



Using OPC UA PA-DIM for field devices

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Agenda: Using PA-DIM for field devices

Prototyping & exploring

- FDI is based on OPC UA. Field device information model is based on PA-DIM. Basic concept of the FDI is first explained as an overview and give some background information. PA-DIM will provide standard information model for different field bus protocols with large scale of devices.
- UaExpert can be used to demonstrate & explore information model. Presentation will cover information model and short presentation of proto-type that illustrates possibilities of the model.
- FDI will be used to parametrize field devices and it can be also used for the condition monitoring.
- Related presentation by Frank Fengler, ABB:
https://www.automaatioseura.fi/site/assets/files/2060/11-opc_day_helsinki_2019_opc_ua_for_process_automation_pa-dim_frank_fengler.pdf

Disclaimer: Examples are proto-types that are used to explore PA-DIM and it's use & maturity.

OPC Foundation and information model: PA-DIM

Short summary generated by Enterprise AI

PA-DIM stands for Process Automation Device Information Model. It is a joint specification developed by several industry organizations to define a common and interoperable information model for process automation devices. PA-DIM enables protocol and vendor independent data exchange between intelligent field instruments and host systems, such as control or asset management systems. PA-DIM also supports control-in-the-field strategies, which allow field devices to communicate directly with each other and maintain safe operations during a host system failure. PA-DIM is based on OPC UA technology, which provides a standard platform for data communication and integration. PA-DIM covers various use cases, such as telemetric and asset management, and defines the parameters, names and semantic identifiers for different device types. [PA-DIM aims to facilitate information-driven systems that can offer increased connectivity, real-time data and advanced analytics for process automation](#)¹²³.

Learn more: [1. opcfoundation.org](https://opcfoundation.org) [2. fieldcommgroup.org](https://fieldcommgroup.org) [3. isa.org](https://isa.org)

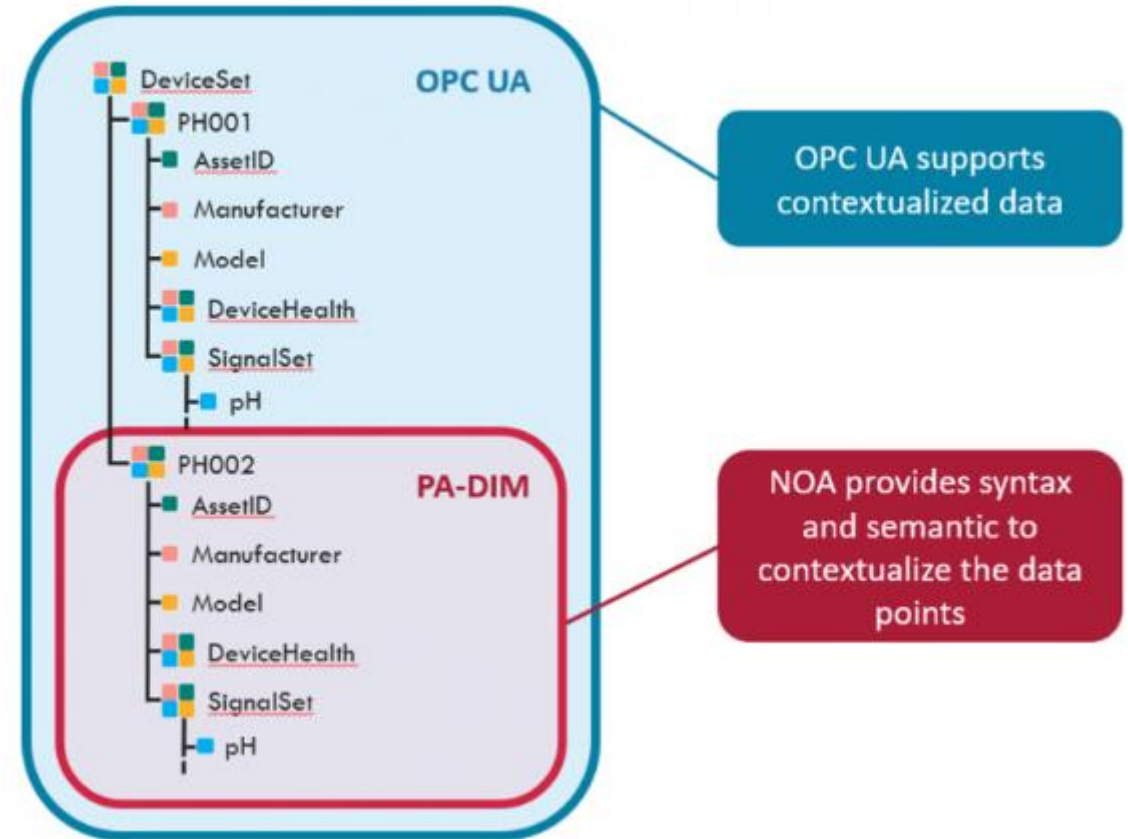
FDI & OPC UA PA-DIM: Designed for understanding semantic identification

Map protocol specific parameters to standardized terms for parameters.

