



IBH OPC UA Editor Manual

Version 7.4.7

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PLC Sample Projects (PLC Programs)

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All examples	OPC UA Editor - Examples.zip

1 IBH OPC UA Editor

The *IBH OPC UA Editor* is used to create the configuration of the PLC - IBH Link UA connection without opening the PLC-project. This also applies if neither change can be made in the project or in the PLC.

In combination with the IBH Link UA the *IBH OPC UA Editor* is available as a download free of charge.

After installation, the *IBH OPC UA Editor* can be used for the following PLC connections:

- S7 300/400 TCP/IP
- S7 200 TCP/IP
- S7 1200 TCP/IP
- S7 1500 TCP/IP
- S7 300/400 with IBH Link S7++ via the S7 TCP/IP protocol
- SIMATIC S5 with IBH Link S5++ via the S7 TCP/IP protocol
- LOGO 8
- SINUMERIK 840D
- Modbus connection
- Mitsubishi Controls / Robots
- Rockwell Controls

Symbolic variables and data from data blocks can be transferred as OPC variables (OPC tags) to PLC projects (PLC programs):

- TIA 13/14/15/16 Project
- STEP 7 (Simatic Manager)
- S5W Projects (IBHsoftec S5/S7 for Windows® Programming System)
- SIMATIC S5
- NC VAR Selector
- LOGOSoft Comfort Software

OPC variables (OPC tags) can be edited (add, remove, assign access rights) using the *IBH OPC UA Editor*.

Configurations generated in the **IBH OPC UA Editor** can be transferred directly to the **IBH Link UA** or saved as **XML** files.

After transferring the defined OPC variables (OPC tags) to the **IBH Link UA**, the online status of the defined OPC variables (OPC tags) can be observed with the IBH OPC UA editor. The **UA nodes** of the online connected **IBH Link UA** server are also displayed.

Note:

To assign OPC variable (OPC Tag), operands must be defined as symbols and data blocks must have a symbolic name.

Note:

Projects generated in the *IBH OPC UA Editor* can be directly transmitted into the *IBH Link UA*.

Likewise, the created projects can be exported and imported as an *XML* file (* *.opc*).

An exported *XML* file optional edited in the *IBH OPC UA Editor*, can be transferred into the *IBH Link UA* (OPC Slot) using the web-browser.

1.1 Using the IBH OPC UA Editor

When installing the *IBH OPC UA Editor*, an icon is created on the desktop to start the program.

Note:

This manual describes the *IBH OPC UA Editor version 7.4.7*. Later versions may contain additional functions.

1.1.1 Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.

The *IBH OPC UA Editor* has three application windows, which are opened via the tabs *Project*, *Server* or *Certificates* are displayed.





By clicking the tab *Certificates*, the own certificate or the server certificate are displayed. Server certificates can be read from files.

For a better distinction, the background of the windows is displayed with different colors (selectable).

The work area is divided (area windows left / right).



Title bar

The name of the active project is specified OPCUAEdit.

Menu bar

The menu bar is the same for the *Project, Server* and *Certificates* application windows.

Toolbar

The toolbar is the same for the *Project, Server* and *Certificates* application windows.

Project toolbar

Only the *Project window* has an additional toolbar.

1.2 New server connection

The *New Server Connection command* from the *Edit* menu or clicking the icon opens the *New Server Connection* dialog box.





1.2.1 Server Connection

To establish a connection to an OPC UA server, the connection data must be specified. The New server connection dialog box makes it easier to specify the connection data.

Note:

The connection data specified by the New server connection dialog box will be displayed in the right part of the Project window after completion.

Some of the connection data can be changed at any time in the right part of the project window.

Server connection properties dialog box

The fields for the general settings for the connection to an OPC UA server must be filled out.

👿 Server connection properties	\times
Name of the server connection: Server address: O Host name or IP address	
Port: 48010	
Select endpoint	
Security settings: Message mode: C Basic128Rsa15 C Signatur C Basic256 Signature and Encryption C Basic5ha256 Inverse connection: C Aes1285ha256RsaOaep C Connect inverse C Aes256Sha256RsaPss Properties	
Login:	
Session Name: Variables format: S7-1500 compatible	
<u>OK</u> <u>Cancel</u> <u>H</u> elp	

Name of the server connection

The name is freely selectable.

Name of the server connection: IBH Link UA

Server address

If the IBH Link UA port to be used for connection is in a network with a DHCP server, the actual host name may be entered.

Server address:	
Host name or IP address:	192.168.1.14
Port:	48010
	,

If there is no DNS server, the absolute IP address of the *IBH Link UA* (192.168.1.14) must be entered with the port (48010).

Show URL

The URL of the selected OPC server is displayed.



Select end point

By clicking the **Select end point...** button, a connection to the specified OPC UA server is established. If the connection is successful, possible transfer data encryptions are displayed in the opened dialog box.

In addition, the existing certificate in the OPC UA server with its settings and the connection path to the OPC UA server are displayed.

Endpoints of Discovery Se	rver opc.tcp://192.168.1.14:48010		
Security policity		Message mode	Key strength
http://opcfoundation.org/	UA/SecurityPolicy#None	None	2048 Bit
http://opcfoundation.org/	UA/SecurityPolicy#Basic256Sha256	Sign	2048 Bit
http://opcfoundation.org/	UA/SecurityPolicy#Basic256Sha256	SignAndEncrypt	2048 Bit
http://opcfoundation.org/	UA/SecurityPolicy#Aes128_Sha256_RsaOaep	Sign	2048 Bit (click / select)
http://opcfoundation.org/	UA/SecurityPolicy#Aes128_Sha256_RsaOaep	SignAndEncrypt	2048 Bit
http://opcfoundation.org/	UA/SecurityPolicy#Aes256_Sha256_RsaPss	Sign	2048 Bit
http://opcfoundation.org/	UA/SecurityPolicy#Aes256_Sha256_RsaPss	SignAndEncrypt	2048 Bit
Certificate:		Connection:	
<u>N</u> ame:	IBHLinkUA@ibhlinkua_rescued	Endpoint URL:	opc.tcp://ibhlinkua:48010
Organization:	Organization	Application <u>U</u> RI:	urn:ibhlinkua_rescued:IBHsoftec:IBHLinkUA
Organization unit:	Unit	Domain name:	ibhlinkua_rescued
Location:	LocationName	IP address:	
Countr <u>y</u> :		Certificate settings:	
State:	DE	Encryption strength:	2048 Bit
		Signature algorithm:	SHA256
The certificate is valid		<u>V</u> alid from:	23.06.2020 10:36:40
		<u>V</u> alid until:	22.06.2025 10:36:40
	Cancel		Help

Security settings

In this field the security procedure and the message mode can be selected.

Security settings:	
C None	Message mode:
C Basic <u>1</u> 28Rsa15	O Signatur
C Basic256	Signature and Encryption
BasicSha2 <u>5</u> 6	
C Aes1285ha256RsaOaep	The security procedure can already be
O Aes256Sba256RsaPss	selected in the <i>End points of</i>
	Discovery Server opc.tcp dialog box.

If a security procedure is selected, certificates must be exchanged between the *IBH OPC Editor* and the *OPC UA Server* (IBH Link UA).

As the message mode signature (Sign) as well as signature and encryption (Sign and Encrypt) are available.

Inverse connection

An inverse server connection (reverse connection) can be set up if the server is in a better protected area behind a firewall than the client.

Inverse connection:	
Connect invers	Proper <u>t</u> ies

Clicking the *Properties...* button opens a dialog box for entering the endpoint URL of the OPC UA client. This simplifies the configuration of the firewall. Of course, the client must support incoming server connections.

🦝 Properties in	nverse connection	<
<u>P</u> ort:	4840	
URL:	opc.tcp://TTI-YELLOW:4840	
Server certifi	cate:	1
Length:	1392	
Content:	3082056C 1148D370	
	Read from <u>fi</u> le	
confirm)		
<u>o</u> k	<u>C</u> ancel <u>H</u> elp	

The specified server certificate can be replaced by an existing one.

Read from	<u>f</u> ile
-----------	--------------

Login

In this field, the *User name* and the associated password can be specified. The proposed registration mode is anonymous.

C Anonymous	
User name and password	
User name:	
Pass <u>w</u> ort:	Store

Session name

The name of the session is freely selectable and can be left blank.

Session Name:

Variable format

The representation of the variables can be adjusted. The *IBH OPC UA Editor* offers four options for acceptance. With this selection, the limitation of the OPC UA specification of not allowing dots in variable names can be avoided.

Note:

The programming systems S7 SIMATIC Manager and the TIA Portal allows dots in variable names (e.g. **Switch 7.1**).

The OPC UA specification does not allow dots in variable names.

The selection of the variable format must match the system setting in the IBH Link UA browser window !

	click / select
Variables format:	Compact
	Classic
	Compact
	S7-1500 compatible
	Compatible

Classic:

The IBH Link UA software accepts only variable names that comply with the OPC UA specification. Dots in variable names must be removed from the symbol tables (S7 SIMATIC Manager or TIA Portal) before transfer to the IBH Link UA. The identifiers ".GlobalVars", ".Programs" ".Generic" are added to the name of a variable.

The IBH UA Editor accepts variable names with a dot. Variable names containing a dot are put in quotation marks by the IBH Link UA software during transmission.

ldentifier	CPU 416.CPU 416-3 PN/DP.Programs.Data block.Var_INT
ldentifier	CPU 416.CPU 416-3 PN/DP.GlobalVars.Bit_Var
ldentifier	IBH Link UA.CPU414.Generic.OFF_2

Compact:

Dots in variable names must be removed from the names (S7 SIMATIC Manager) prior transfer to the IBH Link UA. Variable names with dots are accepted in the TIA Portal. The IBH UA Editor accepts variable names with dots. Variable names containing dots are put in quotation marks by the IBH Link UA software during transmission.

The identifiers ".GlobalVars" ".Programs" ".Generic" are omitted in the variable names. If such a name occurs in a variable name, it is placed in quotation marks. If *Compact* is marked, the identifier of a variable is shorter than marking *Classic*.

Identifier	CPU 416.CPU 416-3 PN/DP."Generic"
ldentifier	CPU 416.CPU 416-3 PN/DP."Bit_Var"
Identifier	CPU 416.CPU 416-3 PN/DP."Data block"."Var_INT"
ldentifier	CPU 416.CPU 416-3 PN/DP."Data block"."Programs"
ldentifier	S7-400-Station_1.CPU 416."On_5.3"
Identifier	IBH Link UA.CPU414."OFF.2"

S7-1500 Compatible:

Dots in variable names must be removed from the names (S7 SIMATIC Manager) before transfer to the IBH Link UA.

Dots in variable names are permitted in the TIA Portal programming system. Variable names not corresponding to the S7-1500 format are put in quotation marks by the IBH Link UA software during the transfer and thus brought to the name format of the S7-1500.

The identifiers ".GlobalVars" ".Programs" ".Generic" are omitted in the variable names.

Identifier	CPU 416.CPU 416-3 PN/DP."GlobalVars"
ldentifier	CPU 416.CPU 416-3 PN/DP.Data block.Var_Bool
ldentifier	CPU 416.CPU 416-3 PN/DP.Lamp
Identifier	IBH Link UA.CPU414."OFF_47.B"
Identifier	IBH Link UA.CPU414.OFF_2
Identifier	IBH Link UA.CPU414.Bit_Var

Compatible

Mark *Compatible* if data block variables (OPC tags – defined in the *IBH OPC UA Editor / Variable Transfer*) "GlobalVars" in the target name have. Only required with older IBH OPC UA Editor version (2017...2019).

To apply the settings, click **OK**. The **New server connection** dialog box closes.

	OK Cancel	Help
Manual.opu - OPCUAEdit	– 🗆 X	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
🗋 📁 🛃 🌲 🙆		
Project	Name of the server connection Name IBH Link UA	The right part of the
- BHLink UA	Server address Host name / Address 192.168.1.14 Pot 48010 URL opc.tcp://192.168.1.14:48010 Inverse connection No Security settings Security policity None Message mode None Authentication settings Login Anonymous Session name Manual Other settings	project window displays the specified settings for the connection to the OPC UA server .
	Variables format Compact	
Project Server Server Certifi	card hund	
	CADS NITM -	

Note:

In one project several **OPC servers** (IBH Link UA) can be collected.

A right-clicking on the **Server icon** (IBH Link UA) opens the context menu.



The *New server connection* command, additional OPC servers can be integrated into the project. The *New server connection command* is also available on the Edit menu.

For each new server connection, the **Server connection properties** dialog box opens. The settings for the connection to the OPC UA server must be completed accordingly.

If a server is highlighted in the left part of the project window, the connection settings are displayed in the right part of the window.

Connection to the further OPC UA servers



1.3 Inserting a New control (PLC)

The *New Control* command from the context menu opens the *New control* dialog box. The *New control* command is also available in the *Edit* menu.



The *New control* dialog box sets the connection settings to the controller (PLC, CPU, etc.) to be connected to the OPC UA Server.

Note:

A project may contain multiple controls in one OPC UA server.

A right-clicking on the **Server icon** (IBH Link UA) opens the context menu.

The command *New control* may assign additional controllers to the OPC UA server. The *New control* dialog box opens for each new

control. The connection settings to the controller (PLC, CPU, etc.) to be connected to the OPC UA server are specified here.



Connection IBH UA OPC UA server – Control

Manual.opu - OPCUAEdit	
File Edit Help	
🗋 💕 🛃 🖨 🔞	
Project	
Project New server connection New server connection Properties Export	
	C S7 200 TCP/IP Own TSAP: 0100 C S7 1200 TCP/IP PLC TSAP: 0101
	OK Cancel Test connection Help

Control Name (PLC)

The name is freely selectable. **CPU416_Tank_Level**).
Control name: CPU 416 Tank Level

Host name / IP address

The host name or the

Host name / IP address: 192.168.1.10

IP address of the device

(CPU) being online connected with the OPC UA server is defined.

Protocol

If **S7 TCP/IP** is selected, the Rack number, Slot number and Position of the target module must be specified. This setting is used to connect S7 300 / 400 CPUs having a usable ethernet port (TCP/IP).

Position of the target module

Target module at the same rack

If the target module is in the same rack, no further information is required.

Via MPI/DP subnet accessible rack

If the target module is in a rack accessible via MPI / DP subnetwork, the *MPI / DP address of the target CPU* and the *Subnet ID* must be specified.

MPI/ <u>D</u> P address of the target CPU	; 2			
Subnet ID: 0000	<u>.</u> 0000			

Via TCP/IP subnet accessible rack

If the target module is in a rack accessible via the TCP/IP subnet, the *TCP/IP address of the target CPU* and the *Subnet ID* must be specified.

TCP/IP address of the target CPU:	192	. 168	•	1.	55
Subnet ID:	0000		1	000	D

Via H1 subnet accessible rack

If the target module is in a rack accessible via an H1 subnet, the *H1* address of the target CPU and the Subnet ID must be specified.

• Via H1 subnet accessible rack				
H1 address of the target CPU:	00.1B.21.25.32.8	32		
Sybnet ID:	002E <u>.</u>	0005		

S7-200 TCP/IP, S7-1200 TCP/IP, S7-1500 TCP/IP

S7-200 / 1200 / or 1500 CPU having a TCP / IP port, are selected directly. If the connection is made via *ISO on TCP*, the *Own TSAP* and the *PLC TSAP* of the (CPU) must be specified.

S7 200 TCP/IP	Own TSAP: 0000
🔿 57 <u>1</u> 200 TCP/IP	
C 57 1500 TCP/IP	<u>P</u> LC TSAP: 0000

Logo8 CPU with TCP / IP Configuration

If a *Logo8* controller is to be connected to the OPC UA server, the following settings must be made in the New Control dialog box:

- S7-200 TCP/ P must be selected as the control type
- 0200 must be entered as the PLC TSAP of the CPU
- The default **Own TSAP** is irrelevant.

New control	×
Control name: Logo 8 Host name / IP address: 192.168.	1.88
Protocol:	
 S7 200 TCP/IP S7 1200 TCP/IP S7 1500 TCP/IP 	Own TSAP: 0000 PLC TSAP: 0200

Test CPU-Online Connection

If the *New control* dialog box is completed, the online connection to

the CPU can be tested. The command *Test*

connection is building up the connection to the

Test connection....

CPU. Information about the successful connection is displayed.



Apply the New control dialog box settings

To apply the settings, click OK. The New control dialog box closes.

Mew control			×
57 1 <u>5</u> 00 TCP/IP			<u> </u>
confirm	·		
QK	<u>⊂</u> ancel	Test connection	Help

1.3.1 IBH Link UA - S7 CPU 300 / 400 connection via IBH Link S7++

To establish a connection to a S7 300 / 400 CPU via IBH Link S7 ++, the settings must be according to the screenshots.



To address an **S7** *CPU 300 / 400* via the *IBH Link* **S7++**, the routing option (dialog box *IBHLink settings / Network tab*) *Configuration with NetPro* must be deactivated (Apply permanently).

This applies to all S7 300/400 CPUs with IBH Link S7++ connection.

Open the *IBH Link* **S7** ++ configuration software *IBH Network settings*.



Dialog box IBH Network settings

IBH Network settings	– 🗆 🗙
File Stations IBH Links Options Help	
Station:	
Station Name	Address
PLC_1-CPU 312-IBH Link S7++	192.168.1.12:1099
Settings: New station Change station IBH Link S7 IBH Link S5 IBH Link S Close Search and configure IBH Link S	Delete station 5++ Language
HS devices.	.,,

Click *IBH Link* **S7** to open the *IBH Links in the local network* dialog box.

IBHLinks in the loca	al network				×
Found IBHLinks:					
MAC Address	Туре	Serial Number	IP Address	Station name	Firmware
50-2D-F4-1C-04-3C	IBHLNKUA	5145	192.168.1.14		
00-02-A2-21-56-CB	NL50MPI	25208	192.168.1.12	PLC_1-CPU 312-IBH Link S7++	V2.168
Configuration via Router 0.0.0.0					
OK	Setting	JS	Search again	Search IP range	Help

Mark the *IBH Link* S7++ connected to the S7 CPU 300 / 400 and click *Settings*.

The IBHLink setting s	dialog b	ox opens.
------------------------------	----------	-----------

BHLink settings - 00025208 M	AC: 00-02-A2-21-56-CB	×		
Network MPI/Profibus	Time synchronisation <u>F</u> irmwa	ire Diagnosti		
	Clic	ck A		
Address settings:				
Network name:	IBH Link S7++ 12			
IP-Address:	192 . 168 . 1 . 12	Static		
Subnet mask:	255 . 255 . 255 . 0	C DHCP		
Gateway:	0.0.0.0	C Boot-P		
🔲 IBHNet port (Port 1099 i	s always active):			
Authentification				
Username:	admin			
Password:	****			
	Change password			
Options not activated Configuration with NetPro/TIA Disable Webserver				
Click memory	ngs will be saved in the IBH Li and are kept after a power cy	nks internal flash cle.		
Save permanently	Reboot	Cancel		

Deactivating the routing option Configuration with NetPro

Open the *Diagnostics tab* click *Test* and *Read*. The MPI addresses of the *IBH Link S7++* and the connected S7 CPU are shown.

IBHNet Diagnostics - IBHLink S7	×	
Select IBHLink		lf cov
CPU 312-IBH Link 57++		
Network status / Diagnostics		in the
Test Lifelist OK		
Station address: 10 © Fixed bus parameter settings C Automatic detection		IBH I
Bus parameters:	-	conn
Baudrate: 187.5 kBit/s Tslot_Init: 100 Max. Tsdr: 60 Min. Tsdr: 12 Tset: 1 Taui: 0		S7 C
CPU MPI address IBH Link S7++ MPI address Bus Nodes 0 1 20/3 4 5 6 7 8 9 10/71 12 13 14 15 16 17 18 19 0 1 20 1 10 1 12 13 14 15 16 17 18 19 20 1 1 1 1 10 1 1 10 1 10 1 10 1 10 1 10 1 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 </th <th></th> <th></th>		
120 Read		
OK Cancel Help		

If several *IBH Link* **S7++** are in the local network, select the correct *IBH Link* **S7++** connected to the *S7 CPU*.

1.3.2 Project Window

The right part of the project window displays the specified *CPU* connection settings.

🎆 Manual.opu - OPCUAEdit						×
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
🗋 📂 🚽 🖨 🎯						
Project 🔷 🔻 🕈 🗙		Name of the control				
alf aik 🖌 V 🗈 🙉 a 🛆	L .	Name	CPU 416 T	ank Leve	el	
27 Gr 🔨 🔊 43 45 T 4M		Offline program assigni	ment			
E IBH Link UA	L .	Program type	No program	n assignm	ent	
🖻 – 🛄 CPU 416 Tank Level	L .	Program path				
🛄 Variables	L .	Station name				
		Online connection				
		Protocol	S7 TCP/IF)		
		Host name / Address	192.168.1.	10		
	L .	Targe module position	Target mod	dul at the	same rack	
	L .	Rack number	0			
	L .	Slot number	2			
Rent Server Server						
	_				CAPS N	IUM

Name of the control

The name was specified in the **New control** dialog box.



Offline program assignment

If a PLC program is assigned to the selected CPU information are displayed.

_	Offline program assignment			
Program type STEP7 program				
	Program path	A:\CPU 416 Tank Level S7\CPU 416 Tank Level S7.s7p		
	Station name	CPU 416		

Program type

Program type

STEP7 program

The following program types can be assigned to a CPU:

- No program assignment
- S5W program
- STEP 5 program
- STEP 7 program
- TIA program
- Icon file

Program type

"No program assignment" or "S5W program" or "STEP5 program" or "STEP7 program" or "TIA program" or "Symbol file"

Program path

Program path A:\CPU 416 Tank Level S7\CPU 416 Tank Level S7.s7p

Once a program has been assigned, the program path is displayed.

Station name

Station name CPU 416

The name of the station, the device or

the program name of the assigned program is displayed.

Online connection

The connection to the CPU is defined in the *New control* dialog box.

-	Online connection			
	Protocol	S7 TCP/IP		
	Host name / Address	192.168.1.10		
	Targe module position	Target modul at the same rack		
	Rack number	0		
	Slot number	2		

Protocol

Protocol S7 TCP/IP

The *Protocol* for the online connection to the PLC, S7 TCP/IP, S7-200 TCP/IP, S7-1200 TCP/IP or S7-1500 TCP/IP is displayed.

Hostname / Address

Host name / Address 192.168.1.10

The host name or the IP address of the online connection CPU / OPC UA Server is displayed.

Target module position Targe module position Target modul at the same rack

In the New control dialog box, the following target module positions may be defined:

- Target module on the same rack
- Rack accessible via MPI / DP subnet
- Rack accessible via TCP / IP subnet
- Rack accessible via H1 subnet

Rack number / slot number

These two numbers define the *MPI address* of the target module. This may be necessary if several CPUs are connected via the MPI bus or the connection is made via an IBH Net S7 ++.

	Online connection							
	Protocol	S7 1	TCP/IP					
	Host name / Address 192 Targe module position Tar Rack number 0 Slot number 2		92.168.1.10					
			arget modul at the same rack					
			D Online connection Protocol					
					S7 TCP/IP			
Ra			Host name / Address		192.16	192.168.1.10		
Ba	ck number (0 7)		Targe module position		Targe	et modul at the same rack		
			Rack number 0		0 ጊ			
		-	Slot number		25	IVIPI Addr	ess definition	
			Back number			Rack No.	Slot No.	
			Rack number (0 7)			3 Bit	5 Bit (0-31)	
						000	00010	
						0	2	

1.4 Assign program

An existing PLC program can be assigned to the CPU specified in the New Control dialog box.

Variables, data, and program information are taken from the PLC program.



The *Assign program* command opens the dialog box *Select program*. The command is also available in the Edit menu.

Program selection

Select the PLC program to be opened in the **Select Program** dialog box.



Clicking *OK*, the variables, data and program information are transferred to the *OPC UA Editor*.

Offline program assignment

In the right part of the project window, information is displayed under Offline program assignment.

🌆 Manual.opu - OPC	UAEdit					-		×
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 💕 🖬 🖨 📀								
Project	🗕 🖕 🛧	-	Name of the control					
AL AL V D		_	Name	CPU 416 Tank Level				
¥ 🖸 🔪 🖉			Offline program assig	nment				
E-			Program type	STEP7 program				
📥 🔚 CPU 416 Tan	k Level		Program path	A:\OPC UA Editor Manu	al\CPU 416 Tank Level S7\C	PU 416 Ta	nk Level 9	57.s7p
🚽 🖓 Variables	mark		Station name	CPU 416)
			Unline connection		ie incortod			_
			Protocol	S7 TCP/IP	is macricu			
			Host name / Address	192.168.1.10				
			Targe module position	Target modul at the sam	e rack			
			Rack number	0				
			Slot number	2				
		0	fline program assignme	ant				
		3	nine program assigning	SIK				
Project Server	Certificat							
- sector								
							CAPS	NUM

Special features when selecting TIA projects

Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





The *SIEMENS support software TIA Openness* is started in the background. Several notices are displayed.

Dpen TIA project A:\OPC UA Editor Manual\CPU 150	00 TIA 16\CPU 1500 TIA 16 🗙
Starting TIA Openness.	
	Open TIA project A:\OPC UA Editor Manual\CPU 1500 TIA 16\CPU 1500 TIA 16 ×
Cancel	Opening project A:\OPC UA Editor Manual\CPU 1500 TIA 16\CPU 1500 TIA 16.ap16.
	Cancel

The SIEMENS program TIA Openness issues a warning, which

must be confirmed, Yes or Yes for all.



If the support software TIA Openness does not allow access to the selected project, TIA Openness issues the following error message:

Note:	The above message may be hidden behind open windows.
	IBH OPC UA Editor
	Access to the TIA Portal denied.
	ОК
Note: In ord TIA correction	To open a TIA project by the SIEMENS support software TIA Openness can take some time. der to be adopted the PLC program, the TIA Portal software version 13, TIA 14, TIA 15 or TIA 16 must be installed on the PC with the esponding version of the TIA Openness software. essential to pay attention to matching software versions.
In ad	 Idition, the user of the PC must be a member of the following groups: Administrators Siemens TIA Engineer Siemens TIA Openness

Registered group memberships in Windows 10

Pete Properties			×
General Member Of Profile			
Member of:			
Administrators			
Siemens TIA Engineer			
Semens TIA Openness			
Changes to	a user's grou	o members	ship
Add Remove are not effectuser logs on	tive until the	next time t	the

The software versions of the TIA Portal and TIA Openness must be identical.

Installed software			
© Siemens AG, 2008-2019 Installed software • Totally Integrated Automation Portal Version V13 SP1 Update 4 • Options • TIA Portal Openness Version V13 SP1 Update 4 • SINAMICS Startdrive Version V13 SP1 • STEP 7 Professional Version V13 SP1 Update 4 • WinCC Basic Version V13 SP1 Update 4	Installed software © Siemens AG, 2008-2019 Installed software < Totally Integrated Automation Portal Version V14 SP1 Update 2 < Options < TIA Portal Openness Version V14 SP1 Update 2 < STEP 7 Professional Version V14 SP1 Update 2 < WinCC Basic Version V14 SP1 Update 2	Installed software © Siemens AG, 2008-2019 Installed software • Totally Integrated Automation Portal Version V15 • Options • TIA Portal Openness Version V15 • STEP 7 Professional Version V15 • WinCC Advanced Version V15	Installed software © Siemens AG, 2008-2019 Installed software • Totally Integrated Automation Portal Version V16 • Options • TIA Portal Version Control Interface • TIA Portal Openness Version V16 • STEP 7 Professional Version V16 • Options • WinCC Advanced
The tree	eferred project is li	ctod Drogram	VEISION VIO

The transferred project is listed. Program

assignment information are displayed in the right part of the project window.

Manual.opu - OPCOAEdit								×
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 💕 🚽 🖨 🙆								
Project 🗢 🗢 🕫	< 🗆	Name of the control						
au aik 🖌 V 🗈 🙉 🗼 🛆		Name		CPU 1500 TIA Projekt				
27 Gr 🔨 🔊 🛥 🖙 T HN		Offline program assig	Inm	ent				-
E-18H Link UA		Program type	Γ	TIA program				
🖻 🛅 CPU 1500 TIA Projekt		Program path		A:\OPC UA Editor Manual\CPU 1500	TIA 16	CPU 15	00 TIA 16	6.ap16
🔤 Variables		Station name	L	PLC_1	is i	inserte	d	J
		Online connection						
		Protocol		S7 1500 TCP/IP				
		Host name / Address		192.168.1.19				
		Local TSAP		0100				
		Remote TSAP		0101				
🙀 Project 🛛 🐼 Server 🛛 🐼 Certificat								
							CAPS	NUM

1.5 **Define OPC tags**

A click on the icon Variables lists the variables / data in the right part of the project window from the adopted PLC program.





variables are listed.

						- 🗆
le <u>E</u> dit <u>H</u> elp						
pi 🔒 🚔 🔞						
IBH Link UA BH Link UA Ganadianual Ganadian Ganadian Ganadian Ganadian Ganadian Ganadian Ganadian Ganadian		Ight click Select a Destect //single ir Search. 0L //single Search. 0L //counter is counting is INT //Counter readin . //counter readin . //counter memally //only used internally //only used internally //counter Data L //Counter Data	gain	F3	ariables displ with comment	ay :
arked variable (OPC tags)	CounterRead Structure : STRU MinNo : I MinNo : I Counting Air conditioner Data Generic	IT //Complex variable - NT //maximum counte NT //maximum counte ON : BOOL //Enable cor alue : INT //Counter val (DB 22) //Instance data	STRUCT - reading (nu reading (nu nting le block; Valu	umber) umber) e, TimeStamp, S	itatus	
arked variable (OPC tags)	CounterRead Structure : STRU MinNo : I MinNo : I OunterV MaxNo : I OunterV Air conditioner Data Generic X X Air Air Air Air Air	T //Complex variable NT //maximum counter NT //maximum counter ON : BOOL //Enable cor alue : INT //Counter val (DB 22) //Instance data	sTRUCT - reading (nu reading (nu reading inting ie block; Valu	umber) umber) e, TimeStamp, S	itatus	
arked variable (OPC tags)	CounterRead	Ing Inf //Conflexing IT //Conflexing NT //maximum counter NT //	STRUCT - reading (nu reading (nu inting le block; Valu	umber) umber) e, TimeStamp, S Origin Acc	itatus cess OPC type	Comment
arked variable (OPC tags)	CounterRead Structure : STRU MarNo : 1 MarNo : 1 O MinNo : 1 O CounterV MarNo : 1 CounterV Air conditioner Data f Generic X X A A A A A	Ing Inf //Contestent T //Complex variable - NT //maximum counte NT //maximum counte NI : BOOL //Enable co alue: INT //Counter val (DB 22) //Instance data	STRUCT - reading (nu reading (nu inting le block; Valu	umber) umber) e, TimeStamp, S Origin Acc Program RW	itatus cess OPC type V Boolean	Comment single inputs to the PLC
arked variable (OPC togs)	CounterRead CounterRead CounterRead CounterV MinNo:1 CounterV MaxNo:1 CounterV Coun	Ing Inf //ordinetwariable - TT //ormplex variable - NT //maximum counter NT //maximum counter NT //maximum counter NI BOOL //Enable co alue : INT //Counter val (DB 22) //Instance data V Address PLC typ E 2.7 BOOL A 3.0 BOOL M 2 BOOL	STRUCT - reading (nu reading (umber) umber) e, TimeStamp, S Origin Acc Program RW Program RW	itatus cess OPC type W Boolean W Boolean	Comment single inputs to the PLC single outputs from the PLC Counteries counting
arked variable (OPC tags)	Air conditioner Data Second Counter Structure : STRU MinNo : I MaxNo : I CounterV Air conditioner Data Generic X X Air Conditioner Data Generic Mane Input Output Count	Ing Inf //contestant T //complex variable - NT //maximum countes NT //maximum countes NT //maximum countes NT //counter val (DB 22) //Instance data Address PLC typ E 2.7 BOOL M 3.0 BOOL M 3.3 BOOL M 3.4 BOOL	struct - reading (nu reading (nu reading (nu nting le block; Valu block; Valu	umber) umber) e, TimeStamp, S Origin Acc Program RW Program RW	itatus V Boolean V Boolean V Boolean V Boolean	Comment single inputs to the PLC single outputs from the PLC Counter is counting
arked variable (OPC tags)	CounterValue CounterValue CounterValue	mg .mg /mg /mg /mg /mg /mg /mg /mg /mg /mg /	reading (nu reading (nu reading (nu nuting le block; Valu block; Valu	umber) umber) e, TimeStamp, S Origin Acc Program RW Program RW Program RW Program RW	cess OPC type W Boolean W Boolean W Boolean W Int16	Comment single inputs to the PLC single outputs from the PLC Counter is counting Counter reading maximum counter reading (number)

A selected variable is accepted as an OPC tag and displayed in the lower part of the window with additional information.

The context menu offers the commands to select or deselect OPC tags.

🗎 Program variables		
right click	Select all	
	Deselect all	
	Click Search	/ select)
	Search again	F3

A search function is available to handle extensive variable lists.

Search	×
Search for: Tank_level	
Case-sensitive	Area: • Complete block
Complete words only	C Marked section
OK Cancel	Help

Add new variable (OPC tag)



With a right clicking on a line of the variable listing (OPC tag list) the context menu opens. The command *Define variable* (OPC tag) is available.

Define variable

The context menu command *Define variable* opens the Variable Properties dialog box.

💹 Variable properties	— —	×
Parameter	Value	
Name	Variable1	
Data type (OPC UA)	Byte	-
Data type (S7)	BYTE	-
Address	DB1.DBB 0	
Area	DB (Data Block)	-
DB number	1	
Byte address	0	
Bit address	0	
Access	RW (read and write access)	•
Number of field elements	0	
Maximum string length	0	
Comment define t	the variable	
Lower limit (OPC-tag	g) properties	
Upper limit		
Release field elements	No	-
Node name	IBH Link UA.UA Edit Manual.Variable1	
	click for next	
confirm	new OPC-tag	
OK Cancel	New	

A new variable (OPC tag) can be created. The drop-down list fields make it easier to define a variable.



Name

Name Variable1 freely selectable

The freely selectable variable name must be unique. A duplicate name is not permitted.

Data Type (OPC UA) / Data Type (S7)

The **Data Type** can be selected from the drop-down list.

Data Type (OPC UA)

Data Type (S7)

Click to ope		Click to op	pen
Data type (OPC UA) UInt16	Data type (S7)	WORD	
mark Boolean SByte Byte Int16 UInt16 Int32 UInt32 UInt32 Float String DateTir	n select	Click BOOL CHAR BYTE INT DINT DWORD REAL STRING DATE_AND_1 S5TIME	<mark>select</mark>) TIME
Data type (OPC UA)		DATE TIME	
	Data type (S	57) TIME_OF_DA	Y
		COUNTER	

The data type of the variables needs to be specified only once. Either data type (OPC UA) or data type (OPC UA). The other data type is automatically assigned to the variable.

Address

Chapter 1

Address

DB1.DBB 0

The address must correspond to the syntax of the control type / programming system. If several field elements are to be specified, the start address must be specified.

Select Variable Area

The *Area* can be selected from the drop-down list.

	click to open
Area	T (Timer) 💦 🐴
	l (Input)
	Q (Output)
	F (Flag)
	T (Timer)
	C (Counter)
Area	DB (Data Block)
	· · · ·

DB number

The DB number is only relevant if DB (data block) is defined as the area.

Byte address / bit address

Depending on the data type, the byte address and, if necessary, the bit address must be entered.





Access

The access rights of a variable (OPC tag) can be defined in the drop-down list box.

Number of field elements

A field (array) created with the specified data types, the number of elements must be specified. The number of field elements is automatically added to the start address, in square brackets [].

Maximum string length

If string is selected as the data type, a length of 254 is automatically specified. The length of the string can be adjusted.

Comment

A comment can be assigned to a variable (OPC Tag).

Access	RW (read and write access)
	R (read access) W (write access)
Access	RW (read and write access)
Access	RW (read and write access)

click to open

C	Address	T 15[20]
	Number of field elements	20
	Number of field eleme	nts





Lower / upper limit

Limit values can be assigned to a variable (OPC Tag).



Release field elements

The field elements specified in the Variable Properties dialog box can be released (Yes) or blocked (No) in the drop-down list box.



Node name

The full node name is automatically displayed.

Node name	IBH Link UA.UA Edit Manual.Variable2
Node name	

Accept variable

Click the **New** button accepts the created variable and reopens the dialog box to enter another variable. Clicking the **OK** button accepts the created variable and closes the dialog box.



1.5.1 Change Variable (OPC tag)

A right-click on a line with a variable (OPC tag), the context menu is opened with commands for editing this variable are available.



The *Properties* command opens the *Variables Properties* dialog box. The marked variable (OPC tag), can be modified.

Change variable (OPC tag)

Properties can be changed depending on the data type. The properties shown in light gray cannot be changed.

Parameter	Value
Name	CounterReading
Data type (OPC UA)	Int16
Data type (S7)	INT (open / select)
Address	DB2.DBW 2
Area	DB (Data Block)
DB number	2
Byte address	2
Bit address	0
Access	RW (read and write access)
Number of field elements	0 (open / select)
Maximum string length	0
Comment	Counter reading can be modified
Lower limit	can be modified
Upper limit	can be modified
	IBH Link UA.UA Edit Manual Counter Data CounterReading

Click the *Continue* button accepts the modifications. The dialog box reopens to modify the next available variable. Clicking the *OK* button accepts the modifications and closes the dialog box.

1.6 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

Manual.opu - OPCUAEdi File Edit Help Project Soft Selection BH Link UA BH Link UA UA Edit Manual Variables	t Transfer selected configuration to Read complete configuration from	click the OPC UA Server OPC UA Server	The command <i>Transfer Selected</i> <i>Configuration to OPC UA Server</i> opens the <i>Transfer Configuration</i> <i>to Server</i> dialog box.
	Import Export	Transver config	uration to the server — 🔲 X
Se an	elect the server d then click	Name of the server IBH Link UA	connection Transfer Status 0% rk firm Close Help

The transfer and the successful transfer are displayed.

Transver configuration to the server —	
Name of the server connection Transfer Status IBH Link UA 100 % Server is being restarted	Transver configuration to the server
<	Name of the server connection Transfer Status IDH Link UA 100 % Transfer successful
Start Gose	<pre>confirm</pre>
	Start Close Help

1.6.1 Configuration Export

A right-click on the Server icon (IBH Link UA) opens the context menu. The *Export* command is available.

Manual.opu - OPCUAEdit	
File Edit Help	
🗋 💕 🗐 🍦 📀	
Project	
 ☆ Carl Note ☆ BH Link UA ☆ BH Link UA ☆ UA Edit Manual ↓ Wariables 	New server connection
	Transfer selected configuration to the OPC UA Server Read complete configuration from OPC UA Server Import Export

The Export command saves the configuration in *XML* format in a file with the file extension *.opx.

🚺 Export Confi	guration				×
Save in:	Documents	-	• 🗈 💣 🎟 •		
Quick access	Name Marker Server_Server.opx CPU 416.opx CPU 416.opx test1.opx Test.opx Marker Test.opx	Date modified 08.11.2017 19:29 09.01.2016 13:52 21.08.2017 12:29 21.08.2017 13:16 27.12.2019 12:28 11.07.2020 18:08	Type OPCEditor.Document OPCEditor.Document OPCEditor.Document OPCEditor.Document OPCEditor.Document	Size 3 KB 3 KB 3 KB 3 KB 1 KB 2 KB	^
Libraries Is inserted					
File name: UA Edit Manual opx			confirm	ave	
	Save as type: OPXfiles (*.c	opx)			ncel

The files exported by the OPC UA Editor in XML format are readable and can be edited directly. A file exported by the OPC UA Editor can be imported into the OPC UA Editor for further processing.



IBH Link UA Training
1.6.2 Transfer the exported / edited XML file to the IBH Link UA

A file created by the OPC UA Editor can be loaded into the IBH Link UA.

Select OPC Editor Project

	時번	IBH Li	nk UA -	OPC	slots		×	+															
¢	\rightarrow	G	۵	0	2	192.1	68.1	1.14	1/?_=,	/opc_s	slots				•••		☆	111\	Ŧ	۲	\mathbf{x}	0	≡
	₭		۲			DPC si	erver	r is t	runnin	ig .		Logout	t Upd	ate pa	isswor	d				qu	ad-c	ore	
N	let	wo	rk			Sier	1en:	s S	ots														
S	ec	uri	ty			► Slo	ot 2 e slo	ot	Dele	ete all	Loa	ad OPC	Editor F	Project	t In	sert S	oftPL	с					
C	er	tifi	cat	es					(click	* U	lpload a	project	from O	PC Edi	itor (*.	opx).]					
T	im	e s	etti	ng	s	Lo	ad	OP	C Edi	itor P	roje	ct										×	
S	ys Ise	ter rs	n			PI Up	ojec Iloac	st fro d:	om OF Bro	PC Edi owse S in th	litor (*	*.opx): - No fili tick)	e selec	ted.		Upl	load:	Load	1 OPC	Editor	Proje	ect	
S H O D	ie lis)P()ia	me tor C C gno	ns s y lien osti	slo it cs	ts	Fr	ee IE	BH I	OPC (Editor n the If	(>= \ BH 0	/4.13) t IPC Edi	to creati	e the o be use	opx pri	ojects	not i	nstalle	ed? on with	n IBH I	Link		
N S N	IQ of loc	TT tPL dbu	.C IS			G	et it f	from	<u>ı ibhs</u>	<u>oftec.c</u>	<u>com</u>						A	pply	OPC P	roject	t Ca	ancel	

The Windows dialog box to open the OPC editor file is displayed.

🖉 Choose File to Upload					×			
\leftarrow \rightarrow \checkmark \uparrow \square \Rightarrow This PC \Rightarrow PLC P	roject	s IBH Link UA (A:) > OPC UA Editor	ٽ ×	Search OPC UA Edito	r ۵			
Organize 🔻 New folder								
🛖 PLC Projects IBH Link UA (A:)	^	Name	Date modified	Туре	Size			
📙 OPC UA Editor		🚾 OPC Tags S5CPU 103U.opx	09.03.2018 16:48	OPCEditor.Document	2 KB			
		🚾 OPC Tags S7 CPU 312 direct.opx	09.03.2018 16:49	OPCEditor.Document	2 KB			
		🚾 OPC Tags TIA. CPU 416.opx	11.07.2020 18:26	OPCEditor.Document	2 KB			
		🚾 UA Edit Manual.opx 🔪	11.07.2020 18:08	OPCEditor.Document	2 KB			
	~	mark						
File name: UA Edit N	File name: UA Edit Manual.opx 👟							
	Open	Cancel						

Loading the OPC Editor Project file

Load OPC Editor Project	×
Project from OPC Editor (*.opx):	(*.opx)
Upload: Browse UA Edit Manual.opx Upload	Load OPC Editor Project
Configured PLCs in the project file : Upload a project fro	m OPC Editor (*.opx).
	Load OPC Editor Project ×
	Project from OPC Editor (*.opx):
	Upload: 100 % Upload: Load OPC Editor Project
Free IBH OPC Editor (>= V4.13) to create the opx projects not After installation the IBH OPC Editor can be used for free in co	UA Edit Manual.opx
Get it from ibhsoffec.com	Configured PLCs in the project file :
	UA Edit Manual - Ok
	Free IBH OPC Editor (>= V4.13) to create the opx projects not installed? After installation the IBH OPC Editor can be used for free in combination with IBH Link UA
	Get it from ibhsoftec.com
	Apply OPC Project Cancel

Information taken from the OPC Editor



Multiple CPUs in an OPC Editor project

If several CPUs have been merged in one OPC Editor project file, the individual CPUs are listed. All CPUs are taken in one project into the IBH Link UA.



OPC editor information



1.7 Configuration Import

🌆 Manual.opu - OPCUAEdit				
<u>F</u> ile <u>E</u> dit <u>H</u> elp				
Project 👻 🕈 🗙		Name of the server connection		
al al 🖌 V 🗈 🕮 🗛 🛆	L .	Name	IBH Link UA	
P7 BH Link UA (right click)		Server address		
		Host name / Address	192.168.1.14	
		Port	48010	
New server connection			opc.tcp://192.168.1.14:48010	
New control			No	
Transformation to the discussion of				
Transfer selected configuration to	o th	e OPC DA Server	None	
Read complete configuration from	mΟ	PC UA Server	None	
Import		IS		
Import			Anonymous	
Export * Click			Manual	
		Other settings		
		Variables format	Compact	

The file (* opx) to be imported must be in XML format.

🧱 Import confi	guration					×		
Look in:	Documents		▼ ← 🗈 📸 ▼					
4	Name	^	Date modified Type		Size	^		
	CPU416.o	рх	21.08.2017 12:29	OPCEditor.Document	3 KB			
Quick decess	<pre>test1.opx</pre>		21.08.2017 13:16	OPCEditor.Document	3 KB			
	OPC Test.opx		27.12.2019 12:28	OPCEditor.Document	1 KB			
Desktop	🚾 UA Edit Mar	nual.opx	I.opx 11.07.2020 18:08 OPC		2 KB			
		mar	<u>k</u>					
		confirm	×					
	File name:	•	Open					
	Files of type:	- (Cancel					

Several notes are displayed during the configuration import.

Dpen TIA project A:\OPC UA Editor	r Manual\example 3 - CPU 300 TIA 16\C	\СРИ 3 🗙	
Starting] TIA Openness.		
	Open TIA project A:\OPC UA Edito	tor Manual\example 3 - CPU 300 TIA 16\CPU 3 🗙	
	Translati	ating device S7-CPU 300.	
		👿 Open TIA project A:\OPC UA Editor Manual\example 3 - CPU 300 TIA 16\CPU 3	×

The imported configuration is displayed.

