8505

Weight Display and Enhanced DigiTOL® Junction Box

Technical Manual and Parts Catalog

A13488500A
(12/95)

IMPORTANT NOTICE

This publication is provided solely as a guide for individuals who are receiving Technical Training to service a METTLER TOLEDO product.

Information regarding METTLER TOLEDO Technical Training may be obtained by writing to:

METTLER TOLEDO
Training Center
1150 Dearborn Drive
Worthington, OH 43085-6712
(614) 438-4400 phone
(614) 438-4444 FAX

IMPORTANT

It is most important that the correct part number is used when ordering parts. Parts orders are machine processed, using only the part number and quantity as shown on the order. Orders are not edited to determine if the part number and description agree.

PRECAUTIONS

READ this manual BEFORE operating or servicing this equipment.

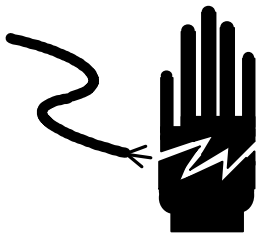
FOLLOW these instructions carefully.

SAVE this manual for future reference.

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

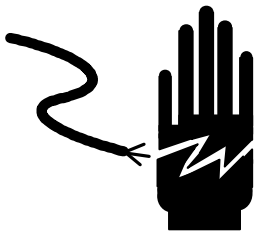
ALWAYS DISCONNECT this equipment from the power source before cleaning or performing maintenance.

CALL METTLER TOLEDO for parts, information, and service.



WARNING

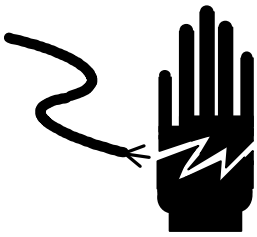
ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE THIS EQUIPMENT. EXERCISE CARE WHEN MAKING CHECKS, TESTS AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILING TO OBSERVE THESE PRECAUTIONS CAN RESULT IN BODILY HARM.



WARNING

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

DO NOT REMOVE THE GROUND PRONG.



WARNING

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

CAUTION

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

CAUTION

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.

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1 General Description

The Enhanced DigiTOL® Junction Box is designed to provide enhanced weighing and diagnostics performance to the Mettler Toledo Heavy Capacity family of products. This primarily includes floor scales, weigh modules, and monorail systems.

The Enhanced DigiTOL Junction Box PCB is backward compatible in size to the first generation DigiTOL Junction Box PCB found in many Model 2157 and Flexmount/Centerlign Weigh Modules. However, software upgrades may be required to interface existing DigiTOL Indicators. *The Enhanced DigiTOL Junction Box IS NOT COMPATIBLE with the 8510-2001 Indicator, 8572 and 8582 Counting Scales.* Contact Mettler Toledo for assistance should a software upgrade be required. Additional features of the enhanced version include:

- Increased system resolution
- Faster update rates
- Enhanced scale diagnostics
- Easier to wire terminals
- Convenient 8505 Weight Display termination

2 Mode Of Operation

DLC Mode

When the DigiTOL Junction Box is used with DigiTOL Indicators; including Models 8510SS, 8520, 8522, 8530, and JAGUAR Terminal; the DigiTOL Junction Box will act as a "slave" to the host indicator. Set-up parameters provided in the DigiTOL Indicator Manuals for use with the original DigiTOL Junction Box/Power Module will still apply. See Chapter 6 of this manual for further details.

Smart Mode (8505 Weight Display)

When the DigiTOL Junction Box is used with a Model 8505 Weight Display the J-Box provides the "brains" for operation. The "Smart Mode" programming steps found in Chapter 7 of this manual must be used.

Model 8505 Weight Display Styles

Two styles of 8505 Weight Displays are now available, including:

85050001—Used with 1st generation DigiTOL Junction Box/Power Module has integral plug-in PCB connector and aluminum sealing connector. This unit can be used with the enhanced DigiTOL Junction Box by cutting the plug-in PCB connector from the cable end and wiring the individual wires into the PCB terminal locations per section entitled Assembly in Chapter 8 and Figure 8-a.

85050002—Can only be used with the new enhanced DigiTOL Junction Box/Power Module integral cable has plain end wires for wiring the display directly into the PCB terminal locations per section entitled Assembly in Chapter 8 and Figure 8-a.

Physical characteristics of the 8505 Weight Display including keypad, display, data output port, and mounting brackets remain the same for either unit. The 8505 Weight Display is provided with an external power supply transformer which operates at 120 VAC

3 Physical Specifications

Enhanced Digitol Junction Box

Mechanical

The Enhanced DigiTOL Junction Box PCB is housed in a stainless steel enclosure, built to NEMA 4X specifications, which has a nominal dimensional envelope of 12 1/4 in. L × 6 1/4 in. W × 1 7/8 in. H. This PCB is compatible in size and mounting points to the original DigiTOL Junction Box PCB.

Electrical

The Enhanced DigiTOL Junction Box PCB operates on an externally supplied voltage between 7.5 and 30 VDC. Operating current for the PCB plus four (4) 350 ohm load cells is:

- 7.5 VDC @ 420 mA
- 17.5 VDC @ 175 mA
- 20.0 VDC @ 150 mA

Typical operation for the DLC mode is 20 VDC. When the 8505 Weight Display is used 12 VDC is supplied by a wall mount transformer.

Analog Load Cell Input Connections

Four terminal strips are provided on the PCB for connecting 1 to 4 analog load cells. 6.2 VDC excitation is provided for up to four 350 ohm (or higher impedance) analog load cells. No remote sense of the load cell excitation is provided. The following load cell types can be supported by the Enhanced DigiTOL Junction Box:

- 350 Ohm, 2 mV/V
- 350 Ohm, 3 mv/V
- 725 Ohm, 2 mV/V
- 1,000 Ohm, 2 mV/V
- 1,000 Ohm, 3 mV/V
- 2,000 Ohm, 2 mV/V

DigiTOL Load Cell Connection

The Enhanced DigiTOL Junction Box will not interface to load cells which output a digital (DigiTOL) signal.

PCB Output Connections

The Enhanced DigiTOL Junction Box supports an output interface compatible with Mettler Toledo DigiTOL indicators.

Hazardous Area Use

WARNING

DO NOT USE THIS DEVICE IN LOCATIONS CLASSIFIED HAZARDOUS BY THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 500.

Wiring

The DigiTOL Junction Box is sent from the factory ready to be used with the 8505 Weight Display (Smart Mode), a jumper wire is installed on the J-Box PCB across terminals 2 and 11 of TB2. In the event the J-Box is to be used with an existing 8505 Weight Display it will be necessary to remove the existing plug-in connector from the 8505 Interface Cable and hard wire the leads into Terminal TB2 of the new PCB. Color codes are provided in the section entitled Assembly in Chapter 8.

Should the J-Box be used with another Mettler Toledo DigiTOL Instrument (DLC Mode), wire per Chapter 6 of this manual. The jumper wire described above will need to be removed.

Model 8505 Weight Display

Electrical

A wall transformer is provided which converts AC input voltage to a nominal 12 VDC output to the display. The voltage requirement for use with the wall transformer is 120 VAC, +10% to −15%.

Operating Temperature

Model 8505 Weight Display is designed to operate between +14ºF to 104ºF (−10ºC to +40ºC) , at 0 to 95% relative humidity, non-condensing.

Physical Construction

The display enclosure is constructed of extruded aluminum with the die cast aluminum end caps. Physical size is 8.75 in. L × 1.31 in. W × 3.75 in. H. Shipping weight is 5 lb.

Application

The Model 8505 Weight Display **IS NOT** designed for hose-down or corrosive environments. This product **IS** designed for general purpose, dry, indoor industrial or commercial environments. **This product is NOT designed for:**

- Hazardous (Classified) Areas
- Immersions
- Hosedown
- Splashing Liquids
- Corrosive Chemical Environments
- Outdoor Installations

Mettler Toledo manufactures other devices which are suitable for these applications.

Hazardous Areas

WARNING

DO NOT USE THIS DEVICE IN LOCATIONS CLASSIFIED BY THE NATIONAL ELECTRICAL CODE (NEC) ARTICLE 500.

Configuration

Factory Number	Voltage Requirement For Use With Wall Transformer	Compatible With Enhanced DigiTOL Junction Box	Compatible With Old DigiTOL Junction Box
85050001	120 VAC- 60 Hz	Yes (*)	Yes
85050002	120 VAC - 60 Hz	Yes	No

(*) Requires removal of cable plug-in connector on 8505 Weight Display integral cable.

4 Performance Specifications

Resolution

- **Smart Mode with 8505 Weight Display**—10,000 counts maximum
- **DLC Mode**—20,000 counts maximum

Update Rate

- **Smart Mode with 8505 Weight Display**—10 updates/second maximum
- **DLC Mode**—15 updates/maximum

Weights And Measures

The Enhanced DigiTOL Junction Box and 8505 Weight Display are designed to meet or exceed:

- NIST H44 (USA): 5000d
- CSA (Canada): 5000d

Model 8505 NTEP APPROVAL NUMBER 94-023

5 Load Cell Wiring

Overview

Floor scale products are provided with load cells pre-wired from the factory. However, other products such as tank, hopper, conveyor, and specialized systems may require field wiring of the load cells to the Enhanced DigiTOL Junction Box PCB. The DigiTOL Junction Box is capable of supporting up to four 350 ohm, 2 mV/V load cells. Each load cell channel provides approximately 240,000 raw counts at 1 mV/V load cell output. Some of the load cells which can be supported by the Enhanced DigiTOL Junction Box include:

- 350 Ohm, 2 mV/V
- 350 Ohm, 3 mv/V
- 725 Ohm, 2 mV/V
- 1,000 Ohm, 2 mV/V
- 1,000 Ohm, 3 mV/V
- 2,000 Ohm, 2 mV/V

Wiring

To install the Enhanced DigiTOL J-Box and connect the load cells proceed as follows:

1. Mount the Junction Box in a location that is easily accessed and well protected from external abuse and environmental influences such as extreme temperature, etc. If possible, the J-Box should be mounted to a "dead" section of the structure.
2. Remove the lid from the Junction Box. There are four 5-position terminals located on the PCB. These terminals are denoted LC1, LC2, LC3, and LC4 for load cells 1 through 4.
3. If a single cell system is required, wire the cell into the LC1 terminal. If a two cell system is required, use LC1 and LC2. For a three cell system use terminals LC1, LC2, and LC3 (See Note and Figure 5-a).

