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PMR MONITORING SYSTEM

TETRA | DMR | dPMR | NXDN | P25 | TETRAPOL





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2 boger electronics – defense technology made in Germany

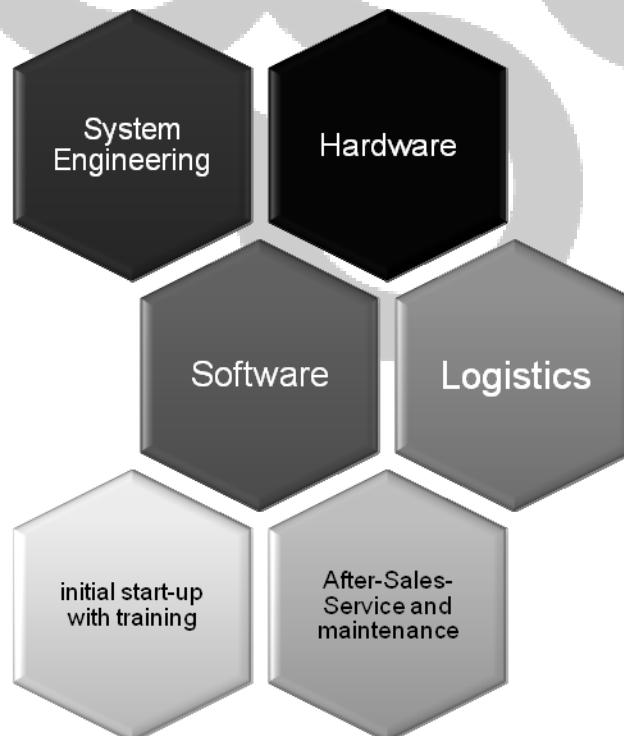
“protecting people and values. A sign of our appreciation”

As an ISO 9001 certified family-owned enterprise we develop systems and solutions geared to providing maximum operational readiness in the civil and military sector. Even in unforeseeable situations. And for prolonged operation.

This is our key to success and sustained growth. Among the experts, boger has long been the trusted synonym for security. Your areas of operation also deserve maximum appreciation! Because a fleeting moment can decide a whole life...

We are your long-term partner for growing challenges and strengthen civil and military interests on the basis of top quality and innovative technologies.

In a crisis many processes require a high degree of sensitivity – something which human beings alone are unable to provide. Boger is your single source for planning, development, production, integration and quality assurance. Your team is now prepared for anything. Because routine is the enemy of reality.





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3 PMR Monitoring

The BOGER spectrum monitoring system is capable of decoding and analyzing modern digital PMR protocols. With its wideband signal acquisition capability both directions are simultaneously monitored and decoded. The system outputs and logs both signal quality and signal power for all parallel channels.

Simultaneously all voice and data content is decoded and recorded in a separate database with all the related meta data like source and destination addresses, call types and timestamps. Moreover a PDU output option can be used to troubleshoot and detect the configuration errors.

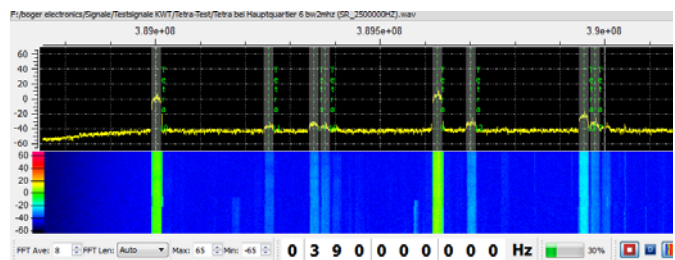
4 system description – PMR Monitoring System

4.1 features

- TETRA, DMR, dPMR, NXDN, P25, TETRAPOL decoders (depending on license)
- automatic emission detection in the realtime bandwidth
- signal quality and power monitoring and logging (per time slot)
- broadcast and base station parameters
- live voice output and recording
- data output
- report generation
- post-processing of recordings (listening, filtering)
- frequency and sampling rate error correction

powerful scan-function

With the powerful scan-function of our PMR-Analysis System you are enabled to detect and to monitor PMR-emissions fully automatically (supported modes, refer to





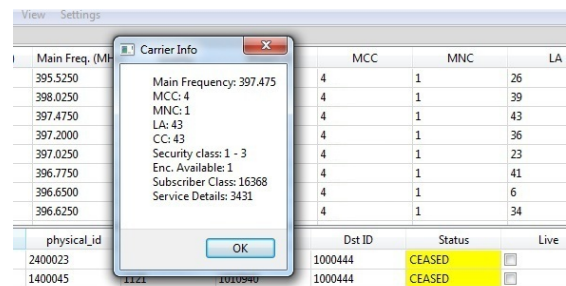
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technical data) – even in a unknown environment.

