Air Cargo

Dual Roller Deck Container Scale

Installation and Service Manual

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(6/98).00

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PROBLEM(S) TYPE:	DESCRIBE PROBLEM(S):	INTERNAL USE ONLY
o **Technical Accuracy**	o **Text** o **Illustration**	
o **Completeness** **What information is missing?**	o **Procedure/step** o **Illustration** o **Definition** o **Example** o **Guideline** o **Feature** o **Explanation** o **Other (please explain below)**	o ***Info. in manual*** o ***Info. not in manual***
o **Clarity** **What is not clear?**		
o **Sequence** **What is not in the right order?**		
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F

INTRODUCTION

This publication is provided solely as a guide for individuals who have received Technical Training in servicing the Mettler Toledo product.

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WARNING!

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

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READ this manual BEFORE operating or servicing this equipment.

FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

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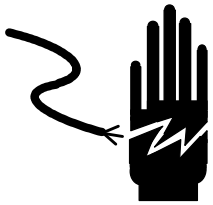

⚠ WARNING

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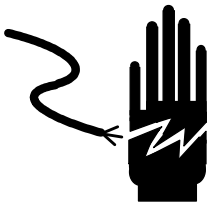
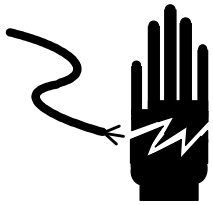


⚠ WARNING

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



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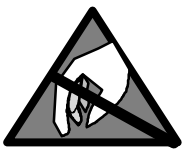
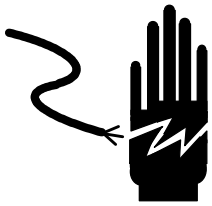


⚠ CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

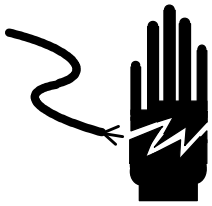
⚠ WARNING

USE EXTREME CAUTION WHEN LIFTING AND MOVING THE SCALE TO THE DESIRED LOCATION. DO NOT ATTEMPT TO LIFT AND MOVE THE SCALE BY YOURSELF OR INJURY COULD OCCUR.



⚠ WARNING

DISCONNECT ALL POWER BEFORE OPENING THE DST.



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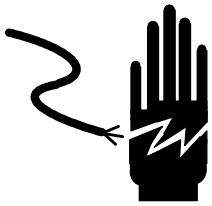

⚠ WARNING

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

Mettler Toledo
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1 Introduction

The METTLER TOLEDO Dual Roller Deck Container Scale system is designed to weigh cargo containers for air freight carriers.

The scale system consists of two independent weighing platforms and a dual scale terminal (DST). Each weighing platform features a roller deck surface and incorporates Centerlign™ weigh modules, which feature a low-profile rocker pin suspension with a high restoring force. The platforms are supported by an adjustable subframe.

The dual scale terminal consists of two Panther indicators that display each individual platform weight and a Lynx indicator that sums data from both scales.

Information from the system helps FedEx load cargo containers onto aircraft in accordance with acceptable weight and balance specifications.

The Dual Roller Deck Container Scale meets FedEx requirements of 0.1% applied load accuracy specifications. The scale uses METTLER TOLEDO 5,000-pound capacity stainless steel hermetically sealed load cells. Overall scale capacity is 20,000 pounds, or 10,000 pounds per platform.

2 Installation and Wiring

This chapter gives detailed instructions and important information you will need to install the scale and dual scale terminal (DST) successfully. Please read this chapter thoroughly before you begin installation.

Inspection

Upon delivery of the Dual Roller Deck Container Scale, visually inspect the scale for any damage which may have occurred during shipping and handling.

Inspect the following areas:

- Platform assemblies
- Load cells
- Load cell cables
- Junction boxes

If any damage is found, contact your freight carrier.

Also inspect the DST for damage. If the container is not damaged, unpack the terminal from its protective package, noting how it was packed, and inspect each component for damage. If it is necessary to ship the terminal, use the original shipping container if possible. The DST must be packed correctly to ensure its safe transportation.

Package contents for the DST include:

- Dual scale terminal
- Post mounting bracket
- Set of capacity labels
- Screwdriver

Safety Considerations

Position the jib pole properly on the forks of the lift truck. Observe all safety procedures. The lift truck must be capable of safely lifting a 4,000-pound object.

Do not place forklift blades beneath the scale assembly. Subframe damage could result.

⚠ WARNING

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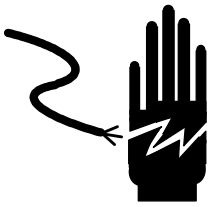

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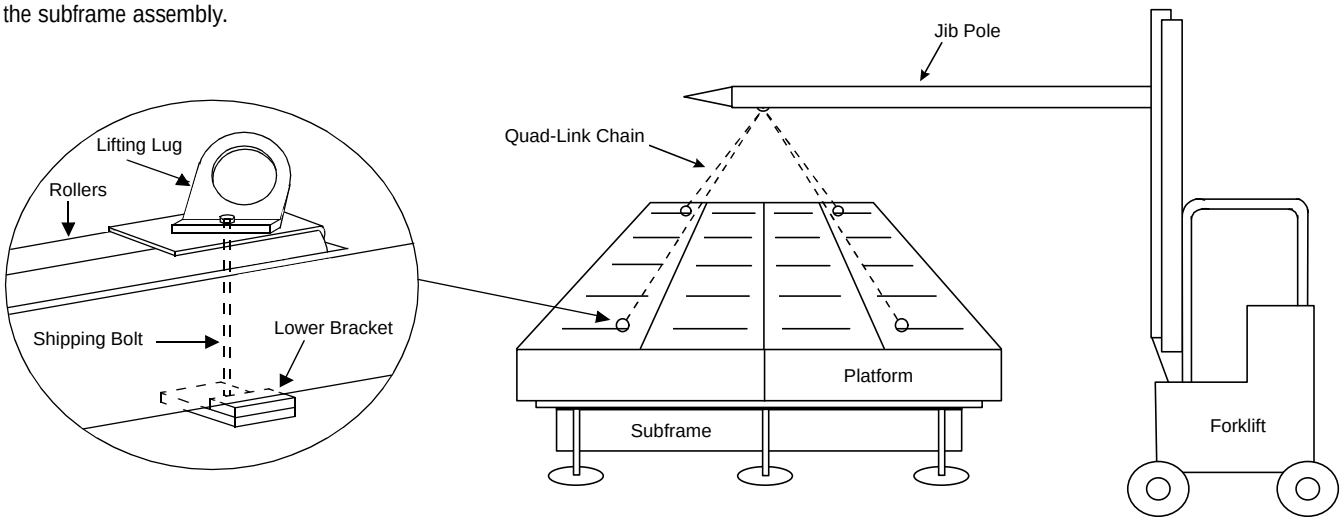
Installing the Scale Platform

> **⚠ WARNING**
>
> **ALWAYS USE THE LIFTING LUGS TO LIFT THE SCALE. FAILURE TO DO SO COULD DAMAGE THE SCALE OR RESULT IN BODILY HARM.**

The Dual Roller Deck Container Scale must be transported to the desired site using rigging such as a quad-link chain or sling attached to the forklift blades, preferably a jib pole engaged to the blades. Attach a chain or sling to each of the four lifting lugs in the corners of the platform (see Figure 2-1).

Do not place the forklift blades beneath the subframe assembly.



Lifting Lug Detail

Figure 2-1: Lifting the Dual Roller Deck Container Scale

1. Place the scale in the desired location, then measure the distance from the floor to the deck at each corner of the scale. Adjust the height of each corner (the height of the scale deck is adjustable ± 2 inches). Each of the six supports can be adjusted independently by screwing the all-thread support legs in or out. Then position the scale deck to match the surrounding platforms. The roller deck weighing surface can tolerate a slope of 1 percent, maximum, in any direction.
2. With the scale in position, remove one or two rollers in each corner of each platform (before removing the rollers, you will need to remove the lifting lug and shipping bolt assembly in each corner). To remove the rollers, remove the cotter pin from one end and push the roller to the side. Depress the spring-loaded rod and lift the roller out.

3. After the legs have been adjusted to the correct height, secure them into position by placing 5/8-inch anchor bolts through each support foot. Using the existing holes as a guide, install two anchors 180° apart in each corner support foot. Install one anchor in each center support foot. The holes for anchoring the center support feet will have to be drilled through the opening between the two decks (see Figure 2-2).

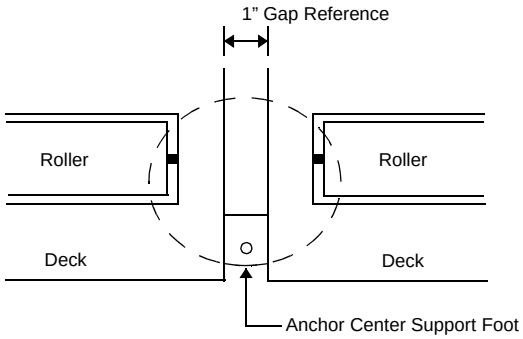
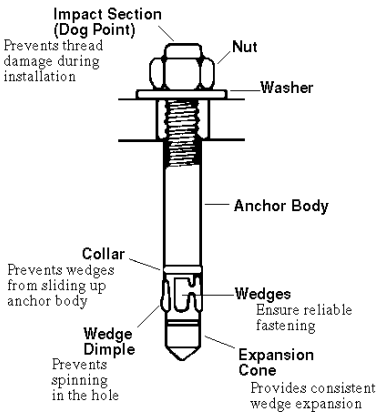


Figure 2-2: Anchoring Center Support Feet

Use a wedge-design expansion anchor such as Hilti's Kwik Bolt II, KB II 58-434 (Item no. 00045371) carbon steel anchor, 5/8 inch x 4-3/4 inches long. For each anchor, drill a hole 5/8 inch diameter x 3-1/2 inches deep into the concrete floor using a hammer drill. Clean each hole. Drive each anchor through the support foot into the drilled hole using a 2-pound hammer. About 1 inch of thread should be exposed above the support foot. Install the washer and nut and torque each anchor to 85 ft-lb or two to three turns past the finger-tight position (see Figure 2-3).

