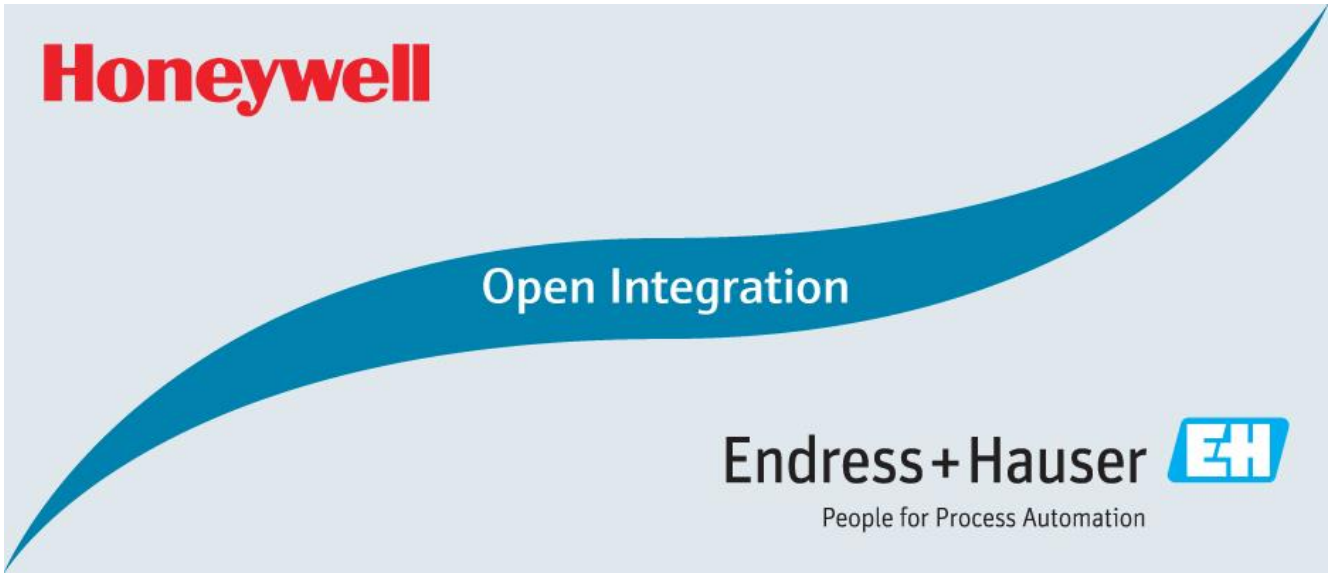
Integration Test Summary HON01

Honeywell Experion PKS and FOUNDATION Fieldbus for Oil & Gas Industry



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1 Document Information

1.1 Purpose and Scope

This document provides a brief summary of Open Integration tests for Reference Topology HON01. All content of this document is jointly developed, reviewed and approved by Honeywell and Endress+Hauser as a common deliverable of Open Integration.

1.2 Document History

This is version 1.00.00 of this document. Version history:

Version	Released	Description
1.00.00	2017.04	Initial version

1.3 Related Documents

Please refer to related documents as listed below:

Document	Description
SD01851S/04/EN/01.17	Reference Topology HON01
SD01852S/04/EN/01.17	Integration Tutorial HON01
SD01854S/04/EN/01.17	List of Tested Devices and Versions HON01

2 Preface

Open Integration focuses on complementary system tests to verify integration and interoperability using practical test conditions. This is done by testing the system versus a reference test network with a relevant variety of components and field devices for defined target applications, and asking questions like this:

Is the system prepared to handle a necessary variety of compliant device implementations?
How does it deal with multiple device revisions and device replacements?
Does it apply reasonable bus settings to share access with other masters?
How can field devices be accessed for configuration or asset health monitoring?
Is this path stable and performing? ...

