9480

EXPRESSWEIGH

Software: SBM137A

Technical Manual

INTRODUCTION

Information regarding Mettler Toledo Technical Training may be obtained by writing, calling, or faxing to:

METTLER TOLEDO
Training Center
P. O. Box 1705
Columbus, Ohio 43216-6712
Phone: (614) 438-4400
Fax: (614) 438-4444

WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause interference to radio communications. It has been tested and found to comply with the limits for a class A computing device pursuant to subpart J or part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

METTLER TOLEDO RESERVES THE RIGHT TO MAKE REFINEMENTS OR CHANGES WITHOUT NOTICE.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

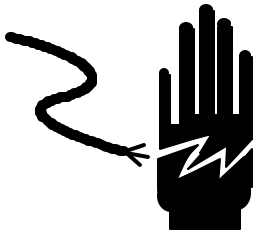
FOLLOW these instructions carefully.

SAVE this manual for future reference.

DO NOT allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.

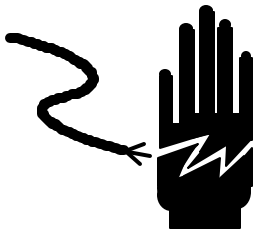
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



WARNING

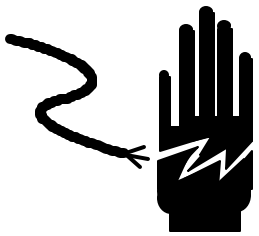
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.



WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY.

DO NOT REMOVE THE GROUND PRONG.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE REMOVING THE FUSE OR SERVICING.

CAUTION

BEFORE CONNECTING/DISCONNECTING ANY INTERNAL ELECTRONIC COMPONENTS OR INTERCONNECTING WIRING BETWEEN ELECTRONIC EQUIPMENT ALWAYS REMOVE POWER AND WAIT AT LEAST THIRTY (30) SECONDS BEFORE ANY CONNECTIONS OR DISCONNECTIONS ARE MADE. FAILURE TO OBSERVE THESE PRECAUTIONS COULD RESULT IN DAMAGE TO OR DESTRUCTION OF THE EQUIPMENT OR BODILY HARM.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

TABLE OF CONTENTS

1.0 GENERAL DESCRIPTION

The Mettler Toledo Expressweigh System is designed to weigh products as they are conveyed in-motion across a scale, and output the products Gross weight to a host system supplied by others. An optional Mettler Toledo printer can be connected to the Expressweigh Controller to record product weights.

The complete Expressweigh System, normally, includes the 9480 Expressweigh Controller, 9410 High Speed Junction Box, a Mettler Toledo load cell base (scale) with a Mettler Toledo conveyor. Two photoeyes are mounted on the conveyor to sense when items are entering and exiting the conveyor. The scale is connected to the Mettler Toledo Model 9410 high speed junction box. The junction box and the photoeyes are interfaced to the 9480 Expressweigh Controller.

9480 Controller Features:

- User Interface, via an alpha / numeric keyboard, for setup configuration, and a local 19 character alpha / numeric display.
- Scale Interface, via RS422 communication for access to scale setup and weighing data.
- Printer, via 20 Ma. current loop or RS232, user selectable data transmission.
- Remote #1 device Interface and protocol user selectable. Data transmission via RS232 or RS422.
- Remote #2 device Interface and protocol user selectable. Data transmission RS232 or 20 mA. current loop(transmit only).
- Remote Input Device Interface, port and data location selectable.
- Packaged in a Painted Mild Steel enclosure or Stainless Steel enclosure.
- Isolated 120 V.A.C. inputs and outputs for high level interface to user equipment.

9410 Features:

- Supports the use of a 1, 2, or 4 load cell strain gauge scale system.
- Serial Port operating at RS422 four wire for full control of the 9410.
- Powered from a single 24 VDC power supply from the Controller.
- Packaged in a Stainless Steel water resistant enclosure with cord grip connectors for cable entry.
- Power up zero capture selectable from 0, 2, or 20% of scale capacity.
- Auto zero capture through a command from the Serial port to allow capturing 6, 14, 24, 54, or 104 minor increments at a time up to 0, 2, or 20% of capacity.
- Digital filtering selectable through the Serial port allowing adjustable corner frequencies from 10 HZ(0.1 sec. setting) to 0.5 HZ(1.0 sec. setting).
- Digital shift adjust and calibration performed through the 9480 Controller.
- The initial can range up to 80% of full scale with a span resolution of 100,000 minor increments.
- 15 Volt excitation for up to 4-350 Ohm load cells.

2.0 SPECIFICATIONS:

2.1 9480 Controller:

2.1.1 Environment

The model 9480 will operate over a temperature range from -10 C (14 F) to 40 C (104 F) at 10 to 95% relative humidity, non-condensing.

2.1.2 Power Requirements

The 9480 RAM 0001 & 0002 operate at 120VAC(+10% -15%) at a line frequency of 49 to 61.5 Hz. The 9480 RAM 0011 & 0012 operate at 220VAC(+10% -15%).

Power consumption is 360 VA maximum(combined of controls and I/O) and 50 VA minimum for controls only.

2.1.3 Appearance and Dimensions

The 9480 is available in two wall mount versions that are both 14" high, 16" wide and 9.5" deep. They are, a painted, charcoal black mild steel version and an unpainted, brushed stainless steel version(See Figure 2.1 for the general dimension detail).

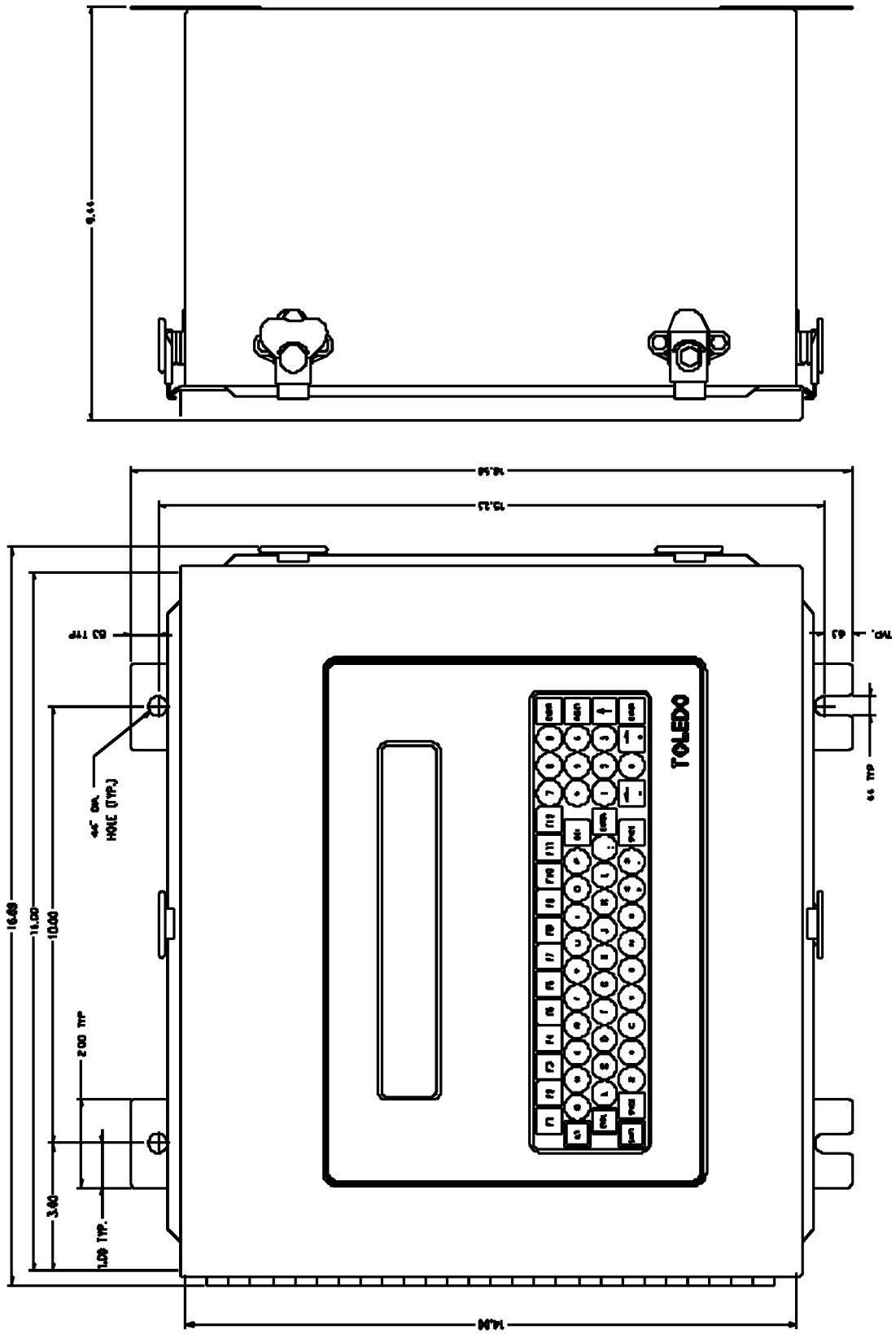


FIGURE 2.1

2.1.4 Data Interface

2.1.4.1 Printer I/F

Allows selection in/out and configuration of the baud rate, bits per character, parity, and enabling of error logging. Formatting of the output string where each selected field (CN, ID1, ID2, Date, Time, Sum, weight, fixed characters and units) may be positioned in the output string by specification of the starting character position. Fixed characters may be utilized to format the output for printer control, multiple print lines, or multiple line feeds between prints. Output is 20 mA. current loop or RS232.

2.1.4.2 Display

Allows formatting of the Run (time) Display where each (Local) selected field (CN, ID1, ID2, Date, Time, Sum, weight, fixed characters and units) may be positioned in the display by specifying the starting character position.

2.1.4.3 Remote #1 I/F

Allows selection of programmable output or Mettler Toledo Continuous output. Communication is RS232 or RS422.

The programmable output allows configuration of the baud rate, bits per character, parity, enabling of ACK/NAK protocol, and enabling of error logging. Formatting of the output string where each selected field (CN, ID1, ID2, Date, Time, Sum, weight, fixed characters, block check character and units) may be positioned in the output string by specification of the starting character position.

The Mettler Toledo Continuous format data allows selection of baud rate. Optional selection of continuous data output of last item weighed or one transmission output per item weighed. Optional selection of Error Logging and CheckSum Character. See Section 9.0 for other details.

2.1.4.4 Remote #2 I/F

Allows selection of programmable output or Mettler Toledo Continuous output. Communication is RS232(Xmit/Recv) or Current Loop(Xmit Only).

The programmable output allows configuration of the baud rate, bits per character, parity, enabling of ACK/NAK protocol, and enabling of error logging. Formatting of the output string where each selected field (CN, ID1, ID2, Date, Time, Sum, weight, fixed characters, block check character and units) may be positioned in the output string by specification of the starting character position.

The Mettler Toledo Continuous format data allows selection of baud rate. Optional selection of continuous data output of last item weighed or one transmission output per item weighed. Optional selection of Error Logging and CheckSum Character. See Section 9.0 for other details.

2.1.4.5 Remote Input

Allows selecting In/Out, port(Remote #1 or #2), location and length of ID1 and/or ID2 in received string.

2.1.5 Test

The system provides for running seven diagnostic tests.

Display - writes a test pattern to the local display.

Keyboard - displays the key pressed.

Printer - outputs a test print line. The test output string is: ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789 .

Remote #1/#2 - outputs a test string repeatedly and displays any displayable characters received (this allows a loop back test) or both transmitted and received printable characters may be printed if printer is enabled. The test output string is:

ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789. For loop back testing, connect the output to the input.

Remote Input - displays any displayable characters received in ID1.

Inputs - displays on/off condition of inputs on the local display as [INPUTS 00000100] where the status of each of the 8 inputs are displayed. A standard unit only uses 3 of the 8 inputs (inputs #0, #1, and #2).

Outputs - The outputs can be selected on and off individually. A standard unit only uses 3 of the 8 outputs (outputs #0, #1, and #2). During the output test observe the status lights on the output opto isolator P.C. board to confirm that outputs are being cycled.

Caution: If external devices are connected during the output testing the devices will be energized.

Scale - Displays the scale reading and sends it out the remote port every half second, in the calibrated units. Also, allows zeroing of the scale.

2.1.6 Run Mode

The system run mode will be the default mode whenever the "RUN PERMISSIVE" input is on. The system allows for operator input of the optional variables (ID, CN, SUM, DATE, and TIME), entry to setup, and test while in the run mode.

2.1.7 I/O Interface

120 V.A.C. Isolated inputs and outputs are provided to interface to other devices outside of the controller.

2.1.7.1 INPUTS

There are three required inputs to the Expressweigher Controller for normal operation.

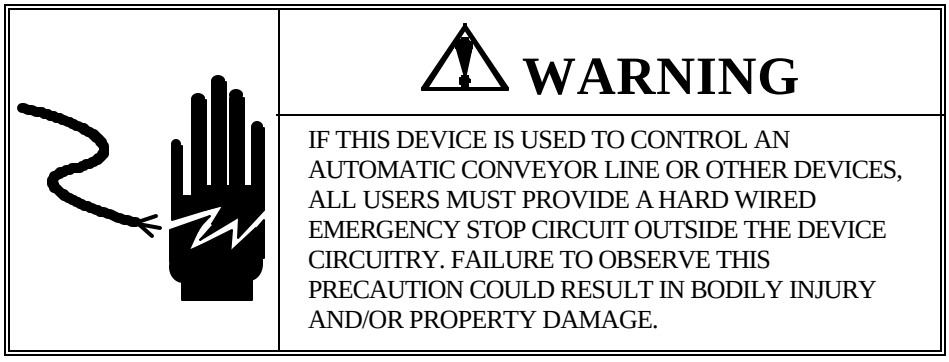
ENTRANCE and EXIT, Photo-eye contact inputs. These two required inputs allow the Controller to detect when a product has moved onto the scale and then detect when the product leaves the scale.

RUN PERMISSIVE, contact input. This required input to the Controller must be "CLOSED" to place the Controller in the "Run Mode". This input may be connected to any user device that provides a dry contact closure. When this contact is "OPEN": (1) the Controller is placed into a standby mode, (2) any error is cleared (see Section 11.0 on Error Conditions for more details), and (3) the Controller becomes an inactive part of the conveyor line.

2.1.7 I/O Interface (continued)

2.1.7.2 OUTPUTS

Three isolated 120 V.A.C. at 1 Amp. continuous, non-inductive, outputs are provided. Use of these outputs is optional.



ALARM, this output comes ON when an Error Condition occurs. This output is OFF when no Error Condition exists.

2.1.7.2 OUTPUTS (continued)

RUNNING, this output is normally ON, this output will be OFF when any of the following conditions occur; (1) An Error occurs, (2) The RUN PERMISSIVE input is removed (Opened), (3) Power has been removed from the Controller, (4) A component failure has occurred within the controller, or (5) The controller is in TEST or SETUP mode.

SCALE EMPTY, this output will be ON when the Photo-eyes (both Entrance and Exit) are clear and there is no product on the scale.

2.2 9410 HIGH SPEED JUNCTION BOX

2.2.1 Environment

The model 9410 will operate over a temperature range from -10 C (14 F) to 40 C (104 F) at 10 to 95% relative humidity, non-condensing. Zero temperature coefficient is 0.5 uV/degree C maximum. Span temperature coefficient is 12 PPM/degree C maximum.

2.2.2 Power Requirements

The 9410 operates from a single 24VDC(+10% -15%) 600mA power supply. The power supply is supplied in the controller.

2.2.3 FCC Regulations

The 9410 meets or exceeds the FCC conducted and radiated emissions requirements.

2.2.4 RFI Specifications

The 9410 has been designed to greatly reduce susceptibility to Radio Frequency Interference if installed per the drawings supplied with the equipment.

2.2.5 Appearance and Dimensions

The 9410 is packaged in a Stainless Steel Nema 4X enclosure. The enclosure is 2.64" deep, 12.00" wide, and 11.25" high. The unit weighs 5 lb.