TETRA-carriers are found automatically in the wideband-spectrum on all devices – it does not matter if it is a recorded or a live spectrum.

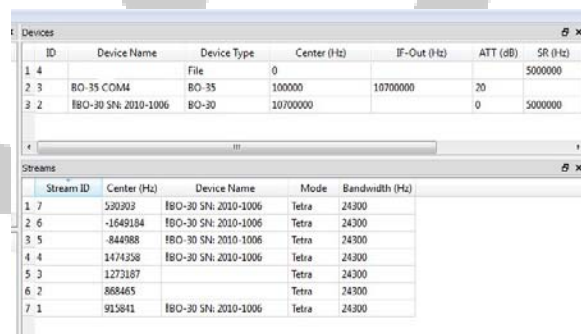
Meta-Data Analysis

Beside conversations our system analyses all corresponding Meta-data of PMR-emissions (SRCID, DSTID, CallID), which will be stored in SQLite-Database. Even Meta-data (Location Area, MCC – Mobile Country Code) of PMR-base stations are shown and stored in a common database. (parameter depending on mode)



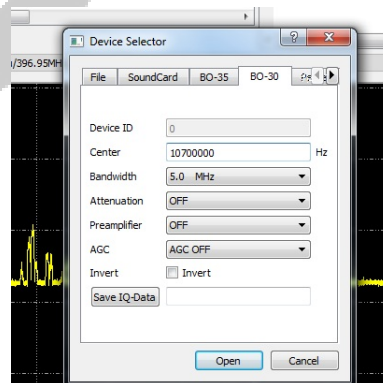
Live-Listening of calls

With our PMR Analysing System we are able to monitor both uplink and downlink. Conversations can be listened in real-time or stored as wav-file for later analysis.



Input-Devices

Input devices: for live-reception our wideband-receiver BO-35 or soundcard input can be chosen. For decoding of recorded frequency spectra we provide the possibility to load wav-files.

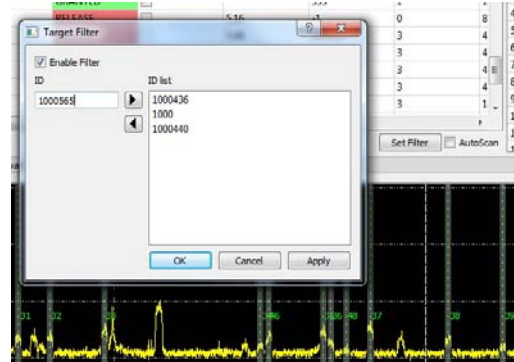




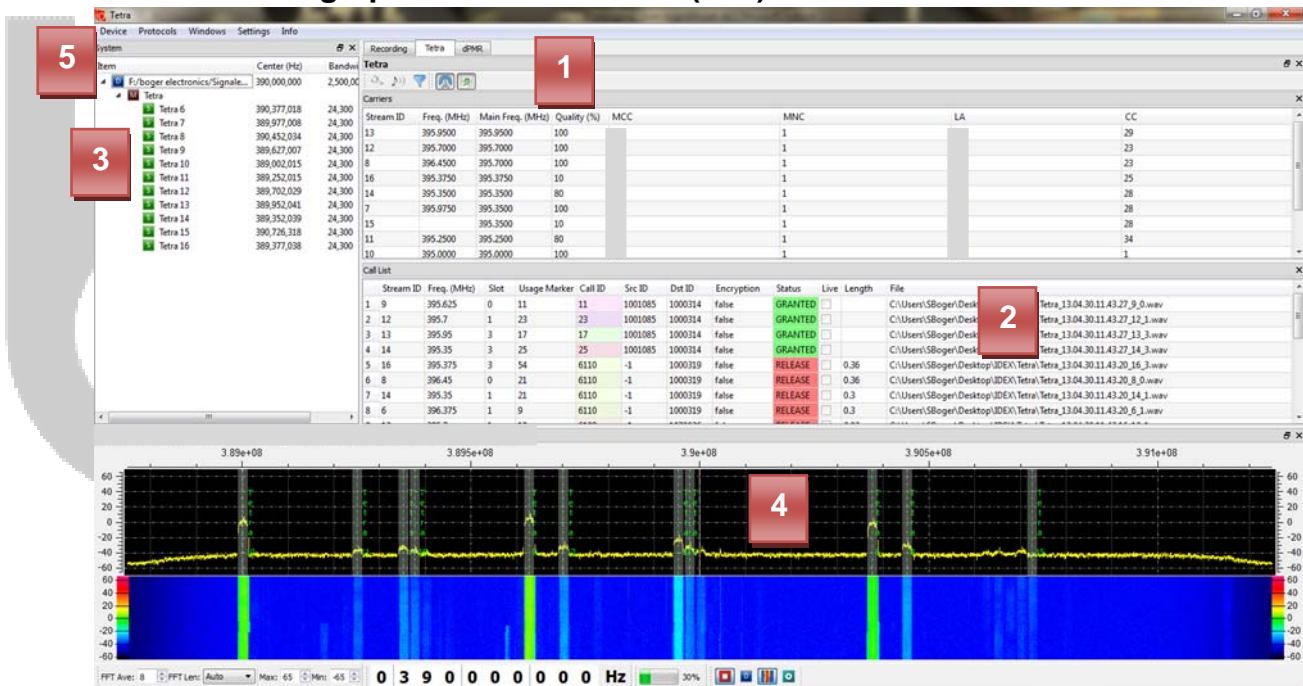
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Target filters

