Table of Contents

Section 6 System Specifications

List of Illustrations

Warranty

SciTronics warrants all products of its manufacture to be free from defects in material and workmanship. This warranty is effective for three years from the date of shipment to the original Purchaser.

Upon notification by the Purchaser, SciTronics will correct any defects in equipment of its manufacture either by repair in our plant or by supply of replacement parts to the Purchaser.

SciTronics must decide to its own satisfaction that the equipment is defective and has not developed malfunctions as a result of misuse, modification, abnormal conditions of operation, or attempted service not authorized by SciTronics.

SciTronics will not accept any product returned for refund or approve any backcharge for labor, materials, or other costs incurred by the Purchaser or others in modification, adjustment, service, or repair of SciTronics equipment unless such return or backcharge has been authorized in writing to the Purchaser.

Any special test or requirement placed upon SciTronics products or products of other manufacture used in SciTronics systems must be mutually agreed upon in writing by SciTronics and the Purchaser prior to the date of shipment.

SciTronics reserves the right to make changes in design or construction of its products at any time without incurring any obligation to make any changes whatsoever on units previously purchased.

This warranty is expressly made by SciTronics and accepted by the Purchaser in lieu of all other warranties, including warranties of merchantability and fitness for particular purpose, whether written, oral, express, implied, or statutory. SciTronics shall not be liable for normal wear and tear nor for any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its products for any reason whatsoever. In no event shall SciTronics' liability exceed the original purchase price of the equipment.

Note : This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Section 1 Introduction

Using This Manual   This manual contains the installation, operation, and maintenance instructions for your SciTronics Model CS 1000 Belt Scale (belt scale system).

> **NOTE**
> The warranty for your belt scale system is on page iv in this manual. Be sure to read it so you are aware of its provisions and exclusions.

This manual is arranged in the following sections so that you can find the information you need quickly and easily:

- *Section 1 Introduction*
  describes the organization of this manual and provides a general description of the belt scale system.

- *Section 2 Installation*
  provides instructions for mechanical and electrical installation of the belt scale system.

- *Section 3 Programming the Processor*
  describes how to program the digital signal processor for initial setup and any time data needs to be changed.

- *Section 4 Calibration*
  explains how to perform electronic calibration of the belt scale using the digital signal processor.

- *Section 5 Maintenance and Troubleshooting*
  provides the necessary information for routinely maintaining the belt scale system.

- *Section 6 System Specifications*
  list the specification data for the belt scale system.

- *Section 7 Custom Applications*
  explains the features unique to your specific belt scale system.

Overview

The SciTronics belt scale system is installed on a conveyor and weighs material in transfer. It is designed for such applications as rock crushing plants, asphalt and concrete products batch plants, ore processing plants, coal preparation plants, recycling plants, paper and wood processing plants, food processing plants, and fertilizer plants.

The belt scale system consists of the following components:
- belt scale assembly with bridge transducer electronics
- speed sensor
- digital signal processor

The rigid steel construction of the belt scale assembly ensures permanent alignment with the conveyor. The precision NTEP-approved strain gauge load cell accurately weighs the material being conveyed. The weight signal from the load cell is converted to a digital computer signal in the bridge transducer signal conditioner and transmitted to the digital signal processor.

The speed sensor outputs the speed signal that is proportional to the velocity of the belt. The signal is converted to a digital computer signal in the bridge transducer signal conditioner and transmitted to the digital signal processor.

The digital signal processor receives the weight and speed signals, performs calculations, and displays values for rate, total weight, and belt speed in selectable standard engineering units (tons, pounds, tonnes, or kilograms). The processor screen display is a high-intensity, 4-line by 20-character alphanumeric display that is adjustable to high, medium, or low intensity. The screen-saver feature automatically turns the display off during inactive periods to prevent damage to the screen. Using the screen menus and processor keypad, the operator easily steps through programming of the setup data.

The multiple scale interface network allows connection of up to four scales to each digital signal processor.

Features

The belt scale system has the following features:

- Accurate to ±0.5% (approved installations).

- Adjustable intensity, 4-line, 20-character vacuum fluorescent display with screen saver.

