

OPC Unified Architecture

OPC UA for Devices (Part 100)

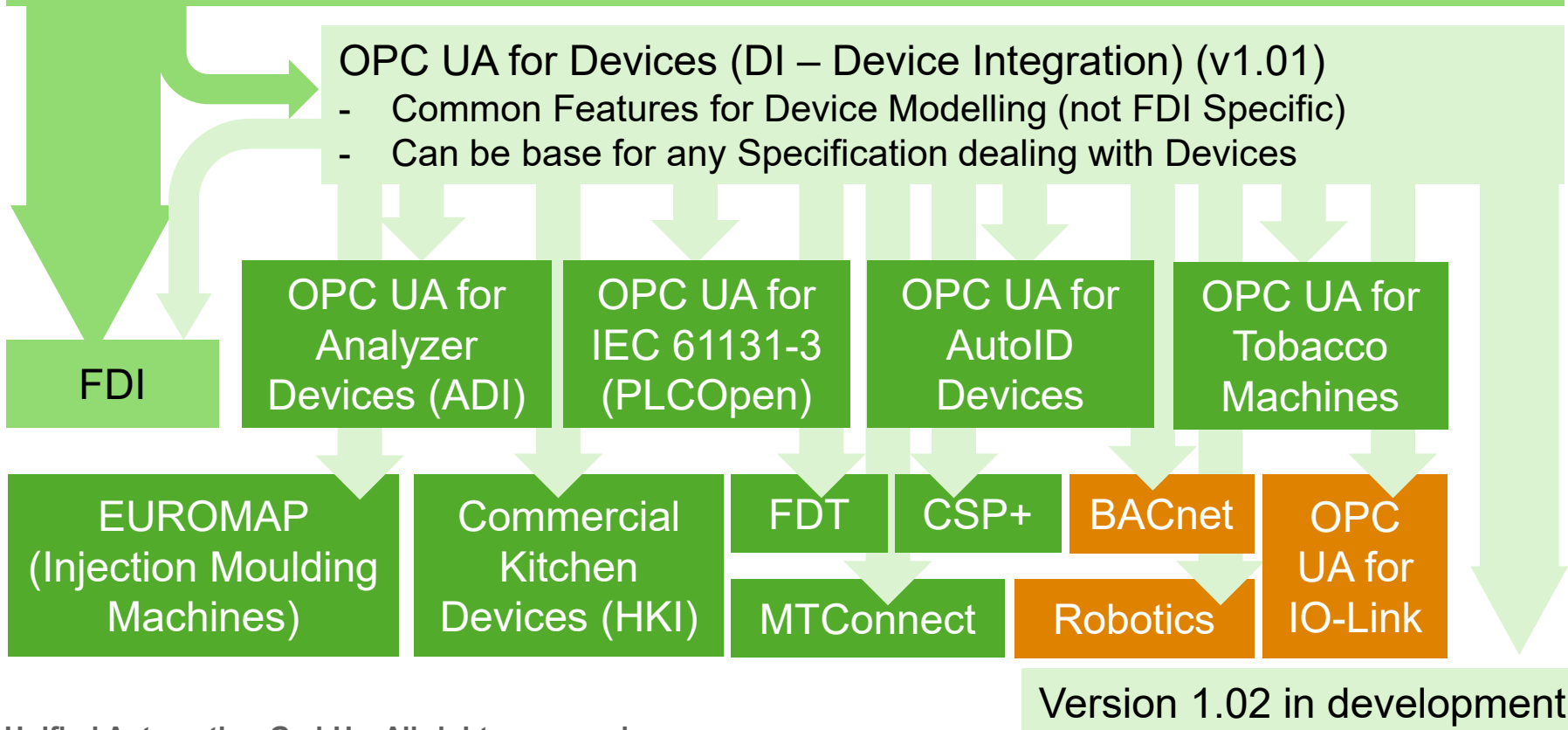
Background on OPC UA for Devices

FDI (Field Device Integration) – Initially called ECT (EDD Cooperation Team)

- Addresses Field Devices in Process Automation (Profibus, Profinet, FF, HART)
- FDI Packages from Device Vendors with Device Descriptions (EDDs)
- FDI Server manages Field Devices from many vendors
- OPC UA as base for Information Model

OPC UA for Devices (DI – Device Integration) (v1.01)

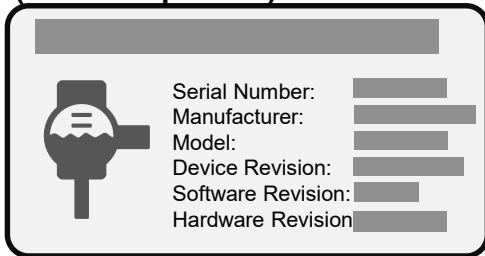
- Common Features for Device Modelling (not FDI Specific)
- Can be base for any Specification dealing with Devices



Version 1.02 in development

What is addressed by OPC UA for Devices (v1.01)?

