PiOPCMaster

Practical Industrial OPC Training

Click below to go to unit

INTRODUCTION

1. Industrial Process Control Network

2. What is OPC

3. OPC Foundation & Standards

4. OPC Solves Compatibility

5. Benefits due to OPC

6. OPC Specifications

7. OPC Server and Client

8. COM and DCOM

9. OPC DA Server (Data Access)

10. OPC HDA Server (Historical Data Access)

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Help   Exit   Review Tests

Motivation to Develop this Course

■ There are many books, software and training products in the market.

■ Between the internet, book stores, software and training courses, there is just a huge amount of information.

■ Too much information and too many options can overwhelm and confuse the person.

■ Over or 20+ years of OPC experience in the industry, we have collected just the practical and useful knowledge needed in a control room environment to do your job!

■ No unnecessary math; no unnecessary distracting or useless information! We know you are busy and have better things to do than open 500 page books and manuals or install software over 2G!

■ Enjoy the course; in a short time you will be able to understand, use and apply OPC in your plant.

Training Covers both Theory and Hands-On Labs/Practicals!
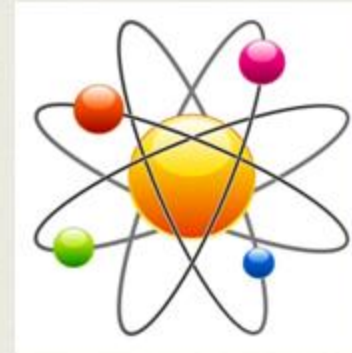
THEORY

◆ OPC Theory and Fundamentals

◆ OPC Software

LABS/PRACTICALS

◆ OPC/Process Control Industrial Software Products

◆ Practical Industrial Examples using OPC

◆ Opportunities for maximizing plant benefits using OPC

Practical OPC Knowledge and Skills

The knowledge from this training will give you the skills to design and implement new OPC systems at any plant for the following and all similar applications:

Modern communications from any field device to DCS/PLC, e.g.:

◆ Online analyzers to DCS/PLC
◆ Vibration monitoring systems to DCS/PLC

Implement APC (advanced process control)

◆ Maximize production rates, minimize utilities
◆ Install LIMS (laboratory information management system)
◆ Provide high speed data monitoring
◆ Convert offline Excel applications into online real-time applications
◆ Install and implement rule-based expert system advisory and control application
◆ The knowledge from this training will give you the skills to design and implement new OPC systems at any plant for the following and all similar applications:

Data communication from various software products, e.g.:

◆ Read data from a DCS into a complex program and write results back to DCS

◆ Read live data into Excel or a custom application

The Best Aspect of this Training Is....

◆ You install OPC software on your own computer and your computer begins to look like a typical OPC installation in a real plant in a real control room!

◆ Many courses offer numerous training slides and paper but this course is very hands on and you install and work with OPC software in real-time manner.

The following software are provided as part of this course:
◆ **PiBridge** (dual OPC client)
◆ **PiLogger** (OPC client)

OPC software products are full-blown versions of software that can be used and installed in any commercial plant.

This course covers many topics using slides to cover theory and hands-on software training.

This approach optimizes time and maximizes learning.
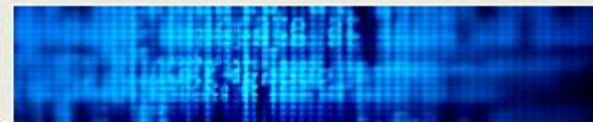
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Practical Industrial OPC Training

1. Industrial Process Control Network

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Devices in Industrial Process Control

■ Any industrial process has numerous devices.

■ What is a device? A device is hardware that sends or generates data in real-time.

Examples of device:
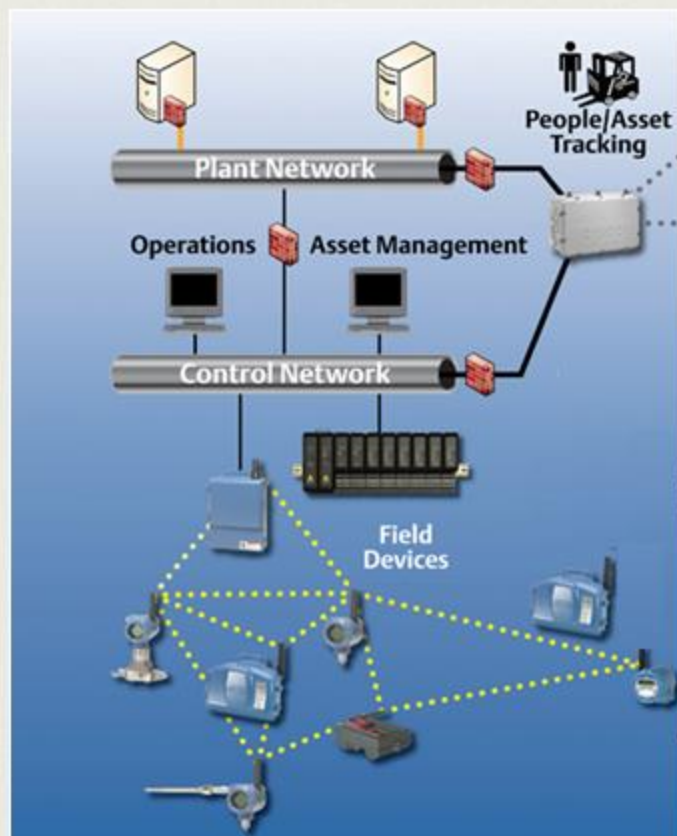◆ Online analyzer (GC) - gas chromatograph
◆ DCS (distributed control system)
◆ PLC (programmable logic controller)
◆ Field instruments (flowmeters, level indicators etc.)
◆ Vibration monitors

