

# USER MANUAL



## ***iFinder*** Apex Locator

\*The unit must be installed by a qualified engineer.

\*Only for use by dental professionals.

\*Read this operation manual carefully before installation or operation.



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### **REMARKS:**

**The pictures here are for reference only.**

**Real products shall prevail.**

**The parameters and pictures in this manual are subject to change without prior notice.**

**Please contact sales distributor directly from whom you have purchased this device for user's record and further after-sale service.**

## 1.2. PRODUCT DESCRIPTION

Thank you for purchasing our apex locator. For optimum safety and performance, read this manual carefully before use for operation instruction, care and maintenance. Please keep this user's manual for future reference.

Apex locator iFinder is our latest model with TFT touch-screen used for determining the position of apex of root canal with the up-to-date technology multi-frequency operation system.

### **Distinctive Features:**

- TF card to save data.
- High-precision 4.3" TFT Touch-Screen with 800\*480 Hd display
- It is equipped with separate calibrator test instrument (calibrator) which can check the operation of control part and spare parts of apex locator when apex locator doesn't measure well.
- Touch-screen key and traditional button control both available.

### **Other Features:**

- 4.3" color screen with real-time graphic of root canals.
- Foldable design to create more choices for view angle.
- Up-to-date multi-frequency operating system.
- Rechargeable, do not need prepare extra battery.

## 1.3. SYMBOL DESCRIPTIONS

The following symbols may appear in this manual, on the label, or on it's accessories. Some of the symbols represent standards and compliances associated with apex locator and its use.



Caution: Consult accompanying documents



Date of manufacture.



Manufacturer



Specifies serial number



Type BF applied part



Refer to instruction manual / booklet



Sterilizable up to the temperature specified at most



The device should not be used after the end of the shown or the day



DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.



alarm indicator displayed on the LCD screen



Battery indicator displayed on the LCD screen

## SECTION 2: MAIN TECHNICAL INDEX

1. Classification: Internally powered equipment
2. AC Adapter    Input voltage: 220V /50Hz  
Output voltage: 5V 1A    Battery: 3.7V 2200mAh
3. Display mode: 4.3 "    TFT 800\*480 color screen
4. Dimension: 132\*120\*31mm    5. Weight: about 500g
6. Degree of protection against electric shock



--- Type BF applied part

## SECTION 3: COMPONENTS



- |                      |                      |
|----------------------|----------------------|
| 1. Power on/off      | 2. SD slot           |
| 3. Probe wire socket | 4. AC adapter socket |
| 5. Mode Switch key   | 6. Up key            |
| 7. Down key          | 8. Save key          |

## Accessories:



- A. Probe wire 1 pc  
 C. Stainless hook 4 pcs  
 E. Charger 1pc

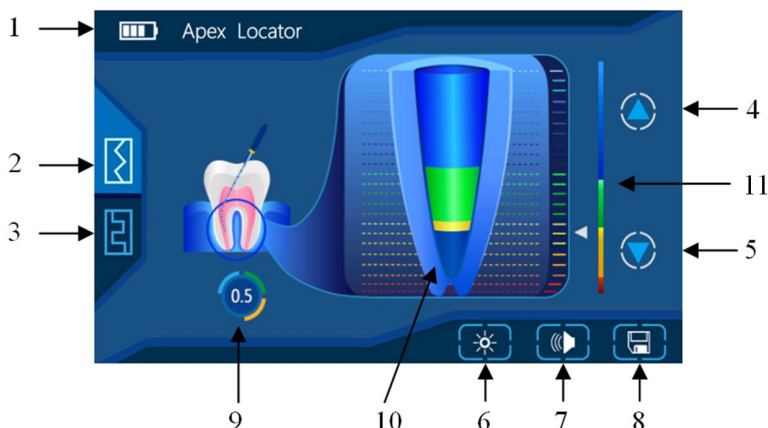


- B. Autoclaved File holder 2 pcs



- D. Test instrument (Calibrator) 1pc

## SECTION 4: LCD SCREEN DISPLAY



1. Battery power indicator

2. Main interface
3. Self-calibration interface
4. Up key for length adjuster of apical constriction
5. Down key for length adjuster of apical constriction
6. Brightness control key
7. Sound adjuster
8. Save key
9. Length between top of file and the apex of root canal
10. Canal length indicator bar
11. Apical line adjuster

## 4.1 Save key

On the **Main Interface**, after insert the TF card, touch save key, as shown in **Figure 1**, it means save successfully. Otherwise, If no TF card inserted or something wrong with TF card, as shown in **Figure 1**, it means save unsuccessfully. Please note: no operation for 3 seconds, it will automatically return to **Main Interface**.

