

#### Accessing data on a Simatic S7-1200/1500 using Python

Accessing data securely by configuring the integrated OPC UA Server

read in your web browser

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TOC



- 1. Enabling and setting up OPC UA in TIA Project
  - a) Setting up security mechanisms based on X.509 certificates to enable authentication and encryption in TIA Portal
  - b) Setting up general PLC security mechanisms
- 2. Installing python-opcua and opcua-client using pip (on Windows)
  - a) Install clients and test installation
  - b) Create client certificate in TIA Portal for Python client
- 3. Accessing data on the SIMATIC S7-1200/S7-1500



# PLC Configuration in TIA Portal





#### Network Topology





IP Adresse: xxx.xxx.xxx.xxx

OPC UA Server: IP Adresse: xxx.xxx.xxx.xxx

#### Enable OPC UA Server in TIA Project





Purchase OPC UA License from

Siemens Industry Mall and

activate it in your TIA project

#### Enable OPC UA Server in TIA Project





Activate OPC UA Server for selected PLC in Device Configuration. Make sure to follow security setup instructions on the following slides to avoid unrestricted OPC UA access!

#### Enable OPC UA Server in TIA Project





... user management via project security settings is available only in case the entire **project is** protected!  $\rightarrow$  protect your TIA project <



#### Setting up OPC UA security mechanisms



Protect entire project to enable advanced security mechanisms such as:

- project-wide user administration
- project-wide certificate manager

Defining project-wide security settings has the advantage, that you can administer security settings globally for multiple PLCs in your project. In addition, when accessing your PLCs remotely using OPC UA, it is more comfortable/securer to maintain your certificates and users project-wide for all PLCs instead of individually for every single PLC.

#### Setting up OPC UA security mechanisms Mutual Authentication



IP Adresse: xxx.xxx.xxx.xxx

OPC UA Server: IP Adresse: xxx.xxx.xxx.xxx Client presents its certificate to server

Server needs to "know" the client's certificate and has to have it marked as "trusted" to accept the connection request.



Client needs to "know" the server's certificate and has to have it marked as "trusted" to accept the connection request. Server presents its certificate to the server.

## Setting up OPC UA security mechanisms



Enable project wide certificate manager for selected PLC → All PLC-specific certificates will be lost! (may cause trouble with OPC UA clients if your PLCs are currently used in existing environments)





In the PLC specific certificate manager create a new **certificate for the OPC Server**! (This creates a key pair)

For the Certificate Authority (CA) select one of the suggested above (alternatively import your CA in the global

certificate manager, which is not part of this slide deck)





Device specific certificate manager,

showing recently created certificate

 $\rightarrow$  Same certificate will be shown in

project wide certificate manager 🧲



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Global certificate manager showing recently generated certificate



Add created certificate to OPC UA server settings





Configure supported authentication and
encryption schemes the PLC should
support!
Disable "No security" to enforce
cryptographic client authentication and
encrypted communication!

# Setting up OPC UA security mechanisms



Disable "Enable guest authentication" to avoid anonymous access by anyone without username and password!

Enable "Enable username and password authentication", define a username and password which will be granted access to the OPC UA Server

# Setting up general PLC security mechanisms







# Setting up general PLC security mechanisms



Set a password for your PLC display when

"Enable write access" is activated (S7-

1500)!

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# Installing OPC UA Python client



Create a python virtualenv and install opcua, opcua-client and PyQt5 into using pip:

• pip install opcua opcua-client PyQt5

opcua – client library

opcua-client – demo application

PyQt5 – GUI framework required by opcua-client

- https://github.com/FreeOpcUa/python-opcua
- https://github.com/FreeOpcUa/opcua-client-gui
- <u>https://pypi.org/project/PyQt5/</u>



icrosoft Windows [Version 10.0.19041.508] c) 2020 Microsoft Corporation. All rights reserved.

