The "EZ 320" Electronic Scale Indicator

Operation & Installation Manual

FEATURES: The "EZ 320" Model has enhanced features such as:
- Scrolling Help Messages for EZ recipe programming & operation.
- Up to 81 different batching recipes.
- Three recipe programming modes - Percent of total, Pounds per animal, or Pounds
  per Ingredient.
- Ingredients can be entered in any order.
- Large 1 inch alpha-numeric display for greater readability.
- Front Panel Calibration without simulator or weights.
- Fiber-optic backlighting for extremely long life.
- Optional European Compliance (CE mark) for use in the European Community

OPERATING SPECIFICATIONS:
Accuracy .............................................. 0.1% with System Accuracy depending on load cells used
Temperature Range ............................................. -20 to 140 degrees F
Power Requirements .................................................. 10½ - 16 VDC

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MODEL 320 - System Operation:

Turning ON the Scale:

Step 1) Press [ON].

A brief message is displayed (such as "HELLO"). The scale enters GROSS weighing mode. Pressing [ON] a second time during normal system operation starts the self test.

A warm up period of ten to fifteen minutes provides the most accurate readings. If the scale is holding a load for a long period of time (ex. overnight), the weight displayed may vary because of zero shift created by changes in temperature. This does not affect the accuracy of the scale.

For example, if the system was loaded with 1000 Lbs, it might read 1200 Lbs the following day. The change in temperature "zero shifted" the ZERO/BALANCE from 0 Lbs to 200 Lbs. When unloading the scale, the display will count from 1200 to 200 Lbs for a total of 1000 Lbs.

Turning OFF the Scale:

Step 1) Press [OFF].

The ZERO/BALANCE will "balance off" trailer, bin, or platform weight.

"ZERO" is displayed to show completion of the step and the scale is then placed in the GROSS mode.

Pressing only the [ZERO] key will cause the message "TO ZERO/BALANCE PRESS NET/GROSS - THEN ZERO" to be displayed.

If the supply power is below the "low battery threshold" (10.5 Volts), the message "INDICATOR CANNOT BE ZERO/BALANCED - LOW BATTERY VOLTAGE" is displayed. The message "LO BAT" is periodically shown on the display (approx. every five seconds) to alert the operator of the low battery condition.

Loss of power does not affect the ZERO/BALANCE or "Setup/Calibration" values.

To Zero-Balance the Scale:

Step 1) Press the [NET/GROSS] key and within three seconds,

Step 2) press the [ZERO] key.
MODEL 320 - System Operation:

Using the Help Key:

The [HELP] key provides additional information about the weighing modes, setup/calibration, and recipe programming.

Step 1) Pressing [HELP] while displaying weight will display information about the last key pressed.

NOTE: The scale is in GROSS mode if there is a flashing arrow pointing toward the GROSS text above the [NET/GROSS] key.

To Select Net Mode:

NET mode displays the weight change after a TARE has been performed. TARE is a temporary "zero" point.

Step 1) If the scale "TARE" weight has not been entered, press [TARE] to acquire a "zero".

Step 2) If in Gross mode, press [NET/GROSS]. The [NET/GROSS] key is an alternating action key. If the scale is in the GROSS mode, pressing the [NET/GROSS] key places it in the NET mode. If the scale is in the NET mode, pressing the [NET/GROSS] key places it in the GROSS mode. If in LOAD-UNLOAD mode, press [NET/GROSS] two (2) times.

If the "TARE" function has not been previously performed, the unit will stay in the GROSS mode and the message "FOR NET MODE PRESS TARE" scrolls across the display.

NOTE: The scale is in NET mode if there is a flashing arrow pointing toward the NET text just above the [TARE] key.
To Enter a Preset:

A "preset" is a weight amount that can be set in the scale. The scale will activate alarms once that weight amount has been either removed or added.

Step 1) Use the numeric keypad to enter the desired preset weight value.

Step 2) Press either [NET/GROSS] or [LOAD/UNLOAD] to enter the preset value and select the "display mode".

The 'PRESET' annunciator outer triangle will turn ON when the preset amount is entered.

The three display modes are:

"GROSS MODE"
The gross weight is displayed by pressing the [NET/GROSS] key. As ingredients are loaded, the weight display counts upward toward the preset value. As ingredients are unloaded the weight display counts down to the preset value.

