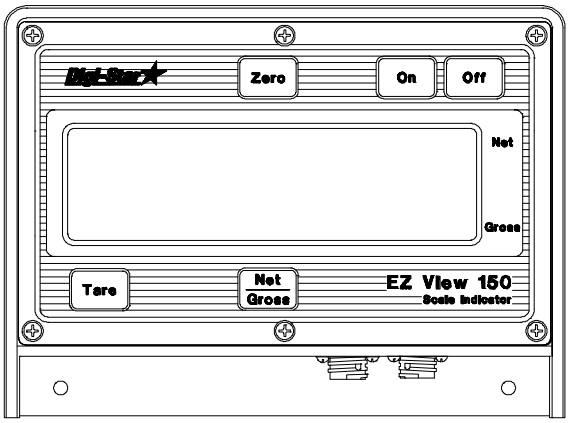
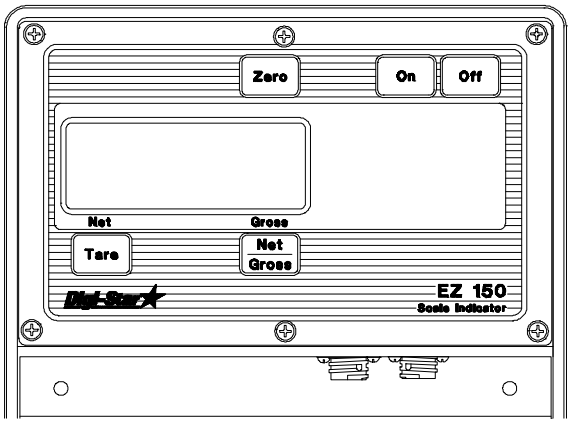
Digi-Star®

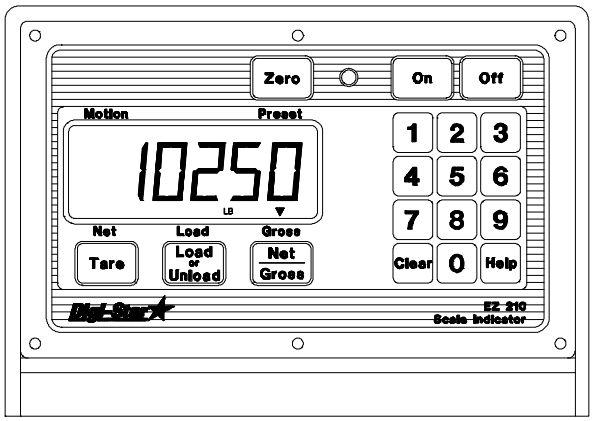
The "*EZ*" Electronic Scale Indicators



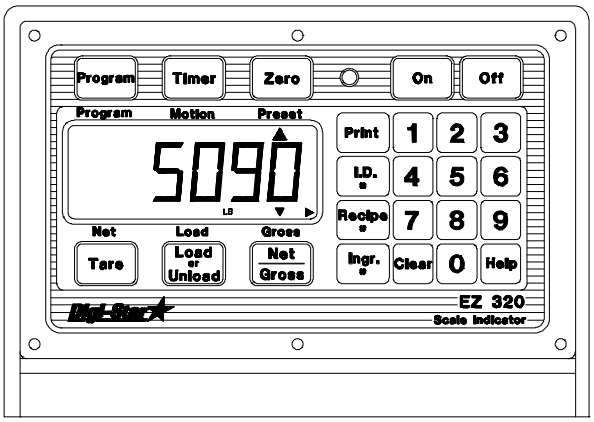
EZ VIEW 150



EZ 150



EZ 210



EZ 320

Operation, Installation, and Technical Manual

DIGI-STAR
790 WEST ROCKWELL AVENUE
FORT ATKINSON, WISCONSIN 53538
PHONE (920) 563-1400

3251 Rev B-1 9/97 Printed in U.S.A.

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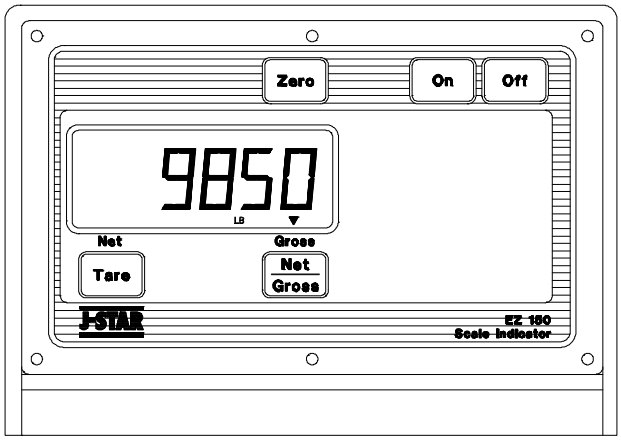
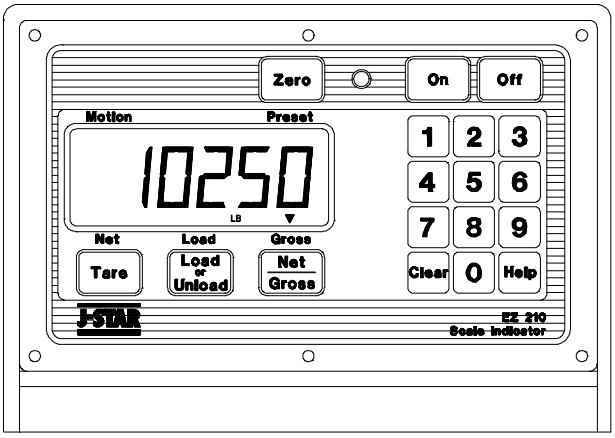


Model EZ 150.



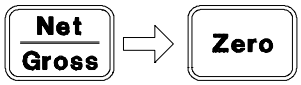
Model EZ 210.

TUTORIAL - Getting Started:

To operate the scale, first attach the scale's power cord to connector J901 and the loadcell cable to connector J902 on the bottom panel of the scale.

Press the [ON] key. A brief message is displayed (such as *"HELLO"*).

The scale now enters the **GROSS** mode.



Press and release the [NET/GROSS] key,then within three seconds, press the [ZERO] key.

"ZERO" is displayed to show completion of the **"ZERO/BALANCE"** step.

Now the scale is ready to weigh!

FEATURES: The "EZ" Model Series has enhanced features such as:

- User friendly Help Messages for EZ operation.
- Front Panel Calibration without simulator or weights.
- Large 1 inch alpha-numeric display for greater readability.
- Fiber-optic style backlighting for extremely long life.
- A simple balancing scheme using a [ZERO] key.
- Up to 81 different batching recipes (EZ 320).
- Three recipe entry modes - Percent of total, Pounds per animal, or Pounds per Ingredient (EZ 320).

OPERATING SPECIFICATIONS:

Accuracy . . . . . System ± .25% or ± .5% depending on load cell used
Temperature Range . . . . . -20 to 140 degrees F
Power Requirements . . . . . 10½ - 16 VDC

MODEL 150 - *System Operation:*

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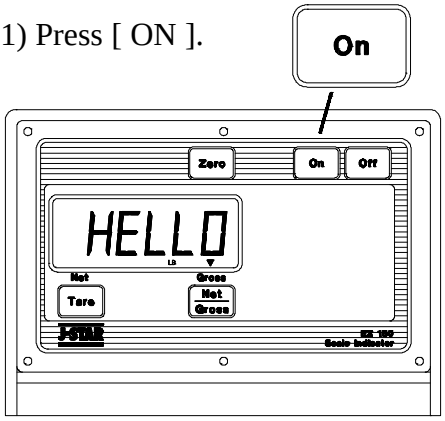
Turning_ON_the_Scale:

Step 1) Press [ON].



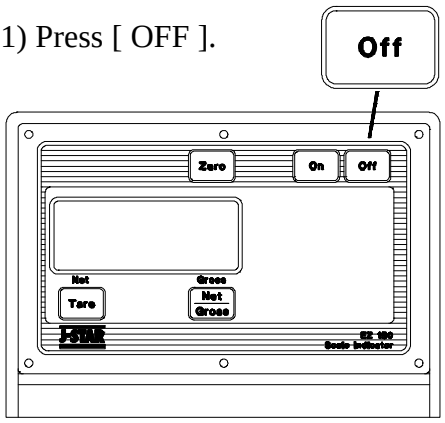
A brief message is displayed (such as *"HELLO"*). The scale enters the GROSS weighing mode. Pressing [ON] a second time during normal system operation starts the self test.

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 <u>does not</u> affect the accuracy of the scale.

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

Turning_OFF_the_Scale:

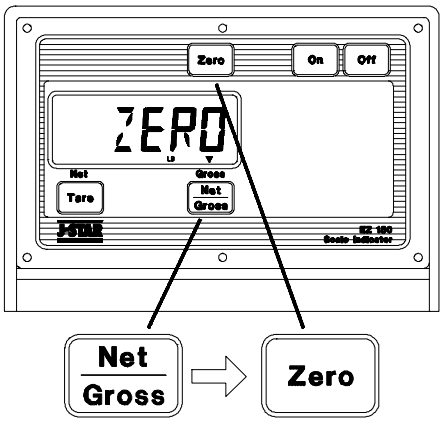
Step 1) Press [OFF].



To_Zero-Balance_the_Scale:

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

Step 2) press the [ZERO] key.



The **ZERO/BALANCE** will "balance off" the dead load such as a trailer, bin, or platform weight.

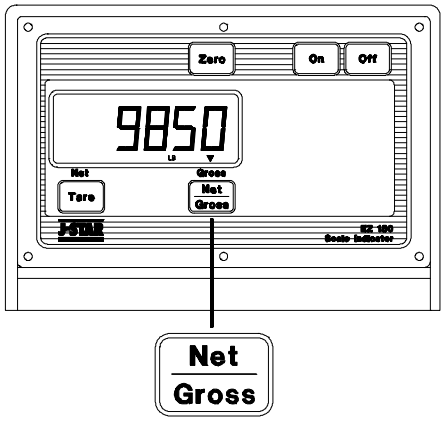
"ZERO" is displayed to show completion of the step and the scale is then placed in the GROSS mode.

Pressing <u>only</u> the [ZERO] key causes 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"* will be periodically shown on the display (approx. every five seconds) to alert the operator of the low battery condition.

To_Select_Gross_Mode:

GROSS mode displays the weight change since the unit was last ZERO/BALANCED.

Step 1) Press [NET/GROSS].

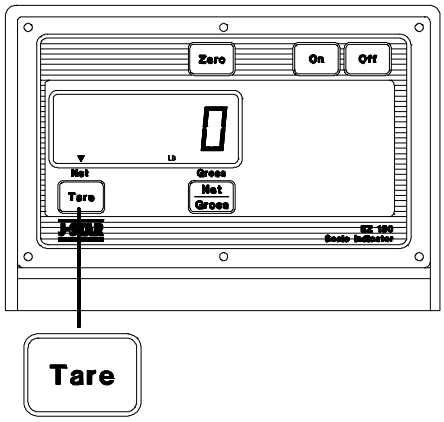


NOTE: The scale is in GROSS mode if there is a flashing arrow pointing toward the GROSS text just above the [NET/GROSS] key.

To_Select_Net_Mode:

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

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



or

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 the "TARE" function has not been performed, the unit stays in the Gross mode and the message *"FOR NET MODE PRESS TARE"* scrolls across the display.

NOTE: The scale is in NET mode if a flashing arrow points to the NET text just above the [TARE] key.

MODEL 150 - *Optional Features:*
W44444444444444444

Remote_Display_Option:
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 TR option listed below.

TR_Option:_Radio_Control
The TR option allows 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 functions.

Contact J-Star or your J-Star Dealer for additional options.

Installation Requirements:
W4444444444444444444444444444444444444444U

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 <u>before</u> "jump starting" or fast charging a battery. Disconnect <u>all</u> 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.

POWER CABLE CONNECTIONS:

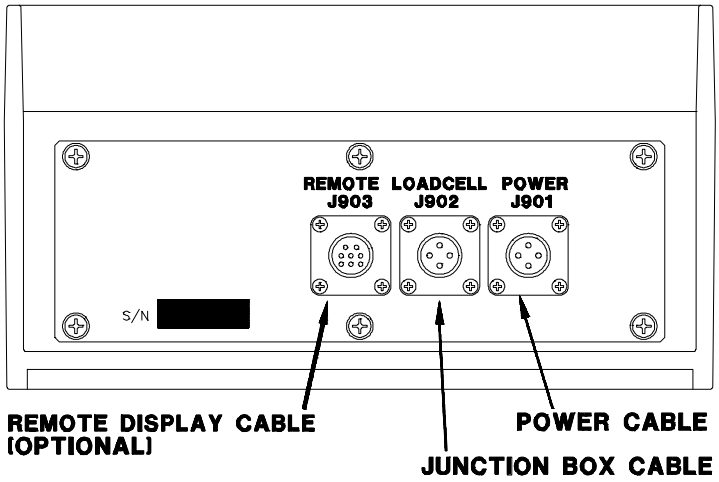
WIRE COLOR	WIRE FUNCTION
RED	Battery(+12 VDC)
BLACK	GROUND
ORANGE	NA
BLUE	NA

Load Cell Connection:
The indicator is designed to operate 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.

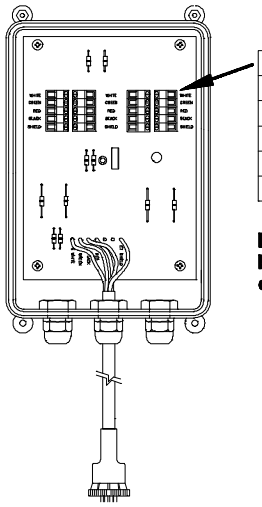
To connect the load cells, attach the junction box cable to the **J902** connector on the bottom panel of the scale. Connect the load cell cables to the junction box as shown below.

Lightning Protection:
Additional protection is achieved with the proper installation of grounding rods. Please call (920) 563-1400 and request Digi-Star Form F3050.

INDICATOR BOTTOM PANEL CABLE CONNECTIONS:



JUNCTION BOX LOAD CELL CABLE CONNECTIONS:



TERMINAL COLOR	DESCRIPTION
WHITE	SIGNAL +
GREEN	SIGNAL -
RED	EXCITATION +
BLACK	EXCITATION -
SHIELD	SHIELD

NOTE: Follow color key on circuit board to insure proper connection of load cell wires.

MODEL 210 - *System Operation:*

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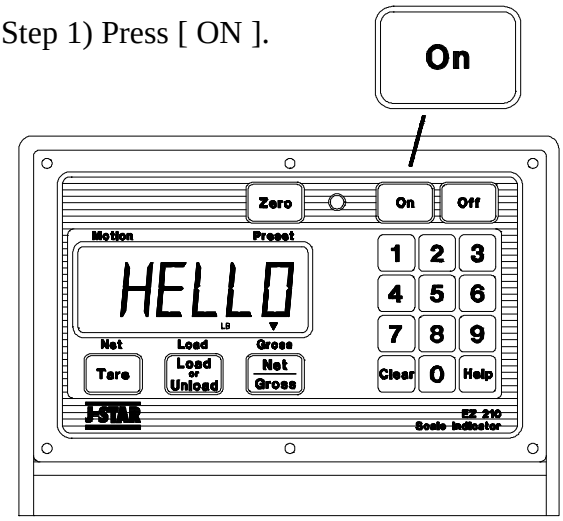
Turning_ON_the_Scale:

Step 1) Press [ON].



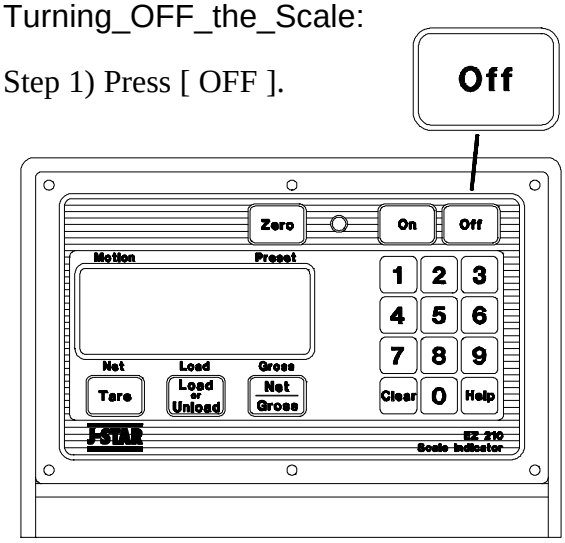
A brief message will be displayed (such as *"HELLO"*). The scale then selects the GROSS weighing mode. Pressing [ON] a second time during normal system operation starts the self test.

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 <u>does not</u> affect the accuracy of the scale.

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

Turning_OFF_the_Scale:

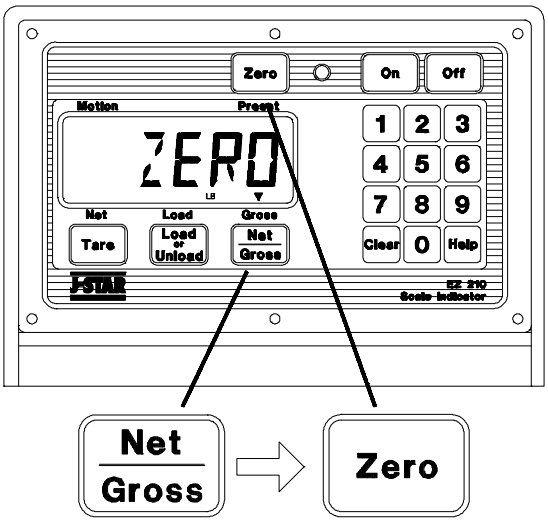
Step 1) Press [OFF].



To_Zero-Balance_the_Scale:

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

Step 2) press the [ZERO] key.



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.

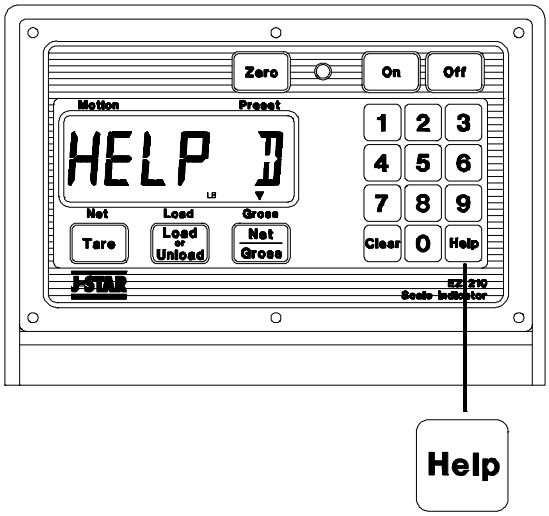
Pressing <u>only</u> the [ZERO] key causes the message *"TO ZERO/BALANCE PRESS NET/GROSS - THEN ZERO"*to be displayed.
If the supply power is below the "low battery threshold" (10.5 Volts), the message *"INDICATOR CANNOT BE ZERO/BALANCED - LOW BATTERY VOLTAGE"* is displayed. The message *"LO BAT"* is 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 *"set-up/calibration"* values.

Using_the_Help_Key:

The [HELP] *key provides additional information about the weighing modes, set-up/calibration, and keypad entries.*

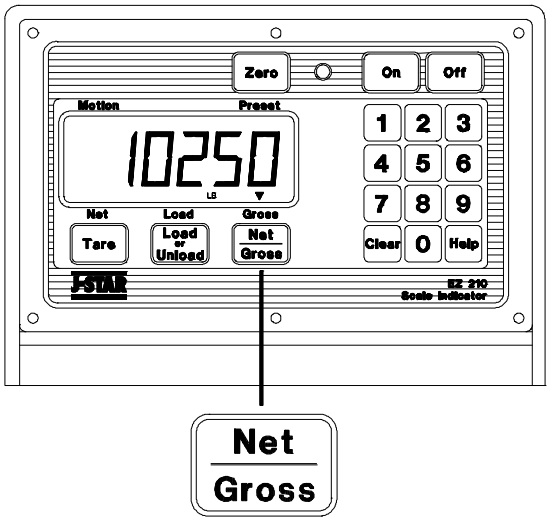
Step 1) Pressing [HELP] while displaying weight will display information about the last key pressed.



To_Select_Gross_Mode:

GROSS mode displays the weight change since the unit was last ZERO/BALANCED.

Step 1) Press [NET/GROSS].



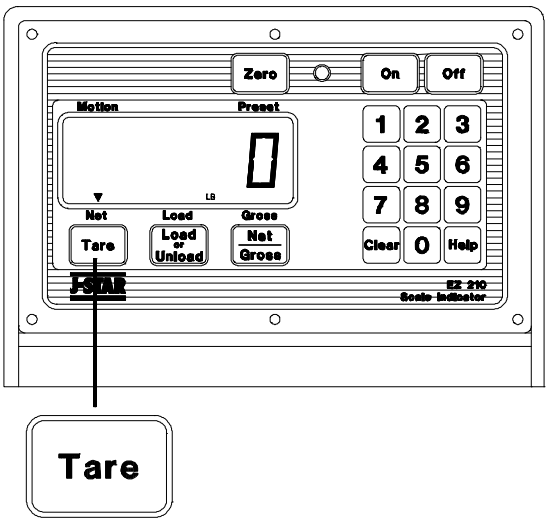
Press the [NET/GROSS] key if in the NET or LOAD/UNLOAD mode.

