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qb SoftClaw

Fanuc CRX Manual

Dear customer,

Thank you for purchasing our product.

The present document provides information at best of our knowledge at the time of publication. This document could present differences from the product and it is subject to changes without notice: the latest version is available on our webpage www.qbrobotics.com.

qbrobotics s.r.l. does not assume any responsibility for errors or omissions.

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Table of Contents

1 Preface

1.1 Using this document

Please, check that the document release date is before the product purchase date.

The documentation must always be complete and in a perfectly readable state.

Keep the document accessible to the operating and, if necessary, maintenance personnel at all times.

Pass the document to any subsequent owner or user of the product.

1.2 Symbols and conventions

STYLE	DESCRIPTION
CRITICAL: …	Identifies information about practice or circumstances that can lead to critical damages on the device and to personal injury. Attentions help you identify a hazard, avoid a hazard and recognize the consequence.
WARNING: …	Identifies information about practice or circumstances that can lead to damages on the device and to personal injury. Attentions help you identify a hazard, avoid a hazard and recognize the consequence.
NOTE: …	Identifies remarkable information and additional notes.

STYLE	DESCRIPTION
	Identifies tips and highlights.
✅ **TIPS:** …	
	Identifies the required tool to be used during the described assembly phase.
`Monospaced text`	Identifies file paths, file names and software functions.

1.3 Kit content

The kit consists of:

- N.1 qb SoftClaw;
- N.1 ISO 9409-1-50-4-M6 tool flange adapter;
- N. 1 0.3m direct wrist connection cable for compatible robots only;
- N.1 main cable of 3m;
- N.1 USB to RS485 converter with extension cord;
- N.1 USB flash drive with user documents and applications;
- N.1 cylindrical pin EN ISO 8734 A d6x14 h6;
- N.4 metrical screws EN ISO 4762 M6x10;
- N.8 metrical screws EN ISO 10642 M3x8;
- N.1 2 mm Allen hex key;
- N.1 5 mm Allen hex key.

Optionals:

- 24 VDC power supply unit with cables;
- ISO 9409-1-40-4-M6 tool flange adapter;
- ISO 9409-1-31.5-4-M5 tool flange adapter;
- Kinova Gen3 tool flange adapter.

2 Safety

2.1 Intended use

The product design is intended for grasping objects up to 3700 g.

Fragile, sharp or sharp-edged objects shall not be grasped.

Objects having the main dimension greater than 200 mm shall not be grasped.

The product is intended for installation on robotic arms: the safety features are established only for use as described in this document.

The safety of the product cannot be guaranteed in case of inappropriate use. One, single, inappropriate use can result in a permanent damage to the safety of the product.

2.2 Safety instructions

> ⚠️ • Check that all the content is intact after removing it from the packaging.
> • The device can be used only by specially trained staff.
> • Disconnect the power supply before installation, cleaning or maintenance operations.
> • Make sure that no residual energy remains in the system.
> • Always operate the product within the specifications defined.
> • Keep away from children and pets. Always set off or unplug when not in use.
> • Never use aerosol products, petroleum based lubricants or other flammable products on or near the end-effectors.
> • Do not use any damaged power cable, plug, or loose outlet. It may cause damages to the product or injury to people.
> • Do not touch electrical components to avoid damages due to electrostatic charges.
> • Make sure the end-effector is properly and securely bolted in place and cabled.
> • Do not use if damaged or defective. Do not disassemble.
> • Do not insert any objects between moving parts of the fingers.
> • Keep head and face outside the reach of the end-effector.
> • Do not wear loose clothing or jewelry when working with the end-effector.
> • Disrespect of these precautions can affect safety of the device.

2.3 EC Directives on product safety

• The following EC directives on product safety must be observed.
• If the product is being used outside the UE, international, national and regional directives must be also observed.

2.3.1 Machinery Directive (2006/42/EC)

Because of their small size, no serious threats to life or physical condition can normally be expected from electric miniature drivers. Therefore, the Machinery Directive does not apply to our products. The products described here are not "incomplete machines", so installation instructions are not normally issued by qbrobotics.

2.3.2 Low Voltage Directive (2014/35/EU)

The Low Voltage Directive applies for all electrical equipment with a nominal voltage of 75 to 1500 V DC and 50 to 1000 V AC. The products described in this device manual do not fall within the scope of this directive, since they are intended for lower voltages.

2.4 Environmental conditions

Wrong environmental and operating conditions can lead to injuries, product damages and/or significant reduction to the product's life.

⚠️ Any use or application deviating from intended use is deemed to be impermissible misuse. This includes, but is not limited to:
- Use before performing a risk assessment;
- Use outside the permissible operational conditions and specifications;
- Use in not low-dust environment;
- Use in places with high temperature or humidity;
- Use in wet places;
- Use in potentially explosive atmospheres;
- Use in medical and life critical applications;
- Use close to a human's head, face and eye area;
- Use as a climbing aid;
- Use in outdoor applications.

2.5 Environmental safety

The qb SoftClaw must be disposed of in accordance with the applicable national laws, regulations and standards.

All the components of this product have been chosen in accordance with the EU RoHS directive 2011/65/EU: they are produced with restricted use of hazardous substances to protect the environment.

Observe national registration requirements for importers according to EU WEEE Directive 2012/19/EU.

