Thank you for your purchase. Your Weigh-Shark® Belt Scale has been carefully designed to provide you with years of operation and accuracy. We have designed features to allow simple installation, calibration and operation of your scale. Our standard features should provide you with the tools to monitor and record your important production data.

The software was designed and written with you in mind. Operation is simple with the use of minimal buttons. No formulas must be calculated and no switches must be set for operation. Everything needed to calibrate your scale is accomplished via our software and high speed processor. You simply enter your calibration data, perform a couple simple steps and your scale is calibrated.

Sincerely,

Mark Humphreys
President

This is not a Legal for Trade Scale.

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Mechanical Installation

1. Select an Idler at least 5 idlers up from drop zone and 5 idlers back from Head Pulley. (See Illustration Below) Idler should be in good operational order, mechanically sound with rollers that are turning with minimum effort.

2. A **Minimum** of 5 idlers; same make, model, can size and degree of angle is required. (or recommendations on Next Page) The selection of good idlers is CRITICAL in the accuracy that your scale will be able to obtain.

3. The scale should be installed within 50 feet of the loading point but not closer than 6m (20 ft.) or 5 idler spaces to the end of the skirt board.

- **Straight conveyors are preferable to curved conveyors. Convex (shown) or Concave curves are permissible at a distance of 20 feet or 5 idler spaces beyond the scale.**
Idler misalignment amplifies the effect of belt tension and is the major contributor of errors on Electro-Mechanical (E/M) belt weighing systems. Idlers alignment can only be as good as the idler sets to be aligned. Standard idlers vary from unit to unit in; troughing angle, T.I.R., idler deflection etc.

This makes accurate alignment almost impossible. Poor roller balance can also affect the scale performance.

To achieve the highest possible accuracy and most reliable operation one should use Weigh (Scale) class idlers on: The **Approach** (before the weigh bridge) The **Retreat** (after the weigh bridge) & The **Weigh Bridge**

**Weigh (Scale) class idlers** are designed to match the application and scale model.

Each application is computer analyzed to optimize: Idler roll diameter, Roll shaft diameter, Roll TIR, Roller dynamic balance, Idler base section, Deflections that can be accommodated and Stiffness for very high speed applications.

These idler **bases** are manufactured to the stringent troughing angle tolerances required for high precision weighing duty.

- On application with higher belt speeds (in excess of approx. 150m/min)
- The idler **rolls** are dynamically balanced
- Additionally (steel rollers only)
- The idler **rolls** are selected to meet the low break-away torque required for weighing duty.
1-B
Must Label 1 Side of Load Cell Cables from assemblies as #1
Mark Other Side of Load Cell Cables from assemblies as #2
4. Install the load cell assembly so that end with the load cell cable will be in the direction of the tail pulley and the V-Block Mounting Hole will be facing the direction of belt travel.

5. Remove bolts that Secure Idler to Conveyor.

6. Cut the mounting feet off the idler as shown in picture above.

7. Slide the load cell assembly under your idler and position it to line up the holes on your conveyor that previously secured the idler.

8. Bolt the assembly to your conveyor.

9. Install and secure the idler to the load cell assembly via the V blocks and bolts provided.

* Do Not Over tighten Bolts as this may cause strain on load cells!!

* DO NOT WALK ON BELT or risk damaging Load cells!!

10. Go to the other side of the conveyor and repeat this process.

11. Your idler should now be supported by the load cell assemblies and should not be making contact with the conveyor frame.

12. Route your load cell cables to the side of the conveyor that you will be installing the control box. DO NOT ROUTE NEAR HIGH VOLTAGE!!

2. DIRECTION OF TRAVEL
13. Run a string along the edge of 2 idlers preceding and 2 idlers following your idler to establish that all 5 idlers are level. *Adjust any idlers that are not in alignment using the shims provided.* This step is important to maintain constant belt pressure on the scale when the belt is empty since during the calibration process we establish the weight of the empty belt for tare.

SEE NEXT PAGE!!

14. Select a different idler to install your speed sensor assembly. It can be any other idler. We suggest you select the next idler in the direction of where you will install the control box. **Minimum Belt Speed recommended is 40 FPM.**

15. Using the special Tri-Fold bolt provided, secure the speed sensor assembly to your idler.

16. Route the speed sensor cable and secure it to the idler with cable ties.

17. Run all three cables to the location where your control box is installed
   A. **DO NOT ROUTE ALONG HIGH VOLTAGE POWER** or near a VFD!
   B. **Do Not Cut Cables Unless Absolutely Necessary.**
   c. Use **Belden 8723** or equivalent twisted shielded pair cable to extend cables,
   D. **Weigh Shark Junction Box** or **Soldering of Cable with Heat Shrink** must be performed when extending cables.

18. **Install your Integrator (Control box)**
   a. Mount Integrator away from vibration to avoid damage to circuit board. **Mounting near vibration will void warranty.**
   b. **Do Not Mount near a Variable Frequency Drive (VFD)!!**
   c. Mount out of direct sunlight to avoid damage to Liquid Crystal Display.

* IMPORTANT *

The Idler mounted on the scale assembly MUST be removed before **Overland Transport** to avoid damage to load cells.
Idler Alignment
(String Lining)

DO NOT SKIP THIS STEP!
The alignment of the idlers directly affects the accuracy of the scale.

Tips:
• Use all the same brand and model idlers.
• ½" Bolts can be used as spacers.

Check Idlers Side-to-Side Alignment

Check Idlers Vertical Alignment
(Check BOTH sides of conveyor)
Shim idlers accordingly to be within 1/8"

Shims are Included and MUST be used to
Raise 2 sets of Idlers directly Before & After the Scale Idler

4.
ELECTRICAL WIRING

1. Route your load cell and speed sensor cables through the special 4 hole cable grip. Locate the load cell terminals and connect. Wire the speed sensor cable to the indicated terminal also on the circuit board.

2. Route your power cable to the control box and run the cable though the 1 hole cord grip.

3. Wire either 110 VAC or 220 VAC single phase or 12-24 VDC to the terminals indicated on the board using 14 gauge wire. (Diagram below.)

When extending Speed Sensor or Load Cell Cables it is highly Recommended to use a Junction Box or Soldeing of Wires with Heat Shrink Wrap. Wire Nuts or Butt Connectors are NEVER to be used.

CIRCUIT BOARD DIAGRAM

4. When all electrical connections are properly made, turn ON the unit at the Power Switch on the board.

5.
CORRECT CIRCUIT BOARD WIRING.

* Junction Box Wiring Instructions *

MUST USE BELDEN 8723 OR EQUIVALENT WHEN EXTENDING CABLES
Single, Dual, Triple and Quad Idler Scales

Our WEIGH SHARK integrator will support up to 8 Load Cells (4-pairs)

Our Standard Weigh Shark Scale is a single idler scale. It can be converted to a Multi Idler Scale by the addition of pairs of load cell assemblies on adjacent idlers. Multi idler scales increase accuracy by weighing more material for a longer period of time.

![Image of idlers](image)

Converting a Single Idler Scale to a Multi Idler Scale.

Bolt additional pairs of load cell assemblies to the adjacent idler using procedure shown on page 1.

**STRING LINING:** -Very Important- All idlers including a minimum of one idler before and after idler scale are mounted on.

**Recommended String lining 2 Idlers Before & After Scale Idler!**

When calibrating your scale you will be asked to enter **Idler Span Distance** during the Span Test.

*Let's say your idlers are on 4 foot centers:*

Single Idler Scale Span = 8 feet.
Dual Idler Scale Span = 16 feet.
Triple Idler Scale Span = 24 feet.
Quad Idler Scale Span = 32 feet.

* See Following Page! *

During the Next Step of the SPAN TEST you are instructed to enter the TOTAL value of test weights including the bar you will be using.

You must put weight on every scale idler using these guidelines:

**TEST WEIGHT VALUE RECOMMENDATIONS-(minimum)**

* Model 100 = 100 lbs. Model 250 = 200 lbs. Model 500 = 400 lbs*
A Multi Scale Idler With 1 Extra Idlers would have a Span of 16'  
\((8' + 8' = 16')\)

A Multi Scale Idler With 2 Extra Idlers would have a Span of 24'  
\((8' + 8' + 8' = 24')\)

A Multi Scale Idler With 3 Extra Idlers would have a Span of 32'  
\((8' + 8' + 8' + 8' = 32')\)

-Continue with Calibration Process-
CALIBRATION

The calibration is divided into two categories.

A) Auto Zero
B) Span Calibration

The display will take you step by step through both processes and instruct you on what is taking place during the process and what to do next.

Auto Zero

1. The first step of calibration is to weigh your **Empty Belt and Idler** and tare off the weight of the belt and the idler so the scale only weighs material on the belt.

2. Push the arrow key located under “Calib.” to select this calibration process.

3. The main calibration screen will appear. An arrow will point to “Zero Test – Press Enter”

4. Mark the belt or use the belt splice as your reference. Follow the instructions on the display.
5. Press the Arrow under **START** when your **Empty Belt** passes a reference point start to measure and weigh your belt. The display will show you information during this step. Watch your belt make one (1) revolution and press the arrow under **END** after completion of this one revolution.

