EZ400

Operators Manual

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TECHNICAL SPECIFICATIONS

SIZE
7.33" long x 5.25" high x 3.38" wide (186mm x 133mm x 85mm)

WEIGHT
2 lbs (.91 Kg)

HELP MESSAGES
Context sensitive help messages in 10 languages
Long messages are scrolled

TRANSDUCER EXCITATION
8 volts D.C. Nominal
Capable of driving eight 350 Ohms transducers
Short circuit proof

ATC
Auto Temperature Compensation of the internal circuitry for high accuracy weighing measurements

TRANSDUCER SIGNAL
Compatible with transducers having full scale indicator transfer characteristics greater than 0.25 mv/v

"AUTO RANGE"
(Selectable) To increase display counts at weight values of 300 and 600 display counts.

CONNECTOR
AMP plastic weather resistant circular connector. Gold contacts.

POWER REQUIREMENTS
10.5 to 16.0 V.D.C.
160 mA nominal with four 350Ω L.C.

SET UP AND CALIBRATION
Via front panel

GROSS RANGE
999,999 max.display

LOW BATTERY WARNING
Enabled at 10.5V nominal

POUND/KILOGRAM
Selectable

DISPLAY
STD EZ 6 Digit LCD 1.0. high

DISPLAY RESOLUTION
.01, .02, .05, .1, .2, .5, 1, 2, 5, 10, 20, 50, 100

DISPLAY UPDATE RATE
Selectable: 1, 2, 3, 4 times/sec.

MAX. DISPLAY RESOLUTION
Adjustable to 40,000 counts max.

ZERO TRACKING
Selectable, On/Off

SPAN ACCURACY
±(.1% + .005%/ °F) or (.1% + 0.009% °C) full scale ± 1 output count

MOTION DETECTION
Selectable, On/Off

ZERO ACCURACY
(.005%/ °F.) or (0.009% °C) full scale ±1 output count for 0.5 mv/v transducer

ENVIRONMENTAL ENCLOSURE
IP65, IEC 529

WEIGH ALGORITHM
4 internally selectable digital filters to optimize performance
(General, Slow, Fast and Lock-on)

NON-VOLATILE MEMORY
EEPROM for balance

OPERATING TEMP
-29°C to 60°C -20°F to 140°F

SAFETY DURING USE

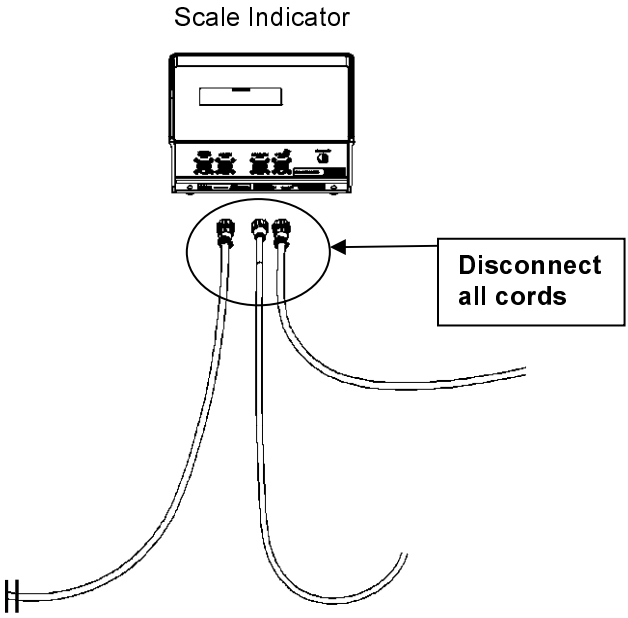
Caution

Cleaning

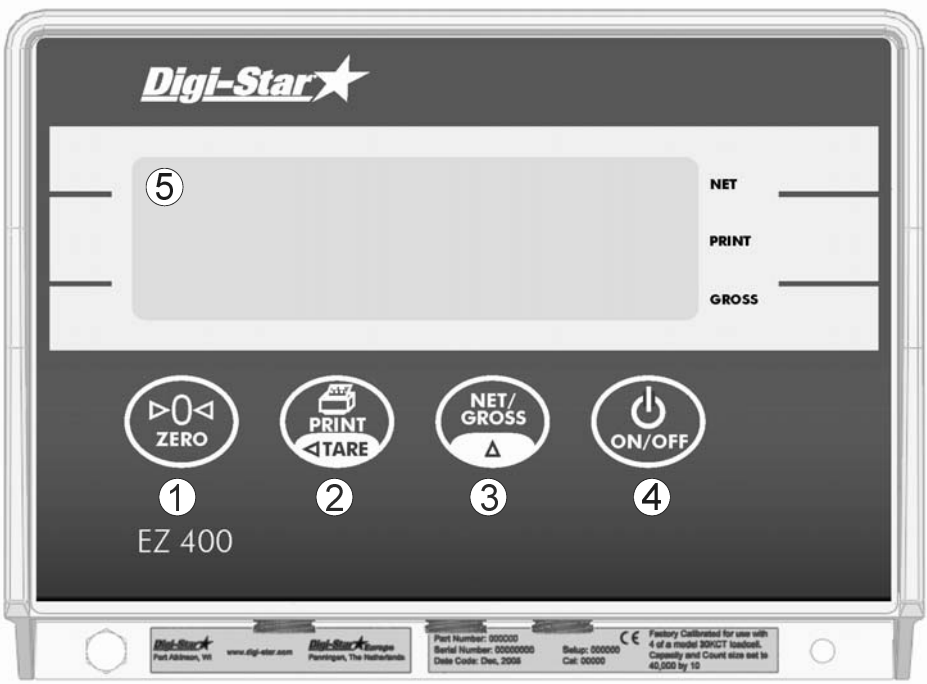
Do not use running water (high pressure cleaners, hoses) to clean the indicator.

