Low cost handheld RF spectrum analyzer
SPECTRAN® HF-2025E measures up to 2,5GHz

RF measurement device for the novice at an unbeatable price

"Unbeatable price..."
"Particularly Aaronia's very powerful (especially considering their price) SPECTRAN handheld spectrum analysers caused much excitement."
(Markt&Technik 20/2005)

References / examples of proof:
- West Virginia University, USA
- University Strasbourg, France
- Athen University, Greece
- Universität München, Germany
- Wilkinson Sword, Solingen, Germany
- WDR, Köln, Germany
Specifications

SPECTRAN® HF-2025E Rev.3

- Frequency range: 700MHz to 2.5GHz*
- Typ. level range: -80dBm to 0dBm*
- Lowest possible SampleTime: 100mS
- Typ. accuracy: +/- 4dB*
- Filter bandwidth (RBW) Min: 1MHz
- Filter bandwidth (RBW) Max: 50MHz
- High performance DSP (Digital Signal Processor)
- USB 2.0 interface
- 50 Ohm SMA RF input (F)
- Direct RF spectrum display
- Frequency and signal strength display
- High resolution multifunction display
- Exposure limit calculation according to DIN/VDE 0848
- AM demodulation
- DECT & TimeSlot Analyser
- REALTIME PEAK power detector (option)
- Advanced HOLD function
- Switchable PULS mode
- Main display in dBm, V/m, A/m or dBiV (switchable)
- ADDITIONAL display in W/m² with AUTORANGE (pW, µW etc.)
- Incl. battery pack and charger
- Incl. HyperLOG 7025 EMC antenna
- Incl. elegant aluminum carrycase
- Dimensions (L/W/D): (260x86x23) mm
- Weight: 420gr
- Warranty: 10 years

Application examples Spectran® HF-2025E Spectrum Analyzer

Analysis and measurement of:
- GSM900
- DECT
- GSM1800
- UMTS
- WLAN
- Microwave oven
- WiFi
RF Measurement in this price range has never been this professional. Find radiation sources in your surroundings. Find their respective frequencies and signal strengths, including direct display of exposure limits. This used to be impossible in this price category, professional units often costing several thousand euros and being excessively complicated in handling.

The highly complex calculations in spectrum analysis incl. exposure limit calculation is being performed, unnoticed in the background, by a high-performance DSP (digital signal processor). This ultra-fast processor even allows REAL-TIME display in all EMF (LF) versions of the SPECTRAN® series.

Fast, handy, cost-effective, beautiful exterior and PRECISION - what more could you ask?

Description

Conforming to standards and exact

RF Measurement in this price range has never been this professional. Find radiation sources in your surroundings. Find their respective frequencies and signal strengths, including direct display of exposure limits. This used to be impossible in this price category, professional units often costing several thousand euros and being excessively complicated in handling.

The highly complex calculations in spectrum analysis incl. exposure limit calculation is being performed, unnoticed in the background, by a high-performance DSP (digital signal processor). This ultra-fast processor even allows REAL-TIME display in all EMF (LF) versions of the SPECTRAN® series.

Fast, handy, cost-effective, beautiful exterior and PRECISION - what more could you ask?

Professional PC analysis software (free download)
The professional PC analysis software demonstrates SPECTRAN's vast capabilities. This software can be used in addition to SPECTRAN and offers an incredible amount of features. All this for FREE. Just download it from our homepage, and your PC turns into a real spectrum analyser with a huge display:

- **MULTI-device capability!** Remote control of several SPECTRAN units. These can be controlled and their data displayed at once on a single PC.
- **HIGH-RESOLUTION!** Freely scalable, coloured spectrum display with falloff function.
- **Display of channel identifiers!** For EXACT identification of providers. Channel numbers etc. freely programmable and extensible!
- Up to 10! markers with frequency and level display.
- Intuitive zoom control with very comfortable frequency adjustment.
- High quality "waterfall"-display with TIMECODE. Colour scale freely configurable. Size freely scalable. Optional display of data DIRECTLY ON TOP OF THE GRAPH by pointing with your mouse and CTRL-clicking!
- **High-resoultion SLOT ANALYSER with 3D display!**
- **SUPER-LOGGER:** ALL data can be written to disk continuously. File format is readable by spreadsheet applications, for creating custom reports, etc.
- Freely positionable windows for comfortable entry of frequency, RBW, sweeptime etc. etc.
- **Various pre-defined profiles** for DECT, UMTS, GSM, WLAN etc. etc. for instant recall. Incl. optimal parameters and extensive channel information! Freely programmable and extensible!
- Independant main display with SIMULTANEOUS display of dBm, dBµV, V/m, W/m2 and A/m, each with AUTORANGE. Freely transposable and scalable.
- **SUPERB exposure limit display** with various profiles (ICNIRP, Salzburg precautionary values, ECOLOG, etc. etc.). Freely programmable with a virtually infinite amount of display options.
- Functionality to update SPECTRAN measurement device firmwares.
- Freely programmable key assignments and labels for SPECTRAN measurement devices.
- Filemanager and COMPILER for creation and management of YOUR OWN PROGRAMS for SPECTRAN measurement devices.
- "Rename" option for renaming any of your SPECTRAN units (for example, including location) for better identification
- etc. etc. etc.
Spectrum ANALYSIS

The perfect analysis:
Professional RF measurement devices use a frequency dependant measurement approach, the so-called spectrum analysis. In a certain frequency range, the individuals signals and their respective strengths are being broken down, for example into a "bargraph" display (see SPECTRAN® screenshots on the left). The height of the individual bars represents the corresponding signal strength. For the 3 strongest signal sources, SPECTRAN® automatically displays the exact frequency and signal level, thanks to its "Auto Marker" feature. Of course, you can also setup the filter width and the frequency range to be analysed as you like.

In the RF spectrum shown, a frequency range of approx. 100MHz to 7GHz from left to right is being analysed (full sweep). During analysis, the Auto Marker feature has determined - fully automatic - three main signal sources:
- Signal#1=942MHz (GSM communications) at -63dBm
- Signal#2=2024MHz (UMTS) at -23dBm
- Signal#3=5832MHz (802.11a WLan) at -42dBm

Thanks to its DIRECT frequency display of the individual signal sources, a doubtless mapping of measurement results to the corresponding radiation sources is possible.

EXPOSURE LIMITS

At the push of a button:
Exposure limit calculation used to be a complex and awkward procedure even for the professional, as most of the time, a chaotic mixture of an abundance of different frequencies, modulations and signal strengths is present.

The indispensable, highly complex calculation of frequency-dependant exposure limits can ONLY be performed CONFORMING TO STANDARDS by a spectrum analyser with high-performance software. Not a problem for SPECTRAN® units: They can calculate even several authoritative exposure limits, precautionary limits and recommendations (simply selectable via a button) and display these as a practical bargraph display (including convergence display in percent!), while the measurement is running.

The attached SPECTRAN® screenshot demonstrates how it works: At the push of a button, the ICNIRP exposure limit has been chosen among the various available exposure limits. SPECTRAN® now automatically calculates convergence or excess of this limit. For achieving this, often thousands of complex calculations have to be performed per second, and a steady scan of the entire frequency range needs to be performed. A true nightmare for every processor. In our test case, the graphic display shows an approximation towards the ICNIRP limit by 6.06%. If you use a NF-5030 you can even cover the total ICNIRP-banwidth (depending on frequency). Hence, even the novice can perform exposure limit calculations ACCORDING TO STANDARDS without having to use complex tables and calculators.

