calibration – See <a href="#">Section 5.0 on page 32</a>
0.CALib (Zero Calibration)	--	Zero calibration – See <a href="#">Section 5.0 on page 32</a>

Table 4-6. Config Menu Parameters and Settings (Continued)

### 4.4.1 Filter Parameters

Standard digital filtering uses mathematical averaging to compensate for the noise that the A/D converter sends periodically because of external vibration. This filter compensation makes data less susceptible to a DC signal bias error for some signals. Each of the filters of the LaserLT are intended to compensate for different types and intensities of digital noise and vibration. Below, find general usage for each family of filters and the **A/D Rate** and **Window** for each filter within those families:

Name	A/D Rate	Window
Static Weighing on Platform		
FLt3	25	24
FLt2	25	16
FLt1	25	12
FLt0	25	8
Custom	For Manufacturer Use Only	
High Speed Weight Capture		
F.F.400	400	24
Filling or Dosing		
F.200.3	200	30
F.200.2	200	32
F.200.1	200	32
Instability, Motion or Vibration		
F.50.3	50	20
F.50.2	50	22
F.50.1	50	22

Name	A/D Rate	Window
Suspended and Oscillating Loads		
dYn.3	6	12
dYn.2	6	12
dYn.1	6	12
dYn.0	6	12
High Resolution Weighing		
h.r.6	6	32
h.r.5	6	24
h.r.4	6	24
h.r.3	6	12
h.r.2	6	12
h.r.1	6	10
h.r.0	6	8
Filling or Dosing		
F.100.4	100	26
F.100.3	100	24
F.100.2	100	20
F.100.1	100	10

Table 4-7. Filter Values



## 4.5 Input/Output Functions

The instrument is fitted with two opto-isolated inputs and two dry contact outputs. See specifications in [Section 2.4 on page 5](#).



Note

Some of functioning modes of the outputs are relative to the specific functioning modes of the instrument; See the following descriptions for the details.

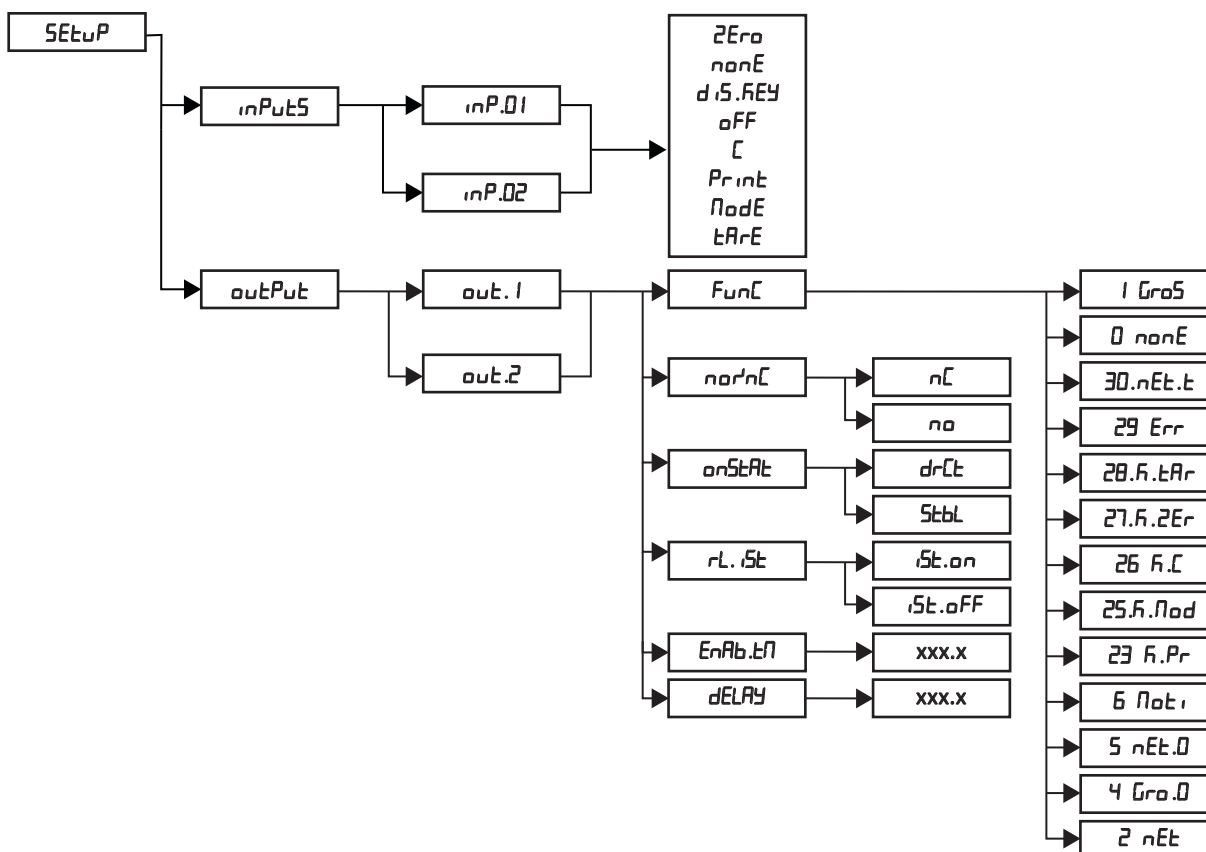


Figure 4-6. Inputs and Outputs Menu

### 4.5.1 Inputs Functions

The *inPuT5* (**Inputs**) menu sets the function of each of the inputs.

Parameter	Settings	Description
inPuT5 (Inputs)	inP.01 inP.02	Input 1 or Input 2 <b>NOTE: In the event two inputs are simultaneously enabled, only the lowest number input will activate.</b>
		2Er0 – Zero key –
		nonE – Disabled (Default for input 1)
		dIS.KEY – Disables the keyboard
		oFF – Turning off the instrument
		C – C key – ON/OFF key –
		PrInt – Print key
		ModE – Mode key (Default for input 2) –
		tArE – Tare key –

Table 4-8. Inputs Functions

### 4.5.2 Output Functions

The parameters of each of the outputs is set in the **OUTPUT** (**Outputs**) menu (Figure 4-6 on page 27).



**Some of functioning modes of the outputs are relative to the specific functioning modes of the instrument; see the following descriptions for the details.**

Parameter	Settings	Description																				
Func (Function)	i Gross	<p>Define the functionality of each output</p> <p>Setpoint based on the gross weight (Default);  <b>Functioning with hysteresis</b> (rL .St parameter set at .St .on);                      Setpoint based on gross weight; Two setpoints for each output must be set; One which disables the output when the gross weight falls below that setpoint and one which enables the output when the gross weight is equal or greater than that setpoint;</p> <ol style="list-style-type: none"> <li>Press and hold  to enter the setpoint values for each configured output;</li> <li>Select <b>inP .StP. S. I on</b> displays (output 1 – this enables the setpoint); Press  ;</li> <li>Enter the weight value; See Section 4.1 on page 17 for key function; Press  to confirm;                      S. I off displays (output 1 – this disables setpoint); Press  ;</li> <li>Enter the weight value. Press  to confirm;</li> <li>Repeat for all outputs;</li> <li>Slowly press  multiple times until <b>SAVEP</b> displays;                      - Press  to confirm and store to the instrument memory;                      - Press any other key to cancel and exit without saving</li> </ol> <p><b>Functioning without hysteresis</b> (rL .St parameter set at .St .off);                      Enables output function on gross weight; One setpoint for each output is set;</p> <ol style="list-style-type: none"> <li>Press and hold  to enter the setpoint values for each configured output;</li> <li>Select <b>inP .StP. S. I on</b> displays (output 1 – enabling setpoint) Press  ;</li> <li>Enter the weight value; See Section 4.1 on page 17 for key function; Press  to confirm;</li> <li>Repeat for all outputs;</li> <li>Slowly press  multiple times until <b>SAVEP</b> displays;                      - Press  to confirm and store to the instrument memory;                      - Press any other key to cancel and exit without saving;</li> </ol> <p>* The configuration of setpoints cannot be accessed if all outputs are set in the <b>none</b> functioning mode, or if the selected functioning mode does not require entry of a setpoint value                      * With the instrument off or in standby outputs are normally open                      * The disabling setpoint must be equal to or less than the enabling setpoint; if the disabling setpoint is set at a value greater than the enabling setpoint the instrument sets the setpoint to zero until a valid value is entered                      * If the enabling setpoint is set at a value lower than the disabling setpoint, the enabling setpoint is entered and accepted, however, the disabling setpoint will be set to zero                      * A zero value is valid on both the enabling and disabling setpoints                      * A setpoint value remains active while modifying the setpoint until the new value is confirmed                      * The tare operations are active                      * These outputs are enabled by pressing a key (, , ,  or ); If the key press time is greater than two seconds the output is disabled and remains disabled until the following pressing of the key</p> <p><b>NOTE: The weight thresholds set with  are common to all connected scales; It is not possible to have different thresholds for different scales. The value assumes the unit of measure and decimals of the selected channel; For example, if 1000 is the set value, the setpoint values will be the following:</b></p> <table border="1"> <thead> <tr> <th>Channel</th> <th>Unit of Measure</th> <th>Decimals</th> <th>Setpoint Value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>kg</td> <td>3</td> <td>1.000 kg</td> </tr> <tr> <td>2</td> <td>g</td> <td>0</td> <td>1000 g</td> </tr> <tr> <td>3</td> <td>kg</td> <td>2</td> <td>10.00 kg</td> </tr> <tr> <td>4</td> <td>g</td> <td>1</td> <td>100.0 g</td> </tr> </tbody> </table>	Channel	Unit of Measure	Decimals	Setpoint Value	1	kg	3	1.000 kg	2	g	0	1000 g	3	kg	2	10.00 kg	4	g	1	100.0 g
Channel	Unit of Measure	Decimals	Setpoint Value																			
1	kg	3	1.000 kg																			
2	g	0	1000 g																			
3	kg	2	10.00 kg																			
4	g	1	100.0 g																			

