

R5500

Precautions & Quickstart Guide



Disclaimer

Important notice

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Obtaining Technical Assistance

For all customers who hold a valid end-user license, ThinkRF provides technical assistance 9 AM to 5 PM Eastern Time, Monday to Friday. Contact us at support@thinkrf.com or by calling +1.613.369.5104. Before contacting support, please have the following information available:

- R5500 serial number and product version which are located on the identification label on the R5500's underside.
- The firmware version running on the R5500 which can be found by typing your connected device's IP address into a web browser.
- Versions of ThinkRF software you are using, including the API libraries to third party applications.
- The operating system and version you are using.

Important Precautions when using the R5500

Ensure that you read and understand the following information about safety and electrostatic discharge before you unpack and install the R5500.



Warning: Only trained and qualified personnel should be allowed to install or replace this equipment. Read the installation instructions before you connect the system to its power source.

Preventing Electrostatic Discharge Damage

Electrostatic Discharge (ESD) is a single-event, rapid transfer of electrostatic charge between two objects, such as an operator and a piece of electrical equipment. ESD can occur when a high electrostatic field develops between two objects in close proximity. ESD occurs when electronic components are improperly handled and is one of the major causes of device failures in the semiconductor industry.

Electrostatic discharge is more likely to occur with the combination of synthetic fibers and dry atmosphere. Always follow these steps to prevent ESD.



Warning: Never open the front or rear panels of the R5500 as personal injury may result and opening the chassis will void the warranty. There are no user-serviceable parts inside. Always contact ThinkRF support for service.



Caution: To prevent ESD, wear an ESD-preventive wrist strap that you provide, ensuring that it makes good skin contact.



Caution: Do not touch any exposed contact pins or connector shells of interface ports that do not have a cable attached. If cables are connected at one end only, do not touch the exposed pins at the unconnected end of the cable.

Connecting the Antenna, Ethernet and Power Cables



Caution: Never connect a transmitter directly to the receiver with a cable.



Caution: Do not over-tighten the antenna connector on the jack. Using a wrench, pliers or even your hand to over-tighten the antenna can cause permanent damage to the receiver.

1. Screw the antenna or the connector of the DUT onto the R5500 “RF IN” input SMA jack. Carefully turn the antenna or connector screw by hand until it encounters resistance. See below for the maximum allowable input and cautions.
2. Connect one end of the Ethernet cable to the R5500’s Ethernet port and the other end to an Ethernet port on your router or PC.
3. Connect the R5500 to its power adapter or battery pack (optional).



Warning: Use only the power adapter provided with the unit.

4. Plug the power adapter into a power outlet.
5. Push the power switch towards the power symbol to power the unit on.



Note: See Status Indicator LEDs section for description of the R5500's status.

Connecting Signal Sources to the R5500 Receiver Front-end

ThinkRF's receivers can tolerate a maximum input signal of **+10 dBm**.

Injecting signal levels that exceed these specifications will result in permanent damage to the receiver.

It is therefore recommended that the output of a signal source be verified with the use of a power meter prior to connecting the source directly to the RF IN connector.

Additionally any external signal sources connected to RF IN must be turned on only after powering on the R5500 and turned off prior to powering down the R5500.

The Use of ThinkRF Products with External 10 MHz Reference

The ThinkRF R5500 can be synchronized with the use of an external 10 MHz reference. The 10 MHz reference can be obtained, for example, from an external oscillator or from the digitizer section of the data acquisition system. As well, this 10 MHz is redistributed within the R5500 and sent to the 10 MHz OUT SMA connector for use by external equipment that needs a 10 MHz reference source.

To set the WSA to use the external 10 MHz reference, send the SCPI command `:SOURCE:REFERENCE:PLL EXT` (Refer the Programmer's Guide for more details)

The external 10 MHz reference level must be between **-10 dBm** and **0 dBm**.



Caution: Exceeding the level of 0 dBm will result in permanent damage to the internal clock circuit. Additionally the 10 MHz reference must be powered down prior to powering down the R5500.

