



**RSA503A and RSA507A
Real-Time Spectrum Analyzers
Installation and Safety
Instructions**





RSA503A and RSA507A Real-Time Spectrum Analyzers Installation and Safety

Instructions

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071-3452-00

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Contacting Tektronix

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Beaverton, OR 97077
USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tek.com to find contacts in your area.

Warranty

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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[W4 – 15AUG04]

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Important safety information

This manual contains information and warnings that must be followed by the user for safe operation and to keep the product in a safe condition.

General safety summary

Use the product only as specified. Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. Carefully read all instructions. Retain these instructions for future reference.

Comply with local and national safety codes.

For correct and safe operation of the product, it is essential that you follow generally accepted safety procedures in addition to the safety precautions specified in this manual.

The product is designed to be used by trained personnel only.

Only qualified personnel who are aware of the hazards involved should remove the cover for repair, maintenance, or adjustment.

This product is not intended for detection of hazardous voltages.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

When incorporating this equipment into a system, the safety of that system is the responsibility of the assembler of the system.

To avoid fire or personal injury

Use proper AC adapter. Use only the AC adapter specified for this product.

Use proper power cord. Use only the power cord specified for this product and certified for the country of use. Do not use the provided power cord for other products.

Connect and disconnect properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Observe all terminal ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

The measuring terminals on this product are not rated for connection to mains or Category II, III, or IV circuits.

Do not operate without covers. Do not operate this product with covers or panels removed, or with the case open.

Avoid exposed circuitry. Do not touch exposed connections and components when power is present.

Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Disable the product if it is damaged. Do not use the product if it is damaged or operates incorrectly. If in doubt about safety of the product, turn it off and disconnect the power. Clearly mark the product to prevent its further operation.

Examine the exterior of the product before you use it. Look for cracks or missing pieces.

Use only specified replacement parts.

Replace batteries properly. Replace batteries only with the specified type and rating.

Recharge batteries properly. Recharge batteries for the recommended charge cycle only.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry. Remove the input signals before you clean the product.

Provide proper ventilation. Refer to the installation instructions in the manual for details on installing the product so it has proper ventilation.

Provide a safe working environment. Avoid improper or prolonged use of keyboards, pointers, and button pads. Improper or prolonged keyboard or pointer use may result in serious injury.

Be sure your work area meets applicable ergonomic standards. Consult with an ergonomics professional to avoid stress injuries.

Use only the Tektronix rackmount hardware specified for this product.

Terms in this manual

These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Symbols and terms on the product

These terms may appear on the product:

- **DANGER** indicates an injury hazard immediately accessible as you read the marking.
- **WARNING** indicates an injury hazard not immediately accessible as you read the marking.
- **CAUTION** indicates a hazard to property including the product.

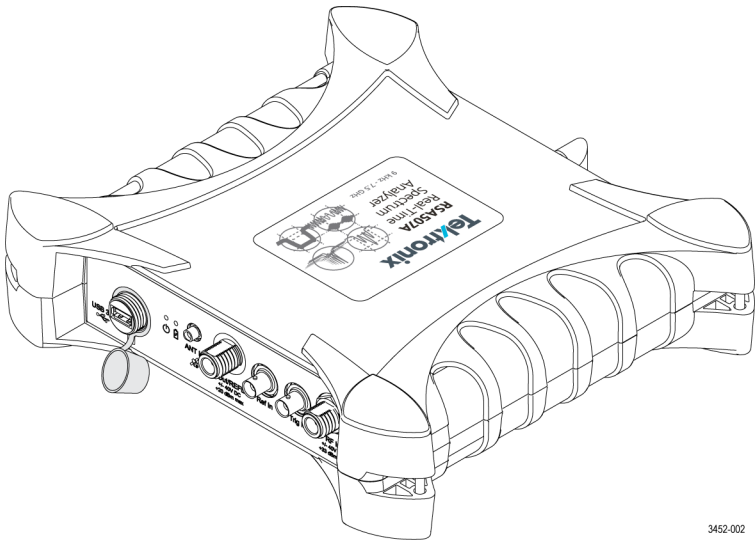


CAUTION
Refer to Manual

Preface

The RSA503A and RSA507A are battery operated, portable Real-Time Spectrum Analyzers that contains an acquisition system inside a small module. The user interface and display are provided by the SignalVu-PC software once it is installed on a Windows tablet (host PC). The host PC provides all control and data signals to the instrument over the USB 3.0 cable.