:\Users\johanneskinzig\PythonVenvs>virtualenv -p python simaticopcua reated virtual environment CPython3.7.8.final.0-64 in 2539ms creator CPython3Windows(dest=C:\Users\johanneskinzig\PythonVenvs\simaticopcua, clear=False, g seeder FromAppData(download=False, pip=bundle, setuptools=bundle, wheel=bundle, via=copy, app added seed packages: pip==20.2.2, setuptools==49.6.0, wheel==0.35.1 activators BashActivator,BatchActivator,FishActivator,PowerShellActivator,PythonActivator,Xor

:\Users\johanneskinzig\PythonVenvs>simaticopcua\Scripts\activate

Command Prompt







Install optional libraries to support cryptographic schemes which we have set up in TIA project:

pip install crypto cryptography

©3 C\\Windows\System32\cmd.exe
(simaticopcua) C:\Users\johanneskinzig\PythonVenvs>pip install crypto cryptography
Collecting crypto
Downloading crypto-1.4.1-py2.py3-none-any.wh1 (18 kB)
Contecting cryptography Developing cryptography-3 1 1-cp37-cp37m-win amd64 wh1 (1 5 MR)
1.5 MB 2.2 MB/s
Collecting Naked
Bownloading Naked-0.1.31-py2.py3-none-any.whl (590 kB)
Collecting shellescape
Downloading shellescape-3.8.1-pv2.pv3-none-anv.whl (3.1 kB)
Requirement already satisfied: six>=1.4.1 in c:\users\johanneskinzig\pythonvenvs\simaticopcua\lib\site-packages (from cryptography) (1.15.0)
Collecting cffil=1.11.3,>=1.8
Downloading c++1-1.14.3-cp3/re-ya1/m-win_amd64.wh1 (1/8 kB)
Collecting requests
Using cached requests-2.24.0-py2.py3-none-any.whl (61 kB)
Collecting pyyaml
Using cached PyYAML-5.3.1-cp3/-cp3/m-win_amab4.whi (216 KB)
Using cached pycparser-2.20-py2.py3-none-any.wh1 (112 kB)
Collecting certifi>=2017.4.17
Using cached certifi-2020.6.20-py2.py3-none-any.whl (156 kB)
Collecting idna(3)>=2.5
Objection unitary, do-py2, py3-none-any, while (36 KB) Collecting unitary, 143, 1-25, 0, 1-1, 25, 1, 27, 1
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Collecting chardet<4,>=3.0.2
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Successfully installed Naked-0.1.31 certifi-2020.6.20 cffi-1.14.3 chardet-3.0.4 cryoto-1.4.1 cryotography 2.10 journal-2.10 yourgarber-2.20 yourgarber-2.20 shellescape-3.8.1 urlib3-1.25.10
WARNING: You are using pip version 20.2.2; however, version 20.2.3 is available.
You should consider upgrading via the 'C:\Users\johanneskinzig\PythonVenvs\simaticopcua\Scripts\python.exe -m pip installupgrade pip' command.
(simpticoncus) C-VIIsens\inhangeskinzig\DythonVenus)



Install optional libraries to get full benefit using the opcua-client application

pip install pyqtgraph numpy

C:\Windows\System32\cmd.exe



C:\Windows\System32\cmd.exe rosoft Windows [Version 10.0.19041.508] 2020 Microsoft Corporation. All rights reserved. Users\johanneskinzig\PythonVenvs>simaticopcua\Scripts\activate maticopcua) C:\Users\johanneskinzig\PythonVenvs>opcua-client	FreeOpcUa Client		- 🗆 X
icrosoft Windows (Version 18 & 19841 589]	Actions		
c) 2020 Microsoft Corporation. All rights reserved.	opc.tcp://localhost:4840		Connect options Connect Disconnect
	DisplayName BrowseName Nodeld	Attributes	e :
:\Users\johanneskinzig\PythonVenvs>simaticopcua\Scripts\activate		Attribute Value DataType	
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			8

# Create client certificate for Python in TIA Portal



Create second certificate for

client (this creates a key pair)

#### Use same CA for server and

#### client certificate!

In the field *Subject Alternative Name*, set the string as seen on the left. This is required by the OPC UA Python client library which we will use later in the project!

# Create client certificate for Python in TIA Portal



In the global certificate manager, the newly created client certificate is shown. Export the certificate (in *der* format – seen on this slide) and the belonging private key (in *pem* format – seen on next slide). Export by secondary-click on the certificate. This key-pair will be used to authenticate the client to the server.