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3 Technical data

3.1 Mechanical dimensions

The figure below shows the overall dimensions of the qb SoftClaw; distances and tolerances in the drawing are noted in millimeters [mm] and degrees [°].
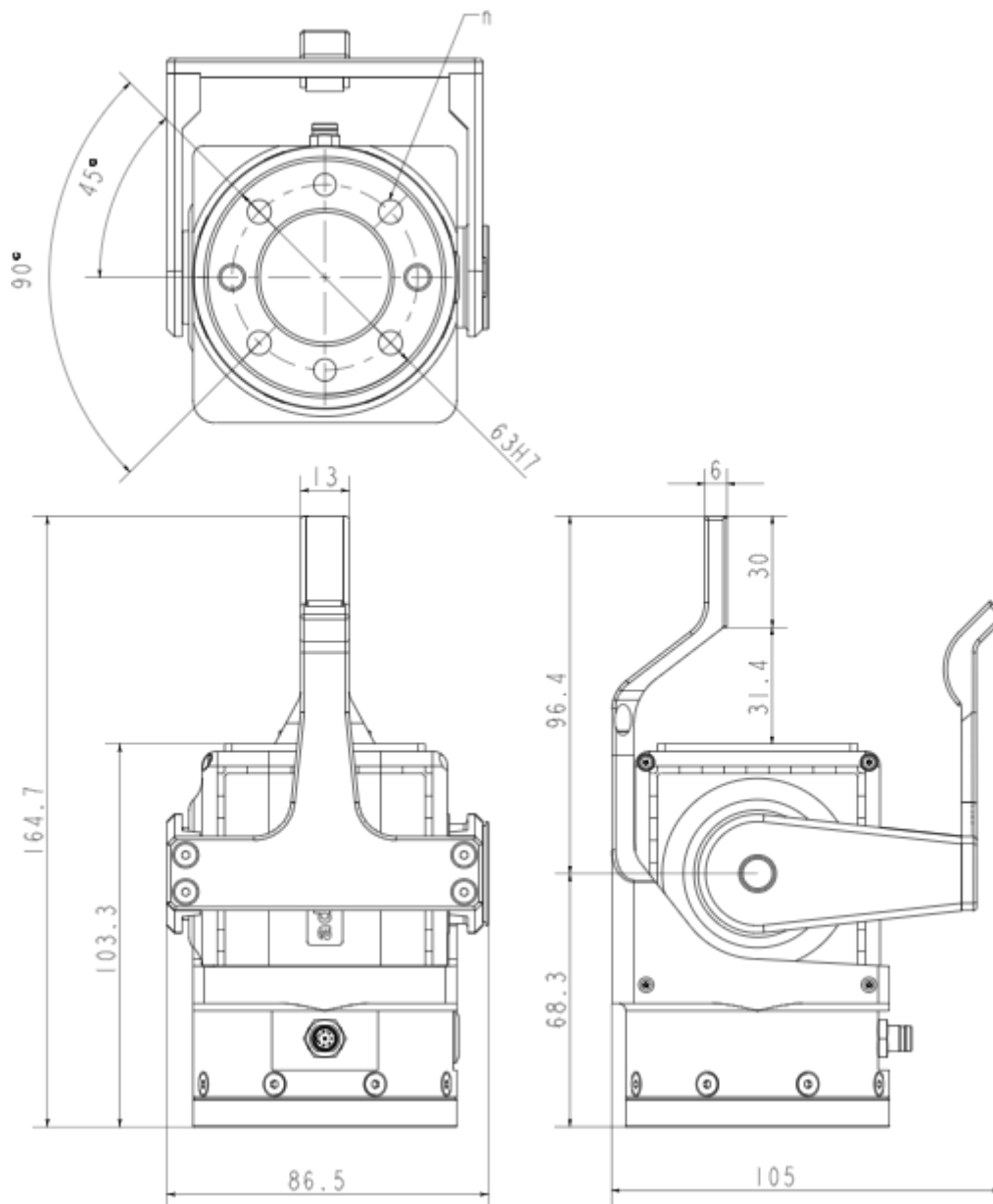

Figure 1. — qb SoftClaw dimensions.

⚠️ Be aware that the above figure may be out of scale.

3.2 Center of Mass

The following table gives also the position of the Center of Mass of the SoftClaw and defines its Coordinate System, like depicted in the following schemes.

	UNIT	LEFT
CoM x coordinate, O_{TX}	[mm]	- 1
CoM y coordinate, O_{TY}	[mm]	1
CoM z coordinate, O_{TZ}	[mm]	53
Weight	[kg]	0.780

Center of Mass, O_T, is evaluated w.r.t. Σ_M considering the device mounted with its fixed finger facing the ground, cf. the figures below.

ℹ️ All coordinate systems here described follow the orthogonal right-hand rule.
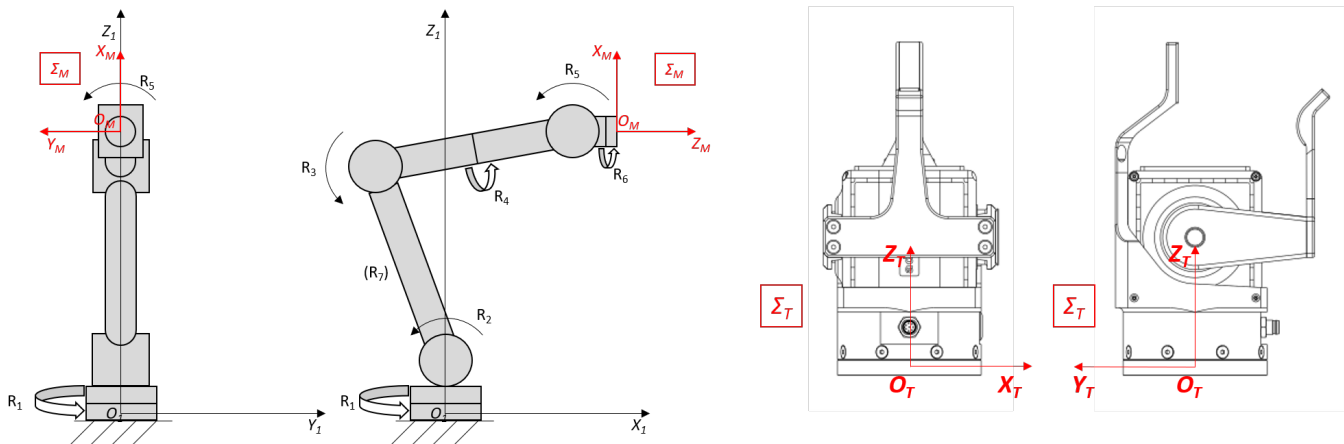
Figure 2. — Robot Tool Coordinate System

On the left, it is represented the mechanical interface coordinate system Σ_M (O_M; X_M, Y_M, Z_M) of an articulated robot, as defined by ISO 9787:2013. In particular, the center of the coordinate system, O_M , is on the interface surface of the robot tool flange and the Z_M axis is coincident with the tool flange axis of symmetry. R_i is the i-th revolute joint of the robot and (O_1; X_1, Y_1, Z_1) is the base coordinate system of the robot.

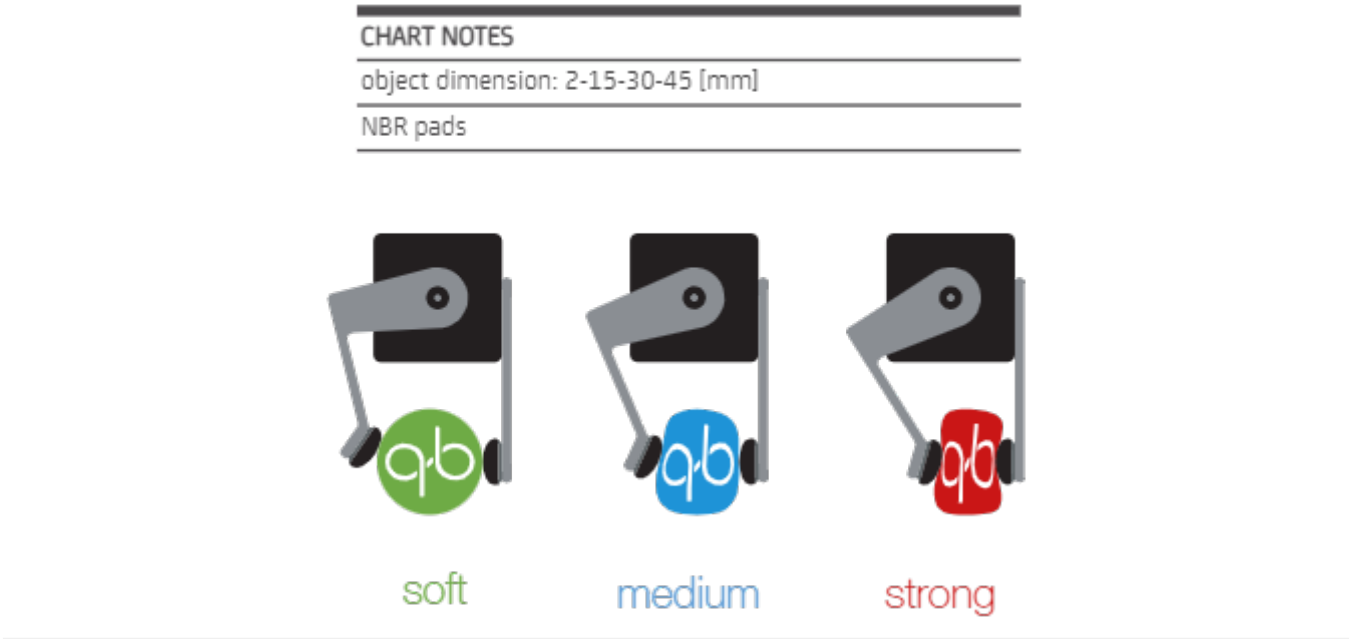On the right, there is the Tool Coordinate System, Σ_T (O_T; X_T, Y_T, Z_T), of the qbSoftClaw and the center, O_T, coincides with the center of mass of the device and its position is defined by the distance from O_M. The Z_T axis is normal to the palm, outgoing positive, and the Y_T axis follows the proximal-distal direction and orientation.