Table 4-9. Output Functions






Parameter	Settings	Description
Func (Function)	0 none	No function, the output is inactive
	2 net	Setpoint based on net weight; Setpoints are set in the same manner as gross weight; See Gross in Table 4-9 on page 28; In addition setpoints can be set and activated on a negative weight; <ul style="list-style-type: none"> <li>Positive weight (5 gross set at POS wt);</li> <li>Negative weight (5 gross set at NET)</li> </ul>
	30 .net.t	Setpoint based on the net weight with tare activated; Selecting this mode the function of the output on the net weight is activated if a tare is entered
	29 Err	Error indication – Function of the output is enabled on an invalid weight (overload/under-load), or without the signal coming from the cell (disconnected cell) <b>NOTE: In the ind.Ch and ErrAnsn mode the output is enabled only when the condition takes place on the selected channel.</b> <b>In the dEP.Ch mode the output is enabled when the condition takes place on any of the set channels.</b>
	28 h.tAr	Tare Key – Function is enabled when  is pressed
	27 h.zEr	Zero Key – Function is enabled when  is pressed
	26 h.c	C Key – Function is enabled when  is pressed
	25 h.mod	Mode Key – Function is enabled when  is pressed
	23 h.Pr	Print Key – Function is enabled when  is pressed
	5 not i	Instability – Output is on for an unstable weight
	5 net .0	Setpoint based on net weight being at zero
4 Gro .0	Setpoint based on gross weight being at zero	
no/nc (NO/NC Contacts)	NO/NC Contacts; <ul style="list-style-type: none"> <li>no – Output normally opened;</li> <li>nc – Output normally closed</li> </ul>	
onStat (On Status)	Switching condition; <ul style="list-style-type: none"> <li>drct – The output is activated when the weight reaches the set threshold, (independently from the stability) and is disabled when the weight goes below the set disabling threshold;</li> <li>stbl – The output is activated when the weight, after reaching the set activation thresholds, becomes stable; The output is disabled when the weight, after going below the set disabling threshold, becomes stable</li> </ul>	
rl .st (Hysteresis)	Hysteresis; <ul style="list-style-type: none"> <li>st .off – Hysteresis disabled;</li> <li>st .on – Hysteresis enabled</li> </ul>	
EnAb.tn (Enabling Time)	Enter the length of time the output is enabled in seconds (four digits with a decimal); The output is disabled once the set time has passed, starting from the moment of the activation (see DELAY); By setting 000.0 the output remains always active <b>NOTE: The delay time is only evaluated when a setpoint on gross weight, setpoint on net weight or is selected as an output function.</b>	
delay (Delay)	Enables delay period – Enter the enabling delay period in seconds (four digits with a decimal); The output is enabled once the set time has passed, starting from the moment the condition takes place; By setting 000.0 the output is enabled when the enabling condition takes place <b>NOTE: The output is enabled only if the enabling condition takes place for the length of time set. The delay is valid only for the enabling of the output. When the enabling condition no longer takes place the output is disabled.</b> <b>NOTE: In a switching condition with stability, the output is enabled only when the weight is stable. The delay time is evaluated when a setpoint on gross weight or setpoint on net weight is selected as an output function.</b>	

Table 4-9. Output Functions (Continued)

## 4.6 Audit Menu

The **Audit** (*Audit*) menu enables the user to view the number of times that configurations have been changed on the LaserLT.

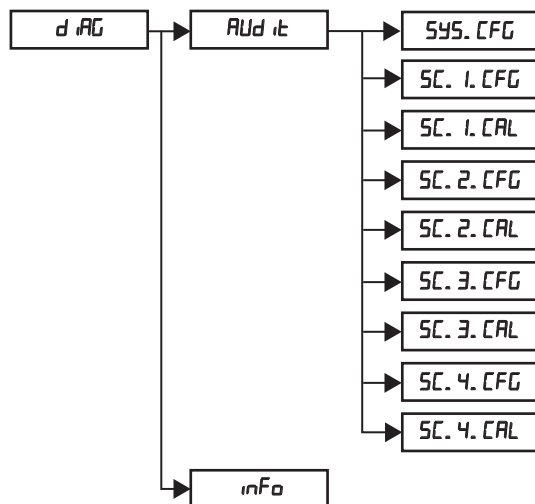


Figure 4-7. Audit Menu


Parameter	Setting	Description
AUd it (Audit)	SYS .CFG	<b>System configuration audit trail</b> – Displays number of times that any of the following system parameters has been changed; TYPE, TARE, RS.ZERO, NCHAN, AUTO-0, C.PERC, 0.PERC, GRAV, REGUL, OV.LOAD
	SC .1.CFG SC .2.CFG SC .3.CFG SC .4.CFG	<b>Scale configuration audit trail</b> – Displays number of times at any of the following scale parameters has been changed; STABIL, 0.TRACK, DIV.STB, DEC1, UM, DIV, RANGE
	SC .1.CAL SC .2.CAL SC .3.CAL SC .4.CAL	<b>Scale calibration audit trail</b> – Displays number of times the scale has been calibrated
inFo (Information)		Indicator scrolls through settings

Table 4-10. Audit Menu Parameters










### 4.6.1 Access the Audit Menu

The **Audit** menu is accessed through the **Setup** mode or, in Legal-for-Trade applications, from **Weigh** mode without power cycling the indicator. Indicator must be sealed as in [Section 2.7.2 on page 8](#) for Legal-for-Trade applications.

#### From Setup Mode










1. Power cycle indicator.
2. Press  as the firmware version displays.
3. Navigate to `d ,R G > A u d i t`.

#### From Weigh Mode

1. Press  until `A u d i t` displays.
2. Press . `in F o` displays. Press  again, `A u d i t` displays.
3. Press . Displays LRV number then displays `5 4 5 . C F G`.
4. Press  or  to toggle between audit counter options.
5. Press  to view Audit trail number for the selected audit counter.
6. Press  to exit to previous menu. Repeat [Step 4](#) – [Step 5](#) as needed.
7. Press  to return to **Weigh** mode.

#### Recall Procedure

These devices use a category 2 sealing method:

1. Hold  until `A u d i t` displays.
2. Press . `in F o` displays then press  again, `A u d i t` displays.
3. Press . Displays LRV number then displays `5 4 5 . C F G` (System Configurations).
4. Press  or  to toggle between `5 4 5 . C F G`, `5 C . 1 . C F G` (Scale 1 Configurations) or `5 C . 1 . C A L` (Scale 1 Calibrations).
5. Press  to view the Audit Trail number for the selected counter.
6. Press  to toggle between `5 4 5 . C F G`, `5 C . 1 . C F G` or `5 C . 1 . C A L`. If multiple scales are used it will toggle to `5 C . 4 . C F G`.
7. Press  to exit **Audit Trail** mode to the previous menu.

## 5.0 Calibration

The type of calibration used is dependent on the type of application chosen for the instrument: *ind.Ch* (**Independent Channels**) and *dep.Ch* (**Dependent Channels**), which can be digitally equalized. See the type parameter in [Table 4-2 on page 21](#).