4. Once the frame is properly anchored, make sure that the roller decks oscillate freely in all directions before proceeding.



Anchor Bolt Detail

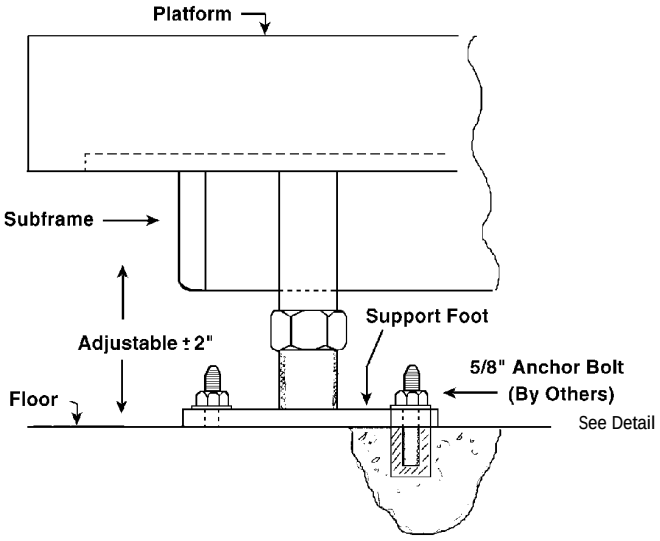


Figure 2-3: Anchoring Subframe

Platform Junction Box Wiring

Refer to the following diagrams and wiring table for basic junction box wiring information.

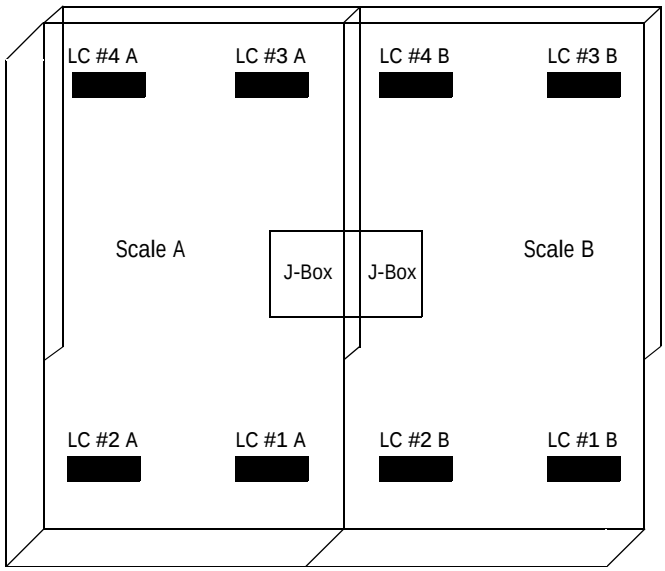


Figure 2-4: Plan View Load Cell Orientation—Dual Platform

		Analog Junction Box	
Load Cell Wiring		Instrument Cable Wiring	
Function	Color	Function	Color
+ Excitation	Green	+ Excitation	White
		+ Sense	Yellow
+ Signal	White	+ Signal	Green
Shield	Yellow	Shield	Orange
- Signal	Red	- Signal	Black
		- Sense	Red
- Excitation	Black	- Excitation	Blue
		Based on METTLER TOLEDO cable number 510620370	

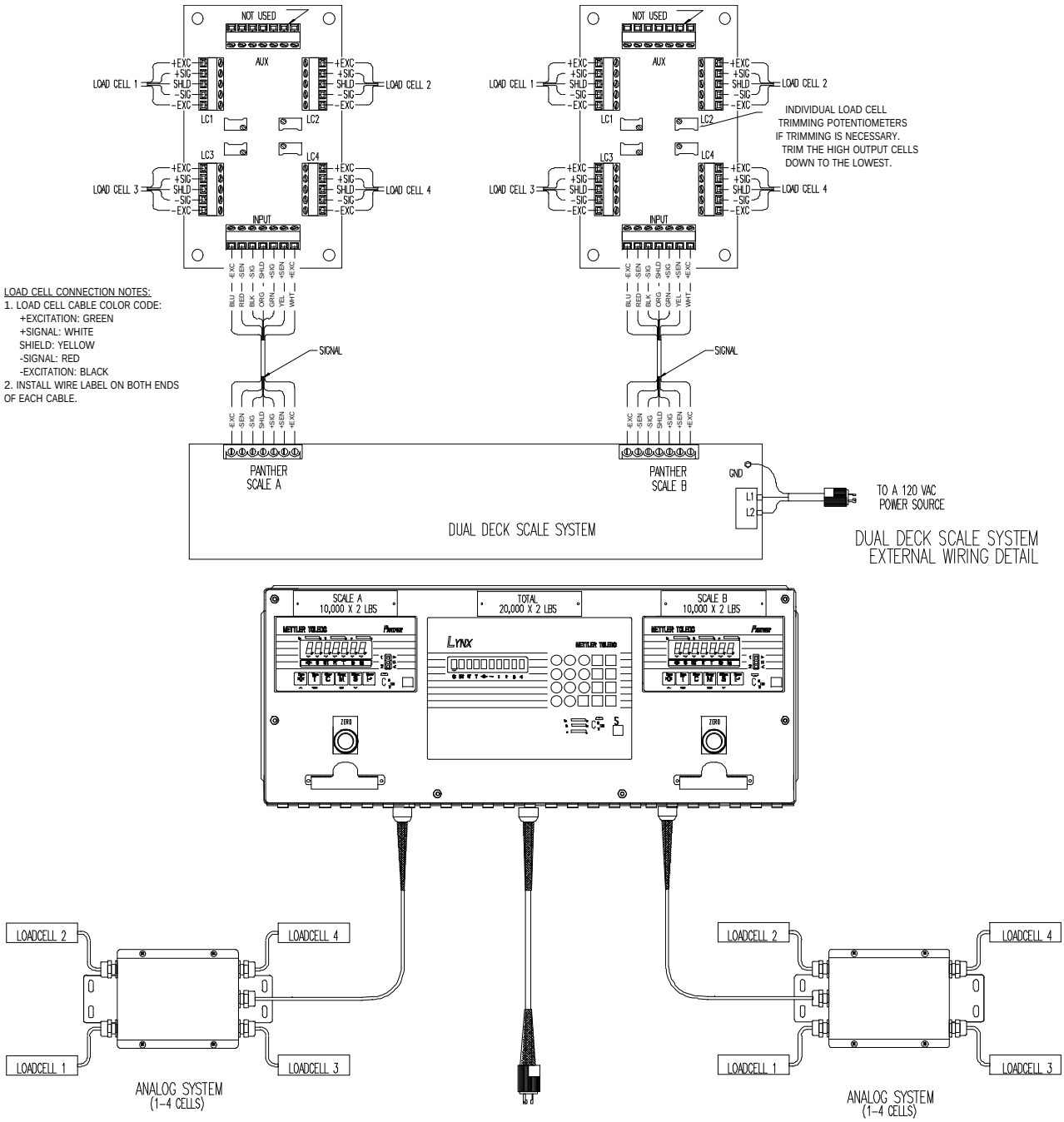


Figure 2-5: Analog System Wiring Diagram

Connecting the DST

Once you have installed the scale platform, connect the DST. Refer to Figure 2-5 for wiring details and color coding.

Mount the DST

The indicator comes with the bracket-mounting hardware shown in Figure 2-6.

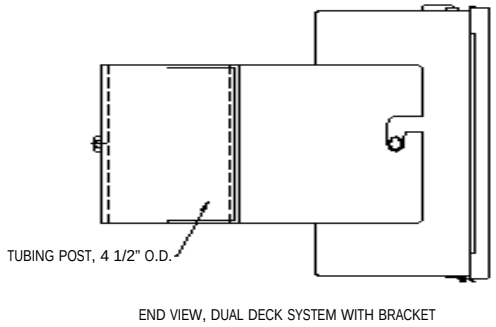


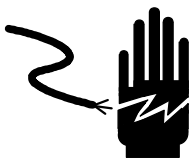
Figure 2-6: Dual Scale Terminal Bracket Mounting Hardware

To mount the DST:

1. Connect the bracket to the back of the DST.
2. Slip the bracket/DST assembly over the tube post and tighten it so that the terminal is secure. The DST can be adjusted horizontally and vertically to place it in the best position for viewing.

Open the DST

The dual indicator uses three quarter-turn fasteners on top to lock the hinged front panel in place and seal the enclosure to NEMA 12 specifications.



⚠ WARNING

DISCONNECT ALL POWER BEFORE OPENING THE DST.

1. Open the front panel by rotating the three fasteners one quarter turn. The center fastener requires an 11/16-inch wrench. The front panel hinges down toward you (the hinge is on the bottom).

   The front panel swings open approximately 180º to allow access to the enclosure interior for wiring and service.

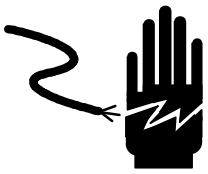
Connect the DST to the Scales

To connect each scale to a terminal:

1. Pass the cable that enters the enclosure through the cable grip and strain relief **before** connecting the wires.
2. After resecuring the back cover, tighten the cable grip sufficiently to provide a watertight seal around the cable. This will allow any internal cable slack to be received through the cable grip.
3. Connect each scale load cell cable to the terminal block labeled +EXC, +SEN, +SIG, SHLD, -SIG, -SEN, -EXC.
   See Figure 2-5 for connections and color codes. Use the cable clamps located on the inside of the front panel to secure the load cell cables. Be sure to allow sufficient slack so the front panel hinges can be closed.
4. Close the latch of the DST cover.

