

KINOVA®
Jaco®
assistive robot

REACH OUT AND CHANGE THE WORLD



USER GUIDE

Contents

Disclaimer.....	1
Symbols and their meanings.....	2
About this document.....	4
Warranty.....	5
EU Declaration of Conformity.....	6
Specifications of Jaco and its accessories.....	7
Jaco specifications.....	7
Jaco Blue Universal Interface specifications.....	8
OLED Display specifications.....	10
Lift Arm specifications.....	10
Safety warning levels.....	12
Labels.....	13
Examples of labels on Jaco.....	14
Examples of labels on Jaco Blue Universal Interface.....	14
Labels on OLED Display.....	14
Labels on Lift Arm.....	15
Jaco® assistive robot.....	16
Intended use.....	16
Indications.....	18
Contraindications.....	18
Dangers.....	19
Precautions.....	21
Warnings.....	22
Restrictions.....	24

Security features.....	24
Inside the box.....	24
Basic supplies.....	25
Additional supplies.....	25
Supplies for on-chair use.....	26
Supplies for off-chair use.....	27
Configuration example for Jaco on an R-net wheelchair control system without Lift Arm.....	28
Components.....	29
Robot external connectors.....	30
Installation, configuration, and operation of the robot.....	31
Removing Jaco from the mount.....	32
Installing Jaco onto the mount.....	33
Kinova Jaco Blue Universal Interface.....	34
Warnings.....	36
LED status indicators.....	36
Installation and configuration.....	37
Pairing with Bluetooth device for the first time.....	38
Initiating Bluetooth pairing with CJSM2-BT.....	39
Initiating Bluetooth pairing with Q-Logic 3.....	40
Initiating Bluetooth pairing with the Omni2 Interface and Mo-Vis.....	45
Pairing Bluetooth automatically with device.....	45
Pairing Bluetooth automatically with CJSM2-BT.....	46
Pairing Bluetooth automatically with Q-Logic 3.....	47
Pairing Bluetooth with the Omni2 interface and Mo-Vis automatically.....	48
Kinova® OLED Display.....	50
Dangers.....	50
Precautions.....	50
Warnings.....	51
Identification of parts.....	51
Switch-on sequence.....	51
Screen sections.....	53
Main section.....	54
Status section.....	58
Mode section.....	59
Function section.....	62

Sleep mode.....	65
Major errors.....	66
Joystick and communication error.....	66
Communication Lost error.....	66
Assistive Robot Configurator software.....	67
Installing Assistive Robot Configurator.....	67
Operating Assistive Robot Configurator software.....	68
Configurations available to the user.....	70
Dashboard and Health center.....	71
Exiting Assistive Robot Configurator.....	72
Accessories.....	73
Kinova® Lift Arm.....	73
Dangers.....	75
Precautions.....	76
Warnings.....	77
Lift Arm components.....	78
Controlling tilt back and forward control.....	78
Swing-away mechanism.....	80
Cutlery and Tool Holder.....	82
Preparing to use the Cutlery and Tool Holder accessory.....	85
Using the Cutlery and Tool Holder accessory.....	86
Operation and control of the robot.....	88
Home and Retract positions.....	90
Operation and control of Jaco with factory settings through a power wheelchair.....	91
Operating Jaco from a power wheelchair.....	93
Maintenance.....	95
Basic maintenance.....	95
Cleaning Jaco.....	95
Cleaning Kinova® Lift Arm.....	96
Disposal of the Jaco and its accessories.....	97
Disposal of Jaco.....	97
Disposal of OLED Display.....	97

Disposal of Lift Arm.....	98
---------------------------	----

Contact support.....	100
-----------------------------	------------

Glossary.....	101
----------------------	------------

A.....	101
B.....	101
C.....	102
D.....	102
E.....	102
F.....	103
H.....	103
I.....	104
L.....	104
M.....	105
N.....	105
O.....	106
P.....	106
R.....	106
S.....	107
T.....	108
U.....	108
W.....	109

Disclaimer

Kinova® and the Kinova logo are trademarks of Kinova inc., herein referred to as Kinova. All other brand and product names are trademarks or registered trademarks of their respective corporations.

The mention of a product does not constitute an endorsement on the part of Kinova. No part of this publication may be reproduced, stored in a data retrieval system, or transmitted in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of Kinova, except as permitted by a special agreement.

The content of this guide is for informational purposes only, is subject to change without notice and should not be construed as an assurance by Kinova. Kinova assumes no liability for any errors or inaccuracies in this document.

Periodically, changes are made to the information contained herein; these changes will be incorporated into new editions of this publication. Kinova may, at any time, make improvements or changes to the products and software programs described in this publication.

If you have any questions or comments about this document, the information it contains, or the product it describes, contact us at support@kinova.ca.

Symbols and their meanings

Throughout the manual, icons are used to draw attention to the reader.

	DANGER:	Safety measure of an impending situation that can result in serious injury or even death, or can severely damage property, if ignored
	CAUTION:	Safety measure that could lead to equipment damage if ignored
	Warning:	Safety measure that can result in minor injury
	Restriction:	Safety measure of what a user must not do in any circumstance
	Attention:	Safety measure while performing a task
	Tip:	Tip on the maintenance, operation, and manipulation of Kinova products
	Remember:	Reminder of information to supply context to content
	Important:	General important information and good practice
		Refer to accompanying documents
		Pinch point
		Medical device
		Serial number
		Date of manufacturing
	Manufacturer	Kinova inc. 4333 boulevard de la Grande-Allée Boisbriand, Québec J7H 1M7
		Direct current
		Alternating current

	Operating temperature range
	Compliance with <i>WEEE2</i> directive
	Compliance with <i>RoHS</i> 3 directive
	Type <i>BF</i> Applied Part device
	European Union (EU) mandatory conformity marking
	European Union (EU) Authorized Representative: CEpartner4U BV Esdoornlaan 13 3951 DB Maarn The Netherlands
	SRN – Number NL-AR-000000111
	KS Swiss Authorized Representative: SKS Rehab AG IM Wyden 3 CH-8762 Schwanden
	Telephone +41 55 647 35 85
	Email sks@sks-rehab.ch
	SRN – Number CHRN-IM-20000882

About this document

The *Jaco® assistive robot user guide* contains information about the configuration and use of Jaco® assistive robot.

Jaco is made up of a robotic arm, an interface between the wheelchair and the arm, a display, and some accessories.

Table 1: Jaco products

Product	Model number	Accessory	Part number
Jaco® assistive robot	KR MJ2 0001	Kinova® Lift Arm	KR8600-01
Kinova Jaco Blue Universal Interface	KR UI3 0001	Kinova® Cutlery and Tool Holder	AM 8181 0001
Kinova Jaco Blue Universal Interface with R-net	KR UI3 0001		
Kinova® OLED Display	PD 0508 0001-01		

The guide also contains information about Assistive Robot Configurator, which is a Kinova-developed software used to adjust how Jaco operates.

The *Jaco® assistive robot user guide* is intended for different groups of people.

- Kinova product end users
- Field and local Kinova representatives



CAUTION: Kinova assumes no liability whatsoever for non-compliance with safety precautions. Read all information before using this product and its accessories.



CAUTION: Read all warnings on the product and in this guide.



CAUTION: Follow all instructions.



CAUTION: Keep the instructions for future reference.

Warranty



Refer to the *Term and Conditions* on the Kinova website: <https://www.kinovarobotics.com/legal/terms-and-conditions>.



Refer to sales conditions for the defined life of service of the device.

EU Declaration of Conformity

Jaco® assistive robot conforms with the requirements of EU directives and regulations, in particular the EU MDR.

The Declaration of Conformity is available upon request.

Specifications of Jaco and its accessories

Before incorporating Jaco and any of its accessories, make sure that they are conducive to the needs of the user.

Jaco specifications

Jaco® assistive robot is a medical device that can be used in many situations. It is important to know its specifications before incorporating it in your environment.

Table 2: Jaco specifications

Environmental

Operating temperature	-10 °C to 40 °C
------------------------------	-----------------

Operating humidity (non-condensing)	15% to 90%
--	------------

Mechanical

Materials	Arm segments and Base	Carbon fiber
	Actuators	Aluminum
	Fingers, outer	Arnitel EL550, Thermoplastic Copolyester Elastomer (TPC)
	Fingers, inner	Rubber made of Thermoplastic Elastomer (TPE)

Total weight	5.4 kg with 3 finger gripper 12 lbs with 3 finger gripper
---------------------	--

Reach	90 cm 35 in
--------------	----------------

Maximum payload	mid-range continuous	1.6 kg 3.5 lbs
	full-reach peak, temporary	1.3 kg 2.9 lbs

Joint range (software limitation)	± 27.7 turns
--	--------------

Maximum linear robot speed	20 cm/s 7.9 in/s
Gripper force	3 fingers: 40 N 2 fingers, where applicable: 25 N
Water resistance	IPX2 (resistance against light rain)
Electrical	
Power supply voltage	24 VDC
Average power consumption	25 W
Average power consumption - in standby	5 W
Peak power consumption	100 W

Jaco Blue Universal Interface specifications

Jaco Blue Universal Interface is the accessible control interface that makes it easier to communicate with Jaco. It is important to know the specifications of Jaco Blue Universal Interface before incorporating it in your environment.

Table 3: Jaco Blue Universal Interface specifications

Environmental

Operating temperature	-25 °C to 40 °C
------------------------------	-----------------



Note: If Jaco is powered up at ambient temperature, Jaco Blue Universal Interface can operate below 0 °C.

Storage temperature	-40 °C to 70 °C
----------------------------	-----------------

Humidity non-condensing	15% to 90%
--------------------------------	------------

Mechanical

Material	Anodized aluminum
-----------------	-------------------

Total weight	< 0.60 kg	< 1.32 lbs
---------------------	-----------	------------

Dimensions excluding protruding connectors	148 x 56 x 92 mm	5.83 x 2.20 x 3.62 inches
Water resistance	IPx4	
Ports	DB9 male and female	
	3.5 mm audio jack (6) and output (2)	
Mounting bracket (Optional)	M4	
Mounting wheelchair rail (Optional)	M6	
Electrical		
Power supply voltage	24 V DC	
Operating voltage	18 V DC to 29 V DC	
Maximum power consumption	350 mA	
USB charging capability	5 V @ 500 mA	
Compatibility		
Bluetooth devices	Curtis Wright R-net	CJMS2-BT and Omni2 interface
	Quantum Rehab Q-Logic 3	
USB	Microsoft Xbox controllers	One, Series X, Series S, Adaptive
Analog joystick	DB9 standard	Female connector, DB9 mini-gender changer for the joystick is available
Digital joystick	DB9 standard	Male connector, DB9 mini-gender changer for the joystick is available
Bluetooth module: Pre-certified		
Federal Communications Commission Identifier (FCC ID)	2AC7Z-ESPWROOM32UE	

OLED Display specifications

OLED Display displays information to the user to make it easier for them to use Jaco. It is important to know the specifications of OLED Display before integrating it in your environment.

Table 4: OLED Display specifications

Environmental

General	Ambient temperature	-20°C to 70°C
	Normal atmospheric pressure conditions	
Storage	Ambient temperature	0°C to 50°C
	Maximum relative humidity	55%

Mechanical

Water resistance	Light rainfall	Limited period of time (IPX2)
		Minimal exposure to rain

Electrical

Power Ratings	Voltage	24 V DC
	Current consumption	0.09A max
		0.5A fused

Lift Arm specifications

Lift Arm is an accessory that enhances Jaco movement. It is important to know its specifications before incorporating it in your environment.

Table 5: Lift Arm specifications



Note: Weight and dimensions are for Lift Arm alone and do not include Jaco.

Mechanical

Weight	5.6 kg (12.3 lbs)
---------------	-------------------

Dimensions	500 mm x 116 mm x 164 mm	
includes mounting clamps	19.7 in x 4.5 in x 6.5 in	
Control box dimensions	115 mm x 95 mm x 55 mm 4.5 in x 3.7 in x 2.2 in	
Swing-away mechanism maximum angle	No limit other than running into the wheels or side of the wheelchair, depending on the setup and wheelchair	
Maximum tilt forward angle	64°	
Maximum tilt backward angle	3°	
Maximum Duty cycle	10% Operation for 2 minutes maximum in every 20 minute period	
<i>Electrical</i>		
Electrical rating	24 V DC max 2.7 A	
Maximum payload	mid-range continuous	1.6 kg 3.5 lbs
	full-reach peak, temporary	1.3 kg 2.9 lbs

Related topics

[Jaco specifications](#) on page 7

Safety warning levels

Follow basic safety rules when operating Jaco to prevent injury to the user or damage to the Jaco system, wheelchair, or the surroundings. Not complying with the safety directives can result in safety issues for the end user.



Notice: Notify Kinova, or the Kinova-certified technician, of any changes in contact information, such as address, telephone number, or email, to make sure reception of all notices and safety communications.

There are several levels of warnings to take into consideration when operating Jaco, its related products, and its accessories.

In the event of contradictory warnings, the ones listed as danger take precedence over all other warning levels.



DANGER: A danger is an impending hazardous situation that can result in serious injury or even death, or can severely damage property. Avoid impending hazardous situations that are associated with dangers.



CAUTION: A caution is a hazardous situation that may cause minor to moderate injury to workers and can damage the property. Avoid hazardous situations that are associated with cautions.



A pinch point is within the Caution safety level and indicates a situation in which a person may find their hand pinched or crushed.



Warning: A warning is a potentially hazardous situation that can cause minor to moderate injury to workers, might result in serious injury or even death, and can damage the property significantly. Avoid potentially hazardous situations that are associated with warnings.



Restriction: Restrictions are limiting conditions and identify when not to use Jaco. Ignoring a restriction can cause irreparable harm to the user or damage the product to the point of voiding its warranty.

Limitation: Limitations describe what is not possible under certain circumstances.

In addition to the various levels of warnings, there are indications and contraindications to remember when using Jaco.

Labels

The product has a label affixed to it that provides pertinent information.

The label may differ from the ones accompanying your device, depending on your country. For instance, the Authorized Representative address on the label differs for each region.

Also, the label may have fewer elements and may have the elements in different places, depending on the device.

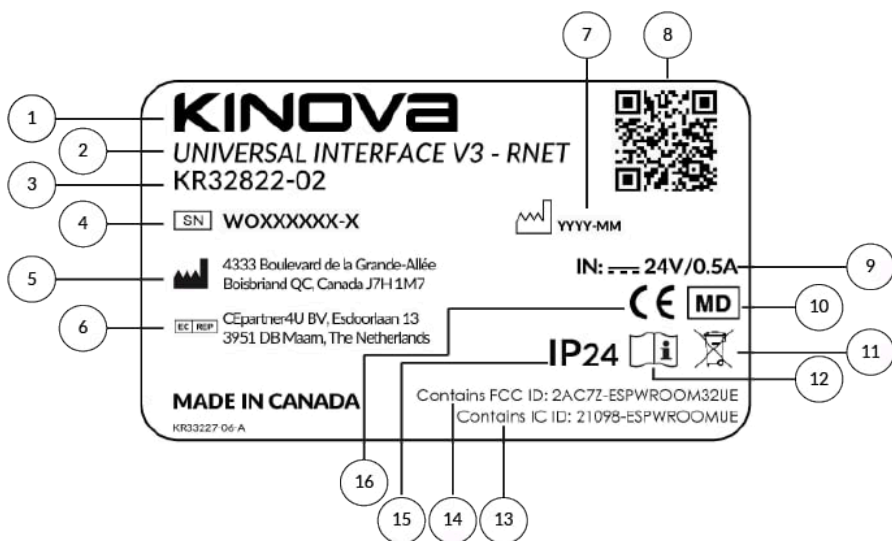


Figure 1: Example of a label

1	Manufacturer	10	Medical device
2	Product (component)	11	Compliance with WEEE2 directive
3	Model number	12	Read instructions before using
4	Serial number	13	IC ID
5	Manufacturer address	14	FCC ID
6	Authorized representative address	15	Ingress protection rating; level of being water proof
7	Manufacturing date		Example: IPN _x N ₂ x indicates no need for solid particle protection; 2 indicates the product is protected against dripping water when it is tilted a maximum of 15°

8 QR code of the serial number

**Note:** IP24

2 indicates it is protected against solid particles $\theta > 12$ mm;
4 indicates it is protected against splashing water from all directions.

9 Voltage and current input

16

European Union conformity marking

Examples of labels on Jaco

The product has a label affixed to it that provides pertinent information.

Variations of the label involve different authorized representative addresses.

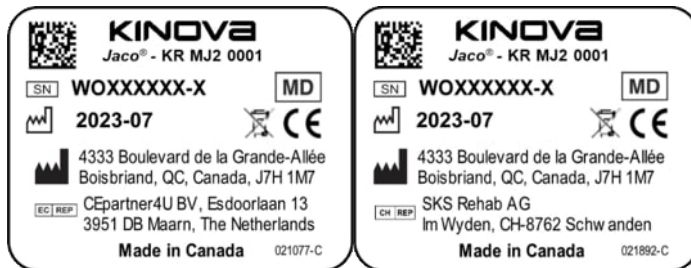


Figure 2: Sample labels with varying authorized representatives

Examples of labels on Jaco Blue Universal Interface

The product has a label affixed to it that provides pertinent information.