6. The screen will automatically change. It will show Belt Length (feet), Old Zero Value and New Zero Value. It will instruct you to press the arrow under **APPLY**. This will establish your Auto Zero value. The screen automatically goes back to the main calibration screen.
Once you have established a Zero Number you have also established a belt length for your conveyor. By using the PRV (previous) feature on the screen, it will allow you to start a zero test without having to wait for your splice or mark on the belt. Keep in mind that the belt MUST be empty and no calibration weights or bar applied.

This feature is only used for recalibrating your zero number with your existing belt length.

If you lose your settings for any reason, you will need to run a New Zero Test following the instructions beginning on page 9.
**Span Calibration**

1. Use the ▼ arrow key located to the right of the display to move the cursor arrow (>) down to the next line. “Span Test – Press Enter”.

2. Press ENTER

3. The screen will automatically change and instruct you to “Press START to perform a Span Calibration.

4. Press the arrow under START to start your process.

5. The screen will change and ask you to “Verify the Idler Span”. (If your idlers are on 4 foot centers….. you have a “Span” of 8 feet)!

6. The screen will instruct you to Press NEXT to continue or Press EDIT to Change. The Idler Span value defaults to 8.00 feet. If you need to change this value, press the arrow under EDIT.

7. To EDIT, press the ◄ or ► Arrow keys to move the cursor to activate the cell you wish to change.

8. Use the + and - keys to change the value up or down.

9. Press the arrow under NEXT to continue.
10. The screen will change and ask you to “Verify the Test Weight” value. Again you can accept the default value (100 lbs) NEXT or select EDIT and change the value. Enter the total weight of your test bar and weights.
- If you are going to run a material test to calibrate your scale….  
  - You can skip these steps……
- Press EXIT….Catch material and follow the instructions on: PAGE 16…”Material Test”

11. When you press NEXT the screen changes and reads: “Install Test Weights on the scale”. When safe, run the belt empty.” 

**INSTALL YOUR TEST BAR AND WEIGHTS** through the holes in the “V” Blocks

12. Start up your conveyor with the belt running empty. Press the arrow under NEXT to start. Since we previously measured your belt, you can start this process at any time and do not have to wait for your reference mark or splice.

13. The screen will again automatically change to show you that the Span Calibration process is taking place. It will show you how many revolutions and feet remain during the test. Since you measured the belt length during the Auto Zero calibration process we know your belt length and count down feet during this step.
14. When the Span Calibration process is complete the display will show you “Actual Accumulation” - “Calculated Accumulation” - "Old Span" & "New Span" and "Difference.

15. Press the arrow under EXIT. The last calibration screen appears. It informs you “Span Calibration is Complete”. It provides “Actual Accumulation”, “Calculated Accumulation”, “Old Span”, “New Span” and “Difference”. (% Error) You want to correct the error by pressing APPLY.

16. Run **Span Calibration** process **2-3 times** with test weights applied and starting @ Step 1 on page 12. Each time you will see the difference in the Old & New Span Decreasing.

*Calibration is Complete*
TEST WEIGHT VALUE RECOMMENDATIONS—(minimum)
Model 150 = 120 lbs.  Model 250 = 120 lbs.  Model 500 = 400 lbs.

Calibration Weight Set for Models 150 & 250

Set Includes: Mounting Bracket & Eight 16 lb. Powder Coated Calibration Weights
Weights Stored on Angle Iron Supplied by Customer

Bar & Test Weights Option
Can be used on All CEMA Standard Scales

You will put your test bar and weights through the holes in the “V” block that secure your idler to the scale. It is important that you are accurate with your test weight value. Including the weight of the bar and total of weights.

15.
**“MATERIAL TEST”**

- We also suggest if possible that you verify the accuracy vs. a legal for trade truck scale. Catch material and write down the Belt Scale total and the Truck Scale total….then

a) Press ▲ under “Calib.”

b) Use ▼ at right of display to bring the cursor down to the line SPAN.

c) Press ENTER

d) You will want to Increase the SPAN if the scale was light and Decrease the SPAN if the scale was heavy.

\[
\text{New SPAN} = \left( \frac{\text{Truck Scale Wt.}}{\text{Belt Scale Wt.}} \right) \times \text{Old SPAN}
\]

(Multiplier you use to calculate your new SPAN number)

**IE:** If you wish to make the SPAN larger by 12% …. You take your existing SPAN number $\times 1.12$….. If you wish to make your SPAN smaller by 12%, you take your SPAN number $\times .88$.

e) Press ▲ under EDIT. A line will appear under the last number in the New Span: line.

f) Use the + or – buttons to change the number. Use the ◄ to move to the next number to the left and again use the + or – button to change that number. Continue until you have entered in the complete number.

g) Press ▲ under APPLY to accept your changes.

h) Press VIEW a couple times to go back to the default screen.

16.
Increasing live load signal in light load applications

If the difference of your Load % when EMPTY and Load % LOADED is less than 20%, follow the instructions below to increase the signal from the live load.

(Requires Software Version 3.3.0 or higher)

1. Write down your LOAD % Empty
2. Write down your LOAD % Under Full Load. If difference is less than 20% than proceed.
   a. Arrow Down to Calibration Setup.
   b. Press ENTER.
   c. Arrow UP to Advanced Calibration.
   d. Change Advanced Calibration to ON by using the + or - key.
   e. Arrow Down to PGA.
   f. Press ENTER.
   g. Press EDIT.
   h. Press the + key to double your PGA number from 16 to 32. *(If your EMPTY Load % is approximately 50% this will double to approximately 100%. If your EMPTY Load % approximately 25% you will want to change your PGA to 64)*
   i. Press APPLY
4. With belt **RUNNING EMPTY** and **NO** calibration weights. Go to Calib Screen.
   a. Arrow UP to OFFSET.
   b. Press ENTER.
   c. Press EDIT.
   d. Press SET, wait for test to complete.
   e. Press APPLY *(We have now lowered your load cell signal in the A/D Converter Chip to tare off the excess dead load signal)*.
5. Run a **ZERO TEST** *(Make sure you have no calibration weighs on the scale.)*
6. Run a **SPAN TEST** *(Entering in your scale application information and using your calibration weights.)* *(We recommend you run the SPAN TEST 3 times since the first test will make a very large calibration change and the following tests will make fine changes.)*

We have lowered your LOAD % with the Empty belt and increased the resolution signal from the load cells to give us as much signal with your Live load as possible.
Load %

The default screen (View) shows your Load %. It is important that you have a reasonable load on the Weigh Shark scale to ensure the best opportunity for accuracy. Ideally we would like to see about 75% Load when you are running your normal rate. This will provide a good load cell signal and allow for additional rate. If you find you are running under 50%, we recommend you increase your ADC Gain. This will increase the amplification of the load cell signal to give us more load cell signal to represent weight.

(Your ADC GAIN is set at the factory to 10).

Steps to Change ADC GAIN:

1) Go to SETUP
2) Arrow down to CALIBRATION SETUP
3) Press ENTER
4) Arrow up to ADC GAIN
5) Press ENTER
6) Press EDIT
7) Use the + button to increase your number to 15 or 20
   Please Contact us to discuss your application.
8) Press APPLY
9) COMPLETED.

You will need to Re-Calibrate your scale.
You must do both the ZERO Test and the SPAN Test.
Real Time Performance (RT Prfm%)

Real Time Performance % is also shown on the default (View) screen. This shows you your performance RATE you are running based on the Standard Rate (your goal). The factory default setting is 350 TPH. You can change your Standard Rate to allow you to see what you are doing in relationship to your goal. This will give you instant information to allow you to understand your production.

Steps to change your Standard Rate:

1) Go to SETUP
2) Arrow down to CALIBRATION SETUP
3) Press ENTER
4) Arrow down to STANDARD RATE
5) Press ENTER
6) Press EDIT
7) Use the + or – buttons to raise or lower the number.
8) Press APPLY
9) COMPLETED

You Do Not have to Recalibrate your Scale.
**TOTALS**

There are four (4) independent totals with their own Production screen. They can be viewed, cleared and *printed separately.* *(With optional ticket printer)*

**Daily Total:** This total is displayed on the default screen. It shows your accumulating total.

If you wish to clear off this total, press **ENTER** key while the cursor is pointing to the "**Daily Total**". This will access your Production Screen.

Press Arrow Button below CLEAR to clear off this total.

Press ESCAPE button or EXIT to go back to Default Screen

Scroll Down (using arrows on right of faceplate) 4 times to “Weekly Total”.

**Weekly Total:** This is also an accumulating total for you to use. You can view the weekly production screen by pressing ENTER.

**Monthly Total:** This accumulating total is listed next and can be cleared by pressing ENTER to go to its production screen.

**Yearly Total:** Located is located on the next screen, just press the down arrow key to move cursor to this line and Press ENTER.

Any of your totals can be printed while viewing the production screen. You can customize your ticket. (See Ticket Printer Pg. 28)

**CHANGING FROM ENGLISH TONS TO METRIC TONS**

1. Press **Setup**
2. Scroll to **Units**
3. Press **Enter**
4. Press **Edit**
5. Press +/- to change Units
6. Press **Apply**
Analog Outputs *(Option)*

You may use the standard analog output (4-20 mA) for monitoring your production to a chart recorder, PLC or any device that accepts 4-20 mA.