Open Integration does not test field devices, field network components or systems as such. All parts of a reference topology under test are released and have passed mandatory integration and interoperability tests as defined by technology foundations upfront.

3 General Introduction

This chapter provides a short introduction to Open Integration testing in general:

3.1 Reference Test Network

Open Integration verifies systems versus a reference test network: Figure 1 shows the principle as applied for FOUNDATION Fieldbus:

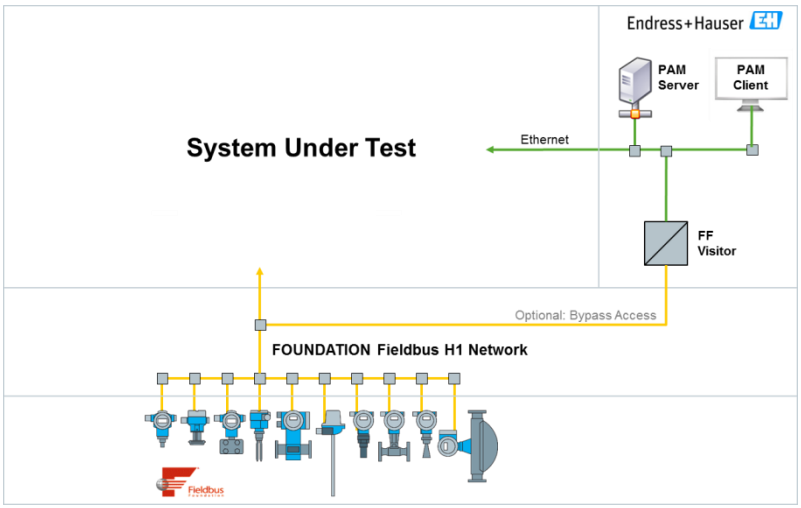

Figure 1: Open Integration Reference Test Network for FOUNDATION Fieldbus

3.2 Integration Test Scenarios

Open Integration verifies supported means for integration into the system and interoperability with other tools. Figure 2 shows the main test scenarios as considered:

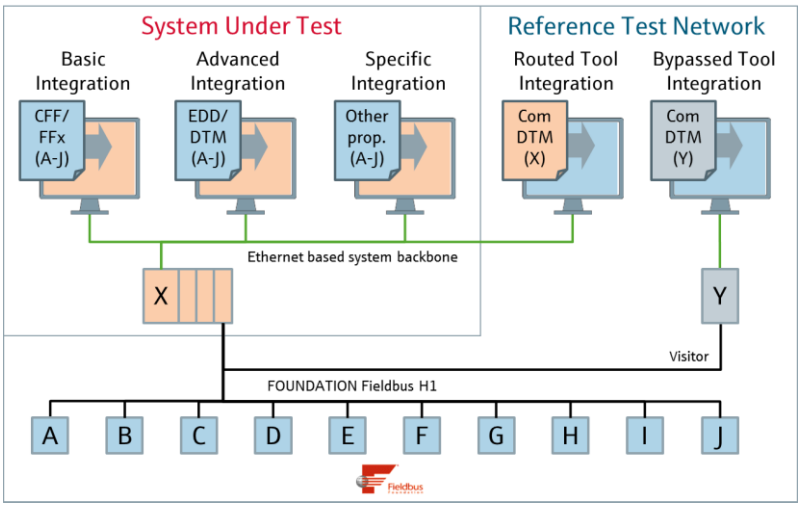

Figure 2: Open Integration Test Scenarios

3.2.1 Basic Integration

This scenario deals with integration of field devices by means of DDs for FOUNDATION Fieldbus. As a result, all process values and device status information are available for further processing within the control strategy of the system. Test cases related to this scenario are mandatory.

3.2.2 Advanced Integration

This scenario deals with device type specific integration of field devices by means of EDD, FDT/DTM or FDI. As a result, the system is enabled to access additional information from field devices, e.g. for an integrated asset management solution. Test cases related to this scenario are mandatory, if the system under test supports such means.

