



OPERATIONS MANUAL

USING URCAP FOR UNIVERSAL ROBOTS

Abstract

This manual is for operating the pneumagiQ, casemagiQ, pneuvaQ and vaQgrip series using URCap for Universal Robots.

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Dear customer,

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If you have any questions or need help with the product, don't hesitate to get in touch with us through support@impaqt-robotics.com.

Best Regards,
Impaqt Robotics team

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Technical changes:

We reserve the right to make alterations for technical and structural improvement.

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Operations Manual – Using URCap for Universal Robots

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Revisions

1.1 Revision 16 November 2023

- Beta Release

1.2 Revision 29 November 2023

- Updated the latest URCap version screens.

1.3 Revision 10 April 2024

- Added pneumagiQ PQ0-1G2S.

1.4 Revision 3 September 2024

- Added casemagiQ CM100.
- Added pneuvaQ PV21.

1.5 Revision 7 January 2024

- Updated pneuvaQ PV21 UR+ button image.

1.6 Revision 10 February 2026

- Added whole vaQgrip part.
- Restructured whole document as per the other Manuals.

2 General Inputs

Download more information and documentation of the products at <https://www.impact-robotics.com>.

2.1 Variants

This operations manual applies to the following variants:

- pneumagiQ PQ0-1G2S
- pneumagiQ PQ90-2G2S
- pneumagiQ PQ180-2G4S
- pneumagiQ PQ9020-2G4S
- casemagiQ CM100
- casemagiQ CM50
- pneuvaQ PV21
- vaQgrip Click
- vaQgrip VQ10
- vaQgrip VQ20

2.2 Compatible Robots

pneumagiQ compatible with all models of Universal Robots.

Recommended minimum version of polyscope in UR is as follows:

- For CB3 starts from v3.12.1
- For E series starts from v5.11.1

2.3 Applicable Documents

- Catalog of the products
- Manuals of the products
- Manuals of the accessories

2.4 Safety Considerations

2.4.1 Personnel Qualifications

Only authorized personnel with a working knowledge of handling pneumatic and electrical circuits should operate the product. Anyone managing the product should have understood the different product manuals.

2.4.2 Notes for operation

Always switch-off pneumagiQ by disconnecting the I/O cable before adding or removing accessories. Before switching off, neutralize the pressure inside by shutting off the pneumatic supply and actuating the air blow-off or the air outlet ports using the URCap (Refer to operations manual).

2.5 Installation of URCap

The URCap of pneumagiQ, casemagiQ and pneuvaQ is available in the respective [product pages](#). Download the URCap to a USB drive and plug the USB drive to the Universal Robot's USB port either in the teach pendant or the robot controller.

1. To install URCap, tap the Hamburger icon () on the top right from anywhere in the Polyscope as shown in Figure 1.
2. Select **Settings**
3. In the side menu on the left, choose **System**
4. Go to **URCaps**.
5. Click the '+' button shown in Figure 2, navigate to the USB disk, and add the corresponding URCap (example: pneumagiQ-X.XX.urcap).

6. Once the URCap is installed, ensure that there is a green check mark next to pneumagiQ in the Active URCaps section as shown in Figure 3. (Same for all the URCaps)
7. Restart the robot after installing URCap.
8. To remove the URCap, select pneumagiQ from under active URCaps and click the '-' button at the bottom. As always restart the robot after removing the URCap.

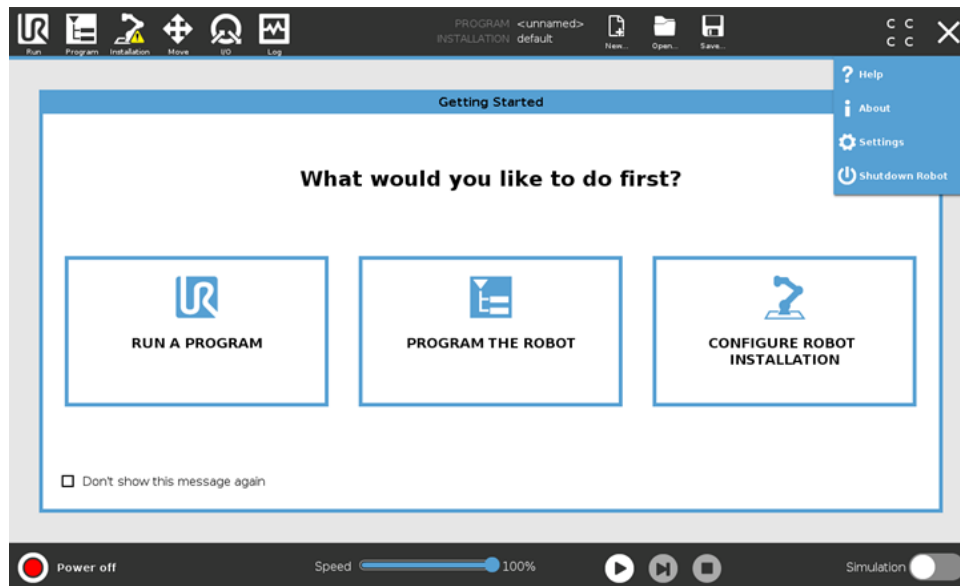


Figure 1: Hamburger Menu

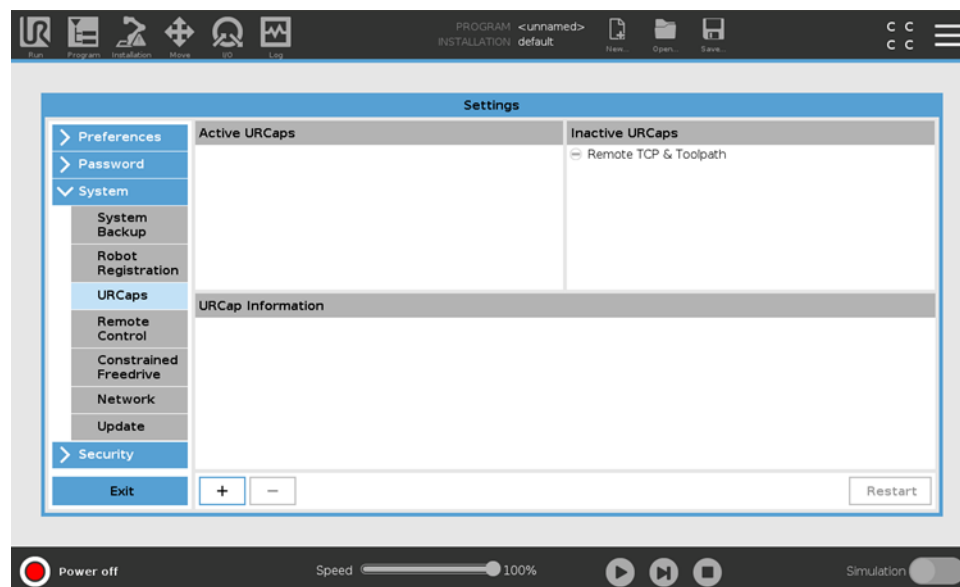


Figure 2: Use the '+' button at the bottom left to install the URCap

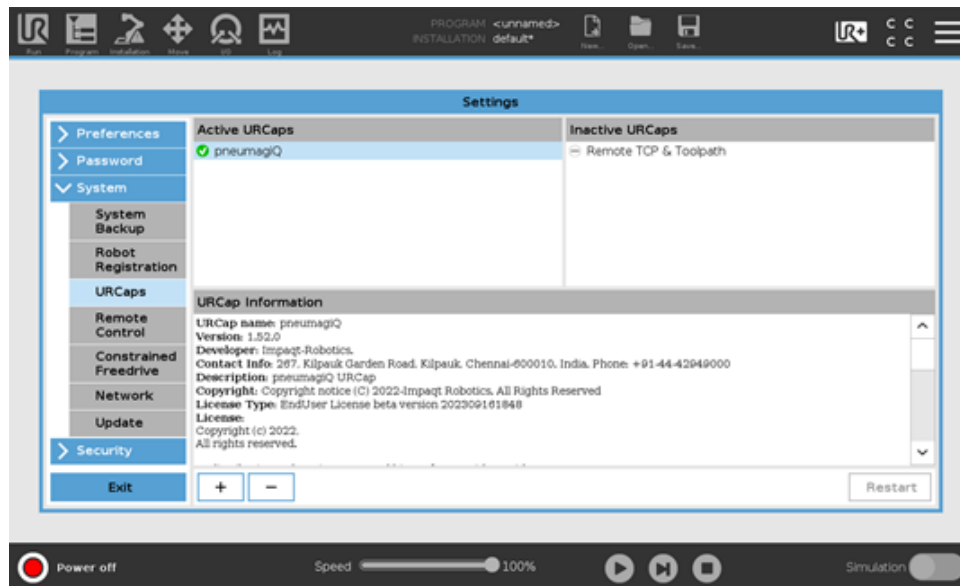


Figure 3: Ensure that there is a green check mark next to *pneumagiQ*

2.6 Setting up the Installation Tab

To control the products with Universal Robots, need to set the right settings in the installation tab as follows:

2.6.1 URCaps > *pneumagiQ* Settings

In the **Installation** tab, under **URCaps**, under ***pneumagiQ* Settings**, choose the *pneumagiQ* Variant from the drop-down box, **Tool Type** as **Pneumatic Grippers** and select the gripping mode of both Tool 1 & Tool 2 as either **External Gripping** or **Internal Gripping**. By default, the gripping mode is in external gripping mode.

