# Challenge 05: Smart HMI – WebIQ





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# Let’s Start!




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## 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




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# 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.




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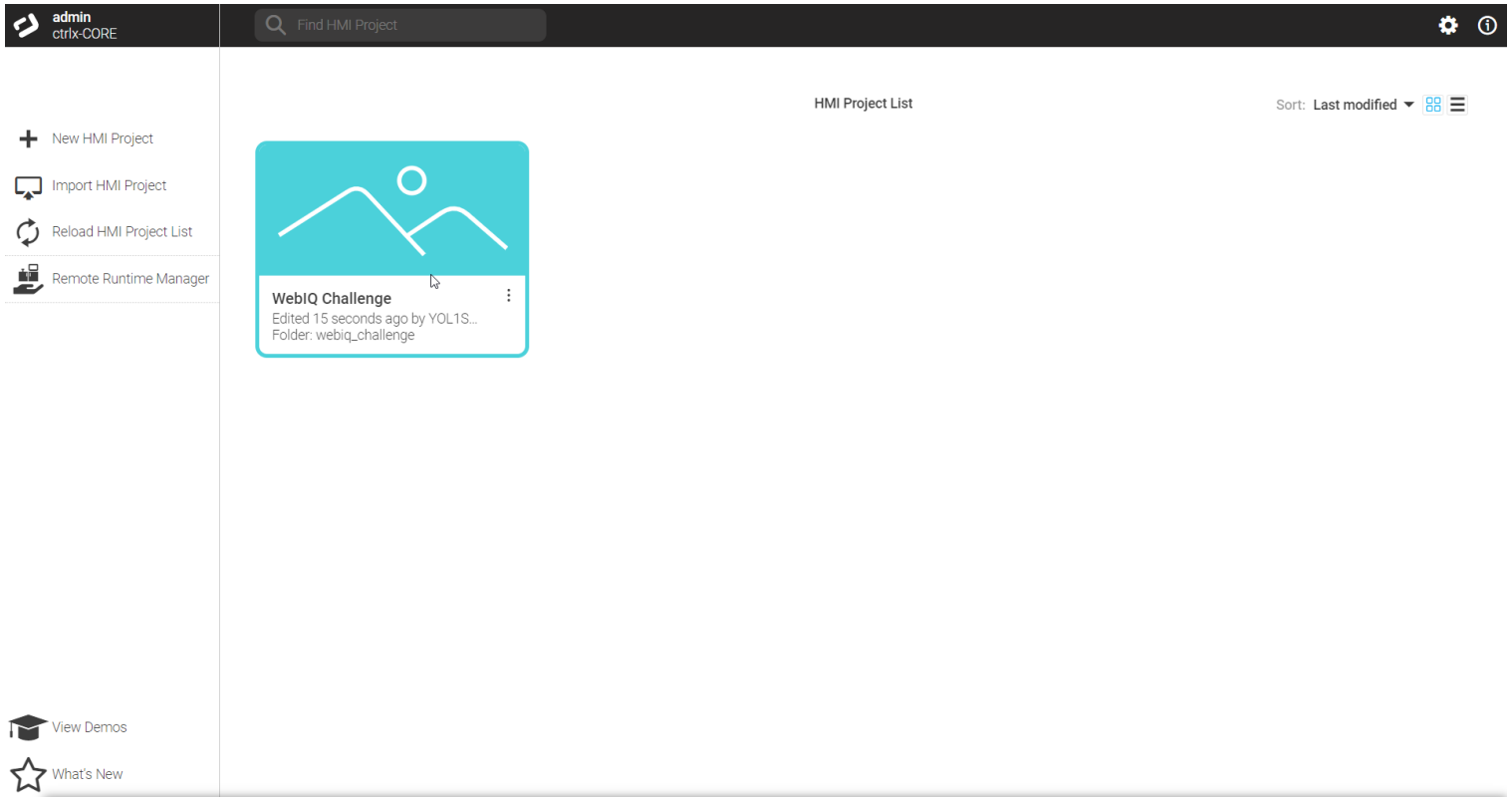
# Challenge 05: ctrlX WebIQ | Create a HMI Project

## 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







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## 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**

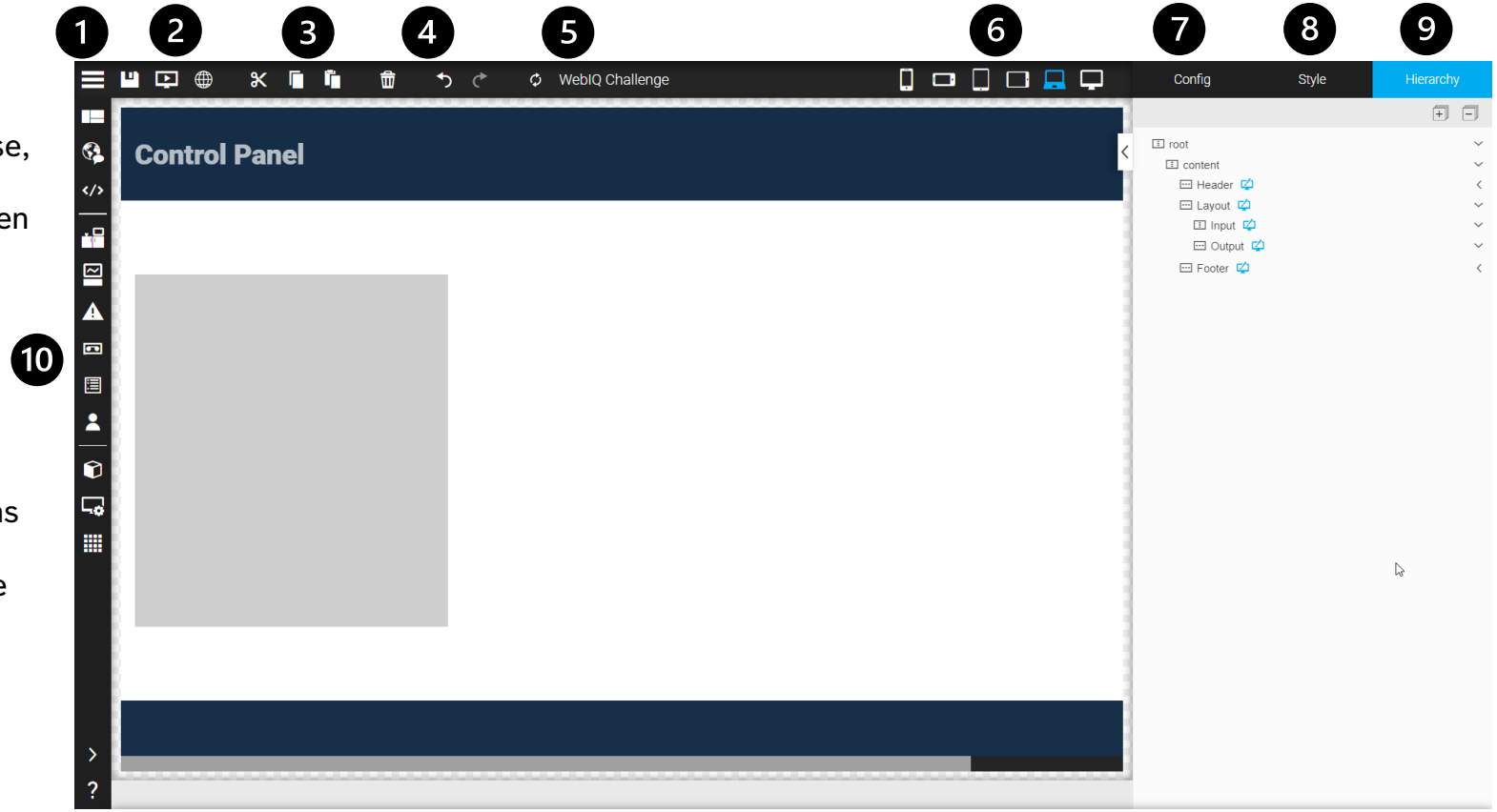
1.Publish or Publish and close, go back to Project List, Preferences and About Screen

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




**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

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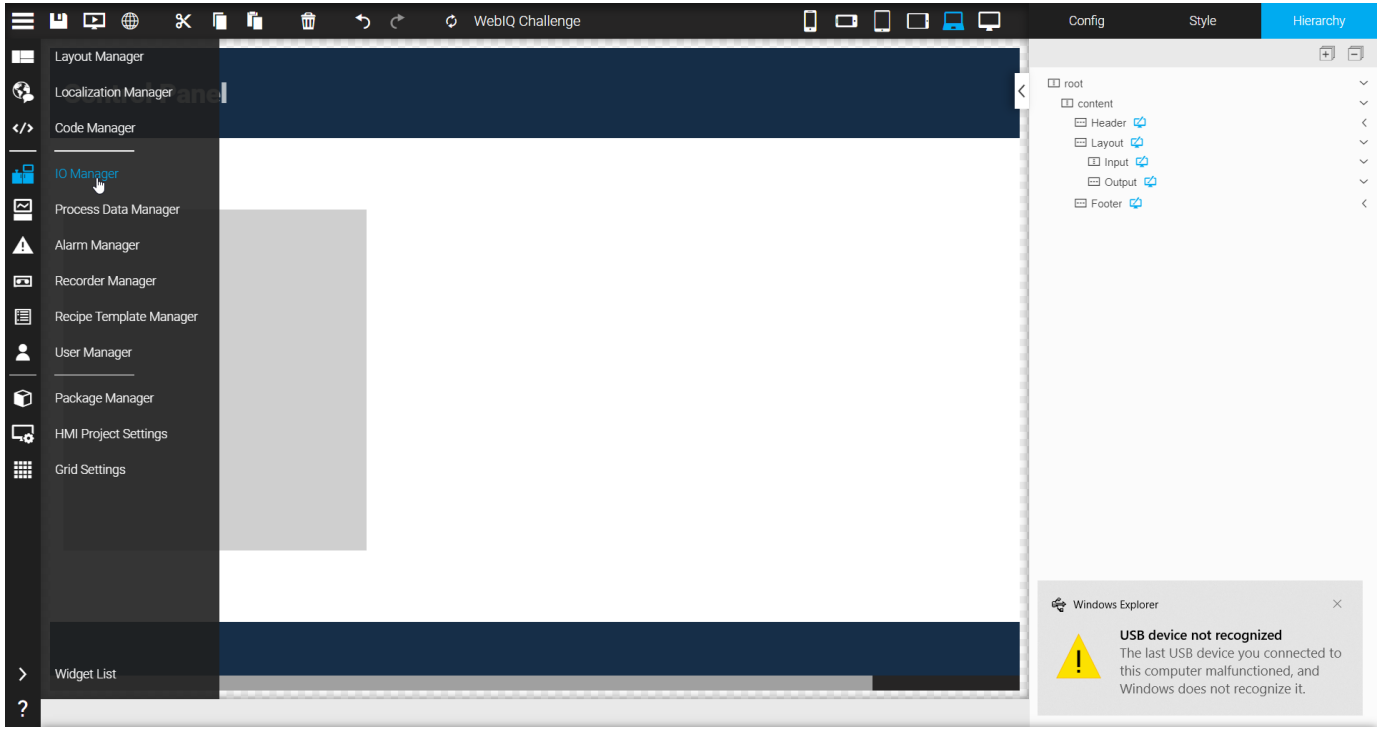
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## 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







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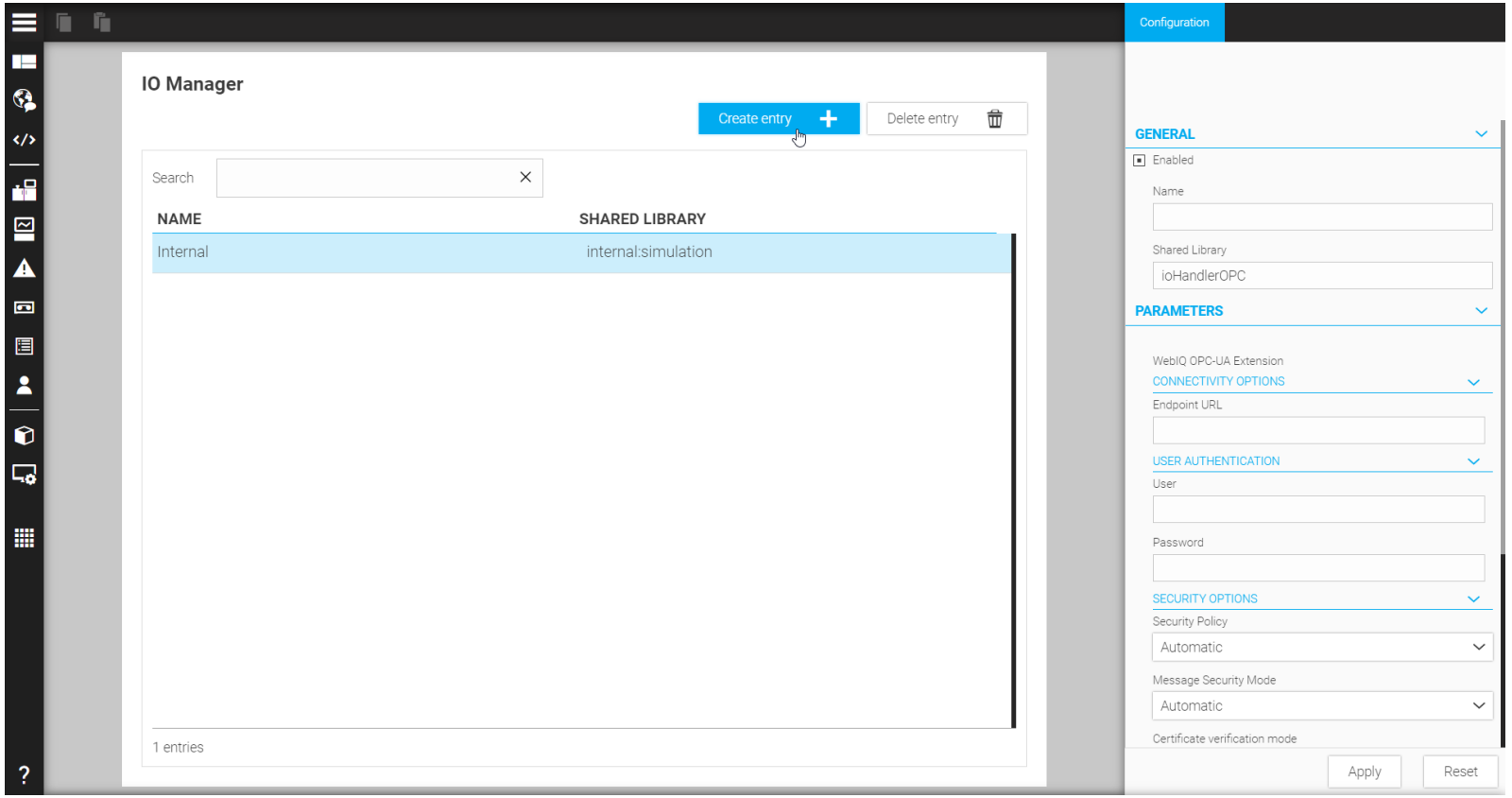
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## 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







