



TRANSCELL TECHNOLOGY, INC.



# ***MODEL TI-500 FDI***

**Force Data Instrument**

**Installer's  
Manual**

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## 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.

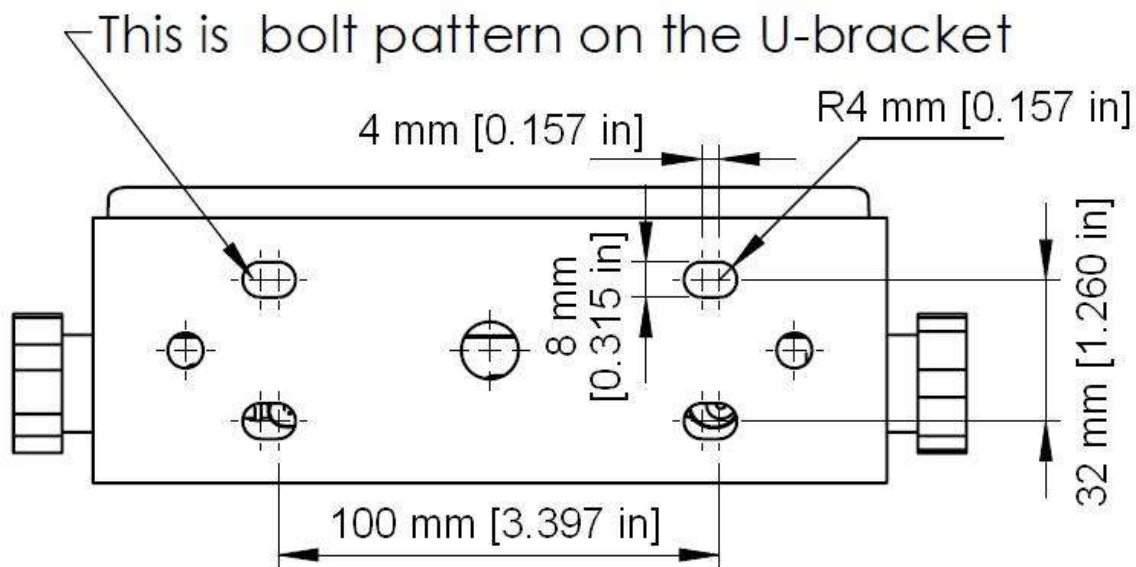
This manual covers the following products:

<i>Model</i>	<i>Display</i>	<i>Enclosure Type</i>	<i>Max. Sampling Rate</i>
<b>TI-500 FDI-01</b>	LCD	Aluminum/ABS	80 Hz
<b>TI-500 FDI-02</b>	LCD	Aluminum/ABS	1200 Hz

This manual covers installation, configuration and calibration of the force data instrument. For operation and troubleshooting, please refer to the separate user's guide.

### Installation of TI-500 force data instrument

Find a suitable location for the instrument 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 force data instrument ships with a force sensor cable which plugs into the appropriate connector. Use the following color codes to connect the force sensor.

