2450

Hanging Scale/Printer

Service Manual

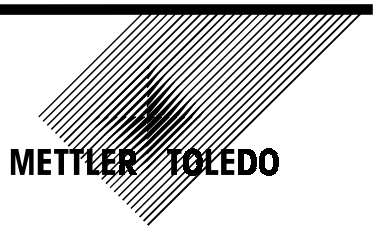
A15275100A
(6/00).00

METTLER TOLEDO®

Customer Feedback

Attention: Retail Quality Manager - MTWR

If you have a problem with one of our products or publications, or just a suggestion on how we can serve you better, please fill out this form and send it to the address on the opposite side of this page (U.S. postage paid), or fax it to us at **(614) 438-4355**. Your feedback will help us to improve product performance, quality, and service.



Part / Product Name:	
Part / Model Number:	**Date:**
Provided By:	
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METTLER TOLEDO Model 2450 Service Manual A15275100A 6/00

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Scales & Systems
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Training

This publication is provided as a guide for individuals who have received Technical Training in servicing the METTLER TOLEDO product. Information regarding METTLER TOLEDO Technical Training may be obtained by calling (614) 438-4940 or writing to:

METTLER TOLEDO, Training Dept., 1900 Polaris Parkway, Columbus, Ohio 43240

FCC Notice

This device complies with Part 15 of the FCC Rules and the Radio Interference Requirements of the Canadian Department of Communications. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

Publication Revision History

Part Number	Date	Revisions
15275100A	10/97	New Manual
A15275100A	6/00	Add Ethernet Information and Self Service.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

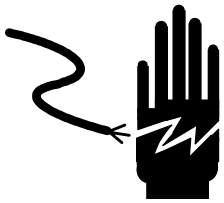
FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

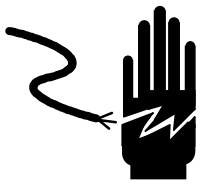
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



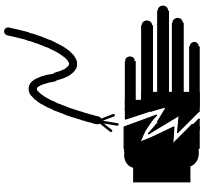
WARNING

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



WARNING

FOR CONTINUED PROTECTION AGAINST SHOCK HAZARD CONNECT TO PROPERLY GROUNDED OUTLET ONLY. DO NOT REMOVE THE GROUND PRONG.



WARNING

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

CAUTION

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

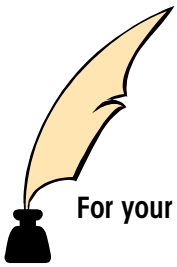
CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

Change Notice

METTLER TOLEDO® reserves the right to make refinements or changes without notice.

CONTENTS



For your notes

1 Specifications

General Description

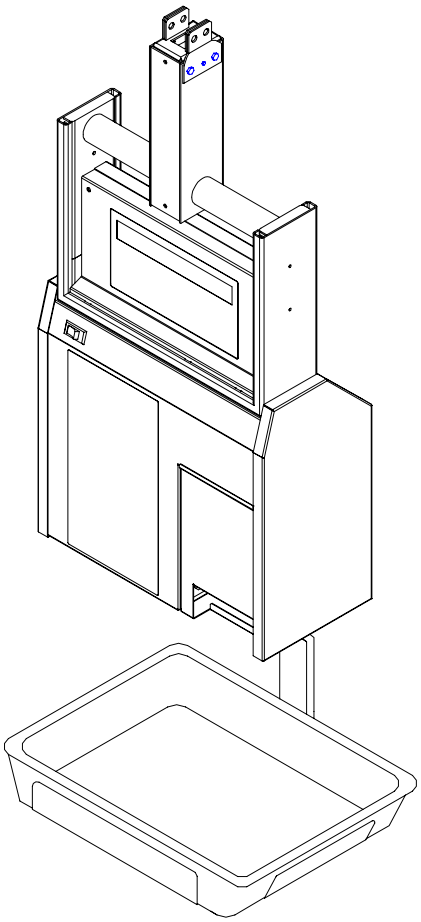


Figure 1-1: Model 2450

The Model 2450 is designed for maximum durability and reliability in demanding application environments. The Model 2450 is manufactured in an ISO 9001 certified METTLER TOLEDO® facility so you are assured to receive a high-quality product.

The METTLER TOLEDO® Model 2450 is a digital computing scale with an integrated thermal label printer. The Model 2450 is designed for a hanging mount from a ceiling support. An optional track mount allows the Model 2450 to be moved on a 10-ft (3-meter) rail. The Model 2450 weighing capacity can be configured for 30 x .01 lb or 15 x .005 kg. The displays consist of a 19-character dot matrix and a 19 character seven-segment display. The Model 2450 is available in TNET Satellite, Ethernet Client, Standalone, or Ethernet Standalone versions.

Ethernet Satellite
The Model 2450 Ethernet Satellite is designed to connect to a METTLER TOLEDO® Scale Server or the STEM (**Smart*Touch*®** Ethernet Master) on an Ethernet network. The Scale Server or STEM contains the database for the PLU, Extra Text, NutriFacts, and Graphics files. Clients on the network access the files through the network as they are needed. No records are stored locally on the satellite, except backup records that are used if the PC goes off-line.

TNET Satellite
The Model 2450 TNET Satellite is designed to connect to a **Smart*Touch*®** TNET Master or STEM (**Smart*Touch*®** Ethernet Master), or to the Model 8422/8423/8305 NF Master (with limited functionality), through a wired RS485 high speed network. The master contains the database containing the PLU, Extra Text, NutriFacts, and Graphics files. Satellites on the network access the files through the network, as they are needed. No records are stored locally on the satellite, except backup records that are used in the event the master goes Off-Line. The satellites are connected to the master controller with standard phone cable using an RS485 multidrop high-speed communications network. The maximum line length (including scale drops) for the scale network is 1500 feet. Each master can support up to 24 satellite scales.

Standalone
The Model 2450 is available as a Standalone or Ethernet Standalone version. The Standalone version is available by from the factory or by adding an optional Standalone kit to the satellite or client scale. The standalone version has the necessary hardware to store records locally in battery backed RAM. The standalone version is available with 256k, 512k, or 1 Meg of memory for database storage.

Self Service
The Model 2450 is also available as a self service TNET satellite version.

Features

- 30 x .01 lb or 15 x .005 kg single range capacities.
- Two displays with indicators for zero, net, 1/2 lb (100g on metric versions), 1/4 lb, Prepack mode, on line, take label, memory, motion, and setup. Motion is not marked, however, a cursor will illuminate between Zero and Net to indicate motion.
- Compliance with H44 3000e, Canadian W&M, and Mexican W&M. Compliance with multi-internal applications as specified by Canada and Australian agencies.
- Standard back up PLU storage for up to 250 PLU records.
- Membrane keyboard with an adjustable beeper and a 48 key preset keyboard for fast PLU retrieval .
- By-Weight, Standard Pack, By-Count, and Fractional (By 1/4 lb, 1/2 lb, and 100 g) pricing modes.
- Real time clock and Data RAM are backed up by a SuperCap and battery. (Typical battery retains information for 2700 days with power off, but could be as low as 60 days depending on the amount of current drawn by the SRAM).
- Push button zero (auto zero power up @ 10% of capacity) and automatic zero tracking.
- VOID key for clearing previous transaction from the master accumulators.
- Price, Tare, Shelf Life, Quantity (for Standard Pack, By-Count), and Net Weight (for Std Pack) override capability.
- Selectable English, Spanish or French display prompts.
- Thermal label printer supports UPC and EAN symbols and graphics. The printer can use die cut labels or continuous strip stock.
- Compatible with METTLER TOLEDO® DataBack software (0918-0027) for Label formats, Label Styles, miscellaneous setup data, and Scale Presets.

Standalone Features

In addition to the Model 2450 Satellite features, the Standalone offers:

- Compatible with METTLER TOLEDO® DataBack software (0918-0027) for Label formats, Label Styles, Scale Presets, Database Parameters, and 8460 records (PLU, NF, ET, GR). For more information, see DataBack Manual.
- Expandable memory for up to 4600 PLU's with ET (540 bytes) and NF (383 bytes) with a 1 Meg Memory PCB.
- Compatible with PC-AT keyboard (0977-0025).
- RS232 and RS422 AUX/HOST communications port standard.

Components

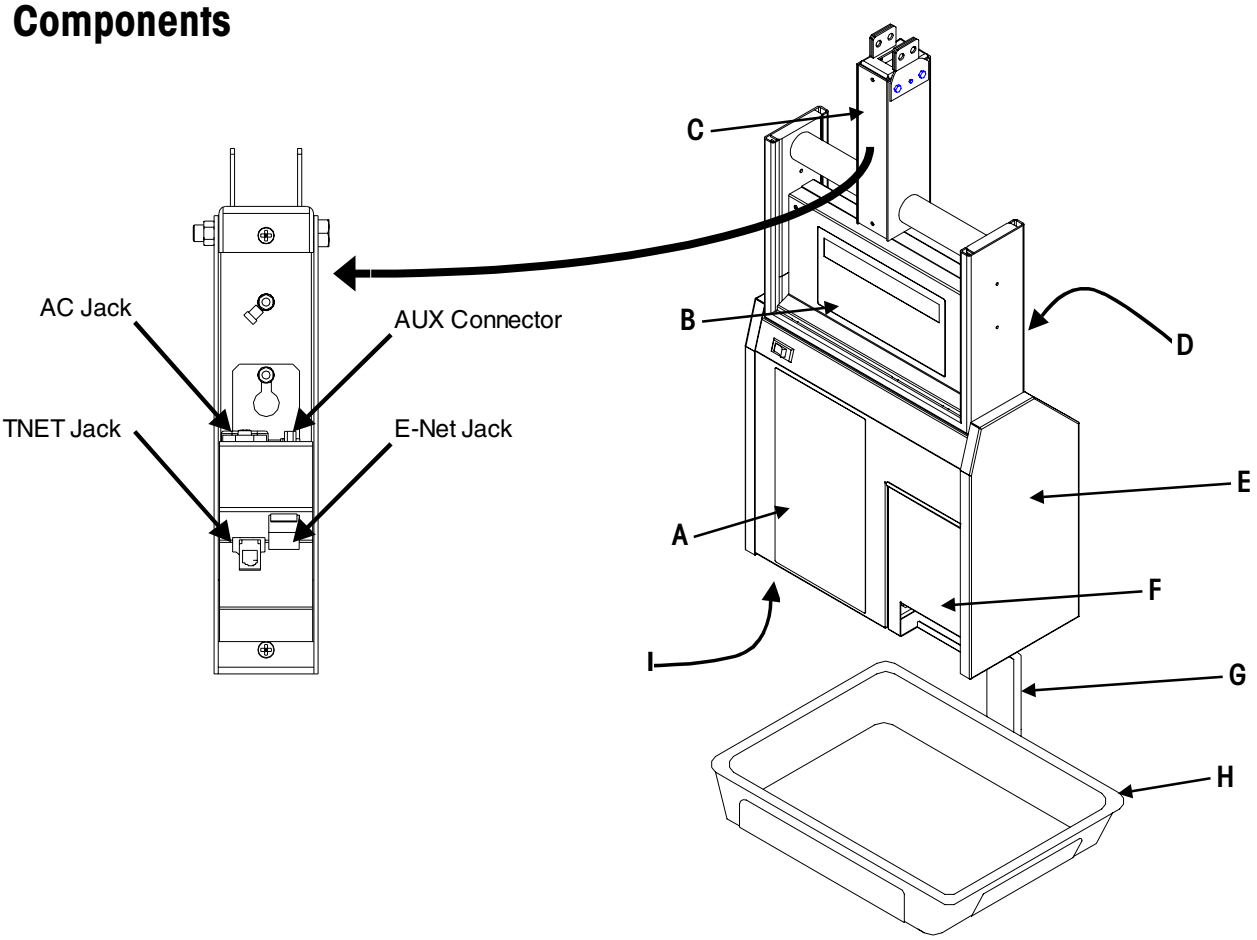


Figure 1-2: Model 2450 Components

Ref	Description
A	Keyboard
B	Display
C	Connector Cover (AC, TNET, Ethernet, AUX)
D	Power Switch (on rear cover)
E	Printer Door
F	Printer
G	Hanger
H	Pan
I	Programming Keyboard Jack (on the bottom)

Displays

The Model 2450 uses two displays. The top display is a 19-character, vacuum fluorescent, seven-segment display (Figure 1-3). The top display characters are .472 in (11mm) high by .22 in (6mm) wide. The bottom display is a 19 character, vacuum fluorescent, 5x7 dot matrix display (Figure 1-4). The characters are .413 in (10mm) high x .236 in (6mm) wide.

The bottom display (Figure 1-4) shows the commodity description when a particular PLU is called, or if no commodity is called, it shows **READY**. If programmed, a marquee message scrolls across this display when the scale is not in use.

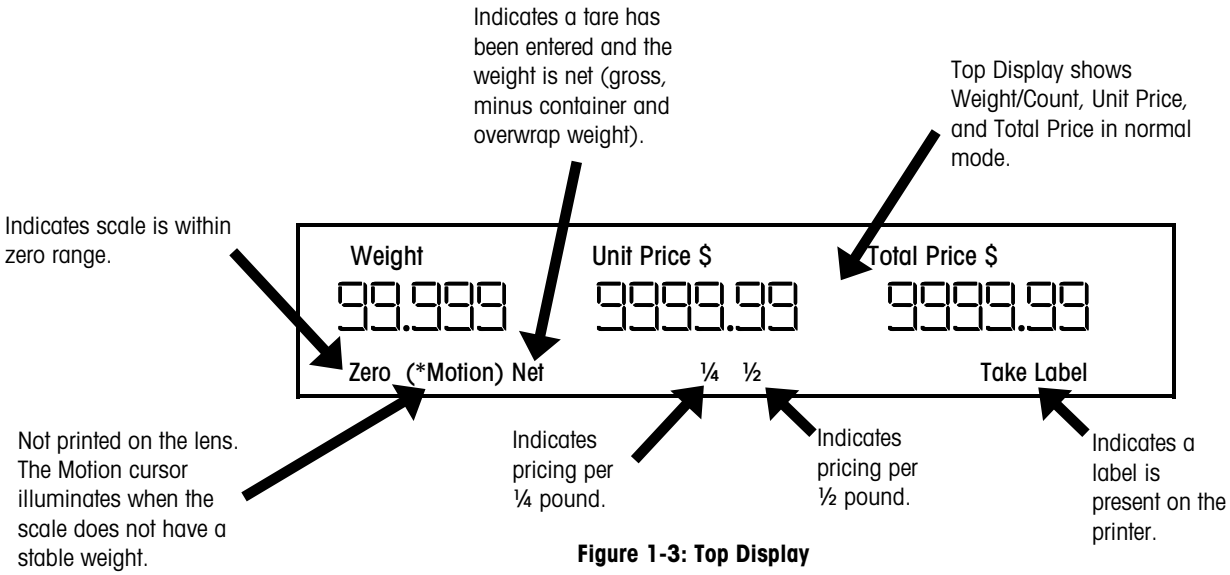


Figure 1-3: Top Display

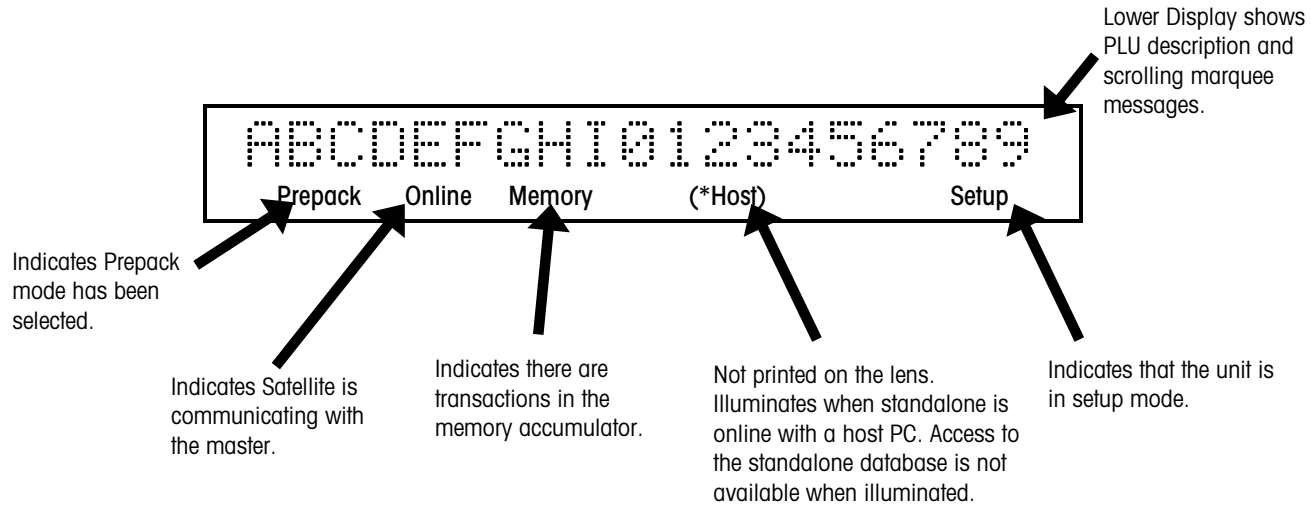


Figure 1-4: Bottom Display

* Cursor used, but not marked on display lens.

Operator Keyboard

Standard Keyboard

The lower keyboard area (except self-service version) is a 30 key keypad is used for operating the Model 2450 (Figure 1-5). The top of the keyboard contains 48 keys used for preset keys. The preset keys allow one-key PLU call-up. The keyboard consists of a membrane switch pad with an overlay that has raised domes over the switch positions to provide tactile feedback. A beeper provides audible feedback.

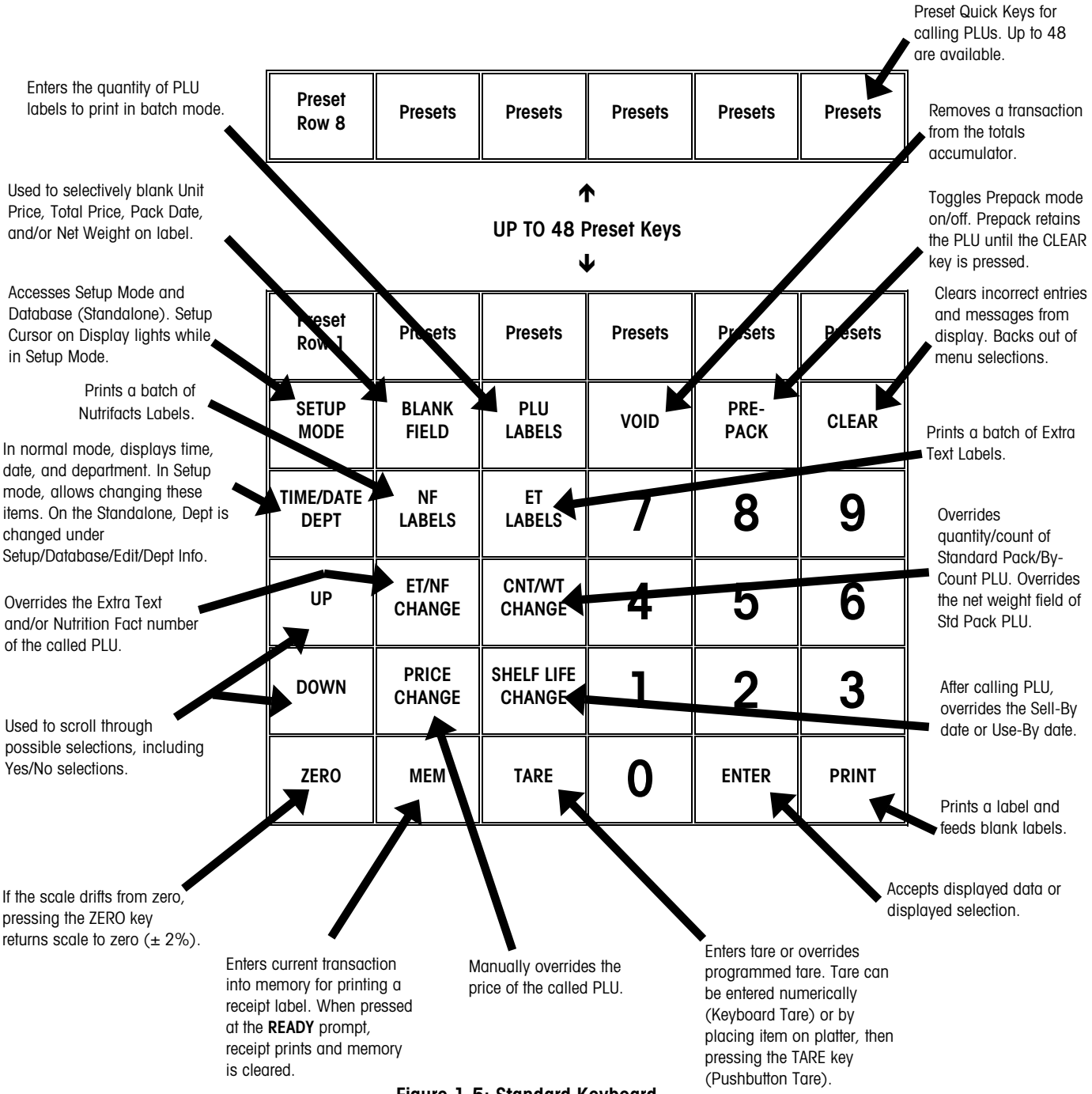


Figure 1-5: Standard Keyboard

Self-Service Keyboard

The self service keyboard is shown below.

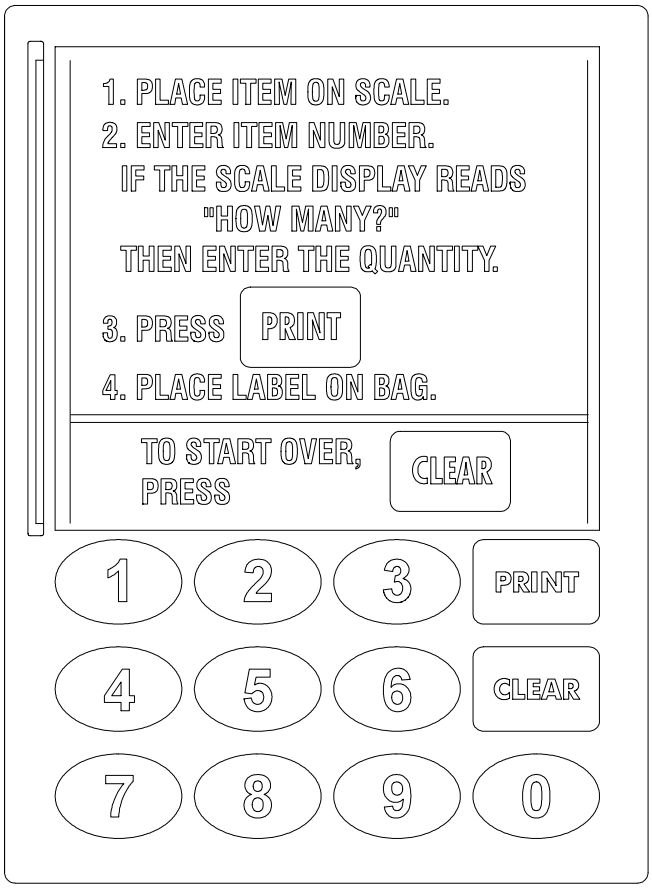


Figure 1-6: Self-Service Keyboard

Tare

Tare is limited to a maximum of 30 lb or 9.995 kg. This value is set in setup.

Memory Specifications

There is a Supercap on the Main Logic PCB and an external alkaline battery that retains backup PLU's and the time/date in the SRAM memory for a minimum of 60 days with power off. On the standalone version, the time/date, PLU, ET, NF, and Graphics files are maintained for a minimum of 60 days with power off. On the satellite, the Main Logic PCB contains 512 kilobytes of SRAM memory that automatically backs up the last 250 PLU's. The Flash Memory retains other data, including calibration constants, and requires no battery for retention.

Agency Approvals

The Model 2450 is designed to meet requirements of the agencies listed below.

UL and cUL

UL 1950 Information technology Equipment Including Electrical Business Equipment.

cUL CSA Standard 22.2 No 950 Information Technology Equipment Including Electrical Business Equipment.

NIST

NTEP requirements for Class III weight device.
NTEP/California Electronic Cash Registers General Code Requirements.

FCC

Code of Federal Regulations No 47 Part 15 Conducted and Radiated Emissions, Class A device.

ISO 9000

This product was developed, produced and tested in a Mettler Toledo facility that has been audited and registered according to international (ISO 9001) quality standards.

Ethernet Communications

The Model 8450 Client or Ethernet Standalone can use any standard Ethernet wiring scheme to connect to the server, but connections at the scale must use 10BASE-T. Refer to Chapter 5 for details.

Master/Satellite TNET Communication

The master/satellite communication network (TNET) uses RS485 Synchronous Data Link Communication (SDLC) at 345k baud. A transformer provides isolation with no DC connection between the scales. A four-conductor modular connector telephone cable is used to connect each scale to the scale network. The maximum recommended data cable length is 1500-ft (457 m), including the 25 ft (7.62 m) scale drops. Both ends of the main data cable must be terminated using a 113 ohm resistor (p/n 12839300A provided with each master) to provide impedance matching at all points on the line. The master can be located at any point on the network, although the middle is recommended on long cable lengths.

Label Printer

The Model 2450 is available with a printer which uses standard labels (supplied on a liner), or with a linerless label printer. The printer uses an 80 mm (3.14") wide, 8 dots/mm, smart thermal printhead. The print speed and density can be adjusted with softswitches to compensate for different quality of labels.

The printer can use label sizes ranging from 1.5 in. (38 mm) to 5.1 in. (129.5mm) long, 1.57 in. (40 mm) to 3.14 in. (80 mm) wide, and continuous strip stock. Labels (with liner) can be printed in a stripped or unstripped mode. In stripped mode, the labels automatically peel from the backing liner. In the unstripped mode, the label and liner will be delivered. A tear bar allows continuous stock to be torn to exact length needed. Print specifications for the thermal printer are as follows:

(Note: the Speed/Power setting depends on the quality of the label stock for optimum printing.)

PRINTHEAD TYPE: Thick Film Smart Thermal Printhead
DOT DENSITY: 8 Dots/mm
PRINT SPEEDS: Five Speed/Power selections from 101 mm/sec to 122.5 mm/sec.

Index Of Specifications

2450 - X X X X - X X X

Memory

0 = NONE
1 = 256 k
2 = 512 k
3 = 1 MEG

Software

0 = TNET Satellite
1 = Standalone
2 = Self-Serve Satellite
4 = TNET Satellite Frequent Shopper
5 = Standalone Frequent Shopper
A = Ethernet Client
B = Ethernet Standalone

Printer

0 = Standard Printer

Type

1 = Scale
2 = Scale, Self-Serve

Market

000 USA, English lb
020 Canada, French kg
087 Spanish, lb
088 Spanish, kg
089 English, kg

Weighing Capacity

The Model 2450 can be configured for 30 x .01 lb or 15 x .005 kg single range capacities. The scale is designed to withstand static overloads up to five times the rated capacity without sustaining permanent damage. A weight greater than five increments over capacity causes the weight display to blank and printing is inhibited. If the scale is under zero by more than five increments, the weight field will display dashes (------). When zero cannot be captured, the weight field will display **EEEEEE**.

Label Specifications

Table 1-1 shows standard label sizes available from Mettler Toledo and general guidelines for fields on the labels.

Label Length	Label Width	# Lines of Text
1.9 in/48 mm	2.63 in/66.8mm	N/A
2.1in/53 mm	2.63 in/66.8mm	N/A
2.4 in/61mm	2.63 in/66.8mm	5
3.3 in/83 mm	2.63 in/66.8mm	7/10
3.7 in/94 mm	2.63 in/66.8mm	11/15
4.2 in/107 mm	2.63 in/66.8mm	15/20
4.7 in/119 mm	2.63 in/66.8 mm	20/25
5.1 in/129 mm	2.63 in/66.8mm	22/30
Roll Stock (Cont)	2.63 in/66.8mm	60 Max.

Table 1-1: Label Sizes Inch/Millimeter

Index Of Accessories

Part #	Description	Factory #
(*)13698700A	Keyboard, PC-AT Programming Keyboard	0977-0025
(*)13816300A	Cable, PC DB25 Serial Port to Model 2450 SA/SAT, 10 ft (3 m)	0900-0286
(*)14102800A	Cable, PC DB25 Serial Port to Model 2450 SA/SAT, 25 ft (7.62 m)	0900-0298
(*)13816200A	Cable, PC DB9 Serial Port to Model 2450 SA/SAT, 10 ft (3 m)	0900-0285
(*)14102600A	Cable, PC DB9 Serial Port to Model 2450 SA/SAT, 25 ft (7.62 m)	0900-0297
(*)14773500A	Preset Envelope Kit (English)	0977-0033
(*)14773600A	Preset Envelope Kit (Spanish)	0977-0035
(*)14930200A	Preset Envelope Kit (French)	0977-0037
(*)14613600A	Standalone Kit w/256k Memory	0977-0029
(*)14613700A	Standalone Kit w/512k Memory	0977-0030
(*)14613800A	Standalone Kit w/1 Meg Memory	0977-0031
-	TNET Interconnection Kit	0901-0293
-	DataBack Software	0918-0027
(*)15336000A	Track Assembly, 10 ft (3 m)	0977-0055
(*)15336100A	Trolley Assembly	0977-0056
(*)15365200A	Trolley Support Post, 5 ft (1.5 m)	0977-0057
(*)15365300A	Trolley Support Post, 10 ft (3 m)	0977-005
(*)15365400A	Trolley Support Post, 15 ft (4.6 m)	0977-005

Table 1-2: Accessories

***** Indicates may have letter prefix.

Reliability

The printer electronics have demonstrated an MTBF of 17,520 hours. The printer mechanism, including printhead and platen, has demonstrated a minimum life of 2 million inches of label using standard label stock (non-synthetic).

Operating & Storage Temperature

Operating Range: 0°C to 40°C (32°F to 104°F), humidity from 5% to 95% non-condensing.

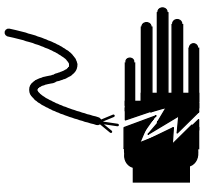
Storage Range: 0°C to 70°C (32°F to 158°F), with humidity from 5% to 95% non-condensing.

Electrical

The Model 2450 uses a universal switching power supply which is autosensing. The power switch opens the hot side of the power line and disconnects power from all scale and printer electronics. The switch is located between the line cord and the AC input to the +21 VDC power supply.

The Model 2450 requires a dedicated, grounded, 100-240 VAC, Single Phase, 50/60 Hz supply, and draws 0.5 amps @ 120 VAC. The AC line (including ground) must not be shared with noise and surge generating equipment such as electric motors, compressors, thermostats, fluorescent lights, etc. A line conditioning device is recommended to provide protection from surges and spikes.

The Power Supply uses an electronic thermal overload protection circuit designed to protect the internal electrical components. When an overload exists, the power supply output will be significantly lowered until the overload condition is corrected. When this condition exists, the unit power should be turned off for a few minutes to allow cooling to reset the thermal fuse.



⚠ WARNING

AC Power is present at the Power Switch when the power cord is connected to AC power, even when the Power Switch is turned off.

Dimensions

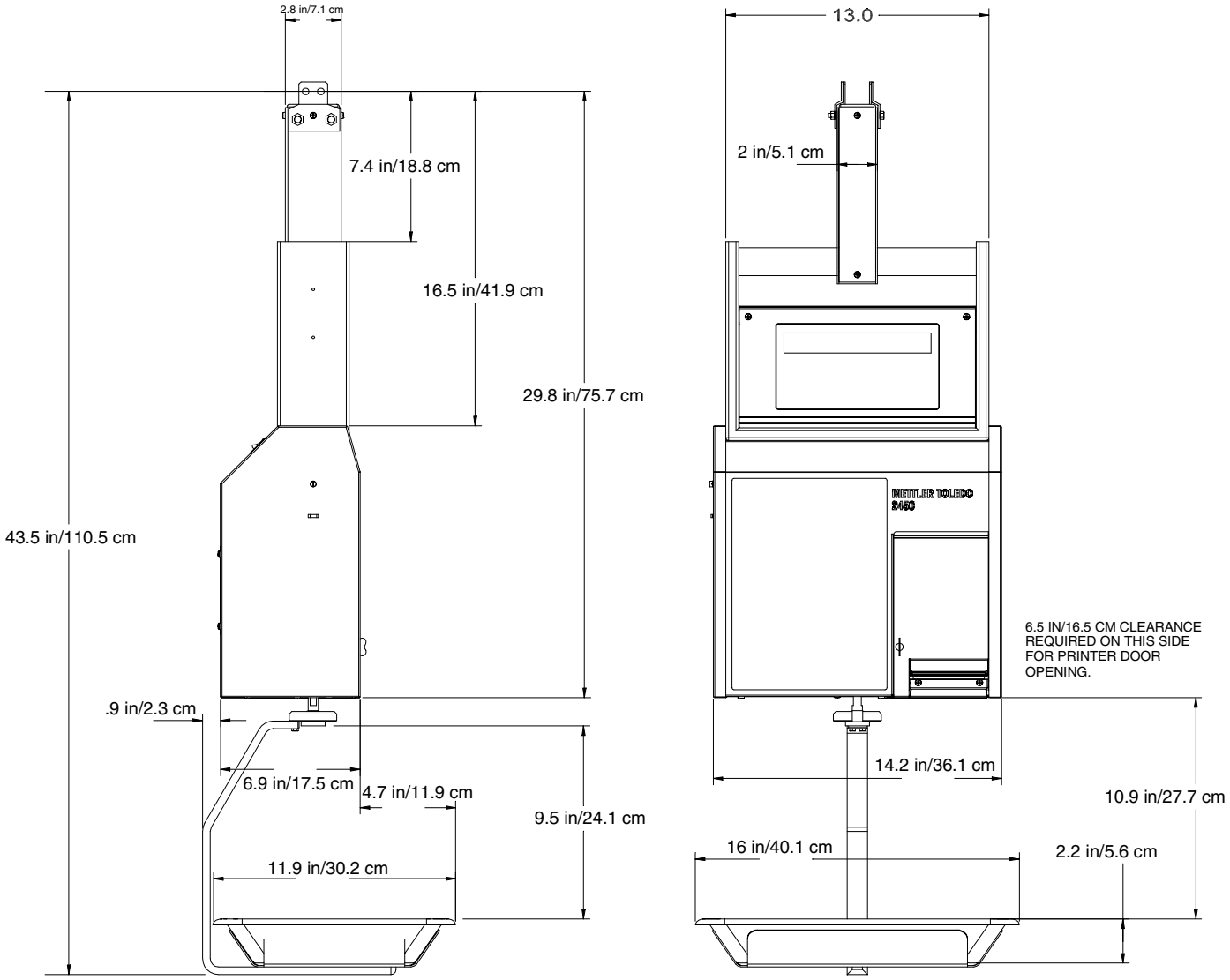


Figure 1-7: Model 2450 Dimensions

Bar Code Symbols

The printer is capable of printing UPC or EAN-13 bar code symbols. The following samples are of **UPC Type-2** and **UPC Type-0** bar codes. The bar code must be set up correctly to work with the store's scanner. In addition, the UPC Type-2 and EAN-13 bar codes include an optional price check digit (PCD) that must match the scanner's settings.

UPC Type-0 Bar Code

The illustration below shows an example UPC Type-0 Bar Code. The Type-0 bar code is used for general grocery, drug, or other prepackaged items. This type of bar code provides the register with a 10-digit Item Number. The number is then used to retrieve the item's description and price. The symbol contains 12 digits. The first position from the left is always the Bar Code Type. Positions 2 through 11 (from left to right) are reserved for data, in this case the 10 digit Item Number. When a Manufacturer Number is used, it will show up at positions 2-6, and the last five digits, positions 7-11, will be the Item Number. Position 12, the last position on the right, is reserved for the Symbol Check Digit.

Note: If the Manufacturer Number is set to any value greater than zero, it will replace the first five MSD (Most Significant Digits) of the Item Number.

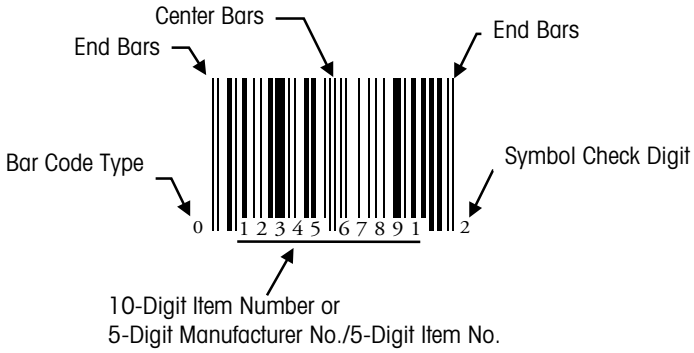


Figure 1-8: Standard UPC Type-0 Bar Code

UPC-A Type-2 and EAN-13 Bar Code

The UPC Type-2 bar code and the EAN-13 Flag 20 bar code are used when the total price of the product varies from package-to-package, such as products sold by quantity, weight, etc. The UPC-A Type-2 bar code is actually a subset of the EAN-13 bar code. The EAN-13 Flag 20 bar code differs only from the UPC-A Type-2 bar code by having a 13th digit called Flag 1. The UPC-A symbols use twelve digits and EAN-13 uses thirteen digits. Since no standard total price can be set, the total price is encoded in the bar code symbol, along with the Item Number. When this type of bar code is scanned, the Item Number is used to retrieve the product description. The UPC Type-2 and EAN-13 bar codes will print a 5 or 6-digit Item Number (with no price check digit) and a 4 or 5-digit total price to be encoded in the bar code symbol. Refer to the UPC and EAN Bar Code Setup section in Chapter 3 for bar code formats.

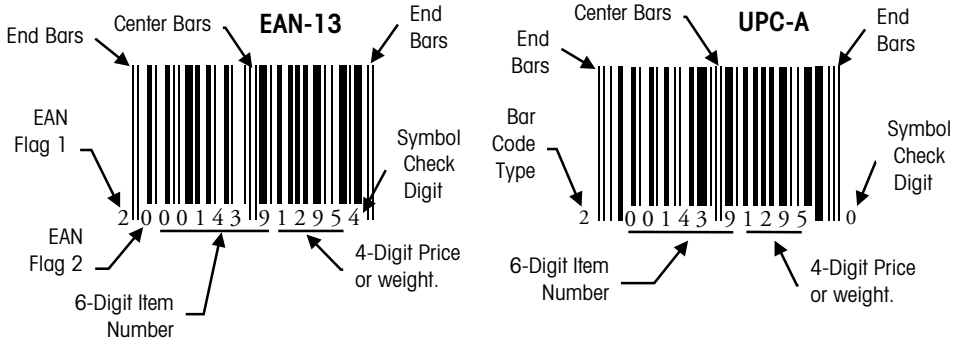


Figure 1-9: Bar Code Symbols/No Price Check Digit

A Price Check Digit (PCD) is also available as an option in the UPC Type-2 and the EAN-13 bar code. The PCD is used as a secondary check for the total price. When enabled, the PCD takes the place of the last position in the Item Number, shifts the Item Number one position to the left, and limits the Item Number to five digits. The PCD will print in the first position to the right of the center bars and shifts the Item Number one position to the left.

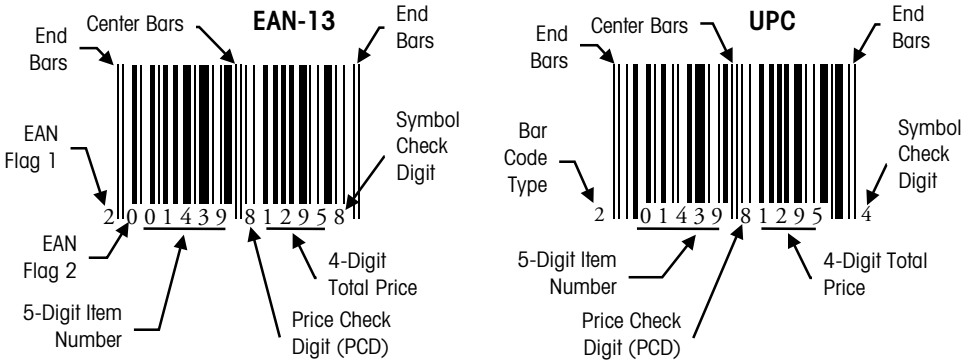
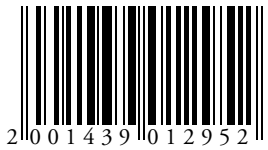


Figure 1-10: Bar Code Symbols/Price Check Digit (PCD) Enabled

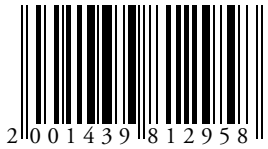
UPC/EAN Bar Code Symbol Examples

EAN 20 Flag
4D Item (1439)
6D Price (000759)
Symbol Check Digit (2)

EAN 20 Flag
5D Item (01439)
5D Price (01295)
Symbol Check Digit (2)



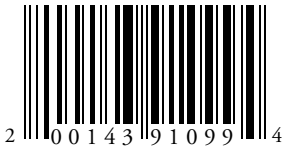
EAN 20 Flag
5D Item (01439)
Price Check (8)
4D Price (1295)
BC Check Digit (8)



UPC Type-0
10D Item
(1234567891)
BC Check Digit (2)

UPC Type-2
5D Item (01439)
Price Check (0)
4D Price (1099)
BC Check Digit (2)

UPC Type-2
6D Item (001439)
4D Price (1099)
BC Check Digit (4)



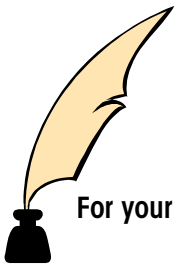
UPC Type-3
10D Item
(1234567890)

UPC Type-4
10D Item
(1234567890)

UPC Type-5
10D Item
(1234567890)

UPC Type-6
10D Item
(1234567890)
Same as Type-0

UPC Type-7
10D Item
(1234567890)
Same as Type-0



For your notes

2 Installation

Unit Installation

Unpacking

Remove the Model 2450 and accessories from the shipping carton and inspect for damage. Report any damage to the carrier promptly. Verify you received the accessories shown in Figure 2-1.

Note: If you choose to dispose of the package, please recycle the materials. The carton is recyclable natural fiber with biodegradable adhesives.

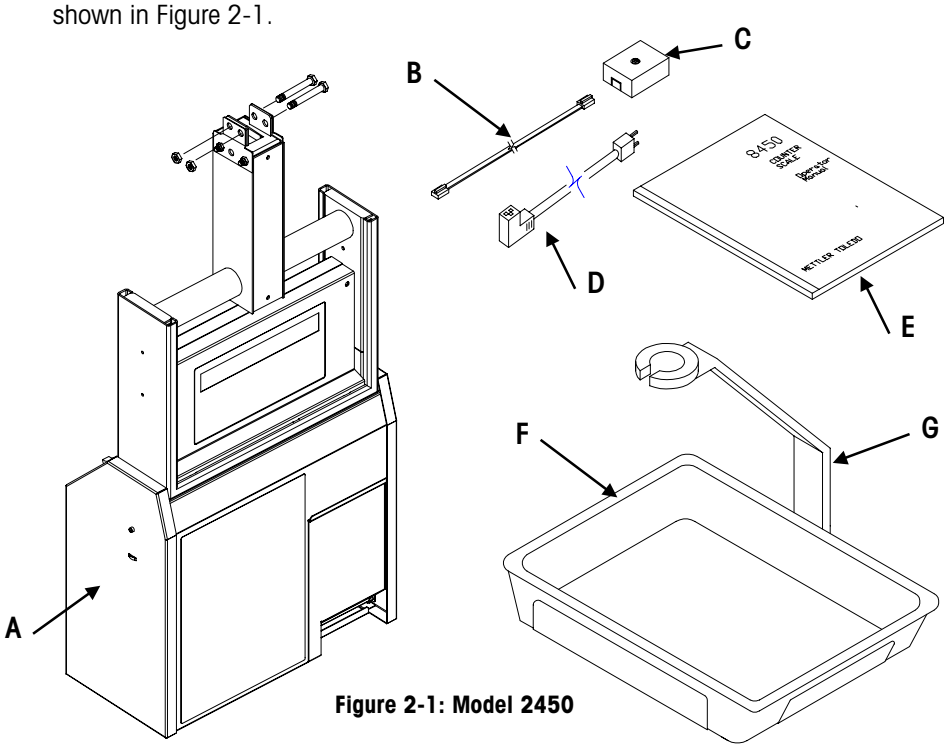


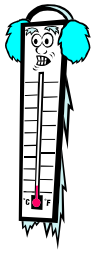
Figure 2-1: Model 2450

Ref	Description
A	Model 2450
B	25 ft/7.62 m TNET Cable *12716500A (TNET Satellite Only)
C	TNET Phone Jack *12716300A (TNET Satellite Only)
D	Power Cord *15039600A
E	Operator Manual
F	Stainless Steel Pan
G	Hanger

Not shown:

*14529600A Keypad Envelope
*14736100A Programmed Disk
*12363300A Security Seal
*14526000A Data Label Shield
*R0259600A Sealing Screw
*14551300A (Qty=5) Keypad Insert
*12800700A Label Form
*12745800A Quality Feedback Card
*14913000A Lead wire Seal Bracket

Installation Checklist



Note: If the unit has been stored or transported in below freezing temperatures, allow the unit to warm up to room temperature before turning on AC power.
Note: After performing the Reset Ram/Database Function procedures for Satellite and Standalone, **you must reset the printhead resistance and print speed/power setting, and the Scale ID.**

Tip: A question mark following a message on the left side of the display means the Model 2450 expects you to enter a number or select an option followed by pressing ENTER. A colon means the data on the right of the display is the current setting. Pressing ENTER will allow you to change it.

Install optional kits. Install any optional kits at this time.

Install optional Track and Trolley. Refer to the Track Installation and Trolley Installation, in Chapter 2.

Connect Data Cable Wiring for TNET or host. Refer to Chapter 6.

Connect AC power. Refer to the power specifications in the section titled Electrical in Chapter 1 and Electrical Wiring Section in Chapter 2.

Reset Ram (Satellite) - The scale must be initialized. To initialize the scale and reset all softswitches to factory defaults, press the SETUP MODE key. Next, press the **CAL Switch**. The display will show **Sure?? No**. Press DOWN/UP to toggle to **Yes**. Press ENTER with **Yes** displayed to initialize or with **No** displayed to abort. Cycle power when complete.

Reset Ram *(Standalone)* - The scale must be initialized. To initialize the scale and reset all softswitches to factory defaults (but not clear the PLUs, ET, NF Database), press the SETUP MODE key. Next press the ENTER key, followed by the **CAL Switch**. The display will show: **Sure?? No**. Press DOWN/UP to toggle to **Yes**. Press ENTER with **Yes** displayed to initialize, or with **No** displayed to abort.

Reset Database (Standalone) The Database Functions must be reset by pressing SETUP MODE key, UP/DOWN to display **Database** on the lower display, ENTER, CLEAR (on the Setup Keypad), UP to display **Clear All,** then press ENTER**.** The display will show **Sure?? No**. Press the DOWN/UP keys to toggle to **Yes**. Press ENTER with **Yes** displayed to initialize, or with **No** displayed to abort. Cycle power when complete.

Continue setup in the following order:

1. **Setup Printer -** Set the print speed/power setting and the print head resistance.
2. **Unit ID -** Set the Satellite and Client Unit ID to a unique number on the network. Do not duplicate any ID numbers on the network or communications errors will occur. Set the Standalone Unit ID to 255. Refer to Chapter 3 Unit Setup.
3. **Protocol -** When using the Model 2450 Satellite with the **Smart*Touch*®** Master or Model 8422/8423/8305 NF Master, set the TNET Protocol to **SmartTouch**. When using the Model 2450 with the Standard Model 8422 Type Master, Select **PLU 4** or **PLU 6**. Set the Standalone protocol to **SmartTouch**.
4. **Calibrate -** Refer to Calibration Instructions in Chapter 3 CAL Key.
5. **Password -** To bypass either a Unit Password or Database Password, press the **CAL** switch when the display prompts for the password.
6. **Install Labels -** Install labels in the printer. Refer to Label Installation.
7. **Set Scale Options -** Scale options must be configured such as Bar Code settings, Label Size, and Label Formats. Refer to Chapter 3 Unit Setup.
8. **Database (Standalone)** Load the standalone database either manually or from Intelli-Net or Databack. Make necessary changes. Use Databack to back it up if manually entered.
9. **DataBack -** Use DataBack to backup and restore the presets, custom label formats, label styles, and miscellaneous categories for the Model 2450 Satellite and Standalone.

Track Installation

Refer to the illustration in Figure 2-2 for track installation. Refer to Figure 1-6 in Chapter 1 for scale dimensions. The Trolley Mount installation is recommended.

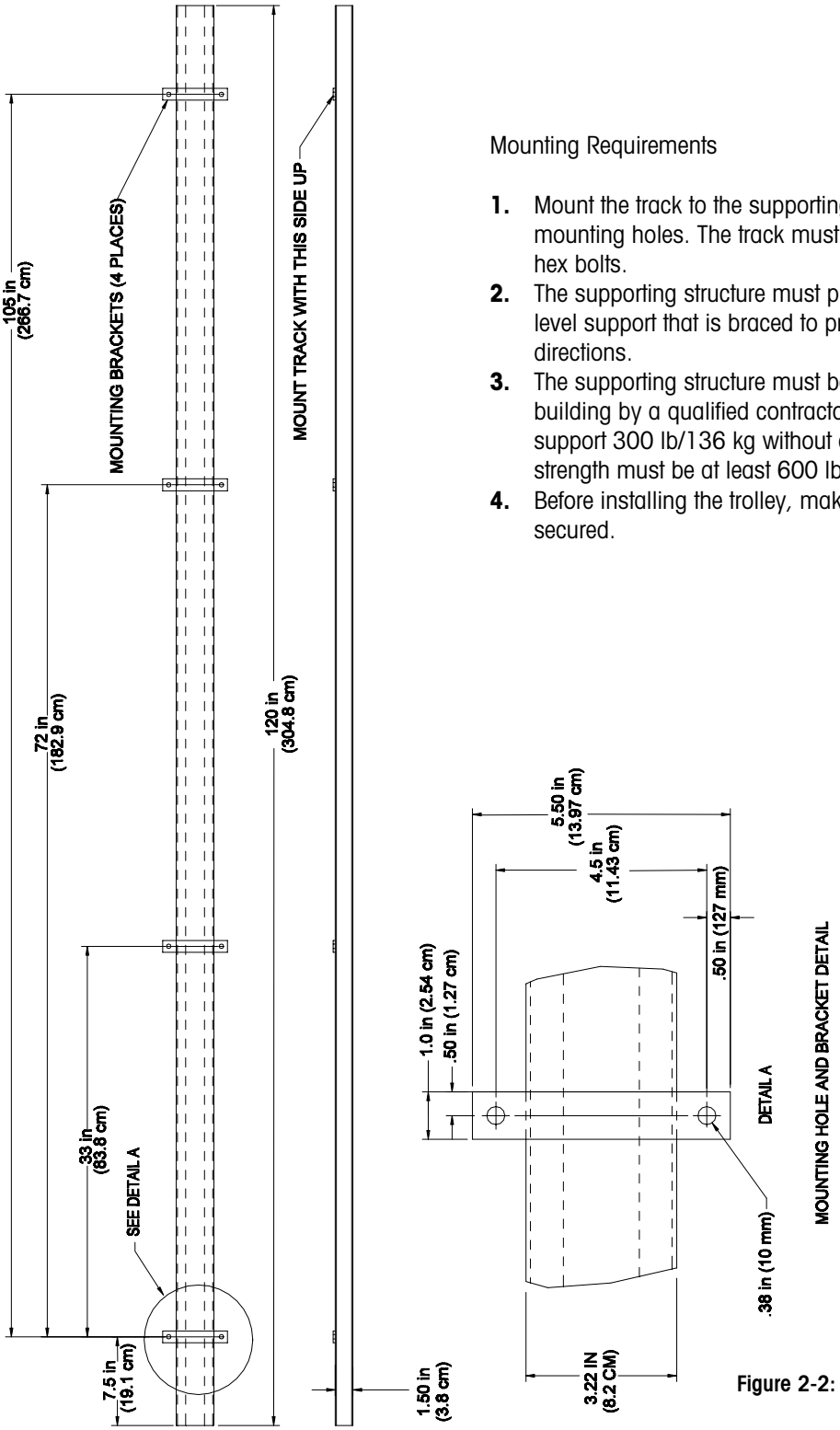


Figure 2-2: Track Installation

Mounting Requirements

1. Mount the track to the supporting structure using all eight mounting holes. The track must be mounted with 5/16 in steel hex bolts.
2. The supporting structure must provide a solid, stable, and level support that is braced to prevent lateral movement in all directions.
3. The supporting structure must be designed and installed in the building by a qualified contractor and must be designed to support 300 lb/136 kg without deformation. The ultimate strength must be at least 600 lb/273 kg.
4. Before installing the trolley, make sure all bolts are properly secured.

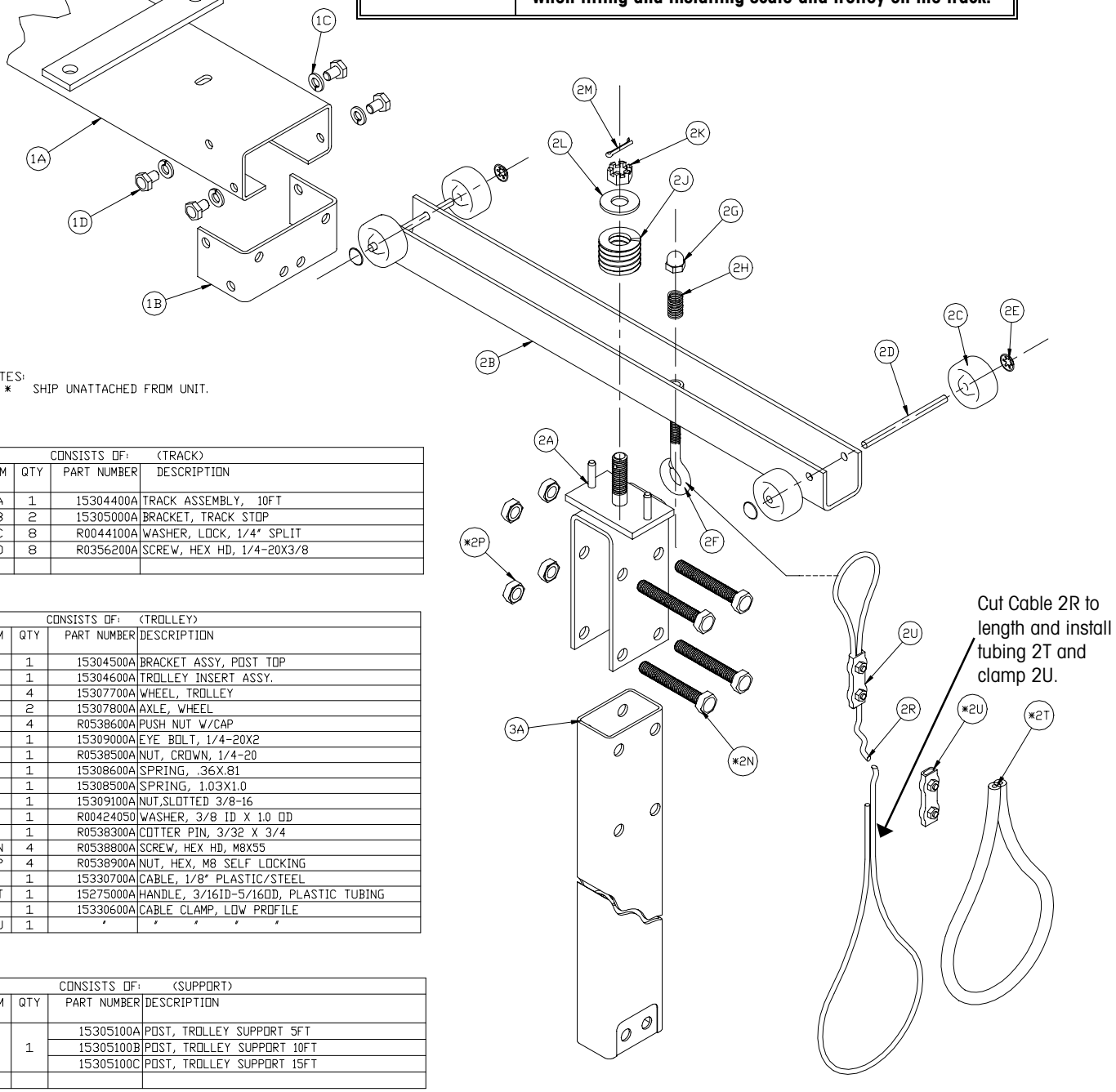
Trolley Installation

The Trolley Mount installation is recommended.