"LOAD/UNLOAD MODE"
Press the [LOAD/UNLOAD] key to display the amount remaining to be loaded or unloaded. As ingredients are loaded OR unloaded, the display counts down from the entered preset weight until it reaches zero.

"NET MODE"
The weight added since the preset has been entered is displayed by pressing the [NET/GROSS] key two (2) times if in the LOAD/UNLOAD mode, one (1) time if in the GROSS mode. As ingredients are loaded, the weight display counts upward, as they are unloaded the weight display counts down.

Switching between these display modes is possible at any time by simply pushing the appropriate keys.

Before the preset weight is reached, the pre-alarm is activated. This causes the preset display annunciator, the front panel alarm light, the output relay, and the alarm horn all to pulse in sequence with the alarm light. Set the pre-alarm value to "0" to prevent the alarm output from pulsing.

When the preset weight is reached, the front panel alarm light, the output relay, the 'PRESET' annunciator, and the alarm horn will all be held ON.

Once the preset has been entered, the display shows the weight data in one of three (3) different "display modes".
To Clear the Preset Alarm:

Step 1) Press the [CLEAR] key twice.

This sets the display to zero's "000000" and returns the scale to weighing.

By pressing the [CLEAR] key only once, a new preset can be entered.

The current preset alarm condition is also cleared if reloading a preset using the "REMOTE ENTER PRESET" feature. This feature is selected by setting Remote Input to 'PRESET' in the Long Form Setup. It is activated by using the 20R TR option or by momentarily connecting the "REMOTE" line in the power cord to +12 Volts DC.

Using the "REMOTE ZERO" feature of the 20R TR option or "REMOTE" line in the power cord also clear the preset.

To Preload a Tare Value:

The scale also allows the "tare weight" to be entered via the numeric keypad. This is performed by entering the weight value on the keypad and then by pressing the [TARE] key.

The preload tare feature is useful for weighing containers after they have already been loaded. If the weight of the container is known, this "tare weight" is preloaded into the scale and the net weight is displayed. The "tare weight" is also sent to the printer.

The following example demonstrates a feed wagon on a platform scale:

Step 1 - Balance the scale.
Step 2 - Weigh and record the weight of the unloaded wagon.
Step 3 - Pull the wagon off the scale and load.
Step 4 - Enter the wagon's tare weight.
Step 5 - Place loaded wagon back on the scale to see net weight.
MODEL 320 - System Operation:

Using the Pre-Alarm:

The Pre-Alarm feature is an "early warning" for the preset. For example, if the Pre-Alarm is set to 100 and the preset is 1000, the preset alarms flash during the last 100 lbs/kgs of the preset. The alarms are continuous once the preset is active. This allows more accuracy in reaching the preset.

Changing Pre-Alarm Weight:

Step 1) Press and hold the [NET/GROSS] key, then press the [ON] key. Continue holding both keys until the indicator beeps and displays the message "P-ALM". The 'CAL' annunciator flashes and the current Pre-Alarm weight is displayed.

Step 2) Press the [CLEAR] key to erase the current weight value.

Step 3) Use the numeric keypad to select a Pre-Alarm weight.

Step 4) Press the [ON] key. The display will advance to the next setup value.

Step 5) To exit setup and return to weighing, press and hold the [TARE] key, then press the [ON] key.
To Start the Mix Timer:

There are two ways to start the Mix Timer.

Step 1) Press the [TIMER] key to see the time currently set. The [NET/GROSS] and [TARE] keys can then be used to change the displayed value.

The [NET/GROSS] key increments the "flashing" digit and the [TARE] key selects which digit of the display is flashing.

When the correct time has been entered or if the number displayed is acceptable, press the [TIMER] key to set the time and start the Mix Timer.

or

Step 2) Use the numeric keypad to select the amount of time. Then press the [TIMER] key to enter the time.

To Clear the Mix Timer:

Step 1) Press either the [CLEAR] or [TIMER] key. The scale clears the mix timer alarms and enters the weighing mode.
To Re-Start the Mix Timer:

Step 1) Press the [TIMER] key twice (2) without entering a numeric value to start the mix timer using the time previously entered.

Entry Methods:

There are three (3) different methods for programming recipes:

<table>
<thead>
<tr>
<th>Entry Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Amount per Animal</td>
</tr>
<tr>
<td>2 - Percent (%) per Load</td>
</tr>
<tr>
<td>3 - Amount per Load</td>
</tr>
</tbody>
</table>

NOTE: Recipes programmed in one method will not be converted if a new entry method is selected. To convert a recipe to a new method, erase and then re-program the recipe.

