

DETECTO 750C Clinical Weight Indicator with WiFi Bluetooth User Manual

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INTRODUCTION

This manual is furnished for the 750C Clinical Weight Indicator with the Redbird Wi-Fi and Bluetooth Low Energy (BLE) wireless transmitter inside the weight indicator enclosure. It has been supplied in addition to the 750 Weight Indicator Owner's Manual, 8555-M483-O1, and should be consulted for guidance through setup and operation of the Redbird Wi-Fi and Bluetooth (BLE) wireless transmitter.

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Disclaimer

While every precaution has been taken in the preparation of this manual, the Seller assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from use of the information contained herein. All instructions and diagrams have been checked for accuracy and ease of application; however, success and safety in working with tools depend to a great extent upon the individual accuracy, skill and caution. For this reason, the Seller is not able to guarantee the result of any procedure contained herein. Nor can they assume responsibility for any damage to property or injury to persons occasioned from the procedures. Persons engaging the procedures do so entirely at their own risk.

Contains FCC ID: 2ADHKWINC3400

1. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.
- 2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter. This equipment must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

WI-FI NETWORKING

The wireless transmitter inside the 750C weight indicator enclosure can easily be enabled and configured for use on a Wi-Fi network.

Wi-Fi Features

- Soft Access Point (AP) for setting credentials for Wi-Fi module
- Setup option to select static or dynamic IP address
- · Built-in web server to display weight, height, and BMI
- TCP/IP connection for continuous output of weight, height, and BMI

WI-FI SETUP

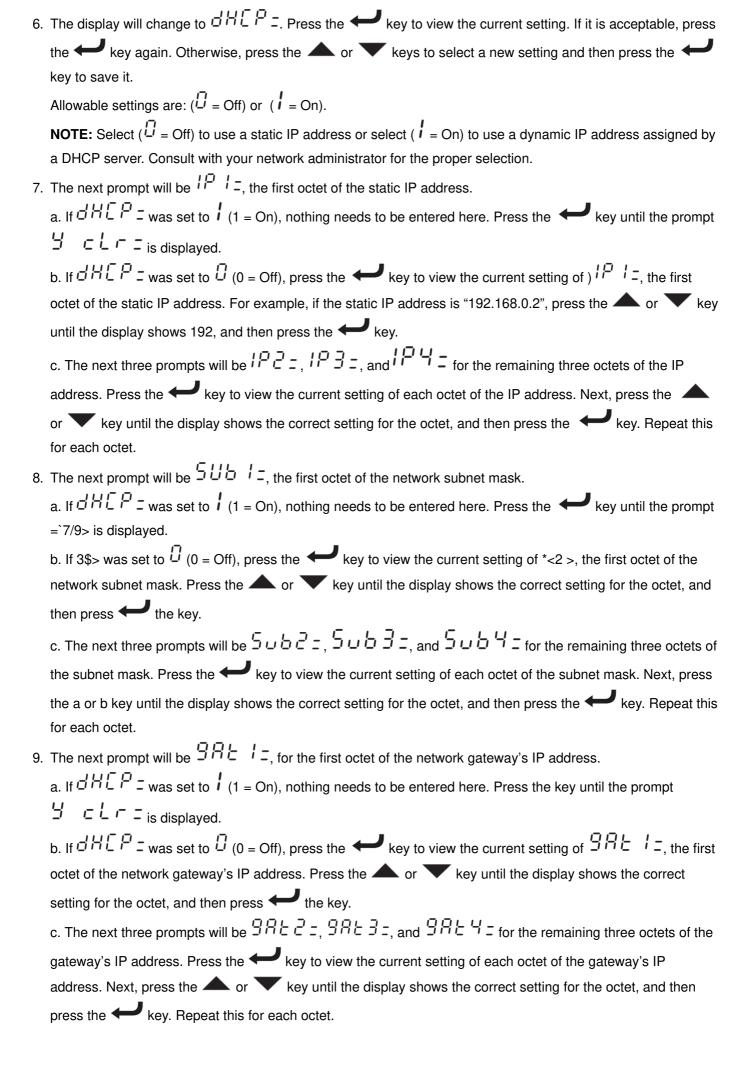
Enable and Configure Wi-Fi Networking

The 750C allows you to view and change network settings without having to perform setup using the calibration switch. The operational settings are entered using the keypad.

