PULSE ROBOTIC ARM

QUICK-START GUIDE

From the Guide, you will learn how to mount, switch, and test operation of the robotic arm. For detailed instructions and requirements, see "PULSE Arm User Manual."

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Before you mount and start operating the robotic arm, read the precautions in the "PULSE Arm User Manual."

STEP 1. Mount the arm

Unpack and position the arm on a horizontal surface and, holding the arm tight, fix it on the surface using one of the below methods:

Method 1

Insert four M8 bolts into the holes on the transition plate edges and tighten the bolts.

Method 2

Dismantle the transition plate. To do that, unscrew the 2 pins and 11 bolts holding together the plate and the arm base. Then, use the same 2 pins and 11 bolts to fix the arm base on the mounting surface without a transition plate.

STEP 2. Connect the arm to the control box, the local network, and peripheries

Connect the arm and other supplied components to the control box as shown below. You need to connect the power cable on one end only—to the corresponding connector on the control box.

Control box, back panel

| Robotic arm | Emergency stop button | Ethernet cable | Power cable |

Screw down cable connectors as far as they go!
The photo on the right illustrates a correctly secured cable connector from the arm to the control box.

For detailed periphery connections, including for work tooling, see "PULSE Arm User Manual."

STEP 3. Switch the arm

> Do not move the arm by hand until its initialization is over and the wrist LED on the arm is steady green!

Supply power

Plug the power cable connector into the mains socket. Then, flip the power switch on the back panel of the control box into the "ON(|)" position.

Wait for the green indicator on the control box to stop blinking and become steady.

This can take about 1-2 minutes.

> When the red LED on the control box lights up, this indicates an error. Flip the power switch on the control box into the "OFF(0)" position and wait for the indicators on the front panel to go off completely. Then, make sure the emergency shutdown button is unpressed and the Step 2 connections are correct and secure, switch the arm back on.

> When the above measures were no enough to eliminate an error, contact the Technical Support Service.
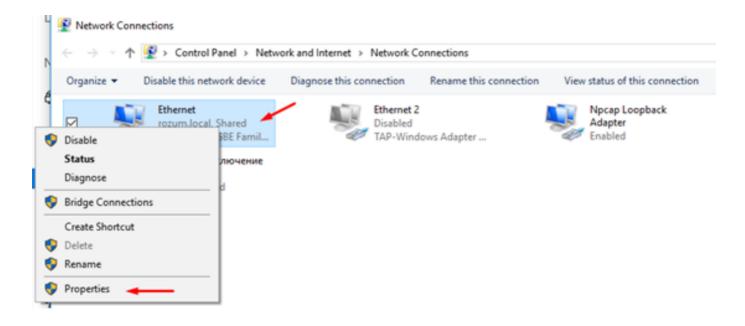
Wait for the LED indicator on the arm wrist to go steady green

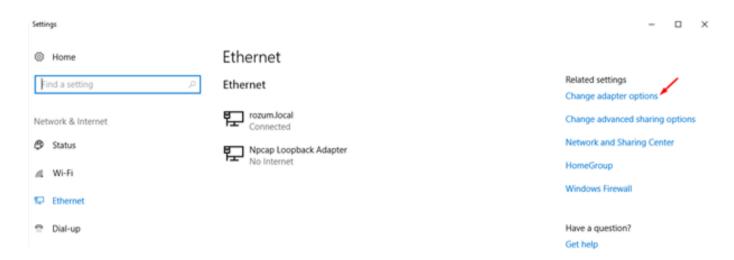Now, the robot is ready for operation.

4. In the Related settings section of the Ethernet settings window, click Change adapter options.
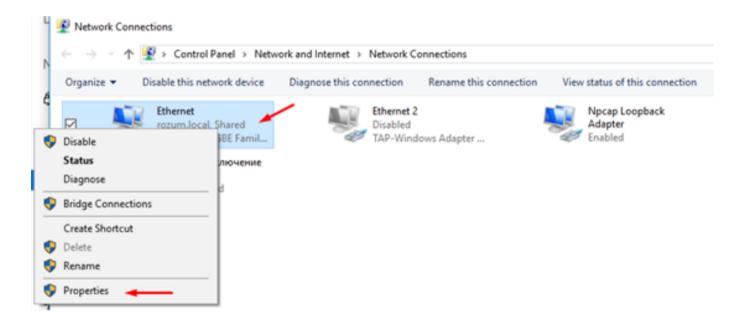