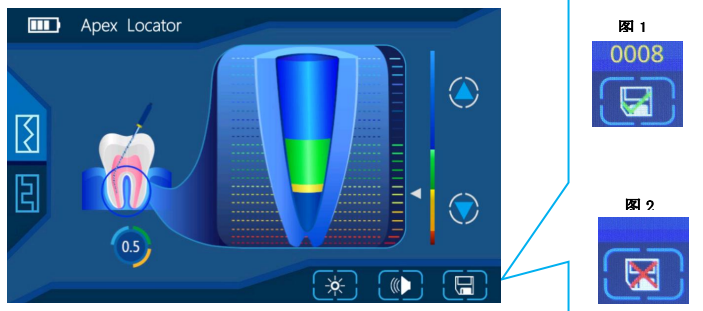
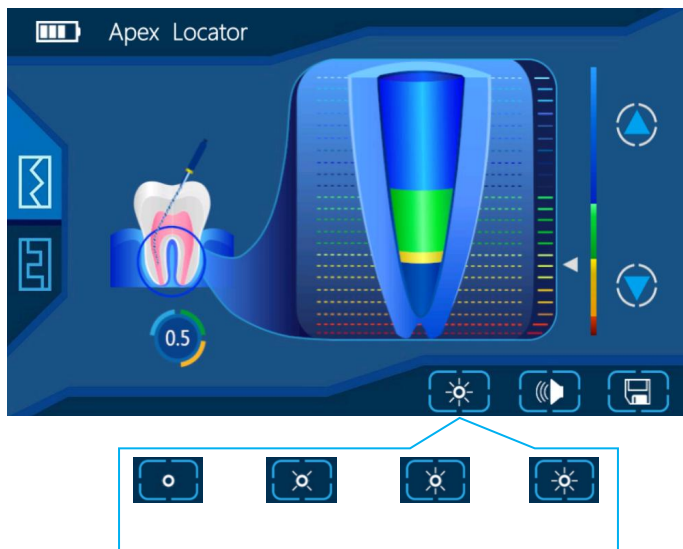


Figure 1

## 4.2 Brightness control key



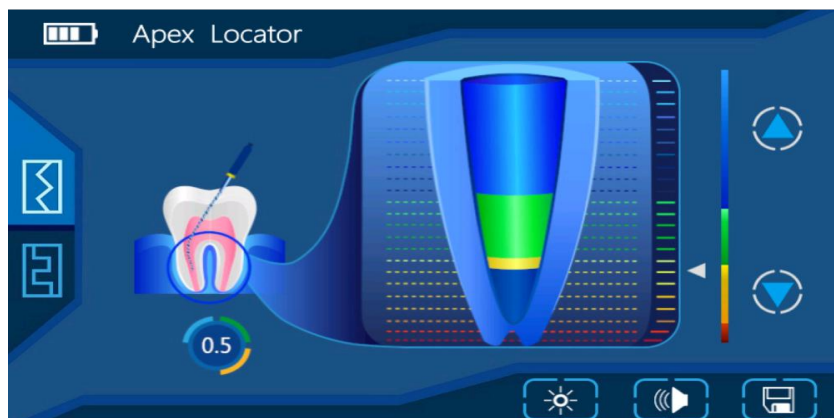
On the **Main Interface**, user can adjust 4 level brightness of the screen by touching the brightness control key. After adjustment, touch the enter key, shown in **Figure 2**, it means set successfully. Please note, no operation for 10 seconds, it will automatically return to **Main Interface**.



**Figure 2**

### 4.3 Sound adjuster

On the **Main Interface**, touch sound adjuster, user can select required volume level, after adjustment, touch enter key, if as shown in Figure 3, it means set up successfully. Please note, no operation for 10 seconds, it will automatically return to **Main Interface**.



**Figure 3**

#### 4.4 Up/Down key for length adjuster of apical constriction

On the **Main Interface**, user can touch up/down key for length adjuster of apical constriction to adjust the apical line.

#### 4.5 Battery sign

The symbol lies on the top left corner of the screen.



