

TOGETHER IN ROBOTICS

ONROBOT PLUGIN

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Copyright notice

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The OnRobot Plugin is an evolving product. Kinova continually works towards improving the reliability and performance of its products. Kinova does its best to ensure the content of the OnRobot Plugin user guide is accurate and precise with respect to the latest version of the robot. However, Kinova does not take responsibility for any erroneous, inaccurate, or missing information.



Note: Colors of the user interface in the guide may appear differently than in the actual user interface in an attempt to increase readability.



Note: The user guide may be updated from time to time. Please make sure to look at the latest version on our website.

The version of the document is in the header of the pages of the document.

The perspective of the OnRobot Plugin user guide is of Kinova and Link 6. To acquire more information about OnRobot hardware used in conjunction with Link 6, please refer to the OnRobot documentation.

Any questions or comments concerning this document, the information it contains or the product it describes may be addressed through support@kinova.ca.

Plugins

Link 6 is designed modularly, which makes it easy to expand on its capabilities. The extensions are added on as [plugins](#).

All installed plugins start to run when the controller is switched on. However, they can be stopped so the settings can be modified or deactivated.

Many plugins contain actions that the user can use when programming the robot with the visual programming interface in Kortex Web App. Each plugin may also contain parameters that can be modified in Kortex Web App from the corresponding plugin page. **Deactivate** the plugin before modifying the plugin parameters.

All plugins have two pages: **Configurations** and **About**.

OnRobot plugin

The OnRobot [plugin](#) works with the OnRobot RG2, RG6, 2FG7, and 3FG15 grippers. Install the plugin to configure the behavior of the gripper.

The plugin declares all of its variables within the [namespace](#) `onrobot_plugin`.

The plugin contains different configuration roles.

- Configure and define the tools on the **Tools** page.
- Configure the actions that the tool can perform for visual programming.

Getting the plugins for the robot

Upload and installation must be done from the teach pendant and a [USB storage device](#) connected to the controller or from Kortex Web App running on a computer that has access to the files.

Before you begin

All plugins have dependencies on different aspects of the robot.

Make sure to verify all dependencies before installing the plugin.

About this task

The plugin installation file is named `onrobot_plugin_<version>.kp`, where `<version>` is the version of the plugin. Contact Kinova to get the appropriate plugin file if you are unsure which files you need.

A computer or [USB storage device](#) is needed to upload and install the plugin installation file.



Note: Plugins are updated from time to time. Always make sure you have the latest plugin for your installation.



Important: If the plugin is not compatible with the currently running version of Link 6, an error dialog launches.

Procedure

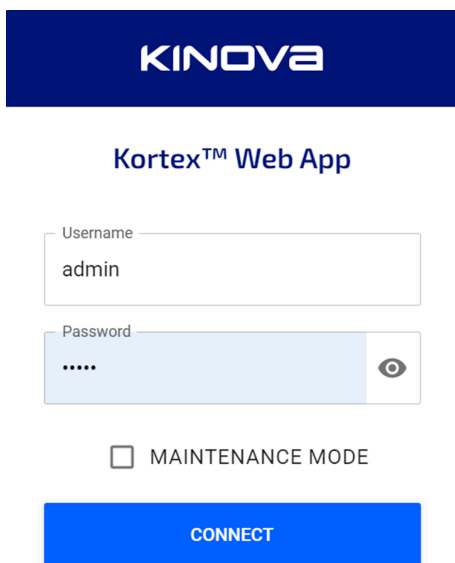
1. Plug the USB storage device on the computer.
2. Download the plugin installation file `onrobot_plugin_<version>.kp`.
3. Save the plugin installation file in the root directory of the USB storage device.
4. Eject the USB storage device after the transfer of the plugin installation file is complete.
5. Plug the USB storage device on the [controller](#).



6. Switch on the [teach pendant](#).

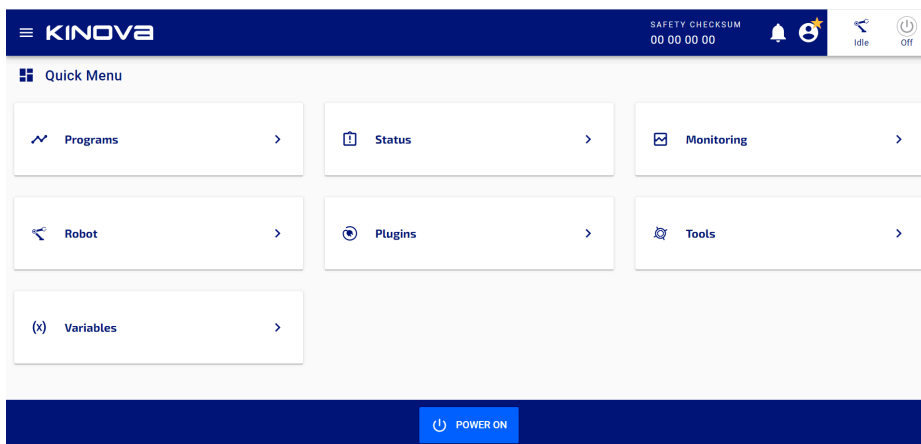


7. Enter the administrator credentials.



The login screen for the KINOVA Kortex™ Web App. It features the KINOVA logo at the top. Below it, the text "Kortex™ Web App" is displayed. There are two input fields: "Username" with the text "admin" and "Password" with masked characters ".....". To the right of the password field is an eye icon for toggling visibility. Below the password field is a checkbox labeled "MAINTENANCE MODE". At the bottom is a blue button labeled "CONNECT".

8. Tap **CONNECT**.



9. Tap **POWER ON**.

The arm is switched on.

What to do next

Install the required plugins from the **Plugins** page in [Kortex Web App](#).

Related topics

[Installing plugins](#) on page 5

Installing plugins

To use an end effector, its associated plugin must be installed.

Before you begin

The plugin files must be on a [USB storage device](#).



Important: The USB must be plugged into the controller when the plugin is being installed on Link 6. Refer to the documentation of other robots for the location of USB connections.

About this task

Access all installed plugins by tapping **Systems > Plugins**.

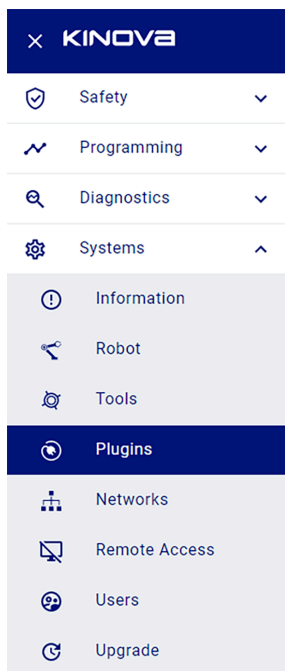
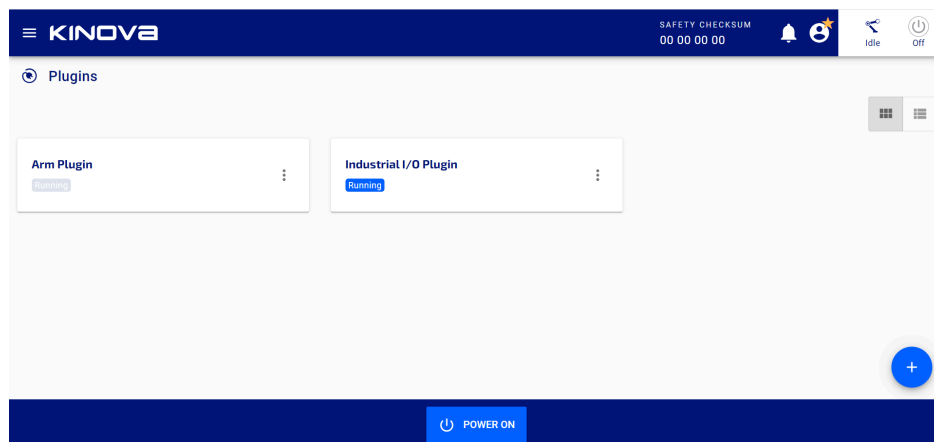


Figure 1: Accessing the plugins

Procedure

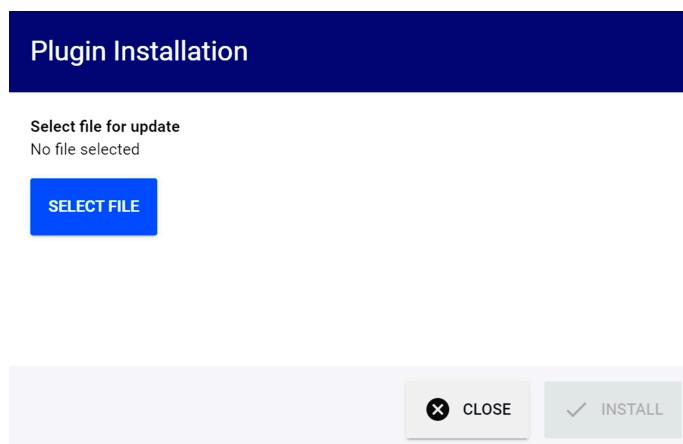
1. Tap **Systems > Plugins**.

The **Plugins** page launches.



2. Tap **+**.

A **Plugin Installation** dialog launches.



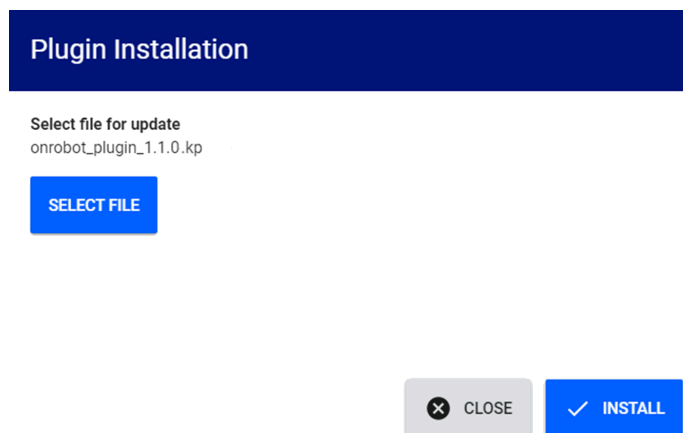
3. Tap **SELECT FILE**.

4. Optional: Browse to the plugin installation files.

5. Select a plugin installation file.

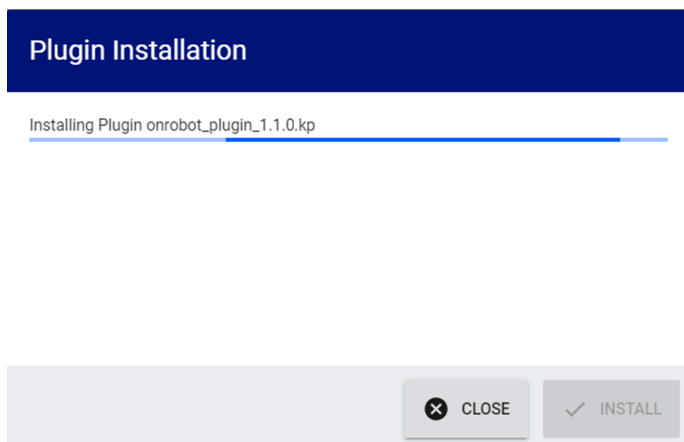
6. Tap **Open**.

The **Plugin Installation** dialog shows the name of the selected file.

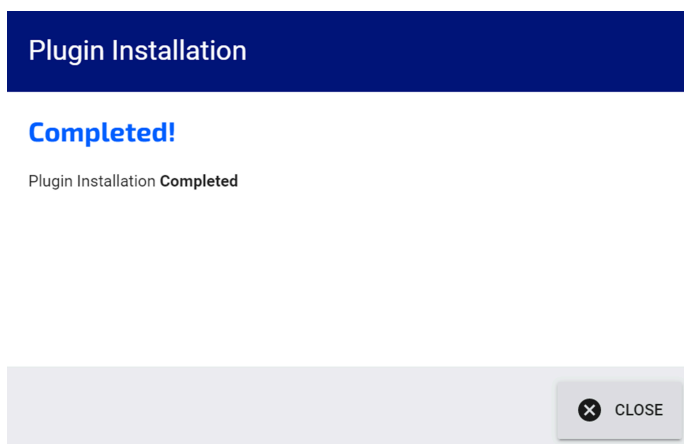


7. Tap **INSTALL**.

The **Plugin Installation** dialog shows that the plugin installation is in progress.

