



## **ThinkRF WSA5000 RTSA Package Release Notes**

See [Firmware Update Quick Notes](#) section for how to install firmware and [Release Limitations](#) section for important information.

### **Release Package 141015**

October 15<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Improved Noise floor figure
  2. Improved calibration values
  3. Fixed HDR PLL unlock issue
- API:
  1. Added Labview API
  2. Added Labview API examples
- RTSA Application:
  1. HDR gain control in GUI now allows values up to +20 dB
  2. Sweep ZIF (100 MHz steps) now only shown in GUI when developer menu is enabled
  3. GUI PLL Reference control now works in Sweep mode
  4. Darkened trace color in GUI for attenuated edges and dc offset now matches trace color
  5. Alternate sweep step color in GUI now matches trace color
  6. DC offset region now limited to middle three bins in GUI (was expanding when decimation was applied)
  7. Correction to usable region in ZIF and SH modes with decimation applied
  8. Fixed HDR center offset value
  9. Added device information dialog to GUI

### **Release Package 140930**

September 30<sup>th</sup>, 2014

This release consists of the following updates:

- RTSA Application:
  1. Channel power measurement tool
  2. Horizontal cursor line
  3. Custom trace colors
  4. Reference level offset
  5. Export spectral data into CSV file
  6. Changed trigger controls

### **Release Package 140923**

September 23<sup>rd</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Fix invalid VRT header while using frequency shift or decimation in SH mode
  2. Noise floor optimization for ZIF and SH mode
  3. All firmware releases will now include a base calibration file

### **Release Package 140909**

September 9<sup>th</sup>, 2014

Note: As of 140909, The WSA5000 Release Package will not be dependent on firmware changes.

This release consists of the following updates:

- RTSA Application:
  1. Added persistence plot
  2. Markers are now selectable, once selected they can be dragged
  3. Added version number to the title bar
  4. Moved DSP options to Developer Menu, which is now hidden by default unless application is run with '-d' in command line (ex: rtsa.exe 192.168.1.103 -d)
  5. Fixed Several controls as well as label issues
- Software:
  1. Renamed 'Software' directory to APIs
  2. Added PyRF API to APIs directory

### **Version 4.2.0 Release**

August 1<sup>st</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Applied ADC dynamic range offset into the reference level
  2. Noise floor/Spur optimizations for SH and ZIF mode
- Software:
  1. Renamed SpectrumAnalyzer to RTSA
  2. RTSA no longer applies ADC dynamic range or FFT baseline offset
  3. Matlab no longer applies ADC dynamic range or FFT baseline offset
  4. Added average trace option to RTSA
  5. Added clear trace function to RTSA
  6. Added waterfall plot to RTSA

### **Version 4.1.0 Release**

July 28<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Enabled level triggers
  2. When using decimation in SH mode, a frequency shift to the zero IF will be applied automatically before decimating, which implies the VRT data format under this condition will be I16Q16
  3. Auto-IP feature enabled (check User Guide v3.5 for more details)

4. [:SENSe]:FREQuency:INVersion? changed to OUTput:IQ:CONNector:INVersion?
5. Enabled upload of custom reference level calibration files (check User Guide v3.5 for more details)

### **Version 4.0.0 Release**

July 9<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Meant for product version 2.0 and above. Note this firmware is incompatible with all product versions below 2.0
  2. Fixed occasional spectral flaring issue
  3. Spectral inversion fixed in HDR mode
  4. 20dB of attenuation will now be applied to the reference level if the attenuator is turned on

### **Version 3.2.6 Release**

June 16<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Fixed HDR data output when switching from ZIF/SH/SHN mode with decimation on
  2. Fixed [:SENSe]:FREQuency:INVersion? SCPI command
- Software:
  1. Added wsa\_ping function to C-API
  2. Matlab GUI now issues a \*RST SCPI command on connect

### **Version 3.2.5 Release**

June 6<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Factory reset re-compiles reference level values into memory

### **Version 3.2.4 Release**

June 3<sup>rd</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Improved the precision of the decimated data output
  2. Improved noise floor performance from 5.1GHz to 5.3GHz in ZIF mode

### **Version 3.2.3a Release**

May 26<sup>th</sup>, 2014

This release consists of the following updates:

- Software:
  1. SpectrumAnalyzerGUI now supports WSA5000-108
  2. Improved SHN spectral plots

### **Version 3.2.3 Release**

May 16<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. New command :STATus:TEMPerature? to query WSA's temperature
  2. New command [:SENSe]:FREQuency:INVersion? to query if spectral inversion is present in a specified frequency
  3. New :SYSTem:COMMunicate:LAN: set of commands to configure the WSA's LAN settings via SCPI
  4. Enabled the USB console to send/query SCPI commands via USB
  5. Reference level calibration improvement
- Software:
  1. Added support in the C-API for all of the new SCPI commands in 3.2.3

