SIPROTEC DigitalTwin

Virtual Testing of SIPROTEC 5 Protection Devices in the Cloud

George Kasparian
SIPROTEC DigitalTwin

- Introduction
- Applications
- Product details
- Live Demo
The “Digital Twin” –
A virtual copy of a physical asset

- The digital twin integrates all data, models, and other information of a physical asset generated during engineering, commissioning, operation, or service.

- Role of the digital twin is to predict and optimize performance of a physical asset (whether for design, production or operation). To this purpose we use simulation methods and/or data-based methods.
SIPROTEC DigitalTwin – Value add through Digitalization

A digital twin of your SIPROTEC 5 device

Individually simulate and test your SIPROTEC 5 project data in the cloud …

… in minutes
… without hardware
… without additional efforts
Our solution –
SIPROTEC DigitalTwin

Motivation
The design up to the commissioning of a complex energy automation system with a lot of protection and automation devices and systems involved is **time-consuming**, especially the engineering and testing. In most cases testing is only possible **after** all devices and systems are set-up physically and connected among each other and wired process signals. We are talking about days and weeks before you are able to test in the field.

Our Solution
With the **SIPROTEC DigitalTwin** you can test your engineered energy automation system in the cloud, in parallel or before you set-up the real hardware. **It shortens your time-to-operation significantly.** All devices to be tested from a bay or from a full substation are set-up virtually in minutes!

The three steps to success
• Upload your engineering data and your automated test cases
• Simulate and test your energy automation system in the cloud
• Get test reports of your engineered system
SIPROTEC DigitalTwin

Application Scenarios

Control Center

Integration in SICAM Systems

Station Level

Firewall

SICAM PAS

Substation Automation

SICAM SCC

Human Machine Interface

SICAM PQS

Power Quality Analysis

DIGSI 5 Online Testing

DIGSI

Communication

Field Level

Process Simulation

Device Testing

Device Training

GOOSE Testing

Remote Substation

Testing of protection interface

Process Level

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Saves time, increases quality throughout the entire lifecycle of your system

**Maintenance and Service**
- Fault analysis
- COMTRADE replay
- Upgrade scenarios

**Pre-sales and Design**
- Information and Presentations
- Application concept and testing
- Design Specification
- Approvals

**Implementation**
- Planning
- Algorithm
- Settings
- Pre-testing

**Commissioning**
- FAT
- SAT, Field test
- Fault analysis

**Operation**
- Device handling
- COMTRADE replay

**Training**
- Device handling
- Operators
- Customer specific
- Flexible at any place
Benefits –
The customer value proposition

Testing of the energy automation system within minutes, without hardware and without additional effort

- Simulation and validation of product properties
- Faster energization of new systems thanks to shorter project lifetimes
  - Increase engineering quality
  - Virtual testing before start of commissioning
  - Shortest commissioning times
- Reduced OPEX with shorter outages for higher availability thanks to better pre-testing
- Efficient, scalable trainings on the job
- Fast and realistic fault analysis by easily reproducing the behavior of products and systems
Functional Overview
SIPROTEC 5 within the entire energy automation system

Fault analysis
- COMTRADE replay
- Upgrade scenarios

Visualize and Interact with the simulated device
- Device operation
- Analog values
- Binary inputs and outputs

Integration into substation automation system
- SICAM PAS
- SICAM SCC
- SICAM A8000
- SICAM PQS
- Interlockings via GOOSE

Documentation
- Test reports
- Logs

Communication interfaces
- IEC 61850
- IEC 60870-5-104
- Protection Data Interface

DIGSI 5 Online Testing and Web Browser
- Online CFC Debugging
- Download Logs and Fault records
- Test sequence
- Plug & Play
Access your SIPROTEC DigitalTwin in 5 Steps

1. Open DIGSI 5 project
2. Export SIM file
3. Connection to the Cloud
4. Import SIM
5. SIPROTEC DigitalTwin
Login to the SIPROTEC DigitalTwin

Supported by all major Web browsers.
Thank you!