

Consultix Android WalkView™ (Outdoor)

Android-based Software for Consultix Receivers

User Manual





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Introduction

Overview

WalkView is an Android-based solution for Consultix receiver's family, a comprehensive, efficient and simple-to-use data acquisition S/W tool that turns Consultix receivers together with a tablet into a fully-fledged walk test or a drive test system that maps measurements, provides complete archiving of results and presents the findings in different reporting file formats including the open CSV format for further processing.

The WalkView allows simple archiving and categorization of different projects, divided into different sites, sub-missions and sessions.

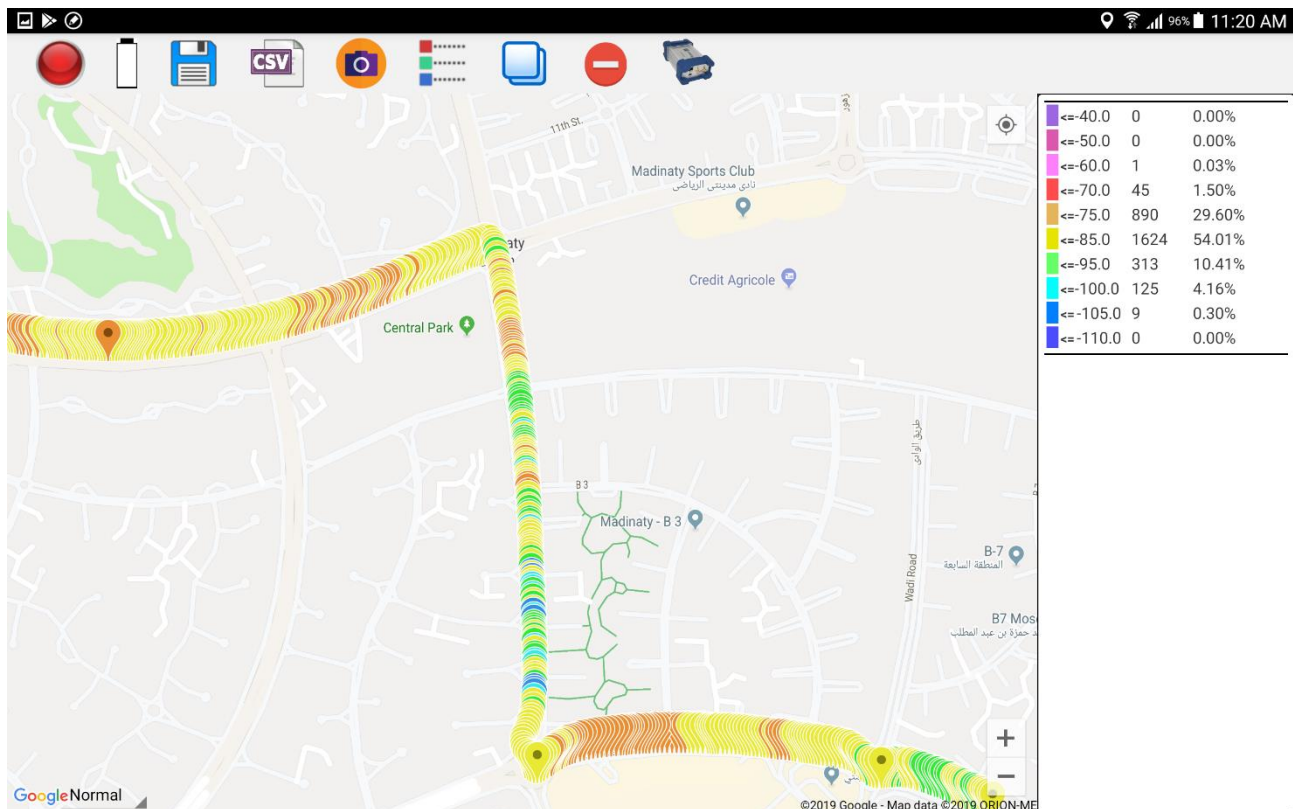


Figure 1: WalkView Software



Minimum Installation Requirements

- OTG support
- Quad-core processor or higher
- 2 GB RAM or higher
- Android 5.0.2 or later

