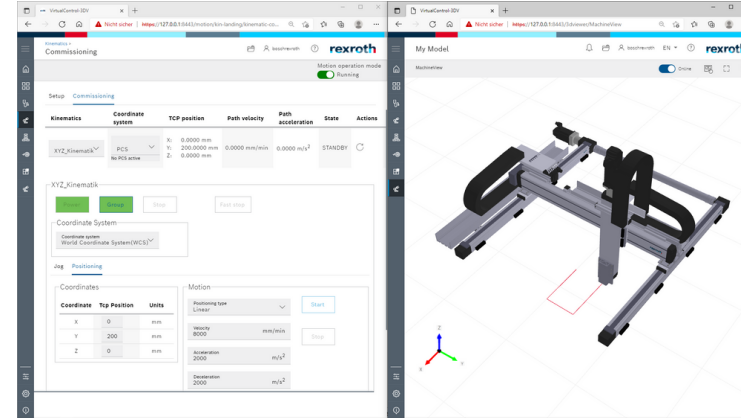
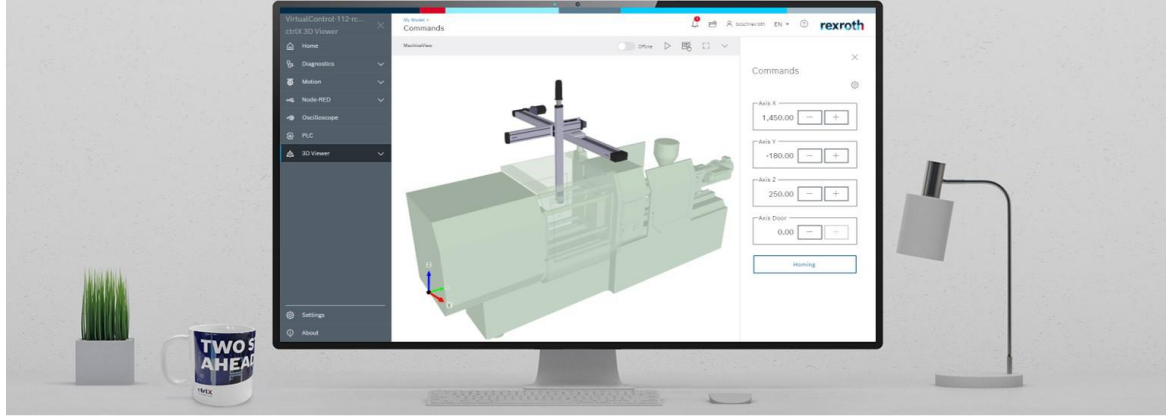




Challenge 04: 3D Viewer App

Task 02

Challenge 04: ctrlX Motion & 3D Viewer | Task 02



Description

From Task 01, you have successfully configured and commissioned the Cartesian Multi-Axis System (CMS). Your next objective is to enhance the user experience (UX) by integrating a 3D design model of the CMS. This addition will enable users to visualize and simulate the motion of a mechanical system or a set of interconnected components, offering a visual preview of the CMS's actions before executing the real commands on the actual system. When the system is on, you should be able to simulate the Axes movements of the 3D model.

Task

This task will test your ability and understanding on configuring a 3D model with Motion Axes and Kinematics for visualization and testing purpose.

Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

1. Navigate to the **3D Viewer App** from the Home page of the ctrlX CORE Web Based User Interface.

ctrlX Web-Based User Interface – Home Page

ctrlX-CORE
ctrlX CORE

IoT Dashboard

IDE

InfluxDB

Modbus TCP

Motion

Node-RED

OPC UA

PLC

PROFINET device

Remote Agent

Telegraf

3D Viewer

Model Library

My Model

WebIQ Runtime Manager

Settings

About

Home

Operating

EtherCAT

Configure and analyze your EtherCAT network

Name: ethercatmaster

State: OP

Message: Running

Status

I/O Engineering

Configuration

Axes

Manage your axes

Motion status: Running

Number of axes: 3

State OK: 3

State ERROR: 0

Configuration/Status

Commissioning

Axis profiles

Axis profiles not configured

Configure axis profiles

Kinematics

Manage your kinematics

Motion status: Running

Number of kinematics: 1

State OK: 1

State ERROR: 0

Configuration

Commissioning

PCS configuration

OPC UA Client

Manage OPC UA Client

Client connections: 0

Configuration/Status

OPC UA Server

Manage OPC UA Server

Status: RUNNING

Start time: 11/19/2023, 5:57:32 PM

Sessions connected: 0

Configuration/Status

Certificate Configuration

PLC

Manage your PLC applications

3D Viewer

Service Indicator

1. Click on the 3D Viewer App

2. Click on "My Model"

Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

2. In the “My Model” window, there is a Demo Model of a Cartesian Multi-Axes System (CMS) pre-installed with the **3D Viewer App**.

ctrlX 3D Viewer – Demo Model

The screenshot displays the ctrlX 3D Viewer interface. The main window shows a 3D model of a Cartesian Multi-Axes System (CMS) on a grid. The interface includes a top bar with '3D Viewer > Demo Model', a status bar with 'Operating', and a 'Connect' button. A red box highlights the 'Shows commands' button in the top right corner. A yellow callout box points to this button with the text '3. Select the “Shows Commands” button'. Another yellow callout box points to the 'Commands' dialog on the right with the text '4. The “Commands” dialog'. The 'Commands' dialog shows the current positions of the axes: Axis X (90.00), Axis Y (130.00), Axis Z (70.00), and Axis C (0.00). Each position has '-' and '+' buttons for jogging. A 'Homing' button is at the bottom of the dialog. The dialog also includes a close button (X) and a settings gear icon.

