

Rev 1.5
02.08.2011

HighEnd Outdoor Spectrum Analyzer SPECTRAN® HF-XFR

Worldwide first "military-standard" Spectrum Analyzer!

Highlights

- ◆ Highest performing fully rugged laptop and world's most sensitive Handheld Analyzer in one device
- ◆ Ready to go, LCS-Analyzer-Software already installed
- ◆ Ballistic Armor™ Protection System to meet or exceed real world and military standards (MIL-STD-810F)
- ◆ Built tough for tough environments

**AARONIA AG**
WWW.AARONIA.DE

Made in Germany



Technical details

Notebook (based on Dell Latitude E6400XFR)

- ◆ Processor: Intel Core 2 Duo P9600(2,66GHz,1.066MHz,6MB)
nVidia Quadro NVS 160M, 256MB with express-card and Fingerprint Reader
- ◆ 14.1" WXGA (1280 x 800) wide-aspect transmissive display with DirectVue™ technology for outdoor readability
- ◆ Memory: 4096MB (2x2048) 800MHz DDR2 Dual Channel
- ◆ Primary Storage: 64GB Solid State Drive
- ◆ Battery: 6-cell primary battery
- ◆ Wireless: Intel WiFi Link 5100 (802.11 a/b/g/n 1X2) 1/2 MiniCard with Centrino label
- ◆ 10/100/1000 Gigabit Ethernet-network card
- ◆ Keypad: Internal English Qwertz with background light
- ◆ Operating System: Windows XP Pro SP3 with Windows Vista Business SP1 Medias
- ◆ Ports: IEEE - 1394, docking connector, USB 2.0 (x4), VGA, Display Port, RJ-11 (optional), RJ-45, eSATA, USB PowerShare, headphone/speaker out, mic (all protected behind sealed doors)
- ◆ Multi Media: 2 speakers
- ◆ Independently Tested to MIL-STD-810F for:
4ft Transit Drop, Aggravated Rain, Blowing Dust, Vibration, Functional Shock, Humidity, Salt Fog, Altitude, Explosive Atmosphere, Temperature Shock, and Temperature Extremes (Operating: -20°F to 145°F (-29°C to 63°C); Non-Operating: -58°F to 160°F (-50°C to 71°C))
- ◆ IP-65 Certified Protection – Dust-Tight and Protected against Pressurized Water Ingress
- ◆ UL1604 Certified for Hazardous Locations (Class 1, Division 2, Zones A, B, C, D)
- ◆ Weight: 8.5 lbs/3.9 kg
- ◆ Width: 13.9"/353.06 mm
- ◆ Depth: 10.1-11.5"/257.6-293.1 mm
- ◆ Height: 2.2"/55.88 mm

Spectrum Analyzer (based on Spectran HF-60100 V4)

- ◆ Frequency range: 1MHz - 9,4GHz*
- ◆ 14Bit Dual-ADC
- ◆ DDC Hardware-Filter
- ◆ 150 MIPS DSP (CPU)
- ◆ AVG Noise Level (DANL): -170dBm(1Hz)*
- ◆ AbsMax Level: +20dBm
- ◆ AbsMax Level: +40dBm (Option)
- ◆ Filter bandwidth (RBW) Min: 200Hz
- ◆ Filter bandwidth (RBW) Max: 50MHz
- ◆ EMC-Filter (RBW): 9kHz, 120kHz, 5MHz; 20MHz; 40MHz
- ◆ Lowest possible SampleTime : 1mS
- ◆ Accuracy (typical) : +/- 1dB
- ◆ Vector power measurement (I/Q) and True RMS
- ◆ AM/FM/PM Demodulation
- ◆ Extended full ICNIRP range
- ◆ Standards-conformant exposure limits (ICNIRP, BGV B11, BlmSchV etc.)
- ◆ Fast ZERO-SPAN sweep
- ◆ HOLD Mode
- ◆ Time-Slot-Analyzer

Application examples SPECTRAN® HF-XFR Spectrum Analyzer

Analysis and measurement of:

- ◆ GSM900
- ◆ DECT
- ◆ GSM1800
- ◆ UMTS
- ◆ WLAN
- ◆ Microwave ovens
- ◆ WiFi
- ◆ WiMax
- ◆ Radar
- ◆ 5GHz WLan
- ◆ PAR-Radar
- ◆ UWB (FB1-FB12)

Description



Real World Rugged

Built for tough environments, the SPECTRAN HF-XFR rises to the challenges you face every workday. The HF-XFR is built to be ready out of the box to withstand pounding rain, blowing dust and dirt, extreme temperatures, accidental drops and more.