If you do not wish to use SignalVu-PC, a Software Application Programming Interface (API) is provided to allow you to create your own custom signal processing application.



3452-002

This document contains the following information:

- A list of standard and optional accessories
- Installation procedure
- Functional check procedure
- Front and rear panel connector description
- EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies

Key Features

- 9 kHz – 3 GHz frequency range (RSA503A)
- 9 kHz – 7.5 GHz frequency range (RSA507A)
- 40 MHz real time bandwidth
- External reference and trigger/sync inputs
- Tracking generator option
- Mapping, GPS, signal database and interference hunting
- USB 3.0 control/data interface to PC
- Publicly-accessible software application programming interface (API)
- Battery-operated
- Water resistant connectors and case

Standard accessories

The instrument ships with the following accessories.

Accessory	Tektronix part number
Installation and Safety manual	071-3452-xx
USB 3.0 A-to-A cable with screw lock	174-6810-xx
Rechargeable Li-Ion battery pack	WFM200BA
AC power adapter (with specified power cord)	See following list of International power cords
USB Flash Drive containing documentation files and software: USB drivers, API drivers, SignalVu-PC software	063-4543-xx
Carrying case for tablet PC and analyzer	016-2055-xx

International power cords

Your instrument was shipped with one of the following power cord options. Power cords for use in North America are UL listed and CSA certified. Cords for use in areas other than North America are approved by at least one authority acceptable in the country to which the product is shipped.



CAUTION. *To reduce risk of fire and shock, use the certified power cord provided with the product.*

Opt. A0 – North America power

Opt. A1 – Universal EUR power

Opt. A2 – United Kingdom power

Opt. A3 – Australia power

Opt. A5 – Switzerland power

Opt. A6 – Japan power

Opt. A10 – China power

Opt. A11 – India power

Opt. A12 – Brazil power

Opt. A99¹ – No power cord

¹ When ordering the A99 option, it is the responsibility of the end user to be sure that a certified power cord, for the country or region in which it is installed, is used with this instrument.

Tablet PC options

Option	Description
CTRL-G1-B	Portable controller, Brazil power, see country list for availability
CTRL-G1-C	Portable controller, China power, see country list for availability
CTRL-G1-E	Portable controller, Europe power, see country list for availability

Option	Description
CTRL-G1-I	Portable controller, India power, see country list for availability
CTRL-G1-N	Portable controller, North America power, see country list for availability
CTRL-G1-U	Portable controller, UK power, see country list for availability

Product options

Option	Description
Option 04	Tracking generator (must be ordered with instrument)

Optional accessories

Optional accessories such as cables, adapters, calibration kits, attenuators, and antennas are available from Tektronix. Visit www.tek.com to view optional accessories.

Service options

The instrument includes a 3 year warranty. Read the warranty statement at the front of this manual for details.

Option number	Description
Purchased with instrument	
C3	Calibration Service 3 Years
C5	Calibration Service 5 Years
D1	Cal Data Report
D3	Cal Data Report 3 Years (with option C3)
D5	Cal Data Report 5 Years (with option C5)
G3	Three Year Gold Care Plan

Option number	Description
G5	Five Year Gold Care Plan
R5	Repair Service for 5 Years (including Warranty)

Post-purchase service options

R5DW	Repair Service Coverage, extending from date of purchase to 5 years (including warranty)
------	--

Documentation

Following is a list of documentation available for this product and shows where you can find it: in a printed manual, on the product flash drive, or on the Tektronix Web site at www.tek.com.

Item	Purpose	Location
Installation and Safety Instructions (this manual)	Software and hardware installation instructions and the associated safety warnings and compliance information.	Printed manual and also available on the product flash drive and at www.tek.com/manuals
Performance Verification Technical Reference	Performance verification procedures to check instrument performance	Available at www.tek.com/manuals
SignalVu-PC Help	Application operation and interpreting measurement results information	Help files located within the application
RSA306B, RSA500A Series, RSA600A Series API Programmer manual	Details on commands used to control the instrument through an API	Available at www.tek.com/manuals
SignalVu-PC Programmer manual	Details on commands used with the SignalVu-PC application	Available at www.tek.com/manuals

Installation

This section provides instructions on how to install the software and hardware, and how to perform a functional check to verify system operation. Refer to the SignalVu-PC application Help for more detailed operation and application information.

