BUG HUNTER

Anti-spy bug detector BugHunter Professional BH-03

OPERATIONS MANUAL

ИНТК.411153.006 РЭ

i4Technology
ЭЛЕКТРОННЫЕ СИСТЕМЫ
СДЕЛАНО В РОССИИ

CONTENTS

Main advantages of BugHunter BH-03 over similar devices

1. The declared and real characteristics of the device are in strict conformity.

2. It covers the entire range of wireless “bugs” working frequencies (from 10 to 3500 MHz).

3. High sensitivity (throughout all the frequencies of the claimed frequency range).

4. Extended dynamic range.

5. It detects both analog and digital wireless bugs (that work on the principle of fast pulses).

6. Automatic adjustment to background radiation levels.

7. OLED-display to provide the visual image of the received signal type and the history of changes within the last 45 seconds.

8. Switchable filters that exclude frequency ranges of base cellular communication stations (GSM900/1800, 3G, 4G, CDMA450), and Wi-Fi (provides successful “bug” hunting in modern city environment, highly contaminated by radio interference). Unique!

9. Vibroindication (switchable) and the possibility to connect the earphones to get the implicit warnings of wireless "bugs".

10. Operating in different modes (sound indication, sound feedback, mute).

11. The possibility to use rechargeable batteries or built-in charger.

12. Search and security operating modes.

13. An additional extendable antenna (to increase the sensitivity).

14. Low battery indicator.

15. Self-diagnosis.

16. The possibility to detect the killers of cellular and other frequencies.

17. Design and manufacturing are made in Russia. Only high-quality components are used during production.

Attention!

Read carefully and follow the rules, restrictions and instructions contained in this manual to increase the lifespan of the equipment and to use it more effectively.

The manufacturer's warranty will become invalid prematurely if the user of the equipment does not follow the storage and transportation instructions.

Attention!

After storing the product in a cold place or transporting in winter the device should be kept at room temperature for two hours before operating.

Attention!

Please request to perform functional testing before purchase. Also make sure that the warranty sticker placed into the battery compartment is not damaged. Check the delivery set against article 1.3.1 of this manual. Ensure the warranty card is signed, dated and stamped.

1 Specification and operation

1.1 Application area

1.1.1 This device allows users to monitor the signal strength ranging from 10 to 3500 MHz and can also be used to detect transmitting devices, such as “bugs”, wireless microphones, wireless spy cams, portable radio sets, working cellphones, cellular signal killers and suppressors, etc., within the area nearby.

1.1.2 Device software provides:

-specially designed algorithm of measuring the digital and analog signal strength and displaying its average and peak values on the time curve;

- sensitivity adjustment (selection of the sensing element’s output characteristics for providing the most convenient detection of local signal peak);

-possibility to work in “security” mode (which includes the adaptation to the ambient background, switching to the standby mode and further exit from the standby mode after when signal sources have been detected, accompanied with sound, visual and vibro indicating);

- displaying of the time based diagram of radio environment;

-minimized impact of the isolated signal sources (such as base cellular communication stations, Wi-Fi access points) on the process of radio transmitting equipment detecting;

-sound indication of the receiving signal’s level;

-vibroindication of exceeding the preset threshold by the average signal (with the vibration intensity control);

-current time indication;

- battery charge level indication.

1.1.3 Device is intended to use at the temperature ranging from -10 to +40°C, the relative moisture below 98% at the temperature of +25°C and at the atmospheric pressure of 84-106,7 kPa.

1.2 Technical features

1.2.1 The Picture 1 below illustrates the physical configuration of the product.

Pic. 1. Physical configuration

1.2.2 The table below gives the information about technical features of the product.

Description	Value
Dimensions, mm, not more than	105x58x18,5
Weight with batteries, kg, max	0,11
DC supply voltage (two AAA batteries), V	from 2,2 to 3,2
Power consumption, W, max	0,6
Working frequency range, MHz	from 10 to 3500
Responsivity with filers switched off, mV / m, min	50
Dynamic range, dB, min	70
Detection range of a radio transmitter with the power of 5 mW, under a quiet radio background, m, min	5
Detection range of an operating cell phone, under a quiet radio background, m, min	50

