

Constelli Radar Toolkit (RTK) for NI LabVIEW

Simulate, Prototype & Test Radar systems

The CONSTELLI RADAR Toolkit extends the built-in analysis capability of LabVIEW and LabVIEW FPGA with functions and tools for radar Signal generation, Signal Measurements and Visualization of standard and custom Radar signals. With this toolkit, you can rapidly develop custom applications for Radar Test & Measurements, Radar Simulators, Radar research, Radar Design & Prototyping and Radar Training & Teaching in academia.



For Radar applications, the Constelli Radar Toolkit can be used directly with majority of the NI RF & FPGA Platforms like VST (PXIe 5840, 5644/45/46) FlexRIO platform (PXIe - 7966R, 7975R, 7915R), RFSA & RFSG. Example library helps to build applications faster with FPGA focused frameworks for Radar Echo Simulations, Radar Signal Generation and Radar Analysis.

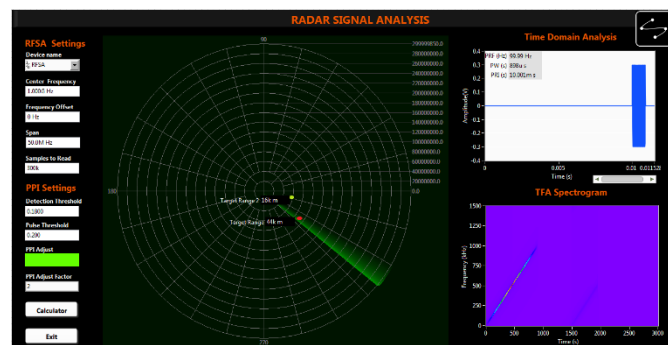
KEY FEATURES

- Wide range of Radar Waveforms
- Real-time Radar Signal Analysis & Measurements on FPGA
- Enables EW Scenario Simulation (Target Echoes & Threats)
- Real-time Hardware-In the-Loop simulation
- Optimized range simulation logics
- Floating & Fixed-point Algorithms
- Handy Radar & Microwave calculators
- Full-fledged applications right out of the box
- Examples run on NI RFSG, NI RFSA, NI VST, NI FlexRIO, NI Controller for FlexRIO, and NI USRP
- Baseband IQ Stream to run with NI RF Signal Generators and RF Signal Analyzers
- Free 30-day Evaluation

Specifications

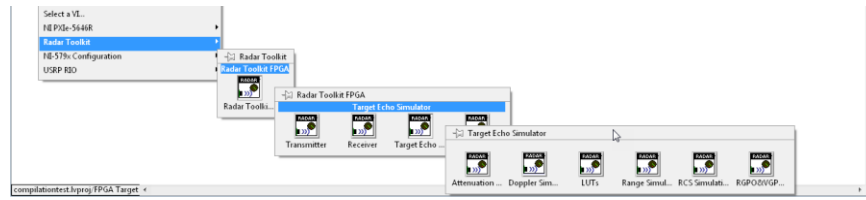
Radar Signal Generation

- CW, Pulsed, Staggered PRI
- LFM, NLFM, FMCW and Stepped FM
- Barker Coded and Poly-phase Coded
- Bandwidths > 200 MHz for UWB radars



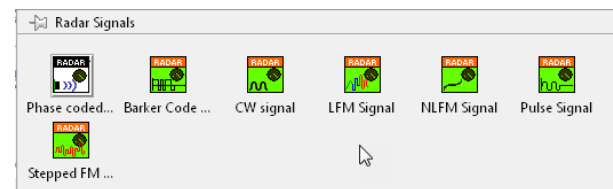
Radar Signal Analysis & Measurements

- Real-time PRI & PW Estimation
- Matched Filtering
- Range & Doppler Estimation
- Time-Frequency Domain Analysis
- Waterfall, Persistence graph, and PPI Plots



Radar Target/Threat Simulation

- Up to 32 Targets or Threats
- Range simulation up to 4000 km
- Doppler Simulation for moving & accelerating targets
- Multiple RCS Models
- Jamming Signal Generation



Application segments for Radar Toolkit:

- Radar Test & Measurement

Present day radars pose a lot of challenges in testing due to the transient nature of radar signals, complex compression techniques & high Bandwidth signals. To test & measure these complex radar systems Constelli RTK offers multiple types of signal generation including staggered waveforms, Signal measurements on pulses like PRF, Pulse width etc. and visualization using time frequency plots in real time on FPGA. Combined with National Instruments hardware platforms like VST, RFSA, RFSG & FlexRIO it provides a ready to use platform for test & Measurement Applications.

- Radar, EW & Threat Simulators

Modern EW & Radar systems demand complex test systems with flexibility & adaptability required for next generation threat detection & avoidance. Constelli RTK provides the flexibility to generate multiple types of radar signals including complex agile waveforms using National Instruments RF & FPGA platforms, which can be used to develop threat simulators with overlapping, time shared or random scenario profiles. RTK library have an extensive set of features for simulating Range, Doppler, Jamming, Clutter models like RGPO, VGPO etc. which can be used to develop complex Radar Echo Simulators.

