FAIRINO

Quick Start Guide | Fairino Cobots

Please read this guide carefully before starting the installation.

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General instructions:

Optional Accessories:

1.1 Unboxing the cobot

Box content:

The box should contain the following items:

- Fairino cobot
- Control Box
- Safety Box
- AC power cable
- Mounting bolts
- Dowel Pins

Please contact the support team if any of these items are missing.

⚠ **Important:** Do not throw away the box: In case of problems the cobot should be shipped in the original box to maintain warranty.

Mounting:

Mount the cobot onto a stable and secure structure. Because the cobot generates significant forces and movement during operation, the mounting base must be rigid and firmly anchored. Ensure that all bolts are tightened to the specified torque values shown in the diagram below:

Cobot model	Bolt type	Bolt torque	Hole Specification
FR3	4 pieces of M6	≥10Nm	φ5mm
FR3-WMS	4 pieces of M6	≥10Nm	φ5mm
FR3-WML	4 pieces of M6	≥10Nm	φ5mm
FR3-C	4 pieces of M6	≥10Nm	φ5mm
FR5	4 pieces of M8	≥20Nm	φ8mm
FR10	4 pieces of M8	≥25Nm	φ8mm
FR16	4 pieces of M8	≥25Nm	φ8mm
FR20	6 pieces of M10	≥45Nm	φ8mm
FR30	6 pieces of M10	≥45Nm	φ8mm
FR30L	6 pieces of M10	≥45Nm	φ8mm

Connectors:

1. Plug the main cobot connector into the control box, tighten the connector.
2. Plug the safety box connector into the control box tighten the connector.
3. Plug the AC power cable into the control box.

Emergency Stop:

When powering up the coot, make sure the emergency stop is **released**. If it is not released, errors will show up in the web interface and the cobot will have no power.

RELEASED: The picture below shows a emergency button that is released. When it is released, a black bar is visible.

ACTIVATED: The picture below shows an emergency button that is activated. When it is activated, the black bar is not visible. Twist the emergency stop to release it.

1.2 Connecting to the control box

⚠ **Important:** Use the screenshots on the next page as reference for these instructions.

Step 1: Connect your laptop/PC to the ethernet port on the emergency stop (yellow safety box) using an internet cable. Turn on the control box.

Step 2: Open the control panel in Windows.

Step 3: Click on "Network & Internet".

Step 4: Click on "Network and Sharing Center".

Step 5: Click on "Change adapter settings".

Step 6: Click on the adapter that connects you to the Control Box. Pay attention to the small internet cable icon, it should be visible. Double-click the appropriate adapter that your ethernet cable is connected to. Make sure **not to select** Wi-Fi ethernet adapters, those are not used in this case.

Step 7: Click on "Properties".

Step 8: Double-click on "Internet Protocol Version 4 (TCP/IPv4)".

Step 9: Click on "Use the following IP address" and enter the values below. IP address: 192.168.58.50 Subnet mask: 255.255.255.0

Then click "Ok" and close all other screens (cross).

Step 10: Go to an internet browser, such as Google Chrome or Internet Explorer. Next, type the following into the search bank, at the top left of the screen: **192.168.58.2**

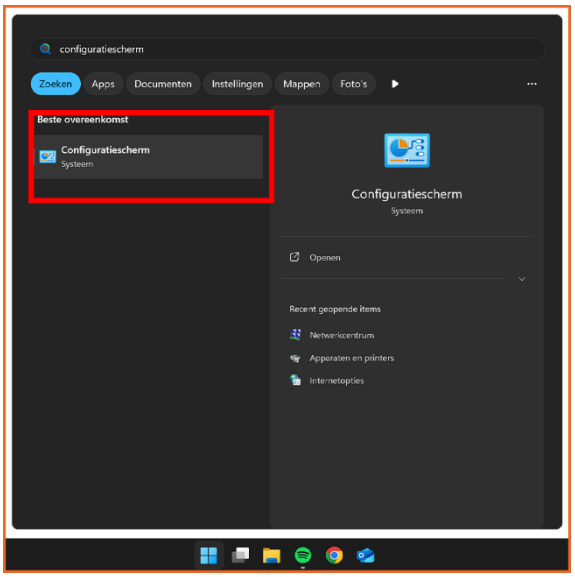
Click enter, then the screen below should appear. Then log in with:

Username: **admin**
Password: **123**

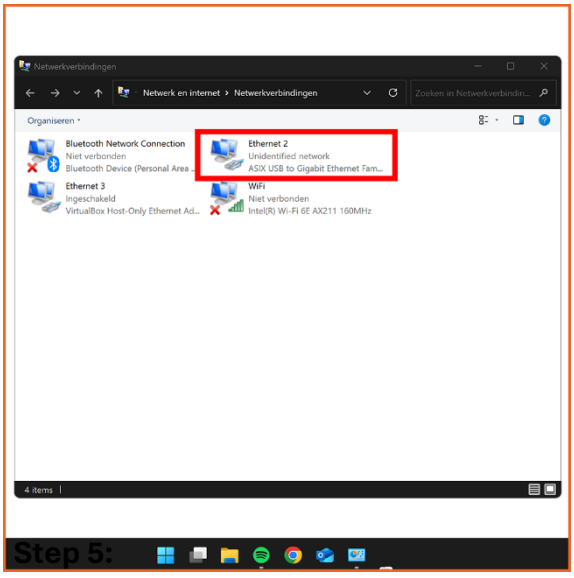
Step 11: You are done and can now control the cobot via your laptop.

Step 1:

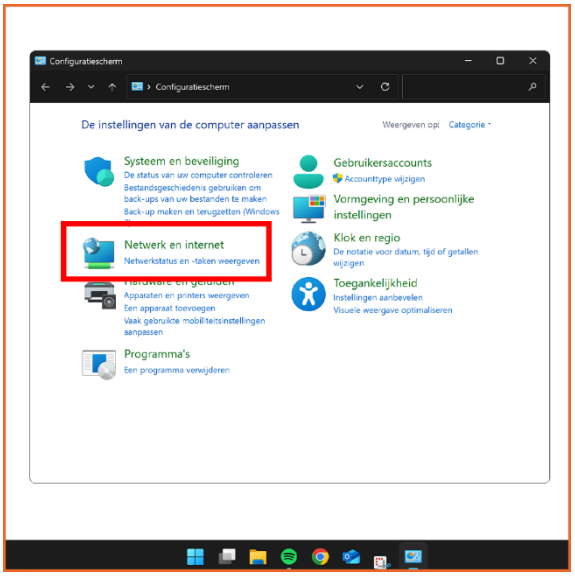
Step 2:



Step 3:

