



OSCIUM

WiPry-Spectrum Manual

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2.400-2.495GHz Spectrum Analyzer for iOS

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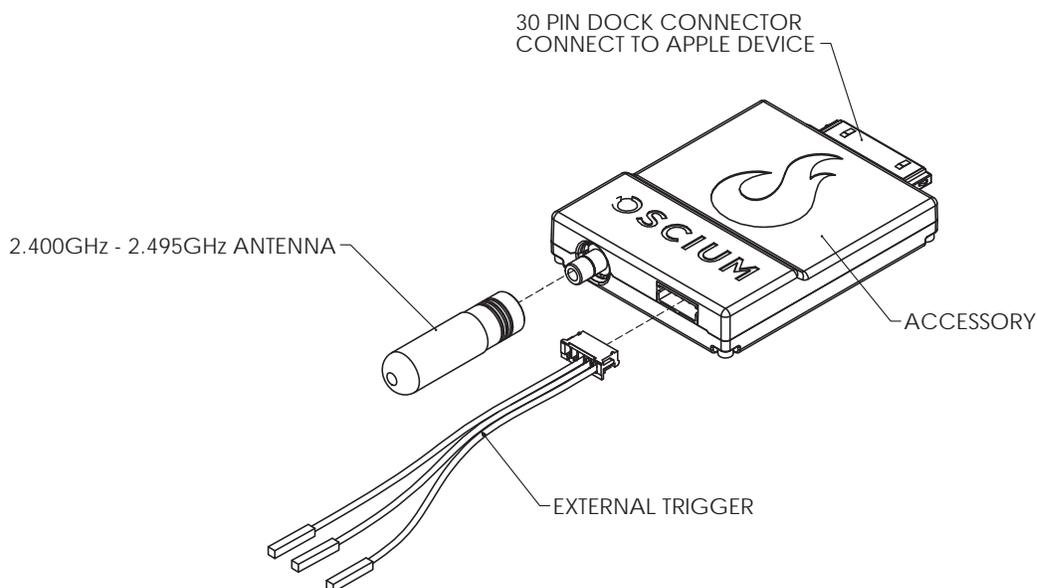
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Section 1 Getting Started with SAFETY

1.10 Quickstart Guide



- 1) Connect Antenna and External Trigger (optional) to the appropriate ports on the scope.
- 2) Download "WiPry" from the app store.
- 3) Connect the scope to the iPod Touch[®], iPhone[®], or iPad[™] using the 30 pin dock connector.
- 4) For more information, please visit the Oscium website.

www.oscium.com

"Made for iPod", "Made for iPhone", and "Made for iPad" means that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.

1.20 Getting Started with SAFETY

Do not apply more than 20dBm to the antenna without attenuation. Oscium is not held liable for usage outside of these limits.

1.30 Compatibility

1.31 Hardware

WiPry works on these specific Apple® devices:

iPod touch (3rd (32GB only), 4th and 5th generation)

iPhone 5

iPhone 4S

iPhone 4

iPhone 3GS

iPad mini

iPad 4

iPad 3

iPad 2

iPad



1.32 Software

WiPry is compatible with all generations of the iPod touch, iPhone, and iPad devices running iOS version 5.0 or higher. Three distinct products are available under the WiPry brand: WiPry-Spectrum and WiPry-Combo. Once hardware is connected, the system will automatically recognize whether it is the spectrum analyzer (WiPry-Spectrum) or the power meter or both (WiPry-Combo). The connected hardware will enable the appropriate functionality. If hardware has not been detected, demo mode will simulate data.

Test drive the software for free by downloading WiPry from the Apple App Store.



