PROCITEC®
HOUSE OF SIGNALS

Technical Specifications

Analysis Suite

Product Version v26.2

July, 2026

ANALYSIS SUITE PRODUCT CONFIGURATIONS	
go2DECODE STANDARD	• Software for detection, demodulation, decoding and analysis of known and unknown radio signals • Knowledge based recognition approach • Automatic production of signal content • Speech detection and recording • Standard set of demodulators and decoders HF/VHF/UHF/SAT • Allows parameterization of decoders • Display for signal monitoring • Handling of modem lists • Universal configurable demodulators • Displays and tools for signal analysis
go2DECODE PROFESSIONAL	• Software for detection, demodulation, decoding and analysis of known and unknown radio signals. • Integrated decoder development environment for the development of customer decoders or the adaption of existing decoders (based on the decoder description language pyDDL). • Knowledge based recognition approach • Automatic production of signal content • Speech detection and recording • Standard set of demodulators and decoders HF/VHF/UHF/SAT • Allows parameterization of decoders • Display for signal monitoring • Handling of modem lists • Universal configurable demodulators and editable decoders • Displays and tools for signal analysis • Software based modulation generator (go2generate) • Decoder Development
go2DECODE LIGHT	• Software for detection, demodulation and decoding of known radio signals • Knowledge based recognition approach • Automatic production of signal content • Speech detection and recording • Standard set of demodulators and decoders HF/VHF/UHF/SAT • Display for signal monitoring
go2modem-studio	• Add processing of new and unknown signals to go2MONITOR • Creating and editing of customer decoders • Adapt decoder output to customer needs • Debug decoder bit processing and output • Creating, editing and testing of customer modem definition files • Test and analyze demodulation and automatic signal processing based on signal recordings • Export decoders and modems to go2MONITOR for automatic signal monitoring

The performance of our software products depends on the hardware used. Technical parameters can differ under real operational conditions. The parameters specified are limit values that cannot be guaranteed in all combinations. Specifications subject to change.

ANALYSIS SUITE PRODUCT CONFIGURATIONS	
go2signal-analyzer	• Software for manual and automated modulation analysis • Measure parameters for FSK, PSK, OQPSK, multi-tone, multi-channel, etc. modulated signal • Integrated automatic modulation classifier with modem classification feature • Multiple predefined analysis sets for modulation type specific signal analysis • Preprocessing with integrated DDC, Chirp, FM and AM demodulation • Audio demodulation and replay • Multiple analysis displays like waterfall, spectrum, histogram, autocorrelation, constellation, scatter, bit, etc. • Set of x-, y-, z-cursors in difference or harmonic measurement modes • Universal demodulator for FSK, PSK and multi-tone modulation (includes burst and multi-channel) • User can save and restore signals, selections and analyses in project files
go2signal-analyzer Option OFDM	• Additional toolset for go2signal-analyzer software for OFDM signal analysis and demodulation • Tu/Ts duration measurement • Scatter displays for amplitude and phase over time and carriers • Multiple I/Q constellation diagrams • Multi-carrier phase correction • Demodulation PSK2-PSK16, QAM4 and QAM16 with bit display
go2ANALYSE	• Software for analysis, evaluation and manipulation of recorded bitstreams to determine the characteristics of the coding used • Configurable bit displays • Functions for editing, manipulation and analysis • Logical operations • Search of periodics and bit pattern • Handling of LFSR • Complete and partial autocorrelation • Testing against codes • Deinterleaving and demultiplexing • Recording and replay of analysis operations • Configurable code tables • Functionality partly adaptable by a scripting language
go2key	• Finds the used keys for ARC4 encryption (e.g. Motorola Enhanced) for DMR radios • Works with data records from go2signals DMR decoders, short records are sufficient • The keys found can be used to decrypt future transmissions as well, e.g. in go2signals • The search speed depends on the computing power of the used computer • Requires export approval prior to supply

