VIAVI V2X Virtual Test System

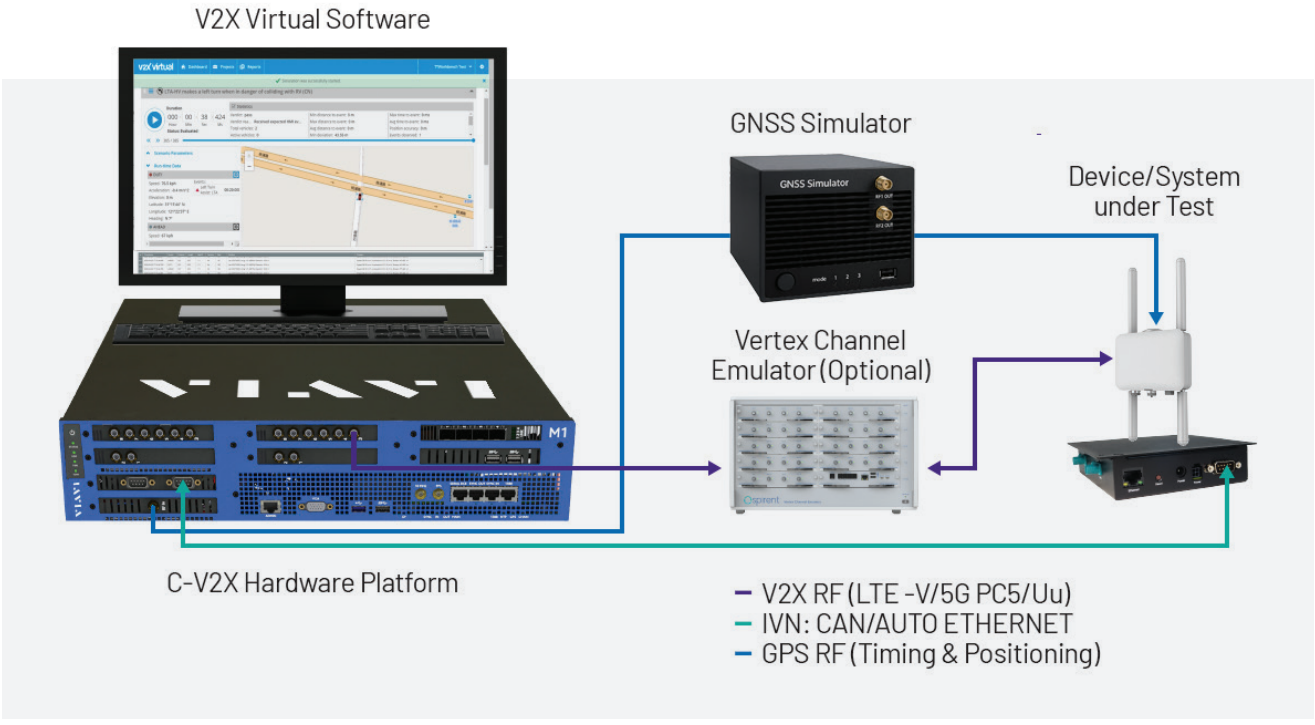
Overview

VIAVI V2X Virtual is a solution for conformance testing and for functional validation and performance testing of devices and systems implementing V2X applications. This integrated and scalable environment combines several components for testing V2X applications at any stage of the product development cycle, from early prototyping to pre-production.

The solution supports the execution of traffic scenarios on the testbench in a virtual environment that reflects all communication properties of field testing. This can help optimize costly and risky field tests by making them more efficient and targeted.

Benefits

- Real-life conditions in the lab
  - Modular and scalable test solution
  - Open APIs for integrating with existing Model-in-the-Loop (MiL) and Hardware-in-the-Loop (HiL) test environments
- Reduce deployment, operation and maintenance costs
  - Optimizing the effort of field tests regarding test results analysis
- Performance assessment and benchmarking of V2X safety applications
- Measure Mobile Network and Road Infrastructure readiness for C-V2Xs



V2X Components

- V2X Virtual C-V2X Emulator Software
  - Modular test platform for functional and performance assessment of V2V, V2P, and V2I/I2V safety applications
  - Conformance & functional test scenarios
  - Open architecture for 3rd party functions (Traffic Sim, Vehicle Sim, GNSS Sim, Test Control)
  - Import CAN DBC to map CAN messages and signals
  - Custom scenario creation with SUMO/External traffic simulators like IPG CarMaker, Hexagon Virtual Test drive, dSpace ASM
- Dedicated VIAVI M1 C-V2X Hardware Kit
  - 8 C-V2X LTE-V PC5 (Side-Link) Radio Modules
  - 4 Ethernet Ports
  - 2 CAN FD Ports

Requirements

- V2X Virtual Software Platform
- VIAVI M1 C-V2X Kit
- Optional: VIAVI Vertex Channel Emulator

Standards

- China Communications Standards Association (CCSA)
- European Telecommunications Standards Institute (ETSI)
- USA Wireless Access in Vehicular Environments (WAVE)

Features

- Multi-region C-V2X protocol stack support
- Execute predefined test cases for V2X Day 1 applications
- Add multiple background vehicles to test congestion in the channel and allow for mapping vehicles to multiple radios in the device
- Easy integration with external traffic simulators to create highly realistic virtual test-driving V2X scenarios
- Dedicated C-V2X RF equipment with advanced timing accuracy
- Test V2X security features of the participating OBUs & RSUs
- Accurate position simulation for the V2X ECU under test using 3rd party GNSS simulator
  - Also simulate various atmospheric conditions that can have an impact on the accuracy of the GNSS receiver of the ECU under test
- Option: Re-create realistic RF channel conditions on the bench using VIAVI Vertex Channel Emulator integrated into the test bed
- In-vehicle Network and Rest-Bus simulation via CAN/Automotive Ethernet for controlling and observing Device Under Test (DUT)

Technical Specifications

Base Specifications	Description
3GPP Rel. 14 PC5	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Release 14 Description; Summary of Rel-14 Work Items (Release 14)
T/CSAE 0053 (2020)	Cooperative intelligent transportation system; vehicular communication; application layer specification and data exchange standard
CCSA YD/T 3709 (2020)	Technical requirements of message layer of LTE-based vehicular communication
CCSA YD/T 3707 (2020)	Technical Requirements of Network Layer of LTE-based Vehicular Communication
SAE J2945_1_2020-04	SAE On-Board System Requirements for V2V Safety Communications
ETSI TS 103 900 2022	Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications

Ordering Information

Part Number	Description
AUTO-M1-KIT-CV2X-01	Automotive M1 CV2X Kit (HW only)
AUTO-M1-KIT-CV2X-02	Automotive M1 HW and CV2X SW Kit
TEC-SW-V2X-APP-CHN	V2X Virtual China Applications Pack
TEC-SW-V2X-APP-EU	V2X Virtual EU ETSI Applications Pack
TEC-SW-V2X-APP-US	V2X Virtual US WAVE Applications Pack
TEC-SW-V2X-SP1	V2X Virtual Security Pack 1
TEC-SW-V2X-Simulator	V2X Virtual Traffic Simulator Interface



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