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Make ideas real



MASTERING O-RAN RADIO UNIT (O-RU) TESTING

How Kyrio found its perfect O-RAN
conformance T&M solution from
Rohde & Schwarz and VIAVI Solutions.

AT A GLANCE

- ▶ **Customer:** Kyrio, a subsidiary of CableLabs
- ▶ **Task:** Add O-RAN radio unit conformance testing capabilities to the Kyrio T&M solutions as needed for the 5G Challenge to accelerate the development of open and interoperable 5G networks
- ▶ **Challenge:** In addition to acquiring pertinent T&M hardware and software to include O-RAN technology, Kyrio needed to broaden its knowledge of O-RU verification and validation
- ▶ **Solution/product:** O-RU fronthaul conformance test platform consisting of R&S®FSV, R&S®SMW200A, R&S®VSE from Rohde & Schwarz with the VIAVI TM500 O-RU tester (O-DU emulator) and VIAVI O-RU Test Manager Application (O-RU TMA) from VIAVI Solutions
- ▶ **Key benefits:** A fully integrated system with all test equipment controlled by a single user interface. Defined test cases can be easily selected to provide a seamless user experience

Taking on new challenges

Kyrio performs 5G testing services on behalf of CableLabs, which was the host lab for the 2022 5G Challenge, organized by the Institute for Telecommunication Sciences (ITS), a part of the National Telecommunications and Information Administration (NTIA) in the United States. The goal was to accelerate the adoption of open interfaces and verify the interoperability of components and multi-vendor solutions.

To ensure the successful execution of the challenge, rigorous testing of contestant equipment was required. Building on a history of cooperation with Rohde & Schwarz for test and measurement (T&M) equipment and impressed with the performance of the integrated solution, Kyrio selected the open radio unit (O-RU) conformance test solution from Rohde & Schwarz and VIAVI Solutions. The joint solution is used at Kyrio, the first O-RAN ALLIANCE open testing and integration center (OTIC) in the Americas. Extending their expertise on hybrid fiber coax (HFC), passive optical networks (PON), Wi-Fi® and mobile network technologies with a special focus on open radio access networks (O-RAN), Kyrio was well prepared for the task, as the company was already familiar with high-precision solutions from Rohde & Schwarz.

Kyrio leveraged the full integration of Rohde & Schwarz instruments in the joint solution with VIAVI Solutions and worked on the O-RU conformance testing solution with ease. The organization also benefitted from the setup of existing Rohde & Schwarz T&M equipment and extended the solution capabilities with hardware and software options.

The test setup by Rohde & Schwarz and VIAVI Solutions has been used around the world, making it a proven, reliable solution for successfully testing O-RU conformance. In the test setup, the VIAVI TM500 O-RU Tester (O-DU emulator) synchronized and configured the O-RU radio unit. The flagship R&S®SMW200A vector signal generator and the best-in-line midrange instrument, the R&S®FSV signal and spectrum analyzer from Rohde & Schwarz, provided RF signals and waveforms, and captured signals. The R&S®FSV analyzed the I/Q data both in the uplink and downlink paths.