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go2DECODE	
DATA ACQUISITION	• Digital IF stream (complex baseband I/Q); Sound card (real or complex) • Digital IF/AF recordings (real / complex WAV 8, 16, 32 Bit; RF64, TCI cap, Medav DAT, Custom RAW, Midas BLUE signal file format)
LANGUAGE	• English or German
RECOMMENDED PC HARDWARE	• Notebook or Desktop; CPU: Intel i5 or higher, min. 2.6 GHz; • Memory: ≥ 4 GByte RAM, HDD: ≥ 10 GB, • Screen Resolution min. 1280 x 1024 Pixel, • Sound card for analog IF input, 1 GBit/s Ethernet for digital IF input
OS	• Windows 10/11 de/en, 64 bit • Red Hat Enterprise Linux RHEL 8 (8.8 or higher, 8.10 recommended) • Red Hat Enterprise Linux RHEL 9 (9.2 or higher, 9.2 recommended) • Ubuntu 22.04 LTS (22.04.2 or higher, 22.04.2 recommended) • Ubuntu 24.04 LTS
LICENSE	• USB-Dongle (CodeMeter) as default • Optional: License sharing with license server • The AMBE+2™ voice coding Technology embodied in this product is protected by intellectual property rights including patent rights, copyrights and trade secrets of Digital Voice Systems, Inc. This voice coding Technology is licensed solely for use within this Licensed Product. The user of this Technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the object code, or in any other way convert the Object Code into a human-readable form. US Patent Nos. #8,595,002, #8,359,197, #8,315,860, #8,200,497, #7,970,606, #6,912,495 B2, #6,199,037.

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go2DECODE PRODUCT FEATURES	
ALPHABETS	• Can be added to the decoder source code, free configurable (requires go2DECODE Professional)
DECODERS	• Our list of standard, military and PMR decoders is subject to continuous development. See the list of available decoders: www.procitec.com/go2signals-decoderlist • MIL and PMR decoders may need an End-User-Certificate (depending on the country of the user)
VOICE DETECTION, DEMODULATION, RECORDING	• Modulation types: AM, FM, USB, LSB • Detection: voice yes / no • Nominal frequency • Voice Pitch • Automatic audio demodulation and recording
DEMODULATORS	• Automatic frequency, amplitude and symbol rate control • Fast equalizer using known training sequences (via pyDDL) • Primary demodulation USB/LSB/AM/FM • Automatic burst synchronization • List of demodulators see later in this brochure
GUI	• Easy and intuitive to operate • Input spectrogram with live audio • Manual and automatic demodulator and decoder control • Different analysis displays for manual signal analysis • Specialized signals analysis cursor measurement functions • Modem editor with demodulator and decoder settings • Decoder editor and debugger (pyDDL, Option Professional) • Light and dark color theme
INPUT FILES (DANA)	• Digital IF (complex baseband I/Q 32 Bit), from 2kHz up to 10 MHz sampling rate (note: functionality may be limited for sampling rates higher than 2 MHz) • Playback of standard WAV files. • Digital IF/AF (real / complex WAV 8, 16, 32 Bit; RF64, TCI cap, Medav DAT, Custom RAW, Midas BLUE, SigMF and SignalHound IQ file format) • Playback of Perseus and WiNRADiO WAV recordings with correct frequency display
INPUT AUDIO (DANA)	• Playlist (files) • Loop mode • Complex IQ / • Audio files • Remove DC • Filtering • Mirror • FM demodulation • Time source (File / System clock) • Sample rate converter • Centre frequency tuning • Streaming TCP/IP • Configurable replay speed