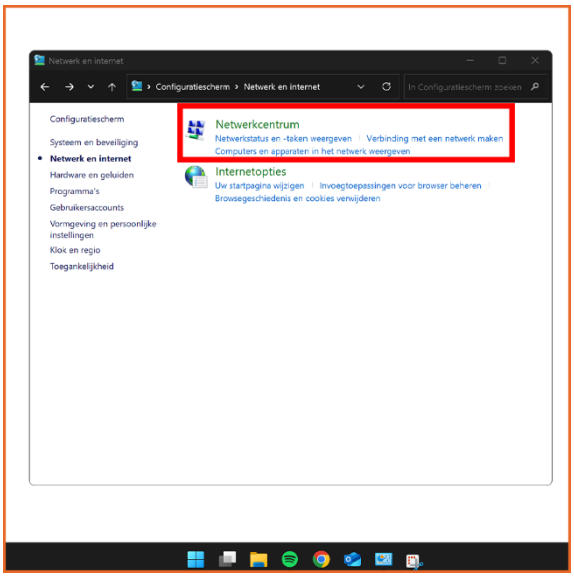


Step 4:



Step 5:

Step 5:



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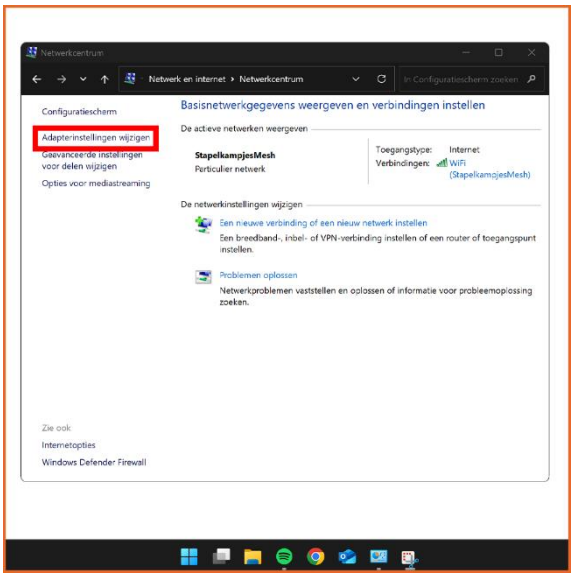

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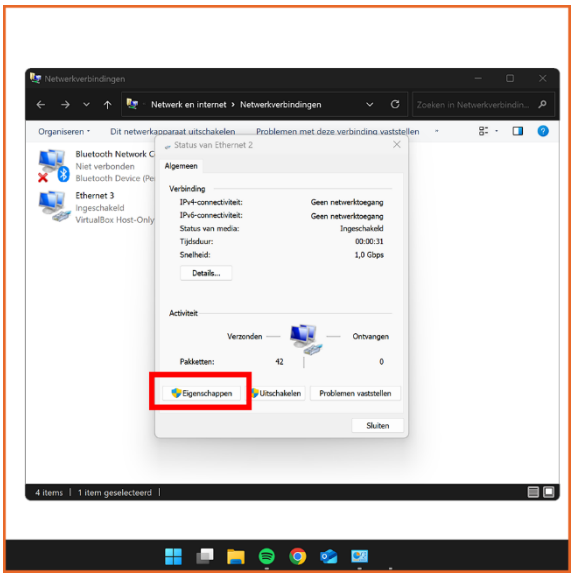

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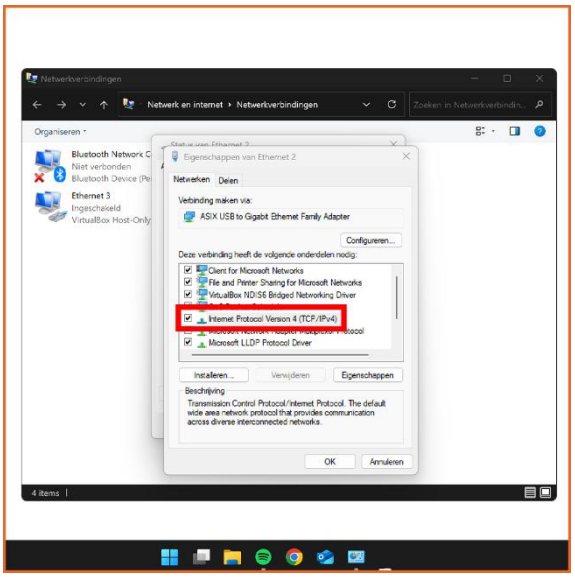
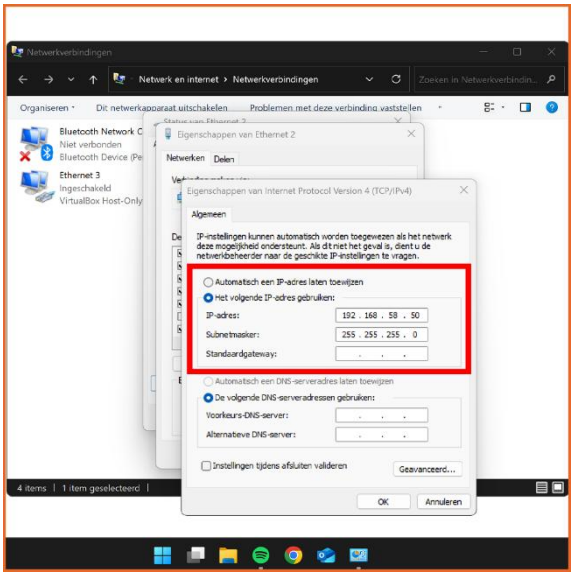
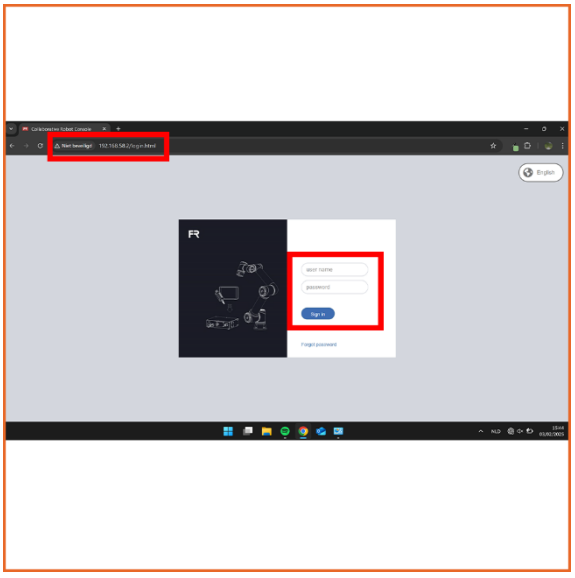


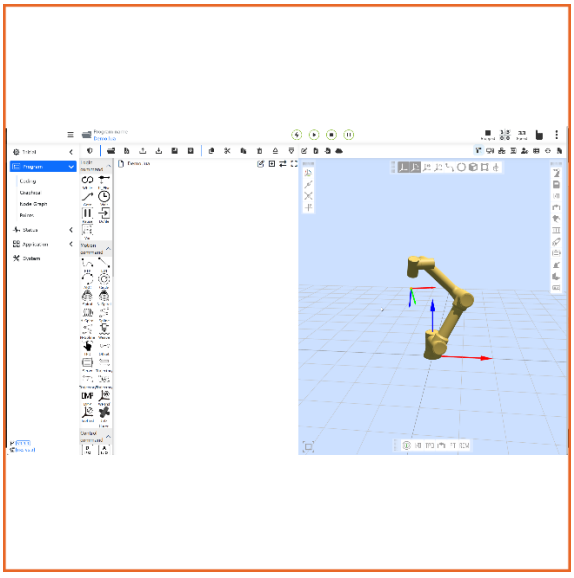
Step 9:



