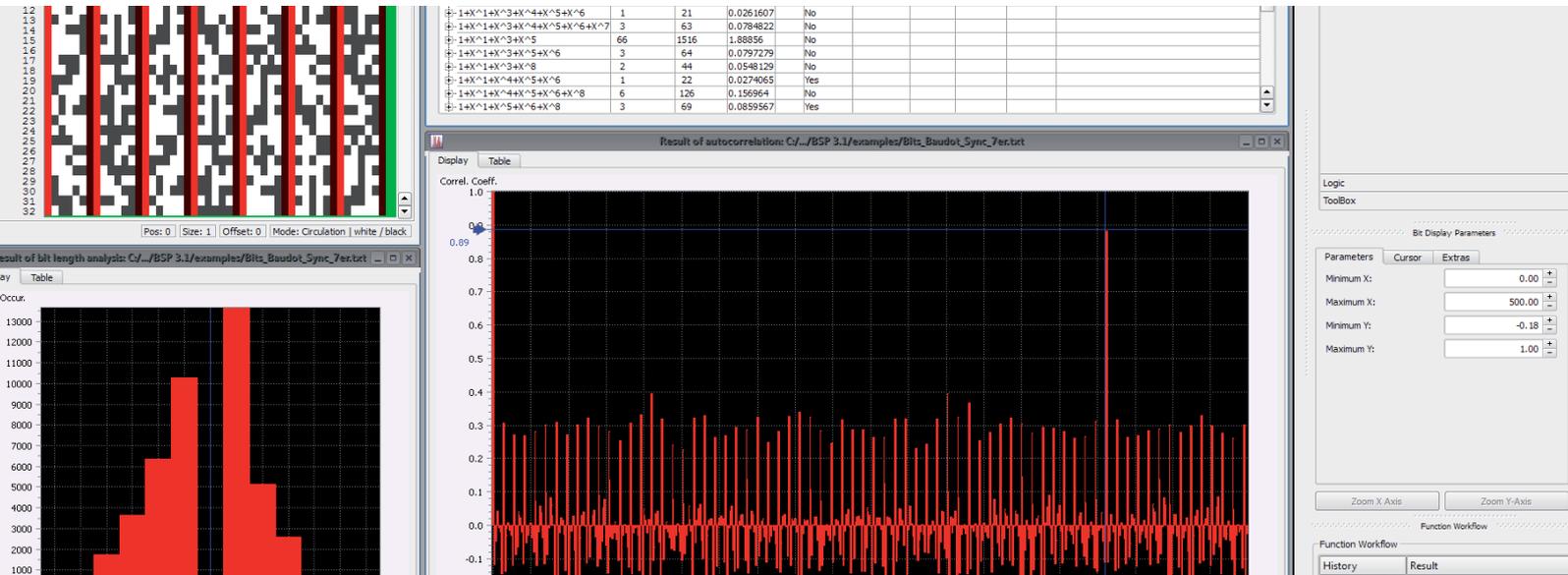




go2ANALYSE

## Bit Stream Analysis and Processing

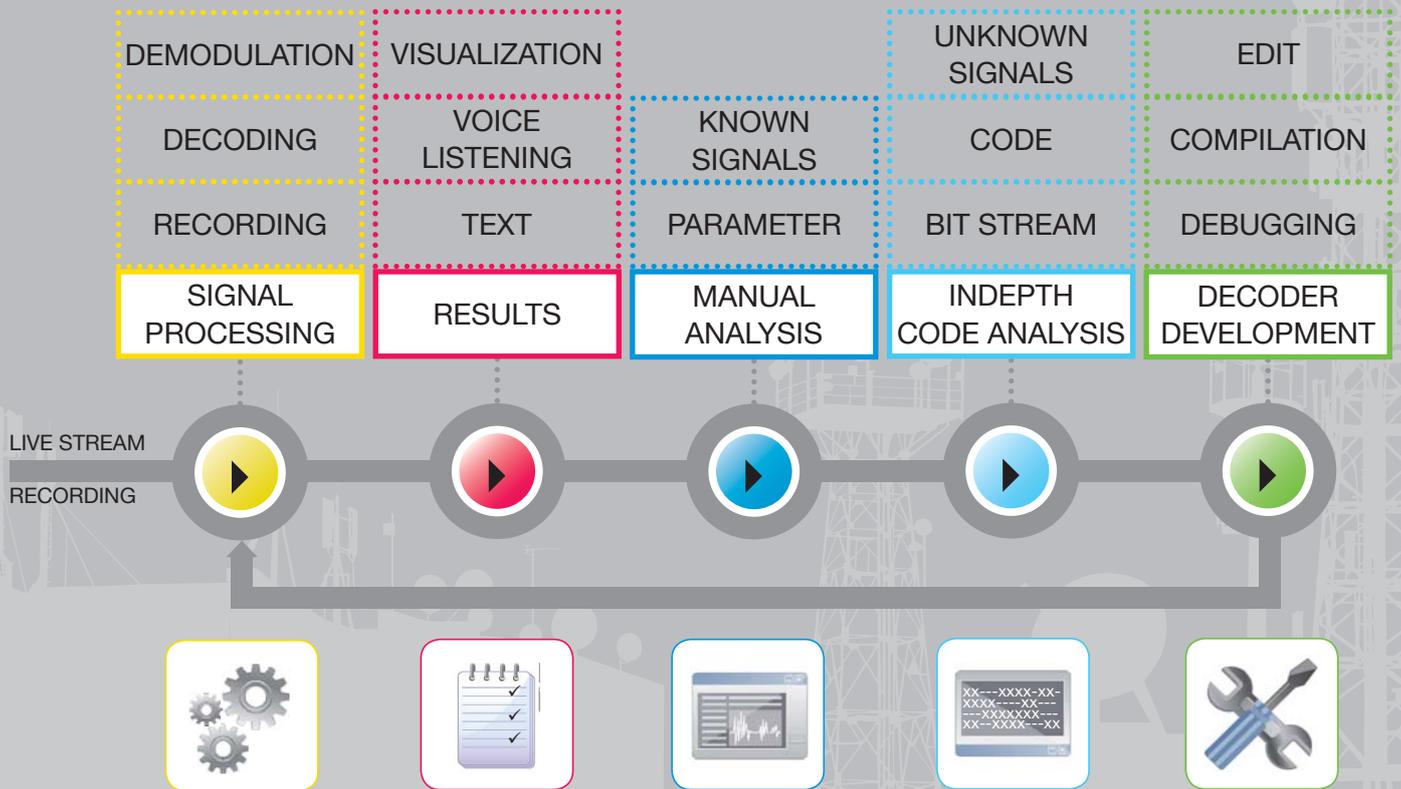


go2ANALYSE is a user friendly and powerful tool for the analysis of unknown signals on bit streams level.

## Key facts

- Powerful offline bit stream analysis tool
- Check unknown bit streams for known/existing decoders
- Identify unknown coding details or parameters
- Analyse existing decoders
- Process generic bit streams
- Search for periodical and non-periodical patterns
- Demultiplexing and deinterleaving
- Use of DDL decoders
- Several alphabets and user-definable code tables
- Recording, saving and replay of analysis steps

# WORKFLOW



## go2ANALYSE

**Offline analysis, manipulation of bit streams to determine the code characteristics.**

- Wide range of logical, statistical, demultiplexing, deinterleaving, LFSR, search and binary modulations functions
- Adapt or modify functions by applying a scripting language
- Use of DDL decoders
- Record, save and replay analysis steps
- Write specific test programmes in order to identify unknown codings (e.g. CRC-polynoms)
- Program parts used for the code analysis can be used in the resulting decoders
- Easy implementation of libraries and use of external programmes
- Processing of already conditioned bit streams

