ABB - Robot Configuration for MachineLogic Applications

Overview

This document provides step-by-step instructions for configuring and using an ABB GoFa robot with MachineLogic. This integration ensures seamless operation within Vention's motion components ecosystem. Robots purchased through the Vention platform are pre-configured for a simple and efficient setup experience.

Supported Models

The following ABB robot models are supported when used with the **Omnicore C30** controller, which is required for compatibility with Vention's MachineLogic:

- GoFa 5
- GoFa 10
- GoFa 12

Installation Steps

The robot and it's controller are shipped from factory pre-configured to ensure ease of deployment. Therefore, only a few steps are required in order to be up an running with your MachineLogic application. To continue with the next steps, ensure all the components you received with your order are out of their shipping boxes. Once this is completed, proceed to the next section.

System Connection

To program the robot through MachineLogic, the MachineMotion must be connected to the Omnicore C30 controller and the necessary safety ecosystem. This guide will define the necessary steps for a basic safety configuration.

Necessary Components

- MachineMotion v2 (1 Drive or 4 Drives)
- Vention Pendant
- E-Stop Module with reset
- ABB GoFa Robot (5, 10 or 12)
- ABB Omnicore C30 Controller
- Robot Safety Module
- ABB external switch module
- ABB safety harness

Connection Diagram

Bellow is a diagram to demonstrate how to connect each component for a successful installation.

> Note

This diagram represent a basic safety configuration and could change if more safety components are needed in the safety chain.

ABB Omnicore C30 connection diagram with MachineMotion v2 ecosystem
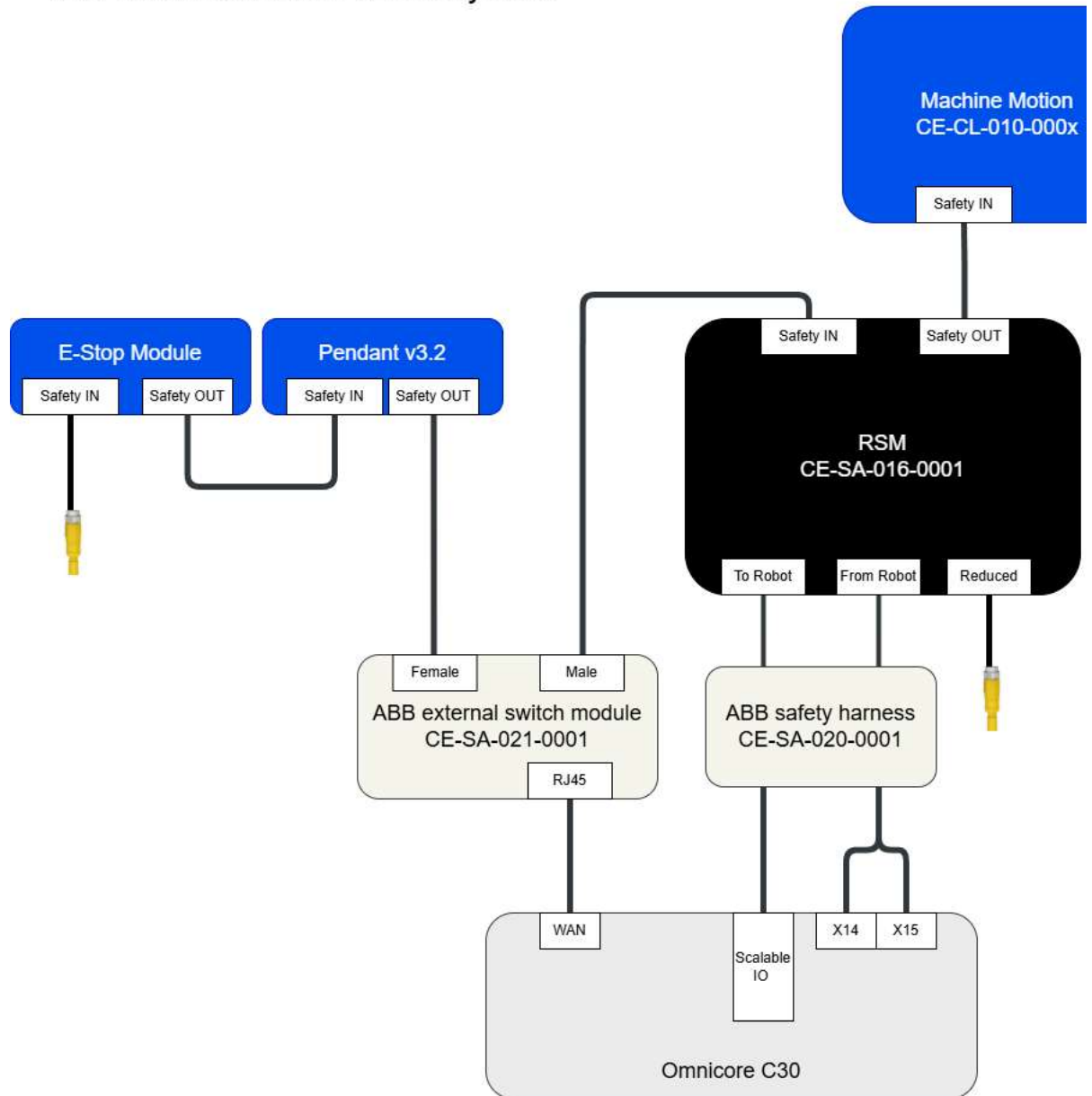
ABB Connection Diagram