Full charge

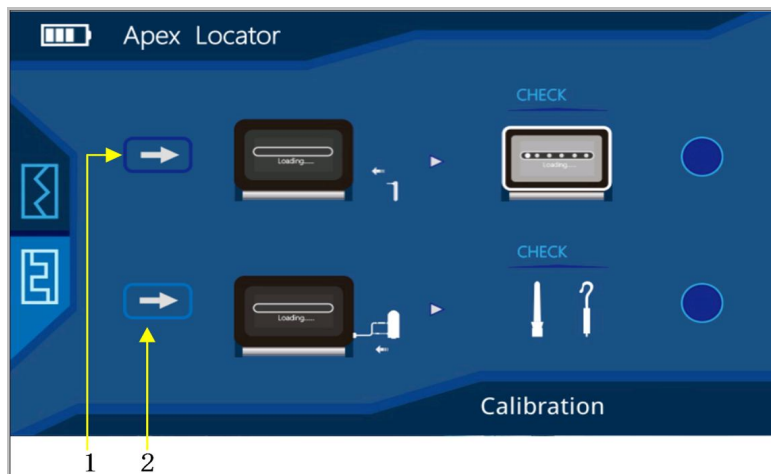


Battery is charging.



When it is flashed, please charge immediately.

## SELF CALIBRATION INTERFACE



MARK 1. Calibration key for control part

MARK 2. Calibration key for accessories (probe wire, file holder, hooks)

1) Self-calibration steps:

Firstly, control part Secondly, accessories

2) The device needs self-calibration for following reasons:

- \* The apex locating result is not accurate.
- \* While the accessories are aging after a long time use.
- \* While replacing new accessories (probe wire, file holder and hooks)

## 4.6 Calibration key for control part

On the **self-calibration interface**, insert the calibrator test instrument into matching socket, touch calibration key for control part (MARK 1), if as shown in Figure 4, it means self-calibrating successfully showing “✓” on the LCD. Otherwise, if as shown in Figure 5, it means self-calibrating unsuccessfully showing “X” on the LCD.

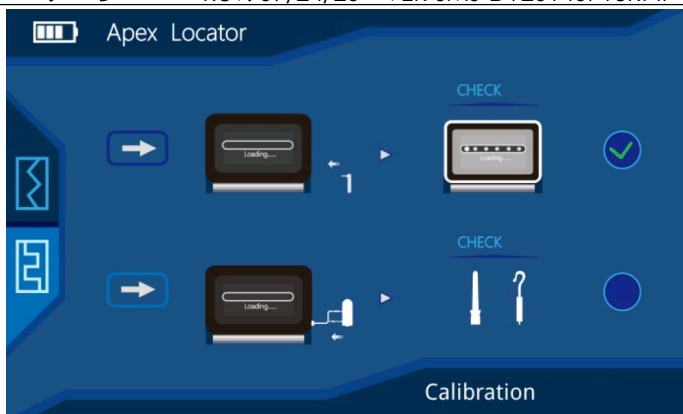


Figure 4

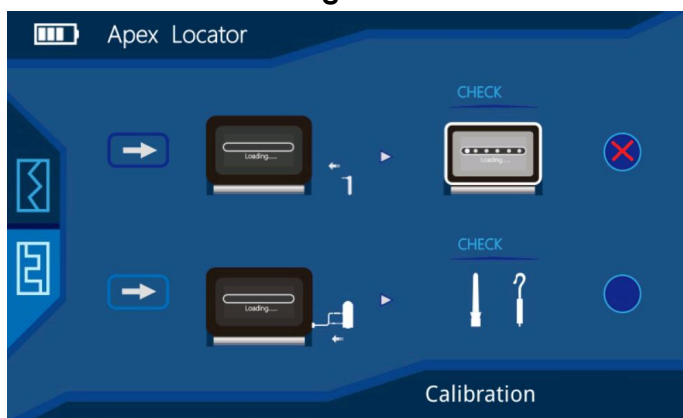
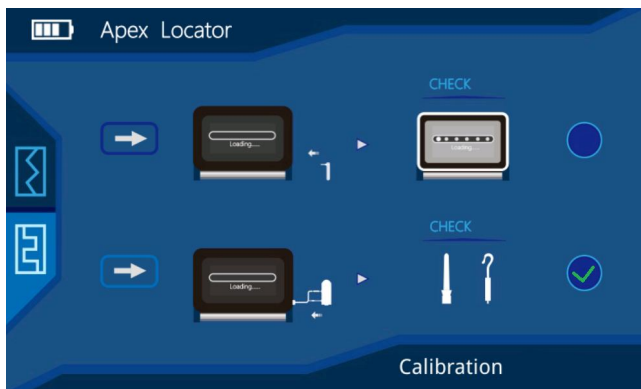


