

OPC UA Client App

OPC UA Client for ctrlX CORE

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DOK-XCORE*-OPCUA*CLIEN-AP07-EN-P

DC-IA/EPI5 (TaDo/MePe)

Table of contents

1	About this documentation	5
2	Important directions on use	7
2.1	Intended use.	7
2.1.1	Introduction.	7
2.1.2	Areas of use and application	7
2.2	Unintended use.	8
3	Safety instructions	9
4	Introduction into the OPC Unified Architecture	11
4.1	General information.	11
4.2	Overview on specifications	11
4.3	Information model	12
4.4	Service-oriented architecture	12
5	Rexroth ctrlX OPC UA client	19
5.1	ctrlX OPC UA Client in the ctrlX AUTOMATION	19
5.2	Installation on ctrlX CORE.	19
5.3	Licensing.	20
5.4	Configuring the ctrlX OPC UA Client.	20
5.4.1	Creating a client instance.	20
5.4.2	Deleting a client instance.	22
5.5	Connecting the client to the server.	22
5.6	Using data available via the ctrlX OPC UA Client.	23
5.7	Configuring via web interface.	25
5.8	Properties.	25
5.8.1	Security.	25
5.8.2	User token.	26
5.8.3	Certificate management.	26
5.8.4	Protocol and encoding.	27
5.8.5	Supported services.	27
5.8.6	NodId	27
6	Related documentation	29
6.1	Overview.	29
6.2	ctrlX AUTOMATION.	29
6.3	ctrlX WORKS.	29
6.4	ctrlX CORE.	30
6.5	ctrlX CORE apps.	30
7	Service and support	33
8	Index	35

1 About this documentation

Editions of this documentation

Edition	Release date	Note
01	2020-06	First edition
02	2021-01	Revision for ctrlX CORE version UAC-V-0106
03	2021-05	Revision for ctrlX CORE version UAC-V-0108
04	2021-08	Revision for ctrlX CORE Version UAC-V-0110
05	2022-01	Revision for ctrlX CORE version UAC-V-0112 New: <ul style="list-style-type: none"> ➔ Chapter 5.3 Licensing on page 20 ➔ Chapter 5.8.6 Nodeld on page 27 Revised: <ul style="list-style-type: none"> ➔ Chapter 5.8.5 Supported services on page 27
06	2022-04	Revision for ctrlX CORE version UAC-V-0114 New: <ul style="list-style-type: none"> ➔ Chapter 5.7 Configuring via web interface on page 25 Revision: <ul style="list-style-type: none"> ➔ Chapter 5.2 Installation on ctrlX CORE on page 19 ➔ Chapter 5.4 Configuring the ctrlX OPC UA Client on page 20
07	2022-09	Revision for ctrlX CORE version UAC-V-0116 Revision: <ul style="list-style-type: none"> ➔ Chapter 5.2 Installation on ctrlX CORE on page 19 ➔ Chapter 5.8.3 Certificate management on page 26

2 Important directions on use

2.1 Intended use

2.1.1 Introduction

Rexroth products are developed and manufactured to the state-of-the-art. The products are tested prior to delivery to ensure operational safety and reliability.

▲ WARNING

Personal injury and damage to property due to incorrect use of products!

The products may only be used as intended.

Failure to use the products as intended may cause situations resulting in property damage and personal injury.

NOTICE

Damages resulting from unintended use

Rexroth As the manufacturer does not assume any warranty, liability or compensatory claims for damages resulting from unintended use of the products. The user alone shall bear the risks of an unintended use of the products.

Before using Rexroth products, make sure that all the prerequisites for an intended use of the products are met:

- Personnel that in any way, shape or form uses Rexroth products must first read and understand the relevant safety instructions and be familiar with their intended use
- Leave hardware products in their original state, i.e., do not make any structural modifications. It is not permitted to decompile software products or alter source codes
- Do not install damaged or defective products or commission them
- It has to be ensured that the products have been installed as described in the relevant documentation

2.1.2 Areas of use and application

Products of the ctrlX series are suitable for Motion/Logic applications.

NOTICE

Products of the ctrlX series may only be used with the accessories, mounting parts, and other components specified in this documentation. Components that are not expressly mentioned must neither be attached nor connected. The same applies to cables and lines.

Only to be operated with the hardware component configurations and combinations expressly specified and with the software and firmware specified in the corresponding documentations and functional descriptions.

Products of the ctrlX series are suitable for single-axis as well as for multi-axis drive and control tasks. Device types with different equipment and interfaces are available for using the system in specific applications.

Typical areas of application:

- Building automation
- IoT and Security Gateway or Device
- Handling & Robotic

Controls of the ctrlX CORE series may only be operated under the mounting and installation conditions, in the position of normal use and under the ambient conditions (temperature, degree of protection, humidity, EMC, etc.) specified in the related documentations.

2.2 Unintended use

"Unintended use" refers to using the ctrlX products outside of the above-mentioned areas of application or under operating conditions and technical data other than described and specified in the documentation.

ctrlX products must not be used if they are exposed to following conditions:

- Operating conditions that do not meet the specified ambient conditions. Operation under water, under extreme temperature fluctuations or under extreme maximum temperatures is prohibited
- Applications that have not been expressly authorized by Rexroth




3 Safety instructions

The Safety instructions contained in the available application documentation feature specific signal words (DANGER, WARNING, CAUTION or NOTICE) and, where required, a safety alert symbol (in accordance with ANSI Z535.6-2006).

The signal word is meant to draw the reader's attention to the safety instruction and identifies the hazard severity.

The safety alert symbol (a triangle with an exclamation point), which precedes the signal words DANGER, WARNING and CAUTION, is used to alert the reader to personal injury hazards.

The Safety instructions in this documentation are designed as follows:

 DANGER	In case of non-compliance with this safety instruction, death or serious injury will occur.
 WARNING	In case of non-compliance with this safety instruction, death or serious injury could occur.
 CAUTION	In case of non-compliance with this safety instruction, minor or moderate injury could occur.
NOTICE	In case of non-compliance with this safety instruction, property damage could occur.

4 Introduction into the OPC Unified Architecture

4.1 General information

OPC UA is the further development of the OPC industrial standard. The service-oriented architecture ensures platform independency, scalability and high-availability by omitting a DCOM basis. OPC UA ensures a complete vertical integration from the control level up to the automation component irrespective of the programming language or the operating system. OPC UA is a client/server system. Several clients can access a server simultaneously. A client can access several servers.

4.2 Overview on specifications

OPC Unified Architecture was published as multi-part specification in 14 parts by the OPC foundation → <http://www.opcfoundation.org>. Only registered users can download the specification. Register on → <http://www.opcfoundation.org>.

