IEC 61850 ONLINE TRAINING

with ITA - Interactive Training Application



Ver. 1.0
Date: March 2012

GridSoftware.com

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Hello

Welcome to the IEC 61850 Interactive Training

Select Topic Start

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Thu Mar 14 2013

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GridSoftware IEC 61850 Online Training Program is an Interactive Training Application (ITA) based on the latest Learning Technology.
It provides easy to follow and understand animation movies designed for protection and control engineers engaging into the complexity of the IEC 61850.

25+ Video Lessons explain the Standards from bottom up taking you gradually up to the expert level.

The following material is incorporated into the ITA lessons:

PRINCIPLES & MODELS

- ✓ Design Principles
- ✓ Information Modeling
- ✓ Interoperability
- ✓ Architecture: Station & Process Buses
- ✓ Logical Nodes
- ✓ ACSI - Class Models
- ✓ DataSet
- ✓ Communication models
- ✓ Controls

COMMUNICATIONS

- ✓ GOOSE / GSSE
- ✓ Client / Server
- ✓ Data Reporting & Logging
- ✓ Sampled Values
- ✓ Time Synch
- ✓ GOOSE & Ethernet Frames
- ✓ 7-OSI Layers & Client / Server
- ✓ MMS Protocol
- ✓ ASN.1 Encoding & Message Parsing

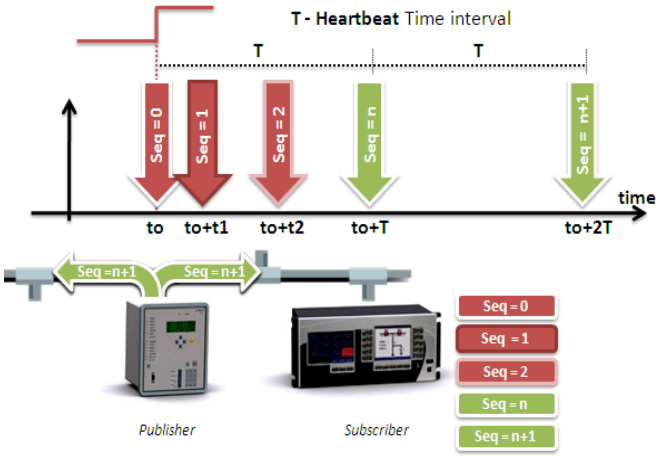
SCL Language

- ✓ SCL Syntax and Semantics
- ✓ .ICD/.CID Files: IED definitions
- ✓ .SCD File: Substation Section
- ✓ Access Points & Communications
- ✓ Engineering process: Configuration
- ✓ Mandatory Software Tools

No installation is required. Simple sign in to our secure server using a standard browser to launch the ITA.

ITA supports two accounts:
- user
- manager (multiple user accounts & the statistics tools)

A regular user can monitor his/her own progress while the Manager is given access to the Team members learning progress and statistics.



GOOSE / GSSE

Learn about the one-directional connectionless communication where sent messages are uncon-firmed & multicasted carrying enough information necessary for recipients only to interpret the content.

You will have opportunity to see our IEC 61850 monitoring Tools in action where GOOSE messages are captured and analyzed within the Ethernet frames.

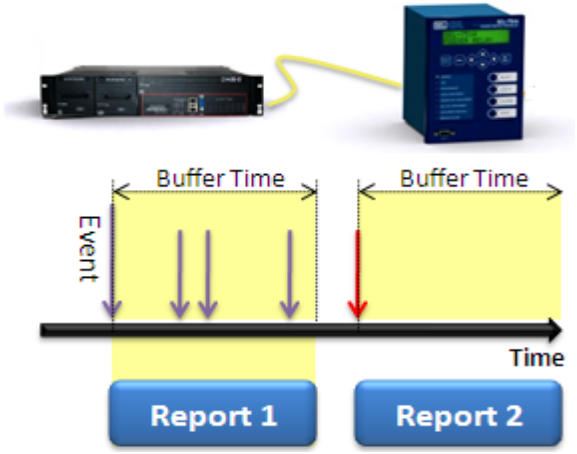
GOOSE Live

Data Set	StNum	SqNum
SEL_751A_1CFG/LLN0$GOOSE_SEL	2	74502
EASYLD0/LLN0$GOOSE_DS1	1	76208
SEL_751A_1CFG/LLN0$GOOSE_SEL	2	74501
EASYLD0/LLN0$GOOSE_DS1	1	76207
SEL_751A_1CFG/LLN0$GOOSE_SEL	2	74500
EASYLD0/LLN0$GOOSE_DS1	1	76206
SEL_751A_1CFG/LLN0$GOOSE_SEL	2	74499
EASYLD0/LLN0$GOOSE_DS1	1	76205

CLIENT / SERVER

For reliable exchange of information, bidirectional connection oriented communication controlled on both sides the IEC 61850 Standards use the Client/Server MMS communication.