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 <u>*temporary*</u> *"zero" point.*

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



or

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 will place it in the NET mode. If the scale is in the NET mode, pressing the [NET/GROSS] key will place 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 stays in the Gross mode and the message *"FOR NET MODE PRESS TARE"* will scroll 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.

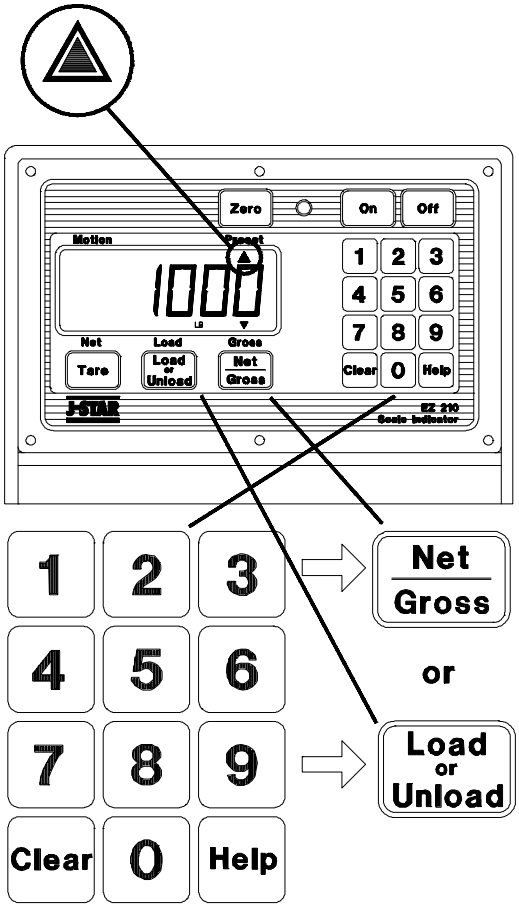
To_Enter_a_Preset:

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 turns ON when the preset amount is entered.



Once the preset has been entered, the display shows the weight data in one of three (3) different *"display modes"*.

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.

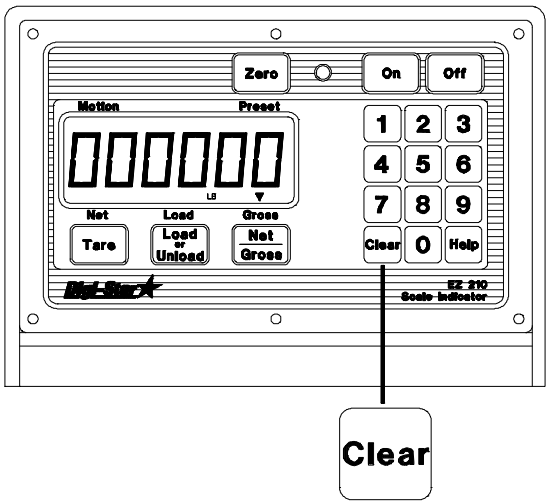
Switching between these display modes is possible at any time by simply pushing the appropriate keys.

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.

To Clear the Preset & Alarm:

Step 1) Press the [CLEAR] key.



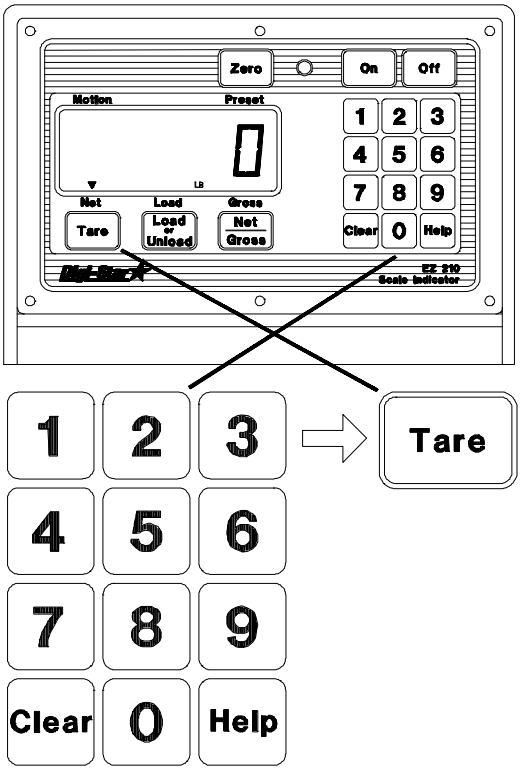
At this time, a new preset can be entered or by pressing the [CLEAR] key a second time (with a flashing zero *" 0"* shown on the display) the scale will return to weighing.

Reloading a preset value with the "REMOTE ENTER PRESET" line of the power cord will also clear the previous preset condition.

Using the "REMOTE ZERO" feature of the 20R TR option also clears the previous preset condition.

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"* could be preloaded into the scale and the net weight will be displayed. The *"tare weight"* is also sent to the printer.

An example could be demonstrated with 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.

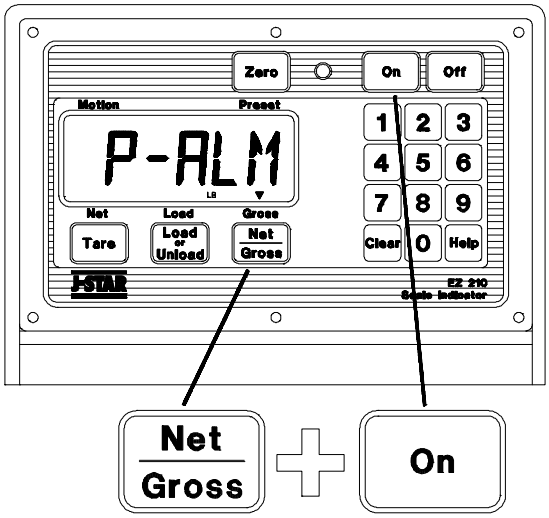
Note: This feature can be turned ON or OFF with the Preload Tare {PRETAR} setting in the Long Form Setup.

Using_the_Pre-Alarm:

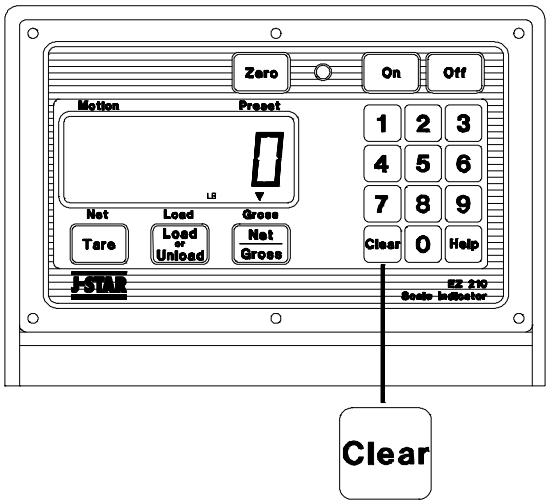
The Pre-Alarm feature is an *"early warning"* for the preset. For example, if the Pre-Alarm is set to 100 and the preset is 1000, the preset alarms will flash during the last 100 lbs/kgs of the preset. The alarms are continuous once the preset is active. This allows more accuracy in *reaching the preset*.

Change_the_Pre-Alarm_Weight:

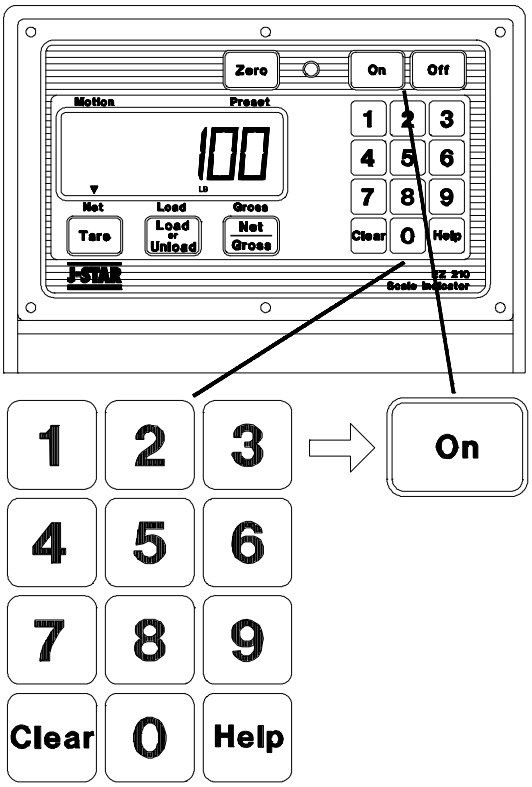
Step 1) Press and hold the [NET/GROSS] key, then press the [ON] key. Continue holding both keys until the indicator beeps and displays the message *" P-ALM"*. The 'CAL' annunciator flashes and the current pre-alarm weight is displayed.



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

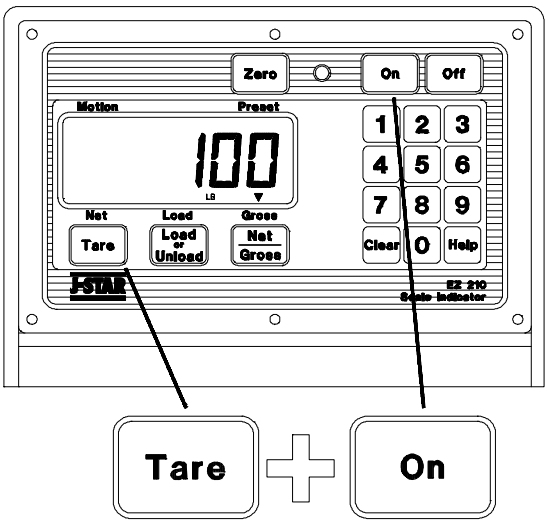


Step 3) Use the numeric keypad to select a pre-alarm weight.



Step 4) Press the [ON] key. The display advances 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.



Installation Requirements:

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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 <u>before</u> "jump starting" or fast charging a battery. Disconnect <u>all</u> 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.

POWER CABLE CONNECTIONS:

WIRE COLOR	WIRE FUNCTION
RED	Battery(+12 VDC)
BLACK	GROUND
ORANGE	Remote Alarm Out +
BLUE	Remote Input

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. The alarm output is fused for a maximum drain of 10 amps. The remote alarm connection may also be used for motor control purposes when used with a relay.

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:

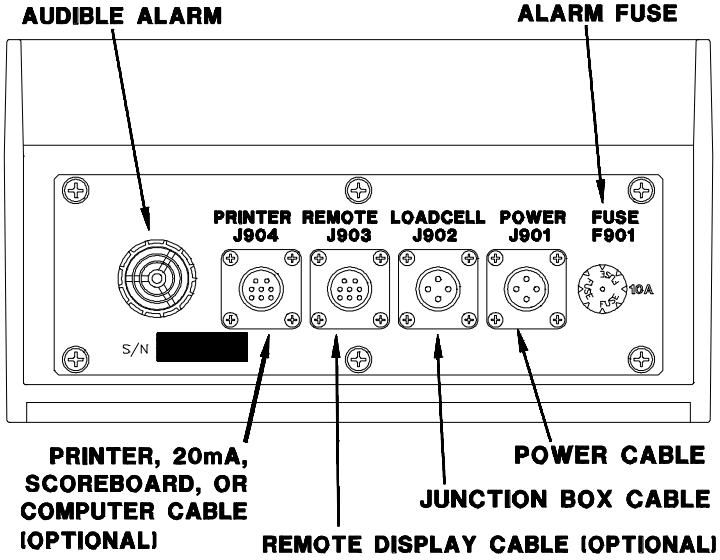
The indicator operates with strain gage load cells. The system is normally supplied with a *"J-BOX"* cable going between the scale and the load cell junction box. Extension Kits are available from your dealer in various lengths.

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.

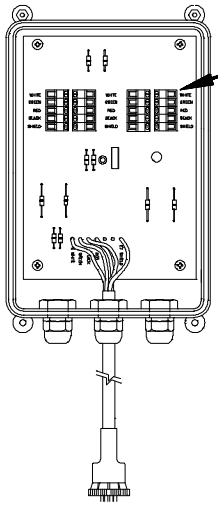
Lightning Protection:

Additional protection is achieved with the proper installation of grounding rods. Please call (414) 563-5521 and request J-Star Form F3050.

INDICATOR BOTTOM PANEL CABLE CONNECTIONS:



JUNCTION BOX LOAD CELL CABLE CONNECTIONS:



TERMINAL COLOR	DESCRIPTION
WHITE	SIGNAL +
GREEN	SIGNAL -
RED	EXCITATION +
BLACK	EXCITATION -
SHIELD	SHIELD

NOTE: Follow color key on circuit board to insure proper connection of load cell wires.

MODEL 210 - *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.
W4444444444444444444444444444444444444

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

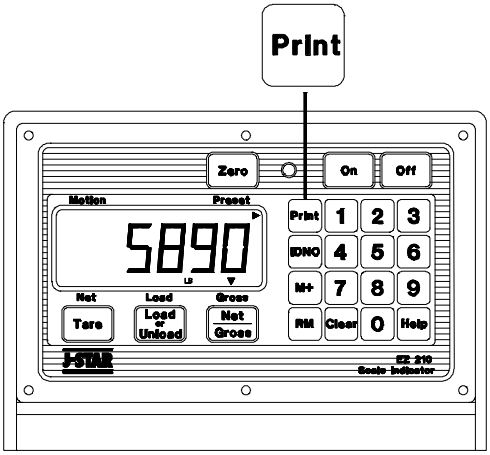
The TR and TR4 options allow the operator to remotely control the scale from a distance up to 100 feet away.

The **TR** option allows the operator to perform TARE and GROSS 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:

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



An auto-print feature is implemented on the TR and TR4 options.

Sample output format shown below:

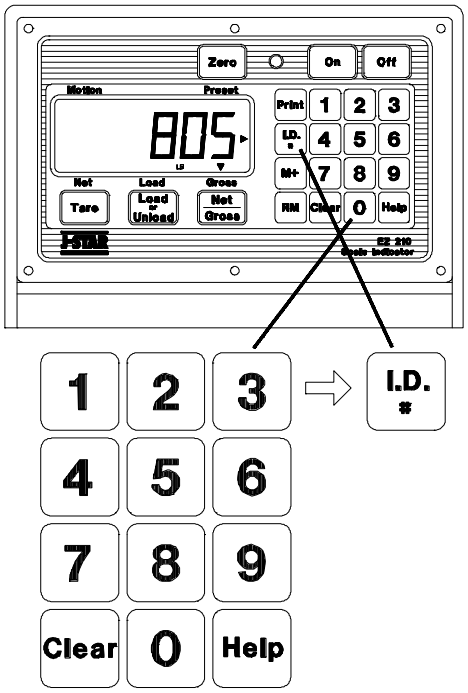
```
+)))))))))))))))))))))))))))))),
*          10JA92  12:01P    *
*   123456 ID  123456LB GR   *
.)))))))))))))))))))))))))))))-
```

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

Enter_Identification_Number:ID#

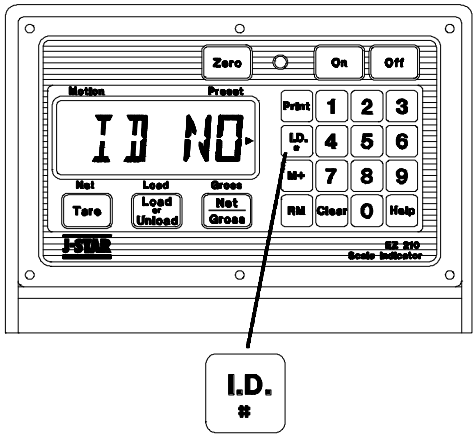
Step 1) Use the numeric keypad to select the identification number.

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



Display_Identification_Number:

Step 1) Press the [ID #] key.

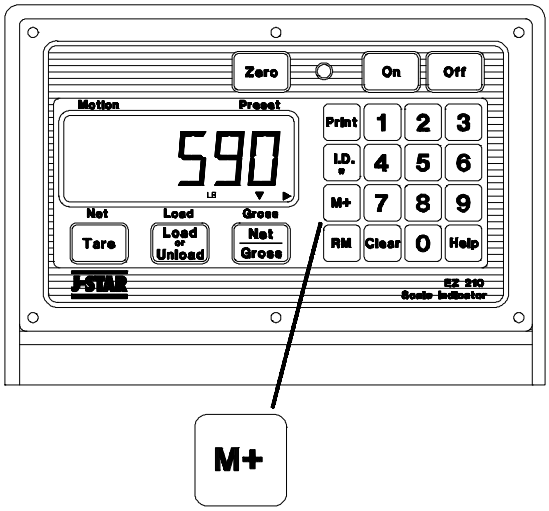


The identification number is cleared by pressing the [CLEAR] key followed by pressing the [ID #] key.
NOTE: Printing automatically clears the

identification number.

Add_Weight_To_Weigh_Memory:

The displayed weight is stored in memory by pressing the [M+] (memory plus) key.

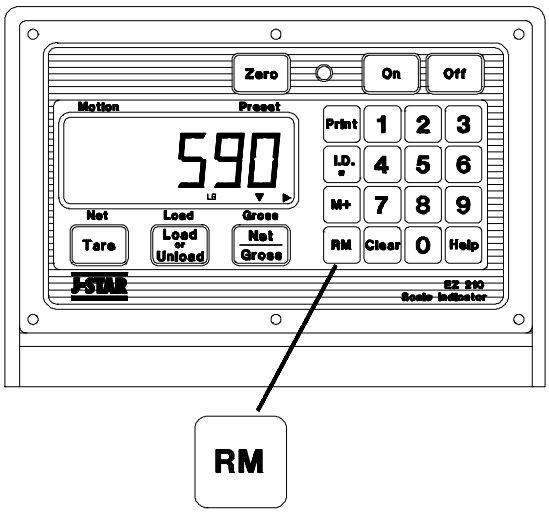


The weigh memory is temporarily displayed.

If a weight was previously stored in memory, the displayed weight is added to weigh memory.

Recall_Weigh_Memory:

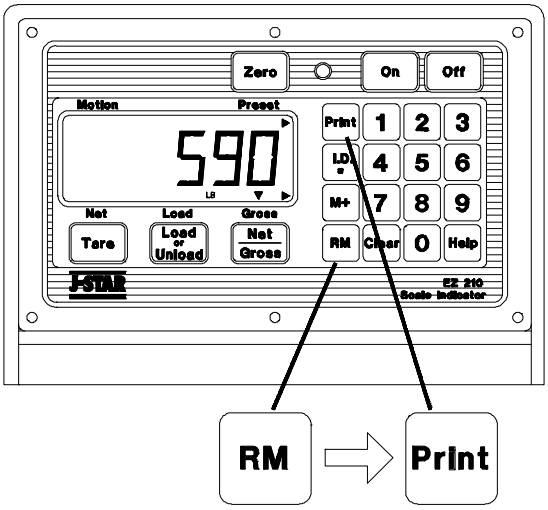
The value of total weight in memory can be displayed by pressing the [RM] (recall memory) key.



The weigh memory is temporarily displayed.

Print_Weigh_Memory:

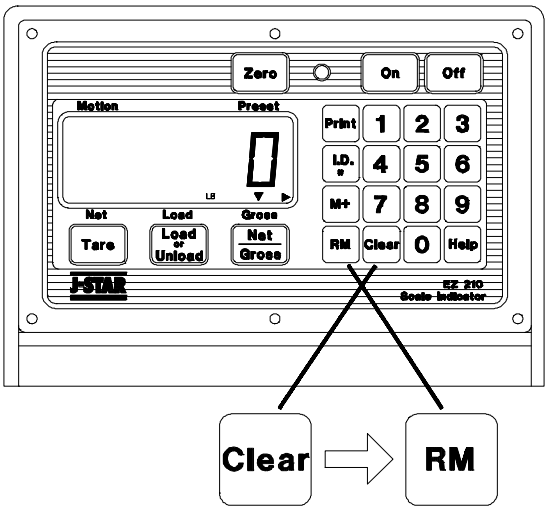
The value of total weight in memory can be printed by pressing the [RM] (recall memory) key and then the [PRINT] key ***while the weigh memory is still displayed***.



The [PRINT] key causes the unit to return to the normal weighing modes.

Clear_Weigh_Memory:

The weigh memory is cleared by pressing the [CLEAR] key followed by pressing the [RM] 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 2000Lbs was unloading a preset of 1000Lbs. After unloading the first 500Lbs, 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 <u>before</u> the black out (500Lbs 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 the line 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.

```
   |<- 1 Display Count ->|<- 1 Display
Count  ->|
S)),         +)))))))))),
+)))))))))),
   *          *            *           *
      *
   .)))))))))-            .)))))))))-
      .Q
   |<-150mS->|<--350mS-->|<-150mS ->|<--
350mS-->|
   |
      |
   |<------ 2 pulses max/second ( 2 Hz )
------>|
```

In this example, 7500Lbs 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).