Entry Method #1 - Amount per Animal.
Program the ingredient amounts required for feeding one (1) animal. When recipe is loaded and indicator flashes "ANIMAL", enter the number of animals to be fed. The scale calculates the preset amounts required for each ingredient.

Example: A recipe had been programmed with 18 Lbs of haylage and 16 Lbs of shell corn for one (1) animal. The recipe was then loaded for 100 "ANIMAL"’s. The scale calculated presets for 1800 Lbs of haylage and 1600 Lbs of shell corn.

Entry Method #2 - Percent (%) per Load/Animal.
Program the ingredient amounts in percentages (%). When recipe is loaded and indicator flashes "TOTAMT", enter the total amount to be loaded. The scale calculates the preset amounts required for each ingredient.

Example: A recipe had been programmed with 55% of haylage and 45% of shell corn. The recipe was then loaded for a "TOTAMT" of 10,000 Lbs. The scale calculated presets for 5500 Lbs of haylage and 4500 Lbs of shell corn.

Entry Method #3 - Amount per Load.
Program the ingredient amounts required per load. When recipe is loaded and indicator flashes "TOTAMT", the total amount programmed for that recipe is displayed. Press [LOAD/UNLOAD] to accept that amount or enter a new total amount and the scale calculates new preset amounts.

Example: A recipe had been programmed with 5500 Lbs of haylage and 4500 Lbs of shell corn. The recipe was then loaded for a "TOTAMT" of 10,000 Lbs. The scale calculated presets for 5500 Lbs of haylage and 4500 Lbs of shell corn.

This same recipe could have been changed the "TOTAMT" to 9,000 Lbs and the scale would have calculated presets for 4950 Lbs of haylage and 4050 Lbs of shell corn.

To Change the Entry Method:

Step 1) Enter the "Long Form Setup Mode" by pressing and holding the [NET/GROSS] key and then pressing the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message "P-ALM".
MODEL 320 - System Operation:

The "CAL" annunciator will be flashing. Press the [ON] key until "E MTHD" is displayed.

To select the recipe entry method.

Step 2) Press [NET/GROSS] until the correct number is displayed.

Entry Method
1 - Amount per Animal
2 - Percent (%) per Load
3 - Amount per Load

Step 3) Press the [ON] key. The display advances to the next setup value.

Step 4) To exit setup and return to weighing, press and hold the [TARE] key, then press the [ON] key.
MODEL 320 - System Operation:

These examples are shown to illustrate the three different program entry methods available. Each method can be used to obtain the same results, the choice is yours. Note that Recipe #5 includes some of the same ingredients as Recipe #12, but are loaded in a different sequence to illustrate the flexibility of programming to match actual loading sequence.

**SAMPLE FEED SHEET - RECIPE #12**

### To Program

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>INGREDIENT NUMBER</th>
<th>AMT. PER ANIMAL</th>
<th>% PER LOAD</th>
<th>AMOUNT PER LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Haylage</td>
<td>3</td>
<td>18.0</td>
<td>34.62</td>
<td>1800</td>
</tr>
<tr>
<td>(2) High Moisture Corn</td>
<td>9</td>
<td>10.0</td>
<td>19.23</td>
<td>1000</td>
</tr>
<tr>
<td>(3) Corn Silage</td>
<td>5</td>
<td>24.0</td>
<td>46.15</td>
<td>2400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>52 Lbs</strong></td>
<td><strong>100.00</strong></td>
<td><strong>5200</strong></td>
</tr>
</tbody>
</table>

### To Load

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>INGREDIENT NUMBER</th>
<th>ENTER # OF ANIMALS</th>
<th>AMOUNT PER LOAD</th>
<th>ENTER LOAD SIZE</th>
<th>AMOUNT PER LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Haylage</td>
<td>3</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>(2) High Moisture Corn</td>
<td>9</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>(3) Corn Silage</td>
<td>5</td>
<td>2400</td>
<td>2400</td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>5200</strong></td>
<td><strong>5200</strong></td>
<td><strong>5200</strong></td>
<td></td>
</tr>
</tbody>
</table>
## SAMPLE FEED SHEET - RECIPE #5

