

RSA306 and SignalVu-PC Frequently Asked Questions

Contents

RSA306 and SignalVu-PC-SVE Frequently asked questions	4
Known Issues.....	4
Spectrum update rate varies with time on some PCs.....	4
Record doesn't wait for triggers	4
PC Recommendations, RSA306 and SignalVu-PC.....	4
What PC should I use with the RSA306?	4
What happens if I don't meet all of the requirements with my PC?	5
What if my disk drive doesn't meet the write-speed requirement for streaming?	5
How long will my laptop or tablet batteries last while operating the RSA306.....	6
What USB cable can I use with the RSA306? What's the longest USB cable I can use?	6
How can I tell if my PC is USB 3.0? What are the USB 3.0 markings on the connectors?	6
SignalVu-PC SVE	7
SignalVu-PC-SVE Option SVE used to be a pay-for option in the software. What happened to it?	
How do I get it?	7
What about all the other options on SignalVu-PC-SVE? Do I need them? What has changed?.....	7
Will the New SignalVu-PC-SVE work with the Live Link option (Option CON) to control the MDO4KB?	
.....	7
Will the new SignalVu-PC-SVE software read MDO4KB TIQ files?.....	8
Will the new SignalVu-PC-SVE software read MDO3K and MDO4K TIQ files?	8
Will the RSA306 SignalVu-PC-SVE software be posted on Tek.com?	8
SignalVu-PC-SVE was originally introduced with support for 32 and 64-bit Windows. The new version is 64-bit only. Can I get the old version?	8
If I purchase options for SignalVu-PC, can I activate them without an internet connection	8
Can I transfer my purchased license from one PC to another without an internet connection?	8
Installation, USB Drivers and TekVISA	8
The installation asks if I would like to install TekVISA. What is TekVISA?.....	8
Is TekVISA required? Why would I want to install TekVISA?	8
Where do I get the USB driver for the RSA306?	9
SignalVu-PC-SVE Live Link cannot find my RSA306.....	9
If I have already installed the Tektronix RSA USB driver, do I need to install it again when I install SignalVu-PC-SVE or the API?	11

Can you run multiple versions of SignalVu-PC-SVE or the API each hosting 1 RSA306 on a single PC?	11
Is there a declassification procedure for the RSA306? What data, if any, would persist through a factory calibration	11
Using the RSA306 and SignalVu-PC SVE, operational questions	11
How can I tell if the RSA306 is connected?	11
What do the red/green lights on the RSA306 indicate?	11
What is the Spectrum Update rate for the instrument?	11
How do I quickly save a screen shot from the RSA306 ?	12
How do I use SignalVu-PC-SVE to re-analyze data collected with a second PC?	12
If I change the number of trace points in swept spectrum (>40 MHz span), some of the instrument residual spurs move or disappear. What's happening?	12
What causes the RSA306 to trigger on signals that aren't shown in the display ?	12
Application Programming Interface	13
How is the API different from SignalVu-PC-SVE?	13
What are the PC requirements for the API?	13
What commands are available from the API?	13
What is the difference between an RSA306, MDO3000, MDO400B and an RSA5106B?	13
RSA MAP	16
What type of map formats does RSA Map Support ?	16
What GPS receiver can I use with my PC?	16
Can I use RSA Map indoors, or without GPS installed?	16
Do I have to create a map to collect data with RSA Map?	17
How to Create a Geo-referenced Map for RSA MAP	17

RSA306 and SignalVu-PC-SVE Frequently asked questions

Known Issues

Spectrum update rate varies with time on some PCs.

SignalVu-PC version 3.4.0245. This has been infrequently seen when used with PCs that have relatively slow (4800 rpm) hard disk drives combined with a small disk-drive cache. Version 3.4.0253 allows the user to set the cache file sized used by SignalVu-PC, but this will does limit the maximum file size that can be acquired. A hardware fix would be to use a PC with a faster drive and larger drive cache.

Record doesn't wait for triggers

SignalVu-PC version 3.4.0245. When using 'Record to Disk, Record on Trigger', the acquisitions begin without waiting for triggers. This has been fixed in release 3.4.0253, available at Tektronix.com.

PC Recommendations, RSA306 and SignalVu-PC

The RSA306 USB 3.0 Real-Time Spectrum Analyzer requires a PC for operation. This document outlines the requirements for a PC to operate the RSA306, and provides selection advice and a list of tested PCs to use as guidance in your selection.

The requirements break into separate parts, depending upon how complete you need your capabilities to be. These parts are **general system requirements, real time spectrum analysis, and streaming operation.**

General System Requirements: Windows 7, Windows 8/ 8.1 64-bit operating system and a USB 3.0 connection is required for operation of the RSA306. 8 GB RAM and 20 GB free drive space is required for installation of SignalVu-PC-SVE.

Real-Time spectrum analysis: The RSA306 has real-time capabilities, specified as the minimum time a signal must exist within the acquisition bandwidth of 40 MHz for which there is a 100% probability of intercept by the DPX spectrum analyzer display. To meet the specification of 100 usec minimum signal duration, a PC with an Intel i7 4th generation processor is required.

Streaming operation: The RSA306 can stream amplitude samples directly to a storage device for later review. The storage device must be capable of streaming storage of 300 MB/sec. This means that either a solid-state drive with 300 MB/sec, or a raid arrangement of spin drives capable of 300 MB/sec is required. If streaming of data to the hard drive is not important to you, this requirement does not need to be met with your PC.

What PC should I use with the RSA306?

Any PC that meets the performance requirements should work. Your selection should take into account your operating environment, application and budget. Tektronix doesn't make a specific recommendation, but a list of models we've evaluated is shown below. In three cases, we've found an

Intel core i5-based tablet (Surface 3 Pro and Panasonic FZ-G1) or laptop (Apple MacBook Air) that do meet minimum signal duration specifications. As new processors are introduced, more i5 machines will be able to meet the minimum signal duration specifications.

The Apple MacBook Air is included on the list. The MacBook, using Bootcamp, can operate as a fully functional PC. See <http://www.apple.com/support/macbook/bootcamp/> for details on this.