Charging Battery and Welding

Disconnect all cables from the weighing indicator before charging the battery or welding on the machine. If cables are left connected, the weighing indicator and connected load cells could be damaged.



INDICATOR OVERVIEW



Note: *See page 20 for installation instructions.*

① – press and hold for 3 seconds to zero balance indicator.

② – temporary zero (Net Mode) (Standard EZ400).

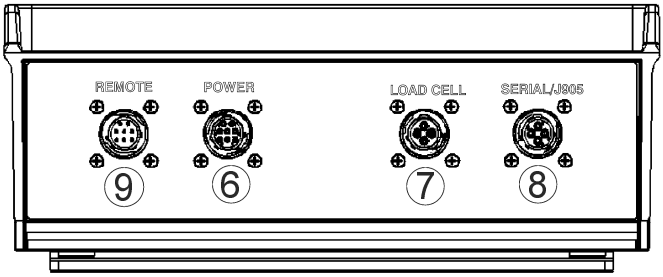
- Optional: (EZ400 with serial port)
temporary zero (Net Mode)
printer records to memory or prints displayed weight

③ – toggles between Net and Gross weights.

④ – turns indicator on/off. Press while on runs self test.

⑤ Display Window – Displays current actions.

Bottom Panel



⑥ -Power Cord Connection – +12 VDC.

⑦ -Load Cell Connection – Connect cable from the J-Box.

⑧ -Serial/J905 – Optional, to communicate with computer and other digital Input/Output devices.

⑨ - Remote Port – Optional, for remote display

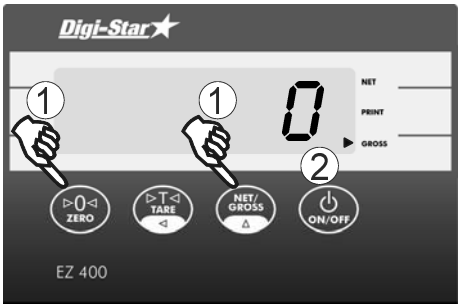
Pin	J905 Connector Signals
1	+5VDC
2	Com #1 Out (Tx) - Computer
3	Com #1 In (Rx) - DDL & Computer
4	Com #2 Out (Tx) - Printer
5	+12 VDC
6	Gnd – Available for any Com device
7	Com #2 In (Rx)
8	Ground

OPERATION

Turn on Indicator

1. Press ON/OFF.

Zero Balance Indicator



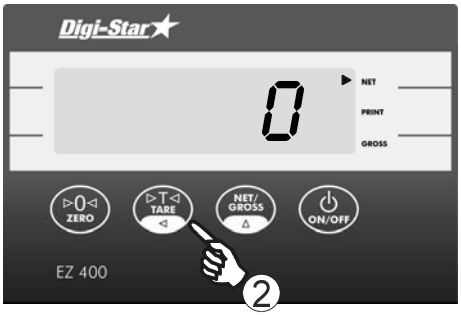
1. Press ZERO for 3 seconds to zero balance indicator.
2. Flashing arrow points to gross next to the display window, indicator ready to weigh.

Tare and Net/Gross

Tare is a temporary zero (Net Weight) to display total weight (Gross Weight)

Press NET/GROSS.

1. Weight displayed, press TARE sets zero weight.



2. Pressing TARE displays zero weight and flashing arrow on side of display points to NET.

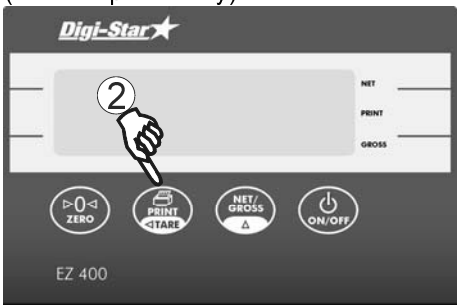
3. Add more weight.

4. To know total of original weight of 4000 pounds plus added 300 pounds, press NET/ GROSS to show 4300 pounds, flashing arrow points GROSS.

5. Press NET/ GROSS 300 pounds displayed flashing arrow points NET.

Store Data to DDL

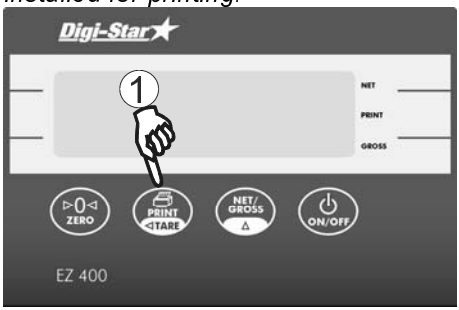
(Serial Option Only)



1. Connect the DDL to the SERIAL port on the bottom panel. See page 4.
2. Press and hold PRINT/TARE to save print data to the DDL.

Printing Gross Weights

Note: *Optional serial port must be installed for printing.*



1. Press and hold PRINT/TARE 3 seconds to send displayed weight to serial port.

Each time this command is executed the value displayed is added to the *"PRTACC"* which is the accumulated weight. Weight is accumulated until cleared.