After the track is installed, remove one track stop bracket on the track. Mount the trolley assembly onto the Model 2450 mounting column using the supplied bolts (2N), then mount the scale and trolley assembly onto the track (See Figures 2-3 and 2-4). Ensure there is adequate help on site, and exercise care when lifting and installing the scale and trolley onto the track. Install track stop bracket when the assembly is in place. Check to make sure all bolts are properly secured.

WARNING

Use extreme caution when lifting and moving the scale to the desired location. Ensure there is adequate help when lifting and installing scale and trolley on the track.



NOTES:
1. * SHIP UNATTACHED FROM UNIT.

CONSISTS OF: (TRACK)			
SYM	QTY	PART NUMBER	DESCRIPTION
1A	1	15304400A	TRACK ASSEMBLY, 10FT
1B	2	15305000A	BRACKET, TRACK STOP
1C	8	R0044100A	WASHER, LOCK, 1/4" SPLIT
1D	8	R0356200A	SCREW, HEX HD, 1/4-20X3/8

CONSISTS OF: (TROLLEY)			
SYM	QTY	PART NUMBER	DESCRIPTION
2A	1	15304500A	BRACKET ASSY, POST TOP
2B	1	15304600A	TROLLEY INSERT ASSY.
2C	4	15307700A	WHEEL, TROLLEY
2D	2	15307800A	AXLE, WHEEL
2E	4	R0538600A	PUSH NUT W/CAP
2F	1	15309000A	EYE BOLT, 1/4-20X2
2G	1	R0538500A	NUT, CROWN, 1/4-20
2H	1	15308600A	SPRING, .36X.81
2J	1	15308500A	SPRING, 1.03X1.0
2K	1	15309100A	NUT,SLOTTED 3/8-16
2L	1	R00424050	WASHER, 3/8 ID X 1.0 OD
2M	1	R0538300A	COTTER PIN, 3/32 X 3/4
*2N	4	R0538800A	SCREW, HEX HD, M8X55
*2P	4	R0538900A	NUT, HEX, M8 SELF LOCKING
2R	1	15330700A	CABLE, 1/8" PLASTIC/STEEL
*2T	1	15275000A	HANDLE, 3/16ID-5/16OD, PLASTIC TUBING
2U	1	15330600A	CABLE CLAMP, LOW PROFILE
*2U	1	"	" " " "

CONSISTS OF: (SUPPORT)			
SYM	QTY	PART NUMBER	DESCRIPTION
3A	1	15305100A	POST, TROLLEY SUPPORT 5FT
		15305100B	POST, TROLLEY SUPPORT 10FT
		15305100C	POST, TROLLEY SUPPORT 15FT

Figure 2-3: Trolley Assembly

WARNING

Make sure the track stop is re-installed after the trolley assembly is installed on the track. Properly secure all mounting bolts.

Remove one track stop bracket to install the scale with the trolley assembly mounted on the scale support post.

Mount the Scale Support Post to the trolley with the supplied bolts.

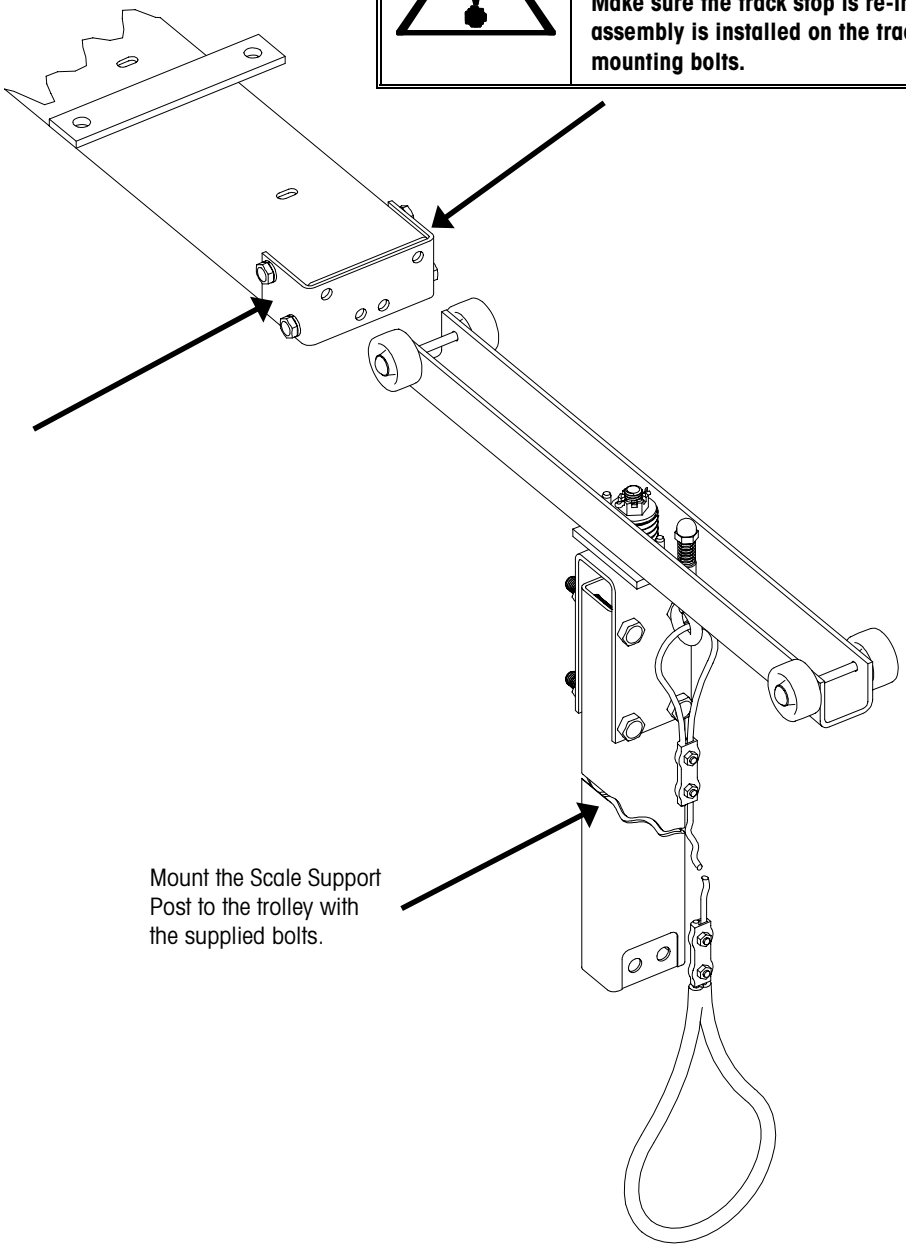
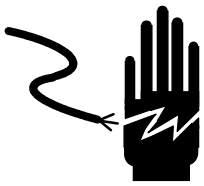


Figure 2-4: Support Post Mounted to Trolley

Electrical Wiring

NOTE: The branch circuit must be protected by a 20A maximum rated UL listed circuit breaker. All wiring must comply with all National and local wiring codes.



⚠ WARNING

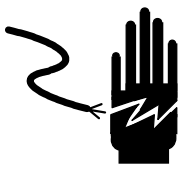
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Refer to Figure 2-5.

1. Install the electrical supply junction box near the center of the track and approximately 6 to 12 inches from the track.
2. Install the bushing (13785100A) in the cover of the junction box with the "O" ring on the outside of the cover and the metal nut on the inside. Securely tighten the metal nut.
3. Cut the scale power cord supplied to the proper length for the installation. This length will depend on the length of the vertical support and must allow the scale to move freely from one end of the track to the other without binding the power cord.
4. Route the power cord down through the vertical support (before mounting the vertical support to the trolley) with the IEC plug at the scale end.
5. Loosen the collar of the bushing and insert the free end of the power cord through the bushing from the outside allowing sufficient length of cord on the inside to make connections in the box.
6. Hand tighten the collar on the bushing snug and then turn one more turn to provide a secure grip on the power cord.
7. Remove the outer jacket from the power cord approximately 3 inches back from the end and strip the ends of the conductors for connection using wire nuts.

METTLER TOLEDO® Power Cord:
Black or Brown = AC Line (120VAC)
Blue or White = Neutral
Green or Green/Yellow = Ground

8. Connect the supply line white wire to the white or blue wire of the scale power cord using a wire nut of the proper size.
9. Connect the supply line black wire to the black or brown wire of the scale power cord using a wire nut of the proper size.
10. Connect the green/yellow wire of the scale power cord to the electrical ground.
11. Install the cover on the junction box.



⚠ WARNING

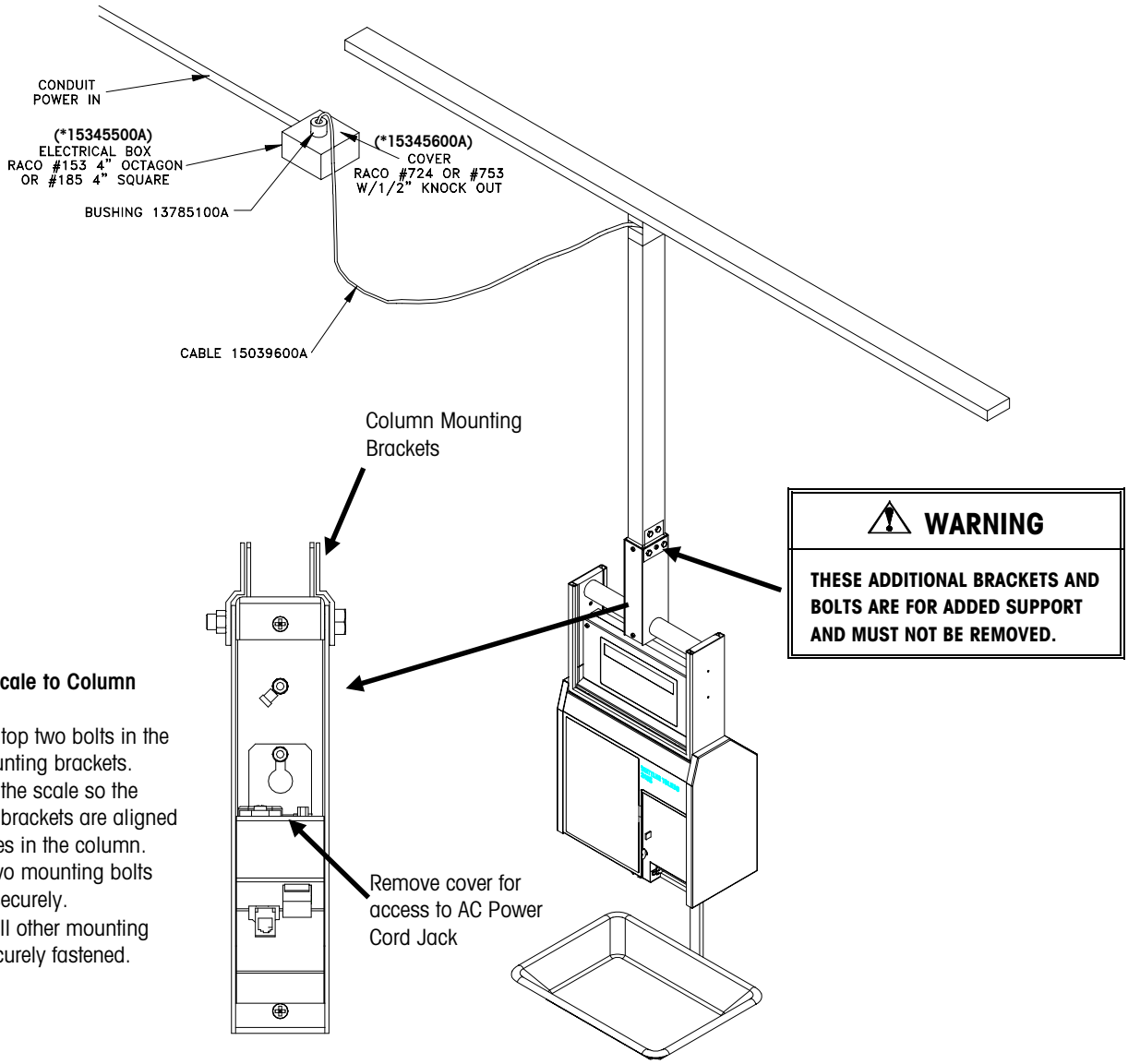
For continued protection against shock hazard, connect to properly grounded outlet only.

Trolley Mount - Scale Mounting and Wiring

The Trolley Mount installation is recommended.

WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

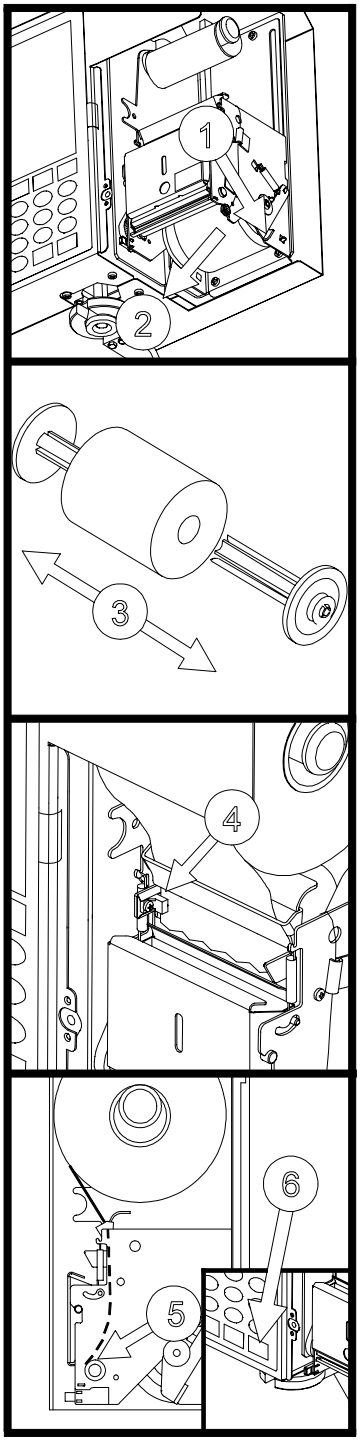


Mounting Scale to Column

1. Remove the top two bolts in the column mounting brackets.
2. Carefully lift the scale so the holes in the brackets are aligned with the holes in the column.
3. Install the two mounting bolts and fasten securely.
4. Make sure all other mounting bolts are securely fastened.

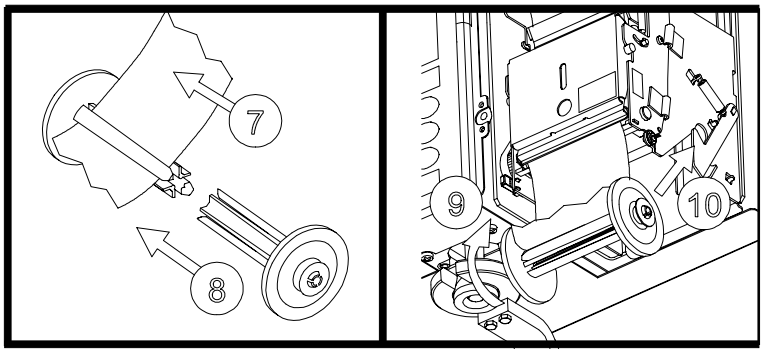
Figure 2-5: Trolley Mount – Scale Mounting and Wiring

Label Installation



To load the labels, follow the illustrations. (It is not necessary to unlock the printhead to load labels).

1. Press the release lever. (For *Unstripped* mode, skip to step 4.)
2. To load standard labels for stripped mode, remove the liner Take Up Spool from the printer mechanism.
3. Slide the two halves of the Take Up Spool apart and discard any spent liner.
4. Insert the end of the paper into the rear chute and through the Gap Sensor.
5. Feed labels into the chute until they stop at the platen roller.
6. For first time installation or if changing label size, set the label size by pressing the SETUP MODE key, then the LABEL SIZE key. Press the UP/DOWN keys to toggle through the available label sizes, then press ENTER to accept. Next press the STRIP key and use the UP/DOWN key to select **Stripped** or **Unstripped** delivery mode, then press ENTER to accept. Press CLEAR to return to the ready mode. Press the PRINT button to feed the labels, while gently pushing the label stock into the rear chute until the label feeds out the front of the mechanism. If the label stock will not feed out the front check for an obstruction or a label jam inside the mechanism. If the delivery method is *Unstripped*, you are done loading labels and can close the printer door.
7. For *Stripped* mode, insert the label liner through the fingers of one half of the liner take-up spool.
8. Reassemble the two halves of the liner Take Up Spool.
9. Wind the spool upwards until the slack is taken up on the liner.
10. Reinstall the liner Take Up Spool into the printer mechanism. At this point, you are finished and can close the printer door.



Calibration Seal

The calibration wire seal can be installed as shown below. In addition, a flathead screw and seal sticker (shipped with unit) can be used, depending on local regulations.

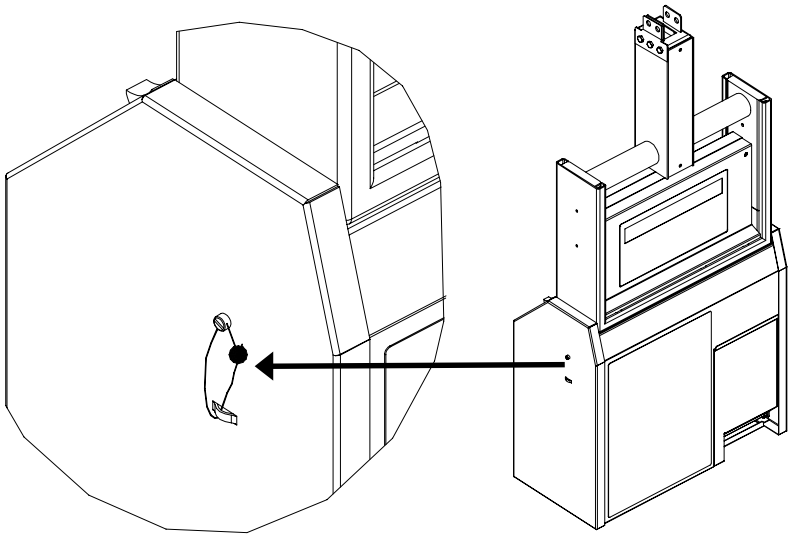
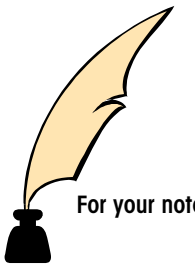


Figure 2-6: Wire Calibration Seal Installation



For your notes

3

Unit Set Up

Prompts that appear on the display will be shown here in **BOLD** type. Keys are shown as UPPERCASE CHARACTERS.

Unit Setup Mode is used to change options of the Model 2450. While in Setup Mode, the "Setup" cursor will be lit on the lower display. The Standalone Database options are covered in Chapter 11.

Setup Overlay

Before entering Unit Setup Mode, insert the Setup overlay (Figure 3-1a and 3-1b) in the slit by the preset keys. This overlay identifies which preset keys correspond with the available options. The four keys in bold-italics in Figure 3-1a are Standalone database functions discussed in Chapter 11. The key descriptions are shown in order starting with the left column and working down.

14551300A							
PLU PRESET	UNIT ID	RESET LABELS	LABEL PRINTER	LABEL SIZE	ENABLE MODIFY	VERIFY LABELS	PASS-WORDS
PRESET REACT.	CAL	DEFAULTS	HOST	LABEL FORMAT	ENABLE FUNC	***EDIT***	BEEPER
ID PRESET	CURRENCY	RESET RAM UNIT		STRIP		***QUICK CHANGE***	
MARQUEE	PLU SETTING			GAP LENGTH		***PRINT***	
MARQUEE SPEED	BAR CODE SETTING			IMAGE OFFSET		***CLEAR***	
				EJECT LENGTH			TIME DATE FORMAT

Figure 3-1a: Setup Mode Overlay, Standard Keyboard

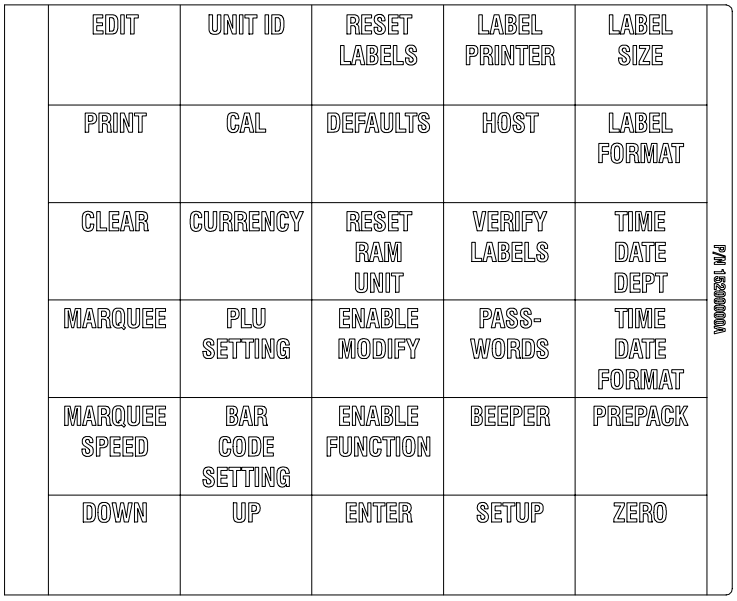


Figure 3-1b: Setup Mode Overlay, Self Service Keyboard

Enter Unit Setup

To enter Unit Setup mode, press the SETUP MODE key. If a password has been programmed, key in the password, then press ENTER.

Standalone Only

If the unit is a Standalone model, there will be 2 options upon pressing the SETUP MODE key. Pressing the DOWN or UP keys will display **UNIT** and **DATABASE**. Press ENTER when **UNIT** is displayed, then enter the *unit* password (if required). Separate passwords can be assigned to unit and database setup modes. The database setup mode is discussed in Chapter 12. This chapter discusses the *Unit Setup* mode.

Exiting Unit Setup

Press the CLEAR key to return to the first option in the current menu; press CLEAR again to return to the previous menu or the **SELECT FUNCTION** prompt. To exit out of Setup mode, press CLEAR when the display shows **SELECT FUNCTION**.

Time Date Depart Key

Pressing this key displays the Time, Date, and Department. In Setup Mode, this key is used to set the time, date, and department. The department setting of the unit determines the PLU's that can be accessed from the master scale.

To change the Time, Date, or Department, press the SETUP MODE key. When prompted to **SELECT FUNCTION**, press the TIME DATE DEPT key. Press the DOWN or UP keys to toggle between **TIME**, **DATE**, and **DEPT**. When all the changes have been made, press CLEAR (two times) to return to **SELECT FUNCTION**.

Date Change

After toggling to **DATE**, press ENTER. Key in the date in the format **MMDDYY** then press ENTER.

Department Change

Satellite/Client: The department cannot be changed if the scale is off line. If the unit is online, the display will show **DOWNLOADING DEPT...** upon entering this mode.

After toggling to **DEPT**, press ENTER. Press the DOWN and UP keys to move between available departments or key in the department number. When the desired department name or number displays, press ENTER.

Time Change

After toggling to **TIME**, press ENTER. Key in the time in the format **HHMM** on a 24 hour clock, then press ENTER.

PLU Preset Key

Forty-eight keys are provided for use as preset PLU keys (standard unit). Several paper overlays and a clear plastic envelope are provided to label and protect the preset keys. Each preset key may be programmed for a single PLU. The reaction when a preset key is pressed may be set to either print a label immediately or require the operator to press the ENTER key before printing a label (See Preset React Key).

To assign a PLU to a preset key, press the SETUP MODE key. When prompted to **SELECT FUNCTION**, press the PLU PRESET key on the Setup overlay. When the prompt **PRESS PRESET KEY** displays, press the preset key you would like to use for the PLU. **PLU** then displays. Key in the PLU number, then press ENTER.

The prompt **PRESS PRESET KEY** then displays again. You may then set another preset key. This message will appear each time you complete entering a preset number. To exit, press CLEAR to return to the **SELECT FUNCTION** display, and CLEAR again to return to normal mode.

Preset React Key

When PRINT is selected, this eliminates keystrokes, however, the operator may not use the override functions for PLU's retrieved using the preset keys.

To change the preset key reaction, while in Setup mode and prompted to **SELECT FUNCTION**, press the PRESET REACT key on the Setup overlay. Use the DOWN and UP keys to toggle between **PRINT** and **ENTER**. The **PRINT** option will set the scale to automatically print a label after a preset key is pressed. The **ENTER** option sets the scale to wait until the operator presses PRINT to print a label. For By-Weight PLUs, a label will not print until weight is on the scale, even with PRESET REACT set to **PRINT**.

ID Preset Key

This setup key is currently not used.

Marquee Key

The Marquee will not function if the satellite scale is off line.

A marquee is a message that scrolls across the display if no PLU is entered and if the scale detects no activity for about five seconds. The satellite marquee texts are Type 3 Action Codes programmed at the master scale, while the standalone marquees are programmed in the Database Edit function. This function selects which Action Codes you wish to display. You may choose up to ten Marquee messages, numbered 0 through 9, that will sequentially scroll across the display.

When in the Unit Setup mode and prompted to **SELECT FUNCTION**, press MARQUEE on the Setup overlay. You may select up to ten (0-9) action codes to scroll across the screen. Use UP or DOWN to toggle between these.

To select a marquee, toggle to the marquee number you wish to change and press ENTER. Key in the desired Action code number (or "0" for no marquee), then press ENTER. You may now change more marquees, or press CLEAR two times to finish. The marquee messages will then scroll across the display in their respective numbered order when the scale is idle.

Marquee Speed Key

In Setup Mode at the prompt **SELECT FUNCTION**, press the MARQUEE SPEED key on the Setup overlay. Enter the speed from 0-9 (0 = slowest speed and 9 =fastest speed.) Press ENTER to keep the displayed value. The default is 5.

Unit ID Key

The UNIT ID key allows configuring the following options.

TNET Satellite

Unit ID - The unit ID identifies the satellite on the TNET master/satellite network.

PROTOCOL? - Set the satellite protocol for SMARTTOUCH for use with the **Smart*Touch*®** Master or 4Digit and 6Digit for use with a Model 8422-Type NF Master.

Standalone

Unit ID - The unit ID identifies the satellite on the TNET master/satellite network.

PROTOCOL? - Set the satellite protocol for SMARTTOUCH for use with the **Smart*Touch*®** Master or 4Digit and 6Digit for use with a Model 8422-Type NF Master.

Ethernet Client and Standalone, Version 1

SCL? - The IP Address identifies the client on the network. The IP Address is a unique number consisting of four parts separated by periods. (Ex: 146.207.40.1)

GW? – Gateway IP address is used if the server is on a different network.

Use the following key sequence to set the client IP address and Gateway address. The example shows setting the IP address to 146.208.104.015.

Press: SETUP
Press: ENTER
Press: UNIT ID
Display: **SCL 255.255.255.255**
Press: ENTER
Display: **SCL? 255.255.255.255** (SCL is this scale's IP.)
Key In: **146 208 104 015** (no spaces or .'s needed)
Press: ENTER
Display: **Port 0**
Press ENTER
Display: **Port ? 0**
Key In: **2305** (always set to this number)
Press: ENTER
Display: **GW 255.255.255.255** (GW is the Gateway's IP.)
Press: ENTER
Display: **GW? 255.255.255.255**
Key In: 146 208 104 100 (no spaces or .'s needed)
Press: ENTER
Display: **SCL 146.208.104.015** (where xxx shows the new number entered)
Press: CLEAR to exit setup mode.

Turn power off and back on to reset the scale with the new data.

Ethernet Satellite and Standalone, Version 2

The new DHCP features in the Version 2 software allow the Ethernet scale to obtain initial TCP/IP parameters from a DHCP or BOOTP server on the Ethernet network instead of manually setting these parameters.

To enter into the setup menus, enter the following:

[SETUP MODE]

[ENTER]

[UNIT ID]

The following setup menu will be then display, one line at a time.

NETWORK: AUTOMATIC
SCL:207.142.140.102
SCL NAME:
SCL MAC:
SERVER: AUTOMATIC
SVR:207.142.140.100
SVR NAME:
MSK:255.255.255.000
RTR:207.142.140.001
DCP:207.142.140.002
DNS:207.142.140.003

Press the "UP" and "DOWN" buttons to advance to the next setup menu item. Press the "ENTER" button to select or change.

You must first select the network boot type, **Manual** or **Automatic**. Automatic is the default. Automatic will use DHCP to automatically obtain the network boot information from a DHCP server. The parameter details are explained below.

Network	When **Automatic** is selected, the DHCP feature will be used. The "SERVER IP", "SERVER MAC", "SUBNET MASK", "ROUTER", "DHCP SERVER", and "DNS SERVER" fields will display but cannot be changed. Changes are allowed in the "Scale Name" and "Server Name" fields. If **Manual** is selected, then the DHCP feature is disabled and the TCP/IP parameters must be entered manually. The "Server MAC" field will display but no changes are allowed. The "DHCP Server" and "DNS Server" fields will not display and changes are not allowed to these fields. Changes are allowed in the "SCALE IP", "SCALE NAME", "SERVER IP", "SERVER NAME", "SUBNET MASK", and "ROUTER" fields.
SCL (SCALE IP)	This is the current scale IP address. If the "Network" is set to "Automatic" this field can not be changed. If the "Network" is set to "Manual" then this field may be changed. The IP address is entered one octet at a time. The default value for this field is 255.255.255.000.
SCL Name	This is the local domain name to given to the Client scale. All other devices on the network will reference the scale by using this name when the "NETWORK" is set to "AUTOMATIC". The default value for this field is "Scale01".

SCL MAC	This is the hardware MAC (Media Access Control) address. The MAC address will be displayed but can not be changed.
Server	This is the client scale's server configuration setting. The server (STEM or PC scale sever) IP address may be configured to be "AUTOMATIC", "AUTO FIND", or "MANUAL". If the "SERVER" is set to "AUTOMATIC", the scale server IP address will be obtained automatically using the "SRR NAME" through the DNS server and/or with a SARP on the local network. If the "SERVER" is set to "AUTO FIND", the scale server IP address will be obtained automatically using the "SVR NAME" through the DNS server and/or with a SARP on the local network. If the "SVR NAME" scale server goes offline or cannot be found, the client scale will search for a primary scale server and use its IP address. If the "SVR NAME" was not set, the primary scale server will be used. If the "SERVER" is set to "MANUAL", the scale server IP address used will be the one set in the "SVR". The "SVR NAME" will not be used.
SVR	This is the STEM or PC Scale Server current IP address. If the "NETWORK" is set to "AUTOMATIC" then this field cannot be changed. If the "NETWORK" is set to "MANUAL" then this field may be changed. The IP address will be entered as currently done, which is four octets, each separated by a decimal. The default value is 255.255.255.000.
SVR NAME	This is the local domain name of the scale server, which may be a STEM or PC. The scale will use this name when the "NETWORK" is set to "AUTOMATIC". The default value is "MTMaster01".
MSK	The Subnet Mask is used to identify the local network when accessing IP address on the Ethernet network. If the "Network" is set to "Automatic" this field can not be changed. If the "Network" is set to "Manual" thee field may be changed. The mask is entered one octet at a time. The default value is 255.255.255.000.
RTR	The router's (default gateway) IP address. The router is used when accessing devices outside of the local network. If the "Network" is set to "Automatic" this field can not be changed. If the "Network" is set to "Manual" this field may be changed. The IP address is entered one octet at a time. The default value is 255.255.255.000.
DCP	This is the current IP address of the local network's DHCP server. This field only displays when the "Network" is set to "Automatic" and can not be changed.
DNS	This is the current IP address of the local network's DNS server. This field only displays when the "Network" is set to "Automatic" and cannot be changed.

CAL Key

The CAL key is used with the CAL switch to access the calibration menu. Test weights are required to calibrate the Model 2450. Remove the left side cover for access to the CAL switch. You will have to remove the Calibration Seal (if used) in order to remove the cover. (Refer to Chapter 2 Calibration Seal). In Setup mode at the prompt **SELECT FUNCTION**, press the CAL key on the Setup overlay. You will then be prompted to press the CAL switch. Press the *CAL Switch* (Figure 3-2) to continue.

Note: To enable x10 Expand Mode:

- Press SETUP MODE key (SA: when UNIT displays, press ENTER key)
- Press CAL key, then CAL setup switch.
- Unit displays Load Cell INT.
- Press TARE key for expand mode.
- Press CLEAR key to exit Expand Mode.

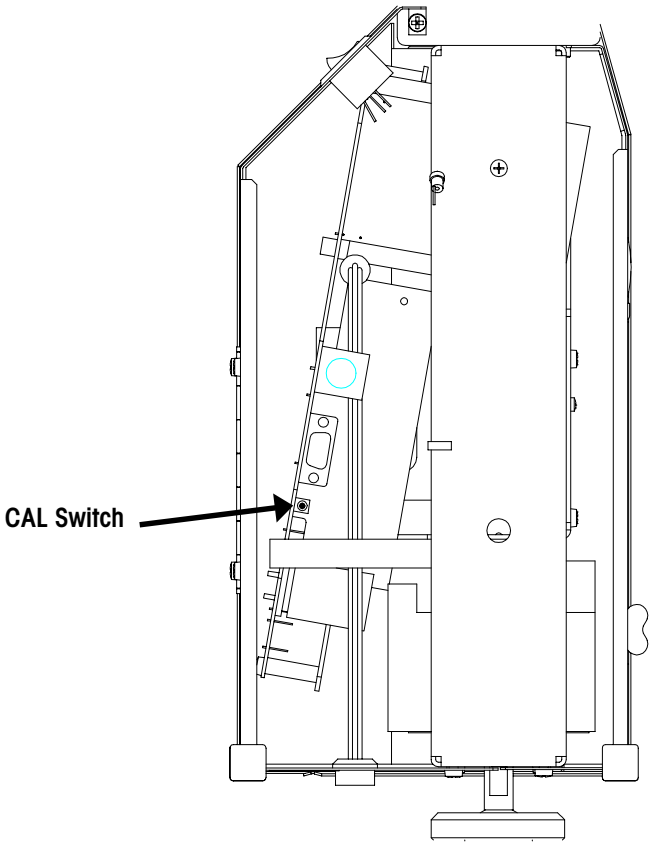


Figure 3-2: CAL Switch (Left Side Cover Removed)

After pressing the CAL Switch, you will be presented the calibration menu. Press the DOWN and UP keys to navigate through the menu. Press the ENTER key followed by the DOWN and UP keys to change the displayed options, then press ENTER again to accept the displayed selection.

Calibration Menu

KG DUAL RANGE affects other settings, including the Units setting. When **KG DUAL RANGE** is set to **YES**, then **UNITS** will automatically be set to **KG**. Then, **UNITS** may *not* be set to **LB** unless **KG DUAL RANGE** is *first* set to **NO**.

Display Prompt	Description
Load Cell	Select **Int-Eagle.** Other selections are **Ext-8270** or **None** if no internal or external load cell is used.
Units	Weight is pounds (**lb**) or kilograms (**kg**).
Canadian Tare	Set to **Yes** is installed in Canada, otherwise set to **No.**
KG Dual Range	Dual range weighs items under 6 kg in increments of 0.002 and above 6 kg in increments of 0.005 kg. Select **Yes** for dual range of 15 x .005 or 6 x .002 kg. Select **No** for single range 15 x .005 kg.
Weight Separator	Select either the period (.) or comma (,) as a decimal separator for weight.
Capacity	The capacity is used in the calibration mode. Select 30 lb or 15 kg.
Increment	Increment size used with the capacity. Automatically set to 0.010 lb or 0.005 kg.
Tare Limit	Default is 15.00. Maximum is scale capacity in lb and 9.995 in kg.
Motion Sense	Used to filter out movement or vibration that may affect the weight. Set the value higher for minimum filtering, and lower for maximum filtering. The range is 1-20.00 d. (Default is 1). This is the range within which the difference of the current weight and the last weight must be to count as motion reads.
Motion Reads	0-50 sets the sensitivity of the weight readings. A high value is most sensitive. A low value can be used to compensate for vibration, etc. (Default is 5). This is the number of consecutive valid motion reads necessary to set the no-motion flag (and cause auto-print in Prepack).
Min Print	The minimum weight that must be on the platter before a label prints. The default value (in divisions) is 20 (ex: .20 lb.) The PRINT key will override this.
AZM Rate	Automatic Zero Maintenance compensates for minor differences in zero. The rate can be set from 0.00 (off) to 30.00 d/second. (Default is 0.1d)
Calibrate	Enables the calibration mode. Press ENTER to start.

When **CALIBRATE** displays, press ENTER to start the calibration procedure.

1. The display will show **Empty Scale, Enter**. Make sure scale pan is empty, then press the ENTER key (Figure 3-3).
2. The display shows **Capturing Zero...** and the top display counts down from 15 while setting zero.
3. The scale will next ask for the amount of test weight: **Load: 10.00**. Recommended minimum test weights are 10 lb or 5 kg. Place the test weight on the scale pan. Enter the amount of the test weight, then press the ENTER key (or just press ENTER if the displayed value is correct). The display will show **Capturing Span…,** and the top display will count down from 15 while setting span (full capacity).
4. When calibration is complete, the display shows **Calibrated!!!**.

Filtering (Standalone only) Used to filter out vibration, etc. Default is None. Selections are None, Light, Medium, Heavy, Very Heavy, and Custom. Use Motion Read and Motion Sense before changing the filtering, as the filters increase settling time of the scale.

Press CLEAR four times until the display shows **Ready**. Delays are normal as the scale stores the calibration information before leaving the setup mode.

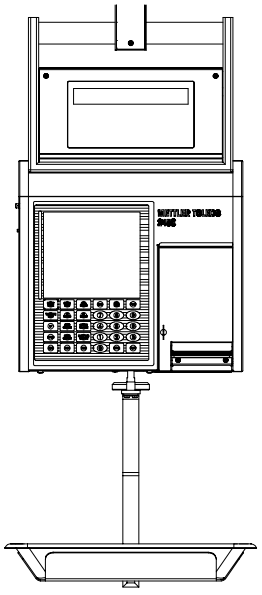


Figure 3-3: Empty Pan

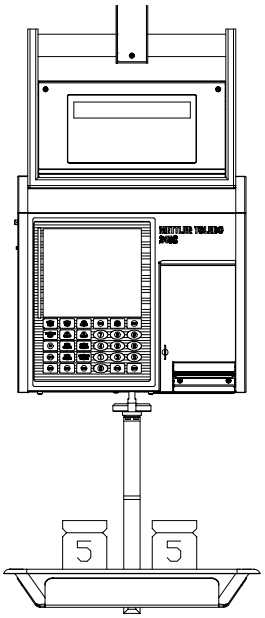


Figure 3-4: Add Weights

Currency Key

This key allows selecting the currency increment, symbol, and separator.

When in the Unit Setup mode and prompted to **SELECT FUNCTION**, press the CURRENCY key on the Setup overlay. Press UP or DOWN to toggle between **CURRENCY INC** (currency increment), **CURRENCY SYMBOL**, and **CURRENCY SEPARAT** (separator).

Currency Increment

After toggling to **CURRENCY INC**, press ENTER. Enter the increment value then press ENTER. The range is from 0.001 to 99.999. The default is 0.01. The currency increment sets two values: (1) Decimal point to round to, and (2) Amount to round with.

The decimal point is determined by the digit where the last non-zero number is located. For example, if the increment is 00.020, the price displays as XXXX.XX. If the increment is 00.100, the price displays as XXXXX.X.

The value to round to is determined by the value entered into the currency increment. The following example explains this in detail using a By Weight PLU with a Unit Price of 2.99.

Increment	Weight	Unit Price	Total Price
00.010	.44	2.99	1.32
00.050	.44	3.00	1.30
00.002	.44	2.990	1.316
00.100	.44	3	1

When the display shows **CURRENCY SYMBOL,** use the DOWN and UP keys to toggle between **CURRENCY SYMBOL**, **CURRENCY SEPARAT** and **CURRENCY INC**.

Currency Symbol

The currency symbol that precedes the Unit and Total Price on the label can be changed. Up to three characters can be used.

After toggling to **CURRENCY SYMBOL**, press ENTER. The display will show **DECIMAL:000 000 000**. Using the keypad, key in the three-digit ASCII character code for the desired symbol. The following ASCII chart shows a complete listing of the characters and the corresponding three-digit codes. The code for a dollar sign ($) with a space before and after is: **032 036 032**. The code for no symbol is **032 032 032**. After entering the codes, press ENTER to save and exit.

Please note the following rules:

- Leading spaces are ignored
- Trailing blanks are ignored
- Leading blanks will blank out the entire currency symbol
- Trailing spaces will print. They use a character position in the unit and total price fields. This can lead to a field full of *'s if there are more characters than the fields will allow. (Total Price field allows 7 spaces including the decimal point.)

The following ASCII table gives the decimal (Dec.) code for each printable character.

* Anything after a NULL is ignored.

Example:
036 000 049
Prints as $ only
(1 space on the label.)

032 036 032
Prints as Space, $, Space
(3 spaces on label.)

*

Char.	Dec.
NUL	000
SP	032
!	033
"	034
#	035
$	036
%	037
&	038
'	039
(	040
)	041
*	042
+	043
,	044
-	045
.	046
/	047
0	048
1	049
2	050
3	051
4	052
5	053
6	054
7	055
8	056
9	057
:	058
;	059
<	060
=	061
>	062
?	063

Char.	Dec.
@	064
A	065
B	066
C	067
D	068
E	069
F	070
G	071
H	072
I	073
J	074
K	075
L	076
M	077
N	078
O	079
P	080
Q	081
R	082
S	083
T	084
U	085
V	086
W	087
X	088
Y	089
Z	090
[	091
\	092
]	093
^	094
_	095

Char.	Dec.
`	096
a	097
b	098
c	099
d	100
e	101
f	102
g	103
h	104
i	105
j	106
k	107
l	108
m	109
n	110
o	111
p	112
q	113
r	114
s	115
t	116
u	117
v	118
w	119
x	120
y	121
z	122
{	123
|	124
}	125
~	126
	127

You will now be able to toggle between **CURRENCY SYMBOL**, **CURRENCY SEPARAT** and **CURRENCY INC**.

Currency Separator

After toggling to **CURRENCY SEPARAT**, press ENTER.

Using the DOWN and UP keys, toggle to the preferred decimal indicator, either a period (**.**) or a comma (**,**). Press ENTER to accept the displayed value.

The display will now show **CURRENCY INC.** Use the DOWN and UP keys to toggle between **CURRENCY SYMBOL**, **CURRENCY SEPARAT** and **CURRENCY INC**.

PLU Setting Key

The PLU SETTING key allows you to change several options relating to PLU's. The procedure for changing these features is as follows.

In Setup mode at the prompt **SELECT FUNCTION**, press the PLU SETTING key on the Setup overlay.

Press the DOWN and UP keys to toggle between **PLU/ITEM**, **TARE FIELD**, **PROP TARE**, **MANUAL MODE TYPES**, **DEFAULT MODE**, and **CHNG DATE BY**. The details on the options are described in the following sections.

PLU/Item

While operating the scale, you can call up the programmed information either by PLU (Price Look Up) or by Item number. Also, while in Operator mode the prompt will be either **PLU?** or **ITEM?** according to this selection. To change this, toggle to **PLU/ITEM:** then press ENTER.

The display will show **CALL BY**. Use the DOWN and UP keys to toggle between **PLU** and **ITEM**. After displaying the desired selection, press ENTER. You can now toggle between other PLU settings.

Tare Field

This option selects which tare field is used. The **Smart***Touch*® master database has two tare values for every PLU, *Tare 1* and *Tare 2*.

After toggling to **TARE FIELD**, press ENTER. Use UP or DOWN to toggle between **TARE 1** or **TARE 2**. When your selection is displayed, press ENTER. You can now toggle between other PLU settings.

PROP Tare

To select proportional tare (if the master scale has this capability **Smart***Touch*® master V3.0 and later), toggle to **PROP TARE**, then press ENTER. **YES** allows proportional tares; **NO** prohibits the use of proportional tares. Use the DOWN key to display the desired selection, then press ENTER. You can now toggle between other PLU settings.

If Proportional Tare is used (**Smart***Touch*® Master must be Version 3.0 or later), it is stored in the Tare 2 field. By-Weight tares are stored in the Tare 1 field. The Net Weight will be the gross weight minus the By-Weight Tare 1, minus the proportional Tare 2 times the Gross Weight, minus By-Weight Tare 1 value. The mathematical representation is as follows:

Net Weight = (Gross Wgt - Tare 1) - (Tare 2 x (Gross Wgt - Tare 1))

Manual Mode Types

PLU's can be programmed as a "Manual Mode" PLU requiring the operator to key in the product's price. This option also allows or prohibits the use of "price per ¼ pound", "price per ½ pound", and "Pounds For pricing" when a Manual Mode PLU is retrieved.

To change the settings, press ENTER when **MANUAL MODE TYPES** displays. You can now toggle between **LB FOR**, **¼ LB**, and **½ LB** using the DOWN and UP keys. A **Y** indicates that the operator will have the option to price this way; an **N** indicates the operator will not have the option to price this way for manual PLU's. When the pricing type you would like to change displays, press ENTER. Use the DOWN key to change the configuration to either **Y** or **N,** then press ENTER. You can now change more pricing types, or press CLEAR to exit.

Default Mode

After toggling to the **DEFAULT MODE** display, press ENTER.

Use the DOWN and UP keys to toggle to the preferred default mode, either **PREPK**, **SERV** (Service counter), or **LAST**.

SERVICE	Clears the PLU after printing.
PREPACK	Retains PLU until clear is touched.
LAST USED	Remembers the mode used in the last transaction, either Service or Prepack.

After you have made your selection, press ENTER. You can now toggle between other PLU settings. Press CLEAR TO exit to the **SELECT FUNCTION** display.

Change Date By

When overriding the shelf life (if allowed) or Use-By date, the date can be changed either by entering the *actual date* (in the format MMDDYY*)* or by entering the *number of days* until the shelf life date.

To change this option, toggle to the **CHNGE DATE BY** display, then press ENTER. Use UP or DOWN to toggle to **DATE** or **DAYS**. Press ENTER to accept the displayed option. You can now toggle between other PLU settings or press CLEAR to exit.

Print After Motion

When this selection is set to YES, a label is issued automatically when an item is placed on the scale platter. When set to NO, the PRINT key must be pressed to print a label.

Print Key Active

When this selection is set to YES, multiple labels can be printed after a PLU is called by pressing the PRINT key. When set to no, only one label will be printed per PLU when PRINT is pressed.

Bar Code Setting Key

In Unit Setup mode with **SELECT FUNCTION** displayed, press the BAR CODE SETTINGS key on the Setup overlay. Use UP or DOWN to toggle **UPC** or **EAN**. When the desired selection displays, press ENTER.

UPC

UPC bar codes are used for standard USA Bar Codes. When **UPC** is selected, the following options are given by pressing UP or DOWN. Press ENTER to change. Key in the selection number, then press ENTER again**.**

BY WEIGHT TYPE

Default is 2. The selections are as follows:

0 = Ten digit Item Number. (No Price is encoded)
1 = Not identified.
2 = Item number and total price encoded.
3 = Drug and health items. Similar to type 0.
4 = In-Store Marking.
5 = Coupons.
6 = Ten digit Item Number. (5d Manufacturer #/5d Item if Manufacturer # is used)
7 = Ten digit Item Number. (5d Manufacturer #/5d Item if Manufacturer # is used)

BY-COUNT TYPE

Default is 2. Refer to By-Weight bar codes.

STD PACK TYPE

Default is 2. Refer to By-Weight bar codes.

RUN TOTAL TYPE

This also sets the type for the Memory mode labels. Default is 2. Refer to By-Weight bar codes.

RAND WGT FORMAT

The Random Weight Format selects the format of the type 2 and 6 barcodes. The default is 1. The selections are:

Bar Code Format Symbol Legend:
N Item number Digits.
C Price Check Digit.
0 The number zero.
$ Total Price Digits.
# Weight Digits.
X Symbol Check Digit.
D Digit.

0	NNNNN C$$$$ X	(5-D Item/Price Check Digit/4-D Price)
1	NNNNN O$$$$ X	(5-D Item/Zero Price Check/4-D Price)
2	NNNNN N$$$$ X	(6-D Item/No Price Check/4-D Price)
3	NNNNN $$$$$ X	(5-D Item/No Price Check/5-D Price)
4	NNNNN C#### X	(5-D Item/Wgt Check Digit/4-D Wgt)
5	NNNNN O#### X	(5-D Item/Zero Price Check/4-D Wgt)
6	NNNNN N#### X	(6-D Item/No Price Check/4-D Wgt)
7	NNNNN ##### X	(5-D Item/No Price Check/5-D Wgt)

RUN TOT WGT FMT
Select Run Totals/Memory Mode Barcode Format when types 2/6 are selected for Run Totals or Receipt labels. Refer to Random Weight Type for available selections.

MFG NUMBER
This selection allows for a default five-digit manufacturer number. When not set to zero, the manufacturer number replaces the first five (MSD) digits of the Item Number in bar code types 0, 1, 3, 5, 6, or 7.

EAN

EAN bar codes are used for applications outside the US. When the **EAN** is selected, the following options are given by pressing the DOWN and UP keys. Each may be edited by pressing ENTER, keying in the selection number, then pressing ENTER again.

BY WGT PREFIX
Enter the EAN Prefix 2 digit to be used for By-Weight labels (0-9).

BY CNT PREFIX
Enter the EAN Prefix 2 digit to be used for By-Count labels (0-9).

STD PCK PREFIX
Enter EAN Prefix 2 digit to be used for Standard Pack labels (0-9).

RUN TOT PREFIX
This also sets the type for Memory mode labels. Enter EAN Prefix 2 digit to be used for Standard Pack labels (0-9).

BY WGT FORMAT
Select the format of the By-Weight bar code. The selections are:

Bar Code Format Symbol Legend:
N Item number Digits.
C Price Check Digit.
0 The number zero.
$ Total Price Digits.
# Weight Digit.
X Symbol Check Digit.
D Digit.

0	NNNNN N$$$$ X	(6-D Item/4-D Price)
1	NNNNN $$$$$ X	(5-D Item/5-D Price)
2	NNNN$ $$$$$ X	(4-D Item/6-D Price)
3	NNNNN C$$$$ X	(5-D Item/PC Digit/4-D Price)
4	NNNNC $$$$$ X	(4-D Item/PC Digit/5-D Price)
5	NNNNN ##### X	(5-D Item/5-D Wgt)
6	NNNNC ##### X	(4-D Item/Wgt Check Digit/5-D Wgt)

BY CNT FORMAT
By Count Format. Refer to By Weight Format.

STD PCK FORMAT
Standard Pack Format. Refer to By Weight Format.

RUN TOT FORMAT
Run Totals Label Bar Code Format. This also sets the format for Memory mode labels. Refer to By Weight Format.

Reset Labels Key

CAUTION!!! This function will reset the label formats to the factory defaults erasing any custom label formats and resetting the label size to 48.3 mm.

In Unit Setup mode when **SELECT FUNCTION** displays, press the RESET LABELS key on the Setup overlay. You will then be asked to confirm this action. Press the DOWN and UP keys to toggle between **NO** and **YES**. After you have made your selection, press ENTER.

Defaults Key

In Unit Setup mode when **SELECT FUNCTION** displays, press the DEFAULTS key on the Setup overlay. Press ENTER to choose the default language. Use the DOWN and UP keys to toggle between **ENGLISH**, **SPANISH**, and **FRENCH**. After you have made your selection, press ENTER.

Reset RAM Unit Key

CAUTION!!! This function will clear the memory and reset all formats and options to the factory defaults. This function should be used when setting up a new unit, or if the Main Logic PCB or battery is replaced.

(Note: This function does not change the label printer settings, Unit ID or Protocol, or CAL Menu settings. See "Setup Checklist." This function will set the department to 0 and will clear the department information for all departments.)

In Unit Setup mode when **SELECT FUNCTION** displays, press the RESET RAM UNIT key on the Setup overlay. You will then be asked to confirm this action. Press the DOWN and UP keys to toggle between **NO** and **YES**.

After you have made your selection, press ENTER.

Label Printer Key

This selection is used to change the print speed/density, and printhead Ohms. In the Unit Setup mode when prompted to **SELECT FUNCTION**, press the LABEL PRINTER key on the Setup overlay. Press the DOWN and UP keys to toggle between **PRINT** (Speed/Density) and **HEAD** (Printhead Ohms).

Print

Note: These settings are not changed when RESET LABELS is pressed.

This selection is used to control the speed and density of the label printer. After toggling to **PRINT**, press ENTER. The first number corresponds to the speed (mm/s) of the printer followed by the print density (low, medium, or high).

A faster speed and a lower density setting should be used with a high quality thermal paper. A lower speed and high density setting should be used with a lower quality thermal paper. You may want to test a few different settings to determine your optimum speed and density.

Use the DOWN and UP keys to toggle between the selections listed below (1 inch = 25.4 mm):

- 122.5 mm/s HIGH
- 122.5 mm/s HIGH-MEDIUM
- 122.5 mm/s LOW-MEDIUM
- 122.5 mm/s LOW
- 101.6 mm/s HIGH

After toggling to your selection, press ENTER.

Head

This function should only be used if the scale's printhead is replaced and a new Ohms rating needs to be selected. After toggling to **HEAD**, press ENTER.

Use the DOWN and UP keys to toggle between the selections listed below. Choose the Ohms Rating marked on the printhead. You can view the rating by unlocking and raising the printhead. The Ohms rating is printed on a tag affixed to the front edge of the printhead.

- >683 Ohms
- 676-683 Ohms
- 669-675 Ohms
- 661-668 Ohms
- 654-660 Ohms
- 646-653 Ohms
- 646-653 Ohms
- 639-645 Ohms
- 631-638 Ohms
- 624-630 Ohms
- <624 Ohms

After toggling to your selection, press ENTER.

Host Key

Refer to the DATABACK Version 4.0 and later manual and the Intellinet manual for specifics on using it with the Model 2450 Satellite and Standalone.

HOST allows you to change the communications options for the Model 2450. While in the unit setup mode and prompted to **SELECT FUNCTION**, press the HOST key on the setup overlay. You will now be able to toggle through and change the following: **BAUD RATE**, **PARITY**, **STOP BITS**, **DATA BITS**, **FLOW CONTROL**, **TIMEOUT**, and **HOST ID**.

