THURMAN SCALE

Operators Manual

TS3300 Series Instrumentation

TS3311 NEMA 12 Desktop Instrument – Intalogix (40294)
TS3312 NEMA 4X Washdown Instrument – Intalogix (40234)



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1.0 SAFETY

Read this manual BEFORE operating, maintaining, or servicing the scale equipment. Follow all instructions carefully and save this manual for future reference.



⚠ WARNING

This manual is for use only by authorized service technicians responsible for installing, maintaining, and troubleshooting the digital weighing instrument. Failure to observe this precaution can result in property damage and/or personal injury and death.



⚠ WARNING

The AC power ground terminal must be connected to a properly grounded receptacle.



⚠ CAUTION

Remove power and wait one minute before connecting or disconnecting any internal electronic components or interconnecting wiring. Failure to observe this precaution can result in property damage and/or personal injury and death.



⚠ CAUTION

Instrument must be installed near an electrical outlet within the distance of the electrical cord.



⚠ WARNING

This equipment is a component of a scale system. The system design must be reviewed by qualified personnel who are trained with the construction, operation, and hazards of the application and all components in the scale system. Failure to observe this precaution can result in property damage and/or personal injury and death.



⚠ WARNING

All equipment must be installed in accordance with the installation instructions detailed in the manual. Incorrect or substitute components and deviations from these instructions can result in property damage and/or personal injury and death.



⚠ WARNING

This equipment is not designed for hazardous or explosive areas.

2.0 INTRODUCTION

2.1 PRODUCT DESCRIPTION

The TS3300 is designed to be a flexible, easy to configure and operate scale instrument for bench, floor, hopper, truck, and rail scales. The instrument can be configured in one of three available operating modes: Basic In/Out, Inbound/Outbound, and GTN.

2.1.1 KEY FEATURES

- 7-inch Color Display
- Numerical Keypad + 5 Function Buttons
- Enclosures: NEMA 12 Desktop or NEMA 4X Washdown
- Operating Modes:
    - Gross-Tare-Net (GTN)
    - Basic In/Out
    - Inbound Outbound
- Product Records
    - Upload products and append to weighments
    - Track product inventory
        - Ex: Product Y has 150,000 lbs. remaining in the silo.
- Customer Records
    - Upload customers and append to weighments
    - Monitor customer weighments
        - Ex: Customer X has received 650,000 lbs.
- Embedded Webserver
    - Remote Mode Access - TCP/IP (within customer's network)
    - Download Transaction Report
    - Mass Upload/Download Customer and Product Data
        - Up to 1,000 stored tares, 1,000 customer records, and 1,000 product records
    - View Product & Customer Summary Reports
    - Remote Troubleshooting (Cell Diagnostics Page)
    - Quick Configuration Tool (Service Technicians Only)
- Scale Apps
    - Accumulation
        - Accumulate weighments and print a transaction record using the 220 tape printer or T88VII thermal printer.
- Standard Communications:
    - (2) RS232 serial ports
    - (1) 20mA serial port
    - (1) Dedicated ACC 165 relay control box output (RS485)
    - (1) Ethernet TCP/IP port
    - (2) USB 2.0 ports
- (1) Expansion Card Slot (for accessory cards)
- Optional Accessory Cards:
    - RS485 serial
    - 4-20mA analog current loop – powered
    - 4-20mA analog current loop – non-powered
    - Voltage Outputs
    - Ethernet/IP
    - Modbus TCP
    - DeviceNet

2.1.2 SUPPORTED ACCESSORIES

Part Number	Model Number	Description
36234	ACC 167	Pass-through gland nut
36240	ACC 168	External Ethernet (RJ45) connector, NEMA 4
362411	ACC 169	External USB connector, NEMA 4
Accessory Cards:		
30921		Serial Expansion Accessory Card
30920		Traffic Light Relay Accessory Card
37068		Enhanced Analog Output Accessory Card 4-20 mA, 0-20 mA, 0-24 mA, 0-5V, 0-5.5V, 0- 10V, 0-11V, -5/5V, -5.5/5.5V, -10/10V, -11/11V,16-bit resolution, Powered
30919		4-20 mA Passive Accessory Card, (16 Bit Resolution)
37045		Ethernet/IP Fieldbus Accessory Card
37720		Modbus TCP Fieldbus Accessory Card
37044		DeviceNet Fieldbus Accessory Card

Table 2-1. Accessory Options

2.2 TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION
Display	7” diagonal, 800 x 480 resolution TFT Color LCD with LED backlight
Displayed Characters	7/8”
Load Cell Interface	(16) 1,000 Ohm or (10) 350 Ohm Load Cells
Load Cell Capacity	No Practical Limit
Load Cell Excitation	5 VDC
No. of Scales	One (1)
Resolution	10,000d Commercial 50,000d non-commercial
Scale Capacity	0-999,999
Division Size	0.0001-200
Units	lb, oz, kg, g, tons, tonne
Serial Input/ Output	(2) RS232, (2) USB 2.0, (1) Dedicated/Optically Isolated 20mA (active or passive)
Network Connection	One (1) RJ45 10/100 Base-T Ethernet Port
Storage	1,000 Tares 10,000 Transactions
Auto Zero Tracking	Selectable – Off, 0.5d, 1.0d, 3.0d
Motion Band	Selectable – Off, 0.5d, 1.0d, 3.0d
Zero Range	Selectable – 2%, 100%
Digital Filter	3 Stage Median of Means, Configurable
Digital Filter Presets	Light, Med/Light, Medium, Heavy/Med, Heavy, Animal
ENVIRONMENTAL	
Enclosure	NEMA 12 Stainless Steel/Aluminum Desktop NEMA 4X Stainless Steel Washdown
Operating Temperature	14°F to 104°F, (–10°C to 40°C).
Operating Humidity	NEMA 12 - 0 to 90% NEMA 4X - 0 to 100%
POWER REQUIREMENTS	
Incoming Voltage Requirement	100 VAC to 130 VAC, 50Hz\ 60Hz 200 VAC to 260 VAC, 50Hz\ 60Hz It is recommended to install a separate circuit from the circuit panel to the outlet used. There must not be more than 0.2VAC between AC neutral and ground.
Ground Requirements	For proper performance, the ground should have no more than 3.0 Ω resistance to true earth ground.
Power Consumption	< 30 W
ETL Listed	Conforms to UL STD 62368-1 Certified to CSA STD C22.2 #62368-1
Approvals	NTEP CC: 25-080 MC: pending
Accuracy	Class III/IIIL

Figure 2-2. Technical Specifications

2.3 FCC COMPLIANCE

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

For further information, contact the manufacturer or refer to the FCC's guidelines on unintentional radiators (47 CFR Part 15, Subpart B).

2.4 DISPOSAL

Proper disposal of this device is essential to ensure safety and compliance with environmental regulations. Follow these steps:

Power Down and Disconnect: Turn off the device and disconnect it from any power source to prevent electrical hazards.

Remove Accessories: Detach all cables, peripherals, and non-integrated components. Dispose of them separately according to their material type.

Follow Local Regulations: Electronic devices must not be disposed of in household waste. Contact your local waste management authority for e-waste recycling programs or designated drop-off locations.

Recycle Responsibly: Take the device to a certified e-waste recycling facility. Components such as circuit boards, batteries, and displays may contain hazardous materials (e.g., lead, mercury) that require special handling.

For additional guidance, consult the Waste Electrical and Electronic Equipment (WEEE) Directive or equivalent regulations in your region. Improper disposal may result in environmental harm or legal penalties.

2.5 NAVIGATING THIS MANUAL

This manual contains CAPITALIZED words separated by a colon (:) to communicate the structure within the menus. Example: **CONFIGURATION : PRODUCTS** - The word **PRODUCTS** is a menu item located in the **CONFIGURATION** menu.

2.6 USER RESPONSIBILITY

All electronic and mechanical calibrations and/or adjustments required for making this equipment perform to accuracy and operational specifications should be performed by trained service personnel.

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

2.7 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.
- Instructions within this manual apply to the instrument and its specific accessories. Installation procedures for printers and other peripherals are given in manuals specifically provided for those units. The instructions include a pre-installation checkout which must be performed either at the service center before the technician goes to the site, or at the site before he places the equipment in service.
- All electronic and mechanical calibrations and/or adjustments required to make this equipment perform to accuracy and operational specifications are considered to be part of the installation and are included in the installation charge. **Only those charges which are incurred as a result of the equipment's inability to be adjusted or calibrated to performance specifications may be charged to warranty.**
- Absolutely no physical, electrical, or program modifications other than selection of standard options and accessories are to be made to this equipment. Electrical connections other than those specified may not be performed, and no physical alterations (mounting holes, etc.) are allowed and will immediately void warranty.

3.0 INSTALLATION

3.1 INTRODUCTION

Installation and Operational Guidelines for a Thurman Scale weighing instrument:

Pre-Installation Verification:

- Prior to installation, confirm that the instrument meets the customer's requirements as specified in the order and this manual.
- If the equipment cannot fulfill the application's needs and the application cannot be adjusted to align with the equipment's design parameters, do not proceed with installation. Consult the Area Sales Manager and customer to resolve discrepancies.

Handling and Replacement of Printed Circuit Assemblies:

- The instrument contains printed circuit assemblies (PCAs) that are sensitive to electrostatic discharge (ESD). Always follow ESD handling procedures during service or replacement.



- PCAs must be replaced as complete units; individual component repairs are prohibited.

  Package replaced PCAs in ESD-protective material and return them intact for replacement or disposal following standard procedures.

Installation Scope and Documentation:

- This manual provides installation, configuration, and operating instructions for the instrument and its specific accessories. For peripheral devices (e.g., printers), refer to their respective manuals.
- Conduct a pre-installation checkout, either at the service center before traveling to the site or on-site before commissioning the equipment.
- Installation includes all electronic and mechanical calibrations or adjustments necessary to meet accuracy and operational specifications, covered under the installation charge.
- Additional charges may apply under warranty only if the equipment cannot be calibrated or adjusted to performance specifications.

Restrictions on Modifications:

- No physical, electrical, or software modifications are permitted beyond the selection of standard options and accessories.
- Do not make electrical connections other than those specified in this manual.
- Physical alterations (e.g., drilling mounting holes) are prohibited and will void the warranty immediately.

Customer and Operator Responsibilities:

- The customer and operator must ensure the instrument operates within its specified parameters and is protected from accidental damage or intentional misuse.
- Report any issues promptly to maintain warranty coverage and ensure safe operation.

3.2 PRE-INSTALLATION

3.2.1 SAFETY AND INSTALLATION REQUIREMENTS FOR SCALE COMPONENTS

Minimum Clearance from High-Energy Circuits:

- All scale components, including load cells, load cell cables, interconnecting cables, digital weight indicators, junction boxes, and home-run cables, must be installed at least 36 inches (91 cm) away from single- or multi-phase high-energy circuits and electrical conductors.
- Peripheral devices, such as printers, remote displays, and auxiliary data entry devices, must also maintain this 36-inch (91 cm) separation from high-energy sources.

Separation from High-Energy Equipment:

- Scale components must be positioned at least 36 inches (91 cm) from high-energy devices and systems, including but not limited to:
    - Machinery operating at 100–480 VAC.
    - High-voltage wiring, AC power transformers, overhead or buried cables, electrical distribution panels, electric motors, fluorescent or high-intensity lighting with ballast assemblies, and electric heating equipment.

Incompatible Power Sources:

- Scale components, including digital weight indicators and peripheral devices, are not designed to operate on power supplied by internal combustion engine-driven electric generators or similar equipment. Use only manufacturer-approved and grid power sources to ensure safe and reliable operation.

Protection from Electric Arc Welding:

- Electric arc welding near scale components can cause severe damage to digital weight indicators, junction boxes, sectional controllers, power supplies, and load cells. Ensure welding activities are conducted at a safe distance or that scale components are properly shielded or powered off during welding.

Operator Training and Responsibility:

- The service technician must ensure that customer personnel are thoroughly trained and familiar with the equipment’s capabilities, limitations, and safety requirements before completing the installation. Proper training is critical to safe and effective operation.

3.2.2 PRE-INSTALLATION CHECKLIST

Before the service technician proceeds to the installation site, the following points must be reviewed and, if necessary, discussed with the Area Sales Manager and the customer:

☐ Business Operations:
- Inform and coordinate with the customer to avoid disrupting normal operations and request they make appropriate arrangements to minimize impact.

☐ Power Supply:
- Verify that a properly grounded power source is available at the installation location, compliant with the equipment's specifications.

☐ Operator Training:
- Ensure that designated equipment operators are available for training during the installation process.

☐ Setup Review:
- Collaborate with the Local Sales or Service Manager to review the recommended setup and identify any modifications needed to meet the customer's specific application requirements.

☐ Equipment Positioning:

Consider the following when selecting the installation location:

- Avoid intense direct sunlight, which may damage the display.
- Do not place near magnetic materials or equipment/instruments that use magnets, as these may interfere with operation.
- Select a location with stable temperatures within the equipment's specified range, as extreme variations can affect weighing accuracy.

3.3 UNPACKING & INSPECTION

Each box includes one instrument, (2) lead seals, and instructions for locating the operator's manual on www.thurmanscale.com.

UNPACKING INSTRUCTIONS

1. Verify all components and accessories against the customer's order and packing list.
2. Remove components from packaging, inspecting for damage and ensuring all items match the invoice.
3. Report any damage to the shipper immediately and order replacement parts as needed.
4. Retain the shipping container and packing materials for future use.
5. Gather all included literature for the customer.
6. Open the equipment and inspect internal components, ensuring hardware, electrical connections, and printed circuit assemblies are secure.
7. Reinstall the equipment cover if final installation does not immediately follow the pre-installation inspection.

3.4 PRODUCT DIMENSIONS

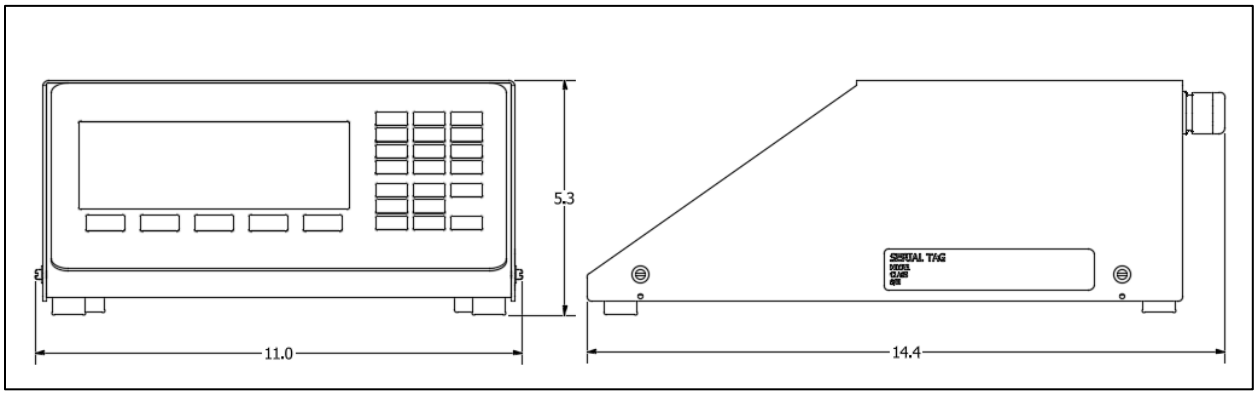


Figure 3-1. NEMA 12 Desktop Dimensions

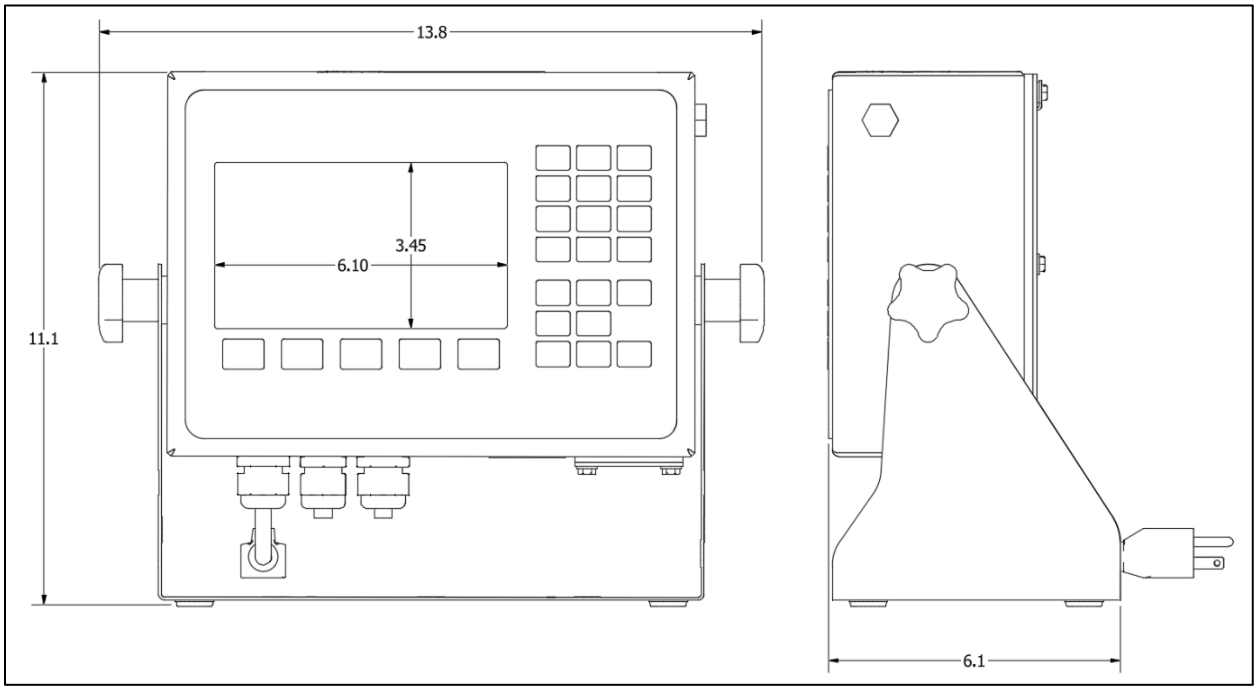


Figure 3-2. NEMA 4X Washdown Dimensions

3.5 MOUNTING INSTRUCTIONS

3.5.1 NEMA 12 DESKTOP

Install TS3300 Desktop instruments in protected indoor environments only.

3.5.2 NEMA 4X WASHDOWN WITH DESK/WALL STAND

The washdown instrument arrives assembled to a universal desk/wall mounted stand that can be set on a flat surface unmounted or affixed to a desk or wall using two 1/4-inch screws or bolts. The stand may also be affixed to a Thurman Scale pillar.

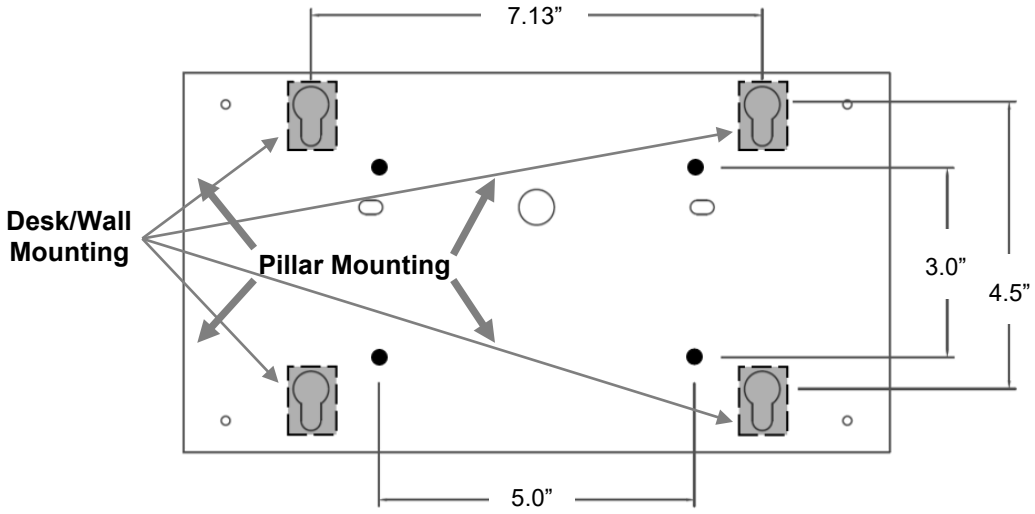


Figure 3-3. Desk/Wall Stand (Top-Down View)

DESK OR WALL MOUNTING

1. Remove TS3300 instrument from the standby unscrewing the friction nuts.
2. Mark locations to pre-drill screws using the stand as a template.
3. Drill holes with an appropriately sized drill bit.
4. Secure the mount using the screws or bolts. (not included)
5. Reassemble TS3300 instrument to the stand ensuring the friction disks are placed between the instrument housing and the mount.

PILLAR MOUNTING

1. Using the four screws, washers and nuts included with the pillar kit, affix stand to the pillar.
2. Re-assemble TS3300 instrument to the stand ensuring the friction disks are placed between the instrument housing and the stand. Route cables through the center hole.

3.6 OPENING THE ENCLOSURE

3.6.1 NEMA 12 DESKTOP

1. Disconnect instrument from power.
2. Place instrument on a flat and level surface with anti-static work mat.
3. Unscrew the (4) flat-head screws holding the top access cover.
4. Remove access cover from enclosure.

3.6.2 NEMA 4X WASHDOWN WITH DESK/WALL STAND

1. Disconnect instrument from power.
2. Place instrument on a flat and level surface with anti-static work mat.
3. Ensure thumbscrews on side of instrument are hand-tight to prevent instrument rotation.
4. Rotate instrument display side down.
5. Unscrew the (8) screws holding the rear access cover. (5/16-inch screw head).

3.7 CORD GRIP CONNECTIONS

3.7.1 NEMA 12 DESKTOP

The TS3300 Desktop models include (1) PG11 cord grip for the home run cable. Plugs are included for use when no cabling is required for the accessory cord grips to prevent moisture ingress. Cord grip nuts must be torqued to 22 in-lbs (2.5 N-m) to secure the cable. If a cord grip is replaced the inner nut must be torqued to 33 in-lbs (3.7 N-m)

The PG11 cord grips are rated for cable diameters of 0.19 inches to 0.393 inches. (5 – 10 mm).

3.7.2 NEMA 4X WASHDOWN WITH DESK/WALL STAND

The TS3300 Washdown models includes (6) PG11 cord grips for the power cable, home run cable, and accessory cabling. Plugs are included for use when no cabling is required for the accessory cord grips to prevent moisture ingress. Cord grip nuts must be torqued to 22 in-lbs (2.5 N-m) to secure the cable. If a cord grip is replaced the inner nut must be torqued to 33 in-lbs (3.7 N-m).

The PG11 cord grips are rated for cable diameters of 0.19 inches to 0.393 inches. (5 – 10 mm).

3.8 INSTRUMENT ELECTRONICS

The TS3300 instrument includes a Breakout PCB, Expansion Board PCB, and CPU board. The breakout board is determined by the load cell interface and style of enclosure selected.

BREAKOUT BOARD

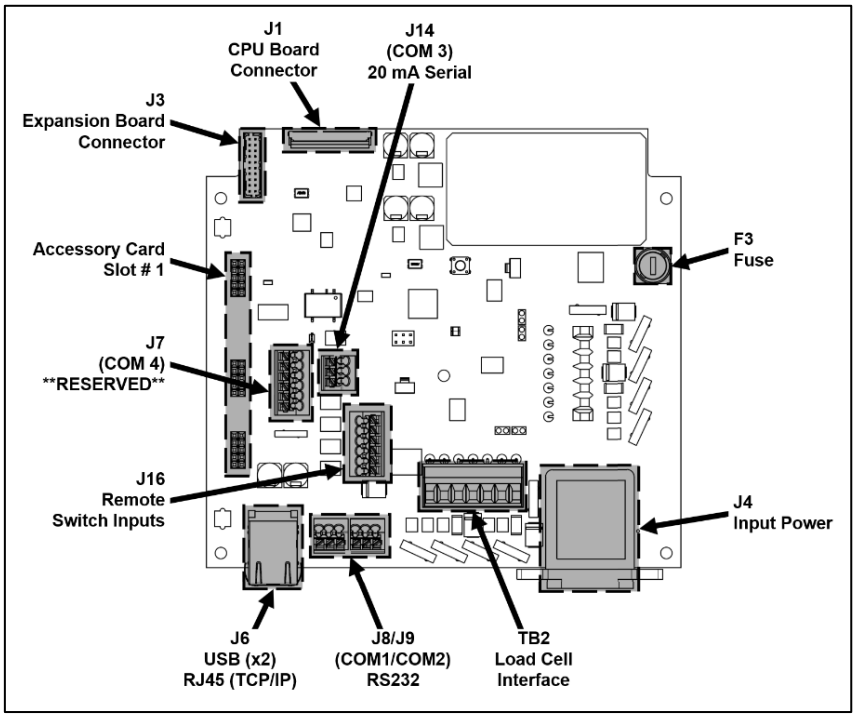


Figure 3-4. Analog Breakout Board Layout

CPU BOARD

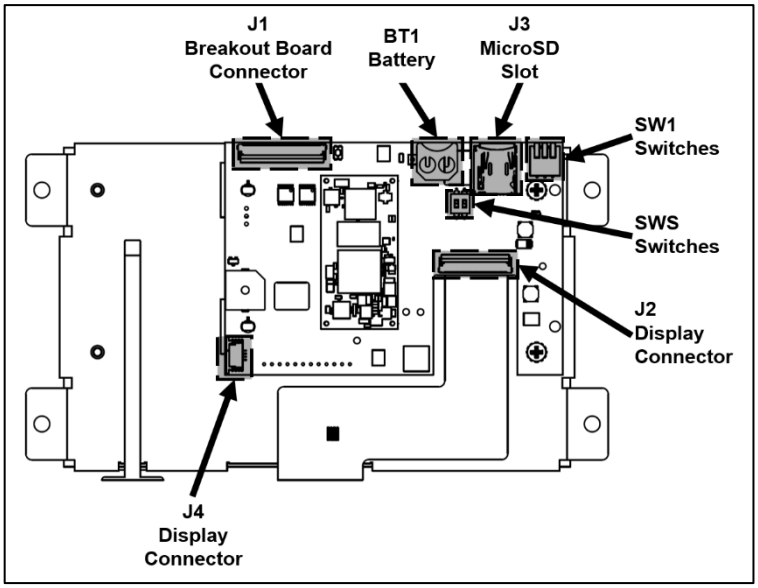


Figure 3-5. CPU Board Layout *(PCB shown assembled with display)*

3.9 POWER CONNECTIONS

Power may be supplied in either 120VAC or 220VAC single phase, 50-60 Hz. See sections below for wiring instructions. There must not be more than 0.2VAC between AC neutral and ground. It is recommended to install a separate circuit from the circuit panel to the outlet used.