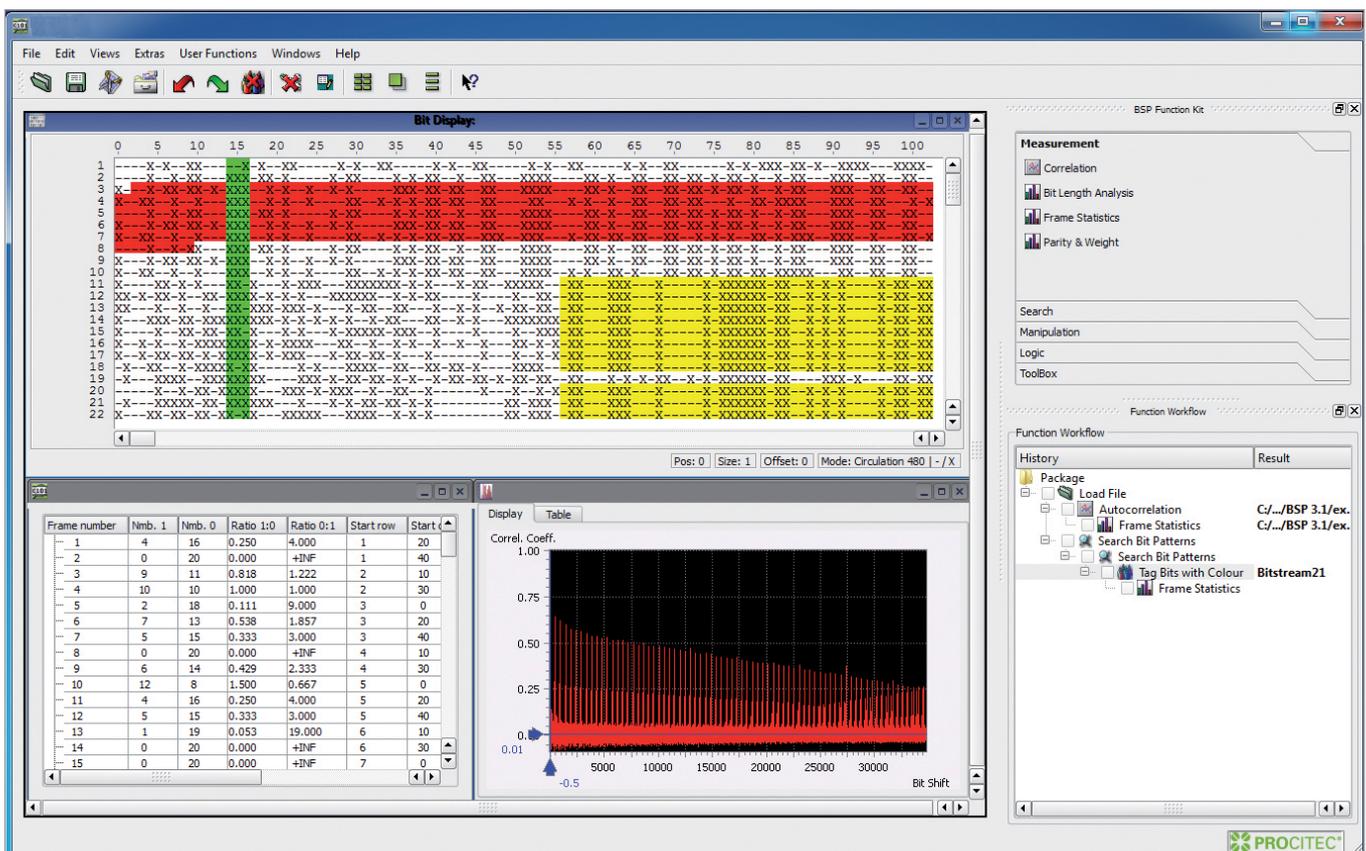
## Analysis tool for specialists

Where the work of manual signal analysis ends, go2ANALYSE enables coding specialists to gather the basis information for the modification of existing or the writing of new decoders.

go2ANALYSE offers a wide range of statistical, mathematical and manipulative functions to determine the characteristics of the applied coding, combined with vital features such as bit stream visualizations in various formats, logic operations and editing functions. For manipulating standardised binary raw data are required.

