ptc

PTC software modeling solution

DRAMATICALLY IMPROVE HOW YOU DESIGN AND DEVELOP COMPLEX SOFTWARE

The ongoing demand for sophisticated but intuitive software and software-enabled devices presents opportunities and challenges for today's developer. These projects often are conceptually complex and require the participation of large distributed teams from multiple disciplines and specialty groups.

Organizations often face barriers to creating and validating design ideas that all stakeholders can quickly understand and agree on. Without a common visual modeling approach and a systematic way to design modular software, improving complex software systems and software product lines is time consuming and expensive.

Develop complex software with ease

The PTC Software Modeling Solution uses a combination of tools and best practices to accelerate software development. Teams are able to leverage the standards-based unified modeling language (UML), reuse programming assets, and automatically generate software code in popular programming languages.

The PTC Software Modeling Solution provides a more efficient and comprehensive framework for abstracting, defining, and communicating design ideas. It relies on a shared model repository approach to help diverse teams collaborate, problem solve, and work toward common goals.

The solution improves on-time delivery, eliminates manual coding errors, and keeps requirements, models, and code aligned. It automatically synchronizes changes to models and code and is ideal for complex projects, including software designs for sophisticated devices, device connectivity, and Internet of Things (IoT) applications that can optionally be delivered on the PTC ThingWorx IoT platform.
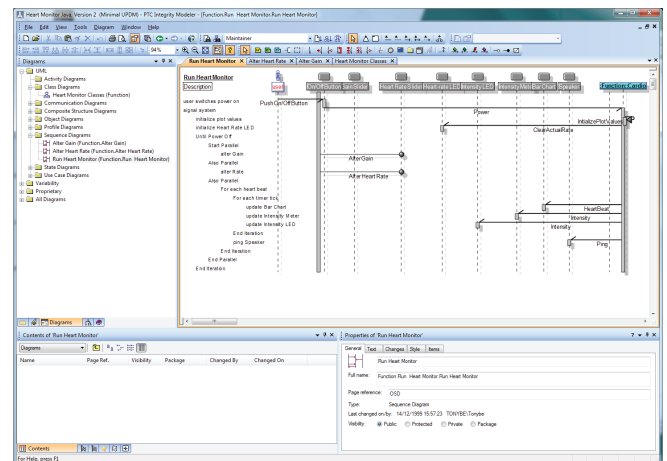
The PTC Software Modeling Solution enables you to improve how you design and develop.

Reduce risk and stimulate innovation

Organizations in many industries rely on our approach to develop innovative software while reducing the costs and design risks associated with complex and long-running projects. The productivity, savings, quality, compliance, and time-to-market benefits of the PTC Software Modeling Solution enable teams to:

- Get up and running quickly with best practices based on PTC's vast experience on actual projects

- Design software before it is built using UML language and in a scalable, multi-user environment

- Validate complex behavior early in the design lifecycle

- Automatically review software designs

- Specify, publish, and reuse software assets

- Tailor specific models to code transformation templates for productivity and flexibility

- Link and trace from requirements to design and implementation

- Enable bi-directional synchronization of models and code

- Automatically publish design documentation

- Accelerate the design and delivery of software variants

Use process, knowledge, and software tools to drive success

The PTC Software Modeling Solution is based on proven model driven architecture (MDA) techniques. No other company offers the breadth and depth of its capabilities.

The solution serves as the hub of your software development environment. PTC's integrated Automated Code Synchronizer reacts instantly to model modifications, simultaneously making the code visible in the project's integrated development environment code editor. You can also use it to retrospectively document your existing code by reverse-engineering it into the PTC Software Modeling Solution and visualizing the existing design as UML.
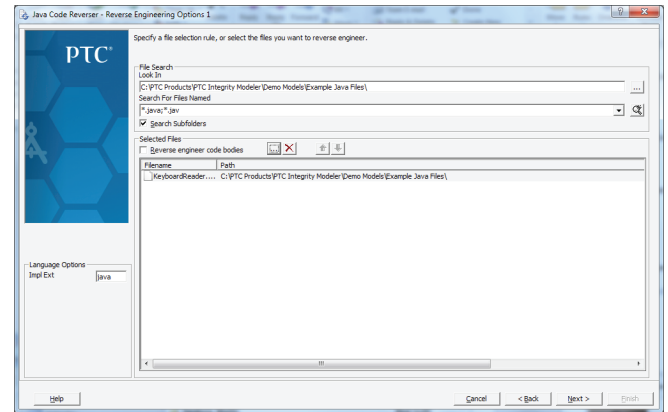
The PTC Software Modeling Solution enables reverse-engineer existing code.

Best practices for a smoother development process

The PTC Software Modeling Solution helps you jumpstart software development with rich process content drawn from our vast experience implementing MDA. By leveraging the unified modeling (UML) and orthogonal variable modeling (OVM) languages, the solution enables you to develop and manage millions of lines of code with speed and efficiency.

Whether you adopt our process completely or use it as a starting point, you benefit from our best practices and model-to-code mappings.

Collaborative tools for keeping large teams on track

The PTC Software Modeling Solution reduces the time and effort required to create high-quality models for software. Its intuitive, visual design process leads you through the appropriate modeling techniques while automating repetitive tasks.

