

Setup of PROCON-WEB ES on u-OS

Abstract:

This application note helps you creating your first visualization with PROCON-WEB ES on a u-OS device. It describes the installation of both the Designer software on your PC and the runtime app on u-OS. Furthermore, you learn how to build, download, and run a small visualization project with a connection to the CODESYS runtime via OPC UA.

Hardware reference

No.	Component name	Article No.	Hardware / Firmware version
1	UC20-WL2000-AC	1334950000	u-OS 2.0.0
2	IoT-GW30	2682620000 2682630000	u-OS 2.0.0

Software reference

No.	Software name	Article No.	Software version
1	CODESYS Development System		SP18 Patch 4
2	CODESYS Runtime App		4.7.0.0-2
3	PROCON-WEB Designer and RT		From 6.6.0

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1 Warning and Disclaimer

Warning

Controls may fail in unsafe operating conditions, causing uncontrolled operation of the controlled devices. Such hazardous events can result in death and / or serious injury and / or property damage. Therefore, there must be safety equipment provided / electrical safety design or other redundant safety features that are independent from the automation system.

Disclaimer

This Application Note / Quick Start Guide / Example Program does not relieve you of the obligation to handle it safely during use, installation, operation and maintenance. Each user is responsible for the correct operation of his control system. By using this Application Note / Quick Start Guide / Example Program prepared by Weidmüller, you accept that Weidmüller cannot be held liable for any damage to property and / or personal injury that may occur because of the use.

Note

The given descriptions and examples do not represent any customer-specific solutions, they are simply intended to help for typical tasks. The user is responsible for the proper operation of the described products. Application notes / Quick Start Guides / Example Programs are not binding and do not claim to be complete in terms of configuration as well as any contingencies. By using this Application Note / Quick Start Guide / Example Program, you acknowledge that we cannot be held liable for any damages beyond the described liability regime. We reserve the right to make changes to this application note / quick start guide / example at any time without notice. In case of discrepancies between the proposals Application Notes / Quick Start Guides / Program Examples and other Weidmüller publications, like manuals, such contents have always more priority to the examples. We assume no liability for the information contained in this document. Our liability, for whatever legal reason, for damages caused using the examples, instructions, programs, project planning and performance data, etc. described in this Application Note / Quick Start Guide / Example is excluded.

Security notes

In order to protect equipment, systems, machines and networks against cyber threats, it is necessary to implement (and maintain) a complete state-of-the-art industrial security concept. The customer is responsible for preventing unauthorized access to his equipment, systems, machines and networks. Systems, machines and components should only be connected to the corporate network or the Internet if necessary and appropriate safeguards (such as firewalls and network segmentation) have been taken.

2 Introduction

PROCON-WEB ES is a tool to create HMI solutions for web-based visualization. It is a platform neutral solution for embedded systems. The visualization is created by the PROCON-WEB designer and can be loaded to the embedded system.

On u-OS, you can use the PROCON-WEB ES app to be able to download and run PROCON WEB visualizations. It is possible to display the visualization with every current web browser. PROCON-WEB offers different communication protocols, like OPC-UA or Modbus TCP.

Find more information online: [PROCON-WEB \(weidmueller-gti-software.com\)](https://www.weidmueller-gti-software.com)

3 Install PROCON-WEB

3.1 App on u-OS

Requirements:

1. u-OS device with internet access.

Procedure:

1. Open the u-OS web-interface and change to the “App manager” tab.
2. Click on the “Install app” button and open the App hub. This might take some time.
3. Click on the “PROCON-WEB Embedded Systems” button, select the version and install the app.

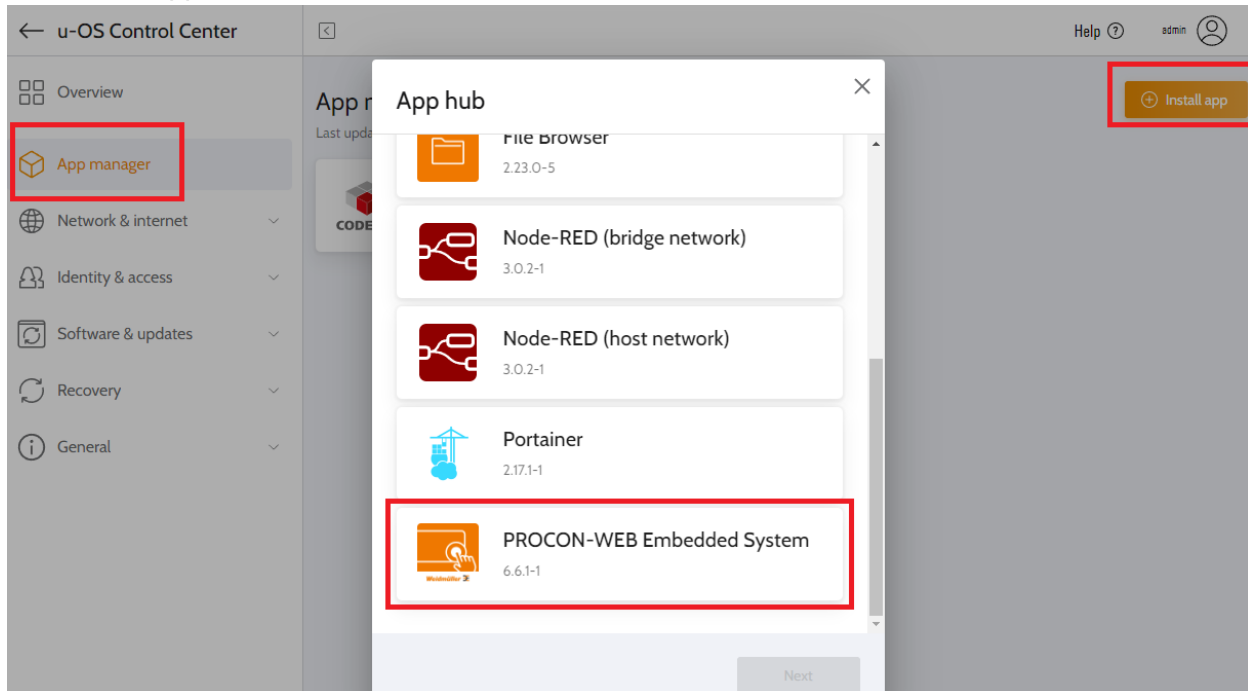


Figure 1: App hub

4. After a successful installation, the app manager displays the installed app.

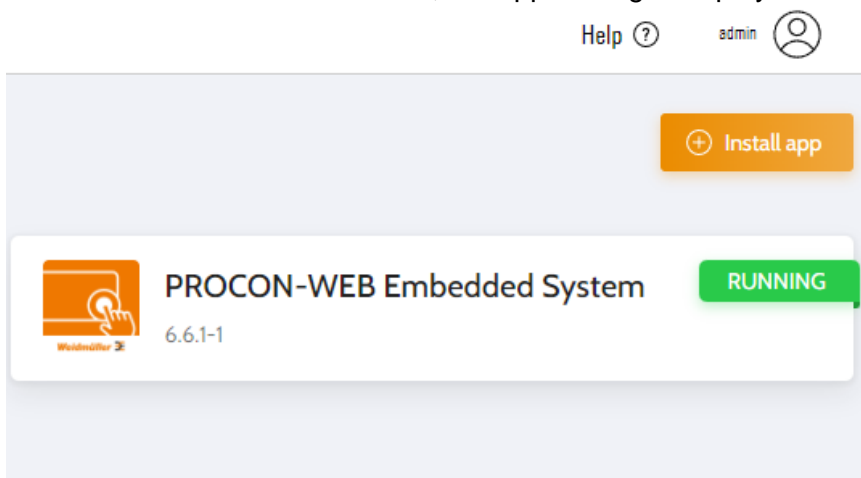


Figure 2: PROCON-WEB app

Setup of PROCON-WEB ES on u-OS

- Now it is possible to open the “System Management” web interface of the PROCON-WEB runtime. → Click on the “PROCON-WEB App”→ click “open”→ enter the password.

Default login settings are:

Username: Administrator

Password: procon

Inside the “System Management” you can view the settings of the PROCON-WEB runtime.