Variations of the label involve different authorized representative addresses.



Figure 3: Sample labels with varying authorized representatives

Labels on OLED Display

The product has a label affixed to it that provides pertinent information.

Variations of the label involve different authorized representative addresses.



Figure 4: Sample labels with varying authorized representatives

Labels on Lift Arm

The product has a label affixed to it that provides pertinent information.

Variations of the label involve different authorized representative addresses.



Figure 5: Sample labels with varying authorized representatives

Jaco® assistive robot

Jaco® assistive robot is a medical device intended for people who are severely impaired or who have lost the functionality of their upper extremities. Jaco replaces the function of the upper limb on one side of the body.

Jaco is designed to reach around the user, hold, handle and operate objects. Using the existing wheelchair drive controls and other types of accessible controls, the user can independently control the robot, move it in three-dimensional space, and operate the gripping function.

Jaco can assist with a wide variety of activities in daily living to compensate for the disability; it facilitates increased independence in both medically necessary and essential personal and social tasks.

Activities in which Jaco can help include grasping for eating and drinking, scratching the head, opening and closing doors, and so on. With Jaco, the user can operate light switches, door handles, elevator buttons, traffic light button, and emergency buttons in domestic and non-domestic places.

The amount of external help can be reduced. For example, the user can remain in the home and the need for caregivers can be reduced.

Jaco is intended for indoor and outdoor use.

Use Jaco in different situations.

- On a power wheelchair
- On a rolling stand

Jaco can be used on the left or right side of the wheelchair. The application page is defined by software settings.

Any other type of installation, set-up, or use is deemed to be improper within the scope of the intended purpose. Kinova is not liable for personal injuries and property damage resulting from improper use.

Related topics

[Jaco specifications](#) on page 7

[Examples of labels on Jaco](#) on page 14

Intended use

Jaco must be used according to its intended use. Kinova is not liable for any use of Jaco beyond its intended use.

The patient is the intended operator of Jaco.

Jaco can be operated with a wide variety of power wheelchair control systems, as well as directly controlled with other types of accessible control inputs.

Use only accessories approved for use with Jaco. For a list of compatible wheelchairs and approved Jaco accessories, contact your Kinova representative.

Normal, or intended, use of the robot means that a maximum load can be lifted, pushed, pulled, or handled continuously, as well as for a short time.

Continuous	1.6 kg from minimum to medium reach with 45 cm between actuator #2 and the load
Temporarily	1.3 kg from medium to full reach with 90 cm between actuator #2 and the load



CAUTION: Jaco is designed to grab and hold objects around the user. However, in some positions at maximum range and at maximum load over a longer period of time, it can heat up. In this case, the user is informed of the situation to avoid overheating, which is a danger to the user. When using the OLED display, the warning is given by an acoustic signal and a warning triangle on the OLED display. On the Kinova joystick, the warning is given by flashing red lights. Place the object that is in the gripper down and bring the arm back to the [Home position](#) or to the [Retract position](#). Wait for the warning to go off before continuing to use the robot.



CAUTION: Lifting weight close to the maximum load and reach may result in a warning message. When using the OLED display, an audible signal is sounded, and a warning triangle appears on the OLED display to signal the warning. When using the Kinova joystick, red lights flash to signal the warning.

Place the object in the gripper down, and bring the arm back to the [Home position](#) or the [Retract position](#). Wait for the warning to clear before using the robot again.



Note: During normal operation, the joints are subject to heating. The joints are normally covered with plastic rings that protect the user from hazards caused by hot metal parts.



DANGER: The fingers of the robot are flexible to protect the internal mechanisms. When moving objects with the fingers, the user must not bend the fingers beyond their maximal limit; otherwise, the internal mechanism may be damaged.



CAUTION: Do not force the fingers beyond their maximal opening; otherwise, some internal components may be damaged.

Indications

Take account all limitations when using the equipment.

Table 6: Limitations of Jaco

When there is a significant or complete loss of arm and hand functionality, the user cannot move, lift, stretch, or move the affected arm freely in space; they can use Jaco only to a limited extent or only for a short time. The hand cannot grasp, hold an object, or move in a controlled manner.

Related topics

[Safety warning levels](#) on page 12

Contraindications

Jaco is not recommended in specified circumstances.

Table 7: Contraindications of Jaco

Jaco is not recommended for anyone who experiences cognitive impairments that prevent the user from operating Jaco in a controlled manner.

Jaco is not recommended for anyone who has impaired, uncorrected vision that prevents the user from clearly seeing both Jaco and the targeted objects they would manipulate with Jaco.

It is not recommended in any circumstance that prevents the safe and independent use of the drive controls of the power wheelchair.

It is not recommended for anyone who is impaired by medication.

Discuss the situation with the doctor or pharmacist of the user.

Dangers

A danger is an impending hazardous situation that can result in serious injury or even death, or can severely damage property. Avoid impending hazardous situations that are associated with dangers.

 DANGER	
	A damaged part of Jaco is in contact with the wheelchair in any position at any time Consequence: May result in fire, which poses a risk of thermal injury, such as severe burns, to the end user. How to avoid: The caregiver must remove power from Jaco immediately to keep the end user and the surroundings safe. 1. Unplug the power cable attached to Jaco from the power source immediately. 2. Remove Jaco from the wheelchair. 3. Put Jaco in a safe place, such as in its NANUK case. 4. Contact a Kinova-certified technician immediately.

Table 8: Dangers related to Jaco



DANGER: Failure to respect the general warnings may result in electrical or fire hazards, such as the arm melting or catching fire; the electrical and fire hazards pose the risk of thermal injury to the user, including severe burns.



DANGER: Always respect the warnings related to wheelchair product and make sure that any modifications are in accordance with the wheelchair manufacturer specifications.



DANGER: Contact the Kinova-certified technician if any part of Jaco is damaged, altered, or scratched, and is also in contact at any point with the wheelchair or mechanical mount.



DANGER: Contact the wheelchair manufacturer or its representative if there are any mechanical or electrical issues with the wheelchair, including if there are any visibly damaged parts.

Examples of issues:

- Open cables
- Damaged cables
- Pinched cables
- Malfunctioning motorized component
- Exposed electronics



DANGER: Do not alter the mechanical or electrical installation of Jaco, Lift Arm, or other accessories unless it is approved by a Kinova-certified technician.



DANGER: Always contact a Kinova-certified technician if any original part on Jaco is loose or missing.



DANGER: Always contact a Kinova-certified technician if any Jaco part breaks, such as fingers, shells, or plastic ring.



DANGER: Always contact a Kinova-certified technician if Jaco is not functioning properly in any way.



DANGER: Always examine the protective coating on Jaco for damage of any kind. Damaged shell may result in fire.



DANGER: No modification of Jaco is allowed.



DANGER: Do not use the robot in heavy rain or in heavy snowfall.



DANGER: Do not submerge Jaco in water or snow, either in whole or in part, or expose Jaco to corrosive environments.



DANGER: Do not hit the robot on a doorframe or other hard surface. The impact can damage the inner components or break the frame of the robot, which results in an electrical shock hazard. Always make sure there is sufficient space for the robot to go through the door; also, make sure the door cannot close on the robot.



DANGER: Never change the various modes of the wheelchair, such as wheelchair driving mode, seat adjustment, arm, and so on, while Jaco is being used. Risk of injury to the user from impact with Jaco.



DANGER: While operating Jaco, make sure Jaco is not in continuous contact with the wheelchair.



DANGER: Any mechanical, electrical, or programmatic adjustments made to a wheelchair already equipped with a robotic arm may have a critical impact on the robot functionality or safety. Always instruct the personnel or company that is responsible for servicing the wheelchair to contact the local Kinova-certified technician before making any changes that may impact the installation of Jaco or affect the Jaco electronics.



DANGER: Call a Kinova-certified technician before any update or repair on the wheelchair.



DANGER: When reinstalling Jaco at home, always secure Jaco at the mounting base according to the instructions and training provided by the Kinova-certified technician.



DANGER: Risk of bodily harm and damage to the equipment; Risk of fire
Jaco must maintain at all times, especially in the retract position, a minimum distance of 15 mm from any part of the wheelchair, whether the wheelchair is powered on or not, Lift Arm, or other accessories, to prevent any possibility of electrical current leakage from reaching Jaco. Contact Kinova to obtain the protective pad if it is missing or worn out.



DANGER: Do not apply excessive force on the device. For example, do not rest on the device.

Precautions

Avoid hazardous situations that are associated with cautions.



CAUTION: Before using Jaco, make sure it is installed properly.



CAUTION: Be careful not to exceed a payload of 1.6 kg in the middle position and 1.3 kg in the extended position of Jaco.

Do not use Jaco to lift any parts of the body that are likely to exceed the maximum payload.



CAUTION: If Jaco is switched off at the base and is not in the programmed retracted position, Jaco collapses. Depending on its position at the time of deactivation, it may cause damage to itself or the environment.

An attendant or caregiver must always hold Jaco before switching off the arm outside of its retracted position.



CAUTION: When using the wheelchair drive controls to operate Jaco, the wheelchair mode must not be changed; that is, do not change Jaco mode to Driving mode. There is a risk that the user may come into contact with the moving Jaco.



CAUTION: Do not block the movement of Jaco when it moves into the retracted position.



CAUTION: Be aware of nearby transmitters, such as radio and TV stations; try to avoid coming close to them.



CAUTION: Be aware that adding accessories or components near Jaco may make Jaco more susceptible to [electromagnetic interference \(EMI\)](#).



CAUTION: Report all incidents of unintended shut downs to the local distributor; note whether there is a nearby source of [EMI](#).

Related topics

[Safety warning levels](#) on page 12

Warnings

Avoid potentially hazardous situations that are associated with warnings.



Warning: Jaco is not intended for use next to flammable fabrics. It is not [AP](#) or [APG](#) compliant.



Warning: Do not expose the inner components of Jaco or Lift Arm. Only the manufacturer is authorized to do so.

Exposing the inner components voids the warranty and may result in malfunctions that could endanger the user.



Warning: If the device does not respond appropriately to the control, do not operate the device until it has been inspected by a trained and certified technician.

For more details, contact your local Kinova representative.



Warning: Jaco and Lift Arm carry the entire weight of an object. Attempting to lift an object that exceeds the maximum payload may cause damage to Jaco or Lift Arm.

The damage incurred voids the warranty.



Warning: Do not use Jaco to cut, or handle, very sharp or dangerous tools or objects.



Warning: Any mechanical, electrical, or programmatic adjustment made to a wheelchair already equipped with Jaco can have a critical impact on the functionality or safety of Jaco.

Always instruct the staff or company responsible for the maintenance of your wheelchair to contact the local Kinova representative before making any changes.



Warning: The seating position can be used as a reference for programming a [No-go zone](#), a [Safety zone](#), a [Slow Zone](#), and for speed reduction.

Any change in the seating position can endanger the safety of the user. The distance between the motion endpoint and the user can be significantly shortened, which can lead to a risk of injury.

Changes in the sitting position in the wheelchair cannot be registered by Jaco.

The software in Jaco, which controls the safety zone around the user and the movement of Jaco, refers only to its own stored coordinates.



Warning: If the attendant or caregiver has removed Jaco, make sure that it is in a safe position before switching it back on.

Confirm Jaco is in the same rest and ready positions as the positions programmed by the installation professional.

If the position or movement of the arm is no longer correct, contact your local Kinova representative.



Warning: No parts may be repaired or replaced by the end user. If there is a problem with the medical device, contact your local Kinova representative.



Warning: Do not modify Jaco without authorization of the manufacturer.



Warning: To avoid electric shock, Jaco must be connected to a supply mains with protective earth when it is connected through a power adapter to a supply mains and must be connected with approved Kinova cables, if applicable.



Warning: Do not apply excessive force to immovable objects, such as doors, walls, and tables. Applying excessive force can damage the fingers and internal components of Jaco.



Warning: Make sure that there is enough space between all parts and any immovable objects when driving through tight spaces, such as doorways.



Warning: Do not apply excessive force on the device. For example, do not rest on the device.



Warning: Do not reset to the start or retract position when carrying liquids. The two positions are based on a preset and the wrist could rotate during movement and the liquid could spill.

Related topics

[Contact support](#) on page 100

[Jaco specifications](#) on page 7

[Safety warning levels](#) on page 12

Restrictions

Anyone who can operate a power wheelchair can operate Jaco. However, there are situations that restrict the operation of Jaco.



Restriction: Do not use the robot near heat sources, such as radiators.
Do not use it for direct handling of hot objects.



Restriction: It is not recommended to use the robot in heavy rain or snowfall.



Restriction: Do not submerge Jaco in water or snow, either in whole or in part, or expose to corrosive environments.



Restriction: Do not overstretch the fingers of the robot outwards or inwards during use; the fingers and internal components may be damaged.

Related topics

[Safety warning levels](#) on page 12

Security features

Jaco is monitored electronically at all times. It is equipped with safety functions.

Collision indication	In the event of increased resistance, Jaco stops moving; it sends signals visually and acoustically on OLED Display.
Automatic finger shut-off	The movement of the fingers is stopped in case of increased resistance.
No-go zone	The range of motion between Jaco and the body of the user is limited electronically.
Slow zone	The speed at which Jaco moves is reduced automatically when it approaches the body of the user.
Temperature monitoring	Sensors in Jaco monitor the temperature of each axis.

Inside the box

Jaco comes in a Jaco Nanuk case.

Depending on the needs of the user, different equipment may be in the packaging.

Basic supplies

Jaco comes with a few supplies so it can be installed.

Table 9: Basic equipment

Item	Details
Jaco with three (3) fingers	Fully assembled
Kinova Jaco Blue Universal Interface	Convert wheelchair control interfaces in a communication protocol compatible with Jaco Control the Kinova® Lift Arm accessory
Kinova® OLED Display	Display that shows the current mode of operation and status notifications. Additionally, it emits sound for warnings.
Comm.	Supply power to Jaco Blue Universal Interface Transmit control commands from Jaco Blue Universal Interface to Jaco
USB cable	Programming  Tip: Use the cable with the base of Jaco for remote troubleshooting sessions.
USB stick	<i>Jaco® assistive robot user guide</i> and Assistive Robot Configurator software to user adjustments
Touch-up pen	Retouch small scratches
Transport case	Prevent damage to Jaco during transportation

Additional supplies

Depending on the needs of the user, additional equipment may be in the boxes.

Table 10: Additional supplies

Item	Details
Kinova® Lift Arm	Accessory
Kinova® Cutlery and Tool Holder	Accessory

Item	Details	
Mounting kit	Display holder	A large number of display holders for OLED Display to be positioned in the individual field of vision of the user.
	Mounting plate	
	Perforated plate	
	Slot nuts	
	Spacers	
	Threaded strips	
	Screws	
Standard fastening set	Aluminum profile for fixed installation of Lift Arm	
Wheelchair cables	Used for integrating Jaco into the wheelchair electronics	
Power cables	Used for power supply through the wheelchair electronics	
Device pouch	Used for protected storage of control unit, interface, and cables Pouch attaches to the outside of the wheelchair back	
Button-style accessible switches	Various accessible switches from the field of assistive devices with 3.5 mm jack plug that function as no contact There are different sizes and release forces.	
Jaco protective sleeve	Acts as a rain cover for Jaco	
Lift Arm	Swing-away and height-adjustable mounting bracket	



CAUTION: Additional equipment from other manufacturers may only be used if they have a **CE** label and the intended purpose is defined as a medical device.



CAUTION: Commercially available buttons may only be used on the Jaco Blue Universal Interface if they trigger a signal to switch a function only by closing a contact.

Supplies for on-chair use

Specific equipment is needed to connect Jaco to a power wheelchair control system. When they are connected, the user controls Jaco® assistive robot with the control elements of the wheelchair.

Item	Details
Custom interfaces	Integrates Jaco and the Lift Arm accessory into the wheelchair control system
Custom cables	Integrates Jaco and the Lift Arm accessory into the respective wheelchair control system and for power supply
Device pouch	Protects the control unit, interfaces, and cables Attaches to the outside of the wheelchair back.
Mounting equipment	
Additional buttons	Work as control elements with the associated mounting equipment, if required and depending on the user

Related topics

[Jaco specifications](#) on page 7

[Jaco Blue Universal Interface specifications](#) on page 8

Supplies for off-chair use

Specific equipment is needed to install Jaco on something other than a wheelchair.