To identify the tool quickly in the *pneumagiQ* PQ90 & PQ9020, Tool Mounting Face 1 is marked with a single dot, while Tool Mounting Face 2 has two dots, on both sides of the product. In the case of *pneumagiQ* PQ180, it is marked as 1 & 2 on the bottom face. Refer to the Installation Manual for the corresponding *pneumagiQ* variant to know more.

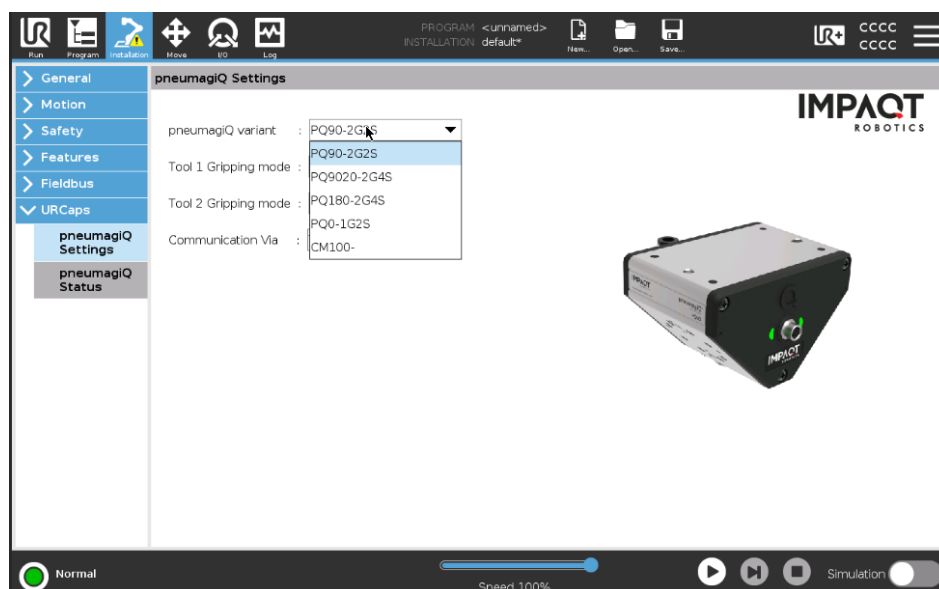


Figure 4: Installation tab - *pneumagiQ*

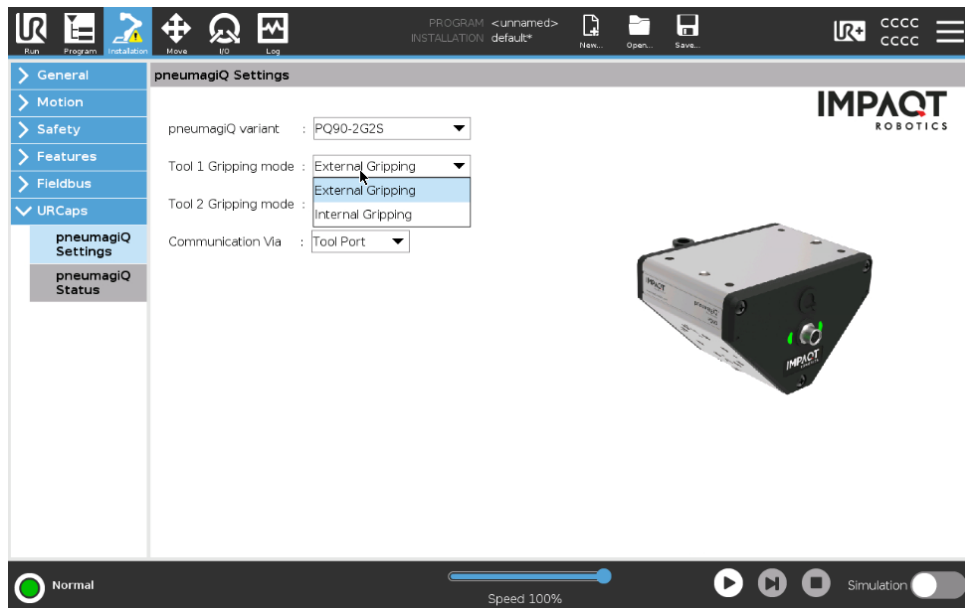


Figure 5: Installation tab - pneumagiQ

2.6.2 URCaps > casemagiQ Settings

In the **Installation** tab, under **URCaps**, under **casemagiQ Settings**, choose the casemagiQ Variant from the drop-down box, and the mode of communication, which is whether is it connected to the UR Tool Port or the robot controller using USB to RS485 Converter with 5m I/O cable.

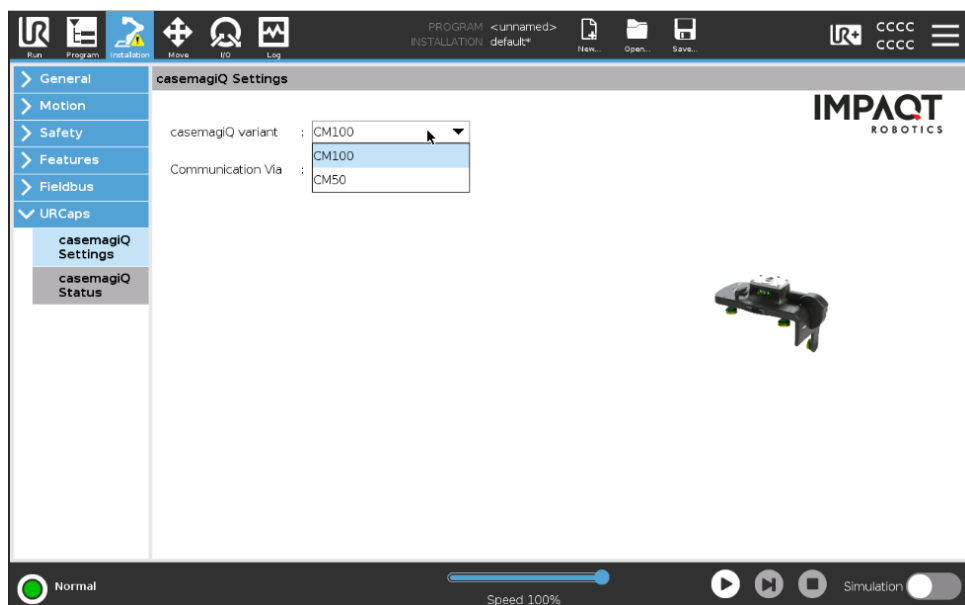


Figure 6: Installation tab – casemagiQ

2.6.3 URCaps > pneuvaQ Settings

In the **Installation** tab, under **URCaps**, under **pneuvaQ Settings**, choose the pneuvaQ Variant from the drop-down box, and the mode of communication, which is whether it is connected to the UR Tool Port or the robot controller using USB to RS485 Converter with 5m I/O Cable.

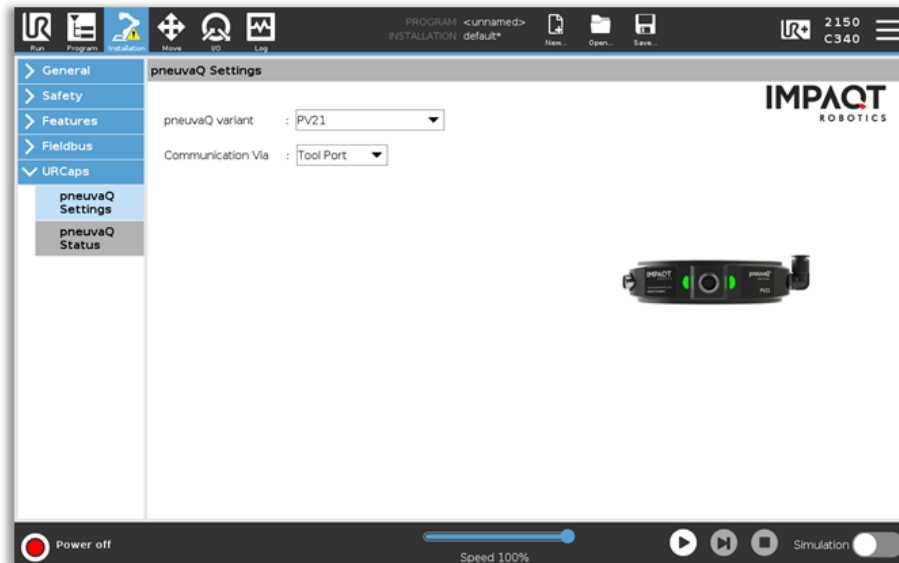


Figure 7: Installation tab – pneuvaQ

2.6.4 URCaps > vaQgrip Click Settings

In the **Installation** tab, under **URCaps**, under **vaQgrip Settings**, choose the vaQgrip Click Variant from the drop-down box, and the mode of communication, which is whether it is connected to the UR Tool Port or the robot controller using USB to RS485 Converter with 5m I/O Cable.