### To Program

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>INGREDIENT NUMBER</th>
<th>AMT. PER ANIMAL</th>
<th>% PER LOAD</th>
<th>AMOUNT PER LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Corn Silage</td>
<td>5</td>
<td>15.0</td>
<td>37.5</td>
<td>1800</td>
</tr>
<tr>
<td>(2) Haylage</td>
<td>3</td>
<td>14.5</td>
<td>36.25</td>
<td>1740</td>
</tr>
<tr>
<td>(3) Soy Bean</td>
<td>10</td>
<td>2.3</td>
<td>5.75</td>
<td>276</td>
</tr>
<tr>
<td>(4) Cotton Seed Hulls</td>
<td>12</td>
<td>8.2</td>
<td>20.50</td>
<td>984</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40 Lbs</strong></td>
<td><strong>100.00</strong></td>
<td></td>
<td><strong>4800</strong></td>
</tr>
</tbody>
</table>

### To Load

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>INGREDIENT NUMBER</th>
<th>AMT. PER ANIMAL</th>
<th>% PER LOAD</th>
<th>AMOUNT PER LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Corn Silage</td>
<td>5</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td>(2) Haylage</td>
<td>3</td>
<td>1740</td>
<td>1740</td>
<td>1740</td>
</tr>
<tr>
<td>(3) Soy Bean</td>
<td>10</td>
<td>276</td>
<td>276</td>
<td>276</td>
</tr>
<tr>
<td>(4) Cotton Seed Hulls</td>
<td>12</td>
<td>984</td>
<td>984</td>
<td>984</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4800</strong></td>
<td><strong>4800</strong></td>
<td></td>
<td><strong>4800</strong></td>
</tr>
</tbody>
</table>
1: Amount per Animal -
Recipe amounts *programmed* for 1 animal.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount per Animal</th>
<th>Ingredient presets for a 100 animal load.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haylage</td>
<td>18 Lbs</td>
<td>Haylage = 1800 Lbs</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>10 Lbs</td>
<td>Corn Silage = 1000 Lbs</td>
</tr>
<tr>
<td>HM Shell Corn</td>
<td>16 Lbs</td>
<td>HM Shell Corn = 1600 Lbs</td>
</tr>
<tr>
<td>Soy Hulls</td>
<td>02 Lbs</td>
<td>Soy Hulls = 200 Lbs</td>
</tr>
<tr>
<td>Soybeans</td>
<td>06 Lbs</td>
<td>Soybeans = 600 Lbs</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>52 Lbs</strong></td>
<td><strong>TOTAL = 5200 Lbs</strong></td>
</tr>
</tbody>
</table>

2: Percent per Load - %
Recipe amounts *programmed* in % for Total Load.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percent per Load</th>
<th>Ingredient presets for 5200 lb load.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haylage</td>
<td>34.60 %</td>
<td>Haylage = 1800 Lbs</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>19.23 %</td>
<td>Corn Silage = 1000 Lbs</td>
</tr>
<tr>
<td>HM Shell Corn</td>
<td>30.77 %</td>
<td>HM Shell Corn = 1600 Lbs</td>
</tr>
<tr>
<td>Soy Hulls</td>
<td>03.85 %</td>
<td>Soy Hulls = 200 Lbs</td>
</tr>
<tr>
<td>Soybeans</td>
<td>11.55 %</td>
<td>Soybeans = 600 Lbs</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100.00 %</strong></td>
<td><strong>TOTAL = 5200 Lbs</strong></td>
</tr>
</tbody>
</table>

3: Amount per Load - Lbs
Recipe amount *programmed* in Total Lbs/Load.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount per Load</th>
<th>Ingredient presets for 5200 lb load.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haylage</td>
<td>1800 Lbs</td>
<td>Haylage = 1800 Lbs</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>1000 Lbs</td>
<td>Corn Silage = 1000 Lbs</td>
</tr>
<tr>
<td>HM Shell Corn</td>
<td>1600 Lbs</td>
<td>HM Shell Corn = 1600 Lbs</td>
</tr>
<tr>
<td>Soy Hulls</td>
<td>200 Lbs</td>
<td>Soy Hulls = 200 Lbs</td>
</tr>
<tr>
<td>Soybeans</td>
<td>600 Lbs</td>
<td>Soybeans = 600 Lbs</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>5200 Lbs</strong></td>
<td><strong>TOTAL = 5200 Lbs</strong></td>
</tr>
</tbody>
</table>
To Program a New Recipe:

Enter the program mode by pressing and holding the [PROGRAM] key and then pressing the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message "PROGRM". The "recipe program annunciator" flashes.