3.3 Mechanical characteristics

		VALUE
Weight	[kg]	0.86
Mobile finger stiffness	[N/mm]	0.07 ... 11.50
Max grasping force	[N]	75.0
Max paypload	[kg]	5.0
Full closing time	[s]	0.5
Fingers opening	[mm]	45

Look at the graph for details. The grasping force in the graph refers to the component along the line joining the centers of the two pads, so it depends on the size of the object.

The obtained force also depend on control: DEFLECTION on the left and POSITION/STIFFNESS on the right.

CHART NOTES
object dimension: 2-15-30-45 [mm]
NBR pads

soft   medium   strong

GRASPING FORCE IN DEFLECTION CONTROL

soft — medium — strong - Deflection preset

grasping force [N]

object dimension [mm]

GRASPING FORCE IN POSITION/STIFFNESS CONTROL

0% — 50% — 100% of stiffness preset

grasping force [N]

object dimension [mm]
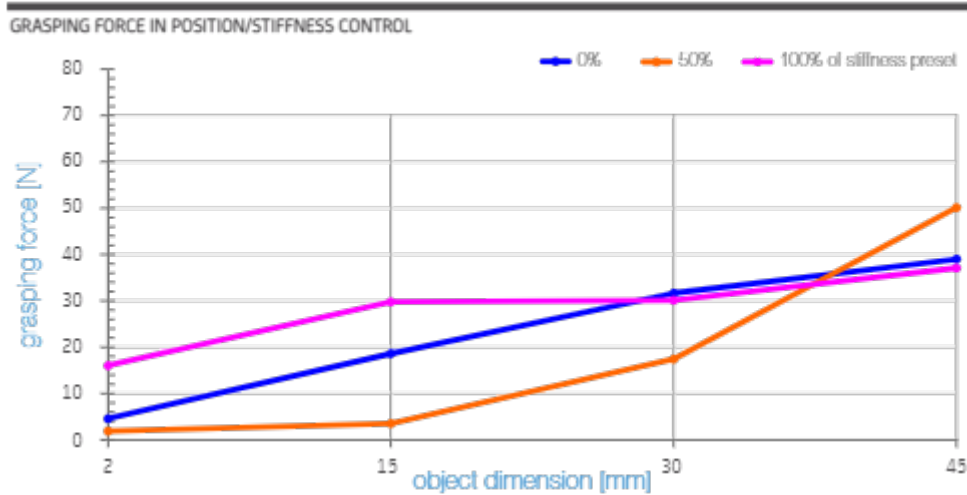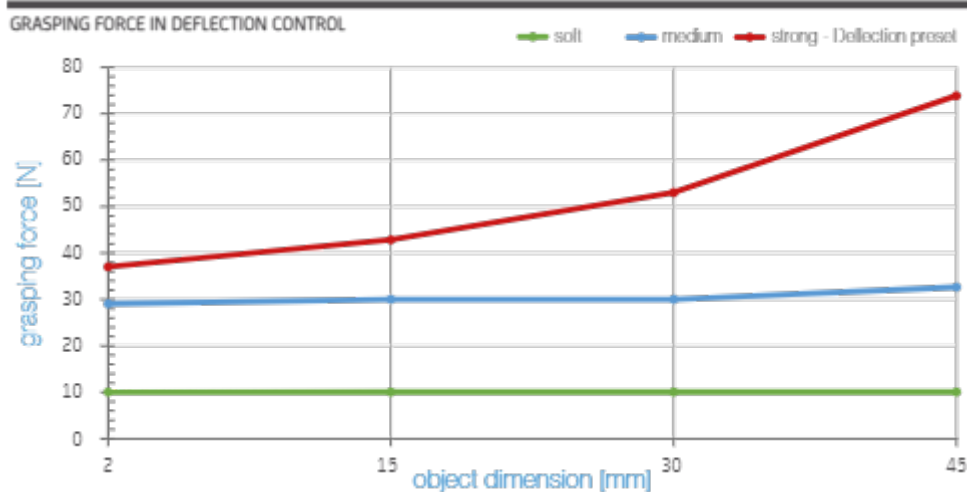
3.4 Electrical characteristics

		VALUE
Power supply voltage	[VDC]	24 ∓ 0.8
Power consumption	[W]	3 ... 22
Operating temperature	[°C]	-5 ... 50
Relative humidity *	[%]	80
Max noise level	[dB]	86

* Only the non-condensing case is to be considered.

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> ⚠️ For external power supplies, use only 24VDC with at least 2.5A (60W) and 3.75A overload current.

3.5 Tool connector pinout

On the qb SoftClaw flange there is a Phoenix Contact 8-position M8 connector, A-coded, with gold-plated copper alloy contacts — Part Number: 1424232[1].

The main cable of the qb SoftClaw is a Phoenix contact 3m free cable end with angled socket — Part Number: 1404192[2].

The RS485 protocol characteristics are as follow:

- 8 bit;
- no parity;
- 1 stop bit;
- no flow control;
- 2M baud rate.

#	WIRE COLOR	DESCRIPTION
1	White	RS485+
2	Brown	RS485-
3	Green	-
4	Yellow	Digital Output
5	Gray	24V ***
6	Pink	Digital Input 2
7	Blue	Digital Input 1
8	Red	GND ***
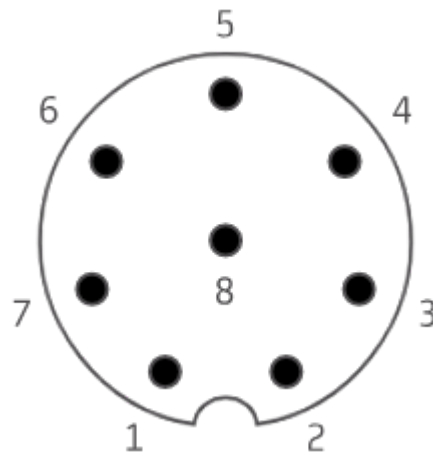
*** *24VDC and GND must be provided by an isolated Power Supply Unit.*

> 🛑 Any error in the pins connection may cause irremediable damages to the device.

