Model-Based Design

The Fastest Way to Your Finalized Software

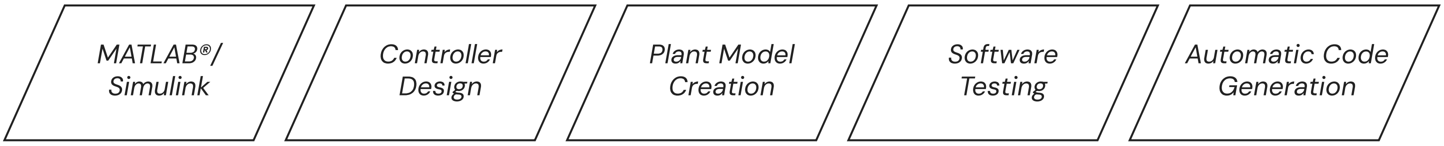
Together with you, we always find the best solutions for your challenges - with high quality software development in the areas of green energy, inverter design, and automotive.

✓ **Support**
from initial requirements to the finished operational software

✓ **Efficient approaches**
to modeling and designing control systems and their environment

✓ **Predictive error detection & correction**
with Simulink® toolboxes

✓ **Automatic code generation**
for multiple target architectures (e.g. microprocessors, ARM microcontrollers, FPGAs or MPSoCs)



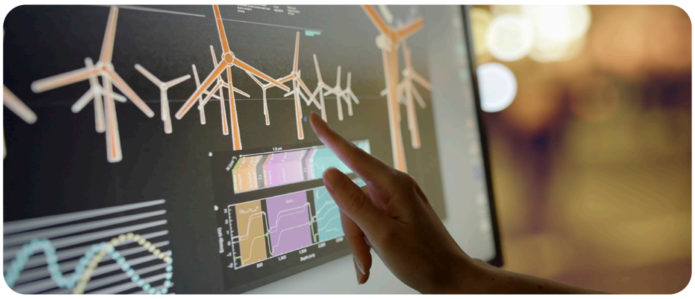
MATLAB®/ Simulink

Controller Design

Plant Model Creation

Software Testing

Automatic Code Generation



Model-Based Design Concept

Model-based design (MBD) provides an **efficient approach to modelling and designing control systems**. Both the controller and the plant model are implemented in **MATLAB® Simulink®**.

Advantages of Model-Based Design

- One Tool Environment
- Automatic Code Generation
- Early Bug Discovery due to Continuous Testing
- Intuitive Understanding
- Continuous Integration

By linking these models, we can analyse the controller optimally and adapt it to the environment and the plant. Simulink offers the possibility to **generate code for your target hardware from the Simulink models automatically**. Thus, the developed controller can be deployed on hardware without any further effort.

We can **rapidly cast your requirements into a root-level design concept**, which can then be further developed iteratively - from the initial idea to the prototype.

Since **continuous integration** can be used throughout the entire development process **from conception to testing**, a **quick reaction to new features** or restructuring as well as adaptation of the models is no challenge for us.

Solid Foundation of Various MATLAB® Simulink® Toolboxes

- Simulink
- Simulink® Test™
- Simulink® Check™
- Simscape™
- HDL Coder™
- Design Verifier™
- Stateflow®
- Control System Toolbox™
- Signal Processing
- Simulink® Coder™
- HDL Verifier™

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SOKRATEL

MathWorks Partner

Software Testing

The implemented controller models are checked and verified by a **rigid software test protocol**, starting with the smallest unit tests. This enables predictive error detection and correction at early stages of the development process.

Furthermore, the control software is tested with **Model in the Loop (MiL)** simulations to precisely analyse and adapt the controller behaviour. To test VHDL® code for an FPGA, we extend these MiL simulations with FPGA simulations using external tools like Verilog® or HDL Verifier for MATLAB. Testing the models with physical hardware focusing on the communication to the actuators and sensors is also an essential step – **Hardware in the Loop (HiL)**.

We offer an experienced, efficient execution from the conception and creation of a HiL system, to the commissioning and development of tests, including HiL tests targeting CPUs and FPGAs. In addition, we provide support for the creation of **custom targets in Simulink**. Workflow and code generation are tailored to be hardware-specific, **even if the hardware is not supported out-of-the box by MATLAB** (such as custom FPGAs and MPSoCs).

You want to learn more?

Scan the QR code to explore our website or contact us!

Tim Krause
Head of Division
Automation

Sebastian Liebetrau
Managing Director

Contact: contact-automation@sokratel.com