

# SPECTRAN V5 XFR Pro (9kHz to 20GHz)

World's fastest technical surveillance counter-measures receiver



Rugged Outdoor Spectrum Analyzer

Real-time bandwidth of up to 175MHz

MIL-STD-810G and IP65 certified

# Highlights

- ✓ Scans 20GHz in less than 20mS (1000GHz / sec.)
- ✓ Wide measuring range up to 20GHz
- ✓ Ultra robust Outdoor Spectrum Analyzer (IP65, -20°C to +60°C)
- ✓ >100.000 data points for 20GHz sweep, even in lowest resolution mode
- ✓ Real-time capture bandwidth up to 175MHz
- ✓ POI below 1µS
- ✓ Unlimited recording time (needs 1GB / min. at max. datarate)
- ✓ Sample rate/second: > 50 million
- ✓ 500 MSPS (14 Bit Dual 256MSPS I/Q)
- ✓ Up to 4TB ultra-fast SSD recording storage
- ✓ Super bright, sunlight readable 15,6“ Widescreen Display (Full HD, 1920x1080)
- ✓ Intel i7 with 8GB RAM and nVidia Graphics
- ✓ Integrated GPS
- ✓ Includes Spectrum Analysis Software RTSA Suite Pro
- ✓ Made in Germany

# Applications

- ✓ Technical surveillance counter-measures (TSCM)
- ✓ Security surveys for eavesdropping detection
- ✓ Interference hunting
- ✓ Radio monitoring and enforcement
- ✓ Maintenance, installation and repair in the factory / field
- ✓ VIP monitoring
- ✓ Conference monitoring
- ✓ EMC/EMI testing
- ✓ Seeing weak signals masked by stronger ones
- ✓ Discovery of rare, short duration events
- ✓ Capturing spread-spectrum and frequency-hopping signals
- ✓ Investigating misuse of the crowded RF spectrum



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**MADE IN GERMANY**

# Introduction

## Built to detect

The SPECTRAN XFR V5 PRO is a portable Real-Time Spectrum Analyzer, designed to capture even shortest signal transmissions. Its scanning speed and recording time is without competition, the Analyzer scans 20GHz in less than 20mS making it the world's fastest counter-surveillance receiver.

## Operation and Software

The easy to use software is suited for detecting unknown or illegal transmissions across a wide frequency range. With an unlimited recording time (needs approx. 1GB hard disk space per minute) the XFR V5 PRO allows to store several hours of real-time data. Once recorded, the entire measurement data can be re-loaded into the software.

## Perfect for Signal Analysis

Several helpful features allow a deep investigation of the real-time measurement or recorded data, e.g. a 3D-Spectrogram view which displays a signal in a way never seen before.

## Military Grade

With this Spectrum Analyzer you can master any challenge. It provides a powerful, extremely impact resistant outdoor notebook and a high-end spectrum analyzer in one compact device. The V5 XFR Pro has been independently tested in accordance to MIL-STD-810G, IP65 and MIL-STD-461F.

- ◆ Ultra wide measurement range from 9kHz to 20GHz
- ◆ Sunlight readable (800 nits)
- ◆ Sealed connectors and caps
- ◆ Fully featured Laptop and Spectrum Analyzer in one
- ◆ Intel i7 processor, 8GB RAM and 500GB HDD (8TB SSD Optional)



- ◆ Hot swap battery
- ◆ 15,6" Widescreen Full HD Display with Multi-Touch
- ◆ Internal GPS
- ◆ High quality magnesium alloy
- ◆ 50 Ohm RF input

# Features and Hardware

The V5 XFR Pro offers a huge variety of helpful functions for spectrum analysis.

## Measurement at the highest level

- Various trigger functions and unlimited number of markers
  - Different views: Spectrum / persistence Spectrum, Spectrogram / Waterfall, 3D Waterfall, Histogram
  - Multi Window feature supports several views at the same time, e.g. Spectrum & Waterfall & Histogram
  - Unlimited storage of measurements, HDD can be expanded up to 8TB for gapless recording of up to 100 hours
  - Comfortable reference level and color settings
  - Reporting and recording function
  - Storage of personal sessions
- and much more ...