Manufacturer	Model	Processor	Meets minimum signal duration specification?	Meets streaming data requirement?
Dell	XPS15-6842sLV	Intel corei7-4702HQ 2.2GHz	Yes	No (spin drive)
Lenovo	Yoga 2 Pro	Intel corei7-4500U 1.8GHz	Yes	No (spin drive)
Microsoft	Surface 3 Pro	Intel core i7-5650U 1.7-2.3 GHz	Yes	Yes (Solid-state drive)
Microsoft	Surface 3 Pro	Intel corei5-4300U 1.7-2.5 GHz	Yes	Yes (Solid-state drive)
Motion Computing	F5te	Intel core i7-3667 2.00 GHz	Yes	Yes (Solid-state drive)
Lenovo	Think Pad	Intel corei7 3632QM 2.2 GHz	Yes	No (spin drive)
Panasonic	ToughPad FZ-G1	Intel corei5 4310Y	Yes	Yes
Dell	Latitude E7440 Ultrabook	Intel Core i7-4600U 2.1 GHz	Yes	Yes
Apple	MacBook Air mid-2013 with Bootcamp Windows	1.3GHz Intel Core i5	Yes	Yes

Table 1: List of PCs that tested with SignalVu-PC, February 2015.

What happens if I don't meet all of the requirements with my PC?

Processors of lower performance can be used, with reduced real time performance. This means that the minimum signal duration for 100% probability of intercept will increase, and the performance of AM/FM demodulation and listening will be degraded.

Older and/or lower performance PCs may also have slower drives, smaller drive caches, slower memories and slower busses, all of which may contribute to reduced performance. You may see slower updates rates, slower sweep times and long pauses in processing.

What if my disk drive doesn't meet the write-speed requirement for streaming?

If a disk drive with streaming storage rates <300 MB/sec is used, you will not be able to stream data to the drive without gaps. The unit will still write to the drive, but it will not be seamless. All other functions will work, including capturing and storing up to 1 second of data with SignalVu-PC-SVE. There

are no spin-drives that meet the requirement for write speed. Many solid-state drives meet the requirement. The write speed of your drive can be determined from the manufacturer's specifications.

How long will my laptop or tablet batteries last while operating the RSA306

Operation of the RSA306 with SignalVu-PC-SVE creates two sources of power draw on your PC. The RSA306 draws approximately 4.5W from the USB 3.0 power supply of your PC. SignalVu-PC-SVE will load the processors of the PCs to varying levels, depending upon what analysis is being performed. DPX real-time spectrum/spectrogram and AM/FM audio listening will heavily load your PC processor.

Depending upon your PC and usage of real time functions, operating times will vary. In the worst case, tablets such as the Surface Pro 3 and Motion Computing F5te both ran the RSA306 with continuous DPX processing for about 80-90 minutes before reaching 10% remaining battery capacity. In the best case, a business-class laptop may run the system with continuous DPX processing for 3-4 hours. Using DPX and AM/FM listening sparingly can add 50-100% to these times.

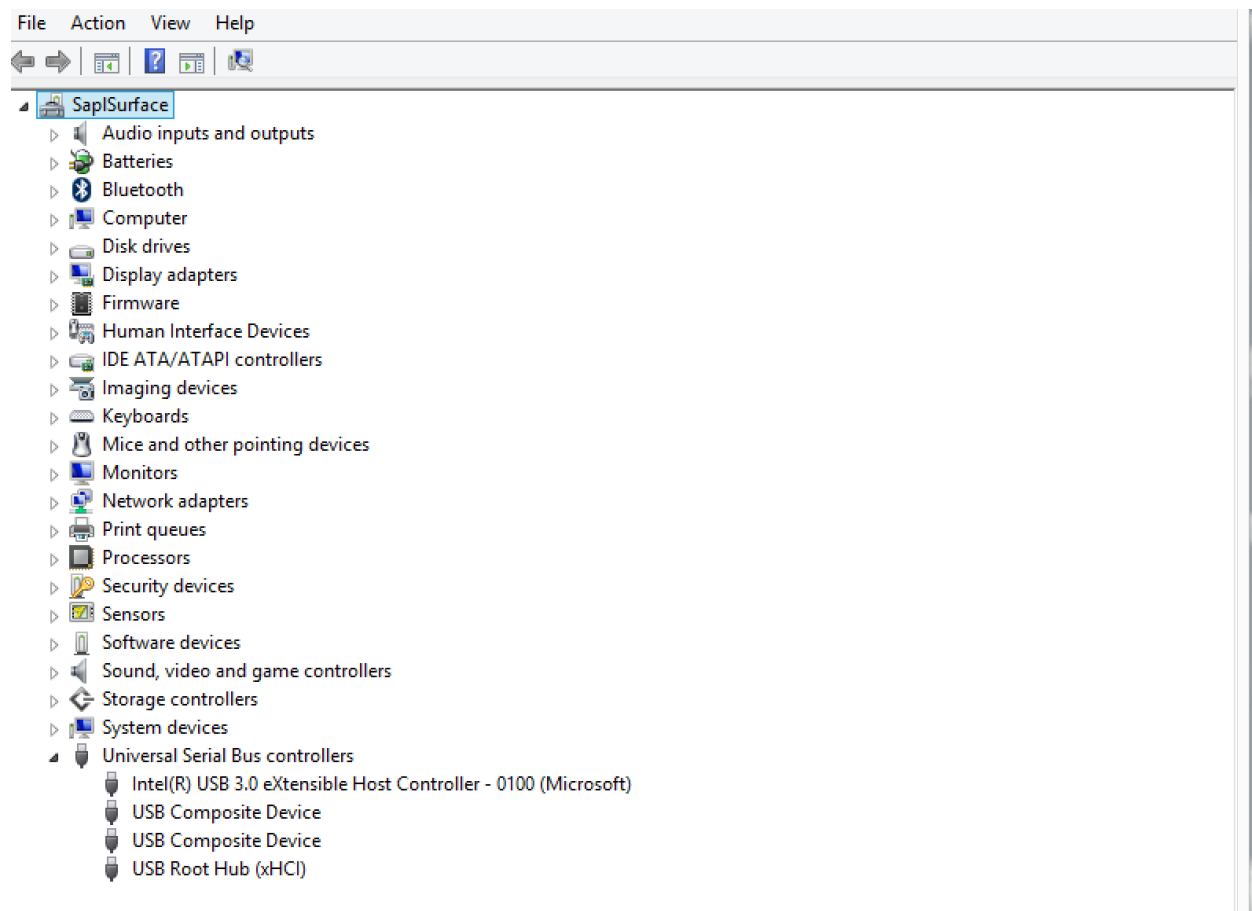
What USB cable can I use with the RSA306? What's the longest USB cable I can use?

