

MYBOTSHOP

ROBOTICS

LimX P1

User Manual



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1 Attention

Attention: Read this document carefully. In case of doubt, it is essential to consult specialists, experts, or the manufacturer (LimX Dynamics) or distributor (MYBOTSHOP GmbH) of the assemblies used. The robot must not be put into operation before clarification. Contact information is available in the Getting Help & RMA chapter.

Do not allow persons who are not familiar with robotics or these instructions to operate the robot. Robots are dangerous in the hands of untrained users.

Do not operate the robot if you are intoxicated, under the influence of drugs, or unable to concentrate. Familiarize yourself with the power-on/off procedure, the remote-control state machine, and the emergency stop (L-stick + R-stick simultaneously) before switching the robot on.

Caution: The P1 is a bipedal robot that can become unstable or fall if powered on or off outside a controllable state. Always power on/off with the robot either lifted clear of the ground (hanging bracket or by hand) or crouched on the ground, keep the emergency stop within reach, and support the toes before entering damping mode.

2 Disclaimer

The LimX P1 documented here is sold and supported by *MYBOTSHOP GmbH* as the German distributor for LimX Dynamics. Basic ROS 2 understanding is required to operate the software stack covered in this manual — if you are not familiar with ROS 2, we recommend checking the [ROS 2 documentation](#) first.

The client acknowledges and agrees that any information or materials provided by MYBOTSHOP GmbH are for R&D and development purposes only. Any services are provided "AS IS" and without any representation or warranty of any kind, express or implied, including but not limited to any warranty of merchantability, fitness for a particular purpose, non-infringement, or any other warranty.

This product is intended for civilian, research and development use only. Users should avoid making dangerous modifications or using the robot in hazardous ways. The P1 is an early-stage documented platform — the ROS 2 driver operation chapter and FAQ are not yet published by LimX Dynamics/MYBOTSHOP at the time of writing, and are included here as placeholders so this manual stays current as they are released. For terms, policies and compliance with local laws and regulations, refer to the RMA/support process in the Getting Help & RMA chapter.

MYBOTSHOP GmbH shall not be liable for any damages, including but not limited to direct, indirect, special, incidental, or consequential damages, arising out of or in connection with the use or inability to use the information or materials in this document. This limitation on liability shall apply regardless of the form of action, whether in contract, tort, or otherwise.

3 About the LimX P1

LIMX P1



The LIMX P1 is a cutting-edge bipedal robot designed to push the boundaries of robotics in both research and practical applications. Developed with advanced control systems and dynamic motion capabilities, the LIMX P1 is capable of navigating complex terrains, maintaining balance, and performing a range of human-like movements. Ideal for research institutions and industries focused on robotics, AI, and automation, this versatile platform provides an invaluable tool for developing and testing algorithms in real-world scenarios. With its robust design and adaptability, the LIMX P1 is paving the way for the future of autonomous bipedal robotics.

4 Quick Start – Powering On, Startup & Remote Control

Powering P1

Power On Procedure

When the Robot is off, turn on the battery first by short pressing + long pressing; the battery light will turn on.



- Then turn on the robot switch to start the robot located at the back of the robot.
- Wait 30-40 seconds for the robot to power on complete.

Power Off Procedure

- When the Robot is on, turn off the robot switch (located at the back of the robot) first.
- Turn off the battery by short pressing + long pressing; the light will turn off.
- Power off complete.

Note: If the device cannot be controlled or does not enter the system after powering on, please check the battery level and try restarting.

Important: When powering on or off, please ensure the device is in a controllable state (e.g., lifeup or crouched on the ground, pictures below).



- Use a hanging bracket to lift the robot off the ground, or you can hold and lift the robot by hand.



- If robot auto zero correction fails. Please re-zero the robot (Press L1+X, then press L1+R1).

Robot Startup

- Turn on the battery switch and ensure the system completes power-up by turning on the switch at the back of the robot and waiting 30-40 seconds after power-up.



