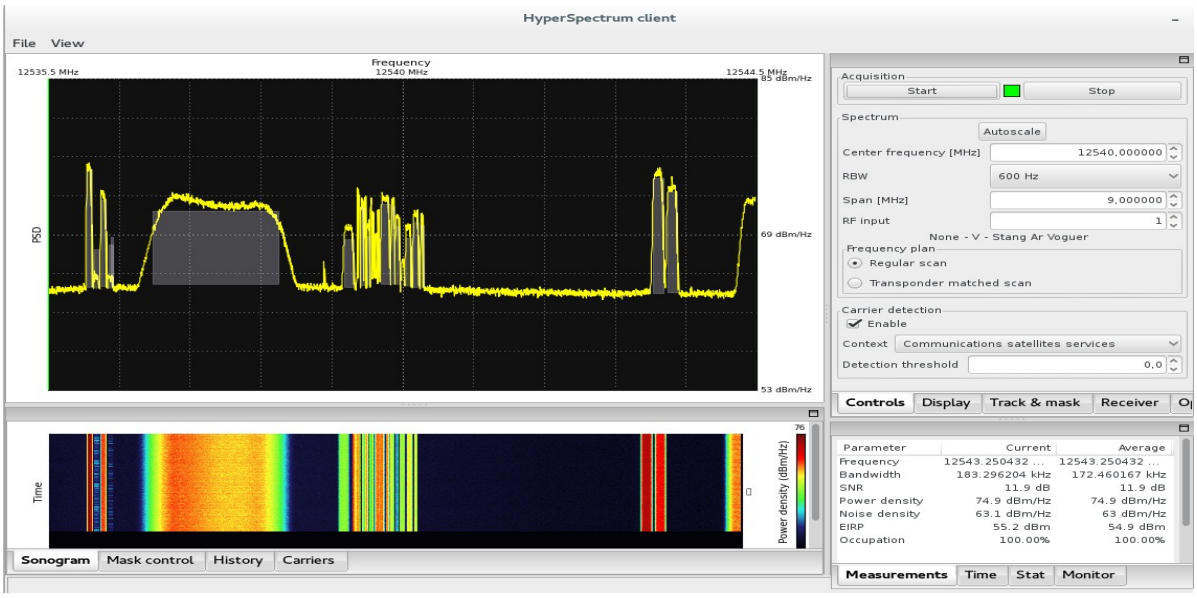
HyperSpectrum 3.2

A Smart Real-Time Spectrum Analyzer



Introduction

The HyperSpectrum software gives an answer to the following needs :

- **Standard Spectrum Analyzer**: Spectrum and spectrogram (time – frequency representation) visualizations and their real time variations.
- **Smart features**: Real time spectrum monitoring with automatic carriers detection. Real-time estimation of RF parameters of each detected carrier and estimation of carrier quality of service.

HyperSpectrum works in a client-server mode.

HyperSpectrum [server]

HyperSpectrum [server] works in a “best effort” manner with the following steps:

- data acquisition / sample recovering from the connected sampler,
- automatic carriers detection over the client specified bandwidth (defined by center frequency and span),
- RF parameters estimation of each detected carriers (center frequency, bandwidth, signal to noise ratio, bursted carrier),
- quality of service estimation of specified carriers.

Samplers

HyperSpectrum [server] integrates drivers for the following samplers:

- IFoIP (V1 & V2) (Zodiac Data Systems)
- BSA (Aeroflex)
- NI (National Instruments)
- IQ audio sampler (sound card).

Performances

The performances of HyperSpectrum [server] depends on the frequency span and the number of carriers in this bandwidth. Typically, in a 36MHz width satellite transponder occupied by thirty carriers, the data acquisition / carriers detection process is done 5 / 6 times per second (Laptop 8 cores I7). This gives a detection and RF parameters estimation performance of 150 carriers / seconds.

Remote interface

A remote control TCP interface is available on this

software. This interface use the XML-RPC format requests (HTTP requests and data format in XML) and allows control and getting detection results from HyperSpectrum [server].

Customers can use this remote interface to build their own application (CSM – Carrier Satellite Monitoring - for example). HyperSpectrum [client] use this remote interface.

