Scalable EW Stimulus Solutions

Compact VPX (CCVPX)

Easily scale from single chassis to rack-mounted 8-channel or 16-port solutions

CEESIM and mini-RFGEN (mRFGEN) configurations available

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Overview

- CCVPX provides cost-effective EW threat stimulus with quick delivery
- High fidelity RF stimulus based on digital technology
- Full scenario/emitter compatibility with trusted and market tested CEESIM product line
  - Enables lower-level testing to share common scenarios and emitter modes with higher-level System Integration Laboratory (SIL) testing
  - Significantly increases probability of early issue detection, providing considerable cost and schedule savings to the EW program
- Provides compatibility with full-size CEESIM systems
  - Proven and tested CEESIM capability
  - Common scenarios/emitters validated by Government-witnessed Threat Representation Validations (TRVALs)
  - Common user interface and maintenance (no need to retrain staff)
  - Common tools (automated calibration and diagnostic test, PDW capture/filter)
  - Common hardware building blocks
- 20 MHz to 40 GHz frequency coverage
- Transport case or rack packaging available

Benefits

Low Cost/Quick Delivery
Cost is comparable to other commercial small simulators, but with all the power and capabilities of our full-sized CEESIM. Quick turn delivery is available.

Small Footprint
CCVPX provides the greatest flexibility and expandability of any small EW simulator available. What takes racks full of other suppliers' hardware can be done with a few desktop CCVPX chassis.

High Fidelity Performance
CCVPX is a DDS source capable of generating complex intrapulse modulations that can vary on a pulse-to-pulse basis, with proven accuracy to validate the parameter extremes in threat intelligence databases. CCVPX can also generate high emitter density (up to one MPPS/channel).

Compatibility
CCVPX maintains full scenario/emitter compatibility with all CEESIM systems and uses the same user interface, hardware modules and tools employed in full-sized CEESIMs and RFGENs.

Confidence
CEESIM is the established threat source used to validate all state-of-the-art EW platforms. CEESIM emitter modes have gone through multiple TRVALs on U.S. programs to validate they are true representations of the threat radar waveform. CCVPX has demonstrated support of all test environments, including: Sub-assembly Test Stations, SILs, Anechoic Chambers, and Open-Air Test Ranges. We can support your test mission.

Core Building Blocks

The Local Oscillator (LO) and Up-converter Direction Finding (UCDF) RF slice pair provides 0.5 to 18 GHz signal generation, and the core building blocks of the Compact CEESIM-VPX. Frequency extension RF slices are available to expand this base frequency coverage. The Ultra-Low Band (ULB) RF slice extends frequency range down to include 20 to 500 MHz and the Millimeter Wave (MMW) slice extends frequency range to include 18 to 40 GHz.
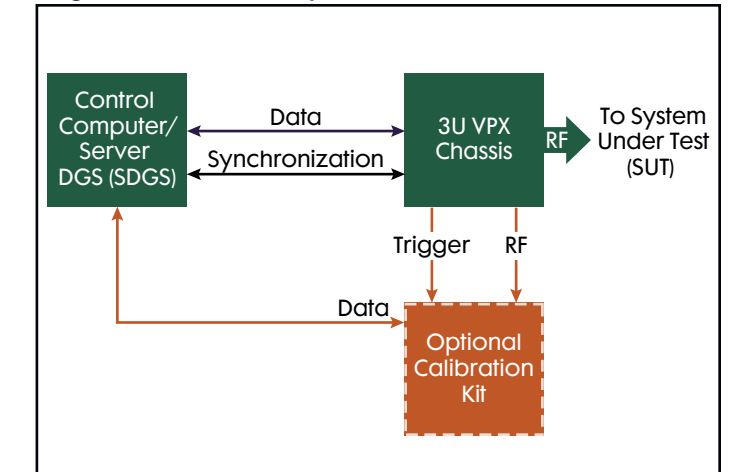
Benchtop Solutions

Benchtop solutions consisting of a single 3U VPX chassis are ideal for lower level test stations, anechoic chambers, and open air test ranges. CEESIM and mRFGEN configurations available.

