

Rev 1.3 / Beta
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REAL-TIME Outdoor Spectrum Analyzer SPECTRAN® XFR V5 PRO (9kHz - 20GHz)

World's fastest Counter-surveillance Receiver

Highlights

- ◆ Fastest Counter-surveillance Receiver in the World, scans 20GHz in less than 20mS (1000GHz / sec.)
- ◆ Ultra robust real-time Outdoor Spectrum Analyzer (IP65, -20°C to +60°C)
- ◆ Real-time capture bandwidth up to 175MHz
- ◆ POI below 1µS
- ◆ Unlimited recording time (needs 1GB / min.)
- ◆ Wide measuring range up to 20GHz
- ◆ Samplerate/second: > 5 million
- ◆ 500 MSPS (14 Bit Dual 256MSPS I/Q)
- ◆ Up to 4TB ultra-fast SSD recording storage
- ◆ Optional I/Q Generator (6GHz) and Power Meter (40GHz)
- ◆ Extra large 15,6" Widescreen Display (Full HD, 1920x1080) with Multi-touch Screen, sunlight readable (800 Nits-QuadraClear)
- ◆ Intel i7 with 8GB RAM, nVidia Power
- ◆ Integrated GPS
- ◆ Includes World's first 3D real-time Spectrum monitoring and recording Software (gapless streaming and playback)

Applications

- ◆ Technical surveillance countermeasures (TSCM)
- ◆ Security surveys for eavesdropping detection
- ◆ Interference hunting
- ◆ Radio monitoring and enforcement
- ◆ Maintenance, installation and repair in the factory / field
- ◆ VIP monitoring
- ◆ Conference monitoring
- ◆ EMC/EMI testing
- ◆ Seeing weak signals masked by stronger ones
- ◆ Discovery of rare, short duration events
- ◆ Capturing spread-spectrum and frequency-hopping signals
- ◆ Investigating misuse of the crowded RF spectrum

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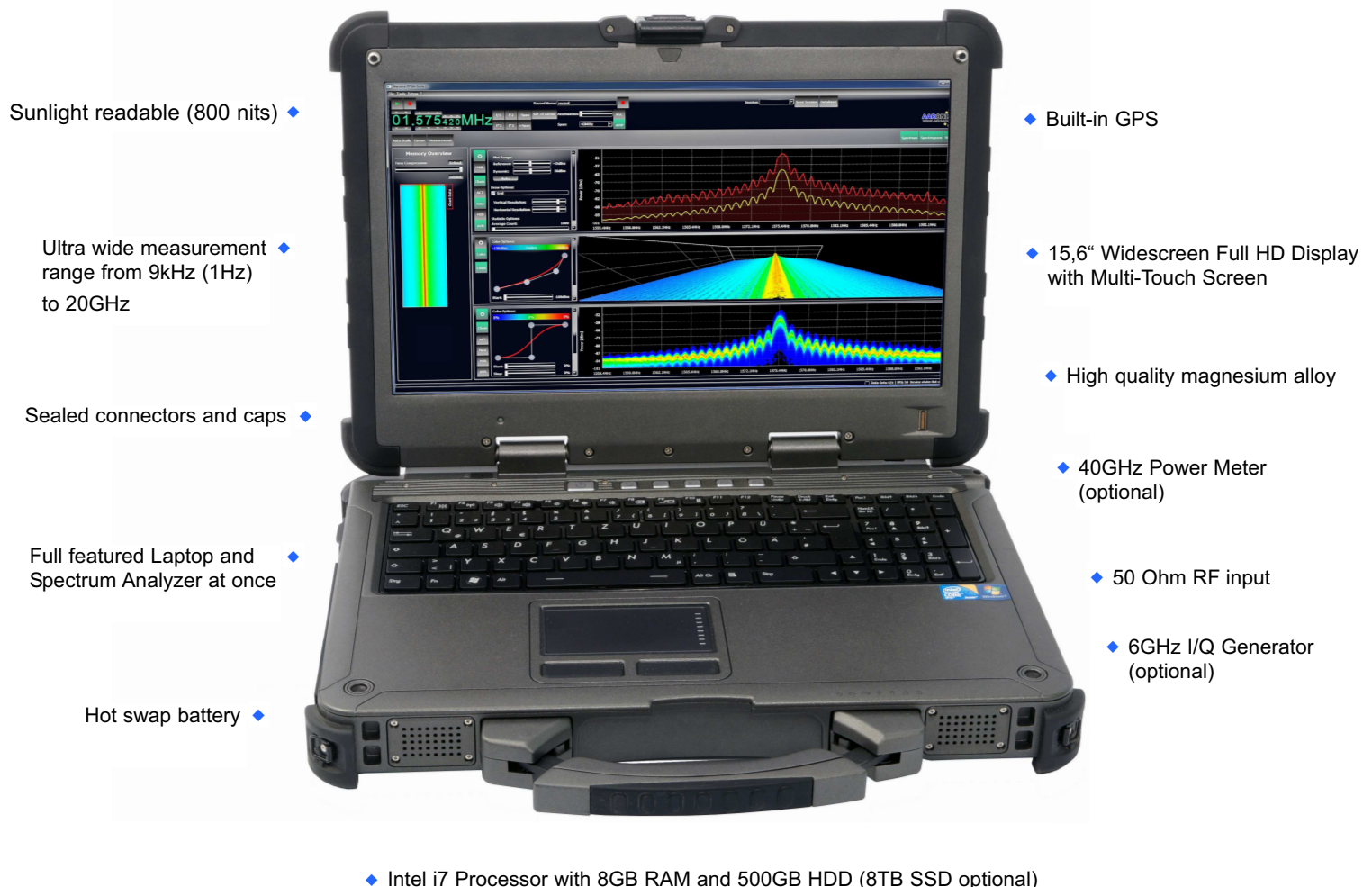
BUILT TO DETECT