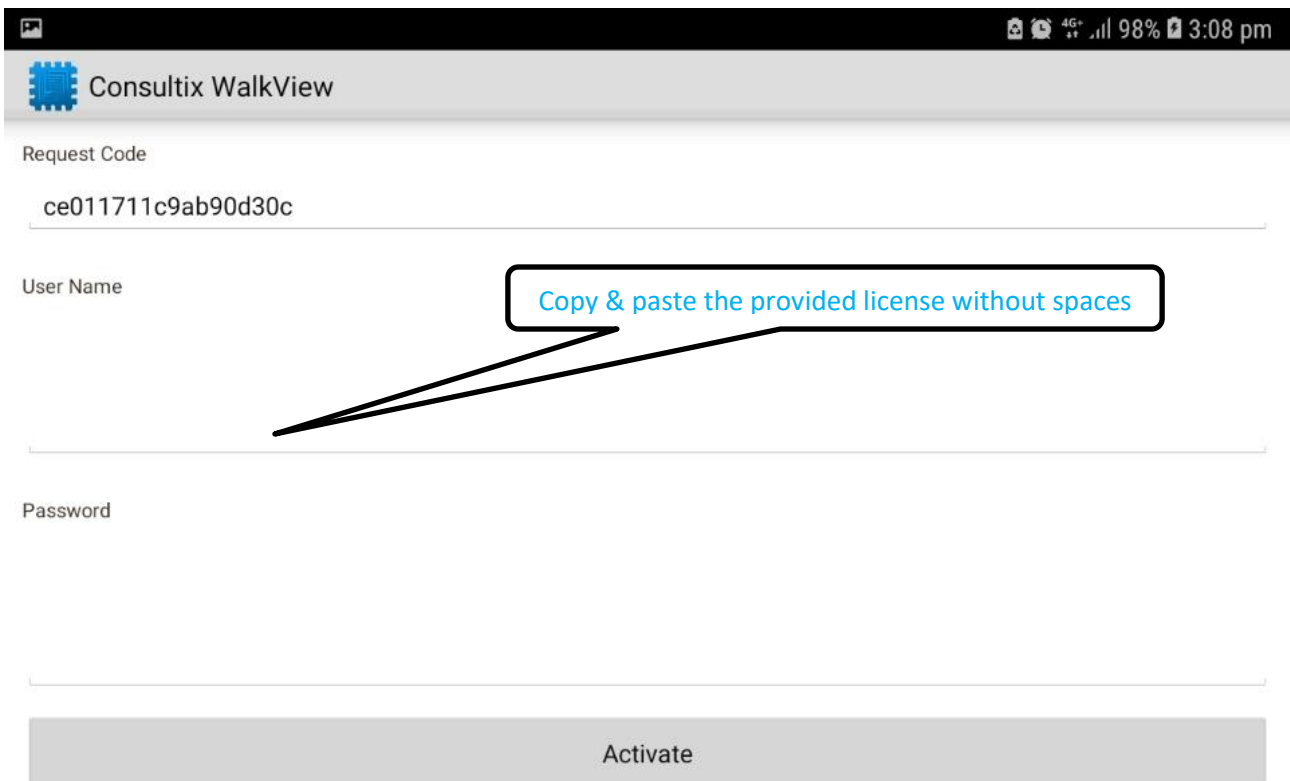
Installation

In this section, we will outline how to configure the WalkView settings in order to customize the software layout appearance and to control the measurements as follows,

1. Download the latest version of WalkView, and tap the downloaded package to start the software installation

Please contact support@consultixwireless.com to get the latest version of WalkView.

2. Tap the application shortcut “**Consultix WalkView**”, the “**Activation window**” appears as depicted in Figure 2 below,

The screenshot shows the 'Consultix WalkView' activation window on a mobile device. At the top, the status bar shows 4G+ signal, 98% battery, and 3:08 pm. The app title bar says 'Consultix WalkView'. Below it, there are three input fields: 'Request Code' with the value 'ce011711c9ab90d30c', 'User Name', and 'Password'. A callout box with a pointer to the 'User Name' field contains the text 'Copy & paste the provided license without spaces'. At the bottom, there is a large grey button labeled 'Activate'.

<https://consultixwireless.com>
support@consultixwireless.com

Figure 2: WalkView Activation Window

Please contact support@consultixwireless.com to request a license.

3. Copy and paste the provided license without spaces then tap the “**Activate**” button

Note: Internet connection is required for license activation. After activating your copy, “**Activation Done**” Message should appear.

WalkView Overview

WalkView Layout

Figure 3 below shows the layout of the WalkView.

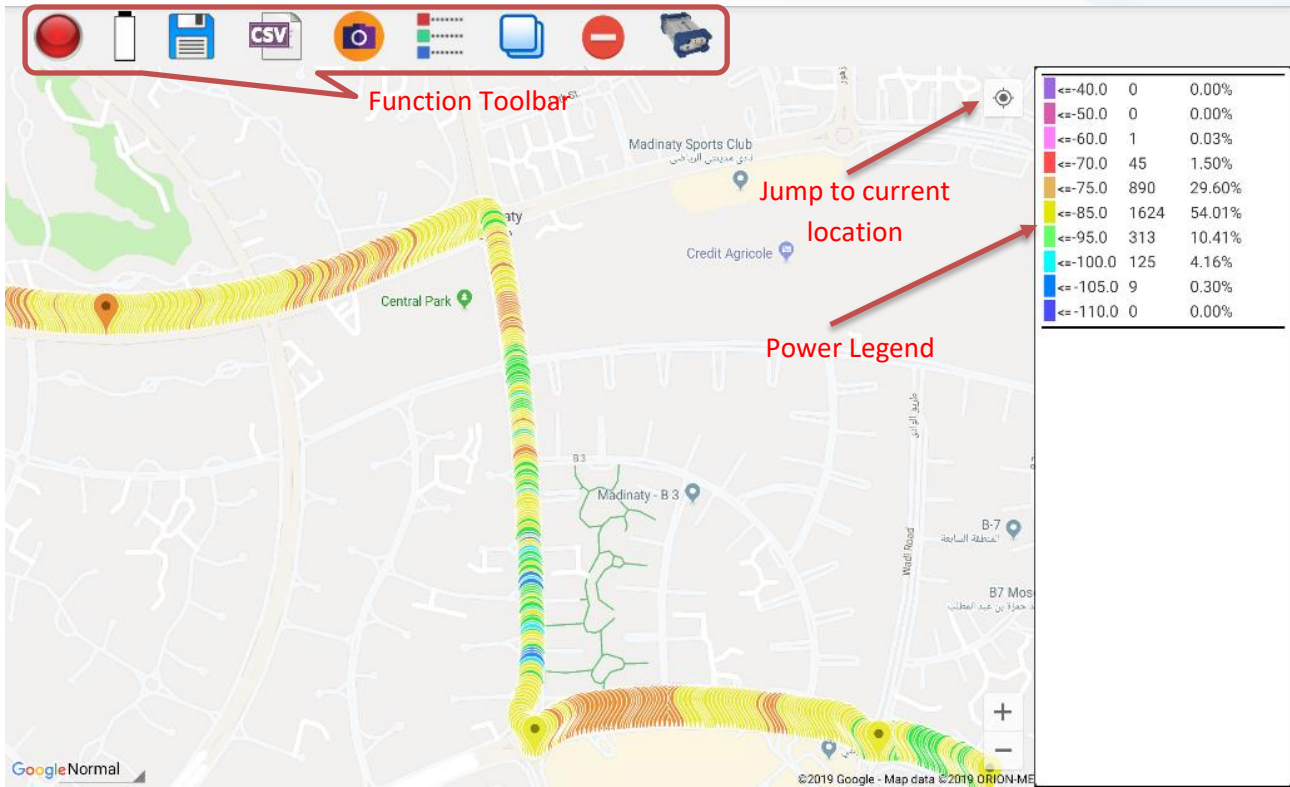









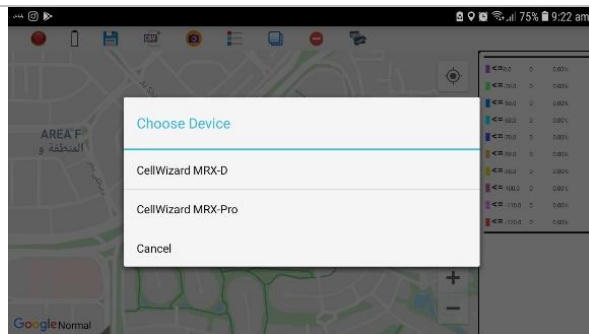


Figure 3: WalkView Layout

WalkView Toolbar and Menu

Each button function is depicted in the table below,

Function Toolbar	
Icon	Description
	Start / Stop measurements
	Battery level indicator
	Save measurements to the working folder
	Export data to .CSV file Note: the data coordinates will be exported according to the original picture dimensions (length & width)
	Export a snapshot of the measurements with/without the legend
	Show the dBm power legend
	Copy the current session configuration without measurements.
	Clear all measurement points on the map
	Choose a receiving device (MRX-Pro or MRX-D) i.e. The default receiving device is the MRX-Pro the figure shows how to choose a device



