

P8820S RU Testing Toolset for Massive MIMO ULPI Testing

Ensure O-RU ULPI conformance and performance



Enhance Network Efficiency with ULPI

Massive MIMO ULPI (Massive Multiple-Input Multiple-Output Uplink Performance Improvement) is a technology used in 5G networks to enhance uplink communications, which is the data sent from users' devices to the network. It improves signal quality and reliability, especially at the cell edges, increases network capacity by allowing more simultaneous connections, and enhances spectral efficiency for higher data rates. This technology provides better coverage and a more robust network performance, benefiting both users and telecom operators by offering a cost-effective solution to improve network efficiency.

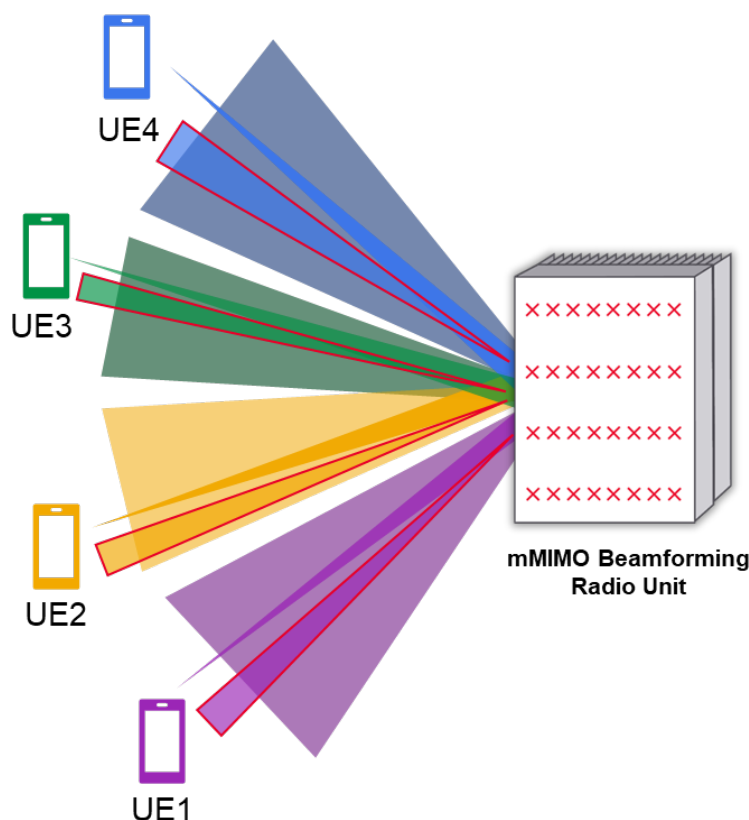


Figure 1. mMIMO ULPI technology enhances uplink communications with 5G networks

Keysight P8820S RU Testing Toolset for ULPI Testing

P8820S RU Testing Toolset provides solution for wrap-around mMIMO Beamforming, ULPI capable Open Radio Unit (O-RU) testing.

With the solution user can confirm that O-RU accepts standard compliant messages from O-DU including following use cases:

- O-RU tracking of fast-moving UE.
- O-RU can support 'n' layer MU-MIMO.
- O-RU frequency offset estimation tracking.
- Ensure reported SINR accuracy.
- Performance at varying SINR.

