

## COURSE DESCRIPTION

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# EcoStruxure Power Monitoring Expert (PME) Virtual ION Processor – Introduction to Advanced System Programming

## Overview

Formerly called Power Monitoring Designer, this advanced course focuses on data manipulation using the *Designer* interface within the PME software. Students will learn the architecture of the ION meter along with using the *Designer* interface to develop an understanding of how frameworks are constructed. Students will be guided through a series of lab activities to creating custom applications for equipment monitoring, alarming and logging. Students will learn to program the *Virtual ION Processor* (VIP) for special applications such as data aggregation and event driven reporting. Students will then have the opportunity to create a custom virtual meter framework by aggregating multiple meters in the VIP and displaying the real-time and historical information from that newly created meter in the Vista application.

## Duration

4 Days (M-W 8am-4pm / Th 8am-1:30pm). *Please book departing flights for 4pm 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. This course does not cover programming the CM or PM series of meters.

## 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 a PME Fundamentals course is recommended

## Students will be able to

- Describe ION architecture and ION module properties
- Examine configuration of meters installed in a PME system
- Understand the procedure to backup and restore a meter template
- Construct programs to perform custom calculations
- Describe how Designer and Vista work together
- Build programs for logging and alarming
- Understand the ION Reference document and how to use it

## Agenda

### Day 1

#### Course Introduction

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

#### Describe ION architecture and ION module properties

- Describe the ION module concept including setup and output registers
- Describe functions of core ION meter modules
- Use *PME Reference* and *ION Device Template Reference* documents

#### Explore navigation inside of the PME Designer interface

- Use *Designer* to open a meter node
- Use *Designer* to view input and output registers
- Use *Designer* to explore notes made inside of templates
- Use *Designer* to make links to different modules

#### Backup and Restore ION meters

- Understand the files that need to be saved
- Describe the different file types in *Designer*
- Backup and restore a meter's program using *ION Setup*
- Backup programs in *Designer*

## Day 2

### **Construct Vista Screens that work with Designer Programs**

- Use *Designer* and *Vista* to see how registers link together
- Use *Designer* to create programs that can be controlled in *Vista*
- Link to setup registers in *Designer* from *Vista* for control

### **Create and understand the Counter Module**

- Design a program that counts pulses being sent from *Vista*
- Display totalized values inside of *Vista*
- Discuss other uses for counter Modules

### **Utilize and understand the functionality of the Arithmetic Module**

- Create a framework to perform basic math operations
- Modify the framework to understand advanced syntax in the Arithmetic module
- Discuss best practices and uses for module
- Build a Framework for power calculations from multiple meters

## Day 3

### **Understand the Clock and Periodic Timer Module**

- Add a clock module to the system and view its outputs in *Vista*
- Create Periodic timers in *designer* analyze its behavior
- Explore the different outputs from the modules
- Discuss possible applications for these modules

### **Create a framework for recording data to the SQL database**

- Observe how data flows through the PME system to the database
- Build frameworks for logging data in the system
- Display logged data in *Vista*
- Understand the Windows Services that are involved with data logging
- Display logged data in *Vista*

### **Create custom alarms in Designer using the Set Point Module**

- Program custom Alarms in PME using the Set point module
- Create alarms for values that fall outside of a band range
- Display Alarms in *Vista* using the Global Events view
- View alarms in the web client
- Add custom alarms in the system using the web client

- Discuss how to modify and customize alarming
- Discuss alarm management and best practices

## Day 4

### **Design and build your own Virtual Meter**

- Apply programming "Best Practices" when building custom applications
- Build a program in the VIP that takes the input from multiple meters and creates a virtual meter
- Design a Vista page to display the output from this newly created virtual meter
- Expand the frameworks capability using modules and skills learned throughout the week to perform more advanced calculations
- Discuss possible applications for this newly created virtual meter

### **Course Summary**

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