HFW-STK-03
Hyfire Wireless Survey Kit c/w Tablet User Manual

Hyfire Wireless Fire Solutions Limited - Unit B12a, Holly Farm Business Park, Honiley, Warwickshire, CV8 1NP - United Kingdom

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General description

To ensure that a wireless fire detection system works correctly and to avoid installation issues, the use of the **HFW-STK-03** is strongly recommended, as it is a proven test kit that enables the installer to check the wireless link quality on the installation site and therefore choose the perfect position for the wireless devices.

The **HFW-STK-03** is a "ready to use" diagnostic system; it's easy to use and it doesn't need a particular programming setup.
When the kit's tablet is remotely connected to the **HFW-EM-01** expander module through the Dongle interface device, the wireless link quality is shown on the tablet's dedicated app.
The installer can easily move around the site with the tablet, the Dongle and the survey detector to check the quality signal level between the **HFW-EM-01** and the survey detector (picture 1).

| Wireless expander |
| Test detector |
| Supporting pole |
| Tablet |
| Dongle interface device |

Picture 1
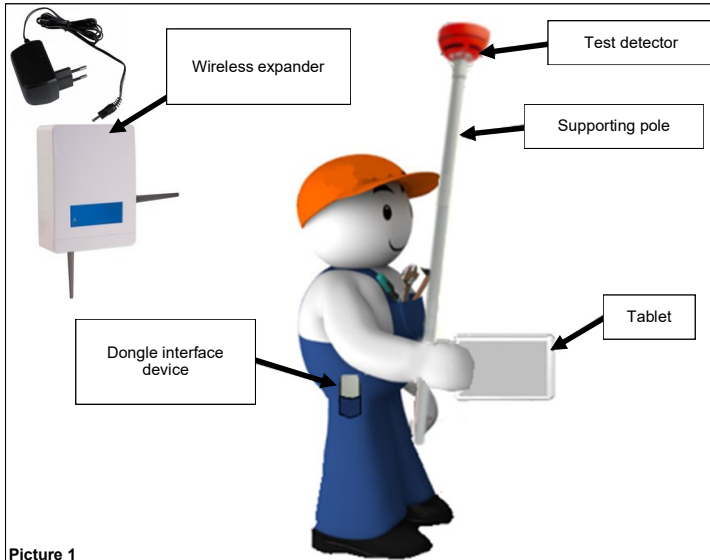
HFW-STK-03   kit's content list

- 1x **HFW-EM-01** test expander

- 1x **HFW-EM-01**'s power supplier (12 Vdc)

- 1x wireless detector survey probe

- 1x survey detector's supporting pole (3x sub-assembly parts)

- 1x Dongle interface device

- 1x tablet

- 2x CR123A (3Vdc)

- 2x LR6 AA (1.5 Vdc)

- 3x screws

- user manual

Technical specifications

HFW-EM-01 test expander

Available operating frequencies	868 / 865 / 916 / 434 MHz
Number of available radio channels	7 channels 6 channels for the 434 MHz band
Maximum radiated power	5 dBm (3 mW) 10 dBm (10 mW) for the 434 MHz band
Power supply voltage range	9 Vdc - 30 Vdc
Current load	30 mA at 12 Vdc
Operative environmental temperature range	-30 °C - +50 °C
Weight	300 g
Dimensions (with antennas)	190 mm x 230 mm x 50 mm
Dimensions (without antennas)	120 mm x 160 mm x 50 mm
IP	IP 51C

HFW-EM-01 power supplier

Output voltage	12 Vdc
Output current load	420 mA
Output connector type	5.5 x 2.1 x 12 mm DC Jack
Input voltage range	90 Vac - 264 Vac
Input current	0.25 A (100 Vac)
Input frequency	63 Hz
Input protection	Internal T1.0A/250 Vac fuse
Weight	80 g
Dimensions	37.0 x 55.1 x 42.9 mm

Specifications for the HFW-EM-01 power supply battery

Suggested output voltage range	12 Vdc - 24 Vdc

Survey wireless detector probe

Available operating frequencies	868 / 865 / 916 / 434 MHz
Number of available radio channels	7 channels 6 channels for the 434 MHz band
Maximum radiated power	≤ 14 dBm (25 mW)
Power supply batteries type	2x CR123A (3 Vdc)
IP	40
Operative environmental temperature range	From –10 °C to +55 °C
Colour	Orange fluorescent
Dimensions	110 mm x 65 mm
Weight	190 g

Dongle interface device

Available operating frequencies	868 / 865 / 916 / 434 MHz
Number of available radio channels	7 channels 6 channels for the 434 MHz band
Maximum radiated power	≤ 14 dBm (25 mW)
Power supply batteries type	2x LR6 AA (1.5 Vdc)
USB connector characteristics for external power supply	5 Vdc, 100 mA
IP	40
Operative environmental temperature range	From -10 °C to +50 °C
Dimensions	118 mm x 79 mm x 19 mm
Weight	90 g

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Measure of the wireless link quality

Wireless link quality between devices can be measured using two indicators:

dB units

Simply decibel units.

RSSI units

RSSI is the acronym of "Radio Signal Strength Indicator" and it is obtained from the measure of the wireless signal quality (in dB units) and the noise level (still in dB units). In order to simplify the measurement of the wireless signal's quality, RSSI and dB units are spaced out in five possible "mark" levels (table 1); on the tablet's survey app, levels from Mark 5 to 2 are visualized using four different colours (picture 2); Mark 1 is considered as "no link".

