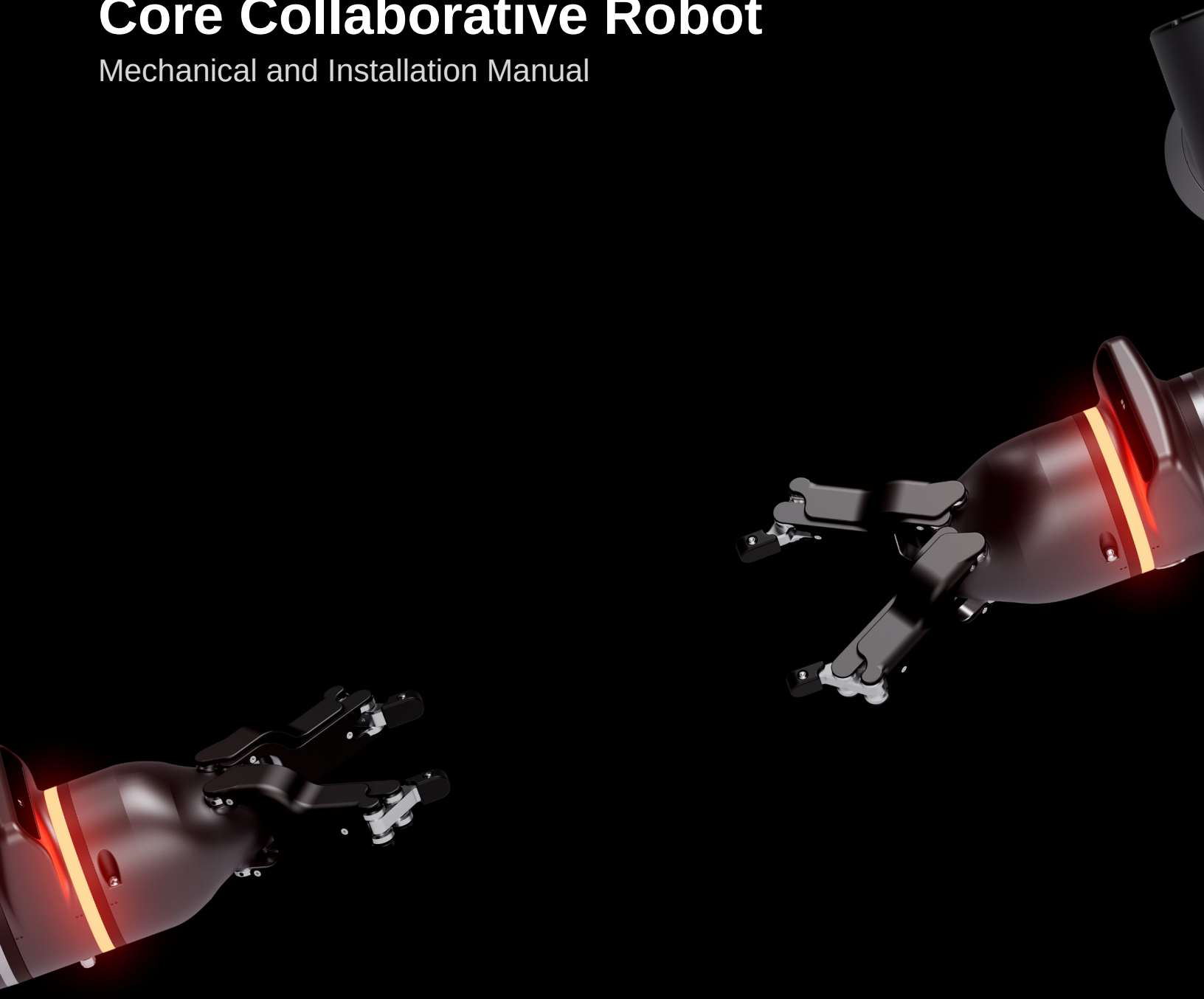
Core Collaborative Robot

Mechanical and Installation Manual



STANDARD BOTS

Core Mechanical and Installation Manual

Standard Bots

Revised August 28, 2026

Table of Contents

Chapter 1

Introduction

1.1 Welcome!

Congratulations on your new Standard Bots **Core** robot.

At Standard Bots, we believe robots should elevate people's work—not complicate it. **Core** was designed to deliver industrial-grade performance while remaining intuitive, accessible, and flexible to deploy. Core offers precision, reliability, and one of a kind user experience that you have come to expect from Standard Bots.

This manual is intended to provide everything you need to safely install, configure, and operate your Core robot. If questions arise at any point, our team is ready to help!

1.2 Contacting Standard Bots Support

- **Email:** support@standardbots.com
- **Phone:** 1-888-9-ROBOTS
- **Address:** Standard Bots, 35 Garvies Point Rd, Glen Cove, NY 11542

1.3 Intended Use & Limitations

The **Standard Bots Core robot and control box** are intended for industrial automation applications such as pick-and-place operations and other repetitive processes performed with compatible tooling. Core is designed to operate within the environmental, electrical, and mechanical constraints defined in this manual.

Core must be used exclusively with the Standard Bots controller supplied with the robot. The robot is not intended to be operated with third-party controllers, and the controller is not intended to be used with other robots.

The Core robot provides various safety settings and measures that, when implemented correctly and evaluated with a risk assessment, allow the robot to work in an unguarded collaborative environment in close proximity to humans.

Any use outside the specifications, constraints, or procedures defined in this manual is considered misuse. Prohibited applications include, but are not limited to:

- Medical applications
- Applications in an explosive environment
- Applications where ingress protection above IP54 is required
- Applications with improper safety integration or where a risk assessment has not been created and evaluated
- Applications requiring a high degree of food safety

Standard Bots expressly denies any liability or expressed or implied warranty claims arising from intentional or unintentional misuse.

1.4 Warnings & Risks

1.4.1 General Information

This manual is not a comprehensive guide to robot cell design or full system integration. It does not cover the selection, validation, or integration of third-party components that may be required to create a complete and compliant automation solution.

All installations must comply with applicable local, national, and international standards and regulations in the country of use. Standard Bots does not assume responsibility for ensuring compliance of a complete installation. The system integrator or end user is responsible for verifying that all applicable safety and regulatory requirements are met.

1.4.2 Installation

- Make sure to install the robot and all electrical equipment according to requirements and specifications in this manual (see Chapter 2).
- The Core control box should only be connected to secure networks.

- **Risk Assessment**: Core is provided as a partially completed machinery. As such, the robot should only be used as part of a cell after a comprehensive risk assessment has taken place.
  - Aside from the robot itself, such a risk assessment may consider the robot's payload, pinching hazards, any toxic or hazardous substances in the cell, and risks involved with sharp end effectors.
  - Risk assessments must cover the entire scope of the integration, including components provided by other suppliers.

  - The risk assessment will help determine any speed or force limits to set up on the robot and what safety accessories (like light curtains or area scanners) can be used. These settings are covered in Chapter 4.
  - Anti-gravity (hand-guided) mode should only be used if risk assessment approves its use.
  - Refer to ISO 10218-2 and ISO/TS 15066 for comprehensive guidelines.
- Only trained, instructed, and otherwise qualified personnel may conduct cleaning, maintenance and repair of the robot.

1.4.3 Operator Safety

- Always ensure that the robot is well-maintained and in good mechanical condition before operating it. Always inspect it before use.
- Don't wear jewelry or loose clothing when working with Core. Tie back any long hair.
- Never open the control box cabinet door during operation. Never feed wires through the door; feed them through the rubber slot on the bottom of the box.
- Don't expose the robot to strong magnetic fields. This may damage the robot or cause malfunctions.
- Depending on other noise in the environment where the robot is used, hearing protection may be required.
- Never attempt to make any repairs, adjustments, or inspections while the robot is running.
- Operators should stay alert and focused when operating the robot. Avoid distractions and keep attention on the task at hand.

1.4.4 Transportation

WARNING — Proper Transportation Required

To prevent damage during transport, the Core robot **must be shipped using the supplied foam slabs and securely fastened to the crate**, with all joints positioned in the **designated "box position."** Transporting the Core robot outside of these conditions may result in damage.

1.4.5 Cybersecurity

The Standard Bots Core is able to connect to both wired and wireless internet in order to facilitate remote access, troubleshooting and software updates. It is imperative to follow best cybersecurity practices, as you would with any industrial device capable of being accessed online.

1. Secure communication: Make sure the communication channels used by your robot are encrypted and secure, so that unauthorized individuals cannot access the robot's data or control its actions.
2. Strong passwords: Set strong passwords for your robot's user accounts and ensure that they are changed regularly. Use a password manager to help you create and manage secure passwords.
3. Regular updates: Keep your robot's software and firmware up-to-date, as updates often contain security patches that address vulnerabilities.

4. Physical security: Ensure that physical access to the robot and tablet is restricted, and that the robot is stored in a secure location when not in use.
5. Network security: Keep your robot on a separate network or VLAN, and restrict access to that network to only authorized users.
6. Regular testing: Conduct regular security testing to identify any vulnerabilities and ensure that your robot is secure.

By following these best practices, you can help ensure the security of your robot and protect it from potential cybersecurity threats.

Chapter 2

Hardware Overview

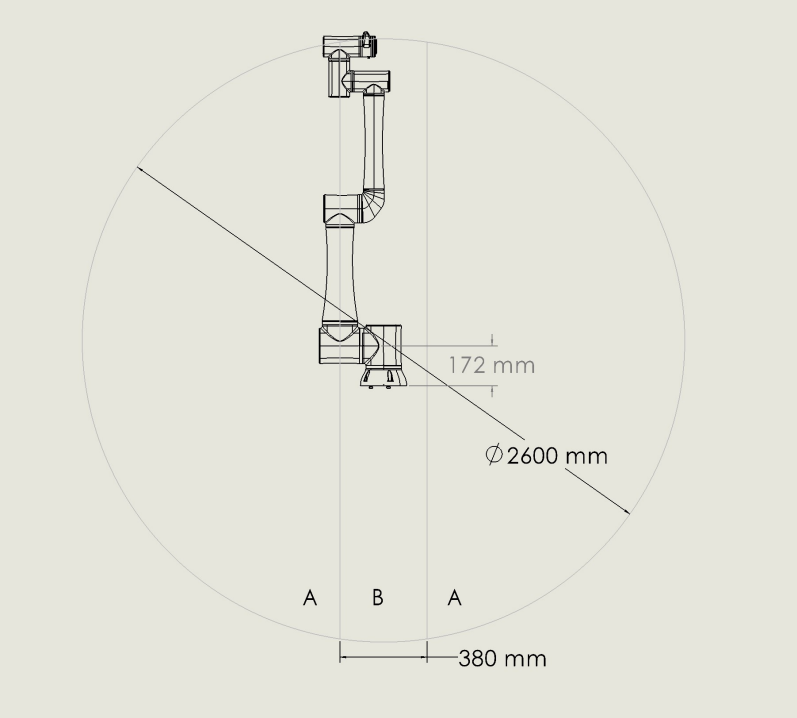
This chapter describes the Core robot's major hardware components — the arm, the control box, and the operating-environment requirements they expect. Use it to orient yourself before installation and as a reference for specifications during integration.

2.1 Arm

2.1.1 Overview

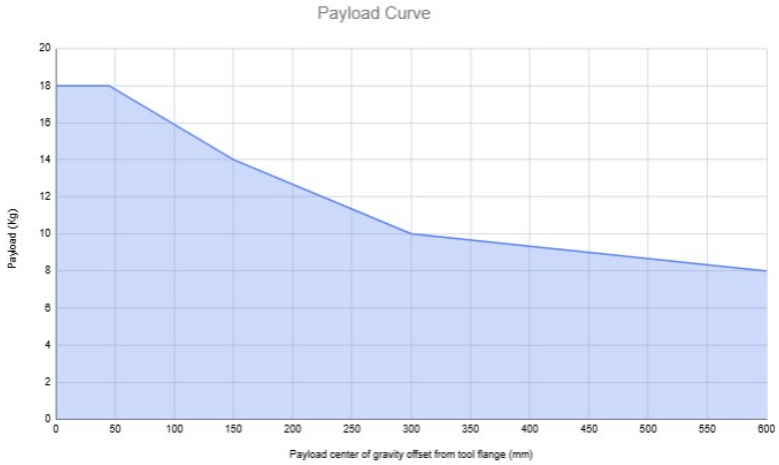
The Core arm contains 6 joints connected by a CAN bus. Each joint has two encoders, two different methods to sense torque, and fail-safe brakes that provide emergency braking torque when power is removed from the arm.

2.1.2 Reach



The Core robot can reach 1300 mm (51.2 in) in a radius from the center of the base (A). There is a radius from the center base of 190 mm (7.5 in) (B) where the robot cannot reach due to its structure. Tools added to the robot end of arm will impact the reach of the robot.

2.1.3 Payload Chart



Footnotes:

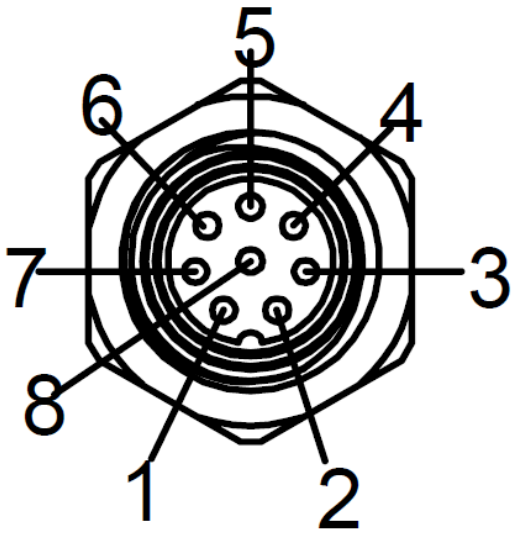
a. At payloads above 16kg, the maximum speed of the robot will be reduced to 25% of the default speed settings. The default tooltip speed is 0.75 m/s.

b. At payloads above 16kg, the weight limit may be reduced if the routine includes stops with the arm near full extension.

c. The above chart assumes near ambient room temperature. Running the robots in warmer environments will reduce payload capacity.

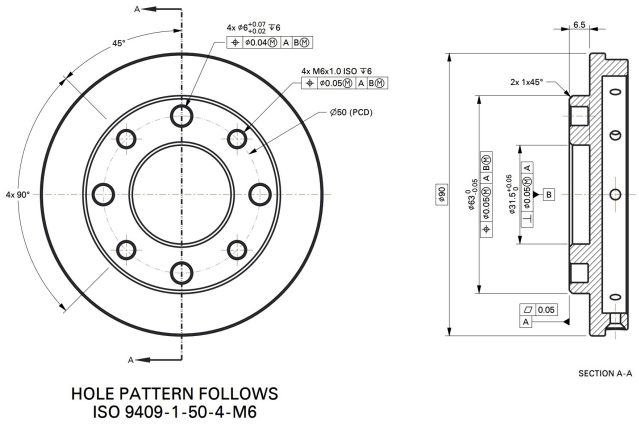
2.1.4 Tool Flange Pinout

The current limit on the 24V DC line of the flange is 3 amps. The flange is capable of PNP or NPN operation and is auto switching. The pinout at the end of the Tool Flange is laid out as shown:



Pin #	Output
1	RS485+
2	RS485-
3	DIG IN 1
4	DIG IN 0
5	POWER 24V
6	DIG OUT 1
7	DIG OUT 0
8	GND

Also, please note that the 4-pin connector at the tool flange is not currently supported.



HOLE PATTERN FOLLOWS
ISO 9409-1-50-4-M6

2.1.5 Supported End Effectors

Core supports a range of integrated end-of-arm tools (EOATs) including OnRobot 2FG7, 2FG14, 3FG15, and Dual Changer, plus Schunk EGU and EGK grippers. Any tool driven via discrete 24V I/O can also be actuated through the Standard Bots routine editor. See Connecting End Effectors in the Assembly & Setup chapter for the full integration list and connection instructions.

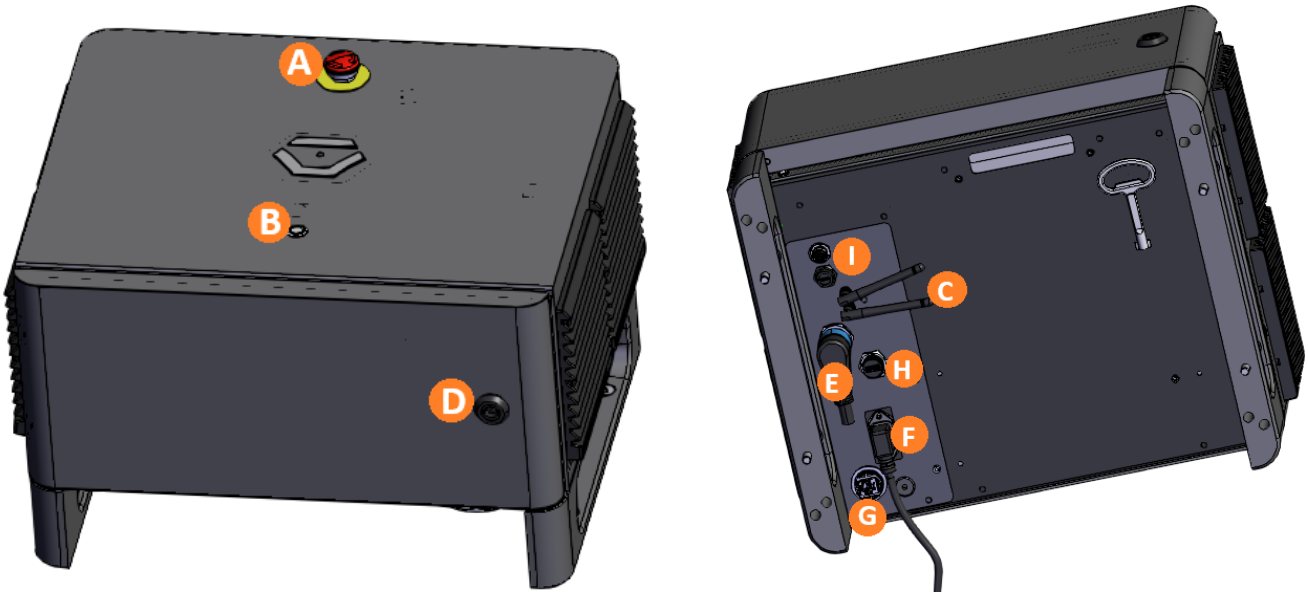
Payload note: When operating with an end effector and payload, the **combined mass** counts toward the robot's payload limit. At payloads above **16 kg, maximum robot speed is automatically reduced to 25% of default settings**. See the Payload Chart above for derating curves.

