



USER MANUAL

FOR UR ROBOTS

v1.13.0

Original Instructions

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1. Introduction

1.1. Important Safety Notice



DANGER:

You must read, understand, and follow all safety information in this manual, and the robot manual and all associated equipment before initiating robot motion. Failure to comply with safety information could result in death or serious injury.

1.2. Scope of the Manual

The manual covers the following OnRobot products and their components:

1.2.1. VGC10

| Tool | Version |
|-------|---------|
| VGC10 | v1 |

1.2.2. Software and Firmware

1.2.2.1. URCap Software

The manual covers the following software versions:

| Software | Version |
|----------|---------|
| URCap | v5.13.0 |

1.2.2.2. Compute Box Software

The manual covers the following Compute Box software version:

| Software | Version |
|-------------|---------|
| Compute Box | v5.13.0 |



NOTE:

When the used Compute Box has lower software/firmware version, update the Compute Box. For detailed instructions, see [7.1.5. Web Client: Update Menu](#).

1.3. Naming Convention

1.3.1. Compute Box/Eye Box

Eye Box and Compute Box are used interchangeably.

1.4. Copyright

The information contained herein is property of OnRobot A/S and shall not be reproduced in whole or in part without prior written approval of OnRobot A/S. The information herein is subject to change without notice and should not be construed as a commitment by OnRobot A/S. This manual is periodically reviewed and revised.

OnRobot A/S assumes no responsibility for any errors or omissions in this document.

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2. Safety

The robot integrators are responsible for ensuring that the applicable safety laws and regulations in the country concerned are observed and that any significant hazards in the complete robot application are eliminated. This includes, but is not limited to:

- Performing a risk assessment for the complete robot system
- Interfacing other machines and additional safety devices if defined by the risk assessment
- Setting up the appropriate safety settings in the robot software
- Ensuring that the user will not modify any safety measures
- Validating that the total robot system is designed and installed correctly
- Specifying instructions for use
- Marking the robot installation with relevant signs and contact information of the integrator
- Collecting all documentation in a technical file; including the risk assessment and this manual

2.1. Intended Use

OnRobot tools are intended to be used on collaborative robots and light industrial robots with different payloads depending on the end-of-arm tooling specifications. OnRobot tools are normally used in pick-and-place, palletizing, machine tending, assembly, quality testing and inspection and surface finishing applications.

The end-of-arm tooling should only operate under conditions noted in [8.1. Technical Sheets](#) section.

Any use or application deviating from intended use is deemed to be impermissible misuse. This includes, but is not limited to:

- Use in potentially explosive atmospheres
- Use in medical and life critical applications
- Use before performing a risk assessment
- Use outside the permissible operational conditions and specifications
- Use close to a human's head, face and eye area
- Use as a climbing aid

2.2. General Safety Instructions

Generally, all national regulations, legislations and laws in the country of installation must be observed. Integration and use of the product must be done in compliance with precautions in this manual. Particular attention must be paid to the following warnings:

DANGER:

You must read, understand, and follow all safety information in this manual, and the robot manual and all associated equipment before initiating robot motion. Failure to comply with safety information could result in death or serious injury.

The information in this manual does not cover designing, installing, and operating a complete robot application, nor does it cover other peripheral equipment that can influence the safety of the complete system. The complete system must be designed and installed in accordance with the safety requirements set forth in the standards and regulations of the country where the robot is installed.

Any safety information provided in this manual must not be construed as a warranty, by OnRobot A/S, that the robot application will not cause injury or damage, even if robot application complies with all safety instructions.

OnRobot A/S disclaims any and all liability if any of OnRobot tools tooling are damaged, changed or modified in any way. OnRobot A/S cannot be held responsible for any damages caused to any of OnRobot tools tooling, the robot, or any other equipment due to programming errors or malfunctioning of any of OnRobot tools.

WARNING:

OnRobot tools are not allowed to be exposed to condensing conditions when power is on or when connected to a robot. If condensing conditions appear during transport or storage, the product must be placed between 20 and 40 Celsius degrees for 24 hours before power is applied or before connected to a robot.

It is recommended that OnRobot tools are integrated in compliance with the following guides and standards:

- ISO 10218-2
- ISO 12100
- ISO/TR 20218-1
- ISO/TS 15066

**WARNING:**

- The tools have to be properly secured before operating the robot.
- Keep fingers, clothes and hair away from the tool while the power is on.
- Always use protective glasses when working with sharp objects.
- Always ensure complete shutdown of the robot when working on the system for maintenance or inspection.
- Do not use the tools on people or animals.
- Do not perform any modification to the tooling.
- If the robot supports a bounded workspace/ speed/ force limit, make sure to use those features.
- Select robot trajectories that minimize risks of internal clamping between robot joints and tooling.

2.3. Risk Assessment

The robot integrator must perform a risk assessment on the complete robot application. OnRobot tools are only components in a robot application and therefore they can be only safely operated if the integrator has considered the safety aspects of the whole application. OnRobot tools are designed with relatively smooth and round design with a limited amount of sharp edges and pinch points

In collaborative applications, the trajectory of the robot can play a significant safety role. The integrator must consider the angle of contact with a human body, e.g. orientate OnRobot tools and workpieces so that the contact surface in the direction of movement is as large as possible. It is recommended that the tool connectors are pointed in the direction opposite to the movement.

OnRobot A/S have identified the potential hazards listed below as significant hazards that must be considered by the integrator:

- Objects flying from OnRobot tools due to loss of grip
- Objects falling down from OnRobot tools due to loss of grip
- Injuries due to collisions between humans and workpieces, OnRobot tools tooling, robot or other obstacles
- Consequences due to loosen of bolts
- Consequences if OnRobot tools cable gets stuck to something
- Workpiece itself represents a hazard

2.4. Environmental Safety

OnRobot A/S products must be disposed of in accordance with the applicable national laws, regulations and standards.

The product is produced with restricted use of hazardous substances to protect the environment; as defined by the EU RoHS Directive 2011/65/EU. These substances include mercury, cadmium, lead, chromium VI, polybrominated biphenyls and polybrominated diphenyl ethers.

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



RoHS



3. Operation Mode(s)

This document covers installation and operation for both:

- UR CB3 series robot controllers
- and UR e-Series robot controllers.

Since the two controllers have similar installation and operation screens in these cases only the e-Series screens are shown. Where the two requires different steps or screens it is highlighted and referred as:

- CB3 series
- e-Series.

3.1. Operation via Compute Box

The product(s) could be used on both UR series via Compute Box, which works with all products and product combinations. Differnet modes of operation require the same installation/operation steps. Where the via Compute Box mode requires different steps, it is highlighted and referred as via Compute Box.

3.2. Operation via UR's Tool Connector

The product(s) could be used on both UR series via UR's Tool Connector, which works with the following products:

- 2FG7 or
- 3FG15 (*Only on e-Series*) or
- MG10 ⁽¹⁾ or
- RG2 ⁽²⁾ or
- RG6 ⁽²⁾ or
- SG or
- VG10 or
- VGC10

Different modes of operation require the same installation/operation steps. Where the via Tool Connector mode requires different steps, it is highlighted and referred as via Tool Connector.

(1) When you use the CB3 tool connector, the following limitations apply to the MG10:

- The Smart grip feature is not available
- The Set finger offset feature is not available

(2) When you use the CB3 tool connector, the following limitations apply to the RG2 and RG6:

- The shown value of the read width (used as Current width and rg_Width) could be up to +/- 1 mm of the actual value. However, the repetition accuracy is still as specified.
- The Set finger offset feature is not available. The zero reference is set with the standard fingertips placed on the inner side.

4. HW Installation

4.1. Overview

For a successful installation the following steps will be required:

- Mount the components
- Setup the software

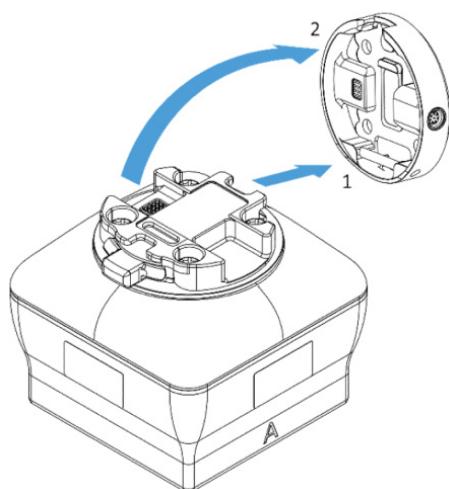
In the following sections, these installation steps will be described.

4.2. Robot Mount

1. Mount the robot-specific adapter (if applicable)
2. Mount any optional accessories
3. Mount the Quick Changer option
4. Mount the tool(s) (if applicable)

4.2.1. Tools

4.2.1.1. VGC10



Step 1:

Move the tool close to the Quick Changer as illustrated.

The hook mechanism (rod and hook tongue) will keep the lower part locked once mounted.

Step 2:

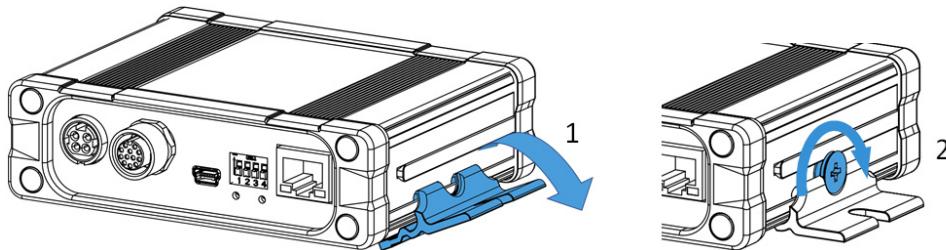
Flip the tool until it is fully mated, and you hear a clicking sound.

To unmount the tool, press the aluminum button on the Quick Changer and repeat the steps in the reverse order.

4.3. Compute Box Mount

4.3.1. Optional - Clip-on Bracket

Optionally, fix the Compute Box to a surface using the provided Clip-on Brackets (included only from 17th December 2020).



Do the following on both sides of the Compute Box:

1. Hook the Clip-on Bracket to the rail on the side of the Compute Box and then flip it down.
2. Fasten the Clip-on Bracket with the plastic screw.

4.4. Wiring via Tool Connector

DANGER:



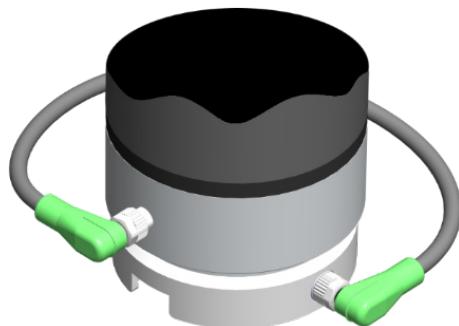
Use only original OnRobot tool data cables.

The following devices are supported in the operation mode via tool connector:

- 2FG7
- 3FG15 (Only for e-Series)
- MG10
- RG2 / RG6
- SG
- VG10 / VGC10

For e-Series

Connect the Quick Changer to the UR's tool connector.

**DANGER:**

Never connect the Quick Changer for I/O to an e-Series UR robot's Tool Connector.

**NOTE:**

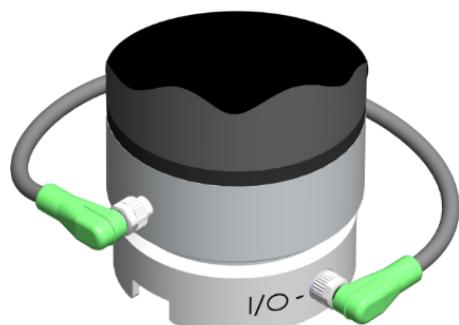
VG10 / VGC10 can only be attached when the UR controller is started (not in IDLE mode) and no program is running or completely powered off.

**CAUTION:**

Dual Quick Changer cannot be connected to the Tool Connector, it must be used via Compute Box.

For CB3

Connect the Quick Changer for I/O to the UR's tool connector.

**DANGER:**

Never connect the Quick Changer or Dual Quick Changer to a CB3 UR robot's tool connector.

Wiring via Tool Connector is finished.

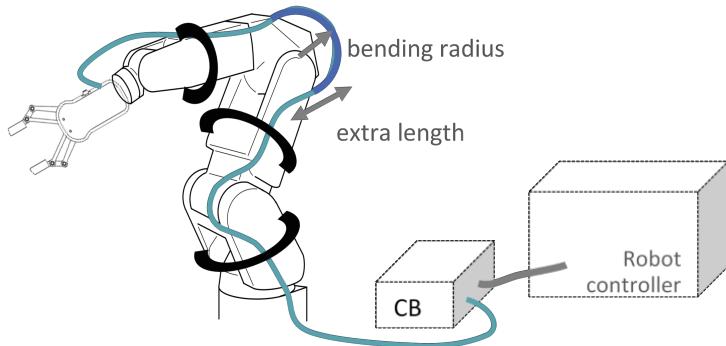
4.5. Wiring via Compute Box

**DANGER:**

Use only original OnRobot tool data cables.

Connect the following cables to wire the system:

- Tool data cable between the tool(s) and the Compute Box
- Ethernet cable between the robot controller and the Compute Box
- Power supply of the Compute Box



NOTE:

For the Quick Changer - Robot Side no cable is needed to be connected.

4.5.1. Ethernet Cable

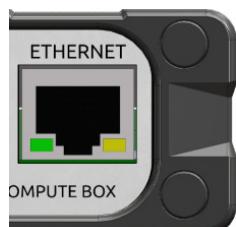
Connect one end of the supplied Ethernet (UTP) cable to the robot controller's Ethernet (LAN) port.



NOTE:

If the robot controller's Ethernet port is in use, use a standard 4-port Ethernet switch to be able to use two network devices at the same time.

Connect the other end of the supplied cable to the Compute Box's ETHERNET connector.



CAUTION:

Use only shielded, maximum 3m long Ethernet cables.



WARNING:

Check and make sure that the Compute Box enclosure (metal) and the robot controller enclosure (metal) are not connected (no galvanic connection between the two).

4.5.2. Compute Box DIP Switch Settings

Set the DIP switches of the Compute Box as follows:



Set the DIP switch 3 to ON and the DIP switch 4 to OFF position.

For more information about the Ethernet interface settings, see [7.1.1. Ethernet Interface Setup](#).

4.5.3. Power Supply: Compute Box

Connect the supplied power supply to the Compute Box 24V connector.



NOTE:

To disconnect the power connector, make sure to pull the connector housing (where the arrows are shown) and not the cable.



CAUTION:

Use only original OnRobot power supplies.

Finally, power up the power supply that will power the Compute Box and the connected Tool(s).

4.5.3.1. VGC10

| Power Supply | |
|--------------|---|
| 1.5 A | ✓ |
| 5 A | ✓ |
| 6.25 A | ✓ |

5. SW Installation

5.1. Robot Software Setup

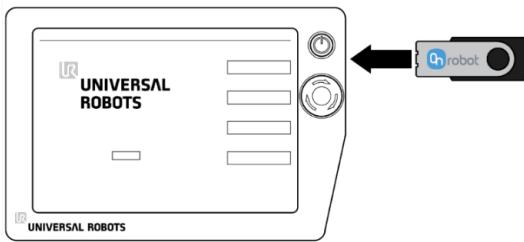
5.1.1. Install URCap

UR CB3


NOTE:

The minimum UR PolyScope version is **3.13.1**. Please remove all previous OnRobot URCap version(s) before the installation. The controller version must be CB3.1.

1. Insert the OnRobot USB drive in the USB slot on the right side of the Teach Pendant.



2. Select the **Setup Robot** option from the main menu, then the **URCaps** option.
3. Tap on the + sign to browse for the OnRobot URCap file. It can be found in the usbdisk/UR/URCAP folder. Tap on **Open**.

UR e-Series


NOTE:

The minimum UR PolyScope version is **5.12.4**. Please remove all previous OnRobot URCap version(s) before the installation.

1. Insert the OnRobot USB drive in the USB slot on the top right side of the Teach Pendant.



2. Then tap on the menu (top right corner of the screen), then from the **System** section tap on the **URCaps** menu.
3. Tap on the + sign to browse for the OnRobot URCap file. It can be found in the usbdisk/UR/URCAP folder. Tap on **Open**.

- The system needs to be restarted for the changes to take effect. Tap on the **Restart** button and then wait for the system to be restarted.



- Initialize the robot.



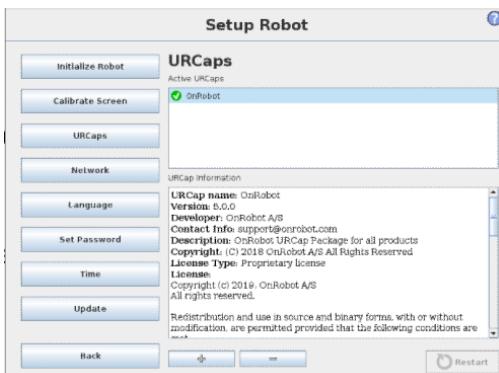
NOTE:

For more information on the URCap installation please refer to UR documentation.

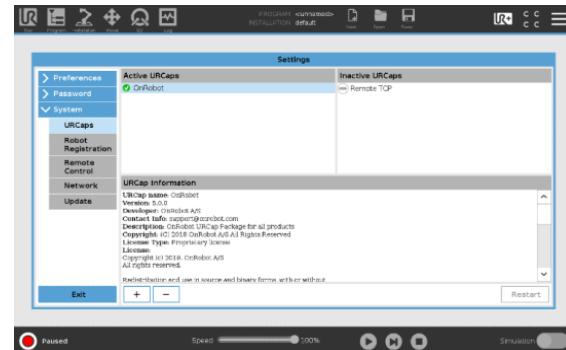
5.1.2. Uninstall Software

UR CB3

- Select the **Setup Robot** option from the main menu, then the **URCaps** option.
- Select the OnRobot URCap file.
- Tap on the - sign.
- Then the system needs to be restarted for the changes to take effect. Tap on the **Restart** button and then wait for the system to be restarted.



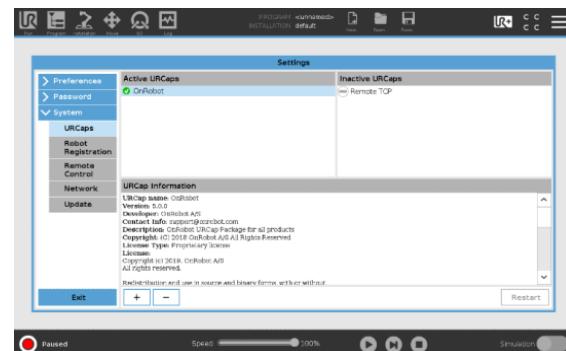
- Then the system needs to be restarted for the changes to take effect. Tap on the **Restart** button and then wait for the system to be restarted.



- Initialize the robot.

UR e-Series

- Tap on the **≡** menu (top right corner of the screen), then from the **System** section tap on the **URCaps** menu.
- Select the OnRobot URCap file.
- Tap on the - sign.
- Then the system needs to be restarted for the changes to take effect. Tap on the **Restart** button and then wait for the system to be restarted.

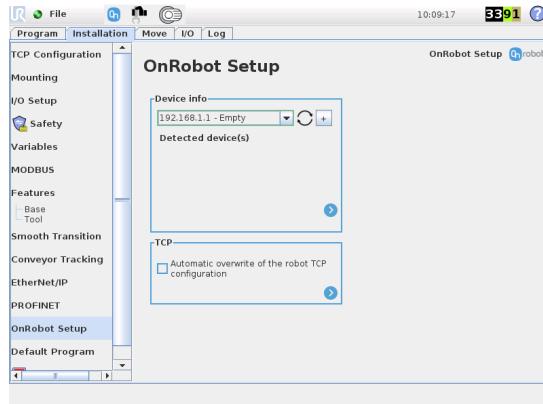


5. Initialize the robot.

5.1.3. URCap Setup

UR CB3

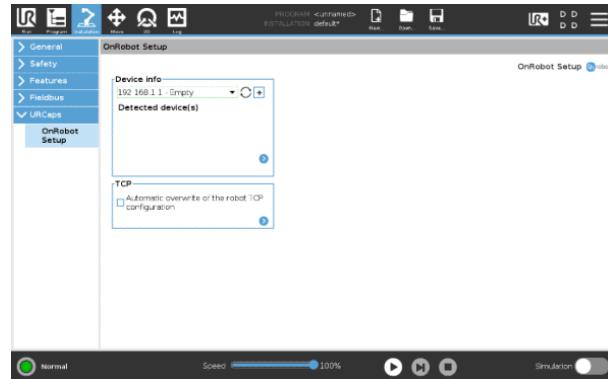
Select the **Installation** tab, then select **OnRobot Setup**. The following screen is shown:



5. Initialize the robot.

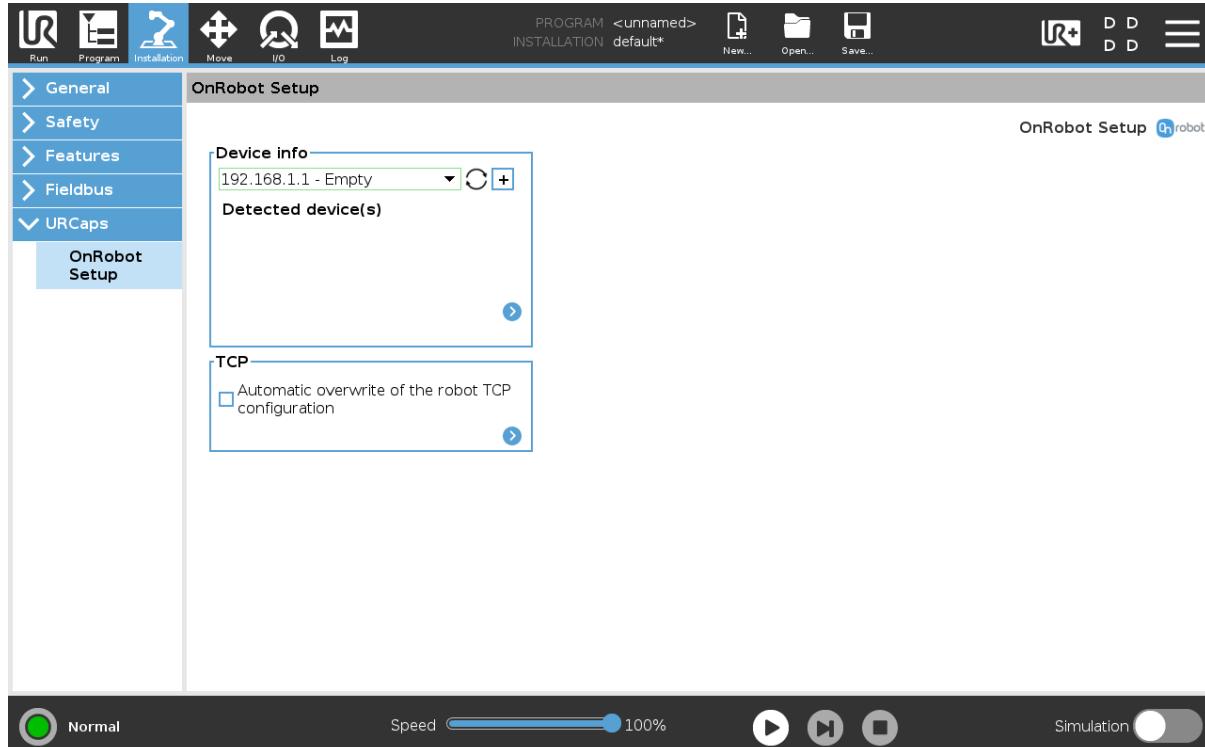
UR e-Series

Tap on the **Installation**  tab in the top menu. Then tap on the **URCaps**.