Baud Rate

Toggle to **BAUD RATE,** then press ENTER. Use DOWN/UP toggle baud rates. Press ENTER when the desired baud rate is displayed. Default setting is 9600.

Parity

Toggle to **PARITY,** then press ENTER. Use DOWN/UP to toggle **EVEN**, **ODD**, **LOW**, **HIGH**, and **OFF**. Press ENTER to accept. Default setting is EVEN.

Stop Bits

Toggle to **STOP BITS**, then press ENTER. Use DOWN/UP to toggle **1**, **1.5**, and **2**. When the desired selection is displayed, press ENTER. Default setting is 1.

Data Bits

Toggle to **DATA BITS,** then press ENTER. Enter 5, 6, 7, or 8 then press ENTER. Default setting is 7.

Flow Control

Toggle to **FLOW CNTRL,** then press ENTER. Use DOWN/UP to toggle **NONE**, **XON/XOFF**, and **RTS/CTS**. Press ENTER to accept. Default setting is NONE.

Timeout

Toggle to **TIMEOUT** and press ENTER. Key in the desired time out, in milliseconds, then press ENTER. Default setting is 20,000 (20 seconds).

Host ID

To change the host identification number, toggle to **HOST ID**, then press ENTER. Key in the desired host ID number and press ENTER. The default is **1**.

Host Interface

Standalone only.

In the Standalone, select 4 or 6 digit host interface. To change, toggle to **HOST I/F**, then press ENTER. Use DOWN/UP to toggle **6 DIGIT** and **4 DIGIT**. Default setting is 6 digit.

Label Size Key

The LABEL SIZE key is used to quickly change the default label size without going through the LABEL FORMAT Key Menu. In Unit Setup mode with the prompt **SELECT FUNCTION** displayed, press the LABEL SIZE key on the Setup overlay. Using the DOWN and UP keys, you may choose between the following selections.

- 48.3 mm (= 1.9 in)
- 53.3 mm (= 2.1 in)
- 61.0 mm (= 2.4 in)
- 83.8 mm (= 3.3 in)
- 94.0 mm (= 3.7 in)
- 106.7 mm (= 4.2 in)
- 119.4 mm (=4.7 in)
- 129.5 mm (= 5.1 in)
- CONT (Roll Stock)

After toggling to the correct label size, press ENTER.

Label Format Key

This key is used to select the format for a given "Label Size" setting. Complete label setups can be programmed using the LABEL SIZE key. If a single label specification needs to be changed, this can be done quickly using the quick keys on the Setup overlay. The keys are STRIP, GAP LENGTH**,** IMAGE OFFSET, and EJECT LENGTH.

First set the label size, select the label formats and then set the label specifications. When done, return to Operator mode. The scale will auto-measure two labels on the first print. To set the label size see the **MEASURE LABEL** prompt under the LABEL FORMAT key or the LABEL SIZE key.

Standard Label Formats

After selecting the label specifications, you may select the label formats. There are eight label specification options in the Standalone and Satellite, 9 label format options in the Satellite and 11 label format options in the Standalone in the Label Format menu. You may choose a separate label format for each of the following label types:

Satellite: By Weight, Prepack, By Count, Standard Pack, Receipt, Verification, Run Total, Nutrition Facts (second label), and Extra Text.

Standalone: By Weight, Prepack, By Count, Standard Pack, Receipt, Verification, Run Total, Report Totals, Nutrition Facts (second label), Extra Text and Graphics.

There are several default label formats for each label size. The "Label Formats" Chapter at the end of the manual contains examples of each of the label formats and their corresponding numbers. Custom label formats may be created using an 8460 or 8360 master scale and loaded into the Model 2450 with DATABACK software (V4.0 and greater).

To specify a format for a particular label type, at the prompt **SELECT FUNCTION**, press LABEL FORMAT on the Setup overlay. Using the DOWN and UP keys, you can toggle between several options. The first nine options for Satellite and the first 11 options for Standalone are label types. When the label type you wish to change is displayed, press ENTER. Key in the desired format number (see Label Formats Chapter), then press ENTER.

The following selections are available after pressing the Label Format key. Use UP or DOWN to toggle through the selections. Press ENTER when a selection is display to modify the setting. For the label format codes, refer to the Label Formats chapter.

BY WEIGHT

Format for Random Weight labels.

PREPACK

Format for Random Weight Prepack labels.

BY COUNT

Format for By-Count labels.

STD PACK

Format for Standard Pack labels.

RECEIPT

Format for Receipt (memory mode) labels.

VERIFICATION

Format for Verification labels.

RUN TOTAL

Format for the Run Totals labels.

REPORT TOTALS (Standalone Only)

Format for the Standalone Report Totals labels.

NF 2ND LABEL

Format for the second label (separate Nutrifacts label) and for the Nutrifact only labels.

ET FORMAT

Format for printing extra text labels.

NF FORMAT

Format for printing Nutrifact labels.

GR FORMAT

Format for printing graphics only labels (Not Used).

LABEL LENGTH

Enter a length up to 152 mm (6 inches). The default is 48.3 mm. For reference, standard size lengths are:

1.9 in/48.3 mm
2.1 in/53.3 mm
2.4 in/61.0 mm
3.3 in/83.3 mm
3.7 in/94.0 mm
4.2 in/107.7 mm
4.7 in/119.4 mm
5.1 in/129.5 mm

Continuous Strip is set to 0.0.

GAP LENGTH

The gap length of the label (in mm) is used to compensate for variances in different label suppliers. To change the gap length, use DOWN and UP until **GAP LENGTH** appears on the display, then press ENTER. Key in the desired gap length (mm),

then press ENTER. (Standard gap length for Mettler Toledo specified die cut labels is 3.2 mm, and 0.0 for continuous strip.)

DELIVERY

Select the delivery mode of the label printer. Stripped will deliver the label to the operator without the label backing. Unstripped will deliver the label to the operator on the label backing. Unstripped mode also turns the Take Label Sensor off allowing you to print another label before the first is removed from the printer.

Use the DOWN or UP keys until **DELIVERY** appears on the display. Press ENTER. Use DOWN and UP to select either **STRIPPED** or **UNSTRIPPED**. When the desired delivery mode is displayed, press ENTER.

LABEL TYPE

This selection is used to select the type of labels, either continuous or die cut labels. To change this entry, press ENTER when **LABEL TYPE** is displayed. Use the DOWN and UP keys to toggle between **DIE CUT** and **CONTINOUS**. When the correct label type is displayed, press ENTER.

MEASURE LABEL

When setting up a custom size label, use this function to measure the label. To measure the label, toggle to **MEASURE LABEL** then press ENTER. Two labels will be ejected. The measured values are automatically entered into the **LABEL LENGTH** and **GAP LENGTH** values, replacing current settings, however these values will not appear in the setup menu until setup is exited and re-entered.

EJECT LENGTH

The Eject Length (in mm) is the distance the label is ejected out beyond the print head. The default is 2.2 mm. If this value is set higher, the labels will eject farther. If set too high, while in stripped mode, the labels may fall completely off the liner. Also, if this value is set too high, printing in this region may be lost or printed on the bottom of the next label.

If Eject Length value is set too low (if using die cut labels in stripped mode), too much of the label may remain on the stripper bar, making it difficult to peel off the liner.

To change this value, when **EJECT LENGTH** is displayed, press ENTER. Key in the desired value (mm), then press ENTER.

LABEL WIDTH

This function is used to set the label width. The default is 64 mm. The label format is centered based on this setting. Increasing the width will shift text to the left of the label. Decreasing the width will shift text to the right of the label.

To change this setting, press ENTER when **LABEL WIDTH** appears on the display. Key in the new width (in mm), then press ENTER.

IMAGE OFFSET

The Image Offset (in mm) is used to offset the printed image on the label referenced to a point above the label. The default is 5.2 mm. To raise the image on a label, lower the Image Offset value. To lower the image on a label, increase the Image Offset value.

To change the Image Offset value, press ENTER when **IMAGE OFFSET** is displayed, key in the desired value (in mm), then press ENTER.

Strip Key

The STRIP key is used to quickly change the delivery mode of the label printer. **Stripped** will deliver the label to the operator without the label backing. **Unstripped** will deliver the label to the operator with the label backing.

In Setup mode at the prompt **SELECT FUNCTION**, press STRIP on the Setup overlay. Press the DOWN or UP key to toggle between **STRIPPED** and **UNSTRIPPED**. When the desired delivery mode is selected, press ENTER.

Gap Length Key

The GAP LENGTH Key is used to quickly change the gap length without going through the Label Format menu. The gap length is the distance (in mm) between die cut labels. This length can be adjusted to compensate for variances in different label suppliers. In Setup Mode, at the prompt **SELECT FUNCTION**, press GAP LENGTH on the Setup overlay. Key in the desired gap length (in mm), then press ENTER. (Normal gap length for Mettler Toledo specified die cut labels is 3.2 mm).

Image Offset Key

The IMAGE OFFSET Key is used to quickly change the image offset without going through the Label Format menu. The Image Offset (in mm) is used to offset the printed image on the labels. The default is 5.2 mm. To raise the image on a label, lower the Image Offset value. To lower the image on a label, increase the Image Offset value.

To change this value, in Setup mode at the prompt **SELECT FUNCTION**, press the IMAGE OFFSET key on the Setup overlay. Key in the desired value (in mm), then press ENTER.

Eject Length Key

The EJECT LENGTH Key is used to quickly change the eject length without going through the Label Format menu. The Eject Length (in mm) is the distance the label is ejected out beyond the print head. The default is 2.2 mm. If this value is set higher, the labels will eject farther. If set too high, while in stripped mode, the labels may fall completely off the liner. Also, if this value is set too high, printing in this region may be lost or printed on the bottom of the next label.

If Eject Length value is set too low, if using die cut labels in stripped mode, too much of the label may remain on the stripper bar, making it difficult to peel off the liner.

To change this value, in Setup mode at the prompt **SELECT FUNCTION**, press the EJECT LENGTH key on the Setup overlay. Key in the new value (in mm) and press ENTER.

Enable Modify Key

The ENABLE MODIFY key controls whether the operator may or may not modify the following values during a transaction: Shelf Life, Use-By Date, Net Weight, Price, Quantity/Count, or Extra Text/Nutrition Fact Number.

To change these settings, enter Unit Setup mode and at the prompt **SELECT FUNCTION**, press the ENABLE MODIFY key on the Setup Overlay.

You are now able to toggle between the following: **SHELF LIFE**, **USE BY** (Use-By Date), **NET WEIGHT**, **PRICE**, **QTY/COUNT**, and **EX/NF#** (Extra Text/Nutrition Fact Number). **YES** allows the operator to override the programmed value. **NO** prohibits the operator from overriding the programmed value.

When the field you wish to change appears on the display, press ENTER. Press the DOWN key to toggle between **YES** and **NO**. When the desired selection appears on the display, press ENTER. You may now continue with more fields. When completed, press CLEAR to escape.

Enable Func Key

The ENABLE FUNC Key is used to either allow or prohibit the operator to carry out certain scale functions. The functions are as follows: blank out fields on a label, print batch PLU labels, print batch Nutrition Fact labels, print batch Extra Text labels, enter a Prepack mode, void transactions, memory mode, collect operator totals (not available for Model 2450 satellite), and auto clear By-Count or Standard pack PLU's.

In Unit Setup mode at the prompt **SELECT FUNCTION**, press the ENABLE FUNC key. Use the DOWN and UP keys to toggle between the following options: **ENABLE BLANK** (blank a field on a label), **ENABLE BATCH PLU**, **ENABLE BATCH NF** (Nutrition Fact), **ENABLE BATCH ET** (Extra Text), **ENABLE PREPAK**, **ENABLE VOID**, **ENABLE MEMORY, ENABLE OP TOTAL** (Operator Totals - not available), and **BY CNT AUTO CLR** (auto clear for By-Count or Standard Pack PLU's).

YES (or **Y**) allows the function to be used in Operator mode. **NO** (or **N**) prohibits the function to be used.

To change an option, press the DOWN or UP key until the option displays, then press ENTER. Use the DOWN or UP key to switch to the desired setting, then press ENTER.

Note the **ENABLE MEM** option allows three settings: **LOC** (local scale memory), **DEPT** (not available), and **NO** (disables Memory function). When your desired selection is displayed, press ENTER.

Verify Labels Key

This function allows the user to print out labels of all (or selected) PLU's in a particular department. The format of these labels is determined in the LABEL FORMAT Setup.

In Unit Setup mode at the prompt **SELECT FUNCTION**, press the VERIFY LABELS key on the Setup overlay.

Standalone Only

In the Standalone model, a list of which type of labels can be verified will be presented. This includes **PLU/ITEM, EXTRA TEXT, NUTRIFACT,** and **GRAPHIC**. Toggle through these options with the UP and DOWN key and select one by pressing ENTER. The format of these labels is determined in the LABEL FORMAT setup. A department number is not required to print Extra Text, Nutrifacts, or Graphics verification labels since they are not associated with any department. Follow the directions below to print verification labels.

Key in the department number (for PLU/ITEM), then press ENTER. Key in the number of the first PLU you would like printed (default is 1), then press ENTER. Key in the number of the last PLU you would like printed (default is 999999), then press ENTER. You will

then be asked if you want to start printing. Press ENTER to begin printing. Press CLEAR to cancel.

In the Satellite model, if the unit is off line, the back-up PLU's will be printed. If the unit is on line, the PLU's from the master database will be printed.

Passwords Key

The password is a numeric number between 1 and 9999. The unit setup options can be password protected by pressing the PASSWORD key at the **Select Function** prompt. The standalone database can be password protected by a separate password by pressing PASSWORDS at the **Select DB Function** display. To clear a password, enter a zero. To bypass the password, press the CAL switch at the **Password** display.

Beeper Key

At the prompt **SELECT FUNCTION**, press the BEEPER key on the Setup overlay.

The current beeper duration will be displayed. Enter a number between 0 and 10, then press ENTER. Zero is off, one is the shortest duration, and nine is the longest duration.

Time Date Format Key

This key is used to select the format of the time, date, and the symbol used for displaying the date. In Unit Setup Mode at the prompt **SELECT FUNCTION**, press the TIME DATE FORMAT key on the setup overlay. Use the UP or DOWN keys to toggle between **DATE**, **TIME**, and **DATE SEPARATOR**.

The following selections are available:

Date Format

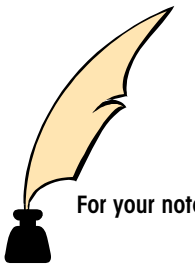
MM/DD/YY	(10/27/99)
DD/MM/YY	(27/10/99)
YY/MM/DD	(99/10/27)
YY/MMM/DD	(99 JAN 30)

Time Format

Select 12 or 24 hours.

Date Separator

/, -

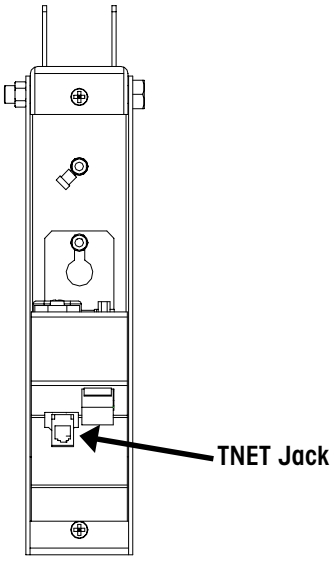


For your notes

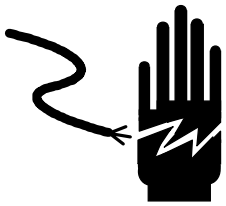
4 PC and Scale Network Interface

Master/Satellite Network (TNET)

Overview



TNET Jack



⚠ WARNING

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

The TNET satellite must be connected to a master scale to access the master PLU file. When a PLU number is called up, it is retrieved from the master and added to a local backup PLU table. On power-up, the backup table, action code table, grade table, and department configuration is updated. If the master is off-line, the satellites operate with the backup information until the master goes back on-line.

The scale network (TNET) connects all the satellite scales to the master scale. Each satellite is shipped with a modular phone jack box and a 25 ft (7.62 m) communication cable that connects the box to the TNET connector on the Model 2450 mounting column. The 25-ft (7.62 m) communication cable has a 4-position modular phone plug on one end, and a 6-position modular plug on the other. Run the cable down the column, then connect the 4-position end to the TNET Jack in the top column (accessible by removing the connector cover) in Model 2450. Connect the 6-position end to the supplied phone jack connected to the network. The total data cable length of the network, including the main data cable and the 25 ft (7.62 m) scale drop cables is limited to 1500 feet (457 meters).

⚠ IMPORTANT NOTE

Maximum recommended cable length, including the main cable and 25 ft (7.62 m) scale drop cables, is limited to 1500 feet (457 meters). Use only approved or equivalent unshielded telephone type cable. The use of unapproved cable may result in data communications errors.

If the cable is to be run through a plenum area or in ceilings, check the local electrical/fire codes. Special non-flammable/non-smoking plenum cable may be required.

TNET Hardware

The maximum cable length of the Master/Satellite TNET network, which includes the main data cable and all 25 ft (7.62 m) scale drop cables, is limited to 1500 feet (457 meters). Use only approved or equivalent UTP (unshielded twisted pair) cable. The use of unapproved cable may result in data communications errors.

If the cable will be routed through a plenum area or in ceilings, check the local electrical/fire codes. Special UTP non-flammable/non-smoking plenum-cable may be required.

The table below lists the METTLER TOLEDO® wiring specifications.

Two-Pair UTP (Unshielded Twisted Pair) Category 2 (or higher), 22-24 Gauge, Solid Core Cable is required for the master/satellite network.

Material	Approved Vendors	Specifications
Phone jack	• METTLER TOLEDO P/N (*)12716300A • Allen Tel. Prod. #AT468-4 (or equivalent)	Wall mount telephone jack with screw terminals and one RJ-45 modular jack.
Terminating Resistor	METTLER TOLEDO P/N (*)12839300A. or equivalent	1/4 Watt, Metal Film, Tolerance ±1%.
UTP Data Cable	Belden 1227A AT&T 1005 002A W1000	Solid-Core (22-24 gauge), Two-Pair UTP (Unshielded Twisted Pair) EIA Category 2 or higher or UTP Telephone Cable. • Category 2 or higher • Maximum 1500 feet (457 m) cable length (including drops) • 22-24 AWG Solid Core • 2-Pair UTP (Unshielded Twisted Pair) • N.E.C. type CM • Nominal Capacitance **16-18** pf/ft **max**.

Table 5-1: TNET Hardware

TNET Wiring

The maximum cable length, including the main data cable and 25 ft (7.62 m) scale drop cables is limited to 1500 feet (457 meters).

Only one twisted pair will be used. The other pair is not connected and can be used as a spare.

The main data cable and must be run so it is located within 25 ft (7.62 m) of each scale on the network. Once the cable is routed, a modular phone jack (P\N 12716300A) must be attached to the main data cable at each scale location. The phone jack must be located within 25 ft (7.62 m) of the scale to allow connecting the 25 ft (7.62 m) communication cable between the phone jack and the scale. Each scale is shipped with a 25-ft (7.62 m) communication cable (P/N 12716500A) which connects the scale communication port to the phone jack. The illustration below gives an example of the scale network wiring in detail. ***The main data line must be terminated at the ends by connecting the supplied 113 ohm resister (P/N 12839300A) between the Green and Red terminals in the phone jacks. The terminating resistors are supplied with each master scale. Use only one twisted pair to connect to the Green and Red terminals in the phone jack. Do not use a wire from each pair.***

NOTE 1: The 25-ft (7.62 m) Communication Cable, P/N 12716500A, and the Phone Jack, P/N 12716300A, are supplied with each scale. The four-position modular phone connector plugs in the scale TNET connector, and the six-position modular phone connector plugs into the phone jack.

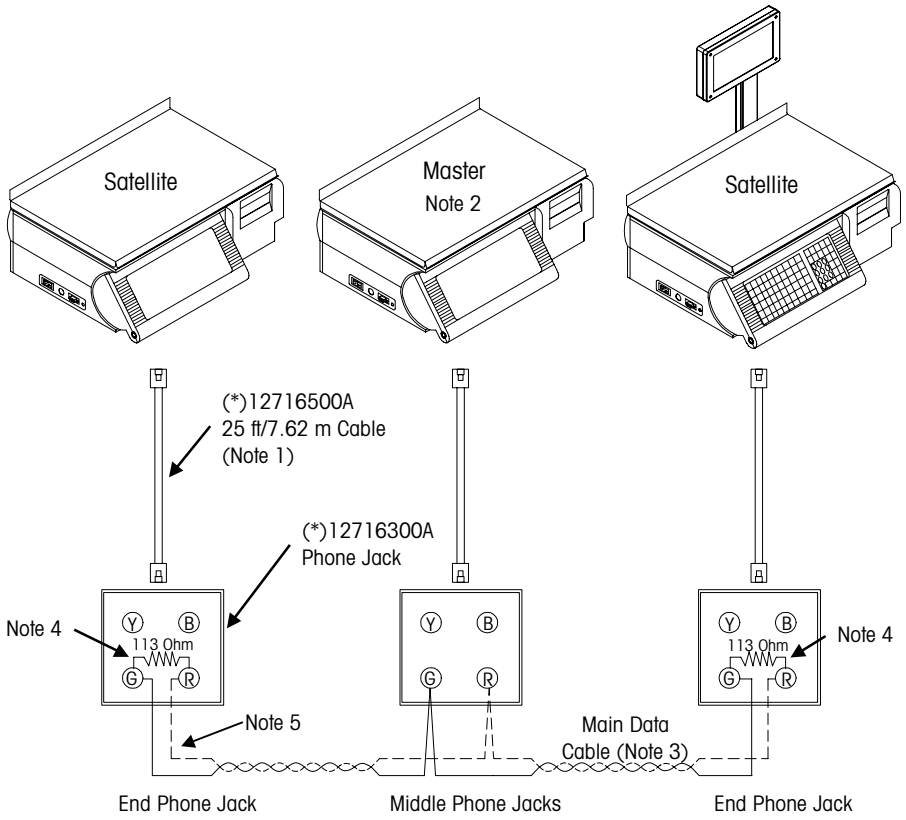
NOTE 2: The Master can be installed at any location on the network. In this example, the Master is installed near the middle of the main cable. When the cable length approaches near maximum, it is recommended the master be located near the middle of the network. Up to 24 satellites are supported.

NOTE 3: All phone jacks must be installed on the main data line which runs to each location. This main data line must not branch off into multiple sub-networks from one phone jack. The total cable length, including the 25 ft (7.62 m) scale communication cables must not exceed 1500 feet (457 meters). The cable must meet the local building code requirements and meet NFPA requirements.

NOTE 4: The 12839300A 113 ohm Terminating Resistor MUST BE INSTALLED BETWEEN THE GREEN AND RED TERMINALS OF THE PHONE JACK AT BOTH ENDS OF THE MAIN DATA CABLE. Trim any excess cable beyond the last connection.

NOTE 5: Use only one twisted pair to make the connections. Leave the other twisted pair for a spare. Do not use one wire from each twisted pair.

(*) = May have letter prefix.



TNET Wiring

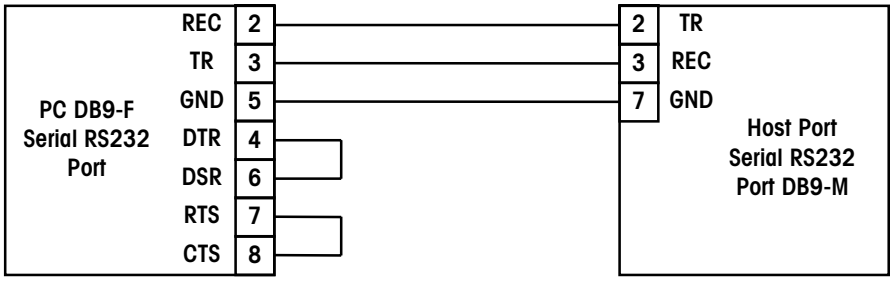
Connecting the Model 2450 to a PC

When connecting the Model 2450 to a host PC, two types of interfaces are available on the Master Host Port: RS232 and RS422. The interface is selected simply by connecting to the appropriate pins.

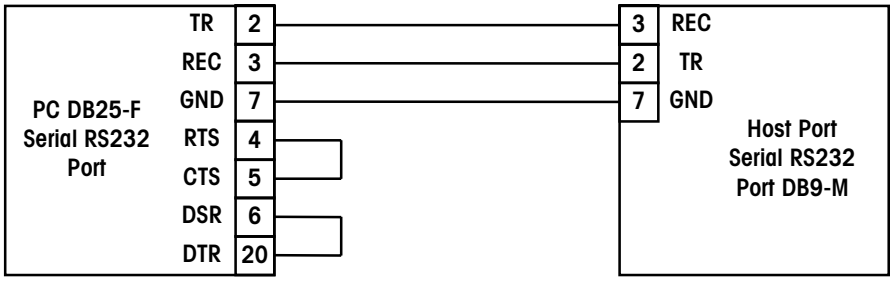
RS232 Interface

When using RS232, a single unit can be connected to a PC RS232 serial port for distances up to 100 feet (30 meters). The illustration below shows a typical RS232 connection to a PC serial-port.

0900-0285 (*13816200A) Cable, PC DB9 to Scale 10 ft/3 m
0900-0297 (*14102600A) Cable, PC DB9 to Scale 25 ft/7.62 m



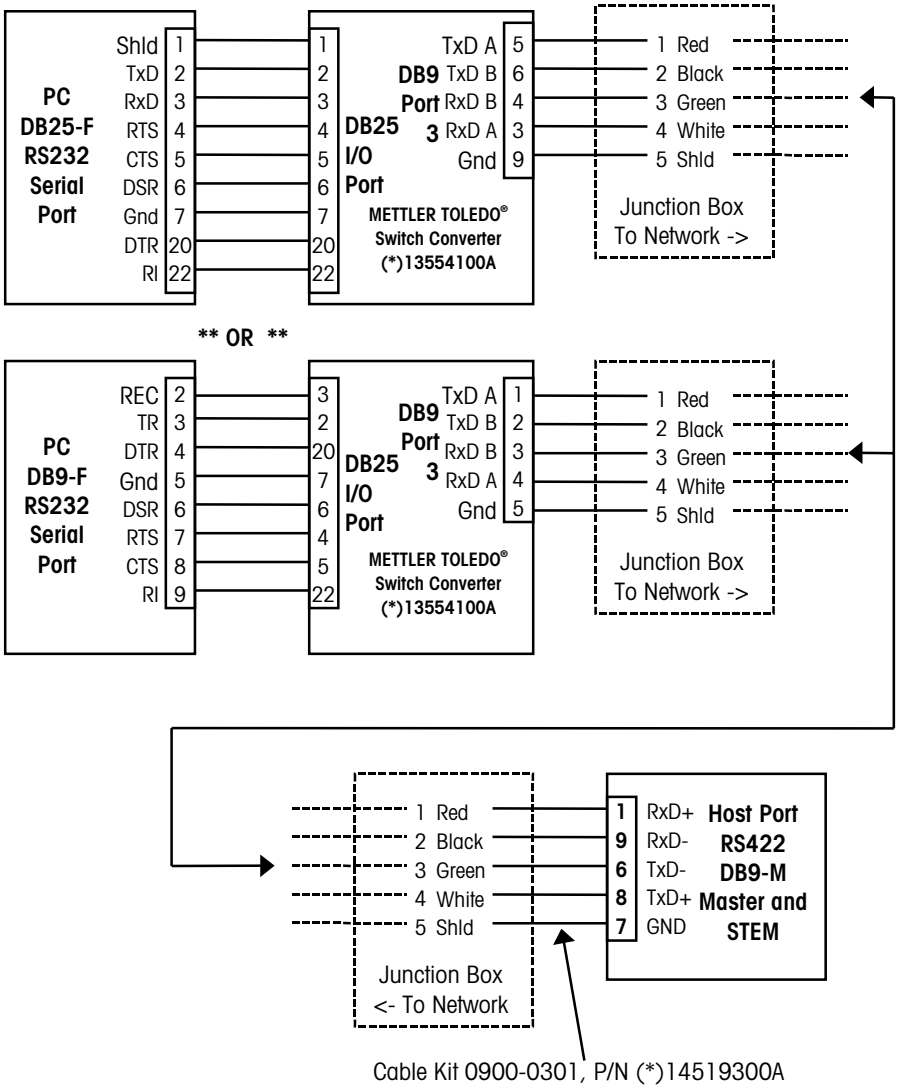
0900-0286 (*13816300A) Cable, PC DB25 to Scale 10 ft/3 m
0900-0298 (*14102800A) Cable, PC DB25 to Scale 25 ft/7.62 m



Model 2450 to PC RS232 Serial Port Wiring

RS422 Interface

When the cable length will exceed 100 feet, or if multi-drop capability is needed (for connecting more than one scale to the network), RS422 must be used. ***The maximum cable length for RS422 is 1200 feet (366 meters).*** A wiring diagram is shown in below using the METTLER TOLEDO® RS232 to RS422 Converter.



Model 8450 RS422 to METTLER TOLEDO® Converter Wiring

DataBack Backup & Restore

Setup data from the Model 355/2450/8450 Standalone and Satellite, and the Database of the Standalone, can be backed up or restored to a PC (Personal Computer) using the Mettler Toledo program DataBack (Version 4 or later). Setup data or database data from existing units can be restored to new scales, making setup very easy. Factory cables are available from Mettler Toledo using the part numbers shown in the earlier section titled "Connecting the Model 2450 to a PC".

Using DataBack 4 or Databack for Windows with the Model 355/2450/8450 Satellite or Standalone, four categories of unit setup data backup/restore can be performed:

ALL	Includes all data sets below.
LABELS	Includes custom label formats and programmable text.
STYLES	Includes the information for each of nine label sizes, such as: assigned formats, label width, label length, gap length, image offset, etc.
SCALE PRESETS	Includes the user defined preset keys.
MISCELLANEOUS	Includes Grade Table, Action Code Table, PLU Settings, TNET Protocol, Department ID and records, Marquee messages, Accumulator Setup, and other settings.

Using DataBack 4 with a Model 355/2450/8450 Standalone, five categories of standalone data backup/restore can be performed:

PLU	Includes the PLU data files for the selected dept.
EXTRA TEXT	Includes the Extra Text files.
NUTRITION FACTS	Includes the Nutrition Facts files.
GRAPHICS	Includes Graphics files.
DATABASE PARAMETERS	Includes Host Protocol, Department Table, Store Record, Grade Table, Message Table, Operator Totals Table, Operator Record Table, Printer Setup, Serial Device Setup, and other database functions.

To backup satellite/standalone data:

1. Connect the socket end of the data cable to the PC's serial port and the pins end (marked 8422 or Scale) to the AUX/HOST Port.
2. Start DataBack (refer to the DataBack Manual for operation of the Databack program.) The AUX port (Host) must be configured to match the Databack setup.
3. In DataBack, select Backup at the Main Menu, then **8450 Satellite** or **8450sa**. Next, select the data to backup. Make your selection, type in the file name and press ENTER.
4. Press any key to continue.

To restore data to the Model 355/2450/8450, select **Restore** from the DataBack menu, select scale type and file name, then follow the same steps.

Notes:

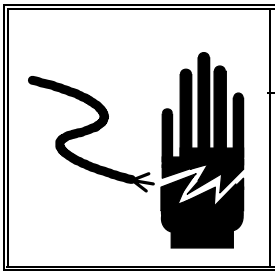
Model 8460 to Model 355/2450/8450 conversions:

Only the Model 8460 labels/cassettes data can be converted for Model 355/2450/8450 use. This must be run through a conversion program that generates the Model 355/2450/8450 "Labels" file. (Label2mm.exe).

Model 8360 custom label formats can be directly backed up and restored to a Model 355/2450/8450 "Labels" file without any conversions.

The Model 355/2450/8450 use the same Databack files.

Flashing Software



WARNING

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

Warning: Setup data is erased when the operating system is updated!

Note: Always reset to factory defaults after flashing the Satellite. Always **Clear All** in database functions and **Reset To Factory Defaults** in a Standalone. Always reset print head resistance (HEAD) and print speed/power (SPEED) after flashing.

The Model 355/2450/8450 Operating System Software is retained in Flash EPROM's on the Main Logic PCB. The EPROM's can be reprogrammed using a PC downloader program called FLASHPRO or Databack for Windows. Data cables are the same as used with DataBack. FLASHPRO uses special files that contain the operating system software. The software is distributed in a compressed format and may need to be uncompressed before using.

Software Diskette

The software is distributed on a diskette. The software is distributed in a compressed format and will need to be uncompressed before using the files. To uncompress the file to a subdirectory called C:\FLASH, type:

A:\filename C:\FLASH

(Note: Check the file name on the diskette. The uncompressed file will then be copied to your hard disk drive. FLASHPRO.EXE is also included on the diskette and should be copied to the same subdirectory or in a subdirectory in the PC's path (such as the DOS subdirectory).

Using FLASHPRO

Tip: Make a batch file that contains the command line with the file name typed into the command line. Name the batch file by the model of the unit you are flashing. Ex: 2450.bat.

Flashpro uses the COM1 RS232 Serial Port as a default. If COM2 is used, add **-COM2** on the command line. Typing *flashpro* alone displays a help screen. The FLASHPRO command line for a cable connected to the PC COM1 is as follows:

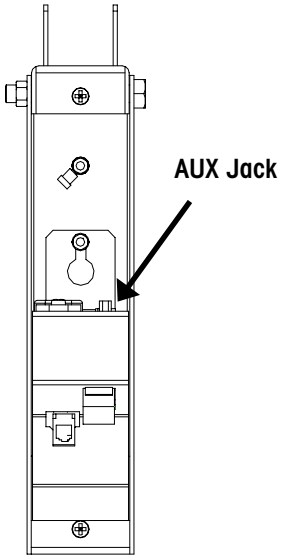
flashpro -t*filename.xxx*

The FLASHPRO command line for a cable connected to the PC COM2 is as follows:

flashpro -t*filename.xxx* **-COM2**

(Replace *filename.hex* with the actual file name on the distribution diskette. Example: FLASHPRO -t123456R.hex.) If you get a DOS Bad command or file name error, check to make sure you have not mis-typed the file name (ex: FLASHPRO), and the file FLASHPRO.EXE is in your PC's path or current directory. If you get a **Checksum Error**, you may be using the wrong file, or you are trying to use the compressed file. Make sure you uncompress the file before attempting to use it. It the error persists, the file may be corrupt.

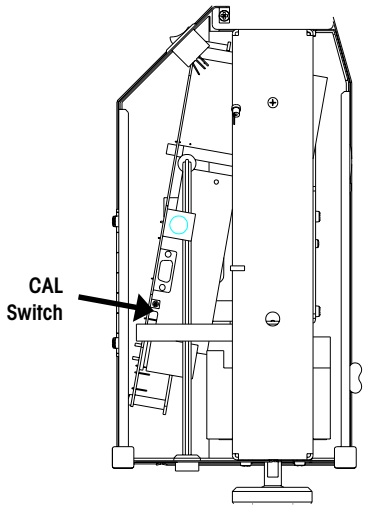
Flashing Software



AUX Port Jack

To flash software into the Model 2450 follow this procedure:

- Turn the Model 2450 power switch to off.
- Connect the cable end marked PC to the PC's serial port and the other end to the Model 2450 AUX Port in the mounting column (accessible after removing the connector cover), as shown in the illustration on the left.
- Remove the left side cover for access to the CAL switch. You may have to remove the Weights & Measures Calibration Seal in order to remove the cover (Refer to Chapter 2 Calibration Seal).



- Press and hold the *CAL* Switch while pressing the power switch to ON.
- Release the *Cal* switch when the lower display shows **Download Program**.
- Next, type in the command line on the PC and press ENTER.
- During normal downloading, FLASHPRO will display **A**'s during the download process, indicating *Acknowledgment*. If **N**'s are displayed on the PC, this indicates *NonAcknowledgment,* which is an error.
- When the download is complete, FLASHPRO will display the message File Transfer Successful.

Troubleshooting

If a **UART Error** is displayed on the PC, check that the cable is connected to COM1 or COM2 and matches the command line used. Make sure the correct cable is used.

If you see a lot of N's, try adding **-S2** at the end of the command line.

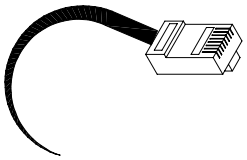
Ethernet Network Cabling Systems

An easy way to tell which type of Ethernet network is being used is by checking the connector to a network card. If it has a telephone-style plug, it is 10BaseT. The cable for 10BaseT looks the same as telephone cable. If the network has a D-shaped connector with many pins in it, it is 10Base5. A 10Base2 network has a connector similar to a cable TV coaxial connector, except it locks into place. The 10Base2 connector is always circular

METTLER TOLEDO® Ethernet cabling specifications follow established industry standards. Additional information on Ethernet networks can be found on the Internet, bookstores, or at most libraries.

Ethernet networks can use UTP (Unshielded Twisted Pair), coaxial, or fiber optic cabling. The IEEE (Institute of Electrical and Electronic Engineers) created Standard 802.3 that describes the operation of 10 Mbps networks. Different versions of Standard 802.3 exist depending on the type of cabling used. METTLER TOLEDO® Ethernet scales require a 10BASE-T connection.

METTLER TOLEDO® Ethernet Client Scales require UTP **10BASE-T** cables, **Category 5** (CAT 5) or higher, wired in a **Star topology**. Each node on the 10BASE-T network has its own cable that connects to a common hub. The cable from the node to the hub (segment) can be up to 100 meters (328 feet) in length. The hub serves as a central switching station that controls the incoming and outgoing signals. When using star topology if a station goes down it does not affect the rest of the network. Typically an RJ45 connector is connected to UTP cabling and is run straight from the hub to the device on the network.



RJ-45 Connector used on UTP 10BASE-T networks. METTLER TOLEDO® clients and the STEM use this connector.

RJ-45 Plug

The ***10*** is for 10 Megabits per second (Mbps) operation, ***Base*** is for baseband operation, and ***T*** is for the twisted pair cable used for the network. 10BASE-T uses unshielded twisted pair (UTP) cabling. METTLER TOLEDO® recommends using **Category 5** (sometimes referred to as CAT 5) or higher wiring for the scale systems. Each node on the network has its own cable that connects to a common hub. The cable from the node (Scale, PC, or other device) to the hub can be up to 100 meters (328 feet) in length.

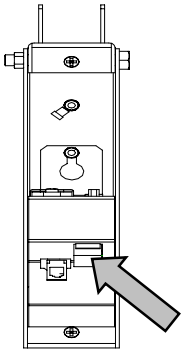
The following basic rules apply to a 10BASE-T network.

- Maximum length per 10BASE-T segment is 100 meters or 328 feet.
- Maximum of two devices per segment; one is the station and the other is the hub.
- Maximum of four hubs can be connected without using a bridge or switch. (Consult the hub vendor for their specific specifications.)
- Star topology.
- 10Base-T Hubs can connect to fiber optic 10BASE-FL or to 10BASE-2 or 10BASe-5 coax networks that can be used to extend the distance of the network. Special hubs will be needed for this application.
- UTP (Unshielded Twisted Pair) cable. Category 5 or higher is recommended.
- UTP cabling is not recommended for areas with high electromagnetic or radio frequency interference (EMI/RFI).

Scale Ethernet Connections

The Ethernet jacks on all METTLER TOLEDO® Clients use the standard Ethernet Wiring configuration as follows:

This wiring configuration allows the use of standard straight-through patch cables from a hub to the client. The Ethernet connection jack on the Model 2450 Client is located in the vertical support, as shown in Figure 5-9.



Model 2450 Column (Cover removed)

Ethernet RJ45
10 Base-T Connector

Pin 1 - TD+
Pin 2 - TD-
Pin 3 - RD+
Pin 6 - RD-

Ethernet Connector Location

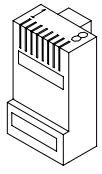
Patch Cables

10BASE-T Straight-Through Patch Cable

Patch cables connect devices to hubs. METTLER TOLEDO® Ethernet Clients require a CAT5 (Category 5) 10BASE-T UTP Straight-Through Patch Cable conforming to the EIA standard 568A or 568B. The only difference between 568A and 568B is the color code positions (green and orange wires are swapped). It is best not to mix 568A and 568B cables in a system to avoid confusion with the color codes (however, complete cables of both types will interchange). 10BASE-T segments are limited to 328 feet (100 m). The CAT5 Straight-Through Patch Cable has four pairs of wires connecting to the same pins on both ends of an RJ-45 connector. Pairs 2 and 3 are used for the 10BASE-T signals, as shown below.

Pin connections for 568A and 568B cables.

	Plug A	Color Code 568A	Color Code 568B	Plug B
Pair 3	1 - TD+	White/Green	White/Orange	1 - TD+
	2 - TD-	Green	Orange	2 - TD-
Pair 2	3 - RD+	White/Orange	White/Green	3 - RD+
Pair 1	4 - Not Used	Blue	Blue	4 - Not Used
	5 - Not Used	White/Blue	White/Blue	5 - Not Used
Pair 2	6 - RD-	Orange	Green	6 - RD-
Pair 4	7 - Not Used	White/Brown	White/Brown	7 - Not Used
	8 - Not Used	Brown	Brown	8 - Not Used



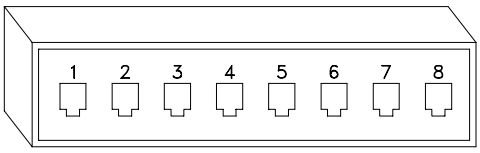
RJ-45 Plug

Straight Through 10BASE-T Patch Cable

Hubs

Ethernet is easily expandable with devices that provide multiple Ethernet ports. These devices are known as "hubs" since they provide the central portion, or hub, of a network system. Hubs can be connected to each other extending the network. Check with the Hub manufacturer or the documentation shipped with the hub to determine the maximum number of hubs that can be connected together. Depending on the manufacturer, up to four hubs can be connected. To further extend the size or distance of a network, a switch or repeater can also be purchased.

Hubs can be purchased with five, eight, and sixteen or more ports. Hubs can also be purchased that can connect a 10BASE-T network to other cable types, such as 10BASE2. A vendor, Network Administrator, or System Engineer should be consulted to determine the best configuration for your application.



Example 8-Port 10BASE-T Hub (RJ-45 Connectors)

TCP/IP

TCP/IP is used for communication on an Ethernet Network between a host and client, such as a PC or METTLER TOLEDO® Ethernet scale.

TCP/IP is software that provides a method for transferring data from one machine to another. **T**ransmission **C**ontrol **P**rotocol (the TCP part of TCP/IP) is a communications protocol that provides reliable data transfer. Data is transmitted by assembling the data into packets (smaller chunks of data). **I**nternet **P**rotocol (IP) is responsible for routing and moving the packets of data across networks. IP uses a set of unique addresses for every device on the network to determine routing and destinations. When packets are received, TCP reassembles the packets into the original data form.

Ethernet Scale Network

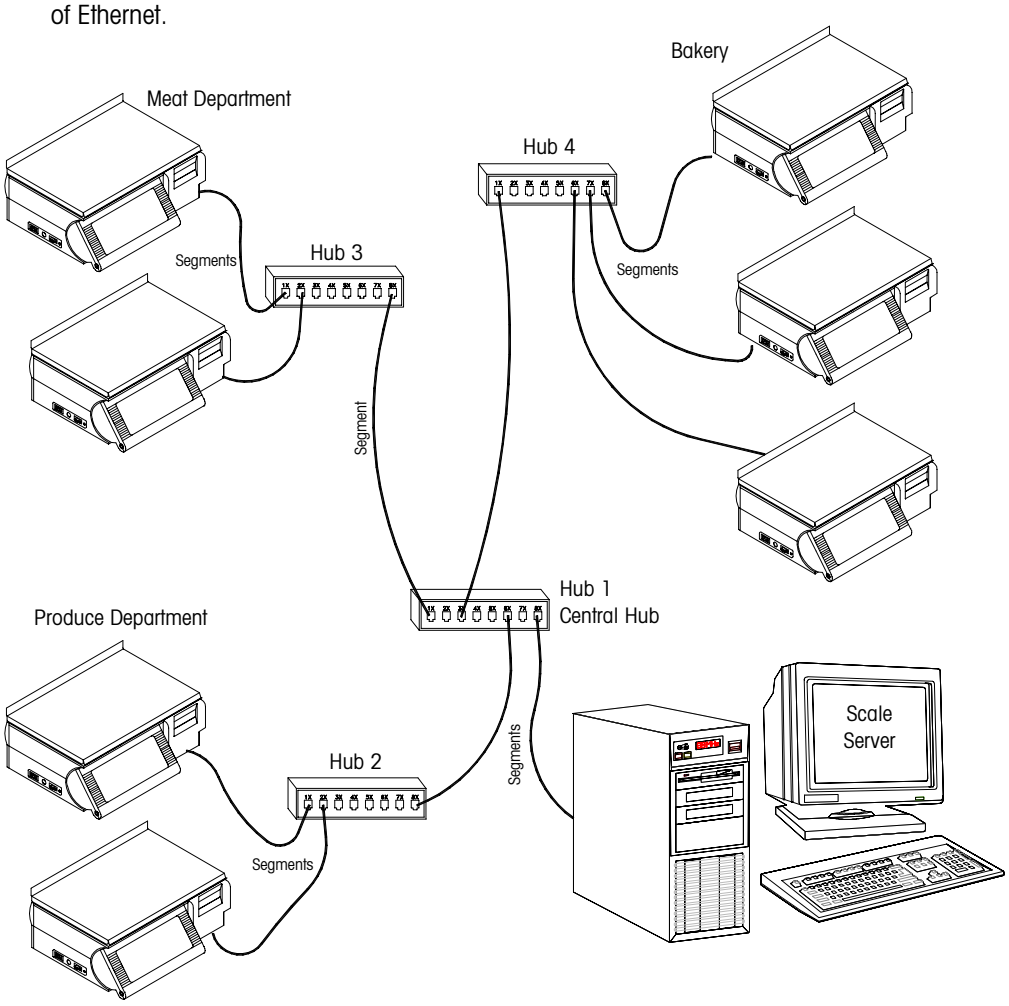
The illustration below shows an example Ethernet Scale Network using the PC Scale Server. A Network Administrator or System Engineer should be consulted prior to purchasing any equipment. Many other configurations are possible due to the flexibility of Ethernet.

10BASE-T Segments are limited to 328 ft (100 m). Cat-5 (Category 5) Cable is recommended.

Check with the Hub manufacturer or documentation to determine how many Hubs can be connected between devices. Normally, up to 4 Hubs can be connected together. When the maximum is reached, a switch must be used to extend the network.

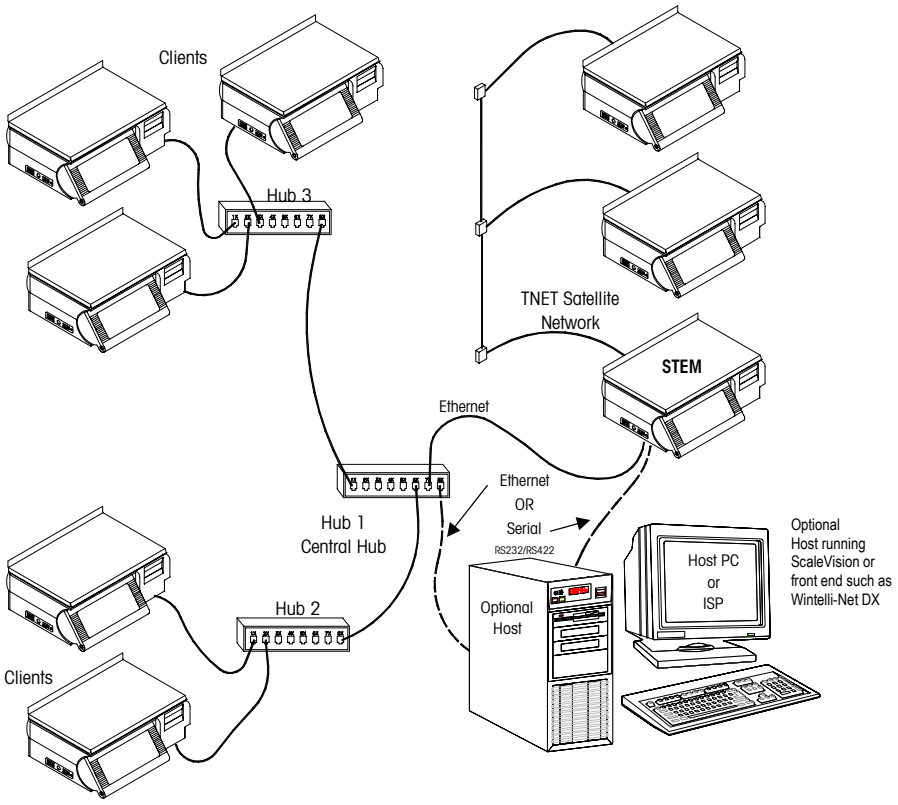
Some common hub manufacturers web pages are:

http://www.linksys.com
http://www.3com.com



Example Scale Network

The figure below shows an example network using the STEM (**Smart*Touch*®** Ethernet Master) as the Server. The STEM can support up to 25 Ethernet Client scales and 25 TNET Satellites simultaneously.



Example STEM Network, Ethernet and TNET

IP Address

Note: **Do not duplicate any ID/IP numbers on the network**. If the STEM will be supporting both TNET Satellites and Ethernet Clients, the following guidelines should be followed.

TNET Unit ID - 1 to 30

Ethernet Clients - xxx.xxx.xxx.031 to xxx.xxx.xxx.254

The Client's Unit ID and server IP are used to identify each of the devices on the network. The numbers must be unique on the network (no duplicates). If connected to the METTLER TOLEDO® STEM with TNET Satellites, no Client Unit ID's and TNET Satellite ID's can be duplicated. If the network is separate from any other networks, the IP address can be any address other than 0.0.0.0 and 255. 255. 255. 255. If the unit is installed on an existing network, the network manager should supply the IP address.

Local Networks

When connecting clients to a local Ethernet network (not on the Internet, etc.) using a Scale Server PC or STEM, arbitrary numbers can be selected for the IP Addresses. The IP Address consists of a group of four numbers from 0 to 255, separated by periods, for example: 207.142.140.101. Do not duplicate any numbers on the network. The Server IP is the IP Number assigned to the STEM or Scale Server PC.

Use on Networks Connected to the Internet

If the network connects to the Internet, network IP addresses must be obtained and registered with American Registry for Internet Numbers (ARIN) (http://www.arin.net). The IP Address is used to specify hosts and networks. IP (Internet Protocol) addresses are part of a global, standardized scheme to identify devices connecting to the Internet. A Network Administrator or System Engineer should be consulted on these issues.

A gateway and submask number can also be used if the units are on different networks, but connected to a WAN or to the Internet.

Subnet Mask

A Subnet Mask is used with an IP address to subdivide a network into smaller networks, allowing a greater number of nodes on a network with a single IP address. The Subnet Mask is the part of the IP address used to represent a subnetwork within a logical network. By using Subnet Masks, network address space is available that would normally be unavailable. Subnet Masks also ensure broadcasts are not sent to the whole network unless intended.

The default Subnet Mask, 255.255.255.0, is recommended to reduce network traffic. When Subnet Mask, 255.255.255.0 is used, the broadcast range would be the local subnet only as follows:

255.255.255.0 Subnet Mask
207.142.140.XXX IP Address with a broadcast range of XXX.

255.255.0.0 Subnet Mask
207.142.XXX.XXX IP Address with a broadcast range of XXX.XXX

Using the Subnet Mask, 255.255.255.0, improves network performance by reducing broadcast traffic.

Default Gateway (or Default Router)

If the server (Scale Server or STEM) is on a different network (see Subnet Mask), the client will access the server by routing the request to the Default Gateway IP Address. The Gateway will route the request to other devices on the network to deliver the request to the server. The requested data from the server will then be routed through the Gateway to the requesting client. The Gateway must be on the same local network as the client.

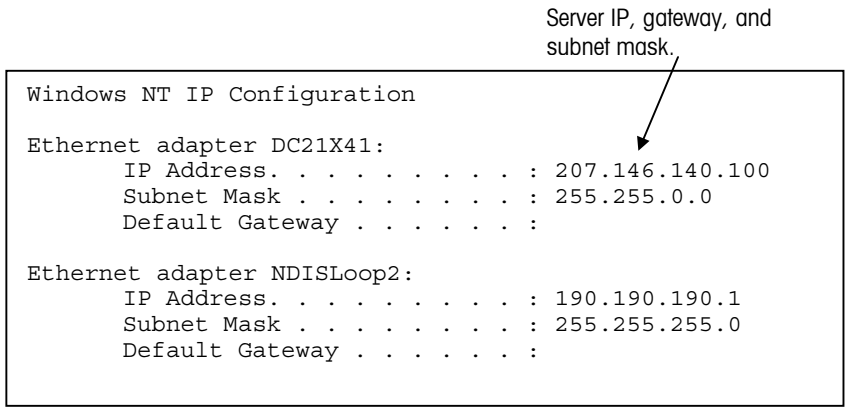
Server IP Address using Scale Server

If METTLER TOLEDO® Scale Server software is in use, this section describes the procedure for obtaining and setting the server IP.

Determining the Server IP Address using a Scale Server

To display the Server IP at the Server or Workstation, click START, PROGRAMS, COMMAND PROMPT. At the DOS prompt, type **IPCONFIG** and press ENTER.

The IP Address will be displayed as follows:



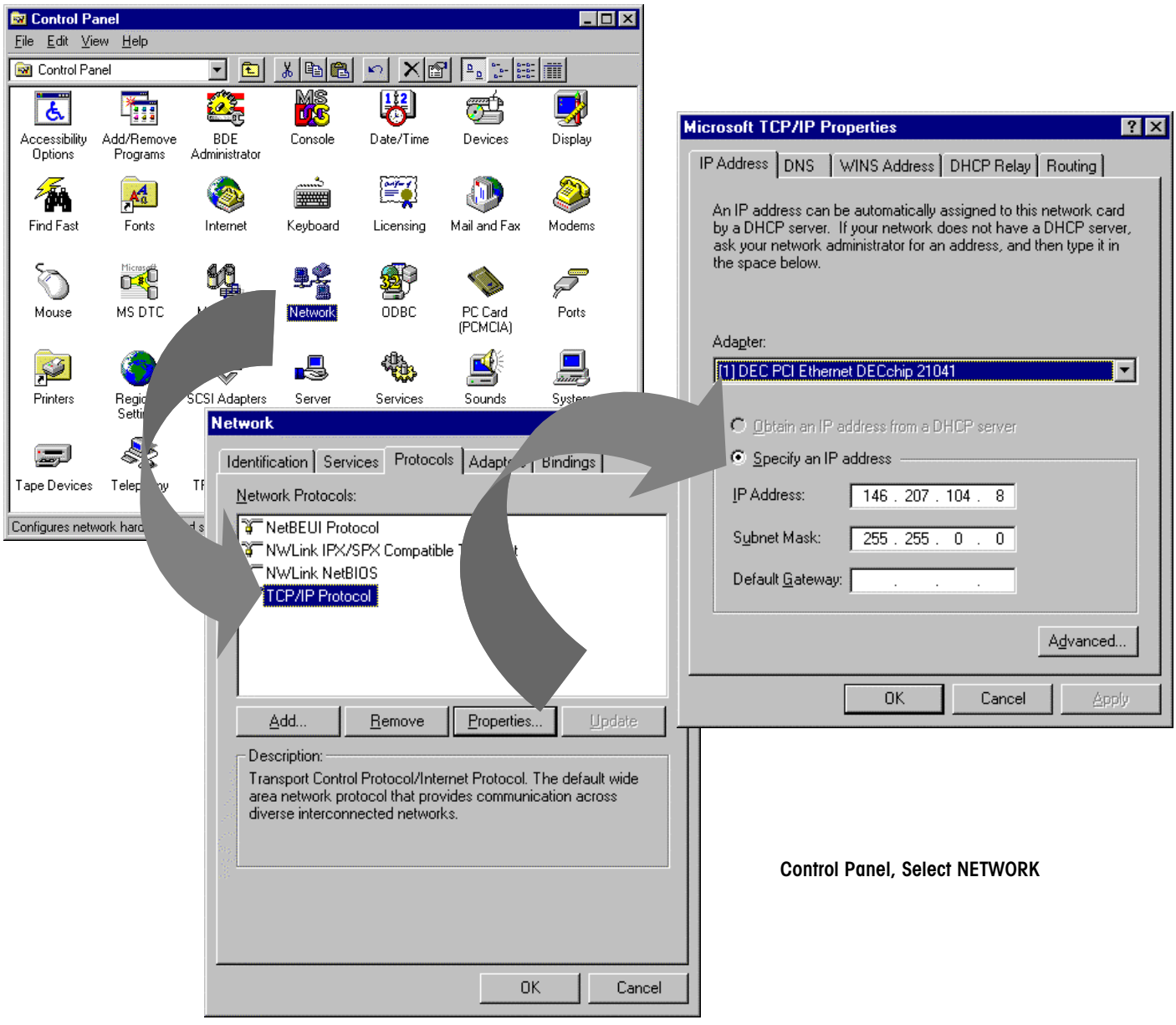
IP Address Display

If the Server IP Address has not yet been configured, refer to the following section, "Entering the Server IP Address".