Manual.opu - OPCUAEdit						
File Edit Help						
🗋 💕 🛃 🕼 📀						
Project 👻 🖛 🗙	E	Name of the control				
A (🗟 🖌 V 🗈 🖻 🗼 🗛		Name	S7 CPU 312			
	E	Offline program assign	ment			
BH Link UA		Program type	TIA program			
🖻 🛄 S7 CPU 312		Program path	A:\OPC UA Editor Manual\example 3 - CPU 300 TIA 16\CPU 300	TIA 16\C	PU 300 TI	A.ap16
🖵 🚰 Variables		Station name	S7-CPU 300			
	E	Online connection				
		Protocol	S7 TCP/IP			
		Host name / Address	192.168.1.12			
		Targe module position	Target modul at the same rack			
		Rack number	0			
		Slot number	2			
Project 🖾 Server 🖾 Certific						
					cane	

1.8 Add external data

If variables are to be exchanged between two OPC UA servers, the second server and its variables are defined under *Add external data*.

The MQTT configuration also takes place under *External data*.

Right-click on *IBH Link UA* and execute the *Add External Data ...* command.



Clicking on *Add External Data...* opens the IBH OPC UA Editor dialog box.



If the desired second OPC UA server has already been inserted in the IBH Link UA, the **Yes** button can be clicked to import the server configuration from the IBH Link UA.

If there is no OPC UA server to be imported in the IBH Link UA, click **No**. The tree structure **External data** is displayed.

🌆 Manual.opu - OPCUAEdit					- 0	×
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
Project 👻 🕂 🗙	Server name	Variable name	Data type	Node name	Used in	Access
🖻 📸 🗙 🎖 🖻 🛍 🗈 🏟						
🖃 🗣 IBH Link UA						
🚋 🌆 S7 CPU 312						
🛓 🗗 External data						
- 😭 Variable transfer						
² 쉽기 User-defined variables						
MQTT configuration						
Roject Server Server						
	·				CA	PS NUM

1.8.1 External data – context menu

A Right-clicking on *External data* opens the context menu.



Read external data from the server

The data of the already configured *OPC UA server* (here - IBH Link UA) are adopted for the external server by clicking **Yes**.



Clicking *No* closes, the information without any action.

Transfer external data to the server

Clicking **Yes**, the data of the external server are transferred to the already configured OPC UA server (here - IBH Link UA).



Clicking No closes, the information without any action.

Export / Import

The *Export* command saves the configuration of the external server as an *XML file* (file extension * .xml).

The file exported by the OPC UA Editor in XML format is readable and can be edited directly.

A configuration file of the external server exported by the OPC UA Editor can be imported into the OPC UA Editor for further processing.

New external server connection – configuration

The *New external server connection* command opens the dialog box to configure an OPC UA server to reading variables.



The structure of the dialog box is largely identical to the dialog box Properties of the server connection (see page 4).

	erver connection:	AirConditioner					
Server address:		,					
Host name of	or IP address	192.168.1.10					
	Port:	48011					
C URL	opc.tcp://192.1	58.1.10:48011					
		Select endpoint					
Security settings: -							
None		Message mode:					
C Basic <u>1</u> 28Rsa	15	C Signatur					
C Basic256		C Signature and B	Encryption				
C BasicSha256	5	Inverse connection:					
C Aes1285ha2	256RsaOaep						
C Aes256Sha2	256RsaPss						
.ogin:							
Anonymous							
C User name a	and password						
	User name:						
	<u>_</u>	I					
	Pass <u>w</u> ort:		🗖 Store				
Publishing interv	vall (ms) 500		Synchronized reading				
Variables	format: Compa	ct 🔹					
confi	rm)						

In addition, the publishing interval time and the synchronized reading can be initialized.

Manual.opu - OPCUAEdit				—	
<u>File E</u> dit <u>H</u> elp					
🗋 💕 🛃 🚓 🔞					
Project 👻 🖡 🗙	Server name	Server address	UA resource name	Security policity	References
9/ 18 X X D B A A	SirConditioner	opc.tcp://192.168.1.10:48011	urn:TTI-YELLOW:UnifiedAutomation:UaServerCpp	None	0
🖃 🏟 IBH Link UA					
57 CPU 312					
External data					
Connected Servers					
Variable transfer					
User-defined variables					
Project Server Server					

Connected servers display

🌆 Manual.opu - OPCUAEdit				—		×	
File Edit Help							
🗋 📂 🔙 🖨 🎯							
Project 👻 🕈 🗙		Name of the server connect	ion				
al al Y V D B A A		Name	AirCon	ditioner			
		Server address					
🖃 📲 IBH Link UA		Host name / Address	192.16	8.1.10			
🖶 🌆 S7 CPU 312		Port	48011				
🚊 🖧 External data		URL	opc.tcp	o://192.1	68.1.10:4	8011	
🚊 🧭 Connected Servers		Inverse connection	No				
AirConditioner		Security settings					
- 😚 Variable transfer		Security policity	None				
🖓 User-defined variables		Message mode	None				
MOTT configuration		Authentication settings					
		Login	Anonyr	nous			
		Session name					
		Other settings					
		Variables format	Compa	ct			
Project Server Scertificates							
	,				CAPS	ΝUΜ .:	

1.8.2 Variable transfer

The OPC UA variable connection is accepted by marking the source and target variables and then clicking the *Connect variable* or *Connect variable (standard parameters)* command. The connection is displayed.

📴 Manual.opu - OPCUAEdit						-		×
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 🚰 🛃 🚓 📀								
roject 0 Image: State Conditioner 1 Temperature Image: State Conditioner 1 Image: State Conditioner 1 Image: State Conditioner 2 Image: State Conditioner 2 Image: State Co			¢2 ¢	H Unk UA::IBH Link UA.:S7 Cl ak UA CPU 312 F (Flag) Counter Data (DB 2) /// Air conditioner Data (DB 2) /// Air conditioner Data (DB JTIEmperstur: REAL SollTemperstur: REAL TimeStamp_Soll: DAT GurrentTime_TimeSta Status_Ist: DWORD Status_Soll: WORD CurrentTime_Status: Generic	PU 312. Air condition Counter Data 22) //Instance da //Ist-Temperatur //Soll-Temperatur //Soll-Temperatur //Soll-Temperatur Connect //Soll-Temperatur DWORD //Current	er Data.IstTemperatur ata block; Value, TimeS wert turwert all child connections variables. Standard par variables. Standard par ar Status ntTime Status	tamp, Stat ect 3 ameters)	tus
		Course veriable	Dectination conver	Dectination variable	Data tuna	Source name		_
	AirConditioner	Temperature	IBH Link UA	IstTemperatur	Double / Float	AirConditioner 1.Te	mperature	
Project Server Server		is inserted	l.					
							CAPS N	NUM

The *Connect variable ...* command opens the following dialog box.

Parameter for reading th	e variables	>
Source variable:		
Variable ID:	AirConditioner_1.TemperatureSetPoint	_
Display name:	TemperatureSetPoint	
Data type:	Double	
Sampling interval [ms]:	1000	
Queue entries:	1 Reject oldest queue entries	
Index range:		
Destination variable:		
Variable ID:	IBH Link UA.57 CPU 312.Air conditioner Data.SollTemperatur	
Display name:	233	
Data type:	Float	
Index range:		
confirm		
ОК С	Cancel Help	

Has the connection of a variable (Value) been carried out the status and the time stamp belonging to the source variable are shown.

🤣 TemperatureSetPoint : Double
📖 💷 TimeStamp : DateTime

1.8.3 User-defined variables

Click on *User-defined variables*, the right project window changes. Click the *New object* icon to open the dialog box to enter the name of the variable structure.

Ē

Manual.opu - OPCUAEdit		—		×
File Edit Help				
Project ▼ St Ct X X Co Co I ↑ ↑ ↑ IBH Link UA	Image: Solution of the second seco	Node na	Data source	2
External data External data Connected Servers Servers Servers Connected Variable Connected Variable MQTT configuration	Mark User-defined structure Name: User_Var Treety selectable Description:	La	anguage ID:	en
	Variable identifier: User_Var		H	ns = 8 elp

Click <u>**OK**</u> to close the dialog box and display the variable area name. A right-clicking on the *User_Var* icon opens a context menu.



The inserted variables are listed.

Manual.opu - OPCUAEdit				-	o x	<
File Edit Help						
Project 👻 🕂 🗙	😤 😤 🌶 🗙 👗 🖻 🖻 🥖	Name	Data type	Node name	Data sour	ce
፼፼፠፠፠ଢଢ∖≁ଢ	⊢* User_Var	Var_1_Name	Int16	User_Var.Var_1_Name		
🖃 🛸 IBH Link LIA	🤣 Var_1_Name : Int16	Var_2_Name	Float	User_Var.Var_2_Name		
57 CPU 312	🤣 Var_2_Name : Float	✓ Var_3_Name	Byte	User_Var.Var_3_Name		
	🛶 🐓 Var_3_Name : Byte					
🚊 🖧 External data						
🗄 🦪 Connected Servers						
- 😚 Variable transfer						
User-defined variables						
S MQTT configuration						
Project Server Server						
					CAPS NUM	

1.8.4 MQTT configuration

Click on *User-defined variables*, the right project window changes.



Click the *New MQTT broker* icon to open the *MQTT connection properties* dialog box.



MQTT connection properties	×
Standard connection	
Broker address: ssl : //a3tbsmgi zxO9û, lot, eu-central-1, air.azor	naws
C Connection to Azure IOT	
Logon text:	
Maximum number of buffered messages: 0	
Folder name for remanent storage:	
Message in case of connection failure:	
Send message in case of connection failure	
Message text:	
MQTT topic:	
Message quality: Low (Qos=0) reception is not guaranteed	
Remanent message storage	
Security:	
Certificate: 2e6e5d7c46. cert. pem	
CA certificate: 2e6e5d7e46. public. key	
Private key: 266e5d7e46. private. key	
Log in with user name and password	
User name: IBHsoftec	
Password: *******	
confirm	
OK Cancel Hel	p

Standard connection

In the dialog box, an MQTT connection to the MQTT broker (RabbitMQ) on mqtt.ibhsoftec.com is shown as an example.

Connection to the Microsoft Azure IOT Hub

All you need to connect to the Azure IOT Hub is the login text (*AzureloTConnectionString*). The rest is anchored in the software. Only one topic is possible per Azure IOT Hub.

Message in case of connection failure (Last Will Message)

The broker can be advised what should happen if the connection drops unexpectedly.

🌆 Manual.opu - OPCUAEdit				—	o x
File Edit Help					
🗋 🖆 🛃 🚓 🞯					
Project 👻 🕂 🗙	🚳 🛱 🕸 🖉 🗙 👗 🖬 🛍 🥖	Name	Data type	Node name	Data source
IBH Link UA IBH Link UA IBH Link UA IST CPU 312 IST Connected Servers IST Connected Servers IST Connected Servers IST Configuration IST Configuration IST Configuration IST Configuration IST Configuration IST Configuration	Morrisoftec. com Publish Subscribe				
					CAPS NUM .::

The configured connections are listed.

1.9 IBH OPC UA Editor Server window

The result of a successful project configuration transferred to the *OPC UA server* can be displayed online in the server window.

Manual.opu - OPCUAEdit					×
File Edit Help					
🗋 💕 🛃 🖨 🞯					
Server 🗢 🖛 🗙	Name of the server connect	ion			
	Name	IBH Link UA	ί.		
SZ CPU 416	Server address				
Globall/arr	Host name / Address	192.168.1.1	4		
	Port	48010			
Air conditioner Data	URL	opc.tcp://19	92.168.1.	14:48010	
🕀 📖 Counter Data	Inverse connection	No			
Variable transfer	Security settings				
庄 📲 UA Nodes	Security policity	None			
	Message mode	None			
	Authentication settings				
	Login	Anonymous			
	Session name	Manual			
	Other settings				
	Variables format	Compact			
Log Project server server					
				CAPS N	UM

Note:

The configuration available in the *IBH Link UA* window *Siemens slots / OPC Project* is displayed in the Server window.

In the right part of the server window, general settings of the connected **OPC UA server** are displayed. This data is based on the settings from the **New server connection** dialog box (Project window).

Name of the server connection

Name of the server connection
 Name
 IBH Link UA

The name is taken from the projectNameIBH Linwindow. Name changes can only be done in the project window.

Server address

The Server address is taken from the project window.

Host name / Address	192.168.1.14
Port	48010
URL	opc.tcp://192.168.1.14:48010

Server address

Server address changes can only be done in the project window.

Security settings

The Security settings are taken

from the project window.

-	Security settings	
	Security policity	BasicSha256
	Message mode	Sign and Encrypt
1 -	in a the disc in material is	!

Security setting changes can only be done in the project window.

Authentication settings

The Authentication settings are

taken from the project window.

-	Authentication settings			
	Login	Anonymous		
	Session name	Workshop		

Authentication setting changes can only be done in the project window.

Other settings

The variable format representation setting done in the project window is displayed.

Other settings	
Variables format	Compact

1.10 Displayed Online OPC UA server information

Information from the OPC UA server and the CPUs both online connected are displayed. It is irrelevant whether the **OPC tags** have reached the **OPC UA server** directly or via the **OPC UA editor**. The configuration in the IBH Link UA Siemens Slots / OPC Project window is displayed.

Configuration Display

The devices are listed in the left server window. The groups of variables (GlobalVars, data blocks) and the selected controller are listed below.

By clicking on a group, the individual variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is continuously updated.

GlobalVars

Manual.opu - OPCUAEdit						– 🗆 X
File Edit Help						
🗋 📂 🛃 🖨 💿					_	
Server 🗢 🕂 🗙	Name	Data type	Status	Access	Value	Node name
HH Link UA Hink UA GlobalVars Air conditioner Data H	Count CounterValue Counting ON Down Up	Boolean Int16 Boolean Boolean Boolean	&OK &OK &OK &OK &OK	RW RW RW RW	true 6039 true false true	IBH Link UA.S7 CPU 416.Count IBH Link UA.S7 CPU 416.CounterValue IBH Link UA.S7 CPU 416.Counting ON IBH Link UA.S7 CPU 416.Down IBH Link UA.S7 CPU 416.Up IBH Link UA.S7 CPU 416.Up
😡 Project 🖾 Server 🖾 Certifi	<					>
						CAPS NUM

Data Block – Air conditioner Data

Manual.opu - OPCUAEdit						– 🗆 X
Eile Edit Help						
Server V X	Name	Data type	Status	Access	Value	Node name
BH Link UA	Current Time_Status CurrentTime_TimeStamp	DateTime Float	&0K &0K &0K	RW RW RW	0 2020-07-20T15:55:43.452Z 72	IBH Link UA.S7 CPU 416.Air conditioner Data.Current Iime_Status IBH Link UA.S7 CPU 416.Air conditioner Data.IstTemperatur IBH Link UA.S7 CPU 416.Air conditioner Data.IstTemperatur
Air conditioner Data	SollTemperatur Status_Ist	Float UInt32	&0K &0K	RW RW	72 continuously 0 updated	IBH Link UA.S7 CPU 416.Air conditioner Data.SollTemperatur IBH Link UA.S7 CPU 416.Air conditioner Data.Status_Ist
Structure	Status_Soll TimeStamp_Ist	UInt32 DateTime	&0K &0K	RW RW	0 2020-07-20T15:55:43.444Z	IBH Link UA.S7 CPU 416.Air conditioner Data.Status_Soll IBH Link UA.S7 CPU 416.Air conditioner Data.TimeStamp_Ist
🗄 🫅 UA Nodes	TimeStamp_Soll	DateTime	&OK	RW	0001-01-01T00:00:00Z	IBH Link UA.S7 CPU 416.Air conditioner Data.TimeStamp_Soll
Project Server Certificates	<					

Data Block – Counter Data / Structure

Manual.opu - OPCUAEdit							- 🗆 X
File Edit Help							
🗋 📁 🔚 🦛 🕐							
Server 🗢 📮	× Name	Data	type S	tatus /	Access	Value	Node name
BH Link UA GlobalVars GlobalVars Grounter Data Counter Data Structure Yariable transfer Hoge UA Nodes Certificates	Count CounterRead	Bool	ean ĉ	KOK	RW	true 2204 1	IBH Link UA.S7 CPU 416.Counter Data.Count IBH Link UA.S7 CPU 416.Counter Data.CounterReading continuously pdated
Manual.opu - OPCUAEdit							– 🗆 X
<u>File Edit H</u> elp							
			_		_	_	
Server 👻 🗘 🗙	Name	Data type	Status	Access	Value	Nod	e name
🖃 📲 IBH Link UA	CounterValue	Int16	&OK	RW	7075	IBH	Link UA.S7 CPU 416.Counter Data.Structure.CounterValue
E S7 CPU 416	MayNo	boolean	&OK	RW/	ennn	IBH	Link UA.S/ CPU 416.Counter Data.structure.CountingON
GlobalVars	MinNo	Int16	80K	RW	100	IBH	Link UA.S7 CPU 416 Counter Data Structure MinNo
Air conditioner Data					<u> </u>	continu	ously
Structure Mark						updated	l de la constante de
Variable transfer							
🖃 UA Nodes							
Project 🖾 Server 🗟 Certificat	<						>
	,						CAPS NUM .::

Variable transfer

The online status of the interconnected **OPC tags** (defined in the Project window / External data / Variable transfer) are displayed.

🎆 Manual.opu - OPCUAEdit							– 🗆 X
File Edit Help							
🗋 📂 🔙 🖨 💿							
Server 👻 🗸 🗙	Source server	Source variable	Destination server	Destination variable	Data type	Value	Source name
🖃 💐 IBH Link UA	AirConditioner	Temperature	IBH Link UA	IstTemperatur	Double / Float	71.9948	AirConditioner_1.Temperature
57 CPU 416	AirConditioner	Temperature.TimeStamp	IBH Link UA	TimeStamp_Ist	DateTime	2020-07-20T16:14:58.677Z	AirConditioner_1.Temperature.TimeStamp
GlobalVars	AirConditioner	Temperature.Status	IBH Link UA	Status_Ist	StatusCode / UInt32	0 continuously	AirConditioner_1.Temperature.Status
Air conditioner Data	AirConditioner	TemperatureSetPoint	IBH Link UA	SollTemperatur	Double / Float	72 updated	AirConditioner_1.TemperatureSetPoint
Counter Data	AirConditioner	TemperatureSetPoint.TimeStamp	IBH Link UA	CurrentTime_TimeStamp	DateTime	2020-07-20T16:14:58.576Z	AirConditioner_1.TemperatureSetPoint.TimeStamp
Structure	AirConditioner	TemperatureSetPoint.Status	IBH Link UA	Status_Soll	StatusCode / UInt32	0	AirConditioner_1.TemperatureSetPoint.Status
mark)	AirConditioner	CurrentTime	IBH Link UA	CurrentTime_TimeStamp	DateTime	2020-07-20T16:14:57.566Z	2258
	AirConditioner	CurrentTime.Status	IBH Link UA	CurrentTime_Status	StatusCode / UInt32	0	2258.Status
H- UA Nodes							
Project Server Scrutificates	<						>
	,						CAPS NUM

UA Nodes display

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.). The corresponding values are displayed in the right-hand server window.



Note:

The values are current values. They are taken only once when the OPC UA Node name is clicked.

1.11 Certificates

The data transfer from the *IBH OPC UA Editor* to the *IBH Link UA* and vice versa can be encrypted.

The encrypted data transfer takes place according to the **OPC UA** specifications.

The security method desired may be selected in the Server Connection Properties dialog box.

🏙 Manual.opu - OPCUAEdit	- 0	×
File Edit Help		
Project 🗢 🕈 🗶 🖂 Name of the server connection		
😥 📸 👗 🖻 🗈 🗅 🏟 👘 🔤 😽 👘	Link UA	
Server address	68114	
S7 CPU 416 Port 4801	0	
Variables New server connection	168.1.1·	4:48010
External data New control		
Properties		
Add external data		
Import		
Export		
Other settings		
Variables format Comp	pact	
Message mode		
	CA	PS NUM -
	CA	
Server connection properties	X	
Name of the server connection: IBH Link UA		
Server address:		
Host name or IP address 192.168.1.14		
Port: 48010		
C URL opc.tcp://192.168.1.14:48010		
Select endpoint		
Security settings:		
C None Message mode:		
C Basic128Rsa15 Signatur		
Basic256 selected Signature and Encryption		
BasicSha256 Inverse connection:		
C Aes1285ha256RsaOaep	es	
C Aes2565ha256RsaPss		
-Login:		
Anonymous		
C Liser name and password		
User name:		
Passwort:	re	
Session Name: Manual		
Variables format: Compact		
confirm		
OK Cancel	Help	

Security setting via Select end point

If there is an online connection to the **OPC UA server**, the selection can be



made from the encryptions provided by the OPC UA server.

The certificate existing in the OPC UA server with its settings and the connection path to the OPC UA server are displayed.

Endpoints of Discovery S	Server opc.tcp://192.168.1.14:48010		X
Security policity		Message mode	Key strength
http://opcfoundation.org	g/UA/SecurityPolicy#None	None	2048 Bit
http://opcfoundation.org	g/UA/SecurityPolicy#Basic256Sha256	Sign	2048 Bit
http://opcfoundation.org	g/UA/SecurityPolicy#Basic256Sha256	SignAndEncrypt	2048 Bit
http://opcfoundation.or	g/UA/SecurityPolicy#Aes128_Sha256_RsaOaep	Sign	2048 Bit 📥
http://opcroundation.org	g/UA/SecurityPolicy#Aes128_Sha256_RsaOaep	SignAndEncrypt	2048 Bit Click / select)
http://opcroundation.org	g/UA/SecurityPolicy#Aes256_Sha256_RsaPss	Sign	2048 Bit
http://opcroundation.org	g/UA/SecurityPolicy#Aes256_Sha256_RsaPss	SignAndEncrypt	2048 Bit
Certificate:		Connection:	
Name:	IBHLinkUA@ibhlinkua_rescued	Endpoint URL:	opc.tcp://ibhlinkua:48010
Organization:	Organization	Application URI:	urn:ibhlinkua_rescued:IBHsoftec:IBHLinkUA
Organization unit:	Unit	Domain name:	ibhlinkua_rescued
Location:	LocationName	IP address:	
Country:		Certificate settings:	
State:	DE	Encryption strength:	2048 Bit
		Signature algorithm:	SHA256
The certificate is valid		Valid from:	23.06.2020 10:36:40
		Valid until:	22.06.2025 10:36:40
confirm		L	
ок	Cancel		Help

The security procedure selected in the project is displayed.

Manual.opu - OPCUAEdit		– 🗆 🗙
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
🗋 💕 🛃 🖨 🎯		
Project 🗢 🕈 🗙	Name of the server	er connection
AL 📲 🖌 V 🗈 🖻 🗛 🛆	Name	IBH Link UA
27 📴 🔨 💩 🖽 🖙 W	Server address	
BH Link UA	Host name / Addres	s 192.168.1.14
🖶 🛅 S7 CPU 416	Port	48010
🗄 🖧 External data	opc.tcp://192.168.1.14:48010	
	Inverse connection	No
	Security settings	selected security method
	Security policity	BasicSha256
	Message mode	Sign and Encrypt
	Authentication set	ettings
	Login	Anonymous
	Session name	Manual
	Other settings	
	Variables format	Compact
Project 🖾 Server 🖾 Certifi	Security settings	
		CAPS NUM .:

The exchanged certificates must be confirmed as trusted in the IBH OPC UA Editor and in the IBH Link UA.

The exchange of certificates takes place when the configuration is transferred to the OPC UA server (IBH Link UA).

Manual.opu - OPCUAEdit	
File Edit Help	
🗋 💕 🗔 🖨 📀	
Project	
ا ا 🔊 🛋 🗙 🎽 👘	ŵ ۱
BH Link UA	Slick
🗄 🛄 External data	New server connection
	New control
	Insert
	Transfer selected configuration to the OPC UA Server
	Read complete configuration from OPC UA Server
	Import
	Export

The command *Transfer selected configuration to OPC UA Server* opens the *Transfer configuration to the server* dialog box.

By marking the server and then clicking *Start*, the transfer takes place.

Transver configuration to the server	—		×
Name of the server connection Transfer Status			
<			>
Start Close		Help	

If the exchanged certificates have not yet been confirmed as trusted by the *IBH OPC UA Editor* and the *IBH Link UA*, an error message appears.

Transver configuration to the server		– 🗆 X				
Name of the server connection Transfer St IBH Link UA 0 % Er	tatus irror in function Connect: Sta	atus = BadCertificateUntrusted	_			
	l	Transver configuration to	the server		- 0	×
<		Name of the server connection	Transfer	Status		
Start Close		IBH Link UA	0%	The security checks during the connection Please check the certificate on the server	n setup failed. r.	
		<				>
		Start Clo	se		Help	

The error message must be closed, and the certificates must be confirmed as trusted.

Rejected IBH Link UA server certificate in IBH OPC Editor

🌆 Manual.opu - OPCUAEdit								
<u>F</u> ile <u>E</u> dit <u>H</u> elp	V Trust							
🗋 📂 🚽 🦛 💿 🛛 📿 click)	Trust the co	ertificate.						
Certificates 👻 🔻 🗙	N N	2						
	Status	Name		Valid from	Valid to	Organisation		
- & Own certificate	Rejected	IBHLink	UA@ibhlinkua	21.07.2020 12:03:01	20.07.2025 12:03:01	Organization		
	Name		IBHLinkUA@ib	hlinkua				
	Valid from		21.07.2020 12:	03:01				
	Valid to		20.07.2025 12:03:01					
	Organisation		Organization					
	organizational	unit	Unit					
	Location		LocationName					
Roject Server Certificates								

Trusted IBH Link UA server certificate in IBH OPC Editor

🌆 Manual.opu - OPCUAEdit									
File Edit Help									
🗅 💕 🛃 🚓 🕐									
Certificates 🗢 🕈 🗙	$\checkmark \otimes \times \mathbb{R}$								
	Status	Name		Valid from	Valid to	Organisation			
- & Own certificate	🖋 Trusted	IBHLin	kUA@ibhlinkua	21.07.2020 12:03:01	20.07.2025 12:03:01	Organization			
	Name		18HLinkUA@ibhli	nkua					
	Valid from		21.07.2020 12:03	:01					
	Valid to		20.07.2025 12:03:01						
	Organisation		Organization						
	organizational	unit	Unit						
	Location		LocationName						
	Country								
	State		DE						
	AppURI		um:ibhlinkua:IBH:	softec:IBHLinkUA					
	Domain name		ibhlinkua						
	IP address								
	Filename		IBHLinkUA@ibhli	nkua (6F629C97CD84910	1587760274B3683A2338	6935C6].der			
Reproject Server Certificates									

The IBH OPC UA Editor has its own certificate.

🌆 Manual.opu - OPCUAEdit		– 🗆 X
File Edit Help		
🗋 💕 🛃 🖨 🎯		
Certificates 🔷 🔻 🛪	Name	OPCUAEdit@TTI-YELLOW
Son or contificate	Valid from	31.01.2020 17:37:20
Server certificate	Valid to	29.01.2025 17:37:20
Www.certificate	Organisation	Organization
* * (mark)	organizational unit	Unit
	Location	LocationName
	Country	State
	State	DE
	AppURI	urn:TTI-YELLOW:IBHsoftec:OPCUAEditor
	Domain name	TTI-YELLOW
	IP address	192.168.1.10
	Filename	OPCUAEdit.der
Project 🗟 Server 🗟 Certificates		
		CAPS NUM .:

The own certificate of the *IBH OPC UA Editor* must be confirmed *trusted* in the *IBH Link UA*.

	🗱 IBH Link UA - Certificate	s × +						- 🗆	\times
¢	$ ightarrow$ C $rac{1}{2}$	0 🔏 192.16	8.1.14/?_=/certificate			⊠ ☆	⊻ III\ 🖽	۲ 🛠 🔘	≡
		OPC server is runn	ning Logout Update	e password				quad-core	
	Network	Status	Name	Valid From	Valid To	Organization	Organization Unit	Locality	
	Security	Server	IBHLinkUA@ibhlinkua	07/21/20 10:03:01	07/20/25 10:03:01	Organization	Unit	LocationName	
6		🗱 Untrusted	OPCUAEdit@TTI-YELLOW	01/31/20 15:37:20	01/29/25 15:37:20	Organization	Unit	LocationName	
ĻĻ	Certificates	mark	Trust Reject View De	elete New Server Cert	ificate Replace Server Ce	rtificate Unload (Certificate from Client or	CA	
	Time settings	Click	Do	wnload Certificate for th	e Client 🕑				
	System		Trust the selected certificate.						

The IBH OPC UA Editor Certificate must beset to trusted in IBH Link UA.

	🚆 IBH Link UA - Certificat	tes × +						- 🗆 ×
¢	$ ightarrow$ G $rac{1}{2}$	0 🔏 192.16	8.1.14/?_=/certificate			⊌ ☆	⊻ III\ 🗉	: * ○ =
		OPC server is run	ning Logout Updat	e password				quad-core
	Network	Status	Name	Valid From	Valid To	Organization	Organization Unit	Locality
	Security	Server	IBHLinkUA@ibhlinkua	07/21/20 10:03:01	07/20/25 10:03:01	Organization	Unit	LocationName
-	ocounty	🗸 Trusted	OPCUAEdit@TTI-YELLOW	01/31/20 15:37:20	01/29/25 15:37:20	Organization	Unit	LocationName
	Certificates Time settings		Trust Reject View D	elete New Server Cer ownload Certificate for t	tificate Replace Server C ne Client C	ertificate Upload (Certificate from Client or	CA

The transfer of the selected configuration to the **OPC UA Server** can be restarted.

Manual.opu - OPCUAEdit									
File Edit Help									
🗋 💕 🗟 🖨 💿									
Project									
ا ا 🔊 ها 🗶 🗶 📸 🕲	ŵ								
BH Link UA	BH Link UA								
🗄 🗳 External data	New server connection								
	New control								
	Insert								
	Transfer selected configuration to the OPC UA Server								
Read complete configuration from OPC UA Server									
	Import								
	Export								

1.12 Modbus configuration

If the connection to the *IBH OPC UA Editor* has been created, a Modbus configuration can be added. The *Add Modbus configuration* command starts the configuration process.

🐱 Modbus Anbindung.opu - OPCUAEdit				—		×
File Edit Help						
Project 👻 🕈 🗙		Name of the server con	nection			
ALAY IN DOM A		Name	IBH Link U/	A - ModBu	s Connect	ion
Ÿ≌`∧ & ч⊒ ч∋ т ₩		Server address				
IBH Link UA - ModBus Connection		Host name / Address	192.168.1.1	4		
right click)		Port	48010			
		URL	opc.tcp://1	92.168.1.1	14:48010	
New server connection	Inverse connection		No			
New control		Security settings				
Properties		Security policity	None			
Add external data		Message mode	None			
		Authentication settings				
Add modbus configuration		Login	Anonymous			
Add Mitsubishi configuration Click		Session name	Modbus An	bindung		
Import		Other settings				
Export		Variables format	Compact			
Project Server Servir Certificates	A	uthentication settings				
					CAPS	MIM .:

In the right part of the project window, the *Modbus configuration* window opens.



1.12.1 Add new Modbus device



If Modbus configuration is marked in the left part of the project window, the Modbus device properties dialog box can be opened by clicking on the New device icon.



Modbus device prop	perties	×					
Device <u>n</u> ame:	PLC416_ModBus_Server (enter)						
Interface:	RL or IP address: 192.168.1.22 (enter)						
C Serial Number of simultaneously possible requests:							
Optional informations: Desc <u>ri</u> ption:	PLC416 the ModBus Device	٦					
Manufacturer: Model:	IBHsoftec GmbH The information is freely selectable. PLC416 V4.16 The fields can be left blank.	_					
	4711						
Re <u>v</u> isionCounter:	5.0 Device revision: 1.0						
H <u>a</u> rdware revision:	4.16 Software revision: 7.47	J					
	Cancel Help						

The *IBH Link UA* devices *SingleCore* or *QuadCore* have a *USB port*. With a converter (USB / serial), this port can be used as an interface for the Modbus device.

Modbus device	e properties	×
Device <u>n</u> ame:	PLC416_ModBus_Server	
Interface: —— C Ethernet	Connection parameters: COM1:9600,8,N,1	
🕞 Serial	Number of simultaneously possible requests:	1

If the device name and the interface are specified, the dialog box can be confirmed with *OK*.

1.12.2 Modbus TCP interface / Modbus variable

The Modbus organization specifies the form in which variables can be present.

Device manufacturers follow these guidelines and provide devicespecific tables that list the address of the variable and how it is addressed.

To define the Modbus variable as OPC tag in the *Modbus Variable Properties* dialog box of the IBH OPC UA Editor, knowledge of the fieldbus node with its data, data coding, addressing and transactions is required.

Following are excerpts from specifications of the Modbus organization, which are necessary for the definition of the OPC tags. The tables / descriptions of the fieldbus node provide this information in a similar form.

Modbus Functions – Partially – (Modbus Organization)

Reading and writing variables are determined by functions.

Physical Discrete Inputs	Read Discrete Inputs		
Internal Bits	Read Coils		
or	Write Single Coil		
Physical coils	Write Multiple Coils		
Physical Input Registers	Read Input Register		
	Read Holding Registers		
	Write Single Register		
Internal Registers or Physical Output Registers	Write Multiple Registers		
	Read/Write Multiple Registers		
,	Mask Write Register		
	Read FIFO queue		
	Read File record		
File record access	Write File record		
	Read Exception status		
	Diagnostic		
Disgrastics	Get Com event counter		
Diagnostics	Get Com Event Log		
	Report Server ID		
	Read device Identification		
Other	Encapsulated Interface Transport		
	CANopen General Reference		

Most Modbus devices do not provide all the functions. However, writing or reading functions are usually supported by all. Therefore, the IBH OPC UA Editor only supports the functions for reading and writing values.

Modbus data formats

Name data access (Storage area)	Quantity Data type	Access Type memory access	Comment
Discrete Input physical inputs process image	1 Bit (Single bit)	Read-Only	These data types can be provided by an I / O system.
Coils Discrete outputs physical outputs process image	1 Bit (Single bit)	Read-Write	These data types can be changed by an application program.
Input Registers	16-Bit Wort	Read-Only	These data types can be provided by an I / O system.
Holding Registers	16-Bit Wort	Read-Write	These data types can be changed by an application program.

specifications are often in hexadecimal form. These add converted into a decimal address for input in the IBH O The address information in the Modbus devices Manufa

-	_
4	_
C	D
5	+
Ç	D

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As
an
ex
am
ple
, ਰੂ
r th
e d
efir
hitic
ň
of a
va
riat
ble
exi
sts.
-

R	Spec egis	cial ster			Diag	gnosis	6			Pro	ces	s Da	ita		
									X (6)			X ⁽³⁾		X ⁽¹⁾	Addr 1 Bit
×	×	X (10)	X ⁽⁹⁾	×	×	×	X ⁽⁸⁾	X (7)		X ⁽⁵⁾	X ⁽⁴⁾		X ⁽²⁾		essing Register
0x0450	0x0440	0x0430	0x0420	0x0413	0x0412	0x0411	0x0410	0x0400	0x0300	0x0200	0x01D0	0x0100	0x00D0	0x0000	Start address
0x045F	0x044F	0x043F	0x042F					0x040F	0x03FF	0x02FF	0x01FF	0x01CF	0x00FF	0x00CF	End address
Read/Write	Read/Write	Read/Write	Read/Write	Read-only	Read-only	Read-only	Read-only	Read-only	Read/Write	Read/Write	Read-only	Read-only	Read/Write	Read/Write	Access
Internal R	Command	Error Reg	Watchdog	Process ir digital inpi	Process ir digital out	Process ir analog inp	Process ir analog ou	Status rec		Process of Physical in Physical of Physica		Process of	Descri		

provided by the Modbus device manufacturers, in Addresses of the memory areas and their access

devices manufacturer inform:

Example - Listing:

Access to variables (fictitious

Modbus register addressing

1.12.3 Defining Modbus variables in the IBH OPC UA Editors

Right-clicking on the Modbus device name (PLC 416 ModBus Server) opens the context menu.



The *New Variable* command opens the *Modbus Variable Properties* dialog box.

This dialog defines the variables that the OPC server should connect to. This can be a write variable, a read variable, or a read / write variable.

1.13 Modbus variable – Properties dialog box

Read- (Coils / Discrete Inputs) – Write-Coils

Name:		Unit ID: 255			
Type: Fgoolean UInt16 UInt16 UInt22 UInt32 CInt32 CInt32 CInt32 Chock jmit values: History: See in bictory.	Access: Read: Image: Constraint of the second s	Write: V Write Address: WriteSingleCol 32-bit swap word order Magmum: 0 Public swap (1000)	Image: Properties modbus values Name: Type: © © Boolean © Uint16 © Int16 © Uint22 © Int32 © Eloat	Read-/Write-R	Registers
UA node recogr	ition: ns=9;s=PLC416_ModBus_Server.		Analog limit values: Check limit values History: Eave in history UA node recogn	Minimum: Image: Content of the second s	Magimum: 0 Buffer sige: 1000

Modbus TCP / RTU interface

Modbus device manufacturers describe in tables the Modbus fieldbus node functions. Based on these descriptions, the definitions of the accesses to variables are defined.

Name (Variable)

The name can be selected freely but must correspond to the OPC UA specification (letters **A-Z**, **a-z**, numbers **0-9**, no special characters, no symbols, no dots, no colon.) As a special character only _ under line.

Unity-ID

For Modbus TCP, the Unity-ID = 255. This is set 10^{10} [255 at default. For Modbus RTU, the address must be set according to the slave address.

Туре

Boolean

One (1) bit information (**Boolean**), which can have the states TRUE (1) and FALSE (0). A variable of type **Boolean** occupies 1 bit in a register address (16 bits). An array of 16 variables of type Boolean occupy an entire register address (16 bits).

UInt16

Positive 16-bit **unidirectional integer** (number) between 0 and 65,535 (2^o to 2⁺¹⁶). A **UInt16** variable occupies a register address (16 bits).

Int16

Positive or negative 16-bit integer (number) between -32,767 and +32,767 (-2⁺¹⁵ to 2⁺¹⁵ -1). An Int16 variable occupies a register address (16 bits).

UInt32

Positive 32-bit unidirectional integer (number) between 0 and 4,294,967,295 (2^o to 2⁺³²). A **UInt32** variable occupies two (16-bit) register addresses.

Тур: –	
C	Boolean
С	UInt16
C	Int16
С	UInt32
C	Int32
С	Float

Int32

Positive or negative 32-bit integer (number) between -2,147,483,654 and +2,147,483,654 (-2^{+31} to 2^{+31} -1). An **Int32** variable occupies two (16-bit) register addresses.

Float

A variable of data type **Float** represents a fractional number that exists as a 32-bit floating-point number (REAL). A **Float** variable occupies two (16-bit) register addresses.

1.13.1 Addresses when accessing read / write

Note:

The address information in the Modbus devices Manufacturer specifications are often in hexadecimal form. These addresses are to be converted into a decimal address for input in the IBH OPC UA Editors.

Data type UInt16 and Int16

A word address (16-bit) is used for accessing variables of a data type. Address 0 addresses the variable that occupies the first 16 bits of a data area. With address 1, the variable occupying the second 16 bits of a data area is addressed. Address 3 addresses the third variable (16-bit) of a data area, and so on.

Data types UInt32, Int32 and Float

Two words (2 x16-bit = 32 bits) are always required for accessing variables of these data types. Address 0 addresses the first 32-bit variable of these data types. Address 1 must not be addressed because this address would address the low word of the 32-bit variable. Address 2 addresses the variable occupying two words 2 and 3 in the data area. The address 4 addresses the third 32-bit variable. etc.

The order of the two 16-bit words, which consist of the data types UInt32, Int32 and Float, can be set.

• High-Word – Low-Word or Low-Word – High-Word.

Data type Boolean

A bit address is used to access bits in the data area.

- Address 0 addresses bit 0 in the word address 0 area.
- Address 1 addresses bit 1 in the word address 0 area.
- Address 16 addresses bit 0 in the word address 1 area.
- Address 66 addresses bit 2 in the word address 3 area.

1.13.2 Access Read Only

Read Discrete Input (read only – Bit access)

Data type Boolean

Example: - Fictitious Modbus table (3)

Start Word Address 0111_{hex} = Bit Address 1110_{hex} = 4368_{dec} - Read-only - Bit Access - Physical inputs, Process image. There are 7 input bits to be defined as OPC tags.

This setting addresses variables from the registers of the *Discrete Inputs* whose contiguous status comes from digital inputs.

The address of the first variable and	
the number of variables must be specified	d.

Read_Discrete_Inputs_Boolean
Access:
I▼ <u>R</u> ead
A <u>d</u> dress: 4368
C ReadCoils
ReadDiscreteInputs
Number: 7

Screenshot: 7 individual bits are read from bit address 4368 of the memory area of the physical inputs.

Read Input Registers (Read only)

All data types except Boolean (example: Int16 - 16-bit)

Example: - Fictitious Modbus table (4)

Start register address 01E0hex = 480dez - Read-only - Word access area **Read Input Registers**. Four registers are to be defined as OPC tags. The contiguous content of digital inputs (analog inputs) is addressed. The address of the first variable and the number of variables must be specified.

Read_Input_Registers_Int16
Access:
Read
Address: 480
ReadInputRegisters
C ReadHoldingRegisters

Screenshot: 4 fixed point numbers from word 480 of the area of the *Read Input Register* are read.

Read Input Registers (Read Only)

All data types except Boolean (example: UInt16 - 16-bit)

Example: - Fictitious Modbus table (7)

Initial register address $400_{hex} = 1024_{dez}$ - Read-only - Word access -The contents of 10 status registers is addressed as OPC tags.

Read_Input_Registers_UInt16

Address: 1024

ReadInputRegisters

C ReadHoldingRegisters

Number: 10

🔽 Read

This setting addresses variables from the diagnostics area (*Input Registers*). The start registers address and the number of registers must be specified.

Screenshot: 10 numbers (unsigned) are read with 16 bits each from word 1024 of the status registers.

Read Input Registers (Read only)

All data types except Boolean (Int16 - 16-bit)

Example: - Fictitious Modbus table (8)

Start register address 410hex = 1040dez - Read-only - Word access - The contents of the register of the process image length in bits, of the analog outputs, are to be addressed as OPC tags.

With this setting, variables from the diagnostic area (*input registers*) are addressed.

Screenshot: The 16-bit word 1040 of the

register process image length is read.

1.13.3 Access Read and Write

Read Coils / Write Single Coil

Data type Boolean

Example: - Fictitious Modbus table (1)

Register Address 0010_{hex} = Bit Address 100_{hex} = 256_{dec} - Read-Write - Bit Access - Physical Inputs, Process image.

Define 1 input bit as OPC tag. With this setting, variables from the registers of the coils are addressed. The address of the variable and the number of variables (1) must be specified.

Read_Coils_Write_Single_Coils_Boolean	Unit ID: 255
Access: Read: Read Address: 256	Write: Write Address: 256
ReadCoils ReadDiscreteInputs	WriteSingleCoil
Number: 1	32-bit swap word order

Read_Input_Registers_Int16
Access: Read:
🔽 Read
Address: 1040
ReadInputRegisters
C ReadHoldingRegisters
Number: 1

Screenshot: 1 single bit is read with bit address 256 of the memory area of the physical inputs.

Read Coils

Data type Boolean

Example: - Fictitious Modbus table (1)

If such a variable is only defined as a read variable, it is defined as an OPC tag with the status **Read**.

Register Address 0014_{hex} = Bit Address 140_{hex} = 320_{dec} - Read - Bit Access -Physical Inputs, Process image. 8 input bits should be defined as OPC tag.

Access:
✓ <u>R</u> ead
Address: 320
ReadCoils C ReadDiscreteInputs
Number: 8

Screenshot: 8 single bits are read from the bit address 320 of the memory area of the physical inputs.

Read Coils / Write Multiple Coils

Data type Boolean

Example: - Fictitious Modbus table (6)

Register Address 0310_{hex} = Bit Address 3100_{hex} = 12544_{dec} - Read-Write - Bit Access - Physical Inputs, Process image.

12 input bits should be defined as OPC tag.

With this setting, variables are addressed from the registers of the coils whose contents reflect individual bits. These can be individual

Read_Coils_Write_Multiple_Coils_Boolean	Unit ID: 255
Access:Read:	Write:
🔽 Read	Vrite
Address: 12544	Address: 12544
ReadCoils ReadDiscreteInputs	WriteMultipleColls
Number: 12	32-bit swap word order

outputs as well as individual inputs. The address of the first specified variable and the number of variables is specified.

Screenshot: 12 individual bits are defined from the bit address 12544 of the memory area of the physical outputs.

Read Holding Register / Write Single Register

(All data types except Boolean)

Example: - Fictitious Modbus table (2) - Data type INT16 (integer).

Register address $00D0_{hex} = 208_{dec}$ - Read-Write - word access - Physical Inputs, Process image.

One (1) integer number should be defined as OPC tags.

With this setting variables from the *Holding Registers* are addressed whose contents reflect individual

RW_Holding_Reg_Single_Reg_Int	Unit ID: 255
Access:Read:	Write:
🔽 Read	Vrite
Address: 208	Address: 208
 ReadInputRegisters ReadHoldingRegisters 	WriteSingleRegister
Number: 1	🔲 32-bit swap word order

registers. This can be, for example, an analogue input. The address of the first variable and the number (1) of the variables are specified.

Screenshot: An integer number is defined from the word address 208 of the storage area of the physical outputs.