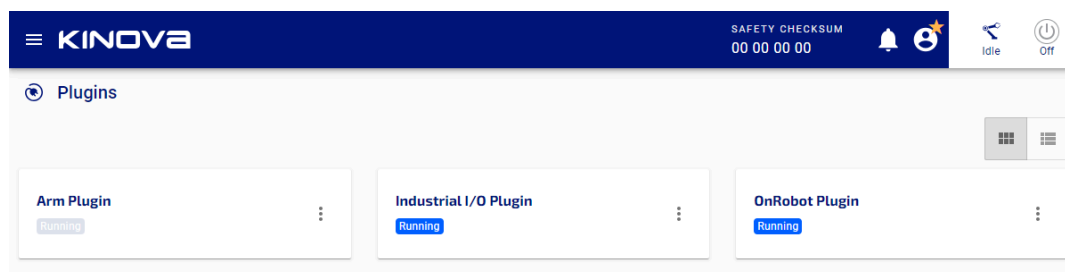


8. Tap **CLOSE** when installation is complete.



Results

The plugin is displayed on the **Plugins** page and is running.



All tools associated with the plugin are added automatically to the **Inactive (drag & drop)** pane on the **Tools** page.

What to do next

Install the physical OnRobot device.

Related topics
[Installing OnRobot grippers](#) on page 25

Updating plugins

Integrate improvements to the plugins by updating them.

Before you begin

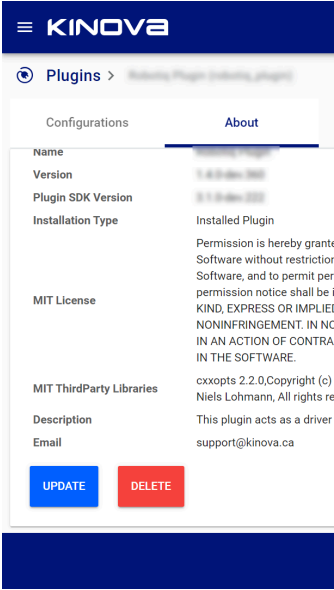
Download the latest version of the plugin. Contact Kinova to get the appropriate plugin file if you are unsure which files you need.

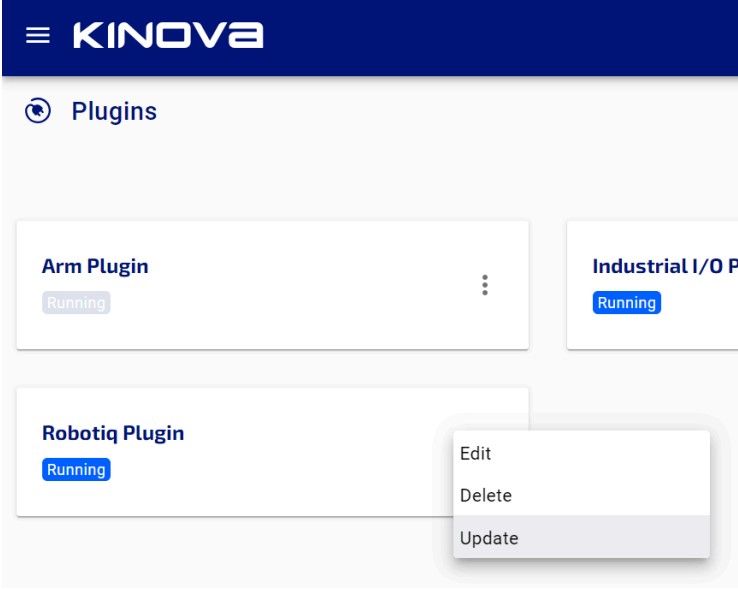
About this task

Use a computer or a [teach pendant](#). Update plugins directly from the **Plugins** page or from the **About** page of the plugin.

Procedure

1. Get the latest version of the plugin.
2. Tap **Systems > Plugins**.
3. Tap the plugin that you want to update.
4. Access the update dialog in one of two ways.

Option	Description
Update from the About page of the plugin	a. Tap About. The About page launches. 

Option	Description
Update from the Plugins page	a. Navigate to the Plugins page. b. Tap the <i>kebab menu</i> () of the plugin that you want to update. 

5. Tap **Update**.

The **Plugin Update** dialog launches.

Plugin Update

Selected file

No file selected

SELECT FILE

☒ Options

☒ Keep configuration

☒ Keep data

☒ Keep tools

☒ Keep variables

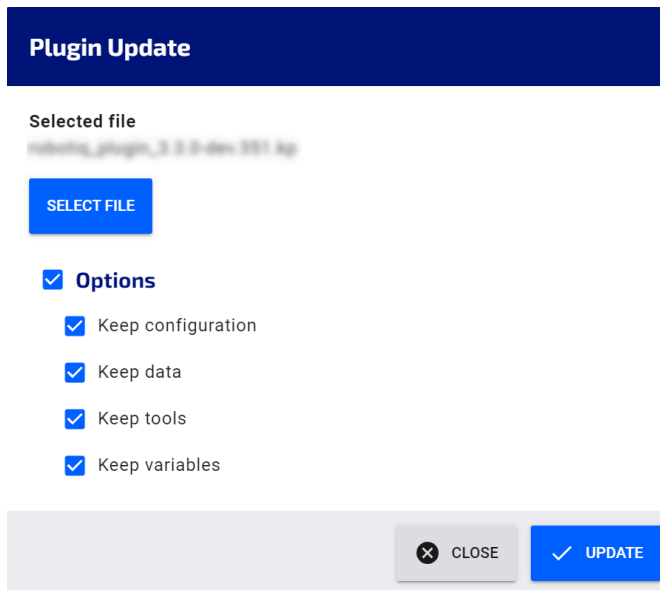
CLOSE

UPDATE

6. Tap **SELECT FILE**.

7. Select the plugin file.

The name of the file is displayed as the **Selected file**.



8. Tap **Options**.

By default, all data is selected. Deselect any information you want to ignore. Data that can be saved include the configuration, data, tools, and variables.

9. Select the type of data you want to keep from the current plugin.

10. Tap **UPDATE**.

The **Plugin Update** indicates that the plugin is updated.



11. Tap **CLOSE**.

The **Plugin Update** dialog closes.

Related topics

[Getting the plugins for the robot](#) on page 3

Activating plugins

When a plugin is installed, but does not appear in the **Action** menu on the **Program** page, the plugin is deactivated. Activate the plugin to use the actions of the plugin.

Before you begin

The plugin must be installed on the robot. The plugin must be deactivated.

About this task

The actions associated with OnRobot Plugin are available on the **Programs** page only when the plugin is activated.

Procedure

1. Tap **OnRobot Plugin** on the **Plugins** page.
 - The **Configurations** page of the **OnRobot Plugin** launches.
 - No **OnRobot Plugin** actions are in the **Action** menu on the **Action Program** page.
2. Tap **Active** to activate the plugin.

Results

- **Active** is blue.
- **Stop** is available to stop the plugin before deactivating it.



- The status of the **OnRobot Plugin** changes to **Running** on the **Plugins** page.
- **OnRobot Plugin** actions appear under **Action** on the **Action Program** page.

What to do next

Create a program with OnRobot actions.

Deactivating plugins

When the actions associated with a plugin are not needed in the program, deactivate the plugin without uninstalling it.

Before you begin

The plugin must be installed on the robot and must be active.

About this task

The actions associated with OnRobot Plugin are available on the **Programs** page.

Procedure

1. Tap **OnRobot Plugin** on the **Plugins** page.
 - The **Configurations** page of the **OnRobot Plugin** launches.
 - **OnRobot Plugin** actions appear under the **Action** menu on the **Program** page.
2. Tap **Inactive** to deactivate the plugin.

Results

- The toggle is white and is closest to **Inactive**.
 - **Stop** is not available to stop the plugin.
- 
- The **OnRobot Plugin** button on the **Plugins** page changes its appearance to indicate that the plugin is not active.
 - **OnRobot Plugin** does not appear in the Plugins **Action** menu on the **Program** page.

Overview of working with plugins

Tapping a plugin from the **Plugins** page launches the page of that plugin.

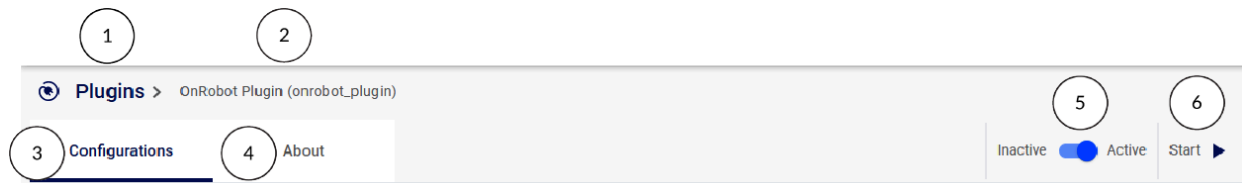


Figure 2: Example of a plugin page of a plugin that is stopped

- 1 Tap **Plugins** to return to the list of plugins.
- 2 Name of the selected plugin with the name of the *namespace* associated with the selected plugin in parentheses.
- 3 Tap **Configurations** to view and modify the current configurations of the selected plugin.
 - ! **Important:** Tap **Stop** (Stop ■) before you attempt to modify the current configurations.
 - ! **Important:** Tap **Start** (Start ►) after you modify the configurations. The plugin runs with the latest configuration values.

When there are no modifiable configurations in the plugin, a message is displayed.

This plugin does not expose any configuration.

- 4 Tap **About** to view important information about the selected plugin.
 - Name
 - Version
 - Plugin SDK Version
 - Installation Type
 - Licenses
 - Libraries
 - Description
 - Email
- 5 Toggle **Active** to deactivate plugins that need to be installed but are not being used. When the toggle is white, it is off.

Tap **Active** to activate a deactivated plugin. When the toggle is blue, it is on.
- 6 The current operating state of the plugin.

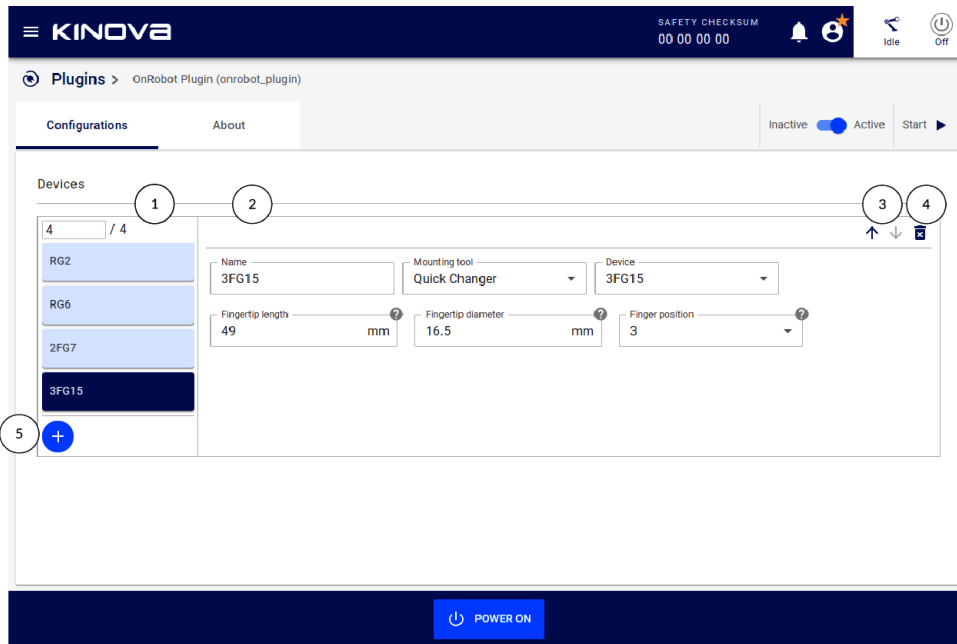
Tap **Stop** (Stop ) to stop the plugin from running. The button changes to **Start** (Start ).

