



OSCIUM
WiPry-Combo Manual

Innovation for Inventors

Table of Contents

Spectrum Analyzer

Section 1 Getting Started with SAFETY

- 1.10 Quickstart Guide
- 1.20 Getting Started with SAFETY
- 1.30 Compatibility
 - 1.31 Hardware
 - 1.32 Software

Section 2 How Spectrum Analyzer Works

- 2.10 Menus
- 2.20 Spectrum Views
 - 2.21 Real-Time View / Waterfall View
 - 2.22 Raw
 - 2.23 Hold / Decay
 - 2.24 Average
 - 2.25 Int. Atten. / Ext. Atten.
 - 2.26 Clear Waveforms
- 2.30 Cursors
 - 2.31 On / Off
 - 2.32 Axis
 - 2.33 Mode
 - 2.34 Horizontal Cursors
 - 2.35 Vertical Cursors
- 2.40 Measurements
- 2.50 Colors
 - 2.51 Real Wave
 - 2.52 Heat Map
 - 2.53 Decay
 - 2.54 Average
 - 2.55 Max Hold
 - 2.56 Min Hold
- 2.60 Demo
- 2.70 Settings
 - 2.71 Grid Settings
 - 2.72 Alerts
 - 2.73 Sounds
 - 2.74 Units
 - 2.75 Screenshot
 - 2.76 Email
 - 2.77 Manage Data Log
 - 2.78 Configuration Settings

2.80 Pause / Play

2.90 Host Properties

Section 3 Switching Spectrum Mode to Power Mode

Section 4 Spectrum Analyzer Performance

- 4.10 Detailed Specifications

Dynamic Power Meter

Section 5 How WiPry-Power Works

- 5.10 Menus
- 5.20 Power Meter
 - 5.21 Int. Atten.
 - 5.22 Ext. Atten.
 - 5.23 Reference wave
- 5.30 Cursors
 - 5.31 On / Off
 - 5.32 Axis
 - 5.33 Mode
 - 5.34 Horizontal Cursors
 - 5.35 Vertical Cursors
- 5.40 Measurements
- 5.50 Trigger
 - 5.51 RF Triggering
 - 5.52 Digital Triggering
 - 5.53 Auto vs. Normal
 - 5.54 Delay
 - 5.55 Holdoff
 - 5.56 Single-shot Waveform Capture
- 5.60 Demo
- 5.70 Settings
 - 5.71 Grid Settings
 - 5.72 Alerts
 - 5.73 Persistence
 - 5.74 Sounds
 - 5.75 Units
 - 5.76 Screenshot
 - 5.77 Email
 - 5.78 Manage Data Log
 - 5.79a Configuration Settings
 - 5.79b Pause / Play
- 5.80 Host Properties

Section 6 Switching Power Mode to Spectrum Mode

Section 7 Product Warranty & Accessory

- 7.10 Manufacturers Warranty
- 7.20 Optional Conducted Measurement Kit

Section 8 Power Meter Performance

- 8.10 Detailed Specifications
- 8.20 Performance Optimization

Section 9 How to Contact Us

Section 1 Getting Started with SAFETY

1.10 WiPry-Combo Quickstart Guide

The quickstart guide listed below applies for both the spectrum analyzer and the dynamic power meter.