The SPECTRAN XFR V5 PRO is a portable Real-Time Spectrum Analyzer, designed to capture even shortest signal transmissions. It's scanning speed and recording time is without competition, the Analyzer scans 20GHz in less than 20mS making it the world's fastest counter-surveillance receiver.

The easy to use software is suited for detecting unknown or illegal transmissions across a wide frequency range. With an unlimited recording time (needs approx. 1GB hard disk space per minute) the XFR V5 PRO allows to store several hours of real-time data. Once recorded the entire measurement data can be re-loaded into the software. The optional I/Q Generator allows to generate the recorded signals 1:1 up to 6GHz.

Several helpful features allow a deep investigation of the Real-Time measurement or recorded data, e.g. a 3D Spectrogram view which displays a signal like never seen before.

With this Spectrum Analyzer you can master all the challenges. It provides a powerful, extremely impact resistant Outdoor notebook and a high-end spectrum analyzer in one compact device. The XFR V5 PRO has been independently tested in accordance with MIL-STD-810G, IP65 and MIL-STD-461F.



RF measurement at the highest level

The XFR offers a huge variety of helpful functions for spectrum analysis

- ◆ Various trigger function and unlimited number of markers
- ◆ Different views: Spectrum / persistence Spectrum, Spectrogram / Waterfall, 3D Waterfall, Histogram
- ◆ Multi Window feature supports several views at the same time, e.g. Spectrum & Waterfall & Histogram at once
- ◆ Comfortable reference level and color settings
- ◆ Reporting and recording function
- ◆ Storage of personal sessions
- ◆ Unlimited storage of measurements, hard disk can be expanded up to 4TB for gapless recording of up to 50 hours

