TRANSCELL TECHNOLOGY, INC.

MODEL
TI-500 RF Series

Digital Weight Indicator
(with wireless weighing capability)

Installer's Manual

Revision 1.3   July 9, 2012

Contents

INSTALLATION & OVERVIEW

Remember that the installer is ultimately responsible to assure that a particular installation will be and remain safe and operable under the specific conditions encountered.

This manual covers the following products:

Model	Display	Antenna	Enclosure Type
TI-500 RF	LCD	Internal	Aluminum/ABS
TI-500 RF SS	LCD	External	Stainless Steel
TI-500 RFTM-B1	N/a	Internal	ABS
TI-500 RFTM-B1E	N/a	External	ABS

Scope of TI-500 RF Series

Out of the box, the TI-500 RF series indicator operates as a basic, cabled digital weight indicator. The load cell(s) and/or j-box is connected to the indicator's internal A/D convertor. This configuration is depicted in the following diagram:
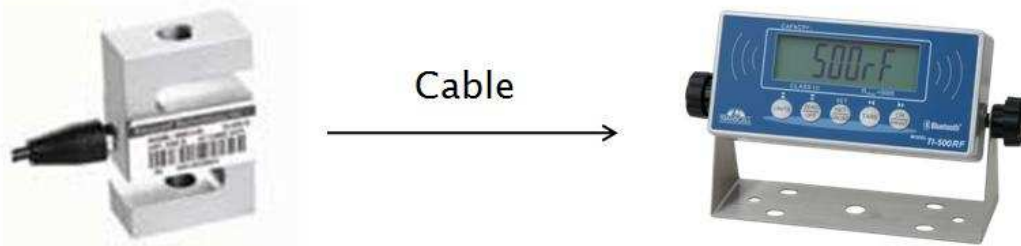
Cable

Conventional Load Cell
(with or without j-box)

TI-500 RF shown

When sold with an external TI-500 RFTM (Radio Frequency Transceiver Module) and an optional wireless radio, your TI-500 RF series indicator is transformed from "wired" to cable-free. This configuration is depicted in the following diagram:

Cable

Conventional Load Cell
(with or without j-box)

TI-500 RFTM-B1E

RF

TI-500 RF

Our products currently use reliable and popular Bluetooth® wireless technology.

This manual covers installation, configuration and calibration of the RF scale system. For operation and troubleshooting, please refer to the separate user's guide.

Installation of TI-500 RF digital indicator

Find a suitable location for the indicator and use the included bracket to mount the unit to a wall or table. Use this handy guide for mounting the bracket to a wall or table:

This is bolt pattern on the U-bracket

4 mm [0.157 in]   R4 mm [0.157 in]

8 mm [0.315 in]

32 mm [1.260 in]

100 mm [3.397 in]
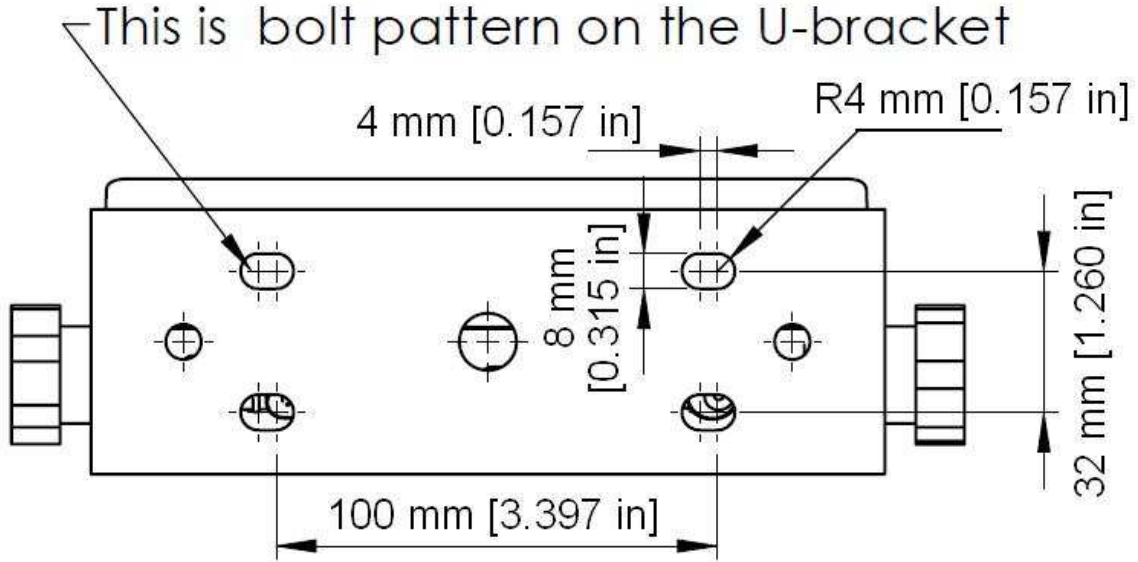
The TI-500 RF digital indicator 4-AA batteries to operate (not included). To install the batteries, remove the plastic battery cover from the rear panel. Observe proper direction (polarity) of the batteries. Replace the battery cover.
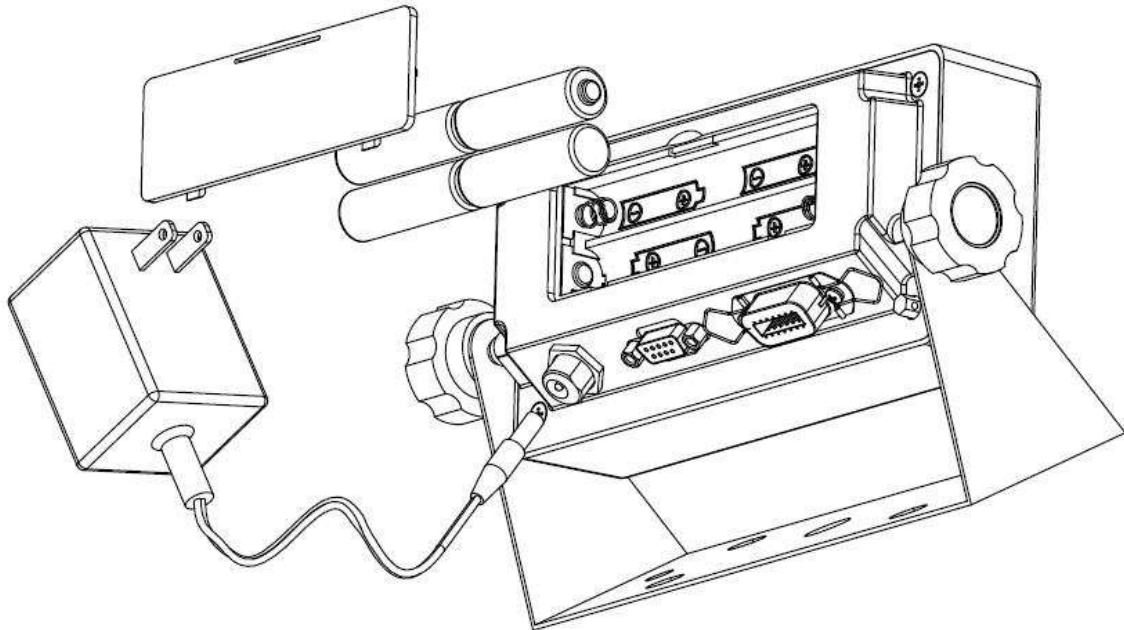
The TI-500 RF digital indicator may also be powered by the AC wall adaptor included with the kit.

The TI-500 RF digital indicator features one full duplex RS-232 serial port, designed for connection to a computer or a serial printer. The same port may be also used as a simplex, RS-232 port designed for connection to a remote display.

DSUB9 Connector

Pin No.	Wire Name
2	RXD
3	TXD
5	Ground

Installation of TI-500 RF SS digital indicator

Find a suitable location for the indicator and use the included bracket to mount the unit to a wall or table. Use this handy guide for mounting the bracket to a wall or table:
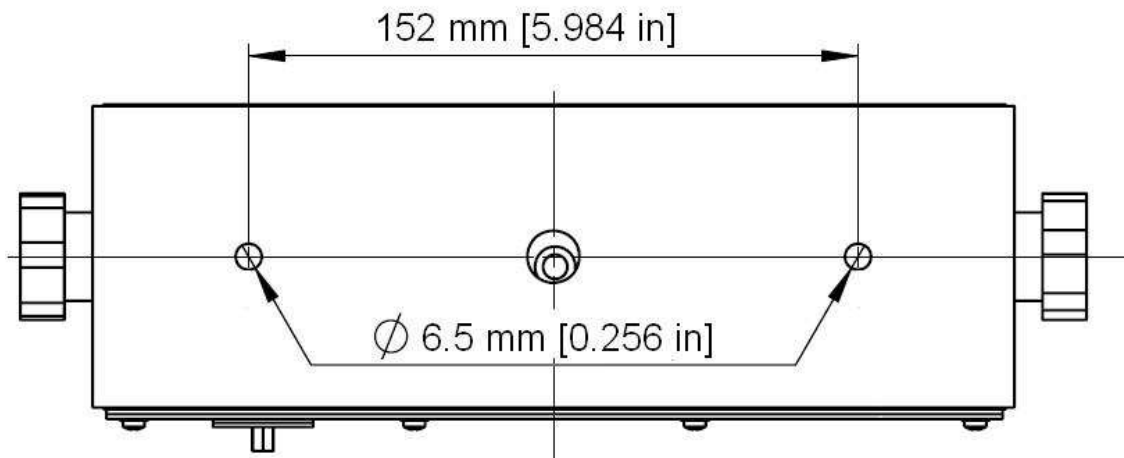
The TI-500 RF SS digital indicator contains an internal lead-acid rechargeable battery. Before using the indicator for the first time, please charge the battery overnight. The battery can be charged while ON or OFF and the indicator can be operated while it's charging unless the state of charge is very low.

CONNECTIONS

The rear cover must first be removed to make the appropriate connections to the weigh platform, printer, remote display and power supply. To remove the rear cover, simply remove the screws that secure it to the enclosure and set aside.

Caution! Disconnect power source from indicator prior to removing rear cover.

Caution! Disconnect leads from rechargeable battery to avoid shorts!

CONNECTING THE WEIGH PLATFORM

The TI-500 RF SS indicator contains a connection terminal on the main board for connection to the load cell cable. Connect your shielded load cell cable (not included) to the appropriate terminal on the main board. **NOTE**: Be sure to set parameter F11 for 4 or 6 wires as needed.

Load Cell Terminal (J3)

Name	Function	Name	Function
-EX	- Excitation	S+	+ Sense
S-	- Sense	+EX	+ Excitation
IN-	- Signal	SH	Shield
IN+	+ Signal		

## CONNECTING THE SERIAL I/O DEVICE

The TI-500 RF SS model comes standard with one full duplex RS-232 serial port, designed for connection to a computer or a serial printer. The same port may be also used as a simplex, RS-232 port designed for connection to a remote display.