3. Select the “Shows Commands” button

4. The “Commands” dialog

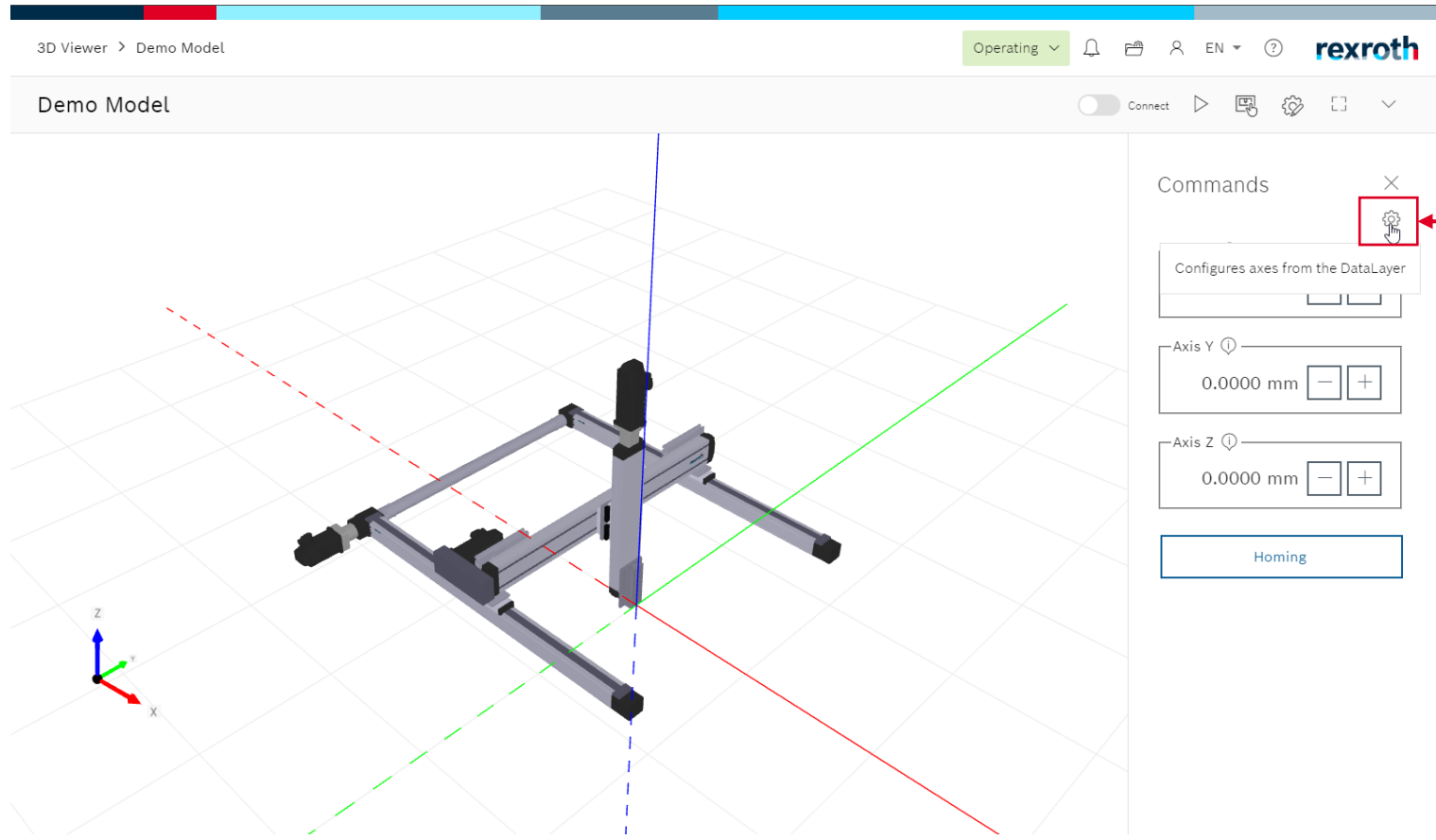
- The “**Commands**” dialog shows the axis positions
- Function:
 - **Jogging:** The buttons “+” and “-” can be used to move the model axes within the limit values
 - **Homing:** The model is reset to the initial positions
- The axis is moved by one increment consisting of a defined step width and the selected direction (+/-)

Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

3. Configure the **Demo Model** in the “**My Model**” window

ctrlX 3D Viewer – Configure Axes



5. Click on “**Configure Axes from the Data Layer**” button

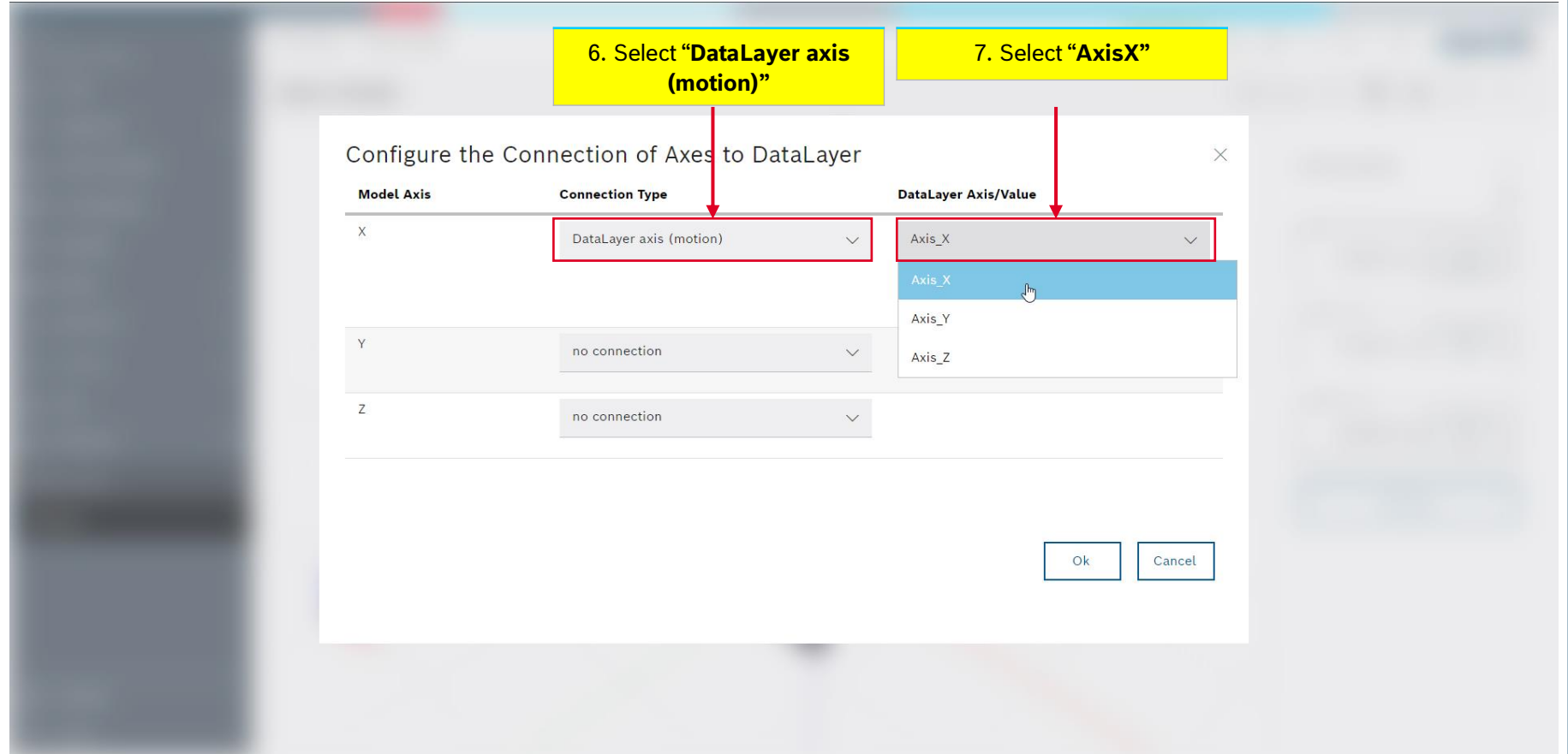
Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

3. Configure the **Demo Model** in the “**My Model**” window.

ctrlX 3D Viewer – Configure Axes

- In the “**Configure the Connection of Axes to DataLayer**” dialog box, the Model Axis and the axis configuration of the ctrlX Motion (in Task 01) need to be configured
- For the “**Connection Type**”, select:
 - **DataLayer axis (motion)**
- For the “**DataLayer Axis/Value**”, select:
 - **AxisX**
- After the correct axis has been selected, confirm with “**OK**”.



Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

4. Now it's your turn! Complete the tasks below.

Do It Yourself

“Configure the Connection of Axes to DataLayer”:

1. Model Axis: **Y**

- “Connection Type”: **DataLayer axis (motion)**
- “DataLayer Axis/Value”: **AxisY**

2. Model Axis: **Z**

- “Connection Type”: **DataLayer axis (motion)**
- “DataLayer Axis/Value”: **AxisZ**

