Weigh Shark

Conveyor Belt Scales

CIT – Scale Installation & Calibration Manual

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Made in the USA

05/17/2019

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.**

Index

*BELT SCALE OVERVIEW ADDENDUM*

Mechanical Installation

✓ 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.

✓ **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.

✓ 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.
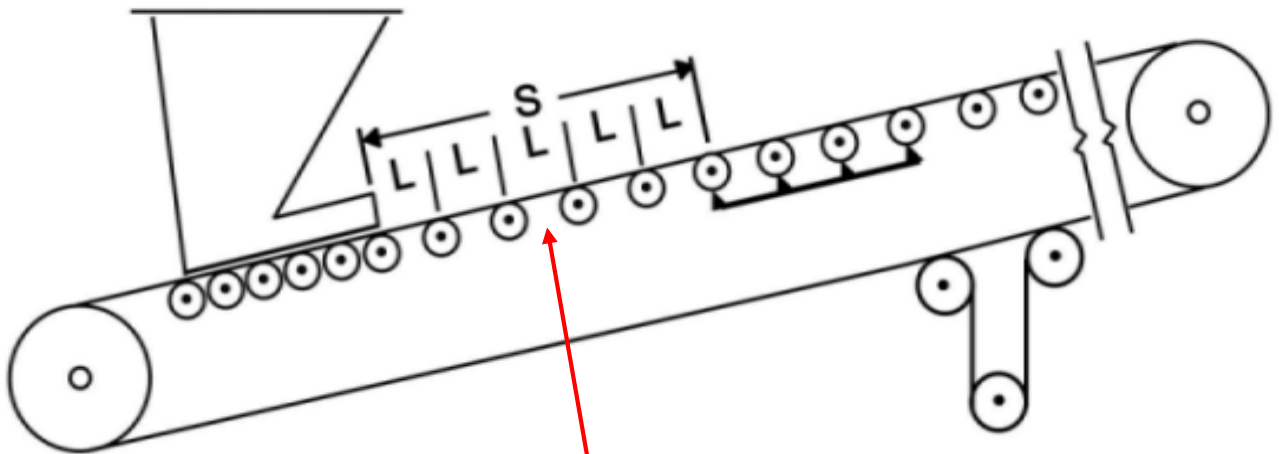
Dual Idler Configuration Shown

- *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.*

Dual Idler Configuration Shown

1.
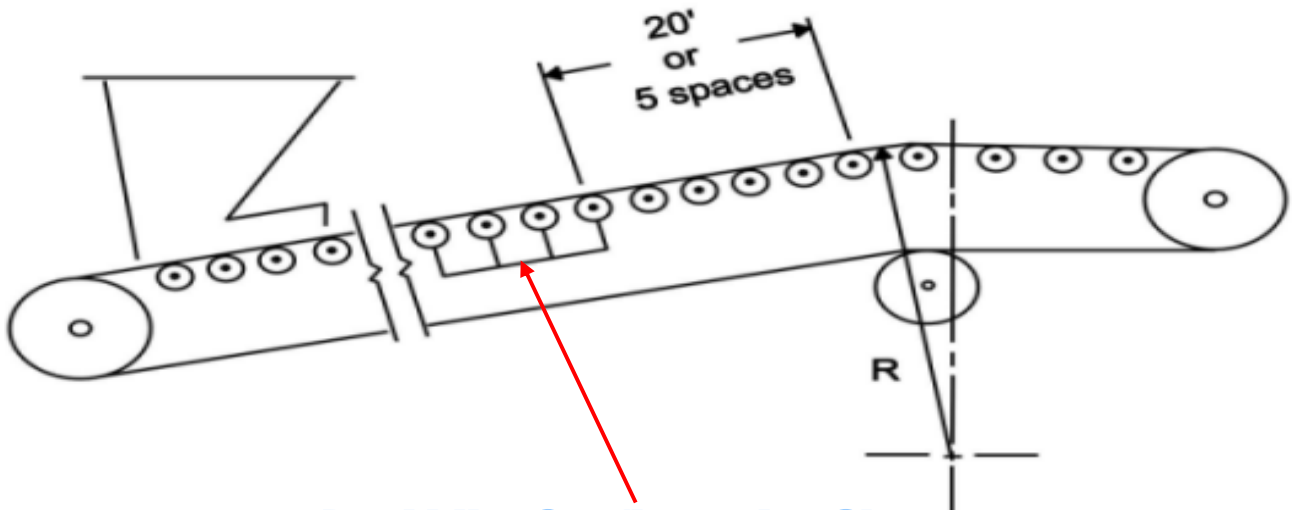
CIT Mechanical Installation

Weigh bridge parts for a single idler.
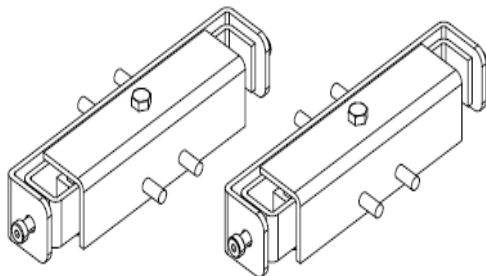
Load Cell Assemblies
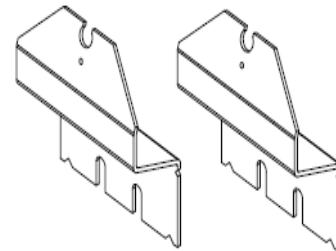
Idler Brackets

Cut Template

Idler Bracket Supports
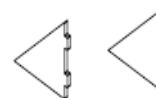
	DRAWN SJK	DATE May 6, 2008	JCI Inset Trougher Belt Scale			
MCR Technologies Group, Inc Sterling, IL 815-622-3181	CHECKED					
	QA		Weigh Bridge Parts List			
	MFG		SIZE B	FSCM NO.	DWG NO.	REV
	APPROVED		SCALE		SHEET	1 of 4

1-A

Modify Existing Idler

D

Cut Template

Detail B

Cut Here

Use Cut Template on Inside of Exisiting Support

F

E

Use Cut Template to Cut Both Ends of the Idler

Weld Idler Brackets

A

Align Frame With Notches

Weld Here

Detail A

1-B

Bolt to
Conveyor Here

Load Cell Wires Should be Coming
Out of Assembly in Opposite
Direction of Belt Travel

Bolt Idler to
Load Cell Assembly

Belt
Travel

Belt
Travel

1-C
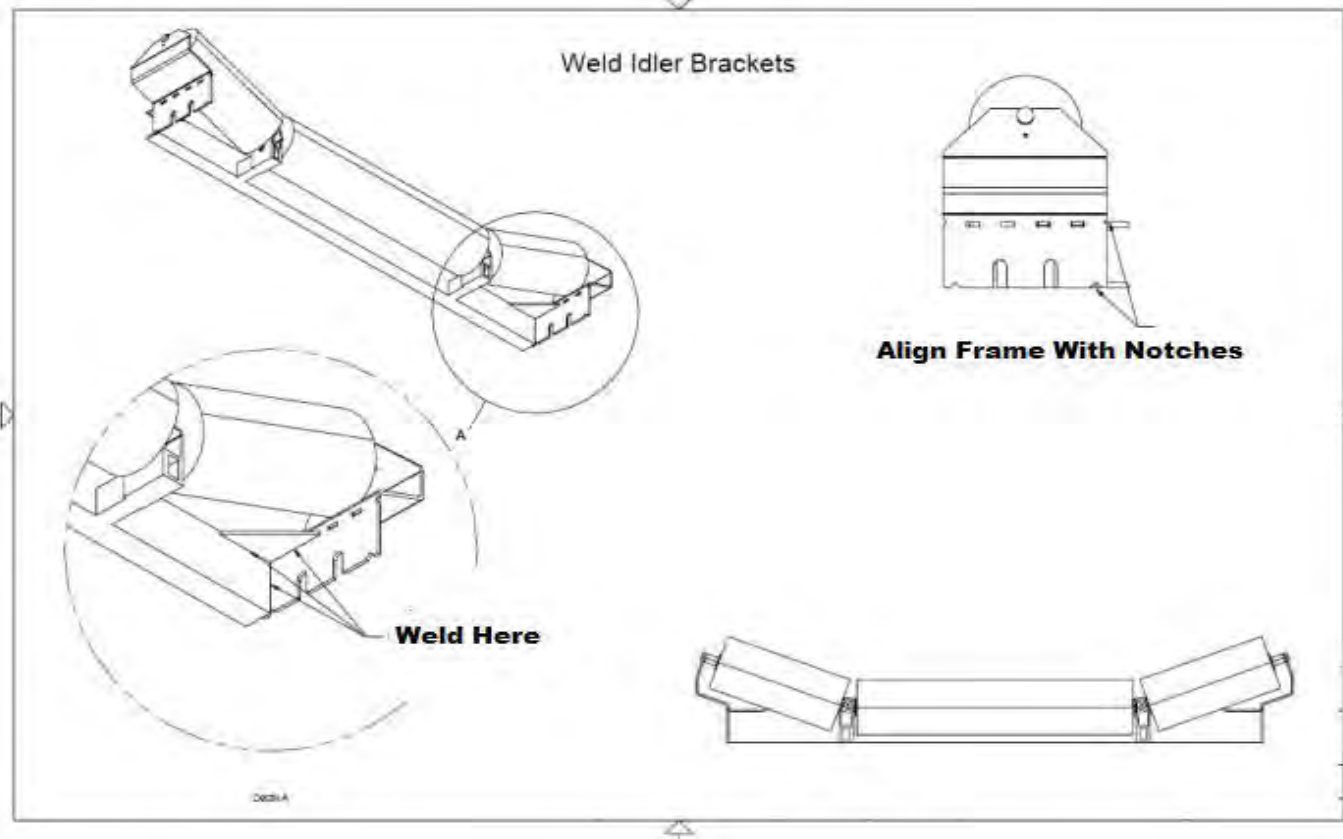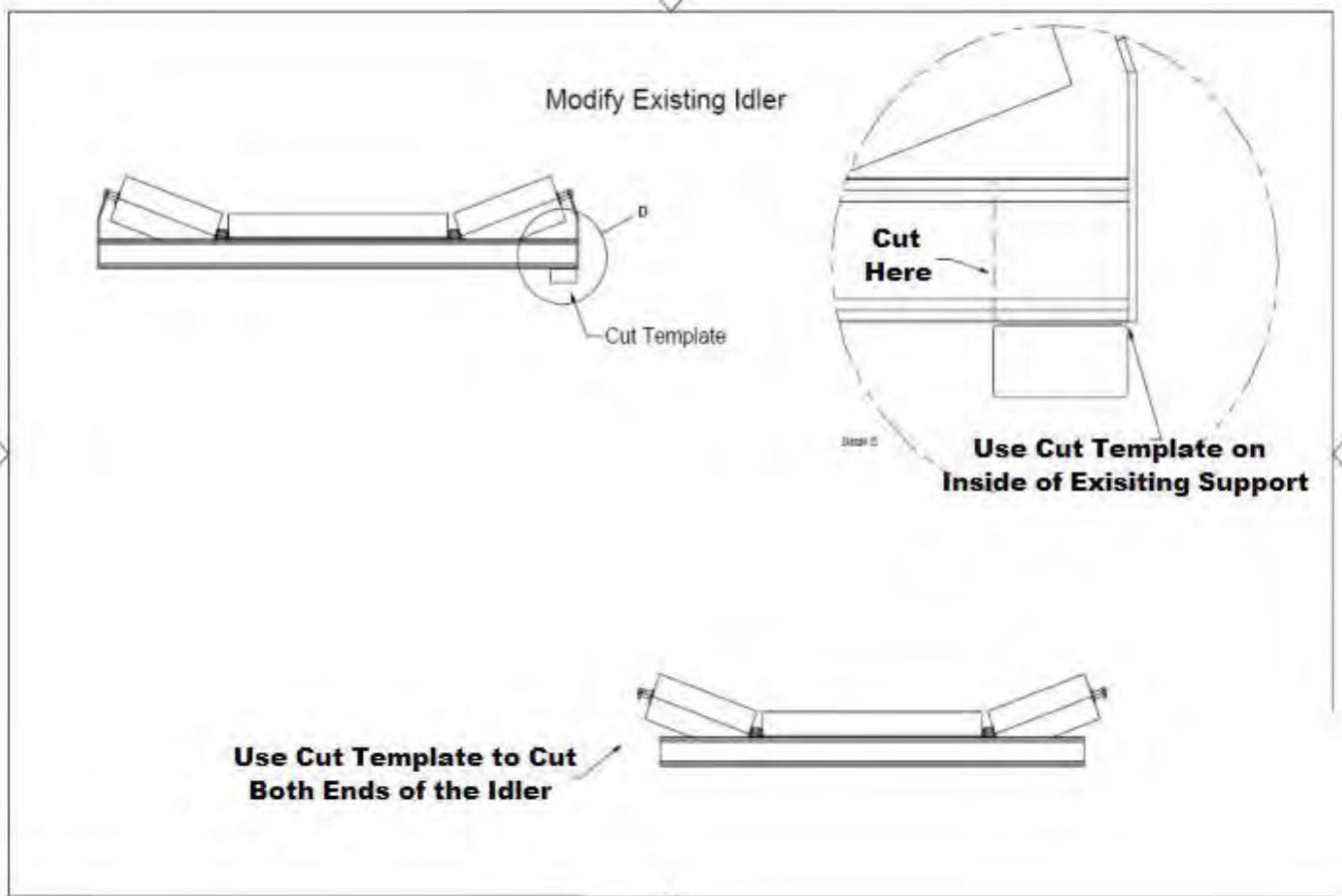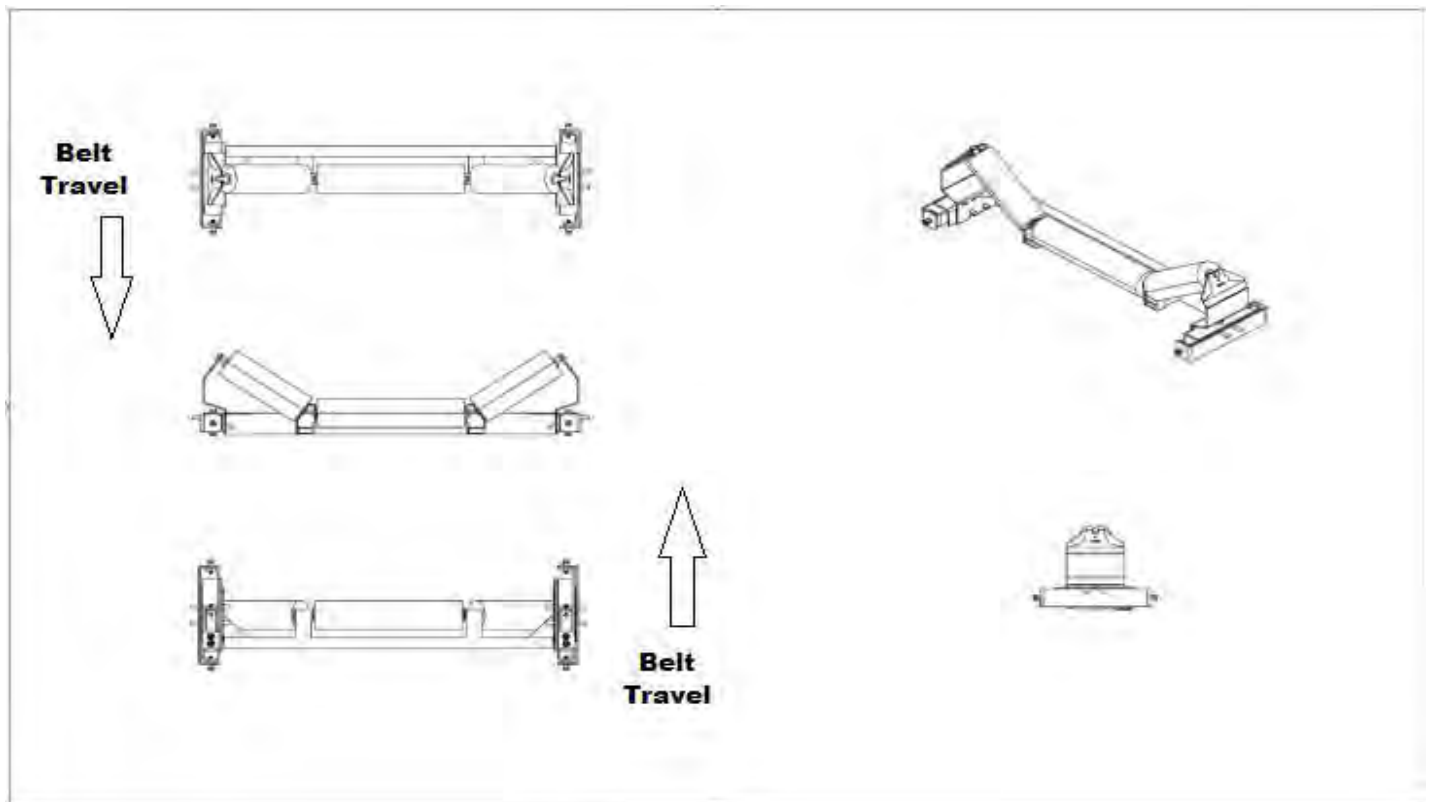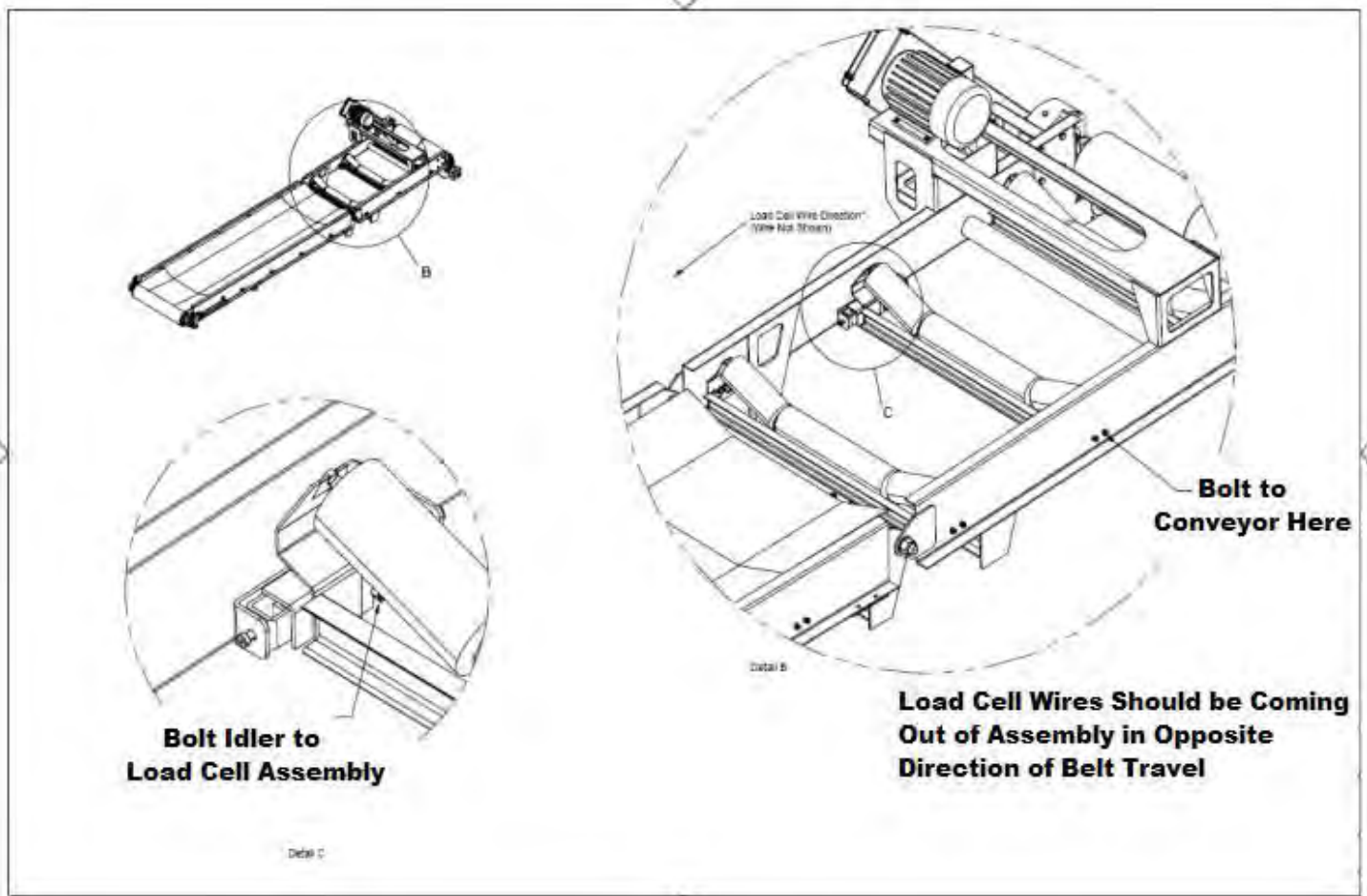
<u>DO NOT ROUTE CABLES NEAR HIGH VOLTAGE !</u>

