

UPDATE

How to get connection between WinStudio and ctrlX CORE

The following how to... describes the OPC-UA connection between WinStudio and our new ctrlX CORE. There are thousands of WinStudio applications running, and there is still a need to keep WinStudio going on with our newest PLC, so here is a short description how to get in contact with ctrlX CORE.

Tested on ctrlXCORE:

OPC UA Server – 1.16.0

PLC – 1.16.0




WinStudio:

IW ML 15V16P1

CtrlX CORE:

At first, you should write a small plc program and put the needed symbols to the Symbol Configuration

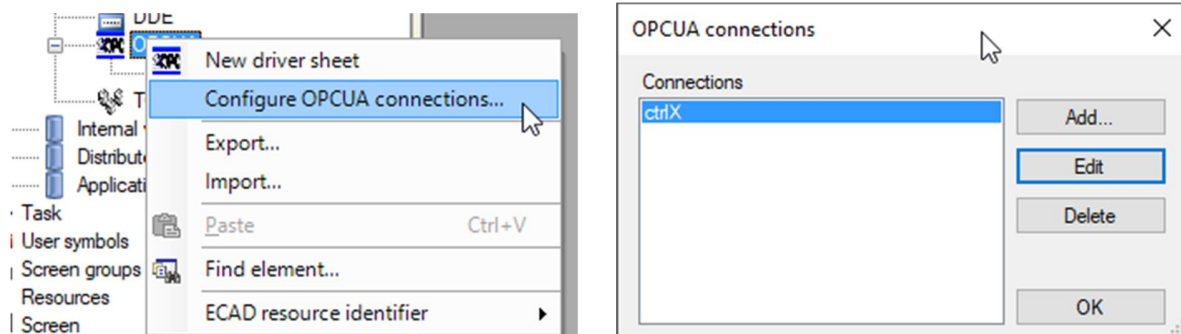
```
1  (*XM_Info ();*)
2
3  ● iVariable1 3767 := iVariable1 3767 + 1;
4  //sString:= "test";
5  ● bBoolFALSE;
6
7
8  ● RETURN;
9  ● RETURN
```

VirtualControl_1.Application.HMI_GVL					
Expression	Type	Value	Prepared value	Address	Com
 iVariable1	INT	10107			
 bBool	BOOL	FALSE			
 sString	STRING	"			

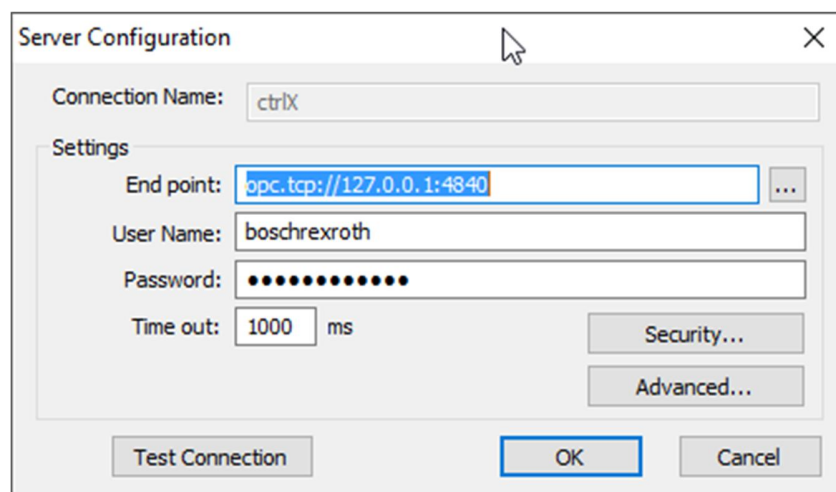
Standard PC, e.g. (VPB40.4, PR3/PR4, VR3/VR4)

Now you must prepare the OPC-UA configuration in WinStudio. Be aware, that you need at least IW 15V12, otherwise you cannot run the WinStudio Application on another PC.

