Overview

- Host registration program
- Field Diagnostics
- Field Device Integration (FDI)
- AG 181 Revision
- WIO (Wireless & Remote I/O)
Host Registration Program
Host Profile Registration

Class 62 – Visitor Host

Class 61 – Integrated Host

Class 63/64 – Bench Host

Operations

Engineering

Maintenance

Note: Illustrations are examples only. Supplier defines host.
2. Host Interoperability Support Test Profiles

2.1 Profile Groups and Classes
A host application will consist of one or more hardware and software components specified by the host manufacturer. For example, a Class 61 integrated host may consist of a controller, engineering station, operation station and asset management station. Individually, these components may not conform to a profile class, but collectively these components function as a single host profile class. The host manufacturer must specify all components that collectively meet the profile class.

It is possible that a host may meet multiple profiles. For example, a host may meet both Class 63 and Class 64. In this case, some features in class 63 are specified as mandatory and specified as prohibited in class 64. The manufacturer must document how those host features are enabled in class 63 while disabled in class 64. (e.g. menu configuration)

<table>
<thead>
<tr>
<th>Group 6 Host Profile Classes</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 61 Integrated Host</td>
<td>Primary, on process host that manages the communication and application configuration of all devices on a network.</td>
<td></td>
</tr>
<tr>
<td>Class 62 Visitor Host</td>
<td>Temporary, on process host with limited access to device parameterization.</td>
<td></td>
</tr>
<tr>
<td>Class 63 Bench Host</td>
<td>Primary, off process host for configuration and setup of a non-commissioned device</td>
<td></td>
</tr>
<tr>
<td>Class 64 Bench host</td>
<td>Primary, off process host with limited access to device parameterization of an off-line, commissioned device</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
In addition to the profiles listed above, the hosts may be suffixed by a compliance level "a" or "b" as specified in table 2.2.1. Each compliance level will become mandatory for new campaigns as defined by the FF-525 Host Profile Test and Registration Process.

2.1.1 Class 61 - Integrated Host
The class 61 integrated host is the primary on-process host.

2.1.1.1 Characteristics
- Fixed H1 address, on process
- Sets and manages Physical Device TAGs for all devices.
- Sets and manages the network configuration (device address, link parameters, application time)
Host Profile Specification - Key Features

Extension to the existing specifications
- Defined in FF-569 Host Interoperability Support Test Procedures
- Released in next specification package update

Defines four profiles
- Integrated Host
- Bench Host (for use with on-process devices)
- Bench Host (for use with non-commissioned devices)
- Visitor Host

For each profile, features are marked
- (M)andatory - required for system interoperability
- (O)ptional - useful, but not essential
- (P)rohibited - to prevent interoperability issues

Staged Implementation
- Two stage profile (6Xa, 6Xb) provides time for systems to become compliant
# Host Profiles and Features – levels a & b