The Idler mounted on the scale assembly MUST be removed before <u>*Overland Transport*</u> of equipment to avoid damage to load cells.

Install your Integrator (Control box)

- Mount Integrator away from vibration to avoid damage to circuit board. - **Mounting near vibration will void warranty.**
- Mount out of direct sunlight to avoid damage to Liquid Crystal Display.

2.

INSTALLTION OF STANDARD SPEED SENSOR

DIRECTION OF TRAVEL

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

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

INSTALLTION OF MAGNETIC ENCODER
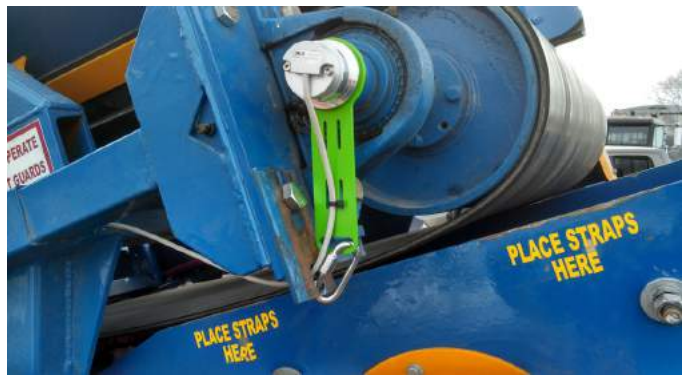
Wiring Specifications for Extended Cable

ENCODER	EXTENDED CABLES	CONTROL BOX
Blue Wire	White/Green	GND(Blue)
Red Wire	Red	+24 vdc(Brown)
Gray Wire	Black	Speed In (Black)

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

When Installing Encoder you will need to go to <u>Control Box</u>:

(Should be set up at Factory when Ordering an Encoder)

3.

Clockwise (CW) rotation of magnetic actuator

Data sheet
RM44D01_04

Output specifications - 24 V supply

RM44IA - Incremental, push-pull, 24 V

Power supply	V_{dd} = 8 V to 26 V
Power consumption	50 mA – at 24 V
Max. output load	30 mA
Output signals	A, B, Z, A-, B-, Z- (RS422A)
Max. cable length	20 m
Operating temperature	-40 °C to +85 °C
Edge separation	min. 1 µs

Resolution options (counts per rev)	Maximum speed (rpm)	Accuracy*	Hysteresis
320, 400, 500, 512	30,000	±0.7°	0.18°
800, 1,000, 1,024	20,000	±0.5°	0.18°
1,600, 2,000, 2,048	10,000	±0.5°	0.18°
4,096	5,000	±0.5°	0.18°
8,192	2,500	±0.5°	0.18°

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

Connections

Function	Wire colour
Shield	–
V_{dd}	Red
GND	Blue
A	Grey
A-	Pink
B	Green
B-	Yellow
Z	White
Z-	Brown

Timing diagram
(complementary signals not shown)

$$\frac{360° \times 4}{\text{counts per rev}} = 1 \text{ cycle}$$

edge separation

A

B

Z

reference impulse
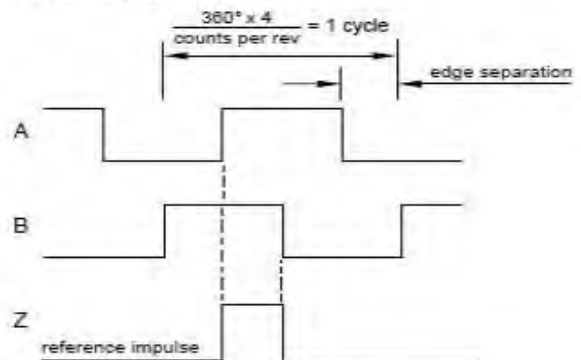
B leads A for clockwise rotation of magnetic actuator.

Operating and electrical specifications

Humidity (for IP64 version)	Storage 95% maximum relative humidity (non-condensing) (IEC 61010-1) Operating 80% maximum relative humidity (non-condensing) (IEC 61010-1)
Acceleration	Operating 500 m/s² BS EN 60068-2-7:1993 (IEC 68-2-7:1983)
Shock (non-operating)	1000 m/s², 6 ms, 1/2 sine BS EN 60068-2-27:1993 (IEC 68-2-27:1987)
Vibration (operating)	100 m/s² max at 55 to 2000 Hz BS EN 60068-2-6:1996 (IEC 68-2-6:1995)
EMV compliance	BS EN 61326
Cable	Outside diameter 5 mm
Mass	Encoder unit 1 m cable (no connector) IP64 112 g, IP68 129 g. Magnetic actuator <2 g
Environmental sealing	IP64 (IP68 optional) BS EN 60529

3-A.

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 diameter of your pulley size

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.

ROUTING OF CABLES

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

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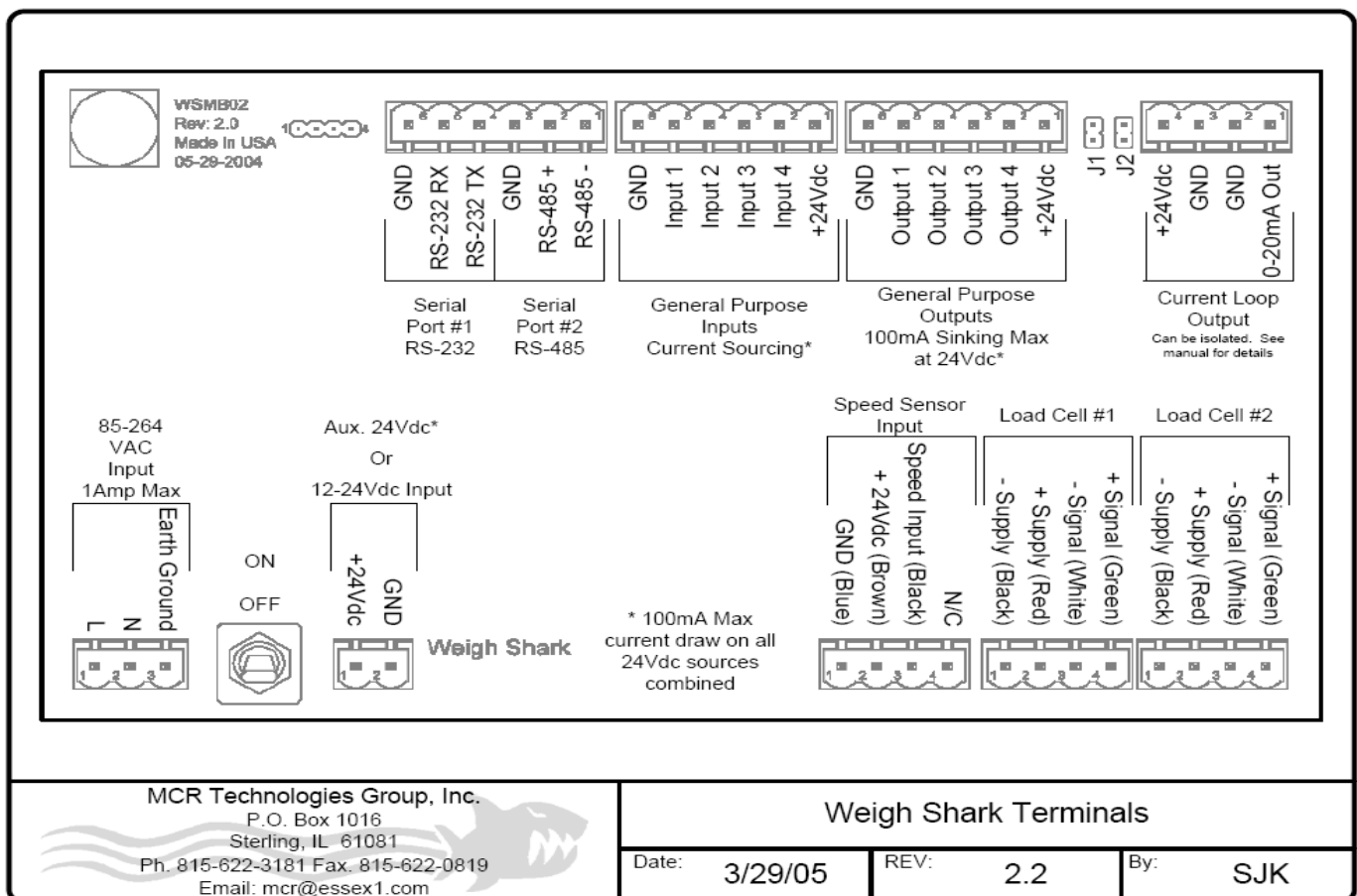
4. When all electrical connections are properly made, turn **ON** the unit at the Power Switch on the board.

5.

CORRECT CIRCUIT BOARD WIRING.

* Junction Box Wiring Instructions *
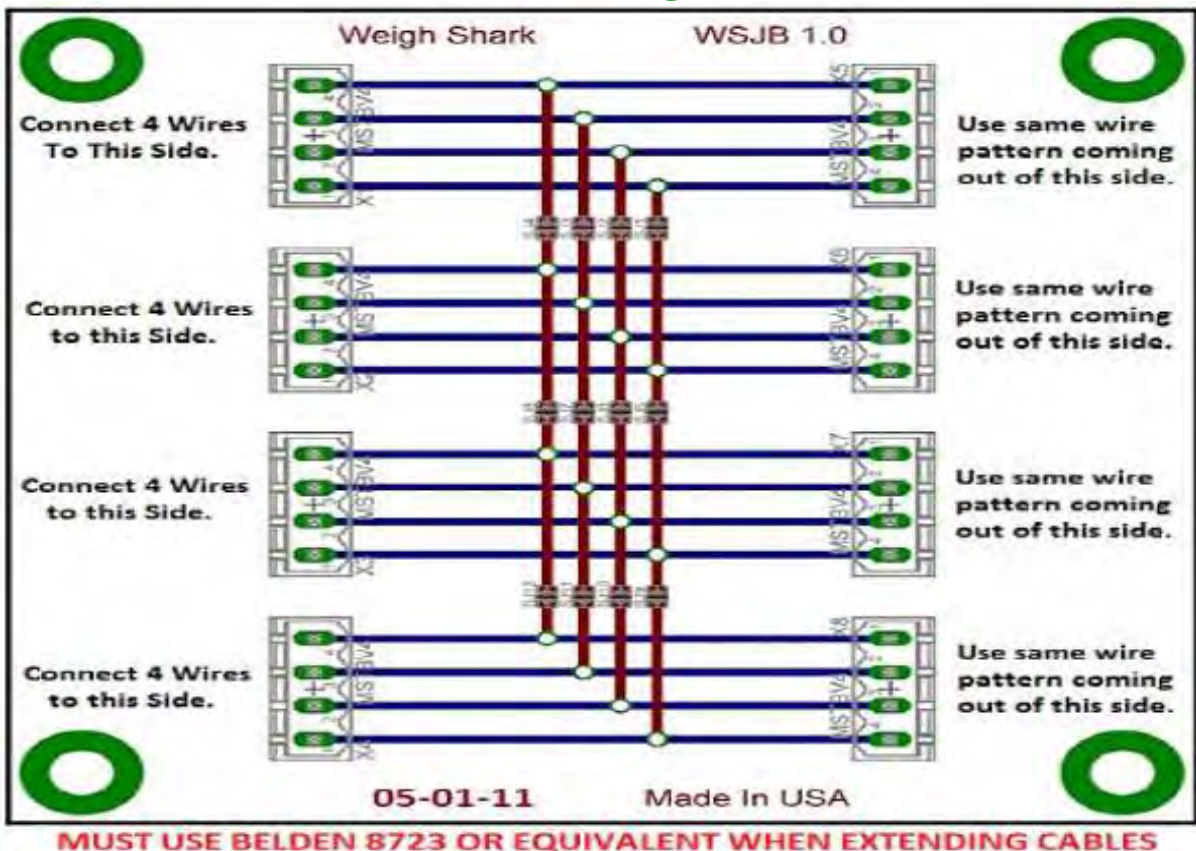
Single, Dual, Triple and Quad Idler Scales

Our WEIGH SHARK integrator will support up to 8 Load Cells (4-pairs)
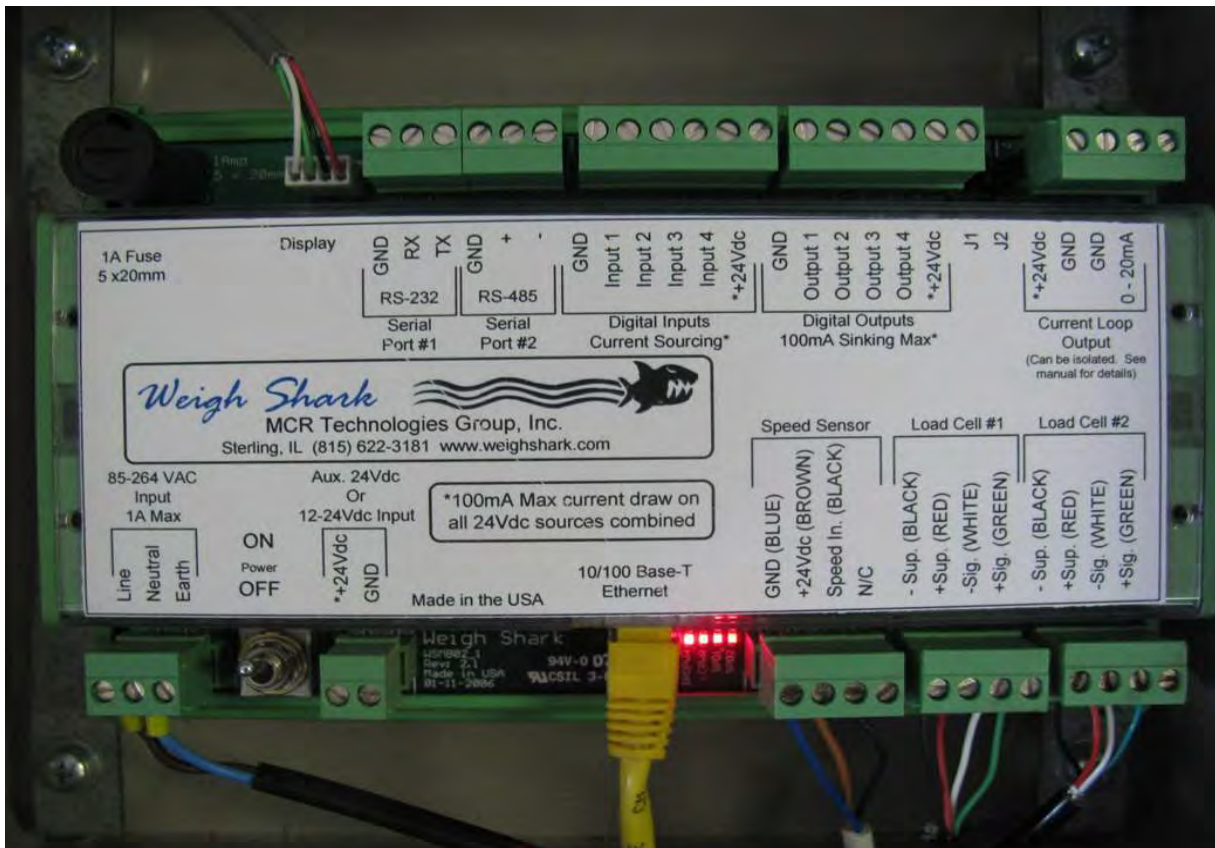
Our Standard Weigh Shark Scale is a single idler scale. It can be converted to a Multi Idler Scale by the addition of pairs of load cell assemblies on adjacent idlers. Multi idler scales increase accuracy by weighing more material for a longer period of time.