Connection assignments for all serial RS-232 communication terminals on the TI-500E-SS are shown below.

RS-232 Communication Terminal (J6)

Pin #	Function	Pin #	Function
1	RXD	4	RTS
2	TXD	5	CTS
3	Gnd		

Installation of TI-500 RFTM remote wireless A/D Module

Physical installation

The remote wireless A/D module is designed to fit into a pre-defined opening:
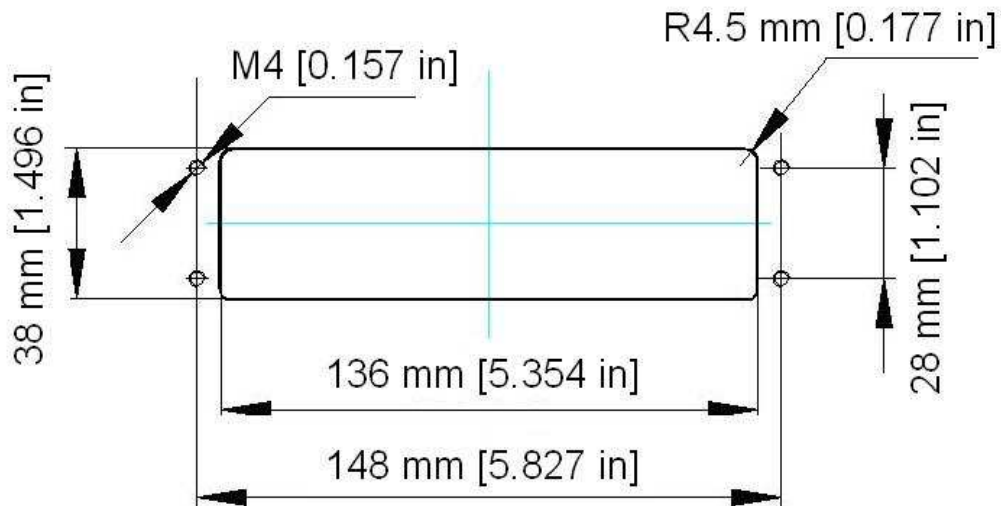
An optional mounting bracket is also available.

<u>Electrical Connections</u>

The RF A/D module requires an external 6VDC power supply. Single channel units require about 60 mA of current to drive four 350 ohm load cells (20 mA plus 10 mA per load cell). Dual channel units require about 100 mA of current to drive eight 350 ohm load cells.

The RF A/D module will operate normally down to approximately 4 VDC whereupon it will indicate a low battery condition.

The power leads are pre-wired to the inside of the RFTM. The red lead goes to the positive DC terminal while the black lead goes to the negative DC terminal.

The RF A/D module also has at least one load cell input terminal or wiring harness. Each terminal or harness can drive up to four 350 ohm load cells. The terminals are spring loaded; to open, use a small screwdriver to press down on the orange tab. The harnesses should be spliced to the load cell or j-box using the supplied butt splices.

Load Cell Input Terminal

Marking	**Wire Name**	**Marking**	**Wire Name**
S-	- Signal	E-	- Excitation
S+	+ Signal	E+	+ Excitation

NOTE: On dual RF A/D modules, each load cell terminal is marked 1-4, e.g. L/C3.

Load Cell Input Harness

Wire Color	**Wire Name**	**Wire Color**	**Wire Name**
White	- Signal	Black	- Excitation
Green	+ Signal	Red	+ Excitation

Getting Started – Cabled Systems

1. Press and hold the ON/PRINT key on the digital indicator unit for two seconds. After a brief initialization period, the scale will revert to a zero ("0") weight display.

Your digital indicator is now ready for configuration and system calibration.

Getting Started – Wireless Systems

1. Switch on the TI-500 RFTM remote wireless A/D module(s) by pressing the BLUE button once*.* The blue LED will turn solid for a few seconds and then start to flash.

2. Next press and hold the ON/PRINT key on the digital indicator unit for two seconds. After a brief initialization period, the scale will revert to a zero ("0") weight display.

Your wireless digital indicator is now ready for configuration and system calibration.

SYSTEM CONFIGURATION

Configuration Menus

The RF digital indicator contains three menus to configure the scale system:

Setup ("F") Menu – Configures all scale-related parameters including calibration procedures.

User ("A") Menu – Configures COM2 communication parameters and other misc parameters, e.g. automatic turn off and hold mode.

COM1 ("C") Menu – Configures COM1 communication parameters. **NOTE:** This menu will not appear for wireless systems (see F29).

Bluetooth ("B") Menu – Configures all parameters relating to the RF weighing module(s). **NOTE**: This menu will not appear for cabled systems (see F29).

The configuration menus are laid out in the following vertical arrangement:

- Top [Menu selection] level
- Parameter level
- Selection level (or function level, e.g. span calibration)

Please review the following chart to get a feel for how to navigate among the various menus and parameters.

Top Level	-F-		-A- or -C-			-B-	
Parameter Level	F1 Graduations	F3 Zero Track Band — Etc.	A1/C1 Baud Rate	A2/C2 Data, Parity, Stop Bits — Etc.		B1 Adjust Load Cell #1	B2 Adjust Load Cell #2 — Etc.
Selection Level	100 to 50000	0, 0.25, 0.5, 1, 3, 5	600, 1200, 2400, 4800, 9600, 19200	8_n_1, 8_n_2, 7_n_1, 7_n_2, 7_E_1, 7_E_2, 7_o_1, 7_o_2		0 to 65535	0 to 65535
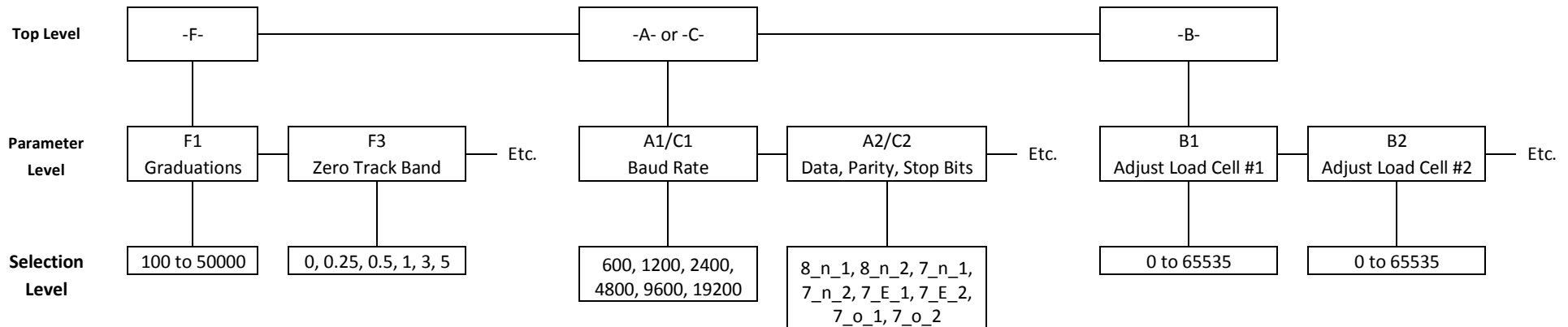
NOTE: The -C- menu appears in place of the -B- menu for cabled systems.

<u>**Entering the Setup ("F") Configuration Menu**</u>

To access this menu, please follow these directions:

1. Switch off the RF digital indicator by pressing and holding down the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Scroll down using the ZERO/OFF (down) key to reach the parameter level. The scale shows "F   1".

4. Move from one "F" menu parameter to the next by using the TARE (left) or ON/PRINT (right) keys. For example, to go from F1 to F2, press the ON/PRINT key. To go from F2 back to F1, press the TARE key.

5. Once you have arrived at the proper "F" menu parameter, e.g. "F   1", press the ZERO/OFF (down) key once to arrive at the selection level. The scale displays the current parameter setting.

6. To scroll thru the available parameter settings, use the TARE (left) or ON/PRINT (right) keys.

7. Once the setting you want is displayed on the screen, press the NET/GROSS (set) key to save this value and revert back up to the parameter level, e.g. "F   1".

8. <u>In order to save all parameter settings</u>, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key <u>twice</u> (two times) to exit the Setup Menu. The indicator displays 'SAvE' and then automatically powers off.

<u>**Setup ("F") Menu Descriptions**</u>

This section provides more detailed descriptions of the selections found in the Setup Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; **(√)**.

CODE/NAME	DESCRIPTION	SELECTION LIST
F1 Graduations	Specifies number of full-scale graduations, i.e. capacity / division. Value should be consistent with legal regulations and environmental limits on the useful system resolution. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 100 - 50000 **10000 √**
F2 Sampling Rate	Sets the sampling rate in Hertz (measurements per second). Use 10 Hz for most applications or 80 Hz for extra fast response time **NOTE:** This menu is not applicable to wireless systems	**10 √** 80
F3 Zero Track Band	Selects the range within which the scale will automatically zero. Note that the scale must be in standstill to automatically zero. Selections are in display divisions (d).	OFF 0.25d **0.5d√** 1d 3d 5d
F4 Zero Range	Selects the range within which the scale will accept a front panel ZERO command. Note that the scale must be in standstill to automatically zero. Selections are in display % of full scale. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 0 - 100 **100 √**

CODE/NAME	DESCRIPTION	SELECTION LIST
F5 Motion Band	Sets the level at which motion is detected. If motion is not detected, the scale can process a Print or Zero command. Maximum value varies depending on local regulations. Expressed as scale divisions per second (d/s).	OFF 0.5d **1d√** 2d 4d 8d 16d 32d
F6 [1] Digital Filter	Averages weight readings to produce higher stability. Choose the speed that works best for your application. "FAST" = Fast "nnEd" = Medium "SLo" = Slow	FAST **nnEd √** SLo
F7 Overload Limit	Selects the desired formula which determines the point at which the indicator shows overload. All selections are based on the primary unit selected in F8. "FS" = Full scale capacity.	FS **FS + 2%√** FS + 5% FS + 1d FS + 9d

F8
Calib. Unit
	Selects the primary base unit to be used in the calibration process. Also the default unit for normal operation.
	    "1" = primary unit is lb "2" = primary unit is in kg
	    "3" = primary unit is oz "4" = primary unit is in g
		1√ 2
		3 4

F9 [2] Display Divisions	Determines the desired weight increments. Value should be consistent with legal requirements.	1√ 2 5
F10 [2] Decimal Pt.	Determines location of the decimal point.	0√ 0.0 0.00 0.000 0.0000 00
F11 No. of L/C wires	Selects the number of wires on the load cell(s) to be connected to the indicator. Cabled systems only. "4" = four wires "6" = six wires (SENSE)	**4√** 6
F12 Percentage Hold Wt	Allows you to select the percentage (of the displayed held value) of weight change before the scale automatically unlocks the held weight and relocks onto the new weight.	5 % **10%√** 20% 50% 75% 100%
F13 Gravity (g)	Allows you to select the gravity (g) of the location of the scale system. Expressed in m/s^2. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 9.750 to 9.850 **9.797√**
F14 Power-on zero (IZSM)	Allows you to enable or disable power-on zero. (IZSM) "YES" = IZSM is enabled "no" = IZSM is disabled	YES **no√**

Footnotes:
    (1) On older units, the selection list ranged from 0 to 12 with a default setting of 8.
    (2) On older units, there was no F10 menu; the display size was programmed thru F9 and the selection list was 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20 and 50.

