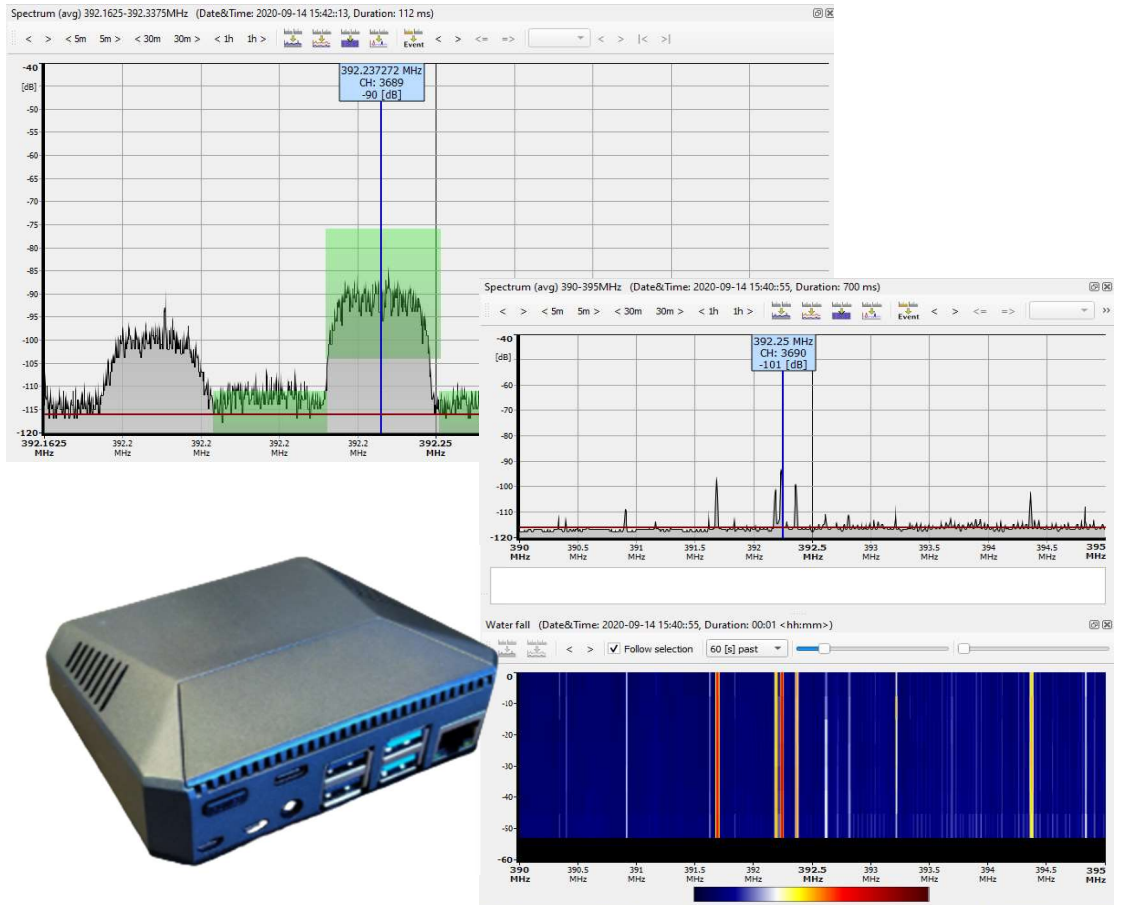


HF Monitor Business

5V555-500



modern engineering & design

Edition 04/2022

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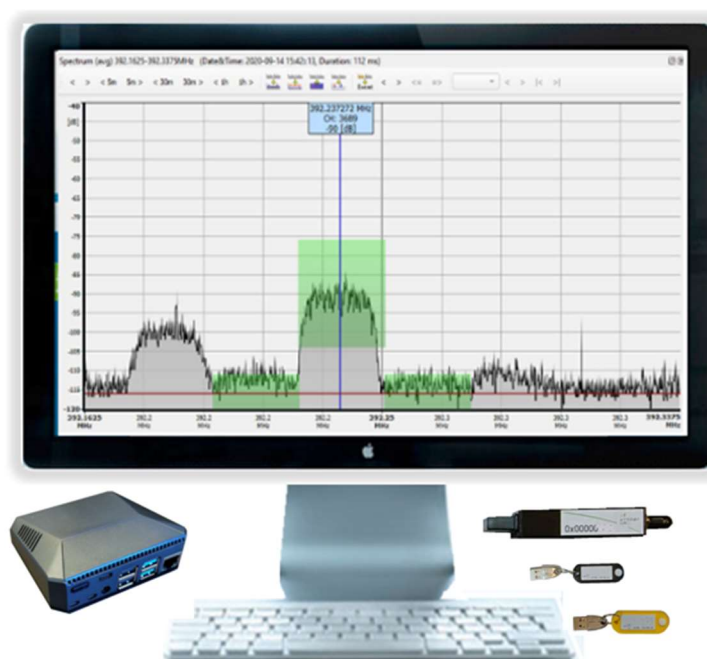
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rfe-global
radio frequency equipment