A live, multi-user database ensures your teams have access to real-time changes, and fully associative modeling replaces error-prone and high-risk copy and clone approaches used to manage complex configurations. The customizable user interface allows teams to work at the right level of abstraction, while providing selective access to advanced menu options.

Software generation and synchronization for greater productivity

The PTC Software Modeling Solution automatically generates C, C++, C#, Ada, Java, VB, ARINC653, SQL, IDL, and XMI from your models. These out-of-the-box generators and synchronizers dramatically increase productivity and quality by reusing core model assets again and again. They also manage change with impact analysis and automated updates in both directions.

The solution enables you to quickly model system of system (SoS), component based development (CBD), and service oriented architecture (SOA) solutions. Our integrated PTC Asset Library optimizes and simplifies communication between component or service suppliers and consumers. While other modeling environments force you to choose between working with disconnected sub-models or overly large, complex models, the solution allows you to break up complex software designs into simpler, linked sub-models that are easy to reuse.
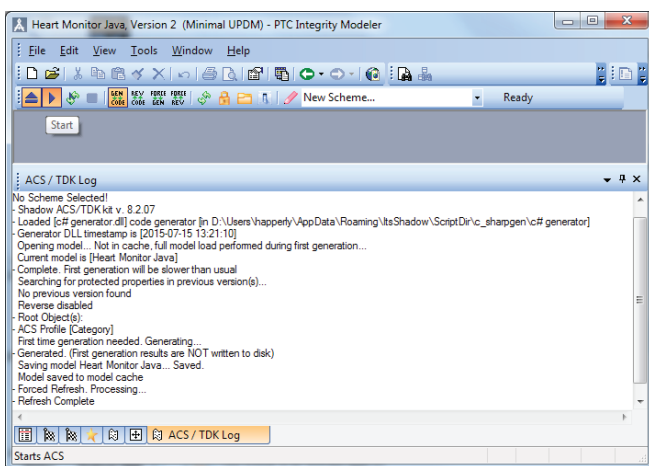
The PTC Software Modeling Solution provides synchronizers for increasing productivity and code reuse.

Transformation patterns for configuring code to specific requirements

With the PTC Transformation Development Kit, you can modify any of the out-of-the-box code generation patterns or create your own. It allows you to define transformation rules as UML class models using object oriented principles, familiar notation, and zero coding. Transformation patterns implemented as UML models are easy to create, modify, version, and reuse. This allows you to implement your own coding standards or generate code for other languages. You can also adapt or create UML profiles to match your domain specific language and project needs, aligning your modeling and programming styles precisely. Your software developers can apply both these facilities to reuse best practice mappings and increase quality. Removing the reparative, low-end work frees your programmers to focus on the most important system features, algorithms, and performance issues.

Reusable components for faster variant design

Asset-based modular design lets you break up your complex software systems into components or services. The Asset Library manages an index of these software interfaces, coordinating software reuse at design-time. This is much more efficient and productive than late stage, opportunistic software reuse. Extending modular design with model-based product line engineering enables a strategic approach to designing software platforms and variants for added agility in the marketplace. Software product line engineering is as straightforward as building an overloaded 150-percent model, selecting the items required in any variant, then generating the variant into a product model for budget analysis and detailed design. These capabilities not only increase productivity but also reduce risks by letting you reuse proven assets while focusing only on the things that differ.

Publication, integration, and traceability

Once your models are ready for wider distribution, the PTC Software Modeling Solution auto-generates your documentation and applies your organization's styles and document templates. Generated document types include Microsoft® Word® and navigable HTML.

As the solution provides a single source of reliable information it also enables you to link and trace model elements and synchronize with other lifecycle tools, including PTC Integrity™ Lifecycle Manager, MATLAB® Simulink®and IBM® Rational® DOORS®.

The PTC Software Modeling Solution has been tested at the OMG model interchange working group (MIWG) and proven to support extensible markup language (XML) importing and exporting using the XML model interchange (XMI) format. Conforming to these and other relevant standards future-proofs your models and allows you to integrate with other XMI compliant tools.

Start your software-modeling journey

PTC has deep expertise in model-based software engineering. Our experts can help your developers learn and apply the key modeling concepts for achieving success with UML and the PTC Software Modeling Solution.

The PTC Software Modeling Solution is powered by the PTC Integrity family of software engineering products and includes:

- PTC Integrity Modeler for scalable, multi-user OMG UML, and variability modeling

- PTC Integrity Asset Library (add-on) for modular, component-based, and service-oriented software design and reuse

- PTC Automatic Code Synchronizer for code generation, reverse engineering, and synchronization

- Transformation Development Kit for creating and modifying code generation patterns

- PTC Integrity Modeler Product Line Engineering (add-on) for modeling variable software product lines

- PTC Integrity Modeler Reviewer for automated design reviews

- PTC Integrity Process Perspective (Add On) for best practices

Choose the package that is right for you

PTC advances software development best practices by staying involved in professional groups that define standards and specifications. This knowledge and experience helped us to produce pragmatic solutions. With the PTC Software Modeling Solution, development teams are able to generate 40 percent to 90 percent of needed code automatically, reducing most programming efforts by up to 45 percent, and cutting rework in half.

The PTC Software Modeling Solution is available by subscription. Each subscription offers transparent payment schedules so you can align your budget to immediate process benefits. Visit PTC.com/subscription for more information.

Please visit PTC.com/model-based-systems-engineering for more information, including customer success stories and product demos.