Frequency ranges of built-in filters, MHz -Wi-Fi -4G -3G -GSM -CDMA	 more than 2400 from 832 to 862 and from 2620 to 2690 from 2110 to 2170 from 925 to 960 and from 1805 to 1880 from 463 to 467,5
Strength loss of output by built-in filters within the preset frequency range, dB, min	15
Continuous work duration (with sound and vibro indication switched off), min: - from 2 alkaline batteries of AAA type GP Ultra - from 2 accumulators of AAA type (2400 mA/h)	 400 500

1.3 Device components

1.3.1 The table below gives the information of components of the product and the delivery set.

№	Description	Quantity	Note
1	**BugHunter Professional BH-03**	**1**	
2	Accumulator of AAA type	**2**	installed
3	Charging unit	**1**	
4	Power cord	**1**	
5	Earphones		
6	Shipping box	**1**	
7	User manual INTK.411153.006 RE	**1**	

1.4 Internal design and operating

1.4.1 Bug Hunter BH-03 is a portable device that has an autonomous power supply. The case made of impact-resistant ABS plastic (item 1) has a battery compartment (item 2) with a battery cover (item 3).There also membrane keyboard with 9 push-buttons (item 4), OLED-display (item 5) and

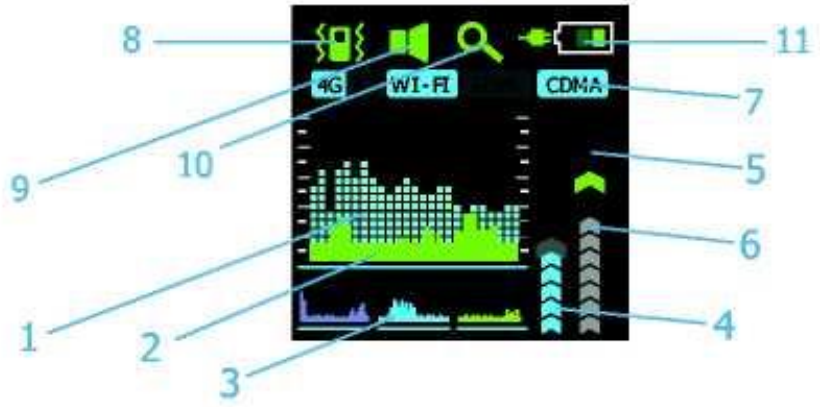
micro-USB connector (item 6) for the charging unit are placed in the case. Picture 2 illustrates the main parts scheme.

Pic. 2. Scheme of main components

1.4.2 Picture 3 illustrates the display in the “search mode”

During the measurement process, the average (item 1) and peak (item 2) values of the received signal strength are being constantly displayed on the screen. The displaying is performed in logarithmic notation, on a selected sensitivity range scale, and as a graph of values for the last 3 seconds. The graph of the average values history for the last 45 seconds (item 3), selected sensitivity level (item 4), vibroindication engagement threshold (item 6) on a scale of a current level of a received signal’s strength (item 5) are also displayed on the screen.

At the same time the device displays on the screen the filter state (switched on/off, item 7), vibroindication state (switched on/off, item 8), adjusted sound mode (mute, sound indication or feedback, item 9), current operating mode (“search” or “security”, item 10), and the selected type of power supply (item 11).



Pic. 3. Screen in the “search” mode

1.4.3 The control buttons are used to:

-turn the device on/off (by holding), and exit from a menu (by short pressing);

-switch to the main settings menu and back (by short pressing);

-navigate through the menu and select values;

-switch between operating modes (by short pressing) and sound modes (by holding);

- gain a quick access to the filter selection menu.

You can learn more about the functions of control buttons below.

1.4.5 The device is powered by two AAA type batteries or two accumulators of the same type. How to install the batteries into the case you can see on the battery compartment’s bottom or in the Picture 4.