Table 1: OPC UA - Overview on specifications

Part	Specification	Download
Part 1	OPC UA Part 1 - Overview and Concepts	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-1-overview-and-concepts/
Part 2	OPC UA Part 2 - Security Model	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-2-security-model/
Part 3	OPC UA Part 3 - Address Space Model	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-3-address-space-model/
Part 4	OPC UA Part 4 - Services	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-4-services/
Part 5	OPC UA Part 5 - Information Model	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-5-information-model/
Part 6	OPC UA Part 6 - Mappings	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-6-mappings/
Part 7	OPC UA Part 7 - Profiles	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-7-profiles/
Part 8	OPC UA Part 8 - Data Access	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-8-data-access/
Part 9	OPC UA Part 9 - Alarms and Conditions	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-9-alarms-and-conditions/
Part 10	OPC UA Part 10 - Programs	→ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-10-programs/

Part	Specification	Download
Part 11	OPC UA Part 11 - Historical Access	↪ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-11-historical-access/
Part 12	OPC UA Part 12 - Discovery	↪ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-12-discovery/
Part 13	OPC UA Part 13 - Aggregates	↪ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-13-aggregates/
Part 14	OPC UA Part 14 - PubSub	↪ http://www.opcfoundation.org/developer-tools/specifications-unified-architecture/part-14-pubsub/

4.3 Information model

The information model of the OPC UA is based on nodes describing an object-oriented context. A node can consist of attributes, methods and events. The content depends on the "NodeClass". The type model allows to map all types of user data including meta data. Each node has a unique "NodeId". References describe the connections between nodes. ReferenceType specifies the reference semantics.

The information model of the OPC UA is used as basis and extended as individual profile by other organizations such as PLCopen. For more information on these extensions, refer to the keyword "Companion Specification" or go to the respective organizations or the OPC foundation. Each OPC UA server reports the profiles it supports upon request.

4.4 Service-oriented architecture

The OPC UA architecture is divided into logical levels.

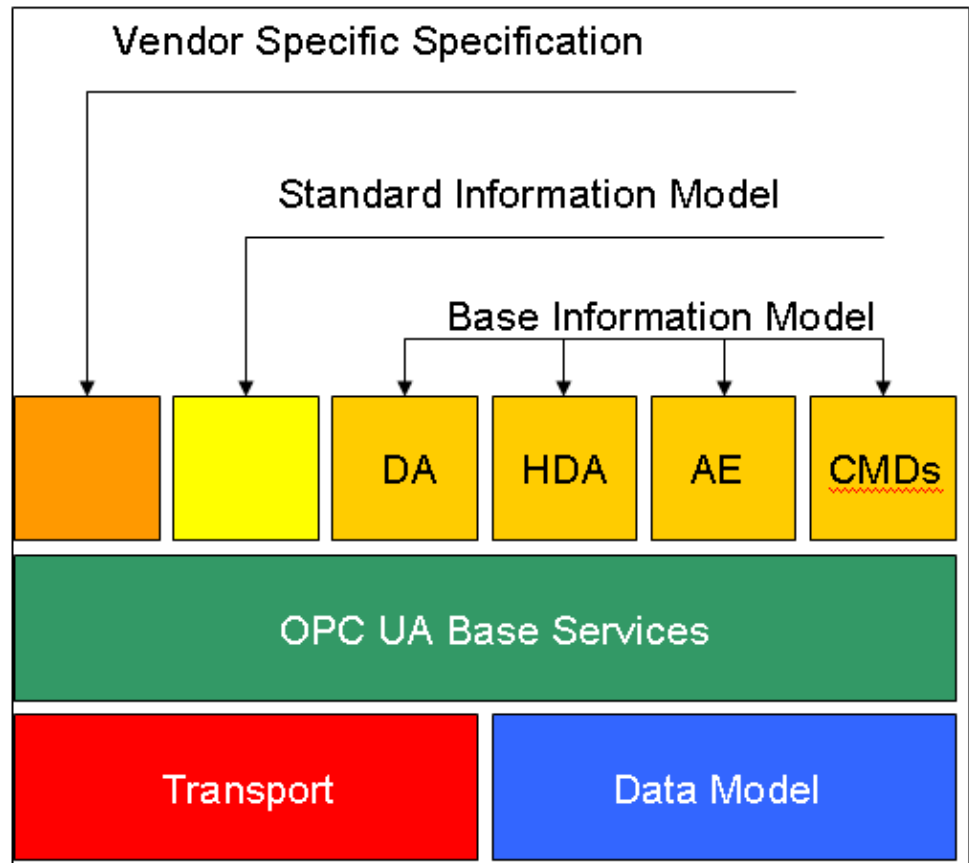


Fig. 1: OPC UA architecture

Transport level

The transport level serializes and deserializes data and sends or receives it. Data is transferred using an XML stream via the HTTP-HTTPS protocol or via a high-performance binary TCP protocol.

Basic OPC UA services

All basic OPC UA services are abstract method descriptions. They do not depend on the transport protocol and they are used as basis for all OPC UA functions. The methods are summarized in "Service Sets".

The most important "Service Sets" are mentioned in the following sections.

Discovery Service Set

The "Discovery Service Set" defines the services a client uses to determine the endpoints of a server and their security configuration. An endpoint is a variant consisting of a communication protocol, a host address, a port number and security settings.

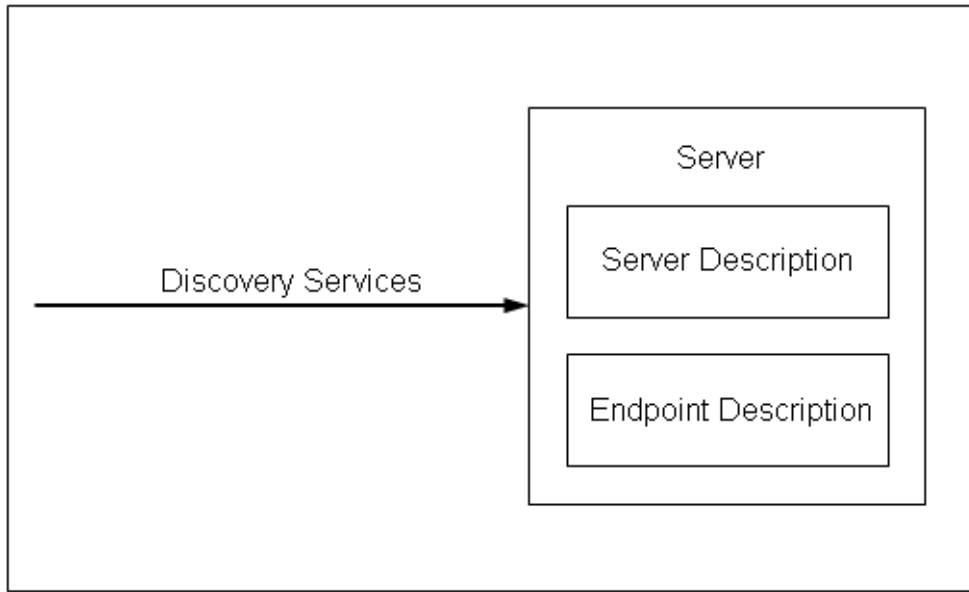


Fig. 2: Discovery Service Set

Session Service Set

A session is a logic connection between the client and the server on application level. The client can set up the connection. It can include client-specific user and language settings.