Wiring Diagram - RSM to Omnicore C30   ⌃

Power Up

After connecting all components, power up the devices in the following order:

1. Turn on the MachineMotion.
2. Turn on the Vention Pendant

Pendant v3 Front View

3. Turn on the Omnicore C30 controller using its main switch.

Devices Initialization

Once all devices are properly connected and powered up, we will then proceed to the intialization of each devices to ensure they will function properly.
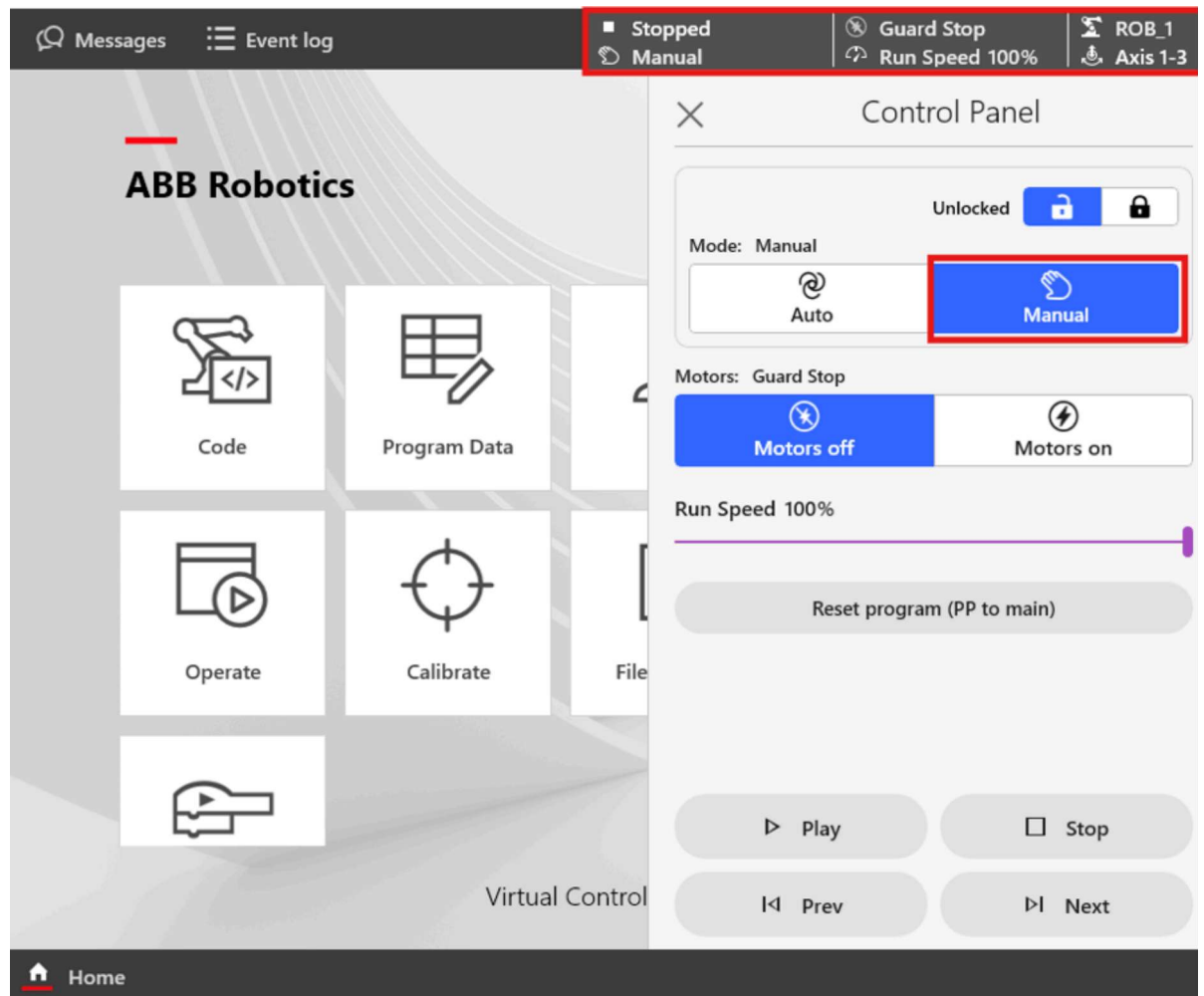
ABB FlexPendant

