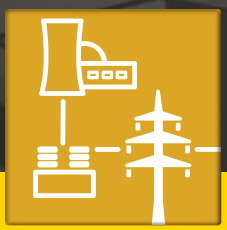
LUCAS-NÜLLE

SCADA FOR POWER ENGINEERING

The Educationally Designed SCADA Solution for Technical Training

SMART MICRO GRID

Cyber Security



1st Edition

SCADA FOR POWER LAB IN SMART GRID

By Supervisory Control and Data Acquisition (SCADA) we mean the real-time monitoring, control and data acquisition of technical processes. In electrical power engineering, SCADA is used to cover everything from power generation and transmission up to and including security and power usage.

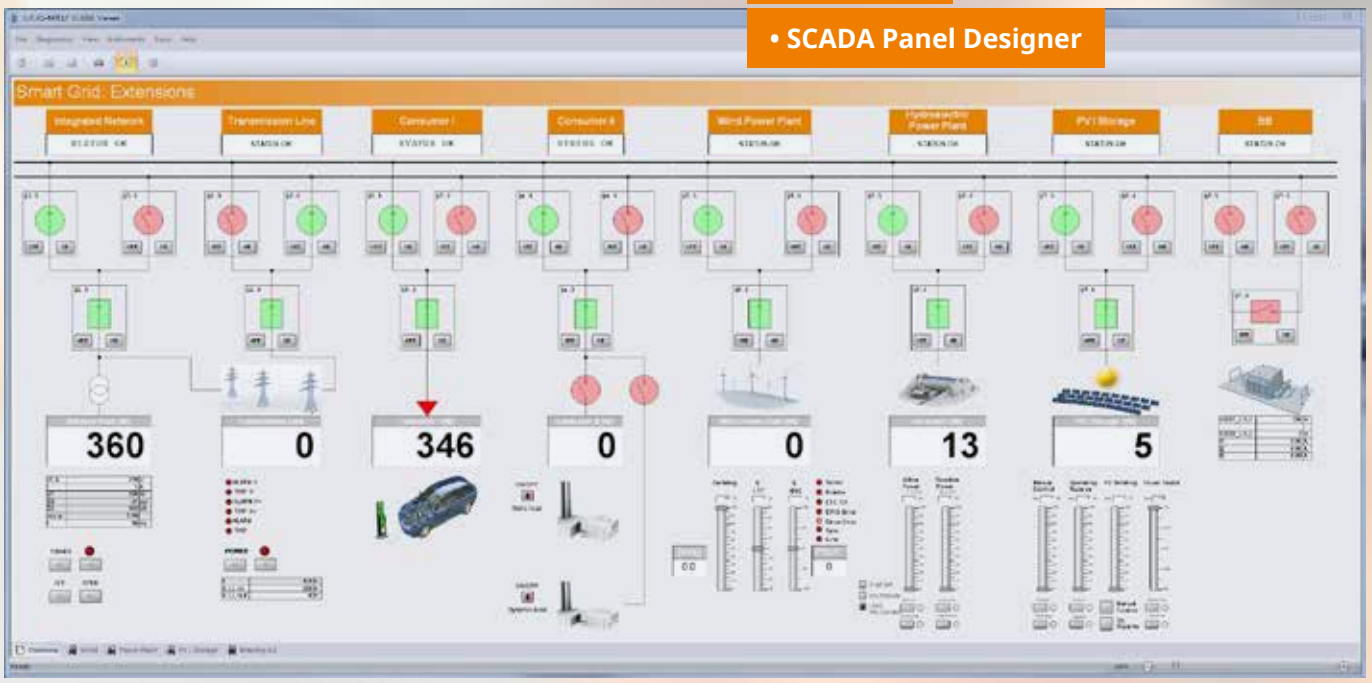
SCADA permits the visualisation and modification of process data. Measurement values are displayed on the screen in real-time. Control signals can be adjusted during the process. The SCADA system can also perform process control automatically. Thanks to the fact that many measurement values are recorded, future planning and economic optimization are possible.

The system can also be remotely controlled via the Internet or also using local area networks (LAN).

SCADA for Power Engineering is a software designed to control and monitor power engineering systems. In the software, the system's measurement values and operating data can be displayed on existing measuring instruments in real-time. Important parameters and signals can also be controlled via the software.

The measurement values and operating states of the equipment can be selected, recorded and displayed over time. Evaluation and export are also possible.

- SCADA NET
- SCADA Remote
- SCADA Logger
- SCADA PLC
- SCADA Panel Designer



The SCADA Designer is used to create user interfaces.

The Viewer is the SCADA system used for system control operation and monitoring.