The instrument ships with a 1M USB 3.0 cable. If a longer cable is needed, take care to purchase a high quality cable. The instrument is powered by the cable, and draws about 800 milliamps when operating. Lower quality cables will have higher resistance, and the voltage drop that results may cause the unit to be unable to operate. We have successfully used the Amazon Basics 9 foot USB cable with several laptops. However, the PC used must have a robust USB power supply to operate over a long cable.

How can I tell if my PC is USB 3.0? What are the USB 3.0 markings on the connectors?

The best way is to ask Windows. In Windows 7, from the Start button, open Control Panel and select Device Manager. In Windows 8, search on 'Device Manager', select it and look for USB 3.0 as shown below

The USB installation is detailed in Universal Serial Bus Controllers. An example is shown below.



It may be that not all of your USB connections are USB 3.0. Frequently (but not always), the USB connector is blue and/or has the 'SS' or '3.0' designator written on it. There are four internal lines on the connector, but some USB 2.0 connectors also have 4 lines. You may also see a 'lightning bolt' printed near the connector: The lightning bolt does not designate USB 3.0, it just means that the port is powered and can charge devices when the PC is powered off.

SignalVu-PC SVE

SignalVu-PC-SVE Option SVE used to be a pay-for option in the software. What happened to it? How do I get it?

SignalVu-PC SVE Option SVE is now standard in the SignalVu-PC-SVE installation. No option key is needed for the functions in the old Option SVE.

What about all the other options on SignalVu-PC-SVE? Do I need them? What has changed?

All other options to SignalVu-PC-SVE remain as before, but their prices have been reduced substantially.

Will the New SignalVu-PC-SVE work with the Live Link option (Option CON) to control the MDO4KB?

Yes, all options in previous versions of SignalVu-PC-SVE are supported

Will the new SignalVu-PC-SVE software read MDO4KB TIQ files?

Yes

Will the new SignalVu-PC-SVE software read MDO3K and MDO4K TIQ files?

Yes, but the IQ data is not calibrated. This is not a change from previous versions.

Will the RSA306 SignalVu-PC-SVE software be posted on Tek.com?

Yes. This is identical to the SignalVu-PC-SVE used with the MDO, and as standalone software. They are all the same version.

SignalVu-PC-SVE was originally introduced with support for 32 and 64-bit Windows. The new version is 64-bit only. Can I get the old version?

Yes. An archive version of SignalVu-PC SVE 32-bit is available on Tektronix.com/downloads. However, new options, such as mapping and APCO P25 support are not available in the 32-bit version.

If I purchase options for SignalVu-PC, can I activate them without an internet connection?

Yes, but you need a second PC that does have an internet connection. There is an offline activation tool included with SignalVu-PC to help you accomplish this. You'll need to get some information from SignalVu-PC from the target computer (the Host ID). You enter this host ID into a PC with internet connection and the offline activation tool installed, and keys will be generated. These are then entered manually into the offline target computer. Instructions for this are included in the 'read me first' documentation included with SignalVu-PC.

Can I transfer my purchased license from one PC to another?

Yes, but an internet connection is required. In the 'Tools: Manage Licenses' menu of SignalVu-PC, there is a deactivate selection. Once you have deactivated successfully, you can enter this key into a new PC to authorize the new PC.

Can I transfer my purchased license from one PC to another without an internet connection?

Yes, but it requires a manual operation at the Tektronix license server. Contact your Tektronix representative and we can help you to move your license.

Installation, USB Drivers and TekVISA

The installation asks if I would like to install TekVISA. What is TekVISA?

TekVISA is the Tektronix implementation of the Virtual Instrument Software Architecture (VISA). VISA is a widely used application programming interface used in the test and measurement industry for communicating with instruments from a PC. The VISA standard includes specifications for communication with instruments via interfaces such as GPIB, VXI, LAN, USB and other interfaces.

Is TekVISA required? Why would I want to install TekVISA?

TekVISA is not required for manual operation of SignalVu-PC-SVE, or for communication with the API. However, if you would like to programmatically control SignalVu-PC-SVE, TekVISA is required. Also, SignalVu-PC-SVE Option MAP communicates to the SignalVu-PC software via TekVISA.

Where do I get the USB driver for the RSA306?

It is installed when you install SignalVu-PC SVE or the application programming interface. The driver is also available separately on the USB thumb-drive included with the RSA306 .

SignalVu-PC-SVE Live Link cannot find my RSA306

After installation of SignalVu-PC-SVE and the Tektronix RSA306 USB driver, I cannot get the instrument to be found with SignalVu-PC-SVE Live Link.

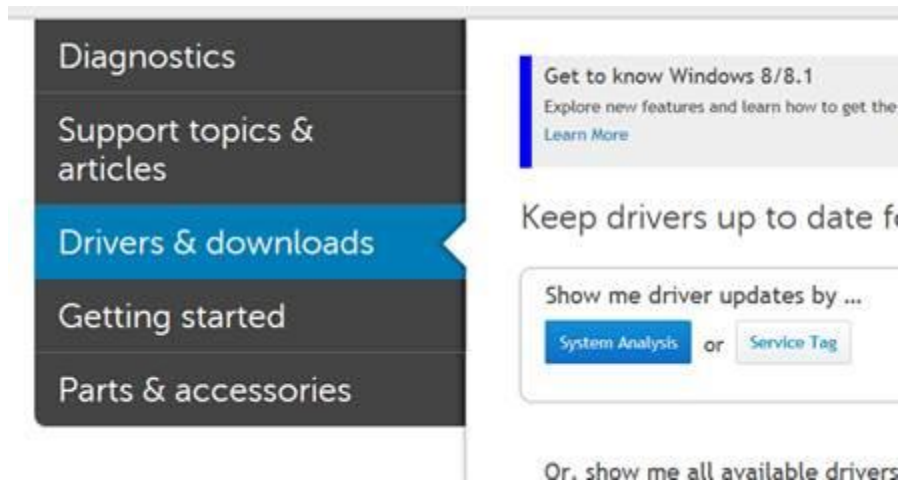
The first time connecting to the RSA306, it may require up to 30 seconds for SignalVu-PC-SVE to find the instrument. Subsequent links will occur faster.

In older PCs, the latest manufacturer's drivers for the PC and for the processor may need to be installed. Check on the website of your PC manufacturer for the latest drivers for your PC. In the case of drivers for Dell PCs, an example of how to do this is shown below.

- Go to www.dell.com
- Find the Product Support page for the specific PC model (e.g. "Latitude E5440")



- On the left side, select the Drivers and Downloads tab



- On the right side, select (open) the Chipset driver dropdown



- 2 Find the Intel USB3.0 xHCI Driver and install it



If I have already installed the Tektronix RSA USB driver, do I need to install it again when I install SignalVu-PC-SVE or the API?

