



**TELEDYNE LECROY**  
Everywhereyoulook™

*CASE STUDY*

# Seamless Integration of Chimera into Acentury's LAMTA Platform



*Xena & Acentury*



**ACENTURY**

## Background: The Need for Efficient Wireless Network Testing

Acentury Inc. develops software automation and orchestration tools for the wireless communications industry. Their product portfolio supports mobile network operators, network equipment vendors, cable multi-service operators, aerospace/defense and satellite communication companies, and hyperscale tech companies.

Wireless networks are complex systems involving equipment from various vendors, multiple radio access technologies, and several frequency bands. Network operators are under constant pressure to improve network performance, launch new technologies, and continuously deliver innovative, cost-efficient services to attract and retain customers.

Operators must carefully evaluate and certify various technologies and configurations before deploying them into the production network. Connecting numerous radio sources, shield boxes, and RF chambers using RF patch panels and separate variable attenuators in the RF lab is cumbersome and time-consuming. Additionally, managing the sharing of scarce lab resources, such as network and test equipment, across multiple test engineers is challenging.

To address these challenges, Acentury has developed LAMTA, an orchestration platform that can control RF switches and other lab equipment to offer zero-touch automation for RF labs. By automating tedious manual processes like setup and teardown, users can run more sophisticated tests, optimize lab resource usage, increase confidence in test results, and reduce time-to-market.

Driven by customer demand, Acentury needed to add the capability to configure the latency between various network elements. This case story outlines how Acentury integrated the Teledyne LeCroy Xena E100 Chimera network impairment emulator into LAMTA.

## The Challenge: Emulating Latency in a Simplified Manner

In modern 5G fronthaul network architectures, the distances between Remote Radio Units (RRUs), Baseband Units (BBUs), Distribution Units (DUs), and Central Units (CUs) can be several tens of kilometers. Such long distances obviously introduce delay (also referred to as latency) which can be detrimental for the transmission. Therefore, when evaluating the performance of a network, varying amounts of latency must be considered during testing.

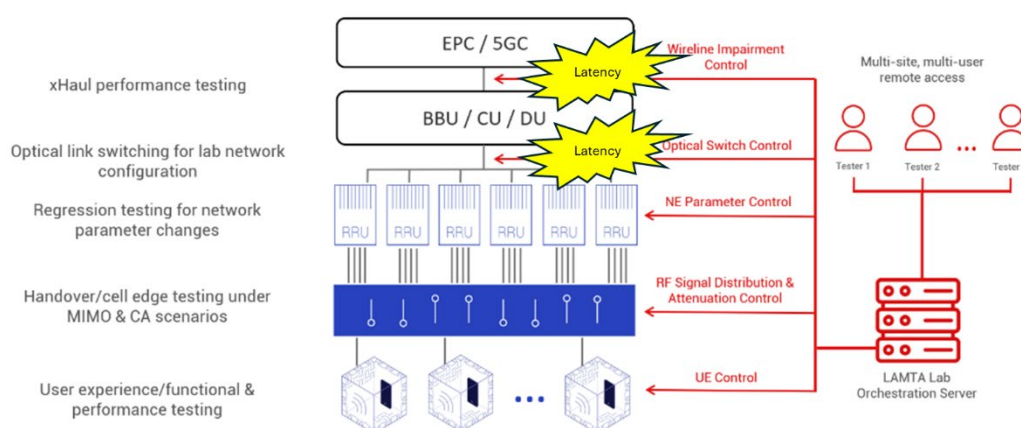


Figure 1: Overview of typical 5G network with indication of segments where it is desirable to configure latency.

As illustrated above, Acentury naturally wanted to enable their customers to configure the latency between different network elements in both backhaul, midhaul and fronthaul segments through their LAMTA orchestration platform. While physical delays could be achieved using fiber cables of varying lengths, connecting and disconnecting these fibers defeats the zero-touch concept of LAMTA.

What Acentury was looking for was a physical latency emulator that would be connected once to an optical switch and provide configurable latency from the software. However, the latency emulator had to allow easy integration into the LAMTA platform thereby enabling a simple and intuitive interface to be implemented for the end-customer.

## The Solution: Integrating Chimera

Acentury found that the Teledyne LeCroy E100 Chimera impairment emulator matched their requirements.



Figure 2: E100 Chimera Impairment Emulator

Chimera can emulate a broad range of network impairments like latency, jitter, packet & port impairments, flexible distributions and BW shaping. All impairments are supported at five Ethernet speeds: 100GE, 50GE, 40GE, 25GE and 10GE. This unique flexibility is provided via two physical transceiver cages, both supporting QSFP28 and QSFP+ transceivers. The result is a versatile solution that provides consistent, accurate, well-defined, and repeatable impairments to traffic between network equipment in the lab.

Chimera comes with the Xena OpenAutomation (XOA) open-source test automation framework based on a Python API that runs on any OS. The XOA Python API enabled Acentury's engineers to seamlessly integrate Chimera into their existing test and software environment. By building a user interface in LAMTA Acentury was able to develop a simplified interface to Chimera displaying specific features relevant for their customers only.

In just two months, Chimera was fully integrated into Acentury's LAMTA platform. "The swift integration was made possible by the XOA documentation and direct support from Teledyne LeCroy's engineer, who provided invaluable assistance



Figure 3: David Woodcock, Head of Product Strategy at Acentury

throughout the process," says David Woodcock, Head of Product Strategy at Acentury.

