5000 Series Indicators

Instruction Manual

T51P Indicator

T51XW Indicator
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1. INTRODUCTION
This manual contains installation, operation and maintenance instructions for the T51P and T51XW Indicators. Please read this manual completely before installation and operation.

1.1 Safety Precautions
For safe and dependable operation of this equipment, please comply with the following safety precautions:

- Verify that the input voltage range printed on the data label matches the local AC power to be used.
- Make sure that the power cord does not pose a potential obstacle or tripping hazard.
- Use only approved accessories and peripherals.
- Operate the equipment only under ambient conditions specified in these instructions.
- Disconnect the equipment from the power supply when cleaning.
- Do not operate the equipment in hazardous or unstable environments.
- Do not immerse the equipment in water or other liquids.
- Service should only be performed by authorized personnel.
- The T51XW is supplied with a grounded power cable. Use only with a compatible grounded power outlet.

1.1.1 Relay Option Safety Precautions
This equipment may have an optional AC or DC Relay Option board installed. This option allows external devices to be controlled by the Indicator.

CAUTION: ELECTRICAL SHOCK HAZARD. REMOVE ALL POWER CONNECTIONS TO THE INDICATOR BEFORE SERVICING OR MAKING INTERNAL CONNECTIONS. THE HOUSING SHOULD ONLY BE OPENED BY AUTHORIZED AND QUALIFIED PERSONNEL, SUCH AS AN ELECTRICAL TECHNICIAN.

Before making connections to the Relay terminals, remove power from the system. If the system contains an optional rechargeable battery system, be sure that the ON/ZERO Off button is used to fully turn off the system after removing the AC power plug.

More detailed installation instructions are included with the Relay Option Kit when purchased.
1.2 Overview of Parts and Controls

Figure 1-1. T51P Indicator.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data Label</td>
</tr>
<tr>
<td>2</td>
<td>Front Housing</td>
</tr>
<tr>
<td>3</td>
<td>Control Panel</td>
</tr>
<tr>
<td>4</td>
<td>Adjusting Knob (2)</td>
</tr>
<tr>
<td>5</td>
<td>Mounting Bracket</td>
</tr>
<tr>
<td>6</td>
<td>Security Screw</td>
</tr>
<tr>
<td>7</td>
<td>Data Label</td>
</tr>
<tr>
<td>8</td>
<td>Rear Housing</td>
</tr>
<tr>
<td>9</td>
<td>Battery Cover</td>
</tr>
<tr>
<td>10</td>
<td>Screw (4)</td>
</tr>
<tr>
<td>11</td>
<td>Power Receptacle</td>
</tr>
<tr>
<td>12</td>
<td>Hole plug for option</td>
</tr>
<tr>
<td>13</td>
<td>Strain relief for alternate load cell connection</td>
</tr>
<tr>
<td>14</td>
<td>Load Cell Connector</td>
</tr>
<tr>
<td>15</td>
<td>Hole plug for option</td>
</tr>
<tr>
<td>16</td>
<td>RS232 Connector</td>
</tr>
</tbody>
</table>
1.2 Overview of Parts and Controls (Cont.)

TABLE 1-2. T51XW PARTS.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data Label</td>
</tr>
<tr>
<td>2</td>
<td>Front Housing</td>
</tr>
<tr>
<td>3</td>
<td>Control Panel</td>
</tr>
<tr>
<td>4</td>
<td>Adjusting Knob (2)</td>
</tr>
<tr>
<td>5</td>
<td>Mounting Bracket</td>
</tr>
<tr>
<td>6</td>
<td>Screw (4)</td>
</tr>
<tr>
<td>7</td>
<td>Rear housing</td>
</tr>
<tr>
<td>8</td>
<td>Data Label</td>
</tr>
<tr>
<td>9</td>
<td>Security Screw</td>
</tr>
<tr>
<td>10</td>
<td>Strain relief for option</td>
</tr>
<tr>
<td>11</td>
<td>Strain relief for RS232</td>
</tr>
<tr>
<td>12</td>
<td>Strain relief for option</td>
</tr>
<tr>
<td>13</td>
<td>Strain relief for option</td>
</tr>
<tr>
<td>14</td>
<td>Strain relief for Load Cell Cable</td>
</tr>
<tr>
<td>15</td>
<td>Power cord</td>
</tr>
</tbody>
</table>

Figure 1-2. T51XW Indicator.
1.2 Overview of Parts and Controls (Cont.)

Figure 1-3. Main PC Board.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sense Jumper W1</td>
</tr>
<tr>
<td>2</td>
<td>Alternate Load Cell Terminal Block J4</td>
</tr>
<tr>
<td>3</td>
<td>Sense Jumper W2</td>
</tr>
<tr>
<td>4</td>
<td>Security Switch SW2</td>
</tr>
<tr>
<td>5</td>
<td>External input Terminal Block J9</td>
</tr>
<tr>
<td>6</td>
<td>RS232 Terminal Block J7 (T51XW only)</td>
</tr>
<tr>
<td>7</td>
<td>Load Cell Connector (T51P only)</td>
</tr>
</tbody>
</table>
1.2 Overview of Parts and Controls (Cont.)

![Figure 1-4. Controls and Indicators.]

**TABLE 1-4. CONTROL PANEL.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>UNDER LED</td>
</tr>
<tr>
<td>2</td>
<td>ACCEPT LED</td>
</tr>
<tr>
<td>3</td>
<td>OVER LED</td>
</tr>
<tr>
<td>4</td>
<td>Capacity Label Window</td>
</tr>
<tr>
<td>5</td>
<td>Brackets (not used)</td>
</tr>
<tr>
<td>6</td>
<td>Kilogram, gram symbols</td>
</tr>
<tr>
<td>7</td>
<td>Scale symbol (not used)</td>
</tr>
<tr>
<td>8</td>
<td>Range symbol</td>
</tr>
<tr>
<td>9</td>
<td>Percent symbol</td>
</tr>
<tr>
<td>10</td>
<td>Pound, Ounce, Pound:ounce symbols</td>
</tr>
<tr>
<td>11</td>
<td>Tonne symbol</td>
</tr>
<tr>
<td>12</td>
<td>Battery charge symbol</td>
</tr>
<tr>
<td>13</td>
<td>Custom unit symbol</td>
</tr>
<tr>
<td>14</td>
<td>Dynamic symbol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>TARE Menu button</td>
</tr>
<tr>
<td>16</td>
<td>Pieces symbol</td>
</tr>
<tr>
<td>17</td>
<td>FUNCTION Mode button</td>
</tr>
<tr>
<td>18</td>
<td>PRINT Units button</td>
</tr>
<tr>
<td>19</td>
<td>ON/ZERO Off button</td>
</tr>
<tr>
<td>20</td>
<td>Pointer symbols (not used)</td>
</tr>
<tr>
<td>21</td>
<td>Brutto, Gross symbols</td>
</tr>
<tr>
<td>22</td>
<td>Preset Tare, Tare symbols</td>
</tr>
<tr>
<td>23</td>
<td>Stable weight Indicator</td>
</tr>
<tr>
<td>24</td>
<td>Negative symbol</td>
</tr>
<tr>
<td>25</td>
<td>Center of Zero Indicator</td>
</tr>
<tr>
<td>26</td>
<td>NET symbol</td>
</tr>
<tr>
<td>27</td>
<td>7-segment Display</td>
</tr>
</tbody>
</table>
## 1.3 Control Functions

### TABLE 1-5. CONTROL FUNCTIONS.

<table>
<thead>
<tr>
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<th>ON/ZERO</th>
<th>PRINT</th>
<th>FUNCTION</th>
<th>TARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Function (Short Press)</td>
<td><strong>ON/ZERO</strong>&lt;br&gt;Turns the Indicator on.&lt;br&gt;If Indicator is On, sets zero.</td>
<td><strong>PRINT</strong>&lt;br&gt;Sends the current value to the selected COM ports if AUTOPRINT is set to Off.</td>
<td><strong>FUNCTION</strong>&lt;br&gt;Initiates an application mode.&lt;br&gt;Temporarily displays the active mode’s reference data.&lt;br&gt;In Weigh mode, temporarily displays 10x expanded resolution.</td>
<td><strong>TARE</strong>&lt;br&gt;Performs a tare operation.</td>
</tr>
<tr>
<td>Secondary Function (Long Press)</td>
<td><strong>Off</strong>&lt;br&gt;Turns the Indicator off.</td>
<td><strong>Units</strong>&lt;br&gt;Changes the weighing Unit.</td>
<td><strong>Mode</strong>&lt;br&gt;Allows changing the application mode.&lt;br&gt;Press and hold allows scrolling through modes.</td>
<td><strong>Menu</strong>&lt;br&gt;Enter the User menu.</td>
</tr>
<tr>
<td>Menu Function (Short Press)</td>
<td><strong>Yes</strong>&lt;br&gt;Accepts the current setting on the display.</td>
<td><strong>No</strong>&lt;br&gt;Advances to the next menu or menu item.&lt;br&gt;Rejects the current setting on the display and advances to the next available setting.</td>
<td><strong>Back</strong>&lt;br&gt;Moves Back to previous menu item.&lt;br&gt;Decrements the value.</td>
<td><strong>Exit</strong>&lt;br&gt;Exits the User menu.&lt;br&gt;Aborts the calibration in progress.</td>
</tr>
</tbody>
</table>
2. INSTALLATION

2.1 Unpacking
Unpack the following items:
- T51P or T51XW Indicator
- AC Power Cord (T51P only)
- Mounting Bracket
- Knobs (2)
- Capacity Label Sheet
- LFT Sealing kit
- Instruction Manual CD
- Warranty Card

2.2 External Connections

2.2.1 Scale Base with Connector to T51P
Ohaus bases with a connector can be attached to the external load cell connector (Figure 1-1, item 14). Refer to section 2.3.2 for bases without a connector. To make the connection, plug the base connector onto the external load cell connector. Then rotate the base connector’s locking ring clockwise.

For connecting bases with a connector to a T51XW (which does not have the external connector), a Load Cell Cable Adapter Kit p/n 80500736 is available as an accessory. This kit connects to the terminal block inside the T51XW and has an external connector on the other end.

2.2.2 RS232 interface Cable to T51P
Connect the optional RS232 cable to the RS232 connector (Figure 1-1, item 16).

2.2.3 AC Power to T51P
Connect the AC power cord (supplied) to the power receptacle (Figure 1-1, item 11), then connect the AC plug to an electrical outlet.

2.2.4 AC Power to T51XW
Connect the AC plug to a properly grounded electrical outlet.

2.2.5 Battery Power to T51P
The indicator can be operated on alkaline batteries (not supplied) when AC power is not available. It will automatically switch to battery operation if there is power failure or the power cord is removed. The indicator can operate for up to 80 hours on battery power.