## Unmatched Performance

The powerful and ultra-stable Spectrum Analyzer is the first outdoor Spectrum Analyser with an Intel® i7 processor with 8GB RAM, full HD multi touch-screen, integrated GPS and ultra-low noise level up to -170dBm (Hz) DANL (with pre-amps). The XFR V5 PRO is rugged and powerful at the same time.

- The **thermal management system** enables compliance with military standards for extreme temperatures. Simultaneously, the XFR V5 PRO offers industry-leading performance, thanks to the very latest Intel® i7 processors.
- The **Turbo Boost feature** increases the processor frequency to the active cores dynamically up to 3.33 GHz.
- With two **USB 3.0 super-speed ports**, two USB 2.0, a USB2.0/eSATA-combi-connector, two serial ports, two Ethernet ports and a VGA port - among other connectors - offers the XFR V5 a variety of interfaces to connect to the desired peripheral.

## Scope of delivery

The SPECTRAN V5 XFR comes with an extensive scope of delivery, depending on the special needs of users, the delivery can be extended to various additional products (see "Accessories" on Page 9).

- SPECTRAN XFR V5 PRO incl. Option 020 (internal 20dB preamp)
- OmniLOG 70600 antenna (700MHz to 6GHz)
- Pre-installed RTSA Suite Pro Software
- Rechargeable 8700mAh battery (installed, a second hot-swap battery is optionally available)
- Battery charger / power supply (optional car charger available)
- English manual (on CD)

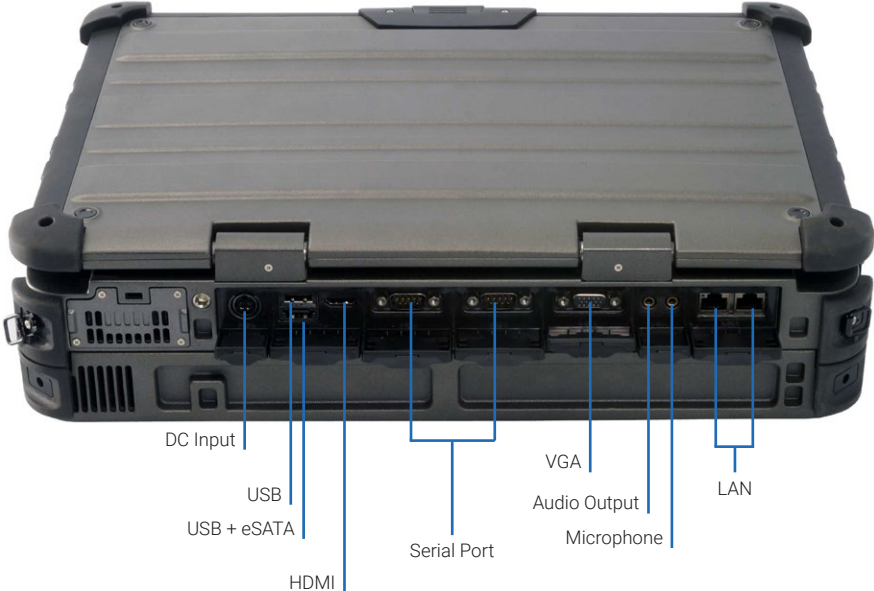
## Options

Optional modifications to the V5 XFR Pro:

**Option 002:** 5ppb (0,005ppm) OCXO Timebase  
This highly precise OCXO timebase, which has been especially developed for the SPECTRAN®, offers significantly reduced phase noise (jitter). This will allow the use of far narrower filters, which will in turn vastly enhance sensitivity. To fully exploit the maximum sensitivity this option is indispensable! Furthermore, the OCXO timebase allows far more accurate frequency measurement and display.