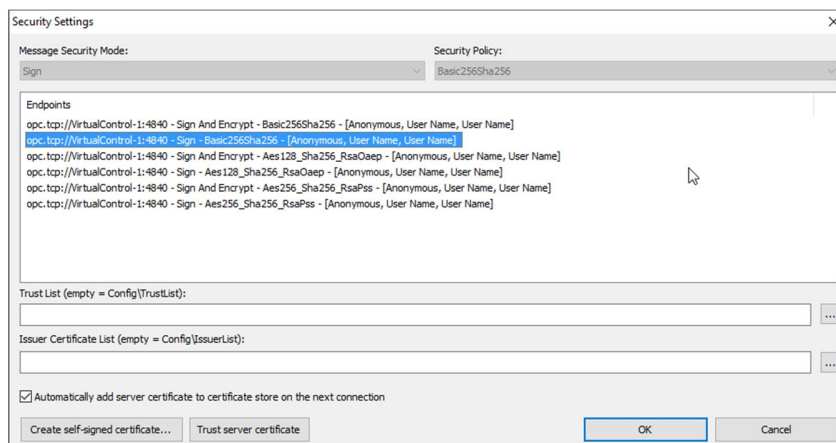
At first you must configure the OPC-UA connections



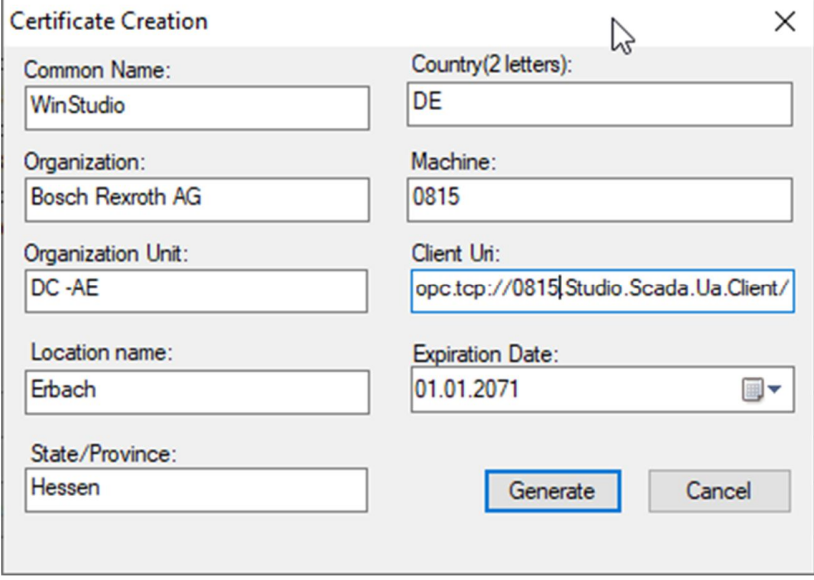
I have created one ctrlX and here is the next screen



CtrlX CORE uses a secure OPC-UA connection. So you have to use User Name and Password (it's the same as you login into the ctrlX CORE) and then you have to open the security screen.



We use the Sign Basic256Sha256 certificate. You have to create the self-signed certificate



The 'Certificate Creation' dialog box contains the following fields:

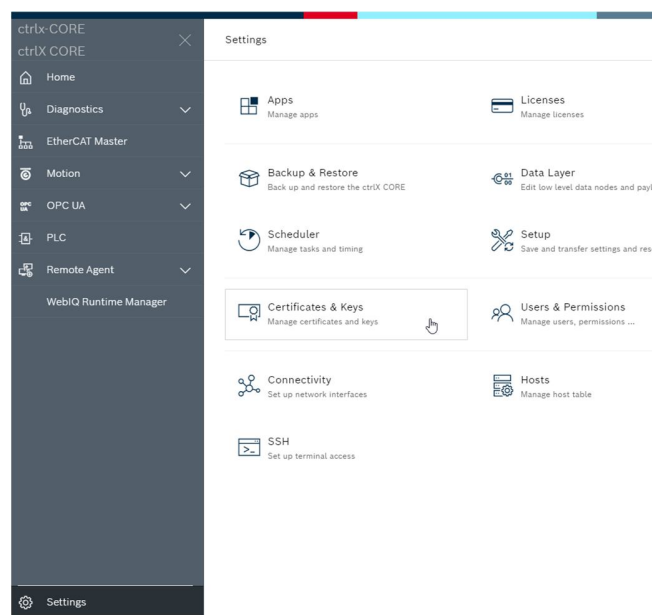
Field	Value
Common Name:	WinStudio
Country(2 letters):	DE
Organization:	Bosch Rexroth AG
Machine:	0815
Organization Unit:	DC -AE
Client Uri:	opc.tcp://0815.Studio.Scada.Ua.Client/
Location name:	Erbach
Expiration Date:	01.01.2071
State/Province:	Hessen

Buttons: Generate, Cancel

The entries on the left side are optional, the entries at machine and Client URL are read by the system and it is the computer name where you create the certificate.