Tap **Start** to restart the plugin after modifying its settings. The button changes to **Stop**.

Configurations of the OnRobot Plugin

The parameters in the OnRobot [plugin](#) that have an overall effect on the [wrist](#) and the gripper are configured on the **Configurations** page of the OnRobot plugin.

To access the **Configurations** page of the OnRobot plugin, tap **Systems > Plugins > OnRobot Plugin**.



- 1 Device list pane
- 2 Configuration pane of the currently selected device
- 3 Move the devices up down the list of available **Devices**
- 4 Delete the currently selected device from the list of **Devices**
- 5 Create a new device for the **Devices** list

Figure 3: Configuration page for the OnRobot plugin

Table 1: Configurable parameters in the OnRobot plugin

Parameter	Device	Description
Name	all	Enter a meaningful name of the tool already highlighted in the tool list pane.  Note: The entered name is listed in the Devices pane. It also is displayed in the Device name: menu on the Tile configuration pane in the Visual programming interface.
Mounting tool		Select the mounting tool that is used to install the OnRobot tool. • Quick Changer • Dual Quick Changer Side A • Dual Quick Changer Side B
Device	all	Select the type of OnRobot tool. • RG2 • RG6 • 2FG7 • 3FG15
Fingertip offset	RG2 RG6	Specify the distance from the inside of the RG2 and RG6 gripper fingertip to the reference point on the fingertip in mm.

**Figure 4: Fingertip offset shown by the blue lines**

Parameter	Device	Description
Fingertip length	2FG7	Enter the length of the fingertip in mm.
	3FG15	Definition of length for 2FG7: from the center of the screws to the center of the fingertip Definition of length for 3FG15: from the last screw to the center of the fingertip
		 Important: Change only when custom fingers are used with the 2FG7 or 3FG15 gripper.
Fingertip thickness	2FG7	Enter the distance between the outer surfaces of the fingers in mm. The width depends which type of 2FG7 fingertip is being used, aluminum or silicone.
Finger orientation	2FG7	Select one of the available orientations of the finger. Inwards  Image: OnRobot Outwards  Image: OnRobot
Fingertip diameter	3FG15	Enter the diameter of the fingertip in mm.
Finger position	3FG15	Select the position of the finger. The position is a number from 1 to 3. Each number corresponds to a hole on the underside of the 3FG15 gripper in which the finger is attached.

Related topics

[OnRobot Plugin actions](#) on page 32

Adding a device

The OnRobot Plugin loads with the default configuration of each available device. It is possible to have slightly altered versions of OnRobot devices and have them reside in the device list.

About this task

Multiple devices may be available within a system.

Add devices from the **Configurations** page of the plugin, which is accessible by tapping **Plugins** > **OnRobot Plugin**.

Procedure

1. Tap **Stop** (Stop ■).
2. Tap **Add** (+).

The **Configurations** page clears and leaves three items for the user to define the new device: **Name**, **Mounting tool**, and **Device**.

The screenshot shows the KINOVA OnRobot Plugin configuration interface. At the top, there is a header bar with the KINOVA logo, a safety checksum display (00 00 00 00), and status indicators for 'Idle' and 'Off'. Below the header, the 'Plugins' section is active, showing 'OnRobot Plugin (onrobot_plugin)'. The 'Configurations' tab is selected, and the 'About' tab is also visible. A red error message states 'Errors detected in the form'. The 'Devices' section shows a list of devices: RG2, RG6, 2FG7, and 3FG15. A blue button with a plus sign is at the bottom left of the list. To the right of the list, there are input fields for 'Name', 'Mounting tool' (set to 'Quick Changer'), and 'Device'. Red error messages are displayed below these fields: 'must NOT have fewer than 1 characters' for the Name field and 'must have required property 'Device'' for the Device field. At the bottom of the screen, there is a blue button labeled 'POWER ON'.

3. Enter a meaningful, unique name for the device so that other people know by its name exactly which tool it is.

Example:

The screenshot shows the Kinova OnRobot Plugin configuration window. At the top, there's a status bar with 'SAFETY CHECKSUM 00 00 00 00' and 'Idle' status. Below, the 'Configurations' tab is active. A red banner indicates 'Errors detected in the form'. The 'Devices' section shows a list of devices on the left: RG2, RG6, 2FG7, 3FG15, and RG2-FT. The main configuration area has a 'Name' field containing 'RG2-FT', a 'Mounting tool' dropdown set to 'Quick Changer', and a 'Device' dropdown. A red error message 'must have required property 'Device'' is displayed below the 'Device' dropdown. At the bottom, there is a 'POWER ON' button.

4. Select the **Mounting tool** used for connect the OnRobot device to Link 6.
 - **Quick Changer**
 - **Dual Quick Changer Side A**
 - **Dual Quick Changer Side B**
5. Select the type, or property, of the device from the **Device** list.

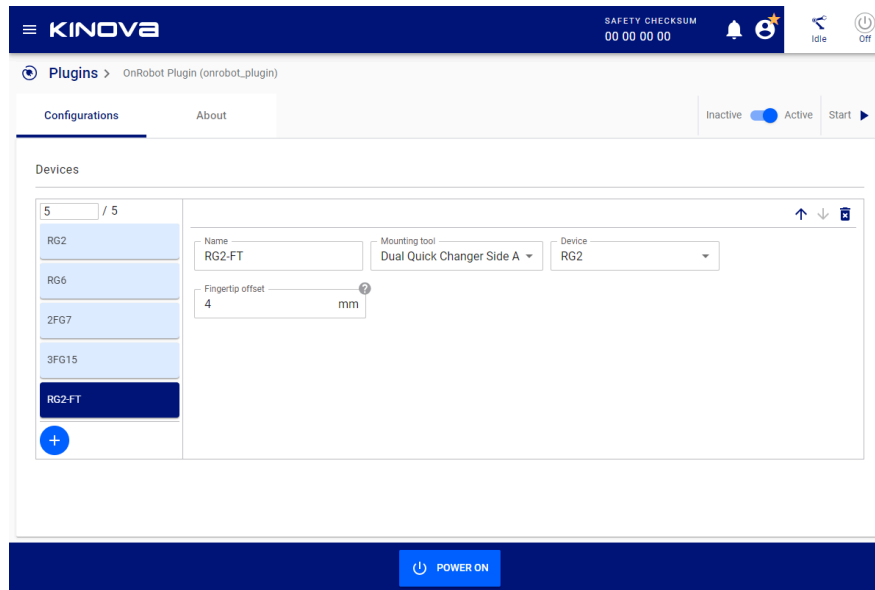


Remember: The device must be set to one of the values listed in **Device**.

- **RG2**
- **RG6**
- **2FG7**

- **3FG15**

The default parameters of the device are displayed.



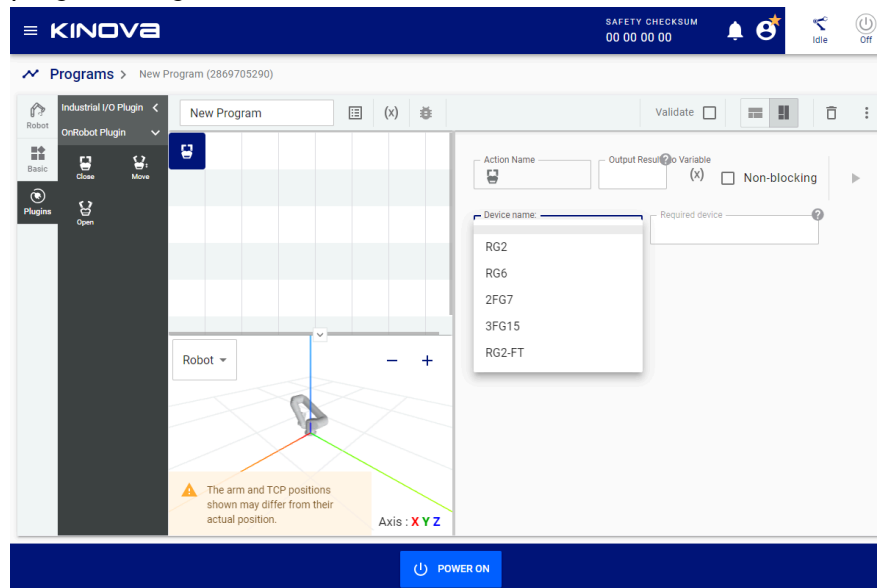
6. Configure the parameters of the device.

7. Tap **Start** (Start ►).

8. Use the **Change Active Tool List** action in the program to select the tool needed for the current task.

Results

The device is in the **Device name:** menu on the **Tile configuration** pane in the Visual programming interface.



Modifying a device

The OnRobot Plugin loads with the default configuration of each available device.

About this task

Modify the configurable parameters of each device according to the actual values of the particular device.

Modify the configuration of one or more devices from the **Configurations** page of the plugin, which is accessible by tapping **Plugins > OnRobot Plugin**.

Procedure

1. Tap **Stop** (Stop ■).
2. Select the device from the **Devices** pane that you wish to configure.
3. Configure the parameters that require adjustments.



Important: Make sure the **Name** of the device is meaningful and reflects the actual device in use so that it can be recreated if ever necessary.



Important: Make sure the **Name** of the device is unique. When there are at least two devices with the same name, an error dialog launches, informing you to rename the devices so that there are no duplicates.

Multiple devices with the same name

Severity

! ERROR

Timestamp

2023-06-05 14:20:54.817Z

Code

N/A

Explanation

At least two devices are named RG2-FT.

Suggestion

Rename one of the device named RG2-FT with a different name.

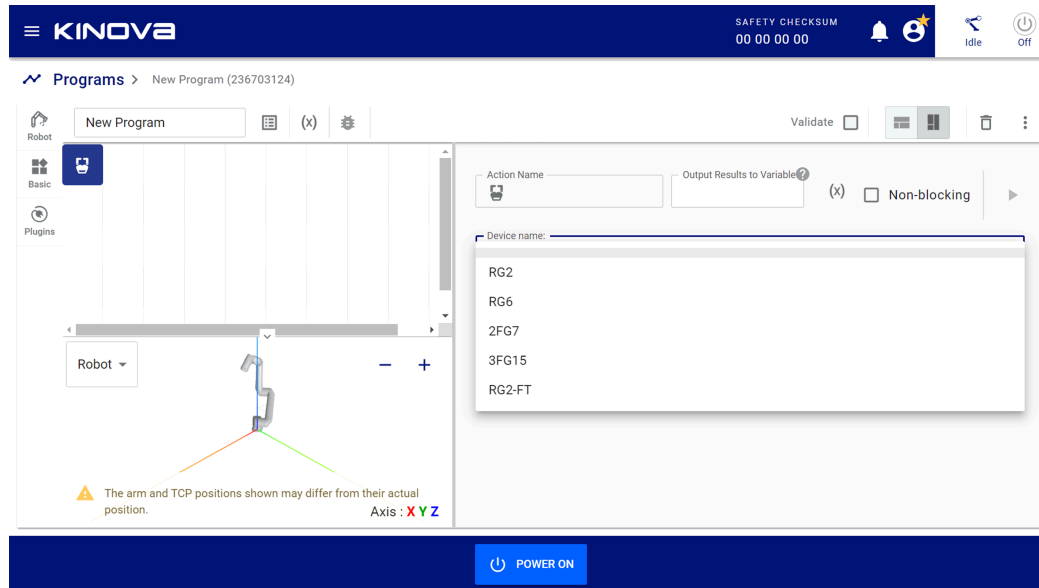
✕ CLOSE

The plugin does not run until the error is corrected.

4. Tap **Start** (Start ►).

Results

The device is in the **Device name:** menu with the new name on the **Tile configuration** pane in the Visual programming interface.



Deleting a device

Devices can be deleted from the OnRobot Plugin.

About this task

Use caution when deleting a device from the system; a program may still be using it.