CODE/NAME	DESCRIPTION	SELECTION LIST
F16 Zero Calibration	Places indicator into the zero calibration routine. Scrolling down with the ZERO key one level begins the procedure.	Press **ZERO** key to begin sequence
F17 Span Calibration	Places indicator into the span calibration routine. Scrolling down with the ZERO key one level begins the procedure.	Press **ZERO** key to begin sequence
F18 View Calibration	Actuates the function that allows you to view both the zero and span calibration value. The values displayed in this function are valid only after Calibration (F16 & F17) has been successfully completed. Scrolling down with the **ZERO** key one level begins the procedure. Multi-point cal	Press **ZERO** key to begin sequence
F19 Key-in Zero	Allows you to key-in known zero calibration value in case of memory loss in the field. Scrolling down with the **ZERO** key one level begins the procedure.	Press **ZERO** key to begin sequence
F20 Key-in Span	Allows you to key-in a known span calibration value in case of memory loss in the field. Scrolling down with the **ZERO** key one level begins the procedure.	Press **ZERO** key to begin sequence
F21 Factory Reset (US)	This sub-menu will reset all parameters in the "F" and "A" menu to the default settings. It will not overwrite any previously saved calibration data. USE WITH CAUTION!	Press the **ZERO** key twice to execute
F22 Factory Reset (EU)	This sub-menu will reset all parameters in the "F" and "A" menu to the default settings. It will not overwrite any previously saved calibration data. USE WITH CAUTION!	Press the **ZERO** key twice to execute
F23 Full Factory Reset	This sub-menu will reset all system parameters to the default settings. It will not overwrite any previously saved calibration data. **USE WITH EXTERME CAUTION!**	Press the **ZERO** key twice to execute
F24 Fine Tune 4-20 mA	Actuates the function that allows you to fine-tune the optional 4-20 mA analog output. Pressing the ZERO key to scroll down one level begins the sequence.	Press the **ZERO** key to begin sequence
F25 Set Point Function	Selects the number of function of the set points and relay outputs. See user's guide for definitions	0 to 10 **0** √
F29 Load Cell Input	Selects the load cell input source. "AdC" = Internal A/D (cabled), "1rAdIo" = One external wireless A/D module, "2rAdIo" = Two external wireless A/D modules	**AdC**√ 1rAdIo 2rAdIo
F30 Special Application	Used to select one special application feature, subject to local legal requirements. "0" = None (Gross/Net), "1" = Accumulator, " "2" = Remote Display, "3" = Piece Count, "5" = Hold, "6" = Set Point	**0** √ 1 2 3 5 6

CODE/NAME	DESCRIPTION	SELECTION LIST
F31 Gross Zero Band	Selects the range within which the scale will automatically clear the tare and switch to Gross mode. Note that the scale must be in stand-still. Selections are in display divisions (d). Scrolling down with the ZERO key one level begins the procedure. "0" = Disabled	Key-in 0 - 10 **0**√
F32 Center of Zero Band	Selects the range around gross zero within which the scale will display the Center of Zero annunciator. Selections are in display divisions (d).	**0.25d** √ 0.5
F34 Auto Print Min. Weight	Selects the minimum weight at which the auto print function will work if enabled. Selections are in display divisions (d). Scrolling down with the ZERO key one level begins the procedure. "0" = Disabled	Key-in 0 - 100 **1**√

Fine-tune 4-20 mA output (F24)

1. While in the Setup Menu mode, scroll to "F 24", then scroll down once using the ZERO key to enter Fine-tune menu. The indicator outputs 4 mA and displays a number.

2. While monitoring the voltage across R_L (see Appendix), use the right (PRINT) or left (TARE) keys to change the displayed value until the measured voltage is exactly 1 VDC.

3. Press the SET (Net/Gross) key to save. The indicator outputs 20 mA and displays another number.

4. While monitoring the voltage across R_L, use the right (PRINT) or left (TARE) keys to change the displayed value until the measured voltage is exactly 5 VDC.

5. Press the SET (Net/Gross) key to save and revert back to F24.

Entering the User ("A") or COM ("C") Menu

NOTE: Follow the same steps to enter the COM ("C") Menu– just substitute "C" for "A" below

1. Switch off the RF digital indicator by pressing and holding down the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Press the ON/PRINT (right) key once. The screen displays "-A-".

4. Scroll down using the ZERO/OFF (down) key to reach the parameter level. The scale shows "A   1".

5. Move from one "A" parameter to the next by using the TARE (left) or ON/PRINT (right) keys. For example, to go from A1 to A2, press the ON/PRINT key. To go from A2 back to A1, press the TARE key.

6. Once you have arrived at the proper "A" menu parameter, e.g. "A   1", press the ZERO/OFF (down) key once to arrive at the selection level. The scale displays the current parameter setting.

7. To scroll thru the available parameter settings, use the TARE (left) or ON/PRINT (right) keys.

8. Once the setting you want is displayed on the screen, press the NET/GROSS (set) key to save this value and revert back up to the parameter level, e.g. "A   1".

9. In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the User Menu. The indicator displays 'SAvE' and then automatically powers off.

User ("A") and COM ("C") Menu Descriptions

This section provides more detailed descriptions of the selections found in the User Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; **(√)**.

CODE/NAME	DESCRIPTION	SELECTION LIST
A1/C1 [1] Baud Rate	Selects the baud rate for data transmission through the serial port.	600, 1200, 2400, 4800, **9600 √**, 19200, 38400, 57600, 115200
A2/C2 Data Bits, Parity and Stop Bits	Selects the number of data bits and parity of serial transmission. "8_n_1" = 8 data bits with no parity bit and one stop bit "8_n_2" = 8 data bits with no parity bit and two stop bits "7_n_1" = 7 data bits with no parity bit and one stop bit "7_n_2" = 7 data bits with no parity bit and two stop bits "7_E_1" = 7 data bits with even parity bit and one stop bit "7_E_2" = 7 data bits with even parity bit and two stop bits "7_o_1" = 7 data bits with odd parity bit and one stop bit "7_o_2" = 7 data bits with odd parity bit and two stop bits	**8_n_1 √** 8_n_2 7_n_1 7_n_2 7_E_1 7_E_2 7_o_1 7_o_2
A3/C3 Serial Port Mode	Selects the mode of the serial port: Refer to Appendix B for more information. "0" = Demand Full Duplex "1" = Continuous Full Duplex "2" = Auto Print "3" = RFID "4" = Test and Measurement	**0 √** 1 2 3 4
A4 MP-20 Print Header	Tells MP-20 printer to print the header information. Valid only when **A6** is set to "2" or "4". "0" = Do NOT Print Header "1" = Print Header	**0√** 1
A5 Units Key	Selects function of the Units key. **NOTE**: The UNITS key will not function if ounces or grams are selected for F8. "no" = Disabled "YES" = Enabled	no **YES√**
A6/C6 Output String	Selects fixed output string for serial port. Refer to Appendix B for details. "0" = String Format 1 (Condec Demand) "1" = String Format 2 (Condec Continuous) "2" = Text Print Ticket "3" = Text Print Ticket with MP-20 Auto Label Feed	**0√ (A6)** 1 **2 √ (C6)** 3
A7 ID Number	Selects the ID number mode. "no" = Disabled "YES" = Enabled	**no√** YES
A8 Set ID Number	Allows you to key-in the ID number. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 0 to 999999 **123456√**

Foot note:
(1) On older units, the selection list stopped at 38400.

CODE/NAME	DESCRIPTION	SELECTION LIST
A9/C9 Line Feeds	Allows you to key-in the number of line feeds. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 0 to 99 **8√**
A10 Auto Power Off - RF Digital Indicator	Allows you to configure the automatic power off time for the RF digital indicator. Expressed in minutes of inactivity (keys and weighing platform). Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 0 to 30 **5√**
A11 Hold Mode	This mode of operation is enabled by setting F30 to "5". This mode captures the weight of an unstable load, e.g. livestock, by freezing the weight on the display. Use the Motion Band setting (F5) and the Percentage Hold setting (F12) to adjust this mode to your specific application. When the weight has been locked onto the display, two arrows beneath the weight display will be turned ON. "0" = Off **AUTOMATIC (A11 = 1)** – Automatically locks weight on the display when stable. If the weight of the object on the scale changes by the F12 setting (e.g. 10%) then the sale unlocks the held reading and relocks onto the new weight. This occurs during both increasing and decreasing weight values. **MANUAL (A11 = 2)** – Press the NET/GROSS key <u>before</u> applying any weight to the scale. After the load has stabilized, the display will hold the weight reading on the screen until the NET/GROSS key is pressed again. If the weight of the object on the scale changes by the F12 setting (e.g. 10%) then the sale unlocks the held reading and relocks onto the new weight. This occurs during increasing weight values only. **PEAK HOLD (A11 = 3)** – The display updates as the load increases but not as the load decreases. The value shown on the screen is the maximum weight applied to the scale. Press the UNITS key to toggle between live mode and peak hold mode. The 'P' annunciator is used to indicate that you are in Peak Hold mode. When you exit out of peak hold mode, the old peak value is automatically cleared.	**0√** 1 2 3
A12 Backlight Brightness	Selects the brightness of the LCD backlight. Selections are in % of full brightness.	0 (OFF) 20 50 75 **100√**
A13/C13 Handshaking	Selects function of the hardware handshaking. (NOTE: Receive pin is used for handshaking). "0" = Disabled "1" = Enabled	**0√** 1
A18 Date	Selects function of the printed date. "no" = Disabled "YES" = Enabled	**no√** YES
A19 Date Format	Selects the printed format for date. "USA" = mm/dd/yy "IntL" = dd/mm/yy	**USA√** IntL

CODE/NAME	DESCRIPTION	SELECTION LIST
A20 Set System Time & Date	Allows you to set the system time and date. Pressing the **ZERO** key to scroll down one level begins the sequence.	Press **ZERO** key to begin sequence
A22 Low Battery Auto Power Off - RF Digital Indicator	Allows you to configure the automatic power off time of the RF indicator after it enters a low battery condition. Expressed in minutes. Pressing the **ZERO** key to scroll down one level begins the sequence.	Key-in 0 to 99 **2**√
A23 Audible Key Feedback	Selects function of the audible key feedback (beeper). "no" = Disabled "YES" = Enabled	no **YES**√
A24 Diagnostics	Used to access the listed test functions (one at a time). Pressing the **ZERO** key begins the sequence. "A24-U1" = Display segment test, "A24-U2" = A/D converter test, "A24-U3" = Input test, "A24-U4" = Output test (all) "A24-U5" = Serial Port test (both), "A24-U6" = Keyboard test "A24-U7" NTEP test mode	Press **ZERO** key to begin sequence
A25 Decimal Point	Selects printed (not displayed) decimal point character. "0" = Period ('.') "1" = Comma (',')	**0** √ 1
A30 Upload EID Database	Actuates the function which transmits the EID database information to all serial ports configured for RFID serial port mode (A3/C3).	Press **ZERO** key to begin sequence
A31 Clear EID database	Allows you to clear the stored EID database.	Press **ZERO** key to begin sequence

Setting system time and date (A20)

1. Switch off the RF digital indicator by pressing and holding down the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Press the ON/PRINT (right) key once. The screen displays "-A-".