Terminals which are not being used must have a jumper wire connected between +Signal and –Signal for proper operation (See Figure 5.1).

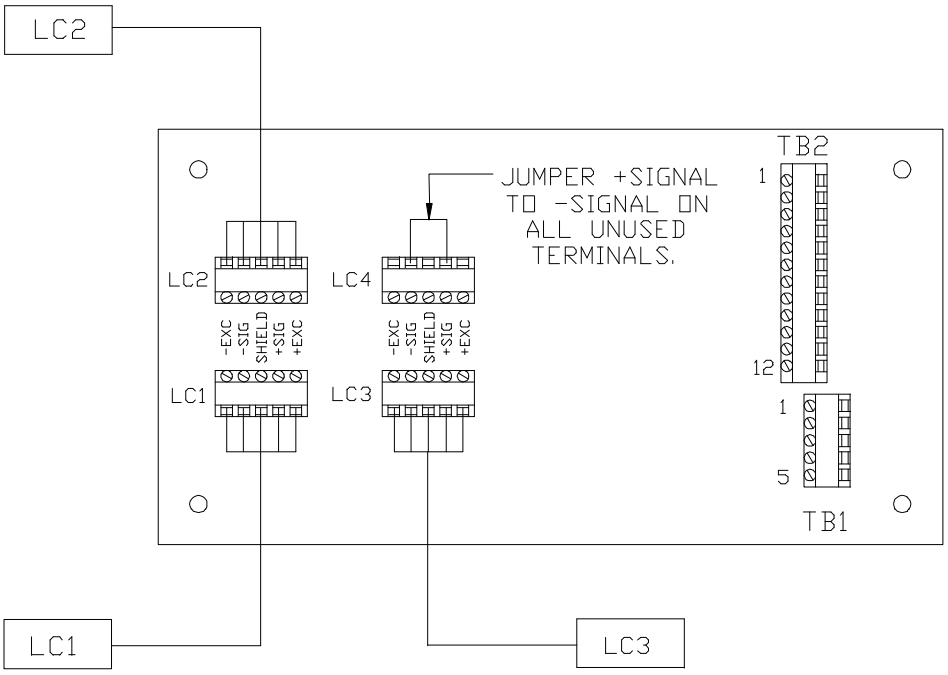


Figure 5-a Enhanced DigiTOL J-Box PCB Load Cell Wiring
(Three Load Cell Wiring Detail Shown)

Load cell wiring codes are:

Product	Wiring Code				
	+Excitation	**–Excitation**	**+Signal**	**–Signal**	**Shield**
2160 Floor	Green	Black	White	Red	Yellow
Flex+ Cent+	Green	Black	White	Red	Yellow
Flex 20K Cent 20K	Green	Black	White	Red	Yellow
Flex 45K Cent 45K	White	Blue	Green	Black	N/A
Flex 75K	Green	Black	White	Red	N/A
Flex 100K/200K	Green	Black	White	Red	N/A

6

DLC Mode Of Operation

When the DigiTOL Junction Box is used with DigiTOL Indicators other than the 8505; including Models 8510SS, 8520, 8522, 8530, and JAGUAR Industrial Terminal; the DigiTOL Junction Box will act as a "slave" to the host indicator. Set-up parameters provided in the DigiTOL Indicator Manuals for use with the original DigiTOL Junction Box will still apply. Follow the programming steps found in the applicable DigiTOL Instrument Manual for scale bases with "DigiTOL Power Module" or "DigiTOL Junction Box" for this mode of operation. Wiring of your DigiTOL instrument to the Enhanced DigiTOL Junction Box is as follows:

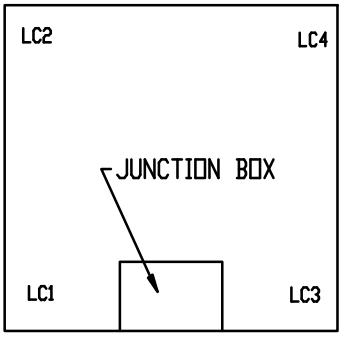
Terminal No.	Position	Function	Wire Color(*)
*TB2	10	+20 VDC	Green
*TB2	12	Ground	Blue
TB1	1	Shield	Orange
TB1	2	RXD A	Red
TB1	3	RXD B	White
TB1	4	TXD B	Yellow
TB1	5	TXD A	Black

*Remove the jumper across terminals 2 and 11 on TB2 (installed at the factory).
See Figure 6-a for terminal and terminal position locations.

Wiring the Enhanced DigiTOL J-Box to DigiTOL Indicators
8510SS, 8520, 8522, 8530, JAGUAR

Terminal No.	Position	Function	DigiTOL Indicator
*TB2	10	+20 VDC	+V Supply
*TB2	12	Ground	Ground
TB1	1	Shield	Chassis
TB1	2	RXD A	TXD A
TB1	3	RXD B	TXD B
TB1	4	TXD B	RXD B
TB1	5	TXD A	RXD A

Maximum cable length 100 feet.



STANDARD FLOOR SCALE LOAD CELL ORIENTATION

(TOP VIEW OF PLATFORM)

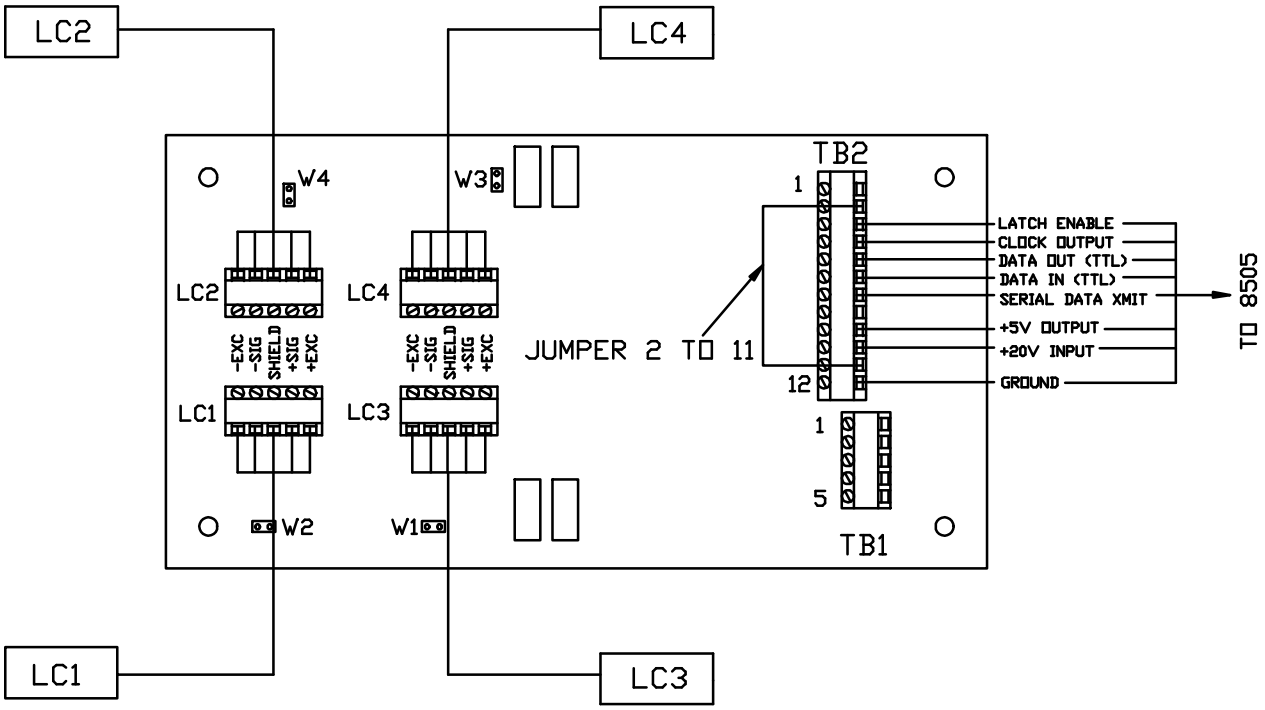


Figure 6-a Wiring Detail DLC Mode

7 Smart Mode of Operation with 8505 Weight Display

Overview

The Model 8505 Weight Display provides an economical and highly functional display when used in a basic weighing system. Programming parameters found in Chapter 9 must be followed. When used in the Smart Mode with the Model 8505 Weight Display this system is capable of supporting fixed scale builds up to and including 10,000 divisions of resolution. Fixed capacity and increment selections are:

Smart Mode Of Operation Capacity & Increment Selection Guide					
Capacity	**Increment Size**	**Capacity**	**Increment Size**	**Capacity**	**Increment Size**
500	0.05, 0.1	4,000	0.5, 1	40,000	5, 10
600	0.1, 0.2	5,000	0.5, 1, 2	50,000	5, 10
1,000	0.1, 0.2, 0.5	6,000	1, 2	60,000	10, 20
1,200	0.2, 0.5	8,000	1, 2	80,000	10, 20
1,500	0.2, 0.5	10,000	1, 2, 5	100,000	10, 20
2,000	0.2, 0.5, 1	12,000	2, 5	120,000	20, 50
2,500	0.5, 1	15,000	2, 5	150,000	20, 50
3,000	0.5, 1	20,000	2, 5, 10	200,000	20, 50
		30,000	5, 10		

Model 8505 External Functions

Display PCB

The display utilizes a large, low power LCD display. The six 7-segment digits are 0.7 inches (17.5 mm) in height. Other display symbols include:

- **Lb or kg**—Indicates avoirdupois or metric mode in use
- **Gross**—Indicates that no tare has been taken
- **Net**—Indicates tare has been taken and the display is showing a net weight
- **Zero**—The Zero legend illuminates when the weight is within ± 0.25 increments of the center of zero.