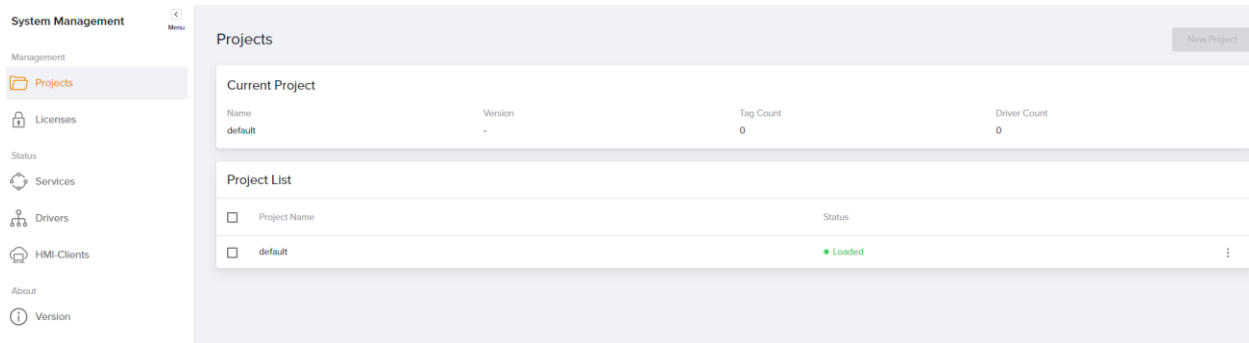


Figure 3: System Management

- Future updates can be installed via the “App manager” of u-OS. Open the app and click on “Check for updates”. Install any updates if necessary.

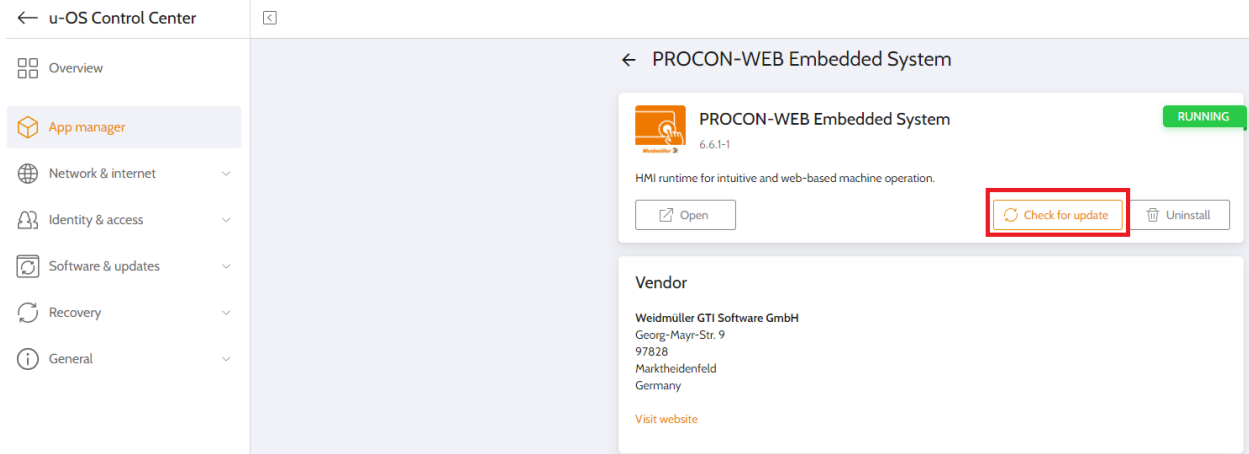


Figure 4: check for updates

3.2 PROCON-WEB Designer on a PC

Requirements:

- Windows PC with internet access.

Procedure:

- Open the Weidmueller support-center and search for PROCON-WEB.
- Click on the “Software” filter box and change to the tab “Downloads”.

Setup of PROCON-WEB ES on u-OS

3. Download the current PROCON-WEB Designer and possible updates or patches.

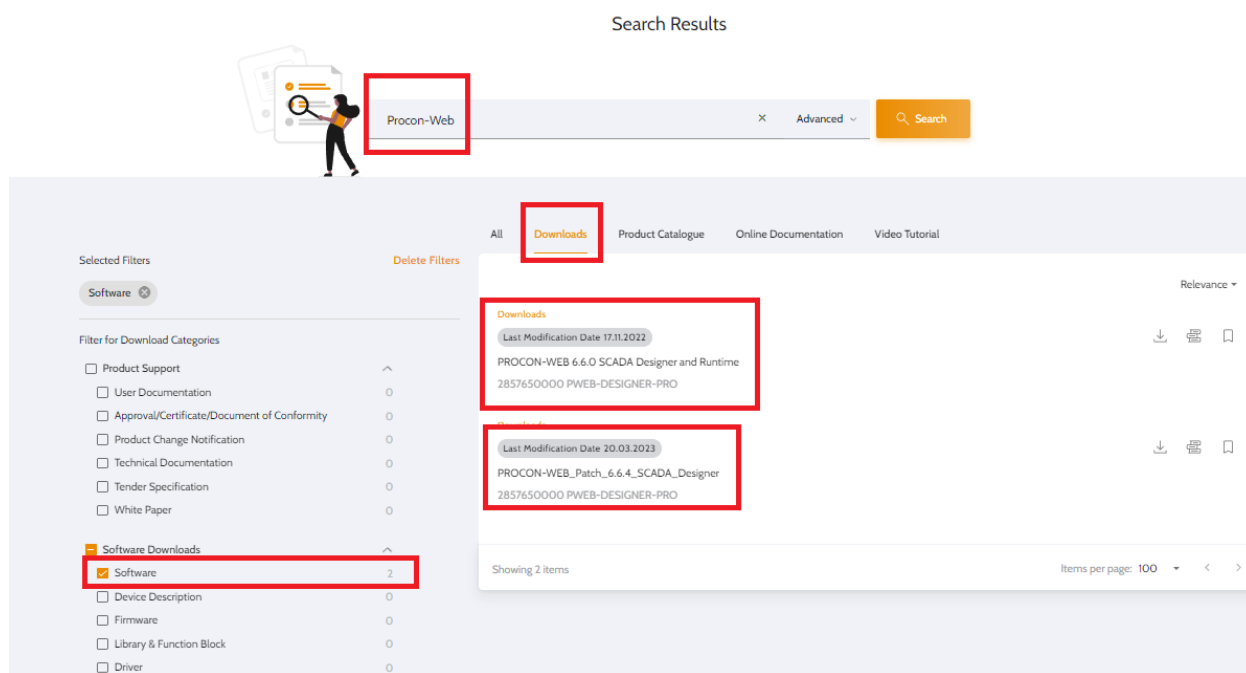


Figure 5: support-center

4. Install the main software and possible updates or patches on your PC.
5. After successful installation, you can start the PROCON-WEB Designer.

4 PROCON-WEB Project

Requirements:

1. Windows PC with installed PROCON-WEB Designer.

Procedure:

1. Start the PROCON-WEB Designer.
2. Click on “Do not search for copy protection again” button if you want to use the free designer version with limited tag count (variables) without a license dongle.



Attention:

Without a license it is possible to use up to 2000 tags. There are no other restrictions. If you need more tags, it is necessary to buy a license.

3. Open or create a new PROCON-WEB project. The following chapter 4.1 explains how to create a small “hello world” project. Skip these steps if, e.g., you already have project.

4.1 Hello World Project with OPC-UA Server connection

Requirements:

1. Device with u-OS and installed CODESYS app, connected to the PC running PROCON-WEB Designer
2. CODESYS project with a configured and running OPC-UA Server on the u-OS device.
3. CODESYS project contains a String, Int and Bool variable that are published via OPC-UA.

Procedure:

1. → Click on “New project”→ select a “Project name”→ change the “Target system” to “Embedded Systems”→ select a Template (Empty project)→ click on “Ok”.

