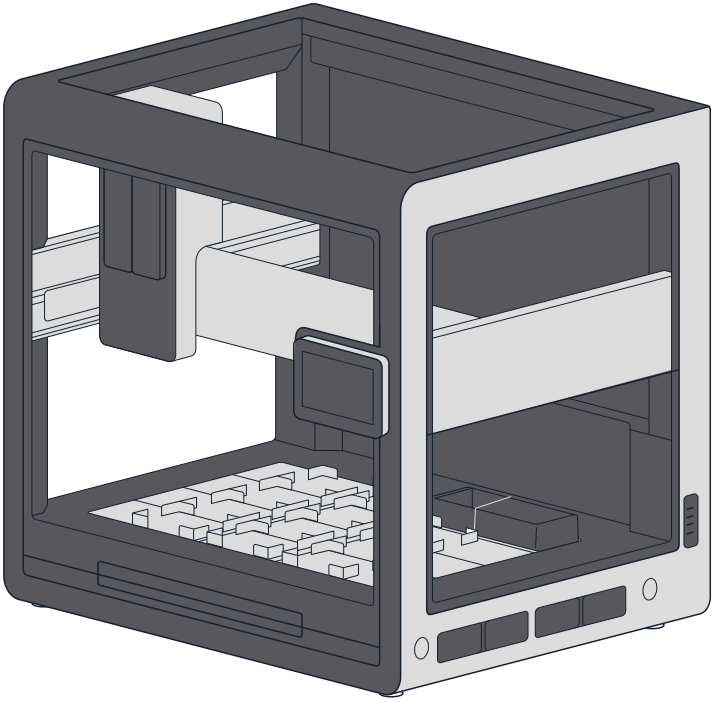
opentrons FLEX™

Opentrons Flex Liquid Handling Robot

Quickstart Guide



Opentrons Labworks Inc.

September 2024

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Product and Manufacturer Description

PRODUCT DESCRIPTION

Opentrons Flex is a liquid-handling robot designed for high throughput and complex workflows. The Flex robot is the base of a modular system that includes pipettes, a labware gripper, on-deck modules, and labware — all of which you can swap out yourself. Flex is designed with a touchscreen so you can work with it directly at the lab bench, or you can control it from across your lab with the Opentrons App or our open-source APIs.