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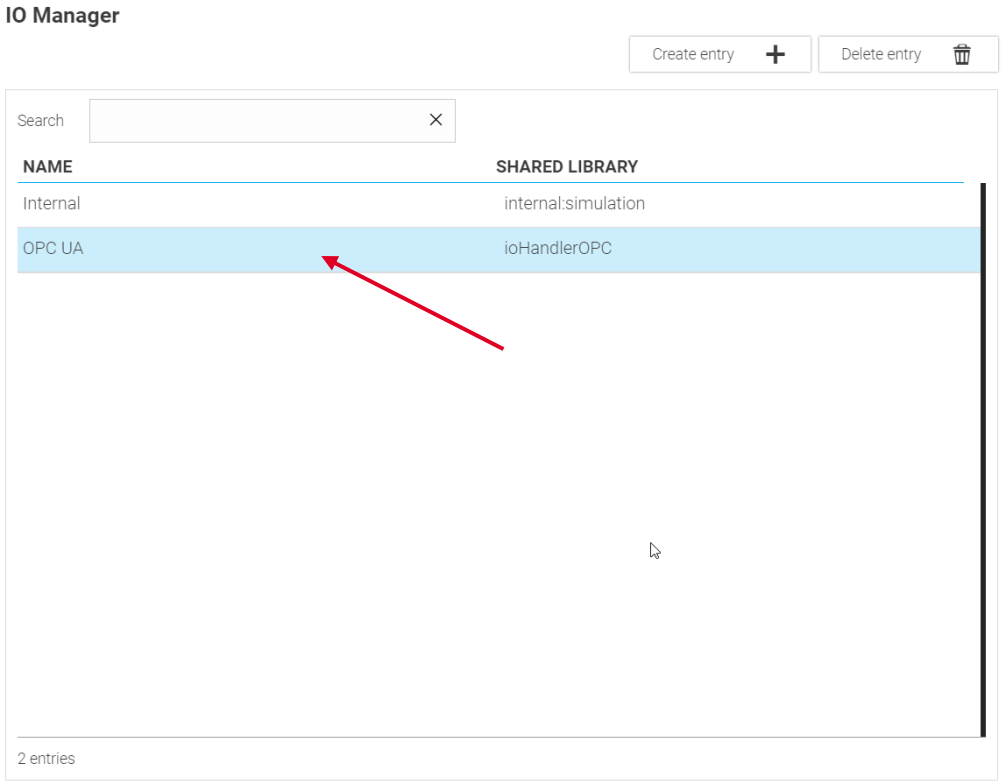
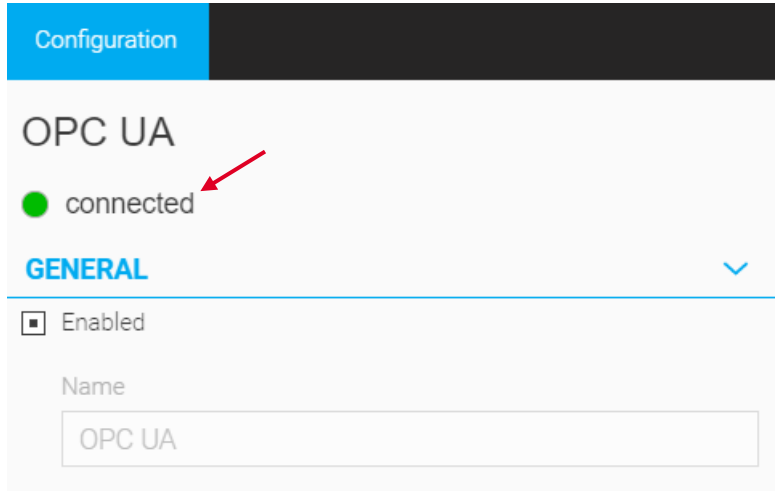
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## Steps

3. Check the accessibility of OPC UA




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

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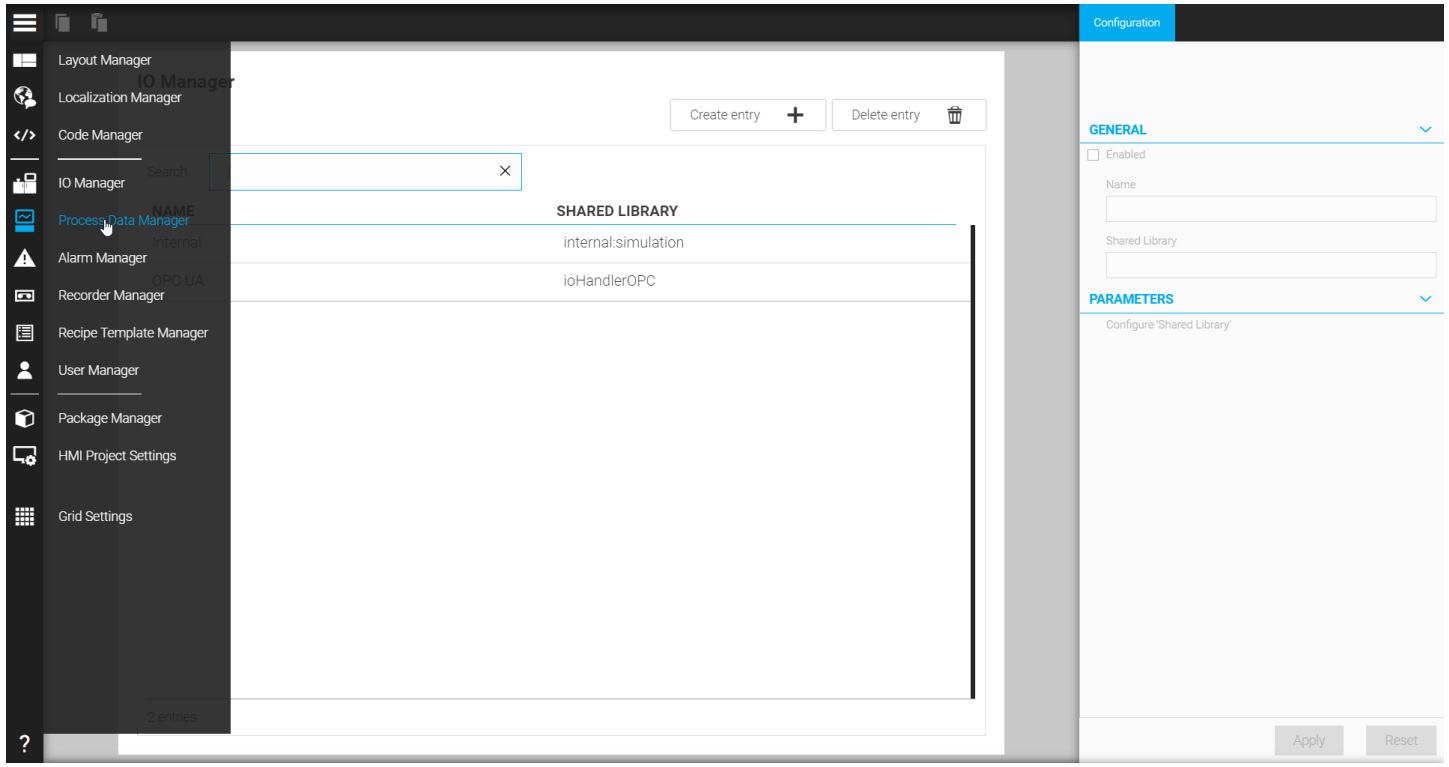
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## 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”







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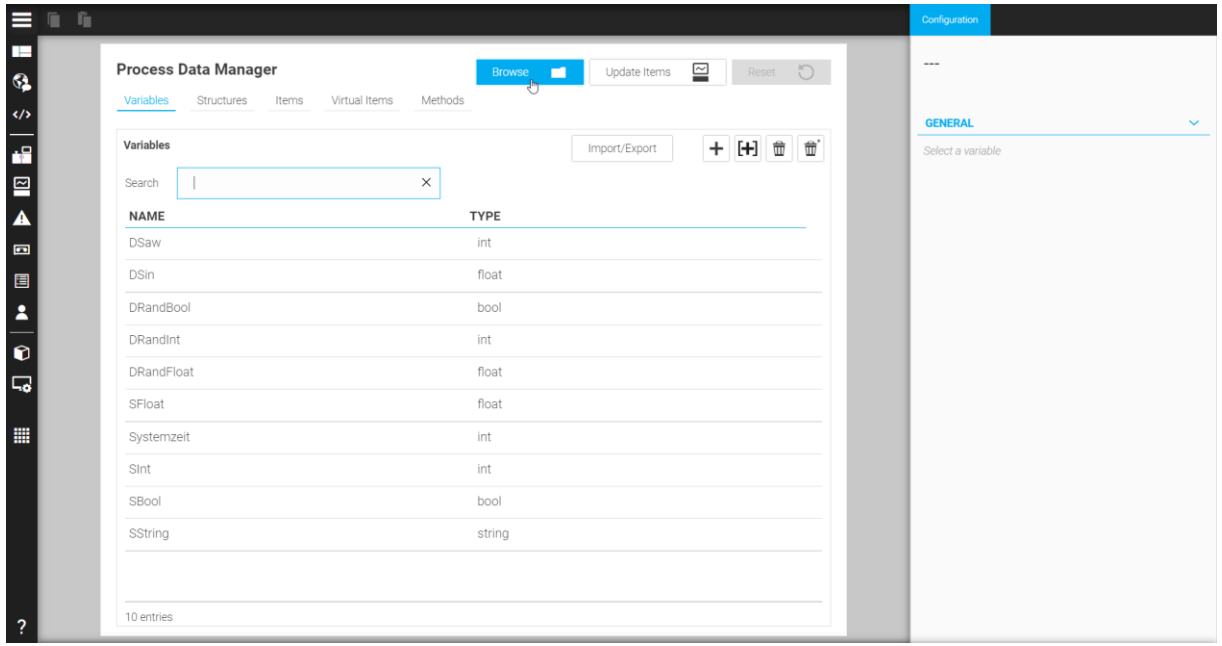
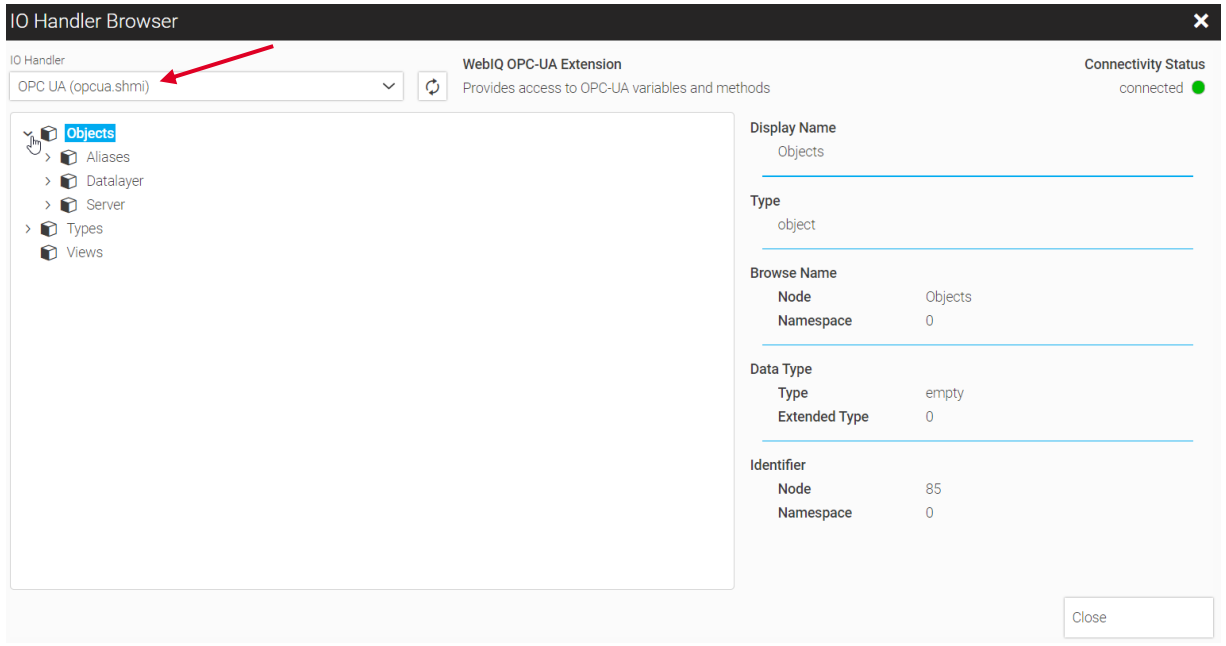
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## 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







