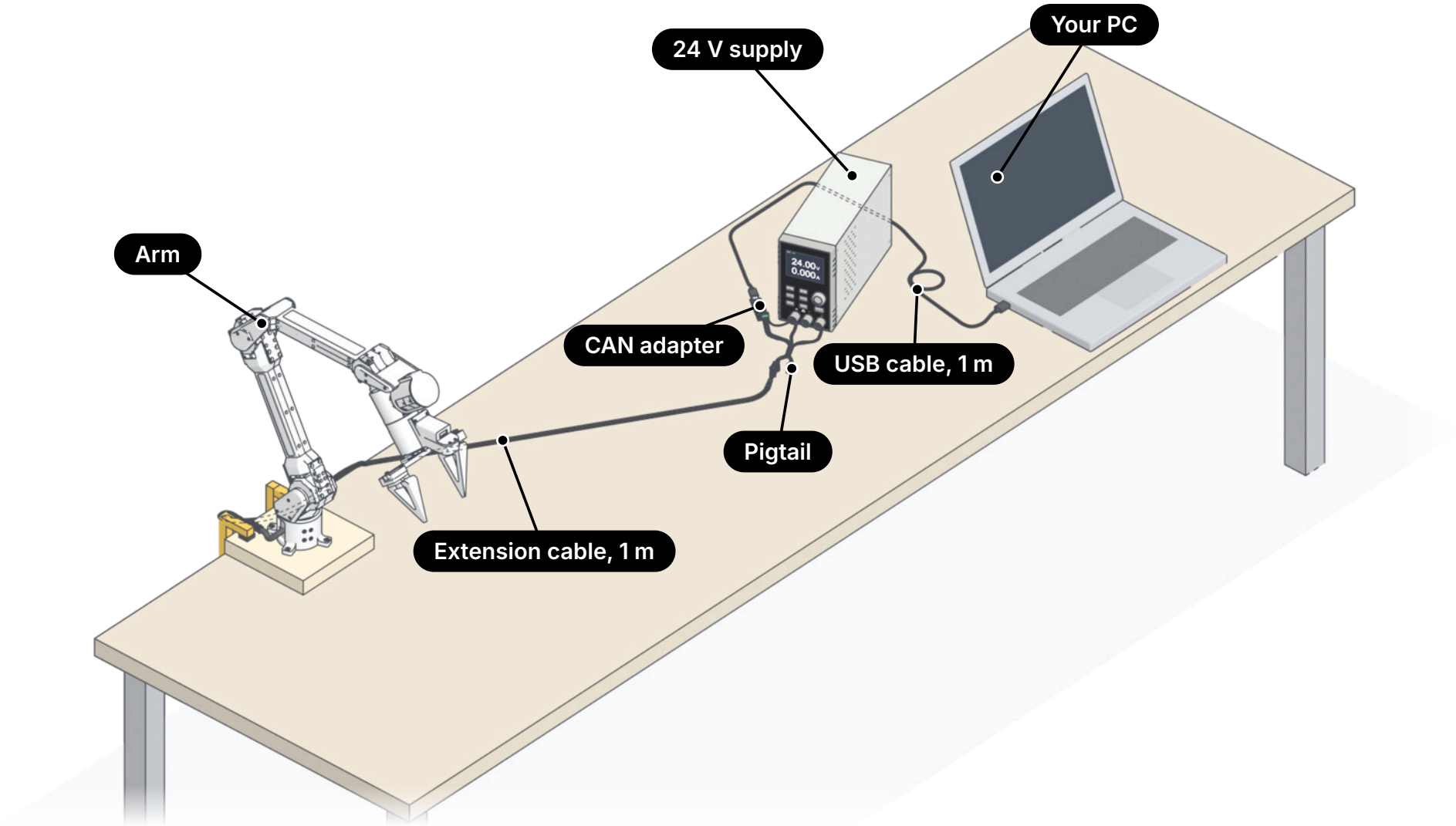
MAKIINA Single Arm

Open → Attach → Connect → Move

Your PC operates one arm through USB.
Where a cable is dashed, it is behind a part.



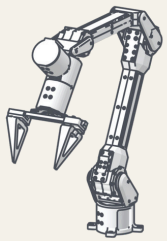
1 Open the Box

Compare the parts in the box with this page. Keep each cable coiled until you use it.

MAKIINA

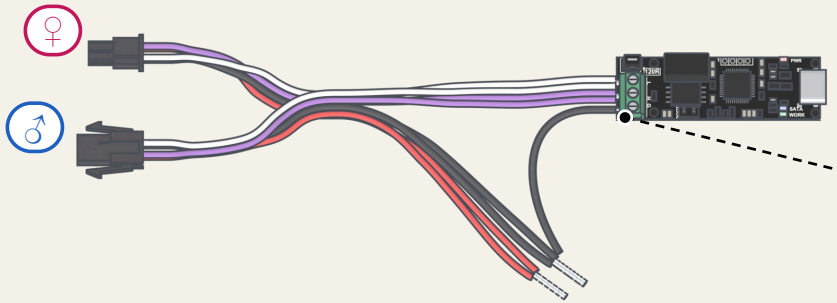
In the Box

1x



6-joint arm

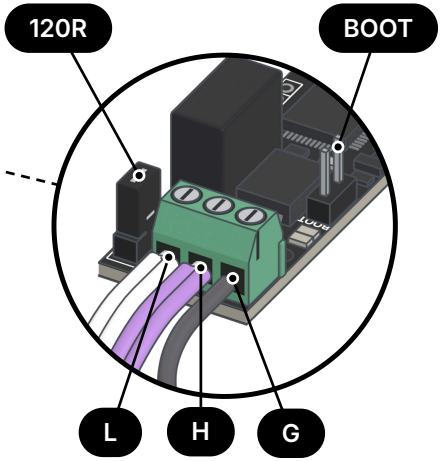
1x



CAN adapter with pigtail
(wired, ready)

The adapter is wired to its pigtail.