Item	Details
One of	Directly control Jaco
- Analog DB9 joystick - Xbox-compatible USB controller	Example: mo-Vis
One of:	
- Power supply for external power supply - Specific cables	
Device pouch	Protective storage of control unit, interfaces, and cables
Mounting equipment	One of: - table clamp - rolling stand

Related topics

[Jaco specifications](#) on page 7

[Jaco Blue Universal Interface specifications](#) on page 8

Configuration example for Jaco on an R-net wheelchair control system without Lift Arm

Packing materials may differ according to the installed use of Jaco.

Quantity	Item	Notes
	Jaco with 3 fingers, fully assembled	
1	Kinova Jaco Blue Universal Interface, with Kinova bus cable for transmitting control commands to Jaco	
1	Kinova® OLED Display	
1	Kinova® OLED Display Holder	
1	R-net power cable to Jaco	Power supply of the Jaco through the R-net bus system
1	R-net power cable extension (m/f) 0.5m	Standard power cables are too short to be installed in the device bag
	R-net input/output module (<i>IOM</i>)	Interface that transmits the control signal from the wheelchair control to Jaco
1	DB9 Adapter m/m	Plug adapter for adapting to the socket of the <i>IOM</i>
1	R-Net 4-Port Connector Block	Distribution strip for the additional R-net bus cables
1	R-net bus cable m/m, 1.2m	From the transfer point of the wheelchair to the power strip
1	R-net bus cable m/m, 0.5m	For connecting the IOM to the connector strip
1	Device bag	for protected storage of control unit, interfaces and cables
	Mounting set	Holder, slot nuts, spacers, threaded strips, screws

* Quantity depends on the wheelchair accessories currently available and connected via bus cable.

Components

Jaco is made of several components.

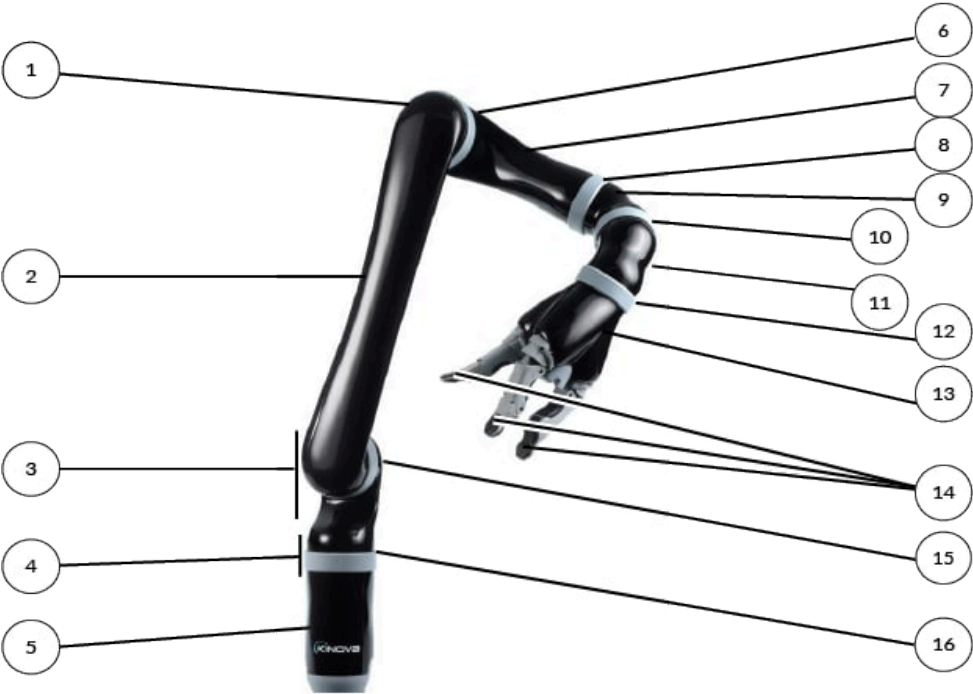


Figure 6: Robot components

1	Elbow	9	Wrist segment #1
2	Upper arm	10	Actuator #5
3	Shoulder	11	Wrist segment #2
4	Actuator #1	12	Actuator #6
5	Controller	13	Gripper
6	Actuator #3	14	Fingers
7	Forearm	15	Actuator #2
8	Actuator #4	16	Plastic ring

Robot external connectors

Jaco can connect to wheelchairs and other devices using different connectors.

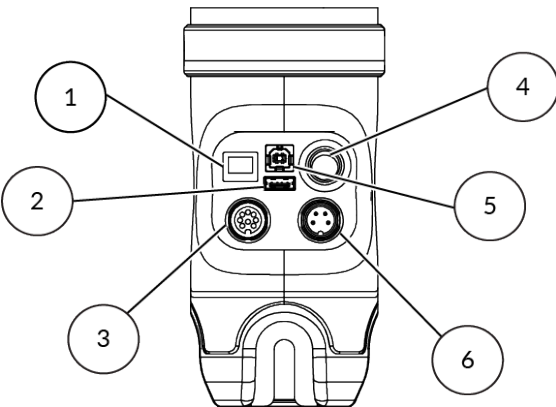


Figure 7: Robot external connectors

1	Ethernet (not used)	4	On/off switch
2	USB-A (not used)	5	USB-B (programming, configuration, update, and troubleshooting)
3	Control cable from Jaco Blue Universal Interface	6	4-pin power supply

The panel at the back of the base has multiple connectors and a power on/off switch.

power on/off switch	Switches Jaco on or off
power connector	Connects Jaco to the power supply
 Tip: A power supply is either a power wheelchair or a power supply.	
8-pin connector	Connects the control cable from Jaco Blue Universal Interface to transmit control commands
USB-B port	Connects to a <i>personal computer (PC)</i> for maintenance and configuration

 **Warning:** The connectors for control cables and the power supply are intended only for connections to a Kinova-approved device. Connecting other devices may impair performance, lead to electric shock or fire; in addition, the arm may become inoperable and void your warranty.

 **Warning:** To prevent risk of fire or electric shock, avoid using extension cords.



Warning: Be careful not to step on or pinch the cables.

Installation, configuration, and operation of the robot

A Kinova-certified technician uses the instructions in the Installation Guide to install the robot. Contact Kinova to make sure the person installing the robot is a Kinova-certified technician. A qualified technician, certified by Kinova, installs the robot by following the instructions in the *IG-003 Jaco Mechanical and electrical integration installation guide*.

A Kinova-certified technician is responsible for installing Jaco. The technician physically installs the robot on the powered wheelchair.

- The technician integrates the robot with the wheelchair power supply and controls.
- The Kinova-certified technician uses the Assistive Robot Configurator software to configure Jaco.

The technician configures the safety settings for the robot, including speed limits and protective no-go zones around the body of the end user.

- The technician maps the controls of the robot to the wheelchair controller.
- The technician defines the home and retract positions of the robot.

Jaco has factory settings as a basic configuration. The technician can adapt the robot to the needs of the user. Discuss the requirements with the technician prior to installation and configuration.

There are two ways to install Jaco.

- Install on a power wheelchair, with integration into the power supply and control of the wheelchair
- Install on a stand, connecting it to the power supply and the control unit

After installation, the technician configures Jaco using the Kinova Assistive Robot Configurator utility.

Configuration ensures the safe use of the robot. There are three main areas of concern.

- Safety settings for the robot, including speed limits and [No-go zone](#) around the body of the user
- Mapping controls of the robot to the wheelchair controller
- Setting up [Home](#) and [Retract](#) positions

The process may take several hours. The technician makes sure that the robot installation is customized to the specifics of the equipment and needs of the user.

The details of how to operate the robot in different modes of control and how to activate these controls depends heavily on the specific controls available with the wheelchair setup. The details are beyond the scope of this user guide.

The technician trains the user how to use Jaco when the technician installs and configures the robot.

The Kinova-certified technician, who installs and configures the robot, provides training on how to move and operate Jaco to perform various tasks after the robot is installed and configured. They also provide each customer with a customer file that contains data related to the installation and configuration of the robot on the wheelchair.

Removing Jaco from the mount

Remove Jaco from the mounting hardware when the user wants to store it at night or when the user needs to travel.

About this task

The mounting hardware is the plate used for installing Jaco directly onto a wheelchair or on the aluminum pedestal that Jaco sits on. Clamping screws affix the mounting hardware to the pedestal.

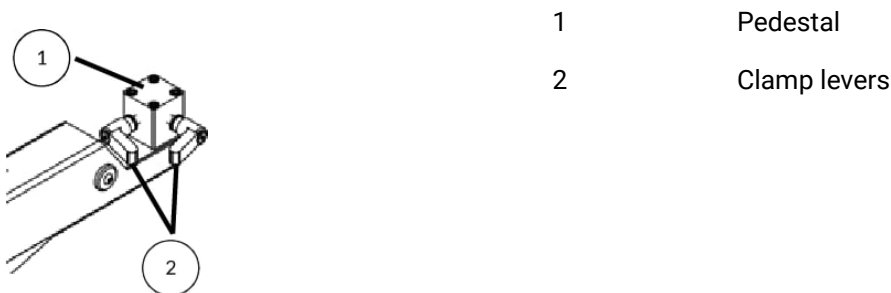


Figure 8: Jaco mount

Procedure

1. Move Jaco into the [Retract position](#).
2. Switch off Jaco.
3. Disconnect and remove the power supply cable.
4. Disconnect and remove the control cable.
5. Loosen the clamp levers on the base.
6. Lift Jaco from the holder.

Related topics

[Robot external connectors](#) on page 30

Installing Jaco onto the mount

Use the mounting hardware to install Jaco directly onto the wheelchair or on the aluminum pedestal that Jaco sits on.

About this task

The mounting hardware is the plate used for installing Jaco onto a wheelchair or on a pedestal.

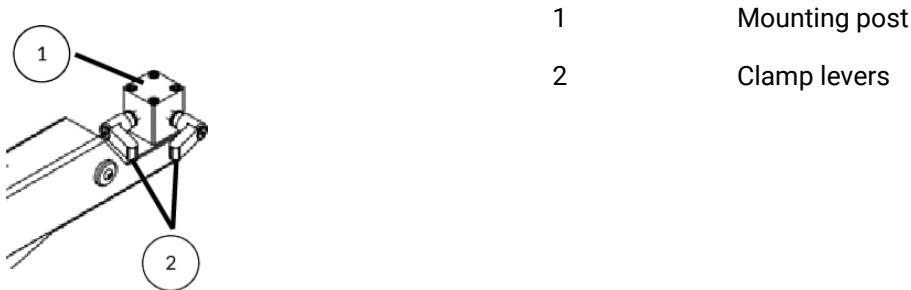


Figure 9: Jaco mount

Procedure

1. Lift Jaco onto the pedestal.
2. Tighten the clamp levers on the base.
3. Connect the control cable.
4. Connect the power supply cable.
5. Move Jaco into the [Retract position](#).
6. Switch on Jaco.

Related topics

[Robot external connectors](#) on page 30

Kinova Jaco Blue Universal Interface

Kinova Jaco Blue Universal Interface is an interface between Jaco and the wheelchair electronics or other external control elements.

There are two variations of Kinova Jaco Blue Universal Interface. There is a basic model and a model for *R-net* devices.

Different types of devices can be used for input control.

Table 11: Input control devices

Device	Extra information
Standard digital joysticks	Male connector, DB9 mini-gender changer for the joystick is available
Standard analog joysticks	Female connector, DB9 mini-gender changer for the joystick is available
3.5 mm button-style adaptive switches	Connect through any of the six (6) audio jack ports
Microsoft devices: Xbox One Xbox Series X Xbox Series S Xbox Adaptive Controller	Connect through the USB-C port

All connections are on one side of the box.

The incoming control signals are transmitted to the arm, triggering the movements or function changes that is seen on OLED Display.

There are numerous ways to connect the wheelchair with *Environment Control Unit (ECU)*, *Input/Output Modules (IOM)*, *R-net* direct port, and Bluetooth devices from compatible wheelchair manufacturers.

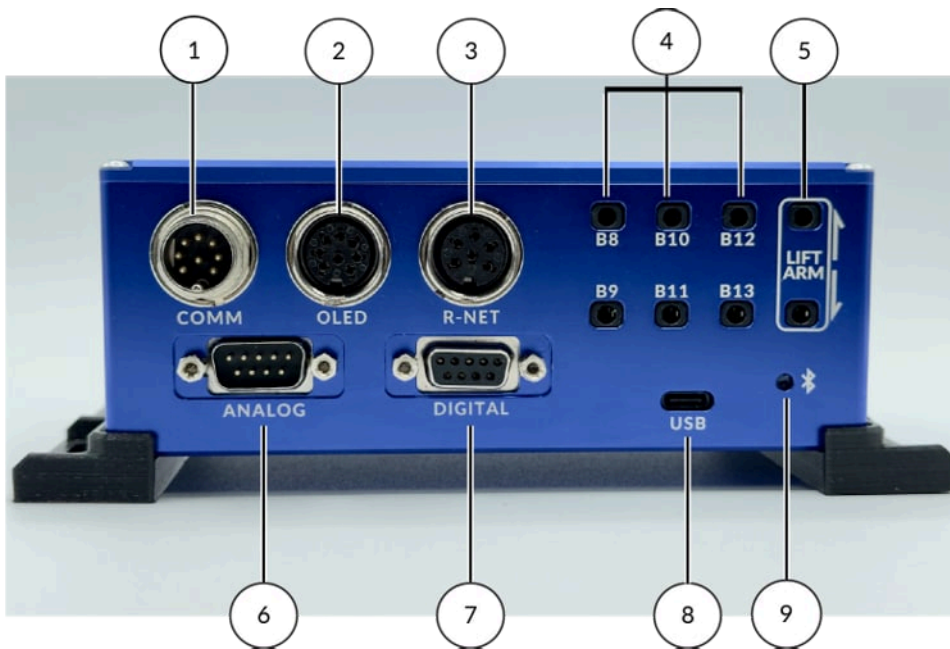


Figure 10: External connectors of Jaco Blue Universal Interface

Table 12: External connectors of Jaco Blue Universal Interface

Number	Port	Type	Description
1	COMM	Lumberg male, 8 pins	Power and communication port between Jaco and Jaco Blue Universal Interface.
2	OLED	Lumberg female, 8 pins	Port for OLED Display to display the Jaco arm mode, and Jaco status
3	R-NET	Lumberg female, 6 pins	Port to interface with the R-net protocol
4	B8 to B13	3.5 mm audio jack	6 inputs for assistive switches
5	LIFT ARM	3.5 mm audio jack	2 output ports to control Lift Arm
 Important: mono auxiliary cable only			
6	ANALOG	DB9 male	Port to interface with standard analog joystick
7	DIGITAL	DB9 female	Port to interface with digital joystick Also, port to interface wheelchair module
8	USB	USB-C	USB-C port to interface with Microsoft Xbox devices and to charge mobile device

Number	Port	Type	Description
9	Bluetooth	N/A	Bluetooth pairing button Interface with compatible Bluetooth devices from supported wheelchair interfaces

Four [LEDs](#) on the top of the Kinova Jaco Blue Universal Interface specify the operating status.



- 1 Bluetooth [LED](#)
- 2 Power LED
- 3 Status LEDs

Figure 11: Top view of Jaco Blue Universal Interface

Related topics

[Controlling tilt back and forward control](#) on page 78

[Jaco Blue Universal Interface specifications](#) on page 8

[Examples of labels on Jaco Blue Universal Interface](#) on page 14

Warnings

Avoid potentially hazardous situations that are associated with warnings.



Warning: Do not modify Jaco Blue Universal Interface without authorization of the manufacturer.

LED status indicators

Jaco Blue Universal Interface has four LED indicators on its top.

Each color corresponds to a status. Different events cause the [light-emitting diode \(LED\)](#) lights to illuminate.

Table 13: LED status indicators

LED	State	Information
Power  Green	Steady	Power on
	Off	No power
Status  Orange	Flashing	Synchronization and arm status  Note: Press and hold the Retract button to move the robot to the <i>Retracted position</i>.
	Steady	Warning • Minor communication issue • A short-circuit is detected in the USB-C port • One of the Lift Arm outputs is disconnected • Warning from Jaco
	Off	Normal operation
Status  Red	Steady	Fault • Major communication issue • Fault from Jaco
	Off	Normal operation
Bluetooth  Blue	Flashing	Bluetooth pairing mode
	Steady	Established Bluetooth connection
	Off	No pairing with Bluetooth device



Trouble: When no lights illuminate on Jaco Blue Universal Interface, Jaco Blue Universal Interface is not switched on.

1. Make sure Jaco Blue Universal Interface is connected to Jaco.
2. Make sure the connector is inserted in the port.
3. Switch on Jaco from its base.

Installation and configuration

Installation and configuration are performed only by a certified technician.

The technician installs Jaco Blue Universal Interface with the correct cable connections.

The technician configures Jaco to work with Jaco Blue Universal Interface by using the Kinova software Assistive Robot Configurator. With Assistive Robot Configurator, the technician can define the function of each of the jack sockets, as well as other interface functions.