Figure 5

#### 4.7. Calibration key for accessories (probe wire, file holder and hooks)

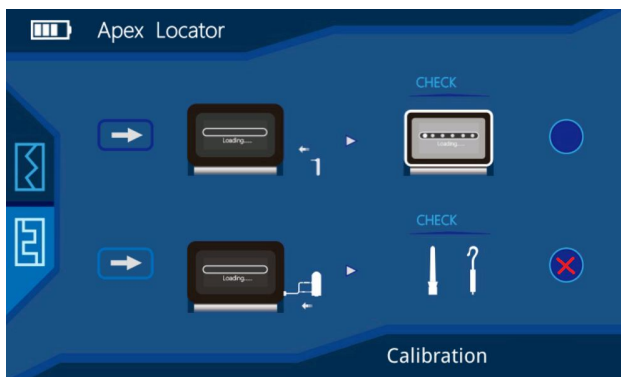
On the **self-calibration interface**, insert the probe wire into matching socket, connect calibrator test instrument with file holder and electrode hook, touch **Calibration key for accessories (MARK 2)**, if as

shown in Figure 6, it means self-calibrating successfully showing “√” on the LCD.



**Figure 6**

If as shown in Figure 7, it means self-calibrating unsuccessfully “X” on the LCD.



**Figure 7**

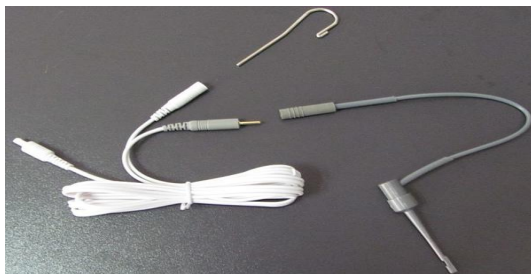
## SECTION 5: OPERATION

Touch-screen key and traditional button control are both available! When first used, insert the calibrator into the device to observe whether the screen display is 0.3 upper and lower two grids, otherwise the machine is defective, and the plug of the cord should be inserted completely into the device.

5.1. The plug of the probe wire should be completely inserted into the socket on the right side of the mainbody (control part).

Note: Do not pull out the probe wire by taking the wire instead of catching hold of the plug to avoid breaking down the probe wire.

5.2. Please connect file holder to probe wire and insert the stainless electrode hook into the socket.



5.3. Long pressing power on/off button,

Note: Long pressing power on/off button for 2 seconds to turn on/off the device.

5.4. Clip the metal part of the endodontic file with the holder, then insert the file into the teeth.

5.5. Hang the stainless hook up at any side of the patient's mouth, insert the file into the teeth, when the endodontic file reaches the position which the number indicated in the color screen is AP. Then please fasten the file with the rubber positioning ring on the reference point of the tooth crest. And this means that the file has reached the position of the apical constriction. (Generally we suggest to use 0.1-AP for measurement the length of root canal).

Note: Please do not make the measurement when in charge.

## 5.6 Deciding the working length of root canal

Measure the distance from the bottom of rubber positioning ring to the tip of the file until the figure indicated AP. So the length of root canal need to minus 0.5~1.0mm is the most suitable working length of root canal.

The working length of root canal varies from different shapes of teeth and root canal.

5.7 After operation, please pull out the probe wire and switch off the instrument. If the dentists forgot to switch off the instrument, the instrument will automatically shut down.

## SECTION 6: SAFETY PRECAUTIONS



### CAUTIONS:

6.1. Before operation, you have to read user manual carefully.

6.2. Like all of the other electric facilities, this device has an electromagnetism disturbance. When there is a patient who is now

using the cardiac pacemaker, or there is an electronic operation, please don't put the machine around. The cardiac pacemaker sufferer, viz. the serious cardiac pulse abnormality sufferer, is forbidden to use this machine.

6.3. Please put in the battery before use. Make sure that the power of the battery is in sufficient supply to guarantee the correct measurement result.

