

RSA306

Real-Time Spectrum Analyzer

Installation and Safety

Instructions



071-3323-00

Tektronix

RSA306

Real-Time Spectrum Analyzer

Installation and Safety

Instructions

Register now!

Click the following link to protect your product.

► www.tektronix.com/register

www.tektronix.com
071-3323-00

Tektronix

Copyright © Tektronix. All rights reserved. Licensed software products are owned by Tektronix or its subsidiaries or suppliers, and are protected by national copyright laws and international treaty provisions.

Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specifications and price change privileges reserved.

TEKTRONIX and TEK are registered trademarks of Tektronix, Inc.

Contacting Tektronix

Tektronix, Inc.
14150 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

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

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.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 one (1) year 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.

THIS WARRANTY IS GIVEN BY TEKTRONIX WITH RESPECT TO THE PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. TEKTRONIX AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TEKTRONIX' RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. TEKTRONIX AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER TEKTRONIX OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

[W2 – 15AUG04]

Table of Contents

Important safety information	ii
General safety summary	ii
Service safety summary.....	iv
Terms in this manual	iv
Symbols and terms on the product.....	v
Compliance information	vi
EMC compliance	vi
Safety compliance	viii
Environmental considerations.....	ix
Preface.....	xi
Documentation	xi
Introduction	1
Standard accessories	2
Optional accessories	2
Service options	3
PC requirements	4
Installation	5
Initial installation.....	5
Front-panel connections	8

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.

To safely perform service on this product, additional information is provided at the end of this section. (See page iv, *Service safety summary*.)

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

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.

Do not operate in wet/damp conditions. Be aware that condensation may occur if a unit is moved from a cold to a warm environment.

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.

Service safety summary

The *Service safety summary* section contains additional information required to safely perform service on the product. Only qualified personnel should perform service procedures. Read this *Service safety summary* and the *General safety summary* before performing any service procedures.

To avoid electric shock. Do not touch exposed connections.

Do not service alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect power. To avoid electric shock, switch off the product power and disconnect the power before removing any covers or panels, or opening the case for servicing.

Use care when servicing with power on. Disconnect power, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

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

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 2006. EMC requirements for electrical equipment for measurement, control, and laboratory use.^{1 2 3}

- CISPR 11:2003. Radiated and conducted emissions, Group 1, Class A
- IEC 61000-4-2:2001. Electrostatic discharge immunity
- IEC 61000-4-3:2002. RF electromagnetic field immunity
- IEC 61000-4-4:2004. Electrical fast transient / burst immunity
- IEC 61000-4-5:2001. Power line surge immunity
- IEC 61000-4-6:2003. Conducted RF immunity
- IEC 61000-4-11:2004. Voltage dips and interruptions immunity

EN 61000-3-2:2006. AC power line harmonic emissions

EN 61000-3-3:1995. Voltage changes, fluctuations, and flicker

European contact.

Tektronix UK, Ltd.
Western Peninsula
Western Road
Bracknell, RG12 1RF
United Kingdom

- 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 should be used.

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 11:2003. Radiated and Conducted Emissions, Group 1, Class A, in accordance with EN 61326-1:2006.

Australia / New Zealand contact.

Baker & McKenzie
Level 27, AMP Centre
50 Bridge Street
Sydney NSW 2000, Australia

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 descriptions

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.

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 2002/96/EC 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).

Restriction of hazardous substances

This product is classified as an industrial monitoring and control instrument, and is not required to comply with the substance restrictions of the recast RoHS Directive 2011/65/EU until July 22, 2017.

Preface

This document contains the following information:

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

Documentation

The following table lists some of the documentation that is 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.tektronix.com.