2.1.6 LED Colors

The robot end of arm has an LED status light for assisting in determining the robot status. The color codes are as follows:

Robot State	Color
Idle or Paused	Solid Green
Bootup / Startup	Color Cycle
Full Speed (above collaborative threshold in Safety Settings)	Yellow Ring Pattern
Reduced Speed (below collaborative threshold in Safety Settings)	Solid Yellow
Antigravity Mode	Solid Blue
Firmware Update	White Ring Pattern
Recoverable Error	Red Pulsing
Fatal Error	Braked

2.2 Control Box

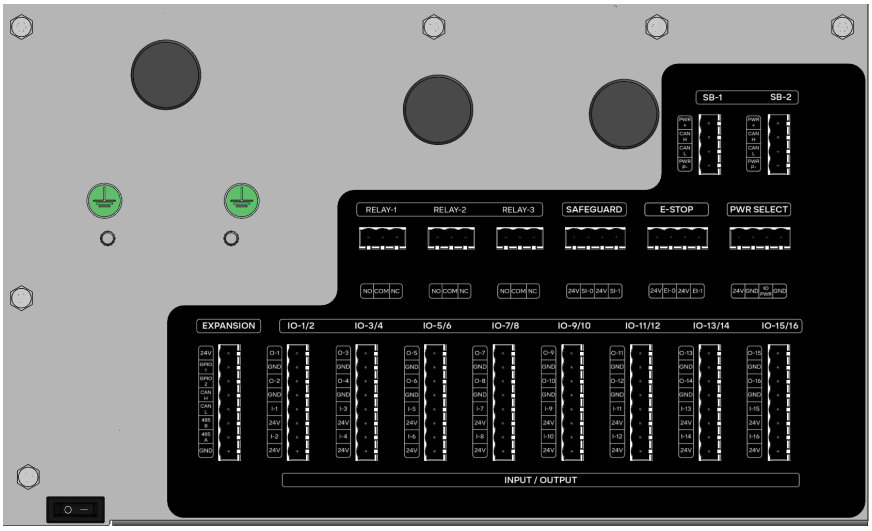


There are several features to note on the control box:

Item	Name	Description
A	**E-Stop**	Pressing the E-stop button initiates an emergency (category 1) stop, cutting power to the arm. Twist the button to reset it.
B	**Button Control**	Turn on button
C	**Bluetooth & Wi-Fi Antennae**	Core ships with two antennas that can be screwed into the top to give the control box access to Bluetooth and Wi-Fi. Bluetooth is used to pair the tablet.
D	**Lock & Key**	Core includes a key that can be used to lock the control box door.
E	**Arm data + power connection**	This links the control box to the arm.
F	**Power**	The control box accepts 120V through a power supply module already certified to IEC 62368-1 and FCC EMI limits.
G	**Ethernet** (RJ45)	This can be used to communicate with other devices in the cell, or to the tablet for programming
H	USB-A port	
I	USB-C port	This links the control box to the camera on the robot arm

2.2.1 Front Panel

Inside the front panel are many ports that can be used to connect the robot to other equipment in the cell:



Section	Port Labels	Description
I/O - 1 and **2**	DI, 24V, GND	This section includes 16 24V I/O ports which can be used to control other equipment in the cell. They are also safety-rated and can be used in pairs to activate safety functions of the robot via the Safety I/O feature.
Relay	RL-1, RL-2, RL3	The relays can be closed to form a circuit and can be used to control equipment in the cell.
Safeguard	-	Unsupported.
E-Stop	-	This can be hooked up to an external E-stop button. When the input is low, it will force the robot to stop. If no external E-stop button is in use, these ports should have jumpers installed.
Motor:	M-1, M-2	Unsupported.
Remote On/Off	ROFF, RON, GND, 24V	Unsupported.
Comms	PWR, GPIO 1+2, CAN H, CAN L, 485 A, 485B	Unsupported. Future software will enable communication with other equipment in cell over serial ports.

2.3 Environmental & Operating Limits

The Core robot and control box are designed to operate safely within the following environmental constraints:

Parameter	Specification
Ambient Temperature	0—55°C (32—131°F)
Humidity (non-condensing)	90% RH
Noise Level	<58 dB (typical, program-dependent)
IP Classification (Robot)	IP54
IP Classification (Control Box)	IP54
Mounting Orientation	Floor mount only

Notes:

- IP54 means the robot and control box are protected against dust ingress and low-pressure water jets from any direction. They are not sealed for submersion or high-pressure washdown.
- Ambient temperature affects payload capacity; operation in warmer environments reduces maximum payload (see Payload Chart above).
- Humidity must remain non-condensing to prevent electrical shorts or corrosion inside the robot or control box.
- Noise levels vary with joint speeds, acceleration rates, and routine complexity. Maximum noise occurs during full-speed, high-acceleration movements.

2.4 Specs

Performance	
Power consumption	Depends on program and payload; range from 25W to 1500W. Does not exceed 15 amps at 120V.
Collaboration operation	Speed & force limiting per ISO/TS 15066, collision detection, and other safety features
Ambient temperature range	0-55°C
Humidity	90%RH (non-condensing)

Specification	
Payload capacity	18kg (39 lbs) maximum. See chart above.
Reach	1.3m (51.2 in)
Max joint speed	435° /s

Specification	
Degrees of freedom	6 degrees

Physical	
Footprint	Ø 200 mm
Materials	Aluminum, steel, plastic
Tool connector type	M8 8-pin & M8 4-pin
Cable length, robot arm	2m (79 in)
Weight, including cable	32.5 kg (71.6 lbs)

Robot Features	
IP classification	IP54
Noise	Depends on program; typically less than 58dB
Robot mounting	Floor mount
Flange I/O ports	Digital In: 2 (24V tolerant, 1A max open-drain), Digital Out: 2 (Open-drain or push-pull, 1A), RS-485 / UART Max data rate: 10mbps
I/O power supply in tool	12V/24V, 3A continuous max

Control Box	
IP classification	IP54
Ambient temperature range	0-55°C
I/O ports	Digital In: 16 (24V Tolerant), Digital Out: 16 (24V 0.7A Out continuous),
Internal I/O power supply	24V, 3A max continuous.
External I/O power supply	12A Maximum
Communication	24V I/O, Modbus TCP, Ethernet IP, APIs over Ethernet
Power source	90 ~ 264VAC, 47-63Hz
Humidity	90%RH (non-condensing)
Control box size	483mm x 385mm x 270mm (19.0in x 15.2in x 10.6in)
Weight	18.5kg (41 lbs)
Materials	Powder-coated steel

Movement	
Repeatability	+/- 0.025 mm

Movement	
Shoulder 1 & 2	Working range: ±360°, Maximum speed: ±287°/sec
Elbow	Working range: ±360°, Maximum speed: ±335°/sec
Wrist 1, 2 & 3	Working range: ±360°, Maximum speed: ±435°/sec
Typical TCP speed	1 m/sec (39.4 in/sec)
Maximum TCP speed	3 m/sec (No payload)

2.5 Hazardous Energy

2.5.1 Overview

Stored energy is a potential source of danger in many industrial settings. When energy is stored in machines or equipment, it can cause serious injury or death if it is released unexpectedly. This type of hazard is commonly known as hazardous stored energy, and it can take many forms, including electrical, hydraulic, pneumatic, chemical, and mechanical energy.

Some common examples of hazardous stored energy include:

- A compressed air cylinder that has not been properly vented before maintenance or repair work is performed
- A hydraulic cylinder that has not been properly locked out before maintenance or repair work is performed
- A battery that is still connected to a piece of equipment, even though the equipment has been shut down
- A piece of machinery that is still moving, even though the power has been turned off

To protect workers from hazardous stored energy, it is important to follow proper lockout/tag-out procedures. Lockout/tag-out procedures involve shutting off the energy source, isolating the equipment, and securing it with a lock or tag to prevent accidental startup. Before any maintenance or repair work is performed on equipment, workers should always verify that the equipment is properly locked out/tagged out.

Additionally, workers should receive proper training on lockout/tag-out procedures and the potential hazards associated with hazardous stored energy. They should understand the importance of following these procedures to prevent injuries and fatalities. Employers should also regularly review and update their lockout/tag-out procedures to ensure that they are effective and up-to-date with the latest safety standards.

Remember, hazardous stored energy can be deadly if not properly controlled. By following proper lockout/tag-out procedures and receiving proper training, workers can stay safe on the job and prevent accidents from occurring.

2.5.2 Hazardous Energy in Standard Bots System

Several types of stored energy can exist in a system utilizing a Standard Bots robot:

Electrical: The Standard Bots control box utilizes 120 VAC power as a primary means of power. The control box utilizes electrical devices such as capacitors which store electrical energy even after the control box has been unplugged from the power source. There are no serviceable parts inside Standard Bots control box and it should not be opened except by trained Standard Bots Employees.

Additionally, the Standard Bots Core robot also contains capacitors to store electrical energy. The robot should not be opened except by Standard Bots personnel. In some cases it may be required to open the joint caps of the robot. This should only be done after the control box power source has been unplugged for at least 2 minutes, and should only be done by Standard Bots personnel.

Mechanical: The Standard Bots Core is capable of lifting 39 lbs (18kg). If the robot is stopped mid cycle and currently has a workpiece in the end of arm tool, a hazard will be present as the workpiece could unexpectedly fall if the source providing the clamping force is de-energized. Always exercise caution and remove the workpiece from the end of arm tool when approaching the robot.

Pneumatic: Core is compatible with a variety of pneumatic accessories. Stored energy exists in the form of compressed air in pneumatic systems. Bodily or hearing injury can occur from accidentally releasing compressed air from pneumatic systems while performing maintenance. Unexpected motion can occur from components when working on energized pneumatic systems. All compressed air should be removed from the system before performing maintenance on any pneumatic system.

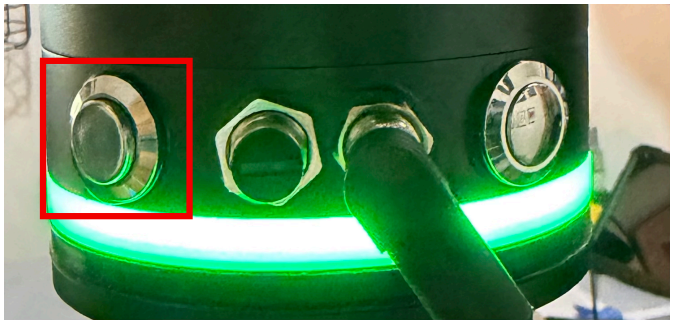
2.5.3 Performing a Lockout

Should a lockout of the Standard Bots Core be required, unplug the AC input cord and use a plug lockout with appropriate lock. Follow all standard lockout tag-out procedures.

If applicable, also lock out any compressed air sources to devices integrated with Core using standard lockout tag-out procedures.

2.6 Anti-Gravity Mode

Anti-gravity mode allows you to physically move the robot by hand. This can be useful for teaching waypoints or positioning the robot. To enable anti-gravity mode, press the Raise button on the robot. The LED at the end of the arm will turn solid blue when anti-gravity mode is active.



Warning: Anti-gravity mode should only be used if the risk assessment approves its use. Ensure the work area is clear before enabling this mode.

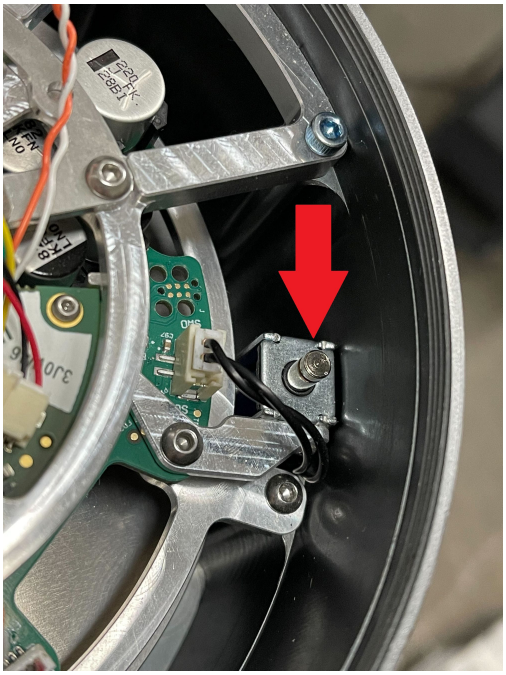
2.7 Movement Without Drive Power

Do not attempt to move Core without drive power unless instructed by Standard Bots personnel, otherwise damage could occur.

Core is a collaborative robot, and is designed to work in environments alongside humans. As such, under normal circumstances moving the robot without drive power is not required. Should the robot position need to be changed, simply use pendant to jog the robot into the required position.

Should you be instructed to move the robot without drive power by Standard Bots personnel, the below procedure can be used on each joint individually to adjust the robot position:

1. Unplug the robot.
2. Remove the cover on either Joint 0 or Joint 1 (bottom 2 joints, shown in attached image) by twisting it off.
3. Press the brake release button (shown in below image) and hold down while moving joint.



4. Move the robot away from the collision a short distance.
5. Release brake button.
6. Replace joint cap.
7. Plug the robot back in.
8. Confirm proper robot operation.

Chapter 3

Assembly & Setup

3.1 Requirements

The Core robot has the following utilities requirements:

Utility	Requirement
Electrical	90 ~ 264VAC, 47-63Hz, 15 A maximum at 120VAC.
Internet	Wi-Fi or RJ45 (Ethernet) wired connection for remote updates and support.
Floor	Mount to a structurally sound concrete floor or engineered base per local codes

3.2 Lifting the Core

Core must be moved using proper lifting practices. The Core arm assembly weighs approximately **32.5 kg (71.6 lb) including cable**. While Core can be lifted by two people, use proper lifting technique — lift with your legs, keep the load close to your body, and ensure the path is clear. Before lifting, ensure the arm is **powered off**, any end effector and payload are removed, and the work area is clear.

Lift slowly and smoothly to prevent swinging or rotation, and use a spotter as needed to guide the arm into position. If the lift or placement cannot be completed safely, stop and contact Standard Bots Support before proceeding.

Lifting and positioning must be performed by qualified personnel.

3.3 Assembly Procedure

3.3.1 Overview

This procedure describes how to mount and set up the Core robot arm. Core can be mounted to the **Standard Bots portable base** (included with most orders) or to a **custom pedestal, table, or struc-**

ture designed by the integrator. Regardless of mounting method, the mounting surface must be rigid enough to support the robot's weight (32.5 kg) plus payload (up to 18 kg) without deflection during operation. A surface that flexes under load will degrade repeatability and may trigger false collision detections.

Do not power the robot until all mechanical fasteners are installed and torqued.

3.3.2 Mounting Requirements (All Installations)

- **Rigidity:** The mounting surface must be structurally sound and resist deflection under the robot's full dynamic load. For custom mounts, steel or thick aluminum plate (minimum 12 mm / 0.5 in) bolted to a rigid structure is recommended.
- **Level:** The mounting surface must be level. The robot's collision detection and gravity compensation assume a level mount.
- **Bolt pattern:** Core uses a twist-lock mechanism with **5× M8 × 30 mm screws** to secure the arm to the arm mount plate. Your custom mount must accept the Core arm mount plate or replicate its bolt pattern.
- **Cable routing:** Ensure adequate clearance and strain relief for the power/data cable between the arm base and control box.

3.3.3 Option A: Standard Bots Portable Base

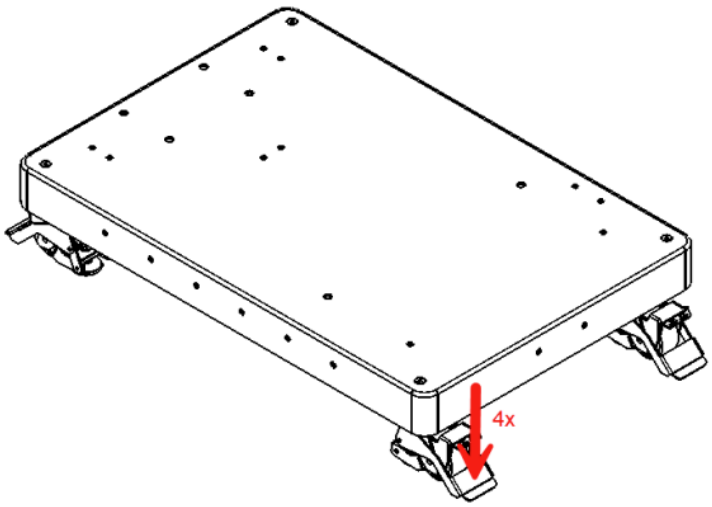
If you are using the Standard Bots portable base, follow the steps below.

Required Tools and Equipment

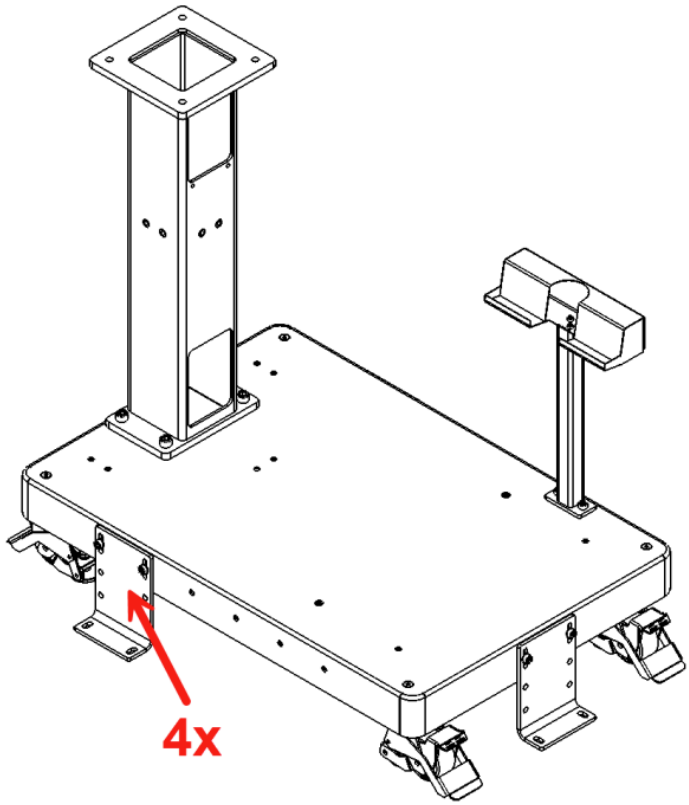
- Standard metric socket set
- Torque wrench (capable of 55 N·m)
- Level
- PPE (eye protection, gloves)

Step 1: Set Up the Base

1. Place the Core base in its final intended location.
2. **Lock the casters** by stepping on lock levers on each wheel.
3. Adjust the **4 leveling feet** until the base is level on the floor.
4. Orient the base so the robot working envelope, cable exit, and service access are correct.



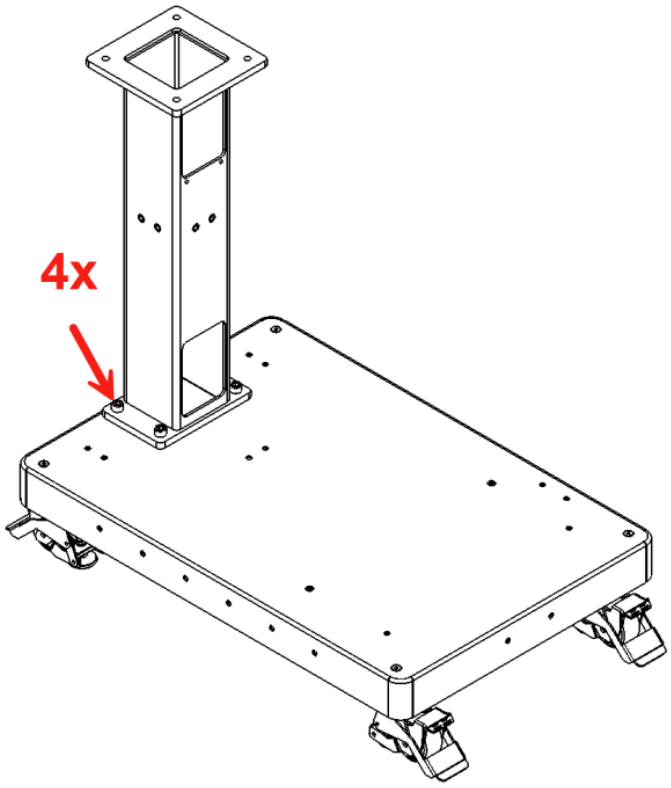
Note: For large payloads or extended work envelopes, optional floor brackets are recommended. Consult Standard Bots Applications Engineering for guidance. Four brackets can be anchored to the floor for added stability.