Single 3U VPX Chassis Configurations

Model Number	Configuration
APG0518V-OMNI	1-channel 0.5 to 18 GHz, Omni Output
APG0518V-MP	1-channel 0.5 to 18 GHz, 4 ports Amplitude/Phase/TDOA
APG0518V-DC	2-channel 0.5 to 18 GHz, Omni Outputs
APG0518V-WB	1-channel 0.02 to 40 GHz, Omni Outputs

Single 3U VPX Chassis System

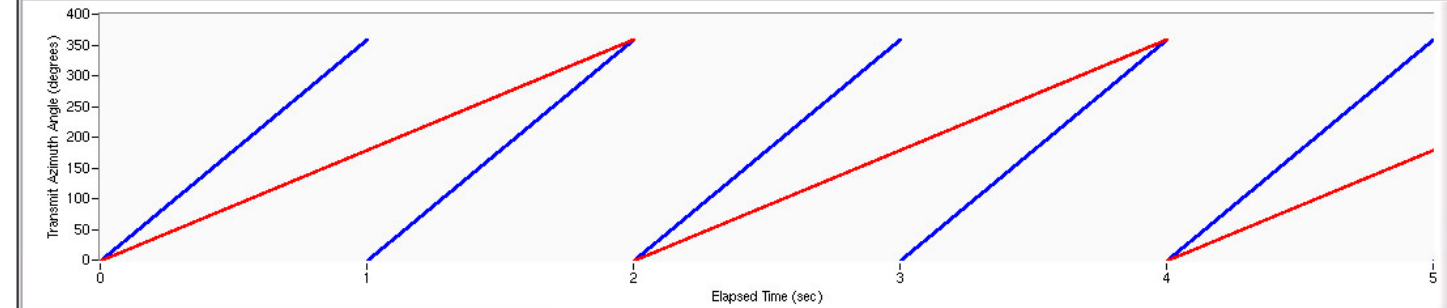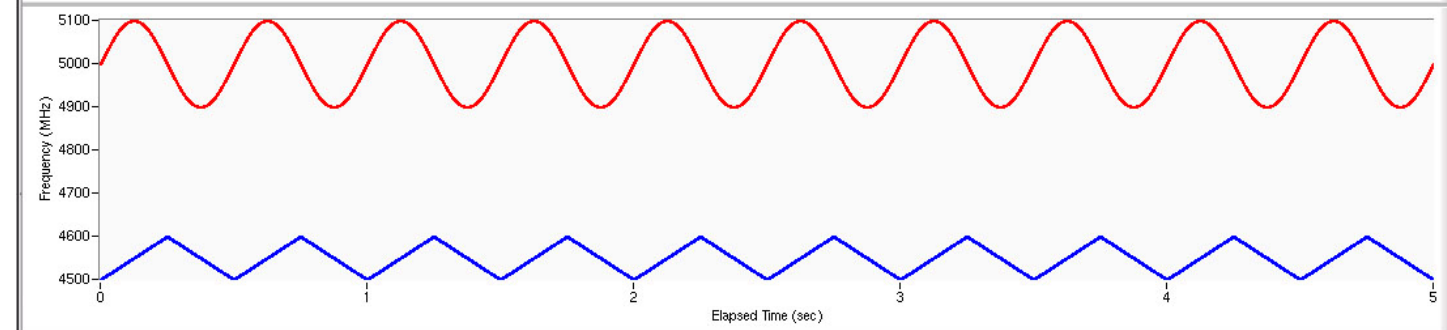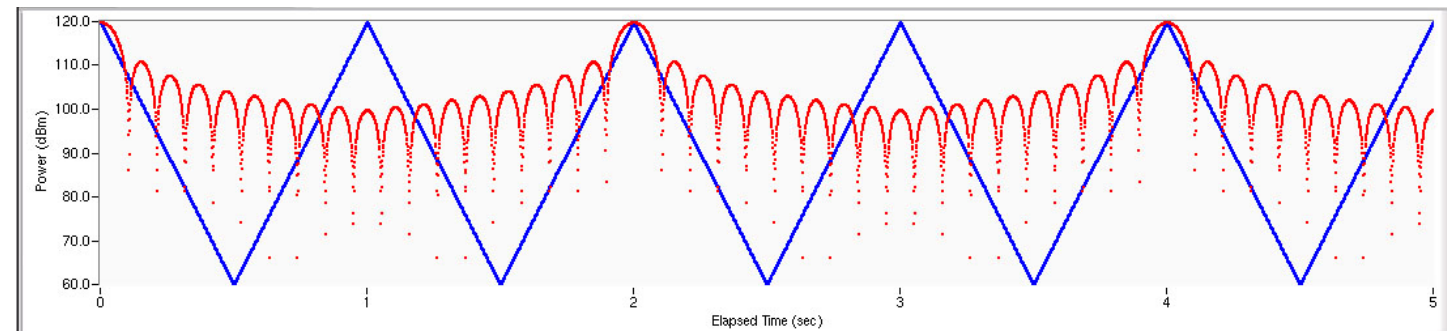