- Lift the robot onto its toes.



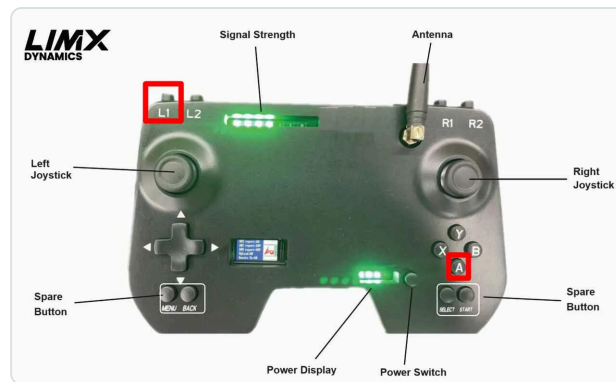
- Press Right joystick to fully activate the robots controls.



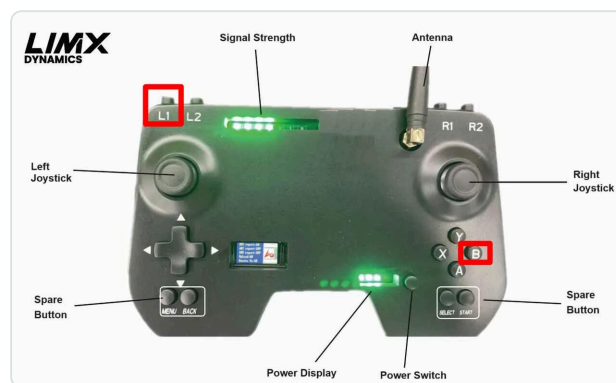
- Use the remote control to zero the robot (press L1 + R1).



- Use the remote control to put the robot into standing mode (press L1 + A) (the robot's feet need to touch the ground).



- Use the remote control to put the robot into walking mode (press L1 + B) (the right joystick of the remote control controls forward and sideways walking of the robot, while the left joystick controls left and right rotation).



- Use the remote control to put the robot into damping mode (press L1 + X, support the toes before entering damping mode).



- Power down the entire system by turning off the switch at the back of the robot.

Remote Control



- **Signal Strength:** At least 1 bar of signal is needed to control the robot.
- **Power Display:** When there is only 1 bar of power left, there is a risk of the remote control.
- **Left Joystick:** Controls the robot's forward and backward movement and lateral movement.
- **Right Joystick:** Controls the robot's direction.
- **Power Switch:** Single click to turn on the power, double click to turn off the power
- **Spare Button:** Currently it has no function.

Remote Control Modes

States	Key Value	States Description	Preconditions
Auto Zeroing	L1+R1	Initialize all joints	The robot needs to be suspended and off the ground
Idle State	L1+X	All joint motors are in torque damping mode and gradually descend This mode is entered after powering on	The robot needs to be suspended and off the ground
Standing State	L1+A	Both legs autonomously Standing power up and perform State ground contact/stand-up actions	Requires external force assistance, and both feet are in contact with the ground
Walking State	L1+B	The robot enters a stepping state and can be controlled remotely	X
Developer State	R1+Left	Users can deploy control and secondary development programs	After switching to developer mode, the main station automatically restarts to take effect
Non-Developer State	R1+Right	Mode for RL model- controlled robot movement	Effective after switching until switching to other modes (developer mode / MB mode) After switching modes, the main station automatically restarts to take effect
E-Stop	Left and right joystick button	All motors and computers immediately Global power off but battery power and indicator lights remain on the entire unit may drop	Press simultaneously; triggers emergency stop in any mode and state, immediately cutting off all motor power

E-Release	Right Joystick button	Motor Power-up again	Single click; no effect in other states; upon release, enters damping state
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External Power

To use external power as an input please follow the below mentioned steps:

- Remove the top cover of P1 by uncrewing two screws as shown in the picture below.



