

## Product Datasheet - Technical Specifications



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# SPECTRAN V6

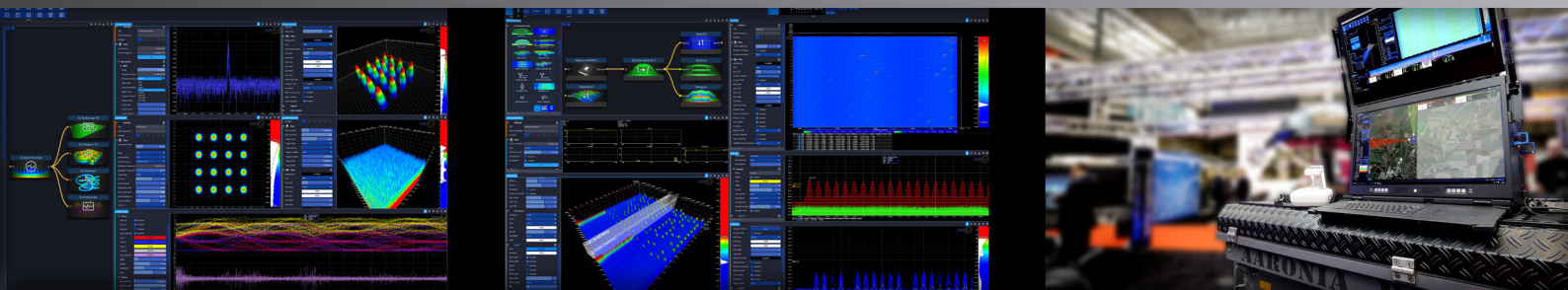
— BEYOND REALTIME —

Real-Time Spectrum Analyzer/Vector Signal Generator | 980 MHz RTBW

## Command Center



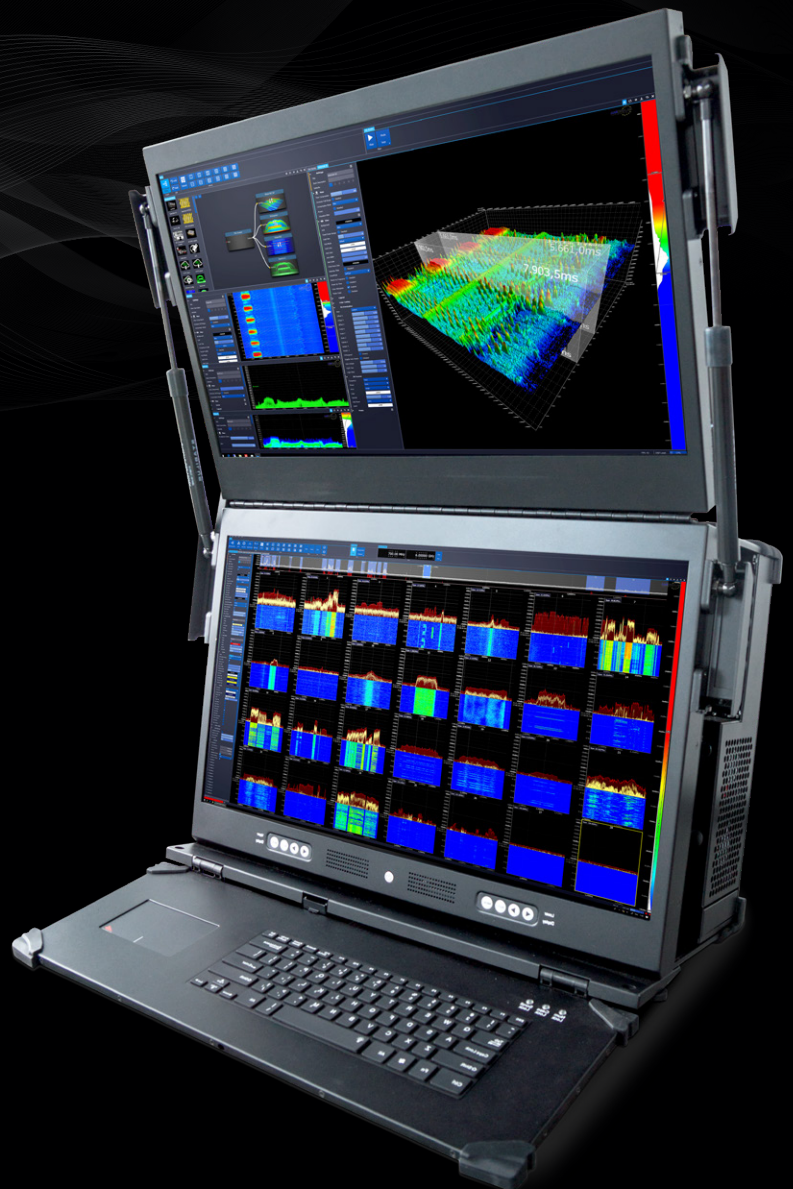
- The ultimate "RF Battle Station" -  
High-End SPECTRAN® V6 Command Center



