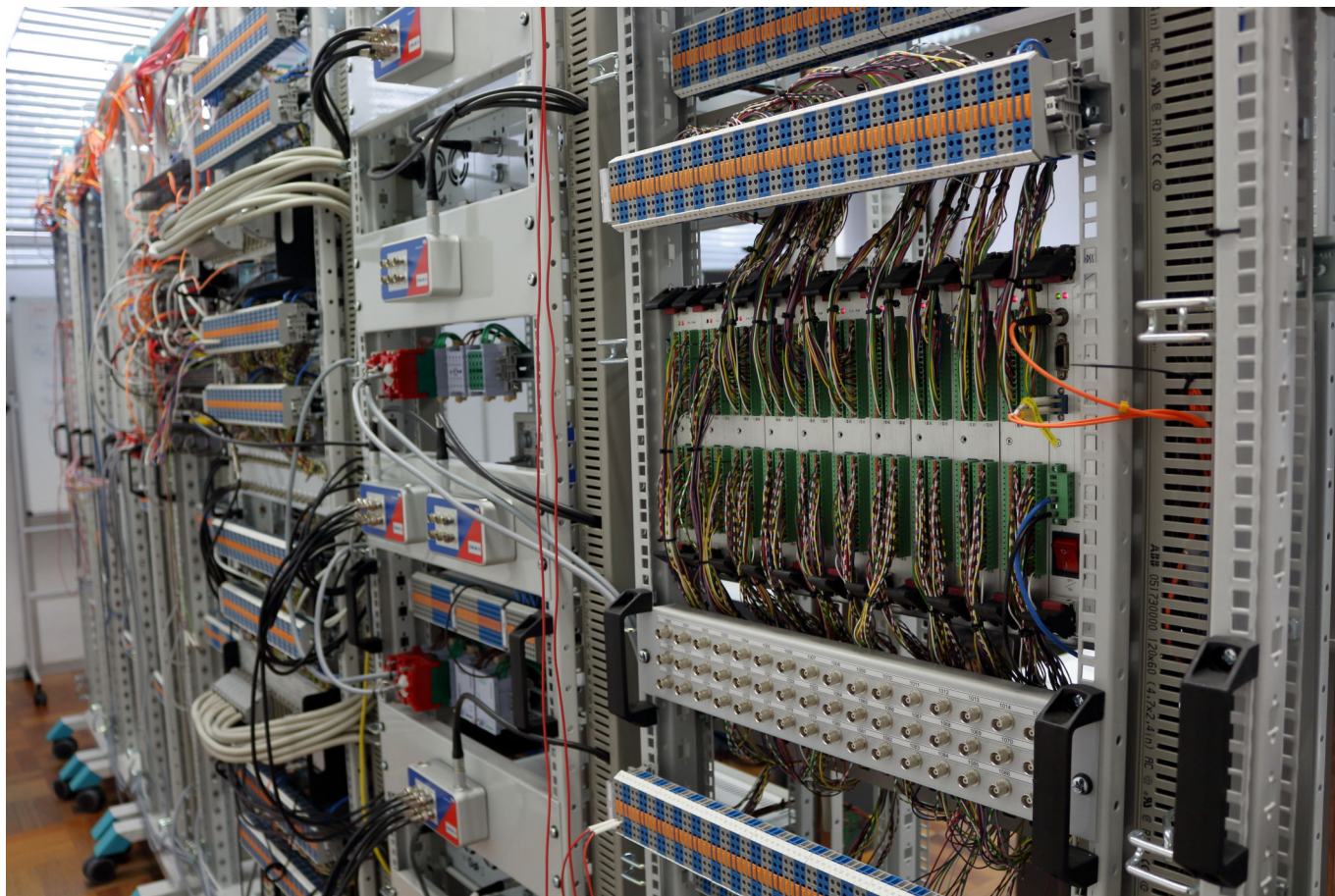










LABORATORY : ARCHITECTURE AND MAIN CHARACTERISTICS

MAIN CHARACTERISTICS

REAL TIME POWER SYSTEM SIMULATION

- Real time server with a high computational power (up to 80 high performance cores)
- Different expansion chassis (interfaces) which enable the association of hardware in the test bench. Total number of available ports: 64 Analog Outputs, 224 Digital inputs and 224 Digital Outputs. Also available 16 SMI ports and 16 digital ports compatible with the standard IEC 61850.
- Different families of software for power system simulation, which enable the simulation of large power networks with up to 2000 buses in EMT simulation or 10000 buses in electromechanical transient stability simulation.

TIME SYNCHRONISATION SERVICES

Time synchronisation servers, which allow the synchronisation of laboratory equipment and devices under test, with the following outputs: PTP, IRIG-B, SNTP, PPS and 1588dc.

ISO TESTING

- A protection test set dedicated to IEC61850, allowing the generation of GOOSE and Sampled Values messages to be sent to the devices under test, for open loop tests. It also translates GOOSE into hardwired output contacts, and vice versa.
- Test power amplifiers, to convert the SEW outputs of the real time power system simulator and test set into 100V, 1A.
- A software package to check the IEC 61850 messages.

IEC CONFORMANCE TEST SOFTWARE

A software family to check IEC 61850 data model and communication services of the devices under test.

IEC SPECIFICATION AND CONFIGURATION TOOL

A tool that allows the specification and configuration of a IEC 61850 system.

COMMUNICATION NETWORK SIMULATION AND TESTING

- A software package to simulate communication networks, permitting the injection of placement studies, without real devices.
- Devices to inject load in the network and to inject the simulating messages.

ARCHITECTURE

POSSIBLE APPLICATIONS

TESTING

Prototyping development and product compliance testing
Product type testing
Testing of protection and automation systems
Hardware in the loop simulation (power network interacting in real time with protection, actual IEDs or other devices)

MODELLING

Model verification for linear elements (constant parameters transmission lines, circuit breakers, ...), and non linear elements (circuit breakers, ...), using field data and event records

SCENARIO SIMULATION

Studies for the optimal integration of renewable energy sources
Power system transient studies
Power system performance assessment in line with European connection grid codes
Analysis of power system events

COMMUNICATIONS

Performing communication network studies, by means of simulation, to aid on the design
Testing communication network performance (measuring parameters and cause impairment) to evaluate the impact in control and automation system

CO-SIMULATION

Performing co-simulation (power system simulator and communication network simulator) running simultaneously, interacting with each other

TRAINING

Staff training for control equipment operation

CREATING A SMART ENERGY FUTURE