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1 https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1424232
2 https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1404192

3.6 Fingers exchange system

The fingers are provided of a easy setup system by simple screws and reference pins.
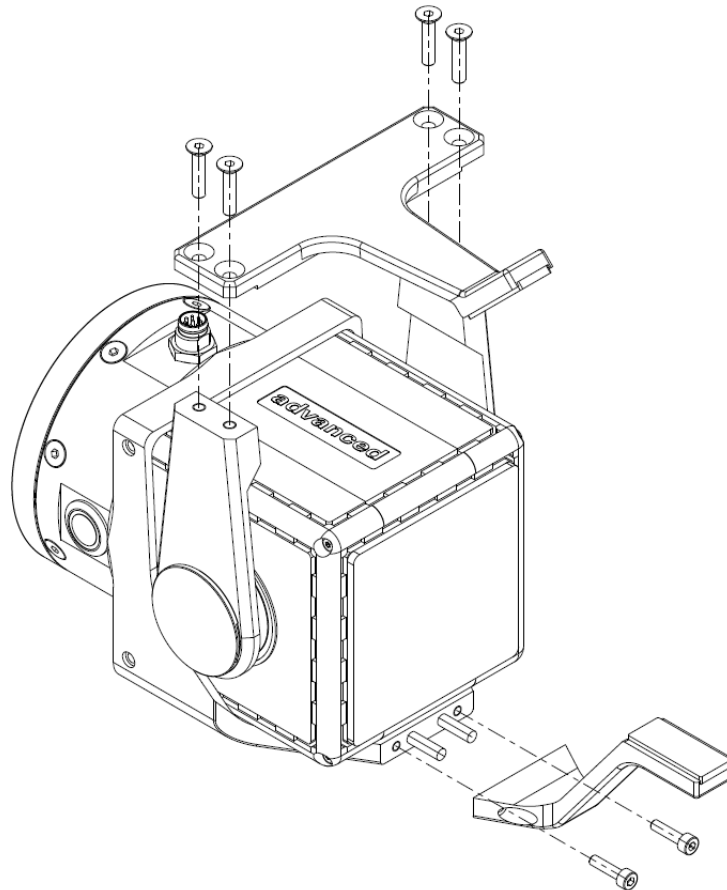
Figure 3. — Disassembly of fingers.

The fingers are designed to be easy replaceable to allow customizations for special applications.
The picture shows the standard version of fingers. For different or customized fingers, please ask a quotation to qbrobotics.

4 Description

4.1 General

The qb SoftClaw is a compact, light and versatile Variable Stiffness Gripper. It's able to grasp objects of the most disparate nature, exploiting the intrinsic mechanical intelligence of its variable stiffness system, without the use of any type of sensors on the contact surfaces or specific algorithms on the absorbed current by the motors.

The custom-made electronic board inside the qb SoftClaw is composed of a logic stage for communication and low-level computation, and a power stage for motion control. This, together with two DC motor and its encoders, establishes a simple position and current control feedback regulated by a properly tuned PID controller.

The qb SoftClaw does not use Common Industrial Protocols (CIP) or other industrial standards for I/O communication due to historical design and technical reasons.

I/O data basically refers as measurements from the device, commands to the device, and parameters from/to the device. These are handled in a custom package format as follows

2-byte — common preamble;
1-byte — target slave id;
1-byte — payload length;
n-byte — payload;
1-byte — checksum for communication integrity.

A custom-made single-master-multiple-slave (SMMS) serial communication protocol is implemented to:

- send commands to the connected devices;
- read measurements from the connected devices (motor position and/or current);
- get and set configuration parameters.

4.1.1 Control Modes

The qb SoftClaw can be controlled by two different modalities:

- **Position:** it is the control mode that most closely approaches the operation of a classic gripper. In this modality the user can control both *position* and *stiffness.* The first parameter is used to set the angular position of the qb SoftClaw movable finger, the second one allows the elasticity of the finger itself to be adjusted. Higher values of stiffness indicates a greater stiffness of the gripper during the grasp; on the contrary lower values allows soft grips.
- **Deflection:** it is the control mode that allows the user to regulate the grip force during the grasp. This modality does not requires any type of sensors on the contact surfaces or specific algorithms on the absorbed current by the motors, but exploits the mechanical intelligence of the qb SoftClaw. In this modality the movable arm is controlled to close completely towards the fixed part for each

commanded value. Small values allow to grip fragile and low-weight objects; on the contrary higher values can be used for heavy and rigid objects.

4.2 Characteristics and key features

- Adaptive grasp;
- Variable Stiffness grasp;
- Interchangeable fingers;

- Plug and play with:
  - Fanuc CRXseries
  - Universal Robots

- ROS packages and general C++ API available;

* Grasp forces and payloads highly depend on object dimensions and approaching strategy (cf. Mechanical Characteristics (see Page 5)).

4.3 Standard customization

- Mechanical flange adapters for non-standard robot flanges;
- Fingers design for special applications.

> (i) We may evaluate other customization for special partners; for requests, please contact our sales team[3].

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3 mailto:sales@qbrobotics.com

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5 Mounting and wiring

> ⚠️ To connect the device to the EE connector of fanuc CRX robots, the device must have a firmware version **7.1.13 or newer**. Please contact our support service[4] for more information.

> ⚠️ The required robot controller version is at least **V9.40P/09 or newer**. If the software version is older (V9.40P/08 or older), the robot controller must be upgraded to the latest version prior to installing the Plugin software.

> ⚠️ The qb SoftClaw must be connected to the EE connector. Please take note of these precautions:
> - The plugin software installation must be completed before connecting the device.
> - FANUC Robot CRX series does not support hot swapping of the tool connections to the EE connector. Please ensure to turn off the robot controller prior to connecting or disconnecting the device.

5.1 Tool mounting

The qb SoftClaw Kit allows you to connect the device to your robot arm.

The device can be mounted on any robot equipped with a mounting interface ***ISO 9409-1-50-4-M6***.

> ⚠️ Use only the screws provided within the package. Longer screws could damage the robot or the end-effector.