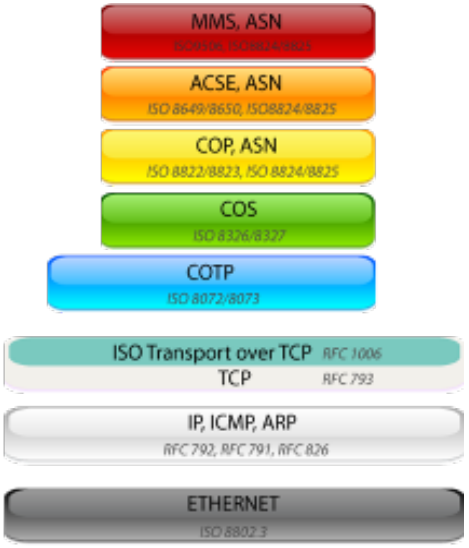
Learn about the Data Reporting and Data Logging by examining Report Control Blocks definitions, data triggers, Integrity, General interrogation and DataSet parameters.



The training program will guide you throughout a full Data Reporting configuration cycle.

You will learn how to:

- ✓ Configure or Create a Dataset
- ✓ Configure Buffer & Unbuffer Control Blocks
- ✓ Associate BRCB/RPCB with DataSet
- ✓ Enable reporting
- ✓ Initiate General Interrogation
- ✓ Capture and Read MMS Data Reports
- ✓ Parse Messages



CLIENT / SERVER LAYERS

Based on 7-OSI layer Model the IEC 61850 Client / Server layers are detailed along with the MMS Protocol and understand the process of establishing connection between a Client and a Server.

Learn the mapping of the models and services into the MMS Objects and how these reflect on the message parsing

A2 82 03 29 30 58 80 0F 30 30 32 32 30
38 30 31 34 31 2F 46 82 02 00 00 83 04
01 85 01 00 87 38 FF FF D9 9A FF FF 33
73 34 FF FF C0 01 00 00 0C CC 00 00 59

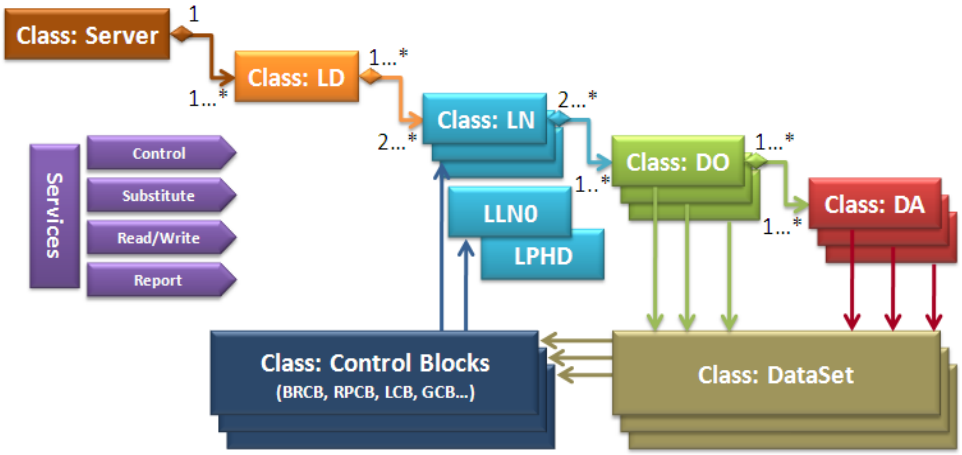
Tag = A = 1 01 00000
Length = 2 = 00000010
Value = 8 2 03 29

LEARN THE IEC 61850 MODELING PROCESS

The IEC 61850 Standards are based on a concept of defining models and modeling methods for common information found in real substation applications.

You will learn how standards decompose information into functional models known as **Logical Nodes**, how they are logically related within **Logical Devices**.