The HF Monitor is a portable device with pre-processing of the recorded data from receivers. It interfaces with the HF Monitor Software to automate the process of collecting data and to enable event creation and alarm functions for unusual signal activity, as well as providing useful information about network health and use of the spectrum. This display of recorded data can be used to help detect the presence of RF transmissions and source of interference.

Your Benefits

- **Portable:** light-weight, rugged and small. The HF Monitor can operate as a stand-alone recorder in remote locations without the need of a PC connection for continuous signal recording.
- **High Performance:** designed for 24/7 monitoring of frequency ranges with simultaneous processing of all triggered signals.
- **Affordable:** the hardware consisting of sensor modules (single board computer) and recording devices gives you the most cost-effective solution in the market.
- **Data Interface:** through a connection to a PC, the data recorded can be analyzed in real time using our sophisticated data acquisition and analysis software. Data can also be retrieved from the internal SD card or with a USB stick for post analysis.
- **Configurable:** users can configure the frequency range and number of frequencies to record as required (i.e., real time, simultaneously, scheduled). Alarms and Events can also be generated.



The Sensor Module

The radio frequency data is captured using detached receiving hardware connected to a Sensor Module. This consists of a single board computer (SBC) which pre-process the recorded data and is connected to a PC for configuration and data visualization.



Several Sensor Modules can be configured to record and transfer data simultaneously. The HF Monitor Software allows the user to manage the connected devices and to assign Monitoring Jobs to each of them.

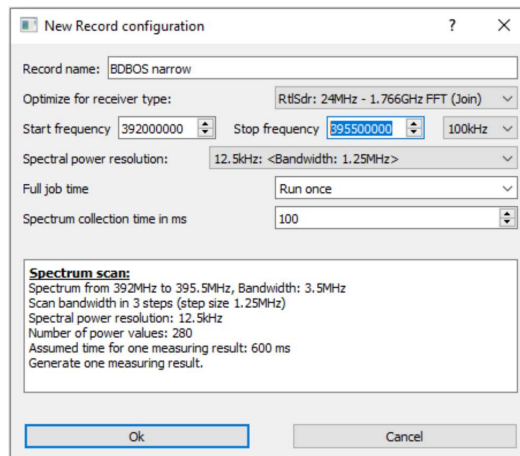
Name	IP	Status	Message
Lisa Melner Str. Z, PC	127.0.0.1	Running	2020-05-12 15:41:11 All jobs are running
Lisa Melner Str. Z, PG	127.0.0.1	Running	2020-05-12 15:41:11 All jobs are running
Lisa Melner Str. S, EG	127.0.0.1	Stopped	2020-05-12 15:51:49 Device configuration started.
Lisa Melner Str. A, EG	127.0.0.1	Running	2020-05-12 15:51:49 Starting.
Gutenberg Str. 54, OG	127.0.0.1	Running	2020-05-12 15:51:49 All jobs are running
Gutenberg Str. 54	10.0.128.127	Connecting	Connecting...