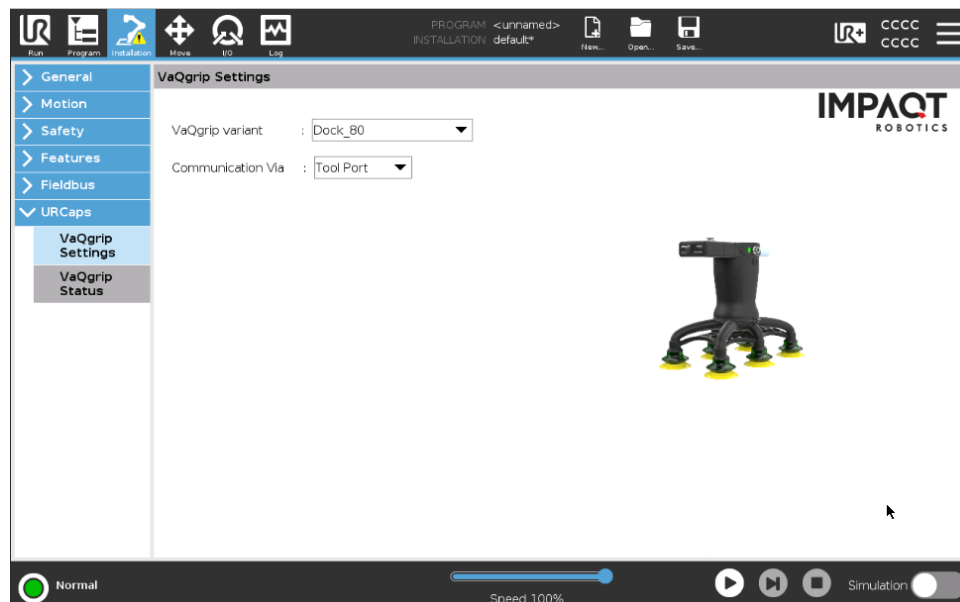


Figure 8: Installation tab - vaQgrip Click

2.6.5 URCaps > vaQgrip VQ Series Settings

In the **Installation** tab, under **URCaps**, under **vaQgrip Settings**, choose the vaQgrip VQ Series Variant from the drop-down box.

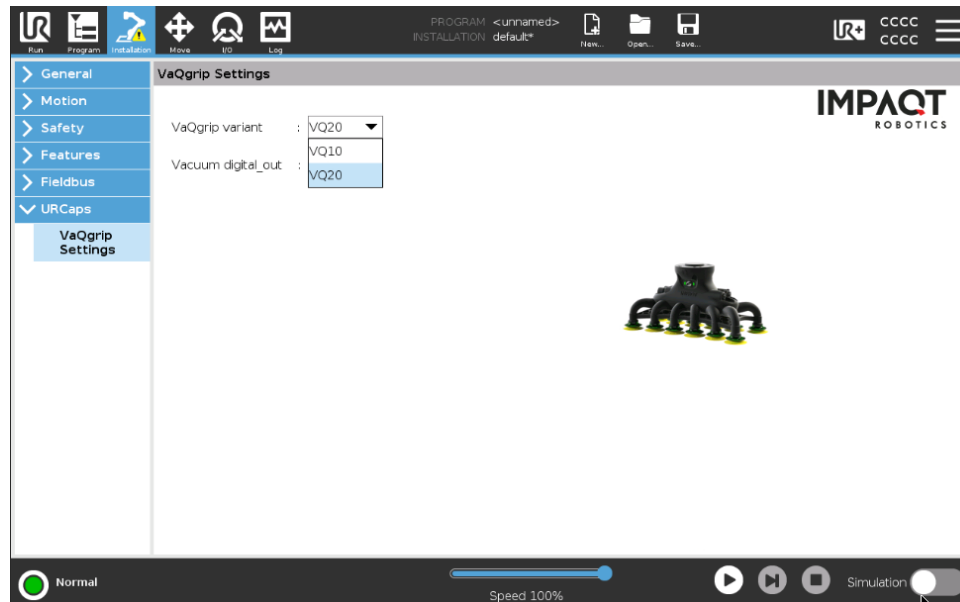


Figure 9: Installation tab - vaQgrip VQ series

2.7 General > Tool I/O

Now, the Tool I/O interface of the robot needs to be controlled by pneumagiQ. Only then, the appropriate Analog Inputs, Communication Interface and Digital Output modes can be set as needed by pneumagiQ. Hence, in the installation tab, in the side menu under **General**, choose **Tool I/O**.

Under the **I/O Interface Control**, for **controlled by**, select **pneumagiQ** or **casemagiQ** or **pneuvaQ** or **vaQgrip** depending on the URCap installed. This will set all the correct settings for the Tool I/O Interface to be controlled by pneumagiQ or casemagiQ or pneuvaQ or vaQgrip. Now that the Tool I/O setting has been set properly, the product will switch-on with red light flickers in the status indicator. Refer to section [3.1](#) or [4.1](#) or [5.1](#) or [6.1](#) to know more about Status Indicator.

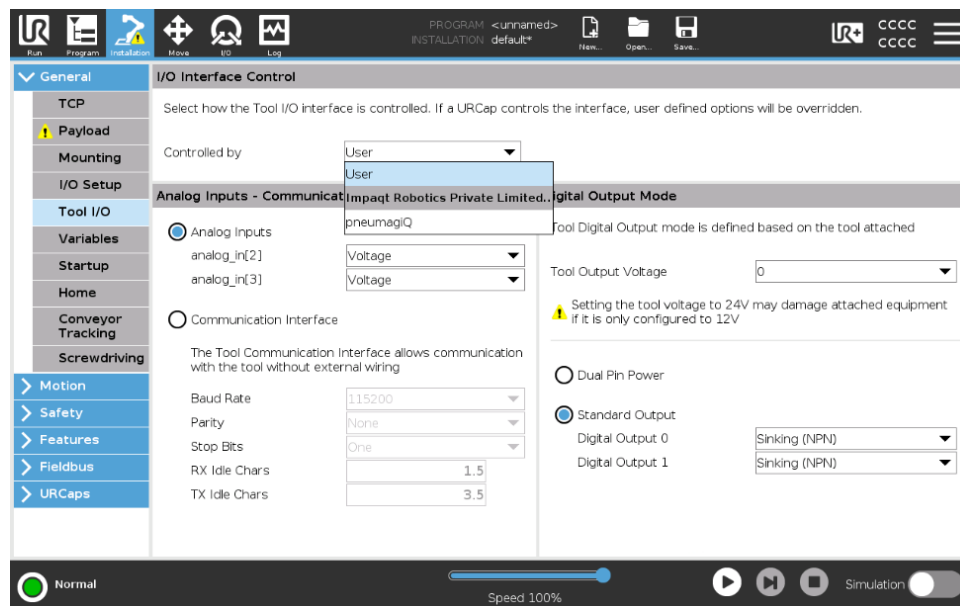


Figure 10: Under I/O Interface Control, for 'Controlled by' choose product based on the URCap installed

2.8 Tool Center Point

The Tool Center Point is the specific point of the EOAT that the robot's control system uses to position and orient the EOAT. By default, the TCP of Universal Robots is set at the end of the robot arm.

Note: In this manual, we are providing the TCP only from the Top Mounting Face of the product until the center point of the Tool Mounting Face (Refer to the respective product installation manuals to know more.). Hence, while calculating the TCP, one must take into consideration the Robot Coupler, Tool Coupler, tool type, tool peripherals such as fingers/jaws and the specific robot application. So, the TCP needs to be calculated by the integrator/ end user depending on the final application setup.

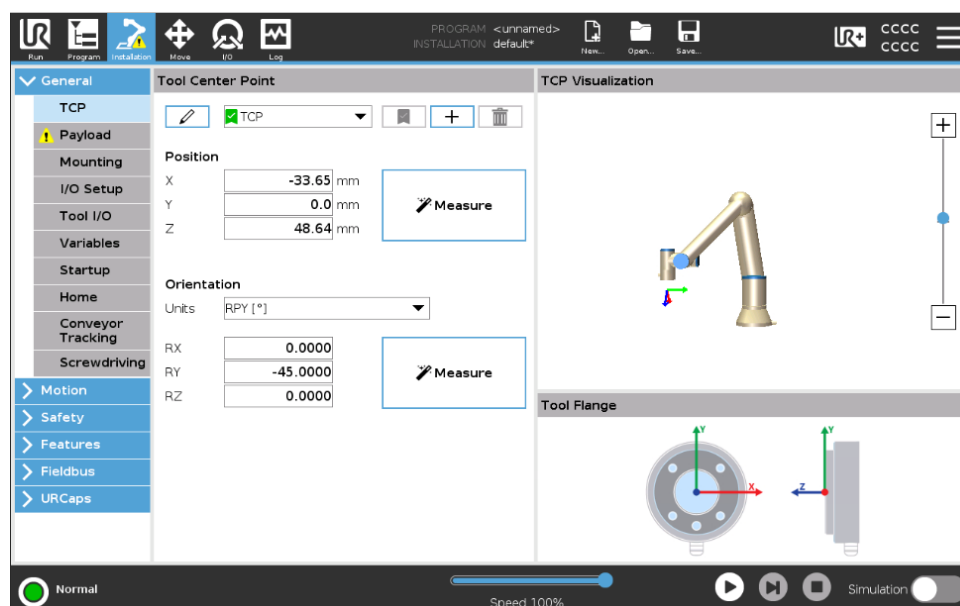


Figure 11: Tool Center Point

2.9 Payload and CoG

The payload for Universal Robots refers to the total weight the robot must lift. By default, the payload is considered as 0kg at the end of the robot arm. In the case of pneumagiQ, there are 2 EOATs that hold payloads further away from the end of the robot arm. Hence, the Center of Gravity (CoG) becomes a critical factor.

The Center of Gravity (CoG) refers to the point where the total weight of the robot is concentrated. This is critical for the robot control system for Balance, Stability, Motion Planning, Payload Handling and Robot Safety.

