

Advanced Testing Chain Supporting the Validation of Smart Grid Systems and Technologies

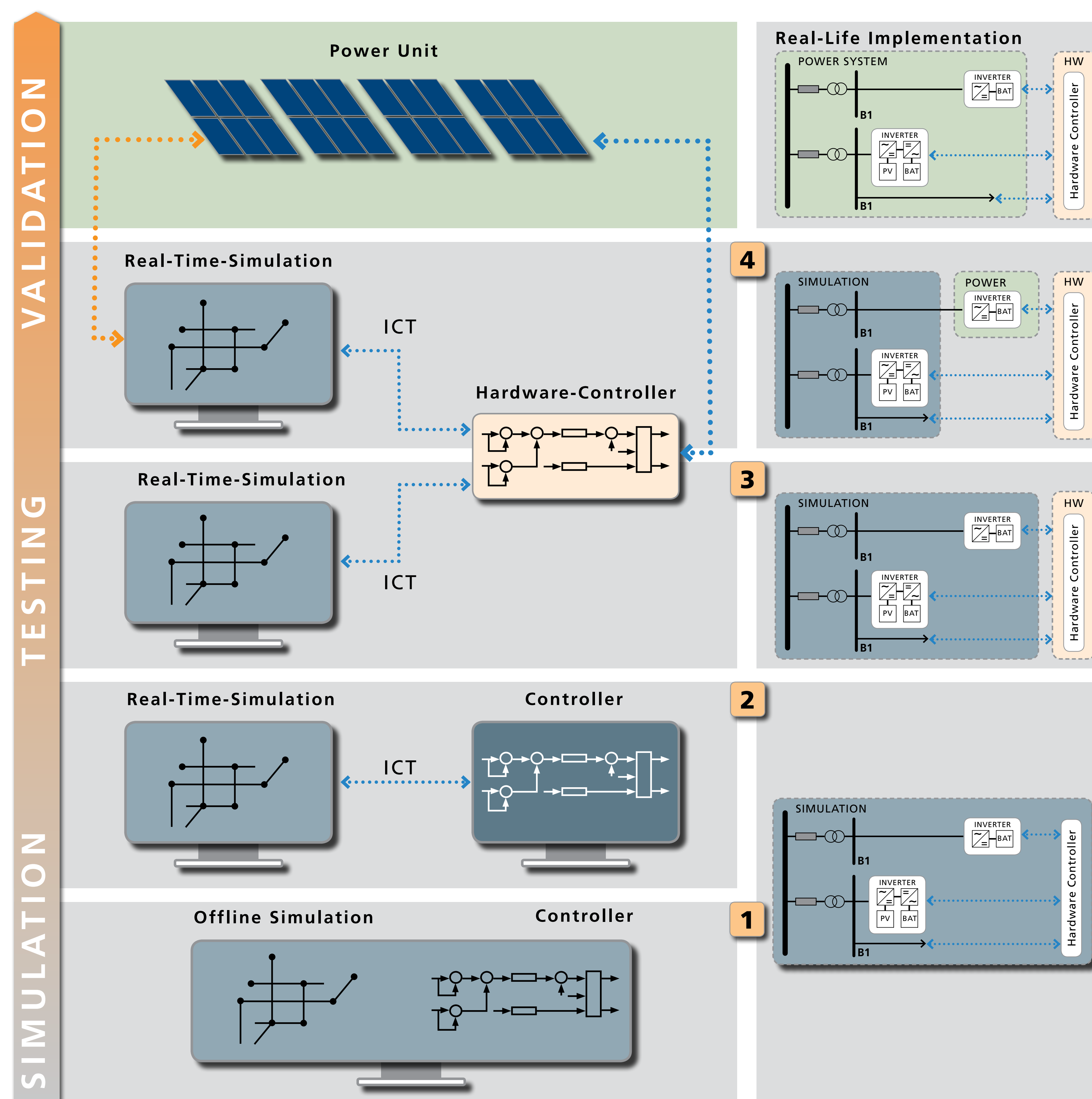
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Advantages of each Stages of the Advanced Testing Chain for Smart Grids

Conclusion

- ✓ Efficient, low-cost prototyping.
- ✓ Early product faults detection.
- ✓ Alternative to cost- & time-intensive field tests.

Stage 3 & 4

- ✓ Realistic & Worst-Case testing in controlled environment.
- ✓ Validation & compliance testing.
- ✓ Optimization of Controller behavior.

Stage 1 & 2

- ✓ Fast controller development
- ✓ Flexible test case studies
- ✓ Controller algorithm optimization
- ✓ Easy to use

Evolution of Hardware-in-the-Loop Testing Methods for Electric Power Systems

Real-Time (RT) and Hardware-in-the-Loop (HIL) simulations proved to speed up developments in the field of smart grids. These simulations represent the basis for the development of a holistic test chain.

RT- and HIL-based Holistic Test Chain for Smart Grids

Stage 1 Pure Simulation

- Preliminary test case studies;
- Simulative investigations on new smart grids technologies.

Stage 2 Software Performance Testing

- Analysis and performance evaluation of smart grids related optimization and control strategies.

Stage 3 Controller Performance Testing

- Test cases for hardware controls;
- Performance and parameters verification of hardware controller.

Stage 4 Power System Testing

- Field-test-close laboratory testing;
- Validation of technologies and/or control strategies by integrating hardware under test.



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