Kalkitech
Enabling the Smart Grid

Case Study

Meter Data Integration with SCADA using DLMS to IEC61850 Gateway

Background

Customer:
Leading European Power Meter Manufacturer

Business:
Meter manufacturer and solution provider

Solutions

SYNC 2000 Protocol Gateway

Challenge

Metering vendor needed to assist a utility customer to transparently connect a large number of DLMS-compliant meters to an IEC 61850 SAS system. A protocol gateway which could convert DLMS data to IEC61850 was needed to communicate with meters in the substation

Business Need

A leading European based electric meter manufacturer with operations in more than 110 countries, needed to interface station feeder meters with a Substation Automation System (SAS). The meters were DLMS–COSEM compliant with a single serial interface. They wanted real-time metrology data to be monitored from an IEC61850 compliant SCADA system. To meet this requirement, they sought to identify a rugged substation-grade protocol converter solution which could convert DLMS-COSEM data to IEC61850 protocol.

Solution

After evaluating several protocol gateway products, the metering vendor selected Kalkitech's SYNC 2000 Protocol Gateway, which can support a wide range of industry standard and proprietary protocols including DLMS and IEC 61850.

Key attributes of design win and selection of SYNC 2000:

- Protocol conversion (DLMS, IEC61850)
- IEC 61850-3 compliance hardware
- RS232/RS485 supported
- Data storage capability
- Configuration and Management tools provided
- Vast Protocols supported (standards based and proprietary/ custom)
- Security – SSL, VPN

The SYNC 2000 was used to connect DLMS-COSEM power meters over a serial communication link on the downstream and Ethernet port on the upstream to a IEC61850 station bus. Installation of the SYNC 2000 is in the control and protection panel using a DIN rail mount. The meters had a single RS485 port that was used for communication with the gateway. Station auxiliary power source of 24V DC Input supply was provided to the power connectors. The ground provided on the SYNC 2000 enclosure is connected to the panel earth bus.

The SYNC 2000 Protocol Gateway configured DLMS-COSEM serial master channel and nodes as per the deployment. In addition, the SYNC 2000 is configured to poll the meters on a periodic basis.

The ICD file for the IEC61850 server in the protocol gateway was created using the Kalkitech ICD Manager. The ICD Manager is a tool for configuration of ICD (IED Configuration Description) files is included with the IEC61850 server license. Each meter is represented as a unique logical device in the IEC61850 IED model. Power meter data points relevant for SCADA are modeled with appropriate logical nodes as per IEC61850-7-4 standard using the ICD Manager. This ICD model is imported into the protocol gateway configuration tool (EasyConnect, an integral part of the SYNC 2000).

The data configured for polling from the DLMS meter is mapped to IEC61850 data attributes/ data objects obtained from ICD file using EasyConnect. The customer also configured a custom dataset to identify the information pushed to SCADA at specified intervals. Information defined is attached to Report Control Block of the IEC61850 Server in the gateway.

The SYNC 2000 proved to be an ideal solution for the customer to obtain data available in the SAS system for periodic monitoring and analytics. The engineering design tool provided by Kalkitech simplified the data model engineering process and allowed for rapid deployment of the solution. Testing and simulation of the environment was accomplished with Kalkitech ASE61850 Suite, which provided host and IED simulation through the protocol converter.

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