To assemble the device on the robot arm, please follow the following instructions:
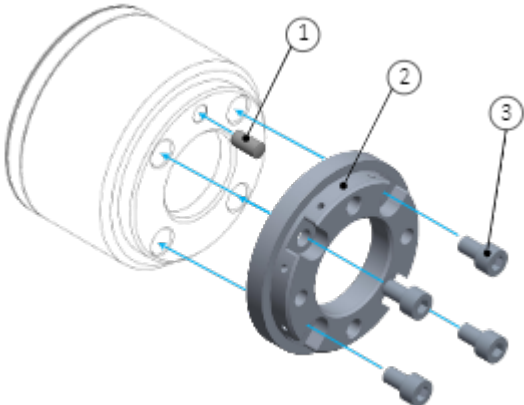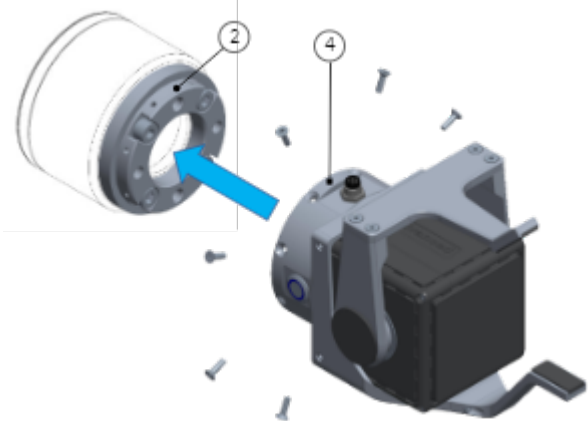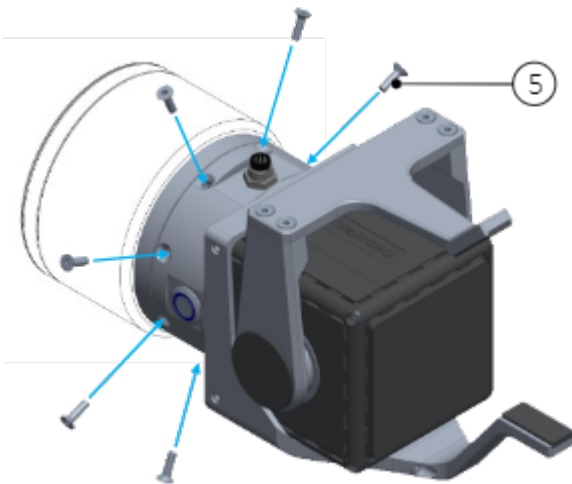
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#	INSTRUCTIONS
1	Insert (1) into the 6 mm hole on the robot wrist, centering (2) on the wrist diameter 63 mm, taking care that the cylindrical pin (1) fits into one of the four d6 reamed through holes. Fasten (2) to the robot wrist by tightening the four screws (3). Max Tightening Torque, TT_{max}=11.1 Nm. You need the 5 mm Allen wrench.
2	Center (4) on the diameter 63 mm of (2), taking care that the plug fits into one of the four d6 mm through holes.
3	Fix axially the device by tightening the 8 screws (5). Max Tightening Torque, TT_{max}=2.1 Nm. You need the 2 mm Allen wrench.

Table 1. — Installation guidelines of the qb SoftClaw on robot arm.

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5.2 Cable connections for FANUC CRX

> ⚠️ The qb SoftClaw must be connected to the EE connector. Please take note of these precautions:
> - The plugin software installation must be completed before connecting the device.
> - FANUC Robot CRX series does not support hot swapping of the tool connections to the EE connector. Please ensure to turn off the robot controller prior to connecting or disconnecting the device.

To control the device with a FANUC CRX robot you have to connect the qb SoftClaw to the EE connector on the robot wrist.
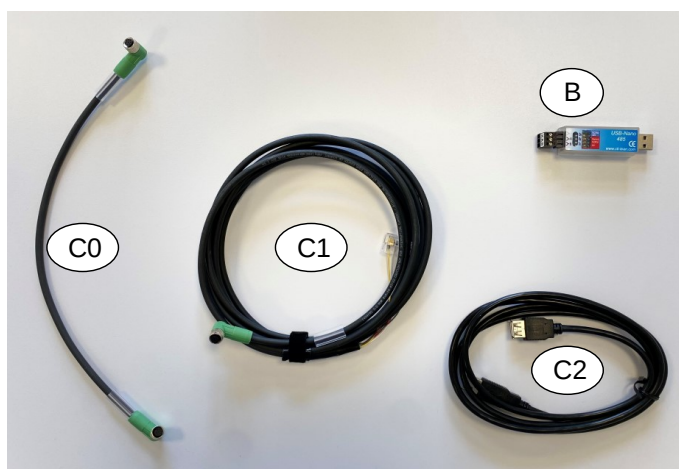

Figure 4. — Connection kit for qbSoftClaw: Fanuc CRX EE connection cable (C0), main cable (C1), RS485-USB converter (B), USB-A extension cable (C2).

INSTRUCTIONS

1 Insert one of the two M8 connectors of (C0) into the receptacle on the SoftCalw wrist flange. Lock the M8 connector by manually tightening its threaded ring on the body of the receptacle (max tightening torque= 0.2 Nm).

> ⚠️ Be careful to insert the connector in the correct direction.
> Do not rotate the M8 connector when inserted into the receptacle.
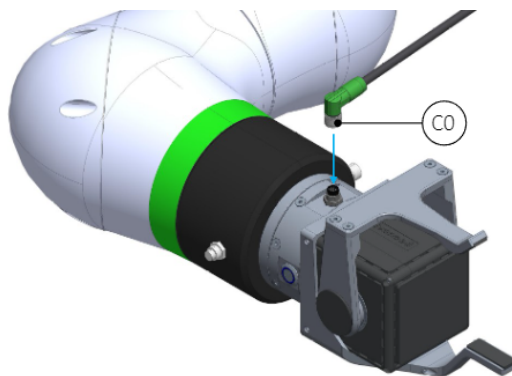
INSTRUCTIONS

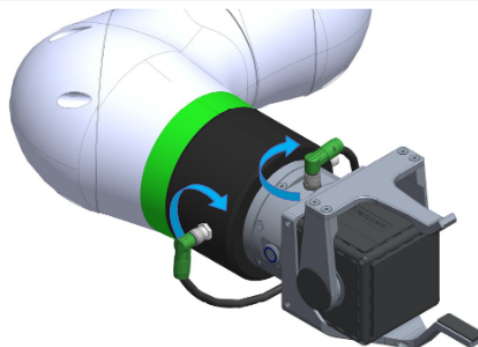| 2 | Do the same on the other M8 connector of (C0) w.r.t. the receptacle on the robot wrist flange. Lock the M8 connector by manually tightening its threaded ring on the body of the receptacle (max tightening torque= 0.2 Nm).

⚠️ Be careful to insert the connector in the correct direction.
Do not rotate the M8 connector when inserted into the receptacle.
Minimum curve radius of the cable (10) = 51 mm. | |

Table 2. — Cable connection for FANUC CRX robots.

ⓘ The setup for RS485 communication with the device is made at the time of plugin installation.