Step 2: Mount the Pedestal to the Base

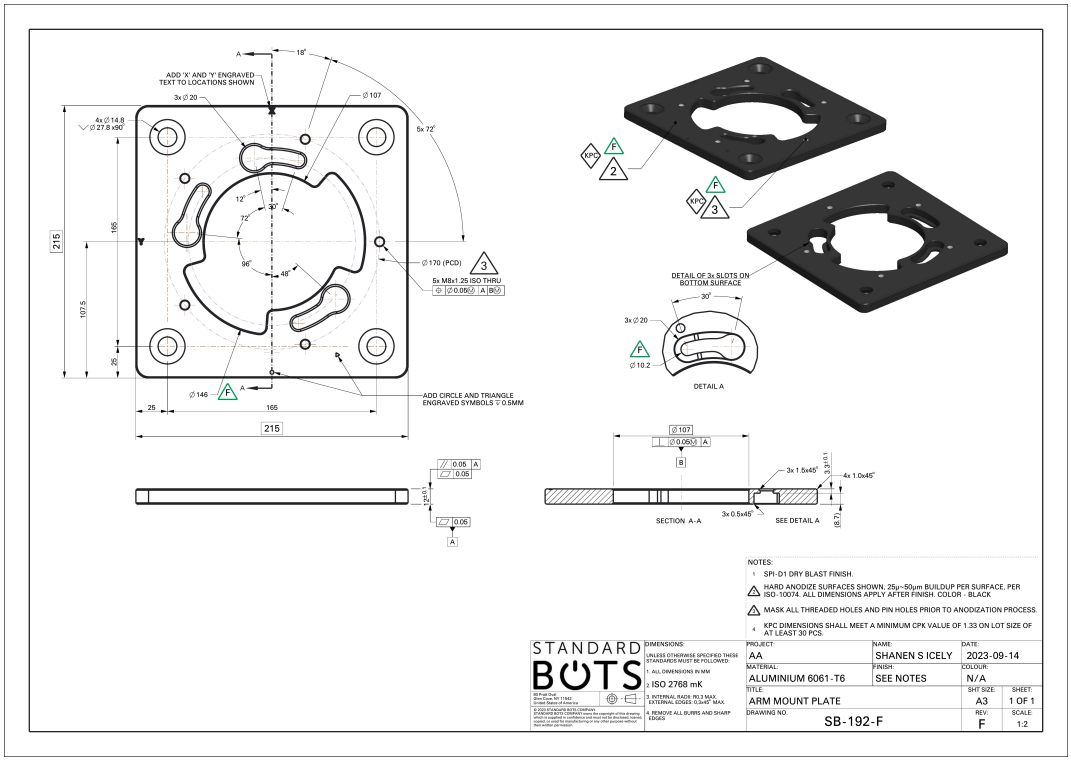
1. Mount the pedestal to the base using **4× M12 × 1.75 mm, 25 mm hex socket screws**.

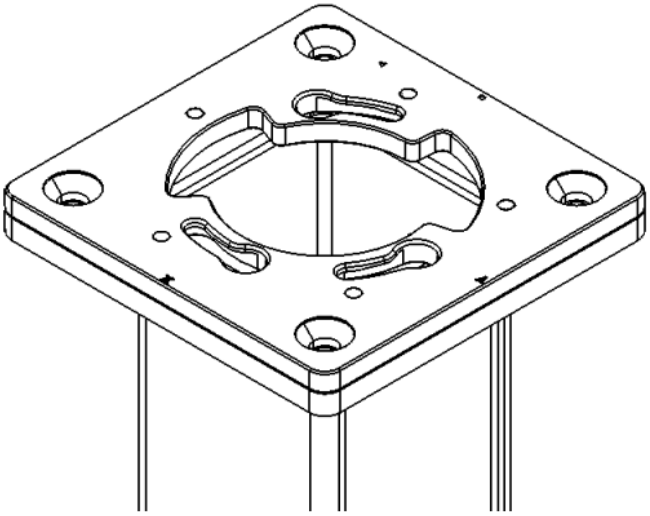
2. Torque to **55 N·m**.



Step 3: Mount the Arm Mount Plate

The Standard Bots arm mount plate (drawing SB-192-F) provides the mounting interface between the pedestal and the Core arm. The plate is a 215 mm x 215 mm hard-anodized 6061-T6 aluminum plate with four M14 clearance holes (for mounting to the pedestal) and five M8x1.25 threaded holes on a 170 mm pitch circle (for the arm twist-lock).



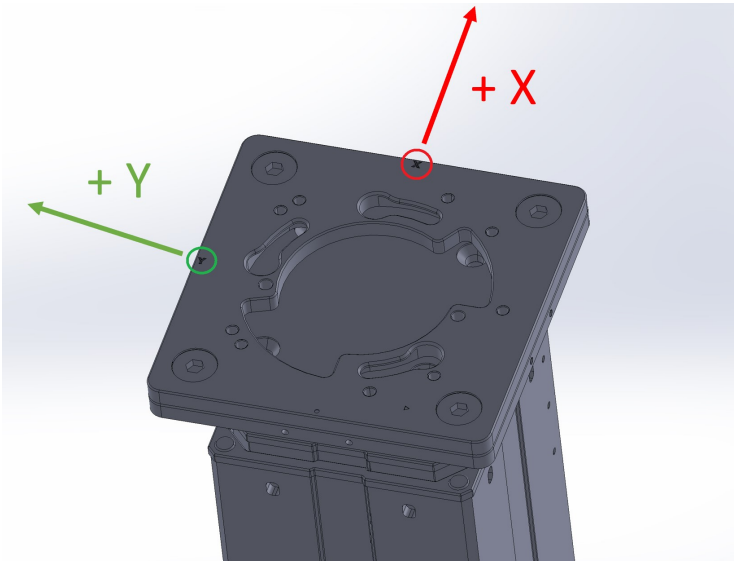


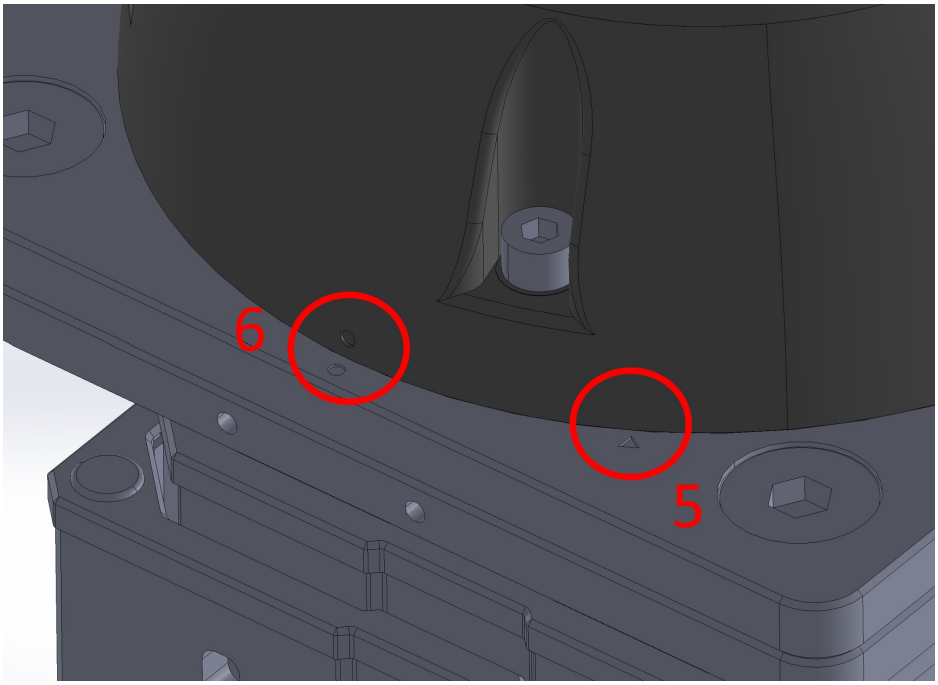
1. Mount the arm mount plate to the pedestal using **4× M14 × 2.0 × 30 mm hex flat head screws**.
2. Torque to **55 N·m**.
3. The arm mount plate can be oriented in 4 directions (90° increments). Choose the orientation that positions the robot working envelope correctly for your application.

Step 4: Mount the Core Robot Arm

1. Align the **“O” marking** on the robot base with the **triangle indicator** on the arm mount plate.

2. Lower the robot onto the mount plate.
3. Rotate the robot **clockwise** until the “O” on the robot base aligns with the matching “O” on the plate.
4. Secure with **5× M8 × 30 mm screws**.

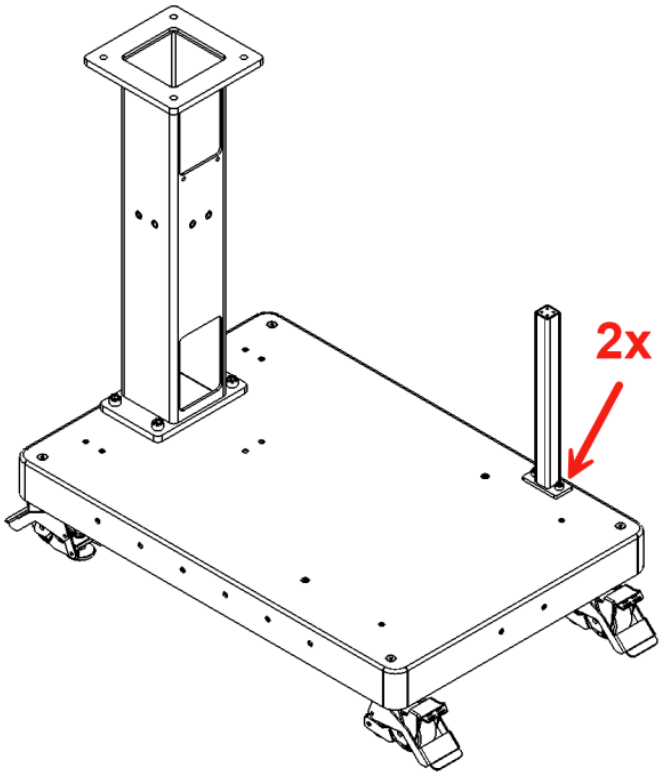


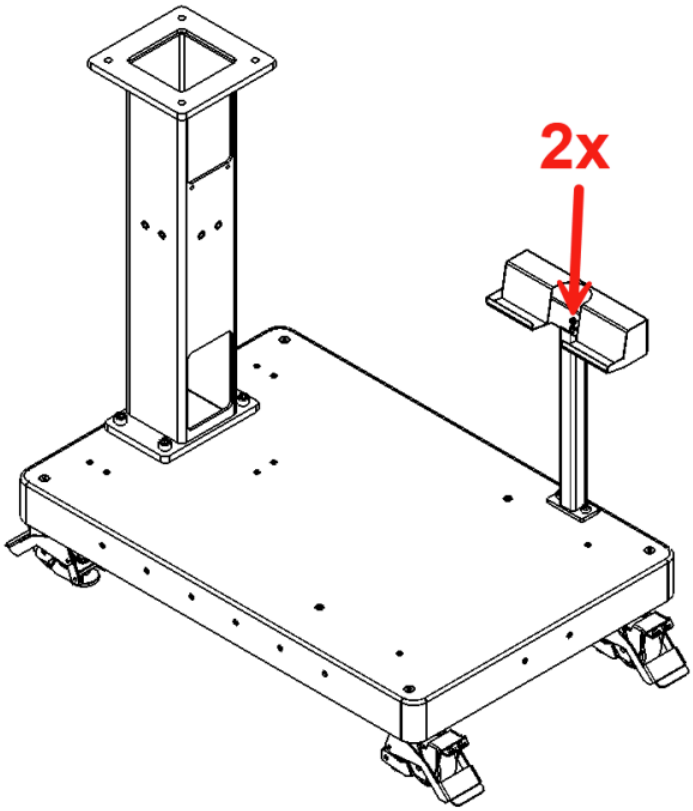


Note: The robot only attaches to the base in one orientation. X/Y markings on the base correspond to the tooltip orientation shown in the Move Robot view.

Step 5: Mount the Tablet Pedestal

1. Mount the tablet pedestal to the base using **2× M8 screws**.
2. Torque to **6 N·m**.


2x


2x

3.3.4 Option B: Custom Pedestal or Mounting Surface

If you are mounting Core to your own pedestal, table, or structure:

1. Ensure your mounting surface meets the rigidity and leveling requirements described above.
2. Secure the **Standard Bots arm mount plate** to your structure using appropriate fasteners for your material. The arm mount plate is the interface between the robot and any mounting surface.
3. Mount the Core robot arm to the arm mount plate using the twist-lock mechanism and **5× M8 × 30 mm screws** as described in Option A, Step 4.
4. Position the control box in an accessible location near the robot, ensuring cable reach and strain relief.

For assistance with custom mounting configurations, contact Standard Bots Applications Engineering.

3.3.5 Prepare Cable Routing

Before powering on:

1. Verify the robot cable path is clear through or alongside the base/structure.
2. Ensure cables will not be pinched between the robot base and mounting surface.
3. Confirm sufficient slack for full joint motion.

3.3.6 Secure Cables and Strain Relief

1. Connect the USB-C, power, and data cables to the base joint.
2. Install strain relief so connectors are not load-bearing.
3. Verify cables have adequate slack and clearance.

3.4 Final Mechanical Checklist

Before power-on, verify:

- ☐ Mounting surface is rigid and level
- ☐ All structural fasteners torqued to specification
- ☐ Robot arm twist-locked and secured with 5× M8 screws
- ☐ Cables routed and strain-relieved
- ☐ No tools or debris remain on base or work area

3.5 Connecting Control Box

1. If using the Standard Bots portable base, hook the control box onto the base bracket. For custom installations, place the control box in an accessible location near the robot.
2. Connect the arm power/data cable to the port labeled Arm Data + Power.
3. Connect Ethernet if required.
4. Connect AC mains.
5. Plug in the service USB-C and any maintenance leads into the control box; secure and tuck the cables.
6. Verify E-Stop is released; power on; Confirm the control box indicates normal operation with no active faults.

3.5.1 Quick checks

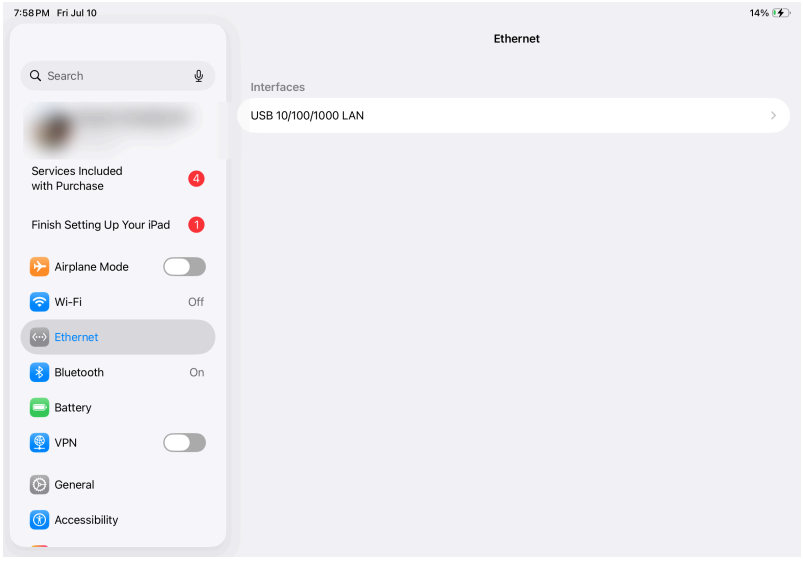
- Cables are strain-relieved and not pinched.
- Verify the control box indicates normal operation before enabling motion.

3.6 Getting Connected

3.6.1 Setting up the Tablet

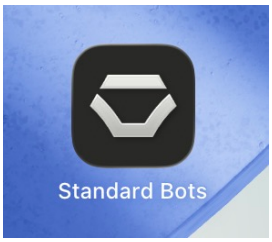
The included iPad is used to configure, control, and program Core. To set it up:

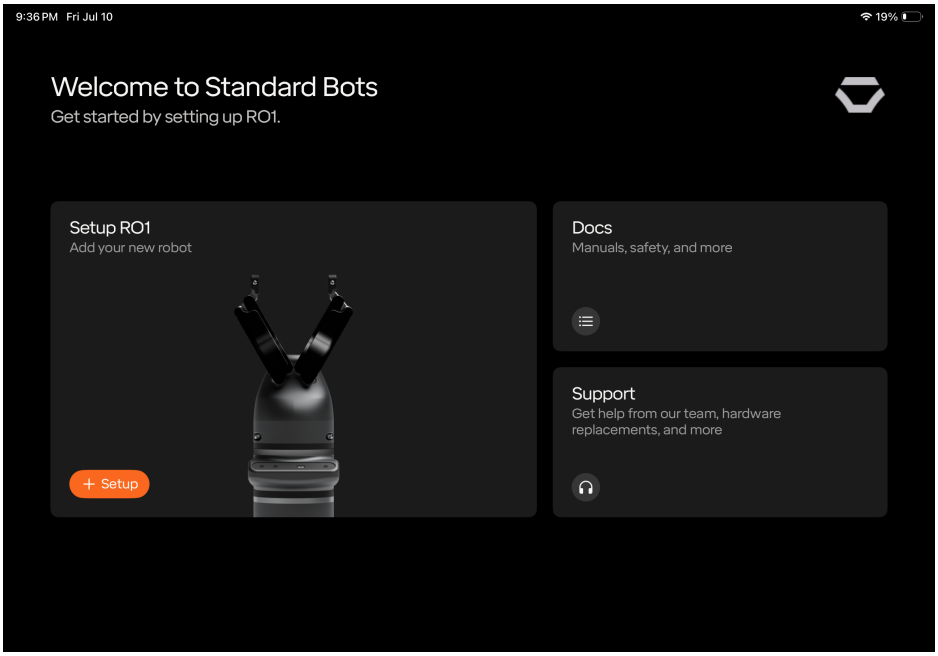
1. Take the iPad out of the box and turn it on.
2. If prompted at any point, enter the iPad's default passcode: "000000" (on older shipments, try "0000").
3. Connect the iPad to the Tablet USB-C port on the bottom of the Control Box and make sure the iPad is charging — if it is not, flip the USB-C cable 180 degrees on the Control Box side. Open the Settings app and confirm **Ethernet** appears in the sidebar below Wi-Fi.



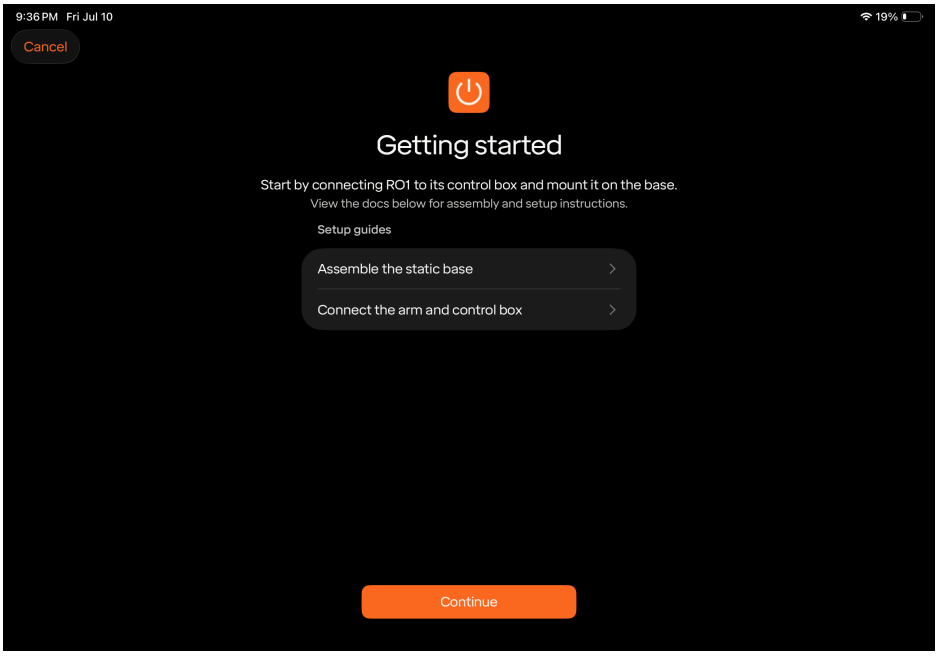
Note: If Ethernet does not appear, try a different USB-C cable or see Troubleshooting Connection Issues below.