5.1.3.1. Device Info

In the normal view of the panel, the available functions are shown below:



Device info

Dropdown menu to select a device-robot communication channel: Discover the connected devices.

Use the reload button  to find new available devices.



NOTE:

After setting up the device the changes need to be saved to be part of the current installation.

For the e-Series UR robots tap on the **Save** button  (from the top menu and use the **Save Installation** button .

For the CB3 UR robots use the **Save** button .



NOTE:

To use the newly discovered devices you might need to restart PolyScope. To do that simply press the **Restart now** button. Remember to save it before, if there are any unsaved changes in your program or settings.

OnRobot products are checked after the robot is restarted and the saved settings are restored while loading a program. That check could take up to 5 seconds via the Quick Changer for I/O. Therefore make sure to wait at least 5 seconds before you start your program. To make sure that the device is connected check the **Device info**.

If the connected OnRobot product is changed, always go to the **Device info** to check if the change was successful.



CAUTION:

After any error message is shown that is related to the connection to our devices, please go to the **Device info** to make sure that the right settings (e.g.: TCP) are used.

No connection: If you want to use OnRobot URCap and there are no connected devices, select **No connection** from the dropdown menu and no error message will show up.

Load multiple devices: The  automatically loads the selected devices to the UR environment, even if the device is not connected to the robot. When you change between loaded devices, the robot does not require a restart but you should press the reload button  to refresh the detected devices.



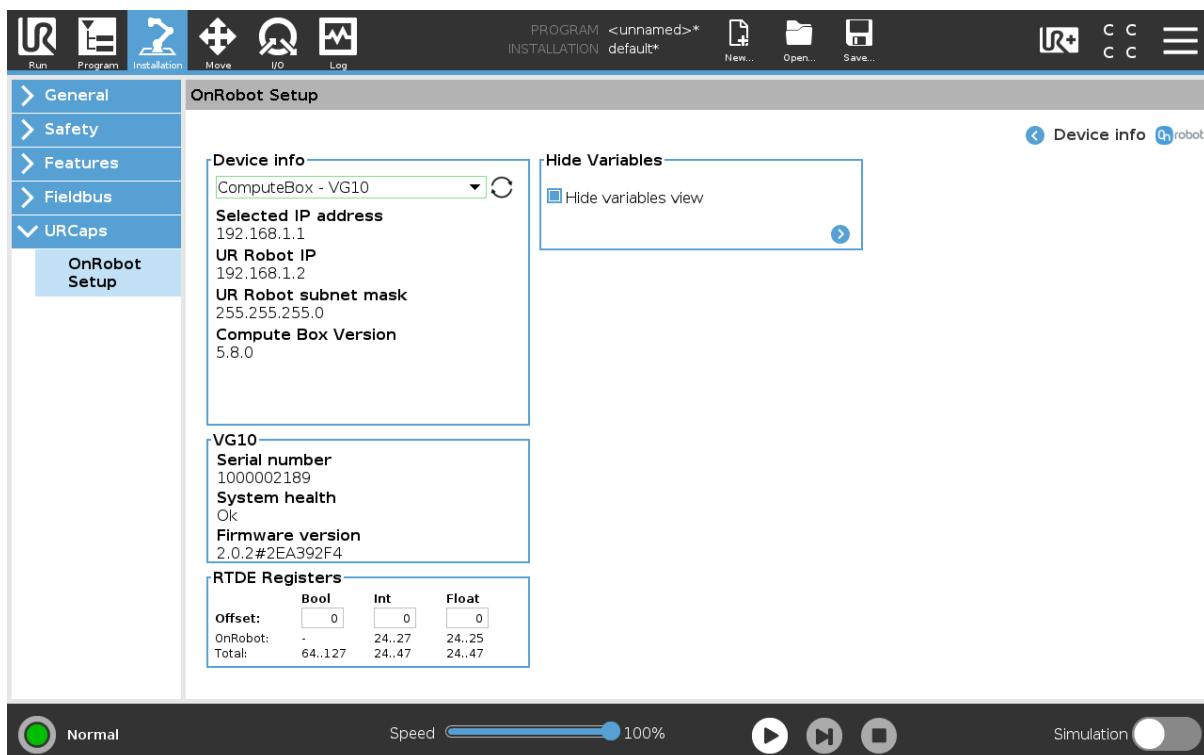
WARNING:

When multiple devices are activated, you may experience slow URCap operation. In this case, activate only the devices that you use. It is recommended to activate up to two devices at the same time.

For each loaded device, the appropriate URCaps commands and Toolbar will be visible, hence load only the devices that you will change frequently.

Detailed parameters of the Device Info

To get more information about the devices press on  and the following screen will show:



Device info

The **Selected IP address**, **Compute Box Version**, **UR Robot IP** and **UR Robot subnet mask** are shown.

Errors

This displays information about the errors if there is any.

Device name

The **Serial number**, **System health** and **Firmware version** are shown.

Update: this will update the firmware if an update is available.

Depending on the selected devices, different panels will become available to configure the devices.

RTDE Registers

OnRobot uses RTDE registers to communicate with UR. Real-Time Data Exchange (RTDE) is an interface that can be used to send data for the robots through registers. For more information about RTDE registers, see UR's [Real-Time Data Exchange \(RTDE\) Guide](#).

You need this option if you use OnRobot devices with other vendors' devices and OnRobot registers might overlap other vendors' registers.

OnRobot uses three different types of registers: **Bool**, **Int** and **Float**.

Offset: Offsets the registers by the amount that is written in the certain field.

OnRobot: Shows the number of registers that OnRobot uses of the certain type.

Total: Shows the maximum number of registers of the certain type that is available in UR.

Check other vendors' registers to make sure that the registers that you are using are not used by other vendors. If your registers overlap other vendors' registers, offset them by writing a certain value in the **Offset** fields. If the offset value is too high, the number of OnRobot registers can exceed the number of **Total** registers. In this case the values will turn red in the **OnRobot** row.

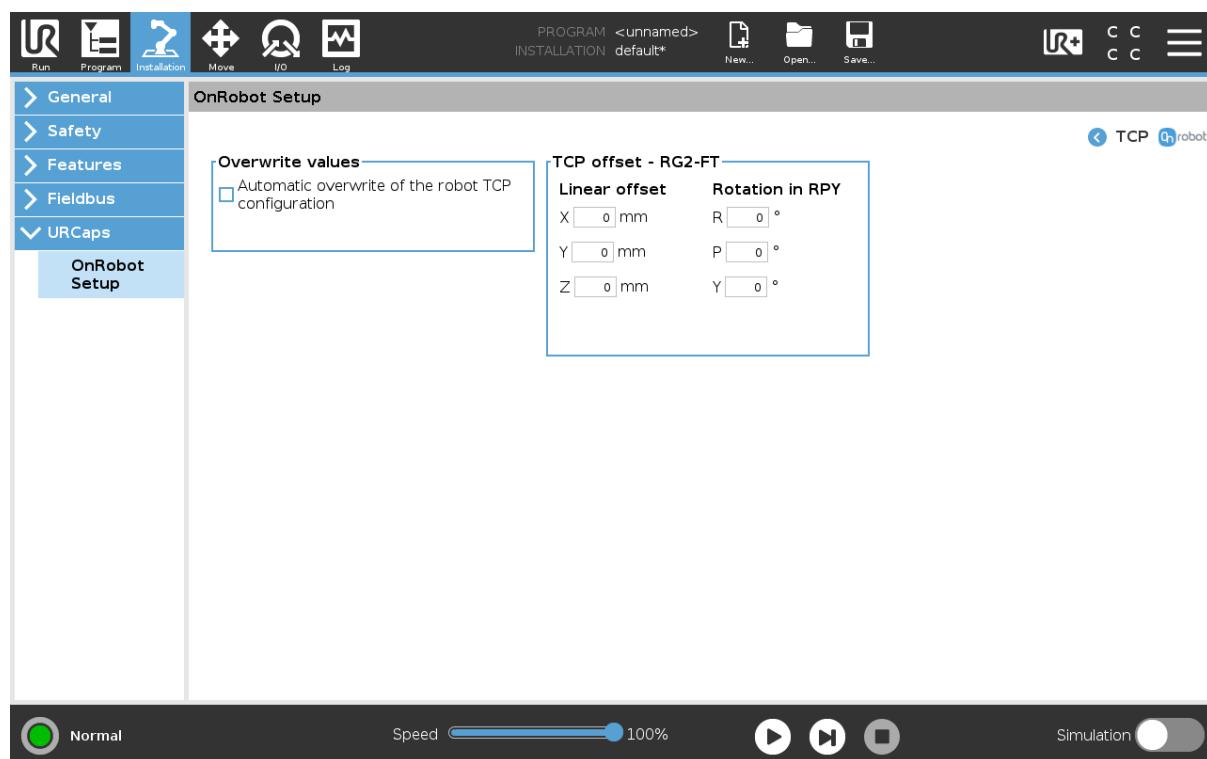
Hide Variables

A list of selectable variables. When a variable is selected to hide, it will not appear on the configuration panel.

TCP

In the normal view of the panel the TCP of the robot can be overwritten by the TCP of the tool by pressing the **Automatic overwrite of the robot TCP configuration** checkbox.

To see more options press on  and the following screen will show:



Overwrite values

Automatic overwrite of the robot TCP configuration: when checked, the UR's TCP configuration is automatically overwritten (Dynamic TCP mode). When unchecked the TCP is left unchanged (Static TCP mode).

For further information and best practices on the TCP setting see [6.4. TCP Configuration](#) section.

TCP offset

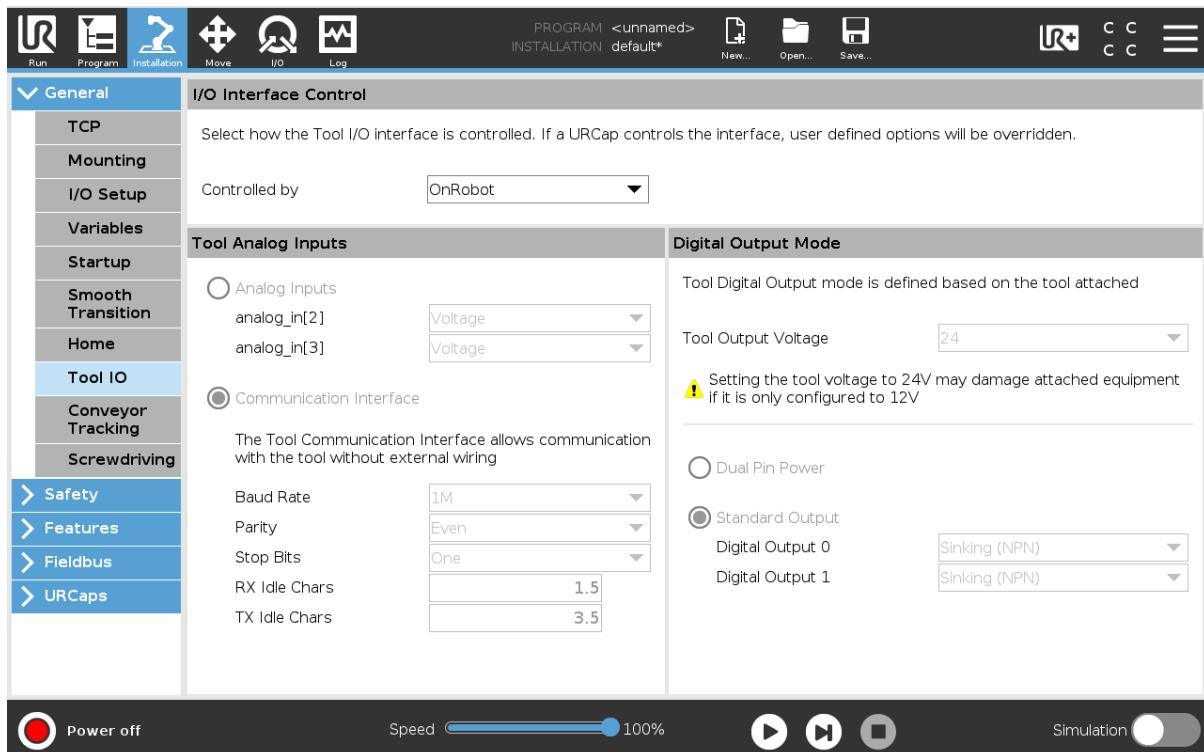
Set the **Linear offset** (X,Y,Z) and the **Rotation in RPY** (Roll-Pitch-Yaw) values to adjust the OnRobot device dependent calculated TCP.

5.1.3.2. Setup Tool Connector

On the **Device Info** page, select Tool Connector from the dropdown menu.

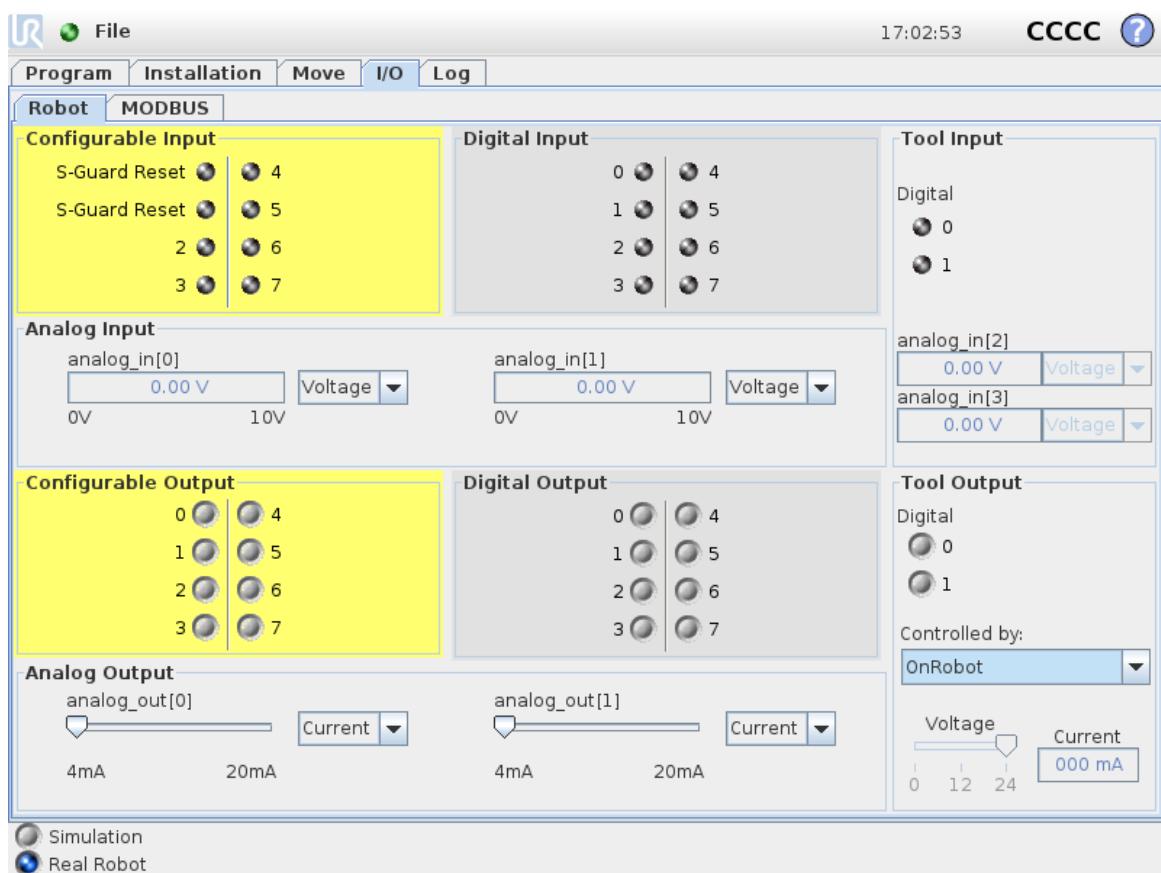
To communicate through the tool connector on an e-Series UR robot please set the following configuration:

1. Press the **General** dropdown menu on the left side.
2. Press the **Tool IO** tab.
3. In the **Controlled by** dropdown menu select **OnRobot** as shown in the image below.
4. Make sure to save the changes to be part of the current installation.



To communicate through the tool connector on CB3 UR robot please set the following configuration:

1. Go to the **I/O** tab.
2. In the **Controlled by** dropdown menu select **OnRobot** as shown in the image below.
3. Make sure to save the changes to be part of the current installation.

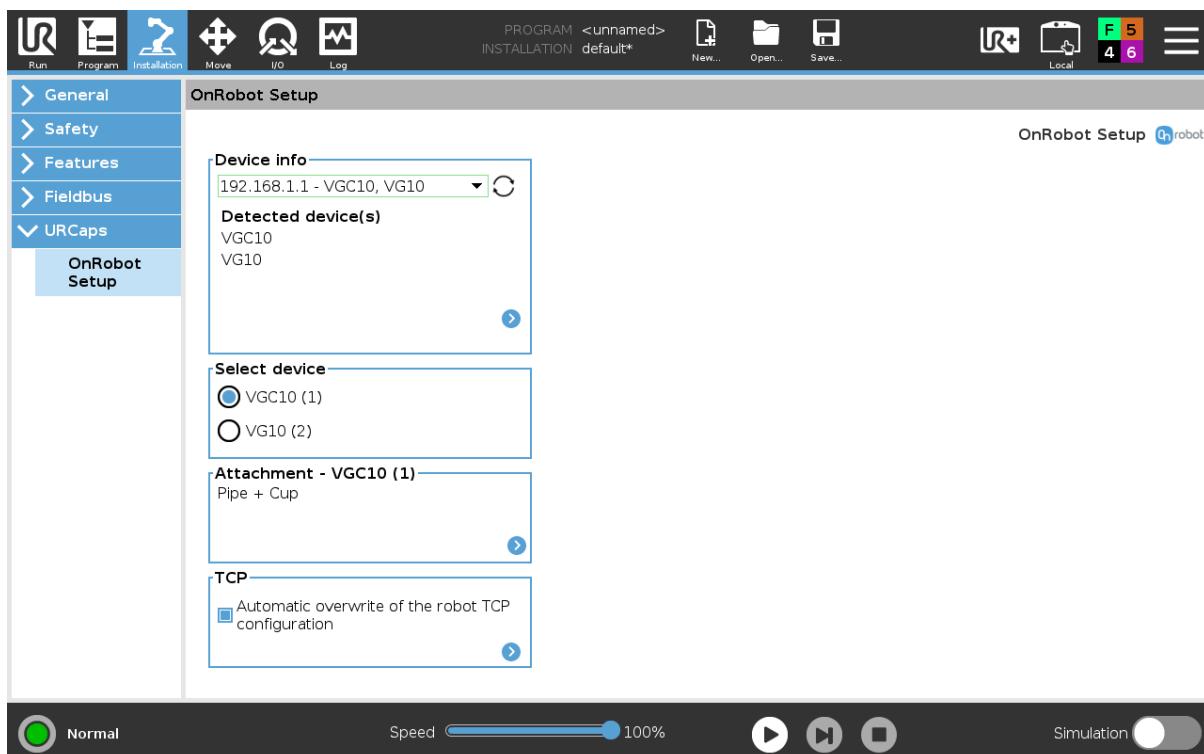


NOTE:

If the Tool connector option is selected in the **Device info** drop-down menu but no OnRobot product is connected to the tool connector then a background service program is running every 2 seconds. In addition to that the Tool IO is set to be logic high and low randomly.