4. Scroll down using the ZERO/OFF (down) key to reach the parameter level. The scale shows "A 1".

5. Move from A1 to A20 by pressing the TARE (left) key repeatedly until the screen shows "A 20".

6. Once you have arrived at A20 press the ZERO/OFF (down) key once. The screen displays "ho_xx" where 'xx' is the current hour, e.g. "15". One digit will be flashing.

7. Use the four directional keys to adjust the displayed value to the actual hour value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

8. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "n¬_xx" where 'xx' is the current minute, e.g. "55". One digit will be flashing.

9. Use the four directional keys to adjust the displayed value to the actual minute value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

10. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "dA_xx" where 'xx' is the current day of the month, e.g. "14". One digit will be flashing.

11. Use the four directional keys to adjust the displayed value to the actual day value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

12. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "n¬_xx" where 'xx' is the current month of the year, e.g. "02". One digit will be flashing.

13. Use the four directional keys to adjust the displayed value to the actual month value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

14. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "yE_xx" where 'xx' is the current month of the year, e.g. "11". One digit will be flashing.

15. Use the four directional keys to adjust the displayed value to the actual year value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

16. After entering the exact value, press the NET/GROSS key to save the value and revert back up to the parameter level, e.g. "A 20".

17. In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the User Menu. The indicator displays 'SAvE' and then automatically powers off.

Diagnostics (A24)

Here is a brief description of each test mode:

A24-U1 Display Test – Lights up all display segments, counting down from 666666 to 11111. Test ends automatically when complete.

A24-U2 ADC Test – Shows internal A/D converter counts – useful for troubleshooting weighing issues. End test manually by pressing the MODE (Set) key.

A24-U3 Input Test – Displays input logic (0 or 1) of input terminal. "0" mean input pin is grounded; "1" means input pin is open. End test manually by pressing the MODE (Set) key.

A24-U4 Output Test – Sets all output pins 'ON'. End test manually by pressing the MODE (Set) key.

A24-U5 Serial Test – Transmits a data string continuously out both serial ports ("TEST1" on COM1 and "TEST2" on COM2). End test manually by pressing the MODE (Set) key.

A24-U6 Keyboard Test – Displays a keycode for each key pressed on the keypad. See Table below. End test manually by pressing the MODE (Set) key.

Key	Keycode
Units	1
Zero	2
Net/Gross	3
Tare	4
Print	5

A24-U7 NTEP Mode – This is a special mode which automatically disables zero tracking and automatic shut off; only the ZERO key can function in this mode. End test manually by pressing the MODE (Set) key.

Entering the Bluetooth ("B") Menu

NOTE: This menu applies to remote wireless A/D systems only.

1. Switch off the display unit by pressing and holding down the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Press the ON/PRINT key until the screen displays "-B-".

4. Scroll down using the ZERO/OFF (down) key to reach the parameter level. The scale shows "B   1".

5. Move from one "B" parameter to the next by using the TARE (left) or ON/PRINT (right) keys. For example, to go from B1 to B2, press the ON/PRINT key. To go from B2 back to B1, press the TARE key.

6. Once you have arrived at the proper "B" menu parameter, e.g. "B   1", press the ZERO/OFF (down) key once to arrive at the selection level. The scale displays the current parameter setting.

7. To scroll thru the available parameter settings, use the TARE (left) or ON/PRINT (right) keys.

8. Once the setting you want is displayed on the screen, press the NET/GROSS (set) key to save this value and revert back up to the parameter level, e.g. "B   1".

9. In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the Bluetooth Menu. The indicator displays 'SAvE' and then automatically powers off.

Bluetooth ("B") Menu Descriptions

This section provides more detailed descriptions of the selections found in the Bluetooth Menu Chart. Factory-set defaults are shown in **bold** with a checkmark; **(√)**.

CODE/NAME	DESCRIPTION	SELECTION LIST
B1 Adjust Load Cell (Corner) #1 Factor	This parameter allows you to adjust ('tweak') the digital corner compensation factory for load cell/corner #1. Be sure to perform a digital corner calibration (via B10) before using this procedure. Pressing the **ZERO** key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 **1.0000√**
B2 Adjust Load Cell (Corner) #2 Factor	This parameter allows you to adjust ('tweak') the digital corner compensation factory for load cell/corner #2. Be sure to perform a digital corner calibration (via B10) before using this procedure. Pressing the **ZERO** key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 **1.0000√**
B3 Adjust Load Cell (Corner) #3 Factor	This parameter allows you to adjust ('tweak') the digital corner compensation factory for load cell/corner #3. Be sure to perform a digital corner calibration (via B10) before using this procedure. Pressing the **ZERO** key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 **1.0000√**
B4 Adjust Load Cell (Corner) #4 Factor	This parameter allows you to adjust ('tweak') the digital corner compensation factory for load cell/corner #4. Be sure to perform a digital corner calibration (via B10) before using this procedure. Pressing the **ZERO** key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 **1.0000√**
B6 Restore factory calibration	Restores factory calibration data. Scrolling down with the **ZERO** key one level begins the procedure.	Press **ZERO** key to begin sequence
B8 RFTM Auto Power Off	This parameter allows you to set the automatic power off timeout for the TI-500 RFTM. "0" = Always on "1" = 30 minutes "2" = 1 hour "3" = 2 hours	0 1 2 **3√**
B9 RFTM Low Battery Force Off	This parameter allows you to set the automatic power off timeout in minutes for the TI-500 RFTM during a low battery condition. Pressing the **ZERO** key to scroll down one level begins the programming sequence.	Key-in 0 to 99 **10√**
B10 Digital Corner Calibration	Places indicator into the digital corner calibration routine. Scrolling down with the **ZERO** key one level begins the procedure.	Press **ZERO** key to begin sequence

SYSTEM CALIBRATION

Calibration Overview

Digital system calibration is accomplished in two steps: zero calibration (F16) and span calibration (F17). You may restore factory calibration values via the B6 menu.

For dual wireless A/D modules systems (e.g. TI-500 RFTM-2BE), a digital corner calibration feature is also available. It does not require a specific test weight value, but the maximum weight that should be used is approximately 25% of the rated capacity of the platform.

NOTE: Please perform corner calibration prior to executing zero/span calibration.

Digital Corner Calibration (dual wireless units only)

1. Switch off the RF digital indicator by pressing and holding the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Press the ON/PRINT key until the screen displays "-B-".

4. Scroll down once using the ZERO/OFF key to enter the "Bluetooth" menu. Scale shows "B 1".

5. While in the Bluetooth Setup mode, scroll to "**B 10**", and then scroll down once using the ZERO/OFF key to enter corner calibration menu. The indicator will display a value. This value is the internal A/D count and can prove useful when trying to troubleshoot setup problems.

6. Remove all items from the weighing platform.

7. Press the NET/GROSS key to save the zero point value. The display will show "**Corn-1**".

8. Place the test weight on the load cell/corner #1 of the weighing platform.

9. Wait 2-3 seconds to allow the internal reading to stabilize.

10. Press the NET/GROSS key to save the load cell/corner #1 calibration. The display will show "**Corn-2**".

11. Repeat steps 8-10 for the remaining load cells/corners. At the conclusion of corner #4 calibration, the display will show "**Set--**".

12. Press the NET/GROSS key to finish the corner calibration and revert back up to B10.

13. In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the Bluetooth Menu. The indicator displays 'SAvE' and then automatically powers off.

Digital Zero/Span Calibration (F16 and F17)

1. Switch off the RF digital indicator by pressing and holding the ZERO/OFF key for about 5 seconds.

2. Enter the Setup mode by pressing and holding the ON/PRINT key for about 20 seconds or until the screen shows "F".

3. Scroll down once using the ZERO/OFF key to enter the "Setup" menu. Scale shows "F 1".

4. While in the Setup mode, scroll to "**F 16**", and then scroll down once using the ZERO/OFF key to enter zero calibration menu. The display will momentarily show "**C 0**" followed by a value. This value is the internal A/D count and can prove useful when trying to troubleshoot setup problems.

5. Remove all items from the weighing platform and press the ZERO/OFF key to zero out the displayed value.

6. Press the NET/GROSS key to save the zero point value. The display will show "**EndC0**" momentarily, and then revert back up to F16.

7. Press the ON/PRINT key to progress to the F17 menu.

8. While at the "**F 17**" screen, scroll down once using the ZERO/OFF key to enter span calibration menu. The display will momentarily show "**C 1**" for the span calibration point, followed by a value with one flashing digit.

9. Place the test weight on the weighing platform.

10. Use the four directional keys to adjust the displayed value to the actual test weight value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

11. After entering the exact value, press the NET/GROSS key to save the value. If the calibration was successful, the display will show "**EndC1**" momentarily, followed by "**C 2**" for the second calibration point.

12. Repeat steps 8-10 for C2 and C3. At the conclusion of C3, the indicator displays the current gravity settings, e.g. "9.800".

13. If the local gravity factor is known, then use the up/down and left/right keys to adjust the displayed value. Otherwise, just press the NET/GROSS key. The display will show "-donE".

14. Press the NET/GROSS key to revert back up to "F17".

15. If the calibration was *not* successful, one of the error messages below will appear. Take the indicated action to correct the problem, and then perform a new calibration.