Keyboard Functions

- **Zero**—Zeroes weight display if within the zero capture range
- **Tare**—Used to (auto) tare the scale
- **Clear**—Switches the scale from Net to Gross, clearing tare
- **Print**—Used to initiate data output via the data output port
- **On/Off**—Turns power on/off to the display and DigiTOL Junction Box

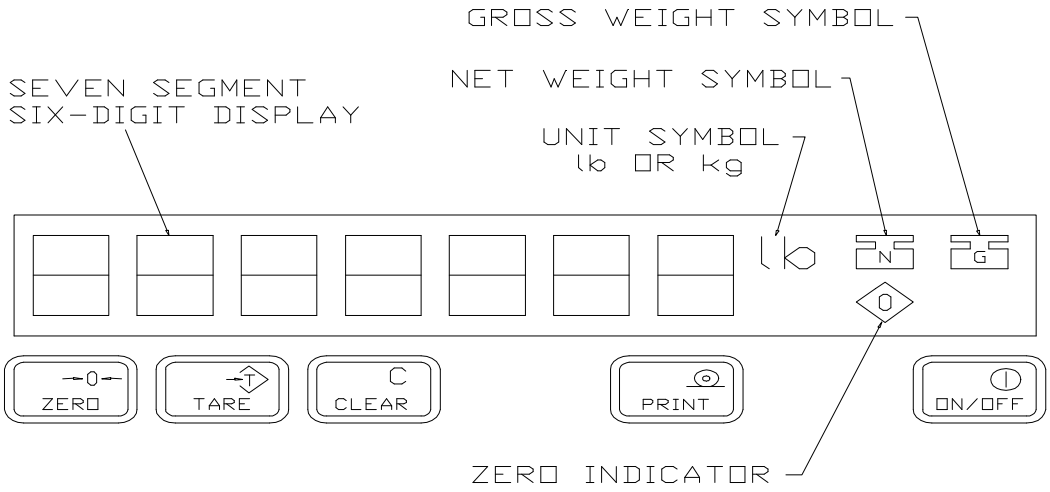


Figure 7-a Model 8505 Display Keyboard Layout

Data Output Port

A data output port is provided on the side of the 8505 Weight Display. The port is a one directional port that is capable of transmitting ASCII characters of scale weight data. The EIA specifications for maximum data cable length using RS232 communications is 50 ft. A 15 ft. long cable is available from Mettler Toledo, option number 09000264.

Information can be sent "on demand" or "continuous" at 300 to 19,200 baud. Gross, Tare, and Net weight can be sent in single or multiple line formats. The 8505 can also be formatted to send Gross weight only or Net weight only. See Chapter 13 for more detailed information data output.

Model 8505 Internal Functions

Power-up Memory and Display Test

On power-up all memory tests are performed including display segments.

Power-up Zero Capture

When power is applied and the gross weight is within the setup selectable range of ±2% or ±20% of calibrated zero, this weight will become the new zero. Power-up zero capture can also be selected to cancel automatically after a time delay if the weight on power-up is outside of the capture range.

Pushbutton Zero

A front panel pushbutton provides rezeroing of the scale over a setup selectable range of ±2% or ±20% of scale capacity. The Zero pushbutton is only effective in the "Gross" weighing mode with a "No Motion" condition. The "Zero" cursor will turn on when the weight is within the center of zero minor increment, unless AZM is disabled, in which case the "Zero" cursor is disabled. **Pushbutton Zero must never be used as a substitute for Pushbutton Tare.**

Auto Zero Maintenance (AZM)

Auto zero maintenance will correct zero errors up to a selected limit of either ±2% or ±20% of scale capacity (determined by the Pushbutton Zero range) within a selectable window of ±0.5d, ±1d, or ±3d where "d" equals one scale division. Weight variations which occur at the rate of 0.04d per second or slower will be compensated. AZM can be disabled in the setup process, and if disabled, the "Zero" cursor will not be operative. Also, if Pushbutton Zero is disabled AZM will also be disabled.

Motion Detection

A "No Motion" condition requires three successive display readings within the setup selected motion band. Print, Tare, Zero, and Zero Capture operations are permitted only during a "No Motion" condition.

Pushbutton Tare

The Model 8505 is equipped with a Tare pushbutton on the front panel. When a weight (e.g. container) is placed upon the scale and the Tare button is pressed while in a "No Motion" condition, the Tare weight is stored and subtracted from the Gross weight to provide a Net weight display of zero. The NET descriptor is turned on. The 8505 cannot be switched to the Net Mode while in the Gross Mode displaying gross zero.

Autoclear of Tare

The Autoclear of Tare upon return to a "No Motion" condition at Gross zero may be selected at Setup.

Tare Interlocks (Legal-For-Trade)

To meet trade regulations in many jurisdictions Tare Interlock features are provided. These can be enabled during Setup. Interlocks provide the following:

- Tare may be cleared only when the Gross weight is at zero.
- Tare pushbutton is only functional when in the Gross mode of operation.
- The GROSS and NET symbols will not turn off when the scale is in motion.
- The display will show either E E E or - E E E until Zero is captured at power-up.

8 8505 Weight Display Installation Instructions

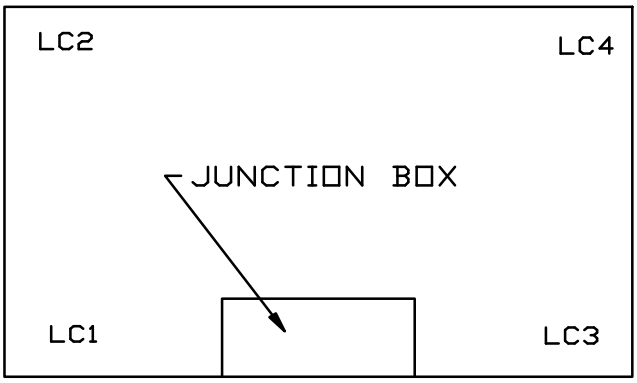
Configuration

These installation instructions only apply to Model 8505-0002 Weight Displays.

Assembly

1. Examine the shipping box for any signs of damage. If damage is found, make a claim with the carrier immediately.
2. Open the box and remove the top packing material. Remove the display from the box.
3. Mount the 8505 within 25 ft. of the Enhanced DigiTOL Junction Box. If installation is a floor scale, provide an additional 4 ft. to 5 ft. of cable slack to allow for raising the scale platform without disconnecting the 8505 interconnect cable from the scale.
4. Route the 8505 interconnect cable to the Enhanced DigiTOL Junction Box enclosure.
5. Remove the Junction Box lid. Loosen the instrument cable box connector and insert the cable. Feed the cable through the connector to terminal TB2 on the Junction Box PCB.
6. Wire the 8505 Weight Display to terminal TB2 per Figure 8-a. Correct positions are:

TB2 Terminal No.	Function	Wire Color
1	Not Used	
2	Jumper to 11	
3	Latch Enable	Orange
4	Clock Output	Blue
5	Data Out (TTL)	Brown
6	Data In (TTL)	Violet
7	Serial Data Transmit	Red
8	Not Used	
9	+5 VDC Output	Yellow
10	+20 VDC Input	Black
11	Jumper To 2	
12	Ground	Green



STANDARD FLOOR SCALE LOAD CELL ORIENTATION

(TOP VIEW OF PLATFORM)

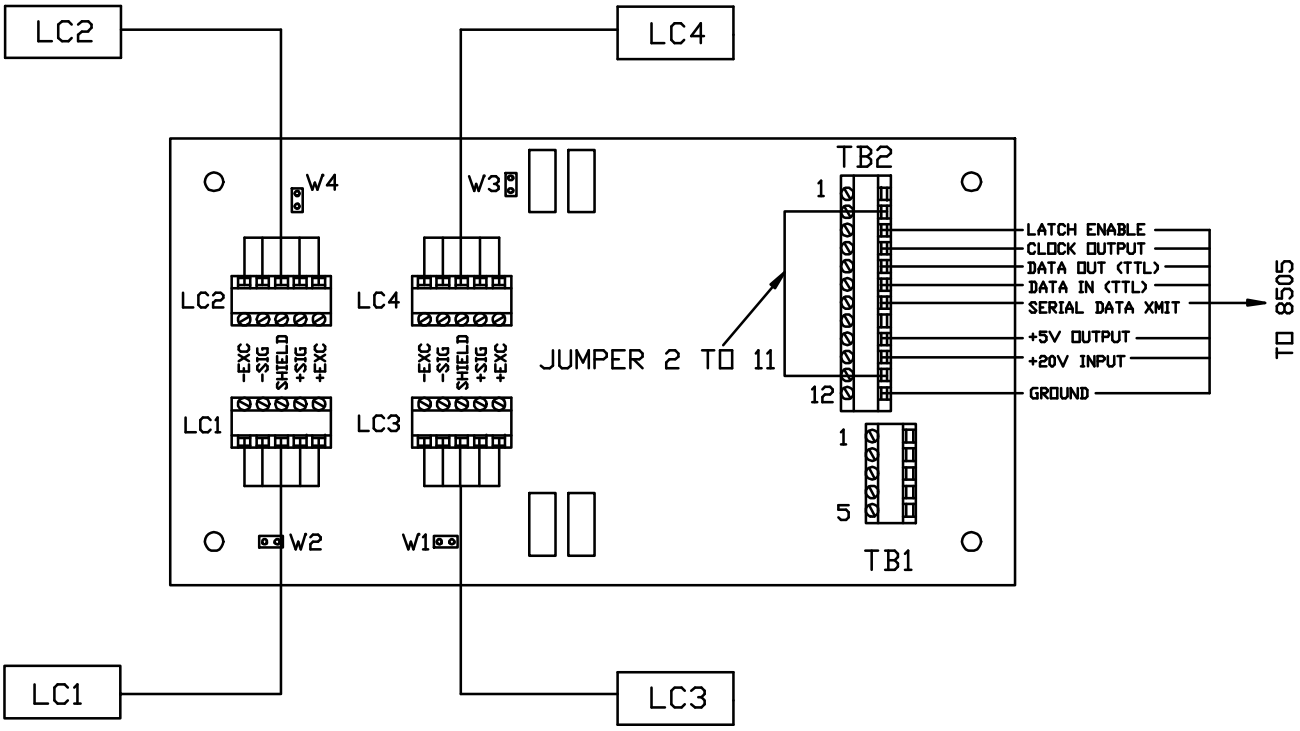


Figure 8-a Wiring Detail Smart Mode

7. Attach the cable shield to the Junction Box PCB mounting screw closest to TB2.
8. Install the Junction Box lid.
9. Plug in the 8505 wall transformer.