Sensor-Modules

Monitoring-Jobs

Monitoring Jobs

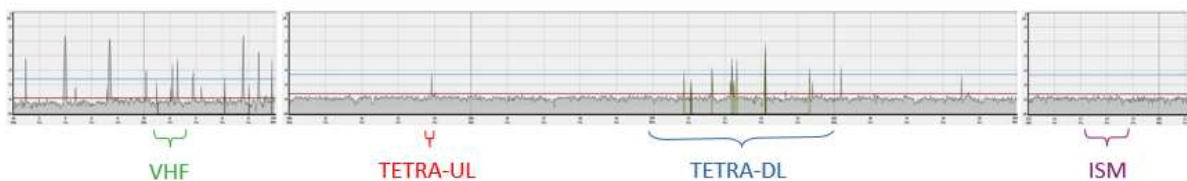
Monitoring jobs are customized by the user to monitor several frequency ranges with different time intervals and observation times:



The 'New Record configuration' dialog box shows the following settings:

- Record name: BDBOS narrow
- Optimize for receiver type: RTISdr: 24MHz - 1.766GHz FFT (Join)
- Start frequency: 392000000, Stop frequency: 395500000, 100kHz
- Spectral power resolution: 12.5kHz: <Bandwidth: 1.25MHz>
- Full job time: Run once
- Spectrum collection time in ms: 100

Spectrum scan:
Spectrum from 392MHz to 395.5MHz, Bandwidth: 3.5MHz
Scan bandwidth in 3 steps (step size 1.25MHz)
Spectral power resolution: 12.5kHz
Number of power values: 280
Assumed time for one measuring result: 600 ms
Generate one measuring result.

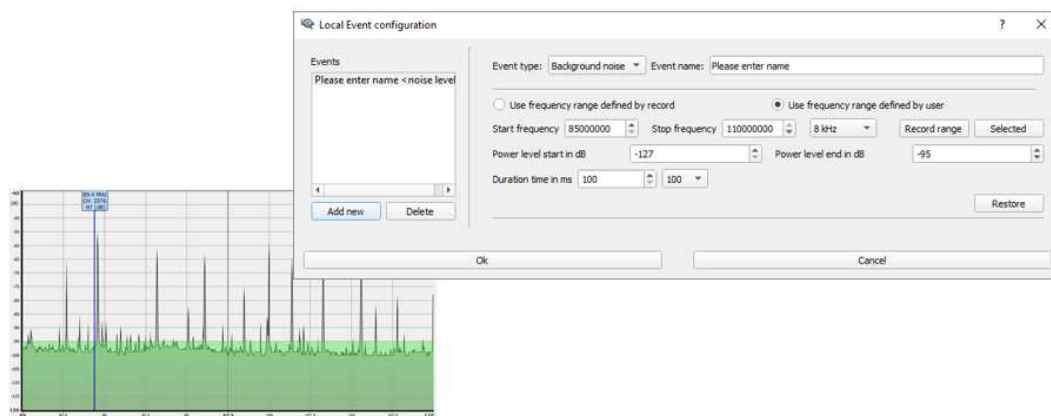


Events

Events serve as a starting point for a detail analysis. If the conditions of an event are met, an automatic action is started (i.e., the transmission of an email or trigger an SMTP notification).

Type of Events:

1. Noise floor surveillance of frequency range over time

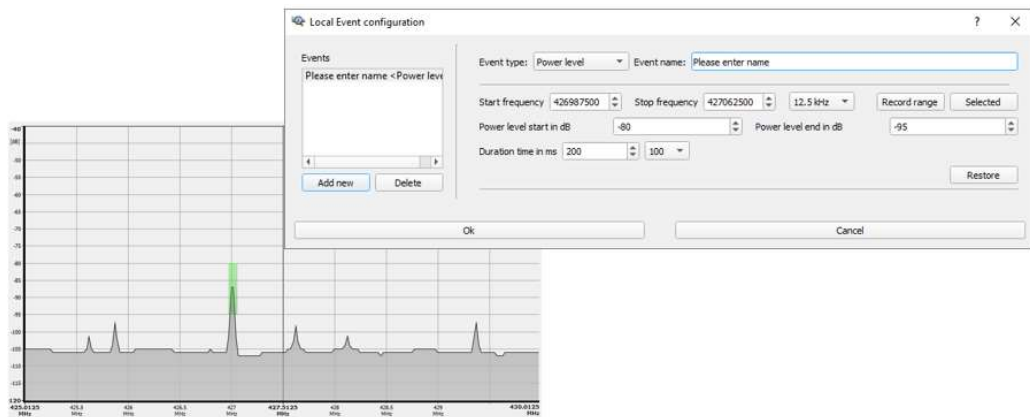


The 'Local Event configuration' dialog box shows the following settings:

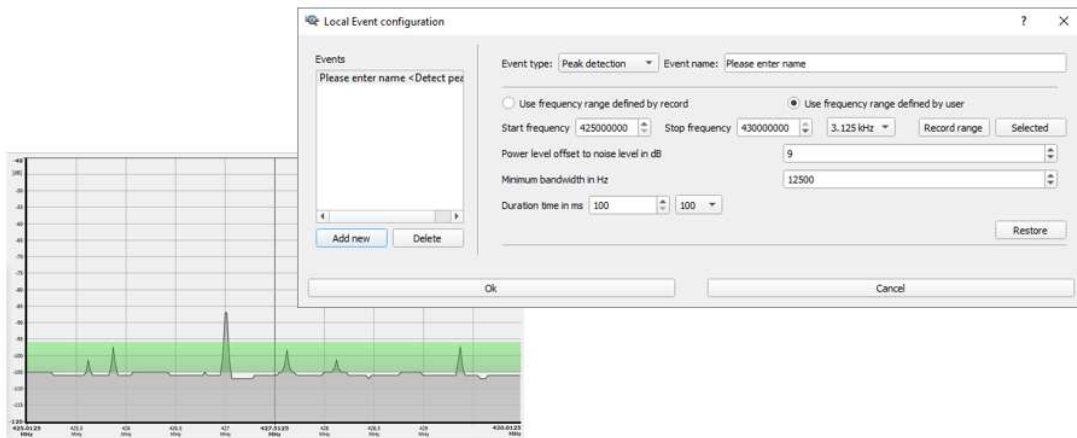
- Event type: Background noise
- Event name: Please enter name
- Use frequency range defined by user (selected)
- Start frequency: 85000000, Stop frequency: 110000000, 8 kHz
- Record range: Selected
- Power level start in dB: -127, Power level end in dB: -95
- Duration time in ms: 100

Below the dialog box is a spectrum plot with a blue vertical line indicating a noise floor level.

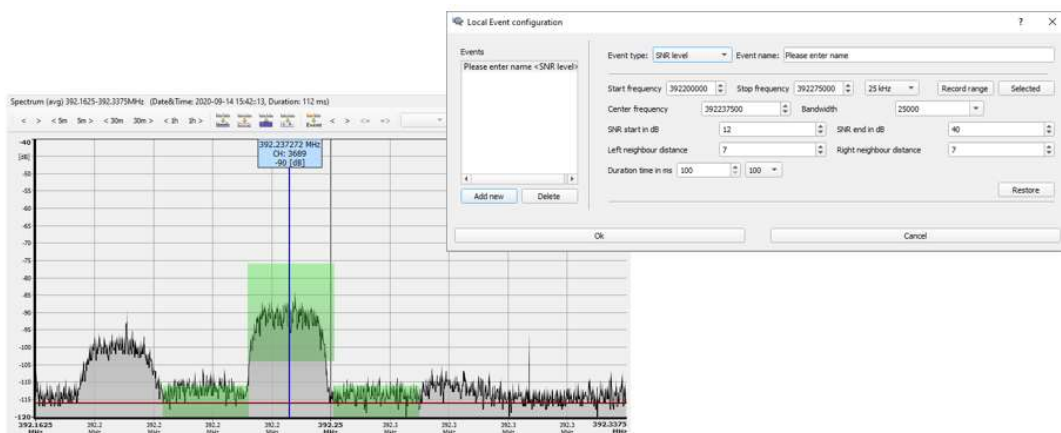
2. Power detection of a certain frequency or frequency range