   - "**Err0**" - The calibration test weight or the keyed-in weight is larger than the full capacity of the scale. Change the calibration test weight or check the input data.
   - "**Err1**" - The calibration test weight or the keyed-in weight is smaller than 1% of the full capacity of the scale. Change the calibration test weight or check the input data.
   - "**Err2**" – There is not enough signal from the load cells to establish a proper calibration. Most commons causes include incorrect load cell wiring, a mechanical obstruction or a faulty (damaged) load cell.

In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the Setup Menu. The indicator displays 'SAvE' and then automatically powers off.

<u>Restore Factory Calibration (B6) – wireless systems only</u>

Caution: This action cannot be undone.

1. Switch off the RF digital indicator by pressing and holding the ZERO/OFF key for about 5 seconds.

2. Enter the Setup mode by pressing and holding the ON/PRINT key for about 20 seconds or until the screen shows "F".

3. Use the ON/PRINT key to change the display to "B".

4. Scroll down once using the ZERO/OFF key to enter the "Bluetooth" menu. Scale shows "B 1".

5. While in the Bluetooth mode, scroll to "**B 6".**

6. Press the ZERO/OFF key once; the display says "F-CAL".

7. To view all of the factory corner calibration values, press the ZERO/OFF key once; the indicator automatically displays the calibration values for each corner (1-4) in sequence and then returns to the "F-CAL" level.

8. To view all of the factory span calibration values, press the UNITS key once; the indicator automatically displays the following in sequence and then returns to the "F-CAL" level.
   Span Point #1 Weight Value
   Span Point #1 A/D Count
   Span Point #2 Weight Value
   Span Point #2 A/D Count
   Span Point #3 Weight Value
   Span Point #3 A/D Count

9. <u>To exit without restoring the factory calibration values</u>, press the PRINT key; the indicator revert backs up to B6.

10. <u>To restore the factory calibration values,</u> press and hold the NET/GROSS key for 3 seconds; the indicator briefly displays "dOnE" and then reverts back up to B6.

11. <u>In order to save all parameters</u>, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key <u>twice</u> (two times) to exit the Bluetooth Menu. The indicator displays 'SAvE' and then automatically powers off.

SERIAL PORT INFO

SERIAL PORT MODES

DEMAND DUPLEX MODE

The Demand Duplex Mode provides a two way serial transmission mode. In this mode, the output information is transmitted on demand; either by pressing the PRINT key on the indicator's front panel or upon receiving a recognized command from a host device (i.e. computer).
NOTE: Ensure that your cabling contains the proper handshaking.

CONTINUOUS DUPLEX MODE

The Continuous Duplex Mode provides a two-way serial transmission mode. In this mode, the output information is transmitted continuously making it a popular choice for remote displays and other remote devices requiring a constant data stream. The transmission automatically occurs at the end of each display update. The indicator will react upon receiving a recognized command from a host device.

RECOGNIZED HOST COMMANDS (applies to both demand and continuous duplex modes)

"P" - This command is sent to the indicator to print the indicated display. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"Z" - This command is sent to the indicator to zero the scale. The indicator will not respond if the scale is in motion, positive overload or negative overload. The indicator will also not respond if it is not in gross mode or within the zero range specified in F4 of the Setup Menu.

"T" - This command is sent to the indicator to tare the scale. The indicator will not respond if the scale is in motion, positive overload or negative overload. The indicator will also not respond if it displaying a negative gross value.

"G" - This command is sent to the indicator to switch to gross mode. The indicator will not respond if the scale is in motion, positive overload or negative overload.

"N" - This command is sent to the indicator to revert to net. The indicator will not respond if the scale is in motion, positive overload or negative overload. The indicator will also not respond if a tare has yet to be established.

"C" - This command is sent to the indicator to toggle among the configured units of measure.

AUTO PRINT MODE

The Auto Print Mode provides a one-time serial transmission once a non-zero, stable condition is achieved.

TEST AND MEASUREMENT MODE

The Test and Measurement Mode is identical to the Demand Duplex Mode with one exception: the indicator will respond to a PRINT command even when the scale is in motion, positive overload or negative overload.

OUTPUT STRINGS

TEXT PRINT TICKET

The Text Print Ticket is designed specifically for a serial printer.

```
ID. NO.     123456
GROSS        25.00  lb
TARE          1.48  lb
NET          23.52  lb
DATE     03/01/2011
```

NOTES:
1. The TARE and NET fields are not printed unless a tare has been established in the system.

2. The ID number field is not printed if it is disabled in A7 of the User Menu.
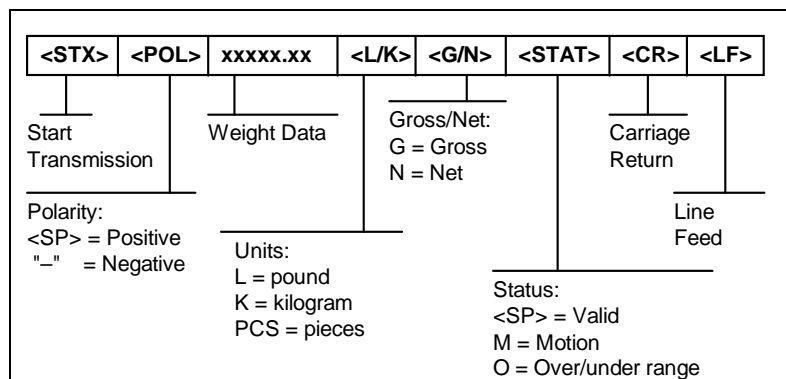
3. The date is not printed if it is disabled in A18 of the User Menu.

STRING FORMAT 1 (Condec Demand String)

String Format 1 is designed for two-way communication.
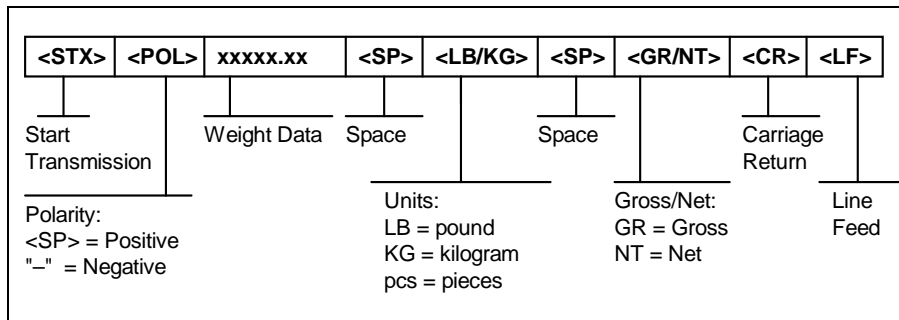
STRING FORMAT 2 (Condec Continuous String)

String Format 1 is designed for one-way communication.

ANALOG OUTPUT OPTION INFO

GENERAL INFORMATION

The digital indicator provides an optional analog output on two wires designated AA and BB. On the TI-500 RF unit, you can get the output through pins 2 and 3 of the D-SUB9 connector. Pin 2 is AA and pin 3 is BB. On the TI-500 RF SS unit, you need to connect the AA and BB wires directly to the green terminal (J2) on the option PCBA located inside of the unit.

The output tracks the weight displayed on the indicator, so you must first have the indicator configured and calibrated correctly in order for it to work properly.

There are two types of analog outputs available:

1. Passive 4-20 mA
2. Active 0-5 V

You can select between the two types of outputs by positioning the JP1 and JP2 shunt blocks inside the unit. **NOTE**: The unit ships from the factory configured to passive 4-20 mA.

Once everything is connected and working, you should use the F24 procedure to fine-tune the output.

How to configure the analog output to active 0-5 V:

1. Remove power and carefully open up the unit.
2. Locate the small PCBA marked "4-20mA(DAC8531) and configure JP1 and JP2 as shown in diagram below:
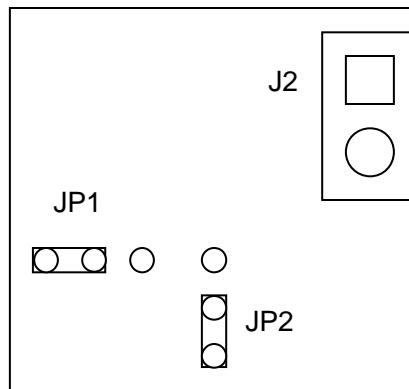
How to configure the analog output to passive 4-20 mA:

1. Remove power and carefully open up the unit.

2. Locate the small PCBA marked "4-20mA(DAC8531) and configure JP1 and JP2 as shown in diagram below:
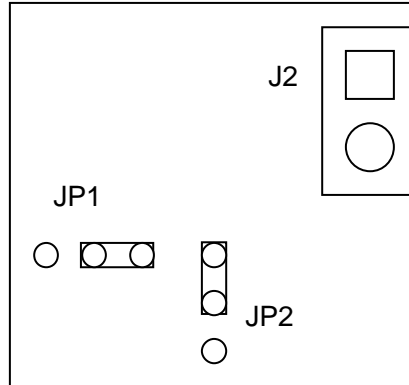
Passive 4-20 mA Analog Output

A 12-bit DAC is used along with a current loop transmitter. Since the output is passive, you will need an external 24 VDC power supply. You can get the output through the AA and BB wires.

Here is a working connection diagram used at the factory to test:
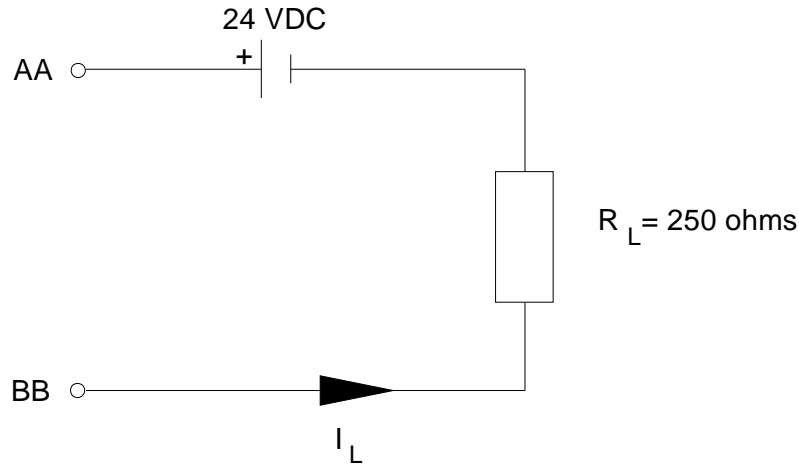
NOTE 1: In your application, substitute the actual input device for R_L. If your input device is polarized, connect the common lead to the negative lead of the 24 VDC power supply and the positive lead to the BB wire.

NOTE 2: The AA and BB wires are not polarized. You may connect them in any manner you wish.