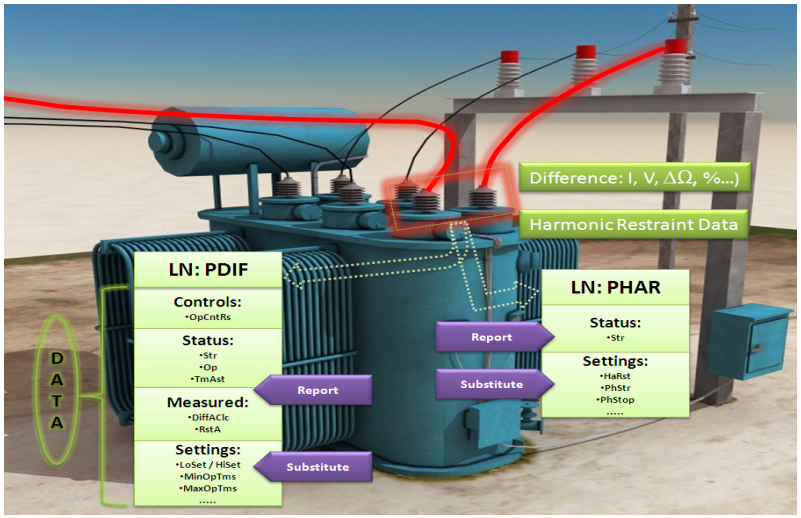
You will also understand the **Data Flow** – where and how exactly is data exchanged? The interfaces, the data exchange rules, syntax and semantics of the information being exchanged…



UNDERSTAND THE IEC 61850 MODELING BLOCKS

Some of the main modeling blocks are explained in depth:

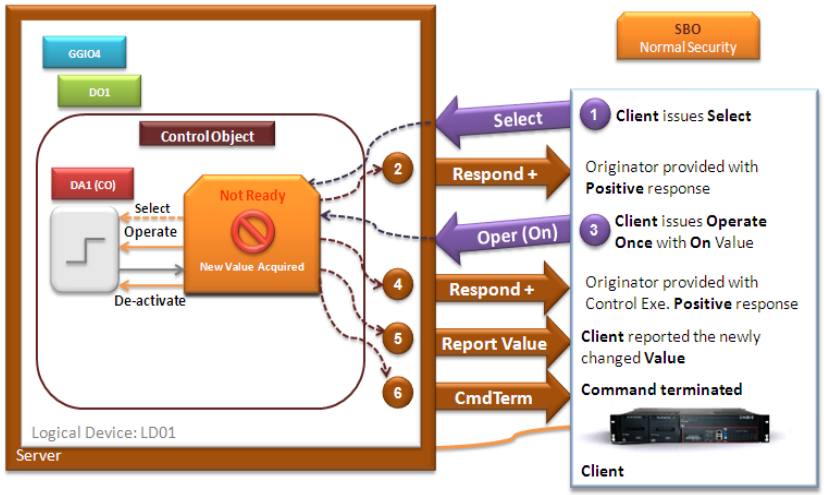
Data Objects - smallest piece of information
Data Attributes - Data Types
DataSets - Data Containers used in the communication
Control Blocks - models for controlling communications like GOOSE, Data Reporting...

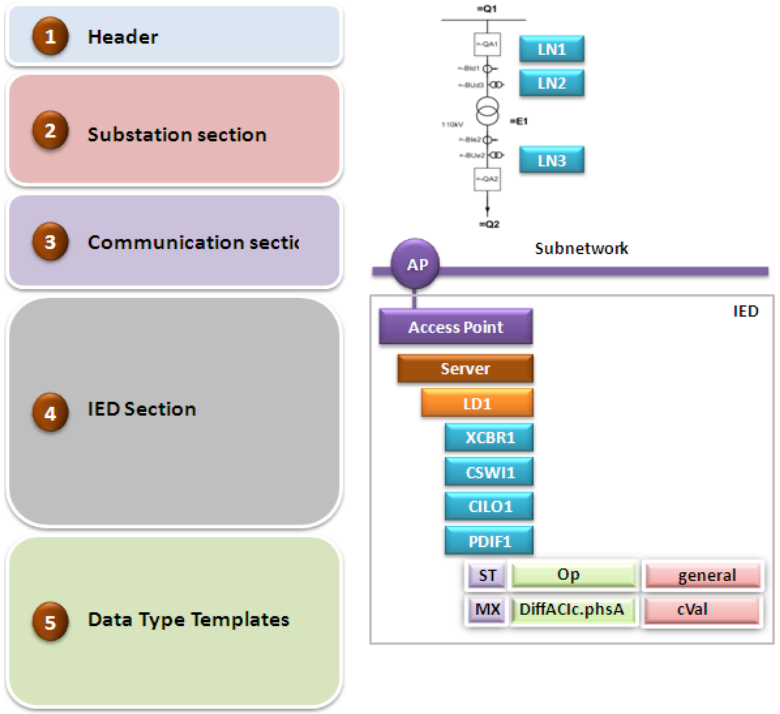


COMMUNICATION MODELS AND CONTROL CLASSES

The material details two major communication models: **Publisher / Subscriber** and **Client /Server.**

Control class models like **Select Before Operate** are described with the corresponding state machines.
Control Security options are also explained.