Only the technician has access to the settings. The user cannot change the settings. When settings need to be adjusted, contact Kinova or the certified technician.

In addition to configuring Jaco and Jaco Blue Universal Interface, the technician configures the wheelchair module so that the module can connect to Jaco Blue Universal Interface using Bluetooth.

Pairing with Bluetooth device for the first time

Jaco Blue Universal Interface can be connected to other Bluetooth devices.

About this task

The only time to pair Bluetooth devices with Jaco Blue Universal Interface is when Jaco Blue Universal Interface and the Bluetooth device is switched on.



Important: Initiating a Bluetooth pairing must be done within 2 minutes of switching on Jaco Blue Universal Interface.

If a Bluetooth device is already paired with Jaco Blue Universal Interface, initiating a new Bluetooth connection erases the previously registered device.

Procedure

1. Initiate Bluetooth pairing on the Bluetooth device.

The Bluetooth device is discoverable.

2. Switch on Jaco.

Jaco and Jaco Blue Universal Interface switch on.

3. Press the pairing button () with a tool or a pen for 5 seconds.

The Bluetooth **LED** blinks.

Results

When the devices are paired, the Bluetooth **LED** illuminates continuously.

If the Bluetooth device does not pair with Jaco Blue Universal Interface, Jaco Blue Universal Interface may be switched on for more than the 2 minutes. There are a few reasons the Bluetooth device might not pair with Jaco Blue Universal Interface.

- The Bluetooth device is switched off.
- The Bluetooth device is not in discovery mode.

- The window of time for pairing the Bluetooth device with Jaco Blue Universal Interface has expired.

Recovery procedure

1. Switch off Jaco Blue Universal Interface.
2. Switch off the Bluetooth device.
3. Restart the procedure.

Related topics

[Initiating Bluetooth pairing with CJSM2-BT](#) on page 39

[Initiating Bluetooth pairing with Q-Logic 3](#) on page 40

Initiating Bluetooth pairing with CJSM2-BT

The Curtis-Wright joystick CJSM2-BT is a wheelchair joystick with Bluetooth capabilities.

About this task

Use the CJSM2-BT joystick to navigate its menu.



Figure 12: CJSM2 joystick

Procedure

1. Go to the Bluetooth mode configuration.
2. Move the joystick up until a beep is heard.

3. Move the joystick down until another beep is heard.

A Bluetooth logo on the CJSM-2 BT screen blinks to show the Bluetooth on the device is discoverable.

Related topics

[Pairing with Bluetooth device for the first time](#) on page 38

Initiating Bluetooth pairing with Q-Logic 3

Q-Logic 3 is an adaptive joystick with Bluetooth capabilities for wheelchairs.

About this task

Use the Q-Logic 3 **Home screen** button to access the menu and use the joystick to navigate its menu. Move the joystick left to access some menus. Move the joystick right to access other menus. Move the joystick up always confirms an action. Press the green Home button to return to the **Home screen**.



Figure 13: Q-Logic 3 joystick

The blue LED on Jaco Blue Universal Interface illuminates a steady blue when it has a Bluetooth connection.

Procedure

1. Press the green **Home screen** (🏠) button.



2. Move the joystick left twice (2 times) to access the **Auxiliary** menu.
The **Auxiliary** launches.



3. Select **Bluetooth operation** with the joystick.

4. Move the joystick to the right to access the **Joystick connections** menu.



5. Use a tool, such as a pen or paper clip, to press the Bluetooth button gently on Jaco Blue Universal Interface for five (5) seconds.

The Bluetooth button is recessed on Jaco Blue Universal Interface.



Tip: The Bluetooth button is below the Lift Arm connectors.



The blue LED on Jaco Blue Universal Interface flashes.



Important: The Bluetooth connection must be made in two (2) minutes or less after switching on Jaco. After two (2) minutes, the blue LED stops flashing.

When the blue LED stops flashing, and is not illuminated, the connection is not established. Reboot Jaco and press the Bluetooth button for five (5) seconds after Jaco is switched on.

6. Select **NEW** with the joystick.



7. Move the joystick to the right to start the Bluetooth connection.
An image of a joystick with the Bluetooth logo at top are displayed on the screen.



8. Wait until there is confirmation of a connection.

A confirmation dialog launches.



9. Move the joystick up to confirm.

Results

The top of the screen and the image of the joystick on the screen illuminate blue to show the Bluetooth pairing is complete.



Related topics

[Pairing with Bluetooth device for the first time](#) on page 38

Initiating Bluetooth pairing with the Omni2 Interface and Mo-Vis

The Omni2 Interface, which has Bluetooth capabilities, connects to the Mo-Vis joystick, which is an adaptive joystick for wheelchairs.

About this task

Use the Mo-Vis joystick to navigate its menu.



Figure 14: Omni2 Interface

Procedure

1. Move the joystick up until a beep is heard.
2. Move the joystick down until another beep is heard.

Results

The Bluetooth logo blinks on the Omni2 interface.

Pairing Bluetooth automatically with device

Jaco Blue Universal Interface connects to other Bluetooth devices automatically after the device is registered.

Before you begin

Jaco Blue Universal Interface and the Bluetooth device are paired previously.

About this task

The only intervention that is needed when Bluetooth is pairing is to observe the Bluetooth [LED](#).

Procedure

1. Switch on Jaco to switch on Jaco Blue Universal Interface.
The Bluetooth [LED](#) blinks until it locates the previously paired Bluetooth device.
2. Switch on the Bluetooth device.

Results

When the devices are paired, the Bluetooth [LED](#) remains steady.

Related topics

[Pairing Bluetooth automatically with CJSM2-BT](#) on page 46

[Pairing Bluetooth automatically with Q-Logic 3](#) on page 47

Pairing Bluetooth automatically with CJSM2-BT

The Curtis-Wright joystick CJSM2-BT is a wheelchair module with Bluetooth.

About this task

Use the CJSM2-BT joystick to navigate its menu.



Figure 15: CJS2 joystick

Procedure

1. Go to the Bluetooth mode configuration.
2. Wait for a steady Bluetooth logo on the CJS2 BT screen.

Related topics

[Pairing Bluetooth automatically with device](#) on page 45

Pairing Bluetooth automatically with Q-Logic 3

Q-Logic 3 is an adaptive joystick with Bluetooth capabilities for wheelchairs.

About this task

Use the Q-Logic 3 **Home screen** button to access the menu and use the joystick to navigate its menu. Move the joystick left to access some menus. Move the joystick right to access other menus. Move the joystick up always confirms an action. Press the green Home button to return to the **Home screen**.



Figure 16: Q-Logic 3 joystick

Procedure

1. Press the **Home screen** button.
2. Move the joystick left twice to access the **Auxiliary** menu.
3. Move the joystick right to select **Bluetooth operation**.
4. Move the joystick to the right to access the **Joystick connections** menu.
5. Select **Kinova Inc.**
6. Move the joystick to the right to start the Bluetooth connection.

An image of a joystick with the Bluetooth logo at top are displayed on the screen.

Results

The top of the screen and the image of the joystick on the screen illuminate blue to indicate the Bluetooth pairing is complete.

Related topics

[Pairing Bluetooth automatically with device](#) on page 45

Pairing Bluetooth with the Omni2 interface and Mo-Vis automatically

Mo-Vis is an adaptive joystick with Bluetooth capabilities for wheelchairs.

About this task

Use the Mo-Vis joystick to navigate its menu.



Figure 17: Omni2 Interface

Procedure

1. Go to the Bluetooth mode configuration.
2. Wait for a steady Bluetooth logo on the Omni2 screen.

Results

The Bluetooth logo blinks on the Omni2 interface.

Kinova® OLED Display

The OLED Display is designed to make controlling Jaco more intuitive. It has visual indications of the current modes of operation, and the status of the Jaco through graphical representations and LEDs. It also emits audible signals for warnings.

The OLED Display usually is used with Jaco and Jaco Blue Universal Interface to show the user the directions in movement, status, and functions.



Note: The OLED Display is designed for use with Kinova Jaco Blue Universal Interface. It can also be used with the older versions of Universal Interface.

Related topics

[OLED Display specifications](#) on page 10

[Labels on OLED Display](#) on page 14

Dangers

A danger is an impending hazardous situation that can result in serious injury or even death, or can severely damage property. Avoid impending hazardous situations that are associated with dangers.



DANGER: No modification of OLED Display is allowed.



DANGER: Do not use the robot in heavy rain or in heavy snowfall.



DANGER: Do not submerge OLED Display in water or snow, either in whole or in part, or expose OLED Display to corrosive environments.

Precautions

Avoid hazardous situations that are associated with cautions.



CAUTION: Before connecting or disconnecting any connections, switch off the system.



CAUTION: Do not expose device to heavy rainfall.



CAUTION: Pay attention to the warning on OLED Display.

An orange triangle in combination with a twice-warning tone indicates an overload.

Reduce the weight or force exerted on Jaco.

Related topics[Safety warning levels](#) on page 12

Warnings

Avoid potentially hazardous situations that are associated with warnings.



Warning: If the device is dropped, hit, or endures any damage, water resistance may be affected.



Warning: Do not modify OLED Display without authorization of the manufacturer.

Related topics[Safety warning levels](#) on page 12

Identification of parts

The OLED Display has a simple user interface.

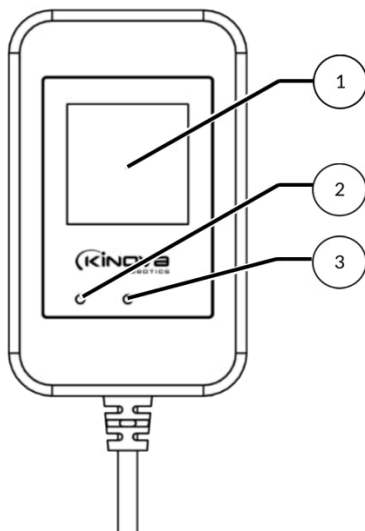


Figure 18: Identification of parts of the display module

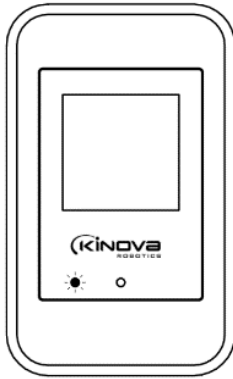
- | | | |
|---|-----------------------------|---|
| 1 | LCD | Shows symbols that indicate the direction of movement and errors |
| 2 | LED indicator | Provides information about the power supply and the connection status of the display at startup |
| | | Switch-on sequence The indicator flashes. |
| | | Normal operating mode The indicator is solid. |
| | | Standby mode The indicator does not illuminate. |
| 3 | Ambient light sensor | Detects the ambient light conditions and adjusts the brightness of the screen accordingly |

Switch-on sequence

OLED Display is powered by Jaco.

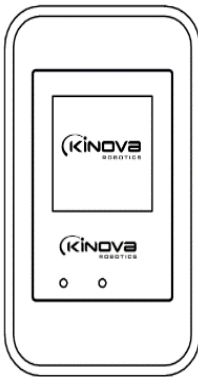
When the arm is switched on, the display switches on automatically. A sequence of three steps takes place.

1. Blank screen



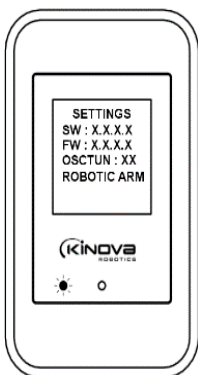
- No display for about ten (10) seconds
- Blue *LED* indicates OLED Display is receiving power

2. Kinova logo



- Kinova logo is displayed for about 5 seconds in the *liquid crystal display (LCD)* screen
- Blue *LED* does not illuminate

3. Settings screen



- **Settings** screen displays information for a maximum of two (2) seconds
- Blue *LED* blinks



Note: To troubleshoot, the technician can request the information from the **Settings** screen. If there is not sufficient time to write down the information, reboot Jaco to see the information.

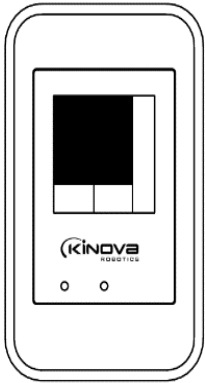
Screen sections

Each of the four (4) sections of the display has a specific purpose.

The location of each section of the display is highlighted in black.

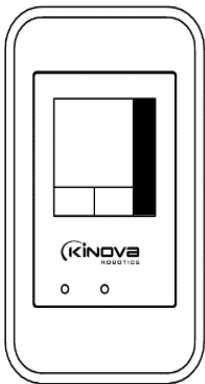
Table 14: Sections of OLED

Main section



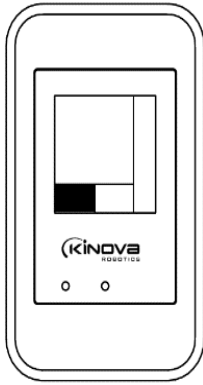
The **Main** section displays two types of movements: *active movements* and *available movements*.

Status section



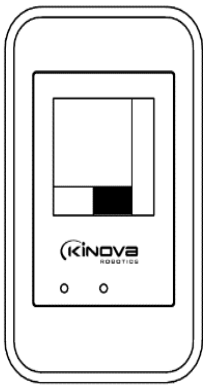
The **Status** section displays different arm status information: arm position, *Drink mode*, and robot speed.

Mode section



The **Mode** section displays the current mode of operation and index.

Function section

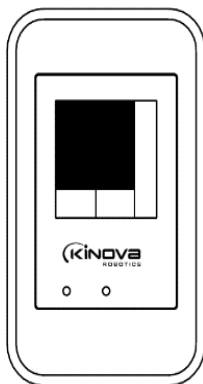


The **Function** section displays two (2) types of information related to functionality.

- Function details
- Error and warning signals

Main section

The **Main** screen is used mainly to communicate information about the available and active movements of Jaco. It also displays whether Jaco is configured to be left- or right-handed.



The **Main** section displays two types of movements.

possible movement

movements that are possible to take in the current mode

available movements

movements that are currently in progress

Handedness of the arm

Handedness, or arm *laterality*, indicates whether the arm is used in left-handed or right-handed mode.

During installation, the technician programs Jaco to fit on either the left or the right side. The *handedness* determines whether Jaco mirrors the movements. Some directional arrows may also be mirrored.

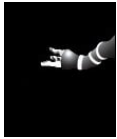


Figure 19: Example of right handedness in the OLED Display



Figure 20: Example of left handedness in the OLED Display

Available and active movements

Jaco can move in multiple directions. Depending on how it is moving, certain other movements are made available.

Available movements in the currently active mode are indicated by a green arrow representing the direction of the movement.



Figure 21: Left and right



Figure 22: Up and down



Figure 23: Forward and backward

Active movements are represented by a yellow highlight around the currently active movement arrow.



Figure 24: Available movement



Figure 25: Active movement

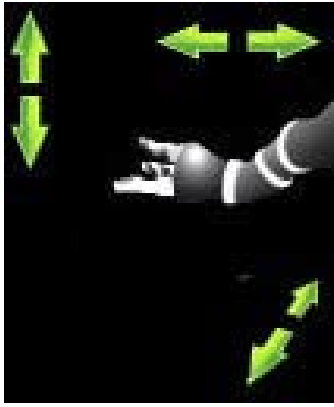


Figure 26: Example of translation movement

Wrist movements

The hand of Jaco rotates around the *wrist*.

The movement of the wrist is sometimes referred to *orientation* or rotational movements; they are how the wrist moves.



Figure 27: Rotate right and left **Figure 28: Turn up and down** **Figure 29: Rotate wrist**



Figure 30: Example of orientation movement

Finger movements

Finger movements are a little bit different than other movements.

When the mode for the fingers is available, the fingers become orange on the OLED Display.

When the movement is activated, the arrows representing the movements are displayed. The number of arrows represents the number of fingers that are moving.



Figure 31: Example of available finger movement



Figure 32: Example of active finger movement, 3 fingers



Figure 33: Example of active finger movement, 2 fingers

Status section

The **Status** section regroups all symbols that are related to the status of the arm.