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

Dual Idler
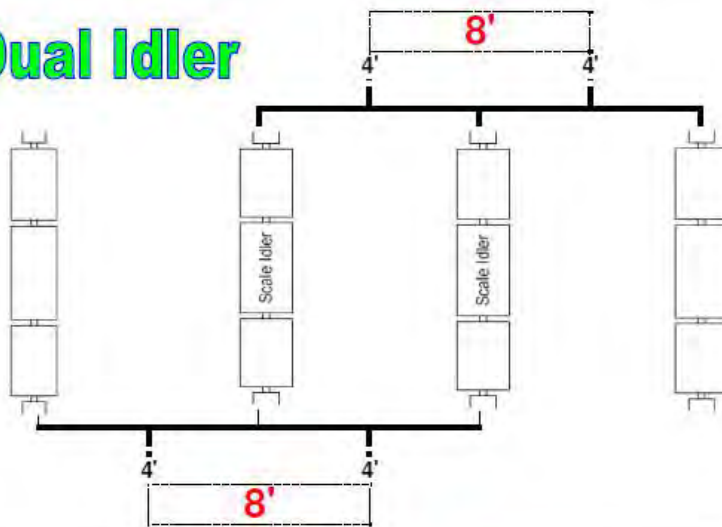
A Multi Scale Idler With 1 Extra Idlers would have a Span of 16'
(8' + 8' = 16')

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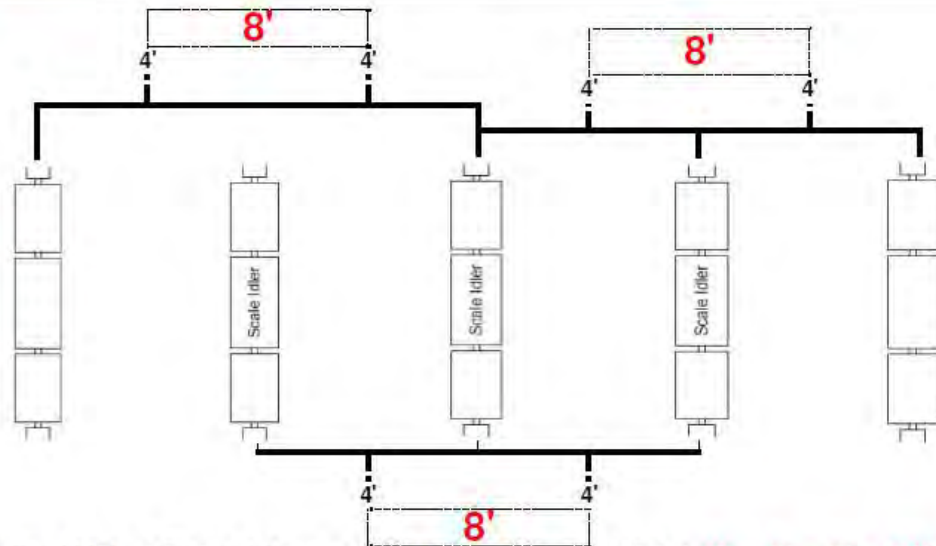
A Multi Scale Idler With 2 Extra Idlers would have a Span of 24' (8' + 8' + 8' = 24')

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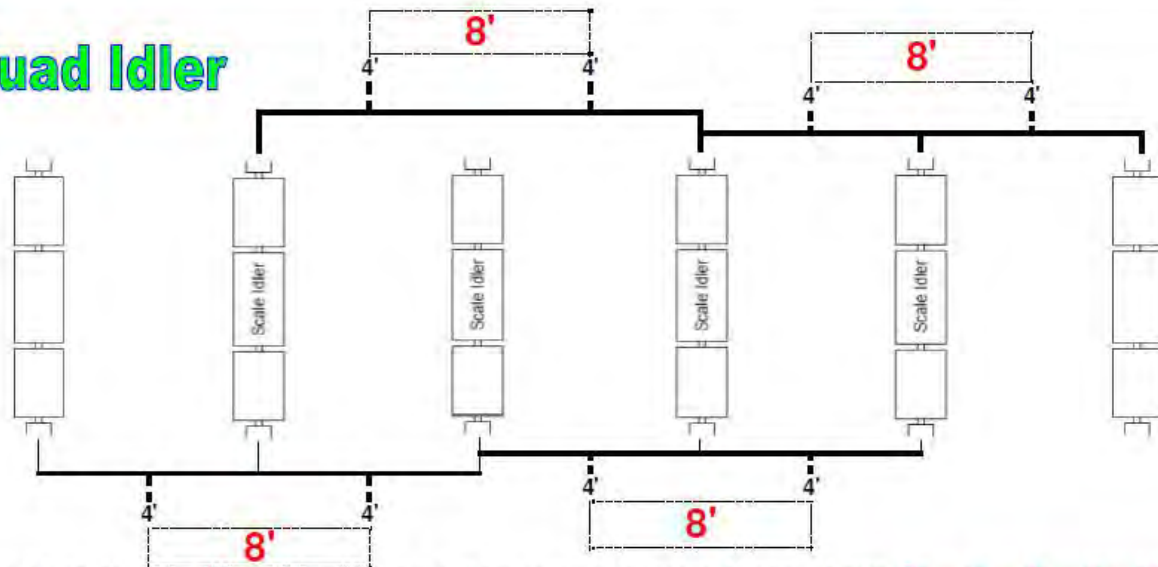
A Multi Scale Idler With 3 Extra Idlers would have a Span of 32' (8' + 8' + 8' + 8'= 32')

-Continue with Calibration Process-

8.

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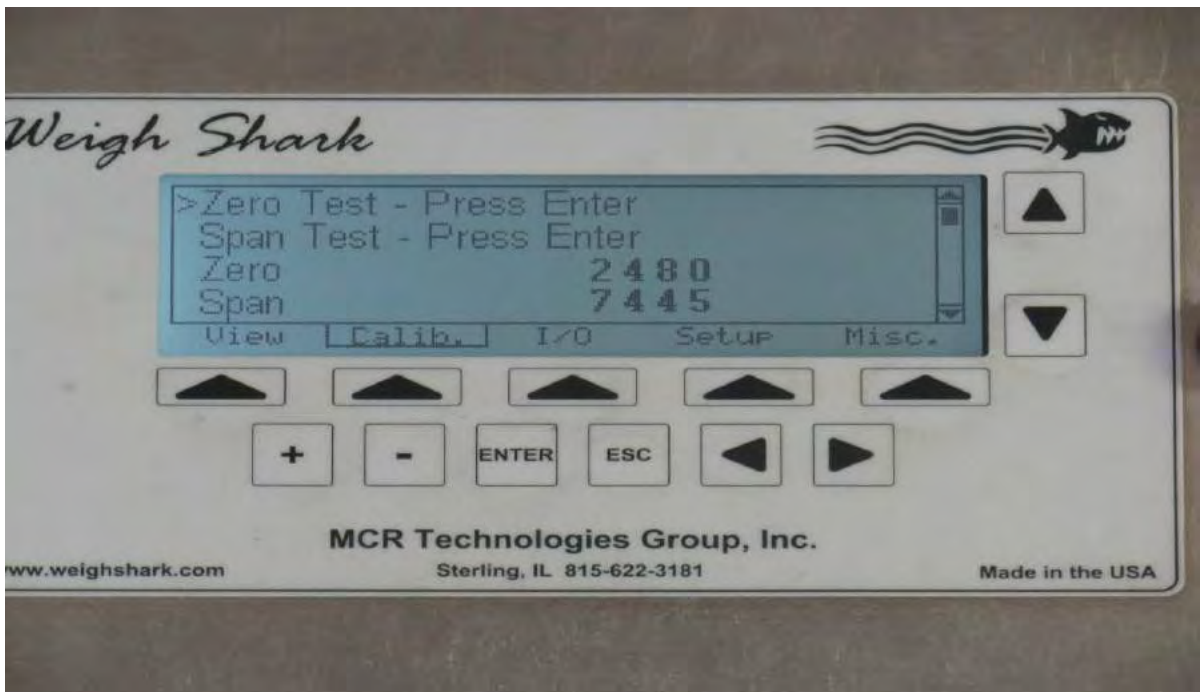
4. Mark the belt or use the belt splice as your reference. Follow the instructions on the display.
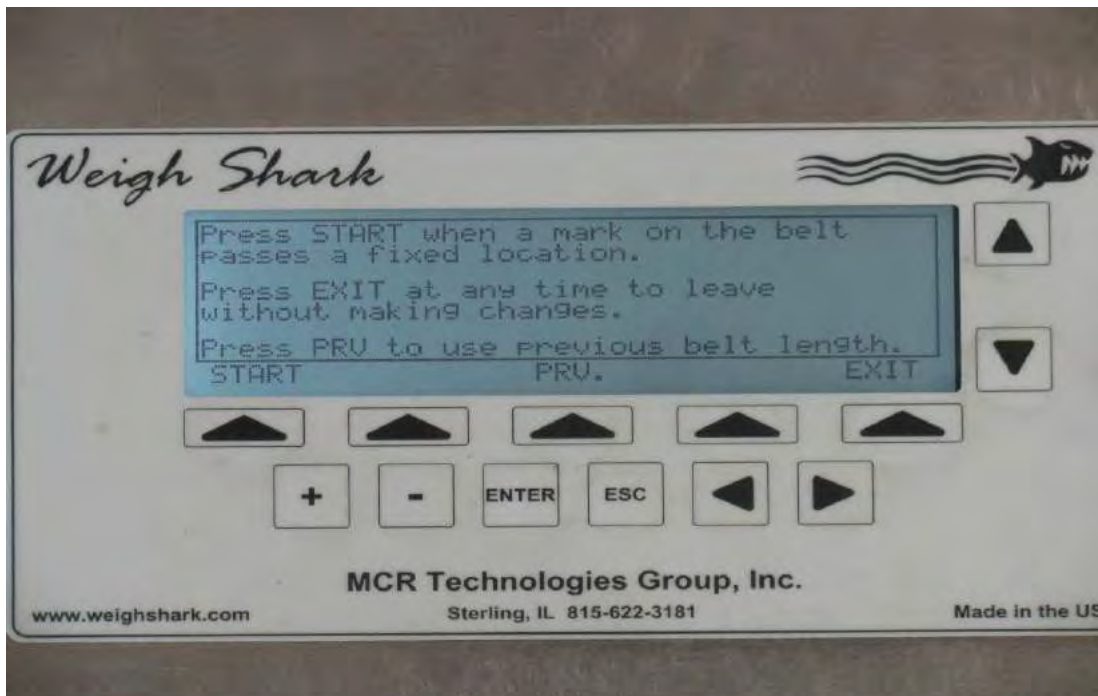
5. Press the Arrow under **START** when your **Empty Belt** passes a reference point start to measure and weigh your belt. The display will show you information during this step. Watch your belt make one (1) revolution and press the arrow under **END** after completion of this one revolution.

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.
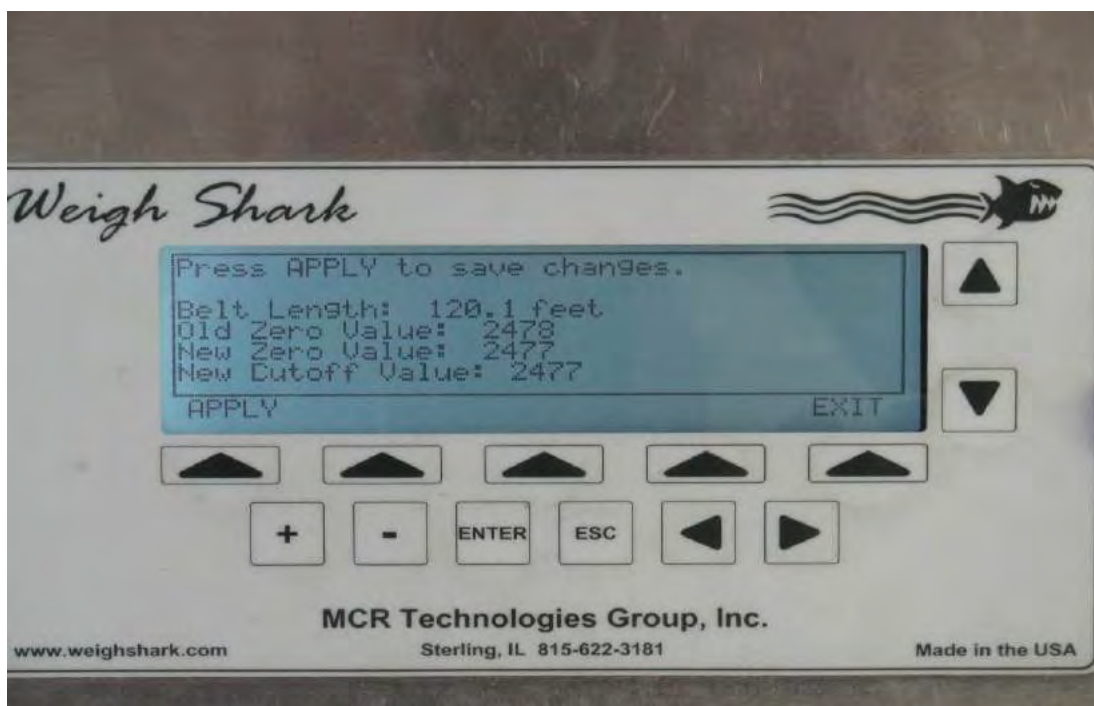
PREVIOUS FEATURE
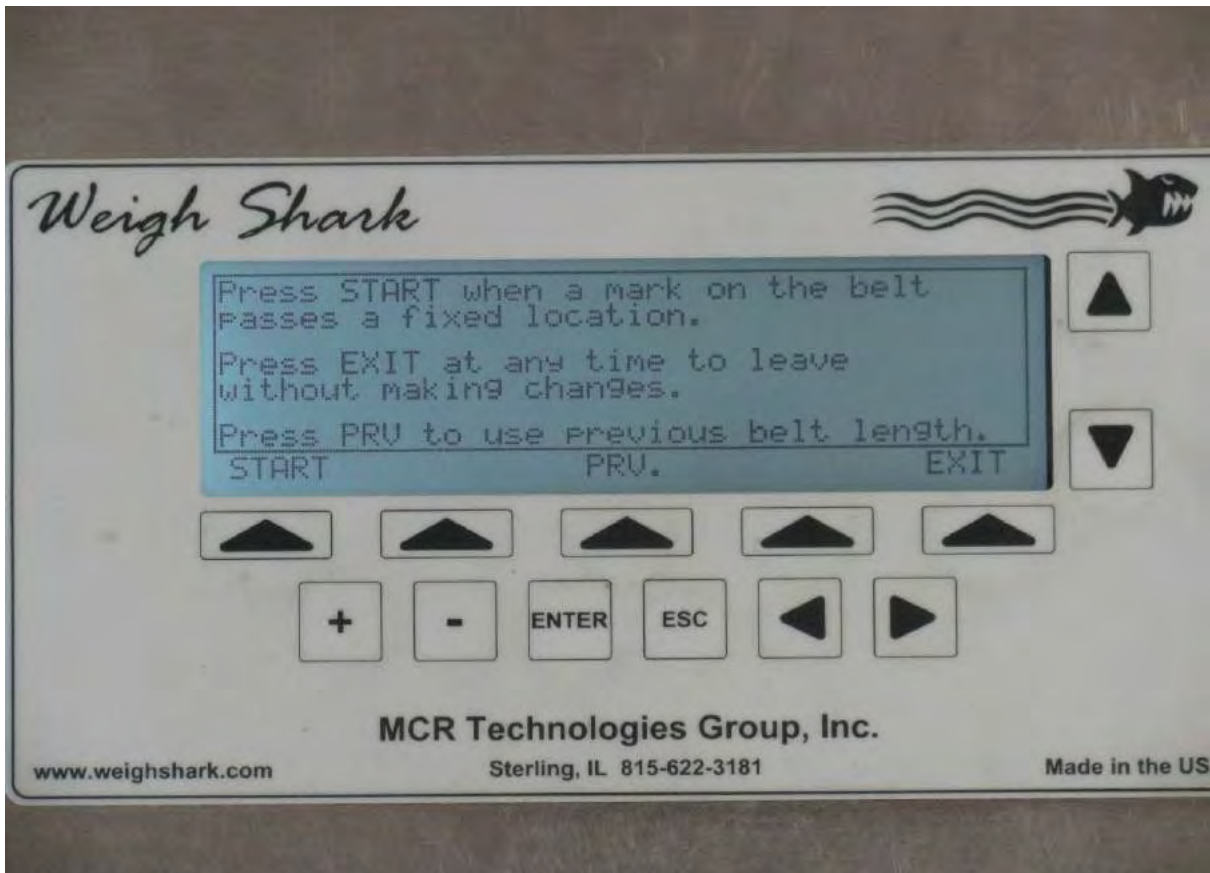
Once you have established a Zero Number you have also established a belt length for your conveyor. By using the PRV (previous) feature on the screen, it will allow you to start a zero test without having to wait for your splice or mark on the belt. Keep in mind that the belt MUST be empty and no calibration 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)!
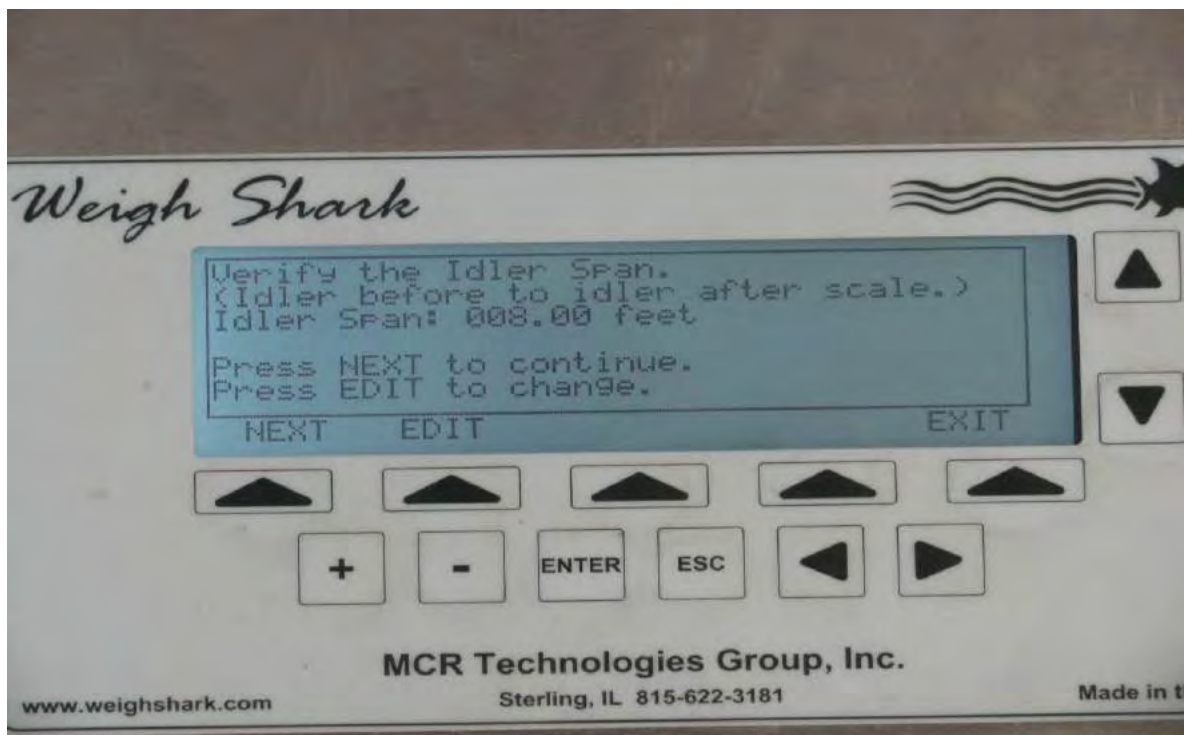
6. The screen will instruct you to Press NEXT to continue or Press EDIT to Change. The Idler Span value defaults to 8.00 feet. If you need to change this value, press the arrow under EDIT.