Apply Power

Apply power to the indicator by plugging the line cord into a properly grounded AC power outlet.



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Each Panther terminal and the summing Lynx terminal go through a power-up sequence when the DST is turned on. The power-up sequence includes a display test and internal diagnostic tests to confirm normal operation.

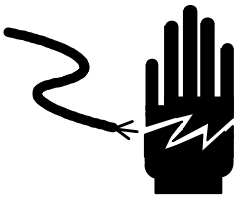
After a brief delay, the terminals display their software part number and advance to normal operation mode.

The total power-up sequence requires approximately 30 seconds. The power-up sequence is similar to the time required to “boot” a personal computer.

Calibration

A METTLER TOLEDO service technician will perform the initial scale calibration according to Federal Aviation Administration (FAA) Guidelines, using certified test weights (20,000 pounds) that are traceable to the National Institute of Standards and Technology (NIST). The system will be calibrated for an analog junction box.

Calibration procedures for FedEx maintenance after the initial calibration are given in Chapter 4 of this manual.



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3 Operating Instructions

The Dual Roller Deck Container Scale lets you load and weigh two small containers or one large container. When weighing two small containers, the system operates as two independent scales (A and B), each with its own terminal display. When weighing one large container, the Lynx component of the DST sums the weights from Scales A and B and displays the total container weight.

Before You Begin

The following tips will ensure accurate weighing:

- Inspect the scale to be sure nothing is on the platform. Clear the vicinity to prevent incidental interference.
- Check the dual indicator display to be sure it is on, then press the ZERO pushbutton to zero the scale. The display should read 00. If the indicator does not return to zero after several attempts, contact the maintenance department and notify them of the problem.

Basic Weighing Procedure

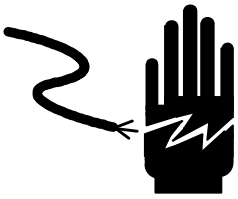
1. Place the container(s) onto the scale. To ensure accurate weight readings, make sure each container is completely on the scale and not touching any other equipment.
2. Raise the container stops to prevent the container(s) from moving during the loading and/or weighing process.
3. If the container(s) are empty, load the container(s).
4. Record the weight displayed on the dual indicator for the container(s). If weighing two small containers, record each container's weight individually. If weighing one large container, record the summed weight.
5. When the container(s) are ready to be removed from the scale, lower the container stops and remove the container(s) from the platform.
6. To weigh additional container(s), zero the scale and repeat steps 1 through 5.

4

Maintenance

The METTLER TOLEDO service technician will install the Dual Roller Deck Container Scale system initially, making sure it is calibrated correctly and accurately and conforms to all FedEx specifications. This chapter describes routine care and maintenance that should be performed regularly by FedEx.

If at any time you need assistance, contact your local METTLER TOLEDO service office.



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⚠ CAUTION

Before connecting/disconnecting any internal electronic components or interconnecting wiring between electronic equipment, always remove power and wait at least 30 seconds. Failure to observe these precautions could result in bodily harm or damage to or destruction of the equipment.

Calibration and Maintenance Intervals

Inspect and check calibration of the Dual Roller Deck scale system every 30 days.

Routine Maintenance

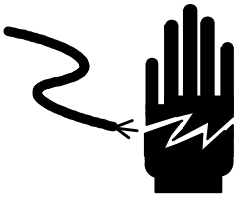
Routine maintenance for the Dual Roller Deck Container Scale is generally limited to inspecting the scale and scale location, cleaning debris, and cleaning the DST.

Inspecting the Scale

Use the following information as a guide during periodic scale inspection.

- Check the torque on all load cell and anchor bolts. Load cell bolt torque should be 100 ft-lb.
- Verify that the junction box lid is properly sealed and all cable connectors are tight against the enclosure.
- Check for moisture or foreign material in or around the junction box assembly.
- Make sure the load cell and instrument cables are not damaged.
- Perform shift adjustments and final calibration using the Panther manual as a reference.
- Make sure the platform is checking properly against the nonadjustable bumpers and the overload stops are clear. Overload gap should be 0.015 inch (see Figure 7-1).

Cleaning the DST



⚠ WARNING

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

You may wipe the enclosure and plastic display cover with a clean, soft cloth that has been dampened with a mild glass cleaner. Do not use any type of industrial solvent such as toluene or isopropanol (IPA) on the plastic display cover. Solvents may damage the finish. Do not spray cleaner directly onto the unit.

Regular maintenance inspections by a qualified service technician are also recommended.

FedEx Calibration Procedures

For each Panther terminal:

1. Apply power to the terminal.
2. Using 7,500 pounds, check the scale span. If span is out of tolerance, continue with the calibration procedure as described in steps 3 through 9.
3. Access the Scale Interface program block, then calibrate Zero and Span values. Refer to the next section, “Configuring the Panther Scale Interface.” Calibrate the span by placing 7,500 pounds of certified test weight in the center of the platform.

Check the shift characteristics to determine if any shift adjustment is required. Any shift adjustment required for a level scale should be minimal.

4. In the standard weighing mode, check the shift adjustment of each scale platform by successively placing a 1,000-pound test weight in each corner (see Figure 4-1). Note and record each weight value.

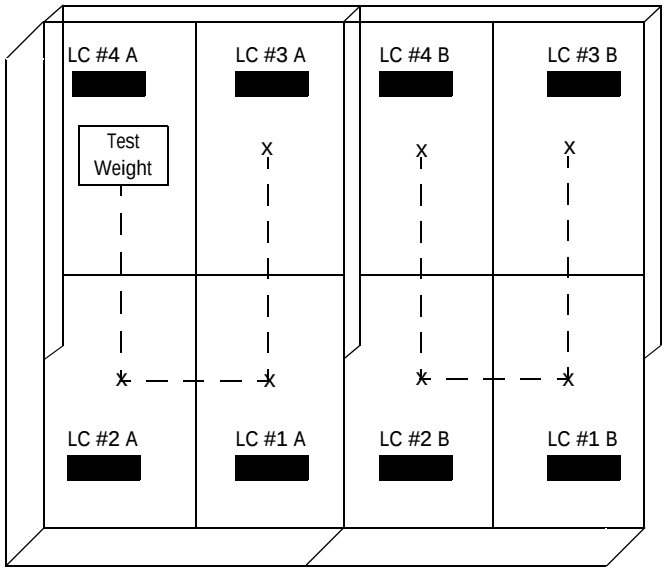


Figure 4-1: Shift Adjust

5. Determine the corner with the lowest out-of-tolerance indication. Place the test weight on that corner and record the weight value.

Because the trim potentiometers interact with each other, any adjustment will affect all corner readings.

6. Proceeding clockwise from the lowest indicating corner, place the test weight at each of the other corners. To adjust a corner reading, remove the junction box lid and turn the trim potentiometer corresponding to that corner until the reading agrees with the lowest indicating corner.
7. Repeat steps 1 through 6 until all platform corners indicate the same value.
8. Recheck the calibration by placing 7,500 pounds at the center of the platform. Make span adjustments as required.
9. Place a desiccant in the junction box and reinstall the lid.
10. Affix a sticker to the scale indicating date and calibrator.

Configuring the Panther Interface

The Panther terminals that come with the DST for the Air Cargo Dual Roller Deck Container Scale are standard terminals. As you become familiar with the equipment, you may see that the Panther terminals have capabilities beyond the scope of the FedEx application.

This section describes the F1 Scale Interface program block for configuration and calibration of the Air Cargo Dual Roller Deck Container Scale. Most of the sub-blocks within the Scale Interface program block should not require adjustment. The Calibration, Zero Adjustment, and Span Adjustment sub-blocks will be used during periodic calibration and maintenance.

For detailed information on other indicator features not described in this manual, please refer to the Panther Terminal Service Manual.

To access the Panther keypad, remove the plastic display cover.

Keystroke Functions

You will use the following keys on the Panther keypad when configuring the F1 Scale Interface program block:

SELECT scrolls forward through a list of choices. As the SELECT key is pressed, programming items are listed and appear in the display area. SELECT also increments a numeric data entry.

ENTER completes a response. Press ENTER to accept data entry.

CLEAR resets a numeric data entry value to zero. CLEAR also skips to the end of setup.

ZERO backs up to the previous step.

MEMORY moves the cursor one character to the right.

TARE moves the cursor one character to the left.

Program Block Access

Before configuring the F1 Scale Interface program block parameters, you must enter the setup mode:

1. Open the DST as described in Chapter 2 of this manual.
2. Remove the plate above the Panther terminal strips by removing the two Phillips head screws securing this plate.
3. Turn the SW1-1 switch ON. The SW1-1 switch is located behind the transformer and adjacent to the F1 fuse.

Note that the SW1-1 switch may be left ON if you are not concerned about the security of Panther setup.

4. Close the terminal and DST.
5. Press the ENTER and ZERO keys simultaneously. The Panther will display the F1 (Scale Interface) prompt.
6. Press ENTER to access the program block. The Panther displays the first sub-block prompt.

Figure 4-2 provides an overview of the Panther Setup Mode program block.