Read Holding Registers / Write Multiple Registers

(All data types except Boolean)

Example: - Fictitious Modbus table (5) - Data type INT16 (integer).

Register Address $0210_{hex} = 528_{dez}$ - Read-Write - Word Access - Physical Outputs, Process image.

9 integer numbers should be defined as OPC tags.

With this setting variables from the *Holding Registers* are addressed whose contents reflect individual registers.

RW_Holding_Register_Multiple_Reg_Int	Unit ID: 255
Access:	Write:
✓ Read	🔽 Write
Address: 528	Address: 528
C ReadInputRegisters	WriteMultipleRegisters
Number: 9	32-bit swap word order

These can be individual outputs (analog outputs). The address of the first specified variable and the number of variables is specified.

Screenshot: 9 integer numbers from the word address 528 of the memory area of the physical outputs are defined as OPC tags.

Read Holding Registers / Write Multiple Registers

(Data types UInt32, Int32, Float)

Example: - Fictitious Modbus table (9) - Float data type (floating point number).

Register address 0424hex = 1060dez - Read-Write - Word access – Watchdog register.

5 floating point numbers are to be defined as OPC tags.

RW_Holding_Reg_Multiple_Reg_Float	Unit ID: 255
Access:	
Read:	write:
✓ <u>R</u> ead	✓ Write
Address: 1060	Address: 1060
C ReadInputRegisters ReadHoldingRegisters	WriteMultipleRegisters
Number: 5	32-bit swap word order

With this setting, variables from the *holding registers* are addressed, the content of which reflects individual registers.

The address of the first specified variable and the number of variables must be specified.

Screenshot: 5 floating point numbers from word address 1120 are defined in the *holding registers* as OPC tags.

Note:

UInt32, **Int32**, and **Float** numbers occupy two (2) 16-bit words (32-bit). The order of the two 16-bit words can be set.

• High-Word – Low-Word or Low-Word – High-Word

Read Holding Registers

(All data types except Boolean)

If such a variable is only defined as a read variable, it is defined as an OPC tag with the status **Read**.

Example: - Fictitious Modbus table (10) - Data type UINT16 unsigned integer number.

Register address 0430_{hex} = 1072_{dez} - Read-Write - word access - special register.

6 unsigned integer numbers should be defined as OPC tags.

With this setting variables from the *Holding Registers* are addressed whose contents reflect individual registers. The address of the first specified variable and the number of variables is specified.

Read_Holding_Registers_UInt16
Access:
Read:
I Read
Address: 1072
C ReadInputRegisters
ReadHoldingRegisters
Number: 6

Screenshot: 6 numbers (unsigned) from the word address 1104 of

the memory area of the special registers are defined as OPC tags.

1.13.4 Analog-limits

Analog limit values can be specified.

Analog limit values:					
Check limit values	Minimum:	100.0	Maximum:	1000.0	

1.13.5 History

While **OPC Data Access** provides real-time access to data, **OPC Historical Data Access**, also known as OPC HDA, supports access to data already stored.

Activation of a variable as historical data as well as sampling interval and number of values (buffer size) is done via the dialog box.

History:				
🔽 Save in history	Sampling interval (sec):	0.5	Buffer size:	1000

OPC UA Node detection

The OPC UA Node name of a variable is displayed in the dialog box.

UA node recognition: ns=9;s=PLC416_ModBus_Server.RW_Holding_Reg_Multiple Reg_Float

1.14 Transfer Modbus configuration to the OPC UA server (IBH Link UA)

🗱 Workshop ModBus US.opu - OPCUAEdit	– 🗆 X
Workshop ModBus US.opu - OPCUAEdit File Edit Help Project Image: A transformed and transfor	 Read_Input_Registers_UInt16 Read_Coils_Write_Single_Coils_Boolean Read_Coils_Write_Single_Coils_Boolean Read_Coils_Write_Single_Coils_Boolean Read_Coils_Write_Multiple_Coils_Boolean Read_Coils_Write_Multiple_Coils_Boolean Read_Coils_Write_Multiple_Coils_Boolean
Project Server Server	 RW_Holding_Register_Multiple_Reg_Int Read_Holding_Registers_UInt16 RW_Holding_Reg_Multiple Reg_Float
	CAPS N:

The variables defined as OPC tags are displayed.

Name	Data type	Access	R address	W address	Number of	Node name
Read_Discrete_Inputs_Boolean	Boolean	R	4368		7	PLC416_ModBus_Server.Read_Discrete_Inputs_Boolean
Read_Input_Registers_Int16	Int16	R	480		4	PLC416_ModBus_Server.Read_Input_Registers_Int16
Read_Input_Registers_UInt16	UInt16	R	1024		10	PLC416_ModBus_Server.Read_Input_Registers_UInt16
Read_Coils_Write_Single_Coils_Boolean	Boolean	RW	256	256	1	PLC416_ModBus_Server.Read_Coils_Write_Single_Coils_Boolean
Read_Coils_Boolean	Boolean	R	320		8	PLC416_ModBus_Server.Read_Coils_Boolean
Read_Coils_Write_Multiple_Coils_Boolean	Boolean	RW	12544	12544	12	PLC416_ModBus_Server.Read_Coils_Write_Multiple_Coils_Boolean
RW_Holding_Reg_Single_Reg_Int	UInt16	RW	208	208	1	PLC416_ModBus_Server.RW_Holding_Reg_Single_Reg_Int
RW_Holding_Register_Multiple_Reg_Int	Int16	RW	528	528	9	PLC416_ModBus_Server.RW_Holding_Register_Multiple_Reg_Int
Read_Holding_Registers_UInt16	UInt16	R	1104		6	PLC416_ModBus_Server.Read_Holding_Registers_UInt16
RW_Holding_Reg_Multiple Reg_Float	Float	RW	1120	1120	5	PLC416_ModBus_Server.RW_Holding_Reg_Multiple Reg_Float

If all Modbus variables are defined as OPC UA tags, the Modbus configuration can be transferred to the OPC UA server.

A right-click on *Modbus configuration* opens the context menu.



The command to transfer the Modbus configuration must be confirmed.

IBH OPC UA Editor	×
Configuration of external data transferred to server 'IBH L UA - ModBus connection'?	ink

The transmitted Modbus configuration is displayed under *Modbus* in the IBH Link UA Browser window.



The Modbus device connection is displayed under *Diagnostics* in the IBH Link UA Browser window.

🗱 IBH Link UA - Diagnosti	cs × +				- 🗆 ×
← → ♂ ଢ	🛛 🔏 192.168.1.14/?_=/diaglistview			… ⊠ ☆	II\ 🗉 📽 🗙 Ο Ξ
Network	OPC server is running Logout Controller diagnostics Clie	Update password	vork diagnostics	stem Log	quad-core
Security Certificates Time settings	ID Connection name PLC416_ModBus_Server Clear diagnose C	Address 192.168.1.22:502	Time 21.7.2020 15:51:53	Source Error number PLC 0	Error Text Connection established >
Diagnostics MQTT					

1.15 IBH OPC UA Editor Server Window

The *Modbus configuration* successfully transmitted to the OPC UA server can be displayed online in the server window.

The variables (Modbus configuration, Modbus device, OPC tag) are listed in the left-hand server window.

Clicking on a variable displays the variable definitions with the status in the right-hand server window. The status of this OPC tag is constantly being updated.



1.16 Mitsubishi configuration

If an OPC server connection has been created with the IBH OPC UA Editor, a Mitsubishi configuration can be added. The *Add Mitsubishi configuration* command starts the configuration process.

🐱 Mitsubishi configuration.opu - OPCUAEdit			– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp			
Project 👻 🕂 🗙		Name of the server connect	ion
au 🛷 🖌 V 🗈 🙉 🗛 🛆		Name	IBH Link UA - Mitsubishi configuration
		Server address	
IBH Link UA - Mitsubishi configuration		Host name / Address	192.168.1.14
		Port	48010
New server connection		URL	opc.tcp://192.168.1.14:48010
New control		Inverse connection	No
Drementing		Security settings	
Properties		Security policity	None
Add external data		Message mode	None
Add modbus configuration		Authentication settings	
Add Mitsubishi configuration		Login	Anonymous
		Session name	Mitsubishi configuration
Import		Other settings	
Export		Variables format	Compact
Project Server Certificates			
			CARS NUM

Click Add Mitsubishi configuration to open the context menu.

Mitsubishi confi	iguration.opu - OPCUAEdit			_		×
<u>Eile E</u> dit <u>H</u> elp						
🗋 💕 🛃 🕼 🤇	0					
Project	~ # ×	Station name	Ethernet address	CPU name	Segment nur	nber
2 🗠 🗙 X 🛛	à 🛍 🔺 🖗					
BH Link UA - Mitsubishi configuration						
	New station					
	Delete Click					
	Read Mitsubishi configuration from server					
	Write Mitsubishi configuration to server					
😡 Project 🛛 🖄 Serve	er 🖾 Certificates	<				>
					CAPS N	JM .a

A new Mitsubishi configuration is to be created.

Clicking *New Station* ... opens a dialog box for entering the station name and its Ethernet address.

Mitsubishi Station	ı	X
Name:	FX-Station	ter)
Ethernet address:	10.0.13.98	
confi	rm)	
ок	Cancel	Help

The Mitsubishi FX station is entered as a project

🗰 Mitsubishi configuration.opu - OPCUAEdit				×
File Edit Help				
🗋 📂 🔙 🛱 🞯				
Project	Station name Ethernet address	FX-Station 10.0.13.98		
IBH Link UA - Mitsubishi configuration Mitsubishi Mitsubishi FX-Station FX-Station Project Server Scrupping Certificates				
	1		CAPS	NUM .:

Insert new CPU

A CPU is to be inserted into the Mitsubishi FX station.



The command *New CPU...* opens the dialog box for defining the CPU.

🌆 Mitsubishi CPU	×
Name: FX-CPU ente	er name
Network number:	0× 00
Station number:	0x FF FX-Series
Module I/O number:	0x 03FF
Multidrop station number:	0x 00
FX series	nark)
ок	Cancel Help

A program can be assigned to the inserted CPU.

Mitsubishi configuration.opu - OPCUAEdit		- 0	ı ×
File Edit Help			
Project 👻 🕂 🗙	CPU name	FX-CPU	
N & X D B A A	Segment number	00	
PDIARGIN	Station number	FF	
🖃 🍕 IBH Link UA - Mitsubishi configuration	Modul/IO number	03FF	
🖮 📷 Mitsubishi	Multidrop station nu	00	
E 😭 FX-Station	FX series	true	
FX-CPU	Offline program assi		
Variables Delete	Number of variables	1	
Properties Click			
Assign program			
Rever Server			
		<i>C</i> 1	DC NUM

The **Assign program** ... command opens the dialog box for selecting a Mitsubishi project file with the file extension **gxw** or **gx3**.

The variables of the Mitsubishi project may be adopted as OPC tags.

In addition to the program variables, structures can be created additionally or exclusively.

Mitsubishi configuration.opu - OPCUAEdit			×		
<u>F</u> ile <u>E</u> dit <u>H</u> elp					
🗋 📂 🖬 🖨 🎯					
Project	■ Variables right Program varial Nev	w structure			
E Y FX-Station		M Add n	ew user-defined struct	ture	×
FX-CPU			Structure name	FX-CPU-Structure enter name	
			<u>Confirm</u>	el	Help

In the created structure, variables can be defined in the.

Mitsubishi configuration.opu - OPCUAEdit					×
File Edit Help					
🗋 📂 🗔 🖨 🞯					
Project 👻 🕈 🗙	🖃 - 🥅 Varia	bles			
୬ 🕾 🗙 🎗 🖻 🖎 । ለ 🙃		rogram	variables		
🖃 🍕 IBH Link UA - Mitsubishi config	·····* L> L	A-CPU-	Structure	right cl	ick)
🖻 – 📅 Mitsubishi		Ne	w structure		
E		Ne	w variable		
		De	elete	click)
	<u> </u>	Cu	ıt		
		Co	ру		
		In	sert		
		Pr	operties		

The dialog box for defining the variable opens.

Mitsubishi variable properties	×
Name: Var_Bit	
Address: D100	umber of field element
Data type:	Access rights:
Comment: FX CPU Bit Variable	
UA Identifier: FX-Station.FX	CPU.GlobalVars.FX-CPU-Structure.Va
OK Cancel	Help

The defined variables (OPC tags) are listed in the right project window.

Mitsubishi configuration.opu - OPCUAEdit									×
File Edit Help									
Project Project Image: Straight of the straight of t									
E FX-CPU	Name	Address	PLC type	Origin	Access	OPC type	Comment	t	
Variables (mark)	Var_Bit	D100 D132	Bit Word	Generic Generic	RW RW	Boolean Uint16	FX CPU E	lit Variabl Vord Vari	le able
Project Server Server		D 164	Float	Generic	κw	Float	FACPUF		

A right-click on *Mitsubishi* opens the context menu.



The command to transfer the Mitsubishi configuration must be confirmed.

IBH OPC U	JA Editor	\times
?	Transfer configuration to the server 'IBH Link UA - Mitsubishi configuration'?	
	Yes No	

The transmitted Mitsubishi configuration is displayed under *Mitsubishi* in the *IBH Link UA* Browser window.


2 IBH OPC UA Editor - Configuration Examples

The following are examples of how to handle the *IBH OPC UA Editor*. All examples are summarized as one project and are transferred as such to the IBH Link UA. The PLC example projects are in the file *IBH Link UA Editor – Examples*.

Example 1 - Project: CPU 416 S7

Connect CPU 300 / CPU 400 with TCP / IP port to IBH Link UA. The PLC project is available as a STEP 7 (Simatic Manager) program.

In the example, the SoftPLC CPU 416 is used.

Example 2 - TANK_PST.S5D or tank level S5W.s5p:

The S5 CPU 103U PLC program is available as SIMATIC S5 or **S5 for Windows** project. The S5 CPU is connected to the IBH Link UA via an IBH Link S5 ++.

Example 3 - Project: CPU 300 TIA 16:

Connect CPU 300 / CPU 400 directly to IBH Link UA via IBH Link S7 ++. The PLC program (CPU300 TIA16) is available as a TIA16 project.

Example 4 - Project: CPU 1200 TIA 16:

Connect CPU 1211C with TCP / IP port to IBH Link UA. The PLC program (CPU 1200 TIA16) is available as a TIA16 project.

Example 5 - project: CPU 416 TIA 16 server - server

In the project, the CPU 416, which is available as an OPC UA server, is connected to an air conditioning system that also has an OPC UA server.

Establishing a server connection. The data of an air conditioning system (OPC UA server) is sent to the CPU-416 (OPC UA server).

Example 6 - Project: CPU 1200 connected to CPU 1500 TIA 16

A CPU 1211C with a TCP / IP port is connected to a CPU 1511-1 PN, which is also a TCP / IP port.

Example 7 - Data exchange between several S7 / S5 CPUs

On a system with three (3) S7 CPU's and two (2) S5 CPU's, data should be exchanged with each other. An S7 CPU that has an

Ethernet connection acts as a master. The other CPUs have no Ethernet interfaces and are connected to the IBH Link UA via IBH Link S7 ++ or IBH Link S5 ++. The master provides data for all CPUs, which provide information to the master.



Example 8 - Connection of two S7 CPU 300 via an IBH Link S7 ++

S7-300 series CPUs not having a free Ethernet port may be connected to the IBH Link UA via MPI bus via an IBH Link S7 ++ via Ethernet (protocol RFC 1006).

The example shows the creation of a project with the connection of two (2) CPU 312 to one (1) IBH Link UA via IBH Link S7 ++. Instead of the CPU 312, any other S7 CPU 300/400 that does not have a free Ethernet port could be used.



Example 9 - Modbus

The IBH SoftPLC PLC416 has the possibility of a Modbus connection. In the example, variables are defined as OPC tags. This Modbus configuration is transferred to the IBH Link UA and the variables are displayed in the **UAExpert client program**.

2.1 Example 1: CPU 416 S7

CPU 416-3 PN/DP (SoftPLC) - with the program *Counter* (CPU 416) in the project *CPU416 S7* shall be connected to the *IBH Link UA*.



IBH OPC UA Editor

Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.

Open the **Project window** by clicking on the **Project** tab.





Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

🌆 Untitled - OPCUAEdit									
File	Edit	Help							
	1	lew server connection							
Project									

2.1.1 Server connection

Settings for the connection to the *IBH Link UA* OPC UA Server are done in the *New server connection* dialog box.

WA Se	rver connection properties	×
– Se	Name of the server connection: IBH_Link_UA rver address: THOSE NAME OF IP address Port: 48010	
	C URL opc.tcp://192.168.1.14;48010	
Se	C Nong Message mode: C Basic128Rsa15 C Signature and Encryption C Basic256 C Nong C Basic256 Inverse connection: C Aes1285ha256RsaOaep C Connect invers C Aes2565ha256RsaPss Properties	
	gin: Anonymous User name and password User name: Passwort: Session Name: Examplel 1: CPU 416 57	
	Variables format:	
	OK Cancel Help	

Check connection to the IBH Link UA

Click Select endpoint ... A connection to the

Select endpoint...

online connected IBH Link UA is established. If the connection is successful, the *Discovery Server Endpoints to opc* dialog box opens.

The possible security settings of the data to be transmitted are displayed here for selection. The existing certificates in the OPC UA server with their settings and the connection path are displayed.

Endpoints of Discovery	Server opc.tcp://192.168.1.14:48010			×
Security policity		Message mode	Key strength	
http://opcfoundation.or http://opcfoundation.or http://opcfoundation.or http://opcfoundation.or http://opcfoundation.or http://opcfoundation.or	ojUA/SecurityPolicy/Mone gUA/SecurityPolicy/#Bait2565ha256 gUA/SecurityPolicy/#Bait2565ha256 gUA/SecurityPolicy/#Bait2565ha256 gUA/SecurityPolicy/#Ae128_5ha56_Rs40ee gUA/SecurityPolicy#Ae126_Sha256_Rs40es gUA/SecurityPolicy#Ae3256_Sha256_Rs40es	None Sign SignAndEncrypt Sign SignAndEncrypt Sign SignAndEncrypt	2048 Bit selected 2048 Bit Click / selection 2048 Bit Click / selection 2048 Bit 2048 Bit 2048 Bit 2048 Bit 2048 Bit 2048 Bit 2048 Bit 2048 Bit	D
Certificate: Name: Organization: Organization unit: Location: Country: State:	IBHLInkUA@bthlinkua Organization Unit LocationName DE	Connection: Endpoint URL: Application Light: Domain name: IP address: Certificate settings: Encryption strength: Signature algorithm:	opc.tcp://bhinkua:48010 um:bhinkua:18Hsoftec:18HLinkUA bhinkua 2048 Bit SHA256	
Confirm		⊻alid trom: ⊻alid until:	20.07.2020 12:03:01	elp

In the example, the security procedure **None** is used. Additional settings are not required. The necessary settings have already been made in the **Server connection properties** dialog box. Click **OK** to close the dialog box.

If a connection to the online connected *IBH Link UA* cannot be established, this will be displayed.



Is the **Server connection properties** dialog box closed, the specified settings for the connection to the **OPC UA server** are displayed in the right part of the project window.



2.1.2 Insert new control

The *New Control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).

🗰 example 1 - CPU 416 S7.opu - OPCUAEdit	– 🗆 🗙
File Edit Help	
New server connection	
Project New control of the server con	nection
	IBH_Link_UA
right click Port	48010
New server connection	opc.tcp://192.168.1.14:48010
New control	No
Properties Click	
Add external data	None
	None
Transfer selected configuration to the OPC UA Server	
Read complete configuration from OPC UA Server	Anonymous
	Examplel 1: CPU 416 S7
Import	
Export	Compact
Project 🐼 Server 🐼 Certifi	
	CAP:

New control dialog box

Mew control X
Control name: CPU_416_Counter
Host name / IP address: 192.168.1.10
Protocol: SZ TCP/IP Rack number: 0 Slot number: 2
Position of the target module:
• Target modul at the same rack
C Via MPI/DP subnet accessible rack
MPI/ <u>D</u> P address of the target CPU: 2
C Via TCP/IP subnet accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0
○ Via <u>H</u> 1 subnet accessible rack
H1 address of the target CPU: 00.00.00.00.00.00
Sybnet ID: 0000
C 57 200 TCP/IP Own TSAP: 0100
C 57 1200 TCP/IP
QK Cancel Test connection Help

Test connection

After completing the New Control dialog box, the connection to the online connected

Test connection....

CPU can be tested. Information about the successful connection is displayed.



	P		
confir	m		
<u>o</u> k	<u>C</u> ancel	Test connection	Help

To accept and close the *New cont*rol dialog box settings click on *OK*.



The access data of the *CPU_416_Counter* (CPU 416-3 PN / DP SoftSPS with TCP/IP Port) is displayed in the right project window.

2.1.3 Program assignment

Open the *Program selection* dialog box with the *Assign program* command.



Program selection

Select the PLC program in the open

Select program dialog box. By clicking (click to open

on the *Plus* icon in front of the *CPU 416 S7* project icon, the PLC program (CPUs) is displayed in the project.



Clicking *OK*, the variables, data and program information are transferred to the *OPC UA Editor*.

In the right part of the project window the *Offline program assignment* is displayed under.

🎆 example 1 - CPU 416 S7.opu - Ol	PCUAEdit	– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
🗋 💕 🛃 🖨 🞯		
Project 👻 🕂 🗙	Name of the control	
🔊 🖉 🖌 V 🕞 🕲 🗛 🔿	Name	CPU_416_Counter
	🗉 Offline program assig	nment
□-10 IBH_Link_UA	Program type	STEP7 program
CPU_416_Counter	Program path	A:\OPC UA Editor Manual\example 1 - CPU 416 S7\CPU 416 S7\CPU 416 S7\CPU 416 S7.s7p
📖 📶 Variables 💦 (mark)	Station name	CPU 416
	Online connection	
	Protocol	S7 TCP/IP
	Host name / Address	192.168.1.10
	Targe module position	Target modul at the same rack
	Rack number	0
	Slot number	2
	Program type	"CB) (memory" or "CTEPE memory" or "CTEP7 memory" or "TIA memory" or "Cumbal
Project Records Records	file"	sow program of sters program of stery program of the program of symbol
Comproject as server as certifi	J	
		CAPS NUM

Define variables as OPC tags

Clicking on *Variables*, these, and data from Data Blocks of the acquired PLC program are listed in the right part of the project window.

Clicking the symbol *Plus* in front of the symbol of the variable area, the existing variables are listed.



If a variable is selected, this is accepted as an OPC tag and is displayed in the lower part of the window with additional information.

💹 example 1 - CPU 416 S7.opu - OPCUAEdit							_		×
<u>Eile Edit H</u> elp									
🗋 🚔 🛃 l 🌐 🞯									
Project	L //Counter is : INT //Count I: BOOL //Star //coly used int //only used int //coly used int //count up i //Counter Da L //Counter is ing : INT //Co CT //Complex	counting ter reading ternally ernally ernally ernally ta counting unter readir variable - S	ng STRUCT -						
(* X) B B A B /	· 10/1								
Name	Address	PLC type	Leng	Origin	Access	OPC type	Comme	nt	_
	M 2.3	BOOL	.1	Program	RW	Boolean	Counte	r is cou	ntina
CounterValue OPC tags MW 12 INT 2 Program RW Int16							Counte	r readin	ng
Counter Data.Count DB2.DBX 0.0 BOOL .1 Program RW Booler							Counte	r is cou	nting
Counter Data.CounterReading DB2.DBW 2 INT 2 Program RW Int16							Counte	r readin	ig
Roject 🗟 Server 🖾 Certi									
								CAPS N	UM

Select / search OPC tags

The context menu offers the commands to select all tags as OPC tags (select all) or deselect (deselect all).

A search function is available to handle extensive variable lists.

🗯 example 1 - CPU 416 S7.opu - OPCUAEdit							– 🗆 X
File Edit Help							
Project T X D Variables							
Program variables	ck 🔴	_					
	Select	all					
BH_Link_UA	ount Desel	ect all					
CPU_416_Counter	//C Search	~ ~	Click / s	select)			
Variables 🛛 🗌 Variables	L / Search	again	F3				
	unt uown	ragani					
	/ used internally	,					
	used internally						
	/ used internally						
Up : BOOL //count	tup						
🚊 🕒 Counter Data (DB 2) //Co	unter Data						
⊡ 🔲 Count:BOOL //C	ounter is counti	ng					
	IT //Counter r	eading					
🖻 🛄 Structure : STRUCT //	Complex variab	le - STRUC	Т-				
🔽 📘 MinNo : INT //	minimum cour	ter reading	g (numbe	er)			
····· ☑ 📗 MaxNo : INT //	'maximum cou	nter readin	g (numb	er)			
🗹 📘 CountingON : B	OOL //Enable	counting					
🛄 🗹 🚺 CounterValue : I	NT //Counter	value					
📸 🗙 🛦 🖻 🛍 🎽 🖊 💙							
Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment
Count	M 2.3	BOOL	.1	Program	RW	Boolean	Counter is counting
CounterValue OPC tage	MW 12	INT	2	Program	RW	Int16	Counter reading
Counter Data.Count	DB2.DBX 0.0	BOOL	.1	Program	RW	Boolean	Counter is counting
Counter Data.CounterReading	DB2.DBW 2	INT	2	Program	RW	Int16	Counter reading
Counter Data.Structure.MinNo	DB2.DBW 4	INT	2	Program	RW	Int16	minimum counter reading (number)
Counter Data.Structure.MaxNo	DB2.DBW 6	INT	2	Program	RW	Int16	maximum counter reading (number)
Counter Data.Structure.CountingON	DB2.DBX 8.0	BOOL	.1	Program	RW	Boolean	Enable counting
Counter Data.Structure.CounterValue	DB2.DBW 10	INT	2	Program	RW	Int16	Counter value
Counting ON	M 2.2	BOOL	.1	Program	RW	Boolean	Start counting
U Down	M 2.5	BOOL	.1	Program	RW	Boolean	count down
	N/ 2.0	BOOL	.1	Program	RW	Boolean	only used internally
	M 0.1	POOL	1	Program	RW DW	Poolean	only used internally
	M26	BOOL	1	Program	R\W/	Boolean	count un
Project Server Certifi	1112.0	5001		riogram	1.000	Doblean	councup

IBH Link UA Training

2.1.4 Transfer configuration to the OPC UA server (IBH Link UA)

A right-click on the **Server** icon (IBH Link UA) opens the context menu.



The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

🗰 Transver configuration to the		—		×	
Name of the server connection	Transfer 0 %	Status 			
Start Close				Help	>

Select the server and then click Start.

If a certified data exchange has been agreed between the *IBH OPC Editor* and the *IBH Link UA*, the exchanged certificates must be confirmed as *trusted* (see Trust certificates; chapter 1 page 1-40).

Transver configuration to the server	— — ×	
Name of the server connection Tran IBH_Link_UA 10	sfer Status 0 % Server is being restarted	
	🗰 Transver configuration to the server 🛛 🗖	×
<startclose< td=""><td>Name of the server connection Transfer Status IBH_Link_UA 100 % Transfer successful</td><td></td></startclose<>	Name of the server connection Transfer Status IBH_Link_UA 100 % Transfer successful	
	<	>
	Start Close	

The successful transfer is displayed.

IBH Link UA - Siemens Slots project CPU 416 Counter



2.1.5 Online OPC UA Server Information

Information from the online connected OPC UA server with the online connected CPUs is displayed.

The groups of the variables (GlobalVars, data blocks) are listed in the left server window. By clicking on a group, the individual variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is continuously updated.

🎆 example 1 - CPU 416 S7.opu - OPCU	AE	dit				×
File Edit Help						
🗋 💕 🛃 🖨 💿						
Server PH_Link_UA GlobalVars GlobalVars Air conditioner Data Counter Data Guberts GlobalVars Air conditioner Data GlobalVars Gl		Name of the server com Name Server address Host name / Address Port URL Inverse connection Security settings Security policity Message mode Authentication settings Login Session name Other settings Variables format	None None Anonymous Examplel 1: Compact	JA 4 92.16 CPU	\$8.1.14:4 1 416 S7	8010
,	,				CA	PS N

CAPS NUM

GlobalVars

🌆 example 1 - CPU 416 S7.opu - OPCI	JAEdit									×
File Edit Help										
🗋 💕 🛃 🖨 🎯										
Server 🗢 🕈 🗙	Name	Data type	Status	Access	Value	Node nar	ne			
🖃 🎼 IBH Link UA	Count	Boolean	&0K	RW	true	IBH_Link	UA.CPU_4	16_Count	er.Count	
CPU 416 Counter	CounterValue	Int16	&0K	RW	3922	IBH_Link	UA.CPU_4	16_Count	er.Counti	erValue
GlobalVars	Counting ON	Boolean	&0K	RW	true	IBH_Link	UA.CPU_4	16_Count	er.Counti	ng ON
	Down	Boolean	&0K	RW	true	IBH_Link	UA.CPU_4	16_Count	er.Down	-
E Counter Data	🚺 Max	Boolean	&0K	RW	false	IBH_Link	UA.CPU_4	16_Count	er.Max	
Structure	I Min	Boolean	&0K	RW	false	IBH_Link	UA.CPU_4	16_Count	er.Min	
⊕ <u>a</u> UA Nodes	🚺 One	Boolean	&0K	RW	true	IBH_Link	UA.CPU_4	16_Count	er.One	
	🚺 Up	Boolean	&0K	RW	false	IBH_Link	UA.CPU_4	16_Count	er.Up	
					co	ntinuously				
Project Server Certificates					up	dated				

Data Block DB2 – Counter Data / Structure

🜆 example 1 - CPU 416 S7.opu - OPCU	JAEdit					- 🗆 X
File Edit Help						
🗋 📂 🛃 🖨 🙆						
Server 👻 🕂 🗙	Name	Data type	Status	Access	Value	Node name
	CounterValue CountingON MaxNo MinNo	Int16 Boolean Int16 Int16	&0K &0K &0K &0K	RW RW RW RW	3819 true 8000 100 CO UD	IBH_Link_UA.CPU_416_Counter.Counter Data.Structure.CounterValue IBH_Link_UA.CPU_416_Counter.Counter Data.Structure.CountingON IBH_Link_UA.CPU_416_Counter.Counter Data.Structure.MinNo IBH_Link_UA.CPU_416_Counter.Counter Data.Structure.MinNo athuousty
	J					curs and

Show under UA Nodes

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.).

The corresponding values are displayed in the right-hand server window.

The values are current values and are only taken once when the OPC UA Node name is clicked.



Example 2: S5 CPU 103U 2.2

Connect an S5 CPU 103 U to the IBH Link UA using IBH Link S5 ++. The S5 CPU 103U PLC program is available as a SIMATIC S5 (COUNT_ST.S5D) or S5 for Windows (Counter S5W.s5p) project

Calling the IBH OPC UA Editor Double-click the IBH OPC UA Editor icon to open the program window. IBH OPC UA Editor Open the **Project window** by click clicking on the Project tab. 🖌 Project 🛛 🖾 Server 🖉 🖓 Certificates Open the New Server *Connection* dialog box with the New Server Connection

command from the *Edit* menu or by clicking the icon.

🗱 Un	titled ·	- OPCUAEdit
File	Edit	Help
	1	New server connection
Project		

The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server connection properties		×
Name of the server connection Server address:	: IBH_Link_UA	
C URL opc.tcp://192		
Security settings: None Basic <u>1</u> 28Rsa15 Basic <u>2</u> 56 BasicSha2 <u>5</u> 6 Aes128Sha2 <u>56RsaOaep</u> Aes256Sha256RsaPss	Message mode: C. Signatur C. Signature and Encryption Inverse connection: Connect invers Properties	
Login: C Anonymous C User name and password User nam Passwo Session Name:	ne: Store Store	
Variables format: Com	pact	
QK <u>C</u> ancel	Help	

The settings for the connection to the IBH Link UA OPC UA server are displayed in the right part of the project window.



2.2.1 Inserting a New control (PLC)

The *New Control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).



New control dialog box

🐱 New control X
Control name: 55_CPU_103U Host name / IP address: 192.168.1.13 IP-Address IBH Link \$5++
Protocol: © <u>57_TCP/IP</u> Rack number: 0 <u>Slot number: 2</u>
Position of the target module:
• Target modul at the same rack
○ Via MPI/DP subnet accessible rack
MPI/ <u>D</u> P address of the target CPU: 2
C Via TCP/IP subnet accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0
C Via <u>H</u> 1 subnet accessible rack
H1 address of the target CPU: 00.00.00.00.00.00
Subnet ID: 0000 _ 0000
C 57 200 TCP/IP Own TSAP: 0100
C S7 1500 TCP/IP PLC TSAP: 0101
Click
<u>QK</u> <u>Cancel</u> Test connection <u>H</u> elp

Test connection

After completing the *New control* dialog box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.



To accept and close the New control dialog box settings click on OK.

Right project window

The right project window displays the access data for the **S5 CPU 103U** (CPU connected via IBH Link S5 ++ with IBH Link UA).



The selected name of the controller is **S5_CPU_103U** (no spaces are allowed in the name). **S7 TCP / IP** was selected as the protocol for the online connection to the PLC.

Under Host name / IP address, the IP address of the IBH Link S5 ++ (192.168.1.13) has been specified.

The target module is on the same rack. The rack number and slot number are irrelevant.

An offline program assignment has not been made, since a program assignment is done via a command.

2.2.2 Offline program assignment

The *Assign Program* command is used to open the *Program Selection* dialog box.

🗱 example	🐱 example 1 - CPU 416 S7.opu - OPCUAEdit — 🗆 🗙										
File Edit	Help										
🗋 😂 🛃	a										
Project	→ # × 🖃	Name of the control									
AL MIK 😽	VENELAA	Name	CPU_416_Counter								
		Offline program assig	nment								
⊡ 📲 IBH_L	ink_UA	Program type	No program assignment								
ė 💷 C	PU_416_Counter	Program path									
	Variables right click	Station name									
		Online connection									
	Delete		S7 TCP/IP								
	Cut	/ Address	192.168.1.10								
	Сору	ile position	Target modul at the same rack								
	Insert	er	0								
	click)		2								
	Assign program										
	Update program assignme	ent									
Project	Properties	signment" or FSIGNMENT Program	"S5W program" or "STEP5 " or "TIA program" or "Symbol file"								
			CAPS I								

Program Selection dialog box

Select the PLC program in the Select program dialog box. By clicking the Plus symbol in front of the folder symbol, the PLC program (CPUs) is displayed in the project.

In the **Select program** dialog box mark the **STEP® 5** project **COUNT_ST** or the **S5 for Windows** project **Counter S5W**.

Select program		×
OPC UA Editor Manual CPU 416 57 CPU 416 57 CPU 416 57 CPU 416 57 COUNT_ST COUNT_ST COUNT_ZO.SEQ COUNT_ST COUNTER SSW COU		^
		×
Path: A:\OPC UA Editor Manual\example 2 - S5 CPU 103U\		
OK Cancel	Help	

Click *OK* to transfer the variables, data, and program information to the *OPC UA Editor*.

Project window

In the right part of the project window information about the *Offline program assignment* are displayed. The variables of the PLC program *Counter S5W* were adopted.

🌆 example 2 - S5 CPU 103U.opu - C	PCUAEdit		-		×
<u>F</u> ile <u>E</u> dit <u>H</u> elp					
🗋 💕 🛃 🚓 🕐					
Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Projec	Name of the control Name Offline program assignm Program type Program path Station name Online connection Protocol Host name / Address Targe module position Rack number Stot number	S5_CPU_103U S5W program A:\OPC UA Editor Manual\example 2 - 5 S7 TCP/IP 192.168.1.13 Target modul at the same rack 0 2	35 CPU 103U\Co	unter S5W	(.55P
Rroject 행 Server 행 Certifi	Program type "No program assignment" or "S "Symbol file"	5W program" or "STEP5 program" or "S	TEP7 program'' o	TIA prog	gram" or

2.2.3 Define variables as OPC tags

Clicking the name *Variables* will list the variables / data from the S5W PLC project *Counter S5W* in the right part of the project window.

🗱 example 2 - S5 CPU 103U.opu - C	DPCUAEdit								-		×
File Edit Help											
🗋 💕 🛃 🚓 🛞											
Project	et Variables Program Varial Program Varial	:BOOL //ma :BOOL //mi :BOOL //mi trol_ON:BOOL trolling_is_ON_ m:BOOL //cou BOOL //cou e:WORD //co uses (OB 2) // :INT // minini :INT // maxin :INT // maxin	ximun nimum //S5 3 : BOOL bunt down it up ounter Val Counter Val Counter va num nume num nume rical value	Select a Deselect Search Search //feedba //feedba //feedba //feedba //feedba //feedba //feedba //feedba //feedba	all click tt all click again tck of S5 CF U 1 te S7 CPU 1 te S7 CPU 1		(/ select)				
	😤 X X Da 🕰 A	h in / V									
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment			_
	Max	M 1.2	BOOL	.1	Program	RW	Boolean	maximum rea	ched		
	Min	M 1.3	BOOL	.1	Program	RW	Boolean	minimum rea	ched		
	Control_ON	M 1.4	BOOL	.1	Program	RW	Boolean	S5 CPU 1 star	: countin	ig	
	Controlling_is_ON_3	M 1.5	BOOL	.1	Program	RW	Boolean	feedback of S	5 CPU 1		
	Down taken as	M 2.5	BOOL	.1	Program	RW	Boolean	count down			
	Up OPC tags	M 2.6	BOOL	.1	Program	RW	Boolean	count up			
	Value	MW 12	WORD	2	Program	RW	UInt16	counter Value	S5 CPU	1	
	CounterValues.D_0	DB2.DBW 0	INT	2	Program	RW	Int16	minimum nu	merical	value S7	CPU 1
	CounterValues.D_1	DB2.DBW 2	INT	2	Program	RW	Int16	maximum ni	umerical	value S7	CPU 1
	CounterValues.D_2	DB2.DBW 4	INT	2	Program	RW	Int16	numerical va	lue S7 Cl	PU 1	
Project Server Server Certifi										CAPS	NUM .:

Clicking the Plus symbol in front of the variable area symbol lists the existing variables.

If a variable is selected, it is adopted as an OPC tag and displayed in the lower part of the window with additional information.

The context menu offers the commands to select all variables as OPC tags (select all) or deselect (deselect all).

A search function is available to handle extensive variable lists.

Add new variable (OPC tag)

With a right-click in a blank line, the Context menu is opened. A click on the *Variable definition* command opens the *Variables properties* dialog box.

Here a new variable (OPC tag) can be created. The drop-down list fields facilitate the definition of a variable.

Change Variable (OPC tag)

A right-click on a line with a variable (OPC tag) opens the context menu with commands for editing this variable.

The *Properties* command opens the *Variables Properties* dialog box. The marked variable (OPC tag), can be modified.

2.2.4 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.



The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Transver configuration to the	server		—		×
Name of the server connection IBH_Link_UA	Transfer 0 %	Status 			
<					>
Start Close				Help	

Select the server *IBH Link UA* and then click Start. The configuration of *Counter S5W* the STEP[®] 5 PLC Program is transferred to the *IBH Link UA*.

Transver configuration to the server	—						
Name of the server connection Transfer IBH_Link_UA 100 %	Status Server is being re	estarted					
		Mart Transver con	figuration to the	server	_		×
<		Name of the service IBH_Link_UA	ver connection	Transfer 100 %	Status Transfer successfu	1	_
Start <u>C</u> lose							
		<					>
		Start	⊆lose	Confirm		Help	

The successful transfer is displayed.

If a certified data exchange has been agreed between the *IBH OPC Editor* and the *IBH Link UA*, the exchanged certificates must be confirmed as *trusted* (see Trust certificates; chapter 1 page 1-40).

IBH Link UA - Siemens Slots project S5_CPU_103U



IBH Link UA – Browser window Diagnostics

The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLC / S5_CPU_103U*.

🗱 IBH Link UA - Diagnostio	cs X	+									
$\overleftarrow{\bullet}$ > C' \textcircled{a}	0	X 192.168.1.14/?_=/dia	aglistview			•••	⊌ ☆	III\ C		* 0	≡
	OPC ser	ver is running Lo	gout Update password						qua	d-core	
Network	Cor	ntroller diagnostics	Client diagnostics	Network diagnostics	System	n Log					
Security	ID	Connection name	Address	Time	Source	Error number	Error Text				
Certificates	🧼 -	S5_CPU_103U	192.168.1.13:102	31.7.2020 10:21:11	PLC	0	Connection esta	blished (IBH	softec S7	to S5)	
T de	Clear	diagnose C									
lime settings	_										
Diagnostics											_
MQTT											
IN MET I											

2.2.5 Online OPC UA Server Information

Information from the online connected **OPC UA server** with the online connected PLC **S5 CPU 103U** is displayed.

The groups of the variables (GlobalVars, data blocks) are listed in the left server window. By clicking on a group, the individual variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is continuously updated.

GlobalVars

🎆 example 2 - S5 CPU 103U.opu - OPCU	AEdit							—		×
File Edit Help										
🗋 📂 🔚 🖨 💿					_					
Server 🔫 🕂 🗙	Name	Data type	Status	Access	Value	Node na	me			
⊡\$] IBH_Link_UA	Control_ON	Boolean	&OK	RW	true	IBH_Link	_UA.S5_CPU	_103U.Cont	rol_ON	
55_CPU_103U	Controlling_is_ON_3	Boolean	&0K	RW	true	IBH_Link	_UA.S5_CPU	_103U.Cont	rolling_is	_ON_3
III GlobalVars	🚺 Down	Boolean	&OK	RW	false	IBH_Link	_UA.S5_CPU	_103U.Down	n	
CounterValues	🚺 Max	Boolean	&OK	RW	false	IBH_Link	_UA.S5_CPU	_103U.Max		
🗖 🦳 IIA Nodes	🚺 Min	Boolean	&OK	RW	false	IBH_Link	_UA.S5_CPU	_103U.Min		
Dhierts	🚺 Up	Boolean	&OK	RW	true	IBH_Link	_UA.S5_CPU	_103U.Up		
Types	🔳 Value	UInt16	&OK	RW	4915	IBH_Link	_UA.S5_CPU	_103U.Value	2	
Views					Cor	tinuously				
010005					upo	lated				
Roject Server 🖄 Certificates										
									CAPS	NUM

Data Block DB2 – CounterValues

🗱 example 2 - S5 CPU 103U.opu - OPCU	IAE dit					– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
🗋 💕 🛃 🕼 💿						
Server 👻 🕂 🗙	Name	Data type	Status	Access	Value	Node name
⊡📬 IBH_Link_UA	🚺 D_0	Int16	&OK	RW	100	IBH_Link_UA.S5_CPU_103U.CounterValues.D_0
	🚺 D_1	Int16	&0K	RW	8000	IBH_Link_UA.S5_CPU_103U.CounterValues.D_1
GlobalVars	🚺 D_2	Int16	&0K	RW	6083	IBH_Link_UA.S5_CPU_103U.CounterValues.D_2
CounterValues					Col	ntinuously
🖃 🛅 UA Nodes					up	dated
 ⊕						
Types						
Views						
Project Server Certificates						
						CAPS NUM .::

Page 2-20

Show under UA Nodes

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.).

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.).

The corresponding values are displayed in the right-hand server window.

The values are current values and are only taken once when the OPC UA Node name is clicked.



2.2.6 Unified Automation UaExpert - The OPC Unified Architecture Client

The *UaExpert program window* lists the *OPC tags* transferred from the IBH OPC UA Editor and the associated *UA nodes*.



Data	Access View	
#	Server	Node Id
1	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Control_ON
2	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Controlling_is_ON_3
3	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Down
4	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Max
5	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Min
6	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Up
7	IBHLinkUA@ibhlinkua-SC-14	NS4[String]IBH_Link_UA.S5_CPU_103U.Value
8	IBHLinkUA@ibhlinkua-SC-14	NS4 String IBH_Link_UA.S5_CPU_103U.CounterValues.D_0
9	IBHLinkUA@ibhlinkua-SC-14	NS4 String IBH_Link_UA.S5_CPU_103U.CounterValues.D_1
10	IBHLinkUA@ibhlinkua-SC-14	NS4 String IBH_Link_UA.S5_CPU_103U.CounterValues.D_2

2.3 Example 3: CPU 300 TIA16

Connect *CPU 300 / CPU 400* directly to IBH Link UA via *IBH Link S7* ++. PLC program is available as a TIA 16 project (CPU 300 TIA16).

The CPU 312 (6ES7 312-1AE13-0AB0) – within the PLC project *CPU 300 TIA16*- is to be connected to the IBH Link UA using the Ethernet connection via an *IBH Link S7++* to exchange variables (OPC tags).

Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.



Open the *Project window* by clicking on the *Project* tab.





Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

Muntitled - OPCUAEdit									
File	Edit	Help Click							
	1	New server connection							
Project									

The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Name of the server connection:	IBH_Link_UA					
Server address:						
Host name or IP address	192.168.1.14					
	49010					
Port:	40010					
C URL opc.tcp://192.	168.1.14:48010					
	Select endpoint	1				
Security settings:						
• Nonej	C Signatur					
C Basic <u>1</u> 28Rsa15						
C Basic256 C Signature and Encryption						
C BasicSha256	Inverse connection:	Inverse connection:				
C Aes1285ha256RsaOaep	Connect invers	Properties				
Meszadoliazadksarss						
Login:						
 Anonymous 						
C User name and password						
<u>U</u> ser name						
Pacquort						
1 033 <u>m</u> 010		1				
Session Name: exam	ple 3: CPU 300 TIA16					
Unvinklag formakı						
variables format:						

The settings for the connection to the **IBH Link UA** OPC UA server are displayed in the right part of the **project window**.



2.3.1 Inserting a New control (PLC)

The *New control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).