Entering the Server IP Address on a Scale Server

If the Server IP Address has not been configured on the NT Server or Workstation running METTLER TOLEDO® Scale Server Software, open Control Panel (click START, SETTINGS, CONTROL PANEL). Next, double click on NETWORK.

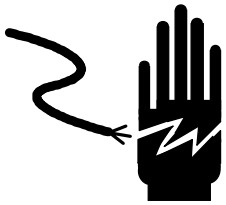
The window for Network setup will display (below right). Click on TCP/IP Protocol, then click PROPERTIES. The window for "Microsoft TCP/IP Properties" will open (below right). Click on the IP Address tab if it is not displayed on top. Click on **Specify an IP address**, then enter the IP Address. Enter the Default Gateway and Submask numbers if required. When done, click **OK**.



Control Panel, Select NETWORK

5 Troubleshooting

Troubleshooting Guide



⚠ WARNING

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

Following is a list of symptoms that could occur, and the recommended action to correct the problem.

General Scale Symptoms

Symptom	Solution
Scale Inoperative/Blank Displays	• Check AC power at outlet. • Check Voltage Test Points on Main Logic PCB. If voltages are zero, check Power Supply. • If test point voltage is good, replace Main Logic PCB. • Check Display Cable at base of scale and in Display Tower. Check Display PCB.
Keyboard Inoperative	• Check Keyboard connection on Main Logic PCB. • Replace Keyboard.
Scale Won't Zero (Displays "------" In Weight Field)	• Check platter and spider for obstructions. Turn power off, then back on. • Check Motion Readings Setting in Calibration Menu. Zero setting will cause this symptom. • Re-calibrate. • Check Load Cell power supply voltage. • Replace Load Cell.
Unable To Calibrate/Won't Recognize Load Cell	• Initialize RAM. • To initialize, press the SETUP MODE key, then press the CAL Switch (in the access hole next to the AUX/HOST Port Connector). The display will show [Sure?? No]. Press the DOWN/UP keys to toggle to Yes. Press ENTER when Yes is displayed to continue. Cycle power on/off when done. Reset printer Speed/Power and Load Cell settings. • If problem persists, replace load cell.
SATELLITE OFF-LINE WITH MASTER	• Are other satellites On-Line? If not, check master. • Check Satellite ID Number. Must be between 1 and 25. • Check for duplicate Scale ID on another satellite. • Check TNET wiring. Disconnect all satellites from main cable. At one end, remove the terminating resistor from

Symptom	Solution
	phone jack and check wiring with meter. There should be from 113 to 180 ohms between the red and green terminals of phone jack. If zero ohms, a wire is shorted. If excessively high, check for bad connections. • Reconnect one satellite. If On-Line, connect another satellite and observe On-Line status. If one unit takes the others Off-Line, check that unit. • Check 25-ft communication cable between scale and phone jack. • Check 8450 Main Logic PCB.
All SATELLITES OFF-LINE WITH MASTER	• Disconnect satellites from Master. Does master come back On-Line? If so check TNET wiring. Disconnect all satellites from main cable. At one end, remove the terminating resistor from phone jack and check wiring with meter. There should be from 113 to 180 ohms between the red and green terminals of phone jack. If zero ohms, a wire is shorted. If excessively high, check for bad connections. NOTE: Each terminating resistor must read approximately 113 ohms. • Check the master.
Client Off-Line With PC Server	• Are other clients on-line? If not, check PC. • Check for duplicate IP on another client. • Check wiring. Check for continuity and other problems with Ethernet Cable Tester. Check polarity of cables. • Check hubs, any RF nodes especially if all scales are served by one hub are off line. • Check 25-ft communication cable between scale and hub or RF node. • Check Model 8450 Main PCB.
Losing Setup Data	• Check Main Logic voltage at test points. • Check External Battery Voltage. Replace battery if necessary. • Replace Main Logic PCB.

Ethernet Networking

Ethernet Networks	Solution
One or more Clients offline.	1. Are other clients online? 2. Is the hub link light on? Check the hub and any RF nodes especially if all scales served by one hub off line. Refer to Chapter 4 "Networking the Model 8461 Client" and Chapter 6 "Ethernet Network Troubleshooting". 3. Check polarity of patch cable. The patch cable from Hub to Client or RF node must be a straight through UTP patch cable. 4. Check for duplicate IP on another client. 5. Verify the IP address of the NT Server or Workstation match the Server IP in the client. 6. Check Model 8461 Ethernet PCB.

Ethernet Networks	Solution
All Clients offline.	1. If the NT PC is on a network with other PCs, PING another PC on the network (refer to "Ethernet Network Troubleshooting"). Observe the LEDs on the NIC (Network Interface Card). When a ping is started, the activity, transmit and receive LEDs should be active when the PC and NIC are working properly. If the transmit LED does not light, troubleshoot the PC and NIC. 2. Attempt to ping the NT PC from another PC on the network. 3. Check the NT Server or workstation. Shut Down the NT PC, turn power off, then reapply power. 4. Recycle power to the hub. 5. If communication cannot be established with any other device on the network, replace the Ethernet Card (NIC) in the PC.
Hub link light blinking or off. **(Hub to Node)**	1. Is the Patch Cable connected at the hub and node (client for RF node)? 2. Check power to the client or RF node. 3. Remove power to client or RF node for 30 seconds, then reconnect power. 4. Is the correct patch cable used? The cable must be straight through from hub to node. 5. Check power to hub and to client or RF node. 6. Plug the patch cord into a different port. If the link is good on another port, the hub may be damaged. 7. If the problem persists, plug another known working node (client or RF node) into the suspect port. If this works, check the client or RF node. Areas to check include the Ethernet jack and internal cable to the Ethernet PCB; the Ethernet PCB, and the Main PCB.
Hub link light is blinking or off. **(Hub to Hub)**	1. Is the Patch Cable connected at both hubs? 2. Verify the correct patch cable is used. Hubs with an internal crossover (crossover ports are sometimes marked with an X), an uplink port, or a switchable port use a straight through patch. Hubs without any crossover capability use a crossover patch cable. 3. Remove power to both hubs for 30 seconds, then reconnect power. 4. Replace the hub(s).
Hub Partition light is on.	1. This indicates a problem with the node or wiring between the port and the node. 2. Remove power to the hub and node for 30 seconds, then reconnect power. 3. Plug the node into a different port. 4. Replace the patch cable. 5. Verify cable is not running close to a high EMI source (electrical magnetic interference). 6. Troubleshoot the client or node.

Ethernet Networks	Solution
Hub Collision light is on.	1. Indicates two or more nodes are attempting to transmit at the same time causing a "collision". 2. Some collision is normal and the light may turn on briefly from time to time. If the light stays on first check the patch cables from the hub to the nodes. Use of a crossover instead of straight through patch cable can cause this condition. 3. Remove power to all of the clients and RF nodes for 30 seconds, then reconnect power to each client and node one at a time to isolate which client or RF node is causing this condition. 4. If the Collision light stays on when a particular client or RF node is powered up, troubleshoot that unit. For the RF node, replace the unit. Areas to check in the client include the Ethernet jack and internal cable to the Ethernet PCB; the Ethernet PCB, and the Main PCB.

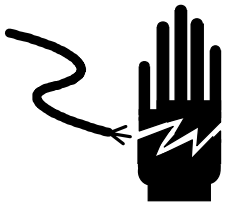
Printing Problems

Printing Problems	Solution
Printer won't deliver a label.	1. Check Take Label cursor on display. If the cursor is ON: -Check Label Taken Sensor for obstructions. -Clean Label Taken Sensor lens on transmitter and receiver. -Test Label Taken Sensor. 2. Check harnesses from printer to Main PCB. 3. Check Label Stepper Motor, Pulley, and Belt. 4. Replace Main PCB.
Incorrectly indexes labels.	1. Check label installation. Verify that the label guides are set to correct width. 2. Check for a label stuck in Gap Sensor. 3. Check label format and label size. 4. Clean Gap Sensor lens. 5. Check and clean platen roller, stripper bar, and delivery path Using MT Cleaning Pen P/N 082287020. 6. Adjust Offset Length. 7. Replace Gap Sensor. 8. Replace Main PCB.
Labels dark or missing dots.	1. If labels are printed correctly, but are excessively dark, check the Label Printer Print Speed/Density setting in Unit Setup, under Printer Setup. 2. If the labels are streaked by lines from top to bottom, replace the Printhead. 3. If characters are cut off, check label format programming, including Offset Length. If OK, replace Printhead.

Printing Problems	Solution
Labels are excessively light or dark.	1. Check Print Speed and Density Setting in Unit Setup, under Printer Setup. 2. Check with other known good label stock. 3. If light print, check and clean printhead resistor line and platen. 4. Check printhead harness for loose wires. 5. Check Main PCB voltages. If OK, replace Printhead.
Print on the label is mottled with light spots.	1. Check with other known good label stock. 2. Check and clean printhead resistor line and platen. 3. Replace printhead.
Labels not stripping correctly.	1. Check with other known good label stock. 2. Check label format programming and Eject length. 3. Check stripper bar for wear. 4. Check Take Up roller/motor. 5. Check set screws on Take Up Motor Gear.
Labels printed even if one is not yet taken.	1. Check setting of stripped/un-stripped option in Printer Setup. 2. Check Label Taken Sensor. 3. Check Main PCB.
Out of Labels errors.	1. Make sure labels are correctly threaded through the Gap Sensor. 2. Clean/Check Gap Sensor. 3. Adjust Image offset. 4. Replace Gap Sensor. 5. Replace Main PCB.

Power Supply

Testing the Power Supply



WARNING

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First, check the AC input power from the AC outlet. If the input AC voltage is between 85 VAC to 264 VAC (continuous steady voltage), proceed with the following voltage tests.

Set your Volt-Ohm Meter to read DC volts. Set the Power Switch to the OFF position. Remove the side cover. Place the power switch to ON, then check the +21 VDC output voltage from the Power Supply terminal strip, as shown below. The acceptable output range is +21VDC ± 0.50 VDC.

If the voltage is high or low, adjust potentiometer P1 for the +21 VDC output. If the output voltage cannot be adjusted to within tolerance with P1, or if the output voltage is zero volts, replace the Power Supply.

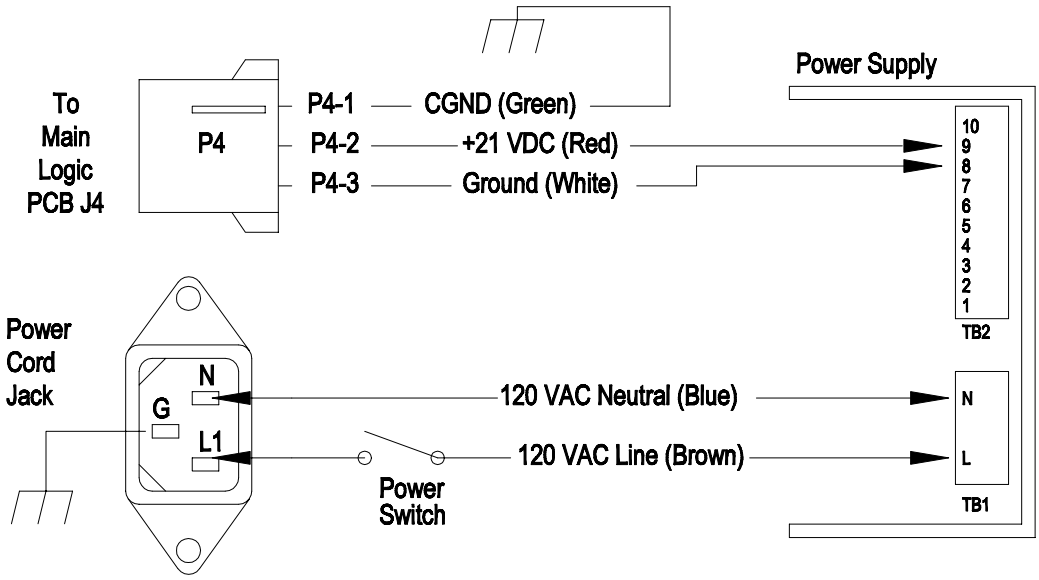
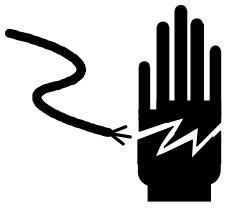


Figure 5-1: Model 2450 Power Supply Test Points

Main Logic PCB



WARNING

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CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

The Main Logic PCB receives +21VDC from the Power Supply and uses this voltage to supply +21VDC and +5VDC to other components. The Main Logic PCB controls all functions in the unit including the thermal printer. Inputs and outputs to the Main Logic include the Take Label Sensor, Gap Sensor, Printhead, Label Stepper Motor, Take Up Motor, and Load Cell. The SuperCap and external battery attached to J3 are used to backup setup data and the standalone database in the event AC power is lost. Figure 5-2 shows the locations of the voltage test points on the Main Logic PCB. Figure 5-3 shows the locations of the connectors on the Main Logic PCB.

The voltage test points on the Main Logic are accessible after removing the side cover. If the voltages are not within the range specified in Figure 5-2, and the Power Supply voltage is correct, replace the Main Logic PCB. **Note: When replacing the Main Logic PCB, the unit must be flashed with software.**

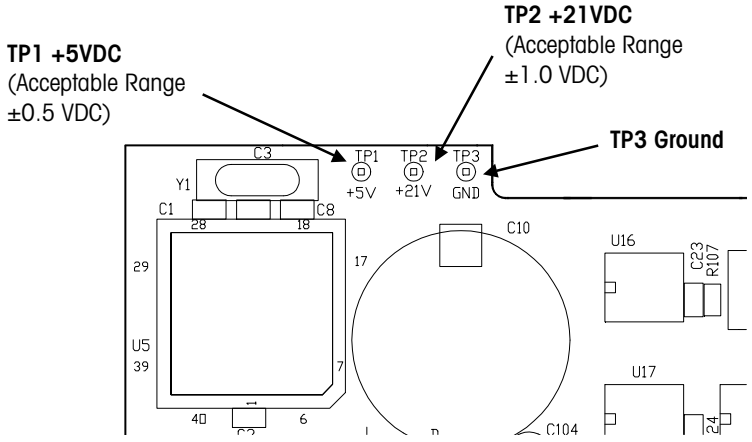


Figure 5-2: Main Logic PCB Voltage Test Points

Main Logic PCB Component Map

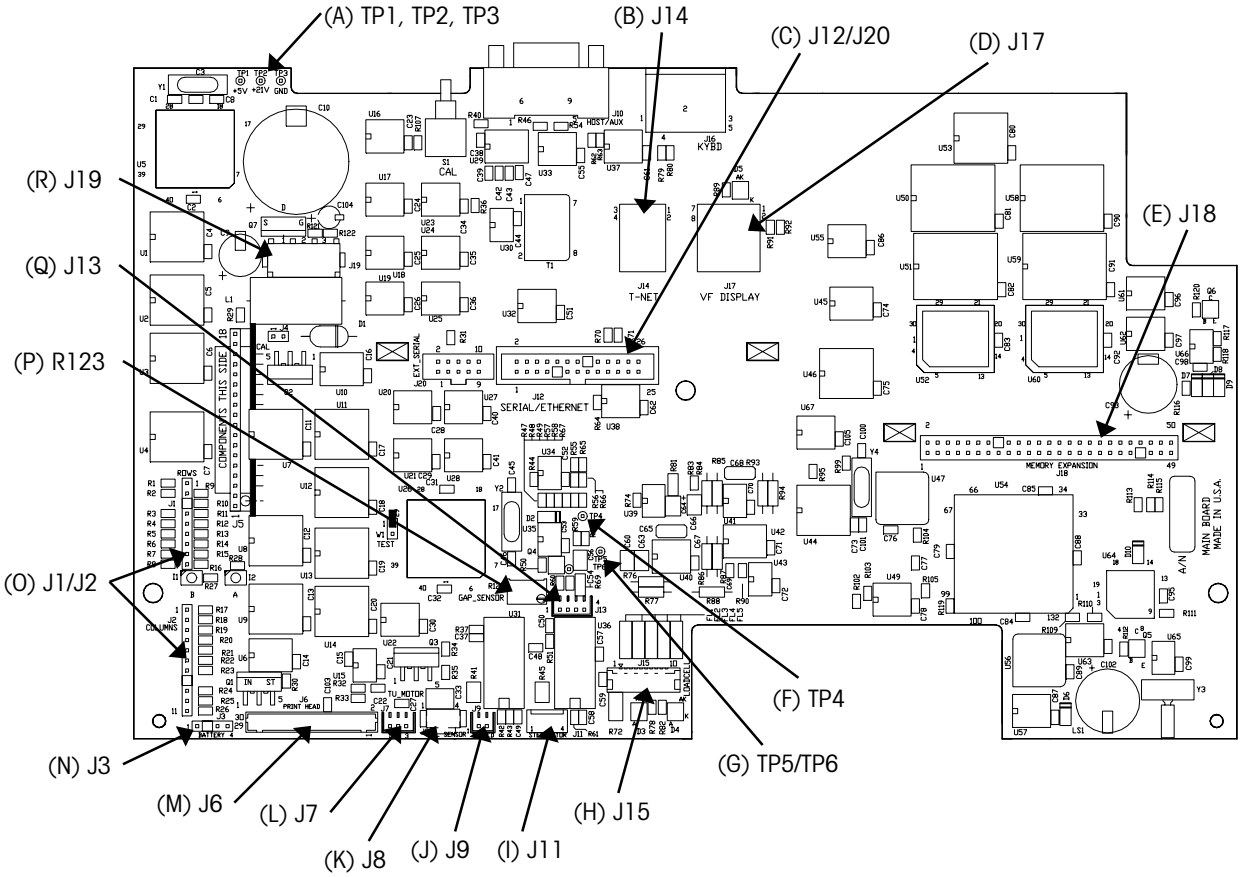
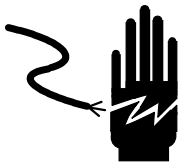


Figure 5-3: Main Logic PCB (15138700A) Component Map

Ref	Description
A	Voltage Test Points TP1 (5VDC), TP2 (21VDC), TP3 (GND)
B	TNET Jack
C	Serial I/O PCB or Ethernet PCB Connector J12/J20
D	Display Jack J17
E	Memory Expand J18
F	Test Point TP4
G	Test Point TP5/TP6
H	Load Cell Connector J15
I	Label Stepper Motor Connector J11
J	Take Label LED Connector J9
K	Take Label Sensor Connector J8
L	Liner Takeup Motor Connector J7
M	Printhead Connector J6
N	Battery Connector J3
O	Keyboard Connector J1/J2
P	Gap Sensor Pot R123
Q	Gap Sensor Connector J13
R	+21VDC Supply from Power Supply Connector J19

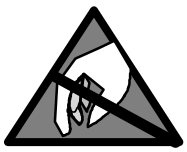
Label Stepper Motor

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



⚠ WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



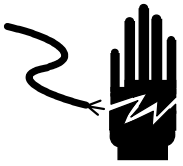
⚠ CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

The Label Stepper Motor can be tested with a volt-ohm meter by disconnecting it from the Main Logic PCB at connector J11 (Figure 5-3). Set the volt-ohm meter to read ohms. Connect the volt-ohm meter between pins 1 and 2. You should read between 2.1 ohms and 3.5 ohms. Next, connect the volt-ohm meter between pins 3 and 4. You should read between 2.1 ohms and 3.5 ohms. If the motor checks good and does not appear to have a mechanical bind, replace the Main Logic PCB.

Take Up Motor

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



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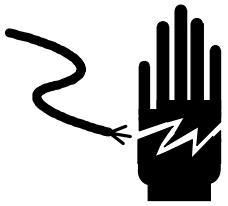
⚠ CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

NOTE: The Take Up Motor does not run when the strip function is set to unstripped.

The Liner Take Up Motor can be tested with a volt-ohm meter by disconnecting the motor from the Main Logic PCB at connector J7 (Figure 5-3). Set the volt-ohm meter to read ohms. Connect the volt-ohm meter across pins 2 and 3. You should read approximately 48 ohms. If the motor checks good and does not appear to have a mechanical bind, replace the Main Logic PCB.

Take Label Sensor



WARNING

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

Tip: The Take Label Sensor can be temporarily by-passed by disconnecting the harness at J8 and shorting J8 pin 2 to J8 pin 3. You can also disable the Take Label sensor by setting delivery to unstripped mode as a temporary fix.

The Take Label Sensor detects the presence of a label in the printer to prevent multiple labels printing at once in prepack mode, batch mode, or demand mode when the labels are being stripped. The sensor locations are shown in Figure 5-4. The Take Label Sensor can be tested with a volt-ohm meter as follows:

Clean the Take Label Sensor Lens

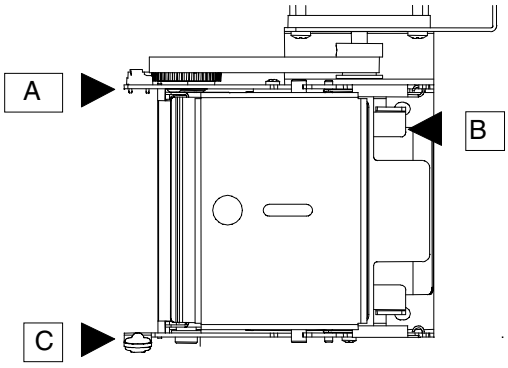
Before proceeding, set the power switch to off. Clean the sensor lens with a soft brush or cloth. Always make sure the sensor lens is clean before troubleshooting Take Label Sensor problems.

The following voltage test is performed with the power ON.

Set the volt-ohm meter to read DC volts. Place your positive meter lead on J8 pin 3 and the negative meter lead on J8 pin 2 (or chassis ground) on the Main Logic PCB (refer to Figure 7-3 for location). You should read +5 VDC when the take label sensor is blocked and near 0 VDC when it is not blocked.

The following test is performed with the power OFF.

Before proceeding, set the power switch to off. If the Take Label Sensor fails the preceding voltage test, check the Take Label Transmitter by disconnecting the harness at J9. Set the volt-ohm meter to read ohms. Place the volt-ohm meter negative lead on the harness removed from J9 pin 1 and the positive meter lead on pin 2. You should read some resistance. Reverse the meter leads. You should then read an "open". If the transmitter fails this test replace the Transmitter. If it passes this test, replace the Take Label Sensor Receiver.

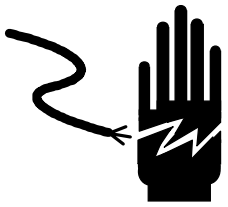


A = Take Label Sensor Receiver.
B = Gap Sensor
C = Take Label Sensor Emitter.

Figure 5-4: Take Label Sensor and Gap Sensor Locations

Label Gap Sensor

The Gap Sensor voltage should be checked and adjusted anytime the sensor or the Main Logic PCB is replaced or when experiencing indexing problems. Before making any adjustments, first clean the Gap Sensor lens to see if this solves the problem. If not, perform the following electrical adjustment procedures.



⚠ WARNING

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Mode 1

Automatic level adjusted. (Default Factory Setting)

The following Ohms test is performed with the power <u>OFF</u>.

NOTE: Readings can be taken with or without labels or liner present in the Gap Sensor.

Turn the power switch to off. Set the volt-ohm meter to read ohms. Place the positive meter lead on TP4 and negative meter lead on ground or TP5. Adjust potentiometer R123 so the meter reads 60K ohms (±5K ohms).

The following Voltage test is performed with the power <u>ON</u>.

Set the volt-ohm meter to read DC volts. With the power ON, the output voltage measured across TP4 and TP5 should be 1.9 VDC (±0.2 VDC).

Mode 2

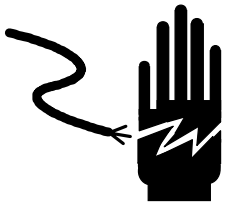
Fixed Level Output. (Should be used with black preprinted labels that pass through the sensor.)

The following Voltage test is performed with the power <u>ON</u>.

Set the volt-ohm meter to read DC volts. If the Mode 1 tests are within specification, and you are still experiencing problems, <u>place the white area of label stock and liner within the Gap Sensor</u> and adjust potentiometer R123 for an output voltage of +1.3VDC (±0.2 VDC) measured across TP4 and TP5.

If the above adjustments do not correct an indexing problem, replace the Label Gap Sensor and retest the unit. If the Label Gap Sensor has already been replaced and tests good, replace the Main Logic PCB.

Load Cell



WARNING

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

The Load Cell can be tested for correct analog voltage input and millivolt output by measuring the voltage at connector J15 on the Main Logic PCB. (Refer to Figure 7-3.) To check the input voltage across +EXC & -EXC, set the volt-ohm meter to read DC volts and put the positive lead on J15-6 and the negative lead on J15-9. You should read a steady +5.0VDC (±0.2 VDC).

If the Excitation voltage is good, the signal output can be checked across +SIG & -SIG. Set the meter to read in millivolts (mV). Put the positive lead on J15-10 and the negative lead on J15-8. With no weight on the platter, you should read near zero volts. As you add weight to the platter, the voltage should rise and be linear if equal weight is added each time. For example, adding one pound each time should increment the voltage approximately 0.02 each time. If the output is linear and correct, but no weight is displayed, replace the Main Logic PCB. If there is no output from the load cell, but correct input voltage, replace the load cell.

Display PCB

The Display PCB voltage can be tested with a volt-ohm meter at the display as shown in Figure 5-5. If the correct voltage is present at connector J1, but the display is blank, replace the Display PCB.

WARNING

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

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

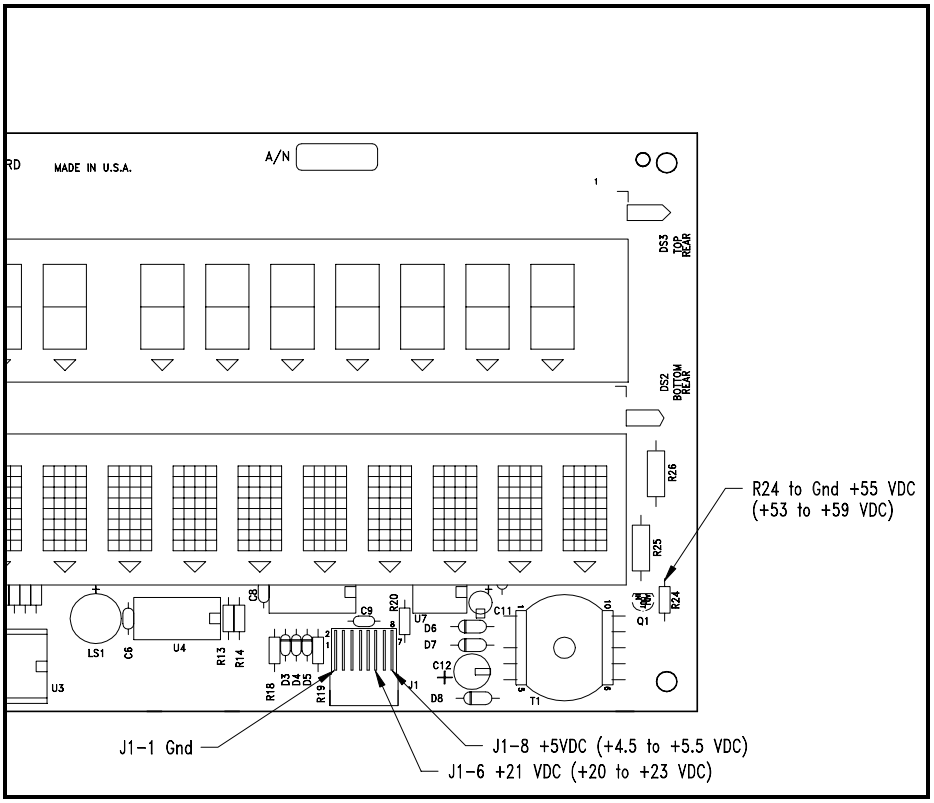


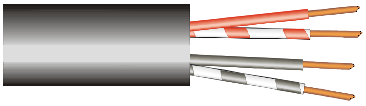
Figure 5-5: Display PCB Voltage Test Points

Testing the M/S TNET Network Wiring

When troubleshooting M/S (Master/Satellite) network online/offline symptoms, the M/S TNET (Toledo NETwork) wiring should be tested as shown in the following Test 1, Test 2, and Test 3. All scales must be disconnected from the phone jacks before making the tests. (Note: verify the cable is unshielded phone cable (UTP Category 2 or higher) as specified in Chapter 4.

Always verify the correct wire is used and that the network is wired correctly. Refer to the TNET hardware specifications in Chapter 4.

(*)=May have letter prefix.

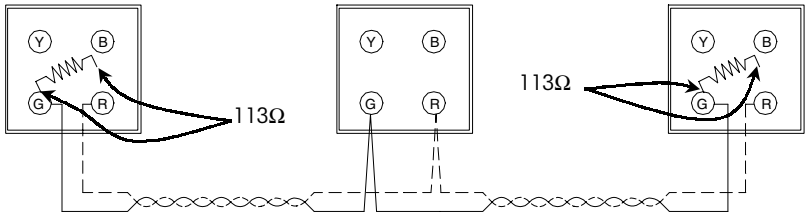


Two-Pair UTP (Unshielded Twisted Pair) Category 2 (or higher), 22-24 Gauge Cable is required for the master/satellite network.

Only one pair is used. The other pair is a spare. Do not use one wire from each pair.

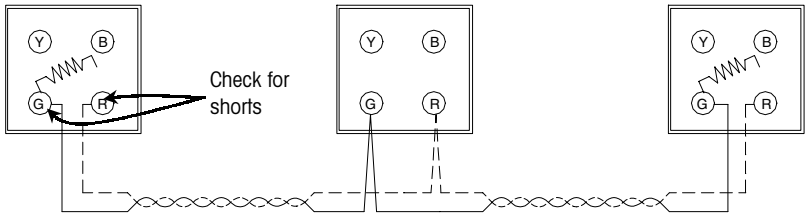
Test 1

Remove both (*)12839300A terminating resistors from one terminal in the end phone jacks. Check both terminating resistors with a meter. Each resistor must read 113 ohms (±2 ohms). If not replace the resistor.



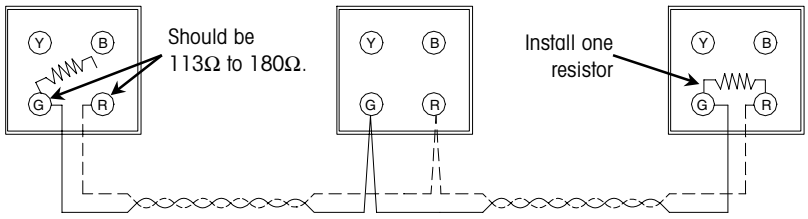
Test 2

Disconnect all scales from the network. While the resistors are off, check across the *Red* and *Green* terminals for shorts. If there is continuity or low resistance between the red and green terminals, there is a short. Isolate the short by disconnecting and testing sections of wire between phone jacks.



Test 3

With all scales disconnected from the network, install one resistor. Check the resistance between the *Red* and *Green* terminals at the end where the resistor is off. You should read between 113 and 180 ohms (depending on the cable length). Zero indicates a short in the cable or resistor. Very high or infinity resistance indicates a defective resistor or break in the cable.



Completion

Reconnect the scales to the network. Before connecting each scale, check the AC outlet with a GOT (Grounded Outlet Tester) to find any faults such as reverse polarity and bad grounds. Report any faulty outlets to the appropriate personnel for repair.

RS422 Network Troubleshooting

This section outlines troubleshooting procedures that can be used to isolate communication problems on an RS422 network. Before performing these tests, you should verify the problem is not due to a duplicate or incorrect scale address, incorrect host port setup in the scale, incorrect COM Port setup in the PC, bad connection, incorrect wiring, etc. The Host Port Test can be used on scales where the host port may have been marginally damaged due to disruptive events on the network wires. The Communication Cable Test can be used to verify the integrity of the wiring.

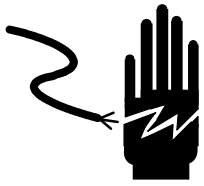
Verify Setup

Verify host port settings in the scale and the serial port setup in the PC. The configuration must match the configuration in the PC software program. For example, Intelli-Net uses 7-bit, Even Parity, and one stop bit. This should match the setup in the master. Continue with the next section when the setup has been verified.

Disconnect Power and Network Cables

Disconnect AC power to the scale when performing these tests. The Host Port Test and the Communication Cable Test are both performed with power off.

Disconnect the network cable (including any protection devices, converter boxes, etc.) at the AUX/Host port of the scale.



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

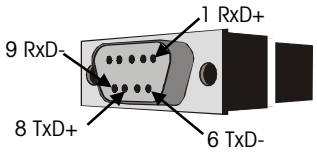
Host Port Test

Disconnect power to all of the scales before performing this test procedure.

This test helps to isolate network problems by determining if the host port hardware on a particular scale is good or bad. The test uses a multimeter to check the resistance between the RxD (receive) terminals and between the TxD (transmit) terminals on the host port. Each scale on the network should be checked if network communication problems exist. This test can be used for scales where the host port may have been marginally damaged. A catastrophic failure (such as lightning) of the host port may also measure infinite resistance. In this instance if the scale does not respond to the host, additional troubleshooting of the unit should be performed using the PC diagnostic software or the PCB may be defective and should be changed (see step 5).

The RS422 wiring (Figure 5-9) is the same on the models: 355SA, 2450SA, 8360M, 8361M, 8460M, 8461M, and 8450SA. (SA=StandAlone, M=Master).

1. Turn the scale power switch off, then disconnect the AC power cord from the AC outlet.
2. Disconnect the network cable from the unit's host port.
3. Check the resistance on the host port RS422 receive terminals. The resistance between **Pin 1 RxD+** and **Pin 9 RxD-** should be greater than **10 k Ohms** (10,000 Ohms).



AUX/Host DB9-F Jack
Figure 5-6

4. Check the resistance on the host port RS422 transmit terminals. The resistance between **Pin 8 TxD+** and **Pin 6 TxD-** should be greater than **1 M Ohms** (1000 k) and may read infinite resistance (open).
5. If the value is less than **10 k Ohms** on the **receive** terminals or less than **1 M Ohms** on the **transmit** terminals, the hardware is damaged or is marginal. For the Model 355SA, 2450SA, and 8450SA, the Main PCB should be replaced. For the **Smart*Touch*®** master, the RS422 hardware is on the I/O Logic PCB.
6. If a protection device is in use at the scale, plug the device into the scale's host port and perform steps 3-5. If the scale passes the test without the protection device, but fails with the device connected, the protection device is should be replaced and retested.
7. Check the polarity of the AC outlet with an outlet tester. If the tester reports reverse polarity or a bad ground, the problem must be corrected before reconnecting power to the scale.

Communication Cable Test

Communication Cable Test

If the scales pass the Host Port Test and you are still experiencing communication problems, the communication cables should be checked.

Disconnect all of the scales from the network before performing this test procedure.

Test for Shorts

Disconnect all scales from the network at the host port (including any protection devices, converter boxes, etc.), and at the host PC. Check the resistance between all of the wires in the communication cable. Any resistance less than infinite resistance (open) indicates a possible short somewhere in the cable. If there is a short, you can isolate the short by disconnecting sections from the network and checking the resistance of the individual sections one at a time. See below "Test for Shorts" in Figure 5-7.

Continuity Test

If you are experiencing off line conditions with certain scales and you have checked all other possibilities, the problem could be caused by a break in the communication cables. All of the scales must be disconnected from the network at the host port (including any protection devices, converter boxes, etc.). See the text in the illustration below titled "Continuity Test" in Figure 5-7.

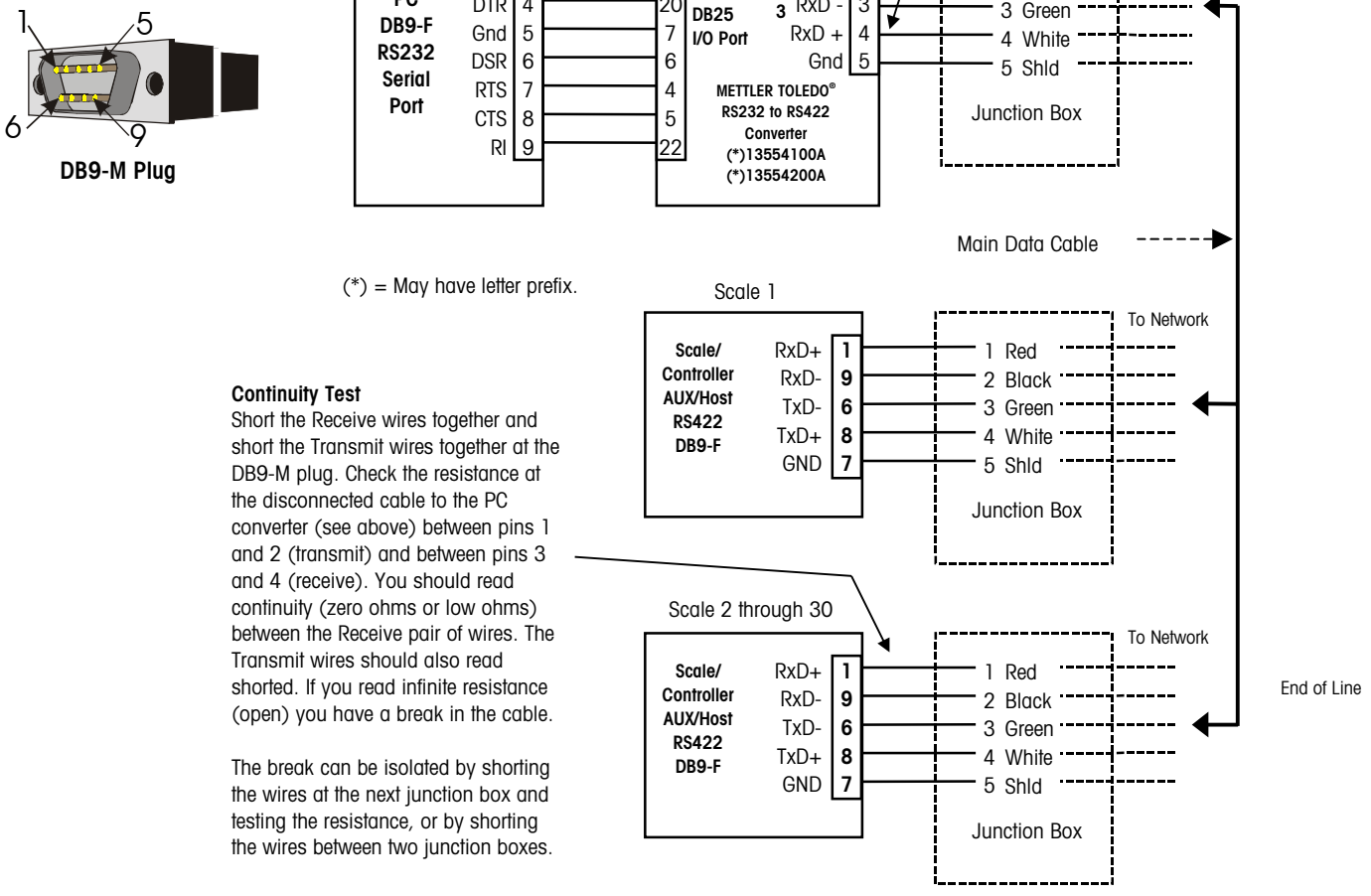


Figure 5-7: Testing the RS422 Wiring

Ethernet Network Troubleshooting

General Troubleshooting

Make sure that any excess network cabling isn't coiled. This can create electromagnetic fields that could interfere with data transfers. Try to keep cables away from florescent lighting, UPS (uninterruptible power supplies), AC outlets and other sources that may produce significant electromagnetic interference.

When connecting a node to a hub, the patch cable must be straight through. Pins 1, 2, 3, and 6 at the PC should line up pin-for-pin at the other end. Category 5 cables are recommended. When connecting two hubs together with 10Base-T cables, the patch cable may need to be a crossover cable. Check with the documentation that comes with the hub.

A 10Mb hub can't connect to a 100Mb hub unless a switch is used to translate the packets between the two speeds. Some hubs can also switch between the two speeds.

10BASE-T Segments (node to hub or hub to hub) are limited to 328 ft (100 m).

A Thin Ethernet Coax backbone can be used for hub to hub connections (if the hubs have a BNC connector) up to 606 ft (185 m). If Thin Ethernet is used the coax cable must be terminated at both ends with a 50-ohm resistor.

There is a maximum of two Inter-Repeater Links between devices without using bridge or switch (A hub is a repeater) and a maximum of 4 hubs and 5 segments between any two nodes.

Hubs

Since each node on a 10 Base-T network has its own cable connecting it to a central hub, it not likely that any node can cause the entire network to fail. Most hubs have a "partitioning" function that can detect a problem on any of its ports. If a problem is found, the node is disconnected from the rest of the network to isolate the node until the problem can be corrected.

Hubs also have LEDs that indicate the status of the hub and ports. Refer to the documentation that comes with the hub for additional information.

The partitioning function built in to most hubs and the star-wired topology makes it easy to troubleshoot a 10 Base-T network. Troubleshooting can be as simple as disconnecting nodes from the hub one at a time until the network recovers. Usually, the hub will give an indication as to which node is causing a problem.

Disconnecting a node from the network will have no effect whatsoever on the rest of the network. Moving an attached device is simply a matter of unplugging it from the hub and reconnecting it somewhere else.

Most hubs have a Collision LED that indicates packet collisions are occurring. This means that two or more devices are attempting to communicate at the same time. Some collision activity is normal.

Always refer to the User's Guide shipped with the hub for detailed information on the operation and description of the LED indicators.

Some of the common LED indicators on a hub are:

Power Indicates power is on to the hub.

Link or Activity Indicates the communication between the hub's port and the transmitting node is good. Most hubs will indicate a good connection by turning the Link LED ON. If the Link LED is OFF, check the cable connections and check that you are not using the wrong cable. Try another cable on the same port. If it works, replace the cable. If the problem persists, plug the cable into another port. If it works on another port, the port may be defective. If all port Line LEDs are off, replace the hub. If the problem still persists for this one unit, check the internal connections from the Ethernet PCB to the Ethernet Jack or replace the Ethernet PCB.

Collision Indicates two or more nodes are attempting to transmit on the network at the same time. Check the cable from the hub to the node. Using a crossover cable instead of a straight through cable can cause this condition. Turn the units off, then turn them back on one at a time.

Partition Some hubs have specific partition LEDs. Others may indicate a partition by a blinking LED. If a problem is found, the node is disconnected from the rest of the network until the problem is corrected.

PING

Refer to the next section HOSTS File for additional information on PING.

Ping (Packet InterNet Groper) is a program that can be used to test the communication on a TCP/IP network by sending an echo request to a client or host. The responding unit will reply if the communication and the unit are working properly.

Ping can be run from any Windows 95® or Windows NT® PC on the network. Ping is run from the MSDOS™ Prompt or NT Command Prompt. The command line for ping is as follows:

ping *ipaddress*

(Where *ipaddress* is the IP Address number of the client or host.)

An example ping command from an NT host at the command prompt to a client with the address **109.205.104.25** is as follows:

ping 109.205.104.25

When the communications are working properly, the responding client will send a reply back to the NT host as follows:

```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

C:\>ping 109.205.104.25

Pinging 109.205.104.25 with 32 bytes of data:

Reply from 109.205.104.25: bytes=32 time<10ms TTL=64
Reply from 109.205.104.25: bytes=32 time<10ms TTL=64
Reply from 109.205.104.25: bytes=32 time<10ms TTL=64
Reply from 109.205.104.25: bytes=32 time<10ms TTL=64

C:\>
```

Example from NT command prompt when the client does not respond:

```
C:\>ping 109.205.104.25

Pinging 109.205.104.25 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

C:\>
```

If the client does not respond, verify that the client and server IP (at the client) are correct. Try pinging another client nearby. If that unit responds, connect the patch cable from the working client to the client that does not respond. Ping the client again. If it responds suspect the patch cable or the hub. To check the hub, plug the client's patch cord at the hub to another known working port and ping the client again. If it now responds, suspect the hub port. If it still doesn't respond, replace the Ethernet PCB and retest.

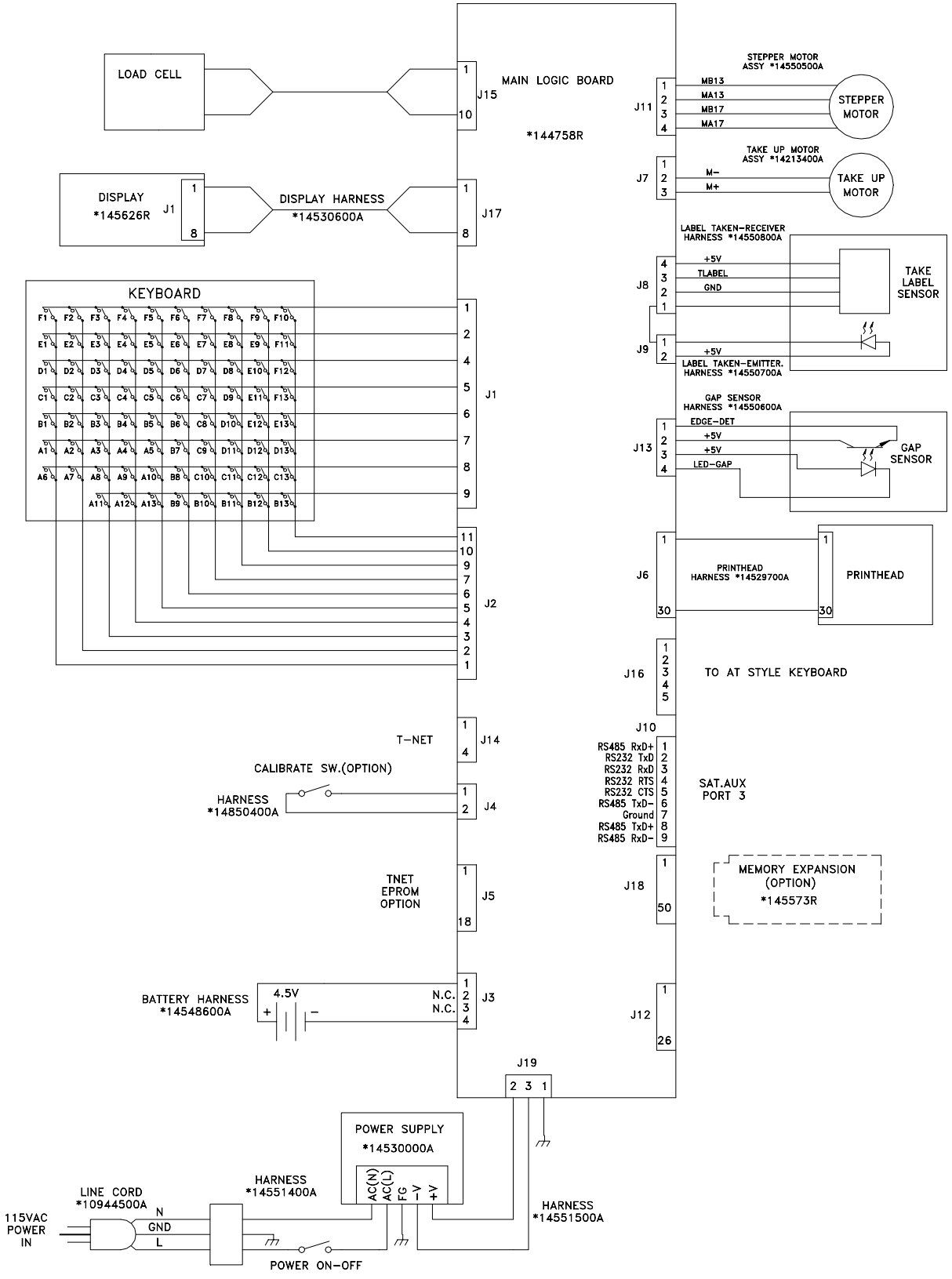
Program Error Messages

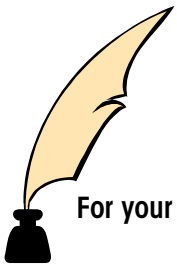
Messages followed by an asterisk (*) are errors that require a service call.

ENGLISH	SPANISH	FRENCH	ERROR MEANING
B_GetMsg OK	B_GetMsg OK	B_GetMsg OK	Application debugging information message. Should not be seen in normal operation.
B_GetMsg ORDER *	B_GetMsg ORDER	B_GetMsg ORDER	Application debugging information message. Should not be seen in normal operation.
B_GetMsg OVERFLOW *	B_GetMsg OVERFLOW	B_GetMsg OVERFLOW	The low level assembly routine for the TNET controller has experienced an overflow of a memory location.
B_GetMsg PARAMETER *	B_GetMsg PARAMETER	B_GetMsg PARAMETER	Application debugging information message. Should not be seen in normal operation.
B_SDLC STATUS ERROR *	B_SDLC STATUS ERROR	B_SDLC STATUS ERROR	An error has occurred regarding TNET communication. **Clear** should clear the error. Check network configuration and report error.
BOUNDS *	BOUNDS.	BOUNDS.	The microprocessor has received an invalid OPCODE (instruction). The software will restart.
Command Q Overflow*	COMMAND Q OVERFLOW	COMMAND Q OVERFLOW	An overflow of commands waiting to be executed in the main microprocessor has occurred.
CONTINUOUS NT SET	ETQTA CONT NO FIJADA	CONTINUOUS NT SET	The printer has determined that continuous stock is loaded in the printer but is not selected in the software. Continuous selection will be selected.
DB REQUEST *	DB REQUEST	DB REQUEST	The application has had an error regarding a database request and will restart.
DB SYNC *	DB SYNC	DB SYNC	The application has had an error regarding the synchroniziation of the TNET network and will restart.
DMA TIMEOUT ERROR*	ERROR DMA	DMA TIMEOUT ERROR	Direct memory transfer between internal parts of the Satellite has taken too long. The primary communication is between the main microprocessor and the printer microprocessor. Check harnesses to the printer.
ERR:HANDLE NT FOUND *			An applicable translated message could not be found.
ESCAPE OPCODE *	ESCAPE OPCODE.	ESCAPE OPCODE.	The microprocessor has received an invalid OPCODE. The software will restart.
FLASH has errors. *	FLASH tiene error	FLASH has errors.	The FLASH has errors either writing or reading which is causing checksum errors to occur.
FLASH ver change.	FLASH ver change.	FLASH ver change.	The FLASH version number has changed. This is not an error but a statement of fact caused by a new version of software.
INT DIV BY ZERO! *	INT DIV BY ZERO!	INT DIV BY ZERO!	The microprocessor has attempted to do a division by zero. This is an application error, the software will restart.
LABEL SIZE ERROR!	ERROR TANO¥O ETQTA!	LABEL SIZE ERROR!	The printer software was unable to correctly determine when the length of the label in the printer matches the length of the label in the program. Possible causes are incorrect label size, bad gap sensors, incorrect paper path, and incorrectly adjusted sensors.
LOW STOCK!	POCAS ETQTAS!	LOW STOCK!	The printer has determined that the label stock has run out.
MISC BRAM ERROR *	ERROR BRAM MISC.	MISC BRAM ERROR	The BRAM memory area that stores miscellaneous data has had a checksum error.
NMI / FP *	NMI / FP *	NMI / FP *	Non-maskable interrupt/floating point error has occurred. Software will restart.
NO MARQUEES FOUND!	NO MARQUEES FOUND!	NO MARQUEES FOUND!	The Master has responded to the Satellites request for Marquees and reported there are none.
OVERFLOW ERROR. *	OVERFLOW ERROR.	OVERFLOW ERROR.	An overflow of a memory locations ability to store numbers has occurred. The software will restart.

ENGLISH	SPANISH	FRENCH	ERROR MEANING
PRINTER ERROR!*	ERROR IMPRESORA!	PRINTER ERROR!	The printer has not successfully completed the print task. Check the printer software and harnesses.
PTR TIMEOUT ERROR*	PTR TIMEOUT ERROR	PTR TIMEOUT ERROR	The printer microprocessor has not completed the printing tasks within the predetermined amount of time. Check harnesses to the printer.
REMOVE LABEL	RETIRE ETQTA	REMOVE LABEL	There is an obstruction to the label taken sensor on the printer mechanism.
RESTARTING… *	REINICIANDO…	RESTARTING…	Events have occurred that the application code has determined would have negative results on continued operation of the scale. The software will restart and try to correct the condition.
Sat setup change.	Sat setup change.	Sat setup change.	The setup for the Satellite has been changed form the initial configuration.
SW bld date change.	SW bld date change.	SW bld date change.	The build date of the application software has changed. This is a fact caused by a new version of software.
T DECREMENT ERROR *	T DECREMENT ERROR	T DECREMENT ERROR	The multi-tasker has experienced an error when switching between tasks. This is an application error.
T INCREMENT ERROR *	T INCREMENT ERROR	T INCREMENT ERROR	The multi-tasker has experienced an error when switching between tasks. This is an application error.
T_RELMEM *	T_RELMEM	T_RELMEM	The application has had an error regarding the release of memory and will restart.
T_RELRES *	T_RELRES	T_RELRES	The application has had a problem releasing resources. TNET will restart.
T_RUNTSK *	T_RUNTSK	T_RUNTSK	The application has had an error regarding a task and will restart.
TNET CTRL BUSY *	TNET CTRL BUSY	TNET CTRL BUSY	The network controller could not process the TNET message because of excess traffic. TNET will restart.
TNET CTRL ERROR *	TNET CTRL ERROR	TNET CTRL ERROR	The network controller had an unspecified error. The network controller will restart.
TNET INC OPCODE *	TNET INC OPCODE	TNET INC OPCODE	An error has occurred causing an invalid TNET opcode to be received by the network controller. TNET will restart.
TNET INV MSG FORMAT *	TNET INV MSG FORMAT	TNET INV MSG FORMAT	The TNET message has not been successfully transferred. TNET will restart.
TNET MSG NOT XFER *	TNET MSG NOT XFER	TNET MSG NOT XFER	The TNET message has not been successfully transferred, will restart.
TNET QWERTY ERROR	TNET QWERTY ERROR	TNET QWERTY ERROR	The Standalone Unit ID is incorrect. Set the Unit ID on all Standalone units to 255.
TREQMEM OPCODE *	TREQMEM OPCODE.	TREQMEM OPCODE.	The microprocessor has received an invalid OPCODE. The software will restart.
TSNDMSG OPCODE *	TSNDMSG OPCODE.	TSNDMSG OPCODE.	The microprocessor has received an invalid OPCODE (instruction). The software will restart.
UNUSED OPCODE *	UNUSED OPCODE.	UNUSED OPCODE.	The microprocessor has received an invalid OPCODE (instruction), the software will restart.