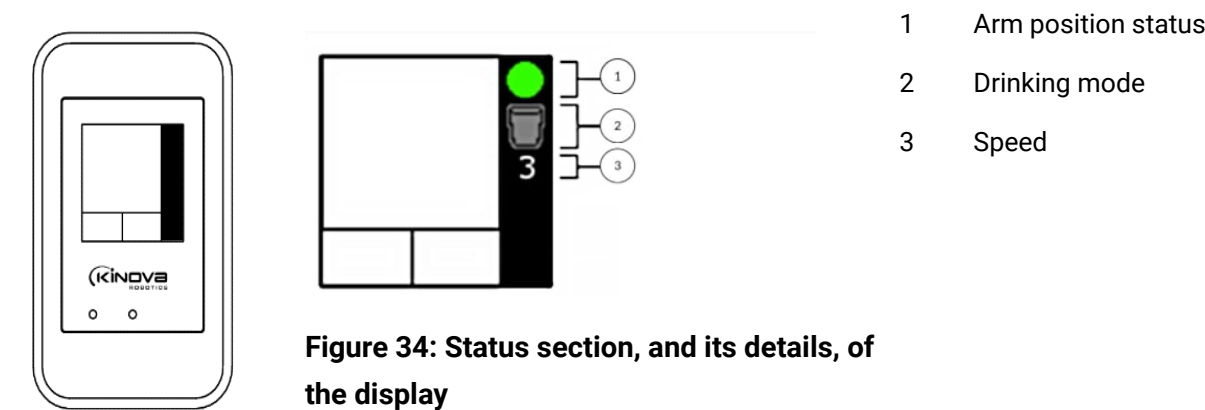


Table 15: Status section and display details

Symbol	State	Information
Arm position		
 Steady Green	Ready	Jaco is operational in the <i>Home position</i> The user can control Jaco.
 Steady Orange	Retracted	Jaco is in its <i>retracted</i> , or stored, position
 Blinking Orange	In Progress	Jaco is between its <i>Home position</i> and its <i>Retract position</i>  Notice: The user must press and hold the Retract button to move the robot to the <i>Retracted</i> or <i>Ready position</i> .
Drinking mode		
 Gray glass	Drinking mode is available in the current mode, but is not currently active	
 Blue glass	Drinking mode is currently active	
No glass	Drinking mode is unavailable and inactive	
Robot speed		

Symbol	State	Information
1	Lowest speed	5 cm/s
2	Low speed	10 cm/s
3	High speed	15 cm/s
4	Highest speed	20 cm/s

Mode section

The current mode is used to communicate information about the currently active controller mapping.

The **Mode** section displays two types of information.

- current mode list
- current mode list index

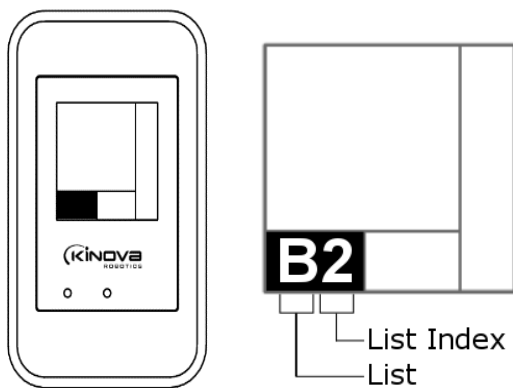


Figure 35: Mode section, and its details, of the display

The two current mode lists are named A and B.

The current mode list index is a list of the different controller mappings that are available. Each list can store a maximum six (6) different controller mappings, each represented by a number from 1 to 6.

Functions B1 through B4 are available with the factory settings of Jaco.



Tip: A technician, certified by Kinova, uses Assistive Robot Configurator to configure the settings.



Tip: When Lift Arm is installed with Jaco, the integrator defines an operating mode for Lift Arm that is separate from the Jaco modes of operation.

Related topics

[Operation and control of Jaco with factory settings through a power wheelchair](#) on page 91

Drink mode

Use drinking mode when the user wants to use Jaco to drink directly from a glass, cup, or bottle.

[Drink mode](#) is possible only in combination with wrist rotation and function B2.

When the drinking mode is activated and the hand rotation is triggered, the wrist rotates and lifts the glass from around its rim. Wrist rotation balances the height and radius of a glass to imitate the way in which the forearm and wrist tilt and lift the glass so that the rim remains on the lower lip.



Note: To replicate the action of drinking that suits the user, the height and diameter of the preferred glass of the user can be programmed. The technician can program preferred drinking glass after installation or the user can program the action using Assistive Robot Configurator software.

Activating and using drink mode

Look at OLED Display to see the current drinking mode before attempting to drink.

About this task

The user uses Jaco for the physical task of drinking. The user uses OLED Display to navigate the menus on OLED Display to deactivate drinking mode.

Procedure

1. Move the rim of the glass, mug, or cup in front of the lower lip of the user.
2. Switch to operating mode B2.
3. Press and hold the operating mode button for two (2) seconds.

The **Status** section changes to a blue, filled glass ().

4. Have the user turn the Jaco hand towards themselves and drink.

Deactivating drink mode

Look at OLED Display to see the current drinking mode before deactivating drink mode.

About this task

The user uses Jaco for the physical task of drinking. The user uses OLED Display to navigate the menus on OLED Display to deactivate drinking mode.

Procedure

1. Switch to operating mode B2.
2. Press and hold the operating mode button for two (2) seconds.

The display changes to a gray, filled glass ()

Robot speed

The speed at which Jaco moves can be changed, which is recommended when getting to know how to operate the robot.

There are four (4) speeds available.

Symbol	Speed	Speed
1	Lowest speed	5 cm/s
2	Low speed	10 cm/s
3	High speed	15 cm/s
4	Highest speed	20 cm/s



Note: The speed is programmed after installation by the technician or by the user with the help of Assistive Robot Configurator software.



Note: The factory settings of Jaco is set to level 3, 15 cm/s.

Reducing speed

At any time, the user may want to slow the movement of Jaco.

About this task

Use OLED Display to control the speed of Jaco.

Procedure

1. Switch to operating mode B3.

2. Press and hold the operating mode button for four (4) seconds.

The speed is reduced by one level.

The current speed level is displayed in the **Status** section of OLED Display.

3. Repeat the procedure to reduce the speed further.

Increasing speed

At any time, the user may want to speed up the movement of Jaco.

About this task

Use OLED Display to control the speed of Jaco.

Procedure

1. Switch to operating mode B3.
2. Press and hold the operating mode button for two (2) seconds.

The speed increases by one level.

The current speed level is displayed in the **Status** section of OLED Display.

Function section

The **Function** section displays two (2) types of information: functions with warnings, and details.

The information is presented with icons.

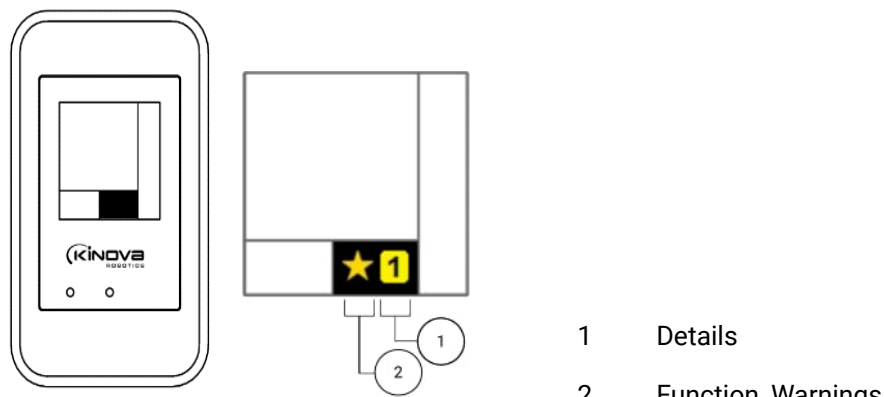


Figure 36: Function section, and its details, of the display

The information is presented with icons.

The functions are divided into three (3) categories.

- Available
- Active
- Warnings

When one or more special functions are available in the current mode, the function is displayed on the left side.

Table 16: Symbols for functions that are available in the current mode

Symbol	Information
 Star with red circle	Both RECORD and Go to functions
 Star with letter S	Only standard Go to pre-defined positions
 Star with letter A	Only advanced Go to pre-defined positions
 Star with letter O	Lift Arm functions
 Star with no letter	More than one different type of function, but no RECORD

When a specific function is activated, the type and index are displayed. After five (5) seconds, the index goes blank and the function type returns to the original symbol of the available function in the current mode.

Table 17: Symbols for active functions

Symbols for function type	Index symbol	Information
 Standard Goto	    	Index of the running advanced Goto command
 Advanced Goto	     	Index of the running advanced Goto command The +/- symbol indicates that the command Add current position or the command Advanced Goto Delete has been sent.
 Lift Arm movements		Hand faces up
		Hand faces down
		Hand faces left
		Hand faces right
		Hand faces forward
		Hand faces backward

Whenever an error occurs, an orange triangle overrides the Goto indicator until the error is cleared. Errors are grouped as minor or major.

Table 18: Warning symbols

Symbol	Error type	Information
 Orange Triangle	Minor errors	OLED Display beeps twice Main section not affected
	Major errors	OLED Display beeps four times Main section displays red robot arm 

Example of function and index workflow

The function symbol changes according to the current function selected by the user. The example demonstrates how the user navigates through the symbols in the **Function** section to control Jaco.

Workflow step	Icon displayed	Description	What is happening
1		The empty star is displayed in the Function section.	No joystick command is sent One standard Goto instruction and one automatic orientation is present in the current mode
2		The symbol changes to an asterisk with the letter "S" inside it to indicate a Standard Goto command is invoked.	The user presses the button corresponding to the function Standard Goto 2.
3		The symbol returns to the empty star. The number 2 is displayed; the function Standard Goto 2 is still running.	The user is pressing the Goto 2 button. More than five (5) seconds has elapsed.

Sleep mode

To save energy and avoid unnecessary distractions, the display enters *Sleep mode* after three (3) minutes of inactivity.

OLED Display reactivates when a button is pressed or any joystick movement is detected.

Major errors

When major errors with the device occur, the display enters *Major Error mode*.

The display beeps four (4) times to attract attention to the user and displays the Major Error symbol. The major error goes back to the *Standard mode* when the error is cleared.



Figure 37: Indicator of a major error

Joystick and communication error

When there is an error with the controller or OLED Display cannot communicate with Jaco for any other reason, a joystick with an X is displayed in the **Main** section of the OLED Display.



Figure 38: Joystick and communication error symbol

Communication Lost error

When the communication between the OLED Display and Jaco is interrupted, the reconnect symbol is displayed in the **Main** section.



Figure 39: Reconnect symbol



CAUTION: Do not attempt to disconnect and reconnect the OLED Display module or the Jaco Blue Universal Interface while Jaco is switched on. Always switch off the system before plugging and unplugging any connectors.

Assistive Robot Configurator software

The technician and the user can configure Jaco by using the Assistive Robot Configurator software.

During installation, the technician accommodates the needs of the user by configuring Jaco and the external control devices.

The software has two roles for configuring Jaco. Each role has different levels of access to the software. The technician uses the **Professional** role for configurations; they may decide to give access to certain parts of the configurations to the caregiver. The caregiver work with the role of **User**

Installing Assistive Robot Configurator

A [USB storage device](#) is included in the transport case of Jaco. The [USB storage device](#) contains software used for configuring Jaco to the needs of the user.

Before you begin

Gather all necessary tools for installation.

- [PC](#) with USB-A port ()
- [USB storage device](#) from the transport case
- [Universal Serial Bus \(USB\)](#) cable from the transport case

About this task

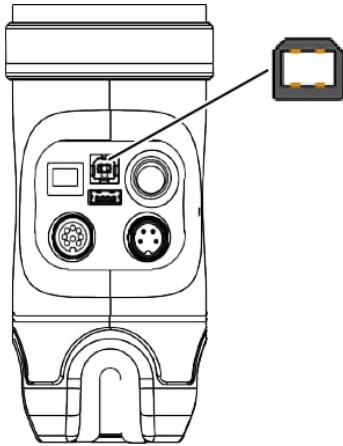
The [USB storage device](#) is required only for installing Assistive Robot Configurator and for saving Jaco profiles.

Procedure

1. Insert the [USB storage device](#) in a computer.
2. Find the file `AssistiveConfigurator-setup.exe` on the [USB storage device](#).
3. Double click `AssistiveConfigurator-setup.exe`.

4. Connect Jaco and the computer with the [USB](#) cable.

Jaco has a USB-B port.



The [PC](#) must have a USB-A port.



Operating Assistive Robot Configurator software

Use Assistive Robot Configurator to make adjustments to some of the features in Jaco.

Before you begin

1. Make sure the software is installed on a [PC](#).
2. Connect Jaco to the [PC](#) that is running the software.

About this task

The technician and the installer can use the Assistive Robot Configurator software. However, the user has fewer features available to them than the technician.

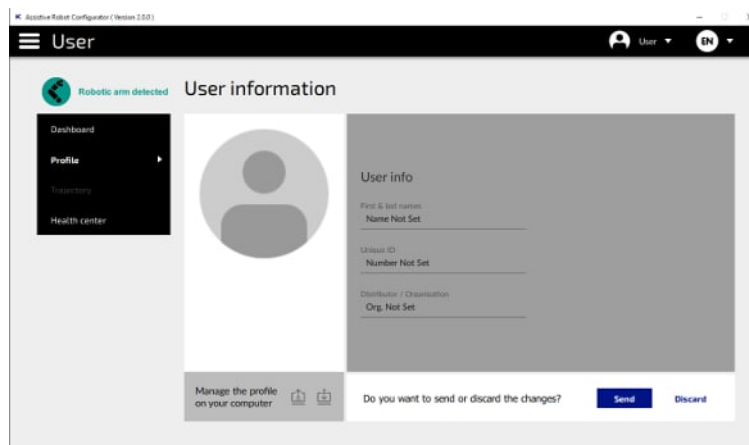
Procedure

1. Double-click the desktop icon ()

The software launches and automatically detects Jaco.

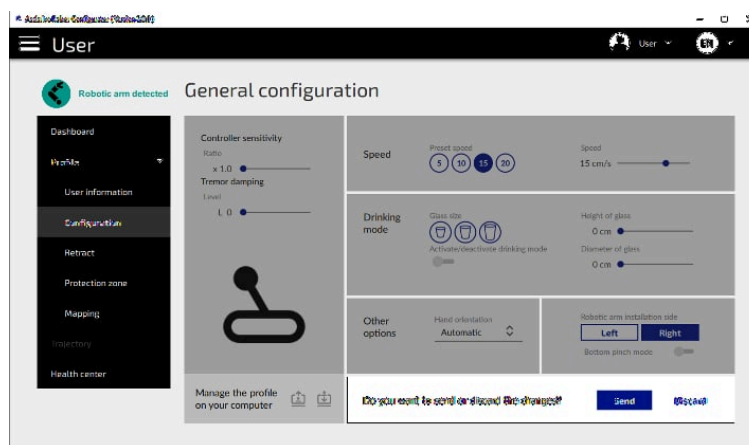


Information about the user, the serial number of Jaco, and the supplier are on the **User information** page.



2. Click **Profile > Configuration**.

The **General configuration** page launches.



Note: Some settings are locked and can be changed only by a technician.

3. Make changes to the current configuration.



Warning: The user can change settings only if they are aware of the effects of the change.

4. Click **Send** () to transfer the changes to Jaco.



Note: Changes that are not transferred to Jaco are yellow in the side menu and in their respective settings.

Configurations available to the user

At the time of installation, the caregiver may receive more training so that they can change some of the configurations that are on the **General configuration** page.

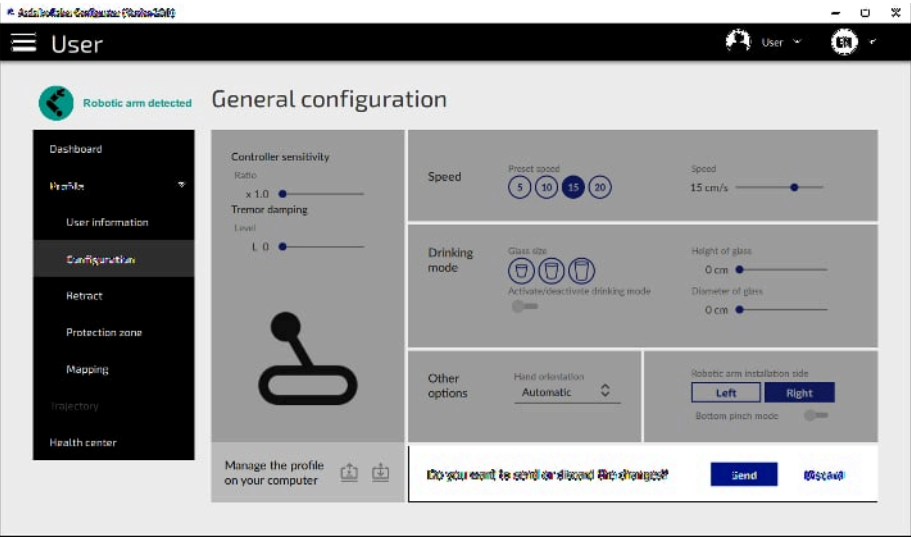


Figure 40: General configuration page

Table 19: User configurations

Configuration	Description
Speed	Measured in cm/s
	Click a Preset speed .
	Use the Speed slider.
Drinking mode	Three (3) icons represent preset glass sizes.
	Click the glass icon that corresponds to the size of glass to be used.
	Use the slider to specify the required Height of glass and Diameter of glass , measured in cm.
	Move the Activate/deactivate drinking mode slider left to activate drinking mode.
	 Note: Activate drinking mode only if the user wants to drink from a glass, cup, or bottle, and is already reaching for the drink with Jaco.

