Future Direction of Foundation Fieldbus

May 23, 2012

Hisashi Sasajima
V.P. Fieldbus Foundation
1. FOUNDATION Technology Gains Momentum
2. Major Recent Installations and Success Cases
   • FOUNDATION Technology Controls The World’s Largest Plants, Most within the Past Few Years
   • FPSO (Floating Production, Storage and Offloading system)
3. Situation of Foundation Technology
   • Devices, Hosts,& Registration
4. Future Technology Roadmap
   • FOUNDATION for Remote Operations Management
   • FDI: Field Device Integration Initiative and LLC
   • SIF (Safety Instrumented Functions)
5. Foundation Certified Training Program (FCTP)
• Economy has Recovered and so Has the Fieldbus Projects Business
• FOUNDATION Technology is controlling the world’s largest plants and refineries
• Many Large Grassroots Projects in the Heavy Process Industries Incorporating FOUNDATION Technology
• Many Project Opportunities in FPSO
• FOUNDATION Technology Increasingly Incorporated into Migration & Modernization Projects
FOUNDATION Technology Controls The World’s Largest Plants, Most within the Past Few Years

- Reliance Jamnagar Refinery, India
- Shanghai SECCO Refinery, China
- CSPC Nanhai Refinery, China
- Petro-Rabigh Mega-Project, Saudi Arabia
- Drax: Largest Coal Fired Power Plant in UK
- NAM Groningen Gas Field: Largest Gas Producer in Netherlands
- FPSO: PSVM (Plutao, Saturno, Venus and Marte) development by BP in Angola’s offshore Block 31 oilfield
1. Reliance Jamnagar Export Refinery (JERP)
   - World largest refinery: 1,240,000 bpd (Expansion of existing 660 bpd, additional 580,000 bpd capacity).
   - More than 3600 Segments, 32,000 Devices
2. Shanghai SECCO Refinery (上海赛科石油化工有限责任公司)

- BP/SINOPEC Shanghai Petrochemical Corporation (SPC) Joint Venture
- 2,300,000 t Petrochemical Complex (2463 Segments, 23,000 Devices, 8,200 Control Loops)
- OPEC Savings by Maintenance Management Solutions
3. CSPC Nanhai Refinery

- Shell and CNOOC joint project
- Refining & Petrochemical Complex with 16,000 FF Devices
- 800,00 t Ethylene Complex, Styrene Monomer 560,000 t
- Online Process/ Device Diagnostics
4. Petro-Rabigh Mega-Project, Saudi Arabia

- Saudi Aramco/Sumitomo Chemical Joint Project
• Drax: Largest Coal Fired Power Plant in the UK
• NAM Groningen Gas Field: Largest Gas Producer in Netherlands
• Molson Coors: Using FF for Energy Optimization
• Duke Power: Using FF in a Nuclear Application
• Novo Nordisk: FF for Multiple Applications in Life Sciences

…and Many Others…
FOUNDATION Fieldbus Provides Advantages with Process OEM Equipment

- Faster Integration of Skids
- Faster Commissioning
- Easier Validation
- Reduced Cost to Both End User and OEM
The developments is based on clustered subsea production wells, 2000 m water depth, tied-back to an external turret moored converted FPSO.

The topsides comprises of process modules for fluid reception, separation, treatment, dehydration, metering and export of the crude oil to export tankers. Utilities modules are provided for power generation, air compression, etc. and an accommodation module is located towards the stern of the vessel.

The project fully leverages the potential benefits of FOUNDATION™ fieldbus technology.

Integrated, Control and Safety System (ICSS)
**FPSO PROJECT ACTIVITY OVERVIEW**

- **Fieldbus Intrinsically Safe Concept (FISCO)**
  - Highest levels of operational safety in hazardous areas
  - Fully live-workable IS circuits throughout the FOUNDATION™ field network
- Performance and online diagnostics.
- Control in the field device (valve)
- Pre-assembled FF Junction Boxes for devices.
- Surge protection for the network trunk.
- Spur short-circuit protection in the wiring hub

**Benefits of FOUNDATION Fieldbus in FPSO**

**Fieldbus**
- 191 instruments
- 24,000 feet of wire
- 22 homeruns

**Conventional**
- 191 instruments
- 1,500,000 feet of wire
- 191 homeruns

**Costs:**
- Wire - $18,400  Wire - $301,000
- Wiring blocks – $19,100
- Connectors – $17,400
- Miscellaneous – $7300
- **TOTAL** - $62,200