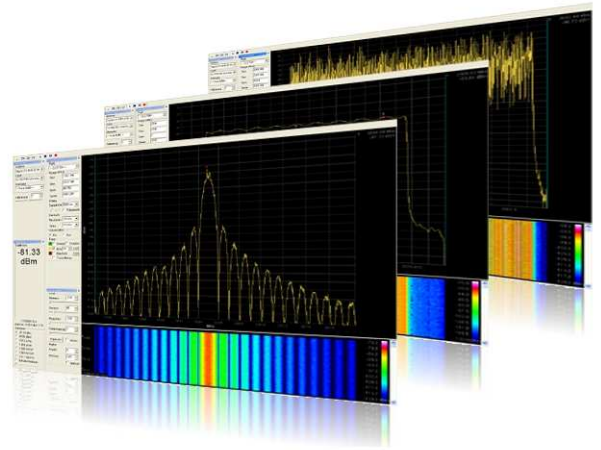
Key rugged features include:

- ◆ The exclusive Ballistic Armor Protection System featuring PR481™ chassis material provides twice the impact strength versus traditional magnesium alloy.
- ◆ The SPECTRAN HF-XFR with Ballistic Armor Protection enables excellent protection and is the first in its class to meet a 4ft drop specification.
- ◆ With PrimoSeal™ technology we provide the highest combined Ingress protection rating (IP65), for enhanced protection against blowing dust and liquid.

Integrated Spectrum Analyzer (based on the Spectran HF-60100 V4)

The PROFESSIONAL PC analysis software demonstrates SPECTRAN's vast capabilities.

- ◆ 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-resolution 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.
- ◆ 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 firmwares.
- ◆ etc. etc. etc.



Screenshots from the SPECTRAN HF-XFR

Inspired Design

SPECTRAN HF-XFR features securely sealed port covers and a wide range of key peripherals to work wherever you need it to.

- ◆ Work in direct sunlight with the large 14.1" wide-aspect LCD featuring DirectVue™ Technology LCD.
- ◆ Vehicle docking allows flexibility for police and field technicians to mount systems directly in their vehicles where they work.
- ◆ Secure, simple, locking doors with PrimoSeal™ for exceptional protection while working in wet or dusty conditions.



Uncompromising Performance

The high performing, fully rugged laptop is the first in its class to ship with both Intel® Core™2 Duo Processor with vPro™ technology. The SPECTRAN HF-XFR has brains as well as brawn.

- ◆ QuadCool™ Thermal Management System enables the XFR to meet the MIL-STD for temperature extremes and supports world-class performance, while running the latest Intel® Core™2 Duo Processors.
- ◆ Extended field use batteries equipped with ExpressCharge enables primary battery re-charge times up to 2 times faster than Panasonic CF-30.