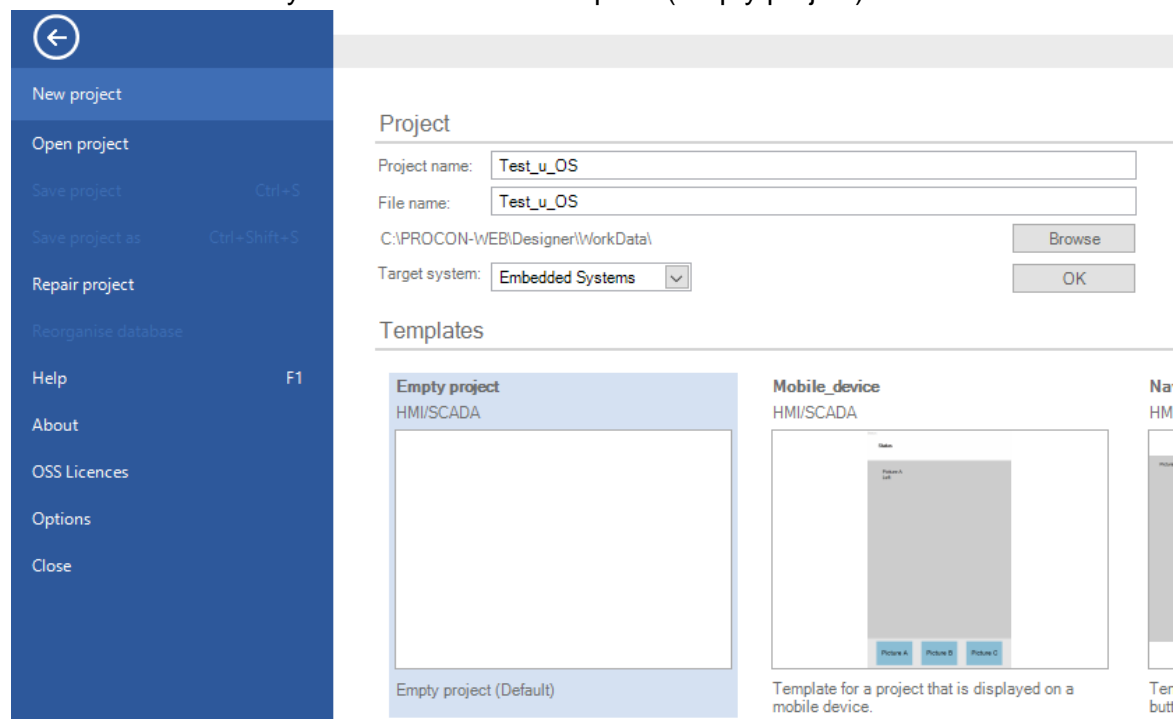


Figure 6: create new project

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2. Open the “Process variables” inside the “project tree” → select the “Driver selection” → mark the box for “OPC-UA V2” → click on “Connections” → click on “New” → put in a name for the connection → adjust settings for the connection → click “OK”.

For example, the default URL for a UC20-WL2000-AC connected via USB would be:
`opc.tcp://192.168.10.202:4840`



Attention:

The “driver connection settings” depends on the configuration of the OPC-UA Server in CODESYS. For a connection to CODESYS OPC-UA Server change the default entry of “SubscribeTimestampChanges” to “false”. Please also refer to chapter 4.2.

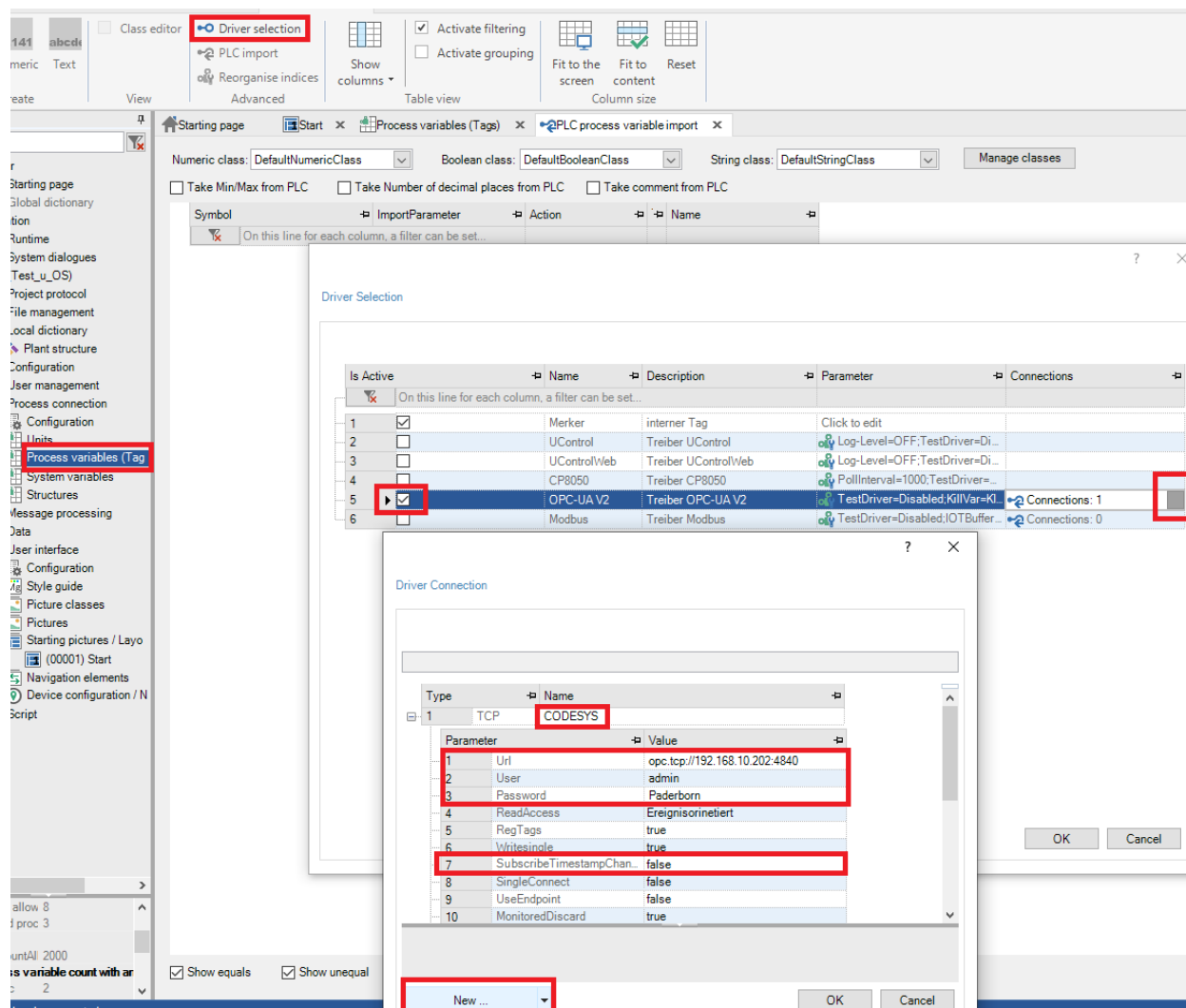


Figure 7: Driver selection

3. We will now import the existing variables by browsing the CODESYS OPC UA server.
→ Open the “Process variables” inside the “project tree” → select the “PLC import” → click on “Add” → put in the OPC-UA Server URL, e.g., `opc.tcp://192.168.10.202:4840` →

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put in the user credentials to connect to the OPC-UA Server → click on “Connect” → browse to the variables from your CODESYS project and select them → click on “Apply”.