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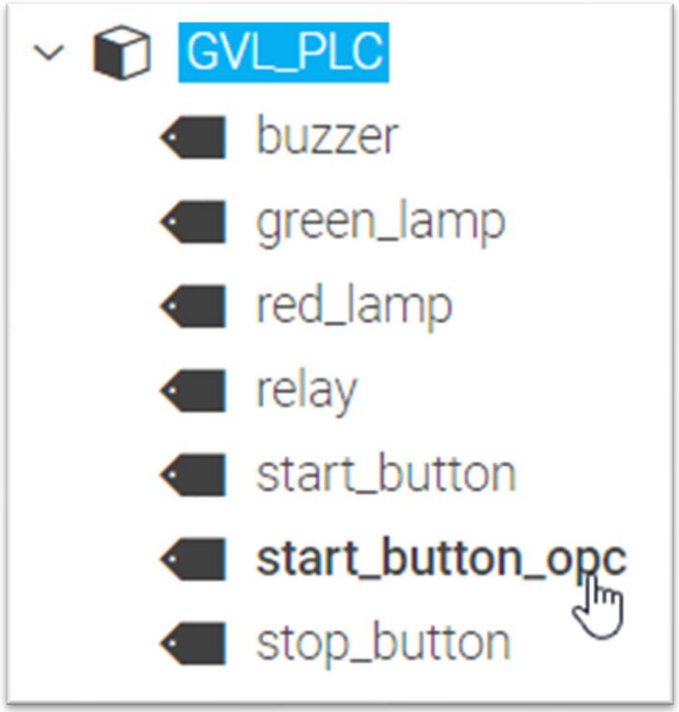
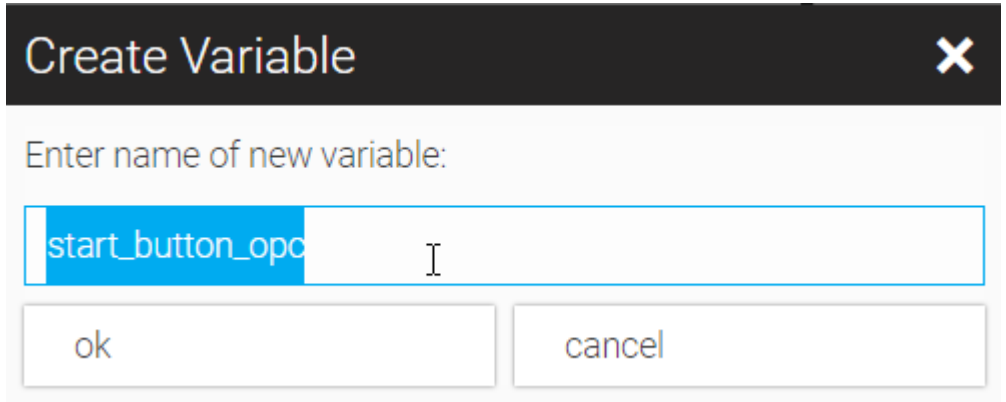
# Challenge 05: ctrlX WebIQ | Connect to OPC UA

## 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







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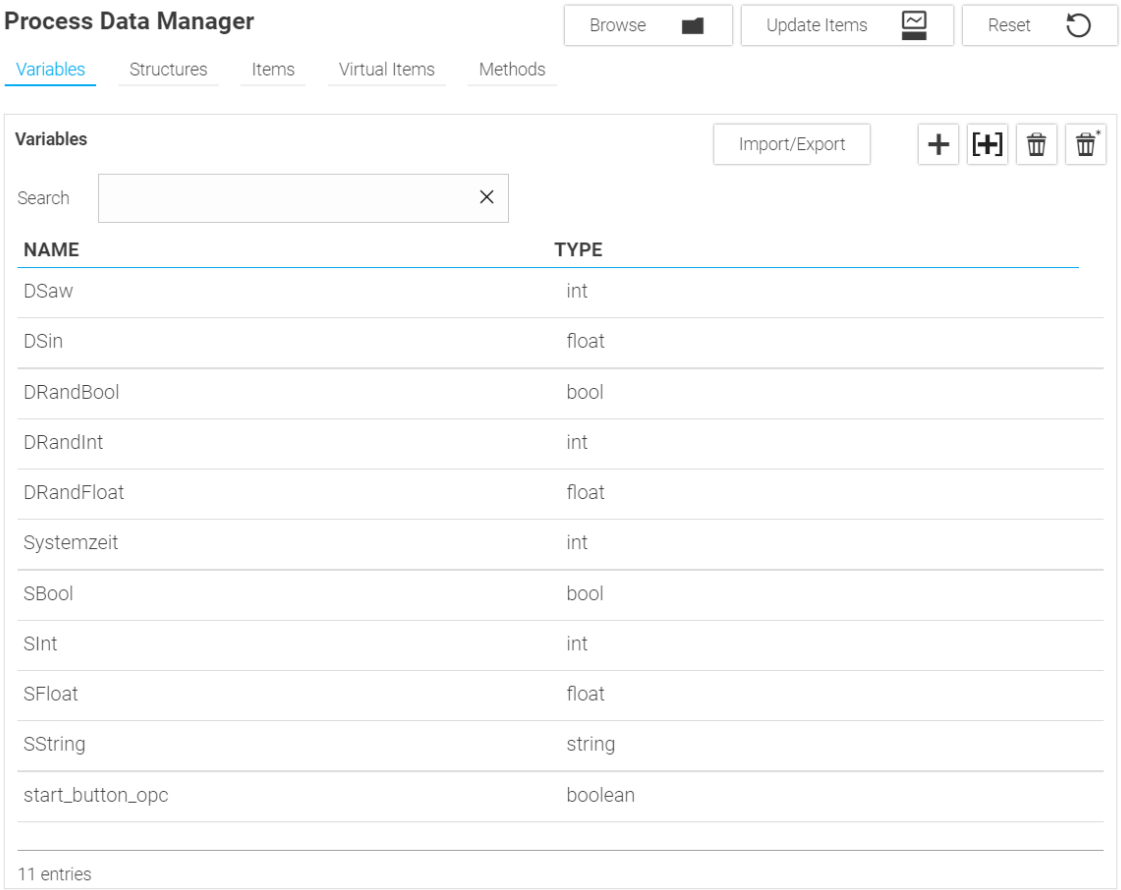
## Steps

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







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## Steps

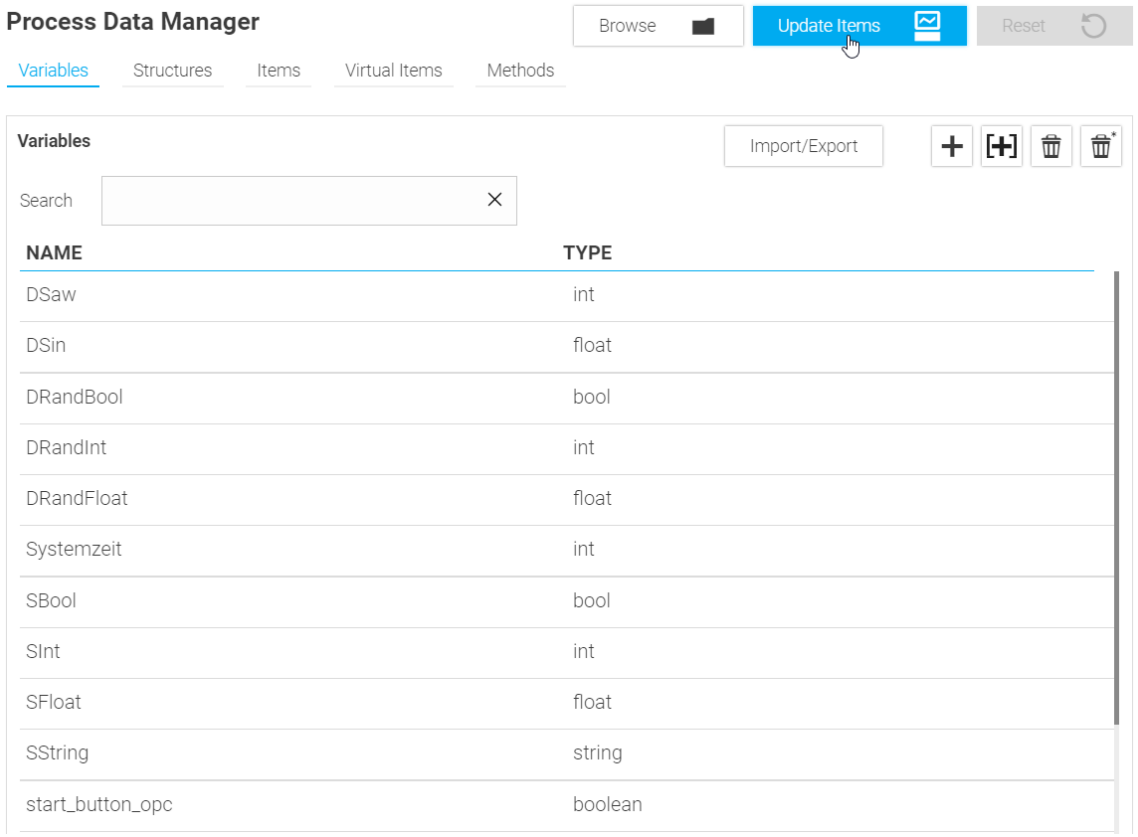
### Try It Yourself

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.







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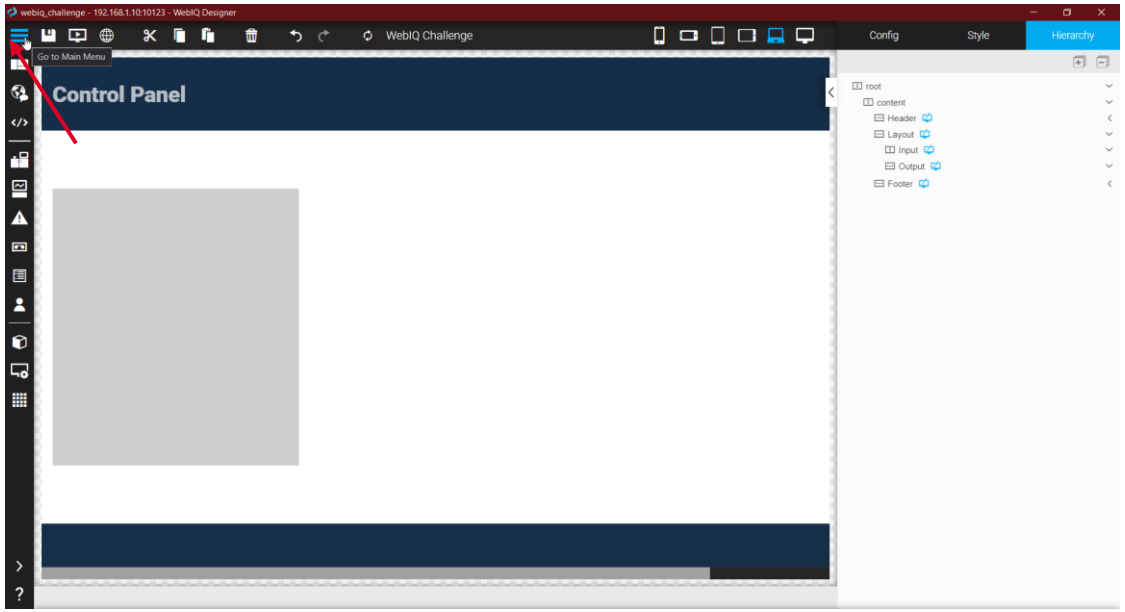
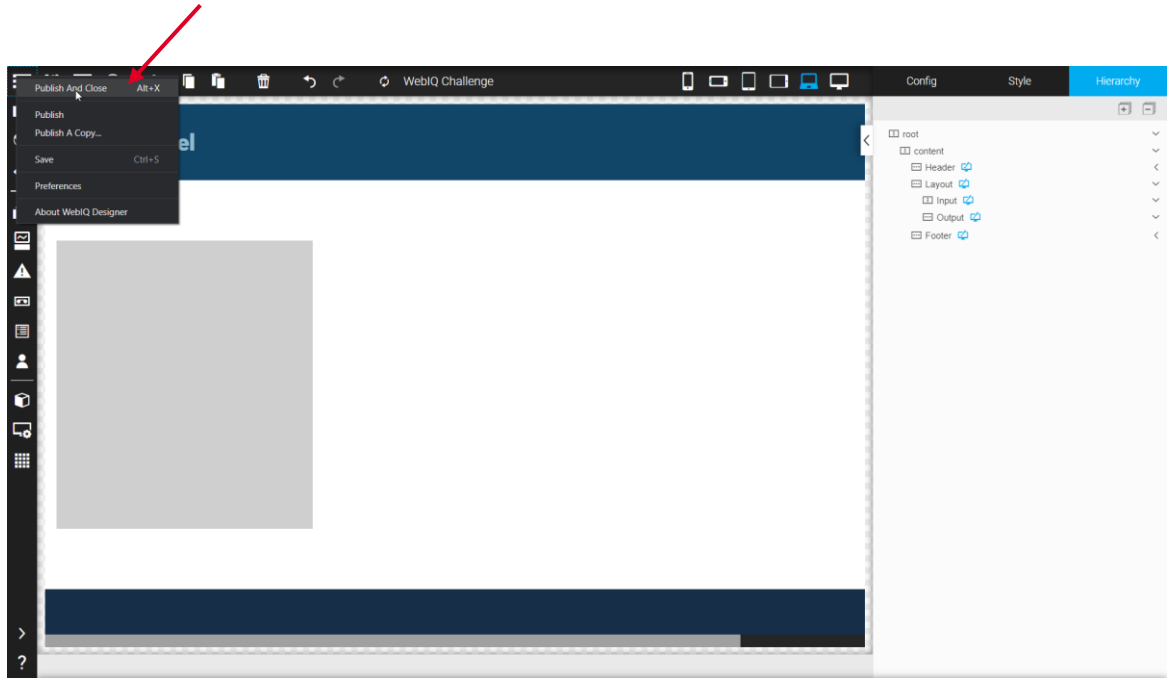
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