Pic. 4. Batteries installation scheme

2 Correct use

2.1 Operating restrictions

2.1.1 Keep the battery compartment and battery contacts clean.

2.1.2 Change discharged batteries and recharge accumulators on time.

2.1.3 Before recharging accumulators installed into the product's case, ensure that there are rechargeable batteries not the galvanic batteries installed. It's prohibited to charge the galvanic batteries, you must renew them.

2.2 Before operating

To prepare the device for working you should:

- loosen the screw and remove the battery compartment's cover (Pic. 2, item 3);
- install the batteries respecting polarities (Pic.4);
- place the battery compartment's cover back and fasten it with screw.

2.3 Intended usage

2.3.1 Turning the device on/off. To turn the device on, press and hold button for 2 seconds. When the device turns on, you'll hear a beep and see the screen saver (Pic. 5).

Pic. 5. Screen saver

The device will switch to the "search" mode and the screen will look like in the Pic. 6.

Press and hold button for 2 seconds again to turn the device off.

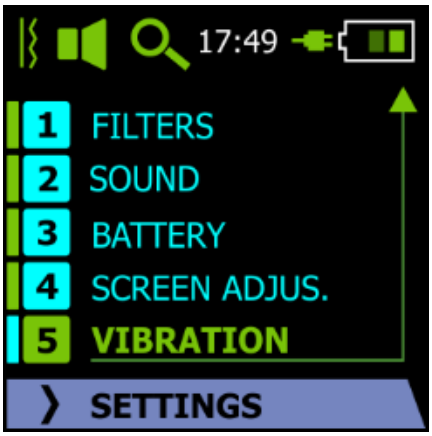
Pic. 6. Screen in the “search” mode

2.3.2 User settings

2.3.2.1 Filters adjustment

This option allows user to reduce the interference of Wi-Fi access points and cellular stations signals, making the search of radio transmitting devices easier.

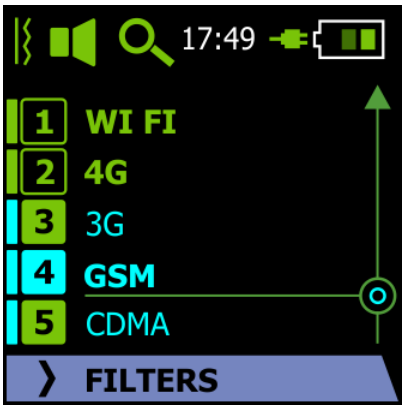
- Press button to display the main menu screen (Pic. 7);



Pic. 7. Main settings menu

- select «FILTERS» bar by pressing «▲» and «▼» and confirm your choice by pressing or «►» button;
- in the opened submenu (Pic. 8) select the filter you need and activate/ deactivate it by pressing (filter marker will change);

- return to the main menu by pressing «◄» button to continue adjustment or to quit right to the "search" mode by short pressing button or button.



Pic. 8. Filters adjustment

Notification:

1. There is button to gain quick access to this option (avoiding main menu).

2. In the "search" mode the filters that have been activated this way glow blue (item7 Pic.8), inactive filers remain grey on the screen.

2.3.2.2 Sound adjustment

This option gives an opportunity of selecting one of three available sound modes:

1) mute (internal speaker produces no sound while searching and setting up the device; while pressing buttons the confirmation sound is not produced also);

2) sound indication (internal speaker produces short sounds in the "search" mode; the sounds are becoming more frequent as the transmitting devices' signal are becoming stronger, i.e. the graphic indication on the display is complemented by sound);

3) sound feedback (internal speaker produces demodulated sound of transmitting devices);

- in main menu (Pic. 7) select "SOUND" bar by pressing «▲» and «▼» and confirm your choice by pressing button or «►», the sound adjustment menu will appear on the screen (Pic. 9).

Pic. 9. Sound adjustment

- you can choose one of three available sound modes by pressing «▲» and «▼»;

- confirm the selection of another sound mode if it's needed by pressing button, after doing this the selected bar will glow;

- return to the main menu by pressing «◄» button to continue adjustment or to quit right to the "search" mode by short pressing button or button.