Accept the entries with generate and the certificate will be stored. You are back to the security settings now. Here you have to trust the server certificate too, then the configuration of the OPC_UA on WinStudio site is finished.












We had sent a certificate to the ctrlX CORE. So there we have to accept this certificate too. To do so, we have to go to the homepage of the ctrlX CORE and have to open certificate & keys under settings



Open this menu and open the OPC-UA Server item. In my case there are several OPC-UA server running.

The last line refers to the WinStudio certificate which is at the moment rejected

OPC UA Server

Certificates Keys					
4 items					
Name	Category	Issued by	Valid from	Valid until	Actions
rexroth-opcua-server2048.der	Own	CommonName: ctrlX OPC UA Server @ Control Organization: Bosch Rexroth AG	03-05-2021 09:34:34	09-04-2120 09:34:34	 
428137910486D0A36BBE199ED2F2B	Trusted	CommonName: opcua.shmi Organization: Smart HMI GmbH	03-05-2021 11:14:44	01-05-2031 11:14:44	  
E3AC1EF7A36730A9C93C534720D0C	Trusted	CommonName: UAIClient Organization: BoschRexroth	03-05-2021 11:03:11	07-04-2026 11:03:11	  
DDA6BB8F2A7506AE975D2C3199755	Rejected	CommonName: WinStudio Organization: Bosch Rexroth AG	11-05-2021 08:08:28	31-12-2070 22:00:00	  

If you are not sure, if your certificate is downloaded, you can go to the details and get more information.

×

DDA6BB8F2A7506AE975D2C3199755AB5342E0D5.der

Category: rejected

Version: 3

Serial Number: 1620720508

Issuer:

CN=WinStudio,

O=Bosch Rexroth AG,

OU=DC - AE,

L=Erbach,

ST=Hessen,

C=DE

IsCA: true

Validity: valid

Valid From: 11-05-2021 08:08:28

Valid To: 31-12-2070 22:00:00

Subject:

CN=WinStudio,

O=Bosch Rexroth AG,

OU=DC - AE,

L=Erbach,

ST=Hessen,

C=DE

Hash Algorithm: SHA256-RSA

Public Key: -----BEGIN PUBLIC KEY-----

MIGfMA0GCsGSIb3DQEBAQUAA4GNADCBiQKBgQCxpLyMDKoP5q1rrxsTW04XeP

oqzMDKEk71XwvoG31fo9igHh1K9sETADxMgk7YTLuDu16zwrAGaw0U1hZMI3r9

3jb20scNi+1S5BbLjnKXKACqGipyN6/F1gmMBHwE65Ah4iUJ03Tp04CPHF4ILQdE




aK03+YnXNAw8XcZnwIDAQAB

-----END PUBLIC KEY-----

Public Key Parameters: RSA

Signature Algorithm: RSA

If everything is ok, you can trust the certificate and then you can start to work with WinStudio as usual.

DDA6BB8F2A7506AE975D2C3199755	Trusted	CommonName: WinStudio Organization: Bosch Rexroth AG	11-05-2021 08:08:28	31-12-2070 22:00:00	  
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VR21xx/VH2110

Due to the fact, that the VR21 and VH2110 using Windows Embedded Compact 7 OS, they cannot use secure OPC-UA connection. Here you must use no security. This works from IndraWorks Version 15V16P1 on.