Additionally, Acentury used Teledyne's live demo setup during development, which allowed them to test their code and gain a thorough understanding of the equipment before making a purchase.

With Chimera integrated into the LAMTA platform, Acentury can now offer a comprehensive solution for wireless network testing. This integration allows for the emulation

of latency and other network impairments, providing a realistic testing environment without the need for extensive physical setups. Customers can configure latency directly through the LAMTA user interface, streamlining the testing process and improving efficiency.

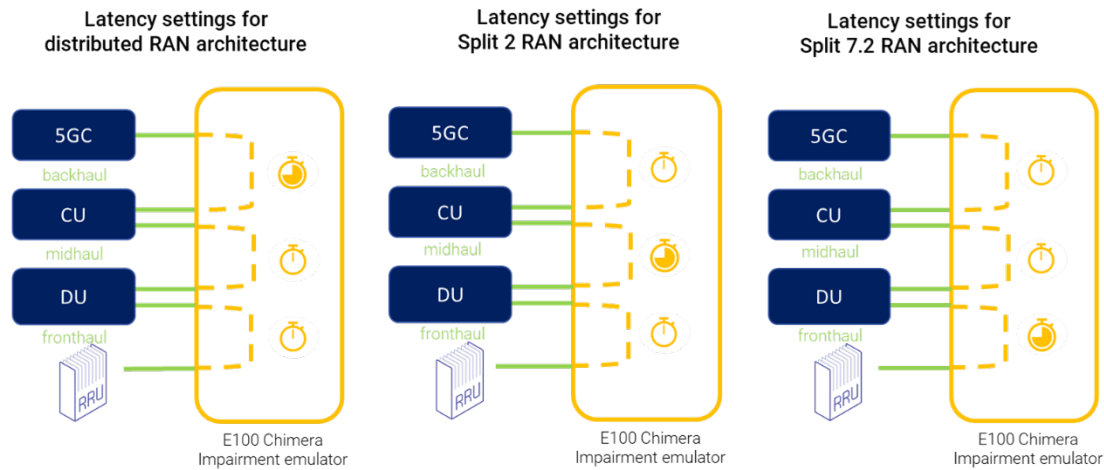
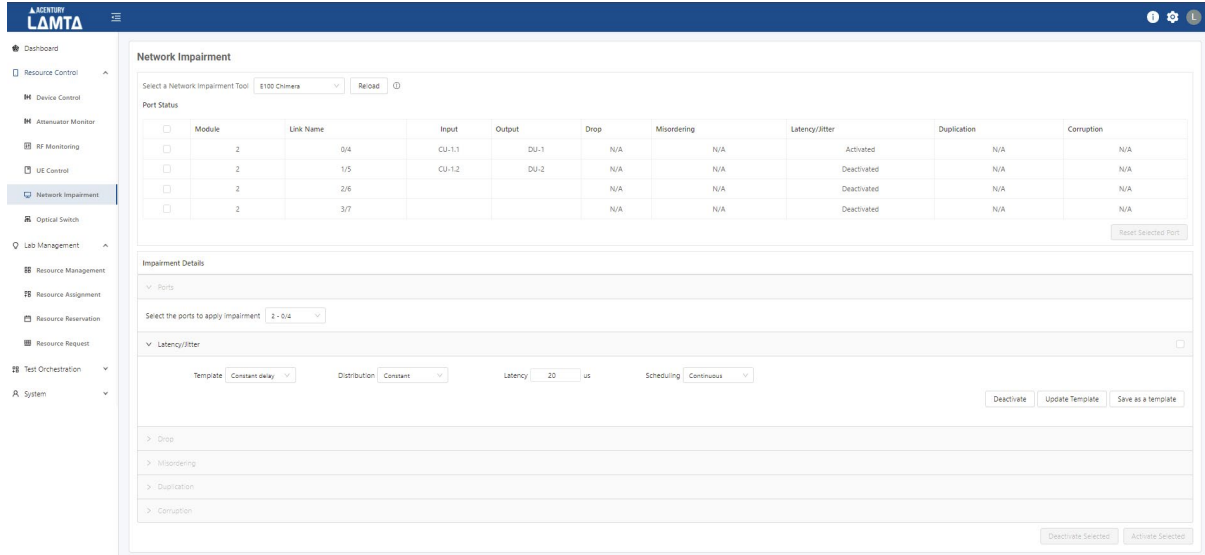


Figure 4: LAMTA user interface and typical test configurations using E100 Chimera with LAMTA

## Conclusion

In modern 5G wireless networks the fronthaul part of the network can extend over tens of kilometers making latency a challenge. Therefore, operators must include latency when testing the performance of new network lay-outs.

The integration of Teledyne LeCroy E100 Chimera impairment emulator into Acentury's LAMTA RF lab test automation platform presents an optimal solution for wireless network labs. By using this integrated system, test labs can configure latency on a link directly from LAMTA, turning hours of test setup and teardown into minutes.

This case study demonstrates that Chimera is not only a powerful tool for network emulation but also easy to integrate due to the XOA open-source Python API, combined with direct support from Teledyne and remote access to a demo setup.