Section 2 How WiPry-Spectrum Works

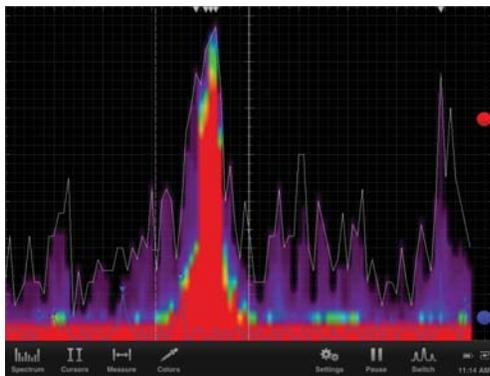
2.10 Menus

This manual describes how WiPry-Spectrum works on the iPad, iPhone and iPod touch. For information on how WiPry-Combo works, please reference that manual.

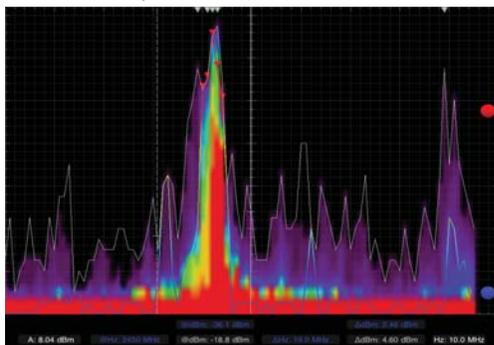
iPad | iPhone | iPod

Double clicking on the display will toggle between: the menu bar and the summary bar.

The Menu Bar



The Summary Bar



The menu bar has sub menus that can be activated by touching the appropriate word or icon. When using the iPad and hardware is not connected, the following options exist in the menu bar:



When hardware is plugged into the iPad, the demo option disappears. On the iPhone / iPod touch, the same options exist in demo mode except that the settings option is not viewable. To view settings in demo mode, press and hold  and it will change to .

If using a device with the capability of both a spectrum analyzer and a power meter, touch  on the menu bar. This will allow you to toggle to power meter mode. To toggle back to spectrum analyzer mode touch .

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2.20 Spectrum Views

2.21 Real-Time View / Waterfall View

Touch  on the menu bar. At the top of the menu, the waveform can be set to either real wave or waterfall by touching either **REAL WAVE** or **WATERFALL**. When activated, it will change from **WATERFALL** to **WATERFALL**. When real wave is selected, six additional views are available: Raw, Decay, Average, Max Hold, Min Hold, and Heat Map. To scroll through the measurement options, touch **RAW**. Then, scroll through the pick wheel to choose the desired measurements. To activate the settings touch away from the menu or touch **BACK**.

2.22 Raw

Touch  on the menu bar, then touch **RAW** and scroll through the pick wheel until it RAW is highlighted. To activate the raw view, touch away from the menu or touch **BACK**.

2.23 Hold / Decay

Touch  on the menu bar. In the default setting **DECAY** should be selected. Once decay is activated both the advanced options for hold and decay will be activated. To change the advanced option touch and swipe the dot to the right of either hold **HOLD:**  264 ms or decay **DECAY:**  1.00 mW. While decay is activated, it is also possible to simultaneously select any two other real-time views.

2.24 Average

Touch  on the menu bar. In the default setting **AVERAGE** should be selected. When selected, an advanced sliding bar is then activated below. To change the advanced options, touch and swipe the dot to the right of average **AVERAGE:**  2.00 s.

2.25 Int. Atten. / Ext. Atten.

Touch  on the menu bar. To change the Internal Attenuation (Int. Atten.) level, touch **0 dBm** to the right of **INT. ATTEN.:**. Enter the desired value using the pick wheel. To activate the setting touch away from the menu or touch **BACK**.

To change the External Attenuation level the same procedure should be followed. Touch **0 dBm** to the right of **EXT. ATTEN.:**. Enter the desired value using the pick wheel. To activate the setting touch away from the menu or touch **BACK**.

2.26 Clear Waveforms

To clear waveforms, touch  on the menu bar. Then touch, **CLEAR WAVEFORMS**.

2.30 Cursors

2.31 Cursors On / Off

Touch  on the menu bar. Touch **ON** to activate cursors. With real-time wave views, it is possible to select either horizontal or vertical cursors. With the waterfall view, both the horizontal and the vertical cursors will be activated.