Print Formats

Three print formats are available to output *PRTACC* value and *SCALE ID* to DDL or printer.

PRTAC1: *FIELD ID, 4856, GR, 274575, PR, 05FE08, 1:44P*

PRTAC2: *FIELD ID, 05FE08, 1:44P*
4856, GR, 274575, PR

Includes following information:

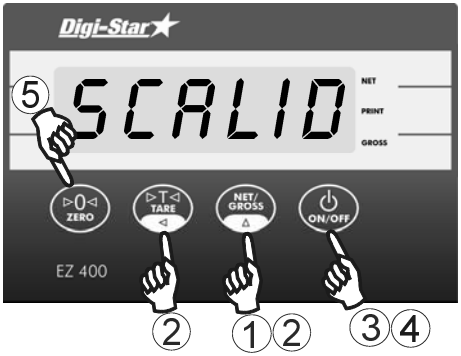
- Scale ID (*SCALID*)
- Weight
- Weight Tag (Net, Gross, Load/Unload)
- Accumulated Weight
- Print Accumulator Tag
- Date and Time

PRTAC3: *FIELD3, 5977, LB, ,GR, 309719,PR,05FE08, 4:42P*

Includes above and adds “Unit of Measure” and “Lock-On Status” (for animal weighing).

See “Setting Options” (page 13) to change print format (*PRTFMT*).

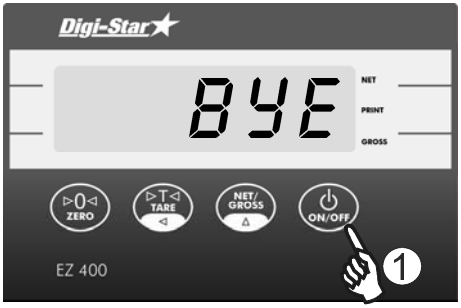
Changing Indicator ID Name & Clearing Accumulated Weight



1. Press and hold NET/GROSS 3 seconds. SCALID is displayed followed by current ID name.
2. Use TARE and NET/GROSS to enter new Scale ID.
3. Press ON/OFF to view accumulated weight.
4. Press ON/OFF to resume weighing.

   Or
5. Press ZERO to clear accumulated weight total.

Turning Off the Indicator



1. Press ON/OFF until "BYE" is displayed.

WEIGH METHODS

Select weigh method #1 for general weighing.

General Weigh Method #1

All purpose weigh method for stable loads.

Slow Weigh Method #2

Higher accuracy for weighing stable loads.

Fast Weigh Method #3

Determines new weight quickly when weighing stable loads.

Lock-on Weigh Method #4

Weighing active animals and displays stable accurate weight. Set to “OFF” for weighing stable weights. Lock-On sensitivity can be adjusted using “LOCKON” menu.

Once weight displayed, scale “Locks-On” to weight. Weight does not change, even if motion never stops. Small ‘L’ appears on left side of the display indicating weight “Locked-On.” Animal’s weight must be greater than 2.5% of scales “capacity” weight before system “Lock-On.”

Break lock, 50% of displayed weight added or removed from scale. “Locked-On” weight can be “rechecked” by pressing 

. This breaks “lock” and scale recalculates weight.

WEIGHING ERRORS

Over-Capacity Limit (OVRCAP)

The display shows the message "OVRCAP" if the weight on the scale system exceeds the capacity limit. The capacity value is entered in SETUP to warn of overloading the scale system.

Over Range (+RANGE)

The display shows the message "+RANGE" if the weight on the scale system exceeds the maximum weight measurable by the scale system. The over range value is always the system's maximum A/D counts multiplied by the scaling factor. The actual weight at which over range occurs depends on the calibration, zero, and display count size.

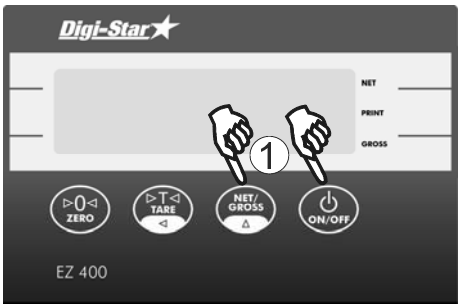
Under Range (-RANGE)

The display shows the message "-RANGE" if the weight on the scale system is less than the minimum weight measurable by the scale system. The under range value is always the system's minimum A/D counts multiplied by the scaling factor. The actual weight at which under range occurs will depend on the; calibration, zero, and display count size.

Low Battery Indication (LO BAT)

If the supply voltage drops below the (10.5 Volts), the message "RECHARGE BATTERY - TURNING OFF" and "LO BAT" will periodically show on the display to alert the operator of the low battery condition.

RUN SELF TEST



1. Press NET/ GROSS then ON/OFF during normal system operation to start self-test.

MENUS AND CALIBRATION

The Indicator has optional settings that allow flexibility in the way that the scale is used and data is collected.

Changing Options Using Long Form Setup

Enter Long Form Setup by holding NET/GROSS and ON/OFF for three seconds.

Press NET/GROSS to select menu 1, 2, 3 or 4.

Press ON/OFF to advance to desired parameter.

Press NET/GROSS to select proper setting.

Press ON/OFF to save setting and advance to next parameter.

Hold TARE and press ON/OFF to return to indicator operation.

Default settings from the factory vary with options and due to customer preferences.