5. In the displayed Network Connections window, right-click the Ethernet icon and select Properties.
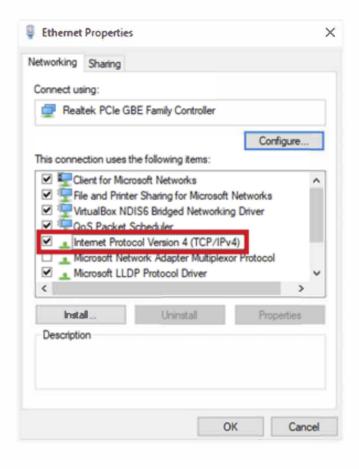
4. In the Related settings section of the Ethernet settings window, click Change adapter options.

5. In the displayed Network Connections window, right-click the Ethernet icon and select Properties.
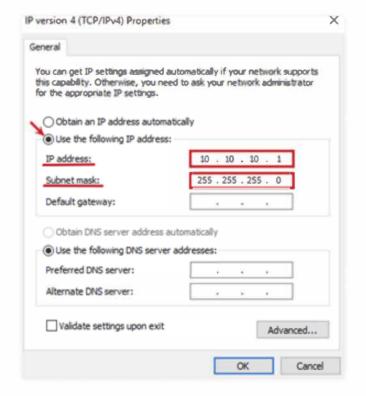
6. On the Networking tab in the displayed Ethernet Properties window, double-click Internet Protocol Version 4 (TCP/IPv4).

7. In the IP Version 4 (TCP/IPv4) Properties window, select Use the following IP address. Set the IP address and the Subnet Mask fields to the values as shown on the right and click OK. Now, you can go to STEP 5.
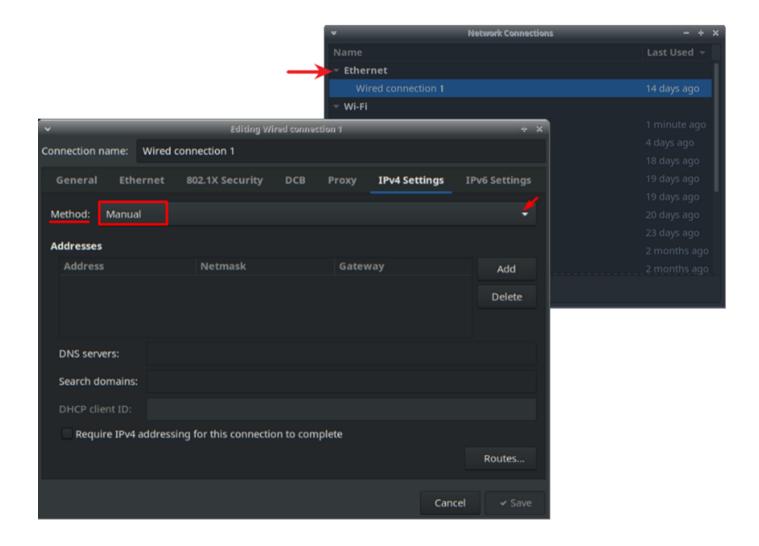
> For the last digit in the IP address field, you can use any value from 1 to 255, except for 20, since 10.10.10.20 is the default static IP address of the arm.

> If you have any problems connecting, refer to "PULSE Arm User Manual."

OS Linux connection

1. Connect the control box to your computer using the Ethernet cable.

2. Open Network Connections and double-click Ethernet to open the editing window. In the displayed window, select the IPv4 Settings tab. In the dropdown list of the Method field, select Manual.

3. In the Addresses area on the same tab, click Add and specify the Address, Netmask, and Gateway as shown in the figure below, click Save. Now, you can go to STEP 5.

Specifying the last digits in the Gateway and the Address fields, it is possible to use any value from 1 to 255, except for 20, since 10.10.10.20 is the default static IP address of the arm.