Press arrow located under I/O to access these setup screens.

Press ENTER while the cursor (>) is next to Analog Output to go to the setup screen.

Press the arrow under EDIT. The cursor (>) moves next to “Rate”. This cell is active and you can select your function. Press the + or – keys to view your options.

The Current Loop configuration screen displays all the settings that pertain to the current loop.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Function of the output (i.e. Rate, Belt Speed, Load%, etc.)</td>
</tr>
<tr>
<td>Direction</td>
<td>Direction of the output (Forward or Reverse).</td>
</tr>
<tr>
<td>Minimum</td>
<td>Minimum value for the output</td>
</tr>
<tr>
<td>Maximum</td>
<td>Maximum value for the output</td>
</tr>
<tr>
<td>Averaging</td>
<td>The number of samples to average (1 to 65000)</td>
</tr>
<tr>
<td>Range</td>
<td>4-20mA or 0-20mA output</td>
</tr>
</tbody>
</table>

To make changes press the EDIT button. Use the ▲ and ▼ keys to move the cursor through the settings. To edit the number values use the ◄ and ► keys to move through the individual digits of the number. Use the + and – keys to change the values.

Press the ▼ arrow key to move your cursor to “Forward”. Use the + key to select Forward or Reverse.

Press the ▼ arrow key again to move your cursor next to “Minimum”. Press the ► arrow key to move your cell line over to the location where you want to enter your TPH. The cell is active at the location of the short line. Use the + key to enter in the value for this cell.

(Example) If you wish to have your Minimum Rate (at 4 mA) be 100 TPH. Press the ► arrow key until the short line is directly left of the 0. Press the + key to select 0. Press the ◄ arrow key 1 time to move the short line to the left. Press the + key to place a 1 in that cell. You should now see 100 TPH.

Press the ▼ arrow key to move the cursor (>) next to “Maximum”. Follow the same procedure to enter your desired Rate at 20 mA.

**Current Loop Tips:**

- Increasing the Averaging value slows the response time of the output. For blending or control applications the number should be lowered to increase the response time.
- When connecting to a PLC or Data Acquisition device, it might be helpful to output a Total; this would allow the calculation of the Rate and Total.
- The 0-20mA and 4-20mA settings both have the same output resolution (16bit).

When you have selected your desired functions; press the arrow under APPLY or EXIT to leave without saving the changes.
To Isolate Current Loop Output Remove Jumpers J1 & J2

Current Loop Examples

Output current Rate (TPH)
Desired output: 500tph = 20mA 10tph = 4mA
Set the following:
  Function: Rate
  Direction: Forward
  Minimum: 10 TPH  Maximum: 500 TPH
  Range: 4 to 20mA

Output current Belt Speed (fpm)
Desired output: 250fpm = 0mA 0fpm = 20mA
Set the following:
  Function: Belt Speed
  Direction: Reverse
  Minimum: 0 fpm  Maximum: 250 fpm
  Range: 0 to 20mA

Output current Total 4
Desired output: 10,000tons = 20mA 0tph = 0mA
Set the following:
  Function: Total 4
  Direction: Forward
  Minimum: 0 tons  Maximum: 10000 tons
  Range: 0 to 20mA

21.
Digital Inputs

Press ENTER under I/O to access the Digital Inputs screen. You have 4 Inputs labeled Input 1, Input 2, Input 3 and Input 4.

1. Press the ▼ to place the cursor (>) next to Input 1.
2. Press ENTER to open the screen for entering your information.
3. Press EDIT to make your entries. You will see the > next to the word Function: This cell is active.
4. Use your + or – keys to scroll your options.
5. Press the ▼ to select if you want your Input to be ON or OFF
6. When you have selected your Function, press APPLY
7. Press EXIT to go back to your I/O screen.
8. If you wish to use more than 1 Input, you will use the ▼ to move the cursor down to the next line (Input 2). Repeat the above procedure etc.
Digital Outputs

You have 4 Digital Outputs labeled Output 1 through Output 4. They are located on the same screen as the Inputs. You will use the ▼ to move your cursor to the Output you wish.

1. Press ENTER to go to the setup screen.

2. Press the arrow under EDIT to make your entries. The cursor (>) will appear next to “Function:”

3. Use the + or – keys to scroll your options. (1 Ton Pulse, .1 Ton Pulse…..)

4. Press the ▼ to move the cursor down one line to “Set point:” This cell is active and this value may be changed. Press the + or – keys to change the value.

5. Press the ▼ to move the cursor to the line “Action”: You can select ON or OFF.

6. Press the arrow under APPLY to set your changes.

Let’s say you want the scale to stop your conveyor when a certain weight is reached. You would select “Daily Total”, and enter you set point (15 tons). You would go to the normal screen. While the cursor (>) is pointing to “Daily Total” you would press ENTER to go to the screen to clear off this total and set it back to 0.

Press CLEAR to clear off your “Daily Total”, when you start running material the accumulation will show your production. When you reach your set point of 15 tons, Output 1 would turn ON to stop your conveyor. You can wire up a “remote clear” button to Input 1. Each time you would press your button your “Daily Total” would clear to 0.
Changing from Belt Driven to Magnetic Encoder 80 Pulse

Wiring Specifications for Extended Cable

<table>
<thead>
<tr>
<th>ENCODER</th>
<th>EXTENDED CABLES</th>
<th>CONTROL BOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Wire</td>
<td>White/Green</td>
<td>GND(Blue)</td>
</tr>
<tr>
<td>Red Wire</td>
<td>Red</td>
<td>+24 vdc(Brown)</td>
</tr>
<tr>
<td>Gray Wire</td>
<td>Black</td>
<td>Speed In (Black)</td>
</tr>
</tbody>
</table>

NOTE: Do NOT use Pink, Green, Yellow, White or Brown wires directly from Encoder.

After Installing Encoder you will need to go to Control Box:

Press SETUP button
Press down arrow key to Calibration Setup
Press ENTER
Press down arrow to Wheel Dia.
Press ENTER
Press EDIT

Use left arrow key to move the cursor to change to your pulley diameter (inches)
Use the + or - buttons to set the pulses per revolution to 80
Press APPLY

Arrow down one line to Pulses per Revolution
Verify you have 80 pulses
If not Press ENTER and EDIT to change this number.
Press APPLY

Changes are complete… Press EXIT to go to default screen.
Data sheet
RM44D01_04

Output specifications - 24 V supply

RM44IA - Incremental, push-pull, 24 V

<table>
<thead>
<tr>
<th>Power supply</th>
<th>( V_{\text{in}} = 8 , \text{V to 26 , V} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>50 mA - at 24 V</td>
</tr>
<tr>
<td>Max. output load</td>
<td>30 mA</td>
</tr>
<tr>
<td>Output signals</td>
<td>A, B, Z, A-, B-, Z- (R8422A)</td>
</tr>
<tr>
<td>Max. cable length</td>
<td>20 m</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 °C to +85 °C</td>
</tr>
<tr>
<td>Edge separation</td>
<td>min. 1 ( \mu )s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resolution options (counts per rev)</th>
<th>Maximum speed (rpm)</th>
<th>Accuracy*</th>
<th>Hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>320, 400, 500, 512</td>
<td>30,000</td>
<td>±0.7*</td>
<td>0.15*</td>
</tr>
<tr>
<td>800, 1,000, 1,024</td>
<td>20,000</td>
<td>±0.5*</td>
<td>0.18*</td>
</tr>
<tr>
<td>1,600, 2,000, 2,048</td>
<td>10,000</td>
<td>±0.5*</td>
<td>0.18*</td>
</tr>
<tr>
<td>4,090</td>
<td>5,000</td>
<td>±0.5*</td>
<td>0.18*</td>
</tr>
<tr>
<td>8,192</td>
<td>2,500</td>
<td>±0.5*</td>
<td>0.18*</td>
</tr>
</tbody>
</table>

* Worst case within operational parameters including magnet position and temperature.

<table>
<thead>
<tr>
<th>Connections</th>
<th>Function</th>
<th>Wire colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shield</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>( V_{\text{in}} )</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>GND</td>
<td>Blue</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Grey</td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>Pink</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Z-</td>
<td>Brown</td>
<td></td>
</tr>
</tbody>
</table>

Timing diagram
(complementary signals not shown)

A

B

Z

Reference impulse

B leads A for clockwise rotation of magnetic actuator.

Operating and electrical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity (for IP64 version)</td>
<td>Storage 95% maximum relative humidity (non-condensing) (IEC 61010-1) Operating 80% maximum relative humidity (non-condensing) (IEC 61013-1)</td>
</tr>
<tr>
<td>Acceleration</td>
<td>Operating 500 m/s² BS EN 60068-2-7:1993 (IEC 68-2-7:1983)</td>
</tr>
<tr>
<td>Shock (non-operating)</td>
<td>1000 m/s², 6 ms, 1/2 sine BS EN 60068-2-27:1993 (IEC 68-2-27:1987)</td>
</tr>
<tr>
<td>Vibration (operating)</td>
<td>100 m/s² max at 55 to 2000 Hz BS EN 60068-2-6:1996 (IEC 68-2-6:1995)</td>
</tr>
<tr>
<td>EMV compliance</td>
<td>BS EN 61320</td>
</tr>
<tr>
<td>Cable</td>
<td>Outside diameter 5 mm</td>
</tr>
<tr>
<td>Mass</td>
<td>Encoder unit 1 m cable (no connector) IP64 112 g, IP68 129 g, Magnetic actuator &lt;2 g</td>
</tr>
<tr>
<td>Environmental sealing</td>
<td>IP64 (IP68 optional) BS EN 60529</td>
</tr>
</tbody>
</table>

26.
**Automatic Angle Compensator**

An Automatic Angle Compensator option is used if you have a stacker conveyor that elevation changes or moves side to side. The Automatic Angle Compensator is bolted to your conveyor frame. It measures the angle incline changes. The scale automatically adjusts for the angle change and the scale remains in calibration.