3.9.1 NEMA 12 DESKTOP

Connect the included power cable to the TS3300 instrument. Connect power cable to a wall receptacle.

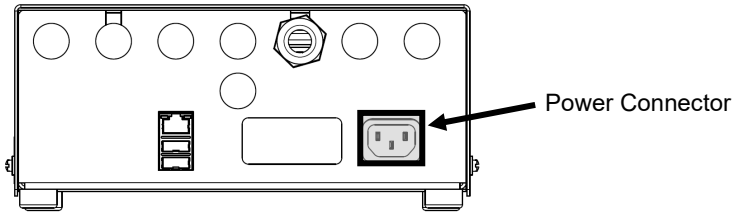


Figure 3-6. TS3300 Desktop (rear view)

3.9.2 NEMA 4X WASHDOWN WITH DESK/WALL STAND

The instrument includes a six-foot 120VAC pre-wired cable. Connect power cable to a wall receptacle.

3.10 HOME RUN CABLE DETAILS

Intalogix Home Run Cable Length Limit – 1,000 & 750 Ohm Load Cells			
# of Load Cells	# of Smart Sectional Controllers (SSC's)	Max Total Home Run Cable Distance (1 PPS)	Max Total Home Run Cable Distance (2 PPS)
(1-10) Load Cells	1-5	1,800 FT	3,600 FT
(12) Load Cells	6	1,150 FT	2,300 FT
(14) Load Cells	7	800 FT	1,600 FT
(16) Load Cells	8	575 FT	1,150 FT

Figure 3-7. Intalogix Home Run Cable Length Limit – 1,000 and 750 Ohm Load Cells

Intalogix Home Run Cable Length Limit – 350 Ohm Load Cells			
# of Load Cells	# of Smart Sectional Controllers (SSC's)	Max Total Home Run Cable Distance (1 PPS)	Max Total Home Run Cable Distance (2 PPS)
(1-6) Load Cells	1-3	1,575 FT	3,150 FT
(8) Load Cells	4	1,000 FT	2,000 FT
(10) Load Cells	5	575 FT	1,150 FT

Figure 3-8. Intalogix Home Run Cable Length Limit – 350 Ohm Load Cells

Intalogix Approved Home Run Cables	
Part Number	Description
17246	6-Conductor, Shielded Pairs, Gray PVC Jacket, (2) 18 Ga., (4) 22 Ga.
17245	6-Conductor, Shielded Pairs, Gray PVC Jacket With S/S Overbraid, (2) 18 Ga., (4) 22 Ga.

Figure 3-9. Intalogix Approved Home Run Cables

3.10.1 COM1/COM2: RS-232 SERIAL COMMUNICATION

The TS3300 includes two RS-232 serial communication connection. See the following tables (*Figures 3-10 and 3-11*) TS3300 terminal assignments.

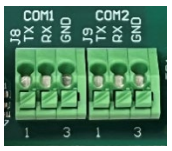
	Pin Number	Conductor	Image
Breakout Board Terminal Block J8	1	TX	
	2	RX	
	3	*Ground*	

Figure 3-10. COM1 RS-232 Serial Terminal Assignments

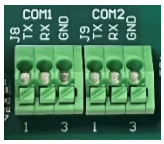
	Pin Number	Conductor	Image
Breakout Board Terminal Block J9	1	TX	
	2	RX	
	3	Ground	

Figure 3-11. COM2 RS-232 Serial Terminal Assignments

3.10.2 COM3: 20MA SERIAL COMMUNICATION

The TS3300 includes one 20mA communication connection. See Table 3-6 for TS3300 20mA terminal assignments.

	Pin Number	Conductor	Image
Breakout Board Terminal Block J14	1	V+	
	2	20mA	
	3	Ground	

Figure 3-12. 20mA Serial Terminal Assignments

WIRING DIAGRAM – 1601/1605 REMOTE DISPLAY WIRING

Wire the 1061/1605 remote display either actively or passively powered.

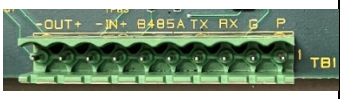
TS3300		1601/1605(T)(RF) Wiring – **Passively** Powered Current Loop			
Breakout Board Terminal Block TB2		PCB Terminal Block TB1			
Pin Number	Conductor	Pin Number	Conductor	Special	Picture
2	20mA	1	P		
3	Ground	7	IN+		
		2	G	} Jumper Pin 2 to Pin 8	
		8	IN-		

Figure 3-13. Table for Wiring 1601/1605(T)(RF) Remote Displays – Passively Powered Current Loop

TS3300		1601/1605(T)(RF) Wiring - **Actively** Powered Current Loop			
Breakout Board Terminal Block TB2		PCB Terminal Block TB1			
Pin Number	Conductor	Pin Number	Conductor	Special	Picture
1	+V	8	IN-		
2	20mA	7	IN+		

Figure 3-14. Table for Wiring 1601/1605(T)(RF) Remote Displays – Actively Powered Current Loop

3.10.3 USB1/USB2: USB

Connect supported USB printers and/or external keyboard using a USB Type A connector. A USB flash drive may also be used to create backups and restore configuration files.

Note: *USB cannot be configured for weight output. Use an external serial to USB adapter if desired.*

3.10.4 USB1/USB2: ETHERNET (TCP/IP)

Connect an ethernet cable to the RJ45 port for TCP/IP network connectivity and remote access to the webserver.

3.10.5 REMOTE SWITCH INPUTS

The TS3300 can accept remote commands using unpowered remote switches. Up to four remote switches may be wired. Wire each remote switch to a numbered terminal and a common terminal.

Note: *Remote Switch Inputs and 20mA output share a common ground. Remote switches cannot be grounded when a remote display is communicating over 20mA to avoid a ground loop.*

	Pin Number	Conductor	Image
Breakout Board Terminal Block J16	1	Remote Switch 1	
	2	Remote Switch 2	
	C	Shared Common	
	3	Remote Switch 3	
	4	Remote Switch 4	
	C	Shared Common	

Figure 3-15. COM4 ACC 165 Relay Control Box Terminal Assignments

3.11 ACCESSORY CARDS

One accessory card may be installed in the available expansion port for external communications. See Section 5 for configuration.

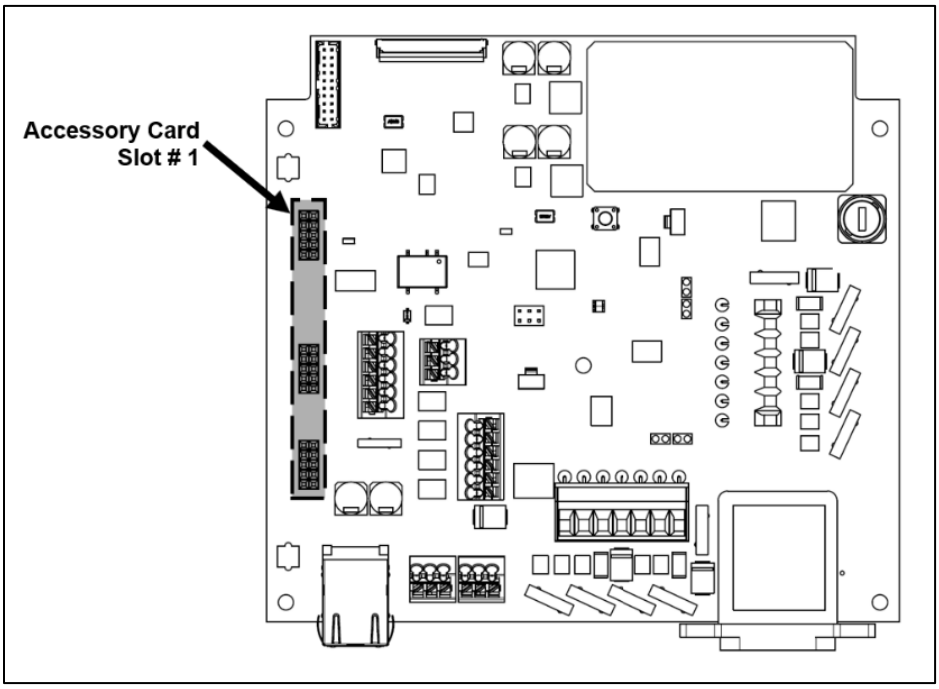


Figure 3-16. Accessory Card Slot Location

3.11.1 ACCESSORY CARD INSTALLATION

1. Disconnect power from instrument.
2. Install accessory card alignment guides. *(if provided)*
3. Insert the accessory card vertically into the accessory card slot.
4. Terminate wiring as required.

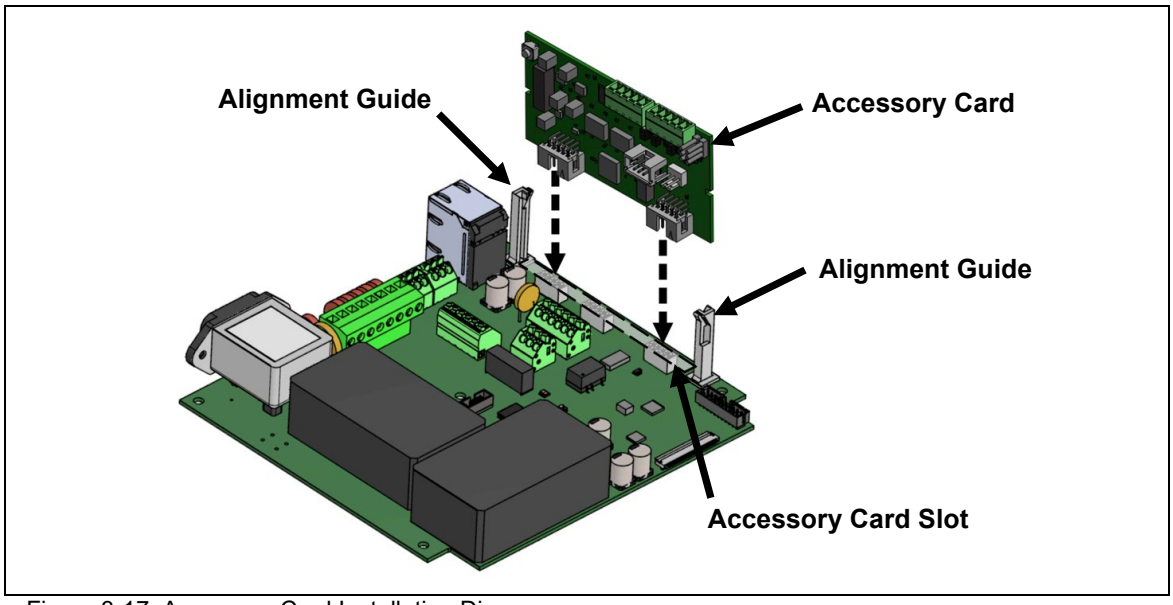


Figure 3-17. Accessory Card Installation Diagram

3.11.2 (30920) TRAFFIC LIGHT RELAY ACCESSORY CARD

Up to two traffic lights may be controlled using the Traffic Light Relay Accessory Card.

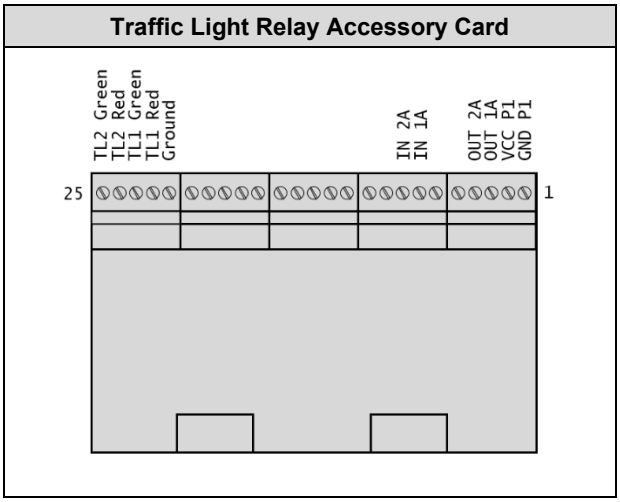


Figure 3-18. Traffic Light Relay Card Diagram

Terminal Block Pinout Assignments		
Pin Number	Conductor	Notes
1	GND P1	ACC 713 Output (Relay)
2	VCC P1	
3	OUT 1A	
4	OUT 2A	
5	Not Used	
6	Not Used	
7	IN 1A	
8	IN 2A	
9….20	Not Used	

21	Ground	ACC 777 Output (5V D.O.)
22	TL1 Red	
23	TL1 Green	
24	TL2 Red	
25	TL2 Green	

Figure 3-19. COM4 ACC 165 Relay Control Box Terminal Assignments

WIRING DIAGRAM – ACC 777

Traffic Light Relay Card			ACC 777	
Accessory Terminal Block J7			PCB Terminal Block TB2	
Image	Pin Number	Conductor	Pin Number	Image
Traffic Light #1	22	Red Light	1	
	23	Green Light	2	
	21	Ground	3	
Traffic Light #2	24	Red Light	1	
	25	Green Light	2	
	21	Ground	3	

Figure 3-20. ACC 777 Wiring Chart

WIRING DIAGRAM – ACC 713 + (1) TL1 TRAFFIC LIGHT

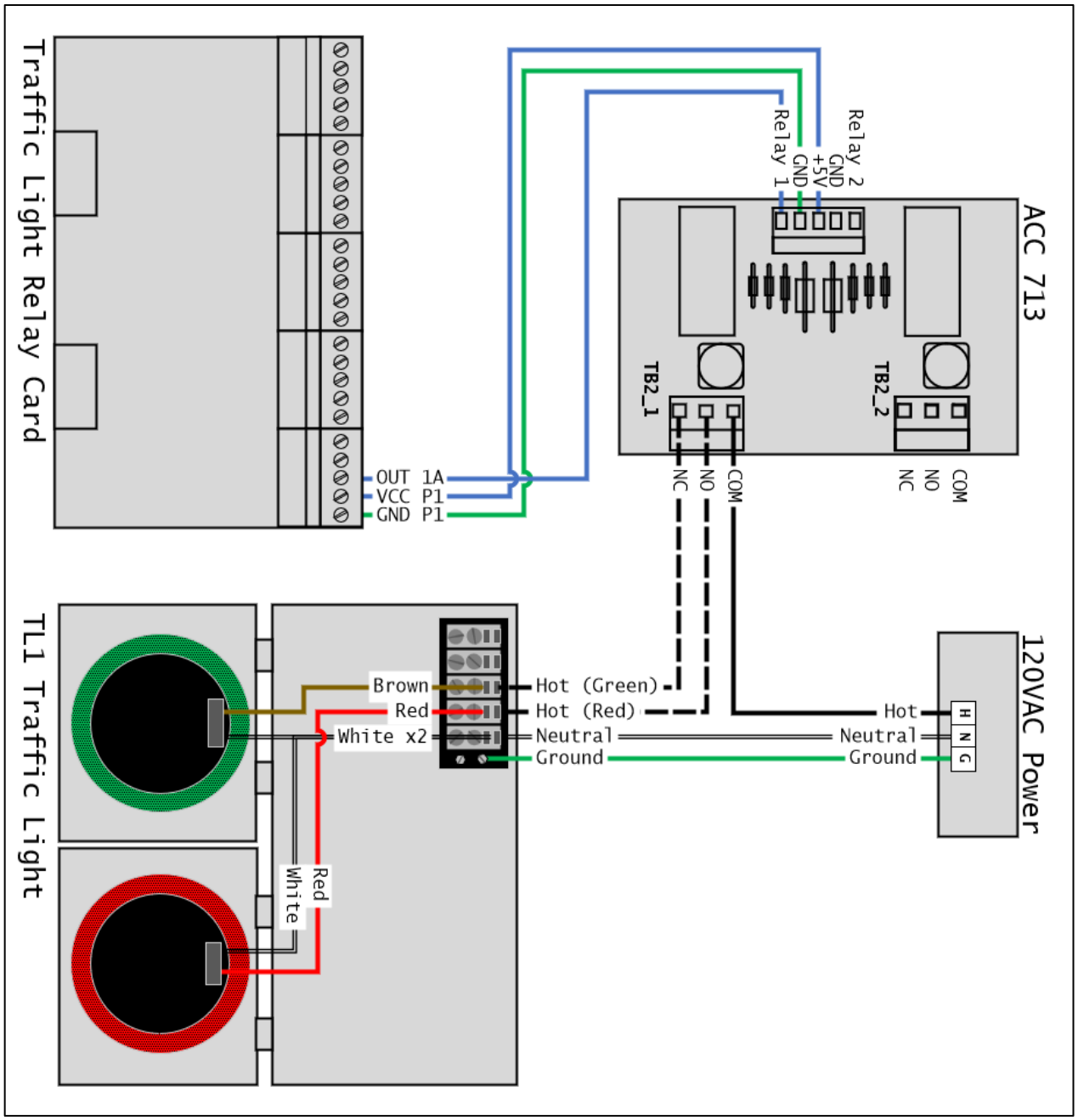


Figure 3-21. Wiring Diagram – ACC 713 + TL1 Traffic Light

WIRING DIAGRAM – ACC 713 + (2) TL1 TRAFFIC LIGHTS

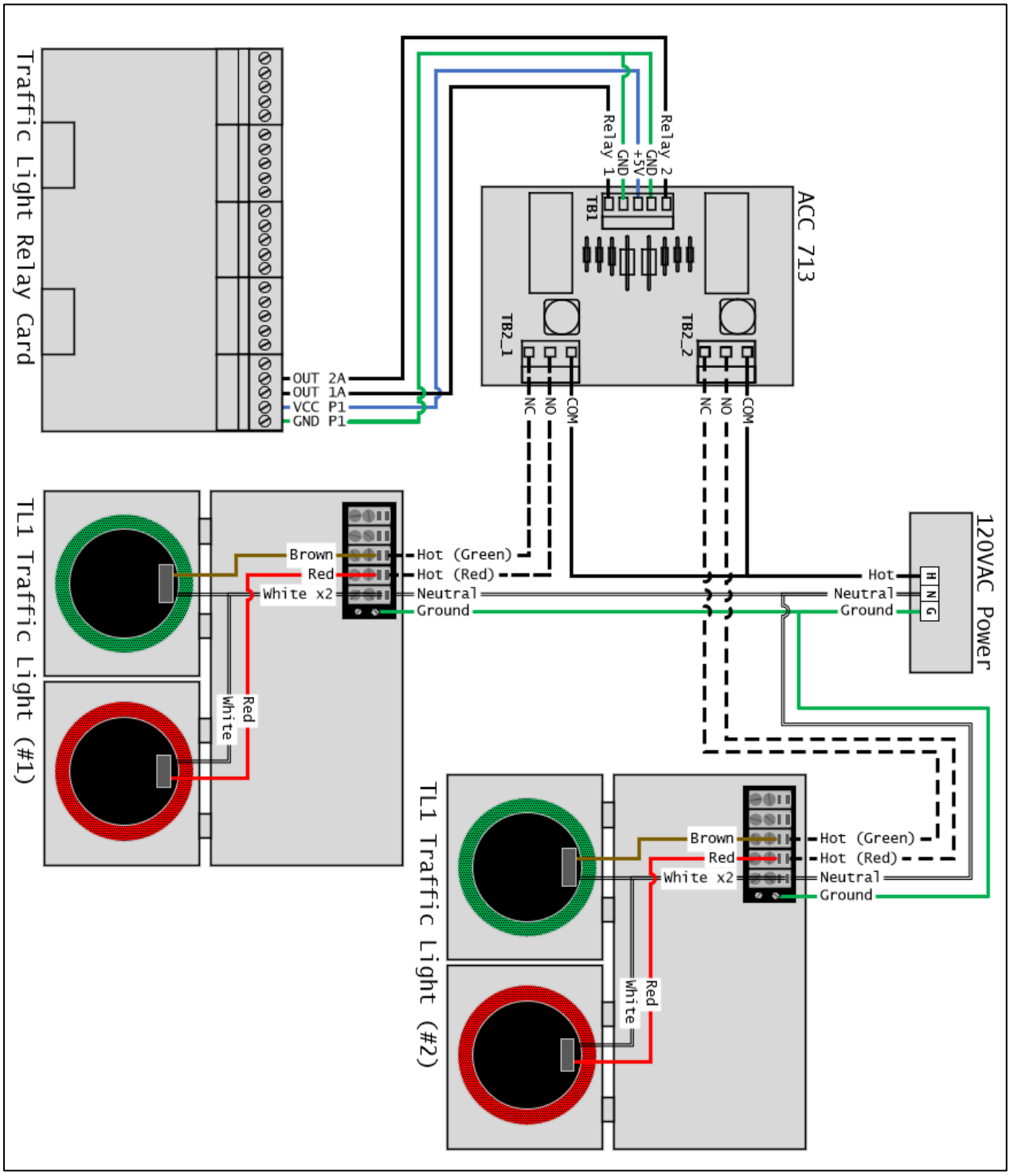


Figure 3-22. Wiring Diagram – ACC 713 + (2) TL1 Traffic Lights

WIRING CHART – ACC 703

Traffic Light Relay Accessory Card		703 Wiring Harness	
Pin Number	Description	Wire Color	Notes
1	GND	Black	*Legacy instruments may connect to 703 using a factory wired plug. Cut and discard the plug on the side that connects to the instrument.
2	+5VDC	Brown	
3	OUT1A	Red	
4	OUT2A	Orange	
5	Not Used	Yellow	
6	Not Used	Green	
7	IN1A	Blue	
8	IN2A	Violet	
9	Not Used	Grey	
10	Not Used	White	

