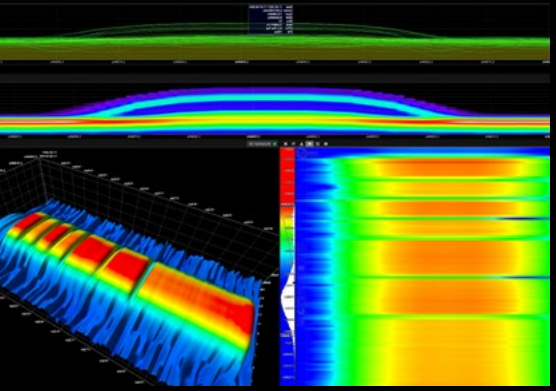
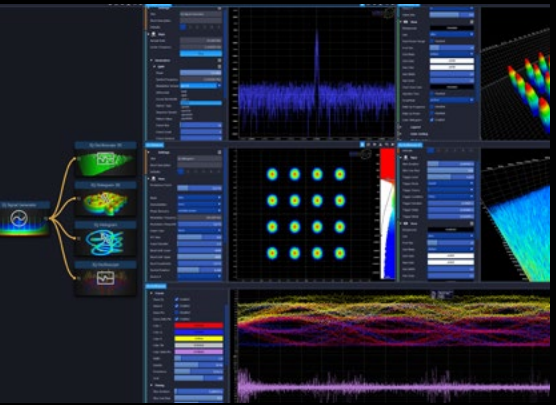


RTSA-Suite PRO

QUICK GUIDE

AARONIA RTSA-SUITE PRO





RTSA-Suite PRO is the world's fastest real-time spectrum analysis software on the market and was developed specifically for our latest SPECTRAN® real-time instruments.

It allows various hardware components to be integrated and used for evaluation. A simple and intuitive configuration via blocks allows optimal settings for almost all measurement applications.

The highlights of the software include the seamless real-time 3D view with up to 25 million samples/sec, unlimited recording time, automatic signal classification and remote controllability.

The comparatively low system requirements also allow working on standard PCs.

The RTSA-Suite PRO is intuitively configurable via drag&drop to connect different hardware, no matter how complex, and to adjust settings/views according to your wishes. With this system there are no limits, because there is also the possibility to program your own blocks.

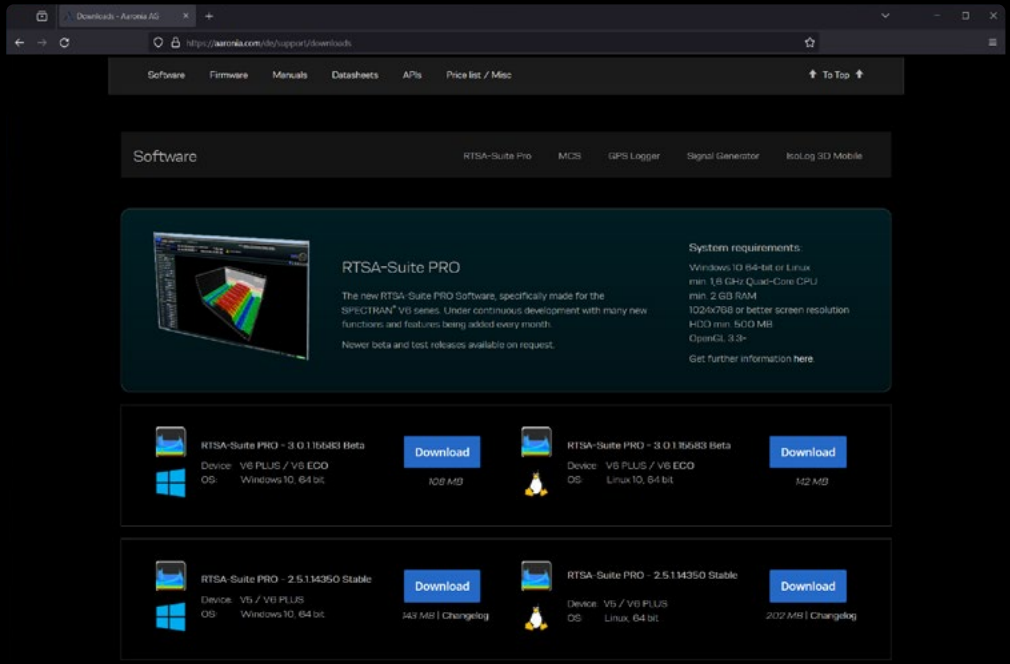
Already with the standard free basic blocks (worth more than 7000 Euro) of the RTSA-Suite PRO you are prepared for most tasks.

