

Rev 1.3
08-01.2013

SPECTRAN-NF/HF

Portable Spectrum Analyser at an unmatched price-performance ratio

References / examples of proof:

- ◆ NATO, Belgium
- ◆ Boeing, USA
- ◆ Airbus, Hamburg, Germany
- ◆ ATI, USA
- ◆ Shell Oil Company, USA
- ◆ EADS, Munich, Germany
- ◆ DLR, Wessling, Germany
- ◆ Mercedes Benz, Austria
- ◆ BMW, Munich, Germany
- ◆ Motorola, Brazil
- ◆ IBM, Switzerland
- ◆ Deutsche Bahn, Berlin, Germany
- ◆ BASF, Schwarzheide, Germany
- ◆ Siemens AG, Nürnberg, Germany



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SPECTRAN - with just 400gr a REAL Handheld

Main features

- ◆ Wide frequency range starting at 1Hz (NF-5030) up to 9,4GHz (HF-60100 V4)
- ◆ High sensitivity up to -170dBm (1Hz) (HF-60100 V4 with Preamplifier (Option 020))
- ◆ Extremely competitive price due to a patented Spectrum analysis method
- ◆ High accuracy (typ. 1dB for HF-60100 V4)
- ◆ Very portable due to small weight (approx. 400g)
- ◆ Internal Datalogger to store measurement results
- ◆ Free Analysis Software for MAC OS, Linux and Windows
- ◆ Limit calculation according to ICNIRP, DIN/VDE 0848 etc.
- ◆ Lot of different options like Preamplifier, Peak-Power-Meter, Static field sensor, TCXO etc.
- ◆ Also available as USB-Version in a high-end Aluminum housing
- ◆ Various accessories included e.g. LogPer Antenna (RF-Analyzer), 3D Sensor (NF-Analyzer), transport case, tripod, Analyzer-Software etc.

Portable, inexpensive, accurate and highly sensitive

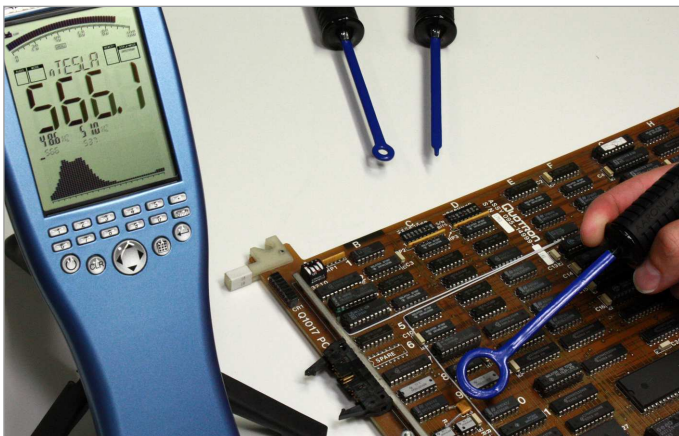
Based on a completely new patented method of Spectrum analysis the Aaronia SPECTRAN Spectrum Analyzer offers RF, EMF and EMC measurements at an spectacular price. The SPECTRAN Analyzers has an extremely compact design and incredibly high sensitivity (HF-60100 V4 up to -170dBm/1Hz).

The discovery of interference sources, the determination of frequency and signal strength as well as the evaluation of even most complex limits is possible using Aaronia Spectrum Analyzers.

All SPECTRANs are developed, individually produced and calibrated in Germany. This guarantees highest standards so that Aaronia can offer a 10 year warranty for all SPECTRAN Spectrum Analyzers.



The SPECTRAN is also available as USB Desktop Version in a high-end Aluminum housing (Remote control by PC Analysis Software)



Measurement on a circuit board using the SPECTRAN NF-5030 and Nearfield Probeset PBS 2

Applications

The SPECTRAN was designed for a very wide range of customers where portability, mobility, low weight and dimensions as well as the price are important.

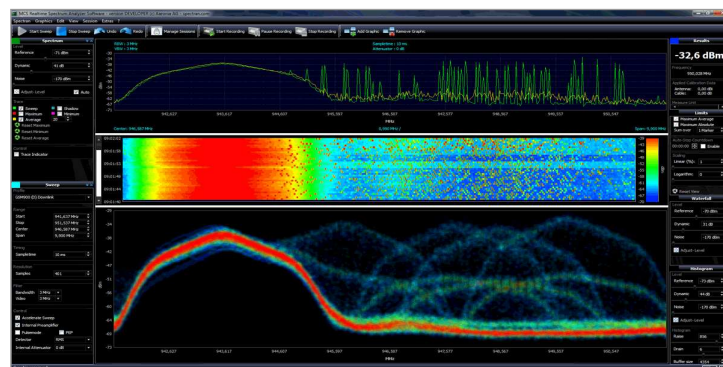
This includes areas such as installation of mobile communication, maintenance, service and EMC / field strenght measurements for users in laboratories, universities, military and university sector.