Figure 3-23. Traffic Light Relay Accessory Card to ACC 703 Wiring Chart

WIRING DIAGRAM – ACC 703 + TL1 TRAFFIC LIGHTS

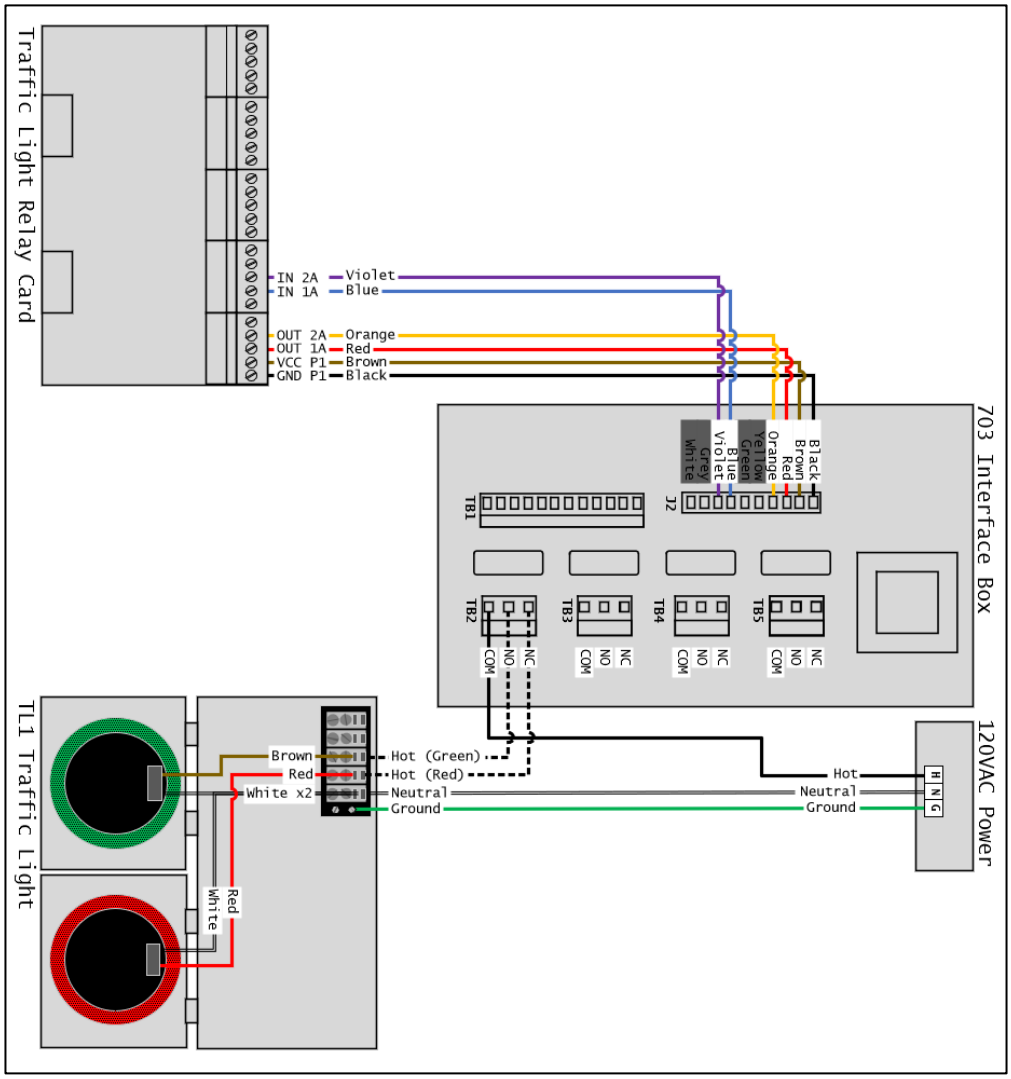


Figure 3-24. Wiring Diagram - ACC 703 + TL1 Traffic Light

WIRING DIAGRAM – ACC 703 + (2) TL1 TRAFFIC LIGHTS

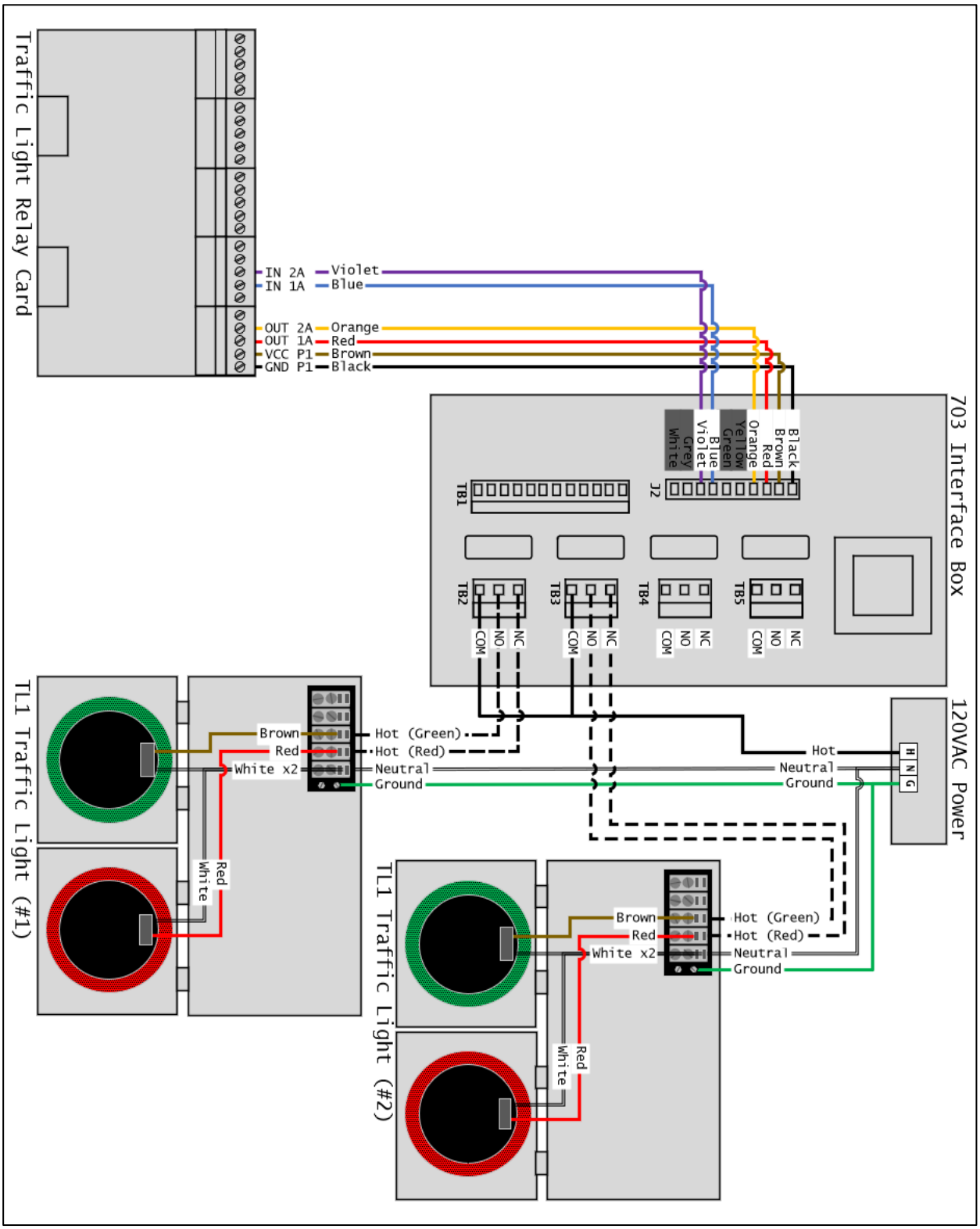


Figure 3-25. Wiring Diagram - ACC 703 + (2) TL1 Traffic Light

WIRING DIAGRAM – 2018 TRAFFIC RELAY BOX + TL1 TRAFFIC LIGHTS

Note: *Set DEVICE ATTACHED to 2018 in Expansion Card Menu.*

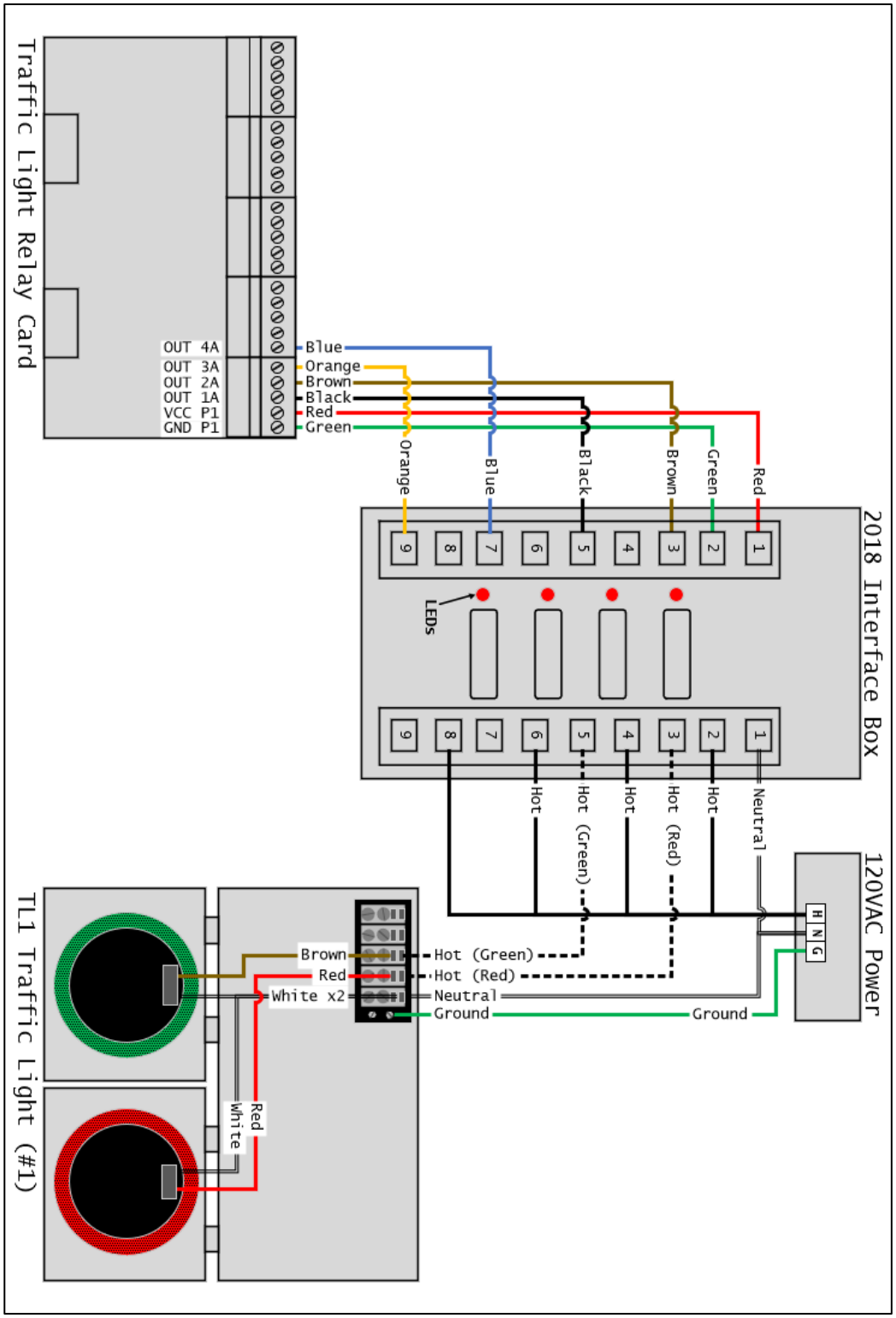


Figure 3-26. Wiring Diagram – 2018 Traffic Relay Box + TL1 Traffic Light

3.11.3 (30921) SERIAL EXPANSION ACCESSORY CARD

The Serial Expansion Accessory card can transmit data using four available ports. See (51157) 1600 Series LED Remote Display Installation Manual for multi-remote display installation guidance.

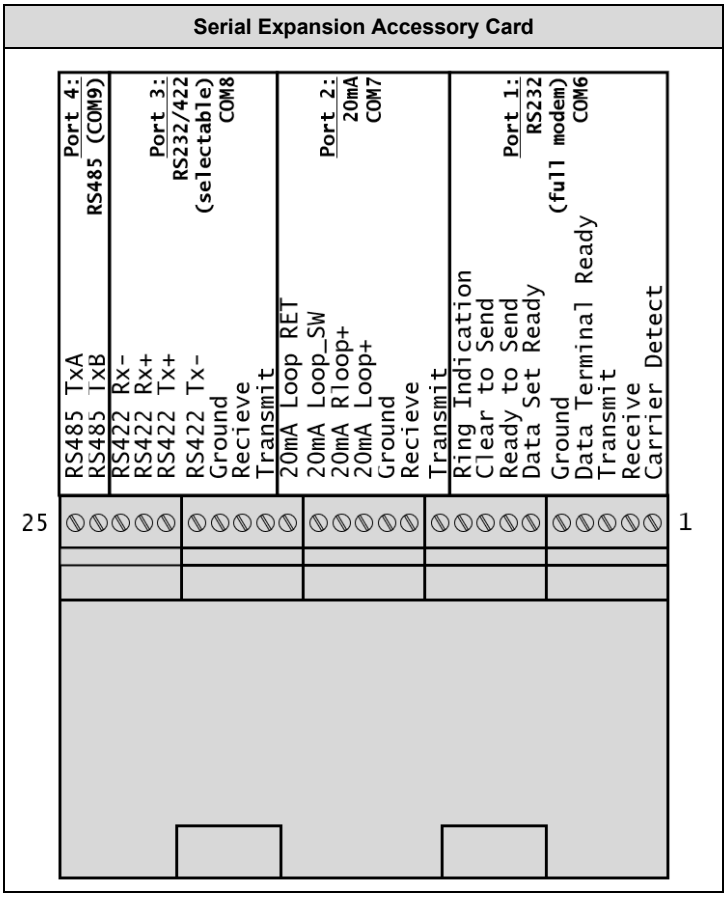


Figure 3-27. Serial Expansion Accessory Card Diagram

Serial Expansion Card Terminal Block Assignments		
	Pin Number	Conductor
Port 1 COM6 RS232	1	Carrier Detect
	2	Receive
	3	Transmit
	4	Data Terminal Ready
	5	Ground
	6	Data Set Ready
	7	Ready To Send
	8	Clear To Send
	9	Ring Indication
Port 2 COM7 – 20mA (Active or Passive)	10	Transmit
	11	Receive
	12	Ground
	13	20 mA Loop+
	14	20 mA RLoop+
	15	20 mA Loop_SW
	16	20 mA Loop RET
Port 3 COM8 – RS232/422 (Selectable)	17	Transmit
	18	Receive
	19	Ground
	20	RS422Tx -
	21	RS422Tx +

	22	RS422Rx +
	23	RS422Rx -
Port 4 COM9 RS485	24	RS485 TxB
	25	RS485TxA

Figure 3-28. Serial Expansion Accessory Card Terminal Block Assignments.

Maximum Cable Distance Chart		
	Max Distance	Notes
RS232	50 FT	
20mA	1,000 FT	Less than 300 FT = Use Cable 17216
RS485	4,000 FT	300-1,000 Ft = Use Cable 20903

Figure 3-29. Serial Expansion Accessory Card – Maximum Cable Distances

WIRING 160X REMOTE DISPLAY (RS232)

Serial Expansion Accessory Card		160x Remote Display Terminal Block TB1	
Pin Number	Pin Label	Pin Number	Pin Label
3	Transmit	3	RX
5	Ground	2	G

Figure 3-30. Serial Expansion Accessory Card to 160X Remote Display (RS232) Wiring Chart

WIRING 160X REMOTE DISPLAY (20MA ACTIVE)

Serial Expansion Accessory Card		160x Remote Display Terminal Block TB1	
Pin Number	Pin Label	Pin Number	Pin Label
15	20 mA Loop_SW	7	IN (+)
16	20 mA Loop RET	8	IN (-)

Figure 3-31. Serial Expansion Accessory Card to 160X Remote Display (20mA Active) Wiring Chart

WIRING 160X REMOTE DISPLAY (20MA PASSIVE)

Serial Expansion Accessory Card		160x Remote Display Terminal Block TB1		
Pin Number	Pin Label	Pin Number	Pin Label	Special:
14	20 mA RLoop+	1	P	
15	20 mA Loop_SW	7	IN (+)	
		2	G	{ Jumper Pin 2 to Pin 8
		8	IN (-)	

Figure 3-32. Serial Expansion Accessory Card to 160X Remote Display (20mA Passive) Wiring Chart

WIRING 160X REMOTE DISPLAY (RS485)

Serial Expansion Accessory Card		160x Remote Display Terminal Block TB1	
Pin Number	Pin Label	Pin Number	Pin Label
2	GND	2	G
5	RS485A	5	485A
6	RS485B	6	485B

Figure 3-33. Serial Expansion Accessory Card to 160X Remote Display (RS485) Wiring Chart

3.11.4 (30919) 4-20MA ANALOG OUTPUT ACCESSORY CARD – PASSIVE

The passive card is for use when an external 24VDC power supply is powering the 4-20mA current loop. External power supply must be dedicated and isolated. A 100-150 Ohm resistor is recommended as detailed in the below.

4-20mA Analog Output Accessory Card – Passive	
Pin Number	Pin Label
1	Output (+)
3	Output (-)

Figure 3-34. 4-20mA Analog Output Accessory Card Wiring Chart

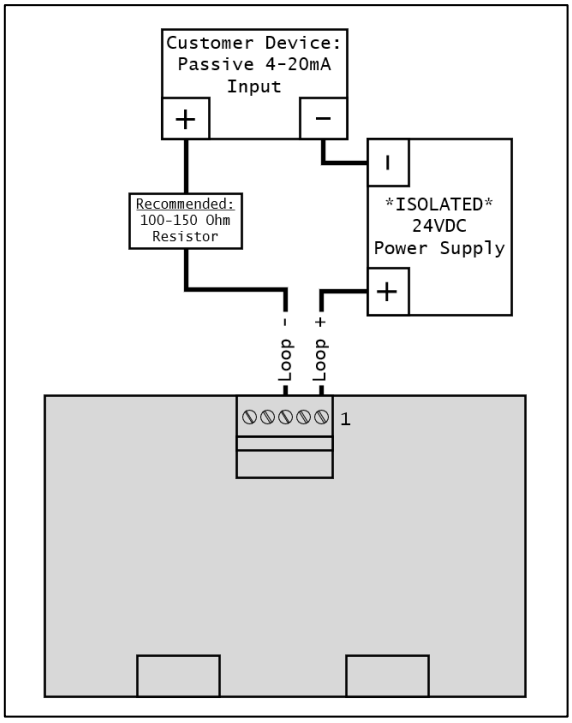


Figure 3-35. Wiring Diagram - 4-20mA Analog Output Accessory Card – Passive

3.11.5 (37068) ENHANCED ANALOG OUTPUT ACCESSORY CARD

4-20MA CURRENT LOOP – ACTIVE

Enhanced Analog Output Accessory Card		Customer Device
Terminal Block **J3**		
Pin Number	Pin Label	Pin Label
1	I OUT +	IN +
2	I OUT –	IN –

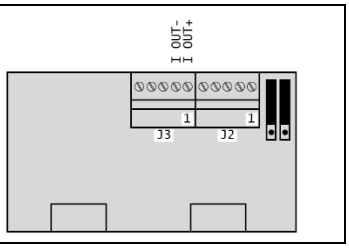


Figure 3-36. Enhanced Analog 4-20mA (Active) Output Wiring Chart

*When testing with a voltmeter, ensure positive lead is plugged into the mA/uA port and set to DC amperage.

VOLTAGE OUTPUT

Enhanced Analog Output Accessory Card		Customer Device
Terminal Block **J2**		
Pin Number	Pin Label	Pin Label
2	I OUT +	IN +
3	I OUT –	IN –

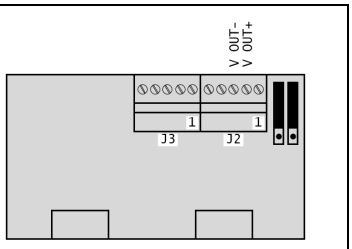


Figure 3-37. Enhanced Analog Voltage Output Wiring Chart

3.11.6 (37045) ETHERNET/IP INTERFACE ACCESSORY CARD

Wire ethernet cable to the RJ45 jack located on the accessory card.

3.11.7 (37720) MODBUS TCP INTERFACE ACCESSORY CARD

Wire ethernet cable to the RJ45 jack located on the accessory card.

3.11.8 (37044) DEVICENET INTERFACE ACCESSORY CARD

Pin Number	Pin Label	Description
1	V	Negative Bus Supply Voltage
2	CAN_L	CAN Low Bus Line
3	SHIELD	Cable Shield
4	CAN_H	CAN High Bus Line
5	V+	Positive Bus Supply Voltage

Figure 3-38. DeviceNET Wiring Chart

3.11.9 (31079) ANALOG SIC ACCESSORY CARD

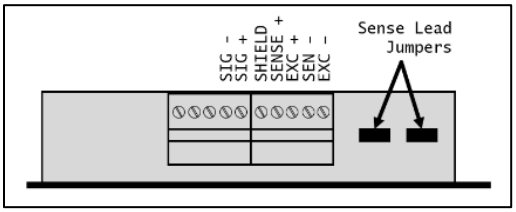


Figure 3-39. Analog SIC Accessory Card Diagram

NOTE*: Remove sense lead jumpers when cable length exceeds 25 FT.*

3.12 REASSEMBLY

3.12.1 NEMA 12 DESKTOP

1. After wiring and calibration, reinstall the top cover and torque screws to 10 in-lbs.
2. Install and crimp lead seals as required.

3.12.2 NEMA 4X WASHDOWN WITH WALL/DESK STAND

1. After wiring and calibration, reinstall rear access cover and torque screws to compress the gasket by 1/3 in accordance with the below screw torquing pattern.

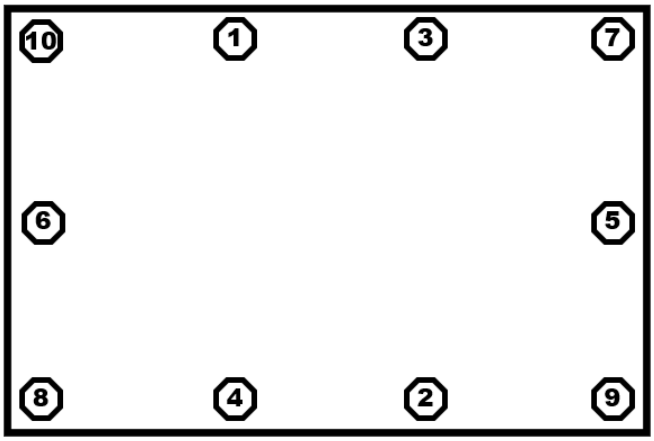


Figure 3-40. Rear Access Cover - Screw Torquing Pattern

3.13 POST-INSTALLATION CHECKLIST

Hardware Installation

- ☐ Verify all wiring is terminated or capped.
- ☐ Verify all screw terminals (instrument, accessories, scale) are properly torqued
- ☐ Verify all terminal blocks are fully seated.
- ☐ Verify wiring runs are clean and secure.
- ☐ Verify instrument, pit power supply, smart sectional controllers, QLC boxes, etc. are wire-sealed.
- ☐ Verify calibration tags are signed.
- ☐ Verify scale equipment is adequately mounted and secure.
- ☐ Verify serial tags are present on scale, instrument, and appropriate accessories.

Process Validation:

- ☐ Verify communication with third party devices.
- ☐ Present the scale and instrument weighing operation to customer representatives. Show representatives how to operate the equipment in accordance with the customer's application.
- ☐ Verify customer requirements and expectations have been met.

Onsite Training:

- ☐ Provide equipment operations training to onsite representatives.
- ☐ Provide equipment maintenance training to onsite representatives.

4.0 OPERATION

4.1 OPERATING MODES

The instrument can operate in the following modes:

4.1.1 WEIGHING MODE

The weighing mode will display the weight on the scale and accompanying information. The instrument may be configured to operate weighing mode in GTN, Basic In/Out, or Inbound/Outbound. These modes are configured in the **MENU : SERVICE MENU : OPERATING MODE.**

GTN: The instrument will display weight and indicators to identify the type of weight and scale status.

Basic In/Out: The instrument will display weight and indicators to identify the type of weight and scale status. The instrument can print a GROSS ticket format and a TARE ticket format, commonly onto the same ticket.

Inbound/Outbound: The instrument will display weight and indicators to identify the type of weight and scale status. The instrument can print an INBOUND ticket format and an OUTBOUND ticket format. The instrument will calculate the Gross, Tare, and Net weights automatically.

4.1.2 SCALE APP MODE

Scale Apps: Accumulation

When enabled, press the **FUNC** button to display accumulator commands. The Accumulator must be enabled in **MENU : ACCUMULATOR.**

4.1.3 CONFIGURATION MODE

The configuration mode allows users and technicians to configure and the instrument in a variety of ways detailed in this manual. Configuration menus are accessed by pressing the MENU button. Certain menus or menu items are only accessible with a password. The **CUSTOMER PASSWORD** allows access to the **CONFIGURATION** and **EXPANSION CARD** menus and the **SERVICE PASSWORD** allows access into the **SERVICE menu**.

*When configured and enabled, the internal calibration switch will deny access to the **SERVICE** and **EXPANSION CARD** menus.*

4.1.4 REMOTE MODE

The remote mode is accessible from the web browser of a smart device connected to the same local network. No password is required to view the scale weight, access the operator menu, or audit trail. The customer and service passwords define which menus are available to the user. When operating in remote mode the screen will display "**REMOTE CONFIGURATION IN PROGRESS, PLEASE WAIT.**"

4.2 GENERAL NAVIGATION

Use the front panel touchscreen display to interact with the TS3300 instrument.

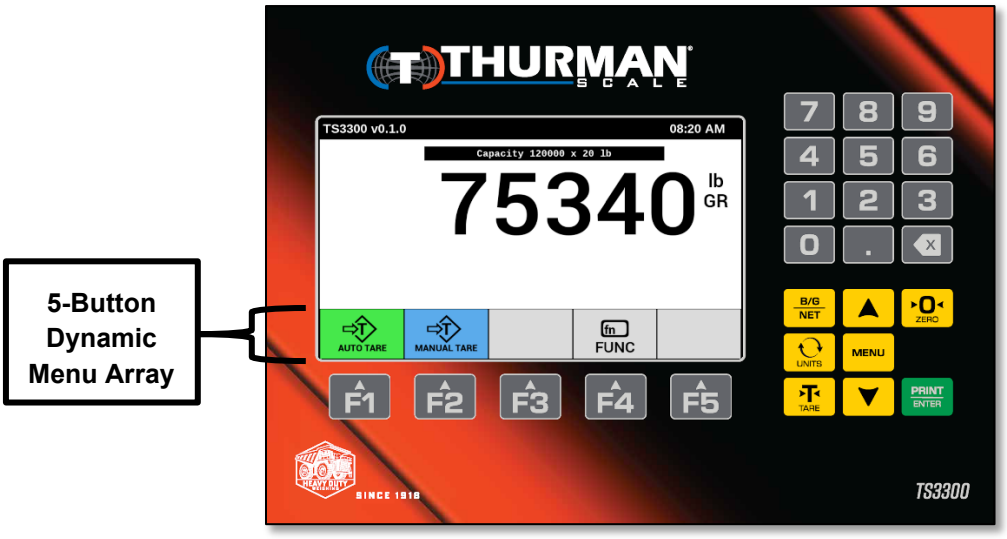


Figure 4-1. Example of Single Scale Operation in GTN Mode

WEIGHING INDICATIONS:

→0←	Indicates the displayed reading is within +/- 0.25 division of true zero.
~	Indicates the scale is in motion.
Unit of Measure	Indicated to the right of the weight digits, indicates the unit of measure. Available units include oz, lb, ton, g, kg, and tonne.
GR	Indicated to the right of the weight digits and below the unit of measure, indicates the displayed weight is gross.
NT	Indicated to the right of the weight digits and below the unit of measure, indicates the displayed weight is net.

