GROUNDBREAKING RF TEMPERATURE SENSOR SYSTEMS UTILIZE CMT'S 1-PORT VNAS

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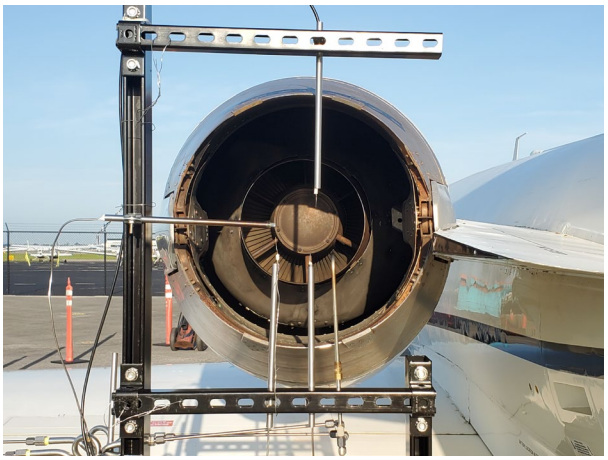
Case Study: Groundbreaking RF Temperature Sensor Systems Utilize CMT's 1-Port VNAs

Sensatek's unique RF temperature sensors utilize CMT's 1-Port Series VNAs to analyze high-powered gas turbines, jet engines, shafts, and pistons, as well as semiconductor processing equipment. Inside all these, the VNA provides continuous, real-time temperature measurements. This rapidly expanding technology has been bolstered by the price, performance, and advanced software features of CMT's R60 and R140 network analyzers. Finding the right instrumentation for their turbine sensor system has helped Sensatek break into new industries and deliver their technology to a much wider audience.



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Taofeek Orekan, Sensatek

Sensatek Propulsion Technology develops and manufactures wireless, high-temperature gas turbine sensors to measure heat transfer data for customers in several industries including energy, aviation, and aerospace. Sensatek's passive RF sensors determine and report the health status of jet turbine engines,

land-based gas turbines, wind turbines, and various other high-powered DUTs with the integration of CMT's Reflectometers.

Sensatek's RF temperature sensor is bonded on rotating equipment such as a jet engine turbine blade. As the sensor passes by the stationary antenna at speeds up to 2000 kph, the antenna communicates with the sensor at RF frequencies. CMT's 1-Port VNA —often an R140— is connected to a high temperature cable that terminates within the antenna and reads the sensor. It then pings the antenna to get frequency sweeps. The sensor is passively ringing at a specific frequency which correlates to a particular temperature, strain, pressure, etc. This allows Sensatek to wirelessly interrogate the temperature, strain, or pressure on these rotating parts at very high speeds (up to over 1,200 MPH). Sensatek's technology is the culmination of over 10 years of R&D on advanced ceramic materials that are robust inside harsh environments and feature elevated temperatures and corrosive gases. These materials are optimized for dielectric and sensor performance up to 1,700 °C.

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Josh McConkey, Sensatek

CMT VNAs are a crucial part of Sensatek's typical measurement chain. When asked what makes the 1-Port analyzers effective for their systems Taofeek Orekan, Chief Engineer at Sensatek explained, "Compared to similar offerings, CMT's 1-Port VNAs are surprisingly fast and durable for use in the field or lab." "I was surprised to see that there were so many software features included as standard for that price point and small form factor," added Sensatek's CTO, Josh McConkey. The users at Sensatek also praised the GUI and automation capabilities of CMT's measurement software. "The user manual is great compared to what others provide and scripting access is excellent," noted McConkey. "We can build applications on top of CMT's firmware and hardware that are commercially valuable to us."

In addition to the VNA instrumentation being a difference maker for their technology, Sensatek has also credited CMT for its responsiveness and technical support. "When working with the engineering staff it was easy to see that they were very knowledgeable about the instruments and with troubleshooting," said Orekan. "They were great when it comes to customer support," he added. CMT's responsiveness went beyond technical support though. McConkey recalled, "I was able to reach the operations department and quickly resolve an issue regarding international shipping codes for CMT equipment. To me that's not something a lot of companies would have been so helpful with."

According to the team at Sensatek, as passive RF sensing becomes a bigger part of the everyday sensor world, being able to leverage the price and form-factor of CMT's Reflectometers is a real enabler for pushing the technology out into wider usage. Sensatek has brought their technology to customers in a variety of industries throughout the world. Many of those projects rely on CMT's 1-Port VNAs to be successful.