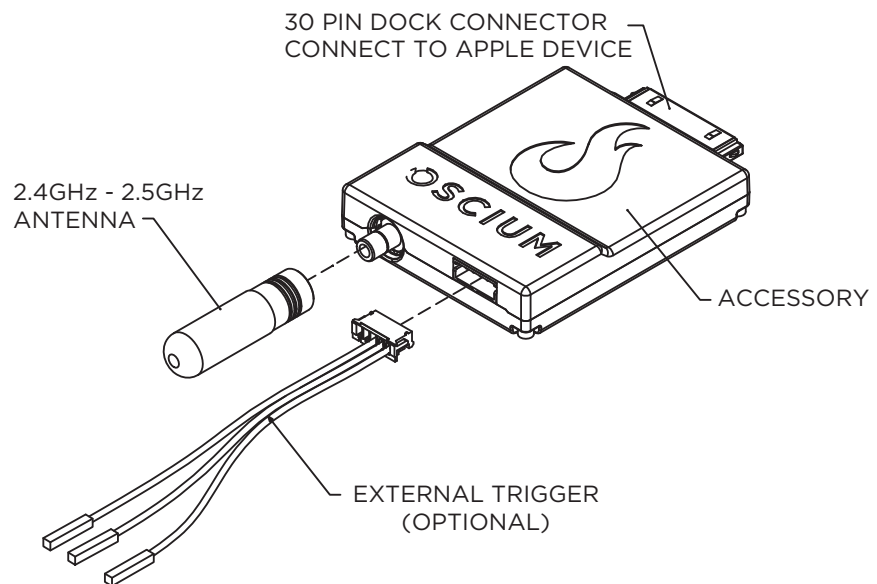
Quickstart Guide

WiPry-Combo

Spectrum Analyzer & Dynamic Power Meter

WARNING
DO NOT APPLY MORE THAN 20dBm TO THE ANTENNA WITHOUT EXTERNAL ATTENUATION

WARNING
DO NOT APPLY MORE THAN -0.5/+3.8 V TO THE EXTERNAL TRIGGER



- 1) Connect Antenna and External Trigger (optional) to the appropriate ports.
- 2) Download “WiPry” from the App Store.
- 3) Connect accessory 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 WiPry-Spectrum 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 a combination spectrum analyzer and power meter (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

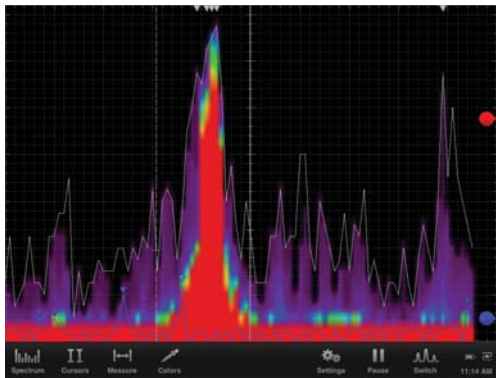
2.10 Menus

The section of the manual describes how the spectrum analyzer portion of WiPry-Combo works on the iPad, iPhone and iPod touch.

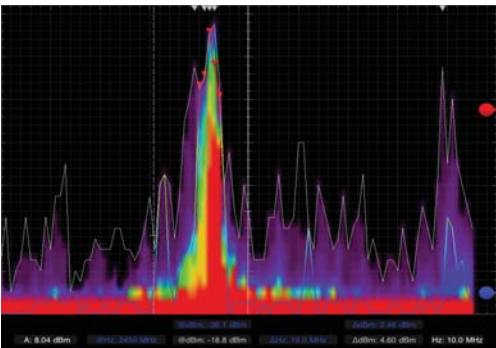
iPad | iPhone | iPod

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

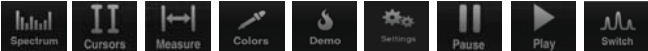
The Menu Bar







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 .

To toggle between spectrum analyzer mode and power meter mode, touch  or  in the bottom right corner of the menu bar to change the mode.

iPad | iPhone | iPod

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 . Then, scroll through the pick wheel to choose the desired measurements. To activate the settings touch away from the menu or touch .

2.22 Raw

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

2.23 Hold / Decay



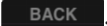
Touch  on the menu bar. In the default setting **DECAY** should be selected. Once decay is activated both the advanced options for hold and decay will be activated. To change the advanced option touch and swipe the dot to the right of either hold  or decay . While decay is activated, it is also possible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


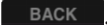
2.24 Average

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

2.24 Int. Atten. / Ext. Atten.

Touch  on the menu bar. To change the Internal Attenuation (Int. Atten.) level, touch  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 .

To change the External Attenuation level the same procedure should be followed. Touch  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 .

2.25 Clear Waveforms

To clear waveforms, touch  on the menu bar. Then touch, .

2.30 Cursors

2.31 Cursors On / Off

Touch  on the menu bar. Touch  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 tap 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  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 ΔdBm or @mW in the summary bar.