- **PA-DIM** is a manufacturer independent Information Model with a structured hierarchy for standardized data access for devices.
- Reuse **DI-model** (nodeset): A Device (Asset) has Set of Signals (Functions) e.g. Process Variables, which are based on OPC UA Part 100 Devices (**DI-model**). **PA-DIM** re-use IVendor-, ITag- Nameplate and IDeviceHealth- Interfaces from **DI**.
- In addition, **PA-DIM** defines IAdministration- and ISignalSet- Interface, so that it is reusable by other Information Models. All parameter are defined in **IEC 61987 CDD** with Semantic ID (**IRDI-model**), which ensures that parameter can be easily re-used between different software tools and protocols (by reference HasDictionaryEntry).
- Another main part is the SignalVariableType, which is an extension of OPC UA Part 8: Data Access and describes analog and discrete variables including its simulation. This variable can be used at any object also from other Information Models. The PA-DIM **SignalType** Object uses the SignalVariableType and adds the **SignalTag** and specific methods like **ZeroPointAdjustment** or **AutoAdjustPositioner**.

PA-DIM Simplified Data Access

- Manufacturer Independent
- Sorted
- Structured Hierarchy
- Prioritized
- Mapping can be understood by standard interface tools
- NOA = NAMUR Open Architecture
- IEC 61987 CDD = Common Data Dictionary



IEC 61987 CDD = Common Data Dictionary

Code is found from the Server Dictionary, IRDI nodeset

The screenshot displays the IEC 61987 CDD website on the left, the OPC UA Expert software interface in the center, and a data table on the right. Arrows indicate the flow of information from the website to the software and then to the table.

IEC 61987 CDD Website: Shows the 'General Items (IEC 61360-7)' tree with '0112/16/1987#AB649' selected. The details pane shows the class name '0112/16/1987#AB649' and its definition: 'level gauge that uses a bypass tube or measuring chamber and a float with a magnetic core, which interacts with...'

OPC UA Expert Software: Shows the 'Address Space' view with the 'Server' node expanded. The 'Server' node contains a list of nodes, including 'Actual value'.

Data Access View Table: A table with columns: #, Server, Node Id, Display Name, Value, Datatype, Source Timestamp, and Server Timestamp. The table contains 5 rows of data for different nodes.

#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Timestamp
1	PA-DIM Server f...	NS String KK1-HardwareRevision	Hardware revis...	DemoX	String	25/10/2023 9:48...	25/10/2023 9:48...
2	PA-DIM Server f...	NS String KK1-Temperature-SensorType	Sensor type	8	UInt32	25/10/2023 9:48...	25/10/2023 9:48...
3	PA-DIM Server f...	NS String KK1-Temperature-SensorType-ValueAsText	ValueAsText	"en", "Pt100"	LocalizedText	25/10/2023 9:48...	25/10/2023 9:48...
4	PA-DIM Server f...	NS String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9:48...	25/10/2023 9:48...
5	PA-DIM Server f...	NS String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9:48...	25/10/2023 9:48...

Attributes Panel: Shows the 'Actual value' attribute with a value of 'ns=4;ns=0112/2//61987#ABN644#001'. The 'NodeId' attribute is expanded to show its structure: NamespaceIndex (4), IdentifierType (String), Identifier (0112/2//61987#ABN644#001), NodeClass (Object), BrowseName (4, "0112/2//61987#ABN644#001"), DisplayName ("", "Actual value"), and Description ("").

References Panel: Shows a reference from 'HasTypeDefinition' to 'IrdiDictionaryEntryType'.

