WAVECOM
NACHRICHTENTECHNIK

Wavecom Company and Products

by Wavecom Elektronik AG

Wavecom Company

- Wavecom Elektronik AG is founded in 1985. This year we celebrate the 30 years company establishment.
- Our company is a leading provider of high quality data decoders both in hardware and software.
- Our company is internationally established within this industry and maintains a longstanding, world-wide network of distributors and business partners.
- Our customers are mainly governmental institutions.
- The compliance to the Swiss Export Control Regulations is a part of our company policy.

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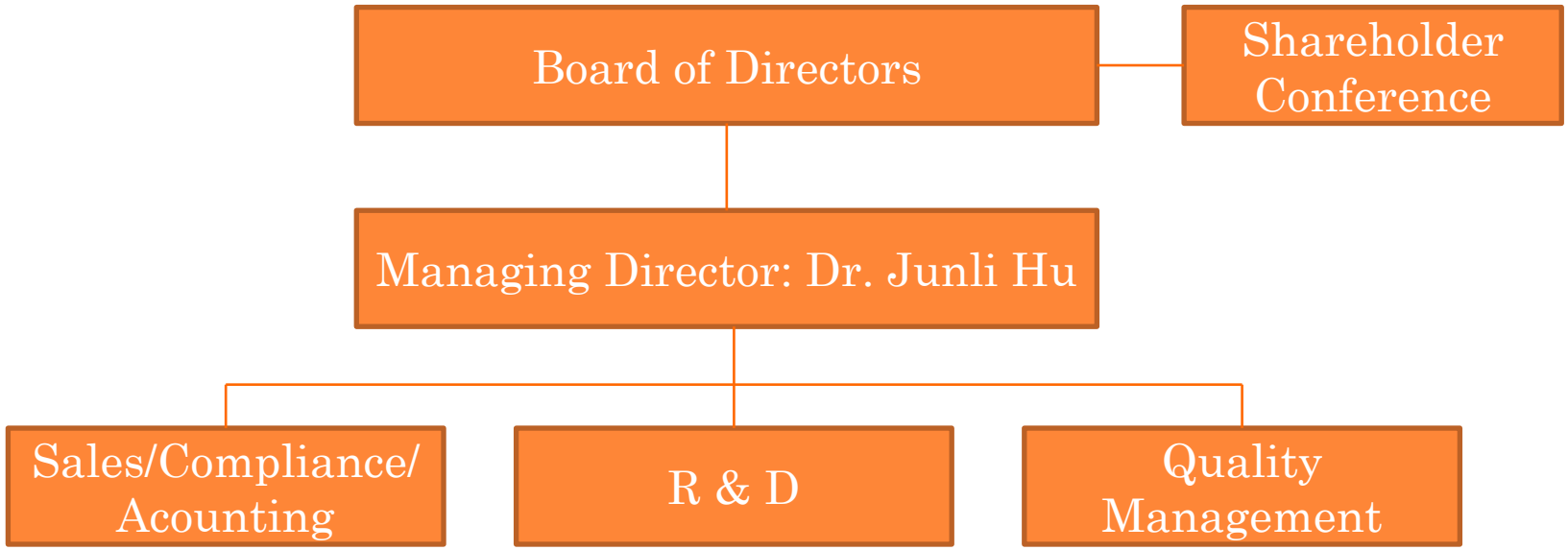
WAVECOM COMPANY

Wavecom Elektronik AG is a private, joint-stock company.



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Main Products

	Products	Classifier Option	Special Decoders
Hardware decoders and systems	• W74PC • W-PCI • W-PCIe • W-PCI-LAN • W-PCIe-LAN	• W-Classifier-NB • W-Classifier-WB	• W-Package HF • W-Package VHF/UHF • W-Package SAT • W-Package FAX & Modem
Standalone software decoder	• W-CODE	• W-Classifier-NB • W-Classifier-WB	
Complete automatic monitoring system	• W-SPECTRA	• W-Classifier-NB • W-Classifier-WB	
Supporting tools	• W-BitView • W-Sat-email-Decoder • W-SPEED		

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Main Products

- All hardware and software products are developed and manufactured in Switzerland
- Decoders (**W-CODE, W74PC, W-PCI, W-PCIe**) over the whole signal bands:
  - HF band > 115 decoders
  - VHF/UHF band > 40 decoders
  - Satellite band > 40 decoders
  - Fax and modem > 15 decoders
  - Latest product documents on www.wavecom.ch

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Main Products

- **Classifier** and Code Check options:

  - Classifier: Narrowband 8 kHz (for HF band) and Wideband 96 kHz (for V/UHF band)

  - Multiple signals in the bandwidth are classified at the same time.

  - Automatic decoder check (Classifier Code Check)
- Remote Decoding: W-CLOUD

  - Included in W74PC, W-PCIe, W-PCI and W-CODE.

  - Suitable to classify and decode signals at remote site.

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Main Products

- Complete Automatic Online Monitoring System: **W-SPECTRA**

  - Real-time (online) signal monitoring and decoding

  - Multiple frequency bands: HF and V/UHF

  - Built-in, direct receiver (SDR) control

  - Multi-band signal classification, code check and automatic recording into database

  - Wideband (2 MHz) IQ signal recording, with on-the-fly side information

  - Offline spectrum cut (in time and frequency domains), signal analysis and decoding: Spectra Editing (W-SPEED)

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Main Products

- Various supporting products
- High product quality and warranty: hardware two years warranty and software one year free update
- After sales services, technical support and training
- Competetive pricing

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Complete Automatic Monitoring System W-SPECTRA – I

W-SPECTRA is an independent system, suitable for long-time automatic online spectrum monitoring and recording.