Software functions

- **SCADA Designer**
  - Freely configurable user interfaces
  - Icon configuration for all Lucas-Nülle equipment used in power engineering
  - Standardised electronic switching symbols for the visualisation of circuits
  - Individually configurable lists of measurement values for any number of measurements
  - Display of measurement values and operating states in real time
  - Implementation and analysis of the Smart Grid
  - Design of several worksheets per system

- **SCADA Viewer**
  - Permits full system control
  - Analysis of smart grid
  - Display of measurement values and operating states in real time
  - Configure files created with SCADA Designer
  - Sample file templates for all experiments
  - Multiuser-capable

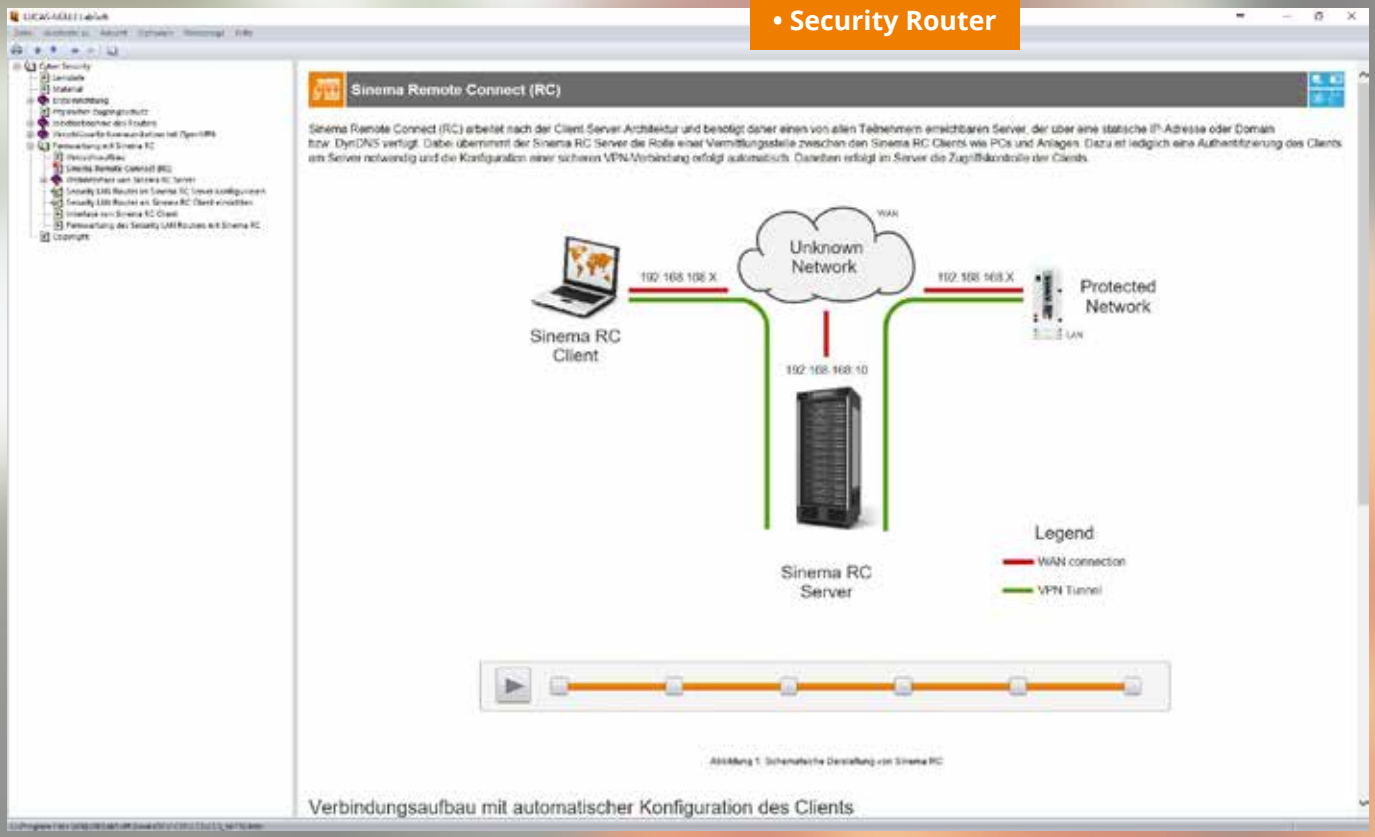
SCADA REMOTE CONTROL

Easy-to-use monitoring and control of the SMART GRID using a host of different end devices

- Tablet mode
- Clear and straightforward servicing thanks to matching worksheets:
  - Survey the entire system
  - Control operation of the individual system
- Connection via WiFi
- Connection via Internet
- Simultaneous access from all computers

CYBER SECURITY

- Encryption
- Firewall
- Security Router



SO2805-4B: "Cyber Security in Automation Technology and Power Engineering"