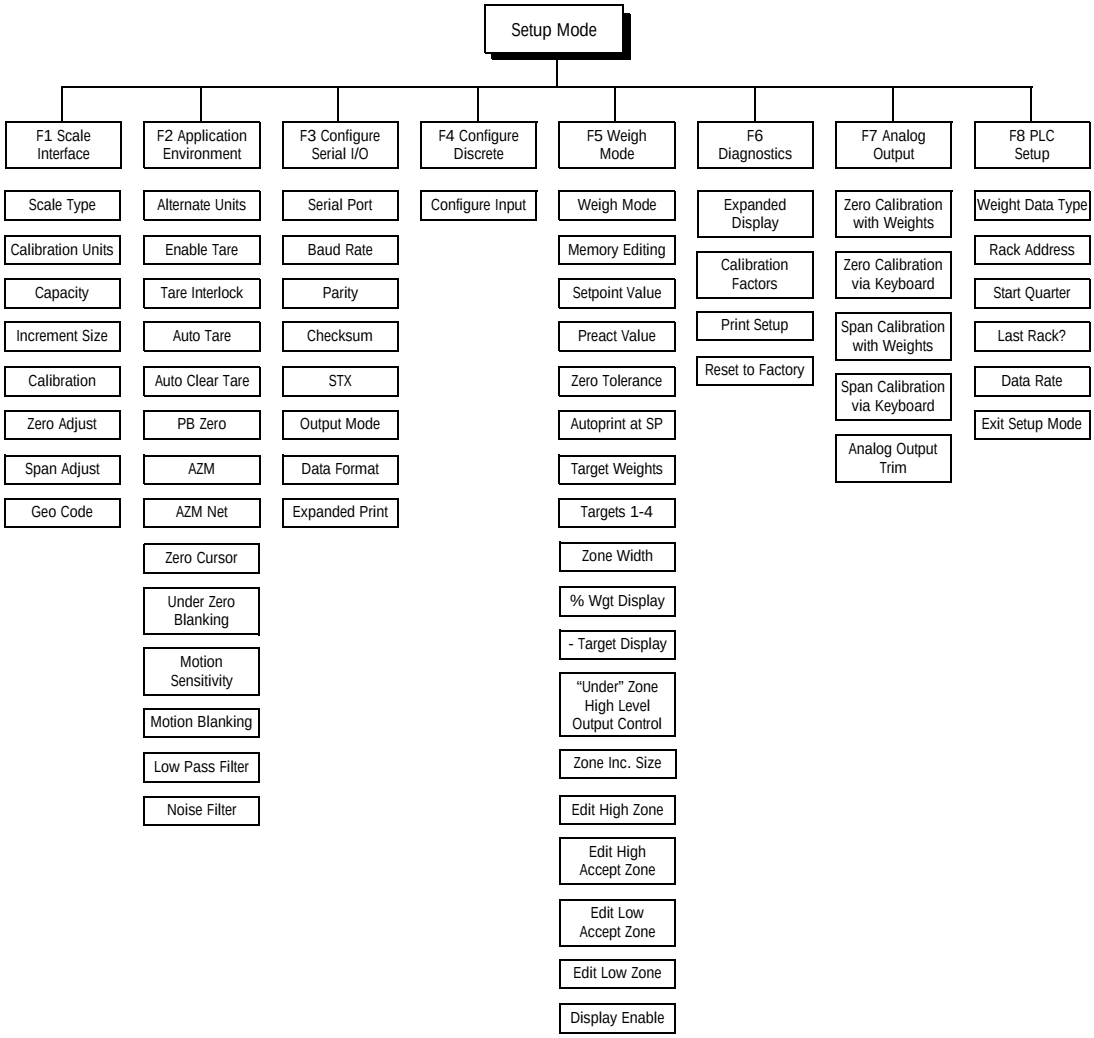


Figure 4-2: Scale Interface Program Block

General Programming Procedure

1. With the first program block prompt displayed, use the SELECT key to scroll through the program blocks. Press ENTER to access a program block. The Panther then displays the first sub-block for the selected program block.
2. Press ENTER to access the parameters of the first sub-block or press SELECT to scroll to another sub-block within the selected program block.
3. Within each sub-block, press SELECT to scroll through the parameters. Panther displays the parameter and its current value.
4. Press SELECT to scroll through a list of options for the displayed parameter, then press ENTER when the desired value is displayed.
5. Continue this basic procedure until the program blocks are configured as desired.

Numeric Data Entry

The Panther has several program blocks and sub-blocks that require numeric data entry. Although the Panther has no numeric keys, you can enter numeric data using the TARE, MEMORY, and SELECT keys.

Parameters requiring numeric data are prompted with 000000. A blinking cursor appears beneath the digit farthest to the right.

For example, to enter the value 8639 for a setup parameter:

1. At the 000000 prompt, press the TARE three times to position the blinking cursor under the second digit.
2. Press SELECT eight times to increment the digit value to 8.
3. Press the MEMORY key once to move the cursor to the next digit.
4. Press SELECT six times to increment the digit value to 6.
5. Press the MEMORY key once to move the cursor to the next digit.
6. Press SELECT three times to increment the digit value to 3.
7. Press the MEMORY key once to move the cursor to the next digit.
8. Press SELECT nine times to increment the digit value to 9.
9. Press ENTER to accept the displayed numeric value.

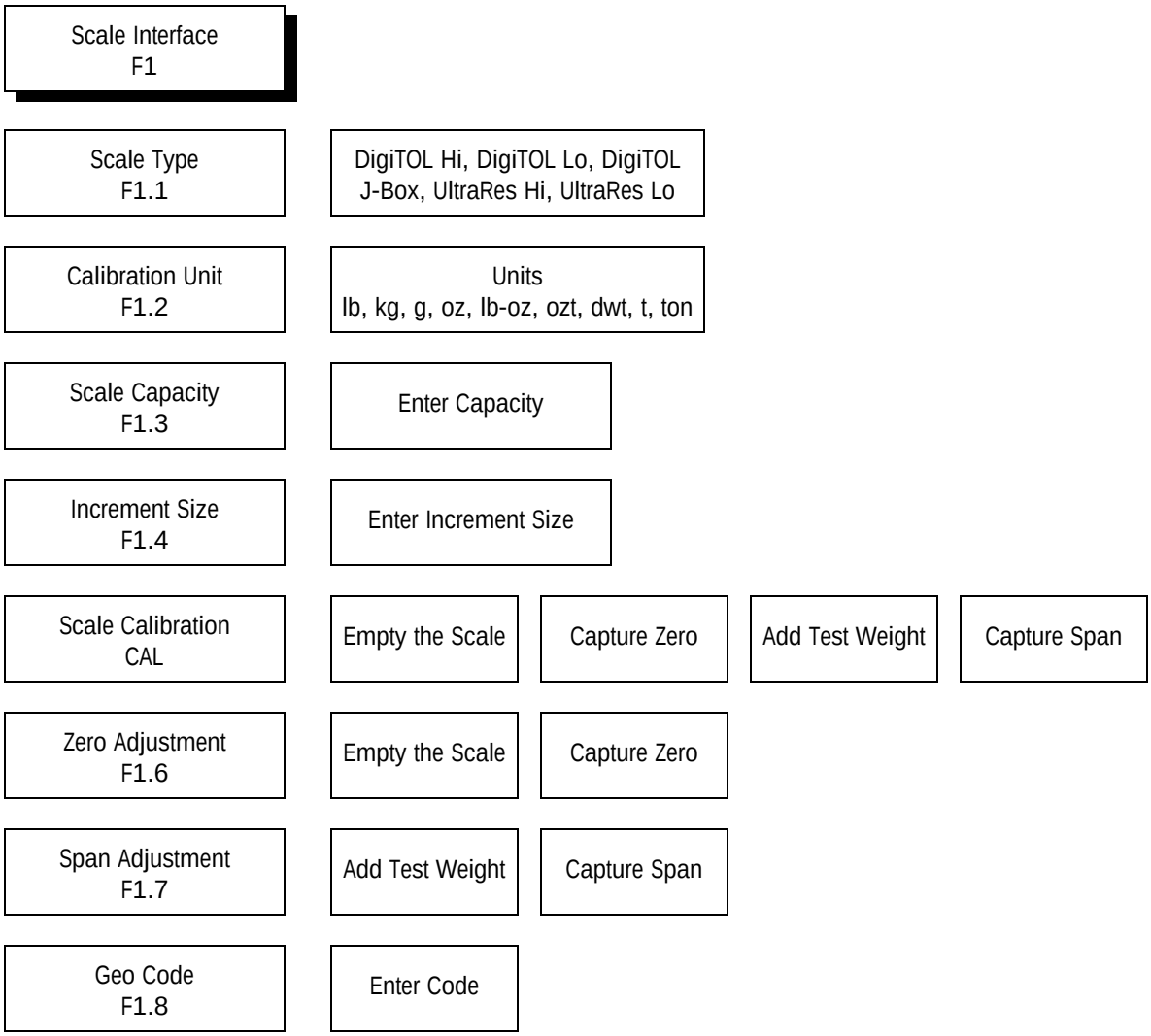
Program Block Exit

To exit setup:

1. Press CLEAR to display the CALOFF prompt, then press ENTER. The Panther exits setup and returns to normal operating mode.
2. Turn off the SW1-1 switch to secure the terminal.

Scale Interface Parameters

The Scale Interface program block lets you set and calibrate the features that affect weighing performance. The following diagram describes this block:



F1.2 Calibration Units Sub-block

With the current calibration unit designation displayed, press the SELECT key to choose the test weight unit that will be used for calibration, then press ENTER. Options include:

1 = lb
2 = kg
3 = g
4 = oz
5 = lb-oz
6 = ozt
7 = dwt
8 = t (tons)
9 = ton (metric tons)

F1.3 Scale Capacity Sub-block

The scale capacity sub-block lets you enter the maximum scale capacity. For the FedEx application, scale capacity is configured to 20,000 pounds. This parameter should not be changed. Press ENTER to proceed to the next sub-block.

F1.4 Increment Size Sub-block

Press the SELECT key to choose the desired increment size from a list of valid options, then press ENTER.

Calibration Sub-block

Calibration involves emptying the scale, then placing a known test weight on an empty platform and allowing the Panther to capture values for zero and span. The terminal prompts you through the calibration.