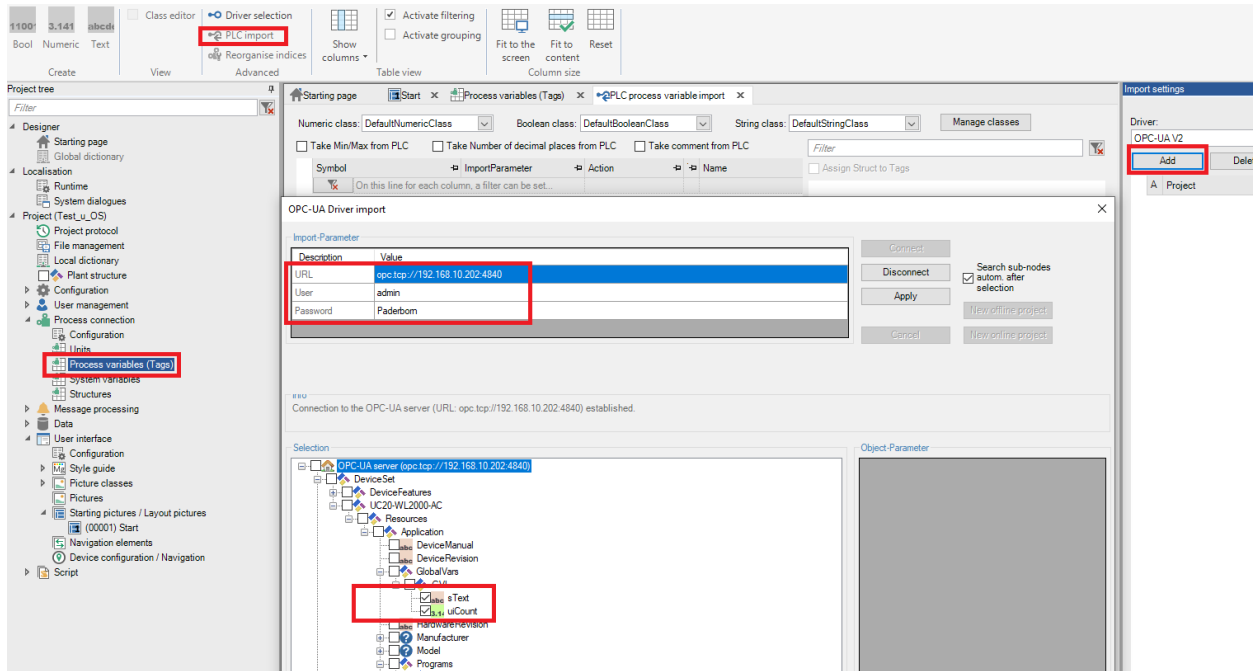


Figure 8: PLC import

4. → Click the “Read Symbols” button to view the OPC-UA Server variables → select the variables you want to use or click on “Mark Action Row” to select all variables → right click on the Action Row (variables) and click “Import Now”.

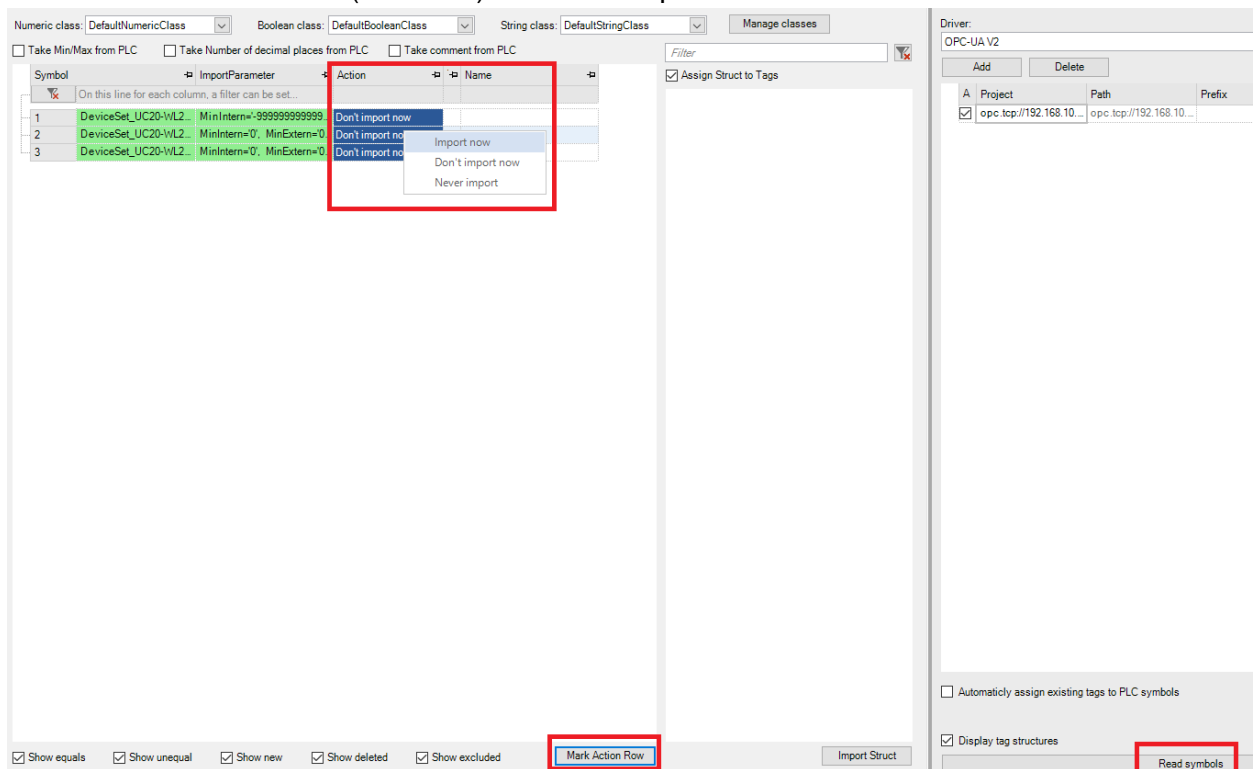


Figure 9: Import variables

Setup of PROCON-WEB ES on u-OS

5. Close the window. The new variables are visible inside the “Process variables” view and now it is possible to use the variables directly inside the PROCON-WEB project.
6. Select the created “Connection” for every OPC-UA variable.

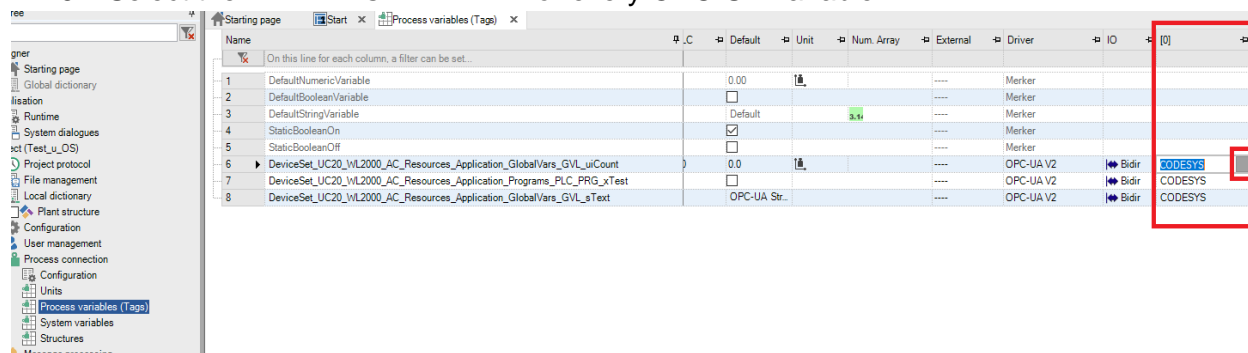


Figure 10: connection

7. → Open the “Start” Picture→ click on the text icon→ select dynamic text.