📃 Include priva	te key (in the export)				
	Encryption for private key	None	-		
Enter a pas as the pas	sword for the private ke sword.	y. If you do not enter	a password, the p	roject name wil	l be used
	Password	*****	6	Very w	eak
	Confirm password	****	6		

# Create client certificate for Python in TIA Portal



Now export the private key and include the
certificate chain. We will be using this certificate
in our client application – which might run
unattended – therefore we will not protect the
private key with a password!

M include certilic	ate chain (in the ex	port)		
🛃 Include private	key (in the export)			
En	cryption for private l	key None	•	
Enter a passu as the passw	word for the private ord.	key. If you do not enter a p	assword, the project nan	ne will be use
	Passwo	rd: ********	8 ∨	/ery weak
	Confirm passwo	rd: ********	<b>B</b>	
			- Europe	Carreal

#### Limit access to clients on PLC





The PLC permits access to clients which provide the recently created client certificate.

Add this certificate to the PLC "Trusted clients" and **disable** "Automatically accept client certificates during runtime" to prevent clients from connecting which do not present a proper certificate to the PLC.

Download the project to the PLC and set it to

Run Mode.



# Connect to PLC using Python Client Library

👹 FreeOpc	Ja Client							-	$\Box$ $\times$
Actions									
opc.tcp://OF	CUser01:11223344Ki@192.168.1.232:4840						<ul> <li>Connect options</li> </ul>	s Connect	Disconnect
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	eq:c:Users/johanneskinzig/git/SimaticS7Demonstrator/TIA-Project/PLC-Main-Siincos-Demo-Client-Cert.demonstrator/TIA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project-TiA-Project		Select certificate	30		Interval [s]	5		Apply
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uaclient.uac	ent - INFO - Application Name: SIMATIC.S7-1500.OPC-UA.Application:PLC_Main') ent - INFO - Application Type: ApplicationType.Server')								
uaclient.uad	ent - INFO - Discovery URL: opc.tcp://192.168.1.232:4840') ent - INFO - Server Certificate: commonName=PLC-Main-Siincos-Demo, countryName=DE, organizationI	Name=Sie	emens, issuer: commonNa	ame=Siemer	ns TIA Proje	ect(fQThBZhtCka1I0Eo-vkD0	Cg), countryName=DE, orga	nizationName=	Siemens,
2020-10-06 uaclient.uad	18:23:39 - 2037-10-05 22:00:00') ent - INFO - Security Mode: MessageSecurityMode.SignAndEncrypt')								
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uacient.uac	ent - 1010 - )								*

Start the OPC UA Python client as described before. In the address field type the URL in the following format:

opc.tcp://<username>:<password>@<ip-address>:<port>
For example:

opc.tcp://OPCUser01:11223344Ki@192.168.1.232:4840

Click on "Connect options" and then on "Query server capability" to get recommended connection properties.

Set your client certificate and client private key!



