

Spectra CX – Development Tool for SCA/SDR Developers

Spectra CX is a model-driven development tool that simplifies, accelerates, and validates a significant proportion of the Software Defined Radio (SDR) Software Communications Architecture (SCA) development process. Spectra CX validates SCA compliance at the architectural and unit test level, and generates correct-by-construction SCA compliant artifacts, such as: XML descriptor files, compliance test reports, and validation documentation. Spectra CX enables SCA and non-SCA software aspects to be developed together, integrated early, and thoroughly tested. Spectra CX also reduces development risk due to its consistent model-based approach. Together the above benefits result in faster time-to-market, lower costs, better software quality, and superior compliance for all SCA waveform and platform code developed with Spectra CX.

Model with Spectra CX

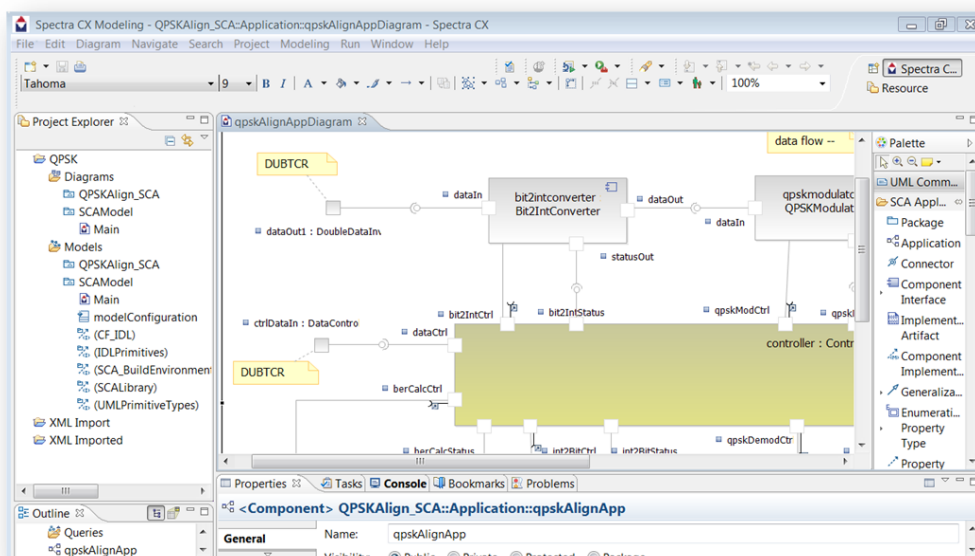
Benefits from complete SCA system modeling – components, applications, nodes platforms, deployments

Spectra CX provides visual modeling for all project stakeholders. Powerful visual representation of SCA concepts ensures that every project team member has a global understanding of the system and can produce correct SCA artifacts. Spectra CX supports modeling of components, applications (waveforms), devices, platforms, and deployment of waveforms on target platforms.

With SCA systems being dependant on multiple devices having enough resources and capacity to run the intended applications, it is vital that all applications are modeled with their planned platform.

Modeling deployments throughout the development cycle with Spectra CX allows the project team to specify and track the deployment explicitly, and ensure that untested deployments are never accidentally deployed.

- ▶ Model SCA components, applications, devices, nodes, platforms, and deployments
- ▶ UML 2-based — system architecture clearly understood
- ▶ Modeling of classes with UML and C++ code generation
- ▶ Intuitive definition of application-to-platform relationships
- ▶ Define SCA constructs in seconds
- ▶ Guides the usage of SCA constructs
- ▶ Intuitive navigation — hyperlinks, context-sensitive menus, cross-linking
- ▶ Integrated with configuration management tools — manage model elements like any software artifact
- ▶ Define multiple views into the application



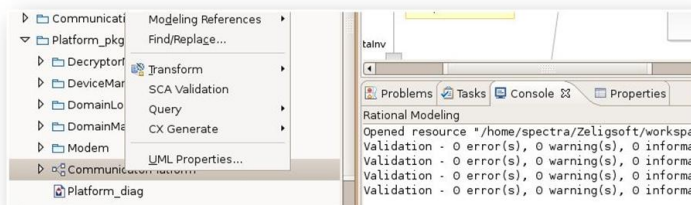
Validate with Spectra CX

De-risk projects by validating early on, and throughout the development cycle

Spectra CX allows developers to produce SCA compliant software from day one. Validation is built right into Spectra CX providing automatic identification of errors in SCA-compliant radio platforms and waveform applications. In addition to checking the syntax of the Document Type Definition (DTD), Spectra CX validates the semantic correctness of the model. Errors are presented along with a hyperlink to the model construct that violates the SCA standard and a reference to the relevant section of the SCA standard. Spectra CX also provides suggestions for correcting the violation.

