

OPC UA Client and Server

Openness, productivity and connectivity - Unified Architecture

The OPC UA Service is a pure software solution and can be executed directly on the controller CPU without additional hardware.

Systems for visualization, data logging or cloud solutions can use OPC UA as a manufacturer independent interface. The communication can be encrypted in accordance with the latest security standards.

The **OPC UA Server** offers full and transparent access to the released controller process data. Values, time stamps and quality information is updated automatically. The alarm system is convenient and flexible at the same time, and automatically monitors variable values. Disturbances are reported as OPC UA Alarms with selectable acknowledge models. The file system of the control unit can be reached via OPC UA file transfer. The configuration is carried out in the SolutionCenter, and an API additionally permits the alarm system to be operated from the application. The alarm history can be saved for later access by clients. The server is integrated in the security concept of the controller, takes into account user rights to variables and files and logs write accesses.

The **OPC UA Client** enables the controller software to access the data on external UA servers via Read, Write, Subscribe and Method Call operations. Subscribe and Write can be executed via the configuration, so that the values are then available automatically in the process image. The supplied PLCopen compliant client library can also be used.

The interface of the method call sets no limits to the application. In conjunction with the freely programmable methods in atvise® scada, any private cloud solution can be implemented.

Part Type Designation	Part Number
OPC UA Client & Server Download	00022170-90
OPC-UA-Server DA RT	00022170-63
OPC-UA-Server DA AC RT	00035569-63
OPC-UA-Client DA RT	00028782-63
OPC-UA-Client/Server DA RT	00028783-63
OPC-UA-Client/Server DA AC RT	00035570-63

Server Data Access

- Maps the supply of variables of the controller in the address space
- Address space can be modelled entirely independently of the controller software in order to emulate Companion Specifications
- Takes into account the user-specific access rights to variables which are managed in the M200 system
- Logging of write accesses

Server Alarms & Conditions

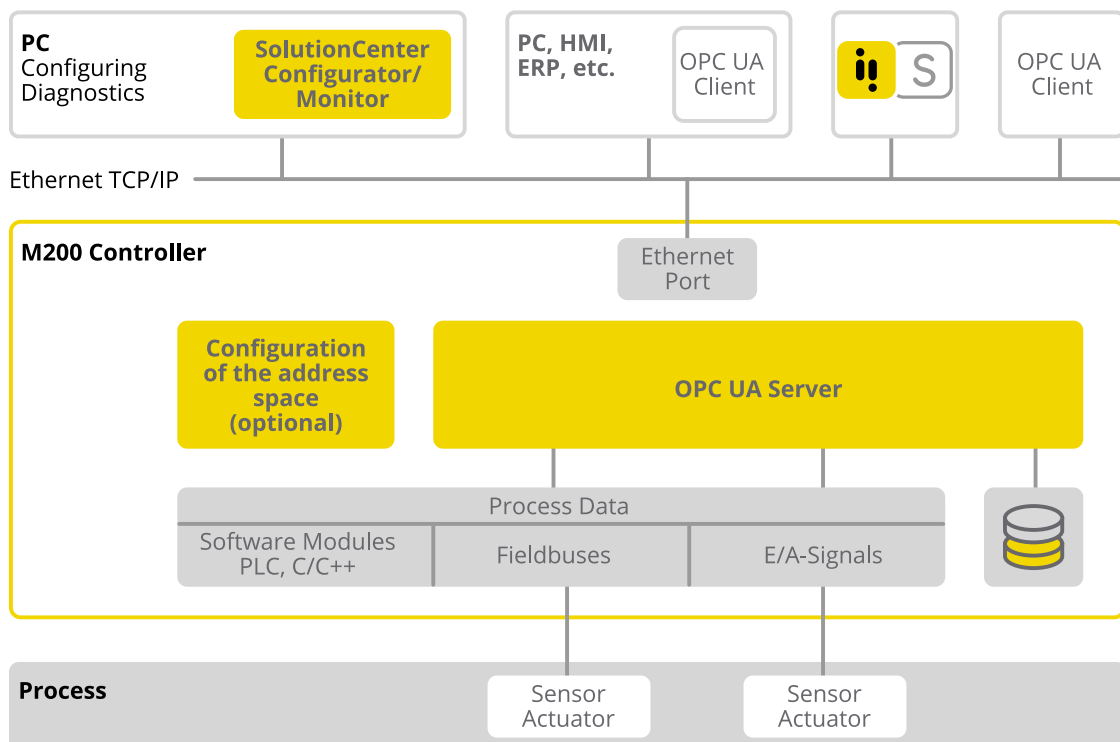
- Automatic monitoring of variable values
- Discrete alarms and level alarms (High, HighHigh etc.)
- Selectable predefined acknowledge models
- Configuration (variables, limits etc.) in CSV format, configurator integrated in the SolutionCenter
- Extensive API for PLC function block library and C/C++: Generating and changing of monitoring tasks, acknowledge, status queries etc.
- Discrete alarms without reference to a variable can be enabled via the API
- Alarm acknowledgement rights can be assigned on a user-specific basis