Single 3U VPX Chassis Capabilities

Parameter	Capability		
Pulse Density	1 MPPS per channel		
Frequency	• 20 MHz to 40 GHz with 1 Hz resolution (Omni configurations) • 0.5 to 18 GHz with 1 Hz resolution (AoA configurations)		
Pulse Width	15.625 ns to 131.071 ms with 3.90625 ns resolution		
Intrapulse Modulation	• Amplitude Modulation (e.g., AM, ASK, Pulse Shaping) • Frequency Modulation (e.g., FM, Chirp, Discrete FMOP) • Phase Modulation (e.g., BPSK, QPSK, poly-phase) • Quadrature Amplitude Modulation (QAM) • User Defined		
PRI	1 µs to 999.999 ms with 0.122 ns resolution		
Scan Types	Steady Conical Sector Circular	Raster Palmer Helical Spiral	Multibeam Electronic Synchronized
AoA Modeling	• Amplitude Angle of Arrival (AoA) • Phase Interferometry AoA • Time Difference of Arrival (TDOA) • Calculated and Measured Data Models • Up to 4 ports (single chassis)		
External Control	Ethernet		
External Synchronization	IRIG-B		

CCVPX Software

The CCVPX, when delivered in the CEESIM configuration, comes with some of the most sophisticated emitter modeling and visualization tools available.

Emitter Modeling & Visualization

The CCVPX comes with software that allows the user to define even the most complex threat radar waveforms by specifying a sequence of segments that describe the radar's behavior in frequency, PRI, pulse, and scan. Segments of each type can trigger the other segment types to advance in their sequences to produce an accurate progression of the waveform over time. The software includes the ability to graph twelve critical parameters of the simulated radar's waveform to allow the operator to verify correct programming.

The CCVPX software can define platforms for the simulated threat radars and the SUT. The motion of all platforms is modeled with full six degrees of freedom to allow dynamic modeling of terrain following and terrain blockage, as well as the calculation of angle of arrival effects for all signals at the SUT.

3D Scenario Visualization and Editing

CEESIM offers 3D scenario visualization and editing capability, which displays the extent of threat domes and emitter activation state. The GUI display includes range and bearing from emitter to SUT.
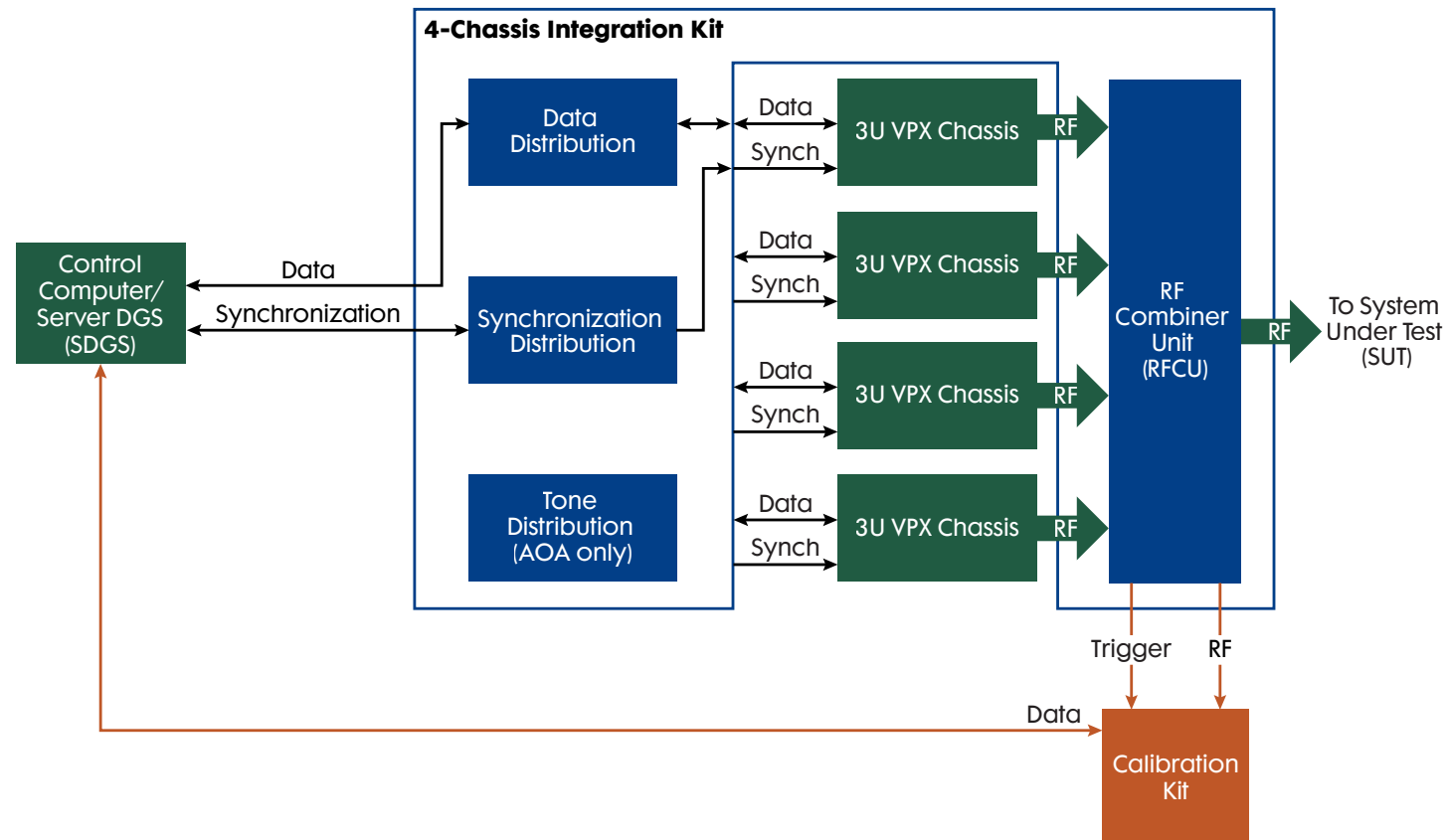
Integrated Solutions