Table i: Product documentation

Item	Purpose	Location
Installation and Safety Instructions (this manual)	Provides software and hardware installation instructions and the associated safety warnings.	Printed manual and also available in electronic format on the product flash drive and at www.tektronix.com/manuals
Performance Verification Technical Reference	Performance verification procedures for checking instrument performance.	Available at www.tektronix.com/manuals
SignalVu-PC online help	Using the application and interpreting the measurement results.	Online help files located within the application
RSA306 API Programmer manual	Details on commands used to control the instrument through an API	Available at www.tektronix.com/manuals
SignalVu-PC Programmer manual	Details on commands used with the SignalVu-PC application	Available at www.tektronix.com/manuals

Introduction

The RSA306 is a portable, 40 MHz Real-Time Spectrum Analyzer that contains an acquisition system inside a small module. The user interface and display resides on a user-provided PC running SignalVu-PC software or a user-developed application. The host PC provides all power, control, and data signals over the USB 3.0 cable included with the instrument. An available SW API is provided to allow you to create your own custom signal processing application.



Figure 1: RSA306 Real-Time Spectrum Analyzer

Key features

- 9 kHz – 6.2 GHz frequency range
- 40 MHz real time bandwidth
- External reference and trigger/sync inputs
- USB 3.0 power/control/data interface to PC
- Publicly-accessible SW API

Standard accessories

The instrument ships with the following accessories.

Table 1: Standard accessories

Accessory	Tektronix part number
Printed Safety/Installation manual	071-3323-xx
USB 3.0 A-to-Micro-B cable, 1 M	174-6584-xx
USB Flash Drive containing documentation files and all support SW: USB drivers, API drivers, SignalVu-PC software	063-4543-xx

Optional accessories

Optional accessories that are available for the instrument are listed below.

Table 2: Optional accessories

Accessory	Tektronix part number
Soft carrying case	RSA300CASE
Hard-sided transit case	RSA300TRANSIT
Rack mount kit	RSA306RACK
EMC Probes for use with spectrum analyzers	119-4146-xx
50 to 75 Ohm adapter (BNC)	131-4190-xx
N to BNC adapter	103-0045-xx
BNC whip antenna	119-6609-xx
Beam antenna, 824 MHz to 896 MHz	119-6594-xx
Beam antenna, 896 MHz to 960 MHz	119-6595-xx
Beam antenna, 1710 MHz to 1880 MHz	119-6596-xx
Beam antenna, 1850 MHz to 1990 MHz	119-6597-xx
Magnetic mount antenna, 824 MHz to 2170 MHz (requires adapter 103-0449-00)	119-6970-xx
Pre-filter, general purpose, 824 MHz to 2500 MHz, Type-N (f) connector	119-7246-xx

Table 2: Optional accessories (cont.)

Accessory	Tektronix part number
Pre-filter, general purpose, 2400 MHz to 6200 MHz, Type-N (f) connector	119-7426-xx
Cable, 50 Ω , BNC (m) 3 foot (91 cm)	012-0482-xx
Cable, 50 Ω , straight Type-N (m) and angled Type-N (m) connector, 1.6 foot (50 cm)	174-4977-xx
Cable, 50 Ω , Type-N (m) to Type-N (m) connector, 3 foot (91 cm)	174-5002-xx

Service options

Table 3: Purchased with instrument

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

Table 4: Post-purchase service options

Option number	Description
R3DW	Repair Service Coverage, extending from date of purchase to 3 years (including warranty)
R5DW	Repair Service Coverage, extending from date of purchase to 5 years (including warranty)

PC requirements

The RSA306 Signal Analyzer requires a PC equipped with the following features:

- USB 3.0 port
- 64-bit Windows 7 or 8 OS

For full performance of the real time features of the RSA306, an Intel Core i7 4th generation processor and 8 GB RAM is required. Processors of lower performance can be used, with reduced real time performance. Storage of streaming data requires that the PC be equipped with a drive capable of streaming storage rates of 300 MB/sec.

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 online help for more detailed operation and application information.

Unpack the instrument and check that you have received all of the items marked in the table as standard accessories for your instrument configuration. (See page 2, *Standard accessories*.) If you ordered optional accessories, check that those you ordered are in your shipment.