- Easily programmable setup data.

- Full-time self-diagnostics.

- Real-time clock calendar.

- Multiple scale interface.

- Manufactured to CEMA standards.

- Optional printer or computer interface (plug-in PC board).

- Optional plug-in cards for relay outputs and 4-20 mA outputs.

- Optional speed sensor selection for variable speed belt.

- Optional LCD Display Model DSP1000LCD

Section 2 Installation

Overview

This section provides instruction for mechanical and electrical installation of the belt scale system.

Unpacking the Belt Scale System

1. Remove the belt scale assembly and speed sensor from the pallet.

2. Place the shipping container containing the digital signal processor on a stable surface and open it, taking care not to damage the contents.

3. Inspect the contents and report any shipping damage or missing parts to the carrier as soon as possible (most carriers will not consider a claim unless notified within 15 days of delivery).

NOTE

The bill of lading for this shipment is an acknowledgment by the carrier of the receipt of the equipment in good condition. SciTronics is not responsible for any loss or damage incurred during shipment. Note any damaged or missing parts on the carrier's delivery receipt. Sign the notation and have the carrier's driver also sign it. The consignee is responsible for initiating claims against the carrier.

Installing the Belt Scale System

WARNING

To prevent bodily injury, be sure that the conveyor is locked out before beginning installation.

CAUTION
1. Whenever possible, be sure to install the belt scale on the conveyor in a location where it is protected from the weather. Wind can cause weighing errors.
2. Curvature or upturn in the conveyor is serious. Consult the factory before mounting the scale.

Mounting the Processor

1. Select a location close to a 115 V power source that is within 1,000 ft (304.8m) of the scale and where the processor will not be exposed to excessive vibration, heat, and moisture. If mounting the processor outside, be sure to place it in a vandal-proof enclosure.

2. Secure the processor to a wall or support at a height where the screen display can be easily seen and the keypad is accessible. Be sure there is sufficient clearance to open the enclosure. Refer to Figure 2-1 for dimensional specifications.

Modifying & Mounting the Weigh Idler to the Belt Scale

The weigh idler (the idler to be mounted to the scale) must be modified to fit the scale mounting pads and then mounted to the scale:

1. Select an idler identical to the idlers that will be in the weighing section of the conveyor. The idler must be in good condition - the rollers must turn freely and have good concentricity.

2. Saw cut or torch cut the existing mounting feet to remove them from the idler.

3. Sometimes it is necessary to remove material from the idler that may weaken the roller support. If so, reinforce the end brackets by welding a "gusset" between the vertical end bracket and the horizontal piece.

4. Place the idler on the new mounting pads, which are bolted the scale assembly. Center the idler from side to side on the pads. Check for sufficient clearance - approximately ½ in. (13 mm) - between the bottom of the idler and the scale frame.

5. Center the idlers exactly 18 in. (457 mm) from the rear pivot support and the center of the end idler rollers, typically to the grease fitting.

6. Clamp in place. Check for squareness from corner to corner and check the dimensions.

   CAUTION
    To prevent damage to the load cell, disconnect it and remove it from the housing.

   ---

7. Weld the idler to the new mounting pads.

Mounting the Belt Scale Assembly on the Conveyor

Place the belt scale assembly where a minimum of belt stress or deformation can occur (that is, away from the loading area and the head pulley). Referring to Figure 2-2, install the belt scale assembly by doing the following:

1. Raise the belt clear of the idlers in the weigh section.

2. Loosen three idlers on each side of the scale. If your conveyor is very short, reduce the scale section to two idlers on each side. Aligning longer sections can improve performance.

2-3

3. Mark the center of each roller.

4. Place two 1/8 in. (3mm) shims (a total of ¼ in.) under the feet of both the +3 and -3 idlers.

5. Stretch three string lines over the center marks on the +3/-3 idlers. Bolt the idlers down exactly six spaces or weigh spans apart. For example, for a 36 in. (91cm) weigh span, attach the +3/-3 idlers exactly 18 ft (5.49 m) center to center and square with the conveyor.