Unpack the instrument and check that you have received all of the standard accessories for your instrument configuration. (See page vi, *Standard accessories*.) If you ordered optional accessories, check that those you ordered are in your shipment.

Prepare the PC

All of the software required to operate the RSA503A and RSA507A from a PC is included on the flash drive that ships with the instrument. The instrument can be controlled with Tektronix SignalVu-PC software, or you can control the instrument through your own custom signal processing application and API. Both SignalVu-PC and API control require a USB 3.0 connection to the instrument for communication.

Load the SignalVu-PC and TekVISA software

This software must be installed to control the instrument through the SignalVu-PC software.

1. Insert the flash drive included with the analyzer into the host PC. Windows File Explorer should open automatically. If it does not, open it manually and browse to the flash drive folder.
2. Select **SignalVu-PC** from the list of folders.
3. Select the **Win64** folder.
4. Double-click **Setup.exe** and follow the on-screen instructions to install SignalVu-PC. The USB driver will install automatically as part of this process.
5. When the SignalVu-PC setup is complete, a TekVISA dialog box appears. Verify that the Install TekVISA box is checked. TekVISA is optimized for SignalVu-PC, especially for instrument searching, and is the recommended VISA application.

For additional information about installation, option activation and operation, refer to the *SignalVu-PC Quick Start User Manual* document, located in SignalVu-PC under Help/Quick Start Manual (PDF).

Load the API driver software

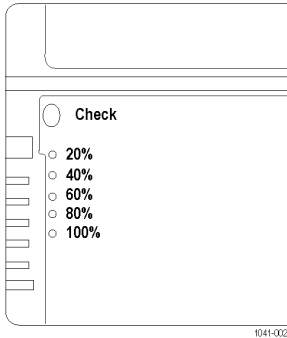
If you want to use the API to create your own custom signal processing application, load the software using the procedure below.

1. Insert the flash drive included with the analyzer into the host PC. Windows File Explorer should open automatically. If it does not, open it manually and browse to the flash drive folder.
2. Select **RSA API and USB** from the list of folders. The USB driver is installed automatically as part of the SignalVu-PC application installation, but if you need to install it manually, it is located in this folder.
3. Double-click the appropriate **setup.exe** file and follow the on-screen instructions to install the software.

Battery pack

Battery charge level indicators

When the WFM200BA battery pack is not installed in the instrument, you can check the charge level by pressing the Check button on the back of the battery pack. LEDs illuminate to indicate the amount of charge remaining in increments of approximately 20%.



When the battery pack is installed in the instrument, it charges whenever the AC adapter is attached. The front-panel battery LED indicates if the battery is charging or not. If connected to the SignalVu-PC application, the application monitors the battery and provides a detailed battery status. Refer to the SignalVu-PC help for more information.

You can charge the battery pack outside of the instrument using the optional WFM200BC external charger.

Battery pack installation

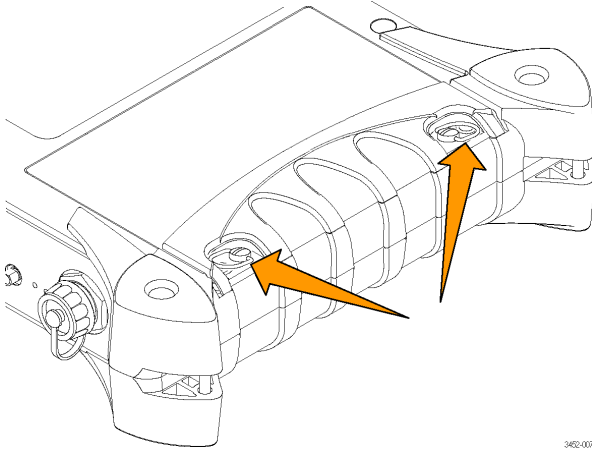
The instrument is shipped with a WFM200BA Lithium-Ion rechargeable battery pack. Perform the following steps to install the battery pack.