Interconnect Diagram



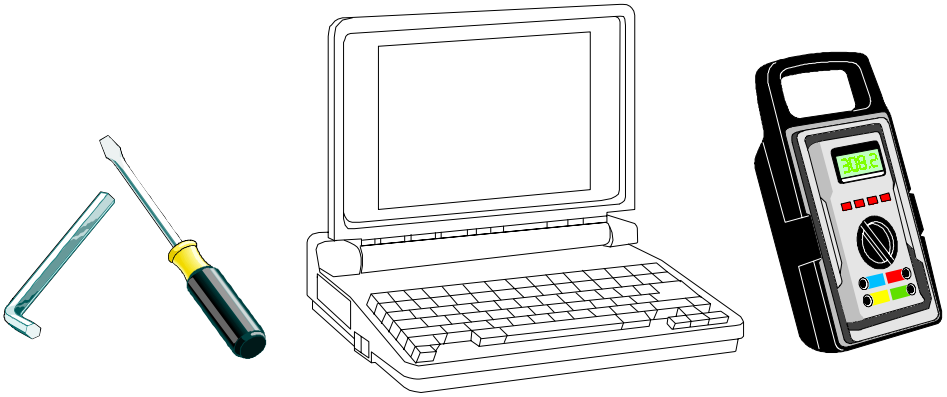


For your notes

6 Parts Replacement & Adjustments

Service Tools

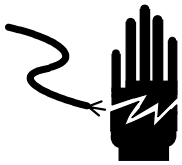
Following is a recommended list of tools that required to service the Model 2450.



- Metric Hex (Allen) Wrench Set (up to 6 mm).
- Multi-Meter for measuring volts and ohms.
- ¼" Nutdriver
- PC with serial ports for running Databack Software for backup and restore, and Flashpro Software for downloading the operating system software into Flash Memory.
- PC to Model 2450 Host Cable (Refer to Chapter 6 Interfacing Figure 6-2).
- Standard Slotted Screwdriver.
- #1 and #2 Phillips Screwdriver.
- Right Angle Phillips Screwdriver.
- Needle Nose Pliers.
- Static Protection Kit
- Test Weights 30 lb or 15 kg.

Printhead Replacement

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

To replace the Printhead in the printer, follow the steps shown in the figure below. After replacing the head, compare the Printhead Resistance Rating on the front of the Printhead with the old Printhead. If the resistance rating is different, it must be set to match the new printhead's rating.

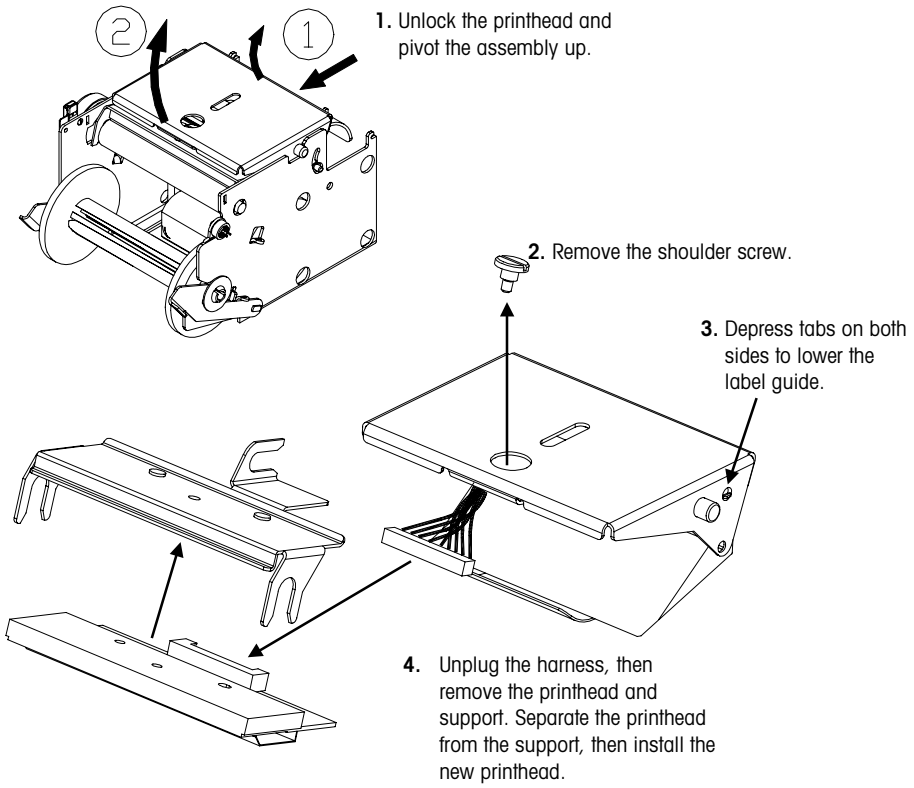


Figure 6-1: Printhead Replacement

PRINT SPEED/DENSITY
(Varies the print speed and power to the printhead to adjust print quality.)

122.5 mm/s HIGH
122.5 mm/s HIGH-MEDIUM
122.5 mm/s LOW-MEDIUM
122.5 mm/s LOW
101.6 mm/s HIGH

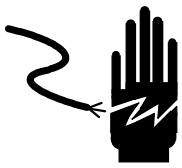
HEAD
(Select Ohms marked on the Print Head.)

>683
676-683 Ohms
669-675 Ohms
661-668 Ohms
654-660 Ohms
646-653 Ohms
639-645 Ohms
631-638 Ohms
624-630 Ohms
<624 Ohms

To set the printhead resistance for the new printhead, first press the SETUP MODE key, then press the LABEL PRINTER key. This selection is used to select the print speed, density, and resistance. Select the new setting by using the DOWN/UP keys, and ENTER to modify the selection. The selections are shown on the left.

Take Up Motor Replacement

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

To replace the Take Up Motor assembly, remove the two mounting screws on the bottom of the printer frame, Slide the motor out from the rear and disconnect the harness of the Main Logic PCB. When installing the new motor, make sure gear meshes with the take up roll gear without slipping.

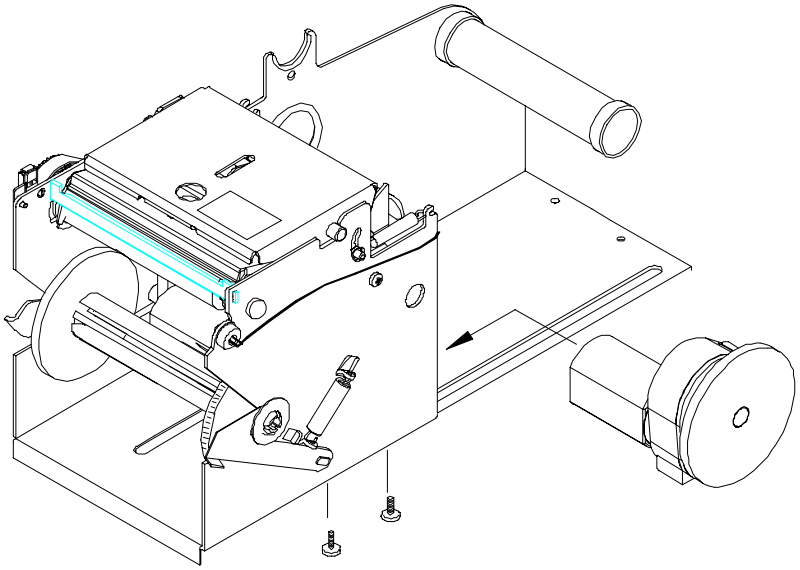
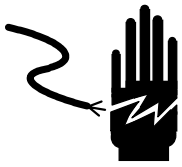


Figure 6-2: Take Up Motor Replacement

Stepper Motor Replacement

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

To replace the Label Stepper Motor, first remove the left side cover. Remove the four Phillips-head screws securing the motor to the vertical frame. Disconnect the motor from the Main Logic PCB, and slide the motor out the side. Reverse the steps to install the new motor.

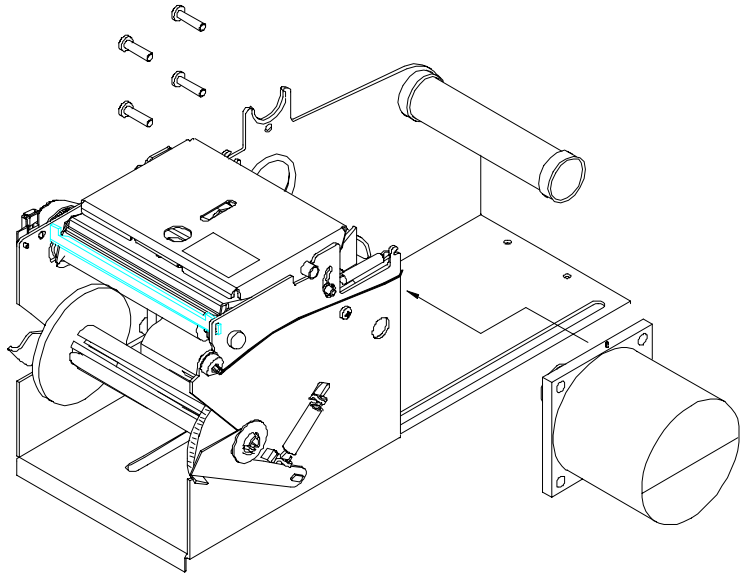


Figure 6-3: Stepper Motor Replacement

Overload and Underload Stops

Whenever the load cell is replaced, the overload and underload stops must be adjusted (Figure 6-4).

Overload Stop Adjustment

Set the scale to display in expanded mode as follows:

- Press the SETUP MODE key (SA: when **UNIT** displays, press ENTER key)
- Press the CAL key, then the CAL switch (Figure 3-2).
- Unit will display **Load Cell INT**. Press the TARE key for expand mode. (Press the CLEAR key to exit expand mode when adjustments are complete.)

Place 34 lb (16 kg if calibrated in kilograms) of test weight in the scale pan. Adjust the overload stop screw to just touch the stop using the expanded display.

Underload Stop

Remove the weight in the pan and adjust the underload stop screw to just touch the stop, then back out 1/8 turn. Make sure the scale reads zero after making any adjustments.

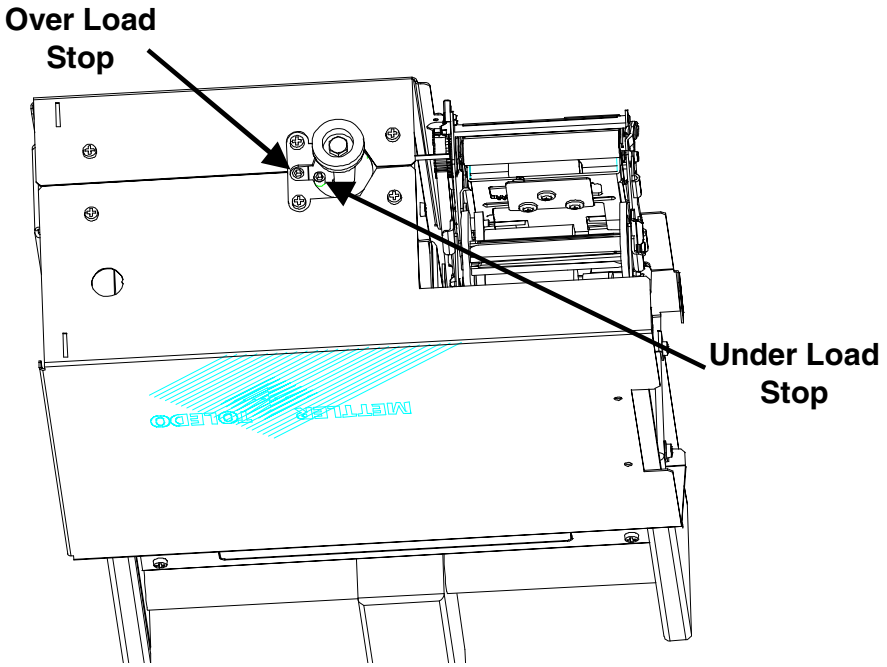
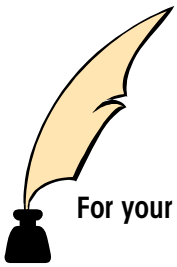


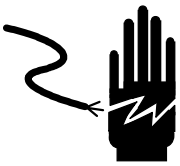
Figure 6-4: Overload and Underload Stop Adjustment Screws (Model 2450 Bottom View)



For your notes

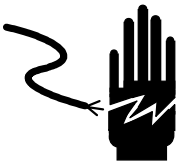
7 Maintenance

External Cleaning



⚠ WARNING

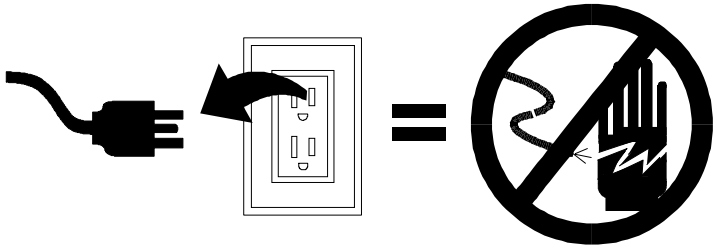
DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.



⚠ WARNING

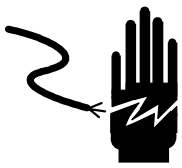
DO NOT SPRAY OR WASH DOWN. HAZARD OF ELECTRICAL SHOCK OR BURN.

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).



Use a soft clean cloth dampened with a mild detergent and water or a mild cleaner to wipe the exterior surfaces. Do not spray directly on the unit. A mild spray cleaner can be used by spraying the cleaning cloth. Do not use solvent or commercial cleaners on the unit. They may harm the surfaces or damage the keyboard.

Internal Cleaning



WARNING

DISCONNECT ALL POWER TO THIS UNIT BEFORE INSTALLING, SERVICING, CLEANING, OR REMOVING THE FUSE. FAILURE TO DO SO COULD RESULT IN BODILY HARM AND/OR PROPERTY DAMAGE.

Before proceeding, disconnect power by pressing the power switch to off (press the **0** on the switch), then disconnecting AC power by either turning off the breaker to the Model 2450, or by disconnecting the AC power cord at the Model 2450 in the mounting pole (see Figures 2-6 and 2-7).

Open the printer door cover. To clean the printer, unlock the printhead by lifting the rear of the printhead assembly out and up at the same time. Once the rear of the assembly is unlocked, lift the front of the printhead assembly. Refer to Figure 7-1. Remove the paper stock and clean the printhead and paper path with a soft clean cloth soaked in isopropyl alcohol, Mettler Toledo Liquid Cleaner (p/n 12587500A) or equivalent (ISC108-B), or the Mettler Toledo Cleaning Pen (p/n 082287020). Clean any adhesive or debris buildup from the stripper edge, platen roller, and printhead. ***DO NOT USE A METAL DEVICE TO REMOVE LABELS FROM COMPONENTS OR SEVERE DAMAGE MAY RESULT. DO NOT SCRAPE THE PRINTHEAD WITH ANY OBJECT TO REMOVE GLUE OR LABEL DEBRIS.***

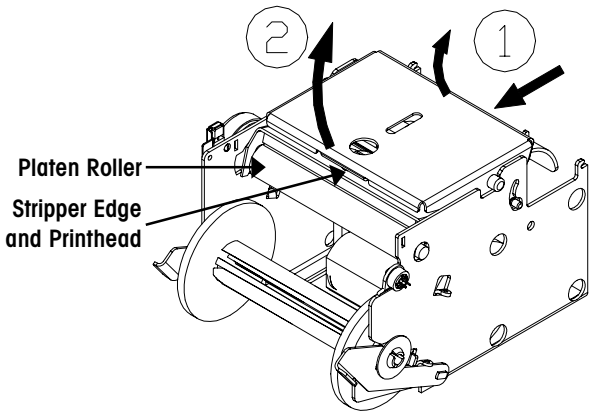


Figure 7-1: Unlocking the Printhead

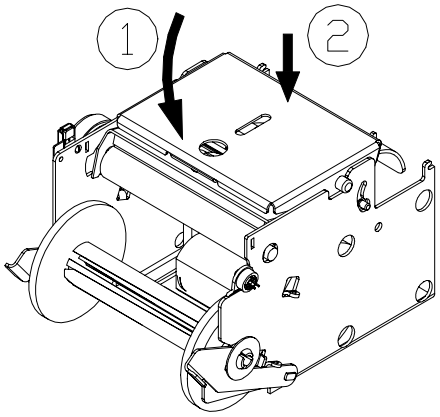


Figure 7-2: Locking the Printhead

When finished, re-load the labels and lock the printhead into the printing position. First lower the front of the printhead assembly onto the platen roller. Once the front of the printhead assembly is down on the platen roller, firmly press on the rear of the printhead assembly until it snaps into place. Use even pressure across the rear of the printhead assembly so both assemblies snap down. Refer to Figure 7-2.

8

Replacement Parts

The Aftermarket Operation at METTLER TOLEDO® is dedicated to satisfying every customer every time. The ISO registered facility provides quick, efficient and quality service. Aftermarket services include everything from daily parts shipments and product repairs to load cells and overhaul kits compatible with most scale manufacturers.

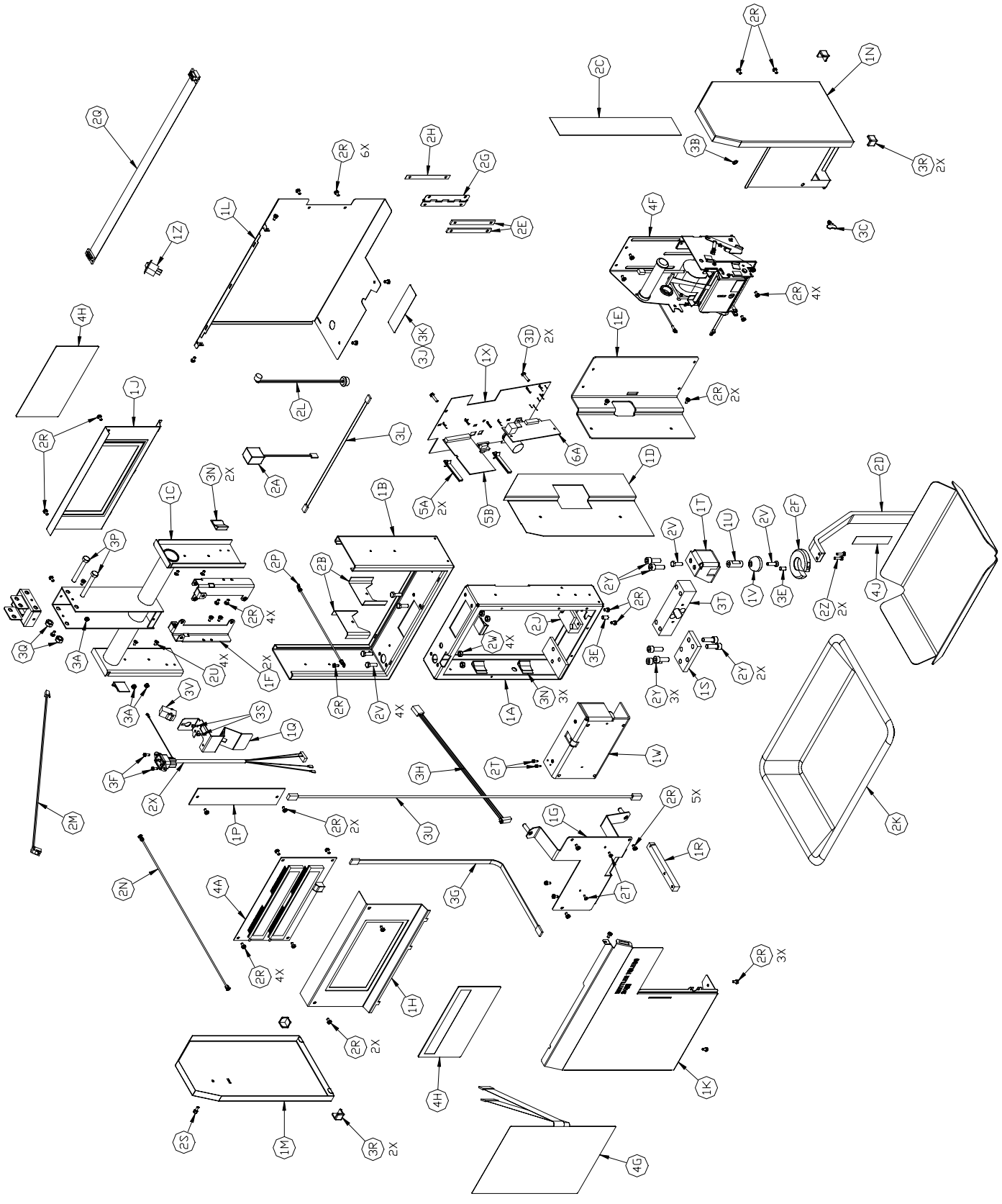
Aftermarket Services:

- Same day replacement parts shipment
- Full service repair center
- Printed circuit board repair and exchange program
- Load cell weighing solutions
- Load cell exchange program
- Mechanical scale overhaul kits
- Rental scales

Mettler-Toledo, Inc.
Aftermarket
60 Collegeview Road
Westerville, Ohio 43081
Tel: (800) 848-3992
(614) 430-2555
Fax: (800) 405-6312
(614) 438-4921

Rental
Tel: (800) 428-4310
Fax: (614) 841-5185
E-mail: rental@mt.com

Model 2450 Parts



Model 2450 Parts List

COMMON PARTS:			
SYM	QTY.	PART NUMBER	DESCRIPTION
1A	1	15122400A	FRAME
1B	1	15122500A	YOKE
1C	1	15122600A	GIRDER ASSY
1D	1	15008500A	BARRIER,ELECTRONICS
1E	1	14987900A	BRACKET,PRINTER MTG
1F	2	15002500A	BRACKET DISPLAY MTG
1G	1	14994900A	CHASSIS
1H	1	15016700A	COVER ASSY,DISPLAY,FRONT
1J	1	15016800A	COVER,ASSY,DISPLAY,REAR
1K	1	14986300A	COVER,FRONT
1L	1	14985100A	COVER,REAR
1M	1	15000300A	COVER,LEFT
1N	1	15012000A	PRINTER DOOR ASSY
1P	1	15123100A	COVER PLATE
1Q	1	15147100A	BRACKET,CONNECTOR
1R	1	15000200A	PCB SUPPORT
1S	1	15123400A	PLATE,LOAD CELL MOUNTING
1T	1	15123500A	BRACKET,LOAD CELL
1U	1	15123600A	STANDOFF,BALL/SOCKET
1V	1	15123000A	BALL
1W	1	15229700A	PWR SUP,CHAS,UNI IN,21VDC,110W
1X	1	15138700A	PCB, MAIN, LOGIC
1Z	1	13688900A	SWITCH,ROCKER,SPST,10A
2A	1	14548600A	BATT,ALKALINE,4.5V,600MAH
2B	2	15004700A	FILLER,DISPLAY
2C	1	15074000A	LABEL,THREADING LABEL
2D	1	15122700A	PAN HANGER ASSY
2E	2	15122800A	HINGE PLATE
2F	1	15122900A	SOCKET
2G	1	15123200A	HINGE
2H	1	15123300A	SPACER,HINGE
2J	1	15123700A	BRACKET,OVERLOAD STOP
2K	1	15169200A	PAN
2L	1	15204000A	QWERTY HARNESS
2M	1	15179000A	TNET HARNESS
2N	1	15188700A	GROUND HARNESS,24"
2P	1	15188800A	GROUND HARNESS,8"
2Q	1	15138600A	DATA HARNESS
2R	39	R0535400A	M4X8,PAN HEAD,PHILLIPS,BLACK
2S	1	R0510000A	SLOTTED,FILISTER HEAD,DRILLED
2T	4	R0374900A	SCREW,M3X8 PH W/LW SFW
2U	4	R0535800A	M4X6,FLAT HEAD,BLACK
2V	6	R0535500A	M6X20,HEX HEAD
2W	4	R0502000A	NUT,M6
2X	1	A15398400A	HARN,AC,SWITCH
2Y	7	R0535700A	M8X25,SOCKET HEAD CAP SCREW
2Z	2	R0536000A	SCREW,HEX M4X16
3A	3	R0519600A	NUT M4 W/WASHER
3B	1	15189800A	RETAINER,STUD 1/4 TURN
3C	1	15189700A	STUD,1/4 TURN,WING HEAD
3D	2	R0384500A	M4X20,PAN HEAD,PHILLIPS W/WASHER
3E	2	R0364600A	OVERLOAD SCREW
3F	2	R0309000A	SCREW 6-32X3/8 SELF TAP
3G	1	14530600A	HARN,8450 VF DISPLAY
3H	1	15295800A	HARN,POWER,DC OUT,8450
3J	1	14800000A	LABEL,DATA,BLANK 1X4.125 SILVER
3K	1	14801800A	SHIELD,LABEL,1.09X4.5
3L	1	15094800A	HARN,BATTERY
3N	5	14665400A	CABLE CLAMP
3P	2	R0538800A	SCREW,M8X60 HH
3Q	2	R0538900A	NUT,M8 HEX
3R	4	15317600A	BUMPER, CORNER
3S	1	10856800A	SCREW LOCK KIT
3T	1	C14621100B	LOAD CELL ASSY, 22KG
3U	1	15216600A	HARNESS, ETHERNET
3V	1	15286700A	CONN.PHONE JACK,RT ANGLE

ADD FOR PRODUCT LITERATURE/INSERTS/MISC.			
SYM	QTY	PART NUMBER	DESCRIPTION
(*)	1	15092900A	MANUAL,OPERATOR,ENGLISH
		15275700A	MANUAL,OPERATOR,SPANISH
		15106200A	MANUAL,OPERATOR,FRENCH
(*)	5	15073300A	INSERT, PRESET ENGLISH
		15274500A	INSERT, PRESET SPANISH
		15330200A	INSERT, PRESET FRENCH
		15200000A	INSERT, PRESET ENG SELF SERVE

ADD FOR KEYBOARD OVERLAY/DISPLAY LENS			
SYM	QTY	PART NUMBER	DESCRIPTION
4G	1	15073500A	KEYBOARD ASSY,ENGLISH
		15274400A	KEYBOARD ASSY,SPANISH
		15093000A	KEYBOARD ASSY,FRENCH
		15199900A	KEYBOARD ASSY,ENG,SELF SERVE
4H	2	14530900A	LENS, DISPLAY ENGLISH LB
		14943100A	LENS, DISPLAY ENGLISH KG,MR
		14627600A	LENS, DISPLAY SPANISH LB
		14627500A	LENS, DISPLAY SPANISH KG
		A14571900A	LENS, DISPLAY FRENCH KG
4J	1	A15313300A	LABEL,CAP.30LB ENGLISH
		15462800A	LABEL,CAP.30LB/25KG SPAINISH
		15465400A	LABEL,CAP.15KG FRENCH

ADD FOR MEMORY CAPACITY			
SYM	QTY	PART NUMBER	DESCRIPTION
5A	2	12977700A	CARD GUIDE
5B	1	14557400A	PCB ASSEMBLY, MEMORY 256K
		14613900A	PCB ASSEMBLY, MEMORY 512K
		14614000A	PCB ASSEMBLY, MEMORY 1 MEG

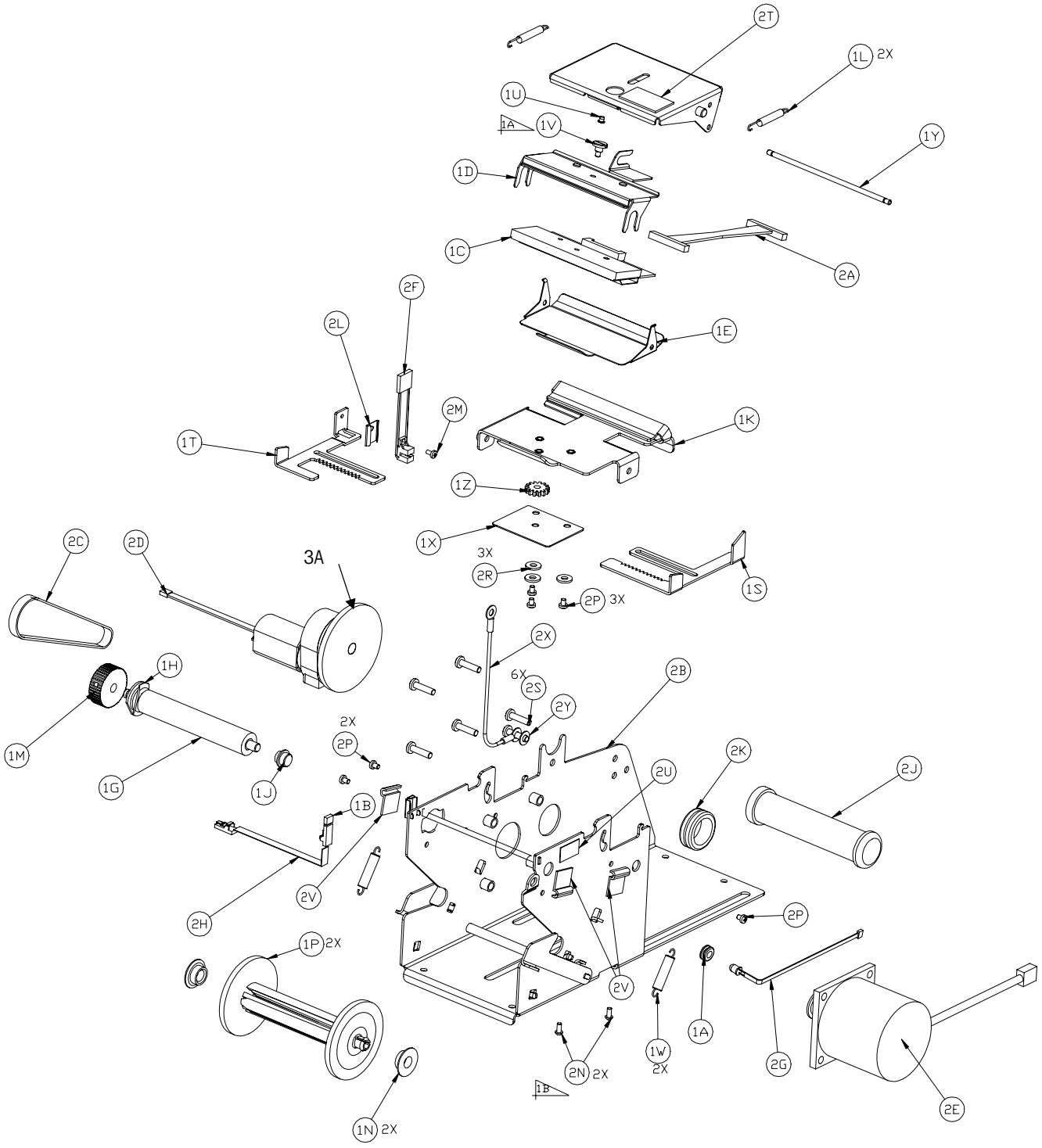
ADD FOR ETHERNET			
SYM	QTY	PART NUMBER	DESCRIPTION
6A	1	15214300A	PCB,ASSY,ETHERNET

ADD FOR DISPLAY PCB			
SYM	QTY	PART NUMBER	DESCRIPTION
4A	1	15514100A	PCB ASSY,QUAD,VF DISPLAY
	1	15514200A	PCB,ASSY,DUAL,VF DISPLAY

NOT SHOWN

(*)	1	11982500A	POLY BAG (35X35)
(*)	1	12716300A	CONN,PHONE,JACK,6POS,WALL MT
(*)	1	12716500A	HARN,PHONE,22 FT
(*)	1	A12745800A	CUSTOMER FEEDBACK,8 1/2 X 11
(*)	1	A12800700A	LABEL FORM,MD FR MAIN TRC
(*)	1	D14736100A	DISK,PGMD,8450 SA,SAT,LABEL2MM
(*)	1	15161900A	KEYPAD ENVELOPE
(*)	2	R0538700A	SCREW,M8X45 HH
(*)	2	R0538900A	NUT,M8 HEX
(*)	1	13785100A	BUSHING,CORD,0.187-0.250,W/LK NUT
(*)	1	15345500A	BOX,ELECTRICAL
(*)	1	15345600A	COVER,BOX,ELECTRICAL
(*)	1	15039600A	LINE CORD, IN-LINE, 25FT
(*)	1	B12363300A	SECURITY SEAL LABEL
(*)	1	R0535800A	SCREW,M4X6,FLAT HEAD,BLACK

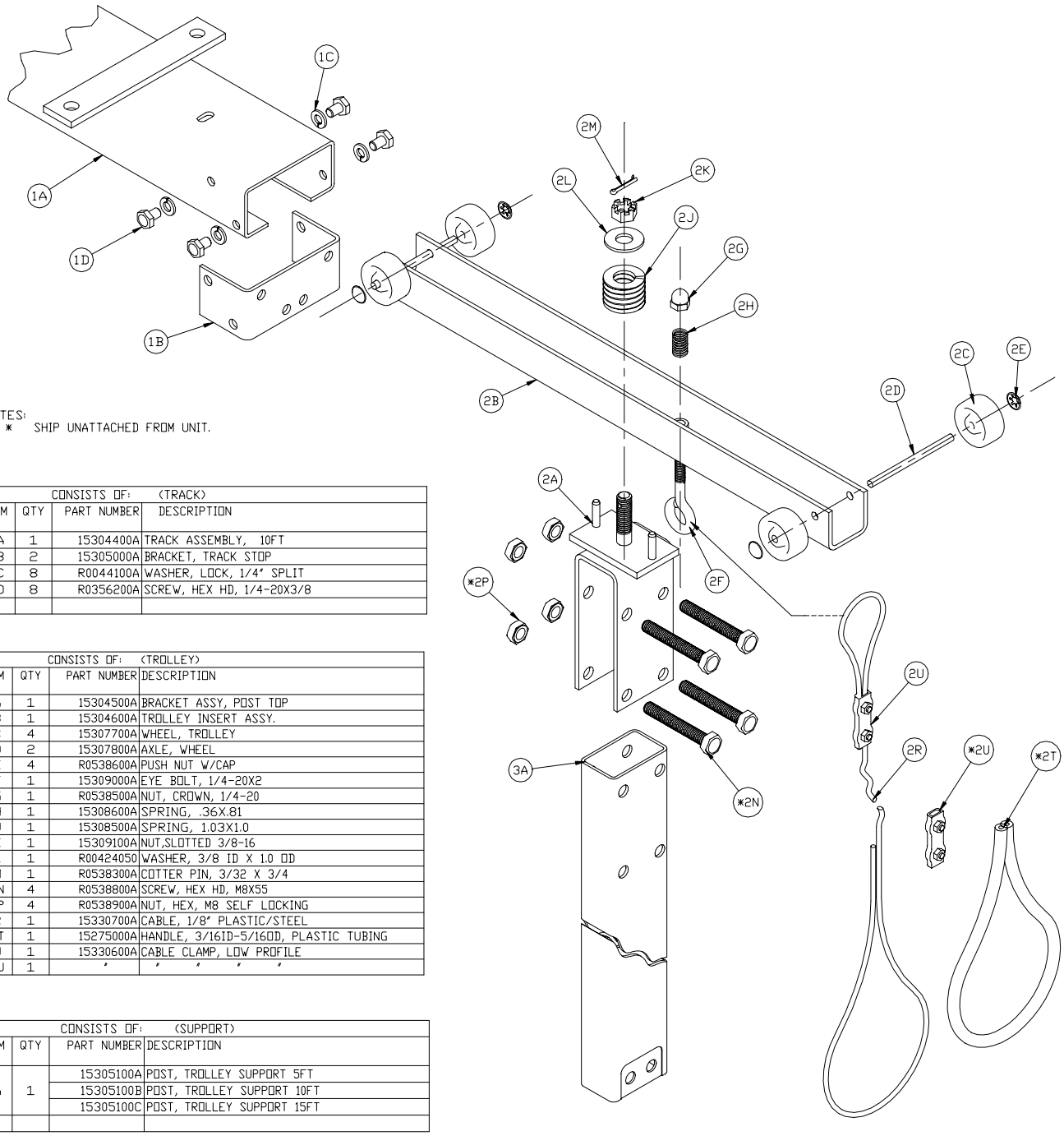
Printer Engine



Printer Engine Parts List

CONSISTS OF			
SYM	QTY	PART NUMBER	DESCRIPTION
1A	1	12462200A	GROMMET .12 ID
1B	1	14156600A	IC, OTIC, IS471F
1C	1	A14180600A	PRINTHEAD ASSY
1D	1	A14203500A	BRACKET, PRINTHEAD MTG.
1E	1	14572200A	GUIDE, UPPER
1F	1	14203800A	BRACKET ASSY, FORCE
1G	1	14211500A	PLATEN
1H	1	A14211600A	BEARING, LEFT PLATEN
1J	1	A14211700A	BEARING, RIGHT PLATEN
1K	1	A14655600A	PAPER GUIDE ASSY, LOWER
1L	2	14212000A	SPRING, EXTENSION
1M	1	14212300A	PULLEY, PLATEN
1N	2	14212600A	BEARING, SPOOL
1P	2	14212700A	SPOOL, TAKEUP
1S	1	14213000A	GUIDE, RIGHT
1T	1	14572300A	GUIDE, LEFT
1U	1	14247900A	BUTTON
1V	1	14262600A	SCREW, PRINTHEAD MTG.
1W	2	14262700A	SPRING, EXTENSION
1X	1	14270900A	PLATE, COVER
1Y	1	14286000A	SHAFT, SPRING
1Z	1	14306900A	GEAR, RACK
2A	1	14529700A	HARNESS, PRINTHEAD
2B	1	A14550100A	FRAME ASSEMBLY
2C	1	14550200A	BELT, TIMING
2D	1	14550400A	MOTOR ASSY, LABEL TAKE-UP
2E	1	14550500A	MOTOR ASSY, STEPPER
2F	1	14550600A	HARNESS, GAP SENSOR
2G	1	14550700A	HARNESS, EMITTER, LABEL
2H	1	14550800A	HARNESS, RECEIVER, LABEL
2J	1	14551100A	HOLDER, LABEL SPOOL
2K	1	14571400A	GROMMET, .88 DIA
2L	1	14625000A	CLIP, SENSOR
2M	1	R0521700A	SCREW, PH PAN HD, M2.5 x 5
2N	2	R0521600A	SCREW, PH FL HD, 4 x .38
2P	6	R0379300A	SCREW, PH PAN HD, M3 x 4
2R	3	R0253900A	WASHER, NO.8 FLAT
2S	6	R0515100A	SCREW, PH PAN HD, M4 x 16
2T	1	12801200A	LABEL, CAUTION HOT
2U	1	13134200A	LABEL
	3	09591500A	CLAMP, BAND, 2.88"
2V	3	14274800A	CLIP, HALF U, .125 DIA
	0	14930800A	FIXTURE, LABEL GUIDE
2X	1	14833100A	ESD GND WIRE
2Y	1	R00589130	LOCK WASHER #8
3A	1	14551000A Gear Only R0375600A Set Screw	

Trolley Assembly



NOTES:
1. * SHIP UNATTACHED FROM UNIT.

CONSISTS OF: (TRACK)			
SYM	QTY	PART NUMBER	DESCRIPTION
1A	1	15304400A	TRACK ASSEMBLY, 10FT
1B	2	15305000A	BRACKET, TRACK STOP
1C	8	R0044100A	WASHER, LOCK, 1/4" SPLIT
1D	8	R0356200A	SCREW, HEX HD, 1/4-20X3/8

CONSISTS OF: (TROLLEY)			
SYM	QTY	PART NUMBER	DESCRIPTION
2A	1	15304500A	BRACKET ASSY, POST TOP
2B	1	15304600A	TROLLEY INSERT ASSY.
2C	4	15307700A	WHEEL, TROLLEY
2D	2	15307800A	AXLE, WHEEL
2E	4	R0538600A	PUSH NUT W/CAP
2F	1	15309000A	EYE BOLT, 1/4-20X2
2G	1	R0538500A	NUT, CROWN, 1/4-20
2H	1	15308600A	SPRING, .36X.81
2J	1	15308500A	SPRING, 1.03X1.0
2K	1	15309100A	NUT,SLOTTED 3/8-16
2L	1	R00424050	WASHER, 3/8 ID X 1.0 OD
2M	1	R0538300A	COTTER PIN, 3/32 X 3/4
*2N	4	R0538800A	SCREW, HEX HD, M8X55
*2P	4	R0538900A	NUT, HEX, M8 SELF LOCKING
2R	1	15330700A	CABLE, 1/8" PLASTIC/STEEL
*2T	1	15275000A	HANDLE, 3/16ID-5/16OD, PLASTIC TUBING
2U	1	15330600A	CABLE CLAMP, LOW PROFILE
*2U	1	"	" " " "

CONSISTS OF: (SUPPORT)			
SYM	QTY	PART NUMBER	DESCRIPTION
3A	1	15305100A	POST, TROLLEY SUPPORT 5FT
		15305100B	POST, TROLLEY SUPPORT 10FT
		15305100C	POST, TROLLEY SUPPORT 15FT

9 Label Formats

Abbreviations

The following abbreviations will be used in the default label style list.

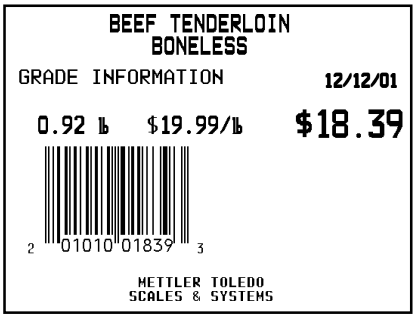
BCB	Bar Code on Bottom
By Cnt	By Count Pricing
By Wght	By Weight Pricing
Cont	Continuous Strip Label
Grd	Grade
NF	Nutrifact Text
Pack	Pack Date
Sell	Sell By Date
SH	Safe Handling Text Printed by 8461.
SHS	Safe Handling Space on Preprinted labels.
Std Pck	Standard Pack Pricing

Cross Reference

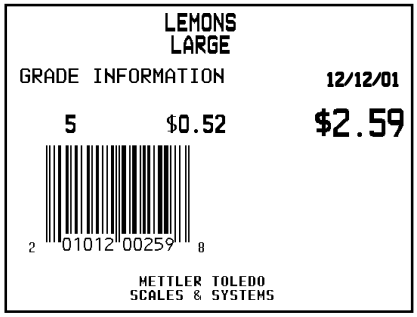
8450 Reference Number	Size	Type	Date	Other Info	BC Position	8461 Reference Name
31	1.9"	By Wght	Sell	Grd		1.9" By Wght Sell Grd
32	1.9"	By Cnt	Sell	Grd		1.9" By Cnt Sell Grd
33	1.9"	Std Pck	Sell	Grd		1.9" Std Pck Sell Grd
34	1.9"	By Wght				1.9" By Wght
35	1.9"	By Cnt				1.9" By Cnt
36	1.9"	Std Pck				1.9" Std Pck
37	1.9"	By Wght	Pack	Grd		1.9" By Wght Pack Grd
38	1.9"	By Cnt	Pack	Grd		1.9" By Cnt Pack Grd
39	1.9"	Std Pck	Pack	Grd		1.9" Std Pck Pack Grd
40	2.1"	By Wght	Sell	Grd		2.1" By Wght Sell Grd
41	2.1"	By Cnt	Sell	Grd		2.1" By Cnt Sell Grd
42	2.1"	Std Pck	Sell	Grd		2.1" Std Pck Sell Grd
43	2.1"	By Wght				2.1" By Wght
44	2.1"	By Cnt				2.1" By Cnt
45	2.1"	Std Pck				2.1" Std Pck
46	2.1"	By Wght	Pack	Grd		2.1" By Wght Pack Grd
47	2.1"	By Cnt	Pack	Grd		2.1" By Cnt Pack Grd
48	2.1"	Std Pck	Pack	Grd		2.1" Std Pck Pack Grd
49	2.4"	By Wght	Sell	Grd		2.4" By Wght Sell Grd
50	2.4"	By Cnt	Sell	Grd		2.4" By Cnt Sell Grd
51	2.4"	Std Pck	Sell	Grd		2.4" Std Pck Sell Grd
52	2.4"	By Wght	Sell	Grd	BCB	2.4" By Wght Sell Grd BCB
53	2.4"	By Cnt	Sell	Grd	BCB	2.4" By Cnt Sell Grd BCB
54	2.4"	Std Pck	Sell	Grd	BCB	2.4" Std Pck Sell Grd BCB
55	2.4"	By Wght	Sell	Grd		2.4" By Wght Sell Grd
56	2.4"	By Cnt	Sell	Grd		2.4" By Cnt Sell Grd
57	2.4"	Std Pck	Sell			2.4" Std Pck Sell
58	2.4"	BW	Sell	Grd	BCB	2.4" BW Sell Grd BCB
59	2.4"	By Cnt	Sell	Grd	BCB	2.4" By Cnt Sell Grd BCB
60	2.4"	Std Pck	Sell		BCB	2.4" Std Pck Sell BCB
61	2.4"	By Wght	Sell	Grd	SH	2.4" By Wght Sell Grd SH
62	2.4"	By Wght	Sell	Grd	SHS	2.4" By Wght Sell Grd SHS
63	3.3"	By Wght	Sell	Grd		3.3" By Wght Sell Grd
64	3.3"	By Cnt	Sell	Grd		3.3" By Cnt Sell Grd
65	3.3"	Std Pck	Sell	Grd		3.3" Std Pck Sell Grd
66	3.3"	By Wght	Sell	Grd	BCB	3.3" By Wght Sell Grd BCB
67	3.3"	By Cnt	Sell	Grd	BCB	3.3" By Cnt Sell Grd BCB
68	3.3"	Std Pck	Sell	Grd	BCB	3.3" Std Pck Sell Grd BCB
69	3.3"	By Wght	Sell	Grd	SH	3.3" By Wght Sell Grd SH
70	3.3"	By Wght	Sell	Grd	SHS	3.3" By Wght Sell Grd SHS
71	3.7"	By Wght	Sell	Grd		3.7" By Wght Sell Grd
72	3.7"	By Cnt	Sell	Grd		3.7" By Cnt Sell Grd
73	3.7"	Std Pck	Sell	Grd		3.7" Std Pck Sell Grd
74	3.7"	By Wght	Sell	Grd	BCB	3.7" By Wght Sell Grd BCB
75	3.7"	By Cnt	Sell	Grd	BCB	3.7" By Cnt Sell Grd BCB
76	3.7"	Std Pck	Sell	Grd	BCB	3.7" Std Pck Sell Grd BCB
77	3.7"	By Wght	Sell	Grd	SH	3.7" By Wght Sell Grd SH
78	3.7"	By Wght	Sell	Grd	SHS	3.7" By Wght Sell Grd SHS
79	3.7"	By Wght	Sell	NF		3.7" By Wght Sell NF
80	3.7"	By Cnt	Sell	NF		3.7" By Cnt Sell NF

8450 Reference Number	Size	Type	Date	Other Info	BC Position	8461 Reference Name
81	4.2"	By Wght	Sell	Grd		4.2" By Wght Sell Grd
82	4.2"	By Cnt	Sell	Grd		4.2" By Cnt Sell Grd
83	4.2"	Std Pck	Sell	Grd		4.2" Std Pck Sell Grd
84	4.2"	By Wght	Sell	Grd	BCB	4.2" By Wght Sell Grd BCB
85	4.2"	By Cnt	Sell	Grd	BCB	4.2" By Cnt Sell Grd BCB
86	4.2"	Std Pck	Sell	Grd	BCB	4.2" Std Pck Sell Grd BCB
87	4.2"	By Wght	Sell	Grd	SH	4.2" By Wght Sell Grd SH
88	4.2"	By Wght	Sell	Grd	SHS	4.2" By Wght Sell Grd SHS
89	4.2"	By Wght	Sell	Grd	NF	4.2" By Wght Sell Grd NF
90	4.2"	By Cnt	Sell	Grd	NF	4.2" By Cnt Sell Grd NF
91	4.2"	Std Pck	Sell	NF		4.2" Std Pck Sell NF
92	4.7"	By Wght	Sell	Grd		4.7" By Wght Sell Grd
93	4.7"	By Cnt	Sell	Grd		4.7" By Cnt Sell Grd
94	4.7"	Std Pck	Sell	Grd		4.7" Std Pck Sell Grd
95	4.7"	By Wght	Sell	Grd	BCB	4.7" By Wght Sell Grd BCB
96	4.7"	By Cnt	Sell	Grd	BCB	4.7" By Cnt Sell Grd BCB
97	4.7"	Std Pck	Sell	Grd	BCB	4.7" Std Pck Sell Grd BCB
98	4.7"	By Wght	Sell	Grd	SH	4.7" By Wght Sell Grd SH
99	4.7"	By Wght	Sell	Grd	SHS	4.7" By Wght Sell Grd SHS
100	4.7"	By Wght	Sell	Grd	NF	4.7" By Wght Sell Grd NF
101	4.7"	By Cnt	Sell	Grd	NF	4.7" By Cnt Sell Grd NF
102	4.7"	Std Pck	Sell	Grd	NF	4.7" Std Pck Sell Grd NF
103	5.1"	By Wght	Sell	Grd		5.1" By Wght Sell Grd
104	5.1"	By Cnt	Sell	Grd		5.1" By Cnt Sell Grd
105	5.1"	Std Pck	Sell	Grd		5.1" Std Pck Sell Grd
106	5.1"	By Wght	Sell	Grd	BCB	5.1" By Wght Sell Grd BCB
107	5.1"	By Cnt	Sell	Grd	BCB	5.1" By Cnt Sell Grd BCB
108	5.1"	Std Pck	Sell	Grd	BCB	5.1" Std Pck Sell Grd BCB
109	5.1"	By Wght	Sell	Grd	SH	5.1" By Wght Sell Grd SH
110	5.1"	By Wght	Sell	Grd	SHS	5.1" By Wght Sell Grd SHS
111	5.1"	By Wght	Sell	Grd	NF	5.1" By Wght Sell Grd NF
112	5.1"	By Cnt	Sell	Grd	NF	5.1" By Cnt Sell Grd NF
113	5.1"	Std Pck	Sell	Grd	NF	5.1" Std Pck Sell Grd NF
114	Cont	By Wght	Sell	BCB		Cont By Wght Sell BCB
115	Cont	By Cnt	Sell	BCB		Cont By Cnt Sell BCB
116	Cont	Std Pck	Sell	BCB		Cont Std Pck Sell BCB
117	Cont	By Wght	Sell	SH	BCB	Cont By Wght Sell SH BCB
118	Cont	By Wght	Sell	NF	BCB	Cont By Wght Sell NF BCB
119	Cont	By Cnt	Sell	NF	BCB	Cont By Cnt Sell NF BCB
120	Cont	Std Pck	Sell	NF	BCB	Cont Std Pck Sell NF BCB
121	Receipt					Receipt

1.9 Inch (48.3 mm) Label Formats

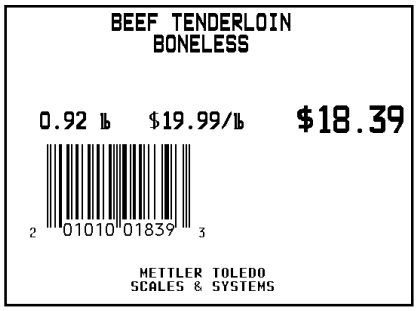


31 By Weight/Prepack (Sell By Date)

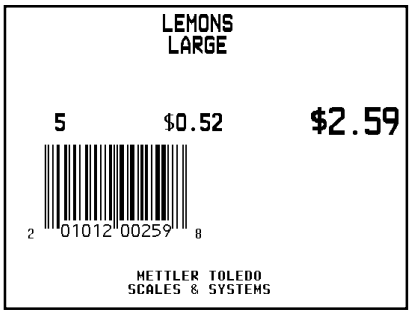


32 - By Count (Sell By Date)

33 - Standard Pack (Sell By Date)

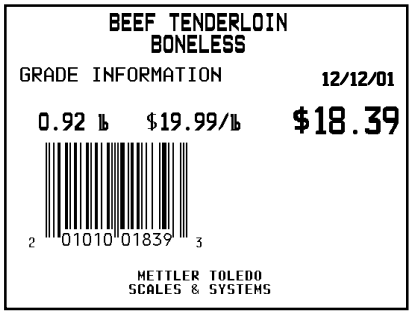


34 - By Weight/Prepack

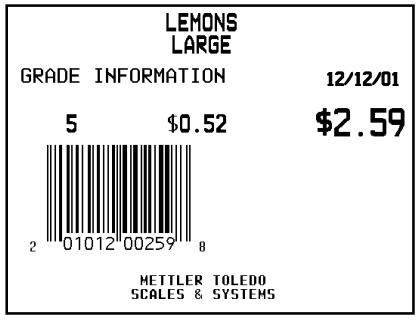


35 - By Count

36 - Standard Pack



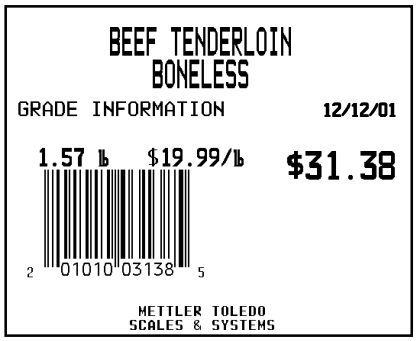
37 - By Weight/Prepack (Pack Date)



38 - By Count (Pack Date)

39 - Standard Pack (Pack Date)

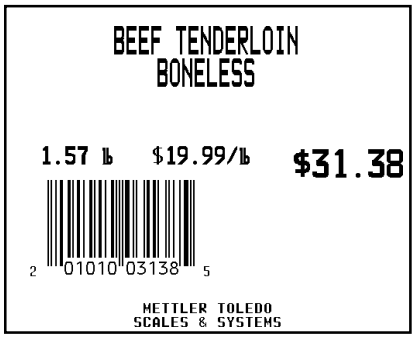
2.1 Inch (53.3 mm) Label Formats



40 By Weight/Prepack (Sell By Date)

41 By Count (Sell By Date)

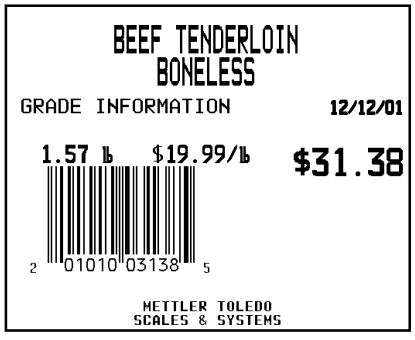
42 Standard Pack (Sell By Date)