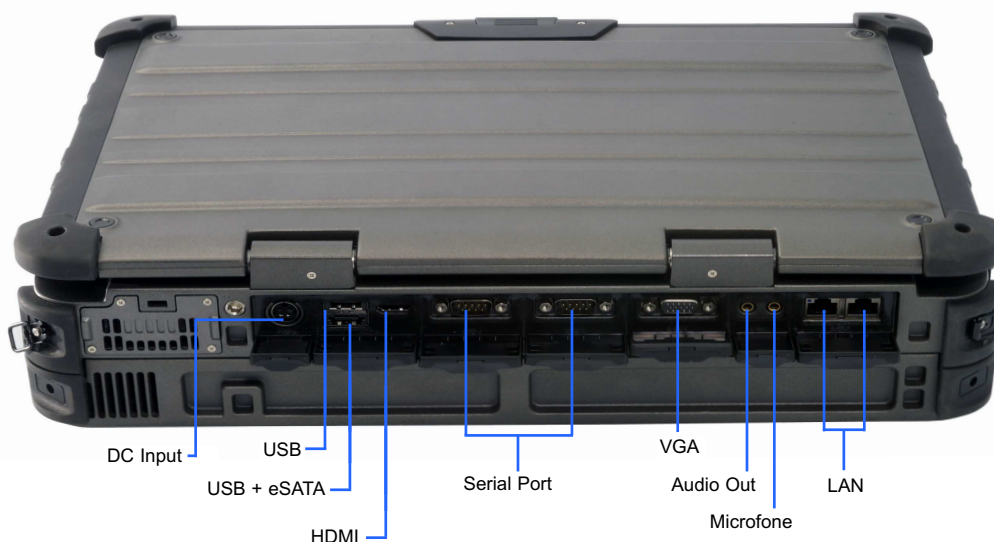
and much more ...



Unmatched Performance

The powerful and ultra-stable Spectrum Analyzer is the first outdoor Spectrum Analyser with an Intel® i7 processor with 8GB RAM, full HD multi touch-screen, integrated GPS and ultra-low noise level up to -170dBm (Hz) DANL (with pre-amps). The XFR V5 PRO is rugged and powerful at the same time.

- ◆ The thermal management system enables compliance with military standards for extreme temperatures. Simultaneously, the XFR V5 PRO offers industry-leading performance, thanks to the very latest Intel® i7 processors.
- ◆ The Turbo Boost feature increases the processor frequency to the active cores dynamically up to 3.33 GHz, and thus, the performance increase required for timely reaction to critical measurement data.
- ◆ With two USB 3.0 super-speed ports, two USB 2.0, a USB2.0/eSATA-combi-connector, two serial ports, two Ethernet ports and a VGA port - among other connections - offers the XFR V5 a variety of interfaces to connect to the desired peripheral.





Scope of delivery

The XFR comes including an extensive scope of delivery, depending on the necessity of the user the delivery can be extended to various additional products (see "Accessories" on Page 9).

- ◆ SPECTRAN XFR V5 PRO incl. Option 020 (internal 20dB preamp)
- ◆ OmniLOG 70600 omnidirectional antenna (700MHz to 6GHz)
- ◆ Pre-installed Spectrum Analysis Software RTSA Suite and MCS
- ◆ Rechargeable 8700mAh battery (installed, second hot-swap battery as option available)
- ◆ Battery charger / power supply (optional car charger available)
- ◆ English manual (on CD)

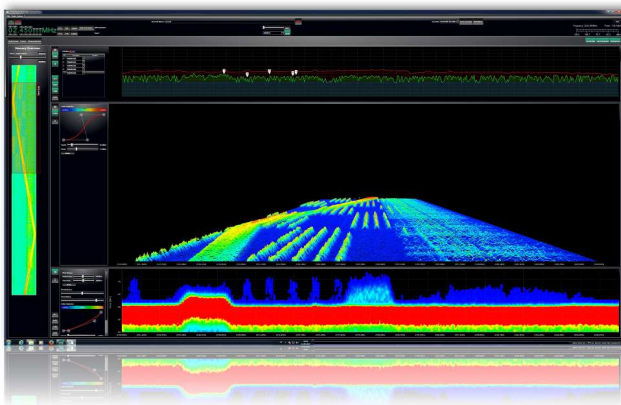
RTSA Suite

World's fastest Real-Time Analyzer Software included

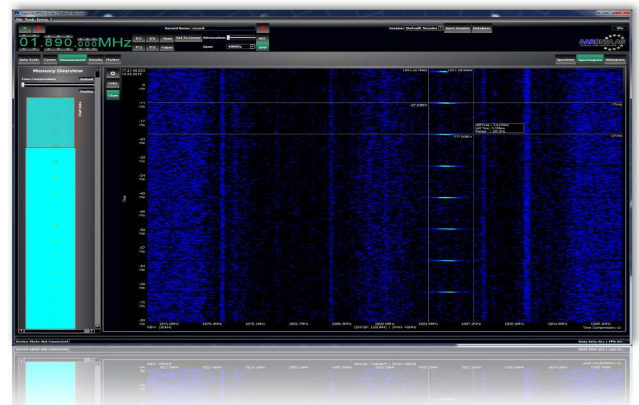
Aaronia's real-time Software „RTSA Suite“ offers powerful analysis features. An intuitive layout combined with useful display options helps to identify, capture, demodulate and track signals up to 20GHz.