- Once unscrewed you should be able to see the power ports from which one of them is for the DJI battery.

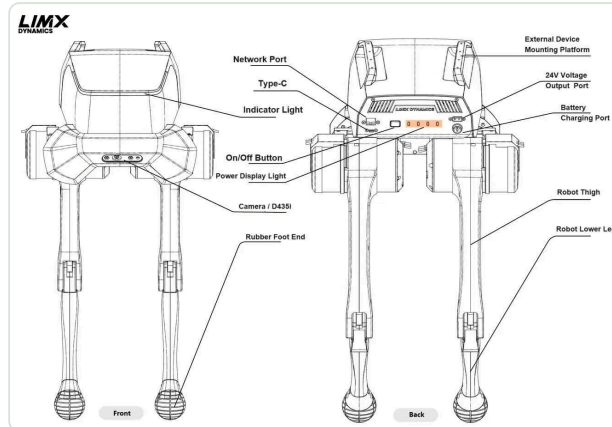


- Unplug that power port and and connect the alternative 24V external power supply that you want to use.

5 Network & Robot Access

Robot Interface

Instructions for interfacing with the robot using Ubuntu 22.04 and ROS2 Humble .



The Ethernet port at the back of the P1 can be utilized for setting up communication via LAN.

Network Connection

For the first time, one needs to connect through a LAN cable to configure the robot's network. To create a static connection in your PC (not the robots), in Ubuntu go to Settings → Network then click on + and create a new connection.

1. Change the connection to Manual in the IPv4 settings.
2. Set the Address IP as 10.192.1.200 and the Netmask as 24.
3. Click save and restart your network.

After a successful connection, check the host's local IP by typing in the Host PC's terminal:

```
ifconfig
```

Now, ping the robot:

```
ping 10.192.1.2
```

Access the robot via SSH:

```
ssh -X limx@10.192.1.2
```

The default password is:

```
123123
```

IP Addresses

Device	IP Address	Password
P1 MCU	10.192.1.2	123123

Note: Sometimes other networks can cause disruptions when connecting to the P1. It is best to have only your connection to the robot active and all others inactive.

6 ROS 2 Software Setup

ROS2 Installation



The ROS driver for the robots is initially supported for the ROS2 Humble . All of ROS related software should be installed in a remote p1-PC as well as the Remote-PC . The steps for shown below are for Remote-PC as the p1 is pre-installed with the required drivers and ROS distribution.

Warning: Care should be taken when installing ROS so that it matches with your CPU's architecture (i.e. armhf, amd64, arm6, etc.)

Note: All the ROS related software should be installed/run on remote PC/Raspberry Pi/Nvidia board, nothing needed to be installed on robots control board if bought with the ROS pkg.

PC Setup

ROS2 Humble installation requires Ubutnu 22.04.

1. Download Ubuntu 22.04
2. Follow the Ubuntu 22.04 installation guide

ROS Humble Installation

The ROS driver provided can be run either on a remote PC or on board robot computer. Typically, the on-board computer already has a pre-installed ROS distribution, so the instructions below will be applicable to a remote computer. You may execute the following commands to install ROS Humble, or you can simply follow the instructions from the ROS Wiki.

Set Locale

Ensure that your system supports UTF-8 locale. Verify your locale settings with the following command:

```
locale
```

If necessary, set up a UTF-8 locale:

```
sudo apt update && sudo apt install locales
sudo locale-gen en_US en_US.UTF-8
sudo update-locale LC_ALL=en_US.UTF-8 LANG=en_US.UTF-8
export LANG=en_US.UTF-8
```

Setup Sourcess

Add the ROS2 apt repository to your system. First, make sure that the Ubuntu Universe repository Ubuntu Universe repository is enabled:

```
sudo apt install software-properties-common
sudo add-apt-repository universe
```

Next, add the ROS2 GPG key with apt:

```
sudo apt update && sudo apt install curl -y
sudo curl -sSL https://raw.githubusercontent.com/ros/rosdistro/master/ros.key -o
/usr/share/keyrings/ros-archive-keyring.gpg
```