🗱 example 3 - CPU 300 TIA 16.opu - OPCUAEdit	– 🗆 🗙
File Edit Help	
New server connection	action
Image: Server address Image: Server address	IBH_Link_UA
New server connection	48010 opc.tcp://192.168.1.14:48010
New control	No
Add external data	None None
Transfer selected configuration to the OPC UA Server Read complete configuration from OPC UA Server	Anonymous
Import	Compact
Export Export Server	
	CAP:

New control dialog box

Mew control	×
Control name: CPU_300_TIA_16 enter Host name / IP address: 192.168.1.12 IP address IBH Link S7++	
© S7 TCP/IP Rack number: 0 Slot number: 2] [
Position of the target module: corresponds to MPI address	
C Via MPI/DP subnet accessible rack Rack Slot Bit 5 Bit (0-31)	
MPI/DP address of the target CPU: 2 000 00010	
C Via TCP/IP subnet accessible rack 0 2	
TCP/IP address of the target CPU: 0 0 0 0 C Via H1 subnet accessible rack	
H1 address of the target CPU: 00.00.00.00.00.00	
Subnet ID: 0000 . 0000	
O S7 200 TCP/IP Own TSAP: 0100	
C S7 1500 TCP/IP PLC TSAP: 0101	
OK Cancel Test connection Help	

Test connection

After completing the New Control dialog box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.

IBH OPC UA Editor	×
The connection to the PLC CPU_300_T successfully tested.	IA_16 has been
	OK
OK Cancel Te	est connection

To accept and close the *New control* dialog box settings click on *OK*.

2.3.2 IBH Link S7 ++ setting

If no connection is established from the PC via *IBH Link* S7 ++, the settings must be checked (see chapter 1 page 1-13 – IBH Link UA - S7 CPU 300 / 400 connection via IBH Link S7++).

Note:

To address the CPU 312 from the *CPU 300 TIA16* project via the *IBH Link S7++*, the routing option (dialog box *IBHLink settings* / *Network tab*) *Configuration with NetPro* must be deactivated (Apply permanently).

This applies to all S7 300/400 CPUs with IBH Link S7++ connection.

Right project window

The right project window displays the access data for the *CPU 312* (CPU S7-300 / S7-400 via IBH Link S7++).

🐜 example 3 - CPU 300 TIA 16.opu - OPCUAEdit — 🗆 >								
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 💕 🛃 🖨 🎯								
Project 👻 🕈 🗙		Name of the control						
alf aik 🖌 V 🗈 🙉 🗼 🔥		Name	CPU_300_TIA_16					
🎦 🔄 🧥 🧔 🖼 🕒 🕂 🕅 🖂 Offline program assignment								
BH_Link_UA		Program type	No program assignment					
CPU_300_TIA_16		Program path 🔨 mark)						
🔤 Variables		Station name						
		Online connection						
		Protocol	S7 TCP/IP					
		Host name / Address	192.168.1.12					
		Targe module position	Target modul at the same rack					
		Rack number	0					
		Slot number	2					
	P	rogram type						
Project 🖾 Server 🖾 Certificat	۸'' or	lo program assignment" or "9 "STEP7 program" or "TIA pr	5W program" or "STEP ogram" or "Symbol file"	ō program''				
				CAPS				

CPU 300 TIA16 was specified as the name of the controller. S7 TCP / IP was selected as the protocol for the online connection to the PLC. The IP address of the *IBH Link S7++* (*192.168.1.12*) has been defined under host name / IP address.

The target module is on the same rack. The rack number and slot number select the *MPI address 2* of the CPU.

An *offline program assignment* has not yet been made. The program is assigned via a command.

2.3.3 Offline program assignment

The *Assign program* command is used to open the *Program Selection* dialog box.



Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





The **SIEMENS support software TIA Openness** is started in the background. If an error occurs see chapter 1, **Special features** *when selecting TIA projects* page 1-16.

Several notices are displayed.

Den TIA project A:\OPC UA Editor Manual\example 3 - CPU 300 TIA 16\CP	из ×
Starting TIA Openness.	
💽 Open TIA project A:\OPC UA Editor M	fanual∖example 3 - CPU 300 TIA 16∖CPU 3 🗙
Opening project A:\OPC UA Editor Ma 16\CPU	nual\example 3 - CPU 300 TIA 16\CPU 300 TIA 300 TIA 16.ap16.
	👿 Open TIA project A:\OPC UA Editor Manual\example 3 - CPU 300 TIA 16\CPU 3 🗙
[Reading device information.
	Cancel

Listed transferred project

In the right part of the project window information about the *Offline program assignment* are displayed.

🙀 example 3 - CPU 300 TIA 16.opu - O	PCUAEdit				×
File Edit Help					
🗋 💕 🛃 🚓 🎯					
Project 👻 🕈 🗙	Name of the control				
a (🚓 🖌 🖌 🕞 👘 🗠 🗛	Name	CPU_300_TIA_16			
M T A 6 4 1 4 7 W	😑 Offline program assig	inment			_
BH_Link_UA	Program type	TIA program			
È- III CPU_300_TIA_16	Program path	A:\OPC UA Editor Manual\example 3 - CPU 300 TIA 16\CPU 300 TIA 16	CPU 30	0 TIA 16.a	ap16
🔤 Variables	Station name	CPU 300 TIA 16			
	Online connection				
	Protocol	S7 TCP/IP			
	Host name / Address	192.168.1.12			
	Targe module position	Target modul at the same rack			
	Rack number	0			
	Slot number	2			
	Program type				
	"No program assignment" or	"S5W program" or "STEP5 program" or "STEP7 program" or "TIA program"	or "Symbo	ol file''	
Project 🖾 Server 🖾 Certificates					
	J			CAPS	NUM .::

2.3.4 Define variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window.

🐲 example 3 - CPU 300 TIA 16.opu -	OPCUAEdit										
File Edit Help											
🗋 💕 🛃 🖨 🎯											
Project 🗢 🕈 🗙	□ Variables	(right click)			aliak						
₩ @ X % B B ^ A	in the line of the		Select	all 📥							
⊡-•••• IBH_Link_UA	CounterEn	ble:Bool //	Desele	ect all							
□[10] CPU_300_TIA_16	🕀 🗋 Q (Outputs)		Search	1							
	庄 🕒 F (Flag)		Search	n again	E3						
	⊕ ∐ Counter Data (DB	2)	June								
	🗳 🗙 X b B č to,	14									
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment			
	CounterEnable	E 0.1	Bool	.1	Program	RW	Boolean	Enable Counter			
	Down	A 2.5	Bool	.1	Program	RW	Boolean	count down			
	Up marked Variable	A 2.6	Bool	.1	Program	RW	Boolean	count up			
	Max (OPC-Tag)	M 2.0	Bool	.1	Program	RW	Boolean	only used intern	all		
	Min .	M 2.1	Bool	.1	Program	RW	Boolean	only used intern	all		
	Une One	M 0.1	Bool	.1	Program	RW	Boolean	only used intern	ally		
	Counter Data.Count	DB5'DBX 0'0	Bool	.1	Program	RW	Boolean	Counter is coun	ting		
	Counter Data.CounterValue	DB2/DBW 2	Int	2	Program	RW	Int16	Counter value			
	Counter Data.MinNo	DB2.DBW 4	Int	2	Program	RW	Intib	minimum coun	ter readin	ig (nun	nber)
	Counter Data.MaxNo	DB2/DBX 6	Int	2	Program	RW	Intib	maximum coun	ter readir	ng (nur	nber)
Designt Recence Recording	Counter Data.CountingUN	DB2/DBX 8/0	8001	-1	Program	KW	Boolean	Enable counting	1		
Continua										cane a	

Clicking the *Plus* icon in front of the variable area symbol displays the existing variables.

If a variable is selected, it is adopted as an OPC tag and displayed in the lower part of the window with additional information.

2.3.5 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

M Untitled - OPCU	JAEdit		- 🗆 X
File Edit Help			
🗋 😂 🛃 🚓 (0		
Project	→ # ×	Name of the server connect	tion
al 🚲 🖌 🗴 🛙		Name	IBH Link UA
		Server address	
		Host name / Address	192.168.1.14
🖻 🛄 S7_CPU3	New server connection		48010
≣ Varia	New control		opc.tcp://192.168.1.14:48010
	Insert		
			None
	Transfer selected configura	tion to the OPC UA Server	None
		click	
	Import	CIICK	Anonymous
	Export		Workshop Manual
Project Serve	er 🖾 Certificates		
			CAPS NUM

The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Select the server *IBH Link UA* and then click Start. The configuration (*CPU_300_TIA_16*) is transferred to the *IBH Link UA*. Successful transfer is displayed.

Transver configuration to the	server —					
Name of the server connection IBH_Link_UA	Transfer Status 0 %	;				
	🦝 Transver confi	iguration to the se	erver	- 🗆	×	
<	Name of the serve	er connection	Transfer Status			
	IBH_Link_UA		100 % Server	is being restarted		
Start Close	jan.	Transver configu	ration to the serve	er —		×
	< Na IBł	ame of the server o H_Link_UA	onnection Tra	ansfer Status 100 % Transfer si	uccessful	_
	Start					>
l						-
		Start	Close		Help	

The successful transfer is displayed.

If a certified data exchange between the IBH OPC Editor and the IBH Link UA has been selected, the exchanged certificates must be trusted (see chapter Trust certificate, Chapter 1, page 1-40).

Note:



To address the CPU 312 from the *CPU_300_TIA_16* project via the *IBH Link S7++*, the routing option (dialog box *IBHLink settings / Network tab*) *Configuration with NetPro* must be deactivated (Apply permanently).

This applies to all S7 300/400 CPUs with IBH Link S7++ connection.

IBH Link UA - Siemens Slots - Project CPU 300 TIA 16



The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLC / CPU 300 TIA 16*.



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IBH Link UA Training

2.3.6 Online OPC UA Server Information

Information from the online connected **OPC UA server** with the online connected **S7 CPU 312** are displayed.

🐱 example 3 - CPU 300 TIA 16.opu - OPCUAEdit — 🛛 🗙							
File Edit Help							
🗋 💕 🗔 🖨 🎯							
Server 🗢 🗢 X		Name of the server conne	ection				
BH_Link_UA		Name	IBH_Link_UA				
		Server address					
Globall (arr		Host name / Address	192.168.1.14				
Country Data		Port	48010				
Counter Data		URL	opc.tcp://192.168.1.14:48010				
⊕i UA Nodes		Inverse connection	No				
		Security settings					
		Security policity	None				
		Message mode	None				
		Authentication settings					
		Login	Anonymous				
		Session name	example 3: CPU 300 TIA16				
		Other settings					
		Variables format	Compact				
Project Server Scertifi							
			CAPS N				

View server

The groups of the variables (GlobalVars, data blocks) are listed in the left server window. By clicking on a group, the individual variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is updated continuously.

CPU 312 – Global Variable

🙀 example 3 - CPU 300 TIA 16.opu	- OPCUAEdit					– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
🗋 💕 🗐 🖨 🔞						
Server 🗢 🕈 🗙	Name	Data type	Status	Access	Value	Node name
BH_Link_UA G-COU_300_TIA_16 COU_300_TIA_16 COUNTER Data D-COUNTER Data	CounterEnable Down Max Min One	Boolean Boolean Boolean Boolean Boolean	&OK &OK &OK &OK &OK	RW RW RW RW RW	false true false false true false	IBH_Link_UA.CPU_300_TIA_16.CounterEnable IBH_Link_UA.CPU_300_TIA_16.Down IBH_Link_UA.CPU_300_TIA_16.Max IBH_Link_UA.CPU_300_TIA_16.Min IBH_Link_UA.CPU_300_TIA_16.One IBH_Link_UA.CPU_300_TIA_16.Une
Project Server & Certifi	<	Doorean	GOK	i viv		pdated CAPS NUM

CPU 312 Data Block DB2 – Counter Data

🗰 example 3 - CPU 300 TIA 16.opu ·	OPCUAEdit					– 🗆 X
File Edit Help						
					_	
Server 👻 🕈 🗙	Name	Data type	Status	Access	Value	Node name
	Count	Boolean	&OK	R₩	true	IBH_Link_UA.CPU_300_TIA_16.Counter Data.Count
- III CPU 300 TIA 16	🚺 CounterValue	Int16	&OK	RW	481	IBH_Link_UA.CPU_300_TIA_16.Counter Data.CounterValue
Global/ars	CountingON	Boolean	&OK	R₩	true	IBH_Link_UA.CPU_300_TIA_16.Counter Data.CountingON
Counter Data mark	MaxNo	Int16	&OK	R₩	8000	IBH_Link_UA.CPU_300_TIA_16.Counter Data.MaxNo
II II Nodes	MinNo	Int16	&OK	R₩	100	IBH_Link_UA.CPU_300_TIA_16.Counter Data.MinNo
H- OA NOUES						ntinuously
Project Server Certifi					up	odated
······································	ļ					CARS MUN

Show under UA Nodes

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.). The corresponding values are displayed in the right-hand server window. The values are current values and are only taken once when the OPC UA Node name is clicked.



2.3.7 Unified Automation UaExpert - The OPC Unified Architecture Client

The UaExpert program window lists the OPC tags transferred by the IBH OPC UA Editor and the associated UA nodes.



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2.4 Example 4: CPU 1200 TIA 16

Connect CPU 1211C with TCP / IP port to IBH Link UA. The PLC program (CPU 1200 TIA16) is available as a TIA16 project.

Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.

Click Project Server Server



Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

Open the Project window by

clicking on the Project tab.



The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server connection properties	>	<
Name of the server connection: Server address:	IBH Link UA	
O URL opc.tcp://192.166	Select endpoint	
Security settings: None Basic128Rsa15 Basic256 Basic5ha256 Aes1285ha256RsaOaep Aes256Sha256RsaPss	Message mode: C Signatur C Signature and Encryption Inverse connection: Connect invers Properties	
Login:	☐ Store	
Session Name: Example Variables format: Compact	+4: CPU 1200 TIA 16	

The settings for the connection to the **IBH Link UA** OPC UA server are displayed in the right part of the **project window**.

🗽 example 4 - CPU 1200 TIA 16.opu - OPCUAEdit — 🛛 🔿							
File Edit Help							
🗋 💕 🛃 🖨 🎯							
Project 👻 🕈 🗙		Name of the server conne	ection				
🕡 🚜 🗙 x 🗈 🖭 🔺 🏠		Name	IBH Link UA				
		Server address					
mark		Host name / Address	192.168.1.14				
	L .	Port	48010				
		URL	opc.tcp://192.1	68.1.14:48	3010		
		Inverse connection	No				
		Security settings					
		Security policity	None				
	L .	Message mode	None				
		Authentication settings					
		Login	Anonymous				
	L .	Session name	Example 4: CPU	1200 TIA	16		
		Other settings					
	L .	Variables format	Compact				
Project Server Certificates							
				CAPS	NUI .::		

2.4.1 Inserting a New control (PLC)

The *New control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).



New control dialog box

Kew control	×
Control name: CPU_1200_TIA16	
Host name / IP address: 192.168.1.16	
Position of the target module:	
Target modul at the same rack	
C Via MPI/DP subnet accessible rack	
MPI/ <u>D</u> P address of the target CPU: 2	
C Via TCP/IP subnet accessible rack	
TCP/IP address of the target CPU: 0 . 0 . 0 . 0	
C Via H1 subn <u>e</u> t accessible rack	
H1 address of the target CPU: 00.00.00.00.00.00	
Subnet ID: 0000 . 0000	
C S7 200 TCP/IP activated Own TSAP: 0100	
• 57 1200 TCP/IP	
C 57 1500 TCP/IP	
confirm Click	
OK Cancel Test connection Help	

Test connection

After completing the New Control dialog box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.

IBH OPC U	JA Editor			×
i	The connect successfully	tion to the PL tested.	C CPU_12 00_ TIA16 has be	en
			Confirm)K
0.57				
<u>_</u>		<u>C</u> ancel	Test connection	Help

To accept and close the New control dialog box settings click on OK.

Right project window

The right project window displays the access data for the CPU 1200.



CPU1200_TIA16 was specified as the name of the controller. S7 1200 TCP / IP was selected as the protocol for the online connection to the PLC. The IP address of the **CPU1200** (**192.168.1.16**) has been defined under host name / IP address.

The Local TSAP (0100) and the Remote TSAP (0101) have their default value.

An *offline program assignment* has not yet been made. The program is assigned via a command.

2.4.2 Offline program assignment

The *Assign program* command is used to open the *Program Selection* dialog box.



Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





The *SIEMENS support software TIA Openness* is started in the background. If an error occurs see chapter 1, *Special features when selecting TIA projects* page 1-16.

Several notices are displayed.

Open TIA project A:\OPC UA Editor №	Manual∖example 4 - CPU 1200 TIA 16\CPU 🗙		
Startin	g TIA Openness.		
	Open TIA project A:\OPC UA Editor Manual\exa	ample 4 - CPU 1200 TIA 16\CPU	×
	Opening project A:\OPC UA Editor Manual\exam TIA16\CPU 1200.a	ple 4 - CPU 1200 TIA 16\CPU 1200 p16.	
		💹 Open TIA project	A:\OPC UA Editor Manual\example 4 - CPU 1200 TIA 16\CPU 🗙
	Cancel		Reading device information.
			Cancel

Listed transferred project

In the right part of the project window information about the *Offline program assignment* are displayed.

File Edit Help		
🗋 💕 🛃 🚓 🔞		
Project 🗸 🗸 🤿	 Name of the contr Name 	ol CPU_1200_TIA16
BH Link UA	 Offline program as Program type 	signment TIA program
CPU_1200_TIA16	Program path Station name	A:\OPC UA Editor Manual\example 4 - CPU 1200 TIA 16\CPU 1200 TIA16\CPU 1200.ap16 CPU 1200 TIA 16
	Online connection Protocol	S7 1200 TCP/IP
	Host name / Address Local TSAP	192.168.1.16 0100
	Remote TSAP	0101
Project 🖾 Server 🐼 Certificate	Program type "No program assignment"	or "S5W program" or "STEP5 program" or "STEP7 program" or "TIA program" or "Symbol file"
2.4.3 Define variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window.

🙀 example 4 - CPU 1200 TIA 16.opu	ı - OPCUAEdit							– 🗆 X
File Edit Help								
🗋 💕 🛃 🖨 💿								
Project V A X	→ Variables → Program variables → I (Inputs) → ✓ → ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ </th <th>able : Bool //</th> <th>Selec Desel Searc Searc</th> <th>t all ect all h h again</th> <th>F3</th> <th></th> <th></th> <th></th>	able : Bool //	Selec Desel Searc Searc	t all ect all h h again	F3			
	ďXXbCab.	14						
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment
	CounterEnable	E 0.0	Bool	.1	Program	RW	Boolean	Enable Counter
	Down	A 2.1	Bool	1	Program	RW PM	Boolean	count up
		M 0 1	Bool	1	Program	RW/	Boolean	only used internall
	BetVal	M 2.2	Bool	.1	Program	RW	Boolean	only used internall
	Max	M 2.0	Bool	.1	Program	RW	Boolean	only used internall
	Min	M 2.1	Bool	.1	Program	RW	Boolean	only used internall
	CounterData.MinNo	DB5.DBW 0	Int	2	Program	RW	Int16	minimum counter reading (number)
	CounterData.MaxNo	DB5.DBW 2	Int	2	Program	RW	Int16	maximum counter reading (number)
	CounterData.Count	DB5.DBX 4.0	Bool	.1	Program	RW	Boolean	Counter is counting
	CounterData.CountingON	DB5.DBX 4.1	Bool	.1	Program	RW	Boolean	Enable counting
	CounterData.CounterValue	DB5.DBW 6	Int	2	Program	RW	Int16	CounterValue
Project Server Server								
								CAPS NUM:

Clicking the *Plus* icon in front of the variable area symbol displays the existing variables.

If a variable is selected, it is adopted as an OPC tag and displayed in the lower part of the window with additional information.

2.4.4 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

🗱 example 4 - CPU 1200 TIA	16.opu - OPC	UAEdit			×
<u>F</u> ile <u>E</u> dit <u>H</u> elp					
🗋 💕 🗟 🖨 🔞					
Project	🗢 🕂 X	Name of the server	r connection		
ر ا 🗠 🖌 🖌 🖌 ا		Name	IBH Link UA		
	T NM	😑 Server address			
BH Link UA		Host name / Address	192.168.1.14	_	
📩 🌆 СРU_1200_ПА16	New server	connection			
🔤 🚰 Variables	New contro	ol		8 <mark>.1.14:48010</mark>)
-				-	
	Transfer sel	lected configuration to th	e OPC UA Server		
	Read comp	lete configuration from O	PC UA Server 🔨 Clic	k) –	
	Import				
	Export				
		Jession name	схатре ч. ст о	200 TIA 16	
		Other settings			
		Variables format	Compact		
🗖 Project 🗟 Server 🗟 Ce	rtificates	Name of the server co	onnection		
				CAPS N	UM

The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Select the server *IBH Link UA* and then click Start. The configuration (*CPU_300_TIA_16*) is transferred to the *IBH Link UA*. Successful transfer is displayed.

Transver configuration to the	server	- 1	o x						
Name of the server connection IBH_Link_UA	Transfer 0 %	Status		-					
Ĺ	🐝 Transver	configu	ration to th	e server	—		×		
confirm	Name of the IBH_Link_UA	server c	onnection	Transfer 100 %	Status Server is bein	ig restarted			
Start Close		MR Tra	ansver conf	guration to t	the server				×
	<	Name IBH_L	of the serve ink_UA	r connection	Transfer 100 %	Status Transfer s	uccessf	iul I	_
-	Start								
L		<			click				>
			Start	Clo	se			Help	

The successful transfer is displayed.

If a *certified data exchange* between the *IBH OPC Editor* and the *IBH Link UA* has been selected, the exchanged certificates must be trusted (see chapter Trust certificate, Chapter 1, page 1-40).

IBH Link UA - Siemens Slots - Project CPU 1200 TIA 16



The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLC / CPU 1200 TIA 16*.

🗮 IBH Link UA - Diagnostic	cs X	+							—		×
← → ⊂ ŵ	0	0 🔏 192.168.1.14/?_=/diaglistview … 🖂 🕅 🗓									
	OPC ser	ver is running	Logout Update password						quad-	core	
Network	Cor	troller diagnostics	Client diagnostics	Network diagnostics	Syst	em Log					
Security	ID	Connection name	Address	Time	Source	Error number	Error Text				
Certificates	=	CPU_1200_TIA16	192.168.1.16:102	31.7.2020 10:21:11	PLC	0	Connection established	(6ES7 21	L1-1AE40-	OXBO)	
Time settings	Clear	diagnose C									
Diagnostics											_

2.4.5 Online OPC UA Server Information

Information from the online connected **OPC UA server** with the online connected **S7 CPU 312** are displayed.

🌆 example 4 - CPU 1200 TIA 16.opu	🗱 example 4 - CPU 1200 TIA 16.opu - OPCUAEdit — 🛛 🛛 🗡										
File Edit Help											
🗋 💕 🗔 🖕 🎯											
Server BH_Link_UA CPU_1200_TIA16 GlobalVars CounterData UA Nodes	 Name of the server connel Name Server address Host name / Address Port URL Inverse connection Security settings Security policity Message mode Authentication settings Login Session name Other settings 	ection IBH_Link_UA 192.168.1.14 48010 opc.tcp://192.168.1.14:48010 No None None None Anonymous Example 4: CPU 1200 TIA 16									
	Variables format	Compact									
Project Server & Certifi											
		CAPS N:									

View server

The groups of the variables (GlobalVars, data blocks) are listed in the left server window. By clicking on a group, the individual variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is updated continuously.

CPU 1200– Global Variable

🎆 example 4 - CPU 1200 TIA 16.opu	- OPCUAEdit							—		×
File Edit Help										
🗋 🚰 🗔 🖨 🔞										
Server 👻 🕈 🗙	Name	Data type	Status	Access	Value	Node name				
🖃 📢 IBH Link UA	CounterEnable	Boolean	&OK	RW	true	IBH Link UA	A.CPU_120	0_TIA16	.Counter	Enable
- 🛱 🥅 CPU 1200 TIA16	Down	Boolean	&OK	RW	true	IBH Link U/	A.CPU_120	0_TIA16	.Down	
GlobalVars	Max	Boolean	&OK	RW	false	IBH Link U/	A.CPU_120	0_TIA16	.Max	
CounterData	Min	Boolean	&OK	RW	false	IBH Link UA	A.CPU_120	0_TIA16	.Min	
T T UA Nodes	🚺 One	Boolean	&OK	RW	true	IBH Link U/	A.CPU_120	0_TIA16	.One	
	RetVal	Boolean	&OK	RW	false	IBH Link U/	A.CPU_120	0_TIA16	.RetVal	
	🚺 Up	Boolean	&OK	RW	false	IBH Link U/	A.CPU_120	0_TIA16	.Up	
						ontinuously				
Project Server 23 Certifi					u u	odated				
									CAPS	NHM

CPU 1200 Data Block DB5 – CounterData

🎆 example 4 - CPU 1200 TIA 16.opu	- OPCUAEdit					– – ×		
File Edit Help								
🗋 💕 🗔 🖨 📀								
Server 🗢 🕂 🗙	Name	Data type	Status	Access	Value	Node name		
🖃 👘 IBH Link UA	Count	Boolean	&0K	RW	true	IBH Link UA.CPU_1200_TIA16.CounterData.Count		
	CounterValue	Int16	&OK	RW	5776	IBH Link UA.CPU_1200_TIA16.CounterData.CounterValue		
GlobalVars	CountingON	Boolean	&OK	RW	true	IBH Link UA.CPU_1200_TIA16.CounterData.CountingON		
CounterData	MaxNo	Int16	&0K	RW	8000	IBH Link UA.CPU_1200_TIA16.CounterData.MaxNo		
II IIA Nodes	MinNo	Int16	&0K	RW	100	IBH Link UA.CPU_1200_TIA16.CounterData.MinNo		
E OANOUES					continuously			
Project Report Cartifica					upo	dated		
Log Project mas server mas certifica								
						CAPS NUM .:		

Show under UA Nodes

The names of the OPC UA Nodes are listed in the left-hand server window (attributes, OPC tags, etc.). The corresponding values are displayed in the right-hand server window.

The values are current values and are only taken once when the OPC UA Node name is clicked.



2.4.6 Unified Automation UaExpert - The OPC Unified Architecture Client

The UaExpert program window lists the OPC tags transferred by the IBH OPC UA Editor and the associated UA nodes.

The UaExpert program window lists the OPC tags transferred by the IBH OPC UA Editor and the associated UA nodes.

Unified Automation UaExpert - The OPC Unit	ified Architecture Client - NewProject*				-		×
File View Server Document Settings	Help						
🗋 🥟 🕞 🗭 🧿 🔶 📼 🔅	🗙 💫 🤰 🖹 🔟						_
Project 🗗 🗶	Data Access View					1	0
Y 📁 Project	# Server Node Id	Display Name Value	Datatype Sou	rce Timestamp	Server Timestamp	Status	code
Servers	1 IBHLinkUA@ib NS4[String]IBH 0 2 IBHLinkUA@ib NS4[String]IBH	CounterEnable true Down false	Boolean 19:33 Boolean 19:34	3:05.371 4:01.535	19:33:06.266 19:34:01.786	Good	
IBHLINKUA@IDHIINKUA*SC*14 Documents	3 IBHLinkUA@ib NS4 String IBH 1	Max false	Boolean 19:33 Boolean 10:33	3:09.017	19:33:09.766	Good	_
Documents	4 IBHLinkUA@ib NS4[String]IBH 0 5 IBHLinkUA@ib NS4[String]IBH 0	Min faise One true	Boolean 19:33 Boolean 19:33	3:12.000	19:33:12.766	Good	_
Address Spare	6 IBHLinkUA@ib NS4[String]IBH 7 IBHLinkUA@ib NS4[String]IBH	RetVal false Up true	Boolean 19:33 Boolean 19:34	3:13.504 4:01.535	19:33:14.268 19:34:01.786	Good Good	
	8 IBHLinkUA@ib NS4[String]IBH 0 9 IBHLinkUA@ib NS4[String]IBH 0	Count true CounterValue 4309	Boolean 19:33 Int16 19:34	3:17.296 4:02.786	19:33:18.019 19:34:03.036	Good	
B Post	10 IBHLinkUA@ib NS4[String]IBH	CountingON true	Boolean 19:33	3:21.048	19:33:21.771	Good	
Abiects	11 IBHLinkUA@ib NS4[String]IBH 12 IBHLinkUA@ib NS4[String]IBH	MaxNo 8000 MinNo 100	Int16 19:33	3:23.064	19:33:26.023	Good	
> 💑 Client	4						
> 👶 DeviceSet	Drag & Drop						
> 💑 MQTT							
> 💑 Modbus							
V PLC3							
DeviceHealth							
DeviceManual							
DeviceRevision						_	
GlobalVars	Display Name	Value	Datatype	Sour	ce Timesta	mp	М
	Display Harrie	value	Ducucype	John		p	
>	CounterEnable	true Bo	oolean	19:33:0	5.371		_ 1
> 🕥 Min	Down	false Bo	oolean	19:38:0	03.371		
> 🕥 One	Max	false Bo	oolean	19:33:0	09.017		
> 🔤 RetVal	Min	false Bo	oolean	19:33:1	0.335		
Hardware Revision	One	true Bo	oolean	19:33:1	2.000		
Manufacturer	RetVal	false Bo	oolean	19:33:1	3.504		
Ø Model	Un	true Bo	olean	19:38:0	3.371		11
> 💑 ParameterSet	Count	true Br	oolean	10-33-1	7 296		
Y Programs	CounterValue	1767 by	+16	10.29.0	12 971		11
> Count	Countervalue	1707 III	cito -	10.22.3	1 040		
> 🔵 CounterValue	CountingON	true bo	oolean	19:55:2	21.040		
> 🔳 CountingON	MaxNo	8000 In	t10	19:55:2	23.004		
> 🔲 MaxNo	MinNo	100 In	t16	19:33:2	25.207)
MinNo							
BevisionCounter							
SerialNumber							
SoftwareRevision							
> 💑 Tasks							
> 📪 Server							
> 🔂 Stations							
> 🗀 Types							
~ ~ ~							

Data	Access View		
#		Server	Node Id
1	IBHLinkUA@)ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.CounterEnable
2	IBHLinkUA @	bhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.Down
3	IBHLinkUA@	bhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.Max
4	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.Min
5	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.One
6	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.RetVal
7	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.Up
8	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.CounterData.Count
9	IBHLinkUA@	ibhlinkua-SC-14	NS4 String IBH Link UA.CPU_1200_TIA16.CounterData.CounterValue
10	IBHLinkUA@	ibhlinkua-SC-14	NS4[String]IBH Link UA.CPU_1200_TIA16.CounterData.CountingON
11	IBHLinkUA@	ibhlinkua-SC-14	NS4 String IBH Link UA.CPU_1200_TIA16.CounterData.MaxNo
12	IBHLinkUA@	ibhlinkua-SC-14	NS4 String IBH Link UA.CPU_1200_TIA16.CounterData.MinNo

2.5 Example 5 - project: CPU 416 TIA 16 server - server

In the project, the CPU 416, which is available as an OPC UA server, is connected to an air conditioning system that also has an OPC UA server.



Establishing a server connection. The data of an air conditioning system (OPC UA server) is sent to the CPU-416 (OPC UA server).

2.5.1 Device configuration S7 project CPU 416 TIA 16 server – server

The data of an air conditioner are given to the CPU-416.



The data block (*DB* **22 –** *AirConditioningValues*) stores the data of the air conditioning system for further processing.

	TIA	16 S	erver - Server 🕨 Serve	r - Server [CPU 41)	5-3 PN/D P]	🕨 Program blocks 🕨 🕯	AirConditionerValues [DB22] 🛛 🗕 🖬 🗮 🗙			
Ś	😰 🛃 🌄 🧱 🗱 🧐 Keep actual values 🔒 Snapshot 🍬 🧐 Copy snapshots to start values 🔹 🥵 🎽 📑									
	AirConditionerValues									
_	Name			Data type	Offset	Start value	Comment			
1	-	▼ St	tatic							
2		•	Temperature	Real	0.0	0.0	Temperature externeal OPC UA Server			
З		•	TimeStamp_Temp	Date_And_Time	4.0	DT#1990-01-01-00:00:00	Temperature Time Stamp			
4		•	Status_Temp	DWord	12.0	16#0	Temperature Status			
5		•	TemperatureSP	Real	16.0	0.0	Temperature Set Point externeal OPC UA Server			
6	-00	•	TimeStampSP	Date_And_Time	20.0	DT#1990-01-01-00:00:00	Temperature Set Point Time Stamp			
7		•	StatusSP	DWord	28.0	16#0	Temperature Set Point Status			
8	-	•	CurrentTime_TimeStamp	Date_And_Time	32.0	DT#1990-01-01-00:00:00	External Server Current Time			
9	-	•	CurrentTime_Status	DWord	40.0	16#0	External Server Current Time Status			

The temperature / temperature set point with time stamp and status are to be read as OPC tags from an air conditioning system. Server time and status should also be transferred for monitoring purposes.

IBH OPC UA Editor

2.5.2 Calling the IBH OPC UA Editor

Double-click the *IBH OPC UA Editor* icon to open the program window.

Open the *Project window* by clicking on the *Project* tab.





Open the *New Server Connection* dialog box with the New

Server Connection command from the *Edit* menu or by clicking the icon.

🐏 Un	titled ·	OPCUAE	dit	
File	Edit	Help		(click)
	1	New server	connection	
Project				
,				

The new server connection

setup was explained in example 1 (see chapter 2, page 2-3.

Server connection properties	\times
Name of the server connection: IBH_Link_UA Server address: I92.168.1.14 Image: Port: I92.168.1.14 Port: Image:	
Select endpoint	
Security settings: Message mode: None Signatur Basic128Rsa15 Signatur Basic256 Signature and Encryption	
Inverse connection:	
C Aes1285ha256RsaOaep C Aes256Sha256RsaPss C Aes256Sha256RsaPss C Aes256Sha256RsaPss	
Login: Anonymous User name and password User name: Passwort: Store	
Session Name: example 5 - project: CPU 416 Variables format: Compact	
OK Cancel Help	

The settings for the connection to the *IBH Link UA* OPC UA server are displayed in the right part of the *project window*.

🗱 example 5 - Server – Server connecti				×								
File Edit Help												
🗋 💕 🛃 🚓 🎯												
Project 🗢 🔻 🛪 🗙	oject 🗸 🗘 🖂 Name of the server connection											
al 📲 🖌 V 🗈 🖻 🖿 🗛	L .	Name	IBH_Link_UA									
월 🔤 🔨 🔊 🤜 💷 🕂 MA		Server address										
IBH_Link_UA	L .	Host name / Address	192.168.1.14									
	L .	Port										
	L .	URL	opc.tcp://192.168.1.14:	48010								
	L .	Inverse connection	No									
		Security settings										
	L .	Security policity	None									
	L .	Message mode	None									
		Authentication settings										
	L .	Login	Anonymous									
	L .	Session name	example 5 - project: CPL	J 416 TIA 1	6 server -	server						
		Other settings										
		Variables format	Compact									
Log Project												
					CAPS	NUM						

2.5.3 Inserting a New control (PLC)

The *New control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).

🚂 example 3 - CPU 300 TIA 16.opu - OPCUAEdi	t	– 🗆 ×
File Edit Help		
New server connection	of the server comon	antian
Project BH Link_UA Cright click	address me / Address	192.168.1.14
New server connection New control		opc.tcp://192.168.1.14:48010 No
Properties Click Add external data		None None
Transfer selected configuration to the OP Read complete configuration from OPC U	C UA Server \$ A Server	Anonymous example 5 - project: CPU 416 TIA 16 server - server
Import Export		Compact
Project Server Certificates		cost unit
		CAPS NUM .:

New control dialog box

Mew control	×
Control name: PLC416	
Host name / IP address: 192.168.1.10	_
• 57 TCP/IP Rack number: 0 Slot number: 2	
Position of the target module:	
Target modul at the same rack	
C Via MPI/DP subnet accessible rack	
MPI/DP address of the target CPU: 2	
C Via TCP/IP subnet accessible rack	
TCP/IP address of the target CPU: 0 . 0 . 0 . 0	
C Via H1 subnet accessible rack	
H1 address of the target CPU: 00.00.00.00.00	
Subnet ID: 0000 . 0000	
C 57 200 TCP/IP Own TSAP: 0100	
C 57 1200 TCP/IP	
OK Cancel Test connection Help	1
	1

Test connection

After completing the New Control dialog box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.

IBH OPC UA Editor		×	
The connection to tested.	the PLC PLC416 has be	en successfully	
	(cont	OK	
	<u>C</u> ancel	Test connection	Help

To accept and close the *New control* dialog box settings click on *OK*.

🔉 example 5 - Serve								
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 💕 🛃 🖨 🥝)							
		-	Name of the control					
AL 🔊 🖌 🖌 🖌			Name	PLC416				
77 Cr 🗸 🔮 🖽	UB T W		Offline program assign	ment				
⊟ 📲 IBH_Link_UA	mark		Program type	No progr	am assig	nment		
🖮 🛄 PLC416 🚄			Program path (mark)					
🚽 📶 Variabl	es		Station name					
			Online connection					
			Protocol	S7 TCP/	/IP			
			Host name / Address	192.168	192.168.1.10			
			Targe module position	Target m	nodul at th	ne same ra	ack	
			Rack number	0				
		Slot number	2					
Project 🗟 Server	Certificat	Program type "No program assignment" or "S5W/ program" or "STEP5 program" or "STEP7 program" or "TIA program" or "Symbol file"						
						C/	APS	

The access data of the *PLC416* (CPU 416-3 PN / DP SoftSPS with TCP/IP Port) is displayed in the right project window.

2.5.4 Offline program assignment

The *Assign program* command is used to open the *Program Selection* dialog box.



Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





Note:



Opening a TIA project can take some time. The TIA project must be opened in the background with the SIEMENS support software TIA Openness.

To adopt the PLC program, the TIA software with the TIA Openness support software must be installed on the PC and the user of the PC must be member of the administrator in the group.

It is essential to ensure that the software versions match.

The *SIEMENS support software TIA Openness* is started in the background. If an error occurs see chapter 1, *Special features when selecting TIA projects* page 1-16.

Several notices are displayed.

Open TIA project A:\OPC UA Editor	r Manual\example 5 - Server – Server con	ne ×			
Starti	ing TIA Openness.				
	Open TIA project A:\OPC UA Editor N	∕lanual∖exa	mple 5 - Server – Server conne 🗙		
	Opening project A:\OPC UA Editor Man 16\CPU 416 TIA 16 Server - Serv	ual\example /er\CPU 416	e 5 - Server – Server connection TIA TIA 16 Server - Server.ap16.		
		🗽 Open	ΠΑ project A:\OPC UA Editor Manual\e	xample 5 - Server – Server conne	×
	<u></u>		Reading device info	rmation.	
Open TIA project A:\OPC UA Editor	Manual\example 5 - Server – Server con	ne ×	<u>Cancel</u>		
Translating o	device Server - Server.				
	Open TIA project A:\OPC UA Editor M	lanual\exai	nple 5 - Server – Server conne 🗙		
	Copying project dat	a to a temp	orary folder.		
		🐝 Open -	ΠΑ project A:∖OPC UA Editor Manual∖e	xample 5 - Server – Server conne	×
-			Reading project da	ta.	
L					

Listed transferred program

In the right part of the project window information about the *Offline program assignment* are displayed.

🌆 example 5 - Server – Server connecti	on.c	opu - OPCUAEdit				
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
🗋 💕 🔙 🕼 🐵						_
Project 🔷 🗸 X	E	Name of the control				
airait 😪 V 🕞 🕋 La 🛆	1	Name	PLC416			
💬 🕒 👗 🔥 🛥 📭 T 🗤		Offline program assign	ment			
BH_Link_UA		Program type	TIA program			
🚊 🛄 PLC416		Program path	A:\OPC UA Editor Manual\example 5 - Server - Server connection TIA 16\CPU 416 TIA 16 Server - Server\CPU 416 TIA	\16 Ser	ver - Serve	er.ap16
🚽 🚰 Variables		Station name	Server - Server			
		Online connection				
		Protocol	S7 TCP/IP			
		Host name / Address	192.168.1.10			
		Targe module position	Target modul at the same rack			
		Rack number	0			
		Slot number	2			
						i
Project 🖾 Server 🖾 Certificates						
					CAPS	NUM

2.5.5 Define variables as OPC tags

Click Variable to list the variables / data (data blocks) of the PLC program in the right part of the project window.

The existing variables are displayed by clicking the plus symbol in front of the variable area symbol.

The variables of the data block *AirConditionerValues [DB 22]* should be selected as OPC tags by clicking.

If a variable is selected, it is adopted as an OPC tag and displayed in the lower part of the window with additional information. AirConditionerValues [DB 22] selected OPC tags

in example 5 - Server – Server conner	ction.opu - OPCUAEdit							– 🗆 🗙	
File Edit Help									
🗋 💕 🛃 🕼 🙆									
Digit 0 X Program variables Program variables									
	🖆 🗙 🛦 🖻 🕲 🍎 🎦 🦯 💙								
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment	
	AirConditionerValues.Temperature	DB22.DBD 0	Real	4	Program	RW	Float	Temperature externeal OPC UA Server	
	AirConditionerValues.TimeStamp_Temp	DB22.DBX 4.0	Date_And_Time	8	Program	RW	DateTime	Temperature Time Stamp	
	AirConditionerValues.Status_Temp taken as	DB22.DBD 12	DWord	4	Program	RW	UInt32	Temperature Status	
	AirConditionerValues.TemperatureSP OPC tags	DB22.DBD 16	Real	4	Program	RW	Float	Temperature Set Point externeal OPC UA Server	
	AirConditionerValues.TimeStampSP	DB22.DBX 20.0	Date_And_Time	8	Program	RW	DateTime	Temperature Set Point Time Stamp	
	AirConditionerValues.StatusSP	DB22.DBD 28	DWord	4	Program	RW	UInt32	Temperature Set Point Status	
	AirConditionerValues.CurrentTime_TimeStamp	DB22.DBX 32.0	Date_And_Time	8	Program	RW	DateTime	External Server Current Time	
Project Server Certificat	AirConditionerValues.CurrentTime_Status	DB22.DBD 40	DWord	4	Program	RW	UInt32	External Server Current Time Status	
								CAPS NUM	

2.5.6 Start external OPC UA server

Double-click the UA Server icon to start the external OPC UA server

program (from *UnitedAutomation*). It simulates several air conditioning and heating systems (air conditioner, furnas) and provides operating data (temperature, time value, etc.) as *OPC UA tags*.



External OPC UA server (air conditioning and heating systems)

-7 UA Server			×
<pre>I/O warning : failed to load external C:/UA_Server_Beispiel/uanodesetimport. ************************************</pre>	entity xml"	"file:	:/// *
Server opened endpoints for following opc.tcp://TTi-Yellow:48011 ***********************************	; URLs:	*****	*
***************************************	******	*****	k
Press x to shutdown server	******	*****	×

The external OPC UA server has the endpoint URL: opc.tcp://TTi-Yellow:48011

Since there is no name server (DNS server), the absolute endpoint URL must be used:

opc.tcp: //192.168.1.10: 48011

2.5.7 Adding a server

There are two options to add an external server. This can be done via the **IBH Link UA** or using the **IBH OPC UA Editor**.

2.5.8 Option 1: Adding a server via the IBH Link UA

In the IBH Link UA web browser window *OPC Client* click *Add Server*. Enter the endpoint URL *opc.tcp:* // 192.168.1.10:48011. Click the icon and select the Security Policy.



For the data transmission Security Policy None were selected.



The server - *UaServerCpp (opc.tcp: //192.168.1.10: 48011)* is connected. The status of the external OPC UA server is good. No read variables are added.

Add external data

Right-click on *IBH Link UA* in the IBH OPC UA Editor and execute the *Add external data ...* command.

🐱 example 5 - Server – Server connection.opu - OPCUAEdit							
<u>File E</u> dit <u>H</u> elp							
🗋 💕 🔙 🖨 🞯							
Project 🗸 🗸	џ×		Name of the server conr	nection			
al 📈 🖌 V 🗈 🕮 L 🗛 🛆			Name	IBH Link UA			
<u>ж с лача</u> с ти			Server address				
BH Link UA			Host name / Address	192.168.1.14			
🖨 🌆 PLC416	Net	New server connection					
	Nev	New control					
	Dro		tion (click)				
	PIO	pen	Click				
	Ad	d ex	ternal data				
	Ad	d me	odbus configuration				
	Imp	oort.					
	Eve	ort					

Clicking on *Add External Data...* opens the IBH OPC UA Editor dialog box.



If the external server **UaServerCpp (opc.tcp: //192.168.1.10: 48011)** has already exists in the IBH Link UA, you can click the **Yes** button in the opened dialog box. The configuration of the external server (OPC tags, names etc.) is transferred into the IBH OPC UA Editor.

OPC server adopted as external data



2.5.9 Option 2: Add server via the IBH OPC UA Editor

The server - *UaServerCpp (opc.tcp: //192.168.1.10: 48011)* - does not exists in the IBH Link UA web browser window / OPC client.

🗽 example 5 - Server – Server conn	ection.o	pu -	OPCUAEdit			
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
🗋 📂 🛃 🚓 🔞						
Project	• • ×		Name of the server connec	tion		
al al 🖌 V 🗈 🔍 🗛 🛆			Name	IBH Link UA		
м т м а на т м			Server address			
E- BH Link UA			Host name / Address	192.168.1.14		
ġ-∰ PLC416 └──∰ Variables	Ner Ner Pro	New server connection New control Properties Click				
	Ad	d ext	ternal data			
	Ad	d mo	odbus configuration			
	Imp	oort.				
	Exp	ort.				