go2DECODE PRODUCT FEATURES	
INPUT, TCP/IP STREAMING	• From 2 kHz up to 10 MHz sampling rate (note: functionality may be limited for sampling rates higher than 2 MHz) • Generic PROCITEC / PLATH format • VITA 49
SIGNAL RECORDINGS	• Types: IF/AF • Start / Stop - Manual by operator - Automatic by trigger • Trigger types - Configurable squelch level - Signal detected - Transmission method recognized - Transmission method unknown - Voice / Morse detected • File formats: WAV
OUTPUT	• Decoding results • TXT-File with decoded text • XML-File with decoded text and metadata • Signal recordings • Voice recordings • Bitstream *.rec files (bits and quality of each bit) • Bitstream *.txt files (bits)
SONAGRAM VIEWER (SOVI)	• Standalone application for spectrum / spectrogram display
RESULT VIEWING (PMO)	• Display of: - Decoder output - Demodulated audio files (CW, TETRA etc.) - Text output (ALE, HFDL, etc.) - Binary files
SIGNAL GENERATOR (go2generate)	• For standard test signals. Requires go2DECODE Professional; • Detailed description see later in this brochure
DECODER DEVELOPMENT	• Modification of standard decoders • Definition of new decoders • Integration of existing decoders, requires go2DECODE Professional • Detailed description see later in this brochure
SOUND CARD INTERFACE (DANA)	• Analog input • WiNRADiO VSC • Virtual-Audio-Cable (VAC) etc.

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go2DECODE SIGNAL ANALYSIS FUNCTIONS	
DISPLAYS	• Spectrum • Spectrogram / Sonagram • Autocorrelation • I/Q Constellation • Eye pattern • Time domain (oscilloscope) with additional histogram • Analysis (magnitude, frequency and phase) with additional histogram • Hell • Bit
SIGNAL SQUARING	• Squaring: 0, 1, 2, 3
WINDOWING	• Rectangle • Hanning • Hamming • Kaiser • Flat Top • Blackman
CURSORS	• Harmonic • Crosshair • 2 cursor modes
CENTRE FREQUENCY	• Adjustable
OPERATION MODES	• Online • Offline

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go2DECODE DEMODULATORS

ALE 3G*/4G*	MT63
AM/A3E (Voice)	OFDM
Analoque Selcal	OQPSK
ASK 2 (OOK), 4, 8	Pactor II, III, 4
Chirp	PSK 2, 4, 8, 16 A/B
Clover II	PSK data aided
Clover 2000	QAM: - QAM 16, 32, 36, 64, 128, 144, 256 (square) - QAM 16, 32, 64 (circle) - APSK16_dvbs2 - ASK2PSK2 abs/diff - ASK2PSK4 abs/diff - ASK4PSK16 diff - QAM 8 - QAM 16 v17 abs/diff - QAM 16 v22 abs/diff
Clover 2500	
Coquelet	
DECT**	
DPSK 2, 4, 8, 16 A/B	
DRM	
F1A	
FAX	
FM/F3E (Voice)	
F7B/F7W	Robust Packet
FreeDV	Serdolik System v2
FSK 2 matched	STANAG 4415*
FSK 2, 4, 8 disc.	TFM 3, 5
FSK (chooses mode selection)	THROB / THROBX
GSM**	Wideband HF (MIL 110 App.D) *
Hybrid	
J3E (USB, LSB) (Voice)	
LINK11*	
LoRa	
MDPSK 2, 4, 8, 16 A/B	
MCFSK 2	
Mil39Tone*	
Morse (A1A, A2A, F1A, F2A)	
MPSK 2, 4, 8, 16 A/B	
MSK/GMSK	

Modem specialized demodulators are only useable in combination with its corresponding decoders
* requires optional product feature MIL decoder package
** requires optional product feature PMR decoder package

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go2DECODE SUPPORTED RECEIVERS

Receiver	Windows supported	Linux supported
AirSpy	•	
CommsAudit CA7851	•	•
Grintek GRX Lan	•	
IZT R3xxx series	•	•
IZT R4000 (SignalSuite)	•	•
narda® NRA-3000 RX	•	•
narda® NRA-6000 RX	•	•
narda® IDA 2	•	•
narda® SignalShark® 3310	•	•
PLATH SIR 51xx	•	•
R&S EB 500/510	•	•
R&S EM100/PR100	•	•
R&S EM200	•	•
RFSPACE NetSDR	•	•
RTLSDR/Noxon USB-sticks	•	
SDRplay RSP1 & RSP2	•	
SignalHound BB60C/D	•	•
ThinkRF R5500-408	•	•
ThinkRF R5500-427	•	•
ThinkRF WSA5000-408	•	•
ThinkRF WSA5000-427	•	•
USRP X310	•	• (Support upon request only)
WiNRADiO G31DDC, G33DDC, G35DDC, G39DDC	•	
Generic VITA 49 receiver support	•	•
Other generic „Winrad ExtIO“ supported receivers	•	