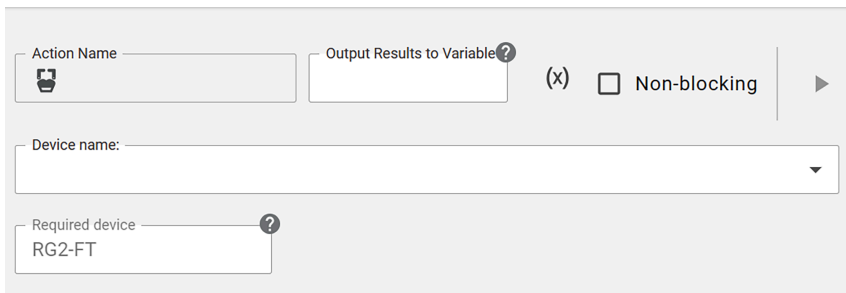
Remove devices from the **Configurations** page of the plugin, which is accessible by tapping **Plugins > OnRobot Plugin**.

Procedure

1. Tap **Stop** (Stop ■).
2. Select a device from the **Devices** pane.
3. Tap **Delete** (✕).
The device is not in the **Devices** pane on the **Configurations** page.
4. Tap **Start** (Start ▶).

Results

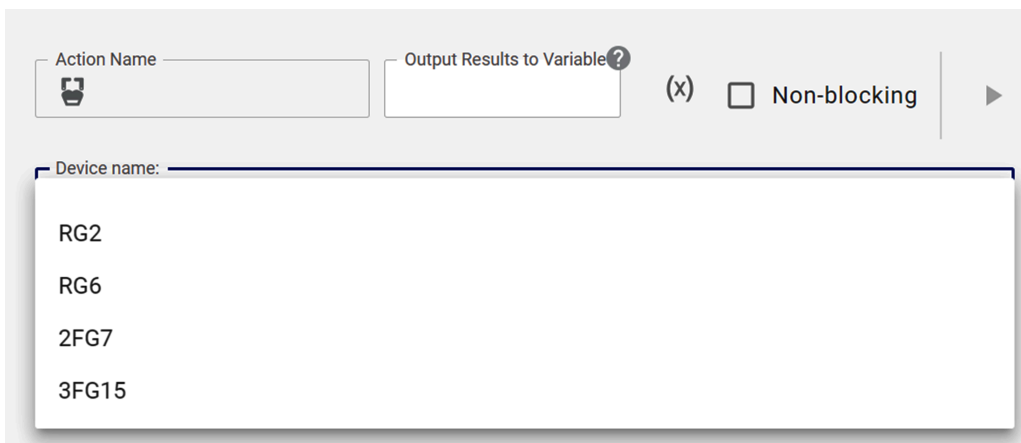
The device may be listed as a **Required device** in the **Tile configuration** pane of the Visual programming interface if it is used in a program.



The screenshot shows the 'Tile configuration' pane with the following fields:

- Action Name:** A text input field with a robot icon on the left.
- Output Results to Variable:** A text input field with a question mark icon on the right.
- (x) Non-blocking:** A checkbox with the label 'Non-blocking' and a right-pointing arrow.
- Device name:** A dropdown menu.
- Required device:** A text input field with a question mark icon on the right, containing the text 'RG2-FT'.

The device is not listed in the **Device name:** menu.



The screenshot shows the 'Tile configuration' pane with the 'Device name' dropdown menu open, displaying a list of device names:

- RG2
- RG6
- 2FG7
- 3FG15

OnRobot tools

The OnRobot grippers connect to the *wrist* of Link 6 with the OnRobot Quick Changer and an external cable.

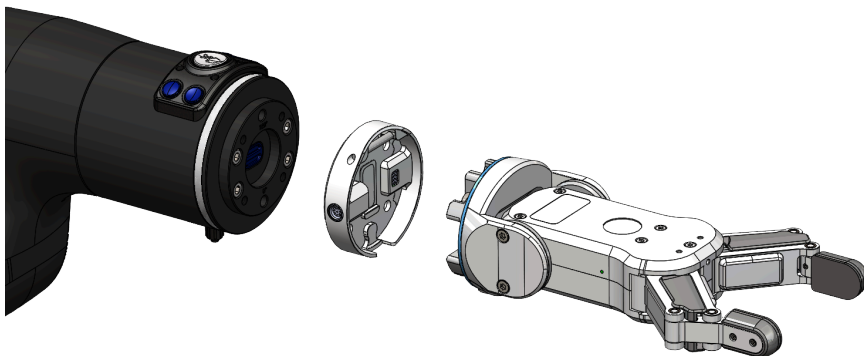


Figure 5: Wrist, flange, OnRobot Quick Changer, and OnRobot gripper

Photo: OnRobot



Figure 6: OnRobot RG2

Photo: OnRobot



Figure 7: OnRobot RG6

Photo: OnRobot



Figure 8: OnRobot Quick Changer

Photo: OnRobot



Figure 9: OnRobot 2FG7

Photo: OnRobot



Figure 10: OnRobot 3FG15

Photo: OnRobot



Figure 11: OnRobot Dual Quick Changer

Installing OnRobot grippers

The OnRobot grippers connect to Link 6.

Before you begin

1. Make sure the robot is off.
2. Make sure you have all tools and equipment nearby.

Personnel:

- **Number of Workers:** 1

Supplies

- TX 30 torx key
- 4 M6 Low profile Torx Socket Cap Screws that come with the OnRobot gripper

About this task

Installation of the OnRobot grippers is done in a stacking fashion. That is, the OnRobot Quick Changer must be fixed to the [wrist](#). Then the OnRobot gripper is fixed to the OnRobot Quick Changer.

Procedure

1. Secure the OnRobot Quick Changer to the wrist of Link 6 end effector.
2. Remove the end cap on the OnRobot connector cable.
3. Connect the OnRobot connector cable to connector B on the wrist of Link 6.
4. Wait for a light on the OnRobot gripper.

When communication is established between the robot and the OnRobot gripper, the light on the OnRobot device illuminates green.

What to do next

Configure the tool from **Tools** in [Kortex Web App](#).

Related topics

[Configuring tools](#) on page 26

[Configurations of the OnRobot Plugin](#) on page 15

Configuring tools

An *end effector* tool that is associated with the *plugin* can be configured even if the corresponding tool is not mounted on the robot, as long as its corresponding plugin is installed.

About this task

A single plugin can communicate with multiple end effector models. Therefore, it is necessary to configure the properties of the tool currently installed on the robot. The associated tool plugin may populate the **Tools** page with tools.



Tip: Before you can edit the active tools, the robot must be switched on and it must be in Monitored Stop.

All tool configuration tasks are accessed by tapping **Systems > Tools**.

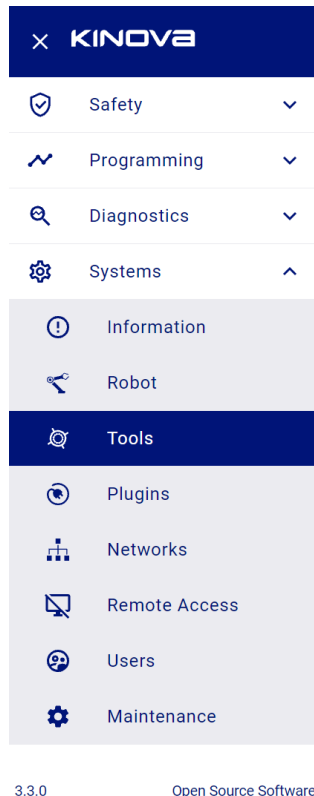
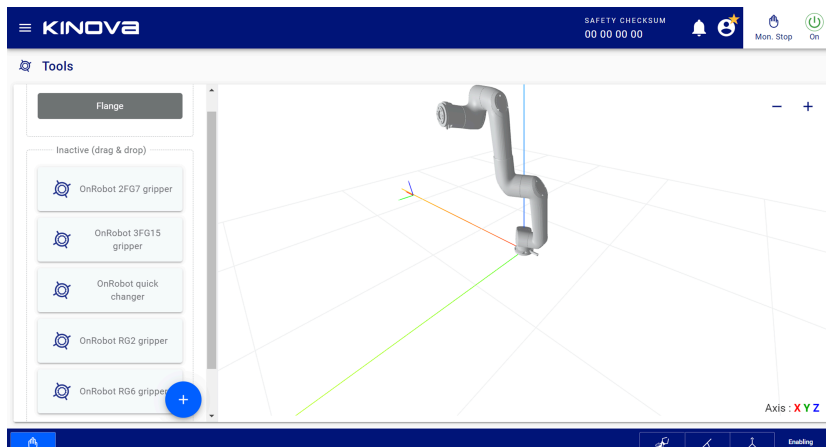


Figure 12: Accessing tool configuration operations

Procedure

1. Tap **Systems > Tools**.

The **Tools** page launches.

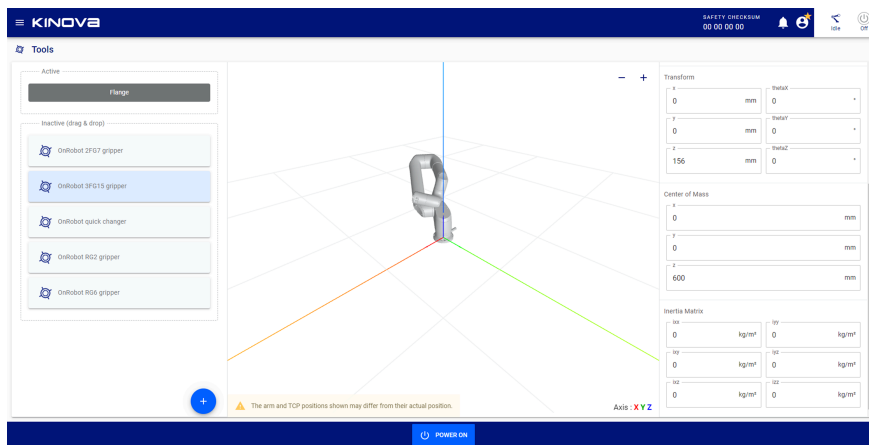


The tools are listed on the left side in two groupings: **Active** and **Inactive (drag & drop)**. The **flange** is always listed in the **Active** tools list because all tools are attached to it.

The center is a 3D view of the arm that can be moved around to help you visualize the tool reference frame. Tap **+** or **-** to zoom in or out. Hold and move the view around to have different viewpoints of the robot.

2. Select a tool in the **Inactive (drag & drop)** pane.

The properties of the selected tool are displayed on the right.



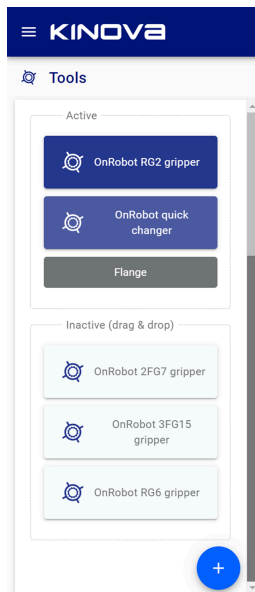
3. Modify the values in the **Properties** panel.



Note: Configure the tools only when they are still in the **Inactive (drag & drop)** pane.

4. Drag each tool in the order they are assembled onto the flange of the [wrist](#).

Example: The OnRobot Quick Changer is already on the wrist when you physically add an OnRobot tool. Drag the OnRobot tool from the **Inactive (drag & drop)** pane to the **Active** pane, placing it above the OnRobot Quick Changer.



Related topics

[Tool configuration fields](#) on page 29

Tool configuration fields

There may be times when the default configuration of a OnRobot tool needs to be modified. You can modify specific information about the tool as long as it is not active.

