



TRANSCCELL TECHNOLOGY, INC.

CR-500

Crane Scale

Setup / Operation Manual

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Contents subject to change without notice.

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Electromagnetic Compatibility Statement for North America

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

CHAPTER 1: INTRODUCTION TO THE CR 500 CRANE SCALES

The CR 500 Crane Scale is a general purpose, industrial grade crane scale. A single model is currently available. Table 1-1 shows the CR 500 product matrix.

An internal 12V rechargeable battery is available as the power source.

The Setup (“F”) menu, configures the CR-500 and the User (“A”) menu configures the user options. See chapter 3 for configuration settings. Prior to installing the indicator, please read this manual carefully and completely. Store the manual in a safe and convenient place so it will be available if you have questions concerning the setup and operation of the scale.

MODEL	DISPLAY TYPE	ENCLOSURE TYPE	POWER SOURCE
CR 500	LED	Steel	Internal 12V battery

TABLE 1-1: CR-500 Product Matrix

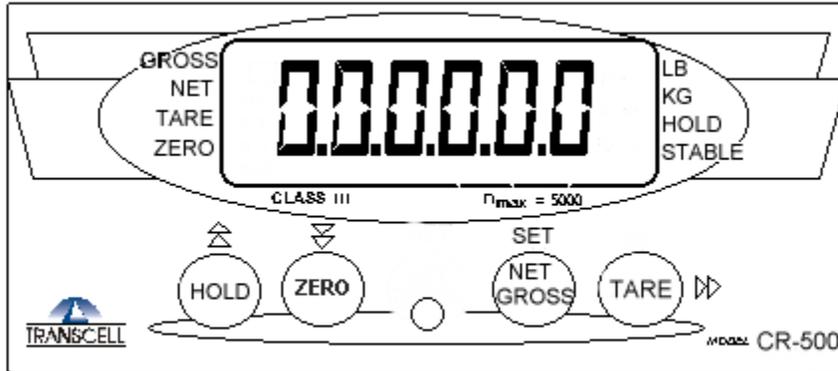


FIGURE 1-1: CR-500

CAPACITY/RESOLUTION
5,000 lb x 2 lb

FIGURE 1-2 CR-500 MODEL CAPACITY

CHAPTER 2: INSTALLATION

2.1 CONNECTING THE POWER SUPPLY

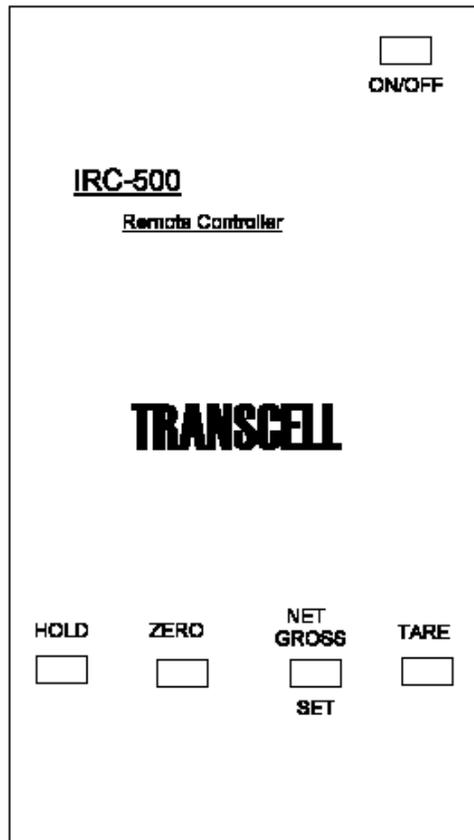
The CR 500 crane scales ship with two 12 volt batteries and a battery charger. Make sure the batteries are fully charged. Recharge time is approximately one hour and battery life under continuous operation is approximately eight hours. Make sure the scale is powered down before attaching or replacing the battery. Remove the battery cover on the back of the scale and connect a battery. Replace the cover and press the power switch also located on the back of the scale.

2.2 POWERING UP THE SCALE & POWERING DOWN THE SCALE

Press and hold the power switch on the back of the scale next to the battery. The scale powers up and begins operation. If the scale does not start at zero weight, press the ZERO key. To turn the scale off, press and hold the ZERO key for three seconds. Make sure the scale is powered down before attaching or replacing the battery.

