SimFlex™

IEC 61850 HMI Simulator

The power of simulators

With the introduction of IEC 61850 new system designs are enabled that allow creating a fully digital substation. In such a substation, systems components will exchange information based on serial communication networks using Ethernet. Testing integrated systems however requires serious consideration. How to verify the correct implementation of a function if it uses multiple IEDs communicating over a network? How to test it in the factory but also in service? The answer is simple with the simulators and support tools provided by GridClone!

The SimFlex™ family of simulators and tools

Simulation of IEC 61850 based systems and components require different simulators and testing tools. GridClone provides these tools in three categories:

- PC based simulators

- Embedded Simulators

- Supporting tools

SimFlex™ HMI Simulator

The SimFlex™ HMI Simulator is meant to simulate a subset of SCADA and HMI functions. These functions are, amongst others, connecting to IEDs that are defined in an SCD file, configure and enable report control blocks, enable GOOSE control blocks, perform control actions (SBO, Direct operate, with/without Enhanced Security) and File Transfer. The SimFlex™ HMI Simulator will enable you to test your system on the basic functionality by simply loading an SCL file.

GridClone

Our experience moves you forward ▶▶▶

SimFlex™ HMI Simulator

Benefits

The main benefits of using the SimFlex™ HMI Simulator are:
- Clear overview on distinctive data in IEDs
- Data change indications based on received report
- Drag-and-drop of IEC 61850 Data Objects and Attributes on the screen for easy supervision
- Display multiple IEDs simultaneously
- Very short setup time by using SCL files

Applications

The SimFlex™ HMI Simulator has a wide range of applications:
- View data values from devices
- Capture reports and monitor value changes
- Send control requests on controllable objects
- File transfer download from and upload to devices

Tool Bar

The SimFlex™ HMI Simulator toolbar provides a flexible user interface for IEC 61850 projects. It contains buttons that provides an easy way to handle the HMI Simulator.


Project files

The SimFlex™ HMI Simulator can store configurations in project files. This enables the user to quickly open and reuse existing projects. A project file contains all relevant information:
- Background image – The file that is opened as image to be used as backgroud in the scheme picture box. Only the full path of the file is stored, therefore the project is only exchangeable when the image file is in the same directory
- Background color – The background color to use in the scheme picture box
- SCL file – The file that contains the definitions of the IEDs
- Items – A list of all nodes that are dragged to the scheme picture box, storing their position and width
  - IEDs – A list of all IED nodes in the SCL file, with information whether the IED is selected or not in the HMI Simulator
    - Screen layout
      - Data Values read level

File Transfer

File Transfer enables you to download files from a connected IED.
The HMI Simulator reads the file directory from the IEDs. After making a selection (multi-select is also possible) the download of the files can be started.
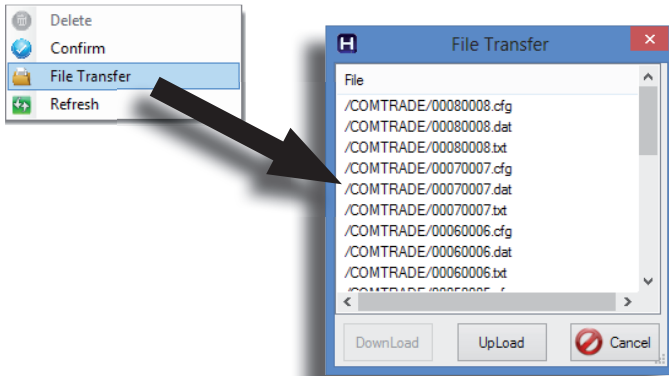

Controllable Objects

The HMI simulator has a feature that enables the user to send control commands to any of the selected IEDs. Inside an IED a controllable object is a Data Object that has a Functional Constraint "CO". In the Data Model tree view, controllable objects are marked by a yellow background color for easy recognition.

If a Logical Node contains more than one Controllable Object, it is marked by a pink background color.
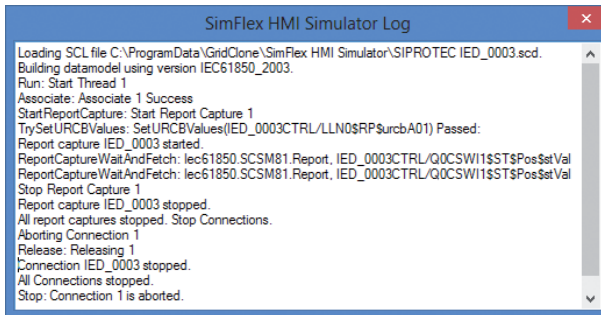
The user can send control commands through an intuitive dialog. No programming is needed for this functionality. Just simply click-and-control IEC 61850 controllable objects.
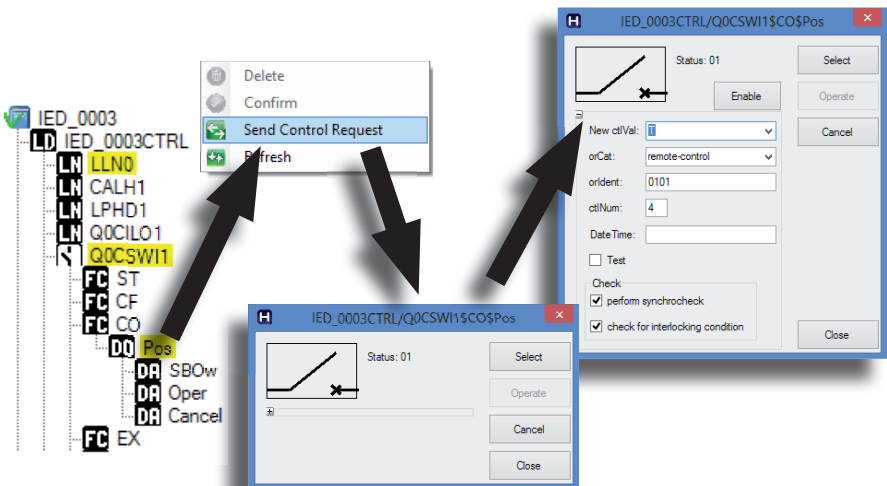
SimFlex™ HMI Simulator

Log Window

The SimFlex™ HMI Simulator has a 'smart' log window that becomes semi-transparent when the mouse cursor is not hovering over it. This way the latest log mesages are always visible, without claiming screen space.

Key Features

The SimFlex™ HMI Simulator includes the following features:

• Select all or multiple IEDs from an SCD file
• Automatically configure all report control blocks in any IED with the default values from SCD file
• Enable all report control blocks in connected IEDs
• Enable all GOOSE control blocks in connected IEDs
• Connect to at least 32 IEDs simultaneously
• Load JPG/PNG files with Single Line Diagrams and show these graphics on the screen as a static picture
• Drag-and-drop important data objects/attributes on the Single Line Diagram for monitoring. Received data changes are indicated on the screen.
• Retrieve all data attribute values from connected IEDs and shows the values in a graphical tree-view
• File transfer to/from connected IEDs
• Send Control requests (Direct Operate, Select Before Operate, with/without Enhanced Security).

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