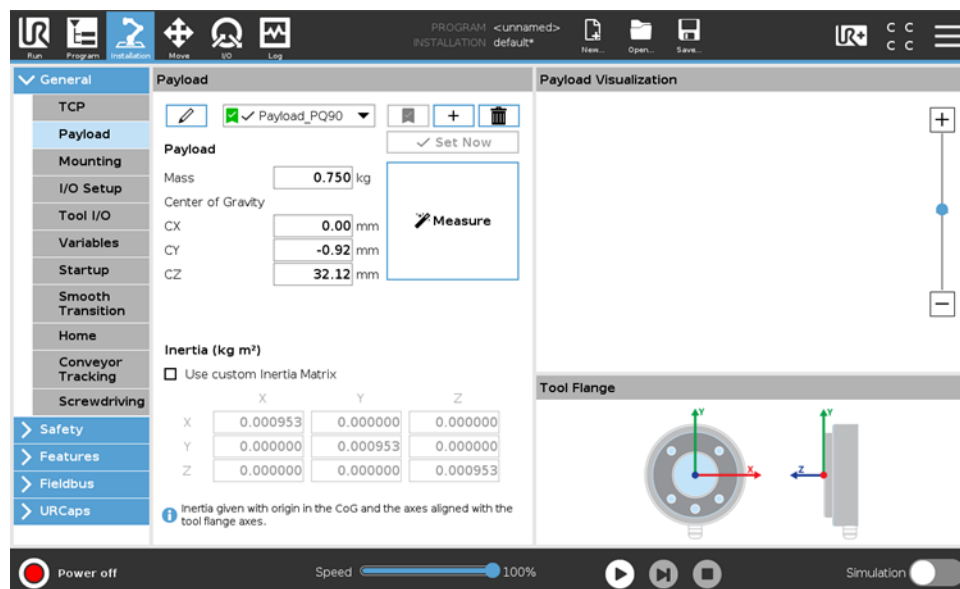


Figure 12: Payload

Note: The Tool Center Point (TCP) and Center of Gravity (Cog) details for each IMPAQT product are provided in the respective product sections of this manual. For example, the TCP information for pneumagiQ is documented under: PneumagiQ → Configuration and Operating pneumagiQ → TCP of pneumagiQ. Users must refer to the corresponding product section to obtain the correct TCP reference values and use them while defining the final TCP based on the complete EOAT configuration and application.

2.10 Test button

The pneumagiQ, casemagiQ, pneuvaQ and vaQgrip nodes have a built-in Test button that can be used to assess the current operational state of the node. Hence, before running the code in the robot program tree, evaluate it for all possible options to understand the complete workflow of the node.

2.11 UR+ button

The UR+ button on the title bar provides easy access to actuating all the nodes of pneumagiQ, casemagiQ & pneumagiQ and quickly showcases the status of the Sensors. The UR+ button is always on the top right of the UR teach pendant as shown in [Figure 13](#).

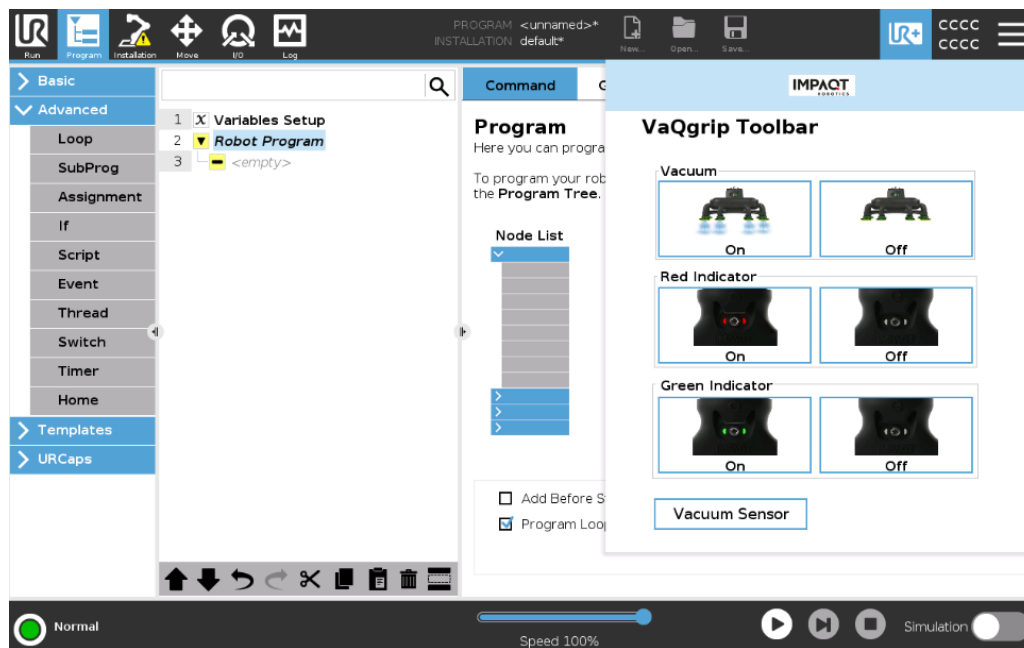


Figure 13: UR+

2.12 Updating URCap

The URCap of pneumagiQ is constantly updated to provide the most seamless integration & operation of the pneumagiQ. Hence, one should always install the latest version of URCap. The URCap is available in the respective [product page](#) in the Impact Robotics page.

3 pneumagiQ

pneumagiQ is a compact Universal Pneumatic EOAT Interface designed to seamlessly mount two pneumatic EOATs. The compact design of pneumagiQ makes it ideal for tight-spaced material handling applications such as machine tending and material handling. The lightweight design maximizes the payload of the robot for handling heavier parts which is especially important for collaborative robots.

These are variants of pneumagiQ:

- pneumagiQ PQ0-1G2S
- pneumagiQ PQ90-2G2S
- pneumagiQ PQ180-2G4S
- pneumagiQ PQ9020-2G4S

The URCap used for all three models are the same.

3.1 pneumagiQ State

While pneumagiQ is in operation, the status indicators are used to communicate the current state of the product.

3.1.1 Status Indicator

The status indicator is on the front cover of pneumagiQ on both sides of the 8-pin I/O connector.

LED Color	State
Red	1. Flickering - Powering up. 2. Gripper actuation 3. Initiating Air blow-off
Green	1. Idle 2. Ready for operation

3.1.2 Status Indicator: Green

The status indicator is green when pneumagiQ is idle & ready for operation.

3.1.3 Status Indicator: Red

The status indicator is red when:

- Powering up the product.
- During power-up the status indicator flickers in Red.
- Receiving communication from the robot through the URCap

3.1.4 Status Indicator: switched off.

The status indicator is switched-off only when:

- No power supply is provided to pneumagiQ.
- I/O cable is not connected properly.
- Universal Robot is not in 'Normal mode'.
- Tool I/O interface of Universal Robot URCap is not set to pneumagiQ.

3.2 Operating pneumagiQ in Tool Bar

After installing the URCap, selecting variant in the Application node and selecting pneumagiQ in the Tool I/O as mentioned in [2.6.1](#) and [2.7](#). In the top right corner press the UR+ icon. The gripper is tested here, with External Gripping Mode selected by default. This tab allows the user to manually test the gripper using Grip, Release, Air On, and Air Off and reset the pneumagiQ.

This page is mainly used to verify proper gripper operation before running robot programs.

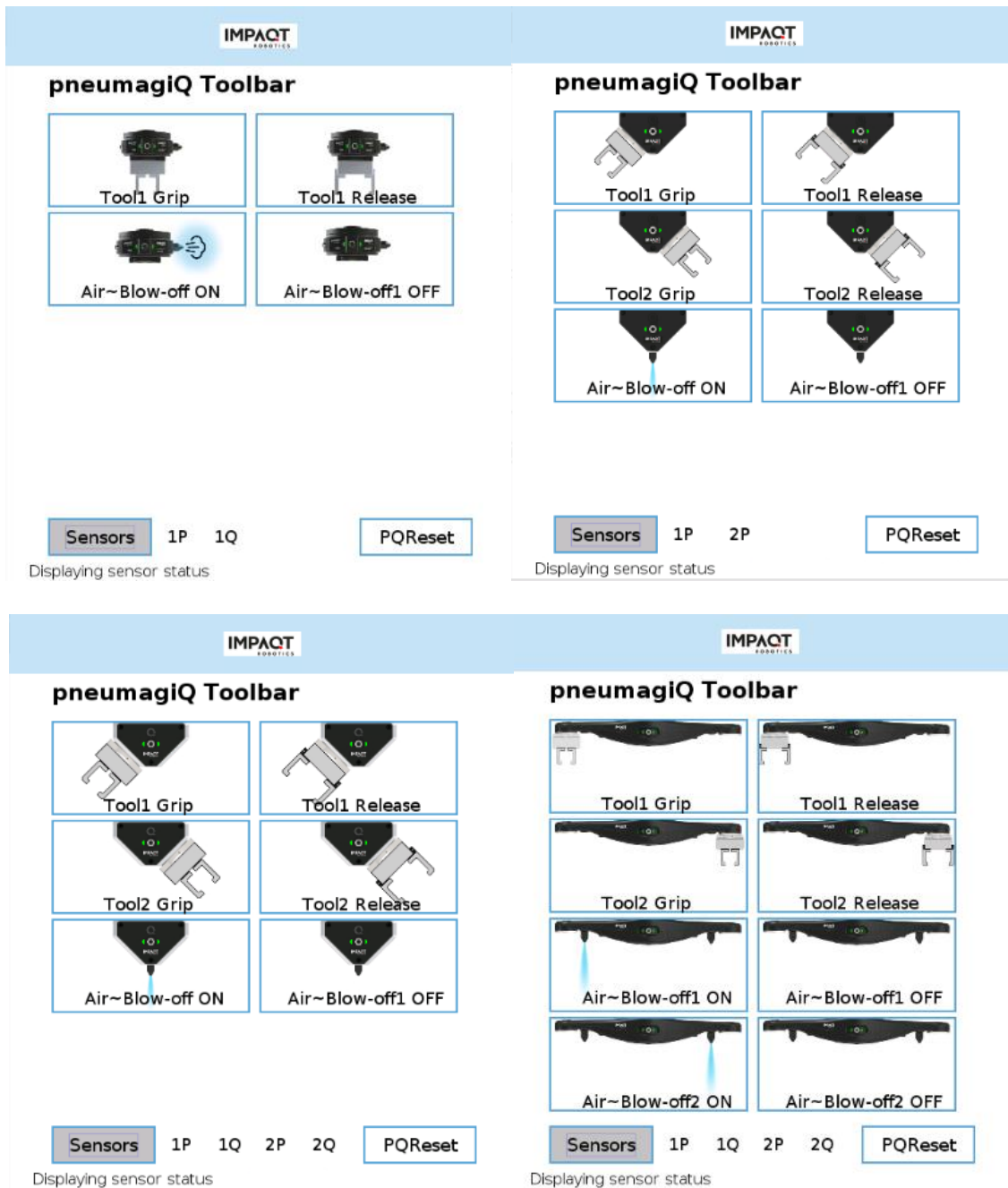


Figure 14: UR+ button for PQ0, PQ90, PQ9020, and PQ180.