Server File Transfer

- Maps all local storage media of the controller
- Enables upload and download of files between the controller and the client (e.g. scada)
- Enables to delete, move and rename directories
- Takes into account the user-specific read and write permissions in the file system

Client

- Parallel connection to multiple external UA servers
- Subscription and Write to values without programming
- Current subscription values are automatically available in the process image and HMI
- API for OPC UA Method Call
- Library of PLCopen function blocks included for easier programming
- Library of C/C++ functions also included

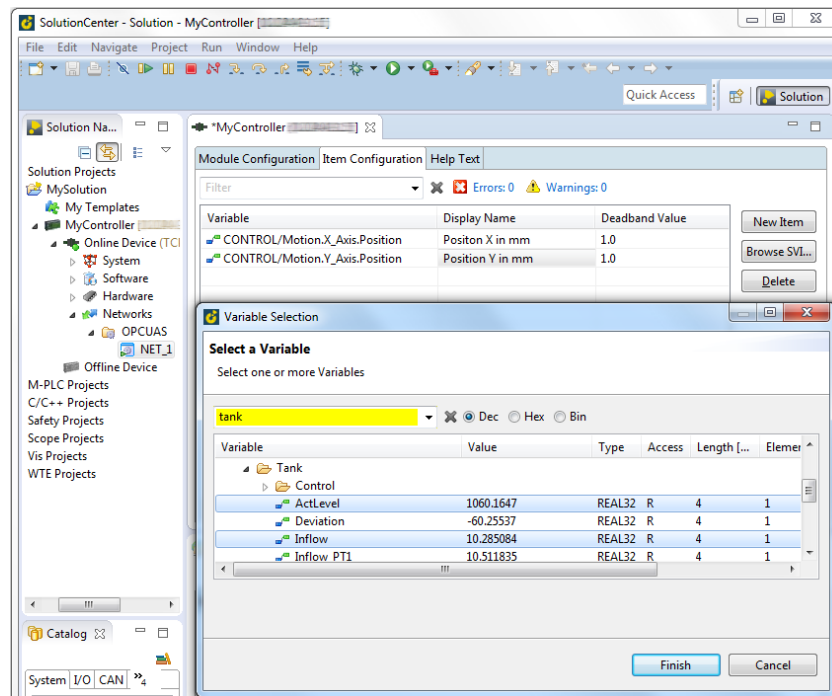


▼ OPC UA Server on the M200 controller

OPC UA Server

Supported OPC UA Profiles	
Information Model	Data Access (DA) Alarms and Conditions (A & C) Historical Access for Alarm Events
Server Profiles	Core Server Facet Base Server Behaviour Facet Enhanced DataChange Subscription Server Facet Embedded UA Server Profile A & C Acknowledgeable Alarm Server Facet A & C Exclusive Alarming Server Facet Base Historical Event Server Facet
Security Profile	None Basic128Rsa15 Basic256 Basic256Sha256
Transport Profile	TCP Binary
Security features	
Encryption	See Security Profile
Protection against overload (DoS)	CPU load caused by clients can be limiting the relevant parameters.
Public Key Infrastructure	File-based on the controller
Logging	Connections and write operations are stored in the security log of the controller.
Restriction of visible variables	The address space can be configured in the SolutionCenter. If the security settings and access rights to the controller are used, visibility also depends on the login of the OPC UA client.
Diagnostics	
State variables	Number of active sessions Number of active subscriptions Number of items monitored by subscription
Show functions	List of sessions List of all software modules in the address space List of all items in subscriptions
Logbook messages	Amount and type of messages can be selected by debug levels
Supported OPC UA service sets	
Discovery Service Set	FindServers GetEndpoints
SecureChannel Service Set	OpenSecureChannel CloseSecureChannel
Session Service Set	CreateSession ActivateSession CloseSession Cancel

Supported OPC UA service sets	
Attribute Service Set	Read Write HistoricalRead
View Service Set	Browse BrowseNext TranslateBrowsePathToNodeIds RegisterNodes UnregisterNodes
MonitoredItem Service Set	CreateMonitoredItems ModifyMonitoredItems SetMonitoringMode SetTriggering DeleteMonitoredItems MonitorEvents
Subscription Service Set	CreateSubscription ModifySubscription SetPublishingMode Publish DeleteSubscriptions Republish
A & C	Enable (without A & C instances) Refresh Acknowledge Confirm Comment Alarm Shelving Suppression by Operator On-Off Delay, Deadband Exclusive Level Discrete
Historical Access	Historical Access Events Historical Access Event Max Events Read Continuation Point