Here is a suggested connection diagram for a PLC:

TI-500   PLC

AA   +24 VDC

BB   +

I_L

R_L

-

GND
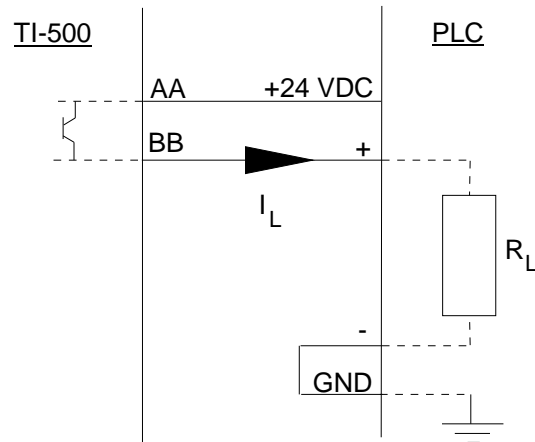
NOTE 1: Do NOT connect the indicator ground to the PLC ground.

Here is how to test to see if it is working correctly:

1. Configure and calibrate the indicator to your load device. Ensure the weighing function is working properly.

2. Connect the AA and BB wires to an external 24 VDC power supply and 250 Ω resistor as shown in the above test diagram.

3. When the indicator is displaying zero weight, the output should be 4 mA. Since $V=IR$, you should measure 1 VDC across R_L.

4. When the indicator is displaying the full-scale load, the output should be 20 mA. Again, since $V=IR$, you should measure 5 VDC across R_L.

Active 0-5 V Analog Output

You can measure the output across the AA and BB wires.

Contents subject to change without notice.

TRANSCELL TECHNOLOGY, INC.

MODEL
TI-500 RF Series

User Manual

Digital Weight Indicator
(with wireless weighing capability)

Revision 1.3   July 9, 2012

Table of Contents

THIS EQUIPMENT CONTAINS NO USER SERVICEABLE COMPONENTS.
- Servicing of the equipment must only be carried out by trained and authorized personnel.
- Use only the AC adapter supplied with the scale. Other adapters may cause damage.

Routine maintenance
- Harsh abrasives, solvents, scouring cleaners and alkaline cleaning solutions should not be used; especially on the display window.
- The outside of the product may be wiped down with a clean cloth, moistened with water containing a small amount of soap.

This manual covers the following products:

Model	Display	Antenna	Enclosure Type
TI-500 RF	LCD	Internal	Aluminum/ABS
TI-500 RF SS	LCD	External	Stainless Steel
TI-500 RFTM-B1	N/a	Internal	ABS
TI-500 RFTM-B1E	N/a	External	ABS

OVERVIEW

Scope of TI-500 RF Series

Out of the box, the TI-500 RF series indicator operates as a basic, cabled digital weight indicator. The load cell(s) and/or j-box is connected to the indicator's internal A/D convertor. This configuration is depicted in the following diagram:

Conventional Load Cell
(with or without j-box)

Cable

TI-500 RF shown

When sold with an external TI-500 RFTM (Radio Frequency Transceiver Module) and an optional wireless radio, your TI-500 RF series indicator is transformed from "wired" to cable-free. This configuration is depicted in the following diagram:

Conventional Load Cell
(with or without j-box)

Cable

TI-500 RFTM-B1E

RF

TI-500 RF

Our products currently use reliable and popular Bluetooth® wireless technology.
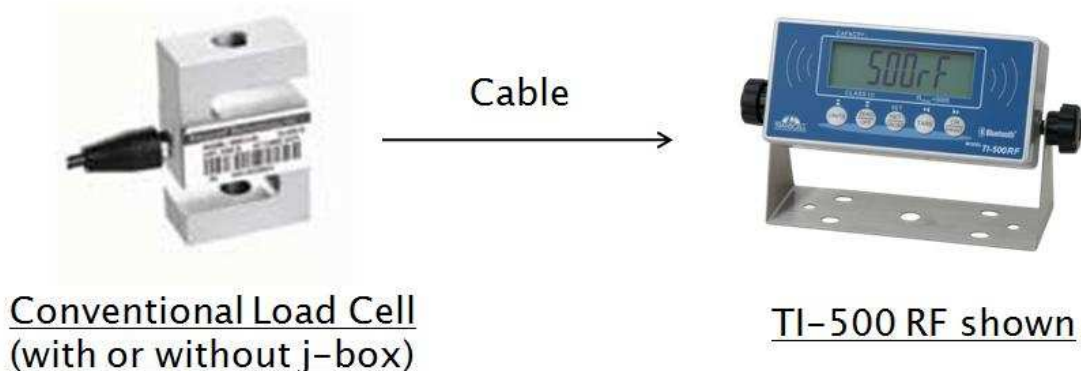
This manual covers operation and troubleshooting. For installation, configuration and calibration of the RF series indicators please refer to the separate installer's guide.

BASIC OPERATION

Getting Started – Cabled Systems

1. Press and hold the ON/PRINT key on the digital indicator unit for two seconds.
   After a brief initialization period, the scale will revert to a zero ("0") weight display.

   Your scale is now ready for operation!

Getting Started – Wireless Systems

1. Switch on the RF weighing module(s) by pressing the BLUE button once**.** The blue LED will turn solid for a few seconds and then start to flash.

2. Next press and hold the ON/PRINT key on the digital indicator unit for two seconds.
   After a brief initialization period, the scale will revert to a zero ("0") weight display.

   Your wireless scale is now ready for operation!

Operation – TI-500 RF and TI-500 RF SS

Before weighing it is necessary to check if the scale is unloaded and indicating zero weight in the desired unit of measure, for example lb for pounds.

If the indicator is not displaying the desired unit of measure, press the UNITS key repeatedly until it is indicated, e.g. lb for pounds, kg for kilograms, etc.

The indicator features an automatic zero correction meaning that small deviations will be zeroed automatically. If the indicator does not automatically determine the zero point, please press the ZERO/OFF key once briefly.

Operation – TI-500 RFTM

The TI-500 RFTM contains two buttons and one LED.
- The BLUE button is used to power up the RF weighing module
- The RED button is used to immediately power down the RF weighing module

The TI-500 RFTM has several operating modes to save battery life and also to alert the user when it's time to replace the batteries. You can determine the operating mode by observing the blinking behavior of the blue LED:

LED Functionality – Blinking interval		
During Power-up (Initialization)	ON for 5 seconds	
FULL BATTERY	Blink interval	
Working Mode	1.5 seconds	
Sleep Mode (power savings)	4 seconds	
LOW BATTERY	Blink interval	
Working Mode	10 seconds	Double Flash
Sleep Mode	10 seconds	Double Flash

Please replace the batteries when the blink interval is 10 seconds!

NOTE 1: TI-500 RFTM will shut down completely within two hours of a lost connection with the indicator.
NOTE: 2: TI-500 RFTM will only enter sleep mode when the TI-500 RF indicator is OFF.

When shipped from the factory, the TI-500 RF digital indicator is configured to automatically switch off after 5 minutes if not in use.

Replacing the batteries – TI-500RF

The TI-500 RF digital indicator can operate either from its AC adaptor or from 4-AA batteries.

1. Remove the plastic battery cover from the rear panel.
2. Remove four AA batteries and discard.
3. Observing the proper direction (polarity), install the new batteries.
4. Replace the battery cover.
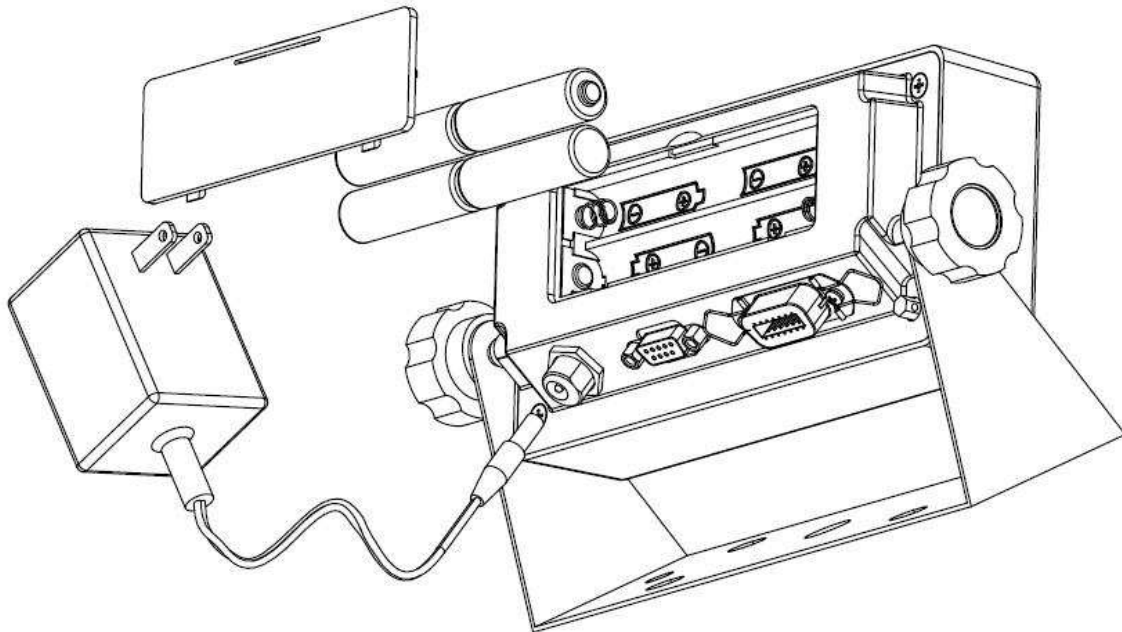
Replacing the batteries – TI-500 RFTM

An optional cylindrical battery holder is available which requires 4 "C" cell alkaline batteries.

1. Turn the TI-500 RFTM OFF (Press the RED button)
2. Locate the metal battery cylinder
3. Unscrew either end cap to reveal batteries
4. Exchange the batteries – be careful to note polarity
5. Replace the end cap
6. Re-install the metal battery cylinder

Rechargeable battery information – TI-500 RF SS

The TI-500 RF SS contains an internal lead-acid rechargeable battery. Before using the indicator for the first time, please charge the battery overnight.

The indicator's battery should operate for about 85 hours if left on continuously. The display unit is configured to power down after 5 minutes of inactivity but this parameter can be changed thru the A10 menu setting.

The battery can be charged while ON or OFF and the indicator can be operated while it's charging unless the state of charge is very low.

WHEN TO CHARGE THE INTERNAL BATTERY

The best time to charge the sealed lead-acid type battery is <u>any time</u> the indicator is not in use. You need not wait for the Low Battery Indication – in fact it's best that you don't. Charging the battery when not in use keeps the battery "fresh" and is the recommended way to manage it.