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DECODER DEVELOPMENT (**included** in go2DECODE PROFESSIONAL and go2modem-studio)	
BASIC FUNCTIONS	• Modification of standard decoders • Definition of new decoders • Integration of existing decoders
FUNCTION LIBRARY	• Preprocessing • 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 • Various output formats, alphabets, channels • Control of demodulation and decoding • Setting of demodulator parameters • Selected voice codecs • Branches and sub-routines • Soft decision • Expandable with third party Python modules or C libraries (pyDDL only)
DECODER EDITOR SPYDER	• Automatic command completion • Content related help • Syntax highlighting
DEBUGGER SPYDER	• Debugging - Breakpoints on lines of code - Single-step mode for lines of code - Display of variable contents in various formats and displays - Editing of variable contents - Display of all input data packages - Display of internal data buffer and current read position • Advanced analysis of recognition, demodulation and decoding - Breakpoints in several decoders for one modem list - Comparison of the decoder behavior in search phase / decoding phase - Monitoring the current demodulator state

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go2generate SIGNAL GENERATOR (Included in go2DECODE PROFESSIONAL)	
MODULATION GENERATION	• Single and multi-channel, continuous and burst signals • Up to 10 MHz output sampling rate • Waveform and digital modulation (using ITU emission designators): - ASKn - PSKn (single and multi-channel) - QAMn (single and multi-channel) - ASKnPSKm (single and multi-channel) - NCPFSKn (Non-Continuous-Phase FSK) - FSKn (single and multi-channel) - MSK (single and multi-channel) - GMSK (single and multi-channel) - OFDM - F7B (FM with 2 or more digital channels) - TFM 3/5 (Tamed Frequency Modulation) - Morse - Sine - Rectangle - Sawtooth - Triangular • Analog modulation: - AM, SSB (LSB / USB), FM • Variable modulation parameters: - Attenuation - Center frequency - Baud rate - Pulse shapes: RC pulse, RC/RRC spectrum, Gauss pulse - Short-duration / burst parameters
CODING GENERATION	• Binary, Baudot, ASCII, HC ARQ, ITA2 • Differential / absolute coding • Convolutional encoding / Viterbi • CCITT standards V.17 … V.33 • Variable bitstream, bit order, parity • Various scrambling algorithms and recursive sequences
CHANNEL SIMULATION	• AWGN • Multi-path propagation: Watterson (ITU) and enhanced ITS model • Doppler Shift (parametrizable shape type, amplitude, phase)
OUTPUT	• Sound card • WAV Files • Network stream

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FEATURE COMPARISON TABLE go2DECODE

FEATURE	go2DECODE LIGHT	go2DECODE STANDARD	go2DECODE PROFESSIONAL
Automatic processing	•	•	•
Signal Analysis functions		•	•
Decoder Development			•
go2generate			•
Recording / replay	•	•	•
Standard decoder package	•	•	•
MIL decoder package[1]	o	o	o
PMR decoder package[2]	o	o	o

• = included
° = as option available

EXPORT CONDITIONS:

1) In case of an export from the Federal Republic of Germany an export permission must be granted by the German authorities. Enduser certificate is required.

2) In case of an export from the European Union an export permission must be granted by the German authorities. Enduser certificate is required.