A session is set up using the "CreateSession" service. A session ID is assigned to the client. The client can use this session ID to call the following data services (Read, Write, Subscribe, etc.).

The server closes a session automatically after a client request (CloseSession) or after a timeout.

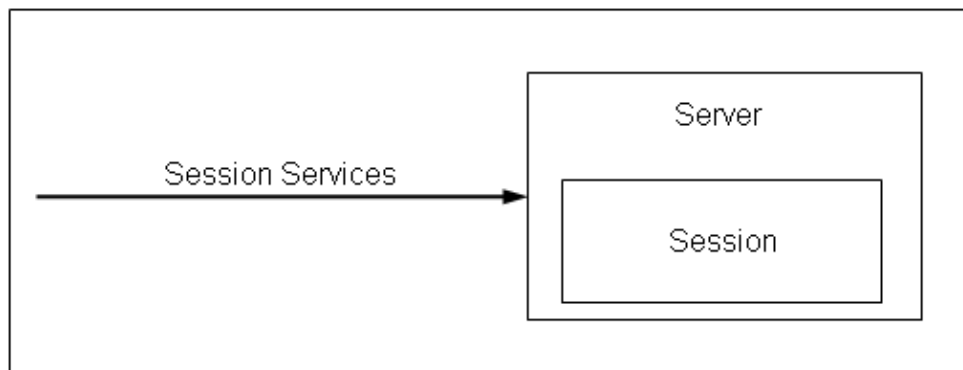


Fig. 3: Session Service Set

View Service Set

With the "View Service Set", the client allows the OPC UA server to browse through restricted address spaces (so-called views). The address space is intended to present available OPC UA server information to a client. It is generally generated from a number of nodes. The nodes are standardized objects and intended to map "Real World" objects.

Most important node classes:

- Variable
- Object
- Method

The connections between the nodes are set up using references. It is differentiated between hierarchical and non-hierarchical references. Hierarchical references are used to map a structural node order for example. Non-hierarchical references are used to refer to a node type definition for example.

The type system of nodes and references include types for objects, references, variables, events and data. This type system can be extended by the derivation of existing types and thus be provided with deeper semantics.

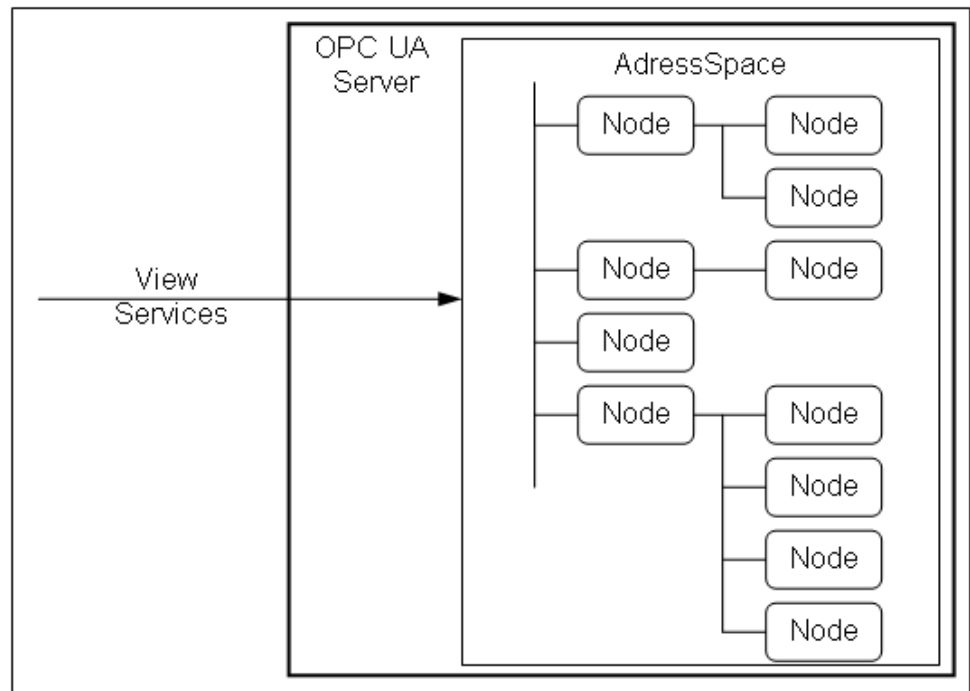


Fig. 4: View Service Set

Attribute Service Set

A node consists of multiple attributes. These attributes describe a node in detail. The node class specifies the attributes of a node. Only nodes of the "Variable" node class contain the attribute "Value".

All node classes have a common set of basic attributes. The basic attributes are for example "NodeId" to uniquely address a node, "NodeClass" and "BrowseName".

Read-only and write access is provided for these attributes using the "Service Set" attribute.