- When a prompt is displayed, press the key to view the current setting.
- To retain the setting and proceed to the next prompt, press the key.
- To change a setting, press the a or b keys to select a new setting, and then press the key to save it. **NOTE:** Holding the a or b key down will rapidly increase or decrease the setting displayed.

NOTE: Factory Network Settings are: $b \ L \ E = \ D$, $\exists F \ r = \ D$, and $d \ H \ L \ P = \ I$, ($\ \overline{D} = \ Off \ and = \ On$). To enable and configure Wi-Fi networking:

- 1. With the indicator turned Off, press and hold the key and then press the key to turn the indicator on.
- 2. The indicator will perform a lamp test, display the model number and software revision, and then display the $\Box \Box \Box \Box = \text{prompt}$.
- 3. When the is display showing $PUQ_{=}$, release the \longleftarrow key.
- 4. Next, press the key until the prompt $\frac{1}{2}$ $\frac{1}{2}$ is displayed.
- 5. With the display showing $\frac{1}{2}$ $\frac{1}{2}$ press the key to view the current setting. Press the key to save it.



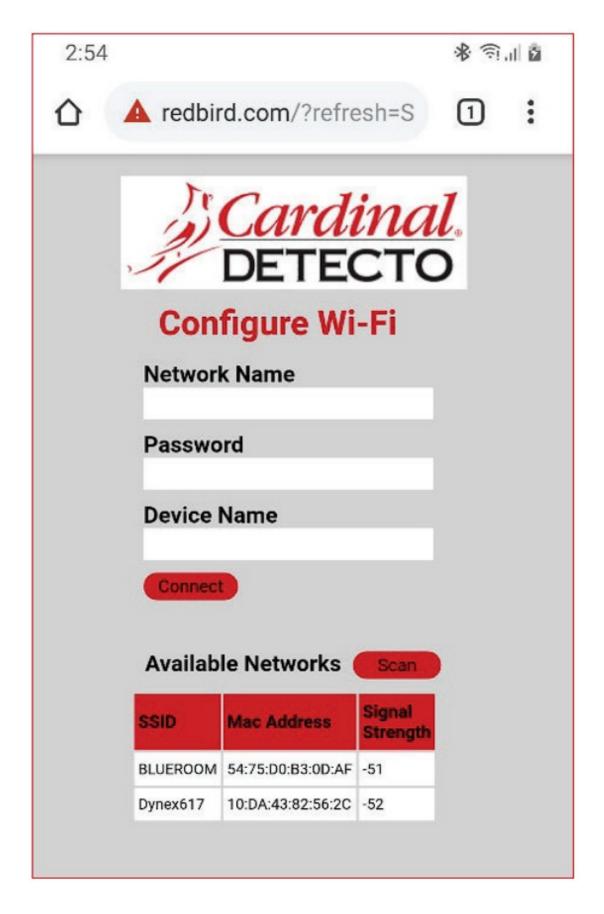
- 10. The display will prompt $\frac{1}{2}$ $\frac{1}{2}$ This is the prompt to clear the Wi-Fi credentials (SSID and password).

 a. To <u>clear</u> the credentials, press the $\frac{1}{2}$ or $\frac{1}{2}$ key until $\frac{1}{2}$ (1 = On) is displayed and then press the key. The credentials will be cleared. The indicator will reset and then display weight. Proceed to the Configure Wi-Fi Network Module section.
 - b. To <u>retain</u> the credentials, press the \frown or key until \Box (0 = Off) is displayed and then press the key. The credentials will be retained. The indicator will reset and then display weight. Proceed to the Configure Wi-Fi Network Module section.