Included are among others: An HTTP Server and Client, the AM/FM Demodulator, Sweep Zoom, Filewriter/reader and the 32k FFT feature.

Through continuous expansions, we've developed an exceptionally powerful modular software system that empowers you to tackle virtually any measurement scenario with ease.

For a comprehensive list of all available RTSA-Suite PRO software blocks, visit:
www.aaronia.com/downloads

INSTALLING THE RTSA-SUITE PRO SOFTWARE



Linux users: The RTSA also works on Linux specifically tested on Debian versions, other popular distributions should also support our software.

For obvious reasons the installer will have some differences to the Windows version, in particular it will not contain an “Install SPECTRAN V6 driver” option.

To use your SPECTRAN® V6, the Aaronia RTSA-Suite PRO analyzer software is required. We recommend **downloading** the latest Windows or Linux version from **www.aaronia.com**.

Alternatively, an installer file is available on the included USB stick. Before proceeding, please ensure your PC meets the **minimum system requirements**. Follow the simple and quick installation process, making sure the "**Install Spectran V6 driver**" option is enabled.

IMPORTANT: The SPECTRAN® V6 ECO models are only compatible with the lastest RTSA-Suite PRO version 3. The SPECTRAN® V5 on the other hand can only be used with RTSA-Suite PRO versions up to 2.x.

Download the latest version at:

RTSA-SUITE PRO INITIAL STARTUP



RTSA-SUITE PRO INITIAL STARTUP

- **Always use the correct USB cable(s)** that came with your SPECTRAN® V6.
- Verify the **compatibility of all used USB ports** as mentioned on the coversheet provided with your SPECTRAN® V6.

1. INITIAL STARTUP

After connecting your SPECTRAN® V6 and starting the RTSA-Suite PRO software, the **"open factory mission"** window displays available preinstalled missions, categorized as **"General"**, **"SPECTRAN® V6 ECO-6"**, and **"SPECTRAN® V6 PLUS"**.

To unlock your SPECTRAN® V6 device's full functionality, ensure all available licenses tied to your device are installed correctly.

Upon starting the RTSA-Suite PRO software for the first time with a SPECTRAN® V6 device connected, all available keys and licenses should be installed automatically.

2. LICENSE MANAGER

Open the **"License Manager"** from the **"Tools"** menu in the RTSA-Suite PRO. The **"Licenses"** section should show an entry for each connected SPECTRAN® V6 device. The **"Keys"** column indicates the valid features for each license.

If your SPECTRAN® V6 device is not listed, check your USB connection and verify the correct drivers are installed in the Windows Device Manager.

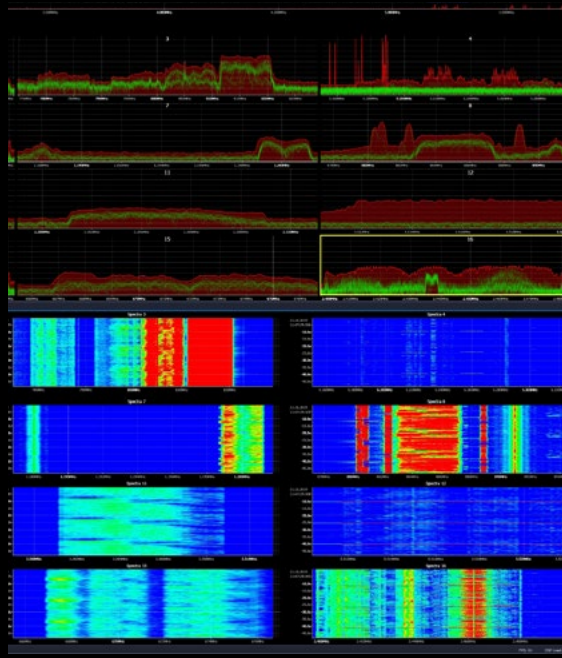
3. MANUAL LICENSE INSTALLATION

In rare cases licenses are not installed automatically. To solve this issue click the **"+"** button above the **"Features"** table, navigate to the included USB memory stick, select the license file, and click **"Open"**.