The modularity of the CCVPX design enables the creation of larger systems by combining up to four 3U VPX chassis. This is ideal for higher level test stations and smaller SILs. It provides the capability for up to either eight RF channels for high pulse density applications (8 MPPS), or up to 16 amplitude/phase/TDOA ports to support larger apertures and in some cases full 360-degree coverage.
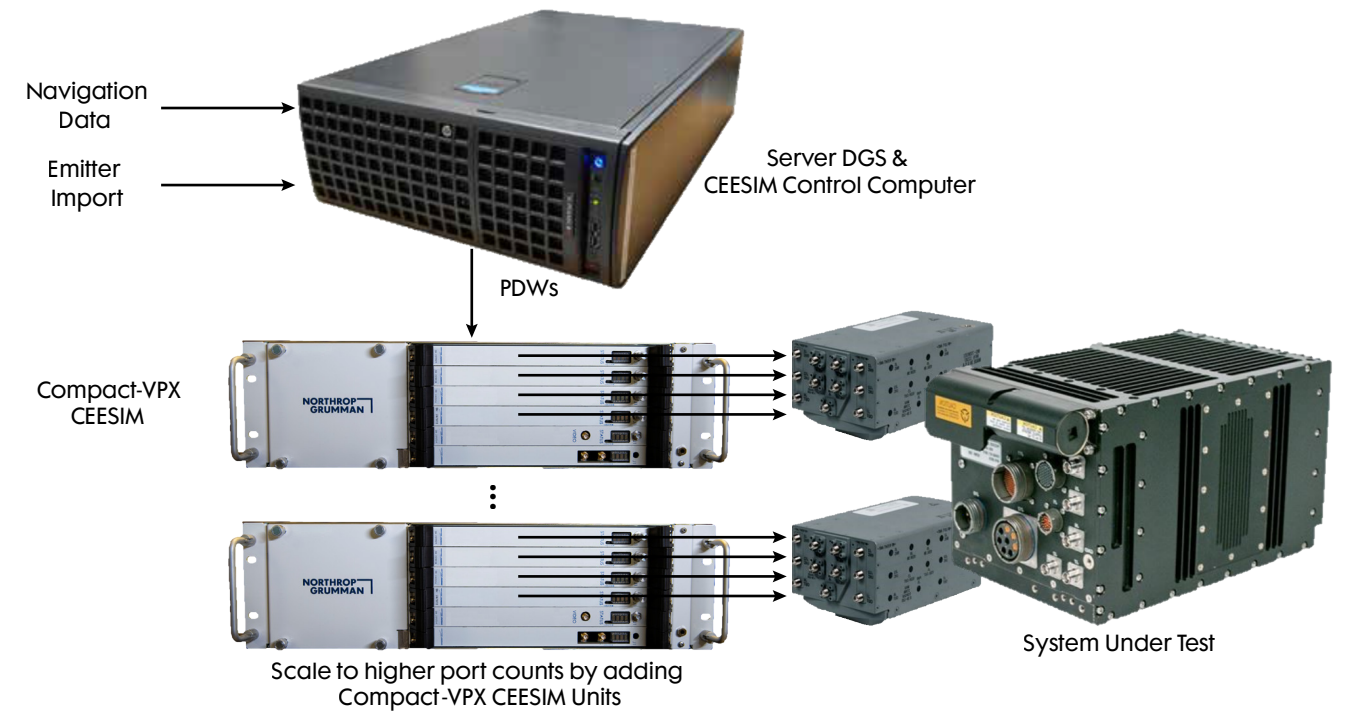
Standard Integration Kits

Standard integration kits are available to combine multiple CCVPX and mRFGEN chassis to form larger systems.

Model Number	Standard Integration Kits
APG0518V-CSDGS-R	CEESIM Server DGS and Control Computer, 2U Rack Mount
APG0518V-CSDGS-T	CEESIM Server DGS and Control Computer, Tabletop Briefcase
APG0518V-RMF-C	RMF Security Service – CEESIM Computers
APG0518V-mRFGEN	RFGEN Computer w/RFRM
APG0518V-RMF-N	RMF Security Service – RFGEN Computers
APG0518V-CALRK	15U Calibration Rack
APG0518-MULTI-OMNI	Multiple Omni SIG GEN
APG0518-MULTI-PHASE	Multiple Phase SIG GEN

Integrated Four 3U VPX Chassis System

Scalable Integrated Solutions

Scale to higher port counts by adding Compact-VPX CEESIM Units

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