Clicking on *Add External Data...* opens the IBH OPC UA Editor dialog box. Click the *No* button to close the dialog box.



New external server connection – configuration

The *New external server connection* command opens the dialog box to configure an OPC UA server to reading variables.

🌆 example 5 - Server – Server connection.opu - OPCUAEdit – 🗆 🗙							
<u>F</u> ile <u>E</u> dit <u>H</u> elp							
Project 👻 🕂 🗙	Server name	Server address	UA resource n	ame			
୬ 🛎 🗙 ୬ 🖻 🛍 । ↑ 🙃							
🖃 📲 IBH_Link_UA							
🚊 📶 PLC416							
🔤 Variables							
External data	t click						
Connected Servers	N			1			
Variable transfer	New e	xternal server con	nection				
User-defined variables	Delete	server connectio	n 🔨 click				
MQTT configuration	Proper	rties					
Project Server Server	<			>			

The connection data to the external server – *Air Conditioner* – (*IP address 192.168.1.10: 48011*) must be specified.

📴 External server connection	×
Name of the server connection: AirConditioner Server address: Image: Server address Image: Server address Image: Server address	
Select endpoint	
Security settings: Message mode: Basic128Rsa15 Signatur Basic256 Signature and Encryption Basic5ha256 Inverse connection: Aes1285ha256RsaOaep Connect invers Aes2565ha256RsaPss Properties	
Login: C Anonymous C User name and password User name: Passwort: Store	
Publishing intervall (ms) 500 Synchronized reading Variables format: Compact	
OK Cancel Help	

Select end point

By clicking the **Select endpoint** button, a connection to the specified OPC UA server

Select endpoint...

is established. If the connection is successful, possible encryptions of the data to be transmitted are displayed for selection in the opened dialog box. The desired security procedure for the data exchange between the *IBH OPC Editor* and the *OPC UA server* (IBH Link UA) must be specified.

Endpoints of Discovery Se	rver opc.tcp://192.168.1.10:48	011			×
Security policity http://opcfoundation.org/ http://opcfoundation.org/ http://opcfoundation.org/	UA/SecurityPolicy#None UA/SecurityPolicy#Basic256	select	Message mode None Sign SignAndEncrypt	Key strength 2048 Bit 2048 Bit 2048 Bit	
http://opcfoundation.org/ http://opcfoundation.org/	UA/SecurityPolicy#Basic2565ha2 UA/SecurityPolicy#Basic2565ha2	256 256	Sign SignAndEncrypt	2048 Bit 2048 Bit	
Certificate:		Connection: -			
Name:	UaServerCpp@TTI-1	Endpoint U	IRL: opc.to	cp://TTI-YELLOW:48011	
Organization:	Organization	Application	URI: Urn:T	TI-1:UnifiedAutomation:UaSer	verCpp
Organization unit:	Unit	<u>D</u> omain na	me: TTI-1		
Location:	LocationName	<u>I</u> P address	:		
Countr <u>y</u> :		Certificate sel	ttings:		
<u>S</u> tate:	DE	Encryption	strength:	2048 Bit	
		Signature a	algorithm:	SHA256	
The certificate is valid		Valid from:		01.04.2016 14:46:29	
		<u>V</u> alid until:		31.03.2021 14:46:29	
confirm	1				. 1
					Help

2.5.10 Variable transfer - define source and target variables

臃 example 5 - Server – Server connectio	n.opu - OPCUAEdit	– 🗆 X
File Edit Help		
🗋 💕 🛃 🕼 🎯		
Project 2 2 X	Source : 0 IBH Link UA Objects Objec	BH_Link_UA:IBH_Link_UA.PI Connect variables. BH_Link_UA Connect variables. Click / select Connect variables. Connect variables. Connect variables.
	Source server Source variable D	estination server Destination variable Data type Source name
Project Server Server		
		CAPS NUM

The OPC UA variable connection is adopted by marking the source and target variables and then clicking the *Connect variable* command (standard parameters). The connection is displayed.

X / Y							
Source server	Source variable	Destination server	Destination variable 🧹	Data type	Source name	Destination name	Status
AirConditioner	Temperature	IBH_Link_UA	Temperature	Double / Float	AirConditioner_1.Temperature	IBH_Link_UA.PLC416.AirConditionerValues.Temperature	
	~	· · · · ·					
		Connected var	lable				

The **Connect variable...** command opens the **Parameters for reading the variables** dialog box. The ID of the variables, the names and data types are displayed here. Sampling interval, queue entries and possibly the index area can be adjusted.

Parameter for reading the	e variables	×
Source variable:		
Variable ID:	AirConditioner_1.Temperature	
Display name:	Temperature	
Data type:	Double	
Sampling interval [ms]:	1000 adjust settings	
Queue entries:	1 Reject oldest queue entries	
Index range:		
Destination variable:		
Variable ID:	IBH_Link_UA.PLC416.AirConditionerValues.Temperature	
Display name:	777	
Data type:	Float	
Index range:		
confirm		
ОКСС	ancel Help	

If the connection of a variable (value) has been done, the time stamp and status of the source variable are offered.

Variable links

Image: Second	💹 example 5 - Server – Server connectio	n.opu - OPCUAEdit							
Image: Second	<u>File Edit H</u> elp								
Space Source : 0 > Sourc	D 💕 🖬 🖨 🎯								
Similar All and and and and an and an and and and a	Project 👻 🔍 🗙	×/		\$. \$					
Source streter Source variable Defination server Server BH_Link_UAR/C46AvConditioner/Muss.Temperature BH_Link_UAR/C46AvConditioner/Server Server BH_Link_UAR/C46AvConditioner/Server Server BH_Link_UAR/C46AvConditioner/Server Server BH_Link_UAR/C46AvConditioner/Server Server Serv	Month Month Month Month	Source 10 B [→] # AulConditioner_1 B [→] # Static Condition B [→] # Temperature: Ioxibile B [→] # Temperature: Source for B [→] # Source B [→] # So	loat : Float meStamp : DateTime	SeturGen 10 SeturGen 20 SeturG					
Source rarer Source rarer Destination rarer Destination rarer Destination rarer UmmTh*RLL0 Temperature BHL/Link_UA Temperature Double / Float ArConditioner_LTimperature BHL/Link_UA/CIGA&/conditioner/Alless-Temperature UmmTh*RLL0 Temperature BHL/Link_UA Temperature Double / Float ArConditioner_LTimperature BHL/Link_UA/CIGA&/conditioner/Alless-Temperature UmmTh*RLL0 Temperature BHL/Link_UA/A Temperature Double / Float ArConditioner_LTimperature BHL/Link_UA/A Statuse UmmTh*RLL0 TemperatureSPoint BHL/Link_UA/A TemperatureSPO Double / Float ArConditioner_LTimperatureStation BHL/Link_UA/A TemperatureSPO UmmTh*RLL0 TemperatureSPO Double / Float ArConditioner_LTimperatureStation BHL/Link_UA/A TemperatureSPO UmmTh*RLL0 TemperatureSPO Double / Float ArConditioner_LTimperatureStation BHL/Link_UA/A TemperatureSPO UmmTh*RL10 TemperatureSPO DatureSPO DatureSPO DatureSPO BHL/Link_UA/A TemperatureSPO UmmTh*RL10 TemperatureSPO		X / Y							
UmmT174ELO. Temperature BHL Junk, UA Temperature Double / Float AnConditioner, Limperature: TimeSamp, Temp UmmT174ELO. Temperature: TimeSamp Dible / Float AnConditioner, Limperature: TimeSamp, Temp Dible / Float AnConditioner, Limperature: TimeSamp, Temp UmmT174ELO. Temperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp Dible / Float AnConditioner, Limperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp UmmT174ELO. Temperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp Dible / Float AnConditioner, Limperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp UmmT174ELO. Temperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, Temp UmmT174ELO. Temperature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, SP Diate/ TimeSamp, SP Diate/ TimePerature: Satus BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, SP UmmT174ELO. CurrentTime BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, SP BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, SP UmmT174ELO. CurrentTime BHL Junk, UA (24.64A/c.onditioner/Mules: TimeSamp, SP BHL Junk, UA (24.		Source server Source variable	Destination server	Destination variable	Data type	Source name	Destination name		
Weight Debuge before a second s	Douber (@ Constructions	U um:TI1-YELLO Temperature um:TI1-YELLO Temperature.TuncSamp um:TI1-YELLO Temperature.Satus um:TI1-YELLO Temperature.SetPoint.TuneStamp um:TI1-YELLO Temperature.SetPoint.Status um:TI1-YELLO CurrentTime um:TI1-YELLO CurrentTime.Status	IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA	Temperature TimeStamp_Temp Status_Temp TemperatureSP TimeStampSP StatusSP CurrentTime_TimeSt CurrentTime_Status	Double / Float DateTime StatusCode / Ulnt32 Double / Float DateTime StatusCode / Ulnt32 DateTime StatusCode / Ulnt32	AirConditioner_1.Temperature AirConditioner_1.Temperature.Situs AirConditioner_1.Temperature.Satus AirConditioner_1.Temperature.SetPoint AirConditioner_1.Temperature.SetPoint.Status 2258 2258.Status	BH_Link_UAPLC416A/rcfordtionet/Viles.Temperature BH_Link_UAPLC416A/rcfordtionet/Viles.Temperature BH_Link_UAPLC416A/rcfordtionet/Viles.Satur_Temp BH_Link_UAPLC416A/rcfordtionet/Viles.Temperatures BH_Link_UAPLC416A/rcfordtionet/Viles.Temperatures BH_Link_UAPLC416A/rcfordtionet/Viles.Temperatures BH_Link_UAPLC416A/rcfordtionet/Viles.ControlTime_Textus BH_Link_UAPLC416A/rcfordtionet/Viles.ControlTime_Textus		
CAPS NUM	Log Project Log Server Log Certificates						CAPS NUM		

2.5.11 Transferring the configuration to the OPC UA server (IBH Link UA)

A right click on the Server icon (IBH Link UA) opens the context menu.



The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Select the server *IBH Link UA* and then click Start. The configuration is transferred to the *IBH Link UA*. Successful transfer is displayed.

Transver configuration to the	server — 🗆 🗙	
Name of the server connection IBH_Link_UA	Transfer Status	
	🗱 Transver configuration to the server 🛛 🗆 🗙	
confirm	Name of the server connection Transfer Status IBH_Link_UA 100 % Server is being restarted	-
Start Close	Transver configuration to the server —	
	Name of the server connection Transfer Status IBH_Link_UA 100 % Transfer succes	sful
	Start	
L		>
	Start Close	Help

The successful transfer is displayed.

If a certified data exchange between the *IBH OPC Editor* and the *IBH Link UA* has been selected, the exchanged certificates must be trusted (see chapter Trust certificate, Chapter 1, page 1-40).

2.5.12 Displaying the links

The connections are displayed in the IBH Link UA web browser window OPC Client.



In the IBH Link UA web browser window *Siemens Slots*, the CPU (PLC416) connected via the IBH Link UA is listed with the *OPC tags* data block *AirConditionerValues [DB22]* selected in the IBH OPC UA Editor.





The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLC / CPU 300 TIA 16*.

🗱 IBH Link UA - Diagnosti	cs 2	× +									
← → ♂ ✿	\Box	🔏 192.168.1.14/?_=/c	liaglistview				… ⊠ ☆	III\ 🗉		* 0	≡
	OPC se	erver is running	.ogout Update password						qua	d-core	
Network	Ca	ontroller diagnostics	Client diagnostics	Network diagnostics	Sys	tem Log					
Security	ID	Connection name	Address	Time	Source	Error number	Error Text				
Cartificatos	🧼 =	PLC416	192.168.1.10:102	15.8.2020 9:22:12	PLC	0	Connection established	(6ES7 ·	416-3ER0	5-0ABO)	
Gertificates	Clear	diagnose C									
Time settings											
Diagnostics	_										
Lughteethee											

2.5.13 OPC UA server information online

Information from the OPC UA server connected online with the PLC416 are displayed.

IBH Link UA

File Edit Help									
🗋 💕 🗐 🖨 🥝)								
Server	🗕 🗕 🗕	-	Name of the server co	nnection					
- Kaliph Lisk HA			Name	IBH_Link_UA					
	Mark	=	Server address						
H PLC410			Host name / Address	192.168.1.14					
y variable tra	inster		Port	48010					
H- UA Nodes			URL	opc.tcp://192.168.1.14:48010					
			Inverse connection No						
		-	Security settings						
			Security policity	None					
			Message mode	None					
		-	Authentication setting	2					
			Login	Anonymous					
			Session name	example 5 - project: CPU 416 TIA 16 server - server					
		-	Other settings						
			Variables format	Compact					

Show variable transfer

Mark Variable transfer to display the status of the OPC tags in the right server window. The status of the OPC tags is updated continuously.

🔯 example 5 - Server - Server connection.opu - OPCUAEdit - 🗆 X											
<u>Eile E</u> dit <u>H</u> elp											
🗋 😂 🗐 🖕 🞯											
Server 🗢 🕂 🗙	Source server		Source variable	Destination server	Destination variable	Data type	Value				
BH_Link_UA DPLC416 CAIConditionerValues CAICONDIC transfer UA Nodes Project Server Screetific	um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie: um:TII-YELLOW:Unifie:	dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp dAutomation:UsServerCpp	Temperature Temperature.TimeStamp Temperature.Status TemperatureSetPoint TemperatureSetPoint.Status CurrentTime CurrentTime.Status	IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA IBH_Link_UA	Temperature TirmeStamp_Temp Status_Temp TemperatureSP TirmeStampSP StatusSP CurrentTirme_TirmeStamp CurrentTirme_Status	Double / Float DateTime StatusCode / Ulnt32 Double / Float DateTime StatusCode / Ulnt32 DateTime StatusCode / Ulnt32	71.9896 2020-08-15T10:04:26.856Z 0 72 2020-08-15T09:22:12.892Z 0 2020-08-15T10:04:26.856Z 0 2020-08-15T10:04:26.856Z 0 continuously updated				
Las Project Cars Server Las Certific	<						C100 100 1				
example 5 - Server – Server conr File Edit Help	nection.opu - OPCUAEdit						– 🗆 X				
Server 👻 🕂 🗙	Data type	Value	Source name		Destination name						
	Double / Float	71.9896	AirConditioner_1.Temperatu	re	IBH_Link_UA.PLC41	6.AirConditionerValue	s.Temperature				
📥 🥅 PLC416	DateTime	2020-08-15T10:12:23.9672	AirConditioner_1.Temperatu	re.TimeStamp	IBH_Link_UA.PLC41	6.AirConditionerValue	s.TimeStamp_Temp				
AirConditionerValues	StatusCode / UInt32	0	AirConditioner_1.Temperatu	re.Status	IBH_Link_UA.PLC41	6.AirConditionerValue	s.Status_Temp				
😪 Variable transfer	Double / Float	72	AirConditioner_1.Temperatu	reSetPoint	IBH_Link_UA.PLC41	6.AirConditionerValue	s.TemperatureSP				
H D UA Nodes	9 DateTime	2020-08-15T09:22:12.8922	AirConditioner_1.Temperatu	reSetPoint.TimeSta	mp IBH_Link_UA.PLC41	6.AirConditionerValue	s.TimeStampSP				
	StatusCode / UInt32	0	AirConditioner_1.Temperatu	reSetPoint.Status	IBH_Link_UA.PLC41	6.AirConditionerValue	s.StatusSP				
	DateTime	2020-08-15T10:12:23.9672	2258		IBH_Link_UA.PLC41	6.AirConditionerValue	s.CurrentTime_TimeStamp				
	StatusCode / UInt32	0 continuously updated	2258.Status		IBH_Link_UA.PLC41	6.AirConditionerValue	s.CurrentTime_Status				
Roject Server Server Certific	<						>				

Status – Data block AirConditionerValue [DB 22]

🎦 exa	mple 5 - Server – Server connection.	opu - OPCUAEdit						– 🗆 X		
<u>F</u> ile	<u>E</u> dit <u>H</u> elp									
🗋 🖆										
Server	→ ‡ ×	Name	Data type	Status	Access	Value		Node name		
- 🕯 I	BH Link UA	CurrentTime_Status	UInt32	&0K	RW	0		IBH_Link_UA.PLC416.AirConditionerValues.CurrentTime_Status		
Г 6 .	DLC416	CurrentTime_TimeStamp	DateTime	&0K	R₩	2020-08-1	15T10:16:14.660Z	IBH_Link_UA.PLC416.AirConditionerValues.CurrentTime_TimeStamp		
	AirConditionerValues	StatusSP	UInt32	&0K	RW	0		IBH_Link_UA.PLC416.AirConditionerValues.StatusSP		
	Variable transfer	Status_Temp	UInt32	&0K	RW	0	continuously	IBH_Link_UA.PLC416.AirConditionerValues.Status_Temp		
	IIA Nodes	Temperature	Float	&0K	RW	71.9948	updated	IBH_Link_UA.PLC416.AirConditionerValues.Temperature		
	- CANOUCS	TemperatureSP	Float	&0K	RW	72		IBH_Link_UA.PLC416.AirConditionerValues.TemperatureSP		
		TimeStampSP	DateTime	&0K	RW	2020-08-1	15T09:22:12.892Z	IBH_Link_UA.PLC416.AirConditionerValues.TimeStampSP		
		TimeStamp_Temp	DateTime	&0K	RW	2020-08-1	15T10:16:14.660Z	IBH_Link_UA.PLC416.AirConditionerValues.TimeStamp_Temp		
Proje	ct Rever Recetificates									
Logar roje	a state secondates							/		
								CAPS NUM		

2.5.14 Status – AirConditionerValue [DB 22] – CPU 416 TIA 16 Server - Server

СР	U 4	16 TIA 16 Server - Server	Server - Server [CPU 416-	3 PN/DP] ▶ Pro	gram blocks 🕨 AirConditio	nerValues [DB22] 📃 🖬 🗮 🗙						
2	🖆 🕐 🐛 🎼 📰 Keep actual values 🔒 Snapshot 降 🧠 Copy snapshots to start values 🕵 🥵 🎽												
	Air	ConditionerValues											
		Name	Data type	Offset	Start value	Monitor value	Comment						
1	-	▼ Static				continuously							
2	-	 Temperature 	Real 🔳	0.0	0.0	71.97918	Temperature externeal OPC UA Server						
З	-	TimeStamp_Temp	Date_And_Time	4.0	DT#1990-01-01-0	DT#2020-08-15-10:18:40.340	Temperature Time Stamp						
4	-	Status_Temp	DWord	12.0	16#0	16#0000_0000	Temperature Status						
5	-	TemperatureSP	Real	16.0	0.0	72.0	Temperature Set Point externeal OPC						
6		TimeStampSP	Date_And_Time	20.0	DT#1990-01-01-0	DT#2020-08-15-09:22:12.892	Temperature Set Point Time Stamp						
7		 StatusSP 	DWord	28.0	16#0	16#0000_0000	Temperature Set Point Status						
8		 CurrentTime_TimeSta 	Date_And_Time	32.0	DT#1990-01-01-0	DT#2020-08-15-10:18:40.340	External Server Current Time						
9		CurrentTime_Status	DWord	40.0	16#0	16#0000_0000	External Server Current Time Status						

2.5.15 UaExpert - Data Access View

With the external OPC server connected information about the external OPC server are displayed in the *UAExpert* program window *Data Access View*.

Use Drag & Drop to display the variables CurrentTime, Temperature, TemperatureSetPoint etc. in the Data Access Viewer window.



Server – IBH Link UA

Server – UaServerCpp (Air conditioner)

🚟 Unified Automation UaExpert - The OPC U	Unified Architectu	are Client - NewProject*							
File View Server Document Settings	Help								
🗋 🥟 🕞 🗭 🥘 🔶 📼 🖉	ಧಿ 🗙 🔏	2 🖹 🖹							
Project & X	Data Access Vi	ew							8
Project Servers UserverCpp@TTI-YELLOW Documents Data Access View	# Serv 1 UaServe 2 UaServe 3 UaServe	rer Node Id rcp NS3[String]AirCond rcp NS3[String]AirCond rcp NS0[Numeric]2258	Display Name Temperature TemperatureSetPoint CurrentTime	Value 71.973975 72 2020-08-15T10:49:01.408Z	Datatype Double Double DateTime	Source Timestamp 12:49:00.774 11:22:12.892 12:49:01.408	Server Timestamp 12:49:00.774 12:47:25.961 12:49:01.408	Statusco Good Good Good	ode
Address Space & X	Dra	g & Drop							
No notifying the set of the		Data Access View # 1 UaServerCp 2 UaServerCp	Server p@TTI-YELLOW p@TTI-YELLOW	NS3 String AirConditio NS3 String AirConditio NS3 Numarid2385	Node Id oner_1.Tempera oner_1.Tempera	ature atureSetPoint	Display I Temperature TemperatureSe CurrentTime	Name etPoint	
 Stop Temperature TemperatureSetPoint AirConditioner_10 	Data	Access View	p@TII-YELLOW	NSUMUMERC			current nime	\prec	ì
> 🔁 Demo	#	Display Nan	ne	Value	Datat	pe	Source Time	estamp	
Server Server AlarmsNoNodes ServerRedundancy ServerStatus	1 2 3	Temperature TemperatureSetPo CurrentTime	71.989 pint 72 2020-	08-15T11:11:48.662Z	Double Double DateTime	13:1 11:2 13:1	1:48.662 2:12.892 1:48.662		J
>			(ontinuously Ipdated					

2.6 Example 6 - CPU 1500 / CPU 1200 (Server – Server Connection)

A CPU 1211C with a TCP / IP port is connected to a CPU 1511-1 PN, which is also a TCP / IP port.

2.6.1 Device configuration project CPU 1500 - CPU 1200

The data from a CPU 1500 and CPU 1200 are exchanged.



2.6.2 Exchanging variables

Variables of the *PLC 1200* data block *CounterValues [DB 5]* are transferred into the *PLC 1500* data block *ReceivedValues [DB 10]* for further processing.

Variables of the *PLC 1500* data block *CounterValues [DB 5]* are transferred into the *PLC 1200* data block *ReceivedValues [DB 10]* for further processing.

PLC 1200 data block ReceivedValues [DB 10]

	PL	с_ ⁻	1200 [CPU 1211C DC/I	DC/DC] → P	rogram bl	ocks 🕨 Rec	eivedValues [DB10]	_ •	∎×
ý	1	8	🐛 🋃 🗮 🚏 Keep a	actual values	🎴 Sna	pshot 🐂 🛍	a, •		
	Ree	cei	vedValues						
		Na	me	Data type	Offset	Start value	Comment		
1	-	•	Static						
2	-		ON_1500	Bool 📗	0.0	false	Counter is counting 1500		
3			MinValue1500	Int	2.0	0	Minimum count 1500		
4		•	MaxValue1500	Int	4.0	0	Maximum count 1500		
5		•	CounterValue1500	Int	6.0	0	Counter value1500		
6		•	CounterStatus1500	DWord	8.0	16#0	Counter status1500		
7		•	CounterTimeStamp	String	12.0		Counter Time Stamp		

The values are read from the PLC 1500 as OPC tags. The status of *CounterStatus1500* should also be transferred for monitoring purposes.

The TimeStamp of CounterValue1500 cannot be accepted directly. A CPU 1200 does not recognize the data type *Date_And_Time*.

A conversion of *Date_And_Time* into data types that the CPU 1200 understands could take place in the PLC integrated in the IBH Link UA.

PLC 1500 data block ReceivedValues [DB 10]

150	00 -	CPU 1200 → PLC_1500 [(Program	i blocks 🔸 ReceivedVa	lues [DB10] 🛛 🗖 🖬 🗙
1	•	🐛 🋃 🚞 😤 Keep actual	values 🔒 Snapsł	not ඁ	Copy snapshots to sta	nt values 🔹 🛃 🕨 📑
Ree	ceiv	/edValues				
	Na	me	Data type	Offset	Start value	Comment
-	•	Static				
-	•	ON1200	Bool 🔳	0.0	false	Counter is counting 1200
	•	MinValue1200	Int	2.0	0	Minimum count 1200
	•	MaxValue1200	Int	4.0	0	Maximum count 1200
	•	Countervalue1200	Int	6.0	0	Counter value 1200
	•	CounterStatus1200	DWord	8.0	16#0	Counter status !200
	•	CounterTimeStamp1200	Date_And_Time	12.0	DT#1990-01-01-00:00:00	Counter Time Stamp 1200
	150 Rei 0 0 0 0	1500 - Receiv Nai 40 ¥ 40 ¥ 40 ¥ 40 ¥ 40 ¥ 40 ¥ 40 ¥ 40 ¥	1500 - CPU 1200 → PLC_1500 [C Image: Static Image: Static	1500 - CPU 1200 ➤ PLC_1500 [CPU 1511-1 PN] ➤	1500 - CPU 1200 → PLC_1500 [CPU 1511-1 PN] → Program Image: Static Image:	1500 - CPU 1200 → PLC_1500 [CPU 1511-1 PN] → Program blocks → ReceivedVal

The values are read from the PLC 1200 as OPC tags. The *status* and the *TimeStamp* of *CounterStatus1500* should also be transferred for monitoring purposes.

Note:



The S7 communication - *GET and PUT* (allow access via PUT / GET by remote partner) in the program of the CPU1200 and the CPU 1500 must be activated.

The IBH Link UA Server cannot access DB variables in an optimized data block (DB) of an S7-1200 CPU / S7-1500 CPU.

2.6.3 Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.



Open the **Project window** by clicking on the **Project** tab.





Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

M Untitled - OPCUAEdit							
File	Edit	Help	(click)				
	1	New server connectio	n				
Project	-						

The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server connection properties	\times
Name of the server connection: IBH_Link_UA Server address: 192.168.1.14 Port: 48010	
C URL opc.tcp://192.168.1.14:48010 Select endpoint	
Security settings: Message mode: Basic128Rsa15 Signatur Basic256 Signature and Encryption BasicSha256 Inverse connection: Aes1285ha256RsaOaep Connect invers Aes256Sha256RsaPss Properties	
Cogin: Anonymous User name and password User name: Passwort: Store Session Name: example 6: CPU 1200 connecl	
Variables format: Compact OK Cancel Help	

The settings for the connection to the *IBH Link UA* OPC UA server are displayed in the right part of the *project window*.



2.6.4 Inserting a New control (PLC)

The *New control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).

💹 example 6, CPU 1500 - CPU 1200 connection.opu - OPCUAEdit	– 🗆 X					
<u>F</u> ile <u>E</u> dit <u>H</u> elp						
Project 🗢 🗣 🗙 🖃 Name of the server conn	ection					
Name Name	IBH_Link_UA					
Server address						
BH_Link_UA	192.168.1.14					
New years and the second secon	48010					
New server connection	opc.tcp://192.168.1.14:48010					
New control	No					
Properties Click						
Add external data	None					
	None					
Transfer selected configuration to the OPC UA Server						
Read complete configuration from OPC UA Server	Anonymous					
	example 6: CPU 1200 connected to CPU 1500 TIA 16					
Import						
Export	Compact					
Project 🗟 Server 🖾 Certifi						
	CAPS NUM .::					

New control dialog box - PLC_1500

🗰 New control	×
Control name: PLC_1500 Host name / IP address: 192.168.1.29	
Protocol: O S <u>7</u> TCP/IP <u>R</u> ack number: 0 <u>S</u> lot number: 2	
Position of the target module:	
O larget modul at the same rack	
C Via MPI/DP subnet accessible rack	
MPI/ <u>D</u> P address of the target CPU: 2	
C Via TCP/IP subnet accessible rack	
TCP/IP address of the target CPU: 0 . 0 . 0 . 0	
C Via H1 subn <u>e</u> t accessible rack	
H1 address of the target CPU: 00.00.00.00.00.00	
Subnet ID: 0000 . 0000	
O 57 200 TCP/IP	
O 57 1200 TCP/IP	
PLC TSAP: UIUI	
<u>Confirm</u> <u>OK</u> <u>Cancel</u> Test connection <u>H</u> elp	

Test connection

After completing the New Control dialog

Test connection....

box, the connection to the online connected CPU can be tested. Information about the successful connection is displayed.

IBH OPC UA Editor	×	
The connection to the PLC PLC_1500 tested.	has been successfully	
	Confirm OK	
	Test connection	Help

To accept and close the *New control* dialog box settings click on *OK*.

Two CPUs in the project.

Right-click on the **Server** ... icon (IBH Link UA) and select from the context menu the New Control command to open the New Control dialog box again.



New control dialog box - PLC_1200

📴 New control	×
Control name: PLC_1200 Host name / IP address: 192.168.1.16	
C S7 TCP/IP Rack number: 0 Slot number: 2	
Position of the target module:	
C Target modul at the same rack	
C Via MPI/DP subnet accessible rack	
MPI/DP address of the target CPU: 2	
${f C}$ Via TCP/IP subnet accessible rack	
TCP/IP address of the target CPU: 0 . 0 . 0 . 0	
${f C}$ Via H1 subnet accessible rack	
H1 address of the target CPU: 00.00.00.00.00.00	
Subnet ID: 0000 . 0000	
O S7 200 TCP/IP Own TSAP: 0100	
○ 57 1200 TCP/IP ○ 57 1500 TCP/IP PLC TSAP: 0101	
confirm 2	
OK Cancel Test connection Help	

Test connection

After completing the New Control dialog

Test connection....

box, the connection to the online connected CPU can be tested. Information about the successful connection is displayed.



To accept and close the *New control* dialog box settings click on *OK*.

2.6.5 Program assignment

The OPC variables from the project are to be assigned to the two CPUs.

Program assignment PLC 1500

The Assign program command from the context menu opens the Program selection dialog box.



Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





The **SIEMENS support software TIA Openness** is started in the background. If an error occurs see chapter 1, **Special features** *when selecting TIA projects* page 1-16. Several notices are displayed.

Open TIA project A:\OPC UA Editor M	lanual\example 6 - CPU 1500 CPU 1200 e	×		
Starting	TIA Openness.			
	Open TIA project A:\OPC UA Editor	Manual∖o	example 6 - CPU 1500 CPU 1200 c 🗙	
	Opening project A:\OPC UA Edit connection\CP	or Manual U 1500 - (\example 6 - CPU 1500 CPU 1200 CPU 1200.ap16.	
	38	Open T	A project A:\OPC UA Editor Manual\exam	ple 6 - CPU 1500 CPU 1200 c 🗙
			Translating device PLC_1	500.
			Cancel	

Transferred 1500 PLC program

In the right part of the project window information about the *Offline program assignment* are displayed.

📴 example 6, CPU 1500 - CPU 13	0 connection.opu - OPCUAEdit	—		×
<u>F</u> ile <u>E</u> dit <u>H</u> elp				
🗋 💕 🗔 🖨 📀				
Project • 4 × Project • 4 × BHL Link UA BHL Link UA FLC_1500 FLC_1200 Variables	Name PLC_1500 Offine program assignment. Program type Program type TIA program Station name PLC_1500 Online connection Protocol S7 1500 TCP/IP Host name / Address 192 168.1.29 Local TSAP 0100 Remote TSAP 0101	\CPU 1500	I- CPU 12	00.ap16
Project 🖾 Server 🗟 Certif				
			CARS	NUM -

Program assignment PLC 1200

The Assign program command from the context menu opens the Program selection dialog box.



Select the PLC program in the **Select program** dialog box. Clicking the **Plus** symbol in front of the TIA symbol of the PLC project, the PLC program (CPUs) is displayed in the project.





The *SIEMENS support software TIA Openness* is started in the background. If an error occurs see chapter 1, *Special features when selecting TIA projects* page 1-16.

Several notices are displayed.

Open TIA project A:\OPC UA Editor M	anual\example 6 - CPU 1500 CPU 1200 c.	×	
Starting	TIA Openness.		
	Mopen TIA project A:\OPC UA Editor	Manual\example 6 - CPU 1500 CPU 1200 c 🗙	
	Opening project A:\OPC UA Edit connection\CF	tor Manual\example 6 - CPU 1500 CPU 1200 PU 1500 - CPU 1200.ap16.	
		Open TIA project A:\OPC UA Editor Manual\example 6 - CPU 1500 CPU 120	00 c 🗙
		Translating device PLC_1200.	

Transferred 1200 PLC program

In the right part of the project window information about the *Offline program assignment* are displayed.

🎆 example 6, CPU 1500 - CPU 120	0 connection.opu - OPCUAEc	dit			
File Edit Help					
🗋 💕 🛃 🕼 🞯					_
Project v a x BH_Link_UA BH_Link_UA BH_C 1200 C 120 Variables Variables	Name of the control Name Offline program assignm Program type Program path Station name Online connection Protocol Host name / Address Local TSAP Remote TSAP	PLC 1200 TIA program A:\DPC UA Editor Manual\example 6 - CPU 1500 CPU 1200 connection\CPU PLC 1200 \$7 1200 TCP/IP 1921681.116 0100 0101	1500 - (:PU 1200.	ap16
				CAPS	IIIM

2.6.6 Define variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window.

Clicking the *Plus* icon in front of the variable area symbol displays the existing variables.

If a variable is selected, it is adopted as an OPC tag and displayed in the lower part of the window with additional information.

Define PLC_1500 variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window.

🎆 example 6, CPU 1500 - CPU 12	00 connection.opu - OPCUAEdit								-		×
File Edit Help											
D 📂 🖌 🦚 💿											
Variables Variables Variables Operation Variables Operation											
											_
		A 4 4 4 4 4 4	Di Chara	1	Origin		ODC have	Comment			
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment			
	CounterData.MinNo1500 taken as	DB5.DBW 0	Int	2	Program	RW	Int16	minimum counte	r readin	g (numl	Jer)
	CounterData.MaxNo1500 OPC tags	DB5.DBW 2	Int	2	Program	RW	Int1b	maximum count	er readin	g (num	aer)
	CounterData.Count 1500	DB5.DBX 4.0	Bool		Program	RW	Boolean	Counter is counti	ng		
	CounterData.CountingUNI500	DBS.DBX 4.1	5001	-1	Program	RW	Boolean	Enable counting			
	Research of Countervalue 1500	DBJ.DBW 0	Real	1	Program	P.WV Phar	Reelern	Countervalue Counter is counti	ng 1200		
	Received values. Or 1200	DB10.DBX 0.0	1-4	2	Deservers	Diar	Lue16	Minimum mumh	1200		
	Received values MaxValue1200	DB10 DBW/A	Int	2	Brogram	P\4V	Int16	Maximum count	1200		
	Received Values Countervalue1200	DB10 DBW/ 6	lot	2	Program	R\A/	Int16	Countervalue 12	1200		
	Received Values CounterStatus 1200	DB10 DBD 8	DW/ord	4	Program	RW/	Liint32	Counter status 12	าก		
	BeceivedValues.CounterTimeStamp1200	DB10.DBX 12.0	Date And Time	8	Program	RW/	DateTime	Counter Time Sta	mn 1200)	
		a a casa a construction	a stag stag time				e ste finite	and the second			
Lee Project ⊠\$ Server ⊠\$ Certif											
										CAPS I	NUM

Not all variables were defined as OPC tags.

Define PLC_1200 variables as OPC tags

Not all variables were defined as OPC tags.

🎆 example 6, CPU 1500 - CPU 12	📴 example 6, CPU 1500 - CPU 1200 connection.opu - OPCUAEdit — 📃											
File Edit Help												
🗋 💕 🛃 🚓 🎯												
Import Import Import Program variables Import Import Import Program variables Import Import Import Import Import Import Import Import Import Import Import Import Import Import Import I												
	🖆 🗙 🕹 🖏 🖏 🖕 💙											
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment				
	CounterData.MinNo1200	DB5.DBW/0	Int	2	Program	RW	Int16	minimum counter	reading (numbe	r)	
	CounterData.MaxNo1200	DB5.DBW 2	Int	2	Program	RW	Int16	maximum counter	reading	(numbe	r)	
	CounterData.Count1200	DB5.DBX 4.0	Bool	.1	Program	RW	Boolean	Counter is counting	3			
	CounterData.CountingON1200	DB5.DBX 4.1	Bool	.1	Program	RW	Boolean	Enable counting				
	CounterData.CounterValue1200	DB5.DBW 6	Int	2	Program	RW	Int16	CounterValue				
	ReceivedValues.ON_1500	DB10.DBX 0.0	Bool	.1	Program	RW	Boolean	Counter is counting	j 1500			
	ReceivedValues.MinValue1500	DB10.DBW 2	Int	2	Program	RW	Int16	Minimum count 15	00			
	ReceivedValues.MaxValue1500	DB10.DBW 4	Int	2	Program	RW	Int16	Maximum count 15	00			
	ReceivedValues.CounterValue1500	DB10.DBW 6	Int	2	Program	RW	Int16	Counter value1500				
	ReceivedValues.CounterStatus1500	DB10.DBD 8	DWord	4	Program	RW	UInt32	Counter status1500				
	ReceivedValues.CounterTimeStamp	DB10.DBX 12.0	String	256	Program	RW	String	Counter Time Stam	р			
Project 🖄 Server 🖄 Certif												

2.6.7 Add external data

With the next steps the variables of the PLC_1200 and PLC_1500 defined as OPC tags are connected...

Right-click on IBH Link UA in the IBH OPC UA Editor and execute the *Add external data ...* command.

🗱 example 6, CPU 15	00 - CPU 1200 d	connection.opu - OPCUAE	dit	-	- 🗆	×		
File Edit Help								
🗋 📂 🚽 🏟 📀								
Project	🗕 🔶 🔶	😑 Name of the server	connection					
al 🛷 🐓 V 🕞 I		Name	IBH_Link_UA					
27 🖬 🔨 & 43 (<u>ь</u> т.м	Server address						
BH_Link_UA	right click	Host name / Address	192.168.1.14					
🖨 🌆 PLC_1500 `		Port	48010					
🔤 🖓 🔤 🖓 🔤	New serv		1.14:48010					
📥 🌆 PLC_1200	New cont	trol						
🔤 📶 Variables	Propertie	(click)						
	Hoperac							
	Add exter	rnal data"						
	Add mod	bus configuration						
	Import			-				
	Export			00 connected	to CPU 1500	FIA 16		
	· · ·	Curor votange						
		Variables format	Compact					
Project Server	Certificates							
					CAPS	NUM		

Clicking on *Add External Data...* opens the IBH OPC UA Editor dialog box.

IBH OPC	JA Editor	×
?	Take over current configuration of external data from server IBH Link UA?	
	Yes No	

Only the OPC tags defined in the IBH OPC UA Editor (PLC_1500 and PLV_1200) are to be used, the opened dialog box must be confirmed with **No**.

2.6.8 Variable transfer - define source and target variables

The OPC UA variable connection is adopted by marking the source and target variables and then clicking the Connect variable command (standard parameters).

Variable links: source – PLC_1500 ⇒ target – PLC_1200

File Edit Help	
Project IPC_1200 IPC_1200 IPC_C1200 IPC connected Servers IPC connected Servers<	etel

The **Connect variable... (standard parameters)** command takes over the connection of the marked variables directly.

The command **Connect variable...** opens the dialog box **Parameter for reading the variables**. The name, type and ID of the variable are displayed here. Sampling interval, queue entries and index area can be influenced.

OPC tags from the *PLC_1500* data block *CounterData [DB5]* are transferred to the *PLC_1200* data block *ReceivedVelues [DB10]*.

If a variable (value) has been connected, the status and the time stamp belonging to the source variable are offered to be connected.



The source OPC tags *CounterValue1500/TimeStamp* and *Count1500* are not connected. The connections are displayed in the lower part of the right project window.

X / Y						
Source server So	ource variable	Destination server	Destination variable	Data type	Source name	Destination name
BH_Link_UA Co	ountingON1500	IBH_Link_UA	ON_1500	Boolean	IBH_Link_UA.PLC_1500.CounterData.CountingON1500	IBH_Link_UA.PLC_1200.ReceivedValues.ON_1500
IBH_Link_UA Mi	1inNo1500	IBH_Link_UA	MinValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.MinNo1500	IBH_Link_UA.PLC_1200.ReceivedValues.MinValue1500
IBH_Link_UA M	1a×No1500	IBH_Link_UA	MaxValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.MaxNo1500	IBH_Link_UA.PLC_1200.ReceivedValues.MaxValue1500
BH_Link_UA Co	ounterValue1500	IBH_Link_UA	CounterValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500	IBH_Link_UA.PLC_1200.ReceivedValues.CounterValue1500
BH_Link_UA Co	ounterValue1500.Status	IBH_Link_UA	CounterStatus1500	StatusC	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500.Status	IBH_Link_UA.PLC_1200.ReceivedValues.CounterStatus1500

Variable links: source – PLC_1200 => target – PLC_1500

OPC tags from the *PLC_1200* data block *CounterData [DB5]* are transferred to the *PLC_1500* data block *ReceivedValues [DB10]*.



The source OPC tag *Count1500* is not connected. The connections are displayed in the lower part of the right project window.

X / V					
Source variable	Destination server	Destination variable	Data type	Source name	Destination name
CountingON1500	IBH_Link_UA	ON_1500	Boolean	IBH_Link_UA.PLC_1500.CounterData.CountingON1500	IBH_Link_UA.PLC_1200.ReceivedValues.ON_1500
MinNo1500	IBH_Link_UA	MinValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.MinNo1500	IBH_Link_UA.PLC_1200.ReceivedValues.MinValue1500
MaxNo1500	IBH_Link_UA	MaxValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.MaxNo1500	IBH_Link_UA.PLC_1200.ReceivedValues.MaxValue1500
CounterValue1500	IBH_Link_UA	CounterValue1500	Int16	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500	IBH_Link_UA.PLC_1200.ReceivedValues.CounterValue1500
CounterValue1500.Status	IBH_Link_UA	CounterStatus1500	StatusC	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500.Status	IBH_Link_UA.PLC_1200.ReceivedValues.CounterStatus1500
CountingON1200	IBH_Link_UA	ON1200	Boolean	IBH_Link_UA.PLC_1200.CounterData.CountingON1200	IBH_Link_UA.PLC_1500.ReceivedValues.ON1200
MinNo1200	IBH_Link_UA	MinValue1200	Int16	IBH_Link_UA.PLC_1200.CounterData.MinNo1200	IBH_Link_UA.PLC_1500.ReceivedValues.MinValue1200
MaxNo1200	IBH_Link_UA	MaxValue1200	Int16	IBH_Link_UA.PLC_1200.CounterData.MaxNo1200	IBH_Link_UA.PLC_1500.ReceivedValues.MaxValue1200
CounterValue1200	IBH_Link_UA	Countervalue1200	Int16	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200	IBH_Link_UA.PLC_1500.ReceivedValues.Countervalue1200
CounterValue1200.Status	IBH_Link_UA	CounterStatus1200	StatusC	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200.Status	IBH_Link_UA.PLC_1500.ReceivedValues.CounterStatus1200
CounterValue1200.TimeStamp	IBH_Link_UA	CounterTimeStamp1200	DateTime	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200.TimeStamp	IBH_Link_UA.PLC_1500.ReceivedValues.CounterTimeStamp1200

2.6.9 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

🌆 example 6, CPU 1500 - CPU 1200	0 coi	nnect	ion.opu - OPCUAEdit			—		×
File Edit Help								
🗋 💕 🛃 🖨 💿								_
Project		 Nev Nev Trar Rea Imp Exp 	Name of the server of Name Server address Host name / Address v server connection v control ster selected configuration ort ort Other settings	onnection IBH_Link_UA 192.168.1.14 on to the OPC UA Server	Clic	0 C pted to Cf	PU 1500 T	IA 16
			Variables format	Compact				
Roject 🖾 Server 🖾 Certificate	es							
							CAPS	NUM

The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Transver configuration to the server		—		×					
Name of the server connection	Transfer Status 0 %			_					
	Transver configuration to the	server			- 🗆	×			
<	Name of the server connection		Transfer	Status					
	IBH_LINK_UA		100 %	Server is being restarted					
Start <u>C</u> lose			🧦 Trar	nsver configuration to the	e server				
	<		Name	of the server connection	Tra	insfer Sta	tus	 	
			- IBH_Lir	k_UA	1	00 % Tra	nsfer successful		
	Start <u>C</u> lose								
			<						>
					confirm				
				Start <u>C</u> lose				Help	

Select the server *IBH Link UA* and then click Start. The configurations (*PLC_1500 / PLC_1200*) are transferred to the *IBH Link UA*. Successful transfer is displayed.

If a certified data exchange between the IBH OPC Editor and the IBH Link UA has been selected, the exchanged certificates must be trusted (see chapter Trust certificate, Chapter 1, page 1-40).

2.6.10 IBH Link UA web browser window

The connections are displayed in the IBH Link UA web browser window OPC Client.

IBH Link UA - Siemens Slots – PLC_1500 / PLC_1200



The browser window *Diagnostics* displays the status of the connections *IBH Link UA – PLC_1500 and PLC_1200*.

$ ightarrow$ Cr $rac{1}{2}$	0	🔏 192.168.1.14/?_=/d	diaglistview				⊌ ☆	\ ⊡	۲	0
	OPC se	rver is running	Logout Update password						quad-o	ore
Network	Co	ntroller diagnostics	Client diagnostics	Network diagnostics	Sys	tem Log				
Security	ID	Connection name	Address	Time	Source	Error number	Error Text			
Partifiantan	9 -	PLC_1500	192.168.1.29:102	17.8.2020 11:39:33	PLC	0	Connection established	d (6ES7 5:	1-1AK00-0	JABO
ertificates	9 -	PLC_1200	192.168.1.16:102	17.8.2020 11:39:33	PLC	0	Connection established	d (6ES7 2:	1-1AE40-0	јхво
Time settings	Clear	diagnose C								

IBH Link UA - browser window OPC Client

Connections specified the IBH UA Editor are displayed in the web browser window OPC Client.