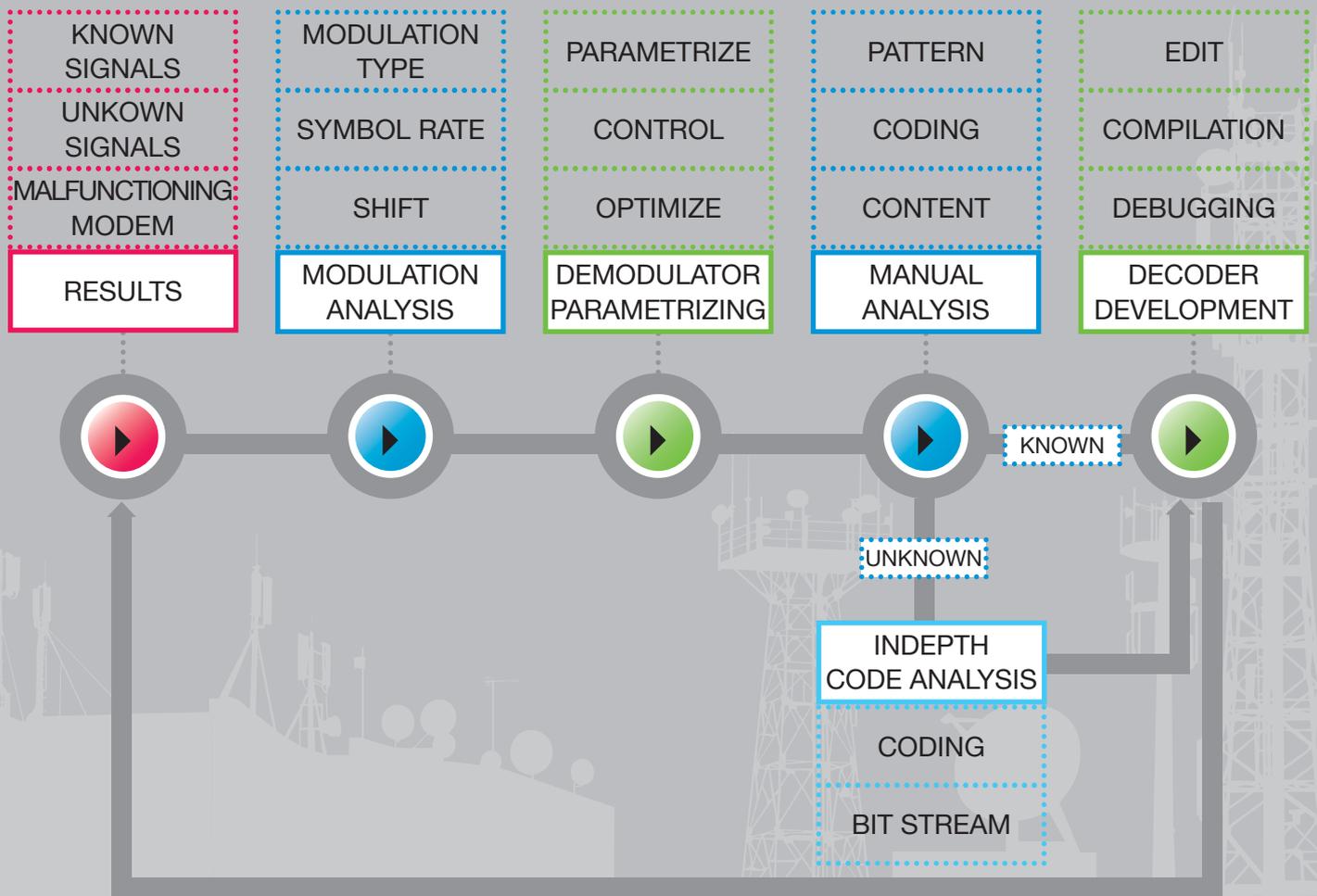
go2ANALYSE facilitates the analysis, providing functions to record, save and replay the analysis steps. Further, existing DDL decoders can be applied to the bit stream currently processed, and the code tables and alphabets in use are accessible for modifications. This way the analysts' knowledge and experience gets build in for future automatic processing.

go2ANALYSE is intended for users familiar with the theory of coding, demodulation and error correction as well as the respective know-how in mathematics and algorithms.