They are ready to use. Keep them together.



Already wired:

The white wire is in L.
The purple wire is in H.
The ground wire is in G.

Check the cap.
It is on 120R, not BOOT.

1x



Extension cable, 1 m

1x



USB-A to USB-C cable, 1 m

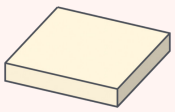
You Must Also Have (Not Included)

1x



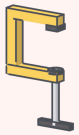
24 V / 6 A
power supply

1x



Board 15 x 15 cm
at least 25 mm thick

2x



Clamps

4x



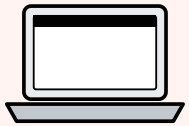
Wood screw
3.5 x 20 mm, Torx

1x



Torx T15

1x



PC
(Windows or Linux)

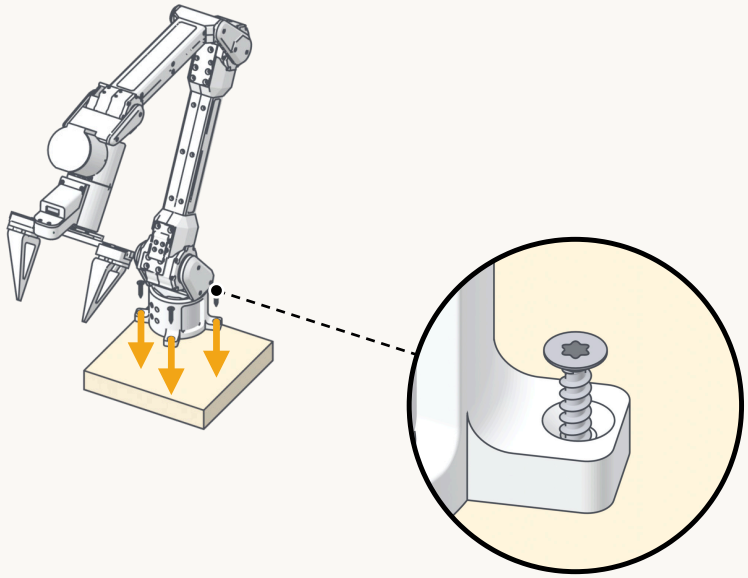
On A4 paper, the screw is drawn 1:1.

2 Attach the Arm

Screw the arm to its board. Clamp the board to the table.

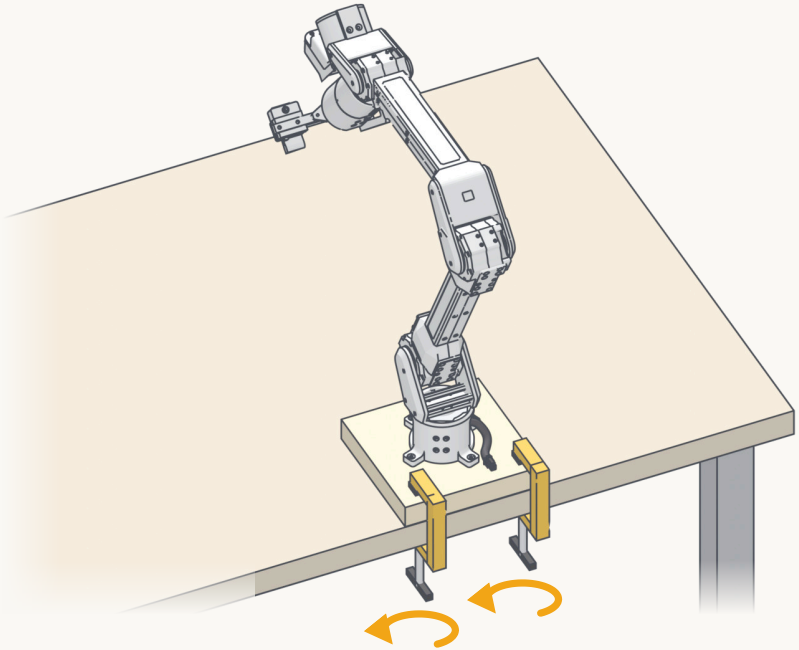
MAKIINA

1 Screw the Arm to the Board



Use 4 wood screws, one through each tab of the base.
Use the Torx T15. In hardwood, drill the holes first.
Drive each screw straight. The base must be flat on the board.

2 Clamp the Board to the Table



Put the board near the table's rear edge.
Use 2 clamps, one on each side of the arm's cable.
Clamp the board. Never clamp the arm.

Use a flat, stiff board, 15 x 15 cm, at least 25 mm thick (screw length + 5 mm).