Below are the general dimensions of the enclosure. Note the rear entry of the load cell cables that must be considered when mounting.

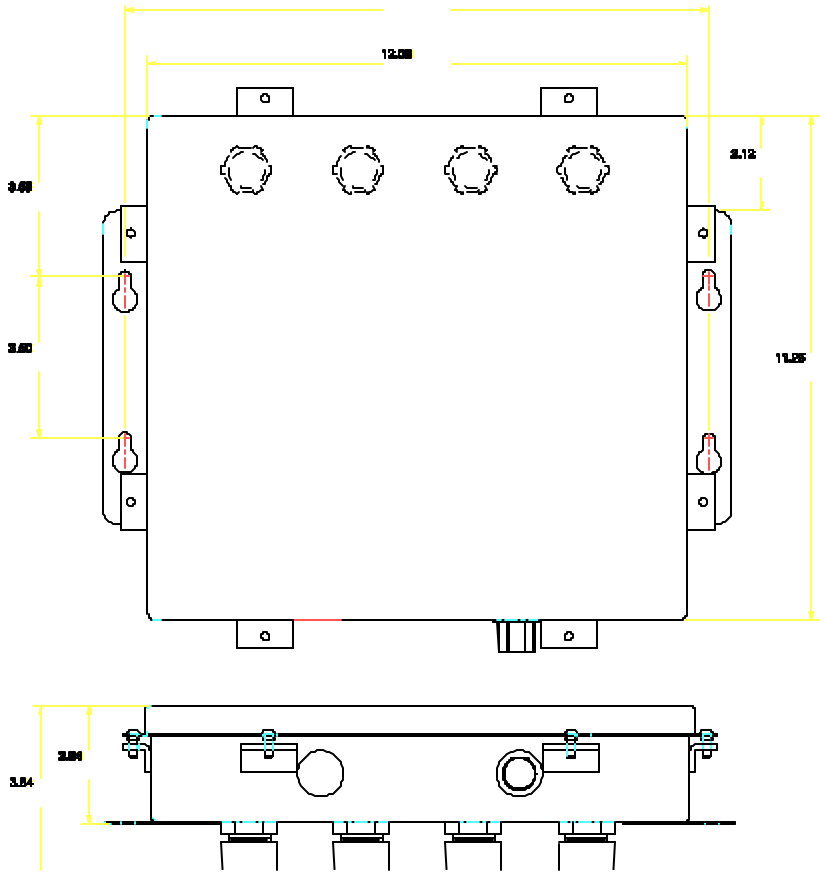


FIGURE 2.2

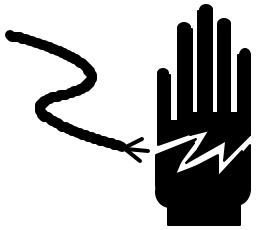
3.0 INSTALLATION

3.1 Preliminary Inspection

Inspect the shipping container(s) and scale for loose or damaged parts. If any damage is found, immediately notify the freight carrier.

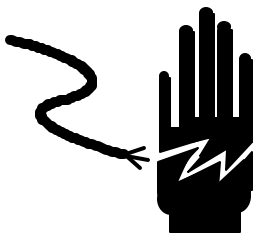
Open the enclosures and verify that all internal harnesses and components are securely fastened.

3.2 External Wiring Installation Recommendations



WARNING

WHEN THIS EQUIPMENT IS INCLUDED AS A COMPONENT PART OF A SYSTEM, THE RESULTING DESIGN MUST BE REVIEWED BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF ALL COMPONENTS IN THE SYSTEM AND THE POTENTIAL HAZARDS INVOLVED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY OR PROPERTY DAMAGE.



WARNING

THIS MODULE AND ITS ASSOCIATED EQUIPMENT MUST BE INSTALLED, ADJUSTED, AND MAINTAINED BY QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF ALL COMPONENTS IN THE SYSTEM AND THE POTENTIAL HAZARDS INVOLVED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY OR PROPERTY DAMAGE.

The following are general installation recommendations only, refer to the wiring diagrams supplied for detailed wiring(See Section 12.7).

1. 120 VAC, 60 Hertz or 230VAC, 50 Hertz, isolated, regulated power source to be furnished by others. Mettler Toledo recommends the use of a computer grade isolated transformer. The transformer shall be sized such that at least 50-70% of the VA rating will be drawn at minimum load.

2. Unless otherwise specified, all external wiring must be in steel conduit.

3. All external AC power and control lines must be in separate conduit from other external control and logic wiring.

4. All conduit shall enter the enclosure through insulated bushings.

5. Mettler Toledo recommends all wires and/or cables be tagged for future identification.

6. Mettler Toledo recommends two (2) spare wires be run in each conduit; maximum ten (10) wires - minimum two (2) wires. All spare wires entering the enclosure should be electrically terminated to the ground lug.

7. All electrical wiring to conform to appropriate national and local area electrical codes for this type of installation.

3.3 Preliminary Calculations

The scale system as supplied by Mettler Toledo is designed for use at a specific scale build. If another build is desired or the 9480/9410 is being used with an existing system then the microvolts per increment must be calculated to verify that the scale build desired(increment size and total number of increments) is attainable with the scale base to be used.

3.3.1 Microvolts per Increment Calculation

Use the following formula to calculate microvolts per increment.

$$\text{Microvolt/increment} = \frac{I * V * O * 1000}{C * R}$$

I - Increment size desired: Increment size, scale capacity and load cell capacity must all be measured in the same weight units, lb or kg. If units are different then multiply kg units by 0.45359 to convert to lb units for the purposes of this calculation.

V - Excitation Voltage: Normal 9410 excitation voltage is 15 VDC. Hazardous area applications will have an excitation voltage of 5 VDC.

O - Load cell output rating in mV/V (millivolts per volt of excitation): The load cell output is normally marked on the load cell. Toledo load cells are typically 2 mV/V. Other types can range from 1 mV/V to 4.5 mV/V.

C - Load cell capacity as marked on the load cell.

R - Total number of load cells.

3.3.2 Total Increments Calculation

The total number of increments is calculated by dividing the desired scale capacity by the increment size.

3.3.3 Minimum Weigh Time Calculation

The minimum weigh time is the minimum amount of time a single product will be fully on the scale. The following will give the minimum weigh time in seconds.

$$\text{Min. Weigh Time} = \frac{(C - P) * 5}{F}$$

C - Conveyor length: Distance between the entrance photoeye and the exit photoeye of the weigh conveyor in inches.

P - Package length: The length of the longest package to be weighed on the scale in inches.

F - Conveyor speed: The speed the conveyor is conveying packages across the scale in feet per minute.

NOTE: Select the next lower value in .1 second increments for filter settle time selection.

3.3.4 Microvolt Build Table

The microvolt build in the 9410 is based on the Weigh Time(Filter Settle Time) selected in scale setup.

Minimum Weigh Time (Filter Settle Time)	Minimum microvolt per increment
less than .5 sec.	0.64
.5 - .8 sec.	0.38
greater than .8 sec.	0.29

The following example refers to a normal scale conveyor installation:

Scale Capacity	150 lb
Increment Size	.05 lb
Load Cell Capacity	250 lb
Number of Cells	4
Cell Output	2 mV/V
Excitation Voltage	15 VDC
Conveyor Speed	240 ft./min.
Conveyor Length	48 in.
Max. Package Length	30 in.

First, divide the scale capacity by the increment size to determine the total number of increments.

150 lb
0.05 lb = 3000 increments

If this value is 10,000 or less, the capacity and increment size is acceptable. The 9410 will not allow total increments of greater than 10,000.

Next, use the formula from section 3.3.3 to calculate our expected minimum weigh time(filter settle time).

(48 in - 30 in) * 5
240 ft/min = .375 seconds = .3 seconds

With the calculated minimum weigh time we can look in the microvolt build table and find the minimum microvolt per increment is 0.64.

Next, use the formula in step 3.3.1 to calculate our microvolt per increment.

.05 lb * 15 VDC * 2 mV/V * 1000
250 lb * 4 load cells = 1.5 µv per incr.

This build is greater than .64, so it is acceptable.

3.4 9480 Controller PCB Configuration

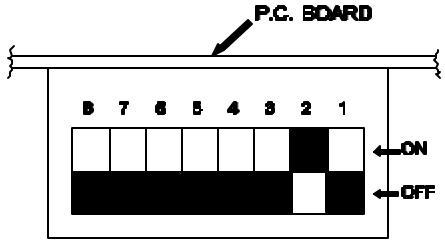
The below listed jumper and switch settings are for the 9480 controller board. See Figure 3.2 for board layout.

The jumpers must be installed as follows for proper operation:

W1	=	OUT
W2	=	OUT
W3	=	Pins 2 to 3
W4	=	Pins 1 to 2
W5	=	Pins 1 to 2
W6	=	OUT
W7	=	IN
W8	=	IN
W9	=	IN
W10	=	OUT
W11	=	OUT
W12	=	OUT
W13	=	Pins 1 to 2, Pins 3 to 4
W14	=	Pins 1 to 2, Pins 3 to 4

The standard Expressweigher Controller only uses switch SW1-2 (normally set to OFF). For all standard applications, these eight (8) switches should be in the OFF position.

SW1-1 = OFF
2 = OFF-Normal, ON-Cold Start
3 = OFF
4 = OFF
5 = OFF
6 = OFF
7 = OFF
8 = OFF



TOP EDGE VIEW OF SW1
FIGURE 3.1

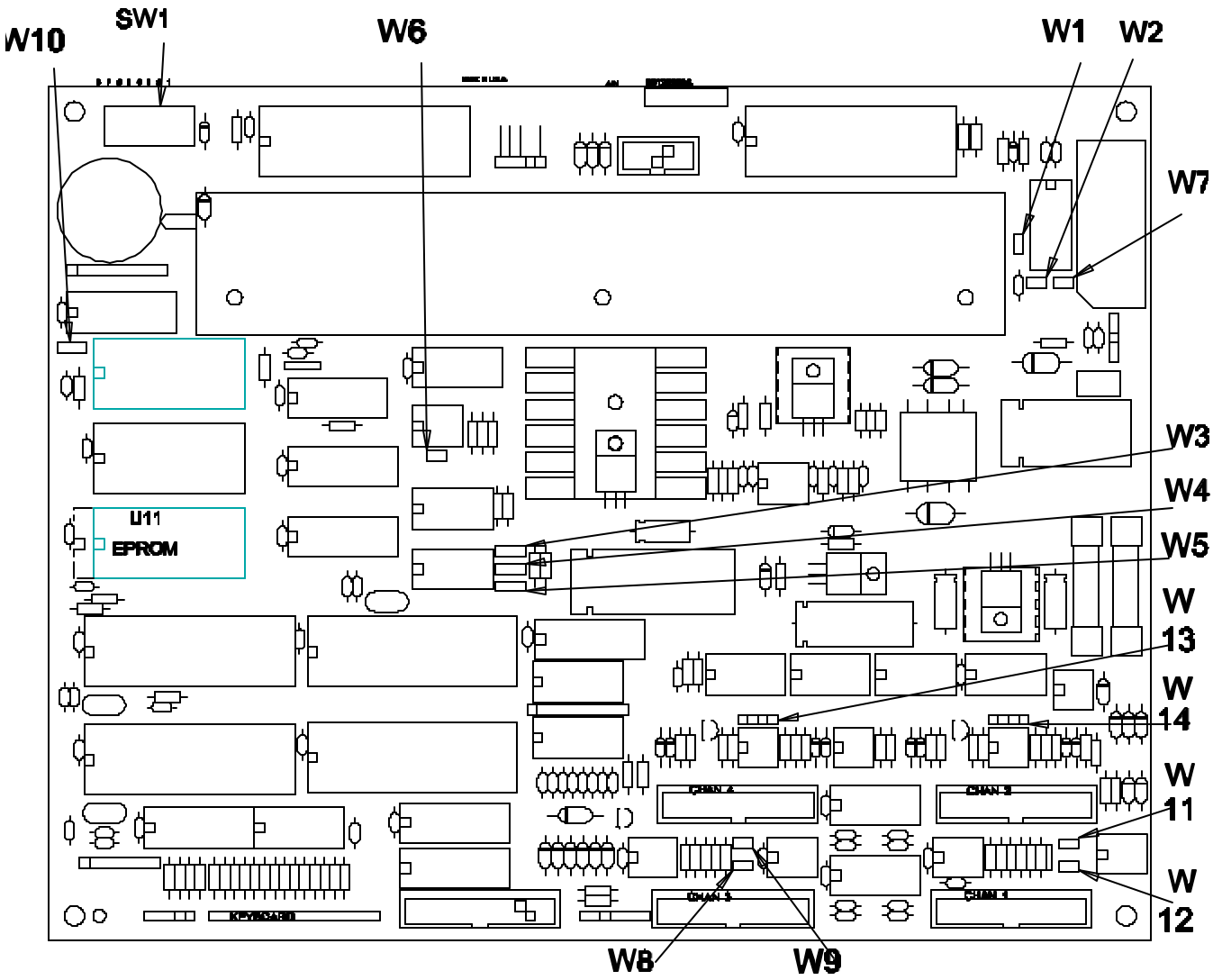


FIGURE 3.2

3.5 Configuration and Setup

The following sections describe the hardware configuration and setup of the 9410.

3.5.1 Circuit Board Layout

The drawing below shows the location of all PCB jumpers, connectors, and switches. The jumper definitions follow:

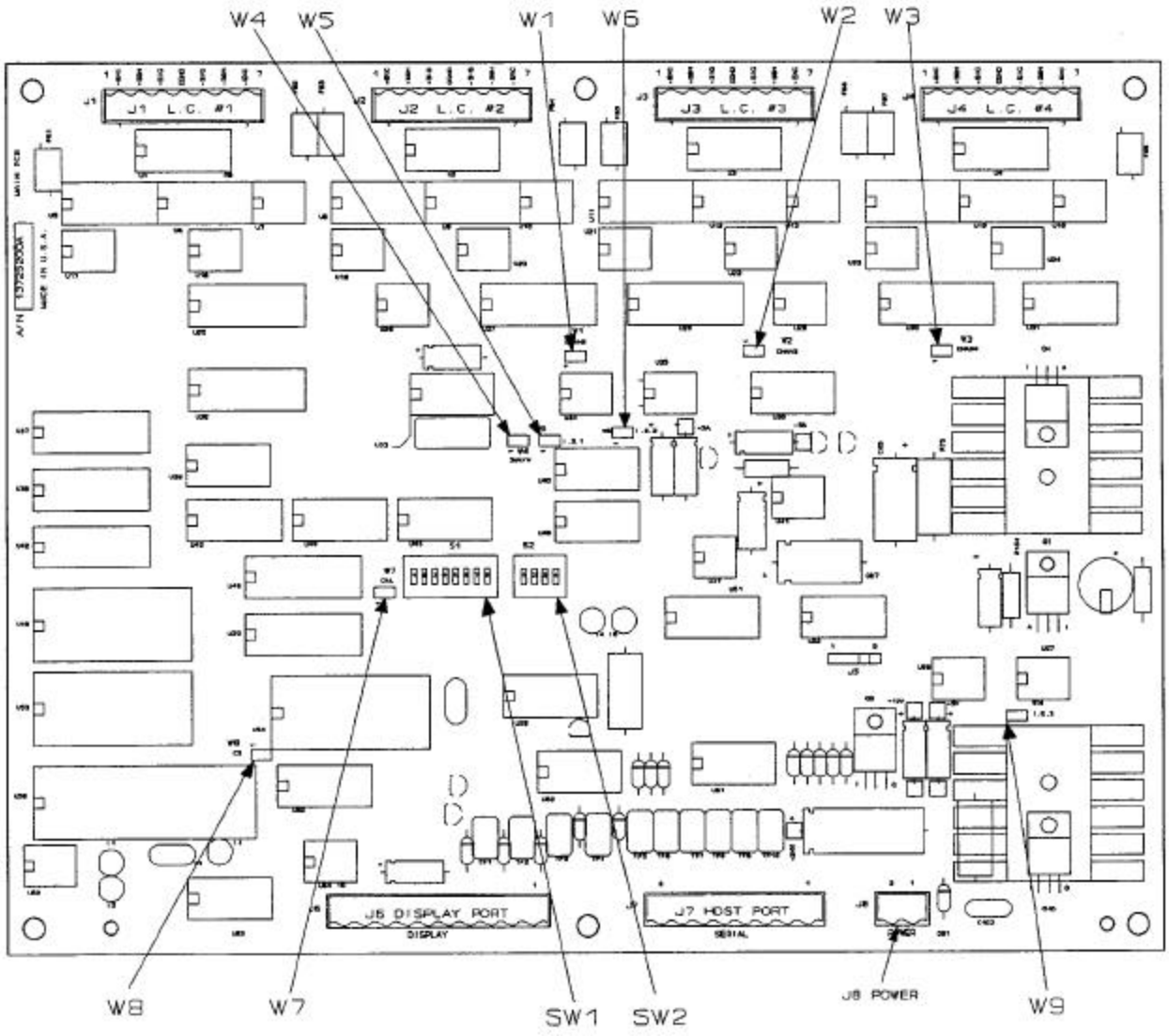


FIGURE 3.3

Jumper Definitions:

W1 - Load Cell 2 Enable - Must be installed.