#### **Force Sensor Cable Leads**

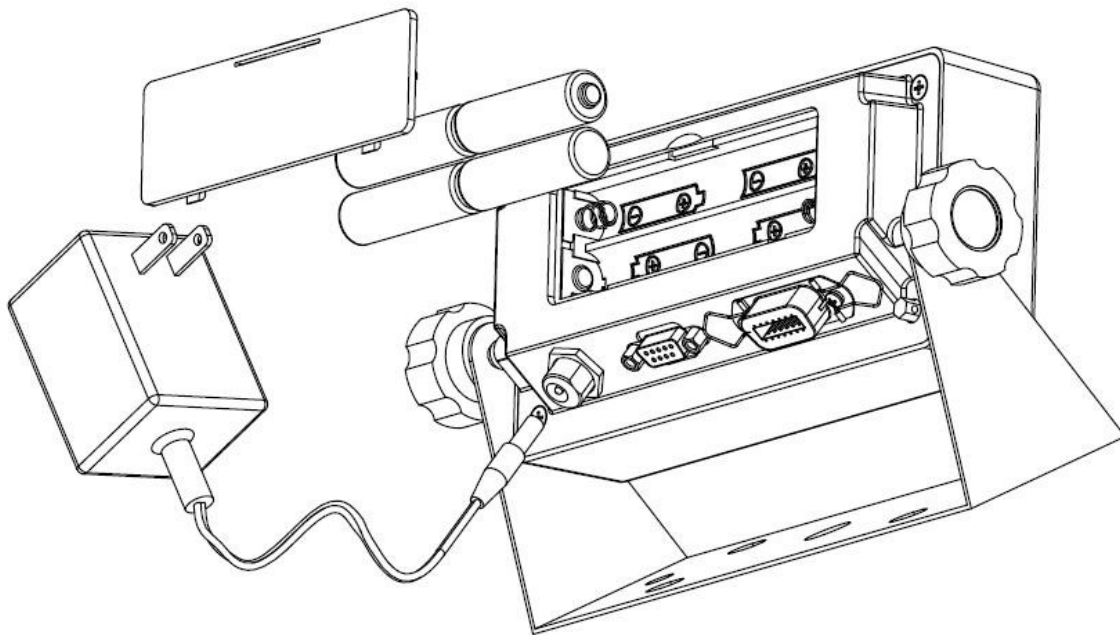
<b>Color</b>	<b>Function</b>		<b>Color</b>	<b>Function</b>
Black	- Excitation		White	- Signal
Red	+ Excitation		Green	+ Signal

The TI-500 force data instrument 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

The TI-500 force data instrument requires 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 force data instrument may also be powered by the included AC wall adaptor included.

#### **Getting Started**

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

Your force data instrument is now ready for configuration and system calibration.

## SYSTEM CONFIGURATION

### Configuration Menus

The TI-500 force data instrument contains three menus to configure the instrument system:

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

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

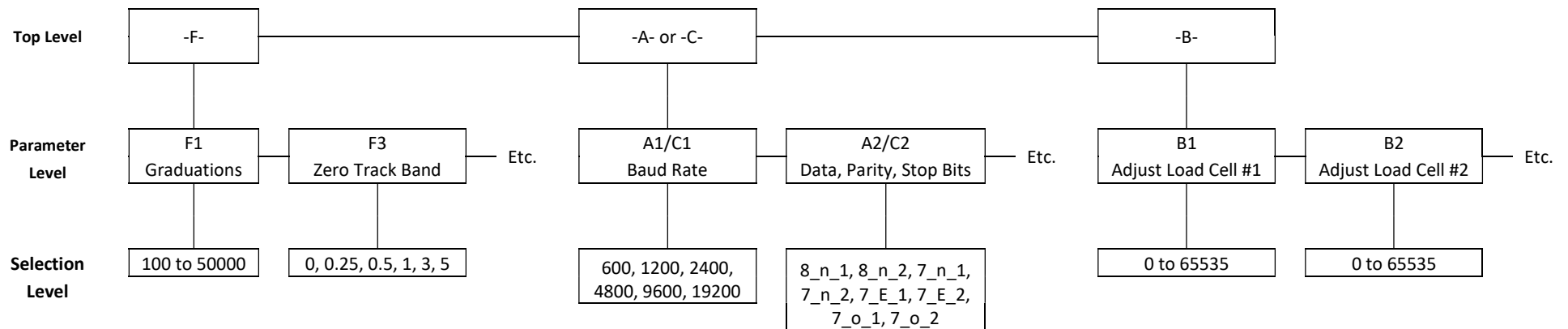
COM1 ("C") Menu – Configures COM1 communication parameters. **NOTE:** This menu will not appear for wireless systems (see F29).

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.



**NOTE:** The -C- menu appears in place of the -B- menu for cabled systems.

## **Entering the Setup ("F") Configuration Menu**

To access this menu, please follow these directions:

1. Switch off the instrument 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 instrument 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 instrument 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. 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 instrument displays 'SAVe' and then automatically powers off.