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.
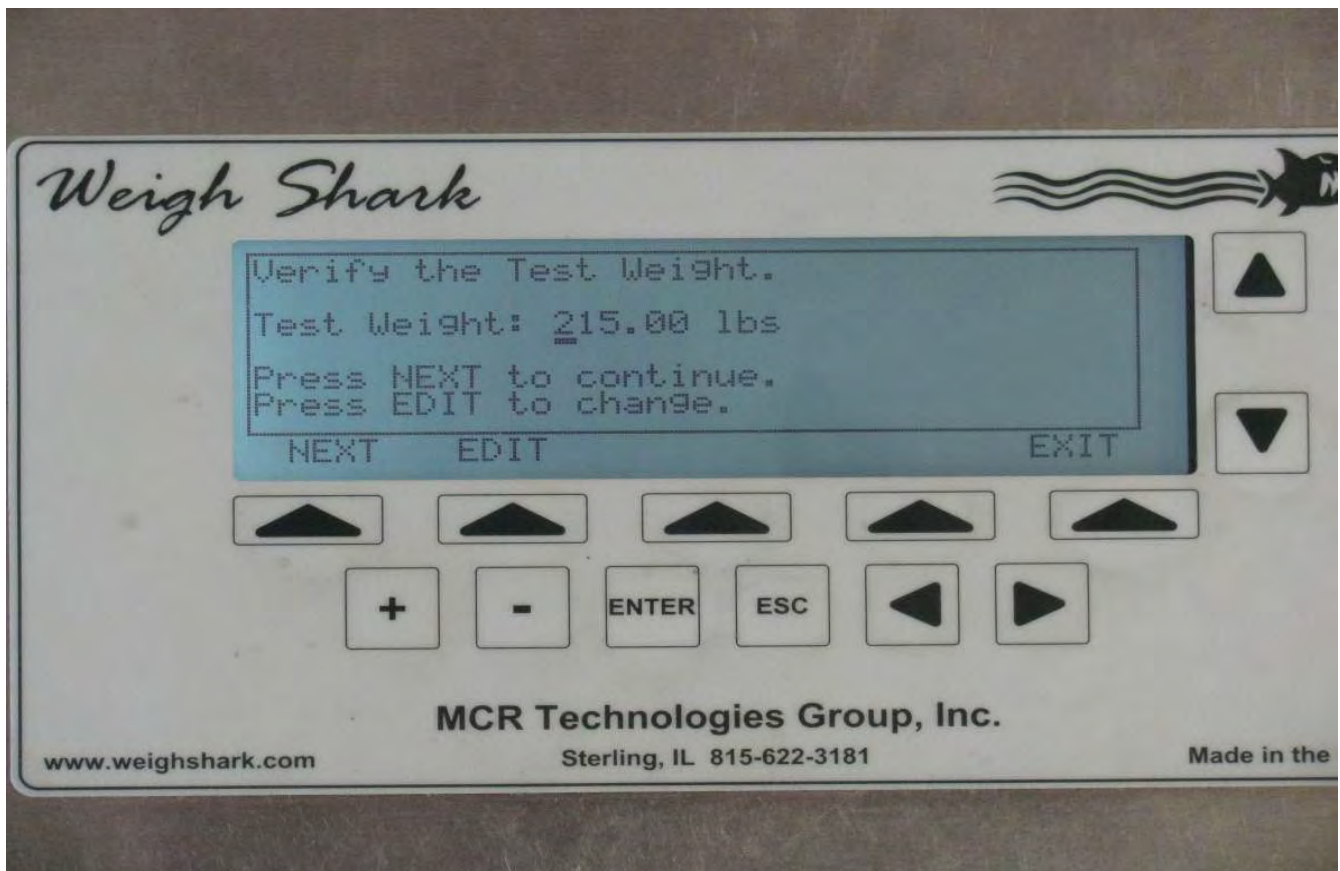
10. The screen will change and ask you to "Verify the Test Weight" value.

11.

- *YOUR MUST run a material test to calibrate your CIT scale....*

-

-

- *Press EXIT....Catch material and follow the instructions on :*
PAGE 15..."Material Test"

13

Channel Insert Scale
Calibration Addendum
01/28/11

The design of CIT idlers makes it virtually impossible to mount calibration weights for the SPAN Test required to establish our SPAN (amplification).

This leaves two (2) alternatives for SPAN calibration:

Preferred**: Material Test. After the ZERO test has been completed, either run a known amount of material over the scale or catch material and weigh it to determine how much actually crossed the scale <u>vs</u> how much the scale thought crossed it. Use the Material Test Formula found on page 16 to adjust the SPAN (line 4 of Calibration screen).**

Second Choice**: If the material test mentioned above is not possible then after the ZERO test is completed, STOP the empty belt. Put a know amount of weight onto the belt directly on top of the scale idler. Go to the MISC. screen and look at your SCALE WEIGHT line. This is telling how much weight the scale thinks is on the scale.**
Use the Known Weight in your Material Test formula to represent your "Truck" weight and use the Scale Weight amount shown to represent your Belt Scale Wt. This will tell you the correct SPAN number you should have so that the scale shows the same weight as is on it. Follow the instruction on the "Material Test" page to change your SPAN number. After you have applied your change the Scale Weight shown on the Misc. screen should agree with what is on the scale.

MATERIAL TEST FOR CALIBRATION

- 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.

<div align="center">(Known Weight)   Divided By   (Wt. On Screen)</div>

New SPAN = (Truck Scale Wt. / Belt Scale Wt.) X 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 x 1.12….. If you wish to make your SPAN smaller by 12%, you take your SPAN number x .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.

Increasing live load signal in light load applications

If the <u>difference</u> 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.
3. Go To Setup.
   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 you 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 <u>normal rate</u>. 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. Each can be viewed and cleared separately. Each has its own Production Screen. It can be Viewed and Printed (with optional ticker 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   on right of faceplate) 4 times to place the cursor in front of the "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)

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.

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

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.

Non-Isolated Current Loop Output

Isolated Current Loop Output

R_{LOAD}

External Vdc Supply*

R_{LOAD}

+24Vdc GND GND 0-20mA Out

J1 J2

Current Loop Output

Remove Jumpers J1 and J2

+24Vdc GND GND 0-20mA Out

J1 J2

Current Loop Output

* Use an external Vdc supply. DO NOT use 24Vdc from Weigh Shark circuit board.

Supply must be 12-30Vdc at 50mA

MCR Technologies Group, Inc. P.O. Box 1016 Sterling, IL 61081 Ph. 815-622-3181 Fax. 815-622-0819 Email: mcr@essex1.com	Weigh Shark Current Loop Output				
	Date: 7/8/04	REV: 1.0	By: SJK

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.
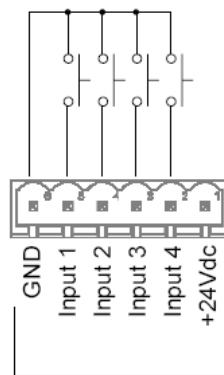
22.
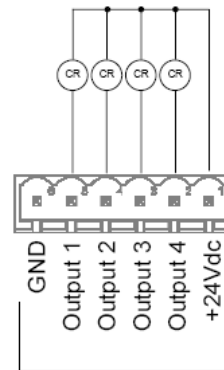
Digital Outputs

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.

23.
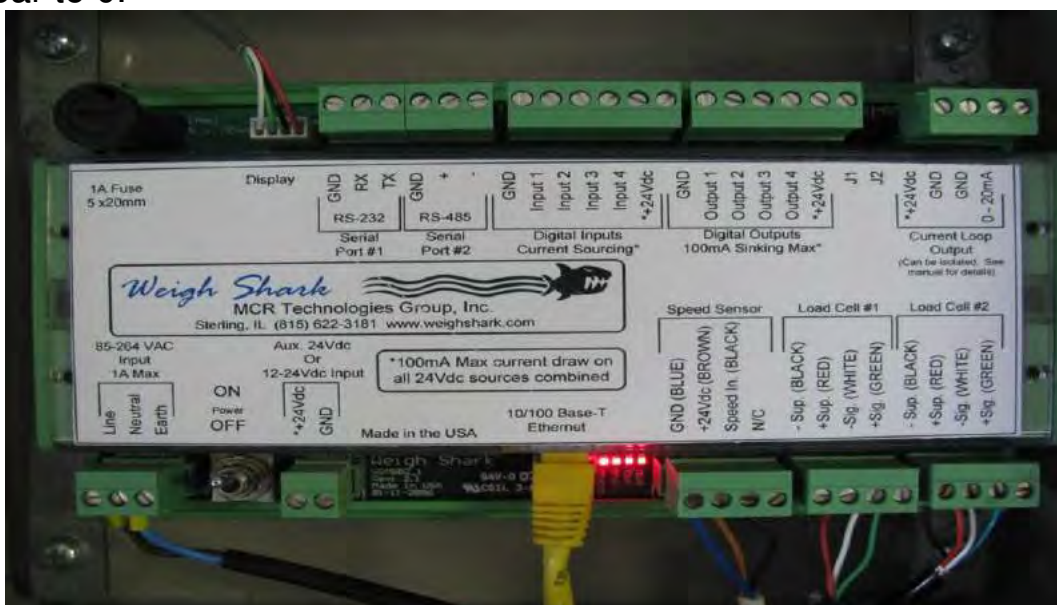
Use the + or - buttons to set the pulses per revolution to 80
Press APPLY
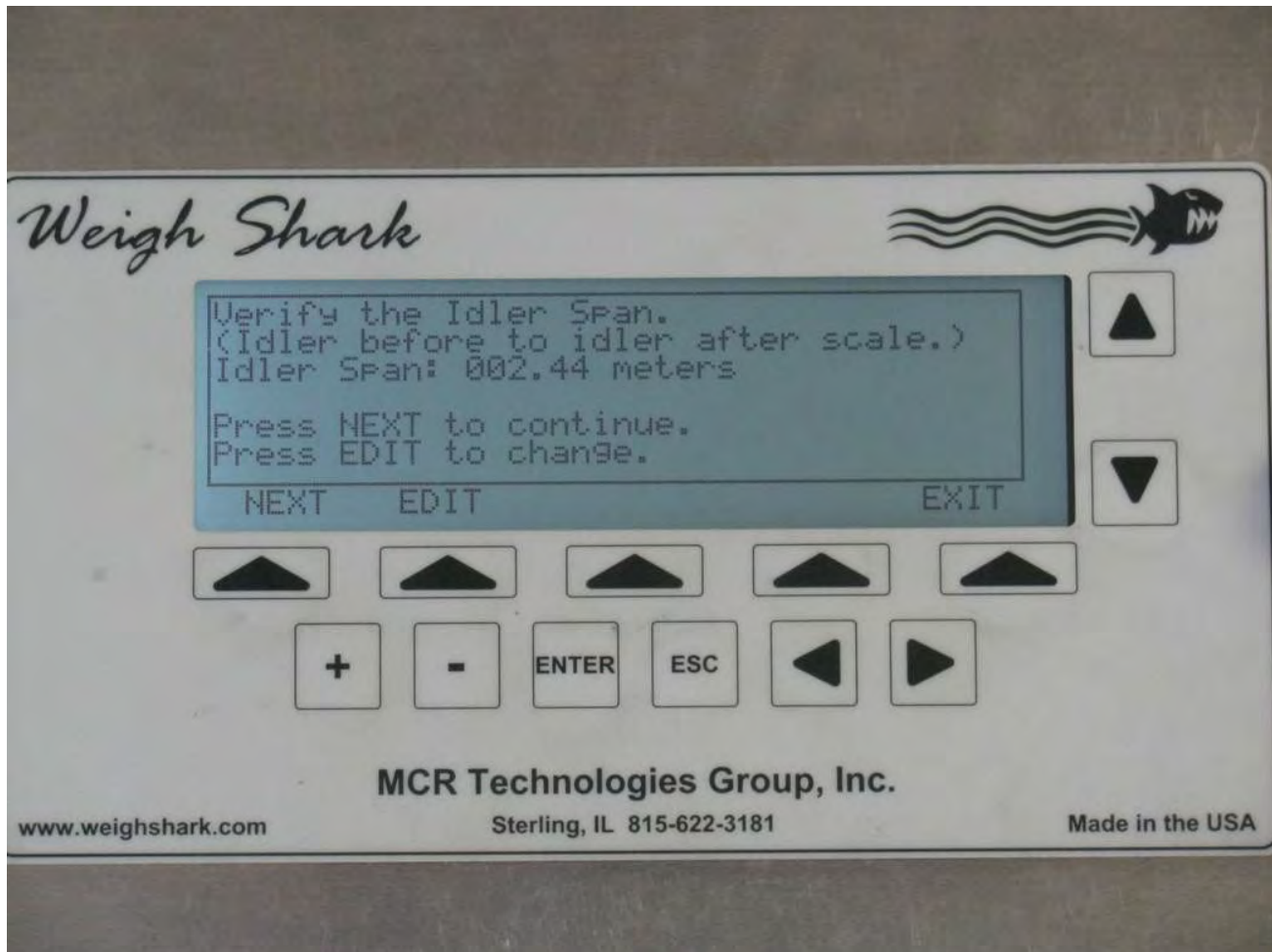
Arrow down one line to Pulses per Revolution
Verify you have 80 pulses
If not Press ENTER and EDIT to change this number.
Press APPLY

Changes are complete… Press EXIT to go to default screen.

