

Table of Contents

Item:	Page:
1. Recommended Tools	3
2. Integrator Mounting	3
3. Mechanical Installation	4
4. Electrical Connections	8
5. Scale Calibration	11
5.1. Scale Setup	12
5.2. Scale Calibration	15
5.3. Belt Tare	19
6. Additional Screens	21
6.1. Contact Arch Environmental Equipment, Inc.	22
6.2. Company information (Users)	22
6.3. Calibration Constant	23
6.4. Diagnostics	23
6.4.1. View Raw Analog	24
6.4.2. Function Test	24
6.4.3. 4-20 mA Test	27
6.4.4. Current Settings	27
6.5. Screen Contrast	28
6.6. Set Date/Time	28
6.7. Loadout	29
6.8. Large Display	29

1. Recommended Tools for Installation

Standard Phillips Screw Driver

Regular Pliers / Needle Nose Pliers

Nylon String

Wire Strippers or Utility Knife

3/8" or 1/2" Socket Set

3/16" T-Handle Allen Wrench

1/4" T-Handle Allen Wrench

Small 1/8" Straight Tip Screw Driver

1/2" Corded or Cordless Drill

Cord Grips or Liquid Tight for Scale and Integrator Wiring

2. Integrator Mounting

The integrator enclosure is a NEMA 4 type. It can be mounted in any location that meets NEMA 4 specifications, however it is recommended that the display be protected from direct sunlight. While direct sunlight will not permanently damage the display, it may cause viewing to be limited until it is shaded and allowed to cool.

3. Mechanical Installation:

Definitions: (See Figure 1)

Load Area: Any area covered by skirt board material.

Scale Area: Area from the minus three approach idler to the plus three retreat idler.

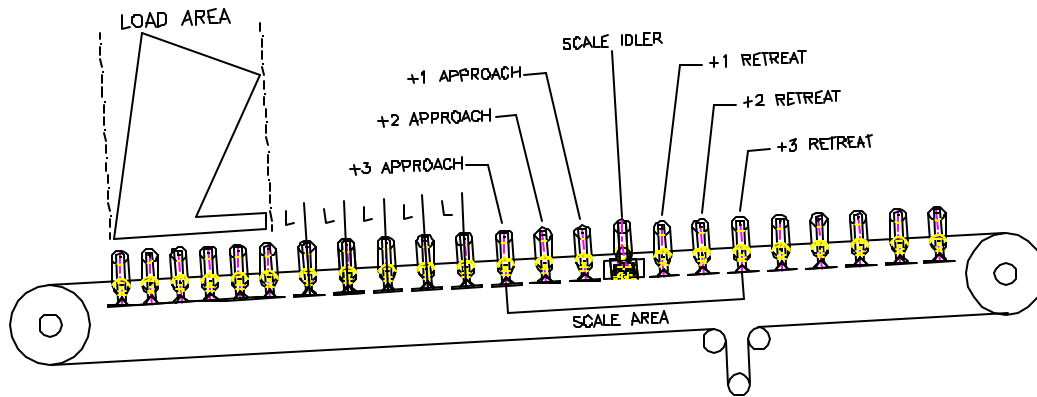


Figure 1

Location:

- The weigh idler should be installed at a point where material speed and belt speed match; generally within 50 feet of the load point, but no closer than 5 idlers of the load area.
- If the scale assembly is to be mounted on a conveyor containing a curve, the weigh idler should not be installed within 40 feet of the curve.
- The conveyor should be rigid, or bracing must be added to strengthen the framework.
- Scale assemblies should be located in areas with minimum vibration.
- Training idlers should not be located within 60 feet of the scale area.
- All idlers within the scale area must be in good condition and of the same make and model. In addition, T.I.R. must not exceed +/- 0.015 inch.
- The entire scale area should be protected from the elements as much as possible.
- Idler spacing within the scale area should conform to CEMA standards based on material conveyed, speed, etc.

Installation: (See Figure 2)

Scale Assembly:

- ? 1) If necessary, strengthen the conveyor framework.
- 2) Any separations (expansion joints) of the conveyor stringers near the scale must be rigidly welded together.
- 3) Insure that the conveyor is level from the minus 3 approach idler to the plus 3 retreat idler.
- 4) Raise or remove the belt over the entire scale area (from minus 3 approach to plus 3 retreat).
- 5) Remove the idler located in the scale position and replace with the ArchWeigh scale assembly.

WARNING: Remove the shipping pins after the scale is bolted in place. (The idler will drop approximately 1/8 to 1/4 inch when the shipping pins are removed. It will be impossible to correctly shim the idler until the shipping pins are removed.)

- 6) Locate and mark the mid point of the wing rolls of each idler assembly located in the scale area.
- 7) Square the minus two approach and the plus two retreat idlers with the conveyor structure.
- 8) Raise the minus three approach and the plus three retreat idlers 1/4 inch Above the belt line.
- 9) Evenly space all idlers (including scale assembly) located between the minus three approach and the plus three retreat idlers.
- 10) Tie four lines (a piano wire or equivalent) to the base of the minus three approach idler; one line running across the center marks of each wing roll and two lines evenly spaced and running across the center roll. Each line should then be tied tightly to the base of the plus three retreat idler.

Note: On scale systems over 54 inches, an additional string line should be placed on each wing roll for a total of 6 lines. Refer to figure 2.