Yes. When you install either SignalVu-PC-SVE or the API, you will be asked to 'OK' installation of the Tektronix USB driver. Should you install new software, you will be asked again to permit driver installation. You do need to install the driver again, because each new installation will erase the old driver, then install the driver from the installation package.

Can you run multiple versions of SignalVu-PC-SVE or the API each hosting 1 RSA306 on a single PC?

You can have multiple RSA306 connected to a signal PC with multiple USB 3.0 ports, but SignalVu-PC-SVE or the API address only one of them at a time. Tektronix has not tried to run multiple instances of SignalVu-PC-SVE or the API on a single PC.

Is there a declassification procedure for the RSA306? What data, if any, would persist through a factory calibration

Declassification procedure is on Tek.com, search on RSA306 declassification. No user data is stored in the instrument, only calibration data. User data IS stored in the PC running SignalVu-PC-SVE or the API.

Using the RSA306 and SignalVu-PC SVE, operational questions

How can I tell if the RSA306 is connected?

When first plugged in, the RSA306 status light is red. When a successful connection is made and the instrument boots, the light turns green. This takes about 5 seconds. When SignalVu-PC-SVE searches for and connects to the RSA306, it forces a re-boot of the instrument, and you will see the light cycle to red, then green again.

What do the red/green lights on the RSA306 indicate?

Solid Green: Instrument has finished boot-up up and is ready to connect or operate.

Red: Unable to power up, or re-booting the instrument

Flashing green: Transferring data

What is the Spectrum Update rate for the instrument?

For the DPX spectrum display at 40 MHz span, RBW=auto, the spectrum update rate is 10,000/second. As the resolution bandwidth is reduced, the spectrum processing rate slows. This affects the minimum signal duration for 100% probability of intercept. You can see the minimum signal duration by selecting DPX Spectrum Settings:Pref:Show Parameter Readouts. The instrument must be connected for this menu to appear in SignalVu-PC.

For the standard spectrum analyzer, the spectrum update rate can be as fast as 50/sec for spans of 40 MHz, RBW=Auto, depending upon your PC. For full-range sweeps of 6.2 GHz in auto-RBW, the sweep rate is generally greater than 1.5 GHz/sec, depending upon the PC used.

How do I quickly save a screen shot from the RSA306 ?

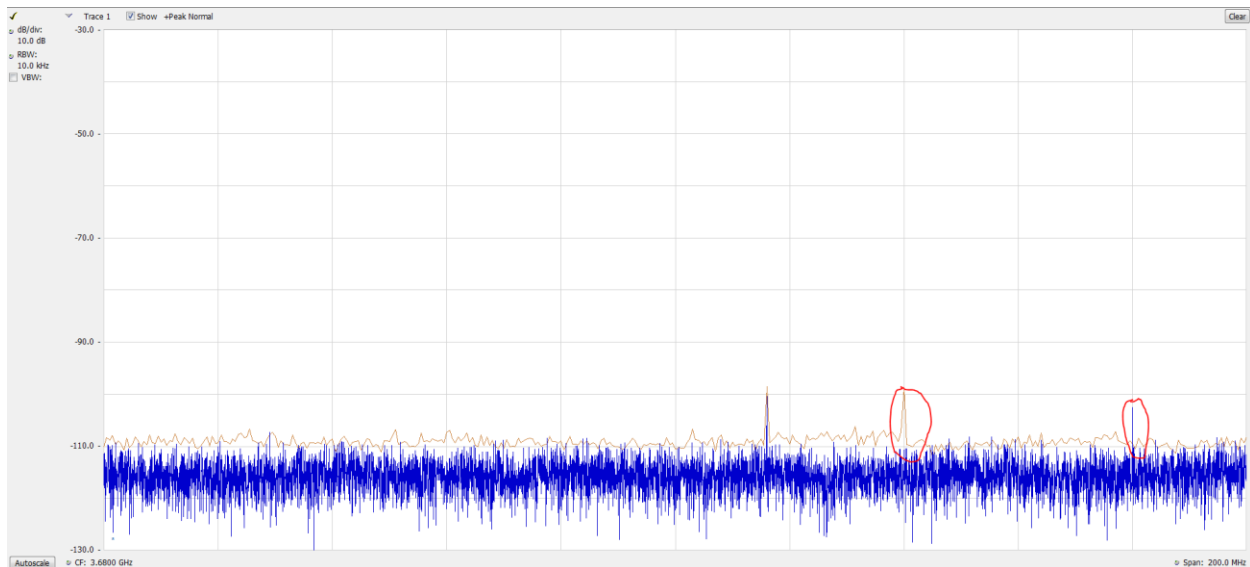
In SignalVu-PC-SVE, navigate to File: Save As: Save as Type: Picture, and select .png or .bmp. Or, use the Windows Snipping Tool.

How do I use SignalVu-PC-SVE to re-analyze data collected with a second PC?

To save data acquired with the RSA306 and SignalVu-PC-SVE, use File: Save As: and select .tiq or .mat. .tiq is the native format for SignalVu-PC-SVE, and .mat is Level 5 Matlab file format. Either of these can be opened by any SignalVu-PC-SVE installation. Files saved as .Mat can be opened with Matlab.

If I change the number of trace points in swept spectrum (>40 MHz span), some of the instrument residual spurs move or disappear. What's happening?

When making a spectrum display >40 span, the instrument is stepped over a number of frequencies and the resultant spectrums are 'stitched' together to create the sweep. When the number of trace points is changed, the acquisition frequency of each stitch may change slightly to accommodate the new number of output points. This results in a different residual output on the display. An example is shown below. The brown trace is 801 points, the blue trace is 4001 points. The change in tuning plan to accommodate the new point values has caused one residual to disappear, and a new one to appear, circled in red.



What causes the RSA306 to trigger on signals that aren't shown in the display ?

The trigger in the RSA306 sees the entire 40 MHz intermediate frequency bandwidth of the instrument, independent of the displayed spectrum span or selected measurement bandwidth. If a signal is present above the trigger level in the IF, it will cause the instrument to trigger.

Application Programming Interface

How is the API different from SignalVu-PC-SVE?

The RSA306 API is a Windows 64-bit C/C++ DLL that provides direct access to the RSA306. It enables full control of the RSA306 and provides several forms of data and measurements to support custom applications independent of SignalVu-PC.

What are the PC requirements for the API?

The API has the same requirements as SignalVu-PC-SVE.

What commands are available from the API?