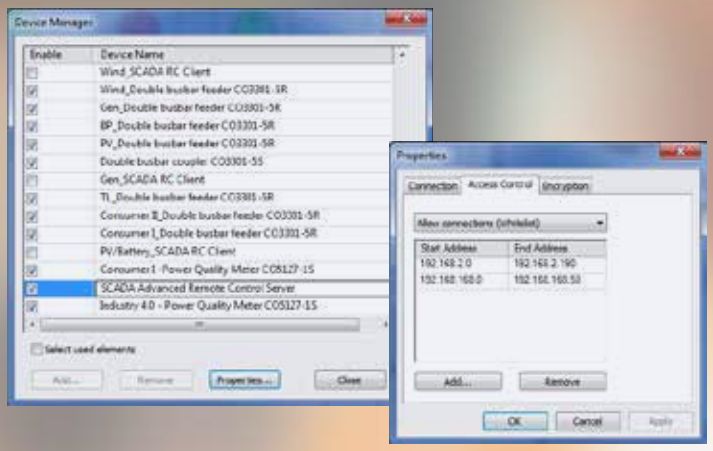
In modern power supply grids, the subject of cyber security is indispensible. All of the standard safety measures used against cyber attacks on power engineering systems are covered with a multitude of exercises.

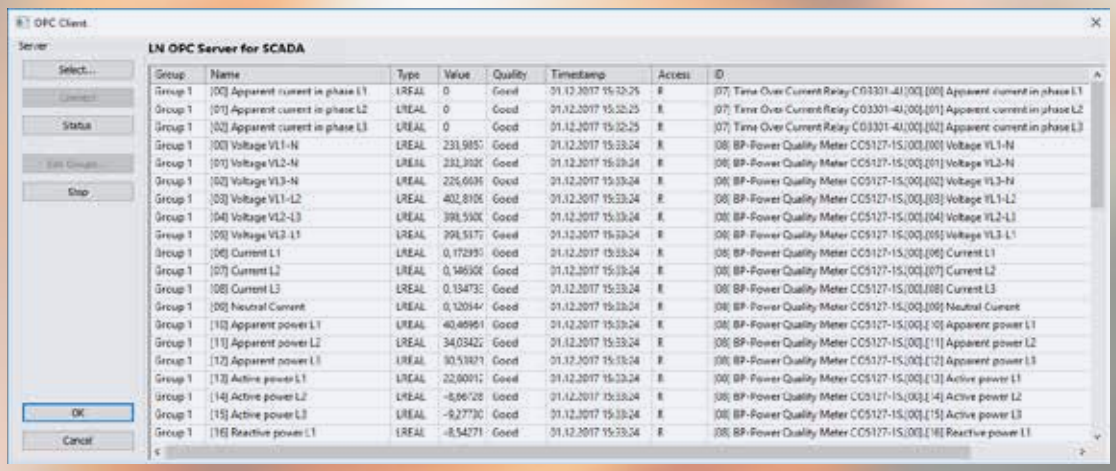
Training content

- Code of conduct for using such systems
- Physical measures
- Configuring a high-security LAN router
- DHCP server
- Firewall
- Open VPN
- Analyzing network protocols
- Secure Shell (SSH)
- HTTP(S)
- Remote maintenance with Sinema
- Access control / access restriction
- Authentication / granting access
- Encoding / Encryption
- Certificates

SCADA NET

- SCADA Client Server
- SCADA OPC
- Cyber Security
- SCADA IEC 61850





SMART MICRO GRID — OPC — MATLAB & SIMULINK

- **SCADA Remote Client / Server**
  - Permits monitoring and operating of all systems from every PC in the laboratory
  - The power engineering lab in the Cloud
- **SCADA OPC Client**
  - Connection of external devices, e.g. PLC
- **SCADA OPC NET Server**
  - Real-time connection to e.g. MATLAB®/Simulink® and LabVIEW via the OPC server
- **Cyber Security**
  - Limiting connections
  - Access control (black / white list)
  - Encryption
- **Further supported protocols**
  - SCADA IEC 61850 client (connection of external devices, e.g. PMU)
  - TCP/IP client/ server
  - MODBUS
  - SML (Smart Message Language)
  - HTTP

SCADA TOOLS

• SCADA Logger

- Plots graphs of measurement values and signals over time
- Permits graphs to be processed, analyzed and exported
- Value scaling

• SCADA Panel Designer

- Permits design and configuration of own user interfaces

• SCADA PLC

- Integrated soft PLC (in accordance with IEC61131)
- Permits access to all values and signals in the Smart Grid
- Automatic generation of variable list permits variable monitoring

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Training Systems Australia
First in Vocational Training Equipment
A Division of Pullman Learning Group

p +61 3 9557 7993
e info@trainingsystemsaustralia.com.au
w www.trainingsystemsaustralia.com.au
a 300 Centre Road, Bentleigh, VIC, 3204