Kinova® Gen3 ultra-lightweight robot quick start guide

Unbox, set up, and power on your robot in less than 30 minutes!

01 Please read the safety information before unboxing your robot

Directives, warnings and safety considerations for the Kinova Gen3 robot

Failure to follow directives, warnings and safety considerations may result in serious injury or death to the user, damage to the robot, or a reduction in its useful life.

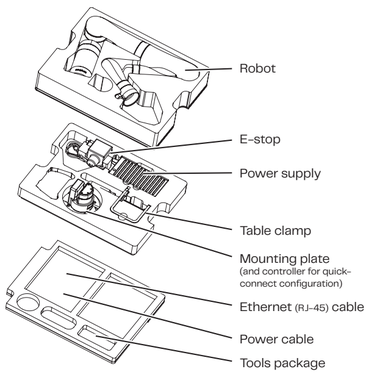
GENERAL

Do not connect the USB ports on the base to one another.
It is recommended that surge protection be used to protect the robot against external surges on the main AC line which might be caused by lightning or other abnormal conditions.
The base must be mounted as specified in the installation section, with particular attention to the bolt pattern, strength requirements and any table or tripod-specific mounting.
Any end effector must be mounted as specified in the installation section (including bolt pattern, power requirements, etc).
The table clamp should not be used for repeated movement as the mounting may eventually detach fom its location, resulting in the robot falling. Mount the robot securely with screws as described in the Getting started section of the user guide for a more permanent installation.
The controller mating interface needs to be kept free of dust and moisture to protect the electrical contacts. Wipe down with a soft, dry cloth to keep the surface of the interface clean.

SAFETY

There are no mechanical brakes on the robot. If the power supply is cut or an unrecoverable error occurs, be aware that the robot will fall. However, mechanisms are in place within the actuators that slow the descent without external power.	
For your personal safety, and that of others, it is strongly recommended that the following be carried out:	• Risk assessment, before integration of the robot into a given application; • Hazard analysis, before integration into an environment which includes atomized flammable dust, particles, explosives or flammable gases, etc.
For your personal safety, and that of others, never:	• Use the robot near a flame or source of heat; • Use the robot to submerge objects in water; • Attempt to stop the robot or prevent its movement by holding it (except in admittance mode); • Install the robot base within 20 cm of your body (base contains a Wi-Fi transmitter); • Power up, reboot, or update the firmware of the robot only when the robot is in a stable position.
For your personal safety, and that of others, always ensure that:	• The robot does not encounter any obstacles (person or objects). Although inherently safe in its default configuration, disabling the robot safeties requires that the user be responsible for ensuring a secure working space; • The end effector never collides with a hard surface; • The grasping of objects by gripper fingers is stable, to prevent the risk or dropped or thrown objects (if using a gripper); • The wrist is supported before turning the power off (otherwise it may fall and cause damage); • The working area is safe when containers of hot (or extremely cold) liquids are to be manipulated with the robot; • The robot working area is safe if sharp objects are to be handled by the robot (e.g., fencing, light curtains, laser scanner, safety mats); • The robot has its base securely fixed to the work surface when in operation; • Before using the robot, you have confirmed that there are no warnings; • The robot is protected adequately before being used near any messy process (e.g., painting).
When using a tool and payload with the robot, ensure that the robot is configured with the parameters of the tool and payload using the Kinova Web App or the Kinova.Api.ControlConfig API. For more details, see the API documentation on GitHub and the Interface, expansion, and vision section of the robot user guide. The robot may behave in an unexpected manner if the tool and payload parameters are not properly configured.	
When mounting the robot in a wall or ceiling mount, ensure that special considerations and configurations set out in the user guide are followed, including analysis of the mounting surface, use of the base locking screw, orientation of the base connector panel, and configuration of the gravity vector.	
High-level force control is supported as an experimental feature. Users should exercise caution.	
Low-level torque control is for **advanced users only** and should only be used by users who know what they are doing. It is very important to carefully monitor the torque commands sent to the actuators to ensure that excessive values are not sent. Incorrect use can lead to rapid movements that can be dangerous for people and equipment. Make sure that the area around the robot is clear before experimenting with torque control.	
Do not power on the product if any external damage to the vision module is apparent. Do not attempt to open the vision module.	
To avoid eyesight injury from wide angle infrared laser light, do not view the front-facing surface of the vision module through magnifying optical elements.	
The robot should not be used without the provided emergency stop connected.	
Do not operate the robot when the relative humidity exceeds the maximum specified. In such a case, remove any object in the gripper, bring the robot to a resting position and wait until the humidity decreases to an allowable value.	
The robot is not certified for use in applications in sterile environments (e.g. food production, pharmaceuticals, medical, surgical).	
Individual protection equipment, such as eye protection, should be used as determined by the user, based on risk analysis.	

02 What's inside

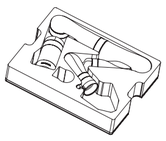


Note: Gamepad and gamepad's cable are packaged separately

03 Mounting and setup

A Unpack robot from case

i. Take the robot out of the tray and gently place it on a table;
ii. ! Move joints **slowly**;
iii. Carefully move the robot near the edge of the table in a way the controller end of the robot slightly protrudes.