4. Navigate to the home screen, open the Standard Bots app, and tap **+Setup**.

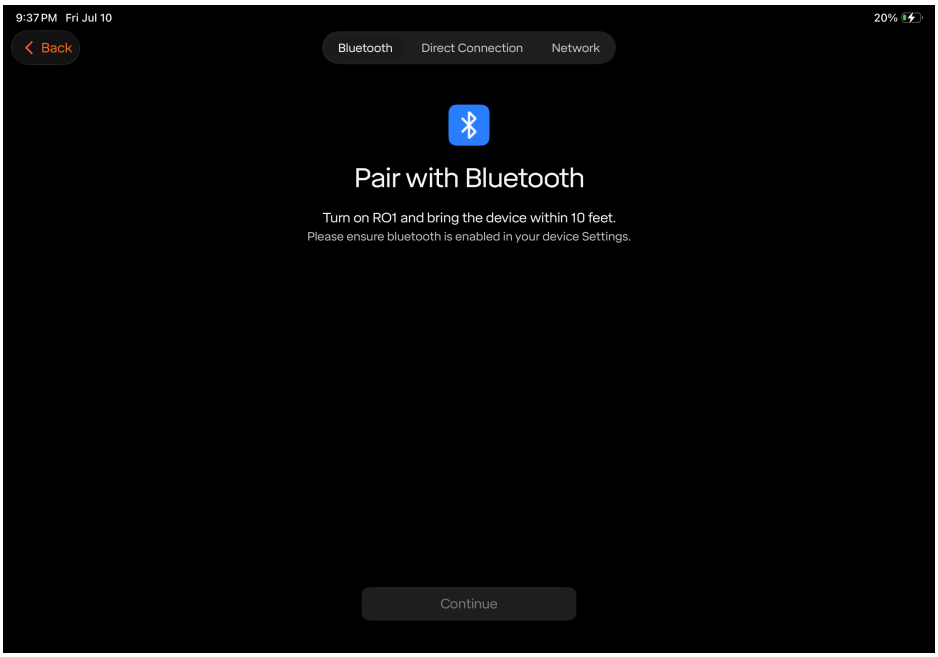


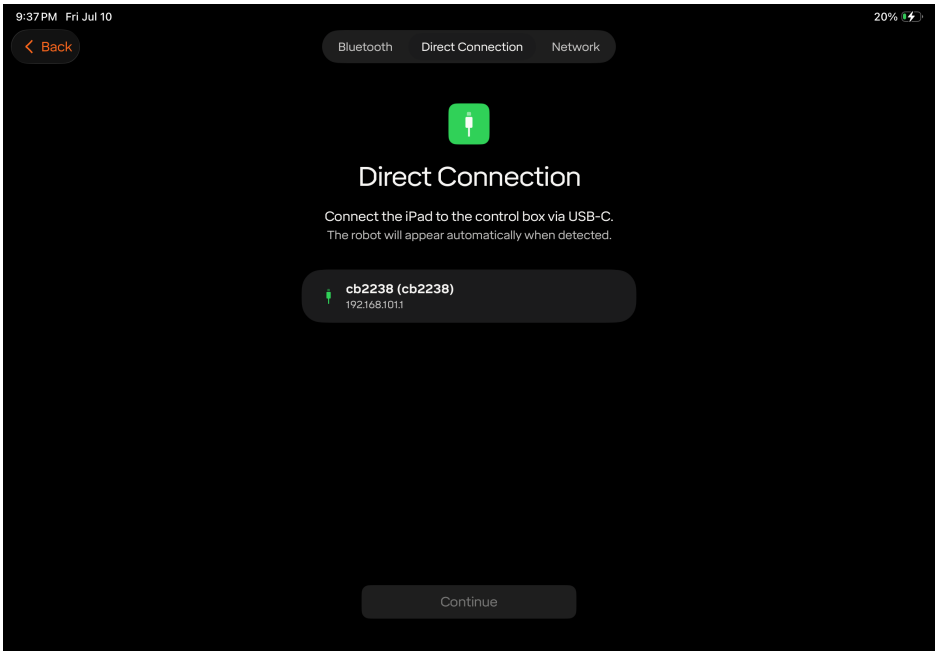


5. On the Getting started page you will also find guides for assembling the robot base and connecting the robot arm to the control box. Once ready, press Continue.



6. Choose how to find the robot, then select it and press Continue:
    - **Pair with Bluetooth** — make sure Core is turned on and Bluetooth is turned on in the iPad settings.
    - **Direct Connection** — with the USB-C cable connected, the robot appears automatically with its address (192.168.101.1).

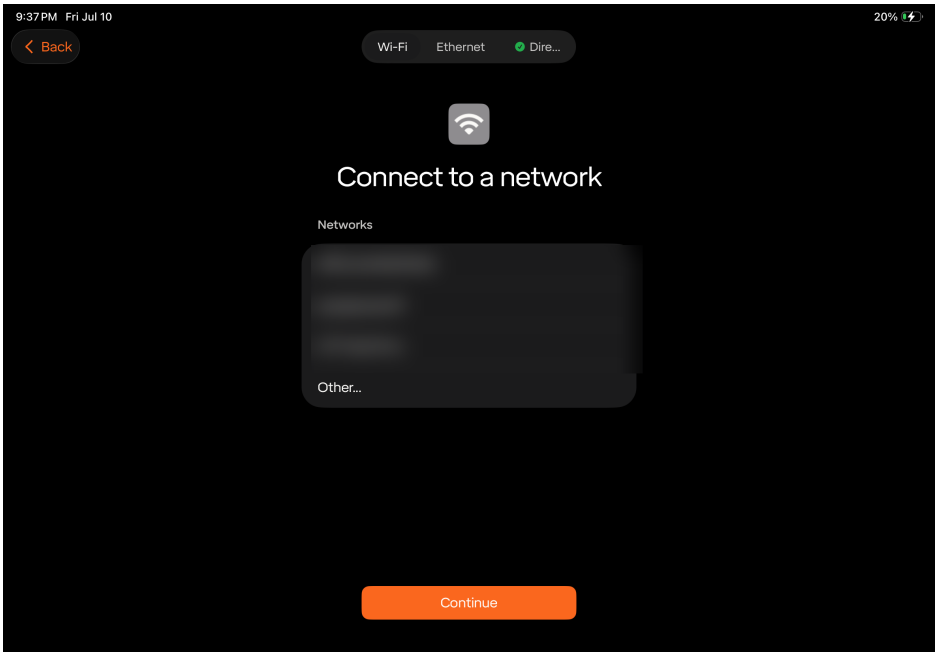




Note: If the robot was previously set up, you may be prompted for its passcode. The default passcode is 000000 (or 0000 on software prior to 1.23).

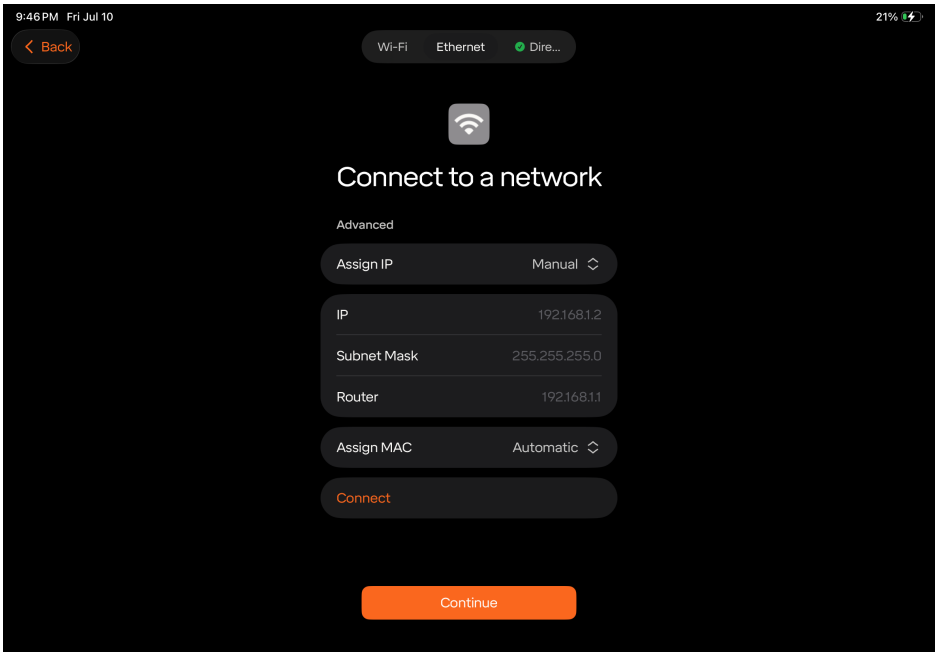
7. On the Connect to a network page, choose how the robot itself connects. This is independent of how the tablet is connected:

   - **Wi-Fi** — the robot's internal Wi-Fi card, powered through the antennas on the Control Box. Make sure the network does not require a splash page to access.
   - **Ethernet** — the RJ45 Ethernet port on the bottom of the Control Box.
   - **Direct** — the USB-C connection on the bottom of the Control Box.

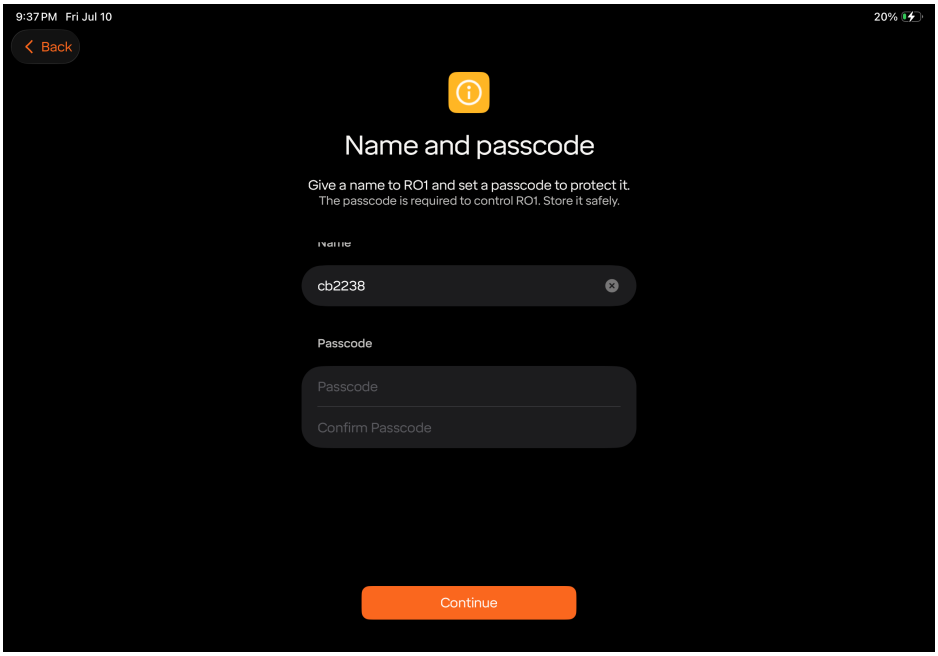


To give the robot a static address on your Ethernet network, select **Ethernet**, set Assign IP to **Manual**,

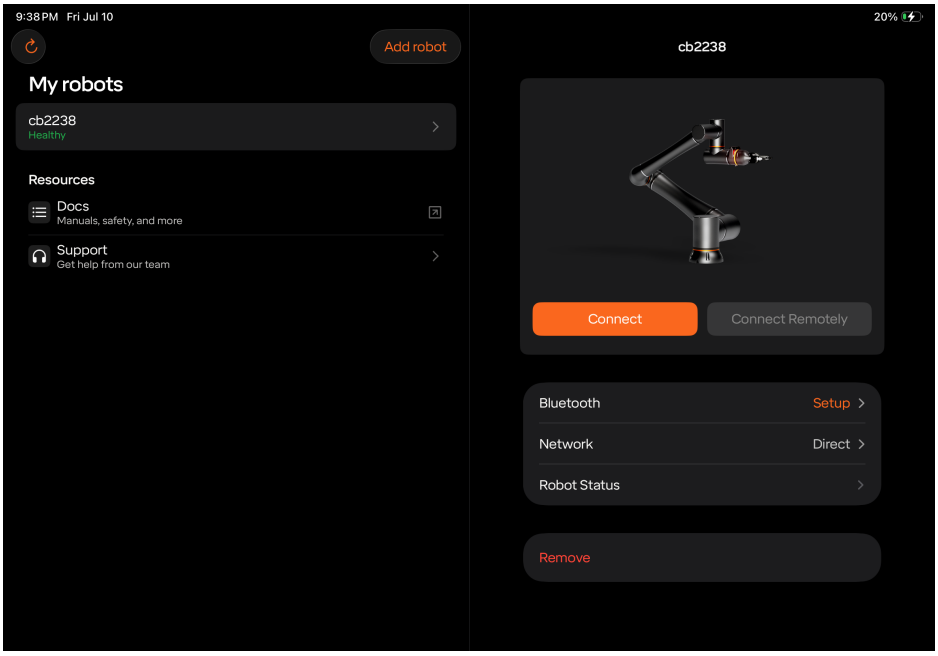
and enter the IP, Subnet Mask, and Router for your network, then tap Connect.



8. Give the robot a name and set a passcode. The passcode is required to control the robot — store it safely.



9. When setup completes, the robot appears under My robots showing **Healthy**. Tap it and press **Connect**.



10. Once connected, you can reset the E-Stop (if required), unbrake, and begin jogging the robot. For details on operating the robot, constructing routines, and programming, see the Standard Bots Programming Manual at programminghelp.standardbots.com.

3.6.2 Troubleshooting Connection Issues

If the iPad can't find a new robot during initial setup, work through these steps in order and try connecting again after each one.

Basic Checks

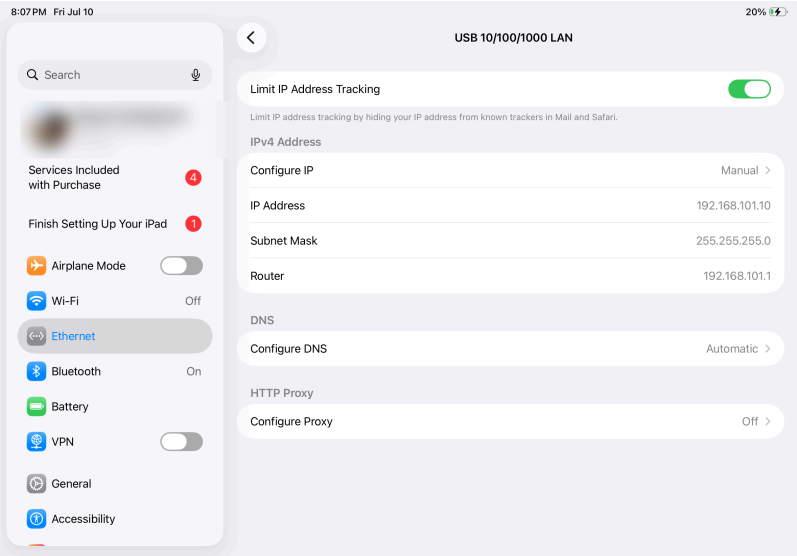
1. **Confirm the Control Box is powered on.** The LED on top of the box should be green. If it stays red, press and hold the button for at least 5 seconds — some Control Boxes do not start automatically when power is applied. If the LED and fans repeatedly start up and shut off in a cycle, the controller is failing to start — continue with the steps below, and contact support if it persists.
2. **Confirm the iPad charges from the Control Box.** Plug the iPad into the Tablet USB-C port on the bottom of the Control Box. If the iPad does not begin charging, flip the USB-C cable 180 degrees on the Control Box side (the port is one-directional), or try a different USB-C data cable — charge-only cables will not work.
3. **Power-cycle the iPad.**
4. **Power-cycle the Control Box.** Disconnect anything wired to the Control Box IO ports and any end-of-arm tooling first — a miswired or shorted accessory can prevent the controller from starting. Power it off and wait for the fans to stop, give it ten or so seconds, then power it back on. Wait for the LED to turn green — if it stays red, press and hold it until it turns green. Try this both with the USB-C cable connected and with it disconnected.
5. **Update the iPad.** Confirm iPadOS and the Standard Bots app are both on the most current ver-

sions.

6. **Check Bluetooth.** Make sure Bluetooth is turned on in the iPad settings and the included antennas are screwed onto the Control Box, then confirm the robot appears when the app searches over Bluetooth. If another iPad is available, try it as well.

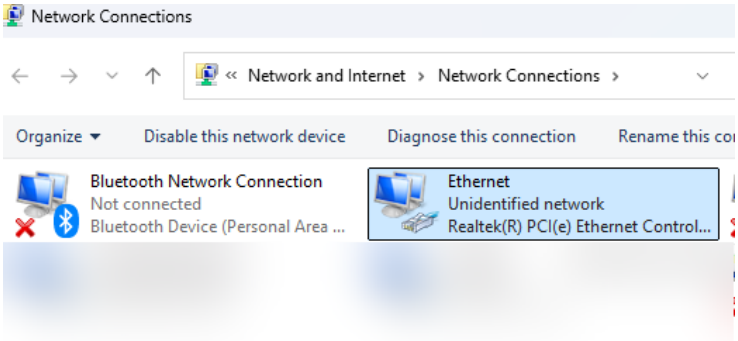
Check IP Settings

7. **Set the iPad's IP address manually.** With the USB-C cable connected, open Settings, tap **Ethernet**, then tap the **USB 10/100/1000 LAN** interface. Tap **Configure IP**, select **Manual**, and enter IP Address **192.168.101.10**, Subnet Mask **255.255.255.0**, and Router **192.168.101.1**, then tap Save.

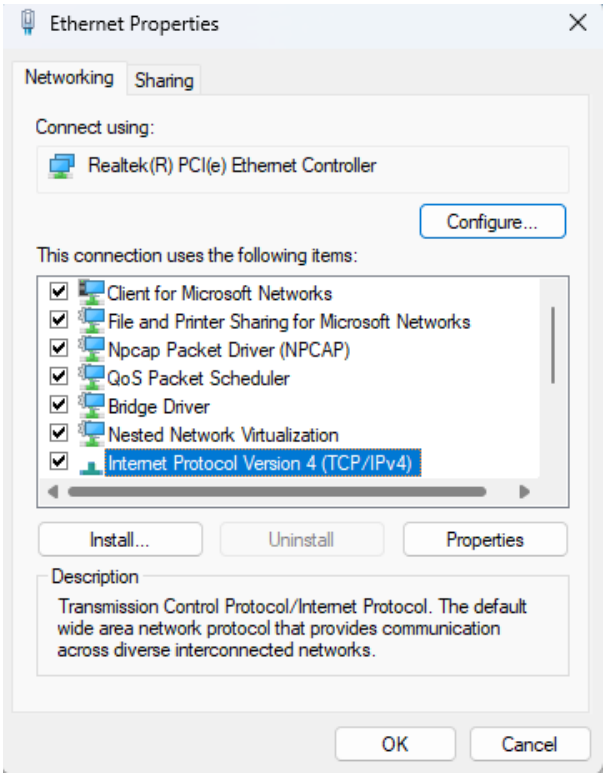


Connect Through a Web Browser

8. **Try the robot's direct address.** The Control Box's direct (USB-C) connection always uses the address **192.168.101.1**. On the iPad, open Safari and go to **192.168.101.1:3000** — the robot login page should appear.
9. **Try a PC.** Connect a Windows PC to the Tablet USB-C port with a USB-C data cable and turn off the PC's Wi-Fi. You will need to change the PC's IP address to match the robot's direct network. Press **Win + R**, type `ncpa.cpl`, and press Enter, then right-click the Ethernet adapter that appears for the USB-C connection and select **Properties**.



Double-click **Internet Protocol Version 4 (TCP/IPv4)**, select "Use the following IP address," and enter IP Address **192.168.101.10** with Subnet Mask **255.255.255.0**, then click OK.



Then go to **192.168.101.1:3000** in a web browser. If that still doesn't work, there are two more options:

- **Internet Connection Sharing** — share your PC's internet connection with the robot (Windows ICS) so the robot is assigned an address automatically. The robot will receive an address in the 192.168.137.x range — run `arp -a` in Command Prompt to find it, then go to that address followed by :3000. If no address appears, check that Windows Firewall is not blocking UDP ports 67 and 68.
- **USB-C-to-Ethernet adapter** — on the PC or on the iPad, with an Ethernet cable run from the adapter to the Ethernet port on the Control Box (see Appendix B: How to Direct Wire Core for the full iPad adapter procedure).

Once the login page loads, you can configure the robot's network from the browser — see Changing the Robot's Network Settings from the Browser below.