- Covers HF and V/UHF bands.
- Direct receiver control (Winradio SDR G3xDDC).
- Three operation modes: **Direct Mode**, **Memory Scan** and **Frequency Search**.
- Automatic signal classification, code check and result is recorded (inserted) into database (XML format).
- Direct call a decoder (mode).

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Complete Automatic Monitoring System W-SPECTRA – II

- Wideband (2 MHz) spectrum display and signal recording (IQ, 16- and 32-bit).
- Narrowband (96 kHz) spectrum display and signal recording (IQ, 32-bit)
- Signal recording with various side information (Rx Freq, bandwidth and timestamp), allow complete and instantaneous information recover during playback.
- Playback recording, classification and decoding.

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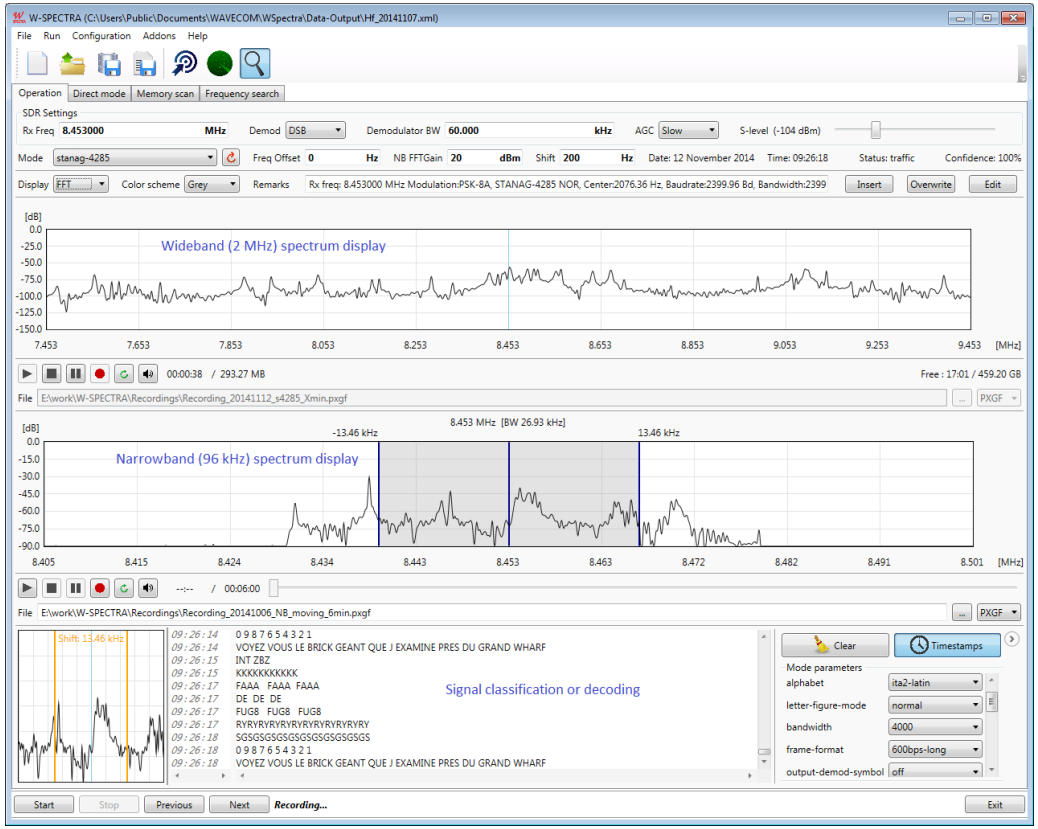
W-SPECTRA GUI – I

W-SPECTRA „Operation tab“.



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W-SPECTRA GUI – II

Operation tab covers all activities for three operation modes (Direct Mode, Memory Scan and Frequency Search).

- Direct receiver (SDR) control: set Rx frequency, demodulator/bandwidth, AGC and squelch etc.
- Choose a decoder mode, classifier and classifier code check.
- Result automatically stored in a database. Standard XML database format, easy for edit by external programs.
- Wideband (2 MHz) and narrowband (96 kHz) spectrum display and IQ signal recording and playback.
- Frequency fine tuning and decoder parameter setting.
- Four buttons (Start, Stop, Previous and Next) with different functionalities in three operation modes.