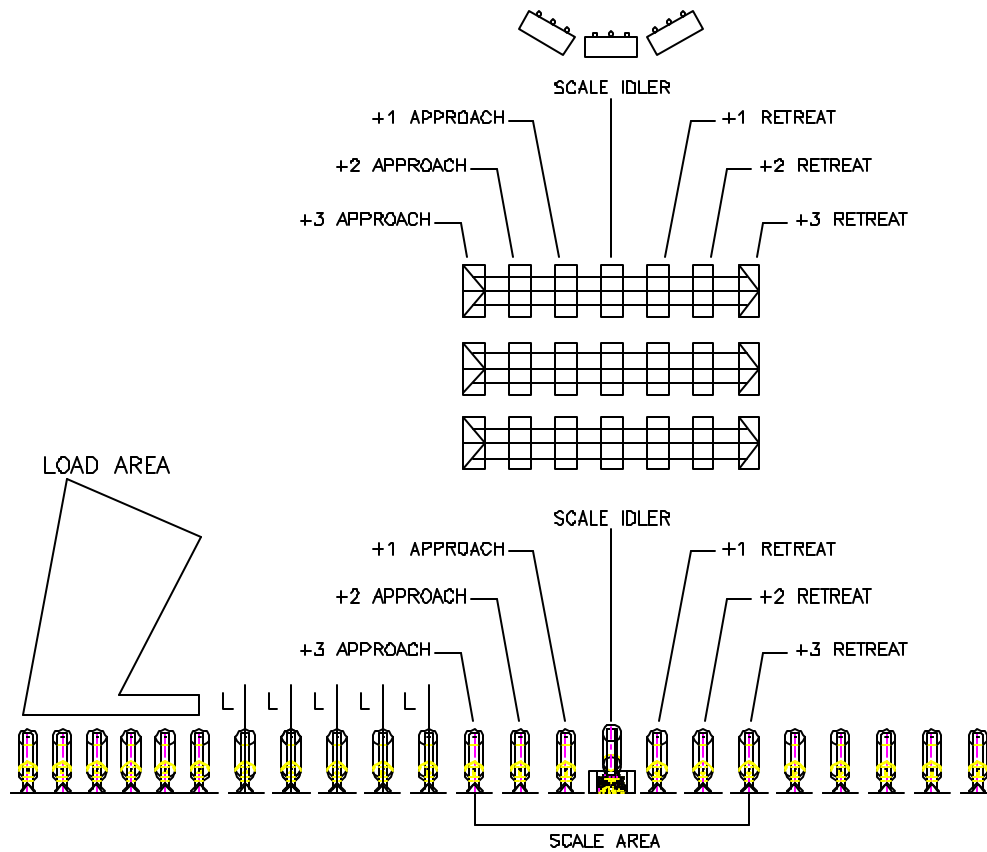


Figure 2

- ❑ **11)** At this point in the setup process the lines should only touch the plus three and minus three idlers. The other idlers should be below the lines. If the line touches any roll located in the scale area, additional 1/16 inch shims should be evenly added to the minus three and plus three idlers until a clearance exists.
- ❑ **12)** Shim all idlers between the plus three and minus three idler including the scale idler to within 1/32 inch of the lines but not touching the lines.
- ❑ **13)** Insure that all idlers are squared, leveled, and bolted tightly in place.
- ❑ **14)** See *Figure 3* - Loosen the Pivot Pin one (1) turn, loosen the Positioning Bolts two (2) turns. Tighten the Positioning Bolts and then tighten the Pivot Bolt. This procedure removes any torsion strain placed on the assembly during installation.
- ❑ **15)** See *Figure 3* - Tighten the load cells to the weight transfer bars and the mounting plate. There are 4 bolts per loadcell that has to be tightened.
- ❑ **16)** Remove all alignment strings.

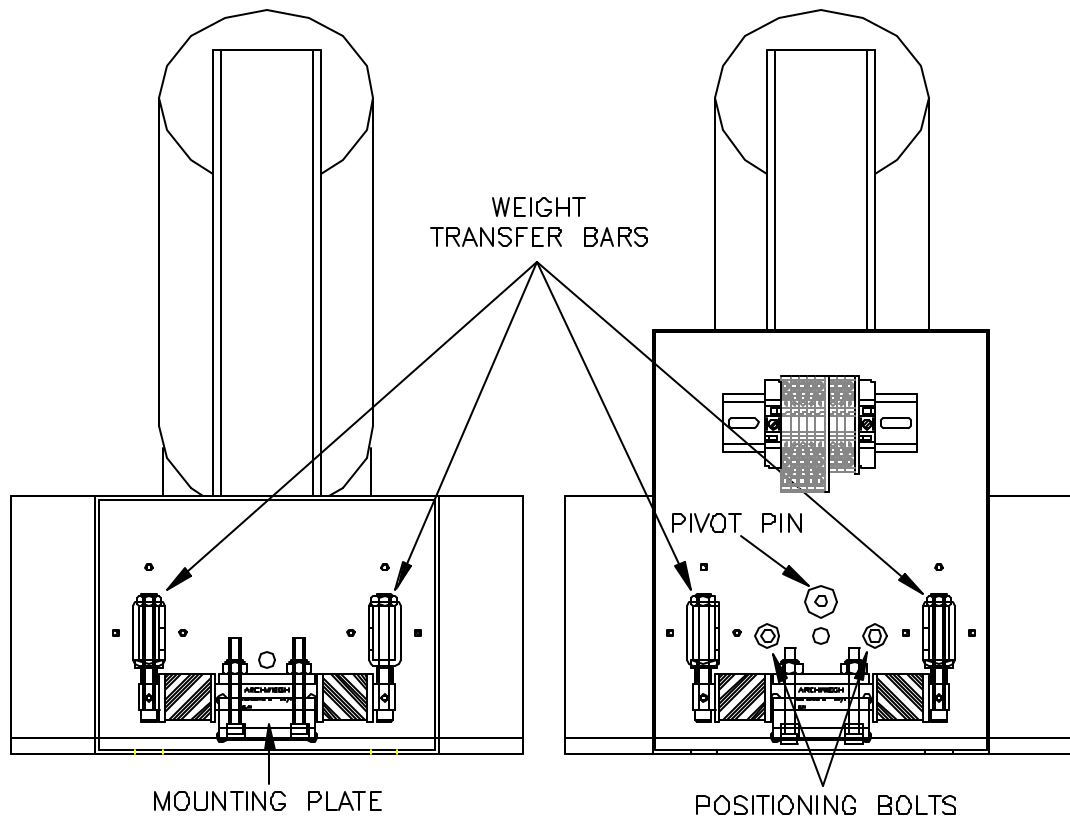


Figure 3

When tightening the loadcells in the junction boxes, make sure that all (4) bolts are tightened. There are (2) bolts through the mounting plate and (1) bolt in each transfer bar.

4. Electrical Connections

Once the Scale has been installed and the integrator mounted in its desired location, the electrical connections can be made. All ArchWeigh Scales are shipped with 25 feet of loadcell cable (Belden Cable P/N 8723, 22 AWG with 2 individually Shielded Pairs).

The load cells use four conductors and a shield, while the Speed Sensor uses 2 conductors. This will allow you to mount the Integrator 10–12 feet from the Scale. If you require the Integrator to be located farther from the scale ARCH can provide you extra cable, at an additional cost, or you may wish to use the above part number to buy it locally in your area.

Starting at the Scale

You will find the two loadcell wires and one speed sensor wire connected to the bottom of the terminal blocks in the junction box. See Figure 4 and 5.

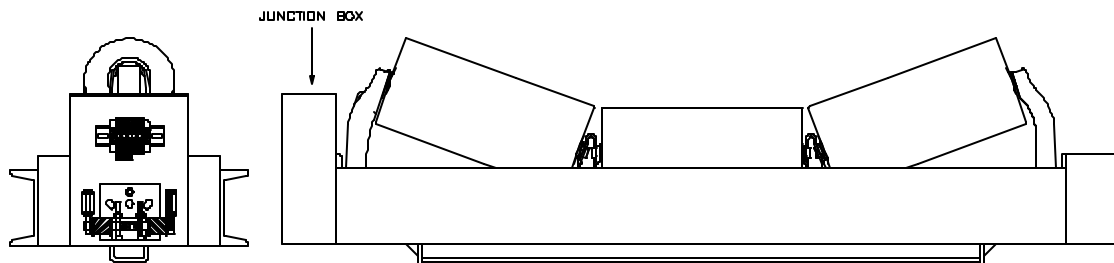


Figure 4

- 1) Remove the load cell enclosure cover from the junction box.
- 2) Place two small cord grips in the desired location of the junction box For the load cell and speed cables.