### **Version 3.2.2 Release**

May 2<sup>nd</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. DD mode is now enabled
  2. SH mode spur optimization
  3. Reference level calibration Improvement
- Software:
  1. Changed data stream IDs in C-API to better represent data types
  2. Small C-API changes to increase robustness

### **Version 3.2.1 Release**

Apr 17<sup>th</sup>, 2014

This release consists of the following updates:

- Documentation:
  1. See Document Revision History section of the Programmer's Guide for new changes
- Firmware:
  1. IQIN mode is now enabled
  2. Changed the command :INPut:GAIN:NB to :INPut:GAIN:HDR for consistency
  3. Added <HDR gain> field to :SWEep:ENTRy:READ? returned string, right after <IF gain>. See the Programmer's Guide
  4. Added new RFE's SHN mode to :INPut:MODE and :SWEep:ENTRy:MODE
  5. Made available the spectral inversion indicator to a pin on the GPIO port when RFE SH or SHN mode is used with OUTput:IQ:MODE CONNector
  6. New commands :SYSTem:OPTions? and [:SENSe]:FREQuency:LOSCillator? to support WSAs with external local oscillators option
- Software:
  1. Added support for IQIN and SHN modes in the C-API
  2. Added Matlab 'readWSAVRT' function to wsaMatlabAPI
  3. Added wsaSingleDisplay and wsaMultiDisplay Matlab GUIs

### **Version 3.2.0 Release**

Jan 31<sup>st</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. SH mode with corresponding VRT data packet
  2. New spectral inversion bit added to trailer of IF data packet
- Software:
  1. C-API and Matlab API handle SH data packet, and spectral inversion bit in the trailer

### **Version 3.1.4 Release**

Jan 15<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Implemented robust handling of PLL errors
  2. Enabled sync word trigger controls

### **Version 3.1.3 Release**

Jan 10<sup>th</sup>, 2014

This release consists of the following updates:

- Firmware:
  1. Fixed PLL unlocking issue
- Software:
  1. Added Matlab API with basic example

### **Version 3.1.2 Release**

Dec 20<sup>th</sup>, 2013

This release consists of the following updates:

- Firmware:
  1. Fixed context/data packet handling
  2. Enabled pulse trigger controls
- Software:
  1. Fixed issue in the C-API that restricts the tuning range of the WSA5000-220 to 8GHz.

### **Version 3.1.1 Release**

Dec 12<sup>th</sup>, 2013

This release consists of the following updates:

- Firmware:
  1. Extension of the frequency range from 8 GHz to 20GHz on the WSA5000-220 product variant
  2. Reference level information via the VRT packets for the ZIF wideband direct conversion mode
  3. Enabling of the push button factory reset
  4. New digital FIR filters for decimation

### **Version 3.1.0 Release**

Oct 30<sup>th</sup>, 2013

This release consists of the following updates:

- Firmware:
  1. Sweep capture controls with list iterations
  2. HDR mode with corresponding VRT data packets
  3. Frequency shift feature
- Software:
  1. C API supports HDR mode VRT packets
  2. PyRF SpecA supports span greater than 100MHz and multiple traces

### **Version 3.0.0 Release**

Sept 13<sup>th</sup>, 2013

This release consists of the following main capabilities:

1. Remote upgrade
2. Discovery response
3. Trace with block mode capture for the ZIF receiver mode
4. Decimation for ZIF receiver mode (without 2 & 1024)
5. 10 MHz reference clock source control
6. Attenuator input control
7. discovery and PyRF executables and the corresponding source code

## Firmware Update Quick Notes

Refer to the ThinkRF WSA5000 User Guide's Administration Console section for a comprehensive description on updating the WSA5000's firmware.

1. Connect to the WSA5000's administration console by entering the IP address of the WSA5000 into your web browser's web address dialog. The "Status" web page should appear providing information on the WSA5000's MAC address, hardware and firmware versions.
2. Click on the "Firmware Install" link in the left column. The "Firmware Install" web page should appear.
3. Enter or browse to the location of the "ThinkRF\_WSA5000\_firmware\_vx-y-z.img" firmware image file and then click the "Install" button. The "Firmware Install" web page should appear which will step through the progression of the firmware being uploaded and installed.
4. Upon completion, a web dialog box should appear. Press the "OK" button to restart the WSA5000 or "Cancel" to defer restarting until a later time.
5. Upon restart the newly installed firmware will take effect.

# **Release Limitations**

## **Software and Firmware Release Limitations**

As of release v3.2.1 of WSA5000 software and firmware provides a baseline of functionality that is equivalent to that of the WSA4000 with the following exceptions. These limitations will be corrected on subsequent releases. The new firmware releases can then be remotely installed to the WSA5000 using the web administration console (see the WSA5000 User Guide).

Please refer to the WSA5000 Programmer's Guide for the description, the list of changes and the release schedule of additional product capabilities.