1. To begin the calibration process, press SELECT to display 1, then press ENTER.
2. At the E SCL prompt, empty the scale platform, then press ENTER to continue. The Panther displays 15 CAL while it pauses for 15 seconds to detect motion on the scale. If motion is detected, the Panther returns to the E SCL prompt. Repeat step 2. Otherwise continue.
3. At the Add Ld prompt, place a 7,500-pound test weight on the platform.
4. At the 000000 prompt, configure the digits to read 7,500. Press ENTER to continue.

The Panther displays 15 CAL while span is captured. The CAL d prompt indicates that the calibration procedure is done.

F1.6 Zero Adjustment Sub-block

The zero value is the scale-empty reference as determined during calibration. The Zero Adjustment sub-block lets you re-establish this value to compensate for any change since the last calibration. The scale must be empty before resetting the zero value.

To begin the calibration process, press SELECT to display 1, then press ENTER. The display counts down 15 seconds while the Panther captures zero. When the countdown reaches 0, the current scale reading is saved as the new zero reference.

You can press CLEAR any time during the zero capture process to abort.

F1.7 Span Adjustment Sub-block

The Span Adjustment feature lets you make minor span adjustments without completely recalibrating the scale. Adjust the span by placing known test weights on the scale prior to entering span adjust.

1. To begin the span adjustment process, press SELECT to display 1, then press ENTER.
2. Place a known test weight on the platform.
3. At the 000000 prompt, configure the digits to indicate the amount of test weight on the platform. Press ENTER to continue. The display counts down 15 seconds while the Panther captures span.

When the countdown reaches 0, the current scale reading is saved as the new span reference.

You can press CLEAR any time during the span capture process to abort.

F1.8 Geo Code Sub-block

The Geo Code feature lets the scale compensate for gravitational effects due to geographical location. This parameter should not require adjustment. Press ENTER to proceed.

Reset to Factory

The Panther has a Diagnostics program block F6.5 that lets you reset **all parameters in all blocks** to factory default values, including Scale Interface values.

Scale Interface program block default values are given below. Use the second column to record any changes made after installation. A complete list of indicator default values is given in the Appendix 1 of this manual.

Scale Interface Program Block	
Default	FedEx Configured
Calibration Units—lb	
Scale Capacity—100 lb	20,000 lb
Increment Size—0.01	2 lb
Scale Calibration—No Defaults	
Zero Adjustment—No Defaults	
Span Adjustment—No Defaults	
Geo Code—16	

To reset Scale Interface parameters to factory default values:

1. While in setup mode and with the F1 Scale Interface program block prompt displayed, press SELECT to scroll to the Diagnostics (F6) program block.
2. Press ENTER to access the Diagnostics program block.
3. Press ENTER until the F6.5 (Reset to Factory) prompt is displayed.
4. Press SELECT to display 1. Press ENTER to acknowledge.
5. At the **Load** prompt, press SELECT to display 1 for Yes or 0 for No, then press ENTER. If Yes, the Panther resets **all** values to factory default status.

Resetting Scale Interface values resets all calibration values. You must recalibrate the system after a reset.

You must recalibrate the system after a master reset.

Configuring the Lynx Interface

The Lynx summing terminal component of the DST is factory-programmed specifically for the FedEx application. There are no Scale Interface parameters to configure.

5 Parts

Chapter 5 provides diagrams and parts lists for the Air Cargo Dual Roller Deck Container Scale and the dual indicator.

Dual Roller Deck

Figure 5-1 shows the Air Cargo Dual Roller Deck Container Scale platform.

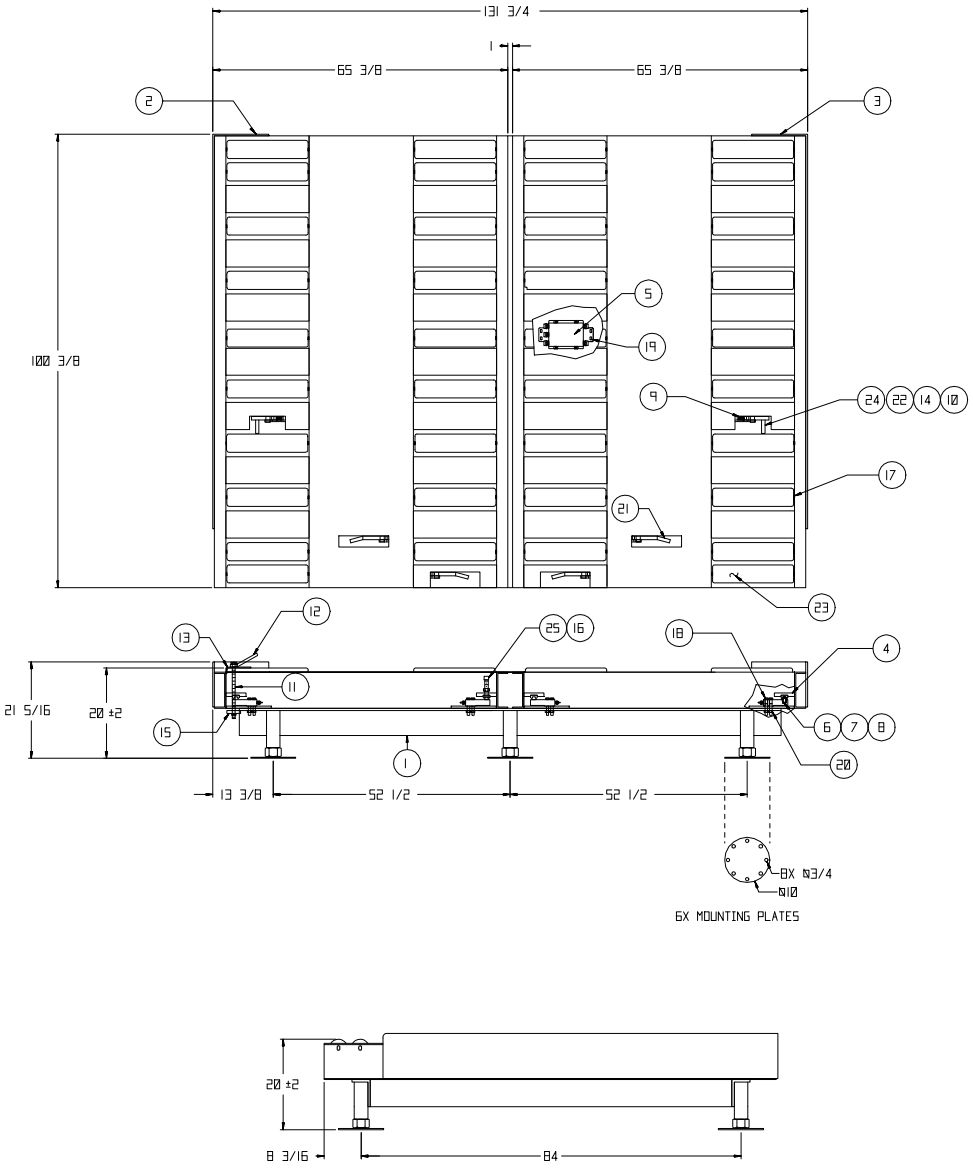


Figure 5-1: Dual Roller Deck Container Scale Platform

Parts List				
Item	Qty.	Part Number	Description	FedEx Part No.
1	1	TB600728	Falcon, Frame, 20K, Dual-Platform	
2	1	TB600750	Falcon, Platform, Roller-DK, left, 10K	
3	1	TB600751	Falcon, Platform, Roller-DK, right, 10K	
4	8	TN600725	0958 Centerlign Top Plate, 5K, MS, No-Bumpers	
5	2	TB100395	Analog J-Box Assembly, 5-hole	
6	8	TB600343	Model 745 Load Cell, 5K, 15-ft cable	
7	16	MZ0909000005	O-Ring, AS-568A-111, 705HA, Buna-N	
8	8	MN21018	Rocker Pin, S.S.	
9	6	MZ0911000001	Spring, Comp, 3/4 OD, 080, 30lb/in, Zl-PL	
10	6	MZ0901010386	Hex Head Cap Screw, 3/4-10 x 1.50, ZN	
11	4	MZ0901010503	Hex Head Cap Screw, 5/8-11 x 12.00, ZN	
12	4	TN600754	Falcon Assembly, Lifting Lug	
13	4	TN600753	Falcon Assembly, Lifting Lug, Base Angle	
14	6	MZ0901020105	Hex Lock Nut, 3/4-10, Zl, Nylon Insert	
15	4	TA600752	Falcon Assembly, Lifting Angle	
16	8	MZ0901020066	Hex Nut, 5/8-11, ZN	
17	38	MZ0904000074	Cotter Pin, 1/16 x 2, ZN	
18	16	TN800677	Hex Head Cap Screw, 1/2-13 x 3.50, ZN	
19	8	MZ0901010247	Hex Head Cap Screw, 5/16-18 x 1.00	
20	16	MZ0901020026	Hex Nut, 1/2-13	
21	4	TN600650	Falcon, Layout Assembly, Lock Angle, Front	
22	2	TN600651	Falcon, Layout Assembly, Lock Angle, Back	
23	38	MZ1002000017	FedEx Roller 17.625	
24	6	TN600652	Falcon, Layout Assembly, Bushing	
25	8	MZ0901010504	Set Screw, 5/8-11 x 4.00, Square Head, Cup Point	

Dual Scale Terminal

Figure 5-2 shows the parts assembly for the dual scale terminal.