When change the battery, do not mix the old battery with the new one and mix the alkali battery with the manganic one.

Please take off the battery in the event of longtime nonuse or long-distance transit.

6.4. Please use the file with the resin handle rather than mental one. Even when using the file with the resin handle, please notice that the fingers should be avoided touching the mental part of file.

6.5. Please clip the upper portion of the file rather than the down portion with the holder, otherwise, the metal part of the holder and the resin part of the file would be damaged. The damaged holder will affect the measure result.

6.6. When the file accidentally touches the inner part of the root-canal, the reading of scale will get a bit abnormality, then will get right automatically a few seconds later.

6.7. The device is not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or nitrous oxide.

6.8. The enclosure of the main body of device is not designed to give any protection against ingress of water. Please keep the device away from any harmful ingress of water.



## **For ACCURATE MARESUREMENT:**

- Make sure that stainless hook entirely contact patient's mouth mucosa.
- Check all connections
- Make sure that when the device is switched on, the device can complete self-checking procedure automatically and successfully.

When following situations appear, please use paper point part to make root canal dry to increase accuracy of measurement.

- It will cause bad electrical conduction between root canal and metal or dental crown if overfull liquid.

## **Other problems need to check:**

- Make sure that endodontic file was getting through the top hole of the root canal, the loose file will lead to measure incorrectly.
- If the diameter of apical is more than 0.4mm, it will affect the accuracy.
- Complicated root canal environment also will affect the accuracy.
- Make sure that the battery is not too low, or it will lead to faulty measurements.
- Avoiding endodontic file and probe contacting metal prosthesis, or it will form the earth current and lead to inaccurate indicating root tip.
- If the root canal is too dry, please inject the NaOCl into the apical foramen.

## **SECTION 7: MAINTENANCE & SERVICE**

### **7.1. MAINTENANCE**

The device is maintained free of charge and doesn't require any routine maintenance within warranty period. The device cannot be repaired.

Do not modify and disassemble the device.

This device described below has been fully inspected and conforms to the current products specification.

This device is guaranteed for its designated use, against original defects in materials and workmanship for a period of 12 months from date of purchase.

Products warranty or service will not be extended if (1) the product is repaired, modified, misused, disassembled, or using the parts are not provided by the manufacturer, (2) The serial number of the product is defaced or missing.

The guarantee for accessories is 6 months. All accessories of the device are damaged or needed to be renewed, the user can purchase new accessories from the seller.

When the device has not been used for 6 months, please recharge for 5 minutes for restart the battery. If the device does not get into use for very long time, please recharge battery 5 minutes each 3 months.

### **7.2. CLEANING AND DISINFECTION**

#### **MAIN BODY CLEANING INSTRUCTION**

When the surface of main body is polluted, please rub the surface with dry soft cloth ONLY.

REMARKS: Any liquid lotion like ethanol, banana oil and light oil are not allowed.

## **PROBE WIRE CLEANING INSTRUCTION**

Please wipe the probe wire with the soft cloth stained with ethanol and reuse it after it is completely dry.

## **STAINLESS HOOK AND FILE HOLDER DISINFECTION INSTRUCTION**

The front part of the file holder, which is easily get polluted with rubbish and liquid medicine, should be disinfected by the ethanol.

**Stainless electrode hook and file holder should be disinfected at temperature 135 °C for 10 minutes and disinfection by autoclave is preferred.**

## **SECTION 8: TROUBLESHOOTING GUIDE**

**Question: After switch on, the LCD screen has no reaction.**

**Answer:**

- Check that the power of the battery is in sufficient supply.
- Check that hold the power on/off key for at least 2 seconds.
- Check that the device can not be switched on when charging.

**Question: No alarm sound**

**Answer:**

- Check the sound adjustor button of panel on top of unit.

**b. The file has not reached the point less than 2.0 at which the machine will give an alarm.**

**Question: NO changes or incorrect reading on the LCD screen**

**Answer:**

- a. Do not clip the file with the holder firstly and switch on the device secondly.
- b. Remember to hang the stainless electrode hook up at any side of the sufferer's mouth.
- c. Check probe wire connections both at unit and at AC outlet to be sure they are properly seated.
- d. The mental part of the file holder may be polluted or corroded.

**Question:** The device can't be charged normally.

**Answer:**

- a. The charger is not connected properly.
- b. The charger is broken.
- c. The battery is broken.