If Nothing Else Works

10. **Try the robot's web address.** If the robot was previously connected to the internet, go to **cbXXXX.sb.app** in a browser, where cbXXXX is the robot's serial number found on the Control Box label. You can also plug the Control Box's Ethernet port into an internet-connected network to give the robot outside access, then use this address (see Changing the Robot's Network Settings from the Browser below).
11. **Scan the network.** If the Control Box's Ethernet port is plugged into your network, the robot should receive an address automatically — out of the box, the Control Box Ethernet is set to DHCP. Check

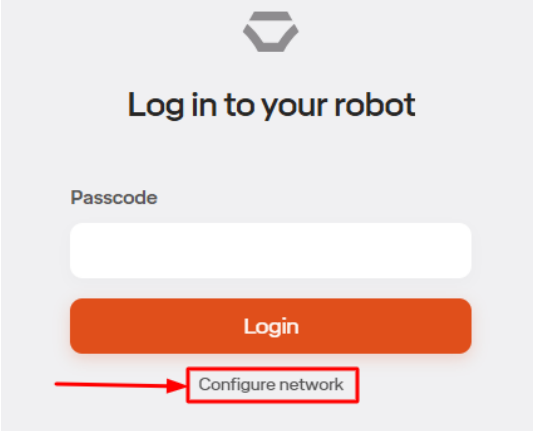
that the link lights on the Ethernet port come on, then from a PC on the same network, network-scanning software (or your router's client list) can detect the robot's IP address.

12. **Connect a monitor.** Plug a monitor into the HDMI port on the Control Box **before** powering on. If boot text appears on screen — even briefly — the controller is starting; if the screen stays blank through a full power cycle, the controller is not starting. Contact support with what you observed.

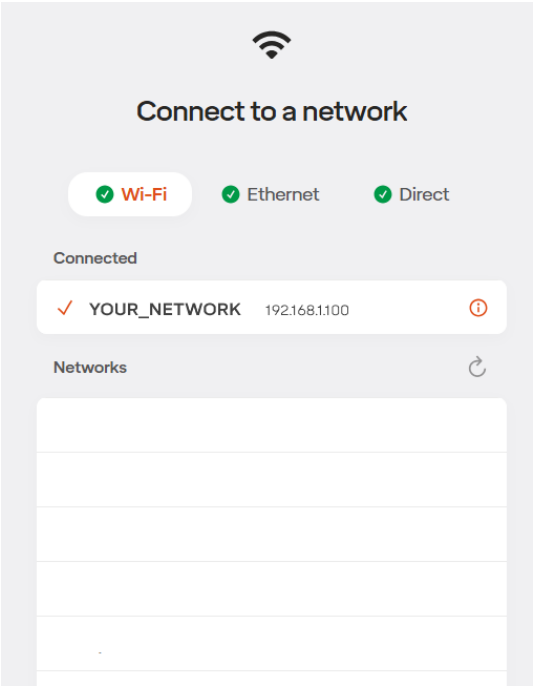
If none of these steps work, contact Standard Bots support with the robot's serial number (cbXXXX, found on the Control Box label) and the list of steps you have tried.

3.6.3 Changing the Robot's Network Settings from the Browser

Once the login page loads, you can point the robot at your network without using the iPad app. Click **Log Out** at the top, then click **Configure Network** below the Login button. You will be asked for your passcode — on a robot that has never completed setup, this is the default passcode (000000, or 0000 on older software).



On the Network Setup page, check the box beside a network type to enable it:



- **Wi-Fi** — recommended to be your company's Wi-Fi network so the robot can be reached from programming PCs and tablets.
- **Ethernet** — the RJ45 port on the bottom of the Control Box, usually the machine network.
- **Direct** — the USB-C connection on the bottom of the Control Box.

After initial setup: once the robot's Ethernet port is configured, you can confirm the robot is reachable on your network by pinging the IP address you assigned it from a PC on the same network.

Note: Robots running older software (12.08 and earlier) do not include this network settings page. If the login page loads but there is no Configure Network link, contact Standard Bots support to update the robot's software.

3.7 Unmounting & Transporting

3.7.1 Warnings

- Do not attempt to move the arm while it has power.
- Do not force the robot into a position while power is off; doing so may damage the robot.
- Use proper lifting technique when handling the Core arm.

3.7.2 Before transportation:

- Ensure the robot is in the desired position for transportation.

- If needed, the robot can be put into the position required for the original box by:
  - Navigating to the Move Robot view

- Go to the Robot menu in the upper right
- Select “Settings”
- Select “Box Robot”
- Save and confirm the Payload
- Click and hold down the “Move Live Arm To Visualizer Position” button. The robot will move into the packing pose.

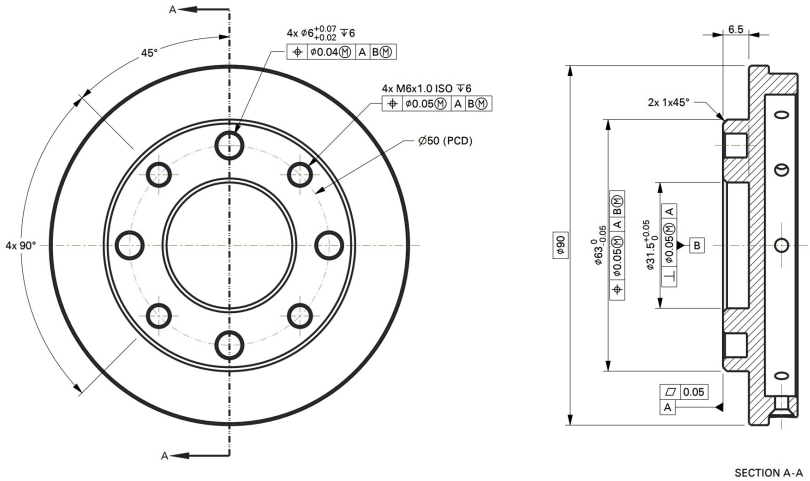
- Click the hexagon button in the bottom right of the Move Robot view
- Select “Brake Robot”
- Unplug the control box from the AC power source
- Wait 30 seconds for stored power to dissipate
- Unplug the connector between the arm and control box by twisting the locking mechanism and pulling down on each end
- Disconnect any inputs and outputs from the control box

The Core control box has an integrated handle for ease of transportation. Ensure all cables are disconnected from the Core control box before moving or shipping the control box. Ensure Core control box is well packaged, preferably in the original packaging, before shipping the control box.

3.8 Connecting End Effectors

3.8.1 Mechanical Connection

The Core robot uses the standard ISO 9409-1-50-4-M6 robot flange pattern. The pattern has 4 M6 bolts on a 50mm circle. Any tool that follows the standard ISO 50mm pattern will mount to the Core robot flange.



HOLE PATTERN FOLLOWS
ISO 9409-1-50-4-M6

3.8.2 Fully Integrated Tools

Standard Bots supports full integration with the following tools. These tools can be fully controlled using standard instructions in the Standard Bots Routine Editor. Other tools can be controlled via digital I/O.

- OnRobot 2FG7 Parallel Tool
- OnRobot 2FG14 Parallel Tool
- OnRobot 3FG15 3 Finger Centric Tool
- OnRobot Dual Changer
- Schunk EGU
- Schunk EGK

Payload derating with EOATs. When operating with an end effector and payload together, the total combined mass must not exceed the payload limit listed in the Hardware Overview. At payloads above **16 kg, maximum robot speed is automatically reduced to 25% of the default speed settings** (default tooltip speed: 0.75 m/s). This derating applies to all movements and is enforced once the payload mass is set in robot settings or within an Actuate Gripper step.

Follow the instructions provided with the tooling to connect the tooling to the robot flange, and connect the wire to the provided connector at the end of the robot arm.

Be careful when attaching the M8 tool connector. Ensure that you line up the key with the receiver when you plug it in. Do not twist it, the pins are fragile and this can cause the pins to break.

3.8.3 Other Supported Tools

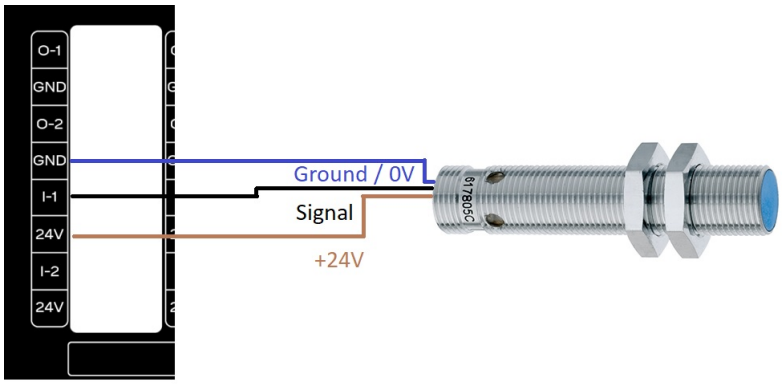
In addition to the above tools, Standard Bots generally supports most tools that mount to the 50mm flange and that support 24VDC discrete control. Please contact Standard Bots support for assistance with confirming tooling compatibility.

3.9 Control Box Inputs and Outputs

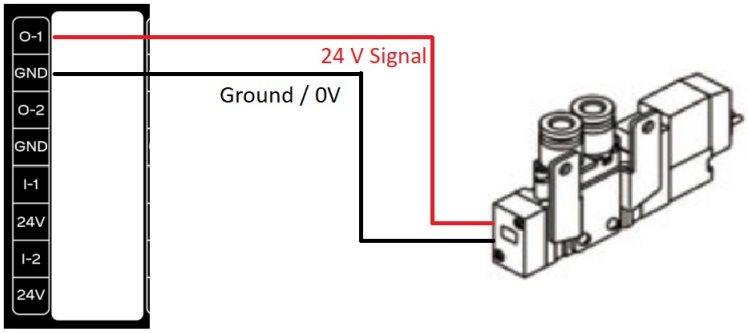
3.9.1 Digital Inputs and Outputs

The Core control box supports 16 24VDC digital inputs and 16 24VDC digital outputs. The signals are sourcing or PNP. The digital outputs support up to 0.7 amps of output; for larger capacity use the digital outputs from the robot to drive a relay coil to a separate power source.

Example of wiring a proximity sensor into the Core control box:



Example of wiring a pneumatic valve into the Core control box:

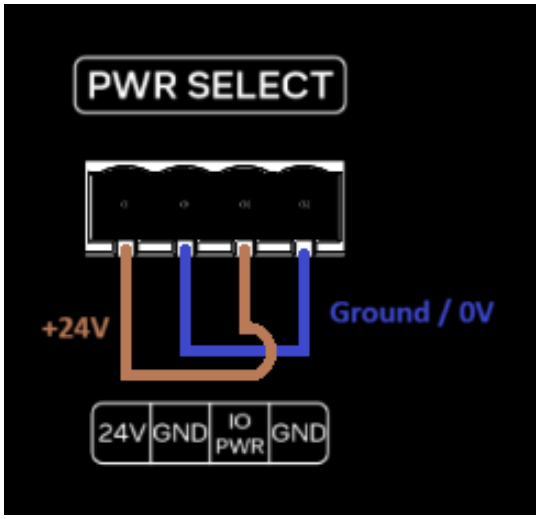


3.9.2 I/O Power Select Feature

The Core control box enables users to manage input/output (I/O) functions using its integrated 24V power supply. Alternatively, an external 24V power supply can be used if preferred. The diagrams below illustrate both wiring configurations.

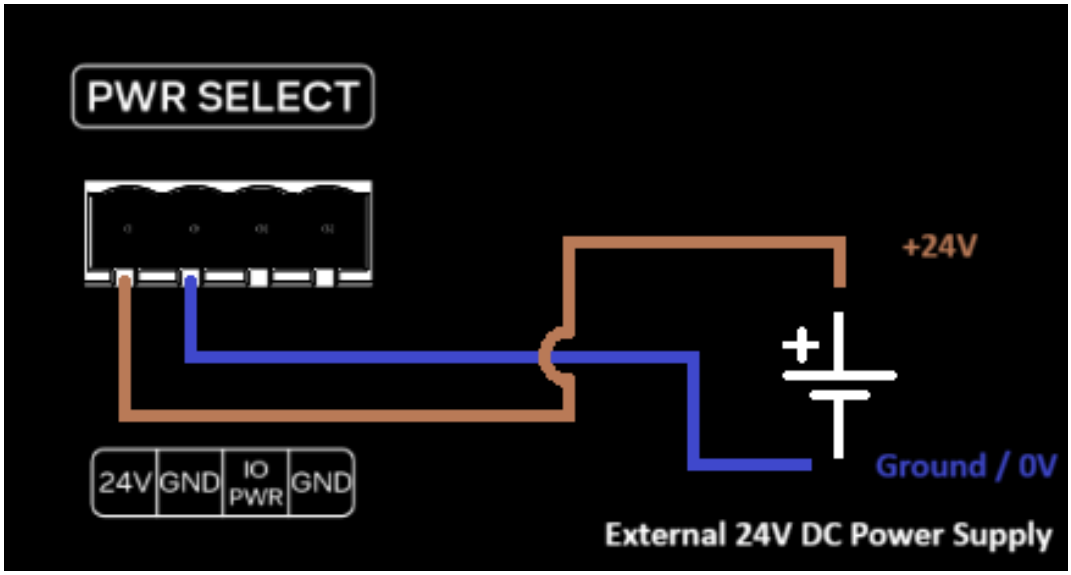
Integrated 24V Power Supply

The image below illustrates the wiring configuration for utilizing the **integrated** 24V power supply for I/O functionality.


PWR SELECT
+24V
Ground / 0V
24V
GND
IO PWR
GND

External 24V Power Supply

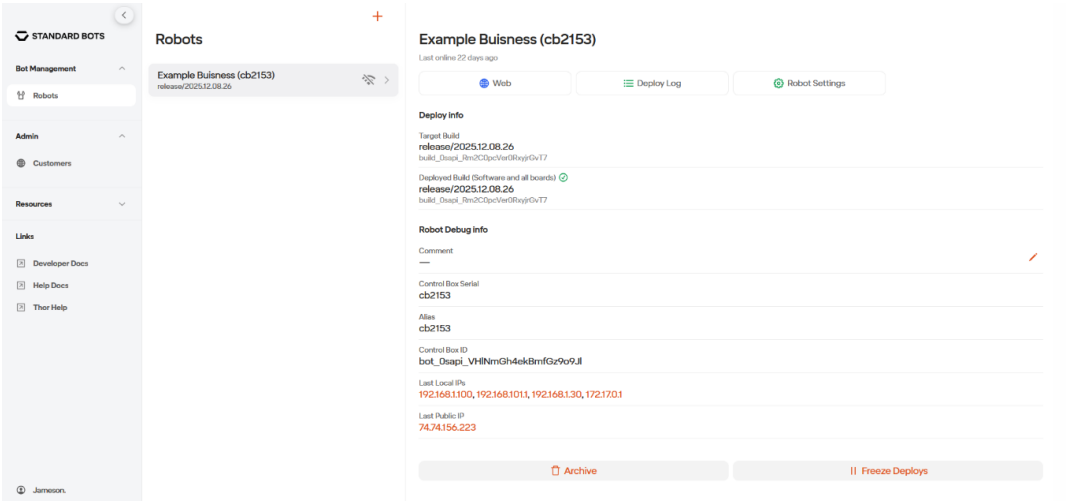
The image below illustrates the wiring configuration for utilizing an **external** 24V power supply for I/O functionality.



3.10 Marvin Admin Page

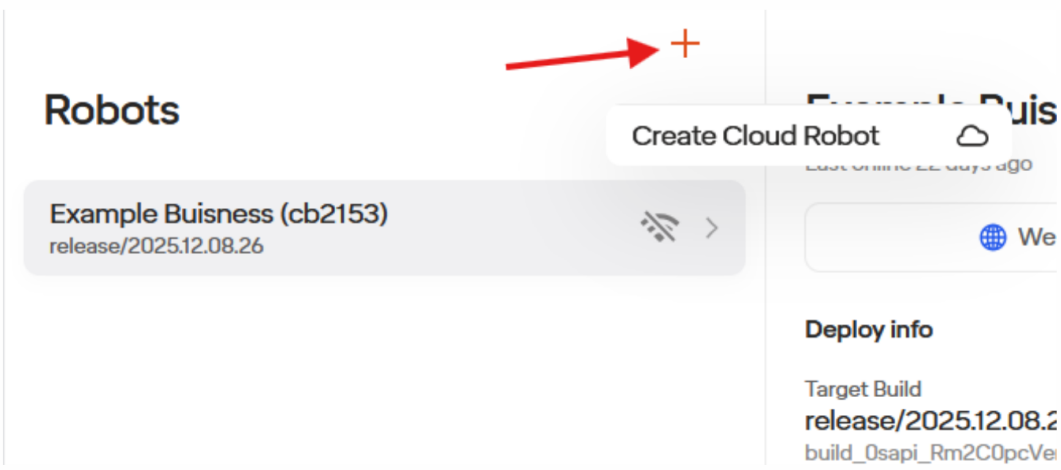
The Marvin Admin page allows you to manage and access all of your robots in one location as well as giving you access to useful information. Please note that using the admin page is **not** necessary for using your robot.

To access the admin page, go to https://marvin.standardbots.com/ in your browser. There you should be able to enter your email address to access your organization's page. If you are unable to enter your organization's admin page, please reach out to Standard Bots Support.

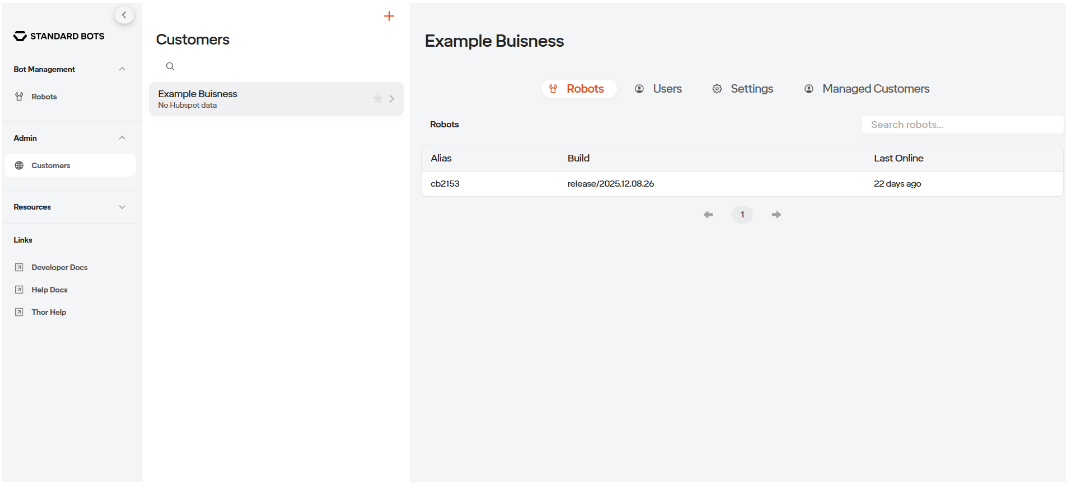


On the Bot Management tab you are able to access the list of robots that you own. Here you can access the robot through the web, see the robot's installed software version and serial number, and here is

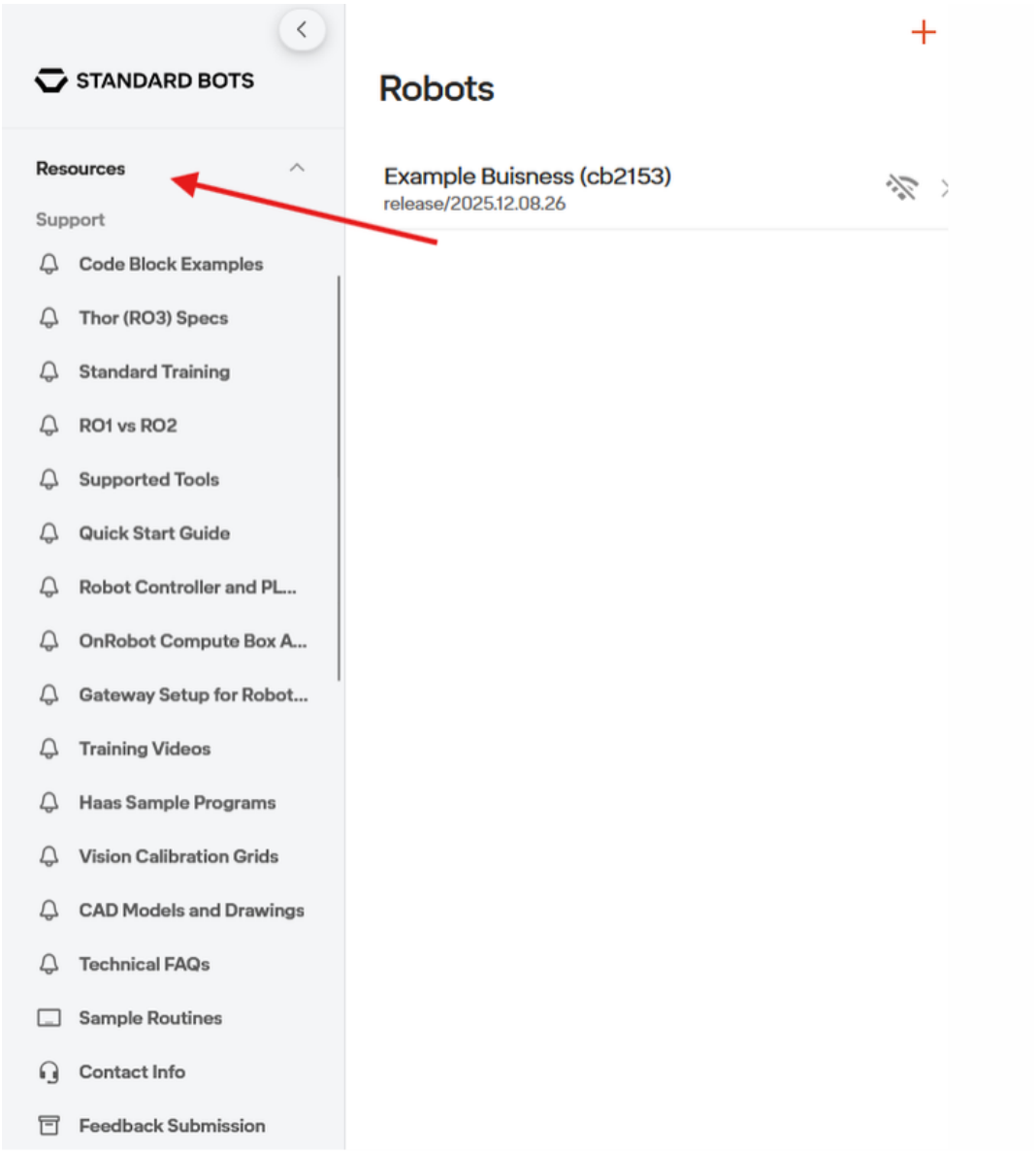
where you can create a cloud, simulated, robot.