NOTE. For optimum performance, charge the battery pack completely before using it for the first time or after prolonged storage.

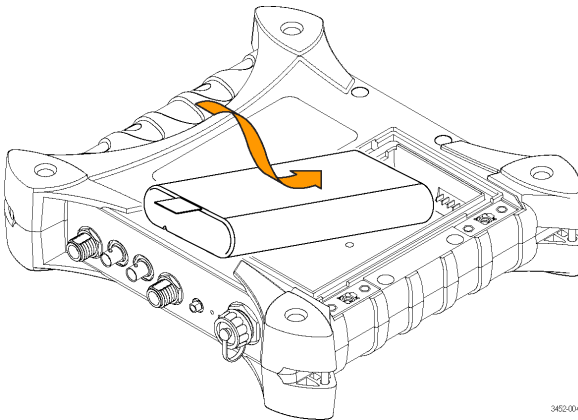
The battery pack can be installed or removed while the instrument is turned on and operating with the AC adapter.

See the WFM200BA Rechargeable Battery Pack Instructions for more information about the battery pack.

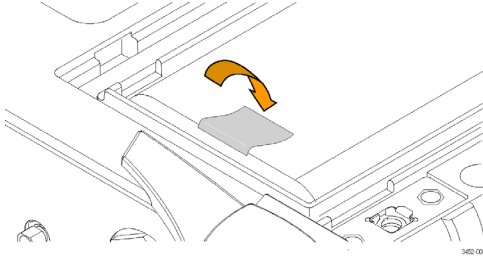
1. On the bottom of the instrument, remove the cover for the battery compartment:
 - a. Lift up the two battery-cover rings and rotate $\frac{1}{4}$ turn counterclockwise.



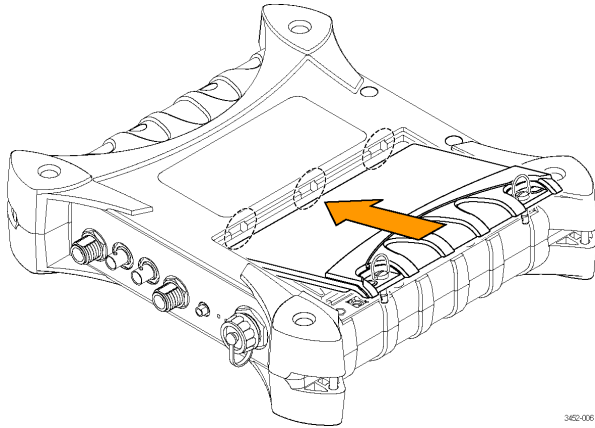
- b. Lift away the battery cover.
2. Insert the WFM200BA battery pack into the battery compartment.



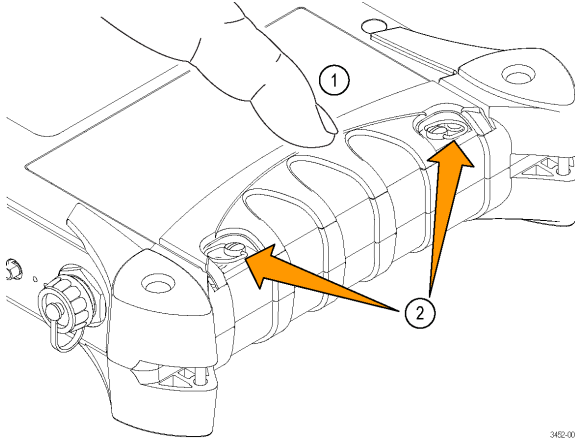
3. Lay battery pack tab flat on top of the battery. Do not let the tab interfere with the battery cover seal.



4. Reinstall the battery compartment cover:
 - a. Insert the tabs on the battery cover into the chassis slots.



- b. Close the battery cover and rotate the battery cover rings $\frac{1}{4}$ turn clockwise to secure the cover.