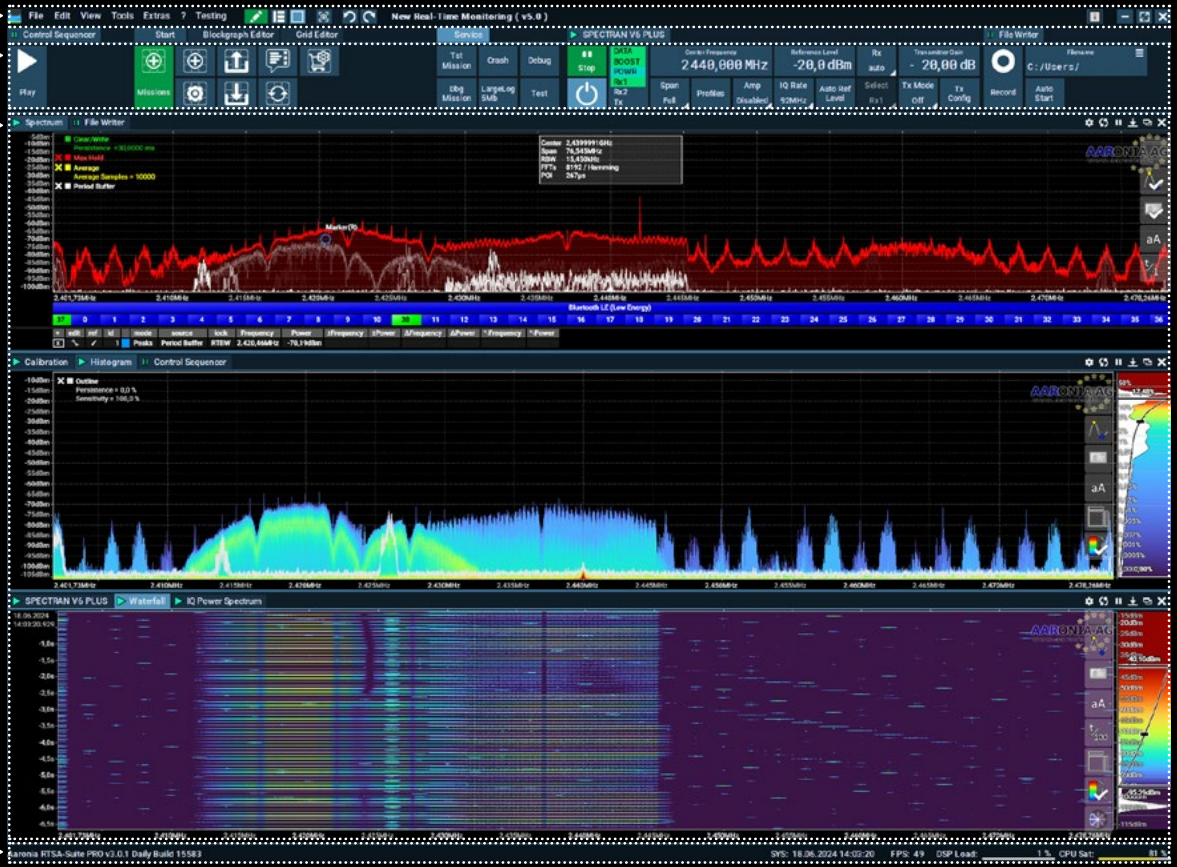
After installation, the **"Features"** table will list the enabled features on your device, and all corresponding controls in the **"SPECTRAN V6"** block of the RTSA-Suite PRO will be available.

4. FINISHING SETUP

All licenses are now configured and the **"License Manager"** window can be closed. The USB memory stick is not needed for further use of the installed licenses.



USING THE RTSA-SUITE PRO SOFTWARE



To explain the basic functions of the RTSA-Suite PRO, the first standard mission **"Real-Time Monitoring"** from the **"Open Factory Mission"** window is used. Please ensure you select the correct mission according to your available hardware (PLUS / ECO).