⚠ **Make sure that the board does not move when the arm moves.**

3 Connect the Arm

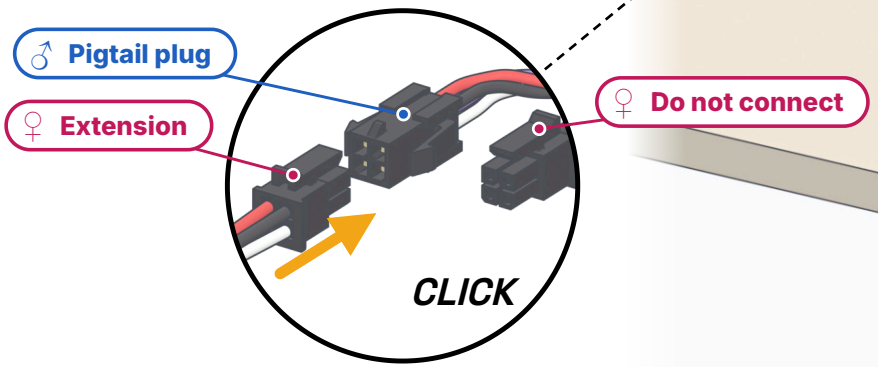
MAKIINA

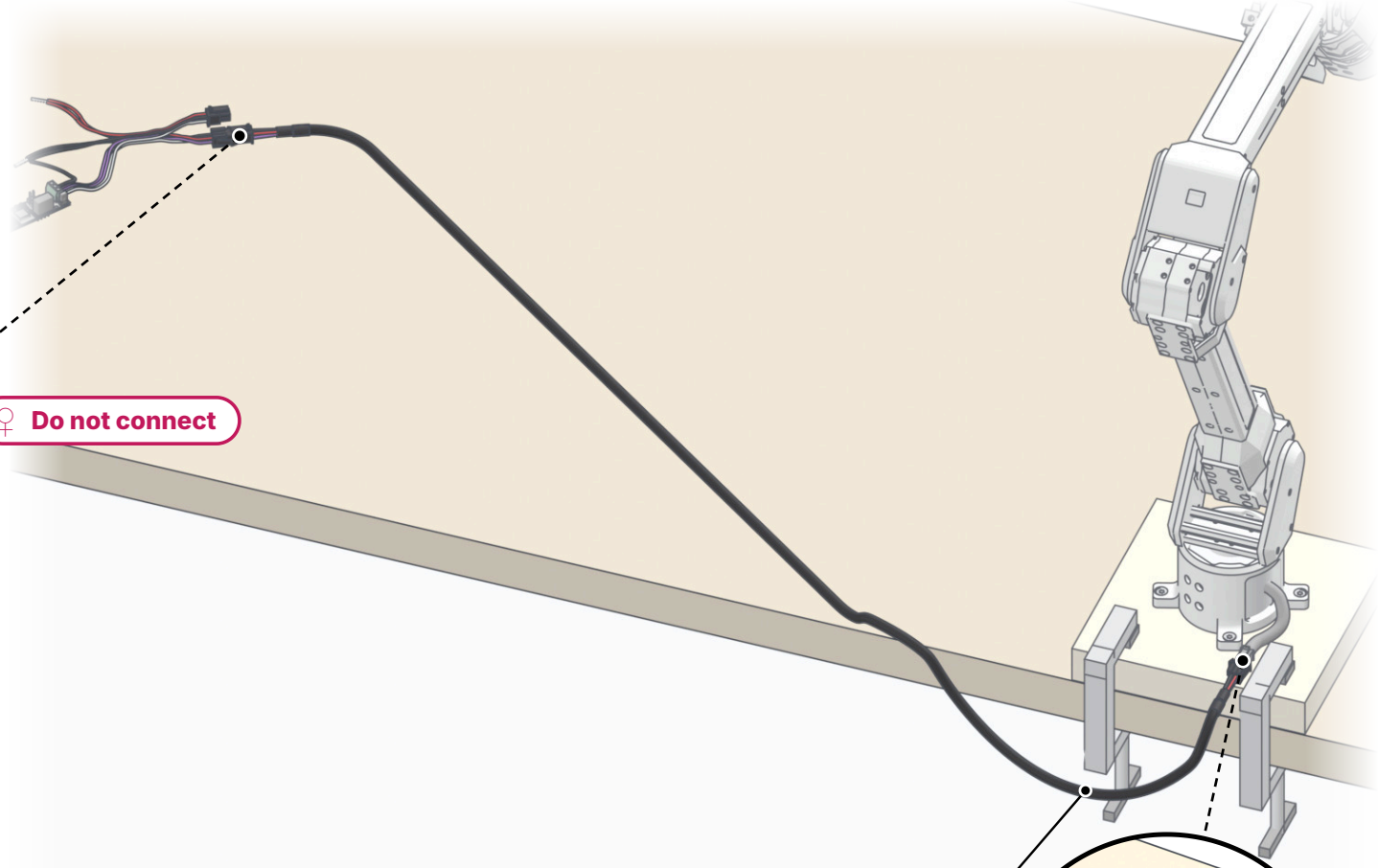
1x

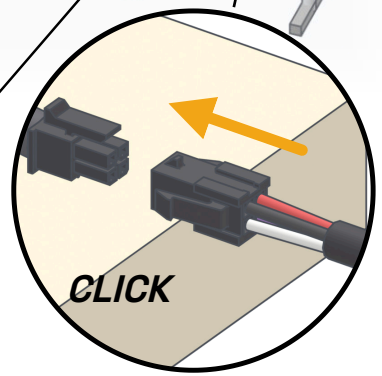


♀ To pigtail — ♂ To arm

Extension cable, 1 m







The cable loop hangs behind the table

Behind the arm base

♂ Extension	to	♀ Arm cable
♀ Extension	to	♂ Pigtail plug
♀ Pigtail plug		Do not connect

✅ Pull gently at both ends: they stay in.