Configure Wi-Fi Network Module

Without Wi-Fi credentials, the Wi-Fi module will enter listening mode, in which it functions as a Wi-Fi access point. The SSID of the AP is of the form "REDBIRD_WIFI_XX:XX", where XX:XX is the last 4-digits of the MAC address. Use a Wi-Fi device, such as a Smartphone, tablet, or laptop to connect to the indicator. If the connection fails, try moving the indicator to another location or turn the indicator off and back on.

When the connection has been made, open a web browser and go to the location <u>redbird.com</u>. The "Configure Wi-Fi" page should appear.



Click on the Scan button to see a list of available Wi-Fi networks.



Enter the Network Name (SSID), Password, and Device Name (optional) for the network you wish to connect to. Note that the Device Name can be anything. Click on the Connect button and the module should try to connect to that network. This may take several seconds. The module will store these network credentials and connect to this network each time the indicator is turned on.

Changing the Network Credentials

To change the network credentials, perform the following steps:

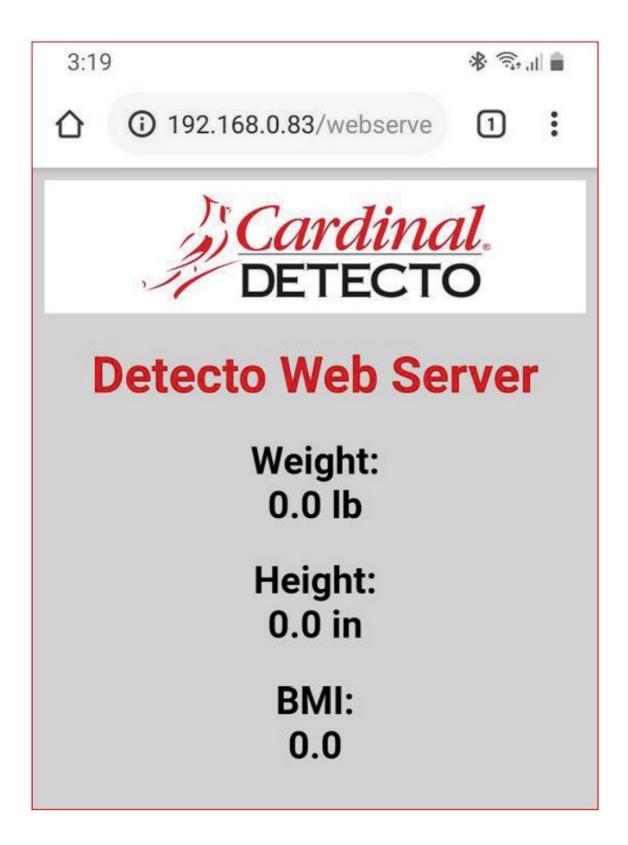
1. With the indicator turned Off, press and hold the key and then press the key.

- 2. The indicator will perform a lamp test, display the model number and software revision, and then display PUD prompt.
- 3. Release the key, and then press the key until the prompt $\frac{1}{2}$ $\frac{1}{2}$ is showing.
- 4. Press the key once again.
- 5. Next, press the \bigcirc or \bigcirc key until (1 = On) is displayed.
- 6. Press the key. This will clear the network credentials.
- 7. Repeat the steps in the previous paragraph to set the new network credentials.

WI-FI OPERATION

Web Server

While the indicator is connected to a network you can access the hosted web page. To view the web page, proceed to the IP address of the Redbird module with "/webserver.html" added to it. For example, if the IP address is "192.168.0.5", enter 192.168.0.5/webserver.html and a page like the following should appear.



TCP/IP Connection

Continuous output is available by TCP/IP connection to the indicator's IP address at port 10001.

- The indicator will transmit a single set of weight data each time the SMA weight request W is received.
- Each time the SMA weight request R is received, the indicator will transmit weight data continually until another SMA command is received.