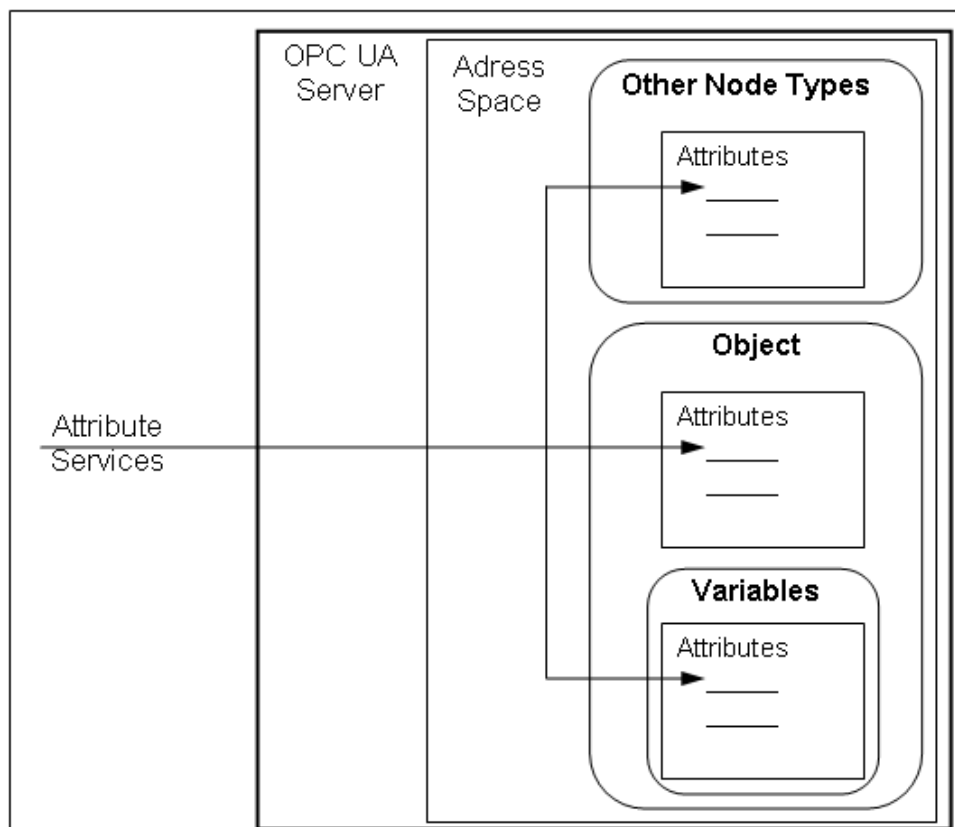


Fig. 5: Attribute Service Set

Subscription Service Set

Subscriptions are an efficient method in the OPC UA to receive information on value changes in the OPC UA server from the server. Clients can create, modify and delete subscriptions using the "Subscription Service Set"

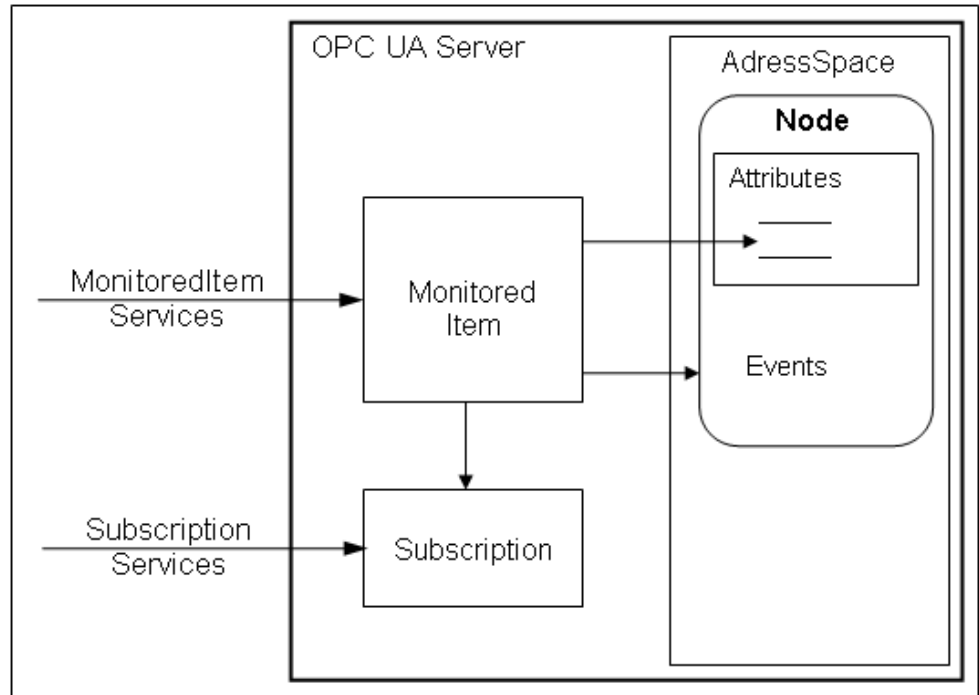


Fig. 6: Subscription Service Set

MonitoredItem Service Set

A "MonitoredItem" is a "Value" attribute, an aggregation of one or several "Value" attributes or an event included in a subscription. If the value of these "Value" attributes changes or if a corresponding event is reported, this value is transferred automatically to the client.

Clients can create, modify or delete "MonitoredItems" in the OPC UA server using the "MonitoredItem Service Set".

5 Rexroth ctrlX OPC UA client

5.1 ctrlX OPC UA Client in the ctrlX AUTOMATION

The ctrlX OPC UA Client runs as individual app in the ctrlX CORE.

Install the app on the ctrlX CORE to allow it to connect to the OPC UA servers and to provide its data to other apps. This allows a standardized access to other devices, e.g. other controls in the network using OPC UA

Data of the “OPC UA” server connected via the app OPC UA Client is provided in the ctrlX CORE using the ctrlX backend Data Layer. This ensures that all data of the OPC UA Client app is available for all apps of the ctrlX CORE.

The app “OPC UA Client” is not installed on the ctrlX CORE by default. Thus, install it first on the ctrlX CORE.

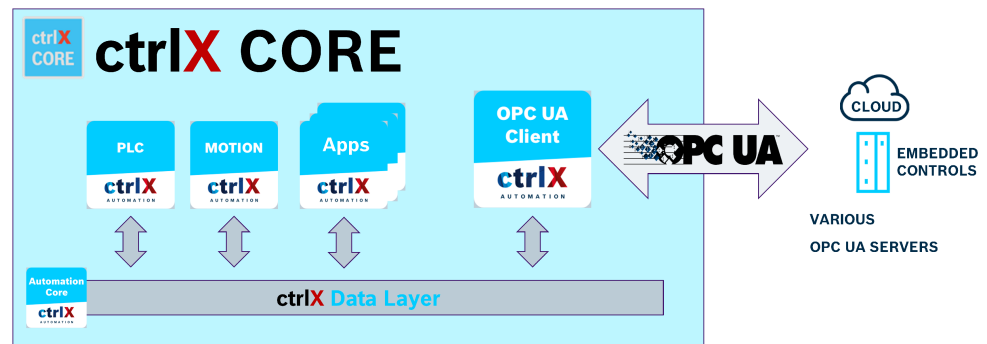


Fig. 7: ctrlX OPC UA Client in the ctrlX CORE

5.2 Installation on ctrlX CORE

Install the app “OPC UA Client” on the ctrlX CORE before using the ctrlX OPC UA Client. Use the package manager of the ctrlX CORE. The installation does not depend on other apps. The installation takes a few minutes. For a successful installation, the apps Device Admin and Automation Core have to be already installed on the ctrlX CORE.

To install on the ctrlX CORE, the user needs the user permission “Apps: Manage apps” or “Administration: Full Access”.

For the Package Manager, go to the web interface under “Settings → Apps”.