4.2.1 MENU NAVIGATION

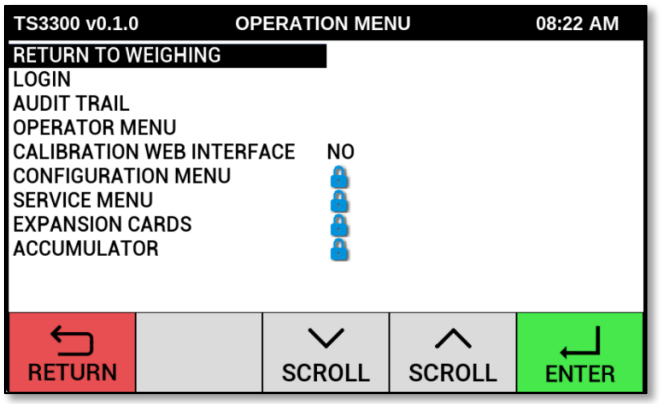


Figure 4-2. Menu Screen

RETURN	Return to weighing mode from the operation menu. Returns to the previous menu when inside a sub-menu.
SCROLL	Scroll down once.
SCROLL	Scroll up once.
ENTER	Enter selection.

4.3 WEIGHING MODE OPERATION

4.3.1 GENERAL OPERATION

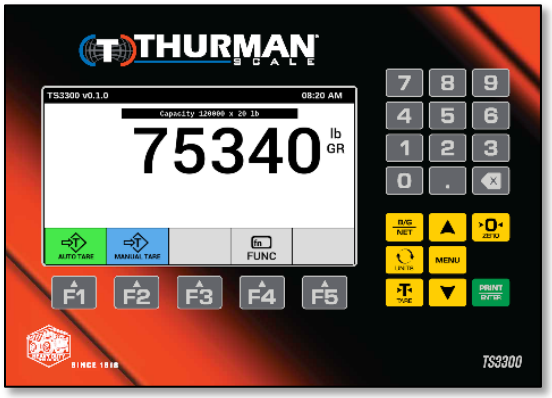


Figure 4-3. Weigh Screen in GTN Operating Mode

F1 F2 F3 F4 F5	Press function buttons to perform the action shown directly above in the menu array.
B/G NET	Press to change the displayed weight between gross and net weight.
UNITS	Press to switch the display between the primary and secondary units of measure.
TARE	Press to set an automatic tare based on the weight of the scale.
MENU	Press to enter the menu. Secondary Function: When navigating the menu, also functions as a RETURN/BACK button.
▲ ▼	Press to scroll up or down in the menu.
ZERO	Press the ZERO button to zero the scale
PRINT ENTER	Press the PRINT/ENTER button to process a transaction, print a ticket (if configured), and confirm entries in the menu.
7 8 9 4 5 6 1 2 3 0 . ⌫	Use the full keypad for numerical entry and edit entries with the backspace button.
FUNC	Secondary menu to access accumulation controls and activate peak hold.

4.3.2 EXCLUSIVE FUNCTIONS IN GTN OPERATING MODE

	Set a tare weight automatically using the weight currently on the scale. *The gross weight must be above the THRESHOLD WEIGHT. This value may be adjusted in CONFIGURATION MENU : THRESHOLD WEIGHT. (password required)*
	Set a tare weight manually using the keypad. *The gross weight must be above the configured THRESHOLD WEIGHT. This value may be adjusted in CONFIGURATION MENU : THRESHOLD WEIGHT. (password required)*
	Clear the automatic or manual tare current set.
	Activate PEAK HOLD. This button is accessed by pressing the FUNC button. *The customer password required to enable and disable peak hold. Peak Hold must be enabled in OPERATOR MENU : OPTIONS*
	Reset the PEAK HOLD function.

4.3.3 EXCLUSIVE FUNCTIONS IN INBOUND/OUTBOUND OPERATING MODE

Inbound/Outbound Mode provides a simple method to calculate the gross, tare, and net weight of trucks picking up or delivering materials. The truck is first weighed upon arrival, then the driver can enter the site to pick up or drop off material and return to be weighed again. The instrument will automatically calculate the gross, tare, and net weight of the shipment, record the transaction, and print a completed ticket if configured. A LOOP ID is the temporary ID used to save and recall the inbound weight of the truck during the outbound transaction.

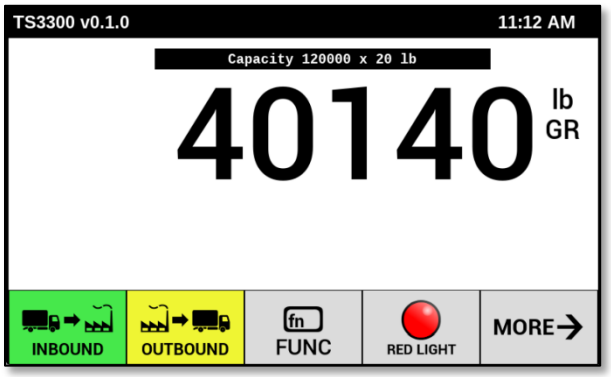


Figure 4-4. Inbound/Outbound - Weighing Mode Screen

EXAMPLE WEIGHING SEQUENCE:

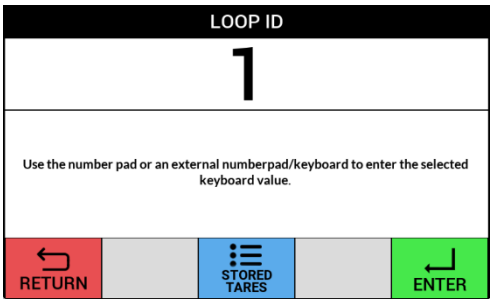
1. Truck arrives and pulls onto the scale, either loaded or unloaded.
2. Scale Operator initiates an INBOUND transaction:
   a. Scale Operator sets a LOOP ID. *(use the recommended ID or create your own)*
   b. Instrument records the inbound weight.
   c. Instrument prints the inbound ticket, if configured.
3. Truck leaves the scale to load or deliver its product.
4. Truck returns and pulls onto the scale.
5. Scale Operator initiates an OUTBOUND transaction:
   a. Scale Operator enters the LOOP ID. *(or press LIST to select from available inbound weighments)*
   b. Instrument records the outbound weight.
   c. Instrument calculates the Gross, Tare, and Net weight of the shipment.
   d. Instrument saves the completed transaction and weights to the transaction record.
   e. Instrument prints the outbound ticket, if configured.

STORED TARES

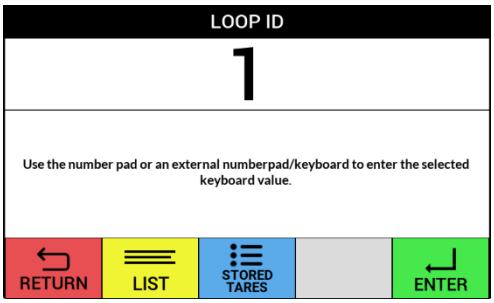
For applicable use-cases, the tare weight (unloaded truck weight) may be saved as a **STORED TARE**. A **STORED TARE** can be selected while performing the INBOUND or OUTBOUND transaction to eliminate the need to re-weigh the unloaded vehicle.

STORED TARES are easily recalled from the **LOOP ID** entry screens, and can be configured to automatically expire after set number of days after creation. See the configuration section of this manual under OPERATOR MENU for instructions to create a **STORED TARE**. A **STORED TARE** may either be set automatically using the weight on the scale or a manually entered value from the keypad.

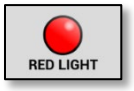
PERFORM AN INBOUND TRANSACTION

 Press the **INBOUND** button	 Figure 4-5. Enter a unique LOOP ID	Set a unique **LOOP ID** and press **ENTER**. Use the recommended number or define your own using alpha-numeric digits. An inbound transaction will be stored, and a ticket will be printed if configured. OR *Select **STORED TARES** to display a list of stored tares available for use as the outbound weight. Selecting a stored tare will complete the transaction.*

PERFORM AN OUTBOUND TRANSACTION

 Press the **OUTBOUND** button	 Figure 4-6. Recall the Inbound Loop ID	Input the **LOOP ID** of the corresponding inbound weighment and press **ENTER**. An outbound transaction will be stored, and the **LOOP ID** will be closed. A completed outbound ticket will be printed if configured. *Select **LIST INBOUND** to display a list of incomplete **LOOP IDs**.* *Select **STORED TARES** to display a list of stored tares available for use as the inbound weight. Selecting a stored tare will complete both the inbound and outbound transaction simultaneously.*

OPERATE THE TRAFFIC LIGHT

 Green Light Active  Red Light Active	**Manual Mode:** Set the position of the traffic light by pressing the **RED LIGHT** or **GREEN LIGHT** button. **Automatic Mode:** The traffic light will automatically change to red after the scale weight has exceeded the threshold weight, and the traffic light delay timer has expired. The light will return to green after once transaction has been processed or weight has dropped below the threshold weight. *Automatic mode will allow a user to manually toggle the traffic light position as desired and whenever needed. Automatic mode will resume once the scale weight has dropped below threshold weight.* Adjust settings in **CONFIGURATION MENU** : **TRAFFIC LIGHT CONTROL**

4.3.4 EXCLUSIVE FUNCTIONS IN BASIC OPERATING MODE

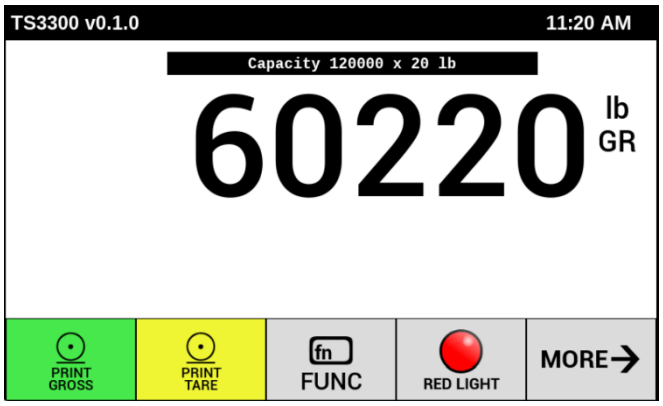


Figure 4-7. Basic Operating Mode Weighscreen

A simple in/out weighing mode used to print either a gross or a tare ticket.

Note: *Basic Operating Mode does not calculate a net weight and no transaction will be stored.*

PRINT GROSS	Prints a ticket using the BasicIn ticket format. *Ex: When a truck is loaded.*
PRINT TARE	Prints a ticket using the BasicOut ticket format. *Ex: When a truck is unloaded.*
GREEN LIGHT Green Light Active RED LIGHT Red Light Active	**Manual Mode:** Set the position of the traffic light by pressing the RED LIGHT or GREEN LIGHT button. **Automatic Mode:** The traffic light will automatically change to red after the scale weight has exceeded the threshold weight, and the traffic light delay timer has expired. The light will return to green after once transaction has been processed or weight has dropped below the threshold weight. *Automatic mode will allow a user to manually toggle the traffic light position as desired and whenever needed. Automatic mode will resume once the scale weight has dropped below threshold weight.* Adjust settings in **CONFIGURATION MENU : TRAFFIC LIGHT CONTROL**

4.4 SCALE APPS OPERATION

4.4.1 ACCUMULATION

The accumulation app must be enabled in **MENU: ACCUMULATOR.** The instrument must be configured for GTN Operating Mode.

Press the **PRINT** button to save an accumulation. Manage the Accumulator by pressing **FUNC** button to display options to **CLEAR**, **PRINT**, or **PRINT/CLEAR** the accumulator. This app must be enabled by a supervisor in the menu, or to view the accumulated weight and number of transactions without printing the accumulator.

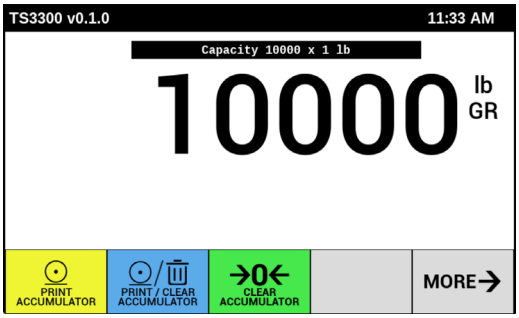


Figure 4-8. Accumulation Controls (Press MORE button)

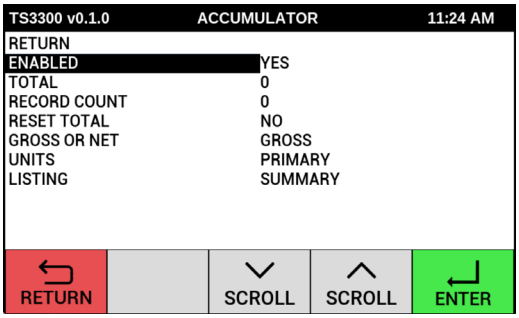


Figure 4-9. Accumulator Menu Page

CLEAR ACCUMULATOR	Clear the accumulator record.
PRINT / CLEAR ACCUMULATOR	Print the accumulator record and then clear the accumulator. **Printing will only occur if configured with a supported tape printer.*
PRINT ACCUMULATOR	Print the accumulator record, if configured.

5.0 CONFIGURATION

5.1 PASSWORD PROTECTION

The TS3300 restricts access to certain menus with either a customer password or a service password. The service password will provide access to all menus.

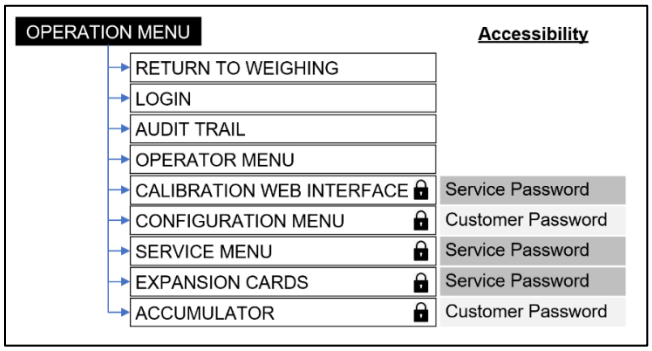


Figure 5-1. Operation Menu Password Accessibility

5.1.1 INTERNAL CALIBRATION SWITCH

The TS3300 provides a mechanical means of preventing calibration inside the instrument. See Section: Internal Calibration Switch of this manual for instructions to enable the internal calibration switch.

5.1.2 ACCESSING OPERATION MENU FROM THE FRONT PANEL

Access the operation menu by pressing the **MENU** button on the front panel. While in the operation menu, the **MENU** button functions as a back/return button to navigate to the previous menu. Exit the setup menu by reaching the top menu level and pressing the **MENU** button once.

5.1.3 ACCESSING OPERATION MENU USING REMOTE MODE (WEB INTERFACE)

Users may connect to the TS3300 remotely from a computer or smart device connected to the same local area network. Alternatively, a user can connect directly into the instrument using an ethernet cable. Remote Mode provides enhanced configuration capabilities including the visual ticket editor and transaction reporting page.

METHOD 1: INSTRUMENT CONNECTED TO LOCAL AREA NETWORK

1. Navigate to **CONFIGURATION MENU : NETWORK: DHCP (or STATIC) OPTIONS**
2. Copy the **IP ADDRESS**. ex: 192.168.1.105
3. Enter the **IP ADDRESS** into your device's web browser.
4. Login to the instrument using the customer or service password to enable Remote Mode.

METHOD 2: INSTRUMENT CONNECTED DIRECTLY TO WINDOWS DEVICE

If a customer does not allow access to the local network, the instrument may be plugged into a local device such as a laptop using an ethernet cable. A private IP address will be assigned and function as if on a network.

1. Plug an ethernet cable into the TS3300 and your device's ethernet ports.
2. Navigate to **CONFIGURATION MENU** : **NETWORK**
3. Change **USE DHCP?** to **DHCP** if necessary.
4. Wait 60 seconds.
5. Copy the **IP ADDRES**S. ex: 169.254.172.165
6. Enter the **IP ADDRESS** into your device's web browser.
7. Login to the instrument using the customer or service password to enable Remote Mode.
8. Upon exiting Remote Mode, if a static IP address was originally configured, modify setting **NETWORK** : **USE DHCP?** back to **STATIC**. The original Static IP settings will be restored.

5.2 AUDIT TRAIL MENU

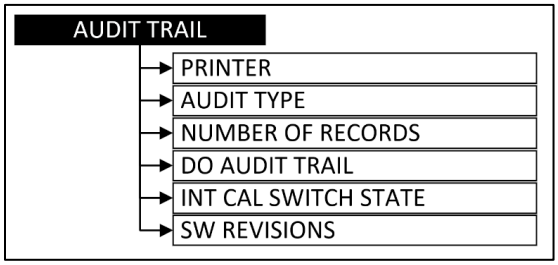


Figure 5-2. Audit Trail Menu Hierarchy

Menu Item	Description
PRINTER	Set the target printer to print the audit trail.
AUDIT TYPE	Set audit trail to include specific records. Options include COMPLETE, INSTRUMENT, or SCALE 1.
NUMBER OF RECORDS	Set audit trail to include the last entry, 10 entries, 50 entries, or all entries.
DO AUDIT TRAIL	Select to generate the audit trail summary. Select the PRINT button to print the generated audit trail.
INT CAL SWITCH STARE	Displays the state of the internal calibration jumper. The instrument cannot be calibrated or recalibrated with the jumper installed
SW REVISIONS	View instrument software revision numbers.

Figure 5-3. Audit Trail Menu

5.2.1 GENERATE AND PRINT AUDIT TRAIL SUMMARY

1. Set **PRINTER** to target printer.
2. Set **AUDIT TRAIL TYPE** to the *target scale* or **COMPLETE**.
3. Set **NUMBER OF RECORDS**.
4. Select **DO AUDIT TRAIL** to generate and view the audit trail summary.
5. Press the **PRINT** button to print the summary.

5.3 OPERATOR MENU

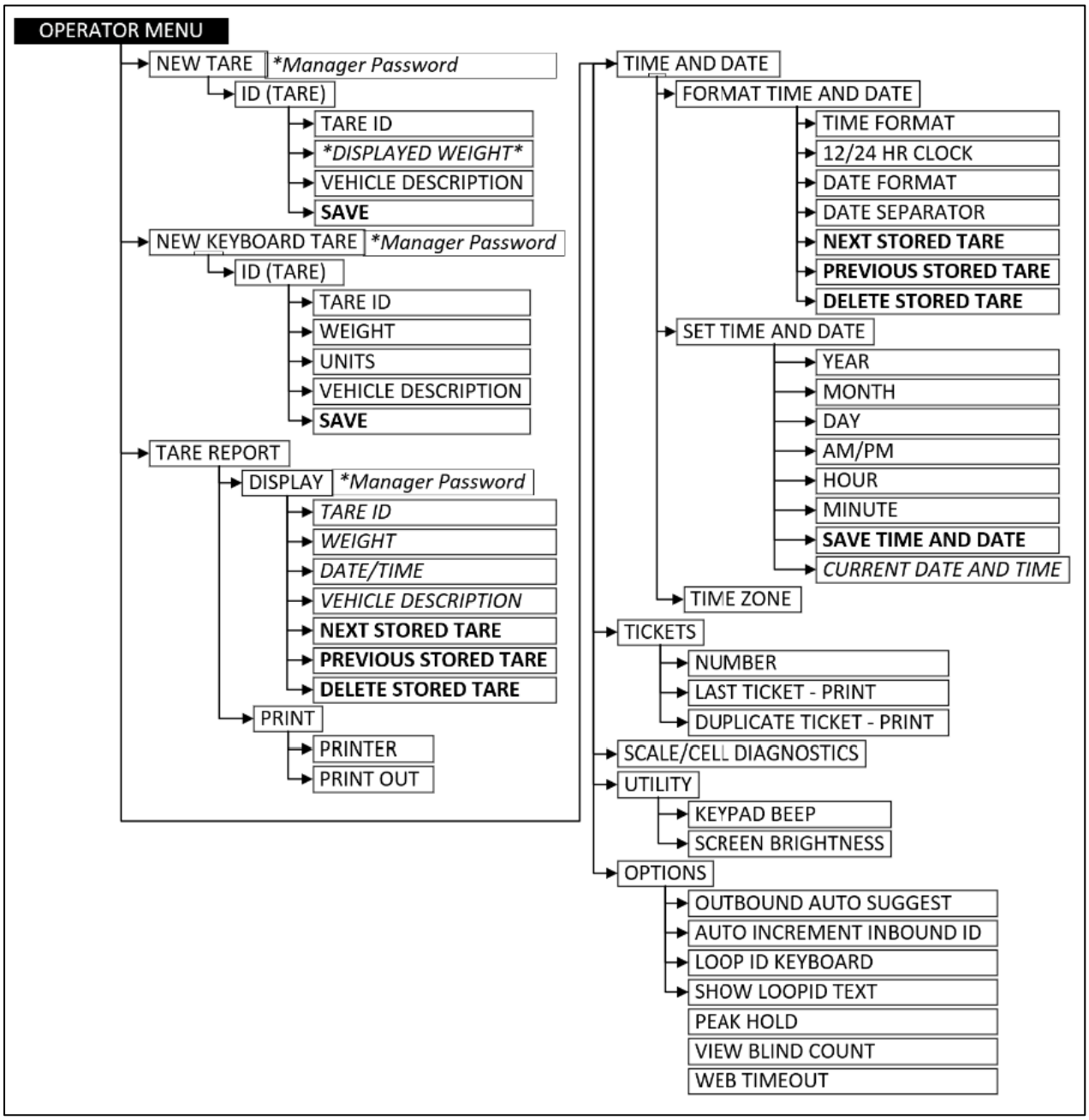


Figure 5-4. Operator Menu Hierarchy

Name	Sub-Menu	Description
NEW TARE *(customer password required)*		Store a tare weight using the current scale weight. *See STORING & MANAGING TARES below this table for additional information.*
NEW KEYBOARD TARE *(customer password required)*		Store a tare weight using a manually entered weight value. *See STORING & MANAGING TARES below this table for additional information.*
TARE REPORT	**DISPLAY** *(customer password required)*	Select to display the stored tares. Select NEXT or PREVIOUS to navigate between stored tares. Select DELETE STORED TARE to remove a stored tare.
	PRINT	Set a target printer and print a record of all stored tares.
TIME AND DATE		Set the time and date and relevant formatting.
TICKETS	**REPRINT LAST TICKET**	Reprint the last printed ticket.
	REPRINT DUPLICATE TICKET	Reprint a ticket number using the keypad.
	TICKET SEQUENCE	Set the starting point of a new ticket numbering sequence.
SCALE/CELL DIAGNOSTICS		View current digital load cell counts and weights, and the zero reference digital counts to identify anomalous load cell and scale behavior. Intalogix and Analog load cell interfaces include automated and configurable error checking routines that will post error codes and the date/timestamp of the first occurrence to this page.
UTILITY	**KEYPAD BEEP**	Set to disable/enable the audible touchscreen keypad beep.
	SCREEN BRIGHTNESS	Set the touchscreen display brightness. (0-3)
OPTIONS (OPERATOR)	**PEAK HOLD**	Enable the Peak-Hold function. *See Peak Hold on page 46 for additional information.*
	AUTO INCREMENT INBOUND ID	Set to automatically increment the LOOP ID when performing the next inbound transaction.
	LOOP ID KEYBOARD	Set the touchscreen keyboard to display a numeric-only or alpha-numeric keyboard for LOOP ID entry.
	SHOW LOOP ID TEXT	*Non-functional, for special applications only.*
	VIEW BLIND COUNT	View the number of times the scale weight has exceeded the threshold weight. *The blind counter must be enabled and configured in SERVICE : SPECIAL FUNCTIONS : BLIND COUNTER*
	WEB TIMEOUT	Set the maximum idle minutes a user may remain in Remote Mode. (1-9 minutes)

Figure 5-5. Operator Menu

5.3.1 STORING & MANAGING TARES

Inbound/Outbound and Basic operating modes provide a method to store manual (keyboard) tares and recall them for use as the inbound or outbound weighment. Tares may be saved and managed from the front panel or using Remote Mode to access the tare management tool. Stored tares may be configured to operate for a fixed number of days by configuring **SERVICE : OPTIONS : TARE OPTIONS : EXPIRATIONS DAYS**. Expired tares may be automatically cleared by setting **AUTO CLEAR** to **YES** from within the same menu.

STORE A TARE (PASSWORD REQUIRED)

1. Place tare weight on the scale.
2. Navigate to the **OPERATOR MENU : NEW TARE**.
3. Select **ID (TARE)**.
4. If prompted, enter the customer password and press **ENTER**.
5. When prompted, enter a new **TARE ID** and press **ENTER**.

6. Add a **VEHICLE DESCRIPTION** if desired.
7. Select **SAVE** when finished to store the tare.

STORE A KEYBOARD TARE (PASSWORD REQUIRED)

1. Navigate to **OPERATOR MENU** : **NEW KEYBOARD TARE**.
2. Select **ID (TARE)**.
3. If prompted, enter the customer password and press **ENTER**.
4. When prompted, enter a new **TARE ID** and press **ENTER**.
5. Select **WEIGHT** and add the tare weight value.
6. Select **UNITS** and set the unit of measure.
7. If desired, select **VEHICLE DESCRIPTION** and set a description.
8. Select **SAVE** when finished to store the tare.

EDIT A STORED TARE (PASSWORD REQUIRED)

Editing and saving a stored tare will also reset the stored tare's expiration timer.

1. Place the updated tare weight on the scale.
2. Navigate to the **OPERATOR MENU**: **NEW TARE**.
3. Select **ID (TARE)**.
4. If prompted, enter the customer password and press **ENTER**.
5. When prompted, enter the existing **TARE ID** and press **ENTER**.
6. Select **VEHICLE DESCRIPTION** to edit the description.
7. Select **SAVE** when finished to store the tare.

EDIT A STORED KEYBOARD TARE (PASSWORD REQUIRED)

Editing and saving a stored tare will also reset the stored tare's expiration timer.