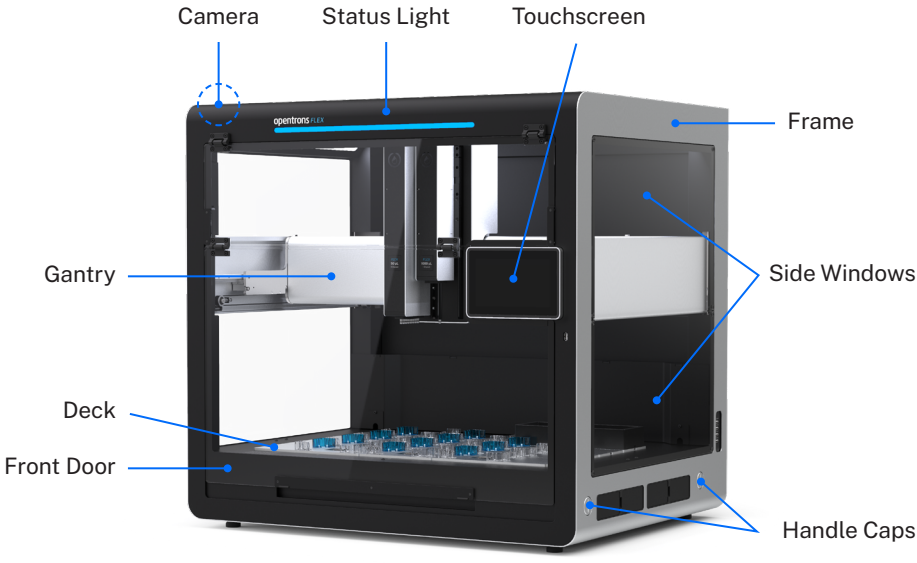
MANUFACTURER DESCRIPTION

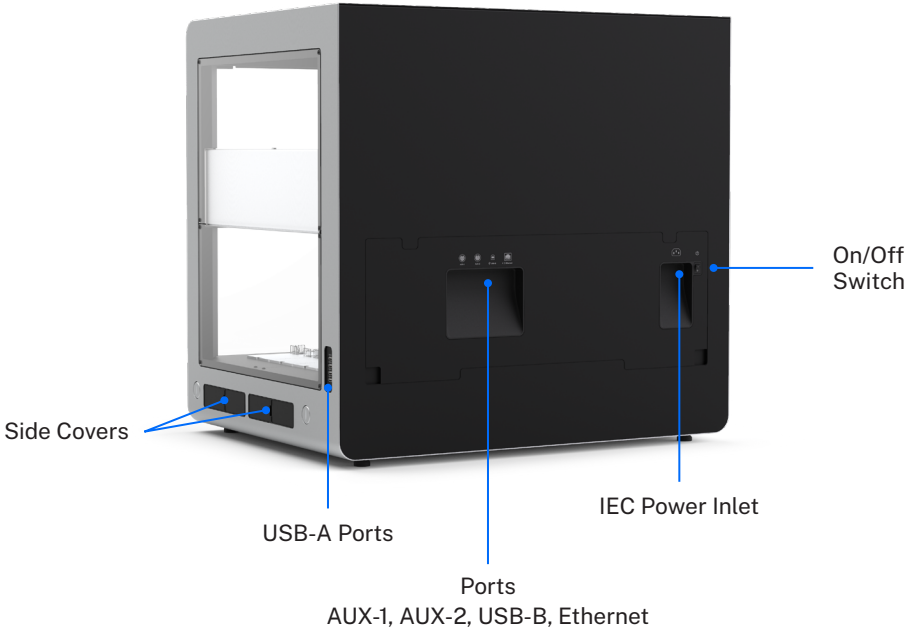
Opentrons Labworks Inc
45-18 Ct Square W
Long Island City, NY 11101

Post-sales service & contacting Opentrons

If you have any questions about the use of the system, abnormal phenomena, or special needs, please contact: support@opentrons.com. Also visit www.opentrons.com.

Product Elements





Product Elements

Shipping weight (crate, robot, parts): 148 kg (326 lbs)

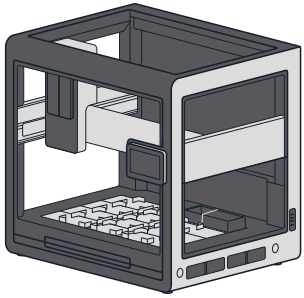
Robot weight: 88 kg (195 lbs)

Dimensions: 87 cm W x 69 cm D x 84 cm H (about 34″ x 27″ x 33″)

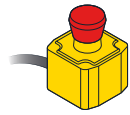
Operating space:
Flex needs 20 cm (8″) of side and back clearance. **Do not** place the sides or back flush against a wall or another surface.

CRATE CONTENTS

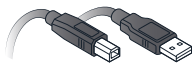
The Flex ships with the following items. Other instruments and modules are packaged separately, even if you purchased them together as a workstation.



(1) Opentrons Flex robot

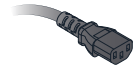


(1) Emergency Stop Pendant

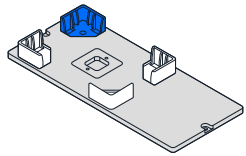


(1) USB cable

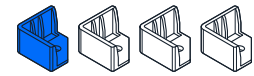
(1) Ethernet cable



(1) Power cable

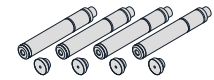


(1) Deck slot with labware clips

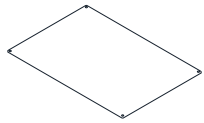


(4) Spare labware clips

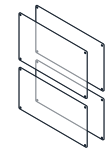
(1) Pipette calibration probe



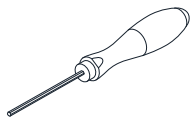
(4) Carrying handles and caps



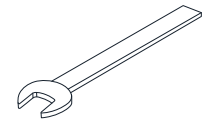
(1) Top window panel



(4) Side window panels



(1) 2.5 mm hex screwdriver



(1) 19 mm wrench

(16 + spares) Window screws
(M4x8 mm flat head)

(10) Spare deck slot screws
(M4x10 mm socket head)

(12) Spare deck clip screws
(M3x6 mm socket head)