Accessing The Setup Mode

1. Remove the screws which secure the end cap on the right side of the display housing, swivel the cap aside allowing access to the inside of the enclosure (see Figure 8-b).

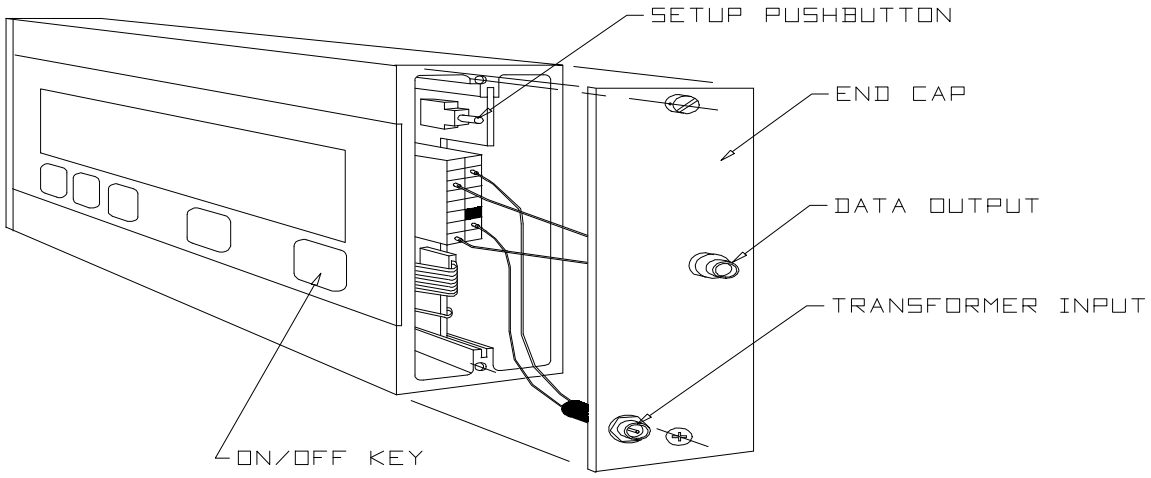


Figure 8-b Access Setup

2. 2. Press the "ON/OFF" key located on the display keypad to turn the scale power ON.
3. 3. After the power-up sequence is complete, press and release the white setup pushbutton located on the end of the display PCB. The display will first indicate [10 0], signifying the start of the setup mode.

Pushbutton Functions During Setup

The keypad of the 8505 Weight Display is used as a data entry point during installation and calibration. The keys have the following functions during the setup mode:

- **ZERO**—Backs up 1 step & provides decade control when entering data
- **TARE**—Advances or toggles the selection
- **CLEAR**—Skips to the end of setup
- **PRINT**—Enters the parameter being displayed & advances to the next step

To enter data the TARE key advances the number in each decade (decimal position) from 0-9. The ZERO key moves the control (blinking digit) from left to right, one decade at a time.

9 Setup Parameters 8505 Weight Display

Display Prompt	Display Sub-Prompt	Description
[10 X]	None	Scale Parameters X = 0 Bypass Section 10 X = 1 Access Section 10
[11 X]	None	Filter Selection X = 0 Filter Off X = 1 Light Filter X = 2 Medium Filter X = 3 Heavy Filter
[12 X]	[XXXXXX] if selection = 1	Gravity Adjust Factor X = 0 Bypass Gravity Adjustment Parameters X = 1 Access Gravity Adjustment Parameters (if this is chosen data entry of the variable gravity adjustment factor [XXXXXX] noted in display sub-prompt will be required)
[13 X]	None	Filnoise Enable 0 = Disable 1 = Enable
SECTION #20 NUMBER OF CELLS & SHIFT ADJUSTMENT		
[20 X]	None	Set Number Of Cells & Shift Adjust 0 = Bypass Section 20 1 = Access Section 20
[21 X]	[tot X]	Select Number Of Load Cells X = Number of load cells used (1-4), if only one cell is used step 22 is skipped.
[22 X]	[22 0]	Shift Adjust Sequence 0 = Bypass shift adjustment 1 = Perform shift adjustment 2 = Set Shift Constants To One
	[22 1] [E SCL] [15] [CELL 1] [15] etc. [donE]	X = 1 Perform Shift Adjustment Display will show [E SCL] make sure the scale platform is empty and press the PRINT key. The display will count down from 15 to 00 and will then display [CELL 1].Place a weight over the Cell 1 quadrant, preferably equal in weight to 50% of the scale capacity and press PRINT. The display will count down from 15 to 00. Repeat this sequence for cells 2, 3, and 4 as selected. Once shift is complete the display will indicate [donE], press PRINT to continue.
	[22 2] [SurE]	X = 2 set Shift Constants to 1 Are you sure? Display will show [SurE] to verify that you want to disable the shift values previously stored in memory. Press PRINT to continue or ZERO to abort and backup to the previous programming prompt. Setting shift constants to 1 removes any previously calculated shift constants and causes the load cell outputs to be used without any trim built into the values. It acts as if the load cells are simply wired in parallel as a conventional analog Junction Box without the benefit of trimming resistors. In normal use this feature would typically be utilized in a tank or hopper scale where a shift test is not practical.

Display Prompt	Display Sub-Prompt	Description
SECTION #30: SCALE CALIBRATION		
[30 X]	None	Scale Calibration X = 0 Bypass Scale Calibration X = 1 Access Scale Calibration
[31 XX]	None	Select Units lb kg
[32]	[XXXXXX]	Capacity Selection Press the TARE key to toggle through the capacity menu. Press PRINT key to accept the selection. Selections include: 500; 600; 1,000; 1,200; 1,500; 2,000; 2,500; 3,000; 4,000; 5,000; 6,000; 8,000; 10,000; 12,000; 15,000; 20,000; 30,000; 40,000; 50,000; 60,000; 80,000; 100,000; 120,000; 150,000; 200,000
[33 XXX]	[XXX]	Increment Size Selection Press the TARE key to toggle through increment choices. Press the PRINT key to accept the selection. Increment sizes are derivatives of 1, 2, and 5. The 8505 Weight Display is limited to a maximum of 10,000 counts of displayed resolution. Refer to section 7.1 for available capacity & increment selections.
[34 X]		Calibration 0 = Bypass scale calibration 1 = Scale calibration without linearity compensation 2 = Scale calibration with linearity compensation 3 = Short-cut calibration
	[34 1] [E SCL] [15] [Add Ld] [XXXXXX] [15] [CAL D]	1 = Calibration Without Linearity Compensation The display will show [E SCL]. Empty the scale platform or vessel and press the PRINT key. The display will count down from 15 to 00 then display [E SCL]. Place the calibration weight on the platform or vessel and press the PRINT key. Enter the test weight value, using the TARE key to toggle the blinking digit from 0 through 9 and the ZERO key to move the blinking digit to the next decade position. The display will count down from 15 to 00 then indicate [CAL D], signifying that calibration is complete. It is recommended that a test weight equal to the scale capacity be used, however, the process can be performed with a minimum of 10% of the scale capacity.
[34 X] (Continued)	[34 2] [E SCL] [15] [LO] [Add Ld] [XXXXXX] [15] [FL] [Add Ld] [XXXXXX] [15] [CAL D]	2 = Calibration With Linearity Correction The display will show [E SCL]. Empty the scale platform or vessel and press the PRINT key. The display will count down from 15 to 00 then display [LO]. Press the PRINT key to continue with mid-point calibration. Place a test weight on the platform equal to one half the scale capacity and press the PRINT key. Enter the test weight value using the TARE key to toggle the blinking digit from 0 through 9 and the ZERO key to move the blinking digit to the next decade position. Once the value is entered press the PRINT key. The display will count down from 15 to 00. The display will indicate [FL], press the PRINT key to continue with full load calibration. Place a test weight on the platform equal to the scale capacity and press the PRINT key. Enter the test weight value and press the PRINT key. The display will count down from 15 to 00 after which the display will show [CAL D], signifying calibration is complete.
	[34 3]	3 = Short-cut Calibration