2.6.11 Online OPC UA Server Information

Information from the online connected OPC UA server with the online connected CPUs are displayed.

IBH Link UA – PLC_1500 – PLC_1200

💹 example 6, CPU 1500 - CPU 1200 co	nnec	tion.opu - OPCUAEdit	– 🗆 X
File Edit Help			
🗋 💕 🗐 🖨 🎯			
Server 🗢 🗘 🛪		Name of the server cor	nnection
- C IDH Hat HA	11	Name	IBH_Link_UA
mark	🗆	Server address	
		Host name / Address	192.168.1.14
		Port	48010
		URL	opc.tcp://192.168.1.14:48010
		Inverse connection	No
	🗆	Security settings	
		Security policity	None
		Message mode	None
		Authentication settings	
		Login	Anonymous
		Session name	example 6: CPU 1200 connected to CPU 1500 TIA 16
	0	Other settings	
		Variables format	Compact
	- 1		
Log Project Server Server			
			CAPS NUM

Variable transfer – PLC_1500 – PLC_1200

Click Variable transfer. The variables (OPC tags) are displayed in the right server window with their status. The status of the OPC tags is updated continuously.

example 6, CPU 1500) - CPU 1200 coni	nection.opu - OPCU	AEdit					- 🗆	×
File Edit Help									
🗋 💕 🗔 🖨 🔞									
Server	→ ‡ ×	Source server	Source variable	Destination server	Destination variable	Data type	Value		
🖃 📢 IBH Link UA		IBH_Link_UA	CountingON1500	IBH_Link_UA	ON_1500	Boolean	true		
- PLC 1200		IBH_Link_UA	MinNo1500	IBH_Link_UA	MinValue1500	Int16	100		
■ ■ PLC_1500		IBH_Link_UA	MaxNo1500	IBH_Link_UA	MaxValue1500	Int16	8000) 5 continuously	
	mark)	IBH_Link_UA	CounterValue1500	IBH_Link_UA	CounterValue1500	Int16	7905		islv
		IBH_Link_UA	CounterValue1500.Status	IBH_Link_UA	CounterStatus1500	StatusCode / UInt32	0	updated	
		IBH_Link_UA	CountingON1200	IBH_Link_UA	ON1200	Boolean	true		
		IBH_Link_UA	H_Link_UA MinNo1200 IBH_Link_UA MinValue1200 I		Int16	1000			
		IBH_Link_UA	MaxNo1200	IBH_Link_UA	MaxValue1200	Int16	10000		
		IBH_Link_UA	CounterValue1200	IBH_Link_UA	Countervalue1200	Int16	4800		
		IBH_Link_UA	CounterValue1200.Status	IBH_Link_UA	CounterStatus1200	unterStatus1200 StatusCode / UInt32			
		IBH_Link_UA	CounterValue1200.TimeStamp	IBH_Link_UA	CounterTimeStamp1200	DateTime	2020-08-1	17T17:44:00.34	40Z
							<u> </u>		_
Project Server	😂 Certificates	<							

The source names and the target names of the variable transfer are also displayed.

🗱 example 6, CPU 1500 - CPU 1200 conn	ection.opu - OPCUAEdit	– 🗆 X			
<u>F</u> ile <u>E</u> dit <u>H</u> elp					
Server 🔻 🖛 🗙	Source name	Destination name			
⊡\$] IBH_Link_UA	IBH_Link_UA.PLC_1500.CounterData.CountingON1500	IBH_Link_UA.PLC_1200.ReceivedValues.ON_1500			
F. M PLC 1200	IBH_Link_UA.PLC_1500.CounterData.MinNo1500	IBH_Link_UA.PLC_1200.ReceivedValues.MinValue1500			
	IBH_Link_UA.PLC_1500.CounterData.MaxNo1500 IBH_Link_UA.PLC_1200.ReceivedValues.MaxValue				
Variable transfer (mark)	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500 IBH_Link_UA.PLC_1200.ReceivedValues.CounterValue1500				
The UA Nodes	IBH_Link_UA.PLC_1500.CounterData.CounterValue1500.Status	IBH_Link_UA.PLC_1200.ReceivedValues.CounterStatus1500			
	IBH_Link_UA.PLC_1200.CounterData.CountingON1200	IBH_Link_UA.PLC_1500.ReceivedValues.ON1200			
	IBH_Link_UA.PLC_1200.CounterData.MinNo1200	IBH_Link_UA.PLC_1500.ReceivedValues.MinValue1200			
	IBH_Link_UA.PLC_1200.CounterData.MaxNo1200	IBH_Link_UA.PLC_1500.ReceivedValues.MaxValue1200			
	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200	IBH_Link_UA.PLC_1500.ReceivedValues.Countervalue1200			
	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200.Status	IBH_Link_UA.PLC_1500.ReceivedValues.CounterStatus1200			
	IBH_Link_UA.PLC_1200.CounterData.CounterValue1200.TimeStamp	IBH_Link_UA.PLC_1500.ReceivedValues.CounterTimeStamp1200			
Rever Certificates		>			
		CAPS NUM .::			

2.6.12 UaExpert - Data Access View

With the IBH Link UA OPC and the PLCs PLC_1200 / PLC_1500 connected, information about the OPC tags are displayed. With drag & drop the OPC tags are pulled into the Data Access Viewer window.

File View Server Deservent Service	Architecture Client - Ne	whoject						
	× 🔊 👩 💷	N 🗖						
i 🔰 💋 🕞 🕲 i 🐨 🔍 🗴	s	8 U						0
Project Br X	Data Access view	N- 4- 14	Diada Na				T	U
✓	# Server 1 IBHLinkUA	Node Id NS4IStringIIBH Link UA.PLC 120	0 Count1200	e va true	Boole	atype sourc an 19:55>	e limestamp Server lim 18.422 19:55:49.0	54 Good
IBHLinkUA@ibhlinkua-SC-14	2 IBHLinkUA 3 IBHLinkUA	NS4[String][BH_Link_UA.PLC_120 NS4[String][BH_Link_UA.PLC_120]	0 CounterValue1200 0 CountingON1200	7535 true	Int16 Boole	19:59: ap 19:55:	33.888 19:59:34.1 51.447 19:55:52.0	38 Good
V 🗊 Documents	4 IBHLinkUA	NS4[String]IBH_Link_UA.PLC_120	0 MaxNo1200	10000	Int16	19:55:	3.402 19:55:53.5	55 Good
Data Access view	6 IBHLinkUA	NS4[String]IBH_Link_UA.PLC_120 NS4[String]IBH_Link_UA.PLC_120	0 CounterStatus1500	0	UInt3	2 19:55:	59.402 19:55:59.5 9.439 19:55:59.5	57 Good
Address Space & X	7 IBHLinkUA 8 IBHLinkUA	NS4 String IBH_Link_UA.PLC_120 NS4 String IBH_Link_UA.PLC_120	0 CounterTimeStamp 0 CounterValue1500	3053 com	tinuously Int16	19:56: 19:59:	00.261 19:56:00.8 33.715 19:59:33.8	18 Good 38 Good
∽ No Highlight ▼	9 IBHLinkUA 10 IBHLinkUA	NS4[String]IBH_Link_UA.PLC_120 NS4[String]IBH_Link_UA.PLC_120	0 MaxValue1500 0 MinValue1500	8000 upd 100	lated Int16	19:56: 19:56:	03.926 19:56:04.5 05.118 19:56:05.8	59 Good 20 Good
Content Conten	11 IBHLinkUA	NS4 String IBH_Link_UA.PLC_120	0 ON_1500	true	Boole	an 19:56:	06.358 19:56:07.0	71 Good
> 🛃 Objects	13 IBHLinkUA	NS4 String IBH_Link_UA.PLC_150	0 CounterValue1500	2568	Int16	19:59:	33.888 19:59:34.1	38 Good
> 👶 DeviceSet	14 IBHLinkUA 15 IBHLinkUA	NS4[String]IBH_Link_UA.PLC_150 NS4[String]IBH_Link_UA.PLC_150	0 CountingON1500 0 MaxNo1500	8000	Int16	an 19:57: 19:57:	10.412 19:57:10.8	36 Good 38 Good
> 💑 MQTT	16 IBHLinkUA 17 IBHLinkUA	NS4 String IBH_Link_UA.PLC_150 NS4 String IBH_Link_UA.PLC_150	0 MinNo1500 0 CounterStatus1200	100	Int16 UInt3	19:57: 2 19:57:	4.414 19:57:14.5 18.586 19:57:19.3	39 Good 39 Good
> 🙀 Modbus	18 IBHLinkUA 19 IBHLinkUA	NS4 String IBH_Link_UA.PLC_150 NS4 String IBH_Link_UA.PLC_150	0 CounterTimeStamp	p1200 2020-08-17T1 5964	17:59:33.387Z Date1	ime 19:59: 10:50-	33.817 19:59:33.8 23.715 10:50:33.8	38 Good
V 🚕 PLC_1200	20 IBHLinkUA	NS4 String IBH_Link_UA.PLC_150	0 MaxValue1200	10000	Int16	19:57:	24.417 19:57:24.5	0 Good
DeviceHealth	21 IBHLINKUA	NS4[String]IBH_Link_UA.PLC_150	0 MinValue1200	1000	Intio	19:57:	25.677 19:57:26.34	10 Good
Model	Drag & Dra							
CounterData	1	Display	Name	Value	Datatvi	ae So	urce Times	tamp
> Count1200		Display	Tanic.	value	Datacy	50	aree mines	camp
> CounterValue1200		Count1200		true	Boolear	ı 11	:21:24.163	
> GountingON1200		CounterVal	ue1200	3994	Int16	11	23:09.731	
> MinNo1200		CountingO	N1200	true	Boolean	11	21-28 094	
🔶 🚞 ReceivedValues		MauNa 120/	11200	9000	lut16	11	21.20.034	_
> CounterStatus1500		IVIAXINO1200	,	8000	Intio	11	21:30.120	PLC 1200
> Counter Intestantp		MinNo1200		100	Int16	11	21:32.094	ODCtage
> 📹 MaxValue1500		CounterSta	tus1500	0	UInt32	11	:21:49.555	OFCitaga
> MinValue1500		CounterTim	neStamp		String	11	21:51.237	
> SupportedTypes		CounterVal	ue1500	5188	Int16	11	23.00 148	
> 📥 Tasks		Mau Value 1	500	9000	lut16	11	23.05.140	
V 🚜 PLC_1500		Max value 1	500	8000	Intio	11	21:55.508	
OeviceHealth	1	MinValue15	00	100	Int16	- 11	21:57.121	
V A Programs	1	ON 1500		true	Boolear	1 11	:21:58.405)
CounterData	1							<u> </u>
> 🕘 Count1500	/							
CounterValue1500								
>		isplay Name		Value	Da	tatype	Source Tim	estamp
> @ MinNo1500	Count	1500	true		Boo	olean	11:29:55.088	
Y	Count	erValue1500	399		Int1	6	11:51:19.364	
CounterStatus 1200	Counti	ingON1500	true		Boo	lean	11:29:59.145	
> 🕲 Countervalue1200	MaxNe	1500	8000		Int1	6	11:30:00 418	
N 49 March 1200	TYINAT N	1500	100		Int1	6	11:30:03 144	PLC_150
MaxValue1200	Aller Man Market	1500	0		Llbs	+22	11:20:06 624	OPC tags
Maxvalue1200 MinValue1200 ON1200	MinNo	arStatur1200	0		000	152	11.51.19 709	
 > ■ MinValue1200 > ■ MinValue1200 > ■ ON1200 > ■ SupportedTypes 	Count	erStatus1200	2020-09-19	T00-51-17-1	067 D-+	aTuraa	11.51,10 700	
A maxvaue 1200 A minValue 1200 A	Count	erStatus1200 erTimeStamp1200	2020-08-18	3T09:51:17.2	286Z Dat	eTime	11:51:18.708	
Maxvalue (200 Maxvalu	Count	erStatus1200 erTimeStamp1200 ervalue1200	2020-08-18 3983	3T09:51:17.2	286Z Dat Int1	eTime 6	11:51:18.708	
Anacyate (200 Anacyate (200 Anacyate) ON1200 ON1200 SerialNumber SerialNumber SoftwareRevision Set Tasks	Count Count Count Count MaxVa	erStatus1200 erTimeStamp1200 ervalue1200 Ilue1200	2020-08-18 3983 10000	3T09:51:17.2	286Z Dat Int1 Int1	eTime 6 6	11:51:18.708 11:51:18.708 11:47:55.522	
 > ■ MinXvalue (200 > ■ MinXvalue (200 > ■ ON1200 > ■ ON1200 > ■ ServisinGrounter > ServialNumber > SoftwareRevision > SoftwareRevision > SoftwareRevision 	MinNo Count Count Count MaxVa MinVa	erStatus1200 erTimeStamp1200 ervalue1200 Iue1200 Iue1200	2020-08-18 3983 10000 100	3T09:51:17.2	286Z Dat Int1 Int1 Int1	eTime 6 6 6	11:51:18.708 11:51:18.708 11:47:55.522 11:48:16.687	
 MintValue (200 MintValue (200 ON1200 Supporterflypes RevisionCounter SoftwareKevision SoftwareKevision SoftwareKevision SoftwareKevision 	MinNo Count Count MaxVa MinVa ON120	erStatus1200 erTimeStamp1200 ervalue1200 ilue1200 ilue1200 i0	0 2020-08-18 3983 10000 100 false	3T09:51:17.2	286Z Dat Int1 Int1 Int1 Boo	eTime 6 6 6 olean	11:51:18.708 11:51:18.708 11:47:55.522 11:48:16.687 11:30:16.825	
 Instavate (200) Instavate (200) ON1200 Supported Types Revision Counter Serial Humber SoftwareRevision Server Sots Stations Types 	MinNo Count Count Count MaxVa MinVa ON120	erStatus1200 erTimeStamp1200 ervalue1200 Iue1200 Iue1200 0	0 2020-08-18 3983 10000 100 false	3T09:51:17.2	286Z Dat Int1 Int1 Boo	eTime 6 6 6 olean	11:51:18.708 11:51:18.708 11:47:55.522 11:48:16.687 11:30:16.825	
2.6.13 PLC-Status

PLC_1200 data block CounterData [DB5]

СР	U 1	500 - CPU 1200 → PLC_1	200 [CPU 12	11C DC/D((/DC] 🕨 Progra	am blocks 🕨 C	ounterData (DB5) 💦 💶 🖬 🗮 🗙
\$	🕐 🕐 💺 🧮 🕼 Keep actual values 🔒 Snapshot 🦄 🧐 Copy snapshots to start values 👢 🥵 🔭 📑						
	CounterData						
-		Name	Data type	Offset	Start value	Monitor value	Comment
1		🔻 Static					
2		I = MinNo1200	Int 🔳	0.0	1000	100	minimum counter reading (number)
3		MaxNo1200	Int	2.0	10000	8000	maximum counter reading (number)
4		Count1200	Bool	4.0	false	TRUE	Counter is counting
5	-	CountingON1200	Bool	4.1	false	TRUE	Enable counting
6	-00	CounterValue1200	Int	6.0	0	1396	CounterValue

PLC_1200 data block ReceivedValues [DB10]

СР	U 1	50	0 - CPU 1200 → PLC_1200) [CPU 1211C D	QDQDC]	Program blo	cks 🕨 Received	Values [DB10] 💦 🗖 🖬 🗙
∌	1	1	🐛 🋃 🗮 🍞 🛛 Keep actua	l values 🛛 🔒 Sr	napshot 🇯	🐴 🖳 🛛 Copy sna	pshots to start value	es 🖳 🖳 🎽 🔤
	Re	ceiv	/edValues					
		Na	me	Data type	Offset	Start value	Monitor value	Comment
1		•	Static					
2		•	ON_1500	Bool 🔳	0.0	false	TRUE	Counter is counting 1500
з		•	MinValue1500	Int	2.0	0	100	Minimum count 1500
4		•	MaxValue1500	Int	4.0	0	8000	Maximum count 1500
5	-00	•	CounterValue1500	Int	6.0	0	3594	Counter value1500
6		•	CounterStatus1500	DWord	8.0	16#0	16#0000_0000	Counter status1500
7		•	CounterTimeStamp	String	12.0			Counter Time Stamp

PLC_1500 data block CounterData [DB5]

CP	U 1	50	0 - CPU 1200 → PLC_1	500 [CPU 1511-1 Pl	N] 🕨 Prog	gram blocks 🔸	CounterData [DB5]	_ # = ×
₫	• 🚽	1	🐛 🋃 🗮 🏋 Keep ad	tual values 🛛 🔒 Sna	apshot 🛤	👆 🖳 🛛 Copy snap	shots to start values	B-B- 🕨 📑
	Co	unt	erData					
-		Na	me	Data type	Offset	Start value	Monitor value	Comment
1		•	Static					
2		•	MinNo1500	Int 🔳	0.0	1000	100	minimum counter reading (number)
з	-00	•	MaxNo1500	Int	2.0	10000	8000	maximum counter reading (number)
4	-00	•	Count1500	Bool	4.0	false	TRUE	Counter is counting
5	-00	•	CountingON1500	Bool	4.1	false	TRUE	Enable counting
6	-00	•	CounterValue1500	Int	6.0	0	7435	CounterValue

PLC_1500 data block ReceivedValues [DB10]

CF	U 1500 - CPU 1200 → PLC_1500 [CPU 1511-1 PN] → Program blocks → ReceivedValues [DB10] _ ■ ■ ■ ×							
10	× =	🕴 🔩 🛃 🎬 🎌 Keep actual	values 🔒 Snaps	hot 🛰	🖏 Copy snapshots to sta	rtvalues 🕵 🛃 🕨		
	ReceivedValues							
-		Name	Data type	Offset	Start value	Monitor value	Comment	
1		▼ Static						
2		 ON1200 	Bool 🔳	0.0	false	FALSE	Counter is counting 1200	
З		 MinValue1200 	Int	2.0	0	100	Minimum count 1200	
4		 MaxValue1200 	Int	4.0	0	10000	Maximum count 1200	
5		Countervalue1200	Int	6.0	0	4888	Counter value 1200	
6		CounterStatus1200	DWord	8.0	16#0	16#0000_0000	Counter status !200	
7		 CounterTimeStamp1200 	Date_And_Time	12.0	DT#1990-01-01-00:00:00	DT#2020-08-18-09:59:16.331	Counter Time Stamp 1200	
-	-	 CounterrimeStamp1200 	Date_And_lime	12.0	DI#1880-01-01-00:00:00	D1#2020-08-18-09:59:16.331	Counter time Stamp 1200	

2.7 Example 7 – Exchanging data between several S7 / S5 CPUs

On a system with three (3) S7 CPUs and two (2) S5 CPUs, data should be exchanged with one another. An S7 CPU with an Ethernet connection acts as a master and is connected to the IBH Link UA via a switch. The other CPUs have no Ethernet interfaces and are connected to the IBH Link UA via IBH Link S7 ++ or IBH Link S5 ++, via the switch. The master makes data available for all CPUs, these give information to the master.



2.7.1 CPU 312 connection via IBH Link S7++

The *IBH Link* **S7++** is an Ethernet converter. The standard TCP / IP protocol is used. The user benefits from all the advantages of Ethernet without any problems.



The use of Simatic Net and the use of a CP

communication processor is not necessary on either the PC or the PLC side.

Configuration of the IBH Link S7 ++

Open the IBH Network settings dialog box to deactivate the option Configuration with *NetPro/TIA*.

BH Network settings	– 🗆 🗙					
<u>File</u> <u>Stations</u> IBH <u>Links</u> <u>Options</u> <u>H</u> elp						
Station:						
Station Name	Address					
Master CPU S7-416 local	192.168.1.10					
PLC_1-CPU 312-IBH Link S7++	192.168.1.12:1099					
PLC_2-CPU 312-IBH Link S7++	192.168.1.17:1099					
PLC_3 IBH Link S5++ CPU103	192.168.1.13:10010					
PLC_4-IBH Link S5++ CPU941	192.168.1.19:10010					
Settings:						
New station Change station	Delete station					
IBH Link S7 IBH Link S5 IBH Link S5	S5++ Language					
Close Search and configure IBH L Close HS devices.	ink S7, Plus, S7++ and S7+					



pe Serial Nu HS7PLC 0	mber IP Address	Station name	Firmware
4S7PLC 0			
1011 EQ 0	192.168.1.10	Master CPU S7-416 local	V0.000
50MPI 66361	192.168.1.17 🚤	PLC_2-CPU 312-IBH Link S7++ .	V2.168
HLNKUA 5145	192.168.1.14 🔀	mark one after the other	
50MPI 25208	192.168.1.12 🕌	PLC_1-CPU 312-IBH Link S7++	V2.168
,		0.0.0.0)
	JUMPI 65361 HLNKUA 5145 JOMPI 25208	190811 192,168,1.17 HLNKUA 5145 192,168,1.14 50MPI 25208 192,168,1.12	JOURPI 66361 192.168.1.17 PEC_2CPU 3124BH Link \$7+++ HLNKUA 5145 192.168.1.14 mark one after the other JOMPI 25208 192.168.1.12 PLC_1-CPU 3124BH Link \$7++

Deactivate the option Configuration with NetPro / TIA

IBHLink settings - 00066361 M	IAC: 00-02-A2-49-64-C6 ×				
Network MPI/Profibus	Time synchronisation Firmware Diagnosti				
Address settings: Network name: IP-Address: Subnet mask: Gateway: IBHNet port (Port 1099 i	IBH Link S7++ 17 F Static 192 168 1 17 255 255 0 C DHCP 192 168 1 17 C Book-P 192 168 1 17 C Book-P s always active): 0 0 0 0				
Aumernancaion Username: Password:	admin ***** Change password				
Options Configuration with NetPro/TIA deactivate Disable Webserver specify for both IBH Link S7++					
Save permanently	Reboot Cancel				

IBH Link S7++ MPI addresses

Diagnostics are available to show the MPI bus parameters and the MPI addresses in use.

HLink settings -	00066361 MAC: 0	0-02-A2-49-64-C6	5	×
<u>M</u> PI/Profibus	<u>T</u> ime synchronisation	n Eirmware 🤇	<u>D</u> iagnostics	Station 💶 🕨
Network statu	s / Diagnostics			
Test	Lifelist OK			
Station addre	ss: 1 10	Fixed bus p C Automatic of	arameter setti detection	ings
Bus paramete	ers:			
Baudrate: 18 Tslot_Init: 10)7.5 kBit/s)0			^
Max. Tsdr: 6 Min. Todr: 11	0			
Tset: 1	-	MPI-Ad	resse	
Toui: 0	MPI-Adresse CF	U IBH Lin	k \$7++	*
Bus Nodes	¥	-		
0 1 2	345678	9 10 11 12 13	14 15 16 1	17 18 19
120 🗆 🗆 🗖		Key		
· · · · · · · · · · · · · · · · · · ·		Station passi	ive	
<u> </u>		Station activ	e readu	
	Click		,	
Save perma	mently	Reboot	1	Cancel

2.7.2 PLC programs

The S5 / S7 CPUs programs count value until *MaxValue* is reached. Then the *Value* is counted down until *MinValue* is reached. This up and down counting is repeated continuously.

The master PLC OPC tag **Control_ON** enables the counting. The master PLC specifies the numerical values **MaxValue** and **MinValue** for each CPU. Each CPU reports back the current counter **Value** and counting active (**Controlling_is_ON**) to the master PLC.

The programs are in the *STEP*[®] 7 - *SIMATIC Manager* format for the *S7 CPUs* and in *S5 for Windows*[®] (*STEP*[®] 5) for the *S5 CPUs*.

IP addresses / PLC programs of the devices used

Device	IP / MPI address
IBH Link UA	192.168.1.14
CPU 416 Master PLC project / program: Multi CPU's 416 Master / CPU 416 Master	192.168.1.10
S7 PLC 1 – [CPU 312] PLC project / program: Multi CPU's S7 PLC_1 / S7 CPU 1	IBH Link S7++ on the S7 PLC 1 192.168.1.12 MPI- address IBH Link S7++: 10 MPI- address CPU: 2
S7 PLC 2 – [CPU 312] PLC project / program: Multi CPU's S7 PLC_2 / S7 CPU 2	IBH Link S7++ on the S7 PLC 2 192.168.1.17 MPI- address IBH Link S7++: 10 MPI-address CPU: 2
S5 PLC 3 – [S5 CPU103] PLC program: Multi CPUs S5 PLC_3.S5P	IBH Link S5++ on the S5 PLC 3 192.168.1.13
S5 PLC 4 – [S5 CPU941] PLC program: Multi CPUs S5 PLC_4.S5P	IBH Link S5++ on the S5 PLC 4 192.168.1.19

2.7.3 Calling the IBH OPC UA Editor

the Project tab.

Double-click the **IBH OPC UA Editor** icon to open the program window.

Open the Project window by clicking on





Open the **Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.



The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server Connection dialog box

Server connection properties			\times
Name of the server connection:	IBH Link UA		
Server address:	<u></u>		_
Host name or IP address	192.168.1.14		
Port:	48010		
O URL opc.tcp://192.16	8.1.14:48010		
	Select endpoir	nt	
Security settings:	⊢Message mode: —		
C Basic128Bsa15	C Signatur		
C Basic256	C Signature a	and Encryption	
C BasicSha256		·	
C Aes1285ha256RsaOaep		·	
C Aes256Sha256RsaPss		s Properties	
Login: • Anonymous			
C User name and password			
User name:			
Passwort:		🗖 Store	
Session Name:	e7: Multi CPU's S7	7	
Variables format:	t 💌		
Confirm)	1		
]		

All necessary settings are shown. The possible encryptions of the data to be transmitted are displayed. The example is using the security method *None*. By clicking *OK* the content of the dialog box is saved and closed.

The settings for the connection to the *IBH Link UA* OPC UA server are displayed in the right part of the *project window*.



2.7.4 Inserting New controls (PLCs)

💹 example 7 - multi CPUs S7.opu - OPCUAEdit	- 🗆 🗡	<
File Edit Help		
New server connection		
Project New control	nection	_
	IBH_Link_UA	
BH_Link_UA	192.168.1.14	
New server connection	opc.tcp://192.168.1.14:4801	0
New control	No	
Properties Click Add external data	None None	
Transfer selected configuration to the OPC UA Server	-	
Read complete configuration from OPC UA Server	Anonymous example7: Multi CPU's S7	
Import		
Export	Compact	
Project 🗟 Server 🖾 Certifi		
	CAF	

The **New control** command from the context menu (or menu Edit / New control) opens the dialog box **New control** to specify the access to the control (CPU).

Dialog box New controller - CPU 416 master

🐱 New control	<
Control name: CPU 416 Master Host name / IP address: 192.168.1.10	
S7 TCP/IP Rack number: 0 Slot number: 2	
Position of the target module:	
Target modul at the same rack	
O Via MPI/DP subnet accessible rack	
MPI/DP address of the target CPU: 2	
C Via TCP/IP subnet accessible rack	
TCP/IP address of the target CPU: 0 . 0 . 0 . 0	
C Via H1 subnet accessible rack	
H1 address of the target CPU: 00.00.00.00.00.00	
Subnet ID: 0000 . 0000	
C 57 200 TCP/IP Own TSAP: 0100	
C 57 1500 TCP/IP	
confirm Click 1	
OK Cancel Test connection Help	

Test connection

After completing the New Control dialog

box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.



Dialog box New controller - S7 PLC 1 CPU 312

👿 New control 🛛 🕹
Control name: 57 PLC 1 CPU 312 Host name / IP address: 192.168.1.12
SZ TCP/IP Rack number: 0 Slot number: 2
Position of the target module: MPL-address S7 PLC1 [CPU 312] C Via MPT/DP submet accessible tack
MPI/ <u>D</u> P address of the target CPU: 2 C <u>Via</u> TCP/IP subnet accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 .
H1 address of the target CPU: 00.00.00.00.00.00 Sybnet ID: 0000
C 57 200 TCP/IP C 57 1200 TCP/IP PIC TSAP: 0101
C 57 1500 TCP/IP confirm QK Cancel Test connection <u>H</u> elp

The connection to the online connected **S7 PLC 1** can be tested.



Dialog box New controller - S7 PLC 2 CPU 312

🔉 New control	×
Control name: 57 PLC 2 CPU 31 Host name / IP address: 192.168.1.17	2 IP-address IBH Link S7++
• SZ TCP/IP Rack number: 0	<u>S</u> lot number: 2
Position of the target module: (interpret modul at the same rack) (Via MPI/OP subnet accessible rack	MPI-address S7 PLC2 [CPU 312]
MPI/ <u>D</u> P address of the target	CPU: 2
TCP/IP address of the target	CPU: 0 . 0 . 0 . 0
H1 address of the target	CPU: 00.00.00.00.00 net ID: 0000 <u>.</u> 0000
С 57 200 ТСР/IP С 57 1200 ТСР/IP С 57 1200 ТСР/IP 2 2 2 2	ISAP: 0100
QK <u>C</u> ancel Test	.connection <u>H</u> elp

The connection to the online connected **S7 PLC 2** can be tested.



Dialog box New controller – S5 PLC 3 CPU 103

🐱 New control 🛛 🕹
Control name: 55 PLC 3 CPU 103 Host name / IP address: 192.168.1.13
Position of the target module:
C Target modul at the same rack
C Via MPI/DP subnet accessible rack
MPI/ <u>D</u> P address of the target CPU: 2
C Via TCP/IP subnet accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0
C Via H1 subnet accessible rack
H1 address of the target CPU: 00.00.00.00.00.00
Subnet ID: 0000 . 0000
C 57 200 TCP/IP Own TSAP: 0100
O 57 <u>1</u> 200 TCP/IP
OK Cancel Test connection Help

The connection to the online connected **S5 PLC 3** can be tested.



Dialog box New controller – S5 PLC 3 CPU 103

New control			×
Contr Host n <u>a</u> me / IP - Protocol:	ol <u>n</u> ame: 55 PLC 4 CPU 941 address: 192.168.1.19	IP-address IBH Link S5++	+
	Rack number: 0	<u>S</u> lot number: 2	
Position of th	e target module:		
• Target	modul at the same rack		
⊂ Via <u>M</u> P	I/DP subnet accessible rack		
м	PI/ <u>D</u> P address of the target (:PU: 2	
C <u>V</u> ia TCI	/IP subnet accessible rack		
т	CP/IP address of the target (PU: 0.0.0.	0
C Via H1	subn <u>e</u> t accessible rack		
	H1 address of the target (PU: 00.00.00.00.00.00	
	Sybre	et ID: 0000 . 0000	
C 57 200 TCP/IP	O <u>w</u> n TS	SAP: 0100	
C 57 1500 TCP/IP		SAP: 0101	
confirm	₽	Click 1	1
QK	<u>C</u> ancel Test o	onnection	Help

The connection to the online connected **S5 PLC 4** can be tested.



To accept and close the *New control* dialog box settings click on *OK*.

The inserted PLC controls are displayed in the left project window.

🗽 example 7 - multi CPUs S7.opu - OPCUAEdit			—		×		
File Edit Help							
🗋 📂 🛃 l 🖨 🞯							
Project 🗸 🕈 🗙	Name of the server conne	ection					
🔐 🛷 🖌 X 🗈 🕲 🗛 🛆	Name	IBH Lin	k UA				
	Server address						
E-S IBH Link UA	Host name / Address	192.168	3.1.14				
🖨 🌆 CPU 416 Master	Port	48010					
🔤 Variables	URL	opc.tcp://192.168.1.14:48010					
🖕 🌆 S7 PLC 1 CPU 312	Inverse connection	No					
🚽 🚰 Variables	Security settings						
🖃 🌆 S7 PLC 2 CPU 312	Security policity	None					
📲 Variables	Message mode	None					
55 PLC 3 CPU 103	Authentication settings						
Variables	Login	Anonymous					
5 PLC 4 CPU 941	Session name	example	e7: Multi C	PU's S7			
Jung 051 204 010 541	Other settings						
	Variables format	Compac	at				
Project							
				CAPS	NUM		

2.7.5 Program assignment

The *Assign program* command is used to open the *Program Selection* dialog box.

🗰 example 7 - multi CPUs S7.	.opu - OPCUAEdit			—	
<u>F</u> ile <u>E</u> dit <u>H</u> elp					
🗋 💕 🛃 🕼 💿					
Project	→ ‡ ×	🗆 Nam	e of the control		
🧶 📈 I 🤟 🖌 🖻 🖌 🛦	A	Name		CPU 416 Maste	er
	NH	🗆 Offlir	ne program assigi	nment	
E-13 IBH Link UA	right click	Progr	am type	No program as:	signment
🔁 🛄 CPU 416 Master		Progr.	am path		
🔤 Variables	Delete				
🚊 🛄 S7 PLC 1 CPU 312	Cut		tion		
🔤 🚰 Variables	Сору			S7 TCP/IP	
🗄 📶 S7 PLC 2 CPU 312	Insert		ess	192.168.1.10	
		click	ition	Target modul a	it the same rack
🖃 🌆 S5 PLC 3 CPU 103	Assign program	n		0	
🛄 Variables	Update progra	m assignme	nt	2	
⊡ S5 PLC 4 CPU 941 	Properties				
Project 🖾 Server 🖾 Cert	tificates				
					CAPS NUM

Select Program dialog box

Select the PLC program in the **Select program**

name. Mark the PLC program (CPU) and click OK to assign the PLC program.

Select program -	—		×
OPC UA Editor Manual			~
example 7 - multi CPUs S7			
Multi CPUs 55 PLC_3 - S5 PLC 3 CPU 103			
📮 🕞 Multi CPU's 416 Master			
E- 🍄 CPU 416 Master			
CPU 416 Master CPU 416 Master			
📄 👘 🤚 Multi CPU's S7 PLC_1			
[⊡			
57 CPU 1 -S7 PLC 1 CPU 312			
📄 👘 📴 Multi CPU's S7 PLC_2			
PLC_2			
📓 57 CPU 2 🖛 S7 PLC 2 CPU 312			× .
Path: A:\OPC UA Editor Manual\example 7 - multi CPUs S7\Multi CPU's 416 Master	1		
confirm)			
<u>Q</u> K <u>C</u> ancel		Help	

Assigned PLC program

In the right part of the project window information about the *program assignment* are displayed.

🚾 example 7 - multi CPUs S7.opu - OP	CUAEdit	—		×
File Edit Help				
🗋 💕 🛃 🕼 🔞				
Project 👻 🕈 🗙	🛛 🖂 Name of the control			
🖄 📸 🗙 🌡 🖻 🛍 🗼 🖗	Name CPU 416 Master			
BH Link UA	Program type STEP7 program Program path A:\DPC UA Editor Manual\example 7 - multi CPUs S7\Multi CPU's 416 Master\M Childre area	ulti CPU's	416 Mas	er.s7p
S7 PLC 1 CPU 312	Cru + 10 master		_	_
E- 🛅 S7 PLC 2 CPU 312	Host name / Address 192.168.1.10			
- J Variables	Targe module position Target modul at the same rack Rack number 0			
- 🚰 Variables	Slot number 2			
ia - 🛄 S5 PLC 4 CPU 941 └──j⊒ Variables				
Project Server Server	1			
			CAPS	NUM 🔡

The corresponding PLC program must be assigned to each of the five (5) PLC controls.

2.7.6 Define variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window. The selected *OPC tags* are listed in the lower part of the right window.

CPU 416 master – OPC tags

All variables of the data blocks *Variable to CPU's [DB2]* and *Variable from CPU's [DB5]* are defined as OPC tags.

🗱 example 7 - multi CPUs S7.opu - OPO	CUAEdit							
File Edit Help								
🗋 💕 🛃 🕼 🞯								
Project 🔫 A 🗙								
Project Projec								
	Generic	CPU 941 Count v	alue					
	🖆 🗙 🌡 🖻 🛍 🍎 🏪 🦯 🌱							
	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment
	Variable to CPU's.Control ON	DB2.DBX 0.0	BOOL	.1	Program	RW	Boolean	CPUs should count
	Variable to CPU's.MaxValue_1	DB2.DBW 2	INT	2	Program	RW	Int16	minimum count value PLC 1 S7 CPU 312
	Variable to CPU's.MaxValue_2	DB2.DBW 4	INT	2	Program	RW	Int16	minimum count value PLC 2 S7 CPU 31
	Variable to CPU's.MaxValue_3 taken as	DB2.DBW 6	INT	2	Program	RW	Int16	minimum count value PLC 1 S5 CPU 10
	Variable to CPU's.MaxValue_4 OPC tags	DB2.DBW 8	INT	2	Program	RW	Int16	minimum count value PLC 1 S5 CPU 94
	Variable to CPU's.MinValue_1	DB2.DBW 10	INT	2	Program	RW	Int16	maximum count value PLC 1 S7 CPU 31
	Variable to CPU's.MinValue_2	DB2.DBW 12	INT	2	Program	RW/	Int16	maximum countivalue PLC 2 S7 CPU 31
	Variable to CPU's MinValue_3	DB2.DBW 14	INT	2	Program	RW/	Intio	maximum count value PLC 3 S5 CPU 10
	Variable from CPU's Controlling is ON 1	DB5 DBY 0.0	ROOL	1	Program	R/W	Boolean	DLC 1 S7 CDI 212 county
	Variable from CPU's Controlling is ON 2	DB5.DBX 0.1	BOOL	.1	Program	RW/	Boolean	PLC 2 S7 CPU 312 counts
	Variable from CPU's.Controlling is ON 3	DB5.DBX 0.2	BOOL	.1	Program	RW	Boolean	PLC 3 S5 CPU 103 counts
	Variable from CPU's.Controlling_is_ON_4	DB5.DBX 0.3	BOOL	.1	Program	RW	Boolean	PLC 4 S5 CPU 941 counts
	Variable from CPU's.Value_1	DB5.DBW 2	INT	2	Program	RW	Int16	PLC 1 S7 CPU 312 Count value
	Variable from CPU's.Value_2	DB5.DBW/4	INT	2	Program	RW	Int16	PLC 2 S7 CPU 312 Count value
	Variable from CPU's.Value_3	DB5.DBW 6	INT	2	Program	RW	Int16	PLC 3 S5 CPU 103 Count value
	Variable from CPU's.Value_4	DB5.DBW 8	INT	2	Program	RW	Int16	PLC 4 S5 CPU 941 Count value
Project Server Scertificates								
,								CAPS NUM

S7 PLC 1 CPU 312 – OPC tags

Only the five (5) variables of the data block *Counter Values* [DB2] are defined as OPC tags.

🎆 example 7 - multi CPUs S7.opu - OPC	CUAEdit								—		×
File Edit Help											
🗋 💕 🛃 🚓 📀											_
Project v 0 × W v 0 × W I hit UA CPU416 Master Variables Variables Variables CPU416 Master Variables CPU416 Master CPU416 Master CPU4	Variables Program variables Program variables Program variables Program Progr	Counter Values P /minimum coun //minimum cour DL //PLC 1 S7 Cl I : BOOL //Feed unt value PLC 1 S	LC 1 S7 CPU ter level PLC ter level PLC 9U 312 shou back from P 57 CPU 312	312 : 1 S7 CPL : 1 S7 CPI : 1 S7 CPI : 1 S7 C : 1 S7 C	J 312 J 312 :PU 312						
- 🚰 Variables	🖆 🗙 🕺 🖻 🛍 🎽 🖌 💎										
🖻 🋄 S5 PLC 4 CPU 941	Name	Address	PLC type	Leng	Origin	Access	OPC type	Comment			
Vanables	Counter Values.MinValue_1 taken as Counter Values.MaxValue_1 OPC tag Counter Values.Control_ON_1 Counter Values.Controling_is_ON_1 Counter Values.Value_1	DB2.DBW 0 DB2.DBW 2 DB2.DBX 4.0 DB2.DBX 4.1 DB2.DBW 6	INT INT BOOL BOOL INT	2 2 .1 .1 2	Program Program Program Program Program	RW RW RW RW	Int16 Int16 Boolean Boolean Int16	minimum counter minimum counter PLC 1 S7 CPU 312 s Feedback from PLC Count value PLC 1	level PLC level PLC hould co 1 S7 CPU S7 CPU 3	1 S7 CPI 1 S7 CPI unt U 312 12	U 312 U 312
										CAPS I	NUM

S7 PLC 2 CPU 312 – OPC tags

Only the five (5) variables of the data block *Counter Values* [DB2] are defined as OPC tags.

💹 example 7 - multi CPUs S7.opu - OP	CUAEdit							—		×
File Edit Help										
🗋 💕 🛃 🚓 🎯										
Project Image: Constraint of the second se	Variables Definition	Counter Values PLC 2 //minimum counter l //minimum counter l 0. //PLC 2 S7 CPU 3 2 : BOOL //Feedbacl unt value PLC 2 S7 Cf	: S7 CPU 312 evel PLC 2 S7 C level PLC 2 S7 C 312 should cour k from PLC 2 S7 PU 312	PU 312 PU 312 it *CPU 312						
🗄 🛄 S5 PLC 4 CPU 941	Name	Address PL	LC type Leng.	Origin	Access	OPC type	Comment			
Variables	Counter Values.MinValue_2 Counter Values.MaxValue_2 Counter Values.Control_ON_2 Counter Values.Oventrol_ON_2 Counter Values.Value_2 taken as OPC tags	DB2.DBW 0 IN DB2.DBW 2 IN DB2.DBX 4.0 B DB2.DBX 4.1 B DB2.DBW 6 IN	NT 2 NT 2 OOL .1 OOL .1 NT 2	Program Program Program Program Program	RW RW RW RW	Int16 Int16 Boolean Boolean Int16	minimum counter l minimum counter l PLC 2 S7 CPU 312 si Feedback from PLC Count value PLC 2 S	evel PLC evel PLC nould co 2 S7 CPI S7 CPU 3	2 S7 CPI 2 S7 CPI unt J 312 12	J 312 J 312
									CAPS	an Maria

S5 PLC 3 CPU 103 – OPC tags

Two (2) flag tags and all (3) data of the data block *Counter Values_3 [DB2]* are defined as OPC tags.

🎆 example 7 - multi CPUs S7.opu - OPC	CUAE dit							-		×
File Edit Help										
🗋 🚅 🛃 🦣 🎯										_
Project • 9 × x • 9 × x • 9 × x • 9 × x • 9 × x • 9 × x • 1 × 16 × x										
	🖆 🗙 🕺 🖻 🖏 🍅	🋅 🥖 🌱								
	Name	Address	PLC ty	Length	Origin	Access	OPC type	Comment		
Project 행장 Server / 행장 Certificates	Control_ON_3 Controlling_is_ON_3 CounterValues_3.D_0 CounterValues_3.D_1 CounterValues_3.D_2	M 1.1 M 1.4 DB2.DBW 0 DB2.DBW 2 DB2.DBW 4	BOOL BOOL INT INT INT	.1 .1 2 2 2	Program Program Program Program Program	RW RW RW RW	Boolean Boolean Int16 Int16 Int16	PLC 3 S5 CPU 10 feedback of PLC MinValue PLC 3 MaxValue PLC 3 S5 Value PLC 3 S5	Genable co 3 S5 CPU S5 S5 S5 OPC	n as tags
									CAPS	NUM

S5 PLC 4 CPU 941 – OPC tags

Two (2) flag tags and all (3) data of the data block *Counter Values_3 [DB2]* are defined as OPC tags.

🐹 example 7 - multi CPUs S7.opu - OPC	UAEdit								-		×
File Edit Help											
🗋 🚅 🔒 🏟 🔞											
Project V 3 X State of the second se		ol_ON_4: BOO olling_is_ON_4 BOOL //max BOOL //mini 4_MW: WORL 4: BOOL //cou es_4 (DB 2) /, NT //minim NT // maxim NT // countri	L //PLC : BOOL . imum reac) //coun counting o nting up /Counter \ um count um count er value S5	4 SS CPU 9 //feedback ched hed ter value P iowm /alues er value SS er value SS PLC 4	41 enable c of PLC 4 S5 LC 4 S5 CPL PLC 4 PLC 4	ounting i CPU 94	1				
	🖆 🗙 🐰 🗈 🛍 🍎	🋅 🥖 🌱									
	Name	Address	PLC ty	Length	Origin	Access	OPC type	Comment			
	Control_ON_4	M 1.1	BOOL	.1	Program	RW	Boolean	PLC 4 S5 CP	U 941 ei	nable co	unting
	Controlling_is_ON_4	M 1.4	BOOL	.1	Program	R₩	Boolean	feedback of	PLC 4 S	5 CPU 9	41
	CounterValues_4.D_0	DB2.DBW 0	INT	2	Program	RW	Int16	minimum c	ounter	value S5	PLC 4
	CounterValues_4.D_1	DB2.DBW 2	INT	2	Program	RW	Int16	maximum o	ounter	value S5	PLC 4
	CounterValues_4.D_2	DB2.DBW 4	INT	2	Program	R₩	Int16	counter val	ue S5 P	LC 4	
Log Project Server St Certificates										CAPS 1	NUM

2.7.7 Add external data

Right-click on *IBH Link UA* and execute the *Add External Data ...* command.

🚈 example 7 - multi CPUs S	57.ори - ОРС	CUAEdit	-	□ ×
File Edit Help				
🗋 📂 🛃 🕼 📀				
Project	→ # ×	Name of the server control	nnection	
🖋 📸 🗙 👗 🛍 🛍 🛛	↑ ŵ	Name Server address	IBH Link UA	
E- CPU 416 Master	click)	Host name / Address	192.168.1.14	
Variables	New s New c Proper Add ex Add m Import Export	erver connection ontrol rties kternal data indbus configuration t		4:48010
Variables	ertificates	Variables format	Compact	

No

The OPC tags defined in the IBH OPC UA Editor are to be used. Confirm the dialog box with **No**.