If cursor data is to be displayed in Base, touch **BASE**. The image next to the word UNIT  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  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 ΔmW (or ΔdBm) 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 ΔdBm. When using vertical cursors both @Hz, ΔHz and @dBm, ΔdBm or @mW, ΔmW will be visible in the summary bar.

iPad | iPhone | iPod

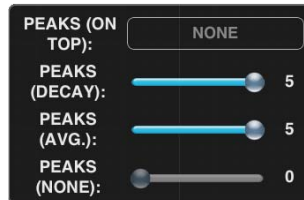
Verify that **VERTICAL** cursors are selected. To move cursors independently of one another, touch **INDEPENDENT**. To move cursors as a single unit with a fixed distance between them, touch **TRACKING**.

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

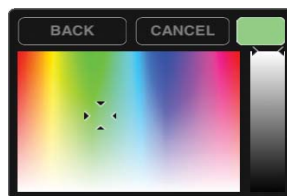
Touch **Measure** from the menu bar. Four different peak measurements exist: Peaks (On Top), Peaks (Decay), Peaks (Avg.) and Peaks (None). To change any of the measurements, touch and swipe the dot to the right of the text. To change Peaks (on top), touch **NONE**. Six options exist: None, Raw, Decay, 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

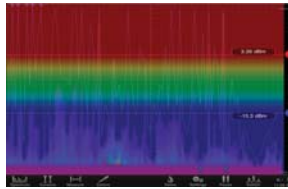
Touch **Color**. Then touch Either **MIN** or **MAX** in the menu. Then select the desired color using the color palette. To activate the settings touch away from the menu or touch **BACK**. To clear the setting, touch **CANCEL**.



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  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  will then appear to the right of . Also, the interface will show a color gradient using the selected colors for Min and Max.




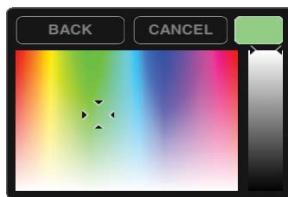
To set the colors to a default Rainbow setting touch . When Rainbow is selected it will look like  and both Min and Max will be grayed out. To personalize Raw Wave colors touch either  or  and select a color from the pick wheel.





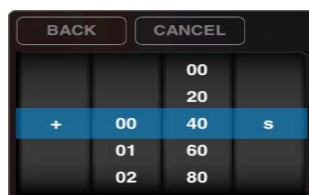
To reset colors to default touch .

2.52 Heat Map

Touch . Then touch either ,  or  in the menu. Then select the desired color using the color palette. To activate the settings touch away from the menu or touch . To clear the setting, touch .



To select the desired color threshold, touch  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 .



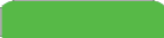
iPad | iPhone | iPod

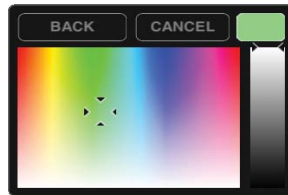
To set the colors to a default Rainbow setting touch **RAINBOW**. When Rainbow is selected it will look like **RAINBOW** and Min, Mid, and Max will be grayed out. To personalize Raw Wave colors touch either **MIN**, **MID** or **MAX** and select a color from the pick wheel.



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

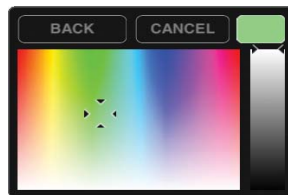
2.53 Decay

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**.




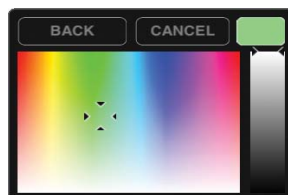
2.54 Average

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**.



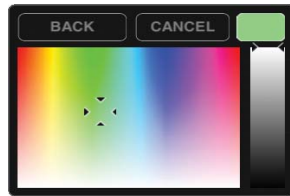
2.55 Max Hold

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**.



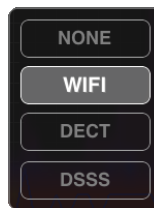
2.56 Min Hold

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.


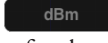


2.73 Sounds

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


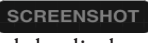
iPad | iPhone | iPod

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



2.74 Units

Touch  from the menu bar. Then touch either  or  next to the word . 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 . 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 . 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  from the data log option, .  will then change to  in order to indicate data is being logged. To stop data logging touch .