Communication between Devices

- For the normal and safe plant operation, it is necessary for data to be transferred both ways from one or more devices to other devices.

- Devices are connected to each other on a process control network.

- The process control network allows the flow of data from various devices.

- Various devices are manufactured by various different hardware and software vendors.

- One of the challenges in industrial process control communications is to allow a two-way data flow from various devices that use different protocol and different operating systems.

Process Control Network

■ All modern manufacturing plants are controlled by either:
- ◆ DCS (distributed control system)
- ◆ PLC (programmable logic controller)

■ A DCS is used to control and manage large continuously running manufacturing plants with very large numbers of input and output signals.

■ A PLC is used on smaller processes running batch or semi-batch operation.

■ In any manufacturing plant, there is always a main process control network (see next slide).

■ The process control network facilitates transmission of data from all field devices and also the manual entry by operators.

Modern Control Networks in DCS/PLC

■ Typically Ethernet is the communications protocol in all new DCSs and PLCs.

■ In older DCSs, coaxial cables or some proprietary cables where used, but not anymore.

■ The control network is very critical to the normal and safer operation of a manufacturing plant because all data flows on this network.

■ The control network needs to be protect against failure:

◆ Protect by shielding, covering, away from heat, rats, water, electric radiation.

◆ Protect using REDUNDANCY- two cables (Primary and Secondary).

◆ If Primary fails, DCS automatically swaps to Secondary, and alarm is generated to alert DCS maintenance people that Cable A has failed.
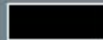
REDUNDANCY

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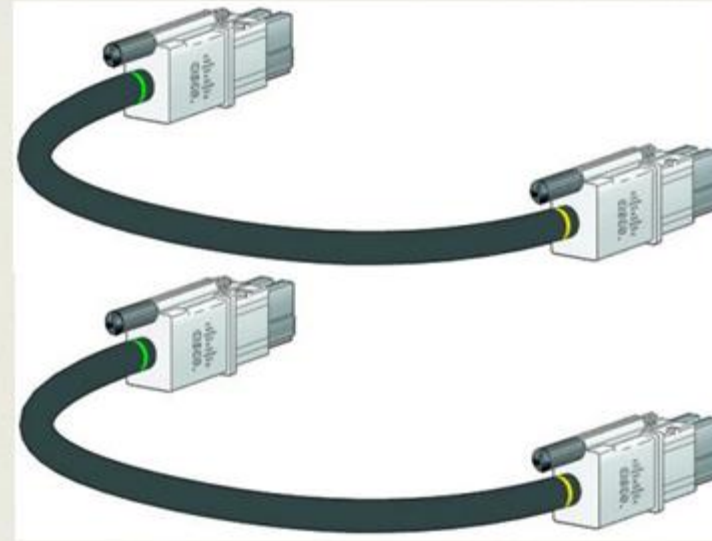
Q. 1

For data communications using OPC, both of the following are required:

- Multiple devices with client - server privileges
- At least two devices
- Two OPC servers
- Ethernet and OPC server
- Two OPC clients
- OPC server and OPC client

Score

Exit

Q. 2

The OPC Server is a piece of custom software created for each unique device by the hardware vendor.

○ True

● False

Score

?

Correct!

Exit

Q. 3

For OPC to work, which of the following are required?

At least one OPC server.

Minimum two OPC servers.

At least one OPC client.

More than two OPC clients.

Correctly configured and working COM or DCOM options.

Powered coax cable communication system to enable OPC.

None of the above.

Score

You are right!

Exit

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Q. 4

An OPC server is:

A) A physical computer box running Windows Server Operating System.

B) A powerful industrial grade computer with over 16G RAM and powerful CPU needed for processing complex real-time calculations.

C) Software required for communications with data generating entity.

D) A and C.

All of the above.

None of the above.

Score

Correct!

Exit

We have lab procedures manual in PDF format.

In the Lab Session, you will install real industrial grade OPC servers and OPC clients on your own computer and go through several lab exercises using software supplied by PiControl Solutions LLC.

Note: You need Adobe Acobat Reader installed on your PC. If you do not have it, you can download anf install from Adobe's website: http://www.adobe.com/

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Click here to open Lab Manual PDF file

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Submit proof of lab completion to us via email to info@picontrolsolutions.com