⚠ **Switch the 24 V output OFF before you plug or unplug any robot cable.**

Push each plug until you hear a click. The ♀ plug goes into the ♂ plug.

4 Connect 24 V Power

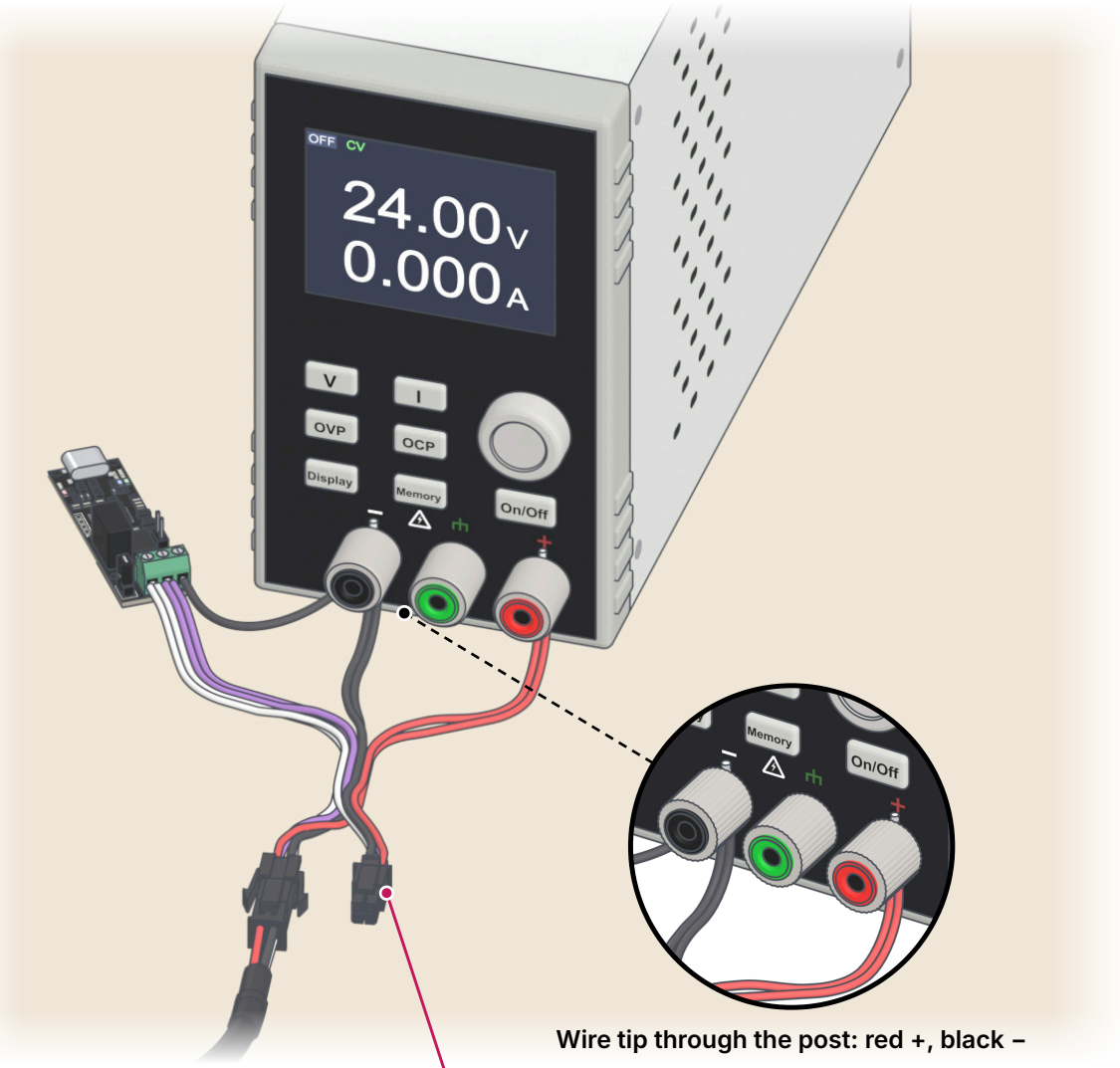
MAKIINA

First, with nothing connected:
Switch the supply on at the back.
Set 24.0 V and 6.0 A. Keep On/Off unlit: the output stays OFF.

Then connect the pigtail to the supply:

Red → + **Black → −**

The white, purple and ground wires stay in the adapter (step 1).





OFF

⚠ **Connect with the output OFF. Do not press On/Off yet.**

⚠ **Switch the 24 V output OFF before you plug or unplug any robot cable.**

5 Connect USB

MAKIINA

1x



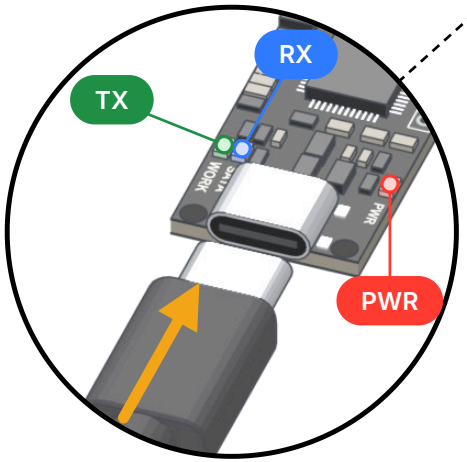
USB-A to USB-C cable, 1 m

Plug the USB-C end into the adapter.
Plug the USB-A end into your PC.

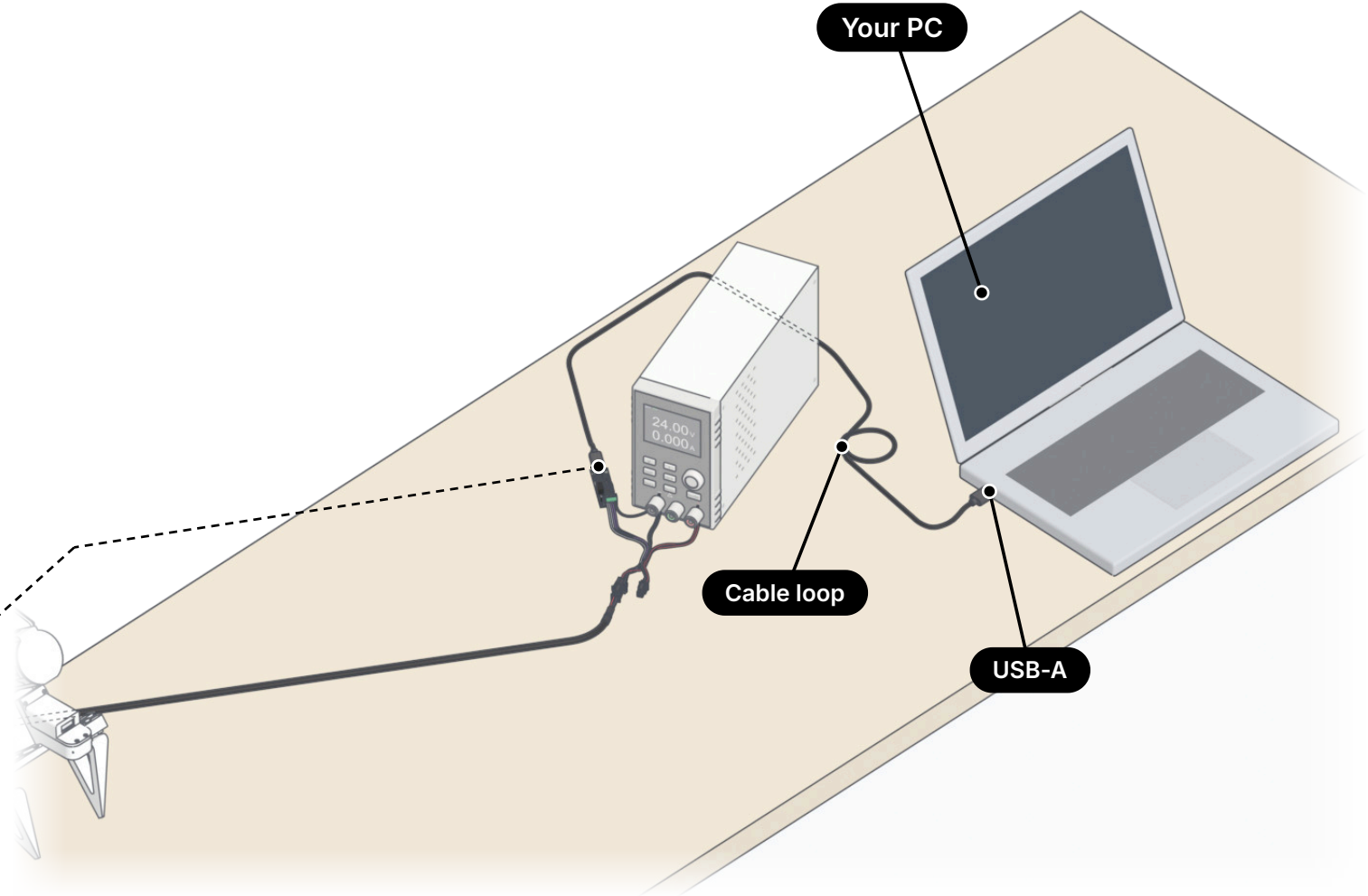
The adapter's lights:

- Red PWR is on.
- Blue RX and green TX flash one after the other.
- Then red PWR and green TX stay on.

Coil the rest of the cable.



USB-C, and the adapter's lights



The adapter carries only CAN data: the arm's power comes from the 24 V supply.

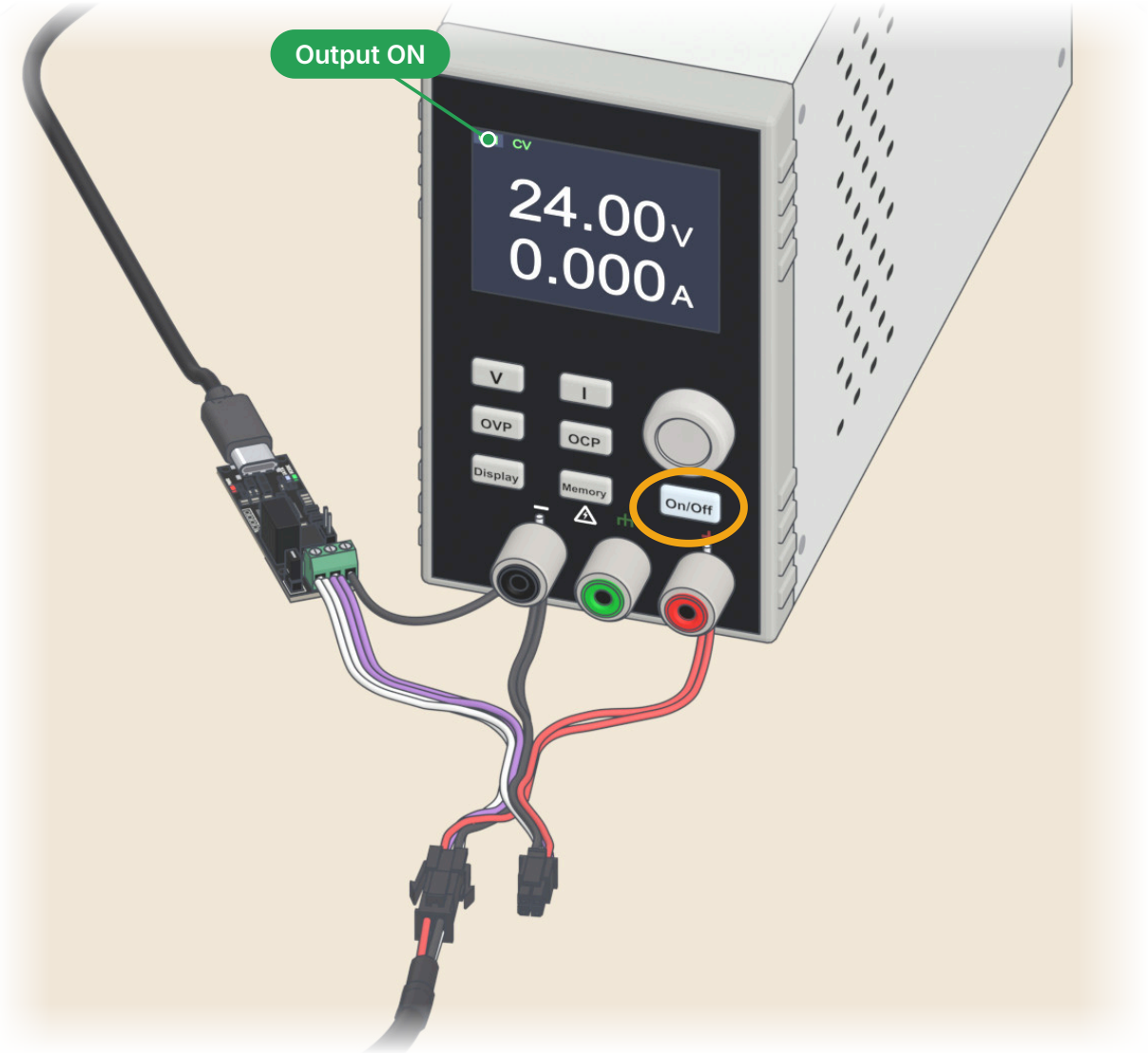
6 Switch On 24 V

MAKIINA



24 V ON

- Output ON, 24.00 V



Press On/Off once, quickly.
The 24 V output is now ON.

The supply's screen shows ON and 24.00 V.
The arm stays where it is.
The adapter's red PWR and green TX stay on.

⚠ **When the 24 V is ON, keep your hands out of the arm's reach.**

The supply is behind your PC, outside the arm's reach. Switch OFF from there.

STEP 07 OF 10

7 Install the Robot Console

MAKIINA

On your PC, once. Download with your MAKIINA account. The console then needs no login.

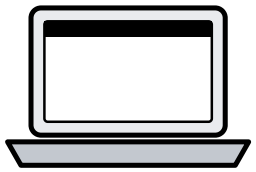
1 Download the MAKIINA SDK
Sign in to your MAKIINA account. Open the SDK page.
Press Get download link for your PC.

2 Unzip it where it will stay.
Inside is one folder: makiina-kit-windows,
makiina-kit-linux-x64 or makiina-kit-linux-arm64.

3 Run the setup once. Then start the console.
See the Windows or Linux box. It takes about a minute, offline.

4 Your browser opens the Robot Console
at 127.0.0.1:8726.

5 Keep the console open.
If you close its black window or last tab, the console stops.



Your PC

The console runs on your PC.
It connects to the arm through the adapter.

Windows

Windows 10 or 11, x64. No Python to install.

1 Install the Visual C++ Redistributable (x64)
from Microsoft, if your PC does not have it yet.

2 In makiina-kit-windows, double-click setup.bat.
Wait for "setup done: .venv is ready".

3 Double-click RobotConsole.bat.
Do not move the folder after setup.

If port 8726 is in use, run this in a terminal in that folder:

```
.\RobotConsole.bat --port 8728
```

Linux

Run the setup once. Then start the console:

```
./setup.sh
./robot_console.sh
```

To let your programs use the adapter, put this line in /etc/udev/rules.d/99-candle.rules. Then re-plug the adapter.

```
SUBSYSTEM=="usb", ATTR{idVendor}=="1d50", MODE="0666"
```