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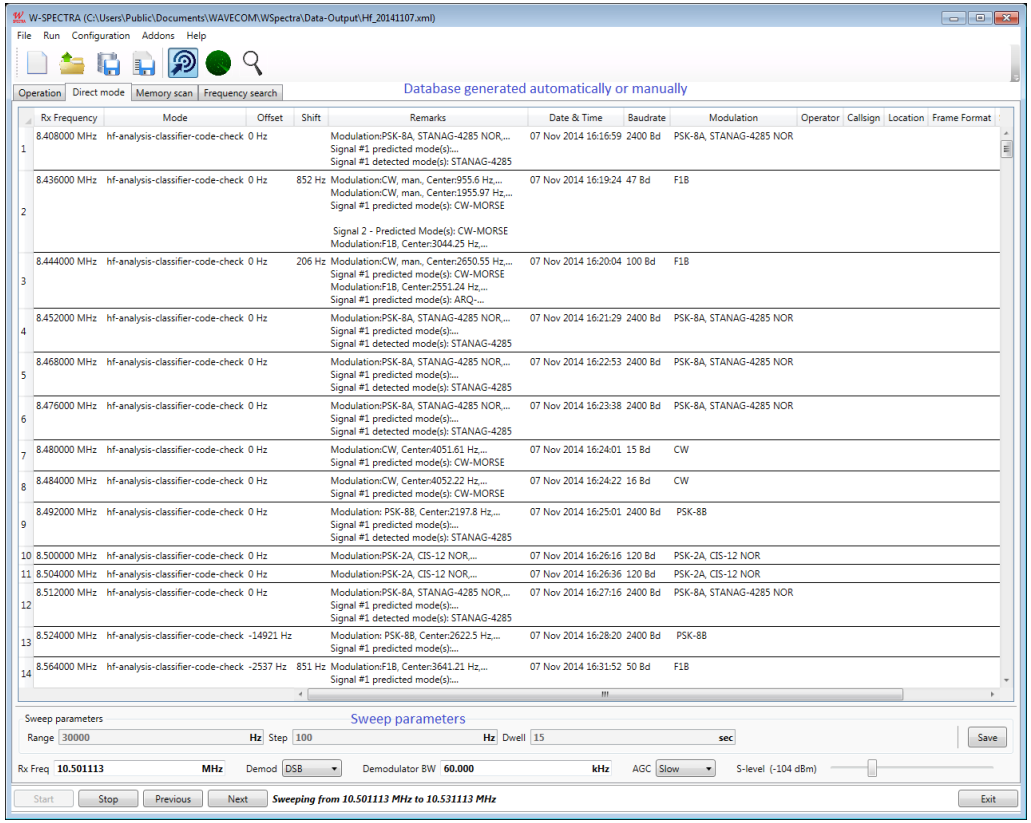
W-SPECTRA GUI – III

W-SPECTRA Direct Mode.



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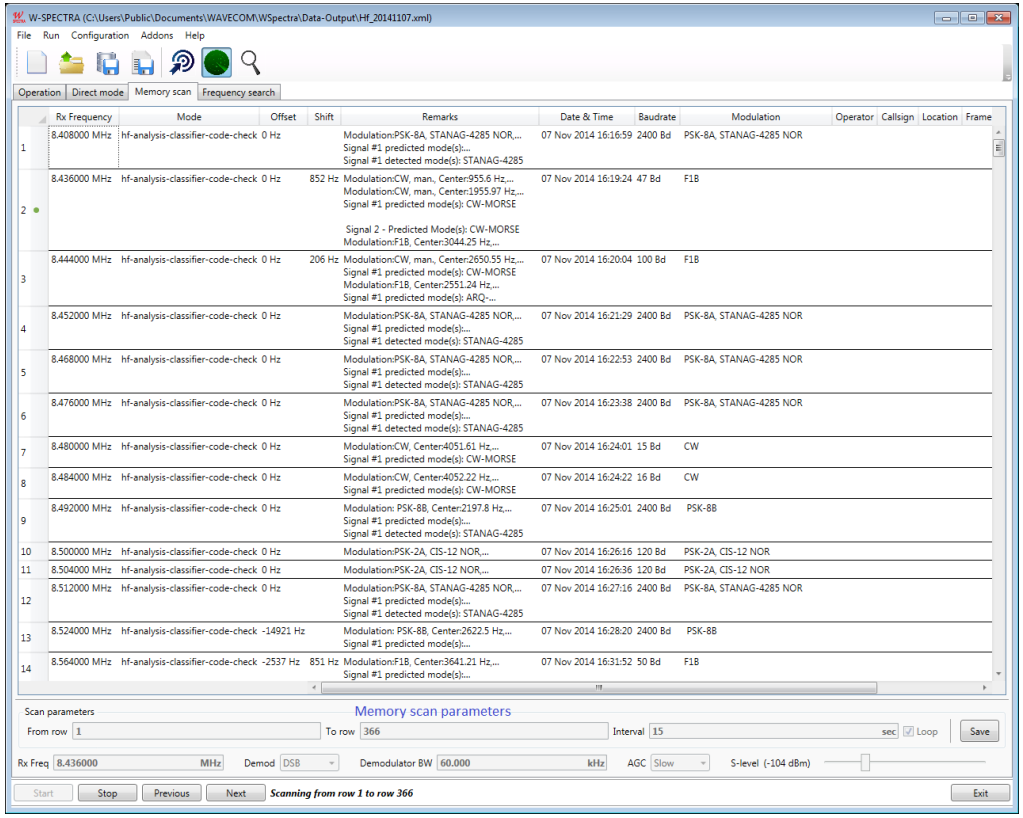
W-SPECTRA GUI – IV

W-SPECTRA Memory Scan Mode.



