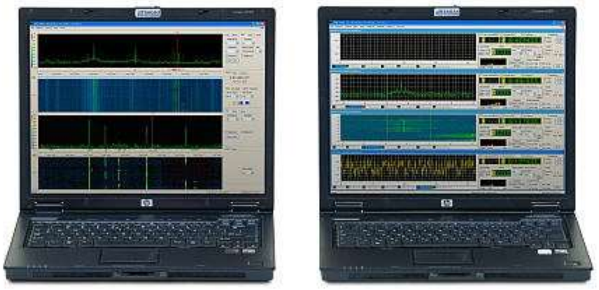
SGX-ORION Integrated SIGINT and COMINT Receiver System

Features

- **Wideband signal processing with 40MHz real-time bandwidth**
- **Built in direction finding processor for all the spectrum components**
- **Full or reduced bandwidth record and playback capability**
- **Spectral emission search with 20GHz/sec speed at 25KHz resolution**
- **Automatic channel scanning with up to 25k predefined channels**
- **Hand off receiver pool with 16 fully independent channels**
- **Narrowband monitoring and recording with 12-768KHz bandwidth**
- **High probability signal classification and decoding functionality**



Main application areas

- SIGINT/COMINT/EW systems
- Signal collection and off-line/delayed analysis
- Radio receiver/transmitter testing
- Signal analysis and waveform generation

Product description

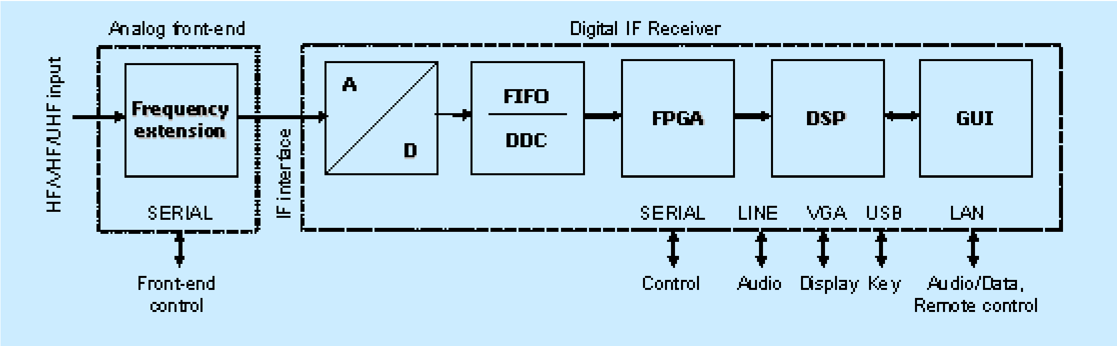
Compact wide band Spectrum Monitoring Receiver System is designed to search, monitor frequency spectrum in HF/VHF/UHF bands. With the help of its fast scanning, wide band receiver capable to recognize and log the activity in the frequency spectrum.

The system using its own multi-channel monitoring receiver to demodulate, record, analyze and decode (optional) the received signal, can measure the bearing (optional) of the incoming radio signal and with its own fast scanning receiver can continuously monitor the spectrum activity.

Every parameter can be adjusted by the operator on the local terminal GUI in case of stand-alone operation or if connected through TCP/IP network, can be operated remotely.