3.3 TCP of pneumagiQ

In pneumagiQ as there are two EOATs, we need to set two different TCPs for each of the EOATs. The TCP value also changes for each of the pneumagiQ variants. Hence, use the data from the Table 1 to create a TCP for each of the Tool Mounting Faces 1 & 2 as shown in the Figure 11.

Product	PQ0	PQ90		PQ180		PQ9020	
Tool Mounting Face	1	1	2	1	2	1	2
X	0	-33.65	33.65	-200.00	200.00	-38.89	38.89
Y	0	0	0	0	0	0	0
Z	34.00	48.64	48.64	37.5	37.5	53.89	53.89
RX	0	0	0	0	0	0	0
RY	0	-45	45	0	0	-45	45
RZ	0	0	0	0	180	0	0

Table 1: Tool Center Point up to the Tool Mounting Face of pneumagiQ

3.4 CoG for pneumagiQ

As there are 2 separate EOATs coupled through pneumagiQ, 4 different Payloads must be created along with respective unique CoG as follows:

1. pneumagiQ No-Load Payload includes:
 - pneumagiQ No-Load Payload includes:
 - all peripherals
 - I/O Cable
 - 8mm pneumatic tube
 - Robot Couplers
 - Tool Couplers
 - EOATs
 - EOAT peripherals such as fingers/jaws, sensors, etc
2. Tool 1 Payload includes:
 - pneumagiQ No-Load Payload
 - Part handled by Tool 1
3. Tool 2 Payload includes:
 - pneumagiQ No-Load Payload
 - Part handled by Tool 2
4. pneumagiQ Full Payload includes:
 - pneumagiQ No-Load Payload
 - Part handled by Tool 1
 - Part handled by Tool 2

Refer to Table 2 for the Payload of all the variants of pneumagiQ and it can be added to the Universal Robots as shown in Figure 12. This is only for the product. As mentioned at the top, all the payloads mentioned above need to be calculated by the integrator/ end user depending on the final application setup.

Product	PQ0	PQ90	PQ180	PQ9020
Weight	0.41 Kg	0.58 Kg	0.87 Kg	1.1 Kg
CX	0	0	0	0
CY	0	-0.92	-1.2	-4.0
CZ	16.5	32.12	30.3	30.2

Table 2: pneumagiQ CoG until the Tool Mounting Face

3.5 Program Tab

3.5.1 pneumagiQ Tools

(1) pneumagiQ Grip/Release

In the robot program tree, to actuate the EOATs, need to use the **pneumagiQ Tool** node. For example, if the Tool Type is selected as Pneumatic Grippers in the pneumagiQ Settings in Installation tab, then choose either Gripper 1 or Gripper 2 tab. Then, set the gripper action as either Grip or Release. The action Grip denotes the fingers/ jaws of the grippers

moving towards each other for External Gripping while for Internal Gripping, it denotes the fingers/ jaws of the gripper moving away from each other.

For example, if the end user has a hardware change in the application and must now use Internal Gripping instead of External Gripping, there is no need to change the complete program tree by swapping Grip and Release actions. Instead, simply change the Tool's gripping mode from External Gripping to Internal Gripping and the program nodes will automatically update themselves.

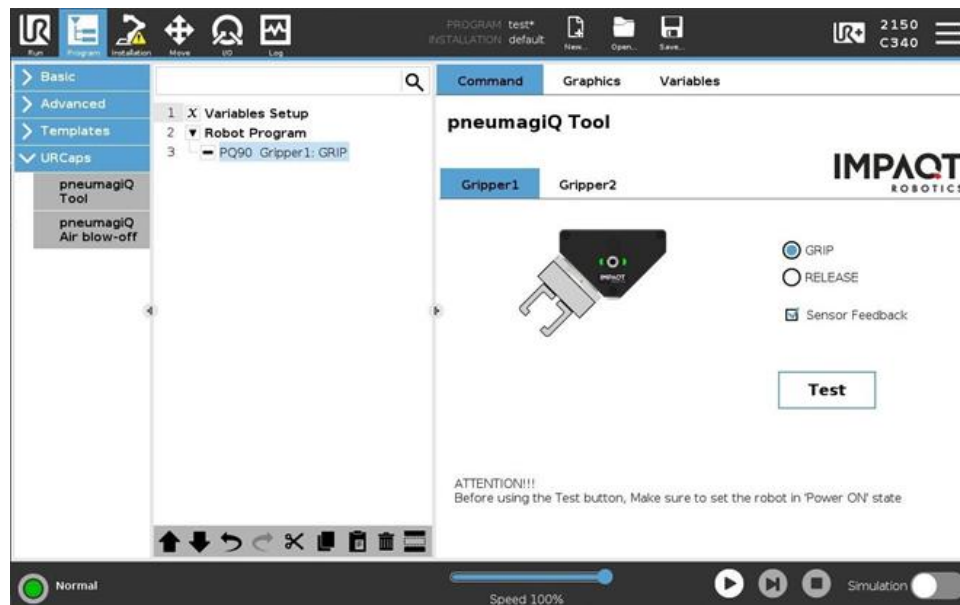


Figure 15: pneumagiQ PQ90 Gripper1 action node

(2) Sensor Feedback

To understand the current state of the pneumatic grippers, connect the sensors such as Reed switches to gripper and sensor connector of the pneumagiQ. Now, when the checkbox of **Sensor Feedback** is selected, the pneumagiQ control system will pause the program tree until the receiving feedback from the sensor ports. The **Sensor Feedback** checks for the following conditions to confirm the Grip or Release action.

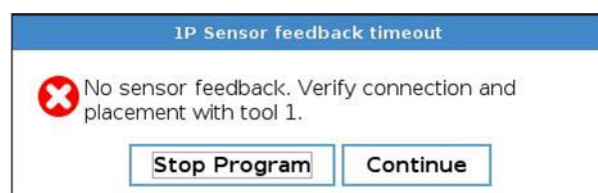


Figure 16: Sensor Timeout dialog box

pneumagiQ Variant	Node Action	Gripper 1		Gripper 2	
		1P	1Q	2P	2Q
PQ0-1G2S	Grip	On			
	Release		On		
PQ90-2G2S	Grip	On		On	
	Release	Off		Off	
PQ180-2G4S PQ9020-2G4S	Grip	On		On	
	Release		On		On

Table 3: Sensor mapping for pneumagiQ

(3) *pneumagiQ Air blow-off*

In the Air blow-off node can do 3 different actions: Active, Inactive and Pulse.

- Activate: the activate node inserted will activate the Air blow-off, thereby blowing compressed air through the Air blow-off port.
- Inactivate: the inactive node inserted will deactivate the Air blow-off, thereby stopping the flow of compressed air through the Air blow-off port.
- Pulse: the pulse node will activate the Air blow-off port for the set duration as determined by the slider value and then deactivates it.
- The duration of the pulse can be varied from 0.5 seconds to 10 seconds at an increment of 0.5 seconds.

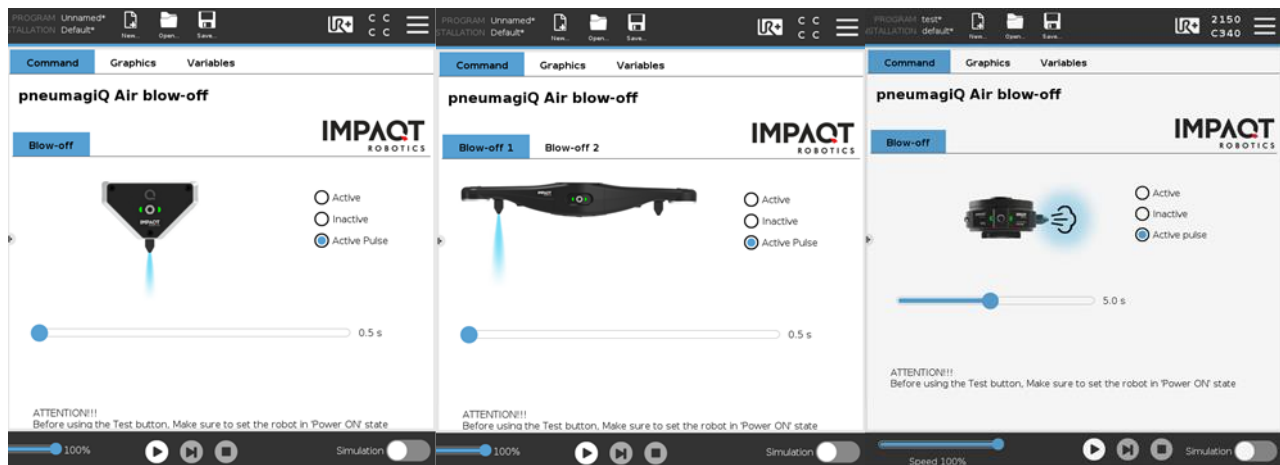


Figure 17: *pneumagiQ PQ90, PQ9020, PQ180 & PQ0 Air blow-off node*

Note: Both pneumagiQ PQ90-2G2S and PQ9020-2G4S have only one Air blow-off port while the pneumagiQ PQ180-2G4S has two Air blow-off ports.