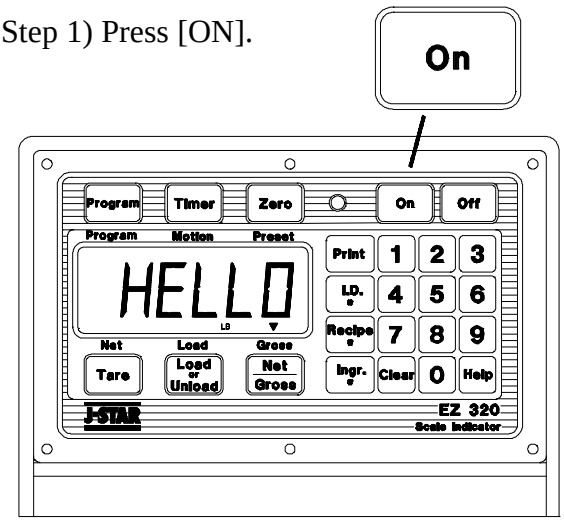
When the scale power is returned and the scale is turned back *ON* after a power loss, the scale will display the message - *"POWER OUTAGE - PRESS NET/GROSS TO CONTINUE PULSED OUTPUT - ZERO TO RESET MO/DA/YR 12:00A"*. This provides the opportunity to start other equipment in the proper sequence.

MODEL 320 - *System Operation:*

W4444444444444444444444444444444444444

Turning_ON_the_Scale:

Step 1) Press [ON].



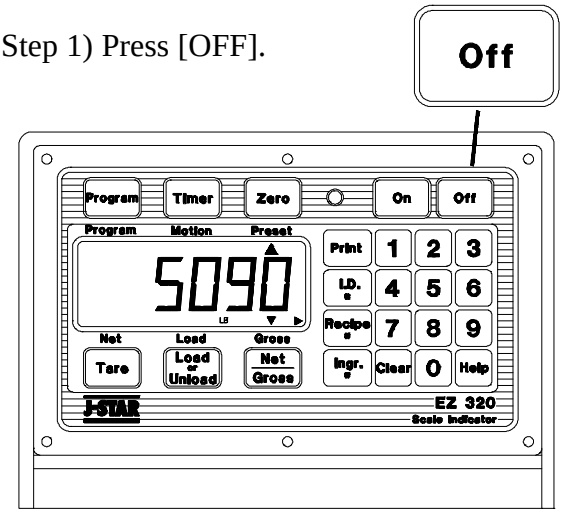
A brief message is displayed (such as *"HELLO"*). The scale then selects the GROSS weighing mode.Pressing [ON] a second time during normal system operation starts the self test.

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 <u>does not</u> affect the accuracy of the scale.

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

Turning_OFF_the_Scale:

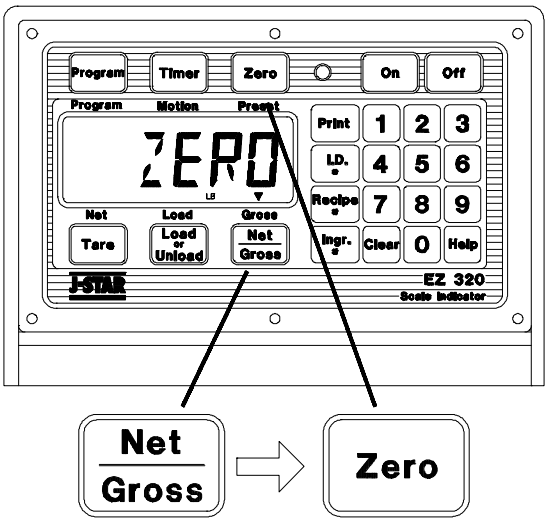
Step 1) Press [OFF].



To_Zero-Balance_the_Scale:

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

Step 2) press the [ZERO] key.



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 <u>only</u> the [ZERO] key will cause the message *"TO ZERO/BALANCE PRESS NET/GROSS - THEN ZERO"* to be displayed

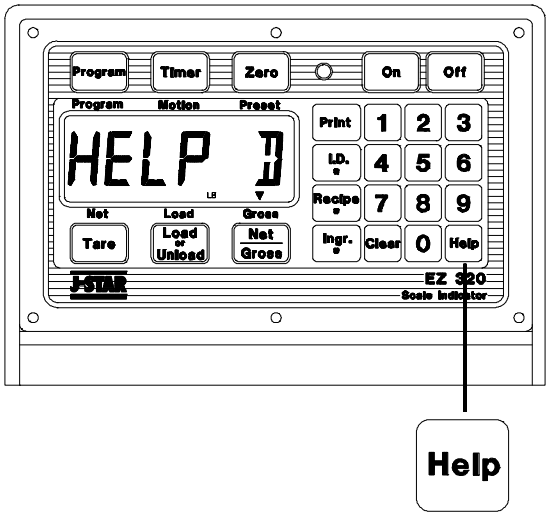
If the supply power is below the "low battery threshold" (10.5 Volts), the message *"INDICATOR CANNOT BE ZERO/BALANCED - LOW BATTERY VOLTAGE"* is displayed. The message *"LO BAT"* is periodically shown on the display (approx. every five seconds) to alert the operator of the low battery condition.

Loss of power **does not** affect the *"set-up/calibration"* values.

Using_the_Help_Key:

The [HELP] *key provides additional information about the weighing modes, set-up/calibration, and recipe programming.*

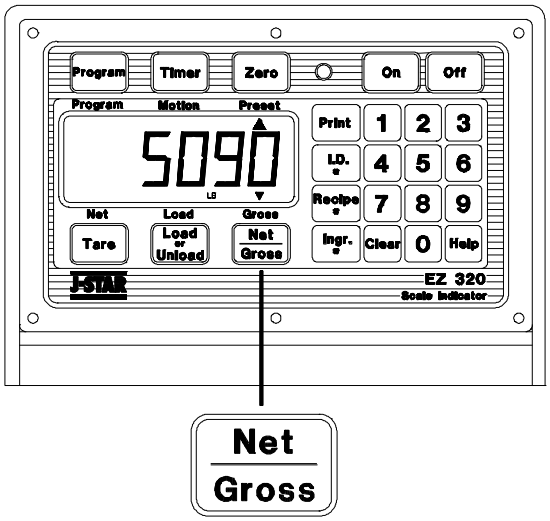
Step 1) Pressing [HELP] while displaying weight will display information about the last key pressed.



To_Select_Gross_Mode:

GROSS mode displays the weight change since the unit was last ZERO/BALANCED.

Step 1) Press [NET/GROSS].



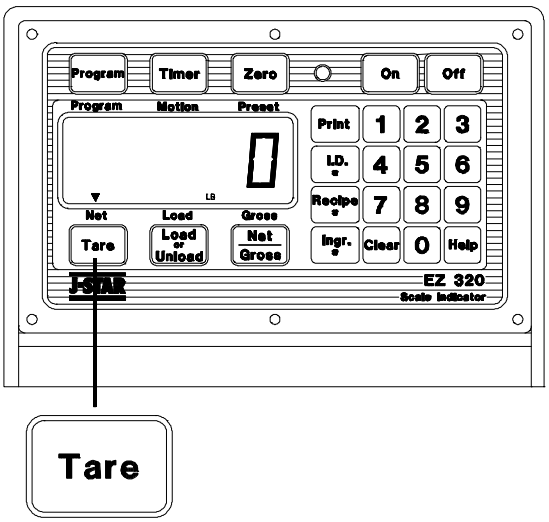
Press the [NET/GROSS] key if in the NET or LOAD/UNLOAD mode.

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 <u>*temporary*</u> *"zero" point.*

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



or

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.

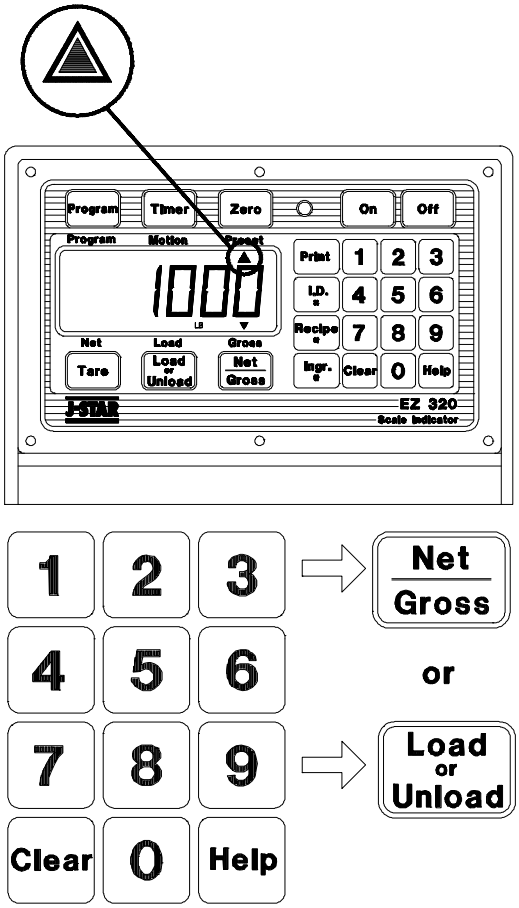
To_Enter_a_Preset:

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.



Once the preset has been entered, the display shows the weight data in one of three(3) different *"display modes"*.

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 <u>OR</u> 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.

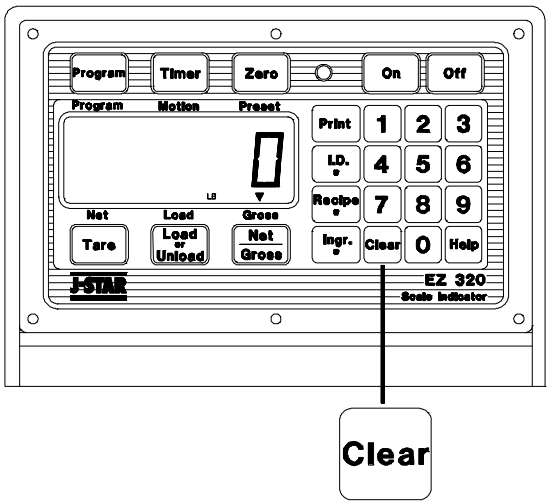
Switching between these display modes is possible at any time by simply pushing the appropriate keys.

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.
See page 21 for more information.

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.

To_Clear_the_Preset_Alarm:

Step 1) Press the [CLEAR] key twice.



This sets the display to zero's *" 0"* and returns the scale to weighing.

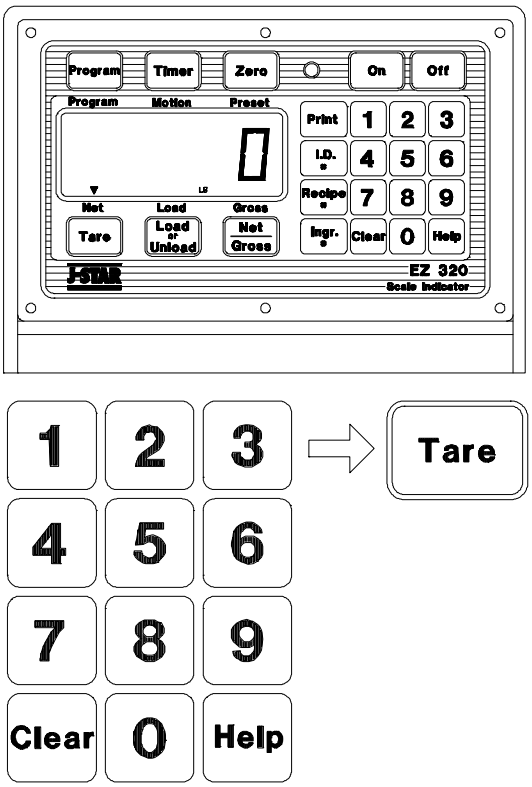
By pressing the [CLEAR] key only once, a new preset can be entered.

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 be displayed. The *"tare weight"* is also sent to the printer.

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

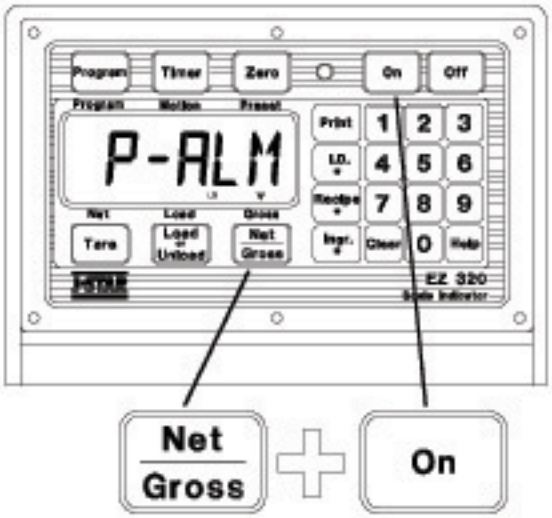
Step 1 - Balance the scale.
Step 2 - Weigh and record the weight of the unloaded wagon.
Step 3 - Pull the wagon off the scale and load.
Step 4 - Enter the wagon's tare weight.
Step 5 - Place loaded wagon back on the scale to see net weight.

Using_the_Pre-Alarm:

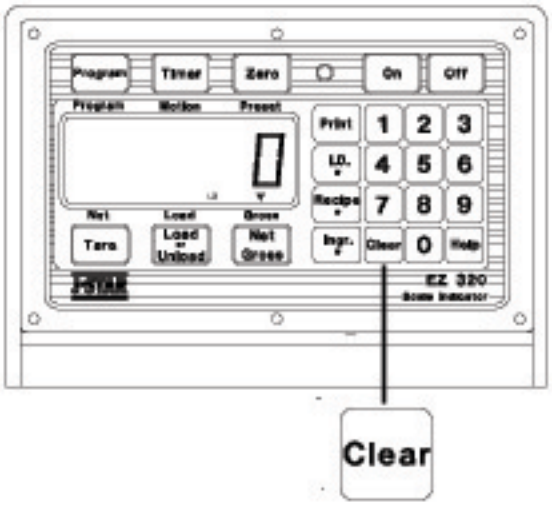
The Pre-Alarm feature is an *"early warning"* for the preset. For example, if the Pre-Alarm is set to 100 and the preset is 1000, the preset alarms flash during the last 100 lbs/kgs of the preset. The alarms are continuous once the preset is active. This allows more accuracy in *reaching the preset.*

Changing_Pre-Alarm_Weight:

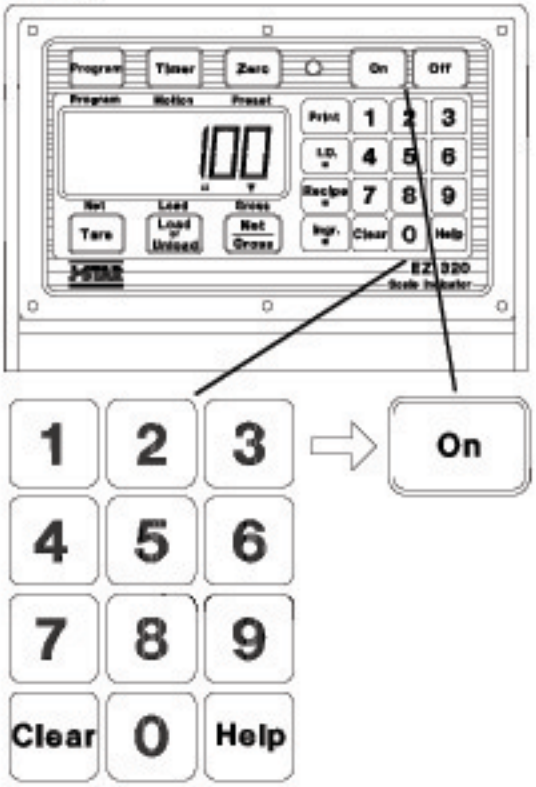
Step 1) Press and hold the [NET/GROSS] key, then press the [ON] key. Continue holding both keys until the indicator beeps and displays the message *" P-ALM"*. The 'CAL' annunciator flashes and the current pre-alarm weight is displayed.



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

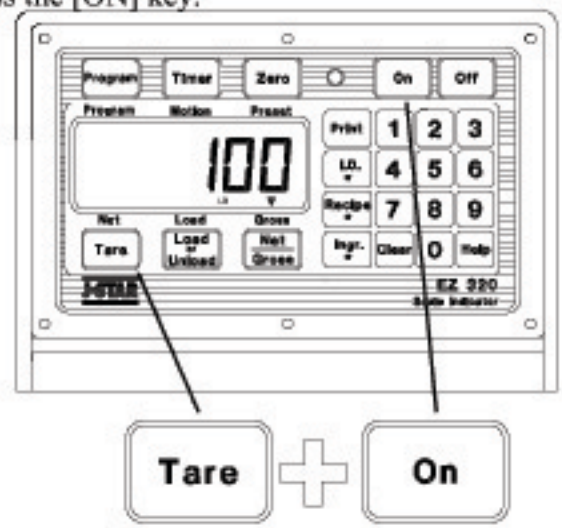


Step 3) Use the numeric keypad to select a pre-alarm weight.



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.

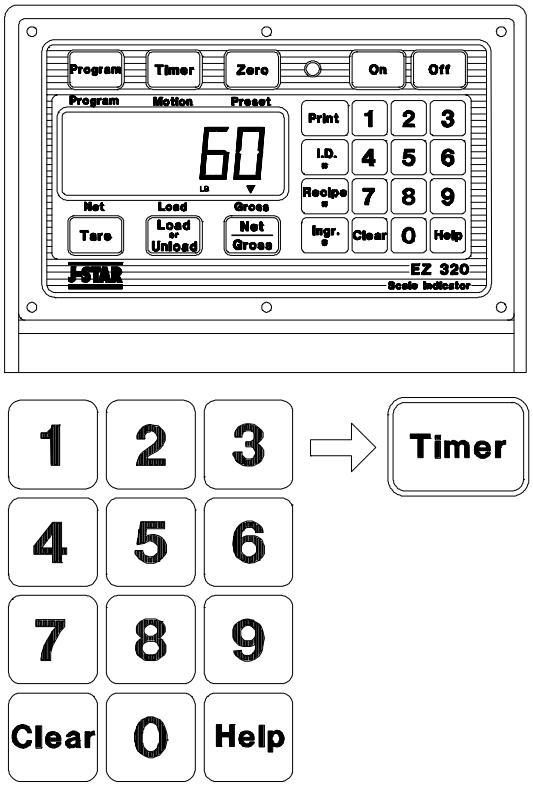
Step 1) Press the [TIMER] key to see the time currently set. The [NET/GROSS] and [TARE] keys can then be used to change the displayed value.

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

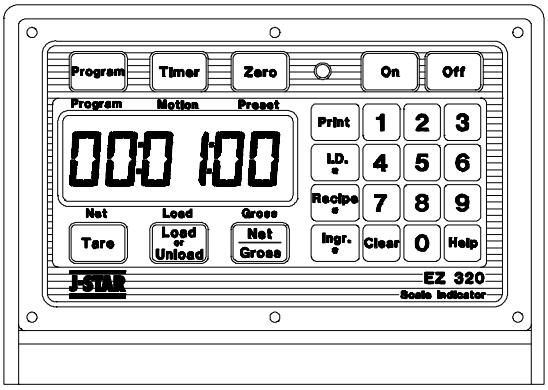
When the correct time has been entered or if the number displayed is acceptable, press the [TIMER] key to set the time and start the Mix Timer.

or

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

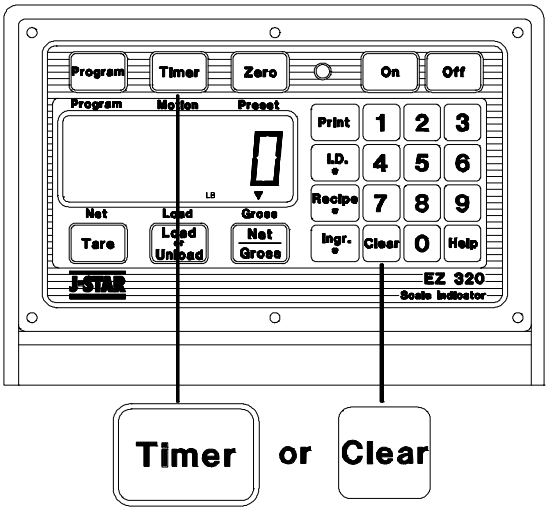


The display now reads HOURS, MINUTES, and SECONDS (HH:MM:SS),separated by colons that flash every second.



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:

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

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 18Lbs of haylage and 16Lbs of shell corn for one(1) animal. The recipe was then loaded for 100 *"ANIMAL"*'s. The scale calculated presets for 1800Lbs of haylage and 1600Lbs 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 10,000Lbs. The scale calculated presets for 5500Lbs of haylage and 4500Lbs of shell corn.