Step 10:



Step 11:



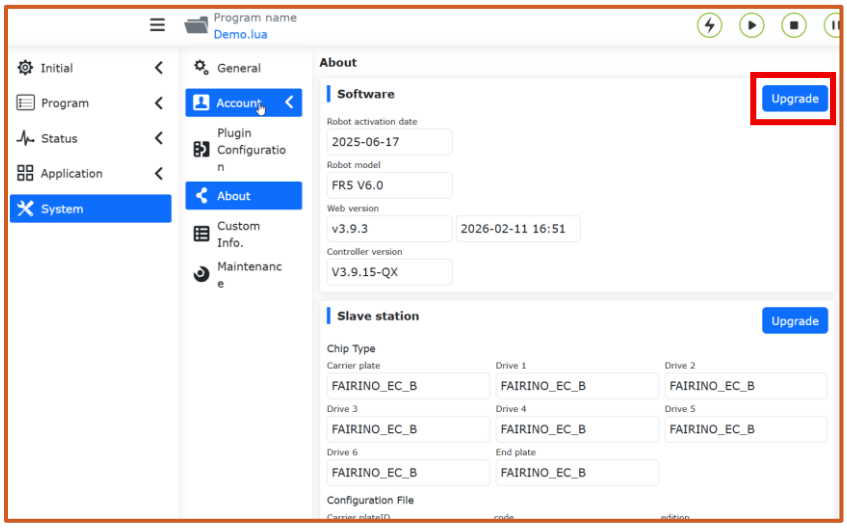
1.3 Updating the WebApp to the latest version

Before you do anything with the cobot, please update to the latest version of the WebApp.

Step 1: To download the latest version, go to this link here or scan the QR code below: https://fairino.short.gy/Latest-Web-App-Fairino

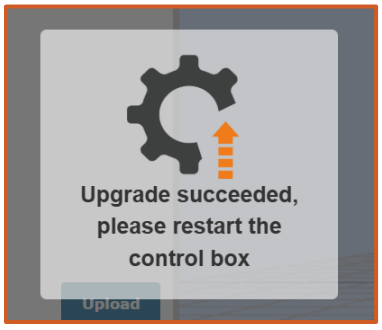
Step 2: Go the “Fairino WebApp Versions”. Download the latest version here. After downloading, unzip the folder.

Step 3: On the WebApp, go to: System -> About -> Software Upgrade.



Step 4: Select the “software.tar.gz” file that you downloaded. After that, click upgrade. Now wait until the updating process is fully finished.

Step 5: Once the update is fully finished, you should receive this message:



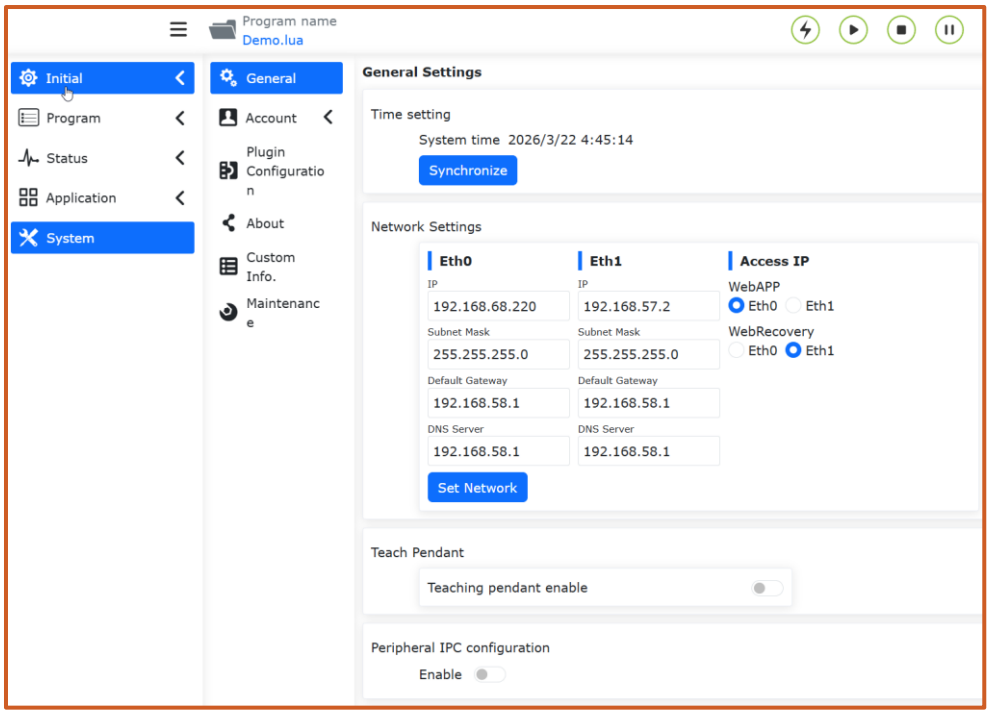
Step 6: Restart the control box once you see this message, you now successfully updated the WebApp to the latest version.

1.4 Changing the IP-Adress of the WebApp (optional)

Only follow these steps when you want to connect the control box to your own network.

Go to System -> General -> Network Settings.

You can choose whether you want to have the connection to the WebApp using the network port on the control box or on the safety box.



ETH0 = Control box **ETH1 = Safety Box**

Important notes:

⚠ Important: When you have changed the settings, make a picture/screenshot of the settings, so that you can later refer to the IP address you have set.

⚠ Important: Do not change the Subnet Mask, Default Gateway or DNS Server, you can leave those at the default values. Only change the "IP" section.

⚠ Important: Only change one IP address at a time. In addition, it is best to not change the IP address of the WebRecovery. This will allow for easier recovery if the main WebAPP is not accessible anymore.

Continue reading on the next page for more instructions.

Option 1:
If you want to access the WebApp on the control box, then you need to change the IP of **ETH0**. Change the IP address to an address that is in range of your network. In the bottom, set WebApp to **ETH0**, and the WebRecovery to **ETH1**.

Option 2:
If you want to access the WebApp on the Safety box, then you need to change the IP of **ETH1**. Change the IP address to an address that is in range of your network. In the bottom, set WebApp to **ETH1**, and the WebRecovery to **ETH0**.

When you have entered the right values, click on "set network". Wait until you get the confirmation, afterwards, restart the control box.