W2 - Load Cell 3 Enable - Must be installed.

W3 - Load Cell 4 Enable - Must be installed.

W4 - 3 mV/V Load Cell Output Enable - Remove for 2 mV/V load cell use. Install for 3 mV/V load cell use.

W5,W6 - Intrinsically Safe Compensation
These jumpers are to be used in conjunction with W9 for the Mettler Toledo HAP module. Remove for normal use. Install if the HAP module is connected.

W7 - Calibration Enable
This jumper allows access to the 9410 calibration by the controller. Install to access calibration. Remove to not allow calibration. Must be removed for normal operation.

W8 - External ROM Enable - must be installed.

W9 - Reduced Excitation Enable
This jumper is used in conjunction with W5 and W6 for the Mettler Toledo HAP module. Remove for normal 15 Volt excitation. Install for reduced 5 Volt excitation.

Switch Settings:

The following switch settings configure the 9410 PCB for 9600 Baud at a Drop Address of 1:

SW1-2 ON, SW2-4 ON, All others OFF.

LED Definitions:

I1 - Processor Running(should flicker constantly)

I2 - Display Interface Transmitting(Not Used)

I3 - Host/9480 Transmitting(Flashes with data)

I4 - Display Receiving(Not Used)

I5 - Host/9480 Recieving(Flashes with data)

Connector Definitions:

J1 - Load Cell 1 Connector
- Pin 1 +Excitation
- Pin 2 +Sense
- Pin 3 +Signal
- Pin 4 No connection
- Pin 5 -Signal
- Pin 6 -Sense
- Pin 7 -Excitation

J2 - Load Cell 2 Connector See J1

J3 - Load Cell 3 Connector See J1

J4 - Load Cell 4 Connector See J1

J5 - Not Used

J6 - Not Used

J7 - Host Port Connector

- Pin 1 Shield(Chassis GND)
- Pin 2 RS422 RB
- Pin 3 RS422 RA
- Pin 4 RS422 TB
- Pin 5 RS422 TA
- Pin 6 Common
- Pin 7 RS232 Rx
- Pin 8 RS232 Tx

J8 - Power Supply connector

- Pin 1 GND
- Pin 2 +24 VDC

3.5.2 Load Cell Connection

The 9410 provides 15 volt excitation for up to four 350 ohm load cells(W5, W6, and W9 removed).

The 9410 can be used with 2 mV/V load cells (W4 removed) or 3mV/V load cells (W4 installed).

Connect the load cells to the 9410 in one of the configurations described following(See Section 12.7 for the drawings supplied with the equipment for further information):

3.5.2.1 Single Load Cell System

When using the 9410 in a single load cell application the load cell should be wired to the J1 connector. The +SIGNAL lead must be connected to remaining load cell connectors(J2-4) +SIGNAL terminals and the -SIGNAL must be connected to the other load cell connectors - SIGNAL terminals.

3.5.2.2 Two Load Cell System

When using the 9410 in a two load cell application, Load cell 1 connects to J1 and to the + and - Signal terminals of J2. Load cell 2 connects to J3 and the + and - signal terminals of J4.

3.5.2.3 Four Load Cell System

When using the 9410 in a four load cell application Load Cell 1 must be connected to J1, Load Cell 2 must be connected to J2, Load Cell 3 must be connected to J3 and Load Cell 4 must be connected to J4.

NOTE: For maximum RFI immunity, each load cell cable must be routed through the provided RFI Toroids with four (4) turns of each cable wire per the method defined in the next section.

3.5.3 RFI Protection Measures

The sensitive analog electronics contained within this enclosure requires that any externally generated electrical noise be stopped before entering the enclosure.

An RFI Toroid ($1\frac{1}{8}$" dia. Ferrite Ring) must be placed on each cable going to and from the enclosure. Each load cell cable wire and the communications cable to the controller must wrap around a Toroid with four (4) turns before connecting to the respective terminal strip. DO NOT wrap the shield wire around the Toroid. Instead, it must terminate directly to the chassis ground lug provided.

Wind the toroid as follows: (and refer to Figure 3.4)

1. Strip the cable jacket back four (8) inches from the end.
2. Wrap all wires (except the shield) through the toroid with at least four (4) complete turns. All wires may be wrapped together or individually as desired.
3. Connect the wire ends to the terminal strip.
4. Connect the shield wire directly to the ground lug on the enclosure. Keep the lead as short as possible. DO NOT pass the shield wire through the toroid.
5. Tuck toroid and leads below cover area so it won't interfere with the cover.

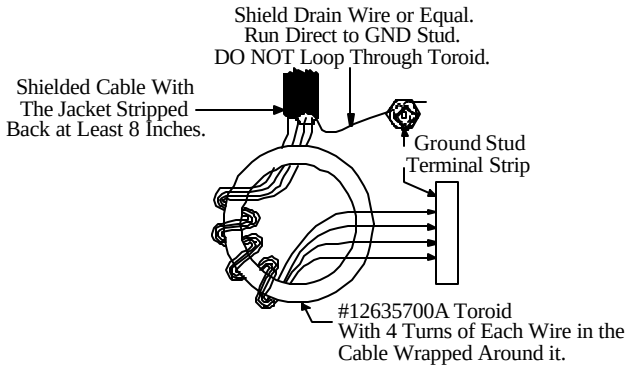


FIGURE 3.4

3.5.4 Communication/Power Cable

The wiring from J7 and J8 within the J-Box to the 9480 controller must be made with #20Ga shielded cable. Use 6 conductor shielded cable, maximum distance of 500 feet.

3.5.5 Conduit

A female ½″ NPT fitting is provided on the bottom of the 9410 enclosure opposite J7 and J8. The installer must provide metal conduit from the controller to the 9410 enclosure for the cable. No other wires are allowed in this conduit.

3.5.6 Cover Closure

After all wiring has been made and the system calibrated, the desiccant (moisture absorbent material) and moisture indicator must be removed from the sealed bag and placed inside the enclosure. Apply 1 small bead of sealing compound (grease tube provided) around the gasket of the enclosure lid. Install the lid on the enclosure and tighten the screws until the cover gasket meets the mounting flange.

4.0 POWER-UP and RUN SEQUENCE:

Statements 10 through 50

About This Section

The following section describes the controller power-up sequence as well as the normal displays during the run mode. A forced cold start may be done by: (1) removing power from the Controller, (2) turning SW1-2 on the TSM300 PCB ON, and (3) restoring power to the Controller.

PROGRAM STATEMENT	APPLICATION
10	**[SBM137 YYYYYYY]** The local display shows the version numbers for this particular program. This display will be shown briefly, while the memory is checked for data retention. If the data stored is valid, the program will advance to statement #30. If the data is not valid the program will advance to statement #14. If SW1-2 on the TSM300 PCB is ON, the program will advance to the next statement.
11	**[FORCE COLD START? N]** The local display ask if a forced cold start is to be performed. **CAUTION -** Cold start will remove all custom setups and system passwords. Press <Y> (Yes) to advance to the next statement. Press <N> (No) to advance to statement #20. Press <ENTER> to advance to statement #20.
12	**[ARE YOU SURE? N]** The local display asks if you are sure that a Cold Start is to be performed. Cold start will remove all custom setups and system passwords. Press <Y> (Yes) to advance to the next statement. Press <ENTER> to advance to statement #26. Press <N> (No) to advance to statement #26.
14	**[COLD START]** The local display indicates the system is performing a Cold Start because, 1) the stored data was not valid or 2) the system was forced to perform a Cold Start and default values were used to initialize the setup parameters. The system passwords and any custom parameter setups must be entered (or re-entered). After controller Cold start is complete the system will advance to the next statement.

4.0 POWER-UP and RUN SEQUENCE: (continued)

PROGRAM STATEMENT	APPLICATION
20	**[FORCE SCALE COLD? N]** The display is asking (if SW1-2 is ON) if a forced cold start is to be performed on the scale. This can only be performed if the calibration jumper was installed at power up on the 9410 PCB. **NOTE:** Cold starting the scale resets the setup information in the scales ram memory and requires a normal calibration to be performed to store the information permanently in EEPROM. Press <Y> (Yes) to advance to the next statement. Press <N> (No) to advance to statement #26. Press <ENTER> to advance to statement #26.
22	**[ARE YOU SURE? N]** The local display asks if you are sure that a Scale Cold Start is to be performed. Cold start will reset all scale setup parameters to their default settings. Press <Y> (Yes) to advance to the next statement. Press <ENTER> to advance to statement #26. Press <N> (No) to advance to statement #26.
24	**[SCALE COLD START]** The display indicates that the scale is performing it's forced Cold Start and default values are being used to initialize the scale setup parameters. **NOTE:** The scale setup and calibration must be performed to save the calibration parameters.
26	**[TURN SW2 OFF]** The display indicates the SW1-2 switch on the Expressweigher control PCB is ON and must be turned OFF. Turn the switch OFF to proceed to the next statement.
30	**[STANDBY XXX.XX LB]** The local display indicates that the RUN PERMISSIVE input is not on. No products will be processed while the RUN PERMISSIVE input is off. The display is indicating the current weight on the scale. A small z will be displayed if ZERO INDICATION is enable and the weight is within the COZ limits(only available with "B" revision or newer 9410). If the RUN PERMISSIVE input is turned on, the program will advance to the next step. Press <F1> OPERATOR VARIABLE SETUP to advance to statement #100. Press <F2> SETUP to advance to statement #200. Press <F3> TEST to advance to statement #1500.

4.0 POWER-UP and RUN SEQUENCE (Continued):

PROGRAM STATEMENT	APPLICATION

50 **[RUNNING XXX.XX LB]**

The local display indicates that the controller is ready to process products(current scale weight is displayed at this prompt). As each product passes over the scale, the configured Run Display will be shown. If no product passes over the scale for a selectable number of seconds the display will return to the RUNNING display. As each product passes over the scale, the formatted string will be sent to the remote ports, to the printer, and if enabled the MT Continuous Format Output, as selected. If the Remote output is enabled, the output data will be updated and the print bit (Status Word "C", bit 3) will be set to one (1) for a single transmission string only(Status Word "C", bit 3 is normally zero {0}). If the RUN PERMISSIVE input is turned off, the program will return to the previous statement. A small z will be displayed if ZERO INDICATION is enable and the weight is within the COZ limits(only available with "B" revision or newer 9410).

Press <F1> OPERATOR VARIABLE SETUP to advance to statement #100.

Press <F2> SETUP to advance to statement #200.

Press <F3> TEST to advance to statement #1500.

Press <SHIFT> then <F12> to ZERO the scale (Rev. D or greater software).

Run Mode Operation

A typical weigh during the run mode is as follows:

Step	Action
1	Approach photoeye dark (ON) for a time period that exceeds the setting of the PE1 timer. (Product is coming onto the scale)
2	Remote input receives new ID1 and/or ID2 data for product entering the scale.
3	Approach photoeye light (OFF). (The trailing edge of the product is on the scale)
4	Initiate scale averaging read cycle. **a.** If a previous product has not exited the scale the Controller will wait until the Exit photoeye is dark (ON). After the previous product passes the Exit photoeye(photoeye light) a delay equal to the PE2 timer setting will occur before starting a new averaging read cycle.
5	End scale averaging cycle when: **a.** Exit photoeye is dark (ON). (leading edge of product exits scale) **b.** Approach photoeye is dark(ON). (next product enters scale)
6	Output the data on the printer and remote ports in the appropriate format as configured, and update the display per the display setup.
7	Perform auto zero maintenance when the product has exited the scale (PE2 dark then light for a time equal to the setting of PE2 timer) until the next product enters the scale.
8	Repeat from Step 1.

5.0 OPERATOR VARIABLE ENTRY SEQUENCE

Statements 100 through 150

About This Section

The following section describes the operator interface which allows entry of the optional variables. These variables may be enabled in setup and may be input by pressing the <F1> key and entering the appropriate password.

PROGRAM STATEMENT	APPLICATION
100	**[OPERATOR PW XXXXXX]** Enter the operator or supervisor password and then press <ENTER> to advance to the next statement. If no password has been set up, the program will skip this statement and advance to the next statement. If no password is entered within 3 seconds the program will return to the previous mode.
110	**[PPPPPPPP XXXXXXXXXX]** The display prompts the operator to enter product ID1. The prompt and the length of the ID is set in Setup mode. If ID entry has not been enabled, the program will skip this statement and advance to statement 120. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to either statement #30 or #50. Press <RESET> to return to either statement #30 or #50.
115	**[QQQQQQQQ XXXXXXXXXX]** The display prompts the operator to enter product ID2. The prompt and the length of the ID is set in Setup mode. If ID2 entry has not been enabled, the program will skip this statement and advance to the next statement. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to return to either statement #30 or #50.
120	**[NEXT CONSEC #XXXXXX]** The display indicates the consecutive number to be assigned to the next product processed. Enter the desired number to be assigned to the next product processed if change is required, if no change is required press <ENTER>. If the consecutive number has not been enabled, the program will skip this statement and advance to the next statement. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to return to either statement #30 or #50. Default - 000001

5.0 OPERATOR VARIABLE ENTRY SEQUENCE (continued)

PROGRAM STATEMENT	APPLICATION
130	**[SUM XXXXXXXXXX]** The display indicates the sum of product weights processed since the value was last cleared. If the sum feature has not been enabled, the program will skip this statement and advance to the next statement. Press <CLEAR> to clear the entry field and sum value. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to return to either statement #30 or #50.
140	**[DATE? MM/DD/YY]** Enter the date. If the date feature has not been enabled, the program will skip this statement and advance to the next statement. Separate the MM, DD, and YY fields with a <SPACE> or <.> when entering a new date. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to return to either statement #30 or #50.
150	**[TIME? HH:MM:SS]** Enter the time. If the time feature has not been enabled, the program will skip this statement and return to either statement #30 or #50. Separate the HH, MM, and SS fields with a <SPACE> or <.> when entering a new time. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and return to either statement #30 or #50. Press <UPARROW> to return to the previous statement. Press <RESET> to return to either statement #30 or #50.

6.0 SETUP

6.1 General Parameter Setup

Statements 200 through 340

About This Section

The following section describes the operator interface which allows setup of general parameters. These parameters are setup only once at installation as required by the application. Setup may only be entered by pressing the <F2> key and entering the supervisors password.

The cold start default settings are shown for each parameter.

PROGRAM STATEMENT	APPLICATION
200	**[SUPERVSR PW XXXXXX]** Enter the supervisor password and then press <ENTER> to advance to the next statement. If a password has not been setup, this statement will be skipped and the program will advance to the next statement. If no password is entered within 3 seconds, or an invalid password is entered the program will return to the previous mode.
210	**[GENERAL SETUP? Y]** The display asks if the general setup parameters are to be set. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #400. Press <UPARROW> to return to statement #30. Press <RESET> to advance to statement #1400.
220	**[PE 1 TIMER XXX]** Enter the PE 1(Entrance photoeye) timer setting in milliseconds. This timer is typically set for 150 milliseconds which will prevent most false photoeye trips due to flaps on products or products entering the scale with a rocking motion. This timer is in addition to a 25 millisecond fixed debounce timer that must be considered for calculation purposes. The setting for a particular installation is a function of conveyor speed and product length. For example: A conveyor running at 120 feet per minute (2 FT/SEC) with a product length of 6 inches could have a maximum setting of 250 milliseconds (the length of time it will require for the 6 inch product to pass the photoeye). Thus a PE 1 Timer of 225 milliseconds could be selected(250 milliseconds minus the 25 millisecond debounce timer). Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 150 milliseconds

PROGRAM STATEMENT	APPLICATION

230 **[PE 2 TIMER XXX]**

Enter the PE 2 (exit photoeye) timer setting in milliseconds. This timer is typically set for 50 milliseconds. It should be noted that this timer should be set to the minimum setting which will provide accurate sensing of exiting products since this timer will lengthen the next products minimum weigh time(if one is fully on the scale). The purpose of this timer is to properly sense that the product has cleared this photoeye, preventing false weighing or auto zero maintenance starts due to false sensing of exiting products.

Press <ENTER> to advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

Default - 50 milliseconds

240 **[PE1 - PE2 TIME X.X]**

Enter the time, in seconds, that it takes after a package breaks the entrance photoeye and until it breaks the exit photoeye. The value entered will be used to generate a Maximum Weigh Time alarm if the controller detects a box(s) on the scale without any photoeye activity for this time. Valid entries are 0.0 through 9.9 seconds. NOTE: A setting of zero will disable this feature.

Below is a method of calculating this value:

$$\text{PE1 - PE2 Time} = \frac{C * 5}{F}$$

C - Conveyor length: Distance between the entrance photoeye and the exit photoeye of the weigh conveyor in inches.

F - Conveyor speed: The speed the conveyor is conveying packages across the scale in feet per minute.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

Default - 3.0 seconds

250 **[ENABLE ID1 ENTRY? N]**

The display asks if the ID1 entry feature is to be used.

Press <Y> (Yes) to enable ID1 entry and advance to the next statement.

Press <N> (No) to disable ID1 entry and advance to statement #280.

Press <ENTER> to branch according to the answer.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

Default - disabled

6.1 General Parameter Setup (continued):

PROGRAM STATEMENT	APPLICATION
260	**[ID1 PROMPT XXXXXXXX]** Enter the prompt to be used to request product ID1 during the OPERATOR VARIABLE SETUP sequence. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
270	**[ID1 LENGTH XX]** Enter the character length to be entered for product ID1. Maximum allowable length is 40 characters. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
272	**[ENABLE ID2 ENTRY? N]** The display asks if the ID2 entry feature is to be used. Press <Y> (Yes) to enable ID2 entry and advance to the next statement. Press <N> (No) to disable ID2 entry and advance to statement #280. Press <ENTER> to branch according to the answer. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - disabled
274	**[ID2 PROMPT XXXXXXXX]** Enter the prompt to be used to request product ID2 during the OPERATOR VARIABLE SETUP sequence. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.

6.1 General Parameter Setup (continued):

PROGRAM STATEMENT	APPLICATION
276	**[ID2 LENGTH XX]** Enter the character length to be entered for product ID2. Maximum allowable length is 40 characters. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
280	**[ENABLE CONSEC #? X]** The display asks if the consecutive number feature is to be used. The consecutive number is incremented after every valid package and may be displayed, sent to the printer and/or remotes. Press <Y> (Yes) to enable consecutive number and advance to the next statement. Press <N> (No) to disable consecutive number and advance to the next statement. Press <ENTER> to branch according to the default answer. Press <UPARROW> to return to statement #250. Press <RESET> to advance to statement #1400. Default - disabled
290	**[ENABLE SUM? X]** The display asks if the sum feature is to be used. The Sum is a total of all packages weighed since the Sum was last cleared. Press <Y> (Yes) to enable sum and advance to the next statement. Press <N> (No) to disable sum and advance to the next statement. Press <ENTER> to branch according to the default answer. Press <UPARROW> to retum to the previous statement. Press <RESET> to advance to statement #1400. Default - disabled

6.1 General Parameter Setup (continued):

PROGRAM STATEMENT	APPLICATION
300	**[ENABLE DATE? X]** The display asks if the date feature is to be used. Press <Y> (Yes) to enable date and advance to the next statement. Press <N> (No) to disable date and advance to the next statement. Press <ENTER> to branch according to the default answer. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - disabled
310	**[ENABLE TIME? X]** The display asks if the time feature is to be used. Press <Y> (Yes) to enable time and advance to the next statement. Press <N> (No) to disable time and advance to the next statement. Press <ENTER> to branch according to the default answer. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - disabled
320	**[CHANGE PASSWORDS? N]** The display asks if either the operator or the supervisor password require changing. Press <Y> (Yes) to advance to the next statement. Press <N> (No) or <ENTER> to advance to statement #400. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - no passwords setup

6.1 General Parameter Setup (continued):

PROGRAM STATEMENT	APPLICATION
330	**[OPERATOR PW XXXXXX]** Enter the operator password. This password allows access to OPERATOR VARIABLE SETUP. If no password is entered, the password will not be required for entry to OPERATOR VARIABLE SETUP. The password is a six (6) character field, characters may be alpha and/or numeric. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
340	**[SUPERVSR PW XXXXXX]** Enter the supervisor password. This password allows access to GENERAL SETUP and SYSTEM TEST. If no password is entered, the password will not be required for entry to SETUP or SYSTEM TEST. The password is a six (6) character field, characters may be alpha and/or numeric. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.

6.2 Printer Interface Setup

Statements 400 through 530

About This Section

The following section describes the operator interface which allows setup of the printer interface. These parameters are set up only once at installation as required by the application.

Printer output is 20 mA. current loop or RS-232.

The cold start default settings are shown for each parameter.

PROGRAM STATEMENT	APPLICATION
400	**[PRINTER SETUP? Y]** The display asks if the printer setup parameters are to be set. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #600. Press <UPARROW> to return to statement #400. Press <RESET> to advance to statement #1400.
410	**[ENABLE PRINTER? X]** The display asks whether the printer is to be enabled or not. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #600. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - printer disabled

6.2 Printer Interface Setup (Continued):

PROGRAM STATEMENT	APPLICATION
420	**[PNTR BAUD RATE XXXX]** Select the baud rate for the printer port. Allowable selections are 300, 1200, 2400, 4800, or 9600. Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept the selection and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 300
430	**[PNTR DATA BITS X]** Enter the number of data bits for the printer port. Allowable settings are 7 or 8. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 7 data bits
440	**[PNTR PARITY (EON) X]** Enter the parity setting for the printer port. Allowable values are <E> for Even parity, <O> for Odd parity, or <N> for No parity. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - even parity enabled

6.2 Printer Interface Setup (Continued):

PROGRAM STATEMENT	APPLICATION
460	**[PNTR ERROR LOG? X]** The display asks if printer error logging is to be enabled. The weight field will be replaced by the appropriate error code when an error occurs(See Section 11.0 on error conditions). Press <Y> (Yes) to enable printer error logging and advance to the next statement. Press <N> (No) to disable printer error logging and advance to the next statement. Press <ENTER> to accept the current setting and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - printer error log enabled
470	**[PNTR WEIGHT POS 002]** A 150 character string buffer is provided for the printer output transmission string. Parameters within this string may be freely formatted. Each parameter to be included in the string is assigned a starting string position number. The starting position may be from 1 to 150; however, to avoid truncation, the starting position plus the parameter string length should not exceed 150. A position value of 0 will cause the parameter not to be printed. The following prompts allow entry of starting positions for each parameter. The prompts will be skipped for the features not enabled in the general setup. Values greater than the maximum starting position values will not be allowed. The transmission string will be initialized to spaces prior to loading, then un-occupied columns will be printed as spaces. The string length will be determined by the greatest ending string position set. Parameter field overlaps will not be checked. A block check character may be sent by setting a block check character position other than 0. The block check is a single character that is computed as the Exclusive OR of all characters beginning at a specified starting character position and up to but not including the block check character itself. The block check begin prompt will not appear if the block check character position is 0.

6.2 Printer Interface Setup (Continued):

Prompt	Field Length	Max Pos Set	Description
[PNTR WEIGHT POS 002]*	6	145	Weight w/decimal pt.
[PNTR UNIT POS 008]*	2	149	Weight Units (LB/KG)
[PNTR ID1 POS 000]	1-40	111-150	Product ID1
[PNTR ID2 POS 000]	1-40	111-150	Product ID2
[PNTR CN POS 000]	6	145	Consecutive number
[PNTR SUM POS 000]	10	141	Sum of weights w/decimal.
[PNTR DATE POS 000]	8	143	Date (MM/DD/YY)
[PNTR TIME POS 000]	5	146	Time (HH:MM)
[PNTR BC CHR POS 000]	1	150	Block check character
[PNTR BC BGN POS 000]	1	150	Begin block check

* The settings shown in the prompt column are the cold start default settings.

Press <CLEAR> to clear the entry field.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

480 **[NEW PNTR LITERAL? Y]**
The display asks if the printer literal constants are to be changed.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #600.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

490 **[CLR PNTR LITRLS? X]**
The display asks if the printer literal constants are to be cleared.

Press <Y> (Yes) to advance to the next statement.

Press <N> (No) or <ENTER> to advance to statement #810.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

6.2 Printer Interface Setup (Continued):

PROGRAM STATEMENT	APPLICATION
500	**[PNTR LITERALS CLRD]** The display indicates that all previously entered printer literals have been cleared. After a few seconds the program will advance to the next statement.
510	**[PNTR LITRL POS XXX]** Enter the string position of the character that will be modified or entered. Press <CLEAR> to clear the entry field. Press <UPARROW> to return to statement #490. Press <ENTER> to complete field entry and advance to the next statement. Press <RESET> to advance to statement #1400.
520	**[PNTR LITERAL CHAR X]** Enter the desired literal to be inserted into the printer transmission string. See Section 12.1 for control and special character entry. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - a start of text (02H) in position 1 a carriage return (0DH) in position 10 a line feed (0AH) in position 11 There is only one (1) limit on the number of Literals that maybe entered, the Printer character string buffer is limited to 150 characters. Re-read program statement #770 to determine the maximum number of Literals that may be entered for your application.
530	**[ANOTHER LITERAL? Y]** Press <Y> (Yes) or <ENTER> to return to statement #810. Press <N> (No) to advance to statement #600. Press <UPARROW> to return to statement #470. Press <RESET> to advance to statement #1400.

6.3 Run Display Setup

Statements 600 through 670

About This Section

The following section describes the operator interface which allows setup of the system Run Display. The Run Display is the message displayed on the local display after a weighment. These parameters are setup only once at installation as required by the application.

The cold start default settings are shown for each parameter.

PROGRAM STATEMENT	APPLICATION
600	**[DISPLAY SETUP? Y]** The display asks if the Run Display setup parameters are to be set. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #700. Press <UPARROW> to return to statement #400. Press <RESET> to advance to statement #1400.
605	**[RUN DISPLAY TIMER 0]** The display asks for time delay in seconds that the Run Display is to be on before returning to the RUNNING message (Statement #50). Valid entries are 0 through 9. An entry of 0 will mean that the Run Display message will remain on the local display and will be updated after each weighment, while in the Run Mode. An entry of 1 through 9 will allow the Run Display message to be displayed for the entered number of seconds before returning to the RUNNING message (Statement #50). Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 0

6.3 Run Display Setup (Continued)

PROGRAM STATEMENT | **APPLICATION**

610 **[DISP WEIGHT POS 011]**

A 19 character string buffer is provided for the Run Display. Parameters within this string may be freely formatted. Each parameter to be included in the string is assigned a starting string position number. The starting position may be from 1 to 19; however, to avoid truncation, the starting position plus the parameter string length should not exceed 19. A position value of 0 will cause the parameter not to be displayed.

The following prompts allow entry of starting positions for each parameter. The prompts will be skipped for the features not enabled in the general setup. Values greater than the maximum starting position values will not be allowed. The Run Display string will be initialized to spaces prior to loading so unoccupied columns will be displayed as spaces. Parameter field overlaps will not be checked.

Prompt	Length	Field Set	Max Pos Description
[DISP WEIGHT POS 011]*	6	14	Weight w/decimal pt.
[DISP UNIT POS 018]*	2	18	Weight Units (LB/KG)
[DISP ID1 POS 000]	1-40	1-19	Product ID1
[DISP ID2 POS 000]	1-40	1-19	Product ID2
[DISP CN POS 000]	6	14	Consecutive number
[DISP SUM POS 000]	10	10	Sum of weights w/decimal.
[DISP DATE POS 000]	8	12	Date (MM/DD/YY)
[DISP TIME POS 000]	5	15	Time (HH:MM)

* The settings shown in the prompt column are the cold start default settings.

Press <CLEAR> to clear the entry field.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

620 **[NEW DISP LITERAL? X]**

The display asks if the Run Display literal constants are to be changed. The display is limited to 19 characters. See Statement #610 to determine the maximum number of literals that may be entered for your application.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #800.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

6.3 Run Display Setup (Continued)

PROGRAM STATEMENT	APPLICATION
630	**[CLR DSP LITERALS? X]** The display asks if the Run Display literal constants are to be cleared. Press <Y> (Yes) to advance to the next statement. Press <N> (No) or <ENTER> to advance to statement #650. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
640	**[DISP LITERALS CLRD]** The display indicates that all previously entered Run Display literals have been cleared. After a few seconds the program will advance to the next statement.
650	**[DISP LITRL POS XXX]** Enter the string position of the character that will be modified or entered. Press <CLEAR> to clear the entry field. Press <UPARROW> to return to statement #630. Press <ENTER> to complete field entry and advance to the next statement. Press <RESET> to advance to statement #1400.
660	**[DISP LITERAL CHAR X]** Enter the desired literal to be inserted into the Run Display string. See Section 12.1 for control and special character entry. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to statement #650. Press <RESET> to advance to statement #1400. Default - an alpha character "G" in position 1 an alpha character "R" in position 2 an alpha character "O" in position 3 an alpha character "S" in position 4 an alpha character "S" in position 5 an alpha character "W" in position 7 an alpha character "T" in position 8

6.3 Run Display Setup (Continued)

PROGRAM STATEMENT	APPLICATION
670	**[ANOTHER LITERAL? Y]** Press <Y> (Yes) or <ENTER> to return to statement #650. Press <N> (No) to advance to statement #700. Press <UPARROW> to return to statement #610. Press <RESET> to advance to statement #1400.

6.4 Remote Output #1 Setup

Statements 700 through 840

About This Section

The following section describes the operator interface which allows setup of the remote #1 interface. These parameters are setup only once at installation as required by the application.

The cold start default settings are shown for each parameter.

PROGRAM STATEMENT	APPLICATION
700	**[RMT1 SETUP? Y]** The display asks if the remote #1 setup parameters are to be set. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #900. Press <UPARROW> to return to statement #600. Press <RESET> to advance to statement #1400.
710	**[RMT1 BAUD RATE XXXX]** Select the baud rate for the remote #1 port. Allowable selections are 1200, 2400, 4800, 9600, or 19,200. **NOTE:** 19,200 is shown as 19.2 Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept the value and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 4800 baud

6.4 Remote Output #1 Setup (continued)

PROGRAM STATEMENT	APPLICATION
715	**[RMT1 ERROR LOG? N]** The display asks if remote #1 error logging is to be enabled. The weight field will be replaced by the appropriate error code when an error occurs(See Section 11.0 on error conditions). Press <Y> (Yes) to enable remote #1 error logging and advance to the next statement. Press <N> (No) to disable remote #1 error logging and advance to the next statement. Press <ENTER> to advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - Disabled
720	**[RMT1 TYPE PROG]** Select the type of output required for the remote #1 port. The type of outputs are: PROG: Programmable output transmitted only after an item is weighed on the scale. CONT: The data transmitted is a continuous stream of standard MT Continuous format data at 4800 baud. The Indicated Weight Value field will have the weight value of the last item weighed, the field will be updated on the next item to cross the scale. The print bit of Status Word "C" will be 1 (one) for the first string after the item is weighed; for subsequent strings the print bit will be zero (0). ITEM: The data transmitted will be a single string of standard MT Continuous format data at 4800 baud. The Indicated Weight Value field will have the weight value of the item just weighed across the scale. The print bit of Status Word "C" will be 1 (one). There will not be another string of data until another item crosses the scale. Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept and advance to the next statement for PROG output or statement 840 for the CONT or ITEM output. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - PROG

6.4 Remote Output #1 Setup (continued)

PROGRAM STATEMENT	APPLICATION
730	**[RMT1 DATA BITS 7]** Enter the number of data bits for the remote #1 port. Allowable settings are 7 or 8. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 7 data bits
740	**[RMT1 PARITY (EON) E]** Enter the parity setting for the remote #1 port. Allowable values are <E> for Even parity, <O> for Odd parity, or <N> for No parity. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - even parity enabled
750	**[ACK/NAK PROTOCOL? N]** The display asks if the ACK/NAK protocol is to be used. Refer to Section 8.1 on ACK/NAK protocol for explanation of ACK/NAK protocol. Press <Y> (Yes) to enable ACK/NAK protocol and advance to the next statement. Press <N> (No) to disable ACK/NAK protocol and advance to the next statement. Press <ENTER> to advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - Disabled

6.4 Remote Output #1 Setup (continued)

PROGRAM STATEMENT | **APPLICATION**

770 **[RMT1 WEIGHT POS 002]**

A 150 character string buffer is provided for the remote #1 output transmission string. Parameters within this string may be freely formatted. Each parameter to be included in the string is assigned a starting string position number. The starting position may be from 1 to 150; however, to avoid truncation, the starting position plus the parameter string length should not exceed 150. A position value of 0 will cause the parameter not to be sent.

The following prompts allow entry of starting positions for each parameter. The prompts will be skipped for the features not enabled in the general setup. Values greater than the maximum starting position values will not be allowed.

The transmission string will be initialized to spaces prior to loading so un-occupied columns will be sent as spaces. The string length will be determined by the greatest ending string position set. Parameter field overlaps will not be checked.

A block check character can be sent by setting a block check character position other than 0. The block check is a single character that is computed as the Exclusive OR of all characters beginning and including a specified starting character position and up to but not including the block check character itself. The block check begin prompt will not appear if the block check character position is 0.

Description Prompt	Field	Max Pos Length	Description Set
[RMT1 WEIGHT POS 002]*	6	145	Weight w/decimal pt.
[RMT1 UNIT POS 008]*	2	149	Weight Units (LB/KG)
[RMT1 ID1 POS 000]	1-40	111-150	Product ID1
[RMT1 ID2 POS 000]	1-40	111-150	Product ID2
[RMT1 CN POS 000]	6	145	Consecutive number
[RMT1 SUM POS 000]	10	141	Sum of weights w/decimal.
[RMT1 DATE POS 000]	8	143	Date (MM/DD/YY)
[RMT1 TIME POS 000]	5	146	Time (HH:MM)
[RMT1 BC CHR POS 000]	1	150	Block check character
[RMT1 BC BGN POS 000]	1	150	Begin block check

* The settings shown in the prompt column are the cold start default settings.

Press <CLEAR> to clear the entry field.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

6.4 Remote Output #1 Setup (continued)

PROGRAM STATEMENT	APPLICATION
780	**[NEW RMT1 LITERAL? Y]** The display asks if the remote #1 literal constants are to be changed. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #900. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
790	**[CLR LITERALS? N]** The display asks if the literal constants are to be cleared. Press <Y> (Yes) to advance to the next statement. Press <N> (No) or <ENTER> to advance to statement #810. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
800	**[RMT1 LITERALS CLRD]** The display indicates that all previously entered remote #1 literals have been cleared. After a few seconds the program will advance to the next statement.
810	**[RMT1 LITRL POS XXX]** Enter the string position of the character that will be modified or entered. Press <CLEAR> to clear the entry field. Press <UPARROW> to return to statement #790. Press <ENTER> to complete field entry and advance to the next statement. Press <RESET> to advance to statement #1400.
820	**[RMT1 LITERAL CHAR X]** Enter the desired literal to be inserted into the remote #1 transmission string at the desired location. See Section 12.1 for control and special character entry. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to statement #810. Press <RESET> to advance to statement #1400. Default - a start of text (02H) in position 1 a carriage return (0DH) in position 10 a line feed (0AH) in position 11

6.4 Remote Output #1 Setup (continued)

PROGRAM STATEMENT	APPLICATION
830	**[ANOTHER LITERAL? Y]** Press <Y> (Yes) or <ENTER> to return to statement #510. Press <N> (No) to advance to statement #900. Press <UPARROW> to return to statement #770. Press <RESET> to advance to statement #1400.

There is only one (1) limit on the number of Literals that may be entered, the Remote #1 character string buffer is limited to 150 characters. Re-read program statement #770 to determine the maximum number of Literals that may be entered for your application.

840 **[CKSM ENBL? Y]**

The display asks if the CHECKSUM in the Continuous Output string is to be enabled.

Press <Y> (Yes) or <ENTER> to enable the CheckSum and advance to the next statement.

Press <N> (No) to disable the CheckSum and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to return to statement #1400.

Default - Remote Output string CheckSum enabled.

6.5 Remote Output #2 Setup

Statements 900 and 1040

About This Section

The following section describes the operator interface which allows setup of the Remote Output. These parameters are setup only once at installation as required by the application.

The cold start default settings are shown for each parameter.
See section 9.0 for details on the Remote Data Output format.

PROGRAM STATEMENT	APPLICATION
900	**[RMT2 SETUP? Y]** The display asks if the remote #2 setup parameters are to be set. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1080. Press <UPARROW> to return to statement #700. Press <RESET> to advance to statement #1400.
910	**[RMT2 BAUD RATE XXXX]** Select the baud rate for the remote #2 port. Allowable selections are 1200, 2400, 4800, 9600, or 19,200. **NOTE:** 19,200 is shown as 19.2 Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept the value and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 4800 baud

6.5 Remote Output #2 Setup (continued)

PROGRAM STATEMENT	APPLICATION
915	**[RMT2 ERROR LOG? N]** The display asks if remote #2 error logging is to be enabled. The weight field will be replaced by the appropriate error code when an error occurs(See Section 11.0 on error conditions). Press <Y> (Yes) to enable remote #2 error logging and advance to the next statement. Press <N> (No) to disable remote #2 error logging and advance to the next statement. Press <ENTER> to advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - Disabled
920	**[RMT2 TYPE PROG]** Select the type of output required for the remote #2 port. The type of outputs are: PROG: Programmable output transmitted only after an item is weighed on the scale. CONT: The data transmitted is a continuous stream of standard MT Continuous format data at 4800 baud. The Indicated Weight Value field will have the weight value of the last item weighed, the field will be updated on the next item to cross the scale. The print bit of Status Word "C" will be 1 (one) for the first string after the item is weighed; for subsequent strings the print bit will be zero (0). ITEM: The data transmitted will be a single string of standard MT Continuous format data at 4800 baud. The Indicated Weight Value field will have the weight value of the item just weighed across the scale. The print bit of Status Word "C" will be 1 (one). There will not be another string of data until another item crosses the scale. Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept and advance to the next statement for PROG output or statement 1040 for the CONT or ITEM output. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - PROG

6.5 Remote Output #2 Setup (continued)

PROGRAM STATEMENT	APPLICATION
930	**[RMT2 DATA BITS 7]** Enter the number of data bits for the remote #2 port. Allowable settings are 7 or 8. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - 7 data bits
940	**[RMT2 PARITY (EON) E]** Enter the parity setting for the remote #2 port. Allowable values are <E> for Even parity, <O> for Odd parity, or <N> for No parity. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - even parity enabled
950	**[ACK/NAK PROTOCOL? N]** The display asks if the ACK/NAK protocol is to be used. Refer to Section 8.1 on ACK/NAK protocol for explanation of ACK/NAK protocol. Press <Y> (Yes) to enable ACK/NAK protocol and advance to the next statement. Press <N> (No) to disable ACK/NAK protocol and advance to the next statement. Press <ENTER> to advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - Disabled

6.5 Remote Output #2 Setup (continued)

PROGRAM STATEMENT	APPLICATION
970	**[RMT2 WEIGHT POS 002]**

A 150 character string buffer is provided for the remote #2 output transmission string. Parameters within this string may be freely formatted. Each parameter to be included in the string is assigned a starting string position number. The starting position may be from 1 to 150; however, to avoid truncation, the starting position plus the parameter string length should not exceed 150. A position value of 0 will cause the parameter not to be sent.

The following prompts allow entry of starting positions for each parameter. The prompts will be skipped for the features not enabled in the general setup. Values greater than the maximum starting position values will not be allowed.

The transmission string will be initialized to spaces prior to loading so un-occupied columns will be sent as spaces. The string length will be determined by the greatest ending string position set. Parameter field overlaps will not be checked.

A block check character can be sent by setting a block check character position other than 0. The block check is a single character that is computed as the Exclusive OR of all characters beginning and including a specified starting character position and up to but not including the block check character itself. The block check begin prompt will not appear if the block check character position is 0.

Description Prompt	Field	Max Pos Length	Description Set
[RMT2 WEIGHT POS 002]*	6	145	Weight w/decimal pt.
[RMT2 UNIT POS 008]*	2	149	Weight Units (LB/KG)
[RMT2 ID1 POS 000]	1-40	111-150	Product ID1
[RMT2 ID2 POS 000]	1-40	111-150	Product ID2
[RMT2 CN POS 000]	6	145	Consecutive number
[RMT2 SUM POS 000]	10	141	Sum of weights w/decimal.
[RMT2 DATE POS 000]	8	143	Date (MM/DD/YY)
[RMT2 TIME POS 000]	5	146	Time (HH:MM)
[RMT2 BC CHR POS 000]	1	150	Block check character
[RMT2 BC BGN POS 000]	1	150	Begin block check

* The settings shown in the prompt column are the cold start default settings.

Press <CLEAR> to clear the entry field.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1400.

6.5 Remote Output #2 Setup (continued)

PROGRAM STATEMENT	APPLICATION
980	**[NEW RMT2 LITERAL? Y]** The display asks if the remote #2 literal constants are to be changed. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1080. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
990	**[CLR LITERALS? N]** The display asks if the literal constants are to be cleared. Press <Y> (Yes) to advance to the next statement. Press <N> (No) or <ENTER> to advance to statement #1010. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400.
1000	**[RMT2 LITERALS CLRD]** The display indicates that all previously entered remote #2 literals have been cleared. After a few seconds the program will advance to the next statement.
1010	**[RMT2 LITRL POS XXX]** Enter the string position of the character that will be modified or entered. Press <CLEAR> to clear the entry field. Press <UPARROW> to return to statement #990. Press <ENTER> to complete field entry and advance to the next statement. Press <RESET> to advance to statement #1400.
1020	**[RMT2 LITERAL CHAR X]** Enter the desired literal to be inserted into the remote #2 transmission string at the desired location. See Section 12.1 for control and special character entry. Press <CLEAR> to clear the entry field. Press <ENTER> to complete field entry and advance to the next statement. Press <UPARROW> to return to statement #1010. Press <RESET> to advance to statement #1400. Default - a start of text (02H) in position 1 a carriage return (0DH) in position 10 a line feed (0AH) in position 11

6.5 Remote Output #2 Setup (continued)

PROGRAM STATEMENT	APPLICATION
1030	**[ANOTHER LITERAL? Y]** Press <Y> (Yes) or <ENTER> to return to statement #1010. Press <N> (No) to advance to statement #1080. Press <UPARROW> to return to statement #970. Press <RESET> to advance to statement #1400. There is only one (1) limit on the number of Literals that may be entered, the Remote #2 character string

buffer is limited to 150 characters. Re-read program statement #970 to determine the maximum number of Literals that may be entered for your application.

1040 **[CKSM ENBL? Y]**

The display asks if the CHECKSUM in the Continuous Output string is to be enabled.

Press <Y> (Yes) or <ENTER> to enable the CheckSum and advance to the next statement.

Press <N> (No) to disable the CheckSum and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to return to statement #1400.

Default - Remote Output string CheckSum enabled.

6.6 Remote Input Setup

Statements 1080 thru 1160

About This Section
The Remote Input is a serial port with a user configured message format for receiving new Run ID's.

PROGRAM STATEMENT	APPLICATION
1080	**[REMOTE IN SETUP? Y]** The setup of this input port enables the extraction of data from a received string. Press <Y> or <ENTER> to advance to Statement #1081. Press <N> to skip remote input setup and to advance the program to Statement # 1200. Press <UPARROW> to return to Statement #900. Press <RESET> to go to Statement #1400.
1085	**[ENABLE REMOTE IN? X]** This prompt asks if the Remote Input Port is to be used. Press <Y> to enable the remote input and to advance to the next Statement. Press <N> to disable the remote input and to advance to Statement #1200. Press <ENTER> to maintain the current remote input setting and to advance to the next Statement if enabled or to Statement #1200. Press <UPARROW> to return to the previous Statement. Press <RESET> to go to Statement #1400.
1095	**[RMT PORT RMT2]** Select the Remote Port Number to receive the remote input data. The selections are 1 or 2. A selection is not allowed if handshake is enabled on the selected port. Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1400. Default - Remote #2 port.

6.6 Remote Input Setup (continued)

PROGRAM STATEMENT	APPLICATION

1105 [ID1 STARTING? XX]

This prompt is asking for the starting character number for the ID1 field. This number must be with in the range of 1 to 49.

Press <ENTER> to select the starting position and to advance the program to Statement #1115. If the number is chosen outside the allowable range (1 - 49) the program will advance to the next Statement.

Press <UPARROW> to return to the previous Statement.

Press <RESET> to go to Statement #1400.

1110 [VALUE TOO LARGE!]

This message is displayed for 2 seconds and then the program returns to the previous Statement.

1115 [ID1 LENGTH? XX]

This prompt is asking for the number of characters in the ID1 field. **NOTE:** The ID1 length is determined in General Setup (1 - 40 characters). If the length selected here is shorter than the length selected in General Setup, the system will pad the ID from the remote port with trailing spaces.

Press <ENTER> to select the length and to advance the program to Statement #1125 if ID2 has been enabled else #1145. If the length chosen is greater than the system ID length the program will advance to the next Statement.

Press <UPARROW> to return to Statement #1105.

Press <RESET> to go to Statement #1400.

1120 [VALUE TOO LARGE!]

This message is displayed for 2 seconds and then the program returns to the previous Statement.

1125 [ID2 STARTING? XX]

This prompt is asking for the starting character number for the ID2 field. This number must be with in the range of 1 to 49.

Press <ENTER> to select the starting position and to advance the program to Statement #1135. If the number is chosen outside the allowable range (1 - 49) the program will advance to the next Statement.

Press <UPARROW> to return to Statement #1115.

Press <RESET> to go to Statement #1400.

PROGRAM STATEMENT	APPLICATION

1130 [VALUE TOO LARGE!]

This message is displayed for 2 seconds and then the program returns to the previous Statement.

1135 [ID2 LENGTH? XX]

This prompt is asking for the number of characters in the ID1 field. **NOTE:** The ID1 length is determined in General Setup (1 - 40 characters). If the length selected here is shorter than the length selected in General Setup, the system will pad the ID from the remote port with trailing spaces.

Press <ENTER> to select the length and to advance the program to Statement #1145. If the length chosen is greater than the system ID length the program will advance to the next Statement.

Press <UPARROW> to return to Statement #1125.

Press <RESET> to go to Statement #1400.

1140 [VALUE TOO LARGE!]

This message is displayed for 2 seconds and then the program returns to the previous Statement.

1145 [REMOTE INPUT MODE:0]

This prompt is asking how the controller should handle ID's that are received from the remote input device. The three choices are mode 0, 1, or 2. Selecting mode '0' which is the default mode, enables the controller to use the ID from the previous box for the current box when the current box is missing its' label. Selecting mode '1' will fill the ID field with the ID Fill Char between boxes. This is the opposite of mode '0'. Selecting mode '2' will also fill the ID field with the ID Fill Char between boxes and generate Non-Fatal Alarm #9 when an ID is not received for a box.

Press <ENTER> to select the mode and advance to the next statement.

Press <UPARROW> to return to Statement #1135.

Press <RESET> to go to Statement #1400.

1150 [ENTR."NOREAD" LABEL]

Press <ENTER> to advance to the next statement.

Press <UPARROW> to return to the previous Statement.

Press <RESET> to go to Statement #1400.

PROGRAM STATEMENT **APPLICATION**

1155 [ID: XXXXXXXXXXXX]

The display shows the "NOREAD" label sent by the scanner and prompts the operator for the new "NOREAD" label. The definition of the label is determined by the model and setup of the scanner device. During entry, characters are placed in the field at the highlighted cursor.

Press <CLEAR> to clear the entry field.

Press <-> or <+> to scroll the entry field around the highlighted cursor.

Press <DEL> to delete the character just left of the highlighted cursor.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to Statement #1145.

Press <RESET> to advance to Statement #1400.

1160 [ID FILL CHAR _]

This prompt is asking for the character to fill the ID1 and ID2 fields with if no barcode is read and mode '1' or '2' is selected.

Press <ENTER> to accept the entry and advance to the next statement.

Press <UPARROW> to return to the previous Statement.

Press <RESET> to go to Statement #1400.

6.7 SCALE SETUP

The following sections describe the setup of the scale for normal operation. The "calibration" jumper (W7) must be in place on the 9410 circuit board to enter Scale Setup If this jumper is not in place the program will advance to Statement #1400.

PROGRAM STATEMENT	APPLICATION
1200	**[SCALE SETUP? Y]** The display is asking if the Scale setup parameters are to be accessed at this time. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1350. Press <RESET> to advance to statement #1350.

6.7.1 Zero Parameters

Statements 1202 thru 1208.

PROGRAM STATEMENT	APPLICATION
1202	**[ZERO PARAMETERS? Y]** The display is asking if the scale zero parameters are to be changed at this time. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1210. Press <UPARROW> to return to statement #1350. Press <RESET> to advance to statement #1350.
1204	**[ZERO RANGE XX]** The display is asking for the maximum weight(percent of capacity) that can be zeroed. This is the limit of weight that the scale can zero off including zeroing in Test mode and auto zero maintenance. Allowable entries are 0%, 2%, or 20% where 0% disables auto zero maintenance and zeroing in Test mode. Press <CLEAR> to scroll through the selections 0, 2 and 20. Press <ENTER> to accept the displayed value and advance to the next statement. Press <UPARROW> to retum to statement #1202. Press <RESET> to advance to statement #1350.

6.7.1 Zero Parameters (continued)

PROGRAM STATEMENT	APPLICATION
1206	**[POWER UP ZRO RNG XX]** The display is asking for the maximum weight(percent of capacity) that can be zeroed at power up. The scale will attempt to zero(up to this amount) at power up. Allowable entries are 0%, 2%, or 20% where 0% disables power up zero. Press <CLEAR> to scroll through the selections 0, 2 and 20. Press <ENTER> to accept the displayed value and advance to the next statement. Press <UPARROW> to return to statement #1204. Press <RESET> to advance to statement #1350.
1208	**[ZERO CAP RANGE XXX]** The display is asking for the automatic zero capture range. This is the amount of minor weight increments(in 1/10 of a division) that can be zeroed off at any one time. Allowable values are 6, 14, 24, 54 or 104 minor increments. Press <CLEAR> to scroll the valid selections. Press <ENTER> to accept the displayed value and advance to the next statement. Press <UPARROW> to return to statement #1206. Press <RESET> to advance to statement #1350.
1209	**[ZERO INDICATION? X]** The display is asking if the center of zero indication is to be displayed if the scale is within .25 divisions of zero. This feature is only available with "B" revision or later 9410's. Press <Y> to enable the center of zero indication. Press <N> to disable the center of zero indication. Press <ENTER> to accept the displayed value and advance to the next statement. Press <UPARROW> to return to statement #1208. Press <RESET> to advance to statement #1350.

6.7.2 Calibrate Scale

Statements 1210 thru 1299.

About This Section

The following section describes the operator interface which allows calibration of the scale attached to the 9410 High Speed Junction Box. See Section 3.3 for scale calculations.

The cold start default settings are shown for each parameter.

1210 **[CALIBRATE SCALE? Y]**

The display asks if the scale setup parameters and/or calibration is to be changed.

If the "calibration" jumper (W7) is not in place on the 9410 circuit board, the program will have advanced to Statement #1400 and this Statement will not be displayed.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1300.

Press <UPARROW> to return to statement #1202.

Press <RESET> to advance to statement #1350.

1212 **[CAL. UNITS LB]**

The display indicates the unit of measure that will be used to calibrate the scale. This will also be the unit of measure that the scale will use for weight displaying and reporting. The <CLEAR> key may be used to toggle the units between LB and Kg.

Press <ENTER> to accept the units displayed and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

1214 **[CAPACITY XXXXXX]**

The display indicates the scale capacity in the units selected in statement #1212. Enter the scale capacity then press <ENTER> or if no change is required press <ENTER>.

Press <CLEAR> to clear the entry field.

Press <ENTER> to complete field entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

6.7.2 Calibrate Scale (continued)

PROGRAM STATEMENT	APPLICATION

1216 **[INCRMNT SIZE XXXXX]**

The display indicates the scale increment size. Press the <CLEAR> key to scroll through the available settings.

Available increment size settings are:

0.001
0.002
0.005
0.01
0.02
0.05
0.1
0.2
0.5
1
2
5

Press <CLEAR> to scroll the field settings.

Press <ENTER> to accept the displayed entry and advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

1218 **[SHIFT ADJUST? Y]**

The display asks if the scale is to be shift adjusted.

NOTE: In multiple loadcell systems a shift adjust should be performed before the scale is calibrated.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1240.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

1220 **[# OF LOAD CELLS X]**

The display indicates the number of load cells connected to the 9410. Allowable entries are 1, 2, or 4. Enter the appropriate number then press <ENTER> or if no change is required press <ENTER>.

Press <CLEAR> to clear the entry field.

Press <ENTER> to accept the entry and advance to the next statement if two or more load cells were selected or to statement #1240 for single load cell scales.

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

6.7.2 Calibrate Scale (continued)

NOTE: When 1 loadcell is to be connected to the 9410 junction box the signal leads must be connected to the remaining channels. In a 2 loadcell system, Loadcell 1 must be connected to Channels 1 & 2 and Loadcell 2 must be connected to Channels 3 & 4. See supplied schematic(See Section 12.7) for details.

PROGRAM STATEMENT	APPLICATION

1222 **[EMPTY SCALE]**

The display directs the operator to empty the scale. This prompt is only displayed if more than one loadcell was entered in the previous statement. Press <ENTER> to allow the 9410 to take an initial reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].

Press <UPARROW> to return to the previous statement.

Press <RESET> to advance to statement #1350.

1224 **[LOAD CELL NUMBER 1]**

The display directs the operator to add the test weight(50% of scale capacity is recommended) above load cell number 1(connected to 9410 Channel 1) of the scale. Press <ENTER> to allow the 9410 to take a sample shift adjust reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].

Upon completion, the controller will advance to the next statement.

1226 **[LOAD CELL NUMBER 2]**

The display directs the operator to move the test weight(50% of scale capacity is recommended) above load cell number 2(connected to 9410 Channel 2) of the scale. Press <ENTER> to allow the 9410 to take a sample shift adjust reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].

Upon completion, the controller will advance to the next statement if there are additional load cells, or to statement #1232 if complete.

1228 **[LOAD CELL NUMBER 3]**

The display directs the operator to move the test weight(50% of scale capacity is recommended) above load cell number 3(connected to 9410 Channel 3) of the scale. Press <ENTER> to allow the 9410 to take a sample shift adjust reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].

Upon completion the controller will advance to the next statement if there are additional load cells, or to statement #1232 if complete.

6.7.2 Calibrate Scale (continued):

PROGRAM STATEMENT	APPLICATION
1230	**[LOAD CELL NUMBER 4]** The display directs the operator to move the test weight(50% of scale capacity is recommended) above load cell number 4 (connected to 9410 Channel 4) of the scale. Press <ENTER> to allow the 9410 to take a sample shift adjust reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].
1232	**[SHIFT ADJUST DONE]** The display indicates that the shift adjust of the 9410 has been completed. This prompt will be displayed momentarily, then the program will advance to the next statement. The scale should be calibrated after performing a shift adjust.
1240	**[CALIBRATE? Y]** The display asks if the scale is to be calibrated. If a shift adjust has just been completed it is recommended that the scale be recalibrated. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1300. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1350.
1242	**[EMPTY SCALE]** The display directs the operator to empty the scale. Press <ENTER> to allow the 9410 to take an initial reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *]. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1350.

6.7.2 Calibrate Scale (continued)

PROGRAM STATEMENT	APPLICATION
1244	**[ADD LOAD XXXXXX]** The display directs the operator to place the calibration test weight on the scale, then enter the known test weight value. The test weight should be as close to scale capacity as possible. At a minimum, the test weight used should be at least 10% of scale capacity. Enter the test weight value and press <ENTER> to allow the 9410 to take a span adjust reading. As the 9480 waits for the 9410 to complete the reading, the display will show [SCALE PROCESSING *].
1246	**[CALIBRATION DONE]** The display indicates that the calibration of the 9410 has been completed. This prompt will be displayed momentarily, then the program will advance to the next statement.

6.7.3 Filter Parameters

Statements 1300 thru 1310

About This Section

The following section describes the operator interface which allows setup of the filter parameters in the 9410 High Speed Junction Box. These parameters are set up only once at installation as required by the application.

The 9410 processes raw weight data with a digital filter. The weight is available as an output from the filter by request from the Expressweigher.

This section describes the filter selection for the weigh time at which the Controller can set the proper filter.

PROGRAM STATEMENT	APPLICATION
1300	**[FILTER SELECT? Y]** The display asks if the scale filter setup parameters are to be changed. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1320. Press <UPARROW> to return to statement #1210. Press <RESET> to advance to statement #1350.
1302	**[AUTO FILTER ADJ? Y]** The display asks if the filter parameters are to be automatically selected by the controller. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1308. Press <UPARROW> to return to statement #1300. Press <RESET> to advance to statement #1350.
1304	**[RUN BOX ACROSS SCL]** The display is requesting the longest container to be run across the weigh conveyor. The controller will calculate the best filter for weighing based on the box length and speed. Press <RESET> to abort and advance to statement #1308.
1306	**[FILTER SEL COMPLETE]** The display is indicating it has successfully selected the proper filter. Press <ENTER> to advance to the next statement.

6.7.3 Filter Parameters (continued)

PROGRAM STATEMENT	APPLICATION
1308	**[F1 SETTLE TIME X.X]** The display indicates the settling time for the F1 filter. This value is either the value selected by the controller during the auto filter select or the previous manually entered setting. This is the amount of time that the filter requires to stabilize at a final output. This parameter should be selected to be a value less than the minimum amount of time, in seconds, that the product will be on the scale. (See section 3.3.3 for calculation.) The valid selections are from 0.1 to 1.0 seconds. Press <CLEAR> to scroll through the valid selections. Press <ENTER> to accept selection and advance to the next statement. Press <UPARROW> to return to the previous statement. Press <RESET> to advance to statement #1350.

6.7.5 SCALE PARAMETER STORAGE

Statements 1350 and 1360.

1350	**[STORE PARAMETERS? Y]** The display asks if the scale parameters should be permanently stored in EEPROM. The settings selected will be lost when power is removed from the scale unless the parameters have been stored. Press <Y> (Yes) or <ENTER> to store the parameters and advance to the next statement. Press <N> (No) to advance to statement #1360. Press <UPARROW> to return to statement #1300. Press <RESET> to advance to statement #1360.
1360	**[REMOVE CAL JUMPER]** Remove the calibration jumper (W7) on the 9410 junction box PCB to proceed to the next statement.

6.8 Setup Parameter Printout Sequence

Statements 1400 and 1410

About This Section

The following section describes the operator interface which allows printout of the setup parameters.

PROGRAM STATEMENT	APPLICATION
1400	**[PRINT SETUP? Y]** The display asks if it is desired to print the setup parameters. If no printer has been selected in statement #710 the program will skip this section and return to statement #30. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to return to statement #30. Press <UPARROW> to return to statement #1000. Press <RESET> to return to statement #30.
1410	**[PRINTING]** The display indicates that the printer is in the process of printing out the setup parameters. The system parameter setup printout is formatted for a 40 column printer. An example printout follows. Upon completion the program will return to statement #1400. Note: ID, Consecutive Numbering, Summation, Date and Time, if DISABLED, these parameters will only be printed out on the General Parameter Setup Report, not on the other Setup Parameter Reports.

GENERAL PARAMETER SETUP

PE1 TIMER	150
PE2 TIMER	50
PE1 - PE2 TIME	3.0
ID ENTRY	ENABLED
ID PROMPT	LICENSE
ID LENGTH	18
ID2 ENTRY	ENABLED
ID2 PROMPT	DEST
ID2 LENGTH	2
CONSECUTIVE NUMBERING	ENABLED
SUMMATION	ENABLED
DATE	ENABLED
TIME	ENABLED
OPERATOR PASSWORD USED	YES
SUPERVISOR PASSWORD USED	YES

RMT1 PARAMETER SETUP

DATA OUTPUT MODE	PROG
BAUD RATE	9600
CHARACTER DATA BITS	7
CHARACTER PARITY	ODD
ACK/NAK PROTOCOL	DISABLED
ERROR LOGGING	DISABLED
WEIGHT POSITION	021
UNITS POSITION	000
ID POSITION	002
ID2 POSITION	000
CONSECUTIVE NUMBER POSITION	000
SUM POSITION	000
DATE POSITION	000
TIME POSITION	000
BLOCK CHECK CHARACTER POSITION	000
BLOCK CHECK CHARACTER START POSITION	000
LITERAL CHARACTER 02H POSITION	001
LITERAL CHARACTER 20H POSITION	020
LITERAL CHARACTER 04H POSITION	028
TOTAL STRING LENGTH	028

RMT2 PARAMETER SETUP

DATA OUTPUT MODE	PROG
BAUD RATE	9600
CHARACTER DATA BITS	7
CHARACTER PARITY	ODD
ACK/NAK PROTOCOL	DISABLED
ERROR LOGGING	DISABLED
WEIGHT POSITION	021
UNITS POSITION	000
ID POSITION	002
ID2 POSITION	028
CONSECUTIVE NUMBER POSITION	000
SUM POSITION	000
DATE POSITION	000
TIME POSITION	000
BLOCK CHECK CHARACTER POSITION	000
BLOCK CHECK CHARACTER START POSITION	000
LITERAL CHARACTER 02H POSITION	001
LITERAL CHARACTER 20H POSITION	020
LITERAL CHARACTER 04H POSITION	030
TOTAL STRING LENGTH	030

PRINTER PARAMETER SETUP

PRINTER ENABLED	YES
BAUD RATE	4800
CHARACTER DATA BITS	7
CHARACTER PARITY	EVEN
ERROR LOGGING	ENABLED
WEIGHT POSITION	002
UNITS POSITION	008
ID POSITION	000
ID2 POSITION	000
CONSECUTIVE NUMBER POSITION	000
SUM POSITION	000
DATE POSITION	000
TIME POSITION	000
BLOCK CHECK CHARACTER POSITION	000
BLOCK CHECK CHARACTER START POSITION	001
LITERAL CHARACTER 02H POSITION	001
LITERAL CHARACTER 0DH POSITION	010
LITERAL CHARACTER 0AH POSITION	011
TOTAL STRING LENGTH	011

DISPLAY PARAMETER SETUP

RUN DISPLAY TIMER	0
WEIGHT POSITION	011
UNITS POSITION	018
ID POSITION	000
ID2 POSITION	000
CONSECUTIVE NUMBER POSITION	000
SUM POSITION	000
DATE POSITION	000
TIME POSITION	000
LITERAL CHARACTER G POSITION	001
LITERAL CHARACTER R POSITION	002
LITERAL CHARACTER O POSITION	003
LITERAL CHARACTER S POSITION	004
LITERAL CHARACTER S POSITION	005
LITERAL CHARACTER W POSITION	007
LITERAL CHARACTER T POSITION	008

SCALE PARAMETER SETUP

ZERO RANGE	2
POWER UP ZERO CAPTURE RANGE	2
ZERO CAPTURE RANGE	104
SCALE UNITS	LB
SCALE CAPACITY	200.0
SCALE INCREMENT SIZE	0.1
NUMBER OF LOAD CELLS	4
FILTER 1 SETTLE TIME	0.3

7.0 SYSTEM TEST SEQUENCE

Statements 1500 through 1650

About This Section

The following section describes the operator interface which allows execution of the system test functions. The Test Mode may be entered by pressing the <F3> key.

PROGRAM STATEMENT	APPLICATION

1500 [SUPERVSR PW XXXXXX]

Enter the supervisor password and then press <ENTER> to advance to the next statement. If a password has not been setup, this statement will be skipped and the program will advance to the next statement. If no password is entered within 3 seconds, or an invalid password is entered the program will return to the previous mode.

1505 [DISPLAY TEST? Y]

The display asks if it is desired to run the display test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1520.

Press <UPARROW> to return to statement #30.

Press <RESET> to return to statement #30.

1510 [**********]

A test pattern that illuminates all display pixels and cursors is written to the display.

Press <ENTER> to advance to the next statement.

Press <UPARROW> to return to the previous statement.

Press <RESET> to return to statement #30.

1520 [KEYBOARD TEST? Y]

The display asks if it is desired to run the keyboard test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1540.

Press <UPARROW> to return to statement #1500.

Press <RESET> to return to statement #30.

7.0 SYSTEM TEST SEQUENCE (Continued)

PROGRAM STATEMENT	APPLICATION

1530 [KEY TEST XXX]

The display indicates the key that is pressed.

Press <RESET> to advance to the next statement.

1540 [RMT1 TEST? Y]

The display asks if it is desired to run the remote #1 test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1560.

Press <UPARROW> to return to statement #1520.

Press <RESET> to return to statement #30.

1550 [RMT1 TEST]

A test string is sent repeatedly to the remote #1. Any displayable characters received will be displayed (this allows a loop back test). If the printer is selected both transmitted and received characters will be printed.
The test output string is: ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789<cr><lf>.

For loop back testing, connect the output to the input. The first 19 characters of the test output string will be shown on the display (ABCDEFGHIJKLMNOPQRS).

Press <ENTER> to advance to the next statement.

Press <UPARROW> to return to statement #1520.

Press <RESET> to return to statement #30.

1552 [RMT2 TEST? Y]

The display asks if it is desired to run the remote #2 test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1560.

Press <UPARROW> to return to statement #1520.

Press <RESET> to return to statement #30.

7.0 SYSTEM TEST SEQUENCE (Continued)

PROGRAM STATEMENT	APPLICATION

1554 [RMT2 TEST]

A test string is sent repeatedly to the remote #2. Any displayable characters received will be displayed (this allows a loop back test). If the printer is selected both transmitted and received characters will be printed.
The test output string is: ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789<cr><lf>.

For loop back testing, connect the output to the input. The first 19 characters of the test output string will be shown on the display (ABCDEFGHIJKLMNOPQRS).

Press <ENTER> to advance to the next statement.

Press <UPARROW> to return to statement #1520.

Press <RESET> to return to statement #30.

1560 [PRINTER TEST? Y]

The display asks if it is desired to run the printer test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1580.

Press <UPARROW> to return to statement #1540.

Press <RESET> to return to statement #30.

1570 [PRINTER TEST]

A test string is sent to the printer. The program then returns to the previous statement.
The test output string is: ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789<cr><lf>.

1572 [REMOTE IN TEST? Y]

The display asks if it is desired to run the remote input test.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to advance to statement #1580.

Press <UPARROW> to return to statement #1560.

Press <RESET> to return to statement #30.

1574 [REMOTE IN TEST]

Any displayable characters received in ID1 will be displayed.

Press <ENTER> to advance to the next statement.

Press <RESET> to return to statement #30.

7.0 SYSTEM TEST SEQUENCE (Continued)

PROGRAM STATEMENT	APPLICATION
1580	**[TEST INPUTS? Y]** The display asks if it is desired to test the inputs. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1600. Press <UPARROW> to return to statement #1560. Press <RESET> to return to statement #30.
1590	**[INPUTS 00000011]** The current input status of all eight inputs is shown on the display. A <1> represents an ON condition and a <0> represents an OFF condition. The inputs are continuously read and updated. Press <ENTER> to advance to the next statement. Press <UPARROW> to return to statement #1580. Press <RESET> to return to statement #30.

INPUT TEST DISPLAY LAYOUT:

The following is a representation of what could be expected.

```
0   0   0   0   0   1   0   0
|   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |-- IP0 = Enter Photo-Eye
|   |   |   |   |   |   |       input. Blocking the
|   |   |   |   |   |   |       Enter Photo-Eye
|   |   |   |   |   |   |       should change the
|   |   |   |   |   |   |       state of the input.
|   |   |   |   |   |   |
|   |   |   |   |   |   |-- IP1 = Exit Photo-Eye
|   |   |   |   |   |       input. Blocking the Exit
|   |   |   |   |   |       Photo-Eye should change
|   |   |   |   |   |       the state of the input.
|   |   |   |   |   |
|   |   |   |   |   |-- IP2 = RUN PERMISSIVE input.
|   |   |   |   |       Removing the RUN PERMISSIVE
|   |   |   |   |       input should change the state
|   |   |   |   |       of the input.
|   |   |   |   |
|   |   |   |   |-- IP3 = Spare input capability, not
|   |   |   |       used in standard units.
|   |   |   |
|   |   |   |-- IP4 = Not used in standard units.
|   |   |
|   |   |-- IP5 = Not used in standard units.
|   |
|   |-- IP6 = Not used in standard units.
|
|-- IP7 = Not used in standard units.
```

7.0 SYSTEM TEST SEQUENCE (continued)

PROGRAM STATEMENT	APPLICATION
1600	**[TEST OUTPUTS? Y]** The display asks if it is desired to test the outputs. **CAUTION:** External devices will be energized if this test is performed. Press <Y> (Yes) or <ENTER> to advance to the next statement. Press <N> (No) to advance to statement #1620.

Press <UPARROW> to return to statement #1580.

Press <RESET> to return to statement #30.

1610 **[OUTPUT TEST X]**

The outputs can be turned on and off by pressing 0-3. Pressing the desired I/O number will turn that output ON and turn the others OFF.

Press <CLEAR> to turn the Output that is On to Off.

Press <UPARROW> to return to statement #1600.

Press <RESET> to return to statement #30.

1620 **[TEST SCALE? Y]**

The display asks if it is desired to test the scale.

Press <Y> (Yes) or <ENTER> to advance to the next statement.

Press <N> (No) to return to statement #1500.

Press <UPARROW> to return to statement #1600.

Press <RESET> to return to statement #30.

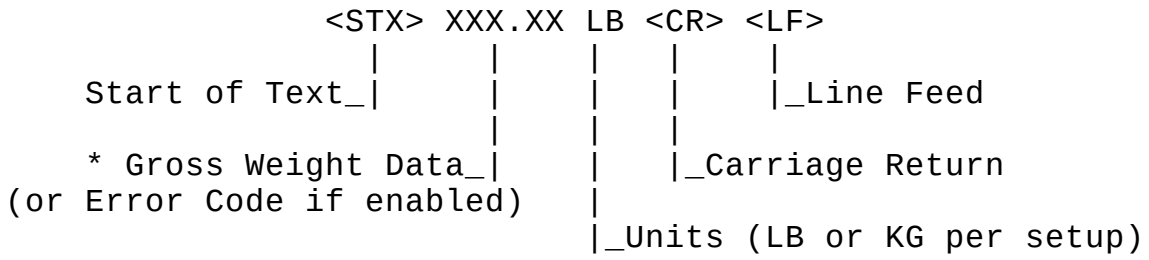
If the Remote Output is enabled and Statement #1110 is a "Y", the Remote Output will transmit scale weight data during testing of the scale. This feature can be useful when the Controller is connected to an Analog Module (9325), as it provides a means to calibrate the Analog Module.

7.0 SYSTEM TEST SEQUENCE (continued)

PROGRAM STATEMENT	APPLICATION
1630	**[WEIGHT XXXXXX UU]** The scale and the display is updated every second. The display indicates the weight reading and units of measure. A small z will be displayed if ZERO INDICATION is enable and the weight is within the COZ limits(only available with "B" revision or newer 9410). Press <ENTER> to advance to the next statement. Press <UPARROW> to return to statement #1620. Press <RESET> to return to statement #30.
1640	**[ZERO SCALE? Y]** The display asks if it is desired to zero the scale. The scale can only be zeroed to the range specified in setup by statement #1204. Press <Y> (Yes) or <ENTER> to zero the scale. The controller will display [ZEROING] for a few seconds and then the program will return to statement #1630. Press <N> (No) to return to statement #1630. Press <UPARROW> to return to statement #1630. Press <RESET> to return to statement #30.

8.0 REMOTE DATA TRANSMISSION

Serial ASCII Data is transmitted at the selected baud rate with 1 Start, selected Data bits, selected Parity, and 1 Stop Bit. Following is the default data string:



(There are no spaces between characters in the actual data transmitted)

* Decimal Point will be located in same position as the weight indication.

8.1 ACK/NAK COMMUNICATIONS PROTOCOL:

When ACK/NAK protocol is enabled (statement 450 = "Y") and the Expressweigh Controller transmits product weight data the host system must respond with an "ACK" (Acknowledge) character within 10 seconds or the Expressweigh Controller will timeout and re-try.
If no response is received from the host system, on the re-try transmission, within 10 seconds the Expressweigh Controller will go into error condition (999.96).

If the host system receives the transmission and detects an error, a "NAK" (Negative Acknowledge) from the host will cause a re-transmission of the last data.

A timeout error (a second data transmission with no response) or two "NAK" responses will result in a communication error condition (999.96). The Expressweigher Controller has a buffer capable of accumulating 20 product weights while waiting for an "ACK" response.

8.2 BLOCK CHECK CHARACTER (BCC) DEFINITION:

The block check is a single character that is computed as the XOR(Exclusive OR) of all characters beginning at a specified starting character position and up to but not including the block check character itself. See Interface Setup for specifying the starting character position for the Block Check Character.

9.0 MT CONTINUOUS DATA FORMAT

The data provided will be the standard Toledo continuous format data at 4800 baud. The output data may optionally include CheckSum, and may optionally transmit Error Codes. See Section 6.5 on Remote Output Setup and Section 11.0 on Error Conditions.
Decimal point location data will be coded in Status Word "A"
Error Codes will be transmitted in the Indicated Weight Value field.

Each data string transmitted will be 17 (no CheckSum character) or 18 (with CheckSum character) characters of ASCII coded data. Data is 7 (seven) bit, even parity, with one (1) start bit and two (2) stop bits.

Character number 1 - Start of Text (02H)
Character number 2 - Status Word "A"
Character number 3 - Status Word "B"
Character number 4 - Status Word "C"
Character number 5 - Weight Value (hundred-thousands digit)
Character number 6 - Weight Value (ten-thousands digit)
Character number 7 - Weight Value (thousands digit)
Character number 8 - Weight Value (hundreds digit)
Character number 9 - Weight Value (tens digit)
Character number 10 - Weight Value (units digit)
Character number 11 - Zero (hundred-thousands digit)
Character number 12 - Zero (ten-thousands digit)
Character number 13 - Zero (thousands digit)
Character number 14 - Zero (hundreds digit)
Character number 15 - Zero (tens digit)
Character number 16 - Zero (units digit)
Character number 17 - Carriage Return (0DH)

Optional:

Character number 18 - CheckSum character

CheckSum is defined as the 2's complement of the binary sum of the 7 low order bits of all characters preceding the CheckSum character including STX and CR. Bit 8 of the CheckSum character is parity of the 7 low order bits of the CheckSum character.

STATUS WORD A DEFINITION

Decimal Point Location

Bit No.	X	.X	.XX	.XXX	.XXXX	.XXXXX
0	0	1	0	1	0	1
1	1	1	0	0	1	1
2	0	0	1	1	1	1

(X10 and X100 are illegal setups)

Increment Size

Bit No.	Count by 1	Count by 2	Count by 5
3	1	0	1
4	0	1	1

General

5	Always = 1
6	Always = 0
7	Even Parity

STATUS WORD B DEFINITION

Operating Parameters

Bit No.	
0	Always = 0
1	Positive Weight = 0 / Negative Weight = 1
2	In Range = 0 / Over Capacity = 1
3	Always = 0
4	LB Mode = 0 / KG = 1
5	Always = 1

6	Normal = 0 / Power up = 1
7	Parity Bit

9.0 MT CONTINUOUS DATA FORMAT (Continued)

STATUS WORD C DEFINITION

Operating Parameters

Bit No.

0	Always = 0
1	Always = 0
2	Always = 0
3*	Normal = 0 / Print = 1
4	Always = 0
5	Always = 1
6	Always = 0
7	Parity Bit

* - Bit 3 will equal 1 on the first data transmission, after the item is weighed in the continuous mode. Bit 3 will be set to 1 on every transmission in the per item mode. This would cause a data transmission to a printer (or other data receiving device) that may optional connected to most Mettler Toledo remote devices. Refer to the manual provided with remote device for this feature.

10.0 REMOTE INPUT DATA FORMAT

A Remote input port is provided to receive a new ID(s) for the next package(s). This data must be received by the controller before the package to be weighed, with the new ID, has cleared the Entrance Photo Eye.

Each data string received must be at the same baud rate, data bits and parity of the selected port, with one (1) start bit and two (2) stop bits.

Data Characters -	Up to 48 ASCII characters with the ID.
End Character -	Carriage Return (0DH), Line Feed (0AH), or EOT [03H]

Data Characters include the ID which is limited to 40 characters determined by entry at Statement #1115. The Start of Text (02H) character when received will clear out all previous data received.

See Section 6.6 for configuration of the Remote input port.

11.0 ERROR CONDITIONS

Several conditions are recognized as errors. When an error occurs the alarm output is turned ON and remains ON until the alarm is RESET. The local display will show the correct alarm message. Error codes will be sent in the weight field as defined by in the following table if Error Logging is enabled in the Remote Output Ports or printed in text form if a printer is used and Printer Error Logging is enabled.

ERROR CODE	ERROR [DISPLAY MESSAGE]	DEFINITION
999.91	NEGATIVE WEIGHT [ALARM 1]	The current item was weighed and the weight was less than 5 increments above zero. Weights below this value are not considered valid due to in motion weighing variations. This indicates a serious problem with the scale system or it's setup that must be investigated and corrected before additional items are weighed.
999.92	SHORT WEIGH TIME [ALARM 2]	The current item broke the exit photoeye before the "MINIMUM WEIGH TIME" is over. A minimum weigh time is approximately .8 of the filter time selected.
999.93	SPACING ERROR [ALARM 3]	More than two boxes are fully on the scale and neither photoeye beam is broken.
999.94	FORMAT ERROR [ALARM 4]	The decimal point location has changed from its location at power-up.
999.95	SCALE FAULT [ALARM 5]	Scale Weight not received or the scale data checksum doesn't match.
999.96	MAXIMUM WEIGH TIME [ALARM 6]	A box is on the scale for a time period that exceeded the PE 1-2 time plus 20 percent. Box on scale too long.
999.97	OVER CAPACITY [ALARM 7]	Current item exceeded the Over Capacity value entered in General setup.
999.98	COMM. FAULT [ALARM 8]	The host system failed to answer a data transmission with an "ACK" or 2 "NAK's" were received (only occurs if ACK/NAK protocol is enabled.)
999.99	SCANNER ID NOREAD [ALARM 9]	The remote input mode for the controller is set at '2', clear ID's after use and generate a Non-Fatal alarm when an ID is missing from a box.

