ADVANCED DIPLOMA OF INDUSTRIAL DATA COMMUNICATIONS, NETWORKING AND IT

MODULE DETAILS

Module 9: DNP3 and IEC 60870-5 for SCADA

Nominal duration: 3 weeks (24 hours total time commitment).

This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study.

MODULE PURPOSE

This module covers the essentials of the DNP3 and IEC 60870-5 SCADA protocols. A solid review is done on the DNP3 protocol where the features, message structure, practical benefits, interoperability and applications are discussed. An overview of the IEC 60870-5 protocols is also given. This module is intended to be product-independent, but examples will be taken from existing products to ensure that all aspects of the protocols are covered.

PRE-REQUISITE MODULES, UNITS /CO-REQUISITES

None

ASSESSMENT STRATEGY

To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.

SUMMARY OF LEARNING OUTCOMES

1. Examine and discuss the fundamentals of DNP3
2. Examine and discuss the fundamentals of IEC 60870-5
3. Examine and discuss advanced considerations of IEC 60870-5 and DNP3

Learning Outcome 1

Examine and discuss the fundamentals of DNP3

Assessment Criteria

1.1 Examine and discuss the fundamentals of DNP3 in terms of:
   (a) Physical, Data Link, Transport and Application Layer implementation
   (b) Message structure
   (c) Data objects
   (d) Transportation over TCP/IP
Learning Outcome 2  
Examine and discuss the fundamentals of IEC 60870-5  
Assessment Criteria  
2.1 Examine and discuss the fundamentals of IEC 60870 in terms of:  
(a) Physical, Data Link, Transport and Application Layer implementation  
(b) Message structure  
(c) Data objects  
(d) Transportation over TCP/IP

Learning Outcome 3  
Examine and discuss advanced considerations of IEC 60870-5 and DNP3  
Assessment Criteria  
3.1 Examine and discuss IEC 60870 and DNP3 in terms of:  
(a) Subset definitions and conformance testing  
(b) Interoperability between IEC 60870-5 devices  
(c) Polling and communication options  
(d) Implementation in terms of software and hardware  
(e) Differences between IEC 60870-5 and DNP3

Delivery mode  
A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, PowerPoint slides, notes, reading and study materials (in PDF, HTML and Word format) accessed through the Moodle Learning Management System (LMS).