PHYSICS | CHEMISTRY BIOLOGY | ENGINEERING

LD DIDACTIC

# SMART GRID
## COMPLETE TRAINING SYSTEMS

- HANDS-ON EXPERIENCE IN SMART GRID WITH REALISTIC SCENARIOS
- TRAINING OPTIONS OF ALL SMART GRID ELEMENTS
- SMART MONITORING & CONTROL WITH CASSY SCADA

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# SMART GRID

## INTELLIGENT POWER GRIDS OF THE FUTURE


SMART GRID ELEMENTS

## MODEL, MONITOR & CONTROL

INTELLIGENT AND EFFICIENT

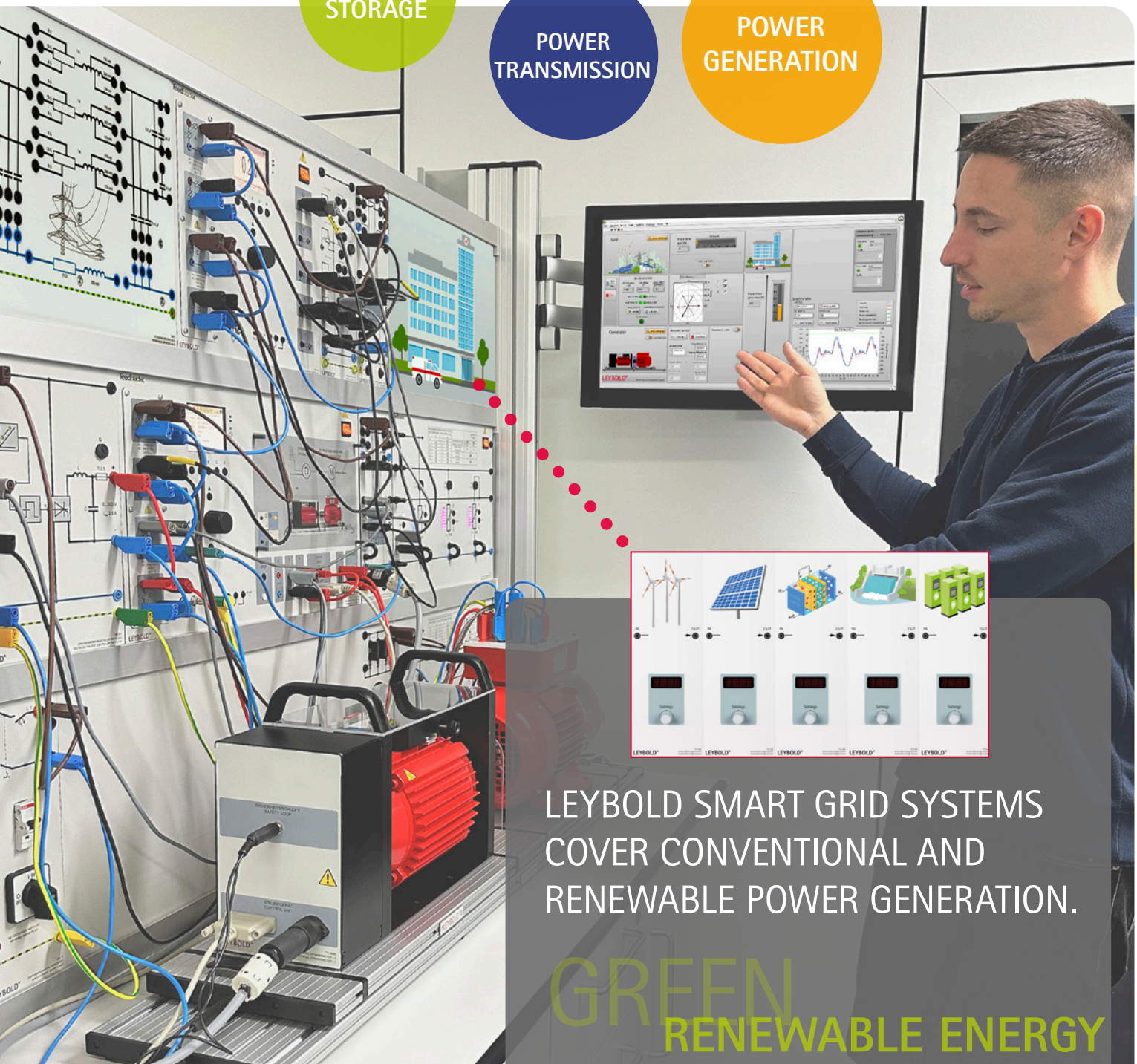
**With LEYBOLD Smart Grid training systems all elements of a smart grid can be modelled, monitored and controlled.**

POWER CONSUMPTION

ENERGY STORAGE

POWER TRANSMISSION

POWER GENERATION





LEYBOLD SMART GRID SYSTEMS COVER CONVENTIONAL AND RENEWABLE POWER GENERATION.

GREEN RENEWABLE ENERGY

SMART GRID SOFTWARE

# CASSY SCADA

SMART MONITORING & CONTROL

## SOLVE REAL-LIFE SCENARIOS & UNDERSTAND THEORY

- Students actively solve tasks to master real-life scenarios.
- They learn to carry out key actions and avoid mistakes, based on real measurements on the training systems.

EXAMPLE SCENARIO:
*POWER BLACKOUT IN A HOSPITAL*


*A power blackout in a hospital is a catastrophic scenario that requires a prompt and well-structured response. In this scenario, the emergency power supply must run quickly and steadily, and the hospital must be safely reconnected to the power grid after the blackout.*

## FURTHER DIDACTICALLY PREPARED SCENARIOS

- Shore power for a ship
- Off-grid supply of a village
- Start up and operation of conventional power plants
- All scenarios can be adapted or own scenarios can be created additionally
- Micro grids are created by combining sets

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Technical details subject to change without notice.

## SCENARIOS

| | |
|---|---|
| SMART METERING | 3.6.1 **Smart Metering and SCADA**<br>3.6.1.1 LabView guide for CASSY SCADA<br>3.6.1.2 Smart meter |
| POWER CONSUMPTION | 3.6.2 **Comsumers in the Smart Grid**<br>3.6.2.1 Power consumption of households<br>3.6.2.2 Power consumption in industry<br>3.6.2.3 Load demand management |
| POWER GENERATION<br>CONVENTIONAL<br><br>RENEWABLE | 3.6.3 **Micro Grid Scenarios for Power Generation**<br>3.6.3.1 Blackout in a hospital<br>3.6.3.2 Shore power for a ship<br>3.6.3.3 Start up and operation of conventional power plants<br>3.6.3.4 Solar power generation<br>3.6.3.5 Wind power generation<br>3.6.3.6 Universal power generation scenarios with PCC |
| ENERGY STORAGE | 3.6.4 **Scenarios for Energy Storage**<br>3.6.4.1 Energy storage in a smart grid |
| POWER TRANSMISSION | 3.6.5 **Power Transmission in a Smart Grid**<br>3.6.5.1 Direction of power flow in mini grid<br>3.6.5.2 Transmission line with reverse power flow |
| MICRO GRID | 3.6.6 **Micro Grid**<br>3.6.6.1 Off-grid power supply of an island<br>3.6.6.2 Derating of wind power<br>3.6.6.3 Grid codes for renewable energy<br>3.6.6.4 Power demand management |
| SMART GRID | 3.6.7 **Smart Grid**<br>3.6.7.1 Black start of the power grid |