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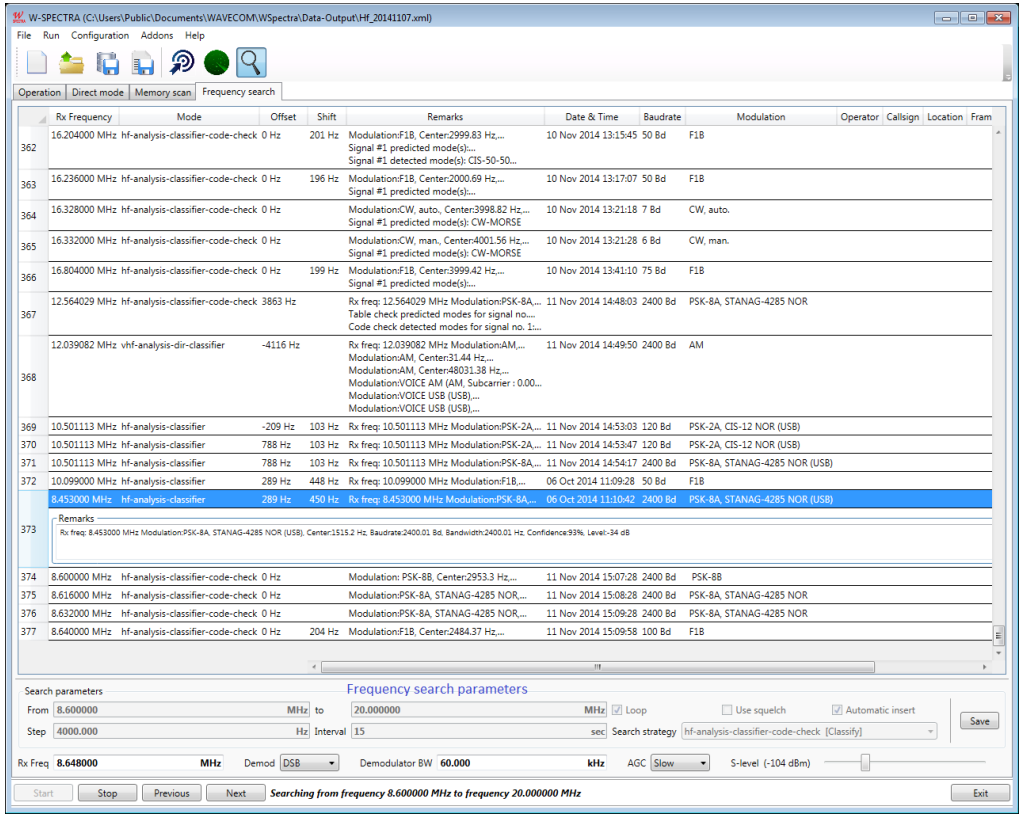
W-SPECTRA GUI – V

W-SPECTRA Frequency Search Mode.



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W-SPECTRA GUI – VI

W-SPECTRA Settings and Operations.

- Set receiver (SDR) start parameter.
- Set system start parameter.
- User configurable database template.
- Convert recording signal format (wav - pxgf).
- Call W-SPEED for spectrum display and two-dimensional editing of a recording signal.
- Classifier Code Check table setting.

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Spectra Editing (W-SPEED) – I

W-SPEED (Spectrum Editing) is a stand-alone tool. Included in W-SPECTRA. Main Functionalities:

- Spectrum display of a recording for offline analysis.
- Two dimensional (time / frequency) display, full recover of side information. Display bandwidth 250 kHz – 24 MHz.
- Spot display of any point in the spectrum. Spectrum zoom (up to 32 times).
- Two-dimensional spectrum cut (BW 96 kHz) and playback.
- W-SPEED is more flexible than media player in W-SPECTRA: random (anywhere) select at signal spectrum.

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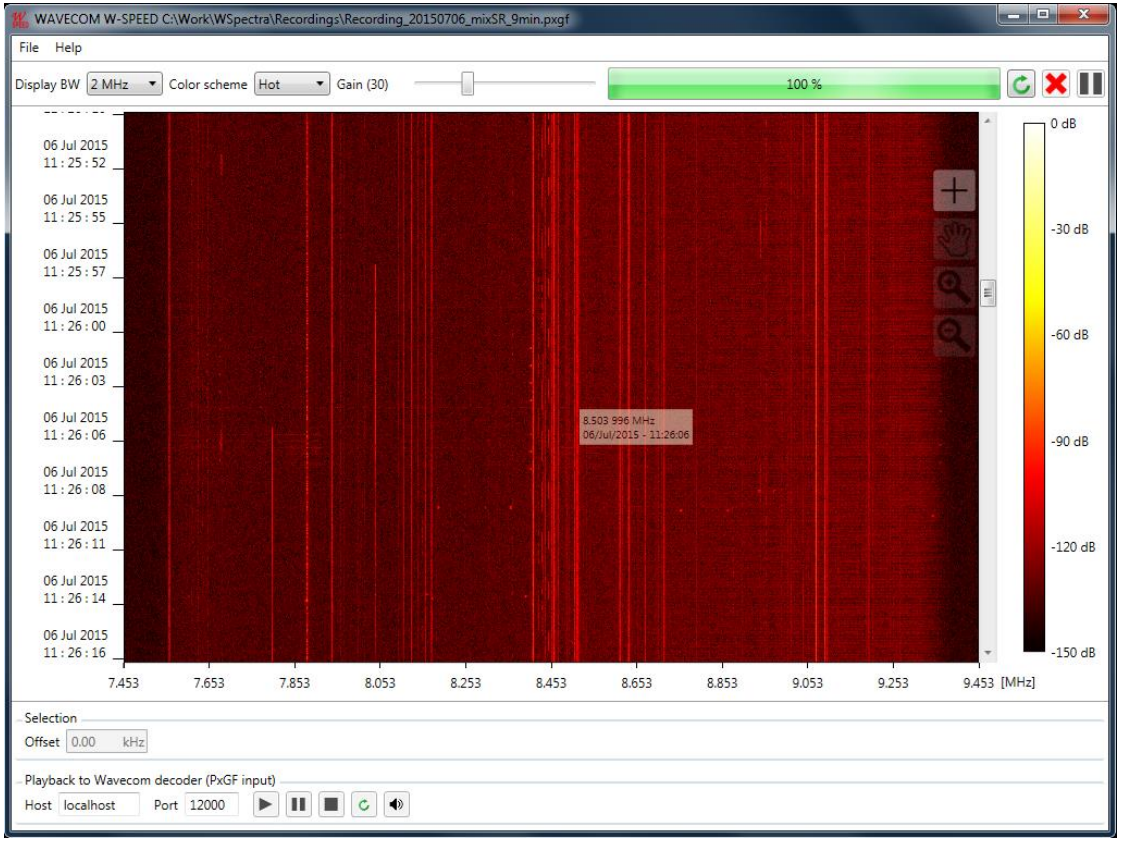
Spectra Editing (W-SPEED) – II