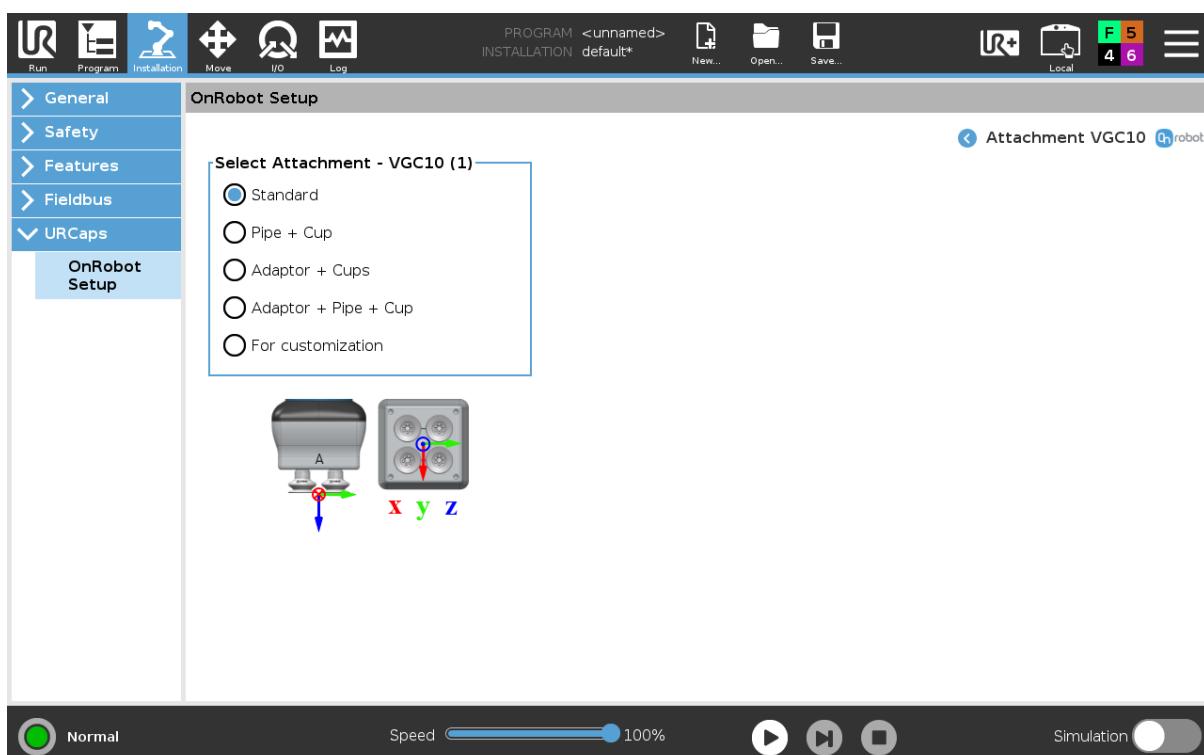
5.1.3.3. VGC10

The configuration panels for the VGC10 are shown in the image below:



Attachment

In the normal view of the panel, the selected attachment types such as **Standard, Pipe + Cup, Adaptor + Cups, Adaptor + Pipe + Cup** and **For customization** are mentioned. This configuration panel is used to set the TCP in the right position as well as to move the Center of Gravity of the workpiece to the new TCP. To select a different attachment configuration press on .



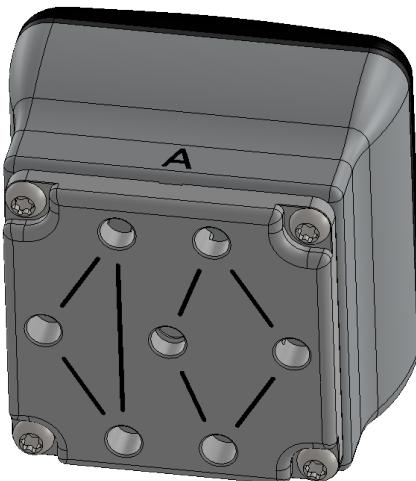
Here the actual mounting can be selected to set up the TCP correctly. The different options are:

- **Standard:** Device with only four cups attached to it. This selection will set the TCP at the center of the end side of the cups (see table below).
- **Pipe + Cup:** Device with the extension pipe with a cup placed in the right side using the letter A as reference. This selection will set the TCP at the end of the cup placed on the extension pipe (see table below).
- **Adaptor + Cups:** Device with the adaptor with cups. This adaptor allows to create several configurations. This selection will set the TCP at the center of the end side of the cups, considering also the adaptor height (see table below).
- **Adaptor + Pipe + Cup:** Device with the adaptor with the extension pipe in the middle with a cup. This selection will set the TCP at the end of the cup placed on the extension pipe (see table below).
- **For customization:** Device with no attachments on. This selection will set the TCP at the center of the bottom side of the device (see table below). This option is useful when the user utilizes a customized configuration and, to edit the offset of the TCP, wants to start by having a reference at the end of the device with no attachments on.

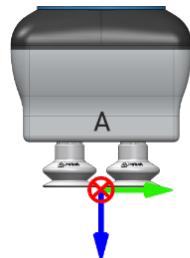
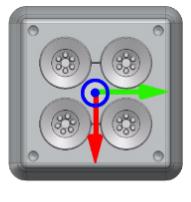
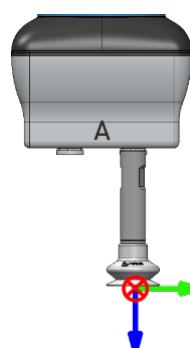
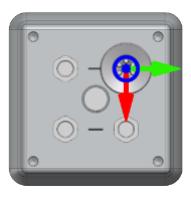
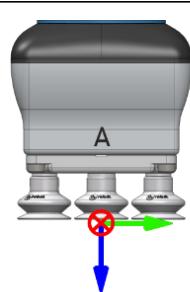
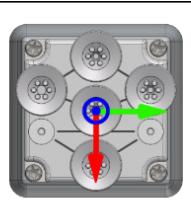
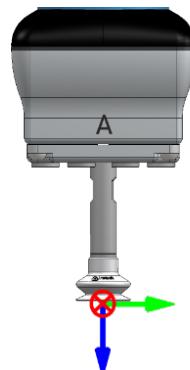
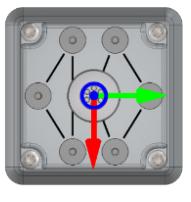
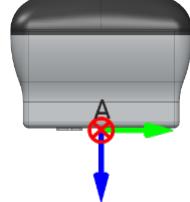
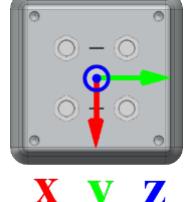


NOTE:

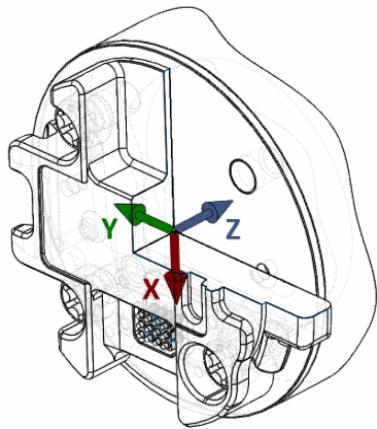
A higher flow can be achieved, by combining both channels, if the adaptor place is mounted 90° rotated as shown in the picture below. See more info in subsection [Adaptor Plate](#).



The table below provides an overview of the different attachment combinations, the TCP values that will be set in the robot and an image with a visual representation of the TCP location.

| Attachment | TCP (x, y, z) [mm] | Image |
|-----------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard | (0, 0, 100) |   X Y Z |
| Pipe + Cup | (-17, 17, 150) |   X Y Z |
| Adaptor + Cups | (0, 0, 110) |   X Y Z |
| Adaptor + Pipe + Cup | (0, 0, 160) |   X Y Z |
| For customization | (0, 0, 75) |   X Y Z |

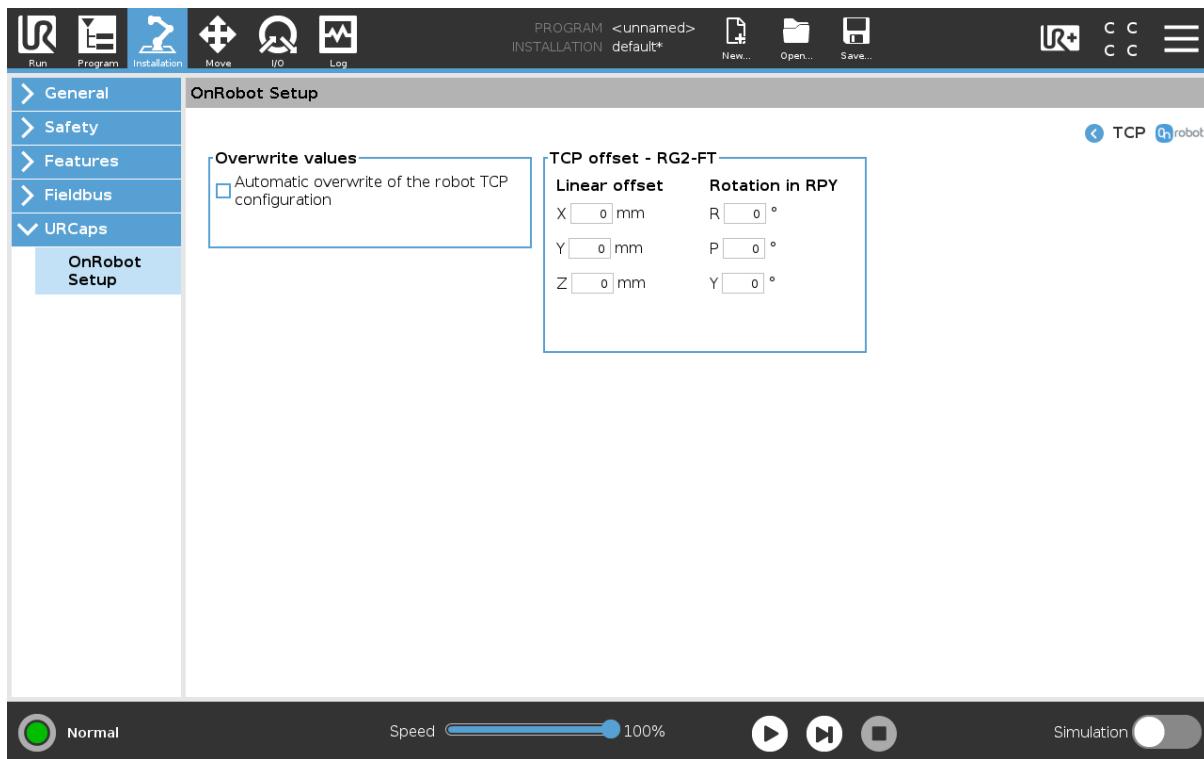
The TCP values have their origin in the top part of the gripper as shown in the image below.



TCP

In the normal view of the panel the TCP of the robot can be overwritten by the TCP of the tool by pressing the **Automatic overwrite of the robot TCP configuration** checkbox.

To see more options press on  and the following screen will show:



Overwrite values

Automatic overwrite of the robot TCP configuration: when checked, the UR's TCP configuration is automatically overwritten (Dynamic TCP mode). When unchecked the TCP is left unchanged (Static TCP mode).

For further information and best practices on the TCP setting see [6.4. TCP Configuration](#) section.

TCP offset

Set the **Linear offset** (X,Y,Z) and the **Rotation in RPY** (Roll-Pitch-Yaw) values to adjust the OnRobot device dependent calculated TCP.

6. Operation



NOTE:

It is assumed that the Installation has finished successfully. If not, first do the installation steps in the previous section.

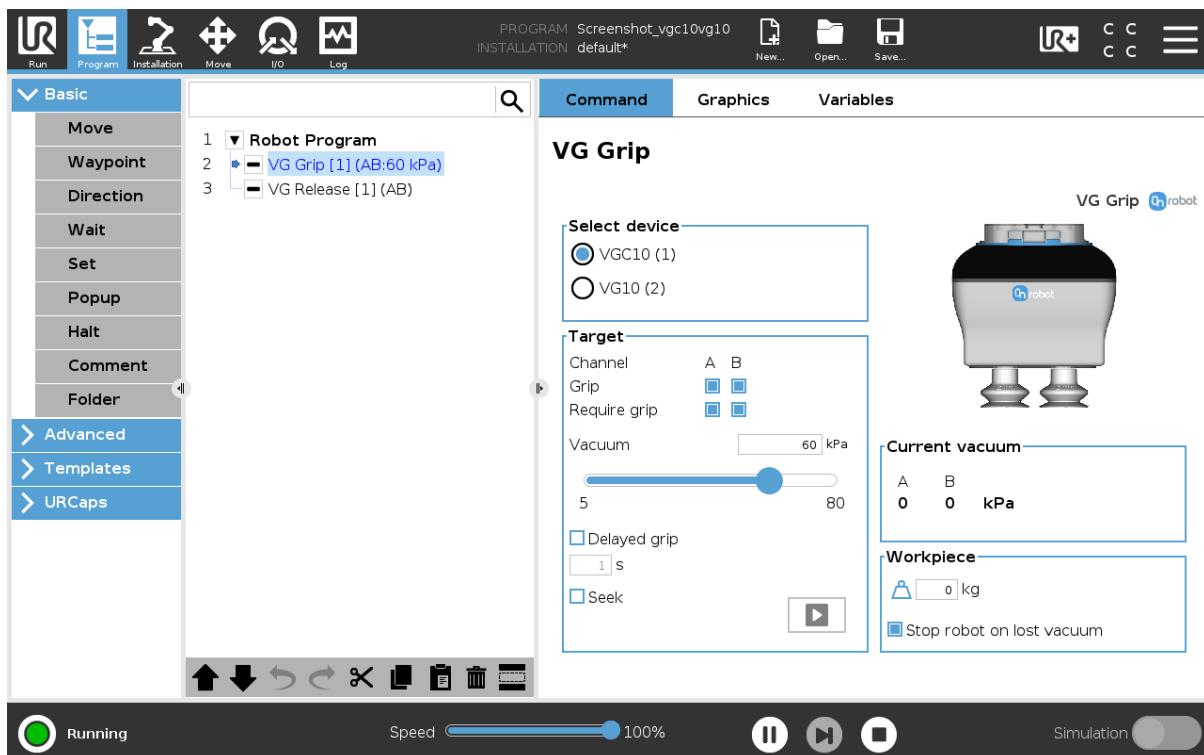
6.1. URCap Commands

URCap commands provide an easy way to program an application.

6.1.1. VG10/VGC10

VG Grip

This command is used to activate the pump and generate vacuum to grip a workpiece.



Select device

When two grippers are used, you can select which gripper performs the action.

Target

Channel(s): Select which channel performs the action. It is possible to select channel A, B or both. To see which one is channel A and B, for VG10 see stickers under the arms and for VGC10 see the letters on the sides on the housing.

Grip: Select which channels will turn on the vacuum. Each selected channel will try to achieve the target vacuum. You can select any combination of channels A, B, or you can select all channels at once. At least one channel must be selected.

Require grip: Select which of the above selected channels must achieve the target vacuum. If the target vacuum is not achieved within 3 seconds, the channel will go to a grip error state and an error popup will be displayed.

If you select a channel in the **Require grip** row, that channel will automatically be selected in the **Grip** row.

If you select a channel in the **Grip** row and you do not select **Require grip** for it, the channel will try to achieve the target vacuum but no errors will be reported for the channel if the target vacuum is not achieved. The vacuum pump will continue to run whether something is gripped or not in this case.

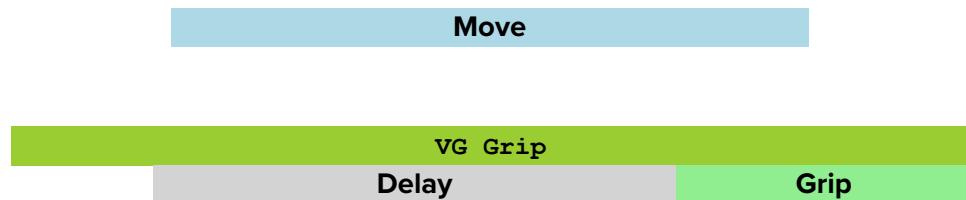
Vacuum: The higher the vacuum is set (up to 80 kPa) the more the lifting power is.

Delayed grip: Using this option, you can save cycle time.

When the **Delayed grip** option is not used, the robot moves to a certain point and then grips the workpiece. The cycle consists of the length of the **Move** command and the length of the **Grip** command.



When the **Delayed grip** option is used, you start the **VG Grip** command before the **Move** command and you delay it. This way the vacuum can build up gradually while the robot is still moving. The cycle time becomes shorter this way.



Make sure you always set the delay time to a smaller value than the length of the **Move** command. Otherwise the **Delayed grip** option will not save any time.

The delay value should be the length of the **Move** command minus 0.5 s.

 : Executes the command.

When any of the VG grippers is used in combination with a HEX-E/H QC the following extra option becomes available:

Seek and auto level: when checked, the gripper will be moved by the robot in the +Z direction (in Tool coordinate system) until it reaches a surface (this is the seek part) with both channels. This feature is only useful if both channels are going to do the grip at the same time. During the motion the gripper's orientation is automatically adjusted to be parallel to the surface (this is the auto level part).

**NOTE:**

In order to help the Auto-level part to function, make sure to use the same suction caps for A and B channels and set the arms to be symmetrical.

When any of the VG grippers is used without a HEX-E/H QC but used on an E-series controller the following extra option becomes available:

Seek: when checked, the same seeking action will happen as above. Since the auto leveling part is not used the VG grippers need to be parallel to the surface.

**NOTE:**

Setting a lower vacuum gives a faster grip with less wear on the vacuum cups. It also reduces the risk of leaving suction marks on delicate workpieces.

It can take a few seconds when pressing **Play** or **Test** before the robot program starts. This is normal.

When the two channels are set to different vacuum percentages the VG grippers automatically release air into the channel with lower pressure. This feature is activated when the pressure is more than 20% vacuum over the setting. Releasing air generates a characteristic rumbling sound and change in pumping speed.

Current vacuum

Displays the current vacuum level for each channel.

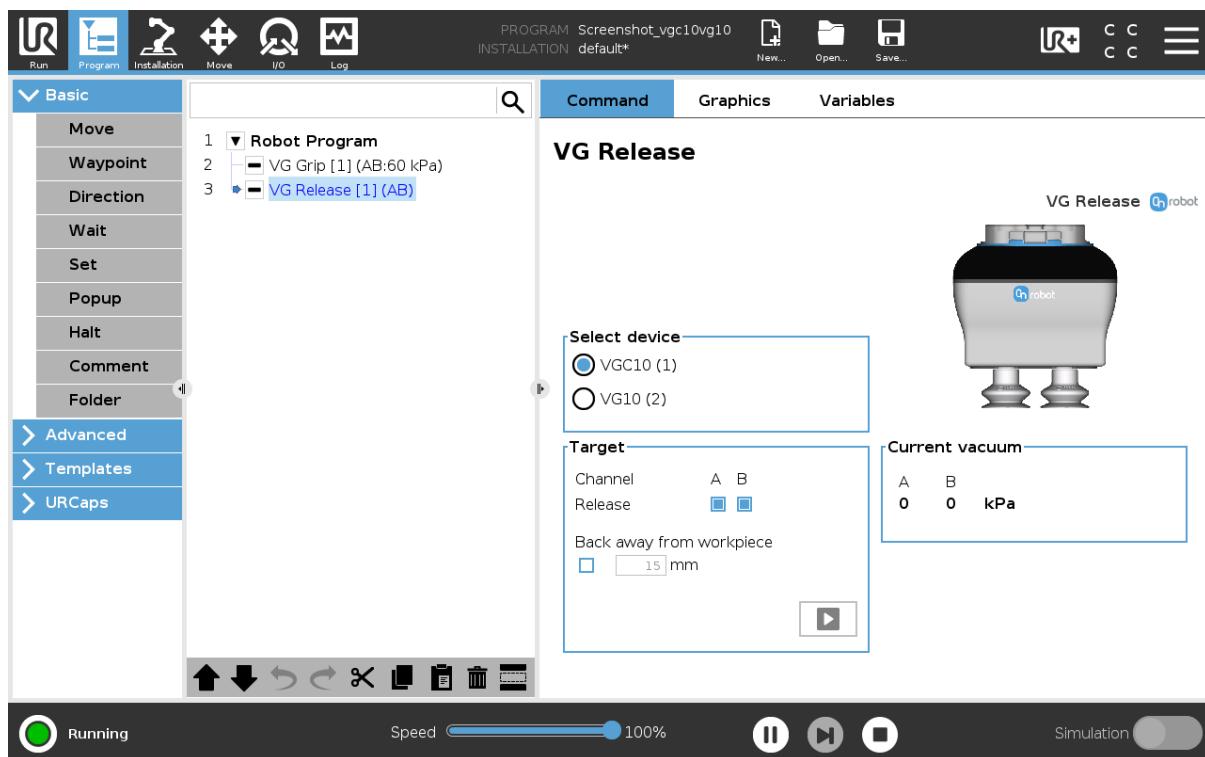
Workpiece

: Enter the workpiece weight. Then the URCap software calculates the resulting payload mass considering the gripper, the Quick Changer, and the workpiece mass.

Stop robot on lost vacuum: When this option is selected, the vacuum is monitored continuously. If the vacuum disappears unexpectedly, the robot will stop the movement and displays a popup window.

VG Release

This command is used to release the grip of the workpiece by removing vacuum.



Select device

When two grippers are used, you can select which gripper performs the action.

Target

Channel(s): Select which channel performs the action. It is possible to select channel A or both. To see which one is channel A and B, for VG10 see stickers under the arms and for VGC10 see the letters on the sides on the housing.

Release: Select which channels will turn off the vacuum. You can select any combination of channels A, B, or you can select all channels at once. At least one channel must be selected.

Back away from workpiece: When the workpiece is released, the robot will travel away 15 mm.