2.2.1 USING THE SUPPLIED REMOTE CONTROL

The remote control is a “line-of-sight” infrared device. Point the remote directly at the center of the face of the scale. The buttons on the remote operate the same as the keypad buttons. The maximum useable distance is approximately 35 feet.



KEY NAME	FUNCTION
On/Off	Enters and exits sleep mode. <i>Does not</i> power up or down main scale operation.
Hold	Depending on A11, enables peak hold or display hold.
Zero	Zeros weight display and powers down scale if held for three seconds.
Net/Gross Set	Switches between net weight and gross weight. Also used to enter changes in configuration parameters.
Tare	Tares weight.

REMOTE CONTROL

2.2.2 Using the CR 500 Crane Scale

Attach the mounting eye ring located on top of the scale to a secure device such as an overhead crane. Attach the material to be weighed to the hook under the scale. Make sure the safety clasp is securely latched. Slowly lift the load of material. Avoid sudden or jerky motions as this will cause undue strain on the load cell and may cause damage. When the load is completely applied, view the display to see the weight.

2.2.3 Adding a tare weight

If the materials to be weighed require a device to facilitate the “net” weight, attach a lifting aid (sling or other device) to the hook under the scale. Lift the scale to fully support the device and press the TARE key. If the scale is out of reach, use the supplied remote control. The remote control is a “line-of-sight” infrared device. Point the remote directly at the center of the face of the scale. Press the TARE button and the scale displays ZERO and operates in the NET mode. To reset tare weight to zero, remove all weight from the hook and press the tare key.

2.2.4 Switching between net and gross

Using either the keypad on the scale or the remote control, press the NET/GROSS key to switch between net weight and gross weight.

2.2.5 Holding the Peak Weight

Access the A menu and set A 11 to 1. See chapter three. Press the HOLD key on the scale or by using the supplied remote control. The scale momentarily displays HOLD. Use the scale to weight something. The maximum weight registered on the scale will be shown and held on the display. To clear the peak value, press the HOLD key again and the scale returns to regular weigh mode.

2.2.6 Holding the Displayed Weight

Access the A menu and set A 11 to 1. See chapter three. Press the HOLD key on the scale or by using the supplied remote control. The scale momentarily displays HOLD. Use the scale to weight something. The displayed weight registered on the scale will be shown and held on the display. To clear the displayed value, press the HOLD key again and the scale returns to regular weigh mode.

2.2.7 Switching between lb and kg

Press and hold the TARE key for three seconds to switch between lb and kg.

CHAPTER 3 CONFIGURATION

3.1 CONFIGURATION OVERVIEW

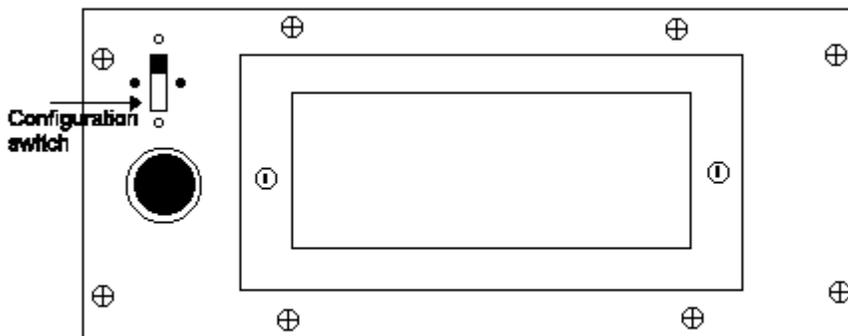
The indicator contains two main setup menus: The Setup (“F”) menu, which configures the indicator to your weigh platform and the User (“A”) menu, which configures the serial communication port and enables some user options. The Setup and User menus consist of several menu selections, each with its own sub-menu of choices.

To set up the indicator, you must first enter the appropriate menu mode. Once there, four of the front panel keys become directional navigators to move around in the menus, and one key is used to save or SET the selections.

