

Challenge 05: Smart HMI – WebIQ



WEBIQ
SERVER



WEBIQ
DESIGNER



SMART**HMI**



Let's Start!

Let's Start!

Inform

Smart HMI WebIQ

WebIQ is **100% web technology based** web HMI system with extensive design features to create breathtaking professional and performant web HMIs. Created from the ground up with open web technologies (OPC-UA, HTML5, CSS, JavaScript) WebIQ is proud to state that it is legacy-free and fully supports responsive layouts so that your HMI works smoothly on both the machine as well as a tablet or smartphone.

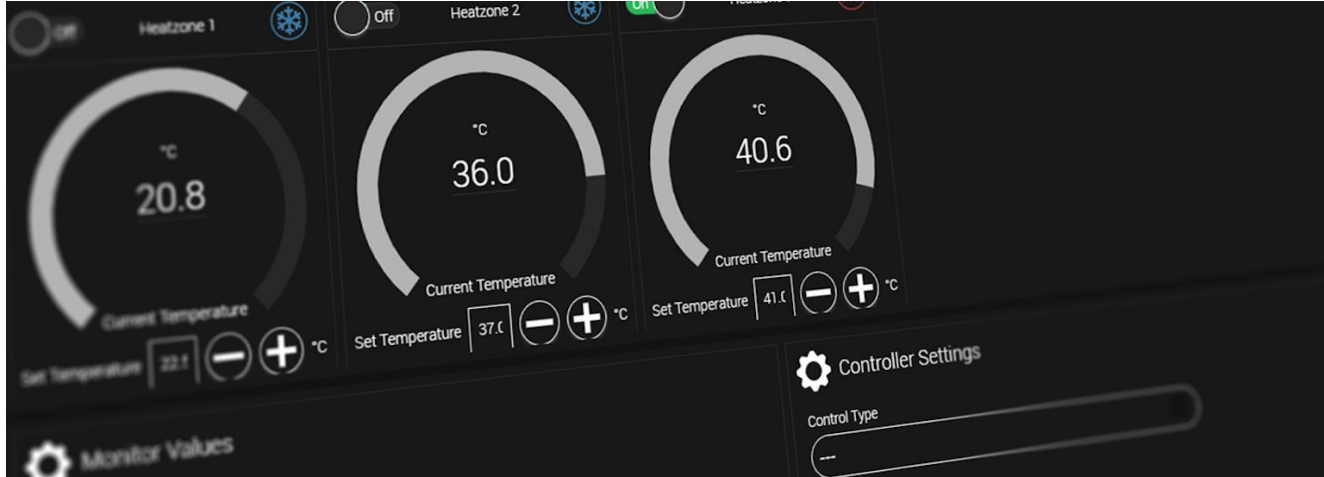
WebIQ is a visualization software for industrial web HMIs and a standard feature of ctrlX CORE. The visualization software consists of two components (apps):

- **WebIQ Server:** The runtime app for web HMIs, which is installed directly on the ctrlX CORE controller.
- **WebIQ Designer:** The intuitive engineering app for developing web HMIs without programming expertise.

Information about the Smart HMI WebIQ can be found online:

- [Smart HMI WebIQ on ctrlX by Bosch Rexroth](#)
- [Smart HMI – WebIQ Server | ctrlX AUTOMATION Community](#)
- [Smart HMI – WebIQ Designer | ctrlX AUTOMATION Community](#)
- [Get started with WebIQ](#)

Challenge 05: ctrlX WebIQ | Introduction



Introduction

WebIQ is the HMI/SCADA system developed by Smart HMI which offers all the advantages of individual web HMIs for various devices and screen resolutions. WebIQ consists of a development version, called WebIQ Designer, and a runtime version, called WebIQ Runtime. Both versions are based on WebIQ Server, which is a web server with HMI/SCADA capabilities, which is installed as a system service and running in the background.

Why WebIQ?

- **100% Web-Based:** Fully web-based, no plugins, works across devices using HTML5 & JavaScript.
- **Fully Responsive:** Adapts seamlessly to various displays, including tablets.
- **Low Code:** WebIQ Designer for drag-and-drop HMIs, customizable with code.
- **Open Platform:** Custom widgets via web technologies, open-source integration.
- **Continuous Improvement:** Regular releases, agile development, swift customer feedback integration.
- **Edge-Based:** Acts as data hub, cloud-ready, global deployment using standard protocols.

Challenge 05: ctrlX WebIQ | Create a HMI Project

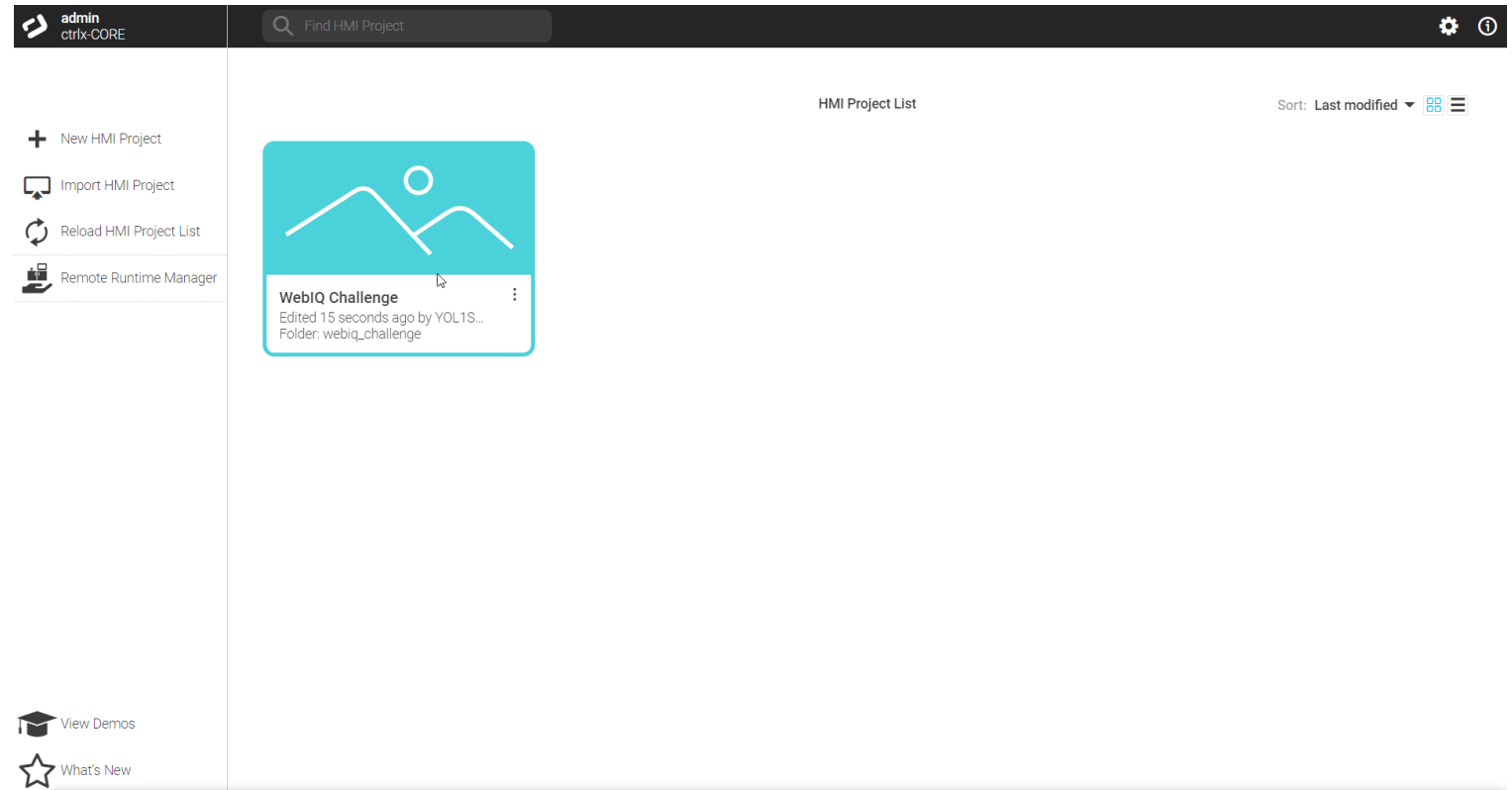
Steps

1. Open the software **WebIQ Designer** on Windows.

Look for the icon



2. The WebIQ Designer main window will open
3. Click the “WebIQ Challenge” to open HMI project



Challenge 05: ctrlX WebIQ | Create a HMI Project

Steps

7. You will be taken to the **WebIQ Layout Manager** window. This is where you can develop and test the HMI using the integrated drag-and-drop editor and parameter dialogs (managers) as well as preview your HMI

LEGEND

1.Publish or Publish and close, go back to Project List, Preferences and About Screen

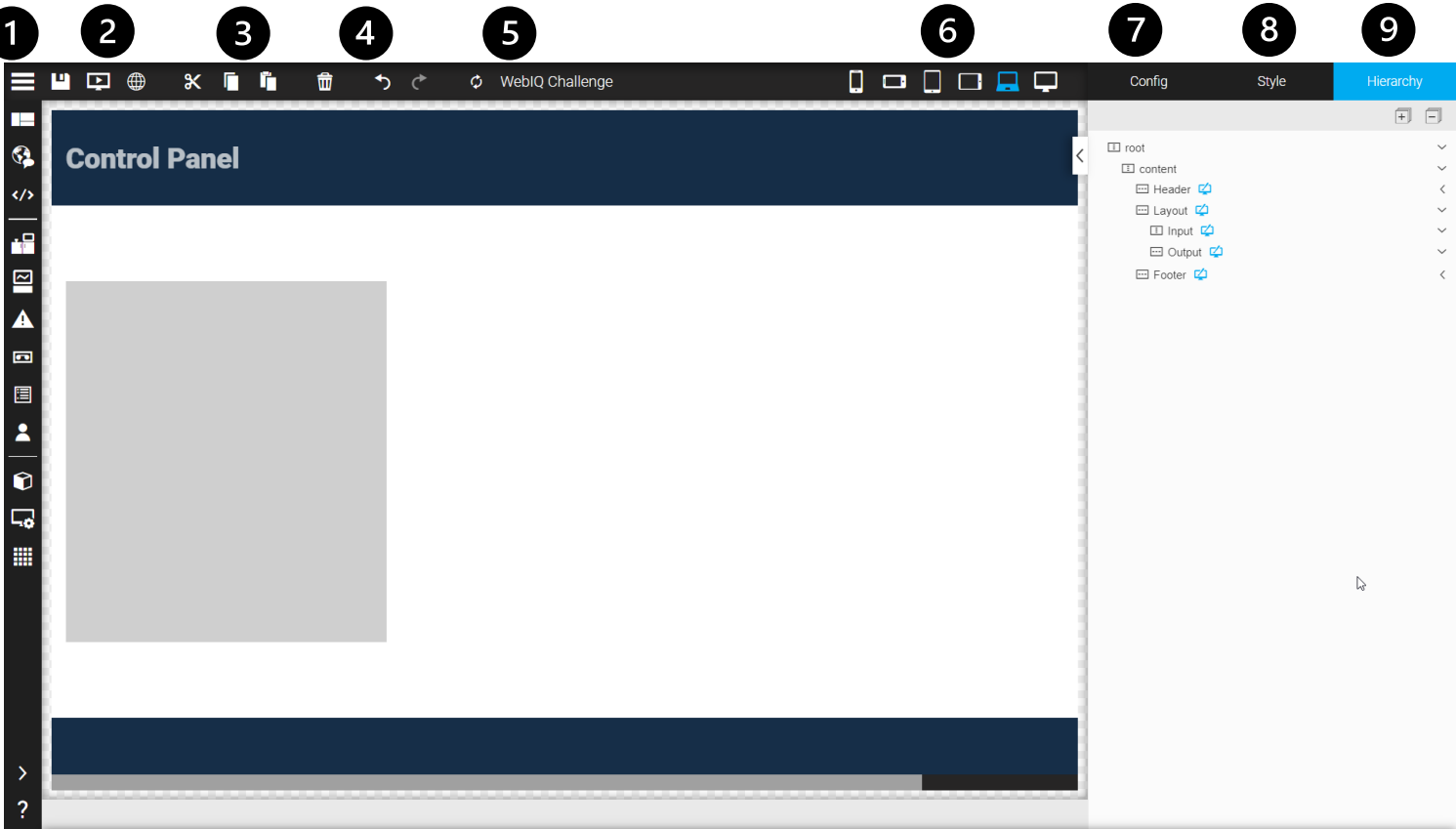
2.Store, Fast Preview and Preview in standard web browser