3. Peak detection over frequency range

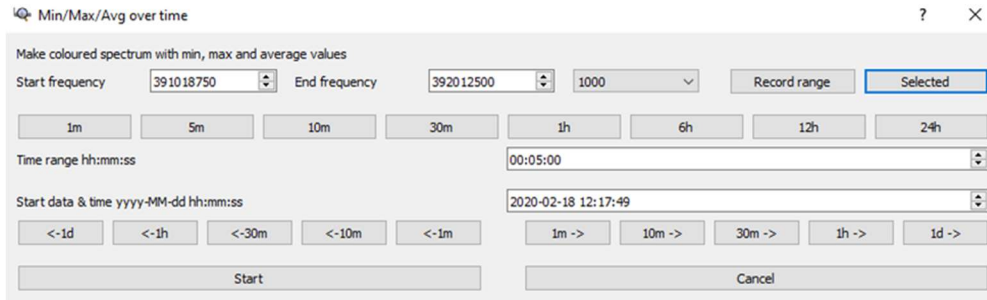


4. SNR surveillance and Carrier surveillance with spectral mask



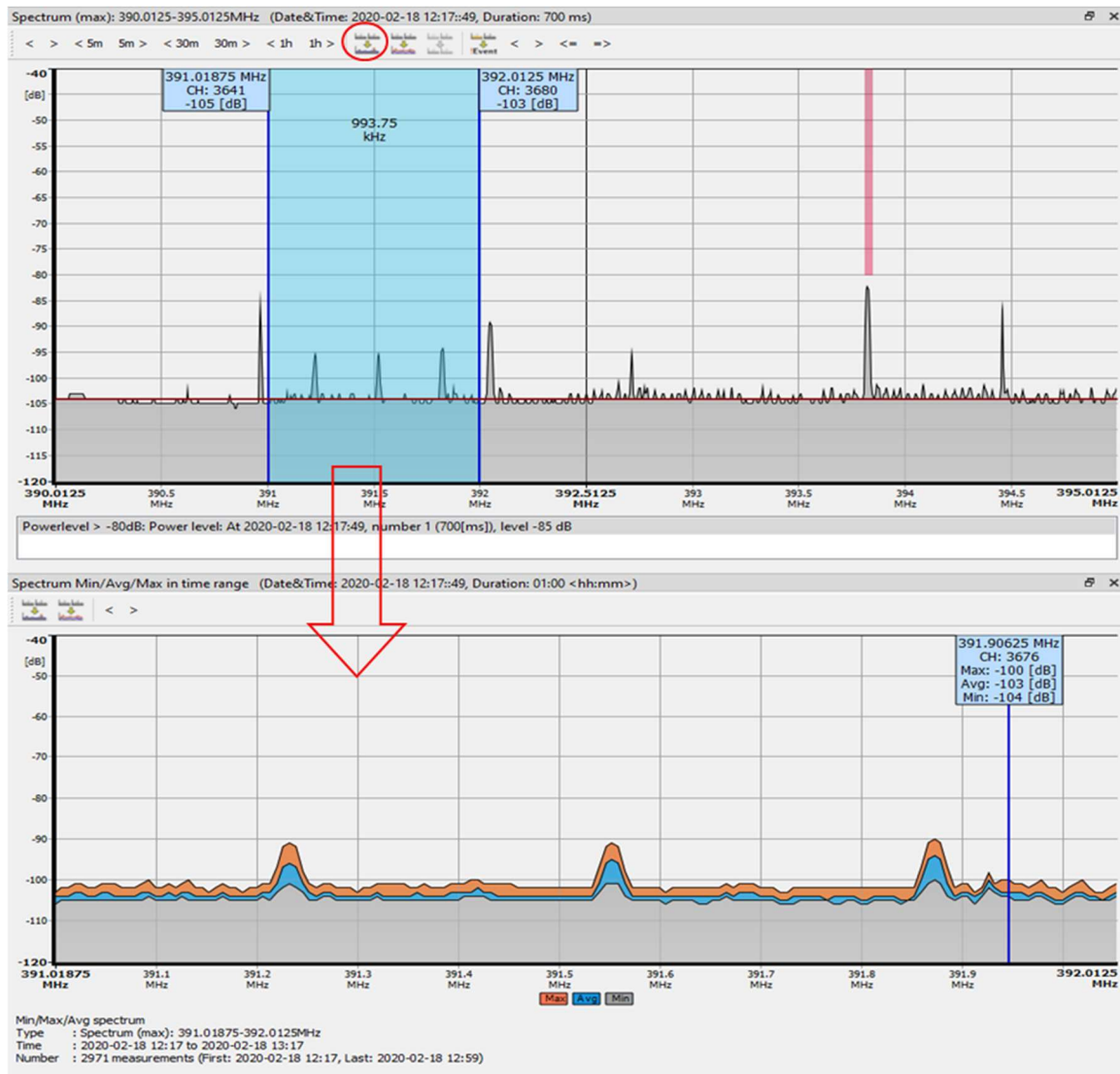
Data Analysis

Using the HF Monitor Evaluation Software, the recorded data is visualized and analyzed at different points in time by selecting the frequency range to evaluate.