## **Setup ("F") Menu Descriptions**

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
<b>F1</b> Graduations	Specifies number of full-scale graduations, i.e. capacity / division. Pressing the <b>ZERO/OFF</b> key to scroll down one level begins the sequence.	Key-in 100 - 50000 <b>50000</b> ✓
<b>F2</b> Sampling Rate (-02 Model)	Sets the sampling rate in Hertz (measurements per second). <b>NOTE:</b> This menu is not applicable to wireless systems	Key-in 1.75 – 1200.00 <b>1200.00</b> ✓
<b>F2</b> Sampling Rate (-01 Model)	Sets the sampling rate in Hertz (measurements per second). Use 10 Hz for most applications or 80 Hz for extra fast response time <b>NOTE:</b> This menu is not applicable to wireless systems	<b>10</b> ✓      80
<b>F3</b> Zero Track Band	Selects the range within which the instrument will automatically zero. Note that the instrument must be in standstill to automatically zero. Selections are in display divisions (d).	OFF      0.25d <b>0.5d</b> ✓      1d 3d      5d

CODE/NAME	DESCRIPTION	SELECTION LIST
<b>F6</b> Digital Filter	Averages weight readings to produce higher stability. Lower number provides a faster response. Choose the speed that works best for your application.	0 to 12 <b>8</b> ✓
<b>F8</b> 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	<b>1</b> ✓      2 3      4
<b>F9</b> Display Divisions	Determines the desired weight increments. Value should be consistent with legal requirements.	<b>1</b> ✓ 2 5
<b>F10</b> Decimal Pt.	Determines location of the decimal point.	<b>0</b> ✓      0.0 0.00      0.000 0.0000      00
<b>F11</b> No. of L/C wires	Selects the number of wires on the load cell(s) to be connected to the instrument . Cabled systems only. "4" = four wires                      "6" = six wires (SENSE)	<b>4</b> ✓      6
<b>F13</b> Gravity (g)	Allows you to select the gravity (g) of the location of the instrument system. Expressed in m/s <sup>2</sup> . Pressing the <b>ZERO/OFF</b> key to scroll down one level begins the sequence.	Key-in 9.750 to 9.850 <b>9.797</b> ✓
<b>F15</b> Span Calibration - Negative	Places instrument into the negative span calibration routine. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>F16</b> Zero Calibration	Places instrument into the zero calibration routine. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>F17</b> Span Calibration - Positive	Places instrument into the positive span calibration routine. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>F18</b> 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/OFF key one level begins the procedure. Multi-point cal	Press <b>ZERO/OFF</b> key to begin sequence
<b>F19</b> 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/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>F20</b> Key-in Span	Allows you to key-in span calibration values. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>F21</b> 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 <b>ZE-RO/OFF</b> key twice to execute

CODE/NAME	DESCRIPTION	SELECTION LIST
<b>F22</b> 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. <b>USE WITH CAUTION!</b>	Press the <b>ZE-RO/OFF</b> key twice to execute
<b>F23</b> Full Factory Reset	This sub-menu will reset all system parameters to the default settings. It will not overwrite any previously saved calibration data. <b>USE WITH EXTREME CAUTION!</b>	Press the <b>ZE-RO/OFF</b> key twice to execute
<b>F24</b> Fine Tune 4-20 mA	Actuates the function that allows you to fine-tune the optional 4-20 mA analog output. Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Press the <b>ZE-RO/OFF</b> key to begin sequence
<b>F25</b> Set Point Function	Selects the number of function of the set points and relay outputs.  See user's guide for definitions	0 to 10 <b>0</b> ✓
<b>F29</b> Load Cell Input	Selects the load cell input source.  "AdC" = Internal A/D (cabled), "1rAdlo" = One external wireless A/D module, "2rAdlo" = Two external wireless A/D modules	<b>AdC</b> ✓ 1rAdlo 2rAdlo
<b>F30</b> Special Appli- cation	Used to select one special application feature, subject to local legal requirements.  "0" = None (Gross/Net), , "2" = Remote Display, "5" = Peak Hold, "	0      2 <b>5</b> ✓
<b>F32</b> Center of Zero Band	Selects the range around gross zero within which the instrument will display the Center of Zero annunciator. Selections are in display divisions (d).	<b>0.25d</b> ✓ 0.5
<b>F34</b> 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/OFF key one level begins the procedure.  "0" = Disabled	Key-in 0 - 100  <b>1</b> ✓
<b>F35</b> Default Units Mode	Selects the power up units mode. Scrolling down with the ZE-RO/OFF key one level begins the procedure.  "1" = Pounds (lb), "2" = Kilograms (kg), "3" = ounces (oz), "4" = grams (g), "5" = Newtons	<b>1</b> ✓      2 3      4 5
<b>F36</b> Default Peak Mode	Selects the power up peak mode. Scrolling down with the ZE-RO/OFF key one level begins the procedure.  "rEAL" = Live, "HoLd P" = Positive Peak, "HoLd U" = Negative Peak	<b>rEAL</b> ✓ HoLd P HoLd U