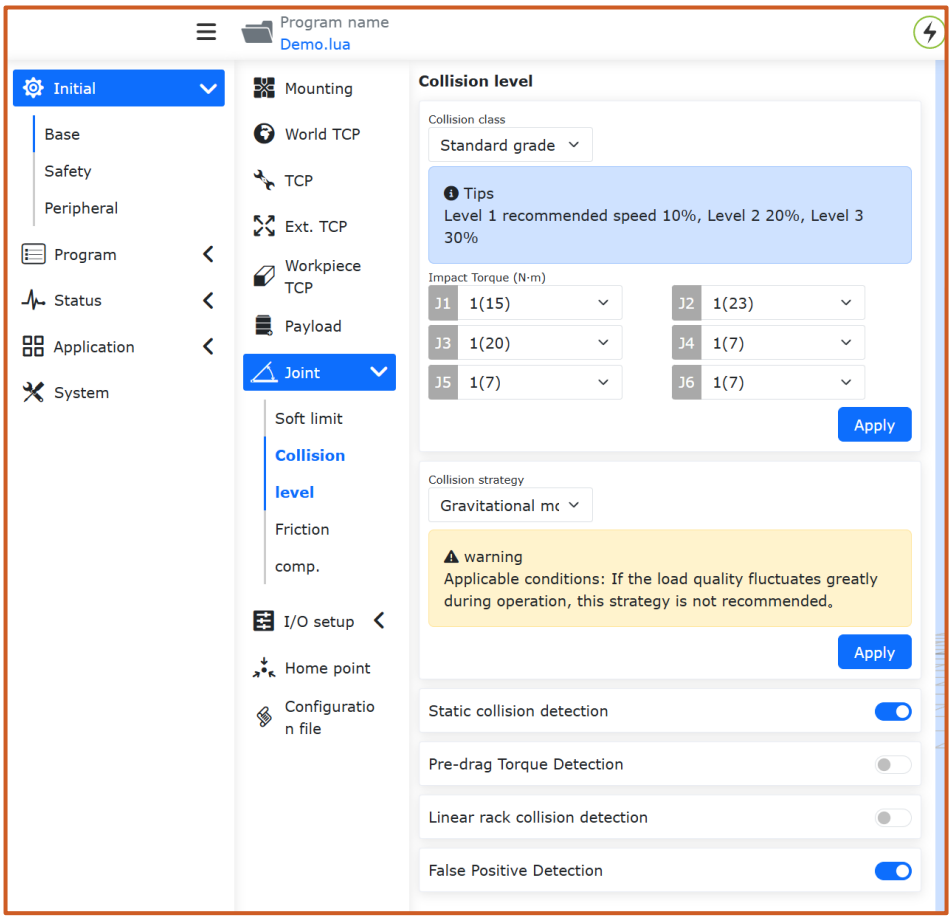
1.5 Changing the cobot collision levels

The collision levels are set to the lowest values out of the box to ensure maximum safety.

The collision levels indicate how much force is needed to stop the cobot. The higher the level, the more force is needed.

If you increase the speed of the cobot, you also need to increase the collision levels. If you run the cobot at high speeds, at minimum levels, it can falsely indicate a collision due to the cobots own acceleration and deceleration.

The collision levels can be changed at: Initial -> Base -> Joint -> Collision Level



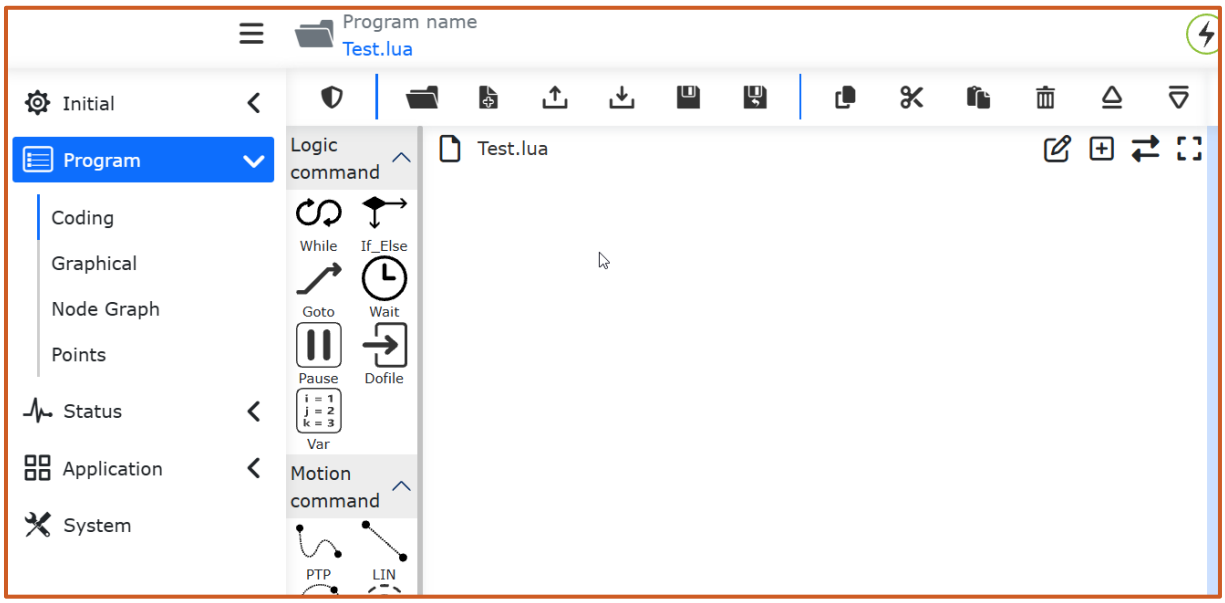
1.6 Creating back-ups

Creating backups is essential to ensure operations can be restored if programs or settings are lost.

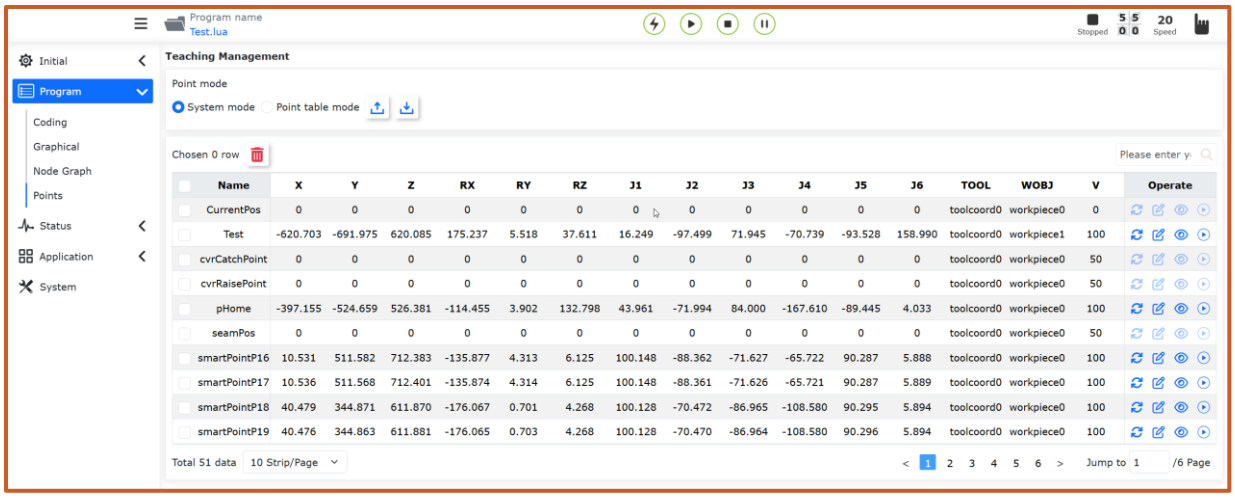
If you only need to back up programs, make sure to back up items **1** and **2**. For a complete backup after an integration is finished, back up items **1, 2, 3, 4, and 5**.