**Option 160:** Expands the real-time Bandwidth from 88MHz to 160 or 175MHz.

# Hardware





# RTSA Suite Pro

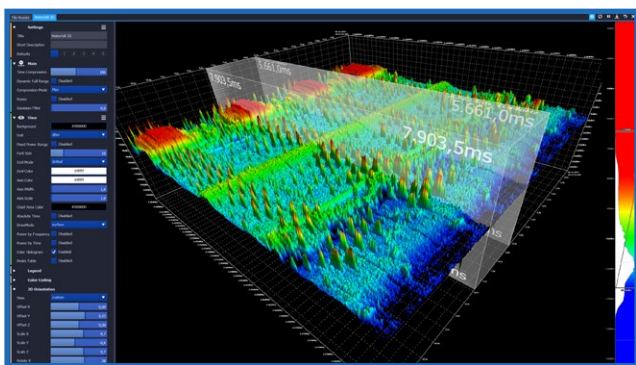
The world's fastest real-time analyzer software.

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



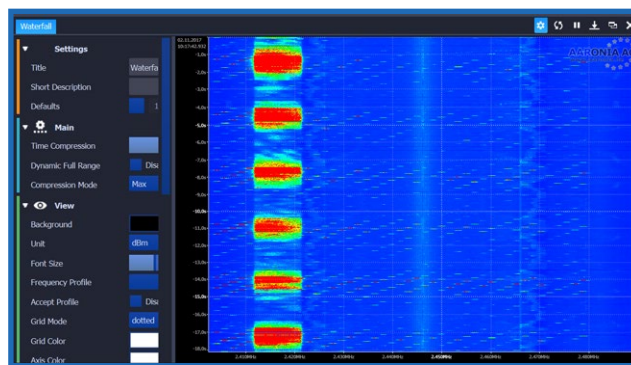
- ◆ High-resolution persistence spectrum display of the current sweep, Average, Min / Max, peak, RMS etc.
- ◆ Marker function with unlimited number of different markers (min, max, delta, AVG, OBW.)
- ◆ Intuitive drag and drop zoom, shortcuts etc.

## 3D View and Histogramm View



- ◆ The V5 XFR Pro can display several views at once (Spectrum, 3D Waterfall, Histogram and more)
- ◆ The different views are fully customizable and can be easily arranged with the drag-and-drop system

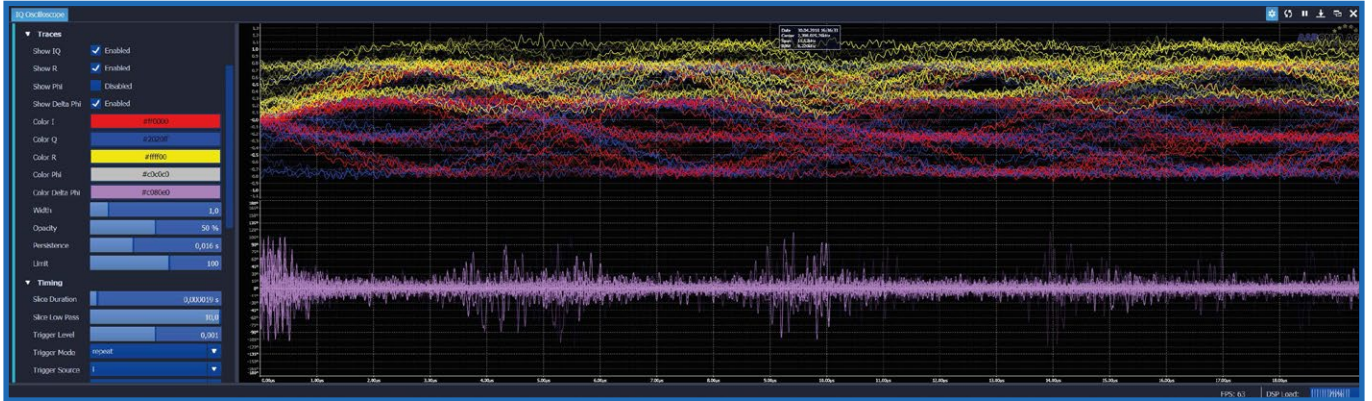
## Waterfall View



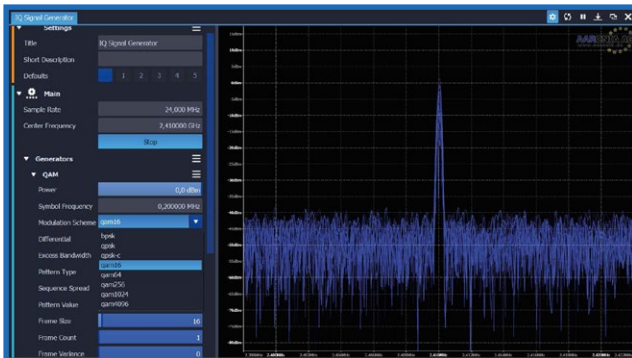
- ◆ Spectrogram / Waterfall View for the identification of frequency hops, measurements of pulse rate, analysis of time variant spectra and the tuning of a VCO