## **SECTION 9: ENVIRONMENTAL REQUIREMENTS**

### **OPERATING CONDITIONS**

Ambient temperature: 5°C ~ 40°C

Relative humidity range: ≤80%

Atmospheric pressure: 80kPa~ 106kPa

### **STORAGE AND SHIPPING CONDITIONS**

Ambient temperature: -40°C ~ 55°C

Relative humidity range: ≤95%

Atmospheric pressure: 50kPa~ 106kPa

Equipment is not suitable for storage in the presence of sunlight, rain, dust, corrosive gasoline and volatile without poor ventilation.

Transportation is applicable to all common methods.

## WARNING

The device is not repairable by user and contains no user serviceable parts.

No modification of this equipment is allowed.

The user must check that the equipment functions safely and see that it is in proper working condition before being used.

The manufacturer does not require such preventive inspections by other persons.

Table 1

Guidance and manufacturer's declaration - electromagnetic emissions		
The [iFinder] is intended for use in the electromagnetic environment specified below. The customer or the user of the [iFinder] should assure that it is used in such an environment		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The [iFinder] uses RF energy only for its internal function. Therefore, its RF emissions are very low and

		are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class [B]	The [iFinder] is suitable for use in all establishments other than domestic, and may be used in domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded:  <b>Warning:</b> This equipment/system is intended for use by healthcare professionals only. This equipment/ system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the [iFinder] or shielding the location.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Table 2

## Guidance and manufacturer's declaration - electromagnetic emissions

The [iFinder] is intended for use in the electromagnetic environment specified below. The customer or the user of the [iFinder] should assure that it is used in such an environment

Immunity Test	IEC 60601 Test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment. The electrical fast transient burst (EFT) is generated by the switching of inductive loads. Separation between the equipment and other loads shall be considered before installation. Mains filter is required, if necessary.


Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s)	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle  40% $U_T$ (60% dip in $U_T$ ) for 5 cycle  70% $U_T$ (30% dip in $U_T$ ) for 25 cycle  <5% $U_T$ (>95% dip in $U_T$ ) for 5s	<5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle  40% $U_T$ (60% dip in $U_T$ ) for 5 cycle  70% $U_T$ (30% dip in $U_T$ ) for 25 cycle  <5% $U_T$ (>95% dip in $U_T$ ) for 5s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the [iFinder] requires continued operation during power mains interruptions, it is recommended the [iFinder] be powered from an uninterruptible power supply or a battery.
Power frequency (50/60Hz)	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of



magnetic field IEC 61000-4-8			a typical location in a typical commercial or hospital environment.
NOTE $U_T$ is the a.c. mains voltage prior to application of the test level.			

Table 3

Guidance and manufacturer's declaration - electromagnetic emissions			
The [iFinder] is intended for use in the electromagnetic environment specified below. The customer or the user of the [iFinder] should assure that it is used in such an environment			
Immunity Test	IEC 60601 Test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3Vrms 150KHz to 80MHz	3V	Portable and mobile RF communications equipment should be used no closer to any part of the [iFinder], including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.  <b>Recommended separation distance</b>

<p>Radiated RF IEC 61000-4-3</p>	<p>3 V/m 80MHz to 2.5GHz</p>	<p>3 V/m</p> $d = \left[ \frac{3,5}{V_1} \right] \sqrt{P}$ $d = \left[ \frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[ \frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>where <math>p</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in meters (m)</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,<sup>a</sup> should be less than the compliance level in each frequency range.<sup>b</sup></p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
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NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

<sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the [iFinder] is used exceeds the applicable RF compliance level above, the [iFinder] should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the [iFinder].

<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Table 4

## **Recommended separation distances between portable and mobile RF communications equipment and the [iFinder]**

The [iFinder] is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the [iFinder] can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the [iFinder] as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter  W	Separation distance according to frequency of transmitter  m		
	150 kHz to 80 MHz  $d=1.2 \sqrt{P}$	80MHz to 800MHz  $d=1.2 \sqrt{P}$	800MHz to 2.5GHz  $d=2.3 \sqrt{P}$
0,01	/	0.12	0.23
0,1	/	0.38	0.73
1	/	1.2	2.3
10	/	3.8	7.3
100	/	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance  $d$  in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

## WARRANTY REGISTRATION FORM

Item Name: \_\_\_\_\_

Model Name: \_\_\_\_\_

Serial No.: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