Initial installation

All of the software required to operate the RSA306 from a PC is included on the flash drive that ships with the instrument. The RSA306 can be controlled with Tektronix SignalVu-PC software, or you can control the instrument through the API. Both SignalVu-PC and API control require a USB 3.0 connection for communication.

Load the SignalVu-PC and TekVISA software

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

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.
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 Read This First* document, located in SignalVu-PC under Help/Quick Start Manual (PDF).

(Optional) Load the API and USB driver software

If you plan to control the instrument through an API, 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 **Tektronix RSA306 API and USB** from the list of folders.
3. Double-click **Setup.exe** and follow the on-screen instructions to install the software.

Make the connections

Refer to the front panel illustration for connector locations. (See Figure 3 on page 8.)

1. After the software has been installed, connect the USB cable included with the analyzer between the analyzer and the host PC.
2. Connect an RF cable between the RSA306 input and the signal source. (See Figure 2.)

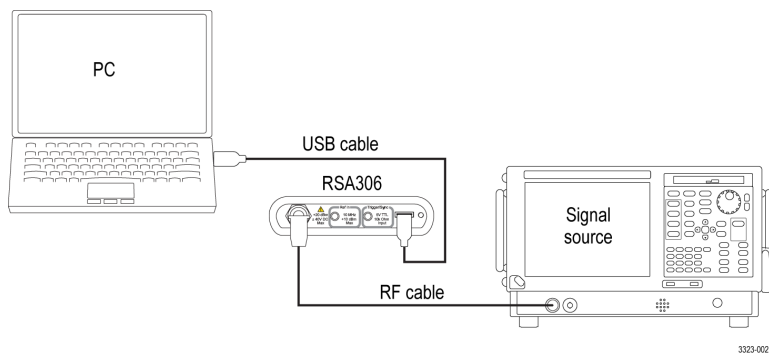


Figure 2: Instrument connections

3. Start the SignalVu-PC application on your PC.
4. Click **Live Link** on the menu bar to view the drop down menu.

5. Select **Connect to Instrument**. The USB-connected RSA306 appears in the **Connect to Instrument** list.
6. If you do not see the RSA306, 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.
7. Select the instrument. First time connection to the analyzer may take up to 10 seconds.
8. A Connect Status dialog appears to confirm that the instrument is connected.

NOTE. *You can quickly verify connection status by looking at the Connection indicator square on the menu bar. It is green when an instrument is connected, and red when it is not. You can also view the name of the instrument that is connected by hovering the mouse indicator over the green indicator square.*

Confirm operation

After you have installed the software and connected the system components, the spectrum trace will be active on your PC, confirming system operation.

When you are ready to disconnect from the RSA306, select **Disconnect from Instrument** to end the current connection.

Front-panel connections

The RSA306 signal analyzer has four input connectors on the front panel.

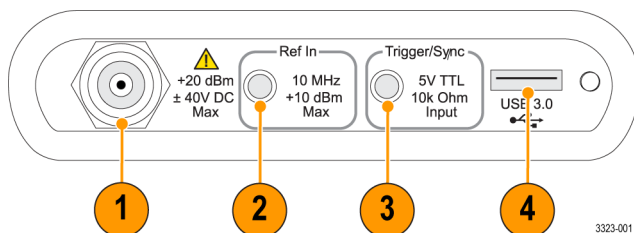


Figure 3: RSA306 front panel

1 – Input connector

This N-type female connector receives the RF signal input from your circuit or device under test (DUT). The input signal frequency range is 9 kHz to 6.2 GHz. Keep the protective cover on the connector when not in use.

2 – Ref In (external reference) connector

Use this SMA female connector to connect an external 10 MHz reference clock signal to the analyzer.

3 – Trigger/Sync connector

This SMA female connector accepts TTL-level signals (0 – 5.0 V), and can be rising- or falling-edge triggered.

4 – USB 3.0 connector

Use the USB 3.0 A-to-Micro B cable provided with the signal analyzer to connect the instrument to the USB 3.0 connection on the host PC.