Unique ID: **onrobot_plugin_tool1**

Tool type: **Plugin**

Connection state: **Disconnected**

Name

OnRobot 2FG7 gripper

Mass

1.1 kg

Transform

x

0 mm

thetaX

0 °

y

0 mm

thetaY

0 °

z

144 mm

thetaZ

0 °

Center of Mass

x

0 mm

y

0 mm

z

55 mm

Inertia Matrix

ixx

0 kg/m²

iyy

0 kg/m²

ixy

0 kg/m²

iyz

0 kg/m²

ixz

0 kg/m²

izz

0 kg/m²

Figure 13: Configuration settings for the selected tool

Table 2: Configurable fields on the Tools page for OnRobot

Field name	Description	Modifiable
Unique ID	Unique identifier assigned by the plugin to the tool The plugin assigns the unique identifier for all OnRobot tools. Examples: - onrobot_plugin_tool1 - onrobot_plugin_tool2 - onrobot_plugin_tool3	No

Field name	Description	Modifiable
Tool type	Type of tool being used There are two types of tools. • Custom • Plugin When you create a tool by tapping the +, the type is Custom. When the OnRobot plugin is installed, the plugin creates and adds the OnRobot tools to the Tools page. The type is Plugin.	No
Connection state	State of the connection between the robot and the device • Connected • Disconnected • Unspecified	No
Name	Configured name of the tool	Yes  Tip: When the name of the tool is changed from the Configurations page of the plugin, it does not affect the name listed on the Tools page. When the name of the tool is changed from the Tools page, the name does not affect the name listed in the Configurations page of the plugin.
Mass	Mass of the OnRobot tool, measured in kg	Yes

Field name	Description	Modifiable
Transform	Position and orientation of the Tool Center Point (TCP), relative to the reference frame of the previous element in the tool stack Position is measured as x,y,z in mm. Orientation is measured as thetaX, thetaY, thetaZ in °.	Yes
Center of Mass	Position of the center of mass of the tool, relative to the flange of the robot Position is measured as x,y,z in mm.	Yes
Inertia Matrix	Specific three-dimensional positions measured as $ixx, iyy, ixy, iyz, ixz, izz$ in kg/m^2, relative to the center of mass	Yes

OnRobot Plugin actions

The OnRobot grippers have their own set of actions available for further configuration when programming Link 6.

All actions associated with the OnRobot Plugin are available as tiles that can be dragged into the **Sequence editor** pane of the current program.

The OnRobot *plugin* has three actions that are available. Some actions have their own set of parameters to make them configurable. Each action can have a specific name assigned to it, output results saved to variables, and be set as *non-blocking*.

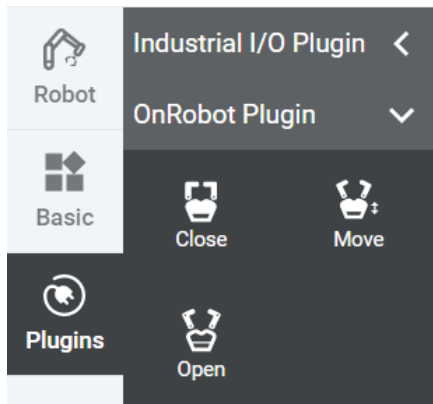


Figure 14: Actions available from the OnRobot plugin

Whenever any of the OnRobot actions are dragged into the **Sequence editor**, the OnRobot tool must first be selected in the **Tile configuration** pane.

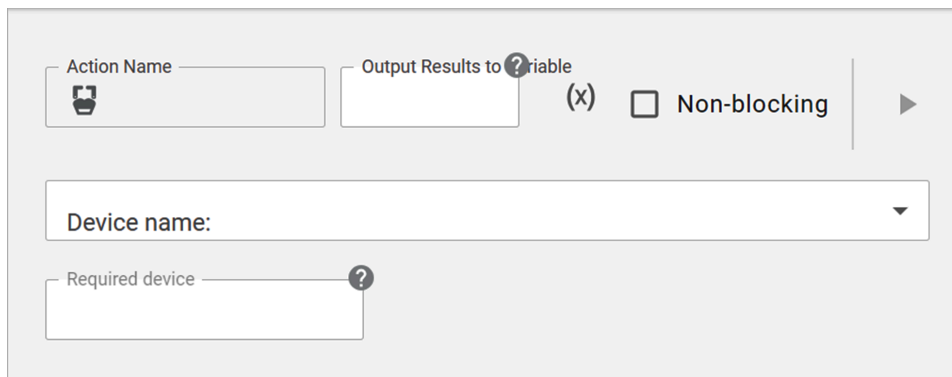
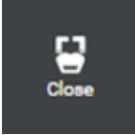
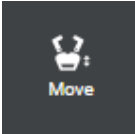
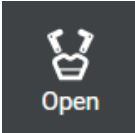


Figure 15: Initial view of the Tile configuration pane when an OnRobot action is dragged into the Sequence editor

Table 3: Parameters of OnRobot plugin actions

Action	Icon	Parameter
Close		Closes the gripper Select the device from the Device name: menu, according to what you have physically installed on Link 6. The device name is saved as the Required device .
Move		Moves the gripper to a specific location Select the device from the Device name: menu, according to what you have physically installed on Link 6. The device name is saved as the Required device .
Open		Opens the gripper Select the device from the Device name: menu, according to what you have physically installed on Link 6. The device name is saved as the Required device .

Related topics

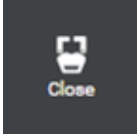
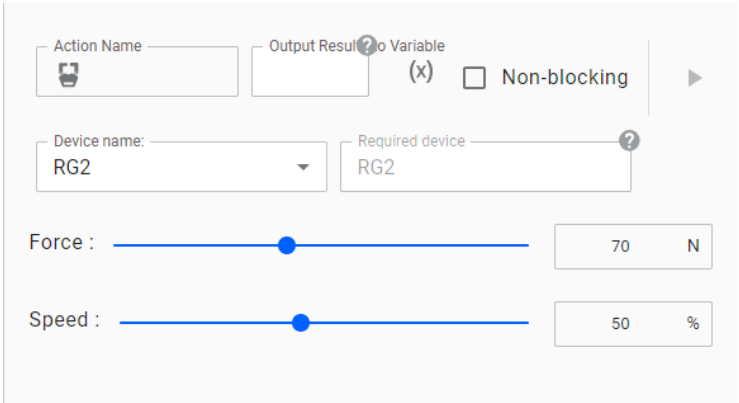
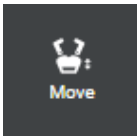
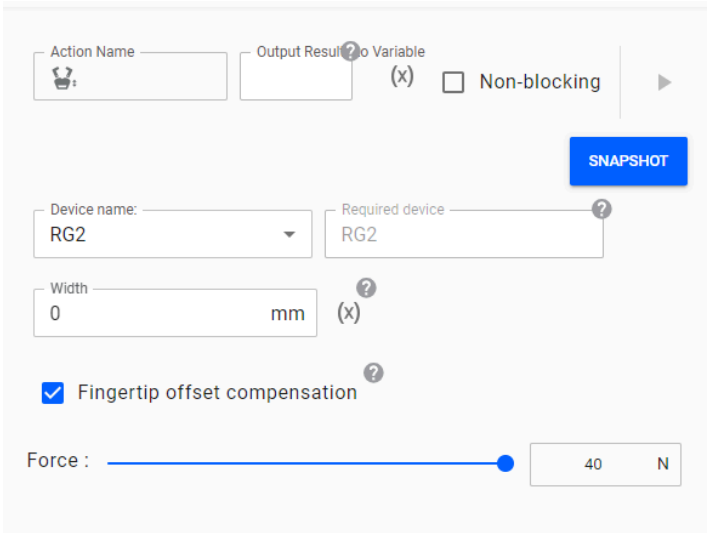
[Configurations of the OnRobot Plugin](#) on page 15

Parameters of the OnRobot RG2 gripper actions

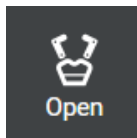
The RG2 OnRobot grippers have their own set of parameters for its actions that are available for further configuration when programming Link 6.

Whenever any of the OnRobot actions are dragged into the **Sequence editor**, the OnRobot tool must first be selected in the **Tile configuration** pane.

Table 4: Parameters of OnRobot RG2 plugin actions

Action	Icon	Parameter
Close		Closes the gripper  Device name: Select the RG2 device from the menu. Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly. Force The higher the value, the greater amount of force is needed before the closing movement stops. The higher the value, the faster the gripper closes. Maximum: 40 N Speed Reduce the speed at which the device is operating by a percentage.
Move		Moves the gripper to a specific location 

Action	Icon	Parameter
		SNAPSHOT When tapped, the current position of the tool is used as the point of reference.
		Device name: Select RG2 device from the menu.
		Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.
		Width The distance between the gripper fingers without fingertip offset is also known as the current width. Maximum and minimum values depend upon the gripper type, the current fingertip offset, and whether Fingertip offset compensation is selected. Range: 0 mm to 120 mm
		Force The higher the value, the greater amount of force is needed before the closing movement stops. The higher the value, the faster the gripper closes. Maximum: 40 N
		Speed The configured speed is a percentage of the speed of the RG2 moves when closing its fingers, which is 450 mm/s. The higher the value, the faster the gripper closes. Range: 10% to 100% of 450 mm/s

Open

Opens the gripper

Device name:	Select the RG2 device from the menu.
Required device	The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.

Action	Icon	Parameter
		Force The higher the value, the greater amount of force is needed before the opening movement stops. The higher the value, the faster the gripper opens. Maximum: 40 N



Tip: The name of the device in the **Device name:** menu is the same name as the one entered in the **Name** field for the device and listed in the **Devices** pane on the **Configurations** page of the OnRobot Plugin. It is not the actual type of device being used.



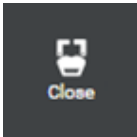
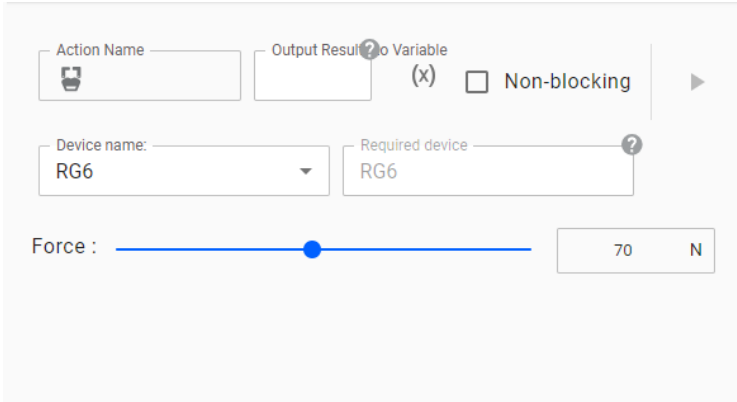
Tip: If the required device is deleted from the system and is required in the program, you must redefine the device for the action.

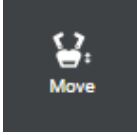
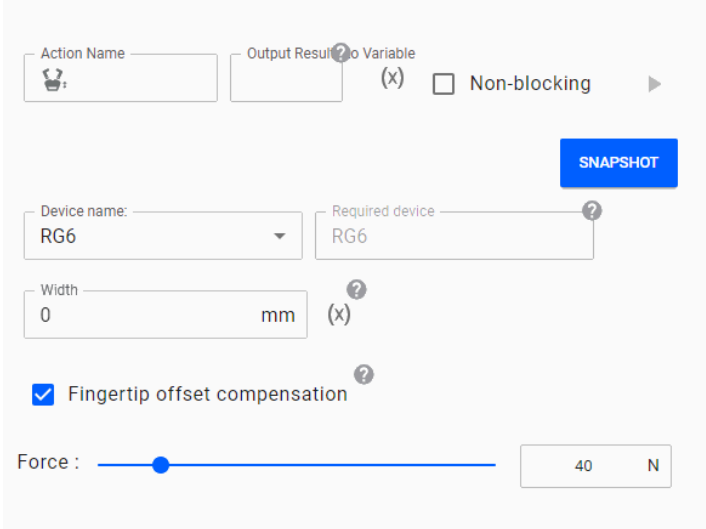
Parameters of the OnRobot RG6 gripper actions

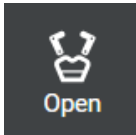
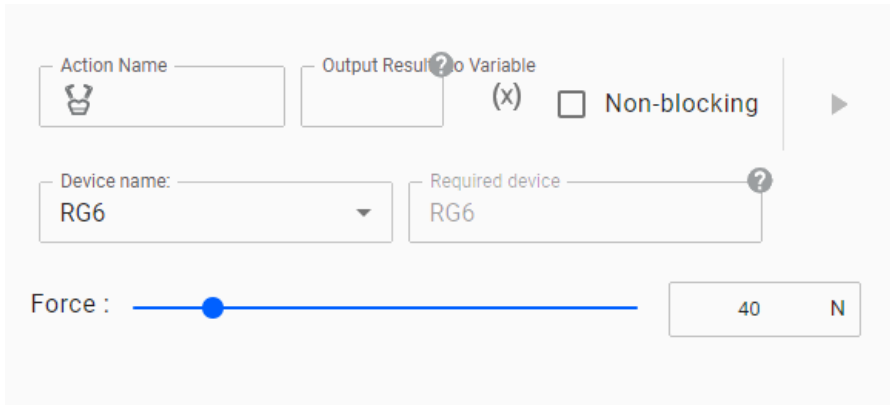
The RG6 OnRobot grippers have their own set of parameters for its actions that are available for further configuration when programming Link 6.