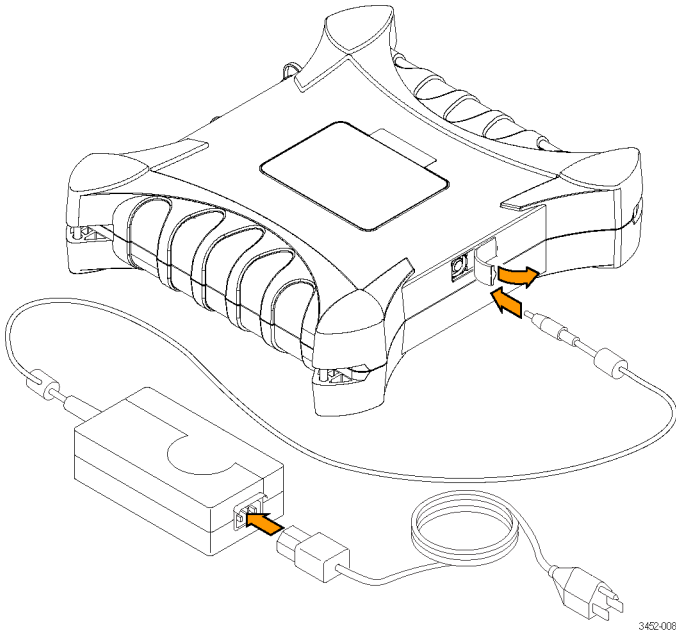
3482-007

- c. Lay the battery cover rings down flat.

AC adapter

Connect the AC adapter to the power connector on the rear of the instrument shown below.

NOTE. *If a battery pack is installed in the instrument, it will automatically charge whenever the supplied AC adapter is connected, whether the instrument is On or Off.*



3452-008

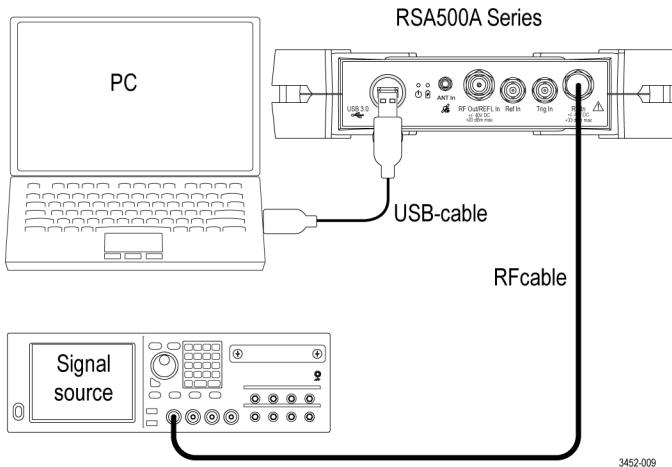
Functional check

Refer to the front panel illustration for connector locations. (See Figure 1 on page 11.)

1. Ensure that either a battery is installed or AC power is supplied from the external supply.
2. Connect the USB cable included with the analyzer between the analyzer and the host PC.



NOTE. *The instrument automatically powers on and the front-panel power LED lights when a USB connection is detected.*

3. Connect an RF cable between the instrument's input and a signal source. This could be a signal generator, device under test, or an antenna.



4. Start the SignalVu-PC application on the host PC.

5. SignalVu-PC automatically establishes a connection to the instrument via the USB cable.
6. A Connect Status dialog appears in the SignalVu-PC status bar to confirm that the instrument is connected.

NOTE. You can quickly verify connection status by looking at the Connection indicator in the SignalVu-PC status bar. It is green () when an instrument is connected, and red () when not connected. You can also view the name of the instrument that is connected by hovering the mouse pointer over the indicator.

Automatic connection fails. In some instances, the automatic connection may fail. Typically, the cause is that SignalVu-PC is already connected to an instrument (either USB or network). In this situation, use the following steps to make a connection using the SignalVu-PC application.

1. Click **Connect** on the menu bar to view the drop down menu.
2. Select **Disconnect From Instrument** to end the existing connection.
3. Select **Connect to Instrument**. The USB connected instruments appear in the **Connect to Instrument** list.
4. If you do not see the expected instrument, click **Search for Instrument**. TekVISA searches for the instrument, and a notification appears when the instrument is found. Check that the newly-found instrument now appears in the **Connect to Instrument** list.
5. Select the instrument. First time connection to the analyzer may take up to 10 seconds while the instrument runs Power On Self Test (POST) diagnostics.