3.2 SETUP (“F”) MENU

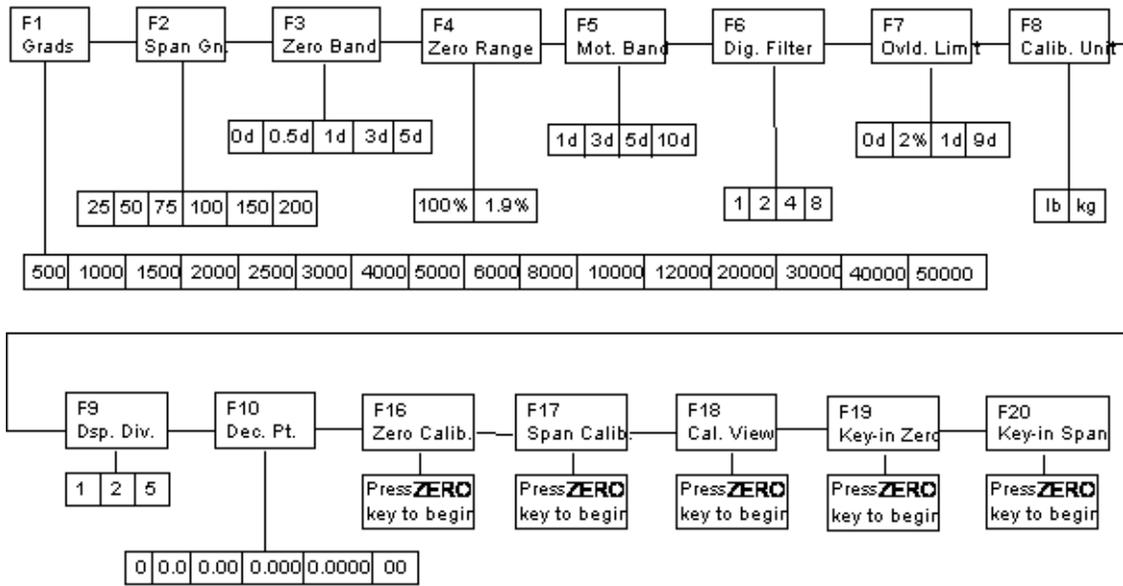
3.2.1 ENTERING THE “F” SETUP MENU

1. Power off the indicator.
2. A metal plate held on by two drilled-head screws conceals the slide switch. Remove the cover and move the switch to the opposite position.
3. Power on the indicator. The indicator shows “F 1” to indicate that you are in Setup Menu mode. Use the RIGHT arrow key (tare) to scroll through the F menu. The “A” menu follows the “F” menu. The entire menu sequence repeats by continuing to press the RIGHT arrow key.



CR-500 Rear view

4. Use the RIGHT arrow (tare) key to change F numbers. The F numbers change sequentially. If you go past the desired F number, keep going through the “A” menu to repeat the list again.
5. To move to the selection level, press the DOWN key (zero) once. The current saved selection is shown.
6. To view the available selections for the current “F” heading, use the RIGHT arrow (tare) key to move through the selection field.
7. To save a new selection, press the SET (net/gross) key. To exit without saving, press the UP arrow (hold) key to return to the current “F” heading.
8. Repeat Steps 1 through 4 until the Setup Menu is programmed.
9. To exit the “F” menu, slide the configuration switch to the original position and the scale returns to normal operation.