Remove the battery cover (Figure 1-1, item 9) and install 6 C-type (LR14) alkaline batteries in the orientation specified. Re-install the battery cover. During battery operation, the battery charge symbol indicates the battery status. The indicator will automatically turn-off when the batteries are fully discharged.

<table>
<thead>
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<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
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<td>N/C</td>
</tr>
<tr>
<td>2</td>
<td>TXD</td>
</tr>
<tr>
<td>3</td>
<td>RXD</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
</tr>
<tr>
<td>7</td>
<td>CTS</td>
</tr>
<tr>
<td>8</td>
<td>RTS</td>
</tr>
<tr>
<td>9</td>
<td>N/C</td>
</tr>
</tbody>
</table>

Figure 2-1. RS232 Pins.
2.2.6 Mounting Bracket
Position the wall bracket over the threaded holes in the side of the indicator as shown in Figures 8-1 or 8-2 and install the knobs. Adjust the indicator to the desired angle and tighten the knobs.

2.3 Internal Connections
Some connections require the housing to be opened.

2.3.1 Opening the Housing

CAUTION: ELECTRICAL SHOCK HAZARD. REMOVE ALL POWER CONNECTIONS TO THE INDICATOR BEFORE SERVICING OR MAKING INTERNAL CONNECTIONS. THE HOUSING SHOULD ONLY BE OPENED BY AUTHORIZED AND QUALIFIED PERSONNEL, SUCH AS AN ELECTRICAL TECHNICIAN.

T51P
Remove the four Phillips head screws from the rear housing.
Remove the front housing being careful not to disturb the internal connections.
Once all connections are made, reattach the front housing.

T51XW
Remove the four hex head screws from the rear housing.
Open the housing by carefully pulling the front housing forward.
Once all connections are made, reattach the front housing.
The screws should be tightened to 2.5 N•m (20-25 in-lb) torque to ensure a watertight seal.

2.3.2 Scale Base Without Connector to T51P or T51XW
Bases without a connector must be attached to the internal load cell connector on the main PC board. Pass the load cell cable through the strain relief (Figure 1-1, item 13 or Figure 1-2, item 13) and attach it to terminal block J4 (Figure 1-3, item 2). Tighten the strain relief to maintain a watertight seal.

Jumper Connections
For a 4-wire load cell with no sense wires: Jumpers W1 and W2 must be left in place shorting the two pins.
For a 6-wire load cell that includes sense wires, Jumpers W1 and W2 must be removed.
For load cells with an extra ground shield wire: Connect the shield to the center position (GND) of J4.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>J4-1</td>
<td>+EXE</td>
</tr>
<tr>
<td>J4-2</td>
<td>+SEN</td>
</tr>
<tr>
<td>J4-3</td>
<td>+SIG</td>
</tr>
<tr>
<td>J4-4</td>
<td>GND</td>
</tr>
<tr>
<td>J4-5</td>
<td>-SIG</td>
</tr>
<tr>
<td>J4-6</td>
<td>-SEN</td>
</tr>
<tr>
<td>J4-7</td>
<td>-EXE</td>
</tr>
</tbody>
</table>

After wiring is completed and jumpers are in place, replace the indicator housing screws. Make sure the liquid-tight connector is properly tightened.
2.3.3 RS232 Interface Cable to T51XW
Pass the optional RS232 cable through the strain relief (Figure 1-2, item 10) and attach it to terminal block J7 (Figure 1-3, item 6). Tighten the strain relief to maintain a watertight seal.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>J7-1</td>
<td>RTS</td>
</tr>
<tr>
<td>J7-2</td>
<td>TXD</td>
</tr>
<tr>
<td>J7-3</td>
<td>RXD</td>
</tr>
<tr>
<td>J7-4</td>
<td>CTS</td>
</tr>
<tr>
<td>J7-5</td>
<td>GND</td>
</tr>
</tbody>
</table>

2.3.4 Footswitch to T51P or T51XW
Pass the optional footswitch cable through the strain relief (Figure 1-1, item 15 or Figure 1-2, item 11) and attach it to terminal block J9 (Figure 1-3, item 5).

2.4 T51P Rear Housing Orientation
The T51P is delivered in the wall mount orientation with the connections exiting below the display. The rear housing may be reversed so the connections exit above the display when the T51P is placed horizontally on a bench. To reverse the rear housing, remove the four Phillips head screws, carefully rotate the housing 180°, and reinstall the screws.

2.5 Mounting Bracket
Attach the bracket to a wall or table using fasteners (not supplied) that are appropriate for the type of mounting surface. The bracket will accommodate up to 6 mm (1/4") diameter screws. Locate the mounting holes as shown in Figure 2-5.
### 3. SETTINGS

#### 3.1 Menu Structure

<table>
<thead>
<tr>
<th>Calibration</th>
<th>Setup</th>
<th>Readout</th>
<th>Mode</th>
<th>Unit</th>
<th>GMP</th>
<th>Print1</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ZERO 1)</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
</tr>
<tr>
<td>• SPAN 1)</td>
<td>• RANGE 2)</td>
<td>• STABLE RANGE 2)</td>
<td>• WEIGHT 2)</td>
<td>• DATE</td>
<td>• DATE</td>
<td>• CONTENT</td>
</tr>
<tr>
<td>• LINEARITY 1)</td>
<td>• CAPACITY 2)</td>
<td>• FILTER</td>
<td>• COUNT 2)</td>
<td>• DATE TYPE</td>
<td>• DATE</td>
<td>• RESULT</td>
</tr>
<tr>
<td>• CAL TEST</td>
<td>• POWER ON UNIT 2)</td>
<td>• AUTO ZERO 2)</td>
<td>• PERCENT 2)</td>
<td>• TIME</td>
<td>• TIME</td>
<td>• GROSS</td>
</tr>
<tr>
<td>• GEO 1)</td>
<td>• AUTO RANGE 2)</td>
<td>• BACKLIGHT</td>
<td>• DYNAMIC 2)</td>
<td>• TIME SET</td>
<td>• TIME</td>
<td>• NET</td>
</tr>
<tr>
<td>• END CAL</td>
<td>• AUTO TARE 2)</td>
<td>• AUTO OFF TIMER</td>
<td>• CHECK WEIGH 2)</td>
<td>• USER ID</td>
<td>• DATE TYPE</td>
<td>• TARE</td>
</tr>
<tr>
<td></td>
<td>• RETAIN WEIGHT 2)</td>
<td>• GROSS INDICATOR</td>
<td>• END MODE</td>
<td>• AUTO PRINT</td>
<td>• PROJECT ID</td>
<td>• HEADER</td>
</tr>
<tr>
<td></td>
<td>• LEGAL FOR TRADE</td>
<td>• END READOUT</td>
<td></td>
<td>• SCALE ID</td>
<td>• PROJECT ID</td>
<td>• USER ID</td>
</tr>
<tr>
<td></td>
<td>• BEEPER VOLUME</td>
<td></td>
<td></td>
<td>• SCALE ID</td>
<td></td>
<td>• END SETUP</td>
</tr>
<tr>
<td></td>
<td>• BEEPER SIGNAL</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• BUTTON BEEPER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Print2</th>
<th>Com1</th>
<th>Com2</th>
<th>I-O</th>
<th>Lock Menu</th>
<th>Lock Key</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
<td>• RESET</td>
</tr>
<tr>
<td>• STABLE ONLY 2)</td>
<td>• BAUD</td>
<td>• BAUD</td>
<td>• BAUD</td>
<td>• LOCK CAL</td>
<td>• LOCK ALL</td>
<td>• END</td>
</tr>
<tr>
<td>• AUTO PRINT</td>
<td>• PARITY</td>
<td>• PARITY</td>
<td>• PARITY</td>
<td>• LOCK SETUP</td>
<td>• LOCK OFF</td>
<td></td>
</tr>
<tr>
<td>• CONTENT</td>
<td>• STOP BIT</td>
<td>• STOP</td>
<td>• STOP</td>
<td>• LOCK READOUT</td>
<td>• LOCK ZERO</td>
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<td></td>
<td>• HANDSHAKE</td>
<td>• ADDRESS 3)</td>
<td>• ADDRESS 3)</td>
<td>• LOCK CAP</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ALT. COMMAND</td>
<td>• HANDSHAKE</td>
<td>• HANDSHAKE</td>
<td>• LOCK SETUP</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• PRINT</td>
<td>• ALT. COMMAND</td>
<td>• ALT. COMMAND</td>
<td>• LOCK MODE</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• TARE</td>
<td>• PRINT</td>
<td>• PRINT</td>
<td>• LOCK UNIT</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ZERO</td>
<td>• TARE</td>
<td>• TARE</td>
<td>• LOCK READOUT</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ZERO</td>
<td>• ZERO</td>
<td>• LOCK TARE</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• LOCK MENU</td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• LOCK LOCK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• END LOCK KEY</td>
</tr>
</tbody>
</table>

Notes:
1) Hidden when LEGAL FOR TRADE is ON.
2) Locked at current setting when LEGAL FOR TRADE is ON.
3) Visible only with RS485/RS422 option installed.
3.2 Menu Navigation

Enter the menu by pressing the TARE Menu button until MENU is displayed. When the button is released, the Legal for Trade status is displayed, followed by the first menu. Press the No or Back button to move to a different menu. Press the Yes button to enter the menu. Once in the menu, press the Yes button to view the menu item setting or press the No or Back button to move to the next menu item. When viewing the setting, press the Yes button to accept the setting, or press the No or Back button to change the setting. Once all settings have been made, press the Exit button to return to the current application mode.

For menu items with numeric settings such as Capacity, the current setting is displayed with all digits flashing. Press the No button to begin editing. The first digit is displayed flashing.

Press the No button to increment the digit or press the Yes button to accept the digit and move to the next digit.

Repeat this process for all digits.

Press the Yes button when the last digit has been set.

The new setting is displayed with all digits flashing. Press the Yes button to accept the setting or press the No button to resume editing.

This method also applies to setting Checkweigh under and over targets.

For End menu items, pressing the Yes button advances to the next menu, while pressing the No button returns to the top of the current menu.

3.3 Calibration Menu

When CAL is displayed, press the Yes button to accept the Calibration menu selection. Press the No button to advance to the desired calibration menu item. Three calibration processes are available: Zero Calibration, Span Calibration and Linearity Calibration. Default settings are bold.