1. Mount your Automatic Angle Compensator to the conveyor frame.
2. Wire Automatic Angle Compensator to control box according to wiring diagram.
3. Power ON the control box.
4. Select I/O menu.
5. Scroll down to SERIAL PORTS.
6. Press ENTER.
7. Select SERIAL PORT 2 (RS 485)
8. Press ENTER.
9. Press EDIT and use + - key to change FUNCTION to ANGLE SENSOR.
10. Press APPLY.
11. Turn OFF the belt scale and turn it back ON.
12. Calibrate the belt scale (Both ZERO and SPAN) as normal.
13. Angle Compensator information can be viewed under the CALIB. Menu by using the ▲ or ▼ buttons on the right side of screen. Display will provide angle degree or error if there is a problem.
Angle Information Displayed when Properly Set Up

ERROR Message Showing NOT properly set up.
TICKET PRINTER

A Ticket Printer may be purchased and used to record Production Data. The ticket printer comes mounted inside a NEMA 4x fiberglass enclosure with clear window and lockable latch. The ticket printer can be used to print Production Data for any of the four (4) independent totalizers of the scale.

1. Wire Ticket Printer according to diagram located in the back of the printer enclosure (RS 232)
2. Connect printer to 110 VAC power.
3. Select I/O menu.
4. Scroll down to line stating: SERIAL PORTS
5. Press ENTER.
6. Select Port 2 (RS 232)
7. Press ENTER than Press EDIT
8. Use + and _ to select Function: TICKET PRINTER
9. Press APPLY
10. Turn scale control box OFF and ON to cycle power.

MUST CHANGE TIME

1. Go to Setup Screen – Scroll to Time Setup – PRESS ENTER
2. Use +/- Button to set time to 00:00 GMT time
3. Exit Screen
4. Got to Miscellaneous Screen – PRESS ENTER – PRESS EDIT
5. Enter In the Current Correct time at your location using the +/- buttons
6. Press Apply to Recycle Power
PRINTING TICKET

1. Select the TOTAL to be printed. Use ▲ or ▼ keys to move the cursor to the TOTAL you wish to view and print.
2. Press ENTER (Here you will see Production Data information for your current TOTAL and the previous TOTAL).
3. Press PRINT to print ticket.

CUSTOMIZE TICKET

1. To add/edit the Scale Name and User Fields…….
2. Select SETUP Menu.
3. Press ▲ or ▼ keys to select Scale Name or User Fields.
4. Press ENTER to edit. Press EDIT to display the cursor.
5. Use + - keys to change the character in the active field.
6. Use the ◄ or ► keys to move the cursor to the next field to make it active.
   (Note: Scale Name and User Field 1 print at the top of the ticket. And User Field 2 and 2 print at the bottom of the ticket).
7. Press: APPLY after you have entered in the information you wish printed.

You can turn ON or OFF information (CURRENT or PREVIOUS) that you wish printed.

1. Select TOTAL you wish to edit.
2. Press ENTER
3. Press SETUP
4. Press EDIT
5. Use any arrow keys to select item…. Then + or – to turn this item ON or OFF.
6. Press: APPLY.
WEIGH SHARK MARQUEE SIGN SETUP

Applies to belt scale software version 3.1.8 or greater.
The Marquee will display either 1 or 2 lines of selectable information from the belt scale.
The Marquee is powered by 110/220 VAC, 12 VDC or 24VDC and communicates with the scale via RS 485. The RS 485 can be up to 1,000ft from the scale.

Setup:
- Connect 110/220 VAC, 12 VDC or 24 VDC to the sign. When marquee is powered up it should display its default message.
- Connect sign to RS 485 serial plug in Weigh Shark scale. Refer to Wiring Diagram included.
  - Go to I/O > Serial Ports (Press Enter) > RS 485 (Press ENTER)
  - Press EDIT. Use the + / - keys to select sign Matko SBL
  - Press-APPLY. Belt scale will automatically reset.
  - After the scale resets, go to I/O > Marquee Setup (Press Enter).
  - Use + / - keys to select # of lines (1 line displayed or 2 lines displayed).
  - Arrow down and use + / - key to select what you want displayed:
### Wiring Configuration

Connect the Scale indicator using the appropriate diagram.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Pin</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active 20 mA Output</td>
<td>5</td>
<td>CL (+)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>CL (-)</td>
</tr>
<tr>
<td>Indicators with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive 20 mA Output</td>
<td>1</td>
<td>VCC</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>CL (-)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>CL (+)</td>
</tr>
<tr>
<td>Indicators with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232 Output</td>
<td>3</td>
<td>232 RXD</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>Indicators with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS422 Output</td>
<td>7</td>
<td>RX 422A</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>RX 422B</td>
</tr>
</tbody>
</table>

**Connector Pin Out**

<table>
<thead>
<tr>
<th>Connector Pin Out</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>232 RXD</td>
</tr>
<tr>
<td>4</td>
<td>232 TXD</td>
</tr>
<tr>
<td>5</td>
<td>CL (-)</td>
</tr>
<tr>
<td>6</td>
<td>CL (+)</td>
</tr>
<tr>
<td>7</td>
<td>RX 422A</td>
</tr>
<tr>
<td>8</td>
<td>RX 422B</td>
</tr>
<tr>
<td>9</td>
<td>TX CL (-)</td>
</tr>
<tr>
<td>10</td>
<td>TX CL (+)</td>
</tr>
<tr>
<td>11</td>
<td>TX 422A</td>
</tr>
<tr>
<td>12</td>
<td>TX 422B</td>
</tr>
<tr>
<td>13</td>
<td>13 GREEN</td>
</tr>
<tr>
<td>14</td>
<td>14 RED</td>
</tr>
</tbody>
</table>

The corresponding green LED will blink when the following three requirements are satisfied.

1. The display is powered on.
2. The indicator’s port is enabled to transmit continuously.
3. The wires are connected to the terminal block as previously described.

The display will learn “automatically configure” to the transmitting device when the **LEARN** button is pressed at the end of startup. It will display the BAUD rate and then display the weight. Pressing LEFT or RIGHT will move the displayed stream accordingly until the desired data can be seen on the display.

---

#7 = White Wire

#8 = Green Wire
Mounting Dimensions / Viewing

Display Information

<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>X</th>
<th>H</th>
<th>D1</th>
<th>X</th>
<th>D2</th>
<th>Shipping Weight</th>
<th>Minimum</th>
<th>Optimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBL-2</td>
<td>12.25</td>
<td>4.75</td>
<td>5.625</td>
<td>8.375</td>
<td></td>
<td></td>
<td>8 lbs.</td>
<td>2'</td>
<td>5-25'</td>
<td>75'</td>
</tr>
<tr>
<td>SBL-4</td>
<td>26</td>
<td>8.375</td>
<td>7</td>
<td>9.75</td>
<td></td>
<td></td>
<td>23 lbs.</td>
<td>10'</td>
<td>20-100'</td>
<td>150'</td>
</tr>
<tr>
<td>SBL4-SG</td>
<td>29.75</td>
<td>8.375</td>
<td>7</td>
<td>9.75</td>
<td></td>
<td></td>
<td>25 lbs.</td>
<td>10'</td>
<td>20-100'</td>
<td>150'</td>
</tr>
<tr>
<td>SBL-6</td>
<td>35.375</td>
<td>10.375</td>
<td>7</td>
<td>9.75</td>
<td></td>
<td></td>
<td>35 lbs.</td>
<td>15'</td>
<td>50-200'</td>
<td>250'</td>
</tr>
<tr>
<td>SBL-6SG</td>
<td>39.25</td>
<td>10.375</td>
<td>7</td>
<td>9.75</td>
<td></td>
<td></td>
<td>39 lbs.</td>
<td>15'</td>
<td>50-200'</td>
<td>250'</td>
</tr>
</tbody>
</table>

Viewing Distances (Ft.)

Mounting Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>W</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBL-2</td>
<td>4&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>SBL-4</td>
<td>4&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>SBL-6</td>
<td>8&quot;</td>
<td>3&quot;</td>
</tr>
</tbody>
</table>

.250" Bolt Holes

33.
The default IP address for all scales is 192.168.000.100. This should be changed to a unique value.

If this will be on an existing network then refer to the network administrator for the proper ID address for this scale.