4 casemagiQ

casemagiQ is a compact Universal Case Forming EOAT designed to seamlessly form cases of wide range of dimensions. The compact design of casemagiQ is ideal for case forming / carton erection applications with minimal footprint.

These are variants of casemagiQ:

- casemagiQ CM100
- casemagiQ CM50

The URCap used for all variants are the same.

4.1 casemagiQ State

While casemagiQ is in operation, the status indicators are used to communicate the current state of the product.

4.1.1 Status Indicator

The status indicator is on the front cover of pneumagiQ on both sides of the 8-pin I/O connector.

LED Color	State
Red	1. Flickering - Powering up. 2. Vacuum Actuation 3. Cylinder Actuation
Green	1. Idle 2. Ready for operation

4.1.2 Status Indicator: Green

The status indicator is green when casemagiQ is idle & ready for operation.

4.1.3 Status Indicator: Red

The status indicator is red when:

- Powering up the product.
- During power-up the status indicator flickers in Red.
- Receiving communication from the robot through the URCap

4.1.4 Status Indicator: switched off.

The status indicator is switched-off only when:

- No power supply is provided to casemagiQ.
- I/O cable is not connected properly.
- Universal Robot is not in 'Normal mode'.
- Tool I/O interface of Universal Robot URCap is not set to pneumagiQ/ casemagiQ/ pneuvaQ.

4.2 Operating casemagiQ in Tool Bar

After installing the URCap, selecting variant in the Application node and selecting casemagiQ in the Tool I/O as mentioned in [2.6.2](#) and [2.7](#). In the top right corner press the UR+ icon. The vacuum, Laser and Flap are tested here. This tab allows the user to manually test the casemagiQ using Flap On/Off, Laser On/Off, and Main vacuum On/Off and Flap vacuum On/Off and reset the casemagiQ. And remember the Flap vacuum will turn on only when Main vacuum is already turned on.

This page is mainly used to verify proper vacuum and flap operation before running robot programs.



Figure 18: UR+ button for CM100, CM50

4.3 TCP of casemagiQ

In case of casemagiQ, there is only one face for the case/carton to be picked. Hence, it is much more straightforward. Hence, use the data from the Table 4 to create a TCP as shown in the Figure 11.

Product	CM50	CM100
X	0	0
Y	0	0
Z	93.6	93.7
RX	0	0
RY	0	0
RZ	0	0

Table 4: Tool Center Point up to the suction cups of casemagiQ

4.4 CoG for casemagiQ

The CoG for casemagiQ is a bit different. As CM100 can extend up to 100mm and the case forming flap can be turned on or off. Hence, the CoG will change depending on the configuration of the casemagiQ

Product	CM50	
	Flap off	Flap on
Weight	0.915 Kg	
CX	36.97	29.86
CY	-3.84	-3.84
CZ	54.73	61.98

Table 5: casemagiQ CM50 CoG until the suction cups

Product	CM 100 - Not Extended		CM 100 - Extended – 100 mm	
	Flap off	Flap on	Flap off	Flap on
Weight	1.352 Kg		1.352 Kg	
CZ	14.4	-15.2	4.2	5.0
CY	-2.6	-2.6	-2.6	-2.6
CZ	53.0	58.3	53.0	58.3

Table 6: casemagiQ CM100 CoG until the suction cups

4.5 Program Tab

4.5.1 casemagiQ Tools

(1) casemagiQ Flap / Laser

The casemagiQ Flap / Laser node is used to control the case forming flap and the laser aligner. As shown Figure 19, the case forming flap can be switched on or off use this node. This is used to bend and shape the flat cases / cartons into an open cuboid ready for taping.

The same node can also be used to switch on / off the laser aligner. The laser aligner becomes an easy guide for the robot programmer to align the casemagiQ right at the fold of the case / carton when positioning the pickup point. This way, the case forming flap is positioned perfectly to bend the flat case / carton at the fold into a cuboid.

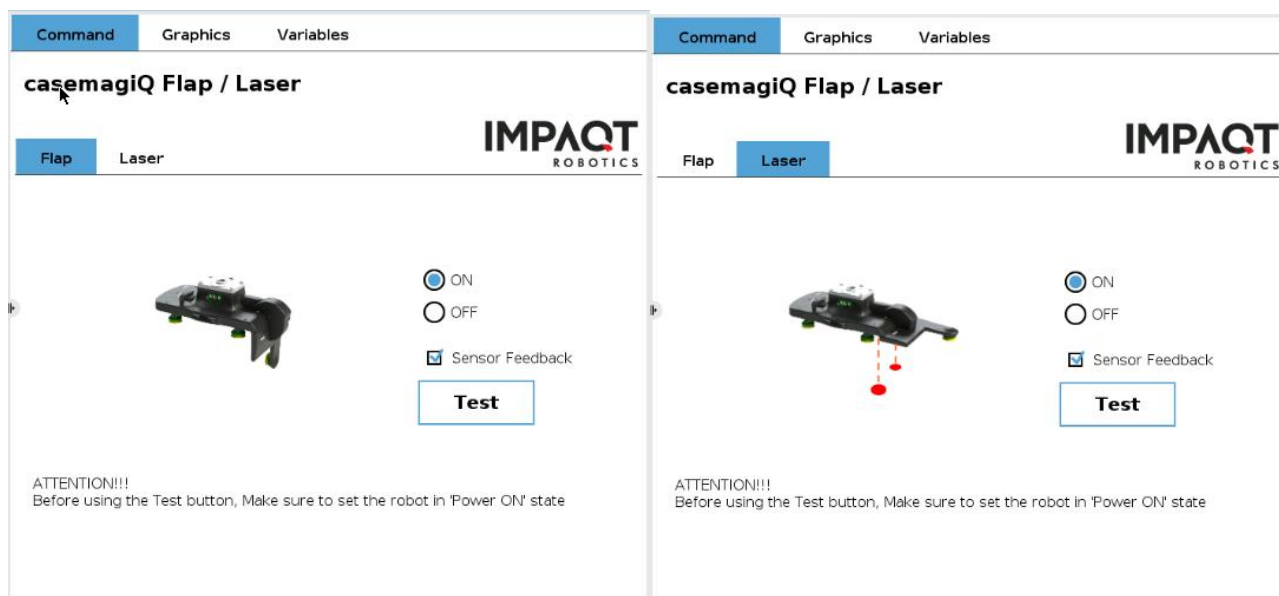


Figure 19: casemagiQ Flap / Laser node

(2) Sensor Feedback

To understand the current state of the Flap. When the checkbox of **Sensor Feedback** is selected, the casemagiQ control system will pause the program tree until the receiving feedback from the sensor which is built-in. The **Sensor Feedback** checks for the following conditions to confirm the Flap On or Flap Off action.

casemagiQ Variant	Action	FS	RS
CM50	Flap Off		On
	Flap On	On	
CM100	Flap Off		On
	Flap On	On	

Table 7: Sensor mapping for casemagiQ

(3) casemagiQ Main/Flap Vacuum

The casemagiQ Vacuum node is used to control both the main vacuum used to hold the case / carton and the flap vacuum used to hold the side face of the case / carton.

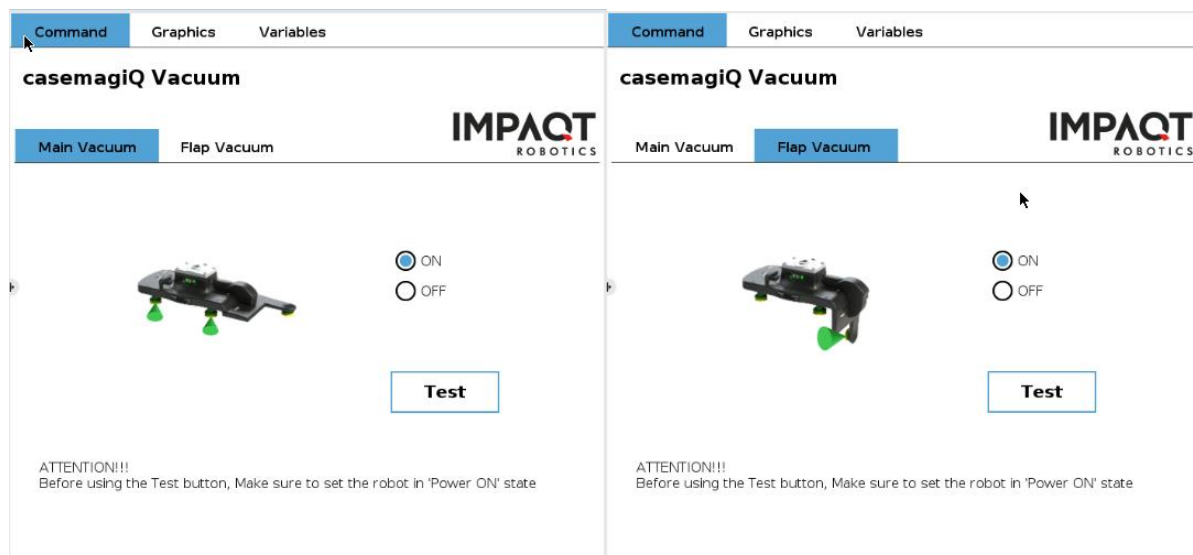


Figure 20: casemagiQ Main/Flap vacuum node

5 pneuvaQ

pneuvaQ is a compact Integrated Pneumatic & Vacuum Interface designed to simplify building custom EOATs for applications such as machine tending for injection molding and press brake. The compact design of pneuvaQ is ideal for adding to custom EOATs to enable quick control of pneumatics and vacuum outlets.