3.Cut/ Copy/ Paste

4.Delete/ Undo/ Redo Buttons

5.Refresh Project view inside the editor

10



LEGEND

6. Select different screen sizes (responsive inspection)

7. Configuration Cockpit (Widget specific configuration parameter)

8. Style Cockpit (Layout and Styling Options of the selected Widget)

9. Hierarchy Cockpit (shows layout Hierarchy)

10. Open/Close Widget List

8

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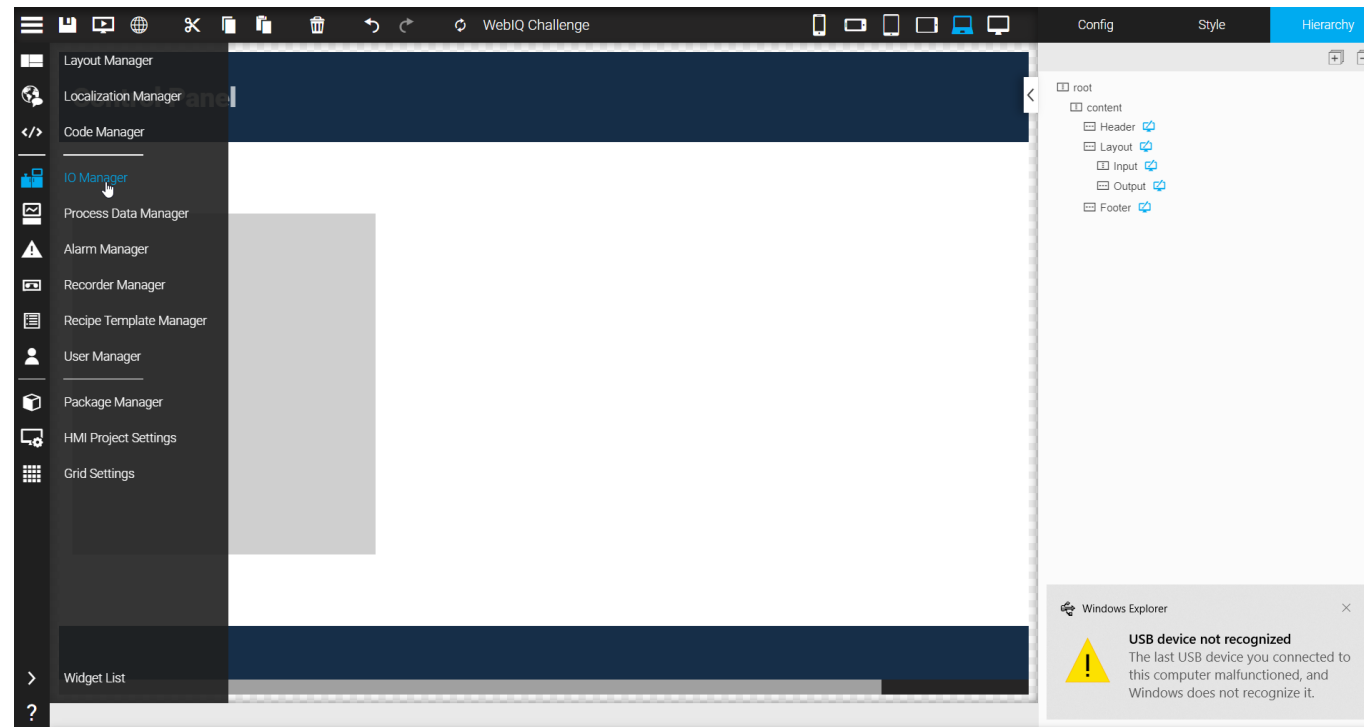
Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

By connecting WebIQ with OPC UA, it will allow us to write and subscribe ctrlX PLC data from WebIQ.

Step:

1. From the side menu select IO Manager

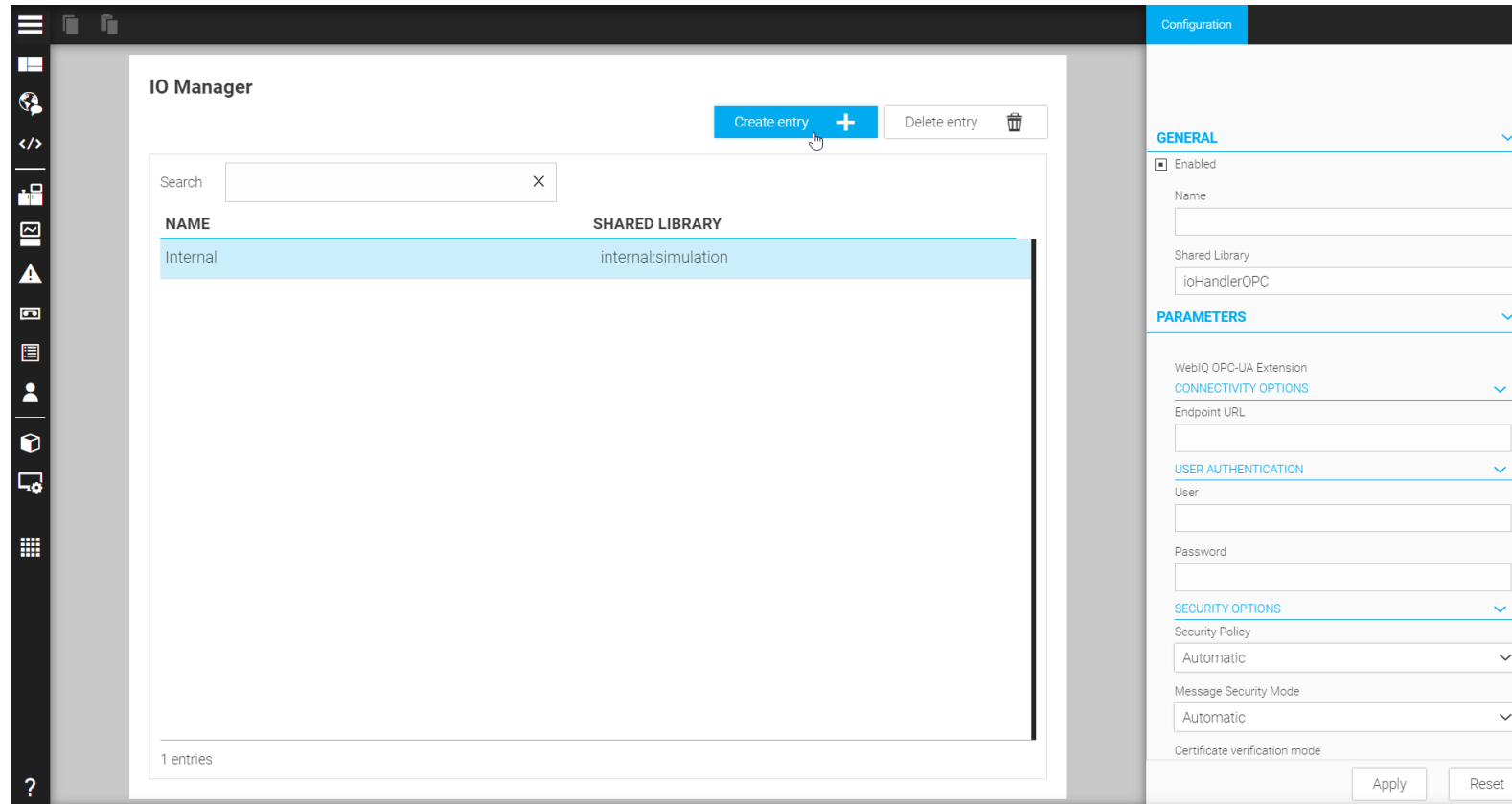


Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

2. Click “Create entry” for creating an entry for OPC UA and try to connect to OPC UA

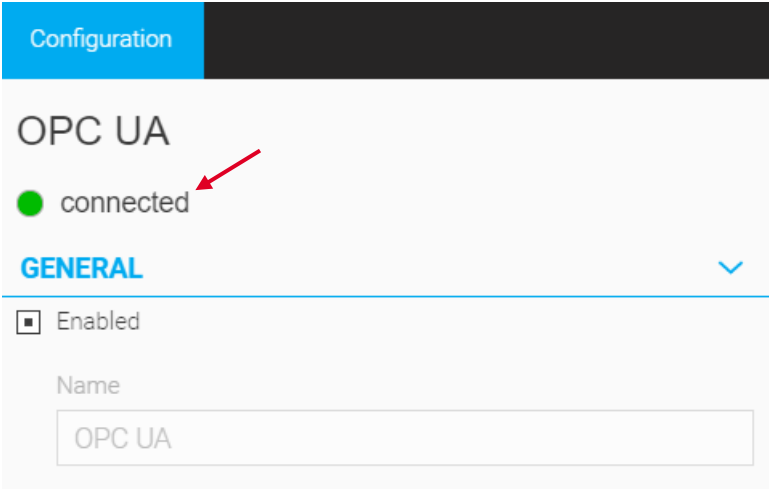
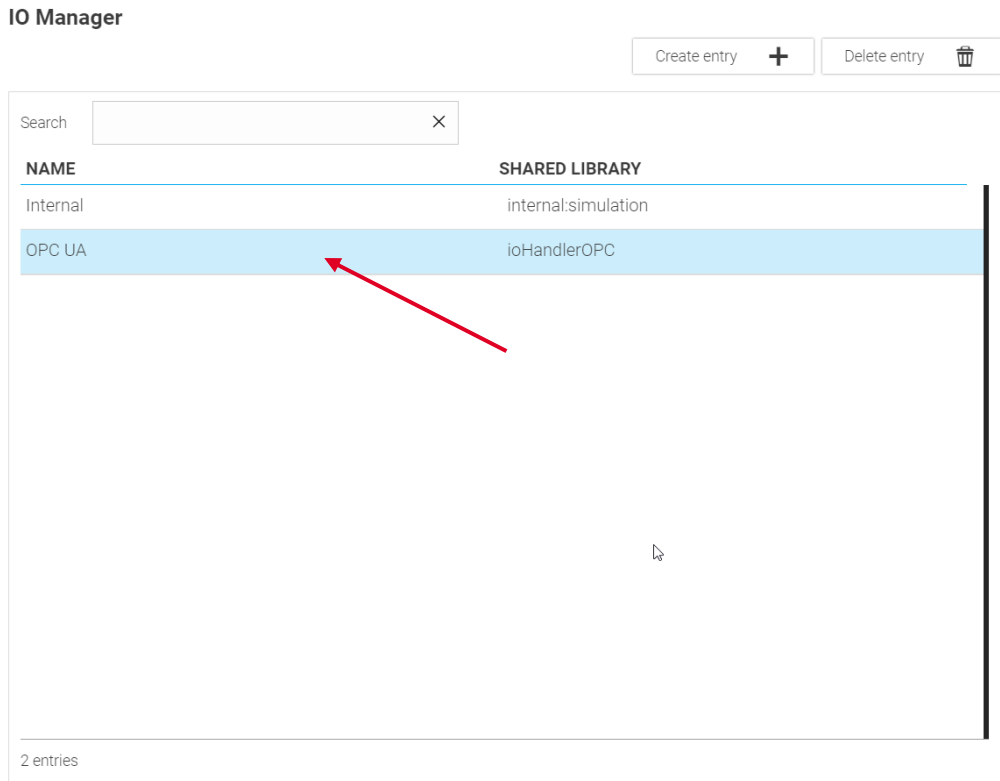
*Hint: OPC UA Test Client from previous OPC UA App Challenge



Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

3. Check the accessibility of OPC UA



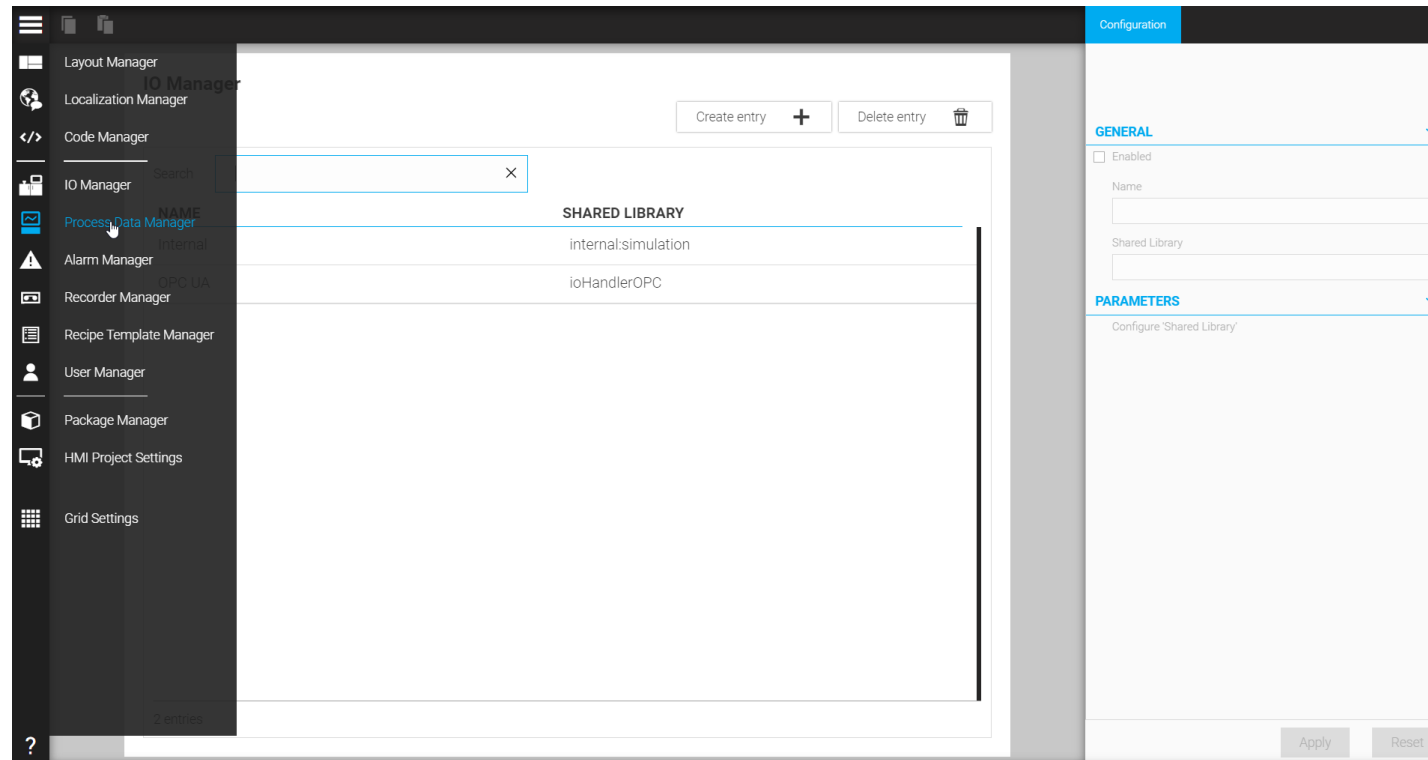
****If the configuration does not show connected, please check again the entry configuration**

Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

After connected to OPC UA server, now we need to assign data from OPC UA to WebIQ

4. From the Menu, select “Process Data Management”

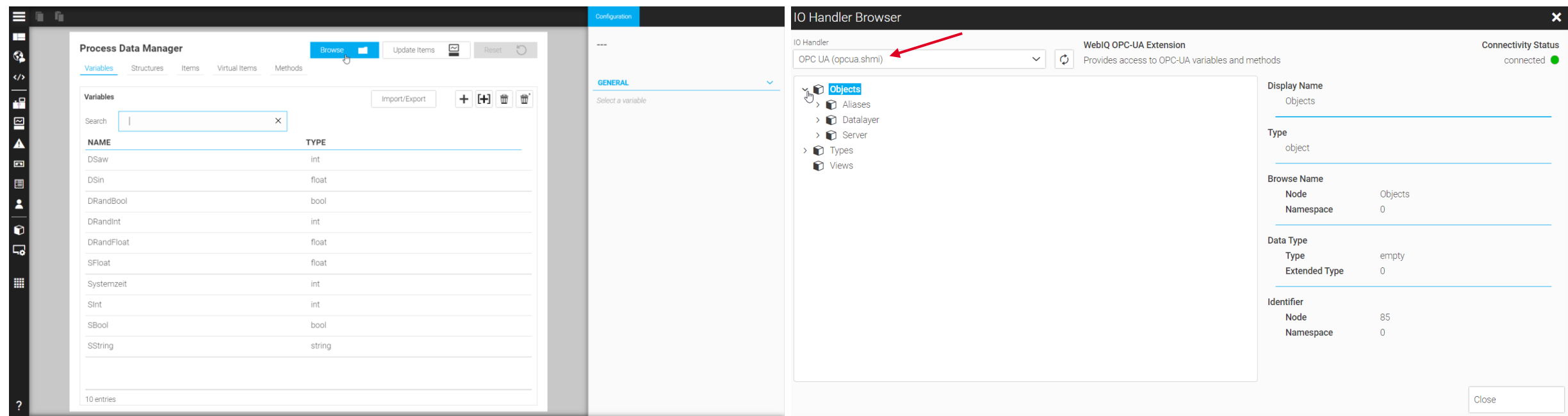


Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

5. In the Process Data Management page, select “Browse” and now try to search for ctrlX PLC variable

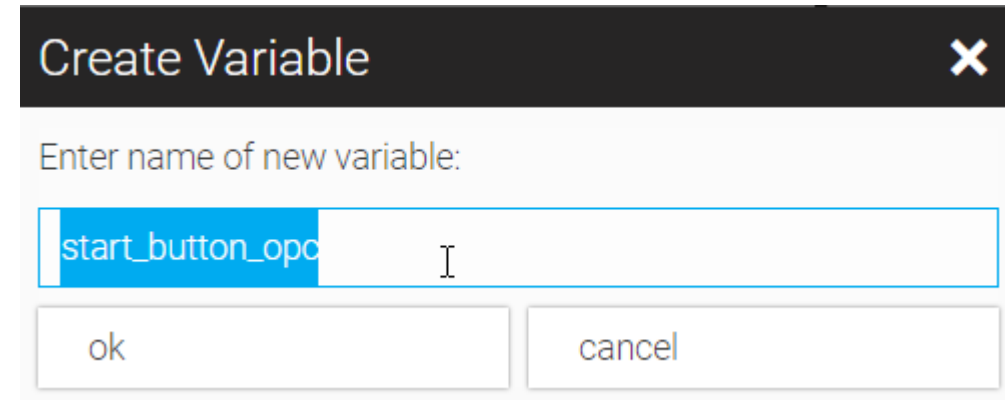
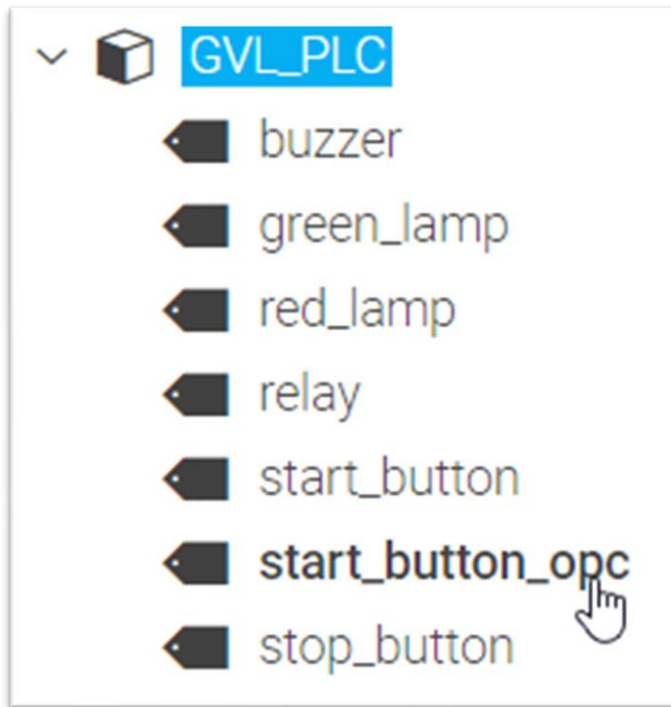
****Make sure the IO Handler is using the right entry**



Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

6. Once you found the ctrlX Variable, right click on the variable that you wish to assign and click “Create variable”
7. Once the Create Variable window pop out, let the variable name as it default and select ok



Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

8. Now you will see the variable you create consist in the list.

Process Data Manager

Browse

Update Items

Reset

Variables

Structures

Items

Virtual Items

Methods

Variables

Import/Export

+

[+]

🗑

🗑*

Search

×

NAME	TYPE
DSaw	int
DSin	float
DRandBool	bool
DRandInt	int
DRandFloat	float
Systemzeit	int
SBool	bool
SInt	int
SFloat	float
SString	string
start_button_opc	boolean

11 entries

Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

Try It Yourself

9. Do it yourself for creating variable for stop_button_opc, green_lamp, red_lamp and buzzer.

Challenge 05: ctrlX WebIQ | Connect to OPC UA

Steps

10. Once finish creating all the variables, click the “Update Items” button to save all the variable that you created.

Process Data Manager

Browse

Update Items

Reset

Variables

Structures

Items

Virtual Items

Methods

Variables

Import/Export

+

[+]

🗑

🗑*

Search

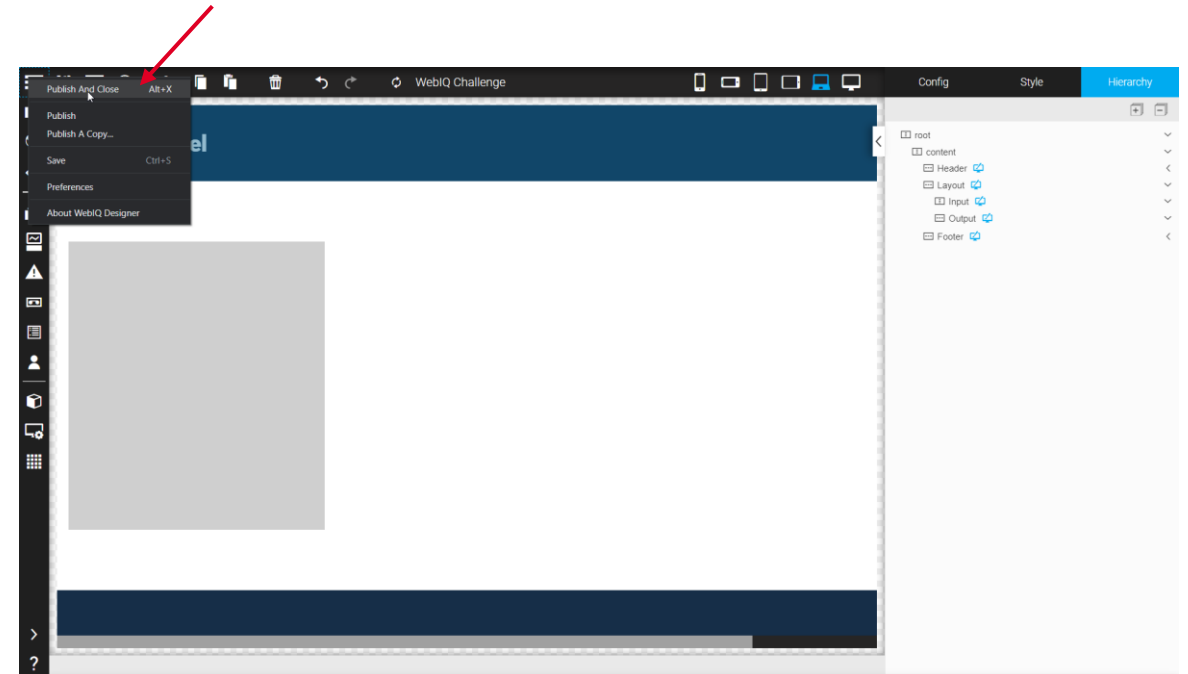
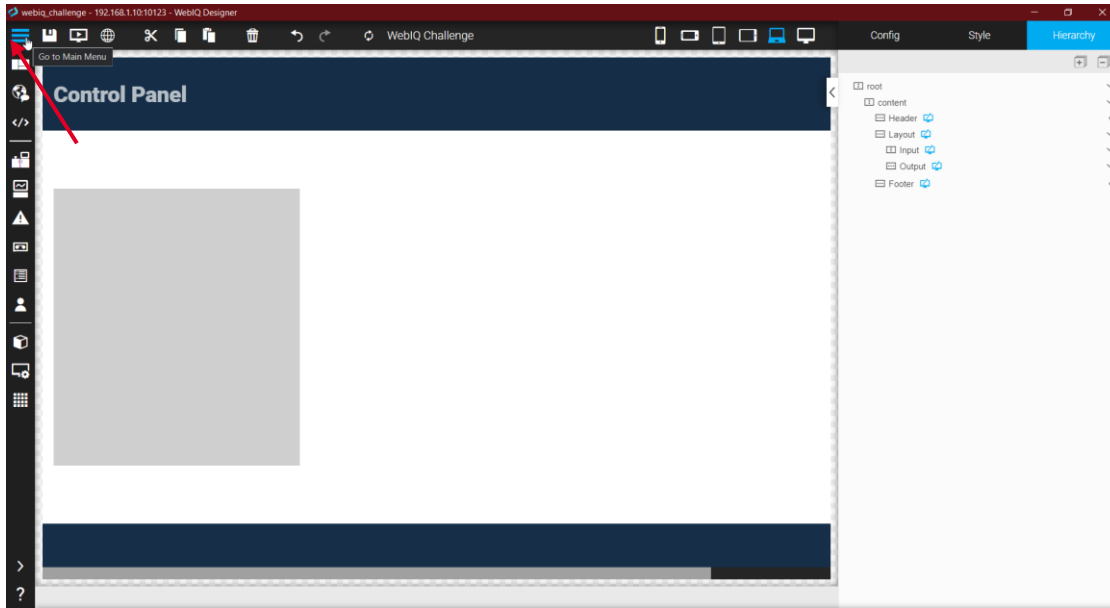
×

