SPECTRAN® EMF Spectrum Analyzer

APPLICATION EXAMPLES: Measurement of traction power, high-voltage lines, power cables, lamps, power supplies, transformer stations, various appliances in home and office

SPECIFICATIONS base unit*	NOVICE		INTERMEDIATE		PROFESSIONAL		Outdoor
	NF-1010*	NF-1010E*	NF-3010*	NF-3020*	NF-5010*	NF-5030*	NF-XFR
Frequency range Min	10Hz	10Hz	10Hz	10Hz	**1Hz**	**1Hz**	**1Hz**
Frequency range Max	2kHz	10kHz	100kHz	400kHz	**1MHz**	**30MHz****	**20MHz**
Range electrical field **[V/m]** (typical) Min (1D)	1V/m	1V/m	0,1V/m	0,1V/m	0,1V/m	0,1V/m	-
Range electrical field **[V/m]** (typical) Max (1D)	2.000V/m	2.000V/m	5.000V/m	5.000V/m	5.000V/m	**20kV/m**	-
Range magnetic field **[Tesla]** (typical) Min (3D!)	10nT	10nT	1nT	1nT	1nT	**1pT****	-
Range magnetic field **[Tesla]** (typical) Max (3D!)	100µT	100µT	100µT	100µT	100µT	**2mT**	-
Range magnetic field **[Gauss]** (typical) Min (3D!)	100µG	100µG	10µG	10µG	10µG	**10nG****	-
Range magnetic field **[Gauss]** (typical) Max (3D!)	1G	1G	1G	1G	1G	**20G**	-
Range Analog input (typical) Min	-	-	-	2µV	2µV	**200nV**	**200nV**
Range Analog input (typical) Max	-	-	-	200mV	200mV	200mV	200mV
Filter bandwidth Min	5Hz	5Hz	1Hz	1Hz	1Hz	1Hz	1Hz
Filter bandwidth Max	10kHz	100kHz	300kHz	300kHz	**1MHz**	**1MHz**	**1MHz**
Accuracy Base unit (typical)	5%	5%	5%	5%	3%	3%	3%
FFT (Resolution in points)	64	64	64	64	1024	1024	1024
Vector power measurement (I/Q) and **True RMS**	-	-	✓	✓	✓	✓	✓
FEATURES							
Standards conformant exp. limits (ICNIRP, BGV B11, BImSchV etc.)	-	✓	✓	✓	✓	✓	-
Extended full **ICNIRP range**	-	-	-	-	-	✓	-
Isotropic (3D) AC magnetic field measurement	✓	✓	✓	✓	✓	✓	-
Supports custom P-Code software	-	-	✓	✓	✓	✓	✓
ADVANCED HOLD mode (HOLD function)	-	✓	✓	✓	✓	✓	✓
INTERNAL data logger (long-term measurements)	-	-	✓	✓	✓	✓	64GB
FLASH memory including firmware update (over the Internet)	-	16k	64k	64k	64k	64k	✓
“Clear text” signal identification with direct frequency display		✓	✓	✓	✓	✓	✓
Integrated battery charging circuitry	-	✓	✓	✓	✓	✓	✓
Internal speaker	Piezo	Piezo	✓	✓	✓	✓	✓
Audio demodulation	AM	AM	AM	AM	AM&FM	AM&FM	-
DISPLAY							
Fast FFT or DFT spectrum analysis	-	✓	✓	✓	✓	✓	✓
Limit calculation with simultaneous percentage display	✓	✓	✓	✓	✓	✓	-
X, Y, Z Axis display or Vectorproduct (only M.-Field)	-	✓	✓	✓	✓	✓	-
Main display in V/m, Tesla, Gauss or A/m (switchable)	-	✓	✓	✓	✓	✓	V / dBµV
High-resolution 50 segment bargraph (trend display)	✓	✓	✓	✓	✓	✓	14” Display
3fold marker display (ex. 3x field strength & frequency at once)	-	✓	✓	✓	✓	✓	10fold
INTERFACES / CONNECTORS							
Fast USB 2.0 interface (computer connection)	-	✓	✓	✓	✓	✓	2x
Audio output	✓	✓	✓	✓	✓	✓	-
DC input (max. 15V) for external power supply	✓	✓	✓	✓	✓	✓	✓
External ultra sensitive signal input (SMA input) with max. 0,2V	-	-	-	✓	✓	✓	✓
Jog Dial (Multi-functional dial) for "one-hand operation"	-	-	✓	✓	✓	✓	Key & Touchpad
OPTIONS (extra charge)							
Option 001 (1MB memory expansion)	-	-	-	-	✓	✓	**harddisk**
Option 005 (12Bit DDC / offers ultra high sensitivity up to 1pT)	-	-	-	-	-	✓	**inclusive**
Option 006 (Measure 3D static magnetic fields)*	-	-	-	-	-	✓	-
Option 009 (Ultra high 24Bit resolution on static magnetic fields)	-	-	-	-	-	✓	-
Option 010 (Expanded frequency range up to 30MHz e.g. RFID)	-	-	-	-	-	✓	**20MHz incl.**
INCLUDED ACCESSORIES in addition to the base unit							
Aaronia 7,2V high-performance battery (1300mAh) + charger	-	✓	✓	✓	✓	✓	6 cell battery
Aluminum design transport case incl. padding inlays	-	✓	✓	✓	✓	✓	-
PROFESSIONAL PC analysis software (Windows, downloadable)	-	✓	✓	✓	✓	✓	**installed**

*Preliminary specifications as of 03.04.2009. NF and XFR series are available with latest BETA-Firmware. ALL options are available for the NF series. The BETA firmware is in continuous 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 version 1.0 of the firmware is released, all functionality and features will be fully available.
Range and accuracy can change depending on frequency, sensor and used parameters. Precision values are based on Aaronia calibration-reference and only valid under specific test conditions. Unless otherwise stated, these specifications apply for the reference condition: ambient temperature 22±3°C, relative air humidity 40% to 60%, continuous wave signal (CW), RMS detection
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.
**Standard: 1MHz. Only with option 010 up to 30MHz. / Standard: 1nT. Only with option 005 up to 1pT.

SPECTRAN® HF Spectrum Analyser

APPLICATION EXAMPLES: Measurement of (active) radar, mobile communications, mobile phones, UMTS, DECT phones, transmission towers, WLan, Wifi, Bluetooth, microwave ovens, TETRA, etc.

SPECIFICATIONS base unit*	NOVICE	INTERMEDIATE		PROFESSIONAL			OUTDOOR
	HF-2025E	**HF-4040**	**HF-4060**	**HF-6060V4**	**HF-6080V4**	**HF-60100V4**	**HF-XFR**
Frequency range Min	700MHz	100MHz	100MHz	10MHz	10MHz	**1MHz**	**1MHz**
Frequency range Max	2,5GHz	4GHz	6GHz	6GHz	8GHz	**9,4GHz**	**9,4GHz**
Optional PEAK Power-Detector (Maximum usable frequency)***	2,5GHz	4GHz	6GHz	6GHz	8GHz	10GHz	-
AVG Noise Level (1Hz)	-80dBm	-90dBm	-90dBm	-135dBm	-145dBm	-155dBm	-
AVG Noise Level (1Hz) with PreAmp	-	-	-	-150dBm	-160dBm	**-170dBm**	**-170dBm**
Maximum Level	0dBm	0dBm	0dBm	+10dBm	+10dBm	**+40dBm****	**+40dBm****
Filter bandwith (RBW) Min	1MHz	100kHz	100kHz	10kHz	3kHz	**200Hz**	**200Hz**
Filter bandwith (RBW) Max	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz	50MHz
EMC-Filter (RBW) 9kHz, 120kHz, 5MHz; 20MHz; 40MHz	-	-	-	✓	✓	✓	✓
Accuracy Base unit (typical)	+/-4dB	+/-3dB	+/-3dB	+/-2dB	+/-2dB	+/-1dB	+/-1dB
Vector power measurement (I/Q) and True RMS	-	✓	✓	✓	✓	✓	✓
Lowest possible SampleTime	100mS	100mS	100mS	1mS	1mS	1mS	**1mS**
FEATURES							
14Bit Dual-ADC & DDC-Hardware-Filter	-	-	-	✓	✓	✓	✓
Standards-conformant exposure limits (ICNIRP, BGV B11, BImSchV etc.)	✓	✓	✓	✓	✓	✓	✓
Extended full **ICNIRP range**	-	-	-	-	-	✓	✓
Fast ZERO-SPAN sweep	-	✓	✓	✓	✓	✓	✓
PULS mode	✓	✓	✓	✓	✓	✓	✓
ADVANCED HOLD mode (HOLD function)	-	✓	✓	✓	✓	✓	✓
INTERNAL Data Logger (long-term measurements)	-	✓	✓	✓	✓	✓	64GB
TIME-SLOT-ANALYZER	✓	✓	✓	✓	✓	✓	✓
Internal speaker	Piezo	✓	✓	✓	✓	✓	✓
Configurable antenna and cable calibration data	-	✓	✓	✓	✓	✓	✓
Audio demodulation	AM	AM&**FM**	AM&**FM**	AM&**FM**	AM&**FM**	AM&**FM**	-
DISPLAY							
DIRECT RF spectrum display	✓	✓	✓	✓	✓	✓	✓
Exposure limits display with simultaneous percentage display	✓	✓	✓	✓	✓	✓	✓
Main display in dBm, V/m, A/m or dBµV (switchable)	✓	✓	✓	✓	✓	✓	simultaneous
ADDITIONAL display in W/m² with AUTORANGE (pW, µW etc.)	✓	✓	✓	✓	✓	✓	simultaneous
Hochauflösender 50-Segment Bargraph (Trendanzeige)	✓	✓	✓	✓	✓	✓	14” Display
3fach Markeranzeige (z.B. 3xLeistung & Frequenz gleichzeitig)	✓	✓	✓	✓	✓	✓	10fold
INTERFACES / CONNECTORS							
Fast USB 2.0 Interface (PC connection)	✓	✓	✓	✓	✓	✓	2x
Audio output (2,5mm MONO)	✓	✓	✓	✓	✓	✓	-
DC input (max. 15V) for external power supply	✓	✓	✓	✓	✓	✓	✓
50 Ohm SMA RF input (F)	✓	✓	✓	✓	✓	✓	✓
Jog Dial (multi-function dial) for “one-hand operation”	✓	✓	✓	✓	✓	✓	key & touchpad
OPTIONS (extra charge)							
Option 001 (1MB memory expansion)	-	-	✓	✓	✓	✓	harddisk
Option 002 (high sensitive 0,5ppm TCXO timebase)	-	-	-	-	-	✓	**inclusive**
Option 020 (internal, switchable 15dB PreAmplifier)	-	-	-	✓	✓	✓	**inclusive**
Option 20x (REALTIME broad band Power-Meter)	2,5GHz	4GHz	6GHz	6GHz	8GHz	10GHz	-
INCLUDED ACCESSORIES in addition to the base unit							
Miniature SMA rod antenna	✓	✓	✓	-	-	-	Omnilog 90200
HyperLOG EMC directional LogPer antenna (model)	**7025**	**7040**	**7060**	**7060**	**6080**	**60100**	**60100 (black)**
Aaronia 7,2V high-performance battery (1300mAh) + charger	✓	✓	✓	✓	✓	✓	6 cell battery
Aluminum design transport case	✓	✓	✓	✓	✓	✓	-
PC analysis software (Windows, downloadable)	✓	✓	✓	✓	✓	✓	**installed**

*Further REALTIME spectrum analysers up to 18GHz are already in development. Please contact us for further details!
Preliminary specifications as of 05.03.2009. The V4 and XFR series are available with latest Beta-Firmware. All options are available for the V4 series too. The Beta-Firmware is in continuous 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, antenna and used parameters. Precision values are based on Aaronia calibration-reference under specific test conditions. Unless otherwise stated, these specifications apply for the reference condition: ambient temperature 22±3°C, relative air humidity 40% to 60%, continuous wave signal (CW), RMS detection. V4 and XFR Noise Level @5,555GHz. Maximum sensitivity of Rev.3 units: -90dBm @2,2GHz.
** Internal: +20dBm. External (with optional 20dB precision attenuator): +40dBm
*** Depending on frequency the optional PEAK power meter offers sensetivity up to -50dBm and max. +10dBm input power with an extremely fast response time.

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 accomodate 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 TXCO 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 below). 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 occuring 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 EMF / NF SPECTRUM ANALYZER

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

Available for: NF-5010, 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 accomodate approximately 100 of them.
Standard memory size is 64K.

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

Available for: NF-5030 (integrated in the 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 005 is therefore a MUST-HAVE for professional measurement, especially considering its attractive price.

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 spacial dimensions AT ONCE (or seperately).
Sensitivity is about 10nT-600µT.

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

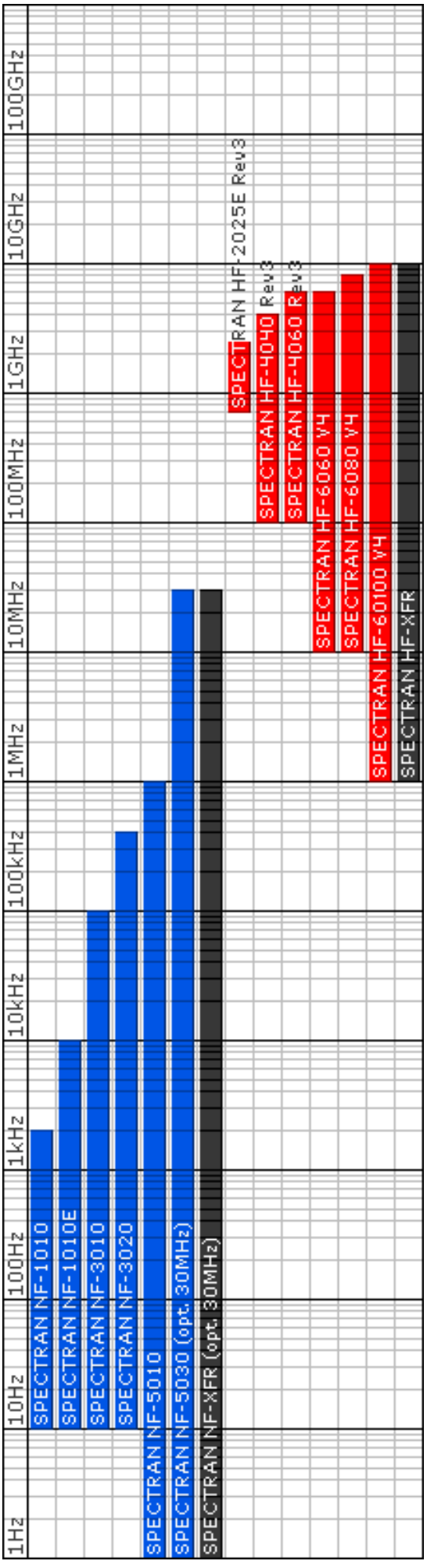
Available for: NF-5030.
Option 009 provides a significantly higher resolution for the optional 3D magnetic field sensor for measurement of static magnetic fields (option 006); it is ABSOLUTELY mandatory for geomagnetic surveys. The standard resolution of the NF-5030 WITHOUT option 009 is 14Bit.

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

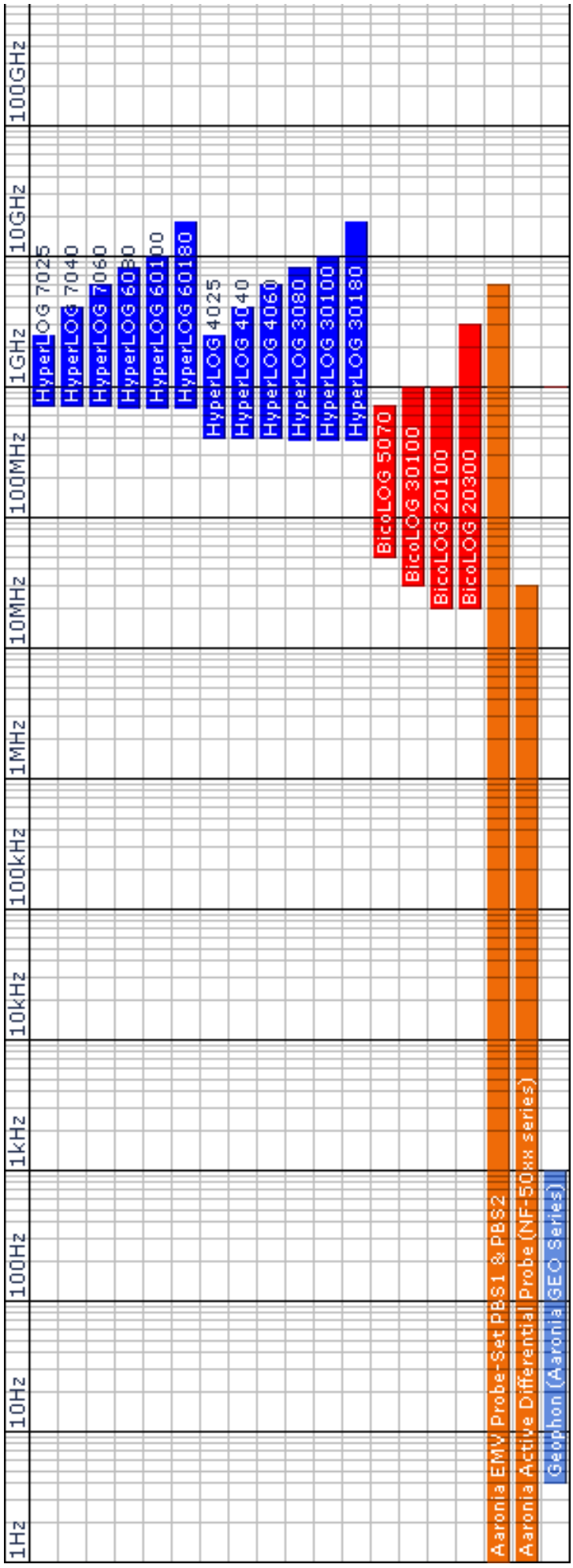
Available for: NF-5030.
Our 30MHz frequency extension extends the frequency range of the NF-5030 to the absolute maximum. The new frequency range is 1kHz - 30MHz. Amongst others, it even allows measurement of VDSL2. The higher clock frequency of the DDC provided by this option is a MUST HAVE for technicians 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 SIECTRAN Spectrum Analyzer



Frequency Overview HyperLOG and BicoLOG Antennas and Probes



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