(5) L-keys
(12 mm hex, 1.5 mm hex,
2.5 mm hex, 3 mm hex, T10 Torx)

Unboxing

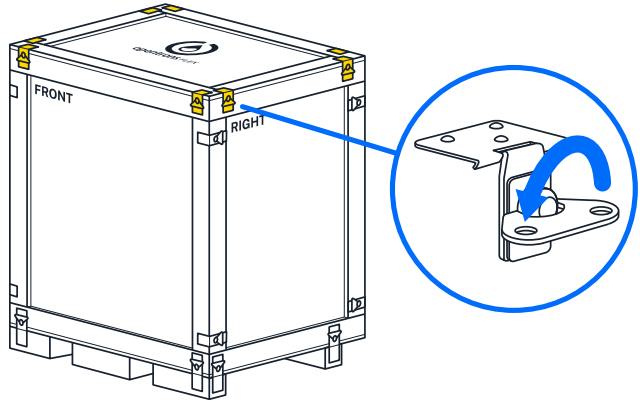
Working with a partner, unboxing and assembly takes about 30 minutes to an hour. See the Installation and Relocation chapter in the Flex Instruction Manual for more information.

Note: The Flex requires two people to lift it properly. Also, lifting and carrying the Flex by its handles is the best way to move the robot.

You can reuse the crate and internal shipping components. We recommend keeping the crate panels and the internal shipping items in case you need to transport your Flex in the future.

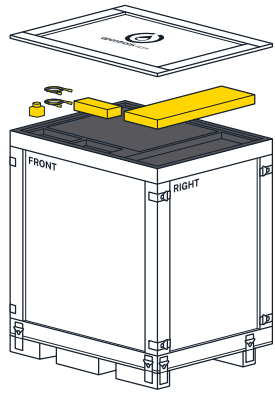
DISASSEMBLE CRATE AND REMOVE ROBOT

1. Unlock the latches holding the top to the sides, and remove the top panel.

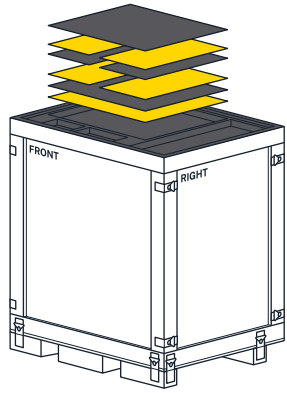


2 Cut open the blue shipping bag, remove these items from the padding, and set them aside:

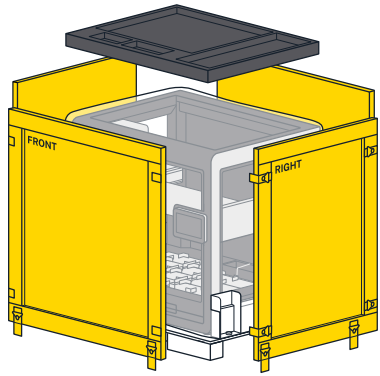
- User Kit
- Power, Ethernet, and USB cables
- Emergency Stop Pendant



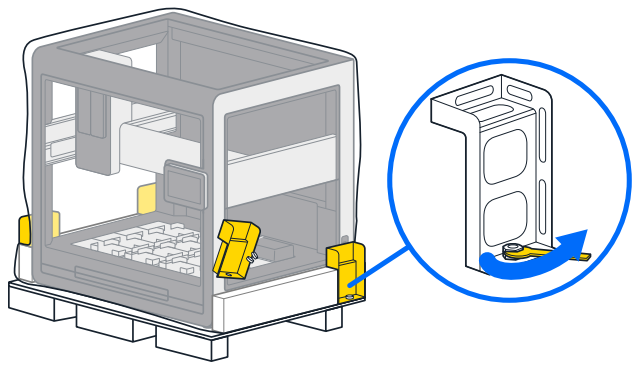
3 Remove the top piece of foam padding to expose the window panels. Remove the window panels and set them aside. You'll attach these later.