Whenever any of the OnRobot actions are dragged into the **Sequence editor**, the OnRobot tool must first be selected in the **Tile configuration** pane.

Table 5: Parameters of OnRobot RG6 plugin actions

Action	Icon	Parameter
Close		Closes the gripper 
		Device name: Select the RG6 device from the menu.
		Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.

Action	Icon	Parameter
		Force The higher the value, the greater amount of force is needed before the closing movement stops. The higher the value, the faster the gripper closes. Maximum: 120 N
Move		Moves the gripper to a specific location  SNAPSHOT When tapped, the current position of the tool is used as the point of reference. Device name: Select the RG6 device from the menu. Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly. Width The distance between the gripper fingers without fingertip offset is also known as the current width. Maximum and minimum values depend upon the gripper type, the current fingertip offset, and whether Fingertip offset compensation is selected. Range: 0 mm to 160 mm Fingertip offset compensation When selected, the width of the gripper compensates for the fingertip offset. Force The higher the value, the greater amount of force is needed before the closing movement stops. The higher the value, the faster the gripper closes. Maximum: 120 N

Action	Icon	Parameter						
Open		Opens the gripper 						
		<table><tr><td>Device name:</td><td>Select the RG6 device from the menu.</td></tr><tr><td>Required device</td><td>The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.</td></tr><tr><td>Force</td><td> The higher the value, the greater amount of force is needed before the opening movement stops. The higher the value, the faster the gripper opens. Maximum: 120 N </td></tr></table>	Device name:	Select the RG6 device from the menu.	Required device	The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.	Force	The higher the value, the greater amount of force is needed before the opening movement stops. The higher the value, the faster the gripper opens. Maximum: 120 N
Device name:	Select the RG6 device from the menu.							
Required device	The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.							
Force	The higher the value, the greater amount of force is needed before the opening movement stops. The higher the value, the faster the gripper opens. Maximum: 120 N							



Tip: The name of the device in the **Device name:** menu is the same name as the one entered in the **Name** field for the device and listed in the **Devices** pane on the **Configurations** page of the OnRobot Plugin. It is not the actual type of device being used.



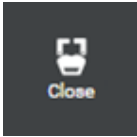
Tip: If the required device is deleted from the system and is required in the program, you must redefine the device for the action.

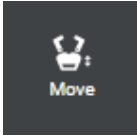
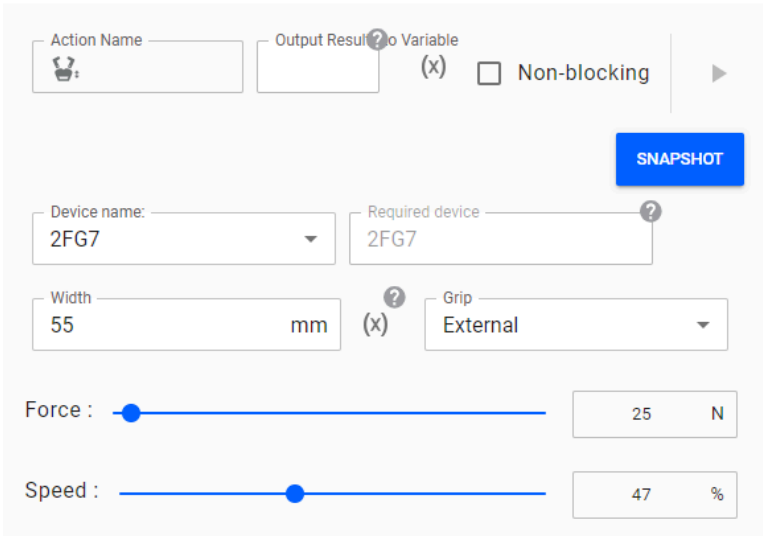
Parameters of the OnRobot 2FG7 gripper actions

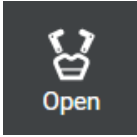
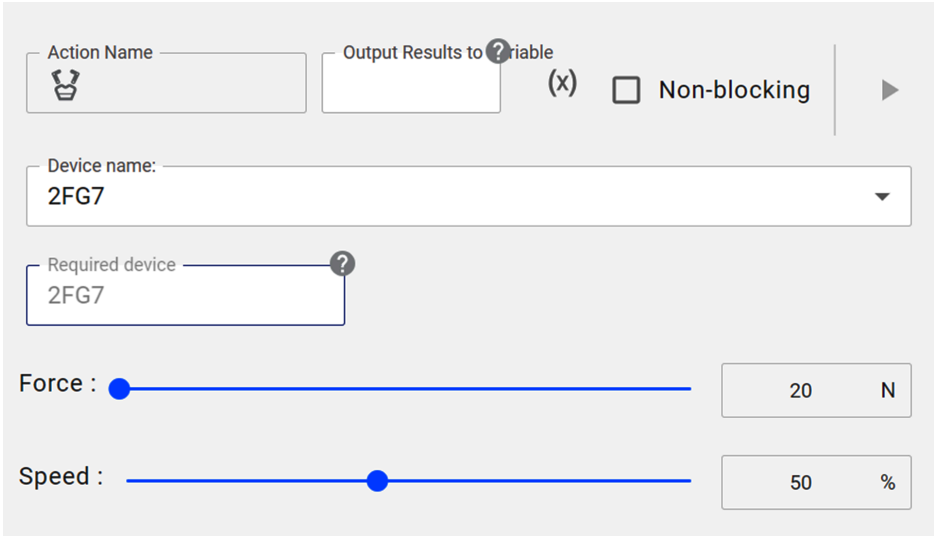
The 2FG7 OnRobot gripper has its own set of parameters for its actions that are available for further configuration when programming Link 6.

Whenever any of the OnRobot actions are dragged into the **Sequence editor**, the OnRobot tool must first be selected in the **Tile configuration** pane.

Table 6: Parameters of OnRobot 2FG7 plugin actions

Action	Icon	Parameter
Close		Closes the gripper Action Name  Output Results to Variable (x) ☐ Non-blocking ▶ Device name: 2FG7 ▼ Required device 2FG7 ? Force : 20N Speed : 50% Device name: Select the 2FG7 device from the menu. Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly. Force* The higher the value, the greater amount of force is needed before the closing movement stops. Range: 20 N to 140 N Speed* The configured speed is a percentage of the speed of the 2FG7 moves when closing its fingers, which is 450 mm/s. The higher the value, the faster the gripper closes. Range: 10% to 100% of 450 mm/s

Action	Icon	Parameter
Move		Moves the gripper to a specific location 
		SNAPSHOT When tapped, the current position of the tool is used as the point of reference.
		Device name: Select the 2FG7 device from the menu.
		Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.
		Width The distance between the outer sides of the gripper fingers.
		Grip Select one of two finger orientations. - Use Internal when the orientation is configured as Inwards. - Use External when the orientation is configured as Outwards.
		Force[*] The higher the value, the greater amount of force is needed for the fingers to move. Range: 20 N to 140 N
		Speed[*] The configured speed is a percentage of the speed of the 2FG7 moves when moving its fingers, which is 450 mm/s. The higher the value, the faster the gripper moves. Range: 10% to 100% of 450 mm/s

Action	Icon	Parameter
Open		Opens the gripper 
		Device name: Select the 2FG7 device from the menu.
		Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.
		Force[*] The higher the value, the greater amount of force is needed before the closing movement opens. Range: 20 N to 140 N
		Speed[*] The configured speed is a percentage of the speed of the 2FG7 moves when opening its fingers, which is 450 mm/s. The higher the value, the faster the gripper opens. Range: 10% to 100% of 450 mm/s



Tip: The name of the device in the **Device name:** menu is the same name as the one entered in the **Name** field for the device and listed in the **Devices** pane on the **Configurations** page of the OnRobot Plugin.

* Explanation of Force and Speed:

The minimum force of 20 N is associated with a speed of 16 mm/s.

The maximum force of 140 N is associated with a speed of 450 mm/s.

To calculate the amount of force required involves applying the required percentage of speed.

Example:

When Speed is set at 50%, Force must be set to $(\text{Force max} - \text{Force min})/2 + \text{Force min}$.

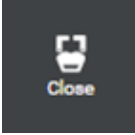
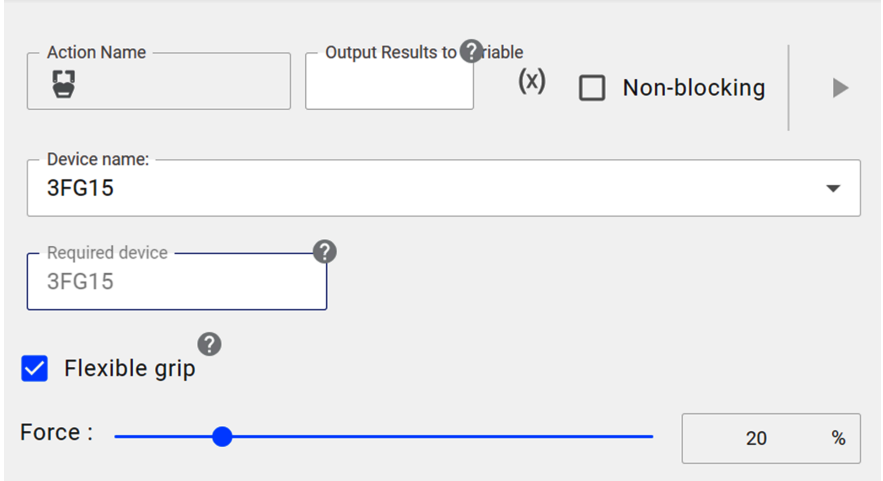
The actual Speed in mm/s, when Speed is set at 50%, is $(\text{Speed max} - \text{Speed min})/2 + \text{Speed min}$.
 Force at 50% = $(140-20)/2 + 20 = 80 \text{ N}$
 Speed at 50% = $(450-15)/2 + 16 = 233 \text{ mm/s}$

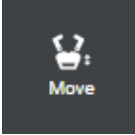
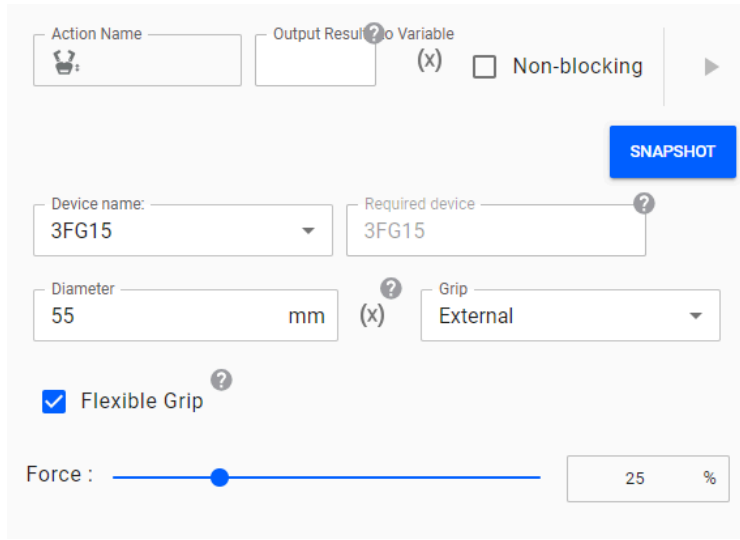
Parameters of the OnRobot 3FG15 gripper actions