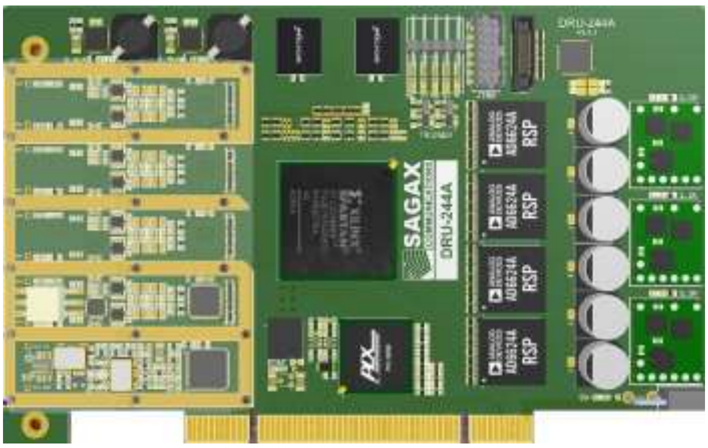
Digital receiver concept

Our digital receiver concept based on the Software Defined (SDR) technology, which means to digitize the data as earlier in the signal path as possible and do all of the functionality in digital domain. Before the analog to digital conversion the required analog signal processing contains band limiting and pre-selection, variable amplification and frequency conversion in higher VHF/UHF bands. After the digitization burst memory (FIFO) or digital down-converter (DDC) is used depending on the application which could be a wide-band scanning or narrow-band monitoring reception. Programmable logic (FPGA) is used for on-board data processing and routing before the data is passed to digital signal processing (DSP) algorithm. The whole receiver is handled trough graphical user interface (GUI) which is running on the platform computer. External connections are provided by the platform computer for local and remote control.



High-tech hardware implementation

We use the latest state of the art analog processing and digital conversion technology available in the market to provide high-dynamic range, wide-bandwidth front-ends and digitizers for our receivers with 16bit resolution and 80MHz sampling rate.



Typical applications

The SGX-ORION as a versatile and highly sophisticated receiver platform is the ideal solution for a multitude of both civilian and military applications such as:

- emission compliancy testing
- spectrum allocation analysis
- automatic signal detection
- search, intercept and emitter location
- strategic and tactical reconnaissance systems
- data acquisition, classification and preprocessing
- threat recognition
- offline processing and technical analysis
- finding unwanted transmitter sources's location by public authorities

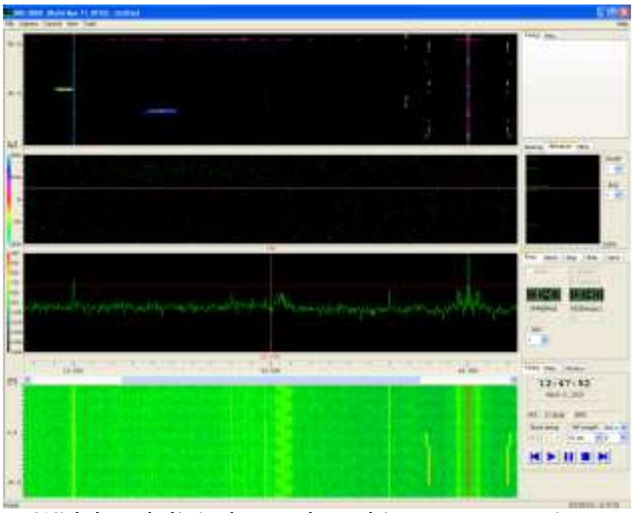
Functional description

The receiver offers advanced spectrum analyzer functionality based on internal radix2/5 complex FFT processing algorithms. Variable bandwidths from 100KHz up to 20MHz with frequency resolutions from less than 50Hz to 100kHz can be chosen.

Emissions can be measured using individual markers or bandwidth and power measurement guides. The marker functionality covers the standard tasks such as normal marker, delta marker and peak search marker.

The zoom functions enable a detailed view of signals without changing acquisition time or bandwidth. When using the combined spectrum and waterfall display, both screens are linked.