This mission is configured so that the SPECTRAN® V6 Analyzer automatically powers up and starts a corresponding measurement. The RTSA-Suite PRO is fundamentally divided into four areas:

1. **Menu with quick-access buttons**
2. **Ribbon bar**
3. **Visualization area**
4. **Footer**

BREAKDOWN OF THE RTSA-SUITE PRO LAYOUT

1 Menu area

Many functions of the RTSA-Suite PRO can be accessed from the top menu area. This menu is divided into the main sections "File," "Edit," "View," "Tools," "Extras," and "Help." Next to these, there are helpful buttons for direct access to functions (Blockgraph Editor, Work Mode, Layout Mode, Screenshot, as well as Undo and Redo).

2 Ribbon bar (pictured below)

Above the main display area is the ribbon bar for quick access to common options.

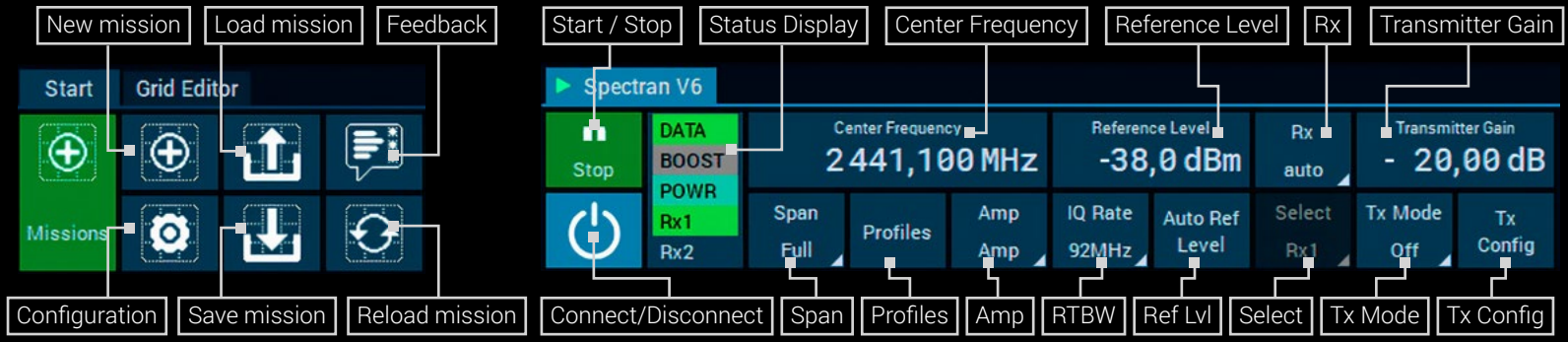
On the left, the "Start" section includes actions for handling mission files like starting, loading, and saving missions. It is grouped with the "Grid Editor" for modifying the display layout of blocks within the Visualization Area. The rest of the ribbon bar displays the most frequently used settings for all active blocks, such as adjusting measurement parameters and settings of the „**SPECTRAN V6** PLUS or ECO Block.

3 Visualization area

The visualization area displays all the blocks used for the currently loaded mission and is freely configurable in layout.

4 Footer

In the left section of the footer, current error messages and the version of the RTSA-Suite PRO software are displayed if needed. The right section shows the system time and system performance data in real-time.



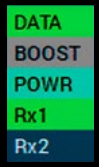
SPECTRAN® V6 RIBBON BAR INFORMATION



Start / stop the actual measurement. The default mission should automatically start it. “Start” will also automatically attempt to connect to a device if not already done.



Enables manual control over the software connection to the selected device. While the default setting automatically establishes the connection, there may be situations where manual intervention is required.



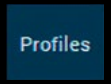
Displays the current connection status and highlights any associated issues. Green signals no problems, while red indicates a critical error. Non-critical issues are displayed in yellow. Hover your mouse cursor over the element to access a tooltip with detailed information.



Adjusts the span of the frequency range to be measured, based on the selected RTBW. “Full” yields the maximum frequency range, the other settings will reduce it by the selected factor.



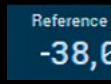
Set the desired center frequency by either using numerical inputs or by using your scroll wheel to adjust different digits.



Allows to select one of several predefined profiles to automatically adjust the measurement parameters to match the profile.



Select the amplifier stage(s) to use. The internal "amp" can be enabled or disabled, while the optional "preamp" requires a license. You can activate both amplifiers or use "auto" to adjust based on the "Reference Level."