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.
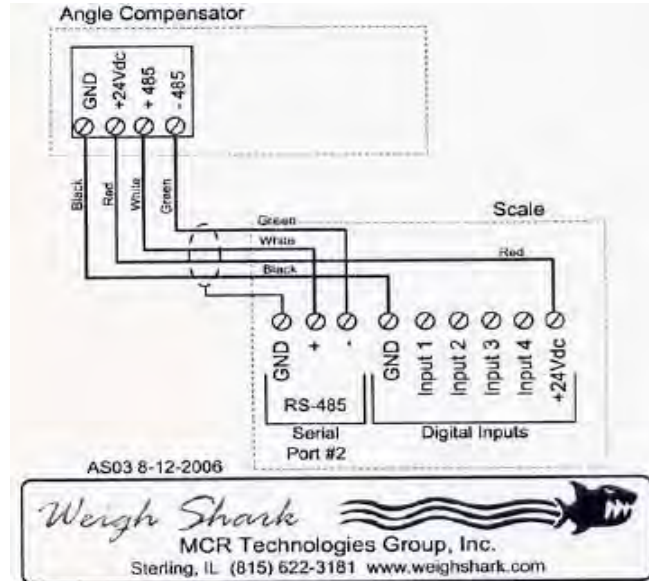
3. Power ON the control box.

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
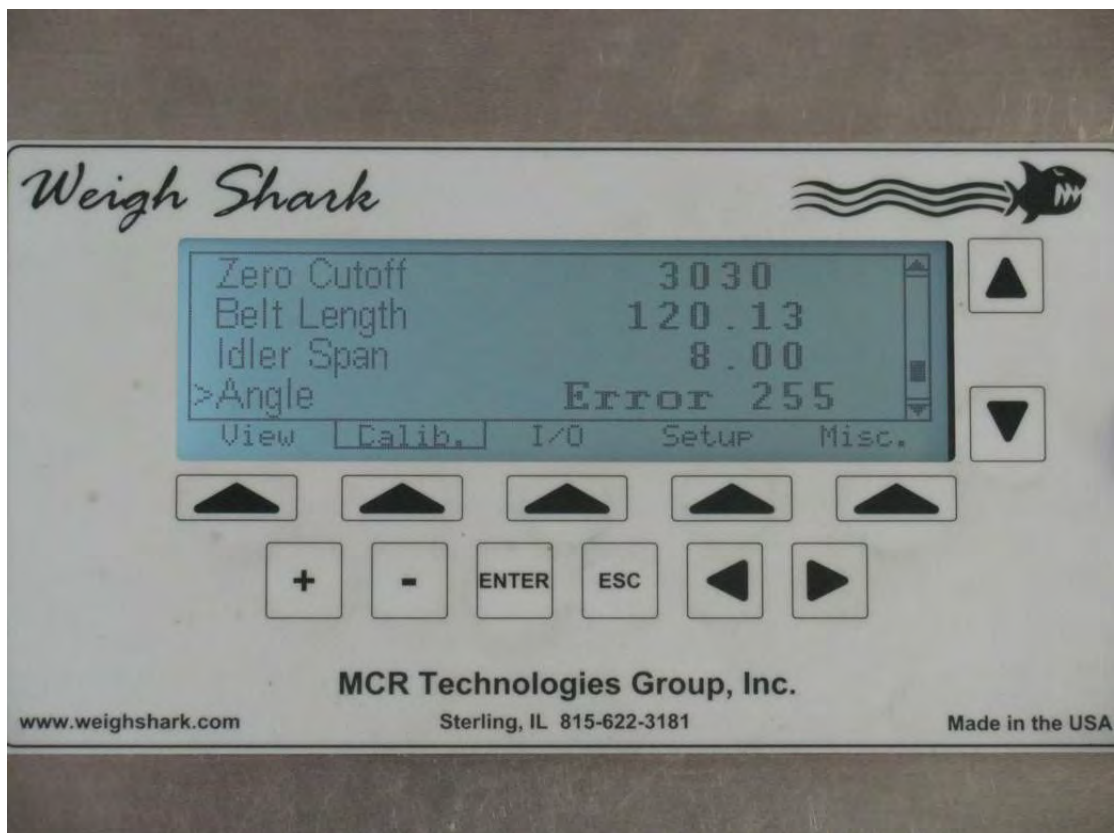
ERROR Message Showing NOT properly set up.

26.

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 1 **(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.
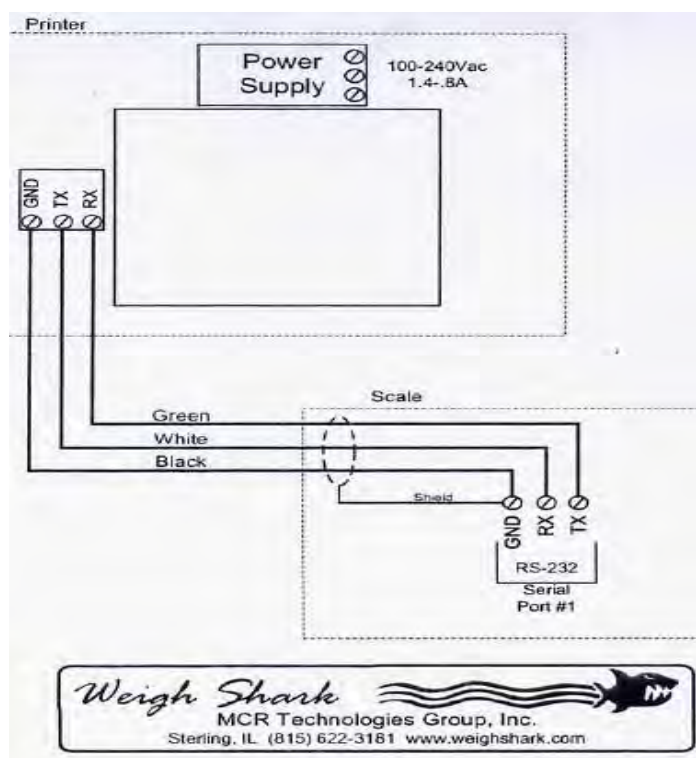
MUST CHANGE TIME

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 Use 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 lies 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.

  o Go to **I/O > Serial Ports** (Press Enter) **> RS 485** (Press ENTER)

  o Press **EDIT**. Use the **+ / - keys** to select sign Matko SBL

  o Press-**APPLY**. Belt scale will automatically reset.

  o After the scale resets, go to I/O > **Marquee Setup** (Press Enter).

  o Use **+ / - keys** to select # of lines (1 line displayed or 2 lines displayed).

  o Arrow down and use + / - key to select what you want displayed:
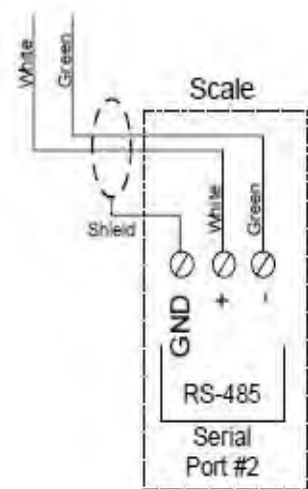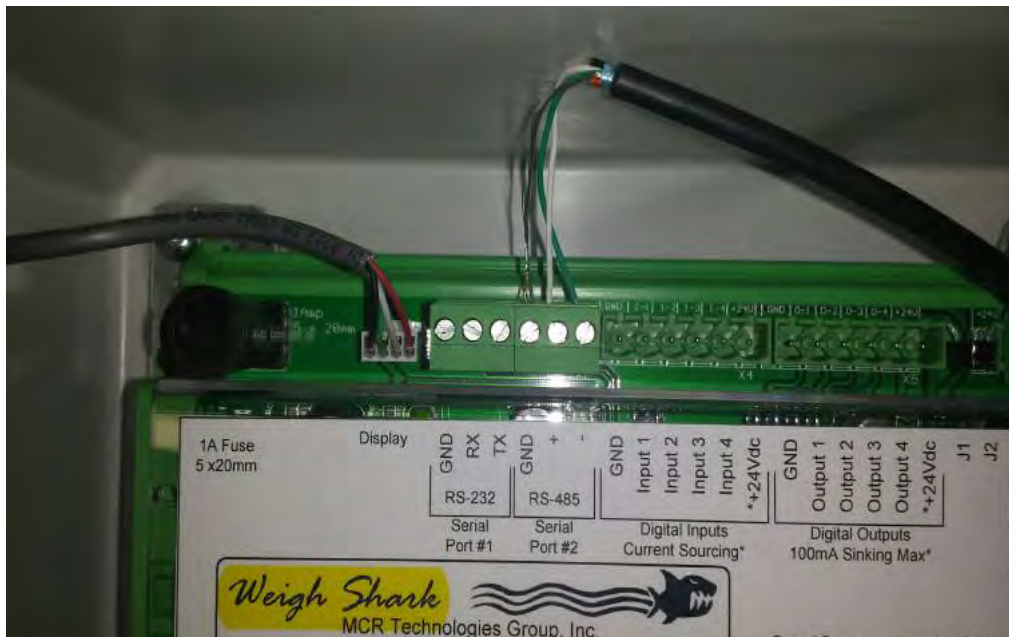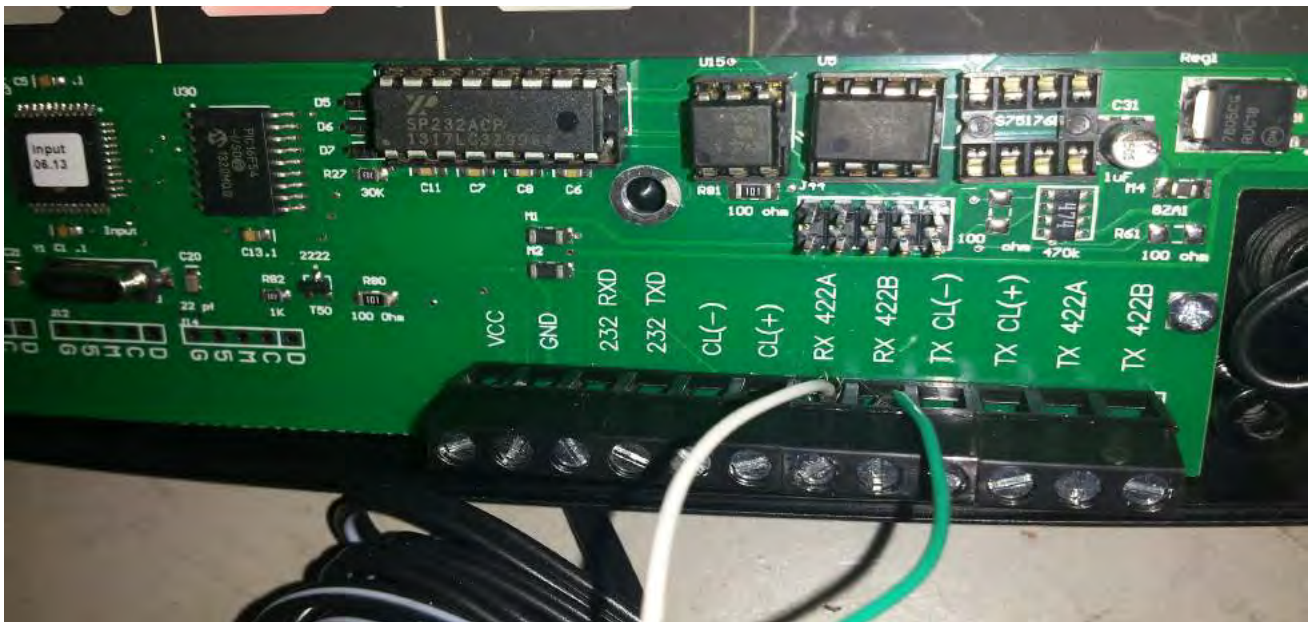
Wiring Configuration

Connect the Scale indicator using the appropriate diagram.

	Indicator	Pin	Display		Connector Pin Out	
Indicators with Active 20 mA Output	+20mA	6	CL (+)		1	VCC
	−20mA	5	CL (−)		2	GND
					3	232 RXD
					4	232 TXD
Indicators with Passive 20 mA Output	+20mA	1	VCC		5	CL(-)
		2	GND ⎤		6	CL(+)
		5	CL(−) ⎦ JUMP		7	RX 422A
	−20mA	6	CL(+)		8	RX 422B
					9	TX CL(-)
Indicators with RS232 Output	TXD	3	232 RXD		10	TX CL(+)
	GND	2	GND		11	TX 422A
					12	TX 422B
Indicators with RS422 Output	TX 422A (+)	7	RX 422A		13	13 GREEN
	TX 422B (−)	8	RX 422B		14	14 RED

#7 = White Wire

8 = Green Wire

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.

30.

Mounting Dimensions / Viewing
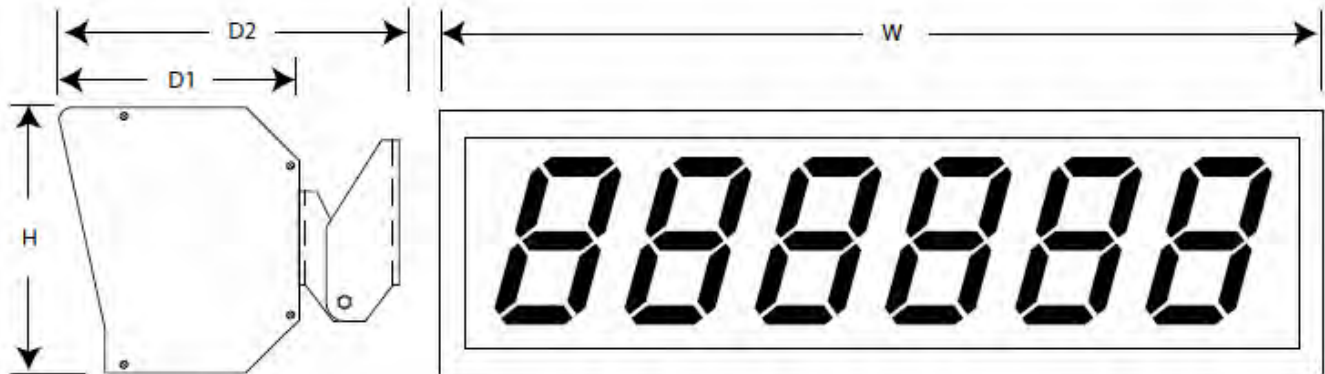
Display Information

Model	W	X	H	X	D1	X	D2	Shipping Weight
SBL-2	12.25		4.75		5.625		8.375	8 lbs.
SBL-4	26		8.375		7		9.75	23 lbs.
SBL4-SG	29.75		8.375		7		9.75	25 lbs.
SBL-6	35.375		10.375		7		9.75	35 lbs.
SBL-6SG	39.25		10.375		7		9.75	39 lbs.

Viewing Distances (Ft.)

Minimum	Optimum	Maximum
2'	5-25'	75'
10'	20-100'	150'
10'	20-100'	150'
15'	50-200'	250'
15'	50-200'	250'

Mounting Dimensions

Model	W	H
SBL-2	4"	3"
SBL-4	4"	3"
SBL-6	8"	3"

.250" Bolt Holes

3"

4"

31.
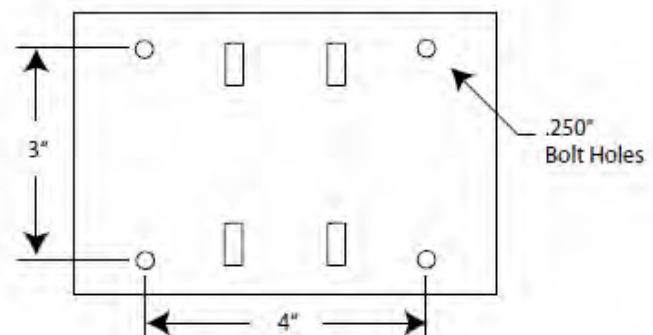
1. **IP Address**

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.

2. **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.

3. **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.

* Internet Access to Scales & Ethernet Example*

Plant 1

Scale 1
Scale 2
Scale 3
•
•
•
Scale 32

Remote Display

Firewall

- All the scales can be access 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 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.

Plant 2

Scale 1
Scale 2
Scale 3
•
•
•
Scale 32

Remote Display

Firewall

Internet

Computer

MCR Technologies Group, Inc. P.O. Box 1016 Sterling, IL 61081 Ph. 815-622-3181 Fax. 815-622-0819 Email: mcr@essex1.com	Internet Access to Scales					
	Date:	1/4/07	REV:	1.0	By:	SJK

Scale 1
Scale 2
Scale 3
Scale 4
Scale 5

Switch
Switch

Remote Display

Computer

Firewall

Internet

- 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.

MCR Technologies Group, Inc. P.O. Box 1016 Sterling, IL 61081 Ph. 815-622-3181 Fax. 815-622-0819 Email: mcr@essex1.com	Ethernet wiring example					
	Date:	7/18/05	REV:	1.0	By:	SJK

33.

Weigh Shark®
Modbus Serial and Ethernet Interface

1.0 Table of Contents

2.0 Technical Description

The Weigh Shark Modbus Slave interface allows a PLC, Operator Interface, PC or other Modbus Master device to access scale data over a RS-485 or Ethernet network.

The Weigh Shark scale provides the Modbus Slave interface thru the RS-485 port (Port 2) or the 10/100 Base-T Ethernet network.

Both the serial port and Ethernet port interfaces use the same data tables and can operate at the same time.

The following operations can be performed using the Modbus interface:

- Totals can be read and cleared. Current totals, run times and average rates as well as previous total information can be read.
- Current Rate and Belt Speed.
- Calibration Data can be read but NOT written. However a Zero Test can be performed thru the interface.
- Digital and Analog Inputs can be read and Outputs can be read and written.
- Data registers for the Truck load out systems can read and written.
- Scale name can be read and written. Total names can be read.

