

COURSE DESCRIPTION

EcoStruxure Power Monitoring Expert (PME) Designer – Advanced Device Programming

Overview

Building on the topics introduced in the Virtual ION Processor – Introduction to Advanced System Programming course, this advanced course will focus on the capabilities of frameworks and modules located inside of ION Meters. Students will learn the differences between the default meter templates and firmware versions that can be pushed to devices and be able to describe each. Students will also take a closer look at the ION metering lineup and be able to describe the different ION meters available and the unique characteristics between the models. In the course, there will be an emphasis on group learning and discussion between attendees. At the end of the course, students will have created frameworks for integrating the different types of WAGES devices available, program frameworks that will perform process and control applications, and implement more advanced power quality functionality within ION meters.

Duration

3 Days (Tu-Th, 8am-4pm). *Please book departing flights for 6pm or later on the last day of class.*

Who should attend

This course is designed for anyone who works with a PME system and has reasonable knowledge of the default functions of ION meters and PME software. This course may be appropriate for meter/instrumentation technicians, system engineers and system integrators who need to learn how to get the most out of their PME system.

Prerequisites

- Working knowledge of PME software, especially experience using *Vista*
- Working knowledge of the default capabilities of ION meters
- General computer skills and basic working experience with Microsoft Windows
- Completion of introductory course or equivalent experience is recommended

Students will be able to

- Describe the different meters offered in the ION meter lineup
- Understand the procedure to backup and restore a meter template

- Construct programs for Advanced WAGES metering
- Build programs to read Modbus registers from one device to an ION meter
- Program applications inside of ION meters to monitor processes and control functions
- Understand the ION Reference document and how to use it
- Learn best practices for programming in Designer

Agenda

Day 1

Course Introduction

- Student and Instructor introductions and overview of course logistics
- Overview of course topics and agenda

Backup and Restore ION meters

- Understand the files that are needed
- Describe the different file types in Designer
- Examine the differences between different ION meters and templates
- Backup and restore programs and templates using ION Setup and Designer

Understand the capabilities of Digital inputs and outputs

- Look at the installation guides to examine the specifications for wiring to an ION meter
- Use *Designer* to view input and output registers
- Build programs to calculate Min/Max/Average/Total values from a pulse input
- Use Logical Devices to assist with system names and measurements

Program Analog Inputs and Outputs

- Use reference guides to understand wiring to ION meters
- Use Designer to build frameworks to calculate scaled values from Analog input modules
- Build programs to calculate Min/Max/Average/Total values from an analog input
- Program a framework to convert and analog input to a digital output

Construct programs for Modbus Mastering

- Configure the serial parameters to communicate to downstream Modbus devices
- Use Designer to create a framework to read values from a downstream serial device
- Configure the meter to broadcast Modbus values from that device over the network
- Modbus Master an Ethernet connected Modbus device over the network to the ION meter

Day 2

Build programs to operate at a scheduled time

- Understand the use of the Scheduling module
- Examine the differences between the scheduling module and clock module

Program a framework for load shedding

- Understand the inputs and outputs of the program
- Add functionality to override the automatic control of the framework
- Build Vista screens to test, troubleshoot, and validate programs functionality

Modify existing programs to perform a different action

- Use existing load shedding framework and modify it to turn on and off capacitor banks
- Discuss similarities between the two frameworks
- Understand best practices and what could be changed when programming in the future

Use the meter to calculate production line energy usage

- Simulate production count through a digital input on a meter
- Program modules to calculate total energy per object and output values to the database
- Examine other uses for similar programs

Day 3

Modify meter template to automatically adjust nominal voltage

- Examine current configuration of meter template and find how nominal voltage is used
- Modify existing program to adjust nominal voltage based on floating average
- Validate programs functionality

Build a program for high speed data recording

- Understand the modules required for high speed data logging
- Build Vista screens to interact and test program functionality
- Expand program to display a total time function has been enabled

Create framework to alert on rapid voltage changes

- Examine what modules would be useful to watch for rapid voltage changes
- Build framework to send an alarm to the PME system when changes occur outside of boundary
- Display alarm conditions in the system

Course Summary

- Answer any remaining questions
- Outline available resources for education going forward