2.32 Cursor Axis

Touch either the **HORIZONTAL** cursor or the **VERTICAL** cursor. Double touch the interface until the summary screen appears. Metrics relating to the cursors appear in the center of the summary screen.

2.33 Cursor Mode

There are two modes available on this device: **INDEPENDENT** and **TRACKING**. Upon activating cursors, two lines will appear. One is dotted and the other is solid. The solid line is active and can be moved, while the dotted line is stationary (unless the cursors are in tracking mode). While in tracking mode both the solid and dotted lines will move together. In independent mode the solid line is the only line that can be moved. Additionally, dynamic metrics related to the solid line are available in the summary screen located at the bottom. Touch on the dotted line and it will become a movable solid line, while the other line will change to dotted.

2.34 Horizontal Cursors

Touch the **II** icon from the menu bar. Touch **ON** to activate cursors.

Touch **HORIZONTAL** from the cursors menu and it will change from **HORIZONTAL** to **HORIZONTAL**. Touch **ON** and **OFF** to turn the horizontal cursors on and off, respectively.

On the main screen, touch and swipe the desired cursor in the vertical direction and place where desired. The selected cursor will be displayed as a solid line and the un-selected cursor, a dotted line. The position of the selected cursor is indicated next to @dBm or @mW in the summary bar. The distance between the two cursors is indicated next to Δ dBm or @mW in the summary bar.

If cursor data is to be displayed in Base, touch **BASE**. The image next to the word UNIT **dBm** allows you to view the current unit of time.

If cursor data is to be displayed as a ratio, touch **RATIO**. The options next to the phrase 100% WITHIN set the ratio. Ratio settings available next to 100% WITHIN include: **GRID** **CURSOR**. The option of **GRID** sets 100% within the screen divisions or grid divisions. The **CURSOR** option sets 100% between the two cursors.

2.35 Vertical Cursors

Touch the **II** icon from the menu bar. Touch **ON** to activate cursors. Touch **VERTICAL** from the cursors menu. On the main screen, touch and swipe the desired cursor in the horizontal direction and place where desired. The selected cursor will be displayed as a solid line and the un-selected cursor, a dashed line. The position of the selected cursor is indicated next to @Hz in the summary bar. The distance between the two cursors is indicated next to Δ mW (or Δ dBm) in the summary bar. The point where the selected cursor crosses the spectrum waveform is indicated in the summary bar next to @dBm. The vertical difference between the crossing points of the two vertical cursors is indicated in the summary bar next to Δ dBm. When using vertical cursors both @Hz, Δ Hz and @dBm, Δ dBm or @mW, Δ mW will be visible in the summary bar.

Verify that **VERTICAL** cursors are selected. To move cursors independently of one another, touch **INDEPENDENT**. To move cursors as a single unit with a fixed distance between them, touch **TRACKING**.

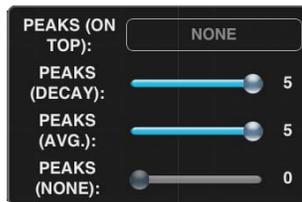
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The following options are available: **BASE** **PHASE** **RATIO**.

1. If cursor data is to be displayed in Base, touch **BASE**. The options next to the word UNIT set the unit of time. Time settings available in the Base option include: **s** **Hz**. The **s** option sets the unit of measure in seconds. The **Hz** option sets the unit of measure in hertz.
2. If cursor metrics are to be displayed in Phase, touch **PHASE**. The options next to the phrase 360° WITHIN sets the phase. The option of **5 DIVS** sets 360° within 5 divisions. The **CURSOR** option sets 360° between the two cursors.
3. If cursor data is to be displayed as a ratio, touch **RATIO**. The options next to the phrase 100% WITHIN set the ratio. Ratio settings available next to 100% WITHIN include: **5 DIVS** **CURSOR**. The option of **5 DIVS** sets 100% within 5 divisions. The **CURSOR** option sets 100% between the two cursors.