- The Integrated Control and Safety System (ICSS) includes DCS oriented Integrated Production Control System, Safety Instrumented System (SIS) and integrated information system.
- The ICSS provides a single interface for operators to start, control, and monitor all facilities from a central control room (CCR).
- Fieldbus architecture fits well with modular construction approach of FPSOs.
Business Case

- Fieldbus control strategies are able to lower capital costs
- Systems can be extended or altered ‘hot’, reducing down-time
- Self-safety techniques built into devices
- Easily extended systems with ‘plug and play’ devices

Lower capital costs  
Reduce installation costs  
Decrease time-to-market
Decrease operating expenses  
Reduce maintenance requirements
• According to ARC, the installed base of process automation systems reaching the end of their useful life is $65 billion. Most of these are 20 years old or older.

• FOUNDATION Fieldbus is being chosen by more major end users as they begin to modernize their installed base.

• Users want to avoid a functional replacement.

Nobody Wants to Replace this with “More of the Same”
Fieldbus Foundation

IP development

Promote

500 members/affiliates

Digital

Interoperable

Vendor Neutral

Automation Focused
# By the Numbers

<table>
<thead>
<tr>
<th>Registered Products</th>
<th>675+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Hosts</td>
<td>11</td>
</tr>
<tr>
<td>Control Systems</td>
<td>6,000</td>
</tr>
<tr>
<td>Devices in Service</td>
<td>1,000,000+</td>
</tr>
</tbody>
</table>
Registered Devices

- 439 Unique Registered Devices
- 236 Re-Registrations
- 675 Total Registrations

Registrations

Jan '98  Jan '00  Jan '02  Jan '04  Jan '06  Jan '08  Jan '10

New

Renewed

Fieldbus Foundation
End User Seminar
Jakarta, Indonesia
May 23, 2012
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Registered Devices & Hosts

675+ Devices
11 Hosts

From 9 Companies
- ABB
- Azbil/Yamatake
- Emerson
- GE
- Honeywell
- Invensys
- Siemens
- Supcon
- Yokogawa
We Test & Register Everything from Cable to Host

Host Profile and ITK Testing

Host Profile Testing

- FOUNDATION-SIF Host
- Integrated Host
  - Operations
  - Maintenance
  - Engineering

Power Supplies

Couplers & Terminators

HSE Network Cable

H1 Network Cable

HSE Devices

ITK Testing

Visitor Host

H1 Devices

Bench Host
Fieldbus Survey: Adoption and Challenges

• Survey construction is complete.
• Will be distributed through ARC and major media outlets
• ARC will host the survey and help us analyze the results
• Based on past survey responses, we should get several hundred responses from end users, systems integrators
• Why are users and systems adopting fieldbus? If not, why not?
• What are the primary challenges faced by users?
• 1.2 million devices sold
• Over 6,000 systems installed worldwide
• Total market for fieldbus products and services is over $2 billion, and growing faster than the overall process automation market.
Fieldbus Survey: Key Questions

- Have you recently installed fieldbus devices and systems? If so, was it for a greenfield project, expansion, project, or modernization project?
- If you did not install fieldbus devices and systems, what were some of the primary reasons?
- What were your primary purchase criteria for fieldbus products and systems?
- What were the primary benefits and challenges during the design and installation phase? The operational and maintenance phase?
• Have you recently installed fieldbus devices and systems? If so, was it for a greenfield project, expansion, project, or modernization project?
• If you did not install fieldbus devices and systems, what were some of the primary reasons?
• What were your primary purchase criteria for fieldbus products and systems?
• What were the primary benefits and challenges during the design and installation phase? The operational and maintenance phase?
• FOUNDATION Fieldbus leads the process fieldbus market, accounting for close to 74 percent of digital fieldbus solutions for the process industries.
• CAGR of over 13 percent in digital fieldbus solutions over the next five years
EUAC: End User Advisory Council

- EUAC Composition

- Wes Meger
  - Canada

- Rong Gul
  - EMEA

- B.R. Mehta
  - India

- Herman Storey
  - US

- Board Liaison
  - Tim Madden

- Staff Support
  - Stephen Mitschke

- Advisor
  - Rich Timoney

- Chair
  - John Rezabek

- Luay Al-Awami
  - Middle East

- Satoru Nunokawa
  - Japan

- Duncan Turner
  - Australia
Our Future Direction: Helping Users Realize Foundation™ Benefits
See Your Process in High Definition