#### **Connect to PLC using Python Client Library**

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Viceset     2.Deviceset     ns=3;s=1910       C.Main     3.PLC_Main     ns=3;s=PLC       Icon     0.lcon     ns=3;s=DeviceManual       DeviceRevision     2.DeviceRevision     ns=3;s=DeviceManual       DeviceRevision     2.DeviceRevision     ns=3;s=DeviceRevision       Manufacturer     2.Manufacturer     ns=3;s=Model       Model     2.Model     ns=3;s=RevisionCounter       SerialNumber     2.SerialNumber     ns=3;s=SerialNumber       SerialNumber     2.SerialNumber     ns=3;s=DatiSclobal       Outners     3.Counters     ns=3;s=DatiSclobal       DataBlockinstance     ns=3;s=Devision       EngineeringRevision     3.Se=EngineeringRevision       Iputs     3.Dutputs     ns=3;s=Se=Dratis       Memory     3.Memory     ns=3;s=Se=Dratis       OrderNumber     ns=3;s=Dratis       Timers     3.Timers     ns=3;s=Dratis       Outputs     3.Outputs     ns=3;s=Dratis       Timers     3.Timers     ns=3;s=Dratis	Server	U:Server	1=2203
Curvinin     SiPIC_Main     Installing SiPIC_Main     Installing SiPIC_Main     Installing SiPIC_Main       Icon     Olicon     ns=3js=5201     NodeClass     Variable     Installing SiPIC_Main       DeviceManual     2DeviceRevision     salge=DeviceRevision     Nodel     CurventWead,     Byte       HardwareRevision     2DeviceRevision     ns=3js=DeviceRevision     UserWriteMask     Unt       Model     2Manufacturer     ns=3js=Mainfacturer     Bool       Model     2Model     ns=3js=SionOcurter     Bool       SerialNumber     2SoftwareRevision     ns=3js=SoftwareRevision     SerialNumber       SoftwareRevision     ns=3js=SoftwareRevision     Socore Timestamp     None Debe       SoftwareRevision     ns=3js=SoftwareRevision     Socore Timestamp     Socore Timestamp       SoftwareRevision     ns=3js=SoftwareRevision     Social     Social       Counters     3Counters     ns=3js=SoftwareRevision     Social     Social       DataBlocksflobal     3DataBlocksinstance     ns=3js=DataBlocksinstance     ns=3js=DataBlocksinstance       EngineeringRevision     ns=3js=DreatingRevision     ns=3js=SoftwareRevision     Social       Inputs     3inputs     ns=3js=OrdenVumber     0.6     Interval [s]       Imers     3OrderNumber     ns=3js=OrdenVumber <td>DeviceSet</td> <td>2:DeviceSet</td> <td>ns=2;1=3001</td>	DeviceSet	2:DeviceSet	ns=2;1=3001
Itoh     Itoh     Itoh     Itoh     Itoh     Itoh     Itoh     Itoh       DeviceManual     2DeviceManual     n=3;s=DeviceManual     ns=3;s=DeviceManual     Itoh     Itoh     Berger       DeviceRevision     2DeviceRevision     ns=3;s=DeviceRevision     Itoh     Berger     User     Berger       Manufacturer     2:Manufacturer     ns=3;s=Manufacturer     Berger     Berger     Berger     Berger       Model     2:Model     ns=3;s=SeniNordel     Value     Berger     Berger     Berger       SerialNumber     2:SerialNumber     ns=3;s=SeniNordel     Value     Berger     Berger       SoftwareRevision     2:SerialNumber     ns=3;s=Counters     Scalar     Unit       SoftwareRevision     ns=3;s=DotaBlocksGlobal     ns=3;s=ThML Interchange     Unit       Counters     3:Counters     ns=3;s=DotaBlocksGlobal     ns=3;s=Dit       DataBlocksGlobal     ns=3;s=DataBlocksIstance     ns=3;s=Dit     SerialNumber     Unit       DataBlocksGlobal     3:DataBlocksIstance     ns=3;s=DeviceRevision     SerialNumber     SerialNumber       DataBlocksInstance     3:DataBlocksInstance     ns=3;s=DeviceRevision     SerialNumber     SerialNumber       Inputs     3:Inputs     ns=3;s=OrderNumber     0.6     Interval [s]		S:PEC_Iviain	ns=3;5=PLC
DeviceManual     2.DeviceManual     163-35-DeviceManual     0.56-25-25-000       DeviceManual     105-35-DeviceManual     0.56-25-25-000       HardwareRevision     2.HardwareRevision     ns=35-DeviceRevision       Manufacturer     2.Manufacturer     ns=35-SenionCounter       Model     2.Model     ns=35-SenionCounter       RevisionCounter     2.RevisionCounter     ns=35-SenionCounter       SerialNumber     2.SerialNumber     ns=35-SenionCounter       SoftwareRevision     2.SoftwareRevision     ns=35-SenionCounter       SoftwareRevision     2.SoftwareRevision     ns=35-SenionCounter       SoftwareRevision     2.SoftwareRevision     ns=35-SenionCounter       SoftwareRevision     2.SoftwareRevision     ns=35-SenionCounter       DataBlocksGlobal     3:DataBlocksGlobal     ns=35-SenionCounter       DataBlocksInstance     ns=35-Seniputs     3:DataBlocksInstance       Inputs     3:Duputs     ns=35-Seniputs       Memory     3:Memory     ns=35-Seniputs       OrderNumber     3:Outputs     ns=35-Seniputs       Timers     3:Timers     ns=35-Seniputs       Timers     3:Timers     ns=35-Seniputs       Outputs     3:Outputs     ns=35-Seniputs       Outputs     3:Timers     i.g		2:DeviceManual	ns=3;= DeviceMenual