Notification:

1. There is a prior mode demonstration while selecting a sound mode by pressing «▲» or «▼» buttons.

2. An icon of selected sound mode is displayed in the top bar of the screen:

- *mute;*

- *sound indication;*

- *sound feedback.*

3. You may select a sound mode quickly (avoiding main menu) by pressing and holding button.

2.3.2.3 Power supply selection:

- in the main menu (Pic. 7) select "BATTERY MODE" bar by pressing «▲» button or «▼» button and confirm your selection by pressing button or «►» button, power supply selection menu will appear on the screen (Pic. 10);

- select the type of power supply that is used by pressing «▲» button or «▼»;

- confirm the selection of another sound mode if it's needed by pressing button, after doing this the selected bar will glow;

- return to the main menu by pressing «◄» button to continue adjustment or to quit right to the "search" mode by short pressing button or button.

Pic. 10. Power supply selection

Notification:

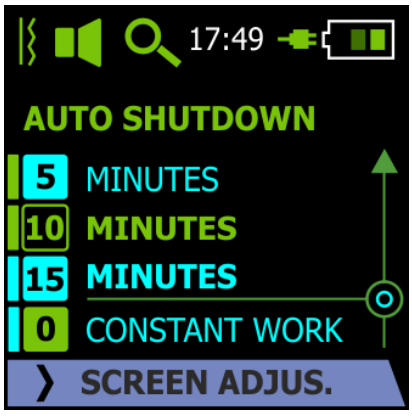
The selected type of power supply is displayed in the top bar of the screen:

rechargeable type of power supply (accumulator) is selected, the charging is possible (the plug lights green);

single-use type of power supply (galvanic battery) is selected, the charging is impossible.

2.3.2.4 **Auto shutdown:** this setting turns off the screen after a timeout selected by the user to save power; the device continues operating in "search" mode. At that you can monitor the readings by pressing any button.

- In the main menu (Pic. 7) select "SCREEN ADJUSTMENT" bar by pressing «▲» button or «▼» button and confirm your selection by pressing button or «►» button, a menu of available timeout periods will appear on the screen (Pic.11)



Pic. 11. Auto shutdown adjustment

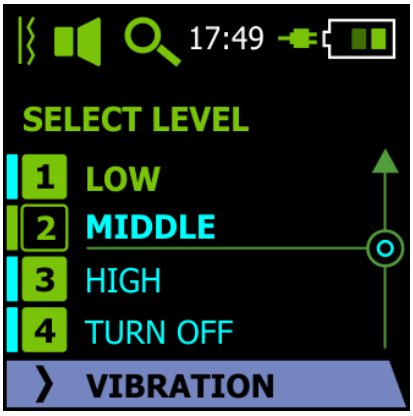
- you can select one of three available timeout values by pressing «▲» button or«▼» button;

- confirm the selection of another timeout value by pressing button, after doing this the selected bar will glow;

- return to the main menu by pressing «◄» button to continue adjustment or to quit right to the "search" mode by short pressing button or button.

2.3.2.5 Vibration level adjustment: this setting turns vibroindication on/off and defines the level of vibration intensity.

- In the main menu (Pic. 7) select "VIBRATION" bar by pressing «▲» button or «▼» button and confirm your selection by pressing button or «►» button, vibration menu will appear on the screen (Pic.12);



Pic. 12. Vibration level adjustment

- you can select one of three available levels of vibration intensity by pressing «▲» button or«▼» button;

- confirm the selection of another intensity level if it's needed by pressing button, after doing this the selected bar will glow;

- return to the main menu by pressing «◄» button to continue adjustment or to quit right to the "search" mode by short pressing button or button.

Notification:

1. There is a prior mode demonstration while selecting a level of vibration intensity by pressing «▲» button or «▼» button.