At first you must configure the OPC-UA Server on the ctrlX CORE. Go to the OPC UA folder, activate the server menu and click on actions

In the Endpoint menu you should only activate NONE for communication with a VR21/VH2110 and BASIC256SHA256 for communication with a standard PC. It should look like this:

Actions

Setup Server [X]

Certificate **Endpoint** Session Subscription

Port number *
4840

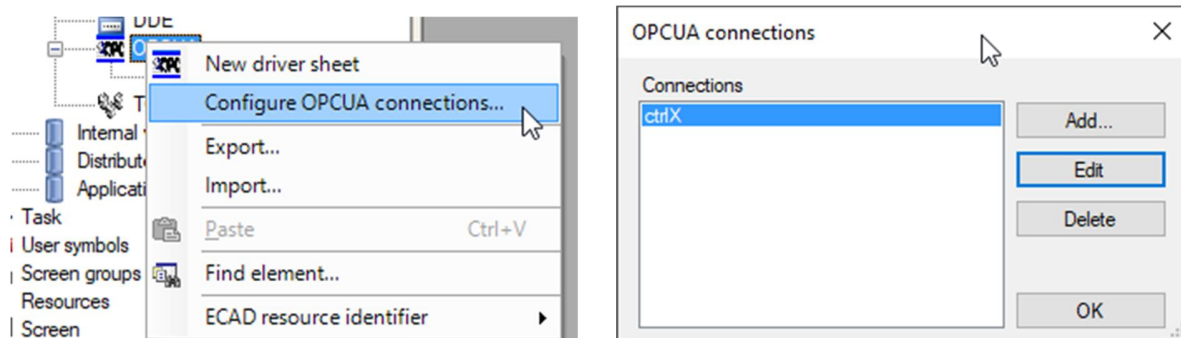
Allows the use of deprecated 'Security Policies'
Yes

'Security' configurations ⊕

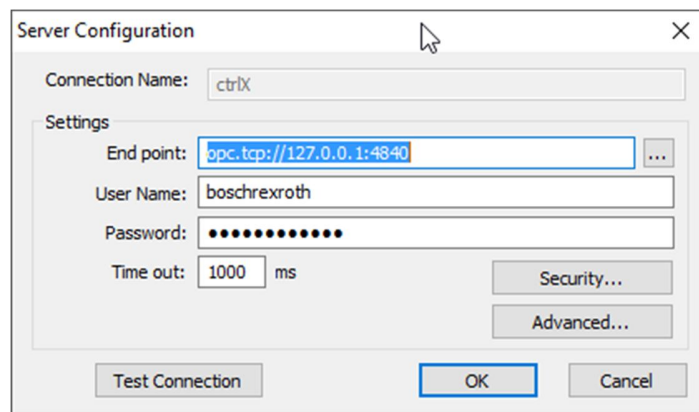
Policy	None	Sign	Sign and Encrypt	Action
NONE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BASIC256SHA256	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
AES128_SHA256_RSAO_AEP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Now you must prepare the OPC-UA configuration in WinStudio. Be aware, that you need at least IW 15V16P1, otherwise you cannot run the WinStudio Application on a VR21/VH2110

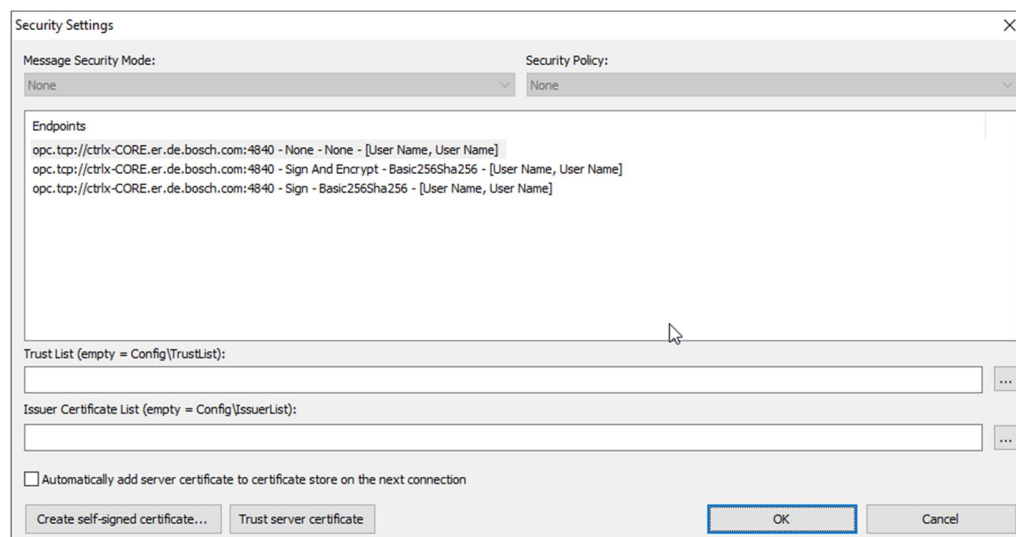
At first you must configure the OPC-UA connections