SMA format for both command <LF>W<CR> and <LF>R<CR>. <LF><s><r><n><m><f><xxxxxxx.xxx><uuu><CR>

LF =	Line feed (hex 0A) = Start of response message
S =	Scale Status definition
	Z = Center of Zero <xxxxxxxxxx>= 0.000</xxxxxxxxxx>
	O = Over Capacity <xxxxxxxxxx>= +weight</xxxxxxxxxx>
	U = Under Capacity <xxxxxxxxxx>= -weight</xxxxxxxxxx>
	E = Zero Error (clears when condition clears)
	<pre><space> = None of the above conditions NOTE: For "E" error condition <xxxxxx.xxx>= (center dashes) and "Z", "O", "U" is overridden</xxxxxx.xxx></space></pre>
r=	Range ("1", "2", "3", etc.) always "1" for single range
n =	Mode of Operation (Gross/Net status)
	G = Gross normal weight
	T = Tare weight (in response to "M" command)
	N = Net normal weight
	g = gross weight in high-resolution
	n = net weight in high-resolution
m =	Motion status
	M = Scale in Motion
	<space> = Scale not in Motion</space>
f =	Future = Reserved for future or custom use

xxxxxxxxx =	Weight with decimal point if necessary
uuu =	Units = e. g. lb, kg
CR =	Carriage Return (hex 0D) = End of response message

SMA Commands

Once a TCP/IP connection has been made to the indicator, you can issue SMA commands to it. The indicator will respond to the SMA commands in the format shown in the Response column of the WI-FI AND BLUETOOTH SMA COMMANDS table on pages 11 and 12 of this manual.

BLUETOOTH LOW ENERGY (BLE)

The wireless transmitter inside the 750C weight indicator enclosure can easily be enabled and configured to connect to a Bluetooth-capable device using Bluetooth Low Energy (BLE). When possible, BLE standard specifications are used (those that are adopted by the Bluetooth SIG).

Custom services were created to request indicator and scale information whose communication protocol was developed by the Scale Manufacturers Association (SMA).

Features Available via BLE

- Device Information Service
 - o Manufacturer Name
 - o Model Number
 - o Software Revision
- · Battery Service
 - o Battery Level Percentage
- · Weight Scale Service
 - o Weight Measurement
 - o Weight Scale Feature
- Custom Services
 - o Detecto SMA Service

Enable Bluetooth (BLE) Networking

NOTE: Factory Network Settings are: $b \ L \ E = 0$, $\exists F \ r = 0$, and $d \ H \ L \ P = 1$, (= Off and = On).

To enable Bluetooth (BLE) networking:

- 1. With the indicator turned Off, press and hold the key and then press the key to turn the indicator on.
- 2. The indicator will perform a lamp test, display the model number and software revision, and then display the
- 3. When the is display showing PUD, release the key.

- 5. With the display showing $\frac{L}{L} = \frac{L}{L} = \frac{L}{L$
- 6. Press the key repeatedly until the indicator resets and displays weight. The indicator is now ready to pair with a Bluetooth-capable device.



Bluetooth Pairing

To pair a Bluetooth-capable device with the indicator, select the name of the indicator from the list of available connections: 750 Scale XX:XX:XX:XX:XX. Note that the X's represents the MAC address of the BLE wireless transmitter in the indicator.

When a stable reading is achieved, and the indicator is paired with a Bluetooth-capable device, the reading will transmit when the connected device sends a request to receive data.

INTERFACING TO BLE

NOTE: 16-bit (4-digit) UUID's are adopted standards. 128-bit (32 digit) UUID's are custom services or characteristics.