To change the IP address of a scale:

- Press the key under I/O
- Use the ▲ key to move the cursor up. This will move to the last item in the I/O menu which is network.
- Press Enter when the cursor is by Network.
- The Network should display.
- Press cursor should now be pointing at IP Address.
- Press Enter to open the edit screen for the IP Address
- Press the arrow key under Edit. This will display the cursor under the last group of Numbers.
- Use the◄ o ► keys to move the cursor Right or Left.
- Use the + or – key to increase or decrease the number under the cursor.
- When the correct I/P address is set ores the Arrow Key under apply. This will save the value and return back to the Network Menu.
- If an error is made during the edit process press default to return the IP addresses back to default.
- Pressing Exit during the edit process will exit the screen with no changes applied.

Set Subnet Mask, Gateway and Name Server in the Same Manner, (If you are not sure which numbers to use refer to you Network Administrator.

1. **Web Server**
   The built-in Web Server must also be enabled.
   - Under the Network Scroll menu scroll down to Web Server (+/-)
   - Press + to change from Off to On.

2. **Scale Name**
   Each scale should have a name that describes the scale. This will allow the scale to be easily identified on the Remote Display-2. If no scale name is given the RD-2 will show the scales IP address when viewing that scales information. The Scale Name can be up to 24 characters long with numbers letters and punctuation

To Change the scale name:

- Press the key under Setup
- The cursor should be on the first line pointing to Scale Name. If not use the ▼ ▲ keys to move the cursor to Scale Name.
- Press Enter when the cursor is next to Scale Name.
- The Scale Name screen should now be displayed.
- Press the key under Edit. This will display the cursor on the far right ofn New Name Line.
- Use the◄ o ► keys to move the Cursor Left and Right.
- Use the +/- keys to change each character.
- When the value correct name is set, press the Key under Apply. The will save the value and return back to the setup menu.
- Pressing Exit during the edit process will exit serene with no changes applied.

34.
*Internet Access to Scales & Ethernet Example*

- All the scales can be accessed from the Internet through a single Remote Display.
- Each plant can have multiple Remote displays, only 1 remote display would be configured to be accessed from the Internet.
- A Remote Display can be configured to display only certain scales in the local plant. For example, if there are 10 scales total on the network, a Remote Display could be programmed to only show information from Scales 1, 2, 5, and 9.
- Scale and Remote Displays can have a 25-character alpha-numeric name that will be visible on Remote Displays and the Internet.
- A computer at a plant can access any scale or Remote Display on the local network.
- There is no special software or licensing to use the networking features.

---

The Remote Display can see all the scales on the network.

For the Remote Display to be visible to the Internet, the Firewall would be configured to direct any web requests to the remote display.

The maximum length for any Ethernet segment is 300 feet.

A segment can be extended using another switch.
<table>
<thead>
<tr>
<th>Performance</th>
<th>Range</th>
<th>-40°F to +176°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>Temperature Compensation</td>
<td>-10°C to +50°C 15°F to +122°F</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Rated Excitation Output</td>
<td>10Vdc (20Vdc Max) 3mV/V</td>
</tr>
<tr>
<td>Non-Linearity</td>
<td>Idler Profile</td>
<td>Flat to 35° Up to 45° with reduced accuracy</td>
</tr>
<tr>
<td>Capacity</td>
<td>Diameter Spacing</td>
<td>2 to 7” 2 to 5 feet</td>
</tr>
<tr>
<td></td>
<td>Conveyor Belt Speed</td>
<td>up to 1000fpm (with standard speed sensor)</td>
</tr>
<tr>
<td>Speed Sensor</td>
<td>Max Belt Width Incline</td>
<td>&gt; 48” 20° from horizontal up to 30° with less accuracy Angle</td>
</tr>
<tr>
<td>Wheel Diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulses/Rev</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Cell (2 per Idler)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stainless Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.511</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 – 30 Vdc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-wire, NPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weigh Shark Mechanical Data

Manufactured by:
MCR Technologies Group, Inc.
P.O. Box 1016
Sterling, IL 61081
Phone: 815-622-3181
Fax: 815-622-0819
www.weighshark.com
<table>
<thead>
<tr>
<th>Weigh Shark Integrator Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display</strong></td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
</tr>
<tr>
<td>Program Memory</td>
</tr>
<tr>
<td>Calibration Memory</td>
</tr>
<tr>
<td>Memory</td>
</tr>
<tr>
<td><strong>Totalizers (4)</strong></td>
</tr>
<tr>
<td>Total 1</td>
</tr>
<tr>
<td>Total 2 and 3</td>
</tr>
<tr>
<td>Total 4</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
</tr>
<tr>
<td>Voltage</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Power</td>
</tr>
<tr>
<td>Isolation</td>
</tr>
<tr>
<td>DC Input</td>
</tr>
<tr>
<td><strong>Load Cell Input</strong></td>
</tr>
<tr>
<td>Excitation</td>
</tr>
<tr>
<td>Input</td>
</tr>
<tr>
<td>Resolution</td>
</tr>
<tr>
<td><strong>Speed Sensor Input</strong></td>
</tr>
<tr>
<td>Supply</td>
</tr>
<tr>
<td>Input</td>
</tr>
<tr>
<td><strong>Digital Inputs (4)</strong></td>
</tr>
<tr>
<td>Supply Input</td>
</tr>
<tr>
<td>Programmable functions (17)</td>
</tr>
<tr>
<td><strong>Digital Outputs (4)</strong></td>
</tr>
<tr>
<td>Supply Output</td>
</tr>
<tr>
<td>Programmable functions (16)</td>
</tr>
</tbody>
</table>

![Weigh Shark Logo](image)

Manufactured by: MCR Technologies Group, Inc. P.O. Box 1016, Sterling, IL 61081 Phone: 815-622-3181 Fax: 815-622-0819 www.weighshark.com

37.
<table>
<thead>
<tr>
<th>Analog Output</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Resolution</td>
<td>0/4-20mA 16bit (0-20mA or 4-20mA)</td>
</tr>
<tr>
<td>Load Isolation</td>
<td>1k Ω max 2500 V rms (External 24Vdc supply required)</td>
</tr>
<tr>
<td>Programmable functions (13)</td>
<td>Rate, Belt Speed, Load % Totals 1, 2, 3, 4 Run Time 1, 2, 3, 4 Truck Fill % Modbus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>10/100Base-T HTTP, Modbus/IP</td>
</tr>
<tr>
<td>RS-232 (1)</td>
<td>Ticket Printer, Angle Sensor, Modbus RTU</td>
</tr>
<tr>
<td>RS-485 (1)</td>
<td>Ticket Printer, Angle Sensor, Touch screen, Modbus RTU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enclosure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>fiberglass reinforced polyester Clear Lexan window</td>
</tr>
<tr>
<td>Dimensions</td>
<td>11.3&quot; W x 9.31&quot; H x 5.43&quot; D</td>
</tr>
<tr>
<td>Protection</td>
<td>NEMA 3, 3R, 4, 4X, 12 &amp; 13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle Compensator Truck Load out touch screen</td>
<td>for conveyors with changing angle, touch screen for truck and rail car loading (6, 8, 10, or 15&quot; screen size available) for printing Truck, Totalizer or Calibration tickets</td>
</tr>
<tr>
<td>Ticket Printer</td>
<td>View multiple scales on 1 display, scales connected via Ethernet.</td>
</tr>
<tr>
<td>Remote Display</td>
<td>Contact factory for availability.</td>
</tr>
<tr>
<td>Industrial Network interfaces</td>
<td></td>
</tr>
</tbody>
</table>
Truck Load Out (TLO)

The TLO software can be configured to work with the scale keypad, external touch screen, external push buttons or a combination of the above. The TLO uses its own accumulator so there is no conflict with any of the 4 main totalizers.

Programming

Settings for the TLO system can be found at Setup>Truck Load Out Setup menu.

<table>
<thead>
<tr>
<th>SETUP&gt;Truck Load Out Setup Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
</tr>
<tr>
<td>Truck Load Out</td>
</tr>
<tr>
<td>Require Truck ID</td>
</tr>
<tr>
<td>Clear ID on Complete</td>
</tr>
<tr>
<td>Require Input</td>
</tr>
<tr>
<td>Auto Print Ticket</td>
</tr>
<tr>
<td>Auto Clear Target</td>
</tr>
<tr>
<td>Stop Timer On</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cutoff</td>
</tr>
<tr>
<td>Min. Target</td>
</tr>
<tr>
<td>Max. Target</td>
</tr>
</tbody>
</table>

TLO Inputs

Any of the 4 digital Inputs can be configured for the following functions. Inputs can be configured under I/O>Inputs menu.

<table>
<thead>
<tr>
<th>I/O&gt;Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
</tr>
<tr>
<td>Truck Load Out Clear</td>
</tr>
<tr>
<td>Truck Load Out Stop</td>
</tr>
<tr>
<td>Truck Load Out Start</td>
</tr>
<tr>
<td>Truck Load Out Enable</td>
</tr>
</tbody>
</table>
TLO Outputs
Any of the 4 digital Outputs can be configured for the following function. Outputs can be configured under I/O>Outputs menu.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck Output</td>
<td>On when loading starts, off when Target weigh is reached.</td>
</tr>
<tr>
<td>Truck Ready</td>
<td>All the requirements are met for the loading to start.</td>
</tr>
<tr>
<td>Truck Done</td>
<td>On when accumulator reaches Target Weight – Truck Cutoff weight.</td>
</tr>
<tr>
<td>Truck Cutoff</td>
<td>On when loading starts, off when Target Weight – Truck Cutoff Weight is reached.</td>
</tr>
</tbody>
</table>

TLO output function table.