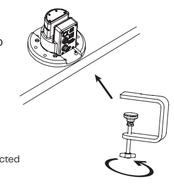
B Mounting plate installation

i. Use the provided four M6 x 30 socket head cap screws to secure the mounting plate to the robot;
ii. For the mounting plate bolting pattern please refer to the user guide in the Getting started section.

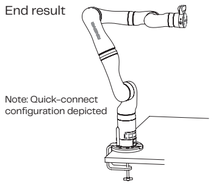
C Table clamp installation

i. Easier when done by two people;
ii. Hold the robot straigt up near the edge you want the robot to be;
iii. Attach clamp;
iv. Tighten clamp.

Note: Quick-connect configuration depicted



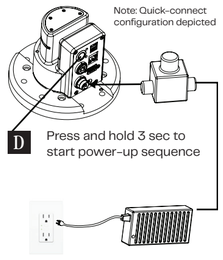
D End result



Note: Quick-connect configuration depicted

04 Power on

A Connect power supply to robot

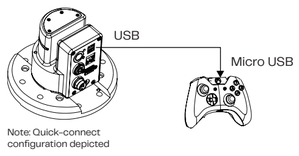


! Power-up sequence:

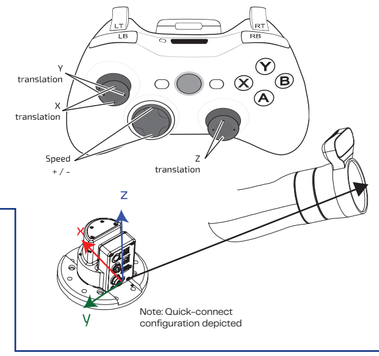
i. Booting: flashing blue;
ii. Initialization: steady blue + amber;
iii. Ready: steady green.

05 Controlling robot with gamepad

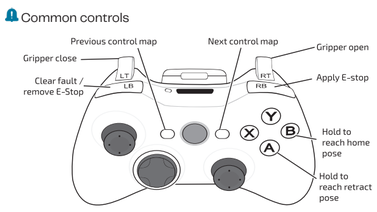
A



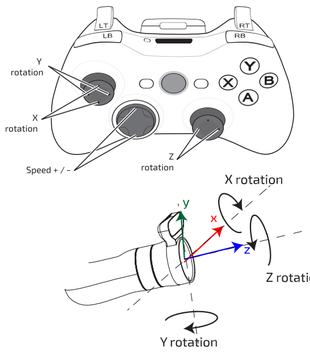
B Twist linear control (translation)



! Common controls



C Twist angular control (orientation)



06 Exploring admittance control

Controlling the robot by hand — admittance button controls

! Press and hold buttons to move robot in admittance modes

Button 1: raised button, right hand side

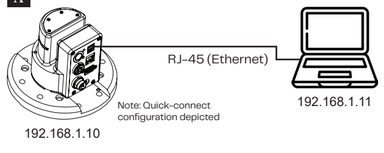
Button 2: indented button, left hand side

Cartesian admittance	Apply force by hand to move tool in translation	Button 1
Joint admittance	Apply force by hand to rotate individual joints	Button 2
Null space admittance	Apply force by hand to move joints within null space while retaining tool position (**7 DoF only**)	Button 1 + Button 2

07 Connecting to a computer

Connecting the robot to a computer and configuring wired LAN settings

A Connect robot to computer by Ethernet



B Configure computer wired LAN adapter IPv4 settings to enable communication with the robot (Windows 10 instructions)

i. Open **Control panel – Network and sharing center**;
ii. Select **Change adapter settings**;
iii. Open wired Ethernet adapter (i.e., **Local area connection**) and select **Properties**;
iv. Select **Internet Protocol version 4 (TCP/IPv4)** and click **Properties**;
v. Enter 192.168.1.11 for IP address and 255.255.255.0 for subnet mask;
vi. Press **Ok**.

08 Accessing the robot via the Web App

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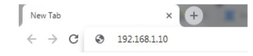
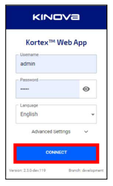


B



i. Username: **admin**;
ii. Password: **admin**;
iii. Press **Connect**;
iv. You are now successfully logged in to the Kinova Kortex™ Web App.

09 Playing a preset trajectory (sequence)

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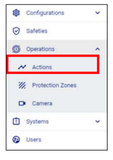
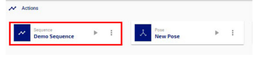
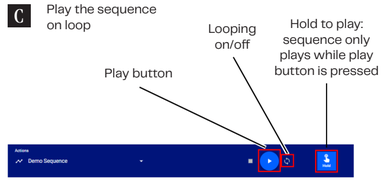


Actions page

B Select preset sequence **Demo sequence**



C Play the sequence on loop



10 Going further

API, documentation and other resources

Kinova Kortex™ GitHub repository

! github.com/kinovarobotics/kortex – Includes development setup instructions, API library package, API code examples, and API documentation.

Technical resources

! kinovarobotics.com/resources – Includes user guides, specifications sheets, FAQ, how-tos, softwares, CAD, drawings, and more.

Look for our tutorial videos on YouTube! Kinova Kortex

Technical support

! support@kinova.ca

Kinova Kortex™ ROS GitHub repository

! github.com/kinovarobotics/ros_kortex – Includes ROS package, ROS examples, and ROS documentation.

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