Configuration	Description
	Move the Activate/deactivate drinking mode slider left to deactivate drinking mode.  Note: Deactivate drinking mode when the user is finished drinking and wants to perform normal movements with Jaco.
Controller sensitivity	Move the slider to increase and decrease how quickly the joystick reacts to control movements.  Note: Only available when using a proportional joystick.
Tremor damping	Move the slider to one of the four (4) desired values to compensate for <i>tremors</i> and <i>spasticity</i>.  Tip: Increase the value to move Jaco more slowly before reaching the maximum speed that is set. Larger values make it easier for people with tremors to control Jaco.  Tip: Decrease the value to move Jaco more quickly before reaching the maximum speed that is set. Smaller values can be used for people without tremors.

Dashboard and Health center

If there are technical problems, a technician may ask for real-time information that is sent from Jaco to Assistive Robot Configurator.

The information on the **Dashboard** and **Health center** pages can help to obtain an initial assessment of possible problems.

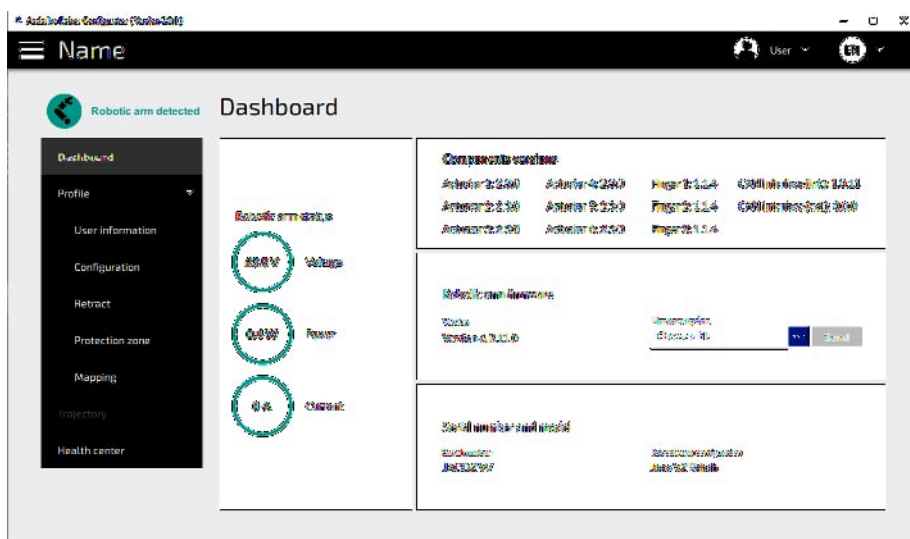


Figure 41: Dashboard page

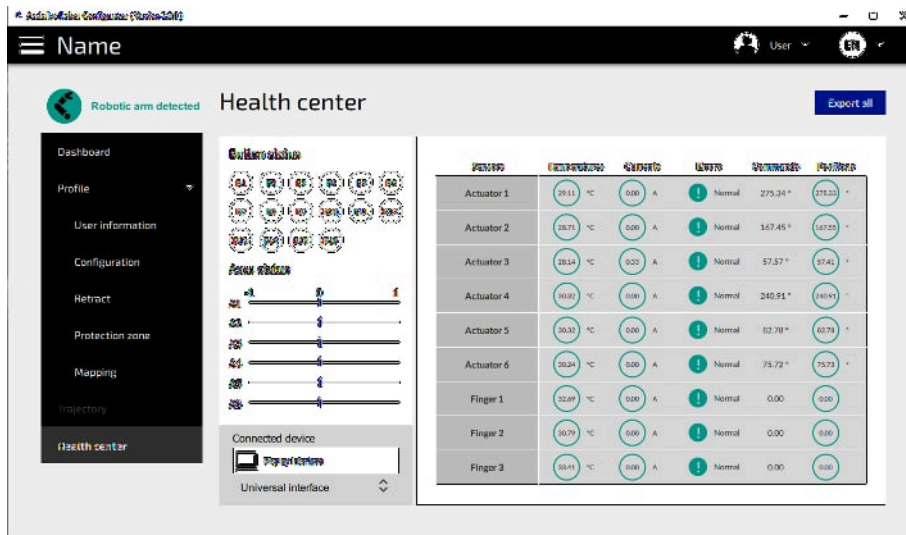


Figure 42: Health center page

Exiting Assistive Robot Configurator

There are two (2) ways to exit Assistive Robot Configurator.

About this task

Choose one of the two ways to exit the software before disconnecting Jaco from the computer.

Procedure

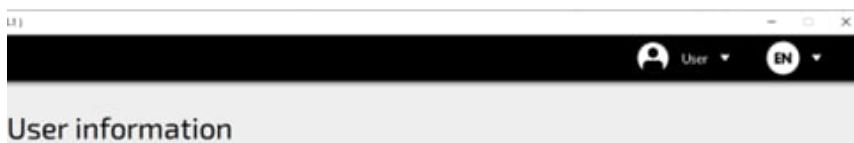
Method 1

1. Expand the **main menu** (☰).
2. Click **Exit**.



Method 2

3. Click **X** in the upper right corner.



Accessories

There are accessories available to enhance the Jaco experience.

Table 20: Available accessories

Lift Arm	A device that lifts and lowers Jaco to increase the range of Jaco, and to facilitate the safe transfer into and out of a power wheelchair.
Cutlery and Tool Holder	A solid support in which an object, such as cutlery, a hairbrush, or electric toothbrush, can be secured. Cutlery and Tool Holder is gripped with the robotic hand and enables a much more stable interaction with objects than with direct grasping with the fingers.

Kinova® Lift Arm

Mount Jaco onto an power wheelchair along with the accessory Lift Arm. Use the wheelchair controls to control Lift Arm and increase the range and flexibility of Jaco.

Lift Arm is used indoors and outdoors on a power wheelchair.

Lift Arm can be mounted on the left or the right side of the power wheelchair, depending on which side the user needs Jaco installed. Change the side on which Lift Arm is installed with the mounting plate.

Lift Arm consists of its arm and separate control electronics.

Swing the Lift Arm out of the way in specific situations.

- The [Lowered position](#) of Jaco is below the level of the arm rests.
- The lowered position of Jaco is below the level of the therapy table.
- The user needs to be positioned to avoid poor posture, transferred, or receive therapeutic services.
- The wheelchair needs to access a table.
- The field of vision of the user is blocked when Jaco is upright in the room, negatively impacting posture and visibility when driving and maneuvering.
- The user needs to reach lower levels on the floor with Jaco due to a more independent lifestyle, independent living and shopping, or independent organization and maintenance of the home.

The range of movement of Lift Arm is limited between fully [lowered](#) and fully [raised](#).

When Lift Arm is in the *Lowered position*, it is *parked*; the user is not using the arm, or plans on reaching objects at lower levels or on the ground.

Jaco can be used at any height along the range of movement of Lift Arm.

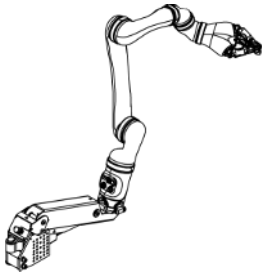


Figure 43: Tilted 20°

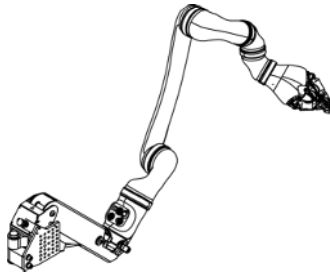


Figure 44: Tilted 45°

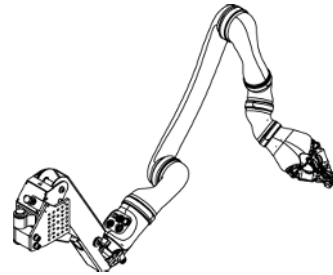


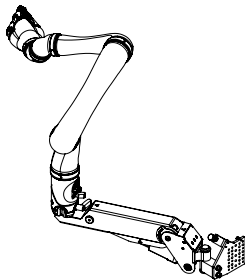
Figure 45: Tilted 60°

When Lift Arm is in the *Raised position*, it is in the *Starting position*; it is in the field of vision of the user and they can control Jaco in all directions.

With the help of the integrated swing-away mechanism, Lift Arm and Jaco can be moved away from the user towards the back of the wheelchair for unrestricted lateral access to the user.



Restriction: Do not operate Jaco when the swing-away mechanism of Lift Arm is not latched.



Lift Arm is available in both left- and right-handed configurations of Jaco.

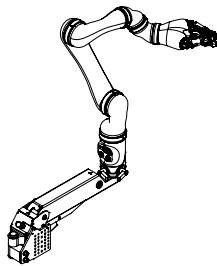


Figure 46: Lift arm installed with left-handed configuration

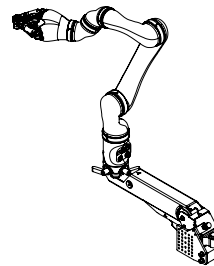


Figure 47: Lift arm installed with right-handed configuration

Lift Arm can be used directly with Jaco or directly with Jaco Blue Universal Interface.

Related topics

[Lift Arm specifications](#) on page 10

[Labels on Lift Arm](#) on page 15

Dangers

A danger is an impending hazardous situation that can result in serious injury or even death, or can severely damage property. Avoid impending hazardous situations that are associated with dangers.



DANGER: Contact Kinova or the Kinova-certified technician if there are any mechanical or electrical issues with Lift Arm.



DANGER: No modification of Lift Arm is allowed.



DANGER: Lift Arm must be installed by a Kinova-certified technician.



DANGER: The end user or their care giver must not repair or replace any parts without the express Kinova authorization. If any problem with the device occurs, only a Kinova-certified technician can repair it.



DANGER: If the device is not responding properly to the controls, do not use the device until it is verified by a Kinova-certified technician. Contact Kinova support for more details.



DANGER: Do not submerge Lift Arm in water or snow, either in whole or in part, or expose Lift Arm to corrosive environments.



DANGER: The swing-away action of Lift Arm must be activated when the wheelchair is stationary. Do not move the wheelchair while Lift Arm is swung out to the side. There is a risk of the arm hitting an object and damaging Jaco or Lift Arm. Be cautious when driving the wheelchair forward while Lift Arm is lowered, and the gripper of the robotic arm is close to the floor or ground. Driving the wheelchair while Jaco is in contact with the floor or ground may damage Jaco or Lift Arm, and cause serious injury.



DANGER: Buttons must not be disconnected from the Lift Arm controller, except by a Kinova-certified technician.



DANGER: Only a Kinova-certified technician can adjust the limit switch.



DANGER: Make sure the swing-away mechanism is latched and Lift Arm is level when passing through narrow areas, such as doorways, narrow hallways, aisles in shops, and so on.



DANGER: Lift Arm must be installed only by a trained and certified professional approved by Kinova.



DANGER: The software in Jaco, which controls the protective areas around the user and the movement of the arm, assumes that the base of the arm is immobile with respect to the wheelchair and the user. The software does not take into account the tilt of Lift Arm. A lowered Lift Arm affects the set protection area.



DANGER: When lowering Lift Arm, make sure that the hand of Jaco does not come into contact with the ground.



DANGER: Do not use Jaco or Lift Arm when the swing-away mechanism is unlocked.



DANGER: Be careful when moving forward with the wheelchair while Lift Arm is lowered and the gripper of Jaco is near the ground. Driving the wheelchair while Jaco is touching the ground may damage Jaco or Lift Arm, or cause serious injury.



DANGER: When Lift Arm is swung to the side, additional weight must not be applied to Jaco or Lift Arm. The additional weight adds stress to the brackets that attach Lift Arm to the wheelchair; the extra weight also adds stress to the mounting rail of the wheelchair.



Important: If, at a certain angle, depending on the wheelchair and configuration, Lift Arm comes into contact with the side of the wheelchair or one of the wheels of the wheelchair. Do not attempt to swing Lift Arm beyond the stop.



DANGER: The limit switch must only be calibrated by a professional approved by Kinova.

Related topics

[Safety warning levels](#) on page 12

Precautions

Avoid hazardous situations that are associated with cautions.



CAUTION: Do not use in heavy rain or snowfall.



CAUTION: Do not submerge Lift Arm in water or other liquids, or expose to corrosive environments.



CAUTION: Wipe the product after contact with water or other liquids.



CAUTION: Unlock the swing-away mechanism of Lift Arm only when the wheelchair is stationary.
Do not move the wheelchair when Lift Arm is swung to the side.
There is a risk that Jaco or Lift Arm may bump into something, and Jaco or Lift Arm may be damaged.



CAUTION: The controls must not be disconnected from Lift Arm control except by a professional approved by Kinova.



CAUTION:  Lift Arm has points where there is a risk of entrapment.

The points are marked on Lift Arm.

The risk to the user is low, but make sure that third parties around you, especially children, do not reach into the mechanism of Lift Arm.



CAUTION: Make sure the swing-away mechanism is latched and Lift Arm is level when passing through narrow areas, such as doorways, narrow hallways, aisles in shops, and so on.

Related topics

[Safety warning levels](#) on page 12

Warnings

Avoid potentially hazardous situations that are associated with warnings.



Warning: Do not modify Lift Arm without authorization of the manufacturer.

Related topics

[Safety warning levels](#) on page 12

Lift Arm components

Lift Arm is made of several parts.

The Lift Arm system consists of the Lift Arm itself and a control box.

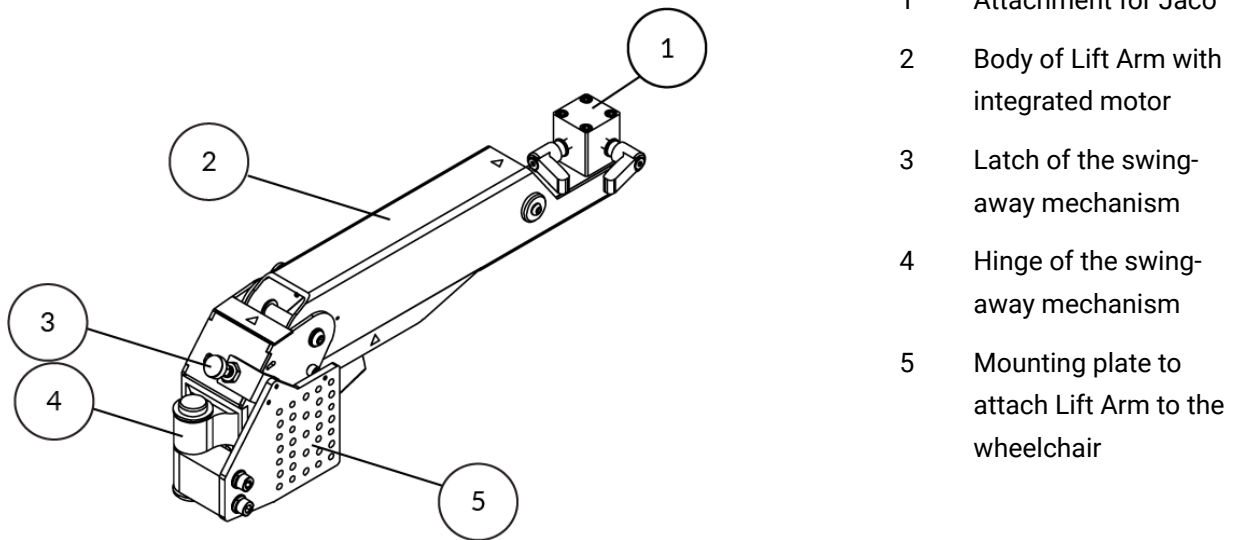


Figure 48: Components of Lift Arm

Controlling tilt back and forward control

Control Lift Arm from the wheelchair control system or from two button-style access switches on the wheelchair.