Always back up programs after you have spent significant time teaching or configuring them. Once the full implementation is complete, create a backup of the entire system. This will make the recovery process much easier if the control box ever needs to be replaced.

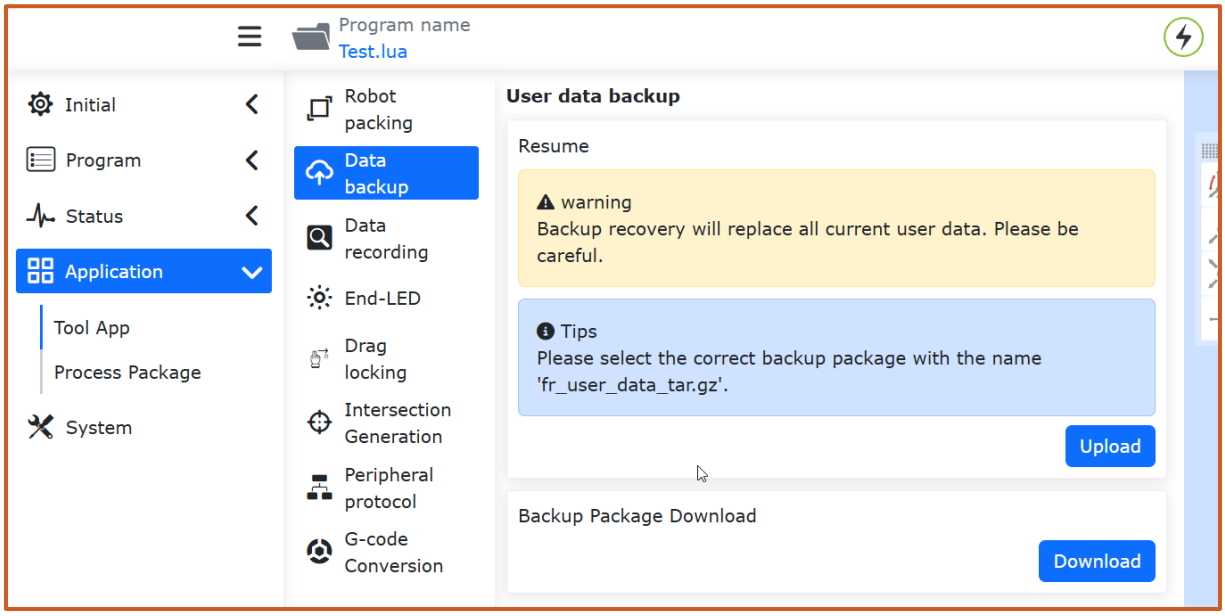
1. You can export individual LUA program files here:



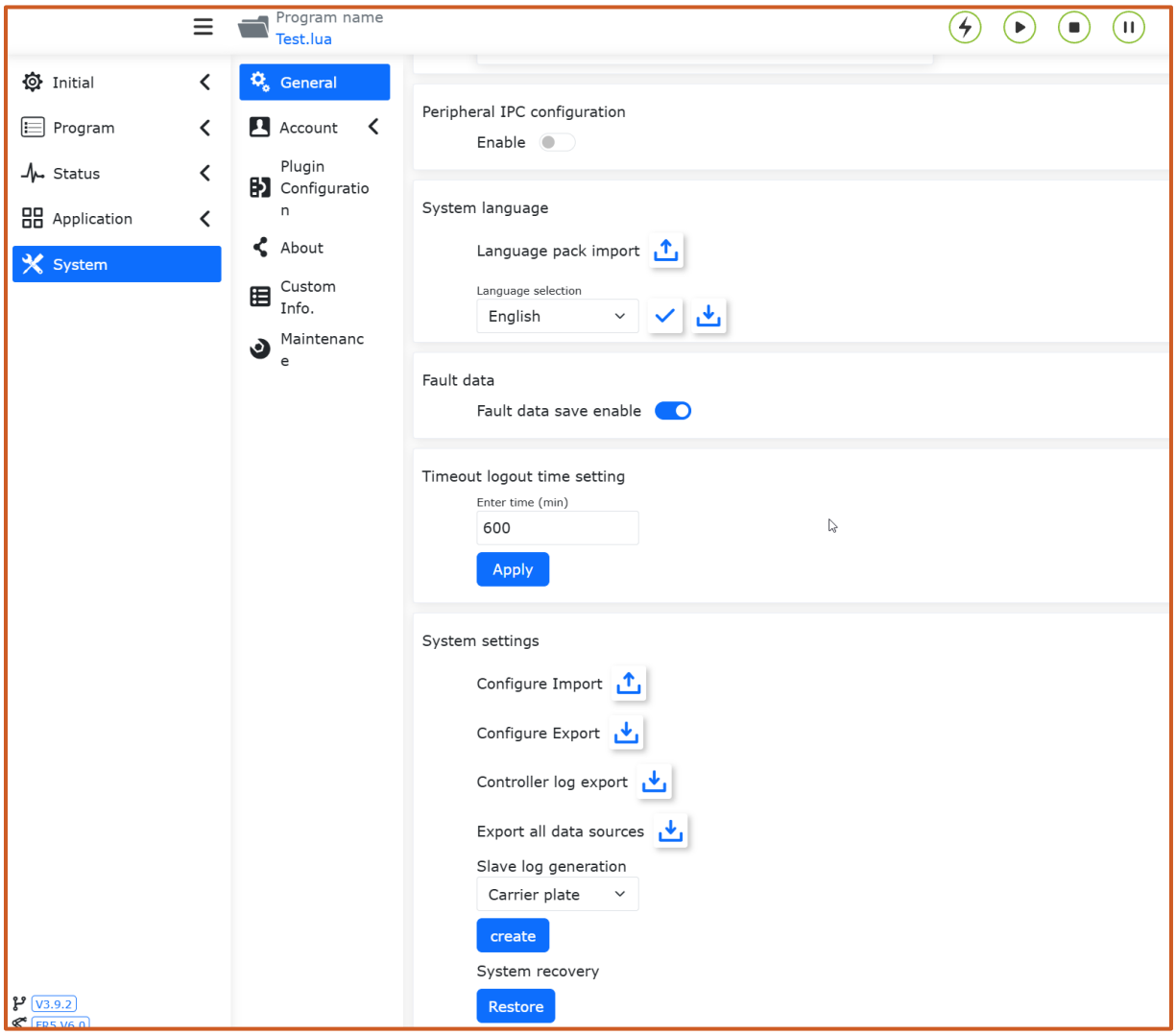
2. You can export all teaching points here:



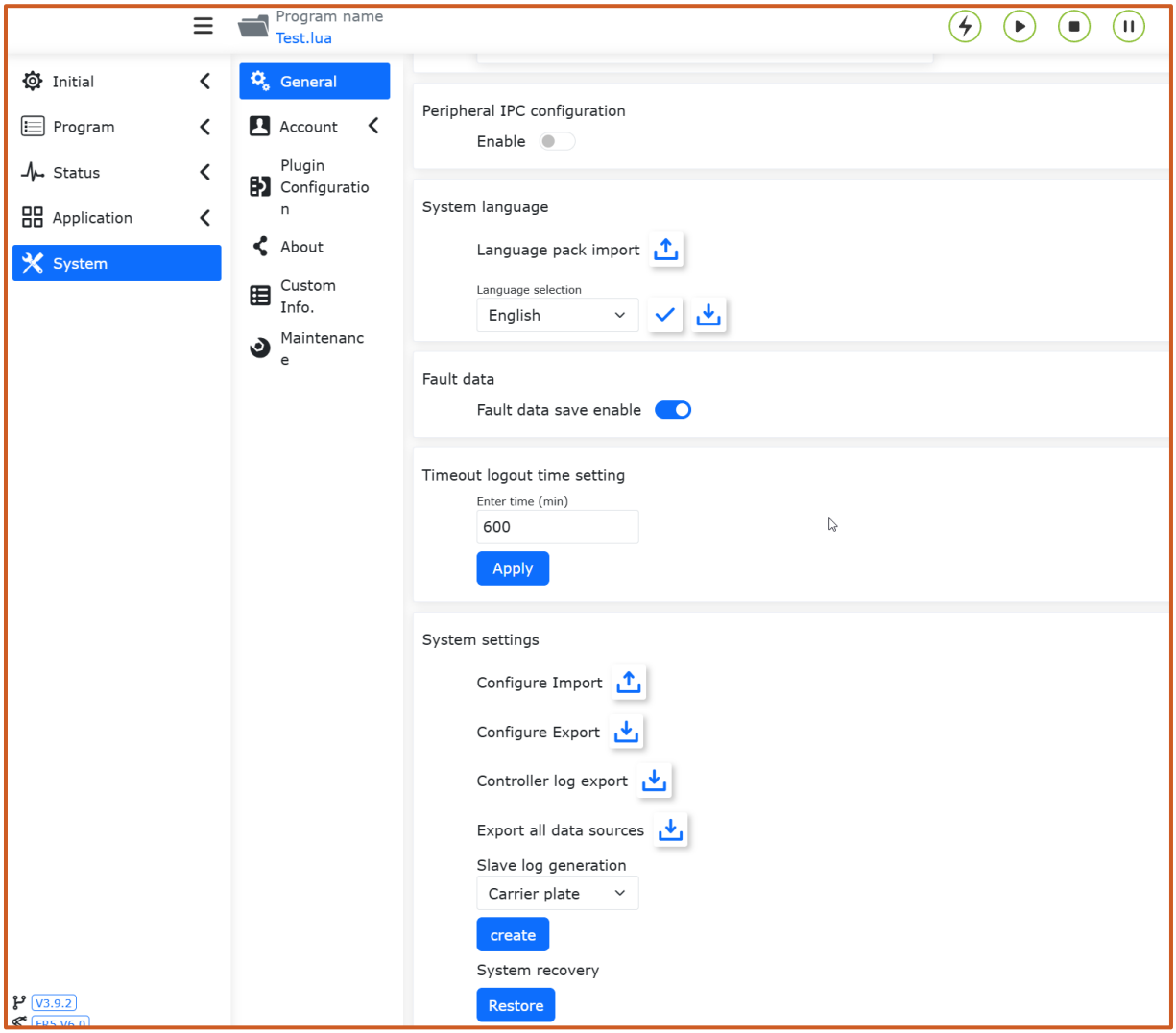
3. You can export all user data here:



4. You can export the current cobot configuration here:



5. You can export all data sources here:



1.7 Commonly made mistakes - how to prevent them

1. **Changing the IP address, then forgetting what you changed it to.**
   If you change the default IP address, make a screenshot of the settings page before saving/restarting. In addition, only change one IP address at the time, and leave the IP address of the WebRecovery unchanged.

2. **Using PNP sensors on the digital in/outputs.**
   The Fairino control box uses NPN in/outputs. Therefore, you need to use NPN sensors and other accessories. Alternatively, you need to use NPN to PNP converters. The control box of the FR20 and FR30 can be changed from NPN to PNP. To do this, follow the instructions on the control box QR code.

3. **Using too much current on the digital outputs.**
   The digital outputs can switch loads with a maximum current consumption of 60 mA only. Use an interface relay, solid state relay or optocoupler to switch big loads or control box failure will occur. Please read the control box QR code manual carefully.

4. **Using an external power supply.**
   It is possible to connect an external 24V power supply to the cobot control box, DO NOT use this functionality. When connecting an external 24V power supply, wrong connections can lead to control box failure. If you want to use this feature, first contact the support channel. Otherwise, use the internal 24V power supply that is connected from the factory.

5. **Setting the collision levels too low.**
   The cobot can give collision errors by itself if the collision levels are set too low, and the speed too high. The inertia of the cobot will falsely activate a collision error. Increase the collision levels to fix this problem.

6. **Having the emergency button pressed in.**
   When the emergency button is pressed in, the cobot will have no power and errors will appear in the web interface. Especially when you unbox the cobot for the first time, make sure the emergency stop button is released.

7. **Not creating back-ups.**
   When you have created cobot programs, make sure to back-up everything. In case the control box would be damaged, you could lose your programs. Therefore, creating a back-up of your programs and cobot settings is vital. Please consult the back-up section for more information on back-ups.

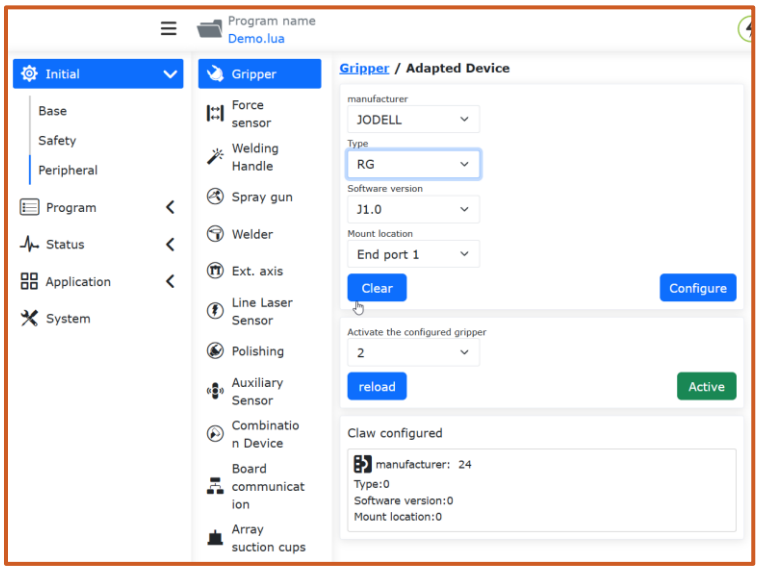
2.1 Connecting a Gripper (optional)

⚠ Important: Never plug any gripper into or out of the cobot while the cobot is powered on. The cobot must always be switched off, so-called "hot-swapping" can cause damage.

