

# Simcenter system simulation solutions 17

## Boosting system simulation efficiency

### Benefits

- Increase system simulation efficiency
- Address electrification and controls engineering challenges
- Meet pollutant emissions standards
- Frontload aircraft system integration, electrify propulsion and streamline engine design
- Take advantage of seamless process integration and maximum modeling accuracy
- Democratize access to digital twins

### Summary

To stay competitive, manufacturers must accelerate innovation. Version 17 of Simcenter system simulation solutions will help you respond to that challenge so you can engineer the right products faster.

### Electrification

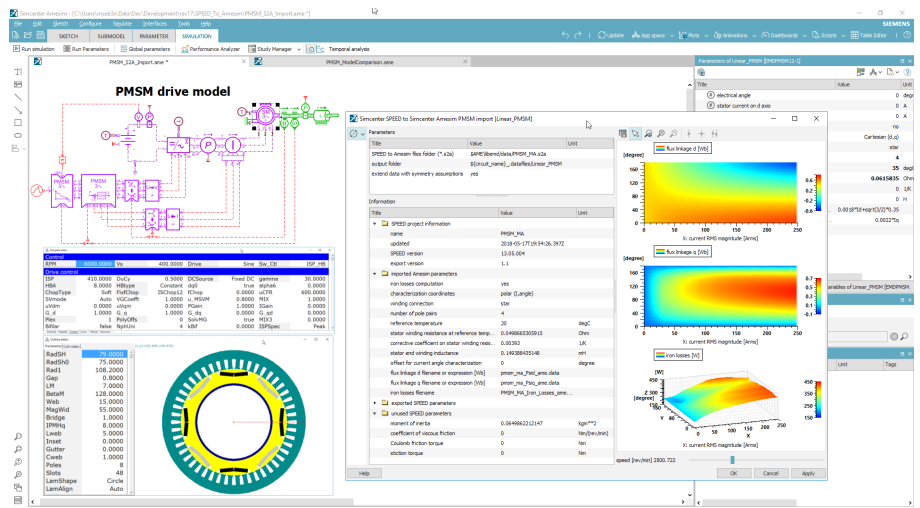
- Seamless characterization of electric machine components

- Expansion of air conditioning system capabilities for battery cooling
- Hybrid and electric vehicle model templates

In 10 years, hybrid and electric vehicles could represent about half of the automotive fleet. That's why there have been major development efforts to support electrification. With the newest version of Simcenter Amesim™ software, you can automatically import motor characteristics from the Simcenter™ SPEED electric motor design software and assess electric powertrain performance early in the development cycle.

To safeguard proper battery operating conditions, you can link the battery cooling system with the air conditioning system. The new brazed plate heat exchanger component helps you easily check the capability of the cooling system to manage the battery and cabin thermal operation.