Then, add the repository to your sources list:

```
echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share/keyrings/ros-archive-
keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /etc/os-release && echo
$UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ros2.list > /dev/null
```

Install ROS2 Packages

Update your apt repository caches after setting up the repositories:

```
sudo apt update
```

Ensure your system is up to date before installing new packages:

```
sudo apt upgrade
```

Warning: Due to early updates in Ubuntu 22.04 it is important that systemd and udev -related packages are updated before installing ROS2. The installation of ROS2's dependencies on a freshly

installed system without upgrading can trigger the removal of critical system packages . Please refer to ros2/ros2#1272 and Launchpad #1974196 for more information.

Desktop Install (Recommended)

Install ROS, RViz, demos, and tutorials:

```
sudo apt install ros-humble-desktop
```

ROS-Base Install (Bare Bones)

Install communication libraries, message packages, and command line tools without GUI tools:

```
sudo apt install ros-humble-ros-base
```

Development Tools

Install compilers and other tools to build ROS packages:

```
sudo apt install ros-dev-tools
```

Environment Setup

Source the setup script to set up your environment:

```
# Replace ".bash" with your shell if you're not using bash
# Possible values are: setup.bash, setup.sh, setup.zsh
source /opt/ros/humble/setup.bash
```

Try Some Examples

If you installed Desktop Install (Recommended) above, try some examples:

Run a C++ talker in one terminal:

```
source /opt/ros/humble/setup.bash
ros2 run demo_nodes_cpp talker
```

Run a Python listener in another terminal:

```
source /opt/ros/humble/setup.bash
ros2 run demo_nodes_py listener
```

This verifies both the C++ and Python APIs are working properly.

Next Steps After Installing

Continue with the tutorials and demos to configure your environment, create your own workspace and packages, and learn ROS2 core concepts.

Uninstall

If you need to uninstall ROS2 or switch to a source-based install once you have already installed from binaries, run the following command:

```
sudo apt remove ~nros-humble-* && sudo apt autoremove
```

You may also want to remove the repository:

```
sudo rm /etc/apt/sources.list.d/ros2.list
sudo apt update
sudo apt autoremove
# Consider upgrading for packages previously shadowed.
sudo apt upgrade
```

7 ROS 2 Driver Operation

Operation

Coming soon ...

8 Getting Help & RMA

RMA / Support

How to Raise a Return Merchandise Authorization (RMA) Case

At MYBOTSHOP GmbH, we are committed to providing excellent support to ensure your issues are resolved promptly. If you encounter any problems with our products, please follow the steps below to raise a Return Merchandise Authorization (RMA) case:

Step 1: Open a Topic in Our Forum

1. Visit MYBOTSHOP Forum .
2. Open a new topic describing your issue in detail. Our support team and community members will attempt to assist you in resolving the problem remotely.

Step 2: Contact Support for RMA Number

If the issue cannot be resolved remotely through our forum:

1. Email us at support @ mybotshop . de .
2. Provide a detailed description of the issue and include any troubleshooting steps already taken.
3. Our support team will evaluate your case and, if necessary, issue a RMA number along with a return address or a shipping label.

Important Shipping Information

Note: Please note: All goods must be sent back to the following address: MYBOTSHOP GmbH Willy - Messerschmitt - Strasse 12 50126 Bergheim Germany Do not ship goods without obtaining a RMA number. Parcels sent without a RMA number will be declined and returned to the sender.

Help Resources

In case of any issues, help can be taken from any of the following forums/resources:

1. MYBOTSHOP Forum : The forum is actively monitored by support teams at MYBOTSHOP GmbH .
2. Github Issues : Issues can be reported in the repository.
3. Online QA Sites: Questions can be asked on any of the QA sites like StackOverflow and Answers ROS .

9 FAQ

Frequently Asked Questions

Comming soon