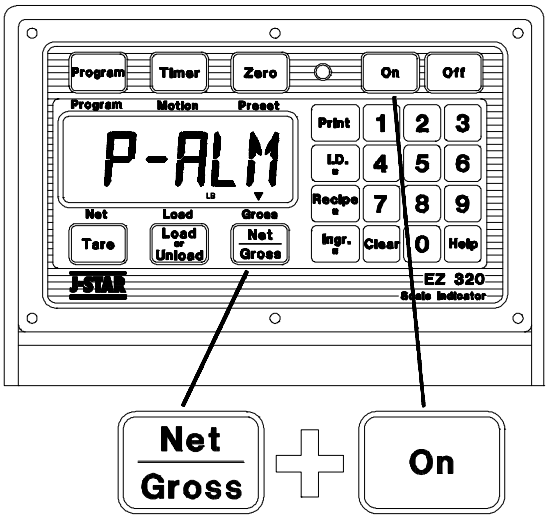
Entry Method #3 - Amount per Load.
Program the ingredient amounts required per load. When recipe is loaded and indicator flashes *"TOTAMT"*, the **total amount programmed for that recipe** is displayed. Press [LOAD/UNLOAD] to accept that amount **or** enter a new total amount and the scale calculates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

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

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

To_Change_the_Entry_Method:

Step 1) Enter the "Long Form Setup Mode" by press 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"*.



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

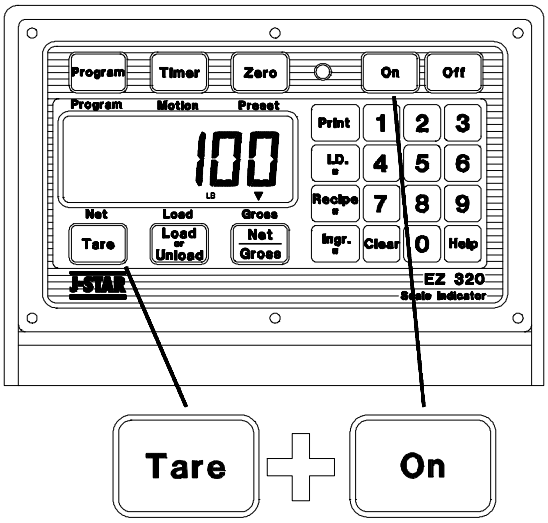
To select the recipe entry method.

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.



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.

To Program

RECIPE #12		PROGRAM ENTRY METHODS AVAILABLE (CHOOSE ONE)				
INGREDIENT NAME	INGREDIENT NUMBER	AMT. PER ANIMAL	OR	% PER LOAD	OR	AMOUNT PER LOAD
(1) Haylage	3	18.0		34.62		1800
(2) High Moisture Corn	9	10.0		19.23		1000
(3) Corn Silage	5	24.0		46.15		2400
	Total	52 Lbs		100.00		5200

To Load

RECIPE #12		AMT. PER ANIMAL	OR	% PER LOAD	OR	AMOUNT PER LOAD
		ENTER # OF ANIMALS		ENTER LOAD SIZE		ACCEPT 5200 OR ENTER NEW SIZE
INGREDIENT NAME	INGREDIENT NUMBER	⇒ 100 ANIMALS		⇒ 5200		⇒ 5200
(1) Haylage	3	1800		1800		1800
(2) High Moisture Corn	9	1000		1000		1000
(3) Corn Silage	5	2400		2400		2400
	Total	5200		5200		5200

To Program

RECIPE #5		PROGRAM ENTRY METHODS AVAILABLE (CHOOSE ONE)				
INGREDIENT NAME	INGREDIENT NUMBER	AMT. PER ANIMAL		% PER LOAD		AMOUNT PER LOAD
(1) Corn Silage	5	15.0	OR	37.5	OR	1800
(2) Haylage	3	14.5		36.25		1740
(3) Soy Bean	10	2.3		5.75		276
(4) Cotton Seed Hulls	12	8.2		20.50		984
	Total	40 Lbs		100.00		4800

To Load

RECIPE #5		AMT. PER ANIMAL		% PER LOAD		AMOUNT PER LOAD
		ENTER # OF ANIMALS		ENTER LOAD SIZE		ACCEPT 4800 OR ENTER NEW SIZE
INGREDIENT NAME	INGREDIENT NUMBER	⇒ 120 ANIMALS	OR	⇒ 4800	OR	⇒ 4800
(1) Corn Silage	5	1800		1800		1800
(2) Haylage	3	1740		1740		1740
(3) Soy Bean	10	276		276		276
(4) Cotton Seed Hulls	12	984		984		984
	Total	4800		4800		4800

1: Amount per Animal -

Recipe amounts *programmed* for 1 animal.

Ingredient presets for a 100 animal load.

Haylage	= 18 Lbs	X 100	Haylage	= 1800 Lbs
Corn Silage	= 10 Lbs		Corn Silage	= 1000 Lbs
HM Shell Corn	= 16 Lbs		HM Shell Corn	= 1600 Lbs
Soy Hulls	= 02 Lbs		Soy Hulls	= 200 Lbs
Soybeans	= 06 Lbs		Soybeans	= 600 Lbs
TOTAL	= 52 Lbs		TOTAL	= 5200 Lbs

2: Percent per Load - %

Recipe amounts *programmed* in % for Total Load.

Ingredient presets for 5200 lb load.

Haylage	= 34.60 %	Haylage	= 1800 Lbs
Corn Silage	= 19.23 %	Corn Silage	= 1000 Lbs
HM Shell Corn	= 30.77 %	HM Shell Corn	= 1600 Lbs
Soy Hulls	= 03.85 %	Soy Hulls	= 200 Lbs
Soybeans	= 11.55 %	Soybeans	= 600 Lbs
TOTAL	= 100.00 %	TOTAL	= 5200 Lbs

3: Amount per Load - Lbs

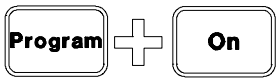
Recipe amount *programmed* in Total Lbs/Load.

Ingredient presets for 5200 lb load.

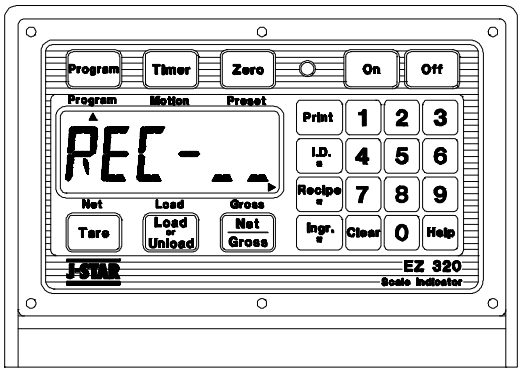
Haylage	= 1800 Lbs	Haylage	= 1800 Lbs
Corn Silage	= 1000 Lbs	Corn Silage	= 1000 Lbs
HM Shell Corn	= 1600 Lbs	HM Shell Corn	= 1600 Lbs
Soy Hulls	= 200 Lbs	Soy Hulls	= 200 Lbs
Soybeans	= 600 Lbs	Soybeans	= 600 Lbs
TOTAL	= 5200 Lbs	TOTAL	= 5200 Lbs

To_Program_a_New_Recipe:

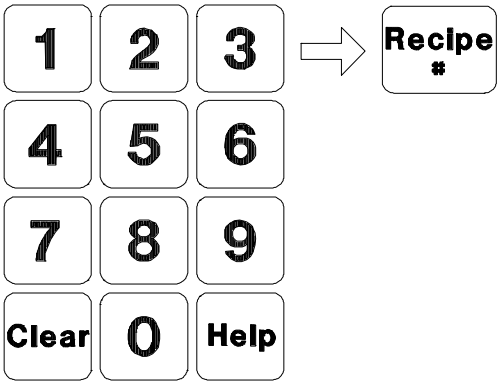
Enter the program mode by press and holding the [PROGRAM] key and then pressing the [ON] key. Continue holding both keys until the indicator beeps and the scale displays the message *"PROGRM"*. The "recipe program annunciator" flashes.



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].



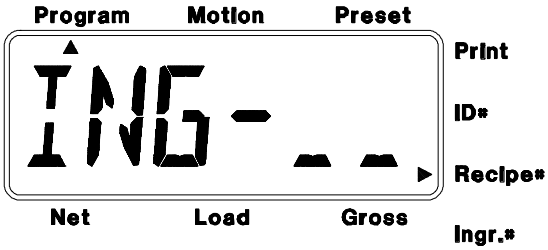
Step 2) Then use the numeric keypad to select the recipe number. Then press [RECIPE #] to enter the recipe number.

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.

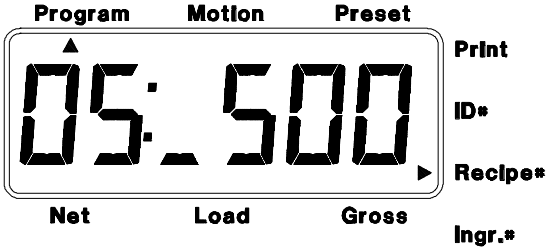
Step 4) *"ING-__"* is displayed immediately following the entry message.



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.

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:

Enter the program mode by press 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" will be flashing.

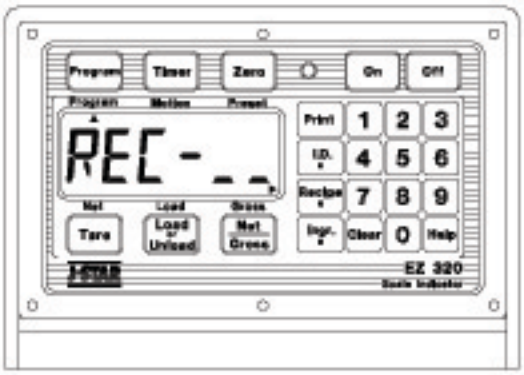
The scale then displays the first formula number programmed *"REC-XX"*. Use one of the following methods to select the recipe to edit:

Method 1:

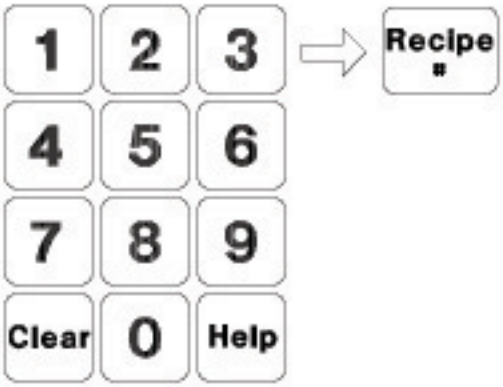
Step 1) Press [RECIPE#] until the desired recipe number is displayed.

Step 2) Then press [INGR#] to edit this recipe. Now go to Step 4.

Method 2:



Step 2) Press [CLEAR].



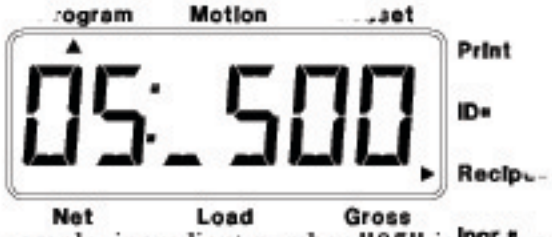
Step 3) Then use the numeric keypad to select the recipe number. Then press [RECIPE #] to enter the recipe number or press [RECIPE#] to advance until the desired recipe is displayed.

Step 4) 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 5) 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 6) Pressing [INGR.#] will advance the scale to the next ingredient of the recipe. Press [INGR.#] until the desired ingredient is displayed.
Step 7) Press [CLEAR] and then use the numeric keypad to select the four (4) digit ingredient value. Press [LOAD/UNLOAD] to enter the value.

Step 8) 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 the any of the recipes.

Step 9) Continue steps 5 through 8 until the desired changes have been made.

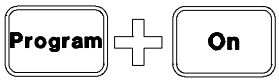
Step 10) Press [RECIPE#] to complete the recipe. The scale will now calculate and display the *"TOTAL"* value of the recipe.

Step 11) Press [PROGRAM] to exit the ***"recipe programming mode"*** and enter the weighing modes.

NOTE: Ingredient amounts

To_Erase_a_Recipe:

Enter the program mode by press 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" will be flashing.

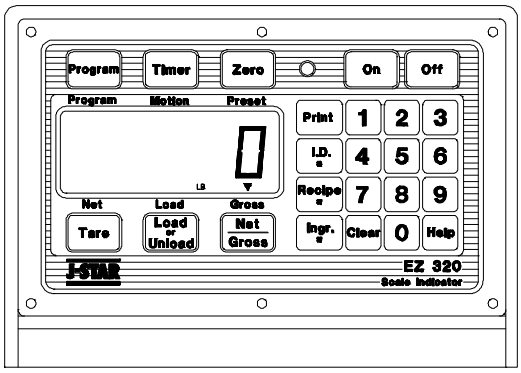


The scale then displays the first formula number programmed *"REC-XX"*. Use one of the following methods to select the recipe to erase:

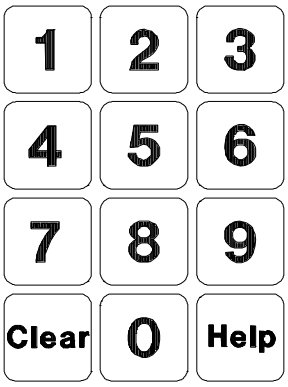
<u>Method 1:</u>

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

<u>Method 2:</u>



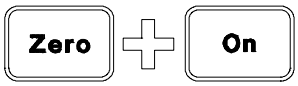
Step 1) Press [CLEAR].



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 the all 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.

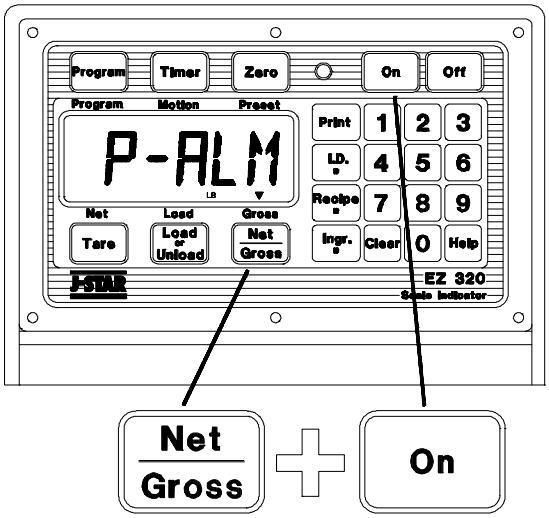
The auto-advance circuitry of the recipe function activates the *"delay time"* counter while the weight is in the *"tolerance window"*. The alarms sound continuous at this time and the preset is considered active. This allows the operator to slightly "under or over shoot" an ingredient amount and still automatically advance to the next ingredient. The auto-advance circuitry resets the *"delay time"* counter everytime 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) Enter the "Long Form Setup Mode" by press 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"* followed by the current pre-alarm weight. The "CAL" annunciator will be flashing.



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,

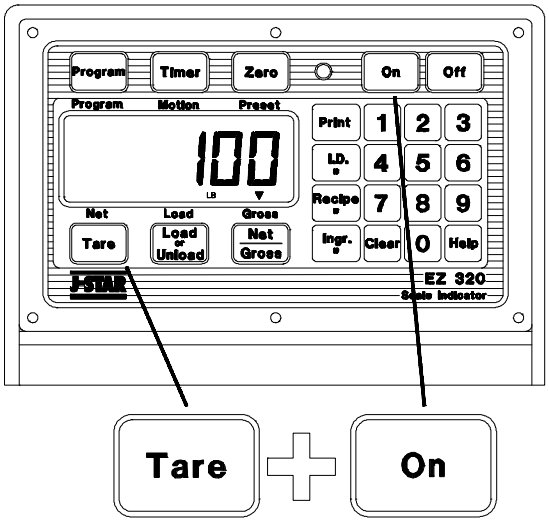
Step 2) Press [NET/GROSS].

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.



Using_Delay_Time:

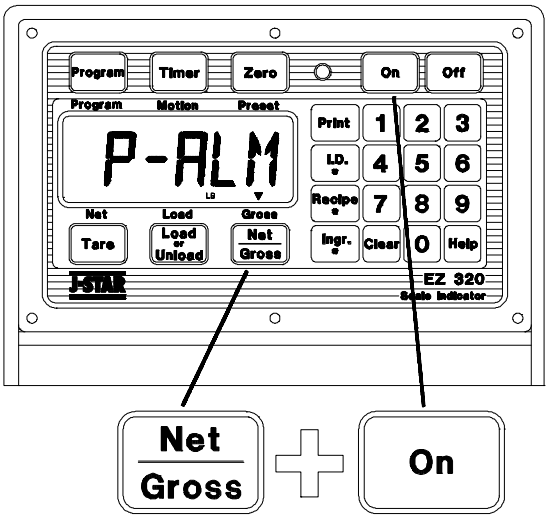
The Delay Time feature allows an operator to select the amount of time the scale should wait before automatically advancing to the next ingredient of the recipe. This helps insure accuracy for the ingredient amount. For example, if the delay time is set to 10(seconds) and the preset alarms are activated 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) Enter the "Long Form Setup Mode" by press 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"* followed by the current pre-alarm weight. The "CAL" annunciator will be flashing.



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].

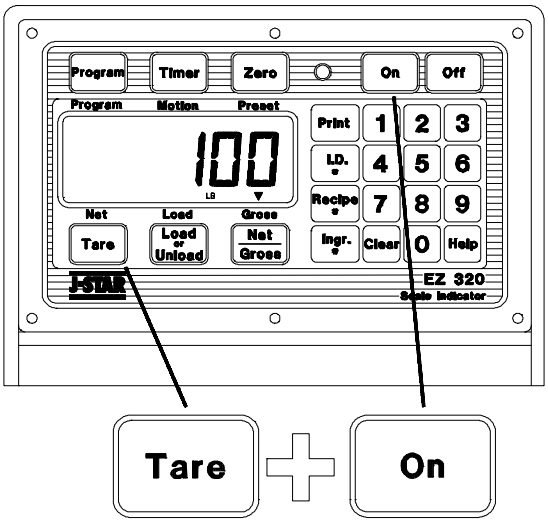
Set to "MANUAL" to prevent advancing after the ingredient amount has been reached.

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:

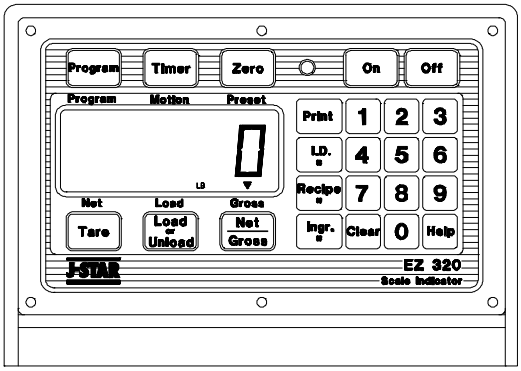
Either of the following methods can be used to load a recipe while in the weighing modes:

Method 1:

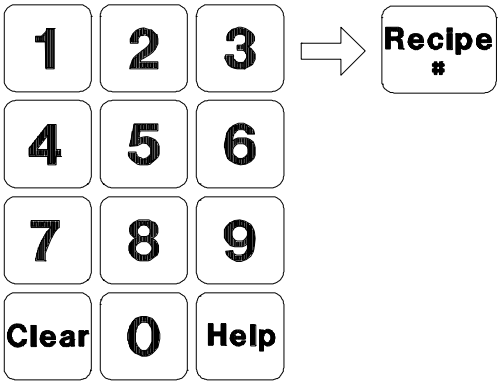
Step 1) Press [RECIPE#] until the desired recipe number is displayed.

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].

or, 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 display 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.

See Pages 31 & 32 for more information.

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

To_Review_a_Recipe:

Step 1) Press [RECIPE#]. The scale displays the first recipe loaded in memory. Press [RECIPE#] until the desired recipe number is displayed.

Step 2) Press [INGR.#]. This displays the ingredients of the recipe.

Step 3) Repeat step 2 to display all ingredients.

Step 4) Continue to press [RECIPE] until all recipes have been displayed or press [CLEAR] to exit the ***"recipe review mode"***.

Installation Requirements:
W4444444444444444444444444444444444444U

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 <u>before</u> "jump starting" or fast charging a battery. Disconnect <u>all</u> 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.

POWER CABLE CONNECTIONS:

WIRE COLOR	WIRE FUNCTION
RED	Battery(+12 VDC)
BLACK	GROUND
ORANGE	Remote Alarm Out +
BLUE	Remote Input

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. The alarm output is fused for a maximum drain of 10 amps. The remote alarm connection may also be used for motor control purposes when used with a relay.