NAME	TYPE
DSaw	int
DSin	float
DRandBool	bool
DRandInt	int
DRandFloat	float
Systemzeit	int
SBool	bool
SInt	int
SFloat	float
SString	string
start_button_opc	boolean

Challenge 05: ctrlX WebIQ | Publish HMI

Steps

1. After finish designing, from the hamburger menu select for “Publish and Close” option



Challenge 05: ctrlX WebIQ | Publish HMI

Steps

- 2. At the Home dashboard, select “Remote Runtime Manager”
- 3. In the pop out window, enter 192.168.1.1:10123 and click connect
- 4. The system will now prompt a login window, username: boschrexroth, password: B0schrexroth

admin
ctrlx-CORE

Find HMI Project

+ New HMI Project

Import HMI Project

Reload HMI Project List

Remote Runtime Manager

View Demos

What's New

HMI Project List

Sort: Last modified

WebIQ Challenge

Manage Remote WebIQ System seconds ago by YOL1S...

Folder: webiq-challenge

Connect to Remote WebIQ System

Enter remote host (<ip>:<port>)

192.168.1.1:10123

Use TLS

Scan for Remote WebIQ Servers

Search

DEVICE NA...	HOST	SERVER VE...	LICENSE
0 entries			

Remote WebIQ Server Information

Device Name

Host

Server Version

License

WebsocketURL

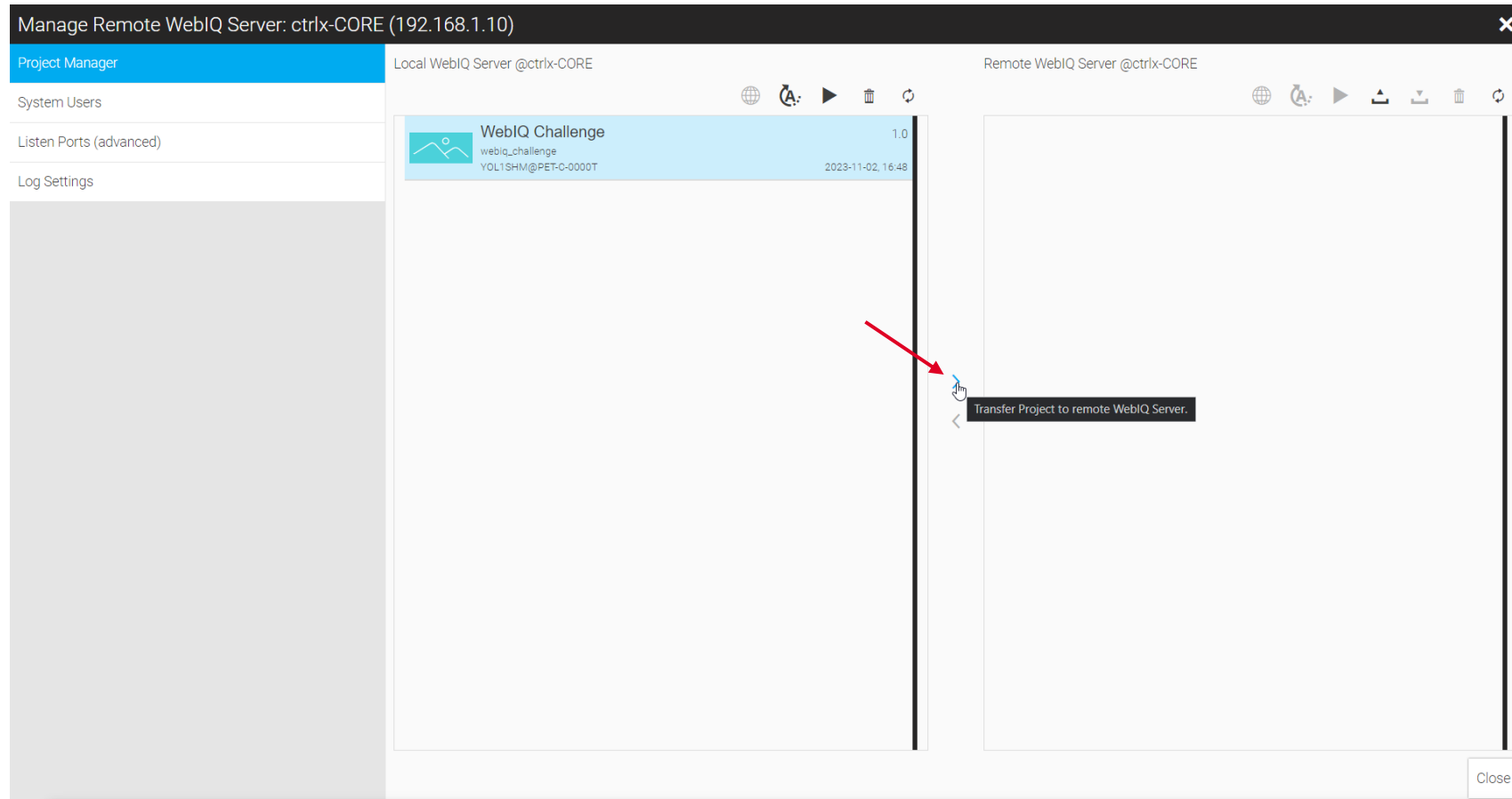
Connect

Cancel

Challenge 05: ctrlX WebIQ | Publish HMI

Steps

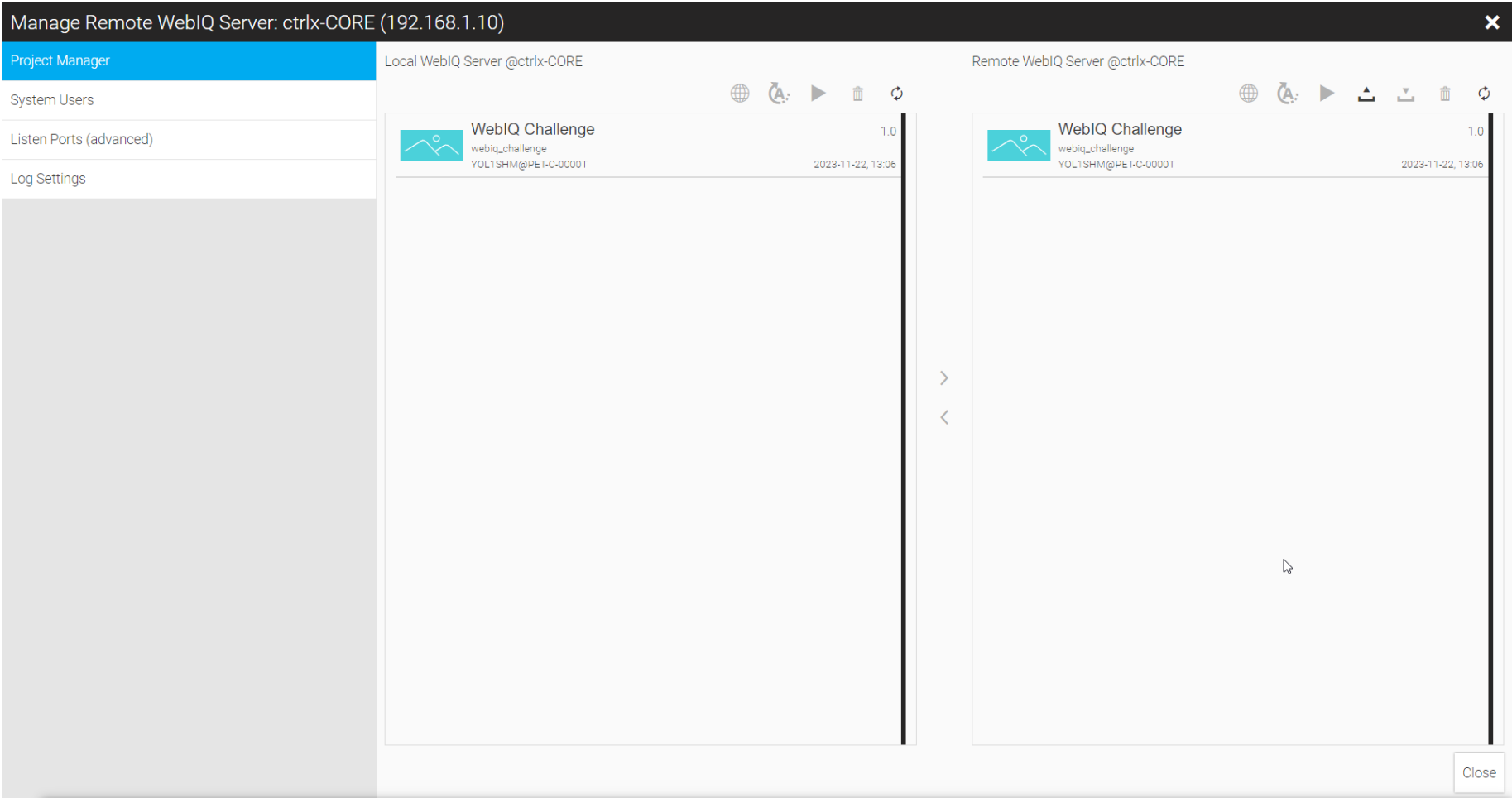
5. Once enter Remote WebIQ Server, at the local host select the HMI project that you wish to run on ctrlX CORE and click the arrow button to transfer the project to ctrlX CORE Runtime Server