- ✓ Sweep speed > 4 THz/s
- ✓ Up to four internal V6 RF-receivers
- ✓ Two 4K screens
- ✓ Frequency range of 10 MHz to 6 GHz
- ✓ Virtually unlimited I/Q recording time
- ✓ Up to 18 TB HDD storage

# Highlights

- ✓ RF frequency range: 10 MHz to 6 GHz
- ✓ Scans 6 GHz in less than 1 ms (4 THz/s)
- ✓ Real-time I/Q capture bandwidth of up to 980 MHz
- ✓ I/Q vector signal generator bandwidth of up to 480 MHz
- ✓ I/Q recording storage of up to 18 TB
- ✓ Virtually unlimited recording time
- ✓ Optional remote control via Ethernet
- ✓ Sample rate: up to 8 x 2GSPS 16 Bit I/Q-data
- ✓ FFT rate: up to 3840 million FFT-points/s
- ✓ FFT-based POI as short as 97 ns
- ✓ I/Q-based POI as short as 10 ns
- ✓ Two 4K widescreen displays with a combined resolution of 3840 x 4320
- ✓ AMD Ryzen CPU, 64 GB DDR4 RAM
- ✓ High-end Nvidia graphics
- ✓ Integrated GPS
- ✓ Included **RTSA-Suite PRO** software
- ✓ Made in Germany



# Introduction

## Pure RF performance

The SPECTRAN® V6 Command Center is the culmination of Aaronia's efforts in building the epitome of a Spectrum Analyzer Battleship: It scans 6 GHz in less than 1 millisecond, equaling an astonishing speed of 4THz per second.

This high-end spectrum analyzer offers all the RF performance you need, and provides every measurement detail necessary at the same time.

## Perfect for any RF Problem

The setup is completely customizable, and – thanks to its cascadable system – can be combined with up to four independent analyzers.

Two 24" 4K widescreen displays capture and visualize a instantaneous bandwidth (complex I/Q) of up to 980 MHz (I/Q) , with a remarkable POI of 10ns (I/Q). Moreover, with up to 18 TB hard drives, you have virtually unlimited recording time.

## Hardware

Our Command Center has a wide measuring range of 10MHz to 6 GHz and includes up to four receivers (8 x 2GSPS 16 Bit I/Q-data) and four vector signal generators (4 x 2GSPS 14-Bit I/Q).

In terms of hardware, the computer features the best components available. The SPECTRAN® V6 Command Center runs on the AMD Ryzen 9 5900X (12Core) processor (opt. AMD Ryzen Threadripper 3960X (24Core), with 64 GB DDR4 RAM and an Nvidia GTX 1660 Ti graphics card allowing for gapless streaming and playback.

## Made in Germany

Last but certainly not least, our SPECTRAN® V6 Command Center is made in Germany, ensuring highest quality standards throughout the entire value chain.



# Features and Hardware

The SPECTRAN V6® CC offers a multitude of helpful functions for spectrum analysis

## Peak Performance Measuring

- Various trigger functions and unlimited number of markers
- Different views: Spectrum / Persistence Spectrum, Spectrogram / Waterfall, 3D Waterfall, Histogram, etc.
- Multi-window feature supports several simultaneous views, e.g. Spectrum & Waterfall & Histogram at the same time
- Virtually unlimited storage of measuring data (HDD can be expanded to up to 18 TB for gap-less recording)
- Comfortable reference level and color settings
- Reporting and recording functions
- Storage of personal sessions
- And much more ...

## Applications

- Technical surveillance countermeasures (TSCM)
- Security surveys for detecting and preventing eavesdropping
- Interference hunting
- Spectrum monitoring and enforcement
- Maintenance, installation and repair both in the factory and in the field
- VIP monitoring
- Conference monitoring
- EMC / EMI testing
- Detection of weak signals masked by stronger ones
- Detection of rare, short-duration events
- Capturing spread-spectrum and frequency-hopping signals
- Investigating abuse of crowded RF spectrums

## Scope of delivery

- SPECTRAN® V6 Command Center
- Padded rolling case to move SPECTRAN V6® Command Center with ease
- Pre-installed spectrum analysis software RTSA-Suite PRO

The SPECTRAN® V6 Command Center comes with an extensive scope of options from which to choose. Catering to individual user needs, the delivery can be extended to include various additional products.

## Options

**Option 0002:** 5 ppb (0,005 ppm) OCXO Time Base

*Our highly precise OCXO time base, especially developed for and adjusted to the SPECTRAN® series, offers significantly reduced phase noise (jitter). This allows for the use of far narrower filters, which in turn vastly enhances sensitivity. In order to use maximum sensitivity, then, this is an indispensable option. Furthermore, the OCXO time base allows far more accurate frequency measurements and displays.*

**Option 0020:** Ultra Low Noise Pre-Amp

*Additional 20 dB of gain.*

**Option:** RF over Fiber

*Aaronia's RF over Fiber solution impresses with its extremely high dynamics and linear frequency response. This makes it possible for the first time to transmit or receive RF signals 1:1 via fiber optics offering ultra-low cable damping of 0,1 dB per km (single mode required).*

# Hardware

## Slots and connectors overview



Ultra-wide measurement range from 10MHz to 6 GHz ✓

24" widescreen 4K displays (sunlight readable) ✓

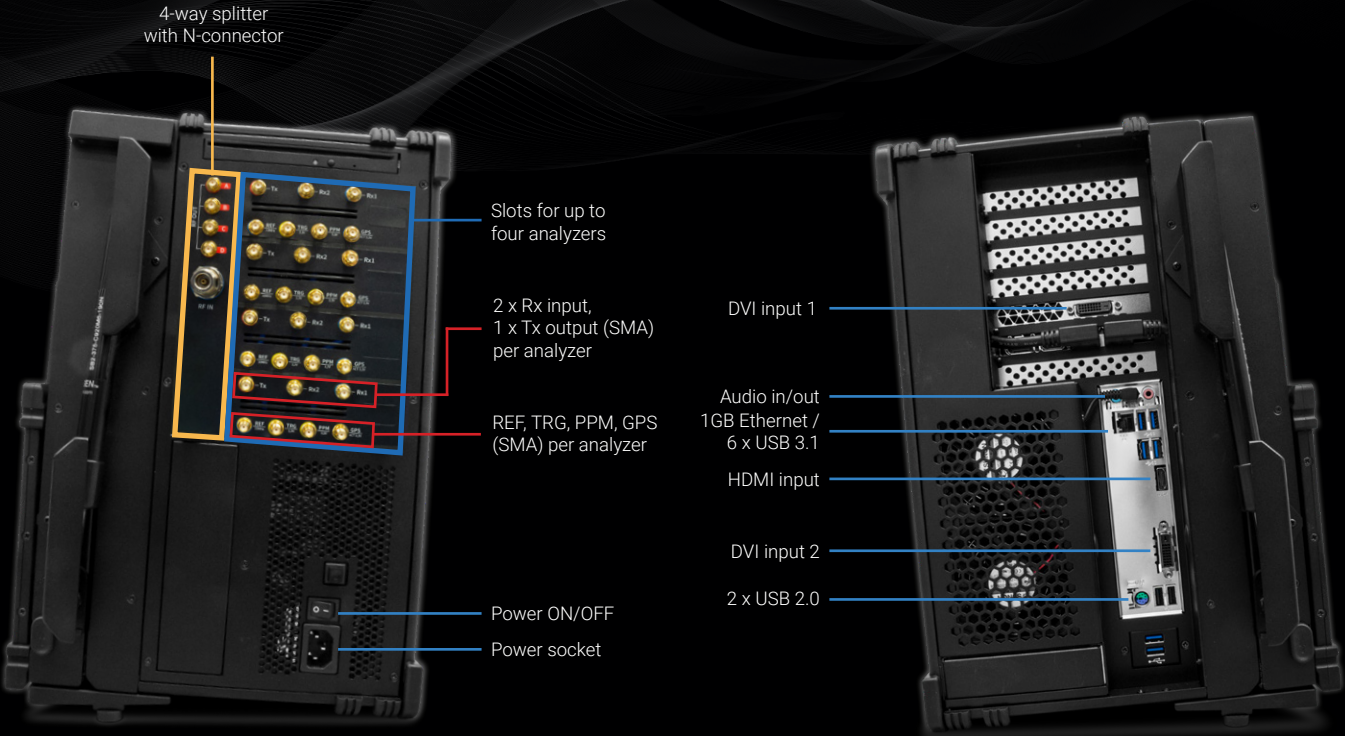
Expandable hard disk (up to 18 TB) ✓

✓ Rolling rack case included

✓ All-in-one solution: Fully featured PC and spectrum analyzer

✓ 50 Ohm RF input

✓ AMD Ryzen CPU, 64GB DDR4 RAM and 4TB HDD



4-way splitter with N-connector

Slots for up to four analyzers

2 x Rx input, 1 x Tx output (SMA) per analyzer

REF, TRG, PPM, GPS (SMA) per analyzer

Power ON/OFF  
Power socket

DVI input 1

Audio in/out  
1GB Ethernet / 6 x USB 3.1

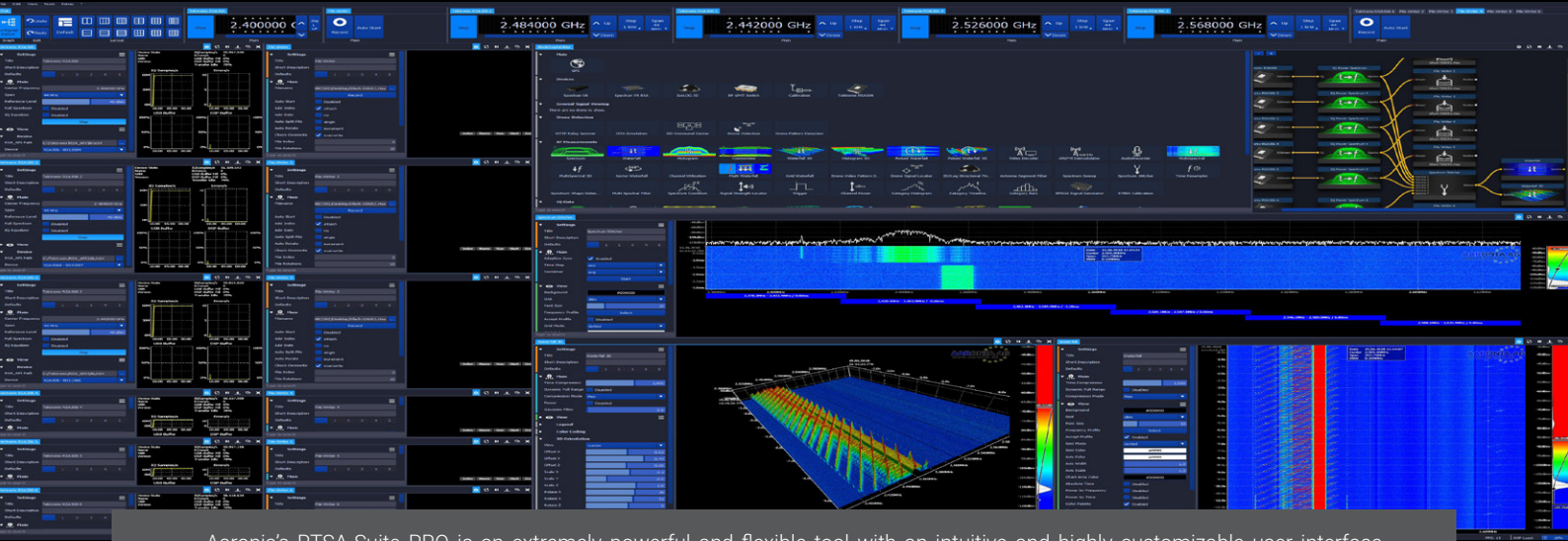
HDMI input

DVI input 2

2 x USB 2.0

# RTSA-Suite PRO Software

World's most powerful RTSA software with endless possibilities!



Aaronia's RTSA-Suite PRO is an extremely powerful and flexible tool with an intuitive and highly customizable user interface. Our node-based software enables users to identify, capture, demodulate and track any signal, and offers a multitude of ways to graphically display the signal detection.

## RTSA-Suite PRO — Layout

An amazing block solution offers a convenient configuration to match any requirement!



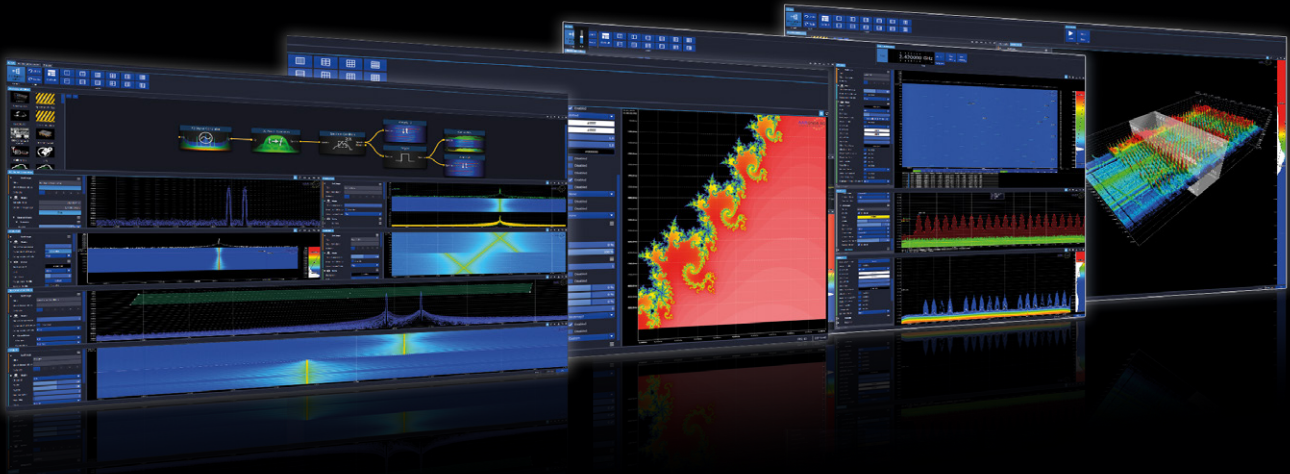
# Multiple 2D/3D Spectrum Analysis

Trigger Block

Powerful Script Block

Various Demodulations

3D/4D Waterfall



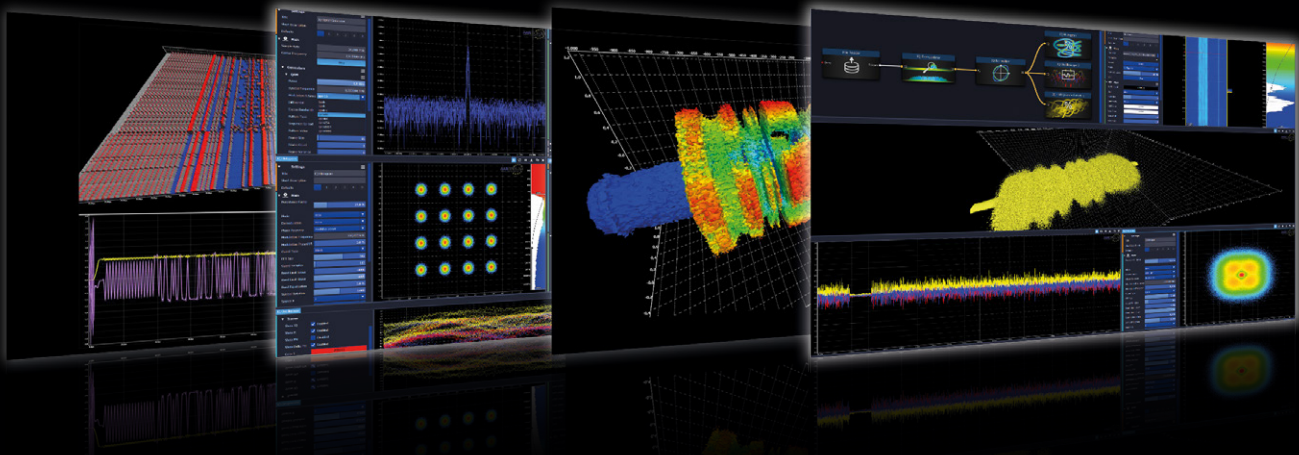
## 2D/3D IQ Streaming & Decoding

DECT Decoding

Software IQ Generator

3D IQ Display

DAB IQ Demodulation



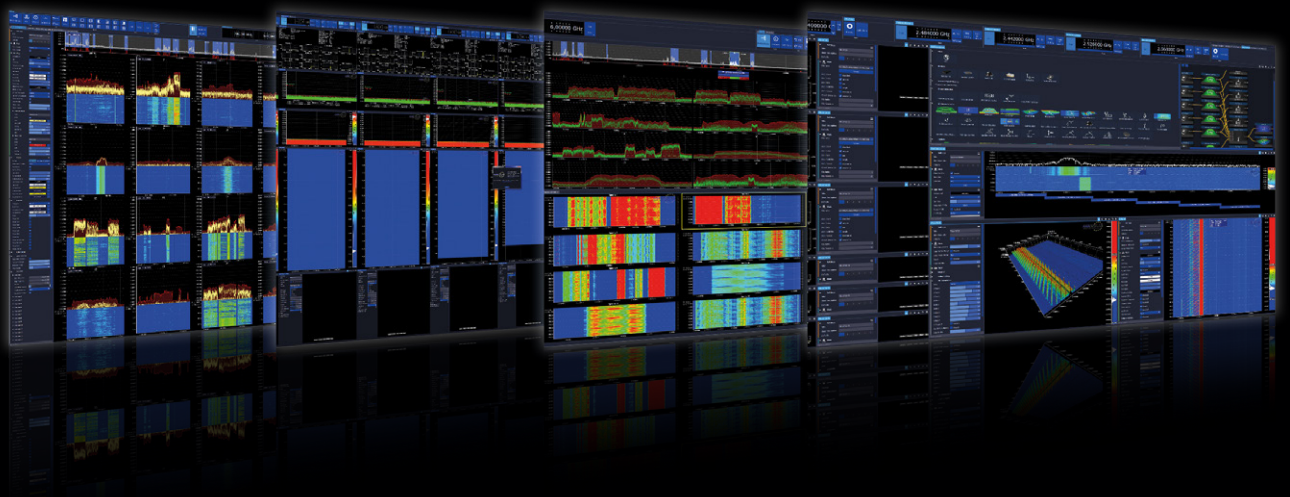
## Multi Unit Stitching / Multi Frequency Monitoring

Multi Frequency Monitoring

Multi Waterfall

V6 full Frequency Monitoring

Multi-Unit Stitching





# Specifications

Specifications	V6 CC	V6 CC PRO	V6 CC ENTERPRISE
Real-time bandwidth Rx	160 MHz RTBW	490 MHz RTBW	980 MHz RTBW
Real-time bandwidth Tx	-	320 MHz RTBW (opt. 490 MHz)	640 MHz RTBW (opt. 980 MHz)
DSP processing	930 GMACs	1860 GMACs	3720 GMACs
FFT-rate	480 million	1920 million	3840 million
ADC	1 x 2GSPS 16 Bit	4 x 2GSPS 16 Bit	8 x 2GSPS 16 Bit
DAC	1 x 2GSPS 14-Bit	2 x 2GSPS 14-Bit	4 x 2GSPS 14-Bit
RF connectors	1x Rx (SMA)	4x Rx, 2x Tx (SMA)	8x Rx, 4x Tx (SMA)