IEC 61987 CDD = Common Data Dictionary (detail view)

Code is found from Server Dictionary, IRDI nodeset

The screenshot shows the IEC 61987 CDD web interface. The search bar contains 'ABN644'. The search results show one hit: '0112/2///61987#ABN644#002'. The detailed view shows the following properties:

Code:	0112/2///61987#ABN644
Version:	002
Revision:	04
IRDI:	0112/2///61987#ABN644#002
Preferred name:	actual value
Synonymous name:	
Symbol:	
Synonymous symbol:	
Short name:	Actual value
Definition:	parameter indicating the value of the not simulated process variable of a device using the units of measure of the process variable
Note:	
Remark:	also used by Process Automation - Device Information Model (PA-DIM)
Primary unit:	
Alternative units:	
Level:	
Data type:	REAL_TYPE
Format:	
Property constraint:	
Definition source:	
Value source:	
Property data element type:	NON_DEPENDENT_P_DET
Drawing:	
Formula:	
Value list code:	
Value list:	

The tree structure on the left shows the following hierarchy:

- Project
 - Servers
 - PA-DIM Server for HART, PROFIBUS and PROFINET
 - Documents
 - Data Access View
 - Actual value
 - Actuator type

The data table on the right shows the following data:

#	Server	Node Id	Display Name	Value	Datatype	source Timestamp	Server Times
1	PA-DIM Server f...	NS String KK1-HardwareRevision	Hardware revis...	DemoX	String	25/10/2023 9:48...	25/10/2023 9...
2	PA-DIM Server f...	NS String KK1-Temperature-SensorType	Sensor type	8	UInt32	25/10/2023 9:48...	25/10/2023 9...
3	PA-DIM Server f...	NS String KK1-Temperature-SensorType-ValueAsText	ValueAsText	"en", "P100"	LocalizedText	25/10/2023 9:48...	25/10/2023 9...
4	PA-DIM Server f...	NS String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9:48...	25/10/2023 9...
5	PA-DIM Server f...	NS String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9:48...	25/10/2023 9...

The 'Attributes' panel on the right shows the following details:

- Attribute: Value
- Value: ns=4;ns=0112/2///61987#ABN644#001
- NamespaceIndex: 4
- IdentifierType: String
- Identifier: 0112/2///61987#ABN644#001
- NodeClass: Object
- BrowseName: 4, "0112/2///61987#ABN644#001"
- DisplayName: "", "Actual value"
- Description: "", ""
- EventNotifier: None
- WriteMask: 0
- UserWriteMask: 0
- RolePermissions: BadAttributeInvalid (0x80350000)
- UserRolePermissions: BadAttributeInvalid (0x80350000)
- AccessRestrictions: BadAttributeInvalid (0x80350000)

The 'References' panel shows the following reference:

Reference	Target DisplayName
HasTypeDefinition	IrdiDictionaryEntryType

Zoomed:

Code:	0112/2///61987#ABN644
Version:	002
Revision:	04
IRDI:	0112/2///61987#ABN644#002
Preferred name:	actual value
Synonymous name:	
Symbol:	
Synonymous symbol:	
Short name:	Actual value
Definition:	parameter indicating the value of the not simulated process variable of a device using the units of measure of the process variable
Note:	
Remark:	also used by Process Automation - Device Information Model (PA-DIM)

Example: Sensor type

Device uses UInt32, PA-DIM can show value as text

Unified Automation UaExpert - The OPC Unified Architecture Client - PA-DIM-Server*

File View Server Document Settings Help

Project: PA-DIM Server for HART, PROFIBUS and PROFINE

Address Space: http://opcfoundation.org/UA/Dictionary/IRDI

Objects: CPU1-Legacy-sensor01

#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Times
1	PA-DIM Server f...	NS1 String KK1-HardwareRevision	Hardware revisi...	DemoX	String	25/10/2023 9.48...	25/10/2023 9...
2	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType	Sensor type	8	UInt32	25/10/2023 9.48...	25/10/2023 9...
3	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-ValueAsText	ValueAsText	"en", "Pt100"	LocalizedText	25/10/2023 9.48...	25/10/2023 9...
4	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...
5	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...

