Symbol configuration: Creating and using multiple symbol configurations

If different clients should have access to different data areas of the controller, then multiple groups of symbols are necessary. In CODESYS controllers, access to the respective symbol set is assigned to the controller by means of user management. As a result, the client has to supply the user and password, which should certainly be encrypted by today's standards.

From these requirements, encrypted communication with the controller is necessary. Especially with large amounts of data, encryption can lead to a higher load on the controller and, for example, prolong the startup behavior of the OPC UA server. Also note that not every client supports encrypted communication, for example an OPCDA-Client => mixed operation is not possible.

• Create a project with encrypted communication for 3 variables and test the communication, for example with the "UaExpert" OPCUA client.

Step-by-step instructions are found in the help:

Devices .	- - - X	LC_PRG 🖉 Symbo	ol Configuration	🗙 👩 De	vice						
SymbolSets	View	→ MB Build Build Betting	gs + Tools +								
Device (CODESYS Control Win V3)					1						
B DLC Logic	(1) There	are 3 configured variable	s which are not re	eferenced by t	the IEC code.	Reading a	nd writing to t	hem may not ha	we the desired effect	(s). Rem	ove
Application	Changed	symbol configuration will	be transferred w	ith the next do	ownload or or	nline chang	e				
👘 Library Manager	Symbols		Access Rights	Maximal	Attribute	Type	Members	Comment			
PLC_PRG (PRG)		Constants				- 21					
		ToConfig Globale									
🖹 🎆 Task Configuration											
🗏 🥩 MainTask (IEC-Tasks)			50	546		ROOI					
PLC_PRG] ψ LL] ♠ ID				BOOL					
		j ψ iz		5		BOOL					
		90	70			BOOL					
	11										
Project		8 ×	Data Access View								
Project			# Server	Nod	e Id Disp	lay Name	Value	Datatype	iource Timestamp Ser	/er Timestamp	Statusc
Servers OPCUAServer@KernTPC3 - None - None	(uatcp-uasc-uabinary)										
Documents			1								_
Data Access View	Server Settings - OPCL	JAServer@KernTPC3 - None -	None (uatcp-uasc-u	abinary)						0	
l i			-								
	Server Information										
	Endpoint Url	opc.tcp://KernTPC:4840									
	Security Settings										
Address Space	Security Policy	Basic256Sha256									-
😏 No Highlight	Message Security Mode	Sign & Encrypt									-
C Root											
4 🛄 Objects	Authentication Settings										
A DeviceSet A CODESVS Control Win V2	@ Anonymous										_
A 💑 Resources	Username										
4 🜲 Application	Password									S	tore
DeviceManual DeviceProvidence											
Device version	Ceroncate										<u> </u>
HardwareRevision	Private Key										
Manufacturer Model	Session Settings										
A SPrograms	Session Name	urn:KernTPC:UnifiedAutomatio	n:UaExpert/@KernTPC								
A 👶 PLC_PRG											
> 🖷 ä											
RevisionCounter						N					
SerialNumber						3			0	Can	cel
SoftwareRevision											

Creating user management for the controller

If user management is already activated on the controller, then you can skip this step.

• In the configuration area of the controller, open the Users and Groups tab. Click the *Refresh* button.

Communication Settings	
oplications Synchronization	ation or load a configuration from disc.
ackup and Restore	
15	© Import
	Z Edit
	¢ Delete
Settings	
Shell	
ers and Groups	
ess Rights	
bol Rights	
k Deployment	
us	
rmation	♦ Add
	O Import
	Z Edit
	Delete

This is followed by a dialog that you confirm by clicking Yes. Then a login dialog opens for you to login on the controller as the default user *Administrator (password: Administrator)*. As this is the first time you have used user management, you will then be prompted to enter a new password.

lame:	Administrator	
Password:	•	
onfirm password:	-	
assword strength:	Very weak Very weak	
	✓ Password can be changed by user	
	✓ Password must be changed at first login	NS

• Create a new user group (example: "grOPCUA") by clicking the Add button.

Communication Settings	💇 📄 🔛 Device user: Administrator		
pplications	Synchronized mode: All changes are immediately downloaded	I to the device.	
Jackup and Restore	Administrator		O Add
			C Import
-1165			Edit
.og			© Delete
LC Settings			
LC Shell			
Isers and Groups			
ccess Rights			
ymbol Rights			
ask Deployment			
tatus	Groups		
formation	*- 1 Administrator		🔍 🗢 Add
	B Developer B Developer		O Import
	gropcua		📝 Edit
	* Service		Delete
	- Si Watch		

• Use this button to create a new user (example: "usrOPCUA") in this area. In the configuration dialog, assign the created group "grOPCUA" to the user:

Add User		23
Name:	usrOPCUA	
Default group:	gropcua	•
Password:	•	
Confirm password:	•	
Password strength:	Weak 📝 Hidepassword	
	Password can be changed by user	
	Password must be changed at first login	
	OK Can	cel

Communication Settings	📀 🗁 🛃 Device user: Administrator		
Applications	Synchronized mode: All changes are immediately downloade	d to the device.	
Backup and Restore	Administrator		Add
Files	is member of group 'grOPCUA'		• Import
Log			Delete
PLC Settings			
PLC Shell			
Users and Groups			
Access Rights			
Symbol Rights			
Task Deployment			
Status	Groups		
Information	Administrator		♦ Add
	B Service		Import
	gropcua		Edit
		45	
	a has user member usrOPCUA		Delete
	as user member usroPCUA Service		¢ Delete

Devices	- 7 X	
= 🔄 SymbolSets		
E Device (COP	EVE Constant USin 1/3	
E PLC Log		
E O Ap	Copy	
	Paste Paste	
	K Delete 2	
	a Properties	
8	Add Object	
	Add Folder	
	Add Davies	
	uppare revice	
	j Edit Object	
	Edit Object With	
	Edit IO mapping	
	Import mappings from CSV	
	Exect mannings in CSV	
	Chine Coning Hode	
<	Reset origin device [Device]	

Creating a new configuration

• In the Symbol Configuration, select the option Settings\Enable Symbol Sets:



This makes the existing configuration the default set.