Mark level	dB units	RSSI units
Mark 5	More than 30 dB	More than 20 RSSI
Mark 4	From 20 to 30 dB	From 13.4 to 20 RSSI
Mark 3	From 10 to 20 dB	From 6.8 to 13.4 RSSI
Mark 2	From 0 to 10 dB	From 0 to 6.8 RSSI
Mark 1	Less than 0 dB	Less than 0 RSSI

Table 1   In order to work properly, the devices
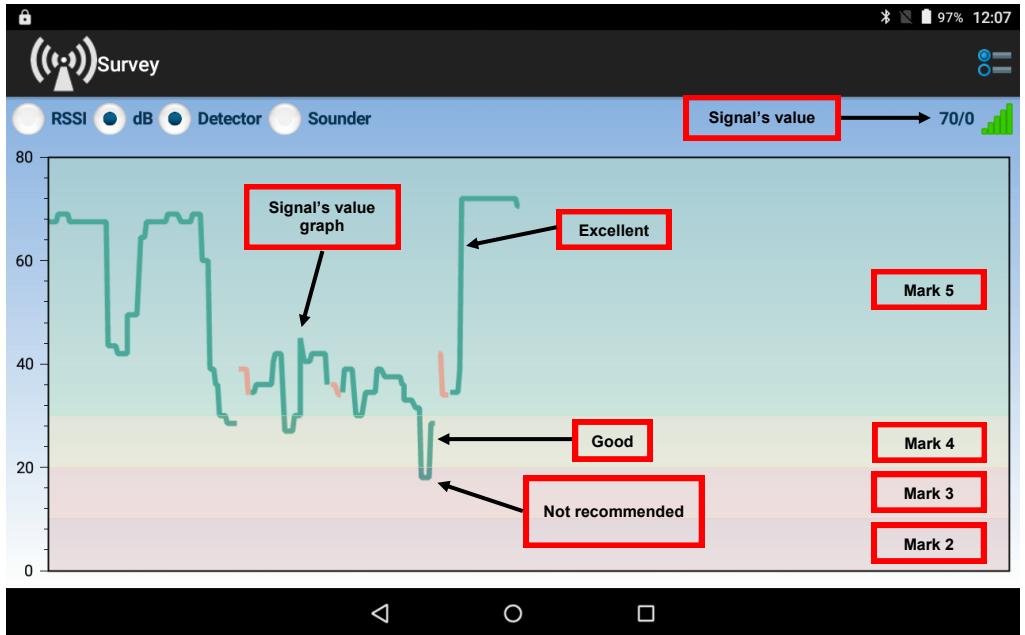
Picture 2

must operate with a signal level quality in the Mark 5 (picture 2, green area) or Mark 4 (picture 2, yellow area) bands.
Mark 3 band is not recommended.
If the signal's level quality is below Mark 3 (i.e. Mark 2), you must change the position of the devices (either the **HFW-EM-01** or the survey probe detector).
If the **HFW-EM-01** and the probe detector do not communicate, the survey app will show a warning popup.

You will notice that the signal's value graph on the survey app is traced either in green or, sometimes, in orange:

	Green colour indicates that the wireless signals are received on the **HFW-EM-01** primary antenna.
	Orange colour indicates that the wireless signals are received on the **HFW-EM-01** secondary antenna.

Survey setup

HFW-EM-01 test expander

1. Place the **HFW-EM-01** test expander in the exact location of the installation site where you want to install a wireless system central or relay node   (i.e. **HFW-W2W-01** wire to wireless translator, **HFW-EM-01** wireless expander or a **HFW-CEM-02** wireless conventional system expander module).
2. Connect the power supplier's output to the **HFW-EM-01**; the socket for the connector is located on the top side of the **HFW-EM-01** (picture
3. Connect the power supplier to the household mains line.

HFW-EM-01 is now ready for use.

Alternatively, you can connect the **HFW-EM-**
ble power supply battery through the battery
Battery's suggested specifications are given at the beginning of this manual.

Picture 3   **01** test expander to a suita-
connector cable (picture 3b).

1. Place the **HFW-EM-01** test expander in the exact location of the installation site where you want to install a wireless system central or relay node (i.e. **HFW-W2W-01** wire to wireless translator, **HFW-EM-01** wireless expander or a **HFW-CEM-02** wireless conventional system expander module).
2. Connect the red wire push-on terminal to the battery's positive pole.
3. Connect the white wire's push-on terminal to the battery's negative pole.
4. Insert the battery connector's jack plug into the **HFW-EM-01** power supply socket; this socket is located on the top side of the **HFW-EM-01**.

Survey detector

1. By rotating it clockwise, remove the support base (picture 4).
2. Extract the battery cover from the
3. Insert both CR123A batteries into their detector's housing (picture 5). Batteries polarities must match the indicated polarity on the detector.
4. Wait until the LEDs at the top of the detector stop blinking.
5. Reinstall the detector's battery cover.
6. Reinstall the detector on its base.

Picture 3b   survey detector from its

bottom of the detector.

The survey detector is now ready for use.

Picture 4

Picture 5

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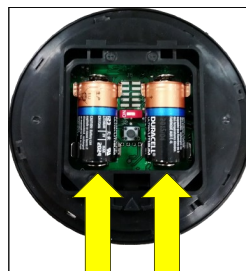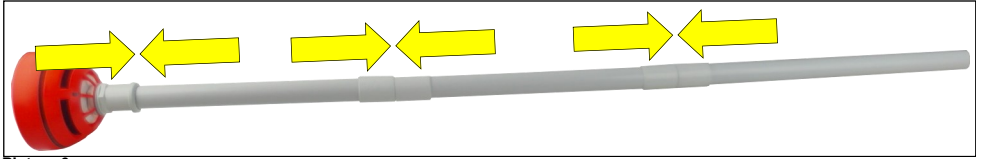
Supporting pole

The supporting pole is used to enable the assessment of the wireless link quality in high locations.

It can be used, also, for assessing lower locations and areas for possible interference caused by wireless fading.

1. Assemble the pole as per picture 6.

2. Fix the survey detector probe at one end of the pole (picture 6).

Picture 6

Dongle interface device - battery power supply

1. Extract the battery cover from the back of the Dongle device.

2. Insert both LR6 AA batteries into their housing.
   Batteries polarities must match the indicated polarity on the device.

3. Reinsert the battery cover.

4. Switch on the Dongle device (On / Off switch on the device; check picture 8).
   Dongle's LED performs some green-red blinking, then stops: the device is now powered on.

