Product Brief

NI PXI Vector Signal Transceivers

PXI Vector Signal Transceivers (VST) combine an RF vector signal analyzer (VSA) and generator (VSG) with a powerful reconfigurable FPGA and high-speed serial and parallel digital interfaces for real-time signal processing and control from baseband to mmWave.

Applications for VSTs:

- Generation and analysis of RF signals ranging from simple CW tones to complex signals demanding 2 GHz of bandwidth and beyond
- RF measurements, including Modulation Accuracy, P1dB, Noise Figure, TOI, ACP, SEM, and more
- Simultaneous analysis and emulation of EW and satellite communications
- Radar target simulation and channel emulation
- Full bandwidth RF record and playback
- RF integrated circuit validation and characterization
- 5G NR, Wi-Fi, Bluetooth, and Ultra-Wideband signal generation and analysis
- Communications and wireless standards research, design, prototyping, and deployment

The NI Advantage

01 Multi-Instrument Power in Compact Form-Factor

The PXI VST's compact size maximizes lab space utilization, enables flexible testing configurations, and facilitates swift field testing. This ultimately accelerates test processes, lowers costs, and enhances productivity across a range of industries reliant on precision signal analysis and generation within a 3U PXI instrument form-factor.

02 Extensible Instrument Functionality

Expand the functionality of the VST with other modules such as a mmWave radio head to increase the frequency range up to 54 GHz of coverage for full FR2 band coverage; or, add a high-speed serial module for streaming at full bandwidth data rates, and additional FPGA coprocessing power like real-time digital signal processing, and custom IP integration through the front panel I/O.

03 Test and Measurement Synchronization

Seamlessly coordinate multiple VSTs and non-RF test instrumentation in a single PXI system for applications such as beamforming, PAE, and AESA by utilizing NI's T-Clk timing and synchronization technology to any module across the backplane of the PXI chassis.

High-Performance Instrumentation

Pair the PXI VST with an assortment of instruments to enable further applications such as a remote measurement module for full FR2 band coverage, an FPGA module for custom IP and data processing, and more

Superior Test Time & Synchronization

Get maximum test speed and customization with access to FPGA resources and stream high-speed data to and from the instrument through the front panel digital I/O

Built for Automation

Take advantage of RFmx, a collection of application-specific RF measurement libraries that tailors the VST for general-purpose measurements to wireless standards and aerospace and defense test applications

Frequency and Bandwidth Options

Multiple entry points into the PXI VST based on your needs of frequency coverage and level of instantaneous bandwidth

NI Vector Signal Transceiver Product Portfolio

	3rd Generation VST	2nd Generation VST	
	PXIe-5842	**PXIe-5841**	**PXIe-5830/1**
Frequency	30 MHz—26.5 GHz	9 kHz—6 GHz	5 GHz—21 GHz
Instantaneous Bandwidth	Up to 2 GHz	1 GHz	1 GHz
Slot Count	4 to 6	2 to 3	4 to 6
Frequency Extension	Up to 54 GHz	N/A	Up to 44 GHz
P2P Streaming	Up to 1 GHz	Up to 1 GHz	Up to 1 GHz
MGT Streaming	Up to 2 GHz	Up to 1 GHz	Up to 1 GHz
Tuning Time	230 us	380 us 170 us with PXIe-5655	See Specifications
VSG Maximum Output Power (CW @ 5 GHz)	+20 dBm	+20 dBm	+12 dBm
EVM (Wi-Fi 6 80 MHz, loopback @ 6 GHz)*	-56 dB	-48 dB	-50 dB
EVM (5G NR 100 MHz, loopback @ 5.5 GHz)*	-58 dB	-49 dB	-51 dB
EVM (5G NR 100 MHz, loopback @ 28 GHz)	-44 dB	N/A	-44 dB

* Note: PXIe-5842 EVM includes noise compensation. All specifications are typical.