6. Shim the belt scale assembly to obtain 1/32 in (.8mm) clearance below the string line.

7. Shim the +1/-1 idlers to 1/32 in (.8mm) clearance.

   CAUTION

   Poor alignment will affect scale accuracy.

8. Shim the remaining idlers according to step 7, aligning all center marks. Bolt the idlers down lightly. Check again after tightening the bolts.

9. When the belt scale and the idlers are securely attached, remove one of the 1/8 in (3mm) shims from the +3/-3 idlers and reattach the +3/-3 idlers into position. The entire belt scale section is now flat between the +2/-2 idlers and 1/16 in (.8mm) higher than the +3/-3 idlers.

CAUTION

To prevent damage to the load cell, disconnect it and remove it from the housing.

10. Tack weld ¼ in (6mm) on each idler foot to prevent it from moving out of position. For extra stability and to minimize twisting on portable conveyors, tack weld all idlers.

11. Remove the string lines and lower the belt. Run the conveyor and adjust the tension until the belt runs true in the center of the idlers. Check that all the idlers in the scale area turn freely from the pressure of the empty moving belt.

Mounting the Bridge Transducer Circuit Board Enclosure

Mount the bridge transducer circuit board enclosure between the processor and the belt scale so that it is within 6 ft (1.8m) of the belt scale assembly.

Installing the Speed Sensor

The "Belt Rider" speed sensor is shipped assembled and ready for installation on the conveyor. For convenience, install the speed sensor just behind the scale in the mounting holes provided. The factory provides an adequate length of cable to allow placing the speed sensor a sufficient distance in front or behind (but not over) any return idlers. If necessary, the speed sensor can be installed in front of the scale if the above guidelines are followed.

Install the speed sensor by doing the following:
1. Place the speed sensor on the conveyor stringers.

2. Center the speed sensor wheel on the belt.

3. Square the speed sensor mounting pipe to the conveyor.

4. Mark and drill the mounting holes in the stringers - drill a ¼ in (6mm) clearance hole.

5. Using the ¼ in X 2 in (6mmX51mm) bolts provided, bolt the speed sensor to the conveyor.

Attaching the Load Cell to the Belt Scale Assembly

The factory disconnects the load cell before shipping the belt scale assembly. Attach the load cell to the belt scale assembly by doing the following:

1. Remove the cover panel of the scale. Locate the T-handle Allen wrench and the load cell and remove them.

2. Using the Allen wrench, remove the 3/8 in (10mm) bolt from the belt scale assembly.

3. Insert the bolt into the load cell and attach the load cell to the belt scale assembly using the wrench.

Wiring the Belt

 WARNING
 Be sure that the power is off before wiring the belt scale system.

Consider the following before making electrical connections:

- Do not shorten the load cell cable. The wire length to load cell temperature compensation.
- Do not route the load cell or signal cables in the same conduit as the power wires or any large source of electrical noise.
- Connect the shields <u>only</u> where shown.
- Check that all wires are tight in their connectors - this is especially important for load cell connections.
- Earth ground all enclosures and conduit.

Referring to the wiring diagram in Figure 2-3 on page 2-7, wire the belt scale system:

1. Open the processor enclosure by releasing the two latches on the right side of the enclosure (when facing the front of the enclosure). Refer to Figure 2-1 on page 2-2. Supply 115 V power to terminals H, N, and G on the processor circuit board. Using the 25-ft wire (7.6-m) provided by the factory, connect terminals 10, 12, and 19 on the processor circuit board to terminals 10, 12, and 19 on the bridge transducer circuit board and the shield to G. Close the processor enclosure and latch the door.

2. Using the 4-ft (1.2-m) flexible Sealtite® conduit provided by the factory, connect the load cell terminals to the bridge transducer circuit board terminals: GRN to 25, RED to 22, BLK to 20, WHT to 29, and the shield to G.

3. Using the 10-ft (3-m) cable provided by the factory, connect the speed sensor terminals to the bridge transducer circuit board terminals: BLK to 30 and WHT to 39.