Touch . Then touch . 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, .

Saving Configurations

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



To upload a saved configuration touch .  will then change to , which confirms that the saved profile 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.**

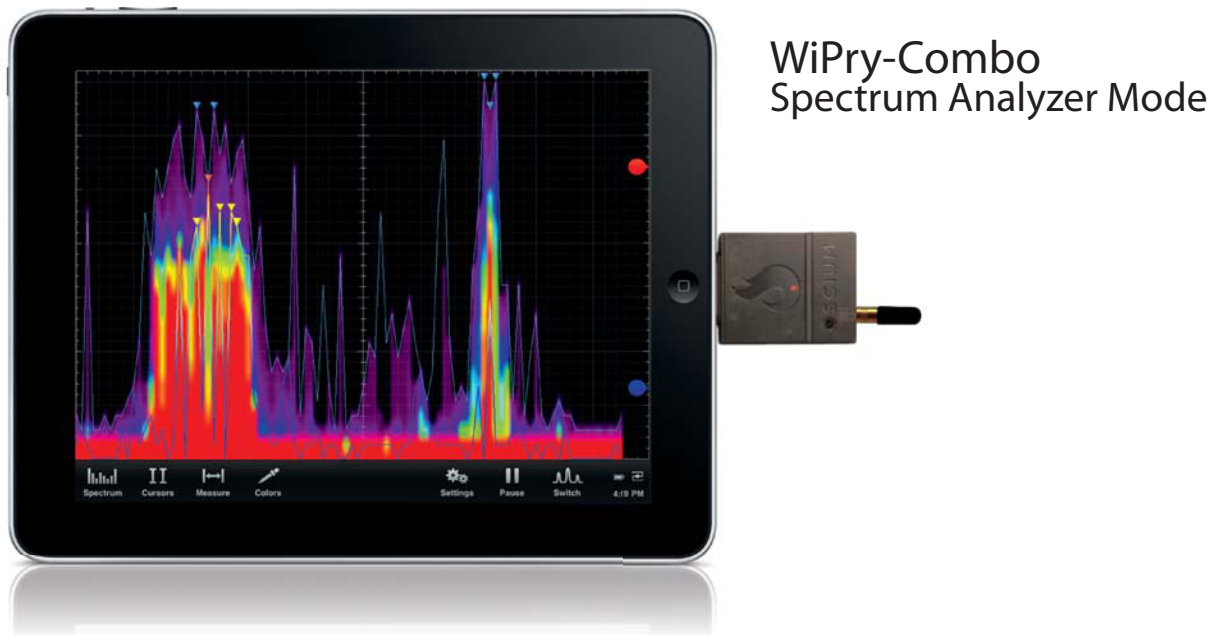
Section 3 Switching Spectrum Mode to Power Mode

While in spectrum mode, touch . It will then change to . These menu item allow you to switch (or toggle) from spectrum mode to power mode and back again.

Section 4 Spectrum Analyzer Performance

4.10 Detailed Performance Specifications

Oscium designs RF 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-Combo, you get both a dynamic power meter and a spectrum analyzer in one. Now it's possible for your phone, touch or tablet to become a powerful test equipment tool that you can use on-the-go.



Spectrum Analyzer Technical Specifications

Frequency Range: 2.400 to 2.495 GHz

Amplitude Range: -100dBm to -10dBm

Amplitude Resolution: 2.0dBm

Resolution Bandwidth: 1MHz

Sweep Time: 200ms

Antenna: External with SMB

Spectrum Analyzer Highlights

- Industry leading visualization capabilities
- Data Logging (in csv format)
- As Mobile As You Are
- Screenshots can be emailed
- Easiest, most intuitive spectrum analyzer you'll ever use

Preferred Tool of the Next Generation of Inventors

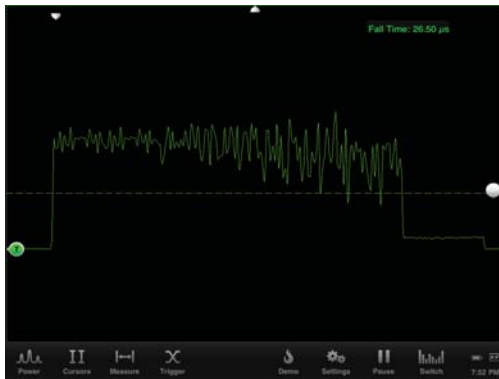
WiPry-Combo also enables you to visualize real-time radio frequency signals in the 2.4GHz ISM band. It is perfect for detecting open WiFi channels and identifying unauthorized WiFi access points.