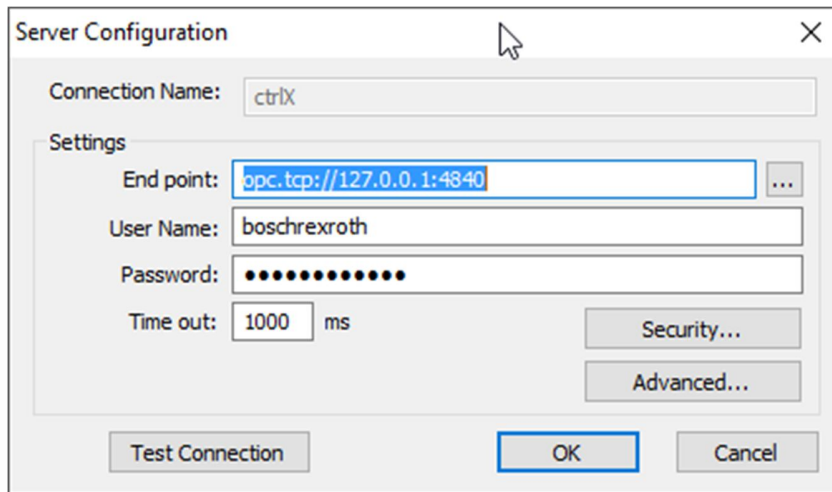
I have created one ctrlX and here is the next screen



When you open the Security menu, it should look like this:



You choose the first topic, leave this menu with ok, and test the server connection. Be aware that you need the username and password you are using when you login into your ctrlX CORE



The image shows a 'Server Configuration' dialog box. At the top, there's a title bar with 'Server Configuration' and a close button. Below the title bar, there's a 'Connection Name' field with the value 'ctrlX'. Underneath, there's a 'Settings' section. Inside 'Settings', there are four fields: 'End point' with the value 'opc.tcp://127.0.0.1:4840', 'User Name' with the value 'boschrexroth', 'Password' which is masked with dots, and 'Time out' with the value '1000' and the unit 'ms'. To the right of the 'Time out' field, there are two buttons: 'Security...' and 'Advanced...'. At the bottom of the dialog, there are three buttons: 'Test Connection', 'OK', and 'Cancel'. The 'OK' button is highlighted with a blue border.

Now you have finished the OPC-UA configuration and you can start your project.

Diagnostic

A last hint regarding the OPC-UA connection. In the header of the WinStudio OPC-UA driver sheet you can create two variables which are written by the OPC-UA Server.

Description:

Connection: ctrlX Advanced...

Status: OPCUA_Stat Status Message: OPCUA_Meld

Publish rate (ms): 100 Disable:

Root node or view:

Tag Name	Node Id	Scan	Div
Filter text	Filter text	(All)	Filter
1 IntVar1	ns=2;s=plc/app/Application/sym/HMI_GVL/iVariable1	Always	
2 String	ns=2;s=plc/app/Application/sym/HMI_GVL/sString	Always	
*		Always	
*		Always	
*		Always	
*		Always	
*		Always	

Status

this is an integer value which shows you the actual connection status. Value 1 means everything is fine.

StatusMessage

this is a string value which shows you the actual connection status in clear text. The text is depending on what is written in the OPC-UA Server.

At runtime it should look like this

Status: 1

Message: Die Verbindung zum OPC-Server wurde hergestellt und liegt im normalen Laufstand.

ctrixvalue: -10919

If you have any questions regarding this how to..., do not hesitate to contact me

Mit freundlichen Grüßen / Best regards

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