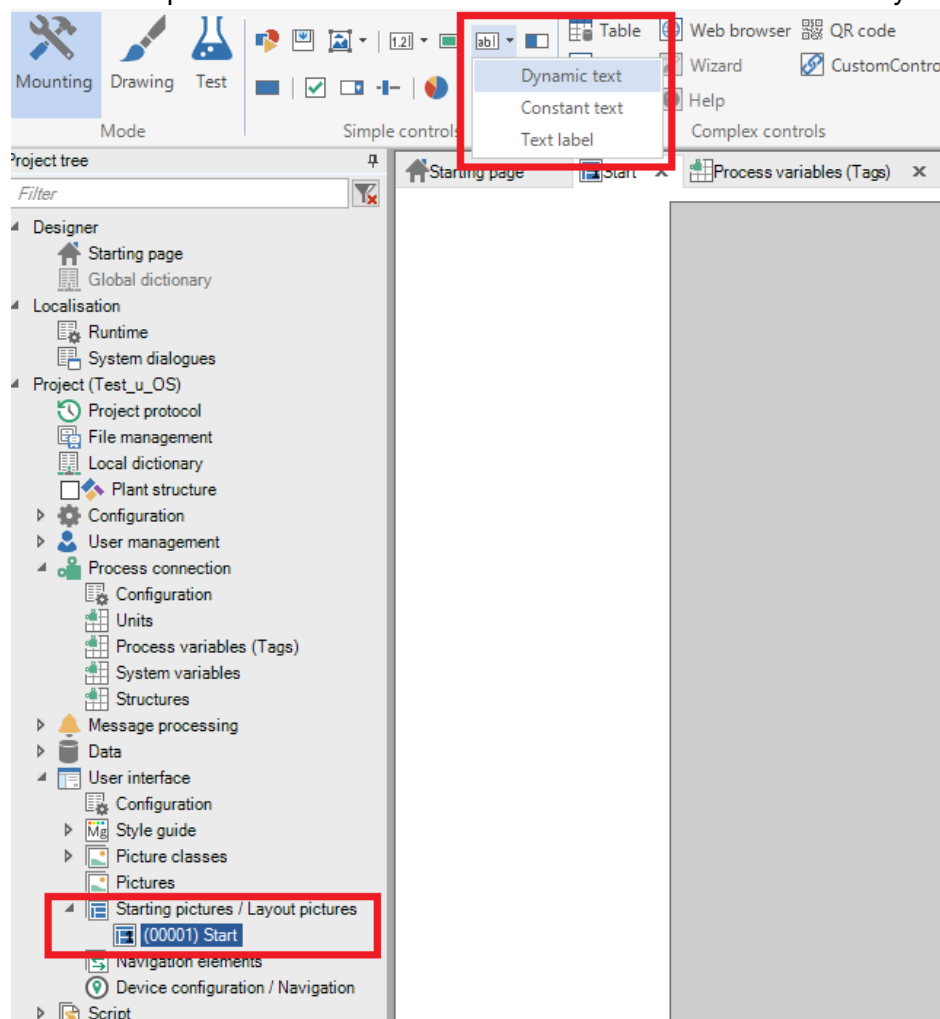


Figure 11: Start picture

8. → Create a name for the class object → click on “Tag” → select the OPC-UA “String” variable → adjust the size (string length) of the variable → write a default value to the variable → click “Ok” → edit the number box (color, size, format...) → click “Ok”.

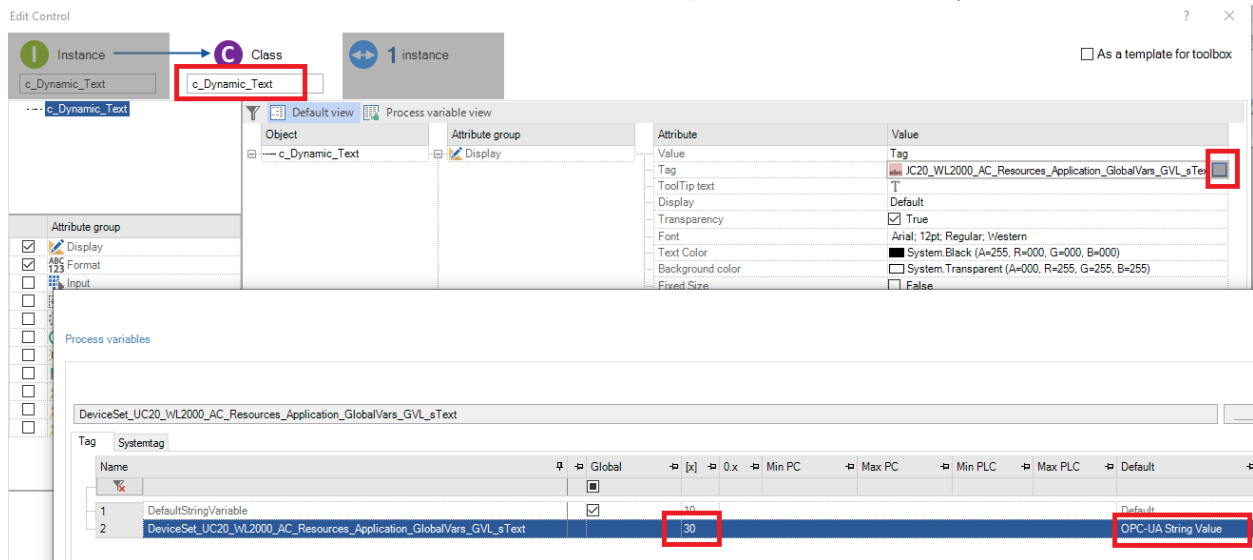


Figure 12: string variable



Note:

It is possible to write a default value to the different variables. This way, it should be easier to work with the respective object. Without a default value, the object is empty inside the designer edit window.

9. → Click on the numeric icon → select Numeric digit.

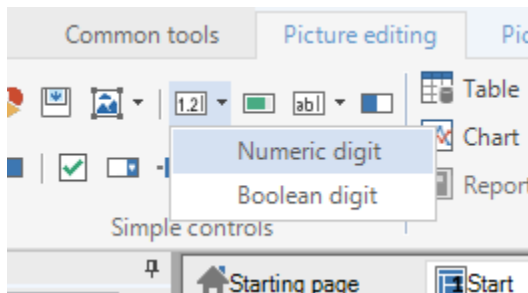


Figure 13: numeric icon

10. → Create a name for the class object → click on Tag → select the OPC-UA “Int” variable → adjust the size and decimal place of the variable → click “Ok” → edit the text box (color, size, format...) → click “Ok”.

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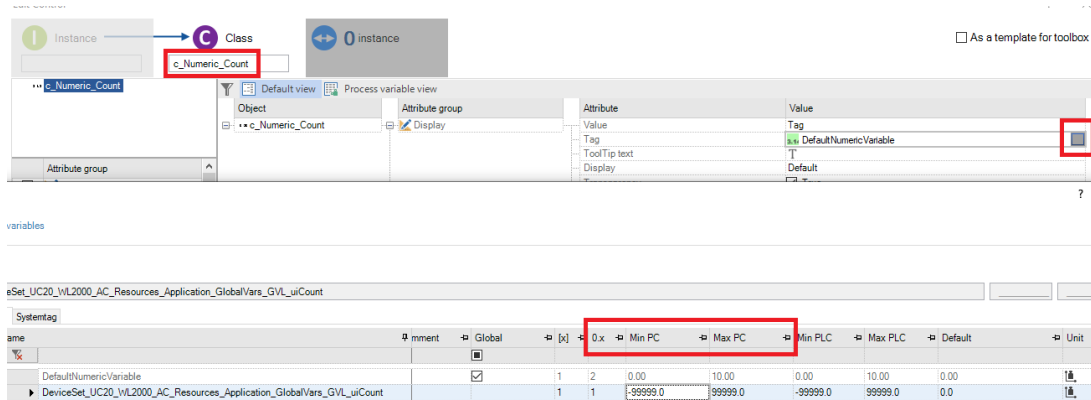


Figure 14: numeric variable

11. → Click on the check box icon → Create a name for the class object → click on “Tag” → select the OPC-UA “Bool” variable → click “Ok” → edit the check box (size, format...) → click “Ok”.

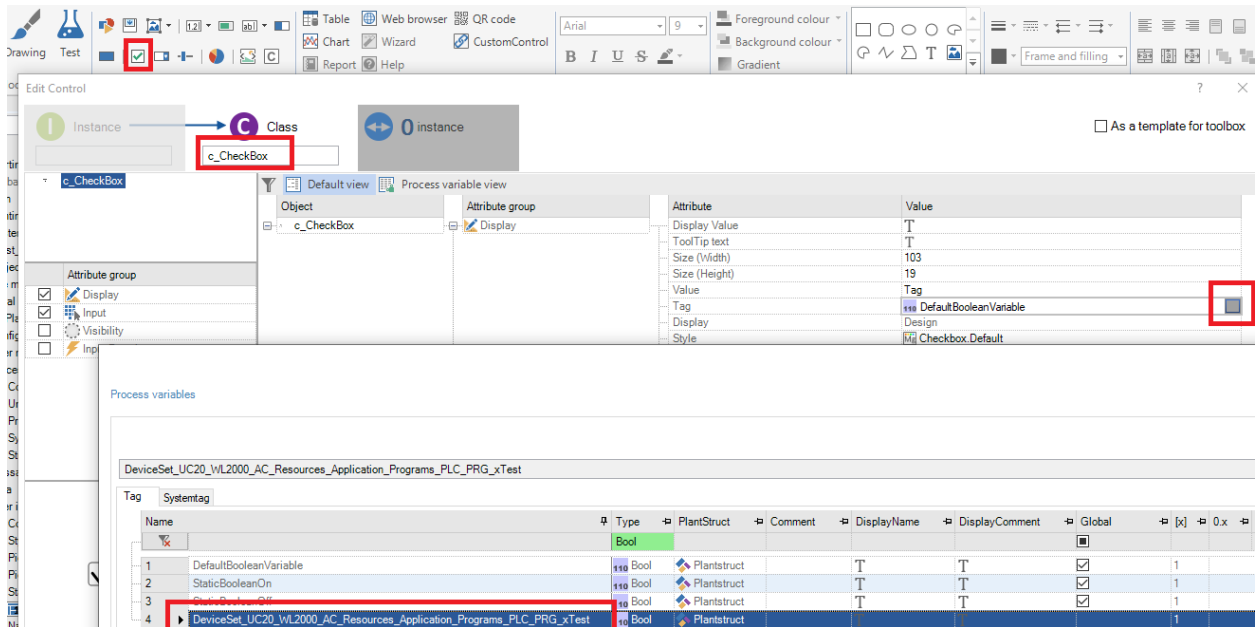


Figure 15: check box

12. → Setup the objects inside the “Start” Picture and click the “Create” button to create the runtime of your project.