SETTING [display]	OPTIONS [displayed] BOLD=DEFAULT		DESCRIPTION
MENU 1. BASIC FEATURES IN MOST INDICATORS			
LANGUAGE (LANGAG)	**English**	(ENGLSH)	Select language to be displayed.
	Dutch	(NEDERL)	
	French	(FRANCS)	
	German	(DEUTSH)	
	Italian	(ITAL)	
	Portuguese	(PORT)	
	Spanish	(ESPAN)	
	Danish	(DANSK)	
	Hungarian	(MAGYAR)	
	Spanish	(VESTA)	
DISPLAY RATE (D RATE)	1,2,3,4		Update display times per second.
ZERO TRACK (ZTRACK)	ON/OFF		If ON -zero track adjust balance for buildup of snow & mud.
WEIGH METHOD (W MTHD)	1=GENERAL, 2=FAST, 3=SLOW, 4=LOCK-ON		Select weigh method

SETTING [display]	OPTIONS [displayed] BOLD=DEFAULT	DESCRIPTION
LOCK-ON (LOCKON)	1-7, **8**, 9	Use the lowest setting that still allows the system to lock on consistently. A low value allows the system to be more sensitive to animal motion. A high value allows the scale to lock on faster.
SCALE ID SETUP (SCALID)	NEW EZ	Identity of scale (truck id or Mixer number).
LOCK-N-HOLD (LKNHLD)	ON/**OFF**	Weight is held until next animal is weighed.
AUTO OFF (AUTOFF)	15, 30, 45, 60, **OFF**	Indicator automatically shut OFF after specified time of inactivity.
LOCK-ON-STORE (LSTORE)		For animal weighing only.
LOCK-ON-STORE SEND (LSSEND)		For animal weighing only.
1 PRESS ZERO (1 ZERO)	ON/**OFF**	If ON -press and hold Zero key to Zero/Balance scale.
MENU 2. CLOCK, PRINTER, COMMUNICATIONS & ESTIMATED WEIGHT FEATURES		
TIME FORMAT (TIME F)	24 HR AM/PM	Select time format -AM/PM or 24 hour
1 TIME (TIME)	XX:XX:XX	Select key changes time, function key chooses hh:mm:ss.
DATE FORMAT (DATE F)	1-mm-dd 2-mm/dd/yy 3-mm/dd/yyyy 4-dd-mm 5-dd/mm/yy 6-dd/mm/yyyy 7-ddmoyy 8-ddmoyyyy.	Select date format
DATE (DATE)	Enter XXXXXX	Select key changes date -function key chooses mm/dd/yy .
TARE AUTO PRINT (TAREAP)	ON/**OFF**	If ON -tare auto-prints displayed weight.
ONE LINE PRINT (1L PRT)	ON/**OFF**	If ON -indicator data prints on one line.

SETTING [display]	OPTIONS [displayed] BOLD=DEFAULT	DESCRIPTION
(SCOREM)	1,2,3,4,5,6,	Select scoreboard output mode 1-1/sec 2-2/sec 3-3/sec 4-every conversion 5-display rate 6-display weight change 7-send status 1/sec, 8-send status1/5sec, 9-Reserved & 10-send EID 1/2 sec.
AUTO PRINT (APRINT)	ON/OFF	If ON -pressing keys auto-prints weight values.
(COM IN)	DOWNLD, EZ CMD, EZ2CMD	Com port interface selections DOWNLD for Data Down Loader, EZ CMD = Original EZ Commands, EZ2CMD = EZII Escape Commands.
PRINT FORMAT (PRTFMT)	AUTO, WTONLY, DOWNLD, DT+TM, ID+TM, IDWTTM, ANIMAL, 3200-A, 3200-B, 32-TMR, DATCHI, FDINFO, WTRCTM, EIDINF, EID, EIDVID, PRTRC1, PRTRC2, PRTRC3	Select alternate & comma (CSV) formats.
(ZEROUT)		
(C1 DLY)	OFF, .10, .25, .50, .75, 1-5	Choose the number of seconds the printer will delay before advancing to the next print line.
(C2 DLY)	OFF, .10, .25, .50, .75, 1-5	Choose the number of seconds the printer will delay before advancing to the next print line.
(PRTRCC)		
(TARPRT)	TARE	
ESTIMATED WEIGHT (ESTWT)	0,1,2,3,4,5,6,7,8,9	Allows operator to adjust Gross weight of scale by changing the zero/balance.
MENU 3. SCALE CALIBRATION SETTINGS		
DISPLAY COUNT (COUNT)	.01,.02,.05,.1,.2,.5,1,2,5,10,20, 50,100	Count set too small, readings unstable and indicator not accurate
AUTO-RANGE (ARANGE)	ON/OFF	Scale increases display count size for weights over 300 again at 600 lbs/kgs.