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go2signal-analyzer	
DATA ACQUISITION	• Digital IF/AF recordings (real / complex WAV 8, 16, 32 Bit; RF64, TCI cap, Medav DAT, Custom RAW, Midas BLUE, SigMF and SignalHound IQ file format)
LANGUAGE	• English
RECOMMENDED PC HARDWARE	• Notebook or Desktop; CPU: Intel i5 or higher, min. 2.6 GHz; • Memory: ≥ 8 GByte RAM, HDD: ≥ 10 GB, • Screen Resolution min. 1280 x 1024 Pixel
OS	• Windows 10/11 de/en, 64 bit with Media Feature Pack • Red Hat Enterprise Linux RHEL 8 (8.8 or higher, 8.10 recommended) • Red Hat Enterprise Linux RHEL 9 (9.2 or higher, 9.2 recommended) • Ubuntu 22.04 LTS (22.04.2 or higher, 22.04.2 recommended) • Ubuntu 24.04 LTS
LICENSE	• USB-Dongle (CodeMeter) as default • Optional: License sharing with license server

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go2signal-analyzer PRODUCT FEATURES	
GUI	• Easy and intuitive to operate • Automate typical analysis steps for quick measurement • Use prepared analysis windows, support all necessary analysis methods at once • Each analysis panel provides a module help, each plot a quick help • Combine practical experience of users and our experts • Support experts, but also users who take their first steps in modulation analysis • Light and dark color theme
SIGNAL SELECTION	• Manual specify time and frequency range for analysis in spectrogram • Walk through signal function, find good signal parts and changing parameters • Multiple selections possible to compare signal parts
CROP PREPROCESSING	• Extract a specific time-frequency region from an input file • Possibility to swap lower and higher sideband • The result is shown in spectrogram/spectrum display • The output signal can be used as input signal for further analysis
FM DEMODULATION	• Remove a primary FM modulation • Demodulates the selected input signal with an FM demodulator • The result is shown in spectrogram/spectrum display • The demodulated output signal can be used as input signal for further analysis
AM DEMODULATION	• Remove a primary AM modulation • Demodulates the selected input signal with an AM demodulator • The result is shown in spectrogram/spectrum display • The demodulated output signal can be used as input signal for further analysis
LINEAR CHIRP DEMODULATION	• Remove a linear chirp up or down modulation • The result is shown in a spectrogram display and time domain plot with selectable metric • The demodulated output signal can be used as input signal for further analysis
ANALYSIS DISPLAYS	• Autorange and zoom function • Spectrogram/spectrum • Spectrum (linear, logarithmic, average, Welch, A3, F3, n'th power, etc.) • Vector/Time (magnitude, phase, frequency, etc.) • Histogram (phase, frequency, etc.) • I/Q-Plot (absolute, differential) • Autocorrelation (input data, frequency, amplitude, weighted frequency, etc.) • Circulation/Hell (frequency, amplitude, weighted frequency, etc.)
CURSOR	• Adapted to the display type cursor functions are available for parameter measurement • X-, Y-, Z-, XY-Cursor • Harmonic, Centered and Mirrored multiple cursor mode • Time, frequency, phase, magnitude, symbol rate, bandwidth, SNR, channel count, channel distance, etc. measurement
TIME ANALYSIS	• Various time domain plots to manually assess basic emission property, e.g. the modulation type of an emission • Initial configured for time behavior of instantaneous magnitude, phase and frequency comparison (AM, PM and FM demodulation) • Additional instantaneous signals (amplitude, in-phase, quadrature, power and level) selectable • Each plot with additional histogram

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go2signal-analyzer PRODUCT FEATURES	
PERIODICITY ANALYSIS	• Allows to detect repetitive signal parts, such as regularly sent synchronization sequences, bit frames, etc. • Several analysis signals like instantaneous frequency, weighted frequency, differential phase and magnitude • Autocorrelation display to measure repetition circulation time • Circulation (Hell) display synchronized with autocorrelation measurement
CLASSIFIER	• Automatic modulation classification of a signal contained within a selection • Includes modem classification • See table for supported modulation and modem types
AUDIO PLAYER	• Audio replay of selected signal • Demodulator for CW, USB, LSB, AM and FM • Parametrizable in signal start and end, frequency and bandwidth
PSK ANALYSIS	• Provides a set of tools specialized in the analysis of PSK modulated signals • Determine modulation parameters like PSK modulation type, symbol-rate, version, etc. • Multiple squared signal spectra display with automatic frequency correction • N'th power spectrum of phase center offset frequency measurement • A3 Spectrum symbol rate measurement • Absolut I/Q display with PLL and differential I/Q display • Differential phase histogram
OQPSK ANALYSIS	• Provides a set of tools specialized in the analysis of OQPSK modulated signals • Determine modulation parameters like OQPSK modulation type, symbol-rate, etc. • Two squared signal spectra display with automatic frequency correction • 4'th power spectrum of phase center offset frequency measurement • A3 Spectrum symbol rate measurement • Absolut I/Q display with PLL and differential I/Q display • Absolut I/Q display with PLL of even and odd symbols • Differential phase histogram
FSK/MSK ANALYSIS	• Provides a set of tools specialized in the analysis of FSK/MSK modulated signals • Determine modulation parameters like FSK modulation type, symbol-rate, shift, etc. • Welch zoom spectrum • Weighted frequency histogram • Weighted frequency trace display • F3 spectrum symbol rate measurement • Differential phase I/Q display (MSK) • Spectrum of the 4'th power (MSK) • Eye diagram of the instantaneous frequency (MSK)
MULTI-TONE ANALYSIS	• Provides a set of tools specialized in the analysis of MFSK (multi-tone) modulated signals • Determine modulation parameters like MFSK modulation type, tone count, tone duration, tone distance, etc. • Spectrogram with automatic tone marking • Histogram over tone frequencies for tone distance measurement • Tone number histogram • F3 spectrum symbol rate measurement

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go2signal-analyzer PRODUCT FEATURES	
MULTI-CARRIER PSK/QAM	• Provides a set of tools specialized in the analysis of multi-carrier PSK and QAM modulated signals • Determine modulation parameters like multi-carrier PSK and QAM modulation type, symbol-rate, channel count, channel distance, etc. • Autocorrelation channel/carrier count and distance measurement • Average spectrum with channel position markers, numbers and selection • A3 Spectrum symbol rate measurement of selected channel/carrier • Differential I/Q display of selected channel/carrier
QAM ANALYSIS	• Provides a set of tools specialized in the analysis of PSK and QAM modulated signals • Determine modulation parameters like PSK and QAM modulation type, symbol-rate, etc. • High performance blind equalizer supporting many different PSK and QAM modulation types from PSK2, 4, 8, 16, 32 up to QAM4, 8,16, 32, 64, 128 • Spectrum symbol rate measurement with selectable clock metric • Raw and equalized I/Q display • Equalizer error based symbol quality analysis
UNIVERSAL DEMODULATOR	• See table of demodulators for go2DECODE, modem specialized demodulators are not available for analysis • Demodulation of burst signals • Demodulation of multi-channel signals • Parametrizable in modulation type, symbol rate, shift, channels, channel distance, symbol table, burst parameters, etc. • Bit display with parametrizable columns per row, burst sync., quality and different styles • Symbol and modem export
SIGNAL INFORMATION DATABASE	• Database with more than 470 modems and their different modes • Contains parameters like name, modulation, symbol rate, channels, channel distance, shift, band, alias, etc. • Automatic generated filter from analysis results to find matching modems • User editable, user expandable • Export to Excel
OPTION OFDM ANALYSIS AND DEMODULATION	• Provides an optional available set of tools specialized in the analysis and demodulation of Orthogonal Frequency Division Multiplexing (OFDM) modulated signals • Automatic parameter estimation for easy analysis • Autocorrelation Tu duration measurement • Autocorrelation of clock recovery Ts duration measurement • Clock recovery, sampling position, frequency and sampling position time behavior plots • Carrier scatter plots for differential phase, absolute phase and magnitude • Time behavior scatter plots for differential phase, absolute phase and magnitude • Multi-carrier absolute and differential I/Q display • Decision directed PLL absolute and differential demodulation for PSK2, PSK4, PSK8, PSK16, QAM4 and QAM16 modulation • Multi-carrier absolute and differential soft decisions symbols I/Q display • Bit display for demodulation result • Special multi-carrier PSK/QAM mode with phase and pulse form correction • Analysis result export to go2MONITOR and go2DECODE as modem description or demodulator parameter file