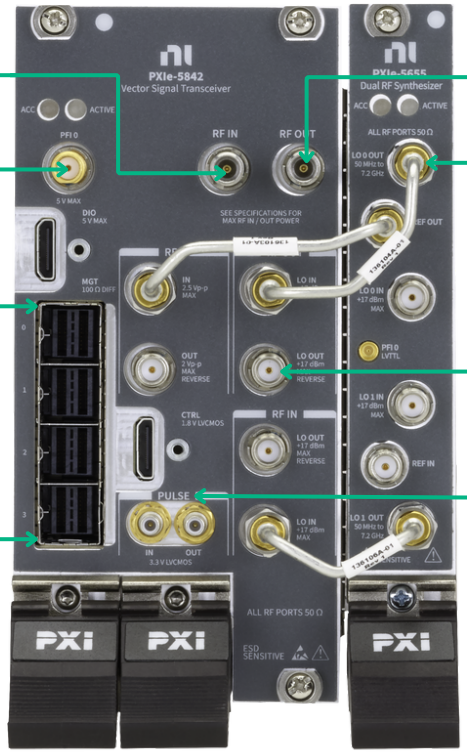
Third-Generation PXIe-5842 VST Detailed View

30 MHz - 26.5 GHz VSA with up to 2 GHz Instantaneous Bandwidth

PFI 0 (Trigger / Event)

High-Speed Serial Interface
MGT Connectors - 16 lanes at 16 Gbps
4 Tx and 4 Rx Channels per connector

Full rate of IQ data streaming to an FPGA coprocessor



30 MHz - 26.5 GHz VSG with up to 2 GHz Instantaneous Bandwidth

Dual LO Synthesizer
Unique LO Chains for RF IN and RF OUT

Multi-instrument Synchronization
Phase Coherent LO sharing and T-Clk synchronization across the PXI backplane

Integrated RF Signal Chain Pulse Modulation
Allows for optimization of On/Off Ratio versus pulse width

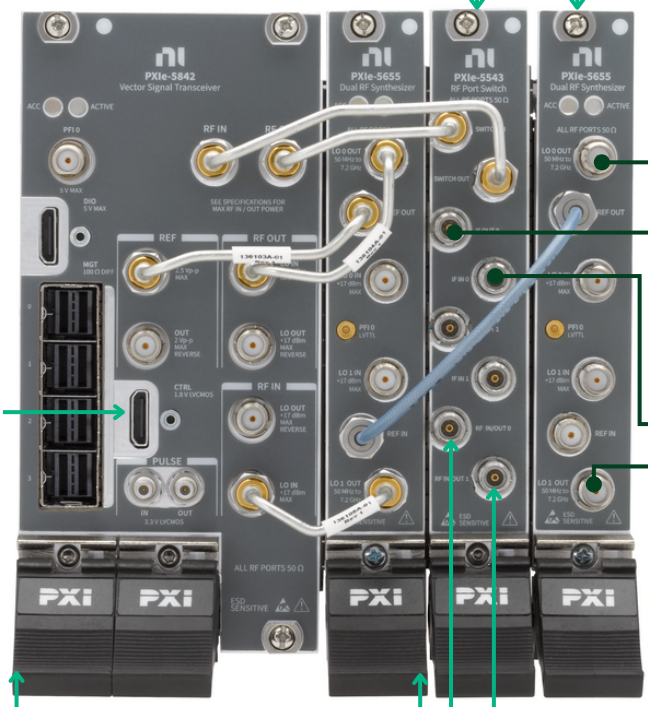
Third-Generation VST with 54 GHz Frequency Extension