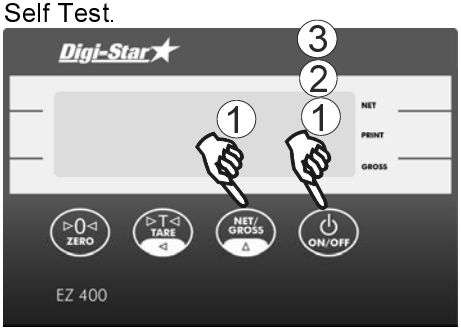
SETTING [display]	OPTIONS [displayed] BOLD=DEFAULT	DESCRIPTION
DISPLAY UNIT (LB-KG)	.01,.02,.05,.1,.2,.5,1,2,5,**10**,20, 50,100	Select display count size of weigh values.
CAPACITY (CAP)	**LB/KG**	Display pounds -lb or kilograms -kg
WM1 ADJUST 1 (WMA1-1)		Enter MAXIMUM weight measurable on scale.
WM1 ADJUST 2 (WMA1-2)		0=OFF Use values less than WMA 1-1 for quick weight response.
WM1 ADJUST 3 (WMA1-3)		Enter weight to activate quick weight response.
WM2 ADJUST 1 (WMA2-1)		Increase number to smooth weighing
WM2 ADJUST 2 (WMA2-2)		0=OFF Use values less than WMA2-1 for quick weight response.
WM2 ADJUST 3 (WMA2-3)		Enter weight activate quick weight response.
MENU 4 – NOT USED		

SHORT FORM CALIBRATION

The Short Form Setup & Calibration procedure allows you to change “SETUP” and “CAL” numbers of indicator.
Do not attempt to calibrate scale if indicator is not reading stable weights. Calibration procedure will not fix instability, inconsistencies, or flashing "RANGE" messages.

Obtain Current Set-up and Calibration Number

Write down current SETUP and CAL numbers of your EZ 400 indicator. These numbers are displayed during Self Test.



To run self test with indicator ON:

1. Press NET/GROSS then ON/OFF to start Self Test.
2. Press ON/OFF to “pause” the Self-Test while numbers are displayed.
3. Press ON/OFF again to allow self-test to complete normally.

SETUP # _____

CAL # _____

SETUP NUMBER

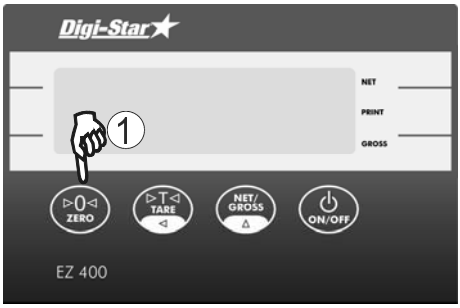
Following is a list of functions that are controlled by the “SETUP” number:

- Weigh Method (W MTHD)
- Display Units (LB-KG)
- Display Counts (COUNT)
- Gain
- Scale Capacity

Calibrating Scale For Maximum Accuracy

Note: *To accurately calibrate scale, you need a large amount of weight that has a known value. For best results you should have at least as much weight as largest load you plan to weigh.*

Determining New Setup and Calibration Numbers



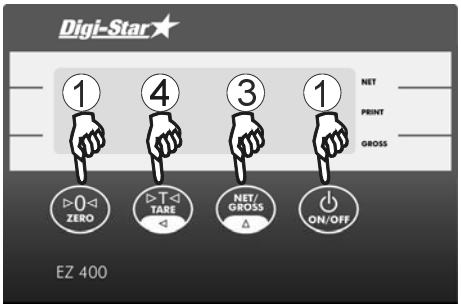
1. Press ZERO to Zero-Balance. See page 5.
2. Put KNOWN WEIGHT on scale platform and write down WEIGHT DISPLAY.

Perform following equation to find ACCURATE CAL #.

$$\frac{\text{Known Weight}}{\text{Displayed Weight}} \times \text{Existing Calibration Number} = \text{Accurate Calibration Number}$$

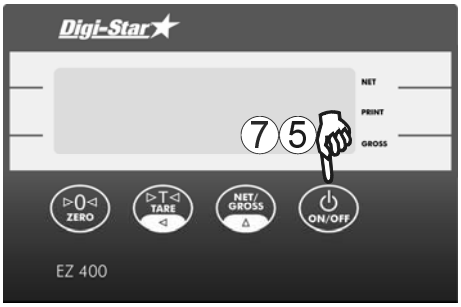
The setup number does not change.

Enter A New Setup And Calibration Number



1. Press and hold ZERO then press ON/OFF for 3 seconds to enter short form calibration.
2. The display will flash "SETUP" and then display the 6-digit setup number with the right digit flashing.
3. Press NET/ GROSS several times to increment digit to it proper value.
4. Press TARE to advance digit left.

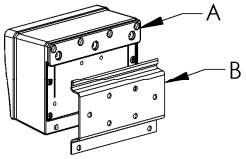
Repeat steps 3 and 4 for each digit as required.



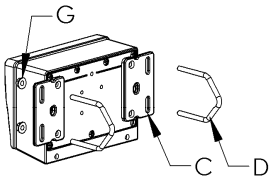
5. Press ON/OFF to enter new setup number and display calibration number.
6. Repeat steps 3 and 4 to modify the calibration number.
7. Press ON/OFF to enter new calibration number and display will go back to normal.
8. Verify the accuracy of scale.

