

The Moxa logo is displayed in white, bold, uppercase letters. The background of the top half of the page features a dark blue cityscape at night, with a network of white lines and dots overlaid, representing a communication network.

Certified Professional (MXCP) Training

Substation Communication Network Training Course Outline

The substation communication networks training course provides knowledge and practical skills related to design, configuration, management and troubleshooting of a modern substation communication network. Course contents are designed for substation automation professionals who want to elevate their expertise in substation communication technologies based on the IEC-61850 standard and gain proficiency in operating Moxa's equipment through hands-on experience.

In order to ensure an efficient learning experience, participants are expected to have or gain knowledge of the following topics prior to attending the training.

- OSI model
- Physical layer, twisted pair, fiber media
- Data link layer, Ethernet addressing, unicast/multicast/broadcast
- Ethernet switch, basic operation
- Network layer, IPv4 protocol addressing and subnetting, default gateway
- Network diagnostics and troubleshooting tools, ping command, Wireshark

Course Outline

THEORY

PRACTICE

1. IEC-61850 Basics

- Information model
- Information exchange
- Substation protocols (GOOSE, SV, and MMS)
- Hardware requirements
- Moxa SAS portfolio overview
- Hands-on: Getting familiar with IEC 61850 traffic and SCL files

- Getting familiar with IEC 61850 traffic and SCL files

2. Network Traffic Control

- Ethernet switch basics
- VLAN (Access, Trunk, Hybrid, Unaware)
- Quality of Service
- Bandwidth Management (Rate Limiting, Multicast Filtering)

- Initial device configuration and VLAN setup

3. Communication Redundancy

- Path redundancy (STP, Turbo Ring v2)
- Message redundancy (PRP, HSR)
- Combined redundancy (Coupling, QuadBox, RSTP Grouping)
- Moxa PRP/HSR portfolio overview

- Turbo Ring v2
- RSTP
- HSR with RSTP Grouping
- PRP with Turbo Ring v2

4. Time Synchronisation

- Time synchronisation basics
- One-way time synchronisation (GPS, IRIG-B)
- Network time protocol
- Precision time protocol IEEE 1588

- PTP

5. Network Management

- Management interfaces
- SNMP
- MMS
- GOOSE Check
- MXview

- SNMP and MMS
- GOOSE Check
- MXview

6. Substation Communication Design

- Network design flow
- Collecting requirements
- Logical design
- Physical design
- Validation

- Success case examples



Training Information

Course duration: 2 days (8:30am - 5:00pm) - Lunch and snacks provided.

The training is conducted in a classroom environment with multiple hands-on opportunities throughout both days to put into action the skills and knowledge learnt.

Colterlec will supply the printed training material for the course.

To achieve the Moxa Certified Professional (MXCP) Industrial Ethernet certification attendees will be required to sit an online multichoice exam at the conclusion to day 2 of the training. A digital certificate will be emailed to attendees who successfully passed the training course.

Cost Per Person \$650 excluding GST.

Requirements

Your own laptop with administrative rights to be able to disable the firewall and install software, as well as RJ45 ethernet port are required. If your corporate laptop does not allow this, you may consider bringing your own Windows based laptop. Your laptop must be able to connect to the internet via Wi-Fi.

For more information and pricing, or to register your interest in training, please contact your Colterlec Business Development Manager or email marketing@colterlec.com.au.