Follow these steps to set up the ABB FlexPendant:

1. Login as Admin on the FlexPendant
   a. Open the **Control Panel** from the navigation bar
   b. Go to the **Logout/Restart** menu
   c. Click on **Logout**
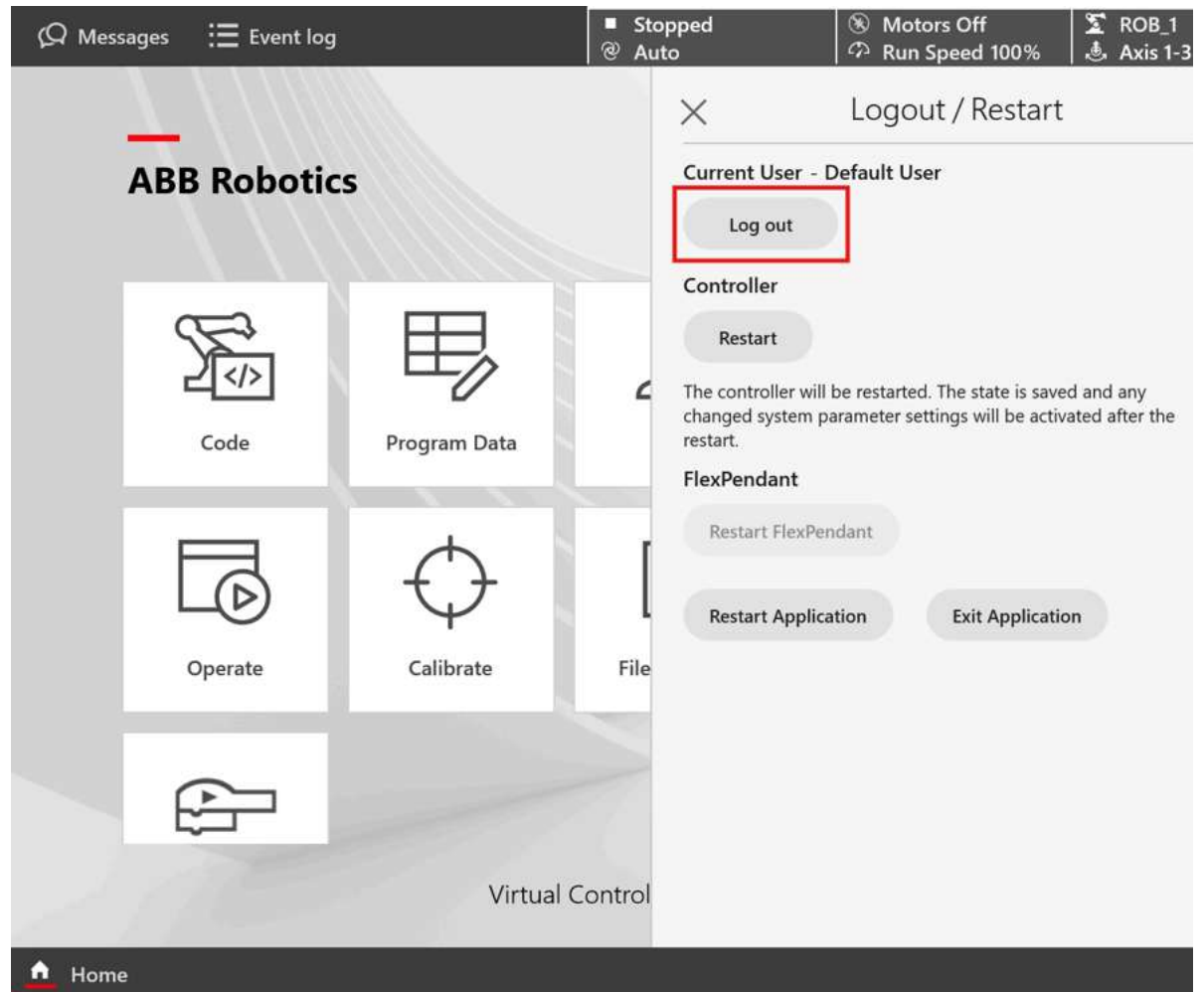
ABB FlexPendant Logout Step