When the battery needs to be charged, the Low Battery Indicator will start blinking in the upper left-hand corner of the display. The indicator may be used for an additional 2 minutes before it automatically powers down. ***It is imperative that you charge the battery at this time to avoid permanent damage.***

HOW TO CHARGE THE INTERNAL BATTERY

1. Connect the charger (AC Adapter 12 VDC, 800mA) to the scale, and then plug the charger into an AC outlet. ***Make sure that the AC voltage appearing at the wall outlet matches the input voltage marked on the AC adapter.***

2. After the charging period expires, unplug the charger from the AC outlet, then from the scale. The scale is now ready for use under its own battery power.

    NOTE: The charger may be left connected to the scale indefinitely without damage to the internal battery.

HOW LONG TO CHARGE THE INTERNAL BATTERY

In general, the battery should be allowed to charge a minimum of 1.5 hours for every hour of use. If you discharge the battery below 50% and do not allow the proper time for charging, you may start to notice a decline in the usage period. This is normal and eventually the battery must be replaced.

REPLACING THE BATTERY

The recommended practice when removing the battery is to disconnect the ground connection (black) first, then the red terminal. This ensures that a short circuit will not occur from a battery lead or fuse lead touching the grounded housing while disconnecting the other terminal. Similarly, the ground should be connected last when installing a new battery.

The US government has classified the internal battery as hazardous waste. <u>Do not</u> place battery into landfill. An automotive store or a local waste agency may accept the batteries for recycling. Contact the manufacturer for more information.

DISPLAY & KEYPAD DETAILS

This model utilizes a 6-digit LCD (Liquid Crystal Display) with adjustable LED backlight. The Table below summarizes the display annunciators.

Symbol	Display
$\rightarrow 0 \leftarrow$	Displays when the scale is on Zero.
N	Indicates that the indicator is displaying net weight (Gross weight minus Tare weigh).
G	Indicates that the indicator is displaying gross weight
T	Indicates that a push-button tare weight has been established in the system
P	Indicates that the indicator is in PEAK HOLD mode
lb	Indicates that the unit of the displayed weight is in pounds
kg	Indicates that the unit of the displayed weight is in kilograms
g	Indicates that the unit of the displayed weight is in grams
oz	Indicates that the unit of the displayed weight is in ounces
pcs	Indicates that the scale is in piece count mode and is displaying the current number of pieces on the platform
◣◢	This light is on whenever the scale is at rest (stable reading).
🔋	When blinking, indicates that battery life of the indicator has reached its useful end and needs to be recharged or replaced soon. More information below

The TI-500 RF digital indicator can show overall system battery health. See the Error Messages for more information.

The keypad is composed of a total of five (5) function keys.

Keypad Functions

Units	This key toggles the indicator between lb and kg.
Zero/Off	This key sets the indicator to display zero weight provided the following conditions are met:

    1. The indicator is displaying Gross weight.
    2. The scale is not in motion.
    3. The scale is not in overload (see error codes).

Press and hold for five seconds to shut the unit OFF.

Net/Gross	This key toggles the indicator between Gross weight and Net weight - but only if a Tare weight has been established first
Tare	This key is used to establish a Tare weight provided the following conditions are met:

    1. The indicator is displaying a Gross weight above zero.
    2. The scale is not in motion.
    3. The scale is not in overload (see error codes).

If a tare weight has already been established, this key <u>cancels</u> the current tare weight.

On/Print	Press and hold for two seconds to turn the unit ON. When the unit is on, this key is used to send weight information out to the serial port provided the following conditions are met:

    1. The scale is not in motion.
    2. The scale is not in overload (see error codes).

ADVANCED OPERATION

Hold operation:

This mode of operation is enabled by setting F30 to "5" in the Setup Menu (see separate installer's guide for more information). This mode captures the weight of an unstable load, e.g. livestock, by freezing the weight on the display. Use the Motion Band setting (F5) and the Percentage Hold setting (F12) to adjust this mode to your specific application. When the weight has been locked onto the display, two arrows beneath the weight display will be turned ON.

There are several specific hold modes, which are selected thru the A11 setting.

AUTOMATIC (A11 = 1) – Automatically locks weight on the display when stable. If the weight of the object on the scale changes by the F12 setting (e.g. 10%) then the sale unlocks the held reading and relocks onto the new weight. This occurs during both increasing and decreasing weight values.

MANUAL (A11 = 2) – Press the NET/GROSS key <u>before</u> applying any weight to the scale. After the load has stabilized, the display will hold the weight reading on the screen until the NET/GROSS key is pressed again. If the weight of the object on the scale changes by the F12 setting (e.g. 10%) then the sale unlocks the held reading and relocks onto the new weight. This occurs during increasing weight values only.

PEAK HOLD (A11 = 3) – The display updates as the load increases but not as the load decreases. The value shown on the screen is the maximum weight applied to the scale. Press the UNITS key to toggle between live mode and peak hold mode. The 'P' annunciator is used to indicate that you are in Peak Hold mode. When you exit out of peak hold mode, the old peak value is automatically cleared.

NET Weighing

Gross weight refers to the total weight of a product and its packaging. Conversely, **net weight** refers to the weight of the product alone, discounting the weight of its container or packaging; and **tare weight** is the weight of the packaging alone.

<u>NOTE</u>: This indicator stores the current tare weight in memory if the indicator is properly powered OFF. If a tare weight is present at startup, the indicator will revert to NET weighing mode and apply the stored tare weight.

1. If weighing an item in a container, place the empty container onto the scale's platter

2. After allowing the weight indication to stabilize, press the TARE key.
   The display shows zero weight and the NET annunciator is activated

3. Place the object to be weighed on the scale's platter and allow the weight indication to stabilize.
   The reading shown is the net value of the applied load

4. If necessary, toggle between the gross weight and the net weight by pressing the NET/GROSS key

5. Press the TARE key again to clear the tare value and return to gross weighing mode

Piece Counting

IMPORTANT NOTE: The piece counting function cannot be used in commercial (NTEP) applications.

This mode of operation is enabled by setting F30 to "3" in the Setup Menu (see separate installer's guide for more information). This mode is used to indicate the number of pieces of an item you have placed on the scale's platform and is accessed by pressing the UNITS key. To ensure accuracy, the parts you are counting must be consistent in weight.

The indicator uses the sampling method to determine the average piece weight (APW) of the items you wish to count. When sampling items, always count the parts in your hand and place them on the platform all at once. If the APW of the items is too light or the total weight of the sample is too light, accuracy cannot be guaranteed. You will get an error message, but piece counting will still be allowed. This indicator does not retain the piece weight when powered down.

1. If the items you will be counting require a container, you must first tare the container off by pressing the TARE key.

2. Press the NET/GROSS key until "Add 5" is indicated on the display. The indicator is prompting you to place five identical items on the platform.
   NOTE: If you wish to change the sample number, simply press the UNITS key repeatedly until the desired sample number appears. Available choices are 5, 10, 20, 25, 50 and 100. If you continue to push the UNITS key, the indicator will resort back to weighing mode and you must start again from Step 2.

3. Place the sample items on the platform all at once and wait two seconds for the weight to stabilize.

4. Press the NET/GROSS key to take the sample. If the sample size is large enough, the indicator now displays the number of pieces on the platform and the "PCS" annunciator is lit. If not, the indicator briefly displays "Lo".

   NOTE: If the indicator continues to display "Lo" even after sampling 100 pieces, the unit weight of the items you wish to count is too light for your scale to process accurately.

5. To exit the piece count mode, press the UNITS key.
   NOTE: The APW will NOT remain in scale memory when you exit piece counting mode.

Peak Hold Mode

IMPORTANT NOTE: The peak hold function cannot be used in commercial (NTEP) applications.

This mode of operation is enabled by setting F30 to "5" in the Setup Menu and A11 to "3" in the User Menu (see separate installer's guide for more information). This mode is used to indicate and hold the peak weight recorded during a specific process. The most common application is testing the breaking point of a part or assembly. The TI-500 RF records both positive and negative peak weights.

1. Push the UNITS key to active peak hold mode; the "P" annunciator turns ON.
2. Apply force to the piece – the display indicates and holds the peak force applied.
3. To toggle between positive and negative peak weights, use the NET/GROSS key.
4. To reset both peak values to zero, press the ZERO key.
5. To exit peak hold mode, press the UNITS key again; the "P" annunciator turns OFF.

Accumulation (Totaling)

This mode of operation is enabled by setting F30 to "1" in the Setup Menu (see separate installer's guide for more information). The mode allows you to add weighments together to obtain a total weight. When a tare weight is active, the net weight is added automatically.

1. Load the system with the weight that is to be added.
2. Press the ON/PRINT key to add the current load to the weight accumulator.
3. The display briefly shows the message "ADDED" and then automatically returns to the weighing mode.
4. If a printer is installed, a printout will be made. The gross, net and tare weights are totaled.
5. No weight can be recorded twice. The system needs to be returned to the net zero-range before another weight can be added.
6. The subtotal can be checked by pressing the ON/PRINT key for 3 seconds.
   The display shows the net total weight and the number of weightings totaled so far repeatedly for 3 seconds.
7. If the PRINT key is pressed briefly during this period, the total is printed (if option is installed) and reset to 0.
8. If the PRINT key is pressed and held for 3 seconds during this period, the total is reset but not printed.
9. If no key is pressed during this period, the subtotal stays in memory and the system returns to the weighing mode after 60 seconds.

<u>**Printer**</u>

If the weighing system has been equipped with a printer, then weighing and time & date data can be printed.

Here is an example of a possible printout:

```
ID.NO.              123456
DATE                01/28/11
TIME                10:23 AM
GROSS                1067 lb
TARE                   67 lb
NET                  1000 lb
PCS                  1000
```

NOTES:
1. Some fields may not appear on your printout, depending upon your configuration settings

2. The TARE and NET fields are printed only when a tare has been established in the system.

<u>**Adjusting the Time and Date on the Printout**</u>

Your indicator will keep track of the current time and date for you, which can then be printed on the print ticket. To adjust the time and date, you must first enter the User Menu Mode.

1. Switch off the RF digital indicator by pressing and holding down the ZERO/OFF key for about 5 seconds.

2. Press and hold down the ON/PRINT key (about 20 seconds) until the screen shows "-F-".

3. Press the ON/PRINT (right) key once. The screen displays "-A-".

4. Scroll down using the ZERO/OFF (down) key to reach the parameter level. The scale shows "A   1".

5. Move from A1 to A20 by pressing the TARE (left) key repeatedly until the screen shows "A 20".

6. Once you have arrived at A20 press the ZERO/OFF (down) key once. The screen displays "ho_xx" where 'xx' is the current hour, e.g. "15". One digit will be flashing.

7. Use the four directional keys to adjust the displayed value to the actual hour value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

8. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "n¬_xx" where 'xx' is the current minute, e.g. "55". One digit will be flashing.