<table>
<thead>
<tr>
<th>Feature</th>
<th>Class 61 Integrated Host</th>
<th>Class 62 Visitor Host (II)</th>
<th>Class 63 Bench Host (HI) Non-Commissioned Device</th>
<th>Class 64 Bench Host (HI) Commissioned Off-Line Device</th>
<th>Section No.</th>
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</thead>
<tbody>
<tr>
<td><strong>Level a &amp; b</strong></td>
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<tr>
<td><strong>Foundation H1 Device Support</strong></td>
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<tr>
<td>H1 Device Address Assignment</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>3.1.1</td>
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<tr>
<td>Configuration of Link Master Devices</td>
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<td>H1 Physical Device Tag Assignment</td>
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<td>M</td>
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<td>Convert Link Master to Basic Device</td>
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<td>P</td>
<td>M</td>
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<td>H1 Software Download</td>
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<td><strong>Foundation Distributed Application Support</strong></td>
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<tr>
<td>Block Tag Configuration</td>
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<td>M</td>
<td>M</td>
<td>M</td>
<td>3.3.4</td>
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<tr>
<td>Block Duplication</td>
<td>O</td>
<td>O</td>
<td>M</td>
<td>M</td>
<td>3.3.4</td>
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<tr>
<td>Multiple Capability Levels</td>
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<tr>
<td>Resource and Transducer Blocks</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>3.3.4</td>
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<tr>
<td>Standard Function Blocks</td>
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<tr>
<td>(Standard Parameters of Standard and Enhanced Blocks)</td>
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<td>Enhanced Function Blocks</td>
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<tr>
<td>(Enhanced Parameters of Enhanced Function Blocks)</td>
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<td>Profixed Custom Function Blocks (1)</td>
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<td>M</td>
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<td>3.3.4</td>
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<tr>
<td>Configuration of scheduled control function blocks</td>
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<tr>
<td>Function Block Linking and Publication Scheduling</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>3.3.10</td>
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<tr>
<td>Function Block Execution Scheduling</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>3.3.11</td>
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<td>Flexible Function Blocks – Fixed OD</td>
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<tr>
<td>Flexible Function Blocks – Variable OD</td>
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<td>Multivariable Optimization (Publisher/Subscriber)</td>
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<tr>
<td>Multivariable Optimization (Report Distribution)</td>
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<td></td>
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</tr>
<tr>
<td>Use Views for Block Data Reads</td>
<td></td>
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<tr>
<td>Multivariable Optimization (Report Distribution)</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Don't care | N/A | DNA

---

O = Optional
This feature may or may not be implemented. If implemented, it will be tested and credited as part of compliance for the relevant profile.

P = Prohibited
This feature is restricted to achieve compliance for the relevant profile. Hosts that implement multiple profiles must demonstrate how the feature is de-activated when operating in the corresponding profile.
Transition to Host Registration

<table>
<thead>
<tr>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

Host Interoperability Support Test
(HIST) 1.x
Valid through Dec 2008

Host 6Xa Profile Test/Registration
registration until June 2010

Host 6Xb Profile Test/Registration
remain in catalogue but no new registrations
Registered Hosts (Oct. 2009)

Registered Product Catalog

Search Results

Results 1 - 7 of 7 for

ABB AUTOMATION PRODUCTS GmbH
Industrial IT System 800xA

EMERSON PROCESS MANAGEMENT
DeltaV & AMS Suite: Intelligent Device Manager

HONEYWELL PROCESS SOLUTIONS
Experion PKS

INVENTYS
Infusion Enterprise Control System

YAMATAKE CORPORATION
Industrial-DEO / Hamonas

YOKOGAWA ELECTRIC CORPORATION
CENTUM VP

YOKOGAWA ELECTRIC CORPORATION
STARDOM

Endress+Hauser

Level

Fieldbus Foundation

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Global News

Fieldbus Foundation Announces FOUNDATION Device 1FK Profile Final Specification
Fieldbus Foundation To Participate In ISA 104 EDDL Booth At ISA EXPO 2009 In Houston
Fieldbus Foundation Releases Updated H1 & HSE Test Kits
FOUNDATION Fieldbus Developer Training To Be Offered During October In Austin, Texas
Fieldbus Foundation Announces FOUNDATION Positioner Transducer Block Final Specification
FDI Project Team Achieves Development Milestones
Fieldbus Foundation Announces Copyright Agreement With PROLITE INTERNATIONAL

Endress+Hauser

Level
FOUNDATION™ Technology Update: Diagnostics
## Types of Maintenance Activities

