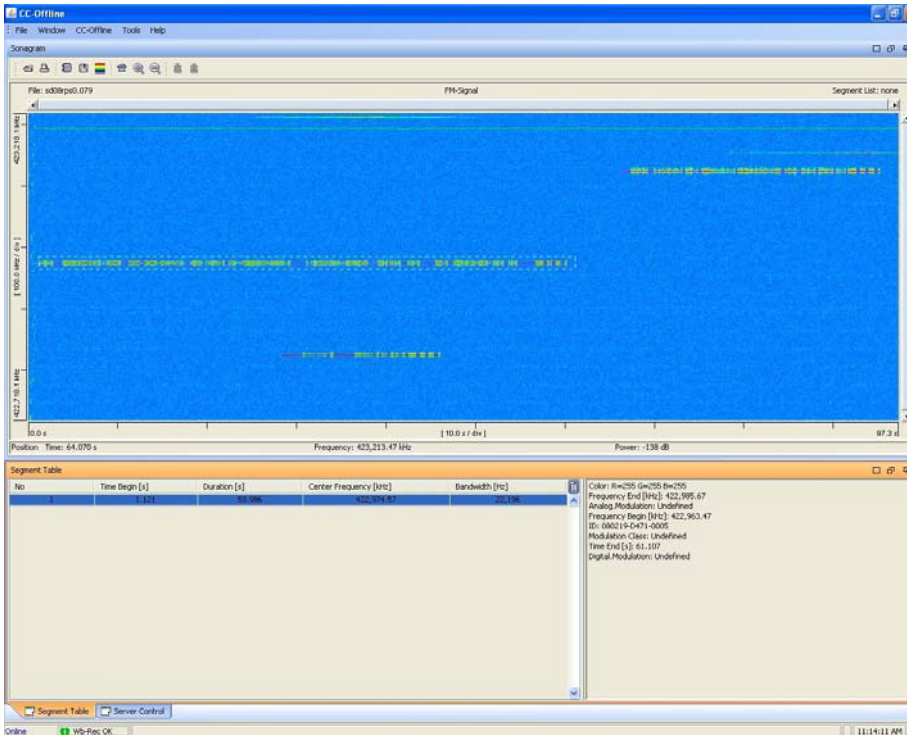




WIR VERSTEHEN DIE ZEICHEN DER ZEIT
KEEPING PACE WITH THE SIGNAL OF TIME



CCI-Offline

Offline Analysis of Wideband
and Narrowband Signals

Fast Navigation. Segmentation. Analysis.

ComCat™ – Device and system concept for recording and processing the radio signals in the wideband scenario

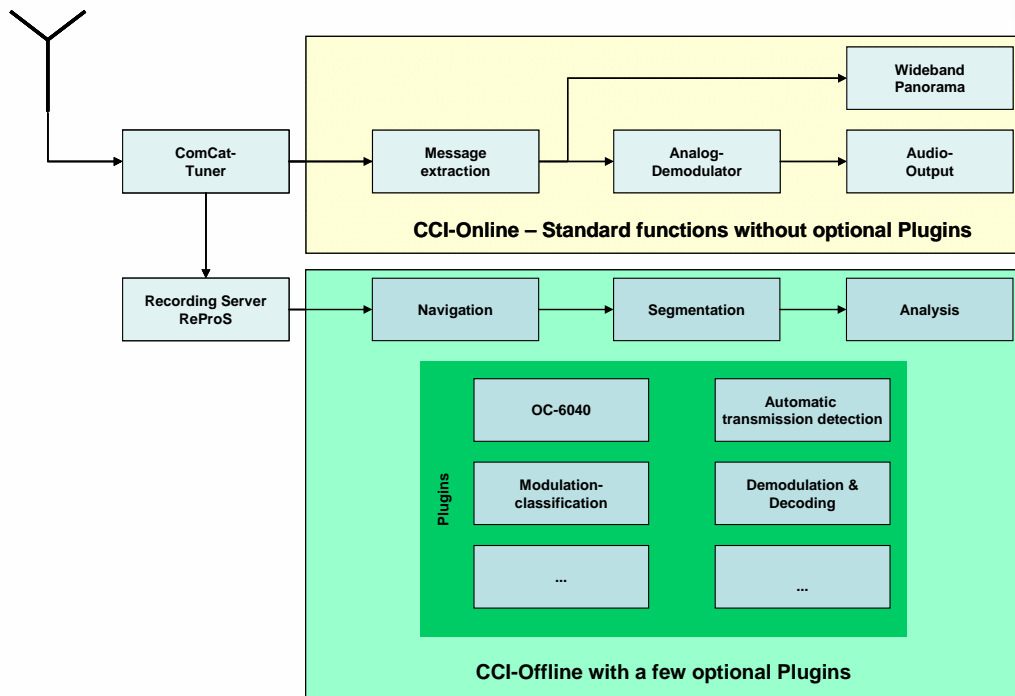
The ComCat™ -family is an innovative device and system concept from MEDAV. It is characterized by the following features:

- Flexible through modular design of hardware and software
- Software modules are designed as Virtual Devices (VD) and can be integrated simply and without risk as plug-ins in the existing ComCat-systems – even later on and several times
- Availability of efficient RF-Tuner (16 MHz monitoring or 24 MHz optional)
- Availability of cost-effective narrowband tuner (LAN-receiver)
- Availability of recording server (4 MHz recording or 8 MHz optional)
- The efficiency can be scaled almost in any way.
- Own analysis techniques can be integrated as plug-ins or as MATLAB-programs
- Economical through the use of conventional PC-technology
- Separation of the product lifespan of the processors (PCs) and algorithms (software)
- The ComCat modules are available and practically tested

System overview of CCI-Offline

CCI-Offline is a software module in the ComCat system concept and has the following functionality:

- Quick, dial-free access to the signal files (raw data) of the recording server (ReProS)
- Quick navigation in the stored wideband data
- Panorama display and visualization of details through zoom
- Manual or automatic segmentation of the wideband data
- Additional plug-ins enhance the analysis possibilities, e.g. with the universal Analyzer OC-6040
- CCI-Offline can be customized for recording systems of third parties too e.g. Tektronix, EONIC, SystemWare



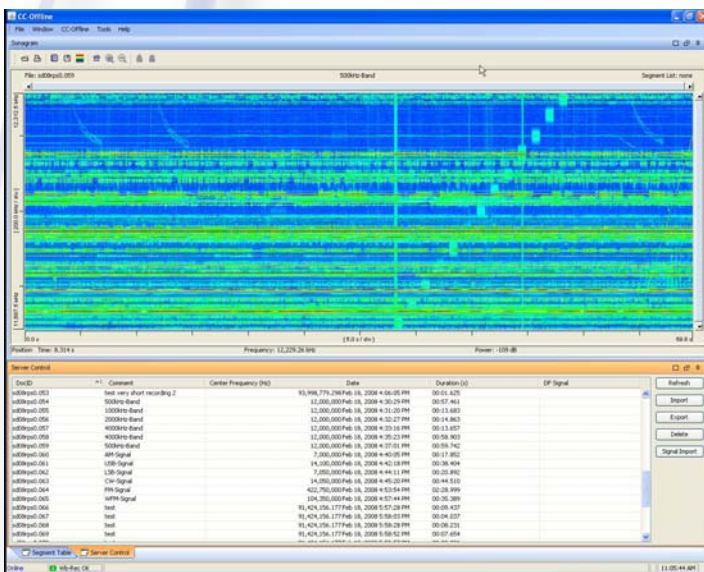
CCI-Offline is implemented platform-independent to the largest extent and is available mainly for operating systems WIN32 and Linux

From wideband signal to the segmented signal

CCI-Offline enables the **fast access** to stored wideband data, in order to find a desired signal section and to mark it for analysis. CCI-Offline gets the signals from the recording server ReProS. Optionally, we also support other recording servers (acquisition systems).

The transmissions found are segmented automatically or manually. All segments are listed in a table. Each transmission found is filled with meta-information (attributes), such as timestamp, duration of the transmission, comments, modulation method or other signal parameters. New attributes can also be created.

The segmented data and the meta-information are stored on the ReProS-server and are available for a downstream audio-output or for further analyses, e.g. with the signal analyzer OC-6040.



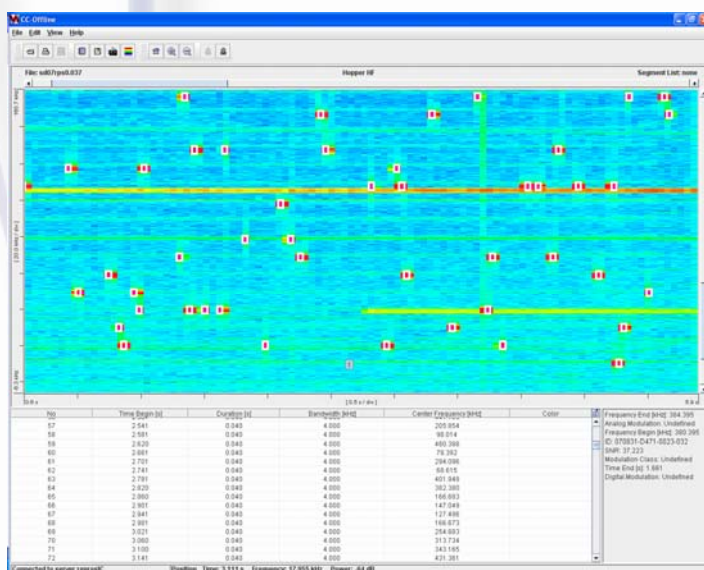
The segmented signals are present as files with the meta-information on the ReProS-server.

The user can select the files and visualize them in CCI-Offline by specifying the search criteria, which are based on the meta-information.

Here too, the signal segments can be marked, stored and processed further.

The image on the left shows a 500 kHz band in case of 12 MHz. This contains a relevant signal portion, which is to be studied in more detail.

CCI-Offline supports the detection and re-extraction of narrow-band signals of frequency-agile senders (Frequency-Hopper). The signals that can skip over some hundred kHz, are detected and converted in the original signal only a few kHz wide.



In the first section of the Hopper processing, the automated hopper-detection is done with the help of Match Filter. Thereby, a search is made in the time and frequency range with the help of suitable patterns. The result is given in a detection list with the detected hoppers.

Each visually detected transmission can be segmented interactively and extracted for further processing. The result comprises of narrowband signals that are suitable for further analysis.

Hopper signals are detected and marked automatically according to the search regulation. Manually, e.g. through mouse, the list of hits can be extended or modified

Linking of own software modules

Our MATLAB-interface offers an easy possibility of linking your own software. MATLAB is widely used and known as a powerful tool for developing algorithms.

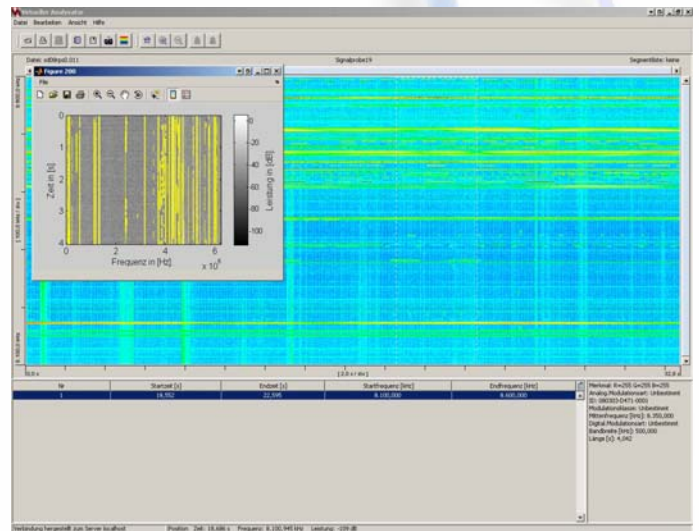
The MATLAB-interface supports you while developing the algorithms as well as while using the completed MATLAB-programs. During the development, the signal archive (ReProS) is accessed via CCI-Offline, the MATLAB-functions are used for the visualization.

After completing the development the MATLAB-runtime code is integrated in the CCI-Offline as a plug-in. Results are written by MATLAB as XML-files. These can be imported by CCI-Offline and are available for further processing and visualization

The MATLAB-interface for CCI-Offline is a powerful and flexible tool for the development and use of algorithms CCI-Offline.

The bi-directional exchange of data and results between CCI-Offline and MATLAB-runtime code makes CCI-Offline an open system, which supports a fast and comfortable extension of the analysis possibilities.

The development-oriented use of the MATLAB-interface requires the use of "MATLAB R2007A" and the toolbox "MATLAB builder for JAVA"

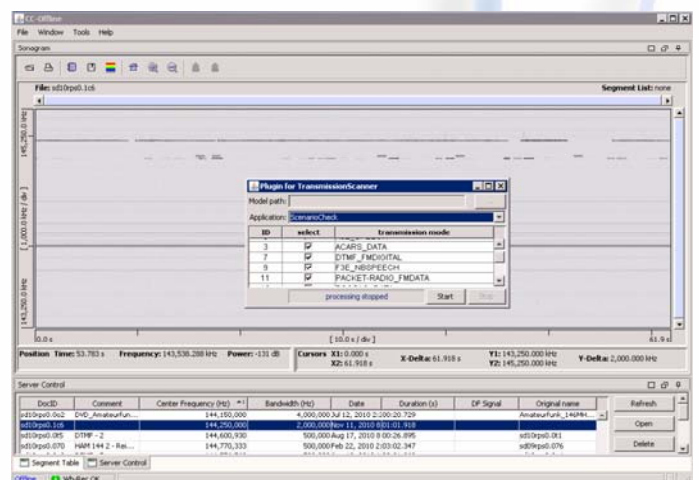


The Transmission Scanner serves for the combined detection and classification of radio standards. The approach is based on radio standard dependent models. It is possible to train models for different radio standards, sampling rates and receiver parameterizations. Additionally, the performance of a model can be improved by using a-priori knowledge.

The graphical user interface shows the detected signals in the wideband scenario and as lists.

The following models are available:

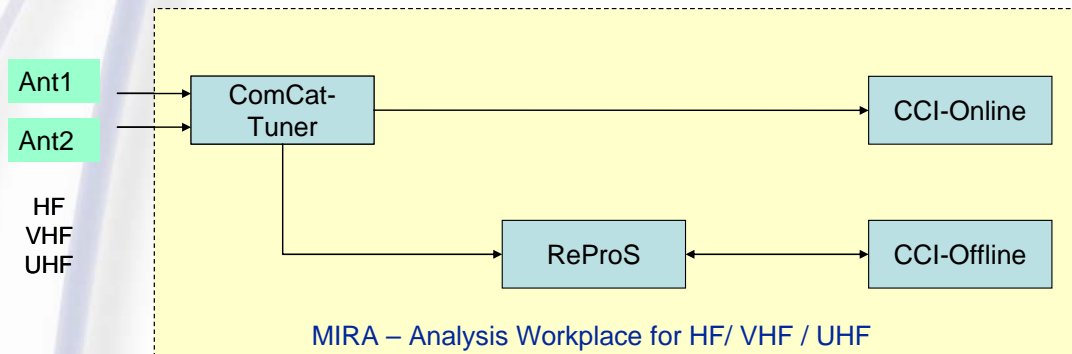
- A3E Speech
- ACARS
- DTMF (VUHF)
- F3E Narrowband Speech
- PACKET-RADIO (VUHF)
- POCSSAG
- TETRA
- TETRAPOL
- VDL2



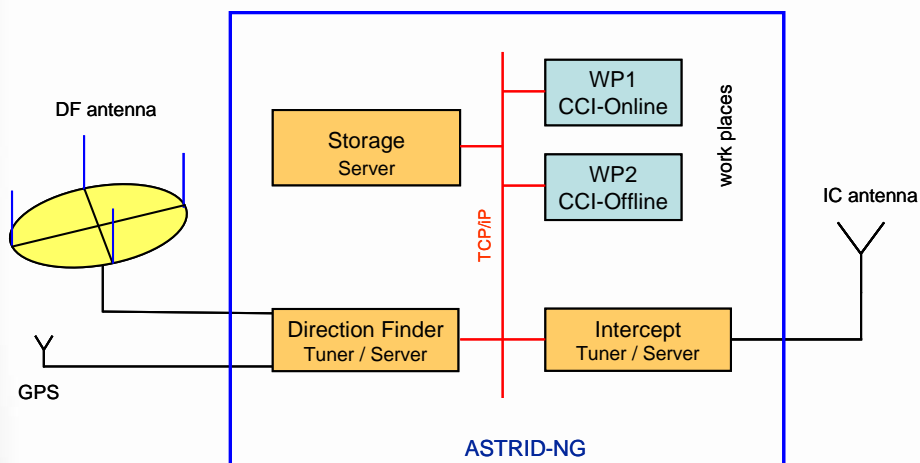
Additional models may be trained / provided by MEDAV upon request

Sample applications

MIRA - Wide- and narrowband analyzer for HF/VHF/UHF, suitable for monitoring (16 MHz or 24 MHz optional), recording and analysis. Special features here are the extensive analysis possibilities and the gap-less recording of 4 MHz (8 MHz optional) in the RF-Band. Scan-operation is possible over the entire RF-Band



ASTRID-NG is a workstation for wideband HF-signal acquisition, **direction-finding**, recording and analysis. Along with numerous analysis possibilities, the outstanding features of ASTRID-NG include the recording bandwidth of 500 kHz (2 MHz optional) of intercept and DF data and mainly the simple use.



Sensors

Signals

Classification

Content

Information

Intelligence

Corporate Policy

Technology

... in the products, development and in the company management is state-of-the-art and represents a top level.

Quality

... in all divisions of our company is considered as the indispensable prerequisite for a risk-free and successful cooperation with our customers and business partners.

Position in the market

... is affected by extensive experience gained from signal and information processing. We are prepared best to face competition.

Product and engineering spectrum

... are comprehensive, complete and tailored to meet all requirements. As a single source supplier of solutions, we offer standard devices, systems and services.

Employees

... form the roots of the company and render the services necessary for maintaining and expanding the technical basis and a trustful and fair cooperation.

Growth

... on a stable technical and economical basis at home and abroad is our declared long-term goal.

Trust and fairness

... vis-à-vis our business partners and within the company are the basis of our business.

Compliance

... with excessive sensibility and compliance with German and international export regulations we act on a worldwide basis.

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