KEYSIGHT TEST-AS-A-SERVICE

Accelerate Test. Improve Safety.

KEYSIGHT
TECHNOLOGIES

5G C-V2X Test Lab

Accelerate Test. Improve Safety.

The race is on to be first to market with safe autonomous driving as car manufacturers improve safety. As new standards evolve, test accuracy, repeatability and reliability mandate the need for both application layer testing and 3GPP compliance readiness. The regulatory uncertainty for C-V2X standards is delaying investment in establishing and staffing test labs. C-V2X includes vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-network (V2N), and vehicle-to-pedestrian (V2P).

Introducing Keysight Test-as-a-Service 5G C-V2X test lab in Novi, Michigan. Keysight, the 5G automotive industry test leader, helps customers solve design and test challenges with the broadest and most reliable end-to-end hardware and software solutions. Let our experts show you the latest automated test setups that apply Society Automotive of Engineers (SAE) protocols with Keysight PathWave software.

Keysight offers you C-V2X application layer, standards, parametric, and custom testing scenarios. Accelerate time to measurement with minimal cost. Reduce risk by performing safety scenarios testing at our lab with our experts. Contact Keysight today to delve deeply into complex measurements to rapidly uncover true insights about your design.

Sample list of TaaS offerings

Scenario testing
- Up to 20 independent on board units (OBU) with customizable trajectories and basic safety message (BSM) information
- Drive device under test (DUT) through scenario via Global Navigation Satellite System (GNSS) simulation

3GPP standards
- Receiver test
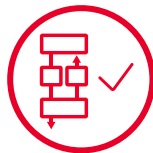- Transmitter test
- Demodulation performance test

Network emulation
- 5G non standalone (NSA)
- 5G standalone (SA)
- LTE advanced professional

C-V2X APPLICATION LAYER TESTING

Access the latest test setups, PathWave software, and expertise for complex scenario testing of the C-V2X application layer and Intelligent Transportation Services (ITS) stack.

STANDARDS-BASED TESTING

Collaborate with 5G experts to validate your product's performance to standards-based specifications for pre-compliance and conformance tests.

PARAMETRIC TESTING

Access state-of-the-art instruments, PathWave software, and experts to help characterize the performance of your design.

CUSTOM TESTING

Partner with Keysight application consultants to design and develop test plans for your leading-edge product designs.

C-V2X application layer testing

Access state-of-the-art test setups, PathWave software, and expertise for congestion, day one, and complex scenario testing of the C-V2X application layer and intelligent transportation services (ITS) stack.

Keysight provides

- 5G experts who work across R&D, manufacturing, and standards boards
- Cutting-edge calibration test setups, PathWave software, and accessories
- Traffic scenario creation and monitoring in a congested environment
- Messaging that conforms to SAE protocols
- Application consultants with the domain expertise to perform measurements
- Detailed data and reporting capability

Benefits

- Ensure your device accurately allocates complex signal resources in a dynamic environment while new standards are adopted and evolve
- Quickly gain insight into critical basic safety message (BSM) interpretation such as forward collision warning, do not pass warning, intersection movement assist, and other use cases
- Make measurements now with minimal capital and operating expense while government bodies adopt regulatory standards
- Keep your teams focused on accelerating designs

Sample list of application layer testing by category

Active road safety messages
- Do not pass warning (DNPW)
- Forward collision warning (FCW)
- Emergency electronic brake lights (EEBL)
- Intersection movement assist (IMA)

Cooperative traffic efficiency
- GeoNetworking (GN)
- Basic transport protocol (BTP)
- Local dynamic map (LDM)

Cooperative local and global internet services
- Cooperative awareness message (CAM)
- Decentralized environmental notification message (DENM)
- Signal phase and timing (SPAT)
- Mapping message (MAP)
- Security (SEC)

Congestion testing
- Speeding cars in the carpool lane during heavy traffic
- Multiple use cases

Standards-based testing

Access the latest test setups, PathWave software, and 5G experts to validate your product performance to standards-based specifications for pre-compliance and conformance tests.