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







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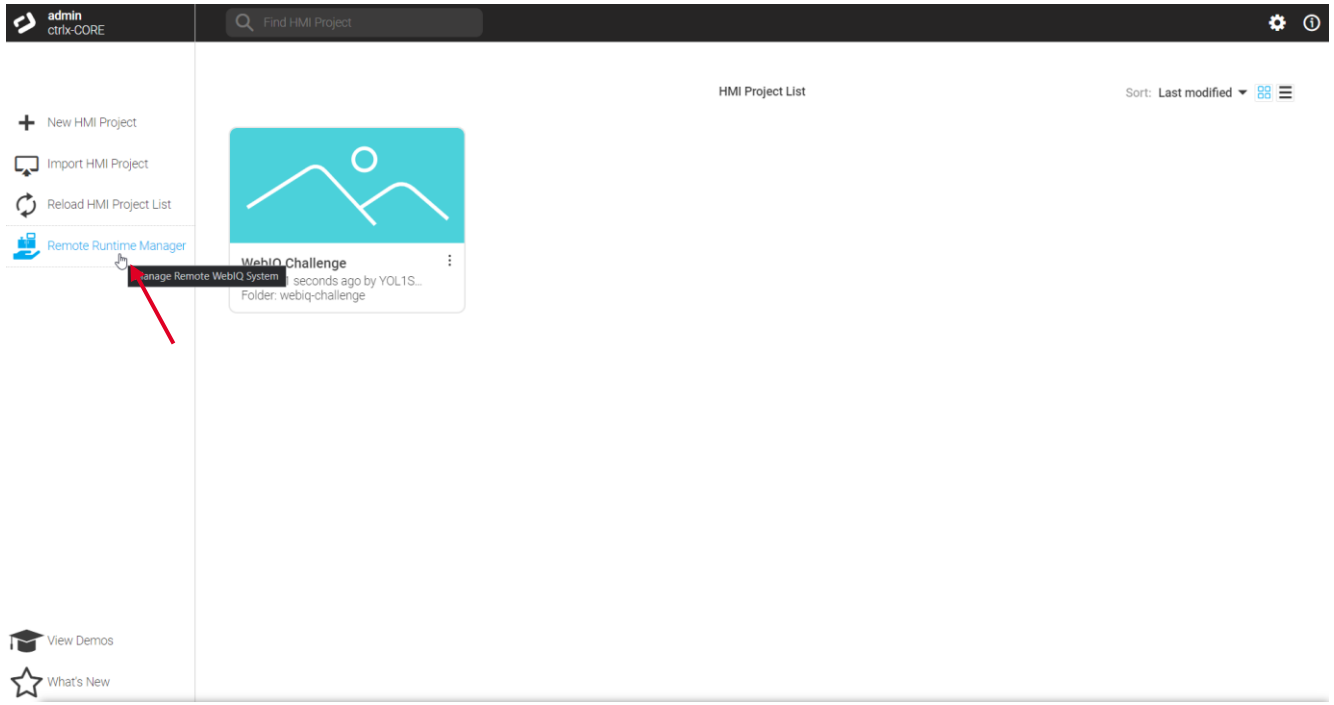
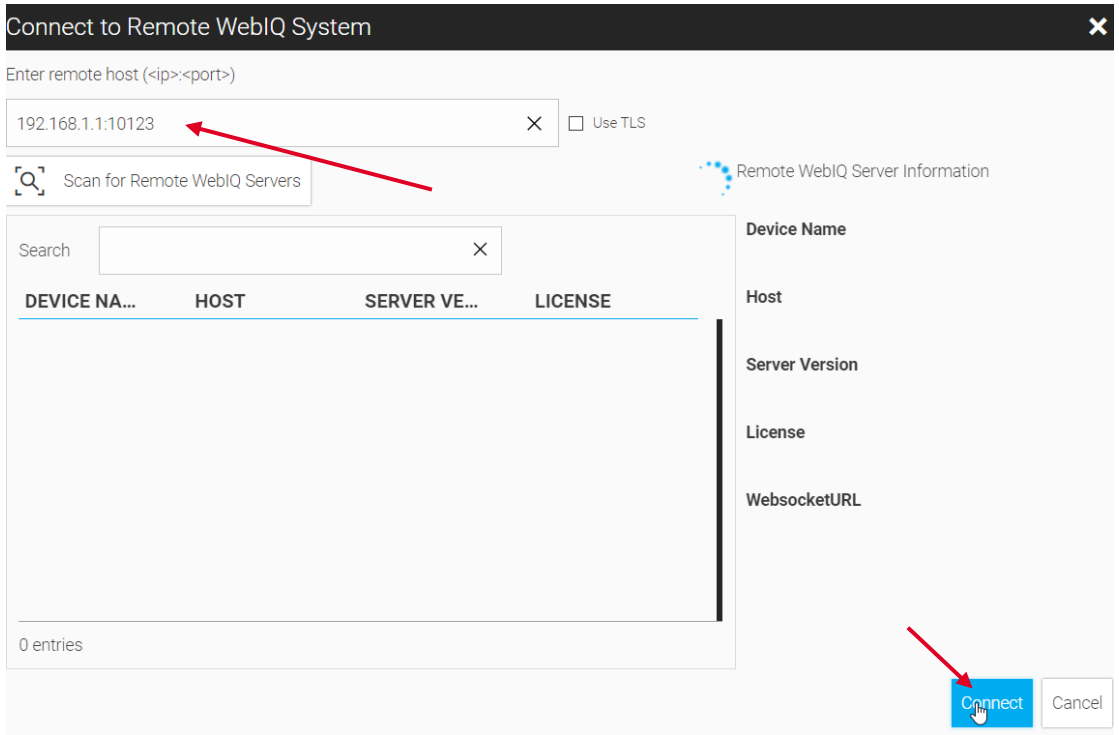
# Challenge 05: ctrlX WebIQ | Publish HMI

## 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







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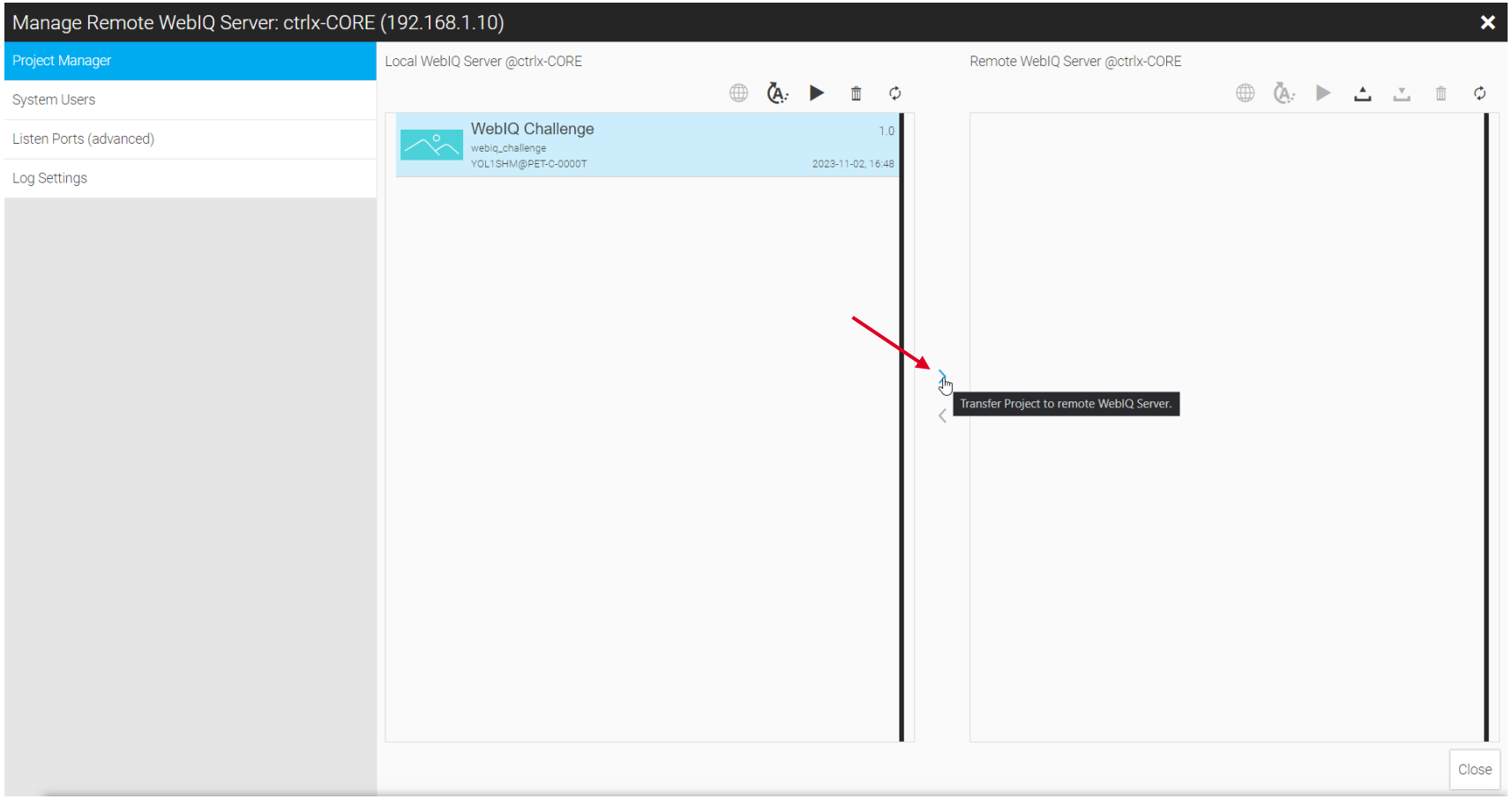
# Challenge 05: ctrlX WebIQ | Publish HMI

## 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







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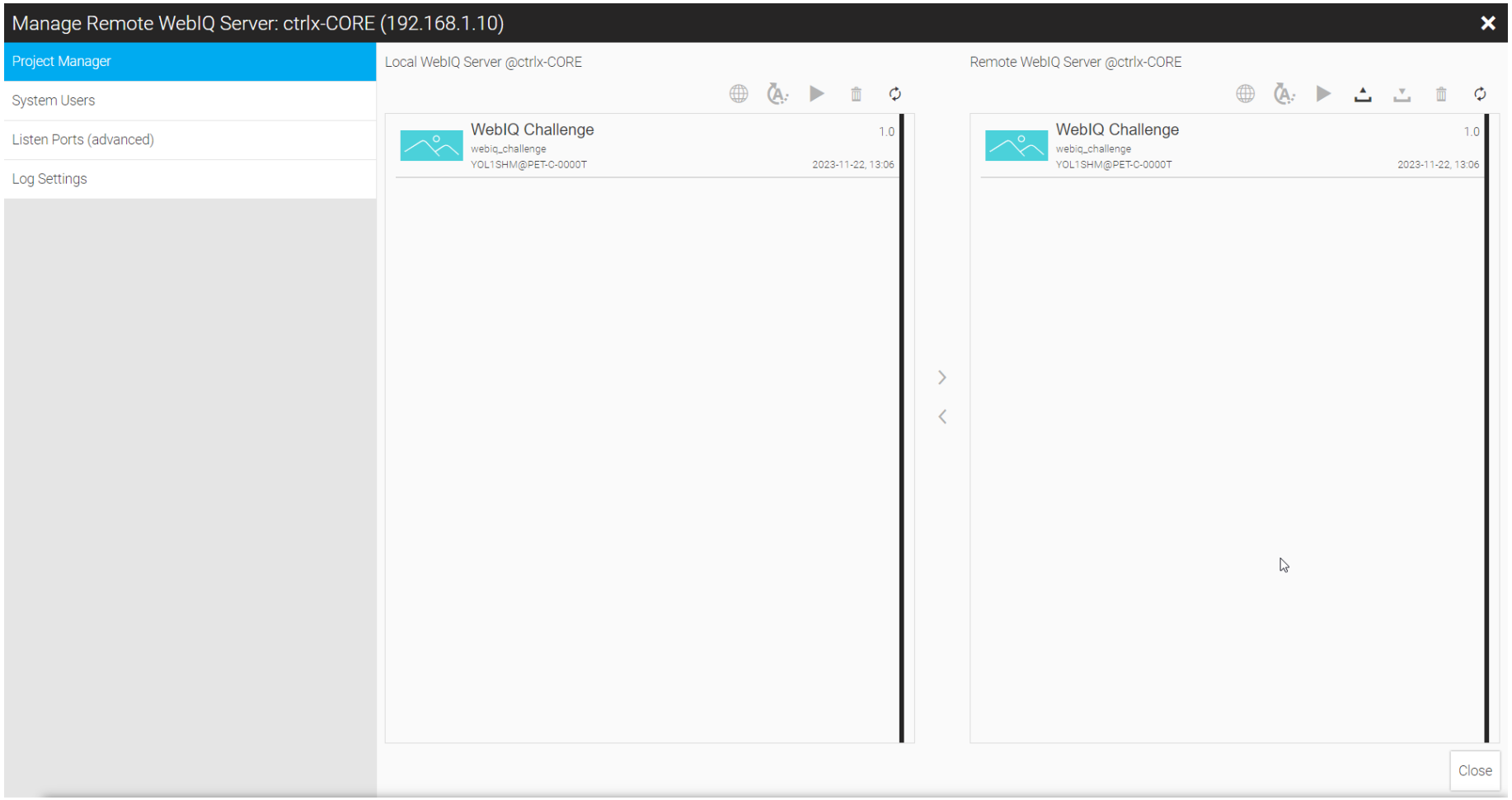
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

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







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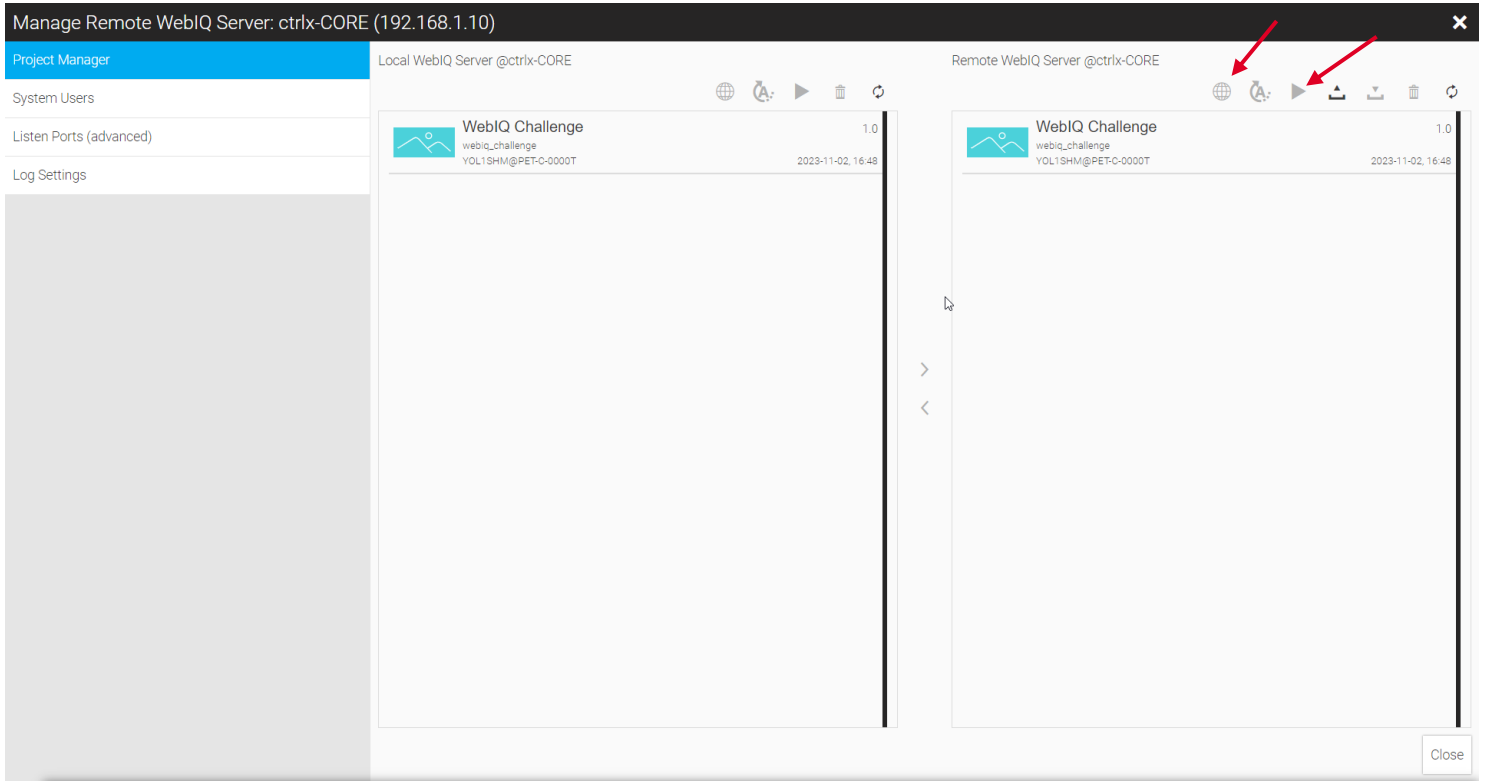
# Challenge 05: ctrlX WebIQ | Publish HMI

## 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.







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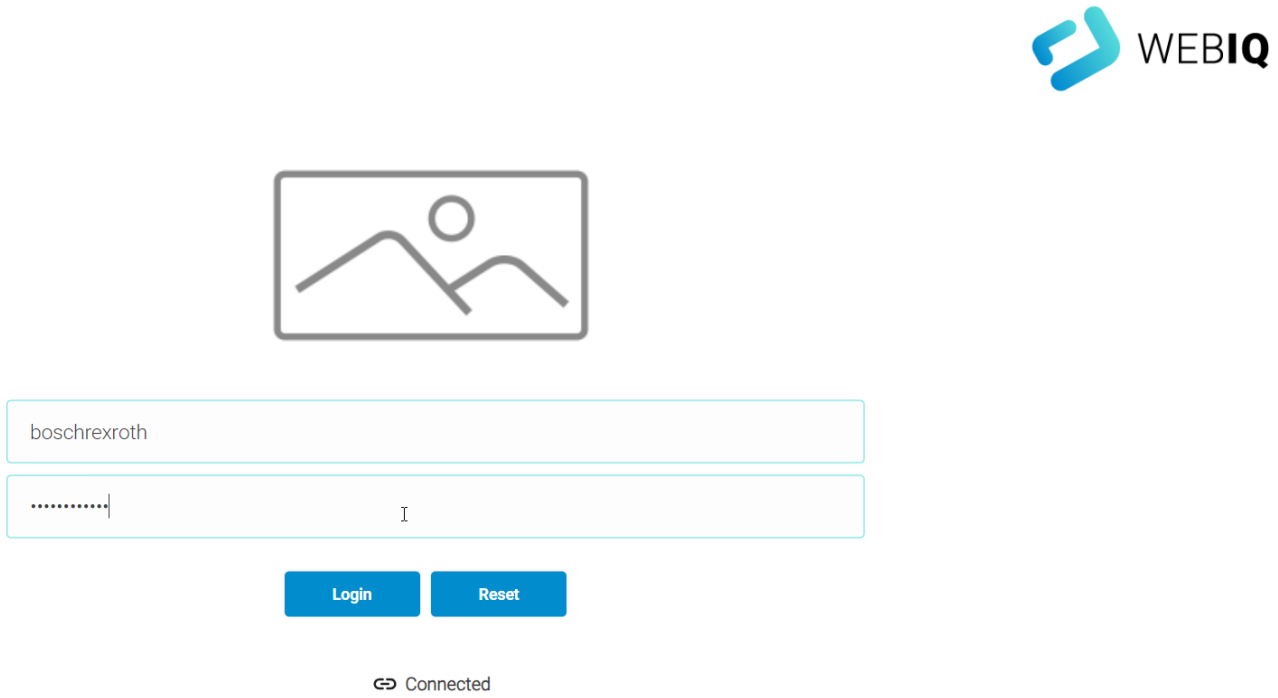
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

**Option 1: Run WebIQ from Laptop or PC**

Step 2: The Website project will looks 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.

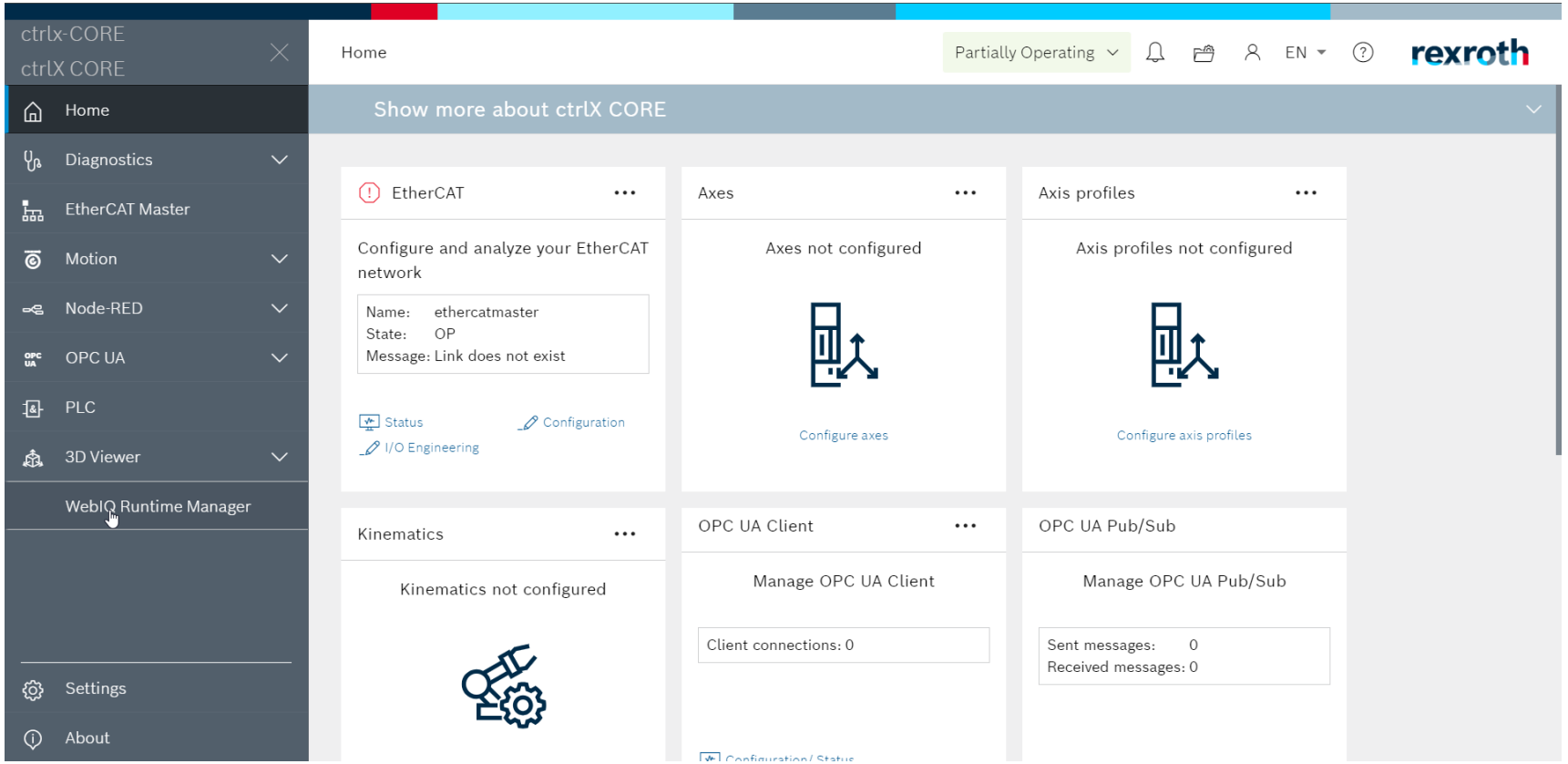


# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

### Option 2: Run WebIQ from ctrlX CORE

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







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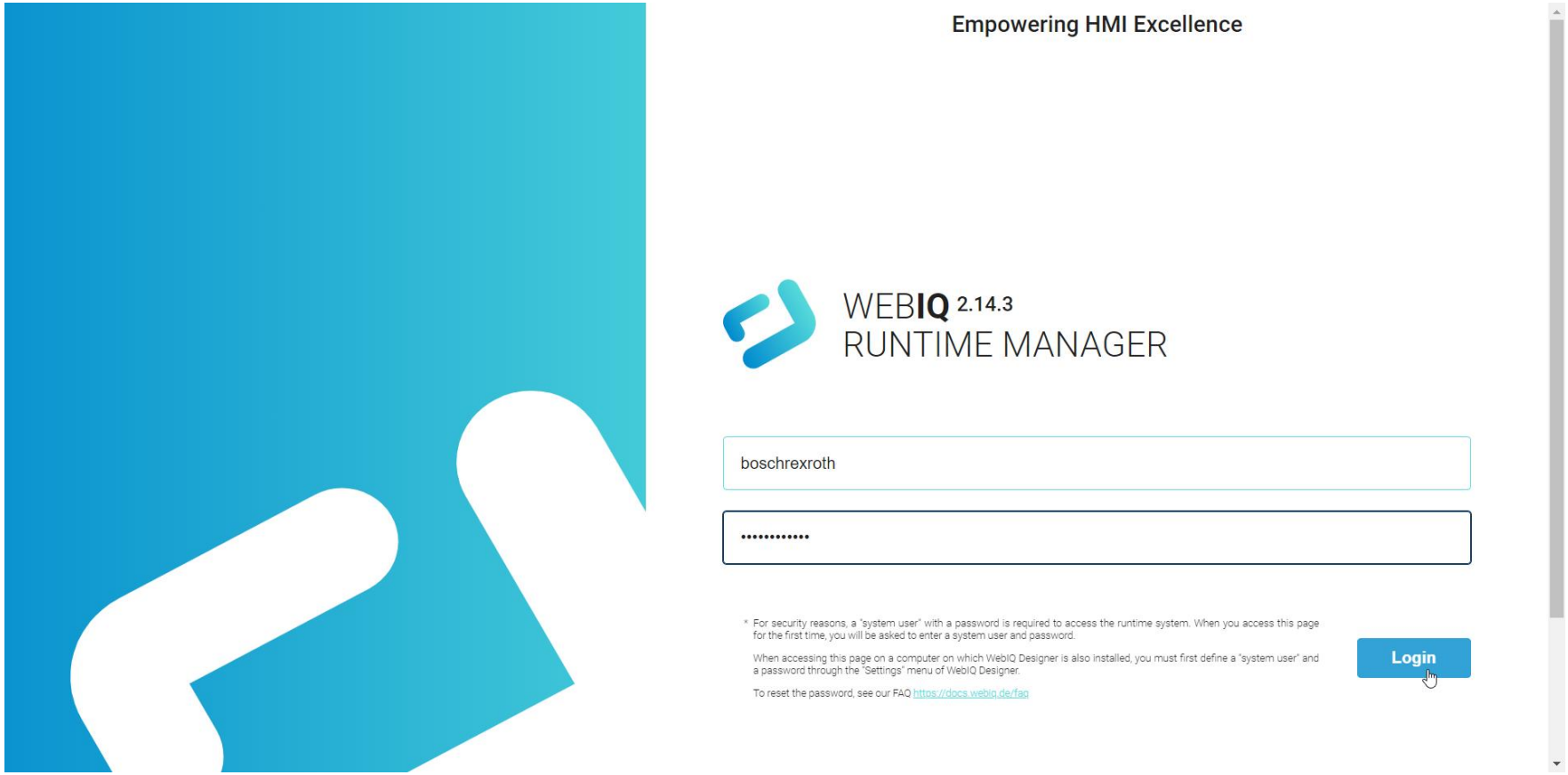
# Challenge 05: ctrlX WebIQ | Publish HMI

## 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







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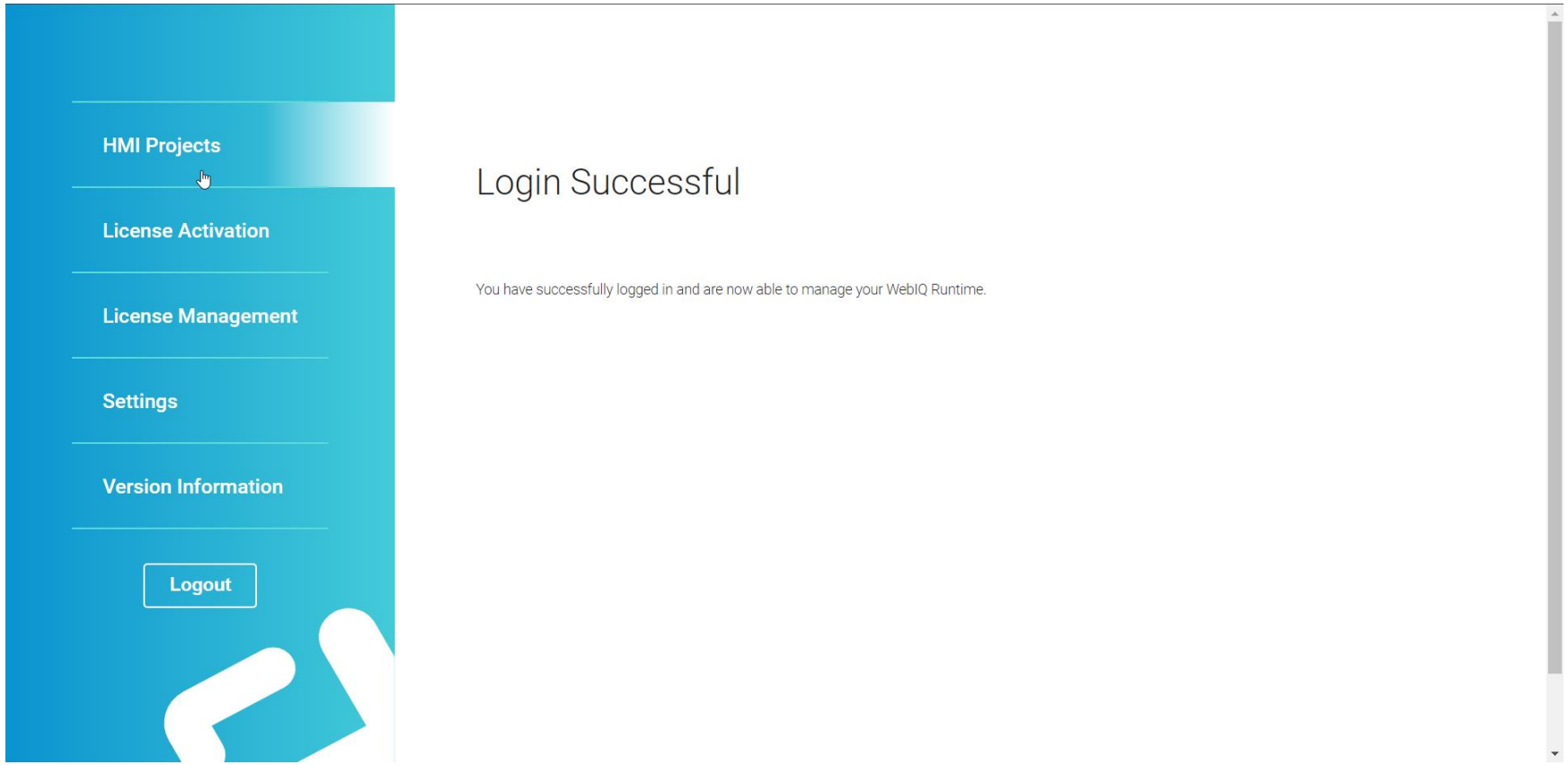
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