Graphical Remote Control Interface


Wideband digital search and intercept receiver

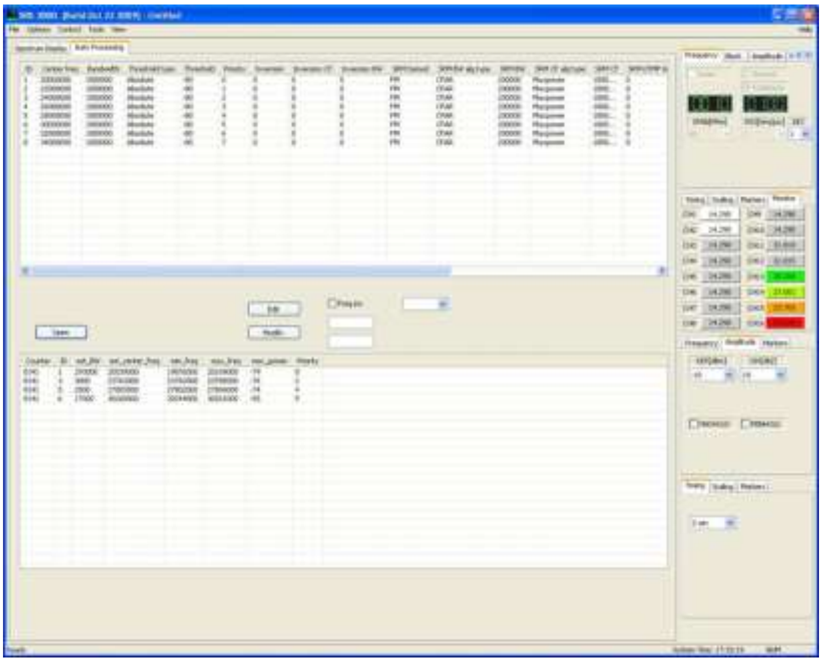

Multi-channel monitoring and collecting receiver

Advanced Radio Monitoring System

Comprising high performance analog and digital signal processing, the SGX-ORION is the perfect choice for single monitoring stations and laboratory applications. The integrated high speed processing core with its powerful complex FFT processor offers a real-time bandwidth of up to 20 MHz for both time and frequency domain.

Up to 16 channels can be demodulated simultaneously in addition to the wideband spectrum display. Simply assign a marker to the desired frequency in the spectrum and select the demodulation mode. Use the peak search functionality to assign the demodulators automatically to emissions. Horizontal lines (threshold) can be used to limit the search functionality to a specific power range.

Scan speeds of up to 20GHz/s at a frequency resolution of 25 kHz can be achieved independent of any channel allocation. This results in a panorama frequency scan which enables the detection of LPI-signals (Low Probability of Intercept) as well as weak signals in the presence of strong neighboring signals. A frequency of interest can be selected by the markers in the panorama scan, the receiver will immediately tune to this frequency and will display the spectrum in the receiver display area.



Signals and scenarios can be recorded continuously limited only by the size and speed of the internal hard disk. When playing back these recorded files all measurement and monitoring functionality such as marker- and bandwidth measurements, zoom and waterfall displays are available in the same detail as if receiving live antenna signals. Snapshot recordings of the complex baseband (I/Q) data at 20 MHz bandwidth can be performed using an onboard memory module.

The SGX-ORION system can be controlled in manual or full automatic mode. In automatic mode comprehensive scans can be performed. The frequency scan can be defined by start frequency, stop frequency and dwell time. Arbitrary frequency areas can be excluded from the scan. A memory scan can be performed by predefining up to 25.000 individual channels. Channels can be grouped for specific sub-scans.