Confirm operation

After you have installed the software and connected the system components, do the following to confirm system operation.

1. Press the **Preset** button in SignalVu-PC. This will launch the Spectrum display, set preset parameters, and set the analyzer to run state.
2. Check that the spectrum appears.
3. Check that the center frequency is 1 GHz.

When you are ready to disconnect from the instrument, select **Disconnect from Instrument** to end the current connection.

Front panel

The following figure shows the connections and indicators on the instrument. Use the reference numbers to locate the descriptions.

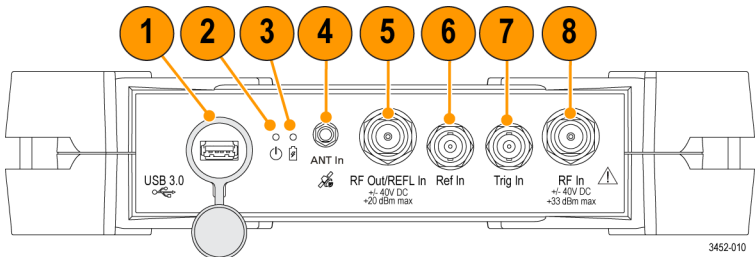


Figure 1: Front panel

1 – USB 3.0 Type A connector

The USB 3.0 connector has a water tight cap attached. When not in use, finger tighten the cap to the connector to prevent ingress of water and dust.

To connect the analyzer to the host PC via the USB 3.0 connector, use the USB 3.0 Type A to USB 3.0 Type A cable provided with the instrument. This cable has a water tight cap on the instrument end to ensure a reliable connection and to protect from water ingress. Finger tighten the USB cable cap to the instrument.

The instrument automatically powers on when connected to a powered USB port.



CAUTION. It is important to secure the USB cable to the instrument using the USB cable cap to maintain a reliable connection and protect from water ingress.

2 – USB status LED

Indicates when the instrument is powered on and USB data transfer.

- Steady Red: USB power applied, or resetting
- Steady Green: Initialized, ready for use
- Blinking Green: Transferring data to host PC

3 – Battery LED

Indicates external power source and battery charging state.

- Blinking Green: External power connected, battery charging
- Off: No external DC power source connected, battery is fully charged

4 – Antenna input connector

Use this SMA female connector to connect an optional GNSS antenna.

5 – Tracking Generator source output connector

Use this N-type female connector to provide RF signal output to use the optional tracking generator feature in the SignalVu-PC application. This connector is available only on instruments with Option 04 Tracking Generator.

6 – Ref In (external reference) connector

Use this BNC female connector to connect an external reference signal to the analyzer. Refer to the instrument specifications for a list of supported reference frequencies.

7 – Trigger/Sync connector

Use this BNC female connector to connect an external trigger source to the analyzer. The input accepts TTL-level signals (0 – 5.0 V), and can be rising- or falling-edge triggered.

8 – RF input connector

This N-type female connector receives the RF signal input, via cable or antenna. The input signal frequency range for each instrument model is listed below. Keep the protective cover on the connector when not in use.

The input signal frequency range varies between models.

- RSA503A: 9 kHz to 3 GHz
- RSA507A: 9 kHz to 7.5 GHz

Operating requirements

This section provides the specifications that you need to know to operate your instrument safely and correctly. See the *RSA500A Series Specifications and Performance Verification Technical Reference* for additional information on specifications.

Cooling requirements

Without battery installed

When placed on a surface. Observe the following clearance requirements for all unsupported faces.

- Top and bottom: 25.4 mm (1.0 in)
- Left and right side: 25.4 mm (1.0 in)
- Rear: 25.4 mm (1.0 in)

With battery installed

When inside the Tektronix approved carry case. Place the instrument with the Tektronix logo facing the mesh side of the carry case in order to provide adequate airflow for cooling.



CAUTION. *To reduce the risk of overheating and damage to the instrument, do not place the instrument into an enclosed case other than the Tektronix approved carry case when the instrument is on. When using the approved carry case, ensure the logo faces the mesh side of the case to ensure proper airflow.*

Environmental requirements

For instrument accuracy, ensure that the instrument has warmed up for 20 minutes and meets these requirements.