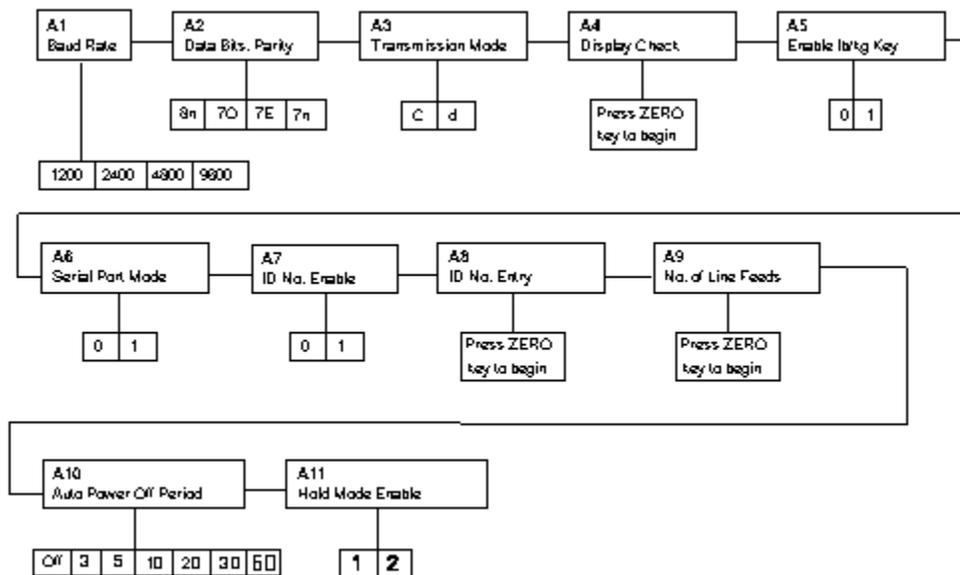
NAME/CODE	DESCRIPTION	CODE/VALUE
F1 Graduations	Specifies number of full-scale graduations. Value should be consistent with legal requirements and environmental limits on the useful system resolution.	500 1,000 1,500 2,000 2,500 3,000 4,000 5,000 ✓ 6,000 8,000 10,000 12,000 20,000 30,000 40,000 50,000
F2 Span Gain	Span Gain is related to A/D integration time. The larger the span gain, the higher the internal resolution, but the slower the update speed. Note that the scale must be re-calibrated whenever this parameter is altered. See Appendix C for more information.	25 50 75 ✓ 100 150 200
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.	0d 0.5d ✓ 1d 3d 5d
F4 Zero Range	Selects the range within which the scale may be zeroed. Note that the indicator must be in standstill to zero the scale.	100% ✓ 1.9% <u>TI-500-SL only</u> 2% 20%
F5 Motion Band	Sets the level at which motion is detected by comparing the present display update with the previous one. If motion is not detected for two seconds or more, scale is in standstill and can process a Print or Zero command. Maximum value varies depending on local regulations.	0.25d 1d ✓ 3d 5d 10d

F6 Digital Filter	Averages weight readings to produce higher stability. The higher the filter setting, the greater the stability but the slower the indicator's response time. Choose 8 unless a very fast response is needed.	1 4	2 8√
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 in primary units.	FS FS + 2%√ 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.	1√ 2	
F9 Display Divisions	Determines the desired weight increments. Value should be consistent with legal requirements.	1√ 2 5	
F10 Decimal Pt.	Determines location of the decimal point.	0√ 0.0 0.00 0.000 0.0000 00	
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.		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. Use the right arrow key to change digit and up/down arrow keys to adjust digit value. Press SET to store.		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. Use right arrow key to select digit and up/down arrow keys to change digit.		Press ZERO key to begin sequence
F21 Factory Reset	This sub-menu will reset all parameters in the "F" and "A" menu to the default settings. USE WITH CAUTION!		Press the ZERO key twice to execute.

3.3 USER ("A") MENU

3.3.1 ENTERING THE "A" USER MENU

1. Enter the Setup ("F") menu as described above in 3.2.1. Scroll past the F parameters to the "A" list.
2. Use the RIGHT arrow (tare) key to select the desired A menu item.
3. Use the DOWN arrow key (zero) to enter the parameter.
4. Use the RIGHT arrow (tare) key to view the parameter selections.
5. Press the SET (gross/net) key to store change or UP arrow ((hold) key to exit without saving.
6. Repeat Steps 2 through 4 until the "A" Setup Menu is programmed.
7. To exit the "A" menu, slide the configuration switch to the original position and the scale returns to normal operation.



Factory-set defaults are shown in bold with a checkmark (✓).