Note that the decimal point location in the "Error Codes" will be in the same position as the weight indication.

To RESET runtime errors the RUN PERMISSIVE signal must be removed, or the error will automatically RESET when both photoeyes are clear and scale weight is zero.

11.0 ERROR CONDITIONS (Continued)

The scale faults listed below are all of the possible faults. The ones that could normally appear are 51-53 that may appear during calibration. The others will not occur unless there is a serious problem in the system.
Following is the list of all possible scale errors:

ERROR CODE		DEFINITION
Scale Communication errors		
SCALE FAULT	01	Unrecognized command.
SCALE FAULT	02	Access denied(Calibration jumper not in place).
SCALE FAULT	03	Invalid data.
SCALE FAULT	04	Can not process command at this time.
Scale weighing errors		
SCALE FAULT	11	Scale outside zero range for analog verify.
SCALE FAULT	12	Scale over capacity.
SCALE FAULT	13	Scale under zero.
SCALE FAULT	14	Scale outside zeroing range.
SCALE FAULT	15	Can not process command due to motion.
SCALE FAULT	16	Can not process command due to insufficient weigh time.
Scale calibration errors		
SCALE FAULT	51	Occurs during shift adjust. The 9410 cannot complete a shift adjustment because it cannot compensate for a large deviation in loadcell loading. This error is normally caused by a loadcell disconnected or faulty, or the conveyor weight not evenly distributed over each loadcell. This error can also occur during the [EMPTY SCALE] routine when there is excessive scale motion.
SCALE FAULT	52	Not enough resolution for selected scale build. The 9410 cannot calibrate the scale because it does not have enough internal counts for the selected grad size and capacity. Check for binding in the scale and verify the scale build(See Section 3.3).
SCALE FAULT	53	Calibration command not in sequence. Do complete calibration from the beginning.
Scale hardware failure errors		
SCALE FAULT	70	A/D conversion error.
SCALE FAULT	71	Analog verification error.
SCALE FAULT	72	EPROM memory failure.
SCALE FAULT	73	RAM memory failure.
SCALE FAULT	74	EEPROM checksum error(invalid parameters). Performing a scale cold start may correct this error.

12.0 APPENDICES

12.1 Control and Special Character Entry

When setting up string literals it is sometimes necessary to use control characters and other characters not available on the Controller keyboard. Special characters are entered on the Controller keyboard by pressing SHIFT, ALT, or CTRL followed by the key. The following charts define the special characters.

Note: The Controller's local display, will display ASCII Control Characters using the CTRL with a bar over the character entered. All other characters will be displayed as shown in the ASCII Control Character column.

ASCII CONTROL CHARACTER	HEX EQUIV.	ENTRY
NUL	00H	Press CTRL then F4
SOH	01H	Press CTRL then A
STX	02H	Press CTRL then B
ETX	03H	Press CTRL then C
EOT	04H	Press CTRL then D
ENQ	05H	Press CTRL then E
ACK	06H	Press CTRL then F
BEL	07H	Press CTRL then G
BS	08H	Press CTRL then H
HT	09H	Press CTRL then I
LF	0AH	Press CTRL then J
VT	0BH	Press CTRL then K
FF	0CH	Press CTRL then L
CR	0DH	Press CTRL then M
SO	0EH	Press CTRL then N
SI	0FH	Press CTRL then O
DLE	10H	Press CTRL then P
DC1(XOn)	11H	Press CTRL then Q
DC2	12H	Press CTRL then R
DC3(XOff)	13H	Press CTRL then S
DC4	14H	Press CTRL then T
NAK	15H	Press CTRL then U
SYN	16H	Press CTRL then V
ETB	17H	Press CTRL then W
CAN	18H	Press CTRL then X
EM	19H	Press CTRL then Y
SUB	1AH	Press CTRL then Z
ESC	1BH	Press CTRL then F7
FS	1CH	Press CTRL then F8
GS	1DH	Press CTRL then F9
RS	1EH	Press CTRL then F10
US	1FH	Press CTRL then F11
DEL	7FH	Press CTRL then F12

12.1 Control and Special Character Entry (Continued)

CHARACTER	HEX EQUIV.	ENTRY
* (asterisk)	2AH	Press SHIFT then F1
/ (slash)	2FH	Press SHIFT then F2
= (equal sign)	3DH	Press SHIFT then F3
<> (not equal)	n/a	Press SHIFT then F4
<= (less than or equal to)	n/a	Press SHIFT then F5
>= (greater than or equal to) n/a		Press SHIFT then F6
! (exclamation mark)	21H	Press SHIFT then F7
" (double quotation mark)	22H	Press SHIFT then F8
# (number sign)	23H	Press SHIFT then F9
$ (dollar sign)	24H	Press SHIFT then F10
% (percent sign)	25H	Press SHIFT then F11
& (ampersand)	26H	Press SHIFT then F12
` (single quotation mark)	60H	Press ALT then F1
' (apostrophe)	27H	Press ALT then F2
^	5EH	Press ALT then F3
@ (at sign)	40H	Press ALT then F4
((opening parentheses)	28H	Press ALT then F5
) (closing parentheses)	29H	Press ALT then F6
[(opening bracket)	5BH	Press ALT then F7
\ (backslash)	5CH	Press ALT then F8
] (closing bracket)	5DH	Press ALT then F9
~	7EH	Press ALT then F10
? (question mark)	3FH	Press ALT then F11
_ (underscore)	5FH	Press ALT then F12
{	7BH	Press CTRL then F5
}	7DH	Press CTRL then F6
|	7CH	Press CTRL then ;

12.2 ASCII Control Code Chart

ASCII CHARACTER	DEC. EQUIV.	OCTAL EQUIV.	HEX EQUIV.
NUL	0	000	00
SOH	1	001	01
STX	2	002	02
ETX	3	003	03
EOT	4	004	04
ENQ	5	005	05
ACK	6	006	06
BEL	7	007	07
BS	8	010	08
HT	9	011	09
LF	10	012	0A
VT	11	013	0B
FF	12	014	0C
CR	13	015	0D
SO	14	016	0E
SI	15	017	0F
DLE	16	020	10
DC1 (XOn)	17	021	11
DC2	18	022	12
DC3 (XOff)	19	023	13
DC4	20	024	14
NAK	21	025	15
SYN	22	026	16
ETB	23	027	17
CAN	24	030	18
EM	25	031	19
SUB	26	032	1A
ESC	27	033	1B
FS	28	034	1C
GS	29	035	1D
RS	30	036	1E
US	31	037	1F
SP	32	040	20

12.2 ASCII Code Chart (Continued)

ASCII CHAR.	DEC. EQUIV.	OCTAL EQUIV.	HEX EQUIV.	ASCII CHAR.	DEC. EQUIV.	OCTAL EQUIV.	HEX EQUIV
!	33	041	21	Q	81	121	51
"	34	042	22	R	82	122	52
#	35	043	23	S	83	123	53
$	36	044	24	T	84	124	54
%	37	045	25	U	85	125	55
&	38	046	26	V	86	126	56
'	39	047	27	W	87	127	57
(	40	050	28	X	88	130	58
)	41	051	29	Y	89	131	59
*	42	052	2A	Z	90	132	5A
+	43	053	2B	[	91	133	5B
,	44	054	2C	\	92	134	5C
-	45	055	2D	]	93	135	5D
.	46	056	2E	^	94	136	5E
/	47	057	2F	_	95	137	5F
0	48	060	30	`	96	140	60
1	49	061	31	a	97	141	61
2	50	062	32	b	98	142	62
3	51	063	33	c	99	143	63
4	52	064	34	d	100	144	64
5	53	065	35	e	101	145	65
6	54	066	36	f	102	146	66
7	55	067	37	g	103	147	67
8	56	070	38	h	104	150	68
9	57	071	39	i	105	151	69
:	58	072	3A	j	106	152	6A
;	59	073	3B	k	107	153	6B
<	60	074	3C	l	108	154	6C
=	61	075	3D	m	109	155	6D
>	62	076	3E	n	110	156	6E
?	63	077	3F	o	111	157	6F
@	64	100	40	p	112	160	70
A	65	101	41	q	113	161	71
B	66	102	42	r	114	162	72
C	67	103	43	s	115	163	73
D	68	104	44	t	116	164	74
E	69	105	45	u	117	165	75
F	70	106	46	v	118	166	76
G	71	107	47	w	119	167	77
H	72	110	48	x	120	170	78
I	73	111	49	y	121	171	79
J	74	112	4A	z	122	172	7A
K	75	113	4B	{	123	173	7B
L	76	114	4C	|	124	174	7C
M	77	115	4D	}	125	175	7D
N	78	116	4E	~	126	176	7E
O	79	117	4F	DEL	127	177	7F
P	80	120	50				

12.3 Data Field Definitions

The available data fields are defined below. Each data field may be selected in or out and may be selected to be sent to the host, printed, and/or displayed.

Weight - 6 characters including the decimal point. Error Codes will be sent in the weight field as defined in Section 11.0 on Error Conditions if the Remote Error Logging is enabled or printed in text form if a printer is used and Printer Error Logging is enabled. Leading zeros are transmitted as spaces (20H).

*** Units** - LB or KG as received from the 9410.

*** Consecutive Number** - 6 digits incremented by each valid weight. Rolls over to 000001 on next valid weight after 999999.

*** ID string** - 40 alpha-numeric characters for variable ID input and an 8 character user definable prompt.

Date - 8 character date field updated in setup.

Time - 5 character time field updated in setup.

*** Sum** - 10 numeric with the same decimal point location as the displayed weight. Leading zeros are transmitted as spaces (20H).

Block Check Character - a single character that is computed as the XOR(of the seven lower bits) of all characters beginning at a specified starting character position and up to but not including the Block Check Character itself. See the Section on Remote Interface Setup for specifying the starting character position for the Block Check Character.

Fixed Characters - a single alpha-numeric or control character that is specified to be sent, displayed, or printed in a character position within the string. Control characters will be specified in accordance with the key strokes specified in the Section 12.1 Control and Special Character Entry. This will allow specification of start and/or termination characters or fixed characters needed to emulate an existing protocol or host language requirement. Fixed characters are also useful for formatting the output to printers to allow multiple line print or special printer control such as expanded or condensed printing or bar code printing.

***** - These fields are transmitted as spaces (20H) if Weight Field is an Error Code. See Section 11.0 on Error Conditions.

12.4 Communication Standards

This section of the manual contains various items of interest when dealing with communication circuit types, signal identification, and data formats.

Communication Circuit Types

RS-232 50 feet maximum cable length. RS-232 has a medium amount of noise immunity. Long lengths of successful communications are highly dependent on the electrical environment. Performance of the RS-232 communication link can be improved by avoiding bundling the cables with other wiring and routing the cable away from devices which produce electrical noise.

RS-422 4000 feet maximum cable length. RS-422 has a medium amount of noise immunity. Long lengths of successful communications are highly dependent on the electrical environment. Performance of the RS-422 communication link can be improved by avoiding bundling the cables with other wiring and routing the cable away from devices which produce electrical noise.

20 Milliamp Current Loop 1000 feet maximum cable length, up to 1500 feet if routed in separate conduit. 20mA current loop offers good electrical noise immunity.

12.5 Connecting To Standard Devices To Remote Output

B.C.D. Module (9323) APPLICATION NOTES:
CheckSum must be enabled for proper B.C.D. Module operation.

The Expressweigh Controller will recognize the item weight being an Over Capacity weight or under zero (gross weight), therefore the B.C.D. module will provide an Over Capacity or Under Zero output condition. Refer to the manual on the B.C.D. Module for details.

If Error Logging is enabled on the Remote Output, the B.C.D. Module will provide B.C.D. data equal to the Error Code, except Over Capacity (99997). This will include 99991 for a negative weight. A negative weight reading will cause the Under Zero output of the B.C.D. Module to go to ground.
When the error is cleared the B.C.D. output data will remain the Error Code until the next item crosses the scale.

If Error Logging is disabled on the Remote Output, no Error Code is transmitted, if continuous output is enabled, the B.C.D. Module output data will remain the last item weight, before the error occurred.

A negative weight reading will cause the Under Zero output of the B.C.D. Module to go to ground. An item weight that exceeds the entered Scale Capacity will cause the Over Capacity output of the B.C.D. module to go to ground and all B.C.D. data to 0's.

ANALOG MODULE (9325) APPLICATION NOTES:
CheckSum must be enabled for proper Analog Module operation.

Use the Scale Test routine in the System Test Sequence to aid in calibrating the Analog Module.

The Expressweigh Controller will recognize the item weight being an Over Capacity weight or under zero (gross weight), therefore the Analog module will provide an Over Capacity output condition (full scale analog output) or Under Zero output condition (output equal to zero indicator value).

If Error Logging is enabled on the Remote output, the Analog Module will provide a full scale analog output on an Error Condition. This will not include 99991 for a negative weight, a negative weight reading will cause the Analog module output to be equal to zero indicator value.

If Error Logging is disabled on the Remote Output, no Error Code is transmitted, if continuous output is enabled, the Analog Module output will remain at the level of the last item weight, before the error occurred.

A negative weight reading will cause the Analog module output to be equal to zero indicator value. A item weight that exceeds the entered Scale Capacity will cause an Over Capacity output condition (full scale analog output).

REMOTE DISPLAY APPLICATION NOTES:
Most Mettler Toledo remote displays ignore the CheckSum character, check the manual provided with the remote display to see if CheckSum is required.

Most Mettler Toledo remote displays will display a special condition for Under Zero or Over Capacity, refer to the manual provided with the remote display for error codes or other special display conditions.

12.6 Recommended Spare Parts

The composition of spare parts kept on hand are dependant upon the critical nature of the installation and the down time that may be tolerated while a repair is being made. Mettler Toledo recommends that at least the following items be kept on hand. They are all available through an authorized Mettler Toledo representative. Refer to the drawings supplied for identification of items not listed here.

Common parts for 120 and 240 VAC units

Qty	P/N	Description
1	KT665040137	9480 Controller Main PCB
1	*13725200A	9410 J-Box Main PCB (part of conveyor assembly)
1	KT665013EAB	Power Supply, 24VDC
1	13362500A	Keyboard Assembly
2	13636700A	AC Output Module (24 - 280 VAC)

Added Parts specifically for 120VAC Units

Qty	P/N	Description
2	13636300A	AC Input Module (90 - 140 VAC)
1	90147300A	Power Supply, 12 VDC
3	09595700A	Fuse, 3.0 Amp, Slo-Blo

Added Parts specifically for 240VAC Units

Qty	P/N	Description
2	13636400A	AC Input Module (180 - 280 VAC)
1	90148800A	Power Supply, 12 VDC
3	12465400A	Fuse, 1.5 Amp, Slo-Blo

* Alpha revision prefix.

12.7 Reference Drawings

The following list includes all schematics, external diagrams, and major assemblies for the 120 VAC 9480 Controller.

KC471412	Internal Schematic (120 VAC)
KC471413	External Wiring Diagram (120 VAC)
90149200A	Dimension Diagram
90148100A	Minor Assembly (120 VAC)
90148000A	Major Assembly (120 VAC)
90147400A	Side Panel Assembly
90147900A	Rear Panel Assembly (120 VAC)

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MAINTENANCE DESCRIPTION	PERFORMED BY	DATE

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Ithaca, NY 14850-9117

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