Section 5 How the Dynamic Power Meter Works

5.10 Menus

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

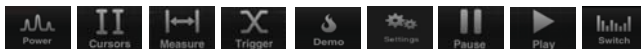
The Menu Bar







The Summary Bar



The menu bar has sub menus that can be selected by touching the appropriate word or icon. 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 .

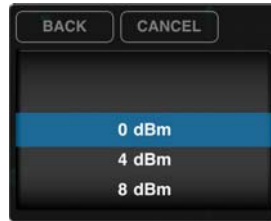
Touch  on the menu bar. This will allow you to toggle to spectrum analyzer mode. To toggle back to power meter mode touch .

iPad | iPhone | iPod


5.20 Power Meter

6.21 Internal Attenuation

Touch  on the menu bar. Touch **0 dBm** to the right of the word **INT. ATTEN.:**. Then select the desired setting in the pick wheel. To activate the settings touch away from the menu or touch **BACK**.





5.22 External Attenuation

The same process should be used when changing the external attenuation. Touch  on the menu bar. Touch **0 dBm** to the right of the word **EXT. ATTEN.:**. Then select the desired setting in the pick wheel. To activate the settings touch away from the menu or touch **BACK**.




5.23 Reference Wave

Touch  on the menu bar. Then, touch grab **GRAB** to create a reference wave for the power output. When a wave has been captured, **REF** will change to **REF** and **GRAB** will change to **GRAB**. Once the wave has been captured, it is saved and available for future use by touching reference. The reference wave will appear as a white wave and  will appear to the far left of that wave. To clear the reference wave touch the word clear **CLR**. Then touch **REF**.

5.30 Cursors

5.31 Cursors On / Off

Touch  on the menu bar. Touch **ON** to activate cursors. Touch **OFF** to turn cursors off.

5.32 Cursor Axis


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

5.33 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; measurements will be in green. Touch on the dotted line

and it will become a movable solid line, while the other line will change to dotted.

5.34 Horizontal Cursors

Touch the  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 dashed line. The position of the selected cursor is indicated next to @mW or @dBm in the summary bar. The distance between the two cursors is indicated next to Δ mW or Δ dBm in the summary bar.

If cursor data is to be displayed in Base, touch **BASE**. The unit of measure is listed across from the word Unit. The default setting is **dBm** but it can be changed to mW.

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 grid or the display screen. The **CURSOR** option sets 100% between the two cursors.

5.35 Vertical Cursors

Touch the  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 @t in the summary bar. The distance between the two cursors is indicated next to Δ t in the summary bar. The point where the selected cursor crosses the waveform is indicated in the summary bar next to @mW or @dBm and the vertical difference between the crossing points of the two vertical cursors is indicated in the summary bar next to Δ mW or Δ dBm. When using vertical cursor, @t, Δ t and @mW, Δ mW or @dBm, Δ dBm 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**. The following options are available:

BASE **PHASE** **RATIO**.


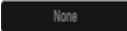
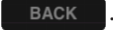
1. If cursor data is to be displayed in Base, touch **BASE**. The options next to the word UNIT set the unit of time. Time settings available in the Base option include: **s** **Hz**. The **s** option sets the unit of measure in seconds. The **Hz** option sets the unit of measure in hertz.

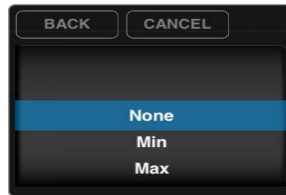
2. If cursor metrics are to be displayed in Phase, touch **PHASE**. The options next to the phrase 360° WITHIN sets the phase. The option of **5 DIVS** sets 360° within 5 divisions. The **CURSOR** option sets 360° between the two cursors.