- Diagnostic Data from FOUNDATION Fieldbus Devices is Miles Ahead of Other Technologies
- Incorporation of NAMUR NE 107 Diagnostics
- Transmission of multiple process variables
- User layer!
- Physical layer diagnostics
- Distinguishing Device Problems from Process Problems
The old Remote Operations Management Model

- Systems collect historical data
- End users analyze the data using their tools and their intellect
- End user make decisions about the future based on their conclusions and historical data
- Steady state environment
- “Coordination comes from a central location in a rigid, hierarchical fashion”: ARC Advisory Group
- Hard wired
- Large degree of customization is often the case
- Run to failure
Introducing FOUNDATION for Remote Operations Management

- Provides a wireless and wired infrastructure for remote assets and applications, all within FOUNDATION fieldbus
- Integrates Wired Infrastructure, Remote I/O, ISA100.11a and WirelessHART®
- Incorporate remote operations data into FOUNDATION Fieldbus infrastructure for data management with direct access to device diagnostics
- FOUNDATION for ROM has the potential to transform remote operations, providing greater reliability and reduced costs.
Application Example

Remote Process

Control Room

HSE Wired and Wireless Backhaul

FOUNDATION for ROM Device

Wireless Backhaul Enables Access To Remote Sensors Using Standard Wireless Technologies

Wireless
What are FOUNDATION for ROM Products?

- More than a simple protocol translation gateway
- Capability Can be Embedded into Existing RTUs, Controllers, etc.
- Will be Tested & Registered with Fieldbus Foundation
The Business Value of FOUNDATION for ROM for End Users

- Enables real time operations management and more effective use of remote experts
- Enables Predictive Maintenance Strategy
- Fewer Personnel
- Reduced engineering and operational costs
- Familiar & comprehensible to a good DCS engineer
- Highly configurable
- Increased Reliability & Availability
- Open and Interoperable Standard
- Less Customization
- Greener

Source: Aramco
FOUNDATION for ROM Device Consolidates Diagnostic Data from Different Networks....

FOUNDATION Infrastructure for Data Management and Diagnostic Information

- Diagnostic & Instrument Data
- Conventional I/O
- H1
- Diagnostic & I/O Data
- HART I/O
- Transducer Blocks
- WirelessHART
- ISA100.11a
And Transmits That Data Across the Wired or Wireless Backhaul to a Central Location/s

HSE Wireless Backhaul

Host System
Central Control Room
Remote Monitoring Station
Etc.
Device Diagnostics Example

H1 + HSE

- Failure
- Out of Specification
- Maintenance Required
- Device Memory Error

- Function Check

- Failure
- Out of Specification
- Maintenance Required
- Device Internal Temperature High

- Function Check

- Failure
- Out of Specification
- Maintenance Required
- Calibration Has Drifted

- Function Check

- Failure
- Plugged Impulse line
Managing Diagnostic Data from Multiple Networks in a Single Infrastructure

- Easier audit trail and reporting
- Data is time-stamped
- FOUNDATION Fieldbus devices can indicate data quality -- whether signals communicating setpoints, PVs, etc. have good, bad or uncertain quality.
- Structured data and data quality means improved handling of failures when one does happen.
- Failure is alarmed, handled by control algorithm
### NAMUR NE 107 Diagnostics Capability

<table>
<thead>
<tr>
<th>Status signal</th>
<th>Color</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal; valid output signal</td>
<td><img src="#" alt="Green" /></td>
<td><img src="#" alt="Green" /></td>
</tr>
<tr>
<td>Maintenance required; still valid output signal</td>
<td><img src="#" alt="Blue" /></td>
<td><img src="#" alt="Maintenance" /></td>
</tr>
<tr>
<td>Out of specification; signal out of the specified range</td>
<td><img src="#" alt="Yellow" /></td>
<td><img src="#" alt="Question Mark" /></td>
</tr>
<tr>
<td>Function check; temporary non-valid output signal</td>
<td><img src="#" alt="Orange" /></td>
<td><img src="#" alt="Wrench" /></td>
</tr>
<tr>
<td>Failure; non-valid output signal</td>
<td><img src="#" alt="Red" /></td>
<td><img src="#" alt="X" /></td>
</tr>
</tbody>
</table>
A Single Environment for Information in Context & Data Quality