• Add a new group by clicking the Add a new symbol set button.

Symbol Configuration	×							
📉 View 👻 🛗 Build 🛛 🛱 Set	tings - Tools -							
There are 3 configured variable	oles which are not re	eferenced by t	the IEC code.	Reading a	nd writing to t	hem may not ha	we the desired effect(s).	Remove
default			- (+)	j 🖻		onfigure Symbo	l Rights	
Changed symbol configuration v	vill be transferred w	ith the next d	ownload or on	line chang	e			
Symbols	Access Rights	Maximal	Attribute	Туре	Members	Comment		
🗉 🔲 📄 Constants								
🖲 📄 📄 IoConfig_Globals								
BW E PLC_PRG								
- 🔽 🤣 i1	N	*		BOOL				
	St.	*		BOOL				
🛛 🖉 🤌 i3	Sep	*		BOOL				

• In the dialog, type in a meaningful name for the group:

Add a new symbol set	×
Symbol-Set Name	symOPCUA
After adding a sym	ol set you have to set permissions in the plc
	Add Cancel

• Assign a variable to the group:

Symbol Configuration	×							
🛛 View 👻 🛗 Build 🛛 🛱 Setti	ngs 🕶 Tools 👻							
!There are 1 configured variabl	es which are not re	ferenced by t	the IEC code.	Reading ar	nd writing to th	nem may not ha	ave the desired effect(s).	Remove
symOPCUA Changed symbol configuration wi	ill be transferred w	ith the next do	▼ 🕂 (ownload or or	iline chang	e X Ca	onfigure Symbo	ol Rights	
Symbols	Access Rights	Maximal	Attribute	Туре	Members	Comment		
🗉 🔲 📄 Constants								
🗉 🔲 📑 IoConfig_Globals								
🖹 🔲 📄 PLC_PRG								
📄 🧔 i1		*		BOOL				
🤍 🛷 i2	N	N		BOOL				
📄 🔌 i3		*		BOOL				

• Download the project to the controller.

Assigning from the symbol set to the user group

• Open the *Symbol Rights* tab in the controller and update the contents by clicking the *Refresh* button. The available symbol sets should now be listed:

Symbol Configuration Device X	
Applications Synchronized mode: All changes are immediately download Symbol Sets	ded to the device. Rights:
Backup and Restore	Groups Access
Files → symOPCUA	Administrator Developer
Log	Everyone arOPCUA
PLC Settings	Service -
PLC Shell	Weel .
Users and Groups	
Access Rights	
Symbol Rights	
Task Deployment	
Status	
Information	

Now you can select the symbol set in the list on the left and assign it by double-clicking the user group:

Applications	Symbol Sets	are mineurately downloaded to	Rights:	
Backup and Restore	E- D Application		Groups	Access
	🚽 default	2	Administrator	+
les	symOPCUA		Developer	-
			Everyone	-
Jg			grOPCUA	-
LC Settings			Service	-
			Watch	-
Symbol Configuration	Device X			
Symbol Configuration	Synchronized mode: All change	s are immediately downloaded	to the device.	
g Symbol Configuration pplications ackup and Restore	Synchronized mode: All change Symbol Sets	s are immediately downloaded	to the device. Rights: Groups	Access
Symbol Configuration pplications ackup and Restore	Synchronized mode: All change Symbol Sets 	es are immediately downloaded	to the device. Rights: Groups Administrator	Access
Symbol Configuration pplications ackup and Restore	Synchronized mode: All change Symbol Sets 	s are immediately downloaded	to the device. Rights: Groups Administrator Developer	Access
Symbol Configuration pplications ackup and Restore	Synchronized mode: All change Symbol Sets	s are immediately downloaded	to the device. Rights: Groups Administrator Developer Everyone	Access
Symbol Configuration pplications ackup and Restore iles	Synchronized mode: All change Symbol Sets	s are immediately downloaded	to the device. Rights: Groups Administrator Developer Everyone grOPCUA	Access
Symbol Configuration Applications Backup and Restore Files Og C Settions	Synchronized mode: All change Symbol Sets	s are immediately downloaded	to the device. Rights: Groups Administrator Developer Everyone grOPCUA Service	Access

Testing with the OPC UA client

In the OPC UA client, change the connection option to use a user:

Project	8 ×	Data Access View					
4 🗊 Project		# Server	Node Id	Display Name	Value	Datatype	Jource Timestamp Server Timestamp
A Servers							
OPCUAServer@KernTPC3 - None - None (uatcp-uasc-uabinary)							
Documents	UAServer@KernTPC3 - None - None (ua	tcp-uasc-uabinary)					8 ×
Server Information							
Endpoint Url	opc.tcp://KernTPC:4840						
Security Settings							
Security Policy	Basic256Sha256						•
Message Security Mode	Sign & Encrypt						•
Authentication Settings							
Anonymous		3					
Username usrOPC	UA						
Password •)						Store)
Certhcate							
Private Key							
Session Settings							
Session Name	urn:KernTPC:UnifiedAutomation:UaExperi	t@KernTPC					
							OK Cancel

If you login as user *usrOPCUA*, ten you only get the variables that have been assigned to the symbol set *symOPCUA*.