Challenge 05: ctrlX WebIQ | Publish HMI

Steps

6. Once successful transfer, the window will look like this:



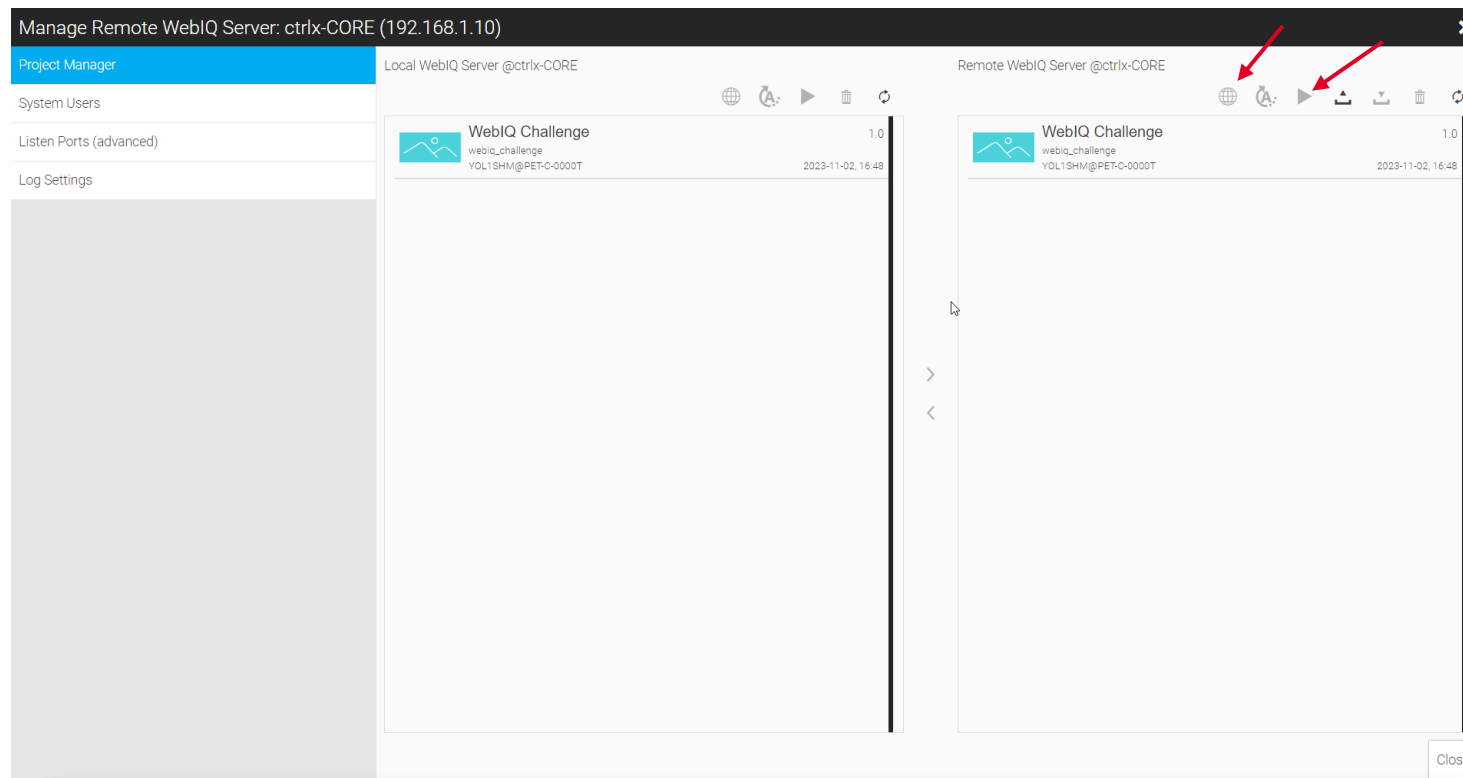
Challenge 05: ctrlX WebIQ | Publish HMI

Steps

7. Now there are two option to open the HMI project that you create

Option 1: Run WebIQ from Laptop or PC

Step 1: On the Remote WebIQ Server side, select the HMI project that you wish to run and click the run button. After that, click the browser icon and your project will pop out in Website format.



Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 1: Run WebIQ from Laptop or PC

Step 2: The Website project will look like below which required you to login and you need to enter the username and password for this project which username: boschrexroth and password: boschrexroth. Once you login, you will see your project.



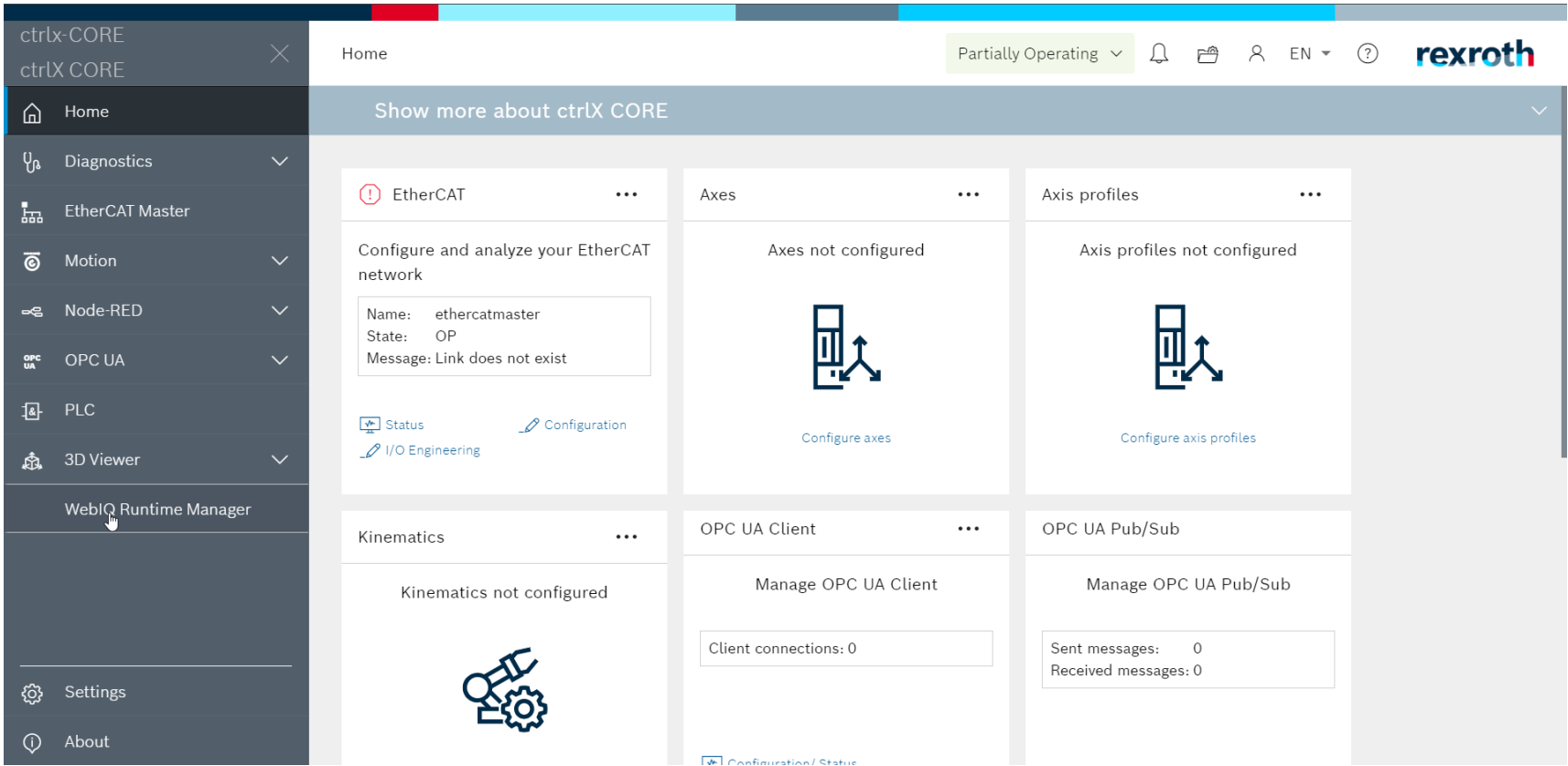
🔌 Connected

Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 2: Run WebIQ from ctrlX CORE

Step 1: Open the ctrlX CORE website and select WebIQ Runtime Manager

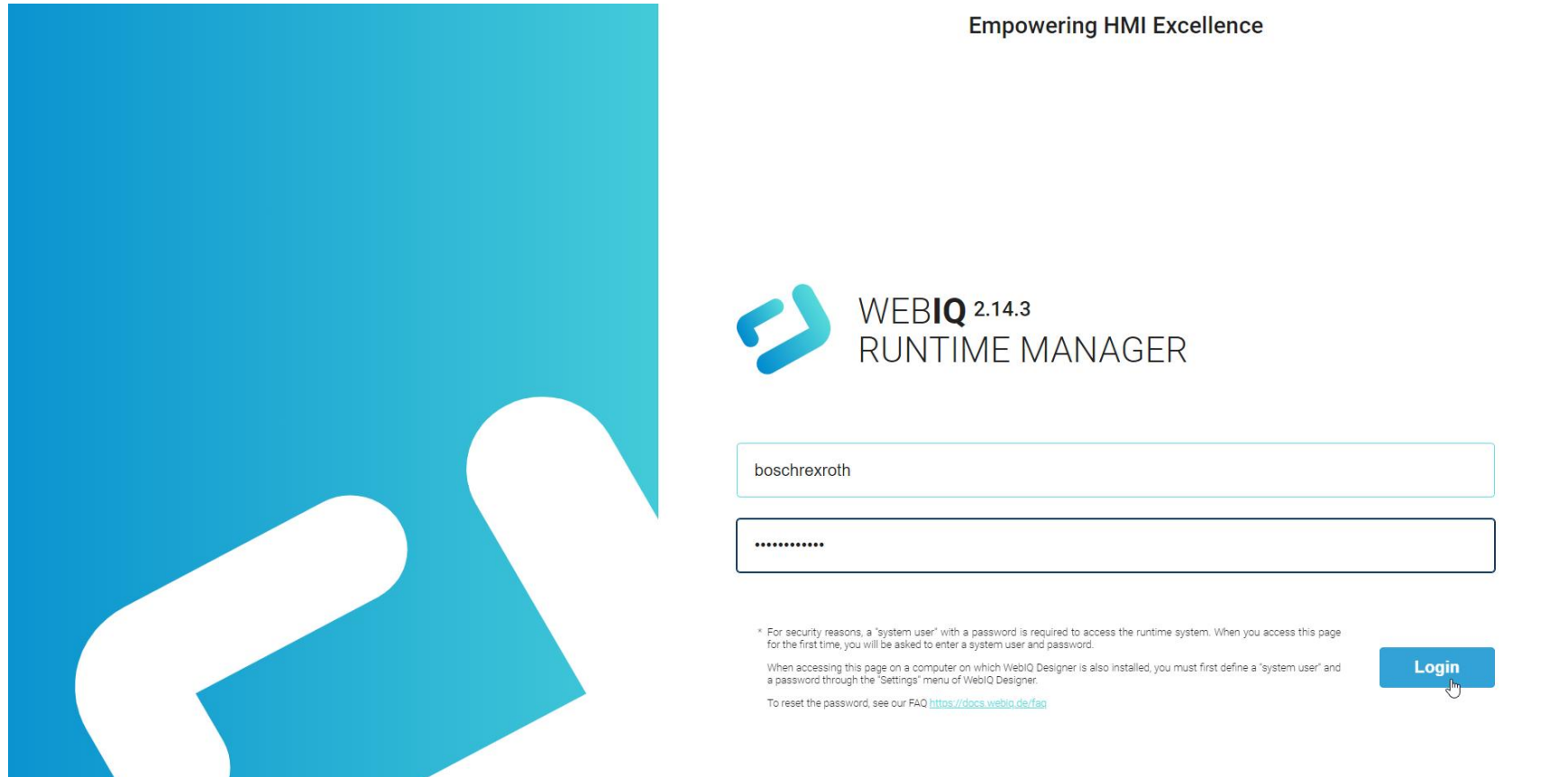


Challenge 05: ctrlX WebIQ | Publish HMI


Steps

Option 2: Run WebIQ from ctrlX CORE

Step 2: The system will navigate you to login page and you need to login into your WebIQ account which username: boschrexroth and password: B0schrexroth



Empowering HMI Excellence

 **WEBIQ 2.14.3**
RUNTIME MANAGER

boschrexroth

.....

* For security reasons, a "system user" with a password is required to access the runtime system. When you access this page for the first time, you will be asked to enter a system user and password.

When accessing this page on a computer on which WebIQ Designer is also installed, you must first define a "system user" and a password through the "Settings" menu of WebIQ Designer.