### **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 force data instrument 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 instrument 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 instrument 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 instrument 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
<b>A1/C1</b> Baud Rate	Selects the baud rate for data transmission through the serial port.	600, 1200, 2400, 4800, <b>9600</b> ✓, 19200, 38400, 57600, 115200
<b>A2/C2</b> 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	<b>8_n_1</b> ✓ 8_n_2 7_n_1 7_n_2 7_E_1 7_E_2 7_o_1 7_o_2
<b>A3/C3</b> 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	<b>0</b> ✓ 1 2
<b>A4</b> MP-20 Print Header	Tells MP-20 printer to print the header information. Valid only when <b>A6</b> is set to "2" or "4". "0" = Do NOT Print Header      "1" = Print Header	0 <b>1</b> ✓
<b>A5</b> Units Key	Selects function of the Units key. <b>NOTE:</b> The UNITS key will not function if ounces or grams are selected for F8. "no" = Disabled "YES" = Enabled	no <b>YES</b> ✓
<b>A6/C6</b> 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	<b>0</b> ✓ ( <b>A6</b> ) 1 <b>2</b> ✓ ( <b>C6</b> ) 3
<b>A7</b> ID Number	Selects the ID number mode. "no" = Disabled "YES" = Enabled	<b>no</b> ✓ YES
<b>A8</b> Set ID Number	Allows you to key-in the ID number. Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Key-in 0 to 999999 <b>123456</b> ✓

CODE/NAME	DESCRIPTION	SELECTION LIST
<b>A9/C9</b> Line Feeds	Allows you to key-in the number of line feeds. Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Key-in 0 to 99 <b>8</b> √
<b>A10</b> Auto Power Off - RF Digital Instrument	Allows you to configure the automatic power off time for the RF force data instrument. Expressed in minutes of inactivity (keys and weighing platform). Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Key-in 0 to 30 <b>30</b> √
<b>A12</b> Backlight Brightness	Selects the brightness of the LCD backlight. Selections are in % of full brightness.	0 (OFF) 20 50 75 <b>100</b> √
<b>A13/C13</b> Handshaking	Selects function of the hardware handshaking. (NOTE: Receive pin is used for handshaking).  "0" = Disabled "1" = Enabled	<b>0</b> √ 1
<b>A18</b> Date	Selects function of the printed date.  "no" = Disabled "YES" = Enabled	<b>no</b> √ YES
<b>A19</b> Date Format	Selects the printed format for date. "USA" = mm/dd/yy    "IntL" = dd/mm/yy	<b>USA</b> √    IntL
<b>A20</b> Set System Time & Date	Allows you to set the system time and date. Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Press <b>ZERO/OFF</b> key to begin se- quence
<b>A22</b> Low Battery Auto Power Off - RF Digital Instrument	Allows you to configure the automatic power off time of the instrument after it enters a low battery condition. Expressed in minutes. Pressing the ZERO/OFF key to scroll down one level begins the sequence.	Key-in 0 to 99 <b>2</b> √
<b>A23</b> Audible Key Feedback	Selects function of the audible key feedback (beeper).  "no" = Disabled "YES" = Enabled	no <b>YES</b> √
<b>A24</b> Diagnostics	Used to access the listed test functions (one at a time). Pressing the <b>ZERO/OFF</b> 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	Press <b>ZERO/OFF</b> key to begin se- quence
<b>A25</b> Decimal Point	Selects printed (not displayed) decimal point character. "0" = Period ('.') "1" = Comma (',')	<b>0</b> √ 1