5.3 Copy of Cable connections for Universal Robots

To control the device with a FANUC CRX robot you have to connect the qb SoftClaw to the EE connector on the robot wrist.
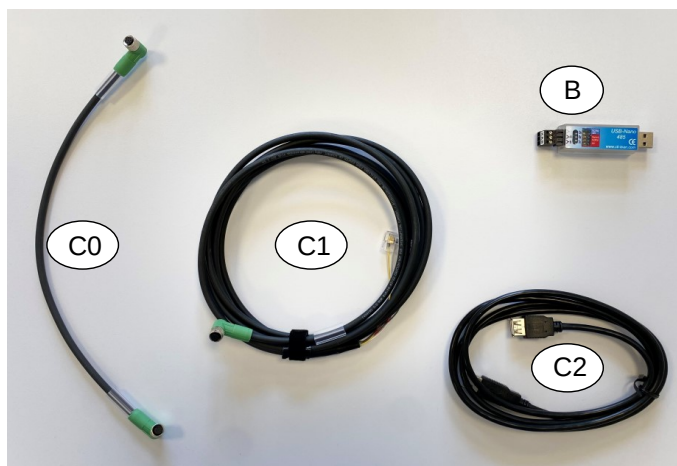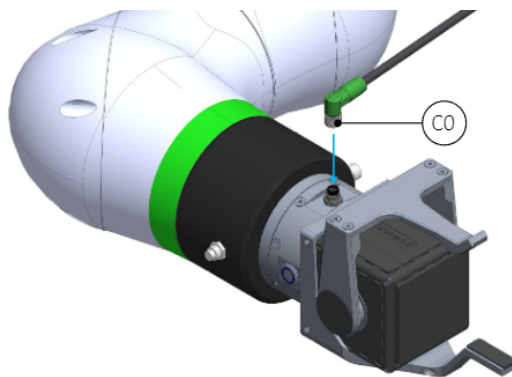

Figure 5. — Connection kit for qbSoftClaw: Fanuc CRX EE connection cable (C0), main cable (C1), RS485-USB converter (B), USB-A extension cable (C2).

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| INSTRUCTIONS	
1	Insert one of the two M8 connectors of (C0) into the receptacle on the SoftCalw wrist flange. Lock the M8 connector by manually tightening its threaded ring on the body of the receptacle (max tightening torque= 0.2 Nm). ⚠️ Be careful to insert the connector in the correct direction. Do not rotate the M8 connector when inserted into the receptacle.	
2	Do the same on the other M8 connector of (C0) w.r.t. the receptacle on the robot wrist flange. Lock the M8 connector by manually tightening its threaded ring on the body of the receptacle (max tightening torque= 0.2 Nm). ⚠️ Be careful to insert the connector in the correct direction. Do not rotate the M8 connector when inserted into the receptacle. Minimum curve radius of the cable (10) = 51 mm.	
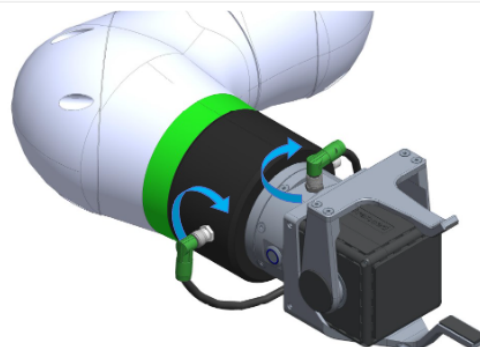
Table 3. — Cable connection for FANUC CRX robots.

ℹ️ The setup for RS485 communication with the device is made at the time of plugin installation.

5.4 Setting the Tool Center Point (TCP) and gripper weight

To use the qb SoftClaw correctly on the FANUC CRX robot, we recommend storing the Tool Center Point (TCP) and the gripper weight in the robot settings after the plugin installation .

ℹ️ The following steps for setting the device parameters made use of Fanuc CRX menu. Please refer to the robot official Instruction Manual for more informations.

5.4.1 TCP

1. On the robot teach pendant, press *MENU* ;
2. Expand the menu and go to *Setup* and then press on *Frames*;
3. Once the *Frames* page opens, select one of the displayed frames and put the following values:
   - Comment: **qb SoftClaw**
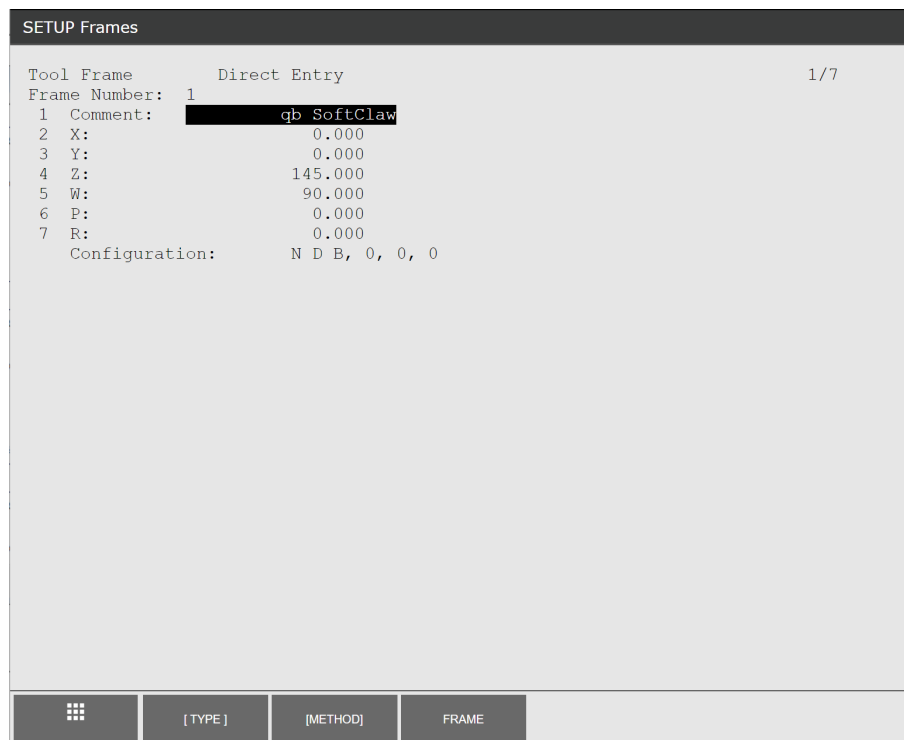   - [X, Y, Z] = [0, 0, 145]
   - [W, P, R] = [90, 0, 0]

```
SETUP Frames

Tool Frame        Direct Entry                                    1/7
Frame Number:  1
 1   Comment:              qb SoftClaw
 2   X:                       0.000
 3   Y:                       0.000
 4   Z:                     145.000
 5   W:                      90.000
 6   P:                       0.000
 7   R:                       0.000
     Configuration:        N D B, 0, 0, 0




                ⊞          [ TYPE ]      [METHOD]      FRAME
```

Figure 6. — Frame setup for qb SoftClaw

5.4.2 Weight

1. On the robot teach pendant, press *MENU* ;
2. Press on *Setup* and then press on *UTool Payload Setup*;
3. Follow the individual steps of the setup process and when the *Entering the Payload Mass* section is opened enter the value **0.76** (Kg).

> ⓘ These configurations are only illustrative examples. You can change them freely depending on your installation on the robot

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Figure 7. — Payload setup for qb SoftClaw

6 Software

6.1 FANUC CRX plugin

> ⚠ The required robot controller version is at least V9.40P/09 or newer. If the software version is older (V9.40P/08 or older), the robot controller must be upgraded to the latest version prior to installing the Plugin software.

> ⚠ The qb SoftClaw must be connected to the EE connector. Please take note of these precautions:
> - The plugin software installation must be completed before connecting the device.
> - FANUC Robot CRX series does not support hot swapping of the tool connections to the EE connector. Please ensure to turn off the robot controller prior to connecting or disconnecting the device.