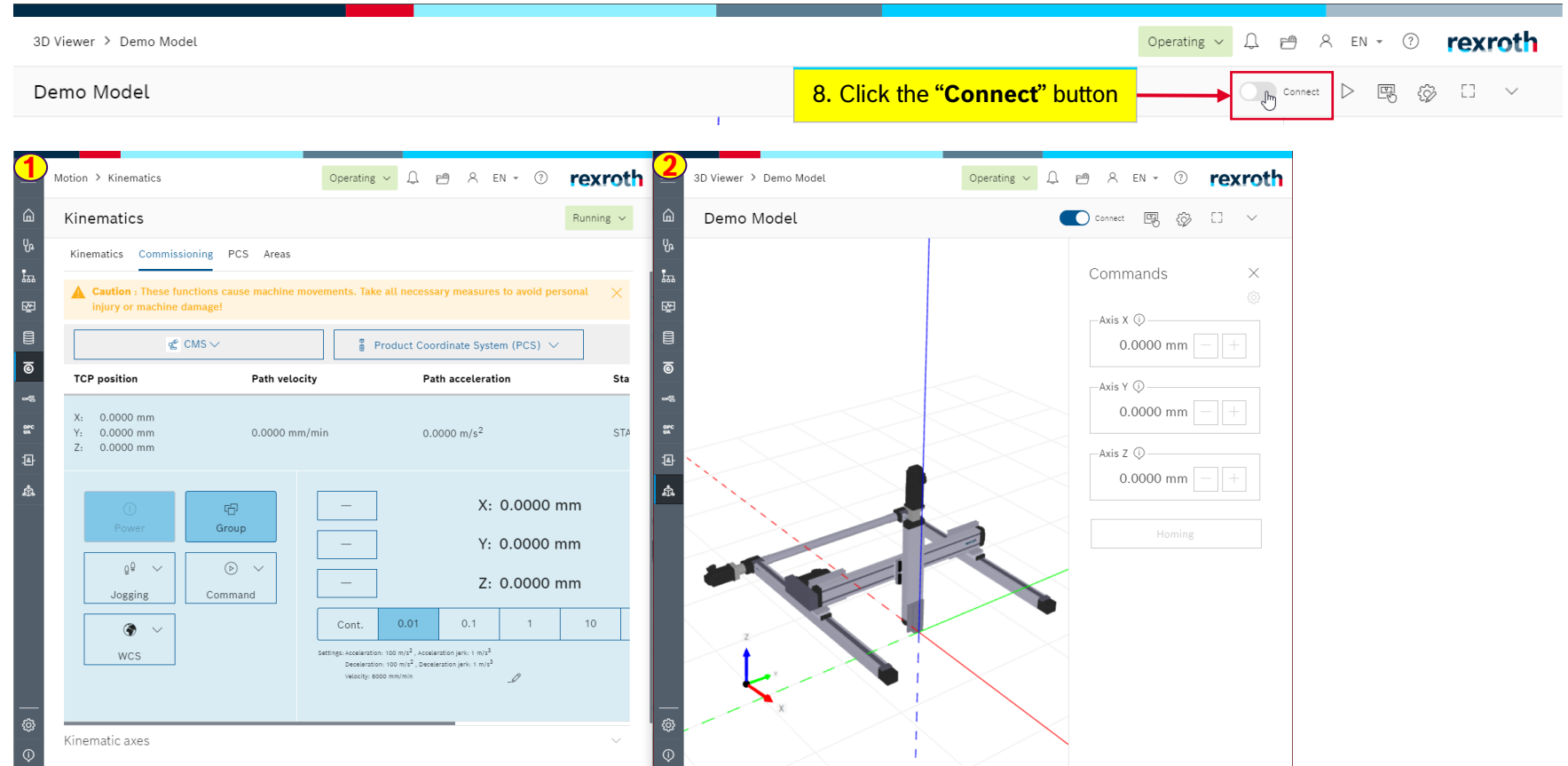
Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

5. After the Axes have been configured, the Demo Model is ready to be connected to the ctrlX Motion Axes.

ctrlX 3D Viewer – “Connected” Mode

- Click the “**Connected**” button in the command bar (top-right)
- The “**Connected**” mode allows the Model Axes to be controlled by the ctrlX Motion Axes (configured in Task 01)
- In the web browser, open two (2) tabs:
 - ctrlX Motion Kinematics Commissioning window**
 - “**Power**” enabled
 - “**Group**” enabled
 - ctrlX 3D Viewer Demo Model window**
 - “**Connected**” mode enabled



Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

6. Now it's your turn! Complete the tasks below.

Try It Yourself

- Move the **“CMS Demo Model”**:
 - X-Axis: **550 mm**
 - Y-Axis: **450 mm**
 - Z-Axis: **375 mm**

Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

Once you have completed Task 2, follow the steps below.