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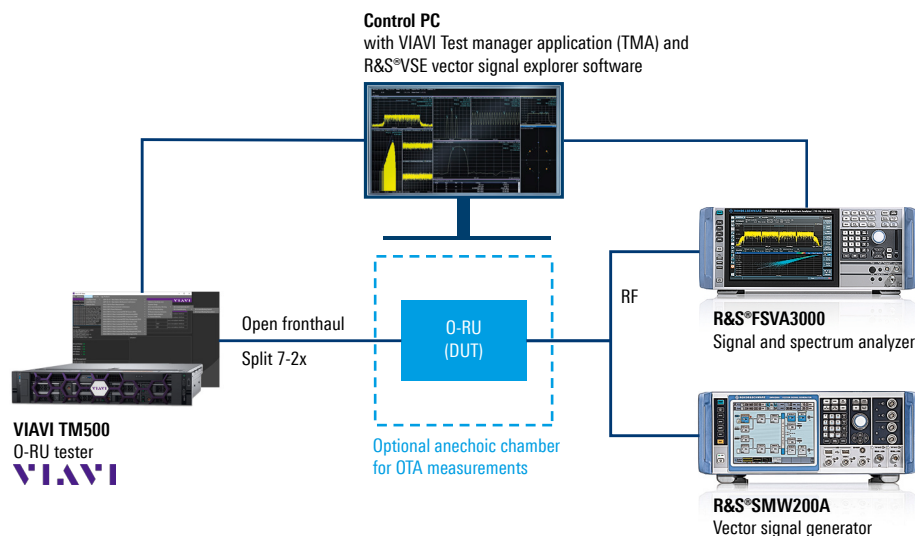
For more information, visit
www.rohde-schwarz.com



O-RU CONFORMANCE TEST SOLUTION

- ▶ Fully integrated O-RAN fronthaul conformance test platform, combining Rohde&Schwarz and VIAVI expert solutions
- ▶ R&S®FSV3000, R&S®FSVA3000 or R&S®FSW signal and spectrum analyzer
- ▶ R&S®SMW200A, R&S®SMM100A or R&S®SMBV100B vector signal generator
- ▶ R&S®VSE vector signal explorer
- ▶ VIAVI TM500 O-RU Tester (O-DU emulator)
- ▶ VIAVI O-RU Test Manager Application (O-RU TMA)
- ▶ Rohde&Schwarz provides test capabilities for 3GPP TS38.141 conformance tests, extended to include O-RAN WG4.CONF testing, when paired with VIAVI TM500 O-RU Tester.

Test setup



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“Building on our past cooperation with Rohde & Schwarz, Kyrio was confident that we could fully address our O-RAN testing needs with leading-edge T&M solutions. Based on the Open RAN O-RU RF testing expertise of Rohde & Schwarz combined with VIAVI’s protocol experience, the whole solution was brought together with superior results.”

Jason Lauer, VP of Engineering & Operations, Kyrio

The full test setup is controlled by the central O-RU Test Manager Application (O-RU TMA). It also provides a clear pass/fail overview of the main test parameters. Among the benefits of the solution is the availability of automated test cases in which all system components are controlled by a single graphical user interface, enabling measurements of test cases with a single click. For in-depth debugging, R&S®VSE vector signal explorer software is used to access detailed measurement results.

Since CableLabs and Kyrio already had instruments from Rohde&Schwarz in use, all they needed for this setup was to acquire the Rohde&Schwarz signal and spectrum analyzer, and O-RAN software options, which they easily integrated with the VIAVI instrumentation.

Cooperation based on trust and expertise

For Kyrio, working with T&M specialists like Rohde&Schwarz and VIAVI Solutions offered clear benefits. The company relied on Rohde&Schwarz for its multi-decade radio unit testing experience in RF performance verification, both conducted and over-the-air (OTA), in addition to VIAVI’s deep knowledge of protocol functionality and network infrastructure stress testing.

Once it identified the need to expand its lab capabilities, Kyrio needed to collaborate with knowledgeable and trustworthy partners. Based in its history of collaboration with Kyrio, spanning more than a decade, Rohde&Schwarz was able to provide the company with insights into the best practices for performing O-RAN T&M. Together with VIAVI Solutions, Rohde&Schwarz successfully guided Kyrio to choose the appropriate instrumentation during the T&M evaluation phase.

Apart from the cost benefit offered by equipment re-use, there is also a scalability advantage. Since the test lab setup supports both O-RAN and 3GPP testing, Kyrio can also use the solution for other testing needs in the future. Users benefit from future-proof solutions prepared for moving from frequency range 1 (FR1) to frequency range 2 (FR2), including radiated OTA measurements.