Setup of PROCON-WEB ES on u-OS

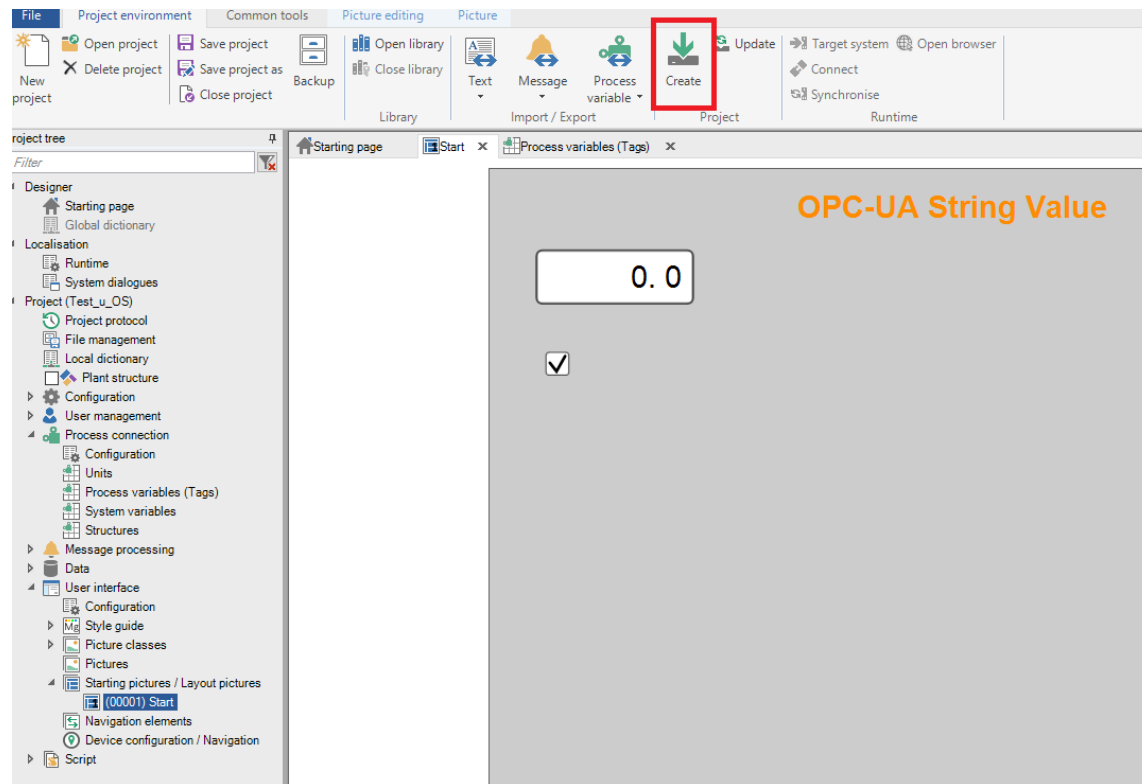


Figure 16: Start Picture

13. → Click on “target system” → put in the IP address of your u-OS device → click “Ok”.

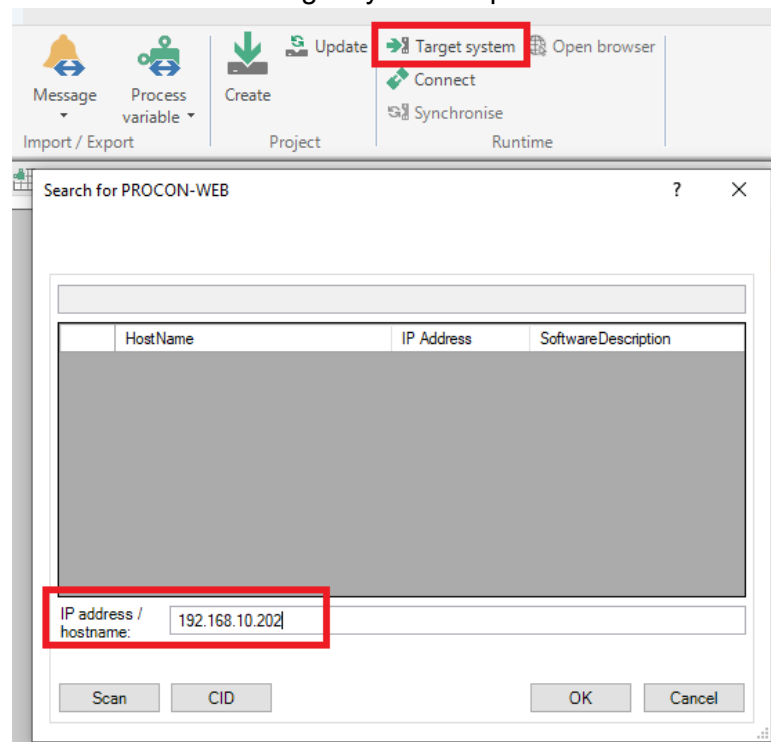


Figure 17: Target system

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14. → Click on “Connect” button → put in the password (default: procon) → click on “Project” to transfer the created project to the u-OS device → close the window.

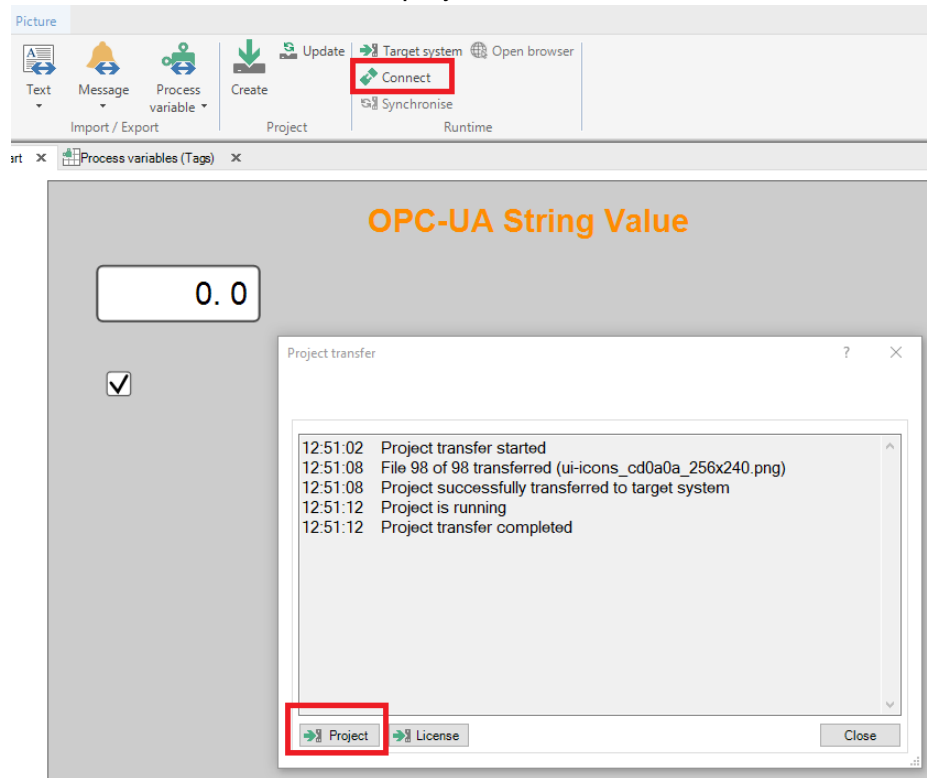


Figure 18: project transfer

15. Open a web browser and enter the correct URL to view the visualization. The URL consists of the IP address of your u-OS device and the port 65300.