Bit stream analysis with a modern and user-definable GUI

## USE CASES:



## Use Case

### Indepth analysis of unknown protocols

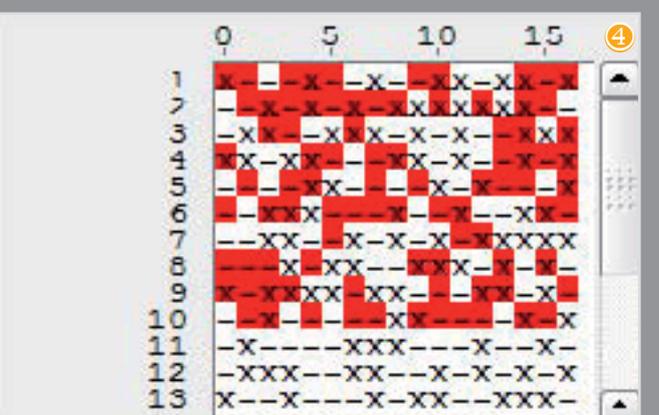
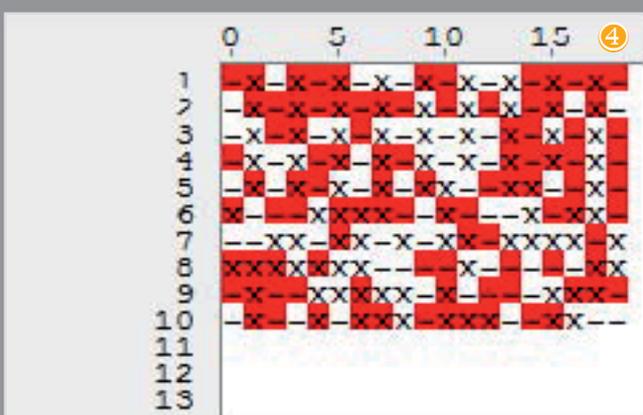
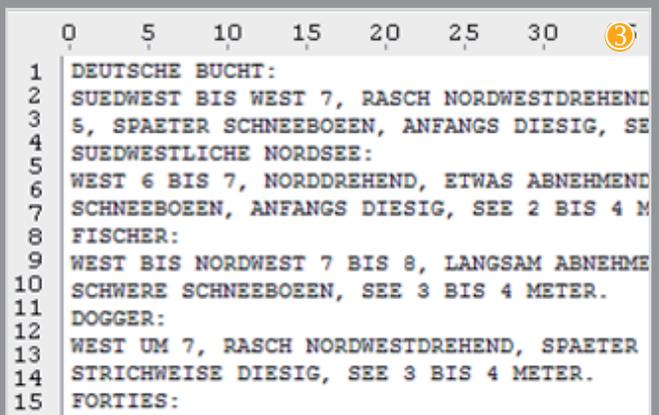
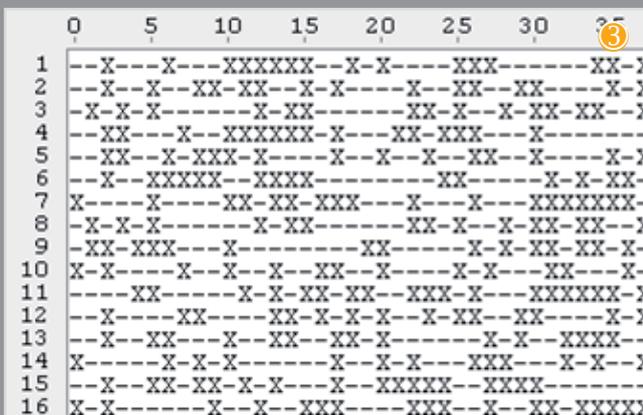
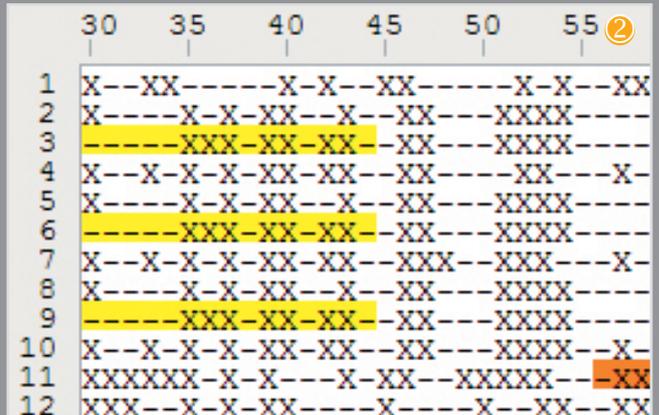
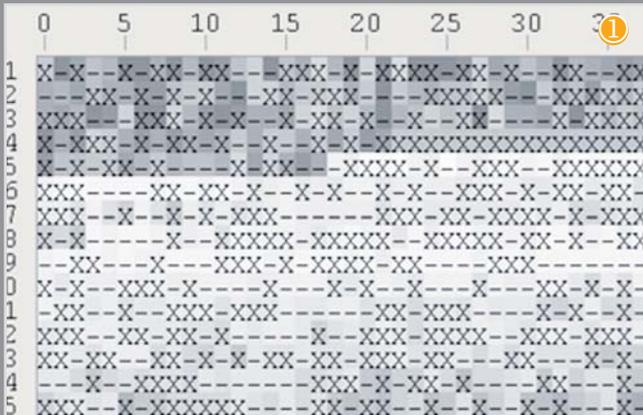
Modern radio monitoring systems support the operators in many ways, but when it comes to new unknown modem types, the operators reach their limits.