INCLUDED WITH DELIVERY
- RF spectrum analyzer SPECTRAN HF-2025E
- HyperLOG 7025 EMC/directional antenna
- 1300mAh power battery with charger
- Pistol grip with miniature tripod mode
- SMA toolset
- SMA adapter
- 1m SMA cable
- Sturdy aluminum-design carrycase (with custom padding!)
- Exhaustive manual with lots of basic information, hints and exposure limit tables
### Specifications base unit

<table>
<thead>
<tr>
<th></th>
<th>HF-2025E</th>
<th>HF-4040</th>
<th>HF-4060</th>
<th>HF-6060V4</th>
<th>HF-6080V4</th>
<th>HF-60100V4</th>
<th>HF-XFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range (min)</td>
<td>700MHz</td>
<td>100MHz</td>
<td>100MHz</td>
<td>10MHz</td>
<td>10MHz</td>
<td>1MHz</td>
<td>1MHz</td>
</tr>
<tr>
<td>Frequency Range (max)</td>
<td>2.5GHz</td>
<td>4GHz</td>
<td>6GHz</td>
<td>6GHz</td>
<td>8GHz</td>
<td>9.4GHz</td>
<td>9.4GHz</td>
</tr>
<tr>
<td>Optional PEAK Power-Detector (Maximum useful frequency)</td>
<td>2.5GHz</td>
<td>4GHz</td>
<td>6GHz</td>
<td>8GHz</td>
<td>10GHz</td>
<td>10GHz</td>
<td>10GHz</td>
</tr>
<tr>
<td>DANL (Displayed Average Noise Level)</td>
<td>-80dBm</td>
<td>-90dBm</td>
<td>-90dBm</td>
<td>-135dBm(1Hz)</td>
<td>-145dBm(1Hz)</td>
<td>-155dBm(1Hz)</td>
<td>-155dBm(1Hz)</td>
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<tr>
<td>DANL (Displayed Average Noise Level with Preamp (Option 020))</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-150dBm(1Hz)</td>
<td>-160dBm(1Hz)</td>
<td>-170dBm(1Hz)</td>
<td>-170dBm(1Hz)</td>
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<tr>
<td>Max Power at RF input</td>
<td>0dBm</td>
<td>0dBm</td>
<td>0dBm</td>
<td>+10dBm</td>
<td>+10dBm</td>
<td>+40dBm</td>
<td>+40dBm</td>
</tr>
<tr>
<td>RBW (resolution bandwidth) (min)</td>
<td>1MHz</td>
<td>100kHz</td>
<td>100kHz</td>
<td>1kHz</td>
<td>3kHz</td>
<td>200Hz</td>
<td>200Hz</td>
</tr>
<tr>
<td>RBW (resolution bandwidth) (max)</td>
<td>50MHz</td>
<td>50MHz</td>
<td>50MHz</td>
<td>50MHz</td>
<td>50MHz</td>
<td>50MHz</td>
<td>50MHz</td>
</tr>
<tr>
<td>EM-C-Filter 200Hz, 9kHz, 120kHz, 200kHz, 1,5MHz, 5MHz</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Demodulator</td>
<td>AM/AM/FM</td>
<td>AM/AM/FM</td>
<td>AM/AM/FM</td>
<td>AM/AM/FM</td>
<td>AM/AM/FM/PM</td>
<td>AM/AM/FM/GSM</td>
<td>AM/AM/FM/GSM</td>
</tr>
<tr>
<td>Detector</td>
<td>RMS</td>
<td>RMS</td>
<td>RMS</td>
<td>RMS/MinMax</td>
<td>RMS/MinMax</td>
<td>RMS/MinMax</td>
<td>RMS/MinMax</td>
</tr>
<tr>
<td>Units dBm, dBµV, V/m, A/m, W/m² (dBµV/m etc. via PC software)</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
<td>✓ ✔ ✓ ✓ ✓ ✔ ✔ ✔</td>
</tr>
<tr>
<td>Internal Datatologer (size). Expandable to 1MB (option 001)</td>
<td>- 64K</td>
<td>64K</td>
<td>64K</td>
<td>64K</td>
<td>64K</td>
<td>harddisk</td>
<td></td>
</tr>
<tr>
<td>Lowest SampleTime</td>
<td>100mS</td>
<td>100mS</td>
<td>100mS</td>
<td>10mS</td>
<td>10mS</td>
<td>5mS</td>
<td>5mS</td>
</tr>
<tr>
<td>Accuracy (typical)</td>
<td>+/-4dB</td>
<td>+/-3dB</td>
<td>+/-3dB</td>
<td>+/-2dB</td>
<td>+/-2dB</td>
<td>+/-1dB</td>
<td>+/-1dB</td>
</tr>
<tr>
<td>Real-time remote control via USB</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Calibration setup (antenna, cable, attenuator etc.)</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Exposure limit calculation according to ICNIRP, EN55011, EN55022 etc.</td>
<td>ICNIRP only</td>
<td>ICNIRP only</td>
<td>ICNIRP only</td>
<td>ICNIRP only</td>
<td>ICNIRP only</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Extended full ICNIRP range</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Suitable for pre-compliance test</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Realtime limit calculation with simultaneous percentage display</td>
<td>-</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Time-Domain and fast Zero-Span sweep</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vector power measurement (I²Q) and True RMS</td>
<td>-</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Simultaneously displays frequency and signal strength</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Up to 3 marker (showing both frequency and field strength)</td>
<td>-</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Jog Dial controlled manual marker readout</td>
<td>-</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>key &amp; touchpad</td>
<td>key &amp; touchpad</td>
<td>key &amp; touchpad</td>
</tr>
<tr>
<td>Write, AVG and Hold function</td>
<td>no AVG</td>
<td>no AVG</td>
<td>no AVG</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>DECT and TimeSlot Analyzer</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Audio Level Indicator (changes audio frequency vs power level)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Free of charge firmware update (via Internet)</td>
<td>✓ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Supports programming of custom P-Code &amp; C++ based custom software</td>
<td>-</td>
<td>✓ ✔</td>
<td>✓ ✔</td>
<td>✓ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>14Bit Dual-ADC &amp; DAC Hardware-Filter</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>150MIPS high performance DSP (Digital Signal Processor)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Large high resolution multifunctional LCD (95mm)</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Spectrum display (51x25 pixel)</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>High resolution 50 segment bargraph (trend display)</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
<td>Analyzer sw</td>
</tr>
<tr>
<td>Enhanced, much sharper Aaronia LCD display (3d generation)</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Integrated battery charger (supports our optional LiPo battery)</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
<td>✔ ✔</td>
</tr>
<tr>
<td>Internal speaker</td>
<td>Piezo</td>
<td>Piezo</td>
<td>Piezo</td>
<td>Piezo</td>
<td>Piezo</td>
<td>Piezo</td>
<td>Piezo</td>
</tr>
</tbody>
</table>