Picture 7
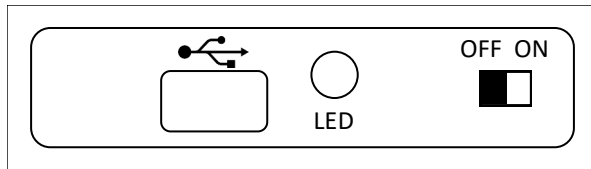
Picture 8

Dongle interface device - external power supply

- Connect the Dongle's Micro USB with OTG cable (not supplied) port to the tablet's Micro USB port (picture 9)

or

- connect the Dongle's Micro USB port to the output of the tablet's power adapter.

External power supply is useful in the event Dongle's batteries run out.
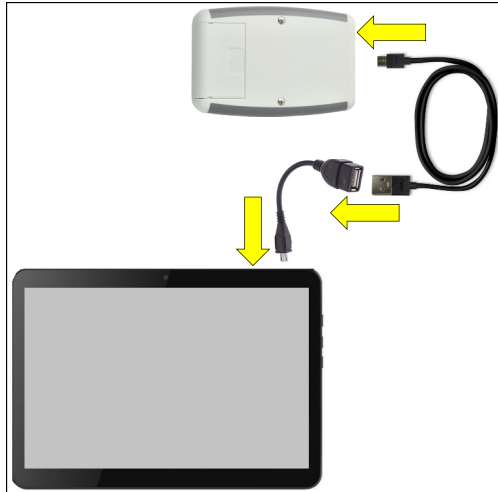
Picture 9

Tablet

1. Long press the key on the side of the tablet (picture 10).
   Tablet's   "lockscreen" will appear.
2. To access the   main screen follow the instructions manual of the tablet.
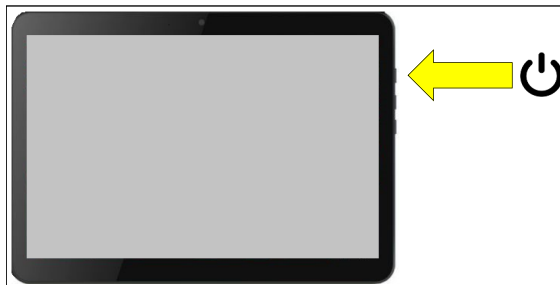
Picture 10

WL Survey

Before start make sure Bluetooth and Gps/Geolocalization are enabled as per tablet's instruction manual.

1. Tap on the **WL Survey** icon to start.

Tablet screen appears as follows:
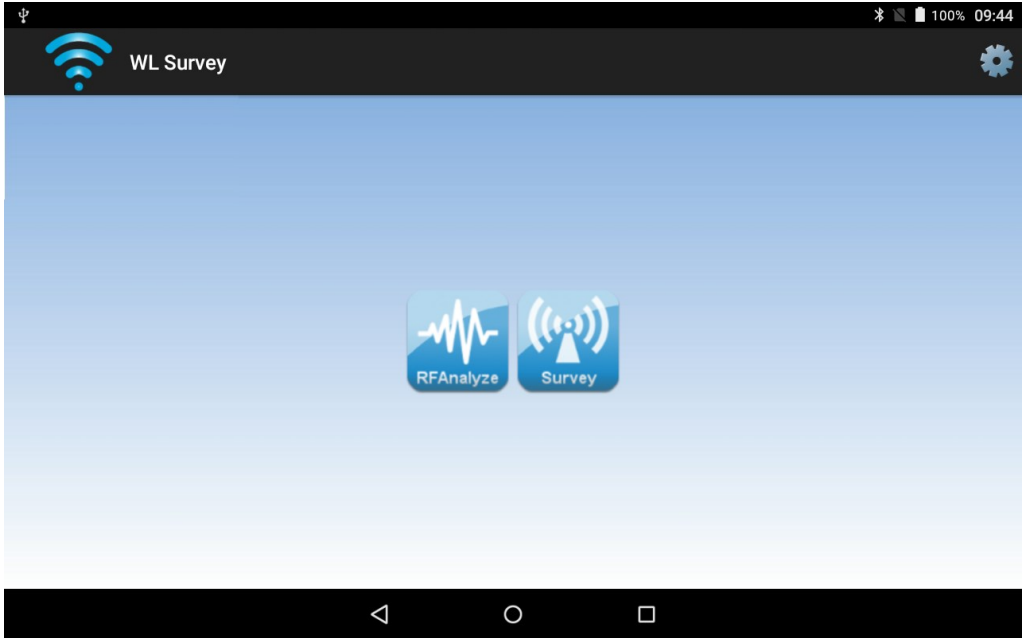
Picture 11

2. Check that **RFAnalyze** and **Survey** icons are blue; if they are grey coloured, consult the troubleshooting section at the end of this manual.

3. Tap on one of the icons to start the needed app.

RFAnalyze

This tool is used to monitor wireless environmental traffic in one or more channels; purpose of this is to find a relatively clean channel suitable for your wireless system.
Interference that can be assessed with this app is normally caused by other wireless devices or other equipment operating within the monitored channel or channels.

Survey

This app is used to measure the wireless signal's link quality between the test **HFW-EM-01** and the survey probe.

RFAnalyze

Tap on the **RFAnalyze** icon to start the app.