Specification summary

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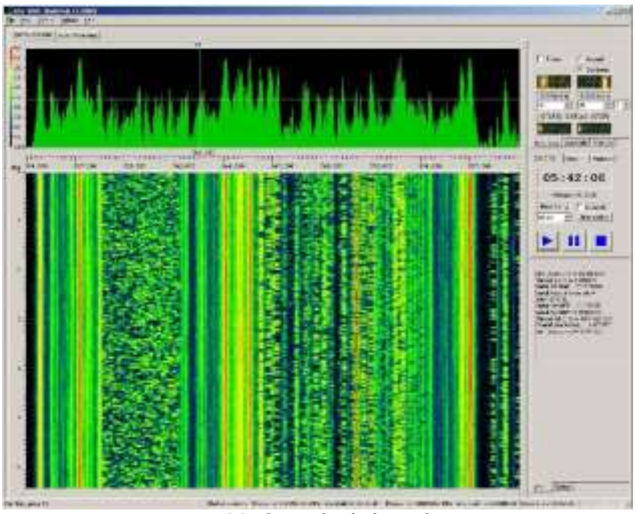
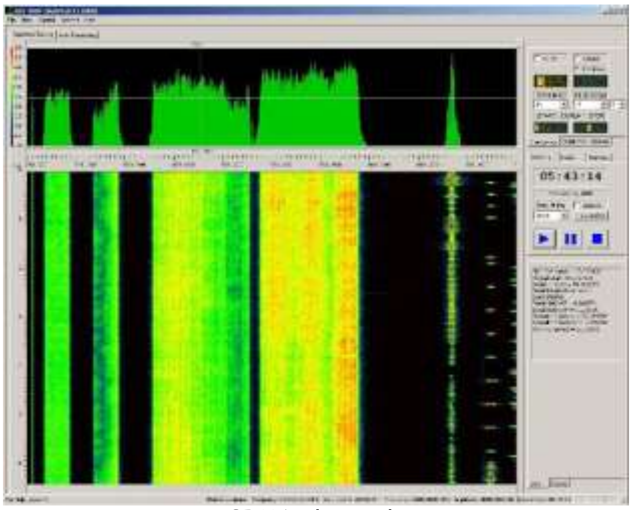
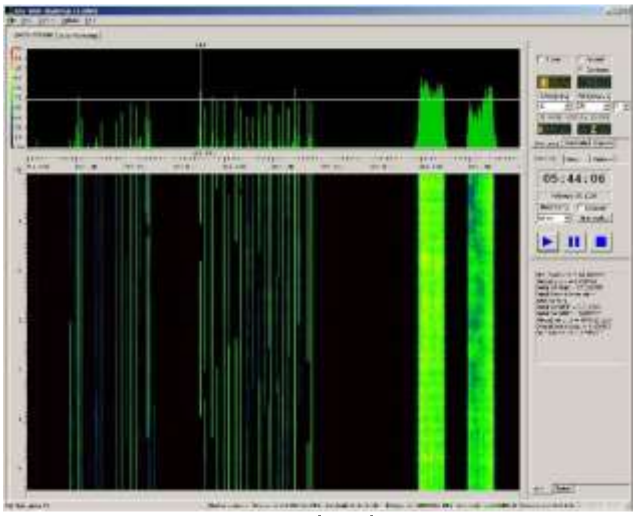
Frequency range	HF: 9 kHz to 32 MHz VHF/UHF: 20 MHz to 3000 MHz
Input impedance	50 ohm
Maximum signal level	HF: +20dBm VHF/UHF: +15dBm
Scan speed	20 GHz/sec (25 KHz raster, 20 MHz bandwidth)
Instantaneous bandwidth	20 MHz
Tuning resolution	1 Hz
Tuning accuracy	< 0.2 Hz
Reference frequency	10 MHz
Reference stability	+/- 1 ppm
Input noise figure	HF: 10 dB typical VHF/UHF: 13 dB typical
Input intercept	HF: 40 dBm typical VHF/UHF: 15 dBm typical
Sensitivity @ 10dB S/N typical	HF: -120dBm @1KHz resolution bw -111dBm @25KHz resolution bw VHF/UHF: -114dBm @1KHz resolution bw -105dBm @25KHz resolution bw
Image and IF rejection	> 100 dB typical
IF bandwidth	6.25 kHz to 20 MHz
Number of demodulators	16 independent channel
De-modulated modes	AM, FM, CW, USB, LSB, ISB
Analog to digital converter	HF: 90 dB dynamic range typical VHF/UHF: 85 dB dynamic range typical
Digital processing	32 bit complex FFT on base-band IF data Variable bandwidth and resolution Variable averaging ratio
Operation mode	- spot frequency - sub-band scan - memory scan

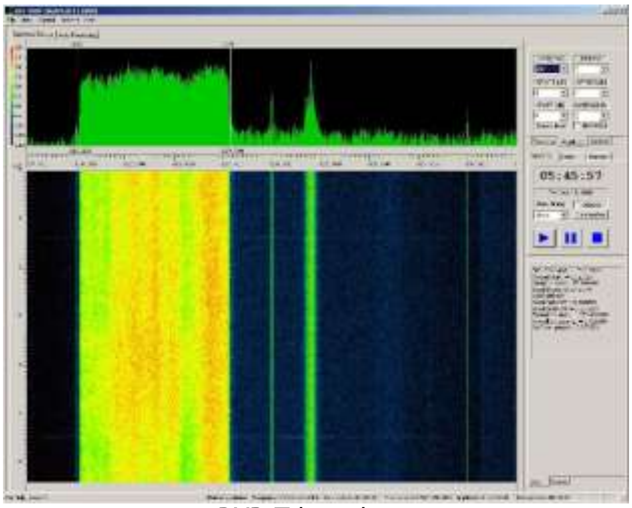
General Data	
Physical dimension:	19 inch / 6-12U
Weight:	App. 45 Kg
Operating temperature:	0 - +45 C
Storage temperature:	-10 C - +70 C
Power supply:	230 V, 50 Hz (12VDC optional)
Power consumption:	950W (typ.)

Specification subject to change without further notice.


PCS downlink band


CDMA channels


Narrow-band FM


DVB-T broadcast