HyperSpectrum [client]

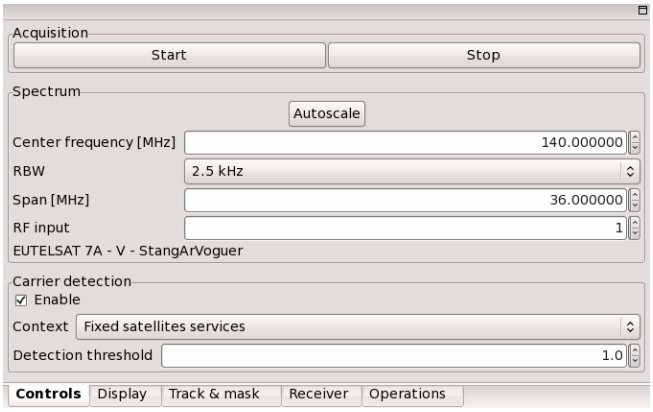
HyperSpectrum [client] allows:

- Server control, display control, Track & mask,
- RF measurements and their time history or statistics for each carrier,
- monitoring the “quality of service” of a selected carrier.

Server and display control

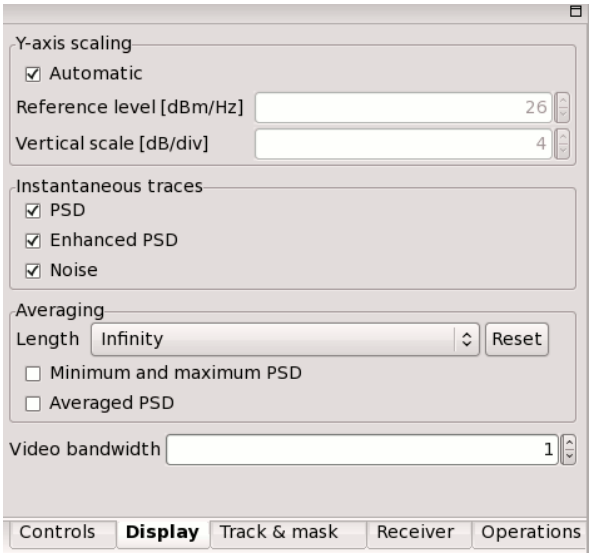
The server controls are those that we can find on all standard spectrum analyzers, but also more smart features:

- start / stop, auto-scale,
- center frequency, RBW, span
- RF input selection,
- context of acquisitions: Fixes satellite services, RCS satellite services, Mobile satellite services, Advanced satellite, HF communications, V/UHF radio networks,
- carrier detection threshold (min SNR).



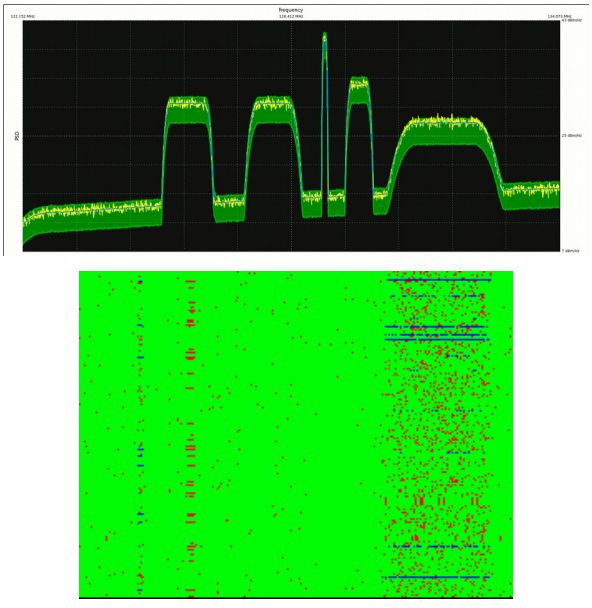
Display parameters

- automatic scaling or reference level and vertical scale,
- traces for PSD (Power Spectral Density), enhanced PSD, noise level, average PSD, minimum and maximum PSD,
- video bandwidth.



Track and mask

Masking feature provides a smart way of detecting variations in the PSD over time. A mask is defined with tolerances values from the mean PSD allowing the detection of time / frequency zones where the PSD is outside this mask.