4. Supply 115 V power to terminals H, N, and G on the bridge transducer circuit board.

Section 3 Programming the Processor

Overview

This section describes how to program the digital signal processor for your specific application. Refer to the information in this section on **Initial Programming** on page 3-3 for initial setup of the processor and to **Changing the Setup Data** on page 3-19 any time the data needs to be changed.

Becoming Familiar with the Processor

The processor (as shown in Figure 3-1) has a screen display that shows the **Main Menu** and each submenu as the operator steps through the screens during programming. The operator can view the changes made to each selection before saving the change. Values are entered and selections are made using the pressure-sensitive keypad. When the operator leaves a field after making a change, this change is automatically saved. During normal operation of the belt scale, values for total weight, rate, and belt speed are shown in the screen display.

Processor Screen Display

The screen display (as shown in Figure 3-1 on page 3-1) is a 4-line, 20-character vacuum fluorescent display. The intensity of the display can be set for high, medium, or low. The screen-saver feature uses a sleep timer to turn off the display during inactive periods so that an image does not become permanently burned into the screen.

Processor Keypad

The pressure-sensitive keypad (as shown in Figure 3-1 on page 3-1) consists of 11 dedicated function keys.

ZERO
Zeros out the tare weight during initial and routine calibration. Refer to **Section 4 - Calibration** for more information on calibration.

RESET TOTAL
Resets the totals being displayed.

DISPLAY
Allows the operator to select the screens in the **DISPLAY** mode.

TEST CAL
Used to check calibration of the belt scale. Refer to **Section 4 - Calibration** for more information on calibration.

PRINT
Initiates printing of a report showing either hourly totals or grand totals as preprogrammed at the factory.

PROG
Selects the **PROGRAM** function and allows the operator to scroll through the submenus of the **Main Menu** and fields of the submenus.

ENTER
Accesses a submenu in the **PROGRAM** function.

EXIT
Closes a submenu and returns the operator to the **Main Menu** in the **PROGRAM** function. At the **Main Menu**, pressing this key returns the operator to the **DISPLAY** function.

SELECTION

Activates a selection or value in a field for making a change to it in the **PROGRAM** function. When changing a numeric value, use this key to move to each digit.

DECR/INCR

Used to change a numeric value in a field or to scroll through the selections in a field in the **PROGRAM** function. Press the **INCR** key to increase the value of a specific digit and the **DECR** key to decrease the value of a specific digit.

Programming the Setup Data

Initial Programming

NOTE

The processor screens shown are examples only. The units of measure displayed will depend on the operator's selections in **Mode 10: units of measurement** in the **scale set up** submenu.

1. Apply power to the processor by plugging it into an outlet. The first screen in the **DISPLAY** function appears in the screen display.

2. Press the **PROG** key for approximately 3 seconds until the **Main Menu** of the **PROGRAM** function appears on the screen.

   #### NOTE

   The flow chart in Figure 3-2 on page 3-4 shows the submenus and fields within each submenu. Table 3-1 on pages 3-5to3-7 lists the fields in each submenu and valid entries for each field in a submenu. Refer to these as necessary during programming.

Figure 3-2 Processor Menu Tree

<u>**Scale Set-Up:**</u>

Mode 1:	Weigh Span
Mode 2:	Belt Length
Mode 3:	Load Span Adjustment
Mode 4:	Calibration (0000.00 pounds)
Mode 5:	Moisture Content (00.0 percent)
Mode 6:	AZT
Mode 7:	Tracking Time
Mode 8:	Auto Zero Tracking
Mode 9:	Test Cal Function (Calibrate / Test)
Mode 10:	Test Cal Timing Source (Minutes / Belt Revolutions)
Mode 11:	Test Cal Time Interval (Min or Rev. selection of Mode 10)
Mode 12:	Belt Speed Span Adjustment
Mode 13:	Units of Measurement
Mode 14:	Damping
Mode 15:	Total Decimal Point
Mode 16:	Rate Decimal Point
Mode 17:	Belt Speed Decimal Point
Mode 18:	Terminal 9 Input Function