Specifications	
Frequency range	10 MHz to 6 GHz (1 Hz to 26 GHz in development)
POI	97 ns (FFT-based), 10 ns (direct I/Q-based)
Max. power Rx	+23 dBm
Max. power Tx	+20 dBm
DANL (internal pre-amp on)	Typ. -170 dBm/Hz
Amplitude accuracy (typ.)	Typ. +/- 0,5 dB (compensated by FIR filter)
Frequency reference accuracy	0,5 ppm (5 ppb via OCXO option)
RBW (resolution bw)	62 mHz to 57 MHz
Measurement units	Over 20 (e.g. dBm, dBμV, V/m, A/m, W/m <sup>2</sup> , dBμV/m, W/cm <sup>2</sup> )
Detector	Min, Max, AVG, Peak, QPeak
Attenuator range	50 dB / 70 dB (0,5 dB steps)
Traces	Over 20 (e.g. ACT, AVG, MAX, MIN, QPEAK)
Measurement modes	True IQ and/or Power/Frequency data
Trigger	Cursor, Measurement, Density
External Frequency Reference Input	Typ. 10MHz, 3,5VRMS into 50 Ohm (SMB-connector)
FPGA	Up to 4 x XC7A200T-2
Recommended calibration interval	2 years

# Specifications (PC)

Specifications	
CPU	AMD Ryzen 9 5900X (12Core) (opt. AMD Ryzen Threadripper 3960X (24Core) with several receivers)
RAM	64 GB DDR4
HDD	256 GB NVMe (OS), 4 TB (storage / opt. SSD) optional expandable (up to 18 TB)
Operation System	Windows 10 PRO
Display	2x 4K (2x 3840 x 2160 px) sunlight readable, anti reflection tempered strengthen glass
Graphics Card	Nvidia GTX 1660 Ti
Keypad	104-key industrial keyboard with integrated numeric keypad and touchpad
Connectors	6 x USB 3.1 2 x USB 2.0 2 x DVI VGA HDMI Power socket LAN (1 Gbit/s)
Mainboard	Name-Brand ATX Mainboard
Operating Temperature	0° to +50° C
Storage Temperature	-20° to +60° C
Dimensions	620 x 270 x 400 mm
Weight	30 kg
Relative Humidity	10% - 90%
Power Supply	850 W, 100 - 240 V, 50 - 60 Hz
Power Consumption	typ. < 250 W
Country of Origin	Germany

# REFERENCES



## Selected Aaronia Clients

### Government, Military, Aeronautic, Astronautic

- NATO, Belgium
- Department of Defense, USA
- Department of Defense, Australia
- Airbus, Germany
- Boeing, USA
- Bundeswehr, Germany
- NASA, USA
- Lockheed Martin, USA
- Lufthansa, Germany
- DLR, Germany
- Eurocontrol, Belgium
- EADS, Germany
- DEA, USA
- FBI, USA
- BKA, Germany
- Federal Police, Germany
- Ministry of Defense, Netherlands

### Research/Development, Science and Universities

- MIT – Physics Department, USA
- California State University, USA
- Indonesian Institute of Sciences, Indonesia
- Los Alamos National Laboratory, USA
- University of Bahrain, Bahrain
- University of Florida, USA
- University of Victoria, Canada
- University of Newcastle, United Kingdom
- University of Durham, United Kingdom
- University Strasbourg, France
- University of Sydney, Australia
- University of Athens, Greece
- University of Munich, Germany
- Technical University of Hamburg, Germany
- Max Planck Inst. for Radio Astronomy, Germany
- Max Planck Inst. for Nuclear Physics, Germany
- Research Centre Karlsruhe, Germany

### Industry

- IBM, Switzerland
- Intel, Germany
- Shell Oil Company, USA
- ATI, USA
- Microsoft, USA
- Motorola, Brazil
- Audi, Germany
- BMW, Germany
- Daimler, Germany
- Volkswagen, Germany
- BASF, Germany
- Siemens AG, Germany
- Rohde & Schwarz, Germany
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- Philips, Germany
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