A | B | C | D | E
---|---|---|---|---
ON |   |   |   |   |
OFF|   |   |   |   |
ON |   |   |   |   |
OFF|   |   |   |   |
ON |   |   |   |   |
OFF|   |   |   |   |
ON |   |   |   |   |
OFF|   |   |   |   |
ON |   |   |   |   |
OFF|   |   |   |   |

A | Target Weight > 0 and Target Weight <= Max Target and Target Weight >= Min Target and Truck ID Entered* and Truck Input ON* *When Enabled
B | Start
C | Truck Weight >= Target Weight - Cutoff Weight
D | Truck Weight >= Target Weight
E | Clear
TLO Operation with Scale Screen

When the TLO system is Enabled there are 2 extra options under the VIEW menu, Truck Total and Trucks. Use the ▲ and ▼ keys to move the cursor to the Truck Total option and press ENTER. This will open the Truck Load out screen.

1. Enter Truck ID. Use the ▲ and ▼ keys to move the cursor to Truck ID. Press ENTER to open the Truck ID edit screen. Press button under EDIT to begin editing the Truck ID. Use the + and – keys to change the value. Use the ◄ and ► keys to move between each column. Press APPLY to apply settings and exit.

2. Enter Target weight. Use the ▲ and ▼ keys to move the cursor to Target. Press ENTER to open the Target edit screen. Press button under EDIT to begin editing the Target weight. Use the + and – keys to change the value. Use the ◄ and ► keys to move between each column. Press APPLY to apply settings and exit.

   If Target weight is between the Maximum and Minimum settings then the screen will display “Ready – Press Start”. If setting, Require Truck ID, is set to ON then a Truck ID will be required before load can begin. If setting, Require Input, is set to ON then the input configure as Truck Load Out Enabled must be ON before the load can begin.

3. Press button under Start to clear the accumulator and begin loading truck. Press Stop at anytime to stop the loading process.

4. When Loading is completed press Clear to complete load. If setting, Clear Truck ID, is set to ON the Truck ID will be cleared. If setting, Auto Clear Target, is set to ON then the Target weight will also be cleared.
### Truck Loadout

<table>
<thead>
<tr>
<th>&gt;Truck ID: ACME01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target: 15.00 tons</td>
</tr>
<tr>
<td>Total: 15.00 tons</td>
</tr>
<tr>
<td>Rate: 0.00 tons/hr</td>
</tr>
</tbody>
</table>

**Truck Full – Press Clear**

| Clear | EXIT |

5. Truck Loadout is complete; the system is ready for the next truck.

### TLO with Touch Screen

1. Enter Truck ID. Press the Truck ID Button on touch screen to edit the Truck ID. Press ENT in the top left corner of the screen to accept changes.

2. Enter Target Weight. Press the Target Weight button to edit the Target Weight. Press Enter to accept changes.

If Target weight is between the Maximum and Minimum settings then the screen will display “Ready – Press Start to continue”. If setting, Require Truck ID, is set to ON then a Truck ID will be required before load can begin. If setting, Require Input, is set to ON then the input configure as Truck Load Out Enabled must be ON before the load can begin.

3. Press Start button to clear accumulator and begin loading truck. Press Stop at anytime to stop the loading process.

4. When Loading is completed press **Clear** to complete load. If setting, Clear Truck ID, is set to ON the Truck ID will be cleared. If setting, Auto Clear Target, is set to ON then the Target weight will also be cleared.

5. Truck Loadout is complete; the system is ready for the next truck.

---

**Existing Conveyor or Feeder Start/Stop Circuit**

- CR: Customer supplied 24Vdc coil control relay.

*100mA Max current draw on all 24Vdc sources combined*

---

**Truck Load Out Control Wiring**

- Date: 6/23/05
- REV: 1.0
- By: SJK
TLO Truck Summary Screen

Under the VIEW menu use the ▲ and ▼ keys to move the cursor to the Trucks option and press ENTER. This will open the Trucks Summary screen.

Page 1

<table>
<thead>
<tr>
<th>Trucks:</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Weight:</td>
<td>194.25 tons</td>
</tr>
<tr>
<td>Total Fill Time:</td>
<td>1.34 hours</td>
</tr>
<tr>
<td>Avg Trucks/Hour:</td>
<td>9.70</td>
</tr>
</tbody>
</table>

Cl ear  EXI T

Page 2

<table>
<thead>
<tr>
<th>Avg Truck Weight:</th>
<th>14.94 tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg Fill Time:</td>
<td>6.18 minutes</td>
</tr>
<tr>
<td>Avg Target Error:</td>
<td>0.06 tons</td>
</tr>
<tr>
<td>Avg Rate:</td>
<td>145.05 tph</td>
</tr>
</tbody>
</table>

Cl ear  EXI T

Page 3

| Last Clear        | 03:35 11/10/2005 |

Cl ear  EXI T

Pressing Clear will clear the Truck summary and change the Last Clear value to the current time and date. The information will update at the completion of every truck load.
TLO Example

The following is an example Truck Load out set up. The system will do the following:

- Target Weight must be between 5 and 25 tons.
- A new Target Weight must be entered after every truck.
- The feeder will be shut off .25 tons before the Target Weight is reached.
- The Truck Fill Timer will accumulate until the loading is complete and the weight is cleared.
- Use an external push button, wired to Input 4, to Start the loading.
- Wire the feeder to Output 1.
- Touch screen will be used to control truck load out.

Software settings:

- Setup>Truck Load Out Setup menu
  - Truck Load Out = ON.
  - Require Truck ID = NO
  - Clear ID on Complete = NO
  - Require Input = NO
  - Auto Print Ticket = NO
  - Auto Clear Target = YES
  - Stop Time On = Clear
  - Cutoff = .25
  - Min. Target = 5
  - Max. Target = 25

- I/O>Inputs>Input 4
  - Function = Truck Load Out Start
  - When Input is: = ON
  - Filter Preset = 50ms

- I/O>Outputs>Output 1
  - Function = Truck Cutoff
  - Action = ON

Hardware Settings:

- Wire push button to Input 4
- Wire feeder relay to Output 1

Operation

1. Enter Target Weight.
2. Press Start push button or Start on touch screen. Truck accumulator will clear to 0.00 and Output 1 will turn ON.
3. When the Truck accumulator is .25 tons from Target Weight Output 1 will turn Off.
4. Press Clear to complete load. This will also clear the Target weight to 0.00.
Weigh Shark Warranty

MCR TECHNOLOGIES GROUP, INC. manufactures the Weigh Shark Conveyor belt Scale and the Weigh Shark SI Dry Solids Impact Flow Meter.

MCR TECHNOLOGIES GROUP, INC. offers a 1 Year Limited Warranty on parts against defective workmanship and failure. MCR TECHNOLOGIES GROUP, INC. will replace any defective part within the 1 Year of Purchase Date by either sending the replacement part to the customer or sending a complete assembly to be exchanged with the defective assembly. The Warranty does not cover Any Labor. MCR will pay Ground Freight expenses to the customer. It will be the responsibility of the customer to return their part to MCR TECHNOLOGIES GROUP, INC for testing.

If MCR TECHNOLOGIES GROUP, INC. determines that the returned part or assembly is not covered under the warranty due to neglect, abuse or misapplication, the customer will be charged to repair or replace the damaged part or assembly. If the customer fails to return their part or assembly, MCR TECHNOLOGIES GROUP, INC. may charge the customer.

This is not a Legal for Trade Scale.

45.
# Belt Conveyor Scale Maintenance Check List

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DAILY</th>
<th>WEEKLY</th>
<th>MONTHLY</th>
<th>QUARTERLY</th>
<th>ANNUALLY</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale Area - Debris</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>Keep area around scale &amp; Speed Sensor Free of Debris</td>
</tr>
<tr>
<td>Load Percentage</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Should be at or around 75% if below 50% increase ADC gain by a factor of 5.</td>
</tr>
<tr>
<td>Idler Roller Condition</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Inspect &amp; repair / replace as needed</td>
</tr>
<tr>
<td>Material Test</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Perform material test as referenced on &quot;Material Test&quot; page in manual</td>
</tr>
<tr>
<td>Auto Zero</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Perform Auto Zero test according to manual.</td>
</tr>
<tr>
<td>Span Calculation</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Run Span Calibration at this time or whenever any mechanical change has taken place</td>
</tr>
<tr>
<td>Belt Scraper</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Check operation, adjust or replace worn blades</td>
</tr>
<tr>
<td>Belt Condition</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Visually inspect for cuts tears or undue wear</td>
</tr>
<tr>
<td>Belt Take Up</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Inspect bearings-sheaves etc... for free travel</td>
</tr>
<tr>
<td>Speed Pulley</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Inspect for wear, material build up, belt wrap. Check Bearings</td>
</tr>
<tr>
<td>Load Cell Offset</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Load Output percentage should not exceed 90%</td>
</tr>
<tr>
<td>Load Cell Balance</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Multiple load cells must be balanced to within 1 mV</td>
</tr>
<tr>
<td>Revolution Time</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Verify time for 1 belt rev @ maximum speed</td>
</tr>
<tr>
<td>Alignment</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Complete per instruction manual</td>
</tr>
<tr>
<td>Belt Length</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Measure &amp; Verify. Perform test outlined in manual.</td>
</tr>
<tr>
<td>I/O Integrity</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Check &amp; Verify performance of all I/O being used.</td>
</tr>
<tr>
<td>Wire Terminations</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Inspect for corrosion and tightness</td>
</tr>
<tr>
<td>Cable Integrity</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td></td>
<td>XXX</td>
<td>Check for corrosion, moisture deterioration and perform ohm test</td>
</tr>
</tbody>
</table>