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go2signal-analyzer MODULATION CLASSIFIER*

Modulation	Spec. general	Spec. HF	Spec. V/U/SHF	Recognition quality (Eb/No) for a detection rate > 90% and false alarms < 1%
Max. signal bandwidth		50 kHz	50 kHz – 80% of input bandwidth	
Signal energy detection min. SNR		6 dB	6 dB	
Analog modulated voice detection (no SELCALS)		- USB J3E - LSB J3E - AM A3E - DSB-SC	- USB J3E - LSB J3E - AM A3E - NFM F3E (Radio frequency ≥ 25 MHz) - DSB-SC	
ASK 2/4			100 Bd – 50 kBd	14 – 18 dB
FSK 2**	m = 1 – 10	25 – 4800 Bd	1.2 – 25 kBd	11 – 15 dB
FSK 2**	m = 0.75 – 1.5		25 – 75 kBd	≥ 25 dB
FSK 4**	(shift > sr)	25 – 4800 Bd	1.2 – 25 kBd	14 – 16 dB
GMSK**	m = 0.5	300 – 4800 Bd	1.2 – 125 kBd	14 – 16 dB
MCFSK2	m ≥ 1; 2 – 64 channels	40 – 250 Bd 120 – 1000 Hz channel spacing (min. 2x shift)	40 – 250 Bd 120 – 1000 Hz channel spacing (min. 2x shift)	17 dB
MORSE		30 – 250 CPM	30 – 250 CPM	
MSK**	m = 0.5	100 – 4800 Bd	1.2 – 125 kBd	14 – 16 dB
Multitone FSKn**	8 – 64 tones (shift > sr)	3 – 200 ms (5 – 330 Bd)	3 – 200 ms (5 – 330 Bd)	14 – 16 dB
OFDM		**Bandwidth ≤ 50 kHz** - 25 – 512 Channels - Tg/Tu 0.125 – 1 - Max. channel spacing 250 Hz - Min. 25 Bd (Tested with PSK8 channel modulation)	**Bandwidth ≤ 50 kHz** - See Spec. HF **Bandwidth > 50 kHz –12.5 MHz** - 128 – 32768 Channels - Tg/Tu 0.0625 – 0.25 - Max. channel spacing 15 kHz - Min. 50 Bd (Tested with PSK8 channel modulation)	14 – 18 dB

* Measurement conditions: Typically, 4 seconds sample and correct segmentation of emission. Signal bandwidth is not more than 80% of the input bandwidth.
Shift is defined as frequency difference between neighboring tones.

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go2signal–analyzer MODULATION CLASSIFIER*