The operating time of up to 9 hours (SPECTRAN HF-4040 with optional 3000mAh battery) predestined the SPECTRAN for mobile use.

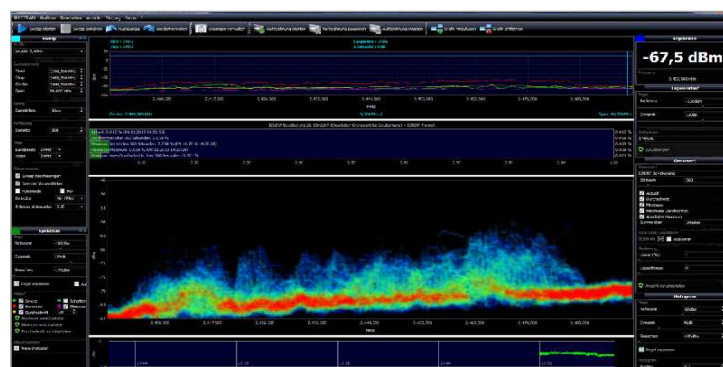
Free PC Analysis Software „MCS“

The cross-platform Spectrum Analyzer Software MCS for Windows, Linux and MAC OS shows the full potential of the SPECTRAN units. The measurement results and controls work in realtime, which means without any delay between the reception and the display of the signal on a monitor.

- ◆ Works on all important operating systems like Windows, MAC OS and Linux
- ◆ Multi-Device capable, remote control function of several RSA units which can be controlled simultaneously from the same PC
- ◆ Real-Time remote control with any Spectran Spectrum Analyzer
- ◆ Unlimited number of limits e.g. EN55011, EN55022, ICNIRP and more, inclusive limit lines and beam indicator as well as a special limit editor to create and save custom limits
- ◆ Multi window support
- ◆ Powerful Undo-Feature
- ◆ Customer-specific skins and color-settings
- ◆ Record and Replay function
- ◆ Advanced Trigger and alarm functions
- ◆ Unlimited number of markers
- ◆ Multiple views at the same time: Spectrum, Waterfall, Histogram, Limits, Chanelpower, Providerdisplay, Time Domain, Results...
- ◆ Personal sessions handling
- ◆ Simultaneous display of multiple units like dBm, dBμV, V/m, W/m² etc. with powerful autorange
- ◆ and many more features that are constantly evolving...



Measurement of a disturbed GSM signal incl. Spectrum (Min/Max/AVG), Waterfall, Results and Histogram view.



Measurement of the 2.4GHz WLAN-range incl. Spectrum, Channel, Limits, Results and Histogram view



Multi-Window View with Display of multiple views at the same time e.g. Spectrum view (min, max, avg and current sweep), waterfall, limits, histogram, daylog. The MCS Software supports as many windows as wanted (Multi-Window).



The connection of the SPECTRAN to a PC is realized by the USB-interface, the control is done by the software only (remote control function), the transmission of the measurement results from the SPECTRAN to the PC is made in realtime

SPECTRAN® NF (EMF) Spectrum Analyser

APPLICATION EXAMPLES: Traction power, power lines and cables incl. harmonics, transformer, switching power supplies, RFID, TFTs, DSL etc. Various appliances in home and office.