For example, if connected via USB to a UC20-WL2000-AC with default settings, use the following URL: <http://192.168.10.202:65300/>

← → ↻ ⚠ Nicht sicher | 192.168.10.202:65300/?peid=a78a843a-464d-4b4b-a0d0-0a4f55fad1c2

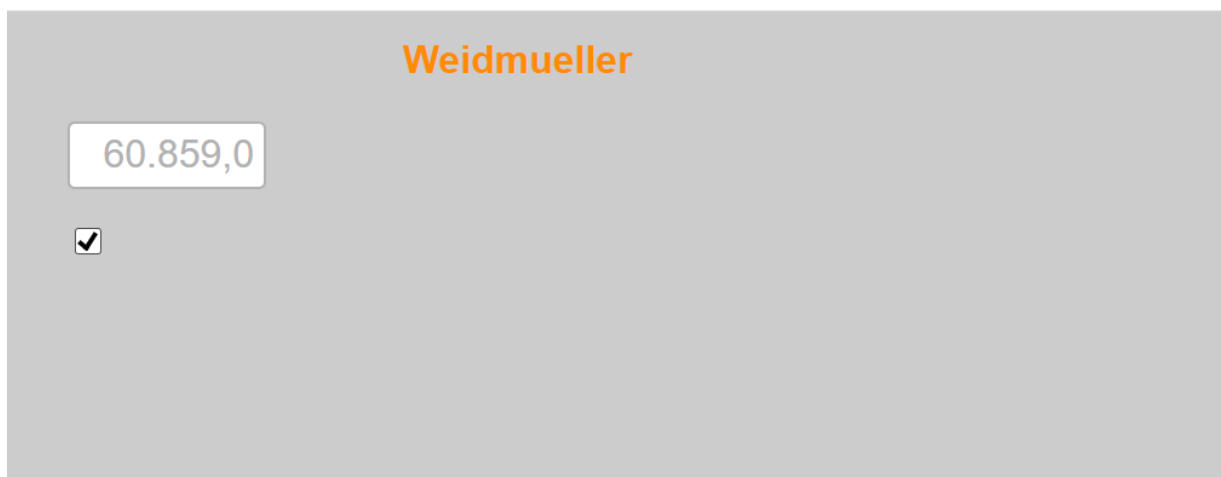


Figure 19: Visualization

4.2 OPC-UA Security settings

To connect the PROCON-WEB runtime with an OPC UA server it is necessary to check the server settings. There are different security options.

CODESYS example:

Device Security Settings

Setting	Value	Description
🔍 CmpOPCUAServer		
🔍 CommunicationPolicy	POLICY_AES128SHA256RSAOAEP	Support for all policies beginning with Aes128Sha256RsaOaep (AES 128 with SHA256)
🔍 CommunicationMode	ALL: Add all available modes. No sec	Add all available modes. No security, just signed, signed and encrypted
🔍 Activation	ACTIVATED	Activates the OPC UA Server. [Default]
🔍 UserAuthentication	ENABLED	Activates the user authentication for the OPC UA Server. [Default]
🔍 AllowUserPasswordOnPlaintext	NO	Forbids to transmit the password in a plaintext way.
🔍 ApplicationName	OPCUAServer@ucm	The application name of the OPC UA server. This will be used for the certificate and the ApplicationName fields of the OPC UA Server.
🔍 CompanyOrOrganizationName		The name of the organization running the OPC UA server. (If empty field is ignored)
🔍 City		Will fill up the city field of the OPC UA Server certificate. If empty the field won't be used.
🔍 State		Will fill up the state field of the OPC UA Server certificate. If empty the field won't be used.
🔍 Country		Will fill up the country field of the OPC UA Server certificate. If empty the field won't be used.

Figure 20: CODESYS default security settings

If the entry “Communication Mode” is set to “All: Add all available modes...”, the PROCON-WEB runtime connects without a certificate only by user authentication.

Type	Name
1	TCP CODESYS

Parameter	Value
1	Url
2	User
3	Password
4	ReadAccess
5	RegTags
6	Writesingle
7	SubscribeTimestampChanges
8	SingleConnect
9	UseEndpoint
10	MonitoredDiscard
11	ErrAsWait
12	Kill
13	Timer
14	SessionTo
15	DataTo
16	WriteTo
17	RefreshCycle
18	MaxMonitored
19	MonitoredQueue
20	MonitoredSampling

Figure 21: PROCON-WEB Driver connection

It is also possible to communicate without user credentials if the server accepts anonymous login. You can activate anonymous login in CODESYS: → Device → check the anonymous login box.

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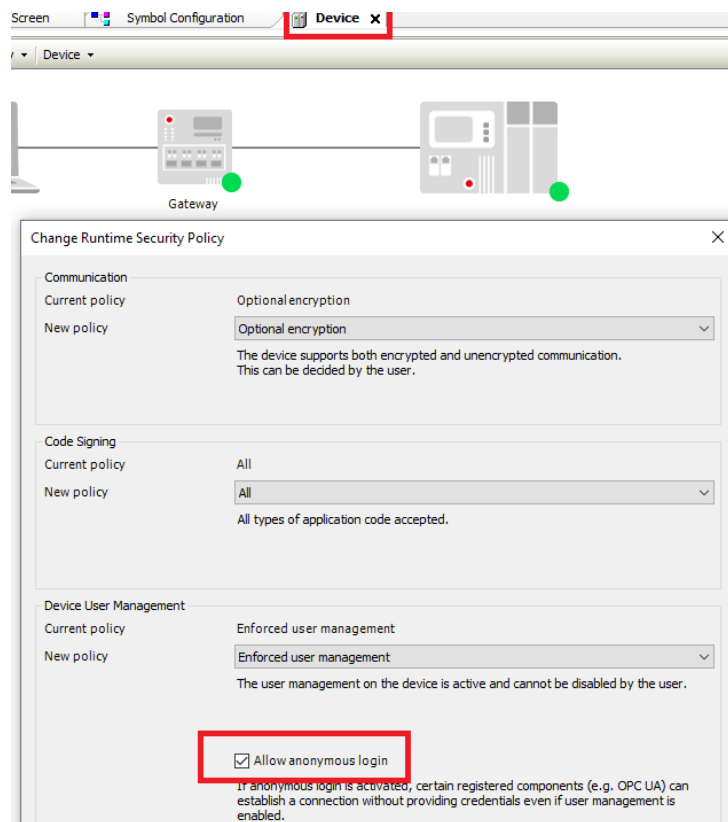
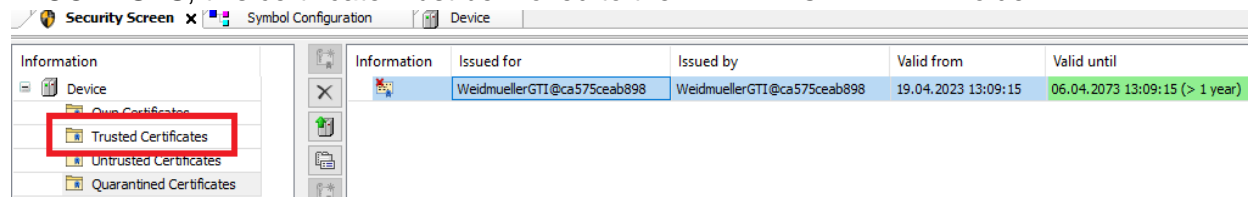


Figure 22: CODESYS anonymous login

If the entry “Communication Mode” is set to “Min_Signed” or “Signed and Encrypted”, the PROCON-WEB runtime creates and sends a certificate to the server.

In CODESYS, this certificate must be moved to the “Trusted Certificates” folder.