2.7.8 Variable transfer – define source and destination OPC tags

External data with additional commands was inserted in the left part of the project window.

🧱 example 7 - multi CPUs S7.opu - OPCU	AEdat — 🗆 🗙
File Edit Help	
🗋 💕 🛃 🕼 🛞	
Project V 3 X Project V 3 X Projec	Source : 0 Source : 0 Sourc
	Image:
	XIV
	Source server Source variable Destination server Destination variable Data type
Project Server Server Gertificates	
	CAPSINIM

Mark *Variable transfer* to define the source and destination OPC tags. The right project window is divided into two parts. The *Source* window is on the left and the *Destination* window on the right. The Source window and the Destination window lists the OPC tags of the OPC server and the PLC Controllers.

The *OPC tags* to be read (read variables) are specified in the **Source** window. The **OPC tag** to be linked with the variable read is specified in the **Destination** window.

Variable connection

Mark the source OPC tag and right-click the destination OPC tag.

Source window

×./
Source : IBH Link UA::IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON
🖃 📲 IBH Link UA
🚊 📶 CPU 416 Master
🚊 🛅 Variable to CPU's (DB 2) 🛛 //Variable to the S5 CPUs and S7 CPUs
🖉 Control_ON : BOOL _//CPUs should count
mark

Destination window

The command *Connect variable (standard parameters)* finalizes the definition. The connected OPC tags are listed in the lower part of the right project window.



Established connection



Once a connection has been established, the symbols in front of the OPC tags changes. In addition to the *value*, the source OPC tag also offers the *time stamp* and the *status* of the OPC tag. To use these OPC tags, the corresponding destination variables must be available.

Source variables connection established



Destination variable connection established



Defined Connections

Source	Destination
CPU 416 Master; Variable to CPU's [DB2]:	S7 PLC 1 CPU 312; Counter Values (DB2):
Control_ON	Control_ON_1
MaxValue_1	MaxValue_1
MinValue_1	MinValue_1
	S7 PLC 2 CPU 312; Counter Values (DB2):
Control_ON	Control_ON_2
MaxValue_2	MaxValue_2
MinValue_2	MinValue_2
	S5 PLC 3 CPU 103; F (Flags)
Control_ON	Control_ON_3
	Counter Values (DB2):
MaxValue_3	MaxValue_3
MinValue_3	MinValue_3
	S5 PLC 4 CPU 941; F (Flags)
Control_ON_4	Control_ON_4
	Counter Values (DB2):
MaxValue_4	MaxValue_4
MinValue_4	MinValue_4
S7 PLC 1 CPU 312; Counter Values (DB2):	CPU 416 Master; Variable from CPU's [DB5]:
Controlling_is_ON_1	Controlling_is_ON_1
Value_1	Value_1
S7 PLC 2 CPU 312; Counter Values (DB2):	
Controlling_is_ON_2	Controlling_is_ON_2
Value_2	Value_2
S5 PLC 3 CPU 103; F (Flags)	CPU 416 Master; Variable from CPU's [DB5]:
Controlling_is_ON_3	Controlling_is_ON_3
Counter Values (DB2):	
Value_3	Value_3
S5 PLC 4 CPU 941; F (Flags)	
Controlling_is_ON_4	Controlling_is_ON_4
Counter Values (DB2):	
Value_4	Value_4

The connections are displayed in the lower part of the right project window.

X/Y						
Source server	Source variable	Destination server	Destination variable	Data type	Source name Des	ination name
IBH Link UA	Control_ON	IBH Link UA	Controlling_is_ON_1	Boolean	IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.Controlling_is_ON_1
IBH Link UA	Control_ON	IBH Link UA	Control_ON_2	Boolean	IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON	IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Control_ON_2
IBH Link UA	Control_ON	IBH Link UA	Control_ON_3	Boolean	IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON	IBH Link UA.S5 PLC 3 CPU 103.Control_ON_3
IBH Link UA	Control_ON	IBH Link UA	Control_ON_4	Boolean	IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON	IBH Link UA.S5 PLC 4 CPU 941.Control_ON_4
IBH Link UA	MaxValue_1	IBH Link UA	MaxValue_1	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_1	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.MaxValue_1
🚺 IBH Link UA	MinValue_1	IBH Link UA	MinValue_1	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MinValue_1	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.MinValue_1
🚺 IBH Link UA	MaxValue_2	IBH Link UA	MaxValue_2	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_2	IBH Link UA.S7 PLC 2 CPU 312.Counter Values.MaxValue_2
IBH Link UA	MinValue_2	IBH Link UA	MinValue_2	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MinValue_2	IBH Link UA.S7 PLC 2 CPU 312.Counter Values.MinValue_2
IBH Link UA	MaxValue_3	IBH Link UA	D_1	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_1
IBH Link UA	MinValue_3	IBH Link UA	D_0	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MinValue_3	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_0
IBH Link UA	MaxValue_4	IBH Link UA	D_1	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_4	IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_1
IBH Link UA	MinValue_4	IBH Link UA	D_0	Int16	IBH Link UA.CPU 416 Master.Variable to CPU's.MinValue_4	IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_0
IBH Link UA	Controlling_is_ON_1	IBH Link UA	Controlling_is_ON_1	Boolean	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.Controlling_is_ON_1	IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_1
IBH Link UA	Value_1	IBH Link UA	Value_1	Int16	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.Value_1	IBH Link UA.CPU 416 Master.Variable from CPU's.Value_1
IBH Link UA	Controlling_is_ON_2	IBH Link UA	Controlling_is_ON_2	Boolean	IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Controlling_is_ON_2	IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_2
🚺 IBH Link UA	Value_2	IBH Link UA	Value_2	Int16	IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Value_2	IBH Link UA.CPU 416 Master.Variable from CPU's.Value_2
IBH Link UA	Controlling_is_ON_3	IBH Link UA	Controlling_is_ON_3	Boolean	IBH Link UA.S5 PLC 3 CPU 103.Controlling_is_ON_3	IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_3
IBH Link UA	D_2	IBH Link UA	Value_3	Int16	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_2	IBH Link UA.CPU 416 Master.Variable from CPU's.Value_3
IBH Link UA	Controlling_is_ON_4	IBH Link UA	Controlling_is_ON_4	Boolean	IBH Link UA.S5 PLC 4 CPU 941.Controlling_is_ON_4	IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_4
IBH Link UA	D_2	IBH Link UA	Value_4	Int16	IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_2	IBH Link UA.CPU 416 Master.Variable from CPU's.Value 4
						CAPS NUM



Linked read variables have this green symbol.

X /	
Source : 0	
E- BH Link UA	
→ → Variable to CPU's (DB 2) //Variable to the S5 CPUs and S7 CPUs	
The O Control_ON : BOOL //CPUs should count	
😥 🖗 MaxValue_1 : INT //minimum count value PLC 1 S7 CPU 312	
🗓 🧳 MaxValue_2 : INT //minimum count value PLC 2 S7 CPU 312	
🚋 🛷 MaxValue_3 : INT //minimum count value PLC 1 S5 CPU 103	
🚋 🛷 MaxValue_4 : INT //minimum count value PLC 1 S5 CPU 941	
🔠 🐠 MinValue_1 : INT //maximum count value PLC 1 S7 CPU 312	
🔠 🖉 MinValue_2 : INT //maximum count value PLC 2 S7 CPU 312	
🗄 🧳 MinValue_3 : INT //maximum count value PLC 3 S5 CPU 103	
■ Jariable from CPU's (DB 5) //S5 CPUs and S7 CPUs send data	
Enter Counter Values (DB 2) //Counter Values PLC 1 S7 CPU 312	
MinValue 1: INT //minimum counter level PLC 1 S7 CPU 312	
MaxValue 1 : INT //minimum counter level PLC 1 S7 CPU 312	
Control_ON_1 : BOOL //PLC 1 S7 CPU 312 should count	
💼 🙋 Controlling_is_ON_1 : BOOL //Feedback from PLC 1 S7 CPU 312	٦.
庄 🖉 🖉 Value_1 : INT //Count value PLC 1 S7 CPU 312	J
🔁 📶 S7 PLC 2 CPU 312	
🖶 🗁 F (Flag)	
🖻 🛄 Counter Values (DB 2) //Counter Values PLC 2 S7 CPU 312	
MinValue_2: INT //minimum counter level PLC 2 S/ CPU 312	
MaxValue_2 : INT //minimum counter level PLC 2 S7 CPU 312	
Control_UN_2: BUOL //PLC2S/CPU3I2 should count	
Value 2 : INT //Count value DLC 2 \$7 CDU 312	
Generic	,
⊡ ⊡ F (Flag)	
Control ON 3 : BOOL //PLC 3 S5 CPU 103enable counting	
🕞 🖉 Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103	
🤍 Max : BOOL //maximum reached	
🔷 Min : BOOL //minimum reached	
📀 Value_3_MW : WORD //counter value PLC 3 S5 CPU 103	
Down_3: BOOL //counting down	
Up_3: BOOL //counting up	
D Outervalues_3 (DB 2) //Counter Values	
D 1 UNT // MaxValue PLC 3 55	
D 2 INT // Value PLC 3 S5	
Generic	







Linked target variables have this blue symbol.

Destination : 0 IBH Link UA CPU 416 Master S7 PLC 1 CPU 312 F S7 PLC 2 CPU 312 F S7 PLC 2 CPU 312 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 IBH Link UA CPU 416 Master S7 PLC 1 CPU 312 S7 PLC 2 CPU 312 S5 PLC 3 CPU 103 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Own_3 : BOOL //counting down
 CPU 416 Master S7 PLC 1 CPU 312 S7 PLC 2 CPU 312 S7 PLC 2 CPU 103 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 O Down_3 : BOOL //counting down
S7 PLC 1 CPU 312 S7 PLC 2 CPU 312 S7 PLC 2 CPU 312 S7 PLC 3 CPU 103 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting O Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 O Max : BOOL //maximum reached O Min : BOOL //minimum reached O Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 O Down_3 : BOOL //counting down
S7 PLC 2 CPU 312 S5 PLC 3 CPU 103 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting O Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 O Max : BOOL //maximum reached O Min : BOOL //minimum reached O Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 O Down_3 : BOOL //counting down
 SS PLC 3 CPU 103 F (Flag) Control_ON_3 : BOOL //PLC 3 SS CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 SS CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 SS CPU 103 Down_3 : BOOL //counting down
 F (Flag) Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 Control_ON_3 : BOOL //PLC 3 S5 CPU 103enable counting Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 Controlling_is_ON_3 : BOOL //feedback of PLC 3 S5 CPU 103 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 Max : BOOL //maximum reached Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 Min : BOOL //minimum reached Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
 Value_3_MW : WORD //counter value PLC 3 S5 CPU 103 Down_3 : BOOL //counting down
Own_3: BOOL //counting down
Up_3:BUOL //counting up
Countervalues_3 (DB 2) //Counter values
D 1. INT // MinValue PLC 3.55
D 2 INT // Waxvalue PLC 3 S5
Generic
Control ON 4: BOOL //PLC 4 S5 CPU 941 enable counting
Controlling is ON 4: BOOL //feedback of PLC 4 S5 CPU 941
Max : BOOL //maximum reached
Min : BOOL //minimum reached
Value 4 MW : WORD //counter value PLC 4 S5 CPU 941
Down 4: BOOL //counting down
Up 4: BOOL //counting up
🖃 🛅 CounterValues_4 (DB 2) //Counter Values
D_0: INT // minimum counter value S5 PLC 4
D_1 : INT // maximum counter value S5 PLC 4
D_2 : INT // counter value S5 PLC 4
🛄 Generic
🗄 🛅 UA Nodes

2.7.9 Check connections

Is the configuration transferred to the IBH Link UA and online connection to the individual CPUs are present, a right-click on the heading opens the context menu with the command *Check all connections*.

💹 example 7 - multi CPUs S7.opu - O	PCUAEdit							
<u>F</u> ile <u>E</u> dit <u>H</u> elp								
🗋 💕 🛃 🕼 🛞								
Project 🔻 🕈 🗙	XI			수. 수			Click the command	1
ቃ 🛎 🗙 አ 🗅 🖾 ↑ 🏚	Source : 0			Destination :	0			~
BH Link UA	E- € IBH Link U/ E- 00 CPU 41	A 6 Master		BH IBH I	Link UA PU 416 Master		Check all	
Variables	🗄 🌆 S7 PLC	1 CPU 312		e 🛄 🗄	7 PLC 1 CPU 312			
🖶 🌆 S7 PLC 1 CPU 312	🔁 🌆 S7 PLC	2 CPU 312 2 CPU 102			7 PLC 2 CPU 312		connections. A	
- J Variables	⊕- () S5 PLC	4 CPU 941		÷	5 PLC 4 CPU 941			
Variables	🗄 🛅 UA Noo	des		ü. 🗄 🚰 د	JA Nodes		defective connection	on
🖨 🛅 S5 PLC 3 CPU 103	N 4 11							
- JU Variables	A / Y	e					changes its	
Variabler	Source server	Source variable	Destin	hation server	Controlling is ON	1	9	
External data	BH Link UA	Control Or	IBH L	INK UA	Controlling_Is_UN_	-	green status icon	
Connected Servers	IBH Link UA	Control_OI	Delete				groon status loon	-
- 😭 Variable transfer	IBH Link UA	Control_OI	Propert	ies			to red	
User-defined variables	BH Link UA	MaxValue_	Show c	onnection in	tree st click		to reu.	
-S MQTT configuration	BH Link UA	MaxValue_z	IBH L	III connection	MaxValue_2			5

IBH Link UA Training

2.7.10 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

💹 example 7 - multi CPUs S	7.opu - OPCl	JAE	dit	-	-		×
File Edit Help							
🗋 💕 🚽 🧔 💿							
Project	🗢 # X	E	Name of the server conr	ection			
al al 🖉 V 🗈 🔍 I			Name	IBH Link UA			
	Tr 1014	E	Server address				
BH Link UA	lick)		Host name / Address	192.168.1.14			
🖨 🛄 CPU 416 Master			Port	49010	_		
🔤 🖓 🖓 🖓 🖓 🖓	New ser	ver	connection		.1	4:48010	
🖶 🛄 S7 PLC 1 CPU 312	New cor	ntro	l				
🔤 🔤 Variables		-			=		
- 🛄 S7 PLC 2 CPU 312	Transfer	sel	ected configuration to the O	PC UA Server			
- 🚰 Variables	Read co	mpl	ete configuration from OPC I	UA Server	lick)		
55 PLC 3 CPU 103					=		
Variables	Import						
	Export				's	S7	
Variables		TE	Uther settings				
External data			Variables format	Compact			
							_
😡 Project 🛛 🖾 Server 🖾 Ce	rtificates						
		£.				CAPS N	UM

The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.

Select the server *IBH Link UA* and then click Start. The configuration is transferred to the *IBH Link UA*.

Transver configuration to the	erver — 🗆 🗙	
Name of the server connection IBH_Link_UA	Transfer Status	
	Transver configuration to the server	– D X
< confirm	Name of the server connection Transfer Stat IBH_Link_UA 100 % Serv	us /er is being restarted
Start Close	Transver configuration to the se	erver — 🗆 X
	Name of the server connection IBH_Link_UA	Transfer Status 100 % Transfer successful
	Start	
L	<	lick)
	Start Close	Help

The successful transfer is displayed.

2.7.11 IBH Link UA browser windows

The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLCs*.

→ C' û	Ū	A https://192.168.1	.14/?_=/diaglistview				… ⊠ ☆	111/		9 X	0
	OPC se	over is running	Logout Update password							quad-o	core
letwork	Ca	ntroller diagnostics	Client diagnostics	Network diagnostics	System	n Log					
ecurity	ID	Connection name	Address	Time	Source	Error number	Error Text				
	Q -	CPU 416 Master	192.168.1.10:102	20.8.2020 10:3:43	PLC	0	Connection establish	ed (6ES7	416-3E	R05-0A	BO)
ertificates	ø -	S7 PLC 1 CPU 312	192.168.1.12:102	20.8.2020 10:17:50	PLC	0	Connection establish	ed (6ES7	312-1A	E13-0A	BO)
'ime settings	🧼 -	S7 PLC 2 CPU 312	192.168.1.17:102	20.8.2020 10:17:49	PLC	0	Connection establish	ed (6ES7	312-1A	E13-0A	BO)
mie settings	🧼 -	S5 PLC 3 CPU 103	192.168.1.13:102	20.8.2020 10:3:43	PLC	0	Connection establish	ed (IBHso	ftec S7	to S5)	
lystem	🧼 -	S5 PLC 4 CPU 941	192.168.1.19:102	20.8.2020 10:3:43	PLC	0	Connection establish	ed (IBHso	ftec S7	to S5)	
lsers	Clear	< diagnose C									

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IBH Link UA – Siemens Slots – OPC Project



IBH Link UA – OPC Client



2.7.12 Online OPC UA Server Information

🐱 example 7 - multi CPUs S7.opu - OPCUAEdit — 🗆 🗙								
File Edit Help								
🗋 💕 🛃 🖨 🔞								
Server 🗢 🕈 🗙	-	Name of the server conne	ection					
		Name	IBH Link UA					
CDU 416 Marter		Server address						
		Host name / Address	192.168.1.14					
		Port	48010					
		URL	opc.tcp://192.168.1.14:48010					
		Inverse connection	No					
🕀 – 🧾 S7 PLC 2 CPU 312		Security settings						
- 😭 Variable transfer		Security policity	None					
🕁 🛅 UA Nodes		Message mode	None					
		Authentication settings						
		Login	Anonymous					
		Session name	example7: Multi CPU's S7					
		Other settings						
		Variables format	Compact					
Project Server & Certifi								

Information from the OPC UA server connected online with the CPUs are displayed.

Show variable transfer

The individual OPC tags are displayed in the right server window with their status. The status of the OPC tags is updated continuously.

🗰 example 7 - multi CPUs S7.opu -	OPCUAEdit					- 🗆	×
<u>F</u> ile <u>E</u> dit <u>H</u> elp							
🗋 💕 🔙 🖨 🕐						_	_
Server 👻 🕈 🗙	Source server	Source variable	Destination server	Destination variable	Data type	Value	
🖃 🏟 IBH Link UA	🚺 IBH Link UA	Control_ON	IBH Link UA	Controlling_is_ON_1	Boolean	false	
🚽 🛱 🎹 CPU 416 Master	🚺 IBH Link UA	Control_ON	IBH Link UA	Control_ON_2	Boolean	true	
🛱 🔚 S5 PLC 3 CPU 103	🚺 IBH Link UA	Control_ON	IBH Link UA	Control_ON_3	Boolean	true	
🕀 🌆 S5 PLC 4 CPU 941	🚺 IBH Link UA	Control_ON	IBH Link UA	Control_ON_4	Boolean	false	
	🚺 IBH Link UA	MaxValue_1	IBH Link UA	MaxValue_1	Int16	9510	
	🚺 IBH Link UA	MinValue_1	IBH Link UA	MinValue_1	Int16	910	
Wariable transfer	📘 IBH Link UA 👘	MaxValue_2	IBH Link UA	MaxValue_2	Int16	8510	tsi i
	🚺 IBH Link UA	MinValue_2	IBH Link UA	MinValue_2	Int16	810	eg
+ UA Nodes	🚺 IBH Link UA	MaxValue_3	IBH Link UA	D_1	Int16	7510	ta ta
	🚺 IBH Link UA	MinValue_3	IBH Link UA	D_0	Int16	700	8 8
	🚺 IBH Link UA	MaxValue_4	IBH Link UA	D_1	Int16	6000	
	🚺 IBH Link UA	MinValue_4	IBH Link UA	D_0	Int16	600	
	📕 IBH Link UA	Controlling_is_ON_1	IBH Link UA	Controlling_is_ON_1	Boolean	true	
	🚺 IBH Link UA	Value_1	IBH Link UA	Value_1	Int16	0	
	🚺 IBH Link UA	Controlling_is_ON_2	IBH Link UA	Controlling_is_ON_2	Boolean	false	
	🚺 IBH Link UA	Value_2	IBH Link UA	Value_2	Int16	4290	
	🚺 IBH Link UA	Controlling_is_ON_3	IBH Link UA	Controlling_is_ON_3	Boolean	false	
	📕 IBH Link UA	D_2	IBH Link UA	Value_3	Int16	6955	
	📕 IBH Link UA	Controlling_is_ON_4	IBH Link UA	Controlling_is_ON_4	Boolean	false	
Roject Server 🖾 Certifi	🚺 IBH Link UA	D_2	IBH Link UA	Value_4	Int16	3048	
	,					CAP	S NUM

The source and destination names of the variable transfer are displayed.

🌆 example 7 - multi CPUs S7.opu -	OPCUAEdit	– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
🗋 💕 🛃 🚓 📀		
Server 👻 🕈 🗙	Source name	Destination name
BH Link UA CPU 416 Master SS PLC 3 CPU 103 SS PLC 4 CPU 941 SS PLC 1 CPU 312 SS PLC 2 CPU 312 SS PLC 2 CPU 312 Variable transfer UA Nodes	IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON IBH Link UA.CPU 416 Master.Variable to CPU's.Control_ON IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_1 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_1 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_2 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_2 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_2 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_4 IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_4 IBH Link UA.SP ILC 1 CPU 312.Counter Values.Controlling_is_ON_1 IBH Link UA.S7 PLC 1 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 3 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 3 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 4 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 4 CPU 312.Counter Values.Controlling_is_ON_2 IBH Link UA.S7 PLC 5 CPU 312.Counter Values.Controlling_is_ON_2 IBH L	IBH Link UA.S7 PLC 1 CPU 312.Counter Values.Controlling_is_ON_1 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.Control_ON_2 IBH Link UA.S5 PLC 3 CPU 103.Control_ON_3 IBH Link UA.S5 PLC 1 CPU 312.Counter Values.MaxValue_1 IBH Link UA.S7 PLC 1 CPU 312.Counter Values.MaxValue_1 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.MaxValue_2 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.MaxValue_2 IBH Link UA.S7 PLC 2 CPU 312.Counter Values.MaxValue_2 IBH Link UA.S5 PLC 3 CPU 103.CounterValues_MaxValue_2 IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_1 IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_1 IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_1 IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_0 IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_1 IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_2 IBH Link UA.CPU 416 Master.Variable from CPU's.Contro
	IBH Link UA:S5 PLC 3 CPU 103.Controlling.is_0N_3 IBH Link UA:S5 PLC 3 CPU 103.Controlling.is_0N_3 IBH Link UA:S5 PLC 3 CPU 941.Controlling.is_0N_4	IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_3 IBH Link UA.CPU 416 Master.Variable from CPU's.Value_3 IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling_is_ON_4
Project Server & Certifi	IBH Link UA.S5 PLC 4 CPU 941.CounterValues_4.D_2	IBH Link UA.CPU 416 Master.Variable from CPU's.Value_4

Marking the data block name, the individual variables (OPC tags) are displayed in the right server window with their status.

🔉 example 7 - multi CPUs S7.opu - OPCUAE	dit					- 🗆 X
File Edit Help						
🗋 📂 🔙 🖨 🔞						
Server 👻 🔻 🗙	Name	Data type	Status	Access	Value	Node name
BH Link UA CPU 416 Master CPU 416 Master Variable toor CPU'S SPLC3 CPU 103 SPLC3 CPU 103 S7 PLC3 CPU 103 S7 PLC3 CPU 112 S7 PLC3 CPU 112 S7 PLC3 CPU 112 S7 Variable transfer B UA Nodes	Controlling_is_ON_1 Controlling_is_ON_2 Controlling_is_ON_3 Controlling_is_ON_4 Value_1 Value_2 Value_3 Value_4	Boolean Boolean Boolean Int16 Int16 Int16 Int16	&OK &OK &OK &OK &OK &OK &OK	RW RW RW RW RW RW	false true true 0 6079 4585 794 CC U	IBH Link UA-CPU 416 Master/Variable from CPU's/Controlling jis_0N_3 IBH Link UA-CPU 416 Master/Variable from CPU's/Value_1 IBH Link UA-CPU 416 Master/Variable from CPU's/Value_2 IBH Link UA-CPU 416 Master/Variable from CPU's/Value_3 IBH Link UA-CPU 416 Master/Variable from CPU's/Value_3 IBH Link UA-CPU 416 Master/Variable from CPU's/Value_4 output: Master/Variable from CPU's/Value_4 Master/Variable from CPU's/Value_4 Maste
Lee Project Server Ag Certificates						a sector and

CPU 416 Master; data block Variable from CPU's [DB2]

CPU 416 Master; data block Variable to CPU's [DB5]

🗱 example 7 - multi CPUs S7.opu - OPCUAE	lit					
File Edit Help						
🗋 😂 🛃 🕼 🔞						
Server 👻 🕈 🗙	Name	Data type	Status	Access	Value	Node name
H Link UA Her Link UA Her CPU's Variable for CPU's Variable for CPU's S FIC 3 CPU 103 S FIC 3 CPU	Control_ON MaxValue_1 MaxValue_2 MaxValue_3 MaxValue_4 MinValue_1 MinValue_2 MinValue_2 MinValue_3 MinValue_4	Boolean Int16 Int16 Int16 Int16 Int16 Int16 Int16 Int16	&OK &OK &OK &OK &OK &OK &OK &OK	RW RW RW RW RW RW RW RW RW	true 9000 8000 7000 6000 900 800 700 600 Coll	IBH Link UA.CPU 416 Master/Variable to CPU's.Control_OM IBH Link UA.CPU 416 Master/Variable to CPU's.MaxValue_1 IBH Link UA.CPU 416 Master/Variable to CPU's.MaxValue_3 IBH Link UA.CPU 416 Master/Variable to CPU's.MaxValue_4 IBH Link UA.CPU 416 Master/Variable to CPU's.MinValue_2 IBH Link UA.CPU 416 Master/Variable to CPU's.MinValue_3 IBH Link UA.CPU 416 Master/Variable to CPU's.MinValue_3
Project Server Scertificates					- up a	

S5 PLC 3 CPU 103; GlobalVars [F flag]

it example 7 - multi CPU	ls S7.opu - OPCU/	AEdit					×
<u>File E</u> dit <u>H</u> elp							
🗋 💕 🛃 🖨 📀						_	
Server	▼ ‡ ×	Name	Data type	Status	Access	Value	Node name
🖃 💐 IBH Link UA		Control_ON_3	Boolean	&OK	RW	true	IBH Link UA.S5 PLC 3 CPU 103.Control_ON_3
👘 🛄 CPU 416 Master		Controlling_is_ON_3	Boolean	8ıOK	RW	true	IBH Link UA.S5 PLC 3 CPU 103.Controlling_is_ON_3
🛓 🌆 S5 PLC 3 CPU 10	03					-	
- 🛄 GlobalVars	(mark)						
🛄 CounterValu	ies_3						
🛓 🌆 SS PLC 4 CPU 94	¥1						
🛓 🛄 S7 PLC 1 CPU 31	12						
🖶 🌆 S7 PLC 2 CPU 31	12						
😚 Variable transfer	r						
🗄 🛄 UA Nodes							
Drojact R Canvar	Cartificator						
Controject Cas server Cas	Certificates) «					>
							CAPS NUM

S5 PLC 3 CPU 103; data block CounterValues_3 [DB2]

🗰 example 7 - multi CPUs S7.o	pu - OPCUA	AEdit					– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp							
🗋 💕 🛃 🖨 📀						_	
Server	- ▼ # ×	Name	Data type	Status	Access	Value	Node name
🖃 🎼 IBH Link UA		D_0	Int16	&0K	RW	700	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_0
🗍 🛱 🥅 CPU 416 Master		🚺 D_1	Int16	&0K	R₩	7000	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_1
📥 🌆 S5 PLC 3 CPU 103		🚺 D_2	Int16	&0K	RW	3322	IBH Link UA.S5 PLC 3 CPU 103.CounterValues_3.D_2
- III GlobalVars						Cont	tinuously
_ 🛄 CounterValues_3	(mark)					upda	ated
🕁 🛅 S5 PLC 4 CPU 941							
🛓 🋅 S7 PLC 1 CPU 312							
🛓 🌆 S7 PLC 2 CPU 312							
- 😚 Variable transfer							
🖶 🧰 UA Nodes							
Project Server Server	icates						
							CAPS NUM

S5 PLC 4 CPU 941; GlobalVars [F flag]

🐘 example 7 - multi CPUs S7.opu - OPCU	AEdit					– 🗆 X
<u>File E</u> dit <u>H</u> elp						
🗋 📂 🛃 🖨 🎯						
Server 🗢 🕈 🗙	Name	Data type	Status	Access	Value	Node name
🖃 📢 IBH Link UA	Control_ON_4	Boolean	&OK	RW	true	IBH Link UA.S5 PLC 4 CPU 941.Control_ON_4
E [10] CPU 416 Master	Controlling_is_ON_4	Boolean	&0K	RW	true	IBH Link UA.S5 PLC 4 CPU 941.Controlling_is_ON_4
55 PLC 3 CPU 103					Cor	ntinuously
- 55 PLC 4 CPU 941					upo	lated
🛄 GlobalVars						
🚋 🌆 S7 PLC 1 CPU 312						
🛓 📶 S7 PLC 2 CPU 312						
- 😭 Variable transfer						
🗄 🛅 UA Nodes						
Droject R Sarver						
and the server at certificates						

S5 PLC 4 CPU 941; data block CounterValues_4 [DB2]

🙀 example 7 - multi CPUs S7.oj	pu - OPCUA	AE dit					- 🗆 ×	
File Edit Help								
🗋 💕 🛃 🕼 🔞								
Server	🔻 🕈 🗙	Name	Data type	Status	Access	Value	Node name	T
BH Link UA CHU 416 Master SPLC 3 CPU 103 SPLC 4 CPU 911 SPLC 4 CPU 911 SPLC 4 CPU 911 Counter/Values SPLC 1 CPU 912 SPLC 1 CPU 912 Counter Values Variable transfer SPLC 4 CPU 912 Counter Values	mark	D_0	Int16 Int16 Int16	&0K &0K &0K	RW RW RW	600 6000 5081 up	IBH Link UA.SS PLC 4 CPU 941.CounterValues_4.D. 0 IBH Link UA.SS PLC 4 CPU 941.CounterValues_4.D.1 IBH Link UA.SS PLC 4 CPU 941.CounterValues_4.D.2 attitutousty clated	
Project Server & Certifi	cates							
							CAPS NUM	

S7 PLC 1 CPU 312; data block CounterValues [DB2]

File Edit Help							
🗋 💕 🛃 🕼 🎯							
Server	▼ @ ×	Name	Data type	Status	Access	Value	Node name
BH-Link UA G (PU 416 Master S 5PLC3 CPU 10 S 5PLC3 CPU 10 S 5PLC4 CPU 941 S 5PLC4 CPU 941 S 7PLC 1 CPU 912 S 7PLC 2 CPU 912	mark)	Control_ON_1 Controlling_is_ON_1 MaxValue_1 MinValue_1 Value_1 Value_1	Boolean Boolean Int16 Int16 Int16	&0K &0K &0K &0K &0K	RW RW RW RW	false false 9000 900 0 0 0 0 0 0	IBH Link UAS7PLC1 CPU 312.Counter Values.Controlio, ON_1 IBH Link UAS7PLC1 CPU 312.Counter Values.Controlling.is.ON_1 IBH Link UAS7PLC1 CPU 312.Counter Values.MaxValue, 1 IBH Link UAS7PLC1 CPU 312.Counter Values.Value, 1 IBH Link UAS7PLC1 CPU 312.Counter Values.Value, 1 IBH Link UAS7PLC1 CPU 312.Counter Values.Value, 1 Interesty

S7 PLC 2 CPU 312; data block CounterValues [DB2]

File Edit Help							
Server	→ # ×	Name	Data type	Status	Access	Value	Node name
IBH Link UA IBH Link UA IIII CPU 416 Master IIIII SPLC3 CPU 103 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	rtificates	Control_ON_2 Controlling_is_ON_2 Max/Slue_2 MinValue_2 Value_2	Boolean Boolean Int16 Int16 Int16 Int16	&0K &0K &0K &0K	RW RW RW RW	true 8000 800 6164 u	IBH Link UA.S7 PIC 2 CPU 312.Counter Values.Control, ON,2 IBH Link UA.S7 PIC 2 CPU 312.Counter Values.Controlling is_ON,2 IBH Link UA.S7 PIC 2 CPU 312.Counter Values.MeXvlue_2 IBH Link UA.S7 PIC 2 CPU 312.Counter Values.MinValue_2 IBH Link UA.S7 PIC 2 CPU 312.Counter Values.Value_2 antimuously eduted

2.7.13 Unified Automation UaExpert - The OPC Unified Architecture Client

The UaExpert program window lists the OPC tags transferred by the IBH OPC UA Editor and the associated UA nodes.

Unified Automation UaExpert - The OPC Unifie	d Architecture Client - NewProject* C
File View Server Document Settings He	lp
🗋 🥔 🕞 🖉 🧿 🔶 🗕 🗞	🗙 💫 🙎 🗈 🖄 🖵
Project 🗗 🛪 🛪	Data Access View
Y Project Y Project Y Project Y Bervers BelLinkUA@ibblinkua-SC-14 Documents Data Access View Address Space X Your Address Your Address Your Address Space X Your Address Space X Your Address Your Address Your Address Space X Your Address Your Your Address Your Address Your Address Your Your Your Your Your Your Your Your	# Server Node Id Display Name Value Datatype Source Timestamp Server Timestamp Statuscode 1 IBHLinkUA@bb NS4StringIBH Controlling, is, ON 1 False Boolean 135317.078 135317.000 Good 3 IBHLinkUA@bb NS4StringIBH Controlling, is, ON 2 True Boolean 135317.078 135317.000 Good 3 IBHLinkUA@bb NS4StringIBH Controlling, is, ON 2 True Boolean 135316.778 135317.000 Good 5 IBHLinkUA@bb NS4StringIBH Controlling, is, ON 2 True Boolean 135316.778 135317.000 Good 6 IBHLinkUA@bb NS4StringIBH Value 2 True Boolean 135317.076 135202.003 Good 7 IBHLinkUA@bb NS4StringIBH NavValue 2 1nt16 135321.765 135322.003 Good 9 IBHLinkUA@bb NS4StringIBH NavValue 2 0nt16 135321.594 135321.753 135322.035
Controlling.is.ON_2 Controlling.is.ON_2 Controlling.is.ON_3 Controlling.is.ON_4 Value_1 Value_1 Value_2 Value_2 Value_4 Value_4 Controllon MaxValue_1 Control_ONI MaxValue_2 MaxValue_2 MaxValue_3 MaxValue_4 MaxValue_3 MaxValue_4 MaxValue_3 MaxValue_5 SerialNumber SerialNumber SoftwareActision Tasks SplC4 (CPU 941	Data Access View # Server Node Id 1 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling.is_ON_2 3 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling.is_ON_2 3 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling.is_ON_2 4 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Controlling.is_ON_2 5 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Value_1 6 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Value_2 7 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable from CPU's.Value_3 8 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_1 10 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_2 12 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3 13 IBHLinkUA@ibhlinkua-SC-14 NS4[String]IBH Link UA.CPU 416 Master.Variable to CPU's.MaxValue_3 14 IBHL

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2.8 Example 8: Connecting two S7 CPU 300 via an IBH Link S7++

S7-300 series CPUs not having a free Ethernet port may be connected to the IBH Link UA via MPI bus via an IBH Link S7 ++ via Ethernet (protocol RFC 1006).

The example shows the creation of a project with the connection of two (2) CPU 312 to one (1) IBH Link UA via IBH Link S7 ++. Instead of the CPU 312, any other S7 CPU 300/400 that does not have a free Ethernet port could be used.

IBH Link S7++

The IBH Link S7++ is an Ethernet converter. The standard TCP / IP is used. The user can benefit from all the advantages of Ethernet.

The use of *SimaticNet* and the use of a CP communication processor is not necessary on either the PC or the PLC side.



Connecting the IBH Link UA with 2x S7 PLC CPU 312



Configuration of the IBH Link S7 ++

Open the IBH Network settings dialog box to deactivate the option Configuration with NetPro/TIA.

IBH Network settings			\times
<u>File</u> <u>Stations</u> IBH <u>Links</u> <u>Options</u> <u>H</u> elp			
Station:			
Station Name	Address	:	
Master CPU S7-416 local	192.168	.1.10	
PLC_1-CPU 312-IBH Link S7++	192.168	1.12:10	99
PLC_2-CPU 312-IBH Link S7++	192.168	1.17:10	99
PLC_3 IBH Link S5++ CPU103	192.168	1.13:10	010
PLC 4-IBH Link S5++ CPU941	192,168	1.19:10	010
Settings:			
New station Change station	Dele	ete statio	1
IBH Link S7 IBH Link S5 IBH Link S5	i++	Languag	je
Close HS devices.	k S7, Plu	s, S7++	and S7+



	Tupo	Corial Number	ID Address	Station name	Firmune
		Senarnumber			Filliwale
0-02-A2-21-56-CB	NL50MPI	25208	192.168.1.12	PLU_1-CPU 312-IBH Link S7++	V2.168

Deactivate the option Configuration with NetPro / TIA

IBHLink settings - 00066361 M	AC: 00-02-A2-49-64-C6 ×
Network MPI/Profibus	Iime synchronisation <u>F</u> irmware <u>D</u> iagnosti
Address settings:	IDUI Link 67., 17
IP-Address:	192 . 168 . 1 . 17 255 . 255 . 255 . 0 . C . DUCR
Gateway:	192 . 168 . 1 . 17 Boot-P
Authentification	s aiways allive).
Username:	admin
Password:	MXXXN
	Change password
Options Configuration with NetPr Disable Webserver	o/TIA deactivate
Save permanently	Reboot Cancel

IBH Link S7++ MPI addresses

Diagnostics are available to show the MPI bus parameters and the MPI addresses in use.

BHLink settings -	00066361 MAC: 00-02-A2-49-64-C6	×
MPI/Profibus	Iime synchronisation <u>F</u> irmware Diagnostics Stat	ion 🔳 🕨
– Network statu	IS / Diagnostics	
Test	Lifelist OK	-
Station addre	sss: 1 10 Fixed bus parameter settings	
Bus paramete	ers:	
Baudrate: 18 Tslot_Init: 10	37.5 kBit/s D0	^
Max. Tsdr. 6 Min. Tsdr. 12	0 2 MPLaddresses	
Tset: 1	2 CPUs S7 PLC_1 IBH Link S7++	~
- Pue Medee	2 CPUs S7 PLC_2	
0 1 2	3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	19
120	Station passive	
(Read Station active	
	Click Station active ready	
Save perma	anently Reboot C	Cancel

IP / MPI addresses / PLC programs of the devices

Device	IP-Address	MPI-Address
IBH Link UA	192.168.1.14	not applicable
IBH Link S7++	192.168.1.12	10
S7-CPU 1 – [CPU 312] PLC-Project / Program: 2 CPU's S7 PLC_1 / S7 CPU 1	IBH Link S7++ together for:	2
S7-CPU 2 – [CPU 312] PLC-Project / Program: 2 CPU's S7 PLC_2 / S7 CPU 2	2 CPU's S7 PLC_1 2 CPU's S7 PLC_2 192.168.1.12	3

2.8.1 PLC programs

The S5 / S7 CPUs programs count value until *MaxValue* is reached. Then the *Value* is counted down until *MinValue* is reached. This up and down counting is repeated continuously.

The data blocks *CounterValue_1 [DB2]* and *CounterData_from_PLC_2 [DB5]* are in the *S7-CPU 1*. The data blocks *CounterValue_2 [DB2]* and *CounterData_from_PLC_1* [*DB5]* are in the *S7-CPU 2*.

These data blocks are available for data exchange with one another. The variables of these blocks are defined as (OPC tags).

The programs for the S7 CPUs are available in the **STEP® 7** - SIMATIC Manager format.

Calling the IBH OPC UA Editor

Double-click the **IBH OPC UA Editor** icon to open the program window.



Open the **Project window** by clicking on the **Project** tab.





Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

🌆 Untitled - OPCUAEdit							
File	Edit	Help Click					
	1	New server connection					
Project	_						

The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server Connection dialog box

Server connection properties			×
Name of the server connection:	IBH Link UA		
Server address:			
Host name or IP address	192.168.1.14		
	49010		
Port:	40010		
C URL opc.tcp://192.168	.1.14:48010		
	Select endpoint	t	
Security settings:			
• None	Message mode:		
C Basic128Rsa15	C Signatur		
C Basic256	C Signature an	d Encryption	
C BasicSha256	-Inverse connection:		
C Aes1285ha256RsaOaep		Desperties	
C Aes256Sha256RsaPss			
Login:			_
Anonymous			
O User name and password			
Licer Dames			
Oser Hame.			
Passwort:		🗖 Store	
Session Name: example	8: 2x 57 CPU 312	٦	
Variables format:	•	J	
confirm			
OK Cancel		Help	

All necessary settings are shown. The possible encryptions of the data to be transmitted are displayed. The example is using the security method *None*. By clicking *OK* the content of the dialog box is saved and closed.

The settings for the connection to the *IBH Link UA* OPC UA server are displayed in the right part of the *project window*.



2.8.2 Inserting a New controls (PLC)

The *New control* command from the context menu (or menu Edit / New control) opens the dialog box *New control* to specify the access to the control (CPU).



New control dialog box – PLC 1 S7-CPU 1

🐱 New control 🛛 🕹
Control name: PLC 1 57-CPU 1 Host name / IP address: 192.168.1.17
© S7 TCP/IP Rack number: 0 Slot number: 2
Position of the target module: MPI-Address Target modul at the same rack
MPI/DP subject accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0
H1 address of the target CPU: 00.00.00.00.00
O S7 200 TCP/IP Own TSAP: 0100
C 57 1500 TCP/IP C 57 1500 TCP/IP
OK Cancel Test connection Help

Test connection

After completing the New Control dialog

box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.



New control dialog box – PLC 2 S7-CPU 2

🐺 New control 🛛 🕹 🗙
Control name: PLC 1 57-CPU 1 Host name / IP address: 192.168.1.17
© S7 TCP/IP Rack number: 0 Slot number: 3
Position of the target module:
Target modul at the same rack PLC 2 S7-CPU 2
C Via MPI/DP subnet accessible rack
MPI/DP address of the target CPU: 2
C Via TCP/IP subnet accessible rack
TCP/IP address of the target CPU: 0 . 0 . 0 . 0
C Via H1 subnet accessible rack
H1 address of the target CPU: 00.00.00.00.00.00
Subnet ID: 0000 . 0000
C 57 200 TCP/IP Own TSAP: 0100
C 57 1500 TCP/IP
confirm 2
OK Cancel Test connection Help

Test connection

After completing the New Control dialog box, the connection to the online connected CPU can be tested.

Test connection....

Information about the successful connection is displayed.



To accept and close the New control dialog box settings click on OK.

0 57 1 <u>5</u> 00 (CP/II			
confir	<u>m</u>)		
OK	<u>C</u> ancel	Test connection	Help

The specified PLC controls are displayed in the left project window.

🗱 example 8 - 2x S7 CPU 312.opu - O	PCU	AEdit	– 🗆 X
<u>F</u> ile <u>E</u> dit <u>H</u> elp			
🗋 💕 🛃 🖨 🎯			
Project 🔷 🔻 🗸 🗙		Name of the server conne	ection
alf 📈 🖌 🖌 🗈 👘 L 🛦 🛆		Name	IBH Link UA
<u>ч с л в ча ча т и</u>		Server address	
E-SE IBH Link UA		Host name / Address	192.168.1.14
📴 🌆 PLC 1 S7-CPU 1		Port	48010
		URL	opc.tcp://192.168.1.14:48010
📄 📶 PLC 2 S7 CPU 2		Inverse connection	No
		Security settings	
		Security policity	None
		Message mode	None
		Authentication settings	
		Login	Anonymous
		Session name	example 8: 2x S7 CPU 312
		Other settings	
		Variables format	Compact
Project Server Certificates			
			CAPS NUM

2.8.3 IBH Link S7 ++ setting

If no connection is established from the PC via *IBH Link* S7 ++, the settings must be checked (see chapter 1 page 1-13 – IBH Link UA - S7 CPU 300 / 400 connection via IBH Link S7++).

```
Note:
```



To address an CPU 300/400 via the *IBH Link S7++*, the routing option (dialog box *IBHLink settings / Network tab*) *Configuration with NetPro* must be deactivated (Apply permanently).

This applies to all S7 300/400 CPUs with IBH Link S7++ connection.

2.8.4 Program assignment

The Assign Program command opens the Program Selection dialog box.



Select Program dialog box

Select the PLC program in the **Select program** (Click to open) (Click to open)

the PLC project name. Mark the PLC program (CPU) and click OK to assign the PLC program.

🥨 Select program		×
B. Peter Schulz-Heise Workshop (A:) OPC UA Editor Manual example 8 - 2x CPU 312 57 CPU 312 57 PLC_1 PLC 1 S7-CPU 1 CPU 312 - 1 PLC 1 S7-CPU 1 CPU 312 - 2 CPU 57 PLC_2 CPU 57 PLC_2 CPU 57 PLC_2 CPU 312 - 2 PLC 2 S7-CPU 2		~
Path: A:\OPC UA Editor Manual\example 8 - 2x CPU 312 57\2 CPUs 57 PLC_1\ Click 2 OK Cancel	Help	

Assigned PLC program

In the right part of the project window information about the *program assignment* are displayed.