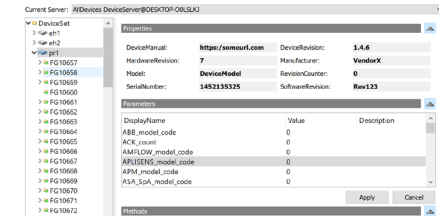
Device Identification (name plate)



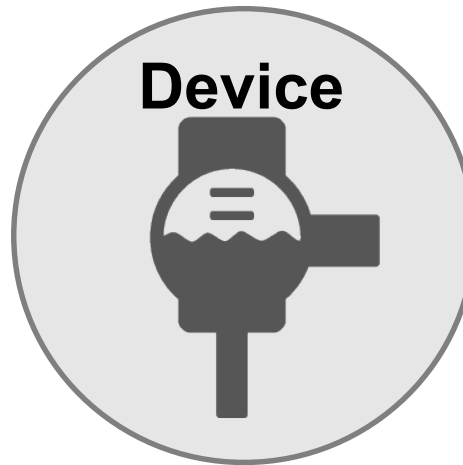
Device Health



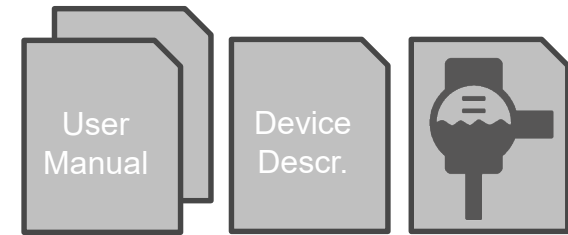
Parameter and Command Organization



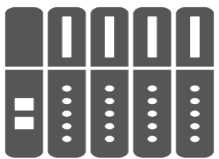
Locking



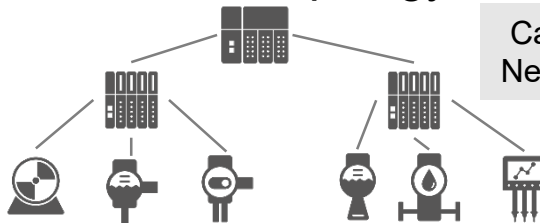
Device Support Information



Block-based / Modular Devices

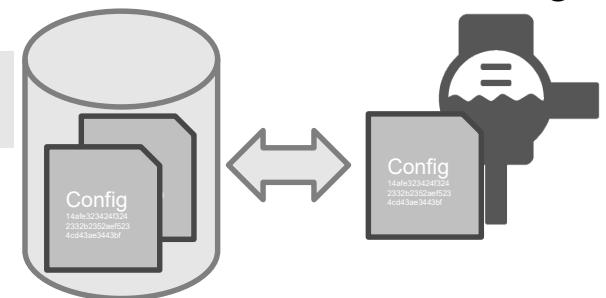


Network Topology



Can include Offline Network Engineering

Online / Offline Handling



Use Cases for OPC UA for Devices

Devices can provide an integrated OPC UA server for

- Configuration
- Diagnostic
- Access to online data, events and state machines
- Online access to device information – no consistency problems

Engineering system can provide OPC UA server to configure all devices of a plant – also for offline configuration

- Standard entry-point (DeviceSet): Find all devices of server

Features / advantages for all use cases

- Defined way to structure and expose information
- Self-describing model
- Client can browse the model and adapt access based on the knowledge about the model

Generic configuration, diagnostic and asset management clients can be used to configure and maintain the device

Standardized View on Device Data

Demo

Generic View

OPC UA for Devices View

The screenshot displays two side-by-side views of the same OPC UA data source. The left view is the 'Generic View', and the right view is the 'OPC UA for Devices View'. The 'OPC UA for Devices View' is annotated with several callout boxes: 'Devices' points to the 'pr1' folder in the 'Data Access View' tree; 'Standardized Properties' points to the 'Properties' section of the right-hand pane; 'Parameters' points to the 'Parameters' section of the right-hand pane; 'Grouping of Parameters' points to the grouped parameter list in the 'Parameters' section; and another 'Parameters' box points to the 'Value' column of the parameter table.