The following window will appear:
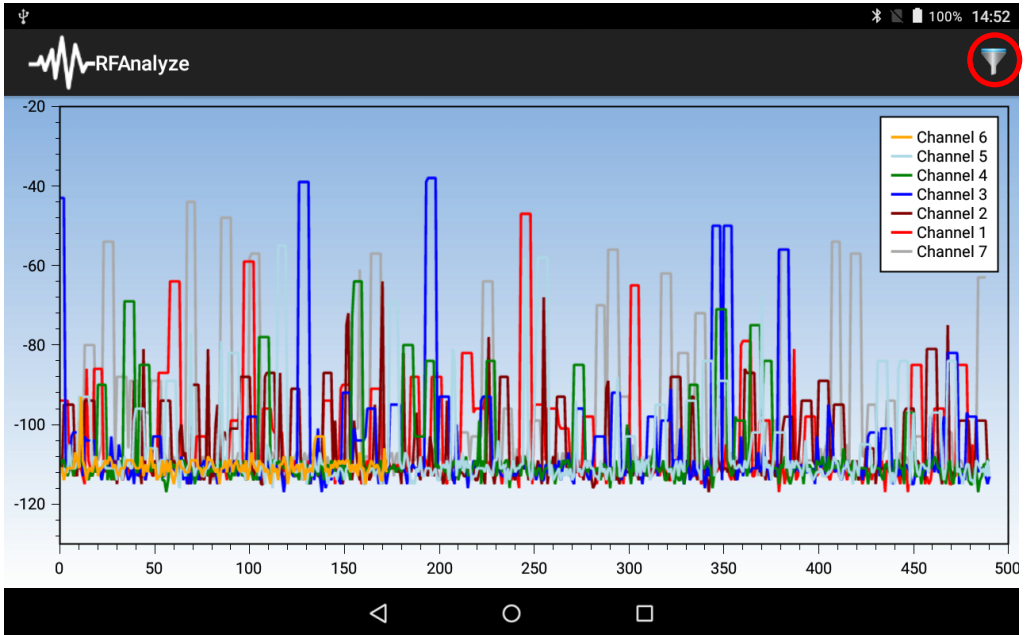
Picture 12

At the beginning, this window shows, through a graph, the degree of wireless traffic present in ALL channels; a single graph of one colour shows the traffic present in one single channel.

Since your system works in one channel only, it is possible to filter out those channels you are not interested in; to do this, on the right upper side of the window tap on the funnel-like icon (in picture 12 is highlighted with the circle).
The following selection window appears:

1. Select those channels that you want to be visualized. Deselect those channels that you don't want to be visualized.

2. Tap on "SUBMIT".
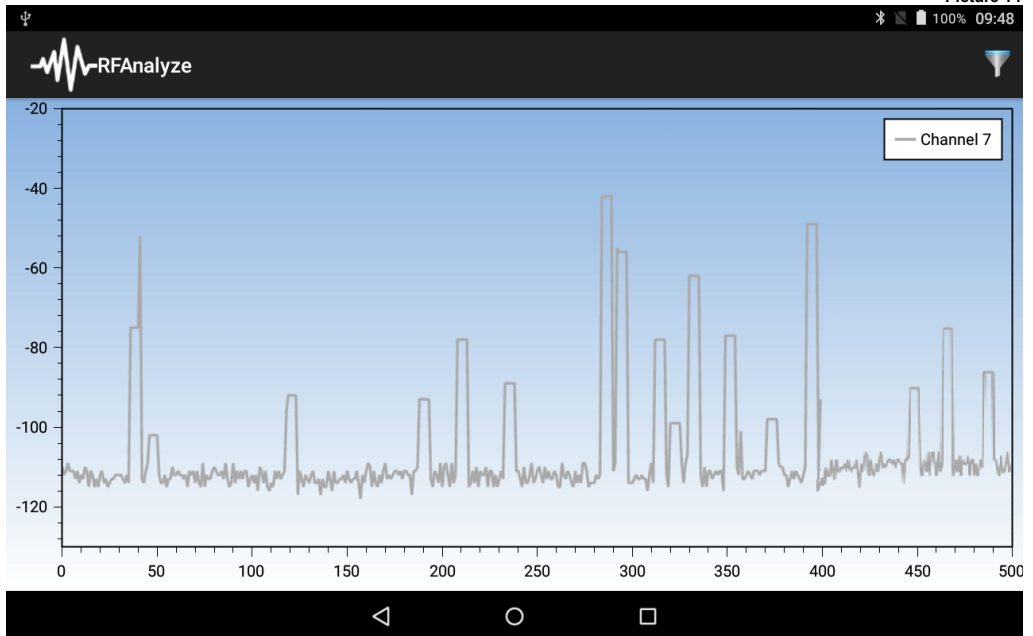
Survey

Tap on the **Survey** icon to start the app.

The following window will appear:
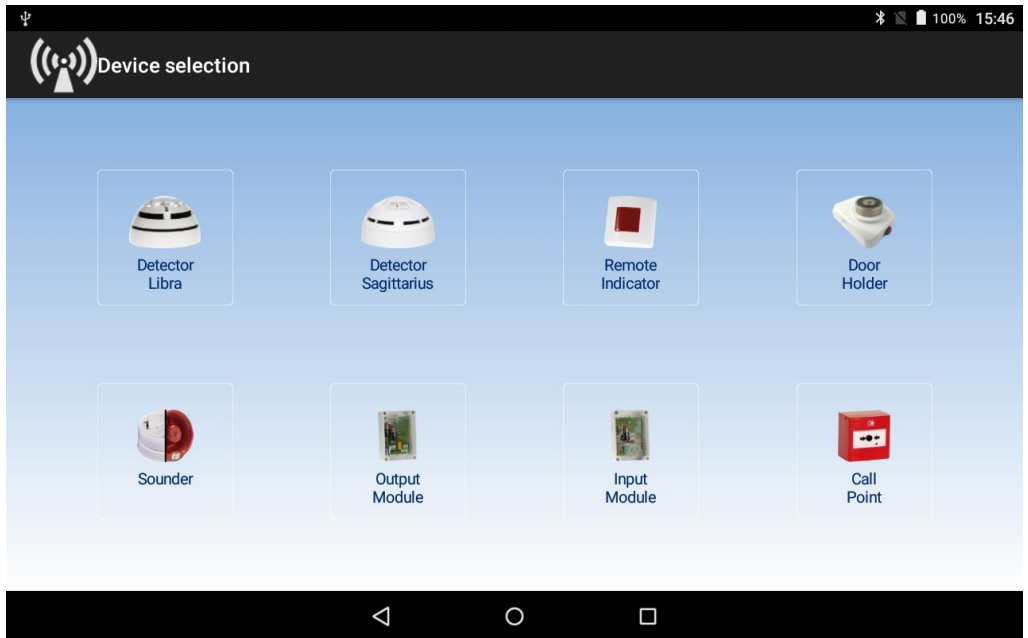
Picture 15

Select the device type you want the survey probe to simulate; bear in mind that **different device types have different signal quality levels**, so it is strongly recommended that you select the correct type.

The **HFW-STK-03** system will now effectively simulate the selected device, in terms of wireless link quality.

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Having selected the device type, the following window appears:
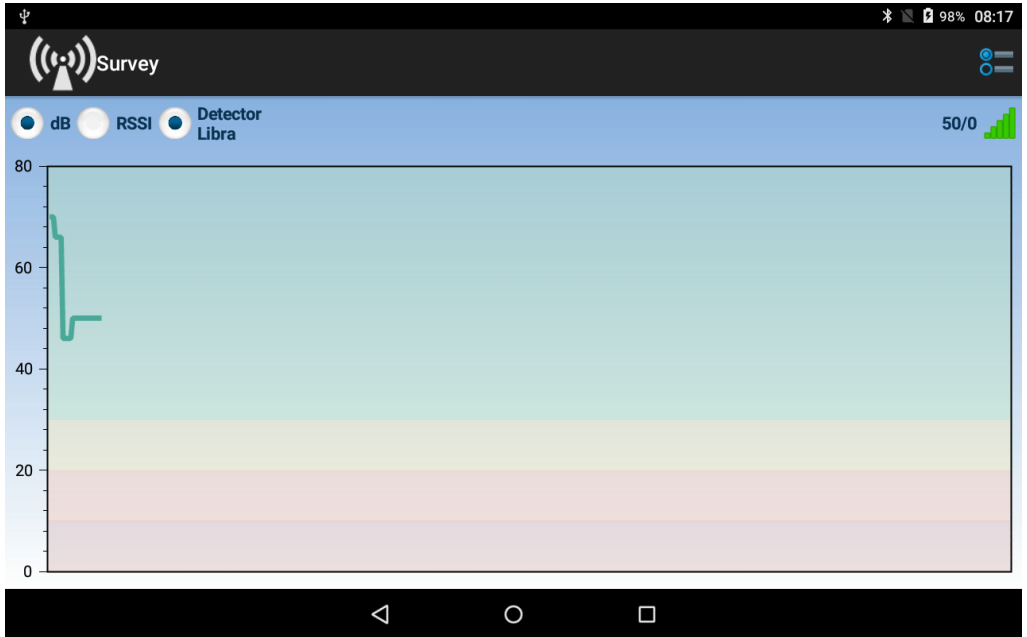
Picture 16

Wireless link quality measurement between the probe and the **HFW-EM-01** is indicated on screen, and its temporal progression is tracked out with a graph.

To achieve a stable progression level it is recommended to wait some minutes after placing the survey detector probe in the chosen position.

If you want to select another device type tap on the ◁ symbol to return to the device type selection screen.

To access **Survey**'s settings window tap on the icon.

The following window will appear:
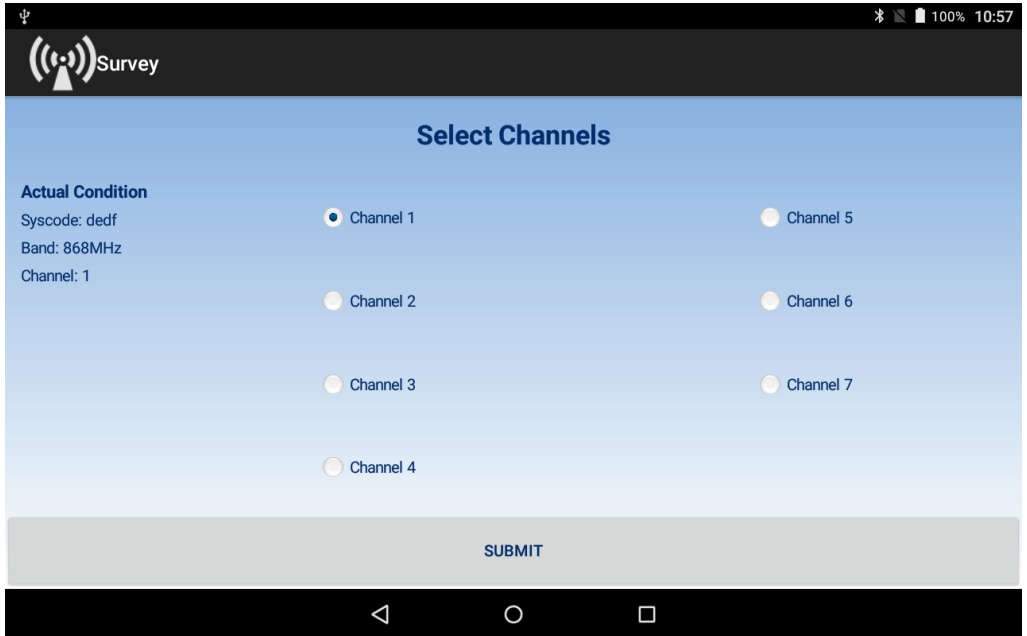
Picture 17

In this window it is possible to:

- Check the wireless system code (Syscode); **it cannot be changed**.

- Check the frequency band; **it cannot be changed**.

- Check and **modify** the survey operating channel.

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To change the survey operating channel:

1. Tap on the desired channel (picture 17).

2. Tap on "SUBMIT".

3. Wait that the system performs the change of the working channel (picture 18).

This operation MUST be performed with the HFW-STK-03 perfectly operating and ALL its devices switched on. Doing otherwise can compromise the functionality of the HFW-STK-03 itself.
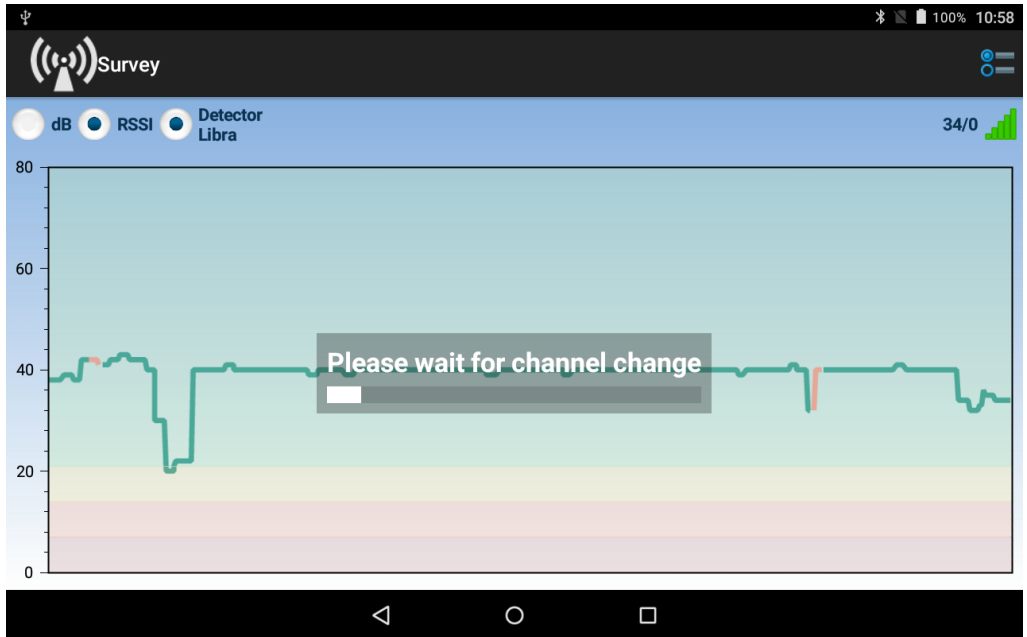
Picture 18

The following table gives the key to symbols that are used in the **Survey** app.

Icon	Description
	Survey detector probe's primary battery low
	Survey detector probe's secondary battery low
	No wireless link between survey detector probe and the **HFW-EM-01**
	Dongle interface device's batteries low
	Wireless link quality level between the Dongle and the **HFW-EM-01**
50/0	Numerical indication of the survey's link quality level on the primary antenna
0/50	Numerical indication of the survey's link quality level on the secondary antenna
dB	Survey's link quality level is indicated in decibel units
RSSI	Survey's link quality level is indicated in RSSI units
Detector Libra	Selected emulated device type indication
	Survey system parameter details and operating channel selection

Table 2

Troubleshooting

Bluetooth not enabled.
Please, turn on Bluetooth
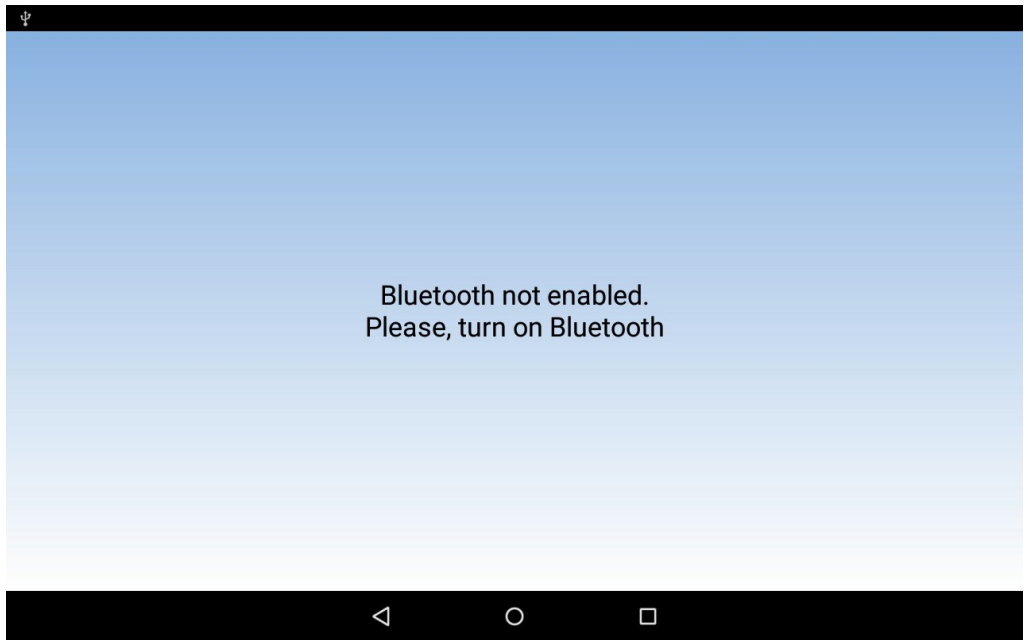
Problem

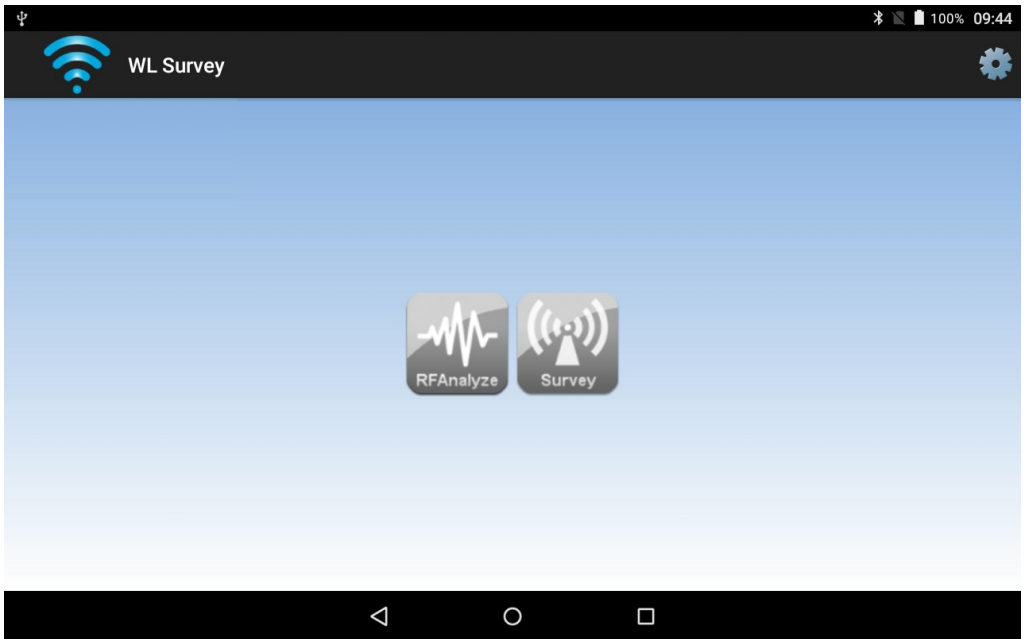**WL Survey** signals: "Bluetooth not enabled. Please, turn on Bluetooth".