Further, for electric and hybrid vehicle design, Simcenter Amesim 17 comes



# Simcenter system simulation solutions 17

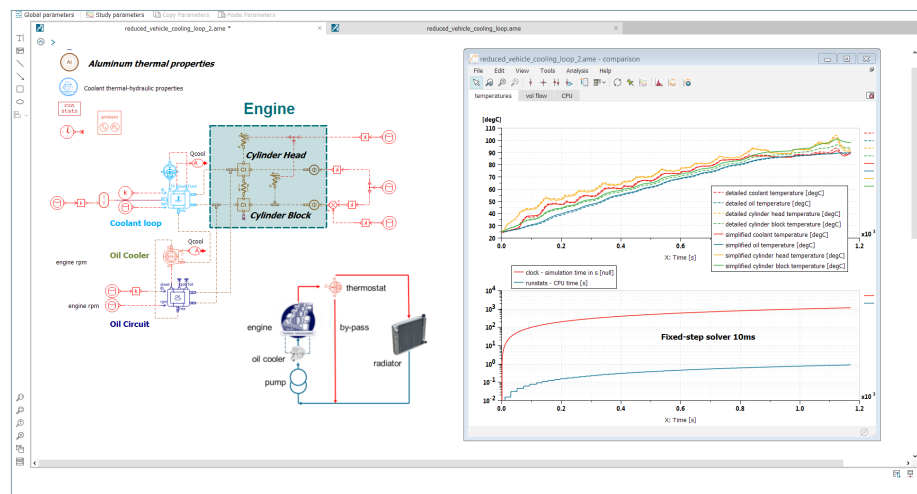
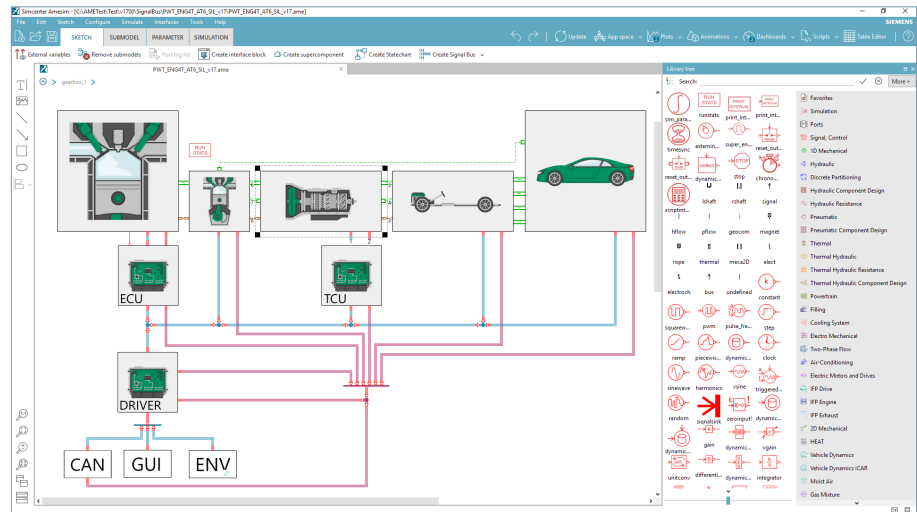
with ready-to-use templates to assess consumption, range, cooling and drivability. These templates provide a good starting point for vehicle electrification projects by delivering parameter consistency and detailed internal combustion engine, transmission, electric drive, battery and cabin cooling subsystems models.

## Controls engineering

- Upgraded signal bus capability and statechart management
- Cooling system functional components
- Real-time compatible components in the fluid component design libraries
- Open software implementation approach and easy integration of legacy code

In the context of software-intensive products, Simcenter Amesim 17 offers new plant modeling capabilities to support controls design, validation and calibration. For instance, the signal bus feature has been reworked to optimize central processing unit (CPU) performance and the user experience. When modeling control units, you can now easily create, edit and manage supercomponents containing statecharts.

Additionally, the release comes with real-time compatible components for automotive cooling system design as well as for hydraulic, thermal-hydraulic and pneumatic component design.



Moreover, version 17 of Simcenter Embedded Software Designer software, a model-based software engineering (MBSE) environment, offers a simplified user interface and enables you to graphically represent your legacy code and instrument the required functionality in a productive way. Based on an architecture-driven development methodology,

the latest release comes with an open approach to software implementation, extending the use of software architecture one step further. This enables you to directly generate templates in form of C-shell or Simulink® environment models for their behavior implementation.

## Vehicle systems and components performance engineering

- Extended modeling capabilities for vane and gerotor pumps
- Upgraded cam and mechanical component design and analysis
- Exhaust calibration tool including optimization features
- Engine manifold design study through full coupling with 3D computational fluid dynamics (CFD)