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.

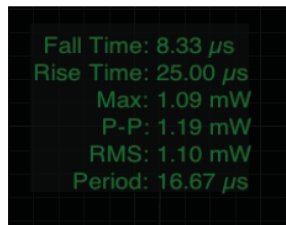
iPad | iPhone | iPod

5.40 Measurements

Touch  from the menu bar. Fifteen different measurements exist: Min, Max, Mean, Peak to Peak, RMS, Duty Cycle (+), Duty Cycle (-), Pulse Width (+), Pulse Width (-), Cycle Mean, Cycle RMS, Frequency, Period, Rise Time, and Fall Time. To scroll through the measurement options, touch . Then, scroll through the pick wheel to choose the desired measurements. To activate a selection, make sure it is highlighted and then touch away from the menu or touch .







Up to six measurements can be selected simultaneously. Measurements appear on the top right of the interface.




5.50 Trigger


5.51 RF Triggering

The trigger level is controlled with  located on the far right of the screen. Touch and drag the bubble either up or down. Moving the level up will increase the trigger level and moving it down will decrease the trigger level. The exact trigger level will appear just to the left of the bubble along with either an up arrow or a down arrow. An up arrow indicates that the trigger is on a rising edge; a down arrow indicates that the trigger is on a falling edge. It is also possible to change the trigger level in the advanced triggering menu. Touch . Then touch  and, when active, it will change to .

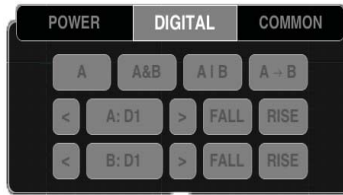


To navigate to an exact trigger level touch on  next to the word LEVEL. The power trigger level pick wheel will then appear in either dBm's or mW's.









To select the desired trigger level, touch and drag in each of the four columns until the specific value is reached. To activate the settings touch away from the menu or touch .

When RF / power triggering has been enabled, then all the advanced options for digital triggering will be grayed out.



To reactivate the RF / power trigger, touch any of the options on the picture below and it will no longer be grayed out. The same process applies for reactivating the digital triggering.

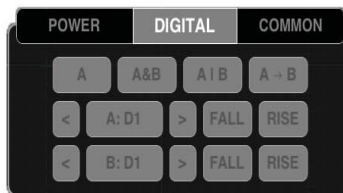



RF / power triggering is only available with hardware; it is not available in demo mode. To trigger off of a rising edge, touch . If rising is already activated, it will look like . This means that falling is deactivated, because both falling and rising cannot be active at the same time. If rising is deactivated it will look like . Touch it once and it will activate to . To trigger off a falling edge the same procedure should be followed. Falling should look like  when activated and  when deactivated.

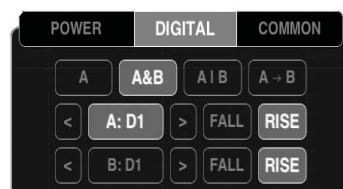
To recenter your trigger level, touch  and your signal will be brought in line with your signal.

5.52 Digital Triggering

This feature is also only available with hardware; it is not available in demo mode. When in demo mode all the digital triggering options are grayed out.



1. Touch  from the menu bar. Then touch **DIGITAL** at the top of the menu to view more advanced digital triggering options. All the options may be grayed out (because power and digital triggering can't both be active at the same time). If power is grayed out, digital is active and vice versa. To activate the desired trigger, touch one of the advanced triggering options.



iPad | iPhone | iPod

The option that is touched will activate. From the menu, select the desired triggering function from these options: single channel only **A**, simultaneous events on two channels **A&B**, a single event on one of two channels **A|B**, or concurrent events on two channels **A - B**.

2. Below the selected triggering functions touch either **<** or **>** to select digital channel one (D1) or digital channel two (D2), which will be used as channels A and B, respectively.



3. After locating the desired digital channel, touch **A: D2** and when activated, it will change to **A: D2**. In this example, channel A is now D2.