# RTSA Suite Pro

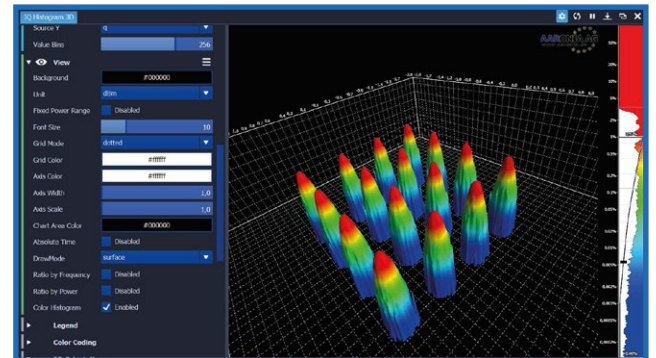
## IQ Oscilloscope



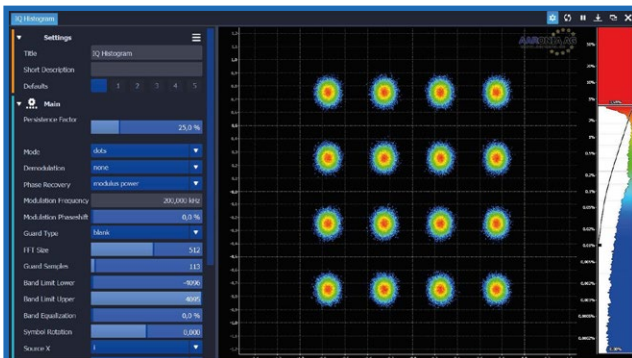
## IQ Signal Generator



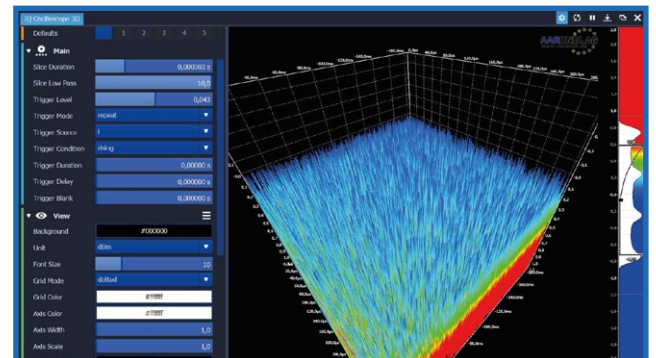
## IQ Histogram 3D



## IQ Histogram



## IQ Oscilloscope 3D



# Specifications (Analyzer)

Main Specifications	
Frequency Range	9kHz to 20GHz
Real-Time Bandwidth	88MHz (Optional: 160/175MHz)
Min. Event Duration	<1 $\mu$ S
Max. Power at RF input	+20dBm (+33dBm*)
Displayed Average Noise Level (internal pre-amp on)	typ. -150dBm/Hz
Displayed Average Noise Level (with external pre-amp)	max. -170dBm/Hz
Amplitude accuracy (typ.)	typ. +/- 1,5dB
RF Input	50 Ohm (SMA-connector)
Frequency reference accuracy	0,5ppm (optional 5ppb with Option 002)
RBW (resolution bandwidth)	1Hz to 3MHz
VBW (video bandwidth)	1Hz to 3MHz
Demodulator	AM, FM
Measurement Units	dBm, dB $\mu$ V, V/m, A/m, W/m <sup>2</sup> , dB $\mu$ V/m, W/cm <sup>2</sup>
Detector	45dB (0,5dB steps)
Traces	ACT, AVG, MAX, MIN
Reference range	-200dBm to 100dBm
Measurement modes	I/Q, Power/Frequency Data
ADC	500MSPS 14Bit
GPS	Inbuilt GPS
FPGA	240K ECP3
DSP	600MHz