Remote Processes

- Maintenance
- Operations
- Engineering

Data Management & Quality

- Process Control
- Custody Transfer
- Machinery Health Monitoring
- Fire & Gas Detection
- Safety Interlocks
- ROM (Remote Operations Management)
An Open Standard for Remote Operations Management

- FOUNDATION Technology is a Standard. Standards *Promote Choices*
- Administered by an Open Foundation, Vendor Neutral
- Products are Tested and Registered
- Standards Based Solutions are More Easily Replicated and Administered
Application Examples: Oil and Gas Fields

- Enables Integrated Operations

Source: CAP Gemini
Application Examples: Pipelines

- API Monitoring, Custody Transfer

Source: Moxa
Application Examples: Tank Farms

- Overfill Protection, Integration of Fire & Gas Detection
Application Examples: Mining, Hydro Fracking

- Coordination of widely dispersed automation assets
- Oil sands
- Concentrating data from multiple wellheads
- Smaller environmental footprint
Application Examples: Pharma

- Faster Integration of Multiple Skid Mounted Mobile Units
- Faster Commissioning
- Easier Validation
- Reduced Cost to Both End User and OEM
## Technical Specification Development Program

### H1 + HSE

#### Basic Control
- Analog Input
- Analog Output
- Bias & Gain
- Control Selector
- Discrete Input
- Discrete Output
- Manual Loader
- PD Control
- PID Control
- Ratio Control

#### Advanced Control
- Analog Alarm
- Arithmetic
- Deadtime
- Device Control
- 8 Channel Discrete Input/Output
- Flexible Function Block
- Input Selector
- Integrator
- Lead/Lag
- Setpoint Ramp Generator
- Signal Characterizer
- Splitter
- Timer

#### Remote Operations Management
- Large Point Count Remote Devices
- 64 Channel Discrete Input/Output
- 16 Channel Analog Input/Output
- Wired HART® Connectivity
- Wireless Connectivity
  - Wireless HSE Backhaul
  - Wireless Field Devices
    - *WirelessHART®*
    - ISA100.11a

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Fieldbus Foundation
End User Seminar
Jakarta, Indonesia
May 23, 2012

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FOUNDATION for ROM Development Phases

HSE Remote I/O (HSE RIO)
- Wired HSE
- FOUNDATION for ROM Device
  - I/O
  - FF H1
  - HART® I/O

HSE Wireless Backhaul and WirelessHART® Interface
- Wireless HSE Backhaul
- FOUNDATION for ROM Device
  - WirelessHART®

ISA100.11a Interface
- Wired HSE
- Wireless HSE Backhaul
- FOUNDATION for ROM Device
  - ISA100.11a

Interface to Other Networks and Flexible Function Blocks
- Wired HSE
- Wireless HSE Backhaul
- FOUNDATION for ROM Device
  - Other Networks (e.g. MODBUS)
FOUNDATION for ROM Development Teams

- Large Point Count Device
- Multi-channel I/O
- Wired HART Block

Fieldbus Foundation – ISA Cooperation
ISA100.15 Working Group

Wireless HSE Backhaul

Conventional I/O

H1

Wired HART

WirelessHART

ISA100.11a

Wireless Sensor Integration Team
Configuration
1. User configures Expected Tags in Association Block
2. ROM Device instantiates appropriate Transducer Blocks
e.g. RIO, HART, WirelessHART, ISA100.11a
3. ROM Device changes TB Tag to Expected Tag
4. TB are connected to FBs.
5. FB links and device diagnostics are configured

Operation
- Real-time process data published as configured
  - Control
  - HMI
  - Asset Management
- Device diagnostics are reported as configured
  - Control
  - HMI
  - Asset Management
  - Maintenance

Association Block (AB)

TB Tag = “TIC_334”

TB Tag = “TIC_336”

TB Tag = “TIC_335”

TB Tag = “TIC_336”

TB Tag = “Tank_1”
Device Diagnostics

- Utilizes advanced diagnostic capabilities of intelligent devices
- 4 standard “status signals” categories are available
- Mapping of diagnostics in status signals configurable by user
- Enables condition-based maintenance – automatic work orders
- Optimizes maintenance functions
- Detailed information available on demand
FOUNDATION for ROM – Wireless Backhaul Model

CCD - Set of devices

BHI - Provides isolation and security of communications flows

BSP - Provides connectivity between CCD’s

IF1 - Physical interface to the backhaul technology

IF2 - Protected data flowing across the backhaul - authentication, authorization, encryption

IF3 - Physical interface to CCD

IF4 - Transparent end-to-end communication between CCDs

IF5 - Management - Configuration of IF1-IF3 and BHI functions
### Foundation for ROM – WirelessHART Integration

**Association Block (AB)**

- **TB**<sub>LL</sub>
  - TB Tag = “HART_LIVE_LIST_GW_1”

- **TB**<sub>HART</sub>
  - TB Tag = “HART_5”

**Gateway Status Table**

<table>
<thead>
<tr>
<th>Gateway</th>
<th>Expected Tag</th>
<th>Network Address</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW_1</td>
<td>HART_5</td>
<td>5</td>
<td>Good</td>
</tr>
<tr>
<td>GW_1</td>
<td>HART_7</td>
<td>7</td>
<td>Bad</td>
</tr>
<tr>
<td>GW_1</td>
<td>HART_9</td>
<td>9</td>
<td>Good</td>
</tr>
<tr>
<td>GW_1</td>
<td>HART_10</td>
<td>10</td>
<td>Good</td>
</tr>
<tr>
<td>GW_1</td>
<td>HART_11</td>
<td>11</td>
<td>Bad</td>
</tr>
</tbody>
</table>

**Mesh Status**

**WirelessHART Mesh**

- Network Address 5
- Network Address 7
- Network Address 9
- Network Address 10
- Network Address 11
FOUNDATION for ROM – ISA100.11a Integration

Association Block (AB)

TB Isa

TB LL

Mesh Status

<table>
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<td>9</td>
<td>Good</td>
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<td>ISA_10</td>
<td>10</td>
<td>Bad</td>
</tr>
<tr>
<td>GW_1</td>
<td>ISA_11</td>
<td>11</td>
<td>Good</td>
</tr>
</tbody>
</table>

GW_1

Network Address 5

Network Address 7

Network Address 9

Network Address 10

Network Address 11

ISA100.11a Mesh
Media Day Demo December 2011 Lee College, Baytown Texas
FOUNDATION for ROM Media Event
December 1 at Lee College

Operator Station  Wireless Backhaul  Security

Wi-Fi  HSE  HSE  HSE  ISA100.11a  WirelessHART

HSE  HSE  I/O  HSE  I/O  ISA100.11a

H1  WirelessHART  HART

Remote Process

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# Specification Development Timeline

### 2008
- **✓** Draft Preliminary Specifications – Conventional I/O, HART, *WirelessHART*  
  - Oct

### 2009
- **✓** Wireless Backhaul Networking Team Kickoff  
  - Jan
- **✓** Validation Team Kickoff Meeting  
  - Feb
- **✓** First Laboratory Prototypes – Conventional I/O  
  - Aug

### 2010
- **✓** First Laboratory Prototypes – HART  
  - Mar
- **✓** First Laboratory Prototypes – Wireless Backhaul  
  - Aug
- **✓** First Laboratory Prototypes – *WirelessHART*  
  - Nov
- **✓** ISA100.11a Development Team Kickoff  
  - Oct
- **✓** Preliminary Specifications – Conventional I/O  
  - Dec

### 2011
- **✓** Final Specifications – Conventional I/O  
  - Apr
- **✓** Preliminary Specifications – Wired and *WirelessHART*  
  - Sep
- **✓** Wireless Backhaul Architecture Model Approval by ISA100.15  
  - Oct
- **✓** FOUNDATION for ROM Media Event at Lee College  
  - Dec

### 2012
- **✓** FOUNDATION for ROM Demo Working Group Kickoff  
  - Feb
- **✓** Final Specifications - Wired and *WirelessHART*  
  - Mar
- **✓** ISA100.11a Draft Preliminary Specification  
  - Apr
- **✓** FOUNDATION for ROM Media Event at Jemima - Japan  
  - Oct
Live Field Demos Being Planned Starting in 2013

- Petrobras
- Reliance Refining
- Saudi Aramco
- Two more sites to be identified
# Supplier Sponsors for Field Demos