> ⚠ To connect the device to the EE connector of fanuc CRX robots, the device must have a firmware version 7.**1.13 or newer**. Please contact our support service[5] for more information.

6.1.1 Install FANUC CRX Plugin

To install the qbrobotics plugin, copy the *.ipl file on a USB drive and insert it in the USB port on the controller. Then do the following:

1. On the robot teach pendant, press *MENU* ;
2. Select *Plugins* and press *Install*;
3. In this menu you can see a list of the plugins on the USB drive with a brief description. Select the desired plugin and agree with the explanation, then press *Install*;
4. Once the plugin has been installed, turn off the robot controller, plug the device to the robot EE connector and then turn on the robot controller.

> ⓘ Once the plugin is installed, the settings of the EE interface are changed and setted according to qbSoftClaw communication requirements. Do not change these settings.

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6.1.2 Uninstall FANUC CRX Plugin

> ⚠️ Before you uninstall the plugin, ensure you have stopped all the communication task with the device.

To uninstall the qbrobotics plugin, do the following:

1. On robot teach pendant, press *MENU* ;
2. Select *Plugins* and press *Plugins List*;
3. In this menu you can see the currently installed plugins and its description. Selects the desired *Plugins* and press *Uninstall.*
4. Once the plugin has been uninstalled, re-start the robot controller.

6.1.3 Work with qbrobotics plugin

PLUGINS menu

After the installation process, an item dedicated to the device will appear in the Plugins menu; pressing on it will appear the following screen:
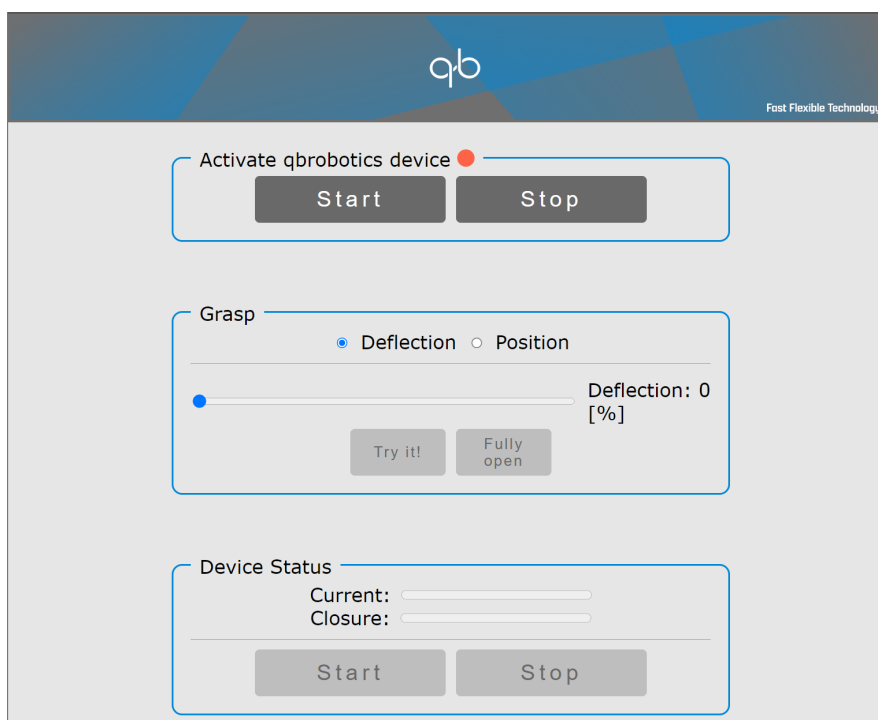

Figure 8. — SoftClaw dedicated menu under PLUGINS section.

> ℹ️ After installation, under **qbrobotics** pugin section you will find a tab for SoftClaw and one for SoftHand. You will only be able to control **SoftClaw** from its dedicated menu. A warning message will appear if you try to activate/control the device from the **SoftHand** menu.

On this screen you will be able to:

1. Activate/Deactivate the device;
2. Test the functioning of the device by sending a command both in *deflection* and *position/stiffness* control mode. For more information on the control mode, please refer to this section (see Page 11) .
3. Monitor the closing percentage/current drawn by the device.

> ⚠ Make sure that you have activated the device before sending a command or retrieving data.

Fanuc CRX Plugin Icon Instructions

To use qb SoftClaw Research Icon instructions, do the following:

1. On the robot teach pendant, press *MENU*;
2. Select *Teaching* and press *Editor*;
3. Drag and drop the qb SoftClaw Icon (plugin section) you want to use.

> ⓘ The device must be enabled before executing each block. Go to the PLUGINS menu and make sure it is enabled.

GRASP Icon

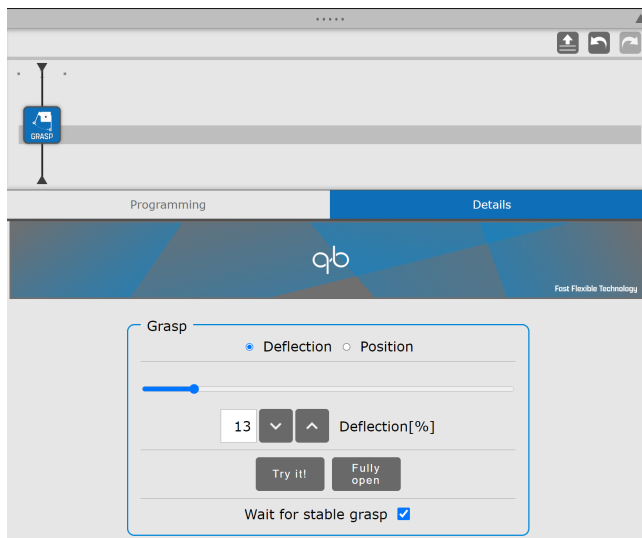Once this icon is dropped in the timeline, you will see the following screen in the *Details* tab:

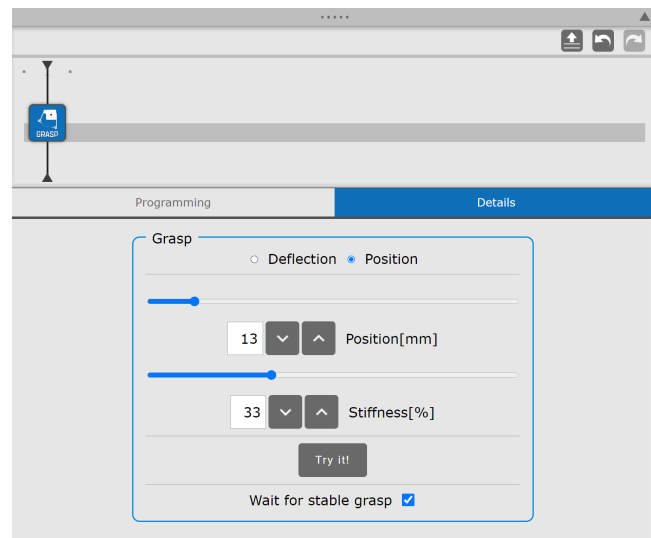*Figure 9. — Screen to control SoftClaw in deflection control mode (grasp command block).*

Figure 10. — Screen to control SoftClaw in position/ stiffness control mode (grasp command block).