<table>
<thead>
<tr>
<th>Maintenance Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unnecessary maintenance</td>
<td>Performed on a healthy asset.</td>
</tr>
<tr>
<td>Reactive maintenance</td>
<td>Performed after the asset has failed.</td>
</tr>
<tr>
<td>Preventive maintenance</td>
<td>Performed on a regular schedule.</td>
</tr>
<tr>
<td>Predictive maintenance</td>
<td>Schedule based on basis of failure rate and drift statistics.</td>
</tr>
<tr>
<td>Proactive maintenance</td>
<td>Schedule based on built-in asset diagnostics.</td>
</tr>
<tr>
<td>Opportunity based maintenance</td>
<td>Combination of proactive maintenance along with special events (e.g. shutdown)</td>
</tr>
</tbody>
</table>

Source: Rong Gul, Shell Global Solution, *Diagnostics from Safety Devices using FOUNDATION™ Fieldbus*. 
Diagnostics and Foundation™ Fieldbus

Block Alarms
- Configuration Error
- Local Override
- Device Needs Maintenance Soon
- Device Needs Maintenance Now
- Out of Service

Data Quality
- Good
- Bad
- Uncertain

Profiles
- Standard Block Parameters

Asset Specific
- Custom Block Parameters
Collaboration with NAMUR *)

*) NAMUR is an international user association of automation technology in process industries with today 121 member companies.

End Users To Benefit From Fieldbus Foundation And NAMUR Working Group 2.6 Fieldbus Collaboration

AUSTIN, Texas, May 3, 2006 — The Fieldbus Foundation, conducting a press briefing on April 25, 2006 at the INTERKAMA Trade Fair in Hannover, Germany, announced the establishment of a liaison relationship between the Fieldbus Foundation and Working Group 2.6 Fieldbus of NAMUR, the international process industries’ end user group based in Germany. This cooperation will focus on two key issues: grounding and shielding and device diagnostics profiles. These topics have been identified by both parties as areas that require further clarification and guidance – particularly benefiting end users within the process industries across the EMEA region.

Using the power of FOUNDATION Fieldbus, and considering NAMUR requirements, the new standard diagnostic profile aim to:

- Standardize the integration of diagnostic information
- Guarantee valuable information to the user
Diagnosis results must be reliable

Diagnosis results must always be viewed in the context of the application.

Internal diagnosis must be categorized into 4 standard “status signals”

Configuration must be free, as reactions will depend on the user's requirements

Detailed information can be read out by the device specialist
Diagnostic Categories

- Failure
- Function Check
- Out of Specification
- Maintenance Required
Role Based Diagnostics

- Process Control Engineering Station
- Asset Management Maintenance Station
- HSE Control Network
- Plant operators
- Plant maintenance engineering

H1 Process Network

FIELDBUS FOUNDATION CONFIDENTIAL
<table>
<thead>
<tr>
<th>Project Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common view of instruments specific diagnostics</td>
</tr>
<tr>
<td>Common configuration environment</td>
</tr>
<tr>
<td>Extensible</td>
</tr>
<tr>
<td>Leverage existing “push” technologies</td>
</tr>
<tr>
<td>Flexible configuration to meet user applications</td>
</tr>
<tr>
<td>Simulation for FAT/SAT Activities</td>
</tr>
<tr>
<td>Easy to understand and implement</td>
</tr>
<tr>
<td>Adoption by system and instrument vendors</td>
</tr>
<tr>
<td>Alarm Type</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Process Alarm</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Device Alarm</td>
</tr>
</tbody>
</table>
New Field Diagnostic Alarms

<table>
<thead>
<tr>
<th>Parameter Name (*)</th>
<th>NE107 Status Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD_FAIL_ALM</td>
<td>Failure</td>
</tr>
<tr>
<td>SD_OFFSPEC_ALM</td>
<td>Out of Specification</td>
</tr>
<tr>
<td>SD_MAINT_ALM</td>
<td>Maintenance Required</td>
</tr>
<tr>
<td>SD_CHECK_ALM</td>
<td>Function Check</td>
</tr>
</tbody>
</table>

Additional supporting parameters

- Enable/Disable of diagnostic detection
- Enable/Disable Simulation
- Configure Priority
- Configure Alert Suppression (Detect, but not alert)
- Recommended Actions