Generic View (Left Pane):

- Project: AllDevices DeviceServer@DESKTOP-O0LSKJ
- Address Space: Root > Objects > DeviceSet > eh1, eh2, pr1
- pr1 > ParameterSet > DeviceManual, DeviceRevision
- pr1 > FG10657, FG10658, FG10659
- FG10659 > Foxboro_Eckardt_model_code, Kajaani_Process_Measurements_model_code, M_System_Co_model_code

OPC UA for Devices View (Right Pane):

Current Server: AllDevices DeviceServer@DESKTOP-O0LSKJ

Properties:

DeviceManual:	https://someurl.c	DeviceRevision:	1.4.6
HardwareRevision:	7	Manufacturer:	VendorX
Model:	DeviceModel	RevisionCounter:	0
SerialNumber:	1452135325	SoftwareRevision:	Rev123

Parameters:

DisplayName	Value
GP_50_model_code	0
General_Monitors_model_code	0
HACH_LANGE_model_code	0
HCF_model_code	0
HEINRICHS_model_code	0

Device / Machine Identification

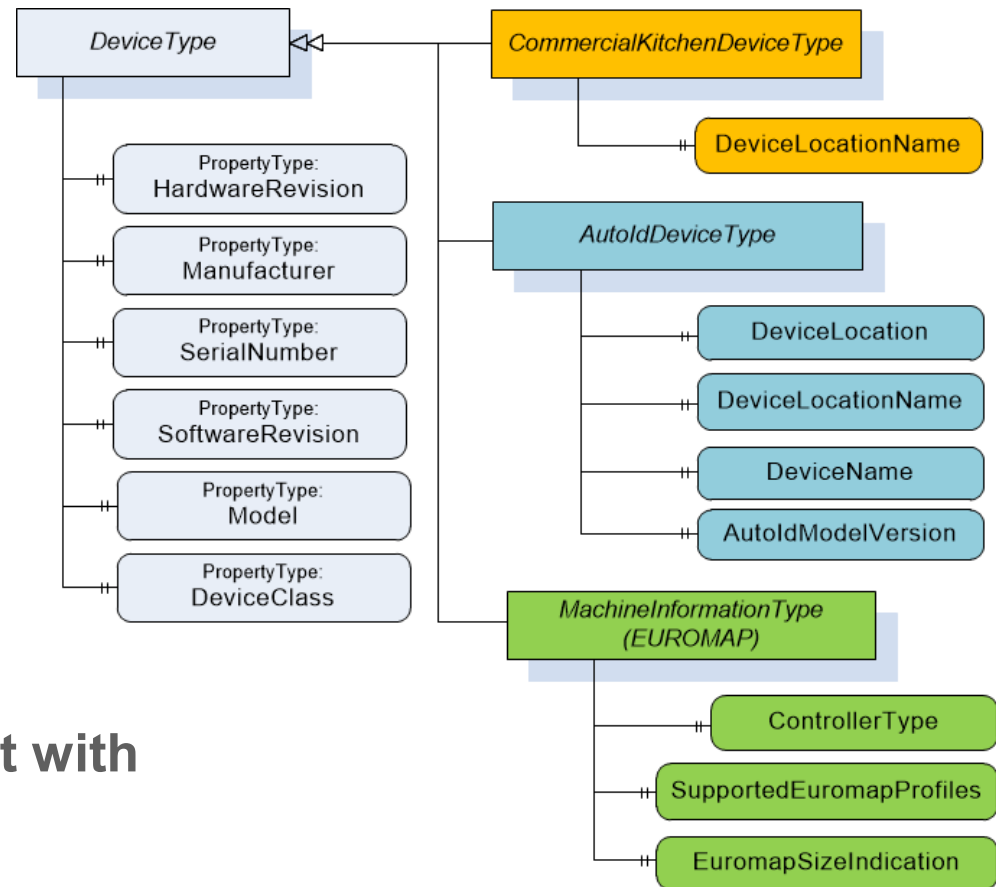
> DeviceType defines properties for name plate

- > SerialNumber
- > Manufacturer
- > Model
- > DeviceRevision
- > SoftwareRevision
- > HardwareRevision
- > RevisionCounter
- > DeviceClass