Standard Services per Bluetooth SIG

Reference adopted specifications at https://www.bluetooth.com/specifications/gatt

Device Information Service (0x180A)

Characteristics	Number	Value(s)	Attributes
Manufacturer Name St ring	0x2A29	"Detecto"	READ
Model Number String	0x2A24	"750-C"	READ
Software Revision Stri	0x2A28	"1.0.XX" software of indicator	READ

Battery Service (0x180F)

Characteristics	Number	Value(s)	Attributes
Battery Level	0x180F	0x00 – 0x64 (uint16), represents 0 – 100 percent	READ

Weight Scale Service (0x181D)

Characteristics	Number	Value(s)	Attributes
Weight Measurement	0x2A9D	<8bit Flag> <uint16 weight=""><uint16 bmi=""> <uint16 ht=""> Supported Flags: Flag bit0: 0 = SI, 1 = Imperial bit3: 0 = BMI and Height not present 1 = BMI and Height present bit4: 0 = Not below zero* 1 = Below zero* SI: Wt is KG with resolution 0.0005 Ht is meters with re solution 0.001 Imperial: Wt is lbs with resolution 0.01 Ht is inches with resolution 0.1</uint16></uint16></uint16>	READ INDICAT E
Weight Scale Feature	0x2A9E	NOT YET IMPLEMENTED	

- If the weight is below zero (0), the weight you will see is zero (0).
- If the weight is below zero (0), bit 4 of Weight Measurement will be set to 1, otherwise bit 4 is set to zero (0).

NOTE: Maximum weight value displayed is 655.35 in both pounds (lb) and kilograms (kg).

BLUETOOTH INTERFACE STANDARD PROTOCOLS

Bluetooth Characteristic - Weight_Measurement: 0x2A9D

Widely accepted BLE GATT profiles are used to transmit data to other devices/software that have implemented these profiles. Data is passed via BLE using GATT characteristic "Weight Measurement" (0x2A9D) as defined by Bluetooth SIG. Refer to the data table below about Weight Measurement Characteristics.

Weight_Measurement: 0x2A9D

NAM E S	FIELD REQUIREMEN TS	FOR M AT	MIN. VALU E	MAX. VALU E	ADDITIONAL INFORMATION					
					віт	FIELD)			
					D:	C:-		Defi	nition	
					Bi t	Siz e	Name	Ke v	Value	Requir es

						0	1	Measuremen t Units	0	SI (Weight a1d Mass inUnits o fKilogram(kg) and Height in Unitsof Meter) Impeiral (Weight and Mass in Units of P,) und (lb)and Height in Units of Inch	CI C2
Flags	Mandatory	8bit	N/A	N/A				0	iaht inUnits ofi nch (in) False		
					1	1	TimeStamp Present	1	True	C3	
							User ID Pres	0	False		
				2	1	ent	1	True	C4		
					3	3 1	BMI and Hei	0	False		
						'	ght Present	1	True	C5	
					4	1	BelowZero	0	Not BelowZero		
								1	t:lelowLero		
			N/A N/A					s with a resolution of the Flaai field			
Weight	CI	uint16		A N/A	Unit: org.bluetooth.unit.mass.oound						
					Exp	Exponent: Decimal, -3					
						Multiplier: 5					
Weight	•		uint16 N/A N						with a resolut ion the Flaqs field is s		
- Imper		uint16		N/A	Un	Unit: org.bluetooth.unit.mass.oound					
					Exp	ponent	:: Decimal, 02.				

Time St	C3		N/A	N/A	Information: Smallest uni	t in se	econds
amp	03				Unit: ora.bluetooth.charac	cteris	tic.date.time
					The special value of OXF esents "unknown user".	F (25	5 Decimal) for User D repr
					Information: Unit is unitle	ss wit	th a resolution of 1
User ID	C4	uint8	N/A	N/A		Ke y	Value
						25 5	Unknown user
					Unit: oro.bluetooth.unit.uı	nitles	S
					Exponent: Decimal, 0		
					Infor mation: Unit is unitle	ess 'M	lith a resolution of 0.1
ВМІ	C5	uint16	6 N/A	N/A	Unit: oro.bluetooth.unit.ui	nit es	S
					Exoonent: Decimal, -1		
							vith a resolution of 0.001 a the Flaas field is set to 0.
Height- SI	CI C5	uint16	N/A	N/A	Unit: orq.bluetooth.unit.le	ngth.	meter
					Exponent: Decimal, -3		
					Information: Unit is in inclis determined when bit 0		rith a resolution of 0.1 and e Flaas field is set to 1.
Height- Imperial	-	uint16	N/A	N/A	Unit:: ora.bluetooth.unit.le	ength	inch
					Exponent: Decimal, 0-1		