W-SPEED GUI



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Main Products

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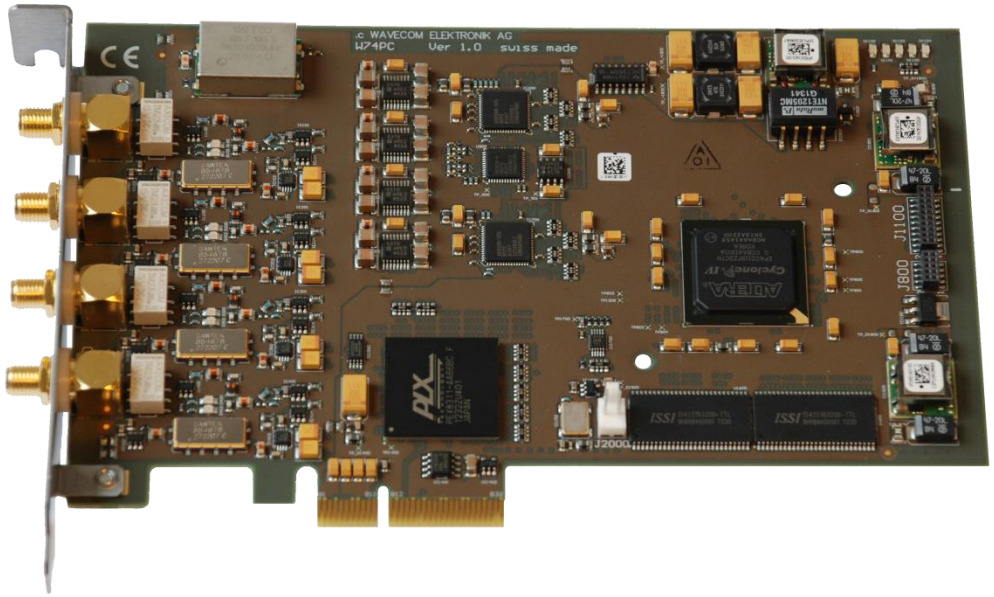
W74PC



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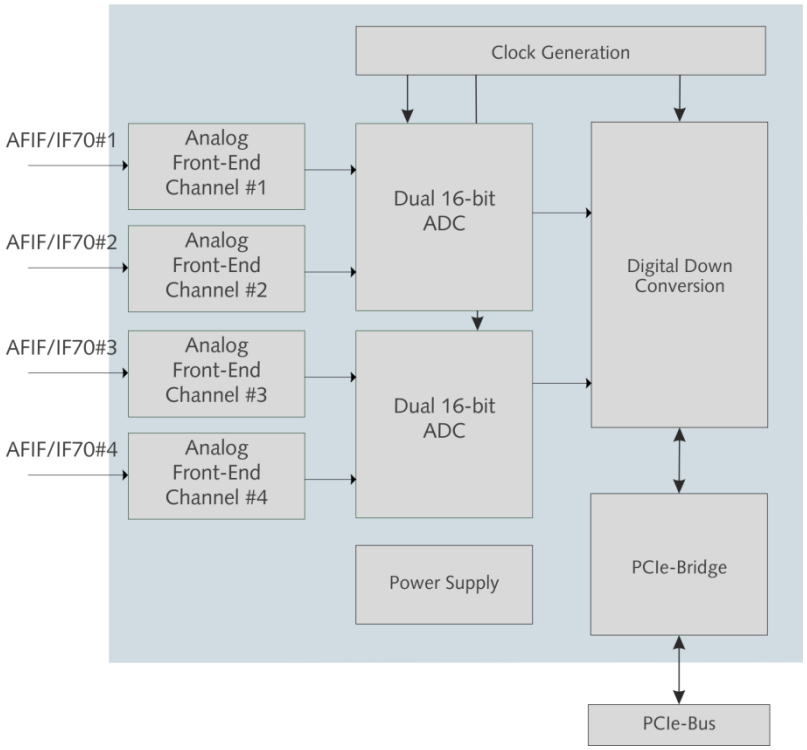
W74PC Function Block Diagram



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Main Products

WAVECOM NACHRICHTENTECHNIK

W74PC

- Hardware decoder
- Four physically independent input channels

Input group	AF/IF (50 Hz – 25 MHz)	70 MHz IF (52.5 – 87.5 MHz)
#1 - #4	AFIF#1 – AFIF#4	IF70#1 – IF70#4

- PCI Express x4 half-size, SMA connector

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Main Products

WAVECOM NACHRICHTENTECHNIK

W74PC

- Two separate *dual* A/D converters:
  98 MHz sample rate, 16 bits resolution, 96 dB dynamic range
- Digital Down Converter (DDC) in FPGA:
  automatic input level control
- Various custom inputs (.wav, TCP/IP IQ or PCM, Virtual Audio Cable VAC)