NAME/CODE	DESCRIPTION	CODE/VALUE
A1 Baud Rate	Selects the baud rate for data transmission through the serial port.	1200 2400 ✓ ¹ 4800 9600
A2 Data Bits and Parity	Selects the number of data bits and parity of serial transmission. "8n" = 8 data bits with no parity bit and one stop bit "7O" = 7 data bits with odd parity bit and one stop bit "7E" = 7 data bits with even parity bit and one stop bit "7n" = 7 data bits with no parity bit and two stop bits	8n ✓ 7O 7E 7n
A3 Mode of Serial Transmission	Selects when data will be sent out of the serial port to a printer or computer: "C" = Continuous mode; send data continuously "d" = Demand mode; send data when a PRINT command is issued from the printer, computer, or indicator.	C d ✓
A4 Display Check	Actuates the function that illuminates all digit segments, decimal points, and LCD annunciators in a test sequence. Pressing the ZERO key to scroll down one level begins the test sequence.	Press ZERO key to begin sequence
A5 Disable the lb/kg Key	Allows the lb/kg key to be disabled so that an operator cannot accidentally press the key and change the displayed units. "0" = Disable the lb/kg key "1" = Enable the lb/kg key	0 1 ✓
A6 Serial Port Mode	Selects the mode of the RS-232 serial port: Refer to Appendix B for more information. "0" = Full Duplex Mode "1" = Print Ticket Mode	0 ✓ 1
A7 ID No. Enable	Allows the ID number to be disabled in the Print Ticket mode. Valid only when A6 is set to "1". "0" = Disable the ID No. "1" = Enable the ID No.	0 ✓ 1
A8 ID No. Entry	Actuates the function that allows entry of a new ID No. Valid only when A6 is set to "1". Pressing the ZERO key to scroll down one level begins the sequence.	123456 ✓
A9 No. of Line Feeds	Actuates the function that allows entry of the desired number of line feeds to be printed in Print Ticket Mode. Valid only when A6 is set to "1". Pressing the ZERO key to scroll down one level begins the sequence.	0 - 99 5 ✓
A10 Auto Power Off Period	Selects the auto off time period in minutes: "Off" = Disabled (Always ON)	Off ✓ 3 5 10 20 30 60

NOTE: A 1 to A 9 not available at present time.

A11 Hold Model Enable	Activates the "Hold" mode where weight of the object on the platform is frozen on the display until the applied weight is decreased to one-half of the memorized weight. This is used in conjunction with the Motion Band setting (F5) to capture an unstable load, such as live-stock. "1" = Peak hold, "2" = Hold display	1√ 2
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CHAPTER 4 CALIBRATION

4.1 CALIBRATION OVERVIEW

The indicator is calibrated by following the procedures embedded in F16 (Zero) and F17 (Span) of the Setup Menu. Each procedure enters a value into the indicator's non-volatile memory - F16 the zero value (deadweight) and F17 the span value (test weight). The minimum test weight that can be used is 1% of full-scale capacity. After the two calibration procedures are executed successfully, you should record both calibration values in Table 6-1 using the F18 View procedure.

In the unlikely event that either value is lost while in the field, the setup menu makes provisions for re-entering these values via F19 and F20, thus eliminating the need for re-calibration with test weights.

NOTE: This chapter assumes that the indicator is in Setup ("F") Menu mode. If the indicator is not in Setup Menu mode, refer to Chapter 3 for instructions.

4.2 ZERO CALIBRATION (F16)

1. While in the Setup mode, scroll to "**F 16**", then scroll down once using the DOWN arrow (ZERO) 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.
2. After making sure that there are is no weight on the hook, press the ZERO key again to zero out the displayed value.
3. Press the SET (NET/GROSS) key to save the zero point value. The display will show "**EndC0**" momentarily, then revert back up to F16. At this time, proceed to the F17 span calibration to complete indicator calibration.

4.3 SPAN CALIBRATION (F17)

1. While in the Setup mode, scroll to "**F 17**", then scroll down once using the ZERO key to enter span calibration menu.
2. The display will momentarily show "**C 1**" for the span calibration, followed by a value with one flashing digit. This value will be zero with the Decimal Point parameter selected in F10. Hang the test weight on the hook.
3. Use the four directional keys (shown in Figure 6-1 below) to adjust the displayed value to the actual test weight value. Use the right arrow key (tare) to move to the desired digit and the up/down arrow (hold/zero) keys to select the digit value.

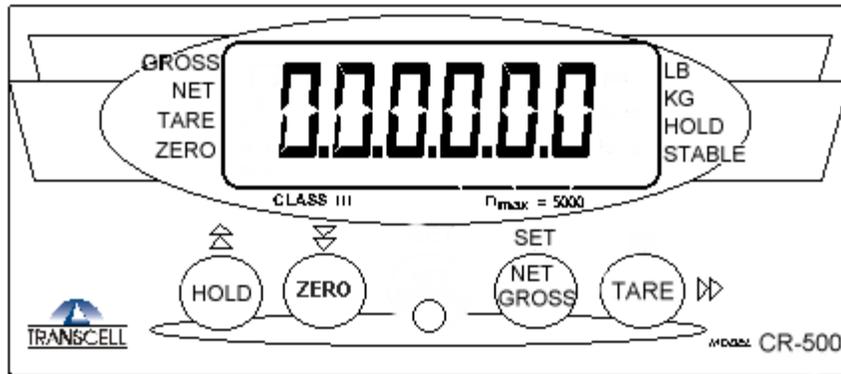


FIGURE 1-1: CR-500

Figure 4-1: Setup Menu Key Assignments

4. After setting the exact value, press the SET (NET/GROSS) key to save the value.
5. If the calibration was successful, the display will show "EndC1" momentarily, then revert back up to F17. At this time it is suggested that the calibration values be recorded for future use (see Section 4.4).
6. If the calibration was *not* successful, one of the error messages below will appear. Take the indicated action to correct the problem, then perform a new calibration.