1. Navigate to the **OPERATOR MENU** : **NEW KEYBOARD TARE**.
2. Select **ID (TARE)**.
3. If prompted, enter the customer password and press **ENTER**.
4. When prompted, enter the existing **TARE ID** and press **ENTER**.
5. Select **WEIGHT** to edit the tare weight value.
6. Select **UNITS** to edit the unit of measure.
7. Select **VEHICLE DESCRIPTION** to edit the description.
8. Select **SAVE** when finished to store the tare.

VIEW SAVED TARES

1. Navigate to the **OPERATOR MENU** : **TARE REPORT: DISPLAY**
2. If prompted, enter the supervisor password and press **ENTER**.
3. Scroll down to **NEXT STORED TARE** or **PREVIOUS STORED TARE**.
4. Press the **RETURN** button to return to the menu.

DELETE A SAVED TARE

1. Navigate to the **OPERATOR MENU** : **TARE REPORT: DISPLAY**.
2. If prompted, enter the supervisor password and press **ENTER**.
3. Scroll down to **NEXT STORED TARE** or **PREVIOUS STORED TARE** to find the intended saved tare.
4. Scroll down to **DELETE STORED TARE** and press **ENTER**.
5. Select Yes.

PRINT ALL SAVED TARES

1. Navigate to the **OPERATOR MENU** : **TARE REPORT** : **PRINT**
2. If more than one printer is configured, select PRINTER to set the intended printer.
3. Select PRINT OUT to print all saved tares.

5.3.2 MANAGE TARES IN REMOTE MODE

Stored Tares may also be managed in Remote Mode by navigating to the **OPERATOR MENU: MANAGE TARES** page.

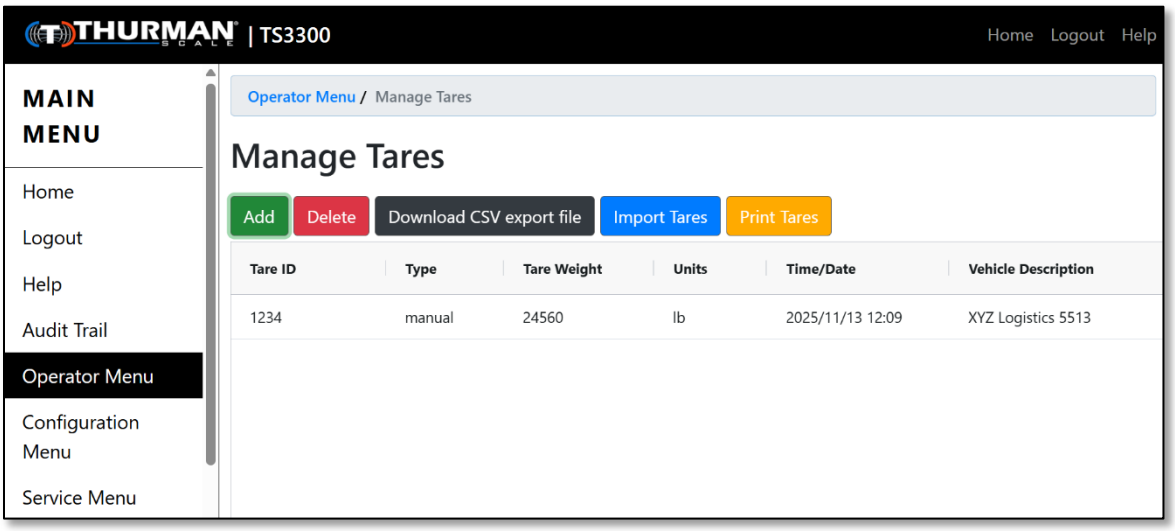


Figure 5-6. Remote Mode – Manage Tares Page

Managing Tares in Remote Mode allows the user to:

- Add, delete, import, export, and edit stored tares from your computer or smart device.
  - Download and upload stored tares in bulk using a .CSV file.
  - .CSV may be edited in Microsoft Excel and other similar spreadsheet editors.
  - Do not change the filename. The instrument will only upload if titled tares.csv
  - Download the CSV export file for the file template with headers.
- Print a Stored Tare report.

5.3.3 PEAK HOLD (PASSWORD REQUIRED)

Peak Hold will display the highest peak weight recorded on the scale. Peak Hold is not for use in legal-for-trade applications.

PEAK HOLD must be to set to **ENABLED** in **OPERATOR MENU** : **OPTIONS** to activate the function in Weighing Mode.

ACTIVATE PEAK HOLD

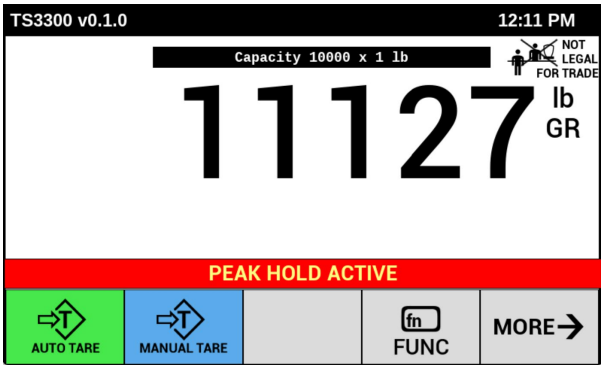


Figure 5-7. Operator Notification PEAK HOLD is active

1. Activate Peak Hold by pressing **FUNC** and selecting **PEAK HOLD**. (requires customer password)
2. Reset the peak weight by pressing the **RESET PEAK**.
3. When finished, disable Peak Hold by pressing **FUNC** and selecting **PEAK HOLD**. (requires customer password)

5.4 CONFIGURATION MENU

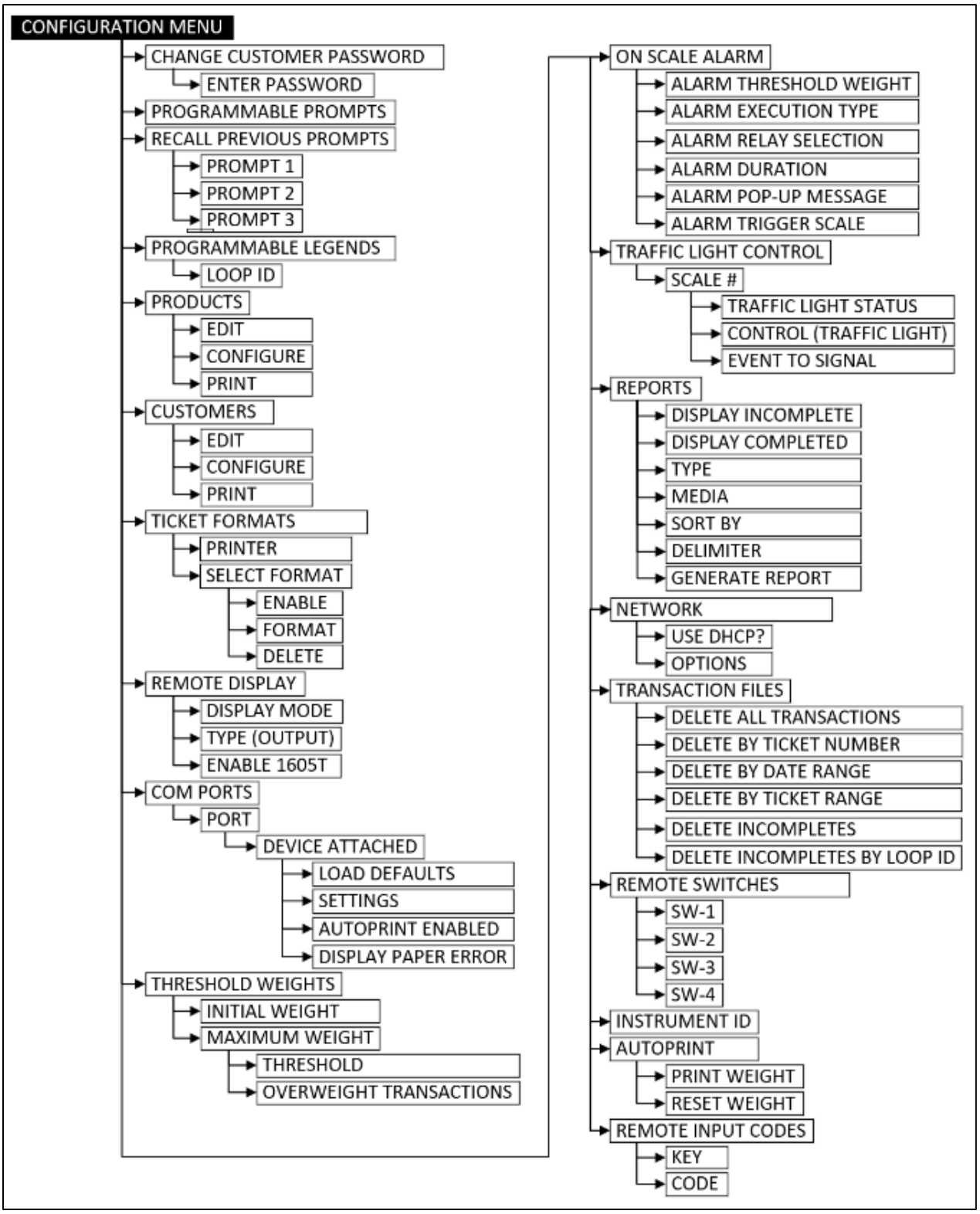


Figure 5-8 Configuration Menu Hierarchy.

Menu Item	Sub-Menu Item	Description
CHANGE CUSTOMER PASSWORD		Set a new customer password. Select and enter the new password.
PROGRAMMABLE PROMPTS	**PROMPTS 1 - 3**	Enable and name up to (3) programmable prompts and assign to a weighing mode sequence.
	RECALL PREVIOUS PROMPT	Set to pre-populate the programmable prompt fields with the previous entry to minimize data entry when entering repeating sequences. User may clear or backspace to edit the pre-populated fields.
PROGRAMMABLE LEGEND		Rename the LOOP ID legend to a customer preference.
PRODUCTS		***See Products on page 59 for additional information.*** Configure, manage, and append products ID's to transaction records. and automatically track product inventory based on deliveries and shipments using the Inbound/Outbound operating mode.
CUSTOMERS		***See Customers on page 61 for additional information.*** Configure, manage, and append customer ID's to transaction records.
TICKET FORMATS		***See Ticket Formats starting on page 62 for additional information.*** Configure and enable tickets to print to a target printer.
REMOTE DISPLAY	**DISPLAY MODE**	Set to continuous output or on-print to limit output to when a transaction has been processed. *Tip: Don't forget to configure remote display communications in the appropriate COM PORT sub-menu.*
	TYPE	Set the remote display to show the Displayed Weight, Gross Weight Only, Net Weight Only, or Ticket Number.
	ENABLE 1605T	Set to append the traffic light position to the remote display format for traffic light operation using the 1605T Remote Display/Traffic Light. *Tip: Don't forget to enable the traffic light in the TRAFFIC LIGHT CONTROL sub-menu.*
COM PORTS	***Introduction***	***See COM Ports section on page 67 for additional information.*** Configure all RS232, 20mA, USB, and Ethernet ports.
	PORT	Select an available COM port, USB port, or ETHERNET port to configure settings. *Configuration settings for optional DeviceNet, Ethernet/IP, and Modbus TCP accessory cards can be found in the EXPANSION CARDS menu. (requires service password)*
	DEVICE ATTACHED	Select from a list of supported devices to enable the port and configure the default settings to the selected device or data output.
	LOAD DEFAULTS	Select to reset the port's communication SETTINGS back to factory defaults.
	SETTINGS	Set the port's communication settings including baud rate, parity, data bits, stop bits, checksum, etc.
	CONFIGURE	When the Device Attached is configured for PC Continuous, PC Polled, or PC Auto, set the data output configuration to a common industry format. Limited modifications of the common industry formats is available, or access the BUILD CUSTOM FORMAT tool in Remote Mode to configure the output as desired. Common industry formats include THURMAN, TOLEDO, CARDINAL, WEIGHTRONIX, or CONDEC.

THRESHOLD WEIGHTS	**INITIAL WEIGHT**	Set a minimum threshold weight to prevent tares and transactions below a configured weight.
	MAXIMUM WEIGHT	A maximum threshold weight may be set prevent the processing an overweight transaction and/or alert the scale operator.
ON SCALE ALARM	**ALARM THRESHOLD WEIGHT**	Set the threshold weight to activate the on-scale alarm.
	ALARM EXECUTION TYPE	Set the on-scale alarm to notify the operator with a pop-up message, internal buzzer, relay output, or all.
	ALARM RELAY SELECTION	Select the relay number on the ACC 713
	ALARM DURATION	Set the alarm duration in seconds. 0 = infinite until acknowledged by user.
	ALARM POP-UP MESSAGE	Set custom text to display to the operator.
	ALARM TRIGGER SCALE	Set alarm to scale 1.
TRAFFIC LIGHT CONTROL	**TRAFFIC LIGHT STATUS**	Set to enable or disable the traffic light output to the relay interface card or 1605T remote display.
	CONTROL (TRAFFIC LIGHT)	Set to automatic or manual control.
	EVENT TO SIGNAL	Set the timer duration.
REPORTS	**DISPLAY INCOMPLETE**	Select to view incomplete transactions. Recommendation: Use Remote Mode to download or view the incomplete transactions report.
	DISPLAY COMPLETED	Select to view completed transactions. Recommendation: Use Remote Mode to download or view the completed transaction report.
	Generate and Export Transaction Report	
	TYPE	Set to generate an incomplete or completed transaction report.
	MEDIA	Set to download to a USB drive, or when using Remote Mode download the file directly to your device.
	SORT BY	Sort the transaction report by Loop ID, Date/Time, Ticket, Product ID, or Customer ID
	DELIMITER	Set to CSV (comma separated values) or Tab.
	GENERATE REPORT	Select to generate and export the report.
NETWORK	**USE DHCP?**	Set TCP/IP output to use a DHCP assignment or static addresses.
	OPTIONS	View DHCP assignments or set static addresses.
TRANSACTION FILES		Delete transactions by all, ticket number, date range, incompletes, or incompletes by a LOOP ID.

REMOTE SWITCHES		Configure each of the (4) available remote switch inputs to a particular function. (Units, B/G Net, Zero, Print, Tare, In, Out, Red Light, Green Light, Start, Stop, Pause, Resume, Next, Trim, Discharge)
INSTRUMENT ID		RS485 Instrument ID
AUTOPRINT	**PRINT WEIGHT**	Set the minimum threshold weight to autoprint. *Auto Print must be enabled for the selected printer in the COM PORTS menu.*
	RESET WEIGHT	Set the reset weight for Auto-Print. The weight must fall below this value to trigger the next Auto-Print.
REMOTE INPUT CODES		Configure hex codes for remote input characters from a connected device over the serial or ethernet ports.

Figure 5-9. Configuration Menu

5.4.1 MANAGING PRODUCT RECORDS

The TS3300 can be configured to append product names to a transaction and inventory by accumulating the incoming and outgoing inventory. Products may be entered and managed through the front panel or in Remote Mode.

Note: *Adding or editing text from the front panel requires an external keyboard.*

ADD/EDIT/DELETE NEW PRODUCTS (FRONT PANEL)

Navigate to and edit **CONFIGURATION MENU: PRODUCTS: EDIT**.

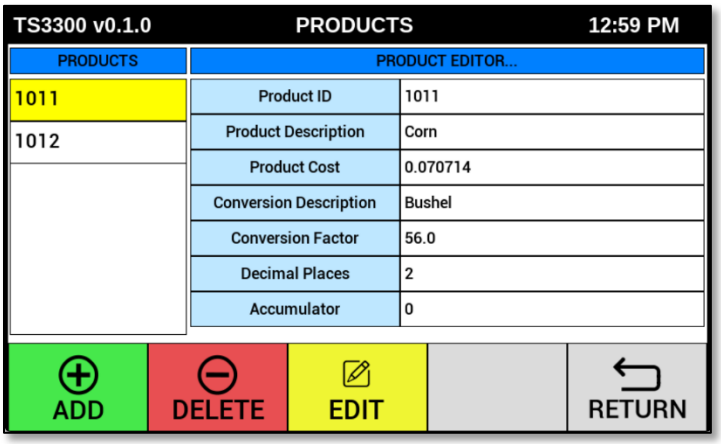


Figure 5-10. Add/Edit/Delete Product Screen (Front Panel)

ADD/EDIT/DELETE NEW PRODUCTS (REMOTE MODE)

Navigate to and edit **CONFIGURATION MENU : PRODUCTS: EDIT**

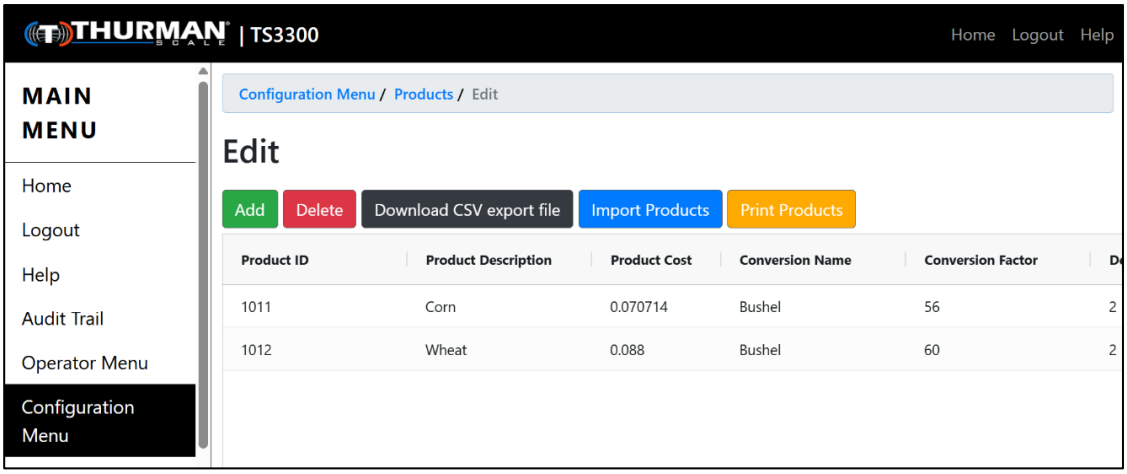


Figure 5-11. Add/Edit/Delete New Products (Remote Mode)

Products may be created or modified by downloading and updating the product file. This file is presented in a .CSV file format for use with Microsoft Excel and other spreadsheet editors. Press the Download CSV Export File button to download a pre-formatted file template.

Uploading partial records files will overwrite data for the intended Product IDs only. Product IDs not included in the upload will not be modified.

Note: *The file must be titled products.csv and include the description headers shown in the downloaded file template.*

ENABLING PRODUCTS

Product tracking must be enabled for a specific weighing sequence. For example, a customer may wish to define the product during the inbound sequence or the outbound sequence while in Inbound/Outbound operating mode.

Enable Products for a weighing sequence by navigating to: **CONFIGURATION MENU : PRODUCTS : CONFIGURE**

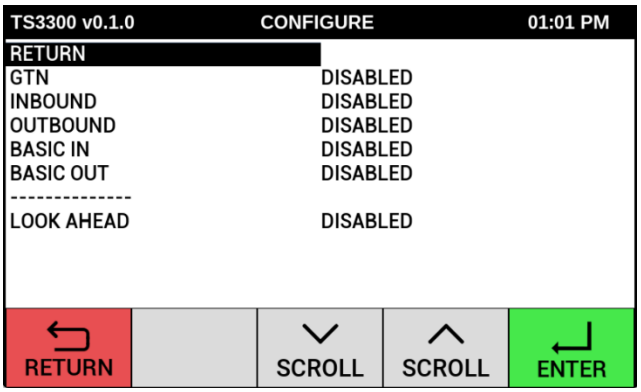


Figure 5-12. Products Enable Screen

5.4.2 MANAGING CUSTOMER RECORDS

The TS3300 can be configured to append customer names to a transaction for tracking. Customers may be created and managed through the front panel or in Remote Mode.

ADD/EDIT/DELETE CUSTOMERS (FRONT PANEL)

Navigate to and edit **CONFIGURATION MENU** : **CUSTOMERS** : **EDIT**

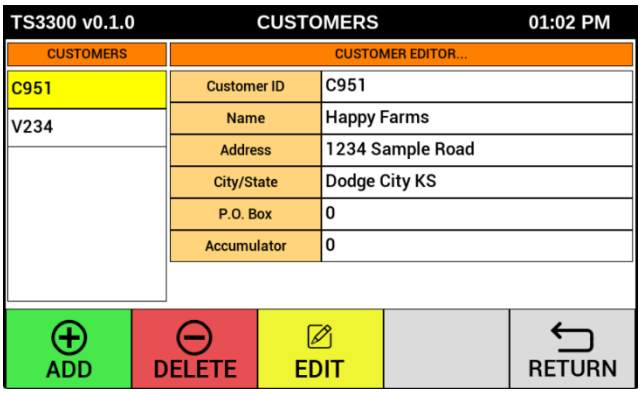


Figure 5-13. Add/Edit/Delete New Customers (Front Panel)

ADD/EDIT/DELETE CUSTOMERS (REMOTE MODE)

Navigate to and edit **CONFIGURATION MENU** : **CUSTOMERS** : **EDIT**

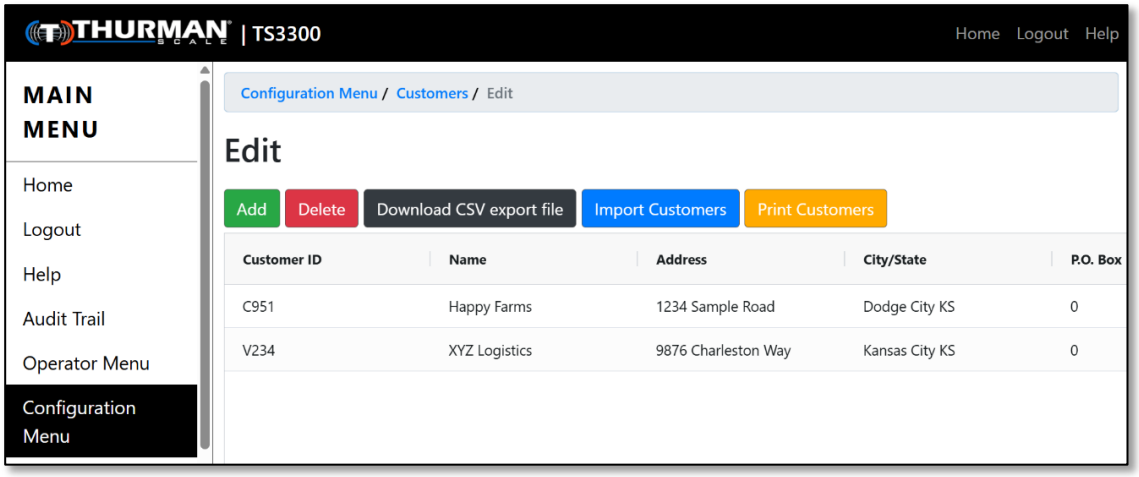


Figure 5-14. Add/Edit/Delete Customers (Remote Mode)

New products may be created or modified by downloading and updating the product file. This file is presented in a .CSV file format for use with Microsoft Excel and other spreadsheet editors. Press the Download CSV Export File button to download a pre-formatted file template.

Uploading partial .CSV files will overwrite data for the intended Product IDs only. Product IDs included in an upload will not be modified.

Note: *The file must be titled "products.csv" and include the description headers shown in the downloaded file template.*

ENABLING CUSTOMERS

Product tracking must be enabled for a specific weighing sequence. For example, a customer may wish to define the product during the inbound sequence or the outbound sequence while in Inbound/Outbound operating mode.

Enable Products for a weighing sequence by navigating to: **CONFIGURATION MENU** : **CUSTOMERS** : **CONFIGURE**

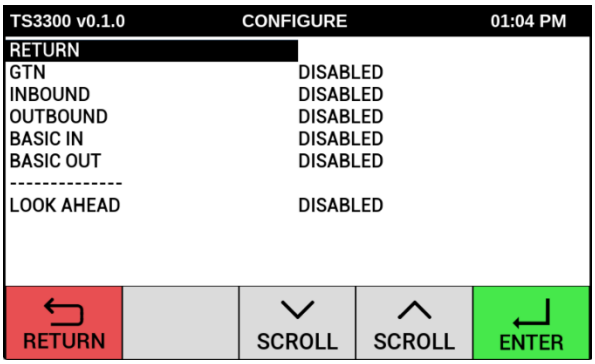


Figure 5-15. Customers Enable Screen

5.4.3 CONFIGURING PRINTED TICKETS

Ticket formats are individually enabled and configured for printing to a specified printer. Default ticket formats may be edited using the front panel, or by the recommended method using the visual ticket editor while in Remote Mode.

ENABLE TICKETS FORMAT

Configure and enable ticket formats by navigating to: **CONFIGURATION MENU** : **TICKET FORMATS**.

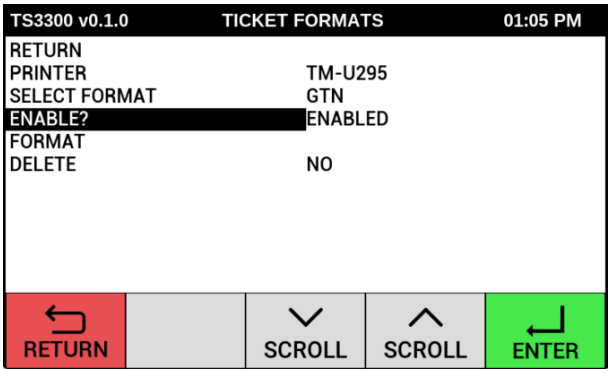


Figure 5-16. Enable Ticket Formats Screen

1. Select **PRINTER** to select the target printer.
2. Select **FORMAT** to enable and edit the format based on an operating mode's weighing sequence.
   a. *A format must be enabled to print at that sequence. Ex: To print both inbound and outbound tickets to the same printer, both the inbound and outbound formats must be enabled.*
3. Select **ENABLE?** and change to **ENABLED** as desired.
4. Format ticket using the front panel or the visual ticket editor available in Remote Mode.

a. Ticket formats are best edited using the visual ticket editor available in Remote Mode.