Display Prompt	Display Sub-Prompt	Description
	[shCUt] [SUrE ?] [ShFt X] [CELL 1] [XXXXXX] [CELL 2]	Short-cut calibration is a method of calibrating the scale without the use of test weights. The constants referred to in this process can be found by accessing Setup Section 60 of this program. In order for the constants to be effective the scale must have been calibrated at one time using test weights. Short-cut calibration can be a valuable tool in minimizing downtime of a system when replacing a load cell or DigiTOL Junction Box PCB. Always record the calibration constants found in Section 60 for future reference after the initial calibration. **This process should never be used if the scale is in a legal-for-trade installation.** Press the PRINT key to begin short-cut calibration. The display will ask if you are SUrE ? that you want to proceed with this process, select 1 then press the PRINT key to proceed. The display will indicate [ShFt X], this is asking if you want to enter the numeric constants for shift adjustment. Enter 0 to bypass short-cut shift adjustment Enter 1 to access short-cut shift adjustment If short-cut shift adjustment is accessed the display will show [CELL 1], press the PRINT key. Enter the shift constant for cell #1 from Setup Parameter 61 using the TARE key to toggle from 0 through 9 on the blinking digit and the ZERO key to move the blinking digit to the next decade. Press the PRINT key to enter the shift constant for Cell #1. Repeat this process for Cells 2, 3, and 4.
	[FL] [XXXXXX] [Lo] [XXXXXX] [ZERO] [XXXXXX] [CAL d]	3 = Short-cut Calibration (Continued) The display will indicate [FL] to begin the short-cut calibration, this prompt is for entering the full-load constant. Press the PRINT key, and enter the full-load constant using the TARE key to toggle from 0 through 9 on the blinking digit and the ZERO key to move the blinking digit to the next decade. Press the PRINT key to accept the full-load constant entered. The display will prompt you for the mid-range calibration constant [Lo]. Press the PRINT key to proceed, enter the mid-range calibration constant, and press the PRINT key to accept the value. The display will show [ZEro], press the PRINT key and enter the constant for zero reference and press the PRINT key to accept the value. The display will show [CAL d] to signify that the short-cut calibration process is complete.
[35 X]	None	Legal-For-Trade To meet trade regulations in many jurisdictions Tare Interlock features are provided. These can be disabled during Setup. Interlocks include: •Tare may be cleared only when the Gross weight is at zero. •Tare pushbutton can only be pressed when in the Gross mode of operation. •The GROSS and NET symbols will not turn off when the scale is in motion. •The display will show either E E E or - E E E until Zero is captured at power-up. 0 = Disable tare interlocks 1 = Enable tare interlocks

Display Prompt	Display Sub-Prompt	Description
[36 X]	[XXXXXX]	Span Adjustment This step adjusts the scale span without performing the complete calibration procedure, however calibration must have previously been performed in order to use this feature. When span adjustment is made, the test weight must be on the scale and value of the actual test weight must be known. 0 = Skip span adjustment 1 = Access span adjustment Place the test weights on the scale and enter the test weight value using the TARE key to toggle from 0 through 9 on the blinking digit and the ZERO key to move the blinking digit to the next decade. Press the PRINT key to accept the test weight value entered.
[37 X]	None	Metric Comma Enable 0 = Disabled 1 = Enabled
SECTION 40: TARE, ZERO, AND DISPLAY PARAMETERS		
[40 X]	None	Access Tare, Zero, and Display Functions 0 = Bypass Section 40 1 = Access Section 40
[41 X]	None	Tare Key 0 = Tare key disabled 1 = Tare key enabled
[42 X]	None	Autoclear Tare Enable 0 = Disabled 1 = Enabled
[43 X]	None	Pushbutton Zero 0 = Disabled 1 = ± 2% capture range 2 = ± 20% capture range Note: If Pushbutton Zero is disabled (selection "0") AZM, Power-up Zero Capture, and Time Out For Power Up Zero Capture are automatically disabled and steps 44, 45, and 46 are skipped.
[44 X]	None	Automatic Zero Maintenance (AZM) 0 = Disabled 1 = ± 0.5d window 2 = ± 1.0d window 3 = ± 3.0d window Note: If AZM is disabled (selection "0") Power-up Zero Capture & Time Out For Power Up Zero Capture is automatically disabled and steps 45 & 46 are skipped.
[45 X]	None	Power-up Zero Capture 0 = Disabled 1 = ± 2% capture range 2 = ± 20% capture range Note: If Power-up Zero Capture is disabled (selection "0") Time Out For Power Up Zero Capture is automatically disabled and step 46 is skipped.
[46 X]	None	Time Out For Power Up Zero Capture

Display Prompt	Display Sub-Prompt	Description
		0 = Disabled 1 = 5 second timeout
[47 X]	None	Motion Detection Range 0 = Motion detection disabled 1 = 0.5 scale division 2 = 1.0 scale division 3 = 2.0 scale division 4 = 3.0 scale division
Section 50: Data Output Parameters		
[50 X]	None	Data Output Parameters 0 = Bypass Section 50 1 = Access Section 50
[51 X]	None	Output Mode 0 = On Demand Output 1 = Continuous Output Note: If continuous mode is selected parameters 55 through 58 will be skipped.
[52 X]	None	Baud Rate Selection 0 = 300 baud 1= 2400 baud 2 = 4800 baud 3 = 9600 baud 4 = 19,200 baud Note: If continuous mode is selected 300 & 2400 baud selections are disallowed.
[53 X]	None	Checksum Enable 0 = No checksum 1 = Checksum enabled
[54 X]	None	Parity Selection 0 = Always "0" 1 = Odd parity 2 = Even Parity
[55 X]	None	Demand Mode STX Enable 0 = STX character not part of the output string 1 = Output string begins with STX character
[56 X]	None	Line Selection 0 = Multiple line mode 1 = Single line mode
[57 X]	None	Print Fields Selection 0 = Gross weight only 1 = Net weight only 2 = Gross & Net weight only 3 = Gross, Tare, & Net weight
[58 X]	None	Print Double Width 0 = Disabled 1 = Double width gross weight 2 = Double width net weight 3 = Double width Gross & Net weight
SECTION 60: SHIFT & CALIBRATION CONSTANTS		
[60 X]	None	Read Shift & Calibration Constants 0 = Bypass Section 60

Display Prompt	Display Sub-Prompt	Description
		1 = Access Section 60
[61 X]	[61 1] [SHFt] [CELL 1] [XXXXXX] [CELL 2] etc.	Read Shift Constants 0 = Bypass parameter 61 1 = Read shift constants After accessing this parameter the display will show [SHFt] press the PRINT key to proceed. The display will show [CELL 1] for approximately 2 seconds. Next a number will be displayed, this is the shift constant for load cell number 1, record the number and press the PRINT key, the display will show [CELL 2] briefly and then the constant will be displayed. Repeat this process until the shift constants for all of the load cells have been viewed and recorded.
[62 X]	[62 1] [ConSt] [FuLL] [XXXXXX] [Lo] [XXXXXX] [ZEr0] [XXXXXX]	Read Calibration Constants 0 = Bypass parameter 62 1 = Read Calibration Constants After accessing this parameter the display will show [ConSt] press the PRINT key to continue. [FuLL] will be displayed for approximately 2 seconds, followed by a numeric value, this is the calibration constant for full capacity or span. After recording this value press the PRINT key. Repeat this process for [Lo] mid-range and [ZEro] empty scale calibration constants. This mode **SHOULD NOT** be used for normal weighing operations but only as a test and evaluation mode.
LOAD CELL OUTPUT DIAGNOSTIC		
[70 X]	None	Load Cell Output Diagnostic 0 = Bypass Section 70 1 = Access Section 70
[71 X]	None	Expanded Weight Display 0 = Disabled 1 = Enabled This will enable a X10 expansion of the weight display without zero maintenance. This mode of operation can be useful in testing and troubleshooting.
[72 X]	None	Read Individual Load Cell Output X = Load cell number After the load cell number is selected, press the PRINT key to show the raw load cell output with no shift value applied. Use the TARE key to toggle through the load cell numbers, press the CLEAR key to exit this mode.
SECTION 90: DEFAULT PARAMETERS & PROGRAM EXIT		
[98 X]	[98 1] [SurE ?]	Reset Default Parameters To Factory Setting 0 = Bypass default parameter reset 1 = Set to default parameters This parameter allows you to quickly reset the 8505 programming to the factory set default parameters. Note that if this parameter is selected any programming, including scale calibration, will be erased from the scale memory. If "1" is selected the display will show [SurE ?] to verify that you want to proceed with this function. If yes press the PRINT key, if no press

Display Prompt	Display Sub-Prompt	Description
		the ZERO key to backup to the previous step.
[99]	None	End of Setup Sequence Press the white setup switch on the end of the 8505 display PCB to exit the setup mode.

10 Routine Care And Maintenance

Overview

Once the scale assembly is installed it is recommended that the assembly be periodically inspected and calibrated by an authorized Mettler Toledo representative. If the scale is used for legal-for-trade purposes (See section entitled Weights and Measures in Chapter 4 prior to installation in a legal-for-trade application), consult the local Weights and Measures Authorities for minimum inspection requirements.

Site Inspection

Ensure that the scale remains in good condition and the scale site continues to be a good environment to conduct weighing functions. Check for the following site conditions:

1. Check for any alterations in the surrounding area from when the scale was first installed. Are there any new structures, pipes, or scale connections? Are there any excessive vibrations or wind currents noted in the area?
2. Are there any unusual wear points, paths, or marks on the weighing assembly?
3. Is the instrument cable free from damage or binding the scale?
4. Is there any debris or foreign material buildup under or around the scale which could inhibit the scale from moving properly (vertical and horizontally)?
5. Does the area properly drain moisture away from the scale assembly?
6. Check load cell and load cell suspension assemblies for any unusual wear or damage.

Enhanced Digitol Junction Box Assembly

1. Check load cell wiring for proper connections (See Chapter 5).
2. Check indicator wiring for proper connections.
3. See Chapter 6 for DLC Mode.
4. See section entitled Assembly in Chapter 8 for Smart Mode/8505 Weight Display wiring.
5. Check desiccant inside the J-Box bag for moisture saturation, replace if required with Mettler Toledo P/N TA800218.
6. Check Junction Box lid seal for deterioration and/or foreign debris which could inhibit proper sealing protection.
7. Check cable box connectors for tightness and sealing quality.

Model 8505 Weight Display

1. Periodically clean the keyboard, lens, and enclosure with a soft clean cloth that has been dampened with a mild window type cleaner or detergent. **Do not use any type of commercial or industrial solvents or chemicals. Do not spray cleaner directly on to the unit. Do not hose down.**
2. Check to ensure that scale to instrument cable is not damaged or binding the scale assembly.
3. Check power cord and wall mount transformer assembly for damage and proper connection.
4. Ensure that the unit is securely mounted to the operator location.