"Err0" - The calibration test weight or the adjusted 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 adjusted 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" - The internal resolution of the scale is not high enough to accept the calibration value. Select a larger parameter for the Span Gain (F2). SEE APPENDIX C FOR MORE INFORMATION.

4.4 VIEW CALIBRATION VALUES (F18)

Note: The values displayed in this procedure are valid only after a successful calibration has been performed using F16 and F17.

1. While in the Setup mode, scroll to "F 18", then scroll down once using the ZERO key to enter View calibration menu.
2. The display will momentarily show "CAL 0" followed by a value. This value is the **zero calibration value** and should be recorded in the table below. Press any key to continue.
3. The display will momentarily show "CAL 1" followed by another value. This value is the **span calibration value** and should also be recorded in the table below. Press any key to return to upper level (F18).

INDICATOR	ZERO CALIBRATION VALUE	SPAN CALIBRATION VALUE
S/N:		

Table 6-1: Calibration Value Table

4.5 KEY-IN ZERO CALIBRATION VALUE (F19)

Note: This procedure is intended for emergency use only in the case of non-volatile memory loss. A valid zero calibration value, obtained from a successful F16 calibration procedure, must be used.

1. While in the Setup mode, scroll to "**F 19**", then scroll down once using the DOWN arrow (ZERO) key.
2. The display will momentarily show "**CAL 0**", followed by a flashing zero. Use the right arrow (tare) key and the up/down arrow (hold/zero) keys to adjust the displayed value to the zero calibration value.
3. After setting the exact value, press the NET/GROSS key to save the value.
4. The display will show "**E CAL 0**" momentarily, then revert back up to F19.

4.6 KEY-IN SPAN CALIBRATION VALUE (F20)

Note: This procedure is intended for emergency use only in the case of non-volatile memory loss. A valid span calibration value, obtained from a successful F17 calibration procedure, must be used.

1. While in the Setup mode, scroll to "**F 20**", then scroll down once using the ZERO key.
2. The display will momentarily show "**CAL 1**", followed by a flashing zero.
3. Use the right arrow (tare) key and the up/down arrow (hold/zero) keys to adjust the displayed value to the zero calibration value.
4. If the entered value is greater than zero, the display will show "**E CAL 1**" momentarily, then revert back up to F20. If a value of zero is entered, the indicator will briefly show "**Err 5**", then revert back to the screen described above in Step # 2.

APPENDIX A: SPECIFICATIONS

ANALOG SPECIFICATIONS

Full Scale Input Signal	30mV, including dead load
Minimum Sensitivity - Non H-44	0.4 μ V / grad
Input Impedance	30M Ω , typical
Internal Resolution	Approximately 260,000 counts
Display Resolution	5000 display division max
Measurement Rate	10 Meas/sec, nominal
System Linearity	Within 0.02% of FS
Calibration Method	Software Calibration, with long term storage in EEPROM
Excitation	+10 VDC, 1 x 350 Ω load cells

DIGITAL SPECIFICATIONS

Microcontroller	Intel 80C32
Program Memory:	64K x 8, external to μ C
SRAM	256 x 8, internal to μ C
EEPROM:	64 x 16, external to μ C
Digital Filtering	Software selectable

SERIAL COMMUNICATIONS

Serial Port	Full Duplex, 1200, 2400, 4800, 9600 Baud
NOT AVAILABLE	8 data bits, no parity, 1 stop bit
	7 data bits, odd parity, 1 stop bit
	7 data bits, even parity, 1 stop bit
	7 data bits, no parity, 2 stop bits

OPERATOR INTERFACE

Display – LED Indicators	0.56" (14 mm) 7-segment, LED, 6 Digit
Additional Symbols	Net, Gross, Stable, Tare, lb, kg, Zero
Keyboard	4-key flat membrane panel