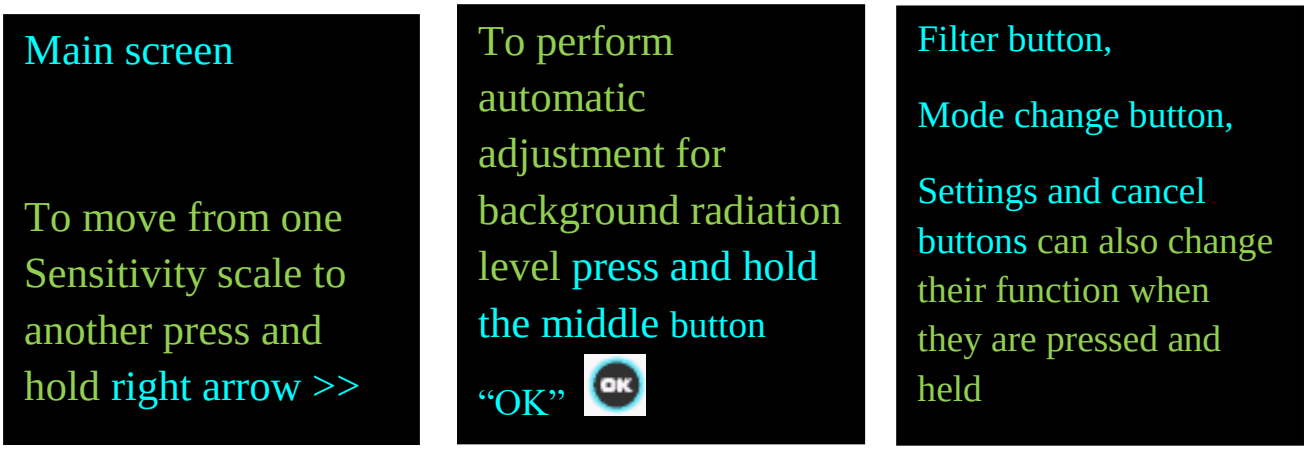
2. An icon of selected vibration mode is displayed in the top bar of the screen:

- *vibroindication is on;*

- *vibroindication is off.*

2.3.3.2.6 Quick guide

- Press and hold button for 2 seconds to call the help menu. Text information shown in the Picture 13 will be displayed on the screen;



Pic. 13. Quick navigation guide

- you can navigate from one help screen to another by pressing «▲» and «▼» buttons;

- you can return to the "search" mode by short pressing button or button.

2.3.3 Operating modes: "search" and "security"

2.3.3.1 Switching between modes

The device always starts in the "search" mode. An icon of the adjusted mode is displayed in the top bar of the screen:

- "search" mode;

- "security" mode.

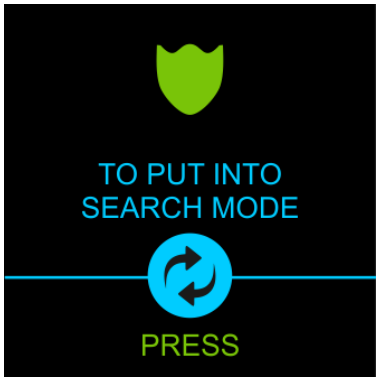
You can switch between operating modes by short pressing button. While switching to another mode you'll see the notification on the screen. While switching to the "security" mode the notification (Pic.14) will appear for 2 seconds:

Pic. 14. Switching to the “security” mode notification

Next you’ll see the animation displayed within the graphs drawing zone. After animation the screen will turn off.

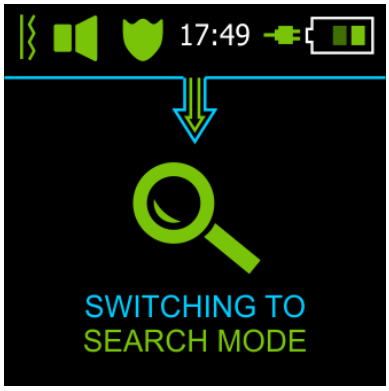
Pic. 15. Switching to “security” mode animation

When the device is in the “security” mode, the notification appears on the screen periodically (Pic.16):



Pic. 16. Notification in the “security” mode

While changing modes by pressing button, the notification (Pic. 17) will appear on the screen for 2 seconds. After it the device will go to the “search” mode.