There are 4 types of Graphs available for analysis:

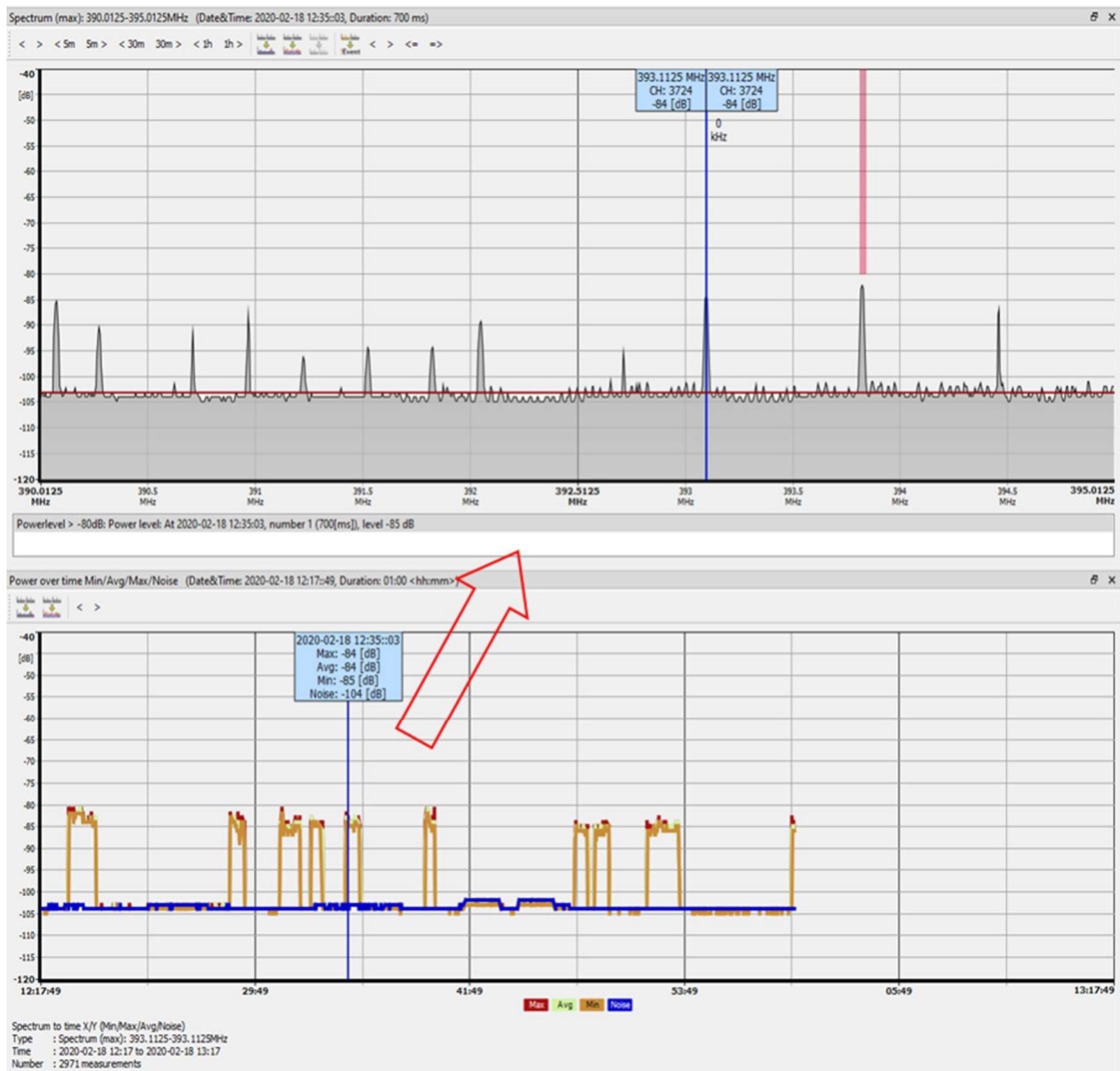
1. Min/Max/Average graph



2. Spectrum display

The Spectrum display shows from a selected point of time a view of the signal power over time.