Included in delivery

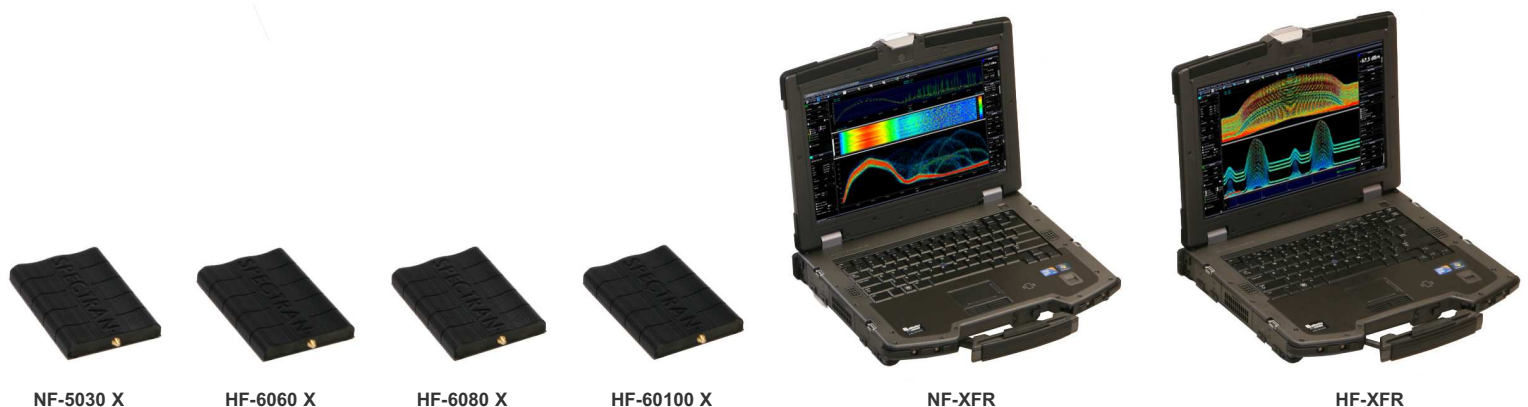
- ◆ SPECTRAN HF-XFR Outdoor Spectrum Analyzer
- ◆ HyperLOG 60100 EMC LogPer Antenna (black) with Pistolgrip
- ◆ OmniLOG 90200 miniature Broadbandantenna
- ◆ 1m SMA-cable
- ◆ SMA-Tool
- ◆ Battery
- ◆ Battery charger
- ◆ Detailed english manual



The SPECTRAN HF-XFR was built for tough environments

Specifications basic unit ⁽¹⁾	Professional				Outdoor	
	NF-5030 X	HF-6060V4 X	HF-6080V4 X	HF-60100V4 X	NF-XFR	HF-XFR
Frequency Range (min)	1Hz	10MHz	10MHz	1MHz	1Hz	1MHz
Frequency Range (max)	30MHz	6GHz	8GHz	9,4GHz	30MHz ⁽²⁾	9,4GHz
Optional PEAK Power-Detector (Maximum usable frequency) ⁽³⁾	-	6GHz	8GHz	10GHz	-	10GHz
DANL (Displayed Average Noise Level) ⁽²⁾	200nV	-135dBm(1Hz)	-145dBm(1Hz)	-155dBm(1Hz)	200nV	-155dBm(1Hz)
DANL (Displayed Average Noise Level) with Preamp (Option 020) ⁽²⁾	-	-150dBm(1Hz)	-160dBm(1Hz)	-170dBm(1Hz)	-	-170dBm(1Hz)
Max. Power at RF input	2V ⁽²⁾	+10dBm	+10dBm	+40dBm ⁽²⁾	2V ⁽²⁾	+40dBm ⁽²⁾
RBW (Resolution bandwidth) (min)	0,3Hz	10kHz	3kHz	200Hz ⁽²⁾	0,3Hz	200Hz
RBW (Resolution bandwidth) (max)	1MHz	50MHz	50MHz	50MHz	1MHz	50MHz
EMC Filter 200Hz, 9kHz, 120kHz, 200kHz, 1,5MHz, 5MHz	-	-	-	✓	-	✓
Demodulator	AM/FM	AM/FM	AM/FM/PM	AM/FM/PM/GSM	AM/FM	AM/FM/PM/GSM
Detector	RMS/MinMax	RMS/MinMax	RMS/MinMax	RMS/MinMax	RMS/MinMax	RMS/MinMax
Units dBm, dBµV, V/m, A/m, W/m ² (dBµV/m, W/cm ² etc. via PC software)	V, dBV	✓	✓	✓	V, dBV	✓
Lowest Sample Time	10mS	10mS	10mS	5mS	10mS	5mS
Accuracy (typical)	+/-3%	+/-2dB	+/-2dB	+/-1dB	+/-3%	+/-1dB
Highlights						
Real-time remote control via USB	✓	✓	✓	✓	internal	internal
Calibration setup (antenna, cable, attenuator etc.)	✓	✓	✓	✓	✓	✓
Exposure limit calculation according to ICNIRP, EN55011, EN55022 etc.	✓	ICNIRP only	ICNIRP only	✓	✓	✓
Extended full ICNIRP range	-	-	-	✓	-	✓
Suitable for Pre-Compliance test	✓	-	-	✓	✓	✓
Suitable for conductive EMC/EMI test	✓	-	-	✓	✓	✓
Real-time limit calculation, limit line display and limit percentage bar display	✓	✓	✓	✓	✓	✓
Time Domain and fast Zero Span sweep incl. DECT and Time Slot Analyzer	-	✓	✓	✓	-	✓
Unlimited longtime recording and playback feature	✓	✓	✓	✓	✓	✓
Simultaneously displays frequency and signal strength	✓	✓	✓	✓	✓	✓
Multiple unit handling and unlimited multiple window handling	✓	✓	✓	✓	✓	✓
Number of marker (showing frequency and field strength simultaneously)	unlimited	unlimited	unlimited	unlimited	unlimited	unlimited
Spectrum, waterfall, persistence and level vs time display	✓	✓	✓	✓	✓	✓
Sweep, AVG, Max, Min and Hold function	✓	✓	✓	✓	✓	✓
Unlimited number of sweep points, resolution and display size	✓	✓	✓	✓	14" TFT	14" TFT
Supports programming of custom P-Code, C++ based custom software support	✓	✓	✓	✓	✓	✓
Free of charge firmware update (via Internet)	✓	✓	✓	✓	✓	✓
14Bit Dual-ADC & DDC hardware filter	-	✓	✓	✓	-	✓
150MIPS high performance DSP (Digital Signal Processor)	-	✓	✓	✓	-	✓
Vector power measurement (I/Q) and True RMS	✓	✓	✓	✓	✓	✓
Solid 3mm aluminum housing with excellent shielding performance	✓	✓	✓	✓	-	-
Integrated rechargeable battery	-	-	-	-	✓	✓
Internal speaker	✓	✓	✓	✓	✓	✓