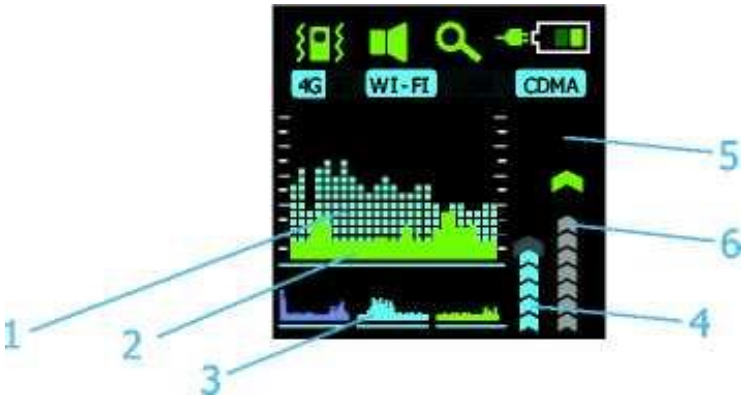


Pic. 17. Notification of switching to the “search” mode

2.3.3.2 “Search” mode

2.3.3.2.1 Graphical presentation of information

“Search” mode is the main operating mode used to search for radio transmitting devices indoors. Main elements of “search” mode graphic interface are shown in the picture 18.



Pic. 18. Main elements of the “search” mode graphic interface

Current level of radio signal strength is displayed in real time as a graph of peak values (item 1, blue color on the background) and average values (item 2, green color on the foreground). Graphs show the changing of radio environment for the last 3 seconds. The current value is in the right part of the graph, and the values are moving to the left becoming obsolete.

Notification: *Peak value graph (Item 1, Pic. 18) illustrates the signal type (pulse-shaped or solid) and it is an analog of “impulse” mode of modern searching devices (digital “bug” search mode). Average value graph (item 2, Pic.18) illustrates the average signal strength and it is actually the realization of the “analog” mode (analog “bug” search mode). You can perform searching of the local signal strength maximum using any of these two graphs considering that “impulse” mode, i.e. peak value graph, is still better for searching for digital “bugs”. Average value history graph (item 3,*

Pic.18) is for storing and displaying radio environment condition for longer period of time (45 seconds). For your convenience the history graph is divided into three 15 seconds blocks.

2.3.3.2.2 Sensitivity and vibroindication engagement threshold adjustment

Within the searching process you will need to adjust the device sensitivity (scale item 4, Pic. 18) and (if needed) the vibroindication engagement threshold (scale item 6, Pic. 18). To select the scale use «◄»and«►» buttons (to confirm selection press and hold the button for 2 seconds, with that the selected scale marker (item 5) will glow), and the adjustment is done by pressing «▲» button and«▼» button.

Sensitivity adjustment scale is active by default. You need to adjust the device sensitivity in the way that selected graph will not "go into overdrive". The «▲» button increases sensitivity (to display signals that have weaker amplitude). The «▼» button decreases sensitivity (to display stronger signals). When changing the sensitivity level, the graph scaling is performed automatically (items 1, 2 and 3, Pic. 18).

Device supports automatic sensitivity adjustment. To perform it in search mode, press and hold OK button for 2 seconds. Automatic adjustment is performed according to the average signal strength level (graph item 2, Pic.18).

Vibroindication engagement threshold adjustment is performed in accordance with the average signal strength level, displayed in real time on scale (item 6, Fig. 18), in device full dynamic range, without a reference to selected sensitivity level. This scale can be used for the overall assessment of the radio environment at current moment.

2.3.3.2.6 Practical recommendations on using the "search" mode:

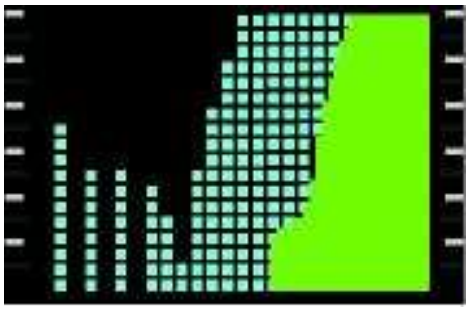
- Before starting the search, switch off all radio-emitting devices if possible (Wi-Fi, smartphones, tablets, computers and other household and office equipment). It simplifies the search by eliminating the excess noise, and makes it possible to use higher sensitivity while searching.

- Extend the device antenna to its maximum size. Turn the device on. The device automatically adjusts the sensitivity level when you turn the device on.

- Begin to walk around your room, holding the device at the distance of 0,3 – 0,5 meters from the researched surface. If a maximum signal strength level is displayed on the screen (green graph of average values shows maximum), press and hold for 2 seconds OK button. The device will automatically adjust the sensitivity level. Repeat these actions until the site, where the evident maximum level of emission is, is located.

- Another search method: after the automatic sensitivity adjustment, you can decrease it by two levels. Then search the supposed "bugs" locations from a distance of at most 0,2 meters. If signal

maximum appears, reduce sensitivity further and search the location of closer distance of 5.. 10 cm to find the location of the signal source more accurately. Picture 19 illustrates the typical view of the screen while approaching to the radio transmission source if this method is used.



Pic. 19. Signal strength level increasing when approaching to the analog transmitter

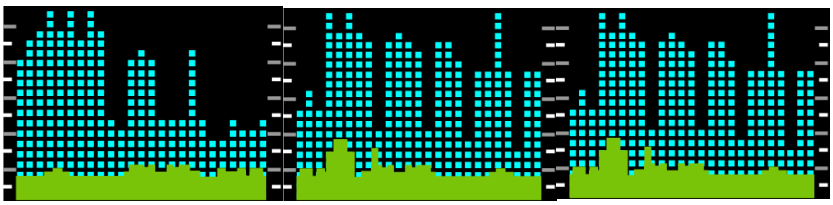
-If there is a strong enough and permanent signal level all over the room, it can mean that there is an powerful external source of radio transmission (cell phone tower, strong Wi-Fi access points). In this case, try to switch on all device filters and continue searching. If the signal amplitude on the graph reduces significantly after switching the filters on, you can figure out exactly what signals jam the search by switching the filters on/off one after another. Next you can reduce the interference by switching on the needed filters and switching off the unnecessary ones.

- The locations where eavesdropping devices and hidden cameras are usually placed, are: cavities and chinks in plinths and walls, behind radiators, remote places on wardrobes and curtain-rods, cavities of suspended ceiling, ventilating shafts, furniture elements, household equipment, flowers, car dashboards and seats, etc.

- Use the sound indication mode when searching in remote places, where it is difficult to keep looking at the screen. The increasing frequency of sound signals will show that you are approaching to the source of radio transmission.

- Carefully inspect for the presence of wireless “bugs” the site where the maximum emission strength was found, the sensitivity level can be adjusted manually at that by pressing «▲» (increasing) button and «▼» (decreasing) button.

- If there are spikes and valleys on the green graph of average values and obvious spaces on the background blue graph of peak values as shown in Picture 20 (a) when searching in the same area (device is not moved), then there is a high probability of an operating digital transmitter. The digital character of the detected signal is also defined by obvious transmission/pause intervals on the peak values graph and higher amplitude of peak values, compared to the average ones (as shown on Pic. 20 b, c).



a) b) c)

Pic. 20. Digital transmitter in work

In this case decrease the sensitivity by pressing «▼» button to the level on which the blue graph of peak values doesn't "go into overdrive". You may also fold down the antenna completely or partially. Continue your search considering the peak values graph.

- If there is an obvious local maximum of unknown emission, the device can be switched to the sound feedback mode. The tonal characteristic of a sound will change if the wireless mic ("bug") is near. In some cases, when approaching to the "bug", the sounds a room is filled up with can be even heard from the internal speaker or earphones. GSM/GPRS-transmitters can be easily identified by specific crack. In the sound feedback mode "bugs" can be found by ear alone, without looking at the screen, if you are skilled enough.

2.3.3.3 "Security" mode

The device is switched to the "security" mode when there are no unknown emissions in a room and the implicit control of the situation is needed, for example during negotiations.

When switched into "security" mode, the device assesses surrounding radio environment and memorizes the signal level, then device screen turns off.

If some new source of signal appears, for example a cell phone turns on to transmit the information or a "bug" activates after long pause in data transmission, etc., the device will alarm you about this (the screen will turn on or the device will vibrate or produce a sound). When the alarm cause is removed (cell phone is switched off or removed from the room, a "bug" is deactivated), graphic, acoustic and vibro indications will automatically switch off.

Notification:

1. The opportunity to adjust the device is limited in "security" mode. To make adjustments (vibration intensity, filters switching on/off, etc.) you need to switch the device to the "search" mode first.

2. Sensitivity and vibroindication engagement threshold adjustment is performed automatically when switching to the "security" mode.

3 Maintenance

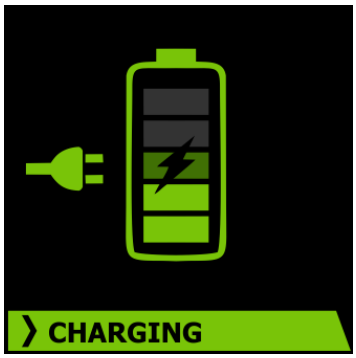
3.1 Keep the product clean. Periodically remove the dust by dry and clean cloth.

3.2 Keep the product from strokes and mechanical damage.

3.3 Recharge accumulators timely. The power level is indicated by the filling level and the color of battery sign located in the top bar of the screen.

3.4 You should charge the accumulators as follows:

3.5 Plug the supplied charger to the device jack (item 6, Pic.2) using supplied cord. If the device is on while charging, the battery icon on the screen becomes animated. If the device is off while charging, the animated screen saver is displayed on the screen (Pic. 21).



Pic. 21. Charging when the device is off

Notification:

1. If you replace the batteries, select the type of power supply properly in options menu!

2. Do not try to charge non-rechargeable batteries (galvanic batteries)! It is dangerous!

4 Troubleshooting

Typical problems and remedies are specified in Table 3.

FAILURE	CAUSE	REMEDY
The device is turned on, but there is no image on the screen	Batteries are fully discharged	Replace galvanic batteries or recharge the accumulators
	Device is defective	Take the device to service center

5 Package and transportation

Every Product delivery set (see Table 2) is packaged in individual corrugated fiberboard box. The moving of contents of the box is not allowed. The packaged products are put into cargo corrugated containers according to the GOST 22637.

Packaged products can be transported by train or by trucks in covered trucks or containers or by air transport in pressurized modules.

While transporting the packaged products should be protected from the direct impact of atmospheric condensation and insolation.

Transportation terms and conditions:

- environment temperature: from -50 to 50°C;
- relative humidity: below 95 % at temperature 25°C;
- atmospheric pressure: from 84 to 107 kPa (from 630 to 800 millimeters of mercury);
- shock acceleration peak values below 147 m/s^2 (15 g), with duration 10-15 ms.

The requirements specified on the package warning labels must be strictly observed during loading and transportation.

6 Acceptance certificate

Anti-spy bug detector BugHunter Professional BH-03, 4224-002-64062607-2011

Serial number_____

Date of manufacture_____

is manufactured and accepted according to the valid technological documents and considered exploitable.

QC stamp _____

7 Manufacturer's warranty

7.1 Manufacturer warrants that the Product satisfies the requirements of the TC 4224-002-64062607-2011 under observance of operation, storage and transportation regulations indicated on exploitative documents.

7.2 The service life of the Product is not less than 5 years (when operating for 4 hours per day).

7.3 Warranty period is 12 months from the date of sale. If the sale date and the vendor's stamp are absent in the warranty card, the warranty period will be calculated from the date of manufacture.

7.4 Manufacturer or the authorized Distributor shall replace or repair the products broken down during the warranty period at the expense of them.

7.5 This warranty shall be void if

- guaranteed use period is over;
- operation, storage and transportation regulations are violated;
- the product put into service failed due to mechanical defects;
- the seal is broken.

7.6 When the warranty period ends, the maintenance of the Product will be provided at the expense of a Consumer.

8 Warranty Card

Product name: Anti-spy bug detector BugHunter Professional BH-03

Manufacturing number □□□□□□

Manufacture date □□.□□

QC stamp

Sale Date

Vendor’s stamp and signature

The customer does not have any claims on quality of the Product and the contents of delivery. The equipment is in good repair.

(Customer’s signature)