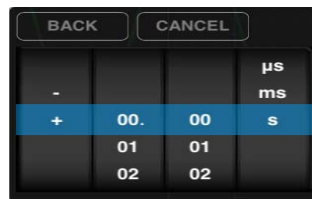
4. To choose whether triggering occurs on a rising or falling edge, either select **FALL** for a falling edge or select **RISE** for a rising edge.

5.53 Auto vs Normal

Touch **X Trigger**. Then touch **COMMON**. Touch the desired mode, either AUTO or NORMAL. For example, if activating AUTO mode touch **AUTO** and it will change to **AUTO**. Repeat the process for NORMAL mode. The default setting is AUTO.

5.54 Delay

To set the trigger delay  from the main screen, touch the screen and swipe horizontally to move the trigger point. The bottom portion  will detach from the top to set the trigger position. To set the trigger delay from the trigger menu, touch **X Trigger** then select **COMMON** and press **0.99 μ s** located next to DELAY. A pick wheel will appear that allows you to set the delay time to the value shown in the readout.



To select the desired trigger delay touch and drag in each of the four columns until the specific value is reached. To activate the settings touch away from the menu or touch **BACK**.


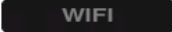



5.55 Holdoff

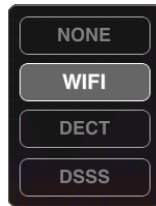
Touch **X Trigger** in the menu bar to enter the trigger menu. Touch **COMMON**. Touch **0.99 μ s** next to HOLDOFF to set the holdoff time. Setting the HOLDOFF value should be done in the same manner as the delay.

5.56 Single-Shot Waveform Capture




If the signal is active, the screen can be paused by touching **Pause**. 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 **Play**. In order to capture a single-shot wave form, touch and hold **Pause** or **Play** until it changes to **Single**. Then touch **Single** and it will capture a single-shot waveform. Once this menu item is changed to single-shot waveform capture, it will remain the menu option even when switching to the spectrum analyzer. To change it back to pause / play, press and hold **Single**.

5.60 Demo

Touch . Four different settings exist, None, WiFi, DECT, and DSSS. Once a setting is selected it will change from  to . On the iPhone and iPod touch, press and hold  and it will change to . That way, the options available in the settings menu are viewable while still in demo mode. Once hardware has been plugged in, however, demo mode no longer is available.



5.70 Settings




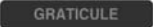

 appears in the main menu bar of the iPad at all times. On the iPhone and iPod touch, press and hold  and it will change to . When hardware is connected, all additional settings and features are available.

5.71 Grid Settings







Lines vs. Dots

Touch . Then touch, the desired selection either  or . 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  to . Touching graticule is a shortcut for touching all of the above.




5.72 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  to . Touching  is a shortcut for touching all of the above.


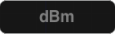

5.73 Persistence

Touch . Then touch and swipe the dot to the right of persist .


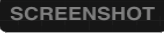
5.74 Sounds

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



5.75 Units

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

5.76 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 . The text SCREENSHOT will briefly fade from translucent to gray. The setting menu will disappear and the display will briefly change to full screen mode. Although this is a very useful method, it may not always be the best way to take a screenshot. By simultaneously pressing the home and the power button, it is possible to take a picture of exactly what is on the screen. In some cases, this will be the best option.



5.77 Email

Touch . Then, touch . The email will consist of the image currently displayed on the screen. Although it is not possible to retrieve screenshots from this spot, the pictures are still 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 they can be emailed.

5.78 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 for DATA LOG: START and STOP are grayed out.

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








Touch . Then touch . 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.

5.79a Configuration Settings

Reset Configurations







To reset the configuration, touch . Then touch, .

Saving Configurations



Up to three configurations can be saved at a time. Touch . Then, touch  next to CONFIG 1, 2 or 3.  will then change to  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.

5.79b 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 waveform, 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 .

5.80 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 iPhone:



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

Section 6 – Switching between Power and Spectrum

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.