A complete list of available function calls is available in the RSA 306 API manual. The manual covers sections on:

Connection
Device status
Device operation
Trigger
ADC streaming
IQ data
DPX
Audio
Self test
Alignment

What is the difference between an RSA306, MDO3000, MDO400B and an RSA5106B?

- The RSA306 is a small, portable real time spectrum analyzer that has amazing performance for its price and it is used with a Windows 64-bit PC with SignalVu-PC-SVE
- The MDO3000 is the ultimate six instruments in one instrument for unmatched versatility and value.
- The MDO4000B provides unique time correlation of the frequency domain signals (SA, RF vs Time) with the time domain signals (Analog and digital channels) and supports being controlled by a Windows 64-bit PC for advanced signal analysis with SignalVu-PC-SVE.
- The RSA5000B is a full featured real time performance spectrum/signal analyzer.

A summary comparison is shown below. The comparison strives to give performance in similar conditions, but for full specifications and conditions, see the individual data sheets.

	RSA306	MDO3xxx Opt SA	MDO4xxx-6B	RSA5106B
Input Frequency	9 kHz to 6.2 GHz	9 kHz to 3.0 GHz	9 kHz to 6.0 GHz	1 Hz to 6.2 GHz
Reference Frequency accuracy	±3 ppm (18 to 28 °C ambient + aging)	NA	±1.6 x 10 ⁻⁶ , includes initial accuracy, temperature, aging(1 year)	± 1 x 10 ⁻⁶ + aging ± 1 x 10 ⁻⁷ (Opt PFR)
External frequency reference input	10 MHz ±10 Hz	NA	10 MHz	Every 1 MHz from 1 to 100 MHz
RF Input				
VSWR (Typical)	≤ 1.8:1(10 MHz to 6.2	-	≤ 2.5:1 (9 kHz – 6 GHz,	< 1.2 10 MHz to 2 GHz,

	GHz, reference level $\geq +10$ dBm)		0dBm Reference Level)	< 1.4 >2 GHz to 3 GHz < 1.5 >3 GHz to 6.2 GHz RF ATT=10 dB, Preamp OFF)
Max. Input, no damage	DC voltage ± 40 V _{dc} +23 dBm (Ref. level ≥ -10 dBm) +15 dBm (Ref. level < -10 dBm)	DC voltage ± 20 V _{DC} +30 dBm	DC voltage ± 40 V _{dc} + 32dBm (Ref. level ≥ 20 dBm) +25dBm (Ref. level < -20 dBm)	DC Voltage +5V + 30 dBm (RF ATT ≥ 10 dB, Pre-amp Off) + 20 dBm (RF ATT ≥ 10 dB, Pre-amp On)
Amplitude Accuracy Typical				
10 MHz - < 3 GHz	± 1.25 dB	± 0.6 dB	± 0.5 dB	± 0.3 dB
≥ 3 GHz – 6 GHz	± 2.0 dB	NA	± 0.5 dB	± 0.5 dB
Intermediate frequency and acquisition system				
IF Bandwidth	40 MHz	1 GHz	Up to 3.75 GHz	25/40/85/165 MHz BW
Sample rate, bits	112 MS/s, 14 bit	10 GS/s, 8 bit	10 GS/s, 8 bit	16 bits, 200 MS/s (Opt B25/B40), plus 14 bits, 400 MS/s (OptB85/ B16x)
Noise and Distortion				
Displayed Average Noise Level	DANL (dBm/Hz), typical (internal preamp automatically activated at low reference levels)	DANL (dBm/Hz), typical, with/without TPA-N-PRE	DANL (dBm/Hz), typical, with/without TPA-N-PRE	DANL (dBm/Hz), typical, Preamp Off/On
100 kHz	-133	-130/-140	-134/-144	-150 dBm/Hz (10 kHz to 32 MHz, LF Band)
5 MHz	-148	-130/-140	-134/-144	-139/-160
1.0 GHz	-163	-140/-150	-149/-159	-157/-167
2.0 GHz	-161	-140/-150	-149/-159	-157/-167
4.0 GHz	-158	NA	-152/-162	-155/-164
6.2 GHz	-153	NA	-144/-154	-153/-164
Phase Noise at specified offset, dBc/Hz, typical				
1 kHz	-88		-104	-107
10 kHz	-97	-85	-111	-113
100 kHz	-92	-101	-113	-117
1 MHz	-120	-122	-123	-139
Input related spurious response	< -50 dBc, typical	Not specified	< -60 dBc, typical	<-75 dBc, typical
3rd-Order Intercept at 2 GHz, typical	+14 dBm	Not specified	Not specified	+18 dBm
Other				
Weight	0.59 kg (1.3 lb)	4.2 kg (9.2 lb.)	5 kg (11 lb)	24.8 kg (54.5 lb)
Temperature Ranges	Operating -10 C to +55 C Non-operating -51 C to +71 C	Operating -10 °C to +55 °C Non-operating -40 °C to +71 °C	Operating -0 °C to +50 °C Non-operating -20 °C to +60 °C	Operating: 5 °C to +40 °C Non-operating: -20 °C to +60 °C

Spectrum Analysis Features	RSA306	MDO3xxx Opt SA	MDO4xxx-6B	RSA5106B
RBW Range	10 Hz-10 MHz	20 Hz-200 MHz	20 Hz-200 MHz	0.1 Hz – 10 MHz
Measurements/ displays	Markers (5, time-correlated). Absolute, delta power, frequency, time, Integrated power,	Markers (6, absolute, delta power, frequency, time, dBc/Hz)	Markers (6, absolute, delta power, frequency, time, dBc/Hz)	Markers (5, time-correlated). Absolute, delta power, delta time, Integrated power, power