### 5.1 Calibration Menu

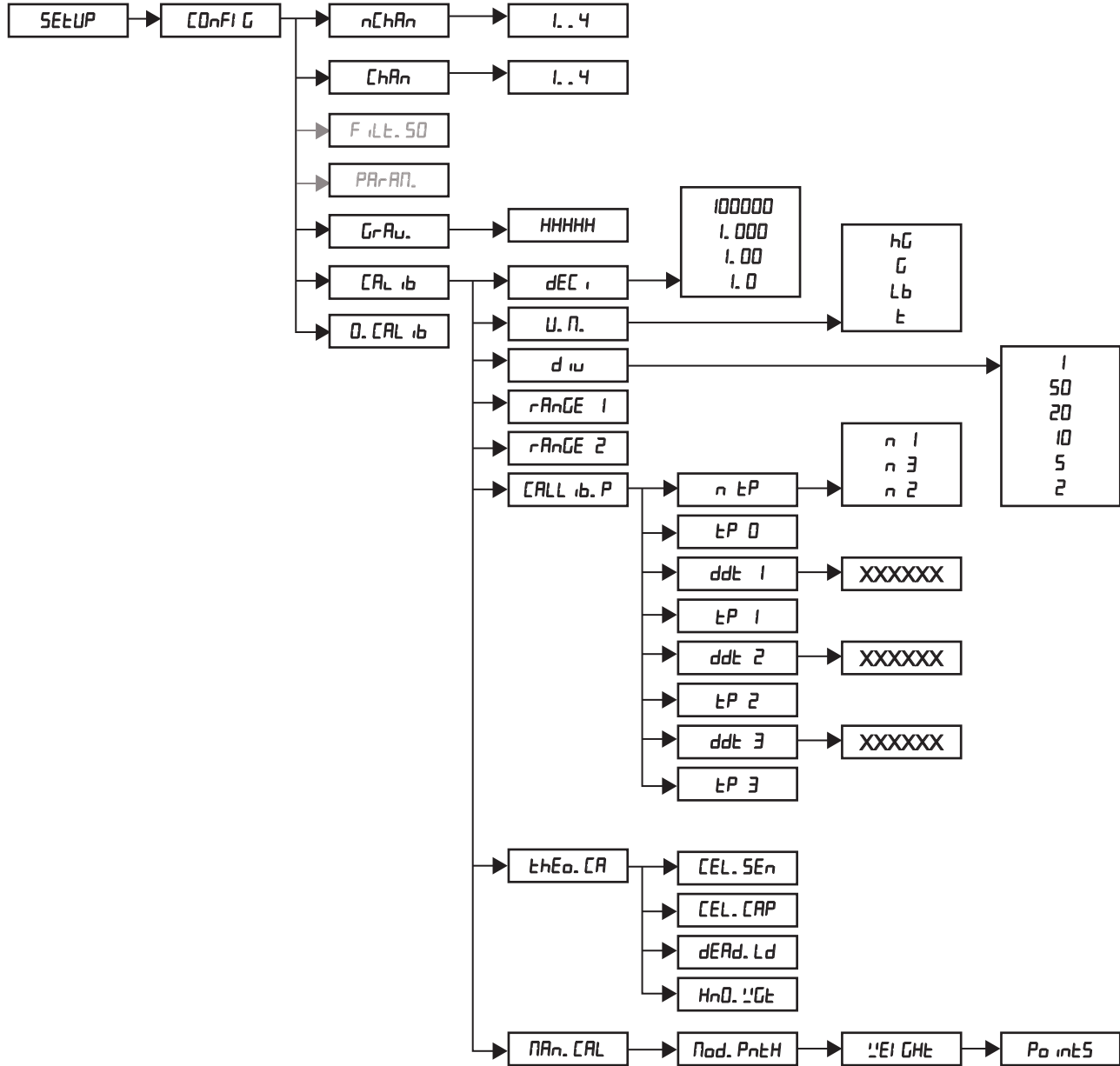


Figure 5-1. Calibration Menu

### 5.1.1 Calibration Parameters

Parameter	Settings	Description
nChAn (Number of Channels)		Select number of channels (Table 4-6 on page 24)
ChAn (Channel)		Select current channel to configure (Table 4-6 on page 24)
GRAV. (Gravity)	9.7500 1-9.84999 default: 9.80665	Gravity acceleration – Select the acceleration value of calibration location and installation location of the instrument; Manual entry of the g value (the gravitational acceleration value may be manually entered); The minimum decimal value is 9.75001m/s <sup>2</sup> ; Any decimal number that is not between 9.75001 and 9.84999 m/s <sup>2</sup> (inclusive), is incorrect
dEc (Decimal)		Decimal Point Location – When combined with the decimal point location, specifies the location of the decimal point or dummy zeroed in the unit display
u.n. (Units)		Units – Specifies units for displayed and printed weight
d.d (Display Divisions)		Display Divisions – Selects the minimum division size for the displayed weight; scale capacity is determined by display division x graduations
Range 1 (Range 1)		Maximum weight for first range or interval
Range 2 (Range 2)		Maximum weight for second range or interval
CALIB.P (Calibration)	nCP	Number of calibration points
	EP0	Set weight value of unloaded scale
	ddt 1	Enter weight value of first sample weight
	EP 1	Add first sample weight and set calibration point
	ddt 2	Enter weight value of second sample weight
	EP 2	Add second sample weight and set calibration point
	ddt 3	Enter weight value of third sample weight
EP 3	Add third sample weight and set calibration point	
Theoretical Calibration (Theoretical Calibration)	CEL.SEN	Cell sensitivity in mV/V
	CEL.CAP	Cell Capacity in the configured unit of measure
	dERd.Ld	Weight of the structure bearing on the load cells
	FnD.BDt	Known value of the sample weight
Manual Calibration (Manual Calibration)	Manual Calibration - Manually change the weight and ADC value of calibration points	
	nCd.PntCh	Select calibration point to change
	BE.Ght	Enter or confirm weight value
	PD.inTS	Enter or confirm ADC value
0.CALib (Zero Calibration)		Performs a zero calibration

Table 5-1. Calibration Parameters












**Note** In the case that a number needs to be entered to set a parameter, press  to select the digit to be modified and

 or  to increase or decrease the digit. To navigate a menu to select an option, Press  or .










## 5.2 Scale Configuration

Use this procedure to configure the scale(s). To connect more than four cells, it is necessary to trim the cells.

1. Restart indicator. Momentarily press  during startup to display setup mode. *TYPE* displays. Press .
2. Navigate to select channel type. Press  when the desired channel type is displayed to select it.
3. Navigate to *SEtUP* → *CONF* → *UNChan*. Press  to set parameter.
4. Navigate to set the number of channels (*Ch 1 - Ch4*). Press  to confirm the desired number of channels. *F ILT .50* displays.
5. Navigate to *CAL* *ib*. Press  to set parameter. *dEC* *i* displays. Press  to set parameter.
6. Navigate menu to select the decimal point location. Press  to confirm selection. *.01* displays. Press  to set parameter.



**Note** *By setting the divisions of the first range, the divisions for the second range are automatically set.*








7. Navigate to select the unit of measure. Press  to confirm selection. *d U* displays. Press  to set parameter.
8. Navigate to select the scale's minimum division, or the first range of dual range. Press  to confirm value. *rANGE 1* displays. Press  to set parameter.
9. Enter the total capacity of the scale, or *rANGE 1* if using multi-range functioning. Press  to confirm.  
See [Section 3.6 on page 11](#) for more information on multi-range functioning.
10. For dual range scale only:
  - Navigate to select *rANGE 2*; Press  to set parameter
  - Enter the second range; Press  to confirm; *CAL* *ib* *.P* displays
11. Press  until the instrument displays *SAVEP*. Press  to confirm. *StOR-E* displays momentarily and the instrument reboots.



**Note** *Perform this procedure for each connected channel.*

## 5.3 Calibration Single Channel (Known Weight)











Use this procedure to calibrate a scale in *ind.Ch*, *dEP.Ch* or *trAnSn* functioning mode and with a known calibration weight.

1. Restart indicator. Momentarily press  during startup to display quick setup menu.
2. Navigate to *ZERO*. Ensure all weight is off the scale then press .
3. Wait until *BE* *ght* displays. Press  to set parameter.
4. Enter the weight value of first sample weight. Press .
5. Place calibration weight on the scale. Press  to confirm.
6. Wait until *AdC* *.NUJ* displays, then remove the weight from the scale.
7. Press . *SAVEP* displays.
8. Press  to confirm. *StOR-E* displays momentarily and the instrument reboots.



## 5.4 Calibration Multi Channel (Known Weight)








Use this procedure to calibrate a scale in the *IND.CH*, *dEP.CH* or *LRN50* functioning mode and with a known calibration weight.

1. Restart indicator. Momentarily press  during startup to display quick setup menu.
2. Navigate to *nChAn*. Press  to set parameter.
3. Select number of channels. Press  to confirm. *ChAn* displays.
4. Select channel to be calibrated. Press  to confirm.
5. Navigate to *ZERO*. Ensure all weight is off the scale then press .
6. Wait until *WEIGHT* displays. Press  to set parameter.
7. Enter the weight value of first sample weight. Press .
8. Place calibration weight on the scale. Press  to confirm.
9. Wait until *ADJ. N.W* displays, then remove the weight from the scale.
10. Navigate to *ChAn*. Repeat [Step 4](#) – [Step 9](#) for each channel to be calibrated.
11. Press . *SAVE?* displays.
12. Press  to confirm. *STORE* displays momentarily and the instrument reboots.