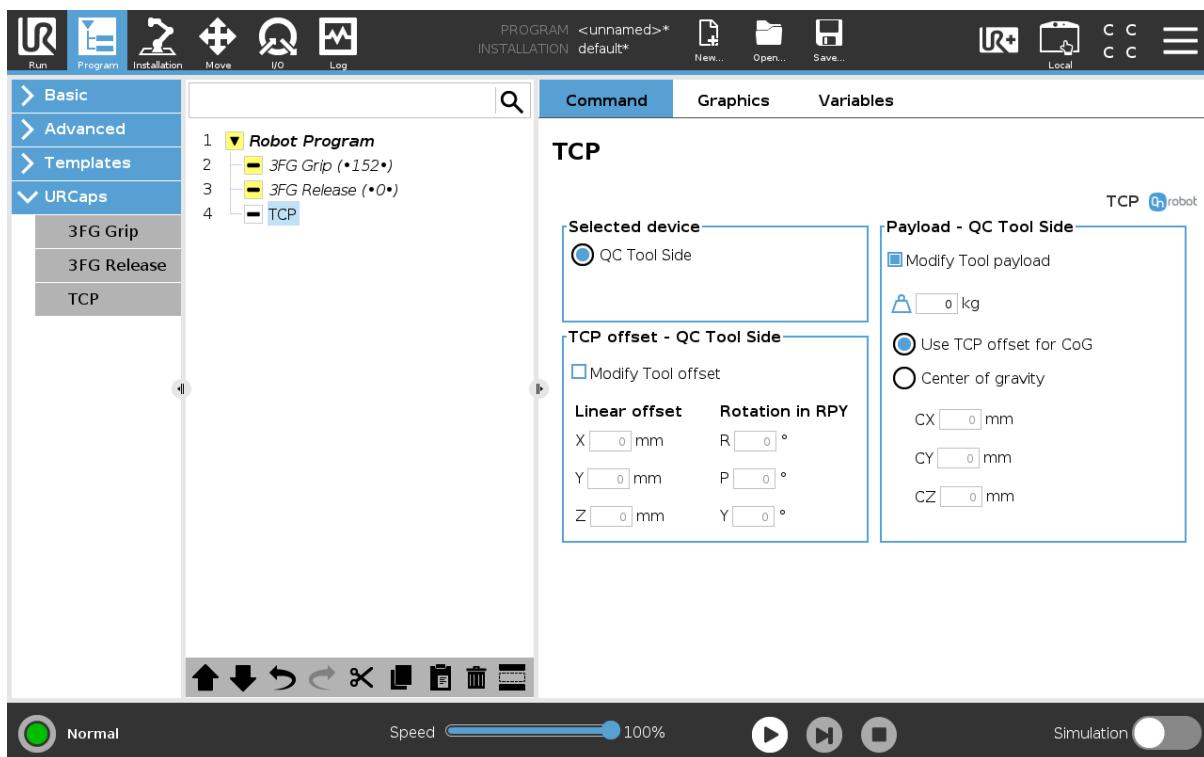
: Executes the command.

Current vacuum

Displays the current vacuum level for each channel.

TCP

The TCP command is used to set the current TCP and/or payload for the robot.



TCP offset

Set the **Linear offset** (X,Y,Z) and the **Rotation in RPY** (Roll-Pitch-Yaw) values to adjust the OnRobot device dependent calculated TCP.

Payload

Modify Tool payload: If enabled the UR's payload will be overwritten.

 enter the workpiece mass that is attached to the device. The device own mass is added automatically.

Use TCP offset for CoG: set the center of gravity of the workpiece at the active TCP position.

Center of gravity CX, CY, CZ: set the location of the center of gravity of the workpiece.

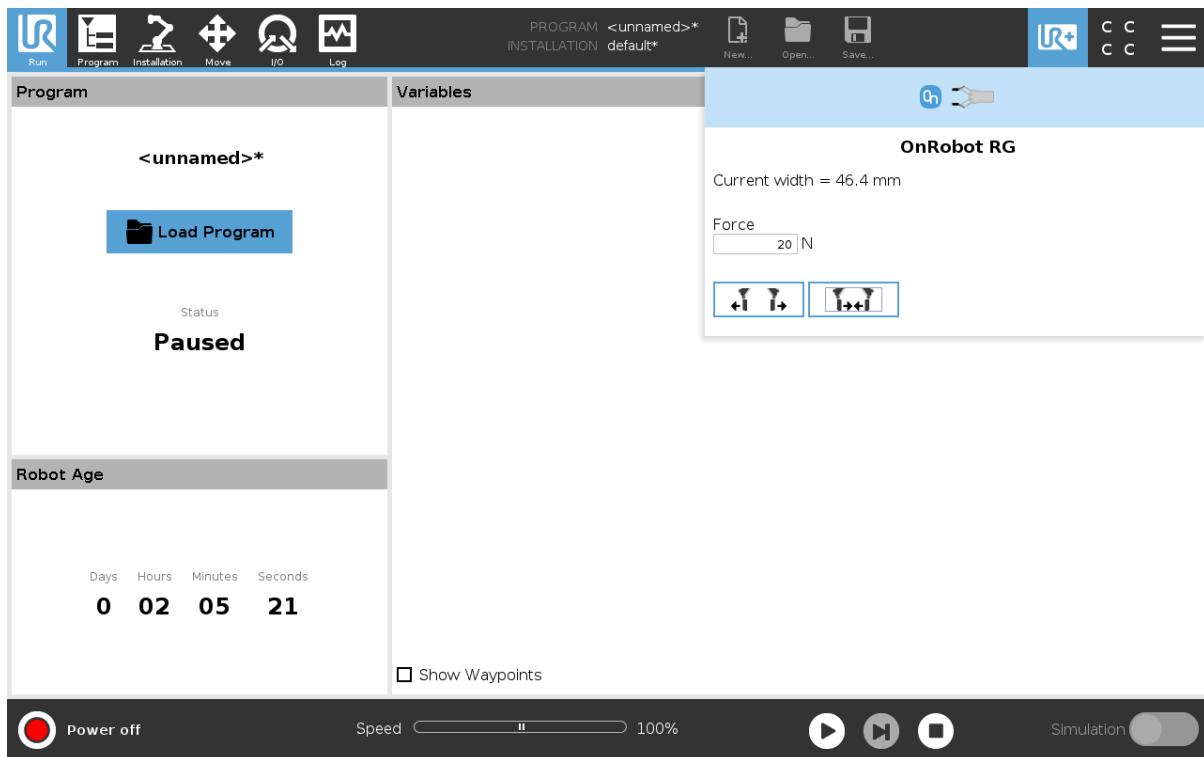
6.2. URCap Toolbar

The Toolbar makes it simple to operate the tools while you are programming or during runtime.

How to Access the Toolbar

The way how the toolbar can be accessed is different on the e-Series and the CB3 UR robots, but the functionality is the same.

To open up the toolbar in the e-Series, press on the UR+ icon  on the top right side. Then press on the OnRobot icon .



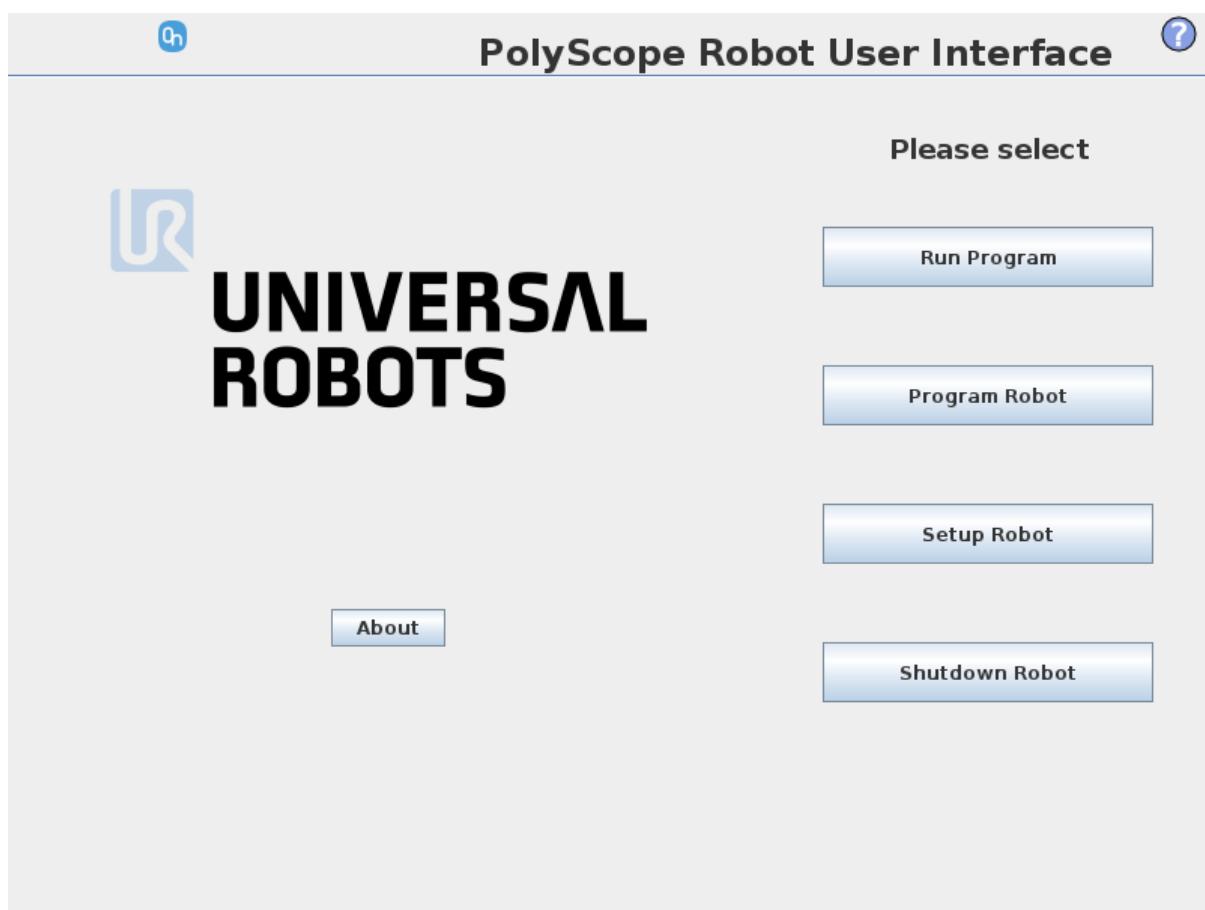
Each OnRobot End of Arm Tooling has its own functionality and that is explained in the sections below.

To open up the toolbar in the CB3, press on the OnRobot icon  on the top left side. The icon might take around 20 seconds to appear after robot power up.

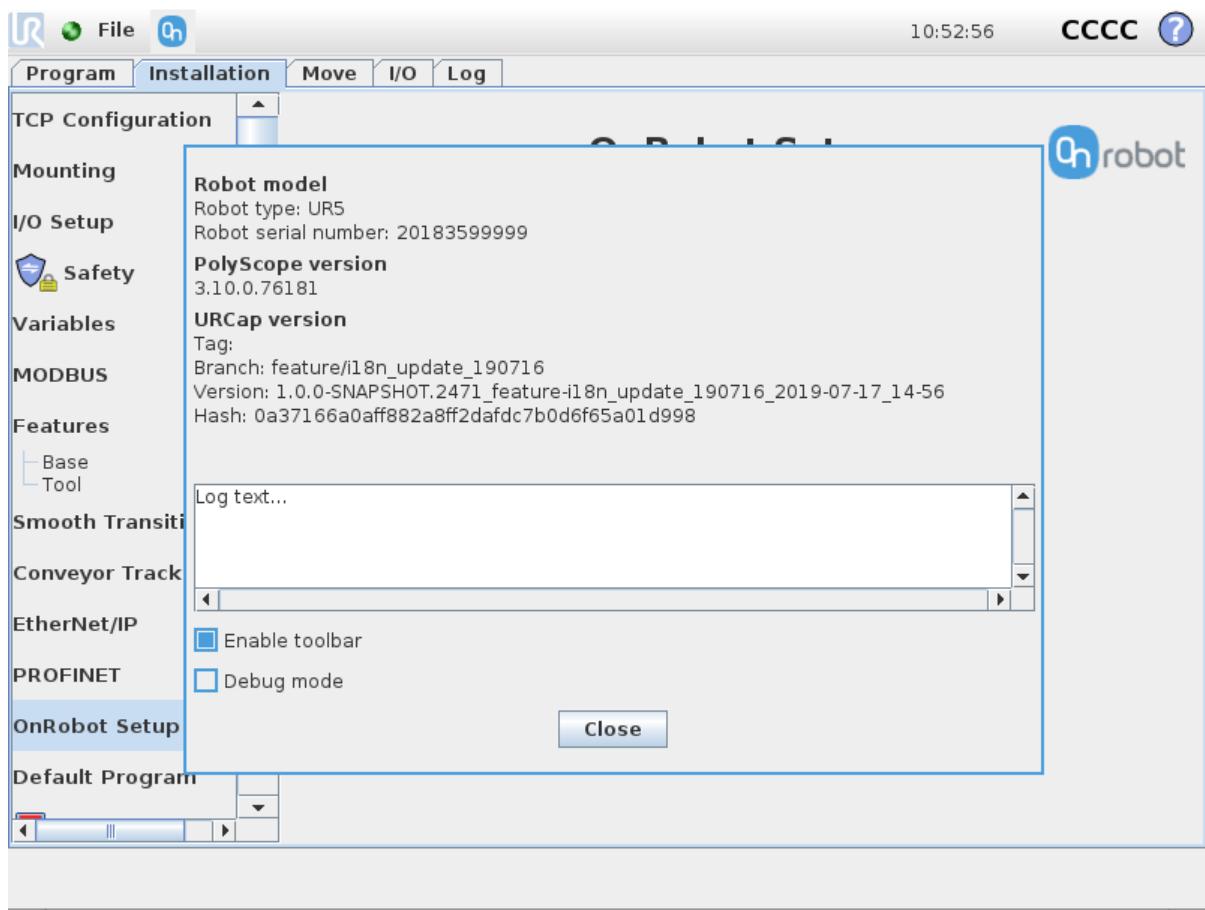


NOTE:

All toolbars are disabled while any robot program is running. Some toolbars are also disabled and cannot be used while the robot is not initialized.



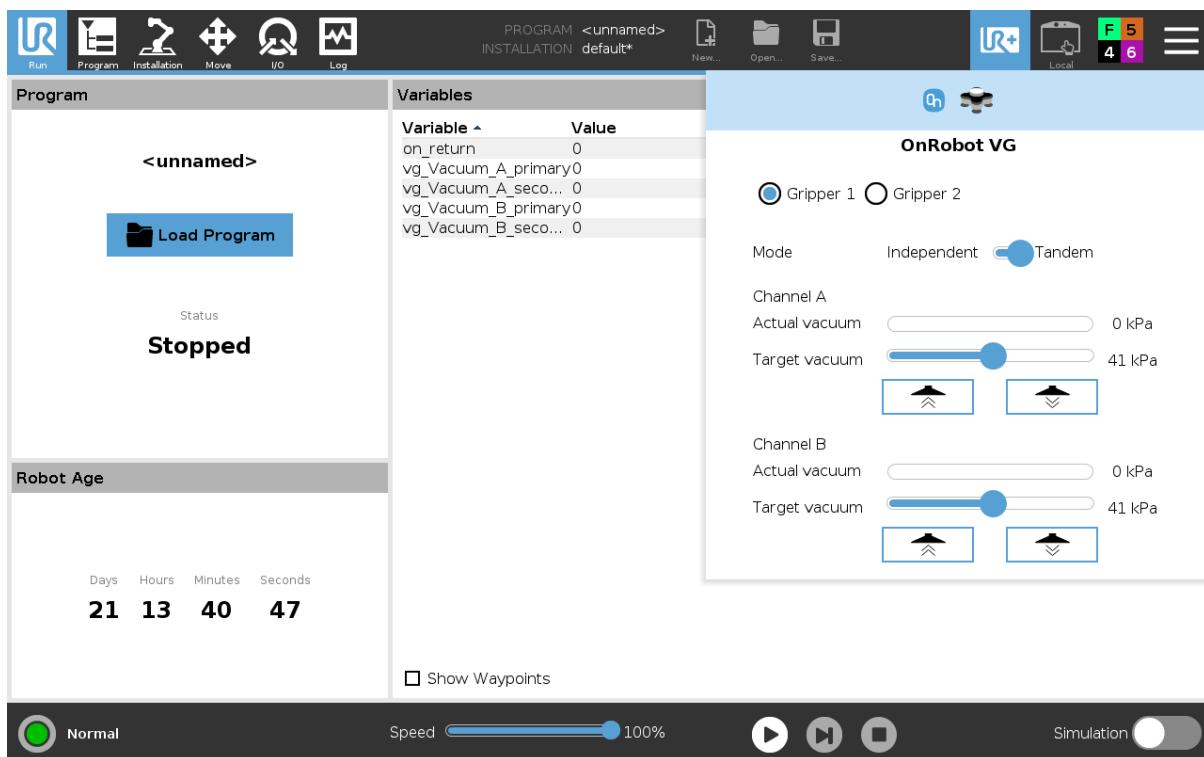
To enable/disable the toolbar, press on the OnRobot logo  on the top right corner and check/uncheck the **Enable toolbar** checkbox.



6.2.1. VG10 / VGC10

To open up the toolbar, follow the instructions under [How to Access the Toolbar](#) in the [6.2. URCap Toolbar](#) section.

The toolbar for the VG grippers is shown below.



Gripper 1 and **Gripper 2**: In case of using 2 VG grippers you can select which one performs the action.

Mode: Select **Independent** (actuate a channel individually) or **Tandem** (actuate both channels together).

Actual vacuum: shows the current vacuum in each channel.

Target vacuum: defines target vacuum in each channel.

 (Grip button): when pressed, the pump will start to generate vacuum at the selected level on the selected channel(s).

 (Release button): when pressed, the test-grip will terminate and release any workpieces that may be held by the selected channel.

6.3. URScript Commands

URScript commands can be used alongside other scripts.

6.3.1. VG10/VGC10

When the OnRobot URCap is enabled, there will be several VG script functions available:

```
vg10_grip (channel, vacuum, timeout, alert, tool_index)
```

Commands the VG10 to perform a grip.

channel: Tells which channel to be gripped with.

- 0 = Channel A
- 1 = Channel B

- 2 = Channel A and Channel B

If not set, this parameter defaults to 2 (A and B).

vacuum: Tells how hard to grasp in the range of 0% to 80 % vacuum.

- 60 = 60% vacuum. A typical firm grip.
- 30 = 30% vacuum. A typical soft grip.

If not set, this parameter defaults to 60%.

timeout: Tells how long to wait for commanded vacuum to be achieved. If vacuum is not achieved, an air leakage at the workpiece or vacuum cups is reported in a popup and the robot program stops.

- 0 = The function will not wait for vacuum, but return immediately after the command is sent
- >0 = Waiting time [s]. Floating point numbers can be used. E.g. 0.6 = 600 ms.

If not set, this parameter defaults to 5 seconds.

alert: Whether the grip should be monitored after vacuum (grip) is established. If vacuum is lost while handling a workpiece, a popup warning is shown, and the robot program stops. This setting cannot be used without a proper timeout setting, see above.

- False = Vacuum is not monitored.
- True = Vacuum is continuously monitored. Popup warning enabled.

If not set, this parameter defaults to True.

If only one VG10 gripper is attached, use:

```
tool_index=vg_index_get()
```

If two VG10 grippers are attached, use:

For primary:

```
tool_index=1
```

For secondary:

```
tool_index=2
```

```
vg10_release(channel, timeout, autoidle, tool_index)
```

Commands the VG10 to perform a release.

channel: Tells which channel to be released.

- 0 = Channel A
- 1 = Channel B
- 2 = Channel A and Channel B

If not set, this parameter defaults to 2 (A and B).

timeout: Tells how long to wait for vacuum to be removed.

- 0 = The function will not wait, but return immediately after the command is sent
- >0 = Waiting time [s]. Floating point numbers can be used. E.g. 0.6 = 600ms.

If not set, this parameter defaults to 5 seconds.

autoidle: Tells if the release valve should automatically be turned off when the release is completed and the robot has moved 5 cm away from the release position.

If not set, this parameter defaults to True.

If only one VG10 gripper is attached, use:

```
tool_index=vg_index_get()
```

If two VG10 grippers attached, use:

For primary:

```
tool_index=1
```

For secondary:

```
tool_index=2
```

```
vg10_vacuum_A or vg10_vacuum_B
```

Returns current vacuum in the selected channel.

If two grippers are attached use _primary or _secondary.

Example:

```
vg10_vacuum_A_secondary
```

```
vg10_idle(channel, tool_index)
```

Commands the VG10 to idle the selected channel. When a channel is in idle, the power consumption is slightly lower, but parts may 'stick' to the suction cup as the air return channel is closed.

channel: Tells which channel to be in idle.

- 0 = Channel A
- 1 = Channel B
- 2 = Channel A and Channel B

If only one VG10 gripper is attached, use:

```
tool_index=vg_index_get()
```

If two VG10 grippers are attached, use:

For primary:

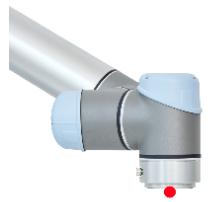
```
tool_index=1
```

For secondary:

```
tool_index=2
```

6.4. TCP Configuration

TCP is the abbreviation of the Tool Center Point.



TCP is a point that is in the beginning (by default) located at the middle point of the UR's tool flange. This is an important point during robot programming since UR's Move commands are always referenced to a given TCP point and rotations could only be carried out about these points.



If a tool is attached to the robot, it makes easier for the user to change that point to the tool's "end" point (see illustration on the left).

In this way it is easy to rotate the tool while the workpiece is being stationary in space (see illustration on the right).

More than one TCP point could be defined but at a given time only one TCP can be active. In UR, it is called the Active TCP.

By default, UR's Move commands are always recording the Waypoints according to the Active TCP.

For further info about the UR's TCP handling read the UR's Manual.



How "far" the TCP needs to be moved to be at the "end" of the OnRobot tools could be found in the [TCP CoG](#) section.

Since, it could be hard to enter these values by hand, OnRobot provides two ways to get these parameters configured for you:

- Static TCP mode - Recommended to be used
- Dynamic TCP mode

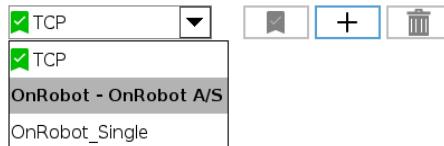
The mode could be selected on the TCP panel in the OnRobot Installation (see in the [5.1.3. URCap Setup](#) setup section).

In the following these two modes will be described.

Static TCP Mode

In this mode the user can manually change the Active TCP based on the predefined OnRobot TCP options:

- **OnRobot_Single**
If no Dual Quick Changer is detected, so only one tool is used.
- **OnRobot_Dual_1 and OnRobot_Dual_2**



If a Dual Quick Changer is detected, so two tools are used.