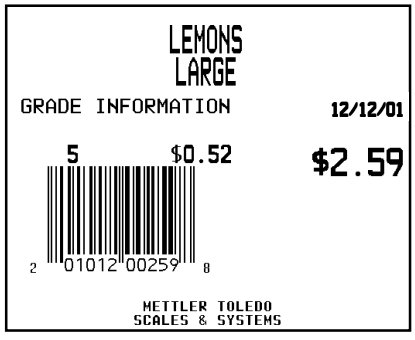
43 By Weight/Prepack

44 By Count

45 Standard Pack



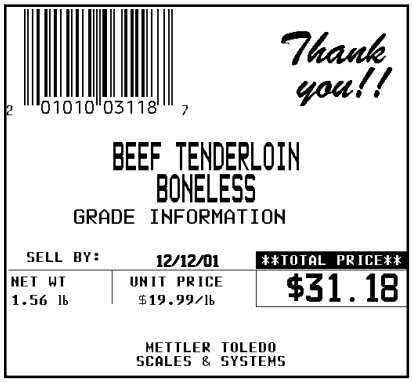
46 By Weight/Prepack (Pack Date)



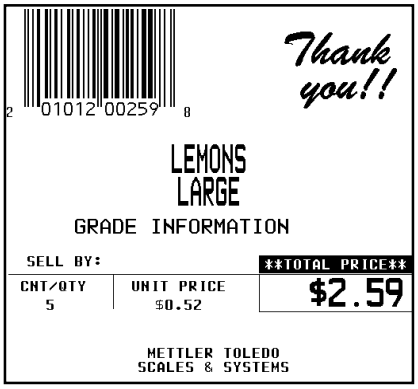
47 By Count (Pack Date)