<u>**Material Test:**</u>

Scale 1:	Test Total

<u>**Serial Port:**</u>

Mode 1:	Baud Rate
Mode 2:	Bits Per Character
Mode 3:	Parity
Mode 4:	Station I.D.
Mode 5:	Time
Mode 6:	Date
Mode 7:	Clock Mode
Mode 8:	Reset Total or Print Command
Mode 9:	Print Net Total (Yes / No)
Mode 10:	Print on the Hour (Yes / No)

<u>**Control Relay 1:**</u>

Mode 1:	Function
Mode 2:	Logic
Mode 3:	Pulse Width
Mode 4:	Pulse Scale
Mode 5:	Alarm Delay

Table 3-1 Programming Data Table

Submenu	Item	Valid Entries
Scale Set Up	Mode 1: weigh span	00.000 to 99.999*
	Mode 2: belt length	0000.00 to 9999.99*
	Mode 3: rate span adjustment	0000.00 to 9999.99 reference
	Mode 4: azt (auto zero time) set point	00.00 to 99.99*
	Mode 5: tracking time interval	01 to 99 belt revs
	Mode 6: auto zero time interval	01 to 99 belt revs
	Mode 7: cal test timing source	Minutes
		Belt Revolutions
	Mode 8: cal test time interval	01 to 99 belt revs
	Mode 9: belt speed span adjustment	0000.00 to 9999.99 reference
	Mode 10 : units of Measurement	Tons Per Hour
		Tons Per Minute
		Pounds Per Hour
		Pounds Per Minute
		Tonnes Per Hour
		Tonnes Per Minute
		Kilograms Per Hour
		Kilograms Per Minute
	Mode 11: damping	00.00 to 99.99 reference
	Mode 12: total decimal point	Ones
		Tenths
		Hundredths
	Mode 13: rate decimal point	Ones
		Tenths
		Hundredths
	Mode 14: belt speed decimal point	Ones
		Tenths
		Hundredths
		Interlock
	Mode 15: terminal 9 input function	Print Command
		Reset Alarm
Material Test	scale 1: test total	0000.00 to 9999.99*
Serial Port	Mode 1: baud rate	1200
		2400
		4800
		9600
		19.2K
	Mode 2: bits per character	Seven
		Eight
	Mode 3: parity	None
		Odd
		Even
	Mode 4: station I.D.	A-P
	Mode 5: time	Format - Hour:Min:Sec
		Example: 11:52:09

* The units displayed depend on the operator's selection in the **Units of Measurement** mode (Mode 10) of the **Scale Set Up** submenu.

Table 3-1 Programming Data Table (continued)

Submenu	Item	Valid Entries
Serial Port (continued)	Mode 6: date	Format - month-day-year
		Example: 04-11-95
	Mode 7: clock mode	AM
		PM
	Mode 8: reset total on print command	Yes/No
	Mode 9: print on the hour	Yes/No
Control Relay 1	Mode 1: function	pulse repeater
		high/low alarm
		diagnostic alarm
	Mode 2: logic	normally open
		normally closed
	Mode 3: pulse width	.00 to .99 seconds
	Mode 4: pulse scale	0000.0 to 9999.99*
	Mode 5: alarm delay	.00 to .99 seconds
	Mode 6: low rate alarm setpoint	0000.00 to 9999.99*
	Mode 7: high rate alarm setpoint	0000.00 to 9999.99*
	Mode 8: low speed alarm setpoint	0000.00 to 9999.99*
	Mode 9: high speed alarm setpoint	0000.00 to 9999.99*
Control Relay 2	Mode 1: function	pulse repeater
		high/low alarm
		diagnostic alarm
	Mode 2: logic	normally open
		normally closed
	Mode 3: pulse width	.00 to .99 seconds
	Mode 4: pulse scale	0000.00 to 9999.99*
	Mode 5: alarm delay	.00 to .99 seconds
	Mode 6: low rate alarm setpoint	0000.00 to 9999.99*
	Mode 7: high rate alarm setpoint	0000.00 to 9999.99*
	Mode 8: low speed alarm setpoint	0000.00 to 9999.99*
	Mode 9: high speed alarm setpoint	0000.00 to 9999.99*
Milliamp Output 1	Mode 1: function	rate output
		belt speed output
		lbs/foot output
		pulse repeater
	Mode 2: offset	0.000 to 9.999 milliamps
	Mode 3: full scale	
	Mode 4: pulse width	
	Mode 5: pulse scale	
Milliamp Output 2	Mode 1: function	rate output
		belt speed output
		lbs/foot output
		pulse repeater
	Mode 2: offset	0.000 to 9.999 milliamps
	Mode 3: full scale	0000.00 to 9999.99*
	Mode 4: pulse width	.00 to .99 seconds
	Mode 5: pulse scale	0000.00 to 9999.99*