UNDERSTAND THE SCL FILE STRUCTURE

The IEC 61850 Standards has a dedicated section (Part 6) for specifying file formats of individual IEDs and the Substation automation as a system.
The files are described by a language whose structure, syntax and semantics are described in the training material.

By examining the SCL files you will learn about:

- ✓ SCL File Types
- ✓ Substation system functionality in form of the Single Line Diagram (SLD)
- ✓ Allocation of the Logical Nodes within the SLD
- ✓ Capabilities of the IEDs
- ✓ Associations with Clients
- ✓ Interconnections between Logical Nodes

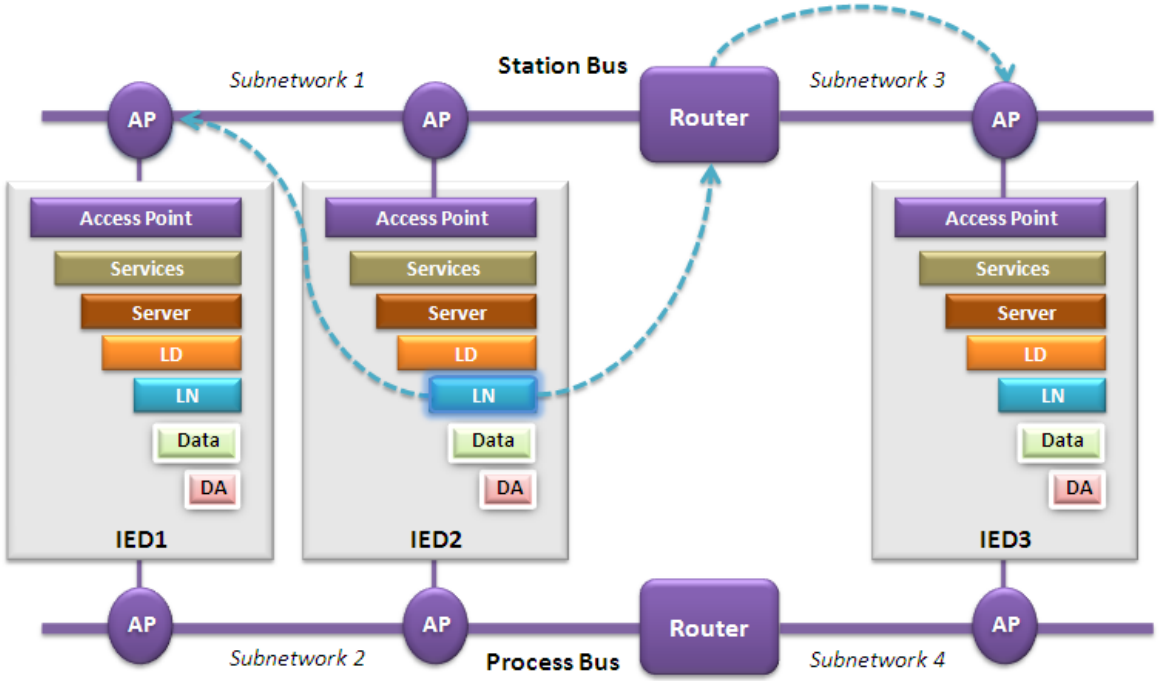
LEARN HOW TO CONFIGURE IEC 61850 IEDs

The SCL part of the standards also defines engineering processes performed on the SCL files, namely:

- ✓ Mandatory IED Configuration Tools
- ✓ System Configuration Tools
- ✓ Data Flow & Configuration Processes
- ✓ Final compilation and Downloading process

FOLLOW THE IEC 61850 IED CONFIGURATION SECTIONS

The final SCL file and its related sections will then be examined and analyzed against the configuration parts to help you visualize a full picture of the configuration process.



GridSoftware & The IEC 61850

Our expertise with the IEC 61850 is built on two segments: engineering and development expertise.

Not only our engineers pioneered in some of the first IEC 61850 implementations, but they also teamed up with our communication experts to develop the IEC 61850 protocol libraries and engineering tools targeted for the system providers and their equipment.

We combined these two segments to create the IEC 61850 leading Test and Simulation software packages.

Such experience allowed us to understand the IEC 61850 from inside out and call ourselves true IEC 61850 experts.

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About The IEC 61850 Training Material

The course material is designed to gradually build understandings of the IEC 61850 models and principles.

However, we believe being practical as much as possible would only give you the hands on experience and the confidence you need to deal with future IEC 61850 systems. We therefore encourage you to take as much of the practical work as you can. on site hands

Note that we also conduct traditional hands on training sessions at our or yours training facility.

We conducted training for:

GE Digital Energy Canada
Scottish Power
Sonelgaz Algeria
Sensa Mexico
Energoinvest
FSK Russia
PLC Venezuela
Optima Russia
.....
many Utilities and System Integrators