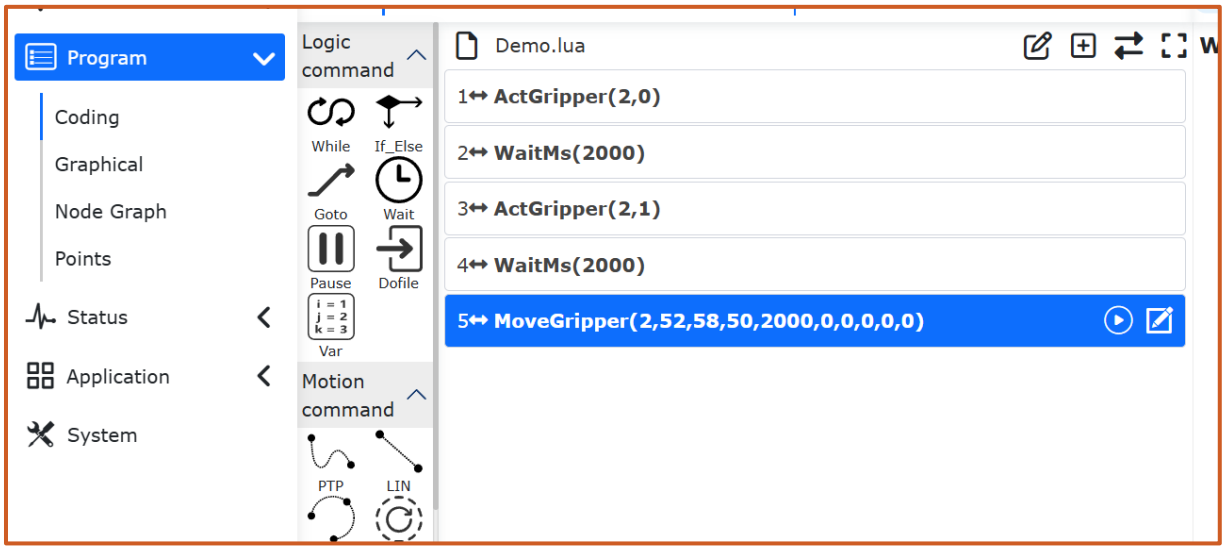
Step 1: Plug the gripper into the arm while the arm is powered off and tighten the connector securely. Then mount the gripper in the desired orientation using supplied bolts.

Step 2: Set the values according to the gripper model you bought, see table below. Then press "clear", followed by "configure", then "reload", and finally "activate". The gripper should now open and close once. The gripper is now configured.

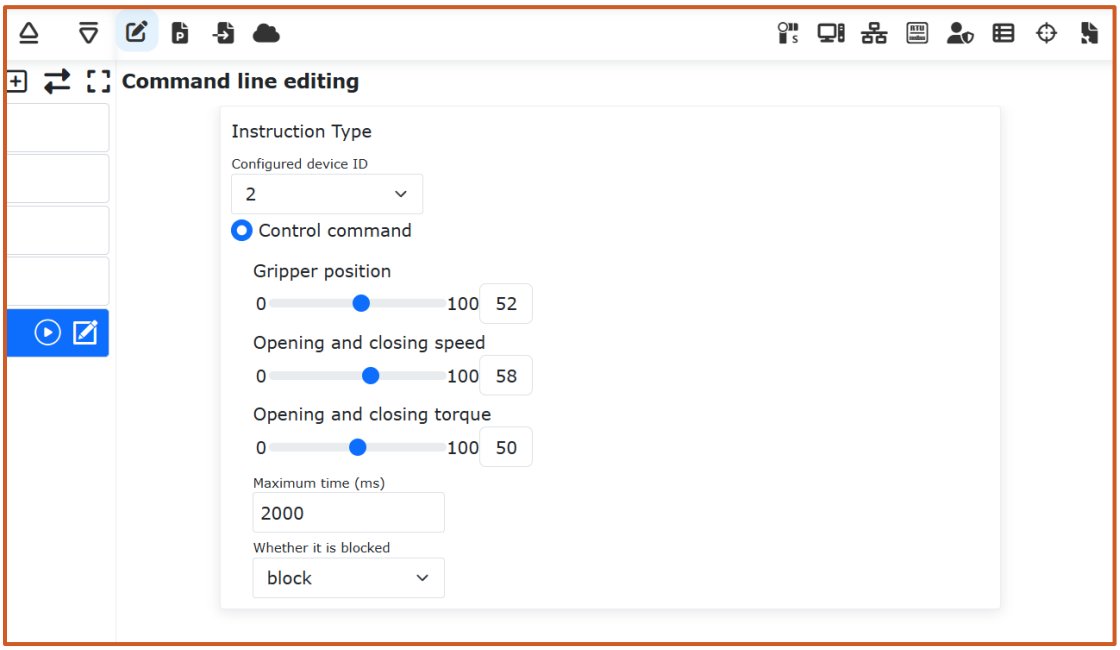
Settings	IR40-50 Gripper	IR75-300 Gripper	IR20-80C Gripper
Equipment Type	Gripper equipment	Gripper equipment	Gripper equipment
Gripper Manufacturer	JODELL	JODELL	HITBOT
Gripper Type	RG	RG	Z-EFG-100
Software Version	J1.0	J1.0	H1.0
Mount Location	End port 1	End port 1	End port 1
Activate the config...	2	1	1



Step 3: It is recommended to include the following commands at the beginning of your program if you intend to use the gripper. This ensures that the gripper is always properly reset and activated, helping to prevent error messages.



Step 4: You can now use the gripper command to control the gripper. It is recommended to use a high value for “Maximum time (ms)”, such as 2000 ms. This value must always be greater than the time the gripper needs to complete its movement. If it is set too low, a timeout error will occur.



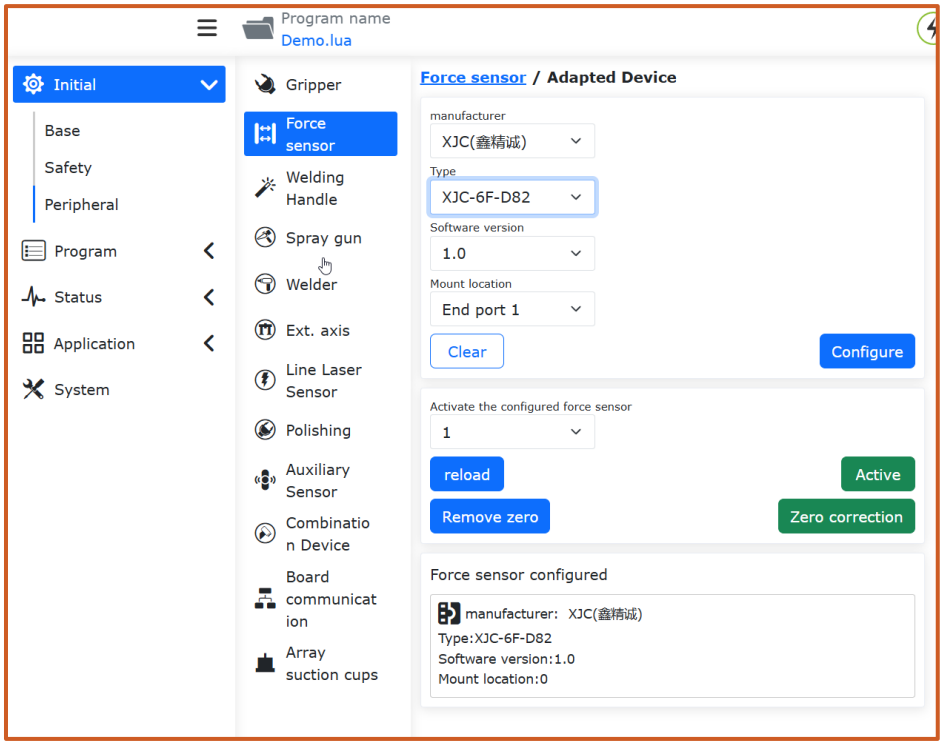
⚠ **Important: When using the IR20-80C Gripper, the gripper position can only be set between 0 and 20. On other grippers, the value can be set between 0 and 100.**