To reset the password, see our FAQ <https://docs.webiq.de/faq>

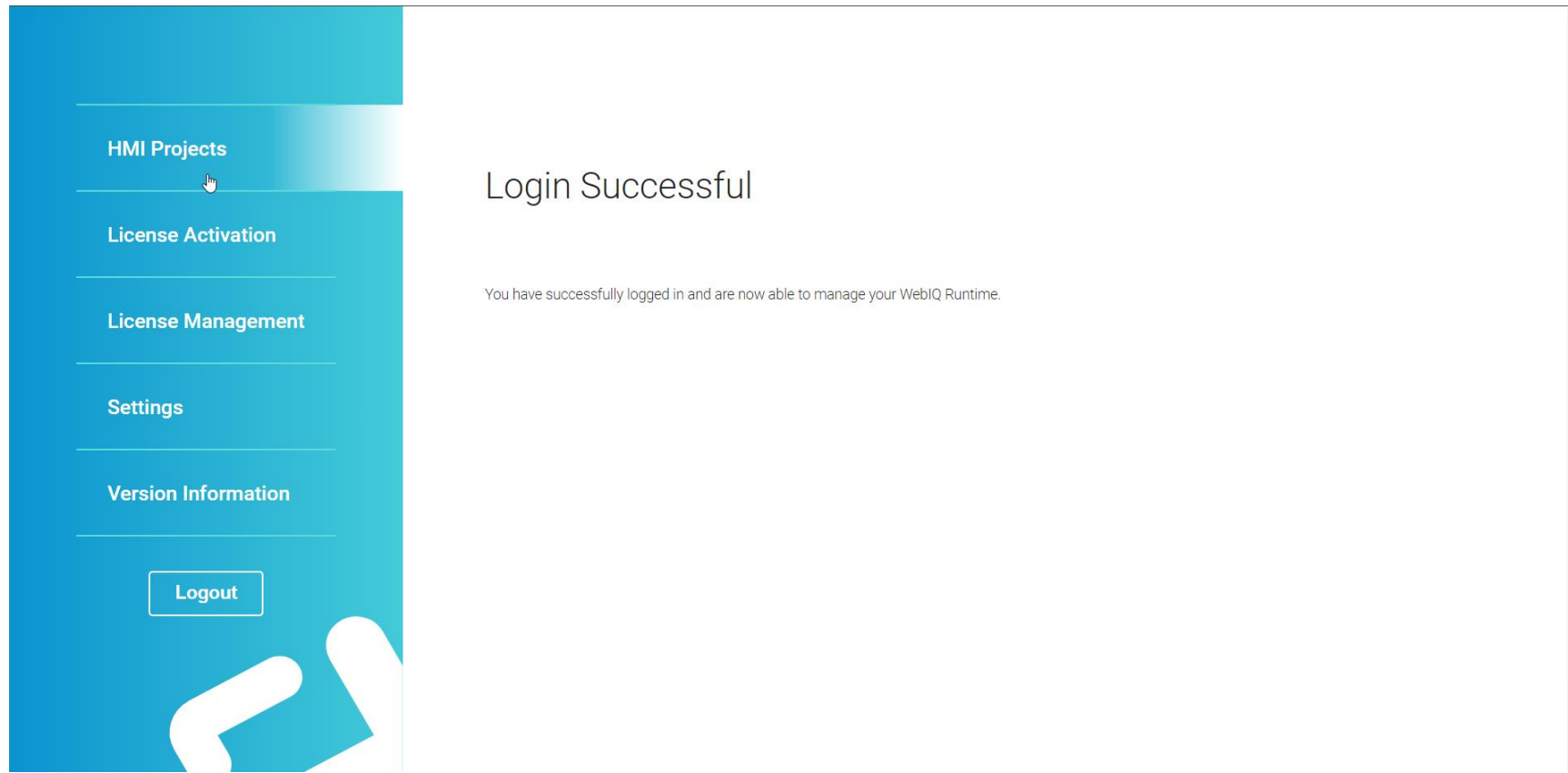
Login

Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 2: Run WebIQ from ctrlX CORE

Step 3: Once you get in into WebIQ Runtime Manager, select “HMI Projects”

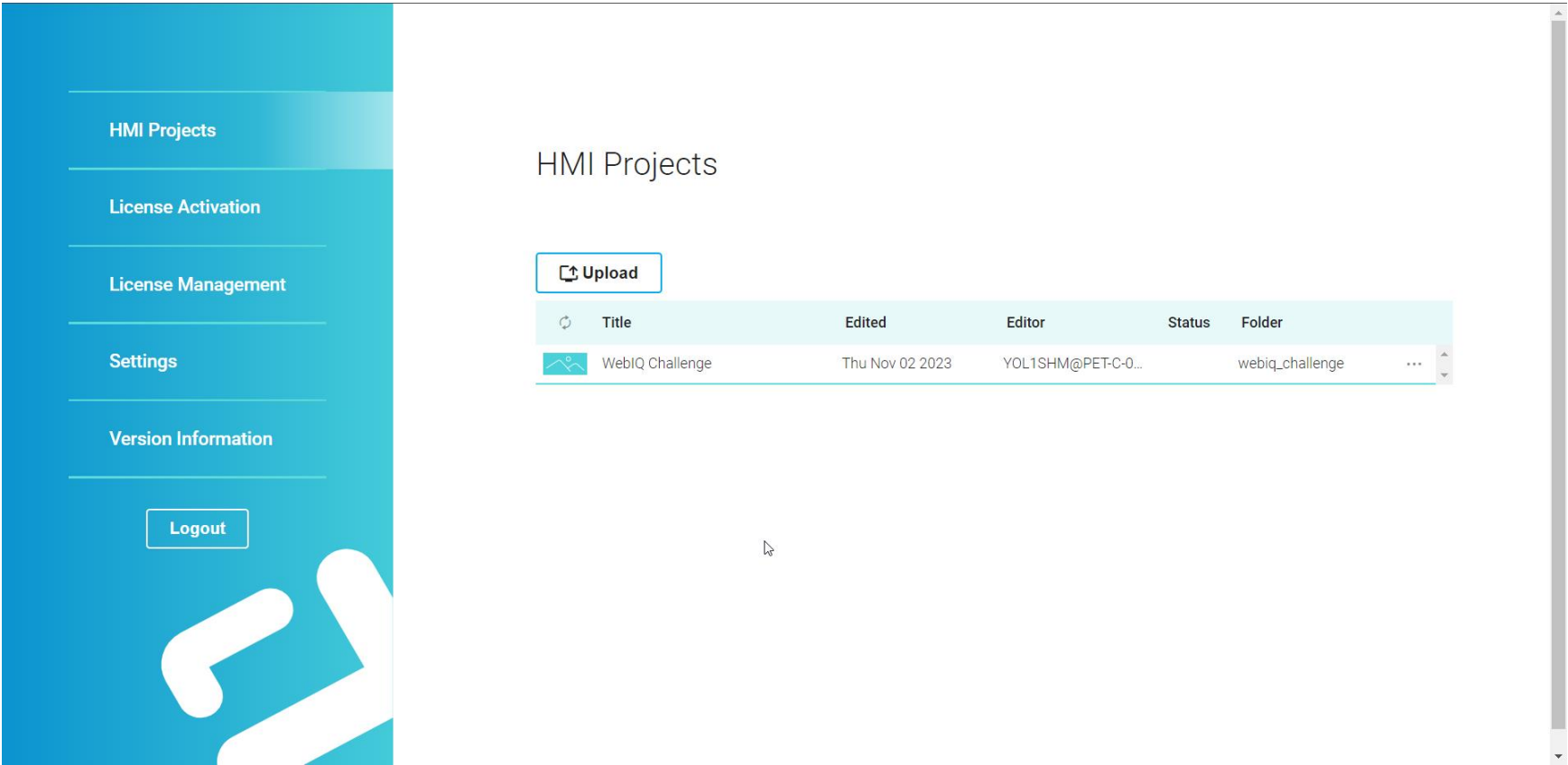


Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 2: Run WebIQ from ctrlX CORE

Step 4: The project that you transfer just now should appear in this page. If not, please check again the transfer process in WebIQ Designer



Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 2: Run WebIQ from ctrlX CORE

Step 5: Click the “...” and select “Start” then select “Open”

Status

Folder

webiq_challenge

...

Upload

	Title	Edited	Editor	Status	Folder	
	WebIQ Challenge	Thu Nov 02 2023	YOL1SHM@PET-C-0...		webiq_challenge	...

▶ Start

■ Stop

⌕ Open

⬇ Download

✕ Delete

ⓘ Properties

Challenge 05: ctrlX WebIQ | Publish HMI

Steps

Option 2: Run WebIQ from ctrlX CORE

Step 6: The Website will pop out and required you to login and you need to enter the username and password for this project which username: boschrexroth and password: B0schrexroth. Once you login, you will see your project.



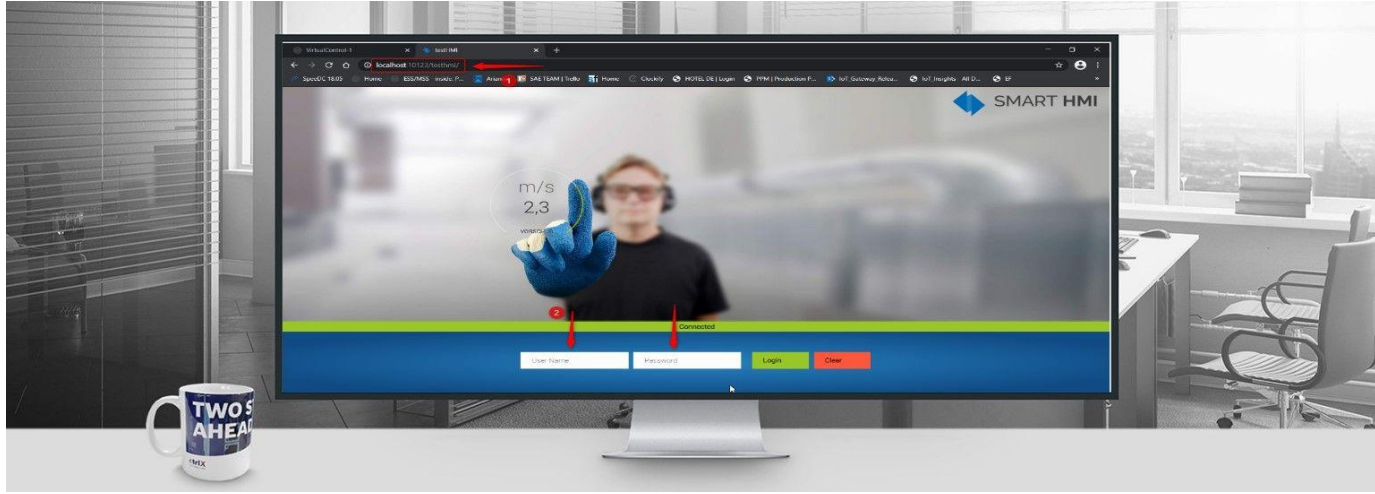
🔌 Connected



Challenge 05: Smart HMI – WebIQ

Task 01

Challenge 05: ctrlX WebIQ | Task 01



Description

During a routine inspection, you noticed that one of the machines on the assembly line could benefit from a Web-based Human Machine Interface (HMI) to control the machine remotely since it can be accessed through any compatible web-browser. For example, the HMI can be accessed via a Tablet-PC since it is relatively inexpensive to purchase or via a Smartphone. Your task is to implement a Simple Web-Based HMI to communicate with ctrlX PLC.