Display Name	Value	Datatype
Hardware revisi...	DemoX	String
Sensor type	8	UInt32
ValueAsText	"en", "Pt100"	LocalizedText
EnumValues	Double click to ...	ExtensionObject
EnumValues	Double click to ...	ExtensionObject

Attributes:

- NodeId: ns=1;s=KK1-Temperature-SensorType
- NamespaceIndex: 1
- IdentifierType: String
- Identifier: KK1-Temperature-SensorType
- NodeClass: Variable
- BrowseName: 5, "SensorType"
- DisplayName: "", "Sensor type"
- Description: "", ""
- Value:
 - SourceTimestamp: 25/10/2023 9.48.03
 - SourcePicoSeconds: 0
 - ServerTimestamp: 25/10/2023 14.51.51
 - ServerPicoSeconds: 0
 - StatusCode: Good (0x00000000)
 - Value: 8
- Data Type: UInt32
- NamespaceIndex: 0

References:

- Reference: Target DisplayName
- HasTypeDefinition: MultiStateDictionaryEntryDiscreteType
- HasProperty: EnumDictionaryEntries
- HasProperty: EnumValues
- HasProperty: ValueAsDictionaryEntries
- HasProperty: ValueAsText

Example: Sensor type

Change value from 8 to 9 will automatically update ValueAsText = Pt1000

Unified Automation UaExpert - The OPC Unified Architecture Client - PA-DIM-Server*

File View Server Document Settings Help

Project Data Access View Devices View

#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Times
1	PA-DIM Server f...	NS1 String KK1-HardwareRevision	Hardware revisi...	DemoX	String	25/10/2023 9.48...	25/10/2023 9...
2	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType	Sensor type	9	UInt32	25/10/2023 14.5...	25/10/2023 1...
3	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-ValueAsText	ValueAsText	"en", "Pt1000"	LocalizedText	25/10/2023 14.5...	25/10/2023 1...
4	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...
5	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...

Edit Value

Name	Value
[0]	EnumValueType
Value	0
DisplayName	en Cu1000
Description	
[1]	EnumValueType
Value	1
DisplayName	en Cu25
Description	
[2]	EnumValueType
Value	2
DisplayName	en Ni100
Description	
[3]	EnumValueType
Value	3
DisplayName	en Ni1000
Description	
[4]	EnumValueType
Value	4
DisplayName	en Ni120
Description	
[5]	EnumValueType
Value	5
DisplayName	en Ni25
Description	
[6]	EnumValueType
Value	6
DisplayName	en Ni50
Description	
[7]	EnumValueType
Value	7
DisplayName	en Pt10
Description	
[8]	EnumValueType
Value	8
DisplayName	en Pt100
Description	
[9]	EnumValueType
Value	9
DisplayName	en Pt1000
Description	
[10]	EnumValueType
Value	10
DisplayName	en Pt200
Description	
[11]	EnumValueType

Enumeration values

Write Cancel

Example: Level measurement, Tag: LI-100

Navigate from the reference to Dictionary

Unified Automation UaExpert - The OPC Unified Architecture Client - PA-DIM-Server*

File View Server Document Settings Help

Project Data Access View Devices View Attributes

Project

- Servers
 - PA-DIM Server for HART, PROFIBUS and PROFINET
- Documents
 - Data Access View

Address Space

4: http://opcfoundation.org/UA/Dictionary/IRDI

- CPU1-Legacy-sensor01
 - Asset ID
 - Date of last change
 - Device diagnostic status
 - DeviceHealthAlarms
 - Factory reset
 - FunctionalGroup
 - Hardware revision
 - Manufacturer
 - MethodSet
 - Model
 - ParameterSet
 - Product code
 - Revision counter
 - Serial number
 - SignalSet
 - Density
 - Analog signal
 - EURange
 - EngineeringUnits
 - HA Configuration
 - Level
 - Analog signal
 - Tag
 - Temperature

#	Server	Node Id	Display Name	Value	Datatype	Source Timestamp	Server Times
1	PA-DIM Server f...	NS1 String KK1-HardwareRevision	Hardware revis...	DemoX	String	25/10/2023 9.48...	25/10/2023 9...
2	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType	Sensor type	9	UInt32	25/10/2023 14.5...	25/10/2023 1...
3	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-ValueAsText	ValueAsText	"en", "Pt1000"	LocalizedText	25/10/2023 14.5...	25/10/2023 1...
4	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...
5	PA-DIM Server f...	NS1 String KK1-Temperature-SensorType-EnumValues	EnumValues	Double click to ...	ExtensionObject	25/10/2023 9.48...	25/10/2023 9...
6	PA-DIM Server f...	NS1 String KK1-Tag	Tag	LI-100	String	25/10/2023 9.48...	25/10/2023 9...