Often, specialists and technical experts have to bring up their entire know-how and spend hours of exhausting manual analysing in order to convert their work in a performing decoder.

The result of the bit stream analysis is a user-defined chronology of functions/commands – ideally resulting in a complete and precise

decoding. Using so called „Analysis Decoders“, bit streams can gradually be analysed, visualised and in the last step decoded. Without additional go2SIGNALS tools like go2DECODE or go2MONITOR these „Analysis Decoders“ can be used directly.

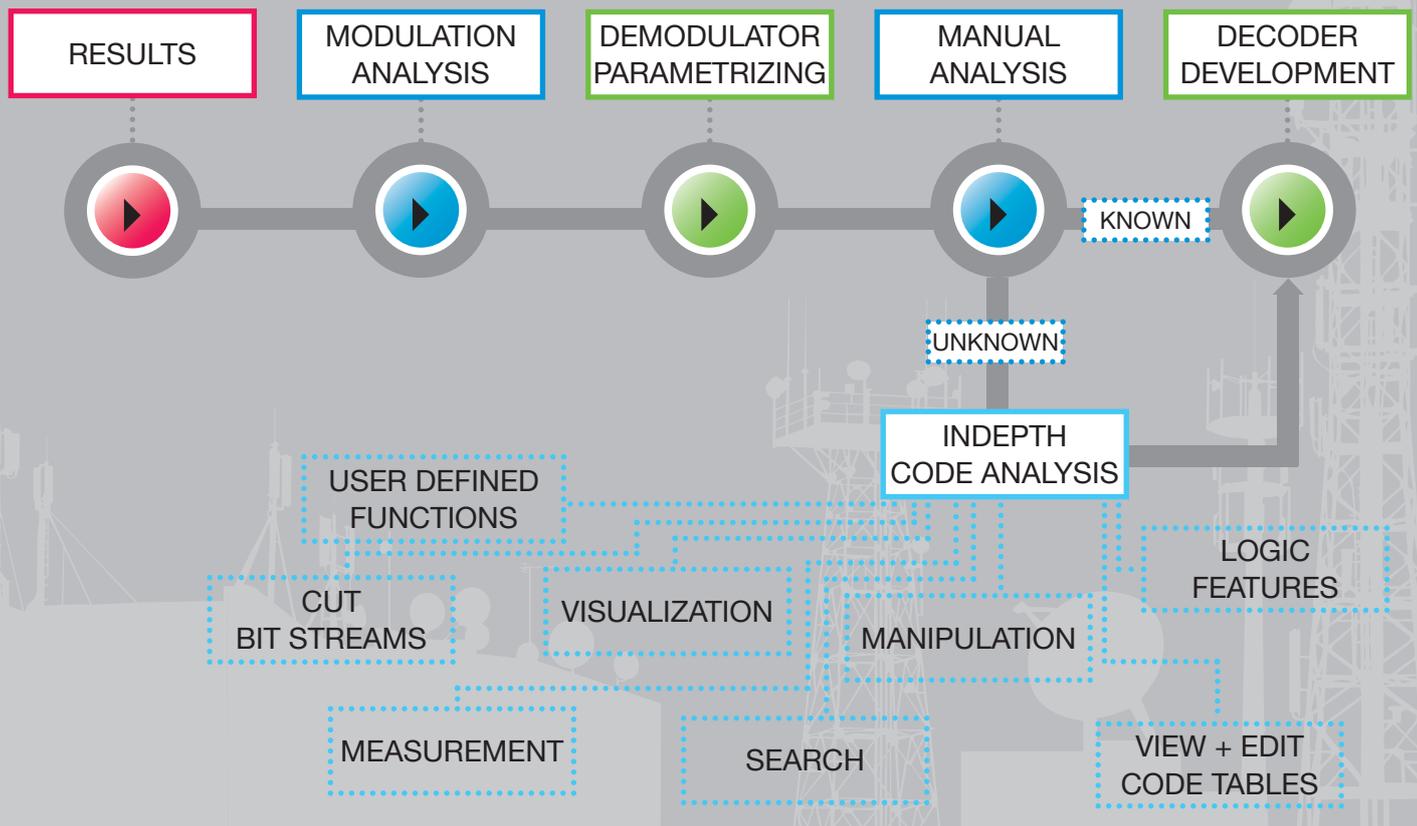
By using programming languages (e.g. DDL, C, C++) the required know-how regarding commands and functions can be implemented in decoders and used in manual or automated radio monitoring systems.