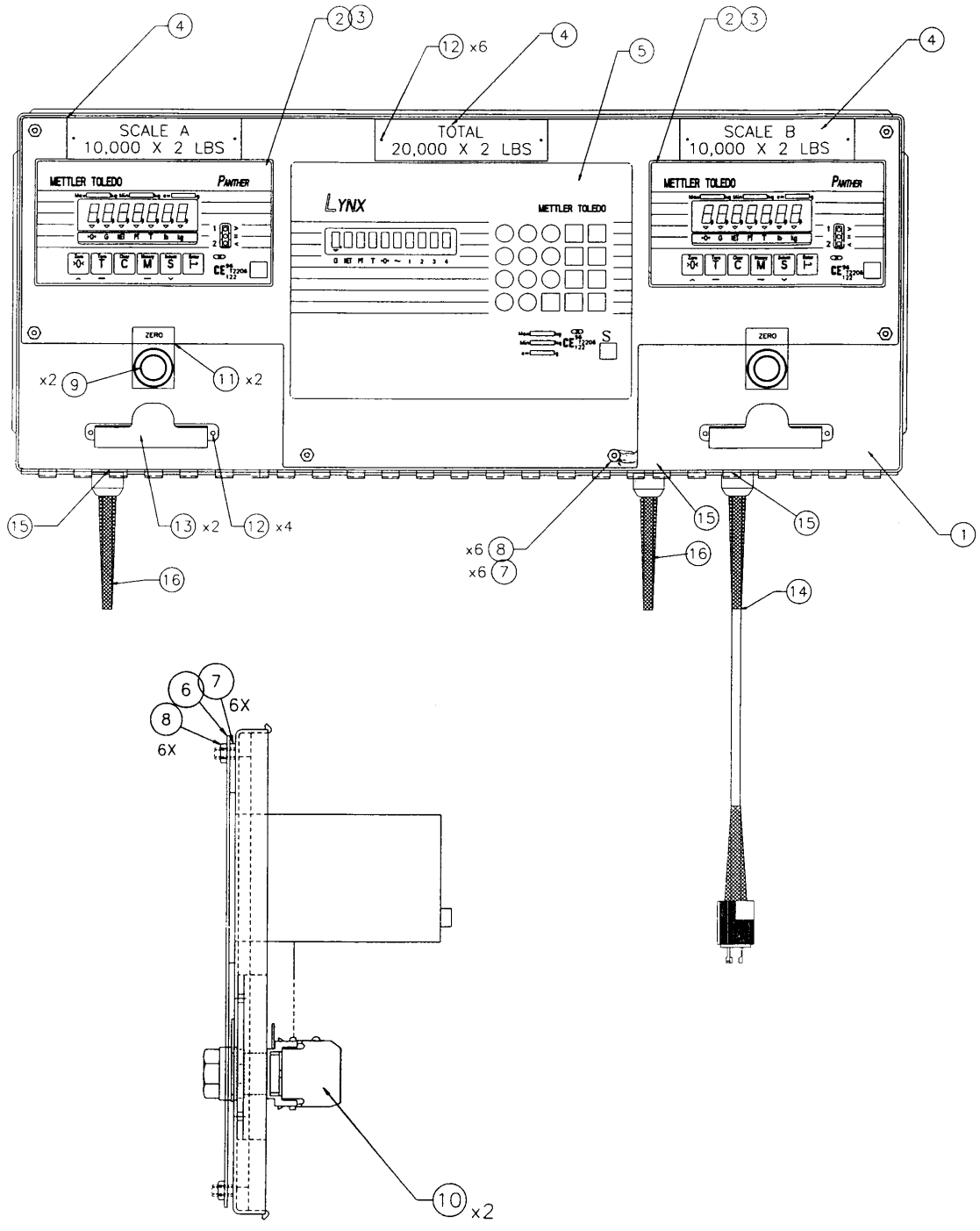


Figure 5-2: DST Front/Side View

DST Parts List (Front/Side View)				
Ref. #	Qty.	Part Number	Description	FedEx Part No.
1	1	90311500A	M. S. Enclosure	
2	2	PTPN-1000-000	Panther Panel Mount	
3	2	14827300A	Gasket, Ref. only part of Panther	
4	1	90315900A	Nameplate set	
5	1	*14468300A	Lynx keyboard assembly	
6	1	90312900A	Plexiglass cover	
7	6	R0339800A	#8 Nylon bevel washer	
8	6	R0218100A	#8-32 Nylock nut	
9	2	90086400A	Switch, pushbutton, black	
10	2	90086100A	N.O. Contact block	
11	2	KA277065020	Nameplate set	
12	10	R00510130	Drive screw, #4 x 3/16 RD	
13	2	90313200A	Spring clips, 3 1/2 inches	
14	1	15221600A	AC power cord assembly	
15	3	15228800A	Nut, conduit lock 1/2 inch	
16	2	15216800A	Cord bushing, Kellum 1/2 inch NPT	

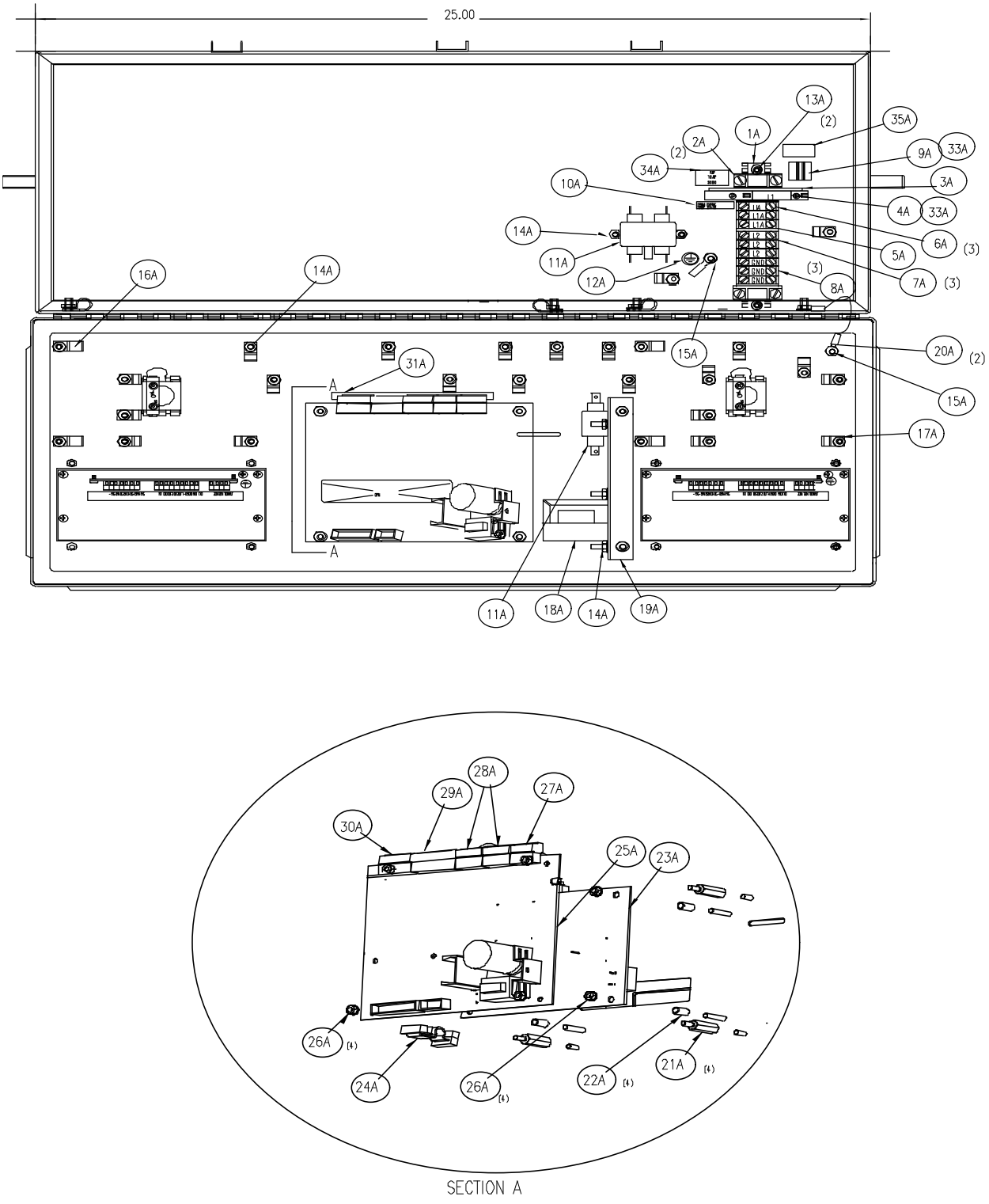


Figure 5-3: DST Rear View

DST Parts List (Rear View)				
Ref. #	Qty.	Part Number	Description	FedEx Part No.
1A	.5	15055000A	Terminal Track	
2A	2	15054900A	End Clamp	
3A	1	KT665004XCA	End Barrier for Fuse Block	
4A	1	KT665004ACG	Terminal Fuse Block, 300 V / 12 Amp	
5A	2	15055100A	Terminal End Barrier	
6A	3	15227600A	Terminal Block, Red	
7A	3	15227700A	Terminal Block, White	
8A	3	15216500A	Terminal Block, Green	
9A	1	11321100A	Spare Fuse Holder	
10A	1	90160000A	Torque Label, 20 in-lb	
11A	2	14560000A	Line Filter 2A RFI 50/60 Hz	
12A	1	12943000A	Label, BSI Ground	
13A	2	R0328300A	#6-32 Hex Nut, Self Locking	
14A	37	R0218100A	#8-32 Hex Nut, Self Locking	
15A	3	R1611050	#8-32 Hex Nut, W/LW	
16A	8	12472300A	Cable Clamp, 3/8 inch	
17A	25	12465500A	Cable Clamp	
18A	1	14690600A	Power Transformer 100/120 VAC Lynx	
19A	1	90313100A	Bracket for Lynx LF and XFMR	
20A	2	12471400A	Terminal, Ring	
21A	4	14466100A	Standoff, M4 x 22 mm M-F	
22A	4	14465900A	Spacer M4 x 11 mm Round	
23A	1	*14287400A	PCB Assembly VF A/N Display	
24A	1	14561700A	Harness Display	
25A	1	90315800A	PCB Assembly Lynx Controller PCB	
26A	8	R0519600A	Hex Nut, M4 KEPS	
27A	1	14374900A	Terminal Plug, 5 Position	
28A	2	14113100A	Terminal Plug, 6 Position	
29A	1	14113400A	Terminal Plug, 10 Position	
30A	1	14113200A	Terminal Plug, 7 Position	
31A	1	14467900A	Label, Controller PCB	
32A	1	14467100A	Screwdriver, ship w/ unit	
33A	2	11250900A	Fuse, 1 AMP SLO BLO	
34A	1	13719900A	Label, Fuse 1.0 AMP	
35A	1	90154200A	Label, Caution Replace Fuse	
36A	1	12661400A	Labels, Warning Electrical Shock	
37A	1	14901000C	Data Tag, Tamper Evident	

6 Technical Data

Power Supply Requirements

Load cell power supply is provided by a METTLER TOLEDO terminal. Maximum excitation is 15 VDC.