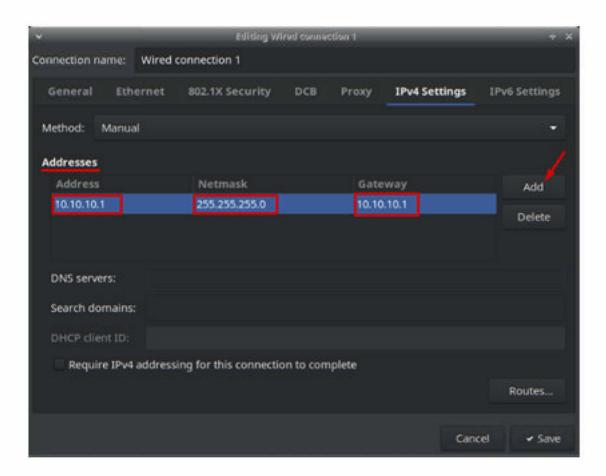If you have any problems connecting, refer to "PULSE Arm User Manual."

STEP 5. Start PULSE DESK and run a sample program

> All parameter values are for reference only. To create a program for your purpose, use your own values specific to your application and operating conditions.

Open a browser and type in the default static IP address 10.10.10.20 and the port number 8080. The browser page should display the starting screen of the PULSE DESK user interface.

Create a new program

In the upper left corner of the screen, click the Main Menu button and select New program on the displayed menu.

The screen displays the Edit window with the Wait For command already in the program body. The wrist LED turns yellow. This means the arm is in the LEARN mode and ready for setting a basic trajectory.

Set a basic trajectory by hand guiding

The section describes how to set a basic trajectory by hand guiding, using the buttons on the arm elbow. For alternative methods to set trajectories (via the web interface, API), refer to the "PULSE Arm User Manual" and "API Reference Guide."

> The buttons on the arm elbow are available in the LEARN mode only. When you switch to the PULSE DESK interface to perform any actions (e.g., to edit a point, add a command via the Commands menu), the mode is off. To set the arm back into the LEARN mode, you will have to create a new program.

To set a basic trajectory, we will use three commands as described below.

1. Press briefly the Free Drive Mode button on the arm elbow. The wrist LED should go blue, indicating you are in the Free Drive mode.

> In the Free Drive mode, the arm cannot retain its position stably. Therefore, when you work with the arm in the mode, make sure to support it with your hands.
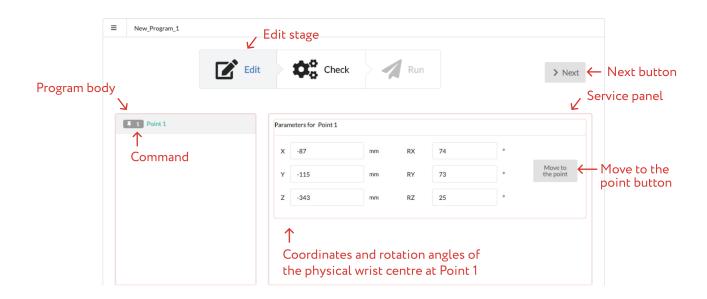
> Before leaving the arm unattanded, switch off the Free Drive mode by clicking the Free Drive Mode button again and make sure the wrist LED turns yellow.

2. Set the arm into a start (safe) position by hand guiding. See the figure on the right for the recommended start pose.

3. Set the arm into the Freeze state by pressing the Free Drive button again. The arm joints are fixed in place in their current positions. The wrist LED turns yellow.

4. Press the Point button to save the current arm position as the first trajectory point (command).

If you check the web interface, you will see the Wait For command has been deleted. Instead, the program body includes a new command—Point 1.

The Service panel displays the parameters for the Point 1 command—the coordinates and rotation angles of the physical wrist centre.

5. Press briefly the Free Drive mode button again to set the arm back into the Free Drive mode and move the wrist to another position. Then, repeat Steps 3 and 4 to set the second point in the trajectory.

6. Repeat Step 5. In the end, the Program body panel should include 3 commands—Point 1, Point 2, and Point 3.
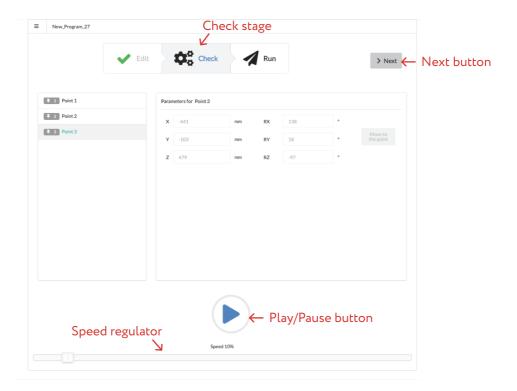
> When the Progam Body includes more than three commands, you can remove unnacessary commands by dragging them beyond the PULSE DESK workspace.