    d. When prompted, login with the admin credentials:
        i. Username: admin
        ii. Password: robotics
    e. Click on **Log In**
2. Set the operation mode of the robot to Manual:
    a. Open the **Control Panel** from the top navigation bar.
    b. Go to the **Control** menu
    c. Set operational mode to **Manual**

ABB Manual Mode

3. From the Home page, navigate to **Settings -> Safety Controller -> Synchronization**.
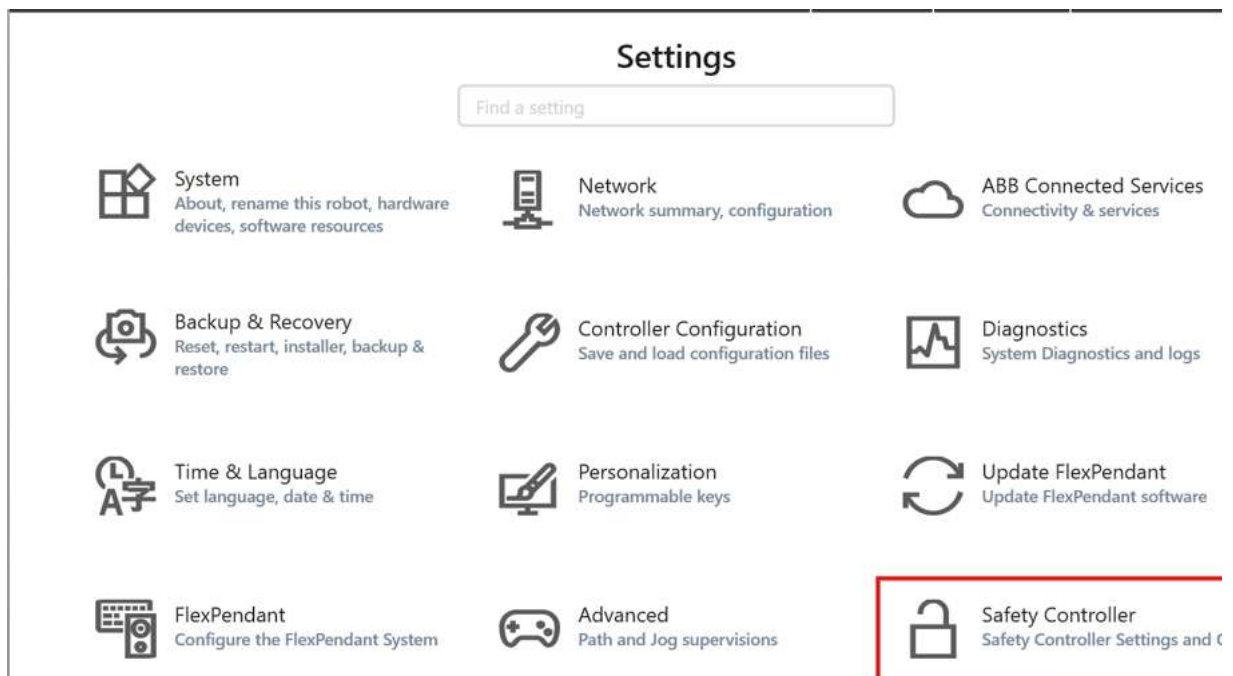
Safety Controller Settings