The scale then displays the first formula number programmed "REC-XX" or will display "REC-__" indicating that a recipe number can be entered.

Step 1) Press [CLEAR].

Step 2) Then use the numeric keypad to select the recipe number. Then press [RECIPE #] to enter the recipe number.

Step 3) The EZ 320 then displays a message indicating the "entry method" to be used:

1 - Pounds per Animal.
2 - Percentage of Total Load.
3 - Ingredient in Pounds.

Note: For more about entry methods see page 23.

Step 4) "ING-__" is displayed immediately following the entry message.

Use the numeric keypad to select the ingredient number. Then press [INGR.#].

NOTE: Ingredient numbers DO NOT have to be in sequence.

Step 5) "AMOUNT" will be shown on the display followed by the prompt for the ingredient amount with the display "YY:XXXX".

The first two digits, "YY" represent the ingredient number. The last four digits, "XXXX" represent the amount for this ingredient.

In this example, ingredient number "05" is shown with an ingredient amount of "500".

Use the numeric keypad to select the four (4) digit ingredient value. Then press [LOAD/UNLOAD] to enter the value.
MODEL 320 - System Operation:

Step 6) The scale will display the message "STORED" indicating that the ingredient has been saved into non-volatile memory.

Step 7) Continue steps 4 through 6 until all ingredients have been entered.

Step 8) Press [RECIPE#] to complete the recipe. The scale will now calculate and display the "TOTAL" value of the recipe.

Step 9) Repeat steps 1 through 8 until all recipes have been entered.

Step 10) Press [PROGRAM] to exit the 'recipe programming mode' and enter the weighing modes.

To Edit a Recipe:

To enter the program mode press and hold the [PROGRAM] key and then press the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message "PROGRM". The "recipe program annunciator" will be flashing.

The scale then displays the first formula number programmed "REC-XX". Use one of the following methods to select the recipe to edit:

Method 1:

Step 1) Press [RECIPE#] until the desired recipe number is displayed.

Step 2) Then press [INGR#] to edit this recipe. Now go to Step 3.

Method 2:

Step 1) Press [CLEAR].

Step 2) Then use the numeric keypad to select the recipe number. Then press [RECIPE #] to enter the recipe number.

Step 3) The EZ 320 will then display a message indicating the "entry method" to be used:

1 - Pounds per Animal.
2 - Percentage of Total Load.
3 - Ingredient in Pounds.

Step 4) The ingredient number and amount will be displayed "YY:XXXX".

The first two digits, "YY" represent the ingredient number. The last four digits, "XXXX" represent the amount for this ingredient.
In this example, ingredient number "05" is shown with an ingredient amount of "500".

Step 5) Pressing [INGR.#] will advance the scale to the next ingredient of the recipe. Press [INGR.#] until the desired ingredient is displayed.

Step 6) Press [CLEAR] and then use the numeric keypad to select the four (4) digit ingredient value. Press [LOAD/UNLOAD] to enter the value.

Step 7) The scale will display the message "STORED" indicating that the ingredient has been saved into non-volatile memory. Non-volatile memory is a special type of memory that allows the power to be removed from the scale without losing any of the recipes.

Step 8) Continue steps 5 through 8 until the desired changes have been made.

Step 9) Press [RECIPE#] to complete the recipe. The scale will now calculate and display the "TOTAL" value of the recipe.

Step 10) Press [PROGRAM] to exit the "recipe programming mode" and enter the weighing modes.

NOTE: Ingredient amounts can be changed, but to add ingredients to a recipe, first erase that recipe and then re-program the recipe.

To Erase a Recipe:

To enter the program mode press and hold the [PROGRAM] key and then press the [ON] key.

Continue holding both keys until the indicator beeps and the scale displays the message "PROGRM". The "recipe program annunciator" will be flashing.

The scale then displays the first formula number programmed "REC-XX". Use one of the following methods to select the recipe to erase:

**Method 1:**

Step 1) Press [RECIPE#] until the desired recipe number is displayed, then go to Step 3.

**Method 2:**

Step 1) Press [CLEAR].