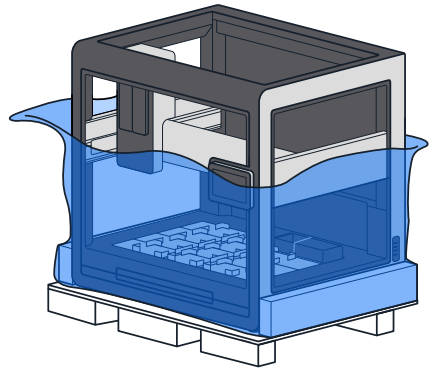
4 Unlock the remaining latches holding the side panels to each other and the base of the crate. Remove the side panels and set them aside.



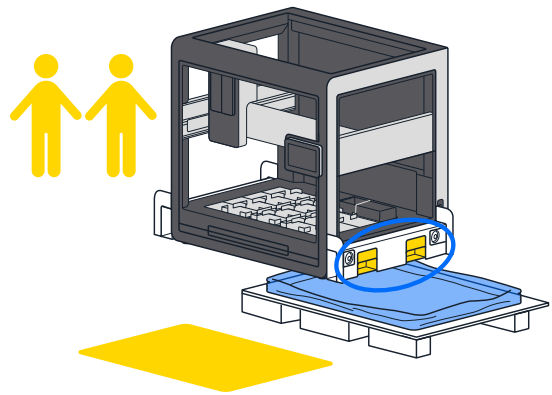
5 Using the 19 mm wrench from the User Kit, unbolt the brackets from the crate bottom.



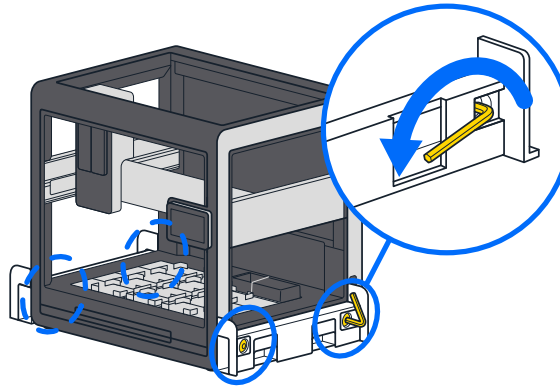
6 Pull or roll the shipping bag all the way down to expose the entire robot.



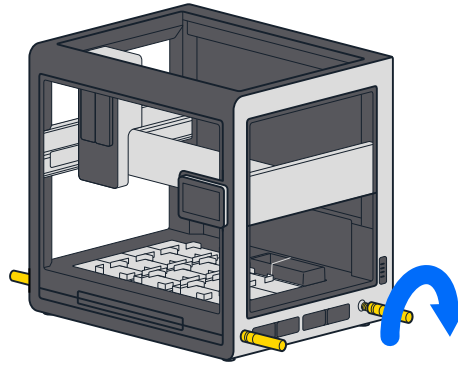
7 With help from your lab partner, grab the handholds in the orange shipping frames on either side of the robot's base, lift the Flex off the crate base, and set it down on the floor.



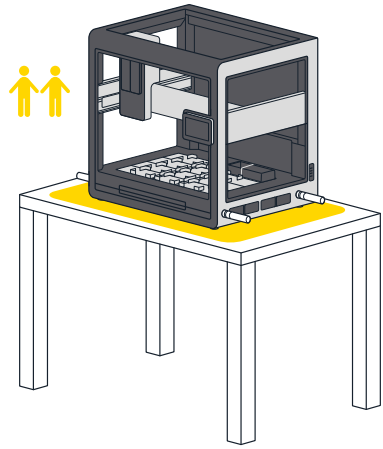
8 Using the 12 mm hex L-key from the User Kit, remove the four bolts holding the shipping frames to the Flex.



9 Remove the four aluminum handles from the User Kit. Screw the handles into the same locations that held the 12 mm shipping frame bolts.