3.2.3 Specific Integration

This scenario considers proprietary means for integration which may be supported by a specific system, e.g. to simplify commissioning or to provide preconfigured elements for visualization. This is optional and not supported by standard test cases. If relevant, a specific set of additional test cases may be defined.

3.2.4 Routed Tool Integration

Vice versa, this scenario deals with integration of system components under test as access path for plant asset management software provided by Endress+Hauser. Test cases related to this scenario are mandatory, if the system under test supports such means.

3.2.5 Bypassed Tool Integration

This scenario focuses on interoperability of the system under test with 3rd party FF visitors, which may be used to access field devices independently from routing support by the system itself. This is optional and not covered by test cases specified in this document. If relevant, a specific set of additional test cases may be defined.

4 Relevant Test Scenarios

We consider using Honeywell Experion PKS in combination with Honeywell Field Device Manager (FDM):

Honeywell Experion PKS requires Basic Integration of field devices by means of DDs for FOUNDATION Fieldbus. The system supports two main workflows for Basic Integration: Workflow 1 starts with offline configuration of field devices as preparation for downloading into the corresponding field devices once connected. Vice versa, Workflow 2 starts with uploading of online configurations from pre-configured field devices for further commissioning. Both workflows for Basic Integration have to be tested.

Honeywell FDM supports Advanced Integration of field devices by means of DTMs and DDs. Both options for Advanced Integration have to be tested.

Honeywell Experion PKS provides some specific means for bulk commissioning based on field device templates. This Specific Integration Workflow shall be evaluated and tested by example as well.

Routed Tool Integration and Bypassed Tool Integration are not supported by Honeywell and therefore these scenarios are not relevant for testing.

5 Summary of Test Results

5.1 Basic Integration

Device Type Library

- All required DD files have been successfully imported into the Control Builder Library.
- The DD revision displayed in Control Builder corresponds to the initial DD revision for a certain device type and version, which is not necessarily the imported one. The correct DD revision can only be determined from the DD file name which was imported.
- DD packages with DD4 and DD5 files must be divided into different folders first, otherwise only the DD5 version will be imported.
- Multiple DD versions and revisions for same device type can be handled by appropriate naming of imports.
- Each imported DD creates a Device Configuration Template, which can be modified by the user afterwards. The system does not indicate if a Device Configuration Template is “as imported” or “modified”. The user must pay attention and use adequate naming to avoid confusion.
- “Save as” for Device Configuration Templates is not supported. Project Specific Templates can be created by re-iterating DD imports with adequate renaming.
- Device Configuration Templates can be exported and imported to other Control Builder Projects.

Field Network Configuration

- Both workflows (Offline Project to Online and Online to Offline Project) have been evaluated.
- All listed field devices have been successfully integrated into the FF network with both workflows.
- The recommended bus address range for field devices consists of twenty addresses from 21 to 40.
- Whenever using the “Device Match” function, the user has to carefully check and sometimes re-enter the “Capability Level”, because this parameter is not always updated correctly. Invalid settings lead to unexpected errors during the commissioning.
- Workflow 1 (Offline Project to Online) requires extensive use of “Device Match” function.
- Workflow 2 (Online to Offline Project) is perceived as more convenient.

Field Device Configuration

- The “DD View” tab does not show all parameters correctly, and for some devices parameters are listed twice. Workaround is to check and configure field devices via the other tabs which are offered in the configuration window.
- The “Method Manager” does not always work very stable. If it hangs up, locks need to be deleted in the admin database. Besides this, using methods when possible is perceived as more convenient than working with standard list views only.

- Endress+Hauser field devices cannot be fully operated with DD5. E.g. the majority of methods as implemented by Endress+Hauser are not supported by Control Builder. We recommend using DD4 only.