* Parameter names will have localized text labels. e.g. “Failure Alarm”
EDDL is essential for Field Diagnostics

- Diagnostic Conditions
- Recommended actions
- Configuration and Setep
EDDL and Field Diagnostics

EDDL visualizes device diagnostics to assist in maintenance troubleshooting.
EDDL Graphic Visualization

- Tabbed Card
- Multi-pen Trend Chart
- Frame
- Bar-graph
- Histogram
- Table
- Pop-Up Window
- Image
- Navigation
- Gauge
EDDL and Field Diagnostics
Example of Opportunity based Maintenance

- Wear limit → Failure
- Wear reserve
- Incrustation
- Calibration point "Not covered"
- User adjustable
- Maintenance required
- Maintenance demanded
- Maintenance alarm
- Operating hours

Maintenance Alarm
Failure Alarm
Field Diagnostics device registration is available today with ITK 5.1

Field Diagnostics will be required for new device registrations starting with ITK 6.0 (3Q 2010)

Field Diagnostics support will be required for new host registrations (3Q 2010)
Next Steps

Ask your vendors when Field Diagnostics will be support in their products

Look for Field Diagnostics in the Registered Product Catalog

Add Field Diagnostics to new project requirements
FOUNDATION™ for Safety Instrumented Functions (SIF)
Faster Commissioning
  - Engineering tools provide faster commissioning

Smaller Footprint
  - Fewer marshalling cabinets

Less Hardware
  - Eliminate HART multiplexers
  - No solenoids or limit switches needed with digital positioners
  - Reduced wiring and terminations
SIF Benefits - OPEX

- Advanced Diagnostics
  - Easier detection of random and systematic failures
  - Increase operating reliability and safety by reducing spurious trips

- Increased Test Interval
  - Integrated system provides partial stroke testing
  - Flattening Slope and Drift of PFD average curve
  - Diagnostics enable upset and trip data to be used in the interval calculation

- Improved Asset Management
  - Integration of device diagnostics data
  - Easier maintenance of devices
SIF End User Demonstration Participants

End User Demonstration Sites
- BP – Gelsenkirchen, Germany – Honeywell Logic Solver
- Chevron – Houston, TX – Emerson Logic Solver
- Saudi Aramco – Dhahran – Triconex Logic Solver and Yokogawa Logic Solver
- Shell Global Solutions – Amsterdam – HIMA Logic Solver

Emerson
HIMA
Honeywell
Invensys - Triconex
Yokogawa

Logic Solver
Engineering Workstation

Asset Management

Basic Process Control System

Valve

Magnetrol
Siemens Milltronics

ABB
E+H
Smar
Yokogawa

Other Providers
Fieldbus Diagnostics
Risknowlogy
RuggedCom
Softing
TÜV Rheinland
TÜV SÜD

Level
Pres
Temp

SIF Protocol
H1 Network
Moore
MTL
P+F

BIFFI
Emerson
Westlock
Yamatake

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Technology Update 2009
© 1994 – 2009 Fieldbus Foundation
SIF System at Shell Global Solutions Amsterdam

Fieldbus Foundation
Freedom to Choose. Power to Integrate.

Softing Device Configuration Tool
HIMA Logic Solver Configuration Tool
Yokogawa BPCS
Yokogawa Asset Management

RuggedCom Switch

HSE

HIMA Logic Solver
Segment # → 3 2 1
H1 H1 H1

Runtime

Setup

Fieldbus Diagnostics

Pressure E+H
Pressure Yokogawa
Pressure Smar
Level Siemens
Level Magnetrol

2003

Emerson Valve
Westlock Positioner
P+F

MTL

Smar Temperature

H1

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Technology Update 2009
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SIF Schedule