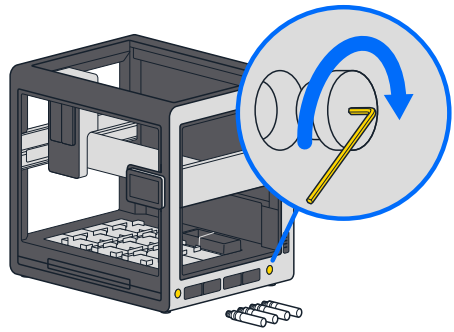


10 With help from your lab partner, lift the Flex by its carrying handles and move it to a workbench for final assembly.



FINAL ASSEMBLY AND POWER ON

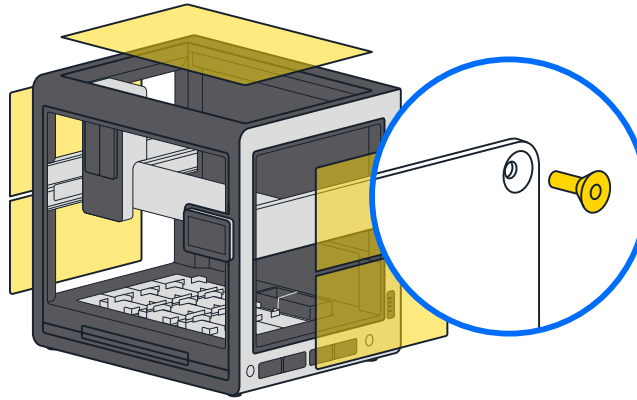
11 After moving the robot, remove the carrying handles and replace them with the finishing caps. The caps close the handle openings in the frame and give the robot a clean appearance. Return the handles to the User Kit for storage.



12 Retrieve the top and side panels from the packing foam you set aside after removing the crate top.

13 Fit the window panels to the Flex by following the labeling information on the front protective film. Then remove the protective film.

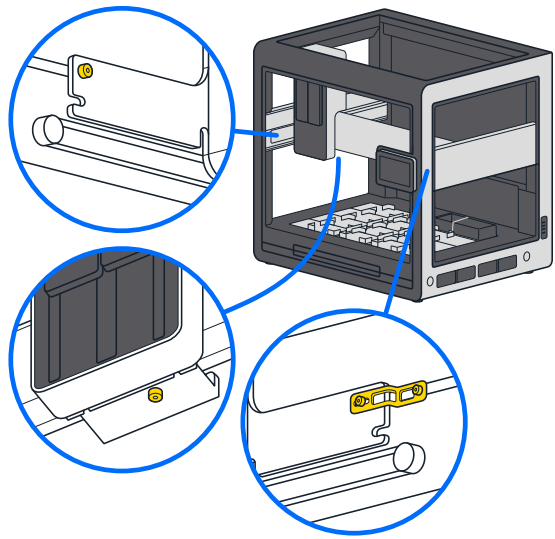
14 Using the beveled window screws and the 2.5 mm screwdriver from the User Kit, attach the window panels to the Flex. Make sure the beveled (V-shaped) holes in the window panels are facing out (towards you). This allows the screws to fit flush with the surface of the window.



Warning: Incorrectly orienting the panels can lead to damage. Excessive screw torque can crack the panels. Hand tighten the screws until the window panels are reasonably secure. This is not a trial of strength.

15 Using the 2.5 mm screwdriver from the User Kit, remove the locking screws from the gantry. These screws prevent the gantry from moving while in transit. The gantry locking screws are located:

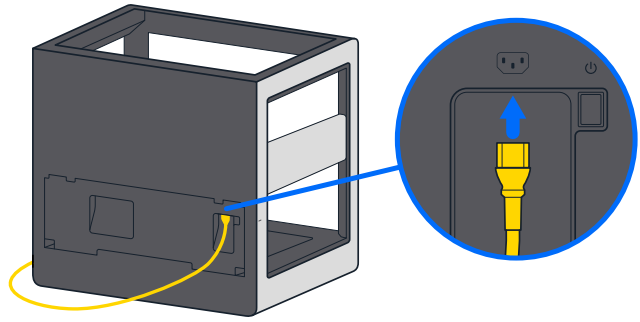
- On the left side rail near the front of the robot.
- Underneath the vertical gantry arm.
- On the right side rail near the front of the robot in an orange bracket. There are two screws here.



The gantry moves easily by hand after removing all the shipping screws.

16 Cut and remove the two rubber bands that hold the trash bin in place during shipping.

17 Attach the power cord to Flex and plug it into a wall outlet. Make sure the deck area is free of obstructions. Flip the power switch on the back left of the robot. Once powered on, the gantry moves to its home location and the touchscreen displays additional configuration instructions.



First Run

When you turn on Flex for the first time, it will guide you through the network connection procedure, update itself with the latest software, and let you give it a name. See the Installation and Relocation chapter in the Flex Instruction Manual for more information.