WARNING: *Do not cut the loadcell wires, they have been manufactured to compensate for temperature variances.*

- ❑ 3) Cut the supplied Belden Cable in half and insert one end of each cable through the side of the junction box enclosure.
- ❑ 4) Remove approximately (2) inches of the cable jacket from both ends of each cable that you inserted into the junction box enclosure.
- ❑ 5) Strip ¼" of insulation off all the colored conductors.

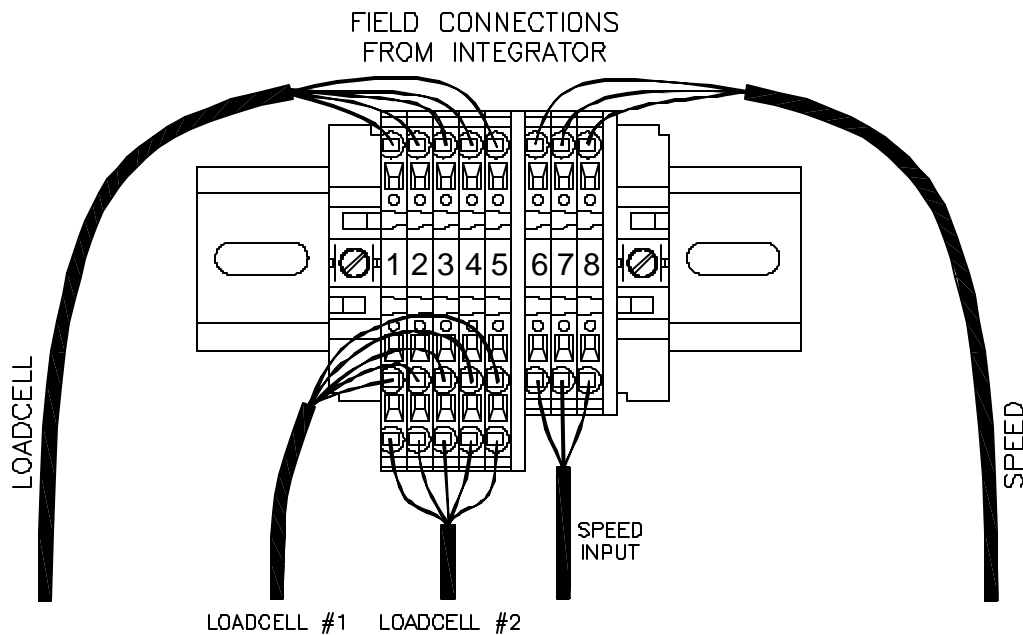


Figure 5

Terminal Strip in Scale Idler Junction Box

- ❑ 5) Place a small straight tipped screwdriver in the square hole just below the hole that you wish to terminate the conductor in. Pull the screw driver down carefully to move the spring clamp so the wire can be inserted. After inserting the wire pull the screw driver out. Pull on the wire to insure that it will not come out of the terminal block.
- ❑ 6) Route other ends of the two cables to the Control Integrator and insert them into the box through cord grips placed at your description.

- ❑ 7) Remove approximately (2) inches of the cable jacket from both ends of each cable that you inserted into the Control Integrator enclosure.
- ❑ 8) Strip ¼” of insulation off all the colored conductors.
- ❑ 9) Place a small straight tipped screwdriver in the square hole just above the hole that you wish to terminate the conductor in. Push the screw driver up carefully to move the spring clamp so the wire can be inserted. After inserting the wire pull the screw driver out. Pull on the wire to insure that it will not come out of the terminal block.
- ❑ 10) Reinstall the Junction Box Cover.

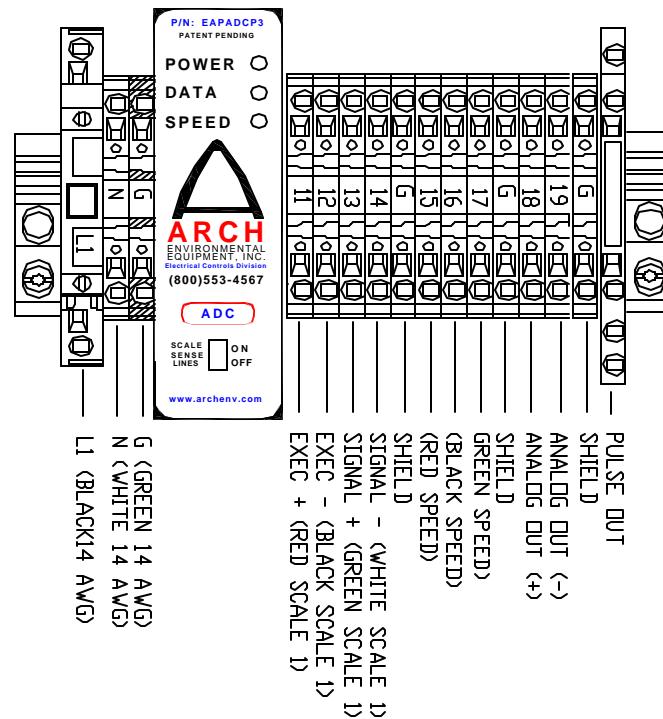


Figure 6

Terminal Strip in Control Integrator Enclosure

5. SCALE CALIBRATION



Main Screen

Function Keys

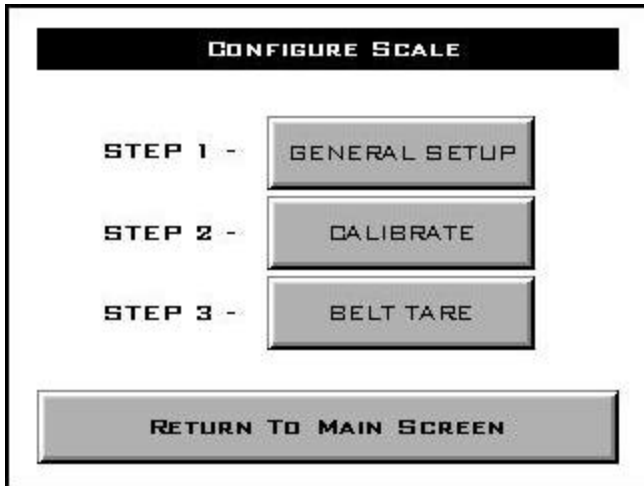
F1 – Configure Scale	Starts the scale calibration procedures
F2 – Additional Screens	More screens with various information
F3 – Reset Total	Reset Main Totalizer. Password '4321'
F4 – Reset T1	Resettable Totalizer

There are (3) steps to configuring the ArchWeigh 1000 Belt Scale.