2008
✓ SIF Demonstration and Press Day May
✓ SIF Technical Team Meeting - Austin Jul
✓ SIF Developers WebEx Aug
✓ SIF Specification v1.2 Released to Developers Sep
✓ SIF v1.2 Test Tool Released with SIF_AI Oct
✓ SIF.AI Lab Validation Completed Nov
✓ SIF.AI Block Approved by TSC Dec
✓ SIF ITK and SIF v1.3 Specifications Released Dec

2009
✓ SIF_DO Prototype - Supplier A Identified Jan
✓ SIF_DO Prototype - Supplier B Identified TBD
✓ SIF_DO Validation with Supplier A May
✓ Outline of SIF Best Practices and Guidelines July
✓ SIF_DO Validation with Supplier B TBD
✓ SIF_DO Block Approved by TSC TBD
✓ Draft of SIF Best Practices and Guidelines Nov
✓ Release SIF Best Practices and Guidelines Dec
EDDL Enhancements

Phase 1 - Completed 2006
✓ Graphs – Graphical display of static Y-T and X-Y data
✓ Charts – Graphical display of real-time data from device
✓ Images – Embedded images
✓ Enhanced User Interface – Screen layouts
✓ Enhanced Data Storage- Securely store data on the host

Phase 2 - Completed 2007
✓ Complex Devices – Off line configuration, Access to Multiple Blocks
✓ Basic Client Applications – OPC Unified Architecture (OPC UA) Data Access
EDDL Enhancements Examples

Graphs, Charts, Images, Screen Layouts Supported

- Multi-pen Trend Chart
- Gauge
- Navigation
- Image
- Bargraph
- Multiple Waveform Graph
- Histogram
- Bar-chart
EDDL Enhancements Examples

All Device Types Supported – Full Functionality

- Radar Level
- Temperature
- Valve Positioner
- Machinery Health
- Pressure
- Mass Flow
- pH
- Ultrasonic Flow
FDI = Benefit (EDDL+ FDT)

- Single solution for integration of field devices into host systems
- Combines strengths of EDDL and Device Type Manager (DTM)
- Open specification that will be an international Standard
- Technology direction agreed by major suppliers
- Use cases agreed by major end users

Platform independence
Robustness
Ease of use
Uniform look and feel
Flexibility
Unlimited Functionality
Unique Features
Nested Communication

One Solution means also only once the effort
FDI Project – General Requirements

- Host system independent
- Platform and operating system independent
- Provide access to the full capability of the field device
- Based on OPC UA client/server specifications and information model
- Support FOUNDATION™ fieldbus, HART®, PROFIBUS and PROFINET
- Adoptable to support other fieldbus communication technologies
- Specifications independently validated by the ECT organizations
- Provide backward compatibility with existing EDD’s and DTM’s
- Provide guidelines for field device and system developers
- Provide conformance tests to assure compliance
- System Architecture
  - Client
    - Advanced Applications – Configuration, Diagnostics, Maintenance
  - Server
  - Device Package

- Backward Compatibility
  - EDDL
  - DTM
FDI Device Package Technologies

Device Package

- **Device Definition**
  - **Mandatory**
  - Based on IEC 61804-3 EDDL

- **Business Logic**
  - **Optional**
  - Based on IEC 62453 FDT

- **User Interface Description**
  - **Optional**
  - Based on IEC 62541 OPC UA

- **User Interface Plug-in**
  - **Optional**
  - Based on IEC 62541 OPC UA
FDI Human Interface Example

User Interface Description

User Interface Plug-In

Programmed Application
## FDI Project Timeline

<table>
<thead>
<tr>
<th>Task</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI Project approved</td>
<td>1Q 2007</td>
</tr>
<tr>
<td>FDI Project technical team kickoff meeting</td>
<td>2Q 2007</td>
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<tr>
<td>Initial use case review with NAMUR and WIB</td>
<td>4Q 2007</td>
</tr>
<tr>
<td>Use cases and requirements approved</td>
<td>2Q 2008</td>
</tr>
<tr>
<td>Architecture</td>
<td>3Q 2008</td>
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<tr>
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<td>4Q 2008</td>
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<tr>
<td>Technology selection</td>
<td>1Q 2009</td>
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<tr>
<td>Draft functional specifications</td>
<td>1Q 2009</td>
</tr>
<tr>
<td>Begin technology validation</td>
<td>2Q 2009</td>
</tr>
<tr>
<td>Draft technical specifications</td>
<td>3Q 2009</td>
</tr>
<tr>
<td>Final specifications</td>
<td>1Q 2010</td>
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Committee Members:

Clark Cogswell  
Shell Global Solutions

Patrick Flanders  
Saudi Aramco

Audun Gjerde  
Shell Global Solutions

Bill Hamilton  
Shell Global Solutions

David Lancaster  
Bechtel O,G&C (ret)

Herman Storey  
Shell Global Solutions

John Rezabek  
ISP Corp.
AG -181 Revisions

• Update contents to reflect current user experiences and implementation methods

• Restructure table of contents:
  1. Introduction, Definitions, Abbreviations
  2. Project Requirements
  3. Host System Requirements
  4. Software Configuration Guidelines
  5. Field Device Requirements
  6. Ancillary Device Requirements
  7. Fieldbus Network/Segment Design Guidelines
  8. Testing Requirements
  9. Site Installation, Commissioning & Validation
  10. Documentation Requirements
AG -181 Revisions

• Add a “Project Requirements” section
  • Introduction
  • Overview of Life Cycle
  • Training at multiple stages of a project
  • Use of Approved Products
  • Project Procedures

• Revise Host System requirements to:
  • include the new HIST (FF-569)
  • Allow non-redundant H-1 interface cards, power conditioners etc. (where applicable)
  • Allow more generic timing values, etc
  • Allow use of HSE

• Address future inclusion of SIF
  – Future considerations
AG -181 Revisions

- Expand “Segment/Network” design guidelines to include:
  - Grounding methods
  - Isolation methods
  - Segregation methods
  - Lightning protection methods

- Simplify “Risk Management” implementation
  - Process impact, not “Criticality” (“Safety Connotation”)
  - Classify as to impact on process control rather than monetary value
  - Matrix using “High, Medium, Low” instead of “Level 1,2,3 & 4”
  - Relaxed quantity of devices per category
AG-181 Revisions

- Define current use and implementation methods for hazardous area classifications:
  - Emphasis on “Non-Intrinsically Safe, High-power trunk – Hybrid
  - Less emphasis on FISCO and FNICO
- Reflect current methods for voltage drop and other segment calculations
  - Less emphasis on dB loss if quality cable is used
  - Less emphasis on VCRs
  - Simplified calculation example
  - Incorporate current values for types of components used today
AG -181 Revisions

- Reflect current cable and wire requirements
  - Emphasis on 100 ohm impedance
    - +,- 20% for <500m segment length
    - +,- 10% for >500m segment length
    - Use of 18 ga for spurs and 16 ga wire for trunks
  - Less emphasis on “Type A” as a “classification”

- Reflect currently used testing methods, including:
  - Device Integration (new category)
  - FAT
  - Installation, commissioning and validation

- Update Documentation Requirements
  - Use of Smart Plant Instrumentation
  - Document examples
High Speed Ethernet (HSE)

Wireless and Remote I/O (WIO)
Latest News:
Initiative Bringing Remote I/O To FOUNDATION Technology

- Fieldbus Foundation launches initiative to develop specification standardizing remote I/O interface into the FOUNDATION architecture
- Remote I/O is a $3 billion dollar market, about one-third of which is connected to DCS
- Users do not have a single infrastructure meeting all their needs, but that is what they prefer
- Existing control networks offer communication capabilities, but stop there
WIO Charter

✓ Develop use cases and requirements for HSE remote I/O and wireless communication in monitoring and control that are interoperable using function blocks and EDDL.