Section 7 – Product Warranty & Accessories

7.10 Product Warranty

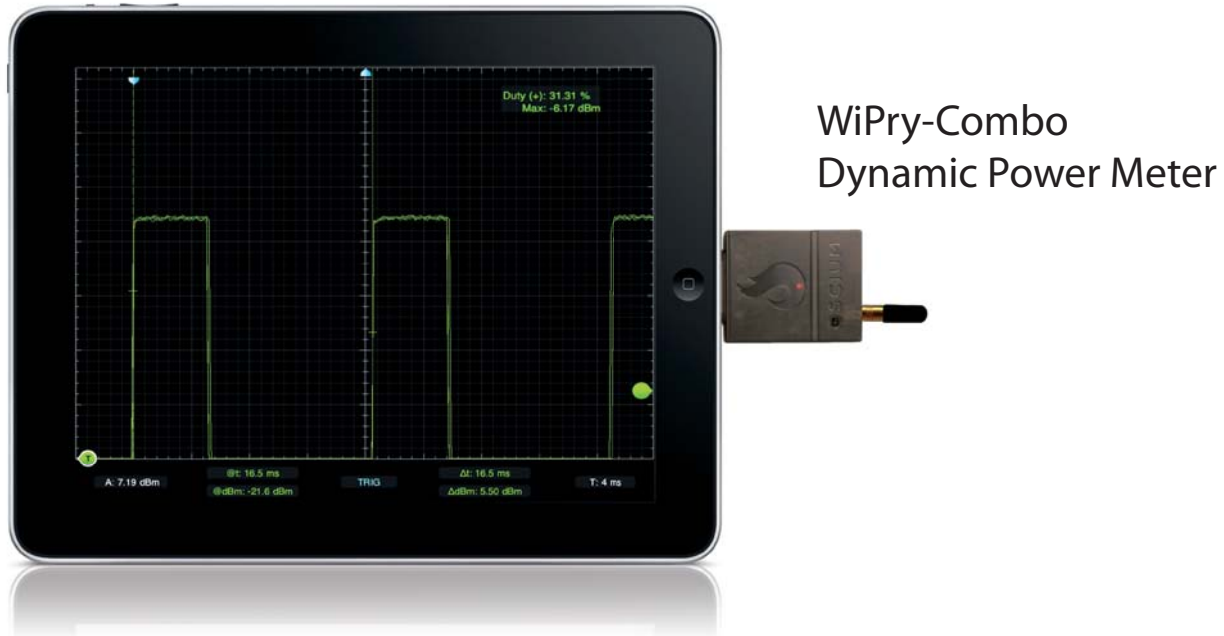
WiPry-Spectrum, WiPry-Power and WiPry-Combo all include hardware along with an external antenna (pictured above). Each product comes with a full one year manufacturer's warranty.



7.20 Conducted Measurement Kit



An optional Conducted Measurement Kit can be purchase along side of WiPry-Combo and WiPry-Power. Included in the kit: three custom SMB Grabbers, Harness, SMA Adapater, and RP-SMA Adapter (all pictured above).



Power Meter Technical Specifications

Frequency Range: 100 MHz to 2.7 GHz

Timescale: 2 μ s/div to 1 s/div

Antenna: External with SMB connector

Amplitude Range: -45dBm to +20dBm

Amplitude Resolution: 2.0dBm

Optional Accessory kit: Provides ability to make conducted measurements

Power Meter Highlights

- Ability to capture, trigger and record the actual power output of RF amplitude!
- Wide frequency range, 100 MHz to 2.7 GHz
- Display configuration can be saved for on-the-go measurements
- Two finger stretch zooms in and out of scaling – no more buttons and knobs!
- Data Logging (in csv format)
- Easiest, most intuitive power meter you'll ever use
- Preferred power meter for the next generation of Inventors

Preferred Tool of the Next Generation of Inventors

WiPry-Combo brings the typical LCD style RF power measurements to a graphical interface showing you the waveform of the amplitude with respect to time. It operates exactly like an oscilloscope but instead of showing voltage, you get RF amplitude! This means that you can capture, trigger, and record the actual power output as you would a voltage on an oscilloscope. This is extremely powerful for protocol verification and troubleshooting of wireless devices. With the optional conducted measurement kit, WiPry-Combo is also capable of conducted measurements as well as non-RF related triggering. Data is collected at up to 12 MSPS allowing you to analyze and verify the smallest protocol level on/off times.

8.20 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 9 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!