Attributes

Attribute	Value
NamespaceIndex	ns=1;s=KK1-Tag
IdentifierType	String
Identifier	KK1-Tag
NodeClass	Variable
BrowseName	1, "Tag"
DisplayName	"" , "Tag"
Description	"" , "Signal identifier"
SourceTimestamp	25/10/2023 9.48.19
SourcePicoSeconds	0
ServerTimestamp	25/10/2023 15.07.55
ServerPicoSeconds	0
StatusCode	Good (0x00000000)
Value	LI-100
Data Type	String
NamespaceIndex	0

References

Reference	Target DisplayName
HasTypeDefinition	BaseDataVariableType
HasDictionaryEntry	Tag

Attributes

Attribute	Value
NamespaceIndex	ns=4;s=0112/2///61987#ABB271#007
IdentifierType	String
Identifier	0112/2///61987#ABB271#007
NodeClass	Object
BrowseName	4, "0112/2///61987#ABB271#007"
DisplayName	"" , "Tag"
Description	"" , ""
EventNotifier	None
WriteMask	0
UserWriteMask	0
RolePermissions	BadAttributeIdInvalid (0x80350000)
UserRolePermissions	BadAttributeIdInvalid (0x80350000)
AccessRestrictions	BadAttributeIdInvalid (0x80350000)

References

Reference	Target DisplayName
HasTypeDefinition	IrdiDictionaryEntryType

Valmet PA-DIM Demo server

Valmet Device server (OPCUA with PA-DIM)

DNA network topology & Device information

Address Space

- No Highlight
- Aliases
- DeviceSet
- DeviceTopology
- Locations
- NetworkSet
 - DNA
 - AP01
 - FBC2 DNA-IO
 - FBC3 DNA-IQ
 - IQ-Frame: AP01-sensor09 KK1**
 - Asset ID
 - Date of last change
 - Device diagnostic status
 - DeviceHealthAlarms
 - Factory reset
 - FunctionalGroup
 - Hardware revision
 - Manufacturer
 - MethodSet
 - Model
 - ParameterSet
 - Product code
 - Revision counter
 - Serial number
 - SignalSet
 - Software revision
 - SubDevices
 - URI of Manufacturer
 - URI of Product instance
 - Scan
 - FBC8 PROFIBUS
 - FBC9 PROFINET

- Server
- ServerMethods

Project

- Project
 - Servers
 - Valmet Device Server for DNA IQ-FRAME, HART, PROFIBUS and PROFI
 - Documents
 - Data Access View
 - Devices View

Address Space

- No Highlight
- DeviceSet
 - DeviceFeatures
 - DeviceHealthAlarms
 - IQ-Frame: AP01-sensor09 KK1
 - Asset ID
 - Date of last change
 - Device diagnostic status
 - DeviceHealthAlarms
 - Factory reset
 - FunctionalGroup
 - Hardware revision
 - Manufacturer
 - MethodSet
 - Model
 - ParameterSet
 - Product code
 - Revision counter
 - Serial number
 - SignalSet
 - Software revision
 - SubDevices
 - SupportedTypes
 - URI of Manufacturer
 - URI of Product instance
 - PROFIBUS Slave: AP01-PB;s-Slaves=A
 - DeviceTopology
 - Locations
 - NetworkSet
 - Server
 - ServerMethods
 - Types
 - Views

Data Access View | Devices View

Current Server: Valmet Device Server for DNA IQ-FRAME, HART, PROFIBUS and PROFINET devices

DeviceSet

- IQ-Frame: AP01-sensor09 KK1
 - FunctionalGroup
 - SubDevices
 - PROFIBUS Slave: AP01-PB;s-Slaves=A

Properties

Asset ID:	KK1	Hardware revision:	LITE	
Manufacturer:	Valmet Automator	Model:	BW non-radioactive	
Product code:	IQ-nd1234	Revision counter:	12	
Serial number:	1029U	Software revision:	Build 2.1.22	
URI of Manufacturer:	https://www.valmet		URI of Product instance:	https://www.valmet

Parameters

DisplayName	Value	Description
1. OS version	3.13.11	OS version
2. Sensor SW version	pfc3_8.11_386	Sensor Sw version

Apply Cancel

Methods

- GetConfiguration
- GetDocumentation

Valmet Device server: Example HART device

Methods: own legacy in this case, aggregates PA-DIM data from the DNA-OPCUA-Server