## 5.5 Calibration With Linearization Points



### 5.5.1 Dependent Channels

Use this procedure to calibrate a scale in the *dEP.CH* mode with linearization points.

1. Restart indicator. Momentarily press  during startup to display **Setup** mode.
2. Navigate to *SETUP* → *CONF* → *CAL* → *ib* → *CAL* → *ib* → *P* → *nLP*. Press  to set parameter.
3. Navigate to set the number of calibration points. Press  to confirm. *LP 0* displays.
4. Ensure all weight is off the scale and then press .
5. Wait until *ddt 1* is displayed. Press  to set parameter.
6. Enter the calibration weight of the first point. Press  to confirm. *LP 1 (LP2, LP3)* displays.
7. Place the calibration weight on the scale and then press . *nLP* displays when all points are complete.












**Note** *The unit advances to (dd2, dd3) if using multiple points. Repeat [Step 4](#) – [Step 7](#) for each point.*

8. Remove the weight from the scale.
9. Press  until the instrument displays *SAVE?*
10. Press  to confirm. *STORE* displays momentarily and the instrument reboots.



## 5.5.2 Independent Channels

Use this procedure to calibrate a scale in the *ind.Ch* or *LRANS* functioning mode with linearization points.

1. Restart indicator. Momentarily press  during startup to display setup mode.
2. Navigate to *SEtUP* → *CONF* → *CH* → *Chan*. Press  to set parameter.
3. Select channel to calibrate (*Ch 1 - Ch 4*). Press  to confirm. *FLt .50* displays.
4. Navigate to *CALib* → *CALib.P* → *n LP*. Press  to set parameter. *n 1* displays.
5. Enter the number of calibration points. Press  to confirm. *LP 0* displays.
6. Ensure all weight is off the scale then press .
7. Wait until *ddt 1* is displayed. Press  to set parameter.
8. Enter the calibration weight of the first point. Press  to confirm. *LP 1 (LP2, LP3)* displays.
9. Place the calibration weight on the scale and then press . *n LP* displays when all points are complete.



**Note** *The unit advances to (ddt2, ddt3) if using multiple points. Repeat Step 7 – Step 9 for each point.*






















10. Remove the weight from the scale.
11. Repeat [Step 2](#) – [Step 10](#) to calibrate each channel.
12. Press  until the instrument displays *SAVE?*
13. Press  to confirm. *StorE* displays momentarily and the instrument reboots.

## 5.6 Theoretical Calibration

A theoretical calibration can be used if a weight of known value is not available, or a manual calibration cannot be performed.



### 5.6.1 Independent Channels

Use this procedure to perform a theoretical calibration on a scale in the *Ind.Ch* functioning mode.

1. Restart indicator. Momentarily press  during startup to display setup mode.
2. Navigate to *SEtUP* → *CONF* → *ChAn*. Press  to enter the menu.
3. Select channel to calibrate (*Ch 1 - Ch4*). Press  to confirm. *F ILt .50* displays.
4. Navigate to *CALib*. Press  to enter menu. *dEE* displays. Press  to set parameter.
5. Navigate to set the decimal place. Press  to confirm. *.01* displays. Press  to set parameter.
6. Navigate to set the weight unit. Press  to confirm. *d U* displays. Press  to set parameter.
7. Navigate to set the display divisions. Press  to confirm. *rAnGE 1* displays. Press .
8. Enter the total capacity of the scale or the first range in case of multi-range functioning. Press  to confirm. *rAnGE 2* displays. Press  to set parameter.
9. Enter the second range or enter all zeros, if only one range. Press  to confirm. *CALib.P* displays.
10. Navigate to *thEd .CA* displays. Press  to confirm. *CEL .SEN* displays. Press  to set parameter.
11. Enter cell sensitivity. Press  to confirm. *CEL .CAP* displays. Press  to set parameter.
12. Enter cell capacity. Press  to confirm. *dEAd .Ld* displays. Press  to set parameter.
13. Enter the dead load. If unknown, enter all zeros. Press  to confirm. *fnD .BLt* displays.


























**Note** *Cell Sensitivity – If several load cells are connected through a junction box enter average sensitivity value of the cells.  
Cell Capacity – If several load cells are connected through a junction box, enter the sum of the load cells.  
By setting the value to zero, the dead load is acquired.*

14. Repeat [Step 3](#) – [Step 13](#) for each connected scale.
15. Press  until the instrument displays *SAVEP*. Press  to confirm. *StorE* displays momentarily and the instrument reboots.

### 5.6.2 Dependent Channels

Use this procedure to perform a theoretical calibration on a scale in the *dEP.Ch* functioning mode.

1. Restart indicator. Momentarily press  during startup to display setup mode. *tyPE* displays. Press  to set parameter.
2. Navigate to select *dEP.Ch*. Press  to confirm. *F .NoDE* displays.
3. Navigate to *SEtUP* → *CONF* → *nChAn*. Press  to set parameter.
4. Navigate to set the number of channels (*Ch 1 - Ch4*). Press  to confirm. *F ILt .50* displays.




5. Navigate to CAL ib. Press . dEC i displays. Press  to set parameter.
6. Navigate to set the decimal place. Press  to confirm. u .1 displays. Press  to set parameter.
7. Navigate to set the weight unit. Press  to confirm. d iJ displays. Press  to set parameter.
8. Navigate to set divisions. Press  to confirm. rAnGE I displays. Press  to set parameter.
9. Enter the total capacity of the scale or the first range in case of multi-range functioning. Press  to confirm. rAnGE2 displays. Press  to set parameter.
10. Enter the second range or enter all zeros, if only one range. Press  to confirm. CAL ib .P displays.
11. Navigate to tHEd .CA. Press  to enter menu. CEL .SEn displays. Press  to set parameter.
12. Enter cell sensitivity. Press  to confirm. CEL .CAP displays. Press  to set parameter.
13. Enter cell capacity. Press  to confirm.  dEAd .Ld displays. Press  to set parameter.
14. Enter the dead load. If unknown, enter all zeros.



**Cell Sensitivity** – If several load cells are connected through a junction box enter average sensitivity value of cells.





**Cell Capacity** – If several load cells are connected through a junction box, enter the sum of the load cells.

**By setting the value to zero, the dead load is acquired.**


15. Press  to confirm. rAnGE displays.
16. Repeat [Step 3 on page 37](#) – [Step 15](#) for each connected scale.
17. Press  until the instrument displays SAUEP.
18. Press  to confirm. StOR-E displays momentarily and the instrument reboots.

## 5.7 Gravity Setting

Use this procedure to correct the weight error caused by a different gravitational value between the calibration zone and the zone of use.

1. Calibrate the indicator. Restart.
2. Navigate to *SEtUP* → *CONF* → *GRAV*. Press  to set parameter.
3. Enter the local gravity. Press . Default is 9.80390.
4. Slowly press  multiple times to exit the menus until *SAVEP* displays.
  - Press  to confirm and return to the weigh mode
  - Press any other key to cancel and exit without saving

Weight error caused by a different gravitational value between calibration zone and zone of use is automatically corrected.

Press and hold  when turning on the instrument. The g value relative to the gravitation zone of the user displays for a few seconds, after the name and the installed software version.



**Note** To find the local gravity, enter the latitude and elevation into the International Gravity Formula.

Listed are links to websites that can be used to determine local latitude and altitude. Please note these website address are provided for reference only and may change.

Map Coordinates uses Google maps to find latitude and elevation: [www.mapcoordinates.net/](http://www.mapcoordinates.net/)

Once local latitude and altitude have been determined, use the following link to calculate local gravity <http://www.sensorone.com/local-gravity-calculator/>

### IMPORTANT

The gravity correction function has not been evaluated by an approvals agency, therefore it is up to the authorized scale dealer to ensure the device is accurate at the intended point of use.

## 5.8 Zero Dead Load A/D Counts

Table 5-2 lists the ideal A/D counts that result from input signals of 0 to 15 mV with zero dead-load. Actual values are typically higher than the values shown in Table 5-2. The ideal values can be used when calibrating the indicator with no attached scale.

Input Signal (mV)	Raw A/D Count
0	1830
2.5	543564
5.0	1085373
7.5	1627166
10	2168897
12.5	2710715
15	3252467

Table 5-2. Ideal A/D Raw Counts

## 6.0 Communications

This section provides an overview of LaserLT-60 and LaserLT-100 Weight Indicator communication information.

### 6.1 Serial Outputs

The instrument has two bidirectional serial outputs which are ASCII code compatible with most printers, remote displays, PCs and other devices. See [Section 2.4 on page 5](#) for connection information.

Transmission of data through the serial ports can be configured in the parameters *PC SEL*, *PC ModE* and *Pr ModE* in the setup mode ([Section 6.2 on page 41](#)).

#### 6.1.1 COM1 Serial Port

The COM1 serial port is bi-directional (half duplex) and uses RS-485 for transmitting data. It is mainly used to connect PCs, PLCs and additional remote displays. The transmission speed may be selected in the setup as: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud (bit/sec).

On the same RS-485 line, it is possible to connect up to 32 devices (instruments, RS-485/RS-232 signal converter).

Considerations when making RS-485 connections:

- Use a Shielded Twisted Pair cable to make the connection (twisted and shielded pair(s) with single shielding for each pair through aluminum band and total shielding through external shielding)
- Using 2x24 AWG duplex cable with external shielding, the RS-485 cable should not exceed 4000' (1200 m) ([Section 8.0 on page 53](#))
- With very long cables, cable capacity becomes a dominant factor in power consumption (normally near 50pF/m); Cable capacity decreases as length increases; Capacity also decreases when speed is increased; The maximum distance cannot be covered with the maximum possible speed

Baud Rate (bit/sec)	Total Cable Capacity (pF)
1200	400000
2400	200000
4800	100000
9600	50000
19200	25000
38400	12000
57600	8000
115200	4000

Table 6-1. Cable Capacity

- Verify single point grounding on all equipment ([Section 2.3 on page 4](#))
- Use correct single point grounding to avoid forming ground loops
- On the RS-485 network, two termination resistances equal to the impedance of the cable (typically 120  $\Omega$ ) are normally connected on the two devices at the ends of the cable; Terminal resistance is not supplied with the ports of the instrument
- Consult the device product data sheet for all connected devices to ensure consistency in the markings

#### 6.1.2 COM2 Serial Port

The COM2 serial port is bi-directional (full duplex) and uses an RS-232 for transmitting data. It is mainly used to connect printers, PCs, and PLCs. The transmission speed may be selected in the setup as: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud.

## 6.2 Serial Port Transmission Modes

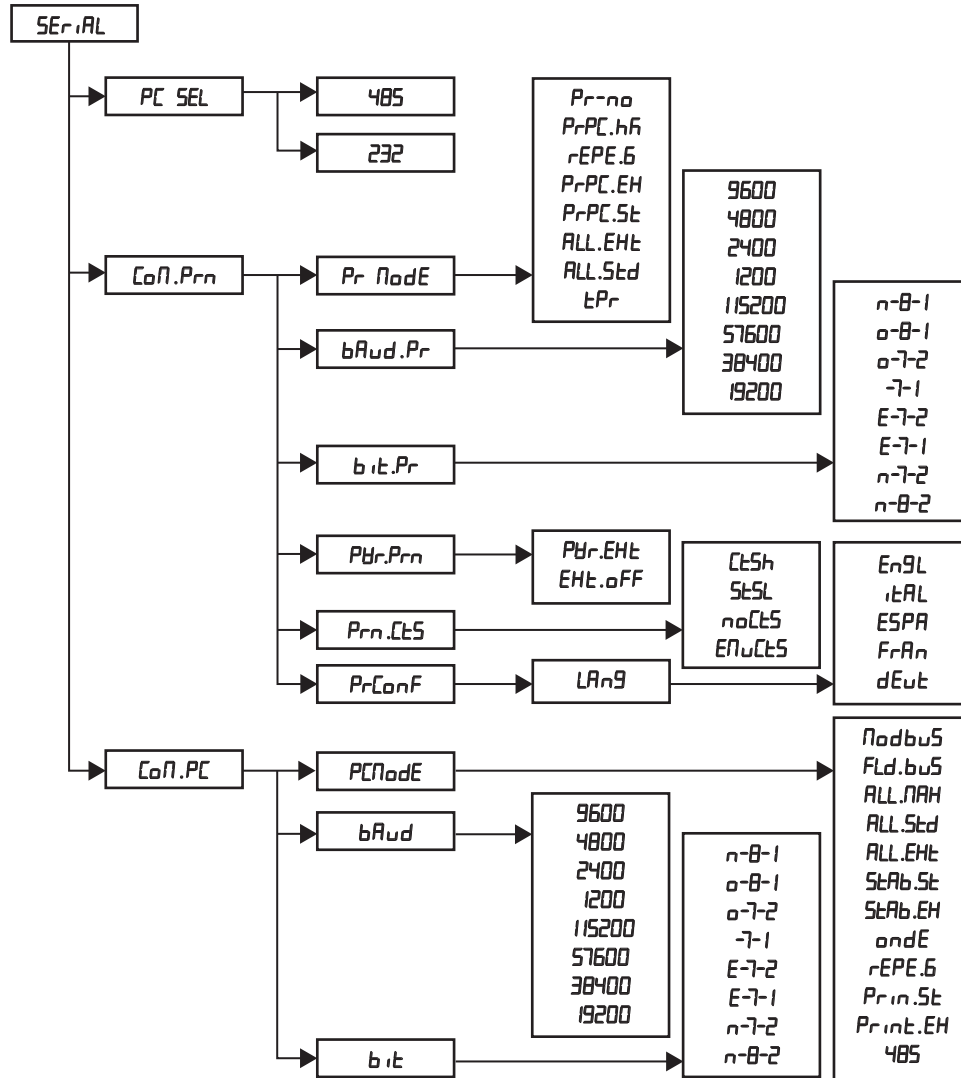


Figure 6-1. Serial Menu

### 6.2.1 PC Port Selection

It's possible to select the serial port to be used as a PC port. When a port is selected for PC port transmission, the other serial port is selected as default for PRN port transmission.

This setting is made in the *SEtUP*→*SErIAL*→*PC SEL* step.

Select the RS-485 serial port as the PC PORT and the RS-232 serial port sets as the PRN PORT.

Select the RS-232 serial port as the PC PORT and the RS-485 port sets as the PRN PORT.

Parameter	Settings	Description
PCSEL (PC Select)	Select the communication carrier for the ports	
	485	Communication between the instrument and the PC takes place through the RS-485 port and transmission of data to the printer through the RS-232 port
	232	Communication between the instrument and the PC takes place through the RS-232 port and transmission of data to the printer through the RS-485 port

Table 6-2. PC Port Selection

## 6.2.2 PRN PORT

This section describes the selectable serial weight transmission modes of the PRN serial port through the parameter set in *PrModE*




Parameter	Settings	Description
<i>Con.Prn</i> (Communication Printer)	–	Serial Format for the printer port
<i>PrModE</i> (Print Mode)	–	Transmission to serial printer
	<i>PrNo</i>	Transmission disabled
	<i>PrPC.hf</i>	Transmission of the weight string by pressing enter
	<i>rEPE.B</i>	The weight is displayed on the instrument and is transmitted to a 6 digit remote display
	<i>PrPC.EH</i> <i>PrPC.St</i>	<i>PrPC.EH</i> allows for transmission of the extended string by pressing <b>Enter</b> (Section 6.4.2 on page 49) or multi-scale string in the <i>LRnSn</i> mode <i>PrPC.St</i> allows for transmission of the standard string by pressing <b>Enter</b> (Section 6.4.1 on page 49)
		Transmission when  is pressed – The instrument transmits the weight data through the serial port when  is pressed; Transmission takes place if the weight is stable and the net weight is > 20 divisions; Re-enabling the transmission depends on how <i>rERCT</i> is set in the setup mode (passing by zero of the net weight, weight instability or always); Data is transmitted with the standard string <i>PrIn.St</i> or the extended string; See Section 6.4 on page 49 for a description of the strings; The transmission is confirmed when <i>LRnSn</i> displays
<i>ALL.EHt</i> <i>ALL.Std</i>		Continuous Transmission for interfacing to the PC, remote displays and other devices which request a constant stream of the data independently from the weight stability; The instrument transmits data with each A/D cycle: <ul style="list-style-type: none"> <li>• Baud rate at 9600 up to 10 transmissions per second are possible</li> <li>• Baud rate at 115200 up to 16 transmissions per second are possible for the PC port and up to 12 for the printer port</li> </ul> The data transmits both positive and negative values: <ul style="list-style-type: none"> <li>• <i>ALL.Std</i> – The data is transmitted using the standard string</li> <li>• <i>ALL.EHt</i> – The data is transmitted using the extended string (or multi-scale string in the <i>LRnSn</i> mode) <ul style="list-style-type: none"> <li>- See Section 6.4 on page 49 for a description of the strings</li> </ul> </li> </ul> <b>NOTE: Filter selection directly affects data transmission; To obtain 250TX/sec configure the filter F.F.400 (SEtUP → ConF.IG → PRrRN. → StAb IL)</b>
<i>tPr</i>		Enables printing with ASCII compatible printer: Data is transmitted to the printer by pressing  on the instrument; The print command is inhibited if the weight is in motion and in all other circumstances in which the data is not valid
<b>NOTE: In the <i>rEPE.B</i> protocol, the serial output is automatically set at 4800, N-8-1 but can be configured differently.</b>		
<b>NOTE: For the protocol and transmission mode specifications (Section 6.2 on page 41).</b>		
<i>bAud.Pr</i> (Baud.Pr)		Set baud rate – Selection of the data transmission speed (baud = bit/second); (9600 default)
<i>bit.Pr</i> (Bit.Pr)		Set parity, word, stop bit
<i>Pbr.Prn</i>		Manufacturer use only
<i>Prn.CtS</i>		Manufacturer use only
<i>Pr.Conf</i> (Pr.Conf)	<i>LRnB</i>	Select Language of Printouts <b>NOTE: Language selection only available if <i>tPr</i> is selected.</b>

Table 6-3. Serial Menu Parameters and Settings



### 6.2.3 PC PORT

This section described the selectable serial weigh transmission modes of the PC serial port.