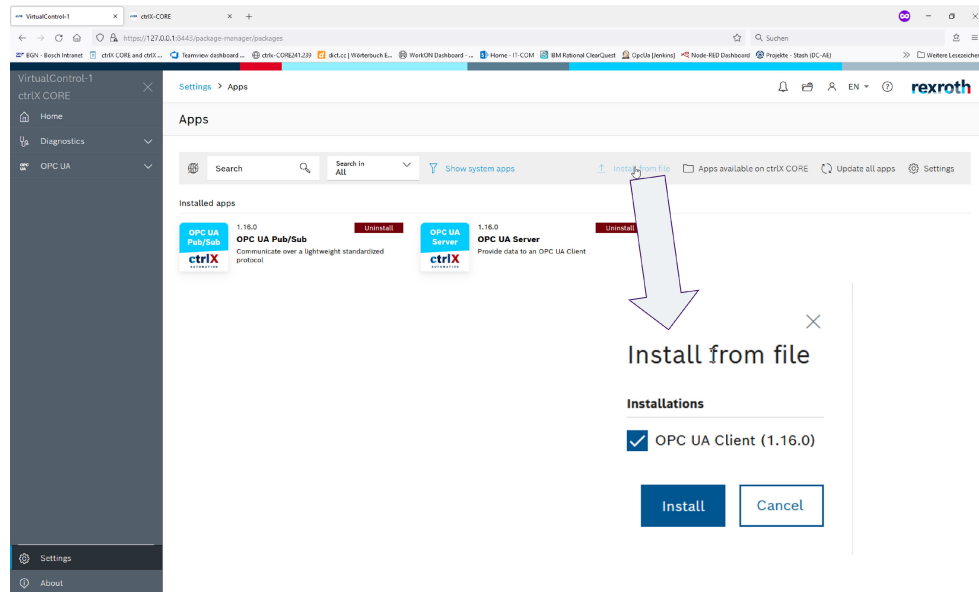
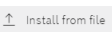


Fig. 8: For the installation of the app "OPC UA Client", go to *"Settings → Apps"*. To install the app "OPC UA Client", use the web engineering interface. To install, proceed with the following steps as shown in Fig. 8:

1. Select "Apps" from the "Settings" menu
2. Select  to install the app from the file system
3. Select the installation file.
4. Install via the button "Install".

5.3 Licensing

A valid license is required to use the ctrlX OPC UA Client. This license can be loaded before or after the installation.

To operate the ctrlX OPC UA Client, one of the following licenses is required:

- SWL_XCR_ENGINEERING_4H
- SWL-XCx-UAC-OPCUACLIENTxx-NNNN



The ctrlX OPC UA Client can be configured without license. However, a license is required to connect a client to the server.

Further information

- ctrlX CORE Runtime, Application Manual, chapter "[ctrlX licenses](#)" (R911403768, DOK-XCORE*-BASE*****-APRS-EN-P)
- [ctrlX Automation website](#)

5.4 Configuring the ctrlX OPC UA Client

Configuration using the Data Layer. The OPC UA can also be used for the configuration if the ctrlX OPC UA Server is also installed on the ctrlX CORE.

From 1.14, basic parameters can also be configured via the web interface, see [Chapter 5.7 Configuring via web interface on page 25](#).

Perform the following steps to configure the ctrlX OPC UA Client and to set up its connection to an OPC UA Server.

5.4.1 Creating a client instance

There are the following options to create a ctrlX OPC UA Client instance:

- Via OPC UA call to the "opcuaclient/create" method
- Via Data Layer call "create" to the *opcuaclient* node

The input arguments "endpointUrl" and "name" are **mandatory**.

In Fig. 9, the client "myClient" is exemplarily created with the endpointUrl "opc.tcp://127.0.0.1:4840".

All configurations (except the name) can also be modified at any time after creating the instance.

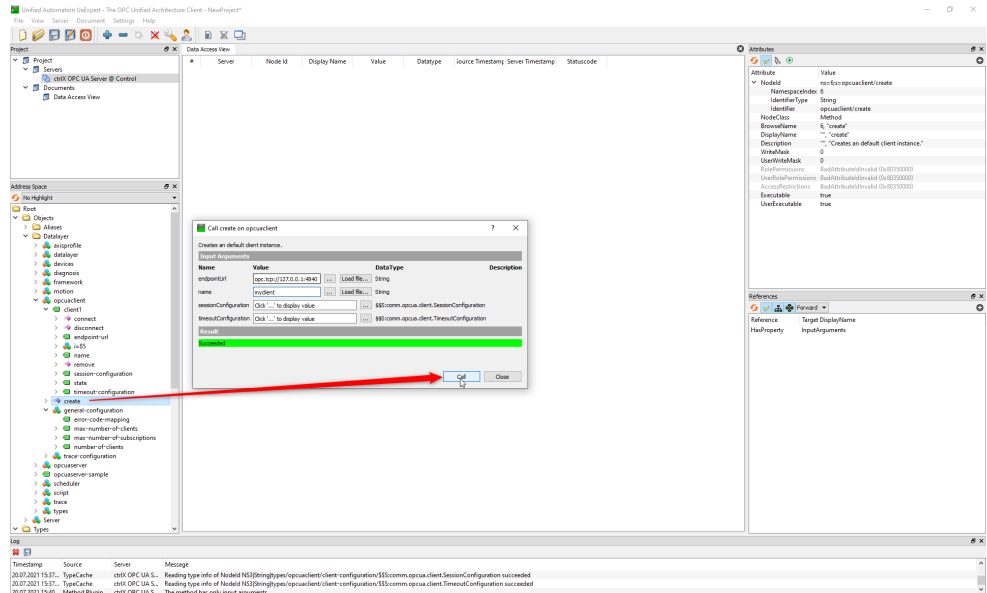


Fig. 9: Creating a ctrlX OPC UA Client via the address space of the ctrlX OPC UA Server in the data range of the Data Layer. View in the UaExpert

The configurations "sessionConfiguration" and "timeoutConfiguration" are optional. Configure them additionally if required.

For the default values, refer to Fig. 10.



When writing the "session-Configuration" via UaExpert, note that the character string "****" is entered into the field "password". This character string is returned when reading the password instead of the actual password.

This character string is only a placeholder of the actually configured password.

Removing the optional field "password" impedes that the actual password is overwritten with the character string "****".

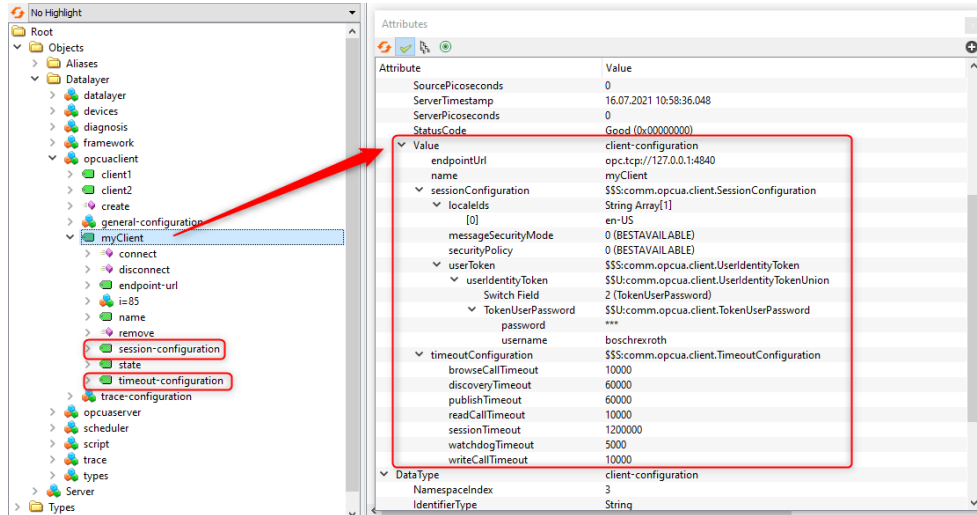


Fig. 10: Default values of "session-configuration" and "timeout-configuration" in the OPC UA Client. View on the address space of the ctrlX OPC UA Server in the data range of the Data Layer in the UaExpert