Scale Specifications

The Dual Roller Deck Container Scale conforms to the following specifications.

Load Cell:

Load Cell Rated Capacity	5,000 lb
Full Scale Output	2.0 ± 0.002 (mV/V)
Excitation Voltage	15 V
Zero Balance	± 0.02 (mV/V)
Input Resistance	350 Ohms minimum
Output Resistance	350 ± 2 Ohms
Non-Repeatability	0.01% of R.C.
Temperature Compensated	+15° to +104° F
Safe Operating Temperature Range	+5° to +180° F
Safe Storage Temperature	+5° to +180° F
Maximum Safe Overload	100 % of R.C.
Ultimate Overload	300 % of R.C.
Maximum Safe Side Load	100 % of R.C.
Creep (in 20 minutes)	0.03 % of R.C.

Bolt Torque: Load cells: 100 ft-lb

Overload Gap: 0.015 inch

DST Specifications

The DST conforms to the following specifications:

Power Requirements

The Panther terminal uses a universal (manually selectable) power supply which operates from 85 to 264 VAC with a line frequency of 49 to 63 Hz. Power consumption is 12 Watts maximum. Power is applied through a terminal strip.

A good ground connection is important for safety and dependable operation of the Panther and scale base. A good ground connection also minimizes extraneous electrical noise pulses. It is important that equipment does not share power lines with noise generating equipment.

To confirm ground integrity, a commercial branch circuit analyzer like an ICE Model SureTest ST-1D (or equivalent) is recommended. This instrument uses a high-amperage pulse to check ground resistance. It measures the voltage from the neutral wire to the ground connection and will provide an assessment of the line loading. Instructions with the instrument give guidelines about limits that ensure good connections.

Display and Keypad

The DST enclosure is made of mild steel sealed to NEMA 12 specifications.

Each Panther terminal has a seven-character, seven-segment, 0.55 inch (12.7 mm) vacuum fluorescent numeric display.

The Lynx terminal has a ten-character, 5x7 dot matrix, 0.44 inch (11.2 mm) vacuum fluorescent alphanumeric display.

Temperature and Humidity

The DST operates over a temperature range of 14° to 113° F (-10° to 45° C) at 10% to 95% humidity, noncondensing.

Storage temperature range is from -40° to 140° F (-40° to 60° C) at 10% to 95% humidity, noncondensing.

Environmental Protection

The DST enclosure meets NEMA 12 requirements for a dust-tight enclosure.

Conducted and Radiated Emissions (RFI)

The DST meets or exceeds FCC docket 80-284 for conducted and radiated emissions requirements as a Class A digital device.

Radio Frequency Interference Susceptibility

The DST meets USA, Canadian, and EC requirements for RFI susceptibility as listed in the following table with a maximum of one display increment of change when calibrated for recommended builds.

RFI Susceptibility			
Radio Interference Frequency	U.S.A. Field Strength	Canadian Transmitted Power at Specified Distance	EC Field Strength
27 MHz	3 volts/meter	4 Watts at 2 meters	N/A
144 MHz	N/A	N/A	N/A
169 MHz	3 volts/meter	N/A	N/A
464 MHz	3 volts/meter	4 Watts at 2 meters	N/A
27-1000 MHz	N/A	N/A	3 volts/meter

AC Power Line Voltage Variation

The Panther terminal meets NIST H-44, Canadian Gazette Part 1, and OIML-SP7/SP2 line voltage variation specifications as listed in the following table:

AC Power Line Voltages						
Specification	AC Line Voltage			Line Frequency in Hz		
Line Voltage Variation	Minimum	Nominal	Maximum	Minimum	Nominal	Maximum
NIST H-44	100	120	130	59.5	60	60.5
Canadian	108	120	132	58.8	60	61.2
OIML-SP7/SP2	102 187 204	120 220 240	132 242 264	58.8 49.0 49.0	60 50 50	61.2 51 51

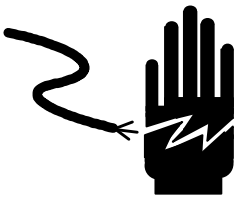
7

Troubleshooting

The Dual Roller Deck Container Scale and dual scale terminal are designed to be virtually error free and reliable. If operational difficulties occur, obtain as much information about the problem as possible. Do not attempt to repair the scale or indicator before you have determined the source of the problem.

If an error occurs, first evaluate the following:

- Determine if the problem is in the scale platform or the DST.
- Determine if the problem is constant or intermittent. Malfunctions can be caused by mechanical or electrical influences. Be patient and use sound logic when troubleshooting.
- Examine the physical location of the equipment, checking for the presence of water, corrosive materials, unlevel floors, high vibrations, air currents, and/or physical damage to the scale platform.
- Check the instrument cable for damage and check all connections for any loose/incorrect wiring.



⚠ WARNING

PERMIT ONLY 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.

⚠ CAUTION

Before connecting/disconnecting any internal electronic components or interconnecting wiring between electronic equipment, always remove power and wait at least 30 seconds. Failure to observe these precautions could result in bodily harm or damage to or destruction of the equipment.

Troubleshooting the Dual Roller Deck

Verify that the system problem is in the scale platform. Use a 10-step analog simulator (PN 100865 00A) or an analog variable simulator (PN 082451 020):

1. With power removed, wire the simulator to the load cell connection on the DST.
2. For 10-step simulators, install a jumper between +Excitation and +Sense. Also install a jumper between –Excitation and –Sense.
3. Apply power and monitor the weight display. If the DST operates normally, the problem is probably in the load cell or scale base. If the DST reads in error, the problem is probably in the terminal. Refer to the troubleshooting information given later in this chapter.

Check Wiring

1. Remove power from the system, then remove the cover from the junction box.
2. Check the interior for moisture or any foreign material.
3. Ensure that all wiring connections are tight and that no insulation material is touching the terminal contacts.
4. Check all cable connections for correct wiring, using the following wiring color code:

		Analog Junction Box	
Load Cell Wiring		Instrument Cable Wiring	
Function	Color	Function	Color
+ Excitation	Green	+ Excitation	White
		+ Sense	Yellow
+ Signal	White	+ Signal	Green
Shield	Yellow	Shield	Orange
- Signal	Red	- Signal	Black
		- Sense	Red
- Excitation	Black	- Excitation	Blue
		Based on METTLER TOLEDO cable number 510620370	

Check Load Cells

1. Check each load cell for proper bridge resistances.

Measuring Points	Resistance
Any lead to shield or ground	Infinity
+ Exc (Green) to - Exc (Black)	350 Ohms minimum
+ Sig (White) to - Sig (Red)	348 to 352 Ohms

2. If bridge resistance is within specification, perform a “shorted signal” symmetry check.
   - Short the signal leads together and place one multimeter lead on the shorted signals and one lead on the +Excitation wire. Note the resistance value indicated.
   - Remove the lead from the +Excitation wire and place it on the –Excitation wire. Both resistance values should be equal.
3. If the cells pass the above test, reapply power to the scale platform. Confirm that proper excitation voltage (15 VDC) is reaching the load cells by placing multimeter leads on the excitation positions of each load cell terminal.

Remove signal leads from terminals to measure output.

4. If proper excitation voltage is reaching the load cells, check the output signal from each cell. If one cell has a particularly high or low dead-load output, it is suspect. The maximum output possible from any cell is 30 mV at 15 VDC excitation and loaded to gross capacity.
5. If any cell has an unusual signal, remove all load from that cell by using the overload stop/jacking bolt to raise the platform (see Figure 7-1).

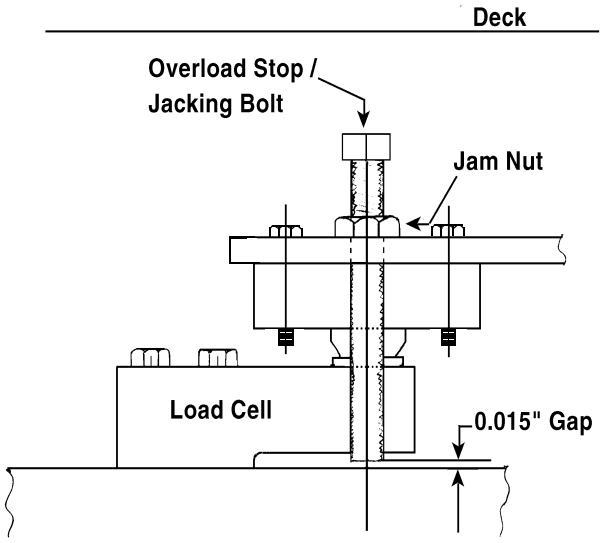


Figure 7-1: Overload Stop/Jacking Bolt

   - With the power still on, measure the output from the suspect load cell. The "no-load" zero output should be +1.5% of the full scale output. For example, if

the excitation voltage is 15 VDC, then the full scale output is 30 mV. Therefore, the no-load zero output should be within +0.45 mV.

- If the load cell is out of specification, replace it.

