



Get The Most Out of
IEC 61850

With The Most Complete
61850 Protocol Stack

Triangle MicroWorks
IEC 61850 Source Code Library



**TRIANGLE
MICROWORKS, INC.**

SOLUTIONS FOR COMMUNICATION PROTOCOL DEVELOPMENT

www.TriangleMicroWorks.com

IEC 61850 Library Overview

IEC 61850 Support

- Components for Client, Server, GOOSE, and Sampled Values
- Implements Edition 1 and Edition 2 of the IEC 61850 standard
- SCL Forge tool included for creating and editing SCL files

Designed for Performance

- Highly optimized code and advanced protocol parsing techniques
- Designed from the ground up to operate efficiently in embedded systems
- Enables Client applications to scale up to hundreds of Server connections

Platform Independent

- Processor and operating system independent
- Library includes target layers for Windows and Linux
- Customers have ported our library to many other platforms
- Library available in ANSI-C, C++, or .NET Components

IEC 61850 Components

Client

Server

GOOSE

Sampled
Values

Benefits of Using Triangle MicroWorks

The Most Complete IEC 61850 Stack

- Support Edition 1 and Edition 2 with a single library
- Full IEC 61850 services out of the box (not just MMS)

A Proven Solution

- Our 61850 Stack has been implemented in hundreds of customer applications
- Highly successful interoperability testing

High Performance

- Designed from the ground up to operate efficiently in small embedded systems
- Client applications can scale to accommodate hundreds of server connections
- Operates in real-time environments

Faster Development & Integration

- Servers can be built in weeks, rather than months
- Free up resources to work on proprietary aspects of your products

Supported IEC 61850 Services

Read services

- ✓ Read at any level in the hierarchy
- ✓ Return configurable errors when a DataAttribute is read

Write services

- ✓ Write at any level in the hierarchy
- ✓ Return configurable errors when a DataAttribute is written

Reporting Services

- ✓ Un-buffered and buffered Report Control Blocks
- ✓ Any valid Data Set can be used in the Report Control Block
- ✓ Supports all trigger options
- ✓ All optional items included in report (Reserve Time, Owner, GI)

External References

- ✓ Support for ExtRef in SCL description

Discovery

- ✓ Supports Server Device Discovery by Client
- ✓ Server Object Model and Supported Services

Control Models

- ✓ Status-only
- ✓ Direct Control with normal security
- ✓ Direct Control with enhanced security
- ✓ Select Before Operate with normal security
- ✓ Select Before Operate with enhanced security

GOOSE

- ✓ Any valid DataSet can be used in the GOOSE Control Block
- ✓ Unicast and Multicast GOOSE messaging
- ✓ Test and simulation flag support

Sampled Values (-9-2)

- ✓ Any valid DataSet can be used in the Sampled Values Control Block
- ✓ Encoded in multicast or unicast Ethernet frames

Logging Services

- ✓ All Trigger options, integrity period, etc.
- ✓ Logging for all configured Log Control Blocks upon Server startup
- ✓ Any valid DataSet can be used in the Log Control Block

Dynamic DataSets

- ✓ Persistent
- ✓ Non-Persistent

File Transfer Services

- ✓ File upload
- ✓ File delete
- ✓ File download
- ✓ Directory browsing

Tracking Services

- ✓ Tracking of Control Blocks
- ✓ Tracking of Control Operations

Data Models Supported

IEC 61850-7-3 (Common Data Classes) - Ed. 1 and Ed. 2

IEC 61850-7-4 (Logical Nodes and Data Objects) - Ed. 1 and Ed. 2

IEC 61400-25 (Wind Turbines)

IEC 61850-7-410 (Hydroelectric Power Plants)

IEC 61850-7-420 (Distributed Energy Resources)

Learn more at www.TriangleMicroWorks.com/scl-iec61850