7. Check execution of the commands. To do that, select a command in the program body and click the Move to the point button on the Service panel. The expected result: the arm should move to the respective position. Repeat the same for each of the three trajectory points.

Debug and edit the trajectory

The next stage is Check, where you test-run the previously created program. To switch to the stage, click the Next button in the Edit screen.

> For the first test run, we recommend using the default 10% speed setting. Later, you can increase the speed by dragging the speed regulator to the right.

Start a test run by clicking the Play ▶ button. PULSE DESK starts running the created program from the first command on, down the list. The Play ▶ button changes into the Pause button ⏸ that you can use to stop the test run.

> In case you understand you need to make changes to the program, stop the test run, go back to the Edit stage and make required changes.

After PULSE DESK executes the last command, the test run stops, and a warning appears on the screen indicating the test run is over.
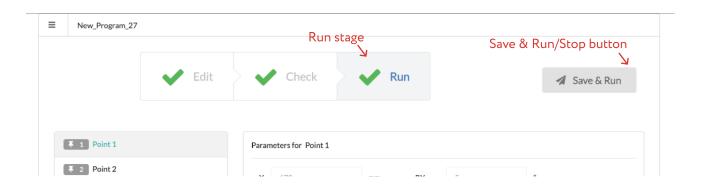
Execute and stop the program

The last stage is executing and stopping the program. To switch to the stage, click the Next button in the Check screen and then the Save&Run button in the Run screen.

PULSE DESK starts executing the commands in the Program body one by one. Once the last command is executed, PULSE DESK starts executing the program again from the beginning until the user stops it.

To stop program execution, click the Stop button that replaces the Save&Run button on the Run screen. Only after that, you can close the browser.

> Closing the browser without clicking the Save&Run button will not stop program execution!

To switch off the arm, set it into a safe position, where the arm can hold its position stably after power supply is disconnected. For instance, you can switch the arm into the start position by selecting the Point 1 command on the Edit screen and clicking the Move to point button.

After setting the arm into a safe position, flip the power switch on the back panel of the control box into the OFF position and wait for the indicators on the control box to go out completely.
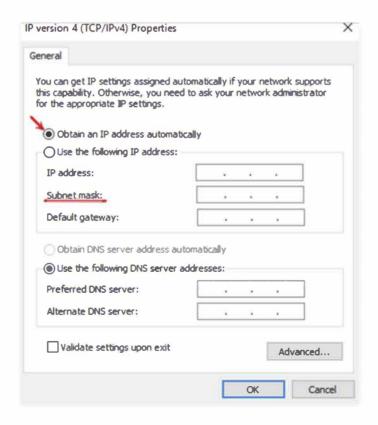
> For a detailed description of the PULSE DESK interface, its features, and progam samples, refer to "PULSE Arm User Manual".

After you have completed the test run sequence for the arm, we recommend restoring initial IP settings on the computer.
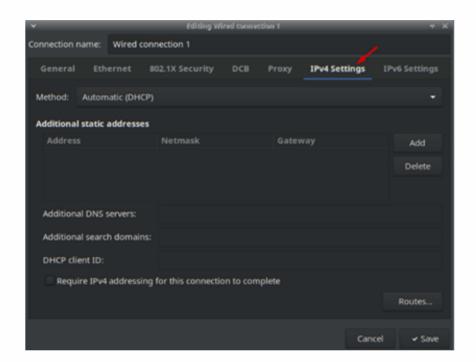
Windows

1. Go back to the IP properties window (see STEP 4 Windows, cl. 7).
2. Select Obtain an IP address automatically and click OK to confirm the selection.

Linux

1. Go back to the window for setting the IP connection properties (see STEP 4 Linux, cl. 2).
2. In the dropdown list of the Method field, select Automatic(DHCP) and click Save to confirm the selection.

Congratulations! You have just started your PULSE arm!

Now you know how to connect and start the arm for a test run. However, to be able to integrate and set up the arm correctly and to use the entire scope of available features, we recommend reading, "PULSE Arm User Manual" and "API Reference Guide".