NOTES:
1. Make sure that appropriate calibration masses are available before beginning calibration.
2. Make sure that the scale base is level and stable during the entire calibration process.
3. Calibration is unavailable with LFT set to ON.
4. Allow the Indicator to warm up for approximately 5 minutes after stabilizing to room temperature.
5. To abort calibration, press the Exit button anytime during the calibration process.
6. When any selection within the GMP menu is enabled, calibration results are automatically printed.
3.3.1 Zero Calibration
Zero calibration uses one calibration point. The zero calibration point is established with no weight on the scale. Use this calibration method to adjust for a different pre-load without affecting the span or linearity calibration. When ZErO is displayed, press the Yes button to initiate Zero Calibration.

The display flashes 0 and the calibration unit. Press the Yes button to establish the zero point.

The display shows --C-- while the zero point is established.

When zero calibration is completed, the display shows dONE.

Then the scale exits to the active weighing mode and displays the actual weight value.

3.3.2 Span Calibration
Span Calibration uses two points to adjust the scale. The span calibration point is established with a calibration mass placed on the scale. The zero calibration point is established with no weight on the scale.

When SPAN is displayed, press the Yes button to initiate Span Calibration.

The display flashes the span calibration point. Place the specified weight on the scale and press the Yes button.

To choose a different span point or calibration unit, edit the setting as explained in Section 3.2 Menu Navigation. When the desired setting is displayed, place the specified weight on the scale and press the Yes button.

The display shows --C-- while the span point is established.

The display flashes 0.

With no weight on the scale, press the Yes button to establish the zero point.

The display shows --C-- while the zero point is established.

When span calibration is completed, the display shows dONE.

Then the scale exits to the active weighing mode and displays the actual weight value.
3.3.3 Linearity Calibration

Linearity calibration uses 3 calibration points. The full calibration point is established with a weight on the scale. The mid calibration point is established with a weight equal to half of the full calibration weight on the scale. The zero calibration point is established with no weight on the scale. The mid calibration points cannot be altered by the user during the calibration procedure.

When LINEAr is displayed, press the Yes button to initiate Linearity Calibration.

The display flashes the full calibration point and calibration unit. Place the specified weight on the scale and press the Yes button.

To choose a different full point or calibration unit (kg or lb), edit the setting as explained in Section 3.2 Menu Navigation. When the desired setting is displayed, place the specified weight on the scale and press the Yes button.

The display shows --C-- while the full point is established.

The display flashes the mid calibration point.

Place the specified weight on the scale and press the Yes button.

The display shows --C-- while the mid point is established.

The display flashes 0.

With no weight on the scale, press the Yes button to establish the zero point.

The display shows --C-- while the zero point is established.

When linearity calibration is completed, the display shows done.

Then the scale exits to the active weighing mode and displays the actual weight value.
3.3.4 Calibration Test
Calibration test is used to compare a known calibration weight against the stored span calibration data.

NOTE: Calibration Test is always available (even when LFT is set to ON).
When TEST is displayed, press the Yes button to initiate Calibration Test.
The display flashes 0. With no weight on the scale, press the Yes button to record the current zero point.
The display shows --t-- while the zero point is recorded.
The display flashes the span calibration weight using the value from the last calibration. The example shows test weight of 30 kg.
Place the specified test weight on the scale and press the Yes button.
The display shows --t-- while the data is processed.
The display flashes the actual difference between the calibration data and the test weight.
The example shows a 0.010 kg difference. The result of the Calibration Test is printed.
After 5 seconds, Calibration Test ends, the scale returns to the active weighing mode and displays the current weight.

3.3.5 Geographical Adjustment Factor
Refer to Table 3-2 and set the GEO factor that corresponds to your location.
00 to 31

NOTE: Only an authorized manufacturer’s representative or certified verification personnel may make these changes. Changing the geographical setting alters the calibration values.

3.3.6 End Calibration
Advance to the next menu.
<table>
<thead>
<tr>
<th>Geographical latitude away from the equator, (North or South) in degrees and minutes</th>
<th>Elevation above sea level in meters</th>
<th>Elevation above sea level in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°00' - 5°46'</td>
<td>31</td>
<td>1060</td>
</tr>
<tr>
<td>5°46' - 9°52'</td>
<td>30</td>
<td>2130</td>
</tr>
<tr>
<td>9°52' - 12°44'</td>
<td>29</td>
<td>3200</td>
</tr>
<tr>
<td>12°44' - 15°06'</td>
<td>28</td>
<td>4260</td>
</tr>
<tr>
<td>15°06' - 17°10'</td>
<td>27</td>
<td>5330</td>
</tr>
<tr>
<td>17°10' - 19°02'</td>
<td>26</td>
<td>6400</td>
</tr>
<tr>
<td>19°02' - 20°45'</td>
<td>25</td>
<td>7460</td>
</tr>
<tr>
<td>20°45' - 22°22'</td>
<td>24</td>
<td>8530</td>
</tr>
<tr>
<td>22°22' - 23°54'</td>
<td>23</td>
<td>9600</td>
</tr>
<tr>
<td>23°54' - 25°21'</td>
<td>22</td>
<td>10660</td>
</tr>
<tr>
<td>25°21' - 26°45'</td>
<td>21</td>
<td>11730</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Geographical latitude away from the equator, (North or South) in degrees and minutes</th>
<th>Elevation above sea level in meters</th>
<th>Elevation above sea level in feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>8°55' - 10°00'</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>10°00' - 10°30'</td>
<td>4</td>
<td>1060</td>
</tr>
<tr>
<td>10°30' - 11°00'</td>
<td>3</td>
<td>2130</td>
</tr>
<tr>
<td>11°00' - 11°30'</td>
<td>2</td>
<td>3200</td>
</tr>
<tr>
<td>11°30' - 12°00'</td>
<td>1</td>
<td>4260</td>
</tr>
<tr>
<td>12°00' - 12°30'</td>
<td>0</td>
<td>5330</td>
</tr>
<tr>
<td>12°30' - 13°00'</td>
<td>-1</td>
<td>6400</td>
</tr>
<tr>
<td>13°00' - 13°30'</td>
<td>-2</td>
<td>7460</td>
</tr>
<tr>
<td>13°30' - 14°00'</td>
<td>-3</td>
<td>8530</td>
</tr>
<tr>
<td>14°00' - 14°30'</td>
<td>-4</td>
<td>9600</td>
</tr>
<tr>
<td>14°30' - 15°00'</td>
<td>-5</td>
<td>10660</td>
</tr>
</tbody>
</table>

TABLE 3-2. GEOGRAPHICAL ADJUSTMENT VALUES
3.4 Setup Menu

When the Indicator is used for the first time, enter this menu to set the Range, Capacity and Graduation. Default settings are bold.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset</td>
<td>No, Yes</td>
</tr>
<tr>
<td>Range</td>
<td>Single, Dual</td>
</tr>
<tr>
<td>Full Scale Capacity</td>
<td>1...999950</td>
</tr>
<tr>
<td>Graduation</td>
<td>0.00001...1000</td>
</tr>
<tr>
<td>Power On unit</td>
<td>Auto, kg, g, lb, oz, lb:oz</td>
</tr>
<tr>
<td>Zero Range</td>
<td>2%, 100%</td>
</tr>
<tr>
<td>Auto-Tare</td>
<td>Off, On, Accept</td>
</tr>
<tr>
<td>Retain Weight Data</td>
<td>Off, On</td>
</tr>
<tr>
<td>Legal for Trade</td>
<td>Off, On</td>
</tr>
<tr>
<td>Beeper Volume</td>
<td>Off, Lo, Hi</td>
</tr>
<tr>
<td>Beeper Signal</td>
<td>Off, Accept, Under, Over, Under-Over</td>
</tr>
<tr>
<td>Button Beep</td>
<td>Off, On</td>
</tr>
<tr>
<td>End Setup</td>
<td>Exit SETUP menu</td>
</tr>
</tbody>
</table>

3.4.1 Reset

Reset the Setup menu to the factory defaults. (except Range, Capacity and Graduation)

NO  = not reset.
YES = reset.

NOTE: If the Legal for Trade menu item is set to ON, the Range, Capacity, Graduation, Zero Range, Auto Tare, Retain Weight Data and Legal For Trade settings are not reset.

3.4.2 Range

Set the number of weighing ranges.

SINGLE  = one weighing range from zero to full capacity.
DUAL    = two weighing ranges, where range 1 is from zero to half capacity and range 2 is from half capacity to full capacity.

3.4.3 Capacity

Set the scale capacity as explained in Section 3.2 Menu Navigation.

NOTE: If DUAL was selected in the RANGE menu item, the Capacity setting defines the Range 2 capacity. The Range 1 capacity is automatically defined as half of the Capacity setting. For example, if Capacity is set to 15, the Range 1 capacity becomes 7.5.

After the capacity is set, select the Primary Unit.

kg  = the primary unit is kilograms
lb  = the primary unit is pounds
3.4.4 Graduation

Set the scale readability.

0.00001, 0.00002, 0.00005, 0.0001, 0.0005, 0.001, 0.002, 0.005, 0.01, 0.02,
0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000.

**NOTE:** Graduation settings are limited to values from Capacity divided by 1000 to Capacity divided by 30000. Therefore, not all settings are available for each capacity.

**NOTE:** If Dual was selected in the RANGE menu item, the Graduation setting defines the Range 1 graduation. The Range 2 graduation is automatically defined as one step greater than the Graduation setting. For example, if Graduation is set to 0.001, the Range 2 graduation becomes 0.002.

**NOTE:** Range 2 graduation is retained even under half capacity until the scale returns to zero.

3.4.5 Power On Unit

Set the unit of measures displayed at startup.

- AUTO = last unit in use when turned off
- Pwr.UN kg = kilograms
- Pwr.UN g = grams
- Pwr.UN lb = pounds
- Pwr.UN oz = ounces
- Pwr.UN lb:oz = pound ounces
- Pwr.UN t = tonnes
- Pwr.UN C = custom unit

**NOTE:** Units oz, lb:oz and C (custom) will not be valid as Power On units when Range is set to Dual. The next available unit will be displayed instead.

3.4.6 Zero Range

Set the percentage of scale capacity that may be zeroed.

- 2% = zero up to 2 percent of capacity
- 100% = zero up to full capacity
3.4.7  **Auto-Tare**
Set the Automatic Tare functionality.

- **OFF** = Automatic Tare is disabled.
- **ON** = the first stable gross weight will be tared.
- **ACCEPT** = when the application mode is CHECK, stable gross weight that is within the Checkweigh accept limits will be tared.

When Accept is selected, set the current delay time is displayed.

Settings:
- **OFF** = automatic tare takes affect immediately
- 0.5, 1, 2 or 5 = automatic tare takes affect after the selected delay period (in seconds).

3.4.8  **Retain Weight Data**
Set the Retain Weight Data functionality.

- **OFF** = Disabled.
- **ON** = When power is turned on, the displayed weight is based on the last stored zero (Zero button or "Z" command).

3.4.9  **Legal for Trade**
Set the legal for trade status.

- **OFF** = standard operation
- **ON** = operation complies with weights and measures regulations

**NOTE:** When Legal for Trade is set to ON, the Menu settings are affected as follows:
- Calibration functions are hidden except for Calibration Test.
- Capacity is read-only.
- Range, Graduation, Power On unit, Auto-Tare, Retain Zero, Gross Indication, Print Output, Unit and Mode settings are locked at their current settings.
- Zero Range is locked at 2%.
- Stable Range is locked at 1d.
- Auto-Zero Tracking is set to 0.5d.
- Continuous Print is disabled.
- IP and CP RS232 commands are disabled.

**NOTE:** When Legal for Trade is set to ON, it is necessary to set the security switch to ON before exiting the menu. If the security switch is not set to ON, the message "NO.SW" is displayed and the indicator returns to the menu.
3.4.10 Beeper Volume
Set the beeper volume.

OFF = disabled.
LOW = soft
HI = loud.

3.4.11 Beeper Signal
Set how the beeper responds in the Checkweigh mode.

OFF = the beeper is disabled.
ACCEPT = the beeper will sound when the weight is within the Accept range.
UNDER = the beeper will sound when the weight is below the Under setting.
OVER = the beeper will sound when the weight is above the Over setting.
UNDER OVER = the beeper will sound when the weight is below the Under setting or above the Over setting.

3.4.12 Button Beeper
Set how the beeper sounds when a button is pressed.

OFF = no sound
ON = sound

3.4.13 End Setup
Advance to the next menu.

3.5 Readout Menu
Enter this menu to customize display functionality. Default settings are bold.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset</td>
<td>No, Yes</td>
</tr>
<tr>
<td>Stable Range</td>
<td>0.5d, 1d, 2d, 5d</td>
</tr>
<tr>
<td>Filter Level</td>
<td>Lo, Med, Hi</td>
</tr>
<tr>
<td>Auto Zero Tracking</td>
<td>Off, 0.5d, 1d, 3d</td>
</tr>
<tr>
<td>Backlight</td>
<td>Off, On, Auto (-&gt;Set 1, Set 2, Set 5)</td>
</tr>
<tr>
<td>Auto Off Timer</td>
<td>Off, Set 1, Set 2, Set 5</td>
</tr>
<tr>
<td>Gross Indicator</td>
<td>Off, Gross, Brutto</td>
</tr>
<tr>
<td>End Readout</td>
<td>Exit READOUT menu</td>
</tr>
</tbody>
</table>
3.5.1 Reset
Set the Readout menu to factory default settings.

- NO = not reset
- YES = reset

If the Legal for Trade menu item is set to ON, the Stable Range, Averaging Level, Auto Zero Tracking, Auto Off and Gross settings are not reset.

3.5.2 Stable Range
Set the amount the reading can vary before the stability symbol turns off.

- 0.5d = 0.5 scale division
- 1d = 1 scale division
- 2d = 2 scale divisions
- 3d = 3 scale divisions
- 5d = 5 scale divisions

NOTE: When LFT is set to ON, the setting is forced to 1 d. The setting is locked when the hardware lock switch is set to the ON position.

3.5.3 Filter
Set the amount of signal filtering.

- LOW = less stability, faster stabilization time (≤ 1 sec.)
- MEd = normal stability, stabilization time (≤ 2 sec.)
- HI = greater stability, slower stabilization time (≤ 3 sec.)

3.5.4 Auto-Zero Tracking
Set the automatic zero tracking functionality.

- OFF = disabled.
- 0.5d = the display will maintain zero until a change of 0.5 divisions per second has been exceeded.
- 1d = the display will maintain zero until a change of 1 division per second has been exceeded.
- 3d = the display will maintain zero until a change of 3 divisions per second has been exceeded.

NOTE: When the LFT menu item is set to ON, the selections are limited to 0.5d, 1d and 3d. The setting is locked when the hardware lock switch is set to the ON position.
3.5.5 Backlight
Set the display backlight functionality.
- **OFF** = always off.
- **ON** = always on.
- **AUTO** = turns on when a button is pressed or the displayed weight changes.

When Auto is selected, set Backlight shut off time.
Settings:
- **SET 1** = backlight turns off after 1 minute of no activity.
- **SET 2** = backlight turns off after 2 minutes of no activity.
- **SET 5** = backlight turns off after 5 minutes of no activity.

3.5.6 Auto Off Timer
Set the automatic shut off functionality.
- **OFF** = disabled
- **SET 1** = powers off after 1 minute of no activity.
- **SET 2** = powers off after 2 minutes of no activity.
- **SET 5** = powers off after 5 minutes of no activity.

3.5.7 Gross Indicator
Set the type of gross indicator.
- **OFF** = disabled
- **G Gross** = the G icon is lit when gross weights are displayed.
- **B brutto** = the B icon is lit when gross weights are displayed.

3.5.8 End Readout
Advance to the next menu.

3.6 Mode Menu
Enter this menu to activate the desired application modes. Default settings are **bold**.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Reset</th>
<th>Weigh</th>
<th>Count</th>
<th>Percent</th>
<th>Dynamic</th>
<th>Checkweigh</th>
<th>End Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No, Yes</td>
<td>Off, On</td>
<td>Off, On</td>
<td>Off, On</td>
<td>Off, Manual</td>
<td>Off, On</td>
<td>Exit MODE menu</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Set 0 … Set 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Semi-automatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Automatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Set 0 … Set 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.6.1 Reset
Set the Mode menu to the factory defaults.

OFF = not reset.
YES = reset.

NOTE: If the Legal for trade menu item is set ON, the settings are not reset.

3.6.2 Weighing Mode
Set the status.

OFF = Disabled
ON = Enabled

3.6.3 Parts Counting Mode
Set the status.

OFF = Disabled
ON = Enabled

3.6.4 Parts Counting Optimize
Set the status.

OFF = Disabled
ON = Enabled

3.6.5 Percent Weighing Mode
Set the status.

OFF = Disabled
ON = Enabled

3.6.6 Dynamic Weighing Mode
Set the status.

OFF = Disabled
MAN = averaging and resetting are initiated manually by pressing the FUNCTION button.
SEMI = averaging is automatically initiated when the load is greater than 5 divisions; resetting is manually initiated by pressing the FUNCTION button.
AUTO = averaging is automatically initiated when the load is greater than 5 divisions; resetting is automatically initiated when the load is less than 5 divisions.

If MAN, SEMI or AUTO is selected, the current level setting is displayed.

Set the averaging time.

SET 0 = the first stable weight will be held on the display until it is reset (display hold).
SET 1 = the weight readings will be averaged for 1 second. The average will be held on the display until it is reset.
SET 60 = the weight readings will be averaged for 60 seconds. The average will be held on the display until it is reset.
3.6.7  Check Weighing Mode
Set the status.
OFF    = Disabled
ON     = Enabled

3.6.8  End Mode
Advance to the next menu.

3.7   Unit Menu
Enter this menu to activate the desired units. Default settings are bold.

Note: Due to national laws, the indicator may not include some of the units of measure listed.

3.7.1  Reset
Set the Unit menu to the factory defaults.
NO    = not reset.
YES   = reset

Note: If the Legal for Trade menu item is set ON, the settings are not reset.

3.7.2  Kilogram Unit
Set the status.
OFF    = Disabled
ON     = Enabled

3.7.3  Pound Unit
Set the status.
OFF    = Disabled
ON     = Enabled
3.7.4 Gram Unit
Set the status.
- OFF = Disabled
- ON = Enabled

3.7.5 Ounce Unit
Set the status.
- OFF = Disabled
- ON = Enabled

**NOTE:** Ounce Unit is not available when Range is set to Dual.

3.7.6 Pound Ounce Unit
Set the status.
- OFF = Disabled
- ON = Enabled

**NOTE:** Pound Ounce Unit is not available when Range is set to Dual.

3.7.7 Tonnes Unit
Set the status.
- OFF = Disabled
- ON = Enabled

3.7.8 Custom Unit
Use Custom Unit to display weight in an alternative unit of measure. The custom unit is defined using a conversion factor, where the conversion factor is the number of custom units per kilogram expressed in scientific notation (Factor x 10^Exponent).

For example: To display weight in troy ounces (32.15075 troy ounces per kilogram) enter a Factor of 3.21508 and an Exponent of 1.

Set the status.
- OFF = Disabled
- ON = Enabled

**NOTE:** Custom Unit is not available when Range is set to Dual.

**Factor**
Set the conversion factor.
- 0.00001 to 9.99999

Refer to Section 3.2 Menu Navigation to enter settings.
Exponent
Set the factor multiplier.

- 0 = $10^0$ (Factor x 1)
- 1 = $10^1$ (Factor x 10)
- 2 = $10^2$ (Factor x 100)
- 3 = $10^3$ (Factor x 1000)
- -2 = $10^{-2}$ (Factor ÷ 100)
- -1 = $10^{-1}$ (Factor ÷ 10)

Least Significant Digit
Set the custom unit readability.

- 0.00001, 0.00002, 0.00005, 0.0001, 0.0002, 0.0005, 0.001, 0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000

**NOTE**: LSD settings are limited to values that result in a displayed resolution of 1000 to 30000 divisions.

3.7.9 End Unit
Advance to the next menu.

3.8 GMP Menu
Enter this menu to set the data for Good Manufacturing Practice. Default settings are **bold**.

<table>
<thead>
<tr>
<th>Reset</th>
<th>No., Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Type (-&gt;MDY, DMY, YMD)</td>
</tr>
<tr>
<td>Time</td>
<td>Type (-&gt; 24 hr, 12 hr)</td>
</tr>
<tr>
<td>User ID</td>
<td>0000000 ... 9999999</td>
</tr>
<tr>
<td>Project ID</td>
<td>0000000 ... 9999999</td>
</tr>
<tr>
<td>Scale ID</td>
<td>0000000 ... 9999999</td>
</tr>
<tr>
<td>End GMP</td>
<td>Exit GMP menu</td>
</tr>
</tbody>
</table>

3.8.1 Reset
Set the GMP menu to factory defaults.

- NO = not reset.
- YES = reset.

3.8.2 Date Type
Set the date format.

- MdY = Month.Day.Year
- dMY = Day.Month.Year
- YMd = Year.Month.Day
3.8.3 Date Set
Set the date.
00 to 99 = year position
01 to 12 = month position
01 to 31 = day position

Refer to Section 3.2 Menu Navigation to enter settings.

3.8.4 Time Type
Set the time format.
24 hr = 24 hour format.
12 hr = 12 hour format.

3.8.5 Time Set
Set the time.
24 hour format
00 to 23 = hour position
00 to 59 = minute position

12 hour format
12 A to 12 P = hour position
00 to 59 = minute position

Refer to Section 3.2 Menu Navigation to enter settings.
3.8.6 User ID
Set the user identification.
000000 to 999999
Refer to Section 3.2 Menu Navigation to enter settings.

3.8.7 Project ID
Set the Project identification.
000000 to 999999
Refer to Section 3.2 Menu Navigation to enter settings.

3.8.8 Scale ID
Set the Scale identification.
000000 to 999999
Refer to Section 3.2 Menu Navigation to enter settings.

3.8.9 End GMP
Advance to the next menu.
3.9 Print1 and Print2 Menus

Enter this menu to define printing parameters. Default settings are bold.

**NOTE:** The Print2 menu is only displayed if a second interface (RS232 or RS422/RS485) is installed.

### 3.9.1 Reset

Set the Print menu to factory defaults.

- **NO** = not reset.
- **YES** = reset.

**NOTE:** If the Legal for Trade menu item is set to ON, the following settings are not reset: Stable

### 3.9.2 Print Stable Data Only

Set the print criteria.

- **OFF** = values are printed immediately.
- **ON** = values are only printed when the stability criteria are met.

### 3.9.3 Auto Print

Set the automatic printing functionality.

- **OFF** = disabled.
- **ON STAB** = printing occurs each time the stability criteria are met.
- **INTER** = printing occurs at the defined interval.
- **CONT** = printing occurs continuously.
- **ACCEPT** = printing occurs each time the display is within the Checkweigh accept range and stability criteria are met.

---

**Print1**

**Print2**

<table>
<thead>
<tr>
<th>Reset</th>
<th><strong>NO</strong>, <strong>YES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable Only</td>
<td><strong>Off</strong>, <strong>On</strong></td>
</tr>
<tr>
<td>Auto Print</td>
<td><strong>Off</strong></td>
</tr>
<tr>
<td>Print Content</td>
<td><strong>Result</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>, <strong>Numeric only</strong>), <strong>Gross</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Net</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Tare</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Header</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>User ID</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Project ID</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Scale ID</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Difference</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Date and Time</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Information</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Application Mode</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Name</strong> (-&gt; <strong>Off</strong>, <strong>On</strong>), <strong>Layout</strong></td>
</tr>
<tr>
<td>(End Print1)</td>
<td><strong>Exit PRINT1 menu</strong></td>
</tr>
<tr>
<td>(End Print2)</td>
<td><strong>Exit PRINT2 menu</strong></td>
</tr>
</tbody>
</table>
When ON.StAb is selected, set the condition for printing, where:
- LOAd = prints when the load is stable and greater than zero
- LOAd.Zr = prints when any load is stable and equal to or greater than zero.

When INtEr is selected, set the Print Interval.
- 1 to 3600 (seconds)

3.9.4 Print Content Sub-menu
This sub-menu is used to define the content of the printed data.

**Result**
Set the status.
- OFF = Disabled
- ON = the displayed reading is printed.
- NUM = only the numeric portion of the displayed reading is printed.

**Gross**
Set the status.
- OFF = Disabled.
- ON = the Gross weight is printed.

**Net**
Set the status.
- OFF = Disabled.
- ON = the Net weight is printed.

**Tare**
Set the status.
- OFF = Disabled.
- ON = the Tare weight is printed.

**Header**
Set the status.
- OFF = Disabled.
- ON = the Header is printed.

**User ID**
Set the status.
- OFF = Disabled.
- ON = the User ID is printed.
### Project ID
Set the status.
- **OFF** = Disabled.
- **ON** = the Project ID is printed.

### Scale ID
Set the status.
- **OFF** = Disabled.
- **ON** = the Scale ID is printed.

### Time
Set the status.
- **OFF** = Disabled.
- **ON** = the Date and Time is printed.

### Difference
Set the status.
- **OFF** = Disabled.
- **ON** = the Calibration Test difference is printed.

### Reference Information
Set the status.
- **OFF** = Disabled.
- **ON** = the Reference Information is printed.

**NOTE:** The Reference Information is dependent on the active mode (Weigh mode: None, Count mode: APW, Percent mode: Reference Weight, Dynamic mode: Level, Check Weigh mode: Under and Over limits).

### Mode
Set the status.
- **OFF** = Disabled.
- **ON** = the Mode is printed.

### Name
Set the status.
- **OFF** = Disabled.
- **ON** = the Name line is printed.
3.9.5 Layout Sub-menu

This sub-menu is used to define format of data output to a printer or computer.

**Format**

Set the printing format.

- **MULTI** = a multi-line (single column style) printout is generated. A CRLF is added after each item.
- **SINGLE** = a single line printout is generated. (A TAB space is added between each item and a CLRF is used only after the very last item.)

**Line Feed**

Set the paper feed.

- **LINE** = move paper up one line after printing
- **4.LINE** = move paper up four lines after printing
- **FORM** = a form feed is appended to the printout

3.9.6 List Menu Settings

Print the menu settings.

- **NO** = do not print.
- **YES** = print.

3.9.7 End Print1 or End Print2

Advance to the next menu.

3.10 COM1 and COM2 Menus

The table shows the items in the communication menus. Default settings are **bold**.

Enter the menu to define communication parameters.

<table>
<thead>
<tr>
<th>Item</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reset</strong></td>
<td><strong>No, Yes</strong></td>
</tr>
<tr>
<td>Baud Rate</td>
<td>300, 600, 1200, 2400, 4800, <strong>9600</strong>, 19200</td>
</tr>
<tr>
<td>Parity</td>
<td>7 Even, 7 Odd, 7 None, <strong>8 None</strong></td>
</tr>
<tr>
<td>Stop Bit</td>
<td>1, 2</td>
</tr>
<tr>
<td>Handshake</td>
<td><strong>None</strong>, XON/XOFF, Hardware</td>
</tr>
<tr>
<td>Address</td>
<td><strong>Off</strong>, 01,…, 99</td>
</tr>
<tr>
<td>All Command</td>
<td>Print (-&gt; Off, A … P … Z), Tare (-&gt; Off, A … T … Z), Zero (-&gt; Off, A … Z)</td>
</tr>
<tr>
<td>End Com1</td>
<td>Exit COM1 menu</td>
</tr>
<tr>
<td>(End Com2)</td>
<td>Exit COM2 menu</td>
</tr>
</tbody>
</table>

**NOTE:** The COM2 menu is only displayed if a second interface (RS232 or RS422/RS485) is installed.

3.10.1 Reset

Set the COM1 and COM2 menu to factory defaults.

- **NO** = not reset.
- **YES** = reset.
3.10.2 Baud
Set the Baud rate.

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>Baud Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>300 bps</td>
</tr>
<tr>
<td>600</td>
<td>600 bps</td>
</tr>
<tr>
<td>1200</td>
<td>1200 bps</td>
</tr>
<tr>
<td>2400</td>
<td>2400 bps</td>
</tr>
<tr>
<td>4800</td>
<td>4800 bps</td>
</tr>
<tr>
<td>9600</td>
<td>9600 bps</td>
</tr>
<tr>
<td>19200</td>
<td>19200 bps</td>
</tr>
</tbody>
</table>

3.10.3 Parity
Set the data bits and parity.

<table>
<thead>
<tr>
<th>Parity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 EVEN</td>
<td>7 data bits, even parity.</td>
</tr>
<tr>
<td>7 Odd</td>
<td>7 data bits, odd parity.</td>
</tr>
<tr>
<td>7 NONE</td>
<td>7 data bits, no parity.</td>
</tr>
<tr>
<td>8 NONE</td>
<td>8 data bits, no parity.</td>
</tr>
</tbody>
</table>

3.10.4 Stop Bit
Set the number of stop bits.

<table>
<thead>
<tr>
<th>Stop Bit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 stop bit.</td>
</tr>
<tr>
<td>2</td>
<td>2 stop bits.</td>
</tr>
</tbody>
</table>

3.10.5 Handshake
Set the flow control method.

<table>
<thead>
<tr>
<th>Handshake</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE</td>
<td>no handshaking.</td>
</tr>
<tr>
<td>ON-OFF</td>
<td>XON/XOFF software handshaking.</td>
</tr>
<tr>
<td>HArd</td>
<td>hardware handshaking.</td>
</tr>
</tbody>
</table>

3.10.6 Address
Set the communication address.

NOTE: Address is only displayed in the COM2 menu if the RS422/RS485 option is installed.

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>no address.</td>
</tr>
<tr>
<td>01 to 99</td>
<td>address 01 to 99</td>
</tr>
</tbody>
</table>
3.10.7 Alternate Command Sub-menu
Enter this sub-menu to set a different command character for the P (Print), T (Tare) and Z (Zero) commands.

Alternate Print Command
Set the alternate command character for Print.
A to Z.

Alternate Tare
Set the alternate command character for Tare.
A to Z.

Alternate Zero
Set the alternate command character for Zero.
A to Z.

3.10.8 End COM1 or End COM2
Advance to the next menu.

3.11 I-O Menu
Enter this menu to set the optional input and output device parameters. Default settings are **bold**.

<table>
<thead>
<tr>
<th>Reset</th>
<th>No, Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Input</td>
<td>Off, Tare, Zero, Print, Function, Start-Stop, Tare-Start-Stop</td>
</tr>
<tr>
<td>Input Beep</td>
<td>Off, On</td>
</tr>
<tr>
<td>Relay Output</td>
<td>Type (-&gt; Open, Closed), Sequence (-&gt; Normal, Hold), Contact (-&gt; Simultaneous, Break-Before-Make, Make-Before-Break), When Stable (-&gt; Off, On)</td>
</tr>
<tr>
<td>End I-O</td>
<td>Exit I-O menu</td>
</tr>
</tbody>
</table>

3.11.1 Reset
Set the I-O menu to factory defaults

NO = not reset.
YES = reset.
3.11.2 External Input
Set the function to be controlled by an optional external input device such as a foot switch.

- OFF = disabled.
- tArE = Tare function.
- ZErO = Zero function.
- PrINt = Print function.
- FUNCt = action specific to the current application mode.
- S-S = the first external input changes the state of the relay. The second external input returns the relay to the original state.
- t-S-S = the first external input initiates a Tare function, the second external input changes the state of the relay. The third external input returns the relay to its original state.

3.11.4 Input Beep
Set the beeper response to an external input.

- OFF = Disabled.
- ON = Enabled.