To make a cloud robot, select the orange plus sign at the top of the screen. There you will be able to give the cloud robot a name (which will be used to access your simulated robot on your browser by going to CloudRobotsName.sb.app) and the region. Afterwards you can hit Create. Please note that it does take multiple minutes for the cloud robot to be made. If you experience any issues, please reach out to support.



In the Admin Tab you will be able to access your organizations users and robots. Here you can add employees emails to the User's list which will give them access to your Marvin Admin page. You can also manage your customer's robots here if applicable.



Next is the Resources Tab. Here you have access to useful information such as CAD files, example routines, supported tools, and much more.

Chapter 4

Safety

4.1 Overview of Safety Features

The Core robot includes many safety features for operating in either collaborative or industrial applications. The exact implementation of these features will depend upon the application and risk assessment. The final performance level of the system will depend on the integration and must be calculated by the integrator.

Core has parameters for the below settings that can be fully customized for the end application and allow for integration with a wide variety of industrial safety components.

- Joint Collision Thresholds
- Joint Velocity, Acceleration, and Torque limits
- Emergency Stop Inputs
- Safety IO / OSSD

4.1.1 Emergency Stop

Pressing the **E-Stop** button on the front of the control box, or triggering any external E-Stop input, initiates a category-1 stop: power is cut to the arm motors after a controlled deceleration, and the brakes engage. The button latches mechanically — twist it clockwise to release before the robot can be re-armed.

External Emergency Stop devices can be wired into the control box's safety inputs as redundant pairs. See Configuring Safety Inputs below for the input options and pairing requirements.

4.1.2 Response Time

Core responds to safety events within the tolerances in the below chart:

Safety Input Event	Worst Case Detection Time	Worst Case Power Off Time	Worst Case Response Time
Internal Emergency Stop	50ms	600ms	600ms
External Emergency Stop	50ms	600ms	600ms
External Safety IO Slow Speed Input	50ms	N/A	600ms
External Safety IO Emergency Stop	50ms	600ms	600ms
Tablet or Browser E-Stop	1000ms*	1600ms*	1600ms*

*Network Latency Dependent

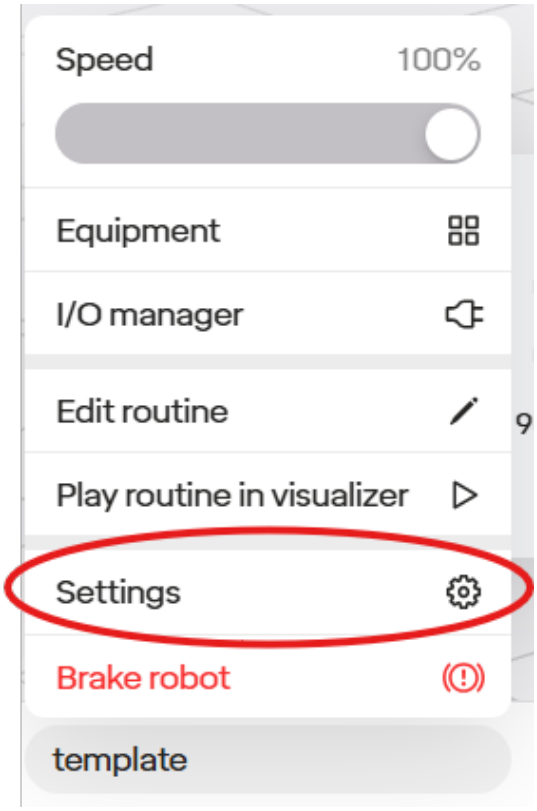
Safety Output Event	Worst Case Response Time
Robot E-Stop	50ms

4.1.3 Performance Level

The Core safety circuitry, including E-Stop circuitry and all digital inputs and outputs is PLe Cat 4.

4.2 Safety Settings

Safety Settings can be accessed by tapping the robot menu, then Settings > Safety.



Settings are locked by default; click the “Unlock” button and re-enter the robot PIN to make the settings here editable.

Safety settings do not take effect until you tap “Apply Settings.”

4.2.1 Speed Limits

How Limits Work

Core has several levels of limits; the robot is always gated to the **lowest** of all of these:

- **Global Limits**: defined in Safety settings, which affect tooltip speed and the acceleration, velocity, and torque of joints.
- **Speed Modifier % Slider**: the robot can be slowed down on an as-needed basis (for instance, to trial a routine) without requiring access to Safety Settings.
- **Step-Level Limits**: the robot can also apply an alternate set of speed limits only for the duration of a specific step.

All of these settings are described below.

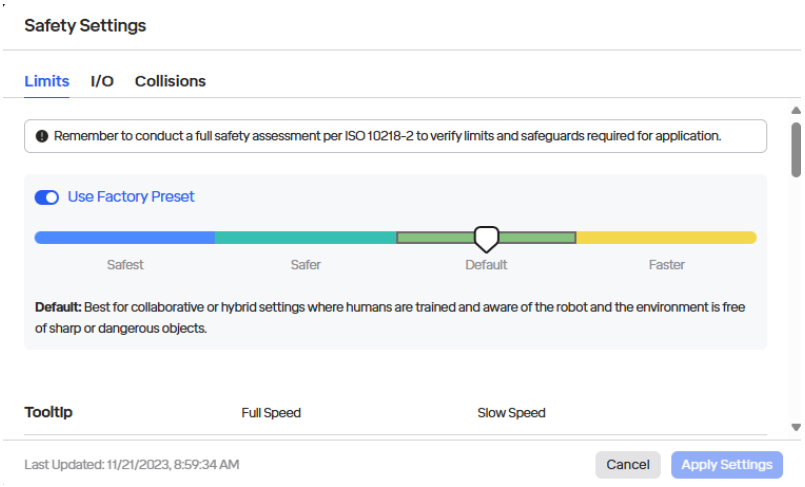
Editing Global Limits

The first tab of safety settings allows setting limits on the speed and acceleration of both the tooltip and the joints of the robot.

Using Factory Presets By default, you will be presented with the choice of several presets.

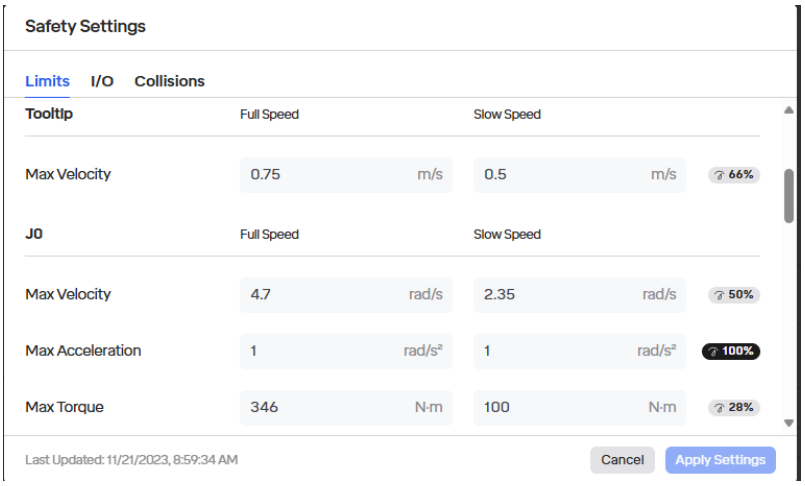
The "default" (middle) setting restricts the robot to a tooltip speed of 0.75m/s, which is safe for most collaborative settings. Several others are available; if there are factors that may require more caution (such as the robot's payload or end effectors), it may be desirable to select a more conservative setting.

Remember that many factors can affect whether a given speed is safe. Before putting the robot into production, you should always conduct a full safety assessment per ISO 10218-2 to determine the proper values for these settings and any other mitigations required.



To review the values set for these factory presets, you can scroll down.

Custom Limits To edit these limits, switch off "Use Factory Preset"; the limits should then become editable:



The following can be customized, both for when the robot operates at its full speed and in a "slow"

mode that can be triggered via Safety I/O settings:

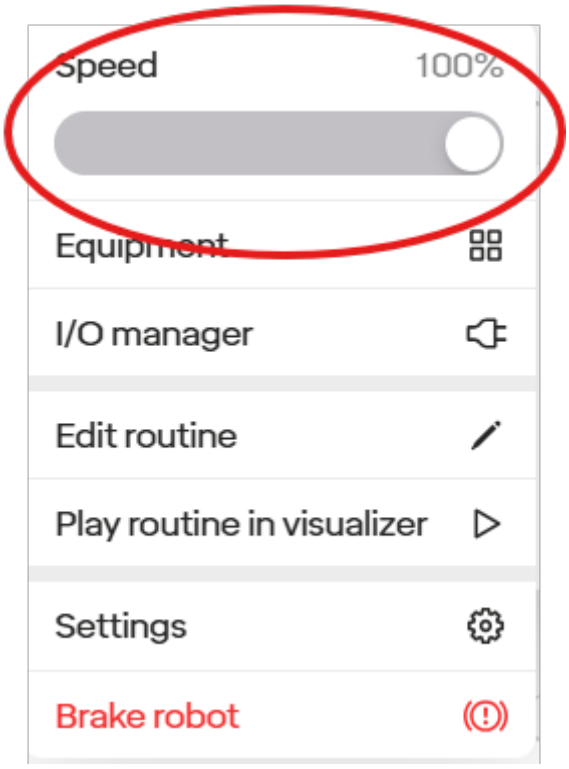
- **Tooltip Speed**: This limits the speed of the tooltip in Cartesian space.
- **Per joint**:
  - **Max velocity**: This is the maximum angular change in the joint's position per second permitted.
  - **Max acceleration**: This affects the rate at which the joint can change speed. If this is too low, the robot may not be able to achieve the maximum velocity otherwise permitted during the course of a movement.
  - **Max torque**: The maximum torque that the motor in the joint can exert.

4.2.2 Speed Modifier % Slider

The robot can be slowed down from its maximum as needed inside the robot menu.

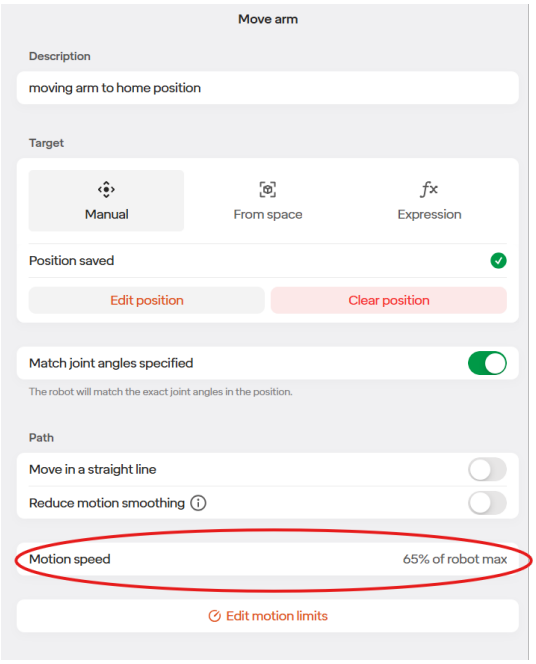
This is useful for trying out a routine before putting it into production.

Setting this slider only applies a cap to the maximum limits that would otherwise be set in Safety Settings; movements that were already slower than that are not affected.



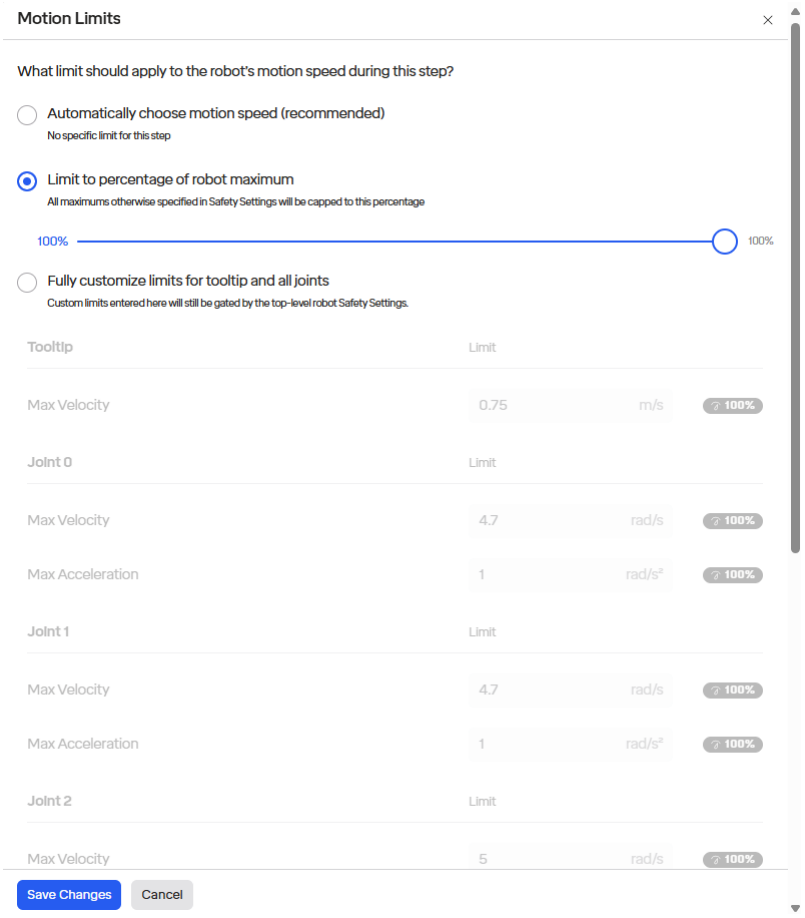
4.2.3 Customizing Speed Limits For A Step

When editing a “Move” step, the “Motion Speed” shows the speed of this specific step. This is useful to notice for delicate movements or when required for safety. To change the speed, tap the “Edit Motion Limits” icon.



By tapping “Edit Motion Limits”, several options are available. The motion can be restricted to percentage of the maximum (as with the global speed modifier in the robot menu), or to a new set of custom limits.

Note that these limits apply whether the robot is operating at full speed or at any “slow” speed mode defined in safety settings. The robot will always apply the lowest of all limits in effect. It is also not possible to set torque limits on a per-step basis.

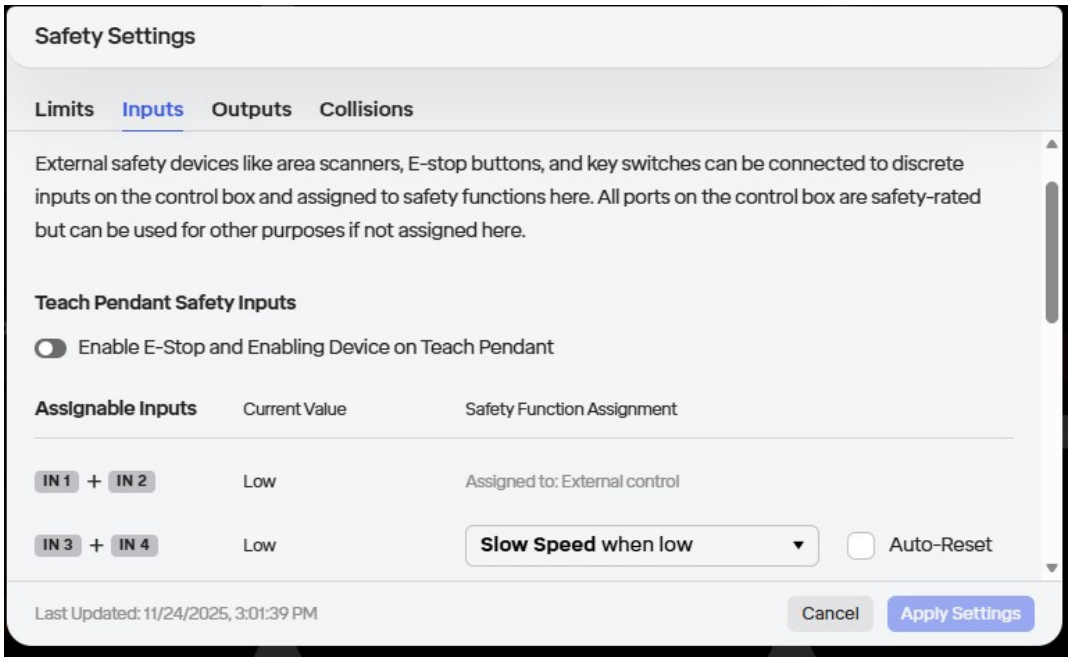

Motion Limits
What limit should apply to the robot's motion speed during this step?
Automatically choose motion speed (recommended)
No specific limit for this step
Limit to percentage of robot maximum
All maximums otherwise specified in Safety Settings will be capped to this percentage
100%
100%
Fully customize limits for tooltip and all joints
Custom limits entered here will still be gated by the top-level robot Safety Settings.
Tooltip
Limit
Max Velocity
0.75
m/s
100%
Joint 0
Limit
Max Velocity
4.7
rad/s
100%
Max Acceleration
1
rad/s²
100%
Joint 1
Limit
Max Velocity
4.7
rad/s
100%
Max Acceleration
1
rad/s²
100%
Joint 2
Limit
Max Velocity
5
rad/s
100%
Save Changes
Cancel

4.3 Safety I/O

In the safety Settings there are two tabs for I/O, Safety Inputs and Safety Outputs. Safety inputs allow you to tie in devices such as area scanners and key switches to discrete inputs onto your control box. Safety outputs allows the robot to indicate safety-critical elements of its status over discrete outputs to other devices like PLCs and other moving equipment that should stop when the robot does.

4.3.1 Configuring Safety Inputs

The sixteen 24V inputs on the control box are all safety-rated and can be used in pairs. Safety devices are connected in pairs to eliminate the possibility of a stray signal keeping the robot operating while actually in an unsafe condition. Therefore, if either of the paired inputs is below 24V, it will be treated as a "low" signal.