3.0 Port Setup

This section covers the basic steps of the Modbus Slave port Configuration. Configuration should be performed by qualified personal.

3.1   RS-485 Setup.

3.1.1   Software Configuration

The RS-485 port is capable running the MODBUS RTU protocol at 9600baud, 8 bit, no parity, and 1 stop bit.

To setup the RS-485 port for Modbus:
- Press the key under I/O.
- Use the ▼ key to move the cursor to Serial Ports.
- Press Enter.
- Use the ▼ key to move the cursor to Port 2 (RS-485).
- Press Enter.
- Press the key under Edit. A cursor should display after the word Function.
- Use the + key to change the function to MODBUS RTU.
- Press the key under Apply.
- The screen will change back to the previous screen. Line 3 shows Modbus/RTU ID.
- To change the Modbus/RTU ID use the ▼ key to move the cursor to line 3. Use the +/- key to change the value.
- **Cycle the power on the scale for the serial port changes to take affect.**

3.1.2   Hardware Configuration

3.1.2.1   RS-485 Port

The RS-485 hardware port is a 3 pin terminal located at the top left side of the main circuit board. If the network cable is going to be run long distances it is recommended that it be isolated; contact factory for more details.
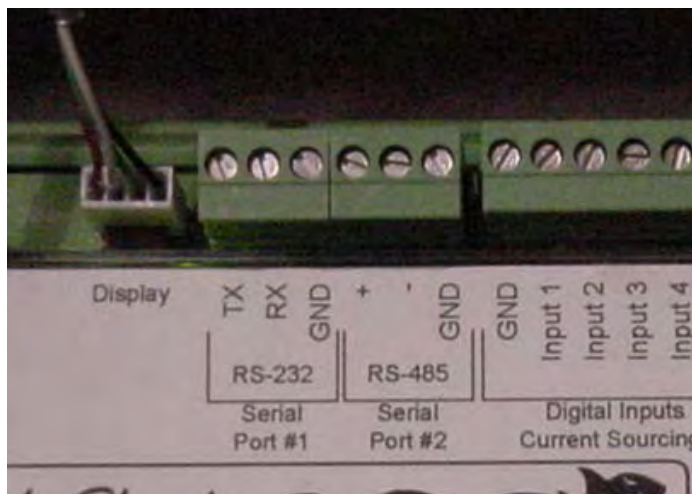
Figure 1

3.1.2.2   RS-485 Port Termination Resistor

The RS-485 port comes standard with a 220Ω termination resistor installed. To change this 2 jumpers must be removed.

- Remove circuit board cover by removing the 4 screws (2 on each side of the cover).
- Locate the two jumpers (JP1) below and to the right of the 3 pin RS-485 terminal.
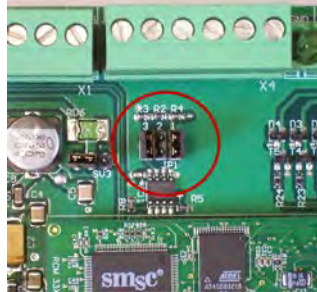
Figure 2 - RS-485 Termination Jumpers ON

- Remove the 2 jumpers and place them on only 1 pin each for storage.
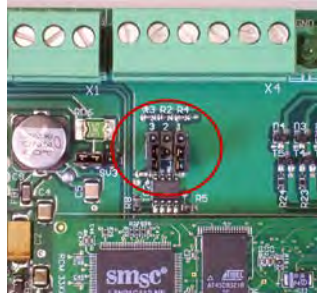
Figure 3 - RS-485 Termination Jumpers OFF

3.2   Ethernet Configuration

3.2.1   Software Configuration

3.2.1.1   Enable Modbus/IP

To enable Modbus on the Ethernet port Modbus/IP must be turned ON.
* 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 menu should display.
* Use the ▲ key to move the cursor up; this will switch to the last screen of the network settings.
* Continue pressing the ▲until the cursor is pointing to Modbus/IP (+/-).
* Use the +/- keys to change the value to ON.
* Press <<Back key to return to previous screen.

3.2.1.2   Set IP Address

An IP address consists of 4 groups of numbers; each group can be a value between 0 and 254. An example of an IP address is: 192.168.000.001. In most simple networks the first 3 groups of numbers stay the same between all the scales and PLC's; only the last group of numbers changes from scale to scale. For example if there were 5 scales on the network the numbering could be as follows:

Scale 1	192.168.000.001
Scale 2	192.168.000.002
Scale 3	192.168.000.003
Scale 4	192.168.000.004
Scale 5	192.168.000.005

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

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 menu should display.
* The cursor should now be pointing to 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 ◄► keys to move the cursor left or right.
* Use the +/- keys to increase or decrease the number under the cursor.
* When the correct IP Address is set, press the arrow key under Apply. The 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 address back to the factory default of 192.168.000.100.
* Pressing EXIT during the edit process will exit the screen without making changes.

Repeat the process for setting the network mask, gateway and name server.

3.2.2 Ethernet Hardware

The Weigh Shark Remote Display accepts standard RJ-12 10/100 Base-T Ethernet connection. The network port is located to the right of the 24Vdc power terminals. Figure 5 shows the empty port and the port with a network cable plugged in.
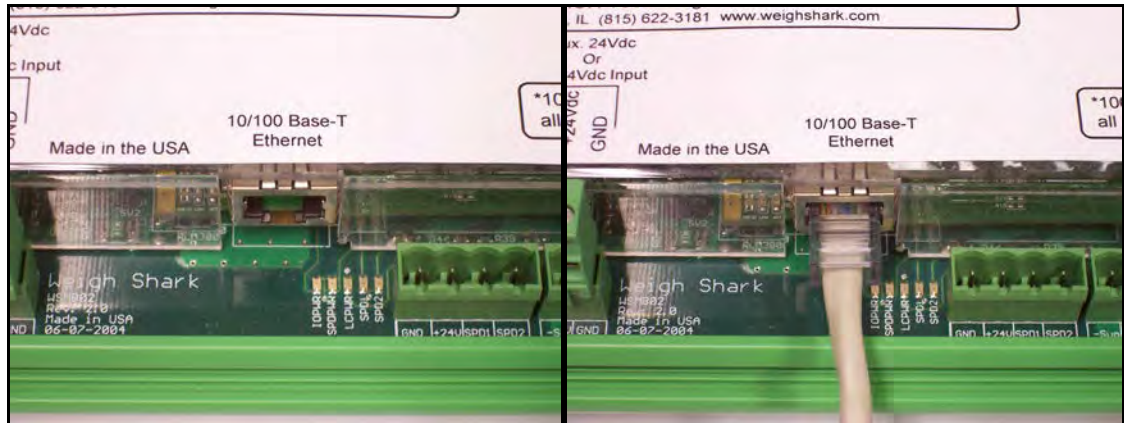

Figure 4

4.0 Modbus Registers

The Modbus registers are the same regardless of the port (RS-485 or Ethernet) used to access them. All register addresses are listed as decimal numbers and are Base 1; registers are numbered starting at 1.

4.1 Input Registers

Command: 0x02 Read Discrete Inputs

Inputs can be read as individual bits or as a single 16bit register.

Address	Function	Holding Register
1	Digital Input 1	92:0
2	Digital Input 2	92:1
3	Digital Input 3	92:2
4	Digital Input 4	92:3
5	Current Loop status (1 = Loop closed; 0 = Loop Open)	92:4
6	Truck Output	92:5
7	Truck Input	92:6
8	Truck Ready	92:7
9	Truck Done	92:8
10	Truck at Cutoff	92:9
11	Ticket Printing Enabled	92:10

4.2 Output Registers

Command: 0x01 Read Coils
                0x05 Write Single Coil

Output values are Read/Write. For Digital outputs to be under Modbus control their function must be set to MODBUS. Outputs can be read/written as individual bits or in one of 2 16bit registers.

Address	Function	Holding Register
1	Digital Output 1	93:0
2	Digital Output 2	93:1
3	Digital Output 3	93:2
4	Digital Output 4	93:3
5	Clear Total 1	93:4
6	Clear Total 2	93:5
7	Clear Total 3	93:6
8	Clear Total 4	93:7
9	Clear All Totals	93:8
10	Print Total 1 Ticket	93:9
11	Print Total 2 Ticket	93:10
12	Print Total 3 Ticket	93:11
13	Print Total 4 Ticket	93:12
14	Truck Load Out Clear	93:13
15	Truck Load Out Start	93:14
16	Truck Load Out Stop	93:15
17	Clear Truck Total	94:0
18	Print Truck Ticket	94:1

4.3   Input and Holding Registers

Command: 0x04 – Read Input Register
                0x03 – Read Holding Register
                0x06 – Write Single Register
                0x16 – Write Multiple Registers
Data Types:
  Int – 16bit Word
  Long – 32bit Signed (stored in 2 Registers)
  Unsigned Long – 32 bit unsigned (stored in 2 Registers)
  Float – 32bit floating point (stored in 2 Registers)

Multi-byte values that are stored in 2 registers are stored as follows:
  123456789 = 0x075BCD15 hex

  Register 0 = CD15
  Register 1 = 075B

Address	Date Type	Read/Write	Description
1	float	r/w	Conveyor Angle (Angle Sensor must be installed)
2			
3	float	r/w	Cosine of Conveyor Angle
4			
5	float	r/w	Multiplier for Load Cell AD
6			
7	int	r/w	Angle Sensor Update
8	int	r/w	Angle Sensor Status
9	int	r/w	Angle Sensor Calibration
10	int	r/w	Used to perform Zero Calibration. See section 5.1
11	int	r/w	Clear Totals. See section 5.3
12	int	r/w	Clear Total 1. (Setting to 1 will clear Daily Total)
13	int	r/w	Spare4;
14	int	r/w	Spare5;
15	int	r/w	Spare6;
16	unsigned int	r/w	Down Counts
17	unsigned int	r/w	Previous Down Counts
18	long	r	Total 1 Accumulator in Lbs or Kg
19		r	
20	long	r	Total 1 Accumulator in Hundredth of Tons
21		r	
22	long	r	Total 2 Accumulator in Tenth of Tons
23		r	
24	long	r	Total 3 Accumulator in Tenth of Tons
25		r	
26	long	r	Total 4 Accumulator in whole Tons
27		r	
28	long	r	Run Time 1 in Seconds
29		r	
30	long	r	Run Time 2 in Seconds

31		r	
32	long	r	Run Time 3 in Seconds
33		r	
34	long	r	Run Time 4 in Seconds
35		r	
36	long	r	Previous Total 1 in lbs
37		r	
38	long	r	Previous Total 2 in Tenth of Tons
39		r	
40	long	r	Previous Total 3 in Tenth of Tons
41		r	
42	long	r	Previous Total 4 in Whole Tons
43		r	
44	unsigned long	r	Total 1 Last Clear in Seconds since January 1, 1980.
45		r	
46	unsigned long	r	Total 2 Last Clear in Seconds since January 1, 1980.
47		r	
48	unsigned long	r	Total 3 Last Clear in Seconds since January 1, 1980.
49		r	
50	unsigned long	r	Total 4 Last Clear in Seconds since January 1, 1980.
51		r	
52	long	r	Previous Run Time 1 in Seconds
53		r	
54	long	r	Previous Run Time 2 in Seconds
55		r	
56	long	r	Previous Run Time 3 in Seconds
57		r	
58	long	r	Previous Run Time 4 in Seconds
59		r	
60	long	r	Unused
61		r	
62	long	r	Average Rate in Hundredth of TPH
63		r	
64	long	r	Unfiltered Belt speed in hundredth of FPM
65		r	
66	long	r	Average Belt Speed in Hundredth of FPM
67		r	
68	long	r	Percent Load in Hundredth of %
69		r	
70	long	r	Unfiltered Load Cell AD value
71		r	
72	long	r	Filtered Load Cell AD Value
73		r	
74	long	r	Unused
75		r	
76	long	r	Scale weight in Hundredth of Lbs.
77		r	
78	long	r/w	Set point Value for Input 1
79		r/w	
80	long	r/w	Set point Value for Input 2

81		r/w	
82	long	r/w	Set point Value for Input 3
83		r/w	
84	long	r/w	Set point Value for Input 4
85		r/w	
86	unsigned long	r	Zero Calibration Value
87		r	
88	long	r	Span Calibration Value
89		r	
90	float	r	Belt Length in Feet
91		r	
92	int	r	Inputs (See Section 4.1)
93	int	r/w	Outputs (See Section 4.2)
94	int	r/w	Outputs (See Section 4.2)
95	int	r/w	Current Loop Output (See section 5.2)
96	int	r	Load Cell ADC Gain
97	int	r	Day
98	int	r	Month
99	int	r	Year
100	int	r	hour
101	int	r	min
102	int	r	sec
103	int	r	units (0 = English; 1 = Metric)
104	unsigned long	r	Total Trucks Loaded
105		r	
106	unsigned long	r	Total Tons loaded in Hundredth of tons
107		r	
108	unsigned long	r	Total Fill Time in Seconds
109		r	
110	float	r	Average Truck Weight
111		r	
112	float	r	Average Truck Fill Time
113		r	
114	float	r	Average Truck Fill Tons Per Hour
115		r	
116	float	r	Average Difference between Truck Loads
117		r	
118	float	r	Current Truck Percent Full
119		r	
120	float	r	Current Truck Estimate seconds until full
121		r	
122	float	r	Average Trucks per Hour
123		r	
124	unsigned long	r/w	Truck Cutoff Weight in Hundredth of Tons
125		r/w	
126	unsigned long	r/w	Truck Minimum Load in Hundredth of Tons
127		r/w	
128	unsigned long	r/w	Truck Maximum Load in Hundredth of Tons
129		r/w	
130	unsigned long	r	Current Truck Fill Time

131		r	
132	unsigned long	r/w	Current Truck Target Weight in Hundredth of Tons
133		r/w	
134	long	r	Current Truck Accumulator
135		r	
136	long	r	Current Truck Difference of Actual from Target weight
137		r	
138	int	r	Truck State
139	int	r	Truck Status
140	float	r	Idler Span in feet
141		r	
142	unsigned long	r	Time and Date of Last Zero. (Seconds since January 1, 1980.)
143		r	
144	unsigned long	r	Time and Date of Last Span. (Seconds since January 1, 1980.)
145		r	
146	float	r	Zero Test Belt Length
147		r	
148	unsigned long	r	New Zero Value
149		r	
150	long	r	Run Time 1 in thousandths of hours
151		r	
152	long	r	Average Rate in hundredth of tons based on Run Time 1.
153		r	
154	unsigned int	r	Cutoff Value
155	unsigned Int	r	Standard Rate in tph
156	char	r	Total 1 Name (16 characters)
157		r	
158		r	
159		r	
160		r	
161		r	
162		r	
163		r	
164	char	r	Total 2 Name (16 characters)
165		r	
166		r	
167		r	
168		r	
169		r	
170		r	
171		r	
172	char	r	Total 3 Name (16 characters)
173		r	
174		r	
175		r	
176		r	
177		r	
178		r	

179		r	
180	char	r	Total 4 Name (16 characters)
181		r	
182		r	
183		r	
184		r	
185		r	
186		r	
187		r	
188	char	r/w	Scale Name (26 Characters)
189		r/w	
190		r/w	
191		r/w	
192		r/w	
193		r/w	
194		r/w	
195		r/w	
196		r/w	
197		r/w	
198		r/w	
199		r/w	
200		r/w	
201	char	r/w	Truck ID (20 characters)
202		r/w	
203		r/w	
204		r/w	
205		r/w	
206		r/w	
207		r/w	
208		r/w	
209		r/w	
210		r/w	

5.0 Special Functions

5.1 Performing an Zero Calibration

Holding Registers Used: 10 – Read/Write Zero Calibration status
146 – Current Belt Length
148 – New Zero Value

A Zero Calibration can be performed at any time. However it is up to the user to be sure that the belt is empty during the test. There is nothing in the scale that will prevent a user from doing a Zero Calibration with a fully loaded belt.

The Zero Calibration is done using the stored belt length so it is not necessary to watch the belt for 1 complete revolution.

Values are Read and Written to Holding Register 10. The user will write values to the register and the scale will update the register with the current status of the Zero Test.

To start Zero Calibration:
- Write 1 to holding register 10. The Zero Calibration will start.
- Read register 10. During the Zero Calibration it will read 2.
- While test is running register 146 will show how far the belt has traveled.
- When test is done register 10 will read 3 and register 148 will contain the new Zero Value.
- Write 4 to register 10 to accept new Zero Value.
- Writing any other value to register 10 will cancel the test with no changes made to the calibration.

Register 10		
0	r	Zero Calibration not running
1	w	Start Zero Calibration
2	r	Zero Calibration Running
3	r	Zero Calibration Complete
4	w	Apply new Zero value
99	r/w	Cancel Zero Calibration

5.2 Current Loop Output

Holding Registers Used: 95 – Current Loop

Setting the Analog output function to Modbus will allow the current loop to be controlled directly by the Modbus master.

The current loop is a 16bit DAC. The value written to register 95 will directly output to the DAC.

The Analog Output settings, Action, Averaging and Range will still affect the output.

5.3 Clearing Totals

There are 2 ways to clear scale totals.
1.   Use Digital outputs addresses 5 – 9. (Or write to their corresponding Holding Registers)
2.   Write to Holding Register 11.
    a. Normally Register 11 is read as -1.
    b. Writing the following values will clear the corresponding total.