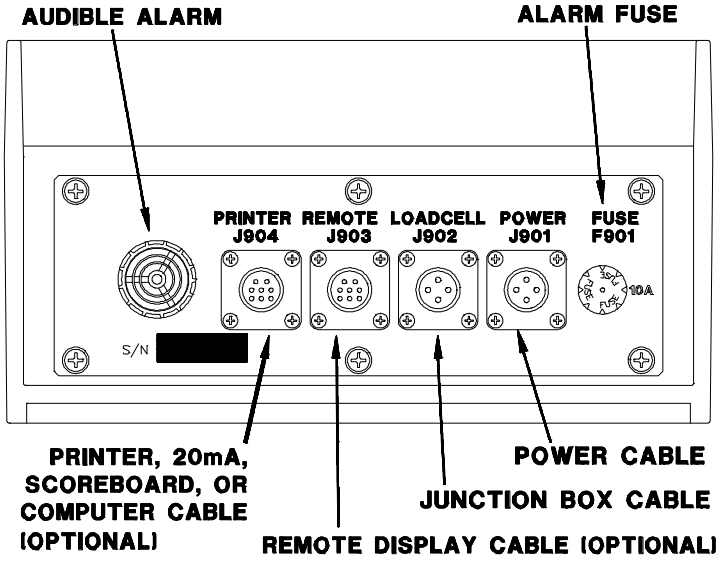
Remote Input Connection:
If the remote input is to be used, connect one side of the normally open momentary switch or relay contact to the power cable blue wire, and the other side to the frame or other GROUND connection. If your power cable does not contain a blue wire and you desire to use this feature, 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.

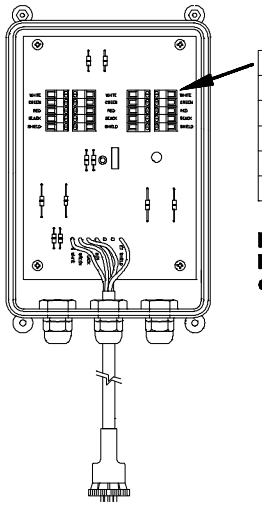
To connect the load cells, attach the junction box cable to the **J902** connector on the bottom panel of the scale. Connect the load cell cables to the junction box as shown below.

Lightning Protection:
Additional protection is achieved with the proper installation of grounding rods. Please call (414) 563-5521 request J-Star Form F3050.

INDICATOR BOTTOM PANEL CABLE CONNECTIONS:



JUNCTION BOX LOAD CELL CABLE CONNECTIONS:



TERMINAL COLOR	DESCRIPTION
WHITE	SIGNAL +
GREEN	SIGNAL -
RED	EXCITATION +
BLACK	EXCITATION -
SHIELD	SHIELD

NOTE: Follow color key on circuit board to insure proper connection of load cell wires.

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.
W4444444444444444444444444444444444444

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.

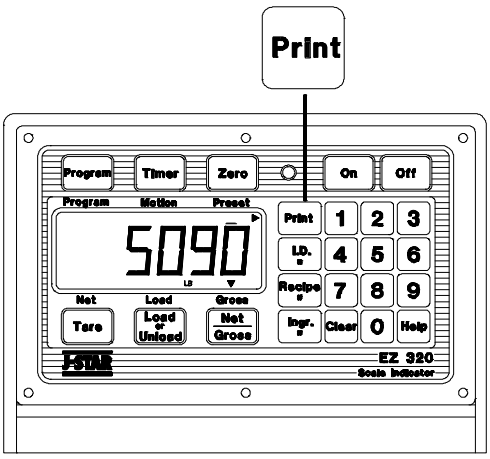
TR:_*Radio_Control_Operation*

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.

To_Print_Weight_Data:

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



An auto-print feature is implemented on the TR and TR4 options.

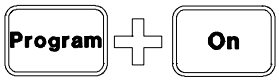
Sample output format shown below:

```
+)))))))))))))))))))))))))))),
*          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].

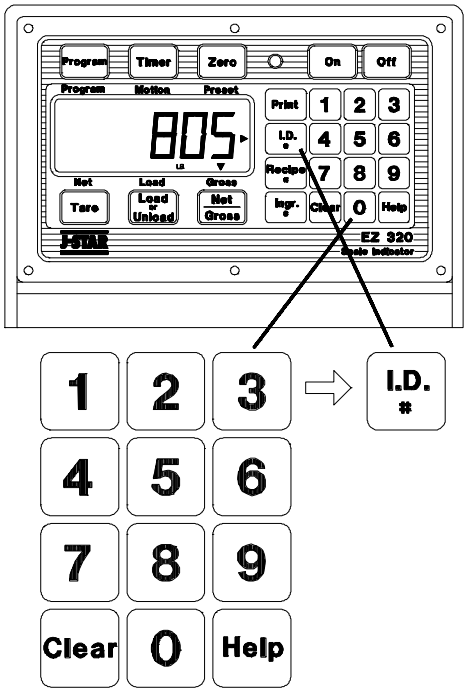
This prints the ingredients of this recipe. Press [RECIPE#] to advance onto the next recipe.

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

To_Enter_ID_Numbers-I.D.#:

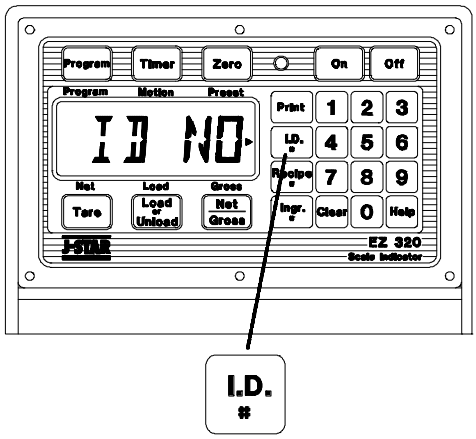
Step 1) Use the numeric keypad to select the identification number.

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



To_Display_ID_Numbers-I.D.#:

Step 1) Press the [ID #] key.



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 2000Lbs was unloading a preset of 1000Lbs. After unloading the first 500Lbs, 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 <u>before</u> the black out (500Lbs 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 the line 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.