- ① Bit visualization with symbol quality allows to focus on areas of low bit error rate.
- ② Highlighting of differences
- ③ Using an alphabet a decoded bit stream is outputted as readable text.
- ④ Bitwise Exclusive OR (XOR) operation of two bit stream files. The different bits are marked.



# FUNCTIONS



## Functions:

### Bit stream visualization and navigation

Our software go2ANALYSE provides the analyst with all necessary functionality to visualise, evaluate and process the bit stream. A large number of measurement, search, manipulation and logic features simplifies the analysis process.

### User defined functions

Furthermore, even more complex problems in the bit stream analysis can be solved as go2ANALYSE is an open tool. It gives you the possibility by using the scripting language DDL (Decoder Description Language) to enhance or to modify existing functions.

Some of the go2ANALYSE functions have been realised that way. The source code is part of the shipment and provides the basis for specific modifications.

Required parameter input masks are being established via XML-data in a simple syntax. „Analysis Decoders“ which are generated this way offer not only text output but also modified bit streams and simple graphic pictures.

### Standard programming interface

An integrated programming interface (C++, etc.) offers additional expandability. This way self-developed algorithms and decoders can be embedded; logfiles and even speech outputs are possible. External libraries and programs can be integrated easy and simple.

### Command and analysis history

The entire workflow is documented in single steps. It can be reproduced step-by-step at any time. Interim results can be shown at any step.

Specifications overview		
Data acquisition	Text-based bit stream Packed binary Bitstream recording from go2DECODE and go2MONITOR	
Localization	English; Others on request	
Documentation	PDF User manual / PDF Online-Help	
Recommended PC hardware	Min. Intel i5 2 Core, 2 GHz, min. 4 GB RAM, 16 GB recommended HDD: min. 50 GB recommended (depends on binary file input) Screen Resolution: min. 1280 x 1024 pixels	
OS	Windows 7 / 10 64 bit	
Features		
Software Feature	Remarks	
Bit Stream Visualization	x/-, L/H, /1 instead of 1/0 Font size changeable Graphical bit display Circulation length  Bit offset Tag bits with different colors Show difference of two bitstreams	Alignment: Burst/Circulation length Cut/Copy/Paste Undo/Redo Bits with quality Symbols of bits
Analysis	Autocorrelation Crosscorrelation Bit length analysis 0/1 ratio Automatic search for periodic sequences	Automatic search for non-periodic sequences Repeated patterns Mark start, stop and parity bits Testing against codes: Hamming, Reed-Solomon, BCH, Golay, CRC
Manipulation / Transformation	Deinterleaving Decimation Demultiplexing Logic: AND, OR, NOT, XOR selected bits, XOR two bitstreams	Inversion: Mirror / NOT Cutting Viterbi correction Descrambling Destuffing
Tools for LFSR	Analysis and handling of linear feedback shift registers Berlekamp-Massey Linear complexities	
Binary Modulation	NRZ-M NRZ-S BIPH-L Manchester	BIPH-M BIPH-S
Map Bits to Text	MSB/LSB Normal/Inverse	predefined code tables: e.g. ASCII8, Baudot, Baudot-3Shift-CYR, HEX, Morse, ITA2P User defined code tables
Workflow Management	Complete workflow recorded Displayed as tree of commands and results Undo/Redo (several steps) Save/Load workflow	Replay saved workflow with different bitstreams Change command parameters in workflow delete individual commands
Integrate External Tools	Open selected bits in external tool (configurable)	
User Functions		
Decoder Development	Item	
Basic functions	Apply compiled software decoders to a loaded bitstream Use of DDL decoders (the Decoder Description Language is a programming language for the implementation of software decoders) Decoder can supply different output types such as bitstream output, graphic output, marker output, progress bar and text output	
Function library	Pre-processing Symbol conversions Descrambling procedures Channel selections Pattern search Burst detection Forward/backward time jumps Deinterleaving	Check and correction procedures: CRC, Hamming, Viterbi, BCH, Reed-Solomon Elementary arithmetic and bit manipulations Table handling Branches and sub-routines (special functions on request)
Decoder Editor	Automatic command completion Content related help Syntax highlighting	
Compiler	Generation of binary decoder files Detailed code check and error messages	



go2SIGNALS

... monitoring a connected world

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[www.procitec.de](http://www.procitec.de)