Parameter	Settings	Description
Con.PC (PC Serial)	PC Serial	
PCModE (PC Mode)	Modbus	<p>Transmission on the PC Serial</p> <p>Transmission with the MODBUS protocol:</p> <ul style="list-style-type: none"> <li>• Mod.tYP displays; Press ; select RS232 or RTU; press </li> <li>• Mod.Addr displays; Press ; enter the address of the unit (0 to 98); press </li> <li>• Enter baud rate; Press </li> <li>• Enter bit parameters; Press </li> </ul>
ALL.NAH ALL.Std ALL.EHL		<p>Continuous Transmission for interfacing to the PC, remote displays and other devices which request a constant stream of the data independently from the weight stability; The instrument transmits data with each A/D cycle:</p> <ul style="list-style-type: none"> <li>• Baud rate at 9600 up to 10 transmissions per second are possible</li> <li>• Baud rate at 115200 up to 16 transmissions per second are possible for the PC port and up to 12 for the printer port</li> </ul> <p>The data transmits both positive and negative values:</p> <ul style="list-style-type: none"> <li>• ALL.Std – The data is transmitted using the standard string</li> <li>• ALL.EHL – The data is transmitted using the extended string (or multi-scale string in the t-RAN mode) <ul style="list-style-type: none"> <li>- See <a href="#">Section 6.4 on page 49</a> for a description of the strings</li> </ul> </li> <li>• ALL.NAH The weight is transmitted in hexadecimal format (example: 03E8= 1000g), without decimal point <ul style="list-style-type: none"> <li>- This transmission protocol is recommended for applications where a high number of output transmissions is required. (up to 250TX/sec. with baud rate equal to 115200)</li> </ul> </li> </ul> <p><b>NOTE: Filter selection directly affects data transmission; To obtain 250TX/sec configure the filter F.F.400 (SEtUP → ConF ID → PARRAN . → StAb IL)</b></p>
StAb.St StAb.EH		<p>Transmission on stability – each time a weight on the scale becomes stable, a communication string is transmitted on the PC port;</p> <ul style="list-style-type: none"> <li>• The transmission takes place when weight is stable and the net weight is greater than 10 display divisions</li> <li>• Re-enabling the transmission depends how rEHL has been set in the setup mode (<a href="#">Table 4-3 on page 21</a>)</li> <li>• The data is transmitted with the standard string StAb.St or the extended string StAb.EH (or multi-scale string in the t-RAN mode); See <a href="#">Section 6.4 on page 49</a> for a description of the three strings</li> </ul>
onDE		<p>Transmission requested on demand, from an external device – the instrument waits for a command before transmitting data (<a href="#">Section 6.3 on page 44</a>)</p> <p>With baud rate at 9600, up to 10-11 requests per second are possible through the READ command; with baud rate at 115200, up to 16 requests per second are possible through the READ command;</p> <p>The data transmits both positive and negative values</p>
rEPE.B		<p>Transmission to 6 digit remote display / Reception of the “rEPE.B” string</p> <p>The weight display occurs both in the instrument and is transmitted to a 6 digit remote display</p>
Pr.in.St Pr.in.EH		<p>The instrument communicates the weight data through the serial port when  is pressed:</p> <ul style="list-style-type: none"> <li>• Transmission takes place if the weight is stable and the net weight is &gt; 20 divisions; re-enabling transmission depends on how the rEHL is set in the setup mode (passing by zero of the NET weight, weight instability or always)</li> <li>• Pr.in.St - The data is transmitted using the standard string</li> <li>• Pr.in.EH - The data is transmitted using the extended string <ul style="list-style-type: none"> <li>- See <a href="#">Section 6.4 on page 49</a> for a description of the strings</li> </ul> </li> <li>• The transmission is confirmed when t-RAN displays</li> </ul>
485		<p>Transmission in RS-485 serial mode; Protocol mimics the command that was sent; the instrument responds only if its ID is the one requested (before the request the module ID must be input, i.e. 00READ&lt;CRLF&gt;); If a broadcast address command (99) is received no answer is given; If the command is correct it is executed</p>
BAud (Baud)		Set baud rate – Selection of the data transmission speed (baud = bit/second)
bit (Bit)		Set parity, word, stop bit

Table 6-4. PC Port Parameters and Settings

## 6.3 Serial Commands Format

Legend	
[CC] o <II>	Instrument ID, e.g. 00 (The ID is only used with RS-485 protocol)
<CR LF>	Carriage Return plus Line Feed (ASCII character 13 and 10)
<ESC>	ASCII character 27
<STX>	ASCII character 02
B	Space character, ASCII character 32

Table 6-5. Serial Command Legend

### Serial Errors

The instrument transmits a response string or it transmits one of the following indications with each serial command received:

Status Response	Description
OK<CR LF>	Displays when a correct command is transmitted from the PC to the instrument; OK does not mean the instrument executes the zero
ERR01<CR LF>	Displays when a correct command is transmitted from the PC to the instrument, but the command is followed by unexpected letters; For example READF, TARES instead of READ, TARE
ERR02<CR LF>	Displayed when a correct command is transmitted from the PC to the instrument, but contains wrong data
ERR03<CR LF>	Displayed when an incorrect command is received; When the command may not be used in the selected functioning mode or when the command is received while the keyboard buffer is already full
ERR04<CR LF>	Displayed when a nonexistent command is received

Table 6-6. Serial Status Response



**Note** *The instrument does not transmit an indication with momentary commands; For example, those made up of only one letter and then the parameter.*

### Version Reading Command

[CC]VER<CR LF>

Instrument response: [CC]VER,vv,DGT1Sbbb<CR LF>

In which:

- vv is the firmware version
- b is the space character, ASCII 32

### Extended Weight Read Command

[CC]REXT<CR LF>

Instrument response in the V mode or in the dEP.Ch mode: extended string ([Section 6.4.2 on page 49](#)).

Instrument response in the tRAnSf mode: multi-scale string ([Section 6.4.3 on page 50](#)).



**Note** *If the instrument is in the ind.Ch mode (scale with independent channels) or in the dEP.Ch mode (scale with dependent channels and digitally equalized) the weight value is read relative to the active channel; To read the values of other channels (if configured) switch to the desired channel ([Converter Channel Switching Command on page 45](#)).*

*If the instrument is in the tRAnSf mode (scale with independent channels) it is possible to simultaneously read the values for all the configured channels*

### Weight Read Command

[CC]READ<CR LF>

Instrument response: standard string ([Section 6.4.1 on page 49](#)).

### Weight Reading Command With Sensitivity Times 10

[CC]GR10<CR LF>

Instrument response: standard string ([Section 6.4.1 on page 49](#)).

## Reading Command of MicroVolts Relative to the Weight

[CC]MVOL<CR LF>

Instrument response in *ind.Ch* mode: standard string (Section 6.4.1 on page 49).

Response of the instrument in *trAnSn* and *dEP.Ch* mode: multi-scale string (Section 6.4.3 on page 50).



### Note

*If the instrument is in the **ind.Ch** mode (scale with independent channels) or in the **dEP.Ch** mode (scale with dependent channels and digitally equalized) the weight value is read relative to the active channel; to read the values of the other channels (if configured) switch to the desired channel. See Converter Channel Switching Command.*

*If the instrument is in the **trAnSn** mode (scale with independent channels) it is possible to read simultaneously the values for all the configured channels.*

## Tare Command

[CC]TARE<CR LF> or [CC]T<CR LF>

Instrument response: [CC]OK<CR LF>

## Zero Command

[CC]ZERO<CR LF> or [CC]Z<CR LF>

Instrument response: [CC]OK<CR LF>

## Clear Command

[CC]CLEAR<CR LF> or [CC]C<CR LF>

Instrument response: [CC]OK<CR LF>

The command also works in the setup mode.

## Converter Channel Switching Command

[CC]CGCHN<CR LF>

Instrument answer: [CC]OK<CR LF> if the CGCH command has been received.

N is the number of the channel on which to position the instrument

## Test Command

[CC]ECHO<CR LF>

Instrument response: [CC]ECHO<CR LF>

## Print Command

[CC]PRNT<CR LF> or [CC]P <CR LF>

Instrument response: [CC]OK<CR LF> if the command has been received, no answer for the P command.