<table>
<thead>
<tr>
<th>Supplier Sponsors</th>
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</thead>
<tbody>
<tr>
<td>Advanced Process Automation Technologies (APAT)</td>
</tr>
<tr>
<td>Azbil (Yamatake)</td>
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<tr>
<td>BEKA Associates</td>
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<tr>
<td>Emerson Process Management</td>
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<tr>
<td>Festo Brasil Ltda.</td>
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<td>MTL</td>
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<td>Phoenix Contact</td>
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<td>Reliance Jamnagar</td>
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<tr>
<td>R. STAHL Schaltgerate GmbH</td>
</tr>
<tr>
<td>Smar International Corporation</td>
</tr>
<tr>
<td>Westlock Controls Corporation</td>
</tr>
<tr>
<td>Yokogawa Electric Corporation</td>
</tr>
</tbody>
</table>
FDI Cooperation LLC
With the Device Integration, a Host can get access (from a central location) to the Device functions and information.

With devices getting more complex, the device integration becomes a must.
A Common Approach
FDI is supported by Manufacturers and Foundations

- ABB
- Emerson
- Endress + Hauser
- Honeywell
- Invensys
- Siemens
- Yokogawa
- FDT Group
- Fieldbus Foundation
- HART Communication Foundation
- OPC Foundation
- PROFIBUS/PROFINET International
FDI Marketing Committee
- We are doing our part on the FDI marketing committee
- Handled logistics for press conference and board meeting at ARC Forum
- Press conference had excellent attendance
- North American automation media is now reporting on FDI
**Target: A single Device Driver**

The Device Package

- Device Definition (Def)
- Business logic (BL)
- User Interface (UID)

- Programmed User Interface
- Device Applications

**Device Package**

- **EDD**
  - FDI encoded file format

- **UIP** (optional)

- Attachments

**Electronic Device Description Language (EDDL)**

**Windows Presentation Foundation (WPF)**

- Manuals
- Certificates
- Protocol specific Files (GSD(ML), etc.)
Harmonized EDDL

Standard

- Harmonized EDDL (IEC 61804-3)
- PROFIBUS
- Foundation Fieldbus
- HART
- UIP

Device Package development

- FDI IDE

Certification/Registration

- FDI Host
  - FDI Client
    - UID Renderer
    - UID Hosting
  - OPC UA Services
    - Information Model
    - EDD Engine
  - OPC UA Services
    - Communication Server

Control system

- FDI Server
  - EDD Engine
  - Information Model
  - OPC UA Services
  - Communication Server

FDI

EDDL

UIP
Common Development Environment

Integrated Development Environment (IDE)

- Editing
- Tokenizing
- Packaging

Reference Host
- UID Renderer
- UID Hosting
- EDD Engine

UIP

EDD

Device Package

Development → Test → Certification/Registration
Generic FDI Architecture

Within FDI (e.g. Within the Device Package) may be used only the harmonized EDDL
IEC Standardization

May 2011:
- DKE K956 has agreed to start FDI standardization and has sent New work item Proposal (NP) to IEC

July 2011:
- IEC has sent out NP to worldwide national committees

October 2011:
- Unanimous agreement by national committees of IEC
- Experts from 6 countries available
- IEC SC65E/WG7 will be responsible for FDI

Beginning of 2012
- Committee Draft (CD) will be available

2014
- Publication of IEC standard
User-Requirements are fulfilled

1. FDI Device Packages may use only the harmonized EDDL.

2. FDI Host Systems implement the FDI Standard Components. The Host Components are maintained centrally.

3. The EDDL is mandatory in a Device Package.

4. User has the choice to activate UID and/or UIP of a Device Package.

5. Migration path for the installed Base are provided.

6. Each device shall have only one Device package that can support optional features that may or may not be activated.
FDI-Summary

• FDI fulfills the End-User requirements
• Process Automation manufacturers support FDI
• The Preliminary Draft Specifications available Q1/12
• The IEC Standardization is underway
• The EDDL was harmonized across HART, Profibus and Fieldbus Protocols
• FDT-FDI Interoperability
• The “Foundations” work together in the FDI Cooperation LLC to finalize the FDI Specifications, Tools and Standard Components
Fieldbus Foundation Social Media Strategy

On Line Today

http://www.youtube.com/user/FieldbusFoundation
http://twitter.com/#!/FOUNDATIONField
http://www.linkedin.com/groups/Fieldbus-Foundation
http://twitter.com/#!/FOUNDATIONFi
http://foundationfieldbus.blogspot.com/
Thank You