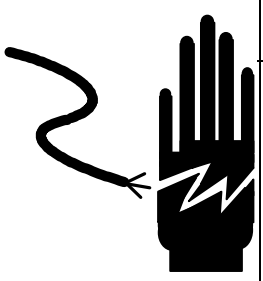
Scale Assembly

Consult scale base technical manual for routine care and maintenance instructions.

11 Error Codes

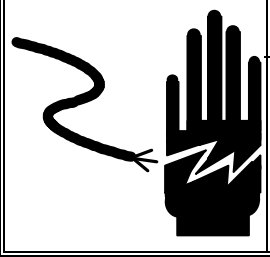
Error Code	Description	Corrective Measures
E1	EPROM Checksum Error	1. Remove power & wait 15 seconds, retry. 2. Check wall transformer voltage. 3. Replace DigiTOL Junction Box PCB.
E3	Invalid EEPROM Checksum	1. Remove power & wait 15 seconds, retry. 2. Check wall transformer voltage. 3. Perform set-up sequence again. 4. Replace DigiTOL Junction Box PCB.
E4	Data RAM Error	1. Remove power & wait 15 seconds, retry. 2. Check wall transformer voltage. 3. Replace DigiTOL Junction Box PCB.
E8	Out Of Range	1. Remove power & wait 15 seconds, retry. 2. Check Excitation voltage, Signal voltage & wiring. 3. Check for mechanical overload or live to dead load binds. 4. Retry shift adjustment and recalibrate. 5. Check wall transformer voltage & retry operation. 6. Replace DigiTOL Junction Box PCB.
E13	EEPROM Error	1. Remove power & wait 15 seconds, retry. 2. Check wall transformer voltage. 3. Perform shift sequence again. 4. Replace DigiTOL Junction Box PCB.
E16	Math Overflow Error	1. Remove power & wait 15 seconds, retry. 2. Check wall transformer voltage. 3. Perform shift and calibration sequence again. 4. Replace DigiTOL Junction Box PCB.
E32	Calibration Error or Build Error	1. Verify desired operation is a valid calibration build. 2. Remove power & wait 15 seconds, retry. 3. Check wall transformer voltage. 4. Re-program set-up sequence. 5. Perform shift and calibration sequence again. 6. Replace DigiTOL Junction Box PCB.
Blank	Blank Display	1. Check transformer, if DC voltage is good replace display PCB.

12 Troubleshooting



WARNING

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



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.

Procedure

If operational difficulties are encountered first obtain as much information as possible regarding the problem. Failures and malfunctions often may be traced to simple causes such as loose connections, improper setup parameters, or mechanical binds.

If a simple cause cannot be found additional troubleshooting is required. First check those items which require minimal disassembly of the system, including:

1. Is the instrument cable free from damage or is it binding the scale?
2. Is there any debris or foreign material buildup under or around the scale which could inhibit the scale from moving properly (vertical and horizontally)?
3. Check load cell and load cell suspension assemblies for any unusual wear or damage.
4. Check load cell wiring for proper connections (See Chapter 5).
5. Check indicator wiring for proper connections:
   - See Chapter 6 for DLC Mode.
   - See section entitled Assembly in Chapter 8 for Smart Mode/8505 Weight Display wiring.
6. Check 8505 power cord and wall mount transformer assembly for damage and proper connection.
7. Are the scale setup parameters correct?
8. Has the scale been calibrated and shift adjusted (if applicable) correctly?

If the problem cannot be found, attempt to isolate if the problem is in the scale indicator or scale base/DigiTOL Junction Box. Initial isolation can be performed by substitution.

Display And Keypad Active, Display Shows Error Code/Scale Not Weighing Properly

If the 8505 Display and keyboard are still active, access Setup Parameter 72. View and record the raw output counts from each of the load cell assemblies. Output values with dramatically high/low count values (normally a ±20% or more difference from the other load cells in the system) or rapidly drifting counts may be the sign of a defective load cell assembly or may be caused by an error in calibration or shift adjustment.

First repeat the calibration and shift adjustment procedure, if the problem continues check the load cell bridge resistance. If a defective cell is found, replace per the instructions found in the scale base/assembly technical manual.

Load Cell Wiring Codes And Specifications

Load Cell Capacity	Wiring Code					Input Resistance (+Exc To -Exc)	Output Resistance (+Sig To -Sig)	Zero Balance (% Of Full Scale Output)
	+Exc	-Exc	+Sig	-Sig	Shield			
500 Thru 10K lb	Green	Black	White	Red	Yellow	≥ 385 Ω	350 ±2 Ω	1%
220 Thru 4400 kg	Green	Black	White	Red	Yellow	≥ 385 Ω	350 ±2 Ω	1%
20K lb	Green	Black	White	Red	Yellow	360 to 400 Ω	350 ±1 Ω	1.5%
45K lb	White	Blue	Green	Black		2500 ±100 Ω	2000 ±20 Ω	1.5%
75K lb	Green	Black	White	Red		360 to 400 Ω	350 ±1 Ω	1.5%
100K lb 200K lb	Green	Black	White	Red		1100 to 1200 Ω	1000 Ω	1.5%

Common Data

Rated Output: 2.0 mV/V
Maximum Excitation Voltage: 15 VDC vms
Insulation Resistance: 5000 MegaOhms @ 50 VDC
Compensated Range: -10°C to +40°C

If all load cells have the correct bridge resistance characteristics, and the problem continues, replace the DigiTOL Junction Box PCB. Retry scale setup, shift adjustment (if required) and calibration.

Weight Display and/or Keyboard Not Operational

First substitute a replacement 8505 Weight Display wall mount transformer/power cord assembly with the existing 8505 Weight Display and DigiTOL Junction Box assembly. If the system does not become operational continue troubleshooting.

Next replace the existing 8505 Weight Display with a known working unit, use the replacement wall mount transformer/power cord assembly from the previous step.

If the Systems Becomes Operational

Replace the existing 8505 Weight Display PCB and reconnect to the base, switch the replacement wall mount transformer/power cord assembly with the existing unit and verify operation.

If the System is Not Operational

Continue with the troubleshooting procedure.

Check to make sure that the instrument cable and individual load cell cables are wired to the correct terminals and correct locations.

If problem continues replace DigiTOL Junction Box, retry setup, shift, and calibration procedures.

Wall Mount Transformer Voltage Check

The wall mount transformer converts standard 120 VAC/60 hz input voltage to a nominal 12 VDC at 500 ma. Although the wall transformer output depends directly upon the AC line voltage, typical output voltage to the 8505 will be between +12 VDC to +17 VDC. This voltage can be checked at the transformer output plug, the outside barrel being ground.

Display PCB Voltages

Various input and output voltages can be checked at the display PCB on J-1, located at the end of the display PCB. Access to J-1 is gained by removing both of the right end cap screws. Figure 12-a provides information on the J-1 terminal.

+10 VDC Output	1	2	Ground
+5 VDC	3	4	12 VDC
Printer TXD	5	6	Clock Output
TXD to DLC	7	8	RXD to DLC
+5 VDC LE	9	10	Key
	11	12	Ground
Data In	13	14	
Ground	15	16	

* Only when power is ON

Figure 12-a J-1 Terminal On 8505 Weight Display

Model 8505 Weight Display Keyboard Replacement

1. Remove power from the display unit by unplugging the AC wall mount transformer.
2. Remove the right end cap from the display housing.
3. Disconnect the keyboard connector on the display PCB.
4. Peel the overlay from the display housing.
5. Remove the switch membrane and clean off any remaining adhesive on the housing.
6. Position the new switch membrane in the slot and feed the connector tail through the hole at the end of the slot.
7. Carefully position the overlay on the housing. When in the correct position apply pressure on the overlay with your fingers, especially to the edges, to secure it to the display housing. **Do not use excessive pressure on the key positions.**

Display PCB Replacement

1. Remove power from the display unit by unplugging the AC wall mount transformer.
2. Remove the both end caps from the display housing.
3. Unplug the load cell harness at J1, the keyboard connector, and the ground connector on the Display PCB.
4. Slide the Display PCB out of the housing to the left.
5. Reverse the sequence for installation of the new Display PCB.

Make sure "fish" paper is present behind the Display PCB after reinstalling.

13 RS-232 Serial Output

Overview

The Model 8505 RS-232 serial port is a one directional port that is capable of transmitting ASCII characters of scale weight data. The 8505 can be programmed to transmit the data using "on-demand" format by pressing the Print key or for "continuous" data output. The character format is one start bit, seven data bits, one (selectable) parity bit, and one stop bit. Coding is in ASCII format. Transmission rates are selectable from 300 baud through 19,200 baud. The printer jack located on the 8505 display housing is setup with the center pin being "transmit" (TXD) and the barrel being "ground".

The EIA specifications for maximum data cable length using RS-232 communications is 50 feet. Data transmission actually originates from the DigiTOL Junction Box and not from the 8505 Weight Display. An integral twenty-five (25) foot cable is provided with the 8505 for connection to the DigiTOL Junction Box, therefore the maximum distance from the 8505 Weight Display to the external device for data transmission is a maximum of twenty-five (25) additional feet. A fifteen (15) foot long printer cable is available from Mettler Toledo as an option, part number 13488900A, or option number 0900-0264.

Demand Output Mode

The demand output mode allows transmission of data to an external device once a print command is given by pressing the "PRINT" button on the 8505 keypad. The data output will only occur when the scale is in a no-motion condition.