NOTE:

OnRobot_Dual_1 belongs to the tool that is attached to the Primary side of the Dual Quick Changer.

The TCP values are created and precalculated based on the detected tool(s). So, if the RG2 is mounted in 30° (with the built-in tilting mechanism) the precise TCP is defined accordingly.

The calculation is only carried out when a new device is detected or when the mounting angle is changed (only for RG2/6 and RG2-FT).

The calculated values are static parameters and do not change during program execution.



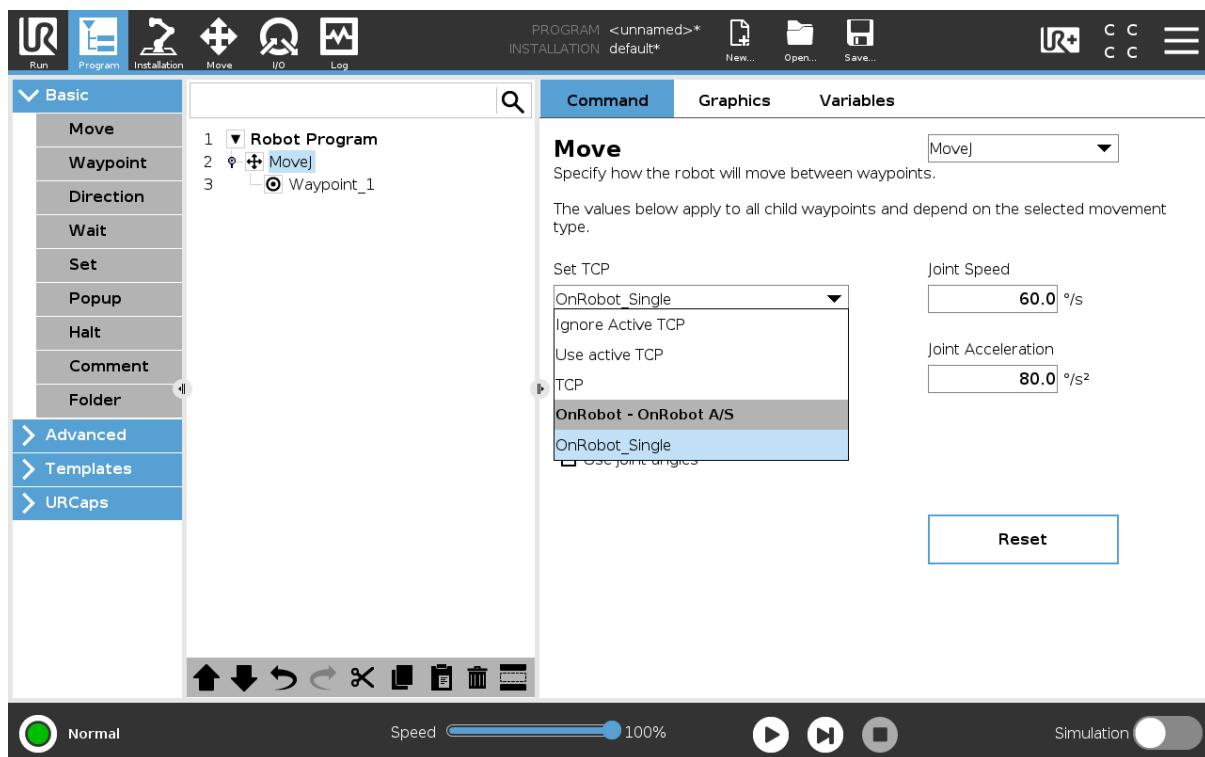
NOTE:

For the RG2, RG6 and RG2-FT grippers the TCP is calculated always assuming that the gripper is fully closed.

It is a good practice to set the used TCP option as the Default TCP () in the UR's TCP Configuration, but it is not mandatory.

However, it is highly recommended to create the Waypoints in the UR's Move command in a way that the referencing TCP is set first.

So, if only a single OnRobot device is used, before the Waypoints are defined, set the UR's Move command's TCP to use the **OnRobot_Single**.



If two OnRobot devices are used, select **OnRobot_Dual_1** or **OnRobot_Dual_2** accordingly.

If not the UR's Move command but the OnRobot F/T Move command is used (for HEX-E/H QC or RG2-FT only):

- Use the OnRobot TCP command just before the F/T Move to set the Active TCP to the right value

As summary here is a code example:

| Single | Dual |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Not mandatory to set OnRobot TCP as Default TCP | Not mandatory to set OnRobot TCP as Default TCP |
| Robot program <pre>MoveJ (Set TCP = OnRobot_Single) #Alternatively TCP F/T Move</pre> | Robot program <pre>MoveJ (Set TCP = OnRobot_Dual_1) MoveJ (Set TCP = OnRobot_Dual_2)</pre> |

Dynamic TCP Mode

In this mode the UR's Active TCP is set automatically according to the detected OnRobot device.

This mode is useful when the TCP effect of the width value of the gripper (RG2, RG6 or RG2-FT only) is needed to be considered.

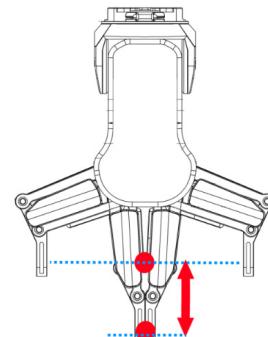
During the robot program execution if the `RG_Grip` commands are used to open or close the gripper TCP is automatically set accordingly.

Furthermore, if the OnRobot Toolbar is used to open or close the gripper the Active TCP is adjusted immediately.

However, the Active TCP is overwritten directly, there is also an OnRobot defined TCP, that is called:

- **OnRobot_Default**

This is the name in both the Single and Dual device case.



It is recommended to set the **OnRobot_Default** option as the Default TCP (✓) in the UR's TCP Configuration.

To let the system to automatically update the TCP during the program execution the UR's Move commands needs to be left at its default setting of **Set as Active TCP**. (Compared to the Static TCP mode where it is needed to be changed to a predefined TCP).

In case when two grippers are used, the Active TCP needs to be selected to which gripper to belong to:

- first use an OnRobot TCP command and select from Gripper 1 and Gripper 2 which one to be used
- then the UR's Move will have an updated Active TCP that could be used for multiple Move commands
- when it will be necessary to change to the other gripper just use another TCP and select the other gripper.

Before you teach any Waypoint make sure to set the Active TCP beforehand:

- for Single device go to the OnRobot Installation panel
- for Dual devices go to the OnRobot Installation panel and Select the Device (1 or 2) that you are using at the time of the teaching

As summary here is a code example:

| Single | Dual |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended to set OnRobot_Default TCP as the UR's Default TCP | Recommended to set OnRobot_Default TCP as the UR's Default TCP |
| | Before each program execution make sure to select on the OnRobot Installation panel the right gripper that will be the first used in the program |

| Single | Dual |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Robot program</p> <p>TCP (Optional) MoveJ (Set TCP = Active TCP)</p> | <p>Robot program</p> <p>TCP (Select Gripper 1) MoveJ (Set TCP = Active TCP)</p> <p>TCP (Select Gripper 2) MoveJ (Set TCP = OnRobot_Dual_2)</p> |

6.5. Feedback Variables

6.5.1. VG10 / VGC10

| Feedback Variable | Unit | Description |
|-------------------|---------|-------------------------------------------|
| on_return | 0 | The return value for the OnRobot commands |
| vg_Vacuum_A | %Vacuum | Returns the %Vacuum achieved on channel A |
| vg_Vacuum_B | %Vacuum | Returns the %Vacuum achieved on channel B |

7. Additional Software Options

7.1. Compute Box/Eye Box

7.1.1. Ethernet Interface Setup

A proper IP address must be set for the Compute Box/Eye Box and the robot/computer to be able to use the Ethernet interface. The IP address can be configured using DIP switches 3 and 4.



WARNING:

Stop the robot program before you change any Ethernet interface settings.



NOTE:

Configuring DIP switch 3 will remove any previously set static IP address.

To change between modes, first change the DIP switches and then cycle the Compute Box/Eye Box power so the changes will take effect.

DIP 3 - sets the Compute Box / Eye Box IP address

- **ON:** Fixed IP (192.168.1.1)
- **OFF:** Dynamic or Static IP (*can be configured via the Web Client*)

DIP 4 - sets whether the connected robot or laptop will receive IP address from the Compute Box / Eye Box

- **ON:** DHCP server is disabled
- **OFF:** DHCP server is enabled

We recommend to set the DIP switches according to either of the two options below:

- **Fix IP/Auto mode** - in simple installations (no external network and/or no PLC connected)
- **Advanced mode** - in more complex installations (external network and/or PLC are used)

Fix IP/Auto mode (factory default)



Set the DIP switch 3 to ON and the DIP switch 4 to OFF position and cycle the power so the changes will take effect.

| IP Address of the Compute Box/Eye Box | IP Address of the Robot/Computer |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The IP address of the Compute Box/Eye Box is fixed 192.168.1.1. This IP address cannot be changed.</p> | <p>The Compute Box/Eye Box will automatically assign an IP address to the connected robot/computer if it was configured to obtain an IP address automatically.</p> <p>NOTE: The assigned IP address range is 192.168.1.100-105 (with subnet mask 255.255.255.0). If the Compute Box/Eye Box is used in a company network where a DHCP server is already in use, it is recommended to use Advanced mode.</p> |

In this mode, the DHCP server of the Compute Box/Eye Box is enabled.

Advanced mode (any static or dynamic IP/subnet mask)



Set the DIP switch 3 to OFF and the DIP switch 4 to ON position and cycle the power so the changes will take effect.

| IP Address of the Compute Box/Eye box | IP Address of the Robot/Computer |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Case 1: Static IP address The IP address 192.168.1.1 is already in use in your network or a different subnet needs to be configured.</p> | <p>The Compute Box/Eye Box will not assign an IP address to the robot/computer. Set the IP address of the robot/computer manually. Make sure to have a matching IP setting to your robot/computer network for a proper communication. Use the same subnet but different IP address.</p> |
| <p>Case 2: Dynamic IP address *</p> | <p>The IP address of the robot/computer is set dynamically. An external DHCP server assigns the IP address to the robot/computer.</p> |

* By default, the IP address of the Compute Box/Eye Box is set to Dynamic IP.

The IP address of the Compute Box/Eye Box can be set to any value by using the Web Client. For more details, see section Web Client: Configuration Menu. Under **Network settings**, set the **Network mode** to either **Static IP** or **Dynamic IP**.

In this mode, the DHCP server of the Compute Box/Eye Box is disabled.

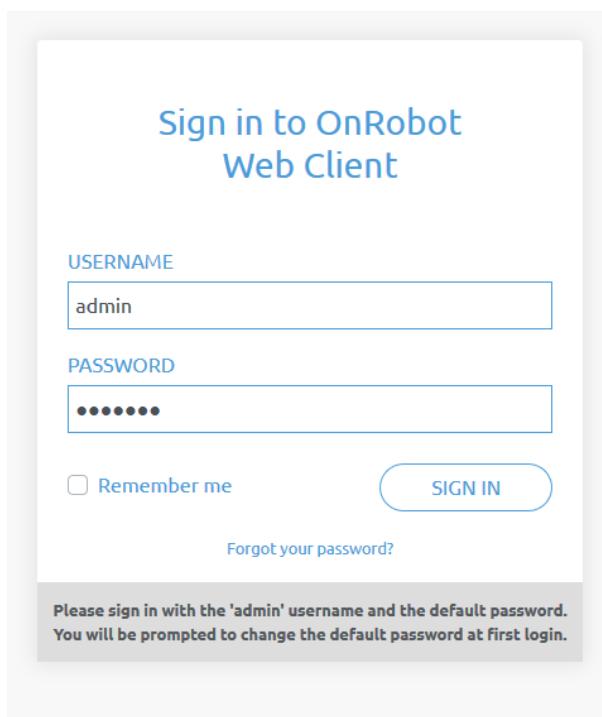
7.1.2. Web Client

To access the Web Client on your computer first the Ethernet interface needs to be set up to have a proper communication between your computer and the Compute Box. It is recommended to use the factory default DIP switch settings (DIP 3 On and DIP 4 Off) (for further details see section [7.1.1. Ethernet Interface Setup](#)).

Then do the following steps:

- Connect the Compute Box to your computer with the supplied UTP cable.
- Power the Compute Box with the supplied power supply
- Wait one minute for the Compute Box LED to turn from blue to green.
- Open a web browser on your computer and type in the IP address of the Compute Box (factory default is 192.168.1.1).

The Sign-in page opens:



Sign in to OnRobot Web Client

USERNAME
admin

PASSWORD

Remember me SIGN IN

[Forgot your password?](#)

Please sign in with the 'admin' username and the default password.
You will be prompted to change the default password at first login.

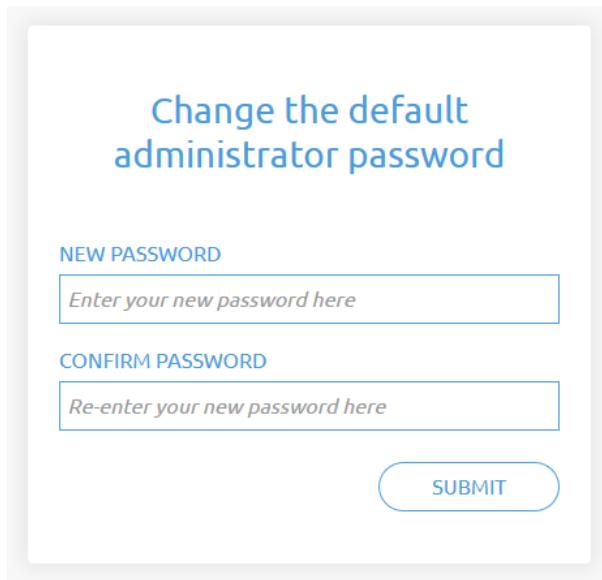
[Forgot your password?](#)

The factory default administrator login is:

Username: admin

Password: OnRobot

For the first login a new password needs to be entered: (password must be at least 8 characters long)



Change the default administrator password

NEW PASSWORD
Enter your new password here

CONFIRM PASSWORD
Re-enter your new password here

SUBMIT

Once signed in the following menus will appear on the left side of the screen:



- **Devices** - Monitor and control the connected devices (e.g.: grippers)
- **Configuration** - Change the Compute Box's settings
- **WebLogic™** - Program the Digital I/O interface through OnRobot WebLogic™
- **Paths** - Import/export the recorded Paths (not available to all robots)
- **Update** - Update the Compute Box and the devices
- **TCP/CoG** - Calculate the TCP (Tool Center Point) and CoG (Center of Gravity) values for your OnRobot product combination.

The following menus will appear in the top right corner of the screen:



-  Select the language of the Web Client
-  Account settings (e.g.: change password, add new user)

In the following, these menus will be described.

7.1.3. Web Client: Devices Menu

To control/monitor a device click on the **Select** button.

Please select from the detected device(s):



Compute Box

[SELECT](#)


HEX-E/H QC

[SELECT](#)


RG2

[SELECT](#)

7.1.3.1. VG10 / VGC10

VG10

This page allows the device to be monitored and controlled. By navigating to the Device info tab the device status is shown. (Some functions might not be accessible without Admin permission.)

[Monitor and control](#)
[Device info](#)

Actual values

| | |
|-------------|--------|
| Power limit | 500 mA |
| Channel A | 0 kPa |
| Channel B | 0 kPa |

Set values

POWER LIMIT



CHANNEL A


 Lock

CHANNEL B



The actual vacuum level for **Channel A** and **Channel B** can be seen in percentage (in the range of 0...80 kPa vacuum). The actual value of the **Power limit** is shown in mA.

The **Power limit** can be adjusted in the range of 0...1000mA with the slider.

**NOTE:**

The power limit set in this page is not stored permanently and always restored to the default value on power reset.

Higher power limit value means the required vacuum level is reached faster (higher airflow), but if it is set too fast overshoot may occur.

Low power limit may not be enough for higher percentage of vacuum and the target vacuum level may not be reached.

The **Channel A** and **Channel B** vacuum level can be set individually or in tandem by checking the **Lock** checkbox.

Make sure to set high enough vacuum before you grip and lift any object.

To release the gripped object, click on the **Release** button.

7.1.4. Web Client: Configuration Menu

Configuration

This page allows the configuration of the Compute Box.



CAUTION

Incorrect settings may cause the device to lose network connectivity.



1. Digital input mode: NPN
2. Digital output mode: NPN
3. Compute Box IP setting is configured on this page.
4. DHCP server enabled: Compute Box tries to assign IP to the robot.

NETWORK SETTINGS

ETHERNET/IP SCANNER SETTINGS

| | |
|--------------|-------------------|
| MAC address | b8:27:eb:0e:c9:a3 |
| Network mode | Static IP |
| IP address | 192.168.1.1 |
| Subnet mask | 255.255.255.0 |

SAVE

| | |
|--------------------------------|----------------------------------|
| IP address to connect to | <input type="text" value="..."/> |
| Origin-to-target instance id | 1 |
| Target-to-origin instance id | 1 |
| Configuration instance id | 0 |
| Requested packet interval (ms) | 8 |

SAVE

COMPUTE BOX SETTINGS

Display name

SAVE

Clock delay

5 min

SYNCHRONIZE CLOCK

Network settings:

The **MAC address** is a world-wide unique identifier that is fixed for the device.

The **Network mode** drop-down menu can be used to decide if the Compute Box will have a static or a dynamic IP address:

- If it is set to **Dynamic IP**, the Compute Box expects an IP address from a DHCP server. If the network that the device is connected to has no DHCP server, the Compute Box will not obtain an IP address and its LED is lighting in blue.
- If it is set to **Static IP**, then a fixed IP address and subnet mask must be set.
- If it is set to **Default Static IP**, the fixed IP revert to the factory default and cannot be changed.

After all parameters are set, click on the **Save** button to store the new values permanently. Wait 1 minute and reconnect to the device using the new settings.

Compute Box / Eye Box settings:

In case, more than one Compute Box is used within the same network, for identification purpose any user specific name can be entered to the **Display name**.

If the **Clock delay** field shows a difference, click **Synchronize clock** to synchronize the Compute Box's time with your computer.

EtherNet/IP scanner settings:



NOTE:

This is a special option of the EtherNet/IP connection for some robots.

In case when the robot is the Adapter and the Compute Box needs to be the Scanner the following addition information is required for the communication:

- **IP address to connect to** - the robot IP address
- **Origin-to-target instance id** - refer to the robot's EtherNet/IP manual (Scanner mode)
- **Target-to-origin instance id** - refer to the robot's EtherNet/IP manual (Scanner mode)
- **Configuration instance id** - refer to the robot's EtherNet/IP manual (Scanner mode)
- **Requested packet interval (ms)** - RPI value in ms (minimum 4)

Check the checkbox and the Compute Box will try to automatically connect to the robot (via the given IP address).

7.1.5. Web Client: Update Menu

This page can be used to update the software on the Compute Box and the firmware on the devices.

Update

This page allows updating the software and firmware.



CAUTION

Installing updates may take several minutes to complete. Please do not power off or unplug your Compute Box or any of the connected devices during the update process.

SOFTWARE

No update file selected yet...

[BROWSE](#)

[Click here to download the result of the last update.](#)

FIRMWARE

| COMPONENTS | CURRENT VERSION | REQUIRED VERSION | |
|-------------------------------|-----------------|------------------|------------------------|
| Compute Box (CBOX_RPT) | | | |
| Firmware | 150 | 150 | |
| HEX-E/H QC (HEXHC001) | | | |
| Firmware | 208 | 208 | |
| | | | UPDATE |

Up-to-date

Update required

Downgrade not supported



CAUTION:

During the update process (takes about 5-10 minutes) DO NOT unplug any device or close the browser window. Otherwise the updated device could be damaged.

The loading screens during the update process are the same for the software and the firmware updates.

Software Update

Click on **Browse** to search for the .cbu software update file. The **Browse** button will turn to **Update**.

Click on **Update** to start the software update process.

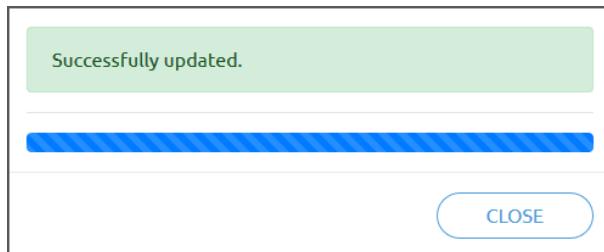
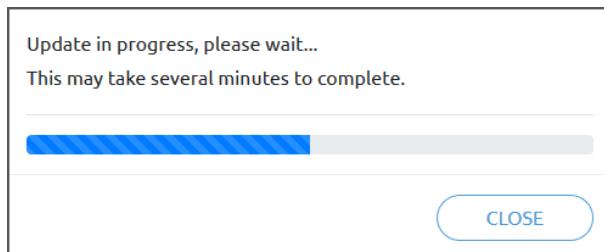
If the update is finished and was successful, the message below is shown.

Firmware Update

Update required: A firmware update is required because one of the components is out of date.