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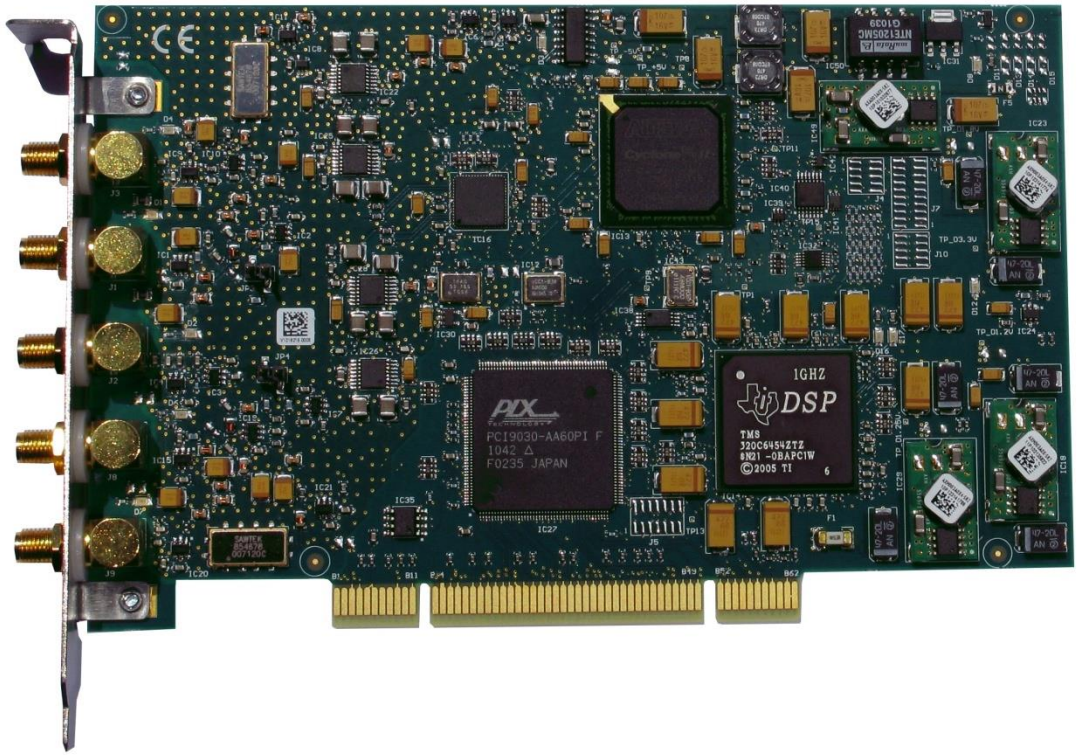
W-PCI



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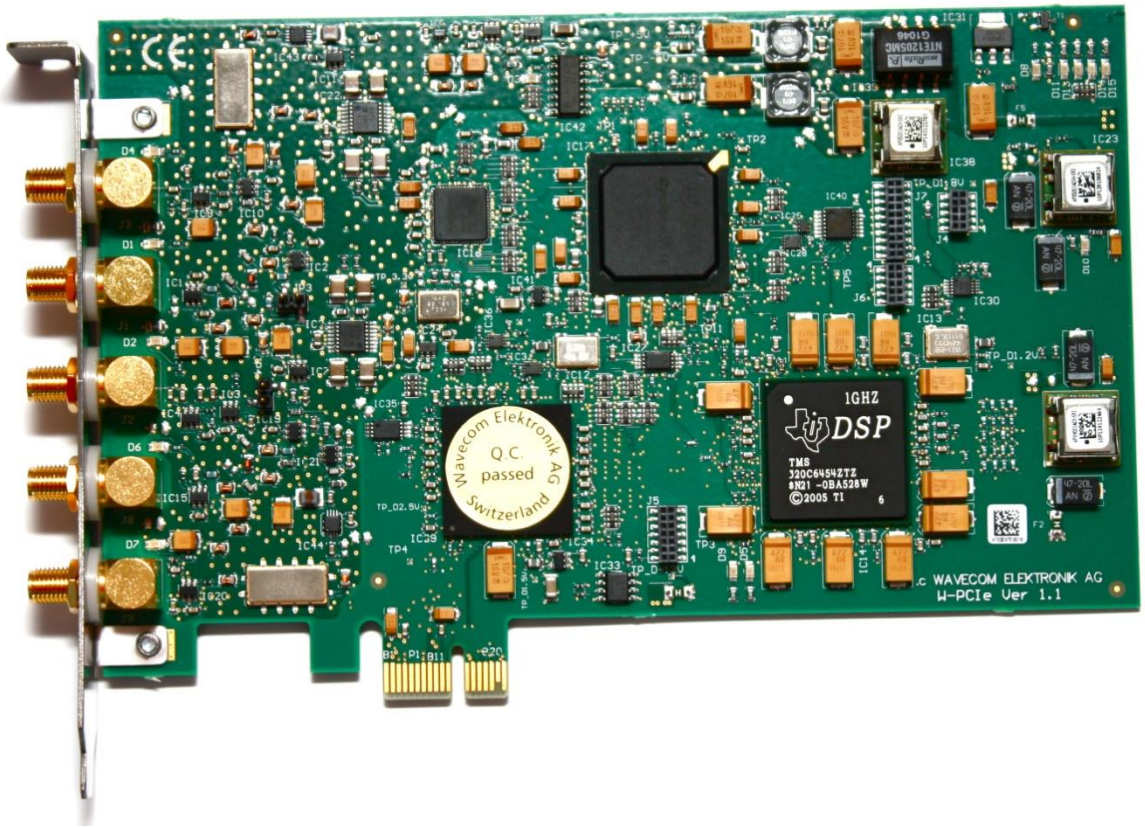
Main Products

