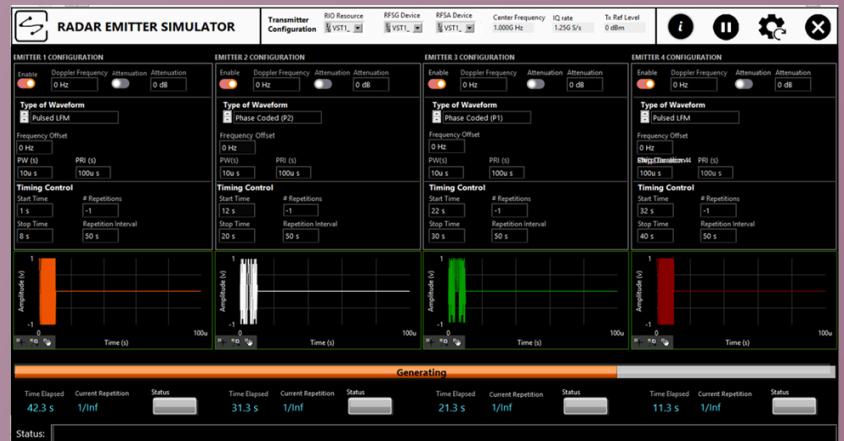# EW Signal Generation Suite (CEWS-G)

A configurable EW Signal generation software for Emitter & Threat Simulator

Overview

Electronic Warfare testing is one of the challenging test & validation process involving high levels of complexity. As most of the present day advanced test systems are driven by the software defined framework, a comprehensive EW software with flexibility of simulating a complete realistic operational scenarios would enable the developers to test the EW systems under all possible conditions. The Constelli Electronic Warfare Signal Generation Suite (CEWS-G) is a graphical software library to create Complex Emitter profiles with access to IQ & PDW data over time and comes with a flexibility to interface with other software platforms like STK etc. for complete EW Scenario Simulation. CEWS-G Emitter profiles can be converted to standard PDW formats compatible with Industry standard Test Instruments from Keysight, R&S & IQ Hardware Platforms.

Key Features

Generation of Complex Emitter Profiles

Compatible PDW data generation for Keysight, R&S & IQ Hardware platforms

Real time Generation of IQ and PDW data w.r.t time

Open API Architecture to integrate with other 3rd Party scenario software like STK etc.

Supports all Amplitude, Frequency and Phase Modulations

AoA simulation for Phase Interferometry, Amplitude Comparison and TDOA schemes

Configurable Inter and Intra Modulations

Visualization of IQ data, Pulse Patterns, Pulse drops, Spectrum & waterfall plots

Programmable Library for custom application development and readily available examples

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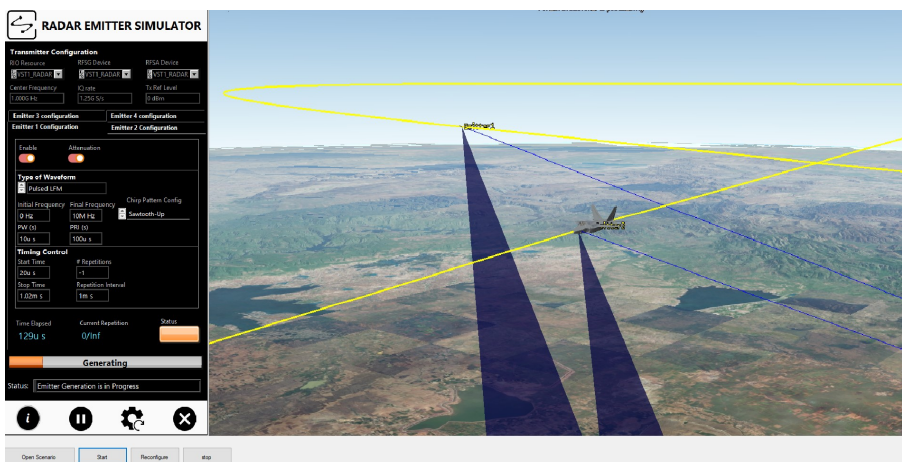
Key Specifications

General	
Operating System	Windows 10
Recommended Processor	≥Octa-core Processor, >16GB RAM, >4GB GPU & >1TB SSD
Realtime Interfacing	10G Ethernet, 1G LAN or Highspeed Serial Interface (SFP+) to stream data in real time to other hardware systems for signal generation with ≥1ms loop rates.
PDW Hardware Compatibility	Keysight UXG, R&S SMW 100 & IQ Hardware Platforms
Recording	Recording of IQ & PDW data w.r.t time for analysis or offline streaming
Open Interfacing Architecture	API's to interface with 3rd party scenario simulation tools like STK etc.
Signal Generation	
Multi Emitter Profile	• Create a scenario of multiple emitters with different modes and pulse profile • Generate pulse summary report with dropped pulses and Hardware compatible PDW stream. • Generate Pulse drop scenario based on Pulse overlap removal, High Density, Priority based profiling and Low Signal quality profile
DF Simulation	• AoA based on Phase Interferometry & TDOA • Real time reference based vector positions of the Transmit & Receive Signals for calculation of AOA • Any custom channel count AoA simulation can be created based on channel count of EW receiver antenna. • Generate all AoA techniques for the same scenario simultaneously to test various types of EW receivers performance.
Pulse Profile	• Pulse Parameters: PW, PRI, Rise & Fall time, Amplitude, Frequency & Phase • MOP: CW, AM, FM, LFM, FMCW, NLFM, Linear & Custom, BPSK Chirp, Barker(2,3,4,5,7,11 & 13) Polyphase P1,P2,P3,P4, Frank and ZC • Create pulse stream based on Number of pulses or Pulse Start & Stop times • PW & PRI Parameters: Stagger, Jitter, Pattern, Pulse Shape • Pattern Library has various patterns like Ramp, Sinusoidal, Trapezoidal, Triangular, Raised Cosine, Gaussian & Uniform Distributions and Custom equation, which can be applied on any parameter to simulate the resultant pattern. • Flexibility to create Inter-pulse Modulation effects with a combination of all above features

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Key Specifications

| Analysis	
Visualization	• Complete Pulse profile vs Dropped Pulses vs IQ data w.r.t time • Time Domain, Frequency Domain & Time vs Frequency Plots • Spectrogram/Waterfall (Optional)
Data Analysis	• Tabulated Pulse parameters data • Real time Freeze option to pause the scenario at a specific time event or based on user control • Zoom and Cursor options for better visualization & Analysis • FMCW Analysis feature for CW Measurements and Analysis • PDW Data recording in .csv and IQ data recording in .dat file

Target Sim (Options)
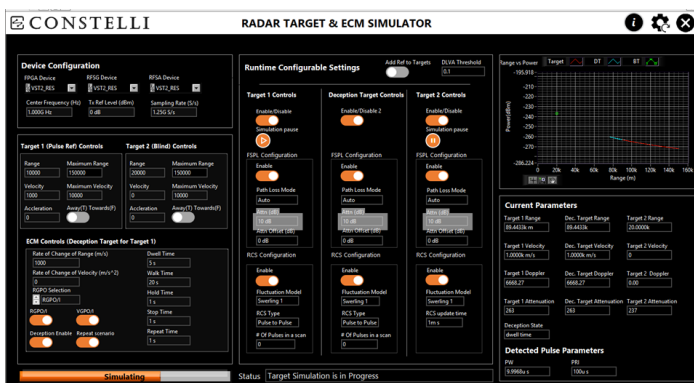
Target Simulation libraries are offered as optional add-ons to **CEWS-G Suite**.

The **Target Sim** library includes target simulation VIs such as Range, Doppler Shift, Free Space Path Loss (R^4 Attenuation), Radar Cross Section (RCS), RGPO(I), and VGPO(I) simulation.

The example is shipped with example illustrating generation of two targets and one ECM target.

Customized Solutions

With expertise in System Architecting and Signal Processing, Constelli offers custom solutions to challenging requirements in Radar Design, Radar and EW Test Applications.

We developed variety of IP which includes Trajectory Definitions, Maneuvers, Antenna Beam & Scan Patterns, complex Jamming and ECM scenarios. **STK AGI** integration can also be done for more realistic and sophisticated Radar & EW test applications.

Apart from IP, we also offer integration and consultancy services for architecting and developing these complex solutions in Radar & EW Test domain.
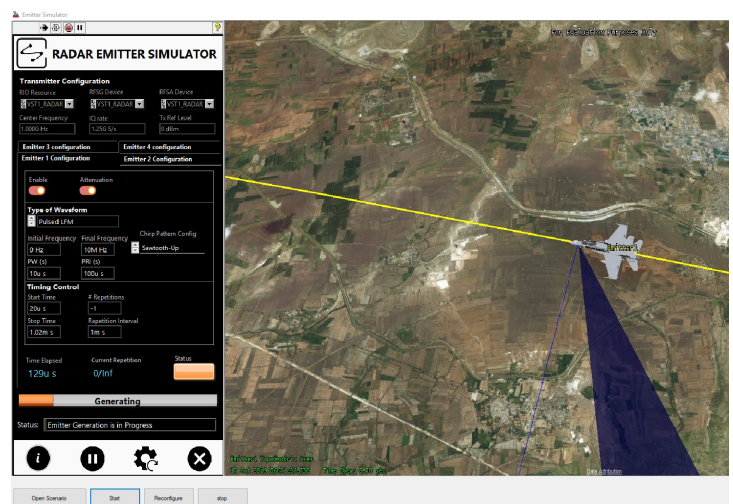
CEWS-G Options

CEWS-G offers options for multi channel simulations to integrate with 4,6,8,16 etc. Channels of Hardware for AoA Simulation. Please contact Constelli for CEWS-XX(Multichannel)-XX(Version) options and more information.

For more information, visit

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