| Specifications base unit ⁽¹⁾ | NF-1010E | NF-3020 | NF-5030 | NF-5030X | NF-XFR |
|---|---------------------|---------------------|-----------------------|----------------------|----------------------|
| Frequency Range (min) | 10Hz | 10Hz | 1Hz | 1Hz | 1Hz |
| Frequency Range (max) | 10kHz | 400kHz | 30MHz ⁽²⁾ | 1MHz | 30MHz ⁽²⁾ |
| Electric field [V/m] (min) (typical) | 1V/m | 1V/m | 0,1V/m ⁽²⁾ | see opt.PBS2 | see opt.PBS2 |
| Electric field [V/m] (max) (typical) | 2.000V/m | 5.000V/m | 20kV/m | see opt.PBS2 | see opt.PBS2 |
| Magnetic field [Tesla] (min) (typical) | 1pT ⁽²⁾ | 1pT ⁽²⁾ | 1pT ⁽²⁾ | see opt.PBS2 | see opt.PBS2 |
| Magnetic field [Tesla] (max) typical | 100µT | 100µT | 2mT ⁽¹⁾ | see opt.PBS2 | see opt.PBS2 |
| Magnetic field [Gauss] (min) (typical) | 10nG ⁽²⁾ | 10nG ⁽²⁾ | 10nG ⁽²⁾ | see opt.PBS2 | see opt.PBS2 |
| Magnetic field [Gauss] (max) typical | 1G | 1G | 20G ⁽¹⁾ | see opt.PBS2 | see opt.PBS2 |
| Analog input [V] (min) typical | - | 2µV | 200nV ⁽²⁾ | 200nV ⁽²⁾ | 200nV ⁽²⁾ |
| Analog input [V] (max) typical | - | 200mV | 2V ⁽²⁾ | 2V | 2V ⁽²⁾ |
| RBW (resolution bandwidth) (min) | 1Hz | 1Hz | 0,3Hz | 0,3Hz | 0,3Hz |
| RBW (resolution bandwidth) (max) | 3kHz | 100kHz | 1MHz | 1MHz | 1MHz |
| Demodulator | - | AM | AM/FM | AM/FM | AM/FM |
| Units (additional units via PC software) | V/m, T, G | V, V/m, T, G | V, V/m, T, G, A/m | V, dBV | V, dBV |
| Detector | RMS | RMS/MinMax | RMS/MinMax | RMS/MinMax | RMS/MinMax |
| Internal Datalogger (size). Expandable to 1MB (option 001) | - | 64K | 64K | - | harddisk |
| FFT resolution (points) | 64 | 64 | 1024 | 1024 | 1024 |
| Lowest Sample Time | 50mS | 50mS | 10mS | 10mS | 10mS |
| Accuracy (typical) | 5% | 5% | 3% | 3% | 3% |
| Highlights | | | | | |
| Real-time remote control via USB | ✓ | ✓ | ✓ | ✓ | internal |
| Integrated electric (E) & isotropic magnetic (H) sensor/antenna | ✓ | ✓ | ✓ | - | - |
| 3D, 2D or 1D mode switchable (only magnetic field sensor) | ✓ | ✓ | ✓ | - | - |
| Calibration setup (selected antenna) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Exposure limit calculation according to ICNIRP, BGV B11, BlmSchV etc. | ✓ | ✓ | ✓ | ✓ | ✓ |
| Extended full ICNIRP range | - | - | ✓ | ✓ | ✓ |
| Suitable for Pre-Compliance test | - | - | ✓ | ✓ | ✓ |
| Real-time limit calculation with simultaneous percentage display | ✓ | ✓ | ✓ | Analyser Software | Analyser Software |
| Vector power measurement (I/Q) and True RMS | - | ✓ | ✓ | ✓ | ✓ |
| Enhanced DFT spectrum analysis | ✓ | ✓ | ✓ | ✓ | ✓ |
| Simultaneously displays frequency and signal strength | - | ✓ | ✓ | Analyser Software | Analyser Software |
| Up to 3 marker (showing both frequency and field strength) | ✓ | ✓ | ✓ | unlimited | unlimited |
| Jog Dial controlled manual marker readout | - | ✓ | ✓ | - | Key- & Touchpad |
| Linear or logarithmic spectrum display (log10, log100, log1000) | ✓ | ✓ | ✓ | unlimited | unlimited |
| Automatic reference level adjustment (switchable) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hold function | ✓ | ✓ | ✓ | unlimited | unlimited |
| Free of charge firmware update (via Internet) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Supports programming of custom P-Code & C++ based custom software | - | ✓ | ✓ | ✓ | ✓ |
| High performance DSP (Digital Signal Processor) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Large, high resolution multifunctional LCD (95mm) | ✓ | ✓ | ✓ | - | 14" TFT |
| Spectrum display (51x25 pixel) | ✓ | ✓ | ✓ | Analyser Software | Analyser Software |
| High resolution 50 segment bargraph (trend display) | ✓ | ✓ | ✓ | Analyser Software | Analyser Software |
| Enhanced, much sharper Aaronia LCD display (3d generation) | - | - | ✓ | - | 14" TFT |
| Integrated battery charger (supports our optional LiPo battery) | ✓ | ✓ | ✓ | - | XFR charger |
| Internal speaker | Piezo | ✓ | ✓ | - | ✓ |

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NF-1010E



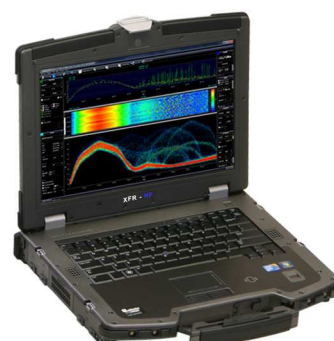
NF-3020



NF-5030



NF-5030 X



NF-XFR

SPECTRAN® NF (EMF) Spectrum Analyser

APPLICATION EXAMPLES: Traction power, power lines and cables incl. harmonics, transformer, switching power supplies, RFID, TFTs, DSL etc. Various appliances in home and office.