Getting Started

1. On Consultix WalkView Main Window, tap Consultix Logo at the upper-left corner then choose “**Settings**” to configure the WalkView settings as depicted in Figure 4 below

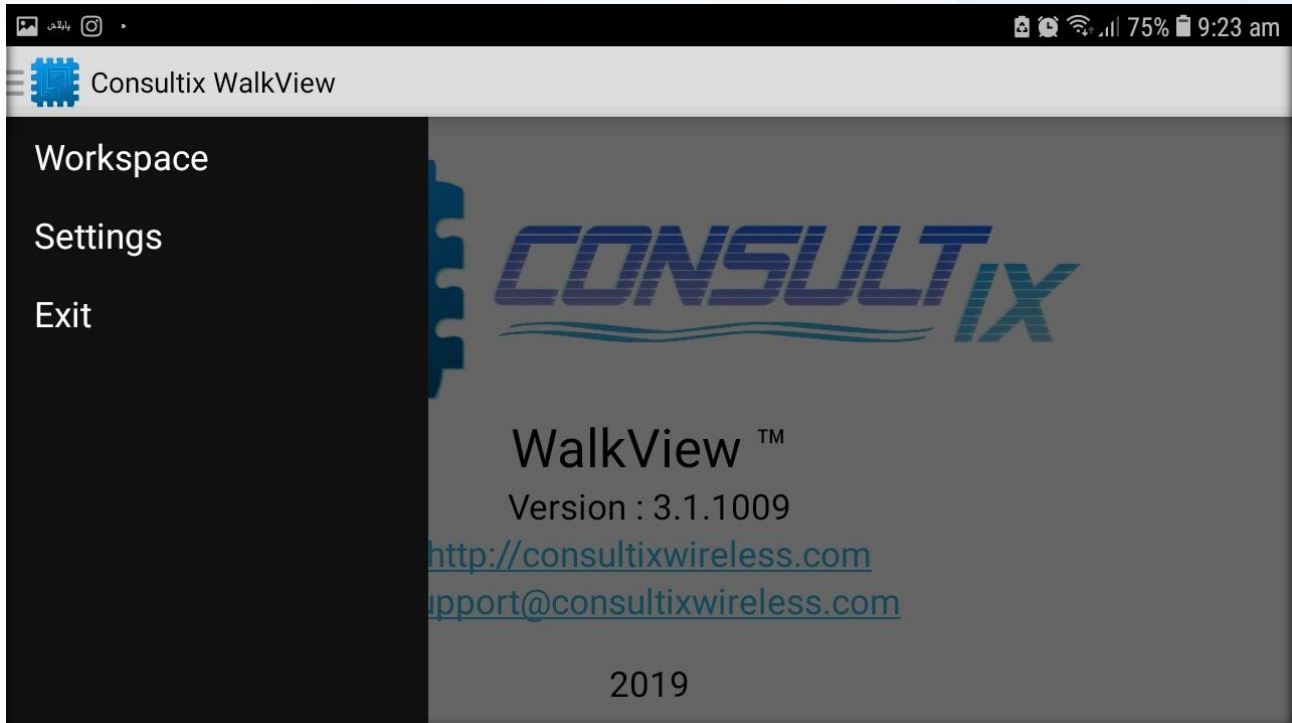


Figure 4: WalkView Main Window

Error! Reference source not found. below depicts the WalkView “Settings” Window,

2. On the **Settings menu**, under legend tab adjust the legend colors for your measurements according to the received power ranges as desired.
3. Tap the colored box to pick a color then tap **OK** as depicted in Figure 5 below,

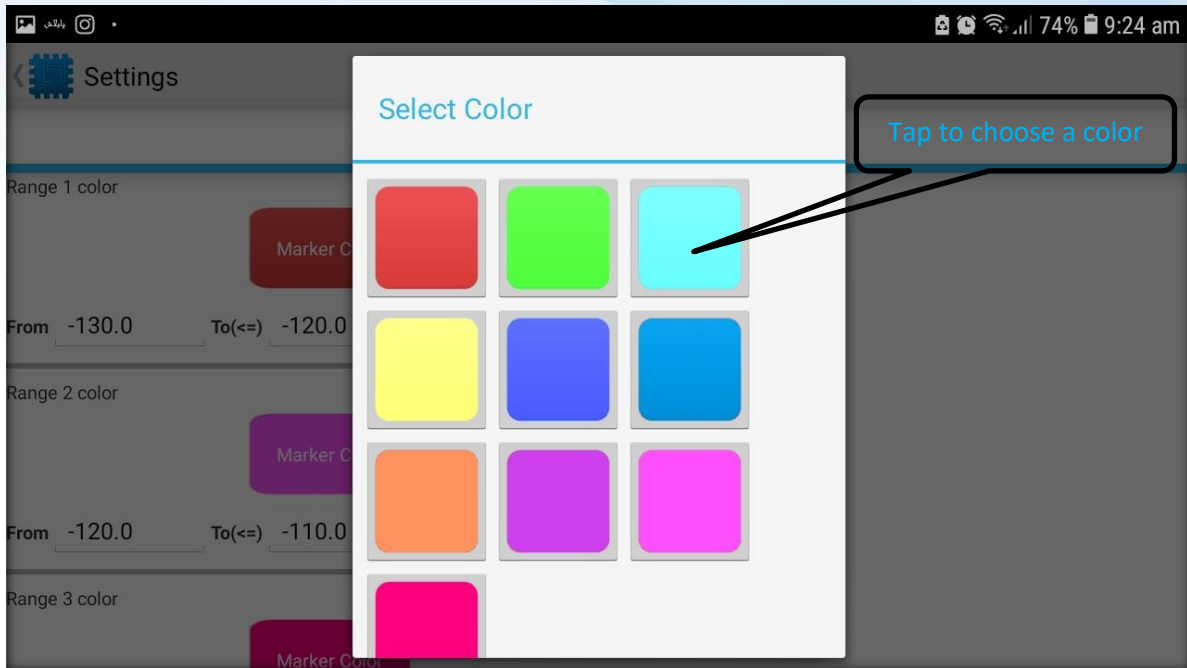



Figure 5: WalkView Power Ranges

After configuring the WalkView settings as desired, tap the **back**  button from the Android device to save your configuration

Prepare your Test

In this section, the user will be able to categorize the workspace by creating a working folder for the whole project and creating the 1st site then adding measurement sessions for this site.