- ◆ High-resolution persistence spectrum display of the current sweep, Average, Min / Max, peak, RMS, etc.
- ◆ Marker function with unlimited number of different markers (min, max, delta, AVG, OBW..)
- ◆ Intuitive drag and drop zoom, shortcuts etc.



- ◆ The XFR V5 PRO displays several views at once (Spectrum, 3D Waterfall, Histogram, etc.)
- ◆ The window size can be adjusted freely, therefore a full utilization of the FULL HD display is possible



- ◆ Spectrogram / Waterfall View for the identification of frequency hops, measurements of pulse rate, analysis of time variant spectra and the tuning of a VCO

Specification (RF / Performance)

Technical Data	SPECTRAN XFR V5 PRO
Frequency Range (min)	9kHz (optionally 1Hz)
Frequency Range (max)	20GHz
Real-Time Bandwidth	88MHz (optional 160/175MHz)
Minimum Event Duration for 100% POI	<1µS
Max. Power at RF input (50 Ohm)	+20dBm (+40dBm*)
Displayed Average Noise Level (internal pre-amp on)	typ. -150dBm/Hz
Displayed Average Noise Level (with external pre-amp)	max. -170dBm/Hz
Amplitude accuracy (typ.)	typ. +/- 1,5dB
RF input	50 Ohm (N-connector)
Frequency reference accuracy	0,5ppm (optional 5ppb with Option 002)
RBW (resolution bandwidth)	1Hz to 40MHz (in preparation)
VBW (video bandwidth)	1Hz to 40MHz (in preparation)
Demodulator	AM, FM
Measurement Units	dBm, dBµV, V/m, A/m, W/m ² , dBµV/m, W/cm ²
Detector	Min, Max, AVG, Peak, QPeak, special (in preparation)
Attenuator range	45dB (0,5dB steps, incl. pre-amp)
Traces	ACT, AVG, MAX, MIN
Reference range	-200dBm to 100dBm
Measurement modes	I/Q (in preparation), Power/Frequency Data
Views	Spectrum, Persistence Spectrum, Spectrogram / Waterfall, Histogram
Trigger	Cursor, Measurement, Density
Video RAM	64MB
SDRAM	256MB
ADC	500MSPS 14Bit
GPS	Inbuilt GPS
FPGA	240K ECP3
DSP	600MHz

* optionally available +33dBm, decreases sensitivity by 20dB, Article number 775-N

Specification (Hardware)

Technical Data	SPECTRAN XFR V5 PRO
CPU	Intel Haswell i7-4600M
RAM	8 GB
HDD	500GB, 7200RPM (optional SSD up to 8TB)
Operation System	Windows 7
Display	15,6" Full-HD 1080p with Multi-touch screen, sunlight readable (800 Nits Quadra-Clear)
Graphic Card	nVidia Geforce GT 745M DDR3
Battery	Intelligent lithium ion battery with 8700mAh (optional second battery, hot swap system)
Keypad	Membrane keyboard with integrated numeric keypad and LED backlight
Connectors	2x PCMCIA Type II, 1x ExpressCard/54, 1 x Smart Card Reader I/O interface: 2x Serial port (9-pin, D -Sub), 1x External VGA port (15-pin, D -Sub), 1x microphone, 1x audio output (mini-jack), 1x DC input, 2x USB 3.0, 2x USB 2.0, 1x USB 2.0 / eSATA combo, 2x LAN (RJ45), 1x HDMI, 1x docking connector (80 - pin)
Interfaces	10/100/1000 BASE -T Ethernet Intel Centrino Advanced-N 6200, 802.11 a/b/g/n, GPS module + Tri - Passthrough
Safety Features	Intel vPro technology, TPM1.2, fingerprint scanner, smart card reader, Kensington Lock
Certification	MIL -STD- 810G, IP65, MIL -STD- 461F, magnesium alloy casing, shock-proof removable hard disk
Temperature Range (Operation)	-20 °C to +60 °C
Temperature Range (Storage)	-40 °C to +71 °C
Dimensions	410 x 315 x 120mm
Weight	7,5 kg
Humidity	95% relative humidity, non-condensing
Power Supply	AC Input: 100-240V, 50-60Hz DC Output: 19V, 4,74A max.
Power Consumption	< 90W
Country of Origin	Germany
Recommended Calibration Interval	2 years