EDIT TICKET FORMAT (REMOTE MODE)

Configure a ticket format using the visual ticket editor in Remote Mode. Navigate to: **CONFIGURATION** : **MENU** : **TICKET FORMATS**.

1. Select the target **PRINTER**.
2. Select the **MODE**.
3. Switch format to enable.
4. Select **EDIT FORMAT** to enter the visual ticket editor.



Figure 5-17. Edit Ticket Formats (Remote Mode)

Learn to format using the front panel by displaying the script in the visual ticket editor. Click the gears icon and **SHOW SCRIPT**. Make changes to the ticket and see the changes in the script.

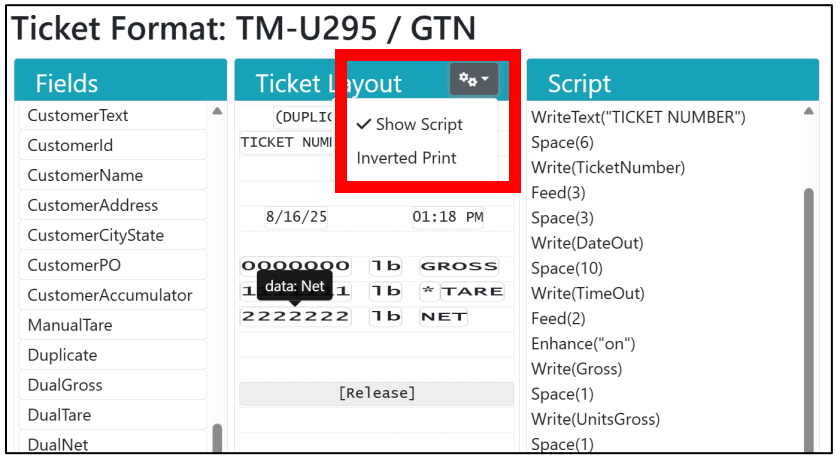


Figure 5-18. Ticket Format Editor(Remote Mode)

Example Ticket Formatting:

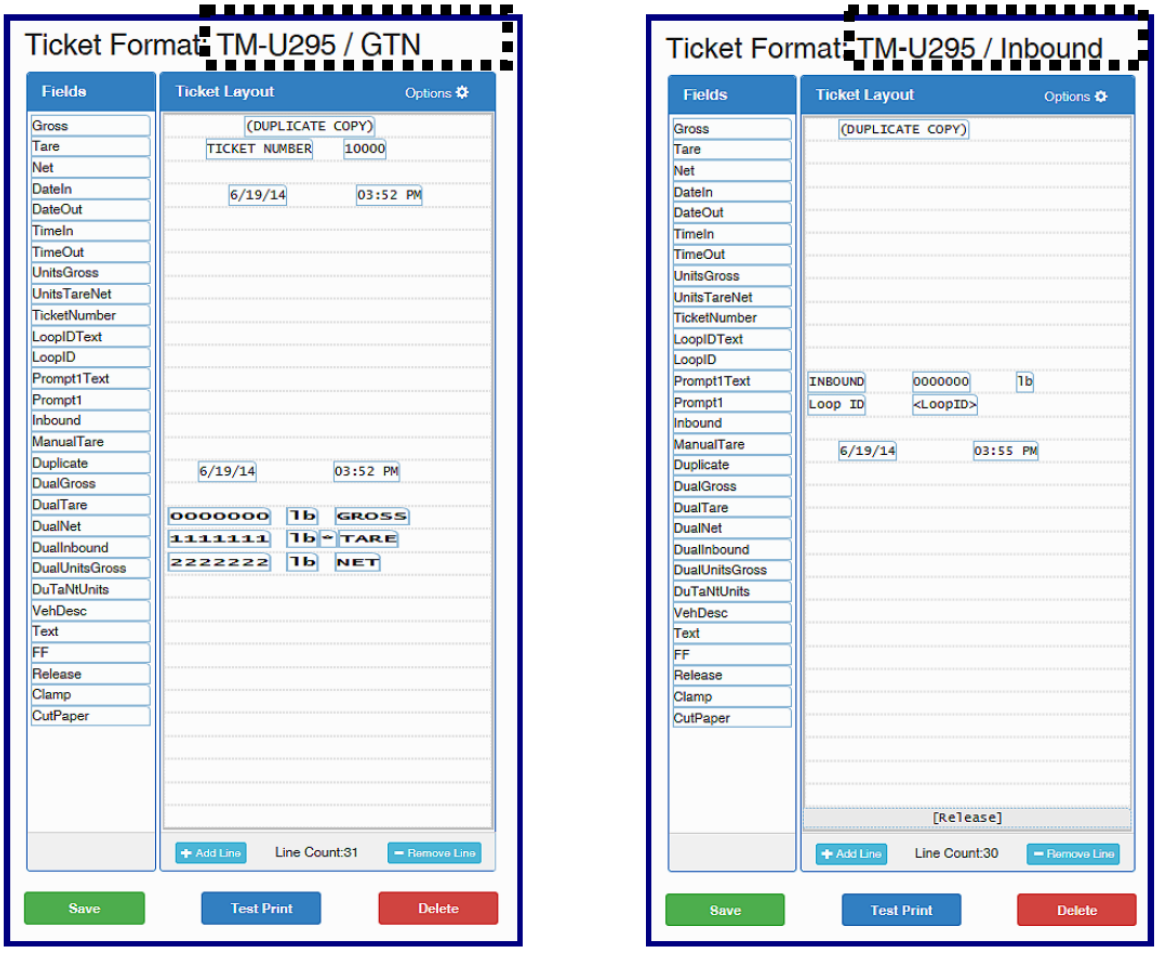


Figure 5-19. Ticket Format Examples – 295 Printer (Remote Mode)

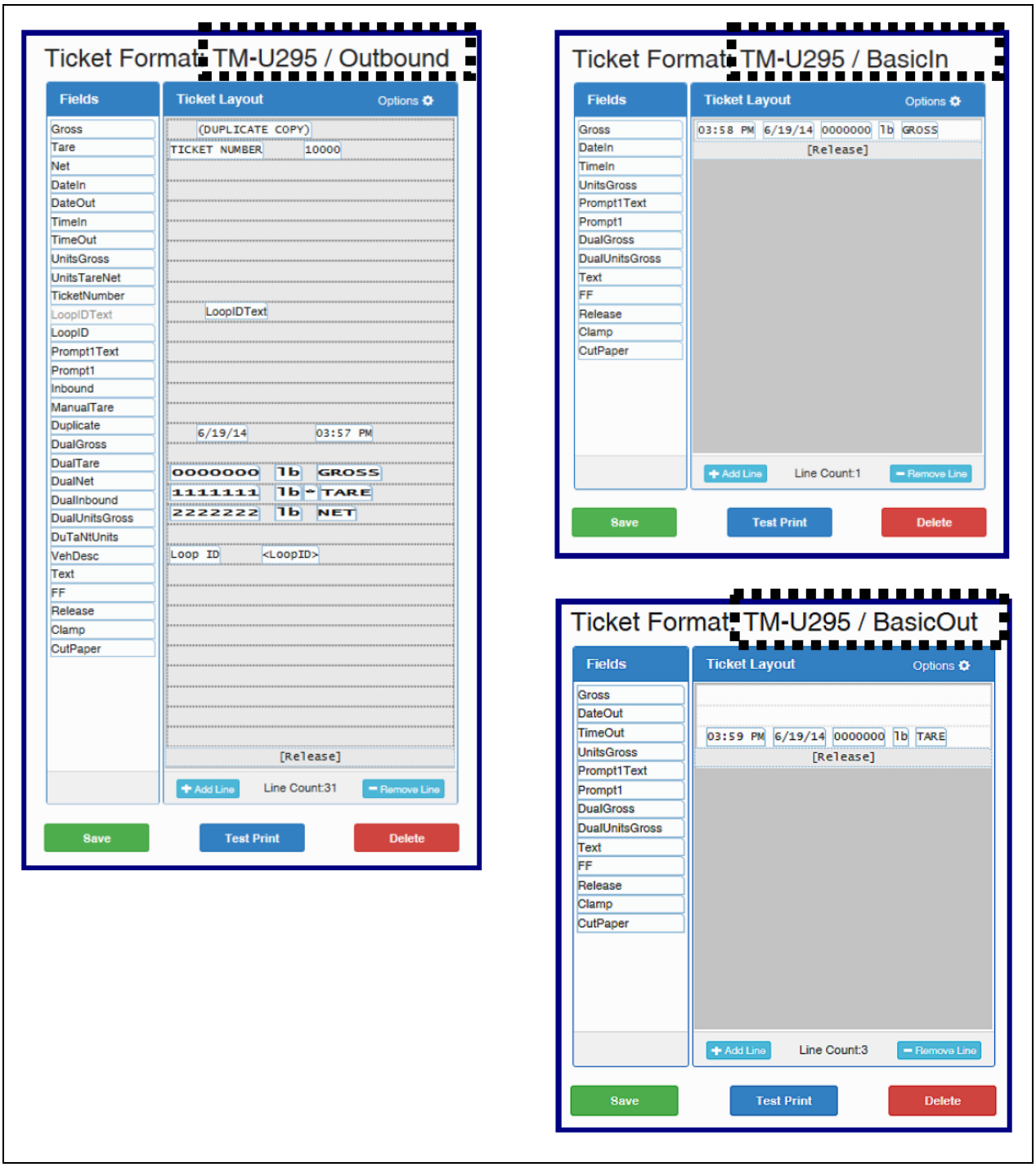


Figure 5-20. Additional Ticket Format Examples – 295 Printer (Remote Mode)

EDIT TICKET FORMAT (FRONT PANEL)

A ticket format can be configured using the front panel. Standard templates are preloaded for ease of editing each format. Each line in the Ticket Layout represents a command that occurs in a fixed sequence and descending order.

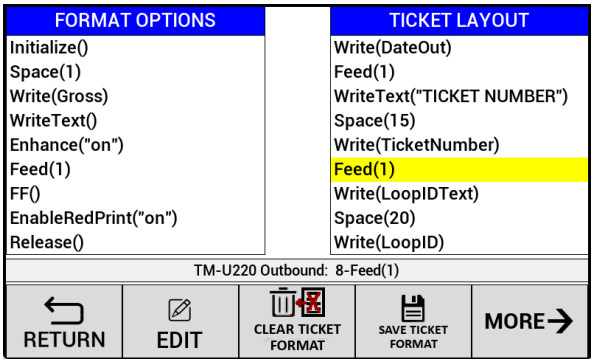


Figure 5-21. Edit Ticket Format (Front Panel)

Ticket Formatting Command List:

Command	Description
Space(x)	Defines movement horizontal from left to right. Ex: Space(3) states the layout will move the printer head three spaces to the right.
Feed(x)	Defines movement vertical up and down. Ex: Feed(5) states the layout will move the printer head five rows downward.
InvertedWrite("on")	Prints the ticket to print from the bottom to the top, placing data where it belongs according to the programmed coordinates. When required, this field must be the first command in the print format.
WriteText("x")	Prints static text. Ex: WriteText("ABC Company") will print the text ABC Company
HideWriteTextOnZero (Tare, "x")	Prints the defined static text except when the a tare weight is not defined. Ex: HideWriteTextOnZero(Tare, "TARE") If the tare is above zero the ticket format will print TARE.
Initialize()	***Required for certain printers (find out which)***
Write(x)	Print a variable. Select the variable from a pop-up list of options.
Enhance("on")	Print text in bold. Insert before a WriteText("x") or Write(x) command.
EnableRedPrint("xx")	Print in red text. Insert before a WriteText("x") or Write(x) command.
Release()	End of the ticket format used to release the ticket from the printer.
Clamp()	Instructs the printer to clamp the paper.
CutPaper()	Instructs the printer to cut the paper.
FF()	(590 Printer Only) Feeds the ticket back to the front after printing.
ReverseFeed()	On ticket-style printers, rolls the ticket back towards the operator.

Figure 5-22. Ticket Format Command List

5.4.4 CONFIGURING COM PORTS

Configure the RS232, USB, and Network ports for printers and other connected devices.

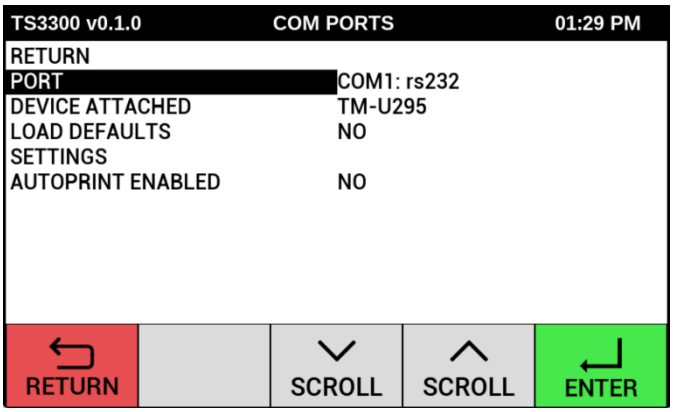


Figure 5-23. COM PORT Menu Screen

COM1/COM2: CONFIGURE A SUPPORTED RS232 SERIAL PRINTER

Supported Serial Printers: TM-U295, IDP-3550, TM-U220, TM-U230, TM-U590, SP-700, SP-298, SP-2000, SP-2200, GC-420d/L540, TM-L90, EU-T432, and OKI-420 printers.

1. Navigate to: **CONFIGURATION MENU: COM PORTS**.
2. Set **PORT** to the appropriate COM1 or COM2 port as wired to the printer.
3. Set **DEVICE ATTACHED** to the supported serial printer.
4. Default communication settings will be loaded into the instrument. If the printer manufacturer's default communication settings have been altered, you may adjust them in the **SETTINGS** menu.
5. If the **AUTO PRINT** feature in **GTN Mode** is desired, set **AUTOPRINT ENABLED** to **YES**.
6. See the **CONFIGURATION MENU** for additional information.
7. If desired, set **DISPLAY PAPER ERROR** to **YES**. Certain printers can communicate a paper error (ex: no paper) to the user by displaying a pop-up notification. When enabled, the user may press a button in the pop-up notification to reprint the ticket after the paper error has been cleared. Certain use cases may not desire this functionality.

COM1/COM2: CONFIGURE AN RS232 SERIAL OUTPUT

The TS3300 can be configured to transmit a common industry format over RS232. Customers that require a uniquely formatted output may do so using the Custom

Serial Output may be transmitted using four different methods:

PC Continuous: Continuously transmits a weight string.

PC Polled: Transmits a weight string after receiving the poll character from the client device.

PC Auto: Transmits a weight when a user presses the PRINT button.

DemandPC: For use in GTN Mode Only. After a poll character is received by a customer device, a highly customizable string of data using any ticket format field available in GTN mode can be transmitted. Note: AUTO PRINT may be configured to automatically transmit data string.

EDIT SERIAL OUTPUT

1. Navigate to: **CONFIGURATION MENU** : **COM PORTS**.
2. Set **PORT** to the appropriate **COM1** or **COM2** port as wired to the customer device.
3. Set **DEVICE ATTACHED** to **PC CONTINUOUS**, **PC POLLED**, or **PC AUTO** as required.
4. Edit **SETTINGS** to adjust communication settings as required by the customer device.
5. Navigate to the **CONFIGURE** sub menu
6. Select **LOAD** and pick from one of the industry typical output formats including **THURMAN**, **TOLEDO**, **WEIGHTRONIX**, and **CONDEC**.
7. Edit **TOKENS** if desired. *(not commonly required)*

POLL TOKEN	Set the two-digit hex characters required by the customer device to initiate a response. Default = 0D (ASCII: Carriage Return)
START TOKEN	Set the two-digit hex characters that define the start of an output string. Default = 02 (ASCII: Start of Text)
STOP TOKEN	Set the two-digit hex characters that define the stop of an output string. Default = 0D (ASCII: Carriage Return)
BLOCK TOKEN	Set the two-digit hex characters that define the block of an output string. Default = 00 (ASCII: NULL)
PRIMARY UNIT	Set the primary unit of measure characters in plain text. (Default = lb)
SECONDARY UNIT	Set the secondary unit of measure characters in plain text. (Default = kg)
MOTION	Set the motion character in plain text. (Default = M)
CAPACITY	Set the capacity character in plain text. (Default = O)
OK	Set the ok character in plain text. (Default = *Not used*)
INVALID	Set the invalid character in plain text. (Default = I)
GROSS	Set the gross indication characters in plain text. (Default = GR)
TARE	Set the tare indication characters in plain text. (Default = TA)
NET	Set the net indication characters in plain text. (Default = NT)
REQUIRE CARRIAGE RETURN	Set to require a carriage return following a POLL TOKEN.

Figure 5-24. Edit Token Menu

Contact Technical Support for assistance before altering status codes.

COM3: 20MA - CONFIGURE REMOTE DISPLAY OUTPUT

1. Navigate to: **CONFIGURATION MENU** : **COM PORTS**.
2. Select **PORT COM3**.
3. Set **DEVICE ATTACHED** to **REMOTE DISPLAY**.

Default Settings:

BAUD RATE	2400
PARITY	NONE
STOP BITS	1
DATA BITS	7
CHECKSUM	NO
DELIMITED	NO
INCLUDE LEGENDS	NO

Figure 5-23. Default 20mA Remote Display Settings

USB1/USB2: CONFIGURE A SUPPORTED USB PRINTER

Supported USB Printer: TM-T88VII

1. Navigate to: **CONFIGURATION MENU** : **COM PORTS**.
2. Set **PORT** to the appropriate USB port connected to the printer.
3. Set **DEVICE ATTACHED** to the supported USB printer.
4. If the **AUTO PRINT** feature in GTN Mode is desired, set **AUTOPRINT ENABLED** to **YES**.
   a. See the **CONFIGURATION MENU** for additional information.

ETHERNET: CONFIGURE THE TCP/IP OUTPUT AND PORT

1. Select **DEVICE ATTACHED** and the target device or type.
   a. Network — Instrument continuously transmits the output
   b. AutoNetwork — Instrument transmits data once after the operator presses PRINT.
   c. Ethernet Polled — Responds with a single transmission when to poll character.
2. Set the **LOCAL PORT** number.
3. Select **CONFIGURE** and set.
   a. **LOAD** to set a standard output format.
      i. Thurman, Toledo, Cardinal, Weigh-Tronix, or Condec
         b. Edit **TOKENS**, if desired.
      ii. Poll, Start, Stop, etc.
         c. Edit **STATUS CODES**, if desired.
      iii. Status Codes should only be modified by trained personnel to avoid unintended outputs. Contact Thurman Technical Support for support if changes are required to Status Words A, B, and C.
         d. Edit **WEIGHTs**, if desired.
   iv. Define the number of weight digits, use leading zeros (or truncate), justification, decimal point use and position, polarity and +/- tokens.
4. Enable **AUTOPRINT** to automatically transmit the output once during an AutoPrint transaction.

5.4.5 BUILDING CUSTOM OUTPUT FORMAT (SERIAL OR TCP/IP)

Build a custom output format in Remote Mode if desired by navigating to:

COM PORTS : *(TARGET PORT)* : CONFIGURE : BUILD CUSTOM FORMAT.

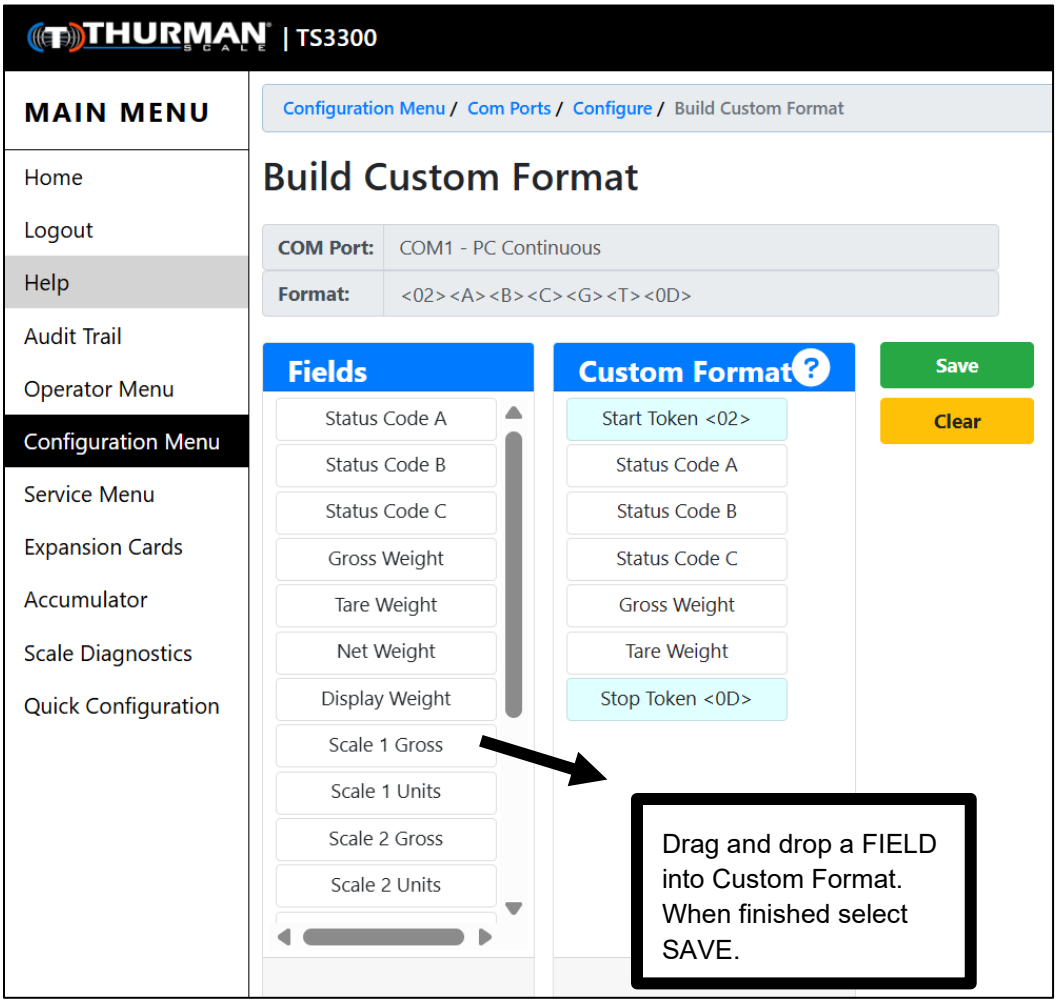


Figure 5-25. Build Custom Format Page (Remote Mode)

5.5 EXPANSION CARDS

5.5.1 (P/N: 37068) ENHANCED ANALOG OUTPUT ACCESSORY CARD

Menu Item		Menu Item
REVISION NUMBER		Displays the accessory card software revision number.
IDLE		The analog output does not update while a user in Configuration or Remote Mode. Set IDLE to define the output state while not in Weighing Mode. **ENABLED** Output stays fixed on the last weight update prior to entering the menu. **4mA** Output reverts to 4mA. **20mA** Output reverts to 20mA. **LOW ALARM** Output reverts to 3.5mA to signal out of range condition. **HIGH ALARM** Output reverts to 24.2 mA to signal high out of range condition.
LOW LIMIT (IN PRIMARY UNITS)		Set the weight value to indicate 4mA (0%)
HIGH LIMIT (IN PRIMARY UNITS)		Set the weight value to indicate 20mA (100%)
UNITS		Set to the calibrated primary unit.
RANGE	**OUTPUT RANGE**	Set the output type. Current Options: 4-20mA, 4-20mA w/Alarm, 0-20mA, 0-24mA
	MIN AT	Set the minimum output value.
	MAX AT	Set the maximum output value.
SCALE		Set the target scale number if configuring for dual scale operation.
GROSS/NET TOGGLE		Transmit gross or net weight. *Note: When no tare weight is set the output is gross weight.*
TEST	**DRIVE OUTPUTS**	Set and fix output to LOW LIMIT (4mA), HIGH LIMIT (20mA), LOW ALARM (3.5mA) or HIGH ALARM (24.2mA) *Output will revert after returning to the weighscreen.*
	FACTORY MODE	Enable to cycle output through 4mA, 8mA, 16mA, 20mA.
CHECK FOR UPDATES		Checks for an update file. Follow all instructions provided by Technical Support.

Figure 5-26. Enhanced Analog Output Accessory Card Menu

5.5.2 (P/N: 37045) ETHERNET/IP ACCESSORY CARD

Menu Item	Menu Item
REVISION NUMBER	Displays the accessory card software revision number.
NETWORK TYPE	Displays the network type. (Ethernet/IP)
BYTE ORDER	Set to Standard or Reverse. This setting must be communicated by the customer if required.
IP ADDRESS	Set the TS3300 IP Address. (Ethernet/IP network only)
SUBNET MASK	Set the TS3300 Subnet Mask. (Ethernet/IP network only)
GATEWAY IP	Set the TS3300 Gateway IP Address. (Ethernet/IP network only)
DHCP	Set to enable or disable DHCP assignment.
COMM SETTINGS	Set to enable COMM Setting as 10 or 100 full or half-duplex, or auto.
DNS 1	Set the DNS 1 Server IP Address.
DNS 2	Set the DNS 2 Server IP Address.