### Highlights

- Exposure limit calculation according to ICNIRP, EN55011, EN55022 etc.
- Extended full ICNIRP range
- Suitable for pre-compliance test
- Realtime limit calculation with simultaneous percentage display
- Time-Domain and fast Zero-Span sweep
- Vector power measurement (I²Q) and True RMS
- Simultaneously displays frequency and signal strength
- Up to 3 marker (showing both frequency and field strength)
- Jog Dial controlled manual marker readout
- Write, AVG and Hold function
- DECT and TimeSlot Analyzer
- Audio Level Indicator (changes audio frequency vs power level)
- Free of charge firmware update (via Internet)
- Supports programming of custom P-Code & C++ based custom software
- 14Bit Dual-ADC & DAC Hardware-Filter
- 150MIPS high performance DSP (Digital Signal Processor)
- Large high resolution multifunctional LCD (95mm)
- Spectrum display (51x25 pixel)
- High resolution 50 segment bargraph (trend display)
- Enhanced, much sharper Aaronia LCD display (3d generation)
- Integrated battery charger (supports our optional LiPo battery)
- Internal speaker

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Specifications subject to change without further notice, errors excepted. Subject to our most current terms and conditions.
### Connectors / Interface

<table>
<thead>
<tr>
<th></th>
<th>Entrance</th>
<th>Intermediate</th>
<th>Professional</th>
<th>Outdoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB 1.1/2.0</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Audio output (2,5mm jack)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Charger plug (max. 12V)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>500Ohm SMA input (f)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Jog Dial (easy usage of menu operation and volume control)</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>1/4” tripod connector</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Included In Delivery