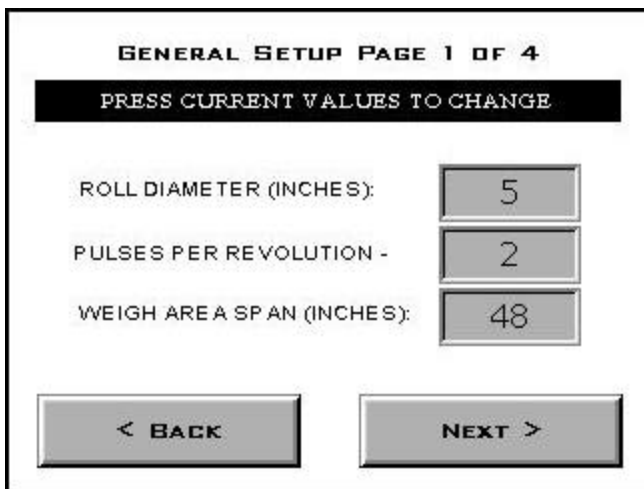
1. Scale Setup – Scale parameters for scale location
2. Scale Calibration – Perform dead weight and test weight procedures.
3. Belt Tare – Remove belt weight from scale.

To configure the belt scale, press the F1 key on the upper right hand side of the screen.

5.1 SCALE SETUP



To perform Setup, press the 'General Setup' button.

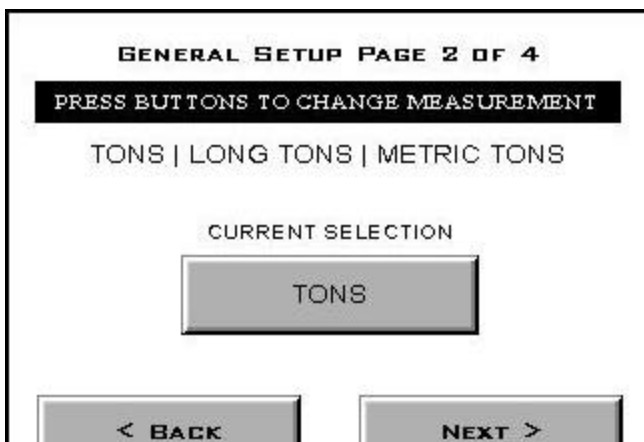


Roll Diameter – Diameter of the weigh idler rolls.

Pulses Per Revolution – Number of magnetic targets in the wing roll on the weigh idler junction box side of the scale.

Weigh Area Span – Measure from the scale to each of the idlers on each side of the scale. Add those two numbers and divide by 2.

Enter the Roll Diameter in inches, Pulses Per Revolution, and Weigh Area Span. Press 'Next >' to Continue or '< Back' to go back one step.



Select the desired unit of measurement.

5929 **Units:** Tons, Long Tons, and Metric Tons.

Press '**Next** >' to Continue or '< **Back**' to go back one step.

GENERAL SETUP PAGE 3 OF 4

PRESS CURRENT VALUES TO CHANGE

4-20 MAX OUTPUT RATE: 1000

AUTO TARE (LBS): 0

< BACK NEXT >

4-20 Max Output Rate – Enter the maximum tons per hour the conveyor will operate at. This is used to scale the 4-20 mA rate output.

Auto Tare (LBS) – During initial setup this value will be set to 0. After initial setup, set auto tare to a value in pounds that is greater than the minor weight variations on the scale and less than the lightest weight of continuous flow on the belt. If weight remains below the Auto Tare value for three revolutions a new tare value is established.

Press '**Next** >' to Continue or '< **Back**' to go back one step.

GENERAL SETUP PAGE 4 OF 4

SYSTEM CALIBRATION CONSTANT

PRESS CURRENT VALUE TO CHANGE

CURRENTLY

CALIBRATION CONSTANT - 1.000

< BACK NEXT >

Calibration Constant – Compensation factor for adjusting totalizer accumulation.

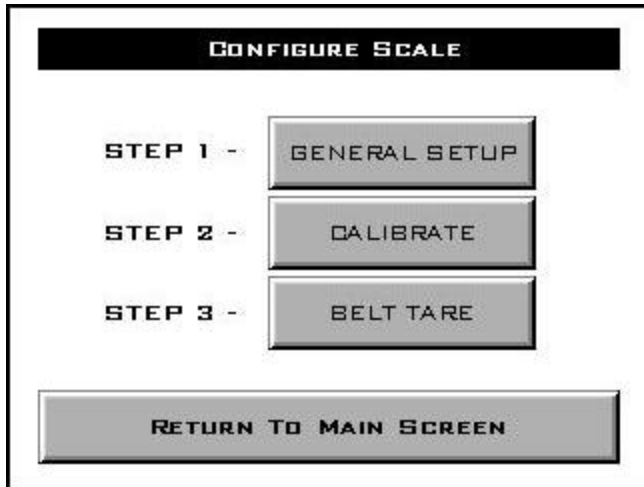
NOTE: This value should be **1.000** for a newly installed scale system.

Press '**Next >**' to Continue or '**< Back**' to go back one step.

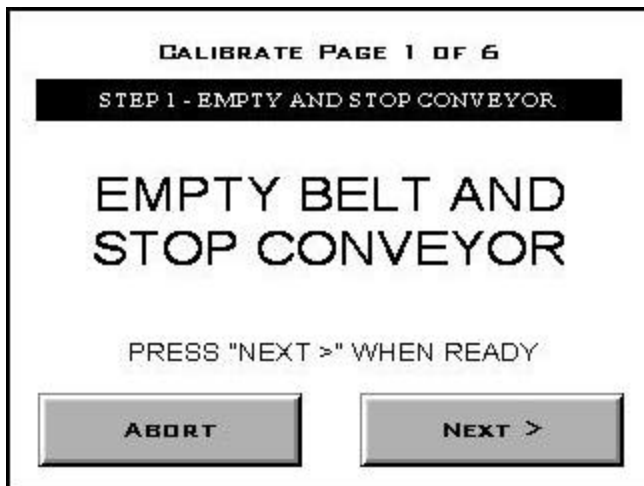


Press '**Exit Setup**' to return to Configure Scale Screen

5.2 SCALE CALIBRATION



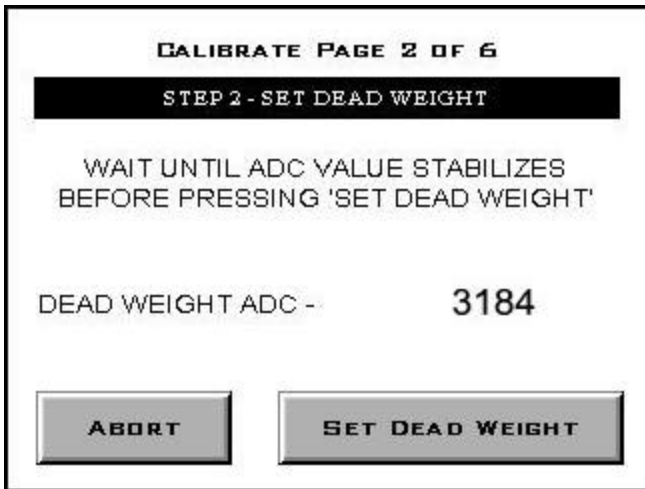
To perform Calibrate, press the 'Calibrate' button.



