

Common Q+ Development Tools

Modernizing Common Q safety software development, simulation, and debugging

Executive Summary

Westinghouse is modernizing the Common Q safety software development experience through the Common Q Development Tools—enabling engineers to develop, test, and debug AC160 safety software in a functional simulation environment without requiring physical hardware.

These tools improve design quality and development efficiency by enabling earlier issue detection, enhanced debugging, and scalable engineering workflows—supporting modernization, lifecycle management, and long-term operation initiatives.

Common Q Development Tools

Functional simulation and debugging tools that improve Common Q software design, testing, and verification—while reducing development cycle time.

Key Features & Capabilities –

- **Functional Software Simulation Scope** - Executes Common Q applications using actual design artifacts (AAX, BAX, PED files) to provide functionally accurate outputs for development and engineering testing.
- **Customer PC Element Engineering Test & Debug** - Enables custom PC elements to be developed, executed, and debugged in a controlled simulation environment with automated unit tests and step-through debugging.
- **Type-Circuit Visual Debugger** - Provides a graphical interface for visualizing Type-Circuit execution, signal propagation, and logic flow supporting debugging, training, and design understanding.

- **Single Processor Module (PM) Simulation** - Simulates a complete AC160 processor module application, producing waveform and signal data to support design verification and regression testing.
- **Automation & CI/CD Enablement** - Supports scripted builds, automated test execution, and integration with modern development pipelines to improve consistency and scalability.

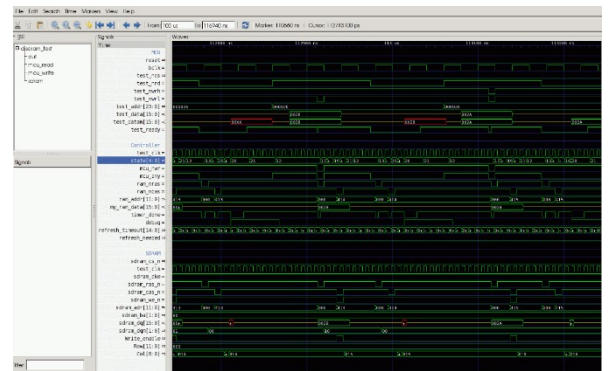


Figure 1 – Single PM Simulator
(Waveforms of signals through the full simulation time)

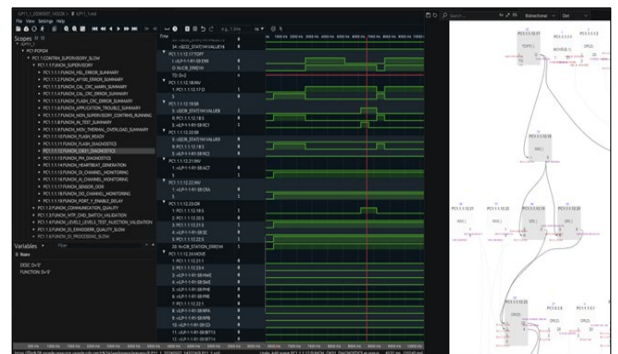


Figure 2 – Virtual CQ+ Integrated Test Environment
(Signal Waveforms and Logic)

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Customer Benefits

- **Improves early design confidence** by enabling functional simulation before hardware integration.
- **Reduces rework and integration risk** through earlier detection of logic, interface, and configuration issues.
- **Enhances debugging efficiency** using visual tools, waveform analysis, and step-through execution.
- **Supports scalable engineering workflows** including onboarding, training, and parallel development activities.
- **Accelerates development schedules** by reducing dependency on physical hardware and manual test setups.



**Virtual Common Q+ Enables
Confident Safety Software
Development**

Why Westinghouse

- Largest global deployment of safety platforms
- Comprehensive lifecycle management commitment
- Proven global delivery track record across AP1000, APR1400, OPR1000 and multiple upgrade programs
- Single accountable partner for architecture, licensing, deployment, and long-term modernization

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