INSTALLATION

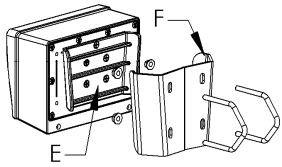
Indicator Mounting



RAIL MOUNT



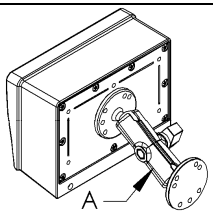
WING MOUNT



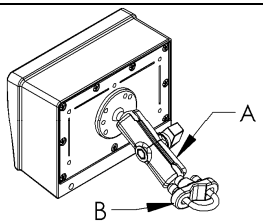
WEDGE MOUNT STANDARD

KEY	PART NUMBER	DESCRIPTION
A	403769	BRACKET – STR TOP MOUNT
B	403980	BRACKET – ROBO MOUNTING
C	403770	BRACKET – WING MOUNT
D	405069	U-BOLT, 1/4-20 X 3.25 ZP
E	403771	MODIFIED PLASTIC WEDGE MOUNT
F	405124	WEDGE MOUNT BRACKET, INCLUDES U-BOLTS & NUTS
G	405084	NUT, 1/4-20 TOP LOCKING FLANGE

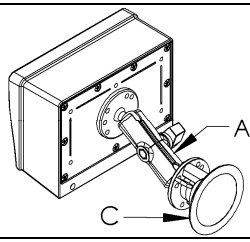
Optional Ram Mounting



RAM MOUNT STANDARD



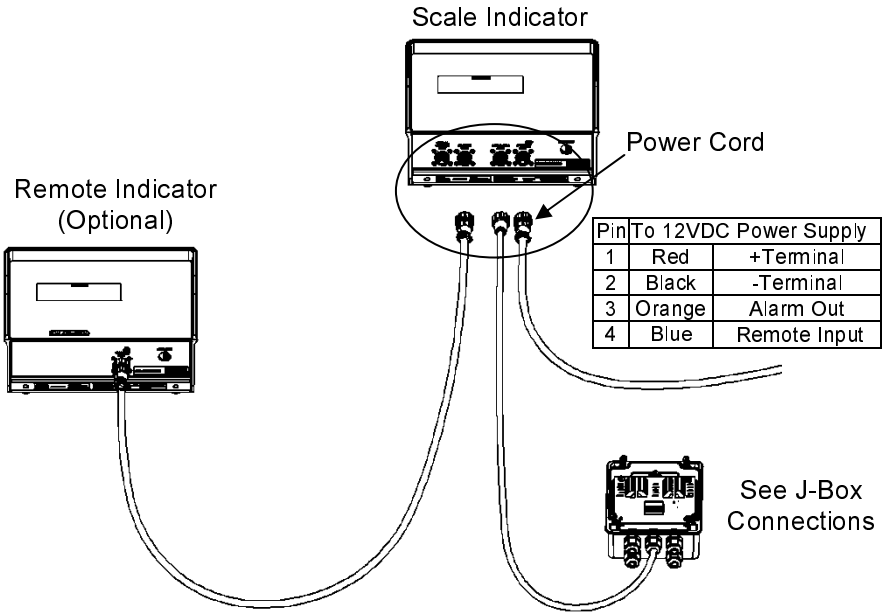
U-BOLT BASE



TWIST LOCK SUCTION CUP

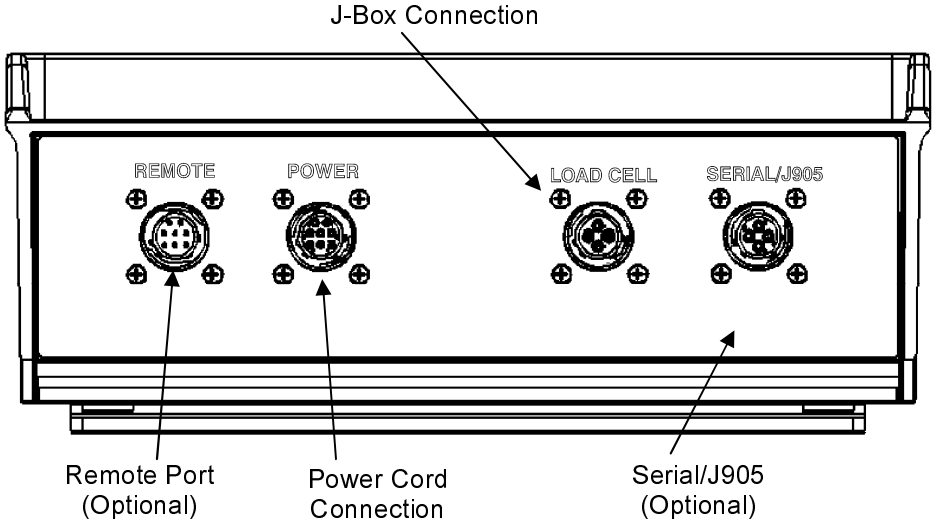
KEY	PART NUMBER	DESCRIPTION
A	403180	RAM MOUNT
B	403179	MOUNT BASE-1" BALL U-BOLT
C	404230	RAM SUCTION CUP W/TWIST LOCK

Cable Connection



Pin	To 12VDC Power Supply	
1	Red	+Terminal
2	Black	-Terminal
3	Orange	Alarm Out
4	Blue	Remote Input

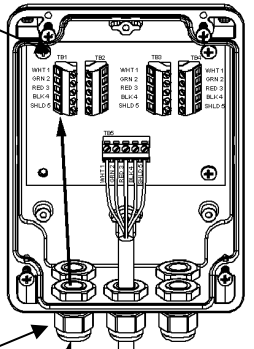
Indicator Connection Diagram



Bottom Panel Cable Connections

Connect Load Cells to J-Box

Connect load cell wires to terminal blocks. See Wire Color Key



J-Box Illustrated for 4 Load Cell Installation

Wire Color Key		
	Color	Description
1	White	Signal +
2	Green	Signal -
3	Red	Excitation +
4	Black	Excitation -
5	Shield	Shield

Tighten Nuts

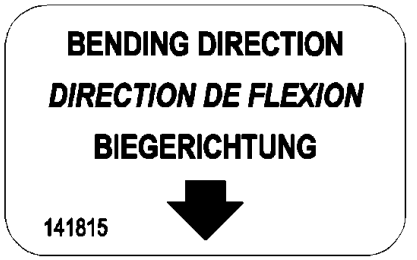
J-Box Cable

Load Cell Cable

Connect to Indicator bottom Panel.