This variable controls the sensitivity of the device. Strong signals may require turning this up, weak signals to tune it down. The available value range depends on the current amplifier configuration and can be changed with the „Rx Amplifier“ setting described before.

SPECTRAN® V6 RIBBON BAR INFORMATION

IQ Rate 92MHz Select the bandwidth to be used. Values above 100 MHz are only available on the SPECTRAN® V6 2000XA-6 model or with a separate bandwidth option.

Auto Ref Level Automatically controls the amp stage(s) and attenuator.

Rx auto If multiple Rx are available on your SPECTRAN® V6 this selects the Rx inputs that should be processed.

Select Rx1 Allows to select which Rx input should be active when “Rx1/Rx2” is selected in the previous setting.



Transmitter Gain - 20,00 dB This adjusts the transmitter gain from -100 dB to +10 dB.

Tx Mode Off Select the mode for the Tx output. "Stream" outputs IQ data from the IQStream1 input of the "Spectran V6" block. "Signal Generator" generates a signal on the PC using parameters defined by "Tx Config." "Pattern Generator" uses SPECTRAN® V6 hardware to generate the signal, significantly reducing USB connection load.

Tx Config This button opens a dialog to define the signal parameters for the „Signal Generator“ and „Pattern Generator“ Tx modes as described above.

ACCESSING MORE SETTINGS



The ribbon bar provides quick access to general settings, but more detailed adjustments can be made for the SPECTRAN® V6 and each mission block.

In the "Real-Time Monitoring" mission, the screen is divided into three areas, with the "Waterfall" tab active in the lowest area, grouped with the "SPECTRAN V6" and "IQ Power Spectrum" blocks.

To access further settings for the "SPECTRAN V6" block, double-click the tab or use the gear icon ⚙ at the top right. Similarly, settings for any other block can be accessed, such as the FFT parameters in the "IQ Power Spectrum" block or other processing/display parameters. In the "IQ Power Spectrum" block (used in the default mission), relevant settings for converting IQ into Spectra data are available:

FFT Size Mode

Allows to select between different options to specify parameters.

FFT Size

Adjusts the conversion from IQ to Spectra data. Higher values will result in a smaller RBW value of the Spectra data.

FFT RBW Frequency

When setting “FFT Size Mode” to “RBW” you can directly enter the desired RBW value of Spectra data here, which will automatically adjust the FFT parameters accordingly.

Attention: Changing these parameters can result in a significant increase of CPU and memory consumption. Please monitor the “CPU Saturation” level in the bottom-right corner of the RTSA window.

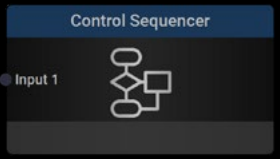
DEFAULT REAL-TIME MONITORING MISSION - BLOCKS IN USE



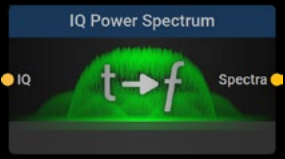
The "Calibration" block offers full control over the loss and gain from all connected loads to Rx1 and Rx2.



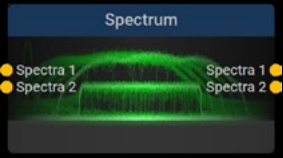
This block controls the SPECTRAN® V6 hardware and allows to configure all relevant settings of the device(s).



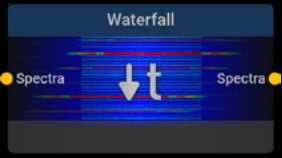
Sends a series of commands to all directly or indirectly attached blocks. in this case it autostarts the SPECTRAN® V6 and begins streaming data.



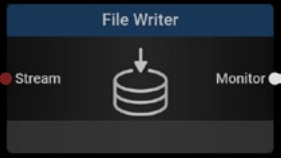
This block converts I/Q data in real-time to Spectra using a highly optimized FFT algorithm to reduce CPU load.



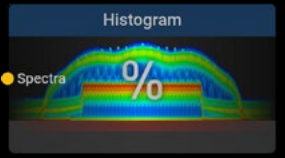
This shows the power over frequency spectrum with different trace types and can handle up to two independent input streams.