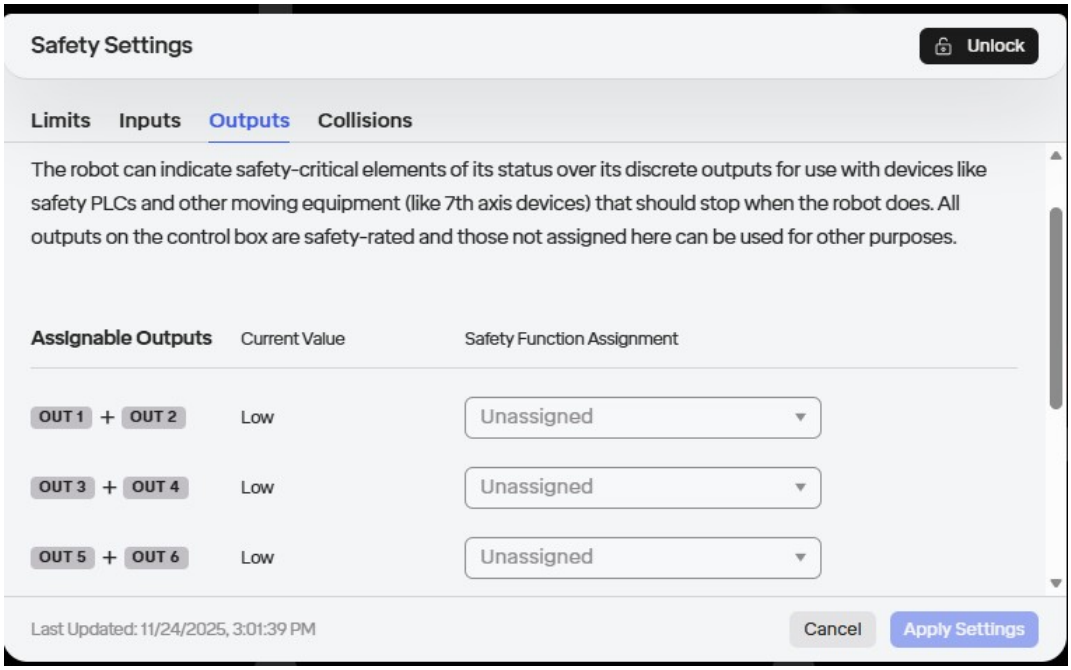
The following options are available:

- **Safety Function Assignment**: Any ports can be assigned to:
  - **Emergency Stop** when low: Triggers a category-0 stop that brakes the robot and cuts power to arm.
  - **Pause** when low or when high: Pauses the currently-running routine but does not brake the robot.
  - **Slow Speed** when low: Makes the robot observe the "Slow Speed" set of limits defined in the "Limits" tab. This is useful, for instance, with an area scanner, to force the robot to move at a collaborative speed when people are nearby.
  - **Reset Safeguards When High**: This will reset the effects of any safeguard that does not have auto-reset (see below). This has no effect on emergency stop.
- **Auto-Reset**: This controls whether the effect of the function, once triggered, should go away

(i.e. when we move back from low to high) or whether it requires a separate, explicit Reset. This is useful, for instance, with a sensor on a door to a fence around the robot: one would not want the robot to re-engage or speed up if the door is closed behind someone.

4.3.2 Configuring Safety Outputs

Additionally, the sixteen outputs on the control box are all safety-rated and are also used in pairs to eliminate the possibility of a stray signal keeping the robot operating while actually in an unsafe condition.



The following options are available:

- Emergency Stop
- Reduced Speed mode
- Full Speed mode
- Robot is moving
- Robot is still

4.3.3 Redundant-Pair Wiring Topology

The Core control box employs a redundant-pair wiring architecture for both safety inputs and outputs to meet PLe Cat 4 performance requirements. This topology ensures that a single stray signal or wiring fault cannot inadvertently create or mask a safety condition.

Input pairing. All 16 safety inputs on the control box are configured in eight pairs. When assigning a safety function to an input:

- Both inputs in a pair must be assigned to the same function (e.g. Emergency Stop, Pause, Slow Speed).
- A function is considered active only when **both** inputs in the pair are in the same state simultaneously.
- If one input differs from its pair (e.g. one high while the other is low), the system treats this as a wiring fault.

Output pairing. All 16 safety outputs are similarly paired. Both outputs in a pair mirror the same state, so external monitoring equipment (e.g. a PLC) can cross-check the pair to detect single-point faults in wiring or the control box and trigger a safe shutdown.

Example: E-Stop input wiring. To implement an external E-Stop button:

1. Connect one terminal of the button to one input of a pair (e.g. DI-1).
2. Connect the other terminal to the second input of the same pair (e.g. DI-2).
3. Configure both DI-1 and DI-2 to "Emergency Stop when low" in Safety Settings.
4. When the button is pressed, both inputs go low simultaneously and the control box registers a valid E-Stop command. If a wire breaks on a single line, the pair diverges and the system flags the wiring fault rather than producing a false E-Stop.

The Safety Inputs and Safety Outputs UIs in the robot menu present the 16 ports organized as eight pairs; selecting a pair and assigning a function configures both ports automatically.

4.4 Collisions & Protective Stops

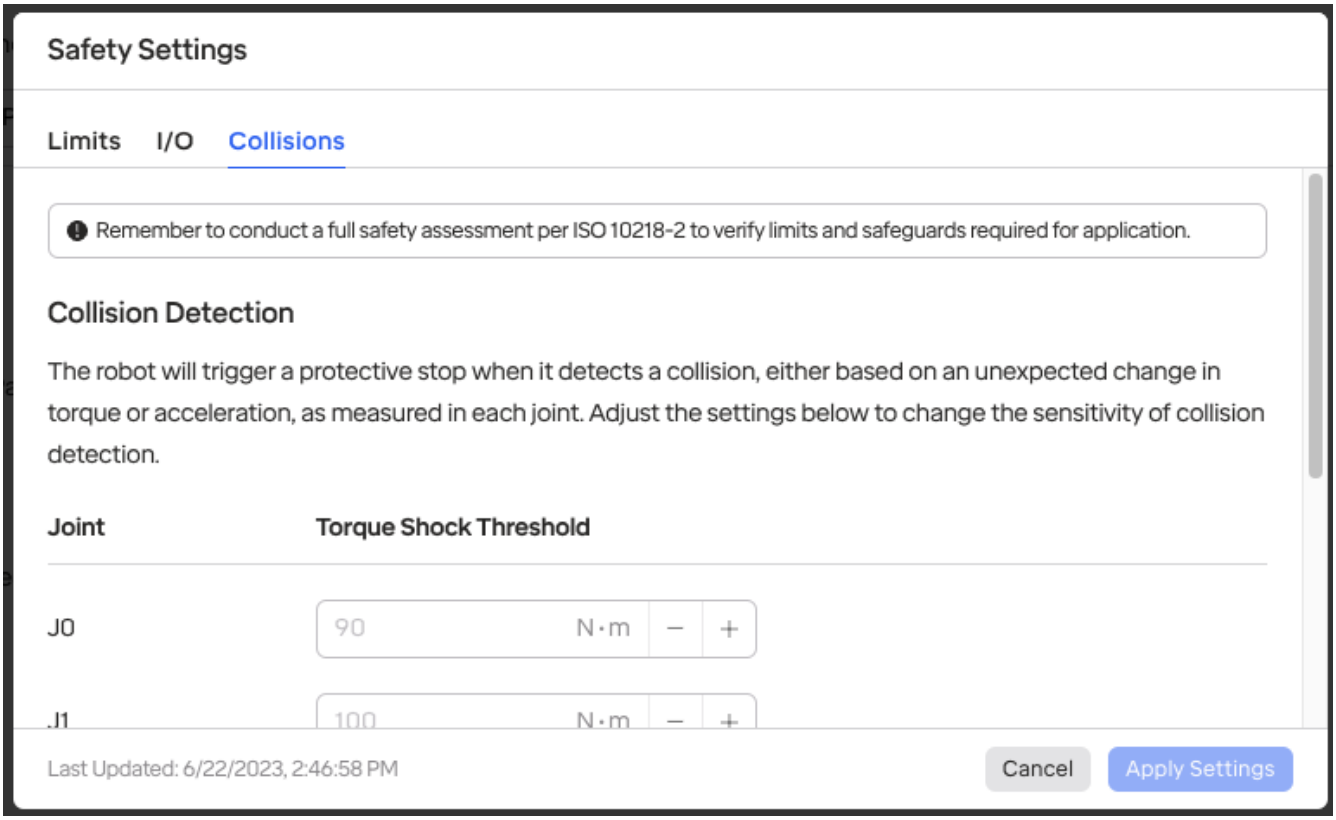
When the robot is running a routine and encounters a collision, it will stop. The routine can be re-started with the "Play" button in the top toolbar. Every time a collision occurs, it will also log the time and force measured, which can be reviewed in the Notification (bell) section.

Collisions are detected with two methods: 1) by monitoring the current coming out of the joint motor to measure torque and find discrepancies, 2) by monitoring an IMU (accelerometer) inside each joint.

4.4.1 Adjusting Collision Sensitivity

Depending on the environment and safety requirements, it may be desirable to change the sensitivity of collision detection. This can be done in the "Collisions" section of Safety Settings.

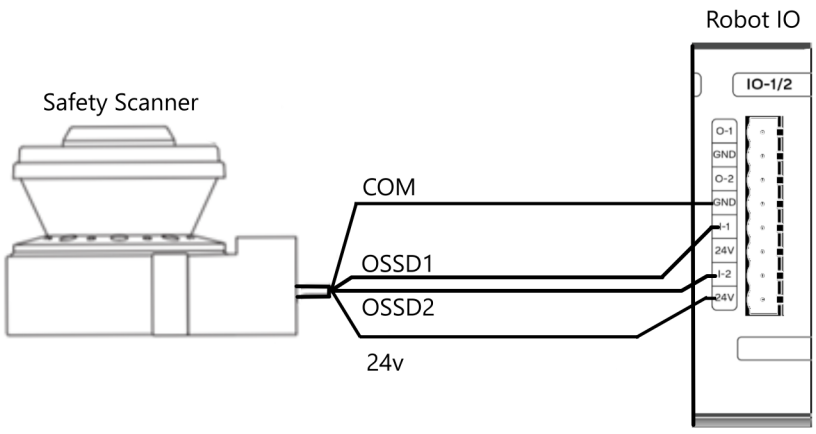
This allows adjusting the thresholds used for both methods: the torque shock threshold (in newton-meters) and the acceleration threshold used by the IMU (in m/s^2).



4.5 Implementing a Safety Scanner

It is highly recommended that a safety scanner is used with the Core robot. Safety scanners, when implemented correctly, can slow or stop the robot automatically. This allows for operators to work safely around the robot.

Every safety scanner has a unique implementation method. Please consult the manufacturer's guide for an in-depth procedure on how to install the device. Below is a generic wiring diagram intended to aid with installing a safety scanner.


Robot IO
IO-1/2
O-1
GND
O-2
GND
I-1
24V
I-2
24V
Safety Scanner
COM
OSSD1
OSSD2
24v

Chapter 5

Maintenance

The Standard Bots Core robot and controller are designed for long life with minimal maintenance. If the robot is installed according to the intended use instructions the robot and controller will provide years of service.

Scope. This chapter covers hardware maintenance and serviceability only. For software setup, routine programming, integrations (Modbus, CNC, ROS), and other operational topics, see the **Standard Bots Programming Manual**.

5.1 User-Serviceable Parts

Part	Description	Part #	Replacement Interval
Control Box Fan Filter	120mm Sq Nylon Mesh 8 Micron Filter	SB-0596-A	6 months, application dependent

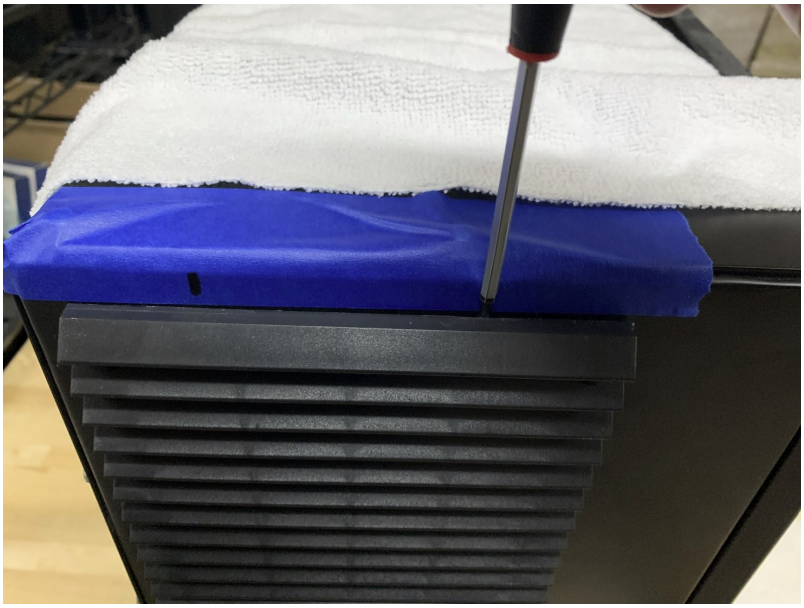
5.2 Replacement Procedures

5.2.1 Controller Fan

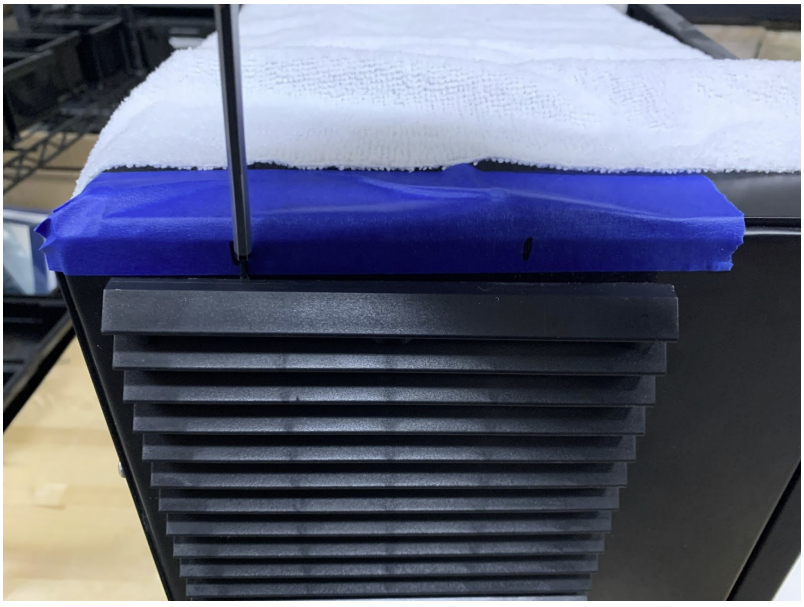
1. Stop the robot.
2. Apply the robot brakes through the Move Robot view in the user interface.
3. Unplug the controller.
4. Wait 30 seconds for power to dissipate.
5. Tape up the area as shown below to avoid damaging surface:

6. Measure from corner of fan shroud and mark tape at 1.5” and 4.5”:

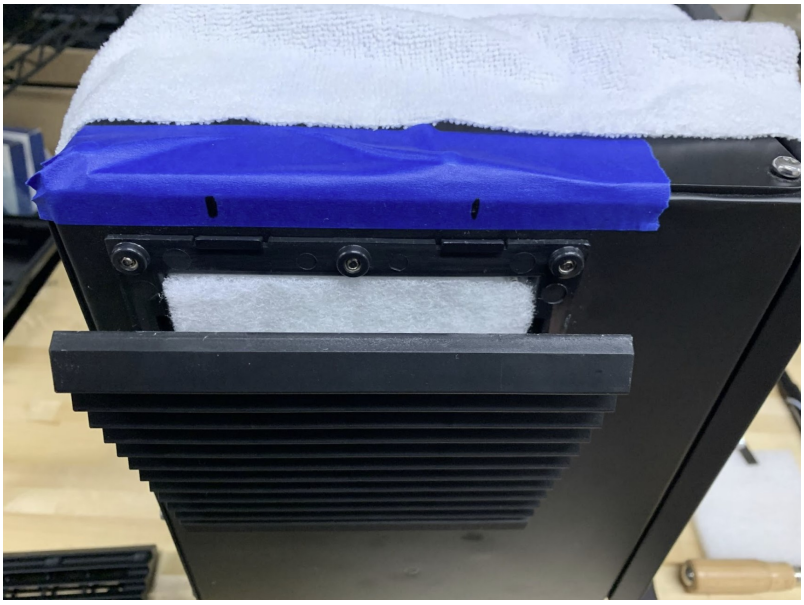
7. Insert a flat head screwdriver just past the lip of the shroud and pry one side out. You will hear a snap noise:



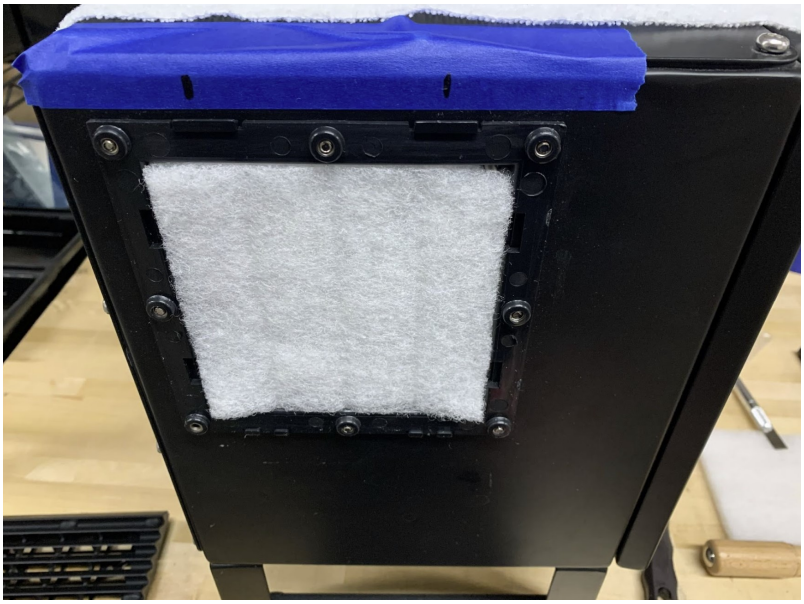
8. Repeat for the other side:



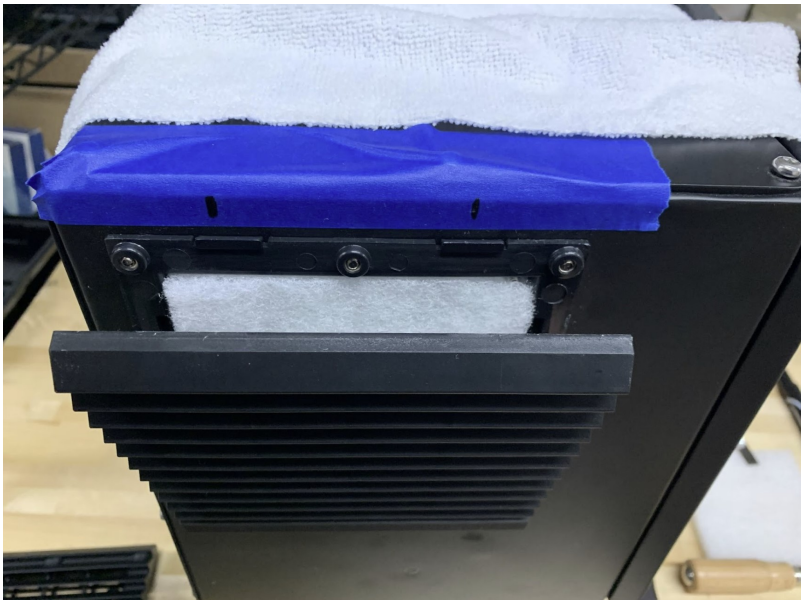
9. Pull shroud downward and remove shroud as shown:



10. Remove and replace filter:



11. Engage bottom of shroud with bottom of assembly:



12. Press in top of shroud with hand.
13. Remove tape.

5.3 Cleaning Instructions

The Core robot is IP54 (protected against harmful dust ingress and water splashing from any direction).