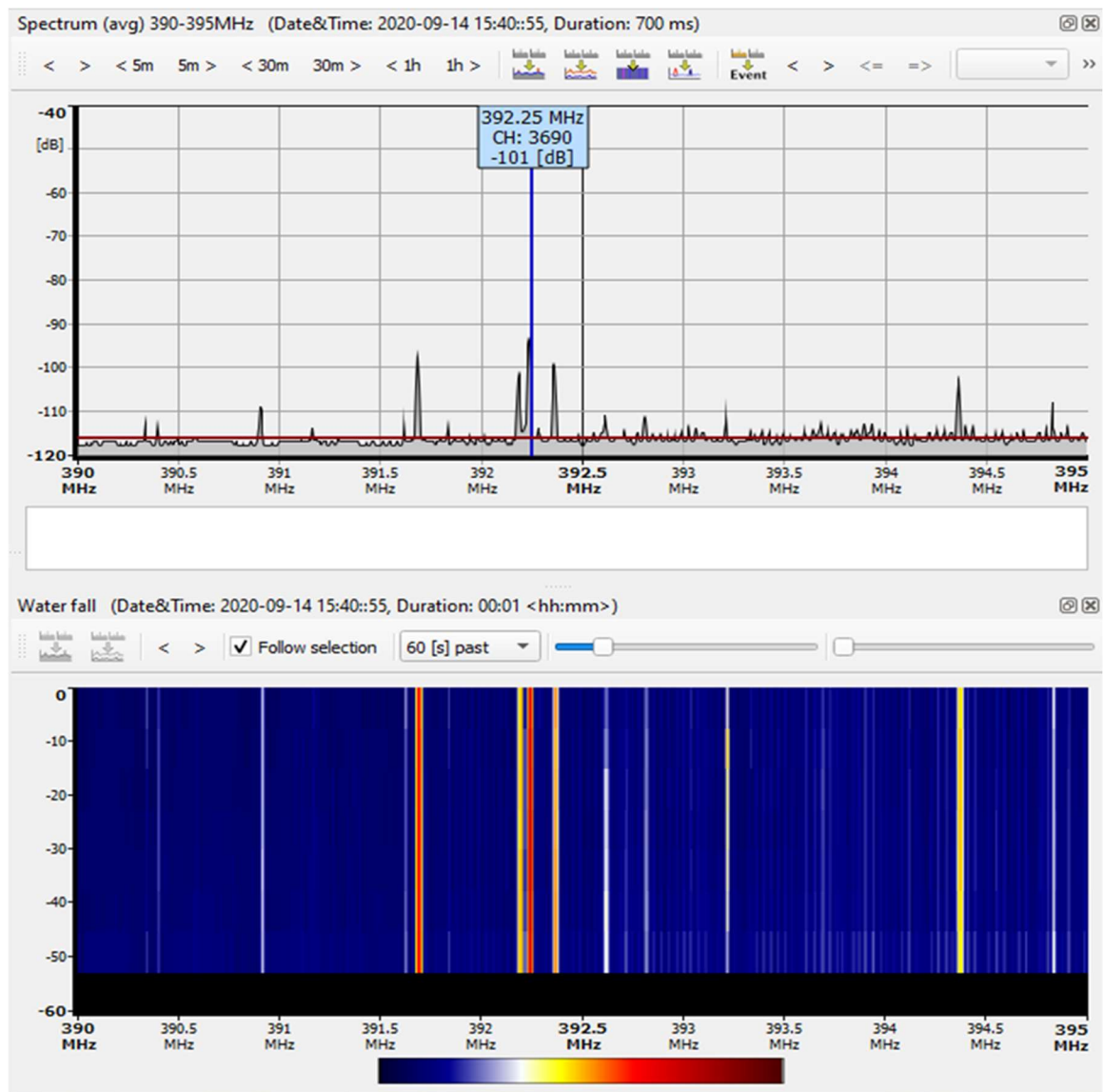
The graph “Power over time Min/Avg/Max/Noise” is the result of the transformation of the specifying frequency domain into the time domain.



3. Spectrum Waterfall diagram

The Waterfall diagram provides a color-based visualization of the RF level and activity over time.