```
   |<- 1 Display Count ->|<- 1 Display
Count  ->|
S)),         +)))))))))),
+)))))))))),
   *          *            *           *
      *
   .)))))))))-            .)))))))))-
      .Q
   |<-150mS->|<--350mS-->|<-150mS ->|<--
350mS-->|
   |
      |
   |<------ 2 pulses max/second ( 2 Hz )
------>|
```

In this example, 7500Lbs 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.

REMOTE EZ R & EZ VIEW DISPLAYS - *System Operation:*
W4444444444444444444444444444444444444444444

The EZ R and EZ VIEW Remote Displays both feature a large 14 segment display capable of displaying the full alpha-numeric output of the EZ Series Indicators. The EZR provides a large 1 inch, 6 digit display; the EZ VIEW provides an even larger 1.7 inch, 6 digit display. Both have fiber-optic backlighting. They are not compatible with indicator models built prior to the EZ Series.

The EZ Remote Displays can also be equipped with a *Radio Control* feature, the optional *TR or TR4*. These options provide *remote control operation* of the EZ Indicator.

Turning_ON:

Step 1) Press the EZ Indicator [ON] key.

When the EZ Indicator is turned ON, the EZ Remote also turns ON showing the full (14 segment) alphanumeric display of the EZ Indicator. The EZ R Remote supports all of the annunciators used on the EZ Indicator. The EZ VIEW Remote supports three of the annunciators used on the EZ Indicator: "NET", "GROSS" and "CAL". The alarm lamp on the front panel of the EZ Remote turns ON whenever the EZ Indicator alarm lamp turns ON.

Turning_OFF:

Step 1) Press the EZ Indicator [OFF] key.

When the EZ Indicator is turned OFF, the EZ Remote also turns OFF.

Setup:

The EZ Indicator can be setup to work with either a Model 20R or an EZ R/EZ View Remote Display. When set incorrectly, the Remote displays nonsense even though it is connected to an EZ Indicator that is working properly.

The procedure for changing the *"REMOTE"* setup style is in *Section 3* of the *"Long Form Setup"*

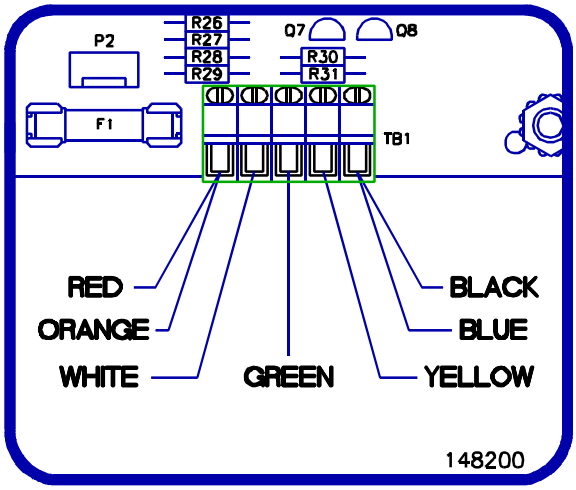
Installation Requirements:

Remote_Display_Mounting:
The EZ Remote Display should be mounted in clear view. It is easily attached to the 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.

If equipped with a *Radio Control - TR/TR4* option, locate the Remote close to where the transmitter will be used. Keep the distance between the Remote Display and the handheld transmitter as short as possible and clear of obstructions. The *TR/TR4* option may be installed in the EZ Indicator instead of the Remote. To identify where it is located, disconnect the Remote from the Indicator. If the *TR/TR4* still works, it is installed in the Indicator. If the *TR/TR4* does not work, it is installed in the Remote.

If installation requires the cable to be removed from the Remote, remove the six (6) screws and pull out the front panel of the EZ Remote. If the front panel does not freely pull out, remove the EZ Remote from its mounting bracket, place the enclosure face down against a flat surface covered with a protective cloth, and tap the entire enclosure against the surface until the front panel pops out. One or two smart blows will generally pop the front panel loose.

With the front panel out of the enclosure, loosen the five (5) screws on the terminal block at the bottom edge of the circuit board. Pull each wire out of the terminal block. Loosen the plastic nut on the cable strain relief on the bottom panel of the enclosure and pull the cable out of the enclosure.



When re-installing the cable, be sure to place the wires in their correct locations. The decal shown (148200) is inside of the Remote Display to show wire positions.

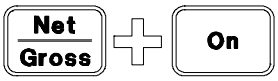
Power_Connection:
Connect the cable of the Remote Display to the J903 REMOTE connector of the EZ Indicator. The Remote Display turns ON when the EZ Indicator is turned ON.

Set Up / Calibration: *There are two setup modes, a "short form" and a "long form". The short form is a quick method providing entry of a limited number of setup values.*
W4444444444444444444444444444444444444

NOTE: Press the [ZERO] or [HELP] key for additional information during Setup and Calibration.

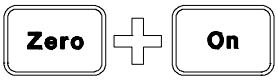
Entering & Exiting Setup Modes:

To Enter "Long Form" Setup/Calibration:



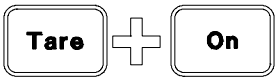
Step 1) Press and hold the [NET/GROSS] key, then press the [ON] key.

To Enter "Short Form" Setup:



Step 1) Press and hold the [ZERO] key, then press the [ON] key.

To Exit either Setup:



Step 1) Press and hold the [TARE] key, then press the [ON] key.

Entering Setup/Calibration Values:

Setup choices that are not numeric are selected by pressing the [NET/GROSS] key. It will show the various choices for that setup parameter.

Numeric entries are entered as follows:

For an EZ 150 - The [NET/GROSS] key increments the "flashing" digit and the [TARE] key selects which digit of the display is flashing.

For an EZ 210 or 320 - use the numerical preset keypad by first pressing [CLEAR] and then pressing the numeric keys 0 through 9. The method described above for the EZ 150 also works.

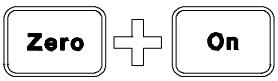
When the display shows the correct value, press the [ON] key to enter and store the value. If the display already shows the desired setting, press the [ON] key to advance to the next setup value.

Short Form Set Up Values:
W4444444444444444444444444444444444444

The "Short Form" has only two values.

The "Short Form Values" are NOT displayed in "Long Form"! See Appendix A: for additional "Short Form" information.

To_enter_the_"Short_Form":



Step 1) Press and hold the [ZERO] key, then press the [ON] key.

Setup Number { SETUP }:
This value is made up of four different items: format-WGDRRR

W = **Weigh Method**. This value selects the weigh method or signal averaging scheme to be used by the scale system and the Display Unit:

Weigh Method Settings	Characteristic
1-LB	General
2-LB	Slow
3-LB	Fast
4-LB	Lock-On
5-KG	General
6-KG	Slow
7-KG	Fast
8-KG	Lock-On

See Appendix E for additional information.

G = **Gain.** This value selects the amplification to be used on the loadcell signal. This is application specific and should only be altered by trained technicians. NOT accessible in "Long Form".

D = **Display Count Index (0-9).** This is an index into the following table:

Note: Index 0 simply indicates a display count smaller than 0.2. These can be selected in the "Long Form".

Index	Display Count
0	0.01, 0.02, 0.05, & 0.1
1	0.2
2	0.5
3	1
4	2
5	5
6	10
7	20
8	50
9 . . .	100

RRR = **Capacity * 1000.** This number represents capacity times one thousand.

An example of a **Setup Number** could be **"146040"**. This number represents:
1 - General Weigh Method in LBS.
4 - Gain setting of "4".
6 - Display Count of "10".
040 - Capacity of "40,000" (40 * 1000).

Calibration Number { CAL }:
This value represents the weight this scale would display with a loadcell input of .4mV/V.

An example of a **Calibration Number** could be **"032890"**.

NOTE: The system automatically returns to the normal weighing mode after Calibration Number.

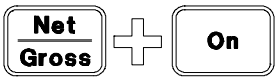
Long Form Set Up Values - *Section 1*:
W4444444444444444444444444444444444444

The Setup/Calibration is split into three (3) groups. *Sections 2 & 3* are only accessible after sequencing through *Section 1*. The [ON] key must be pressed after each selection to allow the scale to update the value.

To EXIT the Setup / Calibration, press [ON] at the end of these three groups *or* press and hold the [TARE] and [ON] keys.
The Setup/Calibration values that can be changed depends upon what options are installed. For example, the setup values Clock Time, Clock AM/PM, Clock Calendar, and Clock Marque will not be displayed if the "Clock Option" is not installed.

See Appendix B for additional information.

To_enter_the_"Long_Form":



Step 1) Press and hold the [NET/GROSS] key, then press the [ON] key.

Language { LANGAG }:
Select the *language* used to display the Help Messages. Example: English(*ENGLSH*), Dutch(*NEDERL*), French(*FRANCS*), German(*DEUTSH*), or Spanish(*ESPANL*).

Pre-Alarm Weight { P-ALM }:
This value represents a pre-alarm weight value (in LB's or KG's) which acts as a set point for activating the pre-alarm. This weight value can be entered by using the [NET/GROSS] and [TARE] keys or by using the numerical preset keypad. Selecting a pre-alarm weight of "0" disables this feature.

Clock Time { TIME }:
The "time of day" clock allows the seconds, minutes, and hour to be set. Pressing the [NET/GROSS] key increments the value of the flashing digit (seconds, minutes, or hours). Holding the [NET/GROSS] key down increments the digit at a faster rate (similar to setting a digital alarm clock). The [TARE] key selects which value is changed (seconds, minutes, or hours).

Clock AM/PM { AM/PM }:
NOTE: Only displayed if Time is changed.
Selects either 'AM' or 'PM' for the internal clock.

Clock Calendar { DATE }:
The calendar allows the month, day, and year to be set. Pressing the [NET/GROSS] key will increment the value of the flashing digit (month, day, or year). Holding the [NET/GROSS] key down increments the digit at a faster rate (similar to setting a digital alarm clock). The [TARE] key selects which value is changed (month, day, or year).

Clock Marque { MARQUE }:
ON causes the scale to cycle between displaying the "time", "date", and "weight" when not weighing a load. Weight on scale must be close to "zero/balance" to see time and date.

Entry Method - Batcher { E MTHD }:
Select the entry method to be used when programming recipes.

Entry Method Selections
1 - Amount per Animal
2 - % per Load
3 - Amount per Load

See pages 24-27 for additional information.

Tolerance - Batcher { TOLER }:
Select the amount by percentage that an ingredient can be under/over-loaded and still automatically advance. Set to " OFF " to always advance after the ingredient amount has been reached.

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

See pages 31&32 for additional information.

Delay - Batcher { DELAY }:
Select the amount of seconds to wait before advancing the to the next ingredient of a recipe. Setting delay to "MANUAL" prevents auto advancing to the next ingredient. [PRINT] or [INGR. #] must be pressed to advance batcher to the next ingredient.

Delay Time Settings in Seconds

MANUAL, 1, 2, 3, 5, 7, 10, 20, 30, or 60

See pages 31&32 for additional information.

Motion { MOTION }:
Selecting ON causes the "MOTION" annunciator to flash if the weight is not stable. The following items are disabled until the weight is stable:

- Printer output.
- "Zero/Balance" function.
- "Tare" function.
- "Ingredient Auto-advance".

NOTE: Motion is temporarily "turned on" during all system weight calibrations to insure a stable measurement is obtained. It is "turned off" after calibration if "OFF" was selected in setup.

Display Update Rate { D RATE }:
This value selects the display update rate, 1, 2, 3, or 4 times per second (approx. 1, .5, .33, or .25 second intervals).

Weigh Method { W MTHD }:
Selects one of the several algorithms used to determine the displayed weights.

NOTE: Setting the Weigh Method in the "long form" **DOES NOT** affect the Display Unit (LB / KG).

Weigh Method Setting	Characteristic
1	General
2	Slow
3	Fast
4	Lock On

See Appendix E for additional information.

Zero Tracking { ZTRACK }:
ON will cause the scale to adjust for small weight variances. This allows the scale to compensate for such things as mud or snow accumulation on a platform scale. The maximum instantaneous weight zero tracking can remove is approximately

0.05% of the scales Capacity Limit value or

Max. Weight = .0005 * Capacity Limit

NOTE: Zero Tracking is temporarily turned OFF during all system weight calibrations to insure a proper "ZERO/BALANCE" is obtained. It is "turned on" after calibration if "ON" was selected in setup.

The display will show the message:
"PRESS NET/GROSS FOR CALIBRATION - TARE FOR SETUP - ON TO EXIT"

Press [NET/GROSS] to enter Section 2.
Press [TARE] to enter Section 3.
Press [ON] to exit.

Long Form Calibration Values -*Section 2*:
W44444444444444444

Display Units { LB-KG }:
Select the scale to display in pounds (LB) or kilograms (KG).

Capacity Limit { CAP }:
This value is used to prevent over-loading of the scale system. The value entered for the scale capacity is usually equal to 105% of the load cell rated capacity or 105% of the total scale capacity, whichever is less.

Display Count Increment { COUNT }:
Use the [NET/GROSS] key to sequence through the available display count increments: .01, .02, .05, .1, .2, .5, 1, 2, 5, 10, 20, 50, and 100.

Zero { ZERO }:
The scale can be zeroed at this time by pressing the [NET/GROSS] key and within three seconds, press the [ZERO] key. If the scale does not require a new zero value,

Press the [ON] button to continue.

Full Scale Calibration { ADD WT }:
After the system has been properly zeroed, a known weight value should be placed on the scale platform (ex. 5000LB test weight). Pressing [NET/GROSS] will cause the scale to display the message *" CAL"* if the calibration weight exceeds 5% of the scale capacity, otherwise the system will not accept the calibration value and will show the message *"ADD WT"*. More weight should then be added to the scale to exceed the 5% capacity weight. Once enough weight has been added, pressing [NET/GROSS] will cause the scale to display the message *"CAL"*. Then the weight estimated to be on the scale at that time is displayed. This weight is estimated by using the "old" calibration value. The correct weight value can then be entered on the display by one of two methods:

For an EZ 150 - The [NET/GROSS] key will increment the "flashing" digit and the [TARE] key will select which digit of the display is flashing.

For an EZ 210 or 320 - use the numerical preset keypad by first pressing [CLEAR] and then pressing the numeric keys 0 through 9. The method described above for the EZ 150 will also work.

When the display reads the correct weight, pressing the [ON] key will automatically determine and store the full scale calibration value. The message *" GOOD "* is displayed for a successful calibration. The scale does not accept the weight entered if the weight is not stable (motion is detected) and displays the error message *"MOTION"*.

If the calibration weight drops below the 5% of the scale capacity, an ***"up arrow"*** **(^)** will be displayed in the far left digit. When enough weight has been added to the scale system, the ***"up arrow"*** **(^)** will disappear. If the value entered by the operator does not exceed the 5% of capacity requirement, the scale will scroll the error message *"VALUE MUST BE MORE THAN XXXXXX"*. The scale value shown, (XXXXXX), will be the 5% capacity value needed for calibration.

If the scale's capacity is set too high for the internal gain setting, the scale displays the error message *"CHGCAP"* and then automatically enter the **Capacity Limit** *{CAP}* setup area to allow the capacity to be lowered.

The system automatically returns to the normal weighing mode after Full Scale Calibration.

Long Form Setup Values - *Section 3*:
W44444444444444444
To enter the last area of the "long form" re-enter *Section 1:*, repeatedly press [ON] to advance through the setup values, but stop <u>after</u> Zero Tracking. Now press [TARE].

Remote Input { RM INP }:
When set to 'PRESET' the Remote Input on the power cord (and the input from the 20R/TR option) will re-enter the last preset value entered. When set to 'TARE' the Remote Input performs the "TARE" function and zero the display.

The EZ 320 Batcher replaces 'TARE' with 'INGRED'. This causes the Remote Input to advance ingredients if a recipe is loaded. It performs a ***tare*** if no recipes are loaded.

Alarm Output { AL OUT }:
When set to 'TR', causes the alarm capabilities of the "preset alarm" to be controlled by the TR/TR4 keys. The Front Panel Alarm Light and the relay output is ON(+12V) when a TR/TR4 key command has been accepted by the scale. 'PRESET', causes the alarm capabilities to be controlled by the "preset alarm".

Remote Style { REMOTE }:
'20R' causes the data being sent to the remote display to be in the 20R format. 'EZR' uses the EZR remote display format.

Alarm Buzzer { BUZZER }:
ON allows the pre-alarm, preset, and TR/TR4 keys to create audible alarm sounds. OFF prevents all audible alarm sounds except for Front Panel key closures.

TR Inventory Hold { TR HLD }:
ON causes the scale to enter the GROSS mode when the TR is pressed "twice" within a three(3) second time period.

When pressed "once", the TR will "ZERO" the display and enter the "NET" mode.

If OFF, the "GROSS" weight is momentarily displayed when the TR is pressed twice within 3 seconds and then return to the "NET" mode.

Raw A/D Display Counts { DSP AD }:
Not available on all units.
ON causes the display to show "raw" or "unscaled" Analog-to-Digital values. Used only by service personnel. When OFF, scale displays "scaled" display counts.
Should be "OFF" for normal operation.

Clear Memory { CLR M }:
When set to 'TR NG', TR4 button #2 toggles between the NET and GROSS modes. When set to 'TR CM', TR4 button #2 clears the Weigh Memory.

Tare Auto-Print { TAREAP }:
ON causes the scale to auto-print the displayed weight everytime the [TARE] key is pressed.

One Line Print { 1L PRT }:
ON causes the scale to print all output information on one (1) line.

Print Delay { PRTDLY }:
Selection not available on all units (always ON in "PRG ID" versions "EZ B5","EZ B6",and newer).
ON causes the scale to insert time delays between print outputs. This feature is used with unbuffered or slow printers.

Lock-On { LOCKON }:
Select a value 1 through 9 to adjust the *"Lock On"* weigh method. By selecting a low value such as 1 or 2, the system becomes more sensitive to animal movement. Selecting a high number such as 8 or 9 will allow the scale to *lock-on* faster. Use the lowest setting that still allows the system to consistantly *lock-on*.

Preload Tare { PRETAR }:
ON enables the "***Preload Tare***" feature which allows the tare weight of a container to be entered using the numeric keypad of an EZ 210 or an EZ 320.

Preset Auto Clear { PRECLR }:
ON enables the "***Preset Auto Clear***" feature. This automatically stores the "*preset amount remaining*" of an active preset into internal memory if the displayed weight does not change more than +/- 2 display counts for 45 minutes. The "*preset amount remaining*" can be reloaded by grounding the Remote Input (BLUE wire) on the Power Cable. This causes a "*re-enter preset*" function to occur (See - Remote Input).

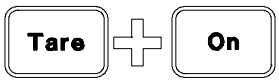
The original preset amount will be entered on the next "*re-enter preset*", once the current preset has been satisfied by loading or unloading the scale.

Estimated Weight { EST WT }:
A new GROSS weight can be entered at this time by using either the [NET/GROSS] & [TARE] keys or the numeric keypad. This feature changes the "zero/balance" of the scale to display the *"estimated gross weight"* entered.

The display shows the message:
"PRESS ON TO EXIT".
Press [ON] to exit.

Exiting Setup/Calibration Mode:
Setup/Calibration mode can be exited by three methods:

1 - Press and hold the [TARE] key, then press the [ON] key at anytime.



2 - Pressing the [ON] key at the end of Sections 1 and 3.

3 - Automatically after the last set up value has been entered in Section 2.

4 - Press the [OFF] key to turn off the unit.

Test Mode:
W4444444444444444444444444444444444444

Initiating Self Test:
Wait until normal operation has begun and press the [ON] key.

During self test operation, the 'TEST' annunciator will flash.

Test Sequence:

Start of Test Sequence:
Display *"TEST"* message.

Display Set Up Values:
Short Form Setup Value first, then the Short Form Calibration Number.

Display Test:
Cycle through all display segments to identify any faulty areas.

Display Program ID:
Display the program revision level.

System Test:
Scale displays *"RUNNING SELF TEST - PLEASE WAIT"* while performing internal system testing.

Self Test System Errors:
If system errors are discovered during internal diagnostics, the operator will see an error message (example: *"- ERROR 1 - PRESS NET/GROSS TO CONTINUE"* followed by *"*** INDICATOR NEEDS SERVICE *** PRESS NET/GROSS TO CONTINUE"*).

Halting the Test:
Pressing the [ON] key during the test halts the sequence. Pressing it again restarts the test.

Terminating the Test:
The self test terminates and continues normal operation if no errors are detected or if keys other than [ON] are pressed.

NOTES:
1:If the Scoreboard option is installed, the scale sends the message *" TEST "* on the scoreboard data line.

2: Sending a command using the Computer Interface causes the system to skip the error messages and attempt normal system operation.

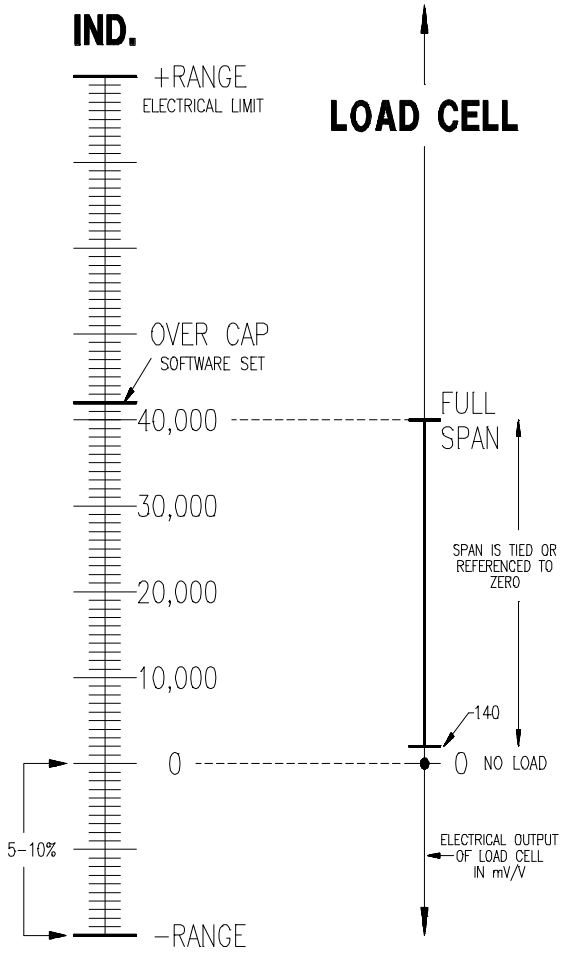
3: The test cannot be terminated while the *"RUNNING SELF TEST - PLEASE WAIT"* message is displayed.

Weighing Errors:
W444444444444444444444444444444444444

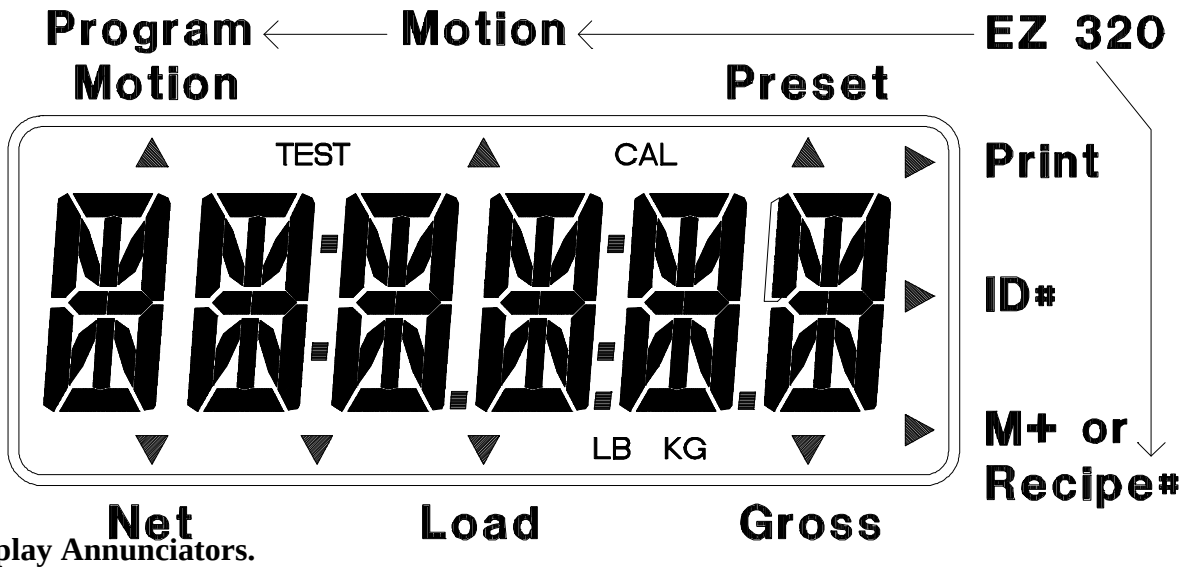
Capacity Limit:
The display shows the message *"OVRCAP"* if the weight on the scale system exceeds the over capacity limit. The over capacity value is the setup parameter "capacity". This value is entered in "SETUP" to prevent over-loading of the scale system.

Over Range:
The display shows the message *"+RANGE"* if the weight on the scale system exceeds the "plus range" or maximum weight measurable by the scale system. The over range value is always the systems maximum A/D counts multiplied by the scaling factor. The actual weight at which over-range occurs depends on the calibration, zero, and display count size.

Under Range:
The display shows the message *"-RANGE"* if the weight on the scale system is less than the "minus range" or minimum weight measurable by the scale system. The under range value is always the systems minimum A/D counts multiplied by the scaling factor. The actual weight at which under-range occurs will depend on the calibration, zero, and display count size.



Annunciators:
W444444444444444444444444444444444444



Display Annunciators.

NOTE: Annunciators for 'NET', 'GROSS', and 'LOAD' will "flash" when "ON".

'MOTION': The arrow pointing to "MOTION" on the front panel flashes when the indicator is unstable or in "MOTION".

'PROGRAM': The arrow pointing to "PROGRAM" on the front panel flashes when recipe's are being programmed.

'TEST': Flashes when the indicator is performing its' self-test. 'TEST' will be on continuously if the test has been halted.

'CAL': Flashes when the indicator is in the "Setup/Calibration" mode.

'PRESET': The triangle pointing to "PRESET" on the front panel overlay turns on when a preset is loaded. The inner arrow turns on when the preset is active.

'PRINT': The arrow pointing to the [PRINT] key on the front panel turns on when the unit is sending data to the printer.

'ID #': The arrow pointing to the [ID #] key on the front panel turns on when an identification number is loaded.

'M+': The arrow pointing to the [M+] key on the front panel turns on when a value has been saved in the Weigh Memory.

'RECIPE#': The arrow pointing to the [RECIPE#] key on the front panel turns on when a recipe is being loaded.

'GROSS': The arrow pointing to "GROSS" on the front panel flashes when the unit is in the *gross mode*.

'KG': Turns on when output units are in kilograms.

'LB': Turns on when output units are in pounds.

'LOAD': The arrow pointing to "LOAD" on the front panel flashes when the indicator is loading or unloading using the preset capabilities.

'NET': The arrow pointing to "NET" on the front panel flashes when the indicator is in the *net mode*.

Appendix A: Short Form Calibration:
W444444444444444444444444444444444444444444

- Access; Zero and hold then On

First LCD Screen "Setup":

_____

1000

Capacity X

Weigh Method			
1	2	3	4 = lbs
5	6	7	8 = kg.
General	Slow	Fast	Lock-on

Gain (1 thru 9)			
60hz	Max Signal	50hz	Max Signal
1	2.0	6	1.9
2	1.5	7	1.3
3	1.14	8	.97
4	.84	9	.66
5	.47		

Display Counts (0-9)										
	0	1	2	3	4	5	6	7	8	9
.01 .02 .05	.1	.2	.5	1	2	5	10	20	50	100
↑ Select in long form only										

On

Press for second LCD Screen "CAL":

__ __ __ __ __ __

CALIBRATION NUMBER
(Calibration weight at 0.4 mv/v)

Appendix B: Long Form Setup and Calibration:

W4444444444444444444444444444444444444444444

- Access: [Net/Gross] and hold then [On] until beeps.

Parameters list follows. Abort with hold and [Tare] [On]

1.	P-ALM	_ _ _ _ _ _	Pre-Alarm weight in actual display counts.
2.	TIME	Time of day	Hrs : Min : Sec and a.m. or p.m.
3.	DATE	Calendar	Month:Day:Year.
4.	MARQUE	ON/OFF	When ON, display alternates between Time/Date/Weight.
5.	E MTHD	1/2/3	Entry Method; 1-amount/animal, 2-percent/load, or 3-amount/load.
6.	TOLER	Tolerance	Ingredient Percentage; OFF, .5, 1, 2, 3, 4, 5, 7, 10.
7.	DELAY	Delay	Seconds Delay; MANUAL, 1, 2, 3, 5, 7, 10, 20, 30, or 60.
8.	MOTION	ON/OFF	When ON, instability inhibits scale operation.
9.	D RATE	1/2/3/4	Display update rate; times per second.
10.	W MTHD	1/2/3/4	Weigh method; General/Slow/Fast/Lock-On.
11.	Z TRACK	ON/OFF	Zero tracking feature.

[On] to exit, [Net/Gross] to calibrate, or [Tare] to set up

- CALIBRATE -

12.	LB/KG	Pounds/Kilograms	Unit of Measure. Calibration is converted automatically.
13.	CAP	_ _ _ _ _ _	Maximum display weight.
14.	COUNT	Display Count Size; 0.01, .02, .05, .1, .2, .5, 1, 2, 5, 10, 20, 50, 100.	
15.	ZERO	Balance the scale now.	
16.	ADD WT	Add Calibration weight.	
17.	CAL	_ _ _ _ _ _	Enter true weight now.

- SET UP -

18.	RM INP	Remote Input	Function of fourth wire in power cord.
		TARE/PRESET	(Model EZ210).
		- or -	
		INGRED/PRESET	(Model EZ320).
19.	AL OUT	Alarm Output	Function of alarm line for EZ 210's & EZ 320's.
		TR-TR4/PRESET	(If TARE or INGRED is selected in Step 15).
		- or -	
		TR4/PRESET	(If PRESET is selected in Step 15).
20.	REMOTE	EZR/20R	Remote model (select EZR for use with EZ VIEW).
21.	BUZZER	ON/OFF	Local buzzer alarm.
22.	TR HLD	ON/OFF	Inventory (Gross) hold with second key.
23.	DSP AD	ON/OFF	Service feature: displays internal counts *(not in all versions).*
24.	CLR M	TRCM / TRNG	Selects function of fourth key on TR4.
25.	TAREAP	ON/OFF	Tare with auto print feature.
26.	1L PRT	ON/OFF	Prints on one line instead of two lines*(requires 35 column printer).*
27.	PRT DLY	ON/OFF	Inserts delays for non-buffered printers*(always ON in newer versions).*
28.	EST WT	- - - - - -	Estimated gross weight.

Appendix C: RS-232 Specifications:

W4444444444444444444444444444444444444444444

Signal Levels:
The Printer, Computer, and Scoreboard are capable of communicating using the EIA Registered Standard #232 (RS-232). The signal levels move between +8 and -8 Volts.

The Scoreboard also has another communication port that drives 20 milli-Amp devices.

Communication Parameters:
Data is transmitted and received in the asynchronous ASCII format. This communication format is compatible with the Model 15XT and most other printers, computers, and terminals.

Port Configuration:

1200 BAUD
1 Start Bit
7 Data Bits
1 EVEN Parity Bit
1 Stop Bit

"Handshake lines" are *not* used and XON/XOFF is *not* supported.

These parameters are not adjustable in the scale. Equipment interfacing to the scale must match this configuration.

Port Wire Connections:
All serial communications use the J904 connector on the bottom panel of the scale.

Device	Function	J904 Pin
To Printer	RS-232 out	pin 2
	Printer ground	pin 6
From Computer	RS-232 in	pin 3
	Computer ground	pin 5
To Scoreboard	RS-232 out	pin 4
	Scoreboard ground	pin 7

also on the J904 connector:

Device	Function	J904 Pin
Scoreboard	20mA Current Loop(+)	pin 1
Scoreboard	20mA Current Loop(-)	pin 8

See Appendix D for additional information.

Computer Command Set:
The Computer Interface controls the scale's operation by a remote RS-232 computer. Most commands acknowledge completion of the command by outputting the appropriate data stream.

Single Letter commands are always in capitols (UPPER CASE).

The following *Single Letter* commands are supported:

'A' - Advance recipe to next ingredient.
'B' - Balance indicator, enter GROSS mode.
'C' - Perform CM (Clear Memory).
'D' - Perform *"recheck weight"* for *"Lock-On"* weigh method.
'E' - Display & re-enter previous preset value. *No print output.*
'G' - Enter GROSS mode.
'I' - Display the "ID NO" number.
'L' - Enter L/UL mode if applicable.

'M'- Perform M+ (Memory Plus).
'N' - Enter NET mode. TARE if necessary.

'P' - Print weight data. This command will also advance to the next ingredient if the scale is processing a recipe.
'Q'- Print *last Recipe Number loaded.* Ingredient number will also be printed if recipe is currently active.
'R'- Perform RM (Recall Memory).
'T' - Perform TARE and enter NET mode.
'Y'- Print Setup Number. *Also temporarily outputs the Setup Number to the Scoreboard.*
'Z'- Print Calibration Number. *Also temporarily outputs the Calibration Number to the Scoreboard.*

Format Example - B
B - (ASCII Dec. 66) Zero/Balance command.

Numeric Entry commands are *not* in capitols (lower case). They are sent with the numbers first (one to six numbers with values 0-9) followed by a lower case letter.

The following *Numeric Entry* commands are supported:

'f' - Clears "Blackout","Pulsed Output", and "Recipe" errors at scale startup.
'g' - Load a preset (0-999999), enter GROSS mode (0 clears preset).
'i' - Load the "ID NO" number 0-999999.
'l' - Load a preset (0-999999), enter L/UL mode (0 clears preset).
'n' - Load a preset (0-999999), enter NET mode (0 clears preset).
'r' - Loads a Recipe (0-99).
't' - Preload a TARE value 0-999999.
'v' - Amount for recipe (0-999999). Should precede the recipe command 'r'.
'y' - Enter *Short Form Setup Value (100000 - 999999).*
'z' - Load *Short Form Calibration Number (1 - 99999).*

Format Example - 2000g
2000 - PRESET weight.
g - (ASCII Dec. 103) Gross Preset command.

Scoreboard Data Format:
Data is sent from the scale to the scoreboard 4 to 8 times each second. The weight data is sent in the following format:

<stx>ABBBCD<cr>

Where:

<stx> is the ASCII control code "START OF TEXT"(dec. 2).

<cr> is the ASCII control code "Carriage Return" (dec. 13).

A is either a minus sign, SPACE, number, or a dollar($). *The dollar($) appears when the indicator is setup for the "Lock On" weigh method and has "locked onto" a weight value.*

B is a number or a SPACE.

C is a number, SPACE, *or a '-' minus sign indicating a TR command is active.*

D is a number *or a '-' minus sign indicating that motion is active.*

If the Clock option is installed with Marquee **ON**, date and time data is sent in the following format:

<stx>mo-dy_<cr> for Date
<stx>hh_mmA<cr> for Time

Where:

<stx> is the ASCII control code "START OF TEXT"(dec. 2).

<cr> is the ASCII control code "Carriage Return" (dec. 13).

mo is the Month.

dy is the Day.

hh is the Hour.

mm is the Minute.

A is A for AM, P for PM.

_ represents a SPACE.

Print Data Format - Two Line:
Data is sent from the scale to the printer whenever the

- [PRINT] key is pressed.
- TR4 or TR options are used.
- Tare auto-print (TAREAP) is ON.

Date and Time make up the first line and will only be present if the *Clock Option* is installed.

The data is sent in the following format:

_____dymoyr__hh:mmA<cr><lf>
xxxxxxID__yxxxxxLB_GR<cr><lf>

Where:

<cr> is the ASCII control code "Carriage Return" (dec. 13).

<lf> is the ASCII control code "Line Feed" (dec. 10).

_ represents a SPACE.

dymoyr is date (Day,Month,& Year).

hh:mm is Time (hours:minutes).

A is either A(AM), or P(PM).

x is a number(0-9), or a SPACE.

ID labels the Identification Number (I.D.#).

y is a number(0-9), SPACE, or a minus sign '-'.

LB is either Pounds(LB), or Kilograms(KG).

GR labels the weight amount.
GR - Gross
NE - Net
TA - Tare
M+ - Memory Plus
RM - Recall Memory
CM - Clear Memory
TP - Tare Point Entered

Print Data Format - One Line:
Data is sent from the scale to the printer whenever the

- [PRINT] key is pressed.
- TR4 or TR options are used.
- Tare auto-print (TAREAP) is ON.

Date and Time make up the last part of the line and are only present if the *Clock Option* is installed.

The data is sent in the following format:

```
xxxxxxID_yxxxxxLB_GR_dymoyr_hh:mmA<cr><lf>
```

Where:

<cr>	is the ASCII control code "Carriage Return" (dec. 13).
<lf>	is the ASCII control code "Line Feed" (dec. 10).
_	represents a SPACE.
dymoyr	is date (Day,Month,& Year).
hh:mm	is Time (hours:minutes).
A	is either A(AM), or P(PM).
x	is a number(0-9) or a SPACE.
ID	labels the Identification Number (I.D.#).
y	is a number(0-9), SPACE, or a minus sign '-'.
LB	is either Pounds(LB), or Kilograms(KG).
GR	labels the weight amount. GR - Gross NE - Net TA - Tare M+ - Memory Plus RM - Recall Memory CM - Clear Memory TP - Tare Point Entered

Recipe Print Data Format:
Data is sent from the scale to the printer whenever the

- [PRINT] or [INGR#] key is pressed while loading a recipe.
- Single recipe is being printed.
- All recipes are being printed.

The data is sent in the following format:

```
_______RECIPE#_xx<cr><lf>
______dymoyr__hh:mmA<cr><lf>
__ING#xx_yxxxxxLB_NE<cr><lf>
*_ING#xx_yxxxxxLB_NE<cr><lf>
__ING#xx_yxxxxxLB_NE<cr><lf>
*_ING#xx_yxxxxxLB_NE<cr><lf>

_TOTAL_=_yxxxxxLB<cr><lf><cr><lf>
```

Where:

_	represents a SPACE.
RECIPE#	labels the Recipe Number (RECIPE#).
x	is a number(0-9) or a SPACE.
y	is a number(0-9), SPACE, or a minus sign '-'.
<cr>	is the ASCII control code "Carriage Return" (dec. 13).
<lf>	is the ASCII control code "Line Feed" (dec. 10).
dymoyr	is date (Day,Month,& Year).
hh:mm	is Time (hours:minutes).
A	is either A(AM), or P(PM).
*	indicates the recipe was advanced *manually* when in the *auto-advance* mode.
ING#	labels the Ingredient Number (INGR.#).
LB	is either Pounds(LB), or Kilograms(KG).
NE	labels the weight amount.

TOTAL = Total of all listed ingredients.

Print Samples:

Shown below are additional print samples from the J-Star "EZ" family of scale indicators.

General Information:

The weight and Identification Numbers can have leading spaces.
The weight information can have a decimal point (100910 or 10091.0).
The ASCII Carriage Return (Dec. 13) is represented as <.
The ASCII Line Feed (Dec. 10) is represented as ^.

In order to identify the line location of the characters, a simple column position identifier is shown directly above the PRINT DATA:

```
         1         2         3         4
12345678901234567890123456789012345678 90
```

So for example - Print Data with the Identification Number Option;

```
         1         2         3         4
12345678901234567890123456789012345678 90
123456ID 109700LB GR<^<^                 <- PRINT DATA LINE 1
```

Shows that the:

ID# (123456ID) starts at column 1 of line 1.
WEIGHT (109700LB -> 109,700 pounds) starts at column 10 of line 1.
GR Scale was in the GROSS mode, starts at column 19 of line 1.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

The same Print Data with Identification Number & Clock Options;

```
         1         2         3         4
12345678901234567890123456789012345678 90
      21JA91 11:22A<^                    <- PRINT DATA LINE 1
123456ID 109700LB GR<^<^                 <- PRINT DATA LINE 2
```

Shows that the:

DATE (21JA91 -> January 21, 1991) starts at column 7 of line 1.
TIME (11:22A -> 11 hours, 22 minutes AM) starts at column 14 of line 1.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).
ID# (123456ID) starts at column 1 of line 2.
WEIGHT (109700LB -> 109,700 pounds) starts at column 10 of line 2.
GR Scale was in the GROSS mode, starts at column 19 of line 2.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

The same Print Data with Identification Number & Clock Options, BUT with the One Line Print (1L PRT) feature enabled;

```
         1         2         3         4
12345678901234567890123456789012345678 90
123456ID 109700LB GR 21JA91 11:22A<^     <- PRINT DATA LINE 1
```

Shows that the:

ID# (123456ID) starts at column 1 of line 1.
WEIGHT (109700LB -> 109,700 pounds) starts at column 10 of line 1.
GR Scale was in the GROSS mode, starts at column 19 of line 1.
DATE (21JA91 -> January 21, 1991) starts at column 22 of line 1.
TIME (11:22A -> 11 hours, 22 minutes AM) starts at column 29 of line 1.

<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

The Print Data for an EZ320 with Identification Number & Clock Options while loading a recipe;

```
         1         2         3         4
1234567890123456789012345678901234567890
       RECIPE# 16 <^
      21JA91 11:22A<^
  ING#01     90LB NE<^
* ING#02      0LB NE<^
  ING#03    490LB NE<^
  ING#04   1000LB NE<^
 TOTAL =   1580LB <^<^
```

Shows that the:

RECIPE# (Recipe Number 16) starts at column 8 of line 1.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

DATE (21JA91 -> January 21, 1991) starts at column 7 of line 1.
TIME (11:22A -> 11 hours, 22 minutes AM) starts at column 14 of line 1.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

ING# (Ingredient # 01) starts at column 3 of line 3.
WEIGHT (90LB -> 90 pounds) starts at column 10 of line 3.
NE Scale was in the NET mode, starts at column 19 of line 3.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

* ING# (* - Manual Advance Ingredient # 02) starts at column 1 of line 4.
The scale is loading a recipe using the "auto-advance" feature. The '*' indicates that the operator pressed either the [INGR.#] or [PRINT] key to force the scale to advance to the next ingredient before the meeting the conditions of the auto-advance (ex. Tolerance, Delay, Motion).
WEIGHT (0LB -> 0 pounds) starts at column 10 of line 4.
NE Scale was in the NET mode, starts at column 19 of line 4.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

ING# (Ingredient # 03) starts at column 3 of line 5.
WEIGHT (490LB -> 490 pounds) starts at column 10 of line 5.
NE Scale was in the NET mode, starts at column 19 of line 5.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

ING# (Ingredient # 04) starts at column 3 of line 6.
WEIGHT (1000LB -> 1000 pounds) starts at column 10 of line 6.
NE Scale was in the NET mode, starts at column 19 of line 6.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

TOTAL = Total amount starts at column 2 of line 7.
WEIGHT (1580LB -> 1580 pounds) starts at column 10 of line 7.
<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

<^ Carriage Return (Dec. 13) & Line Feed (Dec. 10).

Computer Interface Print Samples:
Most commands acknowledge completion of the command by outputting the appropriate data stream.

Single Letter commands are always in capitols (UPPER CASE).

Numeric Entry commands are *not* in capitols (lower case). They are sent with the numbers first (one to six numbers with values 0-9) followed by a lower case letter.

Single Line print feature is shown below - this can be selected in the "Long Form Setup".

```
 Command Sent     Printer Output Data Stream
                           1         2         3         4
                  12345678901234567890123456789012345678 90

     Y            123456ID 145052S# S# 10JL93  7:08P
     Z            123456ID  40000LB C# 10JL93  7:08P
     N            123456ID    260LB NE 10JL93  7:09P
     B            123456ID      0LB ZR 10JL93  7:09P
     T            123456ID    600LB TA 10JL93  7:09P
     G            123456ID    600LB GR 10JL93  7:10P
     M            123456ID    605LB M+ 10JL93  7:10P
     M            123456ID    605LB M+ 10JL93  7:10P
     R            123456ID   1210LB RM 10JL93  7:10P
     C            123456ID      0LB CM 10JL93  7:10P
```

```
 Command Sent     Printer Output Data Stream
                           1         2         3         4
                  12345678901234567890123456789012345678 90