- Radar Prototyping & Research

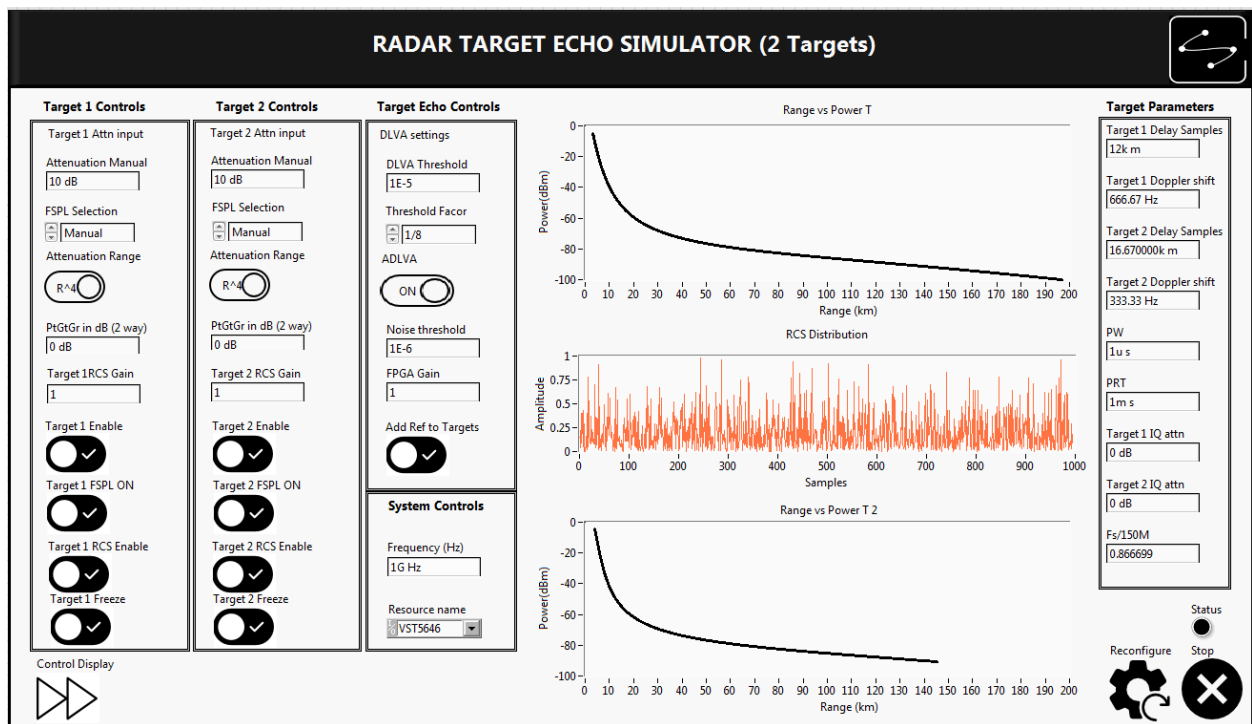
Radar receiver design is seeing an increase in the number of digital tuning and digital signal processing (DSP) functions moved to fixed front-end hardware logic like FPGA's. The front-end receivers have become much more complex and difficult to design. Constelli RTK offers the framework to generate UWB signals with more than 200MHz bandwidth on FPGA's and RF Receiver data acquisition in IQ format where the signal processing IP can be added custom to the receiver development using National Instruments RF & FPGA platforms. The Constelli RTK library has an extensive set of measurements and signal generation VI's which can help you in rapid prototyping.

- Radar Training & Teaching

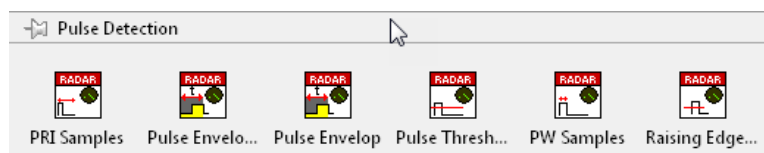
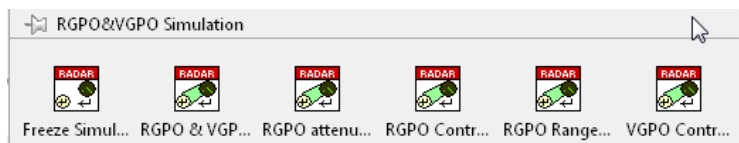
In Defence, Aerospace & Academia radar simulators and Concept scenarios are used to train the personnel or students well-versed with the equipment on field and radar concepts. Using Constelli RTK and LabVIEW complete radar modelling as software simulation can be achieved with realistic visualizations like PPI and Time Frequency plots and graphs mimicking the realistic radar behavior and experience for training and teaching purposes.

Sample Toolkit Examples

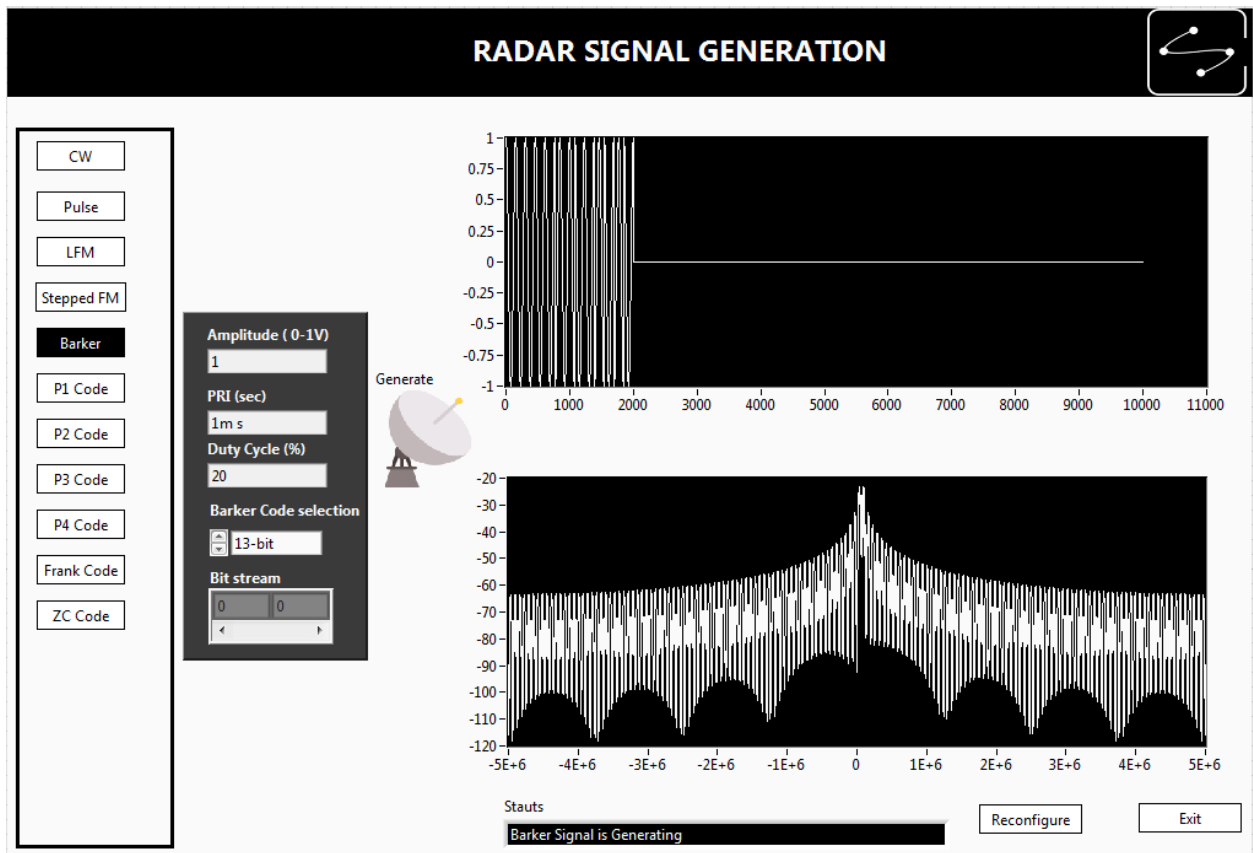
Radar Echo Simulation – Ready to run example for radar target simulation with Multi-target, Range, Velocity and RCS for any type of radar signal on NI VST platform. The echo simulator also has DLVA feature to detect the PRI & PW automatically.



This example can be used as a frame work to develop a complex radar echo simulator, with advanced features like Jamming (RGPO, VGPO, Barrage & Spot Noise), Clutter Models, Decoys, More number of targets etc. All these features are a part of the Constelli RTK.



Radar Signal Generation - Ready to run example for all types of radar signals on Host & FPGA using NI RFSG, NI VST & USRP Platform.



CONSTELLI Services & Support

Training – Constelli Training on RTK is the fastest way to integrate all the features into your application. Constelli training can shorten your learning curve, save development time & maximize the productivity in developing your complete application. We can offer web training online or a custom training at your premises delivered by our engineers who have developed the toolkit and worked on many radar end applications. For more information on pricing and technical details please contact info@constelli.com.

Support – We offer premium and standard support packages. For more information on support packages please contact info@constelli.com.

For standard technical support, please contact Constelli at:
 Phone: +91 40 4853 3841 (Indian Standard Time – 10 am to 6 pm)
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