Requirement	Description
Temperature (without battery installed)	
Operating	-10 °C to 55 °C (+14 °F to +131 °F)
Non-operating	-51 °C to 71°C (-59.8 °F to +123.8 °F)
Temperature (with battery installed)	
Operating (discharge)	-10 °C to 45 °C (+14 °F to +113 °F) Operation at -10 °C may require turning on the unit at room temperature first.
Storage (not charging)	-20 °C to 60°C (-4 °F to +140 °F)
Charging	0 °C to 45°C (32 °F to +113 °F)
Humidity (without battery)	5% to 95% (±5%) relative humidity at 10 °C to 30 °C (50 °F to 86 °F) 5% to 75% (±5%) relative humidity above 30 °C to 40 °C (86 °F to 104 °F) 5% to 45% (±5%) relative humidity above 40 °C to 55 °C (104 °F to 131 °F)
Humidity (with battery)	5% to 95% (±5%) relative humidity at 10 °C to 30 °C (50 °F to 86 °F) 5% to 45% (±5%) relative humidity above 30 °C to 50 °C (86 °F to 122 °F)
Altitude (operating)	Up to 5000 m (16404 feet)

Electrical ratings

Power requirements

This instrument is intended to be powered by the WFM200BA Lithium-Ion rechargeable battery pack or the 18 V DC AC adapter.

AC power

When the instrument operates from the external AC adapter, the following power requirements apply:

- A single-phase power source with one current-carrying conductor at or near earth-ground (the neutral conductor).
- The power source frequency must be 50 or 60 Hz, the operating voltage range must be from 100 to 240 VAC, continuous. The typical power draw is less than 15 W.



WARNING. *To reduce risk of fire and shock, make sure the mains supply voltage fluctuations do not exceed 10% of the operating voltage range.*

- Systems with both current-carrying conductors live with respect to ground (such as phase-to-phase in multiphase systems) are not recommended as power sources.

NOTE. *Only the line conductor is fused for over-current protection. The fuse is internal and not user replaceable. Do not attempt to replace the fuse. If you suspect the fuse has blown, return the unit to an authorized service center for repair.*

- Use the proper power cord with the AC adapter. (See page vii, *International power cords.*)

NOTE. *See the instrument Specifications and Performance Verification Technical Reference for additional information on power and environmental requirements.*

Battery power

This instrument can be powered by a Lithium-Ion rechargeable battery pack. One WFM200BA battery pack is provided with the instrument. If needed, you can purchase additional battery packs.

NOTE. *For optimum performance, charge the battery pack completely before using it for the first time or after prolonged storage.*

When installed, the battery pack will charge whenever the supplied AC adapter is connected, whether the instrument is On, Off, or in Standby mode. The charging rate is unaffected by instrument operation.

When using the WFM200BA battery pack to power the instrument, read the following battery safety notices. See the *WFM200BA Rechargeable Battery Pack Instructions* for information about how to properly operate and maintain the battery pack.



CAUTION. *To avoid damage to the battery pack, use only the instrument or the optional WFM200BC battery charger to charge the battery pack. Do not connect any other voltage source to the battery pack.*

To avoid overheating of the battery pack during charging, do not exceed the maximum ambient temperature of 40 °C. The battery pack will stop charging if it gets too hot.

The temperature at which the battery pack stops charging varies depending on the charging current and the battery heat dissipation characteristics. This is particularly true when the instrument is being operated while the battery pack is charging. The actual battery-charging temperature limit may be lower than 40 °C.

Cleaning

Cleaning is not required for the safe operation of the instrument.

However, if you wish to perform routine cleaning on the exterior of the instrument, clean the with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, use a cloth or swab dipped in a 75% isopropyl alcohol solution. Do not use abrasive compounds on any part of the chassis that may damage the chassis.

Compliance information

This section lists the EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies.