J-Box Connections

Load Cell Direction



Observe direction of arrow when installing load cell.

Indicator Calibration

If you connect an indicator to a different weighing implement, the calibration and setup number may need to change. Refer to calibration procedures (see pages 17-19) or contact your Digi-Star representative for assistance.

OPTIONAL EQUIPMENT

Data Transfer Options

Kit Data Down Loader

Allows transfer of data from indicator to PC. (Optional Serial/J905 port must already be installed in indicator)

Remote Indicators

RD440 small remote display

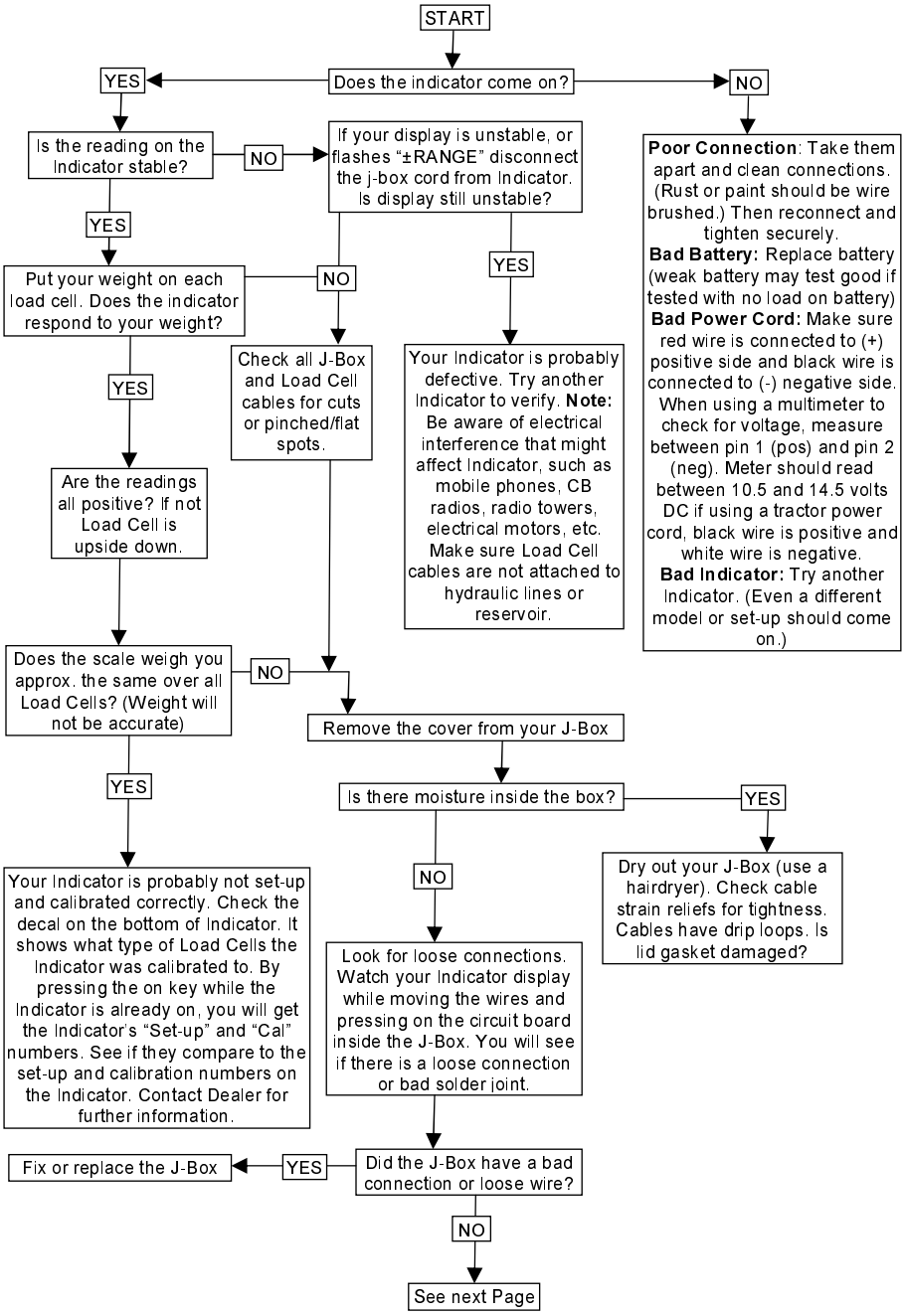
RD2400V backlit remote display with 1.7” high numbers