Options

Included in delivery

Option 020: Internal 20dB Low-Noise Pre-Amplifier

This option provides an internal, super low-noise 20dB Pre-Amplifier, enabling maximum performance particularly when measuring extremely weak signals. It is switched via a true RF switch.

Order/Art.-No.: 120

Available options (extra charge)

Option 003: Low Frequency Extension (starting at 1Hz) (in preparation, not activated yet)

Extension of the low frequency range to 1Hz. The input signal is internally diverted to a second RF- path, which is optimised for low frequency processing. The low frequency path offers a frequency range from 1Hz up to 40MHz. This path uses a high-performance 16Bit AD converter with 105MSPS. This resolution enhancement from 14Bit to 16Bit improves the dynamic range from 80dB (14Bit) to 100dB (16Bit), which leaves nothing to be desired. This path is a fully capable real-time function controllable by μ S DDS sweep. The low frequency path (1Hz-40MHz/16Bit) and the radio frequency path (9kHz-20GHz/14Bit) are seamless to the User, except for the particularly noteworthy improvement in the dynamic range.

Order/Art.-No.: 124

Option 001: Memory Expansion

Extension of the hard disk space from 500GB (standard) up to 4TB with superfast, shock resistant SSD technology.

Order/Art.-No.: 129 (1TB) - Order/Art.-No.: 129-2 (2TB) - Order/Art.-No.: 129-4 (4TB)

Option 002: 5ppb (0,005ppm) OCXO Timebase

This highly precise OCXO timebase, which has been especially developed for the SPECTRAN[®], offers significantly reduced phase noise (jitter). This will allow the use of far narrower filters, which will in turn vastly enhance sensitivity. To fully exploit the maximum sensitivity this option is indispensable! Furthermore, the OCXO timebase allows far more accurate frequency measurement and display.

Order/Art.-No.: 126

Option 004: Ultra Low Phase Noise

Order/Art.-No.: 123

Option 007: 6GHz Tracking / IQ DDS Generator (in preparation)

Order/Art.-No.: 125

Option 160: 160MHz / 175MHz Real-Time bandwidth

Extends the real-time Bandwidth from 88MHz to 160 or 175MHz.

175MHz is subject to export control law and not allowed to be imported in all countries, please contact us for details.

Order/Art.-No.: 119

Accessories

Backpack

High Quality Carrying Bag for XFR V5 PRO. Offers lots of space for all accessories and optional antennas.

Order/Art.-No.: 264



2nd Battery Pack (Hot Swap)

Additional 8700mAh battery. Expands the run-time of the Analyzer. Installed in addition to standard battery.

Order/Art.-No.: 263



DC Car Adapter

11-16V, 22-32V Car-Power-Adapter for Spectran XFR V5 PRO. For continuous operation of the Spectrum Analyzer in the car.

Order/Art.-No.: 264



HyperLOG Antennas (380MHz - 35GHz)

Directional, Ultra Broadband Antennas with extremely wide frequency range from 380MHz to 35GHz. High and constant gain of typ. 5dBi, with optional Laser, GPS, Compass and Pre-Amplifier.



External Pre-Amplifier

External Battery-Powered Pre-amplifier with full range of 1Hz to 30GHz & up to 40dB gain. Perfect to reach extremely high sensitivity up to -170dBm/Hz.