EMC compliance

EC Declaration of Conformity – EMC

Meets intent of Directive 2004/108/EC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61326-1, EN 61326-2-1. EMC requirements for electrical equipment for measurement, control, and laboratory use.^{1 2 3 4}

- CISPR 11. Radiated and conducted emissions, Group 1, Class A
- IEC 61000-4-2. Electrostatic discharge immunity
- IEC 61000-4-3. RF electromagnetic field immunity⁵
- IEC 61000-4-4. Electrical fast transient/burst immunity
- IEC 61000-4-5. Power line surge immunity
- IEC 61000-4-6. Conducted RF immunity⁶
- IEC 61000-4-11. Voltage dips and interruptions immunity^{7 8}

EN 61000-3-2. AC power line harmonic emissions

EN 61000-3-3. Voltage changes, fluctuations, and flicker

European contact.

Mfr. Compliance Contact
Tektronix, Inc. PO Box 500, MS 19-045
Beaverton, OR 97077 USA
www.tek.com

- 1 This product is intended for use in nonresidential areas only. Use in residential areas may cause electromagnetic interference.
- 2 Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.
- 3 For compliance with the EMC standards listed here, high quality shielded interface cables that incorporate low impedance connection between the cable shield and the connector shell should be used.
- 4 Equipment may not meet the immunity requirements of applicable listed standards when test leads and/or test probes are connected.
- 5 Residual spurious signals in the RF section can typically increase to -55 dBm at 80 MHz to 1 GHz and to -50 dBm at 1.4 GHz to 2.7 GHz when the instrument is subjected to electromagnetic interference per the IEC 61000-4-3 test.
- 6 Residual spurious signals in the RF section can typically increase to -55 dBm when the instrument is subjected to electromagnetic interference per the IEC 61000-4-6 test.
- 7 Performance criteria C.
- 8 Self-recovery times of greater than 10 seconds can be experienced.

Australia / New Zealand Declaration of Conformity – EMC

Complies with the EMC provision of the Radiocommunications Act per the following standard, in accordance with ACMA:

- CISPR 11. Radiated and Conducted Emissions, Group 1, Class A, in accordance with EN 61326.

Safety compliance

This section lists the safety standards with which the product complies and other safety compliance information.

- IEC 61010-1. Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements.

Equipment type

Test and measuring equipment.

Pollution degree description

A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.

Pollution Degree 1. No pollution or only dry, nonconductive pollution occurs. Products in this category are generally encapsulated, hermetically sealed, or located in clean rooms.

Pollution Degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.

Pollution Degree 3. Conductive pollution, or dry, nonconductive pollution that becomes conductive due to condensation. These are sheltered locations where neither temperature nor humidity is controlled. The area is protected from direct sunshine, rain, or direct wind.

Pollution Degree 4. Pollution that generates persistent conductivity through conductive dust, rain, or snow. Typical outdoor locations.

Pollution degree rating

Pollution degree 2 (as defined in IEC 61010-1). Rated for indoor, dry location use only.

Ingress Protection (IP) rating

IP52 (as defined in IEC 60529-2004). Rated as dust protected and protected from the ingress of dripping water when less than 15° from vertical.

Environmental considerations

This section provides information about the environmental impact of the product.

Product end-of-life handling

Observe the following guidelines when recycling an instrument or component:

Equipment recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. To avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2012/19/EU and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com/productrecycling).

Battery recycling. The WFM200BA Lithium-Ion rechargeable battery pack must be recycled or disposed of properly:

- Lithium-Ion batteries are subject to disposal and recycling regulations that vary by country and region. Always check and follow your applicable regulations before disposing of any battery. Contact Rechargeable Battery Recycling Corporation (www.rbrbc.org) for U.S.A. and Canada, or your local battery recycling organization.
- Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles.
- Place only discharged batteries in a battery collection container. Use electrical tape or other approved covering over the battery connection points to prevent short circuits.

NOTE. See the *WFM200BA Rechargeable Battery Pack Instructions* (Tektronix part number 075-1041-XX) for information on storage, transportation, and end-of-life recycling or disposal of the *WFM200BA Lithium-Ion battery pack*.

Transporting Lithium-Ion batteries

The capacity of the Lithium-Ion rechargeable battery pack in this product is under 100 Wh. The lithium-equivalent content, as defined by the UN Manual of Test and Criteria Part III Section 38.3, is under 8 g per pack and 1.5 g per individual cell.

- Always check all applicable local, national, and international regulations before transporting a Lithium-Ion battery.
- Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specifically limited or prohibited.
- The battery pack must be adequately protected against short-circuit or damage during transport.