Custom Services

Characteristics	Sub Number	Value(s)	Attributes
Rx Cmd	0001	SMA string received by indicator (up to 20 chars)	WRITE
Tx Cmd	0002	SMA string sent by indicator (up to 20 chars)	NOTIFY

SMA Commands

The SMA commands shown in the WI-FI AND BLUETOOTH SMA COMMANDS table on pages 11 and 12 of this manual can be sent using the Detecto SMA Service's Rx Cmd characteristic (0x907a0001-8699-47dd-ab30-d7aad5f83e54).

Responses will put out a notification on the Tx Cmd characteristic (0x907a0002-8699-47ddab30-d7aad5f83e54).

WI-FI AND BLUETOOTH SMA COMMANDS

The format used to send SMA commands to the indicator is: command <LF>command <CR>

Where "command" is the ASCII letter(s), or the Hex Rep. listed in the table below. For example, <LF>Z<CR> or 0A5A0D would send the command to zero the scale. Note that the response of each command is listed under the Response column of the table.



Any invalid command sent will return a question mark for a response. For example, sending a <LF>XZ<CR> will return 0A 3F 0D (<LF>?<CR>).

Command	Hex Rep.	Response
Z – zero scale	0A5A0D	None. You should see scale zero itself.
D – scale diagnostics	0A440D	0A 20 20 20 0D = means there are no errors, EEPROM error will s how an E in the second space and C will show in the third space if th ere is a calibration error. 20 = SPACE
W – request weight	0A570D	0A 5A 31 47 20 20 30 30 30 30 30 30 2E 30 30 6C 62 0D = Z1G 0000 00.00lb
H – request high resol ution weight	0A480D	0A 5A 31 67 20 20 30 30 30 30 30 30 2E 30 31 6C 62 0D = Z1g 000000.01lb
A – about scale first li ne	0A410D	0A 53 4D 41 3A 32 2F 31 2E 31 0D = SMA:2/1.1
B – about scale scroll	0A420D	Each time sent you will get the next line of information until there is n o longer any information. 1. 0A 4D 46 47 3A 44 65 74 65 63 74 6F 0D = MFG:Detecto 3. 0A 4D 4F 44 3A 37 35 30 2D 43 0D = MOD:750-C 3. 0A 52 45 56 3A 58 2E 58 2E 58 58 0D = REV:X.X.XX 5. 0A 45 4E 44 3A 0D = END: 6. If B is sent again you will get the unknown command response until the A command is sent again. 0A 3F 0D = ?
I – scale information	0A490D	0A 53 4D 41 3A 32 2F 31 2E 31 0D = SMA:2/1.1

Command	Hex Rep.	Hex Rep Response
N – scale information scroll	0A4E0D	Each time sent you will get the next line of scale information until ther e is no longer any information. 1. 0A 54 59 50 3A 53 0D = TYP:S 2. 0A 43 41 50 3A 20 6C 62 3A 36 30 30 2E 30 3A 32 3A 31 0D = CA P: lb:600.0:2:1, this depends on the settings of the indicator. 600.0 - Capacity, 2 - Interval, & 1 - Decimal 3. 0A 43 4D 44 3A 48 5 2 49 4E 58 0D = CMD:HRINX 4. 0A 45 4E 44 3A 0D = END: 5. If N is sent again you will get the unknown command response until I the I command is sent again. 0A 3F 0D = ?
R – Repeat Displayed Weight Continuously	0A520D	0A 5A 31 47 20 20 30 30 30 30 30 30 2E 30 30 6C 62 0D = Z1G 0000 00.00lb, you should get this continuously until another SMA comman d is received.
XB – battery level per centage	0A58420D	0A 38 36 2E 32 35 0D = 86.25