2.40 Measurements

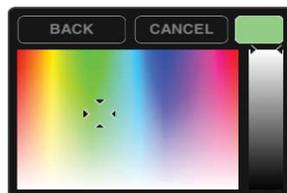
Touch  from the menu bar. Four different peak measurements exist: Peaks (On Top), Peaks (Decay), Peaks (Avg.) and Peaks (None). To change any of the measurements, touch and swipe the dot to the right of the text. To change Peaks (on top), touch **NONE**. Six options exist: None, Raw, Decay, Average, Max Hold, and Min Hold. Select the desired option by scrolling through the pick wheel; to activate the settings touch away from the menu or touch **BACK**.



2.50 Colors

2.51 Real Wave

Touch . Then touch Either **MIN** or **MAX** in the menu. Then select the desired color using the color palette. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.

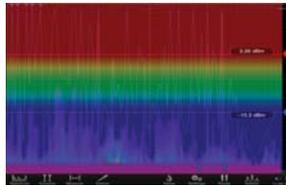


To select the desired color threshold, touch **6.00 dBm** next to either Min or Max. Then select the desired units using the pick wheel. To activate the settings touch away from the menu or touch **BACK**.





The threshold level is controlled with a bubble located on the far right of the screen. Touch and drag the bubble either up or down in order to manually change the threshold. A horizontal line and **6.00 dBm** will then appear to the right of the bubble. Also, the interface will show a color gradient using the selected colors for Min and Max.



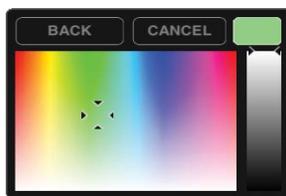
To set the colors to a default Rainbow setting touch **RAINBOW**. When Rainbow is selected it will look like **RAINBOW** and both Min and Max will be grayed out. To personalize Raw Wave colors touch either **MIN** or **MAX** and select a color from the pick wheel.



To reset colors to default touch **RESET**.

2.52 Heat Map

Touch **HEAT**. Then touch either **MIN**, **MID** or **MAX** in the menu. Then select the desired color using the color palette. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



To select the desired color threshold, touch **0.20** next to either Min, Mid or Max. Then select the desired units using the pick wheel. To activate the settings touch away from the menu or touch **BACK**.



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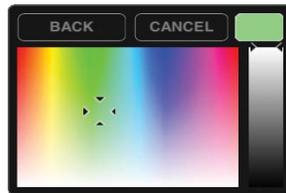
To set the colors to a default Rainbow setting touch **RAINBOW**. When Rainbow is selected it will look like **RAINBOW** and Min, Mid, and Max will be grayed out. To personalize Raw Wave colors touch either **MIN**, **MID** or **MAX** and select a color from the pick wheel.



To reset colors to default touch **RESET**.

2.53 Decay

Touch , then touch  next to the phrase **DECAY:**. Then select the desired color using the color palette. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



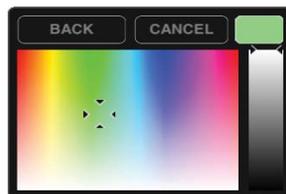
2.54 Average

Touch , Then touch  next to the phrase **AVERAGE:**. Then select the desired setting in the pick wheel. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



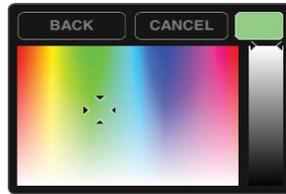
2.55 Max Hold

Touch , Then touch  next to the phrase **MAX HOLD:**. Then select the desired setting in the pick wheel. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



2.56 Min Hold

Touch . Then touch  next to the phrase **MIN HOLD:**. Then select the desired setting in the pick wheel. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



2.60 Demo

Touch . Four different settings exist: NONE, WiFi, DECT, and DSSS. Once a setting is selected it will change from **WIFI** to **WIFI**.



2.70 Settings

2.71 Grid Settings

Lines vs. Dots

Touch . Then touch the desired selection either **LINES** or **DOTS**. This setting affects the way that the signals are displayed; it will either be point by point (dots) or it will be represented with a line.