If the scripts do not start, run chmod +x *.sh

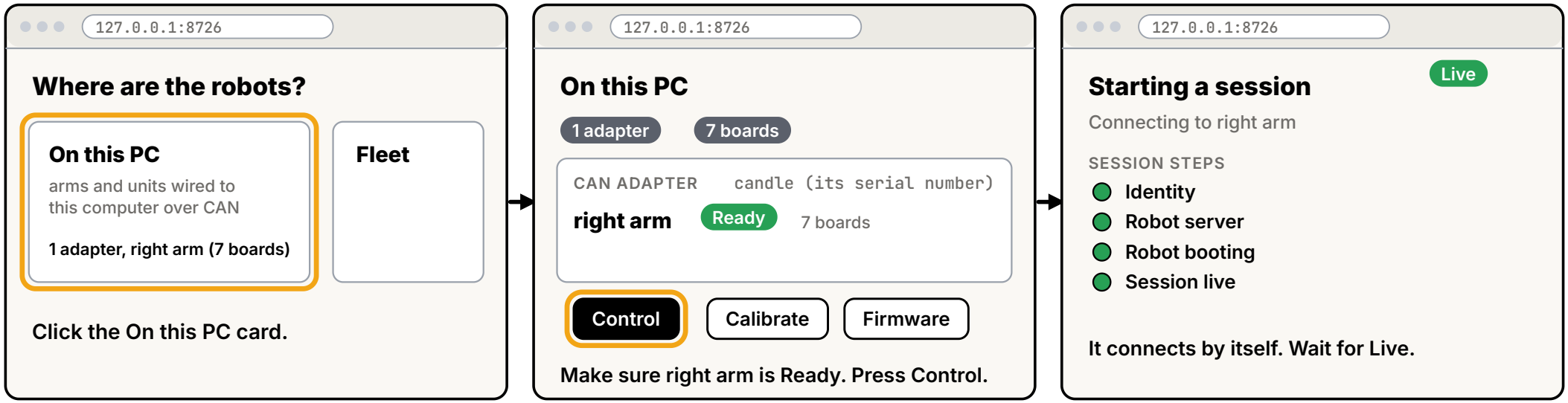
Start the console after the 24 V is ON. If you started it earlier, press Rescan.

STEP 08 OF 10

8 Connect in the Robot Console

What the console shows, step by step.

MAKIINA



If the On this PC Page Shows

No adapter	**Nothing wired to this PC**	Is the adapter's USB in? Fix it. Then press Look again.
Silent	**no boards answered**	Is the 24 V ON? Is the extension in? Fix it. Then press Rescan.
Not calibrated	**Control stays off**	Do not open Calibrate yourself: ask MAKIINA.

If you started the console before the 24 V was ON, press Rescan.

The Adapter's Lights

- Red PWR: on while USB is in.
- Green TX stays on: ready, not in use.
- Blue RX flashes: a message received.
- Green TX flashes: a message delivered.
- Both stay on: blocked after an error.

A message had no answer: is the 24 V ON?
Or a CAN bus or buffer error. Then press Rescan.

Session live: the Joint states card fills with the arm's joints, J1 to J6 and the gripper.

Nothing moves yet. The arm moves only after you press ARM (next step).

STEP 09 OF 10

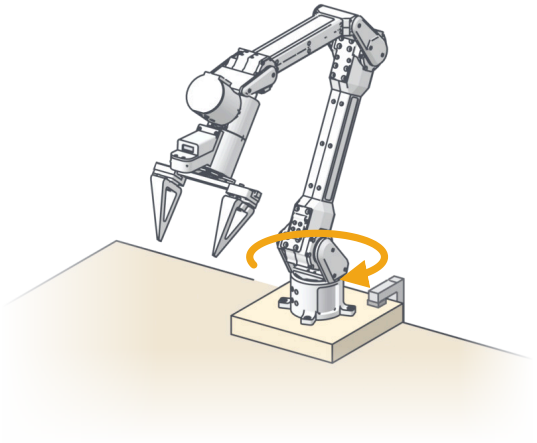
9 Move One Joint

First, turn only J1 a few degrees each way.

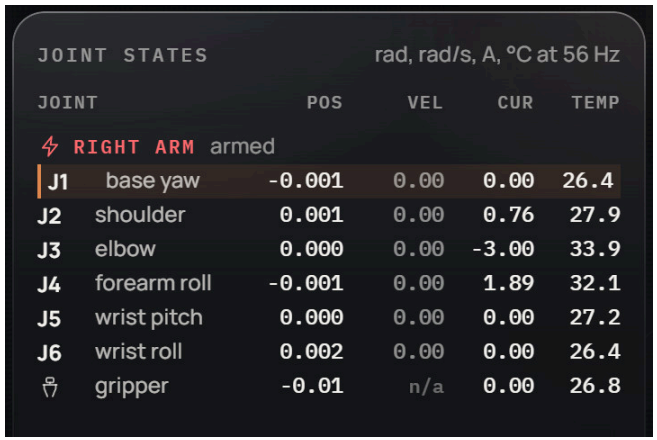
MAKIINA

1 **Press ARM, in the top bar.**
A disarmed arm stays where it is.
Commands do not move it.

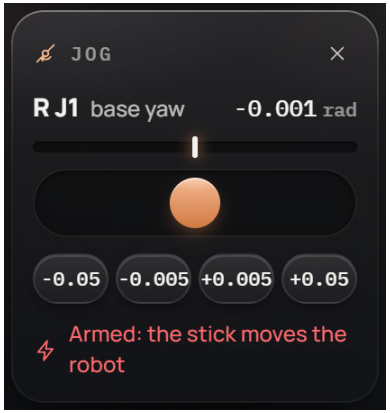




2 **Click the J1 base yaw row.**
The Jog card opens.



3 **Press +0.05. Then press -0.05.**
J1 turns about 3 degrees each way.