For any questions on the above information please email: support@thinkrf.com.

Embedded Chassis Mounting and Heat Dissipation



Caution: The ThinkRF R5500 embedded chassis is designed to be mounted in a cabinet or enclosure. Do not mount the R5500 in exposure to direct sunlight.

When used on a desktop, the rubber feet are inserted in the bottom of the embedded chassis and the heat is dissipated via the heat-spreader through the top of the chassis. Objects that would prevent proper heat-dissipation should not be placed upon the top of the chassis.

When used on a desktop or mounted in a rack, cabinet or enclosure, one must provide cooling to the R5500 by air convection across the embedded chassis's top surface or via heat conduction by mounting the embedded chassis's top surface to an appropriate heat conducting surface, capable of 15W of power dissipation.

Getting Started

Shipping Box Contents

Please ensure that your shipping box contains the following:

- R5500 Real-Time Spectrum Analyzer
- Power adapter and associated power cable
- Straight-through Ethernet cable
- USB flash drive with associated documents and software
- USB-A to mini-B cable for the USB console port
- Antenna (please note that the antenna is included for your convenience and only intended to perform adequately across a limited frequency range)
- This Precautions & Quickstart Guide

Obtaining the Latest Documentation and Software

Please visit our Firmware Updates page at the following URL to download the latest releases of new firmware and software.

- <http://www.thinkrf.com/firmware-updates/>

Please regularly visit our Documentation page at the following URL to obtain the latest releases of new documentation.

- <http://www.thinkrf.com/documentation>

Connecting to the R5500 via an IP Ethernet Network

Please note that your R5500 communicates only via its 10/100/1G Ethernet port and there is currently no software support for its USB console port.

The R5500 provides a means for obtaining an IP address dynamically using DHCP or the manually setting of a static IP address. The unit is set to use DHCP by factory default or on factory reset.

- Launch the pyRF RTSA software and all R5500s on the subnet will appear in the discovery window. Select the one you wish to connect to.

Please Note: The discovery utility will only find R5500s that are on the same IP network subnet as your computer.

- Alternatively, check with your network administrator to determine the IP address of the R5500.

Using the R5500

Please refer to the “Administration Console” section of the *ThinkRF R5500 User Guide* for a comprehensive description of the following.

Changing from Dynamic to Static IP Addressing

1. Connect to the R5500’s administration console by entering the IP address of the R5500 into your web browser’s web address dialog. The Status web page should appear.
2. Click on the “IP Configuration” link in the left column menu of the administrative console web page. The IP Configuration web page should appear.
3. Select “Use the following static IP address”, enter the fields accordingly and click the “Apply” button.

Changing from Static to Dynamic IP Addressing and/or Performing a Factory Reset

Changing the R5500 to dynamic IP addressing may be performed via the web console or via a factory reset.

1. Follow steps 1 and 2 of the above instructions and then Select “Select an IP address dynamically using DHCP” and click the “Apply” button.

Alternatively, performing a reset to factory settings will reset the R5500’s IP configuration to obtain an IP address dynamically using DHCP. Perform this procedure if for any reason you can not connect to the R5500 via the Ethernet.

2. Power on the R5500
3. At any time while the R5500 is powered on, press and hold the reset button (located in The Rear Panel) for at least 5 seconds by inserting a paper clip or similar object
4. The STS LED will blink green fast several times to acknowledge that the factory reset has been performed
5. Wait for the unit to completely boot up (another ~30 seconds) and run the PyRF Discovery Tool to determine the unit's IP, or use the USB Console to verify the network settings (see Using the USB Console Section).

Updating the Firmware

1. Connect to the R5500's administration console by entering the IP address of the R5500 into your web browser's web address dialog. The Status web page should appear. The current firmware revision is indicated on the Status web page.
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 firmware image file and then click the "Install" button. The Firmware Install web page should 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 R5500 or "Cancel" to defer restarting until a later time.
5. Upon restart, the newly installed firmware will take effect.

