



## KEPCO Virtual Server 61850 Edition 2

The KEPCO Virtual Server 61850 Edition 2 provides a software implementation of an IED device that can be configured simply through selecting a SCL file. The Virtual Server is a virtual IED implementation that can be used by users to simulate IED devices in a test or substation environment for testing.

### Key Benefits

- Eliminates need for real IEDs for use in testing 61850 client devices in a test or substation environment
- Provides on the fly IED configuration and simulation for testing
- Great complementary tool for pairwise testing and precertification testing

### Key Features

- Ability to configure specific commercial IEDs by using SCL/ICD files
- Windows based application supporting Wi-Fi and Ethernet based communication
- Ability to instantiate many different IEDs in parallel

### IEC 61850 Overview

The IEC 61850 has evolved into a global standard for substation automation. This standard aims to provide a utility company with a single standards-based protocol for complete substation automation. The standard aims to provide higher level of interoperability between systems from different 61850 vendors. It leverages other standards, such as the IEC 61970 CIM standard for modeling different substation equipment, a common XML based configuration language (SCL) to define models, IEC 9506 MMS standard for message communication, and TCP/IP for transport to name a few.

IEC 61850 standard states that a substation is organized into two primary groups: Intelligent Electronic Devices (IEDs) residing on the Process Bus, and command and control client devices to the IEDs residing on the Station Bus. Some examples of IEDs include relays, switches, relays and switchgear equipment. Examples of client devices include Human Machine Interface (HMI), Remote Terminal unit (RTU), Gateways, and Station Computer.

### Configuration

The KEPCO IEC 61850 Edition 2 Virtual Server testing tool provides

user with the ability to simulate IED devices through a user-friendly Windows application. The Virtual Server allows users to fully configure the IED through use of the IED's own SCL (.icd or .cdi) file. By using the actual SCL file from the vendor, it is insured that the logic nodes and attributes that are defined by the actual IED is fully simulated by the Virtual Server.

## Main Features

The Virtual Server allows users to view the IED's data attributes conveniently through a tree view window. Each IED defines a list of logical devices and attributes using the naming schemes that are described in the IEC 61850 standard. The Virtual Server presents the data through a graphical tree view. There are six tab screens on the left-hand side of the screen that give the user access to features in the IED.

### 1. All Tab

The All tab (Figure 1) provides a full tree for the IED where users can perform Read and Write operations on these attributes using the Set Value feature. This tab presents full unfiltered access to the IED's Logical Devices, Logical Nodes and associated data attributes.

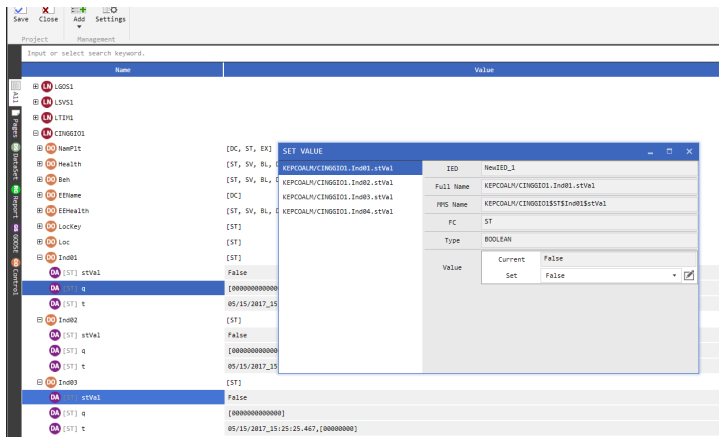


Figure 1

### 2. Pages Tab

The Virtual Server can simulate different behaviors of the 61850 IED device including the ability to change the state of the circuit breaker in specified millisecond cycles. This feature provides the user with ability to simulate overflow conditions by accumulating a collection of IED triggered reports as well as to test the 61850 Client's ability to receive buffered and unbuff-

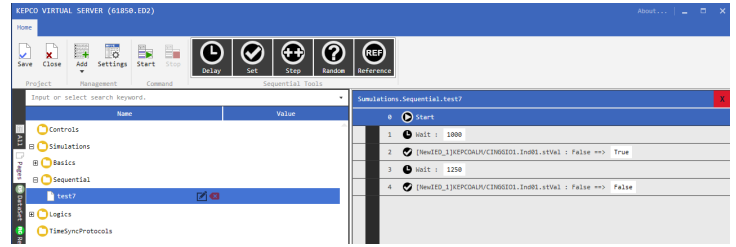


Figure 2

ered reports on the fly. The Pages tab (Figure 2) consists of Controls, Simulations, Logics, and TimeSyncProtocols.

### 3. Dataset Tab

The Dataset tab filters the IED to allow the user quick access to the datasets in the IED. Values can be monitored or set from here.

### 4. Report Tab

The Report tab filters the IED to allow the user quick access to the reports in the IED. Values can be monitored here.

### 5. GOOSE Tab

The GOOSE tab filters the IED to allow the user quick access to the GOOSE messaging in the IED. Values can be monitored here.

### 6. Control Tab

The Control tab filters the IED to allow the user quick access to the controls in the IED. Values can be monitored and set here.

## System Requirements

- OS: Windows 7 or Windows 10 32/64 bit
- HD space: at least 50GB free
- RAM: at least 4 GB (8 GB recommended)
- Network adapters: Ethernet or WiFi
- USB 2.0 port
- Monitor resolution: 1440 dpi/900 pixels or better
- The installation requires access to the Internet
- Network TAP or hub (not switch) or other device that will allow broadcast packets to be seen by all network adapters that are connected for client, server(s), and verifier.