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SPECTRAN® USB Spectrum Analyser

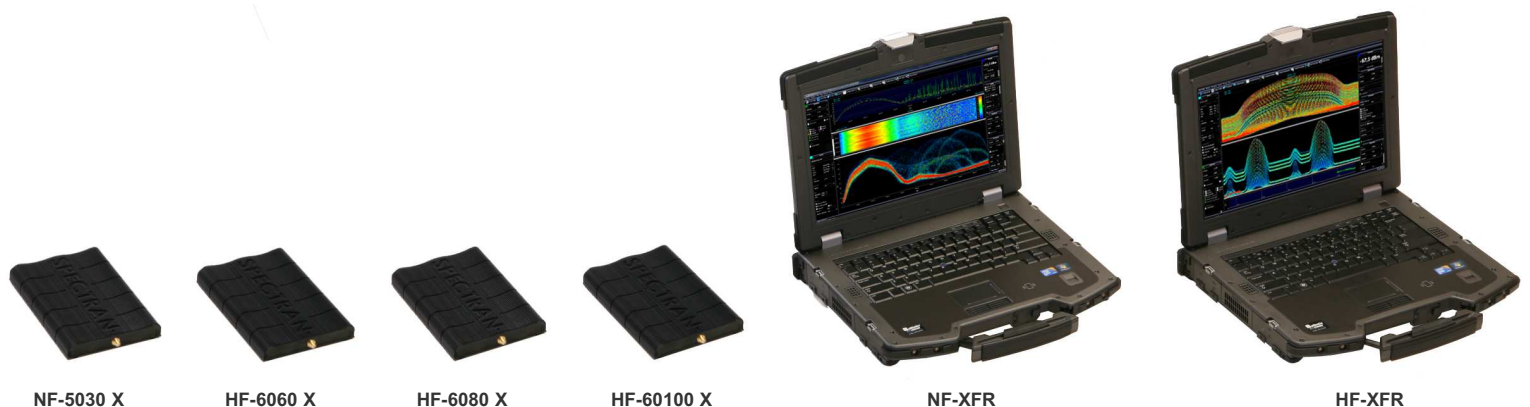
APPLICATION EXAMPLES: Pre-Compliance test, conductive EMC/EMI test, exposure limit measurement etc.