| Connectors / Interface | NF-1010E | NF-3020 | NF-5030 | NF-5030X | NF-XFR |
|---|-----------|-----------|-----------|-----------|--------------------|
| SMA input (f) with high impedance | - | ✓ | ✓ | ✓ | ✓ |
| USB 1.1/2.0 | ✓ | ✓ | ✓ | ✓ | 2x |
| Audio output (2,5mm jack) | ✓ | ✓ | ✓ | ✓ | 3,5mm jack |
| Charger plug (max. 15V) | ✓ | ✓ | ✓ | ✓ | ✓ |
| Jog Dial (easy usage of menu, marker and volume control) | - | ✓ | ✓ | - | key & touchpad |
| 1/4" tripod connector | ✓ | ✓ | ✓ | - | in-Vehicle docking |
| Included In Delivery | | | | | |
| Integrated electric (E) & isotropic magnetic (H) sensor/antenna | ✓ | ✓ | ✓ | - | - |
| SPECTRAN 1300mAh rechargeable battery (integrated) | ✓ | ✓ | ✓ | - | 6 cell battery |
| Battery charger and power supply incl. international adapter set | ✓ | ✓ | ✓ | ✓ | no adapter set |
| Aluminum carrying case with foam protection | ✓ | ✓ | ✓ | ✓ | - |
| Detailed English manual (on CD) | ✓ | ✓ | ✓ | ✓ | installed |
| Analyzer Software for MAC-OS, Linux and Windows (on CD) | ✓ | ✓ | ✓ | ✓ | installed |
| SMA tool | - | - | ✓ | ✓ | ✓ |
| Available Options (extra charge) | | | | | |
| Option 001 (1MB memory expansion) | ✓ | ✓ | ✓ | - | harddisk |
| Option 005 (12Bit DDC for ultra high sensitivity) | installed | installed | installed | installed | installed |
| Option 006 (Isotropic static magnetic field sensor) ⁽¹⁾ | - | - | ✓ | - | - |
| Option 008 (20MHz expansion. New range: 1Hz-20MHz) | - | - | ✓ | ✓ | installed |
| Option 009 (24Bit resolution for Option 006) | - | - | ✓ | - | - |
| Option 010 (30MHz expansion. New range: 1KHz-30MHz) | - | - | ✓ | ✓ | ✓ |
| Option UBBV2 (40dB external preamplifier DC-8GHz) | - | - | ✓ | ✓ | ✓ |
| Optional Accessories | | | | | |
| USB Cable (Special Version) | ✓ | ✓ | ✓ | inclusive | installed |
| 3000mAh Lithium Polymer (LiPo) Power-Battery | ✓ | ✓ | ✓ | - | - |
| Car Power Adapter (operate or charge via cigarette lighter) | ✓ | ✓ | ✓ | - | - |
| Outdoor Rubber Protection (perfect for outdoor usage) | ✓ | ✓ | ✓ | - | - |
| Pistol Grip / Miniature Tripod | ✓ | ✓ | ✓ | - | - |
| Aluminum Tripod (big version) | ✓ | ✓ | ✓ | - | - |
| DC-Blocker (protects the input against DC voltage) | - | - | ✓ | ✓ | ✓ |
| 20dB Attenuator (offers a higher maximum voltage up to 2V) | - | - | ✓ | ✓ | ✓ |
| 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) | - | - | ✓ | ✓ | ✓ |
| Calibration Certificate | ✓ | ✓ | ✓ | - | - |
| Heavy Plastic Carrying Case | ✓ | ✓ | ✓ | - | - |

⁽¹⁾ Preliminary specifications dated 17.04.2012. Range, sensitivity and accuracy can change depending on frequency, setup, antenna and used parameters. Precision datas 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⁾ Option 006 offers a range of 100µG-6G (10nT-600µT). You can "zero" the static field sensor (Option 006) by using our "Zero Gauss" chamber.
NF standard: 1MHz. Only with option 010 up to 30MHz. NF standard: 1nT. Only with option 005 down to 1pT. NF standard 2µV. Only with option 005 down to 200nV. NF standard: 200mV. Only with optional 20dB Attenuator up to 2V.



SPECTRAN® HF (RF) Spectrum Analyser

APPLICATION EXAMPLES: Measurement of (active) radar, mobile communications, mobile phones, UMTS, DECT phones, transmission towers, WLAN, Wifi, Bluetooth, microwaves etc.

| | Entrance | Intermediate | Professional | | | Outdoor |
|--|-------------|--------------|--------------|--------------|-----------------------|-----------------------|
| Specifications base unit ⁽¹⁾ | HF-2025E | HF-4040 | HF-6060V4 | HF-6080V4 | HF-60100V4 | HF-XFR |
| Frequency Range (min) | 700MHz | 100MHz | 10MHz | 10MHz | 1MHz | 1MHz |
| Frequency Range (max) | 2,5GHz | 4GHz | 6GHz | 8GHz | 9,4GHz | 9,4GHz |
| Optional PEAK Power-Detector (Maximum usable frequency) ⁽³⁾ | 2,5GHz | 4GHz | 6GHz | 8GHz | 10GHz | 10GHz |
| DANL (Displayed Average Noise Level) ⁽²⁾ | -80dBm | -90dBm | -135dBm(1Hz) | -145dBm(1Hz) | -155dBm(1Hz) | -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 | 0dBm | 0dBm | +10dBm | +10dBm | +40dBm ⁽²⁾ | +40dBm ⁽²⁾ |
| RBW (resolution bandwidth) (min) | 1MHz | 100kHz | 10kHz | 3kHz | 200Hz ⁽²⁾ | 200Hz ⁽²⁾ |
| RBW (resolution bandwidth) (max) | 50MHz | 50MHz | 50MHz | 50MHz | 50MHz | 50MHz |
| EMC-Filter 200Hz, 9kHz, 120kHz, 200kHz, 1,5MHz, 5MHz | - | - | - | - | ✓ | ✓ |
| Demodulator | AM | AM/FM | AM/FM | AM/FM/PM | AM/FM/FM/GSM | AM/FM/FM/GSM |
| Detector | RMS | RMS | RMS/MinMax | RMS/MinMax | RMS/MinMax | RMS/MinMax |
| Units dBm, dBµV, V/m, A/m, W/m² (dBµV/m etc. via PC software) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Internal Datalogger (size). Expandable to 1MB (option 001) | - | 64K | 64K | 64K | 64K | harddisk |
| Lowest SampleTime | 100mS | 100mS | 10mS | 10mS | 5mS | 5mS |
| Accuracy (typical) | +/-4dB | +/-3dB | +/-2dB | +/-2dB | +/-1dB | +/-1dB |
| Highlights | | | | | | |
| Real-time remote control via USB | ✓ | ✓ | ✓ | ✓ | ✓ | internal |
| Calibration setup (antenna, cable, attenuator etc.) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Exposure limit calculation according to ICNIRP, EN55011, EN55022 etc. | ICNIRP only | ICNIRP only | ICNIRP only | ICNIRP only | ✓ | ✓ |
| Extended full ICNIRP range | - | - | - | - | ✓ | ✓ |
| Suitable for pre-compliance test | - | - | - | - | ✓ | ✓ |
| Realtime limit calculation with simultaneous percentage display | - | ✓ | ✓ | ✓ | ✓ | Analyzer sw |
| Time-Domain and fast Zero-Span sweep | - | - | ✓ | ✓ | ✓ | ✓ |
| Vector power measurement (I/Q) and True RMS | - | ✓ | ✓ | ✓ | ✓ | ✓ |
| Simultaneously displays frequency and signal strength | ✓ | ✓ | ✓ | ✓ | ✓ | Analyzer sw |
| Up to 3 marker (showing both frequency and field strength) | - | ✓ | ✓ | ✓ | ✓ | unlimited |
| Jog Dial controlled manual marker readout | - | ✓ | ✓ | ✓ | ✓ | key & touchpad |
| Write, AVG and Hold function | no AVG | no AVG | ✓ | ✓ | ✓ | & Min, Max |
| 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 & DDC Hardware-Filter | - | - | ✓ | ✓ | ✓ | ✓ |
| 150MIPS high performance DSP (Digital Signal Processor) | - | - | ✓ | ✓ | ✓ | ✓ |
| Large high resolution multifunctional LCD (95mm) | ✓ | ✓ | ✓ | ✓ | ✓ | 14" TFT |
| Spectrum display (51x25 pixel) | ✓ | ✓ | ✓ | ✓ | ✓ | Analyzer sw |
| High resolution 50 segment bargraph (trend display) | ✓ | ✓ | ✓ | ✓ | ✓ | Analyzer sw |
| Enhanced, much sharper Aaronia LCD display (3d generation) | - | - | ✓ | ✓ | ✓ | 14" TFT |
| Integrated battery charger (supports our optional LiPo battery) | ✓ | ✓ | ✓ | ✓ | ✓ | XFR charger |
| Internal speaker | Piezo | ✓ | ✓ | ✓ | ✓ | ✓ |

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HF-2025E



HF-4040



HF-6060 V4



HF-6080 V4



HF-60100 V4



HF-XFR

SPECTRAN® HF (RF) Spectrum Analyser

APPLICATION EXAMPLES: Measurement of (active) radar, mobile communications, mobile phones, UMTS, DECT phones, transmission towers, WLAN, Wifi, Bluetooth, microwaves etc.

| | Entrance | Intermediate | Professional | | | Outdoor |
|--|----------|--------------|--------------|-----------|------------|--------------------|
| Connectors / Interface | HF-2025E | HF-4040 | HF-6060V4 | HF-6080V4 | HF-60100V4 | HF-XFR |
| USB 1.1/2.0 | ✓ | ✓ | ✓ | ✓ | ✓ | 2x |
| Audio output (2,5mm jack) | ✓ | ✓ | ✓ | ✓ | ✓ | 3,5mm jack |
| Charger plug (max. 12V) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 50Ohm SMA input (f) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Jog Dial (easy usage of menu operation and volume control) | - | ✓ | ✓ | ✓ | ✓ | key & touchpad |
| 1/4" tripod connector | ✓ | ✓ | ✓ | ✓ | ✓ | in-Vehicle docking |
| Included In Delivery | | | | | | |
| Miniature SMA rod sniffer antenna | ✓ | ✓ | - | - | - | OmniLOG 90200 |
| HyperLOG EMC directional LogPer antenna (model) | 7025 | 7040 | 7060 | 6080 | 60100 | 60100 (black) |
| SPECTRAN 1300mAh rechargeable battery (integrated) | ✓ | ✓ | ✓ | ✓ | ✓ | 6 cell battery |
| Battery charger and power supply incl. international adapter sit | ✓ | ✓ | ✓ | ✓ | ✓ | no adapter set |
| Aluminum carrying case with foam protection | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Detailed English manual (on CD) | ✓ | ✓ | ✓ | ✓ | ✓ | installed |
| Analyzer Software for MAC-OS, Linux and Windows (on CD) | ✓ | ✓ | ✓ | ✓ | ✓ | installed |
| SMA tool | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SMA adapter | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Available Options (extra charge) | | | | | | |
| Option 001 (1MB memory expansion) | - | ✓ | ✓ | ✓ | ✓ | harddisk |
| Option 002 (high accurate 0,5ppm TCXO timebase) | - | - | - | - | ✓ | installed |
| 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 | | | | | | |
| USB Cable (special EMC screened version) | ✓ | ✓ | ✓ | ✓ | ✓ | installed |
| 3000mAh Lithium Polymer (LiPo) Power-Battery | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Car Power Adapter (operate or charge via cigarette lighter) | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Outdoor Rubber Protection (perfect for outdoor usage) | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Pistol Grip / Miniature Tripod | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| 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) | - | - | ✓ | ✓ | ✓ | ✓ |
| Calibration Certificate | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Heavy Plastic Carrying Case | ✓ | ✓ | ✓ | ✓ | ✓ | - |

⁽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 01.07.2012. The 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 datas 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. V4 and XFR DANL @3,6009GHz. Maximum sensitivity of Rev.3 units: -90dBm @2,2GHz.

⁽²⁾ Standard: +20dBm. Only with optional 20dB attenuator +40dBm. Standard: 1kHz. Only with option 002 down to 200Hz.

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



HF-2025E



HF-4040



HF-6060 V4



HF-6080 V4



HF-60100 V4



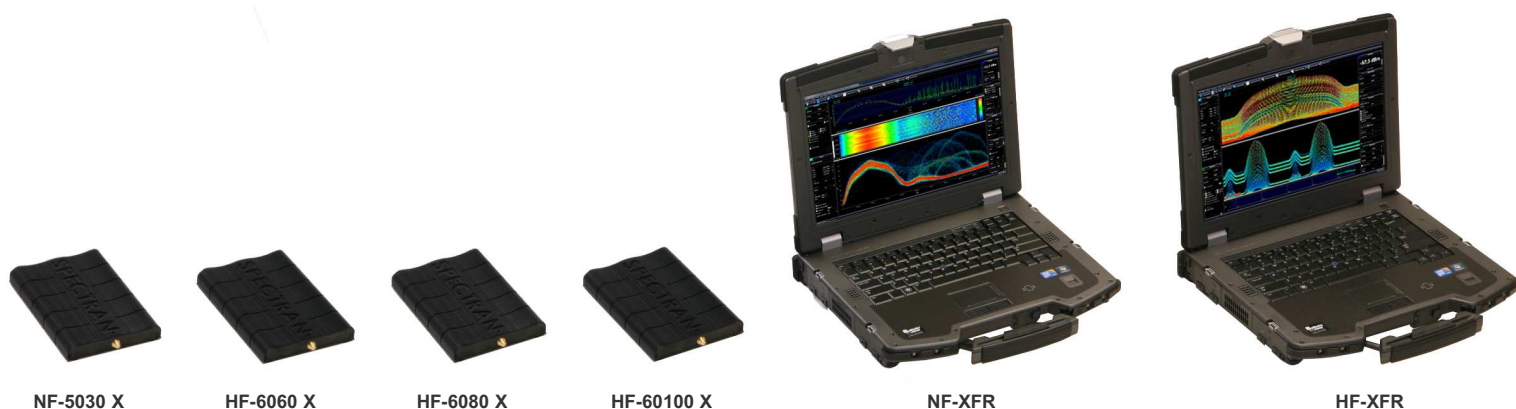
HF-XFR

SPECTRAN® USB Spectrum Analyser

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

| 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/m² (dBµV/m, W/cm² 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 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Please continue on next page



SPECTRAN® USB Spectrum Analyser

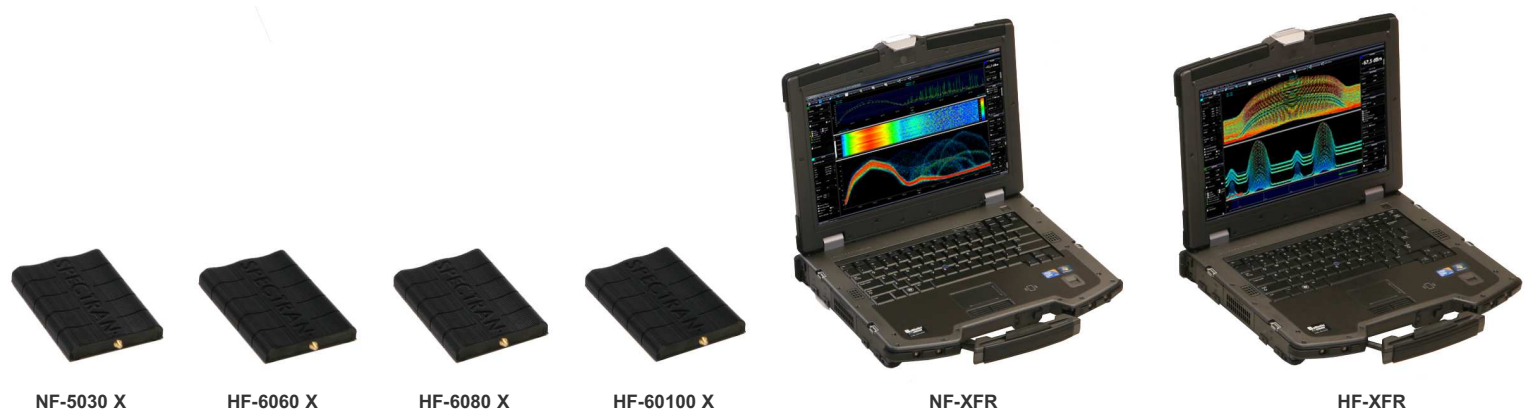
APPLICATION EXAMPLES: Pre-Compliance test, conductive EMC/EMI test, exposure limit measurement etc.

| 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 02.07.2012. The V4 and HF-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 datas 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 @3,6009GHz. 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.



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 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



DC-Blocker (SMA)

It prevents the RF-input of the SPECTRAN to be destroyed by the DC-voltages of f.e. DSL/ISDN lines.

Order/Art.-No.: 778



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



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



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



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



20dB SMA high-end Attenuator

Expands the measurement range to +40dBm. (ONLY SPECTRAN HF-60100 V4 and HF-XFR).

Order/Art.-No.: 775



Options for Spectran Spectrum Analyzers

OPTIONS **HF (RF)** SPECTRUM ANALYZER

Option 001: 1MB memory expansion *Order/Art.-No.: 180*

This memory expansion is a MUST-HAVE particularly when using the data logger, as the standard capacity can quickly become exhausted in this mode. The memory expansion provides space for more than 10,000 logs, while the standard memory will only accommodate approximately 100 of them. Standard memory size is 64K.

Option 020: 15dB low-noise preamplifier *Order/Art.-No.: 177*

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!

Option 002: 0.5ppm TCXO timebase *Order/Art.-No.: 181*

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.