## Tare Insertion Command

[CC]TMANVVVVV<CR LF> or [CC]WVVVVV <CR LF>

VVVVVV is the manual tare value with the decimal point, from 1 to 6 characters; the non significant zeros can be omitted.

Instrument response: [CC]OK<CR LF> if the command has been received; no answer for the W command.

## Command for Displaying Temporary Message on an Instrument

[CC]DISPNNVVVVV <CR LF>

- NN is the instrument display number, standard 00 (ASCII hex)
- V is the message:
  - If present, it is shown on the NN display
  - If not present, the command interrupts the possible visualization enabled with a previous DISP command, restoring the visualization of the weight data



### Note

*If the display shown in the command is numeric (for example the standard display 00) and in the transmitted message there are two consecutive points, the message is stopped after the first of the two points. When the display is showing a message transmitted serially through the DISP command, the instrument does not display those messages usually shown in the scale status (ZERO, TARE, HOLD, etc.).*

*Instrument response: [CC]OK<CR LF>*

*The message remains for the time set through the DINT command*

*The ASCII characters having the decimal code greater than 31 are accepted.*

## Command for Setting Display Message Interval

[CC]DINTNNNN<CR LF>

In which: NNNN is the visualization interval (in milliseconds), expressed in ASCII hex character; for example, in order to set a visualization time of 2 seconds (2000 milliseconds, which converted into hex it becomes 07D0), the command becomes [CC]DINT07D0<CR><LF>.

By setting a time equal to zero, the message transmitted with the DISP command remains permanently shown on the display.

Instrument response: [CC]OK<CR LF>

## PC Confirmation Command

[CC]PCOK<CR LF>

The instrument shows on the display the -PCOK- message for about two seconds.

Instrument response: [CC]OK<CR LF>

## Serial Command which Returns the Instrument Status

[CC]STAT<CR LF>

Instrument response: [CC]STATXX<CR LF>

In which: XX is a decimal value which returns the status of the instrument; the possible values are:

XX	Instrument Status
00	Normal scale status
01	Normal scale status in input
02	Instrument in technical setup
03	Instrument in boot phase
04	Instrument in rx/tx setup phase
05	Instrument in test phase of the serial ports
06	Instrument in print test
07	Instrument in firmware update phase
08	Instrument in standby
09	Instrument in automatic zero phase
10	Instrument in change channel
11	Instrument in inputs test phase

Table 6-7. Instrument Status Commands

## Key Press Simulation Command

[CC]KEYPXX<CR LF>






XX	Code of Pressed Key
00	 – ZERO key
01	 – TARE key
02	 – MODE key
03	 – PRINT key
04	 – C key
05	Numeric 1 key
06	Numeric 2 key
07	Numeric 3 key
08	Numeric 4 key
09	Numeric 5 key
0A	Numeric 6 key
0B	Numeric 7 key
0C	Numeric 8 key
0D	Numeric 9 key
0E	Numeric 0 key

Table 6-8. Key Press Simulation Commands

Instrument response: [CC]OK<CR LF>: accepted command.

In the event the simulated key has two linked functions, key momentarily pressed or pressed at length, if the KEYP command is followed by the release command (KEYR) within a maximum time of 1.5 seconds, the momentary key press is executed; otherwise the key pressed at length is executed.

## Release Key Press Simulation Command

[CC]KEYR<CR LF>

Instrument response: [CC]OK<CR LF>



**Note**

*The instrument does not respond OK to the following momentary commands (P, Q, T, W, X, Z).*

## Scale Information Reading

[CC]RALL<CR LF>

Instrument response:

[CC]SS,B,NNNNNNUM,LLLLLLUM,YYTTTTTTTUM,XXXXXXUM,SSS,AAA,CCC,TTT,XXXXX-YYYYY<CR LF>

Characters	Description
SS	UL Under-load OL Overload ST Stability of the display US Instability of the display TL Active inclination input
B	Number of platform on which the totalization has been made
NNNNNNUM	Net weight with unit of measure
LLLLLLUM	Gross weight with unit of measure
YY	Tare Type; Blank spaces if semi-automatic tare; PT If preset tare
TTTTTTTTUM	Tare value with unit of measure
XXXXXXUM	Not used
SSS	Scale status: • 000 Weighing • 001 Numeric value input • 002 Setup menu
AAA	Counter of pressed keys
CCC	Code of last key pressed
TTT	Not used
XXXXX	Last rewriting number stored in the alibi memory
YYYYY	Last weigh number stored in the alibi memory

Table 6-9. RALL Command Response Characters

## Setpoint Command

[CC]STPTnxxxxxyyyyyy<CR LF>

In which: n indicates the setpoint number (1, 2)

t→F if the following weight value indicates that the setpoint will disable the outputs (OFF).

t→O if the following weight value indicates that the setpoint will enable the outputs (ON).

xxxxx and yyyyy represent the weight value of the setpoint that disables or enables the outputs: the digits must be entered without the decimal point, omitting the non-significant zeros.

Instrument responses: [CC]OK<CR LF> correct syntax and correct values have been received

[CC]NO<CR LF> correct syntax but wrong values have been received

Example of instrument with capacity 10.000 kg and division 1 g:

Command: **STPT1F5000O6500** (Disabling first output at 5 kg and enabling at 6.5 kg)

Instrument response: **OK**



Note

**The ERR 02 code displays when:**

**One of the two entered values is greater than the capacity.**

**One of the two entered values has a minimum division that is inconsistent compared to the one set in the instrument.**

**The disabling value is greater than that of enabling.**

**The transmitted values are valid until the instrument is turned off. To permanently save these on the unit use the saving command (CMDSAVE). To save various setpoints set all of them and at the end transmit the saving command.**

## Setpoint Saving Command

[CC]CMDSAVE<CR LF>

Response: [CC]OK<CR LF>

## Enable/Disable Keyboard

To enable the keyboard: [CC]KEYEE<CR LF>

Instrument response: [CC]OK<CR LF>

To disable the keyboard: [CC]KEYED<CR LF>

Instrument response: [CC]OK<CR LF>

## 6.4 Transmission Protocols

The weight data transmission on the PC and PRN serial ports may take place in 3 formats: standard string, extended string or multi-scale string.

### 6.4.1 Standard String

String transmitted in the dependent or independent channel mode: [CC]hh,kk,pppppppp,uu <CR LF>

String transmitted in the TRANSM mode: [CC]hh,pppppppp,uu <CR LF>

Characters	Description
[CC]	The instrument ID as two ASCII decimal digits (RS-485 protocol)
hh	UL Under-load OL Overload ST Stability of the display US Instability of the display
,	Comma character
kk	NT Net weight GS Gross weight GX Gross weight with sensitivity times 10 VL Value in microvolts relative to the weight RZ Value in converter points relative to the weight
,	Comma character
pppppppp	8 digits (including sign and decimal point) which identify the weight; The insignificant digits are filled with spaces; Through the MVOL and RAZF command the instrument transmits the relative value on 10 digits instead of 8
uu	Unit of measurement kg, bg, bt, lb, mv (microvolts), vv (A/D counts); (b signifies blank)
<CR LF>	Carriage Return + Line Feed (ASCII decimal character 13 and 10)

Table 6-10. Standard String Characters



**Note** Transmitted weight is gross weight (GS) if no tare weight has been entered; Otherwise, net weight (NT) is transmitted.

### 6.4.2 Extended String

Without APW (any mode other than in response to the REXT command):

[CC]B,hh,NNNNNNNNNN,YYTTTTTTTTTT,PPPPPPPPPP,uu,(dd/mm/yybbhh:mm:ss|NO DATE TIME)<CR LF>

With APW (in response to the REXT command):

[CC]B,hh,NNNNNNNNNN,YYTTTTTTTTTT,PPPPPPPPPP,AAAA.AAAAA,uu<CR LF>

Characters	Description
[CC]	The instrument ID as two ASCII decimal digits (RS-485 protocol)
B	Scale number is always 1
,	Comma character
hh	UL Under load OL Overload ST Stability of display US Instability of display
,	Comma character
NNNNNNNNNN	Net weight on 10 characters including possible sign and decimal point
,	Comma character
YY	PT if the tare is manual, if YY = two empty spaces display with semiautomatic tare
,	Comma character
TTTTTTTTTT	Tare weight on 10 characters including possible sign and decimal point
,	Comma character
PPPPPPPPPP	Always 0
,	Comma character
uu	Unit of measure Kg, bg, bt, lb; (b signifies blank)
,	Comma character
dd/mm/yy	Date in the dd/mm/yy format (only with REXD command)
bb	Two space characters, ASCII decimal 32 character (only with REXD command)
hh:mm:ss	Time format (only with REXD command)
<CR LF>	Carriage Return + Line Feed (ASCII decimal character 13 and 10)

Table 6-11. Extended String Characters



**Note** The non significant digits of the net, tare, pieces and gross weights are filled with spaces (space characters, ASCII decimal 32 character). If the optional TIME DATE board has not been detected, in response to the REXD command, only the weight is transmitted and not the date and time; in its place there is NO DATE TIME.