Connectors / Interface	Professional				Outdoor	
	NF-5030 X	HF-6060V4 X	HF-6080V4 X	HF-60100V4 X	NF-XFR	HF-XFR
50Ohm SMA input (f)	high impedance	✓	✓	✓	high impedance	✓
USB 1.1/2.0	✓	✓	✓	✓	2x	2x
Audio output (2,5mm jack)	✓	✓	✓	✓	3,5mm jack	3,5mm jack
Charger plug (max. 12V)	✓	✓	✓	✓	✓	✓
Included In Delivery						
HyperLOG EMC directional LogPer antenna (model)	-	-	-	-	-	60100 (black)
OmniLOG 90200 radial isotropic antenna	-	✓	✓	✓	-	✓
Rechargeable Battery	-	-	-	-	✓	✓
Battery charger and/or power supply incl. international adapter set	✓	✓	✓	✓	no adapter set	no adapter set
Aluminum carrying case with foam protection	✓	✓	✓	✓	-	-
Detailed English manual (on CD)	✓	✓	✓	✓	installed	installed
Analyzer Software for MAC-OS, Linux and Windows (on CD)	✓	✓	✓	✓	installed	installed
1m SMA Cable	-	-	-	-	-	✓
SMA Tool	✓	✓	✓	✓	✓	✓
USB Cable (special EMC screened version)	✓	✓	✓	✓	installed	installed
Available Options (extra charge)						
Option 002 (high accurate 0,5ppm TCXO timebase)	-	-	-	✓	-	installed
Option 005 (12Bit DDC for ultra high sensitivity)	✓	-	-	-	installed	-
Option 008 (20MHz frequency expansion. New range: 1Hz-20MHz)	✓	-	-	-	installed	-
Option 010 (30MHz frequency expansion. New range: 1kHz-30MHz)	✓	-	-	-	✓	-
Option 020 (15dB internal low noise preamplifier, switchable)	-	✓	✓	✓	-	installed
Option 20x (Real-time Broadband Peak Power Meter)	-	✓	✓	✓	-	✓
Option UBBV1 (40dB external preamplifier 1MHz-1GHz)	-	✓	✓	✓	-	✓
Option UBBV2 (40dB external preamplifier DC-8GHz)	✓	✓	✓	✓	✓	✓
Optional Accessories						
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)	✓	-	-	✓	✓	✓
GEO10 Vibrationsensor (4Hz-1kHz)	✓	-	-	-	✓	-
GEO14 Vibrationsensor (10Hz-1kHz)	✓	-	-	-	✓	-
5m or 10m low loss SMA cable	-	✓	✓	✓	-	✓
Calibration Resistor (for noise floor calibration, SMA)	-	✓	✓	✓	-	✓
Calibration Certificate	✓	✓	✓	✓	✓	✓

⁽¹⁾ The new V5 real-time spectrum analyser generation up to 80GHz is already in development. Please contact us for further details!
Preliminary specifications dated 01.07.2011. The NF, V4 and XFR series are available with latest Beta firmware. The Beta firmware is constantly in development. Some functionality may still be limited and not fully to specifications (Beta status). By regularly checking our homepage for updates, you can always keep your measurement device up-to-date. As soon as V1.0 of the firmware is released, all functionality and features will be fully available. Range, sensitivity and accuracy can change depending on frequency, setup, antenna and used parameters. Precision data are based on Aaronias calibration-reference under specific test conditions. Unless otherwise stated, these specifications are according to the following reference conditions: Ambient temperature 22±3°C, relative air humidity 40% to 60%, continuous wave signal (CW), RMS detection.

⁽²⁾ V4 DANL @5,555GHz. V4 internal: +20dBm. V4 external (with optional 20dB attenuator): +40dBm. V4 standard: 1kHz. Only with option 002 down to 200Hz. NF standard: 1MHz. Only with option 010 up to 30MHz. NF standard: 200mV. Only with optional 20dB Attenuator up to 2V.

⁽³⁾ Depending on frequency the option 20x offers a sensitivity down to -50dBm and max. +10dBm, with optional 20dB attenuator +30dBm.



NF-5030 X

HF-6060 X

HF-6080 X

HF-60100 X

NF-XFR

HF-XFR

Options Spectrumalyzer SPECTRAN HF-XFR

Included in delivery:

Option 020: Internal 15dB low-noise preamplifier

This option provides an internal, super low-noise 15dB preamplifier, enabling maximum performance particularly when measuring extremely weak signals. It is switched via a TRUE RF switch. There really is no excuse for not ordering this one, considering its very attractive price!