48 Standard Pack (Pack Date)

2.4 Inch (61.0 mm) Label Formats

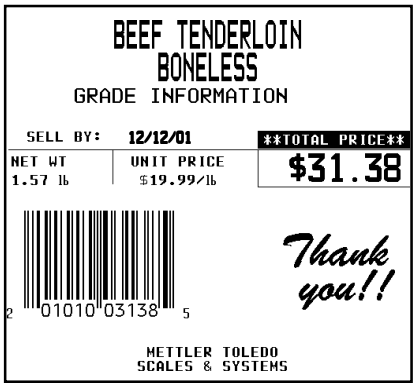


49 By Weight/Prepack

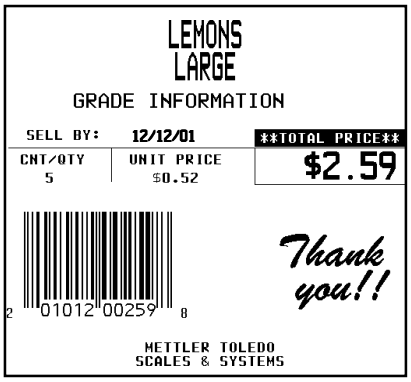


50 By Count

51 Standard Pack

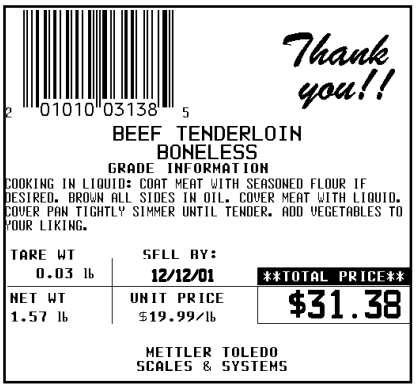


52 By Weight/Prepack

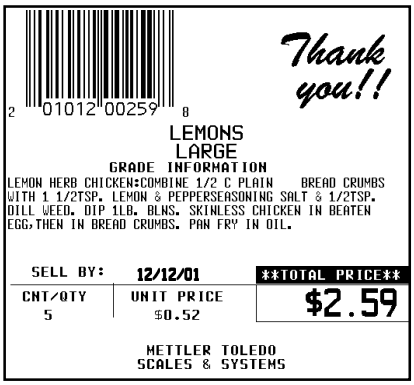


53 By Count

54 Standard Pack

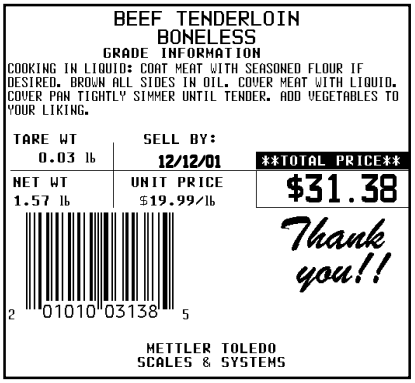


55 By Weight/Prepack

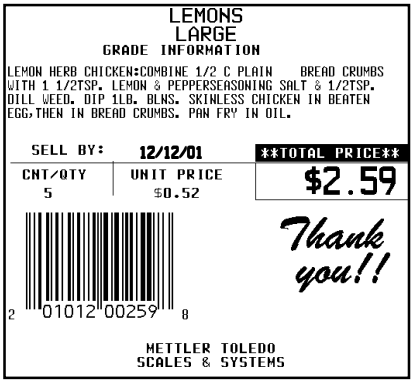


56 By Count

57 Standard Pack



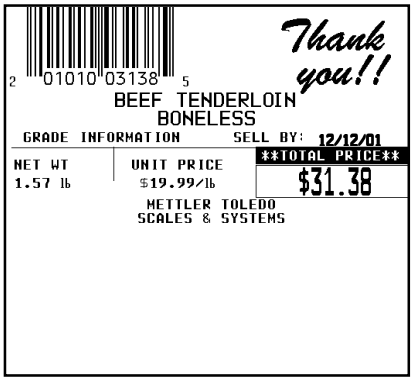
58 By Weight/Prepack



59 By Count

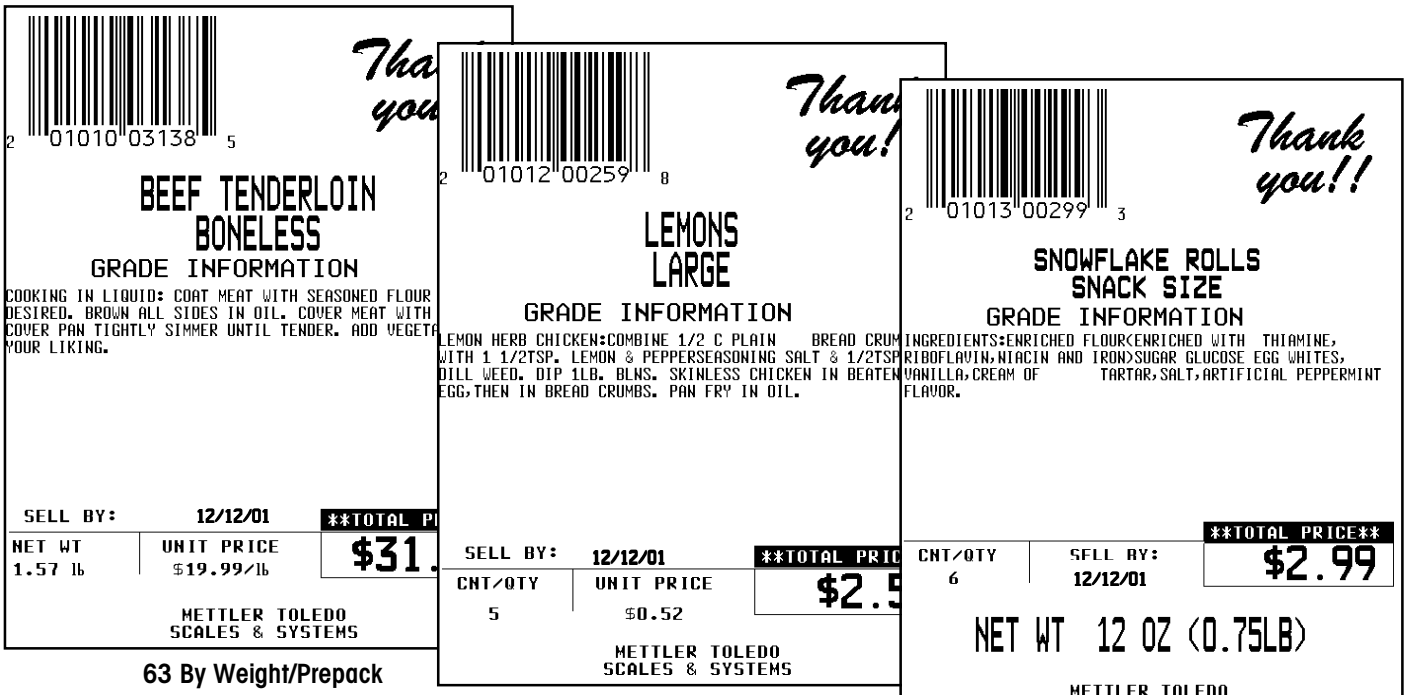
60 Standard Pack

61 By Weight/Prepack



62 By Weight/Prepack

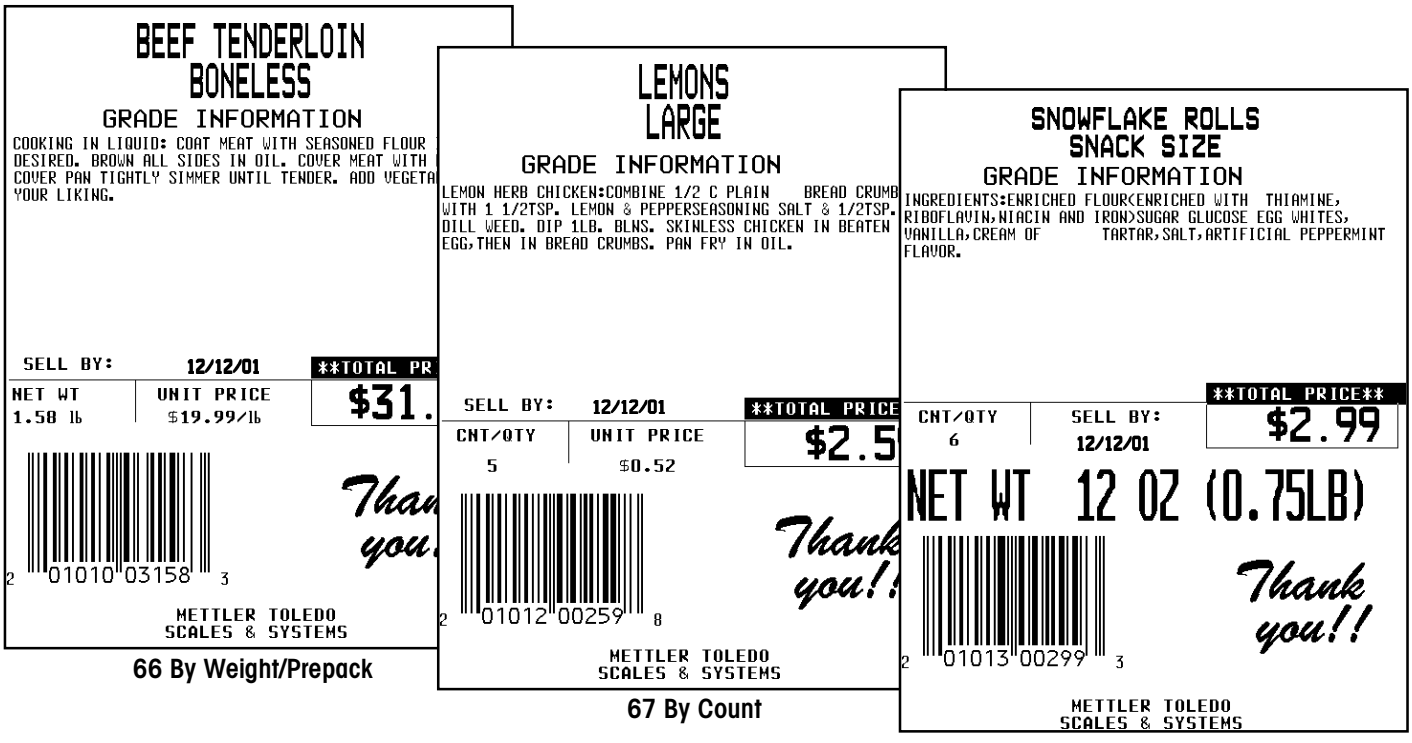
3.3 Inch (83.8 mm) Label Formats



63 By Weight/Prepack

64 By Count

65 Standard Pack

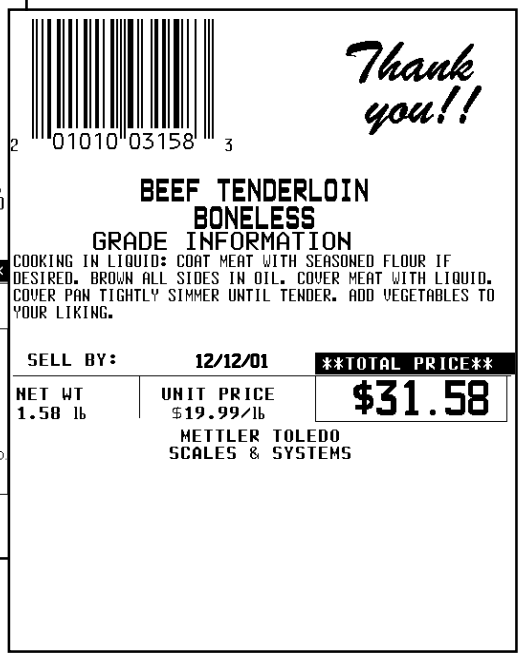


66 By Weight/Prepack

67 By Count

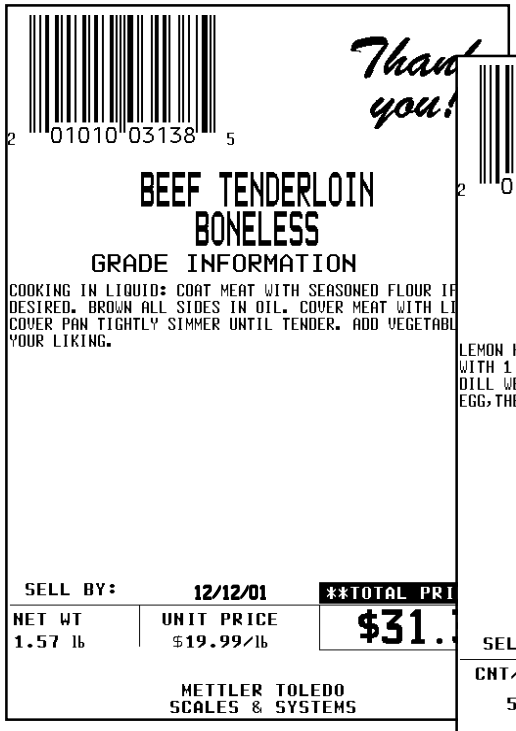
68 Standard Pack

69 By Weight/Prepack

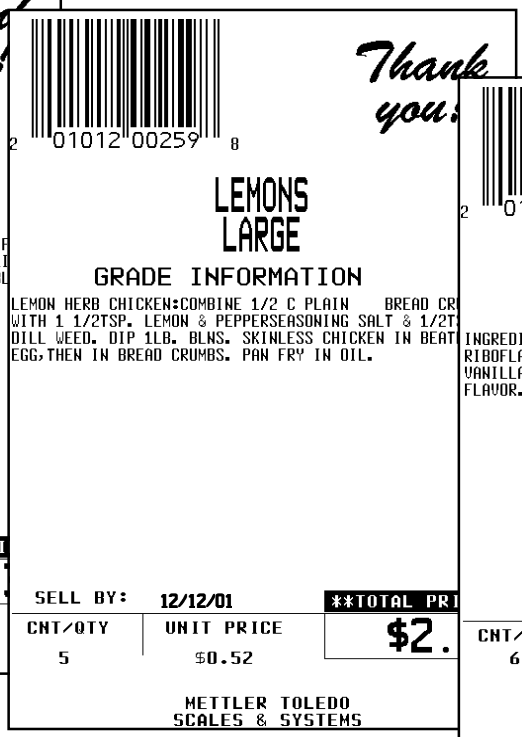


70 By Weight/Prepack

3.7 Inch (94.0 mm) Label Formats

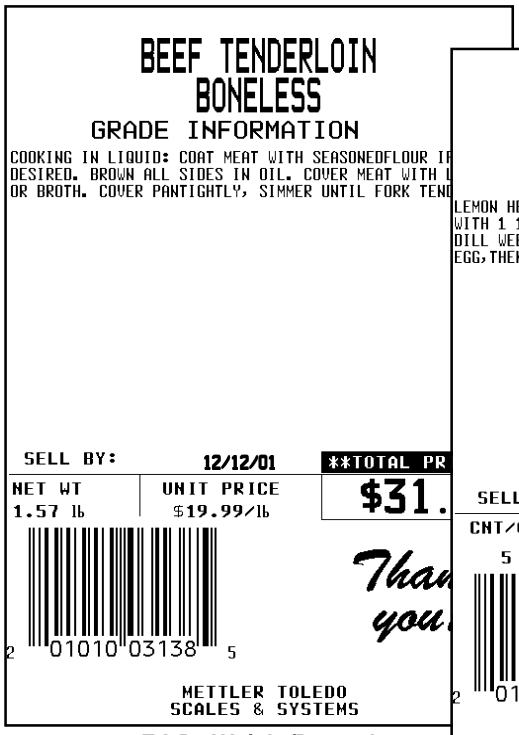


71 By Weight/Prepack

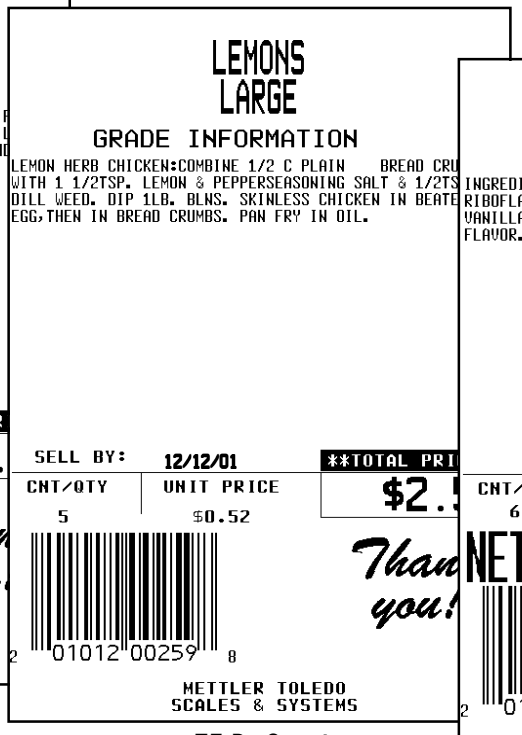


72 By Count

73 Standard Pack



74 By Weight/Prepack

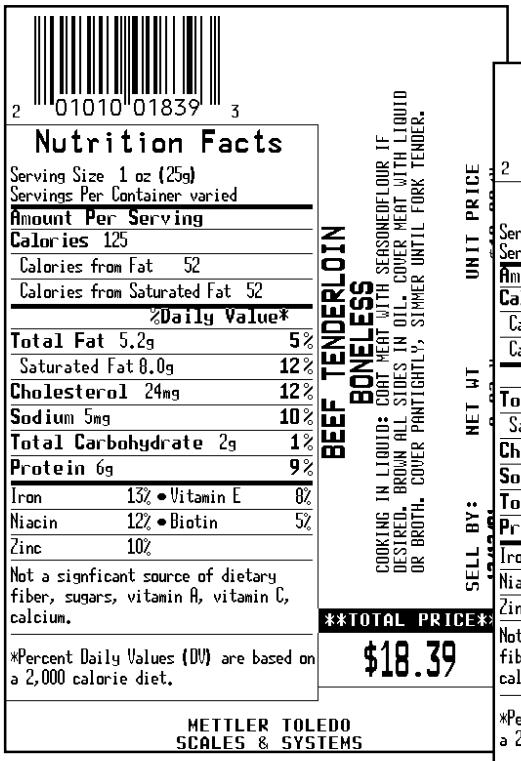


75 By Count

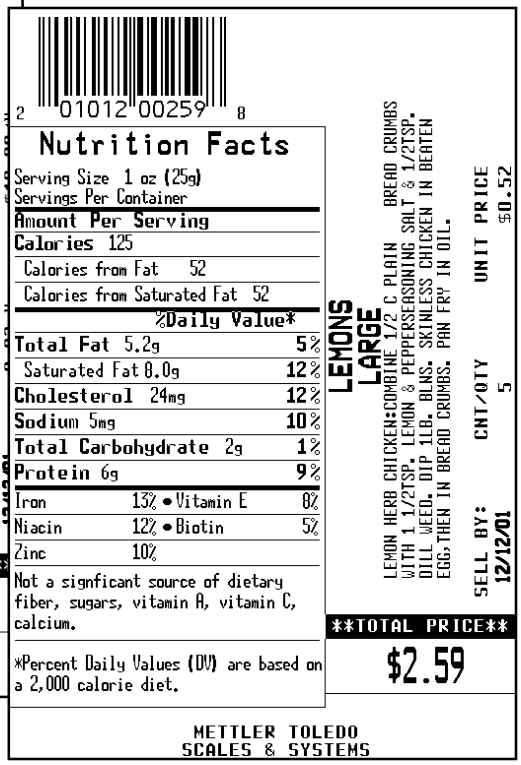
76 Standard Pack

77 By Weight/Prepack

78 By Weight/Prepack

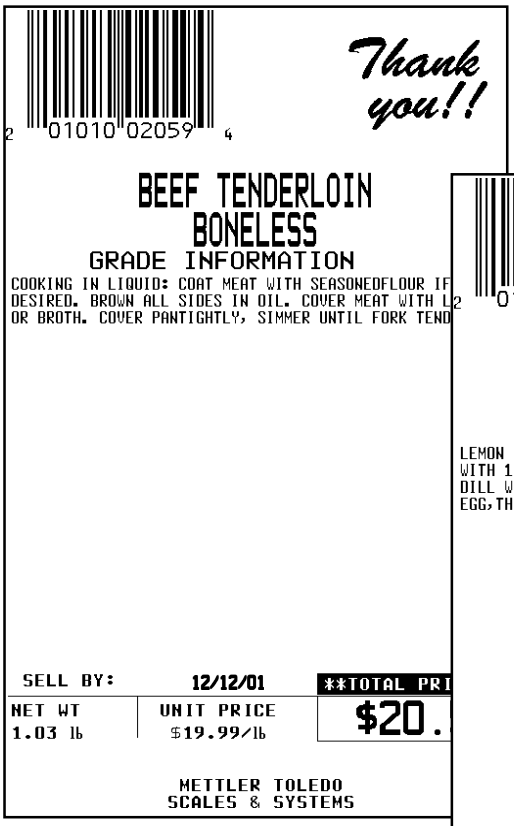


79 By Weight/Prepack

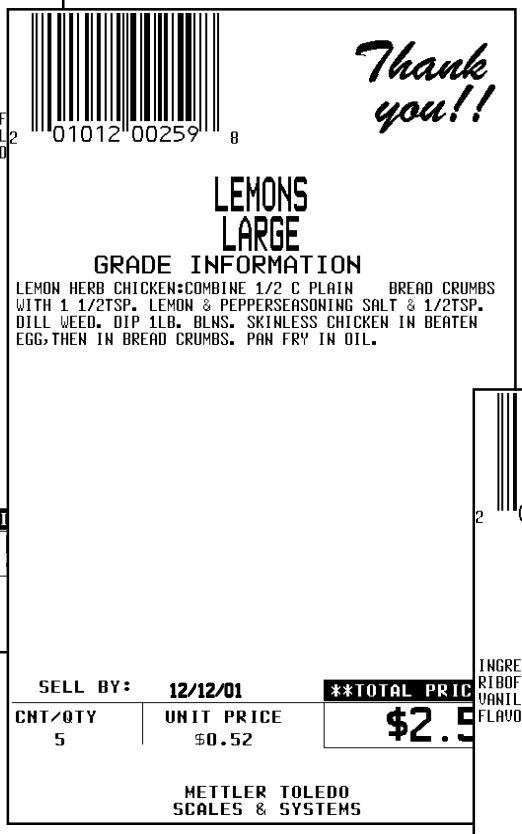


80 By Count

4.2 Inch (106.7 mm) Label Formats

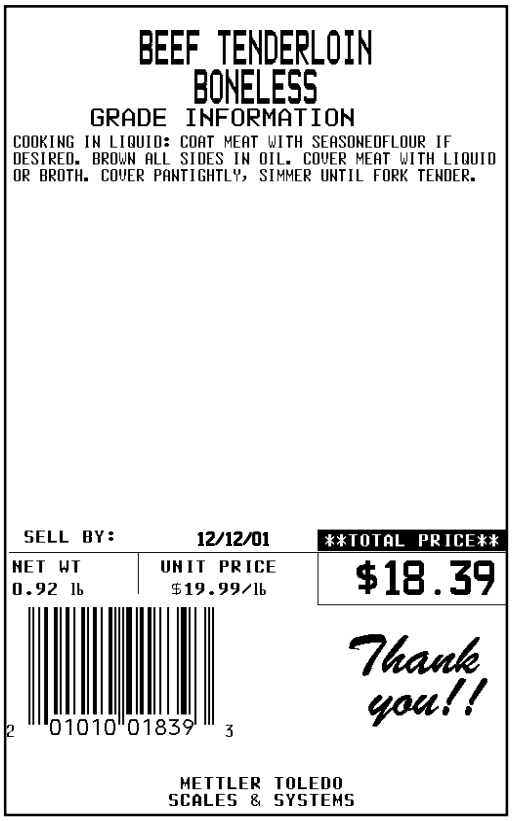


81 By Weight/Prepack

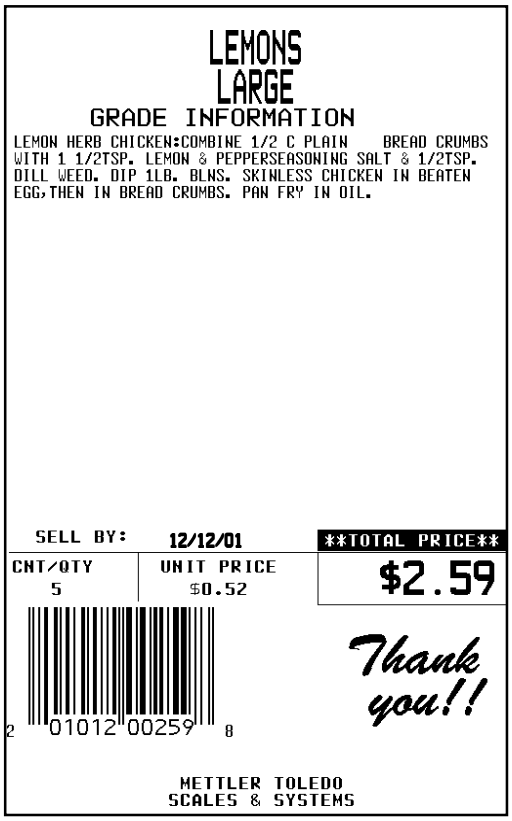


82 By Count

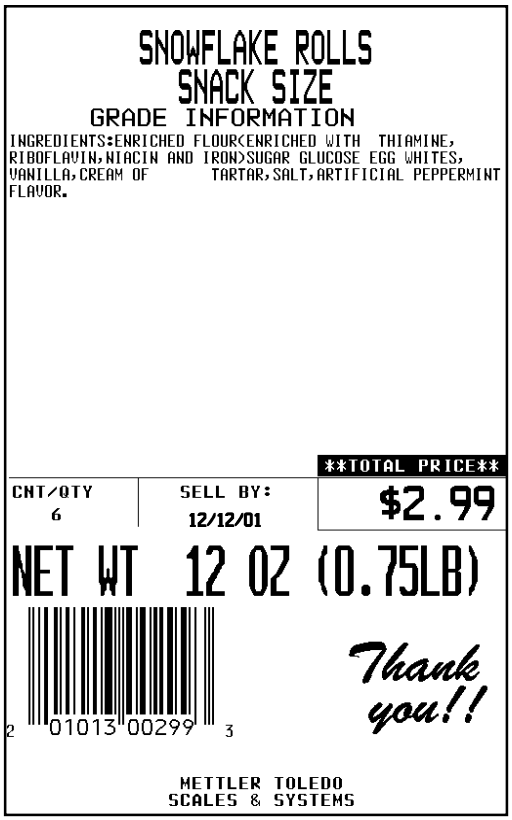
83 Standard Pack



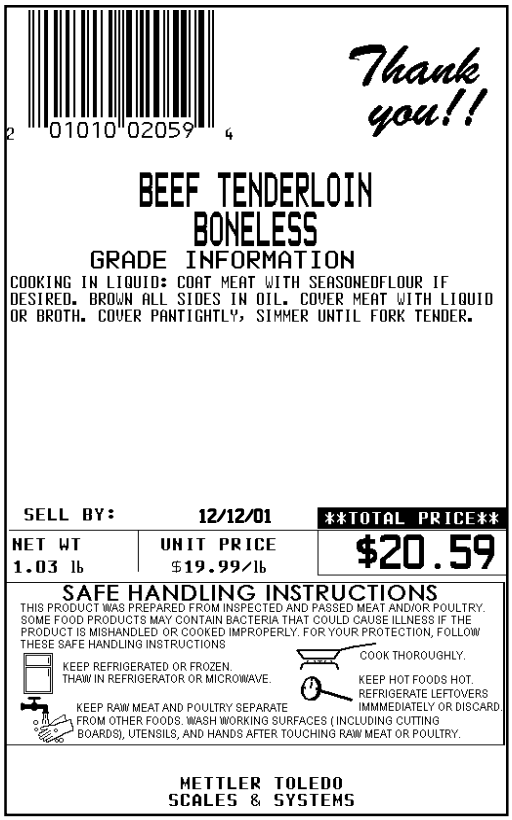
84 By Weight/Prepack



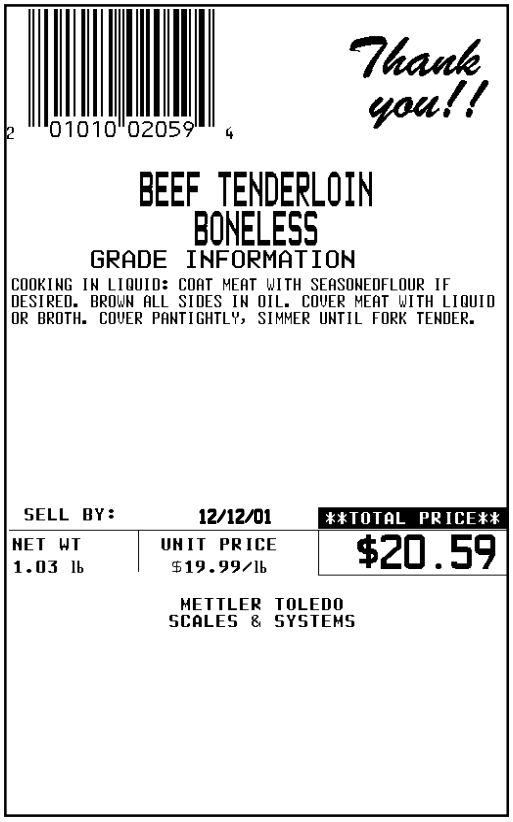
85 By Count



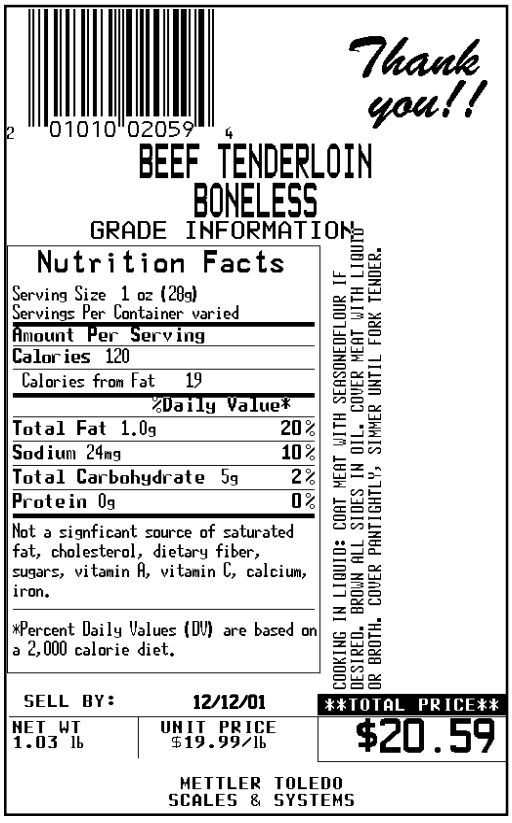
86 Standard Pack



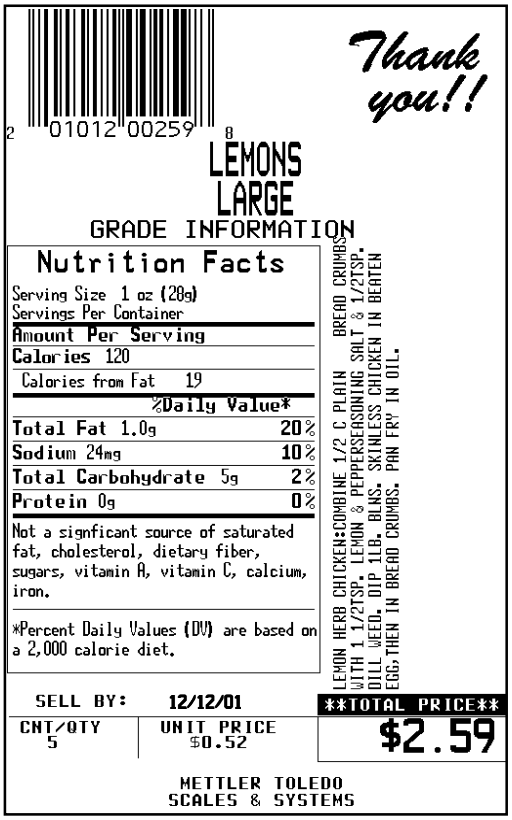
87 By Weight/Prepack



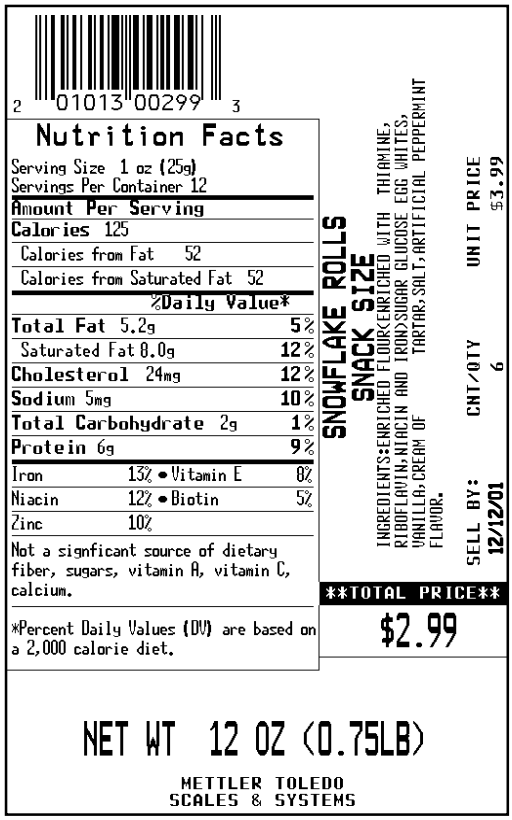
88 By Weight/Prepack



89 By Weight/Prepack

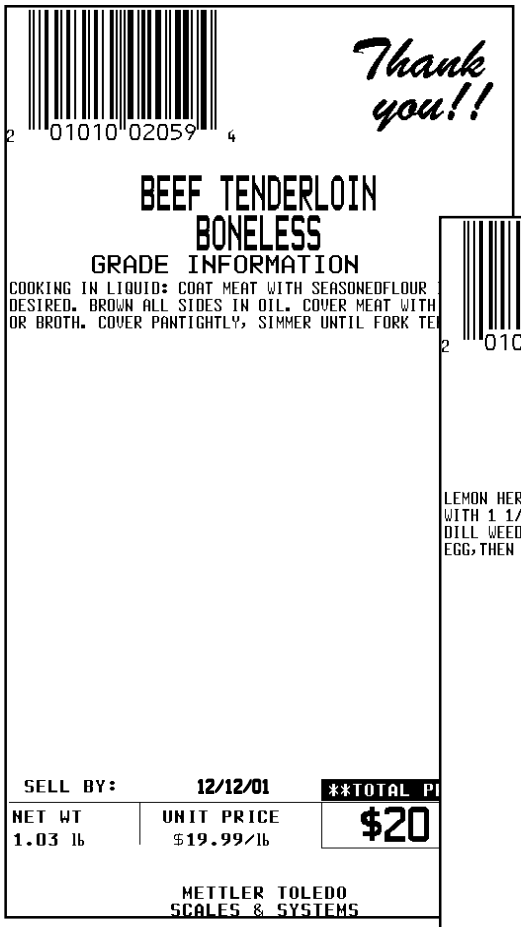


90 By Count

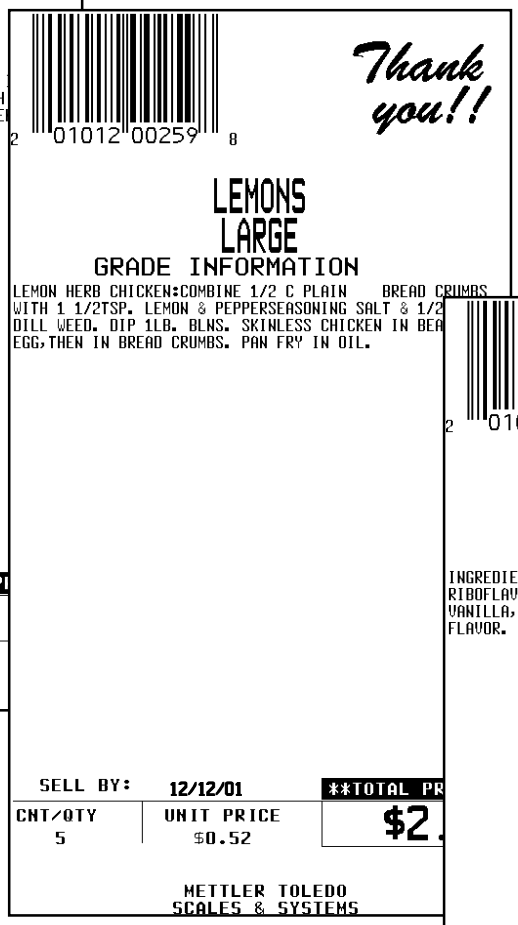


91 Standard Pack

4.7 Inch (119.4 mm) Label Formats

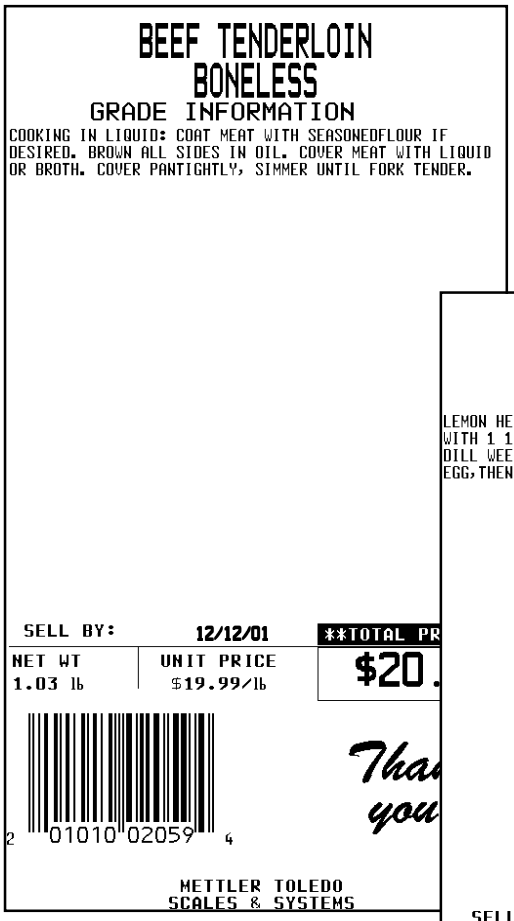


92 By Weight/Prepack

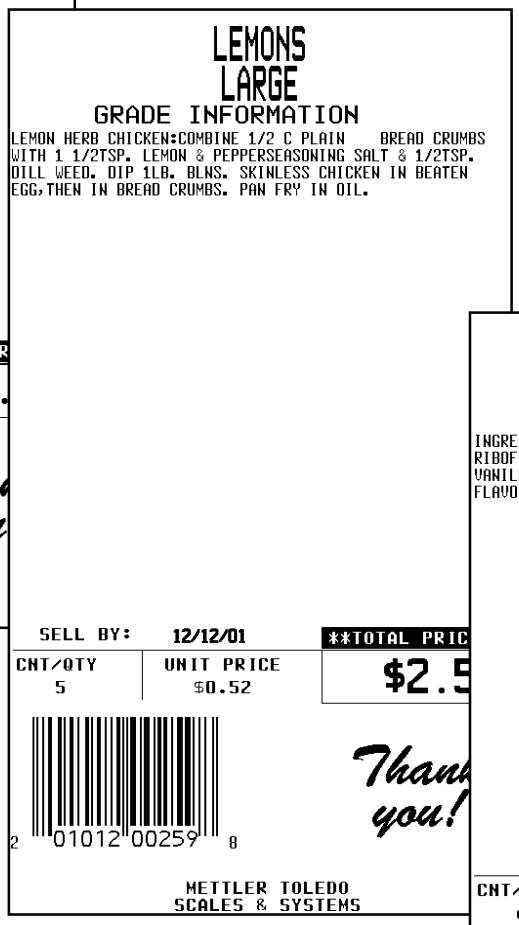


93 By Count

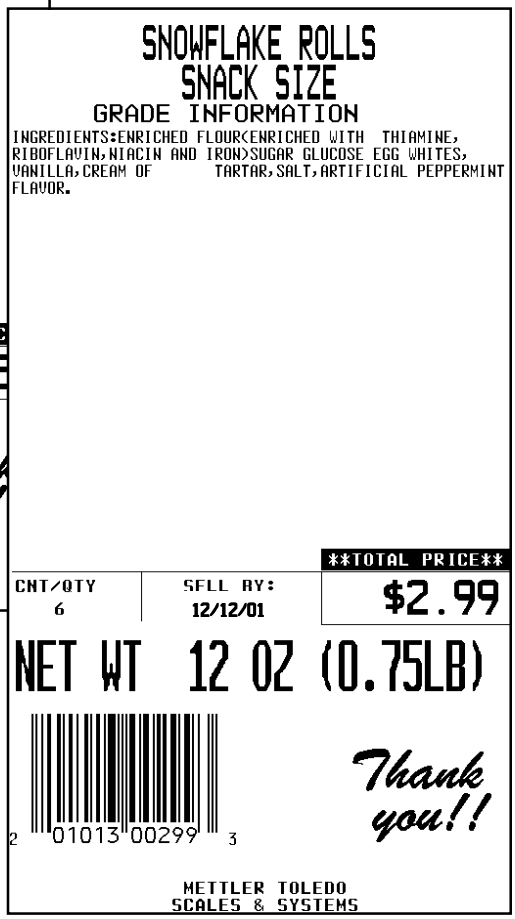
94 Standard Pack



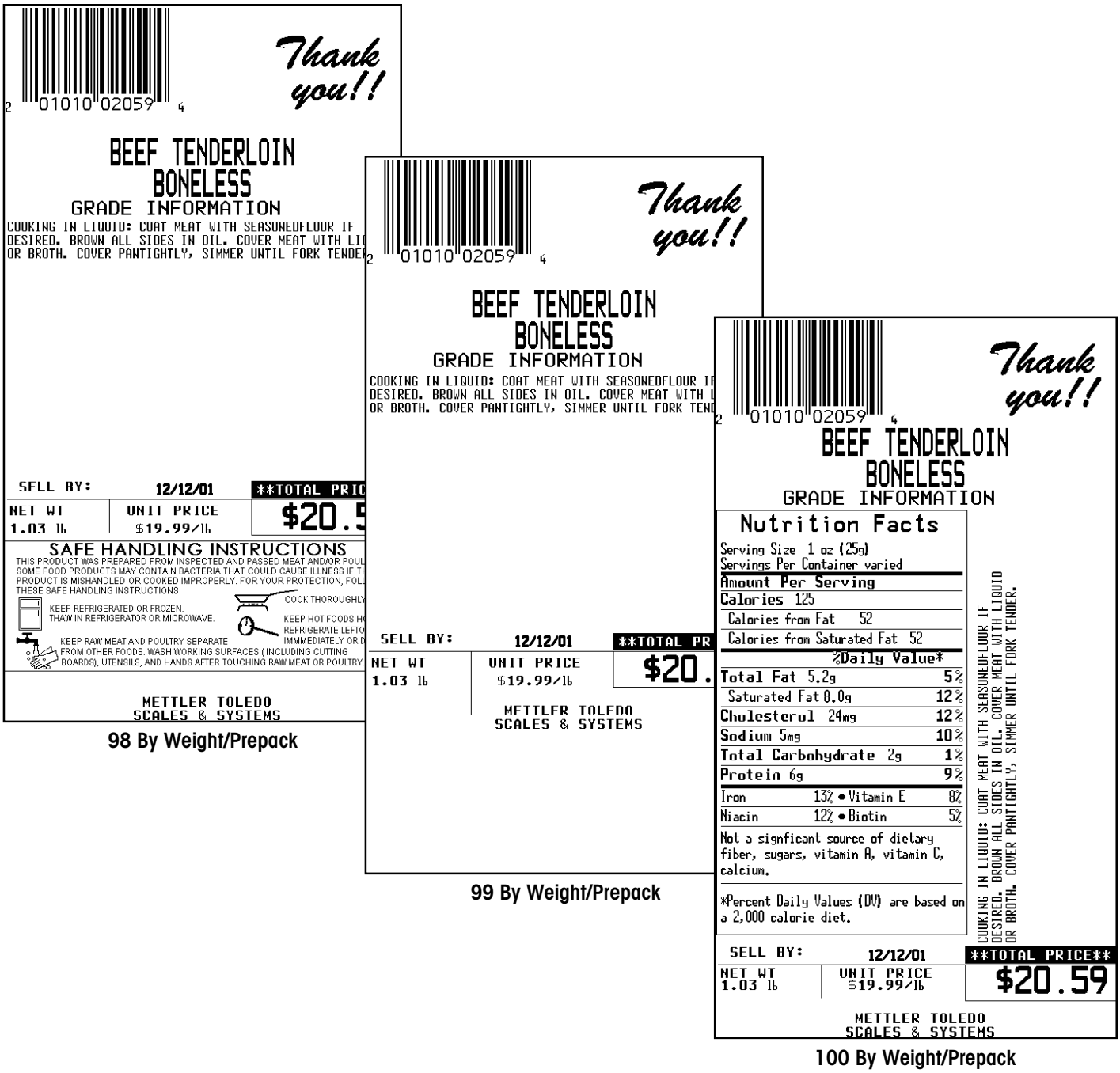
95 By Weight/Prepack



96 By Count



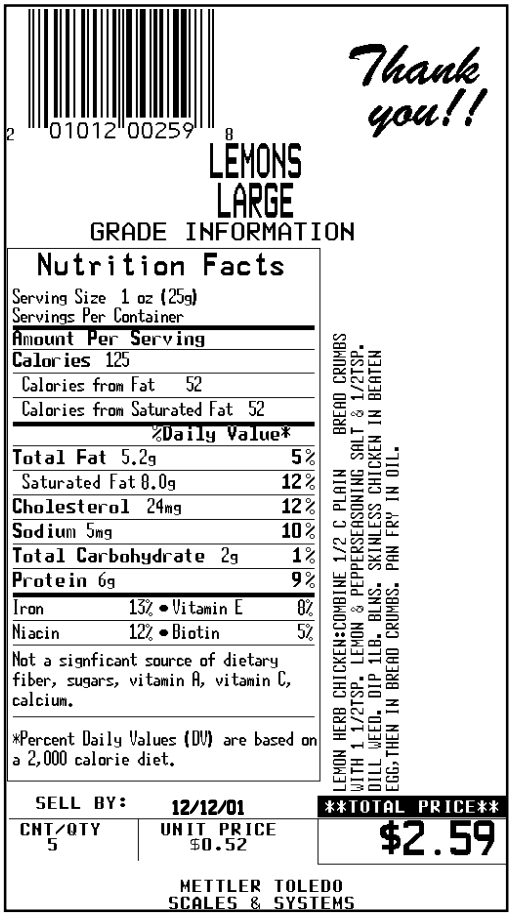
97 Standard Pack



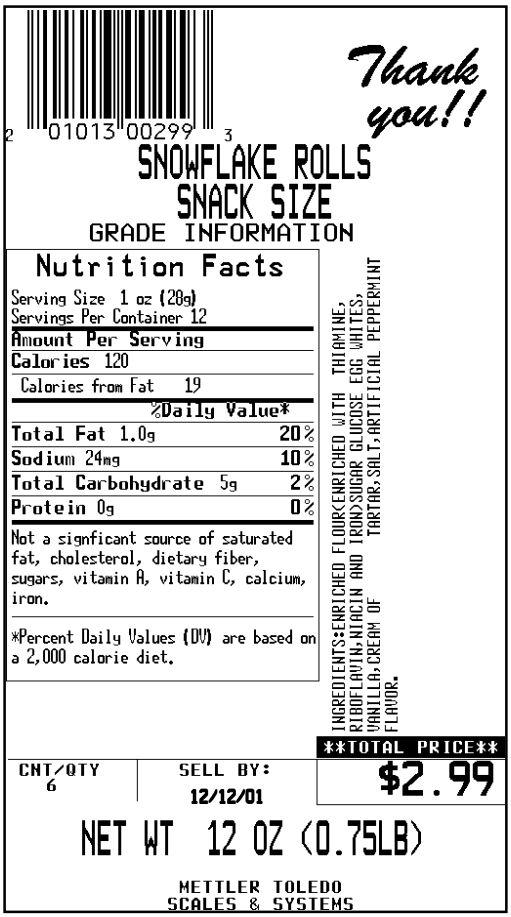
98 By Weight/Prepack

99 By Weight/Prepack

100 By Weight/Prepack

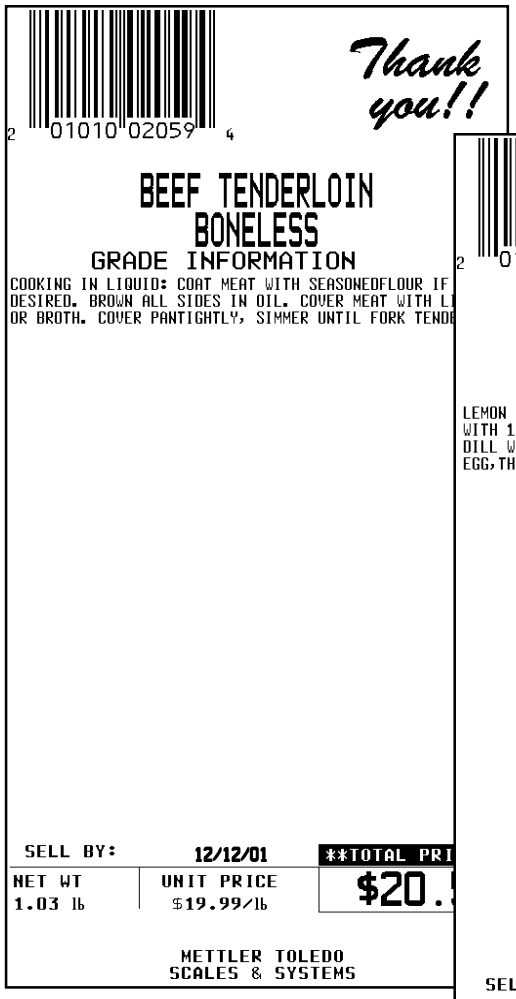


101 By Count

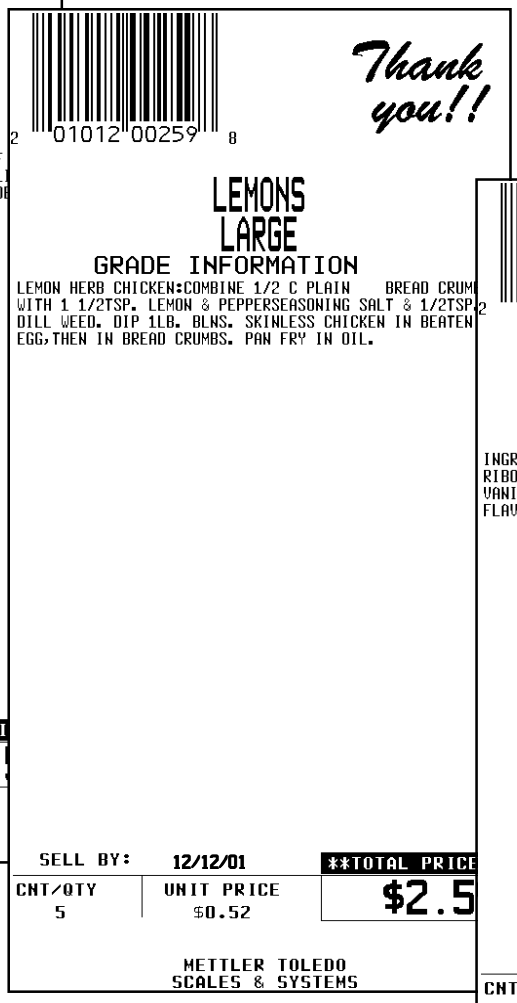


102 Standard Pack

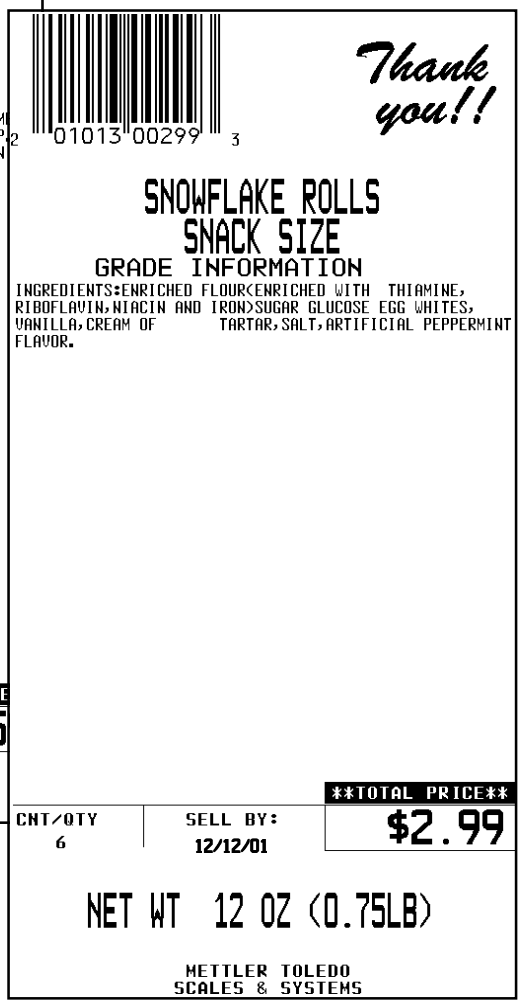
5.1 Inch (129.5 mm) Label Formats



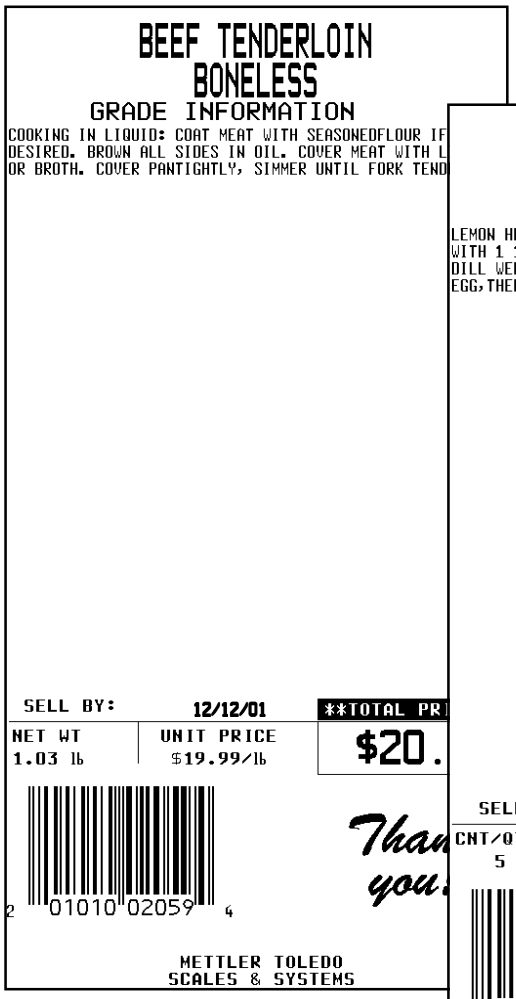
103 By Weight/Prepack



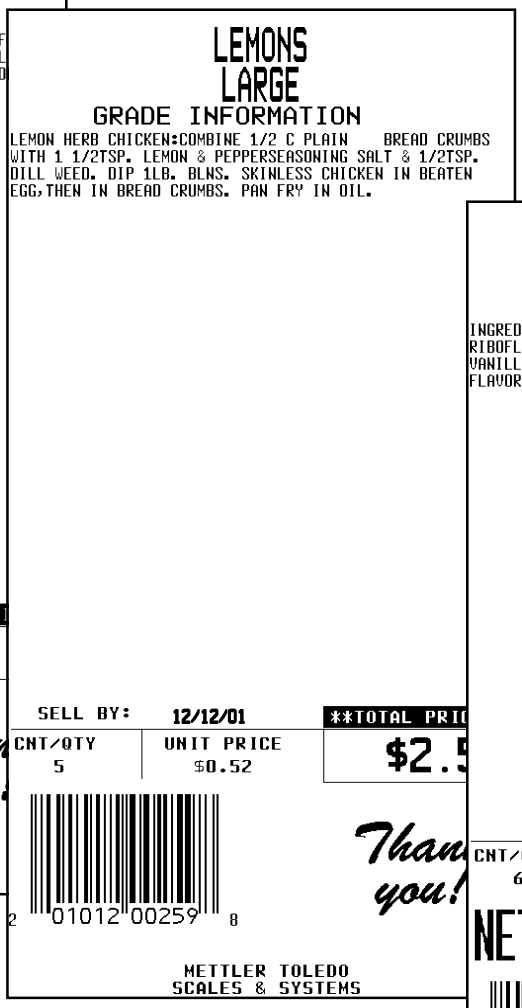
104 By Count



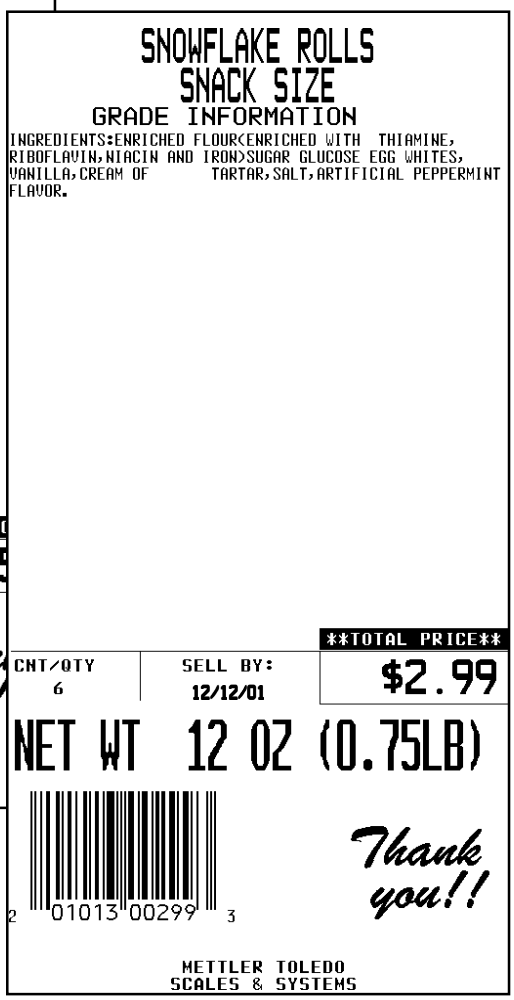
105 Standard Pack



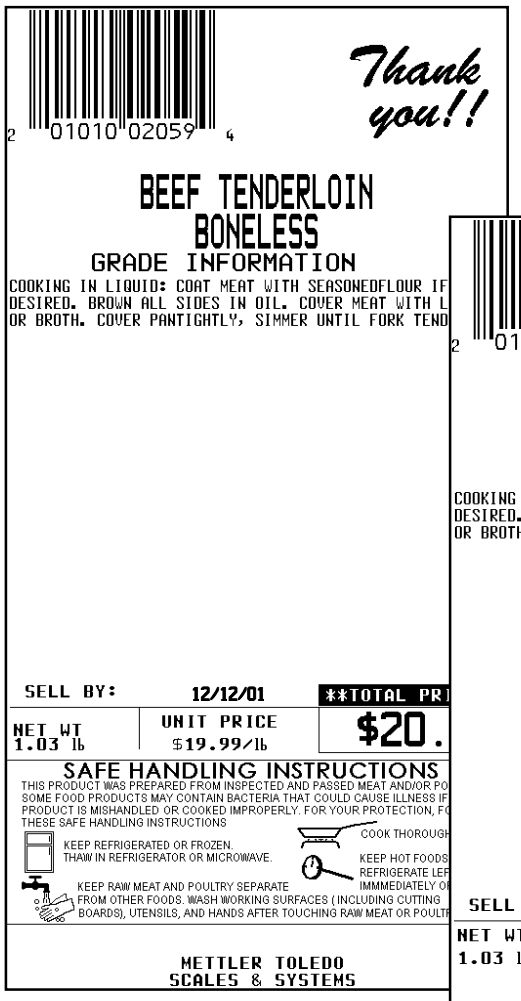
106 By Weight/Prepack



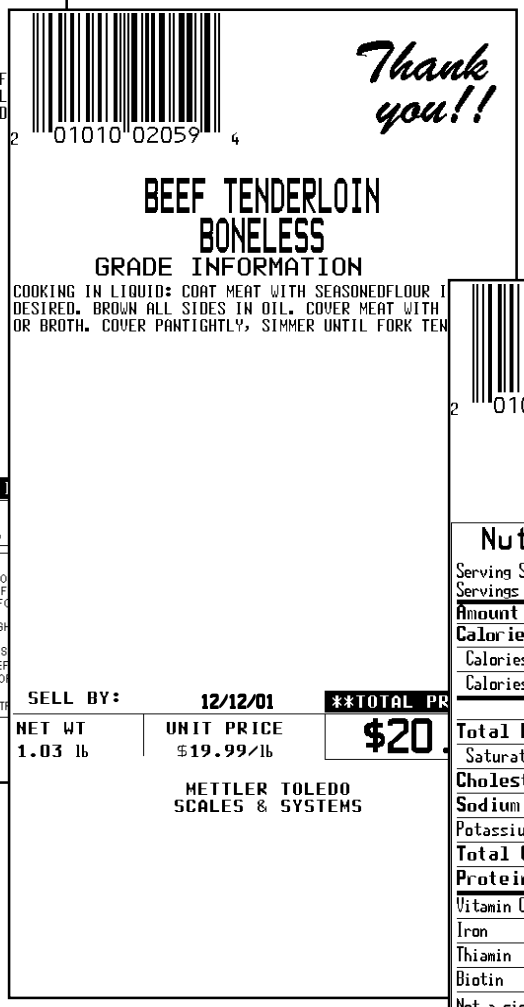
107 By Count



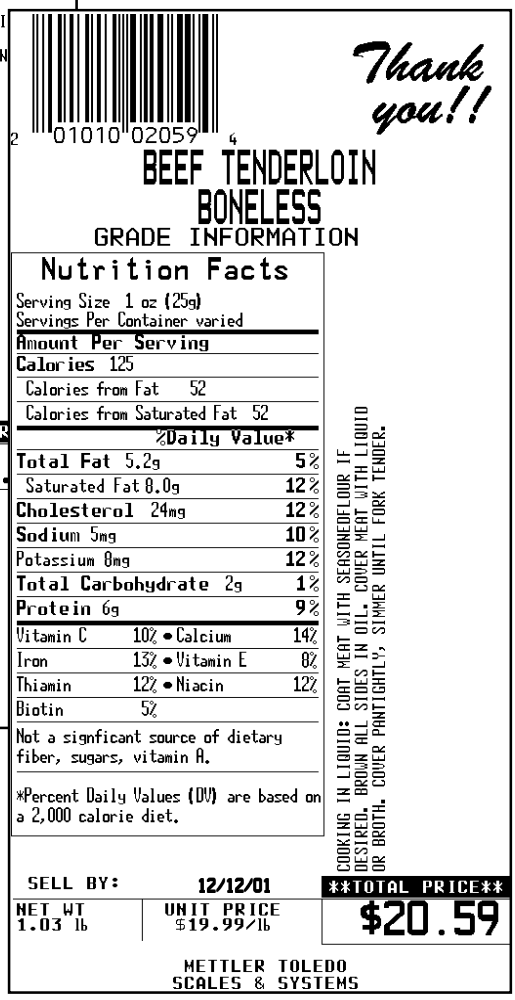
108 Standard Pack



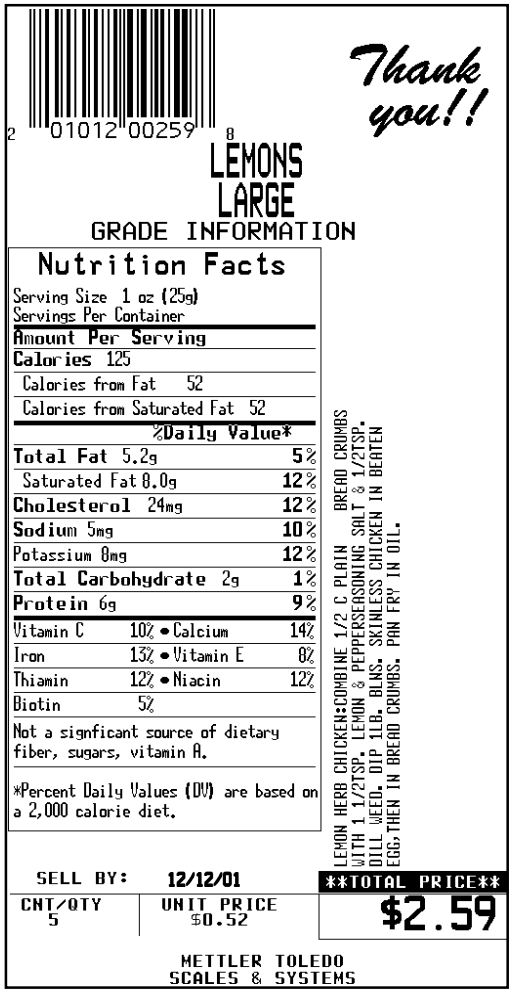
109 By Weight/Prepack



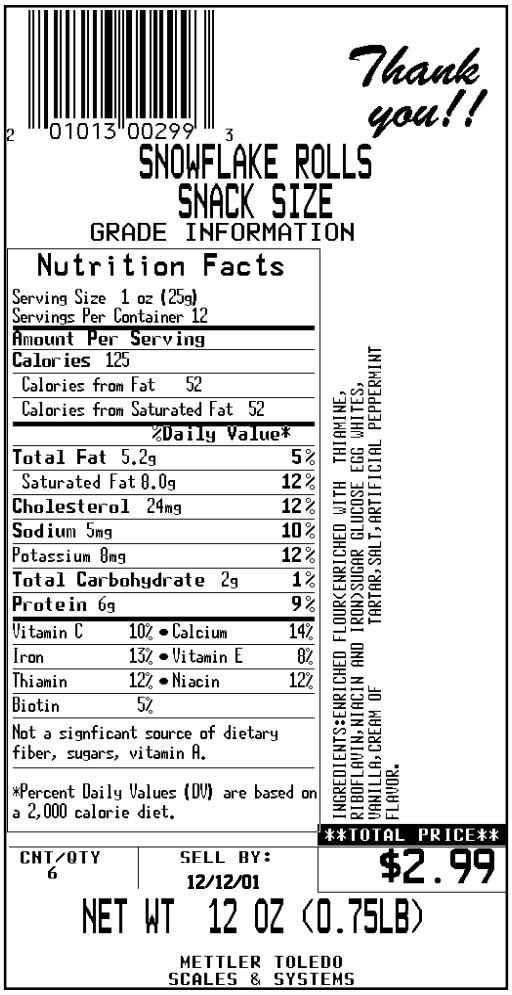
110 By Weight/Prepack



111 By Weight/Prepack



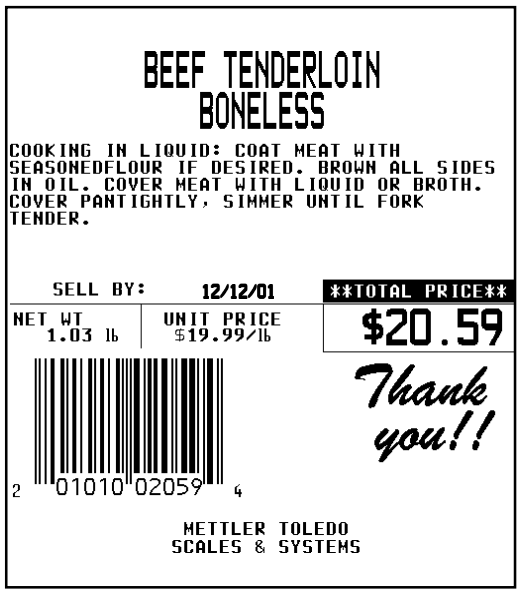
112 By Count



113 Standard Pack

Continuous Label Formats

Maximum of 6 inches for continuous strip labels.

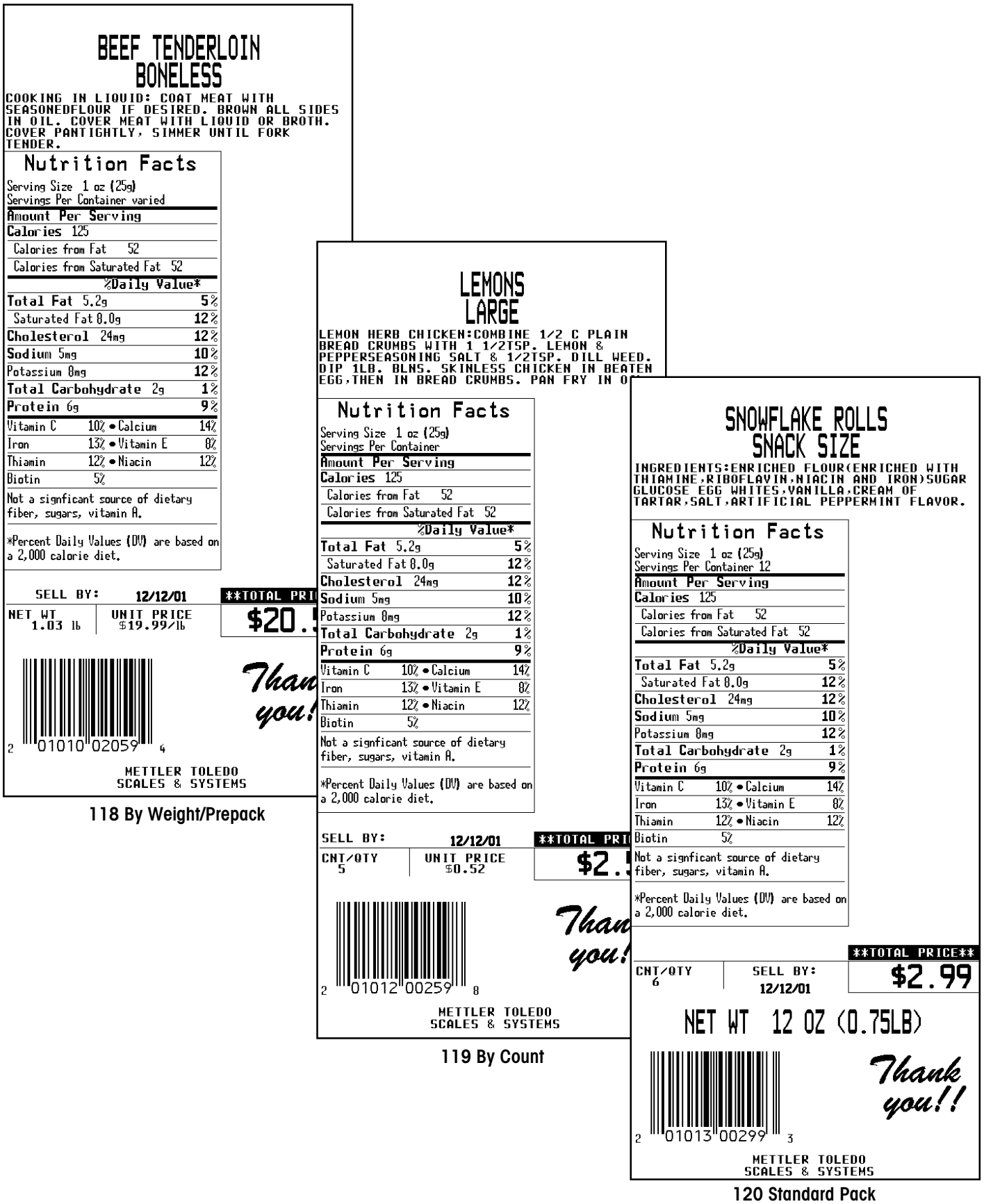


114 By Weight/Prepack

115 By Count

116 Standard Pack

117 By Weight/Prepack



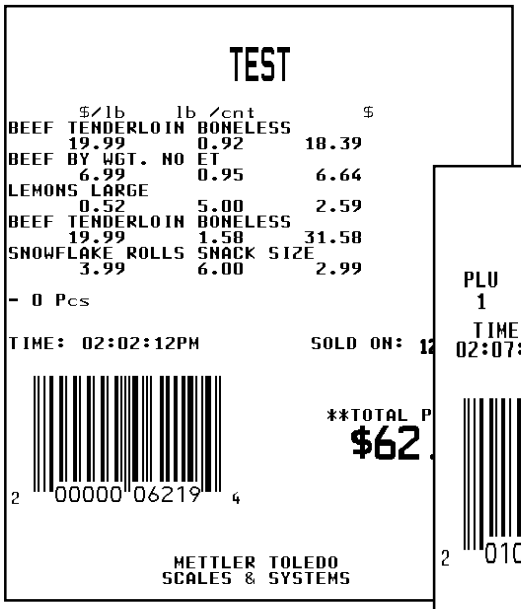
118 By Weight/Prepack

119 By Count

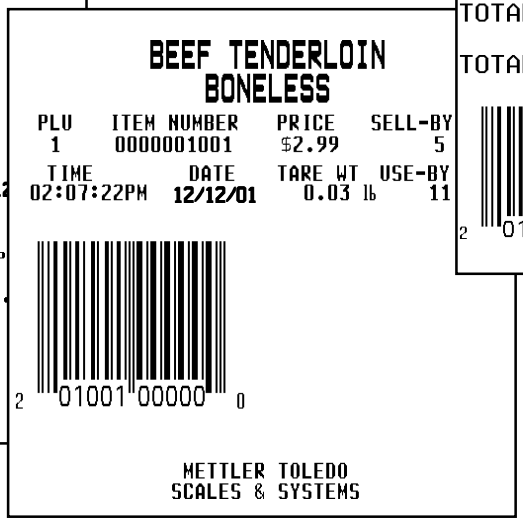
120 Standard Pack

Other Label Formats

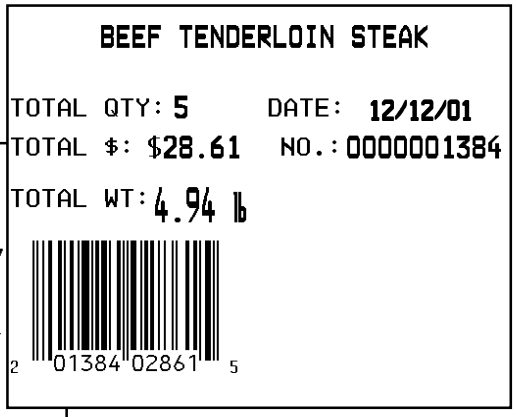
Maximum of 6 inches for continuous strip labels.



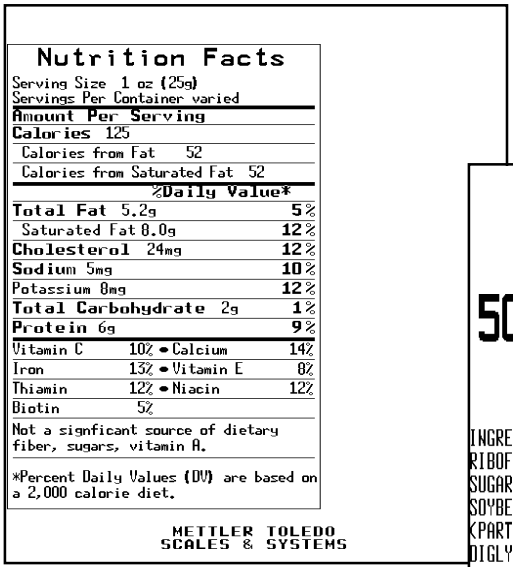
121 Receipt



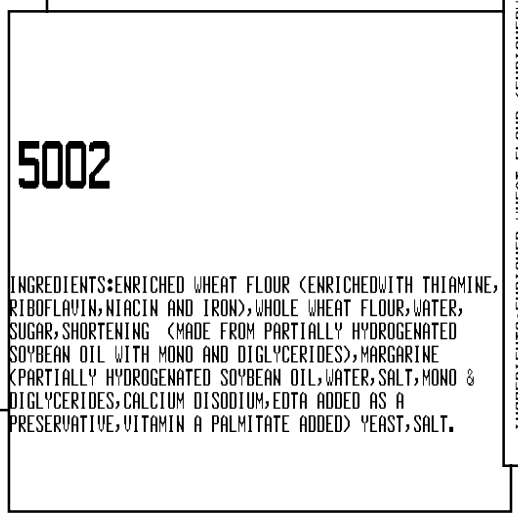
122 Verification Label



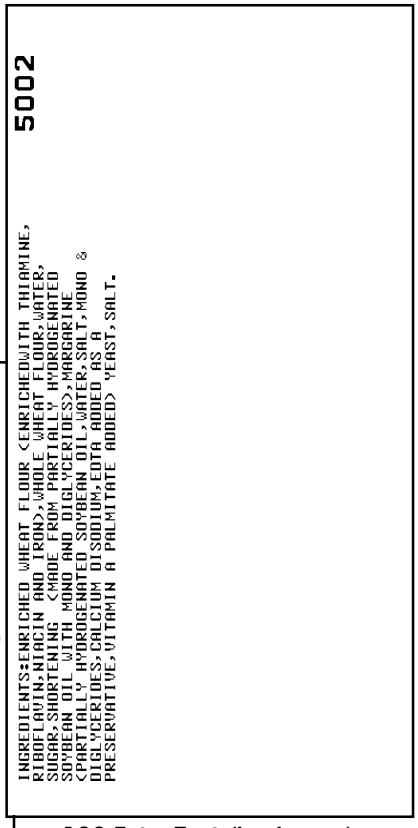
123 Run Total



124 Nutrition Facts

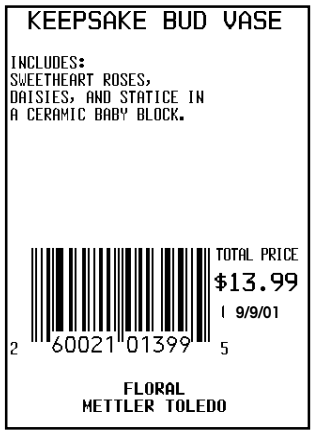


125 Extra Text

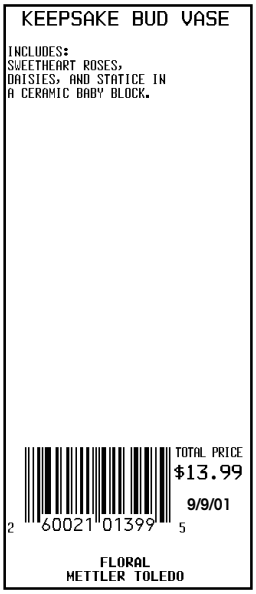


126 Extra Text (landscape)

Floral Label Formats



130 By Count
(2.2 inch/55.9 mm)



131 By Count
(3.8 inch/96.5 mm)

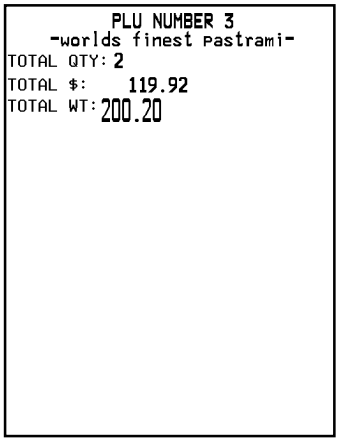
132 By Count
(1.5 inch/38.1 mm)

133 By Count
(0.9 inch/22.9 mm)

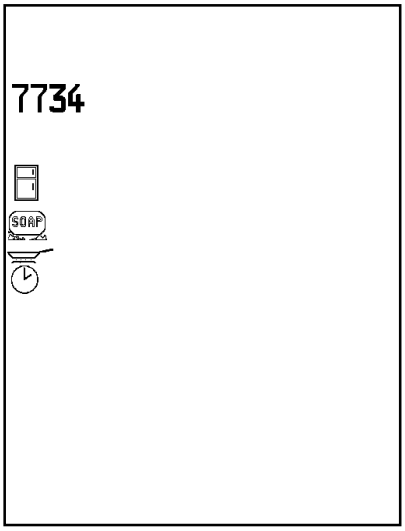
134 By Weight/Prepack
(1.5 inch/38.1 mm)

Stand Alone Label Formats

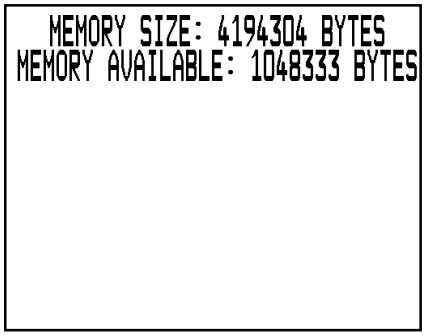
(Can be used in Satellite but normally used for Stand Alone functions)



127 Report Totals



128 Graphics Verification



129 Memory Report Format

10 Operating the Scale

General Guidelines

When weighing items, please follow the DO List.

- Do place the item on the scale pan gently.
- Do place any oversize objects on the pan carefully and centered on the pan.
- Do weigh only items under the scale capacity (30 lb or 15 kg) to prevent damage to the unit.
- Do exercise care when weighing any unstable items that could fall out of the pan.
- Do periodically check for any loose hardware or mounting brackets and report any problems to your maintenance representative.

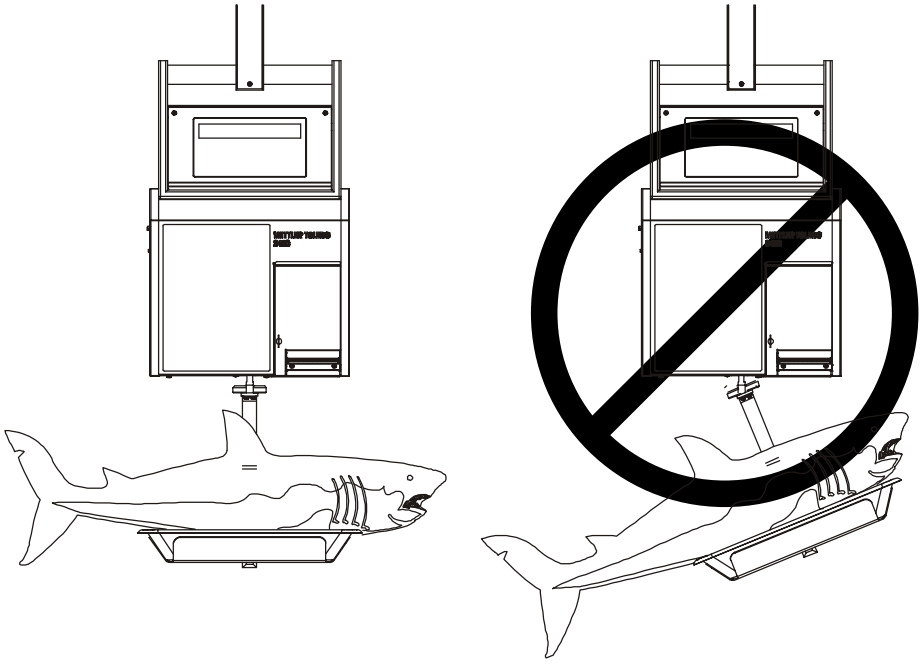
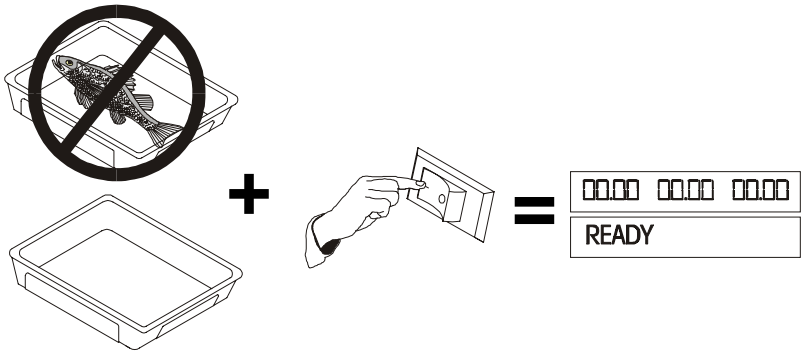


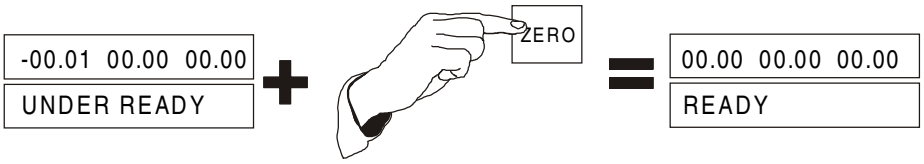
Figure 10-1: Oversized Items

Basic Functions

Starting the Model 2450

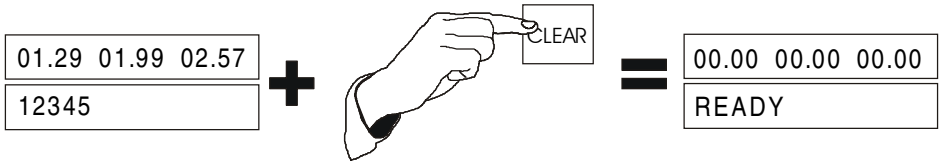


Zero



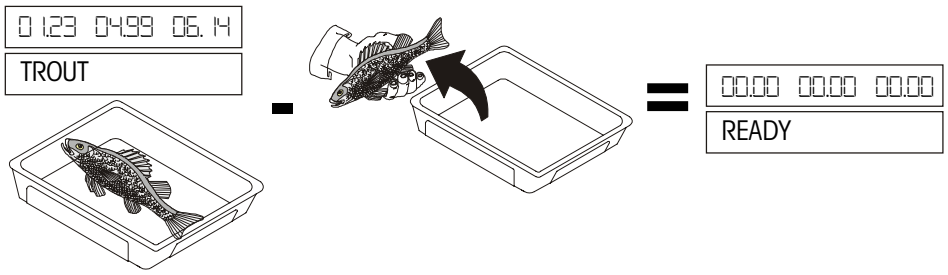
Clear

Manual Clear

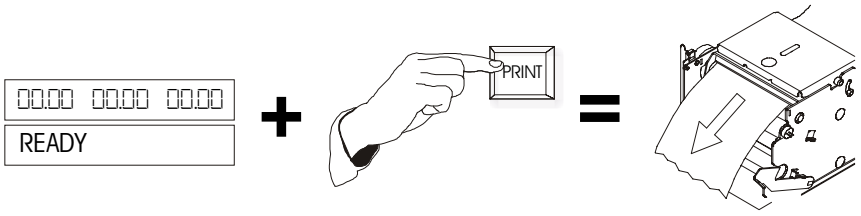


Automatic Clear

In the Service Mode, after a label is printed for a By Weight PLU, and the item is removed from the platter, the display will automatically clear the PLU and return to the **READY** prompt.

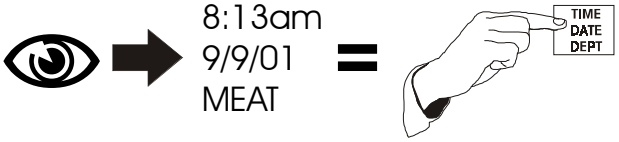


Label Feed

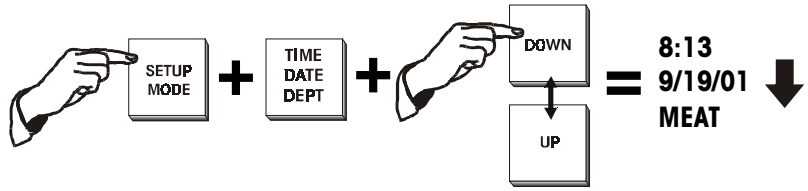


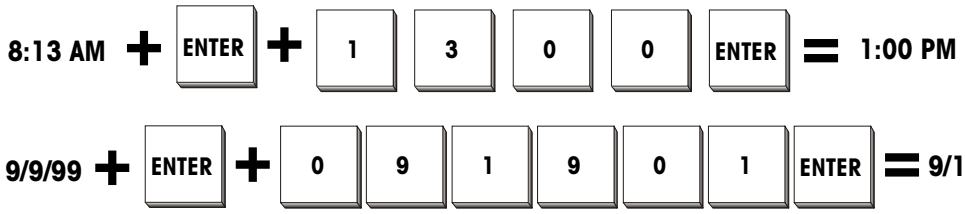
Time, Date, Department

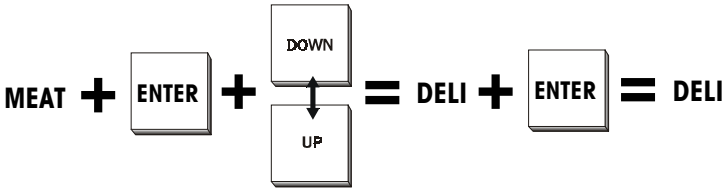
View Only

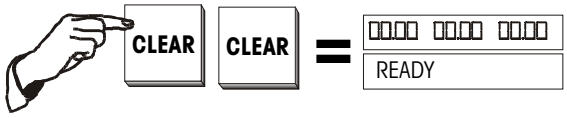


Change



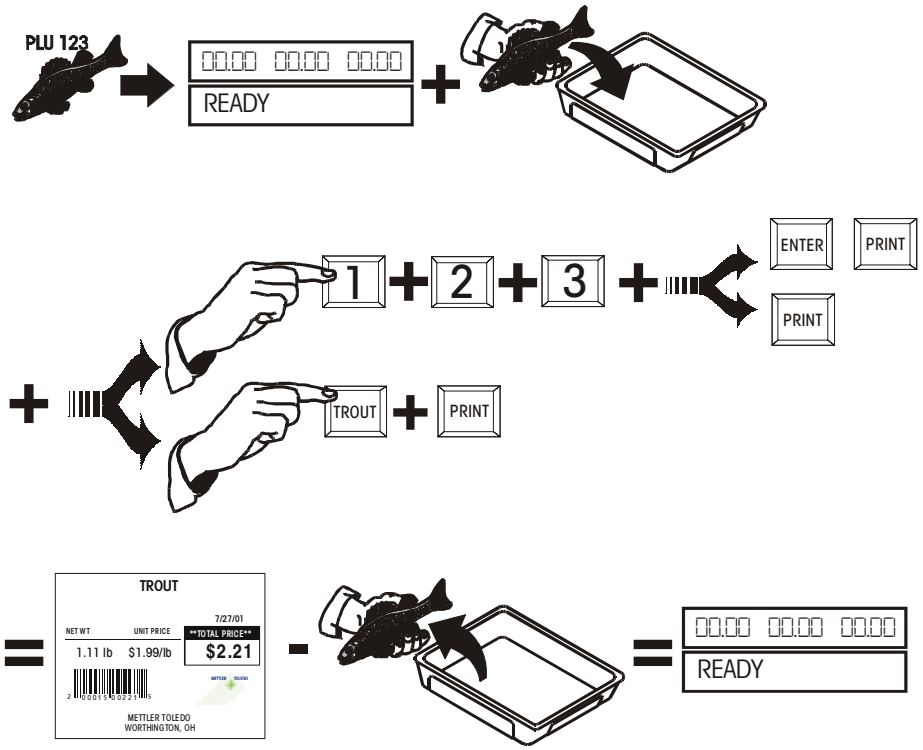




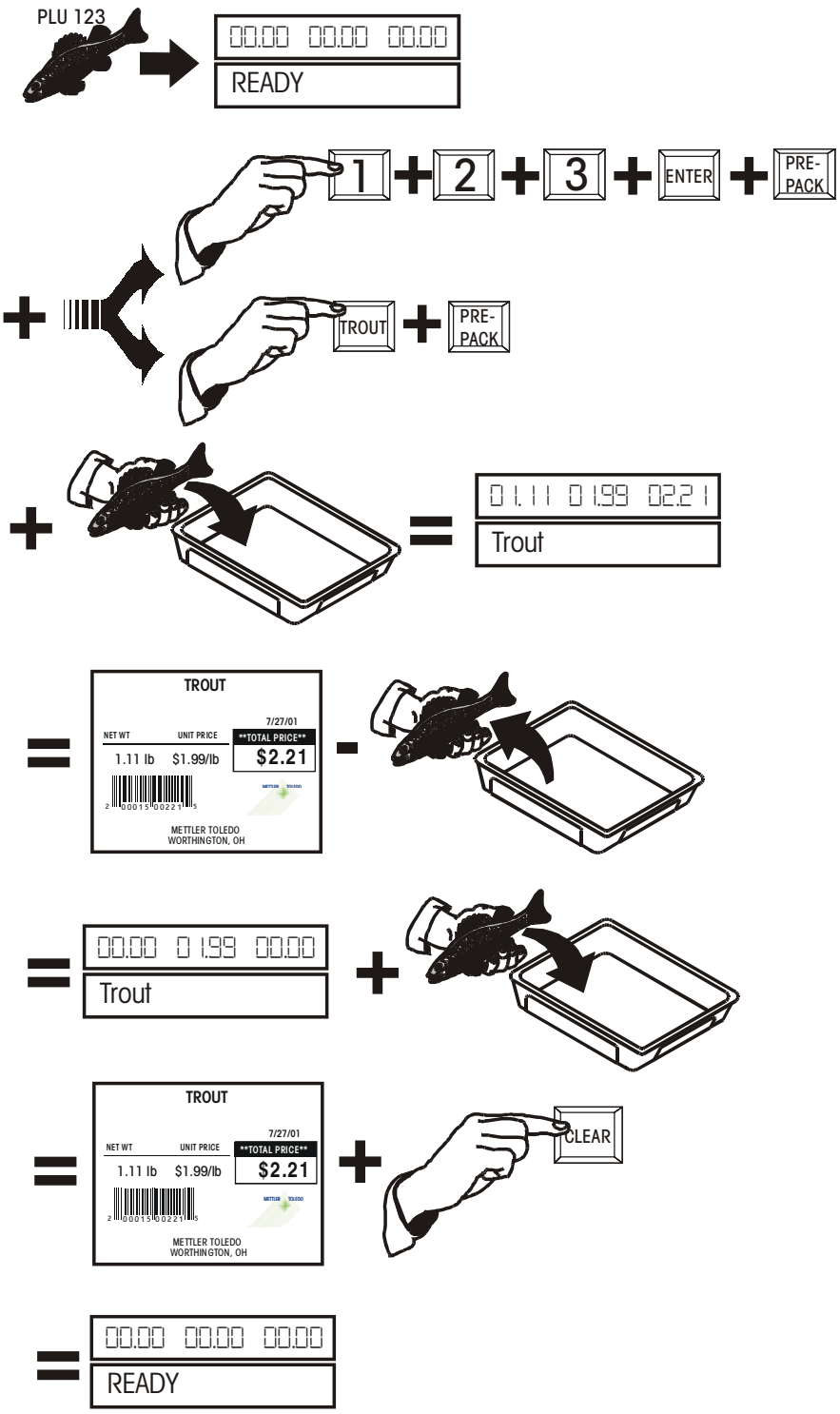


Calling a PLU and Printing Labels

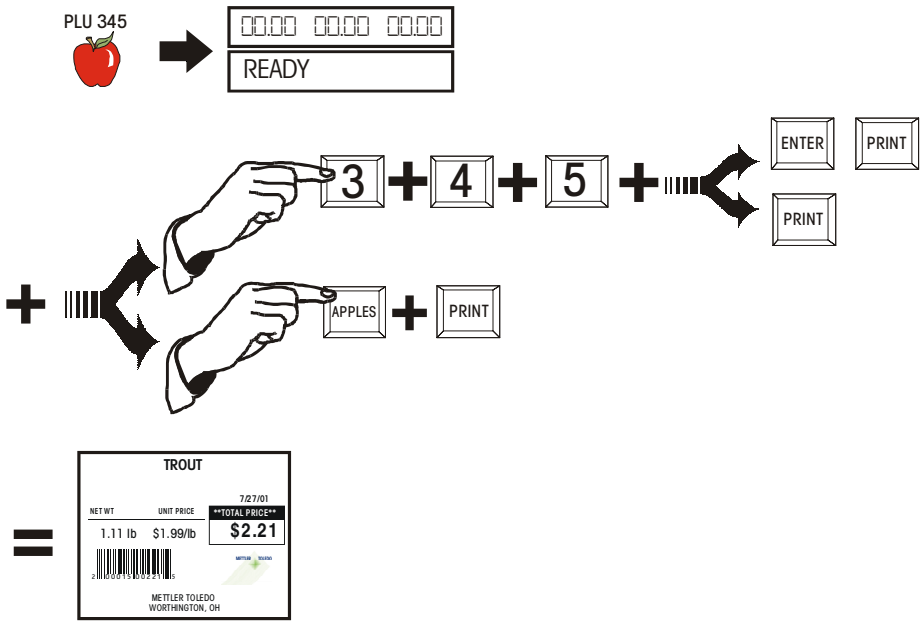
By-Weight PLU Service Mode



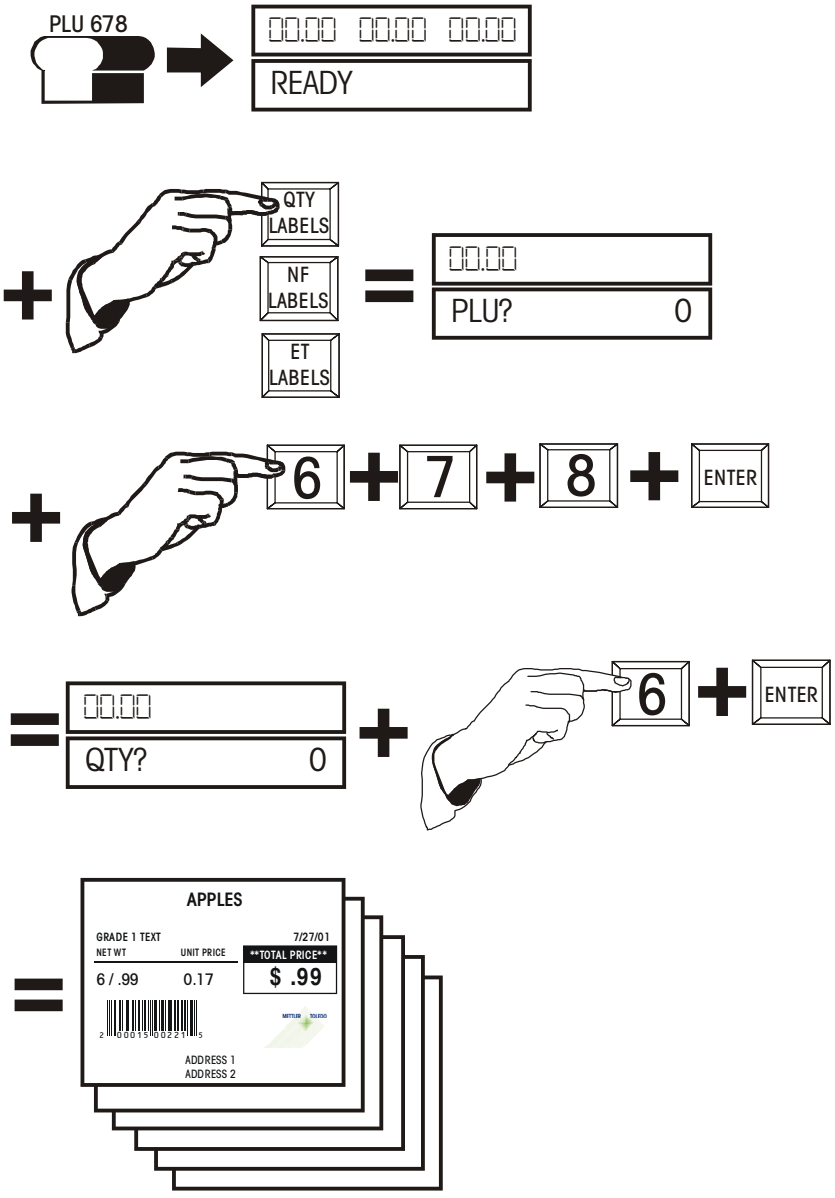
By-Weight PLU Prepack Mode



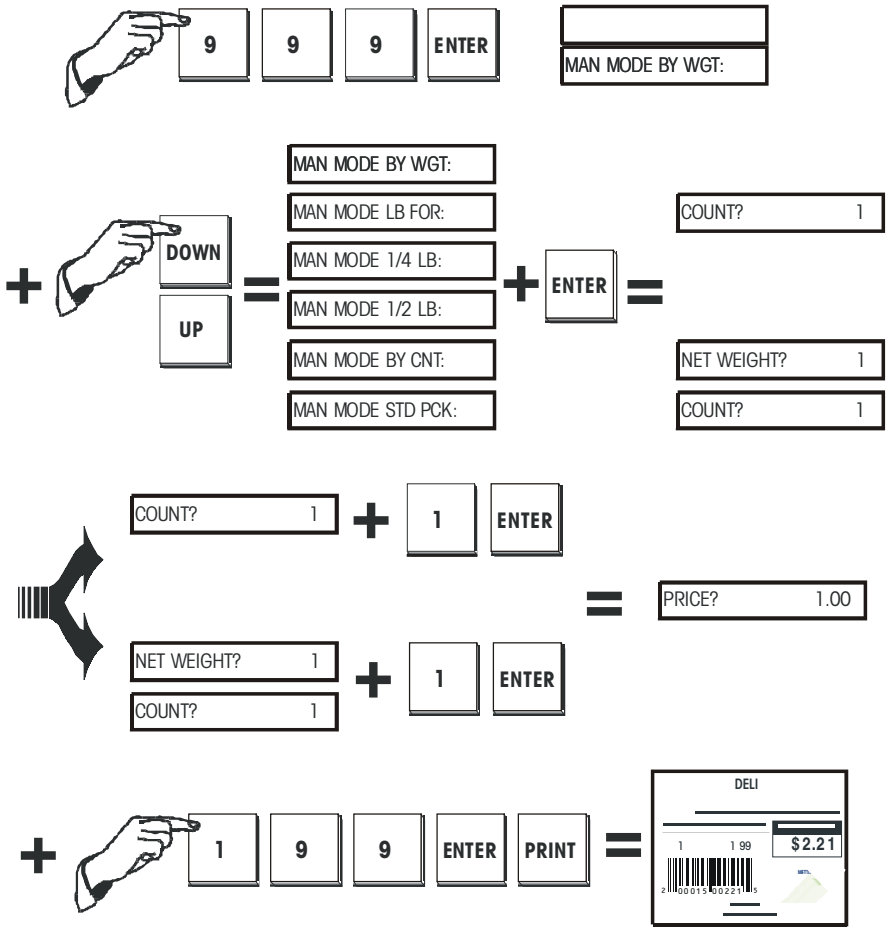
By-Count and Standard Pack (Single Label)



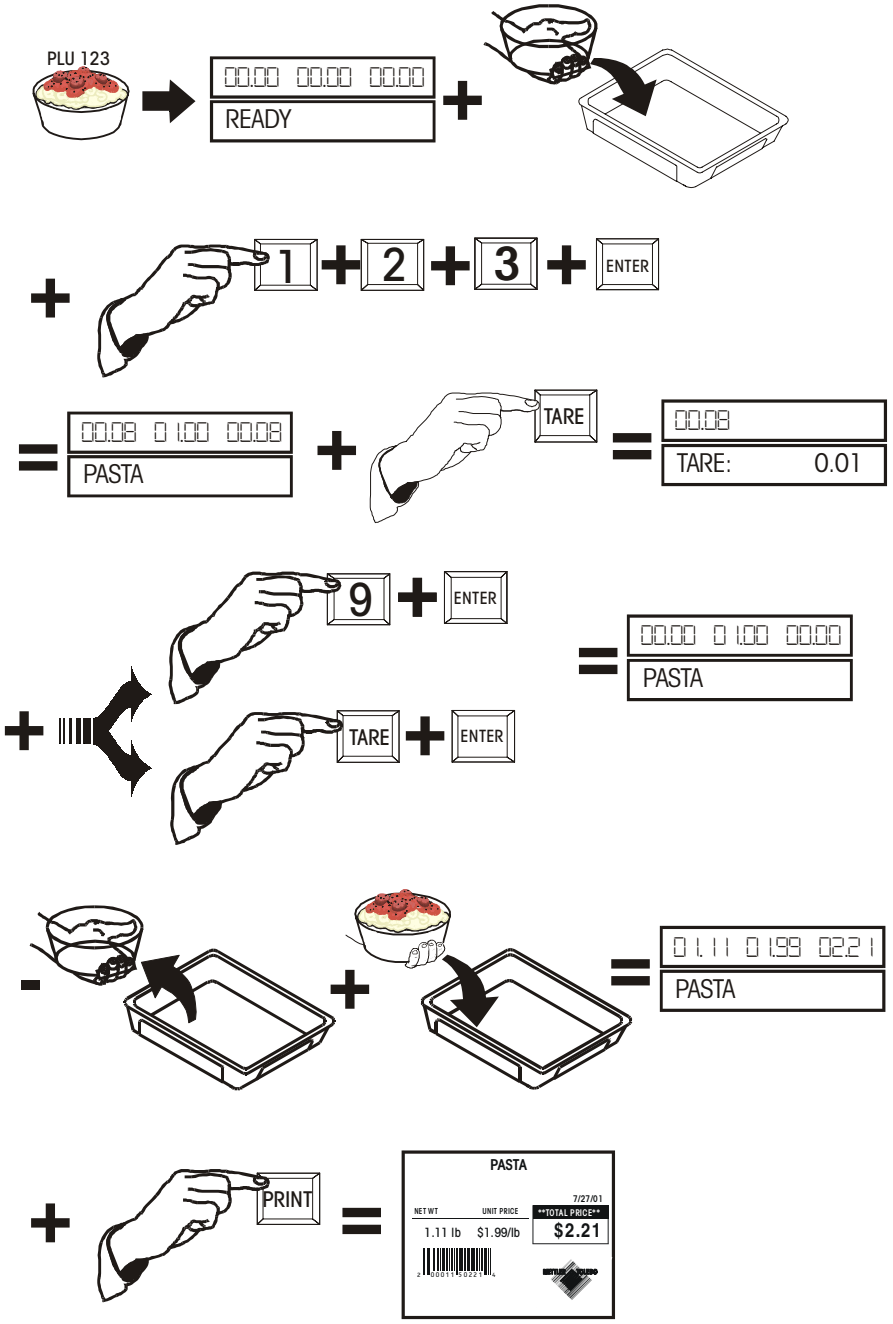
Batch Printing (By-Count and Standard Pack Only)



Manual Mode PLU Label Printing



Manual Tare and Tare Override



Tare

PLU Stored Tare

A tare may be stored with a PLU. In this case, when the PLU is called and no weight is on the platter, the weight display will show a negative number (the tare weight) and a cursor will appear over Net.

Proportional Tare

Proportional tares may be used when supported by the master scale and the PLU is programmed for a proportional tare. This calculation is done automatically by the scale.

Forced Tare

Some items will *require* the operator to enter a tare to complete a transaction. This is called a "forced tare."

Select the PLU.

The bottom display will show **TARE**. You can either key in the tare and press ENTER, or place the tare on the platter and press ENTER. If no tare is desired, press TARE, then ENTER, then place the item on the platter.

Pushbutton Tare

A tare can be manually entered by the following procedure using the TARE button.

Select the PLU (either by entering the number or pressing the preset key).

Press the TARE key.

Place the container on the platter and press TARE.

Keyboard Tare

Select the PLU (either by entering the number or pressing the preset key).

Press the TARE key.

Key in the tare weight. Press ENTER.

Place the item on platter.

If the Canadian Tare is set to YES in the Calibration Settings then the platter must be empty when keying in the tare, and you cannot clear the Tare by entering 0.00.

Memory Mode

When enabled, the Memory mode feature is an alternative to printing individual labels and allows accumulating multiple items for a customer. A receipt label can be printed showing the grand total and a department bar code.

Call the PLU, and place the item on the scale.

The MEM key can act as an ENTER/MEM key. To eliminate keystrokes, press MEM after keying in the PLU to immediately enter the transaction into the scale's memory.

Press the MEM key to enter the current transaction into memory. The cursor over "Memory" on the Display tower will light.

Remove the item from the platter and repeat for the desired number of transactions, pressing the MEM key after each transaction.

When all items are entered for a particular customer, clear the platter and press the MEM key.

If Continuous stock is used the label shows a line of description and the price information for up to 15 items.

You will be prompted to print the total. Press ENTER to print the accumulated total price.

You are then asked **PRINT OK?** If the printing was successful, press the DOWN key to answer **YES**, then press ENTER; the memory is now cleared and the cursor over "Memory" will turn off.

If the printing was not okay, or you do not want to clear the memory, press the DOWN key until **NO** appears, then press ENTER. You may then either print again or add additional transactions to the accumulator.

At the initial **PRINT?** prompt after pressing MEM with an empty platter, you can scroll with the UP and DOWN keys to **CANCEL?** or **CONTINUE?.** At the **CANCEL?** prompt, pressing ENTER will bring up the **CLEAR MEMORY? NO** prompt. Toggle between **YES** and **NO** here to clear the memory. At the **CONTINUE?** prompt, pressing ENTER will retain the current memory as is so that more items can be added.

Void

The last ten transactions can be voided from the totals accumulators using this function.

Press the VOID key and use the DOWN and UP keys to display previous transactions.

The transactions will be displayed as follows: the top display will show the number of transactions/labels printed, item number, and total price.

The lower display will show the product description and whether it has been voided or not (Y/N). When the transaction you wish to void is displayed, press ENTER.

The display will ask if you want to void the transaction. Use the DOWN key to change your response to **Y,** then press ENTER.

You may either continue to void other transactions or press CLEAR to return to the **READY** prompt.

Manual Override Functions

Certain information can be overridden after the PLU has been called. These changes are temporary and last only for a single transaction or a single "run" in Prepack mode. Some or all of these overrides may be disabled through Unit Setup.