The "Waterfall" block (Spectrogram) shows the frequency spectrum over time.



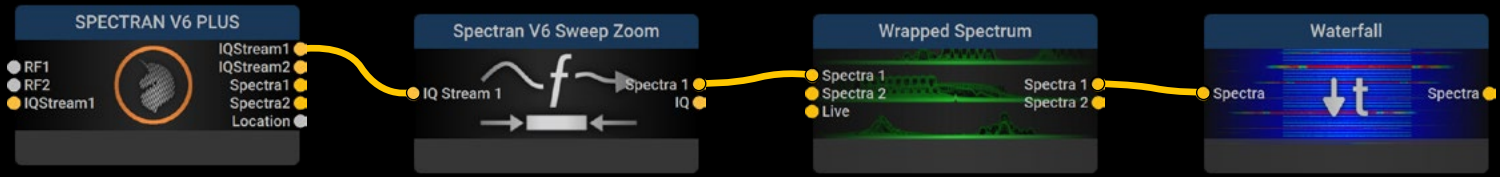
The "File Writer" block records any incoming data stream to disk.



This block shows frequency domain, power domain and time domain in one single 2D view.

SWEEP MISSION EXAMPLE AND CUSTOMIZATION

The default sweep mission consists of the blocks described below. When the default mission does not meet your requirements, you can of course change it to fit your needs. To do so open the blockgraph editor by clicking on the pen button at the top of the application window.



This block controls the SPECTRAN® V6 hardware and allows to configure all relevant settings of the device(s).

Enables complete SPECTRAN® V6 receiver control, including I/Q to Spectra FFT switch between Sweep and Real-Time mode.

Offers a super high spectrum resolution by "wrapping" the spectrum into multiple rows.

Shows the frequency spectrum over time. In this mission it's configured to show a selected area within the wrapped spectrum.



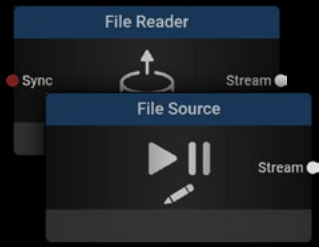
Modify, arrange and connect blocks to analyze data using drag & drop. Blocks have connectors with colors and labels representing supported data types. Connect only compatible data types; for example, IQ output cannot connect to a Spectra input. To remove blocks, select them and press the "Delete" key. In this example the "Calibration" block, the "File Writer" block and the "RF Drive Test" block was added to the default sweep mission.

USING THE VECTOR SIGNAL GENERATOR

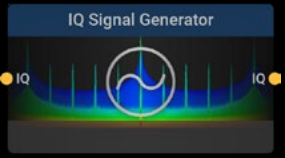


Tx Mode activates the **SPECTRAN V6 Tx** connection and choses the desired mode.

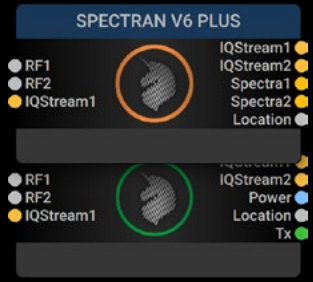
Tx Config configures the **Generator Type** when using the Tx in either **Signal** or **Pattern Generator** mode



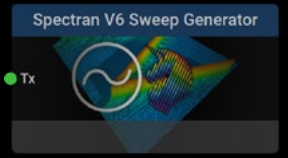
File Reader: Import and playback a previously recorded signal file from disk.
File Source: Import and playback a previously recorded signal file from RAM (faster but less available space).



The "IQ Signal Generator" block generates an I/Q stream, the sample rate (up to 20GHz) and center frequency is adjustable. It is connected to the "IQStream" input of the "SPECTRAN V6" block.



This block controls the SPECTRAN® V6 hardware and allows to configure all relevant settings of the device(s).



The optional "SPECTRAN V6 Sweep Generator" block can sweep over the full frequency and is connected to "Tx" of the "SPECTRAN V6" block.



This optional block offers an impressive tracking generator, e.g. for rejection measurement of a DUT and is connected to "Tx" of the "SPECTRAN V6" block.

TROUBLESHOOTING

PLUS ECO

Q When starting RTSA Suite Pro, the measurement does not start automatically.