It is very important to empty the conveyor and stop the conveyor at this point.

NOTE: It is no longer necessary to lift the belt off the scale to perform a dead weight and test weight.

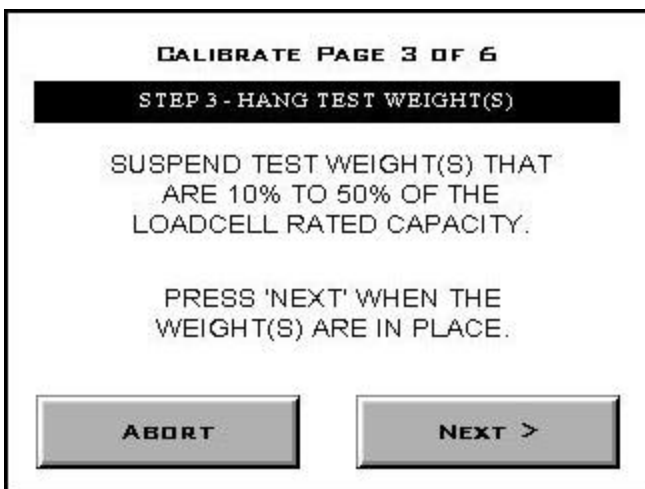
Press 'Next >' to Continue or 'Abort' to cancel calibration.



Set Dead Weight- This will store the digitized analog value that represents the amount of weight the scale sees with no product on the belt.

NOTE: Wait for a few seconds for the ADC value to stabilize before pressing the Set Dead Weight button.

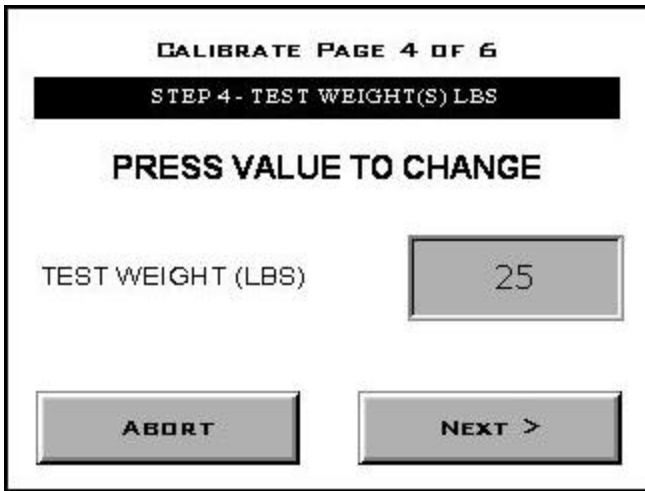
Press '**Set Dead Weight**' to Continue or '**Abort**' to cancel calibration.



Suspend test weights – Insure that the test weights are only in contact with the weigh idler bridge of the belt scale.

If the weights are in contact with any other parts of the scale the calibration will be off thus effecting the accuracy of the scale.

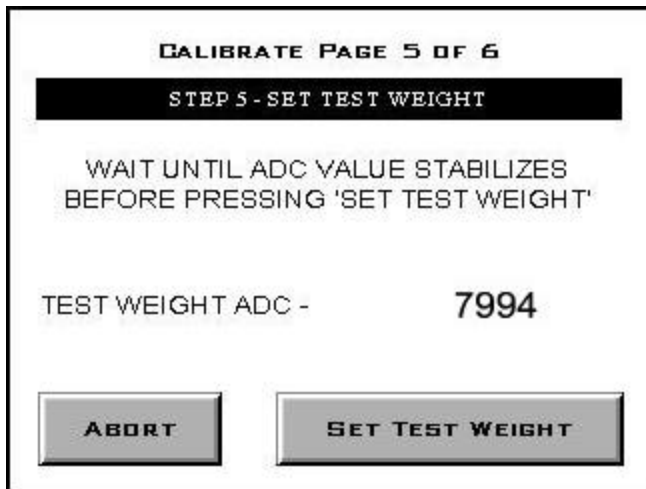
Press '**Next >**' to Continue or '**Abort**' to cancel calibration.



Enter the amount of test weight being used.

It is best if equal amounts of weight are suspended from each side of the weigh idler bridge.

Press '**Next >**' to Continue or '**Abort**' to cancel calibration.



Test Weight ADC - This will store the digitized analog value that represents the amount of test weight the scale sees.

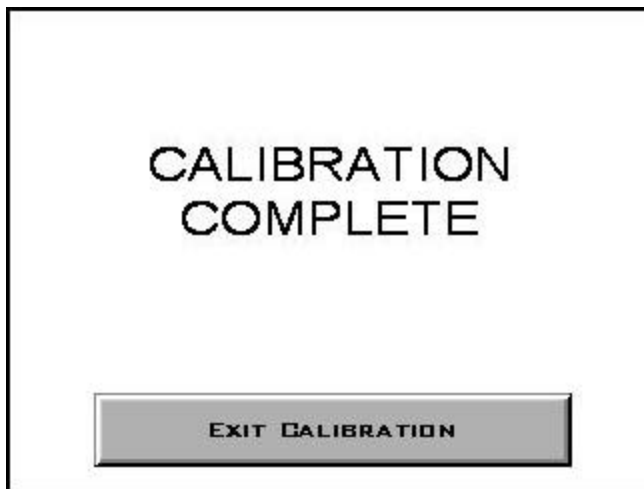
NOTE: Wait for a few seconds for the ADC value to stabilize before pressing the Set Test Weight button.

Press '**Set Test Weight >**' to Continue or '**Abort**' to cancel calibration.



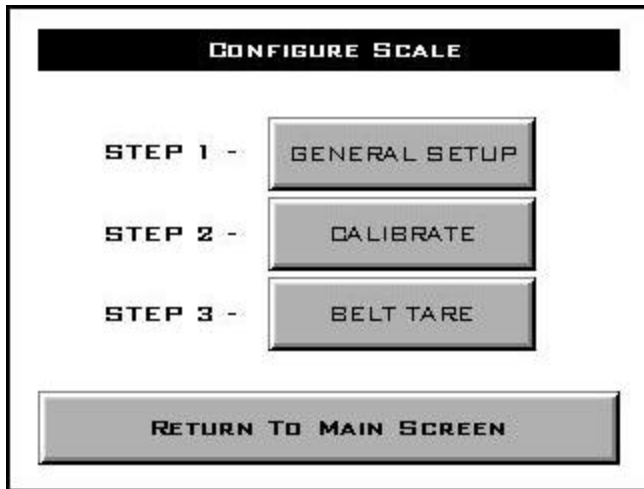
Remove test weights and ensure that every has been picked up and that the belt is clear to be started.