Option 20x 2,5GHz / 4GHz / 6GHz / 8GHz / 10GHz Peak Power-Meter *Order/Art.-No.: 182-x*

A 2.5 to 10GHz peak power meter (5 versions depending on the SPECTRAN model, see price list). This option augments your SPECTRAN® with a power meter with up to 10GHz of bandwidth. Furthermore, it allows exact measurement of signal peaks with high crest factor like those occurring in WLAN technology, or extremely short signals, like RADAR bursts. What's more, measurement is performed in REAL TIME and BROADBAND, while at the same time being temperature-compensated. It is also an ideal solution for measurement of cable attenuation or receiver output. Depending on the actual frequency, the power meter provides a sensitivity of up to approx. -50dBm, while the maximum permissible level is +10dBm. By adding our 20dB attenuator (see price list), the maximum measurable signal level can be enhanced to +30dBm or +50dBm!

Option 022: 40dB low-noise preamplifier DC-1GHz *Order/Art.-No.: 177-2*

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!

OPTIONS **NF (EMF)** SPECTRUM ANALYZER

Option 001: 1MB memory expansion *Order/Art.-No.: 180*

Available for: NF-1010E, NF-3020, NF-5030.

This memory expansion is a MUST-HAVE particularly when using the data logger, as the standard capacity can quickly become exhausted in this mode. The memory expansion provides space for more than 10,000 logs, while the standard memory will only accommodate approximately 100 of them. Standard memory size is 64K.

Option 005: 12Bit Dual DDC frequency filter *Order/Art.-No.: 186*

Already installed in: NF-1010E, NF-3020, NF-5030, NF-5030X, NF-XFR

This cutting edge 12Bit DDC frequency filter allows extremely fast, crisp and accurate frequency filtering, while at the same time drastically enhancing the sensitivity. As an example, magnetic fields can (depending on their frequency) still be measured down to 1pT (0.001nT), compared to 0.1nT without the option.

Option 006: 3D sensor for static magnetic fields *Order/Art.-No.: 188*

Available for: NF-5030.

This top-grade geomagnetic field sensor provides the ability to conduct geophysical assessments and measurement of geomagnetic field anomalies. However, it can also be used to turn the instrument into a Gaussmeter, measuring the difference between field strengths (static fields) of permanent magnets. Thanks to its ISOTROPIC (3D) construction, measurements can be performed in all three spatial dimensions AT ONCE (or separately). Sensitivity is about 10nT-600µT.

Option 009: 24Bit resolution for 3D static magnetic field sensor *Order/Art.-No.: 178*

Available for: NF-5030.

Option 009 provides a significantly higher resolution for the optional 3D magnetic field sensor for measurement of static magnetic fields (option 006); it is ABSOLUTELY mandatory for geomagnetic surveys. The standard resolution of the NF-5030 WITHOUT option 009 is 14Bit.

Option 010: 30MHz frequency extension *Order/Art.-No.: 179-1*

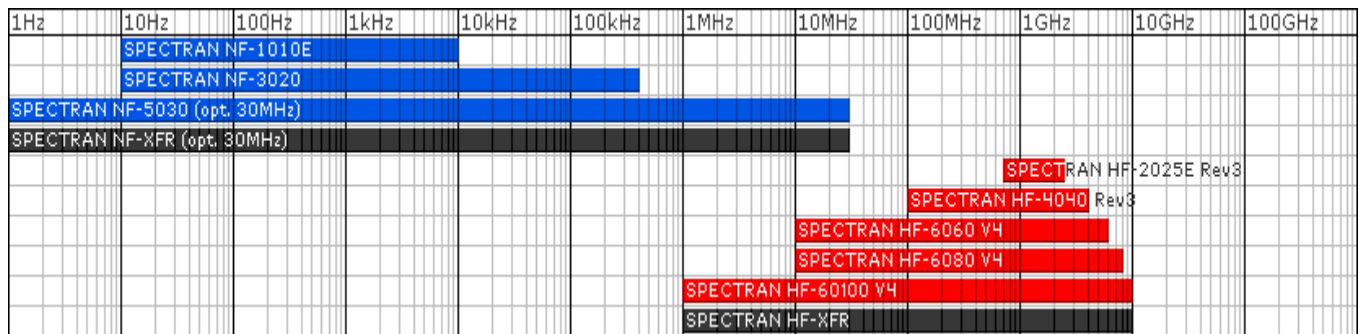
Available for: NF-5030, NF-5030X, NF-XFR.

Our 30MHz frequency extension extends the frequency range of the NF-5030 to the absolute maximum. The new frequency range is 1kHz - 30MHz. Amongst others, it even allows measurement of VDSL2. The higher clock frequency of the DDC provided by this option is a MUST HAVE for technicians and authorities needing ACCURATE assessment of signal sources of up to 30MHz.

The maximum frequency of the NF-5030 WITHOUT option 010 is 1MHz.

Frequency overview Analyzer & Antennas

Frequency Overview SPECTRAN Spectrum Analyzer



Frequency Overview HyperLOG and BicoLOG Antennas and Probes