1. On WalkView Main Window, tap Consultix Logo at the upper-left corner the press **Workspace** to navigate to the workspace
2. Create a new working folder this is where all the measurement data will be saved as depicted in Figure 6 below,

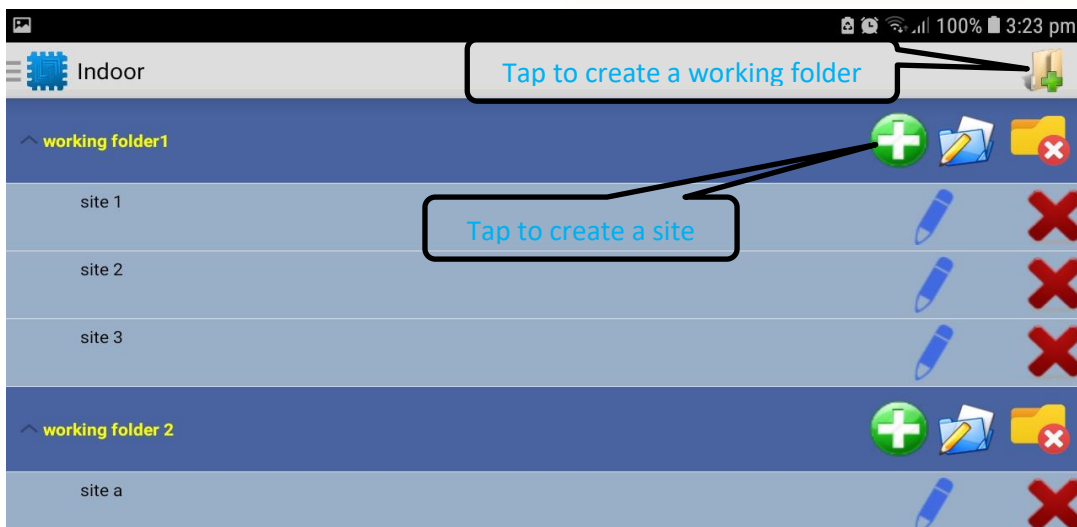


Figure 6: WalkView Session Manager

Note: When creating a new working folder, all measurement files will be saved in the following path,

Internal Storage > Consultix > WorkingFolders

If you want to add/delete/edit many working folders and sites, you can do that in the "Session Manager" window.

3. Create a new site as depicted in Figure 7
4. After creating your site, tap the site that you created to enter "Sessions" window.
5. In "Sessions" window, the user can create a session (or multiple sessions) according to the measurement scenario as depicted in Figure 8
6. Give a name to your session, type in the session note, set the frequencies that you are going to measure, set the cable loss in dB (if required) and tap the "Create" button.
7. Some extra fields are required for Asset tool header file, user may set these fields with the corresponding values or leave it blank



Figure 7: Create new site



Figure 8: Creating a new session

After creating the session, tap the session name then tap the **“Run”** button. Google maps is displayed and you are ready to start Drive Test measurements as depicted in Figure 9 below,

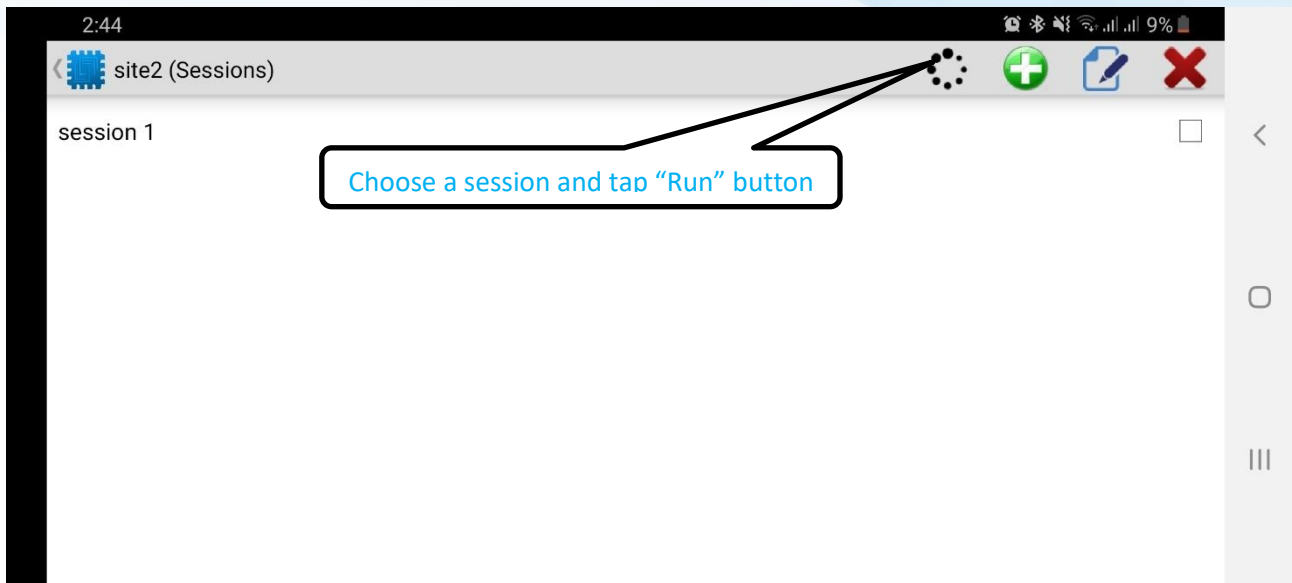


Figure 9: Running a measurement session

Starting your Test

Figure 10 below shows the WalkView measurement window.