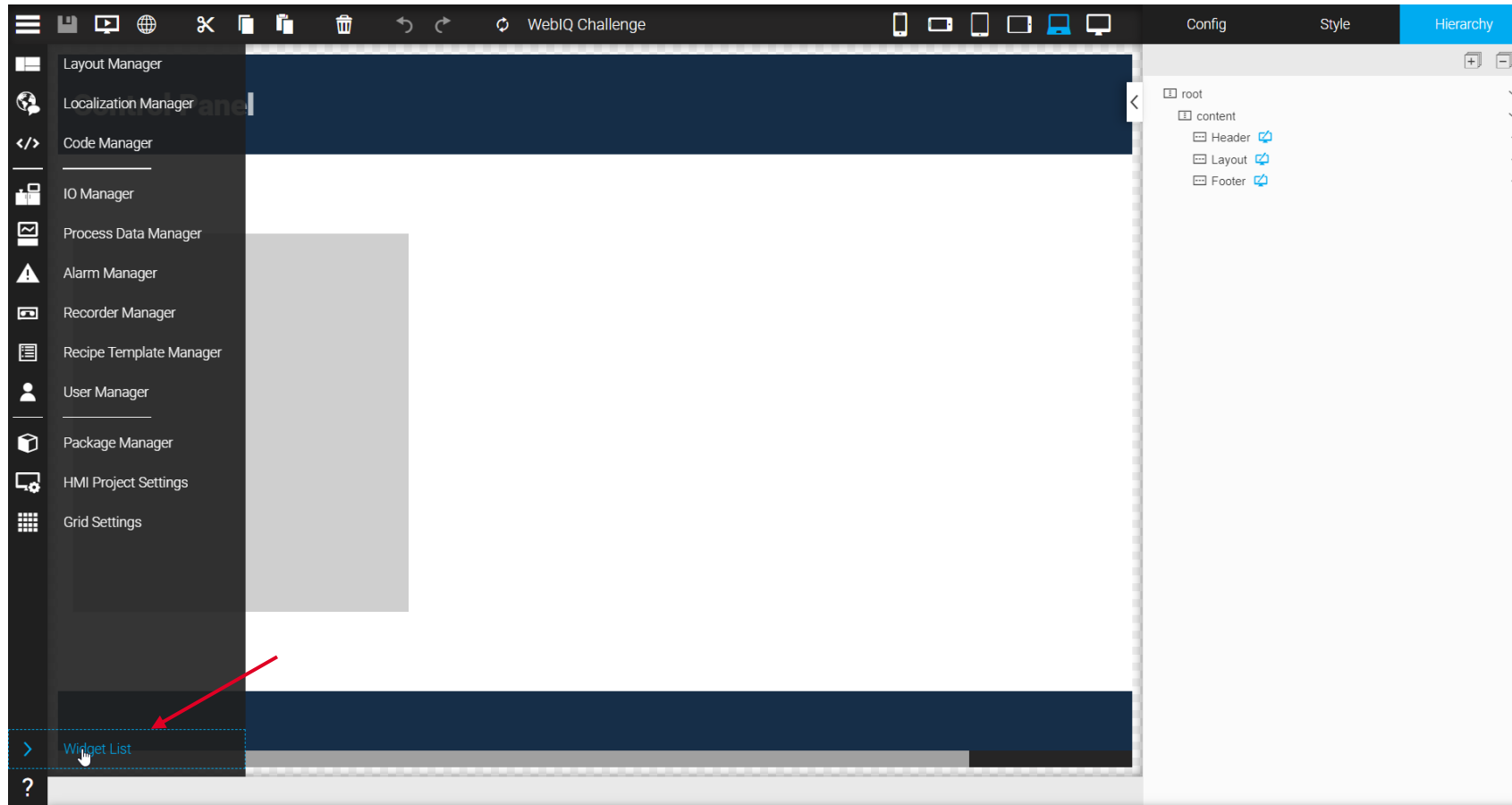
Task

This task will test your ability and understanding on developing a simple HMI and running it on a web-browser. In this first part, you are required to set up the Button widget to work with the PLC Inputs.

Challenge 05: ctrlX WebIQ | Task 01

Steps

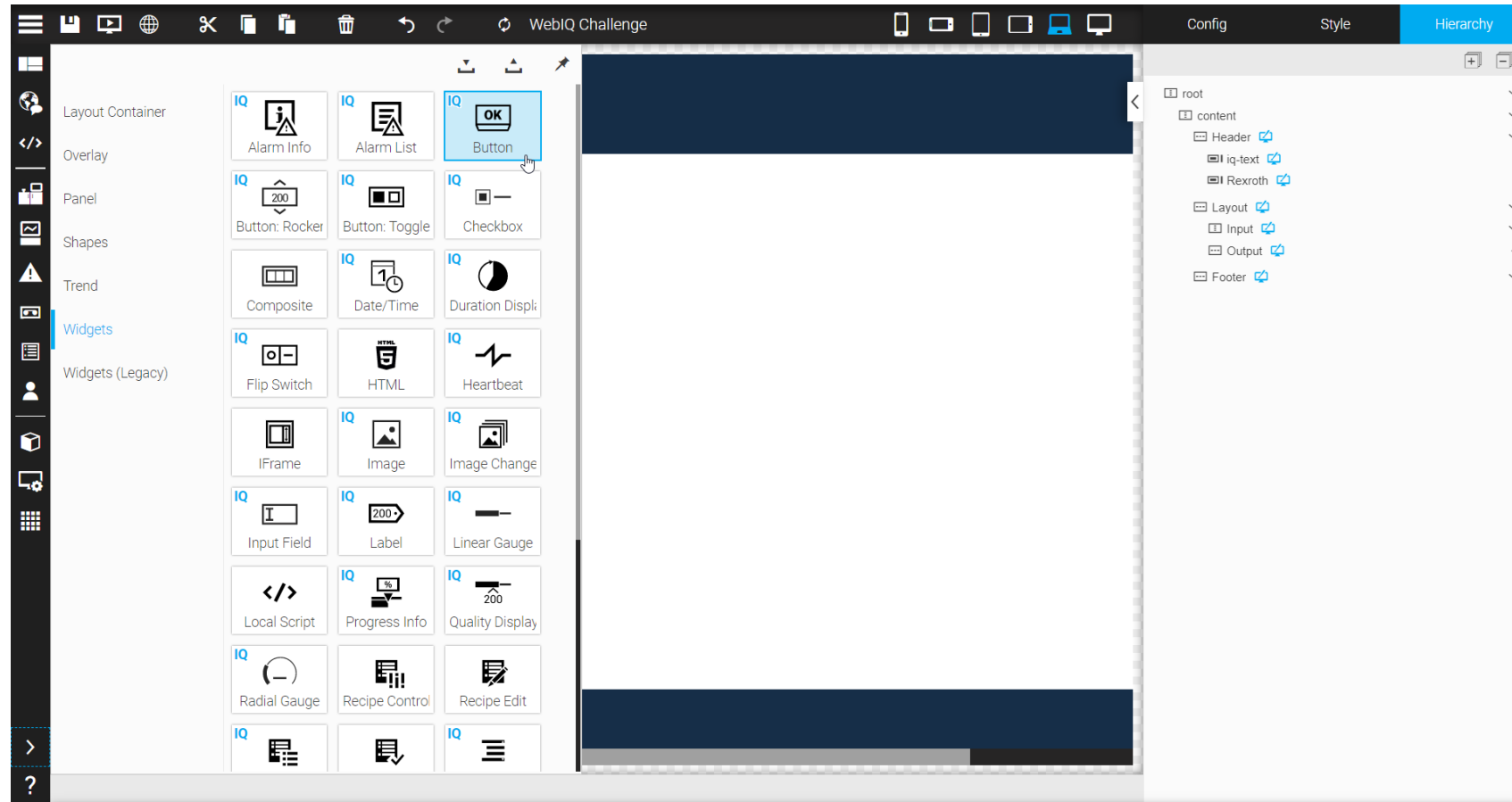
Step 1: From the slide menu, select Widget List.



Challenge 05: ctrlX WebIQ | Task 01

Steps

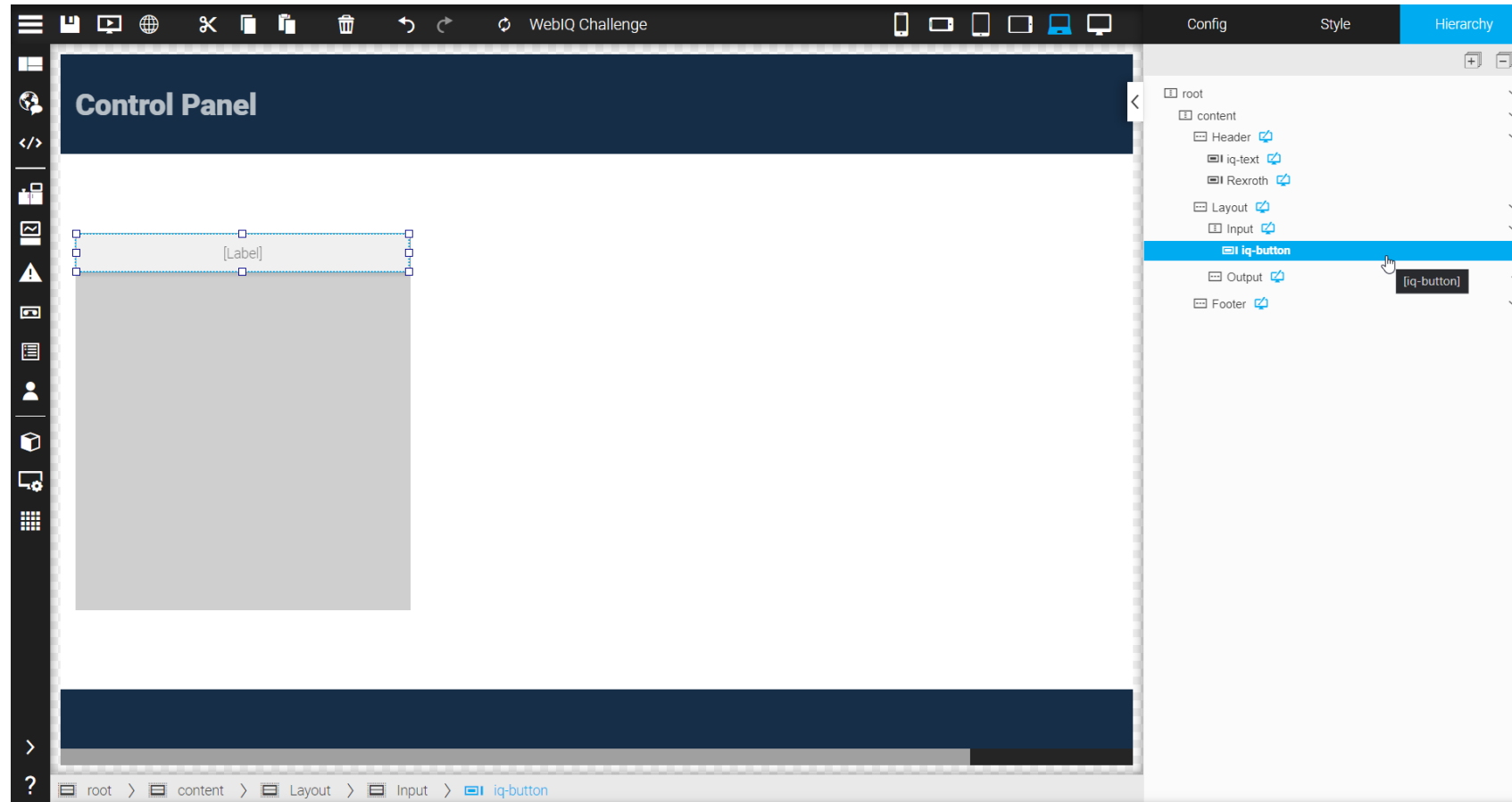
Step 2: Now, from the Widget List find the Button Widget



Challenge 05: ctrlX WebIQ | Task 01

Steps

Step 3: Drag the Button Widget and drop it under Layout and under input category



Challenge 05: ctrlX WebIQ | Task 01

Steps

Step 4: Go to the configuration cockpit of the Button Widget

Step 5: Find the control name option and name it as “start_button”

Step 6: From the Data Attributes section, tick the “Write on/off value when pressed/released”, make sure the On-value is 1 and Off-value is 0.


Step 7: Find the Label option and name it as “Start Button”

The screenshot shows the configuration interface for a Button widget in the ctrlX WebIQ environment. The interface is divided into three tabs: Config (active), Style, and Hierarchy. The Config tab is further divided into three sections: LAYOUT, REFERENTIAL ATTRIBUTES, and DATA ATTRIBUTES.

