

Rev 2.0  
19.07.2012

# Military Outdoor Spectrum Analyzer SPECTRAN® NF-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, MCS-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



Made in Germany



# Technical details

## Notebook (based on Dell Latitude E6420XFR)

- ◆ Processor: Intel Core i7-2640M (2,80GHz, 4MB cache) nVidia Quadro NVS 4200M, 512MB DDR3 with express-card and Fingerprint Reader
- ◆ 14inch High Definition (1366X768) wide-aspect transmissive display with DirectVue™ technology for outdoor readability
- ◆ Memory: 4096MB (2x2048) 1333MHz DDR2 Dual Channel
- ◆ Primary Storage: 128GB 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 7 SP1 Professional (64 Bit OS)  
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 NF-5030)

- ◆ Frequency range: 1Hz -20MHz\*
- ◆ Typ. accuracy: 3%\*\*
- ◆ **65 MSPS** (Option 005)
- ◆ Lots of options
- ◆ NEW: 30MHz Option
- ◆ Typ. level range DDC Analog in: **200nV** to 200mV / -150dBm (Hz)
- ◆ Superfast FFT spectrum analysis
- ◆ High-performance DSP (Digital Signal Processor)
- ◆ Frequency and signal strength display!
- ◆ High-resolution multi-function display
- ◆ True RMS signal strength measurement
- ◆ Average (AVG) measurement
- ◆ Internal data logger
- ◆ Internet Flash Software-Updates

## Application examples SPECTRAN® NF-XFR Spectrum Analyzer

### Analysis and measurement of:

- ◆ traction power
- ◆ power lines
- ◆ power cables
- ◆ lamps
- ◆ power supplies
- ◆ transformer
- ◆ DSL
- ◆ ADSL
- ◆ VDSL
- ◆ various home appliances, industry and office up to 30MHz

# Description



## Real World Rugged

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

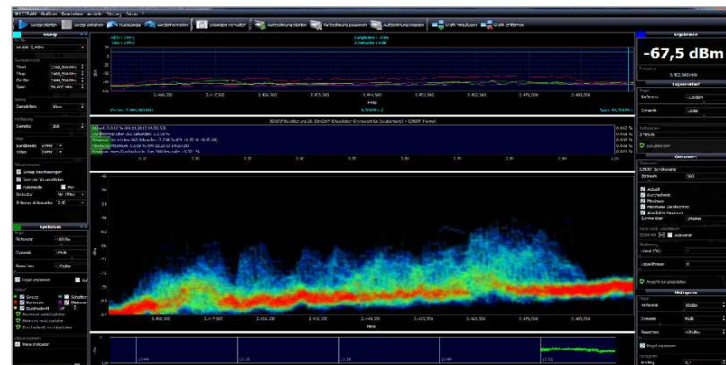
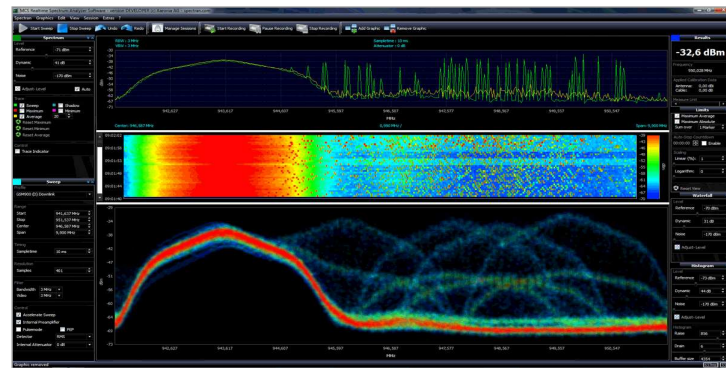
Key rugged features include:

- ◆ The exclusive Ballistic Armor Protection System featuring PR481™ chassis material provides twice the impact strength versus traditional magnesium alloy.
- ◆ The SPECTRAN NF-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.

## Software Highlights

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

- ◆ Works on all important operating systems like Windows, MAC OS and Linux
- ◆ Multi-Device capable, remote control function of several 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 Tesla, Gauss etc. with powerful autorange
- ◆ and many more features that are constantly evolving...



## Inspired Design

SPECTRAN NF-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" 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™i7 Processor.

The SPECTRAN NF-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™i7 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 NF-XFR Outdoor Spectrum Analyzer
- ◆ SMA-Tool
- ◆ Battery
- ◆ Battery charger
- ◆ Detailed english manual



The SPECTRAN NF-XFR was built for tough environments

# SPECTRAN® USB Spectrum Analyser

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

Specifications basic unit <sup>(1)</sup>	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 <sup>(2)</sup>	9,4GHz
Optional PEAK Power-Detector (Maximum usable frequency) <sup>(3)</sup>	-	6GHz	8GHz	10GHz	-	10GHz
DANL (Displayed Average Noise Level) <sup>(2)</sup>	200nV	-135dBm(1Hz)	-145dBm(1Hz)	-155dBm(1Hz)	200nV	-155dBm(1Hz)
DANL (Displayed Average Noise Level) with Preamp (Option 020) <sup>(2)</sup>	-	-150dBm(1Hz)	-160dBm(1Hz)	-170dBm(1Hz)	-	-170dBm(1Hz)
Max. Power at RF input	2V <sup>(2)</sup>	+10dBm	+10dBm	+40dBm <sup>(2)</sup>	2V <sup>(2)</sup>	+40dBm <sup>(2)</sup>
RBW (Resolution bandwidth) (min)	0,3Hz	10kHz	3kHz	200Hz <sup>(2)</sup>	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 <sup>2</sup> (dBµV/m, W/cm <sup>2</sup> 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
<b>Highlights</b>						
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



NF-5030 X

HF-6060 X

HF-6080 X

HF-60100 X

NF-XFR

HF-XFR

	NF-5030 X	HF-6060V4 X	HF-6080V4 X	HF-60100V4 X	NF-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**

		✓	✓	✓	-	
					✓	✓
	✓	✓	✓	✓	no adapter set	
	✓	✓	✓	✓	-	
	✓	✓	✓	✓	installed	
	✓	✓	✓	✓	installed	
	✓	✓	✓	✓	-	✓
		✓	✓	✓	✓	✓
		✓	✓	✓	installed	

**Available Options (extra charge)**

<b>Option 002</b> (high accurate 0,5ppm TCXO timebase)	-	-	-	✓	-	installed
<b>Option 005</b> (12Bit DDC for ultra high sensitivity)	✓	-	-	-	installed	-
<b>Option 008</b> (20MHz frequency expansion. New range: 1Hz-20MHz)	✓	-	-	-	installed	-
<b>Option 010</b> (30MHz frequency expansion. New range: 1kHz-30MHz)	✓	-	-	-	✓	-
<b>Option 020</b> (15dB internal low noise preamplifier, switchable)	-	✓	✓	✓	-	installed
<b>Option 20x</b> (Real-time Broadband Peak Power Meter)	-	✓	✓	✓	-	✓
<b>Option UBBV1</b> (40dB external preamplifier 1MHz-1GHz)	-	✓	✓	✓	-	✓
<b>Option UBBV2</b> (40dB external preamplifier DC-8GHz)	✓	✓	✓	✓	✓	✓

**Optional Accessories**

20dB Attenuator (expands the measurement range by 20dB)	-				✓	
					✓	
					✓	
					✓	
					✓	
					✓	
5m or 10m low loss SMA cable					-	
					-	

**Calibration Certificate**

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

# Frequency overview Analyzer & Antennas

## Frequency Overview SPECTRAN Spectrum Analyzer

1Hz	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz	10MHz	100MHz	1GHz	10GHz	100GHz
	SPECTRAN NF-1010E										
	SPECTRAN NF-3020										
	SPECTRAN NF-5030 (opt. 30MHz)										
	SPECTRAN NF-XFR (opt. 30MHz)										
									SPECTRAN HF-2025E Rev3		
									SPECTRAN HF-4040 Rev3		
									SPECTRAN HF-4060 Rev3		
									SPECTRAN HF-6060 V4		
									SPECTRAN HF-6080 V4		
									SPECTRAN HF-60100 V4		
									SPECTRAN HF-XFR		

## Frequency Overview HyperLOG and BicoLOG Antennas and Probes

1Hz	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz	10MHz	100MHz	1GHz	10GHz	100GHz	
									HyperLOG 7025			
									HyperLOG 7025 X			
									HyperLOG 7040			
									HyperLOG 7040 X			
									HyperLOG 7060			
									HyperLOG 7060 X			
									HyperLOG 6030			
									HyperLOG 6030 X			
									HyperLOG 60100			
									HyperLOG 60180			
									HyperLOG 4025			
									HyperLOG 4025 X			
									HyperLOG 4040			
									HyperLOG 4040 X			
									HyperLOG 4060			
									HyperLOG 4060 X			
									HyperLOG 3080			
									HyperLOG 3080 X			
									HyperLOG 30100			
									HyperLOG 30180			
									HyperLOG 20300 EMI			
									HyperLOG 20600 EMI			
									OmniLOG90200			
									BicoLOG 5070			
									BicoLOG 30100			
									BicoLOG 30100E			
									BicoLOG 20100			
									BicoLOG 20100E			
									BicoLOG 20300			
									Aaronia EMV Probe-Set PBS1 & PBS2			
									Aaronia Active Differential Probe (NF-50xx series)			
									Geophon (Aaronia GEO Series)			
subHz	ELF	SLF	ULF	VLF	LF	MF	HF	VHF	UHF	SHF	EHF	THF

# References

## User of Aeronia Antennas and Spectrum Analyzers (Examples)

### Government, Military, Aeronautic, Astronautic

- ◆ NATO, Belgium
- ◆ Boeing, USA
- ◆ Airbus, Germany
- ◆ Bund (Bundeswehr), Germany
- ◆ Bundeswehr (Technische Aufklärung), Germany
- ◆ Lufthansa, Germany
- ◆ DLR (Deutsches Zentrum für Luft- und Raumfahrt, Germany)
- ◆ Eurocontrol (Flugüberwachung), Belgium
- ◆ Australian Government Department of Defence, Australia
- ◆ EADS (European Aeronautic Defence & Space Company) GmbH, Germany
- ◆ Institut für Luft- und Raumfahrtmedizin, Germany
- ◆ Deutscher Wetterdienst, Germany
- ◆ Polizeipräsidium, Germany
- ◆ Landesamt für Umweltschutz Sachsen-Anhalt, Germany
- ◆ Zentrale Polizeitechnische Dienste, Germany
- ◆ Bundesamt für Verfassungsschutz, Germany
- ◆ BEV (Bundesamt für Eich- und Vermessungswesen)

### Research/Development, Science and Universitys

- ◆ Deutsches Forschungszentrum für Künstliche Intelligenz, Germany
- ◆ University Freiburg, Germany
- ◆ Indonesien Institute of Sience, Indonesia
- ◆ Max-Planck-Institut für Polymerforschung, Germany
- ◆ Los Alamos National Labratory, USA
- ◆ University of Bahrain, Bahrain
- ◆ University of Florida, USA
- ◆ University Erlangen, Germany
- ◆ University Hannover, Germany
- ◆ University of Newcastle, United Kingdom
- ◆ University Strasbourg, France
- ◆ Universität Frankfurt, Germany
- ◆ University Munich, Germany
- ◆ Technical University Hamburg, Germany
- ◆ Max-Planck Institut für Radioastronomie, Germany
- ◆ Max-Planck-Institut für Quantenoptik, Germany
- ◆ Max-Planck-Institut für Kernphysik, Germany
- ◆ Max-Planck-Institut für Eisenforschung, Germany
- ◆ Forschungszentrum Karlsruhe, Germany

### Industry

- ◆ Shell Oil Company, USA
- ◆ ATI, USA
- ◆ Fedex, USA
- ◆ Walt Disney, Kalifornien, USA
- ◆ Agilent Technologies Co. Ltd., China
- ◆ Motorola, Brazil
- ◆ IBM, Switzerland
- ◆ Audi AG, Germany
- ◆ BMW, Germany
- ◆ Daimler Chrysler AG, Germany
- ◆ BASF, Germany
- ◆ Deutsche Bahn, Germany
- ◆ Deutsche Telekom, Germany
- ◆ Siemens AG, Germany
- ◆ Rohde & Schwarz, Germany
- ◆ Infineon, Austria
- ◆ Philips Technologie GmbH, Germany
- ◆ ThyssenKrupp, Germany
- ◆ EnBW, Germany
- ◆ RTL Television, Germany
- ◆ Pro Sieben – SAT 1, Germany
- ◆ Channel 6, United Kingdom
- ◆ WDR, Germany
- ◆ NDR, Germany
- ◆ SWR, Germany
- ◆ Bayerischer Rundfunk, Germany
- ◆ Carl-Zeiss-Jena GmbH, Germany
- ◆ Anritsu GmbH, Germany
- ◆ Hewlett Packard, Germany
- ◆ Robert Bosch GmbH, Germany
- ◆ Mercedes Benz, Austria
- ◆ EnBW Kernkraftwerk GmbH, Germany
- ◆ AMD, Germany
- ◆ Infineon Technologies, Germany
- ◆ Intel GmbH, Germany
- ◆ Philips Semiconductors, Germany
- ◆ Hyundai Europe, Germany
- ◆ Saarschmiede GmbH, Germany
- ◆ Wilkinson Sword, Germany
- ◆ IBM Deutschland, Germany
- ◆ Vattenfall, Germany
- ◆ Fraport, Germany

# 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)1782 645 190, Fax ++44(0)870-8700001  
Email: sales@aaronia.co.uk  
URL: www.aaronia.co.uk



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



**Aaronia North China**, Beijing Mesh Communication  
Tech Co. Ltd., No. 2 Huayuan Road, Building 2,  
Haidian District, 100191 Beijing, China  
Phone ++86 10 822 37 606, Fax ++86 10 822 37 609  
Email: sales@bjmesh.com  
URL: www.bjmesh.com.cn



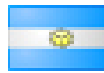
**Aaronia South China**, Shenzhen TORI Wisdom  
Technology Co., Ltd, 3BRM, RD FL Luhua Technology  
Bldg, Guangxia Road 7, Futian, 518049 Shenzhen, China  
Phone ++86 755 888 580 86, Fax +86 755 830 73 418  
Email: mail@aaronia-china.com  
URL: www.aaronia-china.com



**EgeRate Elektronik Muh. ve Tic. Ltd. Sti.**,  
Perpa Ticaret Merkezi, A Blok Kat: 5 No: 141,  
Sisli / Istanbul, Turkey  
Phone ++90 212 220 3483, Fax ++90 212 220 7635  
Email: info@egerate.com  
URL: www.egerate-store.com



**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 ++ 54 114 123 009 1, Fax ++54 114 372 324 4  
Email: info@aaronia-argentina.com.ar  
URL: www.aaronia-argentina.com.ar



**Mono Tech Ltd**, 2 Johanan Hasandlar St.  
44641 Kfar-Sava, Israel  
Phone ++972 72 2500 290, Fax ++972 9 7654 264  
Email: kobi@aaronia.co.il  
URL: www.aaronia.co.il



**Tagor Electronic doo**  
Tihomira Brankovica 21  
18000 Nis, Serbia  
Phone ++381 18 575 545, Fax ++381 18 217 125  
Email: miodrag.stojilkovic@tagor.rs  
URL: www.tagor-instrumenti.rs



**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



**VECTOR Technologies Ltd**, 40 Diogenous str., 15234  
Halandri, Greece  
Phone ++30 210 685 8008, Fax ++30 210 6858 8118  
Email: info@vectortechnologies.gr  
URL: www.vectortechnologies.gr



Made in Germany

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

**Spectran®** **HyperLOG®** **BicoLOG®** **OmniLOG®** **Aaronia-Shield®** **Aaronia X-Dream®** **MagnoShield®** **IsoLOG®**

are registered trademarks of Aaronia AG