MIN WT	Set the minimum weight transmitted by the instrument.
MAX WT	Set the maximum weight transmitted by the instrument.

Figure 5-27. Enhanced Analog Output Accessory Card Menu

5.5.3 (P/N: 37720) MODBUS TCP ACCESSORY CARD

Menu Item	Menu Item
REVISION NUMBER	Displays the accessory card software revision number.
NETWORK TYPE	Displays the network type. (Modbus-TCP)
BYTE ORDER	Set to Standard or Reverse. This setting must be communicated by the customer if required.
IP ADDRESS	Set the TS3300 IP Address.
SUBNET MASK	Set the TS3300 Subnet Mask.
GATEWAY IP	Set the TS3300 Gateway IP Address.
DHCP	Set to enable or disable DHCP assignment.
COMM SETTINGS	Set to enable communicate for 10 mbps or 100 mbps in full or half-duplex, or auto.
CONNECTION TIMEOUT	Set the connection timeout.
PROCESS TIMEOUT	Set the process timeout.
DNS 1	Set the DNS 1 Server IP Address.
DNS 2	Set the DNS 2 Server IP Address.
HOST NAME	Set the host name.
DOMAIN NAME	Set the domain name.
SMTP SERVER	Not applicable, for special software only.
SMTP USER	Not applicable, for special software only.
SMTP PASSWORD	Not applicable, for special software only.
WORD ORDER	Set to little-endian or big-endian.
MIN WT	Set the minimum weight transmitted by the instrument.
MAX WT	Set the maximum weight transmitted by the instrument.

Figure 5-28. Modbus TCP Accessory Card Menu

5.5.4 (P/N: 37044) DEVICENET ACCESSORY CARD

Menu Item	Menu Item
REVISION NUMBER	Displays the accessory card software revision number.
NETWORK TYPE	Displays the network type. (DeviceNET)
BYTE ORDER	Set to Standard or Reverse. This setting must be communicated by the customer if required.
NODE ADDRESS	Set the TS3300 Node Address.
BAUD RATE	Set the baud rate. (125, 250, or 500 kbps, or auto)
MIN WT	Set the minimum weight transmitted by the instrument.
MAX WT	Set the maximum weight transmitted by the instrument.

Figure 5-28. DeviceNET Accessory Card Menu

5.6 ACCUMULATION MENU

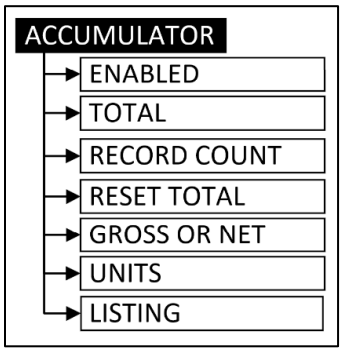


Figure 5-29. Accumulator Menu Hierarchy

Menu Item	Sub-Menu Item	Description
ENABLED		Set to enable Accumulation.
TOTAL		Displays of the total accumulated weight. *Resets when accumulator is cleared.*
RECORD COUNT		Displays the number of times an accumulation has been recorded. *Resets when accumulator cleared.*
RESET TOTAL		Clears the accumulator total and record count.
GROSS OR NET		Set to GROSS to force the accumulator to capture the gross weight even when a tare is taken.
UNITS		Set the accumulated unit of measure as either primary or secondary.
LISTING		Set to SUMMARY to print the total record count and total accumulated weight. Set to ALL to print each accumulation record.

Figure 5-30. Accumulation App Menu

6.0 MAINTENANCE

Scale systems must be checked on a routine basis to determine if recalibration is required. Perform a zero calibration during daily operation, verify calibration using test weights, and recalibrate as necessary. Check for changes in the calibration (mv/V) and other anomalous behavior.

Cleaning:

Wipe enclosure clean with mild soap and water or stainless-steel cleaner. It is recommended to power off and disconnect the instrument before cleaning. Do not use harsh chemicals or high-pressure water jets for cleaning.

Calibration:

The scale system must be checked on a frequent and recurring basis. Check the zero calibration for drift and scale calibration. Record each check to identify changes and report them to the appropriate party.

Electrical Wiring:

Check for proper interconnections between the instrument, the scale, and accessories. Verify terminal blocks are properly torqued. Inspect wiring for abrasions, cuts, or tears. Remove power from the system and inspect wiring for continuity, shorts, and grounds using an ohmmeter.

6.1 TROUBLESHOOTING

Problem	Likely condition(s)	Troubleshooting
Instrument does not power on.	Power failure Blown fuse	- Check for incoming power - Inspect breakout board barrel fuse.
Pressing buttons on display does nothing	Touchscreen failure	- Reboot instrument.
Weighscreen displays "-------" or "---OL---"	Overload or underload condition.	- Check Cell Diagnostics Page for errors and further troubleshooting. - Inspect load cell and wiring.
A pop-up alert displays: SSC COM ERROR	Loss of communication between instrument and scale.	- Check load cell diagnostics page for errors. - Inspect SSC, PPS, QLC, and home-run wiring.
Serial output not transmitting data	Serial output failure.	- Verify communication settings between instrument and customer device. - Verify output from instrument by connecting RS232 output to service laptop and inspect using a serial data capture tool (Docklight, COMDebug, etc.) - If no output, replace breakout board.
CELL DIAGNOSTICS PAGE		
Error [01]	Cell Zero Error Posts when a load cell's current zero reference has deviated from the original span zero reference value by the defined [TOLERANCE %]	- Unload the scale and press zero to clear error. - Adjust [TOLERANCE %] if set too tight for customer operation. - If no resolution, troubleshoot load cell and replace if necessary.
Error [02]	Sectional Error Posts when a load cell deviates from the opposing load cell of the same scale section (same SSC) by the defined [TOLERANCE %]	- Unload the scale and press zero to clear error. - Adjust [TOLERANCE %] if set too tight for customer operation. 1. If no resolution, troubleshoot load cell and replace if necessary.
Error [04]	Cell Motion Error Posts when a load cell weight is not changing that all cell weights change by a minimum amount during a weighment.	- Unload the scale and press zero to clear error. - Adjust [TOLERANCE %] if set too tight for customer operation. 2. If no resolution, troubleshoot load cell and replace if necessary.
Error [08]	Cell Call Error Posts when a load cell's digital counts fall below a defined value.	- Unload the scale and press zero to clear error. - Adjust [CELL COUNT TRIGGER] if set too tight for customer operation. 3. If no resolution, troubleshoot load cell and replace if necessary.
Error [10]	Cell Out of Range Error Posts when the input signal from the load cell is out of range.	- Unload the scale and press zero to clear error. - Inspect load cell and wiring to SSC. 4. Call for Service

Error [20]	SSC COM Error Posts when communication with the Smart Sectional Controller has been lost.	- Reboot instrument. - Check wiring. - Check SSC and PPS functionality and replace if necessary. 5. Inspect home run and SSC to PPS wiring.

Figure 6-1. Troubleshooting Guide

7.0 APPROVALS

Certificate Number: 25-080
Page 1 of 3

NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:
Indicating Element
Digital Electronic
Model: TS3300
(see below) n_{max}: 10 000
Accuracy Class: III / III L

Submitted By:
Thurman Scale
2176 Portland Street
St. Johnsbury, VT 05819
Tel: 802-473-5228
Contact: Devin Holland
Email: Dholland@thurmanscale.com
Website: http://www.thurmanscale.com

Standard Features and Options

TSxx0x- Analog
TSxx1x- Intalogix (Digital)
TSxxx1- Desktop Housing
TSxxx2- Washdown Housing

Note: "PN xxxxx" will be stated to the right of the "Model TS33xx-xxx." This PN xxxxx is a part number for manufacturing identification of variations of the certified "standard features" and "options" listed below.

Standard Features:

- Semi-automatic (push-button) Zero Setting Mechanism
- Automatic Zero Tracking (AZT)
- Remote Calibration and Configuration, Relay and Setpoint control
- Remote Display, External Keyboard, and Printer, PC Output
- Ethernet Interface, Serial, RS-232, RS-485, Current Loop and extra serial ports, USB Ports
- Keyboard, Semi-automatic (push button), Programmable Tare along with Multiple Tare Memories
- Units: Pound/Kilogram/Ton/Tonne/Ounce/Gram
- Multi-Interval and Remote Switch Capability
- Weigh-In/Weigh-Out, Capability Gross/Net/Tare Display
- AC Power 115 / 230 volts
- Weight Accumulation
- Category III Audit Trail Capability (see page 2)
- Brushed Stainless Steel and Aluminum Housing

Options:

- Internal Analog to Digital Converter,
- External Analog to Digital Converter (Model ACC-2000-XX
- External A/D Converter or equivalent with Model ACC-2001-XX Power Supply Box or equivalent (CC 14-103).

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of *Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices*. Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages. *Editorial changes, not affecting the type or metrological content, corrected this certificate.

Kevin Schnepp
Chair, NCWM, Inc.

Marc Paquette
Chair, NTEP Committee
Issued: August 27, 2025

9011 South 83rd Street | Lincoln, Nebraska 68516

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Figure 7-1. NTEP Certificate of Conformance

APPENDIX I: SERIAL DATA OUTPUT FORMATS

The TS3300 can be configured to transmit a pre-formatted serial string of weight data to a PC or remote display using the RS-232 serial or Ethernet TCP/IP ports:

A. THURMAN FORMAT

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Thurman Format	STX	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MSD	-	-	-	-	LSD	CR
		Status Bytes			**Gross Weight**						**Tare Weight**						

Status Word A (SWA)

Bits 2, 1, 0			
2	**1**	**0**	**Decimal Location:**
0	0	0	X00
0	0	1	X0
0	1	0	X
0	1	1	X.X
1	0	0	X.XX
1	0	1	X.XXX
1	1	0	X.XXXX
1	1	1	X.XXXXX

Bits 4, 3		
4	**3**	**Count By:**
0	1	Count by 1
1	0	Count by 2
1	1	Count by 5
Always = 1		**Bit 5**
Always = 0		**Bit 6**
Always = 0		**Bit 7**

Status Word B (SWB)

Bits 7 - 0	
Gross = 0, Net = 1	**Bit 0**
Positive = 0, Negative = 0	**Bit 1**
Out of Range = 1	**Bit 2**
Motion = 1, Stable = 0	**Bit 3**
lb = 0, kg = 1 (See SWC, bits 0-2)	**Bit 4**
Always = 1	**Bit 5**
Zero not captured = 1	**Bit 6**
Always = 0	**Bit 7**

Status Word C (SWC)

Bits 7 - 0			
2	**1**	**0**	**UOM**
0	0	0	Bit 0
0	0	1	Bit 1
0	1	0	Bit 2
0	1	1	TONNE
1	0	0	OZ
1	0	1	GRAM
1	1	0	OFF
Print Switch Pushed = 1			**Bit 3**
Center of Zero = 1			**Bit 4**
Always = 0			**Bit 5**
Keyboard Tare = 1			**Bit 6**
Always = 0			**Bit 7**

Character String Description:

- **THURMAN format** consists of 17 characters.
- Byte sequence is initiated by the ASCII character STX "Start of Text." (02 Hex)
- **STATUS WORD A (SWA)** is 1 byte in length. (8 bits) See table.
- **STATUS WORD B (SWB)** is 1 byte in length. (8 bits) See table.
- **STATUS WORD C (SWC)** is 1 byte in length. (8 bits) See table.
- **GROSS WEIGHT** is 6 bytes in length. See SWA for decimal placement and sign.
- **TARE WEIGHT** is 6 bytes in length. See SWA for decimal placement.
- Non-significant leading weight and tare digits are transmitted as spaces. (20 Hex)
- The sequence is terminated by the ASCII "Carriage Return" character CR. (0D Hex)
- Polled requests require a HEX character to be configured in at least one of the four Poll Character options located at: /PORTS/COM 1/POLL.CHR

Standard RS232 Configuration Settings:

Output:	Continuous
Baud Rate:	19200
Data Bits:	8
Parity:	None
Stop Bits:	1
Poll Char:	None configured

**Changing the string format in LOAD will modify the port configuration settings to the standard RS232 configuration settings of the format selected.*

B. ULTEGRA FORMAT (ULTGR)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ultegra Format	X	X	X	X	.	X	X	_	l/k	b/g	_	G/g	R/r	_	_	CR	LF	EOT
	Gross Weight							**space**	**UoM**		**space**	**Gross + Motion**		**space**	**space**			**Note[6]**

- Character String Description:
- **ULTEGRA format** consists of 17 characters, or 18 characters when in an overload condition. See note 6.
- Characters denoted by X are the gross weight digits with a fixed decimal position.
- When the gross weight is negative a minus character (2D hex) will be transmitted in character 1.
- Unit of Measure (UoM): “lb” = pound, “kg” = kilogram.
- **Gross + Motion**: "GR" in all uppercase indicates gross weight and the weight is stable. "gr" in all lowercase indicates gross weight and the weight is not stable.
- If the scale is in an **overload condition**, the EOT character (04 hex) is appended to the string as an 18th character. ***CAUTION – STRING LENGTH CHANGES***
- Polled requests require a **HEX character** to be configured in at least one of the four Poll Character options. *Configure location: /PORTS/COM 1/POLL.CHR/POL.CH1-4.*

Standard RS232 Configuration Settings:

Output:	Poll
Baud Rate:	9600
Data Bits:	7
Parity:	Odd
Stop Bits:	2
Poll Character:	0D (hex)

**Changing the string format in LOAD will modify the port configuration settings to the standard RS232 configuration settings of the format selected.*

C. TOLEDO

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Toledo	STX	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MSD	-	-	-	-	LSD	CR
		Status			**Displayed Weight**						**Tare Weight**						

Status Word A (SWA)

Bits 2, 1, 0			
2	**1**	**0**	**Decimal Location:**
0	0	0	X00
0	0	1	X0
0	1	0	X
0	1	1	X.X
1	0	0	X.XX
1	0	1	X.XXX
1	1	0	X.XXXX
1	1	1	X.XXXXX

Bits 4, 3		
4	**3**	**Count By:**
0	1	Count by 1
1	0	Count by 2
1	1	Count by 5
Always = 1		**Bit 5**
Always = 0		**Bit 6**
Always = 0		**Bit 7**

Status Word B (SWB)

Bits 7 - 0	
Gross = 0, Net = 1	**Bit 0**
Positive = 0, Negative = 0	**Bit 1**
Out of Range = 1	**Bit 2**
Motion = 1, Stable = 0	**Bit 3**
lb = 0, kg = 1 (See SWC, bits 0-2)	**Bit 4**
Always = 1	**Bit 5**
Zero not captured = 1	**Bit 6**
Always = 0	**Bit 7**

Status Word C (SWC)

Bits 7 - 0			
2	**1**	**0**	**UOM**
0	0	0	LB OR KG (see SWB)
0	0	1	GRAM
0	1	0	TONNE
0	1	1	OZ
1	0	0	TROY OUNCE
1	0	1	PENNY WEIGHT
1	1	0	TONS
1	1	1	CUSTOM UNIT
Print Request = 1			**Bit 3**
Expand Data x10 = 1, Normal = 0			**Bit 4**
Always = 1			**Bit 5**
Always = 0			**Bit 6**
Always = 0			**Bit 7**

Character String Description:

- **TOLEDO format** consists of 17 characters.
- Sequence is initiated by the ASCII character STX "Start of Text." (02 Hex)
- **STATUS WORD A (SWA)** is 1 byte in length. (8 bits) See table.
- **STATUS WORD B (SWB)** is 1 byte in length. (8 bits) See table.
- **STATUS WORD C (SWC)** is 1 byte in length. (8 bits) See table.
- **DISPLAYED WEIGHT** is 6 bytes in length. See SWA for decimal placement and sign.
- **TARE WEIGHT** is 6 bytes in length. See SWA for decimal placement and sign.
- Non-significant weight and tare digits are transmitted as spaces.
- The sequence is always terminated by the ASCII character CR "Carriage Return." (0D Hex)

Standard RS232 Configuration Settings:

Output: Continuous
Baud Rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Poll Char: 0D

**Changing the string format in LOAD will modify the port configuration settings to the standard RS232 configuration settings of the format selected.*

D. CARDINAL (CARD)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Cardinal	STX	+/-	X	X	X	X	X	X	X	m/o	_	l/k	b/g	_	g/n	_	_	ETX
		Polarity	**Displayed Weight**							**Motion/ Overload**	**space**	**UoM**		**space**	**Gross/ Net**	**space**	**space**	

Character String Description:

- **CARDINAL format** consists of 18 characters.
- Byte sequence is initiated by the ASCII character STX "Start of Text." (02 Hex)
- **DISPLAYED WEIGHT** is 7 bytes in length. The decimal placement is determined by the division size. Note: Character # 9 becomes a space when a division size is less than 1.
- Non-significant leading weight digits are transmitted as zeros. (30 Hex)
- **MOTION/OVERLOAD:** "space" (20 hex) = nothing, "m" = motion, "o" = overload
- **UNIT OF MEASURE**: "lb" = pound, "kg" = kilogram
- **GROSS/NET:** "g" = gross, "n" = net
- The sequence is terminated by the ASCII "ETX" character. (03 Hex)
- Polled requests require a HEX character to be configured in at least one of the four Poll Character options located at: /PORTS/COM 1/POLL.CHR

Standard RS232 Configuration Settings:

Output: Poll
Baud Rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Poll Char: 0D

**Changing the string format in LOAD will modify the port configuration settings to the standard RS232 configuration settings of the format selected.*

E. WEIGHTRONIX (WTX)

Character	1	2	3	4	5	6	7	8	9	10	11	12	13
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12
Weightronix WI-120	20	g/n	+/-	X	X	X	X	X	20	l/k	b/g	CR	LF
	space	**Gross/ Net**	**Polarity**	**Displayed Weight**					**space**	**UoM**			

Character String Description:

- **WEIGHTRONIX format** consists of 13 characters.
- Byte sequence is initiated by "space." (20 hex)
- Polarity: "+" = positive, "-" = negative
- **DISPLAYED WEIGHT** is 7 bytes in length. The decimal placement is determined by the division size.
- Non-significant leading weight digits are transmitted as zeros. (30 Hex)
- **Unit of Measure**: "lb" = pound, "kg" = kilogram
- Gross/Net: "g" = gross, "n" = net
- The sequence is terminated by the ASCII "CR" character (0D Hex) and "LF" character. (0A hex)
- Polled requests require a HEX character to be configured in at least one of the four Poll Character options located at: /PORTS/COM 1/POLL.CHR

Standard RS232 Configuration Settings:

Output: Poll
Baud Rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Poll Char: 0D

**Changing the string format in LOAD will modify the port configuration settings to the standard RS232 configuration settings of the format selected.*

F. CONDEC

Character	1	2	3	4	5	6	7	8	9	10	11	12	13
Byte #	0	1	2	3	4	5	6	7	8	9	10	11	12
CONDEC	STX	_	_	X	X	X	X	X	X	L/K	G/N	M	CR
		space	**space**	**Displayed Weight**						**UoM**	**Gross/ Net**	**Scale Motion**	

Character String Description:

- **CONDEC format** consists of 13 characters.
- Byte sequence is initiated by the ASCII character STX "Start of Text." (02 Hex)
- **DISPLAYED WEIGHT** is 7 bytes in length. The decimal placement is determined by the division size.
- Non-significant leading weight digits are transmitted as spaces. (20 Hex)
- **Unit of Measure (UoM)**: L = pounds, K = kilograms.
- **Gross/Net**: "G" = gross, "N" = net
- The sequence is terminated by the ASCII "carriage return" character. (0D Hex)
- Polled requests require a HEX character to be configured in at least one of the four Poll Character options located at: /PORTS/COM 1/POLL.CHR

Standard RS232 Configuration Settings:

Output: Poll
Baud Rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1
Poll Char: 0D

G. THURMAN REMOTE DISPLAY (REMOTE)

Character	1	2	3	4	5	6	7	8	9	10	11
Byte #	0	1	2	3	4	5	6	7	8	9	10
FB Remote Display	STX	4	0	C	W	W	W	W	W	W	ETX
		Identifier Code		**space**	**Gross Weight**						

Character String Description:

- **THURMAN REMOTE DISPLAY** format consists of 11 characters.
- Byte sequence is initiated by the ASCII character STX "Start of Text." (02 Hex)
- **GROSS WEIGHT** is 6 bytes in length. The decimal placement is determined by the division size.
- Non-significant leading weight digits are transmitted as spaces. (20 Hex)
- The sequence is terminated by the ASCII "ETX" character. (03 Hex)
- Polled requests require a HEX character to be configured in at least one of the four Poll Character options located at: /PORTS/COM 1/POLL.CHR

Standard RS232 Configuration Settings:

Output:	Continuous
Baud Rate:	2400
Data Bits:	7
Parity:	Odd
Stop Bits:	1
Poll Char:	None configured

APPENDIX II: ETHERNET/IP & DEVICENET DATA REPRESENTATIONS

A. OVERVIEW

The term **PLC INTERFACE** usually describes an all-digital two-way communications system that interconnects measurement and control equipment such as sensors, actuators and controllers.

Noted below are the two (3) **PLC Interfaces types** used with the TS3300 Instrument.

- DeviceNet
- Modbus TCP
- Ethernet/IP

  Not to be confused with **Ethernet TCP/IP**, but instead, the "**IP**" in EtherNet/IP stands for **"Industrial Protocol".**

B. DEVICENET (37044)

The maximum DeviceNet network size is **up to 64 Nodes**, with message data packets **up to 8 bytes.**

WIRE	SIGNAL	DESCRIPTION
1	**V**	Negative bus supply voltage
2	**CAN_L**	CAN low bus line
3	**SHIELD**	Cable shield
4	**CAN_H**	CAN high bus line
5	**V+**	Positive bus supply voltage



NS = **Operation Mode** LED
MS = **Mode Status** LED
Connection = DeviceNet Connector

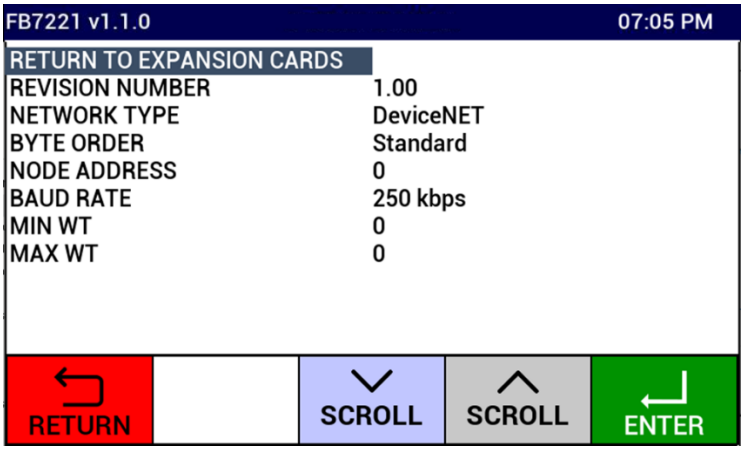
NETWORK STATUS (NS) LED

STATE	INDICATION
Off	Not online/ No power
Solid Green	Online, one or more connection established
Flashing Green (1 Hz)	Online, no corrections established
Red	Critical link failure
Flashing Red (1 Hz)	One or more connections timed out
Alternating Red/Green	Self-test

MODULE STATUS (MS) LED

STATE	INDICATION
OFF	No power
Solid Green	Operating in normal condition
Flashing Green (1 Hz)	Missing/Incomplete configuration/ Device needs comminssioning
Red	Unrecovrerable fault(s)
Flashing Red (1 Hz)	Recoverale fault(s)
Alternating Red/Green	Self-test

DeviceNet Instrument Configuration



Revision Number – Read-only field indicating the firmware revision of the accessory card.
Network Type – Read-only field indicating the network type of the accessory card.
Byte Order – Select the order of bytes within words.

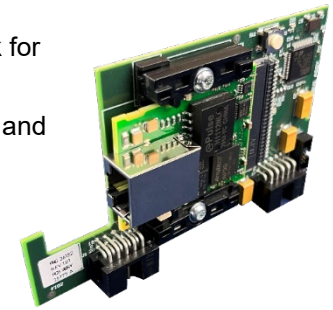
- Standard – Most Significant Bit (MSB) or Big Endian
- Reverse – Least Significant Bit (LSB) or Little Endian

Node Address – Address of the DeviceNet node. Address to be provided by the customer.
Baud Rate – Set the baud rate of the device to match the customer network.
Min WT – Minimum weight of the scale. Weights below this value will set to high bit 2 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).
Max WT – Maximum weight of the scale. Weights above this value will set to high bit 1 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).

C. ETHERNET/IP (37045)

The **ETHERNET/IP MODULE** utilizes the Industrial Protocol.

- The data is transmitted continuously from this module.
- Utility IPConfig – Developed by HMS Industries can scan a network for Ethernet IP devices, and allows IP assignment.
- EDS (Electronic Data Sheet file (Vendor specific data is accessible and recommended
- A custom EDS (Electronic Data Sheet) file is available from our website, uploading this file into PLC software can then help target correct memory addressing for scale data.



Use the following download to change the IP, Sub Net and Gateway addresses of an Ethernet/IP Module:
http://www.fairbanks.com/software/FB7200_090513.zip

Use the following download to load into PLC software for configuring the Ethernet/IP module.
http://www.fairbanks.com/software/FB7200_090513.zip

Note: *EDS Files should be provided to the customer's PLC integrator. Technicians should not upload EDS files to customer software.*

Network Status LED Chart

STATE	DESCRIPTION
Off	No power or offline.
GREEN	Online, one or more connections established.
FLASHING	Online, no connections established.
RED	Duplicate IP address, **FATAL** error
FLASHING RED	One or more connections timed out.