1 2 3
4 5 6
7 8 9
Clear 0 Help
MODEL 320 - System Operation:

Step 2) Then use the numeric keypad to identify the recipe number to be erased.

Step 3) Press the [ZERO] key.

Step 4) Press and hold the [ZERO] key, then press the [ON] key to erase the recipe. Continue holding both keys until the indicator beeps and displays the message "RECIPE XX ERASED".

Step 5) Press [PROGRAM] to exit the "recipe programming mode" and enter the weighing modes.

To erase all recipes, Continue steps 1 through 4 until all the recipes have been erased.

Using the Auto Advance Feature:

The auto advance feature allows for hands free operation of programmed recipes. The indicator prints and advances to the next ingredient once the motion, tolerance, and delay time requirements have been met.

Using Tolerance:

The Tolerance feature is a "tolerance window" for the preset ingredient during batching. For example, if the tolerance is set to 5 (%) and the preset is 1000, the "tolerance window" is ±50. So the scale is in the "tolerance window" when the display is between 50 and -50.

The auto-advance circuitry of the recipe function activates the "delay time" counter every time the weight moves out of the tolerance window. If enabled, "motion detection" also resets the "delay time" counter.

If the tolerance for that ingredient is exceeded, the message "OVER " is displayed alternately with the weight value. During this time the scale WILL NOT auto-advance. This allows the operator the opportunity to remove the excess weight. If the additional weight for the ingredient is acceptable, press either [PRINT] or [INGR.#] to advance to the next ingredient.

Setting tolerance to "OFF" allows the scale to always auto-advance after the ingredient amount has been loaded regardless of additional weight.

To Change the Tolerance:

Step 1) To enter the "Long Form Setup Mode" press and hold the [NET/GROSS] key and then press the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message "P-ALM" followed by the current pre-alarm weight. The "CAL" annunciator will be flashing.
MODEL 320 - System Operation:

Press the [ON] key until "TOLER" is displayed.

To select the amount (by percentage) that an ingredient can be under/over-loaded and still automatically advance,

Step 2) Press [NET/GROSS].

Set to "OFF" to always advance after the ingredient amount has been reached.

Tolerance Percentage Settings
- OFF, 0.5, 1, 2, 3, 4, 5, 7, or 10

Step 3) Press the [ON] key. The display will advance to the next setup value.

Step 4) To exit setup and return to weighing, press and hold the [TARE] key, then press the [ON] key.

The Delay Time feature allows an operator to select the amount of time the scale should wait before automatically advancing to the next ingredient of the recipe. This helps insure accuracy for the ingredient amount. For example, if the delay time is set to 10 (seconds) and the preset alarms are activated continuously, the auto-advance circuitry starts the "delay time" counter. If the preset de-activates, the delay time counter is reset, therefore assuring that the preset weight amount has to be met for the total delay time amount.

Setting Delay Time to "MANUAL" prevents the scale from EVER auto-advancing, regardless of the weight. Pressing either the [INGR.#] or [PRINT] key twice advances the recipe to the next ingredient. The first press completes the current ingredient and enters a "lock weight mode". This allows the scale system to be moved to a new location without affecting the weight amount of the next ingredient. The second press advances the scale recipe to the next ingredient.

After all ingredients have been loaded, the scale displays the message: "RECIPE COMPLETE TOTAL = XXXXXXLB".

To Change the Delay Time:

Step 1) To enter the "Long Form Setup Mode" press and hold the [NET/GROSS] key and then press the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message "P-ALM" followed by the current pre-alarm weight. The "CAL" annunciator will be flashing.
MODEL 320 - System Operation:

Press the [ON] key until the message "DELAY" is displayed.

To select the delay time (in seconds) to wait before automatically advancing,

Step 2) Press [NET/GROSS].

Set to "MANUAL" to prevent advancing after the ingredient amount has been reached.

Delay Time Selections in Seconds
MANUAL, 1, 2, 3, 5, 7, 10, 20, 30, or 60

Step 3) Press the [ON] key. The display will advance to the next setup value.

Step 4) To exit setup and return to weighing, press and hold the [TARE] key, then press the [ON] key.

To Load a Batch Using a Recipe:

Either of the following methods can be used to load a recipe while in the weighing modes:

**Method 1:**

Step 1) Press [RECIPE#] until the desired recipe number is displayed.

Step 2) Press [LOAD/UNLOAD] to accept the recipe.

Go to Step 3.