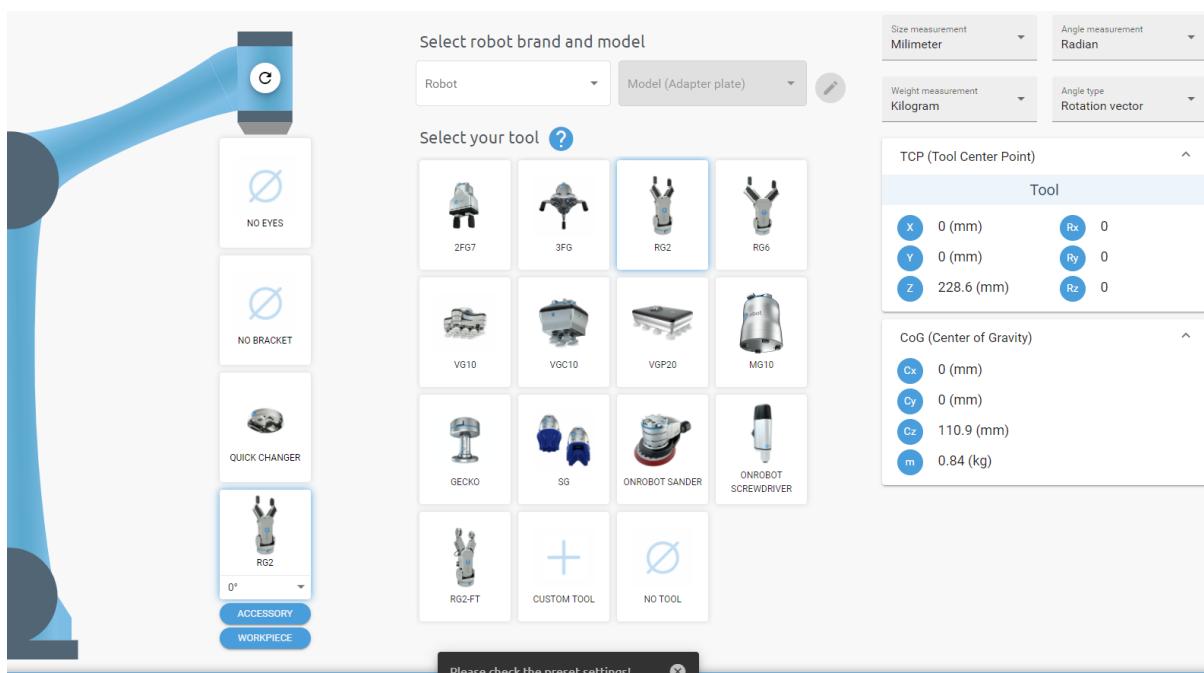
Click on **Update** in the firmware section of the page to start the firmware update process.

If the update is finished and was successful, the message below is shown.



7.1.6. Web Client: TCP/COG

Use the TCP/COG calculator to calculate the TCP (Tool Center Point) and COG (Center of Gravity) values for your OnRobot product combination.



The TCP/COG calculator will show the automatically detected settings.



NOTE:

Make sure to check the preset settings before calculating the TCP and COG values.

1. Select the robot brand and the model you are using from the **Robot** and **Model (Adapter plate)** dropdown menus.

Click on  to set custom Adapter plate settings.

2. Click on the **No eyes** card to modify the Eyes preset settings.
3. Click on the **No bracket** card to modify the Angle Bracket preset settings.
4. Select mounting type.
5. Select tool.

Click on  to get help about how to enter the values.

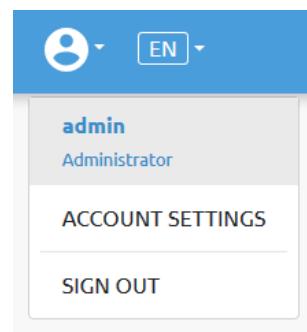
6. Click on **Accessory** to select any OnRobot accessories.
7. Click on **Workpiece** to enter the workpiece weight. Then the calculator calculates the resulting payload mass considering the gripper, the mounting, and the workpiece mass.
8. Choose the unit of measure for the values you want to enter from the **Size measurement**, **Angle measurement**, **Weight measurement** and **Angle type** dropdown menus.

The calculator calculates the values which you can see in the **TCP (Tool Center Point)** and **CoG (Center of Gravity)** boxes. These values can be entered into the robot.

7.1.7. Web Client: Account Settings

This menu can be used to:

- See the currently sign-id user
- Go to **Account settings**
- Sign-out



Account settings:

This page has two tabs:

- **My profile** - to see and update the currently logged in users' profile (e.g.: change password)
- **Users** - to manage users (e.g.: add/remove/edit)

On the **My profile** tab to change any profile data (e.g.: password) click on the **Update profile** button.

Account settings

This page allows modifying your user profile.

[My profile](#) [Users](#)

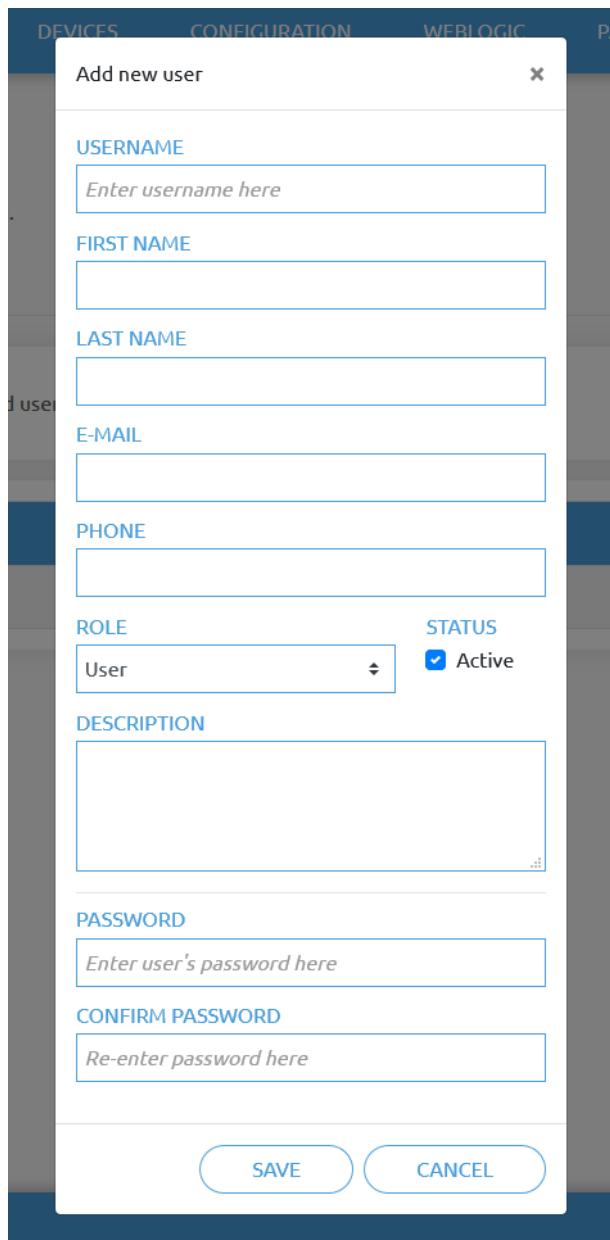


admin
Administrator

[First name](#)
[Last name](#)
[E-mail](#)
[Phone](#)
[Description](#)

[UPDATE PROFILE](#)

On the **Users** tab click on the **Add new user** button to add more users:



The screenshot shows a modal dialog titled "Add new user". The form contains the following fields:

- USERNAME: Enter username here
- FIRST NAME:
- LAST NAME:
- E-MAIL:
- PHONE:
- ROLE: User (dropdown menu)
- STATUS: Active (checkbox checked)
- DESCRIPTION:
- PASSWORD: Enter user's password here
- CONFIRM PASSWORD: Re-enter password here

At the bottom are two buttons: "SAVE" and "CANCEL".

There are three user levels:

- Administrator
- Operator
- User

Fill in the user information and click **Save**.

Later on to change any user information just click on the edit  icon.

Account settings

This page allows modifying your user profile.

My profile **Users**

[ADD NEW USER](#) You can add user on your network to monitor and control the devices.

| USERNAME | ROLE | FIRST NAME | LAST NAME | E-MAIL | PHONE | ACTIVE |
|----------|---------------|------------|-----------|--------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| admin | Administrator | | | | | <input checked="" type="checkbox"/>  |
| operator | User | | | | | <input checked="" type="checkbox"/>   |

To prevent a user to sign-in either could be:

- deactivated by changing its **Active** status in the edit mode
- or removed by clicking the delete  icon.

8. Hardware Specification

8.1. Technical Sheets

8.1.1. VGC10

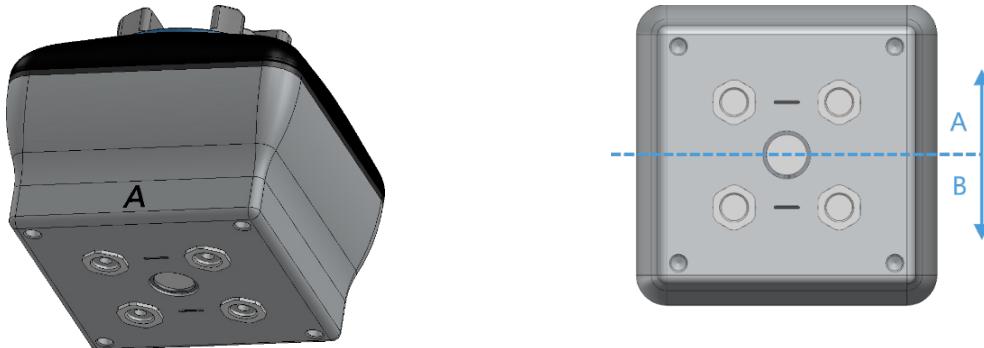
| General Properties | | Minimum | Typical | Maximum | Unit |
|--------------------|---------------------------------------|---------------------|----------|----------------------|-----------------------------|
| Vacuum | | 5 % -0.05 1.5 | - | 80 % -0.810 24 | [Vacuum] [Bar] [inHg] |
| Air flow | | 0 | - | 12 | [L/min] |
| Payload | With default attachments | - - | - - | 6 * 13.2 * | [kg] [lb] |
| | With customized attachments | - - | 10 20 | 15 33.1 | [kg] [lb] |
| Vacuum cups | | 1 | - | 7 | [pcs.] |
| Gripping time | | - | 0.35 | - | [s] |
| Releasing time | | - | 0.20 | - | [s] |
| Vacuum pump | Integrated, electric BLDC | | | | |
| Dust filters | Integrated 50µm, field replaceable | | | | |
| IP Classification | IP54 | | | | |
| Dimensions | 101 x 100 x 100 3.97 x 3.94 x 3.94 | | | | [mm] [inch] |
| Weight | 0.814 1.79 | | | | [kg] [lb] |

* By using three 40mm cups. More info in the table [Number of Cups needed for non-porous materials depending on payload and vacuum.](#)

| Operating Conditions | Minimum | Typical | Maximum | Unit |
|------------------------------------|---------|---------|-----------|--------------|
| Power supply | 20.4 | 24 | 28.8 | [V] |
| Current consumption | 50 | 600 | 1500 | [mA] |
| Operating temperature | 0 32 | - | 50 122 | [°C] [°F] |
| Relative humidity (non-condensing) | 0 | - | 95 | [%] |
| Calculated operation life | 30 000 | - | - | [Hours] |

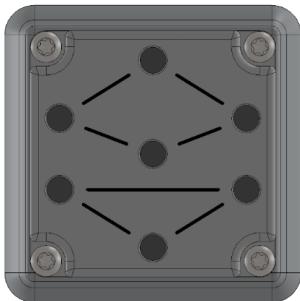
2 Channels

The VGC10 has 4 holes to use fittings with vacuum cups or blinding screws as needed. It also has lines which show the holes that are communicated together. This is useful when using channels A and B independently for vacuum.

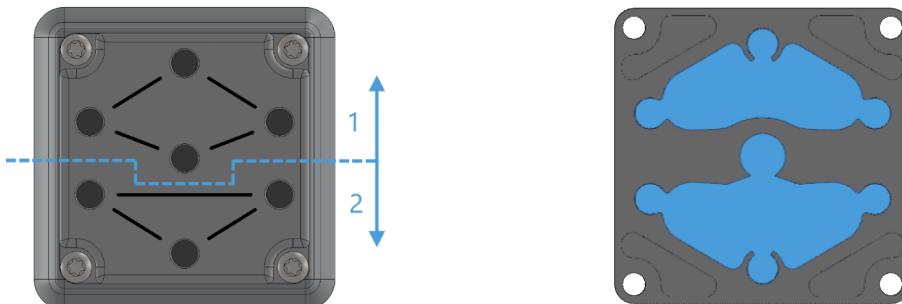


Adaptor Plate

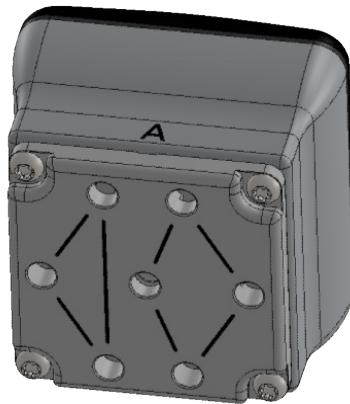
The VGC10 comes with an Adaptor Plate which provides extra flexibility to locate the vacuum cups in different configurations.



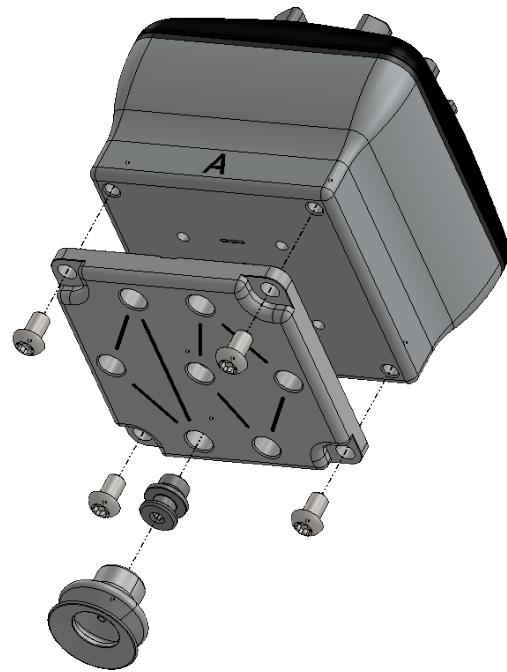
The Adaptor Plate has 7 holes to use fittings with vacuum cups or blinding screws as needed. It also has lines which show the holes that are communicated together. This is useful when using channel A and B independently for vacuum.



The Adaptor Plate can be placed in different positions by rotating it 90°. Having as reference the letters A and B written on the gripper housing, the Adaptor Plate can be placed to separate both channels or to communicate them. If the Adaptor Plate is placed as in picture below on the left, both channels will be separated, and they can be used independently or combined. If the Adaptor Plate is placed as in picture below on the right, both channels will be communicated and a higher air flow can be achieved, although both channels will have to be used combined.



To mount the Adaptor Plate simply remove the 4 fittings or blinding screws from the gripper, place the Adaptor Plate by choosing the right angle according to the desired configuration, and tighten the 4 screws with 4 Nm tighten torque.

**NOTE:**

Please, note that the O-Ring in the Adaptor Plate is not glued therefore it can be pulled out. If that happens simply put it back in place and the gripper will work as before.

Extension Pipe

The Extension Pipe provides an extra length of 50 mm to reach narrow spaces.

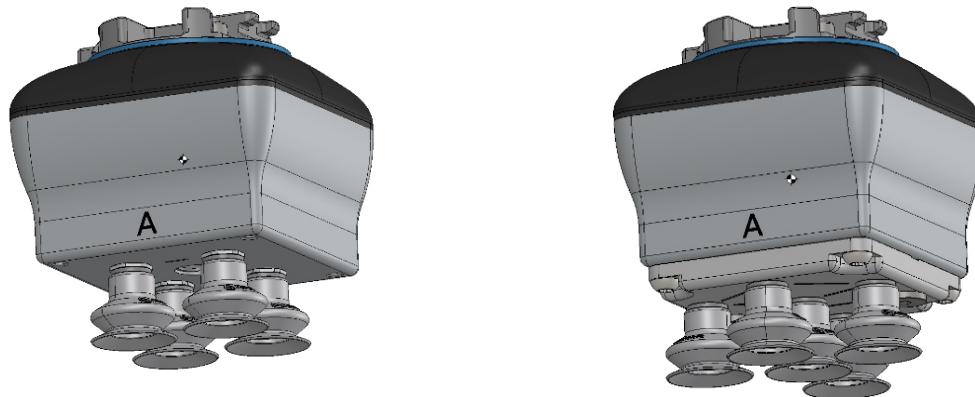
**NOTE:**

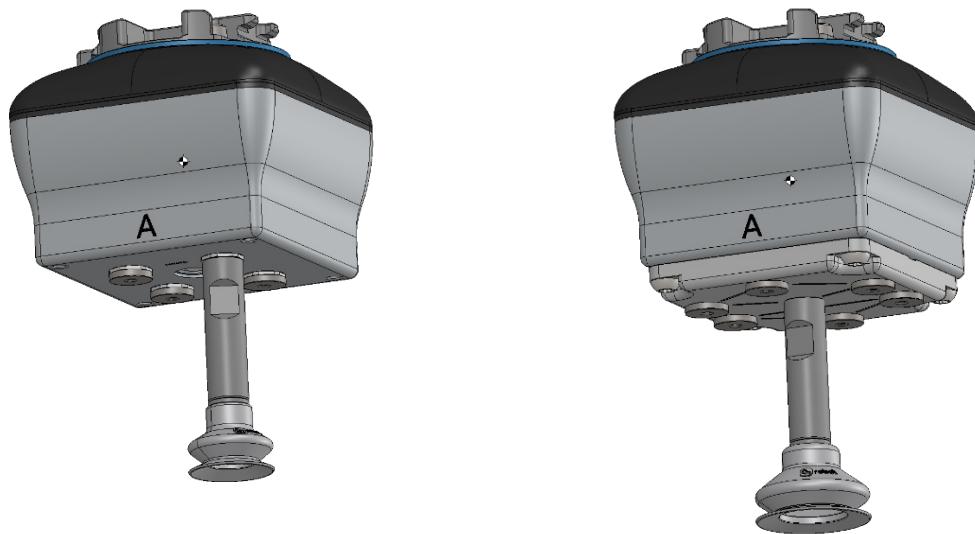
Remember to use the Adaptor Plate rotated to achieve a higher air flow when using both channels together.

The Extension Pipe can be mounted in any of the holes by simply screwing it in and adding a fitting on top as shown in the image below.



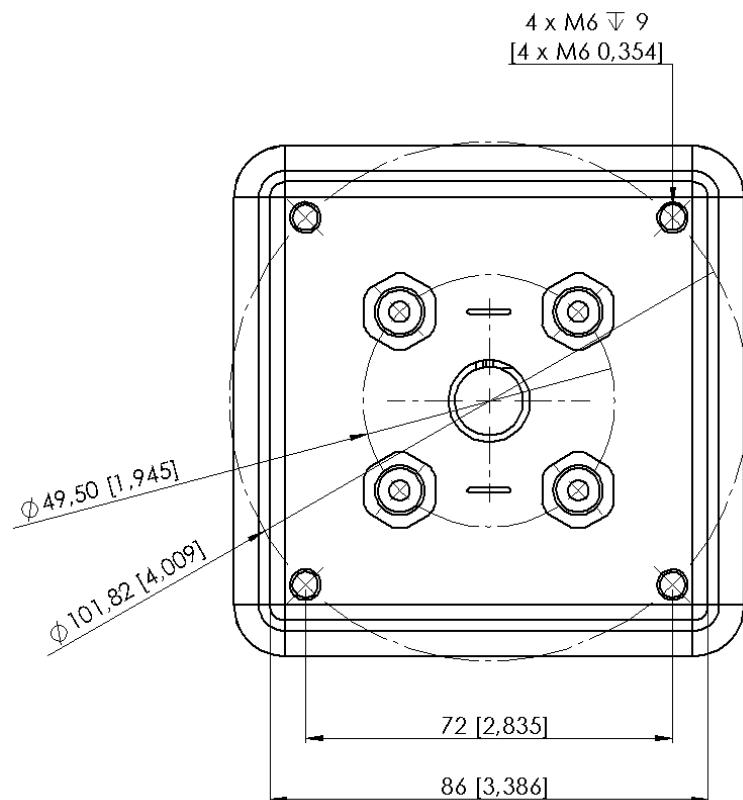
Below different mounting configurations with the provided attachments are shown.





Customized Adaptor Plates and Push-in Fittings

The design of the VGC10 is meant to facilitate the users to make their own adaptor plates to create different kinds of configurations. The dimensions needed to create a customized adaptor plate are shown in the image below.

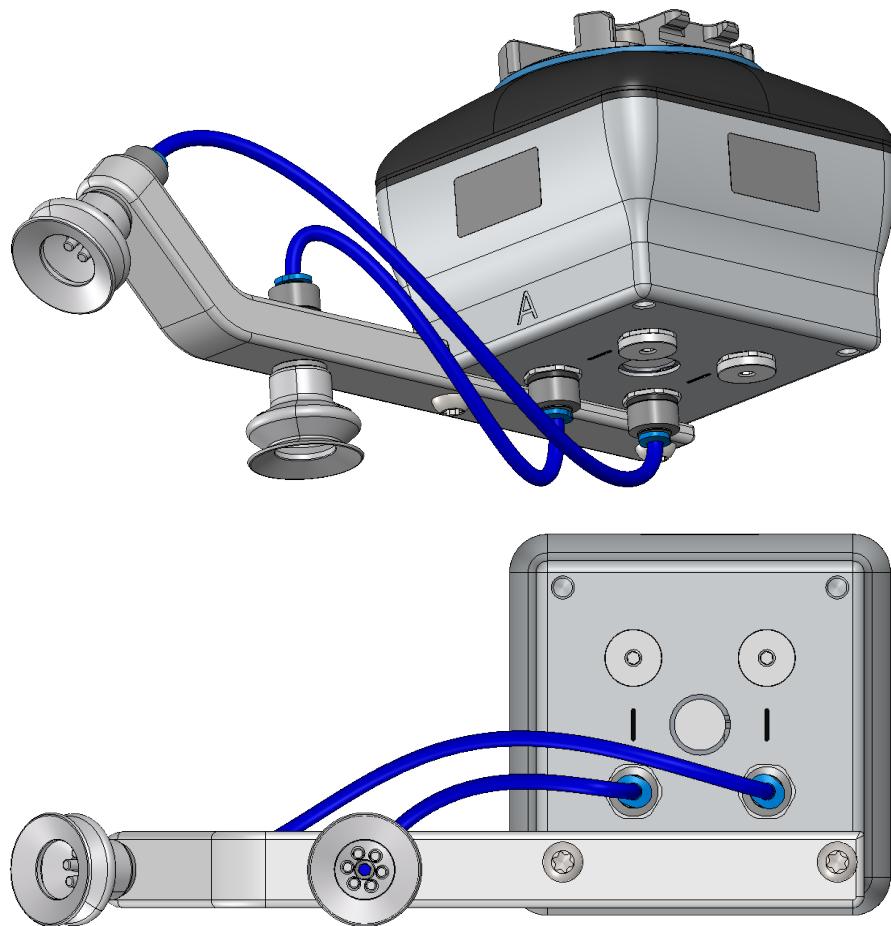


The Push-in Fittings are used to attach 4 mm vacuum tubes to create customized configuration that required remote vacuum. In most cases, this size is enough for generating the needed vacuum from the pump in the gripper.