Press '**Next >**' to Continue after test weights have been removed.

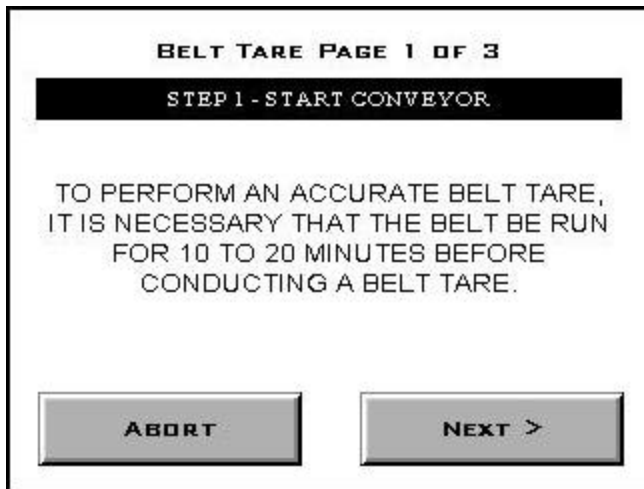


Press '**Exit Calibration**' to return to Configure Scale Screen

5.3 BELT TARE



To perform a Belt Tare, press the 'Belt Tare' button.



MARK THE BELT

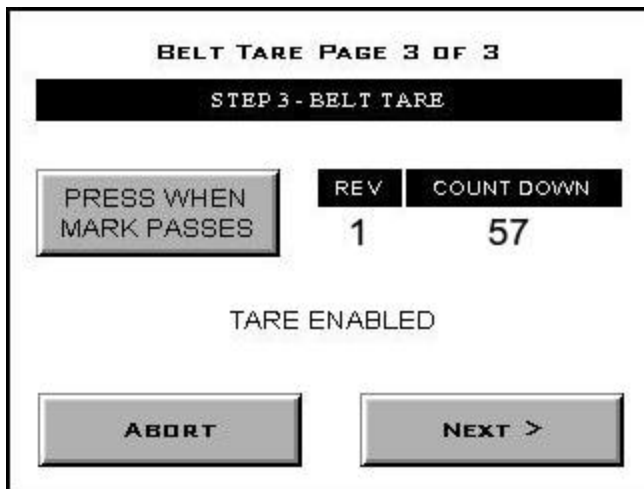
Paint a mark on the belt so it can be easily seen. If the belt has one splice, use it as a reference.

Start Conveyor – Insure that the conveyor is up to its normal operating speed before continuing with the belt tare.

Press 'Next >' to Continue or 'Abort' to cancel Belt Tare.



Press **'Start Belt Tare'** to Continue or **'Abort'** to cancel Belt Tare.



Each time the painted mark or belt splice passes the belt scale press the 'Press When Mark Passes' button.

Press this button each time the mark passes until the screen shows:

Tare Complete, Press 'NEXT >'

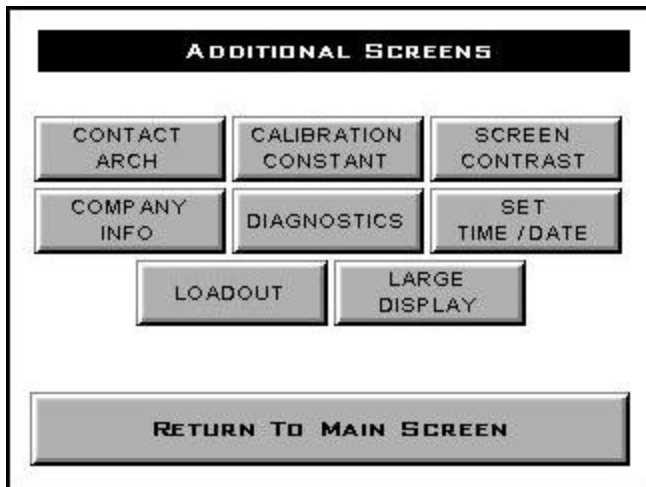
The countdown will help you know when the mark is coming after the second or third revolution.

Press **'Next >'** to Continue or **'Abort'** to cancel Belt Tare.



Press 'Exit Belt Tare' to return to Configure Scale Screen

6. ADDITIONAL SCREENS



Press desired button to see additional information on the belt scale.

Press 'Return To Main Screen' to go back.

6.1 CONTACT ARCH

CONTACT ARCH

Arch Environmental Equipment, Inc
5929 Benton Road
Paducah, KY 42003 USA

PHN: (800) 553-4567
FAX: (800) 230-9462

RETURN TO ADDITIONAL SCREENS

Do not hesitate to call Arch if you have any questions, concerns, or Problems with your ArchWeigh 1000 Belt Scale System.

6.2 COMPANY INFORMATION

COMPANY INFORMATION

PRESS VALUES TO CHANGE

COMPANY NAME - ARCH ENVIRONMENTAL

ADDRESS - 5929 BENTON RD

CITY - PADUCAH

STATE - KY

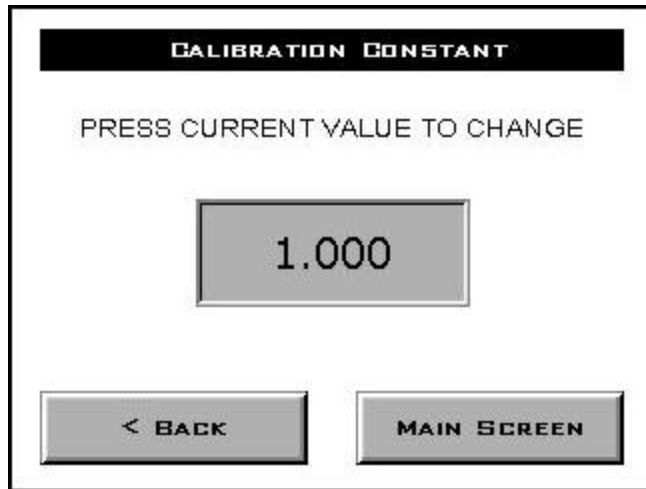
ZIP - 42003

< BACK **MAIN SCREEN**

This screen allows the user to enter their company information. This information may be used for the printing function if specified.

Press '**Main Screen**' to go to main screen or '**< Back**' to go back one step.