Tare Override

When the unit setup allows for programmed tares to be overridden, the desired tare can be entered as if there were no preprogrammed tare.

Keypad Tare

Call the PLU. If a tare is programmed in the PLU the Weight display will show the tare as a negative number and the "Net" cursor will light.

Press TARE.

Enter in the desired tare weight, then press ENTER.

Pushbutton Tare

Call the PLU.

Press TARE.

Place the container on the platter, then press TARE.

Place the item on the platter.

Price Override

When allowed by the unit set up, prices may be overridden by the operator with either of the following procedures:

Place the item on the platter.

Select the PLU.

Key in the new price, and press ENTER.

or

Call the PLU.

Press PRICE CHANGE.

Key in the new price. Press ENTER.

Place the item on the platter.

ET, NF Record Override

Extra Text and Nutrition Facts records are linked to a PLU using Extra text and Nutrition Fact record numbers programmed into the PLU record in the master database. These Record numbers can be overridden using the ET/NF CHANGE key.

Extra Text Change

When allowed by the unit set up, the Extra Text for a single transaction or Prepack "run" may be changed.

Call the PLU.

Press the ET/NF CHANGE key.

Using the DOWN and UP keys, you will be able to toggle between **ET** (Extra Text) and **NF** (Nutrition Facts). When **ET** is displayed, press ENTER.

The current Extra Text number will be displayed. Key in the new Extra Text number, then press ENTER.

Place the item on the platter (if By Weight item).

Press PRINT to print the label (if in Service mode).

Nutrition Fact Change

When allowed by the unit set up, the Nutrition Facts may be changed.

Call the PLU.

Press the ET/NF CHANGE key.

Using the DOWN and UP keys, you will be able to toggle between **ET** (Extra Text) and **NF** (Nutrition Facts). When **NF** is displayed, press ENTER.

The current Nutrition Fact number will be displayed. Key in the new Nutrition Fact number, then press ENTER.

Place the item on the platter (if By Weight item).

Press PRINT to print the label (if in Service mode).

Net Weight, Count Override

Standard Pack Weight/Count Change

For Standard Pack items, the count and/or the Net weight may be changed. When the count is changed, a new total price and net weight will be calculated from the unit price and new count value When the Net weight is changed, the total price does not change, however a new unit price is calculated from the total price and new Net weight.

To change the quantity or weight of the item, press the CNT/WT CHANGE key.

Use the DOWN and UP keys to toggle between **QTY** (quantity, count) and **WEIGHT**.

To change the quantity of the pack, press ENTER when **QTY** is displayed. Key in the new quantity, then press ENTER.

To change the total weight, press ENTER when **WEIGHT** is displayed.

Key in the new weight (in ounces), then press ENTER.

Press CLEAR to return to the Item Description display.

Press PRINT to print a label.

By Count Change

For products that are priced By Count (e.g., 10 biscuits for $5.00), the count (10 biscuits) may be changed; a new price will then be calculated (e.g., 5 biscuits would be $2.50).

Retrieve the PLU. Press the CNT/WT CHANGE key.

The current quantity will be displayed and you will be prompted to enter the new quantity. Key in the new quantity; press ENTER.

The new quantity and the adjusted price will appear on the display and will also be printed on the label.

Press PRINT to print a label.

Shelf Life Override

After calling up the PLU, press the SHELF LIFE CHANGE key.

You are prompted to enter the new Sell By date. Depending on the unit setup, you will enter in the new date one of two ways: if your display reads **ENTER DAYS**, enter the number of days *until* the desired Sell By date. If the display reads **ENTER DATE**, enter the date of the desired Sell By date in the format of MMDDYY, then press ENTER.

Place the item on the platter (if By Weight item).

Press PRINT to print the label (if in Service mode).

Blank Label Fields

When allowed by the unit setup, certain fields on the labels may be temporarily blanked out. Select the PLU. Press the BLANK FIELD key.

Use the DOWN and UP keys to toggle between **BLANK PACK DATE**, **BLANK NET WEIGHT**, **BLANK UNIT PRICE**, **BLANK TOTAL PRICE**, **BLANK SHELF LIFE**, **BLANK USE BY** (date).

When you have the field you would like to blank out displayed, press ENTER.

The display will ask you if you want the field blanked. Press the DOWN and UP keys to change the answers to **YES,** then press ENTER.

You may continue to blank other fields or press CLEAR two times when you are done.

Place the item on the platter (if By Weight item).

Press PRINT to print the label (if in Service mode).

Master Off Line

Not Applicable to StandAlone model.

During scale operations, the satellite relies on the master to supply PLU files and record the PLU accumulators after a transaction. When PLU's are retrieved from the master scale, the satellite scale makes a backup record of the PLU information.

If the master is turned off, or the connecting cables to the master are disconnected or broken the unit will be off line.

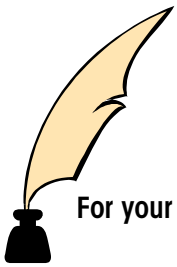
When the master is off line and a PLU is called, the display shows **SEARCHING...** for a few seconds, the Online cursor is removed, and the satellite searches its backup files for the PLU record.

The satellite does not store the PLU accumulators for later transmission to the master during off line operation.

If a PLU is called and no backup file exists, the scale will default to "manual PLU's." The PLU is then treated as a "Manual PLU."

The display will show **MANUAL MODE BY WGT**. Use the DOWN and UP keys to select between **BY WEIGHT**, **LB FOR**, **¼ LB**, **½ LB**, **BY COUNT**, or **STD PACK** pricing. Place the item on the platter. (For Standard Pack items, the weight must first be entered, in ounces, then press ENTER). Key in the price, then press ENTER.

To print a label, press PRINT. A label will be printed with the department name in the product description field and department UPC in the Item number field of the bar code.



For your notes

11 Standalone Database Functions

Overview

The Model 2450 Standalone has database storage for PLU information, extra text, nutrifacts, and graphics. It is available with 256K, 512K or 1M of memory. The following table shows the number of records each size of memory can hold.

	PLUs (223 bytes each)	ET Records (540 bytes each)	NF Records (383 bytes each)
1 Meg	4600	0	0
	1350	1350	0
	900	900	900
	1700	0	1700
512K	2300	0	0
	675	675	0
	450	450	450
	850	0	850
256K	1150	0	0
	335	335	0
	225	225	225
	425	0	425
ET recs + NF Recs + Graphic Recs = 7280 Max			

Record Storage Capacity

More than one department of information can be stored in memory but only one department can be accessed at time. For example, if department 1 is the current department, only PLUs entered in department 1 will be accessible. The department can be changed in Unit Setup Mode or in the Database Setup Mode.

The following is an overview of the database setup structure with the first row of being major headings and items below specific commands. The Up/Down key scrolls through the selections. The Enter key allows changes to the selected function.

EDIT	QUICK	PRINT	CLEAR
PLU	PRICE	PLU TOTALS	CLEAR PLU/ITEM
ET	TARE 1	GROUP TOTALS	CLEAR ET
NF	ET #	HOURLY TOTAL	CLEAR NF
ACTION CODE	NF #	GRAND TOTALS	CLEAR GR
GRADE	SHELF LIFE	MEM AVAILABLE	CLEAR PLU/ITEM TOTALS
GROUP	USE BY		CLEAR GROUP TOTALS
DEPT INFO	GROUP		HOURLY ACCUMULATORS
- DEPT #	ACTION CODE		VOID ACCUMULATORS
- DEPT NAME	ITEM #		COMPRESS DATABASE
- DEPT ADDR	GRADE #		CLEAR ALL
- DEPT UPC			
ITEM # DUPE			

Database Functions

Database Setup Mode

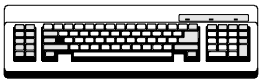
To enter the database setup, press the SETUP MODE key, press DOWN or UP to toggle to **DATABASE,** then press ENTER. If a password has been setup for the database mode, enter the password and press ENTER.

Passwords

To change the database password, press the PASSWORDS key. At the **PASSWORD** prompt**,** enter a number between 1 and 9999. To disable the password enter 0.

Edit

EDIT is used to add or modify records in the database. Editing any of the alphabetical fields, such as Description and Extra Text, requires a programming keyboard.



Required

PLU

Press ENTER at the **PLU** prompt to change or a add a new PLU record. Enter the number of the PLU you wish to add or modify. If it is a new PLU, the prompt **PLU NT FD! ADD ACTV** will appear. To continue and add a new active record press ENTER**,** otherwise press CLEAR. Respond to each of the following prompts by pressing ENTER to update it, or DOWN or UP to display the next selection.

PLU NUMBER:
Enter a new PLU number from 1 - 999999.

ITEM:
Enter a new item number from the numeric keypad from 0 - 9999999999. This number prints in the bar code symbol. Refer to Bar Code Symbols in Chapter 1.

DESC1 and DESC2:
These fields are for the Description Line 1 and 2. The fields are edited by pressing ENTER at the **DESC1** or **DESC2** prompt. Changes must be made on a PC-AT style keyboard which is connected to the unit through the port on the left side of the scale next to the power switch. The Desc1 line is what will be displayed on the tower display when that PLU is called up. There is a maximum of 32 alphanumeric characters per description field.

PLU TYPE:
Choose **BY WGHT, LB FOR, BY 1/2, BY 1/4, BY CNT, STD PACK** or **MANUAL** by toggling to that prompt and pressing ENTER.

TARE1/COUNT:
Toggle between **FORCED** or a numeric value. For the numeric value, enter the value with the numeric keypad and press ENTER. For a forced tare, toggle to **FORCED** and press ENTER.

TARE/PROP TARE:
Toggle between **FORCED, PROP,** or a numeric value. For the numeric value, enter the value of these tares with the numeric keypad and press ENTER. For a forced tare, toggle to **FORCED** and press ENTER. For **PROP** proportional tare, press ENTER, then enter the percentage for the proportional tare as a value between 0 and 99.99. For example, if 10.00 is entered, the proportional tare is 10%.

UNIT/TOTAL PRICE*:*
Enter six digits, 0 - 999999, or **FORCED** price for By-Weight, lb-for, ¼, ½, or total price for By-Count and Standard Pack. To change the currency increments, enter the currency function under Unit Setup.

SHELF LIFE:
0 - 999 days. Used to calculate Sell-By date printed on the label.

USE BY:
0 - 999 days. Used to calculate Use-By date printed on the label.

GROUP #:
Items can be categorized by groups within a department. For example, in a bakery there could be a group for cookies and a group for pies. This allows various reports to be printed based on each group. To change this, enter a new value between 0 - 500 with the numeric keypad and press ENTER.

GRADE #:
Lines of text with grade information can be linked to each PLU. Enter the number of the Grade text between 0 - 16 to be linked to this PLU, then press ENTER. Zero means no grade is selected.

ET #:
Extra Text can be linked to each PLU. Enter the number of the Extra Text record between 0 - 999999 to be linked with this PLU, then press ENTER. Zero means no ET is selected.

NF #:
Nutrition Fact information can be linked to each PLU. Enter the number of the Nutrition Fact record between 0 - 999999 to be linked with this PLU, then press ENTER. Zero means no NF is selected.

GRAPHIC:
Graphics can be linked to each PLU and will be printed if a label format which prints a graphic is selected. Enter the number of the graphic record between 0 - 999999 to be linked with this PLU, then press ENTER. Zero means no Graphic is selected.

ACTION CODE #:
Action codes can be linked to each PLU which will replace the store address, display a different PLU description, or can be used to scroll a marquee. Enter the number of the Action Code record between 0 - 50 to be linked with this PLU with the numeric keypad and press ENTER. 0 means no Action Code is selected.

BARCODE*:*

The barcode to be printed on the label is determined by this setting. This menu is different depending on the Unit Setup for barcode type, **EAN** or **UPC**.

At the prompt you can choose from **USE SCL SETTING** or choose a type from the **TYPE?** List. These types include: **GEN MERCH** (0)**, NOT IDENT** (1)**, RAND WT** (2)**, DRUG & HEALTH** (3)**, STORE MARK** (4)**, COUPONS** (5)**, PRICE ENCODED** (6) and **NOT IDENT** (7)**.** (The numbers in parentheses correspond to the values of these bar code types in the master units.) If **RAND WT** or **PRICE ENCODED** types are selected, a format string can be selected from the **FORMAT?** prompt list. For **RAND WT** and **PRICE ENCODED** these format strings are:

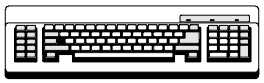
0: NNNNN C$$$$ X
1: NNNNN O$$$$ X
2: NNNNN N$$$$ X
3: NNNNN $$$$$ X
4: NNNNN C#### X
5: NNNNN O#### X
6: NNNNN N#### X
7: NNNNN ##### X

If the Unit Setup barcode type is EAN, you can first choose **USE SCL SETTING**. There is an additional field called **PREFIX**. Here you can enter a number between 0 and 9. This number will be the second number in the EAN barcode. Finally, you can select a format string from a list like the one above.

BLANK:

This allows you to blank one of the following fields on a label: **PACK DATE**, **NET WEIGHT**, **UNIT PRICE**, or **TOTAL PRICE**. To blank one of these fields, press ENTER at that prompt and toggle **YES** or **NO**. When these fields are blanked, only the values are blanked not the legends.

Extra Text



Required

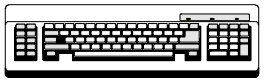
This allows you to add a new record or edit an existing extra text record. Press ENTER at the **EXTRA TEXT** prompt. With the numeric keypad enter the number of the extra text record to be edited (6 digit number 1-999999).

New Extra Text Records

If it is a new record, the prompt will display **XT NT FD! ADD XT**. To add the new Extra Text, press ENTER**,** or press CLEAR to abort. At the **CHAR PER LINE** prompt, enter a number between 1 and 99. The maximum is 54 characters per line without wrapping to the next line. The most common numbers are 32, 42 and 54 characters per line.

Entering the Extra Text

Now you should be able to begin typing in the extra text with the programming keyboard. If the Extra Text was not a new record, the current text will be displayed on the screen and ready for editing. Otherwise, type in the new Extra Text. *Press [F10] on the keyboard when finished*. You will be prompted to **SAVE CHANGES**. Pressing ENTER will display **SURE? YES.** Press ENTER to save or CLEAR to exit without saving. Pressing CLEAR at the **SAVE CHANGES** prompt will exit without saving.



Required

Nutrition Facts

This function adds or edits a Nutrition Facts record. Enter the Nutrition Facts record number (six-digit number 1-999999). A new Nutrition Facts record will read **NF NT FD! ADD NF**. Press ENTER to continue. Press CLEAR to exit the nutrition facts setup. A prompt to **SAVE CHANGES** will be displayed. Press ENTER to save and exit. Press CLEAR to exit without saving.

LABEL?

Select the type of label for the nutrition facts to be printed on by toggling through the choices and pressing ENTER. **SINGLE** will print the nutrition facts on the label with all the rest of the PLU information. **ALT PLU/NF** will print a PLU label followed by a nutrition facts label, while **ALT NF/PLU** will print a nutrition facts label followed by a PLU label. **BATCH PLU/NF** and **BATCH NF/PLU** will do the same, but in a batching process. The second nutrition facts only label will be printed according to the label format selected in the Unit Setup Label Format menu.

FORMAT?

Select the label format by toggling through the following choices and pressing ENTER: **VRT STD** (vertical standard), **VERT SIMP** (vertical simplified), **TABULAR, LINR LND** (linear landscape), and **LINR PRT** (linear portrait).

SERV UNITS?

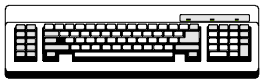
Select the serving units used to calculate servings per container: **OZ** (numeric entry for By-Weight and Standard Pack PLUs only), **PIECES** (numeric entry for By-Count or Standard Pack PLUs only), or **TEXT** (alphanumeric entry, entered for both serving units and servings per container). This is done by pressing ENTER at the prompt, entering the information, then press ENTER again to save. The following table lists the fields that are required (R) and voluntary (V) along with the insignificant value (when applicable).

Nutrition Field	Type	Insig. Amount	Nutrition Field	Type	Insig. Amount
Calories	R	<=5	Other carbohydrates (g)	V	
Calories from fat	R	<=5*	Protein (g)	R	<=1
Calories from saturated	V		Protein (%)	V	
Total fat (g)	R	<=0.5	Vitamin A (%)	R	<=2%*
Total fat (%)	R		Beta-carotene (%)	V	
Saturated fat (g)	R	<=0.5	Vitamin C (%)	R	<=2%*
Saturated fat (%)	R		Calcium (%)	R	<=2%*
Polyunsaturated fat (g)	V		Iron (%)	R	<=2%*
Monounsaturated fat(g)	V		Vitamin D (%)	V	
Cholesterol (mg)	R	<=2*	Vitamin E (%)	V	
Cholesterol (%)	R	*	Thiamin (%)	V	
Sodium (mg)	R	<=5	Riboflavin (%)	V	
Sodium (%)	R		Niacin (%)	V	
Potassium (mg)	V		Vitamin B6 (%)	V	
Potassium (%)	V		Folate (%)	V	
Total carbohydrate (g)	R	<=1	Vitamin B12 (%)	V	
Total carbohydrate (%)	R		Biotin (%)	V	
Dietary fiber (g)	R	<=1*	Pantothenic acid (%)	V	
Dietary fiber (%)	R	*	Phosphorus (%)	V	
Soluble fiber (g)	V		Iodine (%)	V	
Insoluble fiber (g)	V		Magnesium (%)	V	
Sugar (g)	R	0*	Zinc (%)	V	
Sugar Alcohol	V		Copper (%)	V	

NF Record Fields

Action Code

Action Codes can be linked to a PLU to do one of three things: (1) Print a store address line, (2) Print a PLU description, or (3) Scrolling marquee messages. Press ENTER at the **ACTION CODE** prompt to edit Action Codes. Enter the Action Code number, then press ENTER (2 digit number 01-50). The next prompt, **TYPE?**, allows selecting the types. Press ENTER to choose one of the types described below.



Required

STORE ADDR

This type will print a store address at the bottom of a label. After pressing ENTER, the prompt **LINE 1** will appear. Press ENTER and type line one of the store address on the programming keyboard, followed by ENTER. The prompt **LINE 2** will appear. Enter the second line of text, followed by ENTER. At the **SAVE CHANGES** prompt, press ENTER to save and exit, or press CLEAR to exit without saving.

PLU DESCR

This type will override the first line of the PLU description that is displayed on the lower scale display. It does not change the description printed on the label. After pressing ENTER, the prompt **LINE 1** will appear. Press ENTER here and type line one of the store address on the programming keyboard, followed by ENTER. The prompt **LINE 2** will appear. Enter the text for line two followed by ENTER. At the **SAVE CHANGES** prompt, press ENTER to save and exit, or press CLEAR to exit without saving.

MARQUEE

This type of action code will define the text for a marquee. After pressing ENTER, a cursor will appear waiting for text input from the programming keyboard. Enter the marquee text, then press ENTER. At the **SAVE CHANGES** prompt, press ENTER to save and exit, or press CLEAR to exit without saving.

Grade

This function is used to program Grade Text. After pressing ENTER, enter the record number of the Grade Text to be edited (two digit number 0-16). A cursor will appear waiting for text input from the programming keyboard. Enter the Grade Text, then press ENTER. At the **SAVE CHANGES** prompt, press ENTER to save and exit, or CLEAR to exit without saving.

Group

This function will assign a text string to a group number. This text string will then be printed on the Group Totals report heading. After pressing ENTER, enter the record number of the Group Text to be edited. A cursor will appear waiting for text input from the programming keyboard. Enter the Group Text and press ENTER. At the **SAVE CHANGES** prompt, press ENTER to save and exit, or CLEAR to exit without saving

Department Info

Enter information about the department. At each of the prompts, enter the requested information, then press the ENTER key. **DEPT NAME** and **DEPT ADDR** are alphanumeric entries from the programming keyboard. The **DEPT ADDR** can have two lines. The **DEPT UPC** is a generic UPC number for totals labels for that department.

Item # Duplication

Select **YES** or **NO**. **YES** allows different PLU records to have the same item number. **NO** does not allow this.

Quick Change

This function allows you to change one of the following fields of a PLU directly without using the Edit PLU function: **PRICE, TARE, ET #, NF #, SHELF LIFE, USE BY, GROUP #, ACTION CODE, ITEM**, and **GRADE #**. The **QUICK PRICE** changes the **UNIT PRICE** field for By-Weight PLUs and the **TOTAL PRICE** field for Standard Pack and By-Count PLUs. The **QUICK TARE** changes the **TARE1** field.

Print

This function will print reports for the following: **PLU TOTALS, GROUP TOTALS, HOURLY TOTALS, GRAND TOTALS**, and **MEMORY AVAILABLE**. The reports are printed on labels, the format of which are chosen in the *Unit Setup Label Format* function. Refer to the Label Formats Chapter for illustrations of the label formats for reports. To print one of these reports, press ENTER at that prompt. The results are displayed on the tower display. To print, press the PRINT key (exception: Hourly totals will print automatically). To stop printing in the middle of a run, press the CLEAR key.

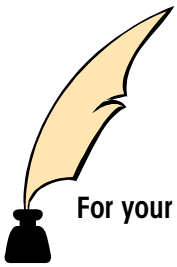
Clear

CLEAR allows you to clear out parts of the database. The first 4 choices**, CLEAR PLU\ITEM, CLEAR EXTRA TEXT, CLEAR NUTRIFACT**, and **CLEAR GRAPHIC**, will clear individual records in each of those areas. Press ENTER at the prompt. The next prompt can be toggled between **ALL** and the record type. For example, press ENTER at the **CLEAR PLU/ITEM** prompt. Now you can toggle between **PLU/ITEM** and **ALL**. Pressing ENTER at **PLU/ITEM**, will request a PLU number to delete. Pressing ENTER at **ALL** will **clear all PLU records**. Both cases will prompt with **SURE?? NO** before continuing. The other choices work the same way, but with the other record types of Extra Text, Nutriion Facts, and Graphics.

The next four choices, **CLEAR PLU\ITEM TOT, CLR GROUP TOTALS, HOURLY ACCUMULATORS**, and **VOID ACCUMULATORS**, will clear the totals for each of those areas. **CLEAR PLU/ITEM TOT** works as described in the above paragraph where there is a choice between clearing totals for **ALL** PLUs or for just one PLU. **CLR GROUP TOTALS** requests a group number to be entered. Both end with a **SURE?? NO** prompt before proceeding. The two accumulators display a prompt with the current department number and a toggle between **YES** and **NO**. There is no **SURE?** prompt to double check on clearing accumulators.

The next choice, **COMPRESS DATABASE**, should be used if any 'Out of Memory' errors are displayed. Press ENTER at the prompt and toggle **YES** and **NO** at the **SURE**? prompt to continue.

The final choice, **CLEAR ALL**, will clear everything from the database completely including all PLU, Extra Text, Nutrition Facts and Graphic records and accumulators. There is a **SURE?? NO** prompt to make sure this is what you want to do.



For your notes

12 Glossary

Standard Glossary

This glossary defines standard terms and some of the specialized terminology and concepts that are used in the weighing industry.

Accumulator—A database that holds a value such as total dollars, total weight, etc.

802.11 - The IEEE standard that specifies a carrier sense media access control and physical layer specifications for 1 and 2 megabit per second wireless LANs.

802.11b - The IEEE standard that specifies a carrier sense media access control and physical layer specifications for 5.5 and 11 megabit per second wireless LANs.

802.3 - The IEEE standard that specifies carrier sense media access control and physical layer specifications for Ethernet LANs.

Access Point - A wireless LAN transceiver that acts as a center point and bridges between wireless and wired networks.

Accuracy—Capability of a measuring device to provide measured values without systematic measurement deviations. The ratio of the error to the full-scale output.

Ambient Conditions—The conditions (humidity, pressure, temperature, etc.) of the medium surrounding a device.

Ambient Temperature—The temperature of the medium surrounding a device.

Analog-Digital Converter—An electronic device designed to convert analog signals (voltages) into digital signals. This type of circuit is used in scales and digital voltmeters.

Analog—In communications, transmission employing variable and continuous wave forms to represent information values, where interpretation by the receiver is an approximation of the encoded value; compare with **Digital**.

ANSI (American National Standards Institute)—The principal standards development body supported by over 1000 trade organizations, professional societies and companies. USA's member body to ISO (International Standards Organization).

ASCII (American Standard Code for Information Interchange)—A system used to represent alphanumeric data; a 7-bit-plus-parity character set established by ANSI and used for data communications and data processing; ASCII allows compatibility among data services; one of two such codes (see EBCDIC) used in data interchange, ASCII is normally used for asynchronous transmission.

Asynchronous—Data transmission that is not related to the timing, or a specific frequency, of a transmission facility; transmission characterized by individual characters, or bytes, encapsulated with start and stop bits, from which a receiver derives the necessary timing for sampling bits; also, start/stop transmission.

Attenuation—The deterioration of signal strength, measured in decibels; opposite of gain.

Auto Zero Maintenance (AZM)—AZM is a way for the scale to gradually re-zero itself to compensate for small changes in zero. Class III, legal-for-trade scales typically use an AZM range of ±0.5 display increments. AZM is active any time the weight on the scale is stable and is within the AZM range near gross zero.

Autotare—An autotare is taken by pressing the TARE key with the empty container on the scale. The scale then displays a zero weight with the net cursor illuminated.

Bandwidth - Specifies the amount of the frequency spectrum that is usable for data transfer. It identifies the maximum data rate that a signal can attain on the medium without encountering significant loss of power.

Bandwidth—The range of frequencies available for signaling; the difference expressed in Hertz between the highest and lowest frequencies of a band.

Baud/baud Rate—Unit of the transmission rate in serial data transmission expressed in bits per second.

Beamwidth - The angle of signal coverage provided by a radio. Beamwidth may by decreased by a directional antenna to increase gain.

Bit (Binary Digit)—The smallest unit of information in a binary system; a 1 or 0 condition.

Bit Parallel, Character Serial—This is a combination of parallel and serial transmission methods where characters are transmitted one at a time using nine wires.

Bit Serial, 20 mA or RS232—A transmission method where each character is transmitted sequentially.

Boot Protocol (BOOTP) - The protocol used for the static assignment of IP addresses to devices on the network.

BPS (Bits Per Second)—The basic unit of measure for serial data-transmission capacity; Kbps for kilo (thousands of) bits per second; Mbps for mega (millions of) bits per second; Gbps for giga (billions of) bits per second; Tbps for tera (trillions of) bits per second.

Bridge - A device used to connect LANs by forwarding packets across connections at the Media Access Control (MAC) layer.

Byte—Data word of length 8 bits, allows the encoding of 256 different characters. All common microprocessors possess a byte structure or a multiple of it in their data words.

Calibration—The comparison and adjustment of load cell outputs against standard test loads. A certified test weight is used in calibration as a known value that is compared with the displayed weight. The scale then adjusts the displayed weight accordingly.

Capacity—The maximum load that can be weighed on a particular scale.

Certificate of Conformance (COC)—A certificate and number issued by NIST under the National Type Evaluation Program that states a submitted device complies with applicable technical requirements of Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices".

Certification Seal—A stamp or seal applied by the weights and measures department to the tested weighing device to attest that certification has been carried out.

Certification—Official testing and sealing of an instrument (balances, weights) according to the certification requirements. The seal (Certification Seal) attests that the instrument has satisfied the certification requirements with respect to its design and metrological characteristics and, in particular, that it conforms with the Calibration Tolerance Limits.

Chain Tare— If a tare is entered using the numeric keypad with the scale in the net weight mode, then the tare value entered is added to the current tare weight value.

Character—Letter, number, punctuation, or any other symbol contained in a message.

Checksum—The total of a group of data items or a segment of data that is used for error-checking purposes. Both numeric and alphabetic fields can be used in calculating a checksum, since the binary content of the data can be added. Just as a check digit tests the accuracy of a single number, a checksum serves to test an entire set of data that has been transmitted or stored. Checksum can detect single-bit errors and some multiple-bit errors.

Class, Scale—An NIST classification system that separates scale types into groups.

Class	**Application or Scale Type** (Reference: 1999 Handbook 44)
I	Precision laboratory weighing.
II	Laboratory weighing, precious metals and gem weighing, grain test scales.
III	All commercial weighing not otherwise specified, grain test scales, retail precious metals and semi-precious gem weighing, animal scales, postal scales, scales used to determine laundry charges, and vehicle on-board weighing systems.
III L	Vehicle, axle load, livestock, railway track scales, crane, hopper (other than grain hopper) scales, and vehicle on-board weighing systems.
IIII	Wheel-load weighers and portable axle-load weighers used for highway weight enforcement.

Clock—An oscillator-generated signal that provides a timing reference for a transmission link; used to control the timing of functions such as sampling interval, signaling rate, and duration of signal elements; an "enclosed" digital network typically has only one master clock.

Communication Protocol—The rules governing the exchange of information between devices on a data link.

Computing Scale—A scale that indicates the money values of amount of commodity weighed at predetermined unit prices.

Conversion Formulas—Useful conversion formulas are as follows:

lb = kg x 2.205
kg = lb x 0.4536
mm = in. x 25.4
in. = mm x 0.03937
ºC = (ºF - 32) / 1.8
ºF = (ºC x 1.8) + 32

Counting Scale—A scale used to count a number of pieces all having the same weight. Electronic counting scales determine the mean individual weight and the weight of all counted parts, and supply the piece number by arithmetic division.

Counts—The total number of display increments available on a particular scale, which is determined by simply dividing the scale capacity by its readability. A scale with a capacity of 10 lb and a resolution of .001 lb would have 10,000 counts.

Creep Error—The change in load cell output occurring with time while under load and with all environmental conditions and other variables remaining the same.—Drift.

Current Loop Interface (20 mA)—Digital peripheral interface for serial data transmission in which the logic states 0 and 1 are represented by the currents 0 mA and 20 mA, e.g. TTY interface in teletype.

Data Bus (serial)—A data bus represents the electrical connection between several components. Bus multipoint connections have a long main cable to which the participants are attached via short spur lines. In contrast to star or ring structures, the bus structure represents a multipoint connection. It can be used for the connection of computers, peripherals and measuring instruments.

Data Link—Any serial data-communications transmission path, generally between two adjacent nodes or devices and without intermediate switching nodes.

Data—Information represented in digital form, including voice, text, facsimile, and video.

Data-Transfer Rate—The average number of bits, characters, or blocks per unit of time transferred from a data source to a data sink.

dBi - A ratio of decibels to an isotropic antenna that is commonly used to measure antenna gain. The greater the dBi value, the higher the gain and, as such, the more acute the angle of coverage.

Declaration of Conformity—Statement by a supplier, claiming under his sole responsibility that a product, process or service is in conformity with a specific standard or other normative document.

Density—The density ("p") of a substance is the quotient of its mass ("m") and volume ("V"); p = m/V.

Department—A grouping of data files that contains similar items, such as produce, meat, seafood, etc.

Differential Quadrature Phase Shift Keying (DQPSK) - Modulation technique used by IEEE 802.11-compliant wireless LANs for transmission at 2Mbps.

Digital Filter—Software-based filtering of very low frequency to negate the effects of vibrations, drafts, etc. for the purpose of achieving more stable indications.

Digital—Referring to communications procedures, techniques, and equipment by which information is encoded as either a binary one (1) or zero (0); the representation of information in digits.

Dip Switches—Switches that are usually in banks of two or more and normally mounted directly to a circuit board that are used to enable or disable certain options or functions.

Dipole - A type of low gain (2.2 dBi) antenna consisting of two (often internal) elements.

Direct Sequence Spread Spectrum (DSSS) - A type of spread spectrum radio transmission that spreads its signal continuously over a wide frequency band.

Directional Antenna - An antenna that concentrates transmission power into a direction thereby increasing coverage distance at the expense of coverage angle. Directional antenna types include yagi, patch and parabolic dish.

Discrimination—Ability of an instrument to react to small variations of load. The discrimination threshold, for a given load, is the value of the smallest additional load that, when gently deposited on or removed from the load receptor, causes a perceptible change in the indication.

Diversity Antennas - An intelligent system of two antennas that continually senses incoming radio signals and automatically selects the antenna best positioned to receive it.

Dot Matrix—(e.g. 5x7 dots) Type of alphanumeric character indication—Display. Also used describe a printer—dot matrix printer.

Downloading—The process of sending data, operating software or other data from a host to another device.

Drift—Slow change with time in the value of a metrological characteristic (e.g. in the display) of a measuring device at constant loading.

Dynamic Host Configuration Protocol (DHCP) - A protocol available with many operating systems that automatically issues IP addresses within a specified range to devices on a network. The device retains the assigned address for a specific administrator-defined period.

Dynamic Weighing— When there is relative motion between the weighing object and the scale during the weighing process. The mass (weight) is recorded while the object is in motion.

EBCDIC (Extended Binary Coded Decimal Interchange Code)—An eight-bit code used primarily in IBM® equipment. The code has 256 characters in the set.

Edit—The process of adding, modifying, or deleting data in a file.

EEPROM (Electrically Erasable Programmable Read Only Memory)— Ready-only, non-volatile, semi-conductor memory that is erasable via a signal input to a certain pin and re-programmable.—See ROM.

EMI (Electromagnetic Interference)—A device's radiation leakage that couples onto a transmission medium, resulting (mainly) from the use of high-frequency-wave energy and signal modulation; reduced by shielding; minimum acceptable levels are detailed by the FCC, based on type of device and operating frequency.

Emulation—The imitation of all or part of one device, terminal, or computer by another, so that the imitating device accepts the same data, performs the same functions, and appears to other network devices as if it were the imitated device.

EPROM (Erasable Programmable Read-Only Memory)—Ready-only, non-volatile, semi-conductor memory that is erasable via ultra violet light and re-programmable.—See ROM.

Erasable Storage—A storage device whose contents can be modified (e.g., Random Access Memory, or RAM) as contrasted with read-only storage (e.g., Read-Only Memory, or ROM).

Ethernet—A popular local area network design (originally designed by Xerox® Corp.) characterized by 10-Mbps baseband transmission over a shielded coaxial cable and employing CSMA/CD as the access control mechanism; standardized by the IEEE as specification IEEE 802.3; referring to the Ethernet design or as compatible with Ethernet.

Even Parity—Data verification method in which each character must have an even number of "on" bits.

Excitation Voltage—The electrical voltage applied to a transducer or load cell for proper operation.

File—A collection of data stored in memory or other storage device such as a floppy or hard disk.

Filter—An electrical circuit designed to pass through certain frequencies and reject others.

Floppy Disk—A removable storage device used on a PC. The most common in use now is the 1.44-megabyte floppy disk.

Flow Control—The procedure or technique used to regulate the flow of data between devices; prevents the loss of data once a device's buffer has reached its capacity.

Frequency Hopping Spread Spectrum (FHSS) - A type of spread spectrum radio transmission in which the transmitter and receiver hop in synchronization from one frequency to another according to a prearranged pattern.

Fresnel Effect - A phenomenon related to line of sight whereby an object that does not obstruct the visual line of sight obstructs the line of transmission for radio frequencies.

Full Duplex (FDX)—Transmission in either direction, at the same time.

Gain - A method of increasing the transmission distance of a radio by the concentration its signal in a single direction, typically through the use of a directional antenna. Gain does not increase a radio's signal strength, but simply redirects it. Therefore, as gain increases, the decrease in angle of coverage is inversely proportional.

Gain—Increased signal power, usually the result of amplification; see Attenuation.

Gateway—A conceptual or logical network station that serves to interconnect two otherwise incompatible networks, network nodes, sub-networks, or devices; performs a protocol-conversion operation across numerous communications layers.

Gigabyte—A term used to express the storage capacity of disk drives, RAM memory, etc. One Gigabyte is equivalent to one billion bytes of data. Commonly referred to as a "Gig"; one Gig, two Gigs, etc.

Gigahertz (GHz) - One billion cycles per second. A unit of measure for frequency.

Gram —The gram (unit symbol g) is the one thousandth part of a kilogram.

Gross Value (G or B)—Indication of the weight of a load on an instrument, with no tare or preset tare device in operation.

Gross Weight—Mass of the weighing sample (net weight) including its container or packaging (tare weight).

Ground—An electrical connection or common conductor that, at some point, connects to the earth. The reference point of an electrical system.

Half Duplex (HDX)—Transmission in either direction, but not at the same time.

Handbook 44—A series of regulations adopted by NIST (National Institute of Standards & Technology) to control the consistency of weighing and measuring devices.

Handshake—One or more special control lines for the timed coordination of the data flow in parallel and serial interfaces by acknowledgments between sender and transmitter. Example: The data receiver reports readiness to receive, the data transmitter then reports that the data are ready for transmission.

Hanging Scale—A scale designed to be hung from an overhead support where the load is suspended below the scale.

Hard Disk—Usually a permanent non-removable storage device used on PC's, usually with a great amount of storage capacity.

Hertz (Hz) - Cycles per second. A unit of measure for frequency.

Hertz (Hz)—A measure of frequency or bandwidth. The same as cycles per second.

Hidden Node - A station on a wireless LAN that attempts to transmit data to another station but, due to its location relative to the others, cannot sense that there is a third station simultaneously communicating with the intended recipient. Lost message and multiple retries is the result.

Humidity, Relative—The moisture content of air relative to the maximum that the air can contain at the same pressure and temperature.

Hysteresis—The maximum difference between load cell output readings for the same applied load. One reading is obtained by increasing the load from zero, and the other by

decreasing the load from rated capacity. Usually measured at half rated capacity and expressed in percent of rated capacity.

I/O—Input/Output.

Increasing Load Test—The performance of a scale as increments of test load are successively added to the scale.

Increment—The value of the smallest value that can be reported by the scale (displayed or printed).

Institute of Electrical and Electronic Engineers (IEEE) - A professional society serving electrical engineers through its publications, conferences, and standards development activities. The body responsible for the Ethernet 802.3 and wireless LAN 802.11 specifications.

Interface—A shared boundary; a physical point of demarcation between two devices, where the electrical signals, connectors, timing, and handshaking are defined; the procedures, codes, and protocols that enable two entities to interact for a meaningful exchange of information.

International Organization for Legal Metrology (OIML)—Abbreviation for Organization Internationale de Metrologie Legale. The main task of the OIML involves unification of the administrative and technical regulations for measurement methods and measuring instruments for the field of legal metrology at an international level.

International Standard—An ISO standards document that has been approved in final balloting.

Intrinsically Safe—An instrument that will not produce any spark or thermal effects under normal or abnormal conditions that will ignite a specified gas mixture.

IPX (Internet Packet Exchange)—A product of Novell, Inc. that represents a network protocol for delivery of data packets from one network node to one or more other nodes. It does not provide guarantee of delivery (see SPX).

IR—Abbreviation for InfraRed. Light lying at the extreme range of red and outside of the visible range. The type of light emitted by an LED (Light Emitting Diode).

ISO (International Standards Organization)—This organization handles the international standardization of terms, measurement methods, tolerances and the like in the industrial field.

Isotropic - An antenna (or a theoretic construct of an antenna) that radiates its signal 360 degrees both vertically and horizontally-- a perfect sphere.

Item Number—The number programmed in a PLU file that is used to encode into a printed bar code symbol. The item number is then used by a bar code scanner to identify the commodity (item).

Jitter—The slight movement of a transmission signal in time or phase that can introduce errors and loss of synchronization in high-speed synchronous communications.

Jumper—(1) A wire which connects a number of pins on one end of a cable only, such a looping back Request to Send from Clear to Send. (2) Connector on a printed circuit board of an electronic circuit used to set or initiate certain functions. A jumper is either ON/SHORTED or OFF/OPEN.

Keyboard (keypad)—A device consisting of an array of keys used to initiate functions and/or enter alphanumeric data and special characters.

Keyboard Tare—Keyboard entered tare is used when the empty weight of a container is a known value. The known tare weight is entered using the numeric keys, and the TARE key is pressed.

Kilogram—the kilogram (unit symbol kg) is the base unit of mass in the metric system.

LAN—Local Area Network. Data link between individual computers at different locations, e.g. in an office or throughout the grounds of a factory, typically up to 1 km. The data transmission rate lies between 100 KB/s and 20 MB/s. Local networks are multipoint connections. They operate with serial data transmission and are independent of the post office lines.

LCD—Abbreviation for Liquid Crystal Display; a type of display used many types of devices, including scales, calculators, notebook PC's, etc.

LED (Light Emitting Diode)—Also called light diode or luminescence diode. Available colors: red, green, yellow, and orange. An LED is a semiconductor diode that emits light when a current of about 10 mA flows through it. Its illuminating power is high, but its current consumption is also relatively high. Can be read without external light.—Readout.

Line of Sight - An unobstructed straight line between two transmitting devices. Line of sight is typically required for long-range directional radio transmission. Due to the curvature of the earth, the line of sight for devices not mounted on towers is limited to 16 miles (26km).

Linearity—Linearity is a measure of how well the scale is capable of following the linear relationship between the loaded weight and the display value. The characteristic curve of a balance is envisaged as a straight line between zero and maximum load. The non-linearity defines the width of the band within which a plus or minus deviation of the measured value from the ideal characteristic line can occur.

Linearization—The non-linearity of the characteristic curve of a weighing cell leads to measurement errors and various measures are thus employed in an attempt to keep the linearity error small. Modern linearizations are, e.g. correction of the characteristic curve by corrections stored in the microprocessor or built-in calibration weights that are weighed singly and together in the calibration process. The microprocessor determines the actual linearity deviation and then corrects it.

Load Cell—A device that produces an electrical output signal proportional to the applied weight or force.

Load—The weight or force applied to the load cell.

Loopback—Type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all, or a portion of, a data communications link or network.

Loss—Reduction in signal strength, expressed in decibels; also, Attenuation; opposite of gain.

Manual Tare (Keyboard Tare)—The operator enters a tare value manually and presses the TARE key.

Mark—Presence of signal. In telegraph communication, a mark represents the closed condition or current flowing. A mark impulse is equivalent to a binary 1.

Mass—The physical quantity mass (m) is the property of matter of a body expressed in terms of both its inertial effects with respect to a change in its state of motion and the attraction it exerts on other bodies. The mass of an object is independent of its location. If is determined by comparison with bodies of known mass, for example by weighing. The embodiment of a unit of mass and its fractions or multiples is called weights or weight pieces. The base unit of mass is the kilogram or kg.

Master—In a scale network, the master acts like a PC File Server. The master contains all of the data records. A satellite on the network can retrieve the record and use it locally for a transaction. The master on the network keeps track on each transaction and adds it

into an accumulator database. The METTLER TOLEDO master/satellite network is commonly called a TNET (Toledo Network). The TNET can support up to 24 satellites.

Maximum Capacity (Max)—Maximum weighing capacity, not taking into account the additive tare capacity.

Maximum Load Capacity—The maximum load a balance or scale can accommodate without damage. It is always greater or equal to the maximum load plus the maximum tare load. Abbreviation: Lim.

Maximum Load—Upper limit of the weighing range without consideration of the additional maximum tare.

Maximum Safe Load (Lim)—Maximum static load that can be carried by the instrument without permanently altering its metrological qualities.

Megabyte—A term used to express the storage capacity of disk drives, RAM memory, etc. One Megabyte is equivalent to one million bytes of data. Commonly referred to as a "Meg"; one Meg, two Megs, etc.

Megahertz (MHz) - One million cycles per second. A unit of measure for frequency.

MELSI—Mettler Large Scale Integration. A proprietary circuit that performs analog-to-digital weight conversion.

Memory—A type of storage used in PC's and scales, generally referred to as RAM (Random Access Memory). The RAM in a PC will only store data as long as the power is on. The RAM used for data storage in scales is usually battery backed in case of a power loss.

Menu—A group of selections or options on a screen.

Metric Weight—A unit of weight based on the kilogram (1,000 grams).

Metrology—The science of measurement, measurement systems, and units.

Minimum Capacity (Min)—Value of the load below, which the weighing results, may be subject to an excessive relative error.

M—Mega; designation for one million (e.g., Mbps or megabyte).

m—Milli; designation for one thousandth.

Modem (Modulator-Demodulator)—A device used to convert serial digital data from a transmitting terminal to a signal for transmission over a telephone channel, or to reconvert the transmitted signal to serial digital data for acceptance by a receiving terminal.

Modulation - Any of several techniques for combining user information with a transmitter's carrier signal.

Monitor—A display screen used on PC's and other devices.

Motion Detection—The process of sensing a rate of change of applied load to determine when a given weighing system has reached a state of equilibrium.

Multipath - The echoes created as a radio signal bounces off of physical objects.

MultiRange—A scale whose weighing range is divided into partial weighing ranges with different scale division values. Switching of the division values occurs automatically with increasing and decreasing load at the same display values. **n = (max.)/d**

Net Weight—The weight of a weighing sample after deduction of the weight of its packaging or of the transport device (tare weight) with which it had previously been weighed.

Network—An interconnected group of Nodes; a series of points, nodes, or stations connected by communications channels; the assembly of equipment through which connections are made between data stations.

NIST—Abbreviation for the National Institute of Standards & Technology.

Noise—An unwanted signal that can contribute to errors in measurement.

Notch Filter—A tunable filter used to filter out one specific frequency below the lowpass filter frequency.

NTEP—Abbreviation for the National Type Evaluation Program. An NIST procedure where devices submitted to NTEP are evaluated using Handbook 44 as a reference. See Certificate of Conformance (COC).

Number of Scale Divisions—Quotient calculated from maximum load (max.) and scale division

Odd Parity— A data verification method in which each character must have and odd number of "on" bits.

Omni-Directional Antenna- An antenna that provides a 360 degree transmission pattern. These types of antennas are used when coverage in all directions is required.

Optical Isolation—Two networks or devices that are connected only through and LED transmitter and photoelectric receiver and with no electrical continuity between the two devices.

Over/Under Indication—A scale that is capable of indicating weights greater or lesser than a predetermined weight.

Overload Rating, Safe—Maximum load in percent of rated capacity which can be safely applied without damaging or producing a permanent shift in performance characteristics beyond those specified.

Parabolic - A concave or dish-shaped object. Often refers to dish antennas. Peer-to-Peer Network: A network design in which each computer shares and uses devices on an equal basis.

Parallel Transmission—Transmission mode that sends a number of bits simultaneous over separate lines.

Parity Bit—A bit that is set at "0" or "1" in a character to ensure that the total number of "on" bits in the data field is even or odd. (See Even/Odd Parity)

Parity Check—The addition of non-information bits that make up a transmission block to ensure that the total number of 1s is always either even or odd.

Password—A set of characters or numbers that must be typed in to gain access to certain functions on a scale or computer.

PC—A common term referring to a Personal Computer.

Pending File—A temporary file that will be used to update a regular file.

Pin Assignment—In electronic instruments, this term refers to the assignment of the individual connector contacts to certain signals. Some types of commonly used connectors used on PC's and peripherals are internationally standardized.

Platter—The platform of a scale on which the load is placed.

PLU—Abbreviation for Price Look Up. The PLU number is a data record's index number used to store it in a data file, and by an operator to retrieve the record.

Poise—A moveable weight mounted upon or suspended from a weighbeam bar and used in combination with graduations on the bar to indicate weight values.

Polarity—Any condition in which there are two opposing voltage levels or changes, such as positive and negative.

Port—A point of access into a computer, a network, or other electronic device; the physical or electrical interface through which one gains access; the interface between a process and a communications or transmission facility.

Precision—The degree to which a scale conforms to a predetermined specification as well as its ability to successfully repeat actions within closely specified limits.

Prepackaging Scale, Prepack—A scale or weighing mode designed for weighing random weight prepackaged items.

PROM (Programmable Read Only Memory)—Nonvolatile memory device which retains its contents when the power supply is switched off. They can be only read (i.e. not written to) by the processor and contain programs and important device parameters. They are installed as integrated components.

Proportional Tare—Proportional Tare (SmartTouch Master must be Version 3.0 or later) is stored in the Tare2 field. By-Weight tares are stored in the Tare1 field. The Net Weight will be the gross weight minus the By-Weight Tare, minus the proportional tare, times the Gross Weight, minus By-Weight Tare value. The mathematical representation is as follows: Net Weight = (Gross Wgt - Tare1) - (Tare2 x (Gross Wgt - Tare1))

Protocol—Formal set of rules governing the format, timing, sequencing, and error control of exchanged messages on a data network; may be oriented toward data transfer over an interface, between two logical units directly connected, or on an end-to-end basis between two users over a large and complex network.

Pushbutton Zero—Pushbutton zero is a way for the operator to capture a new gross zero reference point. The weight on the scale must be stable and within the pushbutton zero capture range of the original zero recorded during calibration.

Radio Frequency (RF) - A generic term for radio-based technology.

RAM (Random Access Memory)—Storage device into which data can be entered (written) and read; compare with ROM.

Range - A linear measure of the distance that a transmitter can send a signal.

Readability—The smallest possible weight change detectable on the scale readout and a function of the external resolution.

Receiver Sensitivity - A measurement of the weakest signal a receiver can receive and still correctly translate it into data.

Repeatability, Reproducibility—The ability of a scale to duplicate the same value when identical samples are loaded and reloaded in succession. Simply put, it's getting the same value repeatedly.

Resolution—The smallest possible weight change detectable on the scale readout. A function of the external resolution.

Reverse Polarity TNC (RP-TNC) - A connector type unique to Aironet radios and antennas. Part 15.203 of the FCC rules covering spread-spectrum devices limits the types of antennas that may be used with transmission equipment. In compliance with this rule, Aironet, like all other wireless LAN providers, equips its radios and antennas with a unique connector to prevent attachment of non-approved antennas to radios.

RFI—Radio Frequency Interference

Roaming - A feature of some access points that allow users to move through a facility while maintaining unbroken connection to the LAN.

ROM (Read-Only-Memory)—A data storage device, the contents of which cannot normally be altered; storage in which writing-over is prevented; also, permanent storage; compare with RAM.

RS-232 Interface—A digital serial synchronous interface complies with the EIA RS-232 standard for modem connections for data transmission over the telephone lines. The standard is suitable for the description of computer interfaces as, e.g. connector design, pin assignment and signals are described. The use of modem control lines is not defined for the connection of computers and often leads to difficulties in data transmission.

RS-422—Electrical characteristics of balanced-voltage digital interface circuits.

RS-423—Electrical characteristics of unbalanced-voltage digital interface circuits.

RS-485—An interface similar to RS422 that has improved drive capabilities and can be used for multiple device networking.

Sample Rate—The number of samples per unit of time that a circuit or device measures the input signal.

Scale divisions, Number of (n)—The quotient of the capacity divided by the value of the scale division (e). **n = Capacity / e**

Scale Divisions, Value of (d)—The value of the scale division, expressed in units of mass, is the smallest subdivision of the scale.

Scale division—Smallest weighing increment of a scale.

Sealing, Security Seal—1. Eliminating access to certain components by attaching objects (seals) that are usually metallic. A safety seal is stamped on these objects by means of pliers (lead-sealing pliers). 2.The official process of attaching a seal to a measuring instrument, e.g. the main seal or the EC certification seal after an instrument has been certified, or any required safety seal. A locking seal is understood to refer to the kind of seal that simultaneously secures the housing of a balance to prevent it being opened.

Sensitivity—The smallest possible weight change detectable on the scale readout. A function of the external resolution.

Serial Data Transfer—The consecutive transmission of data over one or several lines.—Data Transmission.

Serial Transmission—The most common transmission mode in which information bits are sent sequentially on a single data channel.

Shielding—Protective enclosure or surrounding for and electrical circuit or transmission medium, such as coaxial cable, designed to minimize electromagnetic and radio frequency leakage and interference.

Shift Test—A test intended to disclose the weighing performance of a scale under off-center loading.

SI Units—Units of the International System of Units (SI = Systeme International d'Unites). The system consists of seven base units (meter, kilogram, second, ampere, Kelvin, mol, candela), a number of derived units (created by combining several base units e.g. Newton $N=m \cdot kg \cdot s^{-2}$), and certain supplementary units (e.g. radian rad for a plane angle).

Span Stability—The capability of an instrument to maintain the difference between the indication of weight at maximum capacity and the indication at zero over a period of use within specified limits.

Span—The full scale capacity less the zero or minimum value.

Specific Gravity—The ratio or mass of any material to the mass of the same volume of pure water at 4ºC.

Spread Spectrum - A radio transmission technology that "spreads" the user information over a much wider bandwidth than otherwise required in order to gain benefits such as improved interference tolerance and unlicensed operation.

Stability—The measure of a scale's ability to give the same weight or count reading at different points in time. Phenomena affecting stability include creep, vibration, temperature, and humidity.

Start Bit—In asynchronous transmission, the first bit or element in each character, normally a space, which prepares the receiving, equipment for the reception of a character.

Static Weighing— When an object is placed on the scale either manually or automatically for a sufficient time to record the mass (weight). After the weight is recorded, it is removed from the scale.

Stop Bit—In asynchronous transmission, the last bit, used to indicate the end of a character.

Strain Gage—A measuring element for converting force, pressure, tension, etc. into an electrical signal, usually by a change in resistance of the device.

String—Any combination of alphanumeric characters (letters, numbers and special characters.)

Tare—Tare is the empty weight of a container or vehicle. Tare is normally used to determine the net weight of the contents of the container. Tare is used in several different ways.

Temperature Range, Compensated—The range of temperature over which the load cell is compensated to maintain the rated output and zero balance within specified limits.

Test Weight—A calibrated weight used to calibrate scales.

Timeout—Expiration of predefined time period, at which point some specified action occurs. In communications, timeouts are employed to avoid unnecessary delays and improve traffic flow. They are used, for example, to specify maximum response times to polling and addressing before a procedure is automatically reinitiated.

TNET—Toledo Network. An RS485 communications network used in the Retail Master/Satellite network where a single master supports up to 24 satellites. The satellites retrieve PLU data from the master through the high-speed network as needed. The standard TNET runs at 345k baud.

Tolerance—A value fixing the limit of allowable error or departure from true performance or value, as established by authority of usage.

Tonne—A special name for the megagram (unit symbol t) which is equivalent to one thousand kilograms: $1\ t = 10^3\ kg$.

Troy Weight—A series of units of weight based on a twelve ounce pound using ounces of 20 pennyweight or 480 grams.

TTL—Transistor-to-Transistor logic. A type of solid state logic that uses only transistors to form the logic gates.

Vacuum Florescent Display—A type of display that illuminates like a light bulb. VFD displays are used when visibility is required in both brightly lit and dimly lit areas.

Weighing Range—The range, within which, a balance may be used for weighing. The limits of a weighing range are called minimum load (lower limit) and maximum load (upper limit).

Weighing—Determining the mass (weight) of an object. Weight force as the product of the mass of a body and the local acceleration due to Gravity. Weight or weight piece as

the embodiment of a mass unit. In commerce and industry, the result of a weighing can continue to be referred to as weight (DIN 1305).

Weighment—A single complete weighing operation.

Weight Tolerance—A term which describes the difference between the admissible plus or minus deviations and a specified weight value.

Weight Value—(lb or kg, etc.)

Wired Equivalent Privacy (WEP) - Optional security mechanism defined within the 802.11 standard designed to make the link integrity of the wireless medium equal to that of a cable.

X-ON/X-OFF (Transmitter On/Transmitter Off)—Control Characters in a serial communication data stream used for flow control, instructing a terminal to start transmission (X-ON) and end transmission (X-OFF).

Yagi - A type of often cylindrical directional antennas.

Zero Capture at Power-up—The scale attempts to capture a new center of zero when power is applied. Weight on the scale must be stable and within the zero capture range at power-up. The zero capture range is symmetrical around the original zero recorded during calibration.

Zero—Zero is the empty weight of the scale platform. The gross zero reference is recorded during the calibration procedure. The zero reference recorded during calibration can be modified to compensate for changes that are due to material buildup on the scale or temperature change.

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