RD2400V backlit remote display w/transmitter and installed receiver

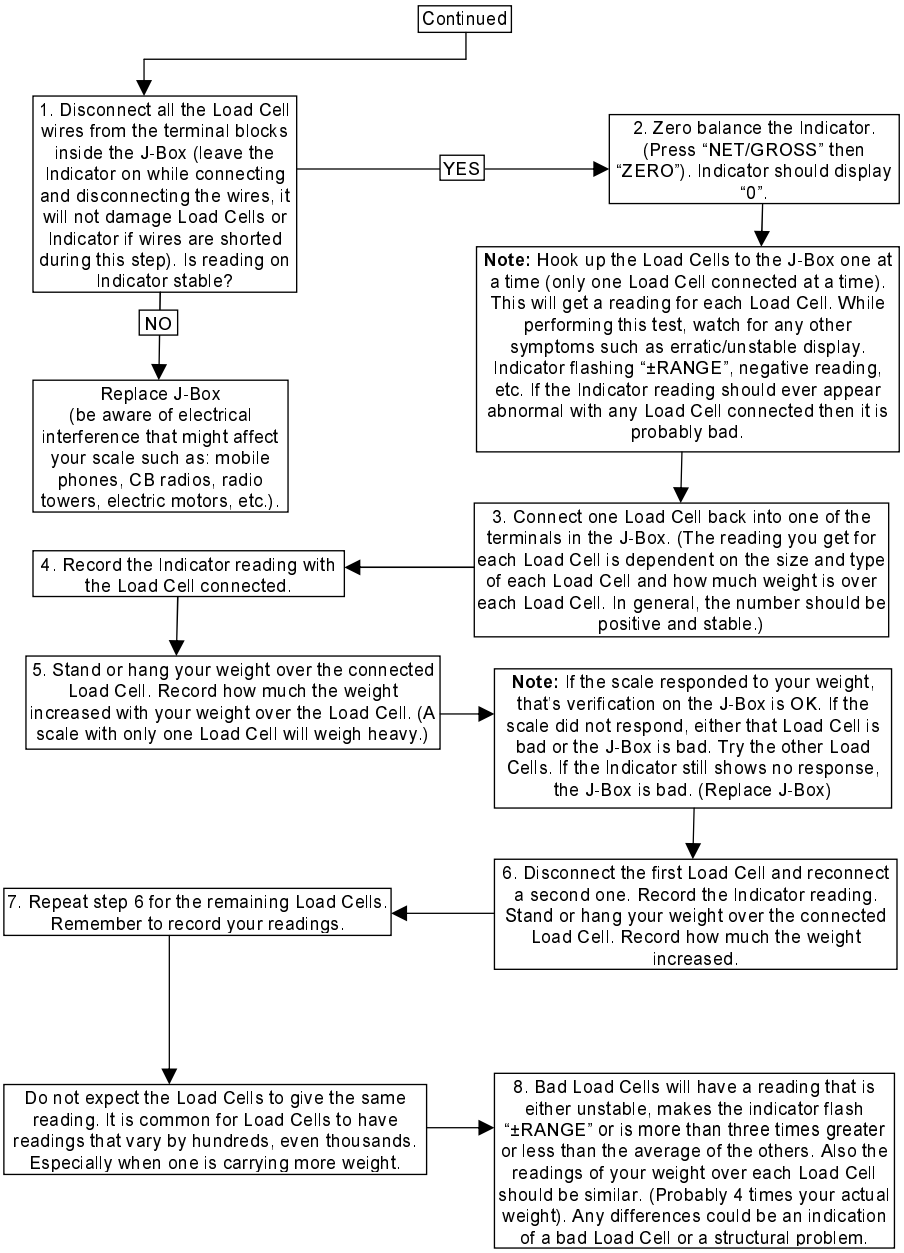
RD4000 remote display

TROUBLESHOOTING

FLOW CHART



FLOW CHART


Continued
1. Disconnect all the Load Cell wires from the terminal blocks inside the J-Box (leave the Indicator on while connecting and disconnecting the wires, it will not damage Load Cells or Indicator if wires are shorted during this step). Is reading on Indicator stable?
YES
2. Zero balance the Indicator. (Press "NET/GROSS" then "ZERO"). Indicator should display "0".
NO
Replace J-Box (be aware of electrical interference that might affect your scale such as: mobile phones, CB radios, radio towers, electric motors, etc.).
Note: Hook up the Load Cells to the J-Box one at a time (only one Load Cell connected at a time). This will get a reading for each Load Cell. While performing this test, watch for any other symptoms such as erratic/unstable display. Indicator flashing "±RANGE", negative reading, etc. If the Indicator reading should ever appear abnormal with any Load Cell connected then it is probably bad.
3. Connect one Load Cell back into one of the terminals in the J-Box. (The reading you get for each Load Cell is dependent on the size and type of each Load Cell and how much weight is over each Load Cell. In general, the number should be positive and stable.)
4. Record the Indicator reading with the Load Cell connected.
5. Stand or hang your weight over the connected Load Cell. Record how much the weight increased with your weight over the Load Cell. (A scale with only one Load Cell will weigh heavy.)
Note: If the scale responded to your weight, that's verification on the J-Box is OK. If the scale did not respond, either that Load Cell is bad or the J-Box is bad. Try the other Load Cells. If the Indicator still shows no response, the J-Box is bad. (Replace J-Box)
6. Disconnect the first Load Cell and reconnect a second one. Record the Indicator reading. Stand or hang your weight over the connected Load Cell. Record how much the weight increased.
7. Repeat step 6 for the remaining Load Cells. Remember to record your readings.
Do not expect the Load Cells to give the same reading. It is common for Load Cells to have readings that vary by hundreds, even thousands. Especially when one is carrying more weight.
8. Bad Load Cells will have a reading that is either unstable, makes the indicator flash "±RANGE" or is more than three times greater or less than the average of the others. Also the readings of your weight over each Load Cell should be similar. (Probably 4 times your actual weight). Any differences could be an indication of a bad Load Cell or a structural problem.