### **Setting system time and date (A20)**

1. Switch off the instrument 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 instrument 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 instrument 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 NET/GROSS (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 NET/GROSS (Set) key.

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

Key	Keycode
UNITS	1
ZERO/OFF	2
NET/GROSS	3
TARE	4
ON/PRINT	5

### **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 instrument 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 instrument 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 instrument 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
<b>B1</b> 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/OFF key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 <b>1.0000</b> ✓
<b>B2</b> 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/OFF key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 <b>1.0000</b> ✓
<b>B3</b> 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/OFF key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 <b>1.0000</b> ✓
<b>B4</b> 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/OFF key to scroll down one level begins the programming sequence.	Key-in 0 to 6.5535 <b>1.0000</b> ✓
<b>B6</b> Restore factory calibration	Restores factory calibration data. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence
<b>B8</b> 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 <b>3</b> ✓
<b>B9</b> 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/OFF key to scroll down one level begins the programming sequence.	Key-in 0 to 99 <b>10</b> ✓
<b>B10</b> Digital Corner Calibration	Places instrument into the digital corner calibration routine. Scrolling down with the ZERO/OFF key one level begins the procedure.	Press <b>ZERO/OFF</b> key to begin sequence

## SYSTEM CALIBRATION

### Calibration Overview

Digital system calibration is accomplished in two steps: zero calibration (F16) and positive span calibration (F17). A third calibration for negative span calibration is also available via F15. You can calibrate up to 7 points per side.

Here is the recommended sequence for multiple fixtures and multiple calibration points:

1. Put load cell onto test fixture
2. Go to F17 and press the down key; indicator prompts for the first calibration point
3. key in number 111111 and press NET/GROSS key ; indicator will show "FIT" momentarily and then automatically record the fixture reference point
4. Follow F17 procedure as written for up to seven calibration points (do not exit F17)
5. Repeat steps 2 thru 6 for negative span calibration (F15)
6. Put the Loadcell onto the final fixture
7. Go to F16 and perform zero calibration

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 force data instrument by pressing and holding the ON/PRINT 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. Instrument 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 instrument 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 instrument displays 'SAVE' and then automatically powers off.

## **Digital Span Calibration (F15 and F17)**

You must perform each span calibration point from lowest to highest absolute value.

1. Switch off the instrument by pressing and holding the ON/PRINT 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. Instrument shows "F 1".
4. While in the Setup mode, scroll to "**F 17**", and then scroll down once using the ZERO/OFF key to enter positive span calibration menu. The display will momentarily show "**C 1**" for the span calibration point, followed by a value with one flashing digit.
5. Use the four directional keys to adjust the displayed value to 111111 and press the NET/GROSS (Set) key; indicator will show "FIT" momentarily and then automatically record the fixture reference point
6. Place the first test weight onto the load cell.
7. 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.
8. After entering the exact value, press the NET/GROSS (Set) 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.
9. Repeat steps 7-8 for C2 thru C7. At the conclusion of C7, the instrument displays the current gravity settings, e.g. "9.800".
10. 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".
11. Press the NET/GROSS key to revert back up to "F17".
12. Follow Step 4 thru 11 for negative span calibration (F15) if needed.
13. 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 instrument. 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 instrument. 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, you must 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 instrument displays 'SAvE' and then automatically powers off.