5.4.2 Deleting a client instance

There are the following options to delete a ctrlX OPC UA Client instance:

- Via OPC UA call to the "opcuaclient/myClient/remove" method
- In the Data Layer via the "delete" call on the *opcuaclient/myClient* node

5.5 Connecting the client to the server

- To connect to the server, use the "opcuaclient/myClient/connect" method via the Data Layer with "Write" or via the OPC UA Call Service
- If there is an error, a negative status code and the "diagnosis" structure are returned
- The "opcuaclient/myClient/state" node provides information on the connection state of the client instance (see Fig. 11)
- To close the connection, use the "opcuaclient/myClient/disconnect" method



After control restart, all clients are in the "Disconnected" state and have to be reconnected.

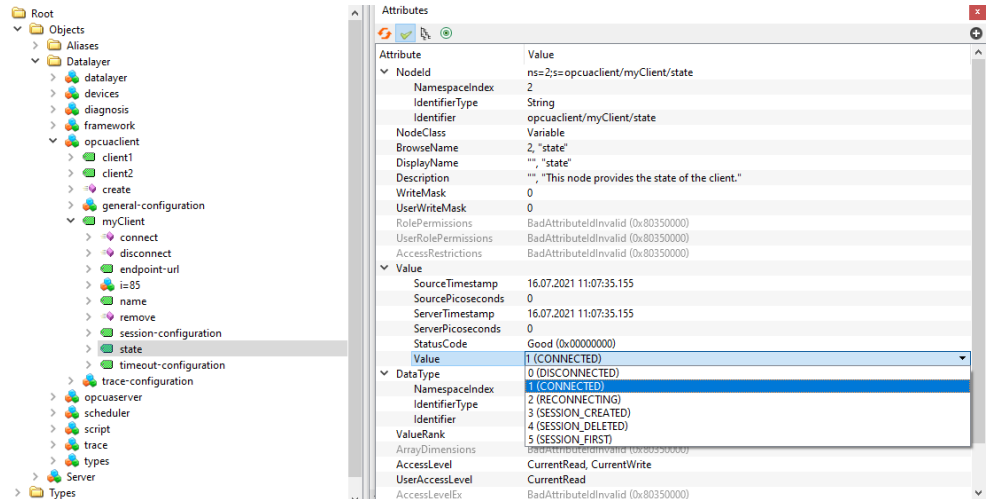


Fig. 11: "opcuaclient/myClient/state" node with possible enumeration values for the connection state of the client instance. View on the address space of the ctrlX OPC UA Server in the data range of the Data Layer in the UaExpert

5.6 Using data available via the ctrlX OPC UA Client

Data of the connected OPC UA server can be used in the system after the configuration.

To determine the Data Layer addresses, use the Data Layer browse of the ctrlX OPC UA Client.

This is exemplarily shown in Fig. 12 in the address space of the ctrlX OPC UA Server.

The ctrlX OPC UA Client provides its data under "opcuaclient" in the Data Layer. Data of the ctrlX OPC UA Server connected via a client instance is available below the respective client node (e.g. "client1"). Browse for the node "i=85" (Data Layer address: opcuaclient/client1/i=85). The address space of the target ctrlX OPC UA Server is mapped below. Currently, this address space implicitly includes data of the OPC UA server located below the "Objects" node. Any node of the OPC UA server can be read and written.

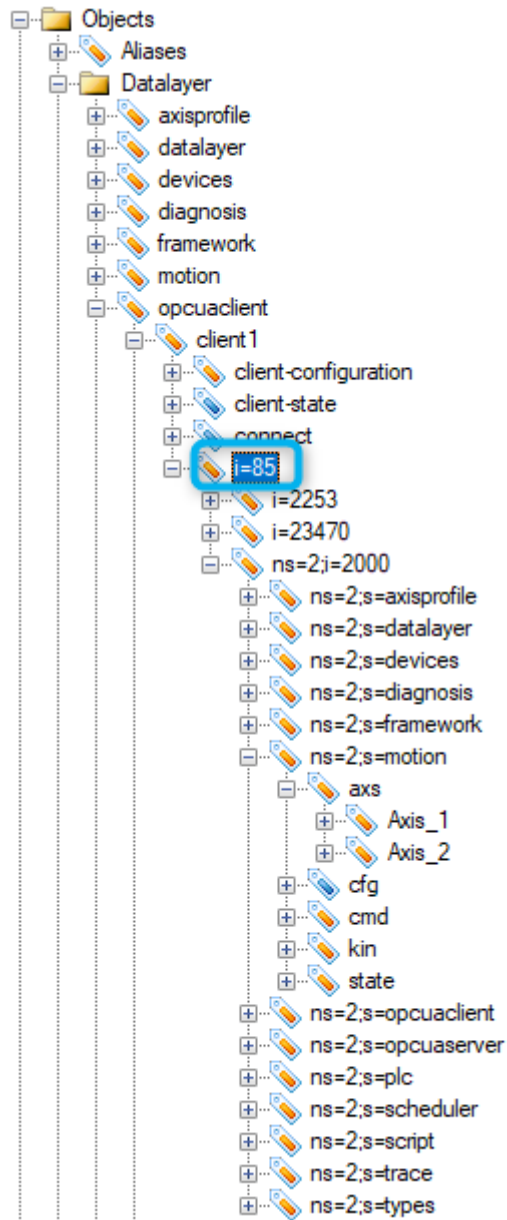


Fig. 12: Mapping data of a ctrlX OPC UA Client in the address space of the ctrlX OPC UA Server in the data range of the Data Layer View in the UA.TestClient

5.7 Configuring via web interface

From 1.14.0, a web interface to access status and configuration data is provided with the app upon delivery.

After installing the OPC UA Client app, it integrates itself automatically into the web interface of the control.

