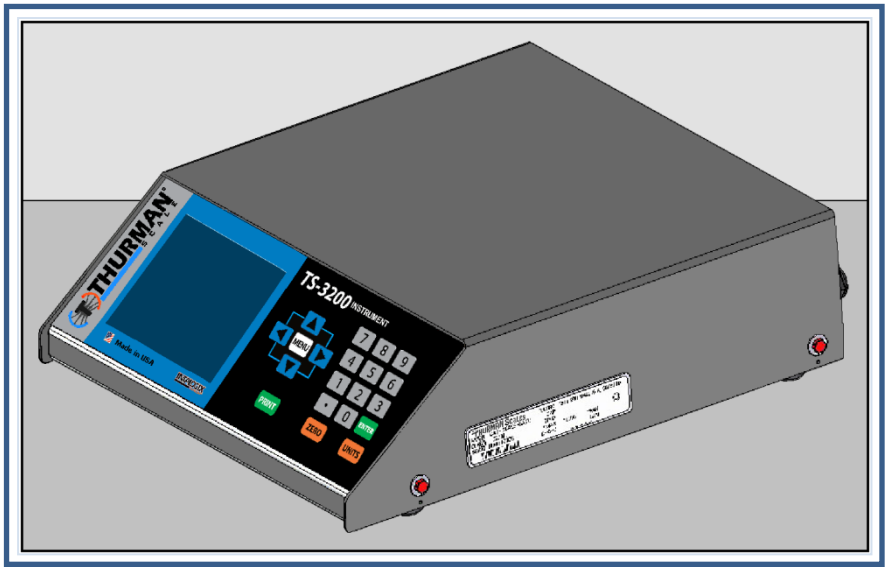
THURMAN SCALE

Operator Manual

TS-3200 Instrument



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51262
Rev. 4 04/2020

TS-3200 INSTRUMENT

Operator Manual
51262

Manufactured by **Thurman Scale Inc.**
4025 Lakewood Crossing
Groveport, Ohio, 43125

Amendment Record

Revision 1	04/12	Created and released first version
Revision 2	01/14	Contains released Rev. 3
Revision 3	06/18	Multiple minor updates throughout
Revision 4	04/20	Updated User Functions; Reports

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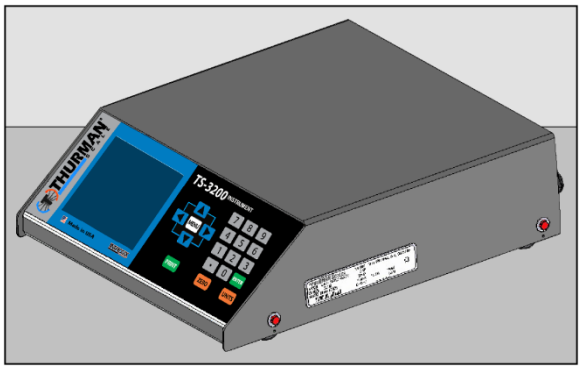
SECTION 1: GENERAL INFORMATION

1.1. Instrument Description



The **Thurman TS-3200 Instrument** has two models.

- The**TS-3200 Desktop Model** is used for office type environments.
- The **TS-3200 Console Model** is used for office type environments.
- The **TS-3200 NEMA 4X Model** is designed for hostile environments.

- The **Thurman TS-3200 Instrument** uses **Intalogix™ Technology**, which is a unique communication system for addressing each (analog) load cell in a scale system, thus allowing outstanding resolution, performance, and diagnostic capabilities.
- The standard system handles up to **sixteen (16) load cells**.
- A **Keyboard Accessory** is a recommended option. The Instrument comes with an available port for it.

1.2. Standard TS-3200 Components

The standard **TS-3200 Weighment System** *consists of the following elements.*

A. TSC 2000-1A THURMAN SECTIONAL CONTROLLERS (TSC) interface to analog loadcells.

- In the TSC, the load cell analog signal is converted to a digital signal, then to an **RS-485 signal**.
- Each TSC interfaces with two (2) loadcells in the system.
- The dipswitch setting in the TSC assigns a digital ID address to each TSC, which identifies each section and to each cell.
- The TSC regulates the excitation voltage for the load cells.
- The TSCs can interface with Mettler Toledo CMOS and NMOS Digital loadcells, standard analog loadcells, or a combination of both.*
- Each controller is fully encapsulated for protection against moisture, in addition to being housed in a **Stainless Steel NEMA 4X enclosure**.

NOTE: *See* **TSC 2000-1A THURMAN SECTIONAL CONTROLLERS (TSC) BULLETIN 51140** *for additional information.*

1.2. Standard TS-3200 Components, Continued

B. TPS 2001-1A THURMAN POWER SUPPLY (TPS) converts the AC to DC voltage, regulates the power, and makes it available to the Smart Sectional Controller (TSC). It also provides the communication interface for the instrumentation.

- The TS-3200 Instrument interfaces the TPS with one (1) communications assembly, and uses one (1) home run cable.
- The standard weighment system will handle up to **sixteen (16) 700 / 1000 ohm loadcells**, or **ten (10) 350 ohm loadcells**.
- Through a **SOLUTIONS GROUP REQUEST**, an assembly can have a *maximum of thirty-two (32) cells.*
- The Instrument supplies **30 VAC** and **20 VDC to the TPS**, located at the scale platform.
- The **20 VDC** is regulated in the TPS.
- The TPS powers the RS-485 Serial Communications Circuit.

NOTE: *See* **PUBLICATION 50734, TPS 2001-1A PIT POWER SUPPLY BULLETIN** *for additional information.*

C. RS485 SERIAL COMMUNICATION from each TSC is returned through the TPS to the instrument, where it is displayed as both counts and weight information, according to the programming parameters in the instrument.

- Both loadcell interfaces communicate with the TS-3200 Instrument on a **RS-485 LAN.** While there are differences in the wiring and power requirements for each one, the RS-485 communication is identical, and both types can be used on a *specialized* LAN.
- The standard weighment system will handle up to **sixteen (16) load cells**, to a **maximum of thirty-two (32) cells** (through inquiry).
- The system is designed to handle a wide variety of printers, computers, and remote displays. A common configuration has a printer connected to one of the communication ports, and also a remote display connected to the dedicated communications port.

1.3. Technical Specifications

ENVIRONMENTAL	• Enclosure, 13 gauge – 304 stainless steel. • NEMA 12 desk mount • NEMA 4X wall mount.	
— Recommended Temperature	14°F to 104°F, (–10°C to 40°C).	
— Recommended Humidity	95% relative humidity non-condensing.	
POWER	100 VAC to 130 VAC or 200 VAC to 260 VAC, 50Hz/60Hz,	
— Power Consumption	• 0.5 amp typical at 115 VAC nominal. • Maximum output for Analog, Intalogix 8 Meg and 16 Meg is 1 Amp.	
— Number of Cells	• Up to sixteen (16) each – 700 Ohm standard, up to a maximum of 32 load cells. • Up to ten (10) each 350 Ohm standard	
CERTIFICATIONS	• NTEP CC# 11-051 • MC# AM5825C	
DISPLAY	LCD, LED Backlit Graphics • 3.54”h x 4.72”w • Led Graphic Display • LED Backlighting • Updates from 0.2 to 10 seconds in 0.1 second intervals (minimum setting of .2 seconds)	
MEMORY	• Basic battery backed non-volatile [Battery life, typically two (2) years] • Backup Compact Flash Card 32 Mb	
SERIAL I/O	• Display 20mA Optically Isolated Remote display interface • COM 2 RS232C • COM 3 RS232C • COM 4 RS232C	
EXPANSION	• COM 5 thru COM 8 RS232C • If installed, the Traffic Control Module is designated to **COM Port 7**.	
FLOW CONTROL	• Hardware – CTS/RTS • Software – XON/XOFF	
KEYBOARD	• Oversized keypad • 9 Function keys: 0 through 9 and decimal point • 105 key PC compatible (PS2) alphanumeric keyboard (optional)	
CLOCK	• Real time clock	• Day of the week
	• 12 hour am/pm • 24 hour	• Numeric month representation • 2 or 4 digit year

1.3. Technical Specifications, Continued

PERIPHERALS	• TM-U295 Ticket Printer	• TM-U590 Ticket Printer
	• SP2000 & SP2200 Ticket Printers	• Tape Printer
	• OKI320/420/520 Form printer	• OKI 186 Form Printer
CUSTOM DRIVER	Commands to control printers or a computer program interface. *These commands include the following:* • Ticket Initialization • Character Size • Double Width Characters • Line Feed • Form Feed • Report Initialization **NOTE:** These commands are not limited to the above functions. They can be used to perform other functions. For example, Form Feed could be used to operate the printer cutter blade.	
OUTPUTS	• **Continuous** – (Programmable) Weight data is continuously transmitted at each display update cycle.	
	• **Demand –** Data for the communication channel is transmitted in its formatted order whenever a **Carriage Return** is programmable to almost anything desired.	
	• **Auto –** Formatted data is transmitted following a keyboard print command.	
REMOTE DISPLAY	• Continuous or Gross on Print • Utilizes the **20 mA passive Display Port** (**2400,7,Odd**) • Continuous, refresh after each display update cycle. • Demand, refresh after each print cycle. • Time can be programmed to be shown when weight data is at zero for **ten (10) or more seconds**.	
NUMBER OF SCALES	1, 2, or 3	
OPERATING MODES	• Gross Only • Gross Tare Net • Inbound/Outbound • Highway System	
ZERO	• 2% to 100% Zero capability. • xxx% programmable capability • Can be completely disabled for tank weighing applications • Load cell diagnostics are performed when the zero switch is operated.	

1.3. Technical Specifications, Continued

UNITS	• Lb	• Lb/Kg	• Lb/Ton
	• Lb/Tonne	• Kg	• Kg/Lb
	• Kg/Ton	• Kg/Tonne	• Ton
	• Ton/Lb	• Ton/Kg	• Ton/Tonne
	• Tonne	• Tonne/Lb	• Tonne/Kg
	• Gram		
MOTION	• 0.5	• 1.0	• 2.0
	• 3.0	• OFF	
FILTER FACTOR	• Heavy	• Heavy-Medium	• Medium
	• Medium-Light	• Light	• OFF
DIVISION	• 0.001	• 0.002	• 0.005
	• 0.01	• 0.02	• 0.05
	• 0.1	• 0.2	• 0.5
	• 1	• 2	• 5
	• 10	• 20	• 50
	• Dual Range		
AUDIT TRAIL	• Calibration – Time and Date Stamp		
	• Configuration – Time and Date Stamp		
BACKUP	Backup Compact Flash Card 32 Mb		
CALIBRATION — Keyboard	• Enter Cell Number, Capacity, Impedance and Sensitivity for each cell in the scale group from the Calibration Certificates packed with each cell. • The resultant span, assuming a good installation and accurate data is entered, produces a calibration with +/-0.1%. • The final calibration is achieved through front panel trimming using the up/down arrow buttons and proper test weights on the platform(s).		
SECTIONAL CALIBRATION	• Apply a known weight (concentrated load, such as test weights or a weight cart) to each section of the scale. • Apply a calibrated weight to the scale. • Trim from the instrument keyboard.		
LOAD CELL CALIBRATION	• Apply a known weight to each cell in the scale group in the order prescribed by the instrument display. • Trim to the final value from the instrument keyboard.		

NOTE: *Both keyboard and keypad can be used together to complement each other.*

1.3. Technical Specifications, Continued

TARE	Can be disabled for **Gross Weight Only** applications.
— Keyboard Tare	Tare Data only entered using a keyboard.
— Auto Tare	Tares stored by direct weighting.
— Auto Clear	Tares automatically cleared after each print function.
— Disabled Tare	Disables the Tare, and the instrument operates as Gross only.
— Tare Expiration	Tares are time and dated stamped to give a warning when their expiration time is over.
— Stored Tares	• Up to 200 stored Tares. • One to fifteen (1-15) alphanumeric character ID.
PRODUCTS	• Up to 500 Product Files. • One to fifteen (1-15) alphanumeric character ID. • Weight Accumulator. • Two (2) Conversion Factors. • Nine (9) decimal places for conversion factor. • One to fifteen (1-15) alphanumeric conversion factor legend • Product data can be programmed to be entered in an Inbound, Outbound, or Gross/Tare/Net Operation. • Product data files can be listed to a printer or viewed directly from the instrument.
FIELD NAMES	• Ten (10) Field Names can be given a fifteen (15) alphanumeric name to denote a driver name, product grade, site location, etc. • Each Field Name can be programmed to be entered in an Inbound/Outbound or Gross/Tare/Net operation. • The first field name is stored as part of the transaction file.
INCOMPLETE	• Up to 7,926 transaction records are stored temporarily as incomplete records. • Incomplete data files can be listed to a printer or viewed directly from the instrument.

1.3. Technical Specifications, Continued

TRANSACTIONS	**7,926** transaction records, each record consists of the following:	
	• Inbound Time	12 hour am/pm format, 24 hour format
	• Outbound Time	12 hour am/pm format, 24 hour format
	• Date	month:dd, mm:dd, dd:month, dd:mm format
	• Inbound Weight	
	• Outbound Weight	
	• Net Weight	
	• Product ID	15 Alphanumeric character ID
	• Loop ID	15 Alphanumeric character ID
	• Field Names 1 thru 10	15 Alphanumeric character ID
	• Customer ID	15 Alphanumeric character ID
	• Ticket Number	
	• Gross	
	• Tare	
	• Net	
	• Alt Gross	
	• Alt Tare	
	• Alt Net	
	• Date Out	Date of completed transaction.
	• Fee	Charge for weighment type.
REPORTS	Two transaction reports can be field-programmed generating any or all portions of a transaction record and in a prioritized order. • Numeric data in the transaction record can be filtered against a search field so that data in the record is only selected if it is less than, equal to or greater than the search field. • Similarly alphanumeric identification fields can be compared to a text search field. • A wildcard command **"*"** is used to generate grouped reports. • For example, if a wildcard string is used in the product search field, all transaction data relating to the first product is generated, then the second and so on for all transaction records. Similarly, a grouped **Loop ID** report can be generated.	

1.4. Computer Interface Specifications

REPORTS, CONTINUED — Tare & Product File Data	The file data is expected in a quote, Comma Delimited Format, and is compatible with spreadsheet and data base file formats.
— Transaction	• Transaction records can be downloaded to a computer (PC), and are compatible to spreadsheet and data file formats. • Transaction File Data can also be cleared by a command from the computer.
— Calibration & Configuration	Calibration and configuration data downloaded to or uploaded from a computer for long term storage and diagnostics.
— Email a Transaction	Configurable to send completed transactions to designated recipients.

1.5. Accessories

1.5.1. Options

31113	Expansion I/O Card Accessory • Adds four (4) additional interface ports • COM Port 7 and 4 is designated for the Traffic Control Module • COM Port 8 is designated for Client/Server configurations between (2) TS3200 3200 instruments
31114	Ethernet Card
25175Q	Traffic Control Module for controlling incandescent lights (COM4 or COM7)

1.5.2. Cables

14390	Accessory 558 Computer Cable • DB9 pin female to DB9 pin female
20702	Accessory 1278 Computer Cable • 9 pin AMP to DB 9pin female (For NEMA 4X Enclosure)
14807	Accessory 336 to connect TS-3200 Series to printer (25 pin)

1.5.3. Thurman Sectional Controller (TSC)

27926	TSC 2000 -1A, Smart Sectional Controller • Required for each section of a truck scale or pair of load cells *Example:* A 4 section, 8 load cell, truck scale requires 4 Smart Sectional Controllers (TSC).
26080	PCB Assembly (board only) encapsulated
26171	Retrofit Kit

1.5.4. Thurman Power Supply (TPS)

32163	TPS 2001-1A, Required to power Smart Sectional Controller (TSC) • An additional power supply is required for applications with more than 16 load cells. **Contact Solutions Group** about ordering this.
23393	PCB Assembly (board only) power supply

Section 2: Company Service Information

2.1. General Service Policy

Prior to installation, ***always*** verify that the equipment satisfies the customer's requirements as supplied, and as described in this manual.

If the equipment cannot satisfy the application and the application cannot be modified to meet the design parameters of the equipment, the installation should *NOT* be attempted.

It is the customer/operator's responsibility to ensure the equipment provided by Thurman Scale is operated within the parameters of the equipment's specifications and protected from accidental or malicious damage.

W A R N I N G !

Absolutely NO physical, electrical or program modifications other than selection of standard options and accessories can be made by customers to this equipment

Repairs are performed by Thurman Scale Service Technicians and Authorized Distributor Personnel ONLY!

Failure to comply with this policy voids all implied and/or written warranties

2.2. Users' Responsibility

Absolutely no physical, electrical or program modifications are to be made to this equipment, other than selection of standard options and accessories.

Failure to comply with this policy voids all implied and/or written warranties.

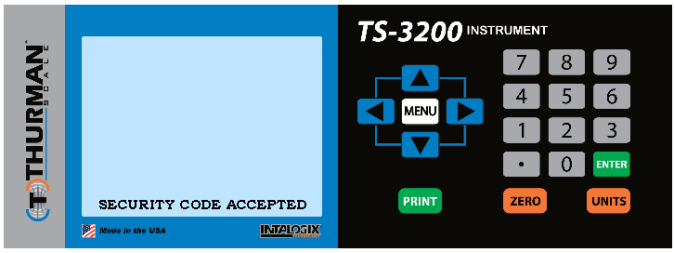
Please call the Thurman Scale Technical Services Department for any questions, problems, or comments.

Section 3: Configuration Password

3.1. Programming the Configuration Password

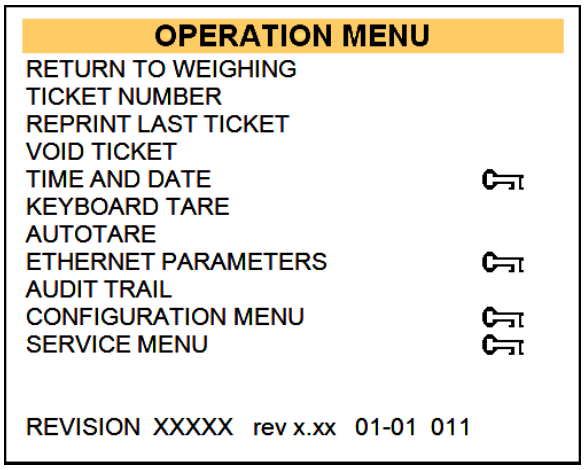
1. Press the **MENU** button,
2. In the **Operation Menu**, open the **CONFIGURATION MENU.**
   - The **Configuration Password** option can be accessed from the **Weigh Screen** by pressing **Ctrl + Alt + Esc** at the same time.
3. Open the **CONFIGURATION PASSWORD** option.
4. Key in the new **SECURITY CODE,** then press **ENTER**.
   - Password up to fifteen (15) digits.
   - The display shows **"SECURITY CODE ACCEPTED"**.
   - Write down and store this password in a safe place for future use.

CONFIGURATION MENU	
OPERATION MENU	
COMMUNICATION PORTS	
PROMPTS (CUSTOMER-PRODUCTS)	
REPORTS	
TITLE	
CUSTOMERS	
PRODUCTS	
TARES	
DISPLAY SETUP	
EMAIL ERROR MINUTES	5
AUDIBLE ALARM	ON
FIELD NAMES	
CONFIGURATION PASSWORD	
LOAD CELL DIAGNOSTICS	



A password can be set to protect access on the CONFIGURATION MENU items shown in the **OPERATION MENU.**

- The **CONFIGURATION PASSWORD** protects the **Configuration Menu,** and **Time and Date** functions.
  - The **Key** symbol (🔑) appears beside each of the **Operation Menu** items that is password protected.



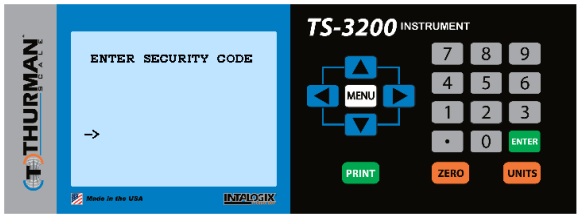
The following **OPERATION MENU** *items are* ***NOT password protected:***

- Operation Menu
- Ticket Number
- Reprint
- Void
- Audit Trail

3.2. Deleting Passwords

NOTE: *The passwords can only be deleted with an* ***external keyboard****.*
Any keyboard can be used temporarily for this function, and then removed.

1. Press the **MENU** button to open the **Operation Menu.**
2. Open the **CONFIGURATION MENU**
   - The **Configuration Password** option can be accessed from the **Weigh Screen** by pressing at the same time.
3. Press **Ctrl + Alt + Esc** on the external keyboard at the ***SAME TIME***.
   - The display shows **"ENTER SECURITY CODE",** with the old password symbols highlighted.



4. Press the **DELETE** button.
   - The display shows "**SECURITY CODE ACCEPTED**".
5. If attached temporarily, the external keyboard can then be removed.

Section 4: User Functions

4.1. Introduction

The TS-3200 Scale Instrument is designed to be programmed quickly.

- The pre-set default values minimize the setup time.
- The **Compact Flash Memory Card** allows backup of Calibration, Configuration, Transactions, and Audit Data.
  - It is extremely useful if a main board is damaged or quits working.
  - Replace the card into the new board, and then restore calibration and configuration.

4.1.1. Standard Menu Navigation

The following are some navigation tips that apply to all of the menus.

- The **UP** or **DOWN** arrows move the cursor in the indicated direction.
- To make an entry, place the cursor beside the item to be selected, then press the **ENTER** key. The operator will be prompted for the data to be entered.
- A **Key** symbol (🔑) beside a menu item means the item is locked and can only be accessed with a password.
- Data may be entered through the keypad.
- When the appropriate data has been entered, press the **ENTER** key to record the data into memory.
- Data may also be selected by pressing the right arrow key to toggle to the appropriate value.

4.2. Three Main Programming Menus

There are three (3) main programming menus that contain basic parameters for the system.

4.2.1. Operation Menu

The **OPERATION MENU** is the main directory of the Instrument functions, and is used for general weighing operations.

- It is accessible without a password by pressing the **MENU** key.

OPERATION MENU

RETURN TO WEIGHING
TICKET NUMBER
REPRINT LAST TICKET
VOID TICKET
TIME AND DATE
KEYBOARD TARE
AUTOTARE
ETHERNET PARAMETERS
AUDIT TRAIL
CONFIGURATION MENU
SERVICE MENU

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4.2.2. Configuration Menu

The **CONFIGURATION MENU** sets up the parameters for the **Tares, Field Names, Products, IDs, Titles, Display Contrast, Audible Alarm,** and **Outputs**.

- This menu may be password protected.

CONFIGURATION MENU

OPERATION MENU
COMMUNICATION PORTS
PROMPTS (CUSTOMER-PRODUCTS)
REPORTS
TITLE
CUSTOMERS
PRODUCTS
TARES
DISPLAY SETUP
EMAIL ERROR MINUTES 5
AUDIBLE ALARM ON
FIELD NAMES
CONFIGURATION PASSWORD
LOAD CELL DIAGNOSTICS

4.2.3. Ethernet Parameters

The **ETHERNET PARAMETERS** menu accesses Ethernet addressing and all related items.

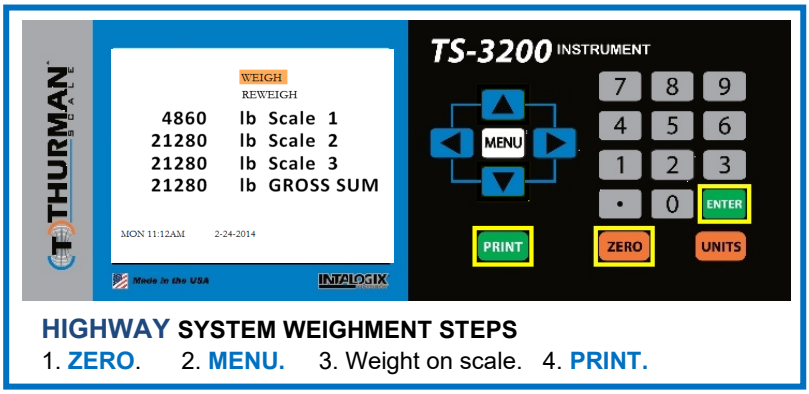
- This menu may or may not be password protected, depending upon the administrative decision.

ETHERNET PARAMETERS		
RETURN		
Initialize ETHERNET Module		
GATEWAY Address	xxx.xxx.xxx. xxx	xxx xxx xxx xxx
IP Address	xxx.xxx.xxx. xxx	xxx xxx xxx xxx
SUB NET Address	xxx.xxx.xxx. xxx	xxx xxx xxx xxx
SMTP IP Address	xxx.xxx.xxx. xxx	xxx xxx xxx xxx
Host IP Address	xxx.xxx.xxx. xxx	
MAC Address	xxx.xxx.xxx. xxx	
Send Test email		
Sender email	yourname@ thurmanscales.com	
Receipt email	theirname@ thurmanscales.com	
LOAD Transactions		
DELETE File		
LOAD Test File		
Administration Mode	Normal	
WRITE System Configuration Files		
Port Number	2000Socket 00	

NOTE: *Do NOT attempt to change these parameters if an ethernet module has not been installed.*

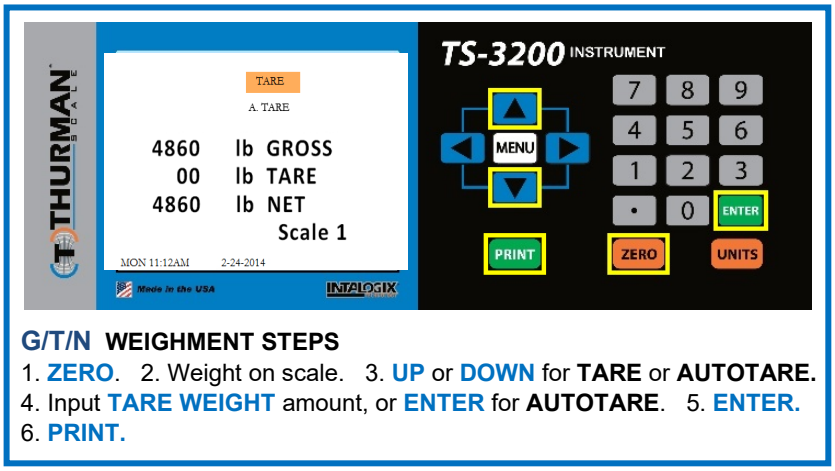
4.3 Weighment Modes and steps

The TS3200 can be installed as (3) available operation modes.



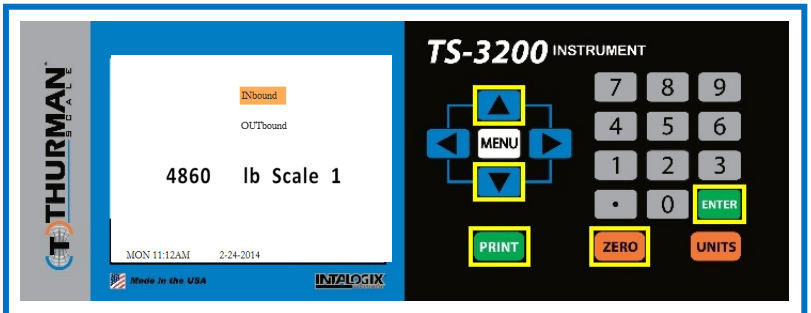
– **Highway System (Axle) Weighing**

HIGHWAY SYSTEM WEIGHMENT STEPS
1. **ZERO**. 2. **MENU.** 3. Weight on scale. 4. **PRINT.**



– **Gross Net Tare**

G/T/N WEIGHMENT STEPS
1. **ZERO**. 2. Weight on scale. 3. **UP** or **DOWN** for **TARE** or **AUTOTARE.**
4. Input **TARE WEIGHT** amount, or **ENTER** for **AUTOTARE**. 5. **ENTER.**
6. **PRINT.**

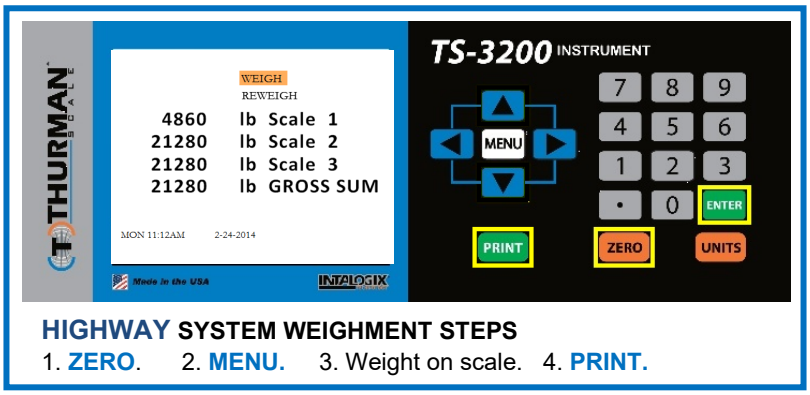


– **INbound OUTbound**

IN/OUT WEIGHMENT STEPS
1. **ZERO.** 2. **INbound** weight on scale. 3. **UP** or **DOWN.**
4. **ENTER.** 5. **OUTbound** weight on scale. 6. **UP** or **DOWN.**
7. Input **LOOP ID.** 8. **ENTER.** 9. **PRINT.**

4.3.1. Highway System (Axle) Weighing

1. Press the **ZERO** button to **"ZERO"** the unloaded scale, if necessary.
   a. If the display reads **"LOAD CELL(S) BAD"**, the weight on the platform has changed from the calibration of **ZERO**.
   b. Check the platform for equipment, debris, or other materials and remove them.
2. Press **ENTER** to toggle from a standard **GROSS weighment** to a **DOUBLE** or **TRIPLE** weighment.
3. When the display is stable, press the **PRINT** button.
   –A **Gross Weight Ticket** prints if *optional* printer is installed.



HIGHWAY SYSTEM WEIGHMENT STEPS
1. **ZERO**. 2. **MENU.** 3. Weight on scale. 4. **PRINT.**

4.3.2. Gross/Tare/Net Weighing

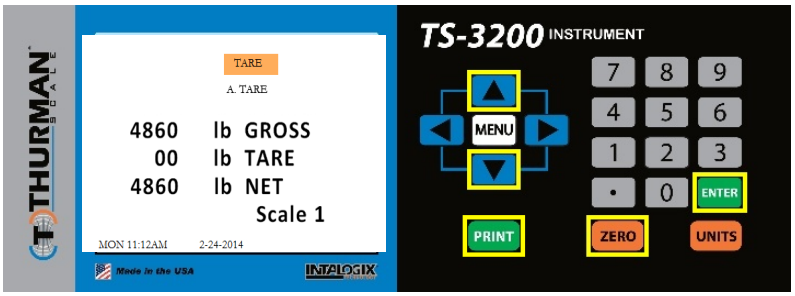
1. Press **ZERO** on the unloaded scale, if necessary.
2. Place the empty container on the platform.
3. Use the **UP** or **DOWN** arrow buttons to highlight the **TARE** or **AUTOTARE** icon at the menu.

   a) If **TARE** is selected, input the known **TARE WEIGHT**, then press **ENTER.**

   b) If **AUTO TARE** is selected. When the display is stable, then press **ENTER.**

   The displayed weight will be stored as a **Tare Weight**.
4. Remove the container from the platform and fill it with the product to be weighed.
5. Place the filled container back onto the platform.
6. Press **PRINT.**

   – A **Gross/Tare/Net Ticket** prints, if the optional printer is installed.
7. To change the scale from the **Gross-Tare-Net Mode,** back to the **Gross Only Mode.**
8. Key in **"0"**, then press **ENTER**.



G/T/N WEIGHMENT STEPS
1. **ZERO**. 2. Weight on scale. 3. **UP** or **DOWN** for **TARE** or **AUTOTARE.**
4. Input **TARE WEIGHT** amount, or **ENTER** for **AUTOTARE**. 5. **ENTER.**
6. **PRINT.**

NOTE: *The* **GROSS WEIGHT** *is the* **Tare weight** *plus the* **product weight.**

The **NET WEIGHT** *is the* **product weight, only**.

The **TARE WEIGHT** *is the* **empty container weight**, *entered in* **STEP 3.**

MODE CHANGE – *When a* **Tare** *or an* **Auto Tare** *is entered, the scale automatically switches from the* **Gross Only Mode** *to the* **Gross-Tare-Net Mode.**

4.3.3. In/Out Weighing Mode

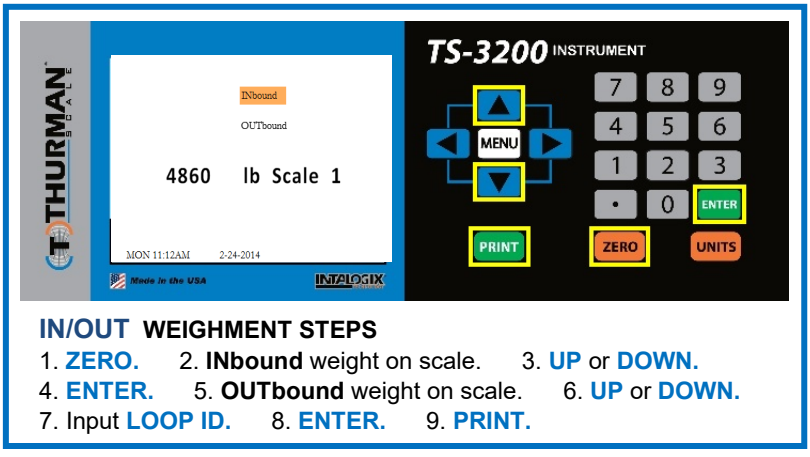
A. INTRODUCTION

IN/OUT weighing consists of weighing a container inbound, either full or empty, then weighing the same container outbound, full or empty, and printing a ticket with those two weights as well as the difference which is the net weight.

- The two weights for the same container, an inbound weighment with a stored tare, or an outbound weighment with a stored tare, is called a complete transaction.
- An inbound weighment with **no outbound weighment** is an incomplete transaction.

B. PROGRAMMING STEPS

1. With the Instrument powered up, press **ZERO**.
2. Place the container to be weighed on the platform. This will be the first weighment.
3. Use the **UP** or **DOWN** arrow buttons to highlight the **INBOUND** icon, then press **ENTER**.
   - The display will prompt the operator for a **"LOOP ID."**
   - This is the identification number that will be used to identify the complete transaction.
   - If it is not enabled a **LOOP ID** will be assigned automatically, then press **ENTER**.
4. Enter the **ID NUMBER**,
   - The ID number should be marked on the container so that it can be used again on the outbound weighment. (License number, trailer #, etc.)
   - An **INBOUND ticket** will be printed.
   - The data for this partial transaction will be stored in the Instrument with the "**LOOP ID**" number as the transaction recall label.
5. Remove the container from the platform.
   - Material can be added or removed from the container, as needed for the weighment.



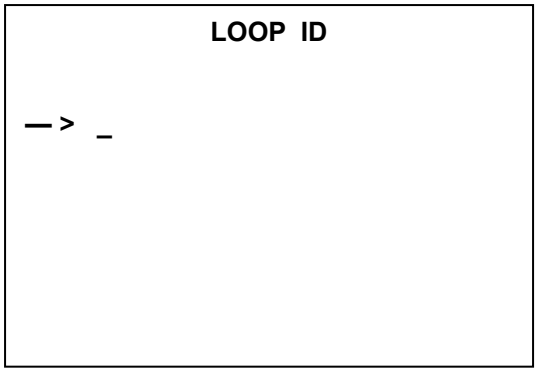
IN/OUT WEIGHMENT STEPS
1. **ZERO.** 2. **INbound** weight on scale. 3. **UP** or **DOWN.**
4. **ENTER.** 5. **OUTbound** weight on scale. 6. **UP** or **DOWN.**
7. Input **LOOP ID.** 8. **ENTER.** 9. **PRINT.**

4.3.3. In/Out Weighing Mode, Continued

6. Move the container back onto the platform.
7. Use the **UP** or **DOWN** arrow buttons to highlight the **OUTBOUND** icon, then press **ENTER.**
8. Input the correct **LOOP ID**, which was generated for this transaction on the inbound weighment, then press **ENTER.**
9. **PRINT** an **OUTBOUND ticket,** containing the **Gross Tare** and **Net Weight** data.
   - The Instrument will retrieve the inbound data from memory and combine it with the new outbound data, storing this as a complete transaction.

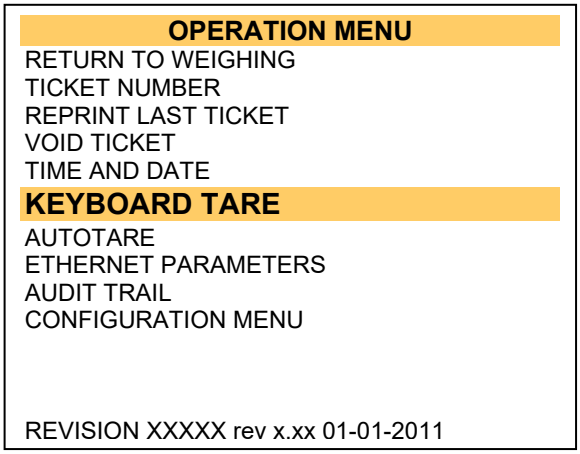
4.4. Weighing with stored Tares

1. Drive the loaded truck onto the scale.
2. Select either **INbound** or **OUTbound**.
3. Key in the corresponding **LOOP ID NUMBER**, then press **ENTER.**
   - If **INBOUND**, then the transaction record will show a **positive weight value**.
   - If **OUTBOUND**, then the transaction record will show a **negative weight value**.
   - The **OUTBOUND TICKET FORMAT** will be used to print the ticket.



4.4.1. Manually Entering a Tare Weight

1. Press the **MENU** key.
2. Scroll to **KEYBOARD TARE**, then press **ENTER.**
3. Enter the **LOOP ID** to be assigned to the empty truck, then press **ENTER.**
4. Enter the **TARE WEIGHT** for the empty truck, then press **ENTER.**



4.4.2. Automatically Entering a Tare Weight

The **AutoTare** feature stores the weight value on the scale under a user entered ID code known as the **LOOP ID**. Follow these steps to perform this operation.

1. Drive the empty truck onto scale.
2. Press the **MENU** key.
3. Scroll to **AUTOTARE**, then press **ENTER.**
4. Enter the **LOOP ID** and the **Tare Weight** will be stored automatically.
5. Remove weight from the scale.

4.4.3. Steps of a Tare Weight

1. Drive the loaded truck onto the scale.
2. Select either **INBOUND** or **OUTBOUND**.
3. Key in the corresponding **LOOP ID NUMBER**, and then press **ENTER**.

   The **OUTBOUND TICKET FORMAT** will be used to print the ticket.

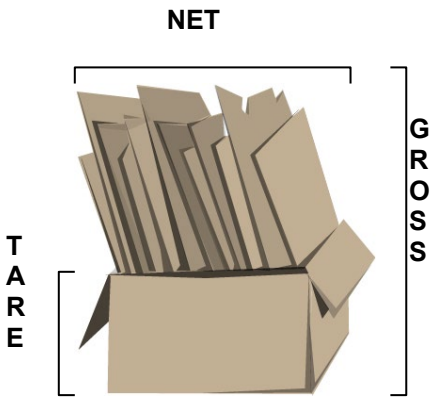
   The transaction will be completed.

   If **INBOUND**, *then the transaction record will show a* **positive weight value**.

   If **OUTBOUND**, *then the transaction record will show a* **negative weight value**.

The **NET WEIGHT** (product only) is the **Gross Weight** (all) *minus* the **Tare Weight** (container only).

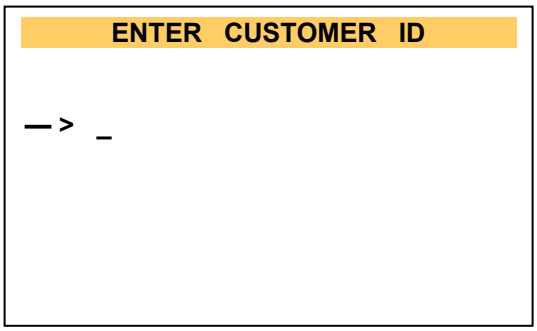
Gross Weight – Tare Weight = NET WEIGHT

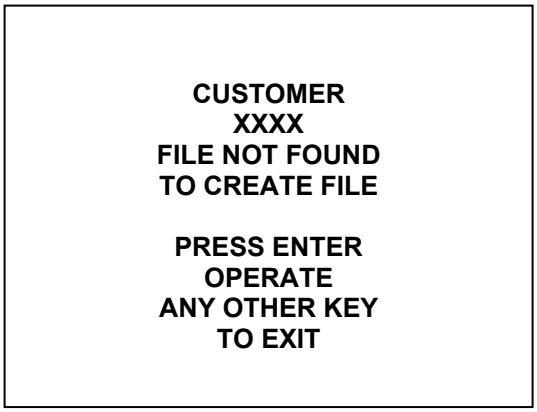


4.5. Entering New Customers

Generate a new customer by following these steps.

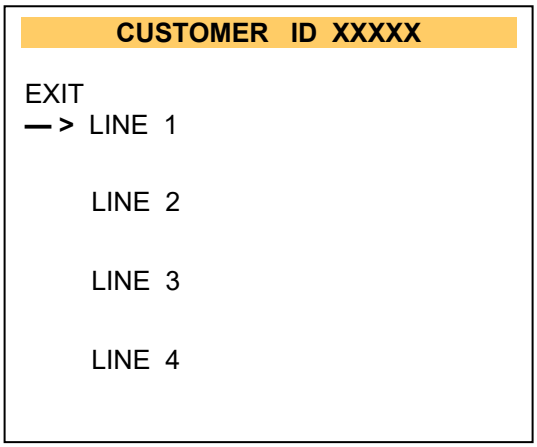
1. Press **MENU** to open the **OPERATION MENU.**
2. Open the **Configuration Menu**.
3. Select **CUSTOMERS**.
4. Enter a new, unique **CUSTOMER ID** number, or an existing ID, then press **ENTER**.
   - A **CUSTOMER ID** is an alphanumeric code of up to **thirty-one (31) characters** that defines each separate product setup within the Instrument.
   - When using an external keyboard, this identifier can also be an alphanumeric name.
   - The CUSTOMER ID *is case-sensitive*.
   - The **NEW CUSTOMER** generator window appears.
5. Press **ENTER** to generate a new customer.





Input customer information to these four (4) lines.

- This becomes printed text on Reports, so the format should be uniform and standardized.
- An optional keyboard accessory is necessary for using alphanumeric characters with this feature.



Listed below are some of the most logical entries.

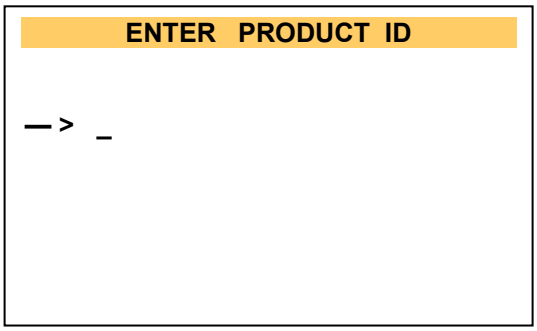
- Company Name.
- Company Address.
- Telephone Number(s).
- Primary point-of-contact.
- Special notices or notes.

6. Use the **UP** and **DOWN** arrow keys to tab down the lines.
7. Once finished, press the **MENU** key.

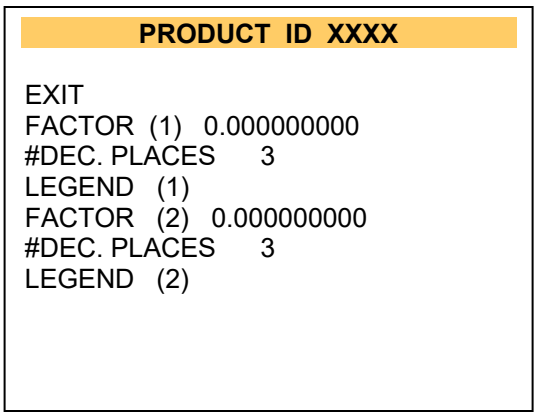
4.6. Entering New Products

Generate a new product by following these steps.

1. Press **MENU** to open the **OPERATION MENU.**
2. Open the **CONFIGURATION MENU**.
3. Select **PRODUCTS**.
4. Enter a new, unique **PRODUCT ID** number, or an existing ID, then press **ENTER**.
   - A **PRODUCT ID** is an alphanumeric code of up to **thirty-one (31) characters** that defines each separate product setup within the Instrument.
   - When using an external keyboard, this identifier can also be an alphanumeric name.
   - The PRODUCT ID is case-sensitive.
   - The **NEW PRODUCT** generator window appears.



5. Press **ENTER** to generate a new product.
6. Tab down using the **ENTER** key.
7. Once finished, press the **MENU** key.



4.6. ENTERING NEW PRODUCTS, CONTINUED

To obtain the **FACTOR**, first determine the Unit of Measure (i.e. TONS, BUSHELS, GALLONS, etc.) Secondly, divide that **Unit of Measure** by the **Primary Unit** of the Instrument. The result is the **FACTOR.**

EXAMPLES

(a) A ton weighs 2000 lbs.	One (1) ton ÷ 2000 lbs. = **0.0005**
(b) Milk weighs 8.6 lbs. per gallon.	One (1) gallon ÷ 8.6 lbs. = **0.116279**
(c) One bushel of shelled corn weighs 45 lbs.	One (1) bushel ÷ 45 lbs. = **0.017857**

1. Highlight **FACTOR**, then press **ENTER** to input the **Conversion Factor Value**.
   - **Conversion factors** are multiplied against the **Net weight** of a transaction to obtain the results.
   - Each conversion factor can be up to fifteen (**15) digits.**
   - Each conversion contains three Items – the **FACTOR, #DEC. PLACES**, and **LEGEND**.
   - Each **Conversion Factors** calculates the product mass against another determined factor, such as how many pounds of shelled corn in a bushel [**Factor (1)**].
   - The second factor [**Factor (2)**] calculates the same product mass against a different factor, such as how many dollars for one bushel of shelled corn, which varies daily.
     - *Based on* **$4.50** *per bushel =* ***0.222222 Conversion Factor****.*
   - Both **Factors (1 & 2)** are detailed on the printed **Report.**

PRODUCT ID 40505

EXIT
FACTOR (1) 0.017857
#DEC. PLACES 2
LEGEND (1) CORN, SHELLED
FACTOR (2) 0.222222
#DEC. PLACES 2
LEGEND (2) $$$ / BUSHEL

4.6. ENTERING NEW PRODUCTS, CONTINUED

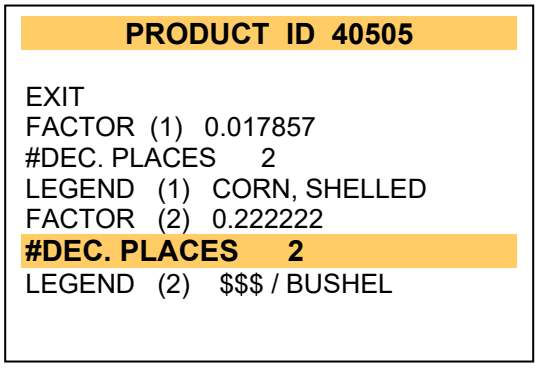
2. Enter the **#DEC. PLACES** (number of decimal places) for accuracy of the resultant product.
   - i.e. Two (2) decimal places = 4038.**25** kg.
     Printed results can be carried out up to four (4) decimal places.

EXAMPLE

To display a printed ticket with one hundredth (1/100th) increments, such as for weighing sand in tons, then enter a **"2"** (i.e. **0.00**)

3. Enter the **LEGEND** name (i.e. tons, gallons, bushel, etc.)
   - Up to fifteen (15) alpha-numeric characters.

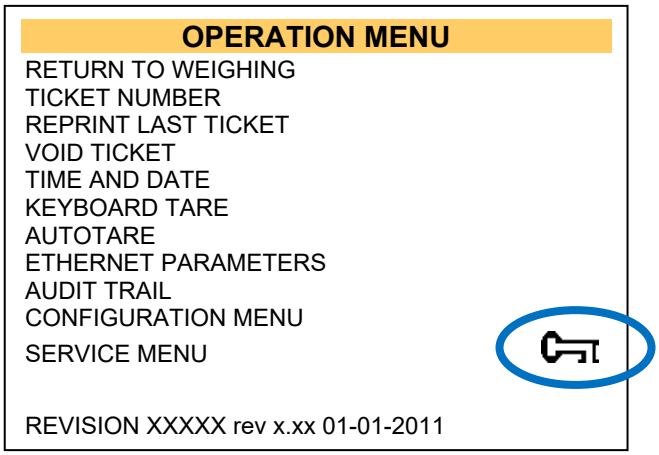
   Repeat these steps for the **FACTOR 2**, if it is used.



SECTION 5: OPERATION MENU

5.1. Introduction

- This menu is used for general weighing operations and general programming access.
- The **OPERATION MENU** is accessible without a password by pressing the **MENU** button.
  - The items in the **Operation Menu** may be set or re-set at any time through the keypad or optional keyboard
  - Items with a **Key** symbol (🔑) beside them are locked by a **Manager** or **Service Password**.



5.2. Operation Menu Options

A. RETURN TO WEIGHING

Pressing **ENTER** returns the instrument to the weight transaction screen.

B. TICKET NUMBER

1. Type the ***full number*** of the **next** ticket to be printed, then press **ENTER.**
2. Verify the ticket number, then press **ENTER.**

I M P O R T A N T !

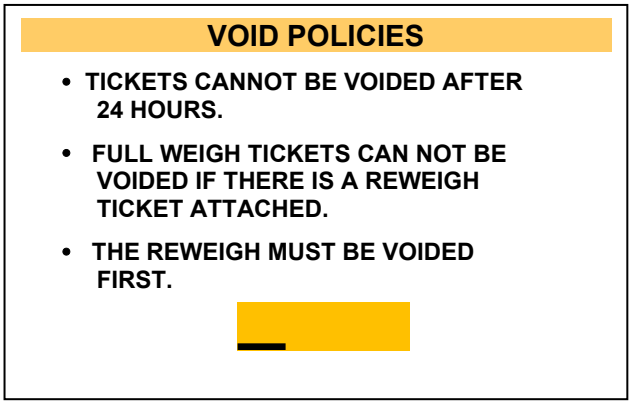
The ticket number must match the printed number on the ticket if it is so equipped.

5.2. OPERATION MENU OPTIONS, CONTINUED

C. VOID TICKET

Type the complete ticket number and press **ENTER**.

– A prompt will appear to confirm the ticket number entered.



VOID POLICIES

- Tickets cannot be voided after twenty-four (24)hours.
- Full weigh tickets cannot be voided if there is a reweigh ticket attached
- The reweigh must be voided first.

D. TIME AND DATE

The time and the date may be entered in the following variety of formats.

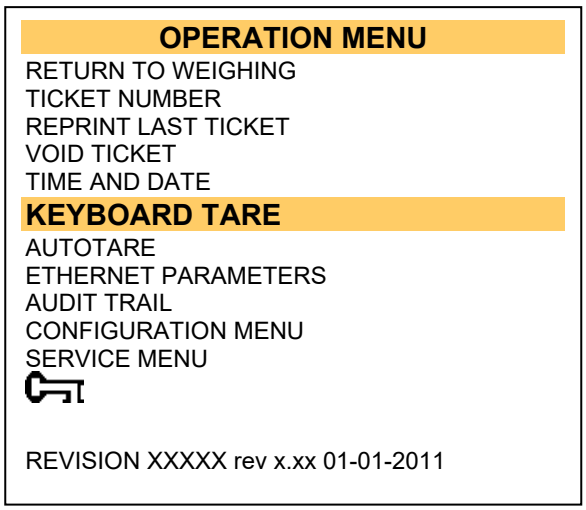
SETTING	DESCRIPTION
MENU	Returns to the Operation Menu.
SET TIME	Enter the **TIME** in Military format. – It will display in the standard format.
DAYLIGHT SAVINGS ADJ.	Enter **YES** or **NO** to set.
SET DATE	Enter the date in **MM-DD-YYYY** format.
TIME FORMAT	The options are hh:mm,, am/pm or hh:mm (24 hour time).
DATE FORMAT	The options are Month-dd, dd:mm, dd-Month, or mm:dd
YEAR FORMAT	The options are yy or yyyy

– The revision number and date at the bottom of the screen are the program version number and date.
– This menu may be protected by a password.

5.2. OPERATION MENU OPTIONS, CONTINUED

E. KEYBOARD TARE

- Key in the **LOOP NUMBER** and **TARE WEIGHT** for the stored tare weight of a particular vehicle.
- This function is not applicable in the **GNT Menu** mode.



F. AUTOTARE

Key in the **LOOP NUMBER** to store the current weight as a stored tare weight.

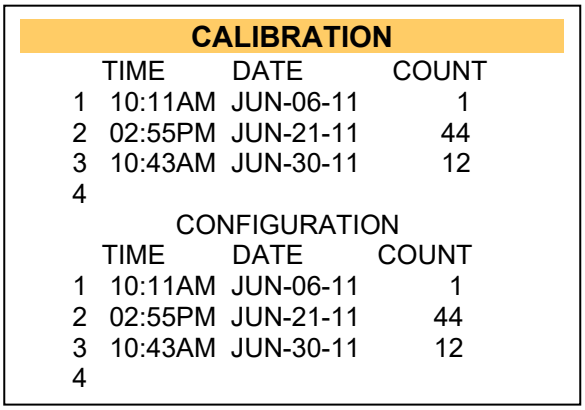
G. ETHERNET PARAMETERS

Programs the **IP Addresses**, **Email Address** for error reporting, and sets up an **Administration Mode** (*fully defined in a following section*).

H. AUDIT TRAIL

A viewable **Audit Trail** displays the time and date of when the **Calibration** and **Configuration** programs were changed.

- The first and second column displays exactly when change was made.
- The count column shows the number of times the platform has been calibrated or reconfigured.
- This display is updated automatically with each calibration or configuration change.
- It cannot be changed manually, and is used for the **Weights & Measures Inspector.**

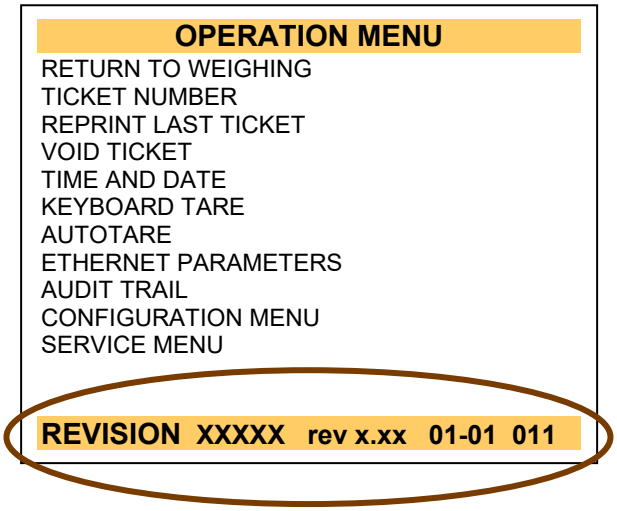


CONFIGURATION MENU

Configures the parameters for **Prompts, Customer ID's, Product ID's, Tares, Field Names, Titles, Display Setup, Audible Alarms**, and **Reports** (*fully defined in a following sub-section*).

I. REVISION

Details the current firmware number and revision level.



Section 6: Configuration Menu

6.1. Introduction

The **CONFIGURATION MENU** may be protected with a password. It sets up the parameters for the **Tares, Field Names, Products, IDs, Titles, Display Contrast, Audible Alarm**, and **Outputs.**

1. Press the **MENU** Key.
2. From the **OPERATION MENU**, select **CONFIGURATION MENU**, then press **ENTER**.
   - This menu has the option of being locked by a Manager or Service Password.
   - If locked, a **Key** symbol (🔑) will display in the right-handed column of the **OPERATION MENU.**

6.2. Configuration Menu Options

A. OPERATION MENU

Returns the display to the **OPERATION MENU**.

B. COMMUNICATION PORTS

Selects and programs the **Serial Output Ports** (*see the following sub-section for full description of this option*).

C. PROMPTS (CUSTOMER PRODUCTS)

Selects whether to prompt for a **PRODUCT ID**, a **CUSTOMER ID**, or an **AUXILIARY TARE** for either a **GTN WEIGHMENT**, or an **INBOUND** or an **OUTBOUND PORTION** of a transaction.

- Sets a **Prompt** for the Loop ID on an inbound weighment.
- If **Loop ID** is not prompted, the instrument will automatically assign a Loop ID.
- Select the **GO MESSAGE**, which will allows the return to edit responses to the previous prompts.
- If multiple printers are connected, the **PRINTER SELECTION** option determines which one is used.

CONFIGURATION MENU	
OPERATION MENU	
COMMUNICATION PORTS	
PROMPTS (CUSTOMER-PRODUCTS)	
REPORTS	
TITLE	
CUSTOMERS	
PRODUCTS	
TARES	
DISPLAY SETUP	
EMAIL ERROR MINUTES	5
AUDIBLE ALARM	ON
FIELD NAMES	
CONFIGURATION PASSWORD	
LOAD CELL DIAGNOSTICS	

6.2. Configuration Menu Options, Continued

D. REPORTS

Sets up, prints, reviews, and deletes **Reports**.

- Incomplete Transactions, Stored Tares, Product IDs, and Customer IDs may also be viewed here (*fully defined in a later section*).

E. TITLE

Heading information printed on every ticket.

- Five (5) input lines available, with up to thirty-one (31) characters per line.*
- Suggested information such as company name, address, telephone number, email address, etc.
- Safety message such as “Drive Safely”.
- Thank you message such as “Thank You”.

F. CUSTOMERS

Inputs any pertinent customer information to print on the ticket.

- Four (4) input lines available, with up to thirty-one (31) characters per line.*
- Included information is name, address, telephone number, email address, etc.

G. PRODUCTS

Inputs a unique code identifying the product.

- Alphanumeric, and up to **fifteen (15) characters**.*
- A product conversion and legend can then be printed on the ticket.

H. TARES

- Enables or disables tares.
- Enables a Manual Tare ID.
- Enables the tare to **Autoclear** after a transaction prints.
- Allows input of an tare expiration date.

I. DISPLAY SETUP

Programs changes to screen parameters and settings.

- Loads the default setup and display bitmaps also.

* When optional keyboard accessory is available, characters are alphanumeric.

CONFIGURATION MENU	
OPERATION MENU	
COMMUNICATION PORTS	
PROMPTS (CUSTOMER-PRODUCTS)	
REPORTS	
TITLE	
CUSTOMERS	
PRODUCTS	
TARES	
DISPLAY SETUP	
EMAIL ERROR MINUTES	5
AUDIBLE ALARM	ON
FIELD NAMES	
CONFIGURATION PASSWORD	
LOAD CELL DIAGNOSTICS	

6.2. Configuration Menu Options, Continued

J. EMAIL ERROR MINUTES

Sets the minimum time between emails (*0-10 minutes*).

K. AUDIBLE ALARM

Turns on and off the audible beep when a key is pressed on the keypad.

- Has no effect on an external keyboard.

L. FIELD NAMES

Defines the information to be placed in a field. Can be printed on a ticket.

- Up to fifteen (15) characters per line with ten (10) available lines, and a message prompt for each line.
- Prompts include **GTN, IN**, and **OUT.**
- Each prompt can be toggled **ON** or **OFF.**

M. CONFIGURATION PASSWORD

Sets up a **Configuration** [Menu] **Password,** requiring the code for menu use.

- Password code can be up to **fifteen (15) characters.**

*Password-lockable **Configuration Menu** options include the following:*

- Time and Date
- Keyboard Tare
- Autotare
- Ethernet Parameters
- Configuration Menu

N. LOAD CELL DIAGNOSTICS

Displays the status for all connected load cells.

CONFIGURATION MENU	
OPERATION MENU	
COMMUNICATION PORTS	
PROMPTS (CUSTOMER-PRODUCTS)	
REPORTS	
TITLE	
CUSTOMERS	
PRODUCTS	
TARES	
DISPLAY SETUP	
EMAIL ERROR MINUTES	5
AUDIBLE ALARM	ON
FIELD NAMES	
CONFIGURATION PASSWORD	
LOAD CELL DIAGNOSTICS	

CELL	STATUS	WEIGHT
1	GOOD	0
2	GOOD	0
3	GOOD	0
4	GOOD	0
5	GOOD	0
6	GOOD	0
7	GOOD	0
8	GOOD	0
9	GOOD	0
10	GOOD	0
11	GOOD	0
12	GOOD	0
13	GOOD	0
14	GOOD	0
OPERATE MENU KEY TO EXIT		

6.3. Communication Ports

From the **CONFIGURATION MENU***, open the* **COMMUNICATIONS PORTS MENU**.

A. COM PORT

Programs the number of the desired Com Port.

- The Com Port selected highlights on the top line of the display.
- Valid Com Ports are **two thru four (2-4).**
- **COM Ports five, six and eight (5, 6 and 8)** are available with **Accessory 31113,** the optional **Serial Expansion Card**.
- If installed, the **Traffic Control Module** is designated to **COM Port 7**.

B. DEVICES

Displays the complete list of available choices for the serial port connection

- When a device is selected, its name displays at the top line of the window.

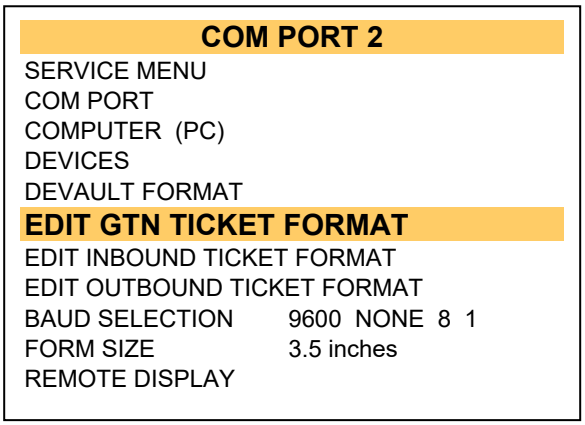
C. DEFAULT FORMAT

Loads the default communication protocol, as well as the default printer location.

D. EDIT GTN TICKET FORMAT

Displays all items printed on a ticket when the Print button is pushed.

- Data items are displayed with numeric coordinates behind them.
- The coordinates locate the data position on the ticket.
- The first number represents the distance from the top of the ticket, and the second is the distance from the edge.



- Each of the field names are prompted when formatting a ticket.
- After editing, a prompt for **Print Legends** is displayed.
  - **1 = YES.**
  - **0 = NO.**
- A prompt for **Enlarged Print** same as **Enhanced Print** is then displayed.
  - **1 = YES.**
  - **0 = NO.**

6.3. Communication Ports, Continued

E. EDIT INBOUND TICKET FORMAT

Displays all items that may be printed on a ticket for an **Inbound** selection on the Weigh Screen.

- The items are all programmed in the same manner as described in the GTN format.

F. EDIT OUTBOUND TICKET FORMAT

Displays all items that may be printed on a ticket for an **Outbound** selection on the Weigh Screen.

- The items are all programmed in the same manner as described in the GTN format.

G. BAUD SELECTION

Changes the **Serial Data Protocol** from the established default setting(s).

- Baud rate, parity, data bits and stop bits are all selectable.
- The new value is displayed at the top of the window.

H. INVERSE PRINT

Select to invert the print on the Inbound, Outbound, and Gross Tare Net printout.

NOTE: INVERSE PRINT is ONLY USED for TICKET PRINTERS.

I. FORM SIZE

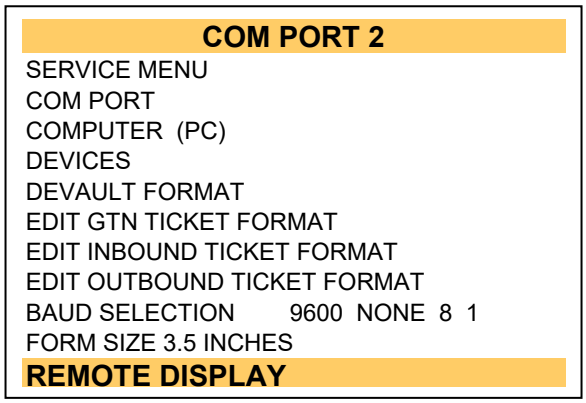
Formats the form print size.

- The a range of zero to twelve and seven tenths inches (0 – 12.7”) may be programmed for the form or ticket length.
- Typical ticket lengths are 3.5”, 5.5”, and 11”.
- Type in the form length in inches.

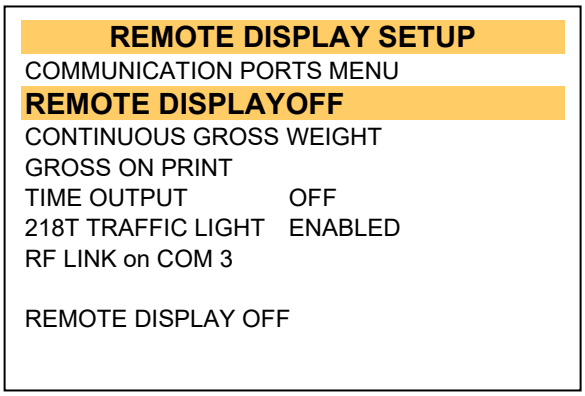
J. REMOTE DISPLAY

Selects the operating mode of the remote display.

- It does not matter which serial port is selected in Com Port, as the remote display port is automatically selected when this menu is entered.



6.4. Remote Display



A. COMMUNICATION PORTS MENU

Returns the operator back to the previous menu.

B. REMOTE DISPLAY OFF

Turns the remote display port **OFF**.

- The current mode of operation displays at the bottom of the window.

C. CONTINUOUS GROSS WEIGHT

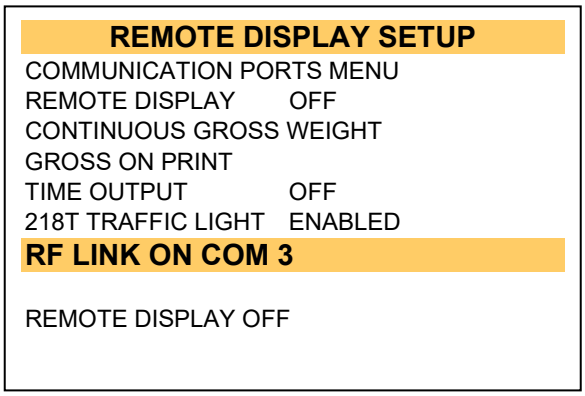
Turns the remote display port **ON** with a continuous output stream.

D. GROSS ON PRINT

Enables the remote display port to transmit the weight data ***one time*** when a print occurs.

E. TIME OUTPUT

When the remote display is set to **Continuous**, approximately **five (5) seconds** after the scale returns to zero, the remote display output transmits the current time.



F. 218T TRAFFIC LIGHT

Enables or disables the available data string that controls the color of the traffic light.

G. RF LINK ON COM 3

Redirects the remote display transmission to **Com Port 3** to connect a modem.

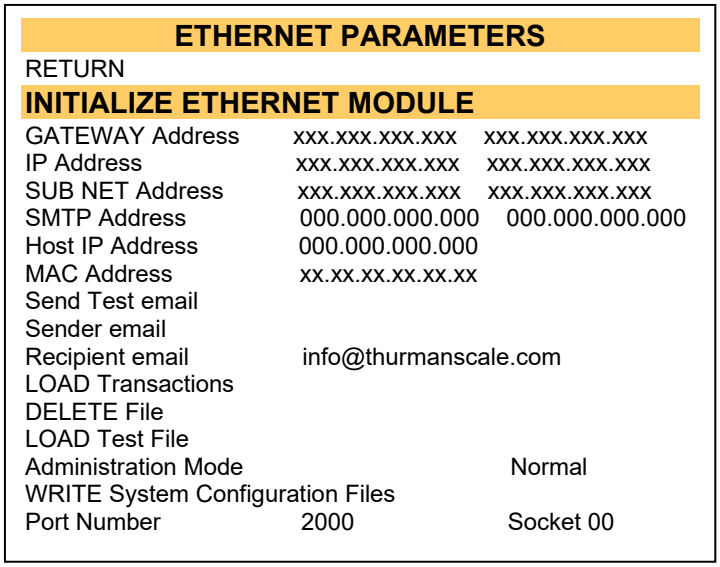
- Baud, parity, and data bit settings can be changed to match the remote.
- Com 3 device settings are programmed in the **Communications Menu**.

Section 7: Ethernet Parameters Menu

7.1. Introduction

The **ETHERNET PARAMETERS** menu accesses Ethernet addressing and all related items.

- It may or may not be password protected, depending upon the administrative decision.
- If locked, a **Key** symbol (🔑) will display in the right-handed column of the **OPERATION MENU.**



1. Access the **ETHERNET PARAMETERS** menu by pressing the **MENU** Key.
2. In the **OPERATION MENU**, select **ETHERNET PARAMETERS**.

7.2. Ethernet Parameters Menu Options

A. RETURN

Returns to the **OPERATION MENU.**

B. INITIALIZE ETHERNET MODULE

If the **Gateway, IP, Sub Net, SMTP, Sender Email, Recipient Email Addresses**, or the **TCP Port Numbers** change, the Ethernet Module must be initialized for these to take effect.

NOTE: *Contact the customer's* **IT Specialist** *or* **Network Team** *for complete network addressing formation.*

7.2. Ethernet Parameters Menu Options, Continued

C. GATEWAY ADDRESS

Allows a networked device to communicate with a different Subnet.

- Typically , it is **x.x.x.1** of a given network, but can be any network assigned number that provides a hop to another Subnet.
  - ***Router*** ***DNS Server*** ***Proxy Server*** ***Firewall Server***
- Enter a decimal point between each **octet**.

D. IP ADDRESS

Each networked component requires a unique IP Address to identify it within that network. *

- Include a decimal point between each octet.

E. SUB NET ADDRESS

A Subnet Address represents the physical maximum number of devices that can be connected to a network. *

- A typical local network uses **255.255.255.255.xxx**.
- A typical network provides up to **253 devices** (255 – 2).
- Enter a decimal point between each octet.

F. SMTP ADDRESS

Not required, but if it is known, this will allow the networked device to send an email based on messages using **SMTP**. *

- Enter a decimal point between each octet.

** The new values must be entered with an external keyboard.*

NOTE: *Contact the customer's* **IT Specialist** *or* **Network Team** *for complete network addressing formation.*

7.2. Ethernet Parameters Menu Options, Continued

G. HOST IP ADDRESS*

Changes the current settings and enter new values by using an external keyboard.

- Enter a decimal point between each octet.

H. MAC ADDRESS*

A unique identifier to each Thurman network adapter. *

- Used by the network specialist to reference it f.
- Enter a decimal point between each octet.

ETHERNET PARAMETERS		
RETURN		
Initialize ETHERNET Module		
GATEWAY Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
IP Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
SUB NET Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
SMTP Address	000.000.000.000	000.000.000.000
Host IP Address	000.000.000.000	
MAC ADDRESS	**XX.XX.XX.XX.XX.XX**	
Send Test email		
Sender email	aaatrucking@msn.com	
Recipient email	info@thurmanscale.com	
LOAD Transactions		
DELETE File		
LOAD Test File		
Administration Mode		Normal
WRITE System Configuration Files		
Port Number	2000	Socket 00

I. SENDING A TEST EMAIL*

Follow these steps to send a **Test Email**.

1. Enter the **SMTP IP ADDRESS, SENDER EMAIL** and **RECIPIENT EMAIL ADDRESSES** fields.
2. Initialize the **ETHERNET MODULE**.

- Resets the power to the Ethernet card.
- Loads the IP addresses into the Ethernet card.

J. SENDER EMAIL*

Changes the current settings and enter new values by using an external keyboard.

- Enter the correct sender's email address.

K. RECIPIENT EMAIL*

Changes the current settings and enter new values by using an external keyboard.

- Enter the correct recipient's email address.

** The new values must be entered with an external keyboard.*

NOTE: *Contact the customer's* **IT Specialist** *or* **Network Team** *for complete network addressing formation.*

7.2. Ethernet Parameters Menu Options, Continued

L. LOAD TRANSACTIONS

Manually transfers transaction data from the memory on the mother board to the memory on the Ethernet module.

M. DELETE FILE

Deletes all file information in **record.txt**.

N. LOAD TEST FILE

Loads a line of text into **record.txt file** in Ethernet Memory.

- Subsequent operations of this function will append a new line of data to the record.txt.
- View the **Record.txt** files by running a Telnet Session.

O. ADMINISTRATION MODE

Toggles between **NORMAL** and **ADMINISTRATION**.

- The **Administration Mode** accesses the files in a Telnet Session without entering the **User Name** or **Password**.

P. WRITE SYSTEM CONFIGURATION FILES

Writes the default files to the **Ethernet Memory**.

Q. PORT NUMBER

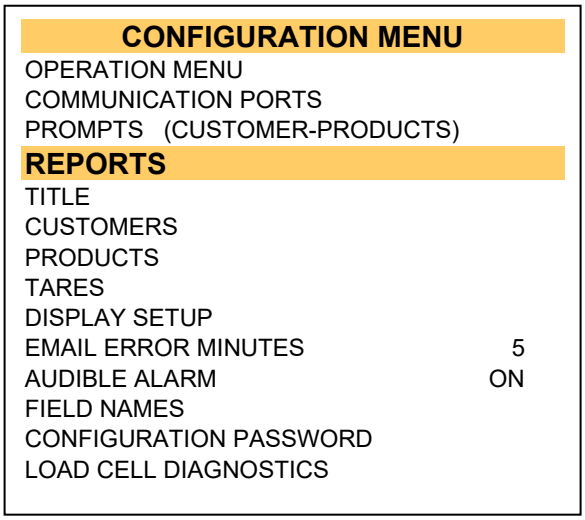
Changes the default Port Number value.

ETHERNET PARAMETERS		
RETURN		
Initialize ETHERNET Module		
GATEWAY Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
IP Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
SUB NET Address	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx
SMTP Address	000.000.000.000	000.000.000.000
Host IP Address	000.000.000.000	
MAC Address	xx.xx.xx.xx.xx.xx	
Send Test email		
Sender email		
Recipient email	info@thurmanscale.com	
LOAD Transactions		
DELETE File		
LOAD TEST FILE		
Administration Mode		Normal
WRITE System Configuration Files		
Port Number	2000	Socket 00

Section 8: Reports

8.1. Introduction

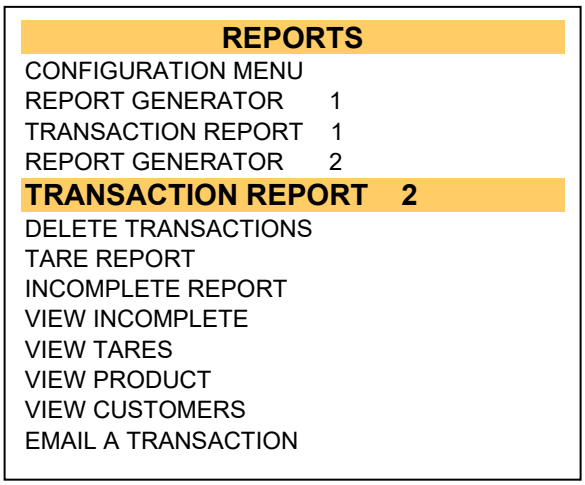
1. Access **OPERATION MENU** the by pressing the **MENU** Key.
1. Open the **CONFIGURATION MENU.**
2. Select the **REPORTS** option.



8.2. Reports Menu Options

A. CONFIGURATION MENU

Returns the operator to the previous menu.



B. REPORT GENERATOR 1*

Designs **Transaction Report 1.**

C. TRANSACTION REPORT 1*

Prints a copy of **Report Format 1.**

- A form printer is required.

D. REPORT GENERATOR 2*

Designs **Transaction Report 2.**

E. TRANSACTION REPORT 2*

Prints a copy of **Report Format 2.**

- A form printer is required.

* *See* **Appendix III: Report Sample**.

8.2. Reports Menu Options, Continued

F. DELETE TRANSACTIONS

Deletes all transaction files. *No warning message in this process**

G. TARE REPORT*

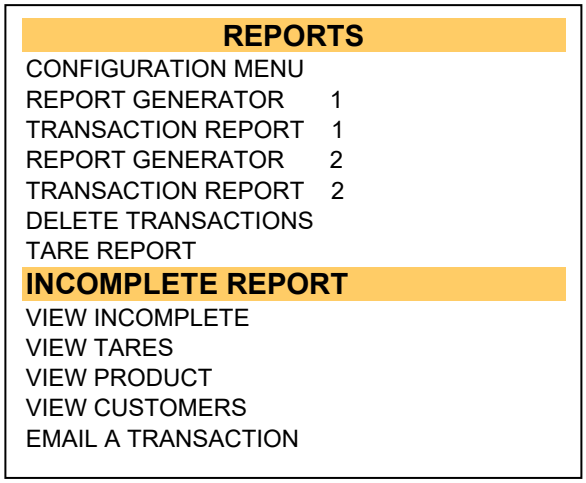
Prints a report of all **Stored Loop IDs** and their associated tare weights.

- A form printer is required for this function.

H. INCOMPLETE REPORT*

Prints a report of **all Incomplete Transactions** stored in memory.

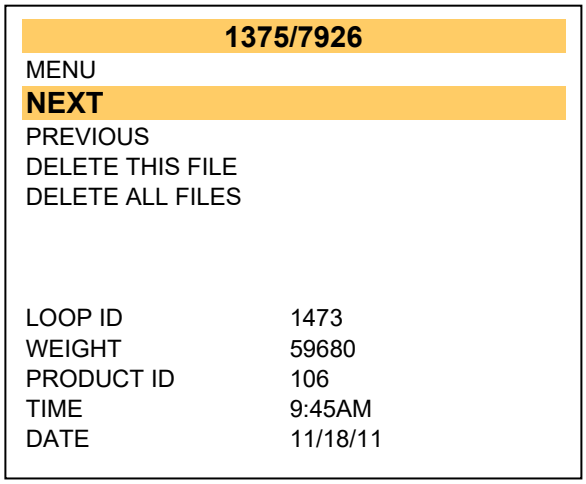
- A form printer is required.
- An incomplete or partial transaction is one with an **Inbound Weight**, **but no Outbound Weight.**



I. VIEW INCOMPLETE

Displays each individual incomplete transaction.

- Shows the **Loop ID**, **Inbound Weight**, the **Product ID**, and the **Time and Date** of the incomplete transaction.
- Individual Incomplete transactions or all incomplete transaction files may be deleted using this option. .



J. VIEW TARES

Displays individual tares stored in memory.

- Shows the **Tare ID**, the **Tare Weight**, the **Time** and **Date** it was entered.
- Can delete individual tares, or all files.

* *See* **Appendix III: Report Sample**.

8.2. Reports Menu Options, Continued

K. VIEW PRODUCT

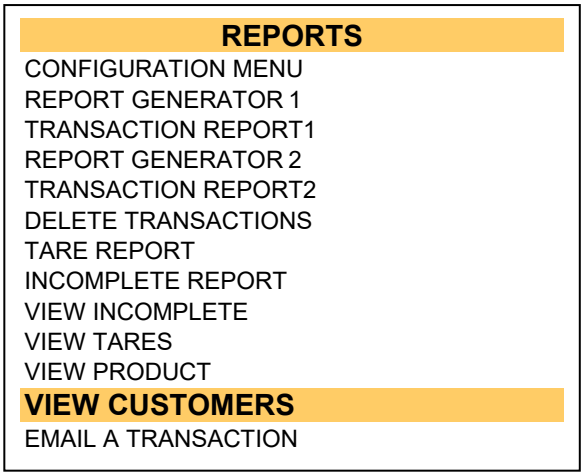
Displays each product stored in memory.

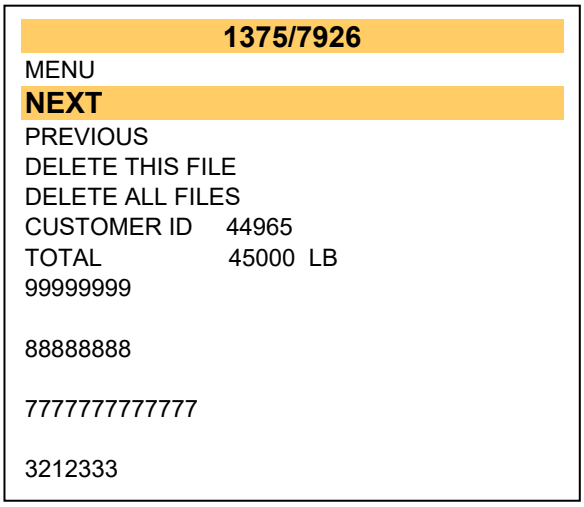
- Shows the **Product ID**, the total weight of the product shipped, the conversion factor and a description of the product.
- Can delete individual products, or all files.

L. VIEW CUSTOMERS

Displays each customer ID stored in memory.

- Shows the **Customer ID**, the total weight of material shipped for that customer, and all four lines of programmed information.
- Can delete individual customers, or all files.





M. EMAIL A TRANSACTION

Emails the **Transaction Report** to all designated recipients via Ethernet transmission.

- Asks for a **ticket number** and an email **Send to:** address (where to send the Report).
- When prompted, press **ENTER** to open the Ethernet Menu.

8.3. Building a Report

When the **Report Generator** (*either* **1** *or* **2**) is selected, a series of stored fields displays for adding them in the report.

REPORTS
CONFIGURATION MENU
REPORT GENERATOR1
TRANSACTION REPORT1
REPORT GENERATOR 2
TRANSACTION REPORT2
DELETE TRANSACTIONS
TARE REPORT
INCOMPLETE REPORT
VIEW INCOMPLETE
VIEW TARES
VIEW PRODUCT
VIEW CUSTOMERS

- There are **twenty-six (26) fields** available in every report, depending upon the operating mode. The field can be selected to be included by assigning a priority to it.
- Assign a priority of **One (1)** for the first column in the report; **Two (2)** for the second column, and so on until all 26 are given.
- If a field is not to be in the report, assign a priority of **zero (0).**

Listed below are the **Report Fields.**

A. WEIGHT ONLY, OR HIGHWAY SYSTEM MODE

1. In Time	2. Time Out	3. Date
4. Gross Weight*	**5. Tare Weight***	6. Net Weight
7. Product ID	8. Conversion 1	9. Conversion 2
10. Loop ID	12. – 20. Field Names 1-10	21. Customer ID
22. Ticket #	23. Alt Gross	24. Alt Tare
25. Alt Net	26. Fee	

B. DATA TERMINAL (INBOUND/OUTBOUND) MODE

1. In Time	2. Time Out	3. Date
4. Inbound Weight*	**5. Outbound Weight***	6. Net Weight
7. Product ID	8. Conversion 1	9. Conversion 2
10. Loop ID	11. – 20. Field Names 1-10	21. Customer ID
22. Ticket #	23. Alt Gross	24. Alt Tare
25. Alt Net	26. Fee	

* *The differences in the two lists above are* ***bolded*** *to show the variation between the* **Highway System** *and* **Inbound/Outbound Modes**.

See **Appendix III: Report Sample.**

NOTE: *A report will only print on a form printer that is properly installed. The report will not print on a ticket printer.*

8.3.1. Using Wildcard Searches

- All fields except **In Time** and **Time Out** can use a search field to further customize the report.
- When a search field is entered, the report generator will only select transaction data that matches the search field exactly.

For example, if the search field for **Product ID** has **2** in it, **only** transactions that include **Product ID 2** will print.

REPORTS
CONFIGURATION MENU
WEEKLY REPORT
REPORT GENERATOR 1
TRANSACTION REPORT1
REPORT GENERATOR 2
TRANSACTION REPORT2
DELETE TRANSACTIONS
TARE REPORT
INCOMPLETE REPORT
VIEW INCOMPLETE
VIEW TARES
VIEW PRODUCT
VIEW CUSTOMERS

- The search fields also have wildcards to assist in further customization.
- A wildcard character of "*" may be assigned to three different fields
  - Loop ID
  - Product ID
  - Customer ID.
- If this wildcard is used, the data will be grouped by the items with the wildcard installed.
  - For example, if **Product ID** has this wildcard, then all transaction data with the **same Product ID** group together and a subtotal for each group is provided.
- A wildcard of either **+** or **–** may be placed in front of search fields of certain numeric fields.
  - This allows the report to print data that is either **greater than** or **less than** a certain value.
  - For example, if **"–11-01-11"** is entered in the date search field, only transaction data ***older than*** **11-01-11** print.

Listed below are the eight data fields that use **+** or **–** for searches.

- Date
- Outbound Weight (or Tare)
- Ticket Number
- Alt Tare
- Inbound Weight (or Gross)
- Net Weight
- Alt Gross
- Alt Net

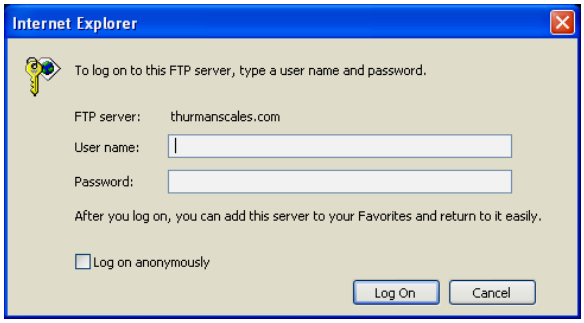
8.4. Obtaining Transaction Data Using FTP

FTP (**F**ile **T**ransfer **P**rotocol) allows the transfer of files between two computers on the Internet.

- FTP is a simple network protocol based on Internet Protocol (IP).
- Also it is the process of copying files when using FTP technology.

To transfer files with FTP, a program often called the "**client**" is used.

- The FTP client program initiates a connection to a remote computer or instrument,TS-3200, running FTP "server" software.
- After the connection is established, the client can choose to send and/or receive copies of files, singly or in groups.
- To connect to an FTP server, a client requires a **username** and **password**, as set by the administrator of the server.
- In any FTP interface, clients identify the FTP server by its IP address (such as http://192.168.X.X).



FTP supports two modes of data transfer.

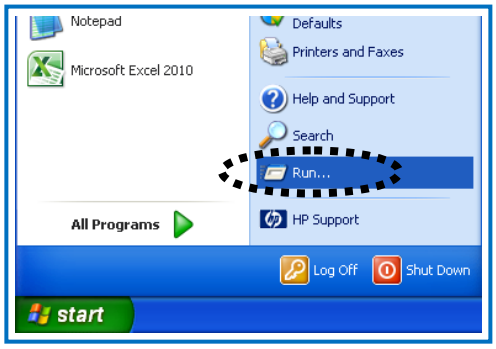
- ***Plain text (ASCII)***
- ***Binary***

Opening this file listings menu presents the recent history of all the Transaction Data generated from the instrument.

- The correct username and password is necessary to access the Instrument.
- This data can be dragged and dropped into MS Notepad to review and analyze it.
- The files are displayed in **CSV** (**C**omma **S**eparated **V**alues) format, which can be imported into an Excel® Spreadsheet for data reporting or data analysis.

8.4.1. Transaction Data Using DOS Commands

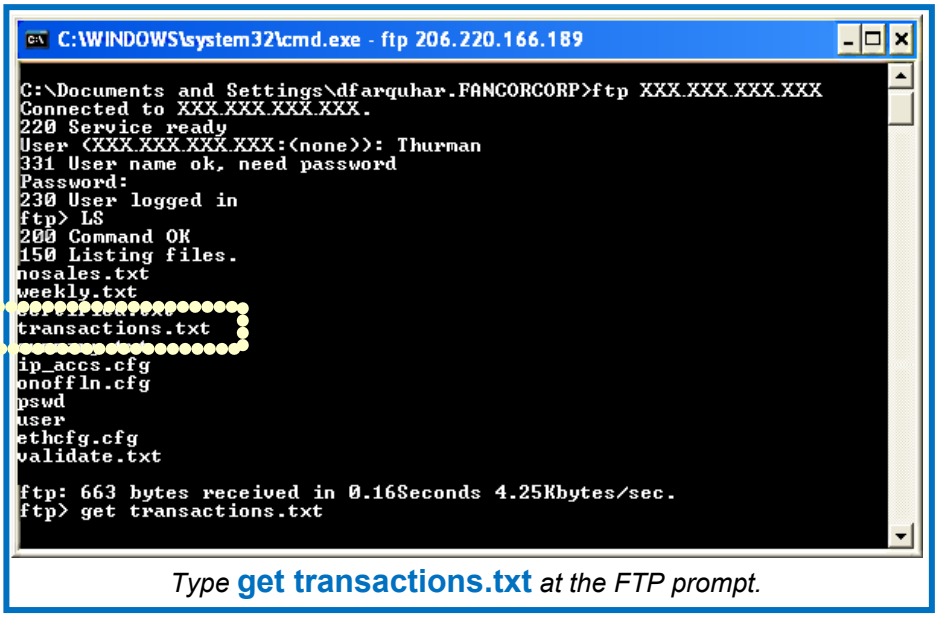
Follow these steps to obtain the **Transaction Data** using FTP Commands**.**



1. Click the **Start** button, then select **Run…**
2. Type **CMD** in the data box, then press **ENTER**.
   - The **Command Console** will open.
3. At the curser, enter either **C:** or **cd**, whichever one accesses the **C-drive**.
4. Enter **"ftp"**, a space, then the exact **Instrument IP Address**.

```
> ftp XXX.XXX.XXX.XXX
```

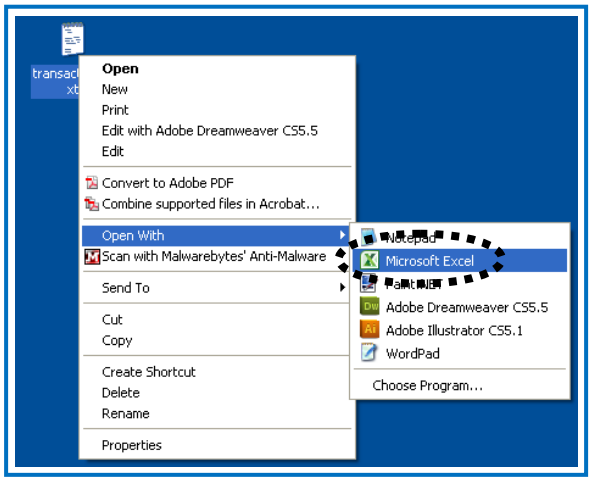
5. Enter the default **Username** and **Password**.
   - Both are **Thurman**.
6. At the **FTP prompt**, input **LS,** then press **ENTER**.
   - This lists all the files.
7. Type **get transactions.txt.**
   - This copies this file, and places it in the root folder **C:\.**
8. Input **bye**, then press **ENTER**.
9. Close this window.



Type **get transactions.txt** *at the FTP prompt.*

8.4.2. Transaction Data Using DOS Commands, Continued

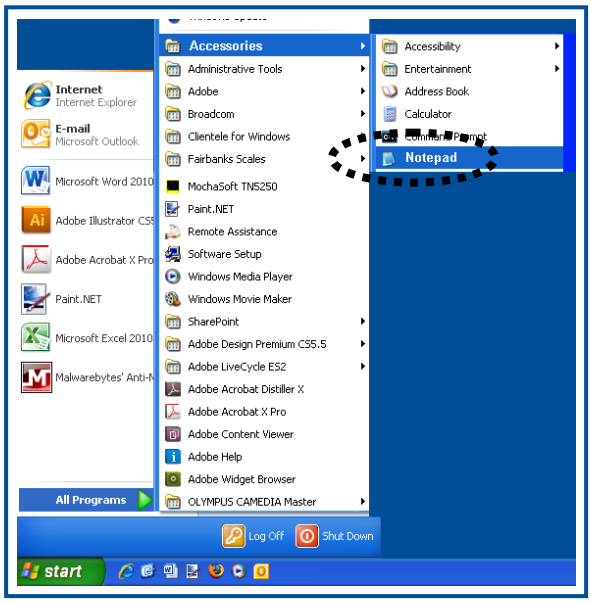
10a. When capturing data using a Spreadsheet, use **Microsoft Excel®.** On the desktop, right-click on **transactions.txt**, then select **Open With…/ Microsoft Excel.**



All the **Transaction Records** will populate in an **Excel® Spreadsheet**.