0	Clear All Totals
1	Clear Total 1
2	Clear Total 2
3	Clear Total 3
4	Clear Total 4
5	Clear Truck Totals

    c. After total is clear Register will read -1.

Totals can be cleared at any time.

Weigh Shark Mechanical Data

Performance	
Accuracy	0.5 to 1% over 3 to 1 range (depends on application)
Repeatability	0.02% of rated output
Non-Linearity	0.03% of rated output
Capacity	>6000 tph at 4' idler spacing and max belt speed

Speed Sensor	
Wheel Diameter	Stainless Steel 4.511
Pulses/Rev	32
Input	10 – 30 Vdc
Output	3-wire, NPN

Load Cell (2 per Idler)	
Construction	Single Ended Shear Beam
Material	Steel or Aluminum (Stainless Optional)
Non-Linearity	0.03% Rated Output
Hysteresis	0.02% Rated Output
Repeatability	0.02% Rated Output
Standard Capacities	100, 250, 500 lbs
Overload	1.5x rated capacity
Operational Temperature	-40°C to +80°C

Range	-40°F to +176 F
Temperature Compensation	-10°C to +50°C 15°F to +122°F
Rated Excitation	10Vdc (20Vdc Max)
Output	3mV/V

Idler	
Profile	Flat to 35° Up to 45° with reduced accuracy
Diameter	2 to 7"
Spacing	2 to 5 feet

Conveyor	
Belt Speed	up to 1000fpm (with standard speed sensor)
Max Belt Width	> 48"
Incline	20° from horizontal up to 30° with less accuracy Angle Compensator available for variable incline applications.

Weigh Shark

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Weigh Shark Integrator Technical Data

Display	
Type	Graphical Dot Matrix Wide Temperature LCD
Size	240 x 64 pixels 5.0" wide x 1.34" high visible

Memory	
Program Memory	non-volatile FLASH memory
Calibration Memory	battery backed RAM
	replaceable lithium coin cell
	10 year retention (Temperature dependant)
Totalizers (4)	
Total 1	1, 073,742 tons max
Total 2 and 3	214,748,365 tons max
Total 4	2,147,483,647 tons max
	Totalizers accumulate and clear independent of each other.

Power Supply	
Voltage	85-264 VAC
Frequency	47-63 Hz
Power	10 Watt
Isolation	4200Vac Input-Output
DC Input	9-30 VDC 10Watts

Load Cell Input	
Excitation	5Vdc
	8 Load Cells max
Input	0 – 30mV
Resolution	16 bit (24bit internal)

Speed Sensor Input	
Supply	24 VDC, 100mA max 5 VDC, 100mA max
Input	1 - 1200Hz NPN switch or dry contact

Digital Inputs (4)	
Supply Input	24Vdc, 100mA max NPN switch or dry contact
Programmable functions (17)	Clear Total 1,2,3,4 or All, Print Total 1,2,3,4 or all ticket, Print Calibration Summary, Truck Load out Clear, Stop, Start, Enable Print Truck Totals or Ticket

Digital Outputs (4)	
Supply Output	24Vdc, 100mA max 30Vdc, 100mA Sinking max
Programmable functions (16)	Rate set point, Speed set point, Total 1,2,3,4 set point, 1, 0.1, 0.01, 0.005 ton pulse Accumulation Direction, Truck Load out Ready, Done, Feeder cutoff, Running MODBUS

Weigh Shark

Analog Output (1)	
Current Resolution	0/4-20mA 16bit(0-20mA or 4-20mA)
Load Isolation	1k Ω max 2500 V rms (External 24Vdc supply required)
Programmable functions (13)	Rate, Belt Speed, Load % Totals 1,2,3,4 Run Time 1,2,3,4 Truck Fill % Modbus
Communications	
Ethernet	10/100Base-T HTTP, Modbus/IP
RS-232 (1)	Ticket Printer, Angle Sensor, Modbus RTU
RS-485 (1)	Ticket Printer, Angle Sensor, Touch screen, Modbus RTU
Enclosure	
Material	fiberglass reinforced polyester Clear Lexan window
Dimensions	11.3" W x 9.31" H x 5.43" D
Protection	NEMA 3, 3R, 4, 4X, 12 & 13
Accessories	
Angle Compensator	for conveyors with changing angle.
Truck Load out touch screen	touch screen for truck and rail car loading. (6, 8, 10, or 15" screen size available)
Ticket Printer	for printing Truck, Totalizer or Calibration tickets
Remote Display	View multiple scales on 1 display, scales connected via Ethernet.
Industrial Network interfaces	Contact factory for availability.

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.

SETUP>Truck Load Out Setup Menu

Setting	Description		
Truck Load Out	On/Off – Enables the Truck Load Out system.		
Require Truck ID	On/Off – Requires a Truck ID to be entered before the load can begin.		
Clear ID on Complete	On/Off – Clears Truck ID at completion of load.		
Require Input	On/Off – Requires a digital input to be activated before the load can begin. The input and configured in the I/O menu.		
Auto Print Ticket	On/Off – Automatically print a truck ticket on completion of load. Requires optional ticket printer.		
Auto Clear Target	On/Off – Clear Target weight at completion of load.		
Stop Timer On	Controls Truck fill timer.		
	Output	Truck fill timer is stopped when the Truck Output turns off.	
	Clear	Truck fill timer is stopped when the load is complete and the operator Clears the weight.	
	Min. Rate	Truck fill timer accumulates time only when the Rate is above the Minimum Rate setting found in the SETUP>Calibration Setup menu.	
Cutoff	The amount to subtract from the Target weight to turn off the Cutoff output.		
Min. Target	Minimum allowable Target weight		
Max. Target	Maximum allowable Target weight		

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

I/O>Inputs

Function	Description
Truck Load Out Clear	Clears Truck accumulator when the load is complete.
Truck Load Out Stop	Stops the truck load out process and turn off outputs. (This should NOT be used as an E-Stop.)
Truck Load Out Start	Starts the Truck load out process
Truck Load Out Enable	If setting Require Input = ON then this input needs to be ON for truck load out to start.

TLO Outputs

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

I/O>Outputs

Function	Description
Truck Output	On when loading starts, off when Target weigh is reached.
Truck Ready	All the requirements are met for the loading to start.
Truck Done	On when accumulator reaches Target Weight – Truck Cutoff weight.
Truck Cutoff	On when loading starts, off when Target Weight – Truck Cutoff Weight is reached.

TLO output function table.

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

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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.

```
┌─────────────────────────────────────────────┐
│           Truck  Loadout                      │
├─────────────────────────────────────────────┤
│ >Truck ID:  ACME01                            │
│   Target:            15.00tons                │
│   Total:             0.00tons   Rate:   0.00tph│
│   Ready  -  Press Start                       │
├─────────────────────────────────────────────┤
│           Start                        EXIT   │
└─────────────────────────────────────────────┘
      ⬆        ⬆        ⬆        ⬆        ⬆
```

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.

```
┌─────────────────────────────────────────────┐
│           Truck  Loadout                      │
├─────────────────────────────────────────────┤
│ >Truck ID:  ACME01                            │
│   Target:            15.00tons                │
│   Total:             3.40tons  Rate:  325.23tph│
│   Loading.  .  .                              │
├─────────────────────────────────────────────┤
│   Stop                                 EXIT   │
└─────────────────────────────────────────────┘
      ⬆        ⬆        ⬆        ⬆        ⬆
```

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                      │
├─────────────────────────────────────────────────┤
│ >Truck ID:  ACME01                               │
│   Target:            15.00tons                   │
│   Total:             15.00tons  Rate:    0.00tph │
│   Truck Full  -  Press Clear                     │
│ ███████████████████████████████████████████████ │
│                           Clear           EXIT   │
└─────────────────────────────────────────────────┘
```
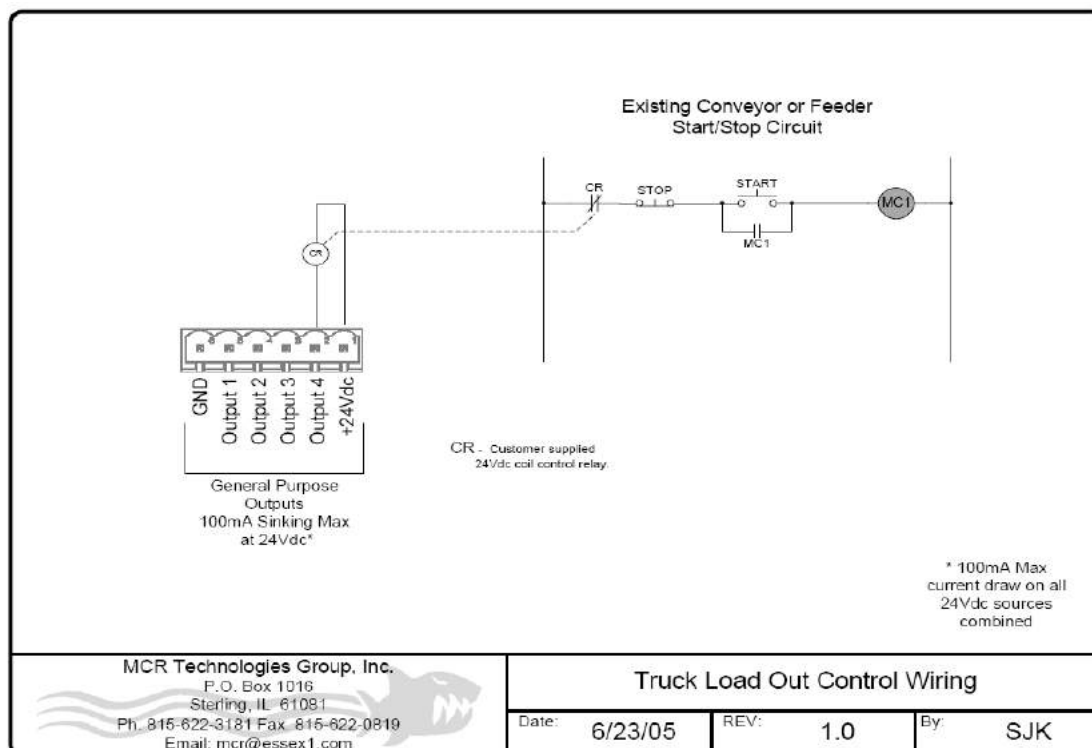

5. Truck Load out is complete; the system is ready for the next truck.

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 Load out is complete; the system is ready for the next truck.

Existing Conveyor or Feeder Start/Stop Circuit

CR - Customer supplied 24Vdc coil control relay.

GND Output 1 Output 2 Output 3 Output 4 +24Vdc

General Purpose Outputs 100mA Sinking Max at 24Vdc*

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

MCR Technologies Group, Inc.
P.O. Box 1016
Sterling, IL 61081
Ph. 815-622-3181 Fax 815-622-0819
Email: mcr@essex1.com

Truck Load Out Control Wiring

Date: 6/23/05   REV: 1.0   By: SJK

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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

```
>Trucks:                          13
 Total  Weight:         194.25tons
 Total  Fill  Time:       1.34hrs
 Avg  Trucks/Hour:        9.70
 Clear                          EXIT
```

⬆ ⬆ ⬆ ⬆ ⬆

Page 2

```
>Avg  Truck  Weight:      14.94tons
 Avg  Fill  Time:          6.18min.
 Avg  Target  Error:       0.06tons
 Avg  Rate:              145.05tph
 Clear                          EXIT
```

⬆ ⬆ ⬆ ⬆ ⬆

Page 3