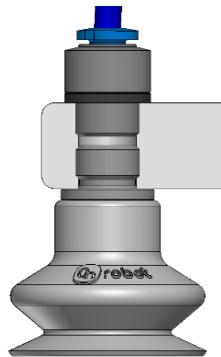


The commercial name of the Push-in Fittings is Fitting QSM-G1/8-4-I-R in case some more units need to be purchased.

An example of a customized configuration with a homemade adaptor plate and remote vacuum is shown below.



The image below shows how the push-in fittings and the normal fittings are communicated.



Payload

The lifting capacity of the VG grippers depends primarily on the following parameters:

- Vacuum cups
- Vacuum
- Air flow

Vacuum Cups

Choosing the right vacuum cups for your application is essential. The VG grippers come with common 15, 30 and 40 mm silicone vacuum cups (see table below) which are good for hard and flat surfaces, but not good for uneven surfaces and it might leave microscopic traces of silicone on the workpiece which can cause issues with some types of painting processes afterwards.

| Image | External Diameter [mm] | Internal Diameter [mm] | Gripping Area [mm ²] |
|-------------------------------------------------------------------------------------|------------------------|------------------------|----------------------------------|
|  | 15 | 6 | 29 |
|  | 30 | 16 | 200 |
|  | 40 | 24 | 450 |

For non-porous materials, the OnRobot suction cups are highly recommended. Some of the most common non-porous materials are listed below:

- Composites
- Glass
- High density cardboard
- High density paper
- Metals
- Plastic
- Porous materials with a sealed surface
- Varnished wood

In an ideal case, working with non-porous material workpieces where there are no air flow going through the workpiece, the table below shows the number of cups and the cup size needed depending on the payload (workpiece mass) and the vacuum used.

Number of Cups needed for non-porous materials depending on payload and vacuum :

| |  15 mm | | | |  30 mm | | | |  40 mm | | | |
|--------------|-----------------------------------------------------------------------------------------|----|----|----|-----------------------------------------------------------------------------------------|----|----|----|-------------------------------------------------------------------------------------------|----|----|----|
| Payload (kg) | Vacuum (kPa) | | | | Vacuum (kPa) | | | | Vacuum (kPa) | | | |
| | 20 | 40 | 60 | 75 | 20 | 40 | 60 | 75 | 20 | 40 | 60 | 75 |
| 0.1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0.5 | 13 | 7 | 5 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | - | 13 | 9 | 7 | 4 | 2 | 2 | 1 | 2 | 1 | 1 | 1 |
| 2 | - | - | - | 14 | 8 | 4 | 3 | 2 | 4 | 2 | 2 | 1 |
| 3 | - | - | - | - | 12 | 6 | 4 | 3 | 5 | 3 | 2 | 2 |
| 4 | - | - | - | - | 15 | 8 | 5 | 4 | 7 | 4 | 3 | 2 |
| 5 | - | - | - | - | - | 10 | 7 | 5 | 9 | 5 | 3 | 3 |
| 6 | - | - | - | - | - | 12 | 8 | 6 | 10 | 5 | 4 | 3 |
| 7 | - | - | - | - | - | 13 | 9 | 7 | 12 | 6 | 4 | 4 |
| 8 | - | - | - | - | - | 15 | 10 | 8 | 14 | 7 | 5 | 4 |
| 9 | - | - | - | - | - | - | 12 | 9 | 15 | 8 | 5 | 4 |
| 10 | - | - | - | - | - | - | 13 | 10 | - | 9 | 6 | 5 |
| 11 | - | - | - | - | - | - | 14 | 11 | - | 9 | 6 | 5 |
| 12 | - | - | - | - | - | - | 15 | 12 | - | 10 | 7 | 6 |
| 13 | - | - | - | - | - | - | 16 | 13 | - | 11 | 8 | 6 |
| 14 | - | - | - | - | - | - | - | 14 | - | 12 | 8 | 7 |
| 15 | - | - | - | - | - | - | - | 15 | - | 13 | 9 | 7 |

**NOTE:**

To use more than 7 (15mm), 4 (30mm) or 3 (40mm) vacuum cups with the VGC10 a customized adaptor plate is needed.

The table above is created with the following formula that equalizes the lifting force with the payload considering 1.5G of acceleration.

$$\text{Amount}_{\text{Cups}} * \text{Area}_{\text{Cup}}[\text{mm}] = 14700 \frac{\text{Payload} [\text{kg}]}{\text{Vacuum} [\text{kPa}]}$$

It is often a good idea to use more vacuum cups than needed, to accommodate for vibrations, leaks and other unexpected conditions. However, the more vacuum cups, the more air leakage (air flow) is expected and the more air is moved in a grip resulting in longer gripping times.

When using porous materials, the vacuum that can be achieved by using the OnRobot suction cups will depend on the material itself and will be between the range stated in the specifications. Some of the most common non-porous materials are listed below:

- Fabrics
- Foam
- Foam with open cells
- Low density cardboard
- Low density paper
- Perforated materials
- Untreated wood

See the table below with general recommendations, in case other suction cups are needed for specific materials.

| Workpiece surface | Vacuum cup shape | Vacuum cup material |
|-----------------------------|--------------------------|--------------------------|
| Hard and flat | Normal or dual lip | Silicone or NBR |
| Soft plastic or plastic bag | Special plastic bag type | Special plastic bag type |
| Hard but curved or uneven | Thin dual lip | Silicone or soft NBR |
| To be painted afterwards | Any type | NBR only |
| Varying heights | 1.5 or more bevels | Any type |



NOTE:

It is recommended to consult a vacuum cup specialist to find the optimal vacuum cup where the standard types are insufficient.

Suction Cups for Foil and Bags Ø25

This suction cup improves the vacuum gripper's ability to pick and place workpieces with surfaces of foil, thin paper, and plastic bags during irregular and angular arm movement.



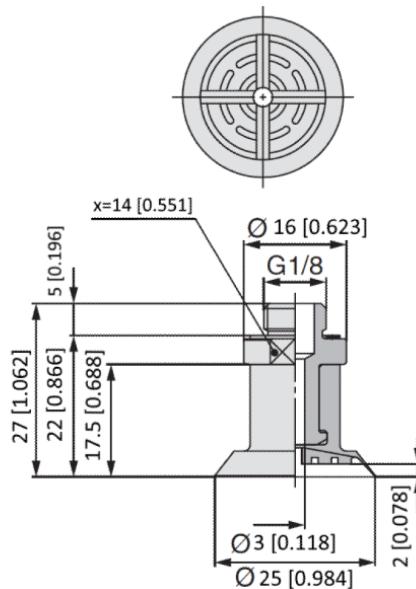
25 mm

| Number of Cups | 1 | 2 | 3 | 4 |
|--------------------|------|------|------|------|
| Surface | kg | | | |
| Foil | 0.83 | 1.07 | 1.43 | 1.57 |
| Thin paper | 1.08 | 1.71 | 2.23 | 3.21 |
| Foil - round shape | 1.28 | 2.32 | 3.32 | 4.25 |
| Plastic bag | 0.32 | 0.54 | 0.63 | 0.74 |

The vacuum cup is silicone rubber compliant with the USA Food and Drug Administration (FDA).

Using this vacuum cup reduces the wrinkles made on thin workpieces (film, vinyl, and so on)

during absorption:



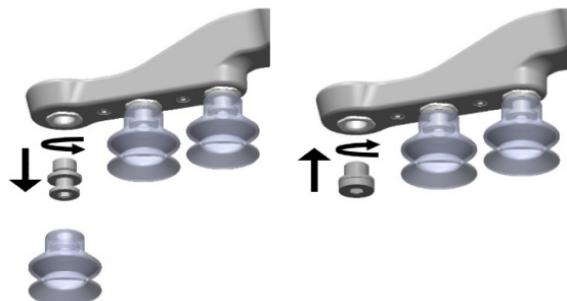
This vacuum cup is an accessory and need to be purchased separately. To purchase the vacuum cup, contact the vendor from where the VGx gripper has been purchased.

- Suction Cups for foil and bags Ø25 - PN 106964

Fittings and Blind Screws

It is possible to change suction cups simply by pulling them off the fittings. It might be a bit challenging to remove the 15 mm Diameter vacuum cups. As suggestion try to stretch the silicon to one of the sides and then pull it out.

Unused holes can be blinded using a blind screw, and each fitting can be changed to a different type to match the desired suction cup. The fittings and the blinding screws are mounted or dismounted by screwing (2Nm tightening torque) or unscrewing them with the provided 3 mm Allen key.



The thread size is the commonly used G1/8"; allowing for standard fittings, blinders and extenders to be fitted directly to the VG grippers.

Vacuum

Vacuum is defined as the percentage of absolute vacuum achieved relative to atmospheric pressure, i.e.:

| % vacuum | Bar | kPa | inHg | Typically used for |
|----------|-----------------------|------------------------|-----------------------|-------------------------------------------------|
| 0% | 0.00rel. 1.01 abs. | 0.00rel. 101.3 abs. | 0.0rel. 29.9 abs. | No vacuum / No lifting capacity |
| 20% | 0.20rel. 0.81 abs. | 20.3rel. 81.1 abs. | 6.0rel. 23.9 abs. | Cardboard and thin plastics |
| 40% | 0.41rel. 0.61 abs. | 40.5rel. 60.8 abs. | 12.0rel. 18.0 abs. | Light workpieces and long suction cup life span |
| 60% | 0.61rel. 0.41 abs. | 60.8rel. 40.5 abs. | 18.0rel. 12.0 abs. | Heavy workpieces and strongly secured grips |
| 80% | 0.81rel. 0.20 abs. | 81.1rel. 20.3 abs. | 23.9rel. 6.0 abs. | Max. vacuum. Not recommended |

The vacuum in kPa setting is the target vacuum. The pump will run at full speed until the target vacuum is achieved, and then run at a lower speed necessary to maintain the target vacuum.

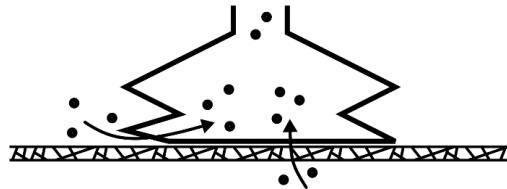
The pressure in the atmosphere varies with weather, temperature and altitude. The VG grippers automatically compensate for altitudes up to 2km, where the pressure is about 80% of sea level.

Air Flow

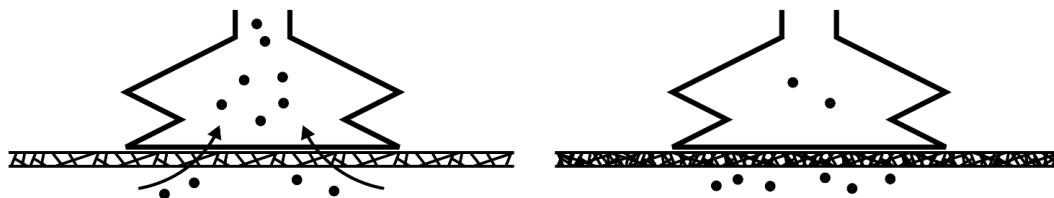
Air flow is the amount of air that must be pumped to maintain the target vacuum. A completely tight system will not have any air flow, whereas real life applications have some smaller air leakages from two different sources:

- Leaking vacuum cup lips
- Leaking workpieces

The smallest leak under a vacuum cup can be hard to find (see picture below).



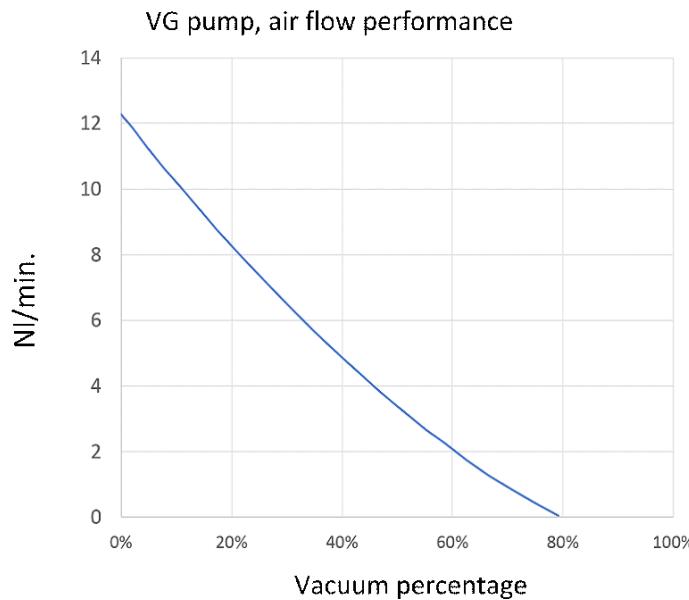
Leaking workpieces can be even harder to identify. Things that look completely tight might not be tight at all. A typical example is coarse cardboard boxes. The thin outer layer is often requiring a lot of air flow to create a pressure difference over it (see figure below).



Therefore, the users must be aware of the following:

- VG grippers are not suitable for most uncoated, coarse cardboard boxes.
- Extra attention must be paid to leakages, e.g. vacuum cup shape and surface roughness

The air flow capability of a VG grippers is shown in the graph below:



**NOTE:**

The easiest way to check if a cardboard box is sufficiently tight is simply to test it using the VG grippers.

A high vacuum percentage setting does not give a higher lifting capacity on corrugated cardboard. In fact, a lower setting is recommended, e.g. 20%.

A low vacuum setting results in less air flow and less friction below the vacuum cups. This means VG gripper filters and vacuum cups will last longer.

8.1.2. Compute Box

8.1.2.1. With 1.5A Wall Adapter (36W)

| Supplied Wall Adapter | Minimum | Typical | Maximum | Unit |
|-----------------------|---------|---------|---------|------|
| Input voltage (AC) | 100 | - | 240 | [V] |
| Input current | - | - | 1 | [A] |
| Output voltage | - | 24 | - | [V] |
| Output current | - | 1.5 | - | [A] |

| Compute Box Power input (24V connector) | Minimum | Typical | Maximum | Unit |
|-----------------------------------------|---------|---------|---------|------|
| Supply voltage | - | 24 | 25 | [V] |
| Supply current | - | 1.5 | - | [A] |

| Compute Box Power output (Device connector) | Minimum | Typical | Maximum | Unit |
|---------------------------------------------|---------|---------|---------|------|
| Output voltage | - | 24 | 25 | [V] |
| Output current | - | 1.5 | - | [A] |

8.1.2.2. With 6.25A Wall Adapter (150W)

| Supplied Wall Adapter | Minimum | Typical | Maximum | Unit |
|-----------------------|---------|---------|---------|------|
| Input voltage (AC) | 100 | - | 240 | [V] |
| Input current | - | - | 2.0 | [A] |
| Output voltage | - | 24 | - | [V] |
| Output current | - | 6.25 | - | [A] |

| Compute Box Power input (24V connector) | Minimum | Typical | Maximum | Unit |
|-----------------------------------------|---------|---------|---------|------|
| Supply voltage | - | 24 | 25 | [V] |
| Supply current | - | 6.25 | - | [A] |

| Compute Box Power output (Device connector) | Minimum | Typical | Maximum | Unit |
|---------------------------------------------|---------|---------|---------|------|
| Output voltage | - | 24 | 25 | [V] |
| Output current | - | 4.5 | 4.5* | [A] |

* Peak currents

8.1.2.3. Compute Box I/O interface

| Power Reference (24V, GND) | Minimum | Typical | Maximum | Unit |
|----------------------------|---------|---------|---------|------|
| Reference output voltage | - | 24 | 25 | [V] |
| Reference output current | - | - | 100 | [mA] |

| Output (DO1-DO8) | Minimum | Typical | Maximum | Unit |
|----------------------------------|---------|---------|---------|------|
| Output current - altogether | - | - | 100 | [mA] |
| Output resistance (active state) | - | 24 | - | [Ω] |

| Input (DI1-DI8) as PNP | Minimum | Typical | Maximum | Unit |
|------------------------|---------|---------|---------|------|
| Voltage level - TRUE | 18 | 24 | 30 | [V] |
| Voltage level - FALSE | -0.5 | 0 | 2.5 | [V] |
| Input current | - | - | 6 | [mA] |
| Input resistance | - | 5 | - | [kΩ] |

| Input (DI1-DI8) as NPN | Minimum | Typical | Maximum | Unit |
|------------------------|---------|---------|---------|------|
| Voltage level - TRUE | -0.5 | 0 | 5 | [V] |
| Voltage level - FALSE | 18 | 24 | 30 | [V] |
| Input current | - | - | 6 | [mA] |
| Input resistance | - | 5 | - | [kΩ] |

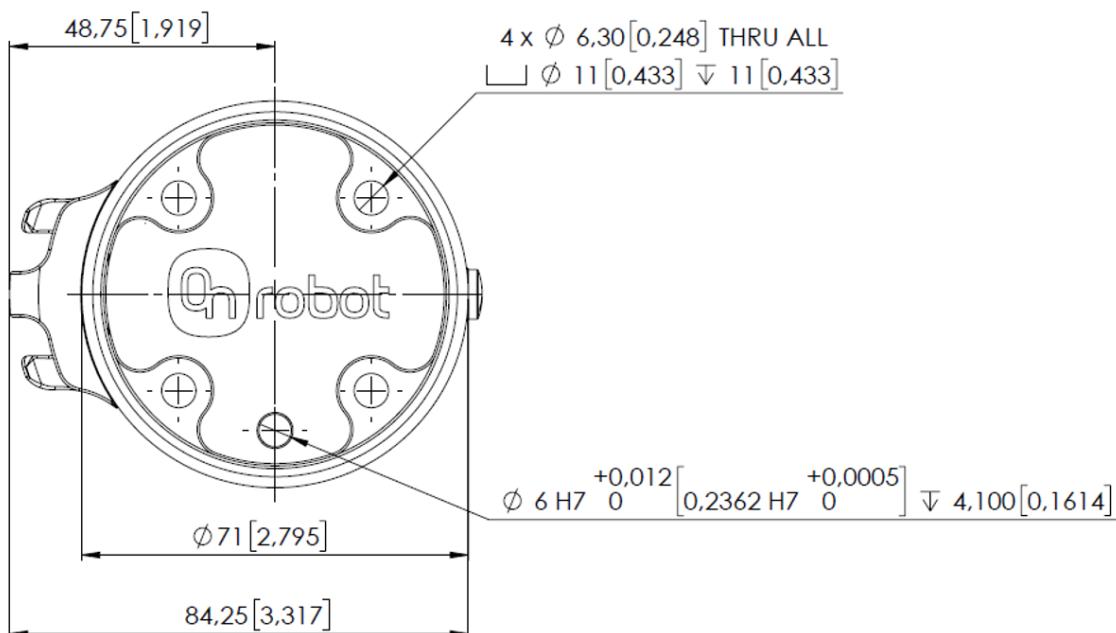
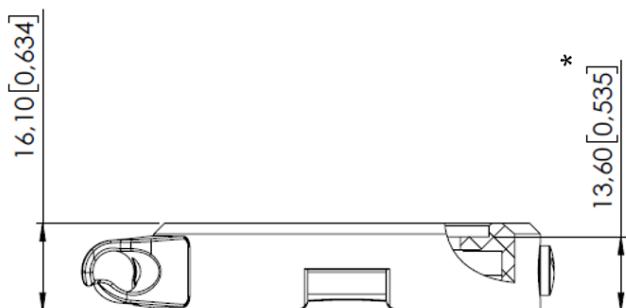
8.2. Mechanical Drawings

8.2.1. Adapter Plate

No adapter plate is required.

8.2.2. Mountings

8.2.2.1. Quick Changer - Robot Side



* Distance from Robot flange interface to OnRobot tool.

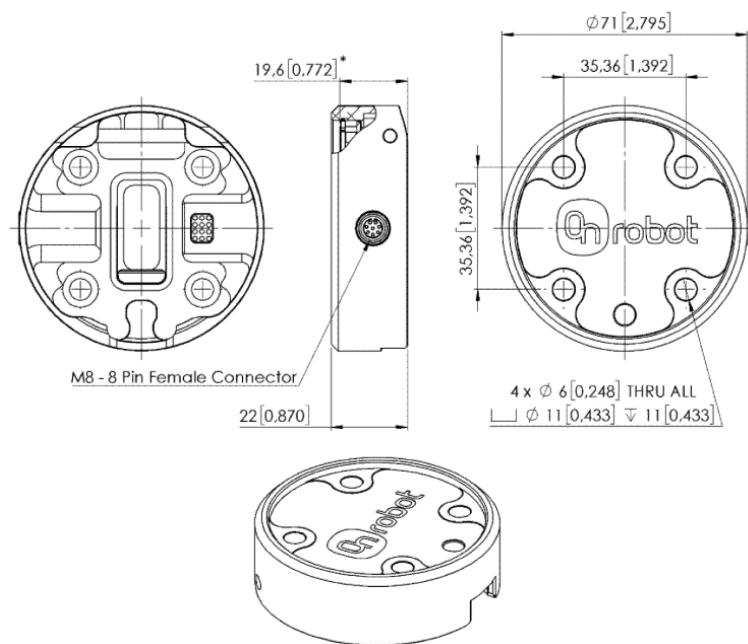
All dimensions are in mm and [inches].