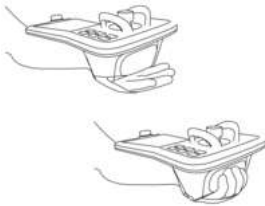4. Enable the motors using the dead man switch in the middle position.

ABB FlexPendant Dead Man Switch

5. Enable **Move to Sync Position**.
6. Press and hold the button to move the robot to its home position. (**Warning:** The robot will move.)
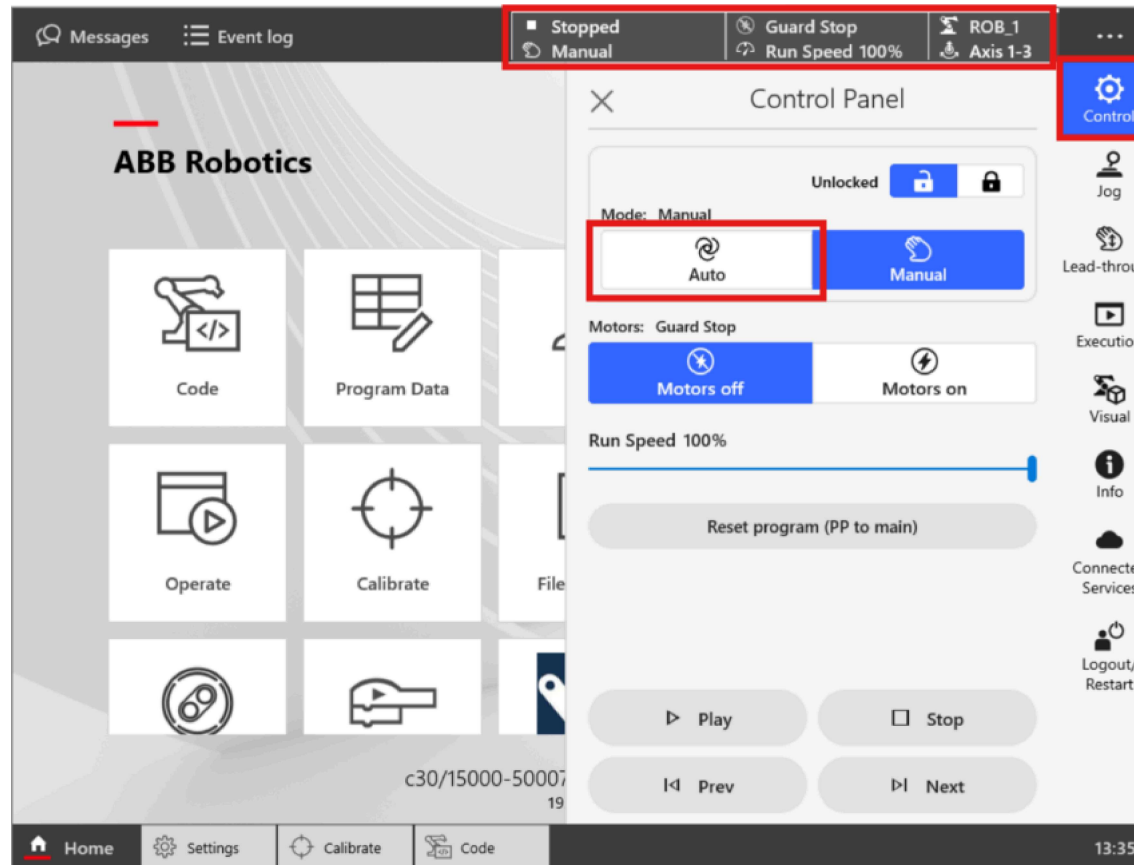7. Once the robot's Actual Positions match the Sync Positions, press **Synchronize**.