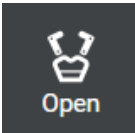
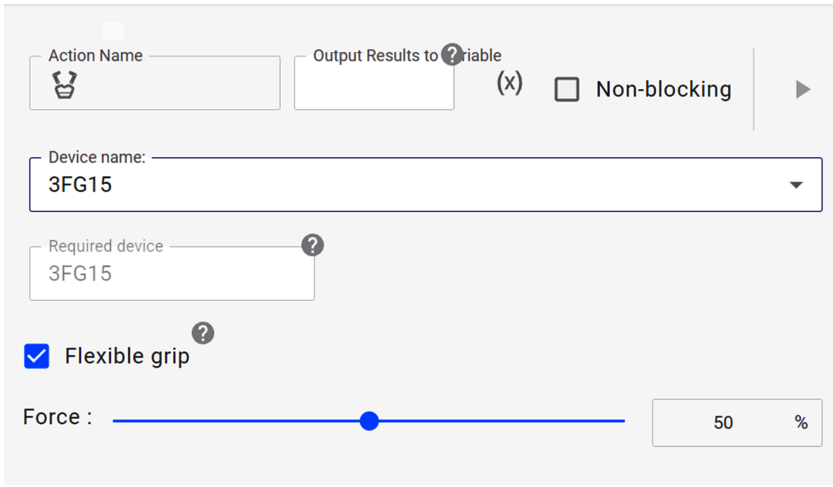
The 3FG15 OnRobot gripper has its own set of parameters for its actions that are available for further configuration when programming Link 6.

Whenever any of the OnRobot actions are dragged into the **Sequence editor**, the OnRobot tool must first be selected in the **Tile configuration** pane.

Table 7: Parameters of OnRobot 3FG15 plugin actions

Action	Icon	Parameter
Close		Closes the gripper 
		Device name: Select the 3FG15 device from the menu.
		Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly.
		Flexible Grip The gripping force of 3FG15 is between 10 N and 240 N. The flexible gripping force of 3FG15 is between 10 N and 140 N. When selected, the flexible gripping force can be adjusted to a smaller amount of force.

Action	Icon	Parameter
		Force The adjustable amount of flexible force required for the gripper when it closes. The percentage of force applies to flexible force. It causes a reduced amount of force needed before the tool closes. The configured force is a percentage of the force the 3FG15 before it closes its fingers. Range: 0% to 100%
Move		Moves the gripper to a specific location  SNAPSHOT When tapped, the current position of the tool is used as the point of reference. Device name: Select the 3FG15 device from the menu. Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly. Diameter The diameter of the open gripper fingers. Range of external grip: 4 mm to 152 mm Range of internal grip: 35 mm to 176 mm Grip Select one of two finger orientations. - Use Internal when grasping parts internally - Use External when grasping parts externally.

Action	Icon	Parameter
		Flexible Grip When not selected, the maximum amount of force that the tool applies to its grip when it moves is set between 10 N and 240 N. When selected, the maximum amount of flexible force that the tool applies to its grip is between 10 N and 140 N.
		Force The adjustable amount of flexible force required for the gripper when it closes. The percentage of force applies to flexible force. It causes a reduced amount of force needed before the tool moves. The configured force is a percentage of the force the 3FG15 device before it moves its fingers. Range: 0% to 100%
Open		Opens the gripper  Device name: Select the 3FG15 device from the menu. Required device The name of the device that is associated with the action. It must match what is selected in Device name: for the action to work properly. Flexible Grip When not selected, the maximum amount of force that the tool needs to close is set between 10 N and 240 N. When selected, the maximum amount of flexible force that the tool needs to close is between 10 N and 140 N.

Action	Icon	Parameter
		Force The adjustable amount of flexible force required for the gripper when it opens. The percentage of force applies to flexible force. It causes a reduced amount of force needed before the tool opens. The configured force is a percentage of the force the 3FG15 before it opens its fingers. Range: 0% to 100%



Tip: The name of the device in the **Device name:** menu is the same name as the one entered in the **Name** field for the device and listed in the **Devices** pane on the **Configurations** page of the OnRobot Plugin.

Variables

It is possible to create variables that are based on the output values of the actions from the plugin.

Program variables can be one of several types, one of which is **Object**. The **Object** type can take on one of many different schemas related to the pose and angles of the robot, as well as output values coming from the pre-installed Arm plugin. The schema must match the selected action.

In the case of the OnRobot plugin, the variable can be set to return the data that is found in the data structure that is output by the OnRobot actions.

- **Close**
- **Move**
- **Open**

Name	Type	Schema	Unit	Value	Actions
onrobot_close_output grip_detected current_width current_width_with_offset fingertip_offset current_depth current_relative_depth external_width force_grip_detected	Object	OnRobot Plugin - Close - Output	N/A	Value { }	

Figure 16: Example of data structure returned by action



Note: Use `grip_detected` as the title of a **Condition** to confirm an object is grasped.

Use the output variable of the action when you are programming with the visual programming interface.

Each of the actions expose the same type of information. Modify the values in the **JSON Object Editor** that launches after you tap the { } of the variable.

JSON Object Editor

onrobot_close_output

☐ Grip detected

(All) Indicates the current width between the gripper fingers.
(RG2, RG6, 3FG15) The width is provided without any fingertip offset. (3FG15) It corresponds to the diameter.

Current width

mm

(RG2, RG6, 3FG15) Indicates the current width between the gripper fingers. The set fingertip offset is considered.
(3FG15) It corresponds to the diameter.

Current width with offset

mm

(All) Indicates the current fingertip offset.

Fingertip offset feedback

mm

(RG2, RG6) Indicates the current depth of the gripper, to be used for depth compensation. The depth is relative to the fully closed position.

Current depth

mm

(RG2, RG6) Indicates the current depth of the gripper, to be used for depth compensation. The depth is relative to the position at which the latest motion was initiated.

Current relative depth

mm

(2FG7) Width between the outer side of the gripper fingers.

External width

mm

☐ Force grip detected

✕ CANCEL

✓ SAVE

Figure 17: Example of JSON Object Editor of an action

Table 8: Information in each OnRobot action

Data element	Tool	Description
Grip detected	All	Sends a signal when the grip is detected if the option is selected
Current width	RG2 RG6 2FG7	Current width between the insides of the aluminum gripper fingers in millimeters, without finger offset
	3FG15	Diameter of the gripper fingers in millimeters
Current width with offset	RG2 RG6	Current width between the gripper fingers in millimeters, taking the fingertip offset into consideration
	3FG15	Diameter of the gripper fingers in millimeters
Fingertip offset feedback	All	Current fingertip offset in millimeters

Data element	Tool	Description
Current depth	RG2 RG6	Current depth of the gripper in millimeters
		Used for depth compensation
		Relative to the fully closed position
Current relative depth	RG2 RG6	Current depth of the gripper in millimeters
		Used for depth compensation
		Relative to the position at which the last motion is initiated
External width	2FG7	Width between the out sides of the gripper fingers
Force grip detected	3FG15	Sends a signal when the force grip is detected if the option is selected

Accessing variables

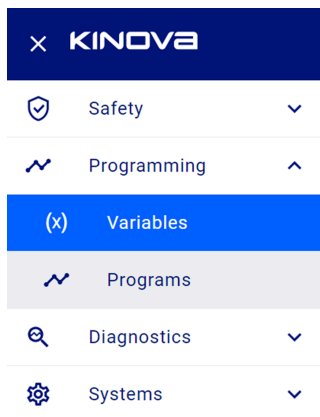
It is possible to create variables from the **Tile configuration** page, it is also possible to create them directly from the **Variables** page.

About this task

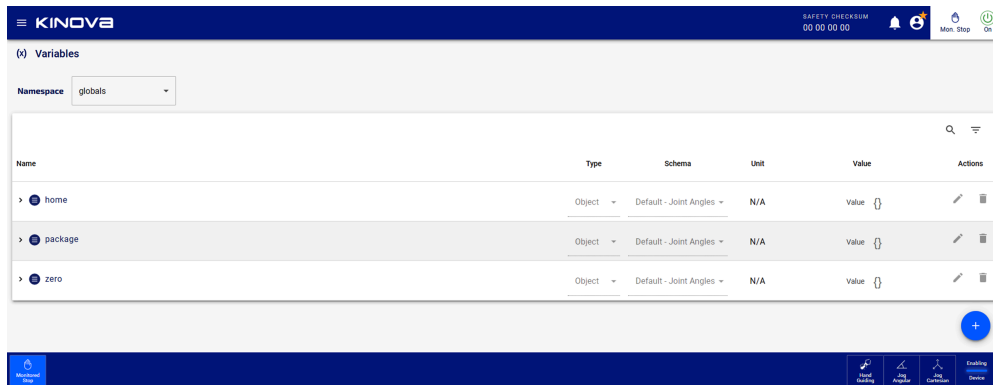
To see all variables that are available or to create a variable ahead of time, access the **Variables** page.

Procedure

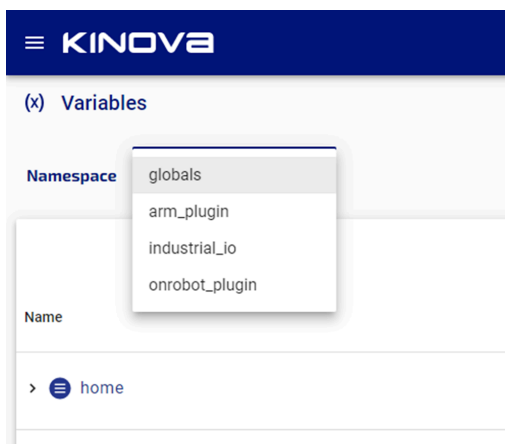
1. Tap **Programming > Variables**.



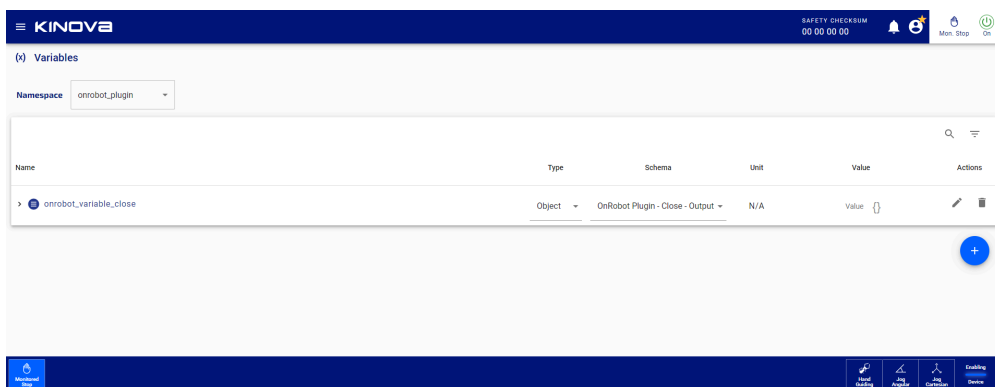
The **Variables** page launches.



2. Select onrobot_plugin from the **Namespace** menu.



All variables with the onrobot_plugin namespace are displayed.