# Specifications (V5 XFR Pro)

Main Specifications	
CPU	Intel Haswell i7-4600M
RAM	8 GB
HDD	500GB, 7200RPM (optional SSD up to 8TB)
Operation System	Windows 7
Display	15,6" Full-HD 1080p with Multi-touch screen, sunlight readable (800 Nits Quadra-Clear)
Graphics Card	nVidia Geforce GT 745M DDR3
Battery	Intelligent lithium ion battery with 8700mAh (optional second battery, hot swap system)
Keypad	Membrane keyboard with integrated numeric keypad and LED backlight
Connectors	2x PCMCIA Type II, 1x ExpressCard/54, 1 x Smart Card Reader I/O interface: 2x Serial port (9-pin, D -Sub), 1x External VGA port (15-pin, D -Sub), 1x microphone, 1x audio output (mini-jack), 1x DC input, 2x USB 3.0, 2x USB 2.0, 1x USB 2.0 / eSATA combo, 2x LAN (RJ45), 1x HDMI, 1x docking connector (80 - pin)
Interfaces	10/100/1000 BASE -T Ethernet Intel Centrino Advanced-N 6200, 802.11 a/b/g/n, GPS module + Tri - Passthrough
Safety Features	fingerprint scanner, smart card reader, Kensington Lock
Certification	MIL -STD- 810G, IP65, MIL -STD- 461F
Temperature (Operation)	-20 °C to +60 °C
Temperature (Storage)	-40 °C to +71 °C
Dimensions	410 x 315 x 120mm
Weight	7,5 kg
Relative Humidity	95% relative humidity, non-condensing
Power Supply	AC Input: 100-240V, 50-60Hz DC Output: 19V, 4,74A max.
Power Consumption	typ. < 90W
Country of Origin	Germany
Recommended Calibration Interval	2 Years

# Accessories

## Backpack

High Quality Carrying Bag for XFR V5 PRO. Offers lots of space for all accessories and optional antennas.



## HyperLOG Antennas

Directional, Ultra Broadband Antennas with extremely wide frequency range from 380MHz to 35GHz. High and constant gain of typ. 5dBi (active up to 45dBi).



## MDF Antennas (9kHz - 400MHz)

Magnetic Tracking Antennas for the low frequency range of the Analyzer. Covers 9kHz to 400MHz. Active and Passive Antennas with high sensitivity.



## 2nd Battery Pack (Hot Swap)

Additional 8700mAh battery. Expands the run-time of the Analyzer. Installed in addition to standard battery.



## External Pre-Amplifier

External Battery-Powered Preamplifier with full range of 1Hz to 30GHz & up to 40dB gain. Perfect to reach extremely high sensitivity up to -170dBm/Hz.



## IsoLOG 3D Mobile (9kHz - 6GHz)

Very light and small isotropic antenna which is compatible to any spectrum analyzer.



## DC Car Adapter

11-16V, 22-32V Car-Power-Adapter for Spectran XFR V5 PRO. For continuous operation of the Spectrum Analyzer in vehicles.



## Near field probe set (DC to 9GHz)

Passive or active Near-Field Probeset PBS1 or PBS2. Consisting of 5 Probes (4xH-Field, 1xE-Field), 40dB Preamplifier (only PBS2). Perfect for EMC near field tests.



## 1m / 5m / 10m SMA-Cable

High quality SMA cable for connecting any HyperLOG or MDF Antenna with the Analyzer. Available as 1m, 5m and 10m Cable. All versions: SMA plug (male) / SMA plug (male).



# References



## Cross-Section of 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
- Indonesien Institute of Sience, Indonesia
- Los Alamos National Labratory, 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 Athen, 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

- APPLE, USA
- 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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- Wilkinson Sword, Germany
- IBM Deutschland, Germany
- Nokia-Siemens Networks, Germany



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