The variant name PV21 has a specific nomenclature. P is for pneumatics, denoting the number of compressed air outlets and V is for vacuum, denoting the number of vacuum outlets. Hence, in this case, PV21 has two compressed air outlets and one vacuum outlet. These are variants of pneumagiQ:

- pneuvaQ PV21

The URCap used for all variants are the same.

5.1 pneuvaQ State

While pneuvaQ is in operation, the status indicators are used to communicate the current state of the product.

5.1.1 Status Indicator

The status indicator is on the front cover of pneuvaQ on both sides of the 8-pin I/O connector.

LED Color	State
Red	1. Flickering - Powering up. 2. Compressed Air actuation 3. Vacuum actuation
Green	4. Idle 5. Ready for operation

5.1.2 Status Indicator: Green

The status indicator is green when pneuvaQ is idle & ready for operation.

5.1.3 Status Indicator: Red

The status indicator is red when:

- Powering up the product.
- During power-up the status indicator flickers in Red.
- Receiving communication from the robot through the URCap

5.1.4 Status Indicator: switched off.

The status indicator is switched-off only when:

- No power supply is provided to pneuvaQ.
- I/O cable is not connected properly.
- Universal Robot is not in 'Normal mode'.
- Tool I/O interface of Universal Robot URCap is not set to pneuvaQ.

5.2 Operating pneuvaQ in Tool Bar

After installing the URCap, selecting variant in the Application node and selecting pneuvaQ in the Tool I/O as mentioned in [2.6.3](#) and [2.7](#). In the top right corner press the UR+ icon. The Air-1, Air-2 and Vacuum are tested here. This tab allows the user to manually test the pneuvaQ using Air-1 On/Off, Air-2 On/Off, and vacuum On/Off reset the pneuvaQ.

This page is mainly used to verify proper Air - 1 and 2 and vacuum operation before running robot programs.

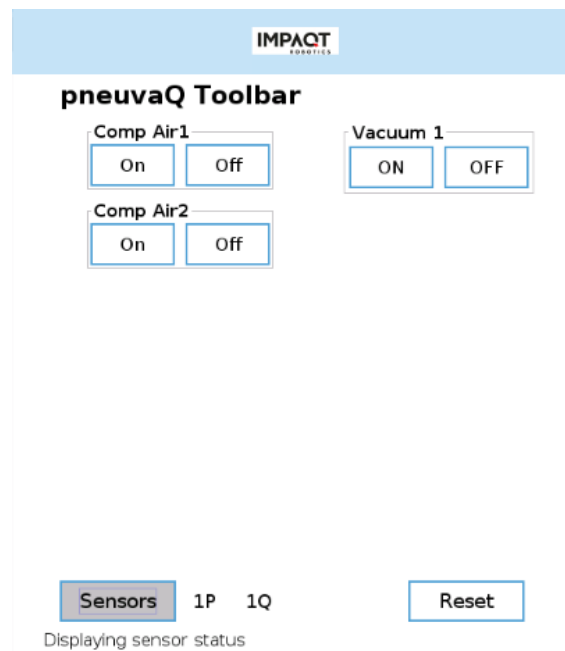


Figure 21: UR+ button for PV21

5.3 TCP of pneuvaQ

In case of pneuvaQ, there is only one face. Hence, it is much more straightforward.

Product	PV21
X	0
Y	0
Z	25
RX	0
RY	0
RZ	0

Table 8: Tool Center Point up to the Bottom Mounting Face of pneuvaQ

5.4 CoG for pneuvaQ

The CoG for pneuvaQ from the robot mounting face

Product	PV21
Weight	0.3 Kg
CX	7.3
CY	0.4
CZ	11.5

Table 9: pneuvaQ CoG until the bottom plate

5.5 Program Tab

5.5.1 pneuvaQ Tools

(1) pneuvaQ Compressed Air1 & Air2

The pneuvaQ Comp. Air node is used to control both the compressed air outlets. They can be individually switched on and off using the pneuvaQ URCap. For other variants of pneuvaQ, the pneuvaQ Comp. Air node will have extra tabs to be able to control all the compressed air outlets.

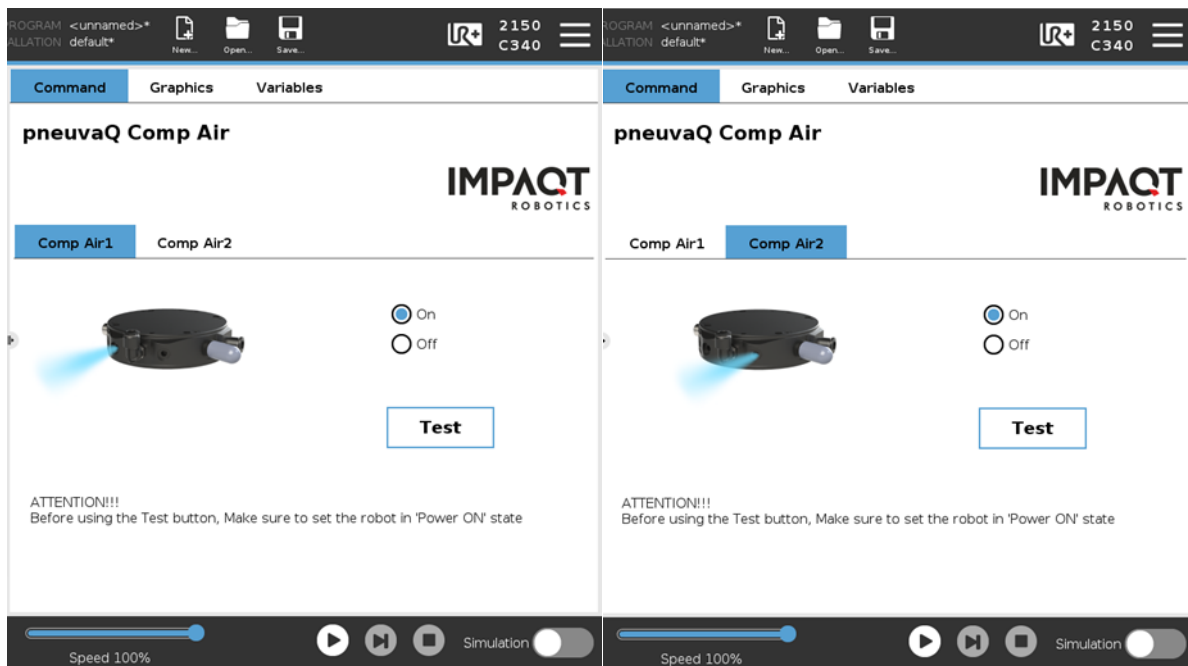


Figure 22: pneuvaQ Comp. Air node

(2) *pneuvaQ Vacuum*

The pneuvaQ Vacuum node is used to control the vacuum outlet. The vacuum can be switched on and off using the pneuvaQ URCap. For other variants of pneuvaQ, the pneuvaQ Vacuum node will have extra tabs to be able to control all the vacuum outlets.

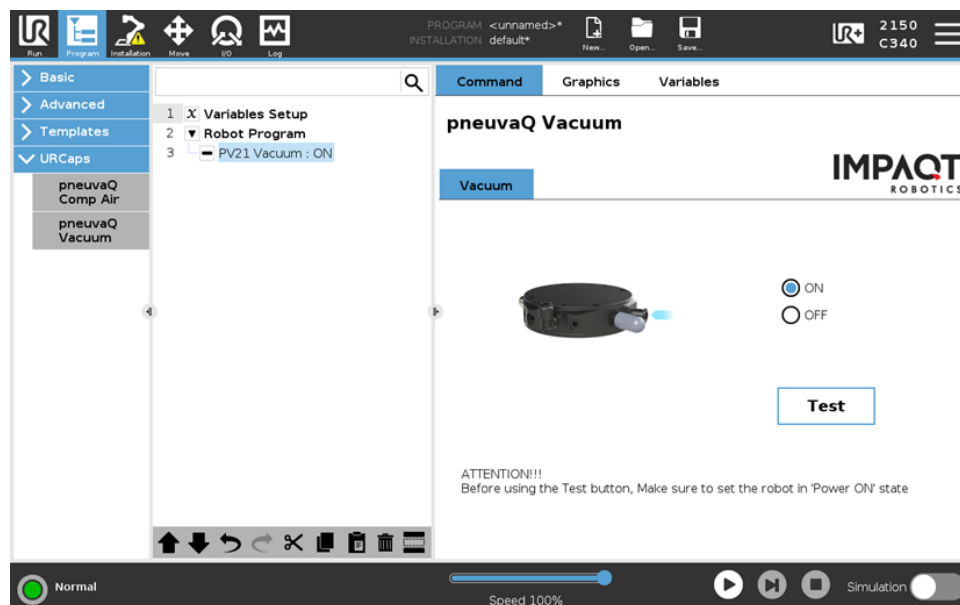


Figure 23: pneuvaQ Vacuum node

6 vaQgrip

vaQgrip is a family of Plug & Play vacuum grippers designed for palletizing and material handling. Its lightweight and compact form eliminates external tubing, reduces clutter, and allows installation in just minutes. The series combines pre-engineered grippers and a modular platform under one system, making vacuum automation practical and scalable. All vaQgrip products follow the same design principles: clean integration, safe operation, and reliable vacuum gripping for industrial use.