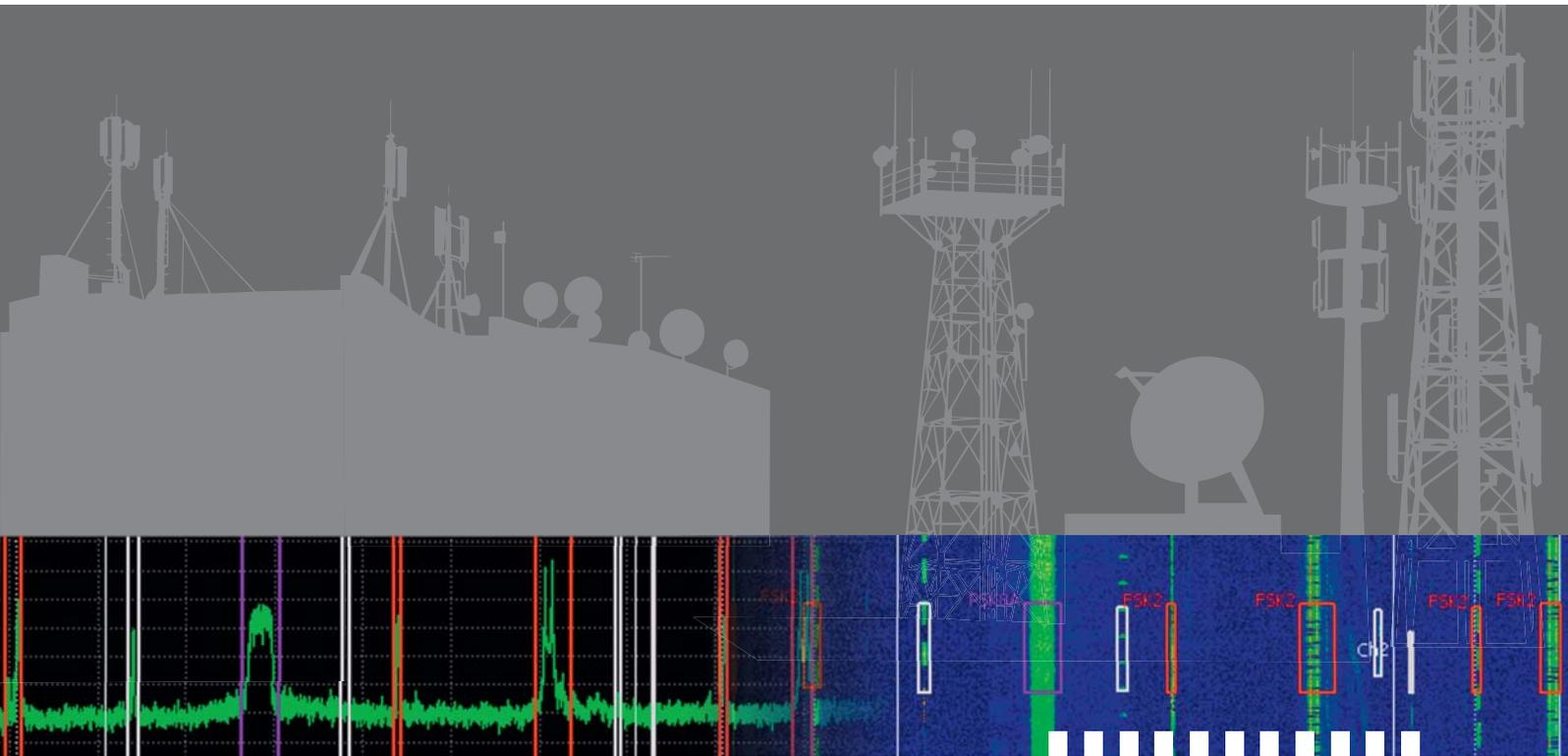
go2DECODE



go2MONITOR



go2ANALYSE



Management System  
ISO 9001:2015

17.2 01/2018 (Subject to modification)