6.3 CALIBRATION CONSTANT



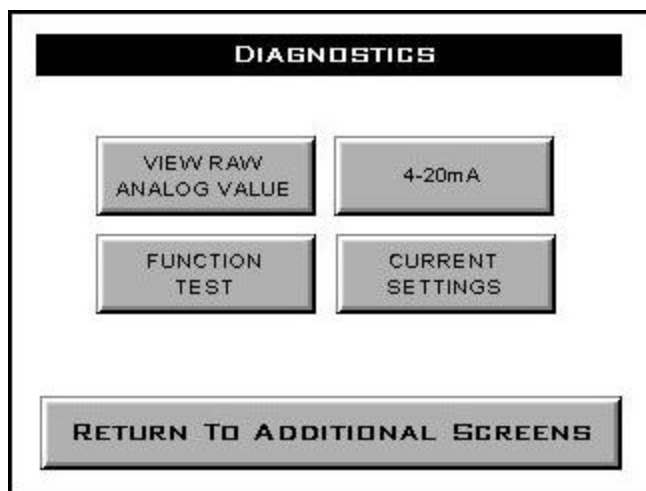
This is a compensation factor for adjusting totalizer accumulation.

This value should be 1.000 for a newly installed scale system.

Valid Ranges: 0.001 to 2.000

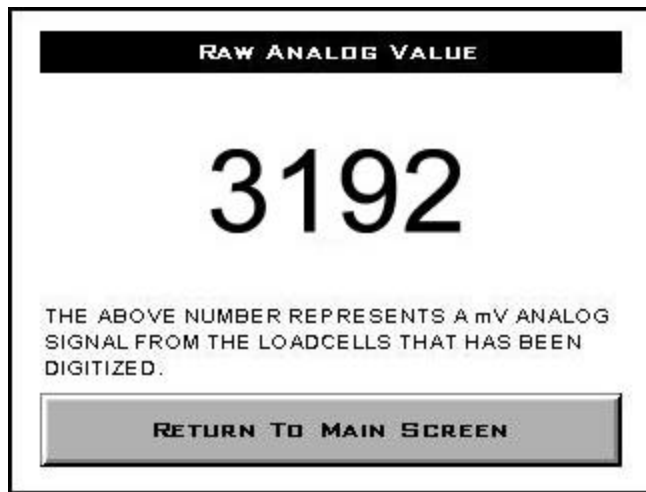
Press '**Main Screen**' to go to main screen or '**< Back**' to go back one step.

6.4 DIAGNOSTICS

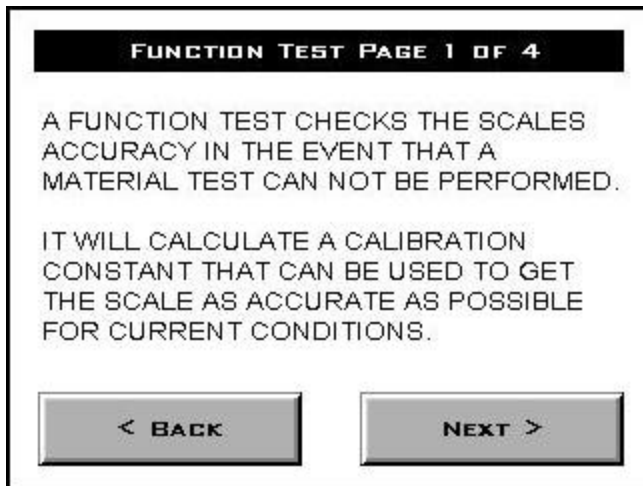


Allows factory or designated plant person to perform tests on the scale system to locate possible problems with the scale system.

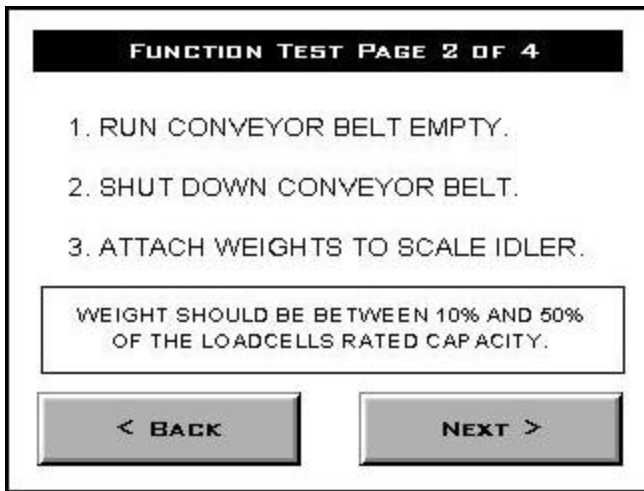
6.4.1 RAW ANALOG VALUE



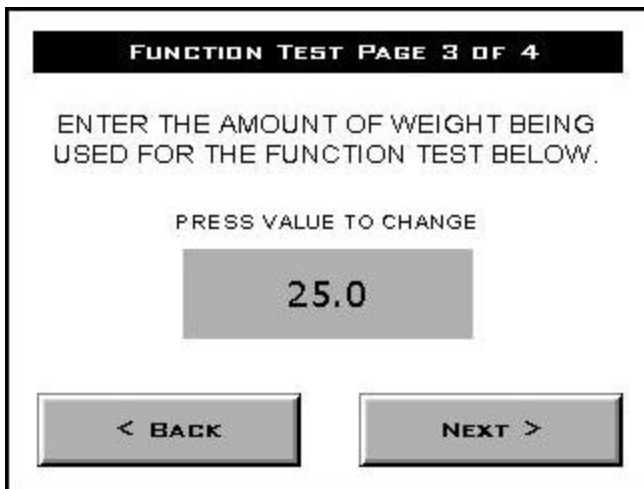
6.4.2 FUNCTION TEST



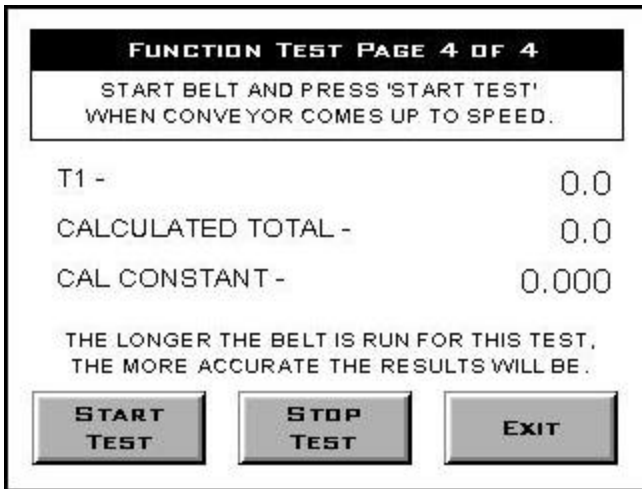
Press '**Next >**' to Continue or '**< Back**' to go back one screen.



