

TRAINING COURSES ON IEC 60870-5-101 & 104 COMMUNICATION PROTOCOLS

Code: TC01/4/TP

IEC 60870-5-101/104 Training Course aims to teach trainees with the basic principles and basic structure of IEC 101 and IEC 104 communication protocols.

This training course is designed for **Distribution Network Operators (DNO)** and **Transmission System Operators (TSO)** qualified personnel:



- Protection and Control Engineers
- Telecommunications Engineers
- RTU and Telecommunication Technicians

After attending the IEC 60870-5-101 & 104 Training Course, the participants will be able to:



- Capture IEC 60870-5-101 & 104 packets
- Analyze IEC 60870-5-101 & 104 packets
- Debug IEC 60870-5-101 & 104 communications
- Parameterize the IEC 60870-5-101 & 104 communications of RTUs and protocol gateways

Our IEC 60870-5-101 & 104 Training Course, includes four (4) days of theoretical and practical sessions, with the following outline:

68 0B 0B 68 73 02 01 64 01 06 00 00 00 00 14 F5 16 E5 68
25 25 68 08 02 01 08 05 14 01 01 00 05 12 00 00 01 00 01
74 0D 00 01 00 02 08 00 00 02 00 02 01 00 00 03 00 02 00
00 00 2E 16



DAY 1

THEORETICAL TRAINING

- Introduction to Network Reference Models
 - OSI
 - ARPA
 - TCP
- Introduction to IEC 870 & 60870-5 standards and companions
- IEC 60870-5-101 Communications & Physical Layer
- IEC 60870-5-101 Data Link Layer
 - Frame Format
 - Message Structure
 - Addressing
 - Transmission Philosophy

DAY 2

THEORETICAL TRAINING

- IEC 60870-5-101 Application Layer
 - ASDU Structure
 - Information Elements Types and Structures
 - Clock Synchronization
 - General Interrogation
- IEC 60870-5-104 Network Operation
- Interoperability

DAY 3

PRACTICAL TRAINING

- IEC 60870-5-101 Packet analysis exercises
- IEC 60870-5-104 Packet analysis exercises
- Presentation of training course simulator equipment and data network

DAY 4

PRACTICAL TRAINING

- Presentation of RTU / PROTOCOL GATEWAY Configuration environment with emphasis to:
 - data base configuration
 - IEC 60870-5-101 Slave configuration
 - IEC 60870-5-104 Slave configuration
- Real time IEC 60870-5-101 packets capture and analysis using dedicated packet analysis software for different Information Objects as well as for IEC 101 protocol sessions initialization and commands (time synchronization, general interrogation)
- Real time IEC 60870-5-104 packets capture and analysis using dedicated packet analysis software