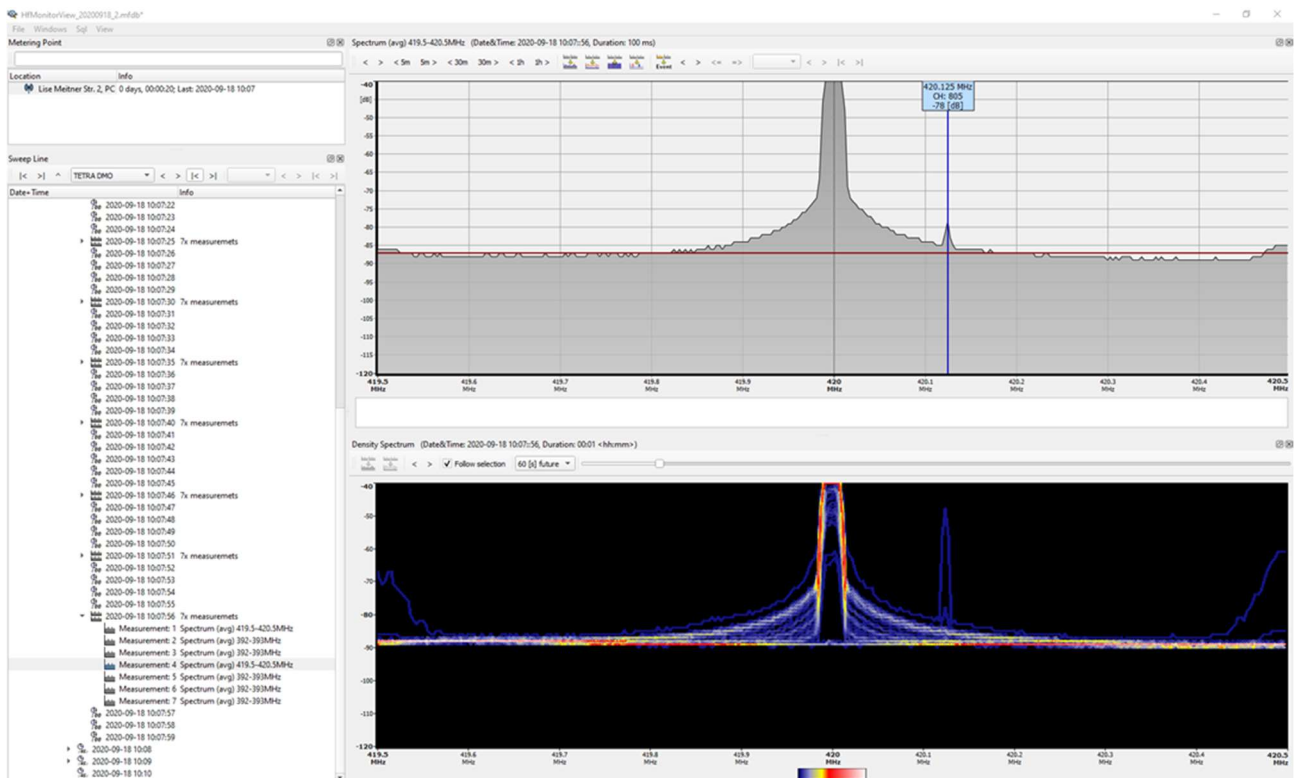
This includes the past or future based on the actual selected point of time.



4. Density Spectrum diagram

The Density Spectrum Diagram displays accumulated RF energy as a function of frequency.

This shows an adjustable time period displaying the data of the past or future based on the actual selected point of time.



HF Monitor Specifications

Name	Description
PC Requirements	
PC-Hardware (Minimum)	Intel® Core™ i5, 8GB RAM, 20 GB available space on the hard disk
OS	Windows 10 (32- or 64-Bit-Version)
USB-ports	2.0 (used for Dongle with Program Program-Licenses)
Interface or card readers for reading and writing	SD-Card (optional used to directly edit configurations of the Sensor Modules and to read out measurement results without a connection via Ethernet)
Ethernet	10/100/1000 Mbit/s (used for connections of the Sensor-Modules with the PC)
Requirements connection of the Sensor-Module	
WIFI	2,4 GHz or 5GHz IEEE 802.11ac (optional used for connections of the Sensor-Modules with the PC)
Ethernet	10/100/1000 Mbit/s (used for connections of the Sensor-Modules with the PC)

The HF-Monitor-Business Package comes with:

- ✓ 1x Program Dongle to operate the Evaluation Software and License Management to handle the carrier license (yellow dongle)
- ✓ 10x HF-Sensor with antenna: SDR (Nooelec) with RTL2832 receiver chip
- ✓ 10x HF Monitor Sensor-Modules (Single Board Computer)
- ✓ 10x Receiving dongle with each 1 carrier license (black dongles)
- ✓ USB-memory stick formatted to NTFS
- ✓ SD-Card already inserted in Sensor Module



Validity of the data sheet, subject to any changes to the software.

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