Near field probe set (DC to 9GHz)

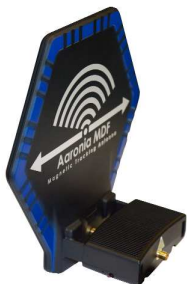
Passive or active Near-Field Probes PBS1 or PBS2. Consisting of 5 Probes (4xH-Field, 1xE-Field), 40dB Pre-amplifier (only PBS2). Perfect for EMC near field tests.

Order/Art.-No.: 720 / 721



MDF Antennas

Magnetic Tracking Antennas for the low frequency range of the Analyzer. Covers 9kHz to 400MHz. Active and Passive Antennas with high sensitivity.



OmniLOG 30800 (300MHz - 8GHz)

Omnidirectional Broadband Antenna with extremely wide frequency range from 300MHz to 8GHz. Small and lightweight.

Order/Art.-No.: 734



1m / 5m / 10m SMA-Cable

High quality special SMA cable for connecting any HyperLOG or MDF Antenna with the Analyzer. Available as 1m, 5m and 10m Cable. All versions: SMA plug (male) / SMA plug (male).



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



20dB Attenuator (DC -18GHz)

Expands the measurement range to +33dBm.

Order/Art.-No.: 775-N



References

Cross-Section of Aaronia Clients

Government, Military, Aeronautic, Astronautic

- ◆ NATO, Belgium
- ◆ Department of Defense, USA
- ◆ Department of Defense, Australia
- ◆ Airbus, Germany
- ◆ Boeing, USA
- ◆ Bundeswehr, Germany
- ◆ NASA, USA
- ◆ Lockheed Martin, USA
- ◆ Lufthansa, Germany
- ◆ DLR, Germany
- ◆ Eurocontrol, Belgium
- ◆ EADS, Germany
- ◆ DEA, USA
- ◆ FBI, USA
- ◆ BKA, Germany
- ◆ Federal Police, Germany
- ◆ Ministry of Defense, Netherlands

Research/Development, Science and Universities

- ◆ MIT - Physics Department, USA
- ◆ California State University, USA
- ◆ Indonesien Institute of Sience, Indonesia
- ◆ Los Alamos National Labratory, USA
- ◆ University of Bahrain, Bahrain
- ◆ University of Florida, USA
- ◆ University of Victoria, Canada
- ◆ University of Newcastle, United Kingdom
- ◆ University of Durham, United Kingdom
- ◆ University Strasbourg, France
- ◆ University of Sydney, Australia
- ◆ University of Athen, Greece
- ◆ University of Munich, Germany
- ◆ Technical University of Hamburg, Germany
- ◆ Max-Planck Institute for Radio Astronomy, Germany
- ◆ Max-Planck Institute for Quantum Optics, Germany
- ◆ Max-Planck-Institute for Nuclear Physics, Germany
- ◆ Max-Planck-Institute for Iron Research, Germany
- ◆ Research Centre Karlsruhe, Germany

Industry

- ◆ APPLE, USA
- ◆ IBM, Switzerland
- ◆ Intel, Germany
- ◆ Shell Oil Company, USA
- ◆ ATI, USA
- ◆ Microsoft, USA
- ◆ Motorola, Brazil
- ◆ Audi, Germany
- ◆ BMW, Germany
- ◆ Daimler, Germany
- ◆ Volkswagen, Germany
- ◆ BASF, Germany
- ◆ Siemens AG, Germany
- ◆ Rohde & Schwarz, Germany
- ◆ Infineon, Austria
- ◆ Philips, Germany
- ◆ ThyssenKrupp, Germany
- ◆ EnBW, Germany
- ◆ RTL Television, Germany
- ◆ Pro Sieben – SAT 1, Germany
- ◆ Channel 6, United Kingdom
- ◆ CNN, USA
- ◆ Duracell, USA
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- ◆ DEKRA, Germany
- ◆ AMD, Germany
- ◆ Keysight, China
- ◆ Infineon Technologies, Germany
- ◆ Philips Semiconductors, Germany
- ◆ Hyundai Europe, Germany
- ◆ JDSU, Korea
- ◆ IBM Deutschland, Germany
- ◆ Nokia-Siemens Networks, Germany



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