Why

Tablet's Bluetooth functionality is not activated.

Solution

Turn on Bluetooth functionality as per tablet's instruction manual.

Turn on Gps/Geolocalization functionality as per tablet's instruction manual.

Problem

WL Survey's **RFAnalyze** and **Survey** launch icons are deactivated (grey coloured).

Why

Dongle interface device is switched off.

Solution

Switch on the Dongle device.
Turn on Gps/Geolocalization functionality as per tablet's instruction manual.

Problem

WL Survey's **RFAnalyze** and **Survey** launch icons are deactivated (grey coloured), **despite the fact that Bluetooth is activated and the Dongle device is switched on**.

Why
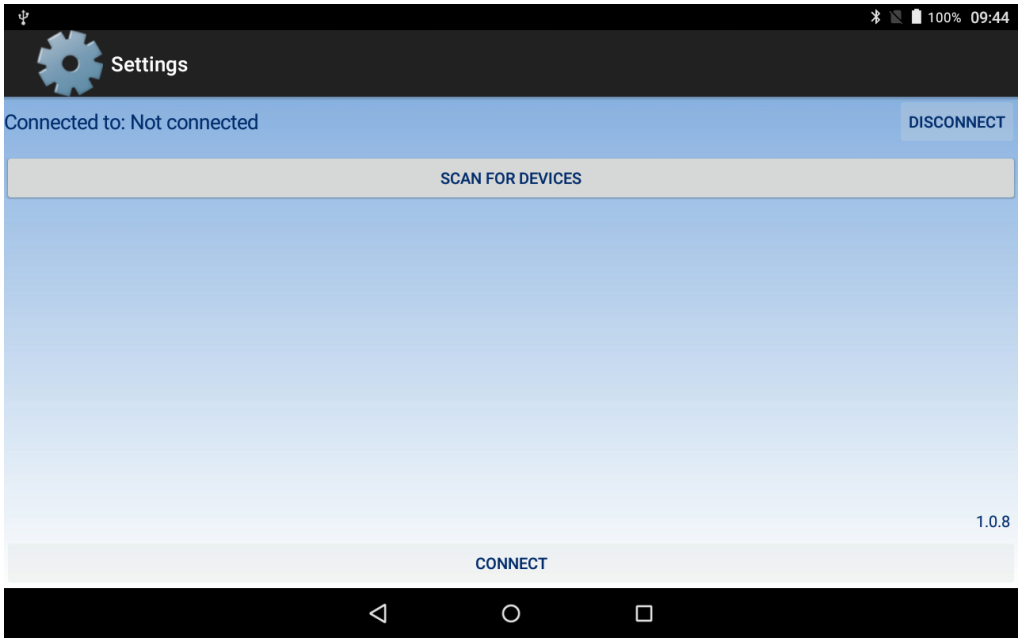
Dongle device is not linked to the tablet via Bluetooth.

Solution

1. Tap on the **WL Survey**'s settings icon

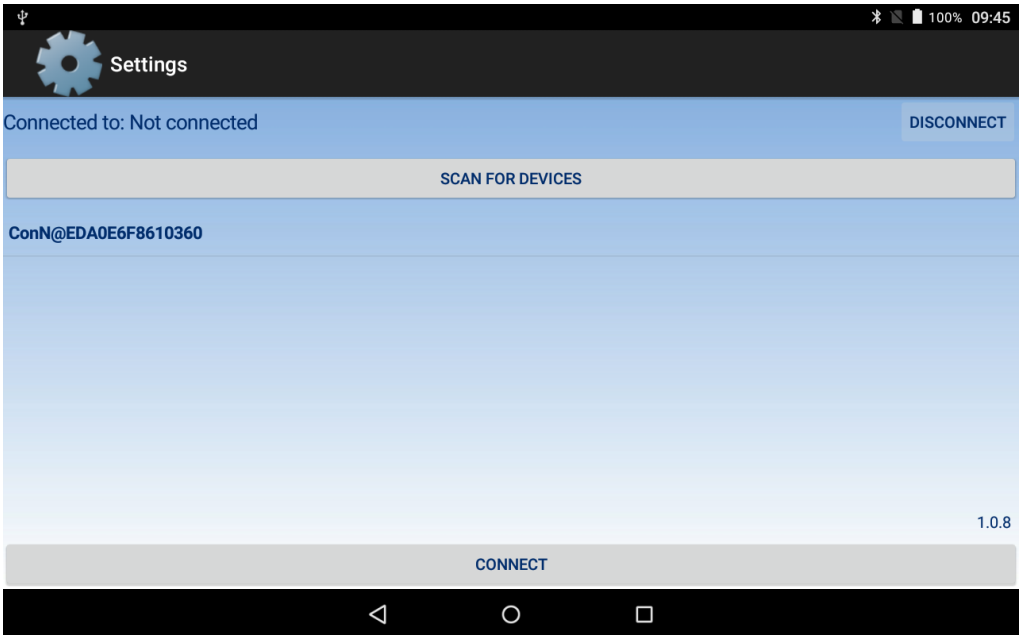**WL Survey**'s settings window is dis-   played (picture 21).
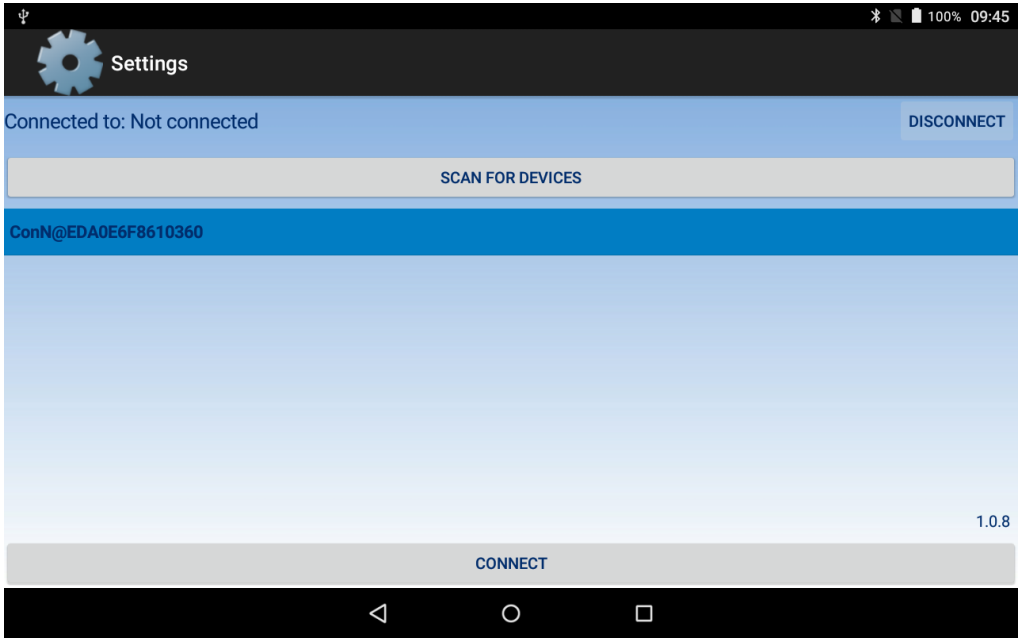
2. Tap on "SCAN FOR DEVICES".
    Window displays all Bluetooth devices in tablet's range, including the Dongle (picture 22).