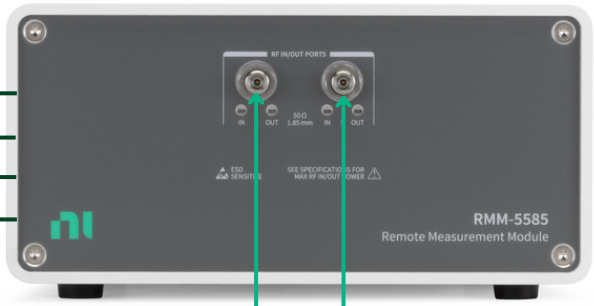
PXIe-5443
RF Port Switch

PXIe-5655
RMM LO Independent LOs for RF IN and RF OUT

RMM-5585
Remote Measurement Module
22.5 GHz - 54 GHz Frequency Range
2 GHz of Instantaneous Bandwidth

RMM CTRL





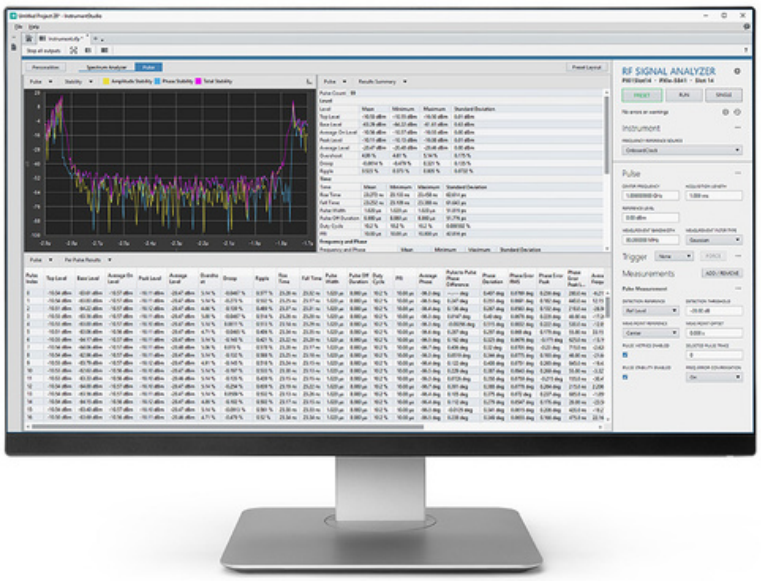
Bidirectional RF Ports
22.5 GHz - 54 GHz

Bidirectional IF Ports
200 MHz - 23 GHz

PXIe-5842
Vector Signal Transceiver

Software to Accelerate RF Front End Validation

Maximize Productivity with RFmx



- **What is RFmx? -** RFmx is a collection of application-specific RF measurement libraries that tailor NI's RF instrumentation to serve general-purpose, cellular, connectivity, IoT, and aerospace and defense test applications
- **RFmx Personalities -** Choose from many RFmx personalities including WLAN, Bluetooth, 5G NR, Noise Figure, Spectrum Analyzer, Pulse, and more
- **Standards Updates -** Keep up to date with new IEEE and 3GPP releases with continual software updates bringing you the latest in standards-based measurements
- **Quick Configuration -** Quickly set up parameters and begin taking measurements with no coding required
- **Extensive Libraries -** Use LabVIEW, C/C++, or .NET libraries to quickly program in the language of your choice

LabVIEW™

Quick, Interactive Measurements with RFIC Test Software

- **Streamlined Validation -** Connect interactive bring-up and automated characterization with a single, easy-to-use application software
- **Interactive Front Panel -** Easily visualize results and quickly set measurement parameters with an interactive and intuitive RFIC front panel
- **Quick Path to Automation -** Save configurations, sweep through power and frequency, and use the Automation Wizard to quickly create test code

Customer Success

"We selected the VST because of its versatility and proven testing speed. We can use the VST to test a variety of cellular and wireless standards from 65 MHz to 6 GHz. Within a single PXI rack, we could integrate five VSTs and test five UUTs in parallel, guaranteeing maximum system production capability."

- Paolo Bertoldo, Business Development
SEICA

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Contact your NI product expert to configure a system today.