How to complete Task 2 Motion App

- You can test your solution against the Task description
- Once it satisfies the requirements, confirm that you have completed the task by informing the available instructor for verification
- In the ctrlX developR challenge [website](#), under the Motion App challenge section, tick [✓] the Task 2 checkbox

Congratulations, you've completed the tasks!

Follow the next step to complete the challenge!

The screenshot displays the 'ctrlX developR Challenges' interface. On the left, a list of applications includes PLC App, OPC UA App, Node-RED App, **Motion App** (highlighted with a blue box and ctrlX logo), HMI WebIQ App, and IDE App. On the right, the '4. Motion App Challenge' section is shown, with the instruction 'Complete the tasks:'. Two tasks are listed: 'Task 1: Setting Up a Multi-Axes System' and 'Task 2: Multi-Axes System 3D Simulation', both marked with a blue checkmark. Below each task is a link to 'Download Task 1 Instructions' and 'Download Task 2 Instructions' respectively. A yellow callout box with the text 'Tick the checkbox !' and a red arrow points to the checkbox for Task 2. A blue 'Complete Task' button is located at the bottom right of the challenge section. The footer of the page reads '© Bosch Rexroth Sdn. Bhd., 2023, all rights reserved'.

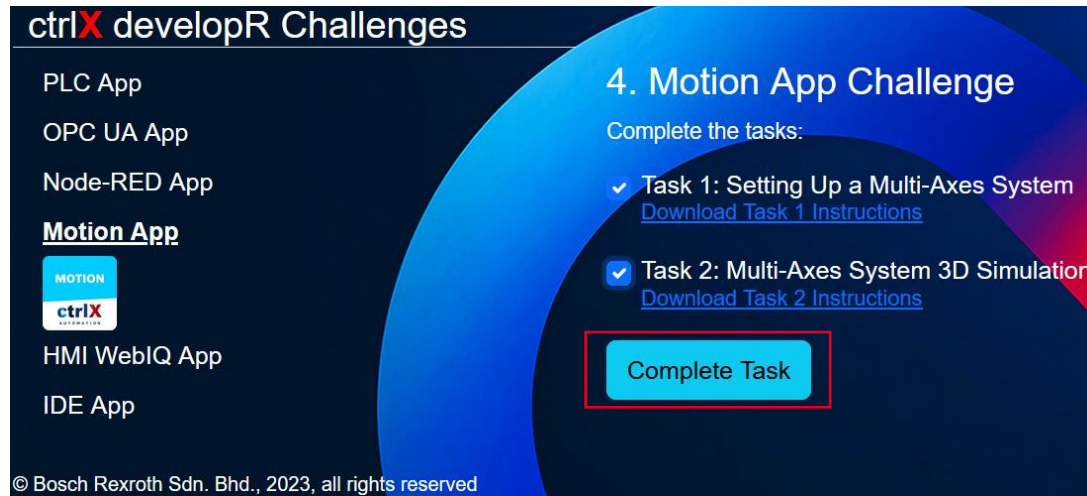
Challenge 04: ctrlX Motion & 3D Viewer | Task 02

Steps

Once you have completed Task 1 and Task 2, follow the steps below.

How to complete the Motion App Challenge

- Finally, click on the “**Complete Task**” button



- Once pressed, the button text will change to “Task Completed” and you will be notified with a message that the challenge has been successfully submitted.
- By pressing the “Complete Task” button, the duration it takes for the team to complete the challenge will be automatically submitted.
- Submission only can be done once per challenge.

Congratulations, you’ve successfully completed the Motion App challenge! Wonderful!

Challenge 04: Motion & 3D Viewer App

Congratulations!