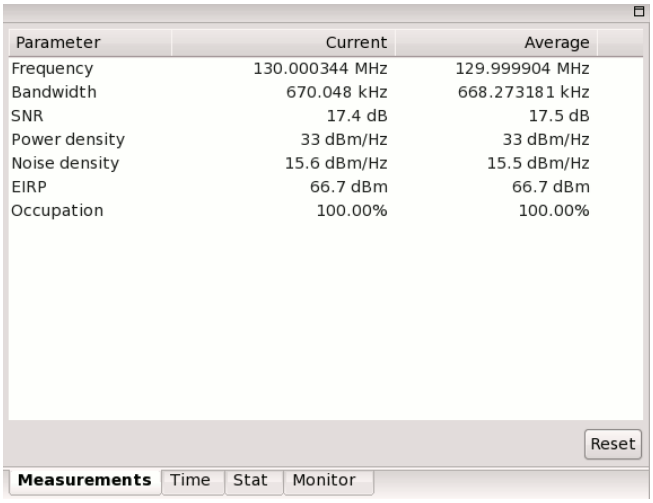
Carrier measurements

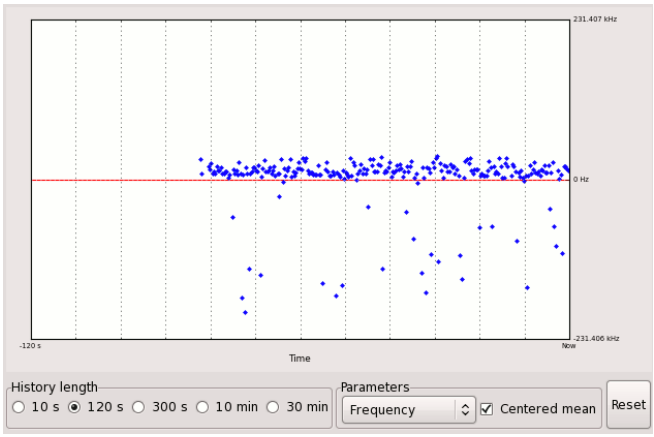
Each parameter of all detected carrier is measured every time a new signal acquisition is available. HyperSpectrum [client] tracks the carriers and stores the history of RF parameters for each carrier.

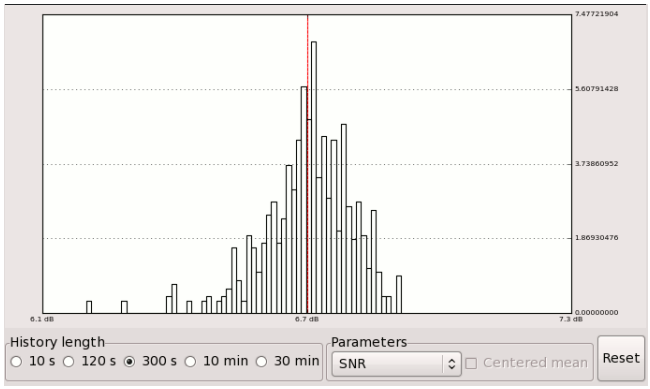
Selecting a carrier, the following figures are

displayed:

- instantaneous measures,
- time history of the selected RF parameter,
- statistics of the selected RF parameter.

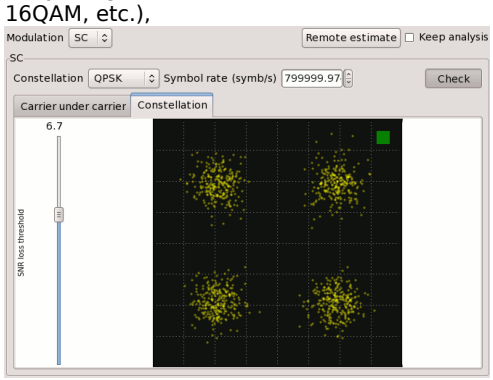




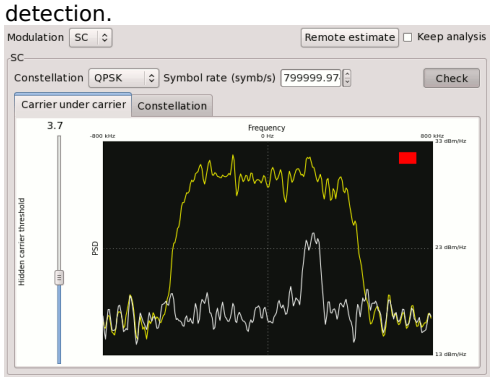


For the selected carrier, HyperSpectrum [client] allows the estimation of the quality of service by displaying:

- synchronized symbols from the constellation (only single carriers – BPSK, QPSK, 8PSK, 16QAM, etc.),



- the PSD on the carrier frequency support along with the "carrier suppressed" PSD. This feature allows “carrier under carrier” detection.



Operating system

HyperSpectrum 3.x works on MS Windows XP, Vista, 7, 8 64bits and Linux (RedHat / CentOs, OpenSuse, Debian, Fedora) operating systems.

Contact

NOVAGRID S.A.S.

3 Allée de la Grande Egalonne
35740 PACÉ
F RANCE

Tél : +33 (0)223 413 797
+33 (0)223 413 879
Email : contact@novagrid.com