```
>Last  Clear        03:35 11/10/2005



 Clear                          EXIT
```

⬆ ⬆ ⬆ ⬆ ⬆

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 .25tons 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.

BELT CONVEYOR SCALE MAINTENANCE CHECK LIST

Conveyor Belt Scales — Weigh Shark

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

* 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**

MCR Technologies Group, Inc.
PO Box 1016 Sterling, IL 61081
815.622.3181   fax 815.622.0819
www.weighshark.com   sales@weighshark.com

MCR Technologies Group, Inc.
PO Box 1016 Sterling, IL 61081
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Customer Name		Date	
Company Name		Phone	
Address		Fax	
State & Zip		e-mail	

Nature of Call

Control Box Serial Number:	Display Number

1   Scale designation: Conveyor [ ]   Product: [ ]   Other: [ ]

2   Scale Model #: [ ]   *(IE Model 100-250 or 500)*

3   Does this scale have an Angle Compensator   Yes [ ]   No [ ]

4   What is your RATE reading?   EMPTY Belt [ ]   **View Screen Line 2**
                            LOADED Belt [ ]

5   What is the belt speed?   [ ] FPM   **View Screen Line 3**

6   Is the belt speed reasonable?   Yes [ ]   No [ ]

7   If not, what would be reasonable?   [ ] FPM

8   What is your ADC GAIN setting?   [ ]   **Setup - Calibration Setup - Line 11**

9   What is your ZERO reading   [ ]   **Calib. Screen Line 3**

10   What is your SPAN reading?   [ ]   **Calib. Screen Line 4**

11   What is your ZERO Cutoff #   [ ]   **Calib. Screen Line 5**

12   Belt Length stored in integrator   [ ]   **Calib. Screen Line 6**

13   Idler Span stored in integrator   [ ]   **Calib. Screen Line 7**

14   Angle number shown (if applicable)   [ ]   **Calib. Screen Line 8**

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

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

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

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

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

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

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

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

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

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

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

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

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:

[   ]

28 Problem resolution and recommendations:

[   ]

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SYMPTOM:

	CHECK	**ACTION**
No Belt Speed	1a. Check connection to control Box to	1a. Correctly wire Proximity Switch according to manual.
	1b. Check for loose wire to control Box or loose connection	1b. Tighten wire or connector if loose connection found.
	1c. Slowly turn speed sensor wheel And observe the LED on the The proximity switch to ensure an Even pace.	1c. If LED lights on an irregular basis, check to make sure it prox switch Is lined up with gear tooth. Also check the gear itself to Ensure that it is aligned close to the switch, so that every Tooth is picked up and it is not rubbing into the switch
	1d. Perform pervious test, but check LED on circuit board labeled SPD1.	1d. If the LED is lighting at 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.
Low Belt Speed	2a. Check speed sensor according to 1c and 1d	2a. Perform the specified action as described in 1c and 1d.
		2b. Confirm the accurate Speed with a hand held tachometer or time the belt to calculate belt speed.

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

No Accumulation Of Weight or Rate	3a. Check belt speed	3a. If there is no belt speed or if belt speed seems too fast or slow, check speed sensor according to 1. & 2.
	3b. Check ZERO and SPAN Number. Both are found on the CALIB. Screen.	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
	3c. Check load cell cables for damage.	3c. Repair or replace damage.

NOTE: If you have extended your cables, it is imparitive 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 unplug 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.

CHECK	ACTION

Scale is reading Light.

4a. Check belt speed.

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

4b. Check rate with belt running empty.

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.

5a. Perform required action in 3d.

5b. Check rate with belt Running empty.

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

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

5c. Check idlers for Alignment

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

Note: To verify the calibration was performed correctly, do the following. When the ZERO and SPAN test are completed, leave the test weights and bar on the scale and leave the test weights on the empty belt. Go to the MISC. screen and look at your SCAL

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

Scale does not turn ON:

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

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

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

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

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

6c. If blown… replace.

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

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.

7a. Perform checks in Section 6

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

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

7c. Is display readable ?

7c. If display has readable info. Replace keypad. If display has nonsense, replace display.

48.

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
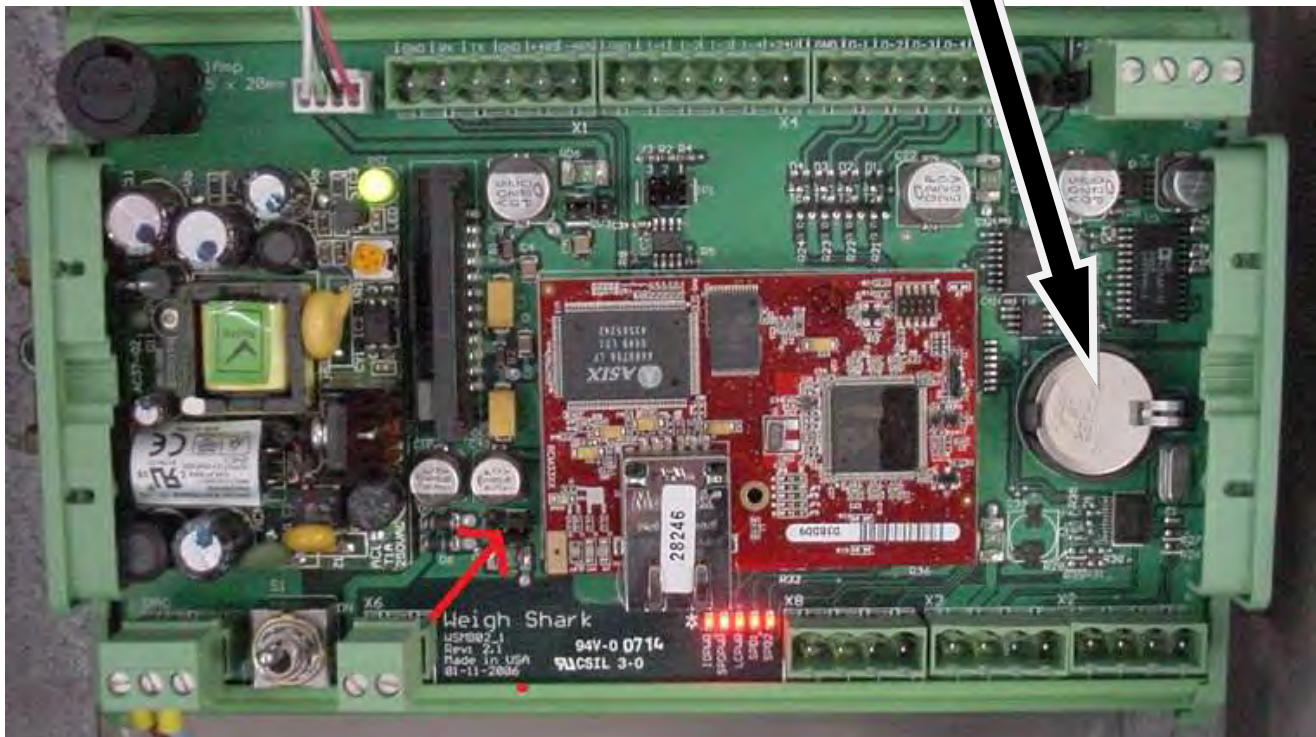
NOTES

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:

_____

_____

_____

_____

_____

_____

_____

_____

_____

N.I.S.A. - BELT SCALES OVERVIEW

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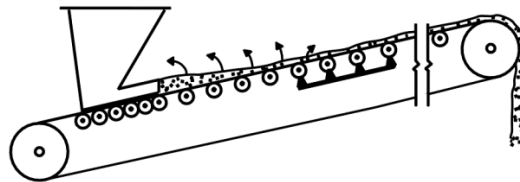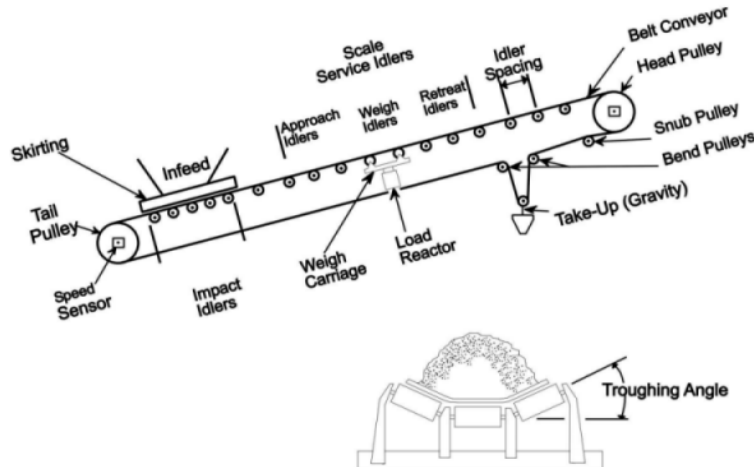
The conveyor speed and slope should not exceed that at which material slippage occurs. Accurate weight totalization requires that material velocity matches belt velocity. This may require that the scale be located a considerable distance from the loading point on a steeply inclined, high velocity systems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

L = Conveyor length (ft.)
T = Minimum totalized load (tons)

$$L = \leq \frac{10T\ (FPM)}{(TPH)}$$
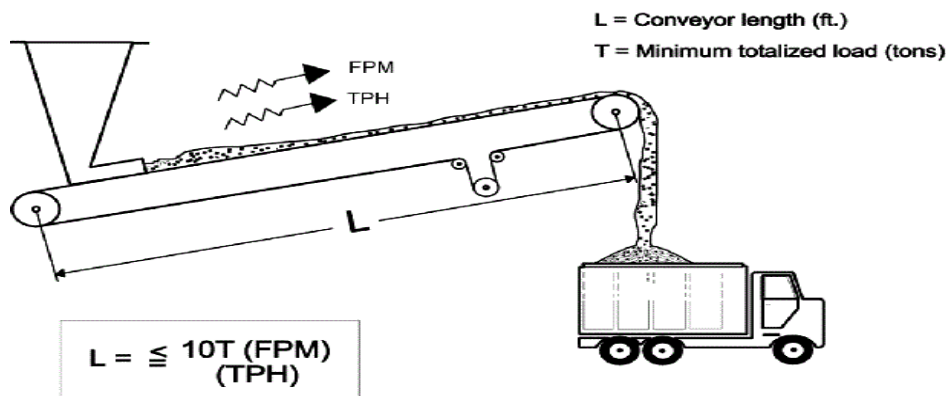
Conveyor length should not exceed that which assures that the belt will travel at least 3 circuits while delivering the minimum totalized load for which accurate weight information is required.

All idlers should be of rigid frame construction with a horizontal roller section. So called "V" rolls and "limber" rolls are not advisable.
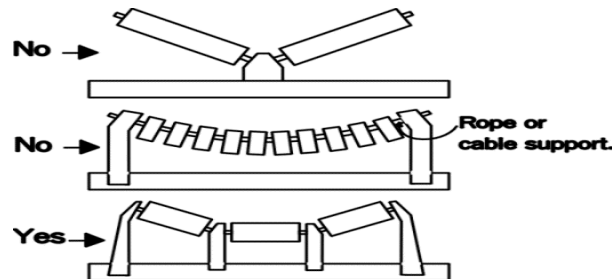
There shall be no tripper or moveable head pulleys in the conveyor.
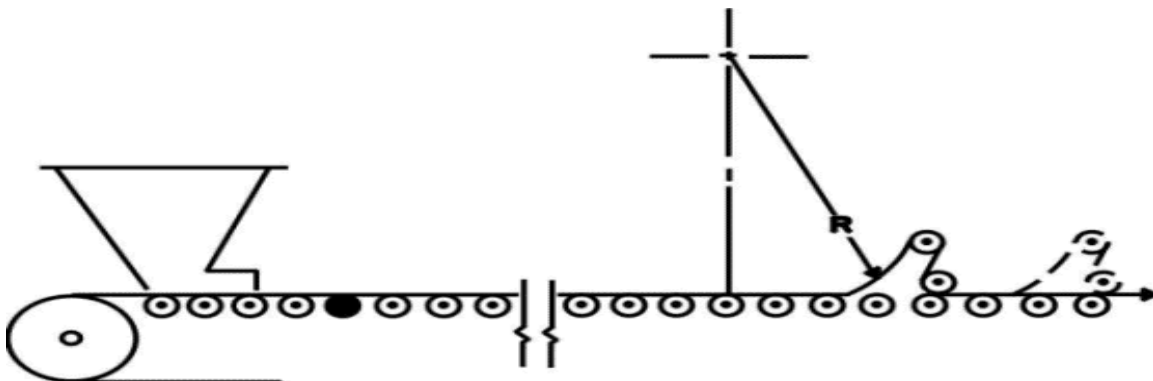
The conveyor should be equipped with a constant-tension or gravity-type take-up
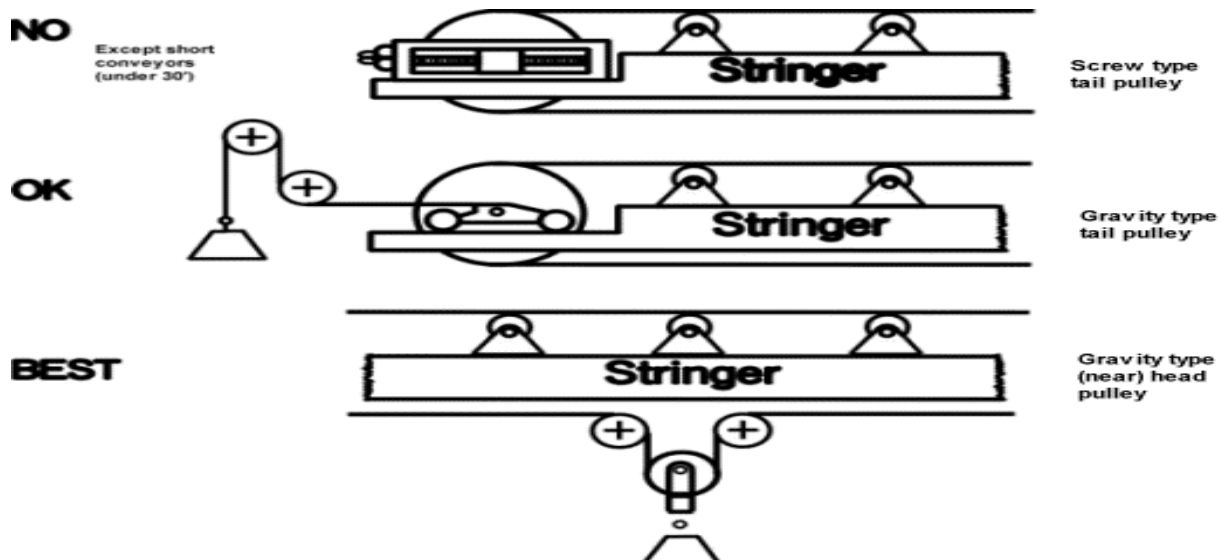
MCR Technologies Group, Inc.
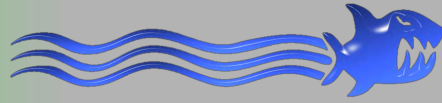
Home of the *Weigh Shark*, not just another scale company!

Belt Scales & Integrator: Standard Troughing, Channel Inserts, European "Wing" B & C and Introducing our New kW Belt Scale
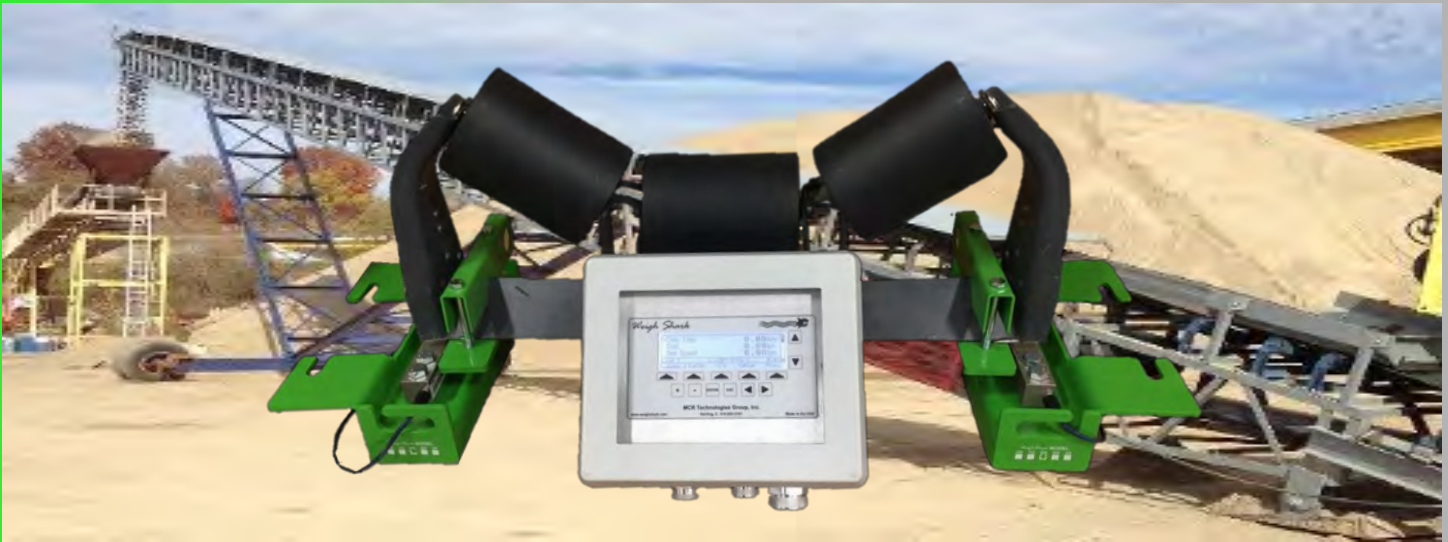
Remote Displays: Networking

Plant Efficency: 78%				07:18:22 03/07/2012
Scale Name	Total	Rate	Speed	Eff %
C4	2697.9	163.1	254.4	47%
C7	3994.5	233.7	316.2	67%
C9	4397.6	276.6	221.4	102%
C1	21.4	1355.3	546.7	100%
C6	3976.7	241.4	246.0	97%
C5	3814.5	221.8	235.6	63%

Scrolling ON

Single View | Multi-View | Menu

Plant Efficency: 78% — 07:18:15 03/07/2012

C3

Daily Total 7066.17 — Rate 272.9

Speed 221.4 — Load % 51%

Real Time % 78%

Scale Info

Scrolling ON

Single View | Multi-View | Menu

AggLink: Networking through the Cloud from ANYWHERE!
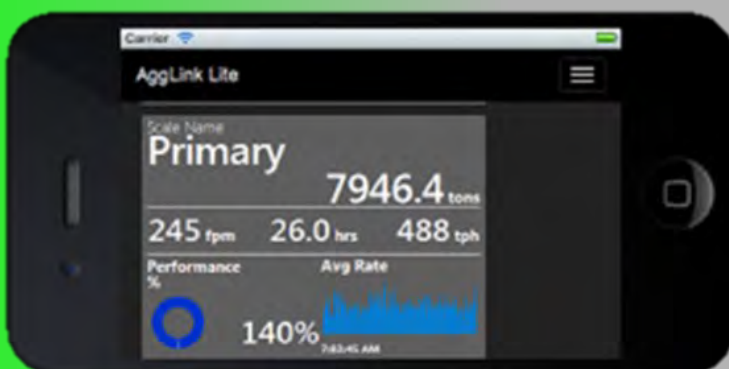
AggLink Lite

Primary

7946.4 tons

245 fpm   26.0 hrs   488 tph

Performance %   Avg Rate

140%

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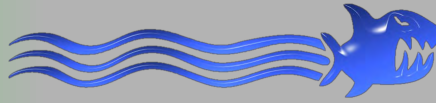
Belt Scales

- Easy to install and calibrate
- Fits any size belt
- Standard accuracy from ±1% to ±.125% *
- Easy prompt calibration on graphic display
- NTEP load cells

kW Belt Scales (NEW)

- Measures amp draw off electric motors
- No load cells
- No speed sensor
- No moving parts
- No calibration weights required
- Easy install 1 hour by your electrician
- kW scale accuracy ± 3%*

Remote Displays

- 7" TFT Color LCD screen w/LED backlight
- 1-USB Port
- Clear scales / run Zero Test
- SDRAM 512MB / NAND FLASH 256MB/ARM Cortex-A8 1 GHz
- WEB interface with data logging
- Multi scale viewing up to 16 scales

Integrator

- 4 Digital Inputs
- 4 Digital Outputs
- 4-20mA (16bit) Current Loop
- Ethernet—HTTP Web Server ready
- RS 232 and RS 485 Serial Ports
- Modbus TCP via Ethernet
- Modbus RTU via RS 485 Port
- Accepts 110/220 Vac and12/24Vdc

* Accuracy *

- Based on single idler through quad idlers
- Proper installation, calibration per instruction manual
- Load cell capacity selected by application
- Mechanical factors can limit accuracy

AggLink

- Remote reporting and monitoring on any device
- No PC required on-site
- No databases to manage
- 1 plant or 100's of locations
- Any type of internet connections
- Cellular data service plans available
- Smart phone and tablets supported

2-Year Limited Warranty on parts against defective workmanship and failure

MCR *Technologies Group, Inc* is a North American Distributor for the following German companies

CASSEL
Digital Metal Detector

CONVEYOR SAFETY SWITCHES — KIEPE ELEKTRIK

EAB AGGREGATE METAL DETECTORS
Analog Metal Detector

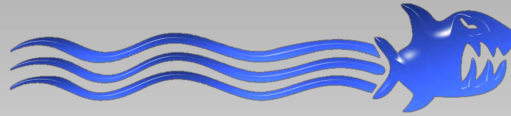**MCR *Technologies Group, Inc.***

P.O. Box 1016 Sterling, IL 61081

815-622-3181

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Belt Scales & Integrator: Standard Troughing, Channel Inserts, European "Wing" B & C and Introducing our **New kW Belt Scale**
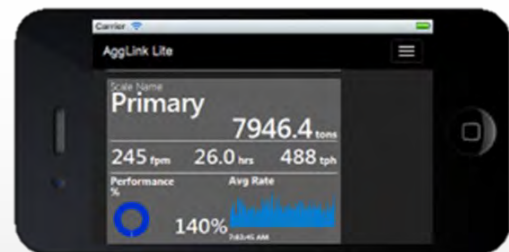
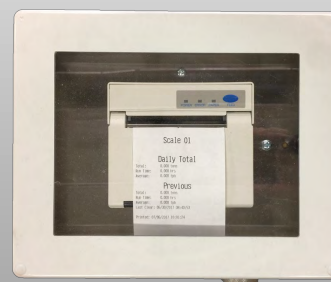**Remote Displays:** RD3 Networking up to 16 conveyors at the same time

AggLink: Networking through the Cloud from ANYWHERE!

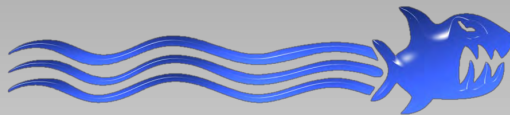**Calibration Kit:** Weights and Bracket for all models - Troughing, and Wing Idlers - Each weight weighs #12

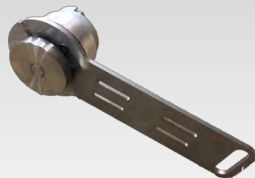**Printers:** For your everyday requirements, 12 VDC, 24 VDC and 110 VAC

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Optional Speed Sensor - Magnetic Encoder—For those wet applications

EAB Metal Detectors (Analog) Protect equipment and prevent metal objects from contaminating products.

Magnets - Permanent and Electromagnet with manual and self clean

Kiepe— Monitoring Devices for Conveyor Systems

Cassel (Digital)– Metal and X Ray Detectors