Optimization of Machine Integration

Industry Conference

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OMI in the Industrial Ecosystem

- Financial and Cost Accounting
- Business Planning and Analytics
- Utilities and Material Cost, Demand and Delivery

Utility Energy Cost
Utility Energy Price
Energy Production and Delivery Systems

Facility and Energy Infrastructure Systems
Manufacturing Execution System
Line Controllers
Machinery Systems
- Machine Asset 1
- Machine Asset 2
- Machine Asset 3
- Machine Asset 4
- Machine Asset 5
Key Challenges of Machine Builders & Users

1. **Proliferation of automation networks in machine automation.**

2. **Long useful life of machine assets which results in many installations with legacy networks.**

3. **Machine builders motivated to provide a high-value machine differentiated from their competition on price and performance relative to asset turnover, not overall equipment effectiveness.**

4. **To maintain machines, manufacturers need to give OEMs secure, remote access to the information being shared from machine-to-machine as well as from the machines to supervisory systems including line controllers, MES and enterprise applications.**
Multi-Organization Partnership

Unified Integration Model for Machine Optimization
Typical Use Cases

- Machine-to-Supervisory Communication
- Machine-to-Machine Communication
- Communication Connectivity
Timeline & Related Topics

SIGs
- On-going energy enhancements
- Safe motion enhancements to CIP Safety
- Integration of I/O-Link devices

Technical Papers
- ODVA 2012 Industry Conference
Technical Approach

Supervisory-to-Manufacturing Execution System
- Leveraging data into actionable information provides business value (e.g., overall equipment effectiveness, streamlined supply chain and other KPIs)

Machine-to-Supervisory Systems
- Machine Objects for CIP or OPC (e.g., machine odometer, production data aggregation)
- Machine Protocol Neutral Machine Attributes (e.g., operating state, run time)

Machine-to-Machine
- Machine Objects and Services for CIP or SERCOS (e.g., command, configure, control)
- Machine Protocol Neutral Attributes (e.g., operating state, energy metrics, safety status)
Technical Approach

UC3 – Communication Connectivity

OPTIONAL BLENDED INFRASTRUCTURE FOR SYSTEMS USING ETHERNET/IP AND SERCOS III

What this means for ODVA and EtherNet/IP vendors...

What this means for sercos international and sercos III vendors...
Technical Approach
UCs 1 & 2: Machine Communication

Common attribute sets for CIP, sercos and OPC UA for logical groups of machine data needed for communications to supervisory and executive systems.
OMI IN ACTION

Typical Architectural Scenarios and Data Types for Machine Communication to Supervisory Systems
UC2: Machine-to-Supervisory Communication
Architectural Scenarios

Machine communication to the MES layer following various paths - an OPC UA server, external line controller or native communication
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Architectural Scenarios

Machine communication to the MES layer following various paths - an OPC UA server, internal line controller or native communication
Typical Flow of Machine Data Types

* Machine data can be either dropped, picked up and passed along at line control level.
Session Panel

• Volker Alt, Bosch Rexroth
• Paul Hunkar, OPC Foundation
• Peter Lutz, SERCOS International
• Cliff Whitehead, Rockwell Automation
• Katherine Voss, ODVA, also participating as panel moderator

Current Participants on the Task Force
Volker Alt, Bosch Rexroth ● Tom Burke, OPC Foundation
Scott Hibbard, Bosch Rexroth ● Pascal Hampikian, Schneider Electric
Paul Hunkar, OPC Foundation ● Peter Lutz, SERCOS International
Paul Taylor, Cisco Systems ● Katherine Voss, ODVA
Cliff Whitehead, Rockwell Automation
Technical Work

Evolve Data Models for UC2 in 2013

**Machine-to-Supervisory Communication**
Architectural guidelines, common data models, objects and services to consolidate, aggregate and exchange machine data across systems including information for production, asset management, diagnostics and alarms and dynamic transaction mechanisms across industrial domains.

**Machine-to-Machine Communication**
Architecture guidelines and common data models for key machine-to-machine functions.

Communication Connectivity
Standards and guidelines for physical media, network infrastructure and secure remote access.
For a written overview of ODVA’s Machinery Initiative, visit www.odva.org and download the white paper.