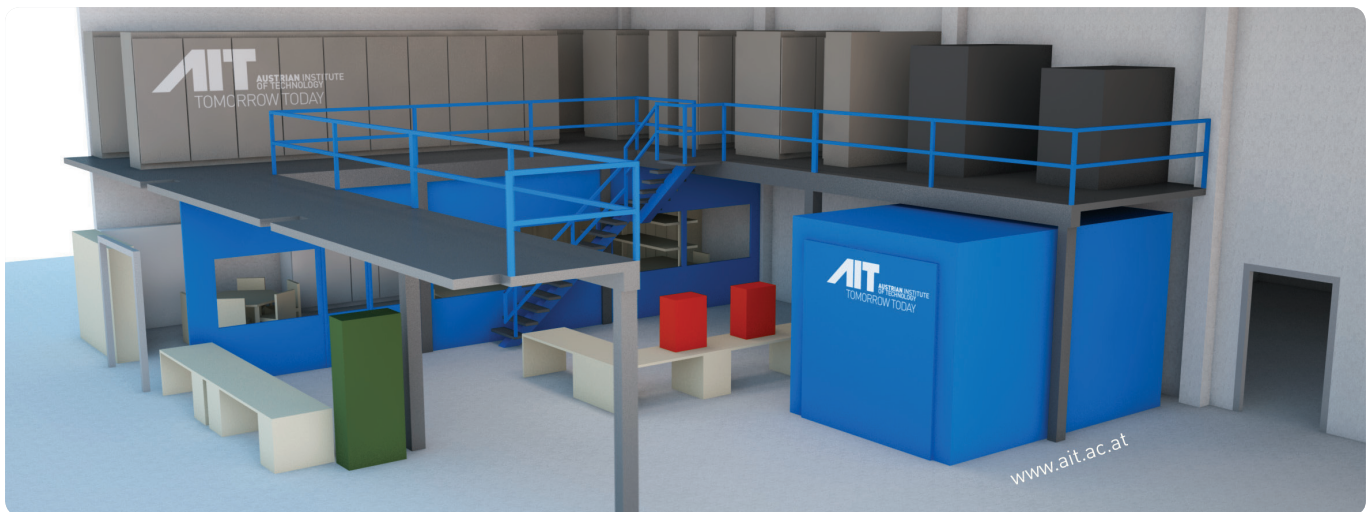


AIT SmartEST Laboratory

Products & Services



R&D AND TESTING OF LARGE SCALE DISTRIBUTED GENERATORS

The new AIT SmartEST Laboratory offers an excellent environment for testing, verification and R&D in the field of large scale distributed energy system integration, and Smart Grids applications.

The laboratory infrastructure accommodates DG components as inverters, storage systems, CHP units, voltage regulators/controllers and other types of related electrical equipment. Powerful controllable AC and DC sources, allow full-power testing capability up to 800 kVA (AC), including a high-performance PV Array (DC) Simulation.

Additional equipment for simulating control and communication interfaces and the possibility of operating the equipment under defined (extreme) temperature/humidity conditions offers extended testing capabilities going far beyond the standard.

INNOVATIVE TESTING APPROACHES

The equipment available at the AIT SmartEST Laboratory, paired with the know-how of AIT experts, opens the path for new, innovative approaches for testing and investigation of DG system integration issues. These new methods which will be available at the lab, include real-time (RT) Power-Hardware-in-the-loop (P-HIL) simulation combining close-to-reality hardware system tests with the advantages of numerical simulation. Via a controllable AC Voltage source distribution network models can be coupled to the real components to develop, validate and evaluate control algorithms, system concepts and components for smart grids applications.

TECHNICAL SPECIFICATIONS

Grid simulation

- 2 independent high bandwidth Grid Simulation Units: 0 to 480 V 3-phase, 800 kVA
- 3 independent laboratory grids, which can be operated in grounded/isolated mode
- 3-phase balanced or unbalanced operation
- Capabilities to perform LVRT (Low Voltage Ride Through) and FRT (Fault Ride Through) testing

DC Sources

- 5 independent dynamic PV-Array Simulators: 1500 V, 1500 A, 960 kVA

Adjustable loads for active and reactive power

- Freely adjustable RLC loads up to 1 MW, 1 MVAR (cap. and ind.)
- Individual control of any RLC components for anti-islanding tests

Line impedance emulation

- Adjustable line impedances for various LV network topologies: meshed, radial or ring network configuration

Real Time P-HIL Simulation

- Multicore Opal-RT Real-Time Simulator
- P-HIL and C-HIL experiments at full power in a closed control loop

Environmental simulation

- Test chamber for performance and accelerated lifetime testing
- Full power operation of equipment under test inside chamber
- Max. footprint of equipment under test: 3,60 x 2,60 x 2,80 m LxWxH
- Temperature range -40°C to +120°C
- Humidity range: 10 % to 98 % r.H.

DAQ and Measurement

- Multiple high precision Power Analyzers with high acquisition rate
- Simultaneous sampling of asynchronous multi-domain data input

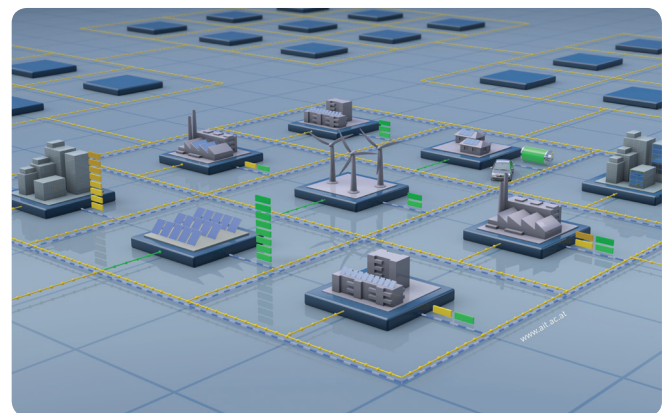
General Specification

- Floor space: 400 m²
- Indoor and Outdoor test areas suitable for ISO containers

SERVICES

For development and research AIT offers unique opportunities for customers and project partners to optimize their products and control strategies directly at this advanced facility, accompanied by qualified experts in order to shorten the time-to-market of new products.

- DR component and systems testing with highly flexible grid and primary energy source (e.g. PV) emulation
- Electrical interconnection, functionality and performance testing according to standards
- Simultaneous testing of power and communication interfaces of DR components
- Performance and lifetime testing under controlled environmental conditions
- Simulation and testing of single components and whole generation systems / plants
- Power-hardware-in-the-loop experiments by the means of Real Time Simulation and CoSimulation in Multidomains (Rapid Modeling and Prototyping of DER systems and components)
- Emulating smart grids scenarios



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