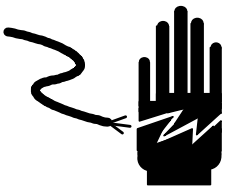
6. If a load cell fails any of the above tests, replace it. Be sure to regap the overload stop bolt to 0.015 inch after servicing the load cell.

Check Mechanical Components

- Check the overload stops for proper adjustment (0.015 inch gap) (see Figure 7-1).
- Make sure that the support feet anchor bolts are tight.

Load Cell Replacement Procedure

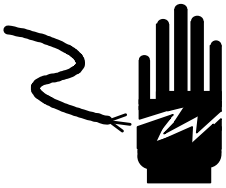
1. Remove all loads from the platform.
2. Remove all power.



⚠ 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 servicing.

3. Remove the corner access plates for entry to the junction box and suspect load cell.
4. Disconnect the load cell cable from the junction box terminal and remove the cable from the junction box.
5. Unlock the jacking bolt (also used as overload stop bolt) and turn it clockwise to raise the platform corner and remove load from the suspect load cell (see Figure 7-1).
6. Loosen the load cell mounting bolts. Be sure to catch the hex nuts when they disengage the load cell bolts.
7. Tip the load cell nose down to disengage the rocker load pin and remove the load cell.
8. Insert the rocker load pin into the new load cell and secure it with load cell bolts. Torque the bolts to 100 ft-lb.
9. Lower the platform onto the load cell with the jacking bolt. Reset the overload stop gap to 0.015 inch and lock into position with the jam nut.
10. Connect the new load cell to the junction box PCB.
11. Reapply power to verify load cell operation.
12. Recheck calibration with a known test weight.

Troubleshooting the DST

If system malfunctions are caused by the indicator, use the following information to guide troubleshooting activities.

The DST is designed to be virtually error free and reliable. If problems do occur, do not attempt to repair the scale or terminal before the source of the problem has been determined. Record as much information as possible about what has happened, including any error messages and physical responses of the terminal and/or scale. If the DST is malfunctioning, identify the problem by performing the troubleshooting tests described in the next few pages.

Panther Error Codes and Actions

Error	Description	Corrective Measures
E1	PROGRAM MEMORY ERROR	1. Check power supply voltages. 2. Replace main logic PCB.
E2	INTERNAL RAM ERROR	1. Check power supply voltages. 2. Replace main logic PCB.
E3	EEPROM MEMORY ERROR	1. Check power supply voltages. 2. Reprogram, recalibrate. 3. Replace main logic PCB.
E4	EXTERNAL RAM ERROR	1. Replace main logic PCB.
E7	A/D CIRCUIT MALFUNCTION OR NO ANALOG LOAD CELL CONNECTED	1. Program for correct load cell type. 2. Check load cells and cables. 3. Check power supply voltages. 4. Replace main logic PCB.
E16	INTERNAL MATH ERROR	1. Press CLEAR to acknowledge, unit will reset.
E20	PREACT VALUE IS GREATER THAN SETPOINT VALUE	Clear preact value, then re-enter setpoint value.
E32	INSUFFICIENT TEST WEIGHT USED FOR CALIBRATION	Recalibrate using more test weight.
E34	TEST WEIGHT EXCEEDS 105% OF CAPACITY	Use less than 105% of capacity. Press CLEAR and re-enter.
E35	SPAN CALIBRATION ERROR	Recalibrate. If error persists, check programming or replace load cell.
E36	ANALOG LOAD CELL OUT OF RANGE	1. Recalibrate. 2. Replace load cell.
E50	WEIGHT CAN NOT BE DISPLAYED IN ALTERNATE UNITS	Some alternate units combinations are illegal. Choose another scale build or disable alternate units.

Error	Description	Corrective Measures
EEE	POSITIVE MORE THAN ZERO CAPTURE LIMIT OF 2% OF SCALE CAPACITY	1. Remove material from scale base. 2. Disable AZM in setup. 3. Cycle power.
-EEE	NEGATIVE MORE THAN ZERO CAPTURE LIMIT OF 2% OF SCALE CAPACITY	1. Disable AZM in setup. 2. Calibrate scale. 3. Cycle power.
------	NO ANALOG LOAD CELL DETECTED	1. Check load cell wiring. 2. Replace load cell. 3. Replace main PCB.

AC Power Test

Using a multimeter, check the AC input power. Input power must be within the range of -15% to +10% of the nominal AC line voltage.

Panther Main Logic PCB Voltage Test

Verify voltage of 5.00 VDC between + and - excitation. If the terminal has AC power and there is no excitation voltage, replace the PCB.

Panther Discrete Output Voltage

With no load applied and the Panther at gross zero, the following voltages should be measured. Refer to the following table for correct voltage readings.

Test Points	Voltage Readings
GND & +5 VDC	5 VDC*
+5 VDC & OUT1	5 VDC*
+5 VDC & OUT2	5 VDC*
+5 VDC & OUT3	5 VDC*

*If voltages are not within the +4.5 to +5.2 VDC range, check for:

- Correct wiring. Refer to the information about discrete outputs in the Panther Technical Manual's appendices.
- Correct programming parameter configuration. Refer to the information about configuring the discrete program block in Chapter 3 of the Panther Technical Manual.
- Correct setpoint weight values. Refer to the information about entering setpoint data in Chapter 4 of the Panther Technical Manual.

8 FedEx Dual Roller Deck Container Scale Warranty

At delivery, the FedEx Dual Roller Deck Container Scale System shall in all respects conform to the Specification and the Equipment shall be free from defects in design, material, and workmanship for a period of the earlier to occur of one year from installation of the Equipment or eighteen (18) months from shipment of the Equipment to FedEx. In addition, a parts-only warranty will be in effect for a period of the earlier to occur of thirty-six (36) months from the original installation of the Equipment or forty-two (42) months from shipment of the Equipment to FedEx.

Fill out the Equipment information below for reference in the event of a warranty claim.

Warranty Registration
Delivery Date: _____ Inspected By: _____
Installation Date: _____
Dual Roller Deck Model Number: _____
Dual Roller Deck Serial Number: _____
Dual Indicator Model Number:_____
Dual Indicator Serial Number: _____

9 Appendices

Appendix 1: Panther Default Values

The following table lists Panther program block default values. For reference, use the FedEx Value column to record any changes you make to the default configurations.

Function	Default Value	Description	FedEx Value
F1.1	2	Scale Type (DigiTOL version only)	
F1.2	1	Calibration Units = lb	
F1.3	100	Scale Capacity	
F1.4	0.01	Scale Increment Size	
F1.6	No default	Zero Adjustment	
F1.7	No default	Span Adjust	
F1.8	16	Geo Code	
F2.1	0	Alternate Units = none (unit switching disabled)	
F2.3.1	1	Tare enabled	
F2.3.2	0	Tare Interlock disabled	
F2.3.3	0	Auto Tare disabled	
F2.3.4	0	Auto Clear Tare disabled	
F2.4.1	1	Push Button Zero enabled, 2% range	
F2.4.2	1	Auto Zero Maintenance enabled within 0.5 d window	
F2.4.3	0	Auto Zero Maintenance in net mode disabled	
F2.4.4	1	Zero Cursor enabled	
F2.4.5	0	No Under Zero Blanking	
F2.5	1	Motion Sensitivity	
F2.5.1	0	Blanking Disabled	
F2.6	2.0	Filter Corner Frequency	

Function	Default Value	Description	FedEx Value
F2.6.1	0	Noise Filter disabled	
F3.1	1	COM1	
F3.1.1	9600	Baud	
F3.1.4	2	Even Parity	
F3.1.5	0	Checksum disabled	
F3.1.6	0	STX disabled	
F3.2	1	Demand Output	
F3.2.1	0	Print Format = displayed weight only	
F3.2.2	0	No Expanded Print	
F4.1	1	Discrete Input = print command	
F5.1	0	Indicator Weighing Mode	
F5.2	1	Setpoints/Targets Editing MEMORY Key	
SP1	0	Setpoint 1/Target 1	
SP2	0	Setpoint 2/Target 2	
SP3	0	Target 3	
SP4	0	Target 3	
P1	0	No Preact for Setpoint 1	
P2	0	No Preact for Setpoint 2	
F5.4	0	No Zero Tolerance	
F5.5	0	No Print at Setpoint 1 Coincidence	
F5.6	0	No Print at Setpoint 2 Coincidence	
F5.7	0	Stored Target Weight disabled	
F5.7.1	0	Zone Weight Entered in Increments	
F5.7.2	0	Display is in Weight Units	
F5.7.3	0	Weight Difference from Target disabled	
F5.7.4	0	Output always on when weight is in “under” zone	
F5.8.1	0	High Zone Width	
F5.8.2	0	High Accept Zone Width	
F5.8.3	0	Low Accept Zone Width	
F5.8.4	0	Low Zone Width	
F5.9	1	Weight Display and Status Lights enabled	

Function	Default Value	Description	FedEx Value
F6.1	0	No Expanded Display Mode	
F6.2	No default	Edit Calibration Factors	
F6.4	No default	Print Setup	
F6.5	No default	Reset to Factory	
F7.2	No default	Analog Output Zero Calibration with Test Weights	
F7.2.1	No default	Analog Output Zero Calibration via Keyboard	
F7.3	No default	Analog Output Span Calibration w/Test Weights	
F7.3.1	No default	Analog Output Span Calibration with Keyboard	
F7.4	No default	Analog Output Trim Adjustment	
F8.1	0	PLC Weight Data Type? (Weight in display increments)	
F8.2	1	Rack Address?	
F8.3	1	Start Quarter?	
F8.4	1	Last Rack?	
F8.5	2	Data Rate? (115.2 Kb)	

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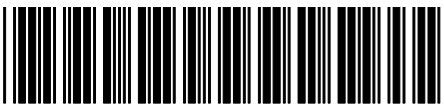

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