### Option 2: Run WebIQ from ctrlX CORE

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







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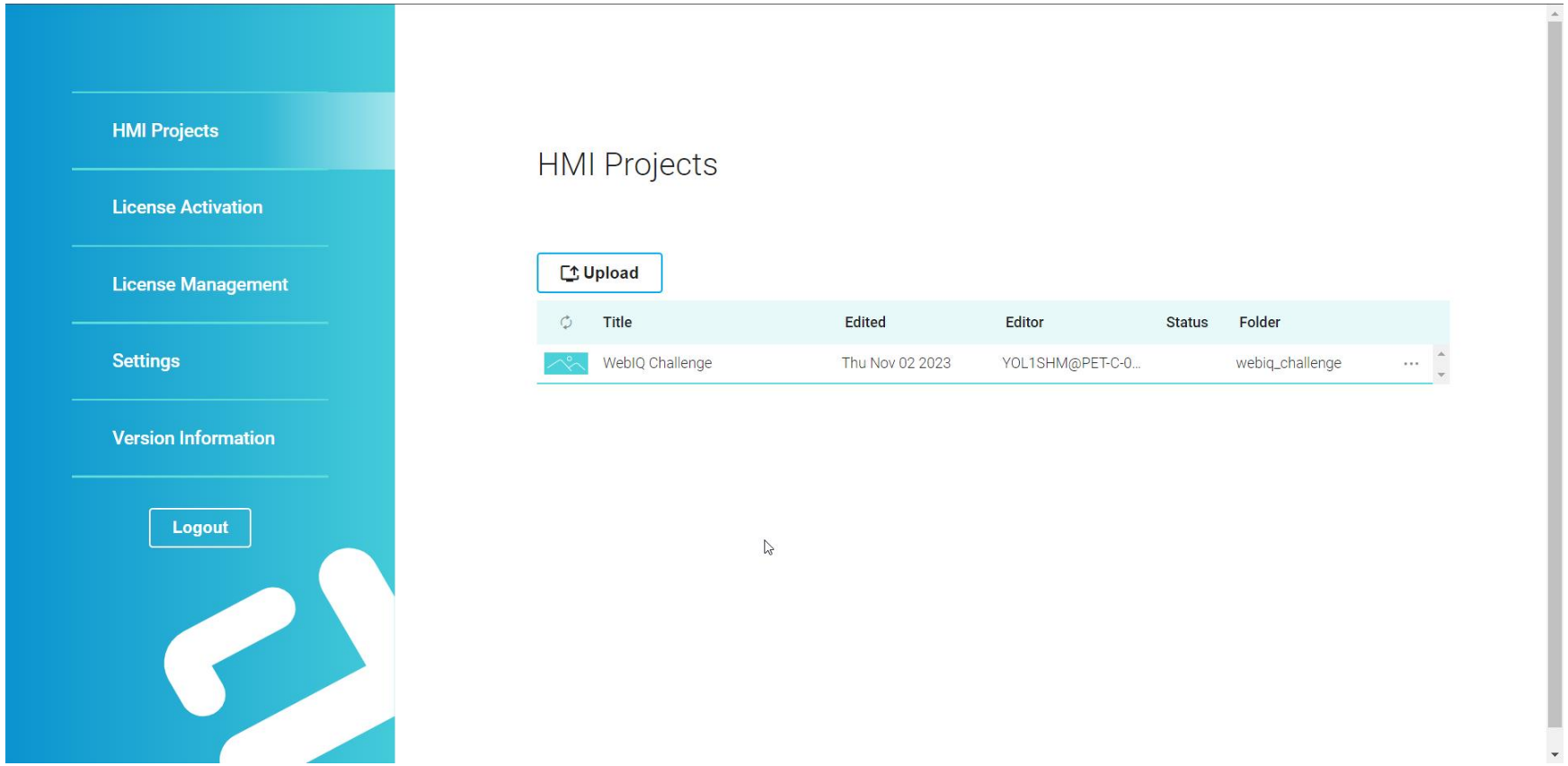
# Challenge 05: ctrlX WebIQ | Publish HMI

## 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







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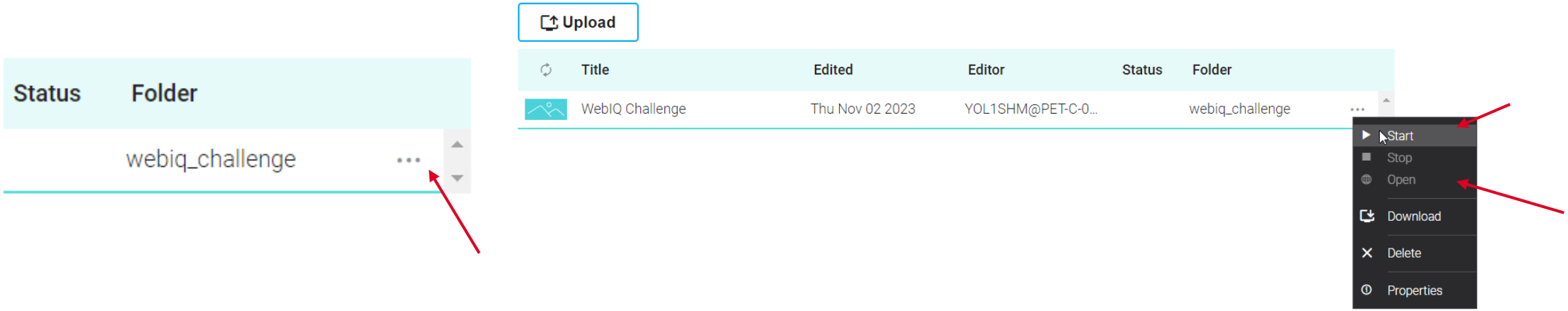
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

### Option 2: Run WebIQ from ctrlX CORE

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







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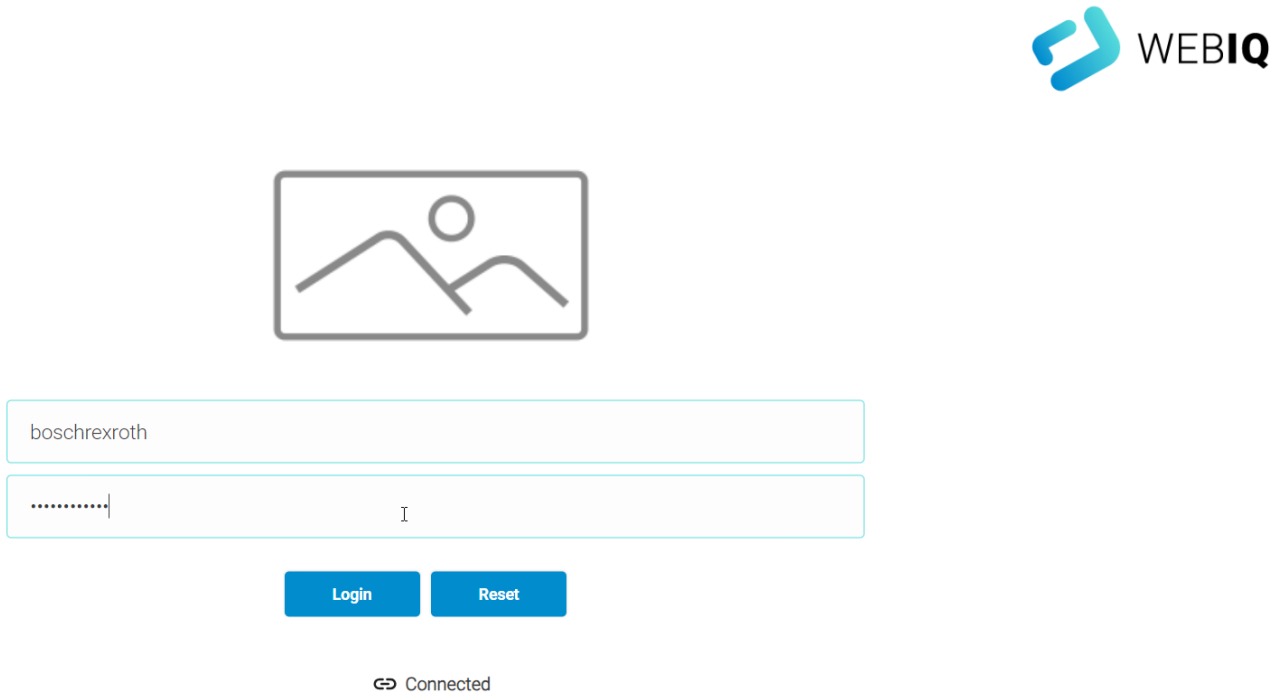
# Challenge 05: ctrlX WebIQ | Publish HMI

## Steps

**Option 2: Run WebIQ from ctrlX CORE**

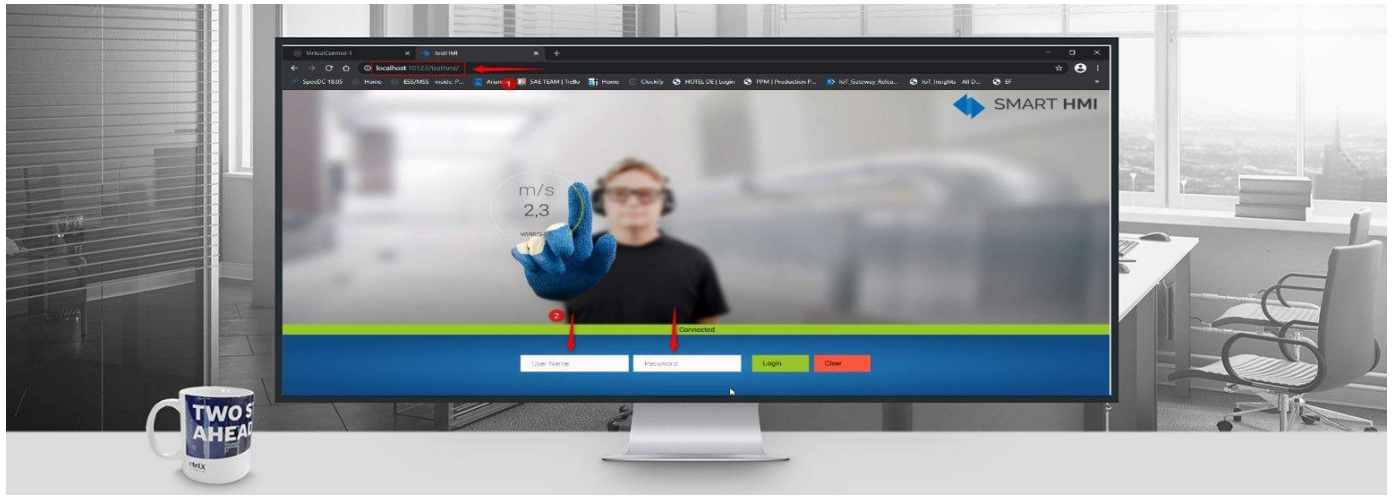
Step 6: The Website will pop out and required you to login and you need to enter the username and password for this project which username: boschrexroth and password: B0schrexroth. Once you login, you will see your project.



# 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.

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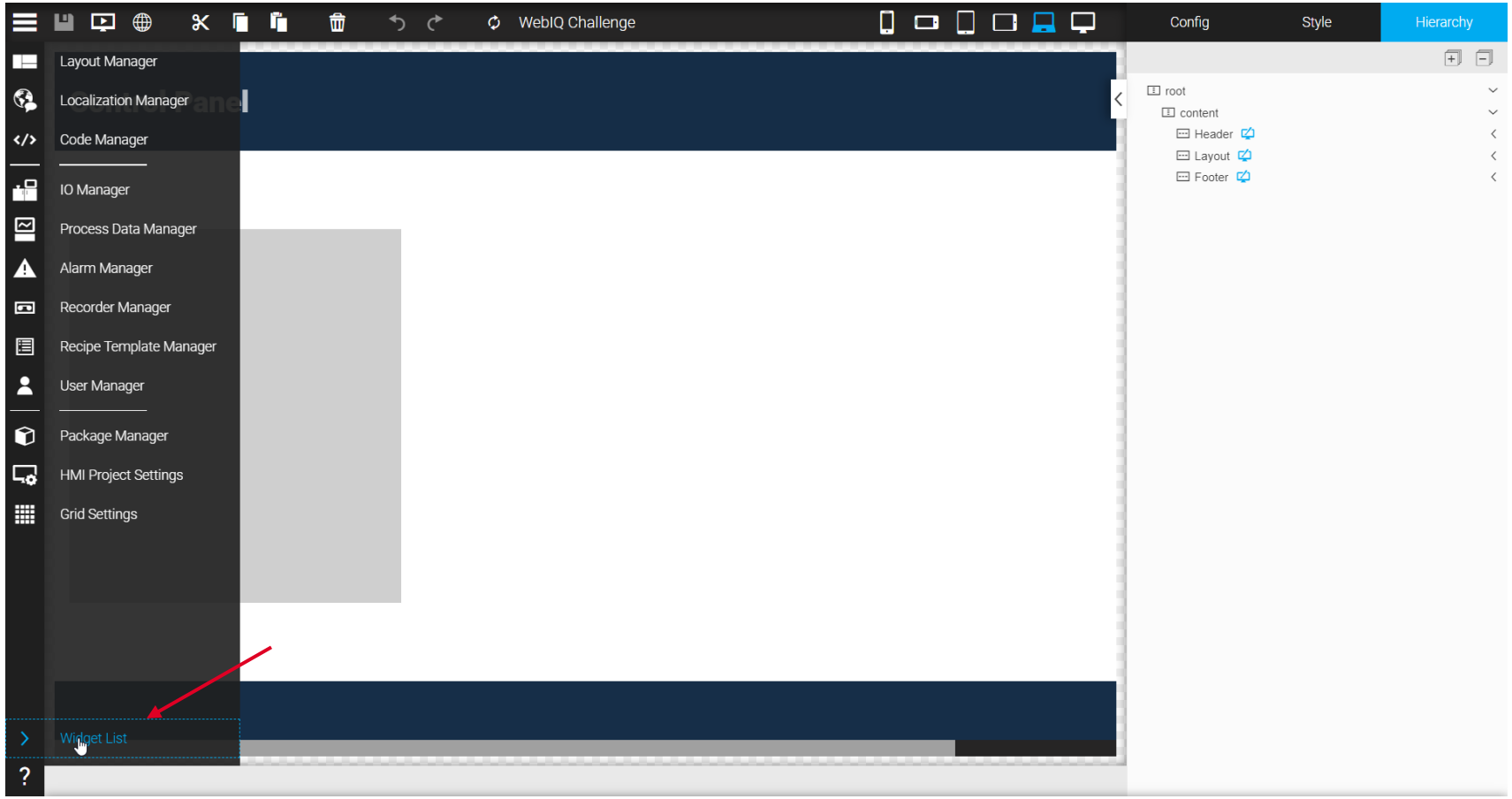
# Challenge 05: ctrlX WebIQ | Task 01