The maximum sensitivity of the V4 series without option 020 is lower by 15dB.

Order/Art.-No.: 177

Option 002: 0,5PPM TCXO timebase

This highly precise TCXO timebase, which has been especially developed for the SPECTRAN®, offers significantly reduced phase noise (jitter). This will allow the use of far narrower filters (in development), which will in turn vastly enhance sensitivity. To fully exploit the maximum sensitivity of the HF-60100 V4, this option is indispensable! Furthermore, the TCXO timebase allows far more accurate frequency measurement and display and is therefore a MUST-HAVE for future applications like time-domain measurements or code-selective measurement of UMTS, all already in development.

The standard accuracy without option 002 is 50ppm.

Order/Art.-No.: 181

OmniLOG 90200 broadband antenna

The OmniLOG® 90200 Antenna is specially developed for a quasi isotropic (radial isotropic) measurement in the GSM (GSM900, GSM1800, GSM1900), UMTS and 2,4GHz WLAN frequency ranges. It fits perfectly in addition to our SPECTRAN measurement devices.

Compared to our HyperLOG-Antennas, the OmniLOG antenna offers the possibility for a direct, radial measurement of field strength without the need to move the antenna to the source. This offers the possibility to get a direct field strength reading without any hassle.

Order/Art.-No.: 177-2

Available options (extra charge):

Option 022: 40dB low-noise preamplifier 1kHz-8GHz

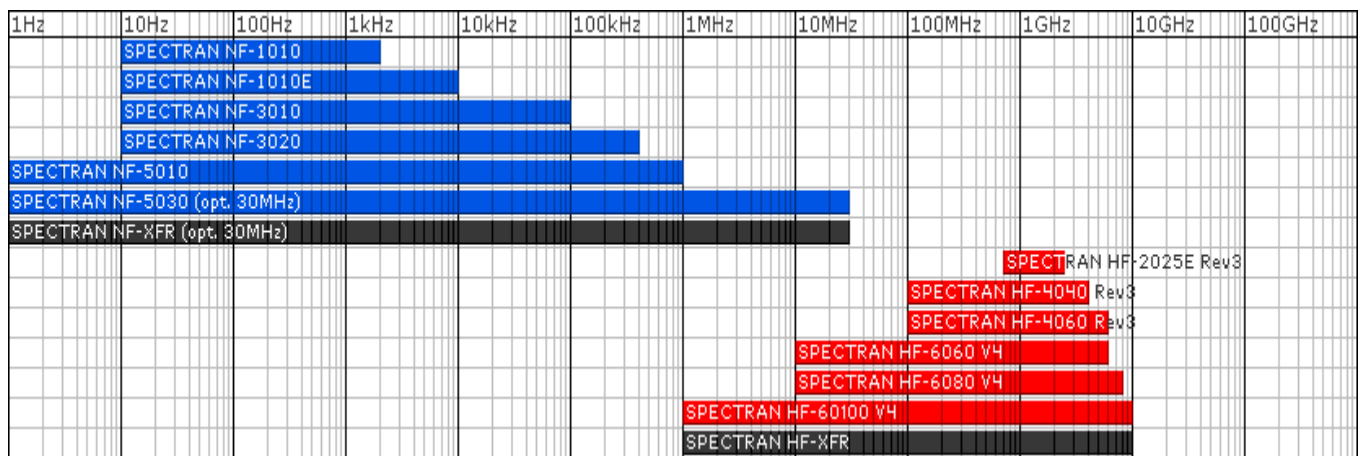
This option provides an external, super low-noise 40dB preamplifier, enabling maximum performance particularly when measuring extremely weak signals at a EN55011, EN55022 or EN50371 EMC-test. If you use our BicoLOG antenna or our PBS1 Probeset and EMC-Sniffer this amplifier is a MUST HAVE to get the best performance!

The 40dB preamplifier is already included in the EMC-Bundle1.