Graticule

Touch . Then touch  or  to scroll through the various background display options. They include: Crosshairs, Major Tics, Minor Tics, Major Grid, Minor Grid, and finally Graticule. Once a selection is touched it becomes active and changes from **GRATICULE** to **GRATICULE**. Touching graticule is a shortcut for touching all of the above.

2.72 Alerts

Touch . Three alerts are available. They are located on the third row from the top: ALERTS, ON STARTUP & ON DISCONNECT. Cycle through the options by touching  or  next to the selection. Then touch the selection to activate it. To deactivate a specific alert, touch the alert and it will change from **ON STARTUP** to **ON STARTUP**. Touching **ALERTS** is a shortcut for touching all of the above.

2.73 Sounds

Sounds can be controlled either through hardware or software. The Apple device can control the sound (in the same way it always controls sound) by using the plus/minus volume controls on the side of the device. In the software, sounds are

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turned off by touching . Then touch **OFF** to turn sounds off or touch **ON** to turn sounds on.

2.74 Units

Touch  from the menu bar. Then touch either **dBm** or **mW** next to the word **UNITS:**. Once a unit of measure has been selected, it will apply to all metrics for the spectrum analyzer. For those that are using WiPry-Combo, a change in the power meter settings will transfer over to the power meter, and vice versa.

2.75 Screenshot

Two options exist. First, a screenshot can be captured by simultaneously pressing both the home button and the power button on your Apple device. The screen will flash white while the picture is captured. When a picture is captured this way, everything visible on the LCD will be captured and available in photos. The second option is to touch  and then touch **SCREENSHOT**. The text SCREENSHOT will briefly fade to from translucent to gray. The setting menu will disappear and the display will briefly change to full screen mode.

2.76 Email

Touch . Then, touch **EMAIL**. The email will consist of the image currently displayed on the screen. It is not possible to retrieve screenshots from this spot, and pictures are not available in photos where they can be emailed. The other option is to simultaneously press both the home button and the power button on your Apple device. The screen will flash white while the picture is captured. When a picture is captured this way, everything visible on the LCD will be captured and available in photos where it can be emailed.

2.77 Manage Data Log

This feature is only available with hardware; it is not available in demo mode. When in demo mode, the data logging options, START and STOP, are grayed out.

Touch  from the menu bar. Then touch **START** from the data log option, **DATA LOG** **START** **STOP**. **START** will then change to **START** in order to indicate data is being logged. To stop data logging touch **STOP**.

Touch . Then touch **MANAGE DATA LOG**. A pick wheel will appear with all of the data that has been previously logged where it will be possible to email the raw data that has been collected.

2.78 Configuration Settings

Reset Configurations

To reset the configuration, touch . Then touch, **RESET CONFIG**.

Saving Configurations

Up to three configurations can be saved at a time. Touch . Then, touch **SAVE** next to CONFIG 1, 2 or 3. **SAVE** will then change to **SAVE** in order to indicate that the configuration is saved.



To upload a saved configuration touch  .  will then briefly change to  indicating that the configuration has been loaded.

2.80 Pause / Play

If the signal is active, the screen can be paused by touching . Pause is located in the menu bar, on the far right side. If the signal is paused, the screen will resume real time measurements by touching . In order to capture a single-shot wave form, touch and hold  or  until it changes to . Then touch  and it will capture a single-shot waveform. Single-shot waveform capture is a feature more for the dynamic power meter but if the setting is changed on the power meter, it will remain in that state on the spectrum analyzer. To change it back to pause / play, press and hold .

2.90 Host Properties

From Demo Mode, touch  from the bottom right corner of the menu screen to view host properties. When hardware is plugged in and product is in active mode, touch  from the bottom right corner of the menu screen to view host properties.