* After performing ANY tests or maintenance ALWAYS run a Zero and SPAN test! *

** Please contact technical support at 815-622-3181 ext 12 with any questions or needed assistance **
# Belt Scale Trouble Shooting Guide

**MCR Technologies Group, Inc.**  
PO Box 1016 Sterling, IL 61081  
815.622.3181 fax 815.622.0819  
[www.weighshark.com](http://www.weighshark.com) [sales@weighshark.com](mailto:sales@weighshark.com)

<table>
<thead>
<tr>
<th>Customer Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name</td>
<td>Phone</td>
</tr>
<tr>
<td>Address</td>
<td>Fax</td>
</tr>
<tr>
<td>State &amp; Zip</td>
<td>e-mail</td>
</tr>
</tbody>
</table>

**Nature of Call**

---

**Control Box Serial Number:**

<table>
<thead>
<tr>
<th>Display Number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Control Box Serial Number</th>
<th>Display Number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Scale designation:</th>
<th>Product:</th>
<th>Other:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Scale Model #:</th>
<th>(IE Model 100-250 or 500)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Does this scale have an Angle Compensator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is your RATE reading?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EMPTY Belt</th>
<th>LOADED Belt</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What is the belt speed?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>FPM</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Is the belt speed reasonable?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If not, what would be reasonable?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>FPM</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What is your ADC GAIN setting?</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What is your ZERO reading</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What is your SPAN reading?</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>What is your ZERO Cutoff #</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Belt Length stored in integrator</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Idler Span stored in integrator</th>
</tr>
</thead>
</table>

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Angle number shown (if applicable)</th>
</tr>
</thead>
</table>

---

47.
### Belt Scale Trouble Shooting Guide

15. What is the LOAD % under EMPTY LOAD?  
   [Blank Line]  
   View Screen Line 4

16. What is the LOAD % under 'NORMAL' LOAD?  
   [Blank Line]  
   View Screen Line 4

17. What is your LOAD CELL AD reading?  
   (With Both Load Cells Plugged in)  
   - EMPTY BELT: [Blank Line]  
   Misc. Screen Line 4
   - LOADED BELT: [Blank Line]

18. Load Cell AD: Reading Load Cell #1 Only  
   Empty Belt [Blank Line]  
   "Un-Plug Load Cell #2" [Blank Line]

19. Load Cell AD: Reading Load Cell #2 Only  
   Empty Belt [Blank Line]  
   "Un-Plug Load Cell #1" [Blank Line]

20. What are the belt dimensions?  
   Length [Blank Line]  
   Feet Width [Blank Line]  
   Inches [Blank Line]

21. What is your idler center distance?  
   (idler to next idler) [Blank Line]

22. Were the idlers string lined during installation?  
   Yes [Blank Line]  
   No [Blank Line]

23. Was scale calibrated using Weights & Bar?  
   Yes [Blank Line]  
   Total of weights & bar: [Blank Line]  
   No [Blank Line]

24. Did you feel comfortable performing the ZERO & SPAN tests?  
   Yes [Blank Line]  
   No [Blank Line]  
   If no, what difficulties did you have?  
   [Blank Line]

25. Did you perform the ZERO & SPAN test with the belt running empty?  
   Yes [Blank Line]  
   No [Blank Line]

26. Have you extended the cable length?  
   Yes [Blank Line]  
   If yes, how did you do this?  
   [Blank Line]  
   No [Blank Line]

---

**NOTE:** Make sure that the Scale Weight (Misc Screen Line 3) matches up with your test bar and weights with the conveyor EMPTY and STOPPED.

27. Additional Information and Notes:  
   [Blank Line]

28. Problem resolution and recommendations:  
   [Blank Line]
**BELT SCALE TROUBLESHOOTING GUIDE**

**SYMPTOM:**

<table>
<thead>
<tr>
<th><strong>CHECK</strong></th>
<th><strong>ACTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Belt Speed</strong></td>
<td></td>
</tr>
<tr>
<td>1a. Check connection to control Box to</td>
<td>1a. Correctly wire Proximity Switch according to manual.</td>
</tr>
<tr>
<td>1b. Check for loose wire to control Box or loose connection</td>
<td>1b. Tighten wire or connector if loose connection found.</td>
</tr>
<tr>
<td>1c. Slowly turn speed sensor wheel and observe the LED on the Proximity switch to ensure an Even pace.</td>
<td>1c. If LED lights on an irregular basis, check to make sure it is aligned close to the switch, so that every tooth is picked up and it is not rubbing into the switch.</td>
</tr>
<tr>
<td>1d. Perform previous test, but check LED on circuit board labeled SPD1.</td>
<td>1d. If the LED is lighting at irregular intervals, check for loose connection on either cable end, loose wire or cable damage. If a loose connection or wire correct the problem. If cable is damaged, repair or replace.</td>
</tr>
<tr>
<td><strong>Low Belt Speed</strong></td>
<td></td>
</tr>
<tr>
<td>2a. Check speed sensor according to 1c and 1d</td>
<td>2a. Perform the specified action as described in 1c and 1d.</td>
</tr>
<tr>
<td>2b. Confirm the accurate Speed with a hand held tachometer or time the belt to calculate belt speed.</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If you have an erratic belt speed, this is typically caused by interference due to VFD's or motors. We suggest you ground the electronics to the conveyor frame. Take a wire from the GND terminal at the 12-24 VDC (2 pin) terminal located to the im.

<table>
<thead>
<tr>
<th><strong>No Accumulation Of Weight or Rate</strong></th>
<th><strong>NO ACTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3a. Check belt speed</td>
<td>3a. If there is no belt speed or if belt speed seems too fast or slow, check speed sensor according to 1 &amp; 2.</td>
</tr>
<tr>
<td>3b. Check ZERO and SPAN Number. Both are found on the CALIB Screen.</td>
<td>3b. If either number is 0, first check load cell wiring to ensure it is correct. If wired incorrectly... Correct. If either number is 0, you will need to go to the CALIB. Select ZERO or SPAN and Press ENTER. You must M</td>
</tr>
<tr>
<td>3c. Check load cell cables for damage.</td>
<td>3c. Repair or replace damage.</td>
</tr>
</tbody>
</table>

**Note:** If you have extended your cables, it is imperative you use a junction box. A splice area is a prime location of problems.

| **3d. Check LOAD CELL AD Located on the MISC.** | **3d. First plug one load cell and observe number. You should never see a 0 or 65,535. Check the other load cell. If one load cell is bent, or damaged by lightning, etc. It must be Replaced.** |

**Note:** Load cell tests, Zero Tests and Span Tests must be performed with the belt running EMPTY.

**Note:** A load cell provides a positive mV signal to our processor. We convert this signal to a number. This number is found as LOAD CELL AD on our MISC. screen. If the load cell is bent UP we will show a 0 since we cannot show a negative number.
Belt Scale Trouble Shooting Guide.

**CHECK**

4a. Check belt speed.

4b. Check rate with belt running empty.

**ACTION**

4a. If belt speed seems wrong check according to 1c and 1d.

4b. If rate is fluctuating near 0, this is perfectly normal this occurs because the scale is seeing the lighter and heavier portions of the belt.

If the rate is a steady negative number, then check load cell According to 3d

If they check out OK, then go to the Calibration Screen and Run both the ZERO test and SPAN test.

Are idlers in alignment?

Perform a string test as is described in the manual.

**Note:** To verify that the calibration was performed correctly, do the following. When the ZERO test and SPAN test are complete, leave the test weights on the empty belt and go to the MISC screen. The SCALE WEIGHT value should match the total amount of

**Note:** Scale accuracy should be confirmed vs. a legal for trade truck scale.

Scale is reading Heavy.

5a. Check Load Cell AD Numbers according to 3d.

5b. Check rate with belt Running empty.

5c. Check idlers for Alignment

5a. Perform required action in 3d.

5b. If rate is significantly above 0 then perform both ZERO and SPAN tests.

5c. Perform string test as Explained in the manual To ensure proper idler Alignment

**Note:** if rate fluctuates slightly above and below 0 this is perfectly normal, Provided there is no accumulation of weight

Scale does not turn ON:

6a. Check to ensure that Proper power is being Supplied to the correct location on the board.

6b. Check to make sure Scale is turned on.

6c. Check fuse located in upper left corner of Board.

6d. Check to make sure display is properly connected to circuit board.

6a. Scale will operate on 110 or 220 VAC or 12-24 VDC. Verify power is wired correctly.