- Miniature SMA rod sniffer antenna
- HyperLOG EMC directional LogPer antenna (model)
- SPECTRAN 1300mAh rechargeable battery (integrated)
- Battery charger and power supply incl. international adapter set
- Aluminum carrying case with foam protection
- Detailed English manual (on CD)
- Analyzer Software for MAC-OS, Linux and Windows (on CD)
- SMA tool
- SMA adapter
- Calibration Certificate
- Calibration Resistor (needed for noise floor calibration, SMA)
- 3000mAh Lithium Polymer (LiPo) Power-Battery
- USB Cable (special EMC screened version)
- Car Power Adapter (operate or charge via cigarette lighter)
- Aluminum tripod (big version)
- DC-Blocker (protects the input against DC voltage)
- Heavy Multifunctional Pistol Grip
- PBS1 Near Field Probe Set (passive)
- PBS2 Near Field Probe Set (active, incl. UBBV2 preamplifier)
- ADP1 Active Differential Probe (conductive measurement)
- Heavy Plastic Carrying Case
- Heavy Multifunctional Pistol Grip
- Aluminum tripod (big version)
- DC-Blocker (protects the input against DC voltage)
- 20dB Attenuator (expands the measurement range by 20dB)
- PBS1 Near Field Probe Set (passive)
- PBS2 Near Field Probe Set (active, incl. UBBV2 preamplifier)
- ADP1 Active Differential Probe (conductive measurement)
- 5m or 10m low loss SMA Cable
- Calibration Resistor (needed for noise floor calibration, SMA)
- Heavy Plastic Carrying Case

### Available Options (extra charge)

- Option 001 (1MB memory expansion)
- Option 002 (high accurate 0.5ppm TCXO timebase)
- Option 020 (15dB internal low noise preamplifier, switchable)
- Option 20x (Real-time Broadband Peak Power Meter)
- Option UBBV1 (40dB external preamplifier 1MHz-1GHz)
- Option UBBV2 (40dB external preamplifier DC-8GHz)

### Optional Accessories

- 3000mAh Lithium Polymer (LiPo) Power-Battery
- Outdoor Rubber Protection (perfect for outdoor usage)
- Pistol Grip / Miniature Tripod
- Calibration Certificate

### Specifications

- **Standard:** +20dBm. Only with optional 20dB attenuator +40dBm. Standard: 1kHz. Only with option 002 down to 200Hz.
- **Standard:** +20dBm. Only with optional 20dB attenuator +40dBm. Standard: 1kHz. Only with option 002 down to 200Hz.
- **Standard:** +20dBm. Only with optional 20dB attenuator +40dBm. Standard: 1kHz. Only with option 002 down to 200Hz.
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Recommended accessories for Aaronia Spectrum Analyzer

**Heavy Plastic Carrycase PRO**
Shock resistant, heavy version with padding. Offers spaces for 2 SPECTRAN units with all accessories and a HyperLOG 70xx or 60xx antenna. A MUST for the professional user or outdoor usage!
*Order/Art.-No.: 243*

**Calibration Certificate**
Available for all SPECTRAN® units. With detailed calibration sheet.
*Order/Art.-No.: 784*

**3000mAh LiPo Power-Battery**
Offers a MUCH higher runtime of your SPECTRAN (up to 400%). Strongly recommended for autonomic measurement! The 1300mAh standard-battery will be replaced.
*Order/Art.-No.: 254*

**USB Cable (Special Version)**
To connect your Spectran to the PC. Special version with high performance EMC-ferrite. STRONGLY recommended for PC use!
*Order/Art.-No.: 774*

**Car power adapter for mobile use**
With power-LED. For charging batteries or operating our units in your car, including special plug.
*Order/Art.-No.: 260*

**Pistol grip / miniature tripod**
Detachable handle with super-practical miniature tripod mode: this handle is attachable to the backside of the unit and allows optimal handling (esp. for directional measurement) and even fixed installation of the unit. STRONGLY recommended for PC use!
*Order/Art.-No.: 280*

**Aluminum tripod**
Height adjustable, high stability. STRONGLY recommended for PC use! Max. height: 105cm.
*Order/Art.-No.: 281*

**1m / 5m / 10m SMA-Cable**
High quality special SMA cable for connecting any HyperLOG®-Antenna or BicoLOG®-Antenna with our RF Spectrum Analyzer. Available as 1m, 5m and 10m Cable. All versions: SMA plug (male) / SMA plug (male).