*The units displayed depend on the operator's selection in **Mode 10: units of measurement** in the **scale set up** submenu.

Table 3-1 Programming Data Table (Continued)

Submenu	Item	Valid Entries
	Mode 1: lock zero	Yes / No
	Mode 2: lock reset	Yes / No
	Mode 3: lock test cal	Yes / No
	Mode 4: lock print	Yes / No
	Mode 5: lock code	6 digits
Display	Mode 1: display intensity	High
		Medium
		Low
	Mode 2: screen saver	00 to 99 minutes
	Mode 3: demo mode	On / Off

NOTE

The procedure for **Initial Programming** is organized
so that the operator can access the first submenu in the
Main Menu and continue in order through each
submenu until all data has been programmed.

Program each submenu as appropriate for your application:

SCALE SET UP SUBMENU

In the **scale set up** submenu, the operator enters belt scale system
parameters that will be used by the processor in its internal
calculations during calibration and normal operation.

*To program the **scale set up** submenu:*

1. At the **Main Menu**, press the **ENTER** key. The **scale set up**
   submenu appears on the screen displaying **Mode 1: weigh
   span.** The weigh span of the belt scale is the exact on-
   center distance between the first advance and the first
   retreat idler from the scale carriage, divided by two. Enter
   this value (**00.000 to 99.999**) into the **weigh span** field
   using the **SELECT** key to move to each digit and the
   INCR and **DECR** keys to scroll through the numbers until
   the appropriate value appears in the field. Press the **PROG**
   key to move to Mode 2.

2. **Mode 2: belt length** appears on the screen. Belt length is the length of one complete revolution of the belt. Enter this value **(0000.00 to 9999.99)** into the **belt length** field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 3.

3. **Mode 3: rate span adjustment** appears on the screen. Rate span adjustment is the value used by the processor during calibration to manually adjust the scale system. This field has been set by the factory but it can be changed as necessary. It may be necessary to change this field during the calibration process. Enter this value **(0000.00 to 9999.99)** into the **rate span adjustment** field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 4.

4. **Mode 4: azt set point** appears on the screen. When the rate falls below the value set in this field, the processor starts to track for the length of time indicated in the **tracking** and **auto zero time interval** fields. Do not enter a value above the lowest normal material flow rate. Setting this field at **00.00** disables auto zero tracking. Enter a value **(00.00 to 99.99)** into the **azt set point** field using the **SLELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 5.

5. **Mode 5: tracking time interval** appears on the screen. Tracking time interval is the number of belt revolutions to be used by the processor during a zero tracking cycle. Enter a value the allows for a 5 to 6 minute zero tracking cycle so that the auto zero cycle does not start before the conveyor belt has emptied. Enter a value **(01** to **99** belt revolutions)** into the **tracking time interval** field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 6.

6. **Mode 6: auto zero time interval** appears on the screen. Auto zero time interval is the number of belt revolutions during an auto zero cycle. Although valid entries in this field range from **01** to **99** belt revolutions, typically, a value of **2** to **3** belt revolutions is recommended. Enter a value into the **auto zero time interval** field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 7.

7. **Mode 7: cal test timing source** appears on the screen. Valid selections in this field are **minutes** or **belt revs.** If the operator selects belt revolutions, the processor uses belt length and speed to determine the duration of the test cycle. If the operator selects minutes, the actual number of minutes entered determines the length of the cycle. Make your selection using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections. When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 8.