	power density, dBc/Hz. Measurements: Spectrum, Spectrogram, Amplitude/Frequency/Phase vs. time, RF I and Q vs. time, Time Overview/Navigator, AM, FM, PM analysis, Spurious Measurement, Spectrum Emission Mask, Occupied Bandwidth, Channel Power and ALCR, MCPDR, CCDF	Measurements: Spectrum, spectrogram, Channel Power, Occupied Bandwidth, ACPR	Measurements: Spectrum, Spectrogram, Amplitude/Frequency/Phase vs. time, Channel Power, Occupied Bandwidth, ACPR, Time Navigator, correlated to oscilloscope and logic analyzer measurements With SignalVu-PC-SVE and Live Link option: All measurements except DPX spectrum/spectrogram available in SignalVu-PC-SVE (see RSA306 for list)	density, dBc/Hz. Measurements: Spectrum, Spectrogram, Amplitude/Frequency/Phase vs. time, RF I and Q vs. time, Time Overview/Navigator, AM, FM, PM analysis, Spurious Measurement, Spectrum Emission Mask, Occupied Bandwidth, Channel Power and ALCR, MCPDR, CCDF
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Real Time Features	RSA306	MDO3xxx Opt SA	MDO4xxx-6B	RSA5106B
Maximum span	40 MHz real-time (9 kHz - 6.2 GHz swept)	Up to 3 GHz real time 9 kHz – 3.0 GHz swept	Up to 3.75 GHz real time 9 kHz-6.0 GHz swept	25/40/85/165 MHz real time (1 Hz – 6.2 GHz swept)
Maximum acquisition time	1.0 s, 40 MHz bandwidth (span-independent) plus streaming to disk	NA	5 ms at 3.75 GHz bandwidth Longer at lower bandwidths	19 sec at 40 MHz bandwidth, longer at lower bandwidths
DPX spectrum display				
Available Displays	Spectrum, Spectrogram	NA	NA	Spectrum, Spectrogram, Amplitude, Frequency, Phase
Spectrums/sec	Up to 10,000/s	NA	NA	Up to 390,625 per second
Minimum signal duration, 100% probability of intercept	100 us, span= 40 MHz, RBW=Auto	NA	NA	2.7 us (165 MHz, Opt. 09, RBW=20 MHz) 23.3 us (std), 10.5 us (opt. 09), span=40 MHz, RBW=auto
Minimum resolution bandwidth	1 kHz (DPX spectrum) 10 Hz (standard spectrum)	NA (DPX spectrum) 20 Hz (standard spectrum)	NA (DPX spectrum) 20 Hz (standard spectrum)	0.1 Hz (DPX spectrum) 0.1 Hz (standard spectrum)
Triggers (RF/IF)	IF Level (40 MHz BW)	NA	RF Power level, Width, Runt, Timeout, and Logic triggers. Triggers on events between 1 MHz-3.25 GHz or 3.25 GHz-6 GHz, based on center frequency.	IF Level (1 kHz-165 MHz BW) Frequency Mask Frequency Edge Density Time-qualified and runt
Triggers (Other)	External	Any analog (scope) channel input, Edge, Sequence, Pulse Width, Timeout, Runt, Logic, Setup and Hold, Rise/Fall, Video Aux in (External) Line	Any analog (scope) or digital (LA) channel input: Edge, Sequence, Pulse Width, Timeout, Runt, Logic, Setup and Hold, Rise/Fall, Video bus. AC Line input	External (2) Line
Modulation Analysis Residual	RSA306	MDO3xxx Opt SA	MDO4xxx-6B	RSA5106B

EVM				
1 MS/s QPSK	1.1%	NA	Not specified	0.35%
802.11b	2.0%	NA	1.04%	1.0%
802.11n	-35 dB	NA	-42 dB	-48 dB
APCO P25 HDQPSK	2.5%	NA	0.5%	0.4%
APCO25 P25 C4FM	1.3%	NA	1.0%	1.0%
Other Features				
	Basic AM/FM analysis, AM/FM Audio listening Frequency-Mask Limit/Act on violation <i>SignalVu-PC-SVE Options</i> for AM/FM/PM/Direct Audio Frequency/phase settling Pulse measurements GP Mod. Analysis WLAN analysis APCO P25	6-in-1 integrated oscilloscope that includes an integrated spectrum analyzer, arbitrary function generator, logic analyzer, protocol analyzer, and digital voltmeter/counter Models for 100/200/350/500 MHz oscilloscope channels, Application modules for Aerospace, Audio, Automotive, Computer, Embedded Serial, FlexRay, USB, Power analysis and limit/mask testing	4-in-1 integrated oscilloscope that includes an integrated spectrum analyzer, logic analyzer, protocol & analyzer. Time correlation frequency domain and time domain. Models for 100/200/350/500/1,000 MHz oscilloscope channels, Application modules for Aerospace, Audio, Automotive, Computer, LAN, Embedded Serial, FlexRay, USB, Power analysis and limit/mask testing	Basic AM/FM analysis, AM/FM Audio listening <i>Internal Options</i> for AM/FM/PM/Direct Audio Frequency/phase settling Phase Noise/Jitter Noise Figure Pulse measurements GP Mod. Analysis WLAN analysis APCO P25

RSA MAP

What type of map formats does RSA Map Support ?

Supported map types Pitney Bowes MapInfo (*.mif), Bitmap (*.bmp)

Map file used for the measurements: Google Earth KMZ file

Recallable results files (trace and setup files): MapInfo-compatible MIF/MID files

What GPS receiver can I use with my PC?

Any GPS receiver with National Marine Electronics Association (NMEA) data outputs should work, and most GPS receivers support this standard. More information on the NMEA data format is at http://en.wikipedia.org/wiki/NMEA_0183 . We have tested and found that the devices listed below do work with SignalVu-PC Option MAP.

GlobalSat BU-353S4, information available at http://www.amazon.com/GlobalSat-BU-353-S4-USB-Receiver-Black/dp/B008200LHW/ref=sr_1_1?ie=UTF8&qid=1425688275&sr=8-1&keywords=bu-353s4

Holux M-215+ USB Mouse GPS Receiver, information at http://www.amazon.com/Holux-M-215-USB-Mouse-Receiver/dp/B00FN2QR7A/ref=sr_1_1?s=electronics&ie=UTF8&qid=1426766655&sr=1-1&keywords=holux+m-215%2B

Can I use RSA Map indoors, or without GPS installed?

Yes. You manually place the measurements you make on the map you have created and selected.

Do I have to create a map to collect data with RSA Map?

Yes. To create a Geo-referenced map, follow the directions in the Word document below. To create a simple map on which you can manually place your measurements, save any map in .jpg format, import it into the RSA Map program.