Keysight provides

- State-of-the-art equipment with traceable calibration, PathWave software, probes, fixtures, and accessories
- Tests that follow 3GPP standards and use test setups found at Plugfest, 5GAA, OmniAir, and more
- Application consultants with the domain expertise to perform measurements
- Detailed data analysis and reporting capability

Benefits

- Increase your confidence in passing future certification testing
- Validate your product performance to standards
- Save time in the development of test assets and resources
- Optimize your test investment with pay-per-use pricing

Sample list of 3GPP LTE-V2X R14 test capabilities

Transmitter tests (TS36.521-1 Clause 6)
- UE min/max output power
- Maximum power reduction (MPR)
- Additional MPR (A-MPR)
- Configured transmitted power
- Transmit off power

Receiver sensitivity and interference tests (TS36.521-1 Clause 7)
- Receiver characteristics
- Maximum input level
- Adjacent channel selectivity
- In-band blocking
- Out-of-band blocking
- Spurious response

Demodulation performance tests (TS 36.521-1 Clause 14)
- Demodulation of physical sidelink shared channel (PSSCH)
- Demodulation of physical sidelink control channel (PSCCH)
- Power imbalance performance with two links
- PSCCH/PSSCH decoding capability

Parametric Testing

Access modern instruments, Pathwave software, and experts to help characterize the performance of your design.

Keysight provides

- Leading-edge test equipment fully calibrated and ready for use
- Application consultants with domain expertise
- Flexible test plans and reporting

Benefits

- Confidence in passing device certification standards
- Validate your product's performance to evolving 3GPP standards
- Accelerate time to gain insight to achieve your design goals
- Expedite your launch schedule by accessing test setups and expertise
- Test beyond the standard for critical measurements to gain greater design insight

Sample list of parametric test capabilities

Transmitter quality measurements

Receiver quality measurements

Edge cases

Sidelink tests

Diagnose and debug

Custom testing

Partner with Keysight application consultants to design and develop test plans for your latest product design.

Keysight provides

- Application consultants to develop test strategies for your products
- Modern test equipment fully calibrated and ready for use
- Comprehensive test plan, project management, test execution, and measurement results
- Custom solution development; including access to our global Keysight solution partners

Benefits

- Accelerate the success of your design with a codeveloped test strategy and validation of your product's performance
- Save time in the development of test assets and resources to keep your teams focused on design
- Reduce the risk to your product design and project schedule
- Optimize your test investment with pay-per-use pricing

Sample list of custom test capabilities

Early technology test development

Test plan and automation development

Custom algorithms and measurement science

Non-standardized interfaces

Custom reporting and data analytics

Crash scenario combination testing
- Ensure accurate C-V2X messages
- Ensure DUT automatically initiates emergency services communication

About Keysight Services

Keysight Services offers the most comprehensive array of people, processes, and tools in the industry to help you improve productivity and product quality. Our calibration, repair, asset optimization, technology refresh, education, financing, and additional services focus on lowering your risks and costs. Learn more at www.keysight.com/find/services.

Introducing PATHWAVE

Traditional product design and development workflows are full of design and test silos, unnecessary rework, and legacy manual processes. Accelerate your workflow with PathWave, the platform for agile and connected engineering workflows. Keysight's trusted design and test software is evolving to meet the ever-increasing needs of your organization. The PathWave software platform provides a consistent user experience, common data formats, and control interfaces. Find out more about the PathWave Software Platform.

Contact us today

Characterize and validate your design performance with state-of-the-art equipment and expertise located at the Keysight Novi, Michigan site. Start reducing your test cost and time-to-market today with Keysight Test-as-a-Service. Learn more at www.keysight.com/find/TestasaService

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

KEYSIGHT
TECHNOLOGIES