Many SCA projects involve the integration of legacy and 3rd party waveforms. Spectra CX facilitates integration by allowing developers to import complete or partial sets of SCA descriptor files (XML), validate them against the SCA standard for correctness, and assemble them into a complete and valid application or platform. Spectra CX provides a complete development environment for SCA compliant software, validating at every stage, up to and including deployment.

- ▶ Automatically validate for SCA compliance — applications (waveforms), platforms, and deployments
- ▶ Validate model for syntactical and semantic correctness
- ▶ Import and validate 3rd party and legacy components, applications, devices, nodes
- ▶ Complete validation of SCA deployments
- ▶ Guidance on resolving SCA violations with links to the cause and suggested modifications
- ▶ Enhanced validation with cross-reference to the standards



Validate with Spectra CX

Generate with Spectra CX

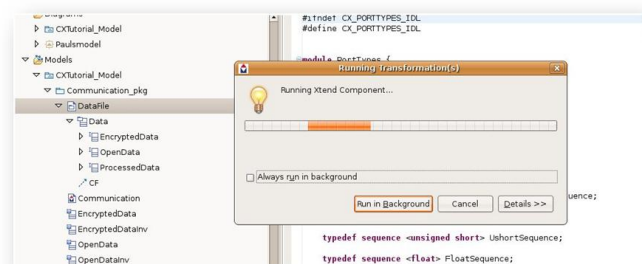
De-risk projects by validating early on, and throughout the development cycle

Spectra CX provides push-button generation of correct-by-construction descriptor files and documentation. By automatically generating the complete set of SCA compliant descriptor files, i.e. the entire SCA Domain Profile, development time can be reduced from months to days. Generating documentation improves communication between team members. Documentation generation through Spectra CX is completely customizable. Developers can produce documentation relating to a specific view, for example, a list of all components in the waveform or a description of an intended deployment.

Automated generation of code implementing SCA component structure is provided through Spectra CX's Code Generators. They automate the production of both SCA application code and SCA device code. Device code abstracts the physical hardware in accordance with the SCA specification. Automating the generation of this code benefits both developers of SCA-compliant radio platforms and developers needing to modify an SCA-compliant radio platform, allowing them to make changes to their hardware while ensuring continuous adherence to the SCA specification.

- ▶ Push-button generation of the complete set of SCA XML descriptors
- ▶ Fully customizable documentation generation
- ▶ Extensible code generators
- ▶ Generates SCA structural code in C++ or C
- ▶ Build environment generation

Generate with Spectra CX



Develop with Spectra CX

Design and develop SCA component behavioral code using Model Driven Development (MDD)

Spectra CX provides developers with a complete model-based development environment that will significantly reduce the time to develop and maintain their components. Seamless integration with the Eclipse IDE allows developers to use their preferred tools for developing and managing source code that is linked to the model of the waveform. Spectra CX supports the integration of behavioural models created by 3rd party UML, Block Diagram, and State Chart design tools.

- ▶ Model-driven development can be used throughout the waveform realization process
- ▶ Component developers can work from a fully described application architecture
- ▶ Complex components can be designed and implemented using Spectra CX
- ▶ Integrated with Eclipse Team system and 3rd party Configuration Management solutions
- ▶ Automatic linkage of the model and source code eliminates the need for manual synchronization
- ▶ CDT integration allows developers to model and code using Spectra CX
- ▶ Supports 3rd party design tools