NOTE:

The cable holder (on the left side) is only required with the long (5 meter) cable.

8.2.2.2. Quick Changer for I/O - Robot Side

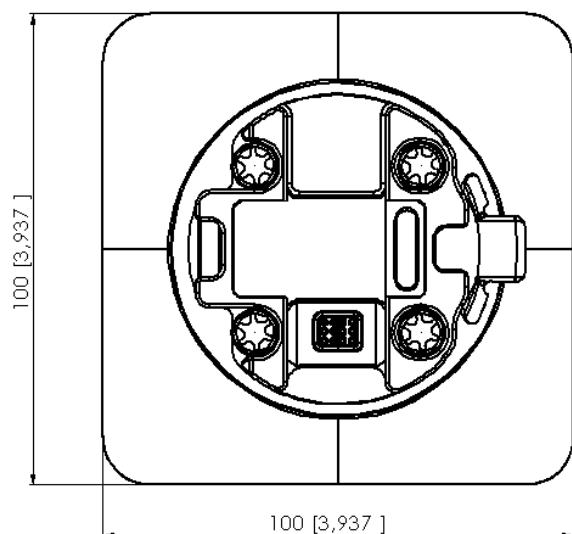
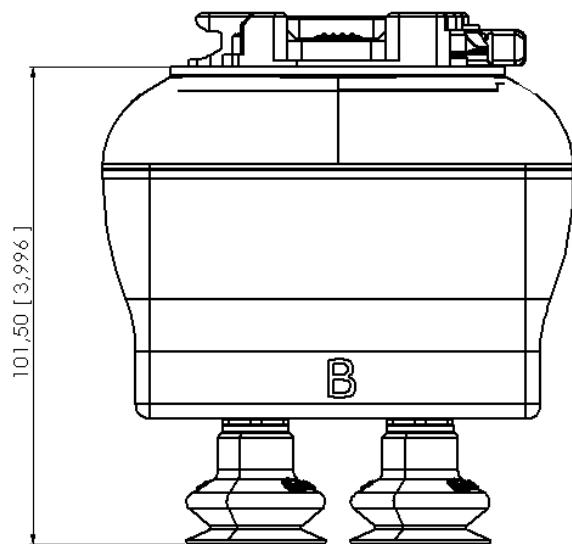


* Distance from Robot flange interface to OnRobot tool

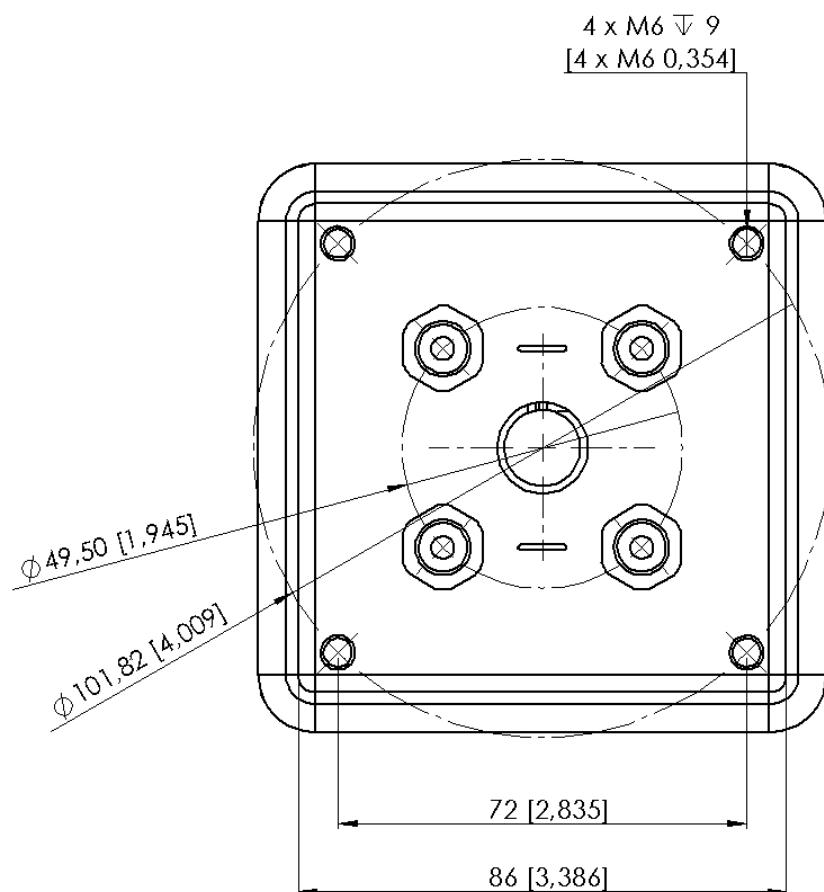
All dimensions are in mm and [inches].

8.2.3. Tools

8.2.3.1. VGC10



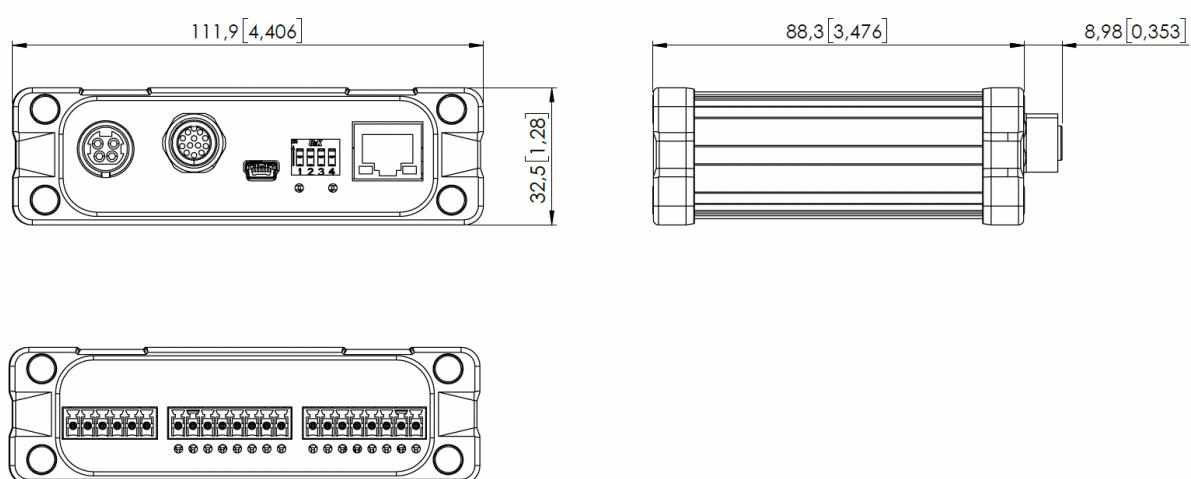
All dimensions are in mm and [inches].



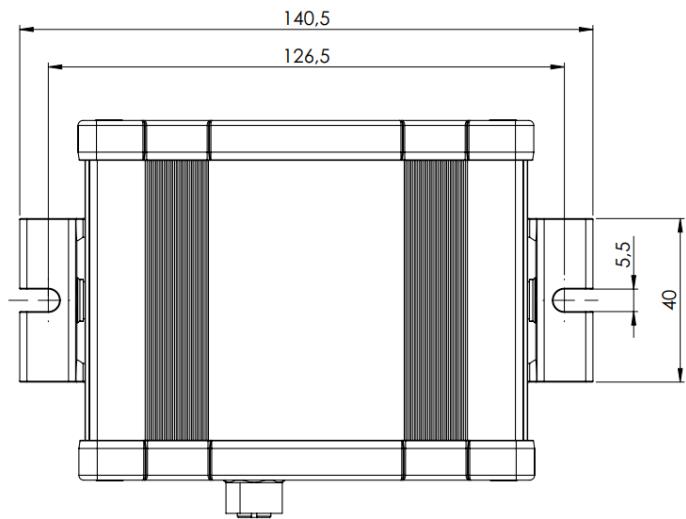
All dimensions are in mm and [inches].

8.2.3.2. Compute Box

Compute Box



Clip-on Bracket (optional)



All dimensions are in mm and [inches].

8.3. TCP, COG

Using Tool Connection

Use the TCP/COG calculator to calculate the TCP and COG values for your OnRobot product combination.

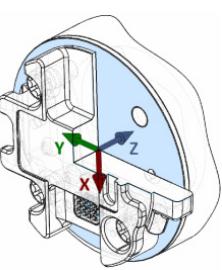
The TCP/COG calculator can be downloaded from www.onrobot.com/downloads.

Using Compute Box/Eye Box

For more information, see the [7.1.6. Web Client: TCP, COG](#) section.

TCP, COG, and weight parameters of the single devices (without any mounting/adapter):

8.3.1. VGC10

| Coordinate system | TCP [mm] | Center of Gravity [mm] | Weight |
|-------------------------------------------------------------------------------------|--------------------|-------------------------|---------------------|
|  | X=0 Y=0 Z=75 | cX=-1 cY=-1 cZ=37 | 0.814 kg 1.79 lb |

* With no attachments

9. Maintenance

WARNING:



An overall inspection of the OnRobot's End of Arm Tooling must be performed regularly and at least once every 6 months. This inspection must include but is not limited to check for defective material and clean gripping surfaces.

Use original spare parts, and original service instructions for the OnRobot's End of Arm Tooling and the robot. Failure to comply with this precaution can cause unexpected risks, resulting in severe injury.

If you have questions regarding spare parts and repair, please visit our website www.onrobot.com to contact us.

9.1. VG10/VGC10

The VG grippers are equipped with one filter for each suction cup socket, and one filter for the exhaust. How often the filters need to be changed depends on the nature of the work piece and the working environment. The VG grippers automatically de-dust the filters every time a grip is released. However, particles can eventually get stuck and build up inside the filter, lowering the VG grippers performance.

A filter service kit is available, which include both new filters and tools needed.

- Filter service kit for VG10, PN 100064
- Filter service kit for VGC10, PN 103757

Neither use nor power on the VG grippers without filters. Dust, hair and larger particles can get stuck in pump membranes and valve seats, causing permanent damage to the VG grippers.

DANGER:



Identify how often the filters need service and schedule maintenance with a fixed period short enough to ensure a firm grip at all times.

An overall inspection of the VG grippers must be performed regularly and at least once every 6 months.

Never power the VG grippers without filters or with filters mounted incorrectly. Failure to comply with this precaution can cause irreversible failure of pump or valves.

10. Troubleshooting

10.1. Robot Has Not Obtained an IP Address

If the Compute Box has not assigned an IP address to the robot, do the following:

Assign a static IP address to the robot that matches your current IP settings on your Compute Box. The default IP address of the Compute Box is 192.168.1.1.

**NOTE:**

Change the last number in the IP address (if using 255.255.255.0 subnet mask) to avoid an IP conflict with the Compute Box.

Example

If the default fixed (192.168.1.1) IP address is used on the Compute Box, then use the following values:

- IP address: 192.168.1.2
- Subnet Mask: 255.255.255.0

10.2. Error During Operation

If an error occurs during operation, try the following:

1. Restart the robot and check the functionality.
2. If the error is still present, contact the distributor from where the product has been purchased.

10.3. Changing the DIP Switch Does Not Take Effect

To change the DIP switch network settings, first change the DIP switches and then cycle the Compute Box/Eye Box power so the changes will take effect.

If the changes still do not take effect, wait one minute and then cycle the Compute Box/Eye Box power once again.

10.4. URCap Operation

**CAUTION:**

Installed URCaps from different vendors may affect the OnRobot URCaps operation.

If you experience slow GUI response, performance issue, slow program start, error pop-ups, or function loss, make sure that only the OnRobot URCap is installed on the robot.

10.5. Tool Functions Are Not Available

If the tool functions are not available (grayed out) in the program, return to the **Installation** tab > **URCaps** > **Device info** and then back to the program.

11. Warranties

11.1. Patents

Products of OnRobot A/S are protected by several patents; some still in global publication process (Patents pending). All manufacturers of copies and similar products violating any patent claims will be prosecuted.

11.2. Product Warranty

Without prejudice to any claim the user (customer) may have in relation to the dealer or retailer, the customer shall be granted a manufacturer's warranty under the conditions set out below:

In the case of new devices and their components exhibiting defects resulting from manufacturing and/or material faults within 12 months of entry into service (maximum of 15 months from shipment), OnRobot A/S shall provide the necessary spare parts, while the customer (user) shall provide working hours to replace the spare parts, either replace the part with another part reflecting the current state of the art, or repair the said part. This warranty shall be invalid if the device defect is attributable to improper treatment and/or failure to comply with information contained in the user guides. This warranty shall not apply to or extend to services performed by the authorized dealer or the customer themselves (e.g. installation, configuration, software downloads). The purchase receipt, together with the date of purchase, shall be required as evidence for invoking the warranty. Claims under the warranty must be submitted within two months of the warranty default becoming evident. Ownership of devices or components replaced by and returned to OnRobot A/S shall vest in OnRobot A/S. Any other claims resulting out of or in connection with the device shall be excluded from this warranty. Nothing in this warranty shall attempt to limit or exclude a customer's statutory rights nor the manufacturer's liability for death or personal injury resulting from its negligence. The duration of the warranty shall not be extended by services rendered under the terms of the warranty. Insofar as no warranty default exists, OnRobot A/S reserves the right to charge the customer for replacement or repair. The above provisions do not imply a change in the burden of proof to the detriment of the customer. In case of a device exhibiting defects, OnRobot A/S shall not be liable for any indirect, incidental, special or consequential damages, including but not limited to, lost profits, loss of use, loss of production or damage to other production equipment.

In case of a device exhibiting defects, OnRobot A/S shall not cover any consequential damage or loss, such as loss of production or damage to other production equipment.

11.3. Disclaimer

OnRobot A/S continues to improve reliability and performance of its products, and therefore reserves the right to upgrade the product without prior warning. OnRobot A/S ensures that the content of this manual is precise and correct but takes no responsibility for any errors or missing information.

12. Certifications

intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

OnRobot A/S

Main Site: Tegl værksvej 47 H, 5220 Odense SØ, Denmark

Chamber of Commerce: 36492449

Additional Site: OnRobot A/S, Cikorievej 44, 5220 Odense SØ, Denmark

has been registered by Intertek as conforming to the requirements of

ISO 9001:2015

The management system is applicable to:

Development and sales of End-of-Arms tools for industrial customers worldwide.

Certificate Number:

0096721

Initial Certification Date:

26 November 2019

Date of Certification Decision:

26 November 2019

Issuing Date:

26 November 2019

Valid Until:

25 November 2022



Intertek™



Accred. no. 1639
Certification of
Management
Systems
ISO/IEC 17021-1



Carl-Johan von Plomgren
MD, Business Assurance Nordics

Intertek Certification AB
P.O. Box 1103, SE-164 22 Kista, Sweden



In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The certificate remains the property of Intertek, to whom it must be returned upon request.



12.1. EMC



Attestation of Conformity no. 120-35088-A1

FORCE Technology has performed compliance testing on electrical products since 1967. FORCE Technology is an accredited test house according to EN17025 and participates in international standardization with organizations such as CEN/CENELEC, IEC/CISPR and ETSI. This attestation of conformity with the below mentioned standards and/or normative documents is based on accredited tests and/or technical assessments carried out at FORCE Technology.

| | | | | | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|------------------------------|-------------------|--------------------|-----------------------|--------------------|---------------------------|--|---------------------------|--|-----------------------|--|---------------------------|--|-----------------------|
| Attestation holder OnRobot A/S, Teglværksvej 47H, 5220 Odense SØ, Denmark | | | | | | | | | | | | | | | | |
| Product identification - Name (Part no.) Power Supplies: PSU (104788), VER36U240-JA, VES120PS24, VES150PS24. Controllers: UR Kit with Compute Box (102344), Doosan Robot kit (102345), Techman/OMRON TM Robot Kit (102359), KUKA-A Robot kit (102360), KUKA-B Robot kit (102361), FANUC Robot kit (102362), Kawasaki-B Robot kit (102363), Kawasaki-C Robot kit (102364), Kawasaki-D Robot kit (102365), Kawasaki-E Robot kit (102366), Yaskawa-F Robot kit (102367), Yaskawa-G Robot kit (102368), Yaskawa-H Robot kit (102369), NACHI-I Robot kit (102370), NACHI-J Robot kit (102371), Hanwha Robot Kit (103208), Eye Box (103707). Mountings: Dual Quick Changer (101788), Quick Changer Robot side (102037), HEX-E QC (102111), Quick Changer Kit (102277), HEX-H QC (102376), Quick Changer Robot side 4,5A (104277), Dual Quick Changer 4,5A (104293), Quick Changer Kit 4,5A (104388). Tools: 2FG7 (106376), 3FG15 (103666), Eyes Lighting Kit (107080), MG10 (105202), OnRobot Eyes (103903), RG2 (102012), RG2-FT (102075), RG6 (102021), Sander (106376), Screwdriver (103961), SG Base Part (103546), VG10 (101661), VGC10 (102844), VGP20 (107242). | | | | | | | | | | | | | | | | |
| Manufacturer OnRobot A/S | | | | | | | | | | | | | | | | |
| Technical documentation FORCE Technology Assessment no. 120-35088-A1 | | | | | | | | | | | | | | | | |
| Standards/Normative documents <table> <tr> <td>IEC 61000-3-2:2018</td> <td>EMC Directive 2014/30/EU, Article 6</td> </tr> <tr> <td>IEC 61000-3-3:2013/AMD1:2017</td> <td>EN 61000-3-2:2014</td> </tr> <tr> <td>IEC 61000-6-2:2016</td> <td>EN IEC 61000-3-2:2019</td> </tr> <tr> <td>IEC 61000-6-4:2018</td> <td>EN 61000-3-3:2013/A1:2019</td> </tr> <tr> <td></td> <td>EN 61000-6-2:2005/AC:2005</td> </tr> <tr> <td></td> <td>EN IEC 61000-6-2:2019</td> </tr> <tr> <td></td> <td>EN 61000-6-4:2007/A1:2011</td> </tr> <tr> <td></td> <td>EN IEC 61000-6-4:2019</td> </tr> </table> <p>Additionally, for RG2 (102012) and RG6 (102021): IEC 61326-3-1:2017, Industry locations, SIL 2</p> <p>The product identified above has been assessed and complies with the specified standards/normative documents. The attestation does not include any market surveillance. It is the responsibility of the manufacturer that mass-produced apparatus have the same properties and quality. This attestation does not contain any statements pertaining to the requirements pursuant to other standards, directives or laws other than the above mentioned.</p> | IEC 61000-3-2:2018 | EMC Directive 2014/30/EU, Article 6 | IEC 61000-3-3:2013/AMD1:2017 | EN 61000-3-2:2014 | IEC 61000-6-2:2016 | EN IEC 61000-3-2:2019 | IEC 61000-6-4:2018 | EN 61000-3-3:2013/A1:2019 | | EN 61000-6-2:2005/AC:2005 | | EN IEC 61000-6-2:2019 | | EN 61000-6-4:2007/A1:2011 | | EN IEC 61000-6-4:2019 |
| IEC 61000-3-2:2018 | EMC Directive 2014/30/EU, Article 6 | | | | | | | | | | | | | | | |
| IEC 61000-3-3:2013/AMD1:2017 | EN 61000-3-2:2014 | | | | | | | | | | | | | | | |
| IEC 61000-6-2:2016 | EN IEC 61000-3-2:2019 | | | | | | | | | | | | | | | |
| IEC 61000-6-4:2018 | EN 61000-3-3:2013/A1:2019 | | | | | | | | | | | | | | | |
| | EN 61000-6-2:2005/AC:2005 | | | | | | | | | | | | | | | |
| | EN IEC 61000-6-2:2019 | | | | | | | | | | | | | | | |
| | EN 61000-6-4:2007/A1:2011 | | | | | | | | | | | | | | | |
| | EN IEC 61000-6-4:2019 | | | | | | | | | | | | | | | |
| Signature <div style="display: flex; align-items: center;"> Knud A. Baltsen Digitally signed by Knud A. Baltsen Date: 2021.05.27 16:58:51 +02'00' </div> <p>Signed by: Knud A. Baltsen, Senior Specialist, Product Compliance</p> | | | | | | | | | | | | | | | | |

12.2. Declaration of Incorporation

12.2.1. VGC10

CE/EU Declaration of Incorporation (Original)

According to European Machinery Directive 2006/42/EC annex II 1.B.

The manufacturer:

OnRobot A/S
Teglværksvej 47H
DK-5220, Odense SØ
DENMARK

declares that the product:

| | |
|-------------|--------------------------|
| Type: | Industrial Robot Gripper |
| Model: | VGC10 |
| Generation: | V1 |
| Serial: | 1000000000-1009999999 |

may not be put into service before the machinery in which it will be incorporated is declared in conformity with the provisions of Directive 2006/42/EC, including amendments, and with the regulations transposing it into national law.

The product is prepared for compliance with all essential requirements of Directive 2006/42/EC under the correct incorporation conditions, see instructions and guidance in this manual. The following essential requirements of Directive 2006/42/EC are fulfilled: 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4, 1.5.1, 1.5.2, 1.5.4, 1.5.5, 1.5.10, 1.5.11, 1.5.12, 1.6.1. Compliance with all essential requirements of Directive 2006/42/EC relies on the specific robot installation and the final risk assessment.

Technical documentation is compiled according to Directive 2006/42/EC annex VII part B and available in electronic form to national authorities upon legitimate request. Undersigned is based on the manufacturer address and authorized to compile this documentation.

Additionally, the product declares in conformity with the following directives, according to which the product is CE marked:

2014/30/EU — Electromagnetic Compatibility Directive (EMC)
2011/65/EU — Restriction of the use of certain hazardous substances (RoHS)

Relevant essential health and safety requirements of the following EU directives are also applied:

2014/35/EU — Low Voltage Directive (LVD)
2012/19/EU — Waste of Electrical and Electronic Equipment (WEEE)

A list of applied harmonized standards, including associated specifications, is provided in this manual.

Budapest, November 11th, 2020

Group Management

Beskid Vilmos
Vilmos Beskid
CTO