Dericteristion     2.Dericteristion     18-3/3-Dericteristion     0.01 mitodia     0.01 mitodi		2:DeviceMaria	ns=3;s=DeviceNatual
Nanufacturer     Linkumsteruturer     Ins-3;s=Hallwähleruturer       Manufacturer     ns-3;s=Manufacturer       Model     2!Manufacturer     ns-3;s=Manufacturer       Model     2!Manufacturer     ns-3;s=Manufacturer       RevisionCounter     2:RevisionCounter     ns-3;s=Manufacturer       SerialNumber     2:SoftwareRevision     ns-3;s=StrialNumber       Others     3:Counters     ns-3;s=SoftwareRevision       DataBlocksfolbal     ns-3;s=DataBlocksfolbal     ms-3;s=DataBlocksfolbal       EngineeringRevision     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       DataBlocksfolbal     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       Manufacturer     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       Manufacturer     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       Mauter     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       Mauter     ss-3;s=DataBlocksfolbal     ss-3;s=DataBlocksfolbal       Mauter     ss-3;s=InjeeringRevision     ns-3;s=SinperingRevision       Inputs     3:Inputs     ns-3;s=OrderNumber       OrderNumber     soOrderNumber     ss-3;s=Outputs       Memory     3:Timers     ss-3;s=Injeers       Oxform     ss-3;s=0     ss-3;s=Outputs       Timers     sitters     ss-3;s=Injeers    <		2:DeviceRevision	ns=3;s=Devicercevision
Model     Enhance.user     Installation       Model     2.Model     nsa3;s=Model       RevisionCounter     2.RevisionCounter     nsa3;s=RevisionCounter       SerialNumber     2.SerialNumber     nsa3;s=SerialNumber       SoftwareRevision     nsa3;s=SoftwareRevision     nsa3;s=Counters       Ocurters     3.Counters     nsa3;s=Counters       DataBlocksGlobal     3.DataBlocksGlobal     nsa3;s=DotaBlocksGlobal       El Icon     0.Icon     nsa3;s=DataBlocksInstance       DataBlocksInstance     3.DataBlocksInstance     nsa3;s=InjueringRevision       Inputs     3.Inputs     nsa3;s=OrderNumber       OrderNumber     3.OrderNumber     nsa3;s=OrderNumber       Outputs     3.Outputs     nsa3;s=Diruers       0.Timers     3.Timers     nsa3;s=Diruers       0.Types     i.e     i.e	Manufacturer	2:Manufacturer	ns=3;s=Manufacturer
Number     Source Timestamp     2020-10-08T16:511 Data       SerialNumber     2.SerialNumber     ns=3;s=SerialNumber       SoftwareRevision     2.SoftwareRevision     ns=3;s=SoftwareRevision       Counters     3.Counters     ns=3;s=SoftwareRevision       DataBlocksGlobal     ns=3;s=SoftwareRevision       icon     0.con     ns=3;s=SoftwareRevision       DataBlocksGlobal     ss=3;s=SoftwareRevision       DataBlocksInbance     ns=3;s=SoftwareRevision       DataBlocksInstance     ns=3;s=DatBlocksInstance       EngineeringRevision     3:Boputs       Memory     3:Memory       0.drefnymber     3:OperatingMode       0.drefnymber     3:OperatingMode       0.drefnymber     3:SofterstamgMode       0.drefnymber     s:Source Timers       0.treps     i.eff       0.treps     i.eff		2·Model	ns=3;s=Model
Activitie     Counter     Scially metric       SoftwareRevision     2:SoftwareRevision     ns=3;s=SoftwareRevision       SoftwareRevision     2:SoftwareRevision     ns=3;s=SoftwareRevision       Counters     3:Counters     ns=3;s=SoftwareRevision       DataBlocksGlobal     s:=3;s=DataBlocksGlobal     s:=3;s=DataBlocksGlobal       Icon     0:Con     ns=3;s=DataBlocksGlobal       Multipletchange     3:HMI_interchange     ns=3;s=DataBlocksGlobal       DataBlocksInstance     ns=3;s=DataBlocksInstance       EngineeringRevision     ns=3;s=DataBlocksInstance       Inputs     3:Inputs     ns=3;s=Diputs       Memory     3:Memory     ns=3;s=SofteringMode       OrderNumber     3:Outputs     ns=3;s=CopratingMode       OrderNumber     3:Outputs     ns=3;s=Timers       0:Timers     3:Timers     ns=3;s=Timers       0:Fypes     i=05	RevisionCounter	2:RevisionCounter	ns=3:s=RevisionCounter