## Steps

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







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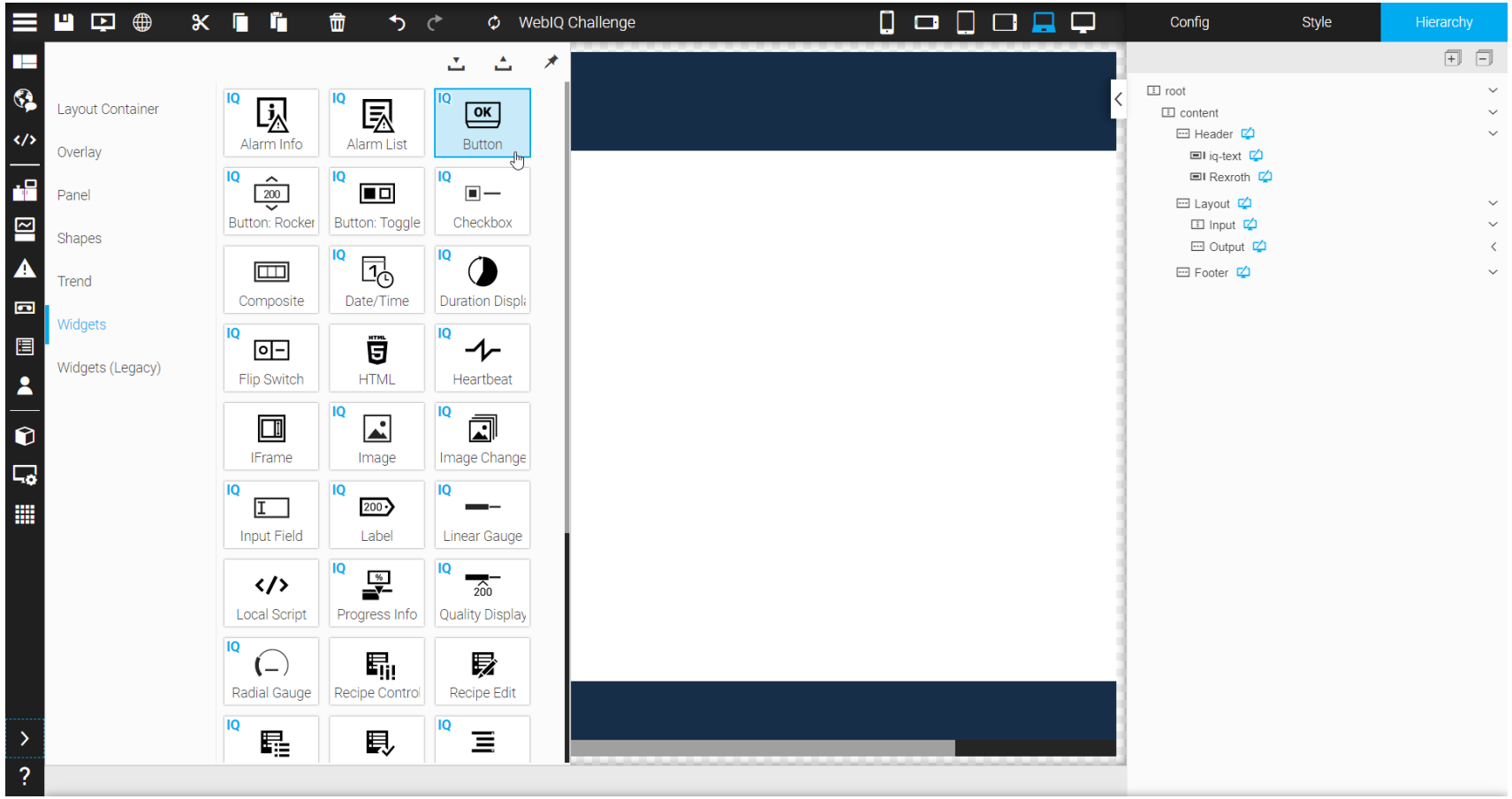
# Challenge 05: ctrlX WebIQ | Task 01

## Steps

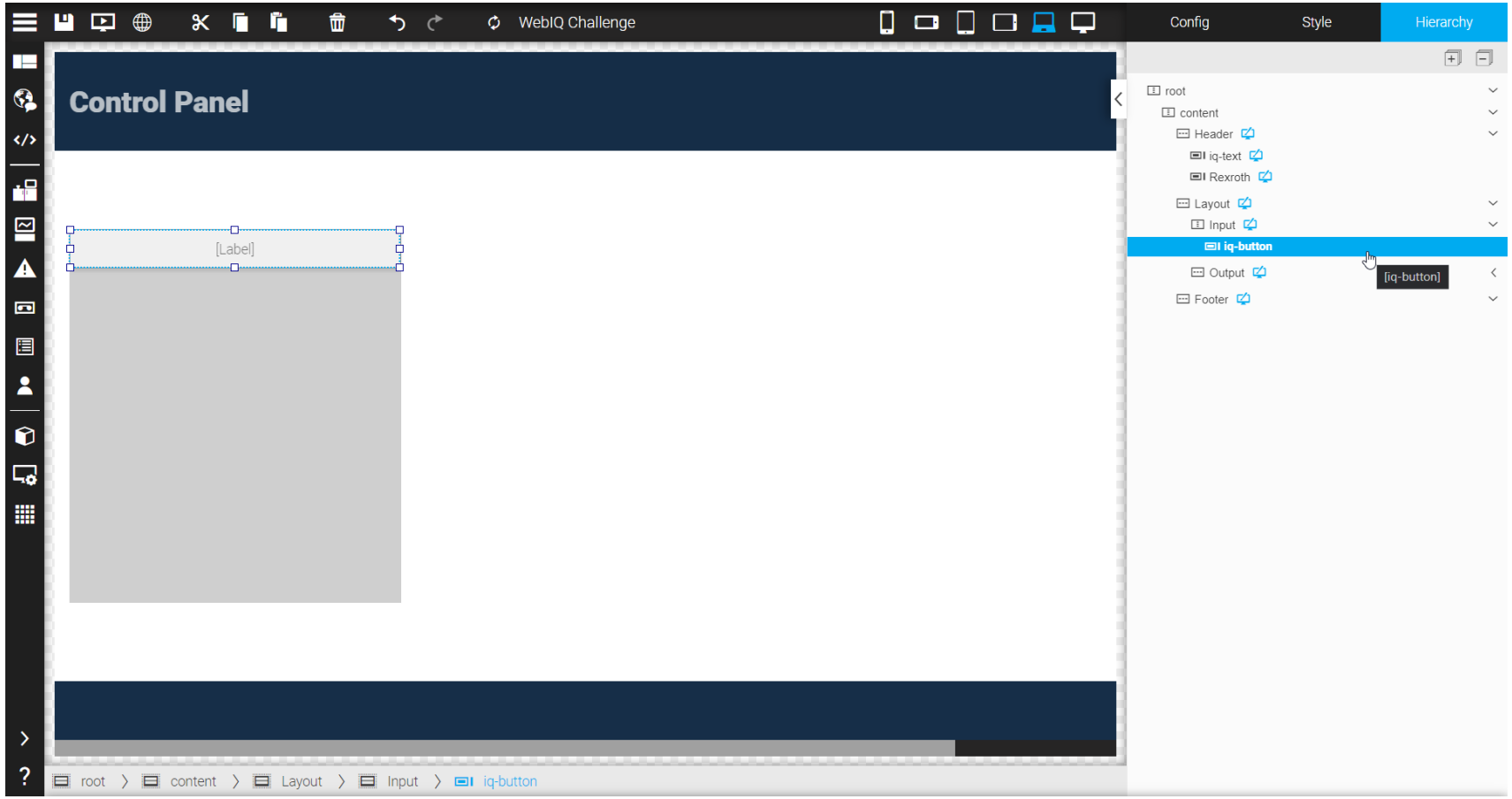
Step 2: Now, from the Widget List find the Button Widget



# 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

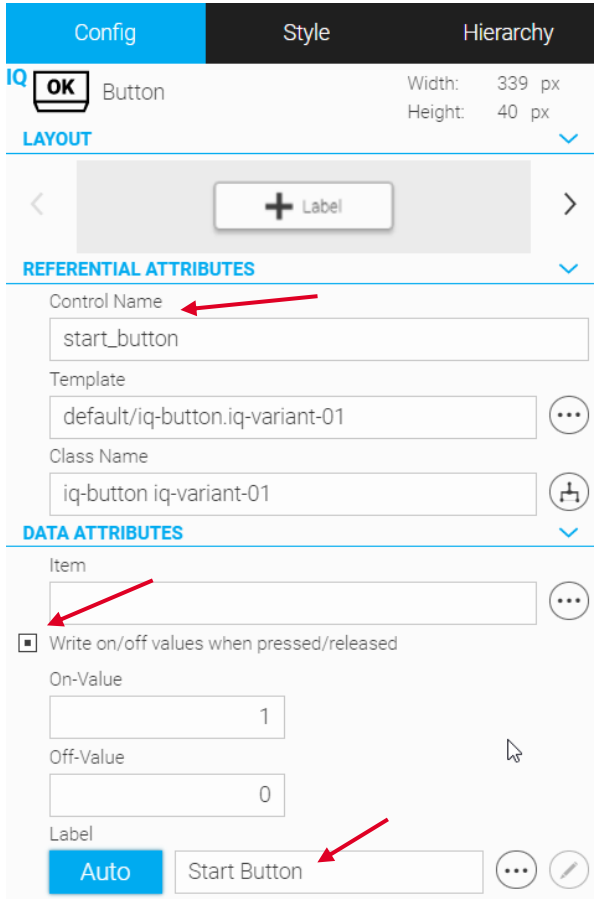
## Steps

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”







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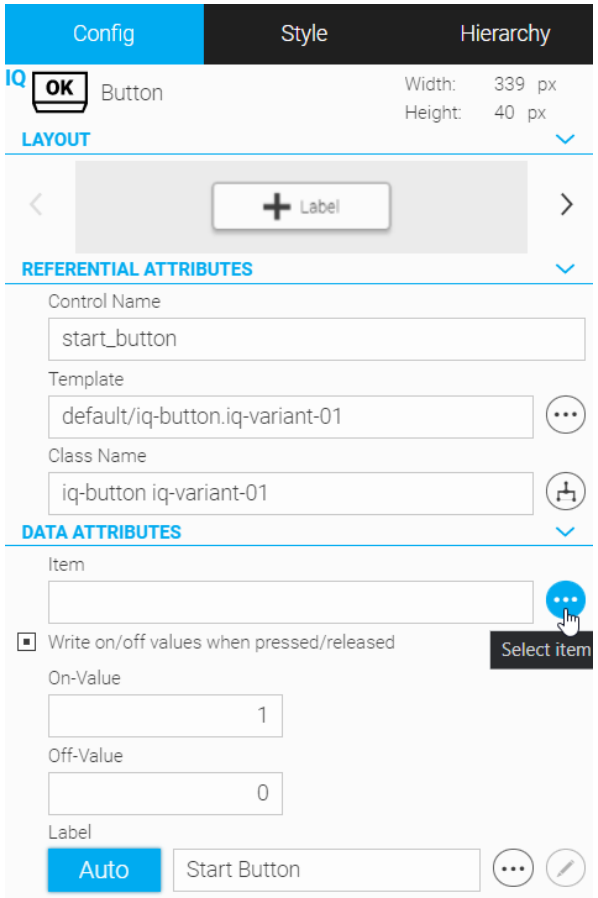
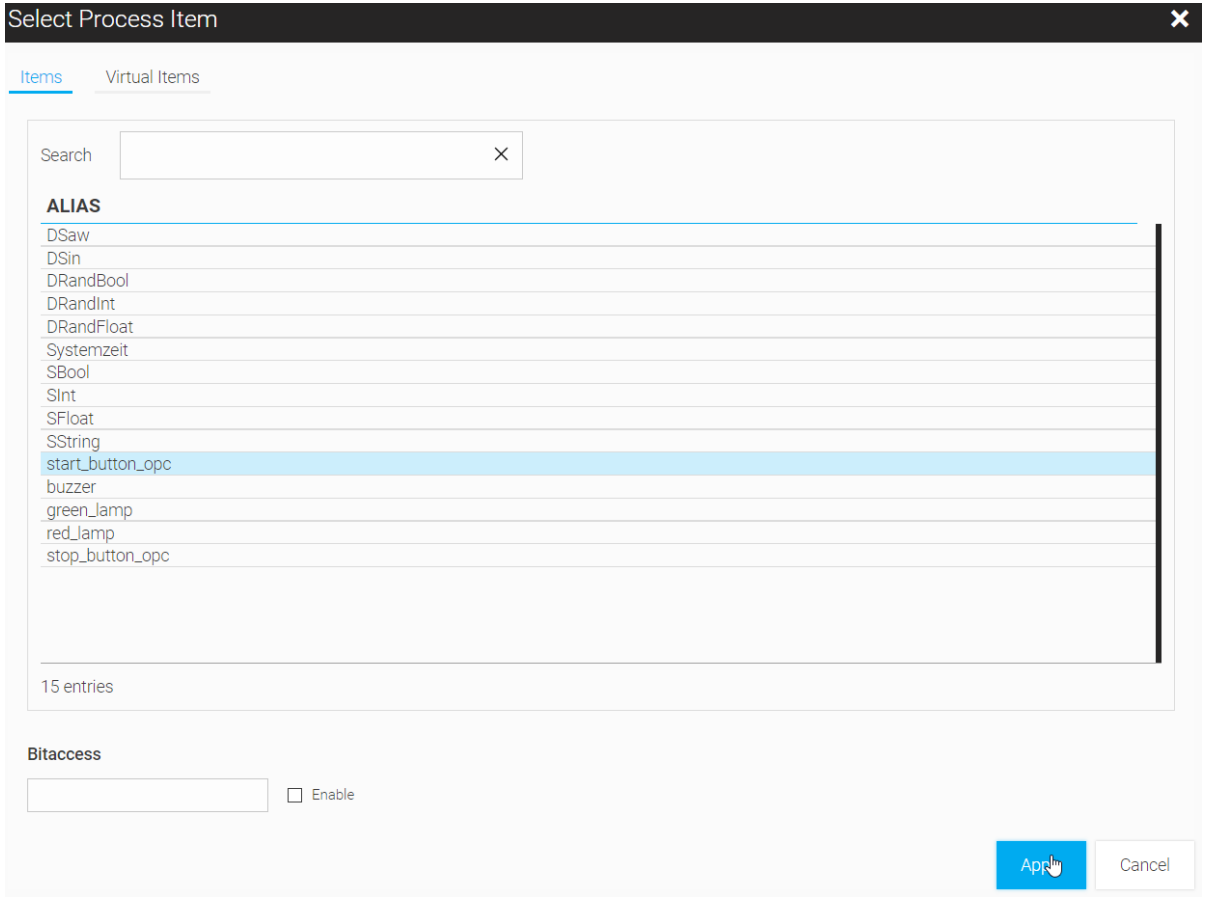
# Challenge 05: ctrlX WebIQ | Task 01