     2500v1r            RECIPE#  1
                       10JL93  7:07P
     N              ING#01      0LB NE    <- NET weight loaded for ING#01.
     G              ING#01   3890LB GR    <- GROSS weight on scale.
     L              ING#01   1000LB LU    <- NET weight yet to be loaded for
ING#01.
     Q              ING#01      1R# R#    <- Recipe and Ingredient number.
     P            * ING#01      0LB NE    <- Print Ingredient and advance
Recipe.
     A            * ING#02      0LB NE    <- Advance Recipe and print
Ingredient.
     P            * ING#03      0LB NE    <- Print Ingredient and advance
Recipe.
                   TOTAL =      0LB       <- Total is automatically printed
upon
                                             completion of Recipe.
```

Appendix D: Serial Cable Drawings:

W4444444444444444444444444444444444444444444

KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
1	1	141603	A141603	TUBING, HEAT SHRINK 3/4"
2	1	141607	A141607	CONN. HOOD, SERIES 1
3	1	145330	B145330	CONN., CHAS/F 25 PIN D-SUB
4	1	141650	B141650	CONN. HOOD, D-SUB
5	AS REQ'D	141820	A141820	CABLE, 4-COND W/SHIELD
6	3	143970	A141642	TUBING, HEAT SHRINK 1/16"
7	1	840500	A840500	TUBING, HEAT SHRINK 3/8"
8	3	840552	A840552	CONN. PIN/F SERIES 2
9	1	840553	B840553	CONN. BODY/M 8-PIN SERIES 2
10	2"	145316	A145316	WIRE, BARE, 24 GA, SOLID

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTH SHOWN.
2. CLIP UNUSED RED WIRE & SHIELD WIRE.
3. STRIP WIRE ENDS TO LENGTH SHOWN.
4. CRIMP PINS, KEY 8, ON WIRE ENDS.
5. INSERT PINS INTO KEY 9, USING TABLE 1.
6. PLACE HEAT SHRINK TUBING, KEY 1 & KEY 7, OVER CABLE.
7. PLACE HEAT SHRINK TUBING, KEY 6, OVER EACH WIRE AND SOLDER WIRE TO KEY 3, USING TABLE 2.
8. CUT JUMPERS FROM BARE WIRE, KEY 10, INSTALL AND SOLDER IN PLACE USING TABLE 2. REMOVE EXCESS FLUX FROM KEY 3.
9. SHRINK TUBING OVER SOLDER JOINTS & CONNECTOR, KEY 2.
10. INSTALL PROTECTIVE CONNECTOR HOOD, KEY 4.

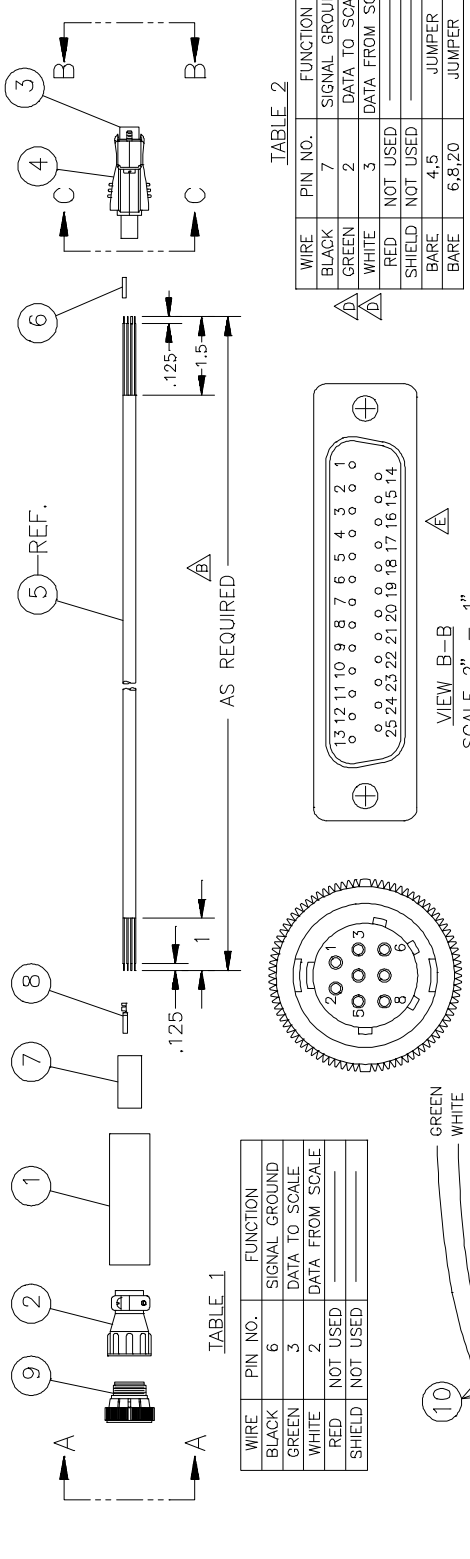


TABLE 1

WIRE	PIN NO.	FUNCTION
BLACK	6	SIGNAL GROUND
GREEN	3	DATA TO SCALE
WHITE	2	DATA FROM SCALE
RED	NOT USED	
SHIELD	NOT USED	

TABLE 2

WIRE	PIN NO.	FUNCTION
BLACK	7	SIGNAL GROUND
GREEN	2	DATA TO SCALE
WHITE	3	DATA FROM SCALE
RED	NOT USED	
SHIELD	NOT USED	
BARE	4,5	JUMPER
BARE	6,8,20	JUMPER

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
F	14832	ADDED KEY 5, CHANGED PART DESCRIPTION	09/30/93	JAB
E	12170	KEY 3 & 4 PIN #'s NUMBERED IN ERROR	05/17/91	JAB
D	10990	TABLE 2 GR & WH WIRE FUNC. REVERSED	06/05/90	JAB
C	10513	DELETED KEY 5 141820	02/20/90	JAB
B	9383	KEY 5 141820 QTY WAS 5'	03/20/89	JAB
A	88-83	RELEASED	10/20/88	

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

TOLERANCE UNLESS NOTED
DECIMAL ± —
HOLE DIA. ± —
ANGLES ± —
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Gordon DATE 10/20/88
FAMILY OF PARTS DWG #

DRAWING TITLE
CABLE, J-STAR RS232 TO DTE

MATERIAL
FINISH

SHEET 1 OF 1
DRAWING NUMBER B 145081

KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
1	1	141603	A141603	TUBING, HEAT SHRINK 3/4"
2	1	141607	A141607	CONN. HOOD, SERIES 1
3	1	141641	B141641	CONN., CHAS/M 25 PIN D-SUB
4	1	141650	B141650	CONN. HOOD, D-SUB
5	AS REQ'D	141820	A141820	CABLE, 4-COND W/SHIELD
6	3	143970	A141642	TUBING, HAET SHRINK 1/16"
7	1	840500	A840500	TUBING, HEAT SHRINK 3/8"
8	3	840552	A840552	CONN. PIN/F SERIES 2
9	1	840553	B840553	CONN. BODY/M 8-PIN SERIES 2
10	2"	145316	A145316	WIRE, BARE, 24 GA, SOLID

D C B

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTH SHOWN.
2. CLIP UNUSED RED WIRE & SHIELD WIRE.
3. STRIP WIRE ENDS TO LENGTH SHOWN.
4. CRIMP PINS, KEY 8, ON WIRE ENDS.
5. INSERT PINS INTO KEY 9, USING TABLE 1.
6. PLACE HEAT SHRINK TUBING, KEY 1 & KEY 7, OVER CABLE.
7. PLACE HEAT SHRINK TUBING, KEY 6, OVER EACH WIRE AND SOLDER WIRE TO KEY 3, USING TABLE 2.
8. CUT JUMPERS FROM BARE WIRE, KEY 10, INSTALL AND SOLDER IN PLACE USING TABLE 2. REMOVE EXCESS FLUX FROM KEY 3.
9. SHRINK TUBING OVER SOLDER JOINTS & CONNECTOR, KEY 2.
10. INSTALL PROTECTIVE CONNECTOR HOOD, KEY 4.

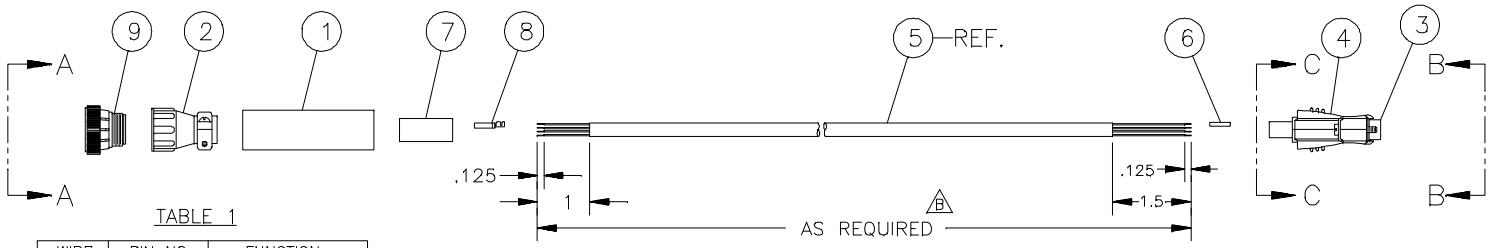
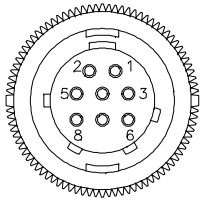
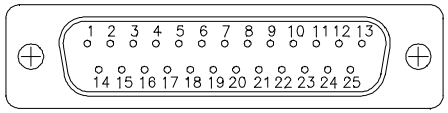


TABLE 1

WIRE	PIN NO.	FUNCTION
BLACK	6	SIGNAL GROUND
GREEN	3	DATA TO SCALE
WHITE	2	DATA FROM SCALE
RED	NOT USED	———
SHIELD	NOT USED	———



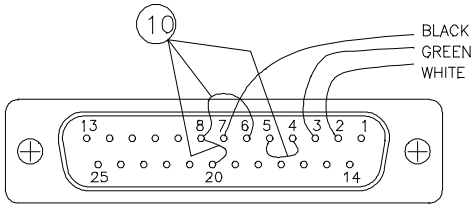
VIEW A–A
SCALE 2" = 1"



VIEW B–B
SCALE 2" = 1"

TABLE 2

WIRE	PIN NO.	FUNCTION
BLACK	7	SIGNAL GROUND
GREEN	3	DATA TO SCALE
WHITE	2	DATA FROM SCALE
RED	NOT USED	———
SHIELD	NOT USED	———
BARE	4,5	JUMPER
BARE	6,8,20	JUMPER



VIEW C–C
SCALE 2" = 1"

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
D	14932	ADDED KEY 5, CHANGED PART DESCRIPTION	09/30/93	SR
C	10513	DELETED KEY 5 141820	02/20/90	SR
B	9383	KEY 5 141820 QTY WAS 5'	03/20/93	JTL
A	88-63	RELEASED	10/20/88	

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

DRAWING TITLE
D CABLE, J-STAR RS232 TO DCE

TOLERANCE UNLESS NOTED
DECIMAL ± —
HOLE DIA. ± —
ANGLES ± —
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Carlson DATE 10/12/88
FAMILY OF PARTS DWG #

MATERIAL
FINISH

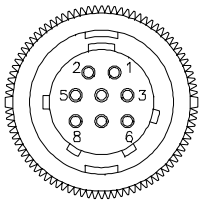
SHEET 1 OF 1
B
DRAWING NUMBER 145082

KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
1	1	141603	A141603	TUBING, HEAT SHRINK 3/4"
2	1	141607	A141607	CONN. HOOD, SERIES 1
3	1	141820	A141820	CABLE, 4-COND W/SHIELD
4	1	840500	A840500	TUBING, HEAT SHRINK 3/8"
5	3	840552	A840552	CONN. PIN/F SERIES 2
6	1	840553	B840553	CONN. BODY/M 8-PIN SERIES 2

E D C

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTH SHOWN.
2. CLIP UNUSED RED WIRE & SHIELD WIRE.
3. STRIP WIRE ENDS TO LENGTH SHOWN.
4. INSERT PINS INTO KEY 6, USING TABLE 1.
5. PLACE HEAT SHRINK TUBING KEY 1 & KEY 4, OVER CABLE. SHRINK TUBING OVER CONNECTOR HOOD, KEY 2.



VIEW A-A
SCALE 2" = 1"

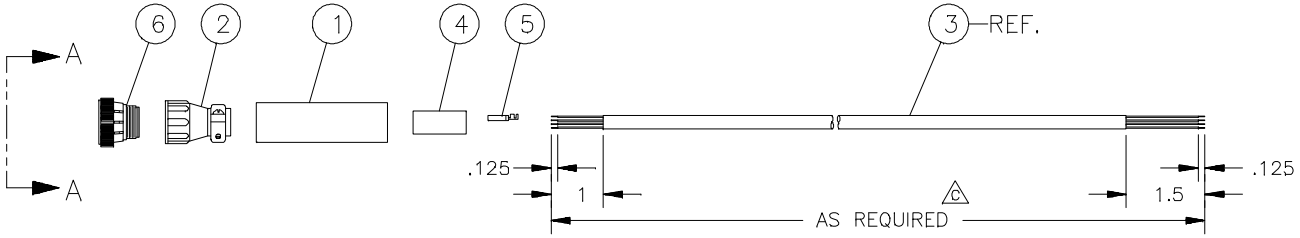


TABLE 1

WIRE	PIN NO.	FUNCTION
WHITE	2	PRINTER DATA
GREEN	3	DATA TO SCALE
RED	4	RS232 SCOREBOARD DATA
BLACK	6	SIGNAL GROUND
SHIELD	NOT USED	———

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
E	14932	ADDED KEY 3, CHANGED PART DESCRIPTION	09/30/93	SR
D	10513	DELETED KEY 3 141820	02/20/90	SR
C	9383	KEY 3 141820 QTY WAS 5'	03/20/89	JTL
B	6688	CHANGED QTY, KEY 8 FROM 1 TO 3	07/07/87	
A	88-63	RELEASED	10/12/88	

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

DRAWING TITLE
E CABLE, RS232 TO USER CONN.

TOLERANCE UNLESS NOTED
DECIMAL ± —
HOLE DIA. ± —
ANGLES ± —
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Carlson DATE 10/12/88
FAMILY OF PARTS DWG #

MATERIAL
FINISH

SHEET 1 OF 1
B
DRAWING NUMBER 145083

	KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
	1	1	141603	A141603	TUBING, HEAT SHRINK 3/4" 2.5"
	2	1	141607	A141607	CONN. HOOD, SERIES 1
	3	1	141641	B141641	CONN., CHAS/M 25 PIN D-SUB
	4	1	141650	B141650	CONN. HOOD, D-SUB
C	5	6'	141820	A141820	CABLE, 4-COND W/SHIELD
	6	3	141811	A141811	TUBING, HEAT SHRINK
	7	1	840500	A840500	TUBING, HEAT SHRINK 3/8"
C B	8	3	840552	A840552	CONN. PIN/F SERIES 2
	9	1	840553	B840553	CONN. BODY/M 8-PIN SERIES 2

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTH SHOWN.
2. CLIP UNUSED RED WIRE & SHIELD WIRE.
3. STRIP WIRE ENDS TO LENGTH SHOWN.
4. CRIMP PINS, KEY 8, ON WIRE ENDS.
5. INSERT PINS INTO KEY 9, USING TABLE 1.
6. PLACE HEAT SHRINK TUBING, KEY 1 & KEY 7, OVER CABLE.
7. PLACE HEAT SHRINK TUBING, KEY 6, OVER EACH WIRE AND SOLDER WIRE TO KEY 3, USING TABLE 2.
8. SHRINK TUBING OVER SOLDER JOINTS & CONNECTOR.
9. INSTALL PROTECTIVE DATAPHONE HOOD, KEY 4.

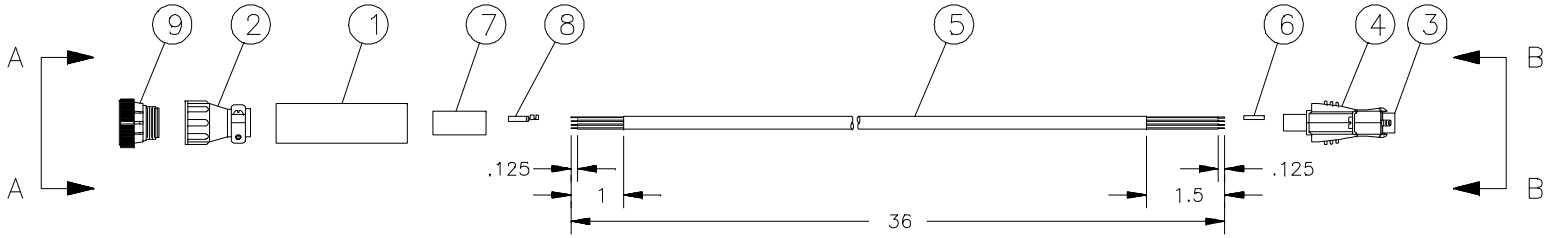
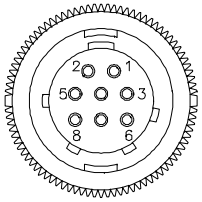
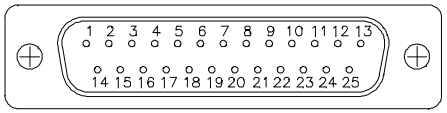


TABLE 1

	WIRE	PIN NO.	FUNCTION
	BLACK	6	SIGNAL GROUND
C	GREEN	NOT USED	———
	WHITE	2	PRINTER DATA
	RED	NOT USED	———
	SHIELD	NOT USED	———



VIEW A-A
SCALE 2" = 1"



VIEW B-B
SCALE 2" = 1"

TABLE 2

	WIRE	PIN NO.	FUNCTION
	BLACK	7	SIGNAL GROUND
C	GREEN	NOT USED	———
	WHITE	3	PRINTER DATA
	RED	NOT USED	———
	SHIELD	NOT USED	———

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
C	14932	CHANGED QTY, KEY 8 FROM 3 TO 2	09/30/93	SR
C	14932	CHANGED QTY, KEY 5 FROM 3' TO 6'	09/30/93	SR
B	6688	CHANGED QTY, KEY 8 FROM 1 TO 3	07/07/93	
A	6621	RELEASED	09/12/86	

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

DRAWING TITLE
ASSY., PRINTER DATA CABLE

TOLERANCE UNLESS NOTED
DECIMAL ± .062
HOLE DIA. ± .010
ANGLES ± 1°
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Bailey
DATE 9/12/86
FAMILY OF PARTS DWG #

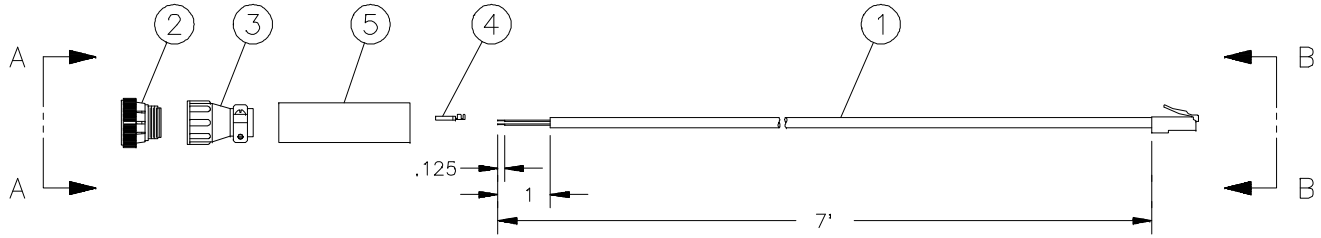
MATERIAL ———
FINISH ———

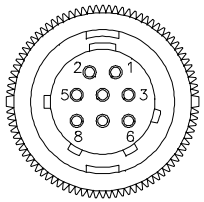
SHEET 1 OF 1
B
DRAWING NUMBER 141649

KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
1	1	148121	A148121	CABLE–7', 8 COND. W/MOD. CONN.
2	1	840553	A840553	CONN. BODY/M 8–PIN SERIES 2
3	1	141607	A141607	CONN. HOOD, SERIES 1
4	2	840552	A840552	CONN. PIN/F SERIES 2
5	1	141603	A141603	TUBING, HEAT SHRINK 3/4"

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTH SHOWN.
2. CLIP UNUSED WIRES.
3. STRIP WIRE ENDS TO LENGTH SHOWN.
4. CRIMP PINS, KEY 4, ON WIRE ENDS. SEE TABLE.
5. INSERT PINS INTO KEY 2, USING TABLE.
6. PLACE HEAT SHRINK TUBING, KEY 5, OVER CABLE AND SHRINK DOWN OVER CONNECTOR HOOD, KEY 3, AND CABLE.

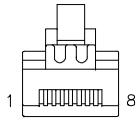




VIEW A–A
SCALE 2" = 1"

TABLE

KEY 2 PIN	WIRE COLOR	FUNCTION	MOD. CONN.
NOT USED	GRAY	———	1
NOT USED	ORANGE	———	2
NOT USED	BLACK	———	3
2	RED	PRINTER DATA	4
NOT USED	GREEN	———	5
NOT USED	YELLOW	———	6
6	BLUE	SIGNAL GROUND	7
NOT USED	BROWN	DTR	8



VIEW B–B
SCALE 2" = 1"

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
A	93–40	RELEASED	10/01/93	SR

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

DRAWING TITLE: CABLE, STAR PRINTER DATA

TOLERANCE UNLESS NOTED
DECIMAL ± .062
HOLE DIA. ± .010
ANGLES ± 1°
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Regnedy DATE 10/01/93
FAMILY OF PARTS DWG #

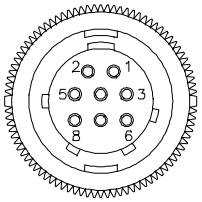
MATERIAL
FINISH

SHEET 1 OF 1
B
DRAWING NUMBER 148120

KEY	QTY	PART NUMBER	DRWG. NO.	DESCRIPTION
1	1	141603	A141603	TUBING, HEAT-SHRINK 3/4"
2	1	141607	A141607	CONN, HOOD, SERIES 2
3	AS REQ'D	141820	A141820	CABLE, 4 WIRE, WITH SHIELD
4	1	840500	A840500	TUBING, HEAT-SHRINK 3/8"
5	2	840552	A840552	CONN, PIN/M SERIES 2
6	1	840553	B840553	CONN, BODY/F 8 PIN SERIES 2

ASSEMBLY INSTRUCTIONS

1. CUT OUTER JACKET TO LENGTHS SHOWN.
2. CLIP UNUSED GREEN & WHITE WIRES & SHIELD WIRE.
3. STRIP WIRE ENDS TO LENGTH SHOWN, CRIMP PINS (KEY 5) ON WIRE ENDS.
4. INSERT PINS INTO KEY 6, USING TABLE 1.
5. PLACE HEAT SHRINK TUBING KEY 1 & KEY 4, OVER CABLE. SHRINK TUBING OVER CONNECTOR HOOD, KEY 2.



VIEW A–A
SCALE 2" = 1"

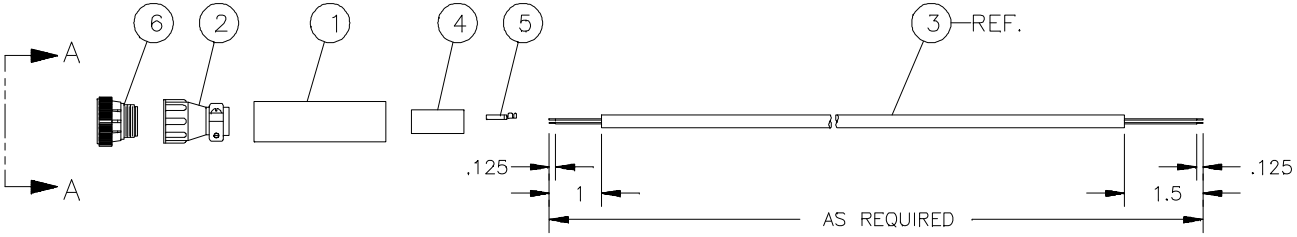


TABLE 1

WIRE	PIN NO.	FUNCTION
RED	1	CURRENT LOOP +
GREEN	NOT USED	————
WHITE	NOT USED	————
BLACK	8	CURRENT LOOP –
SHIELD	NOT USED	————

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
A	92-53	RELEASED	10/13/92	SR

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

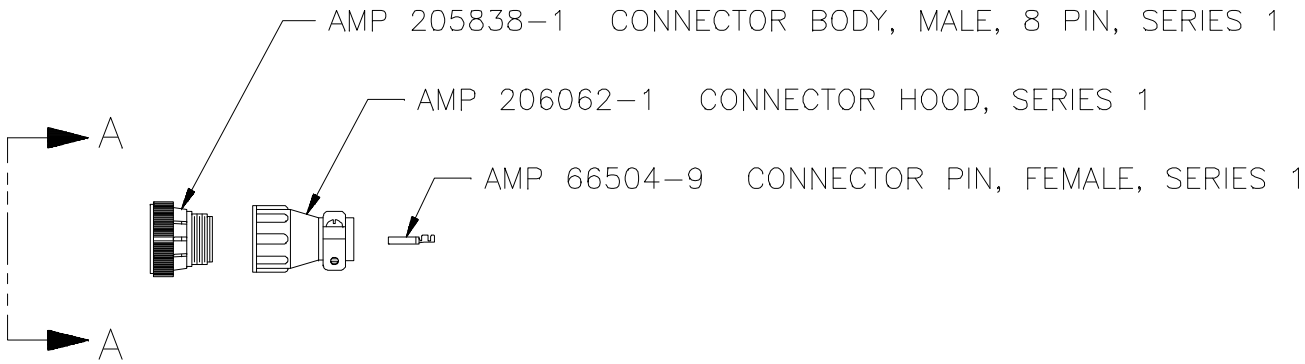
DRAWING TITLE: CABLE, EZ SERIES, 20mA DATA

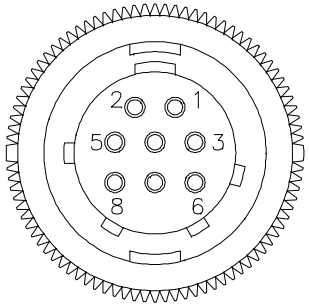
TOLERANCE UNLESS NOTED
DECIMAL ± .062
HOLE DIA. ± .010
ANGLES ± 1°
MACH. FINISH √
DO NOT SCALE

WEIGHT
SCALE 1/2" = 1"
DRAWN Regnely DATE 10/13/92
FAMILY OF PARTS DWG #

MATERIAL
FINISH

SHEET 1 OF 1
B
DRAWING NUMBER 146889





VIEW A–A
SCALE 2" = 1"

PIN	FUNCTION
1	20 mA CURRENT LOOP (+)
2	DATA TO PRINTER
3	DATA INPUT (FROM PRINTER)
4	RS232 SCOREBOARD DATA
5	DATA INPUT SIGNAL GROUND
6	PRINTER SIGNAL GROUND
7	SCOREBOARD SIGNAL GROUND
8	20 mA CURRENT LOOP (–)

J-STAR INDUSTRIES, INC.
801 JANESVILLE AVENUE
FORT ATKINSON, WI 53538

DRAWING TITLE
PRINTER (RS232) CONNECTOR

TOLERANCE UNLESS NOTED
DECIMAL ± .062
HOLE DIA. ± .010
ANGLES ± 1°
MACH. FINISH √

WEIGHT
SCALE –
DRAWN Libert
DATE 09/07/93
FAMILY OF PARTS DWG #

MATERIAL
FINISH

SHEET 1 OF 1
A
DRAWING NUMBER
PRNTCONN

REV	NUMBER	DESCRIPTION OF CHANGE	DATE	CK'D
A		RELEASED	09/07/93	

DO NOT SCALE

Appendix E: Weigh Method Descriptions:

W4444444444444444444444444444444444444444444

Description: ***Weigh Method*** *is the technique used to determine the displayed weight value.*

Different *electronic* techniques are used in an attempt to better fit the weighing application. The EZ Scale Indicators provide four(4) different methods:

Weigh Method Setting	Characteristic
1	General
2	Slow
3	Fast
4	Lock On

Weigh Methods 1, 2, & 3 are suitable for all weighing applications. Method 4, *Lock On*, works best for animal weighing.

General - Weigh Method #1:
The *General* weigh method is the *all purpose* weigh method. It is used for most applications. *General* is similar to the weigh method used on J-Star's *Model 5, 10, 15, & 20*. A comparison would be a *Model 10* with a TC (Time Constant) of 4.

Slow - Weigh Method #2:
The *Slow* weigh method attempts to provide higher accuracy by filtering many weight samples over a longer period of time. Small, instantaneous *weight changes* have less effect on the displayed weight using this technique.

Fast - Weigh Method #3:
The *Fast* weigh method is more sensitive to weight changes than the other weigh methods. When a weight changes quickly, the *Fast* method tries to determine the new weight as quickly as possible. This is done by providing less filtering during the actual *"weight change"*. When the weight begins to stabilize, filtering is increased to provide an accurate weight display.

Lock On - Weigh Method #4:
The *Lock On* weigh method is best suited to applications such as weighing animals.

Lock On has the ability to determine the actual weight of items *while in motion*, such as animals. Once the actual weight is displayed, the scale *"Lock's 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"*. A dollar sign ($) appears in the far left digit of the Scoreboard Data also indicating the *"Locked On"* weight.

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 displayed weight.

Index

W4444444444444444444444444444444444444444

3 YEAR WARRANTY - ELECTRONIC SCALE PRODUCTS

GUARANTEE

J-STAR Industries, Inc. warrants for a period of 3 years from the date of manufacture, to correct by repair or replacement, at J-STAR's option, any defect in material or workmanship in any part of electronic scale products (unless otherwise specified on selected products). In the event of replacement, J-STAR's sole obligation shall be to provide replacement product or parts, FOB. Effective for product manufactured after January 1, 1991.

LIMITATIONS

This Limited Warranty does not apply to electronic scale products, accessories or parts not manufactured by J-STAR Electronics, except to the extent of the warranty given by the actual manufacturer thereof. Furthermore, this warranty shall not apply to:

1. Parts or products requiring replacement due to normal wear and tear, or due to improper installation, abuse, neglect or required maintenance, accident, fire, lightning or other acts of God.
2. Equipment that has been repaired or modified by person(s) not authorized by J-STAR, which in J-STAR's judgement has affected the performance or reliability.

J-STAR does not warrant any part or product to meet local, municipal, state, provincial or national laws and/or regulations.

EXCLUSION OF OTHER WARRANTIES AND REMEDIES

Except where such disclaimers and exclusions are specifically prohibited by applicable law, THE FOREGOING SETS FORTH THE ONLY GUARANTEE OR WARRANTY APPLICABLE TO THIS TRANSACTION, AND SUCH WARRANTY IS GIVEN EXPRESSLY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH IMPLIED WARRANTIES WHICH EXCEED OR DIFFER FROM THE WARRANTY SET FORTH HEREIN ARE HEREBY DISCLAIMED BY J-STAR INDUSTRIES. Oral statements about the products covered by this transaction made by J-STAR's representatives, or statements contained in J-STAR's general advertising, pamphlets, brochures, or other printed matter, shall not constitute warranties. Except where such limitations and exclusions are specifically prohibited by applicable law, the SOLE AND EXCLUSIVE REMEDY AGAINST J-STAR SHALL BE FOR THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS AS PROVIDED, AND NO OTHER REMEDY (INCLUDING BUT NOT LIMITED TO INCIDENTAL, SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES FOR LOST PROFITS, LOST SALES, INJURY TO PERSONS OR PROPERTY, OR AN OTHER LOSS) SHALL BE AVAILABLE. This exclusive remedy shall not be deemed to have failed of its essential purpose as long as J-STAR is willing and able to repair or replace defective parts in the prescribed manner.

PRODUCT CHANGES AND IMPROVEMENTS

We reserve the right to make changes in design, to add improvements to or otherwise modify our electronic scale products without incurring an obligation on goods previously purchased and to discontinue supplying any parts listed when the demand does not warrant production.

J-STAR ELECTRONICS
801 Janesville Avenue
Fort Atkinson, WI 53538
414-563-5521

AUTHORIZED WARRANTY CENTERS

ELECTRONIC SCALE PRODUCTS

Agri-Tronix Corporation
2001 North U.S. 31
Franklin, IN 46131
Telephone: 317-738-4474

Atlas Scale
83 Bridgeport Road East
Waterloo, Ontario N2J 2K2
Canada
Telephone: 519-885-5302

Controls and Weighing Systems, Inc.
205 Faulkenburg Road
Tampa, FL 33619
Telephone: 813-681-5579

Electron Weigh, Inc.
P.O. Box 1097
Highway 50 West
Garden City, KS 67846
Telephone: 316-275-4227

Ferris Equipment
R D 2 Sholtz Road
P.O. Box 507
Oneida, NY 13421
Telephone: 315-363-4510

Harsh International Inc.
600 Oak
Eaton, CO 80615
Telephone: 303-454-2291

Heyco Inc./Oswalt
P.O. Box 1038
North Highway 83
Garden City, KS 67846
Telephone: 316-275-6101

Homer Scale Service
200 16th Street
Hereford, TX 79045
Telephone: 806-364-6456

J-STAR Industries, Inc.
Scale Group
801A Janesville Avenue
Fort Atkinson, WI 53538
Telephone: 414-563-5521

Kirby Manufacturing
484 South Highway 59
P.O. Box 989
Merced, CA 95341-0989
Telephone: 209-723-0778

Mortec Industries, Inc.
515 Industrial Park Road
P.O. Box 977
Brush, CO 80723
Telephone: 303-842-5063

Roto-Mix Inc.
2205 East Wyatt Earp
P.O. Box 1724
Dodge City, KS 67801
Telephone: 316-225-1142

Schuler Mfg. & Equipment Co.
R.R. 2, Box 68
Griswold, IA 51535
Telephone: 712-774-2228

Sioux Automation Center
877 1st Avenue NW
Sioux Center, IA 51250
Telephone: 712-722-1488