These are variants of vaQgrip:

- vaQgrip Click
- vaQgrip VQ10
- vaQgrip VQ20

6.1 vaQgrip State

While vaQgrip is in operation, the status indicators are used to communicate the current state of the product.

6.1.1 Status Indicator

The status indicator is on the front side of the vaQgrip on both sides of the 8-pin I/O connector.

LED Color	State
Red	1. Flickering - Powering up. 2. Vacuum actuation
Green	1. Idle 2. Ready for operation

6.1.2 Status Indicator: Green

The status indicator is green when vaQgrip is idle & ready for operation.

6.1.3 Status Indicator: Red

The status indicator is red when:

- Powering up the product.
- During power-up the status indicator flickers in Red.
- Receiving communication from the robot through the URCap

6.1.4 Status Indicator: switched off.

The status indicator is switched-off only when:

- No power supply is provided to vaQgrip.
- I/O cable is not connected properly.
- Universal Robot is not in 'Normal mode'.
- Tool I/O interface of Universal Robot URCap is not set to vaQgrip.

6.2 Operating vaQgrip Click & VQ Series in Tool Bar

After installing the URCap, selecting variant in the Application node and selecting vaQgrip in the Tool I/O as mentioned in [2.6.4](#) for vaQgrip Click and [2.6.5](#) for vaQgrip VQ series and [2.7](#) for Tool I/O. In the top right corner press the UR+ icon. The vacuum is tested here. This tab allows the user to manually test the vacuum and reset the vaQgrip.

This page is mainly used to verify proper vacuum operation before running robot programs.

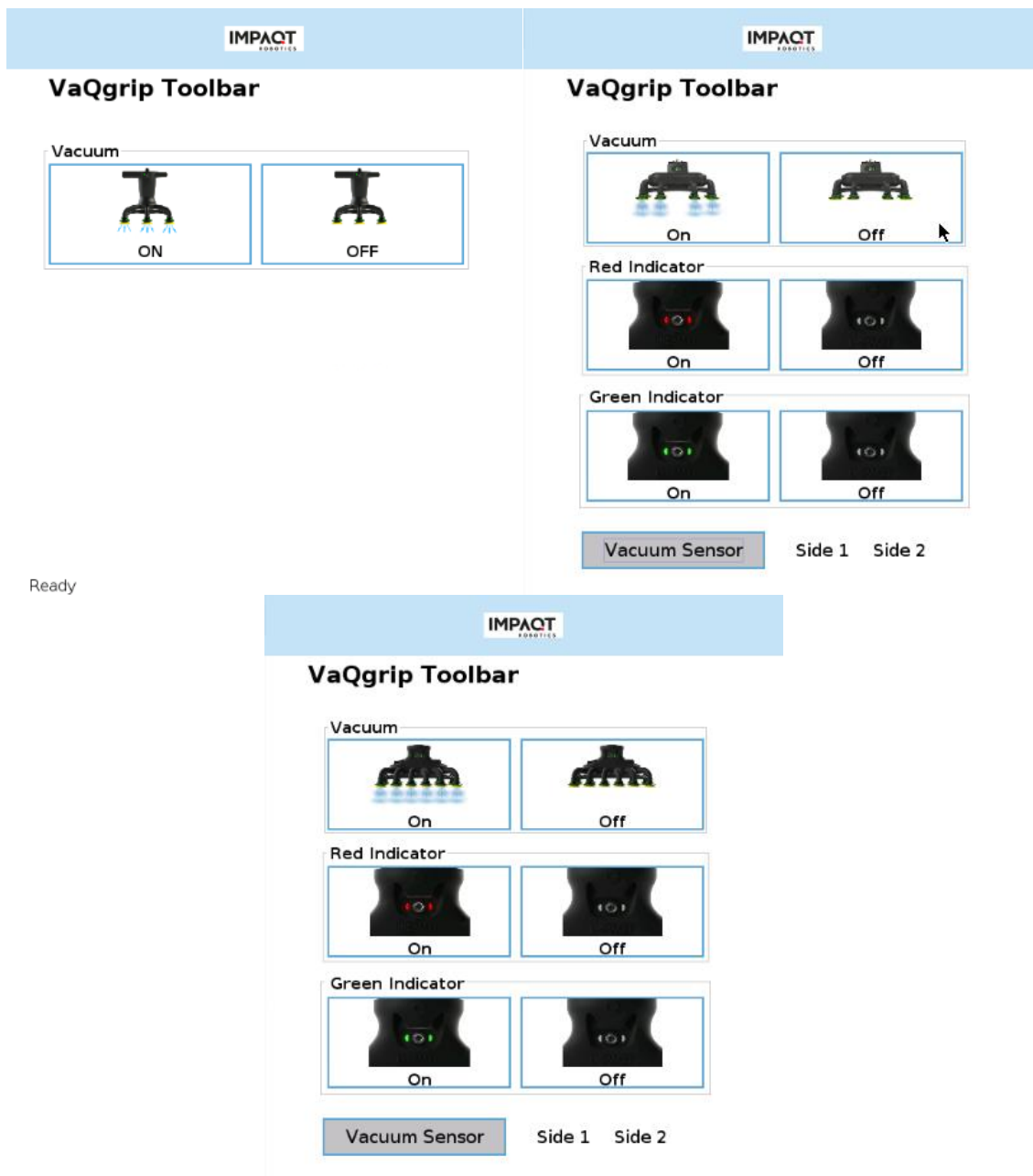


Figure 24: UR+ button for vaQgrip Click, VQ10, VQ20

6.3 TCP of vaQgrip Click and VQ Series

The TCP of the vaQgrip Click varies depending on the selected configuration. Since vaQgrip Click is a modular vacuum gripper, the TCP changes based on the pod, dock, hub, reducer, offset, and vacuum cups used in the setup.

Users must calculate and update the TCP values in the robot controller after configuring or modifying the gripper assembly to ensure accurate motion, stable handling, and safe operation.

In the case of vaQgrip VQ Series, there is only one face for the case/carton to be picked. Hence, it is much more straightforward.

Product	VQ 10	VQ 20
X	0	0
Y	175	0
Z	161	172
RX	0	0
RY	0	0
RZ	0	0

Table 10: Tool Center Point of vaQgrip VQ Series

6.4 CoG for vaQgrip Click and VQ Series

The CoG of the vaQgrip Click varies depending on the selected configuration. Since vaQgrip Click is a modular vacuum gripper, the overall CoG changes based on the pod, dock, hub, reducer, offset, and vacuum cups used in the setup.

Users must calculate and update the CoG values in the robot controller after configuring or modifying the gripper assembly to ensure accurate motion, stable handling, and safe operation.

The CoG values for vaQgrip VQ10 and VQ20 are provided in the below table

Product	VQ10	VQ20
Weight	1.01kg	1.04kg
CX	-2.73	2.3
CY	-143.1	-0.9
CZ	80.1	92.7

Table 11: casemagiQ CoG until the suction cups

6.5 Program Tab

6.5.1 vaQgrip Tools

(1) vaQgrip Vacuum

The vaQgrip Vacuum node is used to control the vacuum outlet. The vacuum can be switched on and off using the vacuum On/Off buttons in the programming node.



Figure 25: vaQgrip vacuum node

(2) vaQgrip VQ Series Indicator

The vaQgrip Red/Green Indicator node is used to show the gripper status during operation. The indicators are mapped to the robot RO (Robot Output) signals to provide a clear visual indication. The Red indicator can be turn ON when the gripper is holding a box or carton, while the Green indicator turns ON when the gripper is not holding a box or carton.

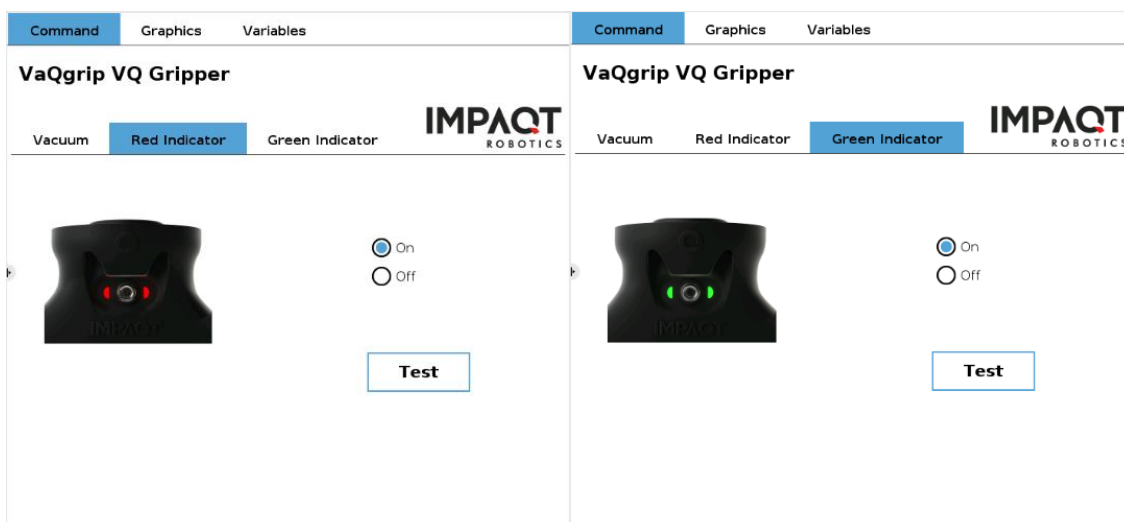


Figure 26: vaQgrip VQ Series Indicators