Clean with 99% isopropyl alcohol and microfiber cloth. Wipe robot with cloth to remove dust and dirt.

Reach out to Standard Bots with any additional questions.

5.4 Limited Product Warranty

Standard Bots Company (the "Company") warrants to the original lessor of the Standard Bots Robot (the "Original Purchaser" and the "Product", respectively) from the Company, that the Product shall be free from defects in materials and workmanship under normal use and in conformance with the Company's instructions, for so long as such Original Purchaser continues to lease the Product from the Company (the "Warranty Period").

If a defect arises during the Warranty Period, the Company will, at its option, (i) repair the Product at no charge, using new or refurbished replacement parts, (ii) exchange the Product with a refurbished or new product with equivalent functionality or (iii) provide the Original Purchaser with a replacement part accompanied by instructions on installation, and any requirements for the disposal of the replaced part. The Company shall not be responsible for any labor costs you incur relating to DIY parts service.

This warranty excludes (i) normal depletion of consumable parts such as batteries and (ii) defects caused by the user's fault.

This warranty is subject to your following the RMA process as may be in place at the Company from time to time. In order to obtain warranty service, please contact customer service at live-support@standardbots.com. It is your responsibility to backup any data, software or other materials you may have stored on the Product, as such data, software or other materials may be lost or reformatted during warranty service and the Company will not be responsible for such loss. In addition, it is your sole responsibility to delete all sensitive and personal information stored in, or in accessible form in, the Product prior to shipping the Product to us, and to disable or remove all security passwords.

Without derogation, this warranty does not apply in any of the following cases:

- Products not leased from the Company
- Damage caused by accident, abuse or misuse
- Products that have been dismantled, tampered with, modified or repaired by anyone other than the Company or a service provider authorized by the Company.

5.5 Return Merchandise Authorization

Should you believe you need to return a Standard Bots product please contact us through one of the below contact methods. Unauthorized returns will not be accepted.

Standard Bots Support:

Phone: 888-976-1287

Email: live-support@standardbots.com

Chapter 6

Appendix A - FAQ

Below is a list of common questions and answers for the Standard Bots Core system.

Q: Do you need to have the robot connected to the internet to use the robot?

A: No, the robot can run on a local network or simply with a single ethernet cable connected between the robot and a PC or tablet. If the robot is not online it will still operate without issue, however remote diagnostics and automatic updates will not be available.

Q: Do you need to have the iPad connected to the robot to run a program?

A: No, the iPad is only needed for setting the network settings for the robot. Once the robot is connected to the network, you can use the iPad to control the robot or a computer using Google Chrome or by using the 24V External Control Interface.

Q: How do I connect the robot to the network?

A: The robot can be connected to the network by going to the robot menu in the iPad application and selecting the network icon. From there you can select the network you want to connect to and enter the password.

Q: How do I access my robot from a computer?

A: If the robot is on the internet: You can access the robot from a computer by entering the robot name into the address bar of Google Chrome. You will then be prompted to enter the password for the robot. This will be cbXXXX.sb.app where XXXX is the last 4 digits of the controller serial number. This number can be found inside of the controller door.

If the robot is not on the internet: Use the iPad application to find the IP address of the robot. Then, in the browser of a computer on the same local network of the robot type in the robot IP address port 3000 as shown in the iPad application. Example: 192.168.110.20:3000.

Q: How do I access the network settings after initial setup?

A: To access the network settings of the robot, for example if you want to set a static IP address, use the Standard Bots application on the tablet. If you are already logged into the robot: In the User Interface on the tablet go to the Move Robot view. Go to the robot name menu in the bottom left and select "Logout". You will now be back to the tablet application main screen. On the left side you can select your robot. Once selected, the network settings will be on the right side.

Q: How do I connect my robot to a tablet or PC directly?

A: You will need an ethernet cable to go between the robot ethernet port and your PC or tablet. You may also need a USB-C to ethernet or similar adapter.

If you are simply using a wire, there will not be a router to give both devices an IP address. This means you will need to set the address manually, and set them on the same subnet.

Using the Standard Bots application on the tablet, set an IP address on the wired port of the robot under the network settings in the application. Then set a static address on the PC or tablet. Generally the address follows the format of 192.168.x.y. x would be the subnet, and both the robot and PC or tablet need to have the same number for x. Y would be unique for each device. Ex, the robot could be 192.168.110.5 and the PC or tablet could be 192.168.110.6.

Then on the PC or tablet go to the robot address you assigned in a browser tab. The format is generally 192.168.x.y:3000.

Q: Why is an axis direction grayed when the robot is not fully extended?

A: When the robot has one or more joints that are at their limit, this can prevent the robot from moving in a certain direction in the XYZ plane. The robot does not need to be fully extended in one direction to cause this. It is simple to fix, go to your move joints tab, then rotate the joint that is at its motion limit (the joint that is maxed out in the positive or negative direction). Once done the robot should be able to move with more freedom.

Q: How do I connect my robot to a tablet or PC without setting static IP address and wires but not have the robot on the internet?

A: You can setup a simple local network for the robot using a standard wireless router. You will need to purchase a wireless router. Ensure it is not just an access point, as an access point will not assign IP addresses.

Setup a standard wireless network on the router. Do not connect the router to your LAN or internet. Connect the tablet to the wireless network. Use the iPad application to connect the robot to the new wireless network. In the tablet, check the network status for the robot IP address, which will be in the format xxx.xxx.xxx.xxx:3000. Any device on your new wireless network can access the robot using this address. The cbxxxx.sb.app link will not work if the robot is not online.

Q: Which end effectors work with Core?

A: The following tools are supported directly in the Standard Bots interface:

OnRobot 2FG7 Parallel Tool

OnRobot 2FG14 Parallel Tool

OnRobot 3FG15 3 Finger Centric Tool

OnRobot Dual Changer

Schunk EGU

Schunk EGK

Standard Bots also supports any tools that are discrete I/O driven, including OnRobot tools that are not listed above through the use of the OnRobot Compute Box.

Currently, Robotiq tools are not supported as they cannot be controlled over discrete I/O.

Q: How do I change which tool I want to use on Core?

A: To change which tool is on the robot, go to the robot menu (has the robot name in an oval) and go to equipment. You can then add or delete tools.

Q: Which protocols does Core support?

A: Currently, Core supports 24V discrete I/O, Modbus TCP, and Ethernet IP. There is also a REST API, a Python SDK and TypeScript API.

Q: What are the power requirements of Core?

A: The control box requires 90 ~ 264VAC, 47-63Hz. The robot draws less than 15 amps at 120V.

Q: How do I get started with a new Core?

A: Please start the included iPad, open the Standard Bots application, and follow the instructions.

Q: What is the payload capacity of Core?

A: Depending on speeds and move types, Core can carry up to 18 kg (39 lbs).

Q: What is the maximum speed of Core?

A: Core joints can move up to 435 degrees / second.

Q: What is the maximum reach of Core?

A: 1.3 meters (51.2 in).

Q: What is the bolt pattern at the end of the arm?

A: ISO 9409-1-50-4-M6 pattern. The pattern has 4 M6 bolts on a 50mm circle.

Q: How do I move a routine to a different robot?

A: Open the routine you would like to copy in the first robot. Select the ... menu, and select "schema". Copy the text in the window. Open up the second robot and create a routine. Again select the ... menu and "schema". Copy the text into the window, rename the routine and select "create routine".

Q: How do I import a model into the environment?

A: To import a model, go to the Move Robot view and go to the space area. The icon is in the bottom right of the view and looks like a square. In this view select the "+" to add an item, and select "Object". The UI will tell you which file formats are supported.

Q: How do I get a Developer API Token?

A: The developer API token and setting can be found in the robot menu. Go to the Move Robot page, click on the robot name, settings, Configure developer API.

Q: My robot says it is online but I cannot access it?

A:

1. Check the device you are accessing the robot from (iPad, PC) is on the same network as the robot.
2. Check that the network the robot is connected to does not have a "splash" page you need to log into. This is often the case with guest networks. The robot does not support web based logins like this.

Q: I imported a model as an object but I cannot see it?

A:

- Try changing the scale. The import is in Meters. Often you must convert to meters by setting the scale to .001.
- Check that the file is valid

Q: How do I get the robot back into the box or case?

A:

1. Ensure all tools are disconnected and that the robot has sufficient space to move
2. Power on the robot
3. Go to the Move Robot page of the interface (where you jog the robot)
4. Click on the robot name menu (where the speed is)
5. Go to Settings
6. Go to Box Robot
7. Hold the Prepare Robot For Shipping button down to bring the robot to the box position.

Q: What should I do if I forget my robot's passcode/PIN?

A: Please reach out to Standard Bots at live-support@standardbots.com. Be sure to provide the serial number of your robot controller (e.g., cbXXXX), which you can find inside the controller door.

Q: Why are the safety settings greyed out, and how do I unlock them?

A: The safety settings will appear greyed out until access is unlocked. To unlock them, click the padlock icon labeled "Unlock" in the top-right corner of the safety settings pop-up window. You will then be prompted to enter your passcode. Once the correct passcode is entered, the safety settings for Core will become editable. Don't forget to click "Apply Settings" and confirm the changes to ensure they take effect.

Chapter 7

Appendix B: How to Direct Wire Core

7.1 With an Ethernet Cable

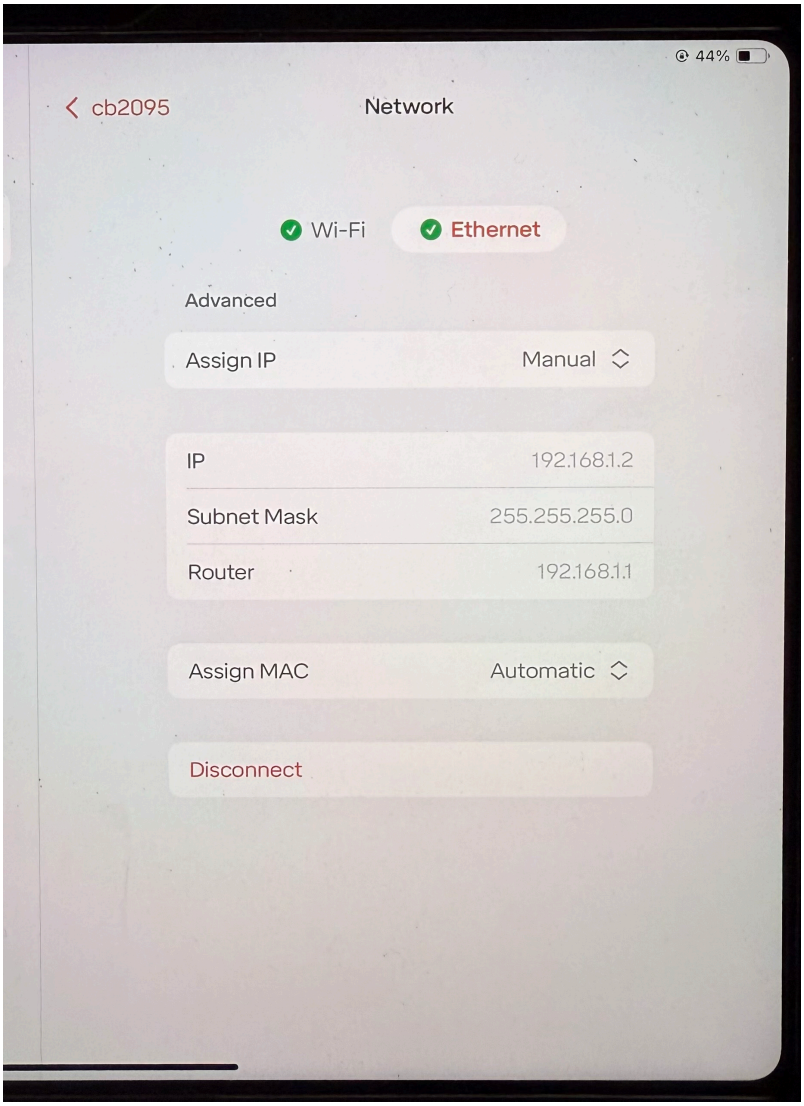
To get started, you need the following:

- iPad with USB-C port
- A USB-C hub with Ethernet port (e.g., Anker PowerExpand 6-in-1)
- Any standard Ethernet cable

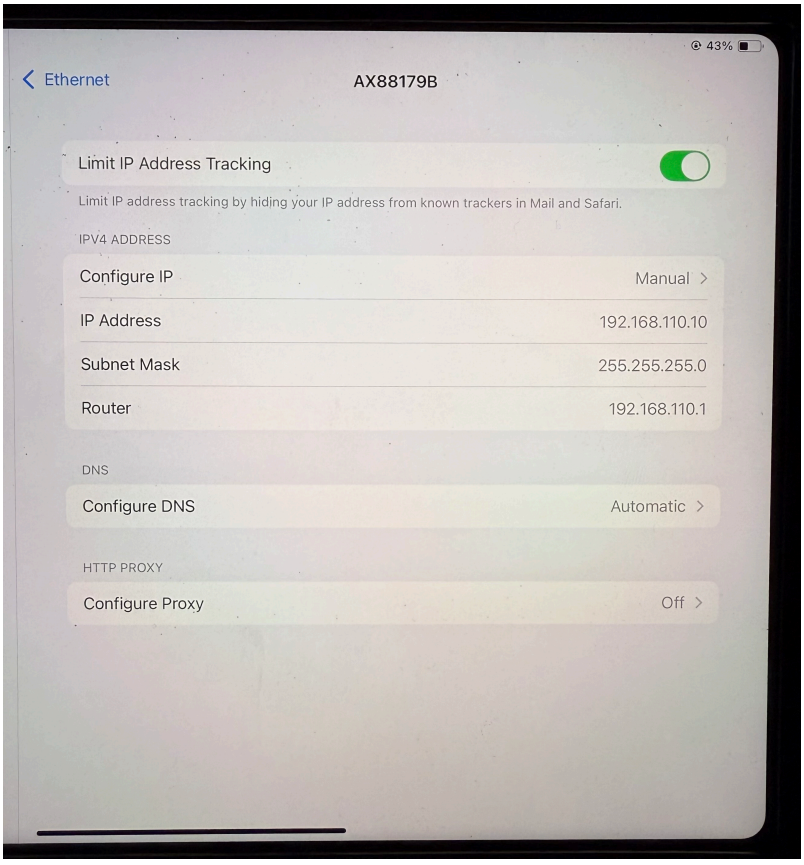
7.1.1 Initial Setup

1. Power up control box.
2. Connect USB-C adapter to iPad.
3. Connect Ethernet cable to USB-C adapter.
4. Connect the other end of the Ethernet cable to the control box.
5. Open iPad.
6. Open the Standard Bots app.
7. Click add robot.
8. Wait for the robot to show up. If it doesn't, check under the control box to make sure the antennas are on the box.

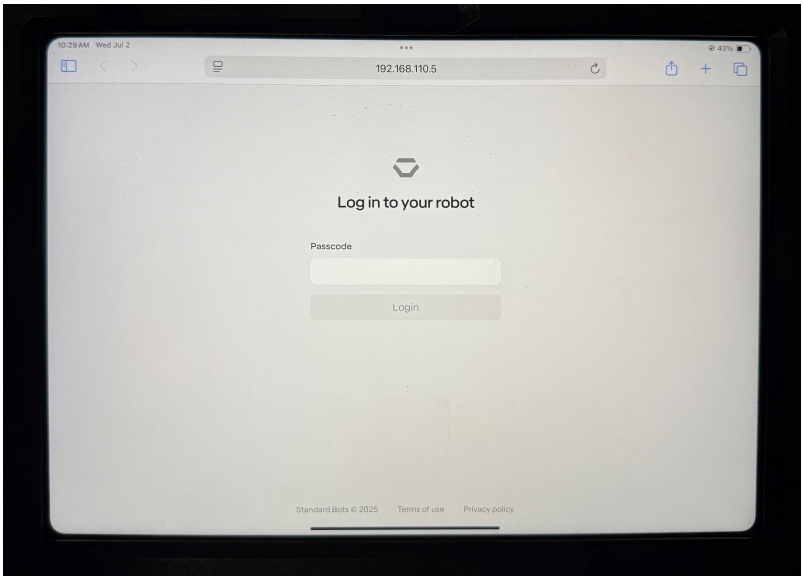
9. Click through until it asks about “network.”
10. Go to the Ethernet tab.



11. Change to these settings:
    - Manual/Auto: **Manual**
    - IP: **192.168.110.5**
    - Subnet Mask: **255.255.255.0**
    - Router: **192.168.110.1**
    - Leave all other settings as-is.
12. Click Connect on the bottom of the screen.
13. Then on the iPad go to Settings.
14. You should now see a setting for Ethernet.
15. Go to Ethernet settings.



16. Change to these settings:
    - Manual/Auto: **Manual**
    - IP: **192.168.110.10**
    - Subnet Mask: **255.255.255.0**
    - Router: **192.168.110.1**
    - Leave all other settings as-is.
17. Don’t forget to save these changes.
18. Open Safari or any web browser.
19. Type in **192.168.110.5:3000**.
20. Hit enter.
21. The UI should then come up.



22. Bookmark this page.
23. If the iPad goes to sleep, you may have to unplug and replug in the USB-C adapter to get it to wake up. You should never have to reset any IPs on the robot or iPad as long as you use the same adapter.

7.1.2 Subsequent Use

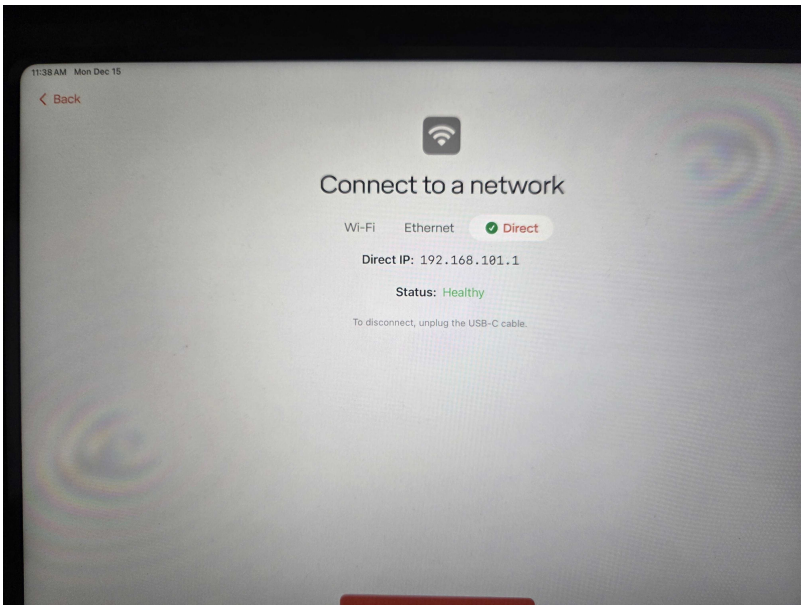
1. Turn on the control box.
2. Wait for the LED on top of the box to turn green. If it does not turn green after 3 minutes, press it.
3. Connect USB-C adapter to iPad.
4. Connect the Ethernet cable to both the adapter and the control box.
5. Go to your web browser and open the bookmark you previously saved.
6. Use the robot!

7.2 Direct Connection (using a USB-C Cable)

7.2.1 Initial Setup

1. Power up control box.
2. Connect the iPad to the Tablet USB port on the bottom of the control box with a USB-C cable. At this time, the port is only one-directional. If you do not see the iPad start to charge, flip the end of the cable 180 degrees on the control box side.
3. Go to the settings on the iPad and set the iPad IP to automatic (this should be the default on the iPad).
4. Open iPad.
5. Open the Standard Bots app.
6. Click add robot.

7. Wait for the robot to show up.
8. Click through until it asks about “network.”
9. Go to the option that says “Direct.” You will see that the status above says “Healthy” if the steps above were followed correctly.



10. Continue to the next page. You can now use your robot.

Standard Bots Company
80 Pratt Oval
Glen Cove, NY 11542 USA

www.standardbots.com
1-888-9-ROBOTS