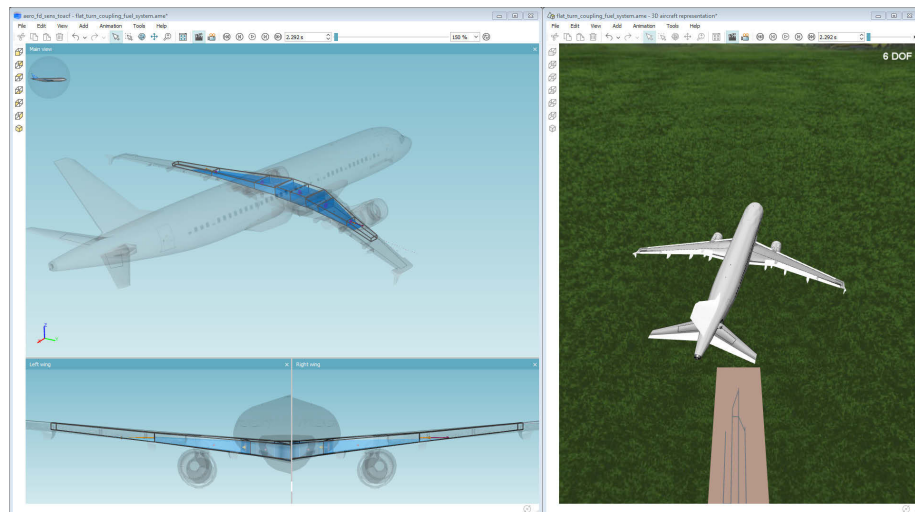
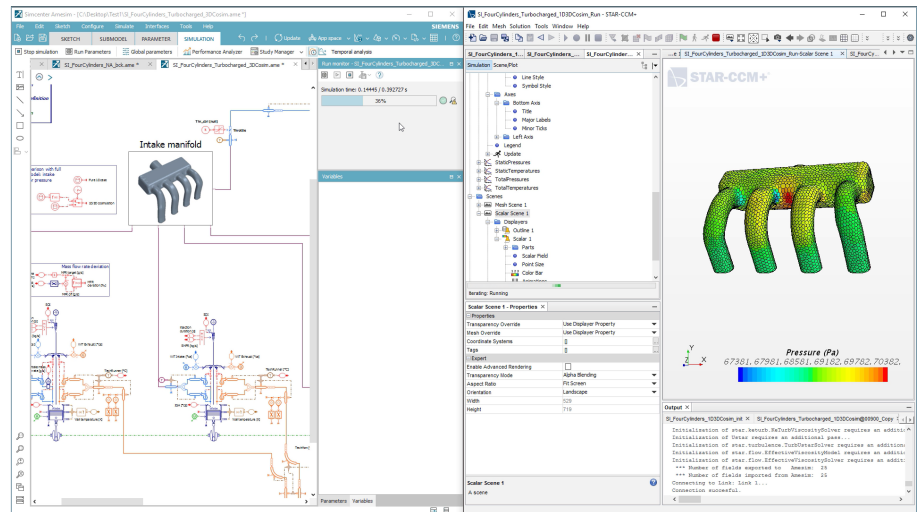
For conventional and hybrid vehicles, a broad set of new capabilities in Simcenter Amesim 17 will help to tackle critical challenges, such as the real driving emissions (RDE) or Worldwide harmonized Light vehicles Test Cycles (WLTC) standards. Among them, the exhaust calibration tool now enables accelerated test data import, batch processing and automated optimization of model calibration.

Moreover, by coupling Simcenter Amesim with Simcenter STAR-CCM+™ software, you can efficiently run an engine design study for operating points of interest. This allows you to assess intake line acoustics or the impact of manifold geometry on performance.

## Aircraft systems performance engineering

- Intuitive and detailed jet engine performance analysis
- Fuel systems and flight dynamics coupling
- Fuel tank mapping plugin in CAD Import

In support of the aerospace and defense industry, Simcenter Amesim 17 offers unique virtual integrated aircraft (VIA) capabilities to frontload system integration, electrify propulsion systems and streamline jet engine design. It enables rapid modeling of compressors and turbines with variable geometry as well as assessing mixture composition corrections and degradation performance.



Since fuel represents a large portion of the aircraft weight, it is critical to understand its impact on handling qualities. You can now quickly assess the aircraft mass balance and trajectory while accounting for its tight coupling with the fuel system. Moreover, Simcenter Amesim now enables you to generate fuel tank maps from computer-aided design (CAD) geometry. Therefore, you can extract the fuel inertia tensor for coupling with flight dynamics, and tank wet areas for thermal management optimization.

## Interoperability

- Enhanced cabin air flow modeling capabilities
- High-fidelity ego vehicle modeling for advanced driver-assistance systems (ADAS) safety analysis
- Direct access to Teamcenter workflows in Simcenter Amesim

To enable seamless process integration and maximize modeling accuracy, Simcenter Amesim 17 further extends synergies within the Simcenter portfolio. For instance, a tight link with Simcenter STAR-CCM+ allows capturing internal 3D flows in the car cabin to rapidly optimize thermal comfort.