3.11.4 Relay Output
Set the relay output parameters.

**NOTE:** If the Relay option is not installed the OUTPUT menu and associated menu items are not available.

**Type**
Set the initial state of the relay.

- OPEN = the relay output is normally open.
- CLOSEd = the relay output is normally closed.

**CAUTION:** The normally closed relay condition is only active while the Indicator is powered on. When powered off or when power is removed, the relay condition returns to a normally open condition. Restoring power to the Indicator will restore the closed condition of the relays.

**Output Sequence**
Set how the relay outputs react as the weight reading changes from under / accept / over.

- NOrM = the previously enabled relay will be disabled as the next relay is enabled.
- HOLd = the previously enabled relay will hold the same state as the next relay is enabled.
**Contact**
Set the timing of the relay contacts.

- **SIM** = relays open or close at the same time.
- **b-b-M** = relay opens before the next relay closes (break before make).
- **M-b-b** = relay closes before the next relay opens (make before break).

**NOTE**: A 100 ms delay or over-lap is used for the break-before-make and make-before-break timing.

**Stable**
Set how the relay outputs react during instability.

- **OFF** = relay changes are immediate.
- **ON** = delays relay changes until weight reading is stable.

### 3.11.5 End I-O
Advance to the next menu.

### 3.12 Menu Lock Menu
Use this menu to prevent unauthorized changes to menu settings. When the security switch is set to ON, the locked menus can be viewed but not changed. Default settings are **bold**.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset</td>
<td>No, Yes</td>
</tr>
<tr>
<td>Lock Calibration Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Setup Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Readout Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Mode Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Unit Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Print1 Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Print2 Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Com1 Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock Com2 Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock GMP Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>Lock I-O Menu</td>
<td>Off, On</td>
</tr>
<tr>
<td>End Lock Menu</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.12.1 Reset
Set the menu Lock menu to factory defaults.

- **NO** = not reset.
- **YES** = reset.

**NOTE**: Settings for LFT controlled menu items are not reset.

#### 3.12.2 Lock Calibration
Set the status.

- **OFF** = Calibration menu is not locked.
- **ON** = Calibration menu settings is locked.
### 3.12.3 Lock Setup
Set the status.
- **OFF** = Setup menu is not locked.
- **ON** = Setup menu is locked.

### 3.12.4 Lock Readout
Set the status.
- **OFF** = Readout menu is not locked.
- **ON** = Readout menu is locked.

### 3.12.5 Lock Mode
Set the status.
- **OFF** = Mode menu is not locked.
- **ON** = Mode menu is locked.

### 3.12.6 Lock Unit
Set the status.
- **OFF** = Unit menu is not locked.
- **ON** = Unit menu is locked.

### 3.12.7 Lock Print1
Set the status.
- **OFF** = Print 1 menu is not locked.
- **ON** = Print 1 menu is locked.

### 3.12.8 Lock Print2
Set the status.
- **OFF** = Print 2 menu is not locked.
- **ON** = Print 2 menu is locked.

### 3.12.9 Lock COM1
Set the status.
- **OFF** = COM1 menu is not locked.
- **ON** = COM1 menu is locked.

### 3.12.10 Lock COM2
Set the status.
- **OFF** = COM2 menu is not locked.
- **ON** = COM2 menu is locked.
3.12.11 Lock GMP
Set the status.

OFF = GMP menu is not locked.
ON  = GMP menu is locked.

3.12.12 Lock I-O
Set the status.

OFF = I-O menu is not locked.
ON  = I-O menu is locked.

3.12.13 End Lock
Advance to the next menu.

3.13 Key Lock Menu
Use this menu to prevent unauthorized access to button functions. When
the security switch is set to ON, the locked buttons are disabled. Default
settings are bold.

3.13.1 Reset
Set the Key lock menu to factory defaults.

NO  = not reset.
YES = reset.

3.13.2 Lock All Buttons
Set the status.

OFF = all buttons unlocked.
ON  = all buttons are locked.

3.13.3 Lock Off Button
Set the status.

OFF = Off button is unlocked.
ON  = Off button is locked.

3.13.4 Lock Zero Button
Set the status.

OFF = Zero button is unlocked.
ON  = Zero button is locked.
3.13.5 Lock Print Button
Set the status.
OFF = Print button is unlocked.
ON  = Print button is locked.

3.13.6 Lock Unit Button
Set the status.
OFF = Unit button is unlocked.
ON  = Unit button is locked.

3.13.7 Lock Function Button
Set the status.
OFF = Function button is unlocked.
ON  = Function button is locked.

3.13.8 Lock Mode Button
Set the status.
OFF = Mode button is unlocked.
ON  = Mode button is locked.

3.13.9 Lock Tare Button
Set the status.
OFF = Tare button is unlocked.
ON  = Tare button is locked.

3.13.10 Lock Menu Button
Set the status.
OFF = Menu button is unlocked.
ON  = Menu button is locked.

NOTE: When the Menu button is locked, the user may unlock this button by holding the Menu button for 10 seconds until UNLOCK is displayed. The hardware Lock Switch must be in the unlocked position.

3.13.11 End Lock
Advance to the next menu.

3.14 Security Switch
A slide switch is located on the Main PCB board. When the switch is set to the ON position, user menu settings that were locked in the Menu Lock and Key Lock menus can be viewed but not changed.

Open the housing as explained in Section 2.3.1. Set the position of security switch SW2 to ON as shown in Figure 1-3.
4. **OPERATION**

4.1 **Turning Indicator On/Off**

To turn the Indicator on, press the ON/ZERO Off button. The Indicator performs a display test followed by a series of informational displays, and then enters the active weighing mode.

To turn the Indicator off, press and hold the ON/ZERO Off button until OFF is displayed.

4.2 **Zero Operation**

Zero can be set under the following conditions:

- Automatically at Power On (initial zero).
- Semi-automatically (manually) by pressing the ON/ZERO Off button.
- Semi-automatically by sending the Zero command (Z or alternate zero command).

Press the ON/ZERO Off button to zero the weight display. The scale must be stable to accept zero operation.

4.3 **Manual Tare**

When weighing an item that must be held in a container, taring stores the container weight in memory.

Place the empty container on the scale (example 0.5 kg) and press the TARE button. The display will show the net weight.

To clear the Tare value, empty the scale and press the TARE button. The display will show the gross weight.

4.4 **Pre-Set Tare**

A Pre-set Tare (PT) is a known tare value entered using the xT command (example 1.234 kg).

The display will show the Pre-set Tare as a negative value, with the PT Indicator on.

**NOTES:**
1. The PT value will supersede any other Tare or PT value in memory.
2. When using Pre-Set Tare, make sure that Auto-Tare function is set off in the Setup menu.
3. If the Tare entry includes digits beyond the readability of the Indicator, the tare value is rounded off to the readability of the Indicator.

To clear a Pre-set Tare value, empty the scale then press the TARE button. The display will show the Gross weight.

4.5 **Auto-Tare**

Auto-Tare automatically tares the initial weight (such as a container) placed on the empty scale, without having to press the TARE button. The tare value is cleared automatically when the weight on the scale is fully removed.

During Checkweighing operation, if the On Accept setting is selected in the Setup menu, weight values that are within the accept range will be tared automatically.

**NOTE:** Auto-Tare supersedes any pre-set (PT) value in memory.
4.6 Changing Units of Measure
Press and hold the PRINT Units button until the desired measuring unit appears. Only measuring units enabled in the Unit Menu will be displayed (refer to Section 3.7).

4.7 Printing Data
Printing the displayed data to a printer or sending the data to a computer requires that the communication parameters in the Print and Communication Menu are set (refer to Sections 3.9 and 3.10).

Press the PRINT Units button to send the displayed data to the communication port (the Auto-Print Mode in Section 3.9 function must be Off).

4.8 Application Modes
Press and hold the FUNCTION Mode button until the desired application mode appears. Only modes enabled in the mode menu will be displayed (refer to Section 3.6).

4.8.1 Weighing
Place the item to be weighed on the scale. The illustration indicates a sample of 1.5 kg, Gross weight.

NOTE: Press the FUNCTION Mode button to temporarily display the weight in 10x expanded resolution.

4.8.2 Parts Counting
Use this mode to count parts of uniform weight. The Indicator determines the quantity based on the average weight of a single part. All parts must be uniform in weight for accurate measurements.

Establishing the Average Piece Weight (APW)
When the FUNCTION Mode button is released, Clr.PW Pcs is displayed.

Clearing a Stored APW
Press the Yes button to clear the stored APW.

Recalling a Stored APW
Press the No button to recall the existing APW.

NOTE: Press the FUNCTION Mode button to temporarily display the APW value.

The display shows the sample size PUT 10Pcs.
Establishing a New APW
Press the No button to increment the sample size. Choices are 5, 10, 20, 50 and 100.

To establish the APW, place the specified quantity of samples on the scale and press the FUNCTION Mode button to capture the weight.

APW is displayed shortly followed by the APW value with the current unit of measure.

Begin Counting
Place the parts on the scale and read the count. If a container is used, be sure to tare the empty container first.

4.8.3 Percent Weighing
Use this mode to measure the weight of a sample as a percentage of a reference weight.

Reference Weight (Ref Wt)
When the FUNCTION Mode button is released, CLR.REF% is displayed.

Clearing a Stored Reference Weight
Press the Yes button to clear the stored reference weight.

Recalling a Stored Reference Weight
Press the No button to recall the existing reference weight.

NOTE: Press the FUNCTION Mode button to temporarily display the reference weight.

Establishing a New Reference Weight
The display shows Put.REF %.

To establish the Ref Wt, place the sample on the scale and press the FUNCTION Mode button to capture the weight. REF.WT is displayed shortly followed by the REF Wt value with the current unit of measure.

Begin Percent Weighing
Place the sample on the scale, and read the percent value. If a container is used, be sure to tare the empty container first.
4.8.4 Check Weighing
Use this mode to determine if the weight of a sample is within prescribed limits.

Checkweighing Limits
When the FUNCTION Mode button is released, CLr.rEF is displayed.

Clearing Stored Check Weighing Limits
Press the Yes button to clear the stored limits.

Recalling Stored Check Weighing Limits
Press the No button to recall the stored limits.

NOTE: Press the FUNCTION Mode button to temporarily display the Under and Over Limit values.

Editing the Under Setting
The display shows SEt.LO. Press the Yes button to edit setting.

Settings:
-999950 to 999950
Refer to Menu Navigation Section 3.2 to enter settings.

NOTE: The minus sign is used together with the first digit to show a negative value.

Editing the Over Setting
The display shows SEt.HI.
Press the Yes button to edit the Over setting.

Settings:
-999950 to 999950
Refer to Menu Navigation Section 3.2 to enter settings.

Begin Check Weighing
The appropriate Under, Accept or Over LED lights to indicate Check Weigh status.

Place a sample on the scale and read the weight.
For loads less than the Under Limit, the yellow Under LED is lit.

For loads greater than the Under Limit and less than the Over limit, the green Accept LED is lit.

For loads greater than the Over Limit, the red Over LED is lit.
4.8.5 Dynamic Weighing

Use this mode to weigh moving or oversized objects. The weight is held on the display until reset. Manual, semi-automatic and automatic start/stop methods are available (refer to Section 3.6.6).

Begin Dynamic Weighing

When the display shows rEAdY, place the object on the scale.

If the manual mode is in use, press the FUNCTION Mode button to start measurement. If the semi-automatic or automatic mode is in use, measurement is started automatically.

**NOTE**: When using manual mode, it is not necessary for the display to be at zero gross or net. When using semi-automatic or automatic mode, the display must be at zero gross or net before placing the object on the scale. The example is for a setting of 5 seconds. During the averaging period, the countdown timer decreases in one second increments.

**NOTE**: If SEt 0 was selected in the Dynamic menu item, the countdown timer is not displayed.

When the countdown has completed, the readings are averaged and held on the display. The averaged weight is displayed until reset.

If the manual or semi-automatic mode is in use, reset the countdown timer by pressing the FUNCTION Mode button. Then the display shows rEAdY.

If the automatic mode is in use, the held reading is shown on the display for 10 seconds after the object is removed to within 5 divisions of zero. Then the display shows rEAdY.

The scale is now ready to accept a new object.
The T51P and T51XW Indicators include an RS232 serial communication interface.

The setup of RS232 operating parameters are more fully explained in Section 3.10. The physical hardware connection is explained in Section 2.6.

The interface enables display and GMP data to be sent to a computer or printer. A computer can be used to control some functions of the indicator using the commands listed in Table 5-1.

### 5.1 Interface Commands

Communicate to the indicator using the command characters listed in Table 5-1.

<table>
<thead>
<tr>
<th>Command Character</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP</td>
<td>Immediate Print of displayed weight (stable or unstable).</td>
</tr>
<tr>
<td>P</td>
<td>Print displayed weight (stable or unstable).</td>
</tr>
<tr>
<td>CP</td>
<td>Continuous Print.</td>
</tr>
<tr>
<td>SP</td>
<td>Print on Stability.</td>
</tr>
<tr>
<td>xP</td>
<td>Interval Print x = Print Interval (1-3600 sec)</td>
</tr>
<tr>
<td>Z</td>
<td>Same as pressing Zero button</td>
</tr>
<tr>
<td>T</td>
<td>Same as pressing Tare button</td>
</tr>
<tr>
<td>xT</td>
<td>Enter a preset tare, where x = the tare value in grams.</td>
</tr>
<tr>
<td>PU</td>
<td>Print current unit: g, kg, lb, oz, lb:oz, t, C (custom)</td>
</tr>
<tr>
<td>xU</td>
<td>Set scale to unit x: 1=g, 2=kg, 3=lb, 4=oz, 5=lb:oz, 6=t, 7=C</td>
</tr>
<tr>
<td>PV</td>
<td>Version: print name, software revision and LFT ON (if LFT is set ON).</td>
</tr>
<tr>
<td>H x “text”</td>
<td>Enter Header line, where x = line number 1 to 5, “text” = header text up to 24 alphanumeric characters</td>
</tr>
<tr>
<td>Esc R</td>
<td>Global reset to reset all menu settings to the original factory defaults</td>
</tr>
</tbody>
</table>

**NOTES:**

1) Commands sent to the Indicator must be terminated with a carriage return (CR) or carriage return-line feed (CRLF).
2) Alternate command characters may be defined by the user (see Alternate Commands in Section 3.10).
3) Data output by the Indicator is always terminated with a carriage return-line feed (CRLF).
5.2 Output Format

The default serial output format is shown below.

<table>
<thead>
<tr>
<th>Field:</th>
<th>Weight</th>
<th>Space*</th>
<th>Unit</th>
<th>Space*</th>
<th>Stability</th>
<th>Space*</th>
<th>G/N</th>
<th>Space*</th>
<th>Term. Char(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length:</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>N</td>
<td>1</td>
<td>**</td>
</tr>
</tbody>
</table>

*Each field is followed by a single delimiting space (ASCII: 32)

Definitions:
Weight - up to 9 characters, right justified, "-" at immediate left of most significant character (if negative).
Unit - up to 5 characters
Stability - "?" character is printed if not stable. If weight is stable, neither "?" nor following space is printed.
G/N - "NET" printed if weight is net weight, "G", "B", or nothing (depending on GROSS menu setting - Sec. 3.5.7) printed if weight is a gross weight.
**Terminating Character(s) - terminating character(s) printed depending on FEED menu setting (CR, LF / 4xCR, LF / ASCII: 12, refer also to Sec. 3.9.5.).

**NOTE**: Shaded areas = this date is printed when set on in the Print Content menu.
Unshaded = typical

5.3 Printouts

The following sample print outs are generated by the Print button, "P" Command or alternate print command. The content of the printout is defined in the Print Content menu item. A maximum of 24 characters can be printed on each line.

**NOTE**: If the Print Content – Result menu is set to Numeric Only, the Result output only includes the weight field and the termination characters.
<table>
<thead>
<tr>
<th>Dynamic Mode Printout</th>
<th>Check Weighing Mode Printout</th>
<th>Calibration Test Printout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohaus Corporation</td>
<td></td>
<td>Ohaus Corporation</td>
</tr>
<tr>
<td>19A Chapin Road</td>
<td></td>
<td>19A Chapin Road</td>
</tr>
<tr>
<td>P.O. Box 2033</td>
<td></td>
<td>P.O. Box 2033</td>
</tr>
<tr>
<td>Pine Brook, NJ, 07058 USA</td>
<td></td>
<td>Pine Brook, NJ, 07058 USA</td>
</tr>
<tr>
<td>Tel: +1-973-377-9000</td>
<td></td>
<td>Tel: +1-973-377-9000</td>
</tr>
<tr>
<td>01/31/08  12:30 PM</td>
<td></td>
<td>01/31/08  12:30 PM</td>
</tr>
<tr>
<td>Scale ID: 123456</td>
<td></td>
<td>Scale ID: 123456</td>
</tr>
<tr>
<td>User ID: 123456</td>
<td></td>
<td>User ID: 123456</td>
</tr>
<tr>
<td>Project ID: 123456</td>
<td></td>
<td>Project ID: 123456</td>
</tr>
<tr>
<td>Name:___________________</td>
<td>Result: 10.00 kg NET OVER</td>
<td>Name:------------------</td>
</tr>
<tr>
<td></td>
<td>11.00 kg G</td>
<td>Mode: Test</td>
</tr>
<tr>
<td></td>
<td>10.00 kg NET</td>
<td>New Cal: 10.000 kg</td>
</tr>
<tr>
<td></td>
<td>1.00 kg T</td>
<td>Old Cal: 10.000 kg</td>
</tr>
<tr>
<td>Final Wt.: 0.200 kg NET</td>
<td>Under: 9.99 kg</td>
<td>Diff: 0.000 kg</td>
</tr>
<tr>
<td>12.34 kg G</td>
<td>Over: 10.01 kg</td>
<td>Wt. ID:------------------</td>
</tr>
<tr>
<td>11.11 kg NET</td>
<td>Mode: Checkweigh</td>
<td>End-----------------------</td>
</tr>
<tr>
<td>1.22 kg T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level: 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode: Dynamic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. **LEGAL FOR TRADE**

When the indicator is used in trade or a legally controlled application it must be set up, verified and sealed in accordance with local weights and measures regulations. It is the responsibility of the purchaser to ensure that all pertinent legal requirements are met.

6.1 **Settings**

Before verification and sealing, perform the following steps:

1. Verify that the menu settings meet the local weights and measures regulations.
2. Perform a calibration as explained in Section 3.
3. Set Legal for Trade to ON in the Setup menu.
4. Without exiting the menu, turn the indicator off.
5. Disconnect power from the indicator and open the housing as explained in Section 2.3.1.
6. Set the position of the security switch SW2 to ON as shown in Figure 1-3, item 4.
7. Close the housing.
8. Reconnect power and turn the indicator on.

**NOTE:** When Legal for Trade is set to ON and the security switch is set to ON, the following menu settings cannot be changed: Zero Calibration, Span Calibration, Linearity Calibration, GEO, Range, Capacity, Graduation, Power On Unit, Zero Range, Auto Tare, Retain Weight, Legal for Trade, Stable Range, Auto Zero Tracking, Gross Indicator, Modes, Units, Stable Only.

6.2 **Verification**

The local weights and measures official or authorized service agent must perform the verification procedure.

6.3 **Sealing**

The local weights and measures official or authorized service agent must apply a security seal to prevent tampering with the settings. Refer to the illustrations below for sealing methods.

![Figure 6-1. T51P Wire Seal](image1)

![Figure 6-2. T51XW Wire Seal](image2)
When the scale base is attached to the indicator using a connector, it is necessary to seal the load cell cable to the indicator in some jurisdictions. The load cell sealing collar P/N 80500737 (Figure 6-5) is available as an accessory.
7. **MAINTENANCE**

**CAUTION: DISCONNECT THE UNIT FROM THE POWER SUPPLY BEFORE CLEANING.**

7.1 **Model T51P Cleaning**
- The housing may be cleaned with a cloth dampened with a mild detergent if necessary.
- Do not use solvents, chemicals, alcohol, ammonia or abrasives to clean the housing or control panel.

7.2 **Model T51XW Cleaning**
- Use approved cleaning solutions for the stainless-steel Indicator housing and rinse with water. Dry thoroughly.
- Do not use solvents, chemicals, alcohol, ammonia or abrasives to clean the control panel.