To simplify the use for the operator and to improve effectiveness of usage, the system is equipped with powerful target filters. With this filters the operator is enabled to focus a certain target.



4.2 overview of graphical user interface (GUI)



- 1: Carriers: shows all received Cells with cell-information from all input- devices (receivers).
- 2: Call List: All Calls are stored as .wav-files. The call lists shows source-ID, destination-ID, length, frequency and much more information. It is possible to select a call for live-listening.
- 3: Stream List: Each device can have one or more streams. The streams are tunable in the FFT or added automatically with the Scan-Feature.



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- 4: Spectrum-Monitoring: Spectrum, which is actually monitored. Carriers are detected and decoded fully automatically. Further carriers can be added or deleted by the operator.
- 5: Input devices: For live-reception our wideband-receiver BO-35 or soundcard input can be chosen. For decoding of recorded frequency spectra we provide the possibility to load wav-files.

4.3 Optional DLL-Interface

Third parties are able to integrate their own decipher modules. Please contact us for further details. For integration and implementation we are always available.

4.4 areas of application

Our PMR Analysing System is developed for analysis of the net structure as well as for monitoring and reconnaissance of PMR-emissions. Due to its user-friendly graphical user interface and its automatic functioning it can be used for fast reconnaissance at a certain place for a certain time as well as for long-time recording and long-time monitoring of PMR-emissions.

Of course the PMR Analysing System will be delivered as all boger systems as rugged version with corresponding cooling and protection against dust and sand. The system can be delivered in a 19-inch rack as well as in a portable casing for mobile use.





4.5 technical data

Frequency range	10kHz-3,5GHz
Frequency resolution	1Hz
Frequency accuracy	20MHz reference intern; 10MHz reference extern: <+/- 1,5ppm, -10° - +55°C
Typ. Sensitivity	2-30MHz SSB 0,4µV, 10dB S/N, BW 2,4kHz AM 1,3µV, 10dB S/N, BW 6,0kHz >30MHz SSB 0,3µV, 10dB S/N, BW 2,4kHz FM 0,4µV 12dB SINAD, BW 15kHz
Immunity to interference	IP³ >+20dBm (10 kHz - 1.5 GHz)* IP³ >+10dBm (1.5 - 3.5 GHz)* 18 Preselector-ranges IP₂ >+70dBm
Linear dynamic	>115dB; IF-Out: 10,7MHz BW 10MHz, > 90dB Audio
maximum number of parallel narrow-band channels	256
narrow-band channel bandwidth	variable from 8 kHz to 12.5 MHz
digital protocols	TETRA, DMR, dPMR, NXDN, P25, TETRAPOL (depending on license)
analogue demodulation	AM, FM, LSB, USB, CW, I/Q
emission detection	< 2 seconds
remote interface	json based IP interface
operating system	Windows
Operation power	DC 12,0 volt 25 watt AC 230 volt / AC 115 volt
Temperature range	-20° - +70°C
Sockets (coax)	ANT: SMA or N-socket 10MHz SMA or N-socket
Case	metal





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As family-owned enterprise (established 1978) we trust on long-term partnerships - with our suppliers and customer.



With boger electronics you will always have a personal contact.



For us business doesn't end with delivery: we support our customer over the whole product life cycle, with training, maintenance or simply with support.

Please do not hesitate to contact us....!!



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