The radio buttons (*Deflection* and *Position*) allow you to select the desired control mode for the device when the block is executed. When the *deflection* control mode is selected, only a slider is visible to control the closing force in percentage. A **Fully Open** button is also displayed, which when pressed, sends the command to fully open the SoftClaw when the block is executed in the timeline. When *position* control mode is selected, two sliders are visible to control the opening [mm] and the shaft stiffness [%].

The value shown in the slider matches to the numbers visible in the text box. Arrows allow you to increase the value by one unit. The value set represents commands that are sent to the device when the block is executed in the timeline.

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The *Try it!* button allows to test the device behavior without running the current program.

Execution of the block can be done in two different modalities, which can be selected via the *Wait for stable grasp* checkmark:

- If the checkmark is enabled, the next block in the timeline will not be executed until the device has reached the steady state of motion;
- If the checkmark is not enabled, the next block in the timeline will be executed even if the device has not reached the steady state of motion;

GET DATA Icon

Once this icon is dropped in the timeline, you will see the following screen in the *Details* tab:
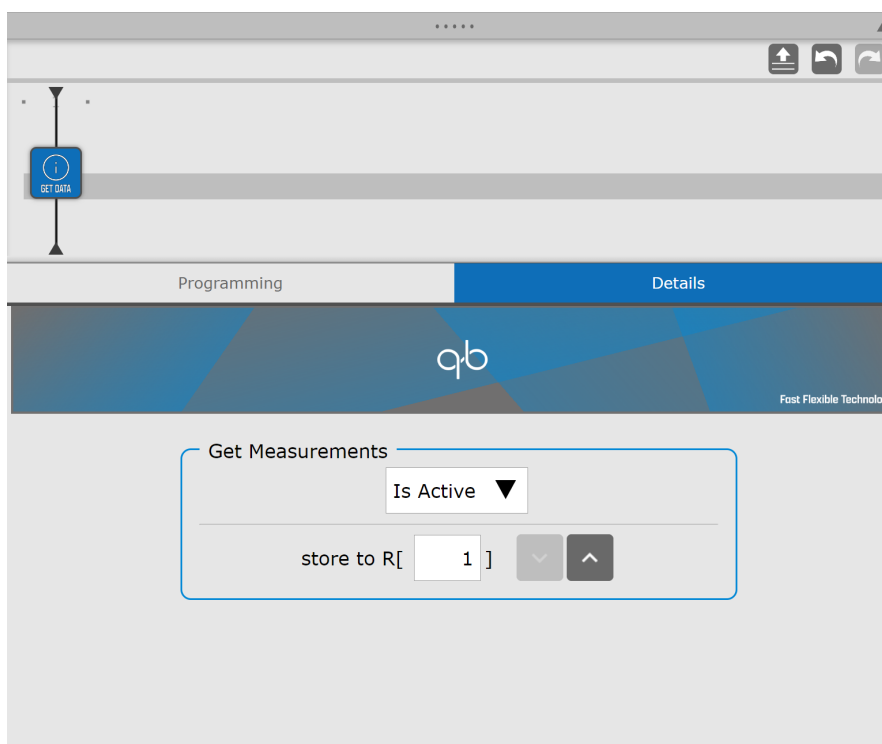

Figure 11. — Block to get information from SoftClaw.

This block allows the following information to be obtained from the device:

- **Activation status**: select *Is Active* from the dropdown menu. It returns 1 if the device is active, 0 otherwise;
- **Current drawn**: select *Get Current* from the dropdown menu. It returns the current drawn from the device in percentace unit (in a scale of 850 mA).
- **Device motor position**: select *Get Motor Position* from the dropdown menu. It returns the current motor position of the device in percentace unit.
- **Check device type(SoftHand)**: select *is SoftHand* from the dropdown menu. It returns 1 if the connected device is a SoftHand, 0 otherwise;
- **Check device type(SoftClaw)**: select *is SoftClaw* from the dropdown menu. It returns 1 if the connected device is a SoftClaw, 0 otherwise;

In this tab you can also select which **R** register you want to use to store the retrieved information. You can select a register in the range [1, 200].

7 Maintenance and warranty

7.1 General

Products of the company qbrobotics s.r.l. are produced using the most modern production methods and are subject of strict quality inspections. All information regarding our Warranty Policy can be found at this[6] site.

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[6] https://qbrobotics.com/technical-support/

8 FAQ and troubleshooting

For any issue not listed below, please contact our support team[7].

8.1 The device is wired but the blue LED on the device's wrist is off

8.1.1 Problem

The device is connected and powered but the blue LED on the device's wrist is off and the device doesn't work, or the device suddenly stopped working and the blue LED on the wrist turned off.

8.1.2 Solution

The self-resetting fuse in the device may have tripped.
The first steps to try to solve the issue are the followings:

- Switch off the device's power supply and wait a few minutes before switching it on again.
- Check whether the wiring is correct, cf. cable connections (see Page 13) .

> ⚠️ Please, also have a look at each connector and check if any is damaged.
> Do not force a connector plug if it seems not to match properly its location. It may be already damaged and you could brake it completely!

If these steps do not solve the problem — i.e. the device still does not connect to the robot system — please raise a support request with at least the following details at our help desk portal:

- The device serial number;
- The type of control system (ROS, C++ API, GUI, etc.);
- The robot system type and software version;
- The power supply configuration;
- Any additional info regarding what you were doing before the first failure.

> ⚠️ Be aware that the device must not violate our warranty policy, cf. maintenance and warranty (see Page 25) , in order to ensure the best support service for our customer.
> Please, do not forget to mention in your request if you have made forbidden hardware/ software modification to the device before/after the issue — e.g. removing the cover is forbidden, cf. forbidden actions (see Page 25) . This will save you, and us, much time during the investigation process.

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7 mailto:support@qbrobotics.com

8.2 Error/warning codes on Fanuc CRX Robots

8.2.1 PLUG-001 The device is not active

The motors device are not active.

Go to PLUGINS menu and press *Start* button in *Activate qbrobotics device* section. If the activation was successful, the status LED will become green.

8.2.2 PLUG-001 Param not retrieved or incorrect data type

The parameters were not retrieved when the block was executed in the timeline or the data type is not compatible.

Check whether the values entered are correct.

8.2.3 PLUG-001 Device not started. Use activation tab.

The device was not enabled from PLUGINS menu.

Go to PLUGINS menu and press *Start* button in *Activate qbrobotics device* section. If the activation was successful, the status LED will become green.

8.2.4 PLUG-001 Device not recognized.

The connected device is not compatible with this version of qbrobotics plugin.

Turn off the robot controller and connect a qbrobotics end-effector.

8.2.5 PLUG-001 Unsupported qbdevice for this application.

You are trying to control a qb SoftClaw from a qb Softhand block.

Use a qb SoftClaw block.

8.2.6 PLUG-001 Cannot retrieve DEVICE_TYPE.

The device is not recognized.

If a qbrobotics device is connected, go to PLUGINS menu and press *Stop* and then *Start* button in *Activate qbrobotics device* section.

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