POWER

Rechargeable Battery	12 V, 1200 mA Lead Acid
Continuous operation time	Approximately 8 hours
Recharge time	One hour

ENVIRONMENTAL

Operating Temperature	-10° to +40° C
Storage Temperature	-25° to +70° C

MECHANICAL

Overall Dimensions (L x W x H)	12" x 10" x 6"
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APPENDIX B: DISPLAYED ERROR CODES

CODE	MODE	MEANING / POSSIBLE SOLUTION
	Normal Operating Mode	Gross Overload. A weight greater than the rated capacity has been applied to the scale. Remove the weight from the platter or try re-calibrating the scale. Otherwise, check for a bad load cell connection or possible load cell damage due to overloading.
Err 0	Span Calibration Mode (F17)	Keyed-in weight value is larger than full-scale capacity. Use a smaller test weight or check keyed-in value.
Err 1	Span Calibration Mode (F17)	Keyed-in weight value is less than 1% of full-scale capacity. Use a larger test weight or check keyed-in value.
Err 2	Span Calibration Mode (F17)	There is not enough load cell signal to produce the internal counts necessary to properly calibrate the scale. First check all load connections. Use F16 mode to view internal counts. See Appendix C for more information.
Err 3	All Modes	Non-volatile memory read error. One or more setup parameters have been lost.
Err 4	All Modes	Non-volatile memory write error. Indicator needs service.
Err 5	Key-in Span Calibration Mode (F20)	You have attempted to enter a zero value for C1. Enter a known calibration value greater than zero.
Err 7	Initialization	No reading from the ADC. Make sure there is a load cell(s) connected to the indicator at start-up.
Err 9	Normal Operating Mode	Span calibration value has been lost. Re-calibrate the scale.
	Normal Operating Mode	Indicates that the battery voltage is too low for normal operation. For alkaline battery units, replace the batteries. For rechargeable battery units, recharge the battery.
Flashes "bAtt"	Normal Operating Mode	Indicates that the battery voltage is too low for normal operation. For alkaline battery units, replace the batteries. For rechargeable battery units, recharge the battery.

LIMITED WARRANTY

Seller warrants that the CR-500 Digital Crane Scale will conform to written specifications, drawings, and other descriptions made by the manufacturer, including any modifications thereof. The Seller warrants the goods against faulty workmanship and defective materials. If any goods fail to conform to these warranties, Seller will, as its sole and exclusive liability hereunder, repair or replace such goods if they are returned within the following warranty period:

Twelve (12) months from date of shipment from manufacturer.

These warranties are made upon the following TERMS and CONDITIONS:

This warranty is limited to the original equipment manufactured by TRANSCCELL TECHNOLOGY, INC. Items not covered under this warranty are batteries and normal wear items like connectors, shrouds, front panels and fuses. For the first sixty (60) days from the date of installation, the warranty covers parts, on-site labor, and limited travel time and mileage. (3 hrs/150 miles maximum per occurrence). After sixty (60) days, the warranty covers the cost of replacement parts only. However, at the discretion and prior approval of TRANSCCELL, certain equipment may be returned, freight pre-paid, for repair, free of any parts or labor charges.

TRANSCCELL's responsibility is confined to repair, replacement or credit of equipment of parts. The warranty does not extend coverage to labor, material, freight or service charges involved in removal, shipping or reinstallation of equipment or parts.

CONDITIONS WHICH VOID LIMITED WARRANTY:

This warranty shall not apply to equipment which:

- A. Examination of such goods discloses that the nonconformity exists and was caused by accident, misuse, neglect, alteration, improper installation improper or unauthorized repair, improper testing, or an act of GOD including lightning and such goods have not been modified, altered, or changed by any person other than the Seller or its duly authorized repair agents.

Transcell Technology, Inc. will have a reasonable time to repair or replace such goods.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SELLER WILL NOT IN ANY EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

IN ACCEPTING THIS WARRANTY, THE PURCHASER OR BUYER AGREES TO WAIVE ANY AND ALL OTHER CLAIMS FOR RIGHT TO WARRANTY FROM TRANSCCELL TECHNOLOGY, INC. SHOULD THE SELLER BE OTHER THAN TRANSCCELL TECHNOLOGY, INC., THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIM OR CLAIMS.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of the Seller.