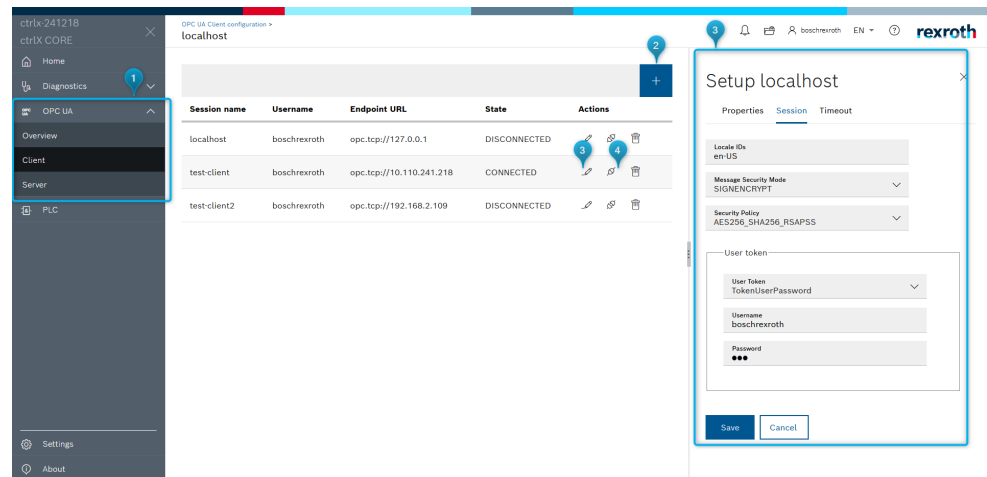


Fig. 13: Overview on the OPC UA Client app in the web interface of the control
The web interface of the OPC UA Client app is divided into the following sections:

- ① side navigation: Entry point to the OPC UA-specific settings
- ② button +: Opens a dialog to set a new client
- ③ button : Opens a sidebar to configure the ctrlX OPC UA Clients. The following settings can be configured:
 - General settings
 - Session settings
 - Timeouts
- ④ button : The client connects to the server endpoint. Then, data is available via Data-layer (via [Chapter 5.6 Using data available via the ctrlX OPC UA Client on page 23](#)).

5.8 Properties

5.8.1 Security

The following methods are supported to encrypt and sign (SecurityPolicies):

- SecurityPolicy – None
- SecurityPolicy [A] - Aes128-Sha256-RsaOaep
- SecurityPolicy [B] – Basic256Sha256
- SecurityPolicy - Aes256-Sha256-RsaPss
- SecurityPolicy – Basic128Rsa15 [deprecated]
- SecurityPolicy – Basic256 [deprecated]



Use the Aes256-Sha256-RsaPss method if possible, as it is the most secure method.

Basic128Rsa15 and Basic256 are not secure procedures and should thus not be used.

OPC UA Client can search for and use the most secure procedure of the server to be connected if the “Safest” mode is configured for the Security Policy.

5.8.2 User token

The ctrlX OPC UA Client supports the following user tokens:

- “AnonymousIdentityToken” (None Secure)
- User token with SecurityPolicies Aes256-Sha256-RsaPss, Basic256Sha256, Basic256[deprecated] or Basic128Rsa15[deprecated]
- None



Username_256-Token with SecurityPolicy BASIC256SHA256 is also the standard method of SecurityPolicy Aes128-Sha256-RsaOaep.

Basic256 and Basic128Rsa15 are not secure procedures and should thus not be used anymore.

None should only be used for diagnostic purposes. It should not be used for the general operation and this disabled if required.

5.8.3 Certificate management

A secure connection between the OPC UA server and the client is based on trustworthy certificates. Currently, only the self-signed certificate management is supported. There is a manual exchange of certificates between the OPC UA server and the client. Certificates are exchanged when establishing a connection between the client and the server. Server and client have to trust the certificates manually.

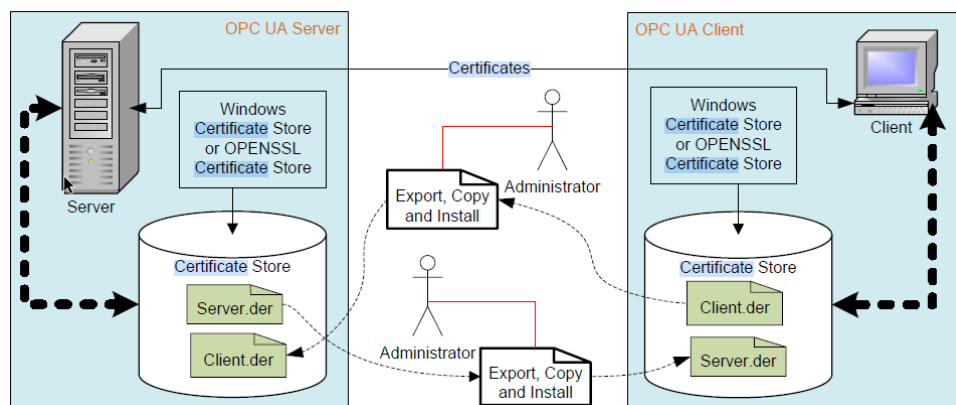


Fig. 14: Manual certificate management from “OPC UA Specification Part 2: Security“

The certificates are trusted automatically in the ctrlX OPC UA Client. The server has to trust the client certificate. For a ctrlX OPC UA Server, trust the certificate in the WebInterface under “Settings → Certificate&Keys → OPC UA Server”.

Technical information on the certificate of the ctrlX OPC UA Client

The certificate of the ctrlX OPC UA Client is currently self-generated and signed and valid by default.

The encryption method used is “sha256“ and the key length is 2048 bits.



Up to the version 1.12, the period of validity of the self-created certificate of the ctrlX OPC UA Client is 1825 days (approx. 5 years). This period of validity remains when updating to newer versions.

The period of validity can be modified via the Data Layer address `opcua-client/certificate-configuration/certificates/0/days-valid`.

For the description of the Data Layer node, go to:

➔ `opcuaclient/certificate-configuration/certificates/<index-of-certificate>/days-valid`

5.8.4 Protocol and encoding

The release 1.04 of the OPC UA standard is supported with the following profiles (Part 7 - Profiles):

Table 2: ctrlX OPC UA Client - Supported profiles

Protocol and Encoding		
Name	Description	From Profile
Protocol UA TCP	Support the UA TCP transport protocol defined in UA Part 6.	UA-TCP UA-SC UA-Binary
UA Secure Conversation	Support UA Secure Conversation specified in UA Part 6.	UA-TCP UA-SC UA-Binary
UA Binary Encoding	Support UA Binary Encoding. Values of these data types are encoded in compact binary formats, contiguously and without tagging. I.e. the receiver is assumed to understand the structure it is decoding.	UA-TCP UA-SC UA-Binary

5.8.5 Supported services

The ctrlX OPC UA Client supports the following OPC UA services to access data on a ctrlX OPC UA Server:

- **Browse**
- **Read**
- **Write**
- **Subscription**
- **Call**

A method is called via the Data Layer operation "read".

The following restrictions apply:

- Only simple data types and arrays of simple data types are supported as parameters (InputArguments and OutputArguments).

5.8.6 NodeId

The ctrlX OPC UA Client can only access string NodeIds and numeric NodeIds.