The 8505 can transmit information in a single line format:

- Gross - Tare - Net

The 8505 can also transmit the information is a multiple line format:

- Gross
- Tare
- Net

Character Definitions

<stx	Start of text
>	Optional Shift Out character for expanded print (HEX 0E)
<so>	Character is either a "space", "most significant digit", or minus sign
#	Numeric digit
X	Space character
_	Units character either "lb" or "kg"
**	Optional Shift In character to end expanded print (HEX 0F)
<si>	Tare weight
TR	Net weight
NET	Carriage Return (HEX 0D)
<cr>	is the two's complement of the sum of all characters from the <stx>
<cks	or <lf> to the <cr> inclusive
>	Line feed (HEX 0A)
<lf>	

Single Line Format:

Gross-Tare-Net
<stx><so>#XXXX.X_**<si>_XXXX.X_**_TR<so>
#XXXX.X**_NET<si><cr><cks><if>

Multiple Line Format:

Gross
Tare
Net

<stx><so>#XXXX.X_**<si><cr><cks>
<lf>_XXXX.X_**_TR<cr><cks>
<lf><so>#XXXX.X_**_NET<si><cr><cks><lf>

- **Start Of Text <stx>**—character transmission is optional and can be disabled in setup Parameter 55. If disabled no character is sent in its place.
- **Shift Out <so>**—character causes double width printing and can be disabled in setup Parameter 58. If disabled no character is sent in its place.
- **Shift In <si>**—character returns the print field to normal width printing and is only used if double width printing is enabled in setup Parameter 58. If disabled no character is sent in its place.

Continuous Output Mode

The 8505 Weight Display allows for weight transmission on a continuous output basis. Baud selections are limited to 4800, 9600, and 19200. The data consists of 18 bytes transmitted in 11 bit ASCII format. The format is 1 start bit, 7 data bits, 1 parity bit, and 2 stop bits.

Character Definitions

- <stx>ASCII Start Of Text (02H)
- <st_a>Status Byte A
- <st_b>Status Byte B
- <st_c>Status Byte C
- W...WWeight (Gross or Net)
- T...TTare Weight
- <cr>ASCII Carriage Return
- <chk>Checksum

Data Format

<stx><st_a><st_b><st_c>WWWWWWTTTTTT<cr><chk>

Transmission Rate—Data is transmitted at every second display update, or approximately 7.5 times per second.

Checksum <chk>—is defined as the two's complement of the 7 low order bits of the binary sum of the 7 low order bits of all characters preceding the checksum including <stx> and <cr>. Bit 8 of checksum <chk> is parity of the 7 low order bits of Checksum <chk>.

Non-significant weight data and tare data digits are transmitted as spaces.

Status Byte A Format

Bit 2,1,0	Encoded Decimal Point 0 0 0 XXXX00 0 0 1 XXXXX0 0 1 0 XXXXXX 0 1 1 XXXXX.X 1 0 0 XXXX.XX 1 0 1 XXX.XXX 1 1 0 XX.XXXX 1 1 1 X.XXXXX
Bit 4, 3	Build Code 0 1 X1 1 0 X2 1 1 X5
Bit 5	Always = 1
Bit 6	Always = 0
Bit 7	Status Byte A Parity

Status Byte B Format

Bit 0	Weighing Mode Gross = 0 Net = 1
Bit 1	Sign Positive = 0 Negative = 1
Bit 2	Overcapacity = 1
Bit 3	Motion = 1
Bit 4	Units lb = 0 kg = 1
Bit 5	Always = 1
Bit 6	In Power Up = 1
Bit 7	Status Byte B Parity

Status Byte C Format

Bit 0, 1, 2	Always = 000
Bit 3	Print = 1
Bit 4	Expand × 10 Data = 1
Bit 5	Always = 1
Bit 6	Hand Tare (Metric Only) = 1
Bit 7	Status Byte C Parity

RS-232 Port Pin Connections

A phone jack is used on the 8505 Weight Display for the RS-232 port, pin connections are as follows:

- **Center Pin**—TXD Transmit
- **Barrel**—Signal Ground

Output Interface Cable

A 15 ft. RS-232 interface cable for the 8505 Weight Display is available from Mettler Toledo, part number 13488900A, or option number 0900-0264. This cable interfaces with Mettler Toledo accessories including most printers and remote displays equipped for RS-232 operation.

14 Normal Operating Sequences

Power-Up Sequence

The 8505 must be attached to the Enhanced DigiTOL J-Box to power-up.

Power is applied to the Model 8505 Weight Display by pressing the ON/OFF button on the keypad. All of the display segments will be visible momentarily for display verification. Next, the software program number followed by the software revision level will be displayed. Following this sequence, the weight data will be visible. If Parameter 45 (Zero Capture) is enabled and the weight is within the capture range (± 2% or ± 20%), a zero will be displayed. If outside of the capture range, "EEEEE" will be displayed (if Parameter 35 = 1, Legal-for-Trade).

Net Weighing Sequence

1. Place an empty container on the scale platform.
2. Press the TARE key. The display will show zero weight and the NET weight legend will appear.
3. Add the load to the scale platform, the NET weight will be displayed.

If the 8505 is interfaced to a printer, the weight data can be transmitted by pressing the PRINT key.

If setup Parameter 42 (Autoclear Tare) is enabled, the weight display will return to Gross Weight Zero once the container is removed from the scale. Follow the previous steps to repeat the process.

If setup Parameter 42 (Autoclear Tare) is disabled, the weight display will show the weight of the container with a minus or negative sign preceding it to show that the scale is still in the NET weight mode of operation. Disabling Autoclear Tare makes the process of repeated weighments using the same container/Tare weight more efficient.

If Autoclear Tare is disabled, and the current Tare is not required, and the operator wishes to return to the GROSS weighing mode, press the CLEAR button on the keypad and the Tare value will be discarded and the display will show zero in the GROSS weighing mode. **NEVER press the "ZERO" key during the TARE process as this will change the calibration of the scale.**

Net Weighing Sequence Chain Tare (Non Legal-For-Trade)

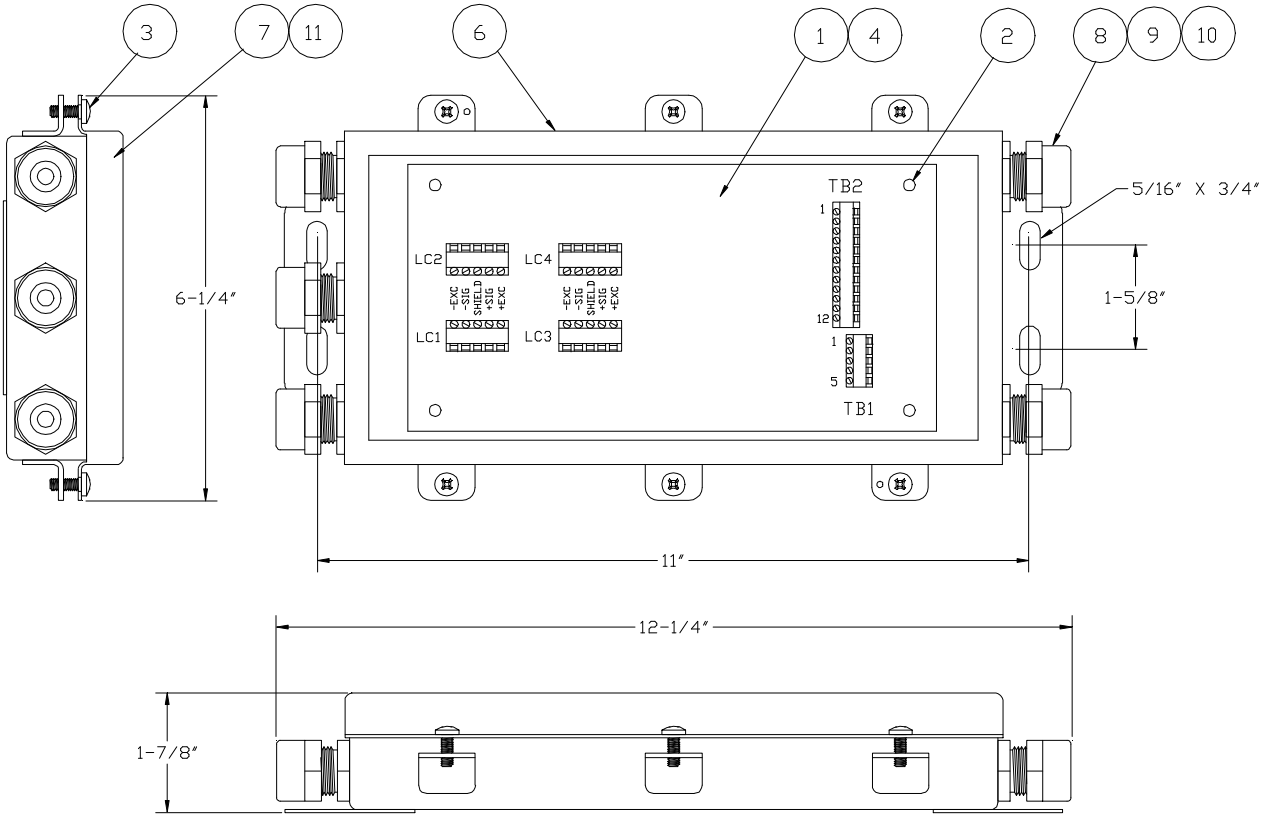
Many operations require multiple materials to be placed in the same container. For these simple manual batching processes the 8505 Weight Display has the ability to chain Tare weights together through the full capacity of the scale. It is recommended that if chain tare is to be used that Parameter 42 (Autoclear Tare) be enabled. Also, Parameter 35 (Tare Interlock) must be disabled, 35 = 0. The sequence is as follows:

1. Place an empty container on the scale platform.
2. Press the TARE key. Display will show zero weight and the NET legend will appear.
3. Add the load (material #1) to the scale platform, the NET weight will be displayed.
4. Press the TARE key. The display will show zero weight.
5. Add the load (material #2) to the scale platform.
6. Press the TARE key. The display will show zero weight.

Continue this process until all materials are in the container. Note, unless the weights are either manually or automatically recorded after each material is added then the net weights of each material will be lost. Pressing the CLEAR key after all materials are added will provide the GROSS weight of the material and the container.

15 Replacement Parts

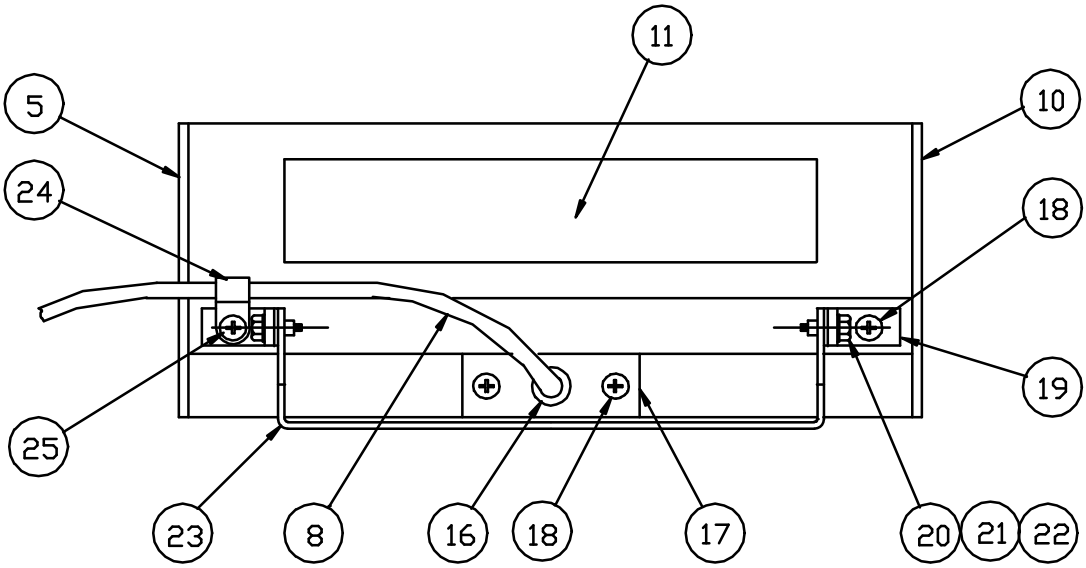
Enhanced Digitol Junction Box



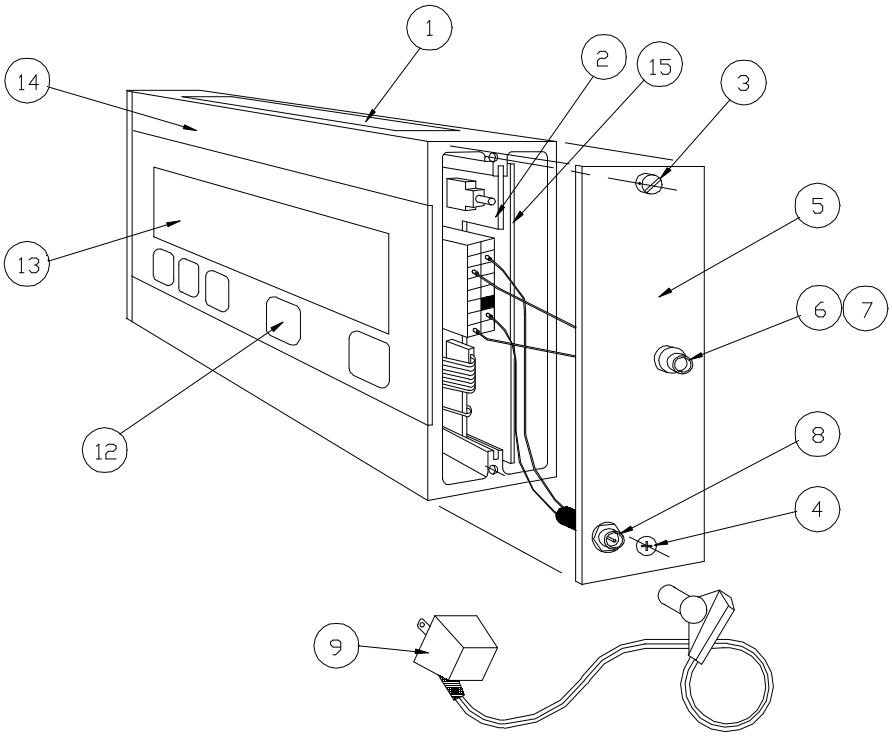
Item	Part Number	Description
12	TN800580	DigiTOL J-BOX LABEL
11	TN100513	J-BOX LID GASKET 5 X 10
10	TN100432	3/8-18 NPT LOCKNUT
9	TN100430	3/8 CORD GRIP (.188-.250)
8	TN100429	CORD GRIP BUSHING KIT
7	TB100424	J-BOX LID 5 X 10
6	TB100410-X	BOX WELDMENT (SEE CHART)
5	TA800218	DESICCANT BAG
4	TA100360	PCB SUPPORT PAD
3	MZ0901010166	10-32 X 1/2 PPHM SS SCREW
2	MZ0901010091	10-32 X 1/4 SS SCREW
1	*13839900A	DIGITAL PCB

Assembly	Description	Use Weldment
TB100515-5	5-HOLE ASSEMBLY	TB100410-5
TB100515-4	4-HOLE ASSEMBLY	TB100410-4
TB100515-3	3-HOLE ASSEMBLY.	TB100410-3

Weight Display



85050002 REAR VIEW



Item	Part Number	Description
1	13353500A	Data Tag
2	*13249000A	Display PCB
3	13795400A	8-32 × 1/2 Fml Drill Hd Screw
4	R0408100A	8-32 × 1/2 Flat Hd Screw
5	13463400A	Right End Cap
6	13463600A	Black Vinyl Cap
7	13488100A	Serial Port (Phone Jack)
8	14111200A 13464200A	Data/Power Harness Ram 0002 Interconnect Harness Ram 0001
9	13082700A	Ac Wall Power Transformer (12.5 VDC)
10	13250400A	Left End Cap
11	13353600A	Data Label
12	13488600A	Keyboard Replacement KOP
13	13250700A	Display Lens
14	13795300A	Indicator Housing
15	13368100A	PCB Insulator ("Fish" Paper)
16	14267900A	Strain Relief Bushing
17	14111400A	Strain Relief Plate
18	R0387200A	8-32 × 3/8 Truss Hd
19	13250600A	Angle Pivot Bracket
20	13250500A	10-32 Shoulder Screw
21	R0387300A	.265 Id Spring Washer
22	13249900A	Neoprene Pivot Washer
23	13488700A	Indicator Support Bracket
24	12476400A	1/4 Cable Clamp
25	R0386800A	8-32 × 1/2 Truss Hd
N.S.	13488900A	15' Printer/ Interface Cable

* May have letter prefix

16 Setup Quick Reference Chart

Step	Description	Selections	Step	Description	Selections
10 Scale Parameters Group			45	Power Up Zero Capture	0 = Disabled **1 = ± 2% Range** 2 = ± 20% Range
11	Filter Selection	0 = Off **1 = Light** 2 = Medium 3 = Heavy	46	Time Out For Power Up Zero Capture	0 = Disabled **1 = 5 Sec Timeout**
12	Gravity Adjust Factor	**0 = Bypass** 1 = Access	47	Motion Detect Range	**0 = Disabled** 1 = 0.5 Division 2 = 1.0 Division 3 = 2.0 Division 4 = 3.0 Division
13	Filnoise Enable	**0 = Disabled** 1 = Enabled	**50 Data Output Parameters Group**		
20 No. Of Cells/Shift Adjust Group			51	Output Mode	**0 = Demand** 1 = Continuous
21	Qty Of Load Cells	X = 1 To 4	52	Baud Rate	0 = 300 Baud 1 = 2400 Baud 2 = 4800 Baud **3 = 9600 Baud** 4 = 19200 Baud
22	Shift Adjust	**0 = Bypass** 1 = Perform Shift 2 = Set To Zero	53	Checksum	**0 = No Checksum** 1 = Enabled
30 Scale Calibration Group			54	Parity	0 = Always "0" 1 = Odd **2 = Even**
31	Select Units	**Lb** Or Kg	55	Demand Mode Stx	**0 = No Stx** 1 = String W/Stx
32	Scale Capacity	[XXXXXX]	56	Line Selection	0 = Multiple Line **1 = Single Line**
33	Increment Size	[XXX]	57	Print Fields	0 = Gross Wgt 1 = Net Wgt **2 = Gross/Net** 3 = Gross/Tare/Net
34	Calibration	**0 = Bypass Cal** 1 = Cal W/Lin	58	Print Double Width	**0 = Disabled** 1 = Dw Gross Wgt

Step	Description	Selections	Step	Description	Selections
		Comp 2 = Cal W/O Lin Comp 3 = Shortcut Cal			2 = Dw Net Wgt 3 = Dw Gross/Net
35	Legal For Trade	0 = Disabled **1 = Enable Interlock**	**60 Shift/Calibration Constant Group**		
36	Span Adjustment	**0 = Bypass** 1 = Access	61	Shift Constants	**0 = Bypass** 1 = Access
37	Metric Comma	**0 = Disabled** 1 = Enabled	62	Calibration Constants	**0 = Bypass** 1 = Read Constants
40 Tare, Zero, And Display Group			**70 Load Cell Diagnostics Group**		
41	Tare Key	**0 = Disabled** 1 = Enabled	71	Expanded Weight	**0 = Disabled** 1 = Enabled
42	Autoclear Tare	**0 = Disabled** 1 = Enabled	72	Individual Load Cell Output	X = Load Cell No.
43	Pushbutton Zero	0 = Disabled **1 = ± 2% Range** 2 = ± 20% Range	98	Reset To Factory Default Settings	**0 = Bypass** 1 = Set To Defaults
44	Auto Zero Maintenance	0 = Disabled **1 = ± 0.5d Window** 2 = ± 1.0d Window 3 = ± 3.0d Window	99	End Of Setup Sequence	Press White Setup Switch To Exit Setup Mode

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