## 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.







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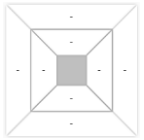
# Challenge 05: ctrlX WebIQ | Task 01

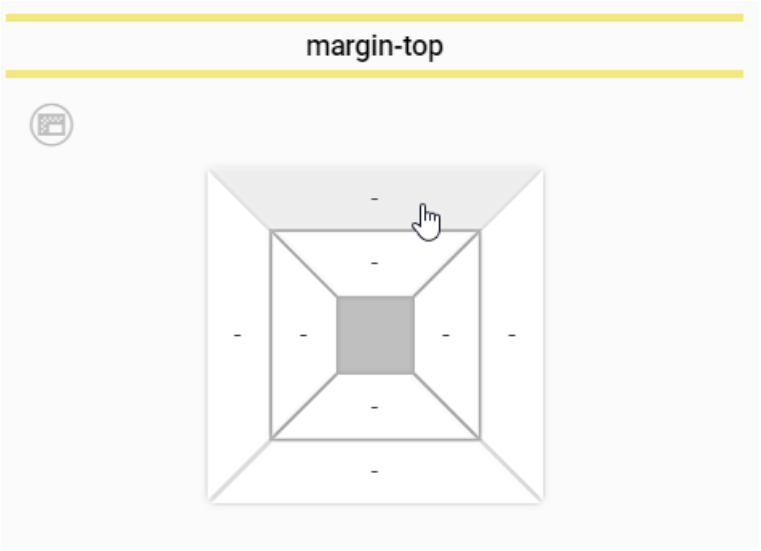
## Steps

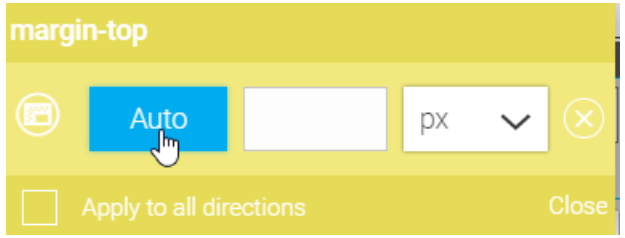
Step 10: Now, go to the style cockpit

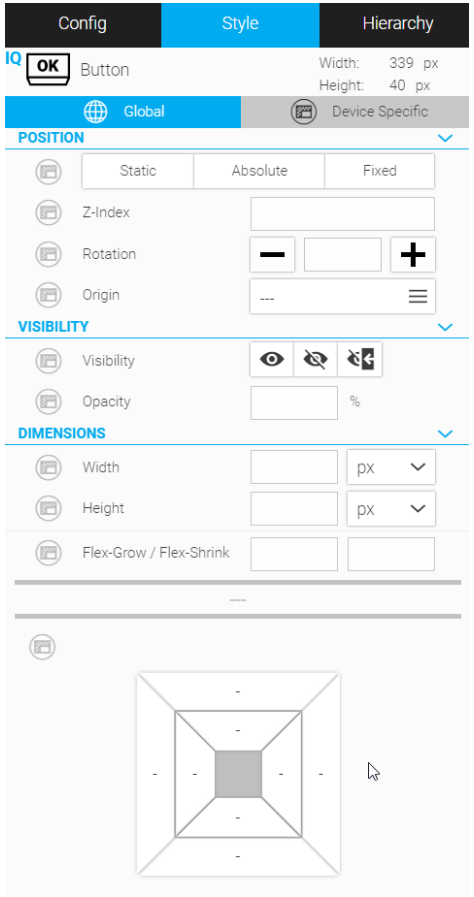
Step 11: Under the Dimensions section, find  which will be use to configure the spacing around button widget.

Step 12: Click the margin-top section

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







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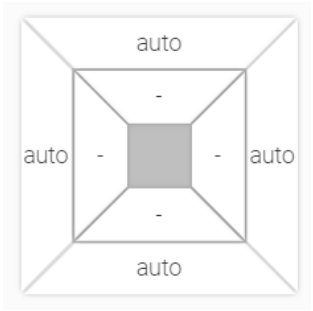
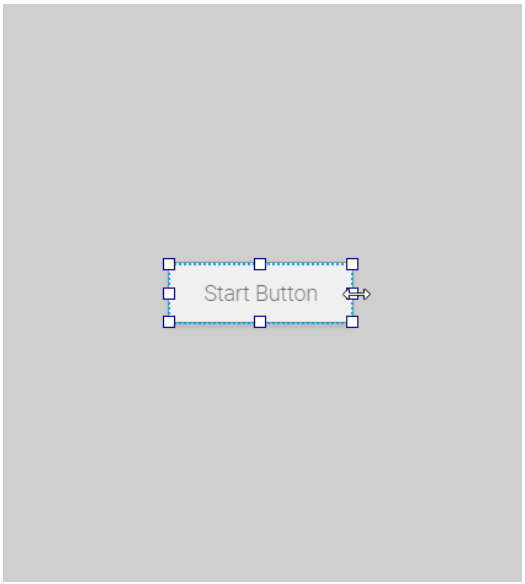
## Steps

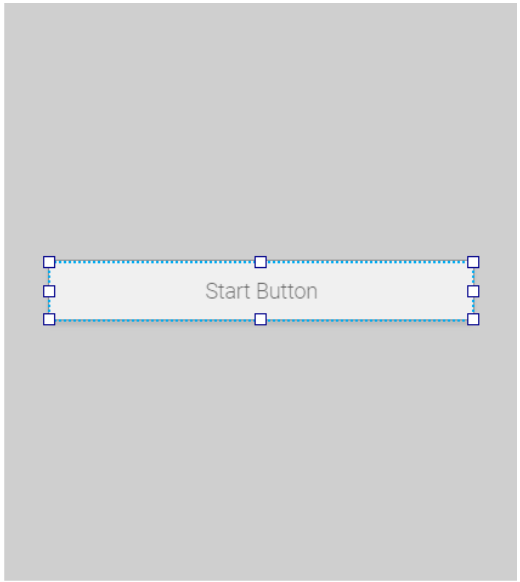
Step 14: Now, set the margin-bottom, margin-left and margin right to auto. The final result will show as below:




** 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 heigh of the button on your reference



# Challenge 05: ctrlX WebIQ | Task 01

## Steps

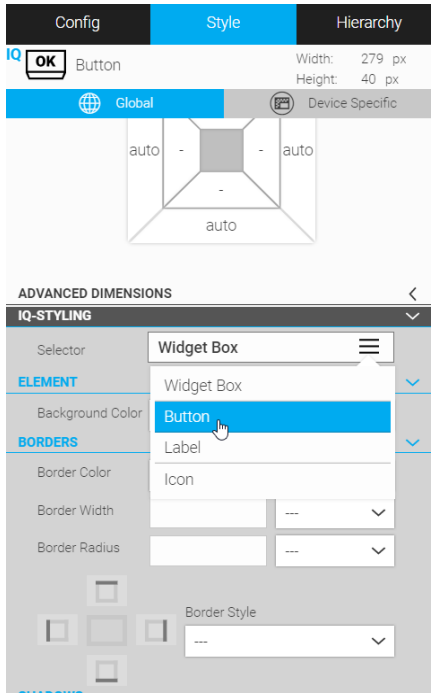
Step 16: In the style cockpit, find the Selector option which placed under the IQ-Styling section

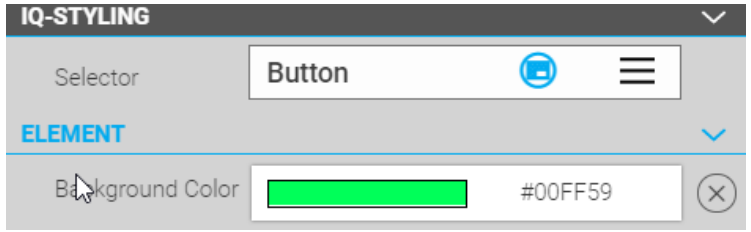
Step 17: Click the ☰ button and select Button

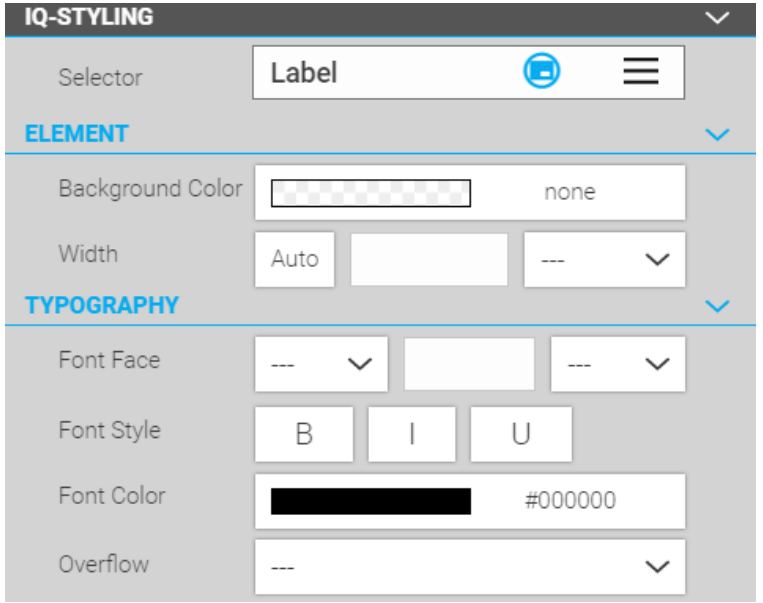
Step 18: Now, you can change the background color of the button on your reference by clicking the background color option under Element section

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.







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# Challenge 05: ctrlX WebIQ | Task 01

## Steps

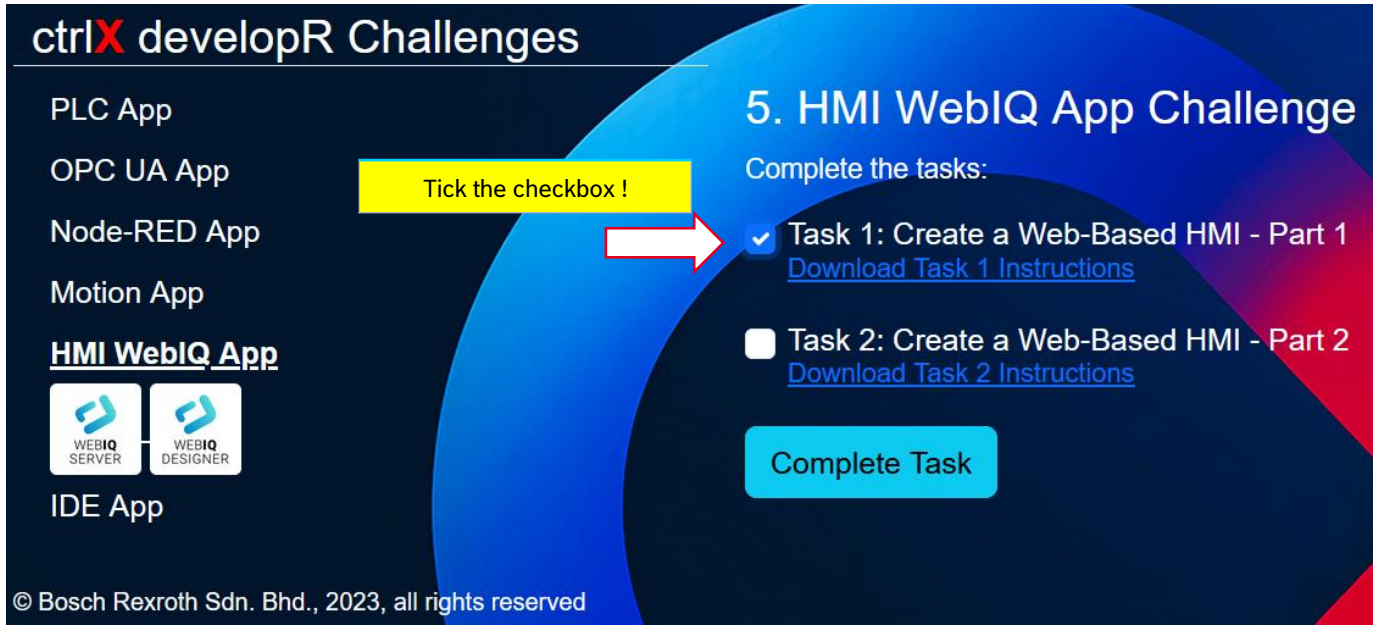
Once you have completed Task 1, follow the steps below.

### 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!**







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