- LAYOUT:** Shows a visual representation of the button with a "+ Label" placeholder.
- REFERENTIAL ATTRIBUTES:**
 - Control Name:** A red arrow points to the input field containing "start_button".
 - Template:** A dropdown menu showing "default/iq-button.iq-variant-01".
 - Class Name:** An input field containing "iq-button iq-variant-01".
- DATA ATTRIBUTES:**
 - Item:** A dropdown menu with a red arrow pointing to it.
 - Write on/off values when pressed/released:** A checkbox that is checked.
 - On-Value:** An input field containing "1".
 - Off-Value:** An input field containing "0".
 - Label:** A section with an "Auto" button and an input field containing "Start Button". A red arrow points to this input field.

Challenge 05: ctrlX WebIQ | Task 01

Steps

Step 8: Under the Data Attributes section, find the item option and click  for assigning variable to the button.

Step 9: Now, select the start_button_opc and click apply so that the button can read and write the start_button_opc variable.

ConfigStyleHierarchy

OK

Button

Width: 339 px
Height: 40 px

LAYOUT

<+ Label>

REFERENTIAL ATTRIBUTES

Control Name
start_button

Template
default/iq-button.iq-variant-01

Class Name
iq-button iq-variant-01

DATA ATTRIBUTES

Item

...

☒ Write on/off values when pressed/released

On-Value
1

Off-Value
0

Label
AutoStart Button

Select Process Item

ItemsVirtual Items

Search

ALIAS

DSaw
DSin
DRandBool
DRandInt
DRandFloat
Systemzeit
SBool
SInt
SFloat
SString
start_button_opc
buzzer
green_lamp
red_lamp
stop_button_opc

15 entries

Bitaccess

☐ Enable

ApplyCancel

Challenge 05: ctrlX WebIQ | Task 01

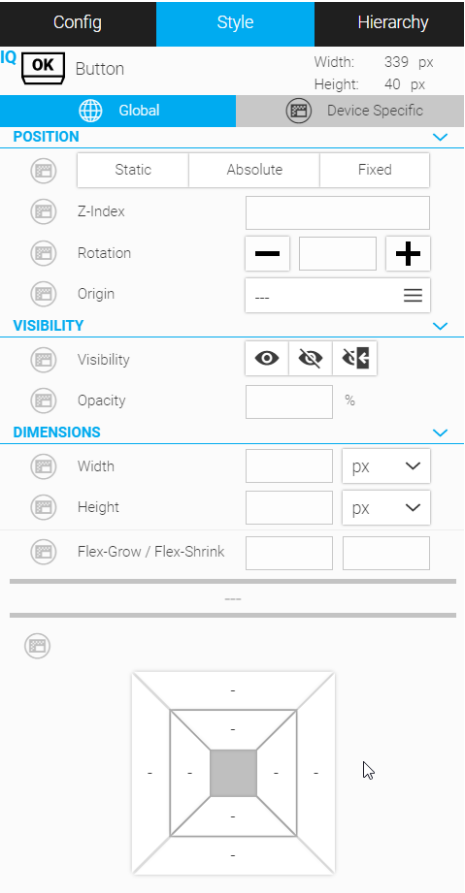
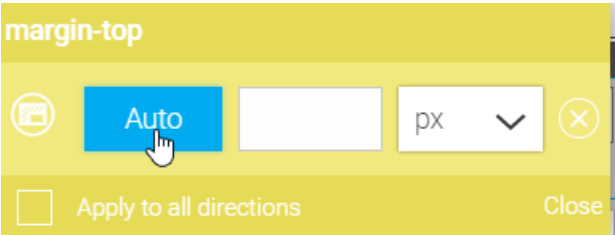
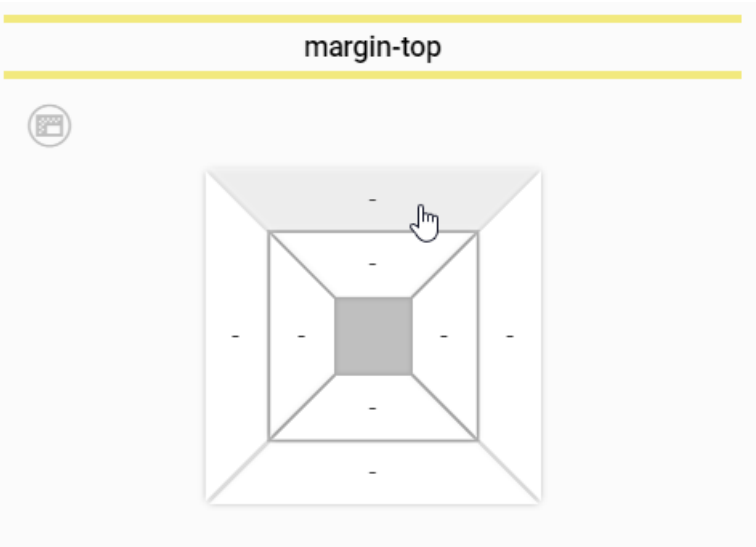
Steps

Step 10: Now, go to the style cockpit

Step 11: Under the Dimensions section, find  which will be use to configure the spacing around button widget.

Step 12: Click the margin-top section

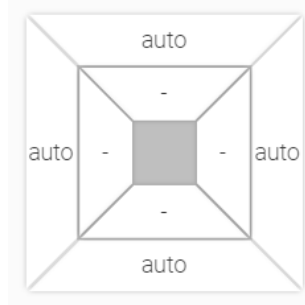
Step 13: From the pop out selection, set the margin top to auto



Challenge 05: ctrlX WebIQ | Task 01

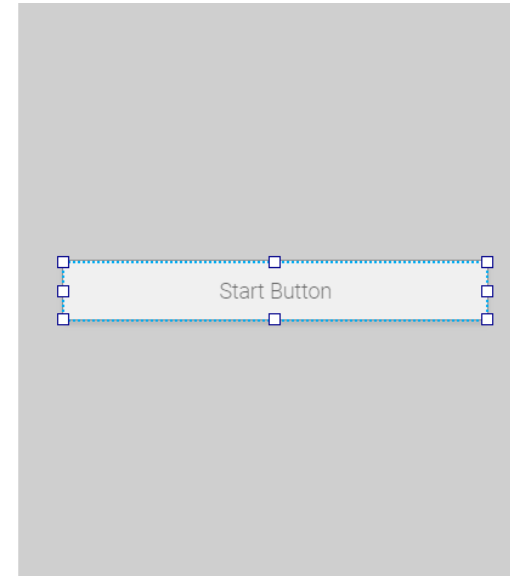
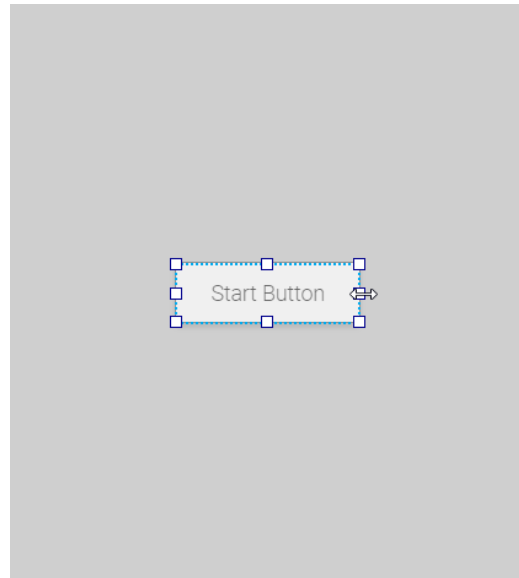
Steps

Step 14: Now, set the margin-bottom, margin-left and margin right to auto. The final result will show as below:




** You can also set the spacing on your own preference

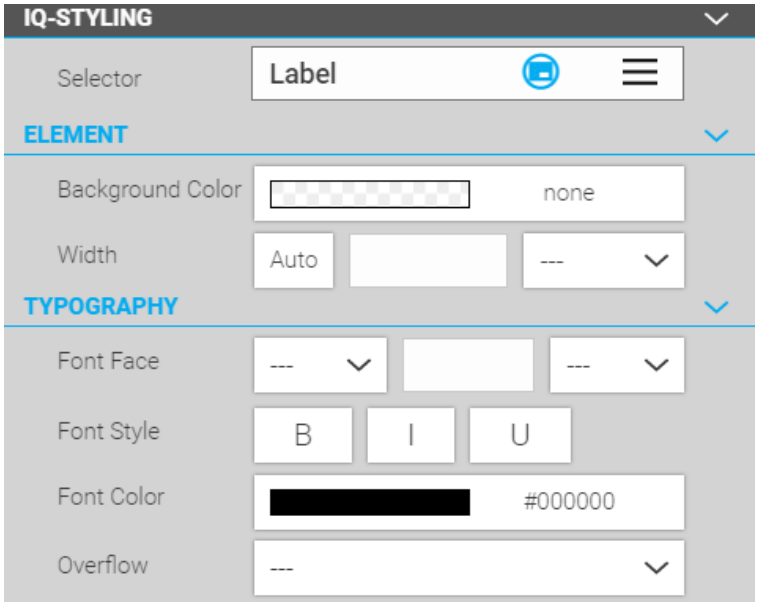
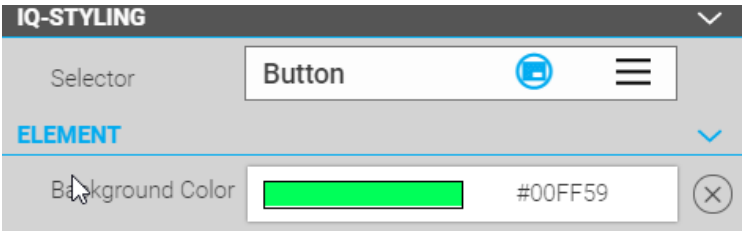
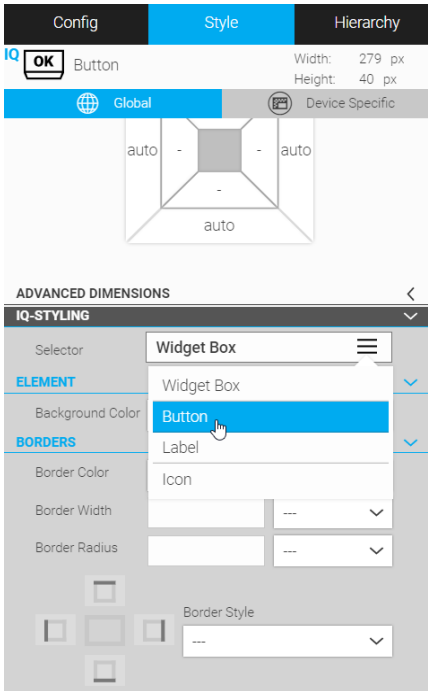
Step 15: In the layout preview, click the start button and now you can adjust the width or height of the button on your reference



Challenge 05: ctrlX WebIQ | Task 01

Steps

- Step 16: In the style cockpit, find the Selector option which placed under the IQ-Styling section
- Step 17: Click the  button and select Button
- Step 18: Now, you can change the background color of the button on your reference by clicking the background color option under Element section
- Step 19: Change the selector to Label and you are available to change the font option of the label base on your reference under Typography section
- Step 20: You are done for setting up a button. Try to configure another button which the label should be Stop Button and could control the stop_button_opc variable.



Challenge 05: ctrlX WebIQ | Task 01

Steps

Once you have completed Task 1, follow the steps below.

How to complete Task 1 Smart HMI – WebIQ App

- You can test your solution against the Task description
- Once it satisfies the task requirements, confirm that you have completed the task by informing the available instructor for verification
- In the ctrlX developR challenge [website](#), under the HMI WebIQ App challenge section, tick ☒ the Task 1 checkbox

Congratulations on completing Task 1!

Proceed to Task 2!

ctrlX developR Challenges

PLC App
OPC UA App
Node-RED App
Motion App
HMI WebIQ App
IDE App

5. HMI WebIQ App Challenge

Complete the tasks:

- ☒ Task 1: Create a Web-Based HMI - Part 1
[Download Task 1 Instructions](#)
- ☐ Task 2: Create a Web-Based HMI - Part 2
[Download Task 2 Instructions](#)

Complete Task

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