A This may be caused by power management settings, timing problems or software issues. Starting the measurement manually by clicking on the Start/Stop button in the V6 ribbon bar should work without problem.

PLUS ECO

Q Pressing the „Connect“ button has no effect.

A Be sure that all cables are connected correctly, that the power supply is properly plugged into the power socket (**V6 PLUS**) and check if you selected the correct device within the „SPECTRAN V6“ block and if that block corresponds to your model (**V6 PLUS**/ **ECO**).

ECO

Q After starting the **SPECTRAN® V6 ECO** the ribbon bar status shows either yellow "Power" or a red "critical state" message is displayed.

A Please verify that the USB port on your device supports the minimum system requirements for operating the **SPECTRAN® V6 ECO** (USB-C 3.1 with 5 GBPS and Power Delivery)

PLUS ECO

Q The device appears to be working (fan is on), but no data is displayed.

A This can be caused if the connections of the "Spectran V6" block does not match the configuration settings. In particular using the “Spectra” connectors while using IQ “Output Format”, or using “IQ 2” or “Spectra 2” outputs without changing the “Receiver Channels” setting.

PLUS

Q The status display in the ribbon bar shows a „DSP buffer overflow“ error.

A More data is being received than can be processed with the current mission configuration. Either reduce the amount of data generated (lower Receiver Clock setting or use Spectra instead of IQ as Output Format) or adjust the configuration to perform less processing (e.g. by reducing the FFT size in the "IQ Power Spectrum" block settings).

PLUS ECO

Q Although the corresponding feature is enabled within the license manager, the FFT size within the IQ Power Spectrum Block cannot be set higher than 131072.

A To use this function, the DSP memory model must be set to "Large" in the RTSA-Suite PRO configuration (Titlebar -> Extras -> Configuration -> Performance). Attention: This can potentially result in a much higher CPU load.

TROUBLESHOOTING

PLUS

Q The status display in the ribbon bar shows a „USB underflow“ error.

A The USB connection does not provide enough bandwidth to transfer all data from the device to the PC. There are two types of causes for this:

1. The “DATA” connection does not support USB 3 SuperSpeed. Please make sure the port is connected to a USB 3.x port on the PC or the cable does support the USB 3 “SuperSpeed” standard.
2. The current measurement parameters are set too high. Some parameter combinations require more bandwidth than a single USB 3 connection can handle. This can be caused by using both Rx1 and Rx2 in parallel, or using more than 122 MHz RTBW. When using such setups please also connect the “BOOST” cable in addition to the “DATA” cable.

ECO

Q When is the internal Amp and Preamp of the **SPECTRAN® V6 ECO** model activated?

A The amp and preamp as activated fully automatic via the Reference Level setting.

- A Reference Level of **-13dBm or higher** uses **no amplifier at all** (only the attenuator will be changed)
- A Reference Level of **-14dBm or lower activates the amplifier** (second stage amplifier)
- A Reference Level of **-33dBm or lower activates the preamplifier & amplifier** (first & second stage amplifier)

You can see the RF path settings (amplifier and attenuator) live within the "SPECTRAN V6 ECO" block.

PLUS ECO

Q The device randomly disconnects when in use.

A This can be caused by a power saving USB option within Windows OS. Change the PC's power plan to Ultimate/Performance, then go into **each** of the USB Root Hub/Generic USB Hub/Generic SuperSpeed USB Hub settings (Computer Management -> Device Manager -> USB Serial Bus Controllers) and un-check the box "Allow the computer to turn off this device to save power".

PLUS ECO

Q The device is obviously providing incorrect measurement results.

A The issue is likely caused by corrupted calibration data. First, disconnect the **SPECTRAN® V6** from your PC, then launch RTSA-Suite PRO and choose Extras -> Data -> Open Datafolder Global. This opens Windows Explorer; navigate to the folder blocks/resources/Your Spectran V6 and delete all of its contents. Finally, reconnect the **SPECTRAN® V6** and restart RTSA-Suite PRO.

AARONIA AG
WWW.AARONIA.DE

MORE INFORMATION: SPECTRAN® V6 FORUM

TECHNICAL DATA	EXAMPLE MISSIONS
CUSTOMER APPLICATIONS	SUPPORT & HELP
API / SDK	**v6-forum.aaronia.de**

MADE IN GERMANY

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