WAVECOM NACHRICHTENTECHNIK

W-PCIe



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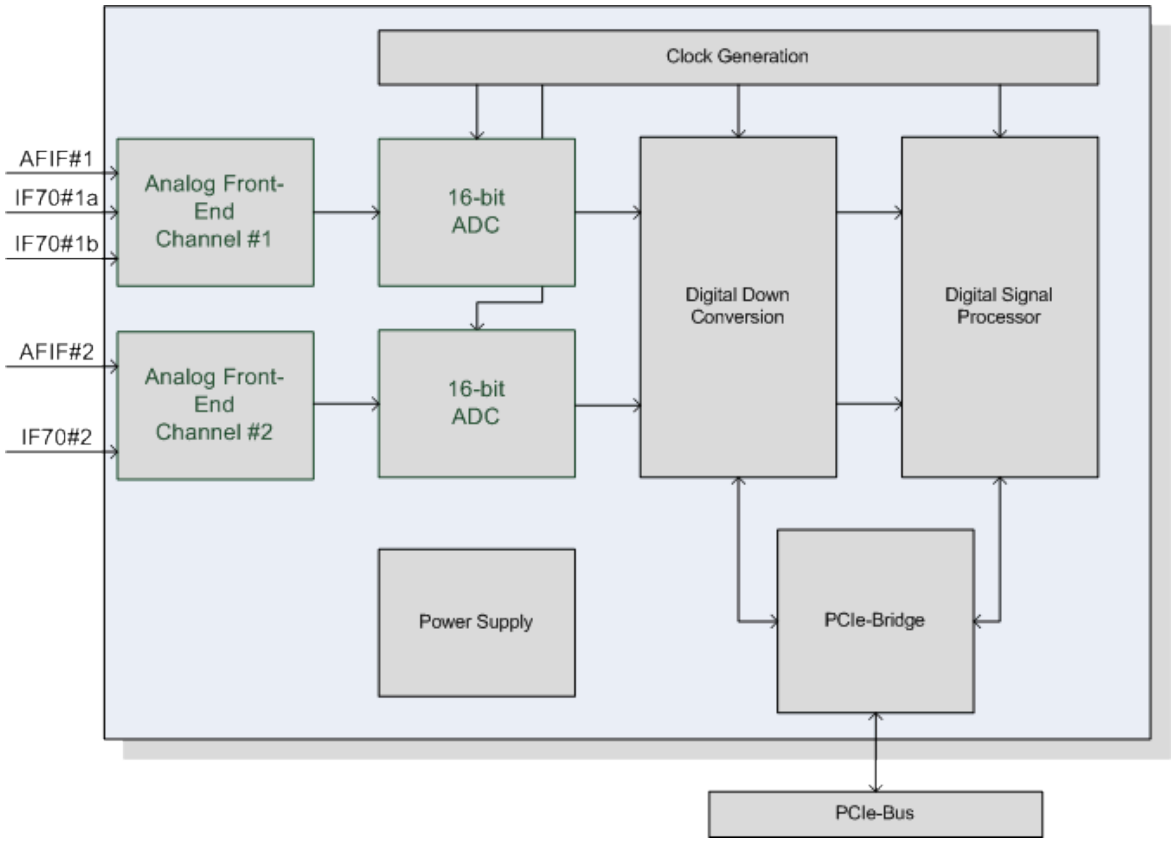
WAVECOM NACHRICHTENTECHNIK

W-PCI/W-PCIe Function Block Diagram



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Main Products

WAVECOM NACHRICHTENTECHNIK

W-PCI/W-PCIe

- Hardware decoder
- Two physically independent input channels

Input group	AF/IF (50 Hz – 25 MHz)	70 MHz IF (52.5 – 87.5 MHz)
# 1	AFIF#1	IF70#1-a, IF70#1-b
# 2	AFIF#2	IF70#2

- PCI, PCI Express half-size, SMA connector

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Main Products

WAVECOM NACHRICHTENTECHNIK

W-PCI/W-PCIe

- Two separate A/D converters:

  92.16 MHz sample rate, 16 bits resolution, 96 dB dynamic range
- Digital Down Converter (DDC) in FPGA:

  automatic input level control
- Various custom inputs (.wav, TCP/IP IQ or PCM, Virtual Audio Cable VAC)

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W-PCI-LAN: offers all functions of the W-PCI hardware decoder with all advantage of a compact computer system.

W-PCI-LAN is well suited for mobile use.

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Main Products

W-PCIe-LAN: offers all functions of the W-PCIe hardware decoder with all advantage of a compact computer system.

W-PCIe-LAN is well suited for mobile use.

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WAVECOM NACHRICHTENTECHNIK

W-CODE

- W-CODE is a standalone software decoder
- Use the existing hardware input device, usually the built-in PC soundcard
- Support IQ input from a Software Define Radio (SDR) and other virtual soundcard (VSC)
- Digital IQ signal input over TCP/IP
- All Wavecom hardware decoders (W74PC, W-PCI, W-PCIe) have the same decoder functions and options as W-CODE.

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Main Products

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Classifier

	W-CL-NB (Narrowband)	W-CL-WB (Wideband)
Bandwidth	4 and 8 kHz	4, 8, 24, 48 and 96 kHz
Voice, speech	☐	☑
Second modulation	☐	☑
HF, VHF/UHF special decoders	☐	☑
Classifier Code Check (CCC)	☑	☑
CW Morse	☑	☑
FSK/MFSK, 2-FSK to 34-FSK	☑	☑
PSK, DBPSK, DQPSK, D8PSK, D16PSK, A and B types	☑	☑
OFDM	☑	☑