9. Use the four directional keys to adjust the displayed value to the actual minute value. In-crease the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

10. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "dA_xx" where 'xx' is the current day of the month, e.g. "14". One digit will be flashing.

11. Use the four directional keys to adjust the displayed value to the actual day value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

12. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "n¬_xx" where 'xx' is the current month of the year, e.g. "02". One digit will be flashing.

13. Use the four directional keys to adjust the displayed value to the actual month value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

14. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "yE_xx" where 'xx' is the current month of the year, e.g. "11". One digit will be flashing.

15. Use the four directional keys to adjust the displayed value to the actual year value. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.

16. After entering the exact value, press the NET/GROSS key to save the value and revert back up to the parameter level, e.g. "A   20".

17. In order to save all parameter settings, it is imperative to exit all menus in the following manner: At the parameter level, press the UNITS (up) key twice (two times) to exit the User Menu. The indicator displays 'SAvE' and then automatically powers off.

Set Point Control (RELAY OPTION)

This mode requires an optional relay board. This mode of operation is enabled by setting F30 to "6" in the Setup Menu (see separate installer's guide for more information). The mode allows you to add two ingredients to a mixture by weight or signal that a target weight has been reached.

The weight of each ingredient to be added to the mixture is called a set point. The set points can be entered from the front panel of the indicator.

Optional relay technical specifications: Type: Zettler AZ833-12DE
Coil voltage: 12VDC
Switched capacity: max. 30VDC/2A
The choice of relay application is made when the system is ordered and the application is selected in the parameter menu (see separate installer's guide for more information).

The instructions for use depend on which application is chosen.
Three different applications are possible;
       1 – Unlatched target weight signal (one set point)
       2 – Latched dosing/filling with manual start (two set points)
       3 – Latched dosing/filling with auto start and (two set points)

<u>Target weight signal</u>

In this application, relay 1 is activated as soon as the gross or net weight value exceeds the set-point 1 value. Conversely, relay 1 is de-activated as soon as the gross or net weight value drops below the set-point 1 value. In this application, the set-point value is an absolute value.

To enter a new set point value:
1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Press NET/GROSS to accept the old value.
3. The set-point value is activated and the display returns to the weighing mode.

Or
1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Use the four directional keys to adjust the displayed value to the actual set point. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.
3. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "SET" briefly. The set-point value is activated and the display returns to the weighing mode.

<u>Dosing/filling with manual start</u>

In this application, relays 1 and 2 are switched on as soon as the TARE key has been pressed
NOTE: set-point values must have been entered already.

To enter new set-point values:

1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Press NET/GROSS to accept the old value.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 2 is on.
3. The set-point value is activated and the display returns to the weighing mode.

Or
1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Use the four directional keys to adjust the displayed value to the actual set point. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.
3. After entering the exact value, press the NET/GROSS key to save the value.
   The pointer for set-point 2 is on.
4. After entering the exact value, press the NET/GROSS key to save the value. The screen displays "SET" briefly. The set-point value is activated and the display returns to the weighing mode.

Filling:

1. Place an empty container onto the scale.
2. Press the TARE key.
   The display shows the net value and the pointers stp1 and stp2 are on.
   Relays 1 and 2 are closed.
3. As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.
4. As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.
5. The display shows "done" for a few seconds and then returns to the normal weighing mode.
   The net weight is displayed. A printout may be made at this point.

Cancel the filling procedure at any time by pressing the NET/GROSS key (see Cancelling the dosing or filling).

Dosing:

1. Place a full container on the scale.
2. Press the TARE key.
   The display shows the net value and the pointers stp1 and stp2 are on.
   Relays 1 and 2 are closed.
3. As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.
4. As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.
5. The display shows "done" for a few seconds and returns in the normal weighing mode.
6. The net weight is displayed. A printout may be made at this point.

Cancel the filling procedure at any time by pressing the NET/GROSS key (see Cancelling the dosing or filling).

The printout will show the following:
- The gross weight is the weight of the container with rest material.
- The tare weight is the weight of the container with material before dosing.
- The net weight will show a minus sign as token of weight being removed from the scale.

Dosing/filling with automatic start

In this application, set-point 1 and 2 are switched on as soon as the set-point values have been entered.

Attention: The tare action is done automatically in this mode. Be sure the container is in place before starting!

To enter new set-point values:

1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Press NET/GROSS to accept the old value.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 2 is on.

3. The set-point value is activated and the display returns to the weighing mode.

Or

1. Press the NET/GROSS key.
   The display shows the last entered value with the left digit blinking. The pointer for set-point 1 is on.
2. Use the four directional keys to adjust the displayed value to the actual set point. Increase the flashing digit by pressing the UNITS key. Decrease the flashing digit by pressing the ZERO/OFF key. Pressing the TARE key or the ON/PRINT key will change the position of the flashing digit.
3. After entering the exact value, press the NET/GROSS key to save the value. The pointer for set-point 2 is on.

4. After entering the exact value, press the NET/GROSS key to save the value.
   The screen displays "SET" briefly.
   The set-point value is activated and the display returns to the weighing mode.
   The display shows TARE and the indicator automatically tares out the scale after the scale has been stable for a few seconds.

Filling & Dosing:

1. The display shows the net value and the pointers stp1 and stp2 are on.
   Relays 1 and 2 are closed.

2. As soon as set-point 1 is reached, pointer stp1 will turn off and relay 1 will be opened.

3. As soon as set-point 2 is reached, pointer stp2 will turn off and relay 2 will be opened.

4. The display shows "done" for a few seconds and then returns to the normal weighing mode. The net weight is displayed. A printout may be made at this point.

Cancel the filling or dosing procedure at any time by pressing the NET/GROSS key (see Cancelling the dosing or filling).

The printout will show the following:
- The gross weight is the weight of the container with rest material.
- The tare weight is the weight of the container with material before dosing.
- The net weight will show a minus sign as token of weight being removed from the scale.

Cancelling the dosing or filling

Cancel the filling or dosing procedure at any time by pressing the NET/GROSS key.

1. Press the NET/GROSS key to stop the procedure.
   The display shows "stop" and the relays are opened.
   Pointers stp1 and stp2 will be turned off.
2. Press NET/GROSS to start the procedure again.
   The display message "stop" is cleared and the net weight is displayed again.
   The relays are closed. Pointers stp1 and/or stp2 will be turned on.
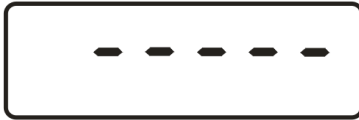
Or

1. Press the NET/GROSS key to stop the procedure.
   The display shows "done" for a few seconds and will return in the normal weighing mode.
   The net weight is displayed.

ERROR MESSAGES

 Indicates that the weighing capacity of the scale has been exceeded.

 Indicates that the weight on the scale is negative. Press the **Zero/Off** key.

 TI-500 RFTM #1 not found; ensure that it is powered ON or move it closer to the digital indicator. **WIRELESS SYSTEMS ONLY**

 NOTE: Dual systems only
TI-500 RFTM #2 not found; ensure that it is powered ON or move it closer to the digital indicator. **WIRELESS SYSTEMS ONLY**

 TI-500 RFTM #1 batteries have been depleted and need to be replaced. **WIRELESS SYSTEMS ONLY**

 TI-500 RFTM #2 batteries have been depleted and need to be replaced. **WIRELESS SYSTEMS ONLY**

 Both TI-500 RFTM #1 *and* #2 batteries have been depleted and need to be replaced. **WIRELESS SYSTEMS ONLY**

 Battery in TI-500 RF indicator need to be recharged or replaced.

 Battery in digital indicator need to be recharged or replaced *and* TI-500 RFTM #1 batteries need to be replaced.

 Battery in digital indicator need to be recharged or replaced *and* TI-500 RFTM #2 batteries need to be replaced.

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Battery in digital indicator need to be recharged or replaced *and* both TI-500 RFTM batteries need to be replaced.

Err 24	Value for SP1 is greater than value for SP2.
Err 99	Parameter menus blocked. Toggle calibration switch back to its original position.
No-ad	Weighing platform not detected

SPECIFICATIONS

Digital Indicator Specifications – TI-500 RF
- Aluminum/ABS enclosure
- 0.8", 6 digit LCD w/LED backlight
- Operating temperature 14℉ to 104℉ (-10℃ to 40° C)
- External DSUB9 connection port for optional printer
- Tilt adjustable bracket included

Digital Indicator Specifications – TI-500 RF SS
- Stainless steel enclosure
- 0.8", 6 digit LCD w/LED backlight
- Operating temperature 14℉ to 104℉ (-10℃ to 40° C)
- Internal connection port for optional printer
- Tilt adjustable bracket included

Bluetooth Specifications
- 2.0, Class I
- Up to 100m unobstructed
- (ISM) band at 2.4 to 2.485 GHz

Digital Indicator Battery – TI-500 RF
- 4 AA alkaline
- User replaceable
- 85+ continuous hours of operation under typical operating conditions

Digital Indicator Battery – TI-500 RF SS
- 6 volt 3 Ah internal rechargeable lead acid battery
- 115+ continuous hours of operation on full charge under typical operating conditions

OPTIONAL TI-500 RFTM Battery Holder
- Holds 1.5 volt x 4 "C" alkaline
- User replaceable
- 130+ continuous hours of operation under typical operating conditions

TROUBLESHOOTING

Issue / Recommendation

"Low Battery" icon blinks on the digital readout, then the indicator powers off.
Replace or recharge the batteries.

Weight reads out lower at one end of the weighing platform than the other end.
- Check for any type of mechanical binding or impingement of scale that is displaying the lower weight
- Check underneath the scale for any obstructions or foreign debris
- Make sure that the scale feet are not screwed in so far as to restrict downward movement of the scale.
- Adjust platform corners using variable trimmer junction box (if supplied)

Indicator displays six small zeros.
- Scale is overloaded. Remove weight from scale.
- Cut, damaged, loose, pinched cable between indicator and platform or within platform with multiple load cells (*cabled configuration only)
- Load cell damaged on platform
- Internal fault with indicator; call Transcell Tech Support

Scale turns off on its own.
The indicator has a power conservation feature, set to automatically power off the scale after 30 minutes of non-use. If your needs require a different setting, call Transcell Tech Support or installer.

Display is erratic.
- A battery may be fully depleted. If so, this condition can cause erratic displays. Power off the indicator and replace or recharge the battery.
- Check underneath the scale for any obstructions or foreign debris

Transcell Tech Support: (847) 419-9180

Limited 12 month Warranty

This product is warranted by Transcell Technology against manufacturing defects in material and workmanship under normal use for twelve (12) months from the date of purchase. For complete warranty details and service information, please contact us at the address below.

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