The screenshot displays the Valmet Device Server interface. On the left, the 'Project' tree shows a hierarchy of servers and documents. The 'Address Space' tree on the bottom left shows a detailed view of the device hierarchy, with 'MP28 FBC02 rack00 card07 ch3' selected. The main window shows the 'Current Server' as 'Valmet Device Server for DNA IQ-FRAME, HART, PROFIBUS and PROFINET devices'. The 'DeviceSet' list includes several HART devices, with 'HART Device: AI8H1-19' selected. The 'Properties' section displays the following information:

Property	Value	Property	Value
DeviceManual:	https://www.valmet.cz	DeviceRevision:	10
HardwareRevision:	10	Manufacturer:	Valmet
Model:	SmartLC	RevisionCounter:	0
SerialNumber:	716	SoftwareRevision:	42

The 'Parameters' section shows a table of device parameters:

DisplayName	Value	Description
1. Primary value	43.6	Primary value
2. Secondary value	0	Secondary value
3. Third value	0	Third value
4. Fourth value	0	Fourth value
5. Min	3	Min
6. Max	5	Max
7. Damping	1	Damping
8. Status	4	Status
8. Status description: bit values as text	Loop Current Saturated	Status description: bit values as text
9. Manufacturer ID	2f	Manufacturer ID
A. Device UUID	0x010637	Device UUID
B. Message	AI8H1 SP, FBCAD 19	Message
C. Date	2009-06-02T00:00:00.000Z	Date
D. More info	0	More info available (vendor specific)

At the bottom, there are buttons for 'Apply', 'Cancel', 'GetConfiguration', and 'GetDocumentation'.

Valmet Device server: Extended functionality

Uses HART command 48 to get vendor specific status information

The screenshot shows the Valmet Device Server interface. On the left is a tree view of the 'Address Space' containing various device sets and methods. The main window displays the 'Current Server: Valmet Device Server for DNA IQ-FRAME, HART, PROFIBUS and PROFINET devices'. It features a 'Properties' section with fields for DeviceManual (https://www.valmet.cc), DeviceRevision (8), HardwareRevision (8), Manufacturer (Neles Controls), Model (ND9000), RevisionCounter (0), and SerialNumber (634). Below this is a 'Parameters' table:

DisplayName	Value	Description
1. Primary value	43.6	Primary value
2. Secondary value	0	Secondary value
3. Third value	0	Third value
4. Fourth value	0	Fourth value
5. Min	0	Min
6. Max	100	Max
7. Damping	0	Damping
8. Status	16	Status
8. Status description: bit values as text	More Status Available	Status description: bit values as text
9. Manufacturer ID	57	Manufacturer ID
A. Device UID	0x634	Device UID
B. Message	MIR-AO4H2 MIO HART TEST2	Message
C. Date	2023-02-20T00:00:00.000Z	Date
D. More info	1	More info available (vendor specific)

At the bottom, there are buttons for 'GetConfiguration', 'GetDiagnostics', and 'GetDocumentation'. A red arrow points from the 'GetDiagnostics' button to a secondary window on the right.

The secondary window is titled 'Call GetDiagnostics on HART Device tag: NDTAG'. It shows the command being executed: 'Read from HART device extended diagnostics, command #48'. The 'Payload' field contains a long hexadecimal string. The 'Result' field shows a green bar, indicating a successful execution. The 'Data Type' and 'Description' columns are visible at the bottom.

Uses device description to find out text for the error(s)



Short live demo before final slides

Condition monitoring: Web server (implemented as React application)

Disclaimer: proto-type – not production ready (proxy component can be licensed from Sterfive)

