



Integrating Real-World Measurements into Ansoft's Ansoft Designer Simulation Software Using National Instruments SignalExpress

“By integrating measurements from SignalExpress with Ansoft’s RF, microwave and communications design tool, Ansoft Designer, we bring a tighter, more efficient measurement and design iteration process to RF system development in all areas, from concept and system design to individual component and system testing,” said David Vye, product marketing manager at Ansoft.

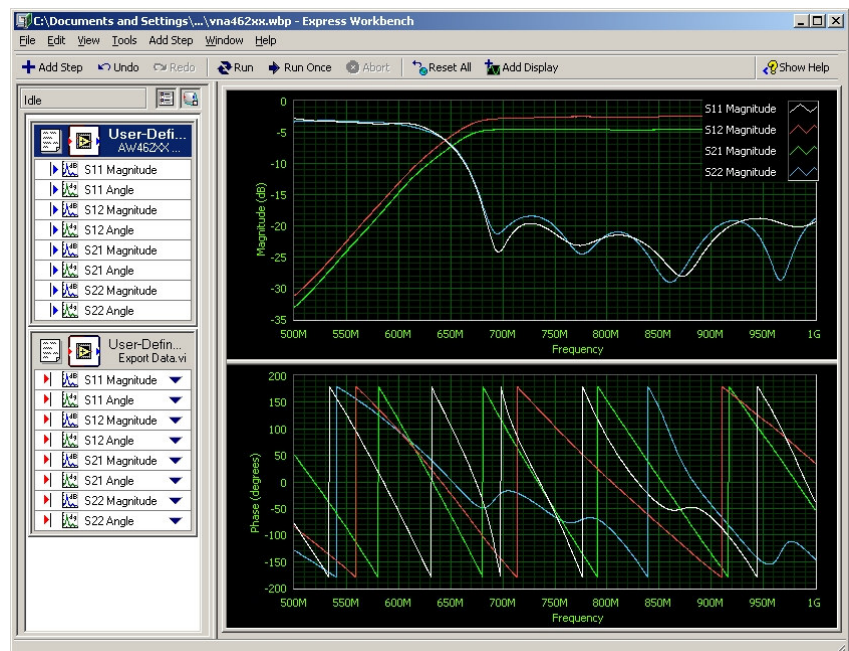
Today’s design engineers must simulate networks with accurate component models to achieve aggressive time-to-market schedules. An ideal design flow accommodates a multitude of component representations ranging from measured data to electromagnetic simulation. High-frequency design tools such as Ansoft Designer coupled with high-level development tools such as National Instruments LabVIEW graphical development environment and SignalExpress measurement software address the complexity of accurate source and component modeling as well as design verification through linking behavioral models for simulation directly to automated test system results.

Engineers use the Ansoft family of circuit, system, and electromagnetic modeling and advanced simulation products to create and simulate RF and microwave system designs. For measurement, these engineers might use RF measurement equipment from Agilent, Anritsu, or Rohde and Schwarz, or use modular PXI-based RF measurement equipment from National Instruments. Regardless of the measurement hardware, the challenge is the same – simplifying the process of acquiring, formatting, and transporting the measurement data between the measurement equipment and the design tool. Connectivity is fundamentally a software challenge.

NI LabVIEW has more than 2,500 instrument drivers for controlling traditional GPIB instruments. LabVIEW is a graphical programming environment that engineers use to configure and control the measurement equipment, further analyze the data, and write it out in formats that Ansoft Designer can use. LabVIEW is commonly used in design labs for characterization and validation measurements. NI SignalExpress is a new tool for design engineers based on the LabVIEW measurement platform that can take advantage of these LabVIEW instrument drivers from an interactive, nonprogramming approach.

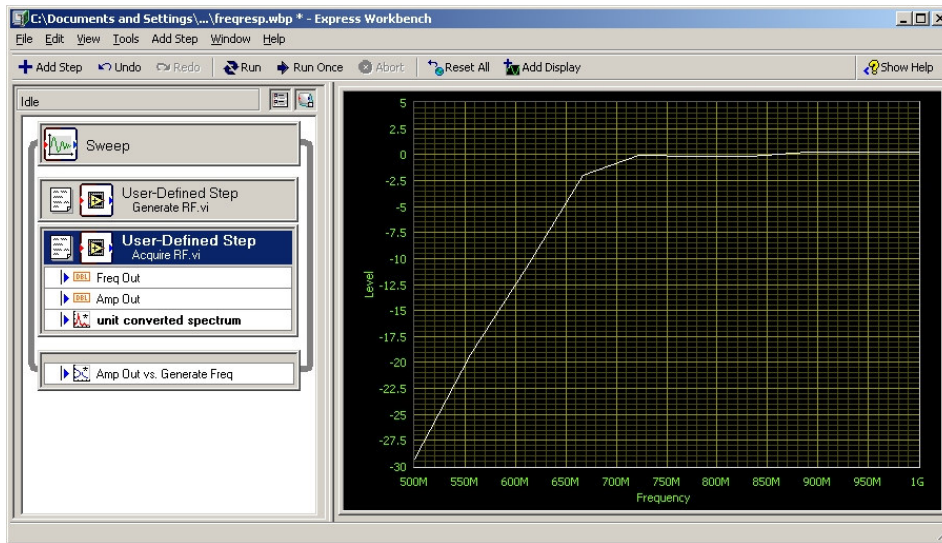
Engineers from Ansoft and National Instruments have collaborated to integrate the measurement data from SignalExpress directly into Ansoft Designer design and simulation capabilities.

The demo on the right combines measurement data acquired from a vector network analyzer (VNA) and an NI PXI-5660 RF signal analyzer with Ansoft Designer. The demo illustrates how engineers can extend the capabilities of the SignalExpress



environment by calling VIs built in LabVIEW. With this user-defined step capability, SignalExpress can call LabVIEW instrument drivers to make specialized measurements from popular RF equipment. In this example, the engineer used the LabVIEW instrument driver to control the Anritsu model 462XX VNA family to measure the filter S-parameters. The instrument driver returned the data to SignalExpress, where the different S-parameter magnitude and phase signals are displayed on the graph. In addition, a LabVIEW VI executed from SignalExpress formatted the S-parameter data from the VNA into a touchstone (s2p) file format.

The second demo below used SignalExpress to control a set of NI PXI-based RF equipment, the NI PXI-5670 RF vector signal generator and the PXI-5660 RF signal analyzer, to sweep through a range of frequencies and measure the response. Again, a LabVIEW VI called directly from SignalExpress controlled this equipment. These LabVIEW VIs can be executed using the sweep capabilities of SignalExpress to sweep through the desired frequency range.



The demonstration also highlights another unique capability built into SignalExpress as a measurement software tool – a programmatic interface for automating the SignalExpress environment from another application. In this case, Ansoft Designer code can call into the SignalExpress programmatic API to automatically launch SignalExpress in the background, perform the automated measurements, and return the data directly to Ansoft Designer. With this programmatic interface, the engineer can use external design tools to plug SignalExpress into their software as a component and automatically control it.



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