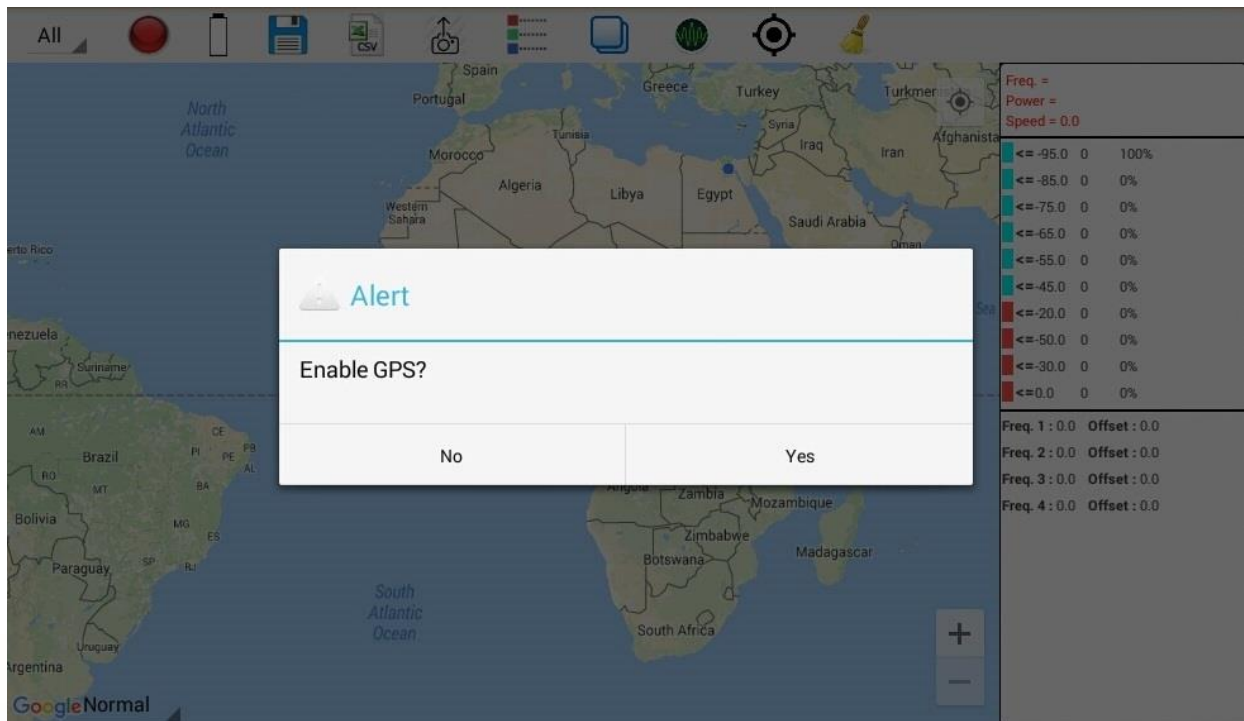



Figure 10: WalkView GPS enabling

1. After running your session, enable your GPS as depicted in (Figure 17) below,
2. Tap the GPS icon from the tools bar to jump to your current location.

Note: You can switch among the different GPS view (Normal, Satellite, Hybrid or Terrain) conveniently.

After installing the test transmitter with the antenna at the desired location, tap start/stop icon



to start your measurements (The button returns orange )

A pop-up message appears to enable the MRX receiver USB connection as shown in Figure 11 below. Check the box and tap **Ok**

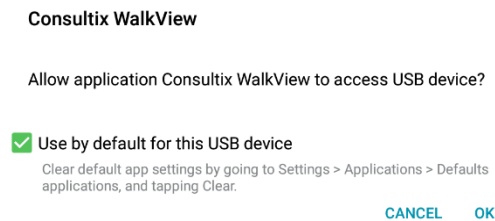


Figure 11: Enabling USB Connection

1. Once you move the car the WalkView starts collecting measurements and stores it in a raw data file
 2. Start moving according to pre-defined measurement routes
 3. The WalkView geotags the measurements on the map according to the GPS reports
- Note:** You can zoom in/out at any point on the map for accurate location pointing.

Figure 12 below shows the WalkView measurement path

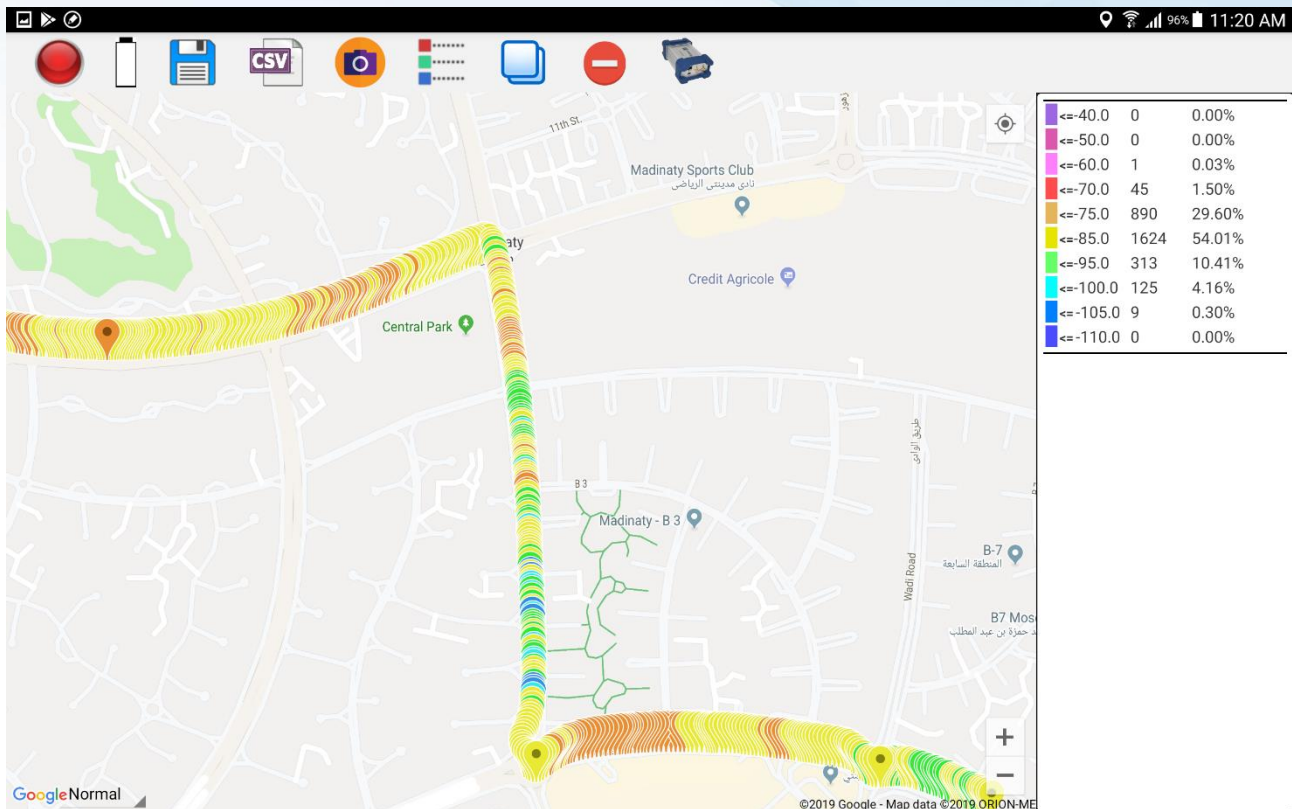




Figure 12: WalkView measurement window

- When you reach the end of the measurement path, tap start/stop icon  again to stop your measurements.
- If you are satisfied with the measurement run, tap the save session icon  to save your measurements, the user can take many runs in the same session as desired