**Method 2:**

Step 1) Press [CLEAR].

Step 2) Then use the numeric keypad to select the recipe number. Then press [RECIPE#].

Step 3) The scale displays the message "LOADING RECIPE XX" and "TOTAMT". The message "TOTAMT" represents either the "total amount to be loaded" or the "total amount of animals" for that recipe.

To accept the total displayed, press [LOAD/UNLOAD].
To change the "TOTAMT" perform the following steps 4 and 5.

Step 4) Press [CLEAR].

Step 5) Then use the numeric keypad to enter a new total amount value. To accept the new total displayed, press [LOAD/UNLOAD].  
All ingredient amounts are automatically re-calculated to provide the new total amount.

Now the recipe is loaded!

The scale displays the first ingredient number to be loaded and then displays the ingredient amount to be loaded. These two values are alternately displayed until 5 percent of the ingredient is either loaded or unloaded.

If using the auto-advance feature, and the weight is within the "tolerance" range, the alarms activate. This causes the internal "delay timer" to begin counting off the seconds required before automatically advancing onto the next ingredient.

Pressing the [INGR.#] or [PRINT] key also completes that ingredient and advances the scale to the next ingredient of the recipe.

If Delay Time is set to "MANUAL", the recipe does not advance until either the [INGR.#] or [PRINT] key is pressed twice. The first press completes the current ingredient and enters a "lock weight mode". This allows the scale system to be moved to a new location without affecting the weight amount of the next ingredient. The second press advances the scale recipe to the next ingredient.

After all ingredients have been loaded, the scale displays the message: "RECIPE COMPLETE TOTAL = XXXXXXLB".
MODEL 320 - Installation Requirements:

Indicator Mounting:
The indicator is easily attached to the Indicator Mounting Bracket by hooking the top over the plate and securing the bottom with two (2) screws (size #10-24 x 5/8”) and nuts.

Power Connection:

Warning!
Always disconnect the indicator power cord before "jump starting" or fast charging a battery. Disconnect all indicator leads before welding on equipment. Failure to do so can cause surges which will damage the scale.

The power cable should be connected directly to a vehicle battery or regulated power supply. The scale end of the power cable is attached to the J901 connector located on the bottom panel of the scale.

Connect the RED wire from the power cable to +12 VDC and the BLACK wire to GROUND. The indicator is fused internally at 4 amps.

<table>
<thead>
<tr>
<th>POWER CABLE CONNECTIONS</th>
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<tbody>
<tr>
<td>WIRE COLOR</td>
</tr>
<tr>
<td>RED</td>
</tr>
<tr>
<td>BLACK</td>
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<tr>
<td>ORANGE</td>
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<td>BLUE</td>
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Remote Alarm Connection:
If a remote 12 VDC alarm is to be used, connect the +12 VDC side of the alarm to the power cable ORANGE wire and the GROUND side of the alarm to the frame.

Remote Input Connection:
If the remote input is to be used, connect one side of the normally open momentary switch or relay contact to the power cable BLUE wire, and the other side to the frame or other GROUND connection. If your power cable does not contain a blue wire and you desire to use this feature, contact your dealer for a special cable. A process control box is available for motor control and remote enter preset capability.

Load Cell Connection:
The indicator operates with strain gage load cells. The system is normally supplied with a "J-BOX" cable going between the scale and the load cell junction box. Extension Kits are available from your dealer in various lengths.

To connect the load cells, attach the junction box cable to the J902 connector on the bottom panel of the scale. Connect the load cell cables to the junction box as shown below.

Lightning Protection:
Additional protection is achieved with the proper installation of grounding rods. Please call (920) 563-9700 request Digi-Star Form F3050.

JUNCTION BOX LOAD CELL CABLE CONNECTIONS:
MODEL 320 - Optional Features:

Options are installed in the indicator if the corresponding keys are on the front panel or if additional connectors are on the bottom panel.

**Remote Display:**

A Remote Display is available for viewing weights at convenient locations. The Remote Display includes a visual alarm light which can be used with the TR4 option listed below.

**TR-TR4: Radio Control Operation**

The TR and TR4 options allow the operator to remotely control the scale from a distance up to 100 feet away.

The TR option allows the operator to perform "TARE and GROSS" or "Ingredient Advance" functions.

The TR4 option allows remote operation of the RM (recall memory), M+ (memory plus), TARE, and either NET/GROSS or CM (clear memory).