DISPLAY WI-FI AND BLUETOOTH SETTINGS

The 750C Clinical Weight Indicator allows you to easily view the Wi-Fi and Bluetooth Settings without having to perform a calibration switch setup. To display the Wi-Fi and Bluetooth Settings, follow the steps below:

- 2. With the display showing r = 2 press the key to view the Redbird software revision, and then press the key to view the next setting.
- 3. If Wi-Fi is enabled $\frac{1}{2}$, the following settings will be shown:
 - a. With the display showing $\frac{1}{2}$ $\frac{1}{2}$, press the key. The Wi-Fi status Connected or Disconnected (*connect* or *diSCon*) will be displayed. Press the key to view the next setting.

 - c. The next prompt will be $55\ 1d =$, the network name. Press the key to view the **)> setting, and then press the key to view to the next setting.
- 4. The next prompt will be $\frac{1}{2}$ $\frac{1}{2}$

- 5. When the display stops scrolling, press the key. The display will change back to showing live weight.
- 6. The indicator is now ready for normal operation.

then the Wi-Fi module is in listening mode. Refer to the **Configure Wi-Fi Network Module** section for the procedure to set the Wi-Fi credentials.

STATEMENT OF LIMITED WARRANTY

Detecto Scale warrants its equipment to be free from defects in material and workmanship as follows: Detecto warrants to the original purchaser only that it will repair or replace any part of equipment which is defective in material or workmanship for a period of two (2) years from date of shipment. Detecto shall be the sole judge of what constitutes a defect.

During the **first ninety (90) days** Detecto may choose to replace the product at no charge to the buyer upon inspection of the returned item.

After the first ninety (90) days, upon inspection of the returned item, Detecto will repair or replace it with a remanufactured product. The customer is responsible for paying for the freight both ways.

This warranty does not apply to peripheral equipment not manufactured by Detecto; this equipment will be covered by certain manufacturer's warranty only.

This warranty does not include replacement of expendable or consumable parts. This does not apply to any item which has deteriorated or damaged due to wear, accident, misuse, abuse, improper line voltage, overloading, theft, lightning, fire, water or acts of God, or due to extended storage or exposure while in purchaser's possession. This warranty does not apply to maintenance service. Purchased parts will have a ninety (90) day repair or replacement warranty only.

Detecto may require the suspect product to be returned to the factory; item(s) must be properly packed and shipping charges prepaid. A return authorization number must be obtained for all returns and marked on the outside of all returned packages. Detecto accepts no responsibility for loss or damage in transit.

Conditions Which Void Limited Warranty

This warranty shall not apply to equipment which:

- A.) Has been tampered with, defaced, mishandled or has had repairs and modifications not authorized by Detecto.
- B.) Has had serial number altered, defaced, or removed.
- C.) Has not been grounded according to Detecto's recommended procedure.

Freight Carrier Damage

Claims for equipment damaged in transit must be referred to the freight carrier in accordance with freight carrier regulations.

This warranty sets forth the extent of our liability for breach of any warranty or deficiency in connection with the sale or use of the product. Detecto will not be liable for consequential damages of any nature, including but not limited to, loss of profit, delays or expenses, whether based on tort or contract. Detecto reserves the right to incorporate improvements in material and design without notice and is not obligated to incorporate improvements in equipment previously manufactured.

The foregoing is in lieu of all other warranties, express or implied including any warranty that extends beyond the description of the product including any warranty of merchantability or fitness for a particular purpose. This warranty covers only those Detecto products installed in the forty-eight (48) contiguous continental United States.



8555-0547-0M Rev B y 750C Wi-Fi and Bluetooth Manual



Documents / Resources



<u>DETECTO 750C Clinical Weight Indicator with WiFi Bluetooth</u> [pdf] User Manual 750C, Clinical Weight Indicator with WiFi Bluetooth, 750C Clinical Weight Indicator with WiFi Bluetooth, Clinical Weight Indicator, Weight Indicator, Indicator

References

- Oredbird.com
- Specifications | Bluetooth® Technology Website

Manuals+,