Note: At any measurement point on the map, the user can zoom in and click to view its power level as depicted in Figure 13: Displaying measurement point details below,

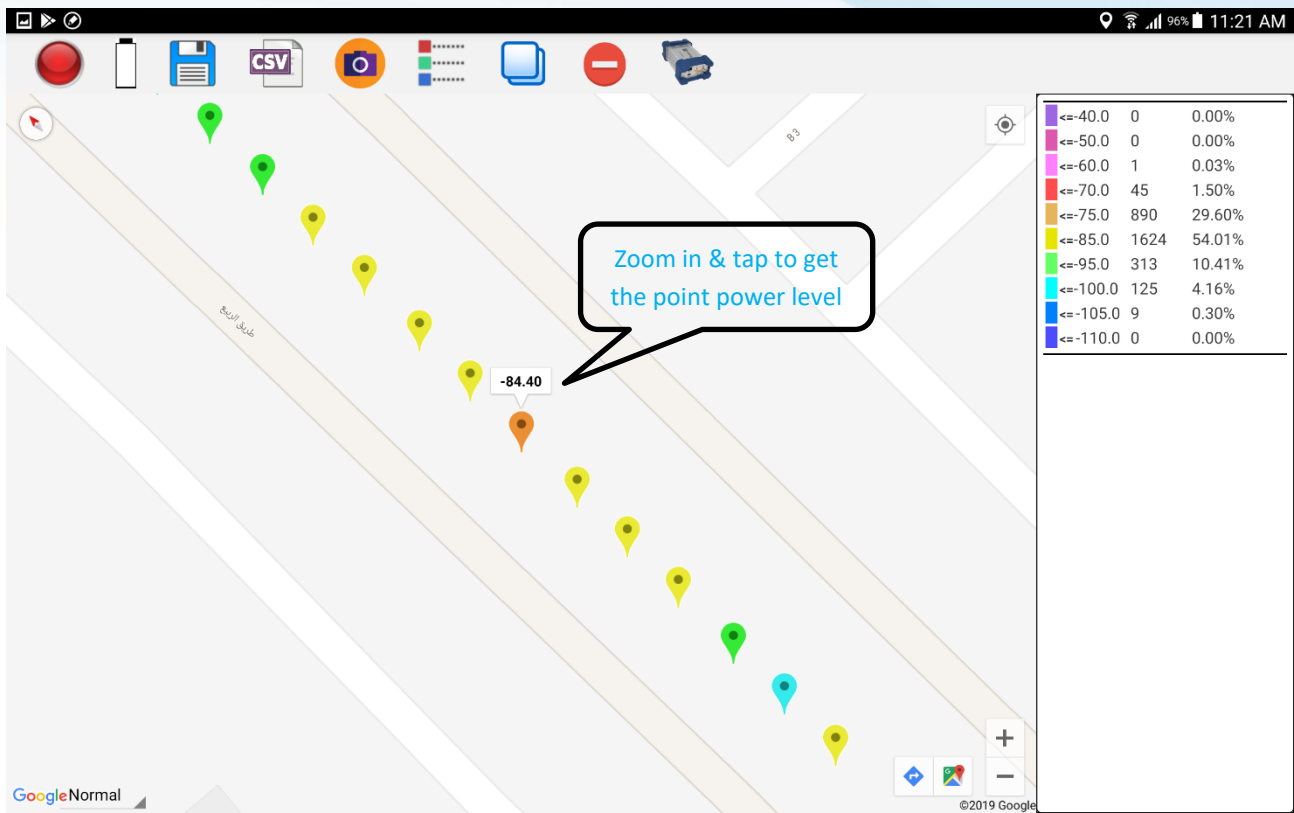


Figure 13: Displaying measurement point details

Typical Drive Test Setup

Figure 14: Typical Drive Test Setup below shows a typical test setup for an outdoor drive test scenario,

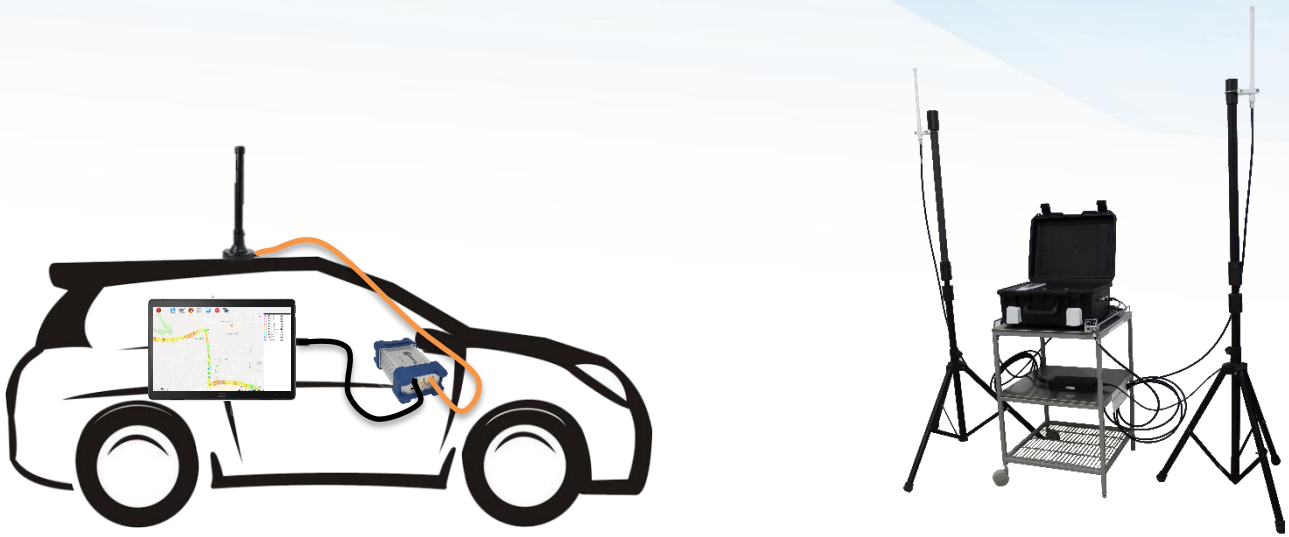


Figure 14: Typical Drive Test Setup

CSV file formatting:

If the user presses the export button, this extracts the average data as per the format below:

Latitude | Longitude | Average

Example:

Latitude	Longitude	Power Value
30.08019	31.65305	-95.0611
30.08016	31.6531	-98.2019
30.08013	31.65315	-97.3584
30.08011	31.6532	-98.0665
30.08008	31.65325	-96.9619

Meanwhile, the raw data is automatically saved in a default path and as per the format below:

Latitude | Longitude | Raw Data

Example:

Latitude	Longitude	Power Value
30.08019	31.65305	-95.0611
30.08016	31.6531	-98.2019
30.08013	31.65315	-97.3584
30.08011	31.6532	-98.0665
30.08008	31.65325	-96.9619

CSV file name

The raw data files are automatically saved to the below path:

C:\Program Files\Consultix\WalkView\rawData

The file name is structured as follows:

The name of the average data file will have the following format

Session Name -> Operating Frequency -> Date -> Time

The name of the raw data file will have the following format

Session Name -> Raw Rout **X** (x increment when session is restarted) -> Operating Frequency -> Date -> Time

Rules of data saving:

- 1- Raw data files will be saved automatically to protect your data against power cut off
- 2- File names will include the date and time once the user presses the connect button
- 3- If the session is stopped and then resumed (using start button) a new raw data file will be created with incremented rout number.

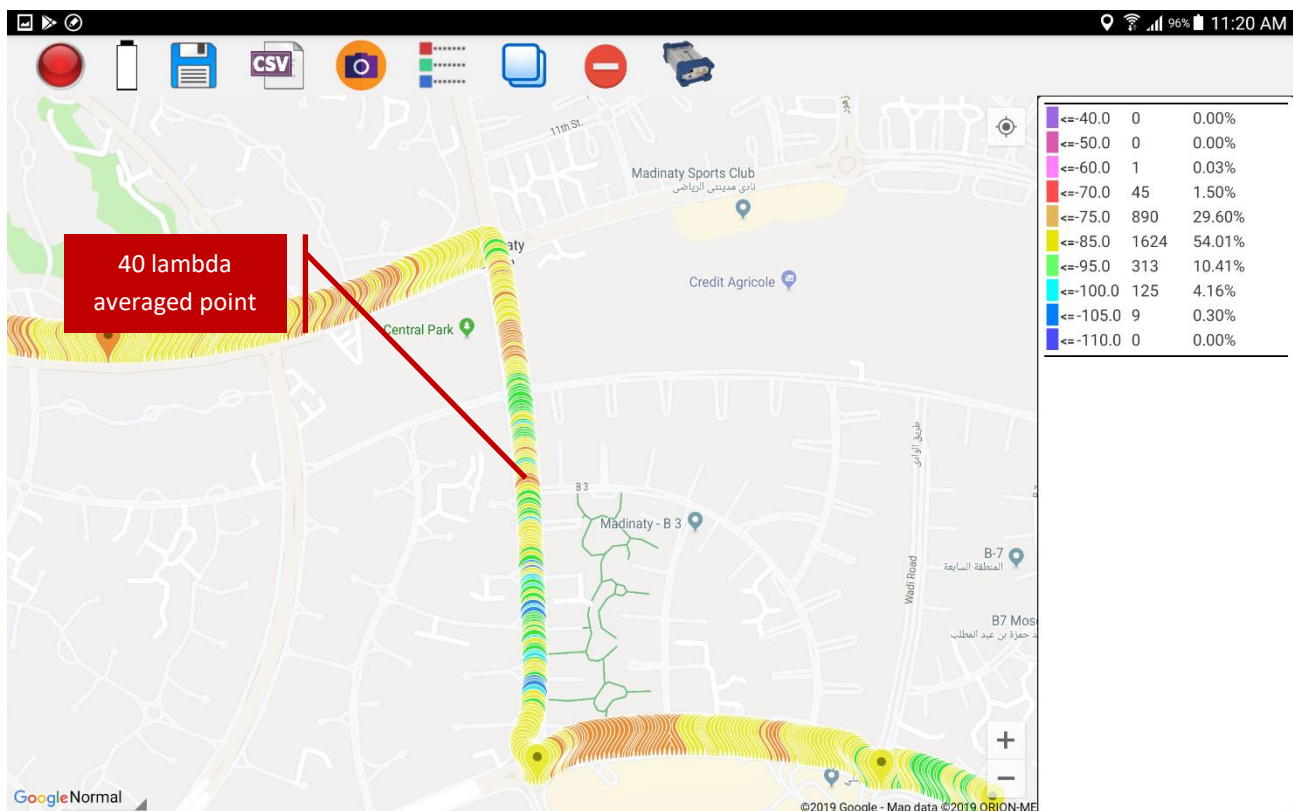
Steps of Operation

Once the receiver is commanded by the WalkView application to start operation, the receiver autonomously collects and sends samples to the software. All collected samples are stored along with GPS coordinates and timestamp in a raw data file. If the car stopped moving (Speed = 0) anytime, the SW would command the receiver to stop measurements, this guarantees that your raw data file size is not filled with static useless measurements.

During the test, the WalkView geotags the averaged data point on the map.

According to Lee Criteria, every 40 wavelengths, WalkView average all sampled data in this distance and plots one point (**Channel 0**) on the map with the average of all samples collected within this distance and stores the original (raw) RF samples to the raw data file.