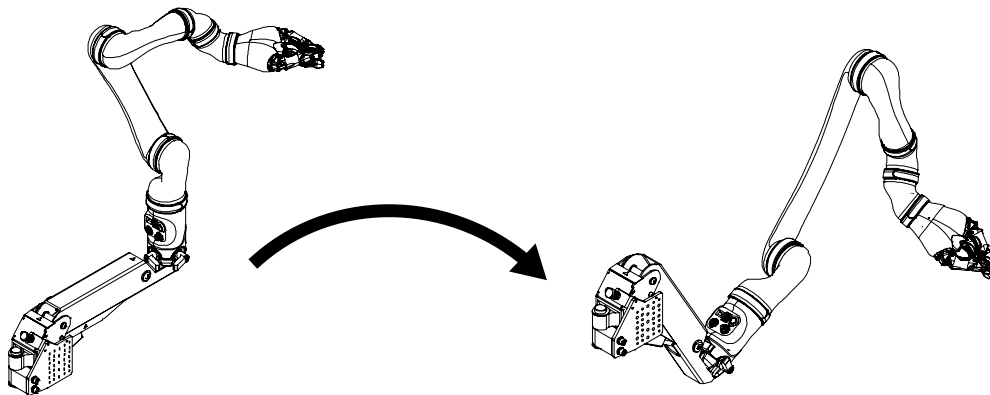


Figure 49: Tilt forward

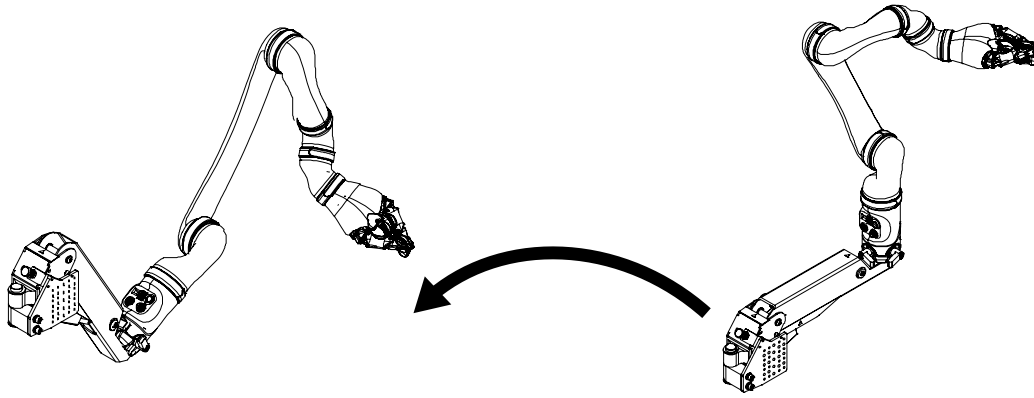


Figure 50: Tilt backward

Controlling Lift Arm from a power wheelchair integration

Lift Arm can be integrated as a function into a wheelchair control menu.

About this task

Power wheelchairs come with wheelchair-dependent interfaces. The technician integrates Lift Arm into the wheelchair control menu during installation.

Procedure

1. Select Lift Arm from the wheelchair control menu.
2. Operate the wheelchair control.

Lift Arm moves in the direction of operation.

- a) Move the control forwards to have Lift Arm move downward.
- b) Move the control backwards to have Lift Arm move upward.
- c) Operate the wheelchair control until Lift Arm is in the desired position.
- d) Release the wheelchair control.

When Lift Arm is tilted further than intended, adjust the angle in the opposite direction with the wheelchair control.

The position of Lift Arm can be moved continuously to its end points.

3. Select Jaco from the wheelchair menu after Lift Arm is in the desired position.

Related topics

[Kinova OLED Display](#) on page 50

Controlling Lift Arm from button-style accessible switches

Control Lift Arm with two (2) button-style accessible switches that are installed in any convenient location on the wheelchair. When Lift Arm is used with Jaco Blue Universal Interface, control Lift Arm with a joystick.

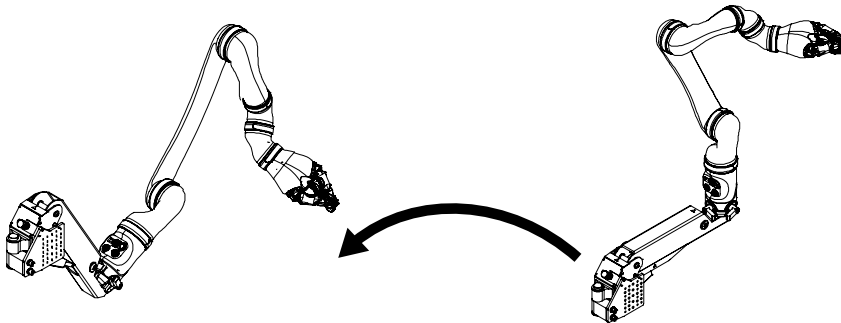
About this task

One switch is used to move Lift Arm downwards; another switch is used to raise it.

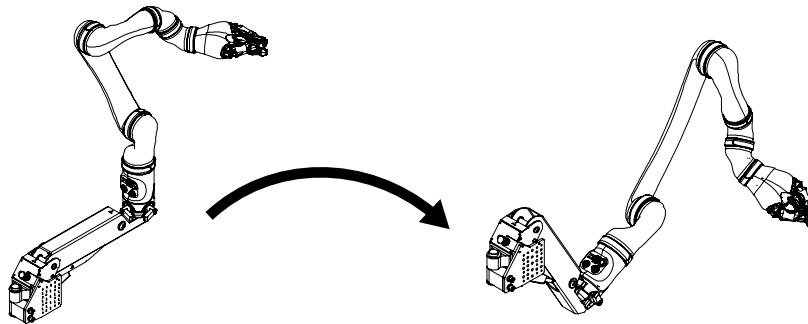
Procedure

1. Press and hold one of the two switches to move Lift Arm.

- Upward-moving switch to raise Lift Arm.



- Downward-moving switch to lower Lift Arm.



2. Release the switch when Lift Arm is in the desired position.

When Lift Arm is tilted further than intended, adjust the angle in the opposite direction with the wheelchair control.

The position of Lift Arm can be moved continuously to its end points.

Swing-away mechanism

The swing-away mechanism helps to swing the arm out of the way.

There are two parts to the mechanism.

- A hinge around which Jaco rotates
- A spring-loaded latch that locks Lift Arm to the side of the wheelchair

The swing-away mechanism pivots around the hinge, moving Lift Arm with Jaco from the side of the wheelchair outwards.

When the swing-away mechanism is not in use, the mechanism must be latched to the frame of the Lift Arm. The swing-away mechanism is meant to make it easier for the user to get out of the wheelchair on the side of Lift Arm.



Important: Make sure the swing-away mechanism is latched and Lift Arm is level when passing through narrow areas, such as doorways, narrow hallways, aisles in shops, and so on.

There is no powered control for the swing-away mechanism; end users require assistance to use it.

Using the swing-away mechanism

There are times when Jaco needs to be moved out of the way, such as when the user needs to get out their wheelchair.

About this task

There is no powered control for the swing-away mechanism; end users require assistance to use it.

Procedure

1. Lift the latch to release the swing-away mechanism.
2. Move Lift Arm out and back by hand.

Storing the swing-away mechanism

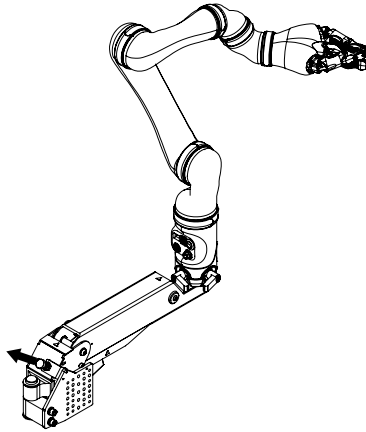
The swing-away mechanism must be stored before using Jaco.

About this task

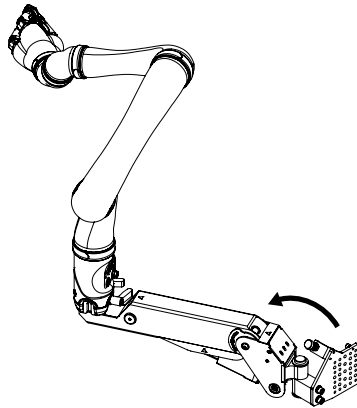
When storing the swing-away mechanism, Lift Arm must be in the [Home position](#). The latch must snap back into place.

Procedure

1. Lift the latch slightly.



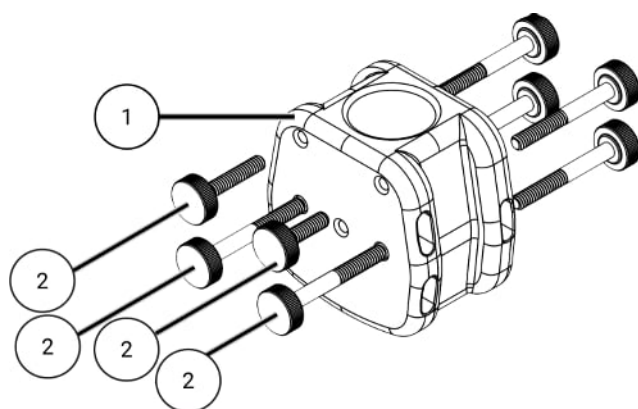
2. Swing Lift Arm back to the *Home position*.



3. Hold Lift Arm in place so that it does not swing back out.
4. Release the latch to click Lift Arm into place.
5. Make sure the swing-away mechanism is locked.

Cutlery and Tool Holder

Use the Cutlery and Tool Holder accessory to use cutlery and other objects that support *Mobility-related Activity of Daily Living (MRADL)* tools, such as an electric toothbrush. The tool makes the user more independent.



- 1 Cutlery and Tool Holder
- 2 Plastic knurled head thumb screw

Figure 51: Cutlery and Tool Holder components



- 1 Toothbrush holder
- 2 Cutlery holder

Figure 52: Cutlery and Tool Holder

Objects are clamped firmly in the carrier and do not move when pressure is exerted on it. Grooves for the fingers of the robotic hand are embedded in the Cutlery and Tool Holder on both sides, which ensures the Cutlery and Tool Holder is held securely in place after gripping it.

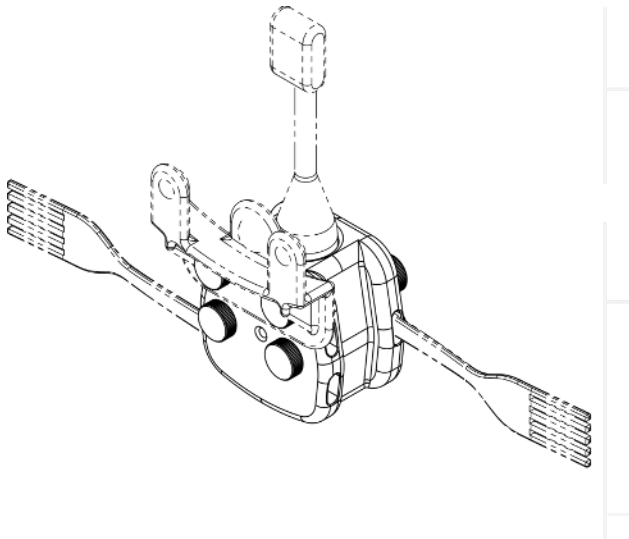


Figure 53: Example of Cutlery and Tool Holder holding multiple tools

The slots on both sides of the cutlery tray are used to hold cutlery, such as a fork or spoon.



Figure 54: Cutlery and Tool Holder holding a fork

In the case of a fork, the user can use the prongs to obtain food without the fork moving. If the user were to grip a fork directly with Jaco fingers, the fork would move between the fingers as soon as pressure would be exerted on the prongs.

The Cutlery and Tool Holder can be fitted on both sides if required, which is useful if a fork and a spoon are to be used. The required cutlery can be selected by turning the hand.



Restriction: Do not use Jaco to cut or handle sharp or dangerous objects.

When using an electric toothbrush, insert the toothbrush into the round opening of the Cutlery and Tool Holder.



Figure 55: Cutlery and Tool Holder and electric toothbrush



Figure 56: Cutlery and Tool Holder holding an electric toothbrush



Note: To use an electric toothbrush with the accessory, the user must be able to move their head along the toothbrush to control the pressure and to make their teeth accessible.



CAUTION: The user must move their head towards the toothbrush. To avoid injury or restricted movement, the toothbrush must not be pressed against the teeth with Jaco.

Preparing to use the Cutlery and Tool Holder accessory

Although the accessory helps with the user to be more independent, it still requires a caregiver to set it up.

About this task

A caregiver must set up the Cutlery and Tool Holder with the fork, toothbrush, or other item the user needs to perform their task independently.

Procedure

1. Insert the required item into the slot or opening of the Cutlery and Tool Holder.
2. Secure the item with the corresponding clamping screw.
3. Place the equipped Cutlery and Tool Holder on a stable surface that is as non-slip as possible.

Results

The user can perform tasks independently.

Related topics

[Using the Cutlery and Tool Holder accessory](#) on page 86

Using the Cutlery and Tool Holder accessory

The user performs tasks independently by using the tool that the caregiver attached to the accessory.

Before you begin

A caregiver has already set up the Cutlery and Tool Holder with the item that the user requires.

About this task

The user uses the tool that is attached to the Cutlery and Tool Holder to perform their task independently.

Procedure

1. Grasp the Cutlery and Tool Holder that is equipped with the required item using the two (2) opposite fingers.



Note: We recommend rotating the hand so that the two opposite fingers are directly above the surface. The hand can be lowered closer to the surface.

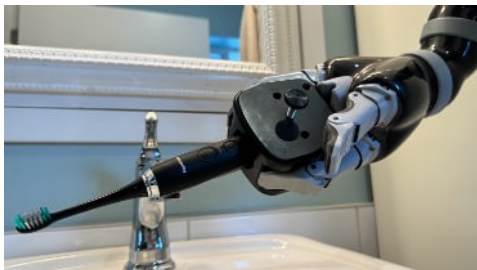
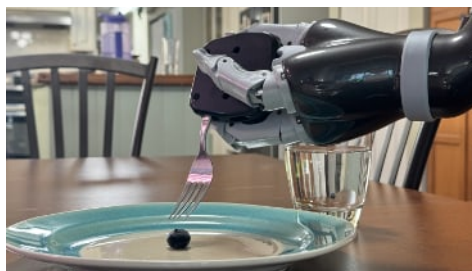


2. Close the fingers completely until the finger movement is switched off automatically.



3. Lift the Cutlery and Tool Holder.

4. Control Jaco according to the current tool.



5. Repeat the process, if necessary.

Example: Finish eating.

6. Place the accessory back on a stable surface that is as non-slip as possible when done.



Related topics

[Preparing to use the Cutlery and Tool Holder accessory](#) on page 85

Operation and control of the robot

Jaco is meant to be connected and controlled through the joystick on a power wheelchair joystick.

To operate and control Jaco, switch it on with the ON/OFF switch on the base of the device.

The control of the robot is Cartesian because the user only controls movements of the robot hand. The wrist always moves in circular movements around the center point of the hand. The center of the hand is the reference point for movement; the reference point moves minimally. The different joints are controlled automatically, according to the command given to the software. The user cannot control the joints individually.

Jaco can perform sixteen (16) different movements. The movements can be divided into different modes of operation. Each mode of operation depends on which control element is used.



Note: Jaco may respond to a command differently than described because of the *singularity* and avoidance algorithms built into the kinematics. The response is normal protective behavior of the robot and depends on the position of Jaco.

Table 21: Robot control modes

Translation mode



Figure 57: Left and right



Figure 58: Forward and backward



Figure 59: Up and down

Wrist mode



Figure 60: Lateral orientation:
Pan left and right



Figure 61: Vertical orientation:
Swing up and down



Figure 62: Wrist rotation:
Rotate left and right

Finger mode

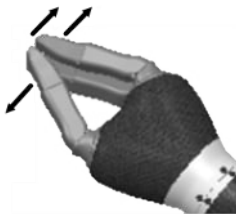


Figure 63: Open all fingers



Figure 64: Close all fingers

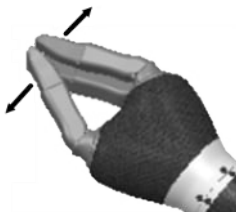


Figure 65: Open two fingers

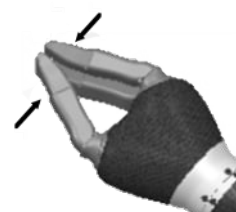


Figure 66: Close two fingers

Use OLED Display to view Jaco.

Use Lift Arm with Jaco for greater flexibility in operations.

Related topics

[Kinova OLED Display](#) on page 50

[Kinova Lift Arm](#) on page 73

Home and Retract positions

The robot comes with two configurable factory default pre-set positions: Home position and Retract position.

The [Home position](#) and [Retract position](#) are configurable by using Assistive Robot Configurator. During the operating briefing, the technician adjusts these configurable positions to the circumstances of the user.

Move Jaco into the [Home position](#) or the [Retract position](#) by pressing an additional button-style accessible switch from a wheelchair control.

Examples:

R-net

Press the speed switch on the wheelchair joystick.

The direction of movement switches between the [Home position](#) and the [Retract position](#) with each activation.



Note: The speed switch invokes the adjustable speed function.

LiNX

Press the programmable switch on the joystick.



Note: Can be used with digital DB9 connections

Q-Logic 3

Press an external button-style accessible switch.

Jaco must be positioned so that no part of the wheelchair, including components attached to the wheelchair, is used for supporting the robot in the retract position. Jaco must never rest directly on the wheelchair and must not be in sustained contact with the wheelchair.



DANGER: When moving Jaco from the home position to the retract position, Jaco must not be obstructed or blocked. Jaco must not come into contact with the wheelchair, the accessories attached to the wheelchair, or any object that may be in the path.

If there is an obstruction, or if Jaco comes into contact with the wheelchair, the accessories attached to the wheelchair, or any other object that is in the path when moving Jaco from the home position to the retract position, contact a Kinova-certified technician immediately.

