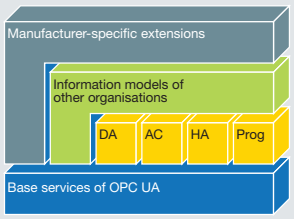
V1.1 GB

OPC FOUNDATION – **WWW.OPCFOUNDATION.ORG**

OPC Unified Architecture –
The universal communication platform for standardised information models

→ OPC Unified Architecture brings two elementary innovations into the OPC world. On the one hand, the Microsoft Windows-specific protocol DCOM is replaced by open, platform-independent protocols with integrated security mechanisms. On the other, the proven OPC features, such as Data Access, Alarms & Events and Historical Data Access, are summarised in an object-oriented model and supplemented by new and powerful features, such as methods and type systems. As a result, not only can the OPC interface be directly integrated into systems on arbitrary platforms with different programming languages, but arbitrary complex systems can also be described completely with OPC UA. The object-oriented rules according to which the address space of an OPC UA server is structured and the OPC UA interface for accessing it are thereby kept so general that OPC UA can be regarded as a network-capable programming language. OPC UA only becomes specialised for automation technology through specific information models such as Data Access, Alarms & Conditions, Historical Access and Programs. For these information models, there is no longer any need to extend the basis and the protocols or the programming interfaces. ■



Cooperation with other standardisation organisations was important for OPC UA from the beginning

This simple extensibility by information models makes OPC UA very interesting for other standardisation organisations. They only have to define which information is to be exchanged, but no longer how the information must be exchanged. Before the start of the OPC UA specification, this was one of the most important requirements that OPC UA as a universal communication platform and IEC standard can form a basis for other standards.

Open
- > 450 members
- Platform-neutral
- All areas of application
- All connections

Productivity
- Industry standard
- Manufacturer-independent
- Interoperability
- Reliability

Collaboration
- Device Integration
- IEC 61131-3 / PLCopen
- Analyzer Device Integration
- ISA-95, ISA-88
- MTConnect
- Smard Grid
- Field Device Integration
- EDDL and FDT

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ALREADY AVAILABLE COMPANION SPECIFICATIONS

→ OPC UA for Devices
→ OPC UA for Analyzer Devices
→ OPC UA for IEC 61131-3

OPC UA – Standardised communication acc. to IEC 62541

OPC UNIFIED ARCHITECTURE COMPANION SPECIFICATIONS

→ OPC UA consists of a list of specifications for the basic functions and the information models based on them, such as Data Access and Alarms & Conditions. Specifications that define further information models beyond that are called Companion Specifications.

HOW ARE COMPANION SPECIFICATIONS CREATED?

→ OPC UA Companion Specifications are developed in various ways. One possibility is a working group of OPC members within the OPC Foundation which defines an information model for special branches of industry or areas of application.
The specification OPC UA for Analyzer Devices (ADI) was created in this way on the basis of customer requirements. Another possibility is a common working group with one or more other organisations with the objective of defining an OPC UA information model for a standard outside the OPC Foundation. The information model OPC UA for IEC 61131-3 was created in this way with PLCopen. ■

COOPERATION:

- → PLCopen
- → ISA
- → MTConnect
- → FDT
- → PNO
- → HART
- → FF

MORE INFORMATION

www.opcfoundation.org

OPC UA FOR DEVICES (DI)

→ A generally accepted model for the configuration of hardware and software components was created in the common working group of OPC Foundation, Profibus User Organisation (PNO), HART Foundation, Fieldbus Foundation (FF) and Field Device Tool (FDT) for the standardised configuration of field devices. This base model was released by the OPC Foundation as an independent information model and also serves as the basis for further standards such as OPC UA for Analyzer Devices and OPC UA for IEC 61131-3. The information model defines basetypes for configurable components and devices; it defines concepts for the logical grouping of parameters, methods and components and it defines points of entry in the OPC UA server address space. Besides that, information for the identification of devices and the available protocols is defined. An initial version of this specification has been available since the end of 2009. ■

Extended options despite simplified interface – new OPC UA communication is applied in existing and new standards

OPC UA FOR ANALYZER DEVICES (ADI

→ This specification defines an information model for complex devices for process analyzer, for example gas chromatography. Apart from the various components of such a device, parameters for configuration and typical state machines are standardised. The ADI specification was created at the suggestion of the users of process analysis devices in order to simplify integration into automation systems. The ADI specification uses the OPC UA DI model as a basis.

OPC UA FOR IEC 61131-3 (PLCOPEN)

→ The IEC 61131-3 standard defines various programming languages and a software model for the programming of control systems. The implementation of this software model on an OPC UA server address space is defined in the specification. Thus, corresponding OPC UA object types are created from declarations of function blocks in the PLC and corresponding OPC UA objects from instances of the function blocks. This results in the advantage that a control program, regardless of the controller being used and the OPC UA server, is always implemented in the same structure of objects in the address space.

FIELD DEVICE INTEGRATION (FDI)

→ Two standards are used today for the configuration of field devices. Electronic Device Description Language (EDDL) works according to the principle that the configuration parameters of a field device are defined by a description file and that the configuration takes place on this basis. Field Device Tool (FDT) works according to the principle that the equipment manufacturer provides a software component for a general configuration tool with the device. Both standards are to be merged in the future via the common FDI standard using OPC UA.
In FDI, a field device is to be described via a so-called Device Package. These consist of a general parameter description and user interface elements. The configuration server is thereby an OPC UA server that fills its address space on the basis of the Device Packages, and the configuration interfaces are OPC UA clients that access the equipment parameters via OPC UA and use specific user interface elements from the Device Packages for the display. ■

OPC UA – interoperability at the semantic level

ISA-95 AND ISA-88

→ The two ISA standards define information models for production control systems for batches and MES. Mapping to OPC UA is planned.

SMART GRID

→ There are various standards in the field of power generation and power distribution and new standards are being created for smart grid networks. In this field, various mappings of existing standards to OPC UA or the direct use of OPC UA in new standards are under discussion.

MTCONNECT

→ MTConnect defines standards for the provision of machine data. Mappings of these data descriptions to an OPC UA information model are to be defined in a common working group. ■