

# Windchill® Modeler

A scalable, multi-user environment for designing systems and software with speed and efficiency

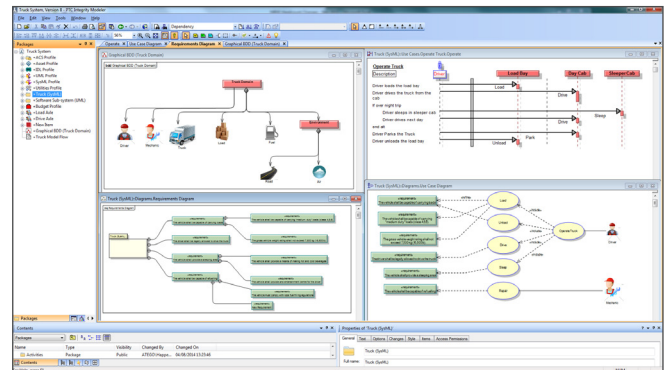
As development projects become more complex, it is increasingly difficult to create and communicate design ideas so they can be easily understood and agreed on by all stakeholders. PTC Windchill® Modeler is a pragmatic solution for modeling the way you build. It provides an integrated toolset for Systems Modeling Language (SysML), Unified Modeling Language (UML), and variability models that runs on a live common database.

## Develop Complex Software With Ease

PTC Windchill® Modeler reduces the time and effort required to design products, systems, and software by leading you through the appropriate industry-standard diagrams while automating repetitive tasks and identifying potential problems.

PTC Windchill® Modeler includes the following main features:

- Modeler for creating consistent, high-quality visual models for systems, software and product lines to improve understanding, decision-making, and stakeholder buy-in.
- An extensible meta-model, power profiling, and user interface simplification.
- Model publication ranging from formatted documents to live web access.
- Reviewer for checking models, finding errors, extracting management metrics, and improving designs early in a process.
- SySim for simulating the behavior of SysML designs using a drag and drop interface.
- Automated Code Synchronizer for automatically generating source code from your UML models.
- Transformation Development Kit for taking advantage of Reverse Syntax Notation.
- Single source of traceable design truth with integration and trace-links to other lifecycle tools.



PTC Windchill® Modeler for scalable, multi-user systems and software modeling.

## Modeler

Modeler enables systems and software engineers to create models, communicate requirements, consider design alternatives, and make decisions involving team members working in multiple locations. It auto-generates many other project artifacts and provides linking and traceability between all model elements. Linking and traceability help to ensure accountability during project development.

Modeler also provides all the facilities you need to manage your models, including access controls, versioning, differencing, branching, merging and more, including full change tracking.

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### Tools for adapting models to your needs

Modeler lets you adapt the meta-models and user interfaces for UML, SysML, and other profiles to match your specific domain and project needs. It also provides out-of-the-box profiles for UPDM, MARTE, and ARINC653. Once your models are ready for wider distribution, it can auto-generate your documentation and apply your organization's styles and templates. Generated document types include Microsoft® Word® and navigable HTML. Alternatively, all interested parties can view the models through a live web interface.

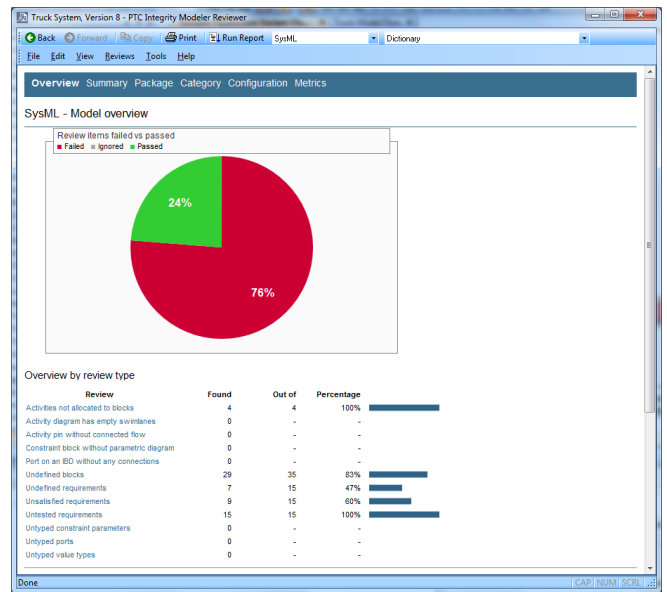
## Reviewer

### Tools for finding errors before they become problems

Reviewer lets you check models, find errors, extract management metrics, and improve designs early in a process. It is particularly useful when projects involve new or infrequent modelers or other individuals who need active mentoring.

Reviewer comes preloaded with 100+ out-of-the-box design reviews that can be extended and configured to reflect your own modeling best practices.

Large projects with architects and systems and software engineers all using one modeling tool make it critically important to extract management statistics to track progress. Reviewer provides this oversight while allowing you to find errors early and improves the confidence in the robustness of your designs. It provides intuitive tools for measuring quality and identifying design faults much faster.



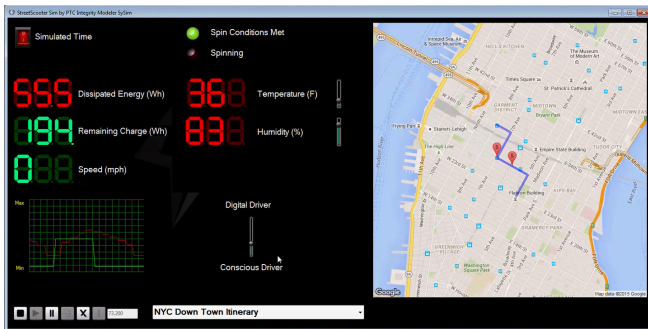
Reviewer helps you improve quality and track progress.

## SySim

### Tools for ensuring consistency and correctness

SySim enables you to simulate the behavior of SysML designs using a drag and drop interface. It transforms your designs into executable, graphical applications that you can share with project participants, customers, stakeholders, managers, and system implementers.

You can generate simulation graphics and scenarios, review complex system behavior early in the specification phase and gain a complete picture of the specification's consistency and completeness. SySim's strong feature set helps you reduce design walkthrough times and eliminate system errors, contributing to significant time and cost savings and on-time delivery.



SySim enables you to simulate design behavior.

### Automatic code synchronizer

#### Tools for improving coding efficiency

Automatic Code Synchronizer (ACS) is a highly efficient tool for building successful software solutions and extensions for existing systems. The out-of-the-box ACS transformation patterns automatically generate C, C++, C#, Ada, Java, VB, ARINC653, SQL DDL, IDL, and XMI from your models. It runs as a background Modeler process and automatically generates source code from your UML models, saving time, increasing productivity, and giving your developers a flying start.

ACS ensures your UML design and code remain synchronized and ready to support ongoing development, maintenance, enhancement, and integration tasks. It uses UML class and relationship information and dynamic information such as state diagrams to generate code logic. This code animates Modeler diagrams when applications are executed on the host or target, while code instrumentation allows your state model to interact with the application to debug your code at design-time.

ACS reacts instantly to model modifications, simultaneously making the code visible in the project's integrated development environment or code editor.

ACS allows you to invest in design once and keeps the design current and ready to use for future projects with the same or different implementation technology. Coding standards and best practices are documented in pattern models and automatically applied by every software developer, reusing best practices and increasing quality. It allows typical users to generate 40 percent to 90 percent of their code automatically, which reduces most programming efforts by up to 45 percent and rework by half. Removing this reparative, low-end work frees the programmers to focus on the most important system features, algorithms, and performance issues.

### Transformation development kit

The PTC Windchill® Modeler Transformation Development Kit provides a unique and powerful model-driven method for defining model-to-code (or file) transformation patterns. 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. They are efficient and self-documented. This gives you full control over the syntax and semantics of the generated code, as well as the opportunity to implement project or company specific coding standards. As the transformation pattern models are updated, the changes are instantly applied to ACS. This linkage eliminates the need manually reconfiguring the background synchronizer process. Modifications immediately change the way code is generated and provides feedback programmers can use to quickly develop new transformations.

Asset library

**Tools for asset-based modular design**

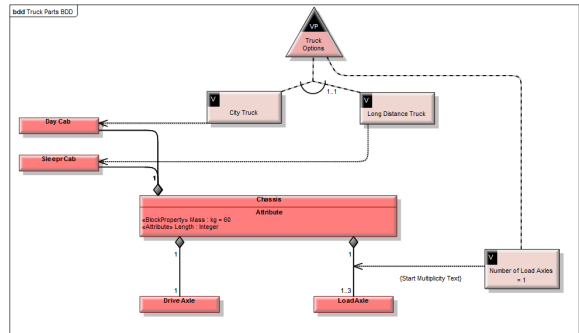
When combined with the PTC Windchill® Asset Library, PTC Windchill® Modeler enables you to quickly model system of system (SoS), component based development (CBD), and service oriented architecture (SOA) solutions. The natural synergy it provides between the design process and your development or engineering approaches enable interface-based modularity, parallel working and outsourcing.

Model-based product line engineering

**Tools for system and software family design**

Modeler Product Line Engineering (PLE) extends the diagrams and model elements to include Variation Points, Variants, Decision Sets, and Variant Diagrams. The modeling language used for Variability Modeling in PTC Windchill® Modeler is Orthogonal Variability Modeling (OVM), and its elements can be linked to all other model elements. This allows you to model system and software product lines (sometimes called Overloaded Models or 150% Models), then make decisions about the variations and available features, and auto generate product specific models. These models can then be analyzed for suitability to resolve the trade-offs and identify the best products.

This unique approach for model-based product line engineering can extend model-based systems engineering and also asset-based modular design to consider while system and software families, not just one product. Doing this can dramatically improve customer satisfaction, market alignment and productivity. Modeler PLE customers have saved 50%



Modeler Product Line Engineering helps you make decisions about variations and features.

of their design costs and achieved 80% reuse.

Integrated products

Modeler’s single source of reliable information enables you to link and trace model elements, which you can synchronize with other design programs, including ITC Windchill® Lifecycle Manager, PTC Windchill, MATLAB® Simulink® and IBM® Rational® DOORS®. It also auto-generates many artifacts and provides project documentation in Microsoft® Word® and navigable HTML.

Modeler is OMG model interchange working group (MIWG) compliant using extensible markup interchange (XML) import and export. Conforming to these standards future-proofs your models and allows integration with other XML compliant tools. It also lets you reuse core model assets, manage change through impact analysis, and automate updates in both directions.

Choose the package that is right for you

Modeler provides an integrated toolset for creating consistent, high-quality SysML, UML, and variability models for SoS, CBD, and SOA solutions. It typically reduces overall development cost by 62 percent and improves on-time delivery by 23 percent.

Modeler is available by subscription. Each subscription offers transparent payment schedules so you can align

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