2.2 Connecting the Force Torque Sensor (optional)

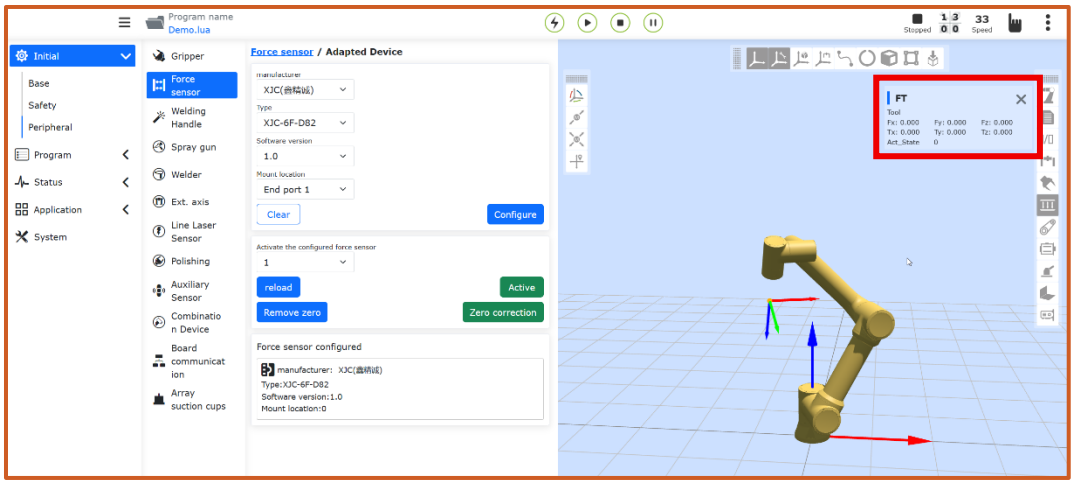
⚠ Important: Never plug the torque sensor into or out of the cobot while the cobot is powered on. The cobot must always be switched off — so-called “hot-swapping” can cause damage.

Step 1: Insert the plug of the torque sensor into the arm when the arm is turned off, tighten the plug well. Make sure that the place where the cable comes out of the sensor is in line with where the plug enters the arm. In that case, the sensor is oriented correctly

Step 2: Set the values as shown in this screenshot. Then press "clear", followed by "configure", then "reload", and finally "activate".



Step 3: Check if the torque sensor is working by seeing if the values change when you apply pressure to the sensor.

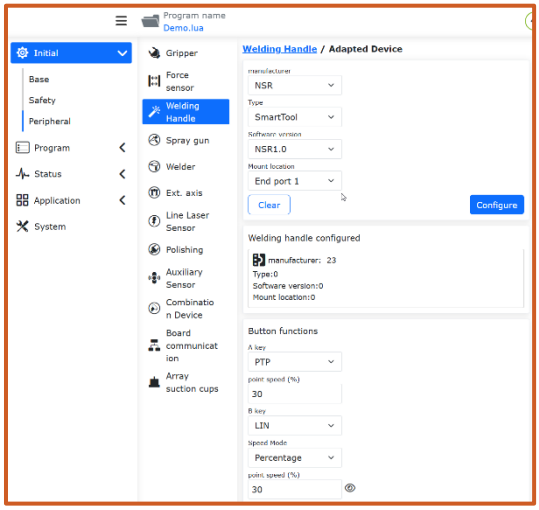


Step 4: The "zero correction" button allows the sensor to be set to 0. The sensor must point straight down before doing this correction. If something is mounted on the sensor, this "zero correction" must be performed again.

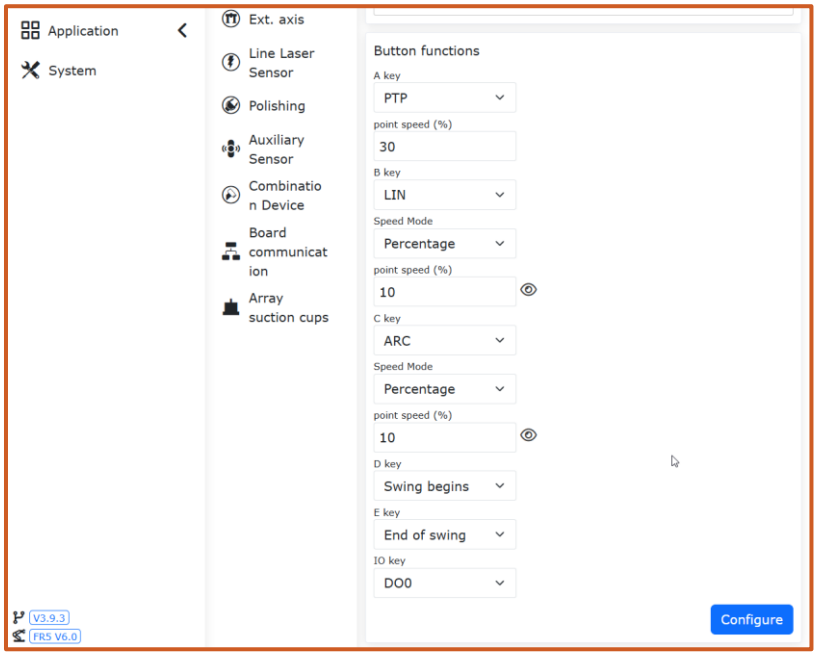
2.3 Connecting the Quick Control Buttons (optional)

⚠️ Important: Never plug the Quick Control Buttons into or out of the cobot while the cobot is powered on. The cobot must always be switched off — so-called “hot-swapping” can cause damage.

Step 1: Set the values as shown in this screenshot. Then press "clear", then "configure".



Step 2: Change what the buttons do by going to the menu in this screenshot below:



2.4 Connecting the Teach Pendant (optional)

Step 1: Make sure that the WebAPP is set to ETH1, and the WebRecovery to ETH0.
Step 2: Click on "Teaching Pendant Enable". Don’t change the Teach Pendant IP.
Step 3: Click on "Set Network"
Step 4: Wait until you get a notification to restart.
Step 5: Now turn off the cobot with the switch on the control box.
Step 6: Unplug the emergency button and connect the plug of the teach pendant.
Step 7: Turn the cobot back on with the switch on the control box, the teach pendant is now set. The web interface will now appear on the teach pendant