8. **Mode 8: cal test time interval** appears on the screen. Calibration test time interval is the number of belt revolutions or minutes (depending on your selection in the **cal test timing source** field) used by the processor during the calibration test. Enter a value in the **cal test time interval** field (**01** to **99** belt revolutions) using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 9.

9. **Mode 9: belt speed span adjustment** appears on the screen. Belt speed span adjustment is the value used by the processor to calculate flow rate. This field is set by the factory but can be manually changed when necessary to compensate for a discrepancy between the actual weight in total tons and the indicated weight in total tons. Enter the value (**0000.00** to **9999.99**) into the **belt speed span adjustment** field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the PROG key to move to Mode 10.

10. **Mode 10: units of measurement** appears on the screen. This field allows the operator to choose English or metric units of measure (**tons per hour, tons per minute, pounds per hour, pounds per minute, tonnes per hour, tonnes per minute, kilograms per hour,** or **kilograms per minute**). The selection in this field is used for the totals in the **DISPLAY** function and for values as appropriate in the **PROGRAM** function. Whenever this field is changed, the processor automatically changes all applicable fields. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections. When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 11.

11. **Mode 11: damping** appears on the screen. The value entered in this field indicates the amount of weight change (typically in pounds) to smooth the rate display when there are rapid input variations. Enter the value (**00.00** to **99.99**) into the damping field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 12.

12. **Mode 12: total decimal point** appears on the screen. In this field, the operator determines how many decimal places will be used in the total displayed on the screen in the **DISPLAY** function. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**ones, tenths,** and **hundredths**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 13.

13. **Mode 13: rate decimal point** appears on the screen. In this field, the operator determines how many decimal places will be used in the rate displayed on the screen in the **DISPLAY** function. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**ones, tenths,** and **hundredths**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 14.

14. **Mode 14: belt speed decimal point** appears on the screen. This field allows the operator to determine how many decimal places will be used in the belt speed displayed on the screen in the **DISPLAY** function. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**ones, tenths,** and **hundredths**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 15.

15. **Mode 15: terminal 9 input function** appears on the screen. This field allows the operator to jumper terminal 9 to an outside circuit. If this terminal is not needed, leave the default setting (**interlock**). Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**interlock, remote reset, print command,** and **reset alarm**). When the desired selection appears on the screen, press the **SELECT** key to leave this submenu and return to the **MAIN MENU.**

MATERIAL TEST SUBMENU
The operator uses the **material test** submenu for calibrating the belt scale. Refer to **Section 4 - Calibration** for more information on this submenu.

SERIAL PORT SUBMENU
The **serial port** submenu is used to enter the settings required for connection to a remote computer.

*To program the **serial port** submenu:*
1. Press the **PROG** key to move to the **serial port** submenu. Press the **ENTER** key to display the first field in the submenu.

2. **Mode 1: baud rate** appears on the screen. The baud rate is the speed in bits per second at which data is transmitted between the processor and the remote computer. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**1200, 2400, 4800, 9600,** and **19.2K**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 2.

3. **Mode 2: bits per character** appears on the screen. This field determines the desired word length that will match the setting of the remote device. It does not include stop, start, or parity bits. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**seven** and **eight**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 3.

4. **Mode 3: parity** appears on the screen. Parity is the method use to check errors in data transmission. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**none, odd,** and **even**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 4.

5. **Mode 4: station I.D.** appears on the screen. Use the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**A-P**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. **B-P** are used for multiple hookups of processors. Press the **PROG** key to move to Mode 5.

6. **Mode 5: time** appears on the screen. The operator enters the current time in this field. When a report is printed, the time the report was generated is printed on the report. Enter the current time in hours, minutes, and seconds (for example: 11:52:09) using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the complete time appears in the field. Press the **PROG** key to move to Mode 6.

7. **Mode 6: date** appears on the screen. The operator enters the current date in this field. When a report is printed, the date the report was generated is printed of the report. Enter the current date in a month-day-year format (for example: 07-11-95) using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the complete date appears in the field. Press the **PROG** key to move to Mode 7.

8. **Mode 7: clock mode** appears on the screen. The operator selects **a.m.** if the current time is before noon or **p.m.** if the current time is after noon using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections. When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 8.