6b. Flip switch in control box to turn on scale

6c. If blown… replace.

6d. Inspect connection and condition of cable between circuit board and display.

Nothing happens When a keypad Button is pressed.

7a. Check to ensure control box is turned on.

7b. Check to ensure that keypad is plugged in.

7c. Is display readable?

7a. Perform checks in Section 6

7b. Look behind door of control panel to ensure that display is connected to the keypad.

7c. If display has readable info. Replace keypad. If display has nonsense, replace display.
Troubleshooting Tips if Scale is resetting to default values when powered on & off

It may be as simple as changing the battery as shown below.

If not please try the following steps:

1. Check Battery Cell Holder to see if it is larger than the battery, this may cause the battery to be loose and causing the default values to appear.

2. If loose remove battery from holder, raise the spring steel normally used for negative contact. This should result in better battery contact.

3. If still having issues place a small coin (penny or dime) in between contact for ground & the battery. It should reset 1 time after this is done.

4. If this does not work replace battery

5. If problem persists contact Weigh Shark Technical Support
   - 815-622-3181 ext. 12

**Battery Part Number: CR 2032**
NOTES

Scale Model: ____________

Control Box #:_________________

Installation Date: _______________________

Scale Designation: Conveyor Name: ____________________

Product: ____________________________

Initial Settings: (after calibration is complete)

   Belt Speed________       ADC Gain:______________
   Zero Reading________    Span Reading__________

Other Notes:

__________________________________________________________________________

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Overview of Conveyor Belt Scales

The following illustrations, text and photos are samples of the Technical Papers presented at the NISA Spring and Fall Technical Seminars. (2/8/98)

The Conveyor

Components of the conveyor, belt scale and weigh bridge assembly.

The conveyor speed and slope should not exceed that at which material slippage occurs. Accurate weight totalization requires that material velocity matches belt velocity. This may require that the scale be located a considerable distance from the loading point on a steeply inclined, high velocity systems handling certain materials.

\[ L = \text{Conveyor length (ft.)} \]
\[ T = \text{Minimum totalized load (tons)} \]
Conveyor length should not exceed that which assures that the belt will travel at least 3 circuits while delivering the minimum totalized load for which accurate weight information is required.

All idlers should be of rigid frame construction with a horizontal roller section. So called "V" rolls and "limber" rolls are not advisable.

There shall be no tripper or moveable head pulleys in the conveyor.

The conveyor should be equipped with a constant-tension or gravity-type take-up
BELT SCALE LOCATION

The scale should be installed within 50 feet of the loading point but not closer than 6m (20 ft) or 5 idler spaces to the end of the skirt board.

If there is a concave curve in the conveyor between the scale and the loading point, the scale shall be installed so that the belt is in contact with the idlers at all times for at least 6m (20 ft) or 5 idler spaces, whichever is greater, before and after the scale. A concave curve beyond the scale shall start no closer than 12m (40 ft) from the scale.
If installed on a conveyor with a concave curve, the scale must be installed in a section of the conveyor where the belt is straight (not necessarily horizontal) and in contact with at least 8 idlers to either side of the scale throughout the entire loading range (empty to full load)

Straight conveyors are preferable to curved conveyors. Convex curves are permissible at a distance of 20 feet or 5 idler spaces beyond the scale.

The scale should be installed within 50 feet of the loading point but not closer than 6m (20 ft) or 5 idler spaces to the end of the skirt board.

**BELT SCALE ALIGNMENT**

The 2 Idlers before & after the scale should be Shimmed within 1/32"
RECOMMENDED PRACTICES FOR CALIBRATING, TESTING, AND OPERATING BELT SCALES

Calibration and simulated load test methods

1. Calibration
   a. Weighed Load Test

2. Simulated Load Testing
   a. Roller Test Chain
   b. Static Test Weights
   c. Electronic Calibration

Material Test Using a Truck Scale as the Reference Scale

Material Test Using Static Hopper Scale
**Weighed Load Test**

**Advantages**

1. Only method which can establish traceable conveyor scale accuracy.
2. Readily permits testing at several feed rates to test linearity.
3. Test entire system, electronics, scale carriage, and conveyor effects.

**Disadvantages**

1. Requires availability of accurate static scale.
2. Requires accumulation, transportation to static scales, and static weighing of the test load material.

**Chain Test**

![Diagram of Chain Test](image)

**Roller Test Chains**

**Advantages**

1. Simulates some conveyor belt effects.

**Disadvantages**

1. Chains do not provide a traceable conveyor scale calibration standard.
2. Heavy chains are difficult to handle.
3. Conveyor belt must be stopped to apply and remove test chains.
4. Linearity test requires several chains.
5. Chains are costly.
Static Test Weights

Advantages

1. Simulates some conveyor belt effects.
2. Easy to apply.
3. Conveyor belt does not have to be stopped to apply weights.
4. Linearity test easy to perform.
5. Detects load cell failures, and applies force to the load cell.

Disadvantages

1. Weights do not provide a traceable conveyor scale calibration standard.
2. Does not simulate conveyor belt effects.
Electronic Calibration (R-Cal)

Advantages:
1. Can be self-contained within the electronics.
2. Checks all electronics including electrical circuits of load cell.
3. Quickest and easiest of all calibration checks.

Disadvantages:
1. Does not detect all types of load cell failures; does not apply force to load cell.
2. Does not simulate conveyor belt effects.
3. Requires calculated factor for incline.
4. Electronic calibration does not provide a traceable conveyor scale calibration standard.
MAJOR FACTORS AFFECTING FREQUENCY OF RE-ZEROING

1. Stability of the scale and associated integrating equipment to environmental changes and time.

2. The rate at which material collects on "weighed parts."

3. Uncontrollable conveyor parameters.


5. Required accuracy.

MAJOR FACTORS AFFECTING FREQUENCY OF SPAN ADJUSTMENT

1. Stability of the scale and associated integrating equipment to environmental changes and time.

2. Mechanical wear.
   a. Leverage ratios.
   b. Belt contact roll.

3. Material collected on speed sensor roll.

4. Uncontrollable conveyor parameters.

5. Conveyor maintenance.

6. Required accuracy.

7. Shifts in conveyor structure.

MATERIAL TESTING OF BELT SCALES FOR CERTIFICATION (NIST Handbook 44)

UR User Requirements

U.R.2.3 - Material Test - A belt conveyor scale shall be installed so that a material test can be conveniently conducted (non-retroactive as of January 1, 1981). Added 1980.

UR 3. - Use Requirements

U.R.3.1 - Loading - The feed of material to the scale shall be controlled to assure that, during normal operation, the material flow is in accordance with manufacturer’s recommendation for rated capacity.

NOTES

N.1.1 - Official Test - An official test of a belt-conveyor scale shall be a materials test.

N.1.2 - Simulated Test - Simulated loading conditions as recommended by the manufacturer and approved by the official with statutory authority may be used to properly monitor the system
operational performance between official test, but shall not be used for official certification (Amended 1991).

N.2 - A belt-conveyor scale shall be tested after it is installed on the conveyor system with which it is to be used and under such environmental conditions as may normally be expected. It shall be tested at normal use capacity and may be tested at any other rate of flow that may be used at the installation.

Each test shall be conducted for:

(a) Not less than 1000 scale divisions,

(b) At least three revolutions of the belt, and

(c) At least 10 minutes of operations, or for a normal weighment. (Amended 1986)

N.3 Test Procedures

N.3.1 Zero Load Tests - The variation between the beginning and ending indication of the master weight totalizer shall not be more than plus or minus 1 scale division when the instrument is operated at no load for a period of time equivalent to that required to deliver the minimum totalized load of 1000 scale divisions.

The zero-load test shall be conducted over a whole number of belt revolutions, but not less than three revolutions or 10 minutes of operations, whichever is greater.

During any portion of the zero-load test, the totalizer shall not change more than three scale divisions from its initial indication. (Amended 1989)

N.3.3 Material Tests - On initial verification, at least three individual tests shall be conducted. On subsequent verifications, at least two individual tests shall be conducted. The performance of the equipment is not to be determined by averaging the results of the individual tests. The results of all of these tests shall be within the tolerance limits. (Amended 1986, 1989)

N.3.2.1 Accuracy of Material - The quantity of material comprising the material test shall be weighed statically to an accuracy of at least 0.1 percent.

N.3.3 Simulated Load Test - As required by the Official with Statutory authority, simulated load tests as recommended by the manufacturer are to be conducted between material tests to monitor the system’s operational performance, but shall not be used for official certification. (Amended 1991)

A simulated load test consisting of at least three consecutive test runs shall be conducted as soon as possible, but not more than 12 hours after the completion of the material test, to establish the factor to relate the results of the simulated load tests to the results of the material tests. (Added 1990)

The results of the simulated load test shall repeat within 0.1 percent. (Added 1990) (Amended 1989 and 1990)

T.1 Tolerances Values - Maintenance and acceptance tolerance on material tests, relative to the weight of the material, shall be plus or minus 0.25 percent of the test load. (Amended 1993)

T.2 Tolerance Values, Repeatability Tests - The variation in the values obtained during the conduct of materials tests shall not be greater than 0.25 percent (1/400) Added 1993)