### 6.4.3 Multi-Scale String

The string can vary depending on the configured channels:

- [CC]hh,pppppppp,uu, (dd/mm/yybbhh:mm:ss|NO DATE TIME)<CR LF>
- [CC]hh,pppppppp,uu,hh,pppppppp,uu, (dd/mm/yybbhh:mm:ss|NO DATE TIME)<CR LF>
- [CC]hh,pppppppp,uu,hh,pppppppp,uu,hh,pppppppp,uu, (dd/mm/yybbhh:mm:ss|NO DATE TIME)<CR LF>
- [CC]hh,pppppppp,uu,hh,pppppppp,uu,hh,pppppppp,uu,hh,pppppppp,uu, (dd/mm/yybbhh:mm:ss|NO DATE TIME)<CR LF>

Characters	Description
[CC]	The instrument code as two ASCII decimal digits (RS-485 protocol)
For each set channel:	
hh	ST Stability of the display US Instability of the display VL Value in microvolts relative to the weight RZ Value in converter points relative to the weight
,	Comma character
pppppppp	8 digits (including eventual sign and decimal point) which identify the weight; The insignificant digits are filled with spaces; Through the MVOL and RAZF commands the instrument transmits the relative value on 10 digits instead of 8
,	Comma character
uu	Unit of measure ( <b>b</b> signifies blank) <ul style="list-style-type: none"> <li>• kg</li> <li>• <b>bg</b></li> <li>• <b>bt</b></li> <li>• lb</li> <li>• mv (microvolts)</li> <li>• vv (converter points)</li> </ul>
,	Comma character
dd/mm/yy	Date in the dd/mm/yy format (only with REXD command)
bb	2 space characters, ASCII decimal 32 character (only with REXD command)
hh:mm:ss	Time format (only with REXD command)

Table 6-12. Multi-Scale String Characters

### 6.4.4 Secondary Mode Strings

#### Secondary Standard String

Standard string transmitted on the print port when *Pr.Mode = ALL.Std* or *Pr.PC.St*; SS,NT,WWWWWWWW,UU<CR LF>

Characters	Description
SS	Status: NV Weight not valid
,	Comma character
NT	ST Stable data US Unstable data UL Under-load OL Overload
,	Comma character
WWWWWWWW	Weight
,	Comma character
UU	Unit of measure

Table 6-13. Secondary Standard String Characters



## Secondary Extended String

Extended string transmitted on the print port when *Pr.NDdE* = *ALL.EHt* or *PcPr.Ht*

C, SS,NT,WWWWWWWW,UU<CR LF>

Characters	Description
C	Secondary or sum: • S, if the sum is sent
,	Comma character
SS	UL Under-load (not transmitted in the TRANSM mode) OL Overload (not transmitted in the TRANSM mode) ST Stability of the display US Instability of the display
,	Comma character
WWWWWWWW	Weight
,	Comma character





Table 6-14. Secondary Extended String Characters



**Note** When the *Pr.NDdE* = *PcPr.Ht* is set, only the weight is transmitted on the printer port.

## 6.5 Connection to a Remote Display

Use the following procedure to connect the LaserLT to a remote display.

1. Restart indicator. Momentarily press  during startup to display setup mode. *TYPE* displays.
2. Navigate to *SEtUP* → *CONF* → *SEr* → *AL* → *CONF* → *PCNdE* → *ALL.Std* then press  to confirm selection.
3. Press  until the instrument displays *SLUEP*.
4. Press  to confirm. *StorE* displays momentarily then unit reboots.

## 7.0 Troubleshooting

Use the following table to troubleshoot error messages on the instrument.



Message	Description
<i>AL.Err</i>	Displays when not connected at start-up, if there are communication problems between the instrument and the board or when the alibi memory operation is selected; The unit of measure conversion is automatically set, but not saved in the setup mode
<i>bUSy</i>	Printing – PRN serial port is occupied or the instrument is waiting to transmit a print job to a PC
<i>unStAb</i>	Trying to print with an unstable weight
<i>un.DUER</i>	Trying to print with the weight in under-load or in overload; With a weight of 9 divisions greater than the capacity or 100 divisions below the gross zero
-----	The weight is 9 divisions above the maximum capacity
-----	The weight is under the gross zero (- capacity – 9 divisions)
<i>Gross.Err</i>	Trying to print with a negative gross weight (equal or less than 0)
<i>net.Err</i>	Trying to print with a negative net weight (equal or less than 0)
<i>LoB</i>	Net weight less than the minimum necessary for the printing or the totalization
<i>no.D.unS</i>	Weight did not exceed net 0 or was not stable
<i>ConU.</i>	Trying to print while the instrument is converting the unit of measure
<i>no in</i>	Second attempt to acquire the input weight (input/output mode, set as <i>in.out</i> )
<i>noout</i>	Second attempt to acquire the output weight (input/output mode, set as <i>in.out</i> )
<i>no 1</i>	Second attempt to acquire the input weight (input/output mode, set as <i>G.t.</i> or <i>15t.2nd</i> )
<i>no 2</i>	Second attempt to acquire the output weight (input/output mode, set as <i>G.t.</i> or <i>15t.2nd</i> )
<i>PrEC</i>	Displays when trying to calibrate a point without first having confirmed the number of calibration points
<i>ErNoB</i>	Weight is unstable during the acquisition of a point during calibration
<i>ErPnB</i>	During the acquisition of a calibration point a null value has been read by the converter
<i>Er- 11</i>	Calibration error – Sample weight used was too small; Use a weight equal to at least half of the scale capacity
<i>Er- 12</i>	Calibration error – Acquired calibration point ( <i>tP 1</i> o <i>tP2</i> o <i>tP3</i> ) is equal to the zero point ( <i>tP0</i> )
<i>Er-37</i>	Scale must be calibrated; Perform a technical default ( <i>dEFAu</i> ) parameter, before proceeding ( <a href="#">Table 4-4 on page 22</a> ) <b>NOTE: Press  to access the Setup menu.</b>
<i>Er-39</i>	Scale must be calibrated; Perform a technical default ( <i>dEFAu</i> ) parameter, before proceeding ( <a href="#">Table 4-4 on page 22</a> ) <b>NOTE: Press  to access the Setup menu.</b>
<i>C_Er_-36</i>	During calibration some internal negative points have been calculated: <ul style="list-style-type: none"> <li>• The calibration point is less than the zero point</li> <li>• The signal is negative (check the connections)</li> </ul>
<i>C_Er_-37</i>	During the calibration some internal points less than the minimum value have been calculated: <ul style="list-style-type: none"> <li>• The calibration point is equal to the zero point</li> <li>• A capacity too high in relation to the division has been set</li> </ul>
<i>hB-Err</i>	Hardware Error – Software not compatible with the installed hardware; The hardware expansion component which allows the software to function is missing

Table 7-1. Error Messages

## 8.0 Specifications

### Power

AC voltages: 100 – 240 VAC  
DC voltages: 12 – 24 VDC

### Power Consumption

AC: 180 mA, DC: 1.4 A

### Excitation Voltage

5 VDC, 120 mA, 16 x 350  $\Omega$

### Analog Signal Input Range

$\pm 39$  mV

### Analog Signal Sensitivity

0.03  $\mu$ V/graduation minimum  
0.3  $\mu$ V/graduation recommended

### A/D Sample Rate

Four channel A/D 24-bit sigma-delta conversion,  
up to 200 conv. /sec. auto select

### Resolution

Internal resolution: 1.5 million counts  
Weight display resolution: 800,000

### Display

6-digit, 7-segment discrete oval  
red LED lamps, single width  
2.4" (60 mm) or 4" (100 mm) digit  
Decimal/comma indication in any position  
Annunciators for NT, Stability, COZ

### Maximum Viewing Distance

LaserLT-60: 2.4" digit, 75' (25 m)  
LaserLT-100: 4" digit, 150' (50 m)

### Serial Interface

RS-232 (1), RS-485 (1)

### Input Data Format

Baud Rate: 1200 to 115.2 K software selectable.  
Even parity 7 data bits, or no parity 8 data bits

### Update

Software selectable 1-20/sec

### Digital Inputs/Outputs

Two inputs: 12/24 VDC  
Two outputs: 150 mA 48 VAC / 150 mA 60 VDC

### Keyboard

Five key, Zero (Down), Tare (Up),  
Mode (Right), Print (Enter), C (On/Off)

### Weight

10 lb (4.5 kg)

### Operating Temperature

-40°F – 120°F (-40°C – 49°C)

### Rating/Material

304 stainless steel, IP68

### Warranty

One-year limited warranty

### Approvals



NTEP  
Certificate Number: 20-046  
Accuracy Class III; 10,000 d



Measurement Canada AM-6165C



## FCC 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 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 Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.







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