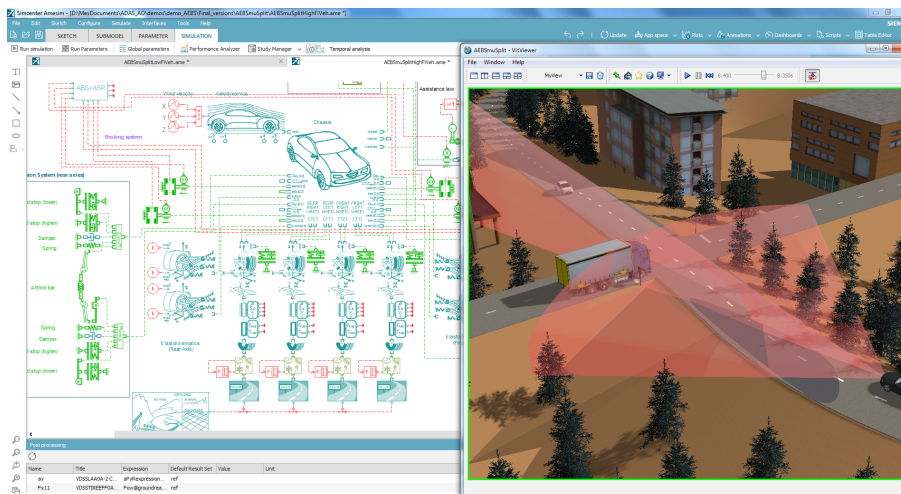
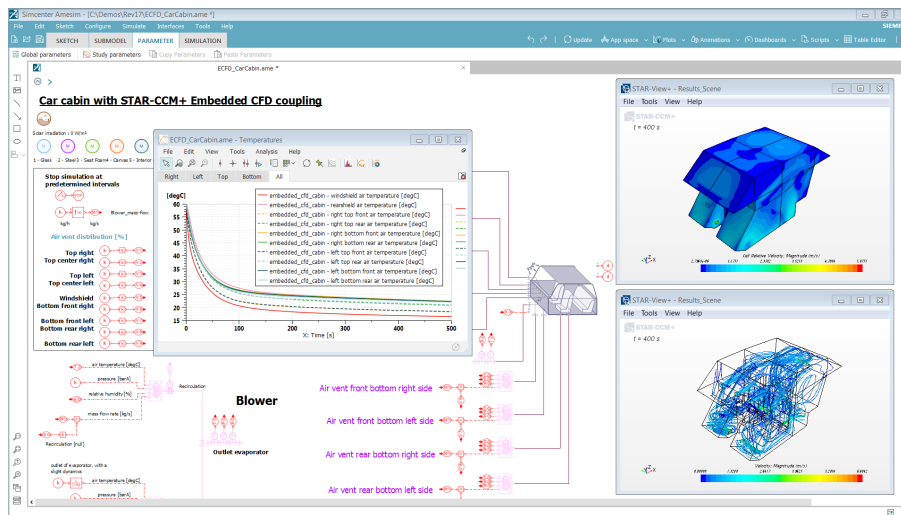
For autonomous vehicle validation, the integration with Simcenter Prescan™ software enables you to accurately capture the ego vehicle's behavior in terms of ride, handling and fuel economy.

In addition, a direct connection between Simcenter Amesim and Teamcenter® software helps improve traceability: You can now easily manage different versions of Simcenter Amesim libraries within Teamcenter.

## Move to the cloud

- Simcenter Amesim as a service
- Web-based access to mechatronic products' configurability

Finally, Simcenter Amesim is now available as a service on the cloud to help cope with system simulation usage peaks. In addition, Simcenter Webapp Server provides your technical sales with an easy-to-use, web-based and cost-effective access to your tailored Simcenter Amesim assets. Therefore, it helps information technology (IT) organizations facilitate system simulation deployment while ensuring that intellectual property stays on the company's premises.



Siemens PLM Software  
[www.siemens.com/plm](http://www.siemens.com/plm)

Americas +1 314 264 8499  
 Europe +44 (0) 1276 413200  
 Asia-Pacific +852 2230 3333

© 2018 Siemens Product Lifecycle Management Software Inc. Siemens and the Siemens logo are registered trademarks of Siemens AG. Femap, HEEDS, Simcenter 3D and Teamcenter are trademarks or registered trademarks of Siemens Product Lifecycle Management Software Inc. or its subsidiaries in the United States and in other countries. Simcenter, Simcenter Amesim, LMS Samtech Samcef, LMS Samcef Caesam, Simcenter SCADAS, Simcenter Testxpress, Simcenter Soundbrush, Simcenter Sound Camera, Simcenter Testlab and LMS Virtual.Lab are trademarks or registered trademarks of Siemens Industry Software NV or any of its affiliates. Simcenter STAR-CCM+ and STAR-CD are trademarks or registered trademarks of Siemens Industry Software Computational Dynamics Ltd. All other trademarks, registered trademarks or service marks belong to their respective holders.  
 75419-A5 10/18 A