💹 example 8 - 2x S7 CPU 312.opu - C	οροι	JAEdit		-		×
File Edit Help						
🗋 💕 🛃 🕼 🔞						
Project 👻 🕈 🗙	E	Name of the control				
🔗 🖄 🗙 🛦 🗈 🛍 🕅 🖗	1.	Name Office program pasig	PLC1 S7-CPU 1			
BH Link UA		Program type	STEP7 program		-	
PLC 1 S7-CPU 1		Program path	A:\OPC UA Editor Manual\example 8 - 2x CPU 312 S7\2 CPUs S7 PLC_	1 \2 CPU	s S7 PLC_	1.s7p
PLC 2 S7 CPU 2	lle	Station name Online connection	CPU 312-1			
- 🖓 Variables		Protocol	S7 TCP/IP			
		Host name / Address	192.168.1.17			
		Targe module position Back number	I arget modul at the same rack			
		Slot number	2			
	5	No program assignment" or '	'S5W program" or "STEP5 program" or "STEP7 program" or "TIA program"	or "Symb	ol file''	
Project Server Server Certificates						

The corresponding PLC program must be assigned to the two (2) PLC controls.

2.8.5 Define variables as OPC tags

Clicking *Variables* lists the variables / data (data blocks) from the PLC in the right part of the project window. The selected *OPC tags* are listed in the lower part of the right window.

OPC tags of the controller –PLC 1 S7-CPU 1

Two (2) variables of the data block *CounterValues_1 [DB2]* and two (2) variables of data block *CounterData_from_PLC_2* are defined as OPC tags.

💹 example 8 - 2x S7 CPU 312.opu - O	PCUAEdit								—		×
<u>F</u> ile <u>E</u> dit <u>H</u> elp											
🗋 💕 🛃 🕼 💿											
Project Project Image: Constraint of the second	A vanables A Program variables A vanables A vanab) 2) //Count NT //minim INT //minim //Counter re on_1:BOOL PLC_2 (DB 5) on_2:BOOL //Counter re	er Values PLC 1 um value PLC um value PLC ading PLC 1 //Counting is o //Counter Dat //Counting is o ading from PL	S7 CPU 3 1 1 2 2 2 2 3 7 2 2 2 2 2 2	12 C 2 LC 2						
Project To Server To Certificates	Image: Source Values_1.Value_1 Image: Source Values_1.Value_1 Image: CounterValues_1.Value_1 Image: Source Values_1.Value_1 Image: CounterValues_1.CounterValues_1.CounterValues_1.CounterValues_1.Value Image: Source Values_1.Value Image: CounterValues_1.Value_1.Value Image: Source Values_1.Value Image: Source Values_1.Value Image: CounterValues_1.Value_1.Value Image: Source Values_1.Value Image: Source Values_1.Value Image: CounterValues_1.Value_1.Value Image: Source Values_1.Value Image: Source Values_1.Value Image: CounterValues_1.Value Image: Source Values_1.Value Image: Source Values_1.Value	marked variable (OPC tags) n_1 ting_is_on_2	Address DB2.DBW 4 DB2.DBX 6.0 DB5.DBX 0.0 DB5.DBW 2	PLC ty INT BOOL BOOL INT	Length 2 .1 .1 2	Origin Program Program Program Program	Access RW RW RW RW	OPC type Int16 Boolean Boolean Int16	Comment Counter read Counting is Counting is Counter read	ling PLC 1 on PLC 1 on from P ling from	LC 2 PLC 2
										CAPS	NUM .:

OPC tags of the controller –PLC 2 S7-CPU 2

Two (2) variables of the data block *CounterValues_2* [DB2] and two (2) variables of data block *CounterData_from_PLC_1* are defined as OPC tags.

📴 example 8 - 2x S7 CPU 312.opu - OPCUAEdit — 📃										×
File Edit Help										
🗋 😂 🛃 🚓 🔞										
Project V 0 X	er Data PLC 2 um value PLC 2 um value PLC 2 ding PLC 2 //Counting is c //Counting is c //Counting is c ading from PLC	2 2 1 from PLC 2 n from PLC 1	त C 1							
	🖆 🗙 🌡 🖻 🛍 🍈 🎦 🧪 💙									
	Name marked variable	Address	PLC ty	Length	Origin	Access	OPC type	Comment		
	CounterValues_2.Value_2 (OPC tags) DB2.DBW 4 INT 2 Program RW Int16 Counter re						Counter read	ing PLC 2		
	U CounterValues_2.Counting_is_on_2 DB2.DBX 6.0 BOOL .1 Program RW Boolean Counting is on PLC 2									
	CounterData_from_PLC_1.Counting_is_on_1 DB5.DBX.0.0 BOOL .1 Program RW Boolean Counting is on from PLC								.C 1	
	CounterData_from_PLC_1.Value_1	DB5.DBW 2	INT	2	Program	RW	Int16	Counter read	ing from I	PLC 1
Project Server Server										
									CAPS	NUM

2.8.6 Add external data

To exchange data between two OPC UA servers, the second server and its variables are defined using *Add external data*.

Right-click on *IBH Link UA* and execute the *Add External Data ...* command.



The OPC tags defined in the IBH OPC UA Editor are to No be used. Confirm the dialog box with **No**.



2.8.7 Variable transfer – define source and destination OPC tags

External data with additional commands was inserted in the left part of the project window.



Mark *Variable transfer* to define the source and destination OPC tags. The right project window is divided into two parts. The *Source* window is on the left and the *Destination* window on the right. The Source window and the Destination window lists the OPC tags of the OPC server and the PLC Controllers.

The *OPC tags* to be read (read variables) are specified in the **Source** window. The **OPC tag** to be linked with the variable read is specified in the **Destination** window.

Variable connection

Mark the source OPC tag and right-click the destination OPC tag.

Source window



Destination window

The command *Connect variable (standard parameters)* finalizes the definition. The connected OPC tags are listed in the lower part of the right project window.



Established connection

X / Y							_
Source server	Source variable	Destination server	Destination variable	Data type	Source name	Destination name	Status
📕 IBH Link UA	Value_1	IBH Link UA	Value_1	Int16	IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Value_1	IBH Link UA.PLC 2 S7 CPU 2.CounterData_from_PLC_1.Value_1	

Once a connection has been established, the symbols in front of the OPC tags changes. In addition to the *value*, the source OPC tag also offers the *time stamp* and the *status* of the OPC tag. To use these OPC tags, the corresponding destination variables must be available.

Source variables connection established



Destination variable connection established



Defined Connections

Source	Destination
PLC 1 S7-CPU 1; CounterValues_1 [DB2]	PLC 2 S7-CPU 2; CountingData_from_PLC_1 [DB5]
Value_1	Value_1
Counting_is_on_1	Counting_is_on_1
PLC 2 S7-CPU 2; CounterValues_2 [DB2]	PLC 1 S7-CPU 1; CountingData_from_PLC_1 [DB5]
Value_2	Value_2
Counting_is_on_2	Counting_is_on_2

The connections are displayed in the lower part of the right project window.





Linked target variables have this blue symbol.



2.8.8 Transfer configuration to the OPC UA server (IBH Link UA).

A right-click on the Server icon (IBH Link UA) opens the context menu.

🗱 example 8 - 2x S7 CPU 312.opu - OF	PCUAEdit	– 🗆 X
File Edit Help		
🗋 📂 🛃 🖾 🎯		
Project	Q × Name of the server connection Name Server address Host name / Address New server connection New control Transfer selected configuration to the Read complete configuration from Of Import Export Other settings Variables format	e OPC UA Server PC UA Server PC UA Server 2 Compact
		CAPS NUM:

The command *Transfer Selected Configuration to OPC UA Server* command opens the *Transfer Configuration to Server* dialog box.
Select the server *IBH Link UA* and then click Start. The configuration is transferred to the *IBH Link UA*.



The successful transfer is displayed.

2.8.9 IBH Link UA browser windows

The browser window *Diagnostics* displays the status of the connection *IBH Link UA – PLCs*.

🗮 IBH Link UA - Diagnostic	s)	× +							-		×
← → ℃ ŵ	0	D 🔏 192.168.1.14/?_=/diaglistview … 🖂 🕁									≡
- <u>}**</u> 💓	OPC server is running Logout Update password quad-core										
Network	Co	ntroller diagnostics	Client diagnostics	Network diagnostics	System	m Log					
Security	ID	Verbindungsname	Adresse	Zeit	Quelle	Fehlernummer	Fehlertext				
0	Q -	PLC 1 S7-CPU 1	192.168.1.17:102	21.8.2020 15:18:8	SPS	0	Verbindung aufgebaut	(6ES7 3	12-1AE	13-0ABC))
Certificates	9 -	PLC 2 S7 CPU 2	192.168.1.17:102	21.8.2020 15:18:8	SPS	0	Verbindung aufgebaut	(6ES7 3	12-1AD	10-0ABC))
Time settings	Clear	diagnose C									
Diagnostics											
											_



IBH Link UA - Siemens Slots - OPC Project

IBH Link UA – OPC Client

🗱 IBH Link UA - OPC Client	×		– 🗆 🗙									
← → ♂ ଢ	0 🖋 192.168.1.14/?_=/de/opc_dient	⊌ ☆	II\ 🖸 ⊖ 🗱 O Ξ									
	PC Server läuft Abmelden Passwort ändern		quad-core									
Netzwerk	Verbundene Server		▼. Status Good									
Zertifikate	▼ tal IBH Link VA.PLC 1 57-CPU 1.COUNTERVAIUE_1.Value_1											
Uhrzeit System	 ✓ IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Value_1.Status ✓ ● IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Counting_is_on_1 											
Benutzer	◆€ urn:ibhlinkua:IBHsofter:IBHLinkUA (opt.trp://192.1681.14:48010).IBH Link UA.PLC 2 57 CPU 2.CounterData_from_PLC_1.Counting_is_on_1 ● IBH Link UA.PLC 1 57-CPU 1.CounterValues_1.Counting_is_on_1.TimeStamp ● IBH Link UA.PLC 1 57-CPU 1.CounterValues_1.Counting_is_on_1.Status											
Siemens Slots	 BH Link UA.PLC 2 57 CPU 2.CounterValues_2.Value_2 um:ibhinkua:1BHsoftee:1BHLinkUA (opc.tcp://192.168.1.14:48010).IBH Link UA IBH Link UA C 2 57 CPU 2 Counter division 2 Transform 	.PLC 1 S7-CPU 1.CounterData_from_PLC_2.v	/alue_2									
OPC Client	Ibh Link VA.PLC 2 S7 CPU 2.CounterValues_2.Value_2.Status Ibh Link VA.PLC 2 S7 CPU 2.CounterValues_2.Counting_is_on_2											
Diagnose	◄ urn:ibhlinkua:IBHsoftec:IBHLinkUA (opc.tcp://192.168.1.14:48010).IBH Link UA ● IBH Link UA.PLC 2 S7 CPU 2.CounterValues_2.Counting_is_on_2.TimeStamp	.PLC 1 S7-CPU 1.CounterData_from_PLC_2.C	Counting_is_on_2									
SoftSPS	IBH LINK UA.PLC 2 S7 CPU 2.CounterValues_2.Counting_is_on_2.Status Server hinzufugen Lese-Variable hinzufugen Verbinde mit Variable X Ø Ø Lade (Client XML Konfiguration Client XML Konfigurati	ion herunterladen									
Modbus	Client Konfiguration löschen											

2.8.10 Online OPC UA Server Information

🗱 example 8 - 2x S7 CPU 312.opu - OPC	CUAEdit		□ ×
File Edit Help			
🗋 💕 🗔 🖨 💿			
Server IX X	 Name of the serve Name Server address Host name / Address Port URL Inverse connection Security settings Security policity Message mode Authentication setti Login Session name Other settings Variables format 	r connection IBH Link UA 192.168.1.14 48010 opc.tcp://192.168.1.14:4 No None None tings Anonymous example 8: 2x S7 CPU 31 Compact	8010
Project Server & Certificates			
			CAPS NUM:

Information from the OPC UA server connected online with the CPUs are displayed.

Show variable transfer

The individual OPC tags are displayed in the right server window with their status. The status of the OPC tags is updated continuously.

🐱 example 8 - 2x S7 CPU 312.opu - OPCUAEdit — 🗌											
<u>F</u> ile <u>E</u> dit <u>H</u> elp											
Server 👻 🕂 🗙	Source server	Source variable	Destination server	Destination variable	Data type	Value	Т				
🖃 📢 IBH Link UA	📕 IBH Link UA	Value_1	IBH Link UA	Value_1	Int16	1883					
📕 🛱 🎹 PLC 1 S7-CPU 1	📕 IBH Link UA	Counting_is_on_1	IBH Link UA	Counting_is_on_1	Boolean	true					
🛱 🥅 PLC 2 S7 CPU 2	📕 IBH Link UA	Value_2	IBH Link UA	Value_2	Int16	7213					
Variable transfer	📕 IBH Link UA	Counting_is_on_2	IBH Link UA	Counting_is_on_2	Boolean	true					
IIA Nodes					continuo	usly 📃	-				
					updated						
Roject Server Certificates	<						>				
						CAPS NU	M				

The source and destination names of the variables are displayed.

🗱 example 8 - 2x S7 CPU 312.opu - OPC	CUAEdit	– 🗆 X
Eile Edit Help		
Server 🗢 🕫 🗙	Source name	Destination name
BH Link UA ⊕ ⊆ PLC 1 S7-CPU 1 ⊕ ⊇ PLC 2 S7 CPU 2 → 2 Variable transfer ⊕ ⊒ UA Nodes	IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Value_1 IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Counting_is_on_1 IBH Link UA.PLC 2 S7 CPU 2.CounterValues_2.Value_2 IBH Link UA.PLC 2 S7 CPU 2.CounterValues_2.Counting_is_on_2	IBH Link UA.PLC 2 S7 CPU 2.CounterData_from_PLC_1.Value_1 IBH Link UA.PLC 2 S7 CPU 2.CounterData_from_PLC_1.Counting_is_on_1 IBH Link UA.PLC 1 S7-CPU 1.CounterData_from_PLC_2.Value_2 IBH Link UA.PLC 1 S7-CPU 1.CounterData_from_PLC_2.Counting_is_on_2
Project Server Certificates		

Marking the data block name, the individual variables (OPC tags) are displayed in the right server window with their status.

PLC1 S7-CPU1; data block CounterData_from_PLC_2 [DB5]

🗽 example 8 - 2x S7 CPU 312.opu - OPCUAE	dit						– 🗆 X
File Edit Help							
🗋 😂 🗔 🕼 🔞						_	
Server 🗸	ψ×	Name	Data type	Status	Access	Value	Node name
BH Link UA Gamma CounterData_from_PLC_2 CounterData_from_PLC_2 CounterValues_1 Gamma CounterValues_1 Co	nark)	Counting_is_on_2 Value_2	Boolean Int16	&OK &OK	RW RW	true 475 cont upda	IBH Link UA.PLC 1 S7-CPU 1.CounterData_from_PLC_2.Counting_is_on_2 IBH Link UA.PLC 1 S7-CPU 1.CounterData_from_PLC_2.Value_2 introotsty ated
							CADE NUM

PLC1 S7-CPU1; data block CounterValues_1 [DB2]

example 8 - 2x S7 CPU 312.opu - OPCU	AEdit						– 🗆 X				
File Edit Help											
						_					
Server	▼ 4 ×	Name	Data type	Status	Access	Value	Node name				
🖃 📢 IBH Link UA		Counting_is_on_1	Boolean	&0K	RW	true	IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Counting_is_on_1				
		Value_1	Int16	&0K	RW	8669	IBH Link UA.PLC 1 S7-CPU 1.CounterValues_1.Value_1				
CounterData from PLC 2						continuously					
CounterValues 1						ир	dated				
PLC 2 S7 CPU 2											
Variable transfer											
🗐 🛅 UA Nodes											
Renter Server Certificates											
		,					CARE NUM				

PLC2 S7-CPU2; data block CounterData_from_PLC_1 [DB5]

🎆 example 8 - 2x S7 CPU 312.opu - OPCUAEdit						– 🗆 X
File Edit Help						
Server 👻 🕈 🗙	Name	Data type	Status	Access	Value	Node name
BH Link UA DEC 1 57-CPU 1 DE PLC 2 57 CPU 2 CounterOsta_from_PLC_1 CounterValues_2	Counting_is_on_1 Value_1	Boolean Int16	&0K &0K	RW RW	true 4089	IBH Link UA.PLC 2 S7 CPU 2.CounterData_from_PLC_1.Counting_is_on_1 IBH Link UA.PLC 2 S7 CPU 2.CounterData_from_PLC_1.Value_1
					up	ntinuously dated
Project Server Certificates						
						CADE MUM

PLC1 S7-CPU1; data block CounterValues_1 [DB2]

🗱 example 8 - 2x S7 CPU 312.opu - OPCUAEdit	it						– 🗆 X
File Edit Help							
						\frown	
Server 👻 🗸	φ×	Name	Data type	Status	Access	Value	Node name
		Counting_is_on_2 Value_2	Boolean Int16	&0K &0K	RW	true 647 upo	. IBH Link UA.PLC 2 S7 CPU 2.CounterValues_2.Counting_is_on_2 IBH Link UA.PLC 2 S7 CPU 2.CounterValues_2.Value_2 dimonsity Lated
							CADE NUM

2.8.11 Unified Automation UaExpert - The OPC Unified Architecture Client

The UaExpert program window lists the OPC tags transferred by the IBH OPC UA Editor and the associated UA nodes.

Use Drag & Drop to pull the OPC tags into the Data Access Viewer window.

Unified Automation UaExpert - The OPC Unified.	Architecture Client - NewPr	oject*			-	
<u>File View Server Document Settings H</u> elp						
🗋 💋 🕞 🔯 🧿 🕂 🗕 🔅 🗴	K 🔦 🚨 🖹 🖻	D				
Project & X	Data Access View		\sim			8
Project Project Servers BHLinkUA@ibhlinkua-SC-14 Documents Data Access View	# Server 1 IBHLinkUA@ib 1 2 IBHLinkUA@ib 1 3 IBHLinkUA@ib 1 4 IBHLinkUA@ib 1 5 IBHLinkUA@ib 1 6 IBHLinkUA@ib 1 7 IBHLinkUA@ib 1	Node Id Disp VS4[String]IBH Countir VS4[String]IBH Countir VS4[String]IBH Countir VS4[String]IBH Value_1 VS4[String]IBH Value_1 VS4[String]IBH Countir VS4[String]IBH Countir	lay Name Value true true true true 3743 true 3744 true 3244 ag.is_on_2 true	Datatype Source Timesti Boolean 18:04:17.096 Int16 18:05:21.630 Boolean 18:04:07.74 Int16 18:05:21.627 Boolean 18:04:32.007 Int16 18:05:21.627 Boolean 18:04:32.007 Int16 18:05:21.627 Boolean 18:04:32.007 Int6 18:05:21.630 Boolean 18:04:35.939	amp Server Timestamp 18:04:18.111 18:05:21.877 18:04:21.360 18:05:21.877 18:04:32.867 18:05:21.877 18:04:36.117	Statuscode Good Good Good Good Good Good Good
∽ No Highlight ✓	8 IBHLinkUA@ib	454[String]IBH Value_2	4643 conti	Int 16 18:05:21.702	18:05:21.877	Good
Root ^			unda	ted		
Objects	<u>γ</u>	Display Name	Value	Datatype	Source Time	stamp
> 💑 DeviceSet		untina is on 2	true	Boolean	18:06:47.910	
> 📥 MQTT	Vali	ie 2	6790	Int16	18:16:41.972	
	Cou	intina is on 1	true	Boolean	18:06:47.910	
✓ 👶 PLC 1 S7-CPU 1	Valu	ue 1	4785	Int16	18:16:42.154	
OeviceHealth Odel		intina is on 1	true	Boolean	18:06:47.910	
🗸 🜲 Programs	Valu	ue 1	6316	Int16	18:16:41.972	
CounterData_from_PLC_2	/ Cou	inting is on 2	true	Boolean	18:06:47.910	
>	Valu	ue_2	8668	Int16	18:16:42.154	
CounterValues_1	// \	-				
>						
> im SupportedTypes				· -		
SerialNumber	Value	Datatype	Source limesta	amp Server Time	stamp Statu	scode
 SoftwareRevision Tasks 	true	Boolean	18:06:47.910	18:06:48.160	0 Good	
🗸 🐥 PLC 2 S7 CPU 2	1232	Int16	18:21:35.843	18:21:36.028	8 Good	
OeviceHealth Model	true	Boolean	18:00:47.910	18:00:48.100	Good Cood	
V 👶 Programs	5500 true	Boolean	18:06:47.910	18:06:48 160	Good Good	
CounterData_from_PLC_1	2380	Int16	18:21:35.843	18:21:36.028	B Good	
> Gunting_is_on_1	true	Boolean	18:06:47.910	18:06:48.160	0 Good	
✓ ☐ CounterValues_2	2479	Int16	18:21:36.028	18:21:36.279	9 Good	
 Counting:s_on_2 Value_2 SupportedTypes RevisionCounter SerialNumber SoftwareRevision Tasks 						
> 👶 Server > 🖻 Slots Data Access View	1					
> 🔄 Stations 🛛 🗮	Server			Nodeld		
	A@ibhlinkua-SC-14 A@ibhlinkua-SC-14 A@ibhlinkua-SC-14 A@ibhlinkua-SC-14 A@ibhlinkua-SC-14	NS4 String IBH I NS4 String IBH I	ink UA.PLC 1 S7-Cf ink UA.PLC 1 S7-Cf ink UA.PLC 1 S7-Cf ink UA.PLC 1 S7-Cf ink UA.PLC 2 S7 CF ink UA.PLC 2 S7 CF	PU 1.CounterData_froi PU 1.CounterData_froi PU 1.CounterValues_1 PU 1.CounterValues_1 U 2.CounterData_froi PU 2.CounterData_froi	m_PLC_2.Countine m_PLC_2.Value_2 .Counting_is_on_1 .Value_1 m_PLC_1.Countine m_PLC_1.Value_1	q_is_on_2 _is_on_1
7 IBHLinkU/ 8 IBHLinkU/	A@ibhlinkua-SC-14 A@ibhlinkua-SC-14	NS4 String IBH L NS4 String IBH L	ink UA.PLC 2 S7 CF ink UA.PLC 2 S7 CF	PU 2.CounterValues_2. PU 2.CounterValues_2.	.Counting_is_on_2 .Value_2	

2.9 Modbus connection - examples

The IBH SoftPLC PLC416 has the option of a Modbus connection. In the example, variables are defined as OPC tags. This Modbus configuration is transmitted to the IBH Link UA and the variables are displayed in the **UAExpert client program**.

SIMATIC Manager PLC project ModBus_Test

🍠 SIMATIC Manager - [ModBus_Test A:\OPC UA Editor Manual\\ModBus_Test] 💦 👘 💷 📧											
🎒 File Edit Insert PLC Vie	🎒 File Edit Insert PLC View Options Window Help 🔤 🖃 🗙										
🗋 🗅 😅 🏪 🛲 👗 🛍 💼	📩 😨 💁 🏻		🔁 🛛 < No Filter >	- ∑∕							
⊡ 🎒 ModBus_Test	Object name	Symbolic name	Created in language	Туре							
🖻 🔐 CPU 416	🚵 System data			SDB							
⊡	🕀 OB1	CYCL_EXC	STL	Organization Block							
	🖬 DB501	DBIn_Read	DB	Data Block							
	🖬 DB502	DBOut_RW	DB	Data Block							
	VAT_1	VAT_1		Variable Table							
	<			>							
Deven Efficie and Links] -										
Press FI to get Help.											





Organization block OB1

In OB1, values are written to the data blocks DB501 (*DBIn_Read*) and DB502 (*DBOut_RW*) and reset to zero after a few seconds' delay.

Example: Modbus list used: - Register start addresses, access options to variables (fictitious device manufacturer information).

1.04	Regis	Start	ing addr	ess					Address	s used	
T BIC	-ter	Hex	Dez	Bit			Hex	Dez	Bit	DB 501	DB 502
X ⁽¹⁾		0x000	0	0	Read /Write	Process data interface.	0x00A	10	80		DBX 20.0
	X ⁽²⁾	0x014	20	160	Read /Write	Physical inputs	0x016	22	176		DBW44
X ⁽³⁾		0x034	52	416	Read only	Process image	0x034	59	464	DBX 118.0	
	X ⁽⁴⁾	0x048	72	576	Read only	Process data interface.	0x048	76	608	DBW 152	
	X ⁽⁵⁾	0x068	104	832	Read /Write	Physical inputs	0x068	112	896		DBD 224
X ⁽⁶⁾		0x07C	124	992	Read /Write	Process image	0x07C	126	1008		DBX 252.0
	X ⁽⁷⁾	0x09C	156	1248	Read only	Status register	0x09C	160	1280	DBD 320	
	X ⁽⁸⁾	0x0BC	188	1504	Read only	Process image length in bits, analog outputs	0x0BC	190	1520	DBW 380	
	X ⁽⁹⁾	0x0FC	252	2016	Read/Write	Watchdog register	0x0FC	254	2032		DBD 508
	X ⁽¹⁰⁾	0x10C	268	2144	Read/Write	Error register	0x10C	272	2176		DBD 544

(nn) Available as an example for the definition of a variable.

Note:

The addresses in the Modbus device manufacturer information are often in hexadecimal form. These addresses are to be converted into a decimal address for input in the IBH OPC UA editor.

2.9.1 Calling the IBH OPC UA Editor

Double-click the *IBH OPC UA Editor* icon to open the program window.

Open the **Project window** by clicking on the **Project** tab.



Open the **New Server Connection** dialog box with the New Server Connection command from the **Edit** menu or by clicking the icon.

	ick)	
😡 Project	🗟 Server	🗟 Certificates

IBH OPC UA Editor

Muntitled - OPCUAEdit			
File	Edit	Help	
	1	New server connection	
Project			

The new server connection setup was explained in example 1 (see chapter 2, page 2-3.

Server Connection dialog box

Server connection properties		×
Name of the server connection:	IBH Link UA - ModBus Connection	
 Host name or IP address 	192.168.1.14	
Port:	48010	
C URL opc.tcp://192.16	8.1.14:48010	
	Select endpoint	
Security settings:		
None	Message mode:	
C Basic128Rsa15	C Signatur	
C Basic256	C Signature and Encryption	
C BasicSha256	Inverse connection:	
C Aes128Sha256RsaOaep	Connect invers Pro	perties
Aes256Sha256RsaPss		
Login:		
Anonymous		
C User name and password		
Licer name:		
oser hand.	J	
Passwort:	Г	Store
Session Name:	9 - ModBus Connecti	
Variables format:		
confirm)	1	
OK Cancel		Help

All necessary settings are shown. The possible encryptions of the data to be transmitted are displayed. The example is using the security method *None*. By clicking *OK* the content of the dialog box is saved and closed.

The settings for the connection to the **IBH Link UA** OPC UA server are displayed in the right part of the **project window**.



2.9.2 Modbus configuration

The OPC tags from the IBH UA editor program ModBus connection.opu can be used. Open the file with the IBH UA Editor and transfer the Modbus configuration to the IBH Link UA. The Modbus configuration can be created with the following steps.

🐲 example 9 - Modbus connections.opu - OPCUAEdit				-		×
File Edit Help						
🗋 😂 🔚 🕼 @						
Project 👻 🕈 🗙		Name of the server con	nection			
alfak 🖌 V 🗈 🖷 🗼 🗛		Name	IBH Link UA	- ModBus	Connect	ion
		Server address				
		Host name / Address	192.168.1.14	1		
right click)		Port	48010			
		URL	opc.tcp://19	2.168.1.1	1.1.14:48010	
New server connection		Inverse connection	No			
New control		Security settings				
Properties	Security policity		None			
Add external data		Message mode	None			
		Authentication settings	ings			
Add modbus configuration		Login	Anonymous			
Add Mitsubishi configuration Click		Session name	Modbus Anb	indung		
Import		Other settings				
Export		Variables format	Compact			
Project 🖾 Server 🗟 Certificates	A	uthentication settings				
	<i>.</i>				CAPS I	NUM

2.9.3 Add new Modbus device



Mark Modbus configuration in the left part of the project window. Click the icon New device to open the Modbus device properties dialog box.



Specify device name and interface.

Modbus device prope	rties		×
Device <u>n</u> ame:	PLC416_ModBus_Server (enter)		
Interface:			
	or IP address: 19	2.168.1.10 (enter)	
C Serial Nur	ber of simultaneously possib	ble requests: 1	
Optional informations: -			
Desc <u>r</u> iption:	PLC416 the ModBus Devic	e	
Manufacturer:	IBHsoftec GmbH	e information is freely selecta	ble.
Model:	PLC416 V4.16	The fields can be left blank.	
Serial num <u>b</u> er:	4711		
Devision Country	5.0	Device vervicies	
Re <u>v</u> isionCounter:			
H <u>a</u> rdware revision:	4.16	Software revision: 7.4	7
confirm			
	Cancel	Hel	Ρ

2.9.4 Define Modbus variable in the IBH OPC UA editor

Right-click on the Modbus device name (PLC416_ModBus_Server) to open the context menu.

The *New Variable* command opens the *Modbus Variable Properties* dialog box. Ten (10) OPC tags are defined for the connection with the OPC server.

1. Read_Write_Multible_Coils_Boolean

🥨 Properties modbus v	ariable	×
<u>N</u> ame:	1_Read_Write_Multible_Coils_Boolean	Unit ID: 255
Type: Booleani UInt16 Int16 UInt32 Int32 Int32 Int32 Int32	Access: Read: Address: 160 ReadCoils C ReadCoils Number: 5	Write: Address: 160 WriteSingleCol 32-bit swap word order
Analog limit values:	s Minimum:	Ma <u>xi</u> mum: 0
History:	Sampling interval (sec): 0.5	Buffer size: 1000
UA node recog	nition: ns=9;s=CPU416_Modbus_Server.1_	Read_Write_Multible_Coils_Boolean
	Cancel	Help

Read-Write, bit access, data type Boolean. Start word address $0014_{hex} = 20_{dec}$; (DBX 20.0) Bit address $160_{dec} = A0_{hex}$. Five (5) bits defined as an OPC tag.

2. Read_Write_Multible_Holdinq_Register_Int

<u>N</u> ame:	2_Read_Write_Multible_Holdinq_Register_Int	Unit ID: 255
Type: C <u>B</u> oolean C UInt <u>16</u> (C <u>Int16</u> C UInt <u>32</u> C Int32	Access: Read: Read: Address: 22 C ReadInputRegisters ReadHoldingRegisters	Write Addr <u>e</u> ss: 22 WriteMultipleRegisters
C Eloat	Number: 3	32-bit swap word order
Analog limit values:	s <u>Mi</u> nimum: 0	Ma <u>xi</u> mum: 0
History:	Sampling interval (sec): 0.5	Buffer size: 1000
UA node recog	nition: ns=9;s=CPU416_Modbus_Server.2_Re	ead_Write_Multible_Holdinq_Register_Int
	Cancel	Help

Read-Write, data type INT16 fixed point number. Start word address, 22_{dec} = 0016_{hex}, word access. Three (3) fixed point numbers defined as an OPC tag.

3. Read_Discrete_Inputs_Boolean

Properties modbus va	riable		\times
<u>N</u> ame:	3_Read_Discrete_Inputs_Boolean	Unit ID: 255	
Type: Boolean UInt <u>16</u> Int1 <u>6</u> UInt <u>32</u> Int32	Access: Read: Pead Address: 944 ReadCoils ReadCoils ReadDiscreteInputs	Write:	
C <u>E</u> loat	Number: 7	32-bit swap word order	
Analog limit values:	Minimum:	Ma <u>xi</u> mum:	
History:	Sampling interval (sec): 0.5	Buffer size: 1000	
UA node recog	nition: ns=9;s=CPU416_Modbus_Server.3_	Read_Discrete_Inputs_Boolean	
<u>o</u> k	Cancel	Help	

Read only, bit access, data type Boolean. Start word address 59_{dec}, = 003B_{hex}, Bit address 944_{dez} = 03B0_{hex} - bit access. Seven (7) bits defined as OPC tags.

4. Read_Input_Registers_Int16



Read only, all data types except Boolean (Int16). Start word address 76_{dez} = 004Chex, word access. Four (4) fixed point numbers defined as OPC tags.

5. RW_Holdinq_Register_Multiple_Reg_Real

🥨 Properties modbus v	ariable	×		
<u>N</u> ame:	5_RW_Holding_Register_Multiple_Reg_Real	Unit ID: 255		
Type: C Boolean C UInt16 C Int1 <u>6</u> C UInt32 C Int32	Access: Read: Read: Address: 111 C ReadInputRegisters C ReadHoldingRegisters	Write: Address: 111 WriteMultipleRegisters		
<u>Eloat</u>	Number: 3	32-bit swap word order		
Analog limit values: — Check limit value	s <u>Mi</u> nimum:	Maximum: 0		
History:				
Save in history	Sampling interval (sec): 0.5	Buffer size: 1000		
UA node recognition: ns=9;s=CPU416_Modbus_Server.5_RW_Holding_Register_Multiple_Reg_Real				
	Cancel	Help		

Read-Write, data type INT16 fixed point number. Start word address 111_{dez} = 006F_{hex}, word access. Three (3) floating point numbers (float) defined as OPC tag.

6. Read_Coils_Boolean



Read only, bit access, data type Boolean. Start bit address 2016_{dec} = 07E0_{hex}. Eight (8) bits defined as OPC tags.

7. Read_Input_Registers_Int32



Read only, all data types except Boolean (Int32 - fixed point number). Start word address 160_{dez} = 00A0_{hex}, word access. Six (6) fixed point numbers defined as OPC tags.

8. Read_Input_Registers_UInt

🔉 Properties modbus va	riable	×	
<u>N</u> ame:	8_Read_Input_Registers_UInt	Unit ID: 255	
Type: C Boolean C UInt <u>16</u> C Int1 <u>6</u> C UInt <u>32</u> C Source	Access: Read: Read: Read: ReadInputRegisters ReadHoldingRegisters	└Write: └ Write Addr <u>e</u> ss: └	
⊂ Int3 <u>2</u> ⊂ <u>F</u> loat	Number: 6	32-bit swap word order	
Analog limit values:	; <u>M</u> inimum: 0	Maximum:	
History:	Sampling interval (sec): 0.5	Buffer size: 1000	
UA node recognition: ns=9;s=CPU416_Modbus_Server.8_Read_Input_Registers_UInt			
	Cancel	Help	

Read only, all data types except Boolean (UInt16 - unsigned fixed point number), Start word address 190_{dez} = 00BE_{hex}, word access. Six (6) unsigned fixed point numbers defined as OPC tags.

9. RW_Holdinq_Register_Multiple_Reg_Int32

🥁 Properties modbus va	riable	×
Name:	RW_Holding_Register_Multiple_Reg_Int32	Unit ID: 255
Type: C Boolean C UInt16 C Int16 C UInt32 (* Int32)	Access: Read: Address: 254 C ReadInputRegisters C ReadHoldingRegisters	Write: V Write Address: 254 WriteMultipleRegisters
C Float	Number: 3	32-bit swap word order
Analog limit values:	; Minimum: 0	Maximum: 0
History:	Sampling interval (sec): 0.5	Buffer size: 1000
UA node recogr	nition: ns=9;s=CPU416_Modbus_Server.9_	RW_Holdinq_Register_Multiple_Reg_Int32
ок	Cancel	Help

Read-Write, all data types except Boolean (Int32 - fixed point number). Start word address 254_{dez} = 001FC_{hex}, word access. Six (3) fixed point numbers defined as OPC tags.

10.RW_Holdinq_Register_Multiple_Reg_UInt32

Read-Write, all data types except Boolean (UInt32 - unsigned fixed point number). Start word address 272dec = 00110hex, word access. Four (4) unsigned fixed point numbers defined as OPC tags.

🦝 Properties modbus v	ariable	X
<u>N</u> ame:	W_Holding_Register_Multiple_Reg_UInt32	Unit ID: 255
Type: C goolean C UInt <u>16</u> C Int1 <u>6</u> (C UInt <u>32</u> C Int3 <u>2</u> C Eloat	Access: Read: Read Address: 272 ReadInputRegisters ReadHoldingRegisters Number: 4	Write: Addr <u>e</u> ss: 272 WriteMultipleRegisters
Analog limit values:	s Minimum:	Ma <u>xi</u> mum:
History:		
Save in history	Sampling interval (sec): 0.5	Buffer size: 1000
UA node recog	nition: ns=9;s=CPU416_Modbus_Server.10	RW_Holdinq_Register_Multiple_Reg_UInt32
	Cancel	Help

Defines OPC variables (OPC tags)

Ten (10) OPC variables (OPC tags) are defined with the Modbus *Variable Properties* dialog box.

😹 example 9 - Modbus connections.opu - OPCUAEdit		– 🗆 X
File Edit Help		
Control of the second sec	Name Data type Access R address W address W address W address W offer Number of Node name 1_Bead_Write_Multible_Colls_Boolean Boolean RW 160 5 CPU416_Modbus_serv 2_Bead_Write_Multible_Holding_Registers Number of Node name CPU416_Modbus_serv 2_Bead_Write_Multible_Holding_Registers Int6 R 76 4 CPU416_Modbus_serv 4_Stead_Jourcet_Input_Boolean Int61 R 76 4 CPU416_Modbus_serv 4_Stead_Jourcet_Registers_Int76 Int61 R 76 4 CPU416_Modbus_serv 6_Stead_Jourcet_Registers_Int72 Int62 R R 100 6 CPU416_Modbus_serv 9_Bead_Jourc_Registers_Int72 Int62 R 100 6 CPU416_Modbus_serv 9_Bead_Jourc_Registers_Multiple_Reg_Int72 Int62 R 254 254 3 CPU416_Modbus_serv 9_BW_Holding_Register_Multiple_Reg_UI0t32 Int62 RW 254 254 3 CPU416_Modbus_serv 9_	r.1, Read, Write, Multible, Colit, Boolean r.2, Read, Write, Multible, Holding, Registre.Int r.3, Read, Discrete, Inputs, Boolean r.5, Read, Joint, Registrer, Mithgle, Reag, Real r.6, Read, Colit, Registrer, Jint2 R. Read, Joint, Registrer, Jint2 r.8, Read, Joint, Registrer, Jint2 r.8, Read, Joint, Registrer, Jint2 r.8, Read, Joint, Registrer, Jint3 r.8, Read, Joint, Registrer, Multiple, Reg. JINt2 r.10, RWI Holding, Registrer, Multiple, Reg. JINt2 r.0, RWI Holding, Registrer, Multiple, Reg. JINt2
File Edit Help		
Project	Image: CPU416_Modbus_Server Image: CPU416_Modbus_Server Image: CPU416_Modbus_Server Image: CPU416_Modbus_Server Image: CPU416_Modbus_Server Image	Name 1_Read, 2_Read, 2_Read, 3_Read, 4_Read, 5_RW_F 6_Read, 7_Read, 8_Read, 9_RW_F 10_RW_F

2.9.5 Transfer Modbus configuration to the IBH Link UA.

A right-click on *Modbus configuration* opens the context menu.

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Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Project Proje	CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_Modb CPU416_MOdb CPU416_MOdb CPU41	Name • 1_Read_Write_Multible_Coils_Boolean • 2_Read_Write_Multible_Holdinq_Register_Int • 3_Read_Discrete_Inputs_Boolean • 4_Read_Input_Registers_Int16 • 5_RW_Holdinq_Register_Multiple_Reg_Real • 6_Read_Coils_Boolean • 7_Read_Input_Registers_Ulnt • 8_Read_Input_Registers_Ulnt • 9_RW_Holdinq_Register_Multiple_Reg_Int32 • 10_RW_Holdinq_Register_Multiple_Reg_Ulnt32
agridett as server as certificates		CADE NUM -

The command to transfer the Modbus configuration must be confirmed.



2.9.6 IBH Link UA browser window

The transmitted Modbus configuration is displayed under *Modbus* in the IBH Link UA Browser window.

Browser-Fenster-ModBus

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Browser window diagnostics

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Certificates	CPU416_ Modbus_Ser	192.168.1.10:502	22.8.2020 11:49:46	PLC 0	Connection established	
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2.9.7 IBH OPC UA Editor Server Information - Online

🗱 example 9 - Modbus connections.opu - OP	CUAEdit							– 🗆 X
File Edit Help								
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Server 🗢 🛪 🗙	Name	Data type	Access	R address	W address	Number of	Node name	Value
🖃 📚 IBH Link UA - ModBus Connection	1_Read_Write_Multible_Coils_Boolean	Boolean	RW	160	160	5	CPU416_Modbus_Server.1_Read_Write_Multible_Coils_Boolean	{true,true,true,true,true}
A Modbus configuration	2_Read_Write_Multible_Holding_Register_Int	Int16	RW	22	22	3	CPU416_Modbus_Server.2_Read_Write_Multible_Holding_Register_Int	{12345,-4711,23456}
R- E CPU416 Modbus Server	😫 🔗 3_Read_Discrete_Inputs_Boolean	Boolean	R	944		7	CPU416_Modbus_Server.3_Read_Discrete_Inputs_Boolean	{true,true,true,true,true,true,true}
🕮 🥅 LIA Nodes	4_Read_Input_Registers_Int16	Int16	R	76		4	CPU416_Modbus_Server.4_Read_Input_Registers_Int16	{-12345,4711,-4712,26789}
	5_RW_Holdinq_Register_Multiple_Reg_Real	Float	RW	111	111	3	CPU416_Modbus_Server.5_RW_Holding_Register_Multiple_Reg_Real	{7.12855e-41,22370.8,332.555}
	6_Read_Coils_Boolean	Boolean	R	2016		8	CPU416_Modbus_Server.6_Read_Coils_Boolean	{true,true,true,true,true,true,true,true}
	7_Read_Input_Registers_Int32	Int32	R	160		6	CPU416_Modbus_Server.7_Read_Input_Registers_Int32	{4711,100000,-400000,4711000,-2004711,4000000}
	8_Read_Input_Registers_UInt	UInt16	R	190		6	CPU416_Modbus_Server.8_Read_Input_Registers_UInt	{62080,60969,10000,20000,35536,31500}
	9_RW_Holding_Register_Multiple_Reg_Int32	Int32	RW	254	254	3	CPU416_Modbus_Server.9_RW_Holding_Register_Multiple_Reg_Int32	{-3456000,-4000567,1000000}
	♀ 10_RW_Holding_Register_Multiple_Reg_UInt32	UInt32	RW	272	272	4	CPU416_Modbus_Server.10_RW_Holding_Register_Multiple_Reg_UInt32	{4294621296,4294566729,10123000,1005670}
Project Server Certificates								
								CAPS NUM

Name	Data type	Access	R address	W address	Number of
1_Read_Write_Multible_Coils_Boolean	Boolean	RW	160	160	5
2_Read_Write_Multible_Holdinq_Register_Int	Int16	RW	22	22	3
3_Read_Discrete_Inputs_Boolean	Boolean	R	944		7
4_Read_Input_Registers_Int16	Int16	R	76		4
5_RW_Holdinq_Register_Multiple_Reg_Real	Float	RW	111	111	3
🔗 6_Read_Coils_Boolean	Boolean	R	2016		8
7_Read_Input_Registers_Int32	Int32	R	160		6
8_Read_Input_Registers_UInt	UInt16	R	190		6
9_RW_Holdinq_Register_Multiple_Reg_Int32	Int32	RW	254	254	3
10_RW_Holdinq_Register_Multiple_Reg_UInt32	UInt32	RW	272	272	4

Node name	Value	
CPU416_Modbus_Server.1_Read_Write_Multible_Coils_Boolean	{true,true,true,true,true}	continuouchu
CPU416_Modbus_Server.2_Read_Write_Multible_Holding_Register_Int	{12345,-4711,23456}	undated
CPU416_Modbus_Server.3_Read_Discrete_Inputs_Boolean	{true,true,true,true,true,true}	upuuccu
CPU416_Modbus_Server.4_Read_Input_Registers_Int16	{-12345,4711,-4712,26789}	
CPU416_Modbus_Server.5_RW_Holdinq_Register_Multiple_Reg_Real	{7.12855e-41,22370.8,332.555}	
CPU416_Modbus_Server.6_Read_Coils_Boolean	{true,true,true,true,true,true,true,t	rue}
CPU416_Modbus_Server.7_Read_Input_Registers_Int32	{4711,100000,-400000,4711000,-20	04711,4000000}
CPU416_Modbus_Server.8_Read_Input_Registers_UInt	{62080,60969,10000,20000,35536,3	1500}
CPU416_Modbus_Server.9_RW_Holdinq_Register_Multiple_Reg_Int32	{-3456000,-4000567,1000000}	
CPU416_Modbus_Server.10_RW_Holding_Register_Multiple_Reg_UInt32	{4294621296,4294566729,10123000),1005670}

2.9.8 UaExpert – The OPC Unified Architecture Client

Unified Automation UaExpert - The OPC Unified Architecture C	ent - NewProject*	
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 Modbus CPU16. Modbus. Server 10.RW_Holdma, Register, Multiple_Reg_Ulint2 1.Read, Write, Multible, Coils, Boolean 2.Read, Write, Multible, Coils, Boolean 3.Read, Discrete, Input, Register, Julti 3.Read, Discrete, Input, Register, Julti 5.RW_Holding, Register, Julti 6.Read, Coils, Boolean 7.Read, Input, Register, Julti 8.Read, Input, Register, Julti 9.W. Holding, Register, Julti 9. Bead, Input, Register, Julti 9. DeviceManual 9. DeviceManual 9. DeviceManual 9. DeviceManual 9. DeviceManual 9. WinteConfiguration 9. Status 9. WinteConfiguration 9. Status 9. WinteConfiguration 9. Device 	Display NameValue10 RW_Holdinq_Register_Multiple_Req_UInt32{4294621296,4294566729,1012301_Read_Write_Multiple_Coils_Boolean{true,true,true,true,true,true}2_Read_Discrete_Inputs_Boolean{true,true,true,true,true,true,true,true,	00,1005670} e} <mark>continuously updated e,true} 2004711,4000000} ;,31500}</mark>