**Spectrum analyzer brings real-time analysis to midrange applications**

*Dan Strassberg* - February 04, 2008

Tektronix has announced the RSA3000B family of real-time spectrum analyzers, which bring the company’s DPX waveform-image-processing technology to midrange spectrum analysis. The RSA3300B series and RSA3408B provide a live-RF view of the spectrum, enabling an unprecedented RF-signal-discovery capability for a broad range of digital-RF applications, including RFID (radio-frequency identification), mobile communications, and spectrum management. DPX rapidly transforms volumes of data to produce live RF-spectrum displays that reveal previously unseen RF signals and signal anomalies.

The rapid expansion of digital-RF applications has driven the measurement needs of many applications beyond the capabilities of traditional swept-spectrum and vector-signal analysis. Digital-RF signals carry complex modulation that can change from one instant to the next, hopping frequencies, spiking briefly, and then disappearing. These transient and time-varying transmission techniques help RF devices to avoid interference, maximize peak power, and—often—evade detection.

According to Rick King, Tektronix’s vice president of real-time-spectrum-analysis products, these analyzers are the first to solve problems that digital-RF technologies create. “Combining the high-performance RSA6100A series’ DPX technology and live RF with a broad range of application-specific measurements makes the midrange RSA3300B series and RSA3408B the best choices not only for the toughest RF-discovery and debugging problems, but also [for use as] as everyday spectrum-analysis and system-characterization tools,” he says.

With a spectrum-processing rate hundreds of times as great as those of other vendors’ spectrum
analyzers, the new RSA3408B and RSA3300B-series units provide 100% probability of intercept for transients as brief as 31 and 41 μsec, respectively. The units combine the exclusive ability to trigger on transient signals in both the time and the frequency domains with unmatched troubleshooting and debugging of digital-RF designs.

The RSA3300B series is available with frequency coverage of either dc to 3 GHz or dc to 8 GHz. With 15-MHz capture bandwidth and 70-dB SFDR (spurious-free dynamic range), the RSA3300B units suit designing and debugging of 3G mobile systems; near-field systems, such as RFID and Bluetooth; and narrow- to medium-bandwidth communications systems. The RSA3408B covers dc to 8 GHz and provides 36-MHz capture bandwidth and 73-dB SFDR for applications that demand higher bandwidth and dynamic range, such as debugging of 3G mobile components and systems, design of WLANs (wireless local-area networks) and WiMax systems, demanding spectrum management, and general-purpose digital-RF debugging.

To display live spectra, the RSA3300B series’ and RSA3408B’s DPX waveform-image-processing technology uses dedicated real-time hardware to process more than 48,000 input-signal-spectrum measurements/sec—orders of magnitude more information than spectrum analyzers without a DPX display. This processing speed minimizes the analysis gaps inherent in swept-spectrum and vector-signal analyzers.

Besides live RF, the waveform-image processor provides an intensity-graded persistence display that holds anomalies until the eye can see them and shows the history of occurrence of dynamic signals, providing immediate feedback on signal variations over time. This display enables engineers to rapidly see transients and signals that are either completely invisible or that a user can deduce only after time-consuming offline analysis.

According to Tektronix, the 15-MHz-bandwidth RSA3000B and the 36-MHz-bandwidth RSA3408B are the only midrange spectrum analyzers that offer frequency-domain triggering. This function uses the FMT (frequency-mask-trigger) feature to find interfering and transient signals that no other instrument can, eliminating potential system instabilities from a design before they can cause problems. By displaying a seamless record of frequency and power changes over time, the new analyzers can solve transient problems, including modulation switching on software-defined-radio systems, identification of rogue pulses in radar transmission, and dynamic-modulation changes during a WLAN transmission.

The US suggested prices for the RSA3303B begin at $32,900; RSA3300B and RSA3408B software options handle 3G, WiMax, WLAN, RFID, signal-source, and general-purpose modulation and RF analysis.