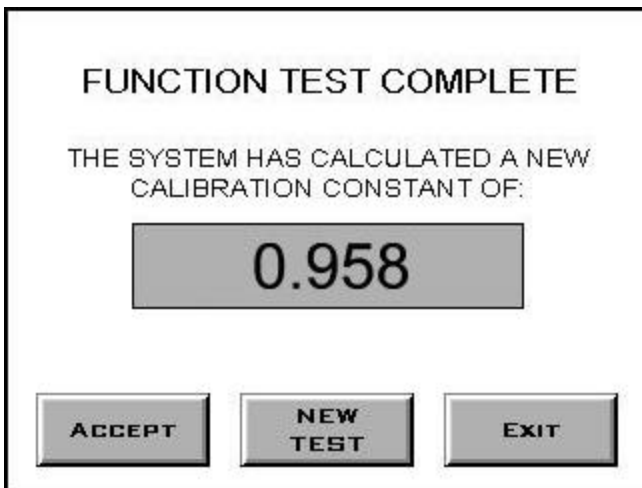
Press '**Next >**' to Continue or '**< Back**' to go back one screen.



Press '**Next >**' to Continue or '**< Back**' to go back one screen.

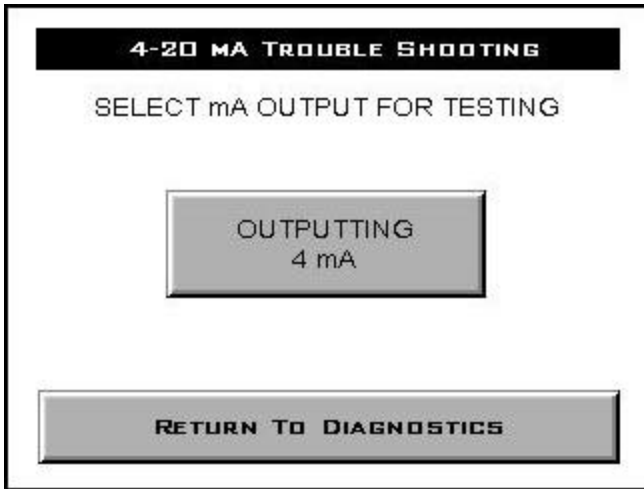


Press '**Start Test**' to begin test.
Press '**Stop Test**' to stop the test.
Press '**Exit**' to return to Diagnostic Screen.



Press '**Accept**' to accept the newly calculated calibration constant.
Press '**New Test**' to perform a new function test.
Press '**Exit**' to return to Diagnostic Screen.

6.4.3 4-20mA TEST

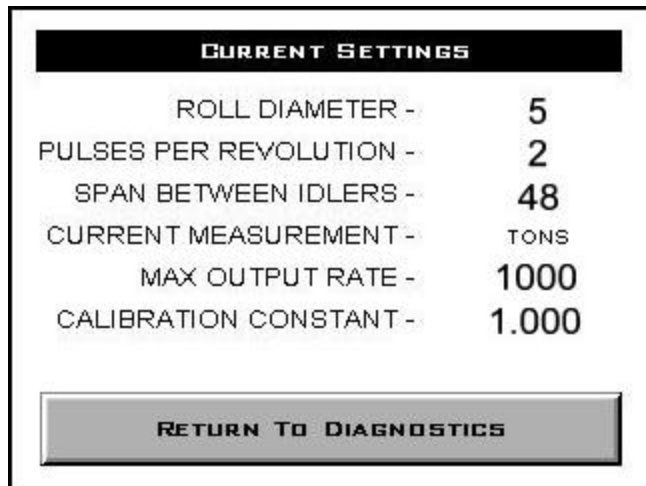


Tests the scales 4-20mA output.

Each time the button is pressed a new output will be sent.

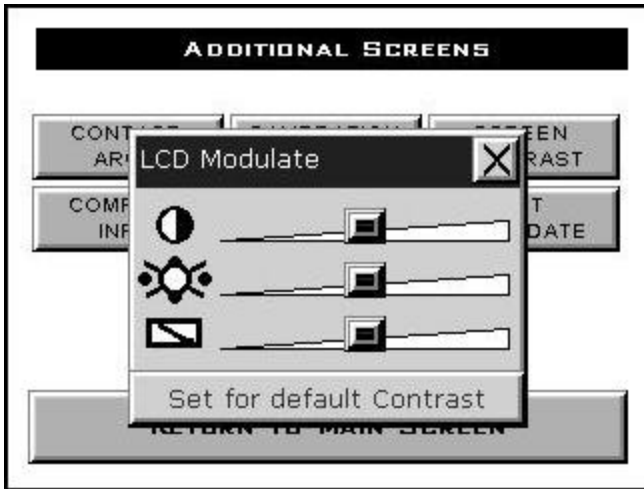
Outputs: 4, 8, 12, 16, and 20.

6.4.4 CURRENT SETTINGS



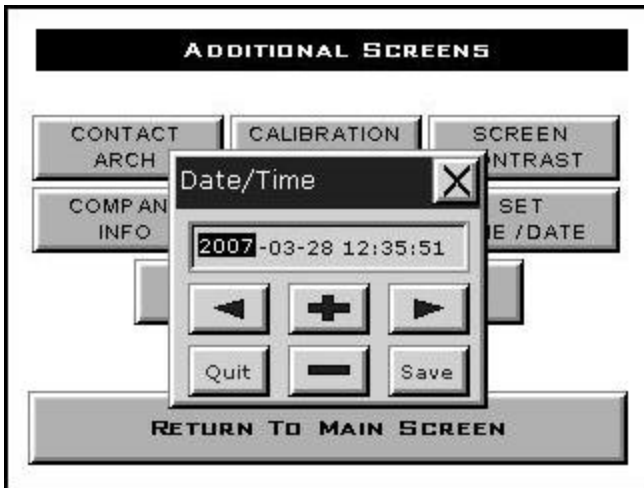
Quick reference of what settings have been entered.

6.5 SCREEN CONTRAST



Adjust the visibility of the screen.

6.6 SET DATE/TIME



Allows the user to set the date and time of the display.

6.7 LOADOUT

LOADOUT	
SET LOADOUT WEIGHT	SET PRE ACT WEIGHT
10.0	1.0
FEEDER CUTOFF -	9.0
BATCH TOTAL (T1) -	3.8
< BACK	BATCH START

Loadout allows the user to load selectable amounts of material in a container, truck, or rail car.

The scale will shut down the belt when the feeder cutoff value is achieved.

A output relay on the PLC is energized when the 'Batch Start' button is pressed and de-energizes when the feeder cutoff value is reached.

Press '**Batch Start**' to start Loadout or '**< Back**' to go back one screen.

6.8 LARGE DISPLAY

LARGE DISPLAY	
TOTAL -	261.4
T1 -	261.4
RATE -	93.5
< RETURN	RESET T1

Displays Total, T1, and Rate in a larger format so the information can be seen easier or farther away.

Press '**Reset T1**' to set back to '0' or '**< Return**' to go back one screen.