**Protection rubber**
Protect and personalize your SPECTRAN with a sturdy rubber case and keep it scratch-n-dent free. Allows full access to all functions.
*Order/Art.-No.: 290*

**Calibration Resistor (DC-18GHz)**
This calibration resistor is necessary for the best possible calibration of the noise-floor of each Spectran V4-Analyzer.
*Order/Art.-No.: 779*

**20dB SMA high-end Attenuator**
Expands the measurement range to +40dBm. (ONLY SPECTRAN HF-60100 V4 and HF-XFR).
*Order/Art.-No.: 775*
## Frequency Overview SPECTRAN Spectrum Analyzer

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<tr>
<th>Frequency (Hz)</th>
<th>SPECTRAN NF-1010</th>
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<th>SPECTRAN NF-3020U</th>
<th>SPECTRAN NF-5010</th>
<th>SPECTRAN NF-5020 (opt. 30MHz)</th>
<th>SPECTRAN NF-5020 (opt. 30MHz)</th>
<th>SPECTRAN HF-20222 Rev.0</th>
<th>SPECTRAN HF-4000 Rev.0</th>
<th>SPECTRAN HF-4060 Rev.0</th>
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## Frequency Overview HyperLOG and BicoLOG Antennas and Probes

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*Note: The frequency overview includes a range of frequencies from 1Hz to 100GHz, showcasing various models and series from different manufacturers such as SPECTRAN and HyperLOG.*
References

User of Aaronia Antennas and Spectrum Analyzers (Examples)

Government, Military, Aeronautic, Astronautic
- NATO, Belgien
- Boeing, USA
- Airbus, Hamburg
- Bund (Bundeswehr), Leer
- Bundeswehr (Technische Aufklärung), Hof
- Lufthansa, Hamburg
- DLR (Deutsches Zentrum für Luft- und Raumfahrt, Stuttgart
- Eurocontrol (Flugüberwachung), Belgien
- Australian Government Department of Defence, Australien
- EADS (European Aeronautic Defence & Space Company) GmbH, Ulm
- Institut für Luft- und Raumfahrtmedizin, Köln
- Deutscher Wetterdienst, Tauche
- Polizeipräsidium, Bonn
- Landesamt für Umweltschutz Sachsen-Anhalt, Halle
- Zentrale Polizeitechnische Dienste, NRW
- Bundesamt für Verfassungsschutz, Köln
- BEV (Bundesamt für Eich- und Vermessungswesen)

Industry
- Shell Oil Company, USA
- AT1, USA
- Fedex, USA
- Walt Disney, Kalifornien, USA
- Agilent Technologies Co. Ltd., China
- Motorola, Brasilien
- IBM, Schweiz
- Audi AG, Neckarsulm
- BMW, München
- Daimler Chrysler AG, Bremen
- BASF, Ludwigshafen
- Deutsche Bahn, Berlin
- Deutsche Telekom, Weiden
- Siemens AG, Erlangen
- Rohde & Schwarz, München
- Infineon, Österreich
- Philips Technologie GmbH, Aachen
- ThyssenKrupp, Stuttgart
- EnBW, Stuttgart
- RTL Television, Köln
- Pro Sieben – SAT 1, Unterföhring
- Channel 6, Großbritannien
- WDR, Köln
- NDR, Hamburg
- SWR, Baden-Baden
- Bayerischer Rundfunk, München
- Carl-Zeiss-Jena GmbH, Jena
- Anritsu GmbH, Düsseldorf
- Hewlett Packard, Dornach
- Robert Bosch GmbH, Plochingen
- Mercedes Benz, Österreich
- EnBW Kernkraftwerk GmbH, Neckarwestheim
- AMD, Dresden
- Infineon Technologies, Regensburg
- Intel GmbH, Feldkirchen
- Philips Semiconductors, Nürnberg
- Hyundai Europe, Rüsselsheim
- Saarschmiede GmbH, Völklingen
- Wilkinson Sword, Solingen
- IBM Deutschland, Stuttgart
- Vattenfall, Berlin
- Fraport, Frankfurt