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Main Products

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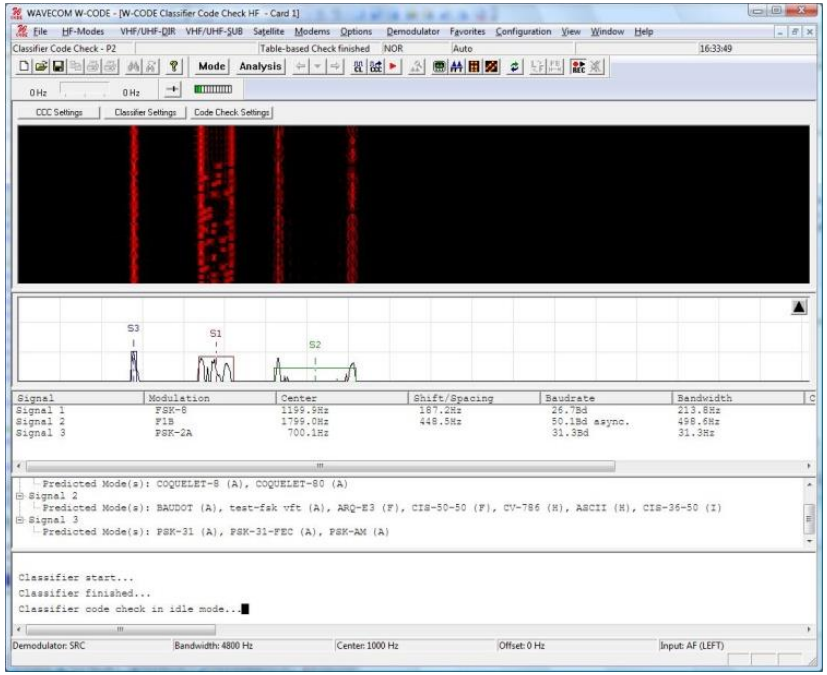
Classifier Code Check (CCC)

Classification → Table check → Code check → Decode



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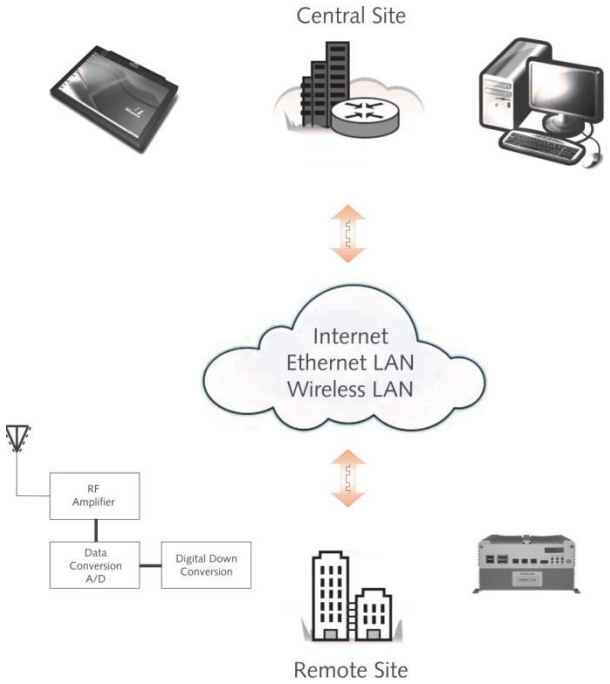
W-CLOUD: works over any Internet, Ethernet or wireless connection with appropriate download bandwidth and allows reliable and input signal true decoding from any location in the world.



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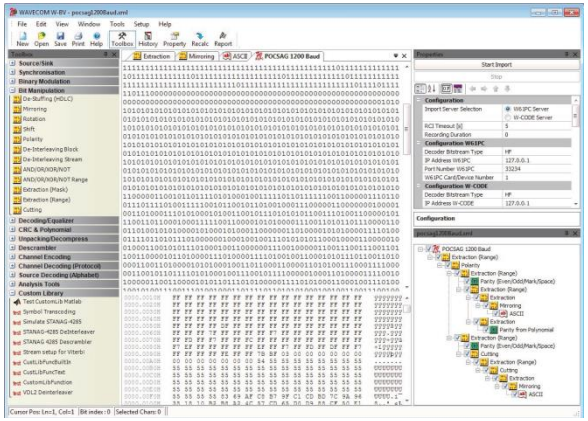
Main Products

W-BitView: an offline software to analyze unknown bit-stream, hunt unknown protocols and to retrieve transmitted data.

W-BitView can be used as a postprocessor for decoded data from W-CODE.



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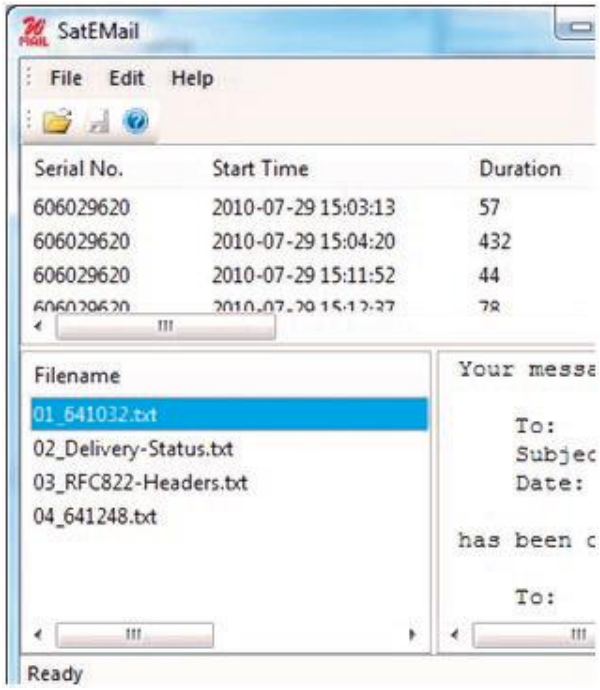
Main Products

W-SAT-email-Decoder: a standalone application which decodes data streams from a wide range of different satellite reception equipments, including Wavecom Inmarsat decoders in W-CODE.



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Main Products

- W-CODE Source Code: the complete implementation in source code. For customers to integrate the decoders into their own system and develop further for their purpose, (for governmental institutions only).
- Training and consultancy in digital communication.
- Provide individual solution and modification with much flexibility.

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