SoftwareRevision     2:SoftwareRevision     ns=3;s=SoftwareRevision       0 Counters     3:Counters     ns=3;s=Counters       DataBlocksGlobal     ns=3;s=DataBlocksGlobal       i Ion     0:con     ns=3;s=DataBlocksGlobal       i Ion     0:con     ns=3;s=DataBlocksGlobal       i Ion     0:con     ns=3;s=DataBlocksGlobal       i Ion     0:con     ns=3;s=DataBlocksInstance       i Ion     0:con     ns=3;s=DataBlocksInstance       0 AtaBlocksInstance     3:DataBlocksInstance     ns=3;s=DataBlocksInstance       EngineeringRevision     ns=3;s=DataBlocksInstance     30       i Ion     0:con     0:a       i Ion     0:a     0.a       i Ion     0.a     0.a       i Ion     0.a     0.a       i Ioners     0:a     0.a       i Ioners     0:a     0.a       i Ioners     0.a     0.a       i Ioners     0.a     0.a       i Ioners     0.a     0.a       i Ioners     0.b     0.a       i Ioners     0.b     0.a       i Ioners     <	SerialNumber	2:SerialNumber	ns=3;s=SerialNumber
Counters     3:Counters     ns=3;s=Counters       DataBlocksGlobal     3:DataBlocksGlobal     ns=3;s=DataBlocksGlobal       icon     0:con     ns=3;s=DataBlocksGlobal       icon     ns=3;s=DataBlocksInstance     ns=3;s=DataBlocksinstance       DataBlocksInstance     3:DataBlocksinstance     ns=3;s=DataBlocksinstance       Inputs     3:Inputs     ns=3;s=OrderNumber       OperatingMode     3:OperatingMode     ns=3;s=OrderNumber       Outputs     3:Oitputs     ns=3;s=OrderNumber       0:Timers     0:Timers     ns=3;s=OrderNumber       0:Types     i=0;	SoftwareRevision	2:SoftwareRevision	ns=3;s=SoftwareRevision
DataBlocksGlobal     3:DataBlocksGlobal     ns:3;s=DataBlocksGlobal       icon     0:con     0:con	Counters	3:Counters	ns=3:s=Counters
Icon         Olcon         ns=3;i=5202         Graph           ● HML_Interchange         3;HML_Interchange         ns=3;i=5202         Number of Points         30         Intervall [s]           DataBlockinstance         ns=3;s=DataBlockinstance         ns=3;s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         3:s=DataBlockinstance         1	DataBlocksGlobal	3:DataBlocksGlobal	ns=3:s=DataBlocksGlobal
HML_Interchange         3HML_Interchange         ns=3;s="HML_Interchange"         Number of Points         30         Interval [s]           DataBlocksinstance         3:0ataBlocksinstance         ns=3;s=DataBlocksinstance         1 </td <td>&gt; = lcon</td> <td>0:lcon</td> <td>ns=3:i=5202</td>	> = lcon	0:lcon	ns=3:i=5202
DataBlocksinstance     3:DataBlocksinstance     ns=3;s=DataBlocksinstance       EngineeringRevision     3:EngineeringRevision     ns=3;s=EngineeringRevision       Inputs     3:Inputs     ns=3;s=Inputs       Memory     3:Memory     ns=3;s=OrderNumber       OpderatingMode     3:OpteratingMode     ns=3;s=OrderNumber       Outputs     3:OrderNumber     ns=3;s=OrderNumber       Outputs     3:Timers     ns=3;s=Outputs       0:Fypes     i=66	> 📕 HMI Interchange	3:HMI Interchange	ns=3;s="HMI_Interchange"
EngineeringRevision         3:EngineeringRevision         ns=3;s=EngineeringRevision         1 </td <td>DataBlocksInstance</td> <td>3:DataBlocksInstance</td> <td>ns=3;s=DataBlocksInstance</td>	DataBlocksInstance	3:DataBlocksInstance	ns=3;s=DataBlocksInstance
Inputs         3inputs         ns=3;s=inputs         0.8         0.8         0.8           Memory         3iMemory         ns=3;s=Memory         0.8	EngineeringRevision	3:EngineeringRevision	ns=3;s=EngineeringRevision
Memory         3Memory         ns=3;s=Memory         0.8         0.8           OperatingMode         3:OperatingMode         ns=3;s=OperatingMode         0.6	> 🛑 Inputs	3:Inputs	ns=3;s=Inputs
OperatingMode         3:OperatingMode         ns=3;s=OperatingMode         0.6	Memory	3:Memory	ns=3;s=Memory
OrderNumber         3:OrderNumber         ns=3;s=OrderNumber         0.0         0.0           Outputs         3:Outputs         ns=3;s=OrderNumber         0.4         0.4         0.4           Timers         3:Timers         ns=3;s=Timers         0.7         0.2         0.2         0.2	OperatingMode	3:OperatingMode	ns=3;s=OperatingMode
Outputs         3:Outputs         ns=3;s=Outputs         0.4           Timers         3:Timers         ns=3;s=Timers         0.4           0:Types         i=86         0.2	GrderNumber	3:OrderNumber	ns=3;s=OrderNumber
Timers         3:Timers         ns=3;s=Timers         0.4           0:Types         i=86         0.2	Outputs	3:Outputs	ns=3;s=Outputs
0.Types i=86 0.2 0.2	Timers	3:Timers	ns=3;s=Timers
0.6	es	0:Types	i=86
U:Views I=0/	/5	0:Views	i=87
0 0.2 0.4			
Events Subscriptions References Graph			
NFO - Security Level: 115) NFO - )	NFO - Security Level: 115) NFO - ')		