Attention:

It is recommended to use the standard CODESYS settings, shown in Figure 20: CODESYS default security settings. The certificate-based communication will be supported with PROCON-WEB runtime app version 6.6.2. or higher!

4.3 Runtime License

Open the System Management of the PROCON-WEB runtime shown in Figure 3: System Management. Navigate to the “Licenses” option and check the current runtime license.

After a new PROCON-WEB Runtime installation, there is only a “Demo” license with 100 Tags and two clients activated.



Attention:

The “Demo” license runs for 1 h. After this time the PROCON-WEB Runtime must be restarted.

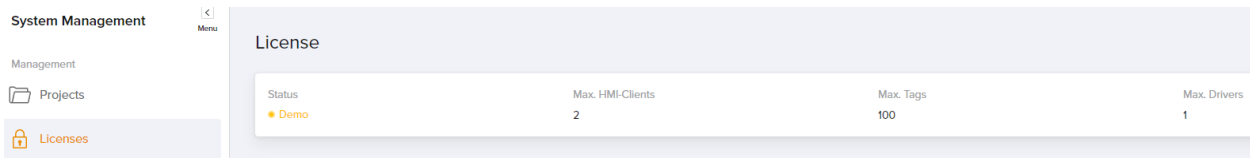


Figure 23: PROCON-WEB License

For the u-OS system it is possible to obtain a free license for 250 Tags and one client. This license has no time limit.

To get the License it is necessary to download the file ComputerID.cid. → open the PROCON-WEB “System Management” → navigate to the tab “Licenses” → click on the “Download Computer ID” button → save the file on you PC.

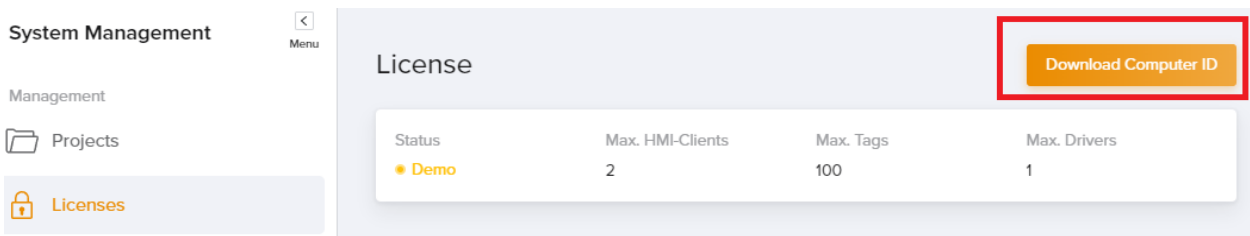


Figure 24: Download Computer ID file (.cid)

To request the license, send an E-Mail with the downloaded file to sales@gti.de.

Subject: PROCON-WEB ES 250 Tag License for u-OS

Message: Name of your company

Appendix: *attach the downloaded ID file (.cid)*

After you received the license file via email, open the PROCON-WEB designer and connect to the PROCON-WEB Runtime. → open a PROCON-WEB project → click “create” → select the “target system” → click “Connect” → click on the “License” button → select your license file (.lic) → click “ok”.

The license file is directly downloaded to the PROCON-WEB Runtime.

Setup of PROCON-WEB ES on u-OS

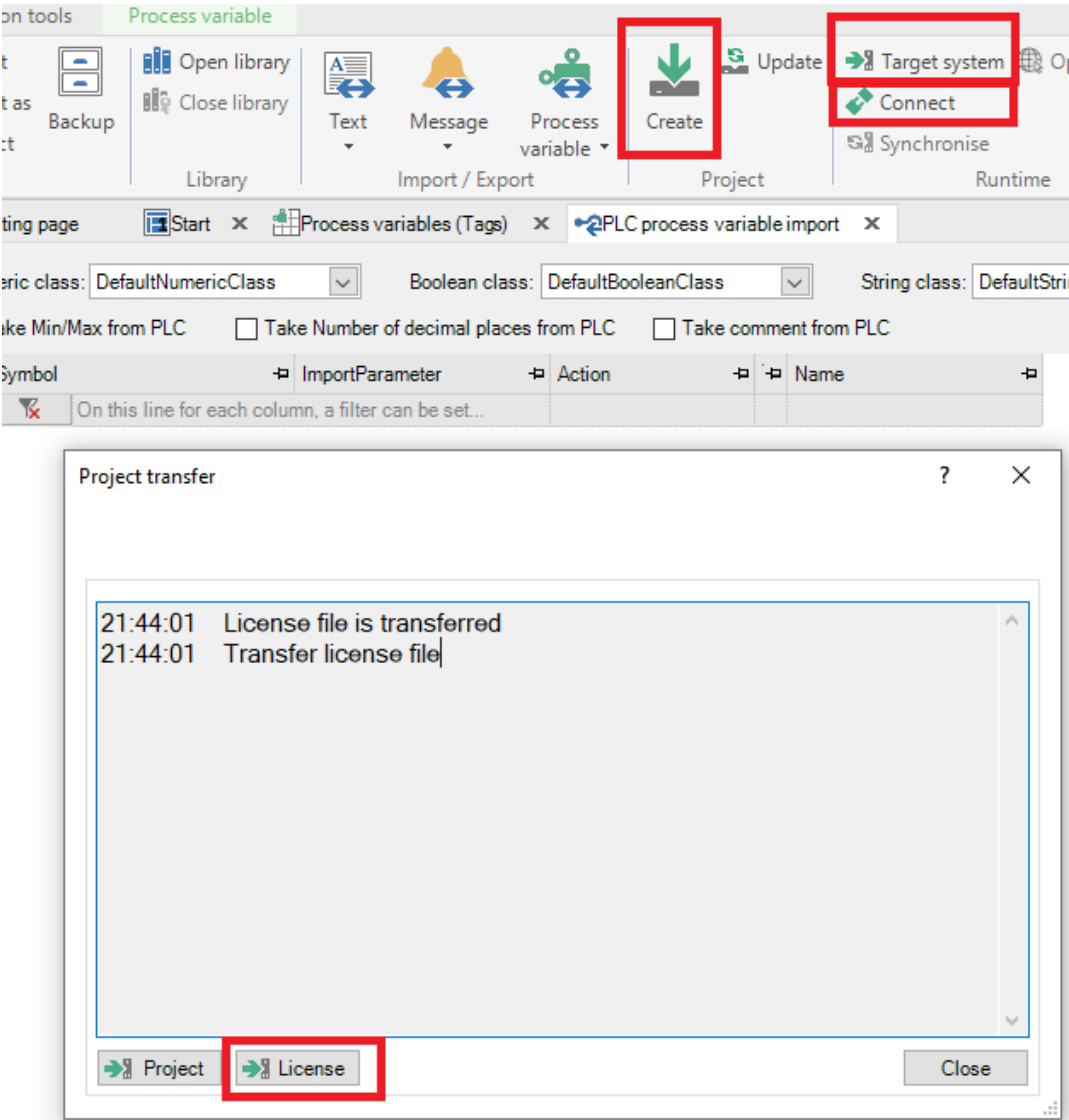


Figure 25: download license file

After successful installation, you can check the license status in the PROCON-WEB Runtime “System Management”:

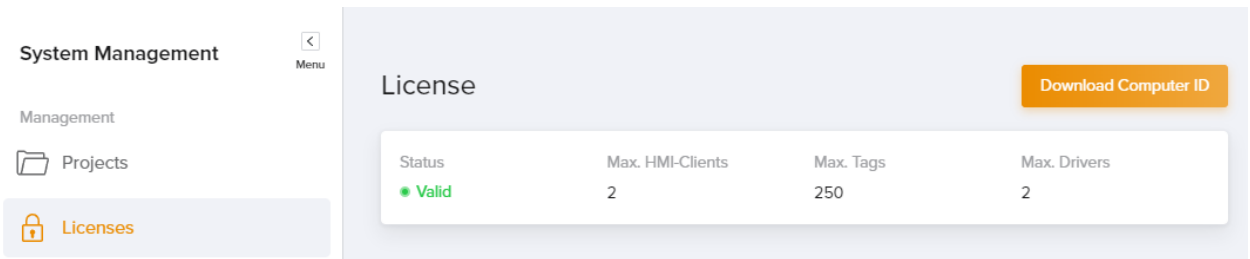


Figure 26: activated license