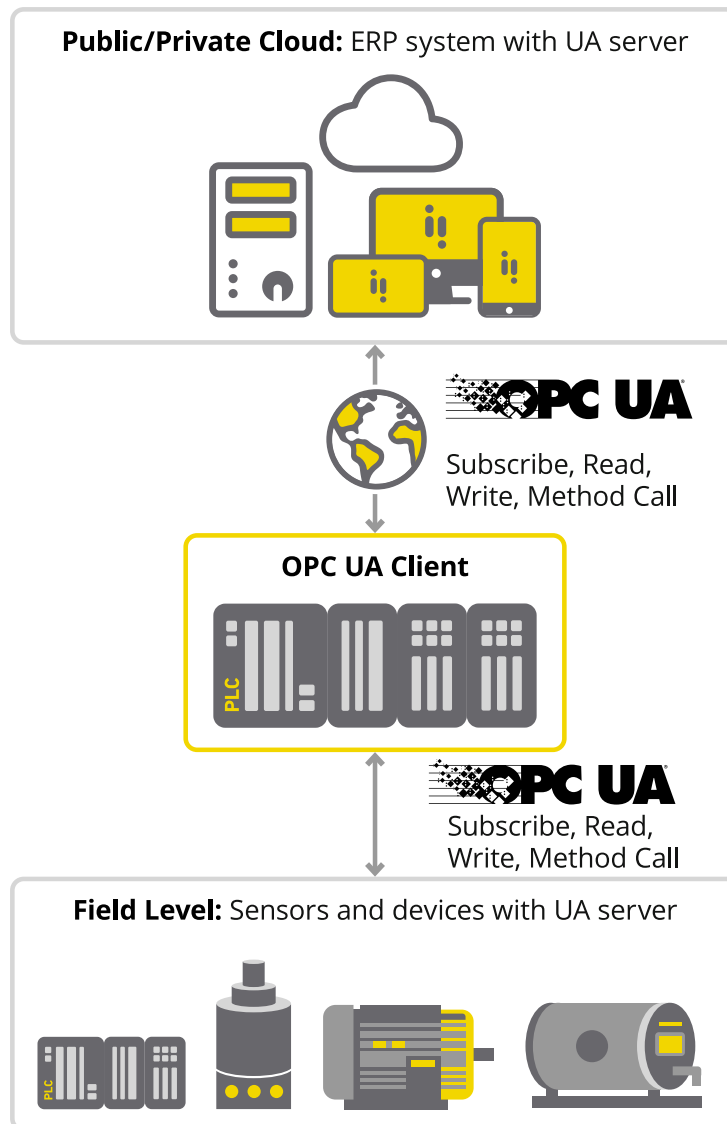
▼ Optional configuration of address space of the server

OPC UA Client

Security	
Encryption	See Server → Security Profile
Certificates	According to standard X509
Public Key Infrastructure (PKI)	File-based on the controller
Verification of server certificate	Optionally possible. Permitted server certificates are stored in the PKI.
User interface (API)	
Function blocks to PLCopen	UA_Connect, UA_Disconnect UA_WriteList, UA_ReadList UA_ConnectionGetStatus UA_NamespaceGetIndexList UA_NodeGetHandleList UA_NodeReleaseHandleList UA_TranslatePathList ua_MethodCall() ua_MethodGetHandleList() ua_MethodReleaseHandleList()
Application from C/C++	Function interface, header file
Subscription	Without programming via configuration. Last values are displayed in the process image; writing is also possible via process mapping. Automatic establishing and monitoring the connection.
Method Call	Possible from C/C++ via the programming interface (API) of the client or with PLCopen blocks

OPC UA Client/Server – general features

Installation	
Shipping	Separately installable product (service); Delivery on DVD or as a download
Target platform	Installation as service on the M200 controller. Depending on the configuration operation as client, server or both.
Installation tool	Bachmann SolutionCenter
Licensing	Requires a runtime license for each controller CPU (independent of number of remote stations and data points), different licenses for server and client
License protection	License file depending on hardware
System requirements	
CPU Hardware	All M200 CPU types (MH200, MC200, MX200) except ME200 series
Memory	Minimum 64 MB, recommended 128 MB
System software version	M-Base V3.95 or higher, M-Base V4.50 or higher recommended



▼ Application fields of the OPC UA Client

Order Data

Part Type Designation	Part Number	Description
OPC UA Client & Server Download	00022170-90	Software, libraries, documentation and examples to operate OPC UA Server and Client on an M200 controller. Available features depend on RT-license. Without license, fully functional operation is possible in a 2 h demo mode.
OPC-UA-Server DA RT	00022170-63	License to operate the OPC UA Server on one controller CPU. Provides communication according to the OPC UA standard Data Access.
OPC-UA-Server DA AC RT	00035569-63	License to operate the OPC UA Server on one controller CPU. Provides communication according to the OPC UA standard Data Access, Alarms & Conditions and Alarm History.
OPC-UA-Client DA RT	00028782-63	License to operate the OPC UA Client on one controller CPU. Provides Read/Write, Subscribe and Method Call to standard-compliant OPC UA servers.
OPC-UA-Client/Server DA RT	00028783-63	License for the combined operation of the OPC UA Client and Server on one controller CPU. Server with Data Access, Client with Read/Write/Subscribe/Method Call.
OPC-UA-Client/Server DA AC RT	00035570-63	License for the combined operation of the OPC UA Client and Server on one controller CPU. Server with Data Access, Alarms & Conditions, Alarm History, Client with Read/Write/Subscribe/Method Call.