3. Select the Dongle from the Bluetooth device's list (picture 23).

4. Tap on "CONNECT".
    The tablet is connected to the Dongle device (picture 24).

5. Tap the   icon to return to the main window.

Picture 21

Picture 22

Settings

Connected to: Not connected   DISCONNECT

SCAN FOR DEVICES

ConN@EDA0E6F8610360

1.0.8

CONNECT

◁   ○   □

Picture 23

Settings

Connected to: ConN@EDA0E6F8610360   DISCONNECT

SCAN FOR DEVICES

1.0.8

CONNECT
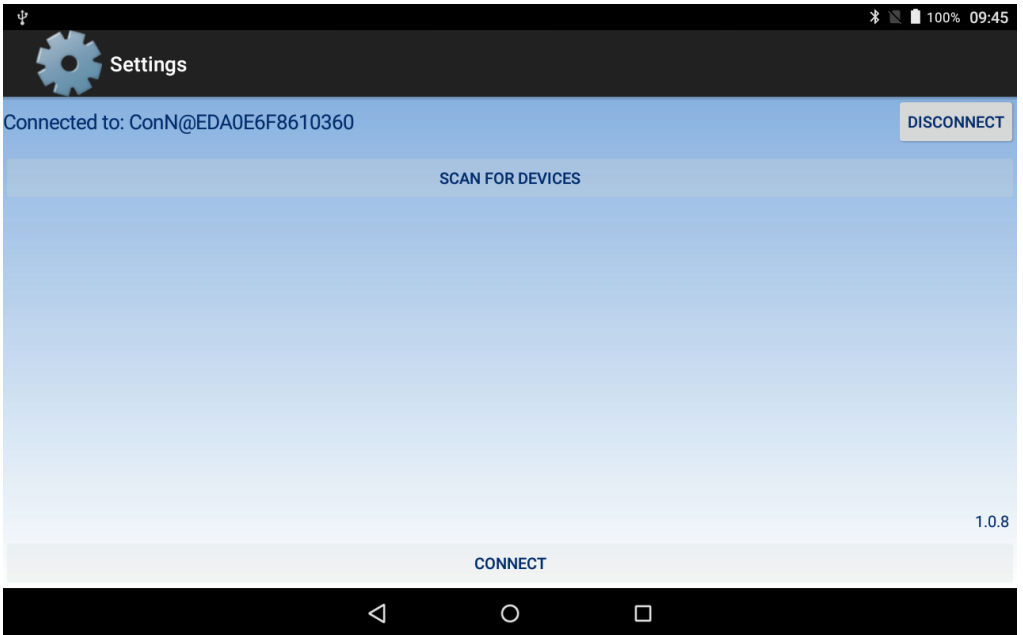
◁   ○   □

Picture 24

WARNINGS AND LIMITATIONS

Our devices use high quality electronic components and plastic materials that are highly resistant to environmental deterioration. However, after 10 years of continuous operation, it is advisable to replace the devices in order to minimize the risk of reduced performance caused by external factors. Ensure that this device is only used with compatible control panels. Detection systems must be checked, serviced and maintained on a regular basis to confirm correct operation. Smoke detectors may respond differently to various kinds of smoke particles, thus application advice should be sought for special risks. Detectors cannot respond correctly if barriers exist between them and the fire location and may be affected by special environmental conditions. Refer to and follow national codes of practice and other internationally recognized fire engineering standards. Appropriate risk assessment should be carried out initially to determine correct design criteria and updated periodically.

WARRANTY

All devices are supplied with the benefit of a limited 5 years warranty relating to faulty materials or manufacturing defects, effective from the production date indicated on each product. This warranty is invalidated by mechanical or electrical damage caused in the field by incorrect handling or usage. Product must be returned via your authorized supplier for repair or replacement together with full information on any problem identified. Full details on our warranty and product's returns policy can be obtained upon request.

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HFW-STK-03

For use in compatible fire detection and alarm system