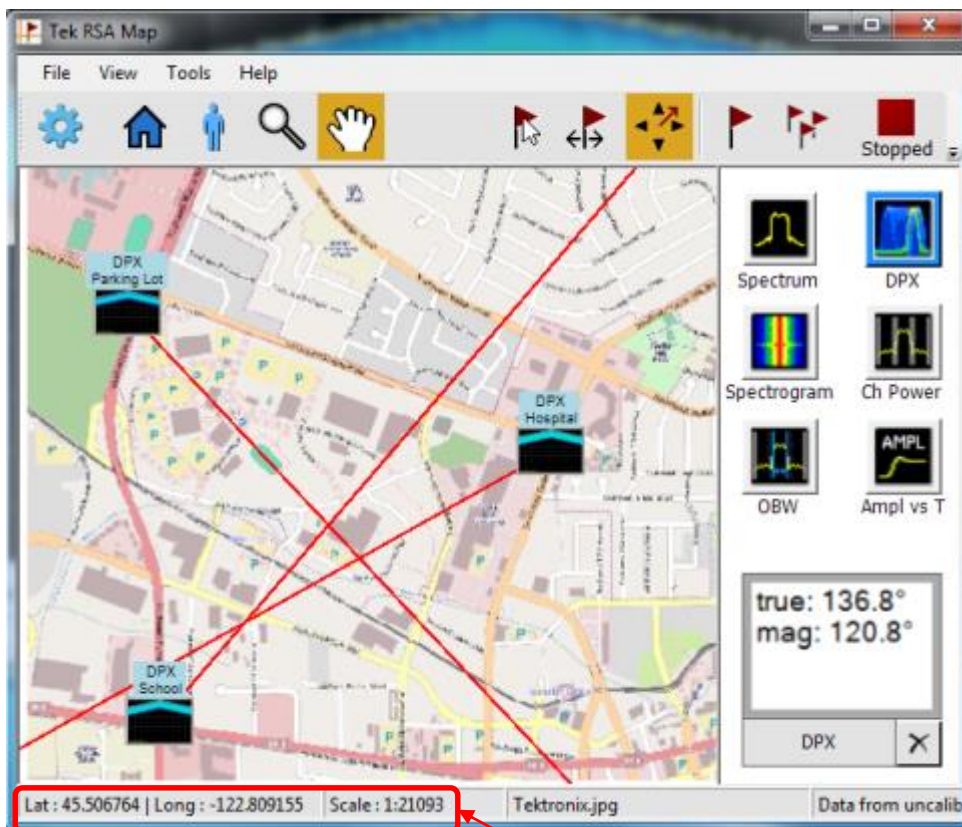
How to Create a Geo-referenced Map for RSA MAP

This guide shows how to create a geo-referenced map to load into RSA Map

The example in this Demo guide uses a free online mapping source OpenStreetMap to capture maps.

OpenStreetMap: <http://www.openstreetmap.org/>

Same map conversion technique could be used for scanned paper maps.



Geophysical reference information

Overview:

The RSA Map tool lets you use an on-screen map to record the location and value of measurements. With RSA Map you can use a GPS receiver (customer supplied) to automatically position measurements at your current location on maps with geophysical reference information.

The map format supported by RSA Map tool includes MapInfo format map files (.mif), Windows bitmap files (.bmp), and JPEG interchange format file (.JPEG or .JPG). The .bmp and .JPEG format map files can be either geo-referenced (using world map file format to specify geographic location) or non geo-referenced (which does not have geographic location information). To perform repeat measurements, GPS must be enabled and locked. The map used must be a geo-referenced map.

What is in a Geo-referenced Map?

A geo-referenced map is made of two files:

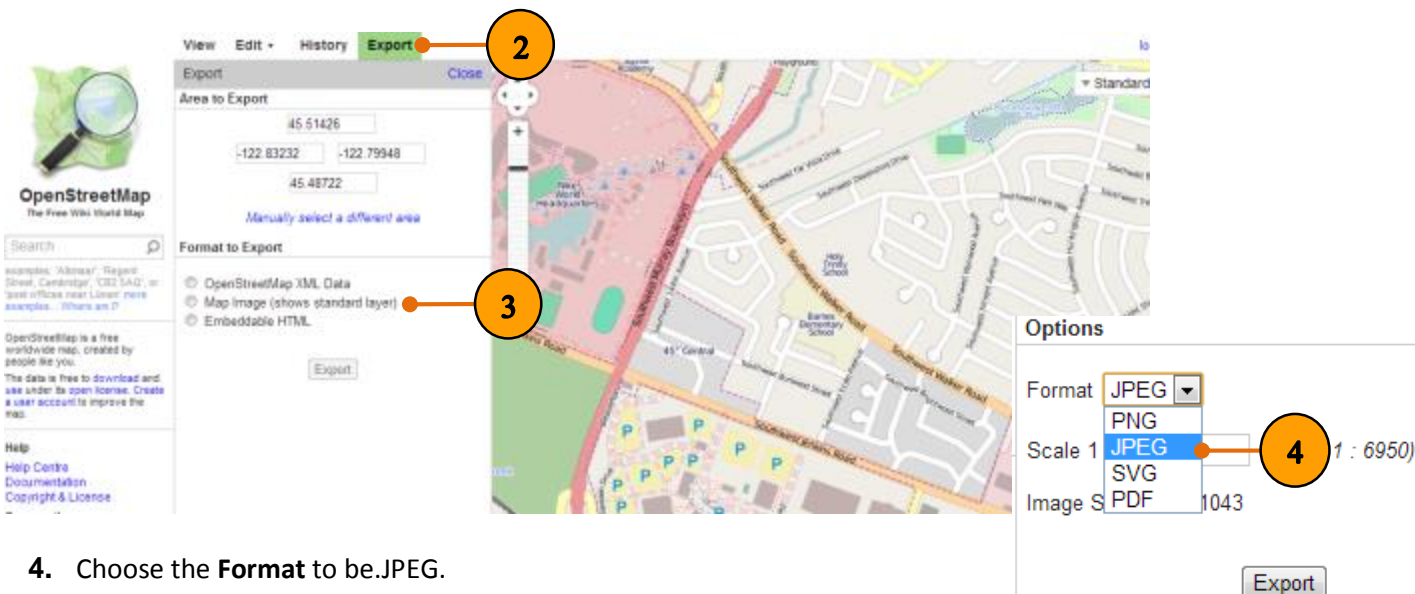
- Bitmap file
- World file (Geo-reference information file)

How to Create a Geo-referenced Map?

Step 1: Capture a Bitmap File:

OpenStreetMap is a collaborative project to create a free editable map of the world. It can capture a map anywhere in the world and can export it in its native format, bitmap image, and embeddable HTML. At this moment, RSA Map does not support the native format but can import a bitmap image file.

1. Open <http://www.openstreetmap.org/>
2. Once the user locates the map, select **Export** tab.
3. Select **Map Image**.



4. Choose the **Format** to be JPEG.

5. Record the **Latitude** and **Longitude** information.
6. Adjust the **Scale** of the map.
7. Record the **Image Size**.
8. Click **Export** to save the map.