– *See* **Appendix III: Report Sample**.

10b. When capturing text only data, use **Microsoft Notepad®.** Press the **START** button, select the **ALL PROGRAMS**, then select **ACCESSORIES**, then open **NOTEPAD**.



Section 9: Serial Input / Output

9.1. Introduction

The Thurman TS-3200 instrument has **one (1) 20ma Current Loop Output** for a remote display, and **three (3) RS232 Outputs** for communications with other serial peripheral devices. The instrument has the capability of adding **four (4) serial ports** with an optional expansion board.

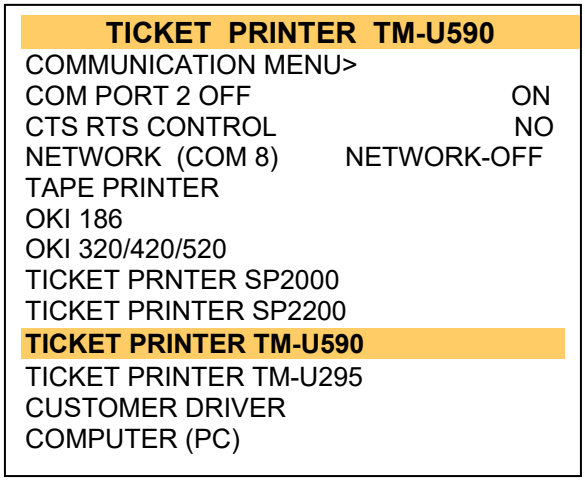
9.2. Interfacing Printers

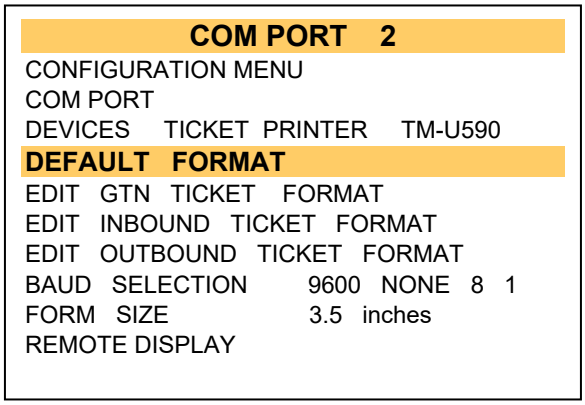
Printers include the following:

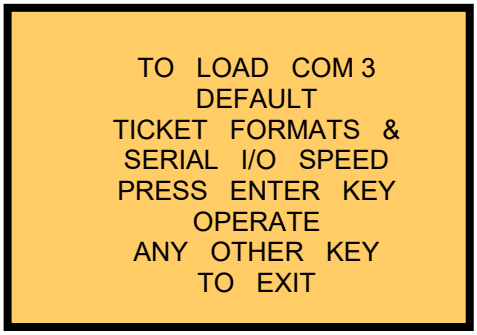
- 3550 Tape Printer
- OKI 320/420/520
- SP2200
- TM-U295
- OKI 186
- SP2000
- TM-U590

Follow these steps to load the default ticket formats and serial I/O speed.

1. From the **OPERATION MENU**, select the **CONFIGURATION MENU**, then press **ENTER**.
2. Select **COMMUNICATION PORTS**, then press **ENTER**.
3. Highlight the correct printer model, then press **ENTER**.
4. Press the **MENU** key once to return to the **COMMUNICATION PORTS MENU**.
5. Select **DEFAULT FOMAT**, then press **ENTER**.
6. Load the **Default Ticket Format** for this printer by pressing **ENTER**.
7. Press the **ENTER** key once to return to the **COMMUNICATION PORTS MENU**.





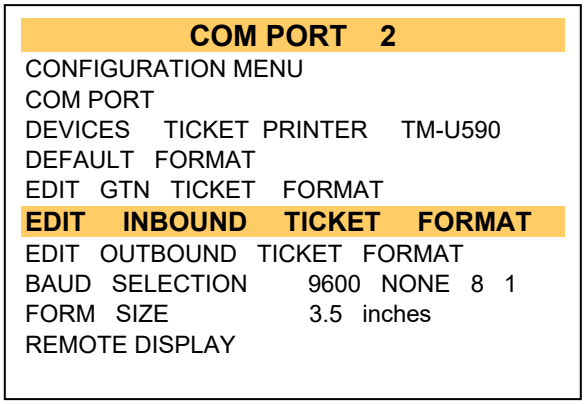


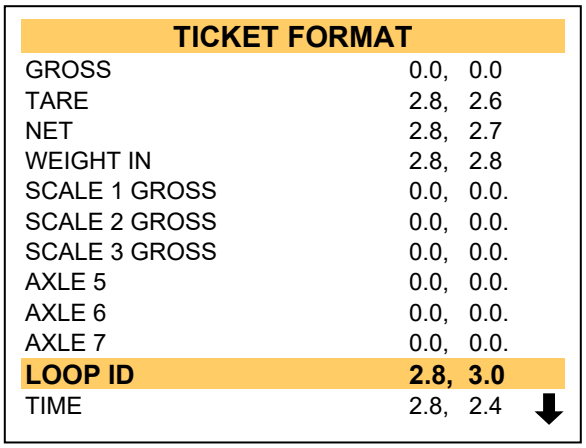
9.3. Editing the Ticket Format

Alter loading the **Default Ticket Format,** the appearance of the scale ticket can be altered to fit the company's specific business needs.

The **TICKET FORMAT window** programs which items appear on the scale ticket when the **PRINT** button is pushed.

1. Select one of the following formats.
   - **EDIT GTN TICKET FORMAT**
   - **EDIT INBOUND TICKET FORMAT**
   - **EDIT OUTBOUND TICKET FORMAT**.





The data items are displayed with numeric coordinates behind them. These coordinates determine the position (in inches) of this data item on the ticket.

- The **first number** represents the distance from the **top of the ticket** (in inches).
- The **second number** represents the distance from the **edge of the ticket**
  - *For a* **ticket printer,** *this number represents the distance from the* **RIGHT** *of the edge.*
  - *For a* **form or tape printer,** *this number represents the distance from the* **LEFT** *of the edge.*

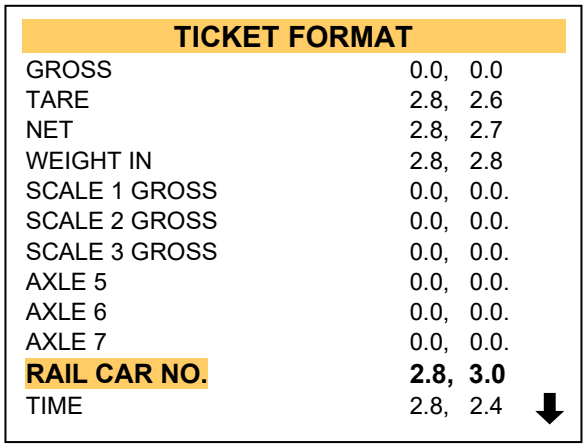
2. After the page location has been edited, answer **1** for **YES**, and **0** for **NO** when prompted for a test print.

3. When finished programming all these legends, , answer **1** for **YES**, and **0** for **NO** for **Enlarged Print**.

9.3.1. Changing the Ticket Format Headers

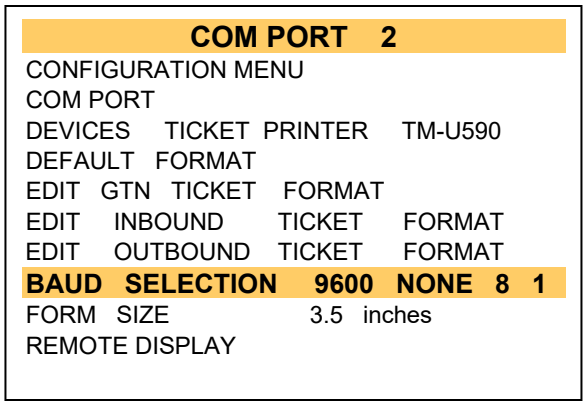
- Two types of the **Ticket Format Headers** can be altered to better meet the specific needs of the customer.
  - **SCALE/ AXLE 1 thru 7**
  - **LOOP ID**
- An external keyboard is necessary for altering the **Ticket Headers.**

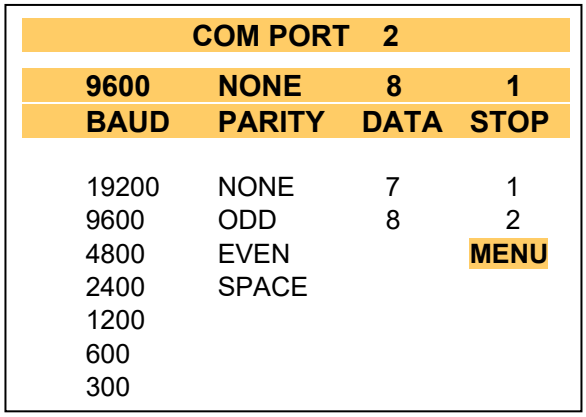
1. While in the **TICKET FORMAT** window, scroll down and highlight the **TICKET HEADER** to be altered.
2. Input the new **TICKET HEADER**.
   - Anything appropriate to the customer's needs, such as **"Truck No."**, **"Rail Car", Unit #",** etc.
3. Press **ENTER.**
   - The prompt moves to the next header.
   - This **Ticket Header** is automatically saved.



9.4. Baud Selection

1. Press **ENTER** to input the serial data protocol.
   - **Baud Rate**
   - **Parity**
   - **Data Bits**
   - **Stop Bits**





9.5. Printer Switch Settings

ROLL TAPE PRINTER	SW 1 ON	SW 2 ON	SW 3 ON	DESKTOP CABLE	NEMA 4X CABLE	ADDITIONAL INFORMATION
3550	2, 3, 4, 8	ALL OFF	—	14809	12654	4800 Baud, No Parity, 8 Data Bits, Stop = 1

TICKET PRINTER(S)	SW 1 ON	SW 2 ON	SW 3 ON	DESKTOP CABLE	NEMA 4X CABLE	ADDITIONAL INFORMATION
OKI 186	1, 2, 3, 5, 6, 7, 8	2, 3, 6,7	—	14807	16157	9600 Baud, No Parity, 8 Bit, Stop = 1
Okidata 320/ 420/520	—	—	—	14807	16157	9600 Baud, No Parity, 8 Bit, Stop = 1
Fargo SP2000	ALL OFF	3	1, 5	14807	16157	2400 Baud, Even Parity, 7 Bit, Stop = 1
Fargo SP2200	2, 3, 8	ALL OFF	ALL OFF	14807	16157	2400 Baud, No Parity, 7 Data Bits, Stop = 2
TM-U590	7	ALL OFF	—	14807	16157	9600 Baud, No Parity, 8 Bit, Stop = 1
TM-U295	1, 3	—	—	14807	16157	9600 Baud, No Parity, 8 Bit, Stop = 1

— *Signifies there is no switch bank on this printer.*

IMPORTANT NOTE: ***Save and exit the*** **SETUP PROGRAM** *before turning off the printer. Otherwise, all the updates and setting* ***changes will not be saved****.*

Please consult the **PRINTER USER MANUAL** *for any additional information.*

9.6. Printer Setup and Programming

9.6.1. 3550 Tape Printer Setup

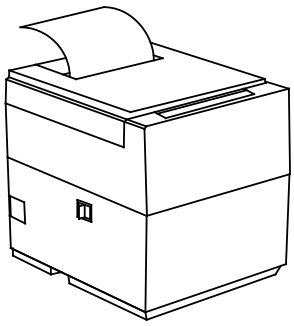
The tape printer selection selects the driver for the 3550 series printer. The following switch settings and cable requirements will work with the default format.

- ***TS-3200 Desktop use cable 14809***
- ***TS-3200 NEMA 4X use cable 12654***

BAUD	**4800**
PARITY	**NONE**
DATA BITS	**8**
STOP BIT	**1**

Set the printer's **dip switche**s according to the following:

- **DSW 1: two (2), three (3),** and **four (4)** and **eight (8)** **ON** only.
- **DSW 2: ALL OFF**.



9.6.2. OKI 186

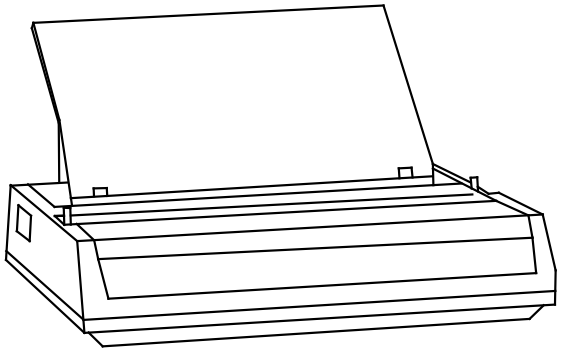
The **OKI 186 Form Printer** has both front panel programming and dipswitch settings to connect to the TS-3200.

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

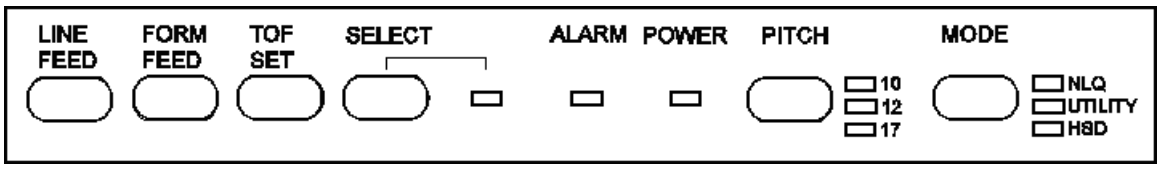
BAUD	**9600**
PARITY	**NONE**
DATA BITS	**8**
STOP BIT	**1**

Set the printer's **dip switche**s according to the following:

- **DSW 1: One (1), two (2), three (3), five (5), six (6), seven (7)** and **eight (8)** are all **on**.
- **DSW 2: Two (2), three (3), six (6) and seven (7)** are all **on**.



9.6.2. OKI 186, CONTINUED



A. PROGRAMMING STEPS

Follow these steps to change the menu settings.

1. To enter the **MENU MODE,** press and hold the **SELECT** button while turning on the printer.
   – The "**12**" and **"UTILITY" LEDs** will blink.
2. Press **SELECT** to print the complete menu.
   – This prints out the current default settings.
   – It is recommended to use tractor fed paper.

NOTE: *The printed menu selections are different for each* **Emulation Mode**.

3. Press **LINE FEED** to select the group that needs to be changed
   – See the left-handed column on the **Menu printout**.
4. Press **FORM FEED** to select any item within a specific group.
   – See the center column.
5. Press **TOF SET** to cycle through the available settings for the item to be changed.
   – See the right-handed column.
6. Press **LINE FEED** for the next group, or press **FORM FEED** for the next item.
   – Repeat as needed until finished.
7. Press **PITCH** and **MODE** together to save the changes, and to exit the **MENU MODE.**

IMPORTANT NOTE: ***Save and exit the*** **SETUP PROGRAM** *before turning off the printer. Otherwise, all the updates and setting* ***changes will not be saved***.

9.6.2. OKI 186, CONTINUED

B. PRINTER SETTINGS

The printed menu changes are setup by the **PRINTER EMULATION MODE**.

- Printer Emulation Mode ***must be set to ML*** before printing the menu.

GROUP Press LINE FEED to change	ITEM Press FORM FEED to change	SET Press TOF SET to change
PRINTER CONTROL	EMULATION MODE	ML
Font	Print Mode	Utility
Font	DRAFT Mode	SSD
Font	Pitch	10 CPI
Font	Proportional Spacing	No
Font	Style	Normal
Font	Size	Single
Symbol Sets	Character Set	Standard
Symbol Sets	Language Set	American
Symbol Sets	Zero Character	Slashed
Symbol Sets	Code Page	USA
Vertical Control	Line Spacing	6 LPI
Vertical Control	Skip Over Perforation	No
Vertical Control	Page Length	11”
Set-Up	Graphics	Bi-directional
Set-Up	7 or 8 Bits	7
Set-Up	Receive Buffer Size	128K
Set-Up	Paper Out Override	No
Set-Up	Paper Registration	0
Set-Up	7 or 8 Bits	8
Set-Up	Operator Panel Function	Full Operation
Set-Up	Reset Inhibit	No
Set-Up	Print Suppress Effective	Yes
Set-Up	Auto LF	No
Set-Up	Print DEL Code	Yes
Set-Up	Time Out Print	Invalid
Set-Up	Auto Select	No
Set-Up	Impact Mode	Normal
Parallel I/F	I-Prime	Buffer Print
Parallel I/F	Pin 18	+5V
Parallel I/F	Bi-Direction	Enable

9.6.2. OKI 186, CONTINUED

The following indicate typical Thurman Serial PCB Assy Switch Settings **(SW1)**.

PARITY TYPE	SWITCH 1 (SW1)
Odd parity	**ON**
Even parity	OFF

PARITY	SWITCH 2 (SW1)
No parity	**ON**
With parity	OFF

DATA BITS	SWITCH 3 (SW1)
7 Bits	OFF
8 Bits	**ON**

PROTOCOL	SWITCH 4 (SW1)
Ready/Busy	ON
X-ON, X-OFF	**OFF**

TEST SELECT	SWITCH 5 (SW1)
Circuit	**ON**
Monitor	OFF

MODE SELECT	SWITCH 6 (SW1)
Print mode	**ON**
Test mode	OFF

BUSY LINE SELECTION	SWITCH 7, 8 (SW1)
SSD- Pin 11	OFF, ON
SSD+ Pin 11	OFF, OFF
DTR- Pin 20	**ON, ON**
RTS- Pin 4	ON, OFF

The following indicate typical Thurman Serial PCB Assy Switch Settings **(SW2)**.

TRANSMISSION SPEED	SWITCH 1, 2, 3 (SW2)
19,200 bps	ON, ON, ON
9,600 bps	**OFF, ON, ON**
4,800 bps	ON, OFF, ON
2,400 bps	OFF, OFF, ON
1,200 bps	ON, ON, OFF
600 bps	OFF, ON, OFF
300 bps	ON, OFF, OFF
110 bps	OFF, OFF, OFF

DSR INPUT SIGNAL	SWITCH 4 (SW2)
Active	ON
Inactive	**OFF**

BUFFER THRESHOLD	SWITCH 5 (SW2)
32 bytes	ON
256 bytes	**OFF**

BUSY SIGNAL	TIMING SW 6 (SW2)
200 ms min.	**ON**
1 sec. min.	OFF

DTR SIGNAL	SWITCH 7 (SW2)
Space after Power On	**ON**
Space when printer is selected	OFF

NOT USED	SWITCH 8 (SW2)
**	OFF

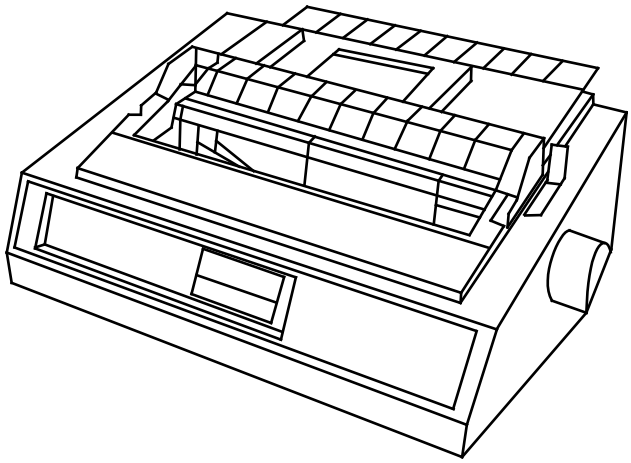
NOTE: *Options highlighted in* **bold** *are the standard Thurman default settings.*

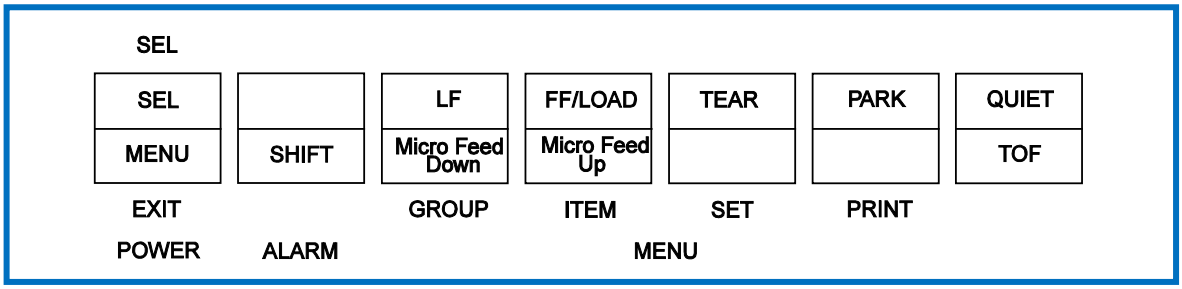
9.6.3. OKI 320/420/520

The **OKI 320/420/520 Form Printers** have only front panel programming settings to connect to the TS-3200. These printers have no internal dip switches to adjust.

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

BAUD	**9600**
PARITY	**NONE**
DATA BITS	**8**
STOP BIT	**1**





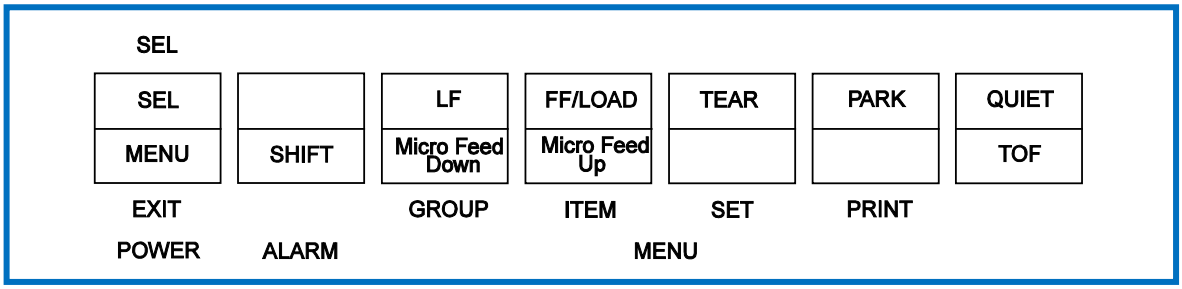
A. PROGRAMMING STEPS

Follow these steps to change the menu settings.

1. To enter the **MENU MODE,** press and hold the **SHIFT** while pressing the **SELECT** key.
   – The **MENU MODE** legend will illuminate.

NOTE: *The printed menu selections are different for each* **Emulation Mode**.

9.6.3. OKI 320/420/520, Continued



2. Press **PRINT** to print the complete menu.
   - This prints the current default settings.
   - It is recommended to use tractor fed paper.
3. Press **GROUP** to select the group that needs to be changed.
   - See the left-handed column on the **Menu printout**.
4. Press **ITEM** to select any item within a specific group.
   - See the center column.
5. Press **SET** to cycle through the available settings for the item to be changed.
   - See the right-handed column.
6. Press and hold the **SHIFT** key while pressing the **SELECT** key to save the changes, and to exit the **MENU MODE.**

IMPORTANT NOTE: ***Save and exit the SETUP PROGRAM*** *before turning off the printer. Otherwise, all the updates and setting* ***changes will not be saved****.*

9.6.3. OKI 320/420/520, Continued

GROUP Press LINE FEED to change	ITEM Press FORM FEED to change	SET Press TOF SET to change
PRINTER CONTROL	EMULATION MODE	IBM PPR
Font	Print Mode	Utility
Font	DRAFT Mode	HSD
Font	Pitch	10 CPI
Font	Proportional Spacing	No
Font	Style	Normal
Font	Size	Single
Symbol Sets	Character Set	Set 1
Symbol Sets	Language Set	American
Symbol Sets	Zero Character	Slashed
Symbol Sets	Code Page	USA
Rear Feed	Line Spacing	6 LPI
Rear Feed	Form Tear-off	500 ms
Rear Feed	Skip Over Perforation	No
Rear Feed	Page Length	11”
Bottom Feed	Line Spacing	6 LPI
Bottom Feed	Form Tear-off	500 ms
Bottom Feed	Skip Over Perforation	No
Bottom Feed	Page Length	11”
Top Feed	Line Spacing	6 LPI
Top Feed	Bottom Margin	Valid
Top Feed	Page Length	11”
Top Feed	Wait Time	1 sec
Top Feed	Page Length Control	by Actual Page Length
Set-Up	Graphics	Unidirectional
Set-Up	Receive Buffer Size	64K
Set-Up	Paper Out Override	No
Set-Up	Print Registration	0
Set-Up	Operator Panel Function	Full Operation
Set-Up	Reset Inhibit	No
Set-Up	Print Suppress Effective	Yes
Set-Up	Auto LF	No
Set-Up	Auto CR	No
Set-Up	SI Select Pitch (10CP)	17.1 CPI
Set-Up	SI Select Pitch (12CPI)	12 CPI
Set-Up	Time Out Print	Valid
Set-Up	Auto Select	No
Set-Up	Graphics Speed	Low
Set-Up	Centering Position	DEFAULT
Set-Up	ESC SI Pitch	17.1 CPI
Set-Up	Power Saving	Enable
Set-Up	UpPower Save Time	5 Min
Set-Up	Time Out FF	Invalid

9.6.3. OKI 320/420/520, Continued

GROUP Press LINE FEED to change	ITEM Press FORM FEED to change	SET Press TOF SET to change
Parallel I/F	I-Prime	Buffer Print
Parallel I/F	Bi-Direction	Enable
Serial I/F	Parity	None
Serial I/F	Serial Data 7/8 Bits	8 Bits
Serial I/F	Protocol	X-On/X-Off
Serial I/F	Diagnostic Test	No
Serial I/F	Busy Line	SSD-
Serial I/F	Baud Rate	9600 BPS
Serial I/F	DSR Signal	Invalid
Serial I/F	DTR Signal	Ready on Power UP
Serial I/F	Busy Time	200 ms

IMPORTANT NOTE: ***Save and exit the*** **SETUP PROGRAM** *before turning off the printer. Otherwise, all the updates and setting* ***changes will not be saved****.*

9.6.4 SP2000

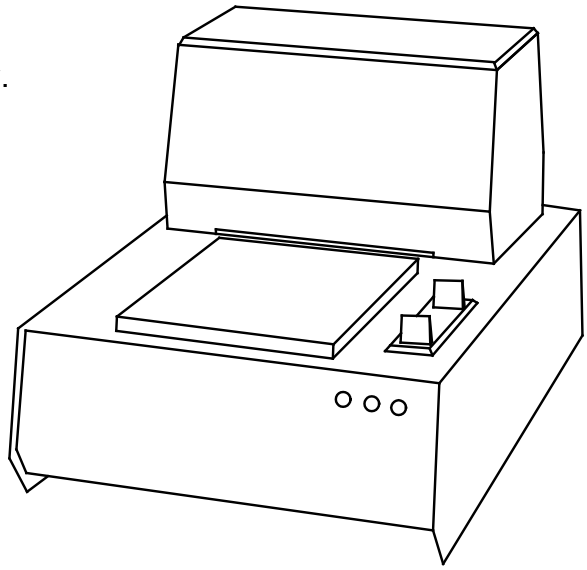
The SP2000 is a Dot Matrix ticket printer. The following switch settings and cable requirements will work with the default format.

BAUD	**2400**
PARITY	**EVEN**
DATA BITS	**7**
STOP BIT	**1**

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

Set the printer's **dip switche**s according to the following:

- All **DSW 1** are all **OFF**.
- **DSW 2: three (3) on** only.
- **DSW 3: one (1),** and **five (5) on** only.



The SP2000 and the SP2200 models look nearly identical.

9.6.5. SP2200

The SP2200 is a Dot Matrix ticket printer. The following switch settings and cable requirements will work with the default format.

BAUD	**2400**
PARITY	**NO**
DATA BITS	**7**
STOP BIT	**2**

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

Set the printer's **dip switche**s according to the following:

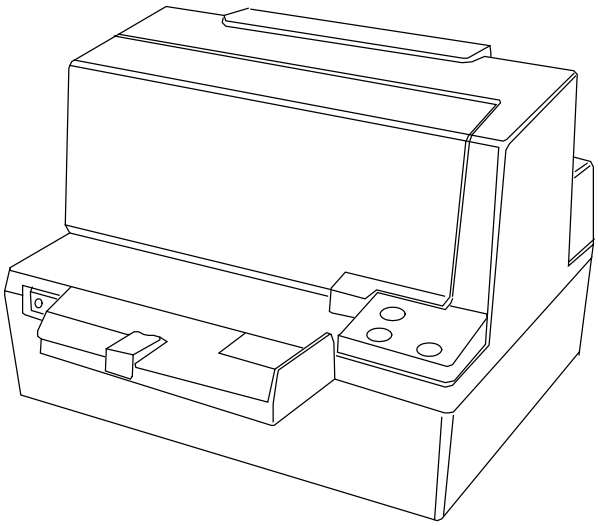
- **DSW 1: two (2), three (3),** and **eight (8) on** only.
- All **DSW 2 and DSW 3** are all **OFF**.

9.6.6. Epson TM-U590

The TM-U590 selection selects the driver for the Epson TM-U590 printer. The following switch settings and cable requirements will work with the default format.

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

BAUD	**9600**
PARITY	**NONE**
DATA BITS	**8**
STOP BIT	**1**



Set the printer's **dip switche**s according to the following:

- **DSW 1: seven (7)** on only.
- The rest are all **OFF**.

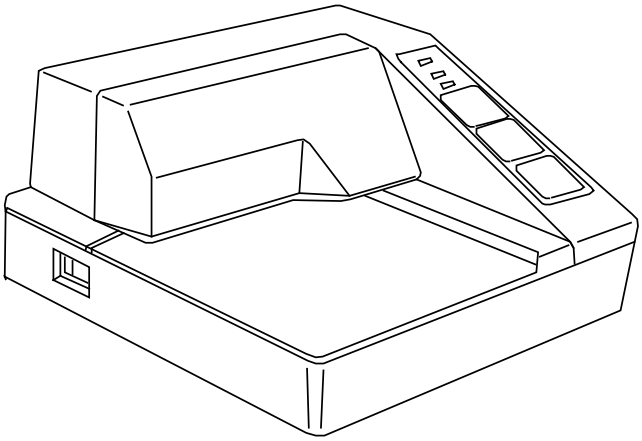
9.6.7. Epson TM-U295

The TM-U295 selection selects the driver for the Epson TM-U295 printer. The following switch settings and cable requirements will work with the default format.

Baud 9600, Parity None, 8 Data bits, 1 Stop Bit.

- ***TS-3200 Desktop use cable 14807***
- ***TS-3200 NEMA 4X use cable 16157***

BAUD	**9600**
PARITY	**NONE**
DATA BITS	**8**
STOP BIT	**1**



Dip Switches

The Printer's **Dip Switches** are set as follows:

- **One (1)** and **three (3)** are **ON**.
- The rest are **OFF**.

IMPORTANT NOTE: ***Save and exit the SETUP PROGRAM*** *before turning off the printer. Otherwise, all the updates and setting* ***changes will not be saved****.*

9.7. Interfacing Remote Displays

Follow these steps to load the default ticket formats and **Serial I/O Speed** *for the Remote Displays.*

Selecting the remote display serial port is not important, as this happens automatically when this menu is entered.

1. From the **OPERATION MENU**, select the **CONFIGURATION MENU,** then press **ENTER**.
2. Select **COMMUNICATION PORTS,** then press **ENTER**.
3. Select **REMOTE DISPLAY.**
   - **COMMUNICATIONS PORTS MENU –** Returns to the previous window.
   - **REMOTE DISPLAY ON/OFF –** This turns the remote display port **ON** or **OFF**
     - *The current mode of operation is displayed at the bottom of the display.*
   - **CONTINUOUS GROSS WEIGHT** or **GROSS ON PRINT –** Turns the remote display port on with a continuous output stream..
   - **GROSS ON PRINT –** Allows the remote display port to transmit the weight data one time when a print occurs.
   - **TIME OUTPUT –** If the remote display is set to **Continuous Gross Weight**, approximately five seconds after the scale returns to zero the remote display output will transmit the current time.
   - **218T TRAFFIC LIGHT –** Enables or disables the available data string that controls the color of the traffic light..
   - **RF LINK on COM 3 –** Redirects the remote display transmission to **Com Port 3** to be connected to a modem.
     - *Baud, parity, and data bit settings can be changed to match the remote.*
     - *Com 3 device setting should be set to off in the communications menu.*

COM PORT 2

CONFIGURATION MENU
COM PORT
DEVICES TICKET PRINTER TM-U590
DEFAULT FORMAT
EDIT GTN TICKET FORMAT
EDIT INBOUND TICKET FORMAT
EDIT OUTBOUND TICKET FORMAT
BAUD SELECTION 9600 NONE 8 1
FORM SIZE 3.5 inches

REMOTE DISPLAY

REMOTE DISLAY SETUP

COMMUNICATION PORTS MENU
REMOTE DISPLAY ON
CONTINUOUS GROSS WEIGHT
GROSS ON PRINT
TIME OUTPUT OFF
218T TRAFFIC LIGHT ENABLED
RF LINK on COM 3

REMOTE DISPLAY ON
CONTINUOUS GROSS

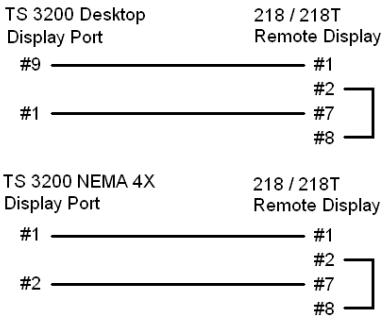
9.7.1. Connecting the Remote Display

NOTE: *When connecting a 20ma configured remote display to a TS-3200, use* **DIS.**

THURMAN IS-3200 (Passive)	MODEL 217	MODEL 218(Active)
DIS CONNECTOR	DISPLAY TERMINAL	DISPLAY TERMINAL
9 (+)	+15VDC (Pin 1)	+15VDC (Pin 1) 20ma+
1 (-)	(C Loop) Pin 5	(Pin 7) 20ma-
	(C Loop) Pin 6	(Pin 8) Jumper
	(GND) Pin 2	(Pin 2) Jumper

THURMAN NEMA 4X REMOTE MODEL 217		MODEL 218
DIS CONNECTOR	DISPLAY TERMINAL	DISPLAY TERMINAL
1 (+)	+15VDC (Pin 1)	+15VDC (Pin 1)
2 (-)	(C Loop) Pin 5	(C Loop) Pin 7
	(C Loop) Pin 6	(C Loop) Pin 8
	(GND) Pin 2	(GND) Pin 2

CONNECTING TO A 218 / 218T REMOTE DISPLAY



9.8. Accessing the Computer (PC) Ports

Follow these steps to building a **CONTINUOUS OUTPUT STRING** for COM Ports.

- Only these two COM Ports are ***programmable***.

1. From the **OPERATION MENU**, select the **CONFIGURATION MENU,** then press **ENTER**.
2. Select **COMMUNICATION PORTS,** then press **ENTER**.
3. Select **COM PORT,** press the numeral **three** (**3**) or **four** (**4**).
4. Scroll down and select the **OTHER DEVICES MENU**.
5. Select **Computer (PC),** then press **ENTER**.

9.8.1. Computer (PC) Ports Options

A. PC SETUP MENU – Returns to the **OTHER DEVICES MENU**.

B. MODE – Toggles for a selection between the three weighment **MODE** choices.

- **CONTINUOUS –** An uninitiated, unrequested output which is transmitted at every display update.
- **DEMAND –** Transmits when the TS-TS-3200 instrument receives a **POLL CHARACTER**.
- **AUTO (Auto Computer Output Mode) –** Transmits when an Inbound, Outbound, or GTN ticket is printed.

STREAM FORMATS Com3	
PC SETUP MENU	
MODE	**CONTINUOUS**
CARDINAL 738	
CONDEC	
FAIRBANKS/TOLEDO	
WEIGH-TRONIX WI-120	
EDIT/CUSTOM FORMAT	Com3
CHECKSUM	NO
WEIGHT FORMAT	
TOKENS	
POLL CHARACTER	CR
BLOCK SEPARATOR	None
STATUS BYTE A	
STATUS BYTE B	
STATUS BYTE C	

9.8.1. Computer (PC) Ports Options, Continued

C. PREFORMATED CONFIGURABLE DATA STRING OPTIONS – Select one of the following as a basis for formatting the **Data Output String**.

- CARDINAL 738
- CONDEC
- THURMAN/TOLEDO
- WEIGH-TRONIX WI-120

D. EDIT/CUSTOM FORMAT– Accesses the **EDIT/CUSTOM FORMAT Menu** to configure the entire data string.

STREAM FORMATS Com3	
PC SETUP MENU	
MODE	CONTINUOUS
CARDINAL 738	
CONDEC	
FAIRBANKS/TOLEDO	
WEIGH-TRONIX WI-120	
EDIT/CUSTOM FORMAT Com3	
CHECKSUM	NO
WEIGHT FORMAT	
TOKENS	
POLL CHARACTER	CR
BLOCK SEPARATOR	None
STATUS BYTE A	
STATUS BYTE B	
STATUS BYTE C	

E. CHECKSUM – Toggles **ON** to **OFF**, controlling whether a **Checksum Character** is sent at the end of the computer output.

F. WEIGHT FORMAT – Accesses the **WEIGHT TOKENS Menu**.

G. TOKENS –Accesses the **STREAM TOKENS** menu.

H. POLL CHARACTER – Press the **ENTER** button on this option to toggle through several default values for the **Polling Character**, or type in the decimal equivalent.

- **STX –** Start Text.
- **ENQ –** Enquiring requests to a shared resource, typically a printer device.
- **CR –** Carriage Return.
- **Blank –** A user-defined character may be entered.
- **Space** – Space or no separator.

For a user-defined character, key in (without pressing **ENTER**) the decimal equivalent of the ASCII character for making a choice other than the previous options.

9.8.1. Computer (PC) Ports Options, Continued

I. BLOCK SEPARATOR – A marker that separates message blocks in the data string, similar to a comma or period in the English language. These are stripped out when the receiving device reads the command.

Press **ENTER** to toggle through several default values for the **Data Block Separator** , or type in the decimal equivalent.

- **CR** – Carriage Return.
- **LF** – Line Feed.
- **CRLF** – Carriage Return Line Feed.
- **Blank** – A user-defined character may be entered.
- **None** – No designated alphanumeric symbol added.
- **Space** – Space or no separator.

J. STATUS BYTE A, B and C – Sets parameters for items to indicate conditions, such as **Overcapacity, Graduation Size, Motion**, etc.

STREAM FORMATS Com3	
PC SETUP MENU	
MODE	CONTINUOUS
CARDINAL 738	
CONDEC	
FAIRBANKS/TOLEDO	
WEIGH-TRONIX WI-120	
EDIT/CUSTOM FORMAT	Com3
CHECKSUM	NO
WEIGHT FORMAT	
TOKENS	
POLL CHARACTER	CR
BLOCK SEPARATOR	**None**
STATUS BYTE A	
STATUS BYTE B	
STATUS BYTE C	

BIT FIELDS							
ACCEPT							
CLEAR							
AALWAYS ZERO							
BALWAYS ONE							
CEVEN PARITY							
DNET MODE							
ECENTRE OF ZERO							
FSTABLE WEIGHT							
GNEGATIVE GROSS							
HOVERCAPACITY							
ISECONDARY UNITS							
JTARE IN SYSTEM							
b7	b6	b5	b4	b3	b2	b1	b0
A	A	B	M	M	P	P	P

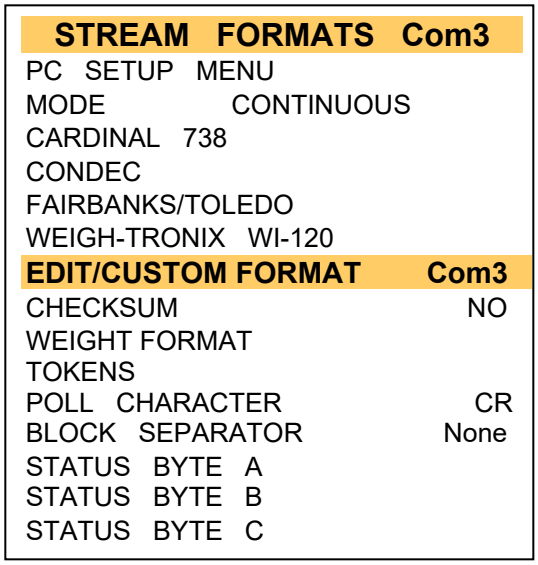
W A R N I N G !

Modification of* Status Byte A, B, *or* C *should only be done at the direction of Technical Services or Engineering.

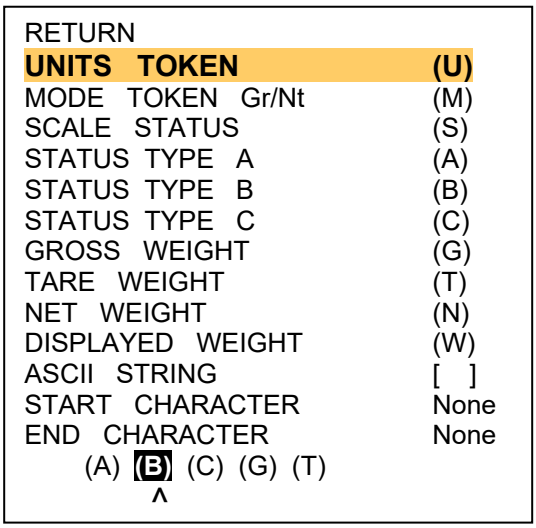
9.9. Accessing Edit/Custom Formats

Follow these steps to build and edit a customized continuous output string.

1. From the **OPERATION MENU**, select the **CONFIGURATION MENU,** then press **ENTER.**
2. Select **COMMUNICATION PORTS,** then press **ENTER.**
3. Select **COM PORT,** then press the correct COM Port**.**
4. Scroll down and select the **OTHER DEVICES MENU.**
5. Select **COMPUTER (PC),** then press **ENTER.**
6. Select **EDIT/CUSTOM FORMAT**.



9.9.1. Accessing Edit/Custom Format Options



A. RETURN – Returns to the **EDIT/CUSTOM FORMAT menu**.

B. UNITS TOKEN – Adds a **Units Token** in the data string, such as **lb, kg** or **lb/kg**.

C. MODE TOKEN Gr/Nt – Adds a **Mode Token** in the data, string such as **GR** or **NT**.

D. SCALE STATUS – Adds a motion bit in the data string at the point of insertion, as shown by a capital **"S"**.

E. Status Type(A, B, C) – Indicates the **Graduation Size, Over Capacity Units, Decimal Location**, etc.

NOTE: *To remove incorrect fields in the data string, highlight the unwanted field, then use the* **ZERO** *button with a keypad unit, or the* **DELETE** *button when the Instrument is equipped with an* **External Keyboard Accessory**.

F. GROSS WEIGHT – Adds the **Gross Weight** to the data string.

G. TARE WEIGHT – Adds the **Tare Weight** to the data string.

H. NET WEIGHT – Adds the **Net Weight** to the data string.

I. DISPLAYED WEIGHT – Displays the **Gross** or Net **Weight**, depending on which is displayed at the instrument.

– No units or weight legends are transmitted.

J. ASCII STRING – Allows the entry of an ASCII text string into the data stream.

M. Clear Format – Clear the currently formatted string.

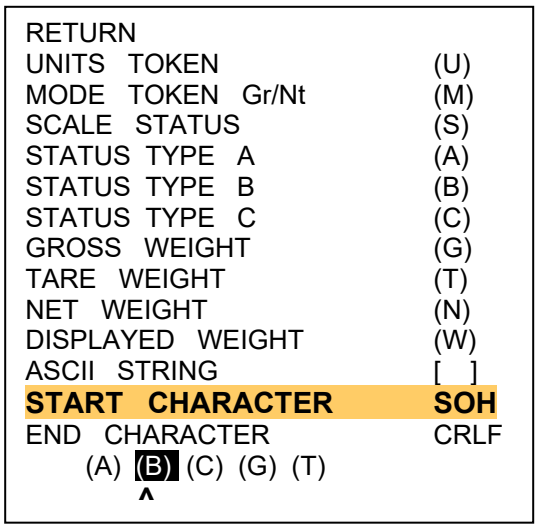
9.9.1. Accessing Edit/Custom Format Options, Continued

K. START CHARACTER – Inserts the start character, if required.

- Press **ENTER** to scroll through the options.
- This character can be removed by selecting **"NONE"**.

L. END CHARACTER – Inserts the end character, if required.

- Press **ENTER** to scroll through the options.
- This character can be removed by selecting **"NONE"**.



9.10. Remote commands

Remote commands can be sent using the below key presses or characters via a serial communication port from PC to instrument (TS-3200).

“Z” sets the scale to zero.

“U” toggles the active units configured

“P” prints current screen weight to configured printer

“A” auto tares current weight on scale

9.11. Client/ Server

Supports exactly (2) TS-3200 instruments via reserved port COM8.

-Requires expansion serial card

-Requires RS 422 serial cable

Device roles:

The instrument set to Server provides the scale data as a source. The scale is located on this instrument.

The instrument set to Client listens for scale data from the COM 8 port and only receives weight data from the Server instrument.

To configure Client/Server

- Access Configuration Menu
- Select Communications PORTS (default location)
- Press 8 on Keypad to access COM PORT 8 Configurations
- PRESS DOWN and ENTER on DEVICES

NETWORK-CLIENT	
COMMUNICATION MENU>	
COM PORT 8 OFF	ON
CTS RTS CONTROL	NO
NETWORK (COM 8)	**NETWORK-CLIENT**
TAPE PRINTER	
OKI 186	
OKI 320/420/520	
TICKET PRNTER SP2000	
TICKET PRINTER SP2200	
TICKET PRINTER TM-U590	
TICKET PRINTER TM-U295	
CUSTOMER DRIVER	
COMPUTER (PC)	
NETWORK DATA CONTROL	RESPONDER

- Select network (com 8), press enter

Selections are:

- EXIT,
- NONE,
- SERVER – Select if serving weight from scale.
- CLIENT - Select if listening and if no scale is local to this instrument.

NETWORK MODE CLIENT
EXIT
NONE
SERVER
CLIENT

9.11. Client/ Server, Continued

Review below items before completing the Client/Server configuration.

1. Will not sync operating modes

   Verify the client instrument has similar operating mode selections to share similar screens between the 2 devices. If using multiple scales select number of scales under calibration to match that of the master/server. Weight will still be shown but no discretion of scale will be known on the client instrument.

2. It will not configure the printer or com ports to match

3. It will carry over any customer related data

4. Load cell configurations are not required on the client/slave unit. All data on weigh screen from master/server will transfer over.

Section 10: Service & Maintenance

10.1. Diagnostics

Follow these steps to help troubleshoot system errors in the TS-3200 Instrument (*with* **Intalogix® Technology**).

- These applications are designed to troubleshoot Instruments with

1. On **POWER-UP**, check for **CELLS FOUND 1,2,3,4,5,6,7,8,** etc.
   - Only properly wired and functioning sectional controllers are "found".

10.2. Load Cell Failure

If the message to the right appears in the display, check the load cell and associated wiring.

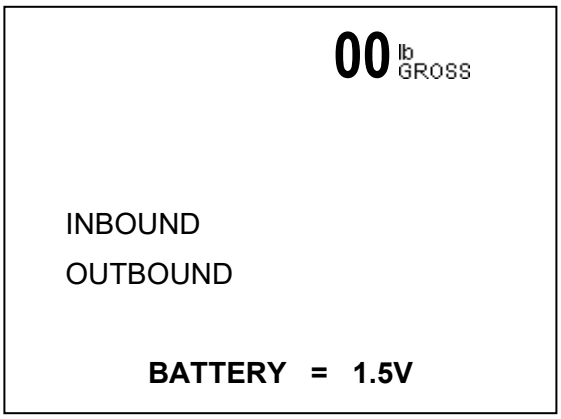
- This message is triggered by one of several conditions.
- If this is the initial installation, check for incorrect wiring or electronic problems in the sectional controller.

```
LOAD   CELL(S)   BAD

CHECK THAT SCALE IS EMPTY
IF SCALE IS EMPTY
CALL FOR SERVICE 800-

OPERATE THE ZERO KEY
TO CONTINUE
```

10.3. Replacing a Battery

The new battery is charged to **3.2 volts**. This is necessary to maintain the RAM memory in the event of a power outage.

If the battery is depleted below the approximate level of **2.8 volts**, a message replaces the **Time and Date** repeatedly at the bottom of the weighment screen, similar to the image at the right.



When below **2.8 VDC**, *the battery value displays on the Weigh Screen.*

Follow these steps to replace the expired battery.

1. **DO NOT UNPLUG THE TS-3200 FROM THE AC Power!**

2a. ***For a Desktop Style TS-3200***, remove the four (4) screws that fasten the cover of the Instrument, then pull off this cover.

b. ***For a Hostile Style TS-3200,*** unscrew the door latches and open up the Instrument.

3. Carefully remove the old battery, lifting it up and out.
   – The battery socket is located on the center of the **Programmable Controller.**
4. Insert the new battery in the battery terminal.
   – The **Positive (+)** end of the battery faces toward the rear of the Instrument.

5a. Replace the cover, then fasten it back together with the **four (4) screws**.

b. Close the **Instrument door,** then screw in the **door fastener latches**.

W A R N I N G !

When replacing a battery,

DO NOT UNPLUG THE TS-3200 FROM THE AC Power!

If the unit is off and the battery is removed,

ALL MEMORY AND SETTINGS WILL BE LOST!

10.4. Load Cell Diagnostics

1. On **POWER-UP**, check for **CELLS FOUND 1,2,3,4,5,6,7,8, etc.**
   – Only properly wired and functioning sectional controllers are "found".
2. In **SERVICE MENU**, select **CELL OUTPUT (COUNTS)** and check for proper loading and proper cell outputs.

Appendix I: Email Data Designations

Email transaction data will include the weighment or printed types included as a two (2) letter designation. Listed below are these abbreviations.

- **FW** **F**irst **W**eight
- **RW** **R**e-**W**eight
- **DO** **D**ouble **F**irst **W**eight
- **RD** **R**e-weigh **D**ouble
- **TR** **T**riple **F**irst **W**eight
- **RT** **R**e-weigh **T**riple
- **VT** **V**oided **T**icket
- **RP** **R**e-**P**rint

Appendix II: FTP Report Sample Data

"9:55", "2-30-12", "10:50", "2-30-12", 62020, 20020, 42000, , , , , , , , 40, , , 2223, , , , , , , , , , , 420, 2732, , , , ,

"10:19", "2-30-12", "11:05", "2-30-12", 55460, 18960, 36500, , , , , , , , 36, , , 5148, , , , , , , , , , , 365, 2733, , , , ,

"10:23", "2-30-12", "11:20", "2-30-12", 73840,19640, 54200, , , , , , , , 26, , , 2289, , , , , , , , , , , 542, 2734, , , , ,

"10:45", "2-30-12", "11:50", "2-30-12", 70900, 21200, 49700, , , , , , , , 22, , , 8484, , , , , , , , , , , 497, 2735, , , , ,

"10:59", "2-30-12", "12:10", "2-30-12", 54980, 20280, 34700, , , , , , , , 36, , , 5974, , , , , , , , , , , 347, 2736, , , , ,

"13:20", "2-30-12", "14:00", "2-30-12", 65680, 19980, 45700, , , , , , , , 19, , , 4884, , , , , , , , , , , 457, 2737, , , , ,

"14:10", "2-30-12", "15:05", "2-30-12", 77480, 18880, 58600, , , , , , , , 14, , , 7563, , , , , , , , , , , 586, 2738, , , , ,

"15:50", "2-30-12", "16:30", "2-30-12", 64920, 20420, 44500, , , , , , , , 11, , , 7875, , , , , , , , , , , 445, 2739, , , , ,

Appendix III: Report Sample

TRANSACTION REPORT 3:09PM 4-09-2012 page 1

DATE	INBOUNDlb	IN TIME	OUTBOUNDlb	TIME OUT	NET lb	LOOP ID	PRODUCT ID	CUSOTMER
3-29-12	6800	7:30AM	48000	12:40PM 3-30-12	41200	48	112	998
3-29-12	7820	7:56AM	56600	1:12PM 3-29-12	48780	49	192	910
3-29-12	4200	8:14AM	62010	2:30PM 3-30-12	57810	50	114	915
3-29-12	10220	8:33AM	55990	3:20PM 3-29-12	45770	51	136	951
3-29-12	5222	8:54AM	69671	6:30PM 3-29-12	64449	52	101	901
3-29-12	7330	9:14AM	49010	2:20PM 3-30-12	41680	53	128	919
3-29-12	10234	9:30AM	55000	3:51PM 3-29-12	44766	54	136	921
3-29-12	5342	9:53AM	44438	4:20PM 3-29-12	39096	55	156	951
3-29-12	7790	10:13AM	48932	4:40PM 3-29-12	41142	56	112	939
3-29-12	10564	10:39AM	55498	4:59PM 3-29-12	44934	57	110	966
3-29-12	4987	10:59AM	63184	5:18PM 3-29-12	58197	58	136	890
3-29-12	8970	11:23AM	52348	5:20PM 3-29-12	43378	59	192	906
3-29-12	5890	11:51AM	64194	5:51PM 3-29-12	58294	60	188	998
3-29-12	7795	12:11AM	57777	7:30AM 3-30-12	49982	61	114	954
3-29-12	4020	12:30PM	55990	7:520AM 3-30-12	55570	62	136	951

TRANSASCTION REPORT 3:09PM 4-09-2012 page 2

NUMBER OF TRANSATIONS: 86
8016123 lb TOTAL NET WEIGHT
REPORT GENERATOR SETUP PARAMETERS

PRIORITY	ITEM	SEARCH FIELD
3	IN TIME	
5	TIME OUT	
1	DATE	3-29-12
2	INBOUND	
4	OUTBOUND	
6	NET	
8	PRODUCT ID	
0	CONVERSION 1	
0	CONVERSION 2	
7	LOOP ID	
0	FIELD NAME 1	
0	FIELD NAME 2	
0	FIELD NAME 3	
0	FIELD NAME 4	

TS-3200 Instrument

Operator Manual 51262

Manufactured by Thurman Scale
4025 Lakewood Crossing
Groveport, Ohio, 43215

Thurmanscale.com