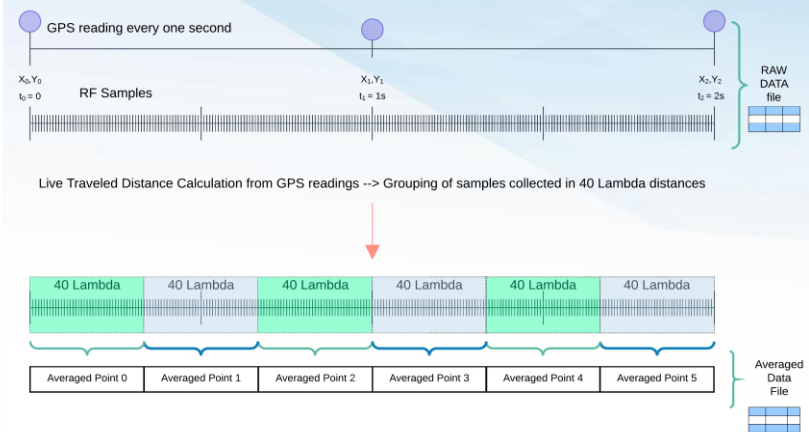
RAW and average data files for all channels are saved automatically to the default path¹, while the user still can export average points plotted on the map (**Channel 0**) to an average data file with different file format such as a CSV format.



¹ C:\Program Files\Consultix\WalkView\rawData

WalkView™ Averaging Process

The GPS Receiver reports the location every 1 second, then the application records RF samples with GPS Readings and stores it in the raw data file, the WalkView performs live distance calculation from the GPS readings then groups the collected RF samples into blocks corresponding to 40 lambda distances



The block size and number of samples in each block, will vary depending on the sampling rate and driving speed, also number of blocks varies with the distance traveled during every GPS report, Samples corresponding to each 40 Lambda distance is then averaged to one point then presented as one point on the map, Optionally the user can export presented points to averaged data file

Examples

Assuming a CW drive test with the following configuration,

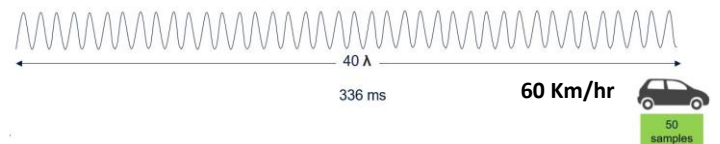
RX Frequency = 2140 MHz

Lambda = 14 cm

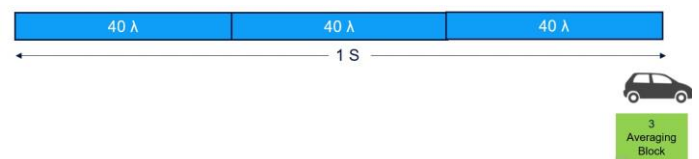
40 Lambda = 5.6m

RF Sampling Rate = 150 samples/second

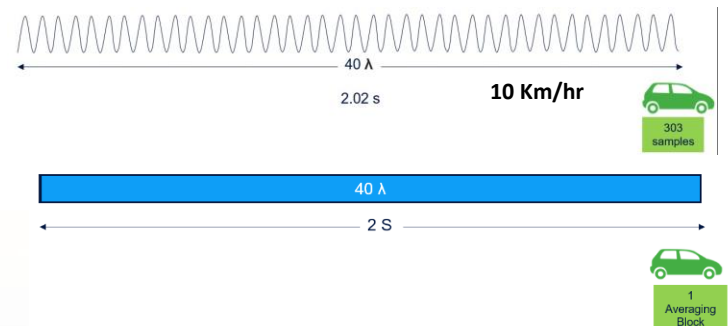
Ex. 1: with a car speed of 60 Km/hr, the car will finish a distance of 40 lambda (5.6 m) in 336 ms and WalkView gets 50 samples.



The application then will have 3 x (40 lambda) blocks between every 2 GPS reports (1 second). Samples corresponding to each block will be averaged and presented as one point on the map - this is done assuming a constant velocity during the one second GPS reporting interval.

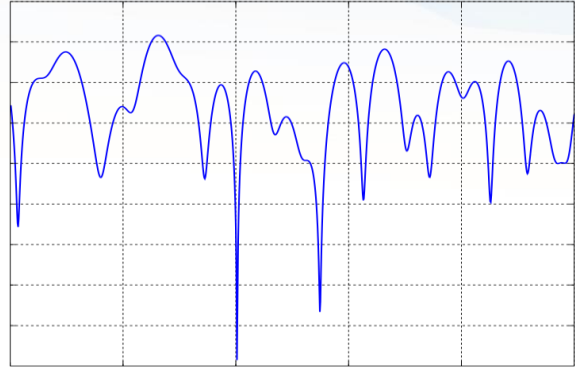


Ex. 2: with a car speed of 10 Km/hr, the car will finish a distance of 40 lambda (5.6 m) in 2.02 s and WalkView gets 303 samples, this happens after 2 GPS reports, and after this period the WalkView will average all samples corresponding to this block (2.02 seconds and 303 samples) as one point presented on the map



Appendix A: Technical Background

1. There are two types of fading that are relevant to performing coverage measurements, fast fading, also known as Rayleigh fading, and terrain-based fading due to obstructions and propagation loss. The goal of coverage measurement is to measure the local signal strength in presence of terrain-based fading.
2. Coverage measurements must be made in a manner that rejects Rayleigh fading, so that accurate measurements of terrain-based fading can be made.
3. It is important to realize that Rayleigh fading is a spatial phenomenon not a time one. The averaging is intended to be done over a distance of 40 wavelengths. All the samples within a grid on a map are averaged to produce one point and in order to ensure rejection of Rayleigh fading, the grid size must be larger or equal than 40 wavelengths.
4. William Lee derived a well-accepted criterion for removing Rayleigh fading and retaining slower terrain-based fading, known as 40 Lambda averaging. This criterion in order to remove Rayleigh fading, you should average data for a time period equal to the time it takes to traverse 40 wavelengths in your measurement vehicle and you should have no less than 36 to 50 points in that time. This makes the averaged value very close to the real value (within several dB's)



Appendix B: Guidelines for CW Measurement Surveys

- Inaccurate measurements → inaccurate calibration → inaccurate model
- The area under test must be scanned against existing interference
- Selected frequency must have a clearance of 400kHz from radio interference
- Measurement surveys should be obtained for distances up to 10km (or until the noise floor of the receiver has been reached).

Equal number of samples should be conducted near as well as far from the transmitter

Further Help

- For any support inquiry, kindly contact:

Support: support@consultixwireless.com

Or contact our distributor covering your region (check www.consultixwireless.com)

- For any information about prices, specifications, future developments, recommendations, customizations, or general question, kindly contact:

Sales: sales@consultixwireless.com