Quick Tip:

- Sometimes the web server is busy and the user needs to try several times.
- OpenStreetMap requires a credit on the map when you distribute the map.
- Smaller scale ratio provides more details, but generates larger file.

Step 2: Create a World File:

The created world file needs to be located in the same directory as the bitmap file.

To prepare for a world file, we need to calculate map parameters by using the recorded data from OpenStreetMap, then use text editor to create the world file.

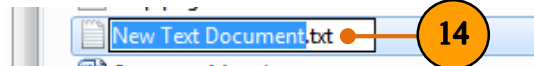
9. Open <http://egb13.net/2009/03/worldfile-calculator/>

10. Enter the **Latitude** and **Longitude** two of corners recorded in 5.
11. Enter the **Width** and **Height** of the map recorded in 7. The first box is Width, and the second is Height.
12. Click **Calc** to calculate the map parameters.
13. Copy the parameters.

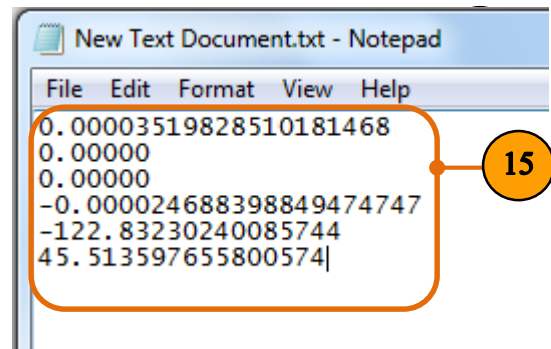
The screenshot shows the 'Export' dialog box in OpenStreetMap. It has tabs for 'View', 'Edit', 'History', and 'Export' (which is active). The 'Area to Export' section contains input fields for latitude (45.51361), longitude (-122.83232), and another longitude (-122.79948), with a callout 5 pointing to the second longitude field. Below these is a field for '45.48786' and a link that says 'Manually select a different area'. The 'Format to Export' section has three radio buttons: 'OpenStreetMap XML Data', 'Map Image (shows standard layer)' (which is selected), and 'Embeddable HTML'. The 'Options' section has a 'Format' dropdown set to 'JPEG' (callout 6), a 'Scale 1' input field set to '14000' (callout 7) with a note '(max 1 : 6950)', and an 'Image Size' field set to '933 x 1043' (callout 7). At the bottom is an 'Export' button (callout 8).

The screenshot shows the 'Calculate Worldfile' web form. It has a title 'Calculate Worldfile' and a subtitle 'Use "N" and "W" if entering northing and easting instead of latitude and longitude.' The form is divided into sections. The 'First corner:' section has input fields for latitude (45.51361) and longitude (122.83232), with dropdowns for 'N' and 'W' (callout 10). The 'Second corner:' section has input fields for latitude (45.48786) and longitude (122.79948), with dropdowns for 'N' and 'W'. The 'Image size:' section has input fields for 'width' (933) and 'height' (1043), with units 'px' (callout 11). The 'worldfile:' section shows the generated worldfile text (callout 13) and a 'Calc' button (callout 12). To the right of the worldfile text, there is a note: 'To use, worldfile name should match image basename with extension of these for the suffix: .tif, .jpg, .png'.

14. Create a **Text Document** and open.



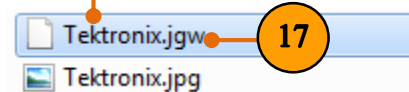
15. Copy the calculated parameters in 13 to the text editor.



16. Save it to the same folder as the Bitmap file exported from OpenStreetMap, and use the same name.



17. Change .txt to the matched file extension.

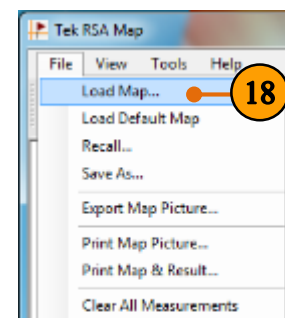


Bitmap Extension	World File Extension
bmp	bpw
jpg	jgw

Quick Tip:

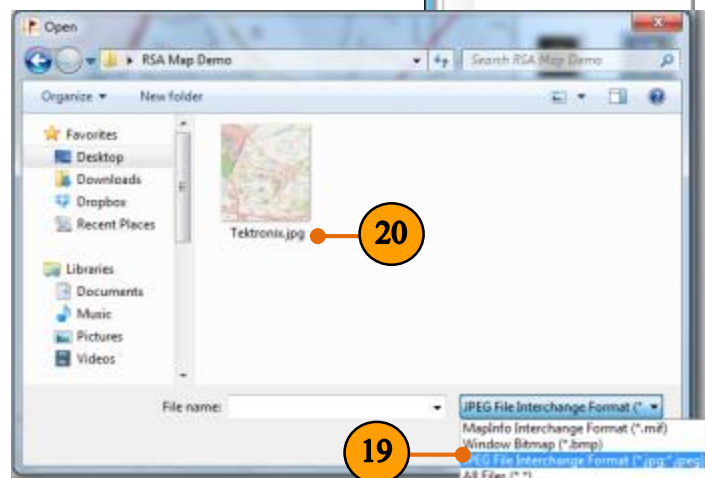
- The bitmap file and the world file have to be located in the same directory.
- OpenStreetMap uses + and – to present North/South and East/West, but this map parameter calculator uses N/S and E/W to indicate direction. Do not enter the negative number.
- Inversed width and height of map may cause error in SPECMON.

18. Click **Load map** in Tek RSA Map

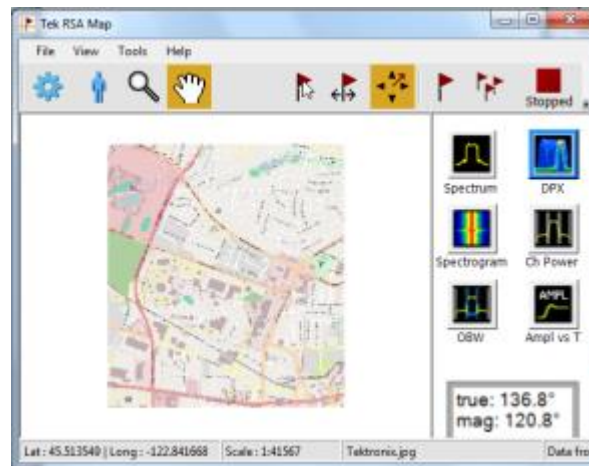


19. Choose the map file type.

20. Select the map you created.



21. The
loaded



selected map will be
into RSA Map.