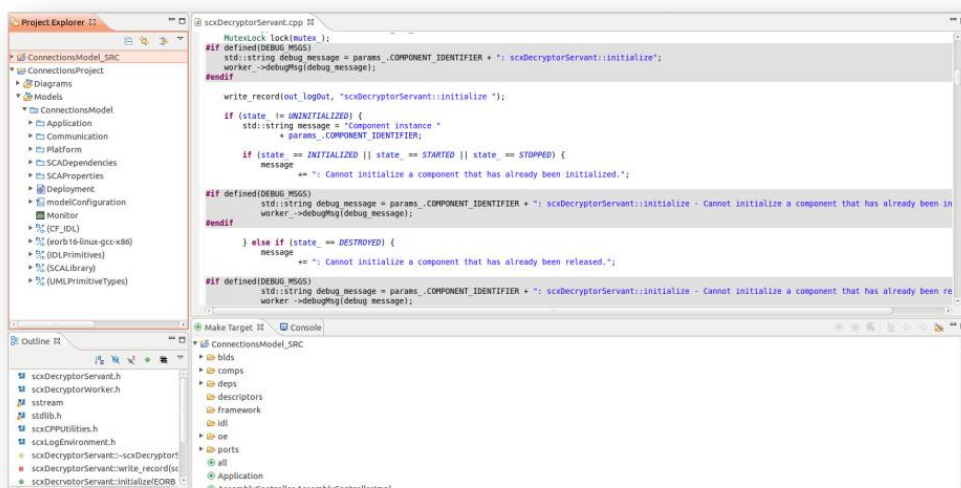
Execute with Spectra CX

Monitor the component system on its actual target, with the platform running multiple applications for complete testing

In an SCA radio, the actual deployment of software components to hardware devices is done at system initialization time. For this reason, developers require features that enable them to connect to the SCA Core Framework (CF) to thoroughly test their application running live. In addition to features for SCA development, the Spectra CX environment contains comprehensive features allowing developers to quickly and easily test and debug their components and applications.

Spectra CX's runtime monitor allows users to start the SCA CF, load an application to a platform and inspect it in real-time. With runtime monitoring, developers can see if the deployment they expected to have is actually the one dynamically created by the CF. Users can also take their deployment design models and explicitly enforce them during runtime. This feature ensures that all specific test cases are executed thoroughly.

Spectra CX's runtime monitoring feature can be connected to any SCA compliant operating environment (OE). For example, it will run on a PC development host equipped with a PC compatible middleware suite. This is especially beneficial because it allows developers to test their deployments very early on in the development cycle. The run-time monitor will communicate with an embedded target's OE, for testing on the actual target.



Develop with Spectra CX

The runtime monitor allows multiple applications to be started and stopped with the click of a button. Users can load their SCA platform with many applications, better representing what is likely to happen in the field. Previously set values, such as component properties, can be adjusted on-the-fly so that users can change the behavior of the waveform as it is running, and continue observing it.

Spectra CX captures logs generated by the CF (if available) and presents them to the user within Spectra CX's UI.

Also available from PrismTech is an SDR Development Suite comprising Spectra CX plus a complete SCA operating environment (Spectra CF and Spectra CDB) designed to run on a PC host. Users can observe their applications deployed on a commercial-grade SCA CF in record time.

- ▶ Start and stop SCA Core Framework on host within Spectra CX environment
- ▶ Load and unload multiple applications
- ▶ Support for development hosts and embedded targets
- ▶ Use design model to force particular deployment
- ▶ Adjust component properties while application is running

Test with Spectra CX

Test early and often to minimize development risk

Automated testing of components and subsystems of an application (waveform) is provided with Spectra CX, through the Spectra CX SCA Test framework. Generating specific code for testing the developed components for SCA compliance is critical to ensuring delivered components meet the runtime characteristics demanded by the standard. Spectra CX SCA Test allows users to generate, compile and execute test code, and view test on host or target systems.

- ▶ SCA Component Test: test the component for compliance with the SCA standard
- ▶ SCA Functional Test: test the component for compliance with functional requirements
- ▶ SCA Scenario Test: test the interaction of components against specified scenarios

Complementary SDR Products

Spectra CX is part of the most complete family of SDR products and technologies designed to support all of your SCA SDR development needs.

Expert Professional Services

PrismTech offers a complete suite of training courses on the SCA and SDR technologies and their implementation using PrismTech's Spectra SDR products.

We also offer professional services conducted by leading industry experts in all skill areas required for SCA radio development. Services include workshops to help SDR engineers develop both SCA platforms and waveforms, as well as longer term consulting services with PrismTech SDR specialists participating throughout the development lifecycle, including the actual implementation of your SDR solution.

Finally PrismTech is renowned for the quality and responsiveness of our Support and Maintenance Services that are available on a worldwide 24x7 basis where required.

Please contact us for further information about Spectra CX or any of PrismTech's SDR products and services.