6 Related documentation

6.1 Overview

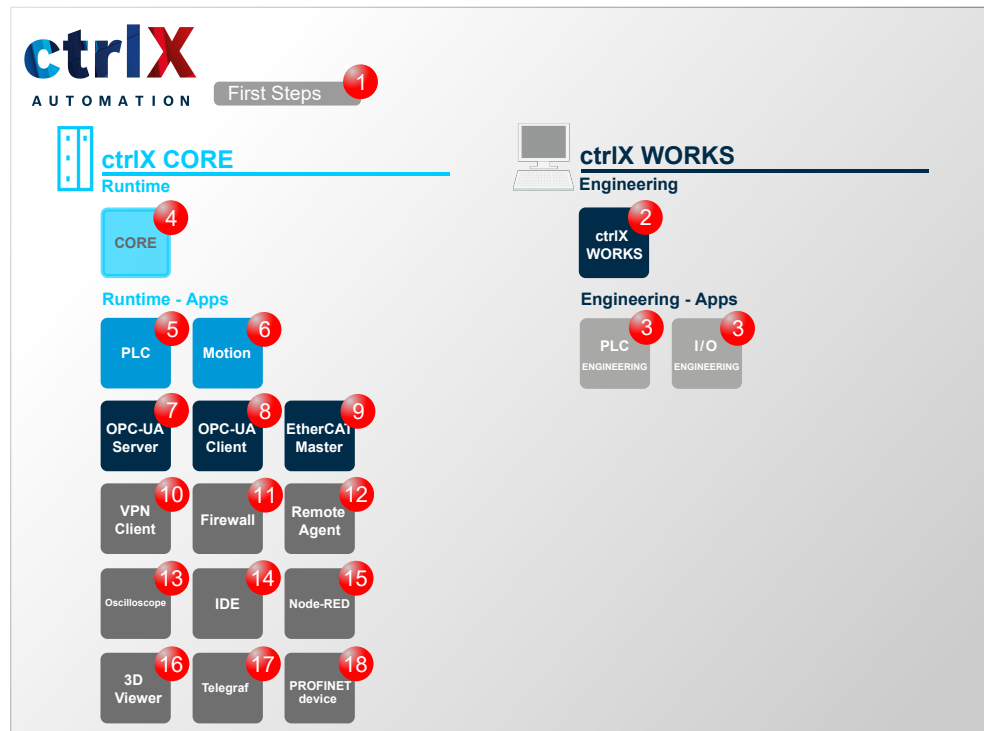


Fig. 15: Overview on further documentations

6.2 ctrlX AUTOMATION

No.	Documentation
1	<p>ctrlX WORKS First Steps Quick Start Guide ↪ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XWORKS-F*STEP*****-QURS-EN-P • R911403760

6.3 ctrlX WORKS

No.	Documentation
2	<p>ctrlX WORKS Basic System Application Manual ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XWORKS-*****-APRS-EN-P • R911403761
3	<p>ctrlX PLC Engineering - PLC Programming System Application Manual ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XPLC**-ENGINEERING-APRS-EN-P • R911403764
3	<p>ctrlX PLC Engineering - PLC Libraries Reference ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XPLC**-LIBRARY****-RERS-EN-P • R911403766

6.4 ctrlX CORE

No.	Documentation
4	<p>ctrlX CORE - Runtime Application Manual ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XCORE*-BASE*****-APRS-EN-P • R911403768
	<p>ctrlX CORE - Diagnostics Reference ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XCORE*-DIAG*****-RERS-EN-P • R911403770

6.5 ctrlX CORE apps

No.	Documentation
5	<p>PLC App - PLC Runtime Environment for ctrlX CORE Application Manual ↔ Web documentation link Ordering information:</p> <ul style="list-style-type: none"> • DOK-XCORE*-PLC*****-APRS-EN-P • R911403787

No.	Documentation
6	<p>Motion App - Motion Runtime Environment for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-MOTION*****-APRS-EN-P ● R911403791
7	<p>OPC UA Server App - OPC UA Server for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-OPCUA*SERV*-APRS-EN-P ● R911403778
8	<p>OPC UA Client App - OPC UA Client for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-OPCUA*CLIEN-APRS-EN-P ● R911403781
9	<p>EtherCAT Master App - EtherCAT master for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-ETHERCAT***-APRS-EN-P ● R911403773
10	<p>VPN Client App - Remote Support Software for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-VPN*****-APRS-EN-P ● R911403775
11	<p>Firewall App - Security Functions for ctrlX CORE</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-FIREWALL***-APRS-EN-P ● R911403783
12	<p>Remote Agent App - ctrlX Device Portal Connection for ctrlX Devices</p> <p>Application Manual ↗ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-REMOTE*AG**-APRS-EN-P ● R911403785

No.	Documentation
13	<p>Oscilloscope App - Oscilloscope Function for ctrlX Devices</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-OSCI*****-APRS-EN-P ● R911409806
14	<p>IDE App - Integrated Development Environment</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-IDE*****-APRS-EN-P ● R911410625
15	<p>Node RED App - Graphic Programming for ctrlX CORE</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-NODE*RED***-APRS-EN-P ● R911403789
16	<p>3D Viewer App - Browser-based 3D Kinematic Simulation for ctrlX CORE</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-3D*VIEWER**-APRS-EN-P ● R911416124
17	<p>Telegraf App - Server Agent for Collecting Data in the Data Layer</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Ordering information:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-TELEGRAF***-AP01-EN-P ● R911416836
18	<p>PROFINET device App - PROFINET device for ctrlX CORE</p> <p>Application Manual</p> <p>↔ Web documentation link</p> <p>Bestellinformationen:</p> <ul style="list-style-type: none"> ● DOK-XCORE*-PROFINET***-AP01-EN-P ● R911417857

7 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts provide you with advice and assistance. You can contact us **24/7**.

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Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

8 Index

C

Certificate management.	26
Configuring the ctrlX OPC UA Client.	20
Configuring via web interface.	25
Connecting the client to the server.	22
Creating a client instance.	20
ctrlX AUTOMATION	
Related documentation.	29
ctrlX OPC UA Client in the ctrlX AUTOMATION	19

D

Deleting a client instance.	22
-------------------------------------	----

E

Encoding.	27
-------------------	----

G

General information.	11
------------------------------	----

H

Helpdesk.	33
Hotline.	33

I

Information model.	12
Installation on ctrlX CORE.	19
Intended use	
Areas of application.	7
Areas of use.	7
Introduction.	7

L

Licensing.	20
--------------------	----

N

Nodetd.	27
-----------------	----

O

Overview on specifications.	11
-------------------------------------	----

P

Properties.	25
Protocol.	27
Protocol and encoding.	27

S

Safety instructions.	9
Security.	25, 26
Service hotline.	33
Service-oriented architecture.	12
Support.	33
Supported services.	27

U

Unintended use.	8
Consequences, disclaimer.	7
Using data available via the ctrlX OPC UA Client	
.	23

W

Web interface.	25
------------------------	----

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