A smooth landing on the protective pad is required at the end of the retract sequence to prevent damage to the outer shell of the arm of Jaco.



Tip: When setting up the advanced retract position, use a pad. Create the pad by folding paper towels to a 2 mm thickness and place the pad under any joints of Jaco that touch mechanical parts. The extra padding while setting up the advanced retract position induces a smooth landing.

The default position is the position of Jaco in the operational state. In the default position, the Jaco waits for the control commands from an operating device. If the Jaco is not in the [Home position](#), no control commands are performed.

The [Retract position](#) is the resting position of Jaco when it is not in use. The user should always place Jaco in the [retracted position](#) when it is not in use to reduce the space occupied by Jaco. In the [retracted position](#), the Jaco is in standby mode; the functions of the control unit are deactivated, and the power consumption is significantly lower.



CAUTION: Never use the function Auto Reset to Home or Retract position when carrying liquid. The two positions are based on a preset and the wrist could rotate during movement and the liquid could be spilled.

Operation and control of Jaco with factory settings through a power wheelchair

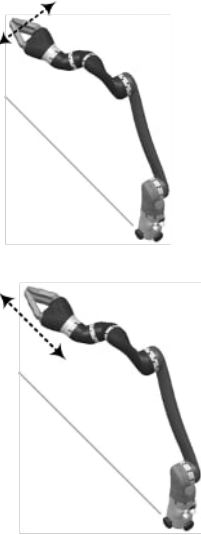
It is possible to control Jaco with factory settings. Contact the installation technician for robots with custom configuration.

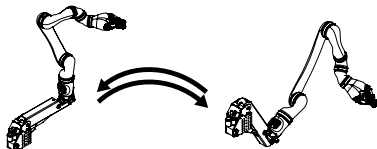
Jaco can be controlled through the wheelchair control system and the each wheelchair control element; that is, Jaco can be controlled by a wheelchair joystick, chin control, head control, and so on, depending on the equipment on the wheelchair.

Wheelchair controls have four (4) basic directions: forward, backward, left, and right.

Jaco has sixteen (16) possible movements. The robot movements are divided into five (5) operating modes.

* Custom configurations may not be the same as the images in the table.

Operating Mode	Default movement *	Description
B1		Horizontal movement mode Forward, backward, left, right
B2		Vertical movement and wrist rotation mode Up, down, clockwise hand rotation, counter-clockwise hand rotation
B3		Hand and gripper orientation mode

Operating Mode	Default movement *	Description
B4		Finger mode Open and close two (2) fingers Open and close three (3) fingers
B5		Lift Arm mode  Important: Used only when Jaco is installed with Lift Arm

OLED Display shows the currently selected operating mode.

The display on the power wheelchair cannot show any information coming from Jaco.

Switching between operating modes depends on the needs of the user and the final configuration of the wheelchair integrated with Jaco. The user may press on an additional switch or press the speed switch on the wheelchair joystick. Scroll through the operating modes by pressing the switch. Whenever the user presses the switch to scroll through the operating modes, the first operating mode is always B1.



Remember: When Lift Arm is not installed, the user scrolls through operating modes B1 to B4.

When Lift Arm is installed, the user scrolls through operating modes B1 to B5.

To reach an object, combine the movements of the operating modes to guide Jaco to the object. Use the gripping function on the object. Reconstruct the complete movement sequence of a human arm.

Operating Jaco from a power wheelchair

Use Jaco with the controls of the power wheelchair. Use OLED Display to know what action is being used. Jaco Blue Universal Interface transmits signals between the wheelchair and Jaco.

About this task

Jaco is installed on the power wheelchair, along with OLED Display and Jaco Blue Universal Interface.

Procedure

1. Select Jaco from the menu of the wheelchair.
2. Make sure Jaco is in the *Home position*.

When Jaco is in the *Home position*, there is a green dot on OLED Display.

Control signals are transmitted from the wheelchair to Jaco only when the green dot is on OLED Display.

3. Select the operating mode by pressing the control.



Remember: The operating modes are B1 to B4 when Lift Arm is not installed. The operating modes are B1 to B5 when Lift Arm is installed

4. Operate the wheelchair control.

Jaco moves according to the operating mode and the direction of operation.

Maintenance

Preventive maintenance averts major issues that can arise, and keeps Jaco and users safe.

Maintenance consists of basic maintenance, as well as cleaning.



Note: Do not reuse the product unless it is re-installed by a Kinova-certified technician.

Basic maintenance

Preventive maintenance helps to keep the product in good working order.

Clean the surface of Jaco, especially the fingers, any time food or liquids are spilled on the robot.

Clean Lift Arm any time food or liquids are spilled on the robot.

Contact your Kinova representative if the fingers of the robot squeak when they move. The fingers need to be cleaned and lubricated.



Warning: Refer all servicing to a Kinova-certified technician. Servicing is required when the apparatus is damaged in any way. For example, the power cable or plug is damaged, the product does not operate properly, or the product is dropped.



Restriction: The product has no user serviceable parts. Do not open.

Cleaning Jaco

Keep the exterior of Jaco clean by cleaning it from time to time.

Before you begin

Make sure the required equipment is available.

- Clean, cotton cloth
- Mild dish detergent

About this task

Only a Kinova-certified technician is authorized to clean internal components, such as the motor or internal mechanisms.

If there is any heavy contamination around Jaco, contact Kinova directly.

Heed the warnings before starting to clean Jaco.



Restriction: Do not immerse any part of the product under water or snow.



Warning: The product is not intended to be sterile. No sterilization procedure should be undertaken with the product.



Warning: Do not rub the external surfaces with abrasive materials.

Procedure

1. Prepare a room-temperature water and soap solution using about 2 ml of dish soap for 100 ml of water.
2. Immerse a clean cotton cloth in the solution.
3. Remove the cloth and wring the cloth out thoroughly.
4. Rub the external surface to be cleaned gently.

Cleaning Kinova® Lift Arm

Keep the exterior of Lift Arm clean by cleaning it from time to time.

Before you begin

Make sure the required equipment is available.

- Clean, cotton cloth
- Mild dish detergent

About this task

Only a Kinova-certified technician is authorized to clean internal components, such as the motor or internal mechanisms.

If there is any heavy contamination around Lift Arm, contact Kinova directly.

Heed the warnings before starting to clean Jaco.



Restriction: Do not submerge Lift Arm in water or other liquids.

Procedure

1. Immerse a clean cotton cloth in the solution.
2. Remove the cloth and wring the cloth out thoroughly.
3. Rub the external surface gently.

Disposal of the Jaco and its accessories

Parts of the product and its accessories are considered to be hazardous waste, while other parts are recyclable.

Disposal of Jaco

The packaging material may be recycled. Jaco contains parts that are deemed hazardous waste.

Item	Description
Packaging material	
Metal parts	Metal parts can be disposed of as recyclable scrap metal.
Electrical components, circuit boards, and carbon fiber	Contact the local distributor for information regarding disposal of such parts. Alternatively, address questions directly to Kinova through our website.
Nanuk transport case	Reuse the Nanuk transport case to store Jaco when it is not installed or in use. Transport Jaco in the transport case.
Jaco® assistive robot	
	The product contains parts that are deemed to be hazardous waste at the end of useful product life. For further information on recycling, contact the local recycling authority or Kinova distributor. Always dispose of product through a recognized agent.

Related topics

[Contact support](#) on page 100

Disposal of OLED Display

OLED Display contains parts that are deemed hazardous waste.

Dispose of OLED Display according to the rules of disposal in the region and according to the type of user.

Item	Location	Description
	Private households	The Waste Electrical and Electronic Equipment (WEEE) symbol on the product and accompanying documents means that used electrical and electronic equipment should not be mixed with general household waste. For proper treatment, recovery and recycling, take OLED Display to designated collection points where it is accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product. Disposing of the product correctly helps to save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.
	Professional users in the European Union	Contact your dealer or supplier for further information if you wish to discard electrical and electronic equipment (WEEE).
	Countries outside of the European Union	The WEEE symbol is only valid in the European Union (EU). Contact your local authorities or dealer, and ask for the correct method of disposal.

Related topics

[Contact support](#) on page 100

Disposal of Lift Arm

Lift Arm contains parts that are deemed hazardous waste.

Lift Arm is expected to have a life span equivalent to that of Jaco. At the end of its service life, the user has two options.

- Continue to use Lift Arm.



Important: Return the device temporarily to Kinova to inspect the device for routine servicing, and replace or repair any internal components that may be worn out.

- Dispose of Lift Arm.

Item	Description
	The product contains parts that are recyclable and parts that are considered to be hazardous waste. Companies are specialized in disassembling the product and sorting the materials. Check local waste handling guidelines before disposing of the product.

Related topics
[Contact support](#) on page 100

Contact support

Direct questions about Jaco or the information in the *Jaco® assistive robot user guide*, through the support page of the Kinova website at <https://assistive.kinovarobotics.com/reach-us/customer-support>, by phone at 1 (514) 277-3777, or by email at support@kinova.ca.

For effective assistance with problem reports, make sure to have specific information ready for Kinova or the distributor.

- Date and time the problem occurred
- Environment where the problem occurred
- Actions performed immediately before the problem occurred
- Serial number of the product

The serial number acts as a cross reference to the exact product, software version, part revisions, part characteristics, and so on.

If the product needs to be returned to Kinova, make sure the product is packaged in its original case for transportation and servicing.

Report all serious incidents that have occurred with the use of Jaco, or any of its accessories, to Kinova or any competent authority.

For technical support issues or more information about product end of life, contact Kinova.

Kinova inc.	4333 boulevard de la Grande-Allée, Boisbriand, QC, Canada, J7H 1M7
Telephone	1-855-6-KINOVA
Email	support@kinova.ca

Customers in Germany can contact our German office.

Kinova Europe GmbH	Vorderbreitenthan 150, 91555 Feuchtwangen
Telephone	0800 5466822
Email	support@kinovarobotics.de

Glossary

A

ACM

Auxiliary Control Module (ACM)

active configuration

a configuration defined in a software and applied to the robot; the configuration currently being used

active movements

the current movement; movements that are currently in progress

AP

flammable anesthetic mixture with air

APG

flammable anesthetic mixture with oxygen or nitrous oxide

available movements

all movements that are possible or available in the current operating mode

[possible movement](#) on page 106

B

BF

a part with the BF designation is not connected to earth ground and makes direct contact with the user; the part does not make direct contact with the heart.

Examples: ultrasound equipment, blood-pressure monitors, Jaco

body floating (bf)

C

CAN bus

a standard internet protocol used for microcontrollers and devices to communicate with each other

controller area network (CAN bus)

CB radio

citizens band radio (CB radio)

pending configuration

a configuration defined in a software, but not applied to the robot

control elements

devices used to control the product

Examples: button-style accessible switch, external joystick

D

Drink mode

mode of operation in which the user can use Jaco to drink

DoF

the number of variable directions needed to define the configuration of a robot, particularly for all the directions in which the motion can occur

degrees of freedom ([DoF](#))

E

ECU

Environment Control Unit (ECU)

Example: environmental control or environmental interface for Dynamic™ DX or DX2 controllers

[ACM](#) on page 101 [IOM](#) on page 104

end user

a person who uses Jaco to accomplish daily activities

EMI

unwanted electromagnetic interference generated by an external source

electromagnetic interference (EMI)

Error mode

mode of operation that indicates there is an error



Important: Uncorrected errors can lead to [major errors](#)

F

FCC ID

Federal Communications Commission Identifier (FCC ID)

Finger mode

a mode of operation that uses the Jaco® assistive robot fingers

fixed environment

an object that does not move on its own

Example: light switches, doors, walls, tables, and so on

H

handedness

the tendency to use one hand more than the other

hamburger menu

three vertical lines that, when tapped or clicked, expose a menu of actions or tasks from which the user can choose; usually used for main menus



hamburger, menu

[main menu](#) on page 105

Home position

physical position of Jaco when it is ready to be used; the robot is waiting for commands from a control device; control features are enabled; power consumption is normal; Jaco is in [standby mode](#)

see [Ready position](#)

I

IC ID

Industry Canada Identifier (IC ID)

IOM

Input/Output Modules (IOM)

[ACM](#) on page 101

L

laterality

the preference to use one side of the body over the other

LCD

a flat panel display that uses liquid crystals to operate

liquid crystal display (LCD)

LED

a semiconductor device that emits light

light-emitting diode (LED)

Lift Arm mode

a mode of operation that uses the Kinova® Lift Arm

Lowered position

the position of the Lift Arm when it is not in use, or when the user needs to reach something that is low or near the ground

also known as *Parked position*

M

main menu

a menu, or list, of operations that can be performed; most often accessed in the banner of an software or from a *hamburger menu*

menu

a list of actions that can be taken in an application

Major Error mode

mode of operation that indicates there is a major error; Jaco does not move and may shut down



Trouble: Possible causes:

- Something inside Jaco becomes disconnected
- An error repeatedly occurs in close succession
- Temperature of Jaco exceeds its limit temperature

mode

a way of operating or using a system

MPDG

Medical Device Law Implementation Act (MPDG)

MRADL

activities performed on a daily basis that require assistance to be completed

Mobility-related Activity of Daily Living (MRADL)

Examples of activities: feeding, toileting, dressing, grooming

Examples of tools (non-exhaustive): fork, spoon, hairbrush, toothbrush

N

No-go zone

restricted zone around the user that the robot cannot enter

Normal mode

mode of operation in which Jaco operates normally

see also [Standard mode](#), [standby mode](#)

O

orientation movement

rotational movement; [wrist](#) movements

P

Parked position

see [Retract position](#)

possible movement

a movement that is possible to take in the current mode

[available movements](#) on page 101

pre-certified module

a module that is already certified and is integrated into the product

Protection zone

the area around the user in which the robot is prohibited from entering; the safety zone around the user that is made of a [No-go zone](#) and a [Slow zone](#)

PC

a desktop computer, laptop computer, tablet, or touchscreen using the Microsoft operating system

personal computer (PC)

R

R-net

software communication protocol used in powered wheelchairs

Raised position

the position that causes Jaco to be in the field of vision of the user and in which the user can move Jaco in all directions

also known as [Starting position](#)

Ready position

physical position of the robot in which it is waiting for input; control features are enabled; power consumption is normal; Jaco is in [standby mode](#)

see [Home position](#)

Retract position

physical position of Jaco when it is not in use to decrease the amount of space it takes; control features are disabled; power consumption is reduced

RoHS

compliance directive for hazardous substances

Restriction of Hazardous Substances (RoHS)

S

Safety zone

see [Protection zone](#)

singularity

a position that is impossible for the robot; a position in which the robot is unable to move the end effector in a given direction no matter how it moves its joints

Sleep mode

mode of operation in which Jaco senses a lack of activity and uses less energy while it waits for further input

Slow zone

a secondary [Protection zone](#) that is immediately outside the [No-go zone](#); a zone in which the robot can move, but only at reduced speeds

spasticity

muscles that are stiff or rigid

Standard mode

mode of operation in which Jaco operates normally

standby mode

a mode of operation in which the device waits for input

Starting position

see [Raised position](#)

T**Translation mode**

a mode of operation that describes left and right, forward and backward, and up and down movements

TPC

materials made with properties of polyesters and polyethers

Thermoplastic Copolyester Elastomer (TPC)

TPE

materials made with properties of thermoplastics and elastomerics

Thermoplastic Elastomer (TPE)

tremor

a neurological condition that causes one or more parts of the body to shake or tremble uncontrollably

U**USB**

industry computer bus standard that makes it easier to transfer data between devices

Universal Serial Bus (USB)

USB controller

a controller, or device, that connects with a [USB](#) cable

USB device

a device that uses the industry computer bus standard that makes it easier to transfer data between devices

universal serial bus (USB) device

USB key

a portable storage device that plugs into [USB](#) ports

[USB storage device](#) on page 109 [USB](#) on page 108

USB storage device

a portable storage device that plugs into [USB](#) ports

[USB](#)

also known as thumb drive, flash drive, USB stick

W

WEEE

compliance directive for handling electrical waste and electrical equipment

Waste Electrical and Electronic Equipment (WEEE)

Wheelchair mode

mode of operation that indicates that the wheelchair controls are in use

wrist

the part found between the robot arm and the robot hand

Wrist mode

a mode of operation that describes the movement of the wrist when it moves left and right, swings up and down, or rotates left and right

TOGETHER IN ROBOTICS



THERE IS NO NEED TOO SMALL.
NO TASK TOO GREAT.

📍 CANADA • 📍 GERMANY

EN-UG-007-r8.1-202411

KINOVA
Assistive

Kinova (HQ)
Boisbriand (QC) J7H 1M7
Canada
T 1 574 277 3777
info@kinova.ca

Kinova Europe • GmbH
Assistive Technologies
91555 Feuchtwangen
Germany
T 0800 5466822 Support@kinovarobotics.de Assistive@kinovarobotics.de