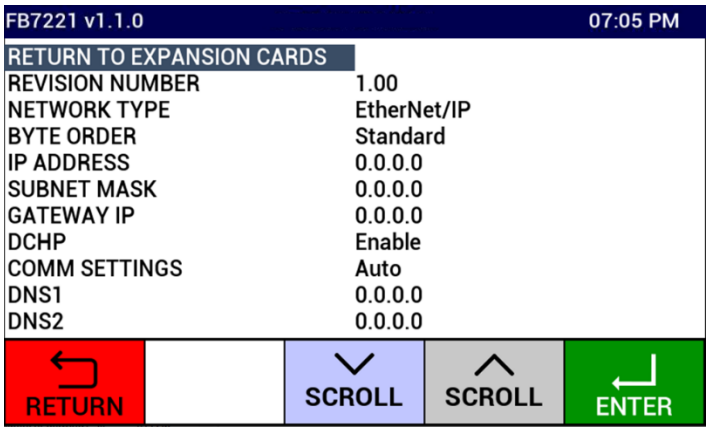
Module Status LED Chart.

STATE	DESCRIPTION
Off	No power.
GREEN	Controlled by a scanner in **RUN** state.
FLASHING	Not configured, or scanner in idle state.
RED	Major fault, **FATAL** error.
FLASHING RED	Recoverable fault(s).

Link / Activity Status LED Chart

STATE	DESCRIPTION
Off	No link, no activity.
GREEN	Link established.
FLICKERING GREEN	Activity.

Ethernet/IP Instrument Configuration



Revision Number – Read-only field indicating the firmware revision of the accessory card.
Network Type – Read-only field indicating the network type of the accessory card.
Byte Order – Select the order of bytes within words

- Standard – Most Significant Bit (MSB) or Big Endian
- Reverse – Least Significant Bit (LSB) or Little Endian

IP Address – Address of the Ethernet/IP device. Address to be provided by the customer.
Subnet Mask – Subnet mask of the customer network. To be provided by customer.
Gateway IP – IP address of the gateway of the customer network. To be provided by the customer.
DHCP – Set to enable to allow the accessory card to receive an IP address from the customer Dynamic Host server. Set to static if the customer network does not assign addresses.
Comm Settings – Set the Ethernet communication speed and settings.

- Auto – Auto-detect the network settings.
- 10 HDX – 10 Mbps half-duplex
- 10 FDX – 10 Mbps full-duplex
- 100 HDX – 100 Mbps half-duplex
- 100 FDX – 100 Mbps full-duplex

DNS1 – Address of DNS 1. To be provided by customer.
DNS2 – Address of DNS 2. To be provided by customer.
Min WT – Minimum weight of the scale. Weights below this value will set to high bit 2 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).
Max WT – Maximum weight of the scale. Weights above this value will set to high bit 1 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).

D. MODBUS-TCP (37720)

Modbus-TCP is an open Master/Slave application protocol that can be used on top of Ethernet-TCP/IP. Modbus reads in 16 bit register sizes == 1 word == (2) bytes.

Connection Style: RJ45 – Standard Ethernet Cat5
Duplexing is 10/100 Mbits/ full/half, and can be configured from the web interface.

Modbus TCP Instrument Configuration

Revision Number – Read-only field indicating the firmware revision of the accessory card.
Network Type – Read-only field indicating the network type of the accessory card.
Byte Order – Select the order of bytes within words

- Standard – Most Significant Bit (MSB) or Big Endian
- Reverse – Least Significant Bit (LSB) or Little Endian

IP Address – Address of the Ethernet/IP device. Address to be provided by the customer.
Subnet Mask – Subnet mask of the customer network. To be provided by customer.
Gateway IP – IP address of the gateway of the customer network. To be provided by the customer.
DHCP – Set to enable to allow the accessory card to receive an IP address from the customer Dynamic Host server. Set to static if the customer network does not assign addresses.
Comm Settings – Set the Ethernet communication speed and settings.

- Auto – Auto-detect the network settings.
- 10 HDX – 10 Mbps half-duplex
- 10 FDX – 10 Mbps full-duplex
- 100 HDX – 100 Mbps half-duplex
- 100 FDX – 100 Mbps full-duplex

Connection Timeout – Timeout if TCP query is received in the configured time in seconds.
Process Timeout – Timeout to exit the processing state after query is received in seconds.
DNS1 – Address of DNS 1. To be provided by customer.
DNS2 – Address of DNS 2. To be provided by customer.
Host Name – Host name entered as an IP address or name. To be provided by the customer.
Domain Name – Domain name entered as an IP address or name. To be provided by the customer.
SMTP Server – Not used.
SMTP User – Not used.
SMTP Password – Not used.
Word Order – Word order for types larger than 16 bits.
Little-endian – Least significant word first
Big-endian – Most significant word first
Min WT – Minimum weight of the scale. Weights below this value will set to high bit 2 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).
Max WT – Maximum weight of the scale. Weights above this value will set to high bit 1 of Status Word 2 (see STATUS/COMMAND WORD BIT USAGE).

E. USING IPCONFIG TOOL TO EDIT IP SETTINGS

1. Download the IPConfig Tool from https://www.fairbanks.com/support/software.cfm
2. Install the utility.
3. Open IPconfig.exe from the file location.
4. Press Scan to see a list of network devices.
5. If your network has more than a single AnyBus device and you are unsure of which needs modification, unscrew the two screws next to the network jack and slide the Anybus module out. Record the MAC ID on the underside and replace.
6. Click the device in the list to make changes to the IP configuration.
7. If the assignments are made dynamically, check the Retrieve IP settings dynamically from a DHCP server box and press Apply.
8. To make static assignments, leave the box unchecked and fill out the IP address, Subnet mask, default gateway, and DNS information. Press Apply to save the settings.

F. EDS FILES

EDS Files are text files uploaded to a network configuration tool to identify the device hardware connected to the network. They should be provided to the installing integrator. They can be downloaded from the Anybus website by clisking the below links:

Ethernet/IP

DeviceNet

G. SOFTWARE SPECIFICATIONS

This section and the ones following it contain information the customer will require for configuring their PLC to correctly read scale information from the PLC interface.

Output Data Format to Gateway from TS3300

The **Gateway** takes a Serial String and remap the data to the format needed for the Fieldbus type installed per the register.

- The following is the definition of the Serial String for one (1) scale.
  - The Scale ID is extracted from **Status Word 0**.
  - The data is placed in the appropriate Fieldbus Registers based on this scale ID.
  - **Status Word Data** is sent as binary values **MSB** first over the Serial Channel.
  - Weight data is sent as six (6) characters representing a 6-digit decimal value (000000 – 999999).
  - This decimal value represents the weight multiplied by the scale factor, listed in **Command/Status Word 1 bits 0-2.**
  - The serial string is a fixed length of fifty-seven (57) bytes.

STX character	1 byte (02h)
Status word 0	2 bytes (includes scale ID)
Status word 1	2 bytes
Status word 2	2 bytes
Unassigned data	6 characters (default ‘000000’)
Gross Weight	6 characters (example ‘002340’)

Tare Weight	6 characters
Net Weight	6 characters
Setpoint 1	6 characters
Setpoint 2	6 characters
Unused	6 characters
Unassigned data	6 characters
CRC	1 byte
ETX character	1 byte (03h)

Note: ***Weight Values*** *sent over the Serial Channel will be represented in the Fieldbus registers based on the settings of* ***bits 14*** *and* ***15*** *in* ***STATUS WORD 0.***

If the data is set to be a 16 bit or 32 bit integer, then the register value will contain the integer value and the host must multiply this by the scale factor to get the actual weight.

If it is set to be a 16 bit integer, and the integer value is greater then **65535**, a value of **0** is placed in the register.

If the data is set to be **FLOATING POINT**, then the gateway will multiply the integer value received by the scale factor, and place the resulting 32 bit floating point value in the register.

In this case the host does not use the scale factor to interpret the value.

Input Data Format From Gateway To TS3300

The Gateway will send a string to the FB7200 reflecting data from the Fieldbus.

The following is the definition of the serial string for one (1) scale.

The scale ID in the Fieldbus register for Command word 0 for a scale must be set to the correct value (1-4) before data for that scale will be sent over the serial channel.

If the scale ID is set to the correct value, any time any data for this scale changes the data will be sent out the serial channel.

Command word data is sent as binary values MSB first over the serial channel.

Weight data is sent as six (6) characters representing a **six (6) digit decimal value** (**000000 – 999999**).

This decimal value represents the weight multiplied by the scale factor listed in **command/status word 1 bits 0-2**.

The serial string is a fixed length of **105 bytes**.

STX character	1 byte (02h)
Command word 0	2 bytes (includes scale ID)
Command word 1	2 bytes
Command word 2	2 bytes
Setpoint 1 weight	6 characters
Setpoint 2 weight	6 characters
Tare Weight	6 characters
Display Message 1	26 characters

Display Message 2	26 characters
Display Message 3	26 characters
CRC	1 byte
ETX character	1 byte (03h)

Note: ***Weight Values*** *sent over the serial channel will represent data in the Fieldbus registers based on the settings of* ***bits 14*** *and* ***15*** *in* ***STATUS WORD 0****.*

If the data is set to be a 16 bit or 32 bit integer, then the integer value in the register will be sent over the serial channel.

If it is set to be 16 bit, the high order word will be ignored.

If the data is set to be floating point, then the floating-point value will be multiplied by the scale factor and the integer portion of this resulting value will be sent over the serial channel.

In all cases if the resulting integer is greater than **999999**, a value of **000000** will be sent over the Serial Channel.

In all cases the scale must multiply the integer by the scale factor to determine the actual weight.

Display Messages

A change in the Display Message Strings will not cause a serial string to be sent. The **Display Message Strings** will be sent when any data for a scale is changed (provided the Scale ID is set to the correct value for that scale).

Typically, this will happen when command word 2 bit 1 is set indicating the display messages are to be displayed. There is a maximum of 26 characters per line for the Display Message Strings.

Serial data is transferred according to the RS232 specification between the gateway and the FB7200. The communications parameters are listed below.

Baud	**115,200**
Data Bits	**8**
Parity	**None**
Stop Bits	**1**

H. PLC DATA REPRESENTATIONS

The following information shows the representation of data on all PLC Interfaces. Each Interface has input data (from the FB7200 to the PLC Network), and output data (from the PLC Network to the FB7200).

ALL PLC TYPES OUTPUT MEMORY MAP

START ADDRESS	HEX	DECIMAL	SIZE
Scale 1	0	0	10 Words
Scale 2	14	20	10 Words
Scale 3	28	40	10 Words
Scale 4	3C	60	10 Words
Scale Message Line 1	50	80	26 bytes
Scale Message Line 2	6A	106	26 bytes
Scale Message Line 3	84 1	32	26 bytes
Unassigned	9E	158	2 bytes
			Total: 160 bytes

START ADDRESS	HEX	DECIMAL	SIZE
Scale 1	0	0	20 Words
Scale 2	28	40	20 Words
Scale 3	50	80	20 Words
Scale 4	78	120	20 Words
			Total: 160 bytes

OUTPUT DATA (WORD BYTE REGISTER USAGE)

WORD	BYTE	REGISTER USAGE	SIZE (BYTES)	SCALE
0	0 – 1	Command Word 0	2	**Scale 1**
1	2 – 3	Comand Word 1	2	
2	4 – 5	Command Word 2	2	
3 – 4	6 - 9	Setpoint 1	4	
5 – 6	10 – 13	Setpoint 2	4	
7 – 8	14 – 17	Tare Weight	4	
9	18 – 19	Unassigned	2	
10	20 – 21	Command Word 0	2	**Scale 2**
11	22 – 23	Command Word 1	2	**(unused)**
12	24 – 25	Command Word 2	2	

13 – 14	26 – 29	Setpoint 1	4	
15 – 16	30 – 33	Setpoint 2	4	
17 – 18	34 – 37	Tare Weight	4	
19	38 – 39	Unassigned	2	
20	40 – 41	Command Word 0	2	**Scale 3**
21	42 – 43	Command Word 1	2	**(unused)**
22	44 – 45	Command Word 2	2	
23 – 24	46 – 49	Setpoint 1	4	
25 – 26	50 – 53	Setpoint 2	4	
27 – 28	54 – 57	Tare Weight	4	
29	58 – 59	Unassigned	2	
30	60 – 61	Command Word 0	2	**Scale 4**
31	62 - 63	Command Word 1	2	**(unused)**
32	64 – 65	Command Word 2	2	
33 – 34	66 – 69	Setpoint 1	4	
35 – 36	70 – 73	Setpoint 2	4	
37 – 38	74 – 77	Tara Weight	4	
39	78 – 79	Unassigned	2	
	80 – 105	Display Message Line 1	26	**All Scales**
	106 – 131	Display Message Line 2	26	
	132 – 157	Display Message Line 3	26	

INPUT DATA (WORD BYTE REGISTER USAGE)

WORD	BYTE	REGISTER USAGE	SIZE (BYTES)	SCALE
0	0 – 1	Status Word 0	2	**Scale 1**
1	2 – 3	Status Word 1	2	
2	4 – 5	Status Word 2	2	
3 – 4	6 - 9	Unassigned	4	
5 – 6	10 – 13	Gross Weight	4	
7 – 8	14 – 17	Tare Weight	4	
9 – 10	18 – 21	Net Weight	4	
11 – 12	22 – 25	Setpoint 1	4	
13 – 14	26 – 29	Setpoint 2	4	
15 – 16	30 – 33	Unused (weight/second)	4	
17 – 19	34 – 39	Unassigned	6	

20	40 – 41	Status Word 0	2	**Scale 2**
21	42 – 43	Status Word 1	2	**(unused)**
22	44 – 45	Status Word 2	2	
23 – 24	46 – 49	Unassigned	4	
25 – 26	50 – 53	Gross Weight	4	
27 – 28	54 – 57	Tare Weight	4	
29 – 30	58 – 61	Net Weight	4	
31 – 32	62 – 65	Setpoint 1	4	
33 – 34	66 – 69	Setpoint 2	4	
35 – 36	70 – 73	Unused (Weight/second)	4	
37 – 39	74 – 79	Unassigned	6	
40	80 – 81	Status Word 0	2	**Scale 3**
41	82 – 83	Status Word 1	2	**(unused)**
42	84 - 85	Status Word 2	2	
43 – 44	86 – 89	Unassigned	4	
45 – 46	90 – 93	Gross Weight	4	
47 – 48	94 – 97	Tara Weight	4	
49 – 50	98 – 101	Net Weight	4	
51 – 52	102 – 105	Setpoint 1	4	
53 – 54	106 – 109	Setpoint 2	4	
55 – 56	110 – 113	Unused (Weight/Second)	4	
57 – 59	114 – 119	Unassigned	6	
60	120 – 121	Status Word 0	2	**Scale 4**
61	122 – 123	Status Word 1	2	**(unused)**
62	124 – 125	Status Word 2	2	
63 – 64	126 – 129	Unassigned	4	
65 – 66	130 – 133	Gross Weight	4	
67 – 68	134 – 137	Tare Weight	4	
69 – 70	138 – 141	Net Weight	4	
71 – 72	142 – 145	Setpoint 1	2	
73 – 74	146 – 149	Setpoint 2	2	
75 – 76	150 – 153	Unused (Weight/Second)	4	
77 – 79	154 – 159	Unassigned	6	

STATUS/COMMAND WORD BIT USAGE

Status / Command Word 0

Bit	Usage
0	Scale ID bits 0, 1, 2
1	Scale 1 = 001, Scale 2 = 010, Scale 3 = 011, Scale 4 = 100
2	
3	Motion
4	Over capacity gross weight = scale capacity
5	Within 2% capacity
6	Enable Tare
7	Disable Tare
8	lb units
9	kg units
10	ton units
11	tonne units
12	
13	
14	Weight conversion, text to numeric (bits 14 and 15)
15	01 = 32-bit floating point
	10 = 32-bit integer
	11 = 16-bit integer

STATUS/COMMAND WORD BIT USAGE

Status / Command Word 1

Bit	Usage
0	Decimal Point Location Bits 0, 1, 2
1	000 * 1.0; 001 * 0.1; 010 * 0.01; 011 * 0.001; 100 * 0.0001
2	
3	Load Tare Command
4	Auto Tare Command
5	Load Setpoint 1
6	Load Setpoint 2
7	Zero Scale Command

8	Load Cell Status bits 8, 9, 10, 11, 12
9	All Good = 0
10	Defective Cell = Cell Number Binary
11	
12	
13	
14	Print Command
15	Beep

Status / Command Word 2

Bit	**Usage**
0	Display Message Command / Operator Acknowledge
1	Scale weight at or above Maximum weight
2	Scale weight at or below Minimum weight
3 – 15	Unused

STATUS/COMMAND WORD BIT USAGE, CONTINUED

SCALE ID	**WORD 0**	**BITS 0,1,2**
Command:	Changes Instrument display to applicable scale.	
Status:	Value is the scale id if the scale is selected, from instrument keyboard or Fieldbus, else the value is zero.	

MOTION	**WORD 0**	**BIT 3**
Command:	Not applicable	
Status:	Indicates that the scale senses motion.	

OVER CAPACITY	**WORD 0**	**BIT 4**
Command:	Not applicable	
Status:	Indicates that the scale is at 105% of capacity. If this condition is true, the gross weight is sent to the Fieldbus as the scale capacity.	

WITHIN 2% CAPACITY	**WORD 0**	**BIT 5**
Command:	Not applicable	
Status:	Scale is within a range of +/-2% capacity and zero	

ENABLE TARE	**WORD 0**	**BIT 6**
Command:	Enable keyboard tare or auto tare weight	
Status:	Tare weight enabled	

DISABLE TARE	**WORD 0**	**BIT 7**
Command:	Disable keyboard tare and auto tare weight	
Status:	Tare weight disabled.	

LB WEIGHT UNITS	**WORD 0**	**BIT 8**
Command:	Switch scale to lb units	
Status:	Scale is indicating in lb units	

STATUS/COMMAND WORD BIT USAGE, CONTINUED

KG WEIGHT UNITS	**WORD 0**	**BIT 9**
Command:	Switch scale to kg units.	
Status:	Scale is indicating kg units.	

TON WEIGHT UNITS	**WORD 0**	**BIT 10**
Command:	Switch scale to ton units.	
Status:	Scale is indicating in ton units.	

TONNE WEIGHT UNITS	**WORD 0**	**BIT 11**
Command:	Switch scale to tonne units.	
Status:	Scale is indicating in tonne units.	

DECIMAL LOCATION	**WORD 1**	**BITS 0,1,2**
Command:	Used in integer to float weight conversions.	
Status:	Indicates location of decimal point in weight data.	

LOAD TARE	**WORD 1**	**BIT 3**
Command:	Load tare from tare memory address.	
Status:	Switches to 1 after command is executed and returns to 0 when command is cleared.	

AUTO TARE	**WORD 1**	**BIT 4**
Command:	Take current scale gross weight as tare value.	
Status:	Switches to 1 after command is executed returns to 0 when command is cleared.	

LOAD SETPOINT 1	**WORD 1**	**BIT 5**
Command:	Load setpoint 1 for this scale.	
Status:	Switches to 1 when command is executed returns to 0 when command is cleared.	

STATUS/COMMAND WORD BIT USAGE, CONTINUED

LOAD SETPOINT 2	**WORD 1**	**BIT 6**
Command:	Load setpoint 2 for this scale.	
Status:	Switches to 1 when command is executed returns to zero when command is cleared.	

LOAD CELL STATUS	**WORD 1**	**BIT 8,9,10,11,12**
Command:	Not applicable	
Status:	All cells are when the value is zero, else data indicates the number of the failing or failed cell.	

PRINT COMMAND	**WORD 1**	**BIT 14**
Command:	Print Scale ticket	
Status:	Switches to 1 when the command is recognized and resets after the print cycle is complete, and the command bit is reset.	

BEEP	**WORD 1**	**BITS 15**
Command:	Sound instrument audible alarm.	
Status:	Switches to 1 when command is executed, resets to 0 after the command bit is reset.	

DISPLAY MESSAGE	**WORD 2**	**BIT 0**
Command:	Display message on Instrument display. Message loaded from display memory 1 to 3 lines.	
Status:	Switches to 1 when the command is received, and the message is displayed. When scale operator operates any key, the message and bit are cleared.	

SCALE ABOVE MAXIMUM WEIGHT	**WORD 2**	**BIT 1**
Command:	Not applicable	
Status:	Bit is set when scale weight is at or above the programmed value.	

SCALE BELOW MINIMUM WEIGHT	**WORD 2**	**BIT 2**
Command:	Not applicable	
Status:	Bite is set when scale weight is at or below programmed value.	

MODBUS MAPPING

Modbus mapping for the DT7000 is as below:

Function Code	Absolute Address	Modicon 5-digit address	Gateway Mapping
1 – Read Coils	0-1279	00001-01280	OutArray 0-79 (As Bits)
2 – Read Discrete Inputs	0-1279	10001-11280	InArray 0-79 (As Bits)
3 - Read holding Registers	0-79	40001-40080	OutArray 0-79
	256-335	40257 – 40336	InArray 0-79
4 - Read Input Registers	0-79	30001-30080	InArray 0-79
5 - Write Single Coil	0-1279	00001-01280	OutArray 0-79 (As Bits)
6 - Write Single Register	0-79	40001-40080	OutArray 0-79
15 - Write Multiple Coils	0-1279	00001-01280	OutArray 0-79 (As Bits)
16 - Write Multiple Registers	0-79	40001-40080	OutArray 0-79
23 – Read/Write Multiple Registers	0-79	40001-40080	OutArray 0-79

Use the following table to locate the Modbus address of the desired scale information:

Word	Description	Size(Bytes)	Function Code	Modbus address	Function Code	Modbus address
0-1	Status Word 0	2	3	40257	4	30001
2-3	Status Word 1	2	3	40258	4	30002
4-5	Status Word 2	2	3	40259	4	30003
6-9	Unassigned	4	3	40260-1	4	30004 - 30005
10-13	Gross Weight	4	3	40262-3	4	30006 - 30007
14-17	Tare Weight	4	3	40264-5	4	30008 - 30009
18-21	Net Weight	4	3	40266-7	4	30010 - 30011
22-25	Setpoint 1	4	3	40268-9	4	30012 - 30013
26-29	Setpoint 2	4	3	40270-1	4	30014 - 30015
30-33	Flow Rate (weight /second)	4	3	40272-3	4	30016 - 30017
34-39	Unassigned	6	3	40274-6	4	30018 - 30020

APPENDIX III: EXTERNAL KEYBOARD - HOT KEYS

F1=	Red stop light
F2=	Green stop light
F3=	Units
F4=	BGN
F5=	Function
Scroll Lock=	Menu
Alt T=	Auto tare
Alt \=	Clear tare
Alt N=	Net weight
Alt G=	Gross weight
Alt I=	Inbound
Alt O=	Outbound
Alt Z=	Zero scale
Alt Tab=	Inbound list in outbound screen
Alt P=	Print (Tare Input)
Esc=	Cancel (Or go back to previous screen)

APPENDIX IV: PRINTER HARDWARE CONFIGURATION

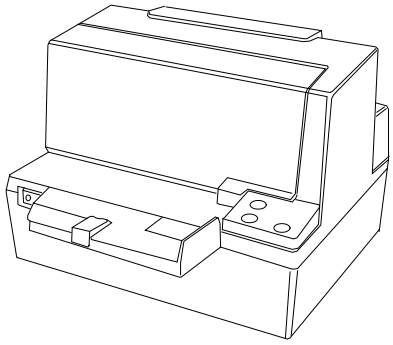
A. TM-U590 TICKET PRINTER SETTINGS

BAUD	**9600**
PARITY	**No**
DATA BITS	**8**
STOP BIT	**1**

Set the printer **dip switche**s as listed below.

DSW 1: 1, 3, and 7 = **ON** only.

DSW 2: All Switches = **OFF**



15599 Cable Kit

WIRE	COM PORT J8 / J9	COLOR	DB-25 PRINTER
1	**1-TX**	R	**3-RX-**
2	**2-RX**	W	**2-TX**
3	**3-GND**	G	**7-GND**

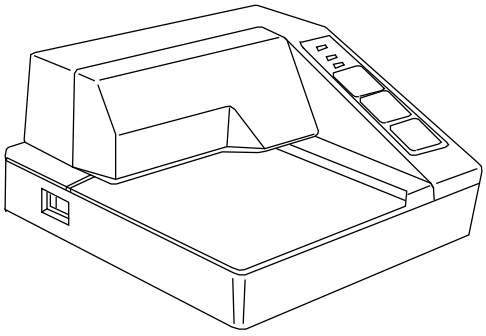
B. TM-U295 TICKET PRINTER SETTINGS

BAUD	**9600**
PARITY	**No**
DATA BITS	**8**
STOP BIT	**1**

Set the printer **dip switche**s as listed below.

SW1: 1 and 3 = **ON**

Remainder = **OFF**



15599 Cable Kit

WIRE	COM PORT J8 / J9	COLOR	DB-25 PRINTER
1	**1-TX**	R	**3-RX-**
2	**2-RX**	W	**2-TX**
3	**3-GND**	G	**7-GND**

THURMAN SCALE
4025 Lakeview Crossing
Groveport, Ohio 43215
www.thurmanscale.com

TS3300 Series Instrumentation

TS3311 NEMA 12 Desktop Instrument – INTALOGIX (40294)
TS3312 NEMA 4X Washdown Instrument – Analog (40234)

Operators Manual 51705