> Can be extended

> Version 1.02 might extend list with

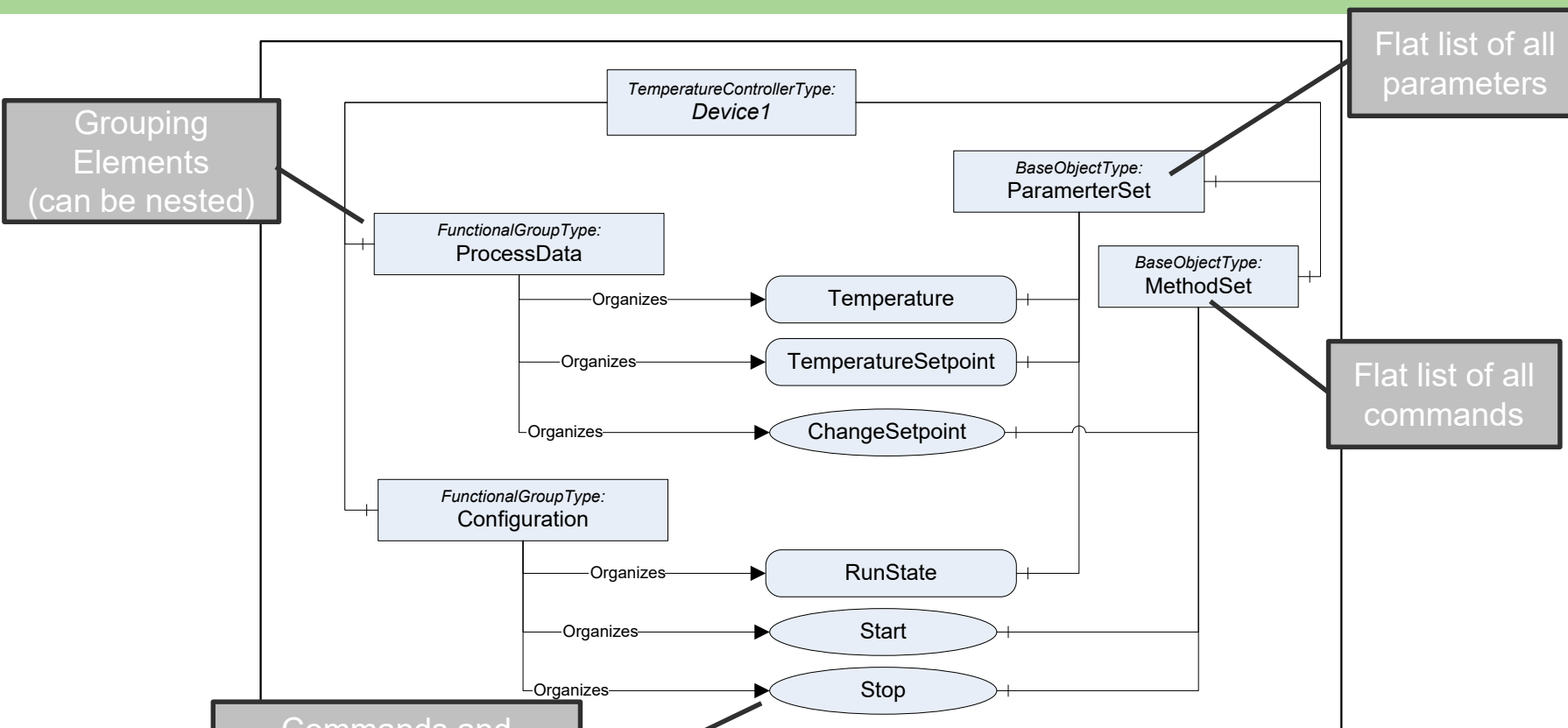
- > CustomerName
- > ArticleNumber
- > ReferenceDesignation (Location)



Examples from

- HKI
- AutoID
- EUROMAP 77

Parameter and Command Organization



Commands and parameters can be referenced by several grouping elements

Pros

- Suitable for managing list of unique parameters

Cons

- Not object-oriented
 - Managing components having same parameters (see Blocks and Modular Devices)
- => Can but does not have to be used

What will be addressed in Version 1.02?

Harmonizing usage of several Information Models based on OPC UA for Devices

Firmware Update

Extensions to Identification

- Article Number, Location Information, Customer Name, ...

Standardized Grouping

- Configuration, Tuning, Maintenance, Diagnostics, Statistics, ...

Ethernet Network Configuration -> Will go to Part 5

Usage of new Interface concept (will be defined in base spec)

- Health, Identification, Device Support Information (Documentation, etc.)

Potentially (probably in later versions)

- Initial Device Setup (incl. device identification and security)
- Physical Network and Logical Network representation
- Alarm Handling
- Black-box Backup and Restore of Device Configuration

Conclusion

OPC UA for Devices provides standardized

- Device Identification (new as Interface)
- Device Health (new as Interface)
- Device Support Information (new as Interface)
- List-oriented Parameter management
- Locking (AddIn)
- Offline / Online Data Transfer (AddIn)
- Block-oriented / Modular Devices
- Topology Management

Companion Specs can pick and choose

- Use things that make sense
- Do not use things not needed (e.g. Topology Management)
- Derive from Base Types or use AddIns / Interfaces