What to do next

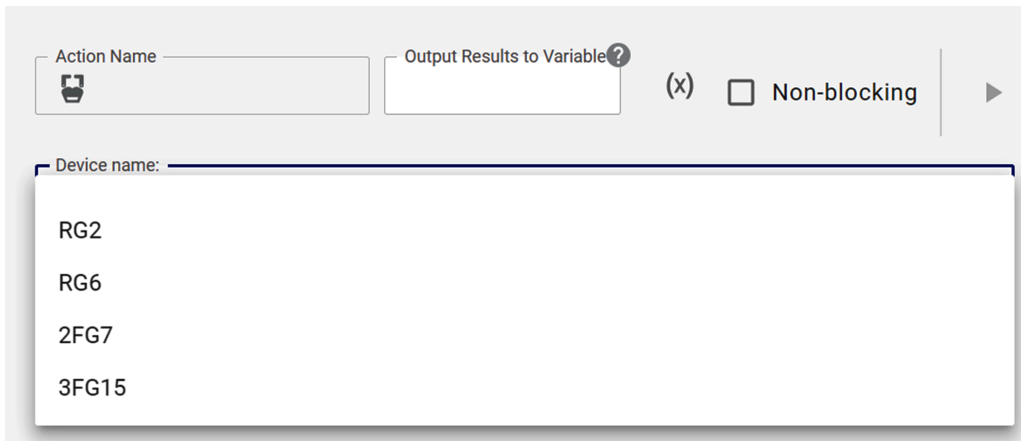
Create variables before programming in the Visual programming interface

Troubleshooting

Why is the Required device not in the list of devices

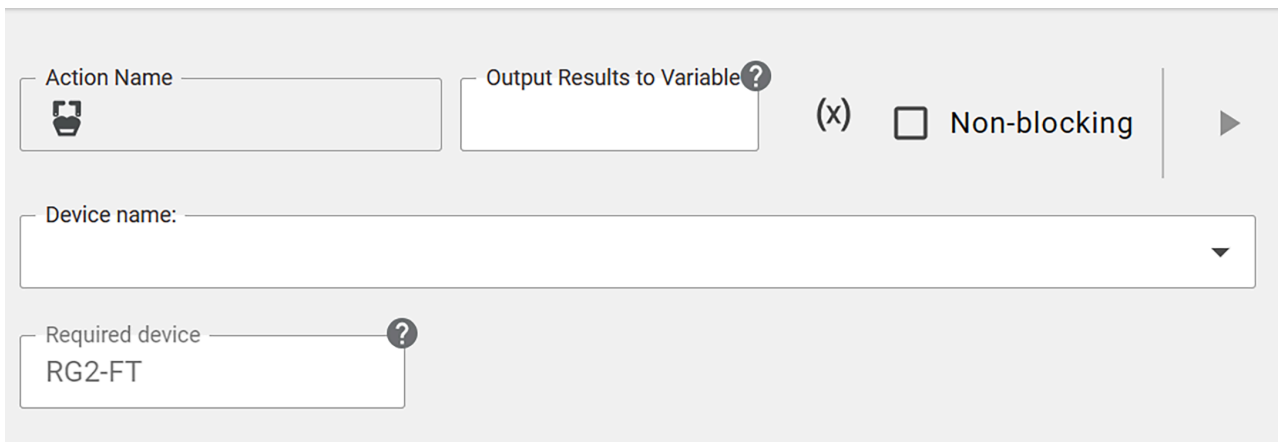
Condition

A program is loaded with OnRobot Plugin actions. The **Device name:** menu does not display any device in the collapsed state.



The screenshot shows the OnRobot plugin interface. At the top, there is a section for 'Action Name' and 'Output Results to Variable' with a question mark icon. Below this, the 'Device name:' dropdown menu is open, displaying a list of devices: RG2, RG6, 2FG7, and 3FG15. The 'Non-blocking' checkbox is also visible.

There is a device listed as a **Required device**.



The screenshot shows the OnRobot plugin interface. At the top, there is a section for 'Action Name' and 'Output Results to Variable' with a question mark icon. Below this, the 'Device name:' dropdown menu is closed. The 'Required device' field is set to 'RG2-FT'.

Cause

The device listed as the **Required device** is deleted. It is not in the list of devices on the **Configurations** of the plugin.

Remedy

Recreate and reconfigure the required device on the **Configurations** page.

Changes since the last release

Modifications were made from the previous version to the current version.

Changes made in version 2.1.0

Version 2.1.0 of the OnRobot Plugin is compatible with the latest Kortex v3.3.0.

New features

The OnRobot Plugin supports the OnRobot Dual Quick Changer.

When the Dual Quick Changer is connected to the arm, make sure to add it on the **Tools** page. Use the information in the OnRobot manuals about the Dual Quick Changer to enter into the **Configuration** pane on the **Tools** page.

When any other OnRobot tool that is not pre-installed with the plugin is installed, make sure to add it on the **Tools** page. Configure the tool with the information from the OnRobot manuals.

Fixes

All fixed issues are described as if the problem exist.

- Gripper communication is lost when an unsupported action is not running.
- When the gripper enters a fault state, the state is reported repeatedly in Kortex Web App.

Known issues

The current version of Link 6 has a few known issues. Kinova is working towards to fixing the issues.

- If the OnRobot Plugin and Robotiq Plugin are installed simultaneously, make sure to deactivate the Robotiq Plugin before using the Updating the OnRobot plugin erases all modifications made to the tool configuration..
- When safety is activated on the gripper, there is no way to power cycle the wrist by using a button on Kortex Web App.
- The **Connection state** on the **Tools** page does not always display the current connection state of the OnRobot tool.



Note: The **Connection state** is supposed to reflect whether a tool is physically connected to the arm of Link 6.

Changes made in version 2.0

Version 2.0 of the OnRobot Plugin benefits from minor bug fixes and increased robustness.

The OnRobot Plugin v2.0 supports additional OnRobot tools.

- 2FG7
- 3FG15

Known issues

If the OnRobot Plugin and Robotiq Plugin are installed simultaneously, make sure to deactivate the Robotiq Plugin before using the OnRobot Plugin.

Changes made in version 1.2

Version 1.2 of the OnRobot Plugin benefits from minor bug fixes, increased robustness, and compatibility with the latest Kortex v3.2.0.

Appendix

2FG7 gripper default configuration

The 2FG7 gripper comes with its default configuration. It can be reconfigured on the **Tools** page. To reuse the default values after a reconfiguration, you must reconfigure the tool with the default values.

Only values that are modifiable are listed.



Note: Fields of the Inertia Matrix that are listed as 0 are an approximation of the real value. The difference between the listed value and the real value is negligible and does not affect computations done by the plugin.

Table 9: Default configuration of the OnRobot 2FG7 gripper

Name	OnRobot 2FG7 gripper					
Mass	1.1 kg					
Transform	x	0 mm	y	0 mm	z	144 mm
	thetaX	0°	thetaY	0°	thetaZ	0°
Center of Mass	x	0 mm	y	0 mm	z	55 mm
Inertia Matrix	ixx	0 kg/m ²	ixy	0 kg/m ²	ixz	0 kg/m ²
	iyy	0 kg/m ²	iyz	0 kg/m ²	izz	0 kg/m ²

Related topics

[Tool configuration fields](#) on page 29

3FG15 gripper default configuration

The 3FG15 gripper comes with its default configuration. It can be reconfigured on the **Tools** page. To reuse the default values after a reconfiguration, you must reconfigure the tool with the default values.

Only values that are modifiable are listed.



Note: Fields of the Inertia Matrix that are listed as 0 are an approximation of the real value. The difference between the listed value and the real value is negligible and does not affect computations done by the plugin.

Table 10: Default configuration of the OnRobot 3FG15 gripper

Name	OnRobot 3FG15 gripper					
Mass	1.15 kg					
Transform	x	0 mm	y	0 mm	z	156 mm
	thetaX	0°	thetaY	0°	thetaZ	0°
Center of Mass	x	0 mm	y	0 mm	z	78 mm
Inertia Matrix	ixx	0 kg/m ²	ixy	0 kg/m ²	ixz	0 kg/m ²
	iyy	0 kg/m ²	iyz	0 kg/m ²	izz	0 kg/m ²

Related topics

[Tool configuration fields](#) on page 29

RG2 gripper default configuration

The RG2 gripper comes with its default configuration. It can be reconfigured on the **Tools** page. To reuse the default values after a reconfiguration, you must reconfigure the tool with the default values.

Only values that are modifiable are listed.



Note: Fields of the Inertia Matrix that are listed as 0 are an approximation of the real value. The difference between the listed value and the real value is negligible and does not affect computations done by the plugin.

Table 11: Default configuration of the OnRobot RG2 gripper

Name	OnRobot RG2 gripper					
Mass	0.78 kg					
Transform	x	0 mm	y	0 mm	z	213 mm
	thetaX	0°	thetaY	0°	thetaZ	0°
Center of Mass	x	0 mm	y	0 mm	z	64 mm
Inertia Matrix	ixx	0.002189 kg/m ²	ixy	0 kg/m ²	ixz	-0.000002 kg/m ²
	iyy	0.002424 kg/m ²	iyz	-0.000005 kg/m ²	izz	0.000485 kg/m ²

Related topics

[Tool configuration fields](#) on page 29

RG6 gripper default configuration

The RG6 gripper comes with its default configuration. It can be reconfigured on the **Tools** page. To reuse the default values after a reconfiguration, you must reconfigure the tool with the default values.

Only values that are modifiable are listed.



Note: Fields of the Inertia Matrix that are listed as 0 are an approximation of the real value. The difference between the listed value and the real value is negligible and does not affect computations done by the plugin.

Table 12: Default configuration of the OnRobot RG6 gripper

Name	OnRobot RG6 gripper					
Mass	1.25 kg					
Transform	x	0 mm	y	0 mm	z	262 mm
	thetaX	0°	thetaY	0°	thetaZ	0°
Center of Mass	x	0 mm	y	0 mm	z	84 mm
Inertia Matrix	ixx	0.005785 kg/m ²	ixy	0 kg/m ²	ixz	-0.000009 kg/m ²
	iyy	0.006645 kg/m ²	iyz	-0.000008 kg/m ²	izz	0.001307 kg/m ²

Related topics

[Tool configuration fields](#) on page 29

Quick Changer gripper default configuration

The Quick Changer gripper comes with its default configuration. It can be reconfigured on the **Tools** page. To reuse the default values after a reconfiguration, you must reconfigure the tool with the default values.

Only values that are modifiable are listed.



Note: Fields of the Inertia Matrix that are listed as 0 are an approximation of the real value. The difference between the listed value and the real value is negligible and does not affect computations done by the plugin.

Table 13: Default configuration of the OnRobot Quick Changer

Name	OnRobot Quick Changer					
Mass	0.06 kg					
Transform	x	0 mm	y	0 mm	z	13.6 mm
	thetaX	0°	thetaY	0°	thetaZ	0°
Center of Mass	x	0 mm	y	0 mm	z	6.8 mm
Inertia Matrix	ixx	0 kg/m ²	ixy	0 kg/m ²	ixz	0 kg/m ²
	iyy	0 kg/m ²	iyz	0 kg/m ²	izz	0 kg/m ²

Related topics

[Tool configuration fields](#) on page 29

Glossary

C

controller

the part of the robot from where the software operates

E

end effector

device specifically designed for attachment to the flange of the wrist

F

flange

a mechanical interface used for attaching another object

G

GUI

a way of interacting with a program of a computer that involves windows, dialogs, icons, and menus

Graphical User Interface ([GUI](#))

synonym: [HMI](#)

H

HMI

a way of interacting with a machine with such items as push buttons connected to a relay or a menu on a touch screen

human machine interface ([HMI](#))

K

kebab menu

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



synonym: contextual menu, menu options, options, menu

Kortex Web App

the [GUI](#) that runs on a web server on the [controller](#) and is accessed on the [teach pendant](#) or on an external computer

synonym: Web App

N

namespace

a way in computer science of grouping together all objects that work together such that each object has a unique name

non-blocking

the ability for a robotic program to proceed to its next step even when the current action is not finished

synonym: *synchronous operation*

P

pendant

a device used to configure and control the movements of a robot

synonym: [teach pendant](#)

plugin

software that is added to an pre-existing base software so as to give the application additional capabilities

T

TCP

the position and orientation of the tool

Tool Center Point ([TCP](#))

teach pendant

a device used to configure and control the movements of a robot

synonym: pendant

U

USB device

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

Universal Serial Bus ([USB](#))

USB storage device

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

synonym: thumb drive, flash drive

W

wrist

the part found at the end of the robot arm to which end effectors may be attached

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📍 QUEBEC, CANADA

EN-UG-023-r2.1-202312

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