Research/Development, Science and Universities
- Deutsches Forschungszentrum für Künstliche Intelligenz, Kaiserslautern
- Universität Freiburg
- Indonesien Institute of Sience, Indonesien
- Max-Planck-Institut für Polymerforschung, Mainz
- Los Alamos National Laboratory, USA
- University of Bahrain, Bahrain
- University of Florida, USA
- Universität Erlangen, Erlangen
- Universität Hannover, Hannover
- University of Newcastle, Großbritannien
- Universität Strasbourg, Frankreich
- Universität Frankfurt, Frankfurt
- Uni München – Fakultät für Physik, Garching
- Technische Universität Hamburg, Hamburg
- Max-Planck Institut für Radioastronomie, Bad Münstereifel
- Max-Planck-Institut für Quantenoptik, Garching
- Max-Planck-Institut für Kernphysik, Heidelberg
- Max-Planck-Institut für Eisenforschung, Düsseldorf
- Forschungszentrum Karlsruhe, Karlsruhe


Visit us at Tradeshows/Conferences:

Aaronia Distributors

Aaronia USA, 651 Amberton Crossing
Suwanee, Georgia 30024 USA
Phone +1 678-714-2000, Fax +1 678-714-2092
Email:sales@aaroniausa.com
URL:www.aaroniaUSA.com

Aaronia UK, Bellringer Road, Trentham, Lakes South,
Stoke-on-Trent, ST4 8GB Staffordshire, UK
Phone ++44(0)845-4379092, Fax ++44(0)870-8700001
Email:sales@aaronia.co.uk
URL:www.aaronia.co.uk

Aaronia Australia Measurement Innovation Py Ltd
Perth - Western Australia
Phone ++61 (8) 9437 2550, Fax ++61 (8) 9437 2551
Email:info@measurement.net.au
URL:www.measurement.net.au

Testpribor, Fabrichnaya St. 30
Moscow 125363 Russia
Phone +7 495-225-67-37
Email:testpribor@test-expert.ru
URL:www.test-expert.ru

Aimil Ltd, B-906, BSEL Tech Park, Opp. Vashi Rly Stn,
400705 Vashi, Navi Mumbai, India
Phone ++91 22 3918 3554, Fax ++91 22 3918 3562
Email:sanjayagarwal@aimil.com
URL:www.aimil.com

Mono Tech Ltd 2 Jahanan Hashandiar St.
44641 Kfar-Sava, Israel
Phone ++972 72 2500 290, Fax ++972 7 6754 264
Email: kobi@aaronia.co.il
URL:www.aaronia.co.il

NDN, Janowskiego 15
02-784 Warszawa, Poland
Phone +48 22 641 1547, Fax +48 22 641 1547
Email: ndn@ndn.com.pl
URL: www.ndn.com.pl

EKKON SA, Paraná 350, Capital Federal,
1017 Buenos Aires, Argentina
Phone ++54 114 123 00 1, Fax ++54 114 372 324 4
Email: info@aaronia-argentina.com.ar
URL:www.aaronia-argentina.com.ar

NDN, Janowskiego 15
02-784 Warszawa, Poland
Phone +48 22 641 1547, Fax +48 22 641 1547
Email: ndn@ndn.com.pl
URL: www.ndn.com.pl

Aaronia AG, Gewerbegebiet Aaronia AG, DE-54597 Strickscheid, Germany
Phone ++49(0)6556-93033, Fax ++49(0)6556-93034
Email:mail@aaronia.de URL:www.aaronia.com

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