✓ Develop a project plan which includes:
  ➢ Solutions using FOUNDATION™ and wireless technologies developed in accordance with ISA100 and future IEC work
  ➢ Solutions for device interoperability and network configuration
  ➢ Validation of technical specifications
  ➢ Interoperability test and registration procedures

✓ Obtain Technical Steering Committee (TSC) approval of the Project Plan

■ Develop the Technical Specifications  (Status Wireless)
■ Obtain lab prototypes & validate technical specifications  (Status HSE-RIO)
■ Demonstrate interoperability of WIO devices at end user sites
## WIO Development Teams

### HSE RIO Team

<table>
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<tr>
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<tr>
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### HSE Backhaul Team

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### Wireless Sensor Team

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HSE Remote I/O (HSE RIO) Charter

 ✓ Develop use cases and requirements for High Speed Ethernet Remote I/O that are interoperable using function blocks and EDDL.

 ✓ Develop a project plan for which includes:
   - Solutions to the use cases and requirements using FOUNDATION™ technology
   - Requirements for device interoperability and network configuration
   - Development cost and schedule for validation of technical specifications
   - Device interoperability test and registration procedures

 ✓ Obtain Technical Steering Committee (TSC) approval of the Project Plan

 ✓ Develop the Technical Specifications

  ■ Obtain lab prototypes and validate technical specifications  August 2009 Austin

  ■ Demonstrate interoperability of High Speed Ethernet Remote I/O devices at end user sites
USE CASES AND REQUIREMENTS FOR FF HSE-REMOTE I/O

- 2.1 Gateways to other buses
- 2.2 Remote Logic
- 2.3 Simple I/O
- 2.4 Hot Swappable I/O Cards - Transparent to Fault Tolerance
- 2.5 Change field device parameter while operating
- 2.6 Acyclic communication to access config, diagnostic & maintenance data
- 2.7 Device Power
- 2.8 Hazardous Location Installation
- 2.9 Offline Configuration
- 2.10 Motor Control Center Comms
- 2.11 Variable Speed Drives
- 2.12 Sequence of Events (High Resolution Timing)
- 2.13 Redundant I/O Cards - Transparent to Fault Tolerance
- 2.14 Configuration changes while in service
- 2.15 Change control strategy while in service
- 2.16 HSE-RIO used as an RTU
- 2.17 Data buffer with Burst communications (Loss of comm without losing history)
- 2.18 Process Interrupt driven control execution
- 2.19 Distinguish & prioritize between Control & Device Support and Config Comms
- 2.20 HSE Interoperability
- 2.21 Standard Connection Mechanism (Physical Layer - Cables, Connectors etc.)
- 2.22 Redundant Comm
- 2.23 Fault Tolerant Comm
- 2.24 Functional Safety - Support of FOUNDATION™ SIF
- 2.25 Historic data retrieval
- 2.26 Device status of self comms, physical layer & connected devices
- 2.27 RIO Pass through (routable) system (i.e. VPN, Internet, Tunneling)
- 2.28 Security
- 2.29 Configuration change status in HSE-RIO reported
- 2.30 High Frequency Update
- 2.31 HSE-RIO capacities
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<td>HSE Remote I/O Use Cases and Requirements</td>
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Wireless Specification Development (WSD) Charter

✔ Develop use cases and requirements for High Speed Ethernet wireless communication in monitoring and control that is interoperable using function blocks and EDDL.