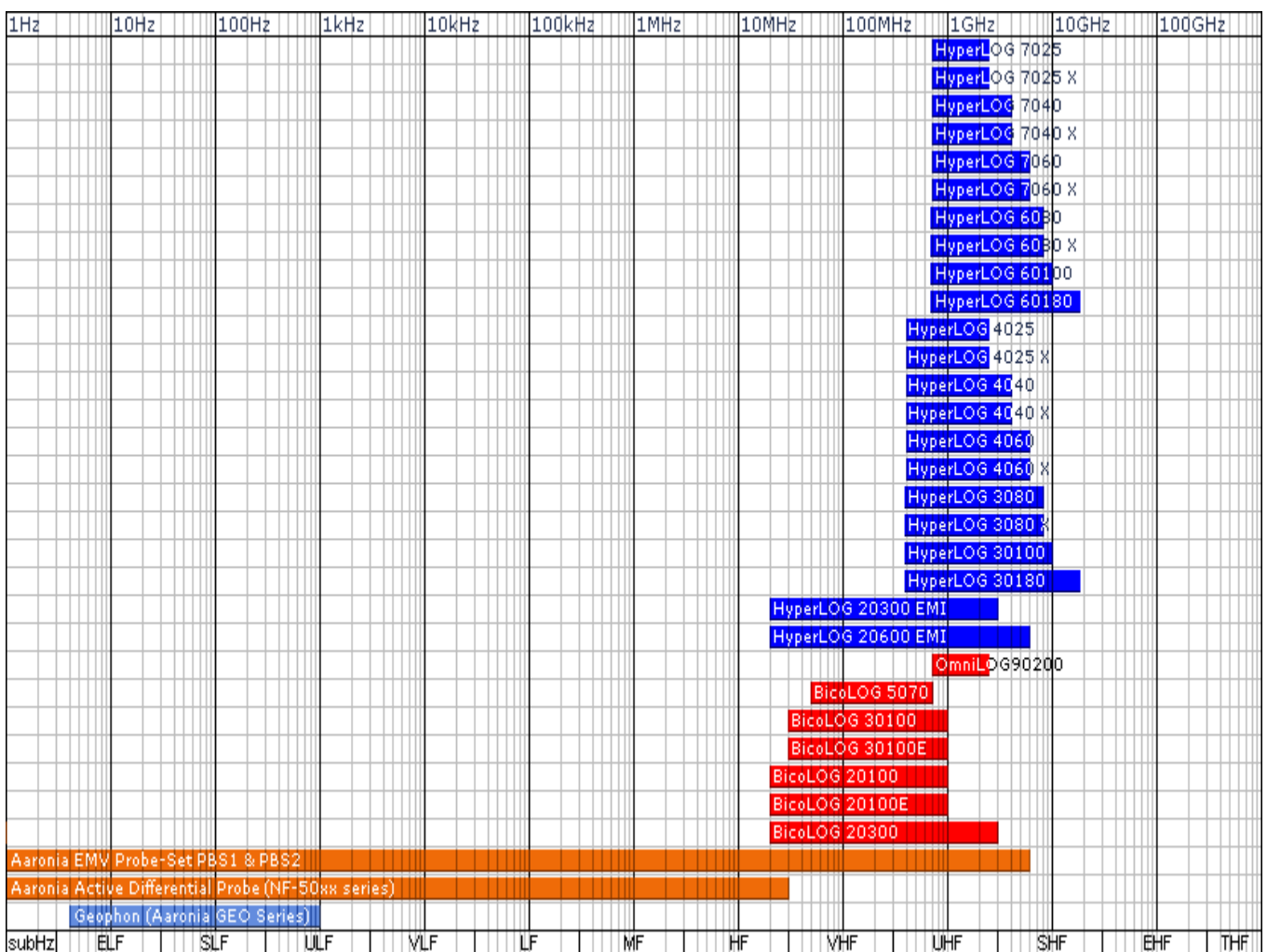
Order/Art.-No.: 177-2

Frequency overview Analyzer & Antennas

Frequency Overview SPECTRAN Spectrum Analyzer



Frequency Overview HyperLOG and BicoLOG Antennas and Probes



References

User of Aeronia 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)

Research/Development, Science and Universitys

- ◆ Deutsches Forschungszentrum für Künstliche Intelligenz, Kaiserslautern
- ◆ Universität Freiburg
- ◆ Indonesien Institute of Science, 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

Industry

- ◆ Shell Oil Company, USA
- ◆ ATI, 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
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- ◆ Vattenfall, Berlin
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