Online Monitoring and Control Strategy

- All resource, transducer and other function blocks can be configured and connected in Online Mode.
- Modification of default values requires a Full Load (Unselect Partial Load) to the device.
- Field Diagnostics and Advanced Alarming can be configured in Control Builder.
- For Field Diagnostics, the alarm description is not always displayed in the alarm list of Experion Station.
- Field Diagnostics as defined by FOUNDATION Fieldbus is limited to 32 messages. For complex Endress+Hauser devices, this requires configurable mapping of many possible events to only a few generic messages. Such messages have generic alarm descriptions providing limited information to the alarm list.

Device Replacement

- Device replacement is supported for identical field devices with same device type and device revision. The workflow has been successfully evaluated for iTEMP TMT85, Micropilot and Prowirl 200.
- Within the Device Replacement Wizard, Address and Tag name assignment does not work properly and leads to error messages. It is recommended to prepare Address and Tag name of the replacement device, before using the Device Replacement Wizard. This can be done e.g. via device display, with help of workbench tools like FieldCare or in the Online Monitoring Window of Control Builder.

Flowserve Digital Positioner Integration

- The Flowserve Logix 3400MD has been successfully integrated into the Honeywell Experion PKS.
- This device can be successfully configured and operated with DD4 as well as DD5 files.
- “Method Manager” for this device sometimes hangs up as well, but typically works again as expected after deletion of locks in the admin database.

5.2 Advanced Integration

Device Type Library

- Honeywell FDM is capable to work with DD4, DD5 or DTMs. DTMs and DDs are handled in separated libraries. Each library supports handling of multiple revisions for the same device type.
- FDM does not allow installing DD4 and DD5 for the same device revision. After installation it is not visible, whether DD4 or DD5 is installed. The user must pay attention to avoid confusion.
- The DD library is prefilled for a variety of field devices from different vendors. However it is not clear if the defaults are based on DD4 or DD5.

- Majority of relevant DDs have been successfully imported, with exception of DDs for Deltabar S. This issue is reported and will be fixed by Honeywell and/or Endress+Hauser.
- The DTM library is empty by default; all relevant Device DTMs have been successfully installed.
- Import of latest generation of Endress+Hauser DTMs ("CoDIA DTMs") requires Honeywell Patches "FDMR450_DTMFix" and "FDM_Rockwell_IO_PatchSetup".
- It is recommended to install DTMs on FDM client computers only, not on the FDM server.

Field Device Management based on DDs

- With exception of Deltabar S (installation issue, see above), all other field devices have been successfully connected based on DD4 as well as DD5.
- Occasionally, some field devices could not be opened (dialog keeps on reading parameters without getting ready). Whenever this issue occurred, it could be solved by reloading the device configuration with Control Builder.
- A maximum of 5 devices can be opened in parallel.
- We have not seen limitations in using DD5 versus DD4, therefore we recommend using the more recent DD5 drivers in FDM.
- DDs don't get automatically reconnected after communication problems (either network or electrical issues). The only way to re-establish the connection is to close and open the DD.

Field Device Management based on DTMs

- All devices have been successfully connected and operated based on DTMs.
- It is recommended to disconnect DTMs after operation.
- A maximum of 5 devices can be opened in parallel.
- DTMs don't get automatically reconnected after communication problems (either network or electrical issues). The only way to re-establish the connection is to close and open the DTM.

5.3 Specific Integration

- Device Configuration Templates would be a powerful tool for smart commissioning; however some smooth means for bulk editing are missing.
- Copy and paste with Excel would need improvements to better support this workflow.

6 Open Integration Result

Reference Topology HON01	Recommended	Not Recommended	Not Applicable
Basic Integration (DD4)	X		
Basic Integration (DD5)		X	
Advanced Integration (DD4)	(X)		
Advanced Integration (DD5)	X		
Advanced Integration (DTM)	X		
Specific Integration (Templates)	(X)		
Routed Tool Integration			X
Bypassed Tool Integration			X

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