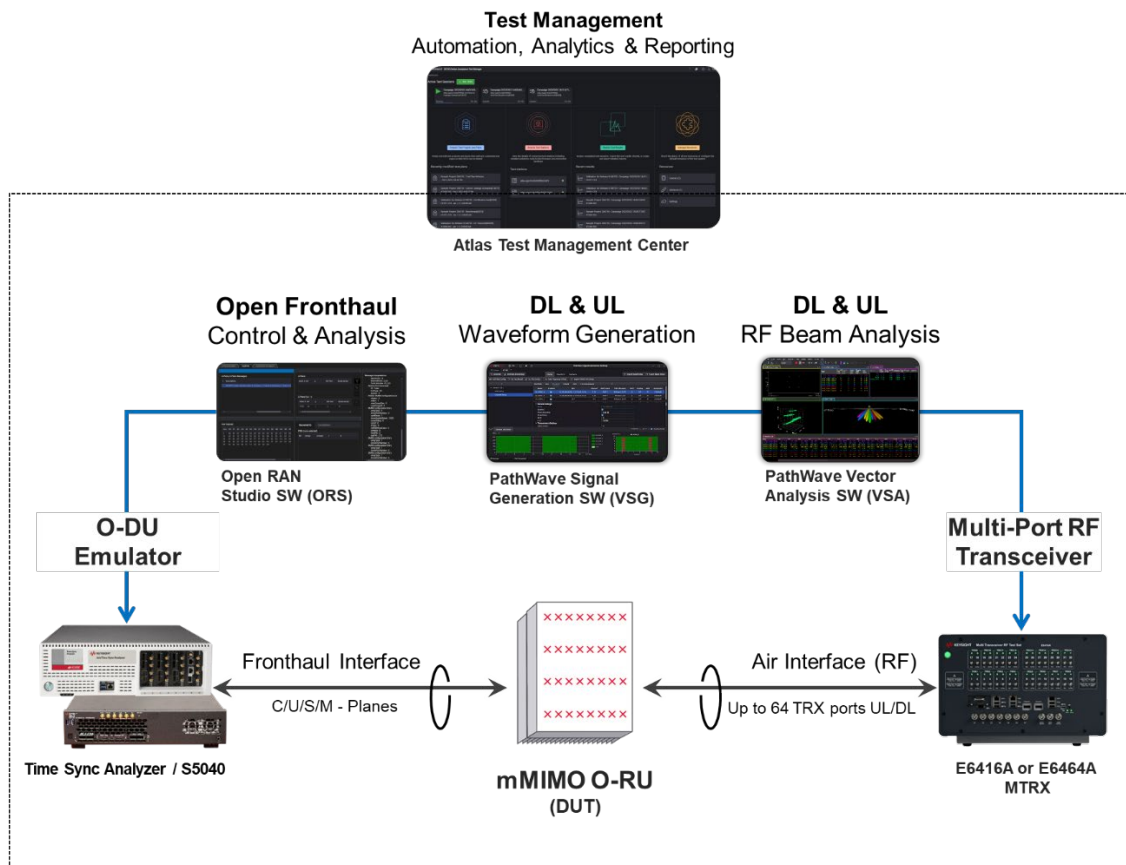


Figure 2. Keysight P8820S RU Testing Toolset for mMIMO ULPI Testing

In figure 2 above, O-DU emulator together with Open RAN Studio (ORS), Signal Generation (VSG) and Vector Analysis (VSA) software's together performs following actions:

- Send C-plane messages corresponding to ULPI.
- Receive and process C- & U- plane messages from O-RU (Figure 3 below).
- Decode C-plane with RRM measurements.
- Decode received signal.
- Validate UL packet timing.

MTRX together with Signal Generation software emulates following actions:

- UE movement by beam steering.
- Multiple UEs beam change independently from each other.
- AWGN noise addition.
- MU-MIMO / mMIMO RF beam generaiton.
- Generate varying timing offset across UEs.

Atlas Test Management Center handles the overall test automation, analytics and reporting.

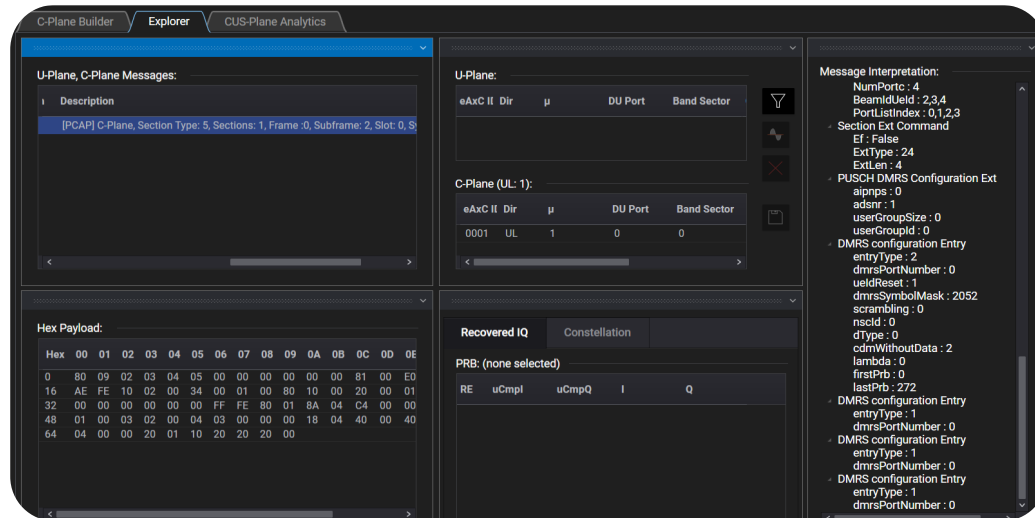


Figure 3. U- and C- plane message creation and analysis with Open RAN Studio software

P8820S RU Testing Toolset Capabilities

mMIMO Development & Performance Testing

- Ensure mMIMO RF L1/L2 Beamforming Performance.
- O-RU Wrap-Around Test for MIMO, Massive MIMO Beamforming and ULPI.
- Support for O-RU from 4TRX up to 64TRX.
- C/U/S/M -Plane Validation in Single Solution.
- RF & Fronthaul Analytics and Troubleshooting.
- 3GPP 38.141-1 TX/RX Pre-Conformance Testing.

mMIMO Conformance Testing

- O-RAN WG4 Conformance Test Scenarios.

Energy Efficiency Testing

- ETSI and Custom Test Scenarios.

For More Information

P8820S RU Testing Toolset

O-RAN Massive MIMO ULPI capable Radio Unit Testing - Application Note

U5040BSCB Open RAN Studio for O-RU Testing and Validation

MTRX E6416A model for up to TR16

MTRX E6464A model for up to TR64

Accelerating Open RAN Innovation

Radio Access and Core Network Test



Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

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