The screenshot shows a web browser window with a React application running on localhost:3000. The page content is as follows:

```
2:DeviceFeatures - ns=2;i=15034
1:IQ-Frame: AP01-sensor09 KK1 - ns=1;s=KK1
DeviceManual https://www.valmet.com/automation/quality-management/quality-control-system-qcs/scanners/
DeviceHealth 3
Manufacturer Valmet Automation
RevisionCounter 0
SerialNumber 1029U
SoftwareRevision Build 2.1.22

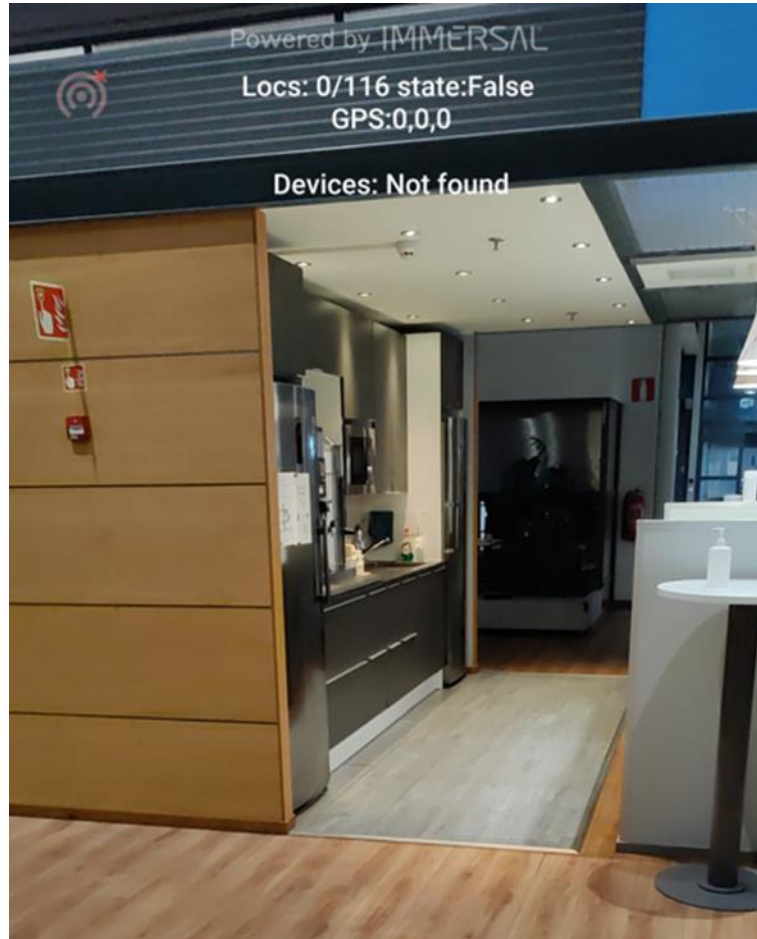
1:HART Device: TEST - ns=1;s=TEST
DeviceManual https://www.valmet.com/automation/distributed-control-system/engineering-maintenance-tools/valmet-dna-field-device-manager/
DeviceHealth 3
Manufacturer Valmet Automation
RevisionCounter 0
SerialNumber 0x1638
SoftwareRevision 0x2a

1:HART Device: COFFEE1 - ns=1;s=COFFEE1
DeviceManual https://www.valmet.com/automation/distributed-control-system/engineering-maintenance-tools/valmet-dna-field-device-manager/
DeviceHealth 3
Manufacturer Valmet Automation
RevisionCounter 0
SerialNumber 0x1639
SoftwareRevision 0x2a

1:HART Device: COFFEE2 - ns=1;s=COFFEE2
DeviceManual https://www.valmet.com/automation/distributed-control-system/engineering-maintenance-tools/valmet-dna-field-device-
```


Immersal: Visual Positioning System (VPS) with PA-DIM Server

Location aware mobile phone AR application that will get live-data from PA-DIM server



Extra information for use case

E&H Ethernet APL device contains fields for the Geolocation

The screenshot shows a web browser window with the URL `172.17.9.199`. The page displays configuration details for a Cerabar device. At the top, there are fields for **Device tag**, **Status signal** (OK), **Pressure** (99.1 kPa), **Scaled variable** (1754.83 Custom Unit), and **Device name** (Cerabar). Below this, there are sections for **System** and **Geolocation**. The **Geolocation** section includes fields for **Location description** (somewhere), **Longitude** (0.0000 °), **Latitude** (0.0000 °), and **Altitude** (2.0000 m). A sidebar on the left contains navigation options: **Device management**, **Device drivers**, **User management**, **Connectivity**, **Date/time**, **Geolocation** (highlighted), **Information**, and **Software configuration**. The top right corner features the **Endress+Hauser** logo and user interface elements like **en** and **Maintenance**.

Questions & comments

- Special thanks to Etienne Rossignon etienne.rossignon@sterfive.com
 - Implementing node-opcua and support for extending OPC UA into the real-life use
 - GITHUB: <https://github.com/node-opcua/node-opcua>
 - Enterprise support for development recommended
 - React components need separate license, not available as open-source code
- Valmet Device server build with TypeScript
 - Proto-type without Valmet related bindings/integration:
Source code could come available with MIT License (not yet final & decided)
 - Can be compiled to executable with pkg (protects your own source code implementation)