**To Print Weight Data:**

Weight data can be sent to a printer by pressing the [PRINT] key.

---

Sample output format shown below:

```
10JA92 12:01P
123456 ID 123456LB GR
```

"Clock" & "ID #" options also shown.

**To Print the Recipe Memory:**

Step 1) Enter the program mode.

Step 2) Press [PRINT].

All recipes currently residing in recipe memory will be printed.

**To Print a Single Recipe:**

Step 1) Press [RECIPE#]

The scale will display the first recipe in memory.

Step 2) Press [PRINT].

This prints the ingredients of this recipe. Press [RECIPE#] to advance onto the next recipe.

Step 3) Press [CLEAR] to exit, or continue to press [RECIPE] until all recipes have been displayed.

An auto-print feature is implemented on the TR and TR4 options.
### To Enter ID Numbers-I.D.#:

Step 1) Use the numeric keypad to select the identification number.

Step 2) Press the [ID #] key to enter the identification number.

The identification number is also printed on every weight printout. Printing automatically clears the identification number so that a new value can be entered.

The identification number can also be cleared by pressing the [CLEAR] key followed by pressing the [ID #] key.

### Black Out:

The Black Out option is a preset enhancement that maintains the "Preset amount left to go" in non-volatile, permanent memory. This insures that the correct weight can be delivered even after a power outage.

For example, a system loaded with 2000 Lbs was unloading a preset of 1000 Lbs. After unloading the first 500 Lbs, a power outage occurred. When the power returned and the scale was turned ON, the message "POWER OUTAGE - PRESS START ON CONTROL BOX TO FINISH PRESET - CLEAR TO CANCEL MO/DA/YR 12:00A" appeared.

Pressing START on the Control Box (or the [NET/GROSS] key on the scale) loads the preset amount remaining before the black out (500 Lbs in this case).

Pressing the [CLEAR] key cancels the preset and the scale displays the GROSS weight.

The Clock option is required as part of the Black Out option. The Clock records the time, date, and preset remaining before the power outage (blackout).
Pulsed Output:

The Pulsed Output option provides one (1) output line to indicate decreasing weight.

Pulsed Output pulls the connected signal line to ground through a 330 Ohm resistor for 150 milli-seconds every time the scale decreases one (1) display count.

1 Display Count = 1 Output Pulse

The scale will not pull to ground more than twice (2 times) a second - 2 Hz.

For example, if the weight decreased from 8000 Lbs. to 7500 Lbs. using a display count of 10 Lb counts.

8000 - 7500 = 500 (Lbs weight change)
500 / 10 (Display Count) = 50 (Pulses)

There would be 50 output pulses taking about 25 seconds to output all 50 pulses.

In this example, 7500 Lbs represents the "GROSS weight reference point". The scale resets the "GROSS weight reference point" if the weight increases 100 or more pounds for at least one (1) minute. The scale starts pulsing outputs as weight decreases from the new "GROSS weight reference point".

There are two (2) ways to "reset" or "abort" the internal pulse counter of the scale:

1 - ZERO/BALANCE the scale,

or

2 - Turn the scale "OFF" and then "ON" again and press "ZERO" when the scale shows the power outage message.

The Clock option is required as part of the Pulsed Output option. The Clock records the time, date, and "GROSS weight reference point" before the power outage (blackout).

When the scale power is returned and the scale is turned back ON after a power loss, the scale will display the message - "POWER OUTAGE - PRESS NET/GROSS TO CONTINUE PULSED OUTPUT - ZERO TO RESET MO/DA/YR 12:00A". This provides the opportunity to start other equipment in the proper sequence.

Animal Weighing:

The Lock On weigh method #4 has the ability to determine the actual weight of items while in motion, such as animals. Once the actual weight is displayed, the scale "Locks On" to the displayed weight and does not change, even if the motion never stops. A small 'L' appears on the left side of the display indicating the weight is "Locked On". The animal’s weight must be greater than 2.5% of the scales "capacity" weight before the system can "Lock On."

In order to break the lock, 50% of the displayed weight must be either added or removed from the scale. The "Locked On" weight can be "rechecked" by pressing the [ZERO] key on the front panel. This breaks the "lock" and the scale recalculates the weight.

For more information on selecting weigh method #4, please contact Digi-Star Technical Service at (920) 563-9700 and/or request Digi-Star Technical Manual F3251.