Synchronize Robots Position Page on FlexPendant

8. Open the **Control Panel** from the top navigation bar.
9. Set the mode to **Auto** under **Control -> Auto** to allow MachineMotion to control the robot.

Control Panel on FlexPendant

Vention Pendant

Ensure your MachineLogic application and configuration are deployed before proceeding. Refer to [How to Deploy your Application to the MachineMotion](#).

1. Validate the configuration:
   a. Click **Configuration** on the navigation bar.
   b. Confirm that the robot appears and the correct model is selected from the dropdown.
   c. Click **Apply Configuration**.
2. Test system control over the robot:
   a. Use the robot jogger found under **Manual Control** on the Vention Pendant to ensure functionality.

Completion

You have now completed the setup process. Your robot is ready to run applications programmed in MachineLogic.

Additional Information

This section contains advanced information regarding the ABB robot.

Admin Log In

Some advanced configuration can only be done with the admin credentials. Either on the FlexPendant or using ABB's RobotStudio.
Username: admin
**Password**: robotics

Modifying the Collaborative Mode Delay

> ⚠️ Important Safety Notice
>
> Modifying this delay **requires approval from a safety engineer** and must follow a formal safety risk assessment.
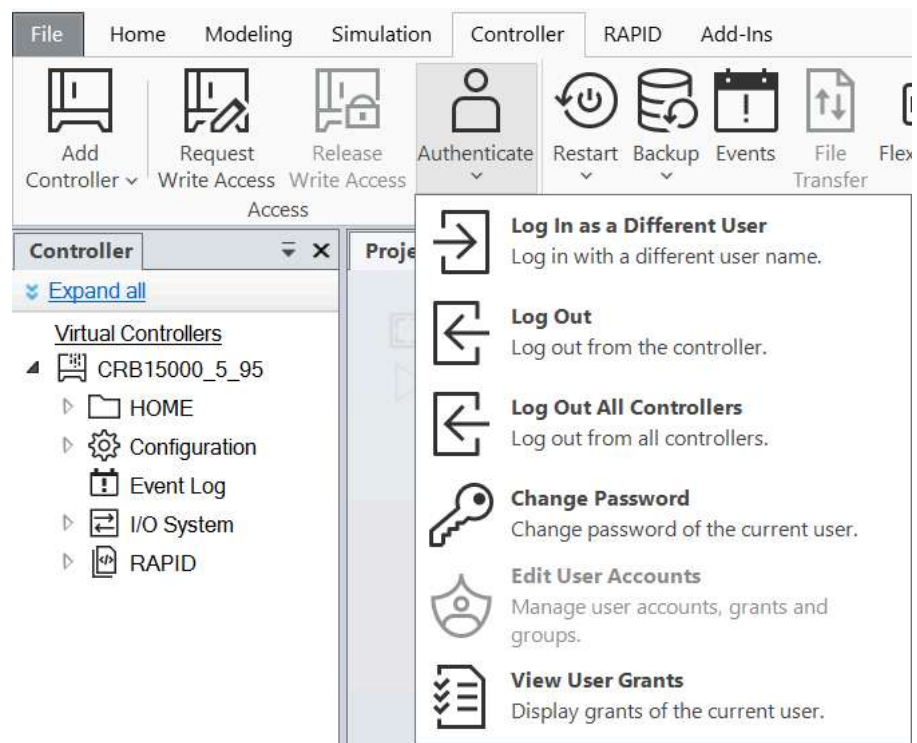
Steps to Modify the Delay:

1. Open **RobotStudio** on your computer.
2. Connect your computer to the robot controller via an Ethernet cable in the **MGMT** port.
3. In **RobotStudio**, navigate to the **Controller** tab and click on:
   - **Add Controller** → **One Click Connect**
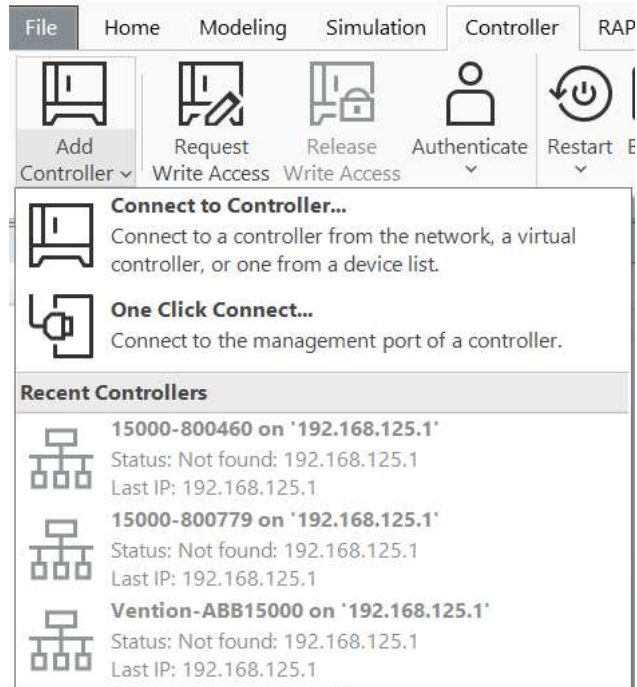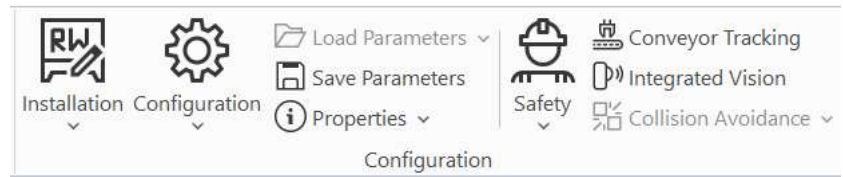

One Click Connect

4. Once connected, authenticate as **Admin**. (Refer to authentication instructions if needed.)

Admin Login

5. Click **Request Write Access**, then **Grant Write Access** on the FlexPendant.
6. In the main menu, click **Safety** to access the Safety Configuration.

Safety Configuration

7. Navigate to **Safe IO Configuration → Pre-Logic → + New**.
8. **Define the expression for the collaborative delay:**
   - Enter the following expression (**Example: 300**):

   Plain text

   ```
   V_Coll_Period := 300
   ```

   - **To calculate the required delay**, use the formula:

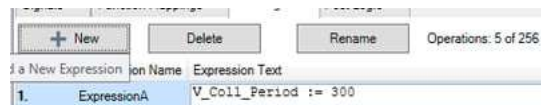   Plain text

   ```
   V_Coll_Period = (TimeInSeconds - 0.015) / 0.003883
   ```

   - **Example:** If the desired delay is **500ms**, use:

   Plain text
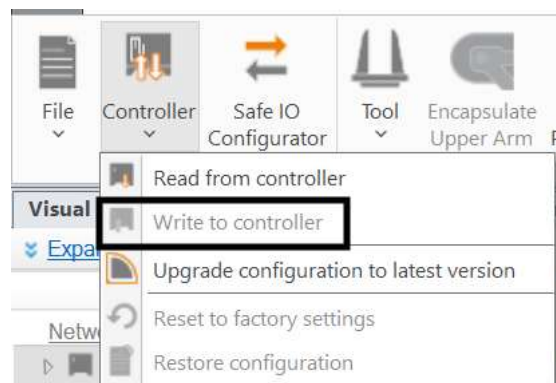
   ```
   (0.5 - 0.015) / 0.003883 = 124.9
   ```

   - Click **Create Missing Formula**.

   V_Coll_Period Expression

9. The new expression should now appear in the list.
10. To apply the new configuration, click **Controller → Write to Controller**.

Write to Controller

11. Restart the controller as prompted to complete the update.

Support

For further assistance, contact our support team:

- Email: support@vention.io
- Phone: +1-1800-940-3617 (ext. 2)