7.3 **Troubleshooting**

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE(s)</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit will not turn on</td>
<td>Power cord not plugged in or properly connected.</td>
<td>Check power cord connections. Make sure power cord is plugged in properly into the power outlet.</td>
</tr>
<tr>
<td></td>
<td>Power outlet not supplying electricity.</td>
<td>Check power source.</td>
</tr>
<tr>
<td></td>
<td>Battery discharged (T51P).</td>
<td>Replace batteries (T51P).</td>
</tr>
<tr>
<td></td>
<td>Other failure.</td>
<td>Service required.</td>
</tr>
<tr>
<td>Cannot zero the Scale, or will not zero when turned on</td>
<td>Load on Scale exceeds allowable limits.</td>
<td>Remove load on Scale.</td>
</tr>
<tr>
<td></td>
<td>Load on Scale is not stable.</td>
<td>Wait for load to become stable.</td>
</tr>
<tr>
<td></td>
<td>Load Cell damage.</td>
<td>Service required.</td>
</tr>
<tr>
<td>Unable to calibrate.</td>
<td>Lock Calibration Menu set to On.</td>
<td>Set Lock Calibration Menu to Off. Refer to Section 3.12 Menu Lock.</td>
</tr>
<tr>
<td></td>
<td>LFT menu set to On.</td>
<td>Set LFT menu to Off.</td>
</tr>
<tr>
<td></td>
<td>Incorrect value for calibration mass.</td>
<td>Use correct calibration mass.</td>
</tr>
<tr>
<td>Cannot display weight in desired weighing unit</td>
<td>Unit not set to On.</td>
<td>Enable unit in the Units Menu. Refer to Section 3.7 in the Unit Menu.</td>
</tr>
<tr>
<td>Cannot change menu settings</td>
<td>Menu has been locked.</td>
<td>Set selected menu to Off in the Lock Menu. Lockout Switch on the circuit board may need to be set to the Off position.</td>
</tr>
<tr>
<td>Error 8.2</td>
<td>Weight reading below Power On Zero limit.</td>
<td>Add load to scale. Recalibrate scale.</td>
</tr>
<tr>
<td>Error 8.3</td>
<td>Weight reading exceeds Overload limit.</td>
<td>Reduce load on scale.</td>
</tr>
<tr>
<td>Error 8.4</td>
<td>Weight reading below Underload limit.</td>
<td>Add load to scale. Recalibrate scale.</td>
</tr>
<tr>
<td>Error 8.6</td>
<td>Weight exceeds six digits. Display overflow.</td>
<td>Reduce load on scale.</td>
</tr>
</tbody>
</table>
### TABLE 7-1. TROUBLESHOOTING (Cont.).

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBABLE CAUSE(s)</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error 9.5</td>
<td>Calibration data not present.</td>
<td>Calibrate scale.</td>
</tr>
<tr>
<td>Battery symbol flashing</td>
<td>Batteries are discharged.</td>
<td>Replace batteries (T51P).</td>
</tr>
<tr>
<td>CAL E</td>
<td>Calibration value outside allowable limits</td>
<td>Use correct calibration weight.</td>
</tr>
<tr>
<td>NO.SW</td>
<td>Attempting to exit the menu with the LFT setting ON and the security switch OFF.</td>
<td>Refer to Section 6.1. Set the security switch to the ON position.</td>
</tr>
<tr>
<td>REF WT Err</td>
<td>Reference Weight too small. The weight on the platform is too small to define a valid reference weight.</td>
<td>Use a greater weight for sample.</td>
</tr>
</tbody>
</table>

#### 7.4 Service Information

If the troubleshooting section does not resolve your problem, contact an authorized Ohaus Service Agent. For Service assistance in the United States, call toll-free 1-800-526-0659 between 8:00 AM and 5:00 PM Eastern Standard Time. An Ohaus Product Service Specialist will be available to assist you. Outside the USA, please visit our website www.ohaus.com to locate the Ohaus office nearest you.
8. TECHNICAL DATA
8.1 Specifications

Materials
T51XW Housing: stainless-steel
T51P Housing: ABS plastic
Display window: polycarbonate
Keypad: polyester
Feet: Rubber

Ambient conditions
The technical data is valid under the following ambient conditions:
- Ambient temperature: -10°C to 40°C / 14°F to 104°F
- Relative humidity: Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Height above sea level: up to 2000m
Operability is assured at ambient temperatures between -10°C and 40°C.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>T51P</th>
<th>T51XW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Displayed Resolution</td>
<td>1:30,000</td>
<td></td>
</tr>
<tr>
<td>Maximum Approved Resolution</td>
<td>1:10,000</td>
<td></td>
</tr>
<tr>
<td>Maximum Counting Resolution</td>
<td>1:300,000</td>
<td></td>
</tr>
<tr>
<td>Weighing Units</td>
<td>kg, lb, g, oz, lb:oz, tonnes, custom</td>
<td></td>
</tr>
<tr>
<td>Functions</td>
<td>Static Weighing, Dynamic Weighing, Counting, Checkweighing, Percent Weighing</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>25 mm / 1 in High 6-digit, 7-segment LCD</td>
<td></td>
</tr>
<tr>
<td>Over/Accept/Under Indicators</td>
<td>Red, Green, Yellow LED</td>
<td></td>
</tr>
<tr>
<td>Backlight</td>
<td>White LED</td>
<td></td>
</tr>
<tr>
<td>Keypad</td>
<td>4-button membrane switch</td>
<td></td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>---</td>
<td>IP66</td>
</tr>
<tr>
<td>Load Cell Excitation Voltage</td>
<td>5V DC</td>
<td></td>
</tr>
<tr>
<td>Load Cell Drive</td>
<td>Up to 8 x 350 ohm Load Cells</td>
<td></td>
</tr>
<tr>
<td>Load Cell Input Sensitivity</td>
<td>Up to 3 mV/V</td>
<td></td>
</tr>
<tr>
<td>Stabilization Time</td>
<td>Within 2 Seconds</td>
<td></td>
</tr>
<tr>
<td>Auto-zero Tracking</td>
<td>Off, 0.5, 1 or 3 Divisions</td>
<td></td>
</tr>
<tr>
<td>Zeroing Range</td>
<td>2% or 100% of Capacity</td>
<td></td>
</tr>
<tr>
<td>Span Calibration</td>
<td>1 kg or 1 lb to 100% Capacity</td>
<td></td>
</tr>
<tr>
<td>Housing Dimensions (W x D x H) (mm/in)</td>
<td>260 x 71 X 168 / 10.2 x 2.7 x 6.6</td>
<td>262 x 76 x 149 / 10.3 x 3.0 x 5.8</td>
</tr>
<tr>
<td>Net Weight (kg/lb)</td>
<td>1.5 / 3.3</td>
<td>3.5 / 7.7</td>
</tr>
<tr>
<td>Shipping Weight (kg/lb)</td>
<td>2.3 / 5</td>
<td>4.3 / 9.5</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-10°C to 40°C/14°F to 104°F</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>100-240 VAC / 50-60 Hz Internal Universal Power Supply, 6 C-type batteries (T51P)</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Built-in RS232 and External Input</td>
<td></td>
</tr>
</tbody>
</table>
8.2 Accessories and Options

### TABLE 8-2. OPTIONS.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Relay Kit</td>
<td>80500720</td>
</tr>
<tr>
<td>Base Mount Kit, T51P</td>
<td>80500722</td>
</tr>
<tr>
<td>Column Mount Kit, 35 cm painted steel</td>
<td>80500723</td>
</tr>
<tr>
<td>Column Mount Kit, 68 cm painted steel</td>
<td>80500724</td>
</tr>
<tr>
<td>Column Mount Kit, 35 cm stainless steel</td>
<td>80500725</td>
</tr>
<tr>
<td>Column Mount Kit, 68 cm stainless steel</td>
<td>80500726</td>
</tr>
<tr>
<td>DC Relay Kit</td>
<td>80500727</td>
</tr>
<tr>
<td>Rechargeable Battery Kit</td>
<td>80500729</td>
</tr>
<tr>
<td>RS422/485 Interface Kit</td>
<td>80500731</td>
</tr>
<tr>
<td>RS232 Interface kit</td>
<td>80500733</td>
</tr>
</tbody>
</table>

### TABLE 8-3. ACCESSORIES.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot Switch</td>
<td>71173378</td>
</tr>
<tr>
<td>Interface Cable/PC 25-pin, T51P</td>
<td>80500524</td>
</tr>
<tr>
<td>Interface Cable/PC 9-pin, T51P</td>
<td>80500525</td>
</tr>
<tr>
<td>Interface Cable/PC 9-pin, T51XW</td>
<td>80500552</td>
</tr>
<tr>
<td>Interface Cable/PC 25-pin, T51XW</td>
<td>80500553</td>
</tr>
<tr>
<td>Load Cell Cable Adapter Kit</td>
<td>80500736</td>
</tr>
<tr>
<td>Load Cell Cable Sealing Collar</td>
<td>80500737</td>
</tr>
</tbody>
</table>

The Rechargeable Battery Kit, RS232 Kit, RS422/485 Kit, AC Relay Kit, DC Relay kit and Foot switch must be installed by a qualified technician.
8.3 Drawings and Dimensions

Figure 8-1. T51P Indicator Overall Dimensions with Mounting Bracket.

Figure 8-2. T51XW Indicator Overall Dimensions with Mounting Bracket.
8.4 Compliance

Compliance to the following standards is indicated by the corresponding marking on the product.

<table>
<thead>
<tr>
<th>Marking</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>![CE]</td>
<td>This product conforms to the EMC Directive 2004/108/EC, the Low Voltage Directive 2006/95/EC and the Non-automatic Weighing Instruments Directive 90/384/EEC. The complete Declaration of Conformity is available from Ohaus Corporation</td>
</tr>
<tr>
<td>![UL60950-1]</td>
<td>UL60950-1 : 2003</td>
</tr>
<tr>
<td>![AS/NZS4251.1]</td>
<td>AS/NZS4251.1, AS/NZS4252.1</td>
</tr>
</tbody>
</table>

EU Emissions Note

This device complies with EN55011 / CISPR 11 Class A Group 1.

FCC Note

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

Industry Canada Note

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ISO 9001 Registration

In 1994, Ohaus Corporation, USA, was awarded a certificate of registration to ISO 9001 by Bureau Veritus Quality International (BVQI), confirming that the Ohaus quality management system is compliant with the ISO 9001 standard’s requirements. On May 15, 2003, Ohaus Corporation, USA, was re-registered to the ISO 9001:2000 standard.
Important Notice for verified weighing instruments

Weighing Instruments verified at the place of manufacture bear one of the preceding marks on the packing label and the green 'M' (metrology) sticker on the descriptive plate. They may be put into service immediately.

Weighing Instruments to be verified in two stages have no green 'M' (metrology) on the descriptive plate and bear one of the preceding identification mark on the packing label. The second stage of the initial verification must be carried out by the approved service organization of the authorized representative within the EC or by the national weights & measures (W+M) authorities.

The first stage of the initial verification has been carried out at the manufacturer’s work. It comprises all tests according to the adopted European standard EN 45501:1992, paragraph 8.2.2.

If national regulations limit the validity period of the verification, the user of the weighing instrument must strictly observe the re-verification period and inform the respective W+M authorities.

Disposal

In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.
LIMITED WARRANTY

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

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

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