You can press STOP at any time. The arm stops where it is. Its motors stay on.

Space works when the console page is in front.
It does not work when you type in a field.

⚠ **Keep your hands out of the arm's reach while it moves. It can hit you.**

Optional: the Gripper R slider opens (0) and closes (1) the gripper.

10

STEP 10 OF 10

Stop and Remove Power

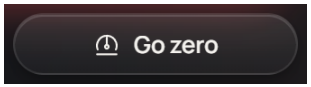
Do the steps in this order. Keep the supply's On/Off key free to press.

MAKIINA

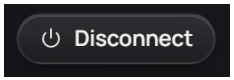
1. **Press STOP or Space.**
   The arm stops where it is. Its motors stay on.



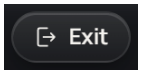
2. **Press Go zero. Wait until the arm stops.**
   If you skip it, hold the arm when you switch OFF.



3. **Click the session chip. Then press Disconnect.**
   The arm stays where it is.



4. **Press Exit. Close the console's browser tab.**
   The console ends by itself after 5 s.



5. **Switch the 24 V output OFF.**
   If the arm is not at zero, hold it and take its weight.
   Press On/Off once. The arm becomes limp.



6. **If you must unplug cables, do it only now.**
   Unplug the USB cable after the console is closed.

A Short Break Instead

Hold the arm. Press Torque off. Then press Continue.

The arm becomes limp after about 3 s.

After the break, keep clear. Press Torque on.

The arm moves back to where it was,
in about 4 s. ARM stays on.



⚠ **Switch the 24 V output OFF before you plug or unplug any robot cable.**

Close the console before you unplug the adapter. If the console cannot open the adapter after a crash, re-plug it or wait about 2 minutes.

Move a Joint from Python

MAKIINA

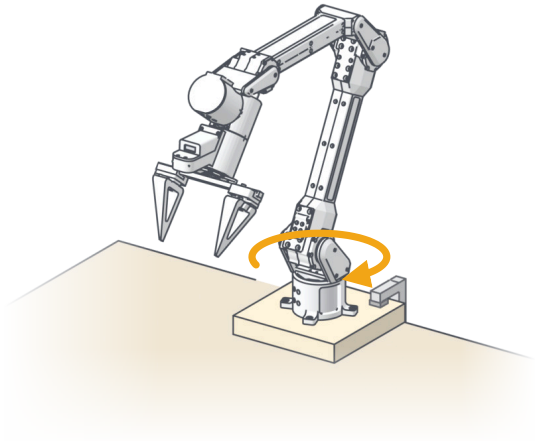
Optional. Your own script moves J1 a little, then moves it back.

1 **Close the Robot Console. Keep the 24 V ON.**
Only one program can use the adapter at a time.

2 **Save this code as move_j1.py in the kit folder.**
This is the folder that you unzipped in step 7.

```
import time
import makiina.robot

arm = makiina.robot.Robot.connect_local()              # Opens the adapter, up to 30 s
try:
    j1 = "J01-R"                                       # J1, base yaw
    print(j1, round(arm.sensors.get_joints()[j1], 3))  # In rad
    for step in (0.05, -0.05):                         # About 3 degrees, then back
        arm.control.set_joints_relative({j1: step})
        time.sleep(2)                                  # Let it get there
        print(j1, round(arm.sensors.get_joints()[j1], 3))
    arm.control.stop()                                 # Holds; its motors stay on
finally:
    arm.disconnect()                                   # The arm keeps holding
```



If the Script Ends with an Error

If it shows "no USB CAN adapter":
Plug in the adapter's USB cable.

If it shows "timed out" or "server exited":
Close the console. The 24 V must be ON.

If J1's angle does not change:
The arm is not calibrated. Ask MAKIINA.

3 **Run it in a terminal in that folder.**

```
.venv\Scripts\python.exe move_j1.py  # Windows
.venv/bin/python move_j1.py          # Linux
```

4 **J1 turns about 3 degrees, then turns back.**
The script does not change the torque or speed limits.
It prints J1's angle 3 times, in radians.

⚠ **Keep your hands out of the arm's reach while it moves. It can hit you.**

To stop the script, press Ctrl+C. The arm stays where it is. Its motors stay on. When you finish, stop and remove power as in step 10.

If Something Is Wrong

MAKIINA

Switch the 24 V output OFF before you touch any robot cable.

No Adapter in the Console	Make sure that the adapter's USB cable is plugged in. If only the red PWR light is on, re-plug the adapter. After a crash, re-plug it or wait about 2 minutes.
Silent: No Boards Answered	Make sure that the 24 V is ON and the red and black tips are in the posts. Make sure that both ends of the extension are fully in. Then press Rescan.
Green TX and Blue RX Both Stay On	The adapter is blocked. No board answered a message within 0.5 s, or there were too many CAN errors, or a buffer was full. Make sure that the 24 V is ON. Then press Rescan.
Not Calibrated	You cannot use Control. Do not open Calibrate yourself: it changes the data that the arm's boards store.
The Arm Is Limp	If the 24 V is OFF, switch it ON. The arm stays where it is. If you pressed Torque off, keep clear. Then press Torque on. The arm moves back to where it was. ARM stays on.
The Supply Limits Current, or the Voltage Drops	Switch the 24 V output OFF at once. Make sure that the red tip is on + and the black tip is on −. Make sure that the supply is set to 24.0 V and 6.0 A.