CONNECT TO A NETWORK OR COMPUTER

Follow the prompts on the touchscreen to get your robot connected so it can check for software updates and receive protocol files. There are three connection methods: Wi-Fi, Ethernet, and USB.

Note: You need to have internet connectivity to set up Flex.

Wi-Fi: Use the touchscreen to connect to a Wi-Fi network that is secured with WPA2 Personal authentication. Or use Ethernet or USB to complete initial setup, and add your Wi-Fi network later.

Ethernet: Connect your robot to a network switch or hub with an Ethernet cable.

USB: Connect the provided USB A-to-B cable to the robot's USB-B port and an open port on your computer. USB setup requires the connected computer to have the Opentrons App installed *and running*.

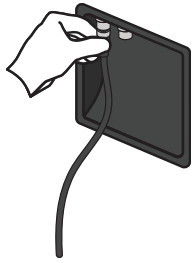
Download the Opentrons App from **https://opentrons.com/ot-app/**. The app requires at least Windows 10, macOS 10.10, or Ubuntu 12.04.

INSTALL SOFTWARE UPDATES

Now that you've connected to a network or computer, the robot can check for software and firmware updates and download them if needed. If there is an update, it may take a few minutes to install. Once the update is complete, the robot will restart.

ATTACH EMERGENCY STOP PENDANT

Connect the included Emergency Stop Pendant (E-stop) to an auxiliary port (AUX-1 or AUX-2) on the back of the robot.



Attaching and enabling the E-stop is *mandatory* for attaching instruments and running protocols on Flex.

For more information on using the E-stop during robot operation, see the System Description chapter in the Flex Instruction Manual.

NAME YOUR ROBOT

Naming your robot lets you easily identify it in your lab environment. If you have multiple Opentrons robots on your network, make sure to give them unique names.

Congratulations! Now you've successfully set up your Opentrons Flex robot!

Follow instructions on the touchscreen or in the Opentrons App to attach and calibrate instruments.

Additional Setup Information

For more information about unboxing, assembly, software configuration, moving/relocation, and attaching instruments and modules, see the Installation and Relocation chapter in the Flex Instruction Manual.

Additional Product Information

MAINTENANCE AND CLEANING

You can use alcohol (70% solution), bleach (10% solution), or distilled water to clean the robot. You can wipe off all the visible and easily accessible surfaces of your Flex. This includes the exterior and interior frame, touchscreen, windows, gantry, and deck. The Flex does not have any internal parts that you need to open or disassemble for this level of maintenance. If you can see it, you can clean it. If you can't see it, don't clean it.

See the Maintenance and Service chapter in the Flex Instruction Manual for more information.

WARRANTY

All hardware purchased from Opentrons is covered under a 1-year standard warranty. Opentrons warrants to the end-user of the products that they will be free of manufacturing defects due to part quality issues or poor workmanship and also warrants that the products will materially conform to Opentrons' published specifications.

See the Warranty section of the Maintenance and Service chapter of the Flex Instruction Manual for more information.

SUPPORT

Opentrons Support can help you with questions about our products and services. If you discover a defect, or believe your product is not functioning to published specifications, contact us at **support@opentrons.com**.

REGULATORY COMPLIANCE

The Opentrons Flex has been tested and complies with all applicable requirements of the following safety and electromagnetic standards.

- IEC/UL/CSA 61010-1, 61010-2-051
- EN/BSI 61326-1
- FCC 47CFR Part 15 Subpart B Class A
- IC ICES-003
- Canada ICES-003(A) / NMB-003(A)
- California P65

See the Introduction of the Flex Instruction Manual for more information.

WEEE POLICY

Opentrons is dedicated to adhering to the EU Directive on Waste Electrical and Electronic Equipment (WEEE – 2012/19/EU). Our goal is to ensure that our products are properly disposed of or recycled once they reach the end of their useful life.

Opentrons products that fall under the WEEE directive are labeled with the  symbol, signifying that they should not be thrown away with regular household waste but must be collected and handled separately.

If you or your business have Opentrons products that are at end of life or need to be discarded for a separate purpose, contact Opentrons for proper disposal and recycling.

For a PDF of the complete **Opentrons Flex Instruction Manual**, scan this QR code: