General Session & 18th Annual Meeting of Members

February 23, 2017
Activities of the Association

Report to the Membership on the Affairs of the Company
Membership: February 23, 2017

308 entities – stable and growing
ODVA at Work

HQ Staff & local PR supporting North & Latin America

HQ Staff & local PR supporting European in-country resources

TAG Korea

ODVA ATS with TAG China

TAG Japan

HQ Staff supporting Asian in-country resources

German

RIC Italy
A Community Driving the Stages of Diffusion for the 4th Industrial Revolution

**ODVA Guiding Principles for Success**

1. Design for Integration of Heterogeneous Systems
2. Deploy ICT Standards to Achieve Interoperability
3. Optimize Performance-Cost Ratio with COTS
4. Blend the Best Technical Solutions of the Future with Proven Solutions of the Present
5. Architect and Automate for Diagnostics
6. Design for the Scalability of “THINGS”

Technology implementations and diffusion from suppliers to users will be particularly impacted by common approaches information models and cybersecurity.
EtherNet/IP has become a comprehensive and proven platform for the smart and secure industrial control systems of tomorrow.

The Ascent of EtherNet/IP

EtherNet/IP

Device Profiles

- CIP I/O
  - CIP Services
    - Profile(s), Objects and Services

- CIP Energy
  - Objects and Services

- CIP Sync
  - Objects and Services

- CIP Security
  - Profile(s), Objects and Services

- CIP Motion
  - Profile(s) and Axis Objects

- CIP Safety
  - Profile(s), Objects and Services

Standard Connections (includes TCP and UDP)

Secured Connections

CIP Application Layer (IPV4 migrating to IPv6, optional CoCo and TCL)

EtherNet/IP Layer 2 (options for high availability, QOS with or without TSN)

Ethernet Layer 1 (with 1 GbE)

NETWORK ARCHITECTURE FRAMEWORK
What are industry analysts saying?

IHS Markit™

“Transition to industrial Ethernet is accelerating and EtherNet/IP accounted for approximately 25% of all new Ethernet nodes shipped in 2015. The growth trend for EtherNet/IP is expected to continue building on its strong installed base, the transition from fieldbus to Ethernet networks, and the fact that industrial Ethernet will provide a fundamental component of connectivity necessary to enable smart manufacturing and IIOT solutions.”

Alex West, analyst for IHS Markit

New Connected Industrial Ethernet Nodes 2015
“Industrial Communications Report 2015”
© IHS Markit.
Leadership

Michael Höing  
Weidmüller Interface

Fabrice Jadot  
Schneider Electric

Dr. Jürgen Weinhofer  
Rockwell Automation

Masaru Takeuchi  
Omron

Dr. Thomas Bürger  
Bosch Rexroth

Dr. Rolf Birkhofer  
Endress+Hauser
Officers

- President and Executive Director – Katherine Voss
- Chief Technology Officer – Joakim Wiberg
- Secretary – Christopher Lynch
- Treasurer – Jürgen Weinhofer
Welcome Back

Call to Order

General Session and
17th Annual Meeting of Members

October 15, 2015
Exhibits at Hannover Fair and SPS IPC Drives show in Germany... and Concurrent Media Briefings
Exhibits at Systems Controls Fair. . .

. . . and Industrial Open Net Fair in Japan
Launched refreshed EtherNet/IP seminar, starting in:

- Barcelona, Spain
- Detroit, Michigan, USA
- Frankfurt, Germany
- Parma, Italy
Industry Awareness

Organization Ambassador to IOT Solutions World Congress
Chinese Automation Association Forum
September 2016
Western China GongKong Forum
December 2016
Agenda

• ODVA Technology Development Overview
• Technical Review Board Roster
• Special Interest Groups and Working Groups
• Key Technical Accomplishments since last Annual Meeting
• Key Planned Activities for Next Term
**ODVA Technology Development Process**

- **EtherNet/IP Roundtable**
  - Special Interest Group
  - Submit SE or TDE
  - Strategic Initiatives

- **Technical Review Board**
  - Approved SE or TDE
  - Update (via Conformance Authority)

- **Board of Directors**
  - Update (TRB review)

- **ODVA**
  - Update

- **Specification Set**
  - Conformance Test

- **Policies and Procedures**
  - Update

- **Strategic Initiatives**
  - Set SIG Work Plans

- **Technical Track**
  - 2017 Industry Conference & 18th Annual Meeting
  - www.odva.org
  - © 2017 ODVA, Inc. All rights reserved.
Technical Review Board

- Joakim Wiberg, chairperson
- Dave VanGompel
- Dr. Ludwig Leurs
- Rudy Belliardi
- Paul Didier
- Shinji Murayama
- Dr. Jörg Hähniche
- Eric Scott
Active Special Interest Groups and Working Groups

- EtherNet/IP In Process Industry – Mirko Brcic (Endress+Hauser)
- CIP Safety – Bruce Brown (Rockwell Automation)
- Common Industrial Cloud Interface – Stephen Briant (Rockwell Automation) (new SIG)
- IO-Link Integration – Frank Moritz (SICK)
- DeviceNet of Things – Thomas Peter (Weidmueller)
- Machinery Information – Beudert/Zuponcic/Leurs
- EtherNet/IP Physical Layer – Bob Lounsbury (Rockwell Automation)
- DeviceNet Physical Layer – Brad Woodman (Molex)
- EtherNet/IP Infrastructure – George Ditzel (Schneider Electric)
- EtherNet/IP System – Brian Batke (Rockwell Automation)
- Distributed Motion and Time Synchronization – Steve Zuponcic (Rockwell Automation)
- CompoNet – Tianbing Li (Omron)
- Conformance – Qi Zeng (ODVA)
- Modbus Integration – Todd Snide (Schneider Electric)
- Motor Control and Circuit Breaker - John Caspers (Rockwell Automation) (new SIG)
- CIP System – Dave VanGompel (Rockwell Automation)
- Energy Applications – Rick Blair (Schneider Electric)
- EtherNet/IP Roundtable – Kevin Knake (HMS Industrial Networks) US Track
  Ulrich Kaemmerer (Schneider Electric) European Track
Specification Enhancement Summary

- 56 Specification Enhancements distributed over 3 publication cycles
- 2 Technical Documents

<table>
<thead>
<tr>
<th>Specification Volume</th>
<th>PC 2016-1 to PC 2017-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP Common (Vol 1)</td>
<td>16</td>
</tr>
<tr>
<td>EtherNet/IP (Vol 2)</td>
<td>8</td>
</tr>
<tr>
<td>CIP Safety (Vol 5)</td>
<td>7</td>
</tr>
<tr>
<td>CIP Security (Vol 8)</td>
<td>9</td>
</tr>
<tr>
<td>CIP Motion (Vol 9)</td>
<td>16</td>
</tr>
</tbody>
</table>
### Key Accomplishments since last Annual Meeting

<table>
<thead>
<tr>
<th>Topic</th>
<th>SIG</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP Motion Reorganization</td>
<td>Motion &amp; Time Sync</td>
<td>Reorganize all the current material into one new volume</td>
</tr>
<tr>
<td>CIP Security</td>
<td>EtherNet/IP System</td>
<td>First prototypes available and two interoperability tests</td>
</tr>
<tr>
<td>EtherNet/IP CT13 and CT14</td>
<td>Conformance</td>
<td>Supporting slides</td>
</tr>
<tr>
<td>DeviceNet CT27 and CT28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roundtable Diagnostic Activities</td>
<td>Roundtable, CIP System, EtherNet/IP System</td>
<td>First enhancements related to the ongoing diagnostic activities</td>
</tr>
<tr>
<td>DLR Whitepaper</td>
<td>EtherNet/IP Infrastructure</td>
<td>New ODVA publication</td>
</tr>
<tr>
<td>Time Sensitive Networking</td>
<td>Motion &amp; Time Sync</td>
<td>Supporting slides</td>
</tr>
</tbody>
</table>
Conformance Test Updates

- EtherNet/IP CT13 and CT14 released
- DeviceNet CT27 and CT28 released

- Significant Enhancements to Common Object Tests
  - Port, Energy and Power, PRP/HSR, TCP/IP, Ethernet, File, CoCo

- Diagnostic Counters
  - From EtherNet/IP Roundtable initiative
Distributed Motion & Time Synchronization SIG

• In November 2015 the SIG changed its name from: “The Distributed Motion SIG” to “The Distributed Motion & Time Synchronization SIG”

• Extended charter to include emerging standards and technologies, including:
  – Time Sensitive Networking
  – Gigabit Ethernet

• Time Synchronization and TSN Activities
  – Analysis of Frame Preemption, Stream Reservation Protocols, Gigabit Ethernet, and Scheduling on overall Performance in the CIP Motion architecture
<table>
<thead>
<tr>
<th>Topic</th>
<th>SIG</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
<td>EtherNet/IP for Process</td>
<td>Finalize HART mapping on CIP</td>
</tr>
<tr>
<td>CIP Security Phase 1.5 &amp; 2</td>
<td>EtherNet/IP System</td>
<td>Certificate enrollment CIP Authentication and Authorization</td>
</tr>
<tr>
<td>DeviceNet of Things</td>
<td>DeviceNet of Things, CIP System</td>
<td>Supporting slides</td>
</tr>
<tr>
<td>IO-Link</td>
<td>IO-Link Integration</td>
<td>Supporting slides</td>
</tr>
<tr>
<td>Roundtable Activities</td>
<td>Roundtable, CIP System, EtherNet/IP System</td>
<td>Diagnostic project, LLDP investigation, CIP Security, Interoperability</td>
</tr>
</tbody>
</table>
DeviceNet of Things SIG

- Proposed plans for next 12-18 months
  - Complete work on the Physical Layer Spec
    - Work on the Power Supply concept
    - Test specification
  - System integration in control / PLC system
    - Scanner enhancements
  - Profile description
  - System Tests
Proposed plans for next 12-18 months

- Specification enhancements
  - Finalization
  - Publication in Volume 7B

- Conformance Test Plan
  - Setup and finalization
THANK YOU