Modulation	Spec. general	Spec. HF	Spec. V/U/SHF	Recognition quality (Eb/No) for a detection rate > 90% and false alarms < 1%
OTH Radar	FM-CW variants only	Detection only		
Multichannel (D)PSK 2, 4 A/B	max. 10 kHz signal bandwidth; 2 – 64 channels	31.25 – 250 Bd 50 – 300 Hz channel spacing	31.25 – 250 Bd 50 – 300 Hz channel spacing	13 – 15 dB
(D)PSK 2 A/B		31.25 – 4800 Bd	1.2 kBd – 50 MBd	7 – 10 dB, A/B Decision: 8 – 15 dB
(D)PSK 4 A/B		31.25 – 4800 Bd	1.2 kBd – 50 MBd	8 – 12 dB, A/B Decision: 10 – 15 dB
(D)PSK 8 A/B		31.25 – 4800 Bd	1.2 kBd – 50 MBd	HF: 8 – 12 dB, A/B Decision: 10 – 15 dB V/UHF: 10 – 14 dB, A/B Decision: 12 – 15 dB
OQPSK **			100 Bd – 50 MBd	10 dB
PSK 16		300 – 4800 Bd	1.2 kBd – 50 MBd	14 – 16 dB
QAM	Order: 8, 16, 32, 64 Selected constellations	100 – 4800Bd (Constellation dependent, at least 50 symbols per constellation point within classification interval)	100 Bd – 12.5 MBd (Constellation dependent, at least 50 symbols per constellation point within classification interval)	Constellation dependent 12 – 20 dB
FM-PSK	After FM-demodulation PSK is searched in 300 – 3400 Hz band		100 – 2400 Bd	
WFM (FM Broadcast only)			Radio frequency: 65 MHz – 108 MHz Bandwidth: 50 kHz – 300 kHz	

* Measurement conditions: Typically, 4 seconds sample and correct segmentation of emission. Signal bandwidth is not more than 80% of the input bandwidth.
Shift is defined as frequency difference between neighboring tones.

** Includes ML/AI technology

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go2signal-analyzer MODEM CLASSIFIER

HF	V/U/SHF
ALE 3G	ACARS-VHF
ALE 4G	APCO-25
CHN 4+4	APCO-25 Phase 2 Downlink
CHN hybrid	DAB
CIS Akula	DECT
CIS-45 (33 / 45 Bd)	DMR
CIS-60	DMR Continuous
CIS-93	dPMR
CIS-112	D-STAR
CIS-128	DVB-T (8 MHz Mode only)
CODAN 3012/3212 16 Channel PSK	Flex
HFDL	GSM (<3G), UMTS, LTE
LINK11 (CLEW and SLEW)	Inmarsat Satphone Uplink
LINK 22	Iridium Satphone Uplink
MIL-STD-188-110A Serial (singletone) mode (a.k.a. STANAG 4539)	MPT1327 1200Bd MSK
MIL-STD-188-110B/C App. C (a.k.a. STANAG 4539 HDR)	NXDN 2400 Bd, 4800 Bd
MIL-STD-188-110C App. D	TETRA Downlink
PACTOR (I, II, II FEC, III, 4)	TETRA Uplink
STANAG 4285/4481 (PSK)	TETRAPOL
STANAG 4529	Thuraya Satphone Uplink
STANAG 4539	VDL-2
	Yaesu System Fusion

The performance of our software products depends on the hardware used. Technical parameters can differ under real operational conditions.
The parameters specified are limit values that cannot be guaranteed in all combinations. Specifications subject to change.

go2ANALYSE	
DATA ACQUISITION	• Text-based bitstream file • Packed binary file • Bitstream recording from go2signal-analyzer, go2DECODE and go2MONITOR
LANGUAGE	• English; Others on request
RECOMMENDED PC HARDWARE	• Min. Intel I5 or higher, 2 cores, 2.6 GHz • Min. 4 GB RAM, 16 GB recommended • HDD: min. 10 GB recommended (depends on binary file input) • Screen Resolution: min. 1280 x 1024 pixels
OS	• Windows 10/11 de/en, 64 bit
LICENSE	• USB-Dongle (CodeMeter) as default • Optional: License sharing with license server

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go2ANALYSE FEATURES	
BITSTREAM VISUALIZATION	• x/-, L/H, ./1, 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

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go2ANALYSE FEATURES	

MAP BITS TO TEXT	• MSB/LSB
	• Normal / Inverse
	• predefined code tables e.g.:
	  - ASCII8
	  - Baudot
	  - Baudot-3
	  - Shift-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)

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PROCITEC®
HOUSE OF SIGNALS

PROCITEC GmbH
Rastatter Strasse 41
75179 Pforzheim
Germany

Phone +49 7231 155 61-0
Fax +49 7231 155 61-11
sales@procitec.com
www.go2signals.de / *www.procitec.com*

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