Unleash the Power of OPC Part 1: OPC Data Access Applications
HMI/SCADA and Beyond
September 10, 2008

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A standard object model and set of interfaces for applications and servers

Performance

Before OPC:  
Custom interfaces  
• costly  
• inefficient  
• risky

With OPC:  
Client and Server write to a standard  
• reduce cost  
• protect investment  
• more choices  
• increase productivity

Connectivity / Collaboration

InterOperability
OPC Data Access Applications
HMI/SCADA, & Beyond

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Overview

- HMI to Device Scenarios & Demo
- Using Web Browsers with OPC DA
- Using Excel with OPC DA
- Variety of Application Types
- HMI/SCADA Telemetry Scenarios
- Data Collection Systems
- Design Considerations
- Review
Connectivity With OPC

- Standard software to software interface
- One connection: OPC
- Communications infrastructure decoupled from the HMI/SCADA
- Improves performance
- Flexibility
- Choices
HMI/SCADA to OPC Scenarios

One HMI to \( n \) Devices via OPC

\( n \) HMIs to \( n \) Devices via OPC
HMI/SCADA to OPC Configuration

• For your HMI/SCADA package, need to know
  – Where to specify target OPC server(s)
  – Where group update rate is set
  – How to browse for items in the OPC server
  – How to connect tags in HMI to OPC items
  – What the HMI does with OPC Quality Data

• Information Sources:
  – HMI supplier application notes & documents
  – OPC Server supplier documents
System Design Steps

- Evaluate & Select OPC Server
- Configure OPC Server
- Test with Test Client
- Validate Values
- Know what you need and how often
- Tags or No Tags in OPC Server?
- Systems are only as good as weakest link
To Tag or Not to Tag?

- Tags in the OPC Server when...
  - HMI client expects/wants you to
  - Need to Insulate HMI configuration from PLC configuration changes
  - OEM desires insulation from PLC model change
  - Need Easy changes w/o HMI development license
To Tag or Not to Tag?

- No tags in the OPC server when
  - Need to avoid multiple databases and..
  - HMI system prefers it this way
  - Benefits of tagging not important to you
  - Retrofitting existing HMI where PLC addresses are in the HMI
  - Existing standards
How Does the Data Get There?

With most HMI’s:
- Reads – exception based
- Writes – on demand

81.2

OPC Client HMI
Temp 1: 78.9
Setpoint: 79.9

OPC Client-Server Connection

OPC Communications Network
HMI/SCADA to OPC Demos

- RSView SE
- Indusoft Web Studio
- Siemens WinCC V6
Indusoft Web Studio to OPC How To

Let's add a tag in the HMI and connect it to an OPC Item – right click on item field.

Let's display a value from the OPC Item here.

Let's tie an OPC Item to this tank fill.

Click here to browse for tags in the HMI.

Here is the tag we connected to the OPC Server.

Tag name is filled in here & we're done.

Let's use this piece of text to show how this HMI can display OPC Quality Values.

Last, let's look at how this HMI allows you to control what is shown for values when OPC Item Quality <> Good.

Check this box to enable ??? when quality not Good.
Siemens WinCC V6

Items added to the HMI and ready to use with your graphics

In this HMI you can define syntax for auto-adding blocks of items

Siemens WinCC V6 to OPC How To
Additional HMI/SCADA Package

Bonus Live Demo

This slide reserved for a demo of an HMI/SCADA package that may vary from location to location of the OPC training classes.
Using Browser as an HMI

Bonus Live Demo #2

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Using Excel as an HMI

Bonus Live Demo #3
HMI to HMI Scenario

Applications:
- Feedback
- Feedforward
- Single Operator, Multiple Machines
- Interplant Communications

HMI/SCADA System Brand X – Plant Standard

HMI/SCADA System Brand Y on New Machine
HMI or PLC to DCS Scenario

Controller Brand A PLC

OPC Bridging Tool – OPC
Client on both sides

- Event driven changes
- Polled changes
- Triggered changes
- Data Transformations

DCS System
Redundant OPC DA Servers

Controllers/Devices on Control Network
OPC DA to Non-Windows OS & Over the Internet

- DataHub
- InTouch
- TOP Server
- InTouch to OPC Driver
- Standard TCP/IP
- Single Port Connections
- SSL
- Passwords
- GE Proficy iFix
- HMI-SCADA
- Front Office
- Factory Floor
- Other OS
- Tunnel
Wireless/Telemetry Scenarios

SCADA Server with \( n \) OPC Servers
Wireless/Telemetry Requirements

- Adjustable timeouts
- Adjustable protocol timing
- Automation demotion of offline devices
- Dialing phone #’s w/phone modems
- Managing dynamic target IP addresses
- Modbus Variants
- Industry specific protocols

Because of OPC, market demand has created a supply of OPC Foundation Member Solutions that address these unique requirements
OPC to Data Storage Scenarios

Logging Data to text or database from 1 OPC Server reading from n Devices

Gathering Data from n OPC Servers from n Devices and logging to remote database(s)
OPC - From Live to Historical

The Historian writes the data to the data store.

OPC DA Server gets the live data into the Historian.

OPC HDA Server retrieves historical data for display & analysis client application.

Definition: OPC HDA = Historical Data Access.
OPC DA to Historian to OPC HDA

Bonus Live Demo
Summary

• OPC DA in HMI/SCADA/DCS
  – Reduces complexity
  – Increases flexibility
  – Lowers Total Cost of Ownership
• Flexibility Supports Your Success
  – HMI to Device
  – HMI to HMI
  – HMI to DCS
  – Bridging of Data
  – Redundancy
  – Excel connectivity
  – Browsers as HMI
  – Wireless/Telemetry Applications
  – Data Collection from Devices
  – What’s your need?
OPC Foundation

• International Industry Standard Organization
  – 500+ Member Companies / 100+ end-users Members
  – 3500+ Total Companies Build OPC Products = 22000+ Products

• The vision of OPC is to be the Foundation for InterOperability
  – for moving information vertically from the data sources through the enterprise of multi-vendor systems (with stops in between…)
  – For moving information horizontally between data sources on different industrial networks from different vendors;
  – Not just data but information……..

• Reliable, Secure Integration is not an Option

• Collaboration is key to pulling multiple “open” standards into unified open platform architecture….

• Success is measured by level of adoption
For more information

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