Close the "Connection Dialog" and click on "Connect".

You'll be presented with the OPC UA XML tree served by your SIMATIC PLC!

You can read/write only these variables/tags you have granted access to in TIA portal!

#### Browse data blocks on PLC



You can access only the variables/tags you have allowed access to in TIA portal!

100	👻 🔩 🛃 😤 Keep actual values 🔒 Snapshot 🌇 Copy snapshots to start values 🕵 🥵 Load start values as actual values 🖳 🖳													
Н	ML_h	nterchange												
	Nar	ne	Data ty	Start val	Retain	Accessible	from HMI/OPC UA/Web API	Writable from HMI/OPC UA/Web API	Visible in HMI engineering	Setpoint	S			
4	•	Static												
4	•	temp1_deg_c	Real 🔳	0.0										
4	•	temp2_deg_c	Real	0.0										
4		current_mA	UInt	0										
1	•	fan1_rpm	UInt	0										
4		fan2_rpm	UInt	0										
4		fan1_status	Bool	false										
4		fan2_status	Bool	false										
4		fan1_error	Bool	false										
•		fan2_error	Bool	false										
4		fan1_power	Bool	false										
4		fan2_power	Bool	false										
-	•	virt_blue_led	Bool	false										
+ -	•	virt_green_led	Bool	false										



Spektrum Ingenieurgesellschaft mbH

Web: <u>https://siincos-remote-connect.de</u> Mail: <a href="mailto:siincos@spektrum-engineering.de">spektrum-engineering.de</a>



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