### **Digital Zero Calibration (F16)**

1. Switch off the instrument by pressing and holding the ON/PRINT 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. Instrument 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.

### **Key-in Span Calibration (F20)**

1. While in the Setup mode, scroll to "F 20", and then scroll down once using the ZERO/OFF (down) key. The indicator will prompt you to enter the positive rated capacity 'P T'.
2. Use the four directional keys to enter in the actual positive rated capacity value.
3. After setting the exact value, press the NET/GROSS (Set) key to save the value. The indicator will prompt you to enter the positive span in mV/V 'P S'.
4. Use the four directional keys to enter in the actual positive span value.
5. After setting the exact value, press the NET/GROSS (Set) key to save the value. The indicator will prompt you to enter the negative rated capacity 'n T'.
6. Use the four directional keys to enter in the actual negative rated capacity value.
7. After setting the exact value, press the NET/GROSS (Set) key to save the value. The indicator will prompt you to enter the negative span in mV/V 'n S'.
8. Use the four directional keys to enter in the actual positive span value.
9. After setting the exact value, press the NET/GROSS (Set) key to save the value.
10. If the entered values are entered successfully, the display will show "E CAL 1" momentarily before reverting back up to F20.

### **Restore Factory Calibration (B6) – wireless systems only**

**Caution:** This action cannot be undone.

1. Switch off the instrument by pressing and holding the ON/PRINT 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. Instrument 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 instrument 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 instrument 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. To exit without restoring the factory calibration values, press the TARE key; the instrument reverts back up to B6.
10. To restore the factory calibration values, press and hold the NET/GROSS key for 3 seconds; the instrument briefly displays "dOnE" and then reverts back up to B6.
11. In order to save all parameters, 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 instrument 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 ON/PRINT key on the instrument'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 instrument 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 instrument to print the indicated display.

“Z” - This command is sent to the instrument to zero the instrument.

“C” - This command is sent to the instrument 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.

## OUTPUT STRINGS

### TEXT PRINT TICKET

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

ID. NO.	123456
GROSS	25.00 lb
DATE	03/01/2011

#### NOTES:

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

### STRING FORMAT 1 (Condec Demand String)

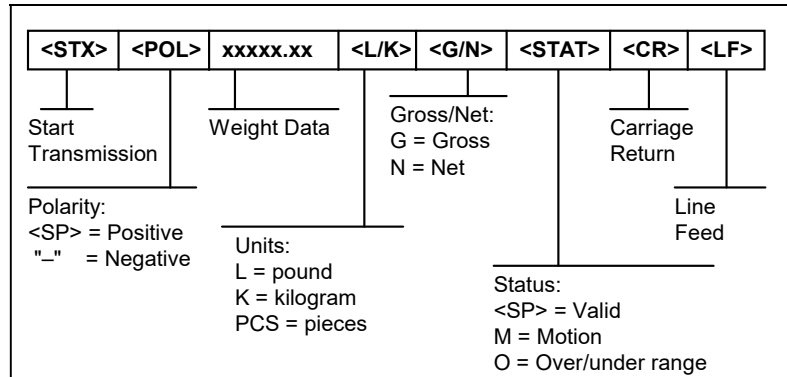
String Format 1 is designed for two-way communication.

<STX>	<POL>	xxxx.xx	<SP>	<LB/KG>	<SP>	<GR/NT>	<CR>	<LF>
Start Transmission		Weight Data	Space		Space		Carriage Return	
Polarity: <SP> = Positive "-" = Negative			Units: LB = pound KG = kilogram pcs = pieces			Gross/Net: GR = Gross NT = Net		Line Feed

**NOTE:** Additional unit is available: NT = Newtons  
oz = ounce  
g<space> = grams  
lb = pounds  
kg = kilograms

## STRING FORMAT 2 (Condec Continuous String)

String Format 1 is designed for one-way communication.



**NOTE:** Additional unit is available: N = Newtons  
O = oz  
G= grams  
L= pounds  
K = grams

Contents subject to change without notice.

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