9. **Mode 8: reset total on print command** appears on the screen screen. The operator indicates in this field if the total should be automatically reset after printing by using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**yes** and **no**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 9.

10. **Mode 9: print on the hour** appears on the screen. The operator indicates in this field if printing on the hour is desired by using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections (**yes** and **no**). When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **EXIT** key to leave this submenu and return to the **Main Menu.**

CONTROL RELAY 1 SUBMENU / CONTROL RELAY 2 SUBMENU

The control relays 1 and 2 allow the operator to program the processor for more than one function. For example, the operator may want each control relay programmed for a different alarm or one control relay programmed for pulse repeater and one for an alarm.

*To program the **control relay 1** and **2** submenus:*

1. Press the **PROG** key to move to the **control relay 1** submenu. Press the **ENTER** key to display Mode 1.

2. **Mode 1: function** appears on the screen. Valid selections in this field are **pulse repeater, high/low alarm,** and **diagnostic alarm.** Make your selection using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections. When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 2.

3. **Mode 2: logic** appears on the screen. Valid selections in this field are **normally open** or **normally closed.** Make your selection using the **SELECT** key to activate the current selection (it will blink) and the **INCR** and **DECR** keys to scroll through the selections. When the desired selection appears on the screen, press the **SELECT** key and the selection will stop blinking. Press the **PROG** key to move to Mode 3.

4. **Mode 3: pulse width** appears on the screen. Enter the value desired (**.00** to **.99** seconds) into the pulse width field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 4.

5. **Mode 4: pulse scale** appears on the screen. The pulse output is scaled at the value entered in this field. Enter the value desired (**0000.00** to **9999.99**) into the pulse scale field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. Press the **PROG** key to move to Mode 5.

6. **Mode 5: alarm delay** appears on the screen. Enter the value desired (**00** to **99** seconds) into the alarm delay field using the **SELECT** key to move to each digit and the **INCR** and **DECR** keys to scroll through the numbers until the appropriate value appears in the field. The value entered in this field indicates the length of time is seconds during an alarm condition before the operator is alerted. Press the **PROG** key to move to Mode 6.

7. **Mode 6: low rate alarm set point** appears on the screen.
When the rate falls below the value set in this field, the
processor alerts the operator to an alarm condition. Enter the
value desired (**0000.00** to **9999.99**) into the **low rate alarm set
point** field using the **SELECT** key to move to each digit and
the **INCR** and **DECR** keys to scroll through the numbers until
the appropriate value appears in the field. Press the **PROG** key
to move to Mode 7.

8. **Mode 7: high rate alarm set point** appears on the screen.
When the rate moves above the value set in this field, the
processor alerts the operator to an alarm condition. Enter the
value desired (**0000.00** to **9999.99**) into the **high rate alarm set
point** field using the **SELECT** key to move to each digit and
the **INCR** and **DECR** keys to scroll through the numbers until
the appropriate value appears in the field. Press the **PROG** key
to move to Mode 8.

9. **Mode 8: low speed alarm set point** appears on the screen.
When the speed moves below the value set in this field, the
processor alerts the operator to an alarm condition. Enter the
value desired (**0000.00** to **9999.99**) into the **low speed alarm
set point** field using the **SELECT** key to move to each digit
and the **INCR** and **DECR** keys to scroll through the numbers
until the appropriate value appears in the field. Press the **PROG**
key to move to Mode 9.

10. **Mode 9: high speed alarm set point** appears on the screen.
When the speed moves above the value set in this field, the
processor alerts the operator to an alarm condition. Enter the
value desired (**0000.00** to **9999.99**) into the **high speed alarm
set point** field using the **SELECT** key to move to each digit
and the **INCR** and **DECR** keys to scroll through the numbers
until the appropriate value appears in the field. Press the **EXIT**
key to leave this submenu and return to the **Main Menu.**

11. To program **control relay 2,** press the **PROG** key once to
move to the **control relay 2** submenu. Follow steps 2-10 above
to complete the procedure for programming **control relay 2.**