- Develop an implementation plan which includes:
  - Solutions to the use cases and requirements using wireless communications technologies developed in accordance with ISA100 and future IEC work. The solutions must include requirements for device interoperability and network configuration.
  - Development and validation of profile specifications
  - Development of interoperability test and registration procedures

- Obtain Technical Steering Committee (TSC) approval of the Project Plan

- Develop the Technical Specifications ✏️ Review Oct. 2009 Austin

- Obtain lab prototypes and validate technical specifications
- Demonstrate interoperability of High Speed Ethernet wireless at end user sites

FIELDBUS FOUNDATION CONFIDENTIAL
<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
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<tbody>
<tr>
<td>Ashok Gupta</td>
<td>Aniotek</td>
</tr>
<tr>
<td>Mohammad Amirahmadi</td>
<td>APAT</td>
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<td>Mustapha Sanfri'an</td>
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<td>Phoenix Contact</td>
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<td>André Fritsch</td>
<td>R. STAHL Schaltgeräte GmbH</td>
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<td>Sterling Valley Associates</td>
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<td>Naoyuki Fukao</td>
<td>Yamatake Corporation</td>
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<td>Hiroshi Mori</td>
<td>Yokogawa Electric Company</td>
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**HSE RIO**
Technical Team Leader
Detlef Arndt
P+F

**Wireless Technical Team Leader**
Marcos Peluso
Emerson
WIO Development Phases

WIO Phase 1
HSE Remote I/O

WIO Phase 2
HSE Backhaul & Wireless HART I/F

WIO Phase 3
Flexible Function Blocks & I/F to other Networks

WIO Phase 4
ISA100 I/F
WIO Timeline

- **WIO Phase 1 Specifications**
- **WIO Phase 1 ITK**
- **WIO Phase 1 Demo**
- **WIO Phase 2 Specifications**
- **WIO Phase 2 ITK**
- **WIO Phase 2 Demo**
- **WIO Phase 3 Specifications**
- **WIO Phase 3 ITK**
- **WIO Phase 3 Demo**
- **WIO Phase 4 Specifications**
- **WIO Phase 4 ITK**
- **WIO Phase 4 Demo**

**DEMO**
- WIO Phase 1 & 2
- HSE Wireless Backhaul
- Conventional I/O
- WirelessHART
- Wired HART
- H1

**DEMO**
- WIO Phase 3
- Other Networks

**DEMO**
- WIO Phase 4
- ISA100

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**WIO Phase 1 + 2 Prototypes for Validation**

- **Smar**
  - Emerson Ovation
  - Yamatake
  - APAT

- **APAT**
  - MTL
  - STAHL
  - Smar

**Demo Sites (Preliminary)**

- **North America** – Emerson Ovation DCS
  - End User: City of Edmonton

- **South America** – Smar DCS
  - End User: Santa Elisa - Brazil

- **Europe** – ABB 800xA?
  - End User: Shell Global Solutions

- **Asia** – Yamatake DCS
  - End User: TBD
## WIO Phase 1 + 2 Validation Team

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Company</th>
<th>Location</th>
<th>Role</th>
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<tr>
<td>Mohammad</td>
<td>Amirahmadi</td>
<td>APAT</td>
<td>Toronto, Canada</td>
<td>Prototype Supplier</td>
<td>Gateway &amp; Host</td>
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<tr>
<td>John</td>
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<td>Emerson</td>
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Wireless Cooperation Team
(WCT)
Wireless Cooperation Team (WCT)

**WCT Project Steering Committee**

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<tr>
<th>Name</th>
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<td>Martin Zielinski*</td>
<td>Emerson</td>
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<td>Rich Timoney</td>
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<td>Raimund Sommer</td>
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*Chairman

**WCT Project Team**

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**Project Coordinator**    **Team Leader**
Develop use cases, requirements and specifications for an interface between wireless field devices and a gateway to each of the respective communication protocols for measurement and control applications in the Automation Industries based on:

- mutually agreed upon use cases,
- requirements for complete and consistent integration with each respective fieldbus network,
- the emerging WirelessHART technology,
- the emerging Wireless ISA100.11a standard.

Develop a common set of compliance guidelines for the gateways for incorporation into the respective registration procedures of each organization.

Make the wireless gateway interface specifications as common as possible, while insuring compatibility with wired versions of each participant’s protocol.

The project schedule shall be mutually agreed.
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