Here is an example of host properties on an iPad:



**iOS version 5.0 or newer
is required for WiPry to operate.**

Section 3 Switching Spectrum Mode to Power Mode

When using WiPry-Combo (with the functionality of both a spectrum analyzer and a power meter), both interfaces will be active and fully functional. Touch . It will then change to . This will allow you to switch between the power interface and the spectrum interface. If the hardware is only compatible with one of the interfaces, touching  will allow you to switch, but only the interface that has been purchased will be functional.

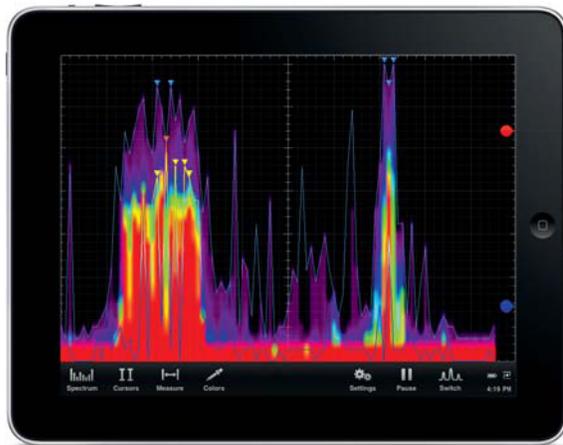
Section 4 Product Warranty

4.10 Product Warranty



WiPry-Spectrum, WiPry-Power and WiPry-Combo all include hardware along with an external antenna (pictured above). Each product comes with a full one year manufacturer's warranty.

Section 5 Performance Specifications



WiPry-Spectrum
Spectrum Analyzer for iOS

Osium designs test equipment you want to get your 'hands on'. We leverage the intuitive features and touchscreen technology found in the iOS family of products (iPad, iPhone, iPod touch) making test equipment easier to use than ever. With WiPry-Spectrum, your phone, touch or tablet now becomes a powerful test equipment tool that you can use on-the-go. WiPry-Spectrum enables you to visualize real-time radio frequency signals in the 2.4GHz ISM band. It is perfect for detecting open WiFi channels and identifying unauthorized WiFi access points. WiPry-Spectrum adds yet another tool to your "iOS Test" toolbox.

Technical Specifications

Frequency Range: 2.400 to 2.495 GHz
 Antenna: External with SMB
 Amplitude Range: -100dBm to -10dBm
 Amplitude Resolution: 2.0dBm
 Resolution Bandwidth: 1MHz
 Sweep Time: 200ms

Highlights

- World's First Spectrum Analyzer Accessory for the iOS Platform
- 2.4-2.495GHz
- Industry-leading Visualization Capabilities
- Data Logging (in csv format)
- Easiest, Most Intuitive Spectrum Analyzer You'll Ever Use
- Screenshots Can Be Emailed
- As Mobile As You Are

6.11 Performance Optimization

Newer generations of Apple hardware will improve the Oscium customer experience. Animations will be faster and crisper. Multitasking can also affect performance. Turning off applications will improve performance. Double click the home button on your Apple device. All the applications listed in this menu are currently running on the device. Press and hold any icon. They will begin to shake and a minus sign will appear on the top left corner of the app. Touching the minus sign will shut down the app; it will not delete it from your device. This will free up additional processing power on your device to maximize the user experience but it will only work on 3rd generation devices and newer.

Section 6 WiPry-Combo Option

WiPry-Spectrum has also been combined with the functionality of the power meter and the result is what we call WiPry-Combo. It retails for \$199.97 and not only does it give the ability to view the 2.4GHz ISM band (with the spectrum analyzer), you can also capture, trigger and record the actual power output of RF amplitude. The power meter has a wide frequency range of 100MHz to 2.7GHz, and it also leverages the 'hands on' nature of touchscreen technology. Check out WiPry-Combo to see why it's the preferred test equipment tool for the next generation